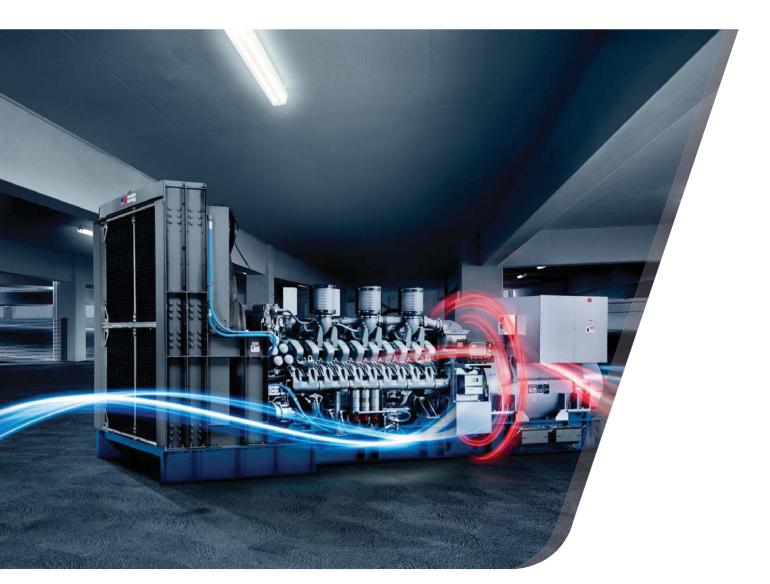
ENGINEER'S GUIDEBOOK

A COMPLETE PRODUCT LISTING





MTU Onsite Energy A Rolls-Royce Power Systems Brand

www.mtuonsiteenergy.com



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MTU 10V0068 GS75 (75 kW)
MTU 10V0068 GS100 (100 kW)
MTU 10V0068 GS125 (125 kW)
MTU 6R0135 GS150 (150 kW)
MTU 6R0185 GS200 (200 kW)



// 60 Hz Generator Sets – Gas Standby (continued)

MTU 8V0183 GS260 (260 kW) MTU 10V0183 GS350 (350 kW)

MTU 12V0183 GS400 (400 kW)

// 60 Hz Generator Sets – Gas Prime

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// 60 Hz Generator Sets – Diesel Standby

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MTU 4R0113 DS40 (40 kW) SCAQMD
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MTU 16V4000 DS2250 (2,250 kW)
MTU 16V4000 DS2500 (2,500 kW)
MTU 20V4000 DS2500 (2,500 kW)
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// 60 Hz Generator Sets – Diesel Data Center Continuous Power

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MTU 12V4000 DS1250 (1,135 kW)

MTU 12V4000 DS1500 (1,400 kW)

MTU 12V4000 DS1750 (1,600 kW)



// 60 Hz Generator Sets – Diesel Data Center Continuous Power (continued)

MTU 16V4000 DS2000 (1,825 kW)

MTU 16V4000 DS2250 (2,045 kW)

MTU 20V4000 DS2500 (2,275 kW)

MTU 20V4000 DS2800 (2,500 kW)

MTU 20V4000 DS3000 (2,800 kW)

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MTU 4R0113 DS50 (45 kW) SCAQMD	
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MTU 12V4000 DS1500 (1,400 kW)	
MTU 12V4000 DS1750 (1,600 kW)	
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Two (2) Year / 6,000 Hour Basic Extended Prime Limited Warranty OE-M-GEN-E-007

Five (5) Year / 3,000 Hour Basic Extended Standby Limited Warranty OE-M-GEN-E-001

Five (5) Year / 3,000 Hour Comprehensive Extended Standby Limited Warranty OE-M-GEN-E-002



// Warranty Information (continued)

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Two (2) Year Basic ATS Standby Limited Warranty OE-M-ATS-S-012

Five (5) Year Basic Extended ATS Standby Limited Warranty OE-M-ATS-E-009

Five (5) Year Comprehensive Extended ATS Standby Limited Warranty OE-M-ATS-E-010

Ten (10) Year Major Components Extended ATS Standby Limited Warranty OE-M-ATS-E-011

One (1) Year Basic Parts Standby Limited Warranty OE-M-GEN-S-003

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Overview

The Engineer's Guidebook is a collection of product specification sheets, component data sheets, and warranty information for the MTU Onsite Energy portfolio of products and accessories. It is available in electronic or hardcopy format and can be delivered in a printed hardcopy from MTU Onsite Energy, electronically on flash drive or CD, or as a download from the MTU Business Portal or public website.

Ordering in Hardcopy, Flash Drive, or CD from MTU Onsite Energy

The Engineer's Guidebook can be ordered in hardcopy, on flash drive, or CD by contacting the MTU Onsite Energy Parts Department as noted below:

- Email: mankato.spareparts@mtu-online.com
- Phone: +1 507 385 6990

You can order the Engineer's Guidebook as you would any other part by using the following part numbers:

Part Number	Description	Price (USD)*
SUA100686	SUA100686 Engineer's Guidebook - Color	
SUA100687	Engineer's Guidebook - Black and White	\$25.00
SUA100688	Engineer's Guidebook - 2 GB Flash Drive	\$15.00
SUA105192	Engineer's Guidebook - CD	\$15.00

* Prices do not include applicable shipping fees. The cost of the Engineer's Guidebook is eligible for 100% Co-op reimbursement.

For any questions regarding the Engineer's Guidebook, please contact your MTU Onsite Energy Account Manager.

Downloading an Electronic Version from the MTU Onsite Energy Website or the MTU Business Portal

For your convenience, the Engineer's Guidebook can be downloaded from the following areas:

- MTU Onsite Energy Public Website (<u>www.mtuonsiteenergy.com</u>)
- MTU Business Portal (<u>http://partner.mtu-online.com/irj/portal</u>)

There is no fee for downloading the document directly from these locations. Please refer to the directions that follow for instruction.



To download from the MTU Onsite Energy Website www.mtuonsiteenergy.com

There are two general areas where the Engineer's Guidebook can be downloaded from the public website. They include:

- From a <u>Product</u> page
- From the <u>Technical Info</u> tab

To download the Engineer's Guidebook from a Product page

- 1. Access the website at http://www.mtuonsiteenergy.com.
- 2. Under the Products heading, select Diesel Generator Sets or Gas Generator Sets.
- 3. Scroll down the left navigation panel and click **Engineer's Guidebook**.
- 4. Follow the directions displayed on the screen.
- 5. When the document is displayed, you can save it by clicking File > Save As in the toolbar.
- 6. In the Save As PDF dialog box, select the location where you wish to save the document.
- 7. Click **Save**. The document will be saved in your chosen location.

To download the Engineer's Guidebook from the Technical Info tab

- 1. Click **Technical Info > Tools and Downloads**.
- 2. Click Engineer's Guidebook.
- 3. Click the link to download the document and follow the directions displayed on the screen.
- 4. When the document is displayed, you can save it by clicking **File > Save As** in the toolbar.
- 5. In the **Save As PDF** dialog box, select the location where you wish to save the document.
- 6. Click **Save**. The document will be saved in your chosen location.

To download from the MTU Business Portal (for MTU Onsite Energy Distributors only)

- 1. Access the MTU Business Portal at http://partner.mtu-online.com/irj/portal.
- 2. Select Applications & Products > Powergen > Diesel Systems US or Gas Systems US.
- 3. From the menu on the right, select **Engineer's Guidebook.**
- 4. A list of links appears. Click Engineer's Guidebook.
- 5. When the document is displayed, save the document by clicking in the toolbar. The **Save A Copy** dialog box is displayed.
- 6. Select the location where you wish to save the document.
- 7. Click Save. The document will be saved in the chosen location.



Searching the Engineer's Guidebook (Electronic Format Only)

The electronic version of the Engineer's Guidebook is searchable. Whether on a flash drive, CD, or downloaded from the MTU Business Portal or public website, the Engineer's Guidebook opens in Adobe Acrobat Reader as a default.

To search the Engineer's Guidebook:

1. From the toolbar menu, select or click **Ctl + F**. A box similar to the following will display:

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2. Enter the search criteria in the box, and press Enter to begin the document search.

Keeping the Guidebook Up To Date Between Releases

Documents contained within the Engineer's Guidebook are updated intermittently between releases. Please refer to the following resources to stay informed of changes.

Document	Purpose	Where to Find It
Spec Sheet Change List	Provides a list of all spec sheet	MTU Business Portal:
	updates for the specified year.	Applications and Products >
	 Check the version ID of the spec sheet in your 	Powergen > Diesel Systems US or Gas Systems US
Engineer's Guidebook to determine whether you have the latest version (found on the last page of each spec sheet).		From the menu on the right, select MTU OED Sitemap . In the Technical Data column, select Spec Sheets > Spec Sheet Change History.
Engineer's Guidebook Version History	Provides a list of all Engineer's Guidebook updates since the last release.	At the beginning of the Engineer's Guidebook
Monthly Sales Distributor Call	A segment of this call advises Distributors of new, updated, or removed documents.	This WebEx meeting is held the third Monday of each month. Please contact your MTU Onsite Energy Account Manager for assistance.



Printing

Printing the Electronic Version of the Engineer's Guidebook

If you wish to have the Engineer's Guidebook in the format that MTU Onsite Energy prints it, you can place an order with MTU Onsite Energy (refer to <u>Ordering in Hardcopy, Flash Drive, or CD from MTU</u> <u>Onsite Energy</u>).

Should you wish to print the Engineer's Guidebook yourself or save an electronic copy on a CD, additional printable PDFs are offered on the MTU Business Portal for the Cover and the CD label. Navigate to the <u>MTU Business Portal</u> and select *Applications and Products > Powergen > Diesel Systems US* or *Gas Systems US*. From the menu on the right, select *Engineer's Guidebook*.

The following table gives paper specifications used by MTU Onsite Energy for each section of the Engineer's Guidebook.

Document to Print	Paper Size
Cover	8.5" x 11" cardstock
History/Enclosures/Accessories and Components/Warranty Information	8.5" X 11", duplexed
Spec Sheets	11 X 17, duplexed, saddle fold booklet
CD Label	Refer to Printing the Engineer's Guidebook CD Label

Printing the Engineer's Guidebook CD Label

If you wish to download the Engineer's Guidebook from any one of the online locations and save onto a CD, MTU Onsite Energy has provided a template for labeling the CD. It is located on the MTU Business Portal. To print the labels from the template provided, Avery 5931/8931 CD Labels are required.

To download and print the CD Label from the MTU Business Portal:

- 1. Access the MTU Business Portal at http://partner.mtu-online.com/irj/portal.
- 2. Navigate to Applications and Products > Powergen > Diesel Systems US or Gas Systems US.
- 3. From the menu on the right, select MTU OED Sitemap.
- 4. In the Tools column, select Engineer's Guidebook.
- 5. Click the CD Label MTU Onsite Energy link. The template will download.
- 6. Once the template is downloaded, you can print it on Avery 5931/8931 CD Labels by following the instructions included with the labels.

Printing Selected Pages of the Engineer's Guidebook

To print portions or selected pages of the Engineer's Guidebook, click **File** and then **Print**. Follow the instructions in the dialog box to choose the pages you wish to print.



Indicated below is a summary of changes that occurred with the current release of the Engineer's Guidebook.

Version	Release Date	Change Type	Description
2017-10	10/10/2017	Added	MTU 16V2000 DS1000 (1,000 kW) Standby
			MTU 16V2000 DS1250 (1,250 kW) Standby
			MTU 16V2000 DS1000 (900 kW) Prime
			MTU 16V2000 DS1000 (900 kW) DCCP
			MTU 4R0063 GS40 (40 kW) Standby
			Circuit Breaker Enclosure Data Diesel 900-1,250 kW (2000)
			CB, CL, and WL Series Water Heater Data Sheet
			CSM Series Water Heater Data Sheet
			TPS Series Water Heater Data Sheet
			Distribution Panel Data Sheet Diesel 750-1,250 kW
			Enclosure and Sound Data Diesel 900-1,250 kW (2000)
			AVR D510C Regulator Data Sheet
			Two (2) Year / 3,000 Hour Basic Standby & Prime Limited Warranty OE- M-GEN-S-025
		Updated	Engineer's Guidebook Version History
			Existing Spec Sheet Changes: Please refer to the 2017 Spec Sheet Change History on the MTU Business Portal (distributor use only).
			ASCO 300 Series ATS Brochure
			Circuit Breaker Enclosure Data Sheets (all)
			MGC-1500 Series Controller Data Sheet
			MGC-2000 Series Controller Data Sheet
			MGC-3000 Series Controller Data Sheet
			Optional Cooling Package Data Sheet
			Enclosure and Sound Data Sheets (all)
			MicroGenius 150 Battery Charger Data Sheet
			12 V Onboard Battery Charger Data Sheet became MTU Onsite Energy 12-6A Battery Charger Data Sheet
			Two (2) Year / 6,000 Hour Basic Extended Prime Limited Warranty OE-M- GEN-E-007
			Five (5) Year / 3,000 Hour Basic Extended Standby Limited Warranty OE- M-GEN-E-001
			Five (5) Year / 3,000 Hour Comprehensive Extended Standby Limited Warranty OE-M-GEN-E-002

ENGINEER'S GUIDEBOOK Version History



Version	Release Date	Change Type	Description
			Ten (10) Year / 3,000 Hour Major Component Extended Standby Limited Warranty OE-M-GEN-E-004
		Deleted	MTU 6V0072 GS40 (40 kW)
			MTU 8V0063 GS50 (50 kW)
			MTU 16V2000 DS900 (900 kW)
			MTU 16V2000 DS1000 (1,000 kW)
			Battery Charger 2608A Data Sheet
			Two (2) Year / 3,000 Hour Basic Prime Limited Warranty OE-M-GEN-S-005
			Two (2) Year / 3,000 Hour Basic Standby Limited Warranty OE-M-GEN-S-006

ONE OF THE NEWEST NAMES IN POWER GENERATION IS ALSO ONE OF THE OLDEST





The name MTU Onsite Energy may be new to you, but behind this name is a global manufacturing organization with more than 100 years of innovative engine manufacturing and 60 years of power generation packaging. Industry legends such as Maybach, Daimler-Benz, Detroit Diesel, Katolight and Rolls-Royce are all integral parts of MTU Onsite Energy's heritage of experience and expertise. MTU Onsite Energy has gained strength from each of these different companies.

Today, MTU Onsite Energy is one of the leaders in the power generation industry, with a comprehensive power generation product portfolio and unmatched customer service. Our network of nearly 300 North American service locations means you're never far from an authorized distributor with a knowledgeable sales staff and EGSA-certified technicians to answer all your power needs.

COMPLETE POWER GENERATION SOLUTIONS

Power generation systems from MTU Onsite Energy are ideal for emergency standby and prime power in the most demanding commercial and industrial applications. As a single-source supplier, MTU Onsite Energy provides generator sets, automatic transfer switches, digital paralleling switchgear, fuel tanks and enclosures for complete onsite power solutions. With reliable MTU engines, MTU Onsite Energy delivers the benefits of vertical integration to its power generation customers.

MEETING CUSTOMER NEEDS

Backed by more than a century of technological innovation in engines and power generation components, MTU Onsite Energy is a verticallyintegrated global manufacturing organization focused on meeting customers' distributed energy needs. With engines and power generation systems manufactured around the world, MTU Onsite Energy has a distinct advantage in being able to deliver power systems on time and on budget anywhere in the world. We have just one goal in mind: to deliver the best onsite power solution whenever and wherever you need it.

PRODUCTS FROM MTU ONSITE ENERGY

- ${\it /\!\!/}$ Diesel-powered generator sets 30 kW to 3,250 kW
- ${\it I\!\!I}$ Gas-powered generator sets 30 kW to 400 kW
- // Natural gas cogeneration systems
- *II* Automatic transfer switches 30 amps to 4,000 amps
- // Paralleling switchgear and digital master control systems
- // Demand response and load management programs

Features

- // 50 Hz and 60 Hz models
- // UL2200 listing available on most models
- // Cutting-edge emissions technology
- // Advanced monitoring and communications technology
- // Digital engine controls for superior performance
- ${\it I\!\!I}$ Proven reliability and durability
- ${\it I\!I}$ Unexcelled transient response and one-step load acceptance
- // 85% 24-hour average load factor standard on most models
- // IBC seismic certification and OSHPD approval available

MTU Onsite Energy history							
	h merges off-highway of Daimler- form ginally an for "Motor ine Union." 1994 MTU and Detroit Diesel form a partnership to develop the Series 2000 and Series 4000 engine families.	2000 MTU merges with the off-highway operations of Detroit Diesel, under the name of MTU Detroit Diesel.	2006 Tognum GmbH is formed as the parent company of MTU and MTU Detroit Diesel; the Tognum Group holding company is headquartered in Friedrichshafen, Germany.	2007 Tognum acquires Katolight Corporation, a generator set manufacturer and packager founded in 1952 and based in Mankato, Minnesota.	2008 MTU Onsite Energy is formed as the global power generation brand for Tognum, and Katolight Corporation is renamed MTU Onsite Energy Corporation.	2011 Daimler AG and Rolls-Royce Holdings PLC become majority shareholders of Tognum AG.	2014 Tognum America becomes MTU America, a wholly owned subsidiary of Rolls-Royce Power Systems AG.

MTU Onsite Energy Corporation

A Rolls-Royce Power Systems Company

www.mtuonsiteenergy.com

DIESEL PRODUCT BROCHURE Reference Page



The *MTU Onsite Energy Diesel Generator Sets* product brochure is a marketing tool designed to introduce your customers to our wide range of products. The brochure is included when you order a hardcopy of the Engineer's Guidebook. Additional copies of the brochure can be ordered from our website, using the path below.

<u>www.mtuonsiteenergy.com</u> > MTU Shop > MTU Onsite Energy > Marketing Material > Diesel Generator Sets > Brochures > MTU Onsite Energy Diesel Generator Sets

The brochure can also be downloaded as a PDF. To download the MTU Onsite Energy Diesel Generator Sets product brochure from the public website, follow the instructions below:

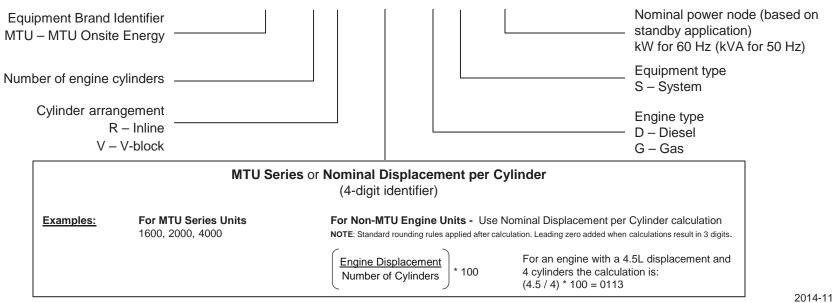
- 1. Access the website at <u>http://www.mtuonsiteenergy.com</u>.
- 2. Under the PRODUCTS heading, select Diesel Generator Sets.
- 3. Scroll down the left navigation panel to the Global Diesel Generator Set Brochure [PDF].
- 4. Click the link and follow the directions displayed on the screen.
- 5. When the document is displayed, click **File > Save As**.
- 6. In the Save As dialog box, select the location where you wish to save the document.
- 7. Click Save. The document will be saved in your chosen location.

SALES NOMENCLATURE Structure Definition

Purpose: For referencing generator set models for MTU Onsite Energy's globally standardized product line.

Effective August 1, 2014, the following sales nomenclature replaces all previous MTU Onsite Energy generator set model number definitions.

Example: MTU 18V2000 DS1250

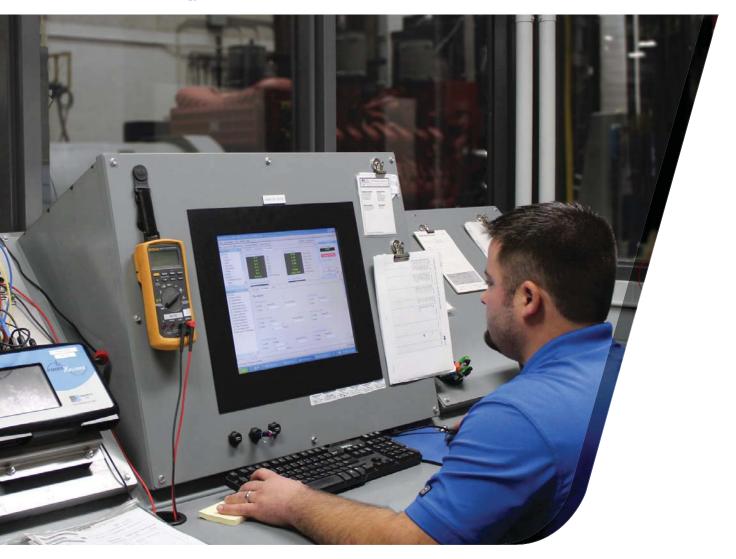


MTU 18 V 2000 D S 1250

MTU Onsite Energy A Rolls-Royce Power Systems Brand



www.mtuonsiteenergy.com



PERFORMANCE ASSURANCE CERTIFICATION



PROTOTYPE TEST PROCEDURES AND METHODS

MTU Onsite Energy has been producing superior engine-generator sets for more than six decades. We understand the importance of reliable cost-effective products, and have developed industry-leading test procedures to ensure we exceed this criteria. Our testing program confirms that our customers will receive products of the highest quality.

The Performance Assurance Certification provided by MTU Onsite Energy certifies that every engine-generator set undergoes rigorous prototype testing including the following:

Prototype test procedures

// Rated Load (NFPA 110)

MTU Onsite Energy certifies that all engine-generator set models will produce the name-plated load within the design tolerance of the generator set.

// Extended-run Testing

MTU Onsite Energy certifies that all engine-generator set prototypes have been subjected to extended run-time testing.

// Transient Response Analysis (ISO 8528-5)

MTU Onsite Energy certifies that all new generator set models have undergone transient response analysis per ISO 8528-5.

// Torsional Analysis

MTU Onsite Energy certifies that all engine-generator-set models have undergone torsional stress analysis.

// Engine Cooling System

MTU Onsite Energy certifies that all generator set models will cool sufficiently within the ambient design conditions per each model.

// Anticipatory Alarms and Shutdowns

MTU Onsite Energy certifies that the pre-alarms and alarms function appropriately to protect the engine-generator set from any foreseen unnecessary failures.

// Vibrational Analysis (ISO 8528-9)

MTU Onsite Energy certifies that all new engine-generator-set models have undergone vibration analysis to ensure that each enginegenerator coupling is balanced and that there is no destructive resonant vibration.

// Noise Analysis (ISO 8528-10)

MTU Onsite Energy certifies that all engine-generator sets undergo airborne noise analysis using the enveloping surface method.

Test standards

MTU Onsite Energy engine-generator sets are compliant with many different codes and standards. MTU Onsite Energy's validation philosophy and performance are regularly reviewed to ensure continuity with these codes and standards: UL2200, CSA, EPA, NFPA 99–Health Care Facilities, NFPA 70–National Electrical Code, NFPA 110–Standard for Emergency and Standby Power Systems, Department of Labor and Industry, NEMA MG 1–Motors and Generators, and MIL-STD-705-c.

FACTORY ACCEPTANCE TESTING PROCEDURES

MTU Onsite Energy's factory testing is performed with the same extreme diligence and attention to detail that is given to the prototype testing process. Every engine-generator set receives a complete factory acceptance test that certifies and ensures that the set will function in accordance to every specific application.

Test metering will have an accuracy of 1.3% or better. This metering is calibrated a minimum of once per year and is directly traceable to the Bureau of Standards.

Factory acceptance testing procedures:

- // Insulation Resistance Inspection (301.1c)*
- // High Potential Test (302.1b)*
- // Alternator Overspeed (1 min.)*
- // Engine Inspection
- **//** Generator Inspection
- // Resistances Inspection (401.1b)
 - Exciter Field Stator
 - Alternator Armatures
- // Mounting and Coupling Inspection
- // Engine Fuel Oil System Inspection
- // Engine Lube Oil System Inspection
- **// Engine Cooling System Inspection**
- // DC Charging System Inspection
- // Circuit Breaker Inspection
- // Anticipatory Alarms and Shutdowns Inspection (505.2b, 515.1b, 515.2b)
- **// Optional Equipment Inspection** (513.2a)
- // Load Test Inspection
 - Full Name-plate Rated Load
 - Regulator Range Test (511.1d)
 - No Load Inspection
 - MAX Load @ 1.0 P.F. (640.1d)
 - MAX Load @ 0.8 P.F.
 - Block Loads @ 0-25%, 0-50%, 0-75%, 0-100%
- // Phase Balance and Sequence Inspection (507.1d, 508.1d, 516.1a)
- * Performed by Alternator OEM

Rating Tolerance

MTU Onsite Energy certifies that all generator set models will produce the name-plated load at the standard conditions within the design tolerance (see table below) of the generator set.

Diesel Genset Product Family	Rating Tolerance
MTU 3R0096 DS30 to MTU 6R0120 DS200	+/- 5%
MTU 6R1600 DS230 to MTU 12V1600 DS600	+/- 2%
MTU 12V2000 DS650 to MTU 20V4000 DS3250	+/- 2%

Gas Genset Product Family	Rating Tolerance
MTU 4R0075 GS30 to MTU 8V0071 GS60	+/- 5%
MTU 10V0068 GS75 to MTU 10V0068 GS125	+/-3%
MTU 6R0135 GS150 to MTU 12V0183 GS400	+/- 5%

OPTIONAL TEST PROCEDURES

Extended-run factory acceptance testing:

In some cases, extended-run testing may be requested. Unless specified otherwise, extended-run testing will be performed in the following manner.

// Full name-plate rated load

// Standard readings taken every 15 minutes

STANDARD READINGS RECORDED DURING LOAD TEST INSPECTION

// Run Time	// Frequency
// AC Voltage	// Exciter Field Voltage
// AC Amperage	// Exciter Field Current
// kVA	// Lube Oil Pressure
// kWe	// Engine Coolant Temperature
// Power Factor	// Ambient Temperature

Witnessed factory acceptance testing

Witnessed factory tests must be scheduled and approved at least four weeks prior to the engine-generator set's scheduled shipping date. Any requests for witnessed factory testing after this four-week period must be approved by the Regional Sales Manager and are subject to additional fees.

Witnessed extended-run factory acceptance testing

Witnessed extended-run tests must be scheduled and approved at least four weeks prior to the engine-generator set's scheduled ship date. Any requests for witnessed extended-run testing after this four-week period must be approved by the Regional Sales Manager and are subject to additional fees.

Additional factory acceptance testing

Additional testing is available upon request. The following is a list of supplementary tests which can be performed on MTU Onsite Energy engine-generator sets. Non-standard testing is subject to additional charges.

Additional test methods:

- // Start and Stop Test (MIL-STD-705c 503.1c)
- // Remote Start and Stop Test (MIL-STD-705c 503.2c)
- // Overspeed Protective Device Test
 (MIL-STD-705c 505.2b)
- // Circulating Current Test (MIL-STD-705c 505.2b)
- // Insulation Resistance Test (MIL-STD-705c 301.1c)*
- // Open Circuit Saturation Curve Test (MIL-STD-705c 410.1b)
- // Temperature Rise Test (MIL-STD-705c 680.1c)
- // Frequency Range Adjust Test (MIL-STD-705c 511.2c)
- // Low Oil Pressure Protective Device Test (MIL-STD-705c 515.1b)
- // Over-temperature Protective Device Test (MIL-STD-705c 515.2b)
- // Controls, Direction, and Rotation Test
 (MIL-STD-705c 516.1a)
- // Frequency and Voltage Regulation, Stability, and Transient Response (MIL-STD-705c 608.1b)
- // Voltage and Frequency Regulation (MIL-STD-705c 614.1b)
- // Voltage Dip and Rise for Rated Load Test (MIL-STD-705c 619.2c)
- // Maximum Power Test (MIL-STD-705c 640.1d)
- // Fuel Consumption Test
- // Vibration and Mechanical Balance Test (ISO 8528-9)
- // Sound Test (ISO 8528-10)
- * Testing conducted by generator OEM



A Rolls-Royce Power Systems Company

MTU Onsite Energy Corporation / 100 Power Drive / Mankato / Minnesota 56001 Phone 507 625 7973 / Fax 507 625 2968 / Toll Free 800 325 5450

www.mtuonsiteenergy.com





Quality Policy

MTU Onsite Energy provides superior products and service in power generation through continual system improvement and employee development, in order to meet or exceed customer requirements and expectations.

Mission Statement

The basic mission of MTU Onsite Energy is to provide, at an optimal growth and profit, power generation products and services to our customers around the world. This will be accomplished by emphasizing Competitive prices, Superior quality, Service and support to customers, employees and communities.



MTU ONSITE ENERGY TRAINING, PARTS & SERVICE

MTU Onsite Energy offers a variety of technical training and certification courses. Factory training includes comprehensive courses ranging from Basic Power Generation Systems to Advanced Power Generation. MTU Onsite Energy also offers custom training to fit your needs. Our trainers have decades of experience in power generation. MTU Onsite Energy offers Sales, SERVICE I, and SERVICE II courses to our partners which create a competitve advantage in today's changing marketplace. MTU Onsite Energy's reputation for a quality parts and service support is admired throughout the distributed power industry. MTU Onsite Energy maintains a world wide network of experienced distributor and service centers. Knowledgeable training, parts, and service resources support the continual operation of MTU Onsite Energy standby and prime engine generator sets.

A Rolls-Royce Power Systems Company

MTU Onsite Energy / 100 Power Drive / Mankato / Minnesota 56001 Phone 507 625 7973 / Fax 507 625 2968 / Toll Free 800 325 5450



TRAINING BY MTU ONSITE ENERGY

Reasons to Attend

- // Increase knowledge of MTU Onsite Energy products
- // Gain a competitive edge
- // Reduce cost/time on a job site
- // Industry updates keep you current
- // MTU Onsite Energy certification
- // Strategies for preventing problems
- // Learn tools and solutions for troubleshooting

Who Should Attend SERVICE I

- // New and experienced technicians
- // Sales staff
- // Spec writers
- // Engineering support staff

Who Should Attend SERVICE II

- // Staff who have completed SERVICE I
- // Experienced technicians
- // Experienced engineering support staff
- // Technicians seeking certification

Who Should Attend MTU Onsite Energy Sales Class

- // Staff members who are new to MTU Onsite Energy products, services, or the power generation industry
- // Those who desire a creative selling edge
- // Those wanting to update their product knowledge

What You Can Expect To Gain

- // Product, service, and sales knowledge
- // Maximize sales opportunities
- // Competitive sales edge

Training courses are only available to MTU Onsite Energy partners. Visit the MTU Business Portal at http://partner.mtu-online.com to view upcoming training dates and couse outlines for MTU Onsite Energy Sales, SERVICE I, and SERVICE II.

MTU Onsite Energy can deliver training on site to save you time and money. If you require custom training for your staff, please contact our training department for a quote.

Contact details: E-mail: producttraining@mtu-online.com Phone: 734-561-2085

PARTS/SERVICE

MTU Onsite Energy strives to be your preferred source for quality parts through understanding customer needs and building strong partner relationships. We support all of your parts needs with genuine OEM replacement parts. We guarantee same day shipment on stock parts orders and if you have an after hours emergency our parts service team will work to provide timely solutions.

24 hours a day, 365 days a year

MTU Onsite Energy partners and service centers offer a variety of service agreements that offer preventive maintenance solutions throughout the year. Members of MTU Onsite Energy's emergency parts and service response team are available 24 hours a day, 365 days a year.



A Rolls-Royce Power Systems Company

MTU Onsite Energy / 100 Power Drive / Mankato / Minnesota 56001 Phone 507 625 7973 / Fax 507 625 2968 / Toll Free 800 325 5450



MASTERSPEC® Data Sheet

MasterSpec[®], a product of the American Institute of Architects (AIA), is the ultimate resource for producing customized specifications. With the MTU Onsite Energy MasterSpec[®], customizations and project-specific details can easily be applied.

MTU Onsite Energy continually works with MasterSpec[®] to provide the most up-to-date specification with current codes, standards, and regulations.

FEATURES

- MTU Onsite Energy's free specifications are available for download at: <u>www.productmasterspec.com/Profile/MTU_Onsite_Energy_Corporation/66916</u>.
- Customizable to customer's requirements
- Diesel and gas specifications available
- Additional product information available (such as, spec sheets and drawings)
- Saves spec writing time
- Contains notes on different options
- · Editing notes and instructions are included in the downloadable file
- Reporting capabilities
- Adjust settings to view hidden text in Microsoft Word® (appearance in other programs may vary)

CERTIFICATIONS AND STANDARDS

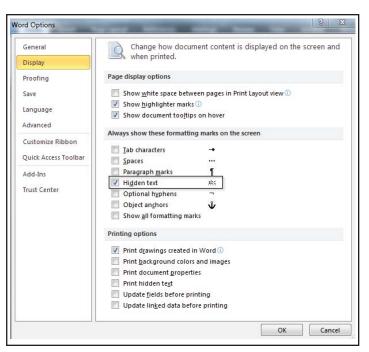
• Specification is AIA Certified



Product MasterSpec



MTU Onsite Energy Corporation 100 Power Drive Mankato.MN 56001



Setting Adjustment Dialog Box

PS-SPEC™ Data Sheet

MTU Onsite Energy's Power System Sizing and Specification Software (PS-SPEC[™]) is a powerful, fully-featured generator set sizing and specification tool. It is provided for use by consulting engineers, contractors, and other professionals involved in the design, application load analysis, and installation of generator sets. PS-SPEC[™] provides the information needed to assist in determining the requirements for appropriate equipment selection.

FEATURES

- PS-SPEC[™] is available for free download from the MTU Onsite Energy website at <u>www.mtuonsiteenergy.com</u> under *Technical Info > Tools and Downloads* or on the Product Pages.
- Create and view sizing and specifications that is formatted to American Institute of Architects (AIA) in one stand-alone application
- Dynamic, accurate sizing calculations for load analysis
- Engine, alternator, and cooling package calculations based on site conditions such as altitude, temperature, or airflow limitations, as well as a voltage dip prediction calculator
- Quick access to:
 - user-defined site ratings with or without load entries
 - load information on all projects
 - project summary details
- Easy entry of load parameters
- · Calculate generator set performance at user- or customer-specific site conditions
- Export and save sizing reports and specification documents in multiple formats
- Can easily create hypothetical scenarios by adding, moving, copying, pasting, or deleting loads and steps within a project



PS-SPEC Opening Screen

		ns Help		0	11				
Manage Projects	E In Project . Step .	A Lord	X Remove	i 🕐 Help					
_	Projects 💓 🛃	I.I. MT	MTU Onsite Energy Summary						1057
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Conne II	Three Phase Motor	41	30%	311	36 100			222.73	200.4
	- A 3	1 2	30%	113	36 100	23 445.46	400.91	445.46	400.9
Specification	Three Phase Motor	13	30%	111	36 100	23 668.15	601.37	668.19	601.3
		3 S	ummary						
			ummary		ng KVA 111.34 ing KW 100.23			nitted Voltage Nonlinear I	Dip 30%
	Load Vault 🔥			Start	ing kW 100.21 Remitted R	Running kW	200.46 ing Starting	Nonlinear	Nonlinear
	par -	Step Deta	ily Add Load	Start	ing kW 100.21 Remitted R	Running kW unning Runn kVA kW	200.46 ing Starting kVA	Nonlinear I Starting KW	WA 222.7 Nonlinea KVA
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Manage Projects Tab



GAS GENERATOR SET MTU 4R0063 GS30

30 kWe / 60 Hz / Standby 208 - 600V



SYSTEM RATINGS

Standby

Voltage (L-L)	240V*	240V*	208V*	240V*	380V*	480V*	600V*
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
Natural Gas							
Ratings: Amps	117	125	104	90	57	45	35
Natural Gas Ratings: kW/kVA LP Gas	28/28	30/30	30/37.5	30/37.5	30/37.5	30/37.5	29/36.3
Ratings: Amps	125	125	104	90	57	45	36
LP Gas							
Ratings: kW/kVA	30/30	30/30	30/37.5	30/37.5	30/37.5	30/37.5	30/37.5
skVA@30%							
Voltage Dip	66	102	141	188	130	188	123
Generator Model	285PSL1700	284CSL1550	285PSL1700	285PSL1700	285PSL1700	285PSL1700	284PSL5252
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 2.5L Engine
 - 2.5 Liter Displacement - 4-Cycle
- // Optional Fuels: LP Liquid and Dual Fuel
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Max. Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Jacket Water Pump	125% Rotor Balancing	
Thermostat	3-Phase Voltage Sensing	
Blower Fan and Fan Drive	100% of Rated Load - One Step	
Radiator - Unit Mounted	5% Max. Total Harmonic Distortion	
Electric Starting Motor - 12V		
Governor – Electronic Isochronous		
Base - Formed Steel	<pre>// Digital Control Panel(s)</pre>	
SAE Flywheel and Bell Housing		
Charging Alternator - 12V	Digital Metering	
Battery Box and Cables	Engine Parameters	
Flexible Fuel Connectors	Generator Protection Functions	
Flexible Exhaust Connection	Engine Protection	
EPA Certified Engine	SAE J1939 Engine ECU Communications	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	2.5L
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	2.5 (153)
Bore: cm (in)	8.9 (3.5)
Stroke: cm (in)	10 (3.94)
Compression Ratio	9.7:1
Rated RPM	1,800
Engine Governor	MTU
Max. Power (NG): kWm (bhp)	34.8 (46.6)
Max. Power (LP): kWm (bhp)	35.8 (48)
Speed Regulation	±0.75%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	6.62 (1.75)
Engine Jacket Water Capacity: L (gal)	1.65 (0.44)
System Coolant Capacity: L (gal)	8.8 (2.33)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	675

// Fuel Inlet - Vaporous Supply

Fuel Supply Connection Size	3/4" NPT
Fuel Supply Pressure: mm H_20 (in. H_20)	178-279 (7-11)

// Fuel Inlet - Liquid Supply

Fuel Supply Connection Size	#6 (3/8") Female SAE 45° Flare
Max. Fuel Supply Pressure: kPa (PSI)	2,150 (312)

// Fuel Consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG
At 100% of Power Rating: m ³ /hr (ft ³ /hr)	11.1 (391)	4.17 (147)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	8.6 (304)	3.2 (114)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	6.4 (227)	2.4 (85)

// Cooling - Radiator System

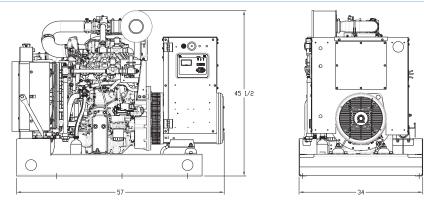
	NG and LPG
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	71.9 (19)
Heat Rejection to Coolant: kW (BTUM)	23 (1,328)
Heat Radiated to Ambient: kW (BTUM)	10.2 (580)
Fan Power: kW (hp)	0.39 (0.53)

// Air Requirements

	NG and LPG
Aspirating: *m³/min (SCFM)	1.6 (56.7)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	44.4 (1,558)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat For a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	50.6 (1,785)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

	NG and LPG
Gas Temp. (Stack): °C (°F)	695 (1,283)
Gas Volume at Stack	
Temp: m³/min (CFM)	5.9 (209)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	10 (40)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	71.7

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

Fuel Type	THC + NO _x	CO
Natural Gas	4.98	7.13
Liquid Propane	6.54	9.02

All units are in g/hp-hr and are EPA weighted cycle values.

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

GAS GENERATOR SET MTU 4R0063 GS40

40 kWe / 60 Hz / Standby 208 - 600V



SYSTEM RATINGS

Standby

Voltage (L-L)	240V*	240V*	208V*	240V*	380V*	480V*	600V*
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
Natural Gas							
Ratings: Amps	167	167	139	120	76	60	48
Natural Gas							
Ratings: kW/kVA	40/40	40/40	40/50	40/50	40/50	40/50	40/50
LP Gas							
Ratings: Amps	167	167	139	120	76	60	48
LP Gas							
Ratings: kW/kVA	40/40	40/40	40/50	40/50	40/50	40/50	40/50
skVA@30%							
Voltage Dip	101	102	141	188	130	188	167
Generator Model	286PSL1701	284PSL1750	285PSL1700	285PSL1700	285PSL1700	285PSL1700	284PSL5253
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 2.5L Engine
 - 2.5 Liter Displacement - 4-Cycle
- // Optional Fuels: LP Liquid and Dual Fuel
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	4 Pole, Rotating Field
Oil Pump	130 °C Max. Standby Temperature Rise
Oil Drain Extension and S/O Valve	1 Bearing, Sealed
Full Flow Oil Filter	Flexible Coupling
Jacket Water Pump	Full Amortisseur Windings
Thermostat	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	100% of Rated Load - One Step
Electric Starting Motor - 12V	5% Max. Total Harmonic Distortion
Governor – Electronic Isochronous	
Base - Formed Steel	
SAE Flywheel and Bell Housing	<pre>// Digital Control Panel(s)</pre>
Charging Alternator - 12V	
Battery Box and Cables	Digital Metering
Flexible Fuel Connectors	Engine Parameters
Flexible Exhaust Connection	Generator Protection Functions
EPA Certified Engine	Engine Protection
Liquid Cooled Turbocharger	SAE J1939 Engine ECU Communications

// Generator

Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	2.5L
Туре	4-Cycle
Arrangement	4-Inline
Aspiration	Turbocharged
Displacement: L (in ³)	2.5 (153)
Bore: cm (in)	8.9 (3.5)
Stroke: cm (in)	10 (3.94)
Compression Ratio	9.7:1
Rated RPM	1,800
Engine Governor	MTU
Max. Power (NG): kWm (bhp)	47 (63)
Max. Power (LP): kWm (bhp)	47 (63)
Speed Regulation	±0.75%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	6.62 (1.75)
Engine Jacket Water Capacity: L (gal)	1.65 (0.44)
System Coolant Capacity: L (gal)	12.3 (3.24)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	675

// Fuel Inlet - Vaporous Supply

Fuel Supply Connection Size	3/4" NPT
Fuel Supply Pressure: mm H ₂ 0 (in. H ₂ 0)	178-279 (7-11)

// Fuel Inlet - Liquid Supply

Fuel Supply Connection Size	#6 (3/8") Female SAE 45° Flare
Max. Fuel Supply Pressure: kPa (PSI)	2,150 (312)

// Fuel Consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG
At 100% of Power Rating: m ³ /hr (ft ³ /hr)	12.42 (439)	5.95 (210)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	9.65 (341)	4.62 (163)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	6.88 (243)	3.29 (116)

// Cooling - Radiator System

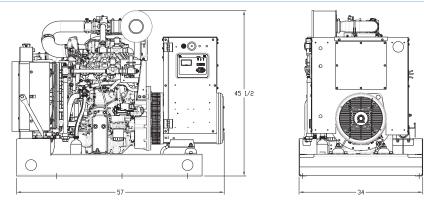
	NG and LPG
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	71.9 (19)
Heat Rejection to Coolant: kW (BTUM)	36 (2,047)
Heat Radiated to Ambient: kW (BTUM)	17.6 (1,002)
Fan Power: kW (hp)	1.4 (1.8)

// Air Requirements

	NG and LPG
Aspirating: *m ³ /min (SCFM)	2.3 (79.4)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	51 (1,801)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat For a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	83.8 (2,958)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

	NG and LPG
Gas Temp. (Stack): °C (°F)	613 (1,135)
Gas Volume at Stack	
Temp: m³/min (CFM)	7.84 (277)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	10 (40)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	69.9

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

Fuel Type	THC + NO _x	СО
Natural Gas	4.98	28.53
Liquid Propane	5.41	37.26

All units are in g/hp-hr and are EPA weighted cycle values.

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. **Temperature**: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

GAS GENERATOR SET MTU 8V0071 GS60

60 kWe / 60 Hz / Standby 208 - 600V



SYSTEM RATINGS

Standby

Voltage (L-L)	240V*	240V*	208V*	240V*	480V*	600V*
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
Natural Gas						
Ratings: Amps	250	250	208	180	90	72
Natural Gas						
Ratings: kW/kVA	60/60	60/60	60/75	60/75	60/75	60/75
LP Gas						
Ratings: Amps	250	250	208	180	90	72
LP Gas						
Ratings: kW/kVA	60/60	60/60	60/75	60/75	60/75	60/75
skVA@30%						
Voltage Dip	127	230	200	200	172	140
Generator Model	362CSL1606	362CSL1615	361CSL1602	361CSL1602	361CSL1601	361PSL1633
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	4 LEAD WYE

*UL2200 Offered

CERTIFICATIONS AND STANDARDS

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 5.7L Engine
 - 5.7 Liter Displacement
 4-Cycle
- // Optional Fuels: LP Liquid and Dual Fuel
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

Windows[®]-Based Software Multilingual Capability

Event Recording

NFPA110 Compatible

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Max. Standby Temperature Rise
Oil Pump	1 Bearing, Sealed
Oil Drain Extension and S/O Valve	Flexible Coupling
Full Flow Oil Filter	Full Amortisseur Windings
Jacket Water Pump	125% Rotor Balancing
Thermostat	3-Phase Voltage Sensing
Blower Fan and Fan Drive	100% of Rated Load - One Step
Radiator - Unit Mounted	5% Max. Total Harmonic Distortion
Electric Starting Motor - 12V	
Governor – Electronic Isochronous	
Base - Formed Steel	<pre>// Digital Control Panel(s)</pre>
SAE Flywheel and Bell Housing	
Charging Alternator - 12V	Digital Metering
Battery Box and Cables	Engine Parameters
Flexible Fuel Connectors	Generator Protection Functions
Flexible Exhaust Connection	Engine Protection
EPA Certified Engine	SAE J1939 Engine ECU Communications

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

// Engine

Manufacturer	GM
Model	5.7L
Туре	4-Cycle
Arrangement	8-V
Displacement: L (in ³)	5.7 (350)
Bore: cm (in)	10.2 (4)
Stroke: cm (in)	8.8 (3.5)
Compression Ratio	9.4:1
Rated RPM	1,800
Engine Governor	Bosch
Max. Power (NG): kWm (bhp)	78.1 (104.7)
Max. Power (LP): kWm (bhp)	84.4 (113.2)
Speed Regulation	C/F
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	4.9 (1.3)
Engine Jacket Water Capacity: L (gal)	8.7 (2.3)
System Coolant Capacity: L (gal)	22.7 (6)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel Inlet - Vaporous Supply

Fuel Supply Connection Size	1 1/2" NPT
Fuel Supply Pressure: mm H_2^0 (in. H_2^0)	178-279 (7-11)

// Fuel Inlet - Liquid Supply

Fuel Supply Connection Size	#6 (3/8") Female SAE 45° Flare
Max. Fuel Supply Pressure: kPa (PSI)	2,150 (312)

// Fuel Consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG
At 100% of Power Rating: m ³ /hr (ft ³ /hr)	20.3 (717)	9 (317)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	15.3 (541)	6.8 (239)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	10.6 (376)	4.7 (166)

// Cooling - Radiator System

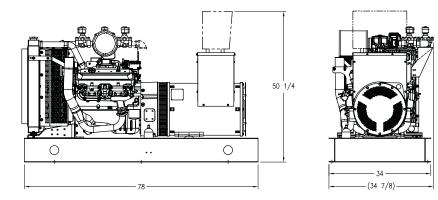
	NG and LPG
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	113.6 (30)
Heat Rejection to Coolant: kW (BTUM)	59.8 (3,400)
Heat Radiated to Ambient: kW (BTUM)	17.5 (993.2)
Fan Power: kW (hp)	3.4 (4.5)

// Air Requirements

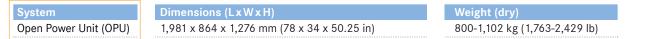
	NG and LPG
Aspirating: *m³/min (SCFM)	5.2 (182.3)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	209.4 (7,396)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat For a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	63.4 (2,240)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

	NG and LPG
Gas Temp. (Stack): °C (°F)	704.4 (1,300)
Gas Volume at Stack	
Temp: m³/min (CFM)	16.7 (588.7)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	10 (40)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	C/F
WPE - No Sound Attenuation dB(A)	C/F
CQE dB(A)	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

Fuel Type	THC + NO _x	СО
Natural Gas	5.77	19.94
Liquid Propane	7.21	22.09

All units are in g/hp-hr and are EPA weighted cycle values. Emission levels of the engine may vary with ambient

temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations. © MTU Onsite Energy. Subject to alteration due to technological advances. OE 23 685 (72 3E) 2017-06

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

GAS GENERATOR SET MTU 10V0068 GS75

75 kWe / 60 Hz / Standby 208 - 600V



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
Natural Gas						
Ratings: Amps	292	292	243	210	105	84
Natural Gas Ratings: kW/kVA LP Gas	70/70	70/70	70/87.5	70/87.5	70/87.5	70/87.5
Ratings: Amps	313	313	260	226	113	90
LP Gas						
Ratings: kW/kVA	75/75	75/75	75/93.75	75/93.75	75/93.75	75/93.75
skVA@30%						
Voltage Dip	311	107	216	216	288	235
Generator Model	363CSL1617	431CSL6202	362CSL1604	362CSL1604	362CSL1604	362PSL1635
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	4 LEAD	12 LEAD DOUBLE DELTA	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

Note: This unit is available with a dual fuel configuration.

CERTIFICATIONS AND STANDARDS

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6.8L Engine
 - 6.8 Liter Displacement - 4-Cycle
- // Optional Fuels: LP Liquid and Dual Fuel
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability
- // Digital Control Panel
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Heavy Duty Air Cleaner	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise	
Full Flow Oil Filter	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Thermostat	Full Amortisseur Windings	
Blower Fan and Fan Drive	125% Rotor Balancing	
Radiator - Unit Mounted	3-Phase Voltage Sensing	
Electric Starting Motor - 12V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 12V	<pre>// Digital Control Panel(s)</pre>	
Battery Rack and Cables		
Flexible Exhaust Connection	Digital Metering	
EPA Certified Engine	Engine Parameters	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self-Ventilated
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load Regulation

Digital Metering Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	Ford
Model	6.8L V 10
Туре	4-Cycle
Aspiration	Naturally Aspirated
Arrangement	10-V
Displacement: L (in ³)	6.8 (415)
Bore: cm (in)	9 (3.55)
Stroke: cm (in)	10.6 (4.17)
Compression Ratio	9:1
Rated RPM	1,800
Engine Governor	Bosch
Max. Power (NG): kWm (bhp)	85.6 (114.8)
Max. Power (LP): kWm (bhp)	89.4 (119.9)
Speed Regulation	C/F
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	5.7 (1.5)
Engine Jacket Water Capacity: L (gal)	5.9 (1.55)
System Coolant Capacity: L (gal)	25.58 (6.75)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel Inlet - Vaporous Supply

Fuel Supply Connection Size	1 1/2" NPT
Fuel Supply Pressure: mm H ₂ 0 (in. H ₂ 0)	178-279 (7-11)

// Fuel Inlet - Liquid Supply

Fuel Supply Connection Size	#6 (3/8") Female SAE 45° Flare
Max. Fuel Supply Pressure: kPa (PSI)	2,150 (312)

// Fuel Consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG
At 100% of Power Rating: m ³ /hr (ft ³ /hr)	27.2 (960)	11.4 (403)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	21.5 (759)	9.3 (328)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	15.6 (551)	6.8 (239)

// Cooling - Radiator System

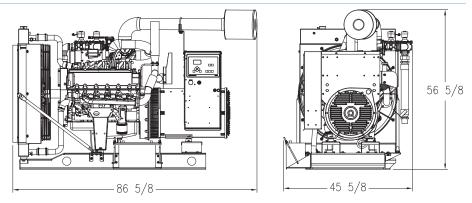
	NG and LPG
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	123 (32.5)
Heat Rejection to Coolant: kW (BTUM)	78.2 (4,448)
Heat Radiated to Ambient: kW (BTUM)	19.1 (1,086)
Fan Power: kW (hp)	2.8 (3.8)

// Air Requirements

	NG and LPG
Aspirating: *m ³ /min (SCFM)	4.54 (160.5)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	303.4 (10,715)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat For a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	103 (3,369)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

	NG and LPG
Gas Temp. (Stack): °C (°F)	660 (1,220)
Gas Volume at Stack	
Temp: m³/min (CFM)	15.3 (539)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	4.98 (20)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load (NG)	Standby Full Load (LP)
Level 0: Open Power Unit dB(A)	75.5	76.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

Fuel Type	THC + NO _x	СО
Natural Gas	7.53	30.49
Liquid Propane	7.65	47.95

All units are in g/hp-hr and are EPA weighted cycle values. Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

GAS GENERATOR SET MTU 10V0068 GS100

100 kWe / 60 Hz / Standby 208 - 600V



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
Natural Gas						
Ratings: Amps	417	417	347	301	151	120
Natural Gas Ratings: kW/kVA	100/100	100/100	100/125	100/125	100/125	100/125
LP Gas			0.47	0.04	454	100
Ratings: Amps	417	417	347	301	151	120
LP Gas Ratings: kW/kVA skVA@30%	100/100	100/100	100/125	100/125	100/125	100/125
Voltage Dip	311	130	258	258	344	277
Generator Model	363CSL1617	431CSL6204	362CSL1606	362CSL1606	362CSL1606	362PSL1636
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	4 LEAD	12 LEAD DOUBLE DELTA	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

Note: This unit is available with a dual fuel configuration.

CERTIFICATIONS AND STANDARDS

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6.8L Engine
 - 6.8 Liter Displacement - 4-Cycle
- // 3-Way Catalyst
- // Optional Fuels: LP Liquid and Dual Fuel
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Brushless Alternator with Brushless Pilot Exciter	
4 Pole, Rotating Field	
130 °C Max. Standby Temperature Rise	
1 Bearing, Sealed	
Flexible Coupling	
Full Amortisseur Windings	
125% Rotor Balancing	
3-Phase Voltage Sensing	
100% of Rated Load - One Step	
5% Max. Total Harmonic Distortion	
<pre>// Digital Control Panel(s)</pre>	
Digital Metering	
Engine Parameters	
Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self-Ventilated
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load

Digital Metering Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Ford
Model	6.8L V 10
Туре	4-Cycle
Aspiration	Turbocharged
Arrangement	10-V
Displacement: L (in ³)	6.8 (415)
Bore: cm (in)	9 (3.55)
Stroke: cm (in)	10.6 (4.17)
Compression Ratio	9:1
Rated RPM	1,800
Engine Governor	Bosch
Max. Power (NG): kWm (bhp)	132 (177)
Max. Power (LP): kWm (bhp)	132 (177)
Speed Regulation	C/F
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	5.7 (1.5)
Engine Jacket Water Capacity: L (gal)	6 (1.6)
System Coolant Capacity: L (gal)	27.47 (7.25)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel Inlet - Vaporous Supply

Fuel Supply Connection Size	1 1/2" NPT
Fuel Supply Pressure: mm H_2^0 (in. H_2^0)	178-279 (7-11)

// Fuel Inlet - Liquid Supply

Fuel Supply Connection Size	#6 (3/8") Female SAE 45° Flare
Max. Fuel Supply Pressure: kPa (PSI)	2,150 (312)

// Fuel Consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG
At 100% of Power Rating: m ³ /hr (ft ³ /hr)	31.15 (1,100)	14.49 (511.5)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	23.67 (835.9)	11.32 (400)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	16.2 (520.1)	8.07 (284.8)

// Cooling - Radiator System

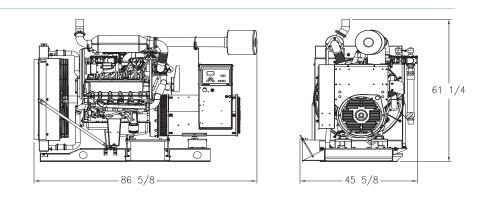
	NG and LPG
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	123 (32.5)
Heat Rejection to Coolant: kW (BTUM)	81.29 (4,623)
Heat Radiated to Ambient: kW (BTUM)	41.54 (2,362)
Fan Power: kW (hp)	4.1 (5.5)

// Air Requirements

	NG and LPG
Aspirating: *m³/min (SCFM)	5.91 (208.7)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	254.9 (9,001.7)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat For a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	150.9 (5,329)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

	NG and LPG
Gas Temp. (Stack): °C (°F)	716.1 (1,321)
Gas Volume at Stack	
Temp: m³/min (CFM)	20.2 (713.4)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	6.23 (25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load (NG)	Standby Full Load (LP)
Level 0: Open Power Unit dB(A)	77.2	77.3

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

Fuel Type	THC + NO _x	СО
Natural Gas	0.44	0.2
Liquid Propane	0.12	0.09

All units are in g/hp-hr and are EPA weighted cycle values. Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor N/A = Not Available

GAS GENERATOR SET MTU 10V0068 GS125

125 kWe / 60 Hz / Standby 208 - 600V



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
Natural Gas						
Ratings: Amps	521	521	434	376	188	151
Natural Gas Ratings: kW/kVA LP Gas	125/125	125/125	125/156.25	125/156.25	125/156.25	125/156.25
Ratings: Amps	521	521	434	376	188	151
LP Gas						
Ratings: kW/kVA	125/125	125/125	125/156.25	125/156.25	125/156.25	125/156.25
skVA@30%						
Voltage Dip	196	130	323	323	430	331
Generator Model	431PSL6224	431CSL6204	363CSL1607	363CSL1607	363CSL1607	363PSL1658
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	4 LEAD	12 LEAD DOUBLE DELTA	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

Note: This unit is available with a dual fuel configuration.

CERTIFICATIONS AND STANDARDS

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed

- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6.8L Engine
 - 6.8 Liter Displacement - 4-Cycle
- // 3-Way Catalyst
- // Optional Fuels: LP Liquid and Dual Fuel
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability
- // Digital Control Panel
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Heavy Duty Air Cleaner	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise	
Full Flow Oil Filter	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Thermostat	Full Amortisseur Windings	
Blower Fan and Fan Drive	125% Rotor Balancing	
Radiator - Unit Mounted	3-Phase Voltage Sensing	
Electric Starting Motor - 12V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 12V	<pre>// Digital Control Panel(s)</pre>	
Battery Rack and Cables		
Flexible Exhaust Connection	Digital Metering	
Liquid Cooled, Ball Bearing Turbocharger	Engine Parameters	
EPA Certified Engine	Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self-Ventilated
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load

Engine Parameters Generator Protection Functions Engine Protection SAE J 1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Ford
Model	6.8L V 10
Туре	4-Cycle
Aspiration	Turbocharged, Intercooled
Arrangement	10-V
Displacement: L (in ³)	6.8 (415)
Bore: cm (in)	9 (3.55)
Stroke: cm (in)	10.6 (4.17)
Compression Ratio	9:1
Rated RPM	1,800
Engine Governor	Bosch
Max. Power (NG): kWm (bhp)	154 (207)
Max. Power (LP): kWm (bhp)	154 (207)
Speed Regulation	C/F
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	5.7 (1.5)
Engine Jacket Water Capacity: L (gal)	6.1 (1.6)
System Coolant Capacity: L (gal)	35.04 (9.25)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel Inlet - Vaporous Supply

Fuel Supply Connection Size	1 1/2" NPT
Fuel Supply Pressure: mm H_2^0 (in. H_2^0)	178–279 (7–11)

// Fuel Inlet - Liquid Supply

Fuel Supply Connection Size	#6 (3/8") Female SAE 45° Flare
Max. Fuel Supply Pressure: kPa (PSI)	2,150 (312)

// Fuel Consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG
At 100% of Power Rating: m ³ /hr (ft ³ /hr)	41.4 (1,463)	18.1 (640)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	32.9 (1,161)	14.3 (505)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	24 (849)	10.4 (366)

// Cooling - Radiator System

	NG and LPG
Ambient Capacity of Radiator: °C (°F)	50 (122)*
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	123 (32.5)
Heat Rejection to Coolant: kW (BTUM)	85.3 (4,850)
Heat Radiated to Ambient: kW (BTUM)	39.82 (2,265)
Heat Rejected to Charge Air Cooler: kW (BTUM)	14.1 (800)
Fan Power: kW (hp)	9.1 (12.2)

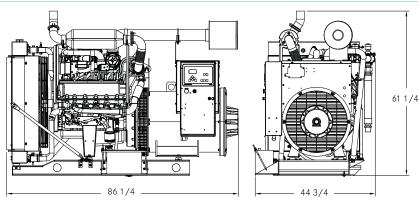
* Installation of enclosures reduces the ambient capacity of the cooling system by 3 °C (5.4 °F).

// Air Requirements

	NG and LPG
Aspirating: *m ³ /min (SCFM)	7.8 (275)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	256 (9,056)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat For a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	144.6 (5,107)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

	NG and LPG
Gas Temp. (Stack): °C (°F)	649 (1,200)
Gas Volume at Stack	
Temp: m³/min (CFM)	25.1 (886)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	6.2 (25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load (NG)	Standby Full Load (LP)
Level 0: Open Power Unit dB(A)	83	83

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

THC + NO _x	СО
0.4	0.04
0.11	0.16
	THC + NO _x 0.4 0.11

All units are in g/hp-hr and are EPA weighted cycle values. Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor N/A = Not Available

GAS GENERATOR SET MTU 6R0135 GS150

150 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 6R0135 GS150 (130 kWe) for Prime Rating Technical Data

SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
Natural Gas						
Ratings: Amps	625	625	520	451	225	180
Natural Gas						
Ratings: kW/kVA	150/150	150/150	150/187	150/187	150/187	150/187
LP Gas						
Ratings: Amps	416	416	346	300	150	120
LP Gas						
Ratings: kW/kVA	100/100	100/100	100/125	100/125	100/125	100/125
skVA@30%						
/oltage Dip	250	360	433	433	577	380
Generator Model*	432PSL6212	432PSL6228	431PSL6206	431PSL6206	431PSL6206	431PSL6242
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

* Consult the factory for alernate configuration

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating



- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 8.1 L Turbo Engine Charge Air Cooling - 8.1 Liter Displacement
 - 4-Cycle
- // 3-Way Catalyst
- // Optional Fuel System: NG and LP Vapor Dual Fuel
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
- LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Maximum Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension & S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Jacket Water Pump	125% Rotor Balancing	
Thermostats	3-phase Voltage Sensing	
Blower Fan & Fan Drive	100% of Rated Load - One Step	
Radiator - Unit Mounted	5% Maximum Total Harmonic Distortion	
Electric Starting Motor - 24V		
Governor – Electronic Isochronous		
Base - Formed Steel	// Digital Control Panel(s)	
SAE Flywheel & Bell Housing		
Charging Alternator - 24V	Digital Metering	
Battery Box & Cables	Engine Parameters	
Flexible Fuel Connectors	Generator Protection Functions	
Flexible Exhaust Connection	Engine Protection	
EPA Certified Engine	SAE J1939 Engine ECU Communications	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self Ventilated and Drip-proof
Superior Voltage Waveform
Solid State, Volts-per-hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 pole, Rotating Field

I Load ot Exciter

Event Recording

NFPA110 Compatible

Windows[®]-Based Software Multilingual Capability

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

// Engine

Manufacturer	Doosan
Model	8.1L CAC
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	8.1 (492)
Bore: cm (in)	11.1 (4.37)
Stroke: cm (in)	13.9 (5.97)
Compression Ratio	10.5:1
Rated RPM	1,800
Engine Governor	Bosch
Maximum Power (NG): kWm (bhp)	177 (237)
Maximum Power (LP): kWm (bhp)	122 (164)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	27.5 (7.2)
Engine Jacket Water Capacity: L (gal)	22.7 (5)
System Coolant Capacity: L (gal)	240 (63)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel Inlet

Fuel Supply Connection Size	1 1/2" NPT
Fuel Supply Pressure: mm H_2^0 (in. H_2^0)	178–279 (7–11)

// Fuel Consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG
At 100% of Power Rating: m ³ /hr (ft ³ /hr)	43.6 (1,539)	14.7 (517)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	33.7 (1,191)	11.1 (390)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	23.9 (845)	8 (283)

// Cooling - Radiator System

	NG and LPG
Ambient Capacity of Radiator: °C (°F)	50 (122)*
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	240 (63)
Heat Rejection to Coolant: kW (BTUM)	164.4 (9,357)
Heat Radiated to Ambient: kW (BTUM)	65.2 (3,710)
Fan Power: kW (hp)	5.6 (7.5)

* Installation of enclosures reduces the ambient capacity of the cooling system by 1 °C (1.8 °F). Gravity exhaust louvers reduce ambient capacity of the cooling system by an additional 3 °C (5.5 °F).

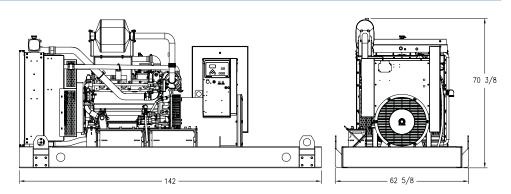
// Air Requirements

	NG and LPG
Aspirating: *m ³ /min (SCFM)	9.3 (317)
Air Flow Required for Rad.	
Cooled Unit: **m ³ /min (SCFM)	428 (15,100)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	147 (5.175)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

** At 0.25 kPa (1 in. H₂0) static pressure and 52 °C (125 °F) at radiator

	NG and LPG
Gas Temp. (Stack): °C (°F)	660 (1.220)
Gas Volume at Stack	
Temp: m³/min (CFM)	29.7 (1,050)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	2.5 (10.25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load (NG)	Standby Full Load (LP)
Level 0: Open Power Unit dB(A)	82	81.7
· · · · · · · · · · · · · · · · · · ·		

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

Fuel Type	THC + NO _x	СО
Natural Gas	0.64	0.13
Liquid Propane	0.08	0.4

All units are in g/hp-hr and are EPA weighted cycle values.

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

- // Ambient capability factor at 984 ft (300 m). Consult your local MTU Onsite Energy Power Generation Distributor for other altitudes.
- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Production tolerances in engines and installed components can account for power variations. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations. Consult your local MTU Onsite Energy Power Generation Distributor for derations. © MTU Onsite Energy. Subject to alteration due to technological advances. OE 23 468 (72 3E) 2017-02

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

GAS GENERATOR SET MTU 6R0185 GS200

200 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 6R0185 GS200 (175 kWe) for Prime Rating Technical Data

SYSTEM RATINGS

Standby	
---------	--

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
Natural Gas						
Ratings: Amps	750	750	694	601	300	240
Natural Gas						
Ratings: kW/kVA	180/180	180/180	200/250	200/250	200/250	200/250
LP Gas						
Ratings: Amps	541	541	451	390	195	156
LP Gas						
Ratings: kW/kVA	130/130	130/130	130/162	130/162	130/162	130/162
skVA@30%						
Voltage Dip	425	370	608	608	809	720
Generator Model*	433CSL6216	432PSL6228	432CSL6210	432CSL6210	432CSL6210	432PSL6246
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

* Consult the factory for alernate configuration

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // UL 2200 / CSA Optional
 - UL 2200 Listed
 - CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

mtu **Fonsi**l

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 11.1 L Turbo Engine Charge Air Cooling
- 11.1 Liter Displacement
 - 4-Cycle
- // 3-Way Catalyst
- // Optional Fuel System: NG and LP Vapor Dual Fuel
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
- LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 pole, Rotating Field	
Oil Drain Extension & S/O Valve	130 °C Maximum Standby Temperature Rise	
Full Flow Oil Filter	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Thermostats	Full Amortisseur Windings	
Blower Fan & Fan Drive	125% Rotor Balancing	
Radiator - Unit Mounted	3-phase Voltage Sensing	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel & Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box & Cables		
Flexible Fuel Connectors	Digital Metering	
Flexible Exhaust Connection	Engine Parameters	
EPA Certified Engine	Generator Protection Functions	
	Engine Protection	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self Ventilated and Drip-proof
Superior Voltage Waveform
Solid State, Volts-per-hertz Regulator
±1% Voltage Regulation No load to full load

Engine Parameters
Generator Protection Functions
Engine Protection
SAE J1939 Engine ECU Communications
Windows [®] -Based Software
Multilingual Capability
Remote Communications to RDP-110 Remote Annunciator
Programmable Input and Output Contacts
UL Recognized, CSA Certified, CE Approved
Event Recording
IP 54 Front Panel Rating with Integrated Gasket
NFPA110 Compatible

// Engine

Manufacturer	Doosan
Model	11.1L CAC
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	11.1 (673)
Bore: cm (in)	12.3 (4.84)
Stroke: cm (in)	15.5 (6.1)
Compression Ratio	10.5:1
Rated RPM	1,800
Engine Governor	Bosch
Maximum Power (NG): kWm (bhp)	225 (302)
Maximum Power (LP): kWm (bhp)	155 (208)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	28.5 (8)
Engine Jacket Water Capacity: L (gal)	25 (5.5)
System Coolant Capacity: L (gal)	149 (32.8)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel Inlet

Fuel Supply Connection Size	2" NPT
Fuel Supply Pressure: mm H_2^0 (in. H_2^0)	178–279 (7–11)

// Fuel Consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG
At 100% of Power Rating: m ³ /hr (ft ³ /hr)	59.9 (2,115)	19.9 (704)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	46.7 (1,648)	17 (600)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	32.8 (1,157)	11.5 (404)

// Cooling - Radiator System

	NG and LPG
Ambient Capacity of Radiator: °C (°F)	50 (122)*
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	310 (82)
Heat Rejection to Coolant: kW (BTUM)	194.6 (11,071)
Heat Radiated to Ambient: kW (BTUM)	40.4 (2,295)
Fan Power: kW (hp)	10.4 (13.9)

 * Installation of enclosures reduces the ambient capacity of the cooling system by 1 °C (1.8 °F). Gravity exhaust louvers reduce ambient capacity of the cooling system by an additional 3 °C (5.5 °F).

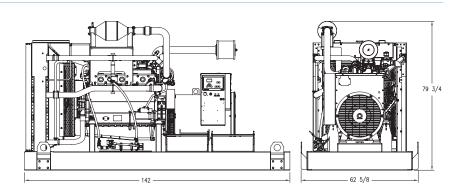
// Air Requirements

	NG and LPG
Aspirating: *m ³ /min (SCFM)	11.7 (400)
Air Flow Required for Rad.	
Cooled Unit: **m³/min (SCFM)	631 (22,300)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	237 (8,365)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

** At 0.25 kPa (1 in. H_2 0) static pressure and 52 °C (125 °F) at radiator

NG and LPG
694 (1,281)
38.8 (1,371)
2.5 (10.25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry)
Open Power Unit (OPU)	3,607 x 1,591 x 2,026 mm (142 x 62.6 x 79.75 in)	3,096 kg (6,258 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load	d (NG) Standby Full Load (LP)
Level 0: Open Power Unit dB(A)	86.3	86.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

Fuel Type	THC + NO _x	СО
Natural Gas	2.25	0.26
Liquid Propane	0.08	0.25

All units are in g/hp-hr and are EPA weighted cycle values.

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

- // Ambient capability factor at 984 ft (300 m). Consult your local MTU Onsite Energy Power Generation Distributor for other altitudes.
- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Production tolerances in engines and installed components can account for power variations of $\pm 5\%$. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations. Consult your local MTU Onsite Energy Power Generation Distributor for derations.

C/F = Consult Factory/MTU Onsite Energy Distributor N/A = Not Available

GAS GENERATOR SET MTU 8V0183 GS260

260 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 8V0183 GS260 (235 kWe) for Prime Rating Technical Data

SYSTEM RATINGS

Standby

hase		208V**	240V**	480V**	600V**
11030	1	3	3	3	3
PF	1	0.8	0.8	0.8	0.8
Ηz	60	60	60	60	60
Natural Gas					
Ratings: Amps	1063	902	782	391	313
Natural Gas					
Ratings: kW/kVA	255/255	260/325	260/325	260/325	260/325
.P Gas					
Ratings: Amps	625	555	481	241	192
.P Gas					
Ratings: kW/kVA	150/150	160/200	160/200	160/200	160/200
kVA@30%					
/oltage Dip	520	608	608	809	740
Generator Model	572RSL4031	432PSL6210	432PSL6210	432PSL6210	432PSL6246
ēmp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

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ene

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- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 14.6 L Turbo Engine Charge Air Cooling
- 14.6 Liter Displacement
 - 4-Cycle
- // 3-Way Catalyst
- // Optional Fuel System: NG and LP Vapor Dual Fuel
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with PMG
 - PMG Standard for 570 frame and larger
 - $^{\rm O}$ PMG Optional for 430 frame and smaller
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

il Pump il Drain Extension & S/O Valve ull Flow Oil Filter cket Water Pump nermostats	4 pole, Rotating Field 130 °C Maximum Standby Temperature Rise 1 Bearing, Sealed	
III Flow Oil Filter cket Water Pump	1 Bearing, Sealed	
cket Water Pump		
nermostats	Flexible Coupling	
	Full Amortisseur Windings	
ower Fan & Fan Drive	125% Rotor Balancing	
adiator - Unit Mounted	3-phase Voltage Sensing	
ectric Starting Motor - 24V	100% of Rated Load - One Step	
overnor – Electronic Isochronous	5% Maximum Total Harmonic Distortion	
ase - Formed Steel		
AE Flywheel & Bell Housing	// Digital Control Panel(s)	
harging Alternator - 24V		
attery Box & Cables		
exible Fuel Connectors	Digital Metering	
exible Exhaust Connection	Engine Parameters	
PA Certified Engine	Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds (with PMG only)
Self Ventilated and Drip-proof
Superior Voltage Waveform
Solid State, Volts-per-hertz Regulator (Digital when PMG is Standard)
±1% Voltage Regulation No Load to Full Load

Digital Metering Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	Doosan
Model	14.6L CAC
Туре	4-Cycle
Arrangement	8-V
Displacement: L (in ³)	14.6 (892)
Bore: cm (in)	12.8 (5.04)
Stroke: cm (in)	14.2 (5.59)
Compression Ratio	10.5:1
Rated RPM	1,800
Engine Governor	Bosch
Maximum Power (NG): kWm (bhp)	300 (402)
Maximum Power (LP): kWm (bhp)	189 (253)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	38.1 (10.1)
Engine Jacket Water Capacity: L (gal)	43.2 (9.5)
System Coolant Capacity: L (gal)	227 (50)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel Inlet

Fuel Supply Connection Size	2" NPT
Fuel Supply Pressure: mm H ₂ 0 (in. H ₂ 0)	178-279 (7-11)

// Fuel Consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG
At 100% of Power Rating: m ³ /hr (ft ³ /hr)	85 (3,000)	24.3 (858)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	64.6 (2,280)	17.9 (633)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	44.7 (1,580)	13.3 (468)

// Cooling - Radiator System

	NG and LPG
Ambient Capacity of Radiator: °C (°F)	50 (122)*
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	680 (180)
Heat Rejection to Coolant: kW (BTUM)	285 (16,189)
Heat Radiated to Ambient: kW (BTUM)	80.5 (4,580)
Fan Power: kW (hp)	16.4 (22)

 * Installation of enclosures reduces the ambient capacity of the cooling system by 1 °C (1.8 °F). Gravity exhaust louvers reduce ambient capacity of the cooling system by an additional 3 °C (5.5 °F).

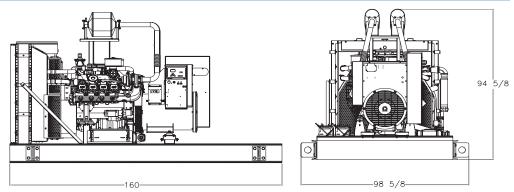
// Air Requirements

	NG and LPG
Aspirating: *m ³ /min (SCFM)	15.6 (532)
Air Flow Required for Rad.	
Cooled Unit: **m³/min (SCFM)	849 (30,000)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	293 (10,330)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

** At 0.25 kPa (1 in. H_20) static pressure and 52 °C (125 °F) at radiator

NG and LPG
554 (1,030)
44.2 (1,560)
2.5 (10.25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

	Stanuby Full Load (LF)
Level 0: Open Power Unit dB(A) 83.	83

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

Fuel Type	THC + NO _x	СО
Natural Gas	0.22	0.06
Liquid Propane	0.07	0.11

All units are in g/hp-hr and are EPA weighted cycle values.

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

- // Ambient capability factor at 984 ft (300 m). Consult your local MTU Onsite Energy Power Generation Distributor for other altitudes.
- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Production tolerances in engines and installed components can account for power variations. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations. Consult your local MTU Onsite Energy Power Generation Distributor for derations. © MTU Onsite Energy. Subject to alteration due to technological advances. OE 23 574 (72 3E) 2017-02

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

GAS GENERATOR SET MTU 10V0183 GS350

350 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 10V0183 G\$350 (300 kWe) for Prime Rating Technical Data

SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	208V**	240V**	480V**	600V**
Phase	1	3	3	3	3
PF	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60
Natural Gas					
Ratings: Amps	1438	1214	1052	526	421
Natural Gas					
Ratings: kW/kVA	345/345	350/437	350/437	350/437	350/437
LP Gas					
Ratings: Amps	1000	850	737	368	295
_P Gas					
Ratings: kW/kVA	240/240	245/306	245/306	245/306	245/306
skVA@30%					
/oltage Dip	700	930	930	1238	1100
Generator Model*	573RSL4035	433CSL6216	433CSL6216	433CSL6216	433PSL6248
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

* Consult the factory for alernate configuration

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

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- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 18.3 L Turbo Engine Charge Air Cooling
 - 18.3 Liter Displacement
 - 4-Cycle
- // 3-Way Catalyst
- // Optional Fuel System: NG and LP Vapor Dual Fuel
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with PMG
 - PMG Standard for 570 frame and larger
 - $^{\rm O}$ PMG Optional for 430 frame and smaller
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter
Oil Pump	4 pole, Rotating Field
Oil Drain Extension & S/O Valve	130 °C Maximum Standby Temperature Rise
Full Flow Oil Filter	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Thermostats	Full Amortisseur Windings
Blower Fan & Fan Drive	125% Rotor Balancing
Radiator - Unit Mounted	3-phase Voltage Sensing
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion
Base - Formed Steel	
SAE Flywheel & Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box & Cables	
Flexible Fuel Connectors	Digital Metering
Flexible Exhaust Connection	Engine Parameters
EPA Certified Engine	Generator Protection Functions

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds (with PMG only)
Self Ventilated and Drip-proof
Superior Voltage Waveform
Solid State, Volts-per-hertz Regulator (Digital when PMG is Standard)
±1% Voltage Regulation No Load to Full Load

Digital Metering
Engine Parameters
Generator Protection Functions
Engine Protection
SAE J1939 Engine ECU Communications
Windows [®] -Based Software
Multilingual Capability
Remote Communications to RDP-110 Remote Annunciator
Programmable Input and Output Contacts
UL Recognized, CSA Certified, CE Approved
Event Recording
IP 54 Front Panel Rating with Integrated Gasket
NFPA110 Compatible

// Engine

Manufacturer	Doosan
Model	18.3L CAC
Туре	4-Cycle
Arrangement	10-V
Displacement: L (in ³)	18.3 (1,115)
Bore: cm (in)	12.8 (5.04)
Stroke: cm (in)	14.2 (5.59)
Compression Ratio	10.5:1
Rated RPM	1,800
Engine Governor	Bosch
Maximum Power (NG): kWm (bhp)	400 (536)
Maximum Power (LP): kWm (bhp)	297 (398)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	42.1 (11.1)
Engine Jacket Water Capacity: L (gal)	50 (11)
System Coolant Capacity: L (gal)	289 (63.5)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8°C (0 °F)	1,050

// Fuel Inlet

Fuel Supply Connection Size	3" NPT
Fuel Supply Pressure: mm H_2^0 (in. H_2^0)	178–279 (7–11)

// Fuel Consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG
At 100% of Power Rating: m ³ /hr (ft ³ /hr)	99.1 (3,498.8)	32.5 (1,145.9)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	77.2 (2,726.7)	27.7 (977.1)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	54.2 (1,913.7)	18.7 (658.5)

// Cooling - Radiator System

	NG and LPG
Ambient Capacity of Radiator: °C (°F)	50 (122)*
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_2^0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	660 (174)
Heat Rejection to Coolant: kW (BTUM)	365 (20,784)
Heat Radiated to Ambient: kW (BTUM)	88.5 (5,030)
Fan Power: kW (hp)	20.9 (28)

* Installation of enclosures reduces the ambient capacity of the cooling system by 1 °C (1.8 °F). Gravity exhaust louvers reduce ambient capacity of the cooling system by an additional 3 °C (5.5 °F).

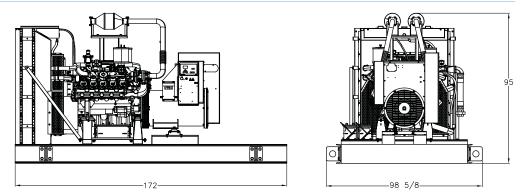
// Air Requirements

	NG and LPG
Aspirating: *m ³ /min (SCFM)	19.4 (664)
Air Flow Required for Rad.	
Cooled Unit: **m³/min (SCFM)	1,019 (36,000)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	321 (11,350)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

** At 0.25 kPa (1 in. H_20) static pressure and 52 °C (125 °F) at radiator

	NG and LPG
Gas Temp. (Stack): °C (°F)	607 (1,125)
Gas Volume at Stack	
Temp: m³/min (CFM)	58.6 (2,070)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	2.5 (10.25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry)
Open Power Unit (OPU)	4,369 x 2,506 x 2,413 mm (172 x 98.63 x 95 in)	4,741 kg (10,452 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load (NG)	Standby Full Load (LP)
Level 0: Open Power Unit dB(A)	85.1	84.8

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

Fuel Type	THC + NO _x	CO
Natural Gas	0.59	0.21
Liquid Propane	0.07	0.15

All units are in g/hp-hr and are EPA weighted cycle values.

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

- // Ambient capability factor at 984 ft (300 m). Consult your local MTU Onsite Energy Power Generation Distributor for other altitudes.
- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Production tolerances in engines and installed components can account for power variations. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations. Consult your local MTU Onsite Energy Power Generation Distributor for derations. © MTU Onsite Energy. Subject to alteration due to technological advances. OE 23 480 (72 3E) 2017-02

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

GAS GENERATOR SET MTU 12V0183 GS400

400 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 12V0183 GS400 (355kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	208V**	240V**	480V**	600V**
Phase	1	3	3	3	3
PF	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60
Natural Gas					
Ratings: Amps	1604	1388	1203	601	481
Natural Gas					
Ratings: kW/kVA	385/385	400/500	400/500	400/500	400/500
LP Gas					
Ratings: Amps	1187	1023	887	443	355
LP Gas					
Ratings: kW/kVA	285/285	295/368	295/368	295/368	295/368
skVA@30%					
Voltage Dip	760	1500	1500	1500	1080
Generator Model*	574RSL4037	572RSL4029	572RSL4029	572RSL4029	433RSS4266
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

* Consult the factory for alernate configuration

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 21.9 L Turbo Engine Charge Air Cooling
- 21.9 Liter Displacement - 4-Cycle
- // 3-Way Catalyst
- // Optional Fuel System: NG and LP Vapor Dual Fuel
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - PMG (Permanent Magnet Generator) supply to regulator
 - 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 pole, Rotating Field	
Oil Drain Extension & S/O Valve	130 °C Maximum Standby Temperature Rise	
Full Flow Oil Filter	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Thermostats	Full Amortisseur Windings	
Blower Fan & Fan Drive	125% Rotor Balancing	
Radiator - Unit Mounted	3-phase Voltage Sensing	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel & Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box & Cables		
Flexible Fuel Connectors	Digital Metering	
Flexible Exhaust Connection	Engine Parameters	
EPA Certified Engine	Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self Ventilated and Drip-proof
Superior Voltage Waveform
Digital, Volts-per-hertz Regulator
±1% Voltage Regulation No Load to Full Load

Digital Metering
Engine Parameters
Generator Protection Functions
Engine Protection
SAE J1939 Engine ECU Communications
Windows [®] -Based Software
Multilingual Capability
Remote Communications to RDP-110 Remote Annunciator
Programmable Input and Output Contacts
UL Recognized, CSA Certified, CE Approved
Event Recording
IP 54 Front Panel Rating with Integrated Gasket
NFPA110 Compatible

// Engine

Manufacturer	Doosan
Model	21.9L CAC
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	21.9 (1,338)
Bore: cm (in)	12.8 (5.04)
Stroke: cm (in)	14.2 (5.59)
Compression Ratio	10.5:1
Rated RPM	1,800
Engine Governor	Bosch
Maximum Power (NG): kWm (bhp)	456 (612)
Maximum Power (LP): kWm (bhp)	351 (471)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	47.1 (12.4)
Engine Jacket Water Capacity: L (gal)	52.3 (11.5)
System Coolant Capacity: L (gal)	291 (64)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel Inlet

Fuel Supply Connection Size	3" NPT
Fuel Supply Pressure: mm H_2^0 (in. H_2^0)	178–279 (7–11)

// Fuel Consumption (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG
At 100% of Power Rating: m ³ /hr (ft ³ /hr)	119.8 (4,230)	39.9 (1,407)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	93.4 (3,297)	34 (1,200)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	65.5 (2,314)	22.9 (808)

// Cooling - Radiator System

	NG and LPG
Ambient Capacity of Radiator: °C (°F)	50 (122)*
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_2^0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	660 (174)
Heat Rejection to Coolant: kW (BTUM)	453 (25,760)
Heat Radiated to Ambient: kW (BTUM)	118.2 (6,720)
Fan Power: kW (hp)	31.3 (42)

 * Installation of enclosures reduces the ambient capacity of the cooling system by 1 °C (1.8 °F). Gravity exhaust louvers reduce ambient capacity of the cooling system by an additional 3 °C (5.5 °F).

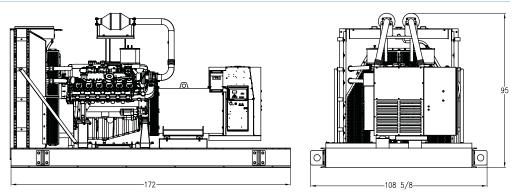
// Air Requirements

	NG and LPG
Aspirating: *m ³ /min (SCFM)	24.6 (841)
Air Flow Required for Rad.	
Cooled Unit: **m³/min (SCFM)	1,333 (40,000)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	429 (15,160)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

** At 0.25 kPa (1 in. H_20) static pressure and 52 °C (125 °F) at radiator

NG and LPG
582 (1,080)
72.2 (2,550)
2.5 (10.25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry)
Open Power Unit (OPU)	4,369 x 2,760 x 2,413 mm (172 x 108.63 x 95 in)	5,228 kg (11,500 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load	I (NG) Standby Full Load (LP)
Level 0: Open Power Unit dB(A)	86.2	85.3

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

Fuel Type	THC + NO _x	СО
Natural Gas	0.39	0.1
Liquid Propane	0.06	0.25

All units are in g/hp-hr and are EPA weighted cycle values.

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

- // Ambient capability factor at 984 ft (300 m). Consult your local MTU Onsite Energy Power Generation Distributor for other altitudes.
- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Production tolerances in engines and installed components can account for power variations. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations. Consult your local MTU Onsite Energy Power Generation Distributor for derations. © MTU Onsite Energy. Subject to alteration due to technological advances. OE 23 477 (72 3E) 2017-02

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

GAS GENERATOR SET MTU 6R0135 GS150

130 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 6R0135 GS150 (150 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
Natural Gas						
Ratings: Amps	542	542	421	391	195	156
Natural Gas						
Ratings: kW/kVA	130/130	130/130	130/162	130/162	130/162	130/162
skVA@30%						
Voltage Dip	265	305	339	339	451	370
Generator Model	432PSL6210	431PSL6226	431PSL6204	431PSL6204	431PSL6204	431PSL6242
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 8.1 L Turbo Engine Charge Air Cooling - 8.1 Liter Displacement
 - 4-Cycle
- // 3-Way Catalyst
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	105 °C Maximum Prime Temperature Rise
Oil Pump	1 Bearing, Sealed
Oil Drain Extension & S/O Valve	Flexible Coupling
Full Flow Oil Filter	Full Amortisseur Windings
Jacket Water Pump	125% Rotor Balancing
Thermostats	3-phase Voltage Sensing
Blower Fan & Fan Drive	100% of Rated Load - One Step
Radiator - Unit Mounted	5% Maximum Total Harmonic Distortion
Electric Starting Motor - 24V	
Governor – Electronic Isochronous	
Base - Formed Steel	<pre>// Digital Control Panel(s)</pre>
SAE Flywheel & Bell Housing	
Charging Alternator - 24V	Digital Metering
Battery Box & Cables	Engine Parameters
Flexible Fuel Connectors	Generator Protection Functions
Flexible Exhaust Connection	Engine Protection
EPA Certified Engine	SAE J1939 Engine ECU Communications

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self Ventilated and Drip-proof
Superior Voltage Waveform
Solid State, Volts-per-hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 pole, Rotating Field

Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Doosan
Model	8.1L CAC
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	8.1 (492)
Bore: cm (in)	11.1 (4.37)
Stroke: cm (in)	13.9 (5.97)
Compression Ratio	10.5:1
Rated RPM	1,800
Engine Governor	Bosch
Maximum Power: kWm (bhp)	149 (199)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	27.5 (7.2)
Engine Jacket Water Capacity: L (gal)	22.7 (5)
System Coolant Capacity: L (gal)	240 (63)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel Inlet

Fuel Supply Connection Size	1 1/2" NPT
Fuel Supply Pressure: mm H ₂ 0 (in. H ₂ 0)	178-279 (7-11)

// Fuel Consumption (NG-1000 BTU/ft³)

At 100% of Power Rating: m ³ /hr (ft ³ /hr)	39.7 (1,400)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	30.7 (1,084)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	21.8 (769)

// Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	50 (122)*
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	240 (63)
Heat Rejection to Coolant: kW (BTUM)	164.4 (9,357)
Heat Radiated to Ambient: kW (BTUM)	65.2 (3,710)
Fan Power: kW (hp)	5.6 (7.5)

* Installation of enclosures reduces the ambient capacity of the cooling system by 1 °C (1.8 °F). Gravity exhaust louvers reduce ambient capacity of the cooling system by an additional 3 °C (5.5 °F).

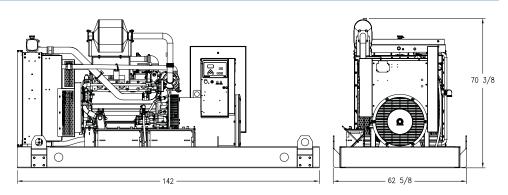
// Air Requirements

Aspirating: *m³/min (SCFM)	9.3 (317)
Air Flow Required for Rad.	
Cooled Unit: **m³/min (SCFM)	428 (15,100)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	147 (5,175)

* Air density = $1.184 \text{ kg/m}^3 (0.0739 \text{ lbm/ft}^3)$

** At 0.25 kPa (1 in. H₂0) static pressure and 52 °C (125 °F) at radiator

Gas Temp. (Stack): °C (°F)	660 (1,220)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	29.7 (1,050)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	2.5 (10.25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load (NG)	Prime Full Load (LP)
Level 0: Open Power Unit dB(A)	81.7	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and are EPA weighted cycle values. Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

- // Ambient capability factor at 984 ft (300 m). Consult your local MTU Onsite Energy Power Generation Distributor for other altitudes.
- // Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%. For limited running time and base load ratings, consult the factory.
- // Deration Factor:

Production tolerances in engines and installed components can account for power variations. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations. Consult your local MTU Onsite Energy Power Generation Distributor for derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

GAS GENERATOR SET MTU 6R0185 GS200

175 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 6R0185 GS200 (200 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
Natural Gas						
Ratings: Amps	C/F	C/F	600	520	261	210
Natural Gas						
Ratings: kW/kVA	C/F	C/F	173/216	173/216	174/217	175/218
skVA@30%						
Voltage Dip	425	370	608	608	809	720
Generator Model	433CSL6216	432PSL6228	432CSL6210	432CSL6210	432CSL6210	432PSL6246
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 11.1 L Turbo Engine Charge Air Cooling
- 11.1 Liter Displacement
 - 4-Cycle
- // 3-Way Catalyst
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	105 °C Maximum Prime Temperature Rise
Oil Pump	1 Bearing, Sealed
Oil Drain Extension & S/O Valve	Flexible Coupling
Full Flow Oil Filter	Full Amortisseur Windings
Jacket Water Pump	125% Rotor Balancing
Thermostats	3-phase Voltage Sensing
Blower Fan & Fan Drive	100% of Rated Load - One Step
Radiator - Unit Mounted	5% Maximum Total Harmonic Distortion
Electric Starting Motor - 24V	
Governor – Electronic Isochronous	
Base - Formed Steel	// Digital Control Panel(s)
SAE Flywheel & Bell Housing	
Charging Alternator - 24V	Digital Metering
Battery Box & Cables	Engine Parameters
Flexible Fuel Connectors	Generator Protection Functions
Flexible Exhaust Connection	Engine Protection
EPA Certified Engine	SAE J1939 Engine ECU Communications

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self Ventilated and Drip-proof
Superior Voltage Waveform
Solid State, Volts-per-hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 pole, Rotating Field

Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Doosan
11.1L CAC
4-Cycle
6-Inline
11.1 (673)
12.3 (4.84)
15.5 (6.1)
10.5:1
1,800
Bosch
203 (272)
±0.5%
Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	28.5 (8)
Engine Jacket Water Capacity: L (gal)	25 (5.5)
System Coolant Capacity: L (gal)	149 (32.8)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel Inlet

Fuel Supply Connection Size	2" NPT
Fuel Supply Pressure: mm H_20 (in. H_20)	178–279 (7–11)

// Fuel Consumption (NG-1000 BTU/ft³)

At 100% of Power Rating: m ³ /hr (ft ³ /hr)	56.1 (1,980)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	42.5 (1,500)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	30.4 (1,075)

// Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	50 (122)*
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	310 (82)
Heat Rejection to Coolant: kW (BTUM)	194.6 (11,071)
Heat Radiated to Ambient: kW (BTUM)	40.4 (2,295)
Fan Power: kW (hp)	10.4 (13.9)

* Installation of enclosures reduces the ambient capacity of the cooling system by 1 °C (1.8 °F). Gravity exhaust louvers reduce ambient capacity of the cooling system by an additional 3 °C (5.5 °F).

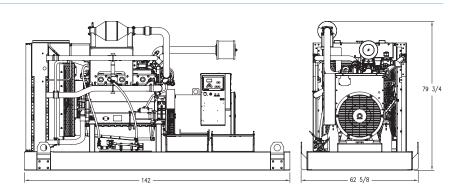
// Air Requirements

Aspirating: *m³/min (SCFM)	11.7 (400)
Air Flow Required for Rad.	
Cooled Unit: **m³/min (SCFM)	631 (22,300)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	237 (8,365)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

** At 0.25 kPa (1 in. H₂0) static pressure and 52 °C (125 °F) at radiator

Gas Temp. (Stack): °C (°F)	694 (1,281)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	38.8 (1,371)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	2.5 (10.25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load (NG)	Prime Full Load (LP)
Level 0: Open Power Unit dB(A)	86.3	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and are EPA weighted cycle values. Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

- // Ambient capability factor at 984 ft (300 m). Consult your local MTU Onsite Energy Power Generation Distributor for other altitudes.
- // Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%. For limited running time and base load ratings, consult the factory.
- // Deration Factor:

Production tolerances in engines and installed components can account for power variations. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations. Consult your local MTU Onsite Energy Power Generation Distributor for derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

GAS GENERATOR SET MTU 8V0183 GS260

235 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 8V0183 GS260 (260 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	208V**	240V**	480V**	600V**
Phase	1	3	3	3	3
PF	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60
Natural Gas					
Ratings: Amps	958	815	707	353	283
Natural Gas					
Ratings: kW/kVA	230/230	235/293	235/293	235/293	235/293
skVA@30%					
Voltage Dip	520	608	608	809	740
Generator Model	572RSL4031	432PSL6210	432PSL6210	432PSL6210	432PSL6246
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 14.6 L Turbo Engine Charge Air Cooling
- 14.6 Liter Displacement
 - 4-Cycle
- // 3-Way Catalyst
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with PMG
 - PMG Standard for 570 frame and larger
 - ° PMG Optional for 430 frame and smaller
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Brushless Alternator with Brushless Pilot Exciter	
4 pole, Rotating Field	
105 °C Maximum Prime Temperature Rise	
1 Bearing, Sealed	
Flexible Coupling	
Full Amortisseur Windings	
125% Rotor Balancing	
3-phase Voltage Sensing	
100% of Rated Load - One Step	
5% Maximum Total Harmonic Distortion	
<pre>// Digital Control Panel(s)</pre>	
Digital Metering	
Engine Parameters	
Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds (with PMG only)
Self Ventilated and Drip-proof
Superior Voltage Waveform
Solid State, Volts-per-hertz Regulator (Digital when PMG is Standard)
±1% Voltage Regulation No Load to Full Load

Digital Metering Engine Parameters Generator Protection Functions Engine Protection SAE J 1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	Doosan
Model	14.6L CAC
Туре	4-Cycle
Arrangement	8-V
Displacement: L (in ³)	14.6 (892)
Bore: cm (in)	12.8 (5.04)
Stroke: cm (in)	14.2 (5.59)
Compression Ratio	10.5:1
Rated RPM	1,800
Engine Governor	Bosch
Maximum Power (NG): kWm (bhp)	270 (302)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	38.1 (10.1)
Engine Jacket Water Capacity: L (gal)	43.2 (9.5)
System Coolant Capacity: L (gal)	227 (50)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel Inlet

Fuel Supply Connection Size	2" NPT
Fuel Supply Pressure: mm H_20 (in. H_20)	178–279 (7–11)

// Fuel Consumption (NG-1000 BTU/ft³)

At 100% of Power Rating: m ³ /hr (ft ³ /hr)	78.2 (2,760)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	58 (2,050)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	40.8 (1,440)

// Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	50 (122)*
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	680 (180)
Heat Rejection to Coolant: kW (BTUM)	285 (16,189)
Heat Radiated to Ambient: kW (BTUM)	80.5 (4,580)
Fan Power: kW (hp)	16.4 (22)

* Installation of enclosures reduces the ambient capacity of the cooling system by 1 °C (1.8 °F). Gravity exhaust louvers reduce ambient capacity of the cooling system by an additional 3 °C (5.5 °F).

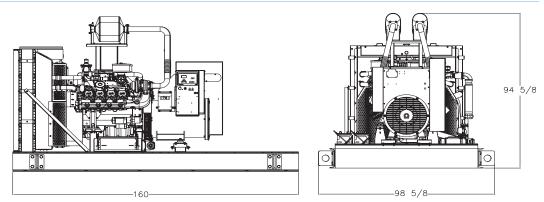
// Air Requirements

Aspirating: *m ³ /min (SCFM)	15.6 (532)
Air Flow Required for Rad.	
Cooled Unit: **m³/min (SCFM)	849 (30,000)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	293 (10,330)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

** At 0.25 kPa (1 in. H₂0) static pressure and 52 °C (125 °F) at radiator

Gas Temp. (Stack): °C (°F)	554 (1,030)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	44.2 (1,560)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	2.5 (10.25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry)
Open Power Unit (OPU)	4,064 x 2,506 x 2,404 mm (160 x 98.63 x 94.63 in)	4,055 kg (8,939 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load (NG)	Prime Full Load (LP)
Level 0: Open Power Unit dB(A)	83.1	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and are EPA weighted cycle values. Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

- // Ambient capability factor at 984 ft (300 m). Consult your local MTU Onsite Energy Power Generation Distributor for other altitudes.
- // Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, ISO-3046/1, BS 5514, and AS 2789. Average load factor: ≤ 75%. For limited running time and base load ratings, consult the factory.
- // Deration Factor:

Production tolerances in engines and installed components can account for power variations. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations. Consult your local MTU Onsite Energy Power Generation Distributor for derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

GAS GENERATOR SET MTU 10V0183 GS350

300 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 10V0183 GS350 (350 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	208V**	240V**	480V**	600V**
Phase	1	3	3	3	3
PF	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60
Natural Gas					
Ratings: Amps	1250	1041	902	451	361
Natural Gas					
Ratings: kW/kVA	300/300	300/375	300/375	300/375	300/375
skVA@30%					
Voltage Dip	700	959	959	1277	1100
Generator Model	573RSL4035	433CSL6220	433CSL6220	433CSL6220	433PSL6248
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 18.3 L Turbo Engine Charge Air Cooling
- 18.3 Liter Displacement
- 4-Cycle
- // 3-Way Catalyst
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with PMG
 - PMG Standard for 570 frame and larger
 - $^{\rm O}$ PMG Optional for 430 frame and smaller
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

4 pole, Rotating Field 105 °C Maximum Prime Temperature Rise 1 Bearing, Sealed Flexible Coupling Full Amortisseur Windings	
1 Bearing, Sealed Flexible Coupling	
Flexible Coupling	
Full Amorticsour Windings	
i uli Allioi usseuri Wiliuliigs	
125% Rotor Balancing	
3-phase Voltage Sensing	
100% of Rated Load - One Step	
5% Maximum Total Harmonic Distortion	
// Digital Control Panel(s)	
Digital Metering	
Engine Parameters	
Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise and motor starting Sustained short circuit current of up to 300% of the rated current for up to 10 seconds (with PMG only) Self Ventilated and Drip-proof Superior Voltage Waveform Solid State, Volts-per-hertz Regulator (Digital when PMG is Standard) ± 1% Voltage Regulation No Load to Full Load

0
Generator Protection Functions
Engine Protection
SAE J1939 Engine ECU Communications
Windows [®] -Based Software
Multilingual Capability
Remote Communications to RDP-110 Remote Annunciator
Programmable Input and Output Contacts
UL Recognized, CSA Certified, CE Approved
Event Recording
IP 54 Front Panel Rating with Integrated Gasket
NFPA110 Compatible

// Engine

Manufacturer	Doosan
Model	18.3L CAC
Туре	4-Cycle
Arrangement	10-V
Displacement: L (in ³)	18.3 (1,115)
Bore: cm (in)	12.8 (5.04)
Stroke: cm (in)	14.2 (5.59)
Compression Ratio	10.5:1
Rated RPM	1,800
Engine Governor	Bosch
Maximum Power (NG): kWm (bhp)	340 (456)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	42.1 (11.1)
Engine Jacket Water Capacity: L (gal)	50 (11)
System Coolant Capacity: L (gal)	289 (63.5)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel Inlet

Fuel Supply Connection Size	3" NPT
Fuel Supply Pressure: mm H_2^0 (in. H_2^0)	178–279 (7–11)

// Fuel Consumption (NG-1000 BTU/ft³)

At 100% of Power Rating: m ³ /hr (ft ³ /hr)	92 (3,247.5)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	71.5 (2,524.8)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	51.9 (1,831.7)

// Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	50 (122)*
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	660 (174)
Heat Rejection to Coolant: kW (BTUM)	365 (20,784)
Heat Radiated to Ambient: kW (BTUM)	88.5 (5,030)
Fan Power: kW (hp)	20.9 (28)

* Installation of enclosures reduces the ambient capacity of the cooling system by 1 °C (1.8 °F). Gravity exhaust louvers reduce ambient capacity of the cooling system by an additional 3 °C (5.5 °F).

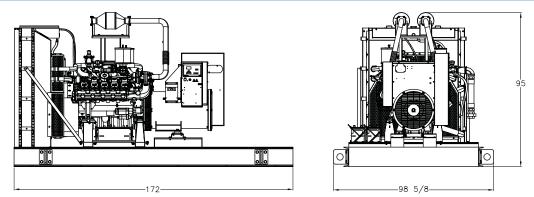
// Air Requirements

Aspirating: *m ³ /min (SCFM)	19.4 (664)
Air Flow Required for Rad.	
Cooled Unit: **m³/min (SCFM)	1,019 (36,000)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	321 (11,350)

* Air density = 1.184 kg/m^3 (0.0739 lbm/ft³)

** At 0.25 kPa (1 in. H₂0) static pressure and 52 °C (125 °F) at radiator

Gas Temp. (Stack): °C (°F)	607 (1,125)
Gas Volume at Stack	
Temp: m³/min (CFM)	58.6 (2,070)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	2.5 (10.25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry)
Open Power Unit (OPU)	4,369 x 2,506 x 2,413 mm (172 x 98.63 x 95 in)	4,741 kg (10,452 lb)

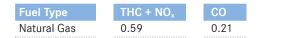
Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load (NG)	Prime Full Load (LP)
Level 0: Open Power Unit dB(A)	84.7	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and are EPA weighted cycle values. Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

- // Ambient capability factor at 984 ft (300 m). Consult your local MTU Onsite Energy Power Generation Distributor for other altitudes.
- // Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, ISO-3046/1, BS 5514, and AS 2789. Average load factor: ≤ 75%. For limited running time and base load ratings, consult the factory.
- // Deration Factor:

Production tolerances in engines and installed components can account for power variations. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations. Consult your local MTU Onsite Energy Power Generation Distributor for derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

GAS GENERATOR SET MTU 12V0183 GS400

355 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 12V0183 GS400 (400 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	208V**	240V**	480V**	600V**
Phase	1	3	3	3	3
PF	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60
Natural Gas					
Ratings: Amps	1458	1232	1068	534	427
Natural Gas					
Ratings: kW/kVA	350/350	355/443	355/443	355/443	355/443
skVA@30%					
Voltage Dip	760	1500	1500	1500	1450
Generator Model	574RSL4037	572RSL4029	572RSL4029	572RSL4029	572RSS4272
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 21.9 L Turbo Engine Charge Air Cooling
- 21.9 Liter Displacement - 4-Cycle
- // 3-Way Catalyst
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - PMG (Permanent Magnet Generator) supply to regulator
 - 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter
Oil Pump	4 pole, Rotating Field
Oil Drain Extension & S/O Valve	105 °C Maximum Prime Temperature Rise
Full Flow Oil Filter	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Thermostats	Full Amortisseur Windings
Blower Fan & Fan Drive	125% Rotor Balancing
Radiator - Unit Mounted	3-phase Voltage Sensing
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion
Base - Formed Steel	
SAE Flywheel & Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box & Cables	
Flexible Fuel Connectors	Digital Metering
Flexible Exhaust Connection	Engine Parameters
EPA Certified Engine	Generator Protection Functions

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self Ventilated and Drip-proof
Superior Voltage Waveform
Digital, Volts-per-hertz Regulator
±1% Voltage Regulation No Load to Full Load

Digital Metering
Engine Parameters
Generator Protection Functions
Engine Protection
SAE J1939 Engine ECU Communications
Windows [®] -Based Software
Multilingual Capability
Remote Communications to RDP-110 Remote Annunciator
Programmable Input and Output Contacts
UL Recognized, CSA Certified, CE Approved
Event Recording
IP 54 Front Panel Rating with Integrated Gasket
NFPA110 Compatible

// Engine

Manufacturer	Doosan
Model	21.9L CAC
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	21.9 (1,338)
Bore: cm (in)	12.8 (5.04)
Stroke: cm (in)	14.2 (5.59)
Compression Ratio	10.5:1
Rated RPM	1,800
Engine Governor	Bosch
Maximum Power (NG): kWm (bhp)	410 (550)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	47.1 (12.4)
Engine Jacket Water Capacity: L (gal)	52.3 (11.5)
System Coolant Capacity: L (gal)	291 (64)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel Inlet

Fuel Supply Connection Size	3" NPT
Fuel Supply Pressure: mm H_2^0 (in. H_2^0)	178–279 (7–11)

// Fuel Consumption (NG-1000 BTU/ft³)

At 100% of Power Rating: m ³ /hr (ft ³ /hr)	109.3 (3,861)
At 75% of Power Rating: m ³ /hr (ft ³ /hr)	84.1 (2,970)
At 50% of Power Rating: m ³ /hr (ft ³ /hr)	61.7 (2,178)

// Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	50 (122)*
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	660 (174)
Heat Rejection to Coolant: kW (BTUM)	453 (25,760)
Heat Radiated to Ambient: kW (BTUM)	118.2 (6,720)
Fan Power: kW (hp)	31.3 (42)

* Installation of enclosures reduces the ambient capacity of the cooling system by 1 °C (1.8 °F). Gravity exhaust louvers reduce ambient capacity of the cooling system by an additional 3 °C (5.5 °F).

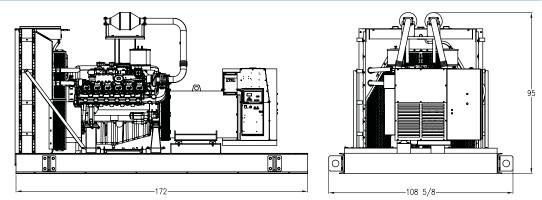
// Air Requirements

Aspirating: *m ³ /min (SCFM)	24.6 (841)
Air Flow Required for Rad.	
Cooled Unit: **m³/min (SCFM)	1,133 (40,000)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	429 (15,160)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

** At 0.25 kPa (1 in. H₂0) static pressure and 52 °C (125 °F) at radiator

Gas Temp. (Stack): °C (°F)	582 (1,080)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	72.2 (2,550)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	2.5 (10.25)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



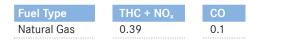
Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load (NG)	Prime Full Load (LP)
Level 0: Open Power Unit dB(A)	85.5	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and are EPA weighted cycle values. Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations.

RATING DEFINITIONS AND CONDITIONS

- // Ambient capability factor at 984 ft (300 m). Consult your local MTU Onsite Energy Power Generation Distributor for other altitudes.
- // Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%. For limited running time and base load ratings, consult the factory.
- // Deration Factor:

Production tolerances in engines and installed components can account for power variations. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations. Consult your local MTU Onsite Energy Power Generation Distributor for derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 3R0096 DS30

30 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 3R0096 DS30 (27 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	208V**	240V**	380V**	480V**	600V**
Phase	1	3	3	3	3	3
PF	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	30	30	30	30	30	30
kVA	30	37	37	37	37	37
Amps	125	104	90	57	45	36
skVA@30%						
Voltage Dip	65	142	142	187	187	142
Generator Model	285PSL1700	285PSL1700	285PSL1700	285PSL1700	285PSL1700	284PSL5252
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 3029TFG89 Diesel Engine
- 2.9 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering

Programmable Input and Output Contacts

Event Recording

NFPA110 Compatible

UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

- LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	130 °C Max. Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Mechanical Droop	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	Windows [®] -Based Software	
EPA Certified Engine	Multilingual Capability	
	Remote Communications to RDP-110 Remote Annunciator	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

// Engine

Manufacturer	John Deere
Model	3029TFG89
Туре	4-Cycle
Arrangement	3-Inline
Displacement: L (in ³)	2.9 (177)
Bore: cm (in)	10.6 (4.2)
Stroke: cm (in)	11 (4.3)
Compression Ratio	17.2:1
Rated RPM	1,800
Engine Governor	Mechanical Droop
Max. Power: kWm (bhp)	35 (47)
Speed Regulation	±1%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	8 (2.1)
Engine Jacket Water Capacity: L (gal)	5.7 (1.5)
System Coolant Capacity: L (gal)	11.4 (3)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	5/16" ID/-6 JIC
Fuel Return Connection Size	5/16" ID/-6 JIC
Max. Fuel Lift: m (ft)	2 (6.6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	111.3 (29.4)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	9.9 (2.6)
At 75% of Power Rating: L/hr (gal/hr)	7.5 (2)
At 50% of Power Rating: L/hr (gal/hr)	5.2 (1.4)

// Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	50 (122)*
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	110 (29)
Heat Rejection to Coolant: kW (BTUM)	20.1 (1,144)
Heat Radiated to Ambient: kW (BTUM)	4.3 (245)
Fan Power: kW (hp)	0.7 (0.94)

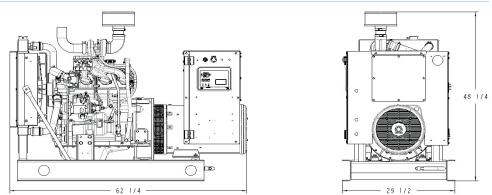
 * Installation of a gravity exhaust louver in a Level 3 enclosure will reduce the ambient capacity of the cooling system by 5 °C (9 °F).

// Air Requirements

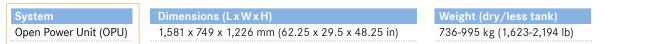
Aspirating: *m ³ /min (SCFM)	3.6 (127)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	46.7 (1,636)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	15.8 (553)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	580 (1,076)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	8.3 (293)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

and	Chandley Full I	Halt Turns
oad	Standby Full L	Unit Type
	72.2	Level 0: Open Power Unit dB(A)
	72.2	Level 0: Open Power Unit dB(A)

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
4.41	0.44	0.11

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 4R0113 DS40

40 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 4R0113 DS40 (40 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	208V**	240V**	380V**	480V**	600V**
Phase	1	3	3	3	3	3
PF	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	40	40	40	40	40	40
kVA	40	50	50	50	50	50
Amps	166	138	120	76	60	48
skVA@30%						
Voltage Dip	63	129	129	112	172	92
Generator Model	361CSL1601	361CSL1601	361CSL1601	361CSL1601	361CSL1601	361PSL1632
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 3 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045TF280 Diesel Engine
 - 4.5 Liter Displacement
 - Mechanical Injection Pump
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts

Event Recording

NFPA110 Compatible

UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

- LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Max. Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V	// Digital Control Panel(s)	
Governor - Mechanical Droop		
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	Windows [®] -Based Software	
EPA Certified Engine	Multilingual Capability	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

// Engine

Manufacturer	John Deere
Model	4045TF280
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19.0:1
Rated RPM	1,800
Engine Governor	Mechanical Droop
Max. Power: kWm (bhp)	63 (85)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.3)
System Coolant Capacity: L (gal)	18.9 (5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Max. Fuel Lift: m (ft)	1.8 (6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	62.5 (16.5)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	17.4 (4.6)
At 75% of Power Rating: L/hr (gal/hr)	13.6 (3.6)
At 50% of Power Rating: L/hr (gal/hr)	9.5 (2.5)

// Cooling - Radiator System

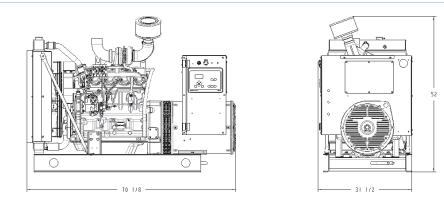
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	144 (38)
Heat Rejection to Coolant: kW (BTUM)	36 (2,049)
Heat Radiated to Ambient: kW (BTUM)	6.8 (384)
Fan Power: kW (hp)	1.6 (2.2)

// Air Requirements

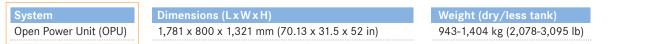
5.3 (187)
117 (4,088)
25 (867)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	579 (1,074)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	19.2 (679)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)
Min. Allowable	
Back Pressure: kPa (in. H ₂ 0)	N/A



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	80.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	СО	РМ	
3.8	0.69	0.22	

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS40

40 kWe / 60 Hz / Standby (SCAQMD) 208 - 600V

Reference MTU 4R0113 DS40 (40 kWe SCAQMD) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	208V**	240V**	380V**	480V**	600V**
Phase	1	3	3	3	3	3
PF	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	40	40	40	40	40	40
kVA	40	50	50	50	50	50
Amps	166	138	120	76	60	48
skVA@30%						
Voltage Dip	63	129	129	112	172	92
Generator Model	361CSL1601	361CSL1601	361CSL1601	361CSL1601	361CSL1601	361PSL1632
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045TF290J Diesel Engine
 - 4.5 Liter Displacement
 - Mechanical Injection Pump
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts

Event Recording

NFPA110 Compatible

UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

- Complete System Metering
- LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Max. Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor - Mechanical Droop	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	Windows [®] -Based Software	
EPA Certified Engine	Multilingual Capability	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

// Engine

Manufacturer	John Deere		
Model	4045TF290J		
Туре	4-Cycle		
Arrangement	4-Inline		
Displacement: L (in ³)	4.5 (275)		
Bore: cm (in)	10.6 (4.19)		
Stroke: cm (in) 12.			
Compression Ratio	19.0:1		
Rated RPM	1,800		
Engine Governor	Mechanical Droop		
Max. Power: kWm (bhp)	55 (74)		
Speed Regulation	±0.5%		
Air Cleaner	Dry		

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.3)
System Coolant Capacity: L (gal)	18.9 (5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under - 17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Max. Fuel Lift: m (ft)	1.8 (6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	112.8 (29.8)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	15.8 (4.2)
At 75% of Power Rating: L/hr (gal/hr)	12.3 (3.3)
At 50% of Power Rating: L/hr (gal/hr)	8.1 (2.1)

// Cooling - Radiator System

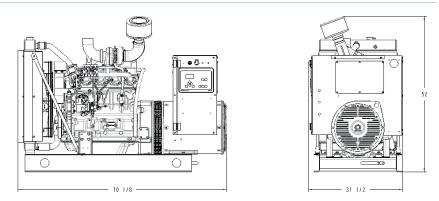
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	144 (38)
Heat Rejection to Coolant: kW (BTUM)	31 (1,765)
Heat Radiated to Ambient: kW (BTUM)	6.8 (384)
Fan Power: kW (hp)	1.6 (2.2)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	4.5 (159)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	117 (4,088)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	25 (867)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	537 (999)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	12.7 (448)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)
Min. Allowable	
Back Pressure: kPa (in. H ₂ 0)	N/A



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	80.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS50

50 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 4R0113 DS50 (45 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	380V**	480V**	600V**
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	50	50	50	50	50	50	50
kVA	50	50	62	62	62	62	62
Amps	208	208	173	150	95	75	60
skVA@30%							
Voltage Dip	127	130	129	129	112	172	138
Generator							
Model	362CSL1604	361CSL1613	361CSL1601	361CSL1601	361CSL1601	361CSL1601	361PSL1633
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 3 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045TF280 Diesel Engine
- 4.5 Liter Displacement
 - Mechanical Injection Pump
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Max. Standby Temperature Rise		
Oil Pump	1 Bearing, Sealed		
Oil Drain Extension and S/O Valve	Flexible Coupling		
Full Flow Oil Filter	Full Amortisseur Windings		
Fuel Filter with Water Separator	125% Rotor Balancing		
Jacket Water Pump	3-Phase Voltage Sensing		
Thermostat	100% of Rated Load - One Step		
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion		
Radiator - Unit Mounted			
Electric Starting Motor - 12V			
Governor – Mechanical Droop	<pre>// Digital Control Panel(s)</pre>		
Base - Formed Steel			
SAE Flywheel and Bell Housing	Digital Metering		
Charging Alternator - 12V	Engine Parameters		
Battery Box and Cables	Generator Protection Functions		
Flexible Fuel Connectors	Engine Protection		
Flexible Exhaust Connection	Windows [®] -Based Software		
EPA Certified Engine	Multilingual Capability		

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Digital Metering Engine Parameters Generator Protection Functions Engine Protection Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	John Deere
Model	4045TF280
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19.0:1
Rated RPM	1,800
Engine Governor	Mechanical Droop
Max. Power: kWm (bhp)	63 (85)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.3)
System Coolant Capacity: L (gal)	18.9 (5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Max. Fuel Lift: m (ft)	1.8 (6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	62.5 (16.5)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	17.4 (4.6)
At 75% of Power Rating: L/hr (gal/hr)	13.6 (3.6)
At 50% of Power Rating: L/hr (gal/hr)	9.5 (2.5)

// Cooling - Radiator System

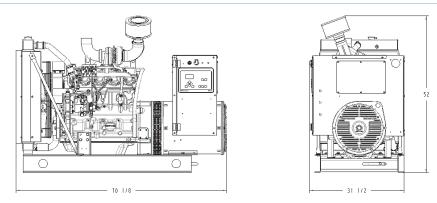
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	144 (38)
Heat Rejection to Coolant: kW (BTUM)	36 (2,049)
Heat Radiated to Ambient: kW (BTUM)	8.7 (495)
Fan Power: kW (hp)	1.6 (2.2)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	5.3 (187)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	117 (4,088)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	32 (1,117)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	579 (1,074)
Gas Volume at Stack	
Temp: m³/min (CFM)	19.2 (679)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)
Min. Allowable	
Back Pressure: kPa (in. H ₂ 0)	N/A



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	80.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	СО	PM
3.8	0.69	0.22

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS50

50 kWe / 60 Hz / Standby (SCAQMD) 208 - 600V

Reference MTU 4R0113 DS50 (45 kWe SCAQMD) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	380V**	480V**	600V**
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	50	50	50	50	50	50	50
kVA	50	50	62	62	62	62	62
Amps	208	208	173	150	95	75	60
skVA@30%							
Voltage Dip	127	130	129	129	112	172	138
Generator							
Model	362CSL1604	361CSL1613	361CSL1601	361CSL1601	361CSL1601	361CSL1601	361PSL1633
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045TF290J Diesel Engine
 - 4.5 Liter Displacement
 - Mechanical Injection Pump
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts

Event Recording

NFPA110 Compatible

UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

- Complete System Metering
- LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Max. Standby Temperature Rise		
Oil Pump	1 Bearing, Sealed		
Oil Drain Extension and S/O Valve	Flexible Coupling		
Full Flow Oil Filter	Full Amortisseur Windings		
Fuel Filter with Water Separator	125% Rotor Balancing		
Jacket Water Pump	3-Phase Voltage Sensing		
Thermostat	100% of Rated Load - One Step		
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion		
Radiator - Unit Mounted			
Electric Starting Motor - 12V			
Governor – Mechanical Droop	<pre>// Digital Control Panel(s)</pre>		
Base - Formed Steel			
SAE Flywheel and Bell Housing	Digital Metering		
Charging Alternator - 12V	Engine Parameters		
Battery Box and Cables	Generator Protection Functions		
Flexible Fuel Connectors	Engine Protection		
Flexible Exhaust Connection	Windows [®] -Based Software		
EPA Certified Engine	Multilingual Capability		

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

// Engine

Manufacturer	John Deere
Model	4045TF290J
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19.0:1
Rated RPM	1,800
Engine Governor	Mechanical Droop
Max. Power: kWm (bhp)	55 (74)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.3)
System Coolant Capacity: L (gal)	18.9 (5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under - 17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Max. Fuel Lift: m (ft)	1.8 (6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	112.8 (29.8)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	15.8 (4.2)
At 75% of Power Rating: L/hr (gal/hr)	12.3 (3.3)
At 50% of Power Rating: L/hr (gal/hr)	8.1 (2.1)

// Cooling - Radiator System

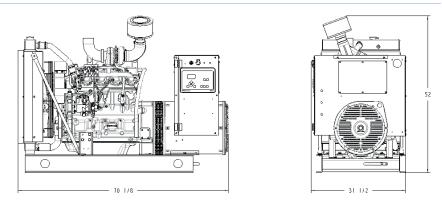
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	144 (38)
Heat Rejection to Coolant: kW (BTUM)	31 (1,765)
Heat Radiated to Ambient: kW (BTUM)	6.8 (384)
Fan Power: kW (hp)	1.6 (2.2)

// Air Requirements

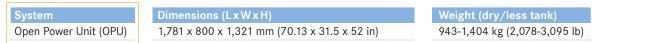
Aspirating: *m³/min (SCFM)	4.5 (159)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	117 (4,088)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	25 (867)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	537 (999)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	12.7 (448)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)
Min. Allowable	
Back Pressure: kPa (in. H ₂ 0)	N/A



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	80.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS60

60 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 4R0113 DS60 (55 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	380V**	480V**	600V**
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	60	60	60	60	60	60	60
kVA	60	60	75	75	75	75	75
Amps	250	250	208	180	114	90	72
skVA@30%							
Voltage Dip	127	130	200	200	172	172	172
Generator							
Model	362CSL1604	361CSL1613	361CSL1602	361CSL1602	361CSL1602	361CSL1601	361PSL1633
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 3 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045HF280 Diesel Engine
- 4.5 Liter Displacement
- Mechanical Injection Pump
- 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Max. Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor - Mechanical Droop	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	Windows [®] -Based Software	
	Multiliagual Capability	
EPA Certified Engine	Multilingual Capability	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

 Generator Protection Functions

 Engine Protection

 Windows®-Based Software

 Multilingual Capability

 Remote Communications to RDP-110 Remote Annunciator

 Programmable Input and Output Contacts

 UL Recognized, CSA Certified, CE Approved

 Event Recording

 rise

 IP 54 Front Panel Rating with Integrated Gasket

 NFPA110 Compatible

// Engine

Manufacturer	John Deere
Model	4045HF280
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19.0:1
Rated RPM	1,800
Engine Governor	Mechanical Droop
Max. Power: kWm (bhp)	74 (99)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.3)
System Coolant Capacity: L (gal)	16.7 (4.4)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Max. Fuel Lift: m (ft)	1.8 (6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	113 (29.9)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	19.3 (5.1)
At 75% of Power Rating: L/hr (gal/hr)	14.8 (3.9)
At 50% of Power Rating: L/hr (gal/hr)	10.6 (2.8)

// Cooling - Radiator System

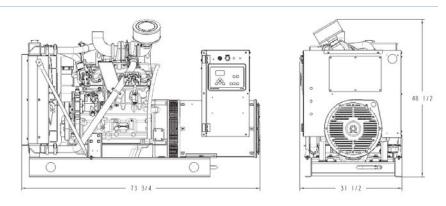
50 (122)
0.12 (0.5)
144 (38)
35 (1,979)
5 (278)
10.9 (619)
1.16 (1.55)

// Air Requirements

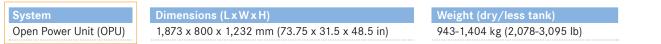
Aspirating: *m ³ /min (SCFM)	5.4 (191)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	91 (3,162)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	40 (1,396)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	545 (1,013)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	14.4 (508)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)
Min. Allowable	
Back Pressure: kPa (in. H ₂ 0)	N/A



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	73

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
3.5	0.97	0.32

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS80

80 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 4R0113 DS80 (80 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	80	80	80	80	80	80
kVA	80	80	100	100	100	100
Amps	333	333	278	241	120	96
skVA@30%						
Voltage Dip	157	310	216	216	288	235
Generator Model	363CSL1607	363CSL1617	362CSL1604	362CSL1604	362CSL1604	362PSL1635
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045HF285 Diesel Engine
 - 4.5 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	130 °C Maximum Standby Temperature Rise
Oil Pump	1 Bearing, Sealed
Oil Drain Extension & S/O Valve	Flexible Coupling
Full Flow Oil Filter	Full Amortisseur Windings
Fuel Filter with Water Separator	125% Rotor Balancing
Jacket Water Pump	3-Phase Voltage Sensing
Thermostat	100% of Rated Load - One Step
Blower Fan & Fan Drive	5% Maximum Total Harmonic Distortion
Radiator - Unit Mounted	
Electric Starting Motor - 12V	
Governor – Electronic Isochronous	// Digital Control Panel(s)
Base - Formed Steel	
SAE Flywheel & Bell Housing	Digital Metering
Charging Alternator - 12V	Engine Parameters
Battery Box & Cables	Generator Protection Functions
Flexible Fuel Connectors	Engine Protection
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications
EDA Cortified Engine	Windows [®] -Based Software
EPA Certified Engine	Willows -based Soltwale

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved rise Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Model Type Arrangement Displacement: L (in ³) Bore: cm (in)	John Deere
Arrangement Displacement: L (in ³)	4045HF285
Displacement: L (in³)	4-Cycle
· · · · · · · · · · · · · · · · · · ·	4-Inline
Bore: cm (in)	4.5 (275)
	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	118 (158)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	12 (3.2)
Engine Jacket Water Capacity: L (gal)	12.5 (3.3)
System Coolant Capacity: L (gal)	20.1 (5.3)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	74.6 (19.7)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	23.1 (6.1)
At 75% of Power Rating: L/hr (gal/hr)	18.5 (4.9)
At 50% of Power Rating: L/hr (gal/hr)	13.2 (3.5)

// Cooling - Radiator System

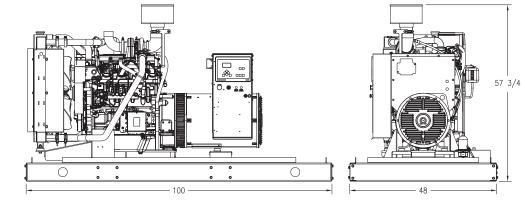
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Allowable Static	
Pressure on Rad. Exhaust: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	180 (48)
Heat Rejection to Coolant: kW (BTUM)	56 (3,190)
Heat Rejection to Air to Air: kW (BTUM)	17.6 (1,002)
Heat Radiated to Ambient: kW (BTUM)	10.5 (596)
Fan Power: kW (hp)	6.5 (8.7)

// Air Requirements

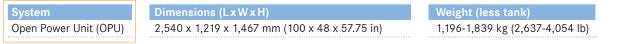
7.7 (273)
187 (6,587)
38 (1,343)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	560 (1,040)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	21.2 (750)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	83.6
Level 0: Open Power Unit dB(A)	83.6

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
3.97	0.72	0.08

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0120 DS80

80 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 4R0120 DS80 (72 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	80	80	80	80	80	80	80
kVA	80	80	100	100	100	100	100
Amps	333	333	278	241	151	120	96
skVA@30%							
Voltage Dip	145	311	216	216	165	288	236
Generator							
Model	363CSL1607	363CSL1617	362CSL1604	362CSL1604	362CSL1606	362CSL1604	362PSL1635
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM924LA Diesel Engine - 4.8 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	130 °C Max. Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	

// Generator

Engine Parameters Generator Protection Functions Engine Protection SAE J 1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM924LA
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.8 (293)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	147 (197)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	15.8 (4.2)
Engine Jacket Water Capacity: L (gal)	7 (1.8)
System Coolant Capacity: L (gal)	20.8 (5.5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.7 (9)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	328.2 (86.7)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	19.3 (5.1)
At 75% of Power Rating: L/hr (gal/hr)	14 (3.7)
At 50% of Power Rating: L/hr (gal/hr)	9.8 (2.6)

* Based on 362CSL1604 480 Volt generator set

// Cooling - Radiator System

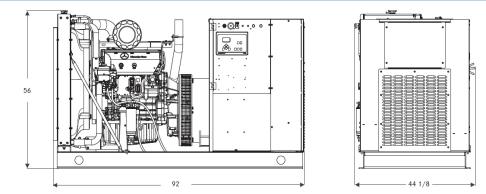
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	143 (37)
Heat Rejection to Coolant: kW (BTUM)	37.5 (2,133)
Heat Rejection to Air to Air: kW (BTUM)	23.6 (1,342)
Heat Radiated to Ambient: kW (BTUM)	24.8 (1,410)
Fan Power: kW (hp)	3.3 (4.4)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	8.6 (304)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	209 (7,381)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	90.7 (3,203)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

	054 (((0)
Gas Temp. (Stack): °C (°F)	354 (669)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	21.6 (763)
Max. Allowable	
Back Pressure: kPa (in. H_2^0)	6.5 (26)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	83

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
3.61	1.42	0.08

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS100

100 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 4R0113 DS100 (90 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	100	100	100	100	100	100
kVA	100	100	125	125	125	125
Amps	417	417	347	301	150	120
skVA@30%						
Voltage Dip	136	311	258	258	344	270
Generator Model	431CSL6204	363CSL1617	362CSL1606	362CSL1606	362CSL1606	362PSL1636
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045HF285 Diesel Engine - 4.5 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Maximum Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension & S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostats	100% of Rated Load - One Step	
Blower Fan & Fan Drive	5% Maximum Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V	// Digital Control Panel(s)	
Governor – Electronic Isochronous		
Base - Formed Steel		
SAE Flywheel & Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box & Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
	Windows [®] -Based Software	
EPA Certified Engine	Windows [®] -Based Software	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

Remote Communications to RDP-110 Remote Annunciator

Multilingual Capability

// Engine

Model Type Arrangement Displacement: L (in ³) Bore: cm (in)	John Deere
Arrangement Displacement: L (in ³)	4045HF285
Displacement: L (in³)	4-Cycle
· · · · · · · · · · · · · · · · · · ·	4-Inline
Bore: cm (in)	4.5 (275)
	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	118 (158)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	12 (3.2)
Engine Jacket Water Capacity: L (gal)	12.5 (3.3)
System Coolant Capacity: L (gal)	20.1 (5.3)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	74.6 (19.7)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	31 (8.2)
At 75% of Power Rating: L/hr (gal/hr)	25 (6.6)
At 50% of Power Rating: L/hr (gal/hr)	17.8 (4.7)

// Cooling - Radiator System

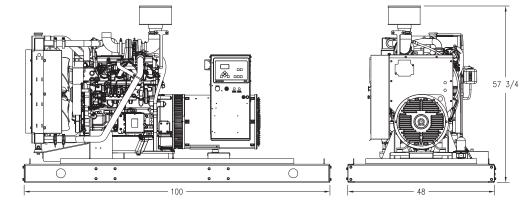
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	180 (48)
Heat Rejection to Coolant: kW (BTUM)	62 (3,544)
Heat Rejection to Air to Air: kW (BTUM)	19.8 (1,127)
Heat Radiated to Ambient: kW (BTUM)	16.2 (919)
Fan Power: kW (hp)	6.5 (8.7)

// Air Requirements

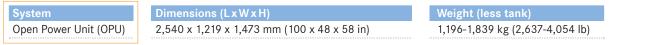
8.2 (288)
187 (6,587)
59 (2,074)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	580 (1,076)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	22.8 (805)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA



Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0120 DS100

100 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 4R0120 DS100 (90 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	100	100	100	100	100	100	100
kVA	100	100	125	125	125	125	125
Amps	417	417	347	301	190	150	120
skVA@30%							
Voltage Dip	107	311	258	258	268	344	272
Generator							
Model	431CSL6202	363CSL1617	362CSL1606	362CSL1606	363CSL1607	362CSL1606	362PSL1636
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM924LA Diesel Engine - 4.8 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Max. Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostats	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	// Digital Control Panel(s)	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	

// Generator

Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM924LA
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.8 (293)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	147 (197)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	15.8 (4.2)
Engine Jacket Water Capacity: L (gal)	7 (1.8)
System Coolant Capacity: L (gal)	20.8 (5.5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.7 (9)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	328.2 (86.7)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	23.9 (6.3)
At 75% of Power Rating: L/hr (gal/hr)	17.4 (4.6)
At 50% of Power Rating: L/hr (gal/hr)	11.7 (3.1)

* Based on 362CSL1606 480 Volt generator set

// Cooling - Radiator System

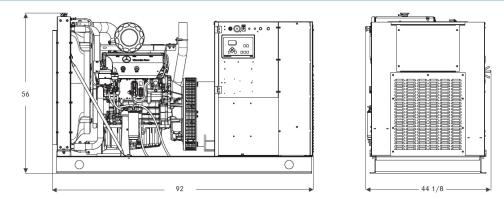
50 (122)
0.12 (0.5))
143 (37)
46.3 (2,633)
26.9 (1,530)
27.1 (1,541)
3.3 (4.4)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	9.1 (321)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	209 (7,381)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m³/min (SCFM)	99.1 (3,500)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	404 (759)
Gas Volume at Stack	
Temp: m³/min (CFM)	24.1 (851)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	6.5 (26)



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Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	83

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS125

125 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 4R0113 DS125 (111 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	125	125	125	125	125	125
kVA	125	125	156	156	156	156
Amps	521	521	434	376	188	150
skVA@30%						
Voltage Dip	187	192	323	323	430	333
Generator Model	431PSL6206	431PSL6224	363CSL1607	363CSL1607	363CSL1607	363PSL1658
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045HF285 Diesel Engine
- 4.58 Liter Displacement
- 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	130 °C Maximum Standby Temperature Rise		
Oil Pump	1 Bearing, Sealed		
Oil Drain Extension & S/O Valve	Flexible Coupling		
Full Flow Oil Filter	Full Amortisseur Windings		
Fuel Filter with Water Separator	125% Rotor Balancing		
Jacket Water Pump	3-Phase Voltage Sensing		
Thermostat	100% of Rated Load - One Step		
Blower Fan & Fan Drive	5% Maximum Total Harmonic Distortion		
Radiator - Unit Mounted			
Electric Starting Motor - 12V			
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>		
Base - Formed Steel			
SAE Flywheel & Bell Housing	Digital Metering		
Charging Alternator - 12V	Engine Parameters		
Battery Box & Cables	Generator Protection Functions		
Flexible Fuel Connectors	Engine Protection		
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications		
EDA Cortified Engine	Windows [®] -Based Software		
EPA Certified Engine			

// Generator

o Full Load ss Pilot Exciter

Multilingual Capability

Event Recording

NFPA110 Compatible

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

// Engine

Manufacturer	John Deere
Model	4045HF285
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	147 (197)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.2)
System Coolant Capacity: L (gal)	24 (6.2)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	90.1 (23.8)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	37.3 (9.9)
At 75% of Power Rating: L/hr (gal/hr)	28.8 (7.6)
At 50% of Power Rating: L/hr (gal/hr)	19.3 (5.1)

// Cooling - Radiator System

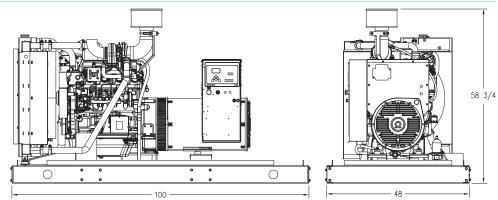
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Allowable Static	
Pressure on Rad. Exhaust: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	180 (48)
Heat Rejection to Coolant: kW (BTUM)	72.1 (4,098)
Heat Rejection to Air to Air: kW (BTUM)	26.5 (1,508)
Heat Radiated to Ambient: kW (BTUM)	19.9 (1,134)
Fan Power: kW (hp)	10.6 (14.2)
<u>, , , , , , , , , , , , , , , , , , , </u>	

// Air Requirements

9.7 (341)
433 (15,303)
71 (2,520)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	580 (1,076)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	27 (953)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	86.8

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Availabler

DIESEL GENERATOR SET MTU 4R0120 DS125

125 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 4R0120 DS125 (111 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	125	125	125	125	125	125	125
kVA	125	125	156	156	156	156	156
Amps	521	521	434	376	237	188	150
skVA@30%							
Voltage Dip	184	196	323	323	191	430	334
Generator							
Model	431PSL6208	431PSL6224	363CSL1607	363CSL1607	431CSL6202	363CSL1607	363PSL1658
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions - EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM924LA Diesel Engine - 4.8 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	130 °C Max. Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM924LA
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.8 (293)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	147 (197)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	15.8 (4.2)
Engine Jacket Water Capacity: L (gal)	7 (1.8)
System Coolant Capacity: L (gal)	20.8 (5.5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.7 (9)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	328.2 (86.7)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	28.8 (7.6)
At 75% of Power Rating: L/hr (gal/hr)	21.6 (5.7)
At 50% of Power Rating: L/hr (gal/hr)	14.8 (3.8)

* Based on 363CSL1607 480 Volt generator set

// Cooling - Radiator System

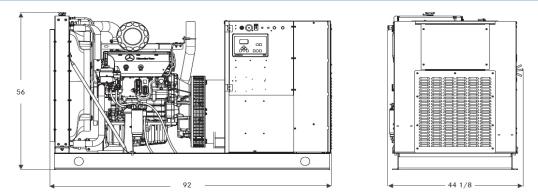
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	143 (37)
Heat Rejection to Coolant: kW (BTUM)	54 (3,071)
Heat Rejection to Air to Air: kW (BTUM)	28.5 (1,621)
Heat Radiated to Ambient: kW (BTUM)	29.3 (1,666)
Fan Power: kW (hp)	3.3 (4.4)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	9.3 (328)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	209 (7,381)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	107 (3,779)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	470 (877)
Gas Volume at Stack	
Temp: m³/min (CFM)	26.3 (929)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	6.5 (26)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	83.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R0113 DS150

150 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 6R0113 DS150 (135 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	150	150	150	150	150	150
kVA	150	150	187	187	187	187
Amps	625	625	520	451	226	180
skVA@30%						
Voltage Dip	182	195	296	296	394	315
Generator Model	431CSL6208	431PSL6224	431CSL6202	431CSL6202	431CSL6202	431PSL6240
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6068HF285 Diesel Engine
- 6.8 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Maximum Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension & S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan & Fan Drive	5% Maximum Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel & Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box & Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

UL Recognized, CSA Certified, CE Approved mperature rise Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

Programmable Input and Output Contacts

Remote Communications to RDP-110 Remote Annunciator

Multilingual Capability

// Engine

Manufacturer	John Deere
Model	6068HF285
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	6.8 (415)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	177 (237)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	20 (5.28)
Engine Jacket Water Capacity: L (gal)	12.3 (3.25)
System Coolant Capacity: L (gal)	22.7 (6)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	107.2 (28.3)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	44.7 (11.8)
At 75% of Power Rating: L/hr (gal/hr)	34.8 (9.2)
At 50% of Power Rating: L/hr (gal/hr)	25.4 (6.7)

// Cooling - Radiator System

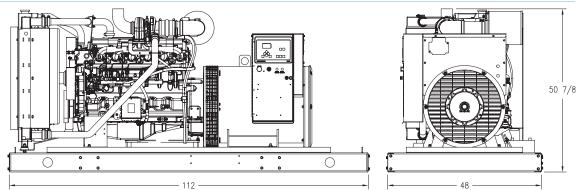
0.12 (0.5)
180 (48)
93.5 (5,324)
32 (1,821)
25.7 (1,461)
10.7 (14.3)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	13.6 (480)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	304 (10,732)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	94 (3,295)
Max of 25 °F Rise: *m ³ /min (SCFM)	94 (3,295)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	505 (941)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	34 (1,201)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	85.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R0120 DS150

150 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 6R0120 DS150 (135 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	150	150	150	150	150	150	150
kVA	150	150	187	187	187	187	187
Amps	625	625	520	451	285	226	180
skVA@30%							
Voltage Dip	188	196	296	296	282	394	316
Generator							
Model	431CSL6206	431PSL6224	431CSL6202	431CSL6202	431CSL6204	431CSL6202	431PSL6240
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions - EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM926LA Diesel Engine
- 7.2 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	130 °C Max. Standby Temperature Rise		
Oil Pump	1 Bearing, Sealed		
Oil Drain Extension and S/O Valve	Flexible Coupling		
Full Flow Oil Filter	Full Amortisseur Windings		
Fuel Filter with Water Separator	125% Rotor Balancing		
Jacket Water Pump	3-Phase Voltage Sensing		
Thermostat	100% of Rated Load - One Step		
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion		
Radiator - Unit Mounted			
Electric Starting Motor - 12V			
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>		
Base - Formed Steel	• • • • • • • • • • • • • • • • •		
SAE Flywheel and Bell Housing	Digital Metering		
Charging Alternator - 12V	Engine Parameters		
Battery Box and Cables	Generator Protection Functions		
Flexible Fuel Connectors	Engine Protection		
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications		
EPA Certified Engine	Windows [®] -Based Software		

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM926LA
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	7.2 (439)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	247 (331)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	29 (7.7)
Engine Jacket Water Capacity: L (gal)	10 (2.6)
System Coolant Capacity: L (gal)	24.1 (6.4)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.6 (8.5)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	330.5 (87.3)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	40.5 (10.7)
At 75% of Power Rating: L/hr (gal/hr)	30 (7.9)
At 50% of Power Rating: L/hr (gal/hr)	20.4 (5.4)

* Based on 431CSL6202 480 Volt generator set)

// Cooling - Radiator System

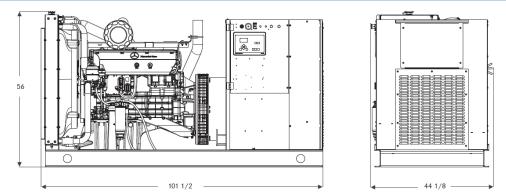
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	143 (37)
Heat Rejection to Coolant: kW (BTUM)	77.8 (4,424)
Heat Rejection to Air to Air: kW (BTUM)	50.8 (2,889)
Heat Radiated to Ambient: kW (BTUM)	29.4 (1,672)
Fan Power: kW (hp)	15.6 (22.1)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	13.4 (473)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	408 (14,408)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	107 (3,779)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	434 (813)
Gas Volume at Stack	
Temp: m³/min (CFM)	39.1 (1,381)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	10.5 (42)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	88.7

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
3.93	1.2	0.06

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R0113 DS 180

180 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 6R0113 DS180 (180 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	180	180	180	180	180	180
kVA	180	180	225	225	225	225
Amps	750	750	625	541	271	217
skVA@30%						
Voltage Dip	267	370	433	433	451	510
Generator Model	432CSL6210	432PSL6228	431CSL6206	431CSL6206	431CSL6204	431PSL6243
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6068HFG85 Diesel Engine
 - 6.8 Liter Displacement
 - Electronic Unit Pump Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	130 °C Maximum Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension & S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan & Fan Drive	5% Maximum Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel & Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box & Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	

Multilingual Capability

Event Recording

NFPA110 Compatible

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

// Generator

// Engine

Manufacturer	John Deere
Model	6068HFG85
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	6.8 (415)
Bore: cm (in)	10.6 (4.2)
Stroke: cm (in)	12.7 (5)
Compression Ratio	17:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	235 (315)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	32.2 (8.5)
Engine Jacket Water Capacity: L (gal)	11.9 (3.3)
System Coolant Capacity: L (gal)	29.3 (7.75)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	93 (24.5)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	51.9 (13.5)
At 75% of Power Rating: L/hr (gal/hr)	40.5 (10.7)
At 50% of Power Rating: L/hr (gal/hr)	27.6 (7.3)

// Cooling - Radiator System

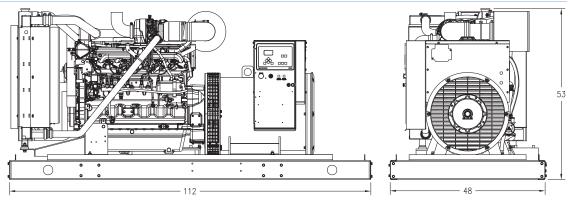
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_2^0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	265 (70)
Heat Rejection to Coolant: kW (BTUM)	83.7 (4,766)
Heat Rejection to Air to Air: kW (BTUM)	40 (2,298)
Heat Radiated to Ambient: kW (BTUM)	24.2 (1,378)
Fan Power: kW (hp)	8.6 (11.5)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	14.7 (520)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	412 (14,537)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	89 (3,108)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	528 (982)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	38.8 (1,371)
Maximum Allowable	
Back Pressure: kPa (in. H_2^{0})	10 (40)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full
Level 0: Open Power Unit dB(A)	87.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R0120 DS180

180 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 6R0120 DS180 (163 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	180	180	180	180	180	180	180
kVA	180	180	225	225	225	225	225
Amps	750	750	625	541	342	271	217
skVA@30%							
Voltage Dip	268	366	433	433	362	451	375
Generator							
Model	432CSL6210	432PSL6228	431CSL6206	431CSL6206	431CSL6206	431CSL6204	431PSL6242
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM926LA Diesel Engine
- 7.2 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional Permanent
- Magnet Generator (PMG) // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	130 °C Max. Standby Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM926LA
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	7.2 (439)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	247 (331)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	29 (7.7)
Engine Jacket Water Capacity: L (gal)	10 (2.6)
System Coolant Capacity: L (gal)	24.1 (6.4)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.6 (8.5)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	330.5 (87.3)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	50 (13.2)
At 75% of Power Rating: L/hr (gal/hr)	36 (9.5)
At 50% of Power Rating: L/hr (gal/hr)	23.9 (6.3)

* Based on 431CSL6204 480 Volt generator set

// Cooling - Radiator System

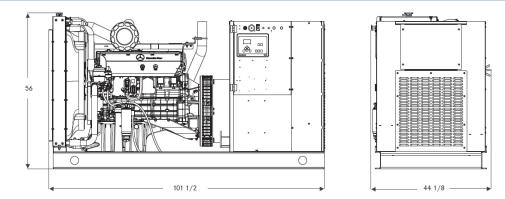
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	143 (37)
Heat Rejection to Coolant: kW (BTUM)	88.8 (5,430)
Heat Rejection to Air to Air: kW (BTUM)	54 (3,071)
Heat Radiated to Ambient: kW (BTUM)	38.3 (2,178)
Fan Power: kW (hp)	15.6 (22.1)

// Air Requirements

Aspirating: *m³/min (SCFM)	14.3 (505)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	408 (14,408)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	139.9 (4,941)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	491 (916)
Gas Volume at Stack	
Temp: m³/min (CFM)	43 (1,519)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	10.5 (42)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA



Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
3.93	1.2	0.06

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R0113 DS200

200 kWe / 60 Hz / Standby 208 - 600V



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	200	200	200	200	200	200
kVA	200	200	250	250	250	250
Amps	833	833	694	601	301	241
skVA@30%						
Voltage Dip	265	370	433	433	577	510
Generator Model	432CSL6210	432PSL6228	431CSL6206	431CSL6206	431CSL6206	431PSL6243
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6068HFG85 Diesel Engine
- 6.8 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension & S/O Valve	130 °C Maximum Standby Temperature Rise	
Full Flow Oil Filter	1 Bearing, Sealed	
Fuel Filter with Water Separator	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostat	125% Rotor Balancing	
Blower Fan & Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	100% of Rated Load - One Step	
Electric Starting Motor - 12V	5% Maximum Total Harmonic Distortion	
Governor – Electronic Isochronous		
Base - Formed Steel	<pre>// Digital Control Panel(s)</pre>	
SAE Flywheel & Bell Housing		
Charging Alternator - 12V	Digital Metering	
Battery Box & Cables	Engine Parameters	
Flexible Fuel Connectors	Generator Protection Functions	
Flexible Exhaust Connection	Engine Protection	
EPA Certified Engine	SAE J1939 Engine ECU Communications	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load Regulation

Digital Metering Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	John Deere
Model	6068HFG85
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	6.8 (415)
Bore: cm (in)	10.6 (4.2)
Stroke: cm (in)	12.7 (5)
Compression Ratio	17:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	235 (315)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	32.2 (8.5)
Engine Jacket Water Capacity: L (gal)	11.9 (3.3)
System Coolant Capacity: L (gal)	29.3 (7.75)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	93 (24.5)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	58.6 (15.5)
At 75% of Power Rating: L/hr (gal/hr)	42.9 (11.3)
At 50% of Power Rating: L/hr (gal/hr)	30 (7.9)

// Cooling - Radiator System

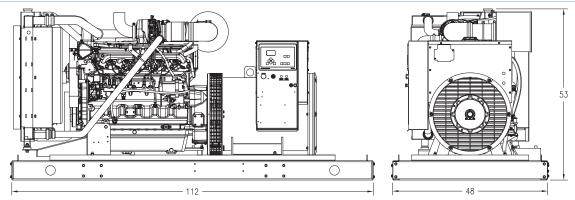
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	265 (70)
Heat Rejection to Coolant: kW (BTUM)	94.9 (5,404)
Heat Rejection to Air to Air: kW (BTUM)	57 (3,264)
Heat Radiated to Ambient: kW (BTUM)	30 (1,703)
Fan Power: kW (hp)	8.6 (11.5)
	•••••••••••••••••••••••••••••••••••••••

// Air Requirements

Aspirating: *m ³ /min (SCFM)	17.5 (619)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	412 (14,537)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	109 (3,842)
	109 (3,842)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	485 (905)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	42.9 (1,514)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	10 (40)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (less tank)
Open Power Unit (OPU)	2,845 x 1,219 x 1,346 mm (112 x 48 x 53 in)	1,573-2,262 kg (3,469-4,986 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	87.2
· · · · · · · · · · · · · · · · · · ·	

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

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C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R0120 DS200

200 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 6R0120 DS200 (180 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	200	200	200	200	200	200	200
kVA	200	200	250	250	250	250	250
Amps	833	833	694	601	380	301	241
skVA@30%							
Voltage Dip	268	366	433	433	373	577	512
Generator							
Model	432CSL6210	432PSL6228	431CSL6206	431CSL6206	431CSL6208	431CSL6206	431PSL6243
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions - EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM926LA Diesel Engine
- 7.2 Liter Displacement
- 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter
Oil Pump	4 Pole, Rotating Field
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise
Full Flow Oil Filter	1 Bearing, Sealed
Fuel Filter with Water Separator	Flexible Coupling
Jacket Water Pump	Full Amortisseur Windings
Thermostat	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	100% of Rated Load - One Step
Electric Starting Motor - 12V	5% Max. Total Harmonic Distortion
Governor – Electronic Isochronous	
Base - Formed Steel	<pre>// Digital Control Panel(s)</pre>
SAE Flywheel and Bell Housing	
Charging Alternator - 12V	Digital Metering
Battery Box and Cables	Engine Parameters
Flexible Fuel Connectors	Generator Protection Functions
Flexible Exhaust Connection	Engine Protection
EPA Certified Engine	SAE J1939 Engine ECU Communications

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise		
and motor starting		
Self-Ventilated and Drip-Proof		
Superior Voltage Waveform		
Solid State, Volts-per-Hertz Regulator		
±1% Voltage Regulation No Load to Full Load Regulation		

Digital Metering
Engine Parameters
Generator Protection Functions
Engine Protection
SAE J1939 Engine ECU Communications
Windows [®] -Based Software
Multilingual Capability
Remote Communications to RDP-110 Remote Annunciator
Programmable Input and Output Contacts
UL Recognized, CSA Certified, CE Approved
Event Recording
IP 54 Front Panel Rating with Integrated Gasket
NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM926LA
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	7.2 (439)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	247 (331)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	29 (7.7)
Engine Jacket Water Capacity: L (gal)	10 (2.6)
System Coolant Capacity: L (gal)	24.1 (6.4)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.6 (8.5)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	330.5 (87.3)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	55.3 (14.6)
At 75% of Power Rating: L/hr (gal/hr)	40.5 (10.7)
At 50% of Power Rating: L/hr (gal/hr)	26.5 (7)

* Based on 431CSL6206 480 Volt generator set

// Cooling - Radiator System

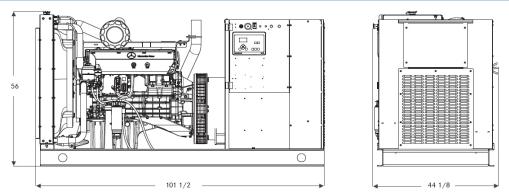
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	143 (37)
Heat Rejection to Coolant: kW (BTUM)	95.5 (5,431)
Heat Rejection to Air to Air: kW (BTUM)	55.3 (3,145)
Heat Radiated to Ambient: kW (BTUM)	40.8 (2,322)
Fan Power: kW (hp)	15.6 (22.1)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	14.8 (523)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	408 (14,408)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	149.2 (5,269)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	520 (968)
Gas Volume at Stack	
Temp: m³/min (CFM)	44.8 (1,582)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	10.5 (42)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	88.9
Sound data is provided at 7 m (23 ft). Generator set tes	ted in accordance with ISO 8528-10 and wit

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
3.93	1.2	0.06

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R1600 DS230

230 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 6R1600 DS230 (210 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V*	208V*	240V*	380V	440V	480V*	600V*
Phase	1	3	3	3	3	3	3
PF	1.0	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	230	230	230	230	230	230	230
kVA	230	287	287	287	287	287	287
Amps	958	798	692	437	377	346	277
skVA@30%							
Voltage Dip	430	608	608	430	580	605	510
Generator							
Model	432CSL6216	432CSL6210	432CSL6210	432CSL6210	432CSL6210	431CSL6208	431PSL6243
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	DOUBLE DELTA	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6R1600 Diesel Engine
 - 10.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter
Oil Pump	4 Pole, Rotating Field
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise
Full Flow Oil Filters	1 Bearing, Sealed
Closed Crankcase Ventilation	Flexible Coupling
Jacket Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±1% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Formed Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	
Flexible Fuel Connectors	Digital Metering
Flexible Exhaust Connection	Engine Parameters
EPA Certified Engine	Generator Protection Functions

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Rei
and motor starting	Pro
Sustained short circuit current of up to 300% of the rated current for	UL
up to 10 seconds	Eve
Self-Ventilated and Drip-Proof	IP (
Superior Voltage Waveform	NF
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	6R1600G70S
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (Cu In)	10.5 (641)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	ECU 8
Max. Power: kWm (bhp)	312 (418)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	45 (11.9)
System Coolant Capacity: L (gal)	82 (21.7)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	198 (60.4)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	66 (17.5)
At 75% of Power Rating: L/hr (gal/hr)	54 (14.2)
At 50% of Power Rating: L/hr (gal/hr)	39 (10.2)

// Cooling - Radiator System

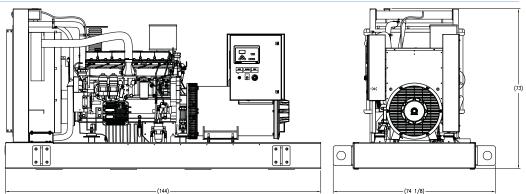
50 (122)
0.2 (0.8)
277 (73.1)
143 (8,132)
84 (4,777)
27.5 (1,564)
17.8 (23.9)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	30 (1,059)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	396 (13,985)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	99.9 (3,527)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	430 (806)
Gas Volume at Stack	100 (000)
Temp: m³/min (CFM)	72 (2,542)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry/less tank)
Open Power Unit (OPU)	3,658 x 1,883 x 1,855 mm (144 x 74.13 x 73 in)	3,134-3,953 kg (6,908-8,715 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	86.3

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM	
3.54	0.45	0.04	

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R1600 DS250

250 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 6R1600 DS250 (230 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	250	250	250	250	250	250
kVA	312	312	312	312	312	312
Amps	867	752	475	410	376	301
skVA@30%						
Voltage Dip	608	608	430	580	809	720
Generator Model	432CSL6210	432CSL6210	432CSL6210	432CSL6210	432CSL6210	432PSL6246
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6R1600 Diesel Engine
 - 10.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter
Oil Pump	4 Pole, Rotating Field
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise
Full Flow Oil Filters	1 Bearing, Sealed
Closed Crankcase Ventilation	Flexible Coupling
Jacket Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±1% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Formed Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	
Flexible Fuel Connectors	Digital Metering
Flexible Exhaust Connection	Engine Parameters
EPA Certified Engine	Generator Protection Functions

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Rer
and motor starting	Pro
Sustained short circuit current of up to 300% of the rated current for	UL
up to 10 seconds	Eve
Self-Ventilated and Drip-Proof	IP 5
Superior Voltage Waveform	NF
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	6R1600G70S
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (Cu In)	10.5 (641)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	ECU 8
Max. Power: kWm (bhp)	312 (418)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	45 (11.9)
System Coolant Capacity: L (gal)	82 (21.7)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	198 (60.4)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	70 (18.5)
At 75% of Power Rating: L/hr (gal/hr)	57 (15.2)
At 50% of Power Rating: L/hr (gal/hr)	42 (11)

// Cooling - Radiator System

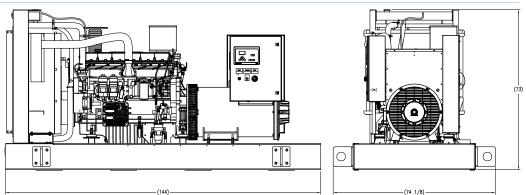
50 (122)
0.2 (0.8)
277 (73.1)
143 (8,132)
84 (4,777)
30.2 (1,717)
17.8 (23.9)

// Air Requirements

Aspirating: *m³/min (SCFM)	30 (1,059)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	396 (13,985)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	109.7 (3,873)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	430 (806)
Gas Volume at Stack	
Temp: m³/min (CFM)	72 (2,542)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	86.6

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
3.54	0.45	0.04

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite EnergyDistributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R1600 DS275

275 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 6R1600 DS275 (250 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	275	275	275	275	275	275
kVA	343	343	343	343	343	343
Amps	954	827	522	451	413	331
skVA@30%						
Voltage Dip	930	930	640	860	809	720
Generator Model	433CSL6216	433CSL6216	433CSL6216	433CSL6216	432CSL6210	432PSL6246
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6R1600 Diesel Engine
 - 10.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise	
Full Flow Oil Filters	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±1% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	
Flexible Exhaust Connection	Engine Parameters	
EPA Certified Engine	Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Rei
and motor starting	Pro
Sustained short circuit current of up to 300% of the rated current for	UL
up to 10 seconds	Eve
Self-Ventilated and Drip-Proof	IP :
Superior Voltage Waveform	NF
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	6R1600G70S
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (Cu In)	10.5 (641)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	ECU 8
Max. Power: kWm (bhp)	312 (418)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	45 (11.9)
System Coolant Capacity: L (gal)	82 (21.7)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	198 (60.4)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	74 (19.7)
At 75% of Power Rating: L/hr (gal/hr)	60 (15.9)
At 50% of Power Rating: L/hr (gal/hr)	46 (12.2)

// Cooling - Radiator System

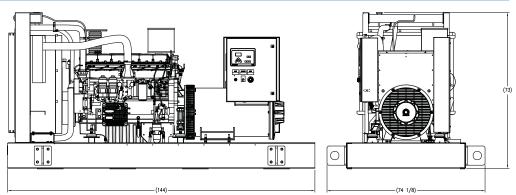
50 (122)
0.2 (0.8)
277 (73.1)
143 (8,132)
84 (4,777)
34.1 (1,939)
17.8 (23.9)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	30 (1,059.4)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	396 (13,985)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	123.8 (4,374)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	430 (806)
Gas Volume at Stack	
Temp: m³/min (CFM)	72 (2,542.7)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	86.9

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R1600 DS300

300 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 6R1600 DS300 (275 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	300	300	300	300	300	300
kVA	375	375	375	375	375	375
Amps	1041	902	570	492	451	361
skVA@30%						
Voltage Dip	930	930	640	860	820	720
Generator Model	433CSL6216	433CSL6216	433CSL6216	433CSL6216	432CSL6212	432PSL6246
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6R1600 Diesel Engine
 - 10.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter		
Oil Pump	4 Pole, Rotating Field		
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise		
Full Flow Oil Filters	1 Bearing, Sealed		
Closed Crankcase Ventilation	Flexible Coupling		
Jacket Water Pump	Full Amortisseur Windings		
Thermostats	125% Rotor Balancing		
Blower Fan and Fan Drive	3-Phase Voltage Sensing		
Radiator - Unit Mounted	±1% Voltage Regulation		
Electric Starting Motor - 24V	100% of Rated Load - One Step		
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion		
Base - Formed Steel			
SAE Flywheel and Bell Housing			
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>		
Battery Box and Cables			
Flexible Fuel Connectors	Digital Metering		
Flexible Exhaust Connection	Engine Parameters		
EPA Certified Engine	Generator Protection Functions		

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Rei
and motor starting	Pro
Sustained short circuit current of up to 300% of the rated current for	UL
up to 10 seconds	Eve
Self-Ventilated and Drip-Proof	IP :
Superior Voltage Waveform	NF
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	6R1600G80S
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (Cu In)	10.5 (641)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	ECU 8
Max. Power: kWm (bhp)	343 (460)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	45 (11.9)
System Coolant Capacity: L (gal)	82 (21.7)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	198 (60.4)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	82 (21.6)
At 75% of Power Rating: L/hr (gal/hr)	66 (17.5)
At 50% of Power Rating: L/hr (gal/hr)	51 (15.4)

// Cooling - Radiator System

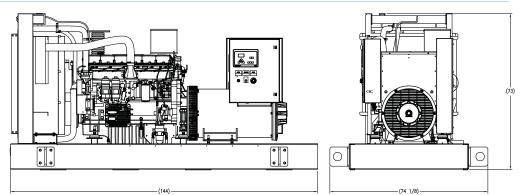
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.2 (0.8)
Water Pump Capacity: L/min (gpm)	277 (73.1)
Heat Rejection to Coolant: kW (BTUM)	154 (8,758)
Heat Rejection to After Cooler: kW (BTUM)	90 (5,118)
Heat Radiated to Ambient: kW (BTUM)	36.9 (2,099)
Fan Power: kW (hp)	17.8 (23.9)
	•••••••••••••••••••••••••••••••••••••••

// Air Requirements

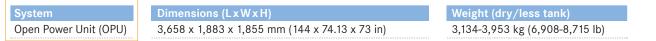
30 (1,059.4)
396 (13,985)
134 (4,733)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	440 (824)
Gas Volume at Stack	
Temp: m³/min (CFM)	72 (2,542.7)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	87.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM	
4.14	0.52	0.04	

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 8V1600 DS350

350 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 8V1600 DS350 (325 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	350	350	350	350	350	350
kVA	438	438	438	438	438	438
Amps	1214	1052	665	574	526	421
skVA@30%						
Voltage Dip	930	930	635	850	1238	1100
Generator Model	433CSL6216	433CSL6216	433CSL6216	433CSL6216	433CSL6216	433PSL6248
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 8V1600 Diesel Engine
 - 14.0 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Permanent Magnet Generator (PMG)
 - PMG Standard for 570 frame and larger
 - PMG Optional for 430 frame and smaller
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise	
Full Flow Oil Filters	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation (570 frame)	
Electric Starting Motor - 24V	±1% Voltage Regulation (430 frame)	
Governor – Electronic Isochronous	100% of Rated Load - One Step	
Base - Formed Steel	5% Max. Total Harmonic Distortion	
SAE Flywheel and Bell Housing		
Charging Alternator - 24V		
Battery Box and Cables	// Digital Control Panel(s)	
Flexible Fuel Connectors		
Flexible Exhaust Connection	Digital Metering	

// Generator

EPA Certified Engine

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Ν
and motor starting	F
Sustained short circuit current of up to 300% of the rated current for	F
up to 10 seconds	ί
Self-Ventilated	E
Superior Voltage Waveform	I
Digital, Solid State, Volts-per-Hertz Regulator	Ν
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	8V1600G70S
Туре	4-Cycle
Arrangement	8-V
Displacement: L (Cu In)	14 (854)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	408 (547)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	50 (13.2)
System Coolant Capacity: L (gal)	80.3 (21.2)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	402 (106)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	100 (26.5)
At 75% of Power Rating: L/hr (gal/hr)	82 (21.7)
At 50% of Power Rating: L/hr (gal/hr)	62 (16.3)

// Cooling - Radiator System

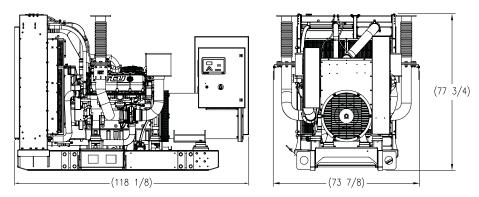
(122)
2 (0.8)
2 (95)
1,658)
5,824)
2,519)
(22.9)
1

// Air Requirements

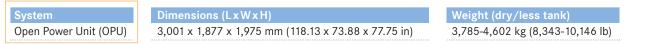
Aspirating: *m³/min (SCFM)	34.8 (1,229)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	510 (18,010)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	160.9 (5,682)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	450 (842)
Gas Volume at Stack	
Temp: m³/min (CFM)	81 (2,860)
Max. Allowable Back Pressure: kPa (in. H ₂ 0)	15 (61)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	88.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
4.06	0.52	0.05

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO-3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 8V1600 DS400

400 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 8V1600 DS400 (365 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	400	400	400	400	400	400
kVA	500	500	500	500	500	500
Amps	1388	1203	760	656	601	481
skVA@30%						
Voltage Dip	800	820	640	920	1277	1100
Generator Model	572RSL4025	572RSL4025	572RSL4025	433CSL6220	433CSL6220	433PSL6248
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 8V1600 Diesel Engine
 - 14.0 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Permanent Magnet Generator (PMG)
 - PMG Standard for 570 frame and larger
 - PMG Optional for 430 frame and smaller
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter
Oil Pump	4 Pole, Rotating Field
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise
Full Flow Oil Filters	1 Bearing, Sealed
Closed Crankcase Ventilation	Flexible Coupling
Jacket Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation (570 frame)
Electric Starting Motor - 24V	±1% Voltage Regulation (430 frame)
Governor – Electronic Isochronous	100% of Rated Load - One Step
Base - Formed Steel	5% Max. Total Harmonic Distortion
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	
Battery Box and Cables	<pre>// Digital Control Panel(s)</pre>
Flexible Fuel Connectors	
Flexible Exhaust Connection	Digital Metering

// Generator

EPA Certified Engine

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Mu
and motor starting	Re
Sustained short circuit current of up to 300% of the rated current for	Pr
up to 10 seconds	UL
Self-Ventilated	Ev
Superior Voltage Waveform	IP
Digital, Solid State, Volts-per-Hertz Regulator	NF
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	8V1600G80S
Туре	4-Cycle
Arrangement	8-V
Displacement: L (Cu In)	14 (854)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	448 (601)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	50 (13.2)
System Coolant Capacity: L (gal)	80.3 (21.2)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	402 (106)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	109 (28.8)
At 75% of Power Rating: L/hr (gal/hr)	88 (23.4)
At 50% of Power Rating: L/hr (gal/hr)	68 (18)

// Cooling - Radiator System

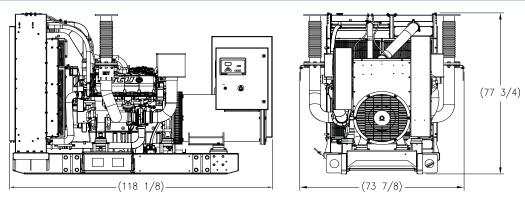
50 (122)
0.2 (0.8)
362 (95)
205 (11,658)
120 (6,824)
48.1 (2,735)
17.1 (22.9)

// Air Requirements

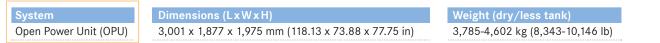
Aspirating: *m ³ /min (SCFM)	36 (1,271)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	510 (18,010)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	174.7 (6,169)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	466 (871)
Gas Volume at Stack	
Temp: m³/min (CFM)	85.2 (3,008)
Max. Allowable Back Pressure: kPa (in. H ₂ 0)	15 (61)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	88.6

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO-3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 10V1600 DS450

450 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 10V1600 DS450 (400 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	450	450	450	450	450	450
kVA	563	563	563	563	563	563
Amps	1561	1353	855	738	677	541
skVA@30%						
Voltage Dip	900	900	850	900	1090	1040
Generator Model	572RSL4027	572RSL4027	572RSL4029	572RSL4025	572RSL4025	572RSS4270
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality, and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 10V1600 Diesel Engine
 - 17.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - PMG (Permanent Magnet Generator) supply to regulator
 - 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise	
Full Flow Oil Filters	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V // Digital Control Panel(s)		
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	
Flexible Exhaust Connection	Engine Parameters	
EPA Certified Engine	Generator Protection Functions	
-		

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Re
and motor starting	Pr
Sustained short circuit current of up to 300% of the rated current for	UL
up to 10 seconds	Εv
Self-Ventilated	IP
Superior Voltage Waveform	N
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	10V1600G70S
Туре	4-Cycle
Arrangement	10-V
Displacement: L (Cu In)	17.5 (1,068)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	511 (685)
Speed Regulation	±0.25%
Air Cleaner	Dry
•••••••••••••••••••••••••••••••••••••••	

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	61 (16)
Engine Jacket Water Capacity: L (gal)	60 (15.9)
System Coolant Capacity: L (gal)	99.3 (26.2)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	401.3 (106)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	112 (29.6)
At 75% of Power Rating: L/hr (gal/hr)	90 (23.7)
At 50% of Power Rating: L/hr (gal/hr)	65 (17.2)

// Cooling - Radiator System

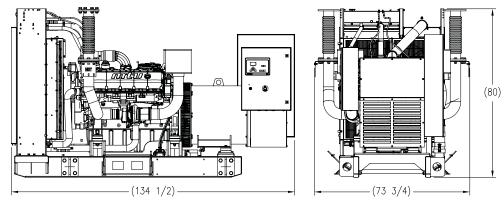
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.2 (0.8)
Water Pump Capacity: L/min (gpm)	466 (123)
Heat Rejection to Coolant: kW (BTUM)	235 (13,364)
Heat Rejection to After Cooler: kW (BTUM)	118 (6,710)
Heat Radiated to Ambient: kW (BTUM)	58.6 (3,332)
Fan Power: kW (hp)	17.1 (22.9)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	35 (1,250)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	642 (22,672)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	213 (7,516)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	461 (862)
Gas Volume at Stack	
Temp: m³/min (CFM)	103 (3,623)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	93.4

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM	
3.31	0.37	0.03	

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO-3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 10V1600 DS500

500 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 10V1600 DS500 (450 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	500	500	500	500	500	500
kVA	625	625	625	625	625	625
Amps	1735	1504	950	820	752	601
skVA@30%						
Voltage Dip	1040	1040	980	1040	1290	1040
Generator Model	572RSL4029	572RSL4029	573RSL4033	572RSL4027	572RSL4027	572RSS4270
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 10V1600 Diesel Engine
 - 17.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - PMG (Permanent Magnet Generator) supply to regulator
 - 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter
Oil Pump	4 Pole, Rotating Field
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise
Full Flow Oil Filters	1 Bearing, Sealed
Closed Crankcase Ventilation	Flexible Coupling
Jacket Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Formed Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	
Flexible Fuel Connectors	Digital Metering
Flexible Exhaust Connection	Engine Parameters
EPA Certified Engine	Generator Protection Functions
-	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	F
and motor starting	F
Sustained short circuit current of up to 300% of the rated current for	l
up to 10 seconds	E
Self-Ventilated	Ī
Superior Voltage Waveform	N
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability e rise Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts for UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	10V1600G80S
Туре	4-Cycle
Arrangement	10-V
Displacement: L (Cu In)	17.5 (1,068)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	561 (752)
Speed Regulation	±0.25%
Air Cleaner	Dry
•••••••••••••••••••••••••••••••••••••••	

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	61 (16)
Engine Jacket Water Capacity: L (gal)	60 (15.9)
System Coolant Capacity: L (gal)	99.3 (26.2)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	401.3 (106)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	125 (33.1)
At 75% of Power Rating: L/hr (gal/hr)	97 (25.6)
At 50% of Power Rating: L/hr (gal/hr)	74 (19.5)

// Cooling - Radiator System

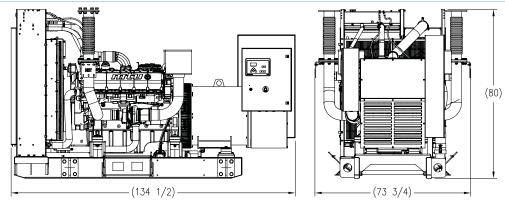
0.2 (0.8)
66 (123)
(13,364)
8 (6,710)
5 (3,332)
7.1 (22.9)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	35 (1,250)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	642 (22,672)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	213 (7,516)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	461 (862)
Gas Volume at Stack	
Temp: m³/min (CFM)	103 (3,623)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry/less tank)
Open Power Unit (OPU)	3,416 x 1,873 x 2,032 mm (134.5 x 73.75 x 80 in)	4,175-5,129 kg (9,205-11,308 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	93.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
6.9	0.45	0.03

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO-3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 12V1600 DS550

550 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 12V1600 DS550 (500 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	550	550	550	550	550	550
kVA	687	687	687	687	687	687
Amps	1908	1654	1045	902	827	662
skVA@30%						
Voltage Dip	1200	1200	1230	1750	1450	1430
Generator Model	573RSL4033	573RSL4033	573RSL4033	573RSL4033	572RSL4031	572RSS4272
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V1600 Diesel Engine
 - 21.0 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise	
Full Flow Oil Filters	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	
Flexible Exhaust Connection	Engine Parameters	
EPA Certified Engine	Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	R
and motor starting	P
Sustained short circuit current of up to 300% of the rated current for	U
up to 10 seconds	E١
Self-Ventilated and Drip-Proof	IF
Superior Voltage Waveform	Ν
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V1600G70S
Туре	4-Cycle
Arrangement	12-V
Displacement: L (Cu In)	21 (1,281)
Bore: cm (in)	12 (4.72)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	613 (822)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	73 (19.3)
Engine Jacket Water Capacity: L (gal)	65 (17.2)
System Coolant Capacity: L (gal)	106 (28.1)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel Diesel	
Total Fuel Flow: L/hr (gal/hr)	402 (106.2)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	140.4 (37.1)
At 75% of Power Rating: L/hr (gal/hr)	106 (28)
At 50% of Power Rating: L/hr (gal/hr)	75.3 (19.9)

// Cooling - Radiator System

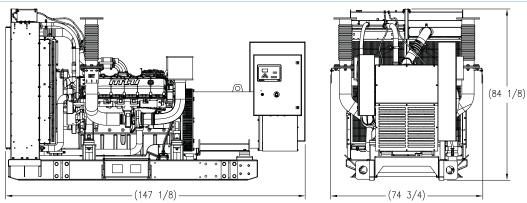
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.2 (0.8)
Water Pump Capacity: L/min (gpm)	517 (137)
Heat Rejection to Coolant: kW (BTUM)	242 (13,762)
Heat Rejection to After Cooler: kW (BTUM)	150 (8,530)
Heat Radiated to Ambient: kW (BTUM)	62.2 (3,537)
Fan Power: kW (hp)	23.1 (31)
	20.1 (01)

// Air Requirements

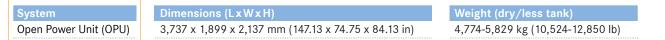
Aspirating: *m³/min (SCFM)	52 (1,844)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	756 (26,700)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	226 (7,977)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	413 (775)
Gas Volume at Stack	
Temp: m³/min (CFM)	126 (4,450)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	91.9

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 12V1600 DS600

600 kWe / 60 Hz / Standby 208 - 600V

Reference MTU 12V1600 DS600 (550 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	600	600	600	600	600	600
kVA	750	750	750	750	750	750
Amps	2082	1804	1140	984	902	722
skVA@30%						
Voltage Dip	1200	1200	1200	1400	1430	1430
Generator Model	573RSL4033	573RSL4033	573RSL4035	573RSL4033	572RSL4031	572RSS4272
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V1600 Diesel Engine
 - 21.0 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	130 °C Max. Standby Temperature Rise	
Full Flow Oil Filters	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	
Flexible Exhaust Connection	Engine Parameters	
EPA Certified Engine	Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Rei
and motor starting	Pro
Sustained short circuit current of up to 300% of the rated current for	UL
up to 10 seconds	Eve
Self-Ventilated and Drip-Proof	IP :
Superior Voltage Waveform	NF
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V1600G80S
Туре	4-Cycle
Arrangement	12-V
Displacement: L (Cu In)	21 (1,281)
Bore: cm (in)	12 (4.72)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	668 (896)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	73 (19.3)
Engine Jacket Water Capacity: L (gal)	65 (17.2)
System Coolant Capacity: L (gal)	106 (28.1)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	402 (106.2)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	151.4 (40)
At 75% of Power Rating: L/hr (gal/hr)	114.3 (30.2)
At 50% of Power Rating: L/hr (gal/hr)	80.2 (21.2)

// Cooling - Radiator System

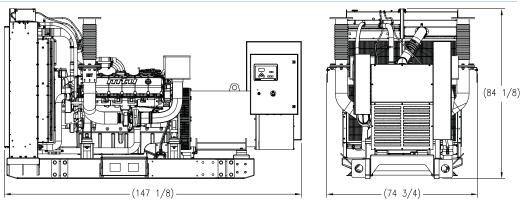
50 (122)
0.2 (0.8)
517 (137)
270 (15,354)
170 (9,667)
67.1 (3,816)
23.1 (31)

// Air Requirements

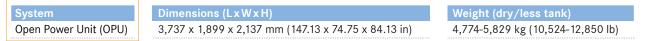
54 (1,907)
756 (26,700)
244 (8,606)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	425 (797)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	132 (4,662)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	91.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 12V2000 DS650

650 kWe / 60 Hz / Standby 208 - 4160V

Reference MTU 12V2000 DS650 (615 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V**	240V**	380V	480V**	600V**	4160V
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	650	650	650	650	650	650
kVA	812	812	812	812	812	812
Amps	2255	1954	1234	977	781	112
skVA@30%						
Voltage Dip	1750	1750	1600	1750	1350	1850
Generator Model*	573RSL4033	573RSL4033	574RSL4037	573RSL4033	573RSS4274	574FSM4358
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	12 LEAD HI WYE	4 LEAD WYE	6 LEAD WYE

 * Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA – Optional

- UL 2200 Listed

- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 2000 Diesel Engine
 - 23.9 Liter Displacement
 - Electronic Unit Pump Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension & S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	130 °C Maximum Standby Temperature Rise
Closed Crankcase Ventilation	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan & Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel & Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box & Cables	
Flexible Fuel Connectors	Digital Metering

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature	re rise
and motor starting	
Sustained short circuit current of up to 300% of the rated curren	t for
up to 10 seconds	
Self-Ventilated and Drip-Proof	
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	12V 2000 G45 TB
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	23.9 (1,457)
Bore: cm (in)	13 (5.1)
Stroke: cm (in)	15 (5.9)
Compression Ratio	16:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Maximum Power: kWm (bhp)	780 (1,046)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	77 (20.3)
Engine Jacket Water Capacity: L (gal)	110 (29.1)
After Cooler Water Capacity: L (gal)	20 (5.3)
System Coolant Capacity: L (gal)	274 (72.4)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	3/4" NPT
Fuel Return Connection Size	1/4" NPT
Maximum Fuel Lift: m (ft)	3 (10)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	480 (127)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	192.7 (50.9)
At 75% of Power Rating: L/hr (gal/hr)	145 (38.3)
At 50% of Power Rating: L/hr (gal/hr)	98.4 (26)

// Cooling - Radiator System

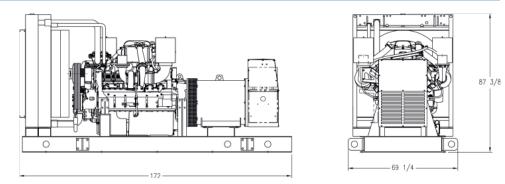
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	833 (220)
After Cooler Pump Capacity: L/min (gpm)	257 (68)
Heat Rejection to Coolant: kW (BTUM)	270 (15,354)
Heat Rejection to After Cooler: kW (BTUM)	235 (13,364)
Heat Radiated to Ambient: kW (BTUM)	76.4 (4,345)
Fan Power: kW (hp)	37.9 (50.8)

// Air Requirements

Aspirating: *m³/min (SCFM)	63 (2,225)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	784 (27,687)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	277 (9,798)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	550 (1,022)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	159 (5,615)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	92

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
4.45	0.37	0.02

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 12V2000 DS750

750 kWe / 60 Hz / Standby 208 - 4160V

Reference MTU 12V2000 DS750 (680 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V**	240V**	380V	480V**	600V**	4160V
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	750	750	750	750	750	750
kVA	937	937	937	937	937	937
Amps	2602	2255	1424	1127	902	130
skVA@30%						
Voltage Dip	2600	2600	1850	2120	3050	1850
Generator Model*	574RSL4037	574RSL4037	575RSL4044	573RSL4035	574RSS4278	574FSM4358
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD LOW WYE	12 LEAD HI DELTA	4 BAR WYE	12 LEAD HI WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA - Optional

- UL 2200 Listed

- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 2000 Diesel Engine
 - 23.9 Liter Displacement
 - Electronic Unit Pump Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension & S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	130 °C Maximum Standby Temperature Rise	
Closed Crankcase Ventilation	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan & Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion	
Base - Structural Steel		
SAE Flywheel & Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box & Cables		
Flexible Fuel Connectors	Digital Metering	

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Re
and motor starting	Pr
Sustained short circuit current of up to 300% of the rated current for	U
up to 10 seconds	E١
Self-Ventilated and Drip-Proof	IP
Superior Voltage Waveform	Ν
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V 2000 G85 TB
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	23.9 (1,457)
Bore: cm (in)	13 (5.1)
Stroke: cm (in)	15 (5.9)
Compression Ratio	16:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Maximum Power: kWm (bhp)	890 (1,194)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	77 (20.3)
Engine Jacket Water Capacity: L (gal)	110 (29.1)
After Cooler Water Capacity: L (gal)	20 (5.3)
System Coolant Capacity: L (gal)	274 (72.4)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	3/4" NPT
Fuel Return Connection Size	1/4" NPT
Maximum Fuel Lift: m (ft)	3 (10)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	480.7 (127)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	218.8 (57.8)
At 75% of Power Rating: L/hr (gal/hr)	164.6 (43.5)
At 50% of Power Rating: L/hr (gal/hr)	111.3 (29.4)

// Cooling - Radiator System

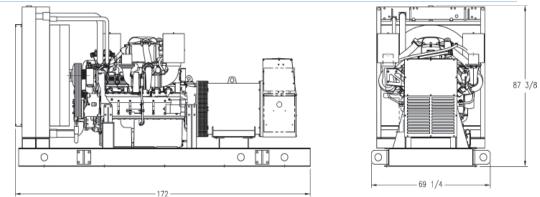
Ambient Capacity of Radiator: °C (°F)	40 (104)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	833 (220)
After Cooler Pump Capacity: L/min (gpm)	257 (68)
Heat Rejection to Coolant: kW (BTUM)	315 (17,913)
Heat Rejection to After Cooler: kW (BTUM)	270 (15,354)
Heat Radiated to Ambient: kW (BTUM)	84.5 (4,805)
Fan Power: kW (hp)	38 (50.9)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	66 (2,331)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	828 (29,248)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	307 (10,840)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	580 (1,076)
Gas Volume at Stack	
Temp: m³/min (CFM)	174 (6,145)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (less tank)
Open Power Unit (OPU)	4,369 x 1,759 x 2,219 mm (172 x 69.3 x 87.4 in)	5,592 kg (12,328 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	92

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 12V2000 DS800

800 kWe / 60 Hz / Standby 208 - 4160V

Reference MTU 12V2000 DS800 (725 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V**	240V**	380V	480V**	600V**	4160V
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	800	800	800	800	800	800
kVA	1000	1000	1000	1000	1000	1000
Amps	2776	2406	1519	1203	962	139
skVA@30%						
Voltage Dip	1800	1800	1850	2500	2825	2600
Generator Model*	741RSL4045	741RSL4045	575RSL4044	574RSL4038	574RSS4280	742FSM4364
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD LOW WYE	12 LEAD HI DELTA	4 BAR WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions - EPA Tier 2 Certified

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA - Optional

- UL 2200 Listed

- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 2000 Diesel Engine
 - 23.9 Liter Displacement
 - Electronic Unit Pump Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension & S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	130 °C Maximum Standby Temperature Rise
Closed Crankcase Ventilation	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan & Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel & Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box & Cables	
Flexible Fuel Connectors	Digital Metering

// Generator

EPA Certified Engine

Flexible Exhaust Connection

	0 1 ,
NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Remote Communicatio
and motor starting	Programmable Input ar
Sustained short circuit current of up to 300% of the rated current for	UL Recognized, CSA C
up to 10 seconds	Event Recording
Self-Ventilated and Drip-Proof	IP 54 Front Panel Ratin
Superior Voltage Waveform	NFPA110 Compatible
Digital, Solid State, Volts-per-Hertz Regulator	

Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket

// Engine

Manufacturer	MTU
Model	12V 2000 G85 TB
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	23.9 (1,457)
Bore: cm (in)	13 (5.1)
Stroke: cm (in)	15 (5.9)
Compression Ratio	16:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Maximum Power: kWm (bhp)	890 (1,194)
Speed Regulation	±0.25%
Air Cleaner	Dry
•••••••••••••••••••••••••••••••••••••••	

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	77 (20.3)
Engine Jacket Water Capacity: L (gal)	110 (29.1)
After Cooler Water Capacity: L (gal)	20 (5.3)
System Coolant Capacity: L (gal)	316 (83.5)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#12 JIC 37° Female
	3/4" NPT Adapter Provided
Fuel Return Connection Size	#4 JIC 37° Female
	1/4" NPT Adapter Provided
Maximum Fuel Lift: m (ft)	3 (10)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	480.7 (127)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	218.8 (57.8)
At 75% of Power Rating: L/hr (gal/hr)	164.6 (43.5)
At 50% of Power Rating: L/hr (gal/hr)	111.3 (29.4)

// Cooling - Radiator System

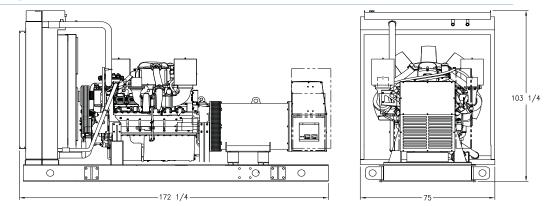
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	833 (220)
After Cooler Pump Capacity: L/min (gpm)	257 (68)
Heat Rejection to Coolant: kW (BTUM)	315 (17,913)
Heat Rejection to After Cooler: kW (BTUM)	270 (15,354)
Heat Radiated to Ambient: kW (BTUM)	84.5 (4,805)
Fan Power: kW (hp)	38 (51)

// Air Requirements

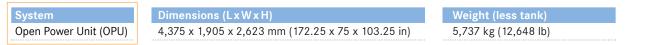
Aspirating: *m ³ /min (SCFM)	66 (2,331)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	1,164 (41,090)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	307 (10,840)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	580 (1,076)
Gas Volume at Stack	
Temp: m³/min (CFM)	174 (6,145)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	88.9

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

0

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 16V2000 DS 1000

1000 kWe / 60 Hz / Standby 208 - 4160V

Reference MTU 16V2000 DS1000 (900 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	208V**	240V**	380V**	480V**	600V**	4160V
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	1000	1000	1000	1000	1000	1000
kVA	1250	1250	1250	1250	1250	1250
Amps	3470	3007	1899	1504	1203	173
skVA@30%						
Voltage Dip	2475	2475	2310	2830	3625	2270
Generator Model*	LSA 50.2 M6	LSA 50.2 M6	LSA 50.2 S4	LSA 49.1 L11	LSA 50.2 M6	LS 50.2 VL7
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 16V 2000 Diesel Engine
 - 35.7 Liter Displacement
 - Electronic Unit Pump Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- AREP supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension & S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	130 °C Maximum Standby Temperature Rise	
Closed Crankcase Ventilation	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan & Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion	
Base - Structural Steel		
SAE Flywheel & Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Rack & Cables		
Flexible Fuel Connectors	Digital Metering	

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperatur	e rise
and motor starting	
Sustained short circuit current of up to 300% of the rated current	for
up to 10 seconds	
Self-Ventilated and Drip-Proof	
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	16V 2000 G86S
Туре	4-Cycle
Arrangement	16-V
Displacement: L (in ³)	35.7 (2,179)
Bore: cm (in)	13.5 (5.3)
Stroke: cm (in)	15.6 (6.1)
Compression Ratio	16:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Maximum Power: kWm (bhp)	1,371 (1,839)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	114 (30.1)
Engine Jacket Water Capacity: L (gal)	70 (18.5)
After Cooler Water Capacity: L (gal)	25 (6.6)
System Coolant Capacity: L (gal)	188 (50)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#12 JIC 37° Male
Fuel Return Connection Size	#12 JIC 37° Male
Maximum Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,500 (396)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	276 (73)
At 75% of Power Rating: L/hr (gal/hr)	211 (56)
At 50% of Power Rating: L/hr (gal/hr)	146 (38)

// Cooling - Radiator System

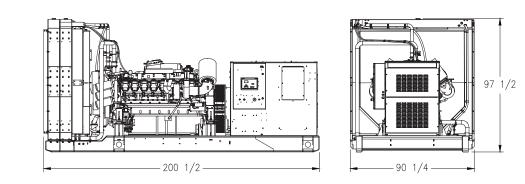
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	783 (207)
After Cooler Pump Capacity: L/min (gpm)	258 (68)
Heat Rejection to Coolant: kW (BTUM)	510 (29,003)
Heat Rejection to After Cooler: kW (BTUM)	345 (19,620)
Heat Radiated to Ambient: kW (BTUM)	91 (5,289)
Fan Power: kW (hp)	49 (65.7)

// Air Requirements

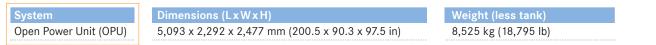
Aspirating: *m³/min (SCFM)	108 (3,814)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	1,709 (60,350)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	338 (11,925)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	505 (941)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	270 (9,535)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	95.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 16V2000 DS1250

1250 kWe / 60 Hz / Standby 380 - 4160V



SYSTEM RATINGS

Standby

Voltage (L-L)	380V**	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1250	1250	1250	1250
kVA	1562	1562	1562	1562
Amps	2374	1879	1503	216
skVA@30%				
Voltage Dip	3625	4440	4420	2800
Generator Model*	LSA 50.2 L8	LSA 50.2 L8	LSA 50.2 L8	LSA 50.2 UL8
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 16V 2000 Diesel Engine
 - 35.7 Liter Displacement
 - Electronic Unit Pump Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- AREP supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension & S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	130 °C Maximum Standby Temperature Rise
Closed Crankcase Ventilation	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan & Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel & Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Rack & Cables	
Flexible Fuel Connectors	Digital Metering

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	
and motor starting	
Sustained short circuit current of up to 300% of the rated current for	
up to 10 seconds	
Self-Ventilated and Drip-Proof	
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	16V 2000 G86S
Туре	4-Cycle
Arrangement	16-V
Displacement: L (in ³)	35.7 (2,179)
Bore: cm (in)	13.5 (5.3)
Stroke: cm (in)	15.6 (6.1)
Compression Ratio	16:1
Rated RPM	1,800
Engine Governor	Isochronous (ADEC)
Maximum Power: kWm (bhp)	1,371 (1,839)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	114 (30.1)
Engine Jacket Water Capacity: L (gal)	70 (18.5)
After Cooler Water Capacity: L (gal)	25 (6.6)
System Coolant Capacity: L (gal)	188 (50)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#12 JIC 37° Male
Fuel Return Connection Size	#12 JIC 37° Male
Maximum Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,500 (396)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	333 (88)
At 75% of Power Rating: L/hr (gal/hr)	261 (69)
At 50% of Power Rating: L/hr (gal/hr)	173 (46)

// Cooling - Radiator System

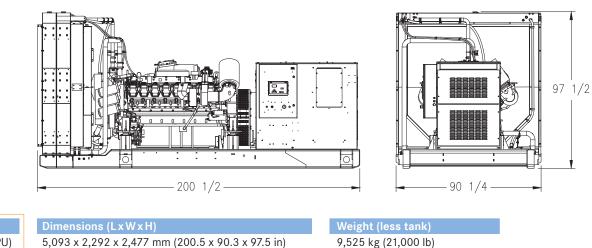
Ambient Capacity of Radiator: °C (°F)	40 (104)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	783 (207)
After Cooler Pump Capacity: L/min (gpm)	258 (68)
Heat Rejection to Coolant: kW (BTUM)	510 (29,003)
Heat Rejection to After Cooler: kW (BTUM)	345 (19,620)
Heat Radiated to Ambient: kW (BTUM)	100 (5,687)
Fan Power: kW (hp)	49 (66)

// Air Requirements

Aspirating: *m³/min (SCFM)	108 (3,814)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	1,709 (60,350)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	363 (12,822)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	535 (995)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	312 (11,018)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Open Power Unit (OPU)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

Full Load

SOUND DATA

Unit Type	Standby F
Level 0: Open Power Unit dB(A)	96.3

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 18V2000 DS1250

1250 kWe / 60 Hz / Standby 380 - 4160V

Reference MTU 18V2000 DS1250 (1000 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	380V**	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1250	1250	1250	1250
kVA	1562	1562	1562	1562
Amps	2374	1879	1503	216
skVA@30%				
Voltage Dip	2700	3100	4650	3100
Generator Model*	743RSL4052	742RSL4048	743RSS4288	742FSM4366
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions - EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // UL 2200 / CSA Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality, and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 18V 2000 Diesel Engine
 - 40.2 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator Resilient Mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	130 °C Max. Standby Temperature Rise	
Closed Crankcase Ventilation	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Thermostat	Full Amortisseur Windings	
Blower Fan and Fan Drive	125% Rotor Balancing	
Radiator - Unit Mounted	3-Phase Voltage Sensing	
Electric Starting Motor - 24V	±0.25% Voltage Regulation	
Governor – Electronic Isochronous	100% of Rated Load - One Step	
Base - Formed Steel	5% Max. Total Harmonic Distortion	
SAE Flywheel and Bell Housing		
Charging Alternator - 24V		
Battery Rack and Cables	<pre>// Digital Control Panel(s)</pre>	
Flexible Fuel Connectors		
Flexible Exhaust Connection	Digital Metering	

// Generator

EPA Certified Engine

NEMA MG1, IEEE and ANSI standards compliance for temperature rise and motor starting	Mul Ren
Sustained short circuit current of up to 300% of the rated current for	Pro
up to 10 seconds	UL
Self-Ventilated	Eve
Superior Voltage Waveform	IP 5
Digital, Solid State, Volts-per-Hertz Regulator	NFF

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	18V2000G76S
Туре	4-Cycle
Arrangement	18-V
Displacement: L (in ³)	40.2 (2,448)
Bore: cm (in)	13.5 (5.3)
Stroke: cm (in)	15.6 (6.15)
Compression Ratio	17.5
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	1,371 (1,838)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	122 (32.2)
Engine Jacket Water Capacity: L (gal)	73 (19.3)
System Coolant Capacity: L (gal)	185 (48.9)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#12 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	#12 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,500 (396)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	329 (87)
At 75% of Power Rating: L/hr (gal/hr)	251 (66)
At 50% of Power Rating: L/hr (gal/hr)	171 (45)

// Cooling - Radiator System

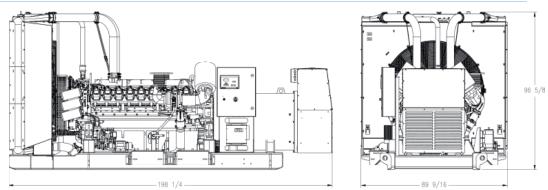
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	950 (251)
Heat Rejection to Coolant: kW (BTUM)	515 (29,288)
Heat Rejection to After Cooler: kW (BTUM)	340 (19,335)
Heat Radiated to Ambient: kW (BTUM)	117.3 (6,671)
Fan Power: kW (hp)	33.5 (44.9)

// Air Requirements

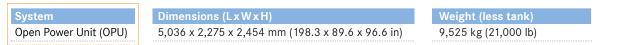
102 (3,602)
1,512 (53,396)
428 (15,224)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	480 (896)
Gas Volume at Stack	
Temp: m³/min (CFM)	252 (8,899)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	88.4

EMISSIONS DATA



All units are in g/hp-hr and at 100% load.

Emission levels of the engine may vary as a function of ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data provided are laboratory results from one engine representing this rating. The data was obtained under controlled environmental conditions with calibrated instrumentation traceable to the United States National Bureau of Standards and in compliance with US EPA regulations found within 40 CFR Part 89. The weighted cycle value (not shown) from each engine is guaranteed to be below the US EPA Standards at the US EPA defined conditions.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

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DIESEL GENERATOR SET MTU 12V4000 DS1250

1250 kWe / 60 Hz / Standby 380 - 4160V

Reference MTU 12V4000 DS1250 (1125 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	380V	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1250	1250	1250	1250
kVA	1562	1562	1562	1562
Amps	2374	1879	1503	216
skVA@30%				
Voltage Dip	2700	3100	4650	3100
Generator Model*	743RSL4052	742RSL4048	743RSS4288	742FSM4366
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	4 BAR WYE	4 BAR WYE	4 BAR WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 4000 Diesel Engine
 - 57.2 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension & S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	130 °C Maximum Standby Temperature Rise
Closed Crankcase Ventilation	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostat	125% Rotor Balancing
Blower Fan & Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel & Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box & Cables	
Flexible Fuel Connectors	Digital Metering

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature	re rise
and motor starting	
Sustained short circuit current of up to 300% of the rated curren	t for
up to 10 seconds	
Self-Ventilated and Drip-Proof	
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	12V 4000 G43
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	57.2 (3,491)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Maximum Power: kWm (bhp)	1,736 (2,328)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	260 (68.7)
Engine Jacket Water Capacity: L (gal)	160 (42.3)
After Cooler Water Capacity: L (gal)	40 (10.6)
System Coolant Capacity: L (gal)	583 (154)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

#16 JIC 37° Female
1" NPT Adapter Provided
#16 JIC 37° Female
1" NPT Adapter Provided
1 (3)
Diesel #2
960 (254)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	341 (90)
At 75% of Power Rating: L/hr (gal/hr)	268 (70.8)
At 50% of Power Rating: L/hr (gal/hr)	192 (50.7)

// Cooling - Radiator System

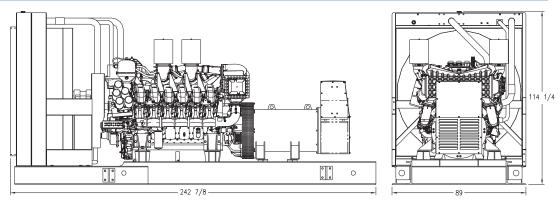
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,117 (295)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	576 (32,757)
Heat Rejection to After Cooler: kW (BTUM)	396 (22,520)
Heat Radiated to Ambient: kW (BTUM)	144 (8,165)
Fan Power: kW (hp)	36.7 (49.2)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	138 (4,873)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	1,416 (49,997)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	525 (18,414)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	425 (797)
Gas Volume at Stack	······
Temp: m³/min (CFM)	336 (11,866)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



II Load

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Fu
Level 0: Open Power Unit dB(A)	91.9

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 12V4000 DS1500

1500 kWe / 60 Hz / Standby 380 - 4160V

Reference MTU 12V4000 DS1500 (1400 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	380V	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1500	1500	1500	1500
kVA	1875	1875	1875	1875
Amps	2849	2255	1804	260
skVA@30%				
Voltage Dip	3350	3500	4800	3900
Generator Model*	744RSL4054	742RSL4050	743RSS4290	743FSM4368
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 4000 Diesel Engine
 - 57.2 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	130 °C Max. Standby Temperature Rise	
Closed Crankcase Ventilation	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Structural Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature	e rise
and motor starting	
Sustained short circuit current of up to 300% of the rated current	for
up to 10 seconds	
Self-Ventilated and Drip-Proof	
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V4000G43
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	57.2 (3,491)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Maximum Power: kWm (bhp)	1,736 (2,328)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	260 (68.7)
Engine Jacket Water Capacity: L (gal)	160 (42.3)
After Cooler Water Capacity: L (gal)	40 (10.6)
System Coolant Capacity: L (gal)	583 (154)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

#16 JIC 37° Female
1" NPT Adapter Provided
#16 JIC 37° Female
1" NPT Adapter Provided
1 (3)
Diesel #2
960 (254)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	420 (111)
At 75% of Power Rating: L/hr (gal/hr)	323 (85.3)
At 50% of Power Rating: L/hr (gal/hr)	226 (59.6)

// Cooling - Radiator System

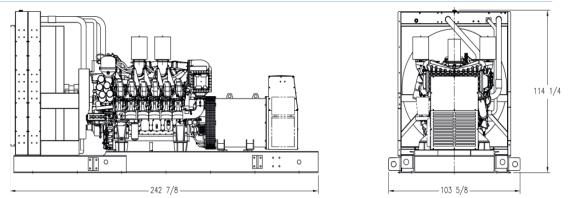
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,117 (295)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	640 (36,396)
Heat Rejection to After Cooler: kW (BTUM)	440 (25,022)
Heat Radiated to Ambient: kW (BTUM)	154 (8,755)
Fan Power: kW (hp)	36.7 (49.2)

// Air Requirements

Aspirating: *m³/min (SCFM)	144 (5,085)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	1,416 (49,997)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m³/min (SCFM)	563 (19,745)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	435 (815)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	342 (12,078)
Max. Allowable	
Back Pressure: kPa (in. H_2^0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	92.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ	
5.34	0.52	0.05	

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 12V4000 DS 1750

1750 kWe / 60 Hz / Standby 380 - 4160V

Reference MTU 12V4000 DS1750 (1600 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	380V	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1750	1750	1750	1750
kVA	2187	2187	2187	2187
Amps	3323	2631	2105	303
skVA@30%				
Voltage Dip	4200	4700	3600	4000
Generator Model*	744RSL4056	743RSL4052	744RSS4292	743FSM4370
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 4000 Diesel Engine
 - 57.2 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	130 °C Max. Standby Temperature Rise	
Closed Crankcase Ventilation	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Structural Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	
and motor starting	
Sustained short circuit current of up to 300% of the rated current for	
up to 10 seconds	
Self-Ventilated and Drip-Proof	
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V4000G83
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	57.2 (3,491)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	1,910 (2,561)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	260 (68.7)
Engine Jacket Water Capacity: L (gal)	160 (42.3)
After Cooler Water Capacity: L (gal)	40 (10.6)
System Coolant Capacity: L (gal)	583 (154)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	#16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	960 (254)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	466 (123)
At 75% of Power Rating: L/hr (gal/hr)	352 (93)
At 50% of Power Rating: L/hr (gal/hr)	246 (65)

// Cooling - Radiator System

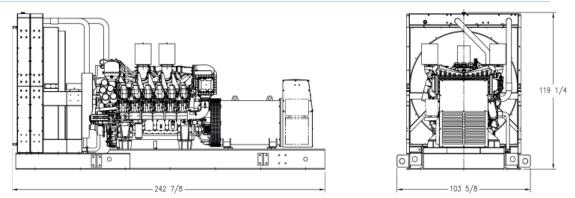
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,117 (295)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	700 (39,808)
Heat Rejection to After Cooler: kW (BTUM)	500 (28,435)
Heat Radiated to Ambient: kW (BTUM)	157 (8,955)
Fan Power: kW (hp)	48.7 (65.3)

// Air Requirements

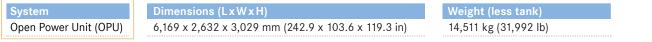
Aspirating: *m ³ /min (SCFM)	144 (5,085)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	1,574 (55,587)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	575 (20,196)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	465 (869)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	366 (12,925)
Ma. Allowable	
Back Pressure: kPa (in. H_2^0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	93.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
5.16	0.67	0.05

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

wer

DIESEL GENERATOR SET MTU 16V4000 DS2000

2000 kWe / 60 Hz / Standby 380 - 13.8kV

Reference MTU 16V4000 DS2000 (1800 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2000	2000	2000	2000	2000	2000	2000
kVA	2500	2500	2500	2500	2500	2500	2500
Amps	3798	3007	2406	347	116	109	105
skVA@30%							
Voltage Dip	4300	5800	3600	5100	3900	4250	4583
Generator							
Model	744RSL4176	744RSL4054	744RSS4292	744FSM4374	1020FDH 1242	1020FDH1242	1020FDH1242
Temp Rise	130 °C/40 °C						
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 16V4000 Diesel Engine
 - 76.3 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	130 °C Max. Standby Temperature Rise	
Closed Crankcase Ventilation	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Structural Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	// Digital Control Panel(s)	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Digital, Solid State, Volts-per-Hertz Regulator

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	16V4000G43
Туре	4-Cycle
Arrangement	16-V
Displacement: L (in ³)	76.3 (4,656)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	2,280 (3,058)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	300 (79.3)
Engine Jacket Water Capacity: L (gal)	175 (46.2)
After Cooler Water Capacity: L (gal)	50 (13.2)
System Coolant Capacity: L (gal)	547 (145)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,200 (317)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	558 (147.3)
At 75% of Power Rating: L/hr (gal/hr)	426 (112.6)
At 50% of Power Rating: L/hr (gal/hr)	299 (78.9)

// Cooling - Radiator System

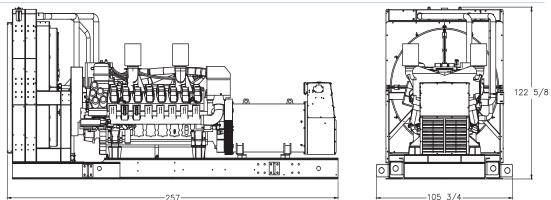
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,350 (357)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	840 (47,770)
Heat Rejection to After Cooler: kW (BTUM)	610 (34,690)
Heat Radiated to Ambient: kW (BTUM)	184 (10,478)
Fan Power: kW (hp)	95.4 (128)

// Air Requirements

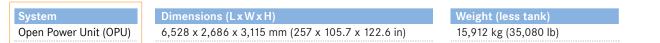
Aspirating: *m ³ /min (SCFM) 186 (6,5	
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	2,053 (72,500)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	673 (23,631)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	480 (896)
Gas Volume at Stack	400 (070)
Temp: m ³ /min (CFM)	456 (16,103)
Max. Allowable	······
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	98.7

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
5.38	0.45	0.04

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 16V4000 DS2250

2250 kWe / 60 Hz / Standby 380 - 13.8kV

Reference MTU 16V4000 DS2250 (2045 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2250	2250	2250	2250	2250	2250	2250
kVA	2812	2812	2812	2812	2812	2812	2812
Amps	4273	3383	2706	390	130	123	117
skVA@30%							
Voltage Dip	3625	8400	3900	5000	4120	4120	4900
Generator							
Model	1020FDL1102	744RSL4058	1020FDS1120	744FSM4376	1020FDH1246	1020FDH1244	1020FDH1246
Temp Rise	130 °C/40 °C						
Connection	6 LEAD WYE	4 LEAD WYE	6 LEAD WYE				

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 Listed – Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 16V4000 Diesel Engine
 - 76.3 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	130 °C Max. Standby Temperature Rise	
Closed Crankcase Ventilation	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Structural Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	// Digital Control Panel(s)	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	

Engine Parameters

Engine Protection

Event Recording

NFPA110 Compatible

Generator Protection Functions

CANBus ECU Communications Windows[®]-Based Software Multilingual Capability

Programmable Input and Output Contacts

UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

Remote Communications to RDP-110 Remote Annunciator

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise and motor starting Sustained short circuit current of up to 300% of the rated current for up to 10 seconds Self-Ventilated and Drip-Proof Superior Voltage Waveform

Digital, Solid State, Volts-per-Hertz Regulator

// Engine

Manufacturer	MTU
Model	16V4000G83
Туре	4-Cycle
Arrangement	16-V
Displacement: L (in ³)	76.3 (4,656)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	2,500 (3,353)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	300 (79.3)
Engine Jacket Water Capacity: L (gal)	175 (46.2)
After Cooler Water Capacity: L (gal)	50 (13.2)
System Coolant Capacity: L (gal)	547 (145)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,200 (317)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	617 (163)
At 75% of Power Rating: L/hr (gal/hr)	467 (123)
At 50% of Power Rating: L/hr (gal/hr)	325 (86)

// Cooling - Radiator System

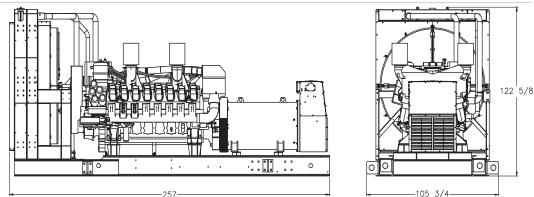
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,350 (357)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	930 (52,888)
Heat Rejection to After Cooler: kW (BTUM)	680 (38,671)
Heat Radiated to Ambient: kW (BTUM)	206 (11,711)
Fan Power: kW (hp)	95.4 (128)

// Air Requirements

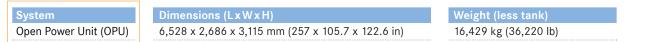
192 (6,780)
2,053 (72,500)
752 (26,412)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	505 (941)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	504 (17,799)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Load

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full
Level 0: Open Power Unit dB(A)	98.7

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 16V4000 DS2500

2500 kWe / 60 Hz / Standby 380 - 13.8kV



SYSTEM RATINGS

Standby

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2500	2500	2500	2500	2500	2500	2500
kVA	3125	3125	3125	3125	3125	3125	3125
Amps	4754	3759	3007	434	145	137	131
skVA@30%							
Voltage Dip	3400	4625	5200	5800	4300	4750	5350
Generator							
Model	1020FDL1104	1020FDL1102	1020FDS1122	1020FDM 1180	1020FDH1248	1020FDH1248	1030FDH 1250
Temp Rise	130 °C/40 °C						
Connection	6 LEAD WYE						

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval
- // UL 2200 Listed Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 16V4000 Diesel Engine
 - 76.3 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Flexible Fuel Connectors

Air Cleaners	No Load to Full Load Regulation		
Oil Pump	Brushless Alternator with Brushless Pilot Exciter		
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field		
Full Flow Oil Filters	130 °C Max. Standby Temperature Rise		
Closed Crankcase Ventilation	2 Bearings, Sealed		
Jacket Water Pump	Flexible Coupling		
Inter Cooler Water Pump	Full Amortisseur Windings		
Thermostats	125% Rotor Balancing		
Blower Fan and Fan Drive	3-Phase Voltage Sensing		
Radiator - Unit Mounted	±0.25% Voltage Regulation		
Electric Starting Motor - 24V	100% of Rated Load - One Step		
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion		
Base - Structural Steel			
SAE Flywheel and Bell Housing			
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>		
Battery Box and Cables			

Flexible Exhaust Connection	Engine Parameters		
EPA Certified Engine	Generator Protection Functions		
	Engine Protection		
	CANBus ECU Communications		
// Generator	Windows [®] -Based Software		
	Multilingual Capability		
NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Remote Communications to RDP-110 Remote Annunciator		
and motor starting	Programmable Input and Output Contacts		
Sustained short circuit current of up to 300% of the rated current for	UL Recognized, CSA Certified, CE Approved		
up to 10 seconds	Event Recording		
Self-Ventilated and Drip-Proof	IP 54 Front Panel Rating with Integrated Gasket		
Superior Voltage Waveform	NFPA110 Compatible		
Digital, Solid State, Volts-per-Hertz Regulator			

Digital Metering

// Engine

Manufacturer	MTU
Model	16V4000G83L
Туре	4-Cycle
Arrangement	16-V
Displacement: L (in ³)	76.3 (4,656)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.4:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	2,740 (3,674)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	300 (79.3)
Engine Jacket Water Capacity: L (gal)	458 (121)
After Cooler Water Capacity: L (gal)	254 (67)
System Coolant Capacity: L (gal)	712 (188)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,200 (317)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	693 (183)
At 75% of Power Rating: L/hr (gal/hr)	515 (136)
At 50% of Power Rating: L/hr (gal/hr)	356 (94)

// Cooling - Radiator System

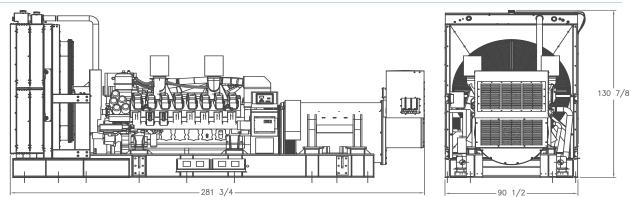
Ambient Capacity of Radiator: °C (°F)	43 (110)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,350 (357)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	1,115 (63,408)
Heat Rejection to After Cooler: kW (BTUM)	750 (42,653)
Heat Radiated to Ambient: kW (BTUM)	209 (11,537)
Fan Power: kW (hp)	108.4 (145.3)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	222 (7,840)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	2,457 (86,760)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	741 (26,340)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	515 (959)
Gas Volume at Stack	
Temp: m³/min (CFM)	600 (21,189)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type Level 0: Open Power Unit dB(A)

Standby Full Load

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

93.6

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor N/A = Not Available

DIESEL GENERATOR SET MTU 20V4000 DS2500

2500 kWe / 60 Hz / Standby 380 - 13.8kV

Reference MTU 20V4000 DS2500 (2250 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2500	2500	2500	2500	2500	2500	2500
kVA	3125	3125	3125	3125	3125	3125	3125
Amps	4748	3759	3007	434	145	137	131
skVA@30%							
Voltage Dip	3400	4625	5200	5800	4300	4750	5350
Generator							
Model	1020FDL1104	1020FDL1102	1020FDS1122	1020FDM1180	1020FDH 1248	1020FDH1248	1030FDH 1250
Temp Rise	130 °C/40 °C						
Connection	6 LEAD WYE						

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval
- // UL 2200 Listed Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 20V4000 Diesel Engine
 - 95.4 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filters	130 °C Max. Standby Temperature Rise	
Closed Crankcase Ventilation	2 Bearings, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Structural Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box and Cables		

Flexible Fuel Connectors

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Rer
and motor starting	Pro
Sustained short circuit current of up to 300% of the rated current for	UL
up to 10 seconds	Eve
Self-Ventilated and Drip-Proof	IP 5
Superior Voltage Waveform	NF
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	20V4000G43 6 ECT
Туре	4-Cycle
Arrangement	20-V
Displacement: L (in ³)	95.4 (5,822)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.4:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	2,740 (3,674)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	390 (103)
Engine Jacket Water Capacity: L (gal)	205 (54.2)
After Cooler Water Capacity: L (gal)	30 (7.9)
System Coolant Capacity: L (gal)	814 (215)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	4,200

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,620 (428)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	636 (168)
At 75% of Power Rating: L/hr (gal/hr)	507 (134)
At 50% of Power Rating: L/hr (gal/hr)	363 (96)

// Cooling - Radiator System

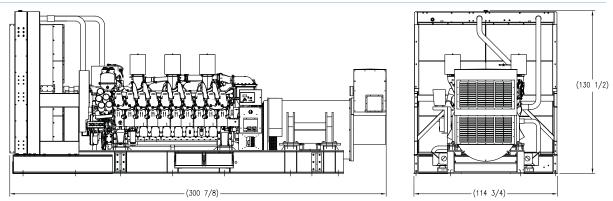
Ambient Capacity of Radiator: °C (°F)	54 (129)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,567 (414)
After Cooler Pump Capacity: L/min (gpm)	567 (150)
Heat Rejection to Coolant: kW (BTUM)	940 (53,456)
Heat Rejection to After Cooler: kW (BTUM)	630 (35,827)
Heat Radiated to Ambient: kW (BTUM)	209 (11,895)
Fan Power: kW (hp)	87.5 (117.3)

// Air Requirements

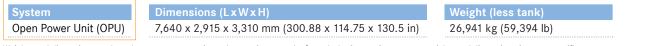
Aspirating: *m ³ /min (SCFM)	225 (7,946)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	2,895 (102,247)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	784 (27,686)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	455 (851)
Gas Volume at Stack	
Temp: m³/min (CFM)	540 (19,070)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type Level 0: Open Power Unit dB(A)

Standby Full Load 97.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor N/A = Not Available

DIESEL GENERATOR SET MTU 20V4000 DS2800

2800 kWe / 60 Hz / Standby 380 - 13.8kV

Reference MTU 20V4000 DS2800 (2500 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2800	2800	2800	2800	2800	2800	2800
kVA	3500	3500	3500	3500	3500	3500	3500
Amps	5318	4210	3368	486	162	153	146
skVA@30%							
Voltage Dip	4000	5400	5875	5250	5125	4875	6000
Generator							
Model	1030FDL1110	1020FDL1106	1020FDS1124	1020FDM1182	1030FDH1254	1030FDH1252	1030FDH1254
Temp Rise	130 °C/40 °C						
Connection	6 LEAD WYE						

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval
- // UL 2200 Listed Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 20V4000 Diesel Engine
 - 95.4 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	130 °C Max. Standby Temperature Rise	
Closed Crankcase Ventilation	2 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Structural Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	// Digital Control Panel(s)	
Battery Box and Cables		

// Generator

Flexible Fuel Connectors

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Re
and motor starting	Pr
Sustained short circuit current of up to 300% of the rated current for	UI
up to 10 seconds	Εv
Self-Ventilated and Drip-Proof	IP
Superior Voltage Waveform	N
Digital, Solid State, Volts-per-Hertz Regulator	•••••

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	20V4000G83 6 ECT
Туре	4-Cycle
Arrangement	20-V
Displacement: L (in ³)	95.4 (5,822)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.4:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	3,010 (4,036)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	390 (103)
Engine Jacket Water Capacity: L (gal)	205 (54.2)
After Cooler Water Capacity: L (gal)	30 (7.9)
System Coolant Capacity: L (gal)	860 (227)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	4,200

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,620 (428)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	704 (186)
At 75% of Power Rating: L/hr (gal/hr)	553 (146)
At 50% of Power Rating: L/hr (gal/hr)	394 (104)

// Cooling - Radiator System

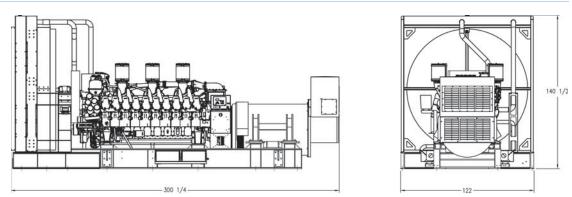
Ambient Capacity of Radiator: °C (°F)	48 (118)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,567 (414)
After Cooler Pump Capacity: L/min (gpm)	567 (150)
Heat Rejection to Coolant: kW (BTUM)	1,040 (59,143)
Heat Rejection to After Cooler: kW (BTUM)	740 (42,083)
Heat Radiated to Ambient: kW (BTUM)	237 (13,475)
Fan Power: kW (hp)	60.6 (81.3)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	240 (8,476)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	3,082 (108,843)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m³/min (SCFM)	843 (29,603)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	470 (878)
Gas Volume at Stack	
Temp: m³/min (CFM)	594 (20,977)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



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Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type Level 0: Open Power Unit dB(A) Standby Full Load 97.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

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C/F = Consult Factory/MTU Onsite Energy Distributor N/A = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

www.mtuonsiteenergy.com

DIESEL GENERATOR SET MTU 20V4000 DS3000

3000 kWe / 60 Hz / Standby 380 - 13.8kV

Reference MTU 20V4000 DS3000 (2800 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	3000	3000	3000	3000	3000	3000	3000
kVA	3750	3750	3750	3750	3750	3750	3750
Amps	5698	4511	3608	520	174	164	157
skVA@30%							
Voltage Dip	4000	5400	6125	5250	5125	5625	6000
Generator							
Model	1030FDL1110	1030FDL1108	1030FDS1126	1020FDM1184	1030FDH1254	1030FDH1254	1030FDH1254
Temp Rise	130 °C/40 °C						
Connection	6 LEAD WYE						

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval
- // UL 2200 Listed Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 20V4000 Diesel Engine
 - 95.4 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	130 °C Max. Standby Temperature Rise
Closed Crankcase Ventilation	2 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	

// Generator

Flexible Fuel Connectors

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperatu	re rise Re
and motor starting	Pr
Sustained short circuit current of up to 300% of the rated curren	nt for UL
up to 10 seconds	Ev
Self-Ventilated and Drip-Proof	IP
Superior Voltage Waveform	NF
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

20V4000G83L 6 ECT 4-Cycle 20-V 95.4 (5,822) 17 (6.69)
20-V 95.4 (5,822)
95.4 (5,822)
17 (6 69)
17 (0.07)
21 (8.27)
16.4:1
1,800
Electronic Isochronous (ADEC)
3,490 (4,680)
±0.25%
Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	390 (103)
Engine Jacket Water Capacity: L (gal)	205 (54.2)
After Cooler Water Capacity: L (gal)	30 (7.9)
System Coolant Capacity: L (gal)	860 (227)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	4,200

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,620 (428)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	784 (207)
At 75% of Power Rating: L/hr (gal/hr)	594 (157)
At 50% of Power Rating: L/hr (gal/hr)	413 (109)

// Cooling - Radiator System

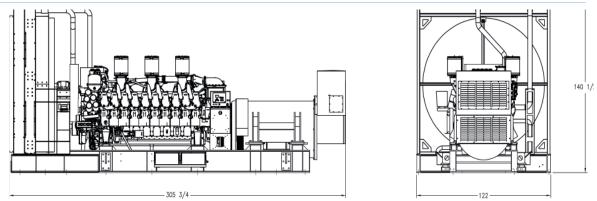
Ambient Capacity of Radiator: °C (°F)	47 (117)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,567 (414)
After Cooler Pump Capacity: L/min (gpm)	567 (150)
Heat Rejection to Coolant: kW (BTUM)	1,300 (73,929)
Heat Rejection to After Cooler: kW (BTUM)	970 (55,162)
Heat Radiated to Ambient: kW (BTUM)	230 (13,080)
Fan Power: kW (hp)	60.6 (81.3)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	264 (9,323)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	3,082 (108,843)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	888 (31,359)

* Air density = 1.184 kg/m (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	525 (977)
Gas Volume at Stack	
Temp: m³/min (CFM)	702 (24,791)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

Standby Full Load

SOUND DATA

Unit Type Level 0: Open Power Unit dB(A)

Level 0: Open Power Unit dB(A) 94.6 Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor N/A = Not Available

DIESEL GENERATOR SET MTU 20V4000 DS3250

3250 kWe / 60 Hz / Standby 480 - 13.8kV



SYSTEM RATINGS

Standby

Voltage (L-L)	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	3250	3250	3250	3250	3250	3250
kVA	4062	4062	4062	4062	4062	4062
Amps	4886	3909	563	188	177	170
skVA@30%						
Voltage Dip	5500	6125	6300	6300	6850	7400
Generator Model	1030FDL1110	1030FDS1128	1030FDM1188	1040FDH1256	1040FDH1256	1040FDH1256
Temp Rise	130 °C/40 °C					
Connection	6 LEAD WYE					

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval
- // UL 2200 Listed Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 85%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 20V4000 Diesel Engine
 - 95.4 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	130 °C Max. Standby Temperature Rise
Closed Crankcase Ventilation	2 Bearings, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	5% Max. Total Harmonic Distortion
Governor – Electronic Isochronous	
Base - Structural Steel	
SAE Flywheel and Bell Housing	// Digital Control Panel(s)
Charging Alternator - 24V	
Battery Box and Cables	Digital Metering
Flexible Fuel Connectors	Engine Parameters
Flexible Exhaust Connection	Generator Protection Functions
EPA Certified Engine	Engine Protection

// Generator

NEMA MG 1, IEEE and ANSI standards compliance for temperature rise
and motor startingPro
ULSustained short circuit current of up to 300% of the rated current for
up to 10 secondsEven
Even
IP Self-Ventilated and Drip-ProofNFSuperior Voltage Waveform
Digital, Solid State, Volts-per-Hertz RegulatorNemo
Self-Ventilated and Drip-ProvinceNemo
Self-Ventilated State, Volts-per-Hertz Regulator

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	20V4000G83L 6 ECT
Туре	4-Cycle
Arrangement	20-V
Displacement: L (in ³)	95.4 (5,822)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.4:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	3,490 (4,680)
Speed Regulation	±0.25%
Air Cleaner	Dry
••••••	

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	390 (103)
Engine Jacket Water Capacity: L (gal)	205 (54.2)
After Cooler Water Capacity: L (gal)	30 (7.9)
System Coolant Capacity: L (gal)	860 (227)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	4,200

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,620 (428)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	844 (223)
At 75% of Power Rating: L/hr (gal/hr)	644 (170)
At 50% of Power Rating: L/hr (gal/hr)	447 (118)

// Cooling - Radiator System

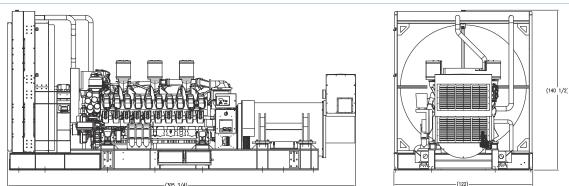
Ambient Capacity of Radiator: °C (°F)	43 (108)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,567 (414)
After Cooler Pump Capacity: L/min (gpm)	567 (150)
Heat Rejection to Coolant: kW (BTUM)	1,300 (73,929)
Heat Rejection to After Cooler: kW (BTUM)	970 (55,163)
Heat Radiated to Ambient: kW (BTUM)	237 (13,472)
Fan Power: kW (hp)	60.6 (81.3)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	264 (9,323)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	3,082 (108,843)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m³/min (SCFM)	866 (30,384)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	525 (977)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	702 (24,791)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (less tank)
Open Power Unit (OPU)	7,766 x 3,099 x 3,569 mm (305.75 x 122 x 140.5 in)	29,651 kg (65,369 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Standby Full Load
Level 0: Open Power Unit dB(A)	95.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	СО	РМ
5.1	0.6	0.03
0.1	0.0	0.00

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 16V2000 DS1000

900 kWe / 60 Hz / Data Center Continuous Power 208 - 4160V

Reference: MTU 16V2000 DS1000 (1000 kWe) for Standby Rating Technical Data MTU 16V2000 DS1000 (900 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Data Center Continuous Power

Voltage (L-L)	208V**	240V**	380V**	480V**	600V**	4160V
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	900	900	900	900	900	900
kVA	1125	1125	1125	1125	1125	1125
Amps	3123	2706	1709	1353	1083	156
skVA@30%						
Voltage Dip	2475	2475	3205	2830	3590	2800
Generator Model*	LSA 50.2 M6	LSA 50.2 M6	LSA 50.2 M6	LSA 49.1 L11	LSA 49.1 L11	LSA 50.2 UL8
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Data Center Continuous Power (DCCP) rating is optimized for data center applications
- Uptime Institute compliant for Tier III and IV data centers
- No runtime limitation
- 100% Load Factor
- 10% Overload Available
- Accepts Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 16V 2000 Diesel Engine
- 35.7 Liter Displacement
- Electronic Unit Pump Injection
- 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted

CANBus ECU Communications Windows[®]-Based Software

Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

Remote Communications to RDP-110 Remote Annunciator

Multilingual Capability

Event Recording

NFPA110 Compatible

- Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension & S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Inter Cooler Water Pump	125% Rotor Balancing	
Thermostats	3-Phase Voltage Sensing	
Blower Fan & Fan Drive	±0.25% Voltage Regulation	
Radiator - Unit Mounted	100% of Rated Load - One Step	
Electric Starting Motor - 24V	5% Maximum Total Harmonic Distortion	
Governor – Electronic Isochronous		
Base - Structural Steel		
SAE Flywheel & Bell Housing	<pre>// Digital Control Panel(s)</pre>	
Charging Alternator - 24V		
Battery Rack & Cables	Digital Metering	
Flexible Fuel Connectors	Engine Parameters	
Flexible Exhaust Connection	Generator Protection Functions	
EPA Certified Engine	Engine Protection	

// Generator

NEN	IA MG1, IEEE and ANSI standards compliance for temperature rise
and	motor starting
Sus	tained short circuit current of up to 300% of the rated current for
up t	to 10 seconds
Self	-Ventilated and Drip-Proof
Sup	erior Voltage Waveform
Digi	tal, Solid State, Volts-per-Hertz Regulator

// Engine

Manufacturer	MTU
Model	16V 2000 G26S
Туре	4-Cycle
Arrangement	16-V
Displacement: L (in ³)	35.7 (2,179)
Bore: cm (in)	13.5 (5.3)
Stroke: cm (in)	15.6 (6.1)
Compression Ratio	16:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Maximum Power: kWm (bhp)	998 (1,338)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	114 (30.1)
Engine Jacket Water Capacity: L (gal)	70 (18.5)
After Cooler Water Capacity: L (gal)	25 (6.6)
System Coolant Capacity: L (gal)	188 (50)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#12 JIC 37° Male
Fuel Return Connection Size	#12 JIC 37° Male
Maximum Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,500 (396)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	252 (66.6)
At 75% of Power Rating: L/hr (gal/hr)	186 (49.2)
At 50% of Power Rating: L/hr (gal/hr)	132 (34.9)

// Cooling - Radiator System

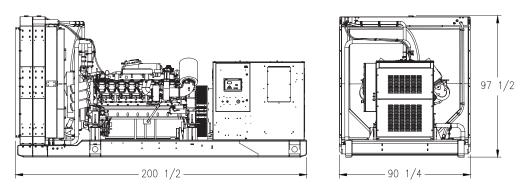
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	783 (207)
After Cooler Pump Capacity: L/min (gpm)	258 (68)
Heat Rejection to Coolant: kW (BTUM)	390 (22,179)
Heat Rejection to After Cooler: kW (BTUM)	250 (14,217)
Heat Radiated to Ambient: kW (BTUM)	93 (5,289)
Fan Power: kW (hp)	49 (66)
	•••••••••••••••••••••••••••••••••••••••

// Air Requirements

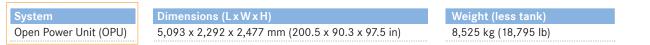
Aspirating: *m³/min (SCFM)	96 (3,390)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	1,709 (60,350)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	338 (11,925)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	495 (923)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	252 (8,899)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	DCCP
Level 0: Open Power Unit dB(A)	95.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Data Center Continuous Power (DCCP) ratings apply to data center installations where a utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 100%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 12V4000 DS1250

1135 kWe / 60 Hz / Data Center Continuous Power 380 - 4160V

Reference: MTU 12V4000 DS1250 (1250 kWe) for Standby Rating Technical Data MTU 12V4000 DS1250 (1125 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Data Center Continuous Power

Voltage (L-L)	380V	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1135	1135	1135	1135
kVA	1419	1419	1419	1419
Amps	2156	1707	1365	197
skVA@30%				
Voltage Dip	2700	3100	4650	3100
Generator Model*	743RSL4052	742RSL4048	743RSS4288	742FSM4366
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Data Center Continuous Power (DCCP) rating is optimized for data center applications
- Uptime Institute compliant for Tier III and IV data centers
- No runtime limitation
- 100% Load Factor
- 10% Overload Available
- Accepts Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 4000 Diesel Engine
 - 57.2 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Centrifugal Oil Filtration	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Inter Cooler Water Pump	125% Rotor Balancing	
Thermostat	3-Phase Voltage Sensing	
Blower Fan and Fan Drive	±0.25% Voltage Regulation	
Radiator - Unit Mounted	100% of Rated Load - One Step	
Electric Starting Motor - 24V	5% Max. Total Harmonic Distortion	
Governor – Electronic Isochronous		
Base - Structural Steel		
SAE Flywheel and Bell Housing	<pre>// Digital Control Panel(s)</pre>	
Charging Alternator - 24V		
Battery Box and Cables	Digital Metering	
Flexible Fuel Connectors	Engine Parameters	
Flexible Exhaust Connection	Generator Protection Functions	

// Generator

EPA Certified Engine

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Digital, Solid State, Volts-per-Hertz Regulator

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V4000G43
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	57.2 (3,491)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	1,520 (2,038)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	260 (68.7)
Engine Jacket Water Capacity: L (gal)	160 (42.3)
After Cooler Water Capacity: L (gal)	40 (10.6)
System Coolant Capacity: L (gal)	583 (154)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

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// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	309 (81.5)
At 75% of Power Rating: L/hr (gal/hr)	238 (62.9)
At 50% of Power Rating: L/hr (gal/hr)	176 (46.4)

// Cooling - Radiator System

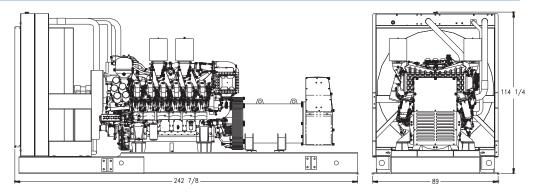
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,117 (295)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	504 (28,662)
Heat Rejection to After Cooler: kW (BTUM)	333 (18,937)
Heat Radiated to Ambient: kW (BTUM)	133 (7,562)
Fan Power: kW (hp)	36.7 (49.2)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	126 (4,450)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	1,416 (49.997)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	486 (17,054)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	400 (752)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	306 (10,806)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Data Center Continuous Power (DCCP) ratings apply to data center installations where a utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 100%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 12V4000 DS1500

1400 kWe / 60 Hz / Data Center Continuous Power 380 - 4160V

Reference: MTU 12V4000 DS1500 (1500 kWe) for Standby Rating Technical Data MTU 12V4000 DS1500 (1400 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Data Center Continuous Power

Voltage (L-L)	380V	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1400	1400	1400	1400
kVA	1750	1750	1750	1750
Amps	2659	2105	1684	243
skVA@30%				
Voltage Dip	3350	3500	4800	3900
Generator Model*	744RSL4054	742RSL4050	743RSS4290	743FSM4368
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Data Center Continuous Power (DCCP) rating is optimized for data center applications
- Uptime Institute compliant for Tier III and IV data centers
- No runtime limitation
- 100% Load Factor
- 10% Overload Available
- Accepts Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 4000 Diesel Engine
 - 57.2 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Centrifugal Oil Filtration	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Inter Cooler Water Pump	125% Rotor Balancing	
Thermostats	3-Phase Voltage Sensing	
Blower Fan and Fan Drive	±0.25% Voltage Regulation	
Radiator - Unit Mounted	100% of Rated Load - One Step	
Electric Starting Motor - 24V	5% Maximum Total Harmonic Distortion	
Governor – Electronic Isochronous		
Base - Structural Steel		
SAE Flywheel and Bell Housing	<pre>// Digital Control Panel(s)</pre>	
Charging Alternator - 24V		
Battery Box and Cables	Digital Metering	
Flexible Fuel Connectors	Engine Parameters	
Flexible Exhaust Connection	Generator Protection Functions	
EPA Certified Engine	Engine Protection	
_	-	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Digital, Solid State, Volts-per-Hertz Regulator

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V4000G43
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	57.2 (3,491)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	1,520 (2,038)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	260 (68.7)
Engine Jacket Water Capacity: L (gal)	160 (42.3)
After Cooler Water Capacity: L (gal)	40 (10.6)
System Coolant Capacity: L (gal)	583 (154)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

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// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	372 (98.2)
At 75% of Power Rating: L/hr (gal/hr)	285 (75.4)
At 50% of Power Rating: L/hr (gal/hr)	200 (52.9)

// Cooling - Radiator System

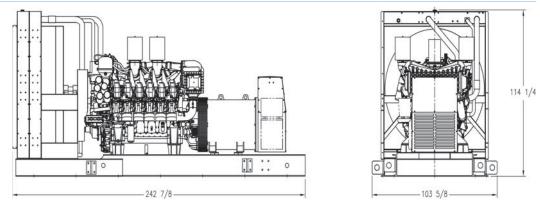
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,117 (295)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	560 (31,847)
Heat Rejection to After Cooler: kW (BTUM)	370 (21,042)
Heat Radiated to Ambient: kW (BTUM)	144 (8,192)
Fan Power: kW (hp)	36.7 (49.2)

// Air Requirements

132 (4,662)
1,416 (49,997)
526 (18,475)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	410 (770)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	312 (11,018)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Level 0: Open Power Unit dB(A) 92.2	Unit Type	DCCP Full Load
	Level 0: Open Power Unit dB(A)	92.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Data Center Continuous Power (DCCP) ratings apply to data center installations where a utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 100%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 12V4000 DS 1750

1600 kWe / 60 Hz / Data Center Continuous Power 380 - 4160V

Reference: MTU 12V4000 DS1750 (1750 kWe) for Standby Rating Technical Data MTU 12V4000 DS1750 (1600 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Data Center Continuous Power

Voltage (L-L)	380V	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1600	1600	1600	1600
kVA	2000	2000	2000	2000
Amps	3042	2406	1925	278
skVA@30%				
Voltage Dip	4200	4700	3600	4000
Generator Model*	744RSL4056	743RSL4052	744RSS4292	743FSM4370
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions - EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Data Center Continuous Power (DCCP) rating is optimized for data center applications
- Uptime Institute compliant for Tier III and IV data centers
- No runtime limitation
- 100% Load Factor
- 10% Overload Available
- Accepts Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 4000 Diesel Engine
 - 57.2 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Centrifugal Oil Filtration	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Inter Cooler Water Pump	125% Rotor Balancing	
Thermostats	3-Phase Voltage Sensing	
Blower Fan and Fan Drive	±0.25% Voltage Regulation	
Radiator - Unit Mounted	100% of Rated Load - One Step	
Electric Starting Motor - 24V	5% Max. Total Harmonic Distortion	
Governor – Electronic Isochronous		
Base - Structural Steel		
SAE Flywheel and Bell Housing	<pre>// Digital Control Panel(s)</pre>	
Charging Alternator - 24V		
Battery Box and Cables	Digital Metering	
Flexible Fuel Connectors	Engine Parameters	
Flexible Exhaust Connection	Generator Protection Functions	
EPA Certified Engine	Engine Protection	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Digital, Solid State, Volts-per-Hertz Regulator

Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved D0% of the rated current for

Multilingual Capability

CANBus ECU Communications Windows[®]-Based Software

for Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V4000G83
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	57.2 (3,491)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	1,736 (2,328)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	260 (68.7)
Engine Jacket Water Capacity: L (gal)	160 (42.3)
After Cooler Water Capacity: L (gal)	40 (10.6)
System Coolant Capacity: L (gal)	583 (154)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	#16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	960 (254)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	420 (111)
At 75% of Power Rating: L/hr (gal/hr)	322 (85)
At 50% of Power Rating: L/hr (gal/hr)	227 (60)

// Cooling - Radiator System

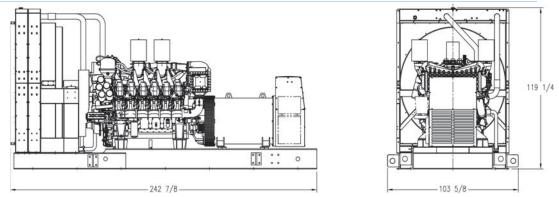
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,117 (295)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	640 (36,396)
Heat Rejection to After Cooler: kW (BTUM)	440 (25,022)
Heat Radiated to Ambient: kW (BTUM)	145.1 (8,254)
Fan Power: kW (hp)	48.7 (65.3)

// Air Requirements

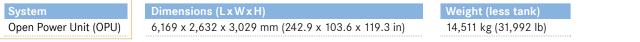
Aspirating: *m ³ /min (SCFM)	138 (4,873)		
Air Flow Required for Rad.			
Cooled Unit: *m³/min (SCFM)	1,574 (55,587)		
Remote Cooled Applications;			
Air Flow Required for Dissipation			
of Radiated Generator Set Heat for a			
Max. of 25 °F Rise: *m ³ /min (SCFM)	530 (18,616)		

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	435 (815)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	342 (12,078)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	DCCP Full Load
Level 0: Open Power Unit dB(A)	92.8

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Data Center Continuous Power (DCCP) ratings apply to data center installations where a utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 100%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 16V4000 DS2000

1825 kWe / 60 Hz / Data Center Continuous Power 380 - 13.8kV

Reference: MTU 16V4000 DS2000 (2000 kWe) for Standby Rating Technical Data MTU 16V4000 DS2000 (1800 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Data Center Continuous Power

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	1825	1825	1825	1825	1825	1825	1825
kVA	2281	2281	2281	2281	2281	2281	2281
Amps	3466	2744	2195	317	106	100	95
skVA@30%							
Voltage Dip	4300	5800	3600	5100	3900	4250	4583
Generator							
Model	744RSL4176	744RSL4054	744RSS4292	744FSM4374	1020FDH 1242	1020FDH1242	1020FDH 1242
Temp Rise	130 °C/40 °C						
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Data Center Continuous Power (DCCP) rating is optimized for data center applications
- Uptime Institute compliant for Tier III and IV data centers
- No runtime limitation
- 100% Load Factor
- 10% Overload Available
- Accepts Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 16V4000 Diesel Engine
 - 76.3 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted

CANBus ECU Communications Windows[®]-Based Software

Remote Communications to RDP-110 Remote Annunciator

Multilingual Capability

- Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	No Load to Full Load Regulation		
Oil Pump	Brushless Alternator with Brushless Pilot Exciter		
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field		
Centrifugal Oil Filtration	1 Bearing, Sealed		
Closed Crankcase Ventilation	Flexible Coupling		
Jacket Water Pump	Full Amortisseur Windings		
Inter Cooler Water Pump	125% Rotor Balancing		
Thermostats	3-Phase Voltage Sensing		
Blower Fan and Fan Drive	±0.25% Voltage Regulation		
Radiator - Unit Mounted	100% of Rated Load - One Step		
Electric Starting Motor - 24V	5% Max. Total Harmonic Distortion		
Governor – Electronic Isochronous			
Base - Structural Steel			
SAE Flywheel and Bell Housing	<pre>// Digital Control Panel(s)</pre>		
Charging Alternator - 24V			
Battery Box and Cables	Digital Metering		
Flexible Fuel Connectors	Engine Parameters		
Flexible Exhaust Connection	Generator Protection Functions		
EPA Certified Engine	Engine Protection		

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Programmable Input and Output Contacts		
and motor starting	UL Recognized, CSA Certified, CE Approved		
Sustained short circuit current of up to 300% of the rated current for	Event Recording		
up to 10 seconds	IP 54 Front Panel Rating with Integrated Gasket		
Self-Ventilated and Drip-Proof	NFPA110 Compatible		
Superior Voltage Waveform			
Digital, Solid State, Volts-per-Hertz Regulator			

// Engine

Manufacturer	MTU
Model	16V4000G43
Туре	4-Cycle
Arrangement	16-V
Displacement: L (in ³)	76.3 (4,656)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	2,020 (2,709)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	300 (79.3)
Engine Jacket Water Capacity: L (gal)	175 (46.2)
After Cooler Water Capacity: L (gal)	50 (13.2)
System Coolant Capacity: L (gal)	547 (145)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,200 (317)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	487 (128.6)
At 75% of Power Rating: L/hr (gal/hr)	381 (100.7)
At 50% of Power Rating: L/hr (gal/hr)	265 (69.9)

// Cooling - Radiator System

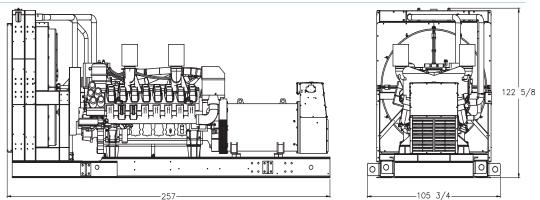
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,350 (357)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	740 (42,083)
Heat Rejection to After Cooler: kW (BTUM)	520 (29,572)
Heat Radiated to Ambient: kW (BTUM)	173.6 (9,871)
Fan Power: kW (hp)	95.4 (128)

// Air Requirements

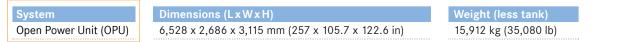
Agnirating: *m3 (min (CCEM)	100 (4 257)
Aspirating: *m³/min (SCFM)	180 (6,357)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	2,053 (72,500)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	634 (22,262)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	435 (815)
Gas Volume at Stack	
Temp: m³/min (CFM)	426 (15,044)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	DCCP Full Load
Level 0: Open Power Unit dB(A)	98.6

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
5.26	0.67	0.05

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Data Center Continuous Power (DCCP) ratings apply to data center installations where a utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 100%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 16V4000 DS2250

2045 kWe / 60 Hz / Data Center Continuous Power 380 - 13.8kV

Reference: MTU 16V4000 DS2250 (2250 kWe) for Standby Rating Technical Data MTU 16V4000 DS2250 (2045 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Data Center Continuous Power

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2045	2045	2045	2045	2045	2045	2045
kVA	2556	2556	2556	2556	2556	2556	2556
Amps	3888	3078	2463	355	118	112	107
skVA@30%							
Voltage Dip	3625	8400	3900	5000	4120	4120	4900
Generator							
Model	1020FDL1102	744RSL4058	1020FDS1013	744FSM4376	1020FDH1246	1020FDH1244	1020FDH1246
Temp Rise	130 °C/40 °C						
Connection	6 LEAD WYE	4 LEAD WYE	6 LEAD WYE				

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 Listed – Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Data Center Continuous Power (DCCP) rating is optimized for data center applications
- Uptime Institute compliant for Tier III and IV data centers
- No runtime limitation
- 100% Load Factor
- 10% Overload Available
- Accepts Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 16V4000 Diesel Engine
 - 76.3 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field
Centrifugal Oil Filtration	1 Bearing, Sealed
Closed Crankcase Ventilation	Flexible Coupling
Jacket Water Pump	Full Amortisseur Windings
Inter Cooler Water Pump	125% Rotor Balancing
Thermostats	3-Phase Voltage Sensing
Blower Fan and Fan Drive	±0.25% Voltage Regulation
Radiator - Unit Mounted	100% of Rated Load - One Step
Electric Starting Motor - 24V	5% Max. Total Harmonic Distortion
Governor – Electronic Isochronous	
Base - Structural Steel	
SAE Flywheel and Bell Housing	<pre>// Digital Control Panel(s)</pre>
Charging Alternator - 24V	
Battery Box and Cables	Digital Metering
Flexible Fuel Connectors	Engine Parameters
Flexible Exhaust Connection	Generator Protection Functions
EPA Certified Engine	Engine Protection

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise and motor starting	Prog UL R
Sustained short circuit current of up to 300% of the rated current for up to 10 seconds	Even IP 54
Self-Ventilated and Drip-Proof	NFP
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	16V4000G83
Туре	4-Cycle
Arrangement	16-V
Displacement: L (in ³)	76.3 (4,656)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	2,280 (3,058)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	300 (79.3)
Engine Jacket Water Capacity: L (gal)	175 (46.2)
After Cooler Water Capacity: L (gal)	50 (13.2)
System Coolant Capacity: L (gal)	547 (145)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,200 (317)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	558 (147)
At 75% of Power Rating: L/hr (gal/hr)	426 (113)
At 50% of Power Rating: L/hr (gal/hr)	299 (79)

// Cooling - Radiator System

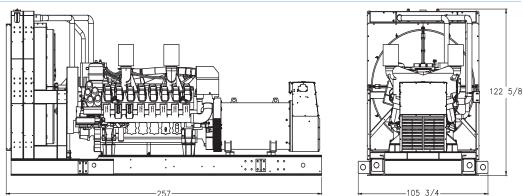
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,350 (357)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	840 (47,770)
Heat Rejection to After Cooler: kW (BTUM)	610 (34,690)
Heat Radiated to Ambient: kW (BTUM)	186.7 (10,615)
Fan Power: kW (hp)	95.4 (128)

// Air Requirements

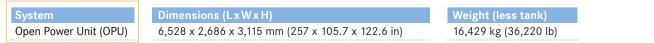
Aspirating: *m ³ /min (SCFM)	180 (6,357)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	2,053 (72,500)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	682 (23,940)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	480 (896)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	456 (16,103)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Data Center Continuous Power (DCCP) ratings apply to data center installations where a utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 100%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 20V4000 DS2500

2275 kWe / 60 Hz / Data Center Continuous Power 380 - 13.8kV

Reference: MTU 20V4000 DS2500 (2500 kWe) for Standby Rating Technical Data MTU 20V4000 DS2500 (2250 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Data Center Continuous Power

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2275	2275	2275	2275	2275	2275	2275
kVA	2843	2843	2843	2843	2843	2843	2843
Amps	4320	3420	2736	394	131	124	119
skVA@30%							
Voltage Dip	3400	4625	5200	5800	4300	4750	5350
Generator							
Model	1020FDL1104	1020FDL1102	1020FDS1122	1020FDM 1180	1020FDH 1248	1020FDH1248	1020FDH1250
Temp Rise	130 °C/40 °C						
Connection	6 LEAD WYE						

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 Listed – Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Data Center Continuous Power (DCCP) rating is optimized for data center applications
- Uptime Institute compliant for Tier III and IV data centers
- No runtime limitation
- 100% Load Factor
- 10% Overload Available
- Accepts Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 20V4000 Diesel Engine
 - 95.4 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Centrifugal Oil Filtration	2 Bearings, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Inter Cooler Water Pump	125% Rotor Balancing	
Thermostats	3-Phase Voltage Sensing	
Blower Fan and Fan Drive	±0.25% Voltage Regulation	
Radiator - Unit Mounted	100% of Rated Load - One Step	
Electric Starting Motor - 24V	5% Max. Total Harmonic Distortion	
Governor – Electronic Isochronous		
Base - Structural Steel		
SAE Flywheel and Bell Housing	<pre>// Digital Control Panel(s)</pre>	
Charging Alternator - 24V		
Battery Box and Cables	Digital Metering	
Flexible Fuel Connectors	Engine Parameters	
Flexible Exhaust Connection	Generator Protection Functions	
EPA Certified Engine	Engine Protection	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Pro
and motor starting	UL
Sustained short circuit current of up to 300% of the rated current for	Eve
up to 10 seconds	IP 5
Self-Ventilated and Drip-Proof	NFF
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

CANBus ECU Communications Windows[®]-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator ogrammable Input and Output Contacts

Recognized, CSA Certified, CE Approved ent Recording 54 Front Panel Rating with Integrated Gasket PA110 Compatible

// Engine

20V4000G43 6 ECT 4-Cycle 20-V 95.4 (5,822)
20-V
95.4 (5,822)
17 (6.69)
21 (8.27)
16.4:1
1,800
ectronic Isochronous (ADEC)
2,490 (3,339)
±0.25%
Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	390 (103)
Engine Jacket Water Capacity: L (gal)	205 (54.2)
After Cooler Water Capacity: L (gal)	30 (7.9)
System Coolant Capacity: L (gal)	814 (215)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	4,200

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,620 (428)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	587 (155)
At 75% of Power Rating: L/hr (gal/hr)	462 (122)
At 50% of Power Rating: L/hr (gal/hr)	337 (89)

// Cooling - Radiator System

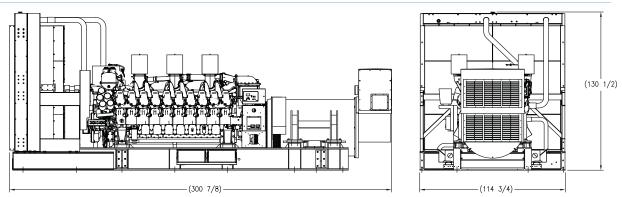
Ambient Capacity of Radiator: °C (°F)	54 (129)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,567 (414)
After Cooler Pump Capacity: L/min (gpm)	567 (150)
Heat Rejection to Coolant: kW (BTUM)	890 (50,613)
Heat Rejection to After Cooler: kW (BTUM)	580 (32,984)
Heat Radiated to Ambient: kW (BTUM)	203.6 (11,581)
Fan Power: kW (hp)	87.5 (117.3)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	228 (8,052)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	2,895 (102,247)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	744 (26,119)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	455 (851)
Gas Volume at Stack	
Temp: m³/min (CFM)	534 (18,858)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type Level 0: Open Power Unit dB(A)

DCCP Full Load

97.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Data Center Continuous Power (DCCP) ratings apply to data center installations where a utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 100%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 20V4000 DS2800

2500 kWe / 60 Hz / Data Center Continuous Power 380 - 13.8kV

Reference: MTU 20V4000 DS2800 (2800 kWe) for Standby Rating Technical Data MTU 20V4000 DS2800 (2500 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Data Center Continuous Power

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2500	2500	2500	2500	2500	2500	2500
kVA	3125	3125	3125	3125	3125	3125	3125
Amps	4748	3759	3007	434	145	137	131
skVA@30%							
Voltage Dip	4000	5400	5875	5250	5125	4875	6000
Generator							
Model	1030FDL1110	1020FDL1106	1020FDS1124	1020FDM1182	1030FDH1254	1030FDH1252	1030FDH1254
Temp Rise	130 °C/40 °C						
Connection	6 LEAD WYE						

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 Listed – Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Data Center Continuous Power (DCCP) rating is optimized for data center applications
- Uptime Institute compliant for Tier III and IV data centers
- No runtime limitation
- 100% Load Factor
- 10% Overload Available
- Accepts Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 20V4000 Diesel Engine
 - 95.4 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Centrifugal Oil Filtration	2 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Inter Cooler Water Pump	125% Rotor Balancing	
Thermostats	3-Phase Voltage Sensing	
Blower Fan and Fan Drive	±0.25% Voltage Regulation	
Radiator - Unit Mounted	100% of Rated Load - One Step	
Electric Starting Motor - 24V	5% Max. Total Harmonic Distortion	
Governor – Electronic Isochronous		
Base - Structural Steel		
SAE Flywheel and Bell Housing	<pre>// Digital Control Panel(s)</pre>	
Charging Alternator - 24V		
Battery Box and Cables	Digital Metering	
Flexible Fuel Connectors	Engine Parameters	
Flexible Exhaust Connection	Generator Protection Functions	
EPA Certified Engine	Engine Protection	

// Generator

	Remote Communications to RDP-110 Remote Annunciator	
NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Programmable Input and Output Contacts	
and motor starting	UL Recognized, CSA Certified, CE Approved	
Sustained short circuit current of up to 300% of the rated current for	Event Recording	
up to 10 seconds	IP 54 Front Panel Rating with Integrated Gasket	
Self-Ventilated and Drip-Proof	NFPA110 Compatible	
Superior Voltage Waveform		
Digital, Solid State, Volts-per-Hertz Regulator		

CANBus ECU Communications Windows[®]-Based Software

Multilingual Capability

// Engine

Manufacturer	MTU
Model	20V4000G83 6 ECT
Туре	4-Cycle
Arrangement	20-V
Displacement: L (in ³)	95.4 (5,822)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.4:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	2,740 (3,674)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	390 (103)
Engine Jacket Water Capacity: L (gal)	205 (54.2)
After Cooler Water Capacity: L (gal)	30 (7.9)
System Coolant Capacity: L (gal)	860 (227)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	4,200

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,620 (428)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	647 (171)
At 75% of Power Rating: L/hr (gal/hr)	511 (135)
At 50% of Power Rating: L/hr (gal/hr)	367 (97)

// Cooling - Radiator System

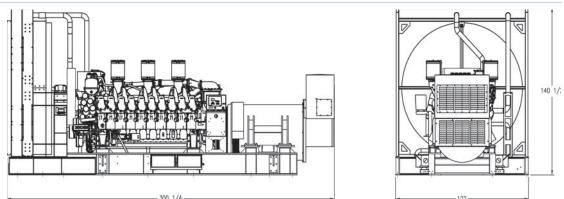
48 (118)
0.12 (0.5)
1,567 (414)
567 (150)
970 (55,162)
670 (38,102)
217.3 (12,360)
60.6 (81.3)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	240 (8,476)	
Air Flow Required for Rad.		
Cooled Unit: *m³/min (SCFM)	3,082 (108,843)	
Remote Cooled Applications;		
Air Flow Required for Dissipation		
of Radiated Generator Set Heat for a		
Max. of 25 °F Rise: *m ³ /min (SCFM)	794 (27,875)	

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	465 (869)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	576 (20,341)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



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Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type Level 0: Open Power Unit dB(A) DCCP Full Load

97.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Data Center Continuous Power (DCCP) ratings apply to data center installations where a utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 100%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 20V4000 DS3000

2800 kWe / 60 Hz / Data Center Continuous Power 380 - 13.8kV

Reference: MTU 20V4000 DS3000 (3000 kWe) for Standby Rating Technical Data MTU 20V4000 DS3000 (2800 kWe) for Prime Rating Technical Data



SYSTEM RATINGS

Data Center Continuous Power

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2800	2800	2800	2800	2800	2800	2800
kVA	3500	3500	3500	3500	3500	3500	3500
Amps	5318	4210	3368	486	162	153	146
skVA@30%							
Voltage Dip	4000	5400	6125	5250	5125	5625	6000
Generator							
Model	1030FDL1110	1030FDL1108	1030FDS1126	1020FDM1184	1030FDH1254	1030FDH 1254	1030FDH1254
Temp Rise	130 °C/40 °C						
Connection	6 LEAD WYE						

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 Listed – Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Data Center Continuous Power (DCCP) rating is optimized for data center applications
- Uptime Institute compliant for Tier III and IV data centers
- No runtime limitation
- 100% Load Factor
- 10% Overload Available
- Accepts Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 20V4000 Diesel Engine
 - 95.4 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Centrifugal Oil Filtration	2 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Inter Cooler Water Pump	125% Rotor Balancing	
Thermostats	3-Phase Voltage Sensing	
Blower Fan and Fan Drive	±0.25% Voltage Regulation	
Radiator - Unit Mounted	100% of Rated Load - One Step	
Electric Starting Motor - 24V	5% Max. Total Harmonic Distortion	
Governor – Electronic Isochronous		
Base - Structural Steel		
SAE Flywheel and Bell Housing	<pre>// Digital Control Panel(s)</pre>	
Charging Alternator - 24V		
Battery Box and Cables	Digital Metering	
Flexible Fuel Connectors	Engine Parameters	
Flexible Exhaust Connection	Generator Protection Functions	
EPA Certified Engine	Engine Protection	

// Generator

	Remote Communications to RDP-110 Remote Annunciator
NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Programmable Input and Output Contacts
and motor starting	UL Recognized, CSA Certified, CE Approved
Sustained short circuit current of up to 300% of the rated current for	Event Recording
up to 10 seconds	IP 54 Front Panel Rating with Integrated Gasket
Self-Ventilated and Drip-Proof	NFPA110 Compatible
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

CANBus ECU Communications Windows[®]-Based Software

Multilingual Capability

// Engine

Manufacturer	MTU
Model	20V4000G83L 6 ECT
Туре	4-Cycle
Arrangement	20-V
Displacement: L (in ³)	95.4 (5,822)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.4:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	3,010 (4,036)
Speed Regulation	±0.25%
Air Cleaner	Dry
•••••••••••••••••••••••••••••••••••••••	

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	390 (103)
Engine Jacket Water Capacity: L (gal)	205 (54.2)
After Cooler Water Capacity: L (gal)	30 (7.9)
System Coolant Capacity: L (gal)	860 (227)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	4,200

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,620 (428)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	712 (188)
At 75% of Power Rating: L/hr (gal/hr)	553 (146)
At 50% of Power Rating: L/hr (gal/hr)	390 (103)

// Cooling - Radiator System

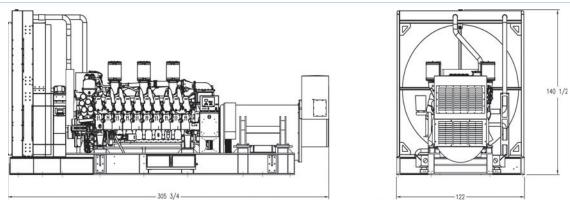
Ambient Capacity of Radiator: °C (°F)	47 (117)
Max. Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,567 (414)
After Cooler Pump Capacity: L/min (gpm)	567 (150)
Heat Rejection to Coolant: kW (BTUM)	1,040 (59,143)
Heat Rejection to After Cooler: kW (BTUM)	770 (43,789)
Heat Radiated to Ambient: kW (BTUM)	221.7 (12,606)
Fan Power: kW (hp)	60.6 (81.3)

// Air Requirements

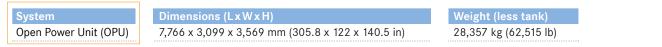
Aspirating: *m ³ /min (SCFM)	252 (8,900)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	3,082 (108,843)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	799 (28,041)

* Air density = 1.184 kg/m (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	480 (896)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	624 (22,036)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type Level 0: Open Power Unit dB(A)

DCCP Full Load 97.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Data Center Continuous Power (DCCP) ratings apply to data center installations where a utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 100%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 3R0096 DS30

27 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 3R0096 DS30 (30 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	208V**	240V**	380V**	480V**	600V**
Phase	1	3	3	3	3	3
PF	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	27	27	27	27	27	27
kVA	27	33	33	33	33	33
Amps	112.5	94	81	51	40	32
skVA@30%						
Voltage Dip	65	142	142	187	187	142
Generator Model	284PSL1700	284PSL1700	284PSL1700	284PSL1700	284PSL1700	284PSL5252
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 3029TFG89 Diesel Engine
- 2.9 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering

Programmable Input and Output Contacts

Event Recording

NFPA110 Compatible

UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

- LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	105 °C Max. Prime Temperature Rise
Oil Pump	1 Bearing, Sealed
Oil Drain Extension and S/O Valve	Flexible Coupling
Full Flow Oil Filter	Full Amortisseur Windings
Fuel Filter with Water Separator	125% Rotor Balancing
Jacket Water Pump	3-Phase Voltage Sensing
Thermostat	100% of Rated Load - One Step
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion
Radiator - Unit Mounted	
Electric Starting Motor - 12V	
Governor – Mechanical Droop	<pre>// Digital Control Panel(s)</pre>
Base - Formed Steel	
SAE Flywheel and Bell Housing	Digital Metering
Charging Alternator - 12V	Engine Parameters
Battery Box and Cables	Generator Protection Functions
Flexible Fuel Connectors	Engine Protection
Flexible Exhaust Connection	Windows [®] -Based Software
EPA Certified Engine	Multilingual Capability
	Remote Communications to RDP-110 Remote Annunciator

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

// Engine

Manufacturer	John Deere
Model	3029TFG89
Туре	4-Cycle
Arrangement	3-Inline
Displacement: L (in ³)	2.9 (177)
Bore: cm (in)	10.6 (4.2)
Stroke: cm (in)	11 (4.3)
Compression Ratio	17.2:1
Rated RPM	1,800
Engine Governor	Mechanical Droop
Max. Power: kWm (bhp)	31 (42)
Speed Regulation	±1%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	8 (2.1)
Engine Jacket Water Capacity: L (gal)	5.7 (1.5)
System Coolant Capacity: L (gal)	11.4 (3)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" ID/-6 JIC
Fuel Return Connection Size	1/4" ID/-6 JIC
Max. Fuel Lift: m (ft)	2 (6.6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	111.3 (29.4)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	9.1 (2.4)
At 75% of Power Rating: L/hr (gal/hr)	6.8 (1.8)
At 50% of Power Rating: L/hr (gal/hr)	4.9 (1.3)

// Cooling - Radiator System

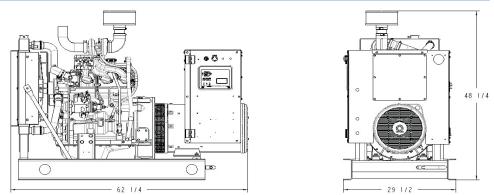
Ambient Capacity of Radiator: °C (°F)	50 (122)*
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	110 (29)
Heat Rejection to Coolant: kW (BTUM)	20.1 (1,144)
Heat Radiated to Ambient: kW (BTUM)	4.3 (245)
Fan Power: kW (hp)	0.7 (0.94)

 * Installation of a gravity exhaust louver in a Level 3 enclosure will reduce the ambient capacity of the cooling system by 5 °C (9 °F).

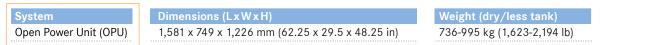
// Air Requirements

Aspirating: *m ³ /min (SCFM)	3.6 (127)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	46.7 (1,636)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	15.8 (553)
* Air density = 1.184 kg/m ³ (0.0739 lbm/ft ³)	

Gas Temp. (Stack): °C (°F)	580 (1,076)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	8.3 (293)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	71.3

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS40

40 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 4R0113 DS40 (40 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	208**	240V**	380V**	480V**	600V**
Phase	1	3	3	3	3	3
PF	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	40	40	40	40	40	40
kVA	40	50	50	50	50	50
Amps	167	139	120	76	60	48
skVA@30%						
Voltage Dip	63	128	128	128	172	92
Generator Model	361CSL1601	361CSL1601	361CSL1601	361CSL1601	361CSL1601	361PSL1632
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 3 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification - Optional - IBC Certification

// UL 2200 / CSA – Optional

- UL 2200 Listed

- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045TF280 Diesel Engine
 - 4.5 Liter Displacement
 - Mechanical Injection Pump
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts

Event Recording

NFPA110 Compatible

UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

- Complete System Metering
- LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	105 °C Max. Prime Temperature Rise
Oil Pump	1 Bearing, Sealed
Oil Drain Extension and S/O Valve	Flexible Coupling
Full Flow Oil Filter	Full Amortisseur Windings
Fuel Filter with Water Separator	125% Rotor Balancing
Jacket Water Pump	3-Phase Voltage Sensing
Thermostat	100% of Rated Load - One Step
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion
Radiator - Unit Mounted	
Electric Starting Motor - 12V	
Governor – Mechanical Droop	<pre>// Digital Control Panel(s)</pre>
Base - Formed Steel	
SAE Flywheel and Bell Housing	Digital Metering
Charging Alternator - 12V	Engine Parameters
Battery Box and Cables	Generator Protection Functions
Flexible Fuel Connectors	Engine Protection
Flexible Exhaust Connection	Windows [®] -Based Software
EPA Certified Engine	Multilingual Capability

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

// Engine

Manufacturer	John Deere
Model	4045TF280
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19.0:1
Rated RPM	1,800
Engine Governor	Mechanical Droop
Max. Power: kWm (bhp)	57 (76)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.3)
System Coolant Capacity: L (gal)	18.9 (5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Max. Fuel Lift: m (ft)	1.8 (6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	56.4 (14.9)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	15.9 (4.2)
At 75% of Power Rating: L/hr (gal/hr)	12.5 (3.3)
At 50% of Power Rating: L/hr (gal/hr)	9.1 (2.4)

// Cooling - Radiator System

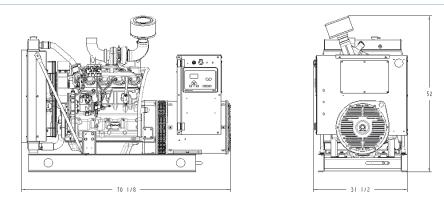
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	144 (38)
Heat Rejection to Coolant: kW (BTUM)	33 (1,878)
Heat Radiated to Ambient: kW (BTUM)	5.8 (327)
Fan Power: kW (hp)	1.6 (2.2)

// Air Requirements

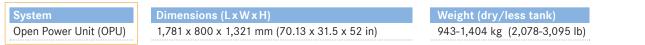
Aspirating: *m³/min (SCFM)	5.1 (180)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	117 (4,088)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	21 (738)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	551 (1,024)
Gas Volume at Stack	
Temp: m³/min (CFM)	18.3 (645)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)
Min. Allowable	
Back Pressure: kPa (in. H ₂ 0)	N/A



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	80.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
3.8	0.69	0.22

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS40

40 kWe / 60 Hz / Prime (SCAQMD) 208 - 600V

Reference MTU 4R0113 DS40 (40 kWe SCAQMD) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	208**	240V**	380V**	480V**	600V**
Phase	1	3	3	3	3	3
PF	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	40	40	40	40	40	40
kVA	40	50	50	50	50	50
Amps	167	139	120	76	60	48
skVA@30%						
Voltage Dip	63	128	128	128	172	92
Generator Model	361CSL1601	361CSL1601	361CSL1601	361CSL1601	361CSL1601	361PSL1632
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045TF290J Diesel Engine
 - 4.5 Liter Displacement
 - Mechanical Injection Pump
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional PMG

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts

Event Recording

NFPA110 Compatible

UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
- LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	105 °C Max. Prime Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Mechanical Droop	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	Windows [®] -Based Software	
EPA Certified Engine	Multilingual Capability	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

// Engine

Manufacturer	John Deere
Model	4045TF290J
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19.0:1
Rated RPM	1,800
Engine Governor	Mechanical Droop
Max. Power: kWm (bhp)	50 (67)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.3)
System Coolant Capacity: L (gal)	18.9 (5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under - 17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Max. Fuel Lift: m (ft)	1.8 (6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	112.8 (29.8)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	14.2 (3.8)
At 75% of Power Rating: L/hr (gal/hr)	10.9 (2.9)
At 50% of Power Rating: L/hr (gal/hr)	7.4 (2)

// Cooling - Radiator System

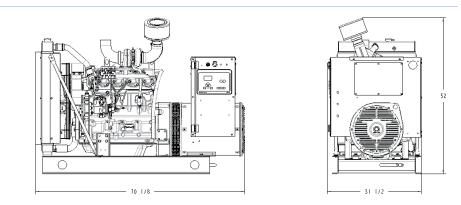
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	144 (38)
Heat Rejection to Coolant: kW (BTUM)	29 (1,651)
Heat Radiated to Ambient: kW (BTUM)	5.8 (327)
Fan Power: kW (hp)	1.6 (2.2)

// Air Requirements

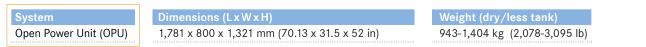
Aspirating: *m ³ /min (SCFM)	4.3 (152)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	117 (4,088)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	21 (738)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	506 (943)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	12 (424)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)
Min. Allowable	
Back Pressure: kPa (in. H ₂ 0)	N/A



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	80.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS50

45 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 4R0113 DS50 (50 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	240V**	208V**	240V**	380V**	480V**	600V**
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	45	45	45	45	45	45	45
kVA	45	45	56	56	56	56	56
Amps	187	187	156	135	85	67	54
skVA@30%							
Voltage Dip	127	117	129	129	172	172	92
Generator							
Model	362CSL1604	361CSL1612	361CSL1601	361CSL1601	361CSL1602	361CSL1601	361PSL1632
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 3 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional - IBC Certification

- IBC Certification

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045TF280 Diesel Engine
- 4.5 Liter Displacement
 - Mechanical Injection Pump
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	105 °C Max. Prime Temperature Rise		
Oil Pump	1 Bearing, Sealed		
Oil Drain Extension and S/O Valve	Flexible Coupling		
Full Flow Oil Filter	Full Amortisseur Windings		
Fuel Filter with Water Separator	125% Rotor Balancing		
Jacket Water Pump	3-Phase Voltage Sensing		
Thermostat	100% of Rated Load - One Step		
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion		
Radiator - Unit Mounted			
Electric Starting Motor - 12V			
Governor – Mechanical Droop	<pre>// Digital Control Panel(s)</pre>		
Base - Formed Steel			
SAE Flywheel and Bell Housing	Digital Metering		
Charging Alternator - 12V	Engine Parameters		
Battery Box and Cables	Generator Protection Functions		
Flexible Fuel Connectors	Engine Protection		
Flexible Exhaust Connection	Windows [®] -Based Software		
EPA Certified Engine	Multilingual Capability		

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Digital Metering Engine Parameters Generator Protection Functions Engine Protection Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	John Deere
Model	4045TF280
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19:1
Rated RPM	1,800
Engine Governor	Mechanical Droop
Max. Power: kWm (bhp)	57 (76)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.3)
System Coolant Capacity: L (gal)	18.9 (5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Max. Fuel Lift: m (ft)	1.8 (6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	56.4 (14.9)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	15.9 (4.2)
At 75% of Power Rating: L/hr (gal/hr)	12.5 (3.3)
At 50% of Power Rating: L/hr (gal/hr)	9.1 (2.4)

// Cooling - Radiator System

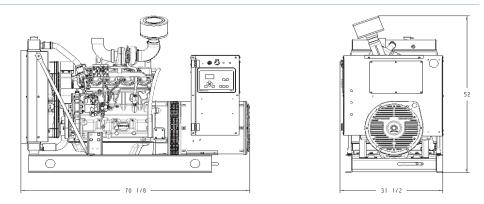
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	144 (38)
Heat Rejection to Coolant: kW (BTUM)	33 (1,878)
Heat Radiated to Ambient: kW (BTUM)	7.3 (415)
Fan Power: kW (hp)	1.6 (2.2)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	5.1 (180)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	117 (4,088)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	27 (937)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	551 (1,024)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	18.3 (645)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)
Min. Allowable	
Back Pressure: kPa (in. H ₂ 0)	N/A



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	80.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
3.8	0.69	0.22

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS50

45 kWe / 60 Hz / Prime (SCAQMD) 208 - 600V

Reference MTU 4R0113 DS50 (50 kWe SCAQMD) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	240V**	208V**	240V**	380V**	480V**	600V**
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	45	45	45	45	45	45	45
kVA	45	45	56	56	56	56	56
Amps	187	187	156	135	85	67	54
skVA@30%							
Voltage Dip	127	117	129	129	172	172	92
Generator							
Model	362CSL1604	361CSL1612	361CSL1601	361CSL1601	361CSL1602	361CSL1601	361PSL1632
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045TF290J Diesel Engine
 - 4.5 Liter Displacement
 - Mechanical Injection Pump
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts

Event Recording

NFPA110 Compatible

UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

- Complete System Metering
- LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	105 °C Max. Prime Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Mechanical Droop	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	Windows [®] -Based Software	
EPA Certified Engine	Multilingual Capability	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

// Engine

Manufacturer	John Deere
Model	4045TF290J
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19:1
Rated RPM	1,800
Engine Governor	Mechanical Droop
Max. Power: kWm (bhp)	50 (67)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.3)
System Coolant Capacity: L (gal)	18.9 (5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under - 17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Max. Fuel Lift: m (ft)	1.8 (6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	112.8 (29.8)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	14.2 (3.8)
At 75% of Power Rating: L/hr (gal/hr)	10.9 (2.9)
At 50% of Power Rating: L/hr (gal/hr)	7.4 (2)

// Cooling - Radiator System

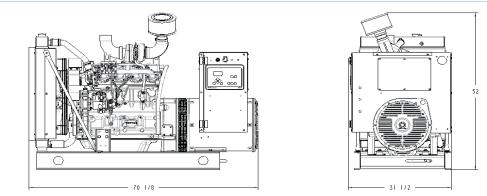
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	144 (38)
Heat Rejection to Coolant: kW (BTUM)	29 (1,651)
Heat Radiated to Ambient: kW (BTUM)	5.8 (327)
Fan Power: kW (hp)	1.6 (2.2)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	4.3 (152)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	117 (4,088)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	21 (738)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	506 (943)
Gas Volume at Stack	
Temp: m³/min (CFM)	12 (424)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)
Min. Allowable	
Back Pressure: kPa (in. H ₂ 0)	N/A



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	80.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS60

55 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 4R0113 DS60 (60 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	380V**	480V**	600V**
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	55	55	55	55	55	55	55
kVA	55	55	68	68	68	68	68
Amps	229	229	190	165	104	82	66
skVA@30%							
Voltage Dip	127	130	200	200	172	172	172
Generator							
Model	362CSL1604	361CSL1613	361CSL1602	361CSL1602	361CSL1602	361CSL1601	361PSL1633
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 3 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification - Optional - IBC Certification

- IBC Certification

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045HF280 Diesel Engine
- 4.5 Liter Displacement
- Mechanical Injection Pump
- 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	105 °C Max. Prime Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Mechanical Droop	// Digital Control Panel(s)	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	Windows [®] -Based Software	
EPA Certified Engine	Multilingual Capability	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Engine Parameters Generator Protection Functions Engine Protection Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	John Deere
Model	4045HF280
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19.0:1
Rated RPM	1,800
Engine Governor	Mechanical Droop
Max. Power: kWm (bhp)	67 (90)
Speed Regulation	±0.5%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.3)
System Coolant Capacity: L (gal)	16.7 (4.4)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Max. Fuel Lift: m (ft)	1.8 (6)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	113 (29.9)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	17.8 (4.7)
At 75% of Power Rating: L/hr (gal/hr)	13.6 (3.6)
At 50% of Power Rating: L/hr (gal/hr)	9.5 (2.5)

// Cooling - Radiator System

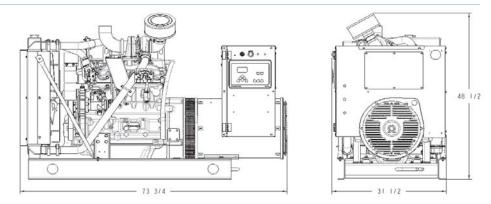
50 (122)
0.12 (0.5)
144 (38)
33 (1,849)
4 (233)
9.2 (522)
1.16 (1.55)

// Air Requirements

5.3 (187)
91 (3,162)
34 (1,176)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	515 (959)
Gas Volume at Stack	
Temp: m³/min (CFM)	13.5 (477)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)
Min. Allowable	
Back Pressure: kPa (in. H ₂ 0)	N/A



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	76.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0120 DS80

72 kWe/60 Hz/Prime 208 - 600V

Reference MTU 4R0120 DS80 (80 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	72	72	72	72	72	72	72
kVA	72	72	90	90	90	90	90
Amps	300	300	250	217	137	108	87
skVA@30%							
Voltage Dip	133	311	216	216	165	288	236
Generator							
Model	362CSL1606	363CSL1617	362CSL1604	362CSL1604	362CSL1606	362CSL1604	362PSL1635
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM924LA Diesel Engine - 4.8 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	105 °C Max. Prime Temperature Rise
Oil Pump	1 Bearing, Sealed
Oil Drain Extension and S/O Valve	Flexible Coupling
Full Flow Oil Filter	Full Amortisseur Windings
Fuel Filter with Water Separator	125% Rotor Balancing
Jacket Water Pump	3-Phase Voltage Sensing
Thermostat	100% of Rated Load - One Step
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion
Radiator - Unit Mounted	
Electric Starting Motor - 12V	
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>
Base - Formed Steel	
SAE Flywheel and Bell Housing	Digital Metering
Charging Alternator - 12V	Engine Parameters
Battery Box and Cables	Generator Protection Functions
Flexible Fuel Connectors	Engine Protection
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications
EPA Certified Engine	Windows [®] -Based Software

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM924LA
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.8 (293)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	134 (180)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	15.8 (4.2)
Engine Jacket Water Capacity: L (gal)	7 (1.8)
System Coolant Capacity: L (gal)	20.8 (5.5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.7 (9)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	328.2 (86.7)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	17 (4.5)
At 75% of Power Rating: L/hr (gal/hr)	12.9 (3.4)
At 50% of Power Rating: L/hr (gal/hr)	9.1 (2.4)

* Based on 362CSL1604 480 Volt generator set

// Cooling - Radiator System

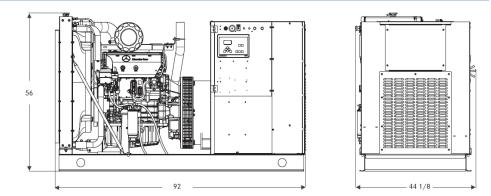
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	143 (37)
Heat Rejection to Coolant: kW (BTUM)	33.6 (1,911)
Heat Rejection to Air to Air: kW (BTUM)	21.3 (1,211)
Heat Radiated to Ambient: kW (BTUM)	22.2 (1,263)
Fan Power: kW (hp)	3.3 (4.4)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	8.2 (290)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	209 (7,381)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	81 (2,860)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	334 (634)
Gas Volume at Stack	
Temp: m³/min (CFM)	20.3 (717)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	6.5 (26)



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Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	83

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

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C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS80

80 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 4R0113 DS80 (80 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	80	80	80	80	80	80
kVA	80	80	100	100	100	100
Amps	333	333	278	241	120	96
skVA@30%						
Voltage Dip	157	310	258	258	288	235
Generator Model	363CSL1607	363CSL1617	362CSL1606	362CSL1606	362CSL1604	362PSL1635
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

- OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045HF285 Diesel Engine
 - 4.5 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	105 °C Maximum Prime Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension & S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan & Fan Drive	5% Maximum Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel & Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box & Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	
EFA Gertined Engine		

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

oad Exciter

Event Recording

Multilingual Capability

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

// Engine

Manufacturer	John Deere
Model	4045HF285
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	107 (144)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	12 (3.2)
Engine Jacket Water Capacity: L (gal)	12.5 (3.3)
System Coolant Capacity: L (gal)	20.1 (5.3)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	74.6 (19.7)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	23.1 (6.1)
At 75% of Power Rating: L/hr (gal/hr)	18.5 (4.9)
At 50% of Power Rating: L/hr (gal/hr)	13.2 (3.5)

// Cooling - Radiator System

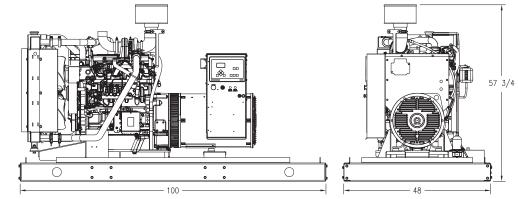
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Allowable Static	
Pressure on Rad. Exhaust: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	180 (48)
Heat Rejection to Coolant: kW (BTUM)	56 (3,190)
Heat Rejection to Air to Air: kW (BTUM)	17.6 (1,002)
Heat Radiated to Ambient: kW (BTUM)	10.5 (596)
Fan Power: kW (hp)	6.5 (8.7)

// Air Requirements

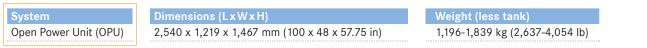
Aspirating: *m ³ /min (SCFM)	7.7 (273)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	187 (6,587)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	38 (1,343)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	560 (1,040)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	21.2 (750)
Maximum Allowable	
Back Pressure: kPa (in. H_2^0)	7.5 (30)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	83.3

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0113 DS100

90 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 4R0113 DS100 (100 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

240V**	240V**	208V**	240V**	480V**	600V**
1	1	3	3	3	3
1	1	0.8	0.8	0.8	0.8
60	60	60	60	60	60
90	90	90	90	90	90
90	90	113	113	113	113
375	375	312	271	135	108
136	193	323	323	430	333
431CSL6204	431PSL6224	363CSL1607	363CSL1607	363CSL1607	363PSL1658
105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE
	105 °C/40 °C 12 LEAD	1 1 60 60 90 90 90 90 375 375 136 193 431CSL6204 431PSL6224 105 °C/40 °C 105 °C/40 °C 12 LEAD 4 LEAD	1 1 0.8 60 60 60 90 90 90 90 90 113 375 375 312 136 193 323 431CSL6204 431PSL6224 363CSL1607 105 °C/40 °C 105 °C/40 °C 105 °C/40 °C 12 LEAD 4 LEAD 12 LEAD LOW WYE	1 1 0.8 0.8 60 60 60 60 60 90 90 90 90 90 90 90 113 113 113 375 375 312 271 136 193 323 323 431CSL6204 431PSL6224 363CSL1607 363CSL1607 105 °C/40 °C 105 °C/40 °C 105 °C/40 °C 105 °C/40 °C 12 LEAD 4 LEAD 12 LEAD LOW WYE 12 LEAD HI DELTA	1 1 0.8 0.8 0.8 0.8 60 60 60 60 60 60 60 90 90 90 90 90 90 90 90 90 90 113 113 113 113 113 375 375 312 271 135 135 136 193 323 323 323 430 431CSL6204 431PSL6224 363CSL1607 363CSL1607 363CSL1607 105 °C/40 °C 12 LEAD 4 LEAD 12 LEAD LOW WYE 12 LEAD HI DELTA 12 LEAD HI WYE

**UL2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

- OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045HF285 Diesel Engine
 - 4.5 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	105 °C Maximum Prime Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension & S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostats	100% of Rated Load - One Step	
Blower Fan & Fan Drive	5% Maximum Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel & Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box & Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

ad xciter

Multilingual Capability

Event Recording

Remote Communications to RDP-110 Remote Annunciator

Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved

IP 54 Front Panel Rating with Integrated Gasket

// Engine

Manufacturer	John Deere
Model	4045HF285
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (8)
Compression Ratio	19:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	107 (144)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	12 (3.2)
Engine Jacket Water Capacity: L (gal)	12.5 (3.3)
System Coolant Capacity: L (gal)	20.1 (5.3)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	74.6 (19.7)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	28 (7.4)
At 75% of Power Rating: L/hr (gal/hr)	22.3 (5.9)
At 50% of Power Rating: L/hr (gal/hr)	15.9 (4.2)

// Cooling - Radiator System

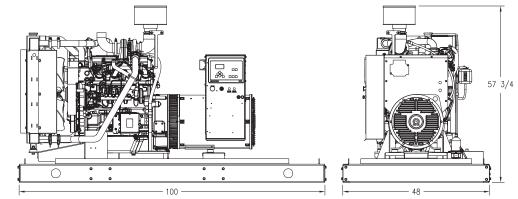
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	180 (48)
Heat Rejection to Coolant: kW (BTUM)	56 (3,190)
Heat Rejection to Air to Air: kW (BTUM)	17.6 (1,002)
Heat Radiated to Ambient: kW (BTUM)	13.8 (785)
Fan Power: kW (hp)	6.5 (8.7)

// Air Requirements

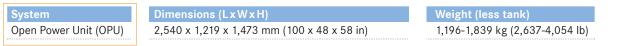
Aspirating: *m ³ /min (SCFM)	7.7 (273)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	187 (6,587)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	50 (1,771)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	560 (1,040)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	21.2 (750)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	83.3

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
3.97	0.72	0.08

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0120 DS100

90 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 4R0120 DS100 (100 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	90	90	90	90	90	90	90
kVA	90	90	113	113	113	113	113
Amps	375	375	312	271	171	135	108
skVA@30%							
Voltage Dip	145	311	258	258	269	344	272
Generator							
Model	363CSL1607	363CSL1617	362CSL1606	362CSL1606	363CSL1607	362CSL1606	362PSL1636
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM924LA Diesel Engine - 4.8 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	105 °C Max. Prime Temperature Rise
Oil Pump	1 Bearing, Sealed
Oil Drain Extension and S/O Valve	Flexible Coupling
Full Flow Oil Filter	Full Amortisseur Windings
Fuel Filter with Water Separator	125% Rotor Balancing
Jacket Water Pump	3-Phase Voltage Sensing
Thermostats	100% of Rated Load - One Step
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion
Radiator - Unit Mounted	
Electric Starting Motor - 12V	
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>
Base - Formed Steel	
SAE Flywheel and Bell Housing	Digital Metering
Charging Alternator - 12V	Engine Parameters
Battery Box and Cables	Generator Protection Functions
Flexible Fuel Connectors	Engine Protection
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications
EPA Certified Engine	Windows [®] -Based Software

// Generator

Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM924LA
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.8 (293)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	134 (180)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	15.8 (4.2)
Engine Jacket Water Capacity: L (gal)	7 (1.8)
System Coolant Capacity: L (gal)	20.8 (5.5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.7 (9)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	328.2 (86.7)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	21.2 (5.6)
At 75% of Power Rating: L/hr (gal/hr)	15.9 (4.2)
At 50% of Power Rating: L/hr (gal/hr)	11 (2.9)

* Based on 362CSL1606 480 Volt generator set

// Cooling - Radiator System

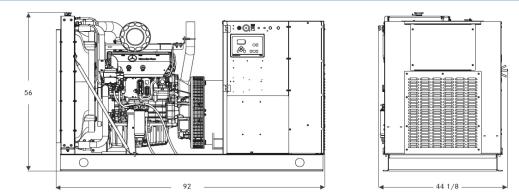
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	143 (37)
Heat Rejection to Coolant: kW (BTUM)	41.4 (2,354)
Heat Rejection to Air to Air: kW (BTUM)	25.3 (1,439)
Heat Radiated to Ambient: kW (BTUM)	24.7 (1,405)
Fan Power: kW (hp)	3.3 (4.4)

// Air Requirements

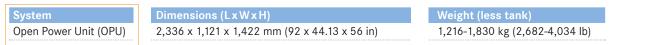
Aspirating: *m ³ /min (SCFM)	8.9 (314)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	209 (7,381)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	90.2 (3,185)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	374 (706)
Gas Volume at Stack	
Temp: m³/min (CFM)	22.8 (805)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	6.5 (26)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	83.3

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

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DIESEL GENERATOR SET MTU 4R0113 DS125

111 kWe/60 Hz/Prime 208 - 600V

Reference MTU 4R0113 DS125 (125 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	111	111	111	111	111	111
kVA	111	111	139	139	139	139
Amps	463	463	385	334	167	134
skVA@30%						
Voltage Dip	187	192	296	296	430	333
Generator Model	431PSL6206	431PSL6224	431CSL6202	431CSL6202	363PSL1607	363PSL1658
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

- OSHPD Pre-Approval

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 4045HF285 Diesel Engine
- 4.58 Liter Displacement
- 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	105 °C Maximum Prime Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension & S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan & Fan Drive	5% Maximum Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel & Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box & Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	
	Windows Dased Contware	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

 Multilingual Capability

 Remote Communications to RDP-110 Remote Annunciator

 Programmable Input and Output Contacts

 UL Recognized, CSA Certified, CE Approved

 ature rise

 Event Recording

 IP 54 Front Panel Rating with Integrated Gasket

 NFPA110 Compatible

// Engine

Manufacturer	John Deere
Model	4045HF285
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.5 (275)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	134 (180)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	13 (3.4)
Engine Jacket Water Capacity: L (gal)	8.5 (2.2)
System Coolant Capacity: L (gal)	24 (6.2)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	90.1 (23.8)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	34.6 (9.2)
At 75% of Power Rating: L/hr (gal/hr)	26.9 (7.1)
At 50% of Power Rating: L/hr (gal/hr)	21.2 (5.6)

// Cooling - Radiator System

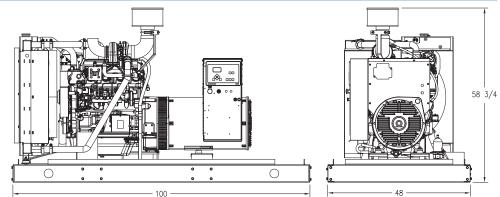
50 (122)
0.12 (0.5)
180 (48)
64.1 (3,643)
22.8 (1,295)
17.1 (972)
10.6 (14.2)

// Air Requirements

8.8 (311)
433 (15,303)
61 (2,159)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	572 (1,062)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	24.6 (869)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)



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Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	86.8

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

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/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 4R0120 DS125

111 kWe/60 Hz/Prime 208 - 600V

Reference MTU 4R0120 DS125 (125 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	111	111	111	111	111	111	111
kVA	111	111	139	139	139	139	139
Amps	463	463	385	334	211	167	134
skVA@30%							
Voltage Dip	184	196	296	296	191	430	334
Generator							
Model	431CSL6208	431PSL6224	431CSL6202	431CSL6202	431CSL6202	363CSL1607	363PSL1658
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM924LA Diesel Engine - 4.8 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	105 °C Max. Prime Temperature Rise
Oil Pump	1 Bearing, Sealed
Oil Drain Extension and S/O Valve	Flexible Coupling
Full Flow Oil Filter	Full Amortisseur Windings
Fuel Filter with Water Separator	125% Rotor Balancing
Jacket Water Pump	3-Phase Voltage Sensing
Thermostat	100% of Rated Load - One Step
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion
Radiator - Unit Mounted	// Digital Control Panel(s)
Electric Starting Motor - 12V	
Governor – Electronic Isochronous	
Base - Formed Steel	
SAE Flywheel and Bell Housing	Digital Metering
Charging Alternator - 12V	Engine Parameters
Battery Box and Cables	Generator Protection Functions
Flexible Fuel Connectors	Engine Protection
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications
EPA Certified Engine	Windows [®] -Based Software
	Windows Dasca Contware

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	
and motor starting	
Self-Ventilated and Drip-Proof	
Superior Voltage Waveform	
Solid State, Volts-per-Hertz Regulator	
±1% Voltage Regulation No Load to Full Load	
Brushless Alternator with Brushless Pilot Exciter	
4 Pole, Rotating Field	

 Multilingual Capability

 Remote Communications to RDP-110 Remote Annunciator

 Programmable Input and Output Contacts

 UL Recognized, CSA Certified, CE Approved

 temperature rise

 Event Recording

 IP 54 Front Panel Rating with Integrated Gasket

 NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM924LA
Туре	4-Cycle
Arrangement	4-Inline
Displacement: L (in ³)	4.8 (293)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	134 (180)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	15.8 (4.2)
Engine Jacket Water Capacity: L (gal)	7 (1.8)
System Coolant Capacity: L (gal)	20.8 (5.5)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.7 (9)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	328.2 (86.7)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	25.7 (6.8)
At 75% of Power Rating: L/hr (gal/hr)	19.3 (5.1)
At 50% of Power Rating: L/hr (gal/hr)	12.9 (3.4)

* Based on 363CSL1607 480 Volt generator set

// Cooling - Radiator System

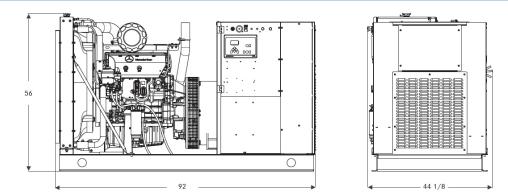
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5))
Water Pump Capacity: L/min (gpm)	143 (37)
Heat Rejection to Coolant: kW (BTUM)	49.5 (2,815)
Heat Rejection to Air to Air: kW (BTUM)	27.7 (1,575)
Heat Radiated to Ambient: kW (BTUM)	25.2 (1,433)
Fan Power: kW (hp)	3.3 (4.4)

// Air Requirements

Aspirating: *m³/min (SCFM)	9.2 (325)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	209 (7,381)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	92 (3,249)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	426 (799)
	()
Gas Volume at Stack	
Temp: m ³ /min (CFM)	24.9 (879)
	24.9 (079)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	6.5 (26)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	83.3

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

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C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R0113 DS 150

135 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 6R0113 DS150 (150 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	135	135	135	135	135	135
kVA	135	135	169	169	169	169
Amps	563	563	468	406	203	162
skVA@30%						
Voltage Dip	267	310	339	339	451	375
Generator Model	432CSL6210	431PSL6226	431CSL6204	431CSL6204	431CSL6204	431PSL6242
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

**UL2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

- OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6068HF285 Diesel Engine
- 6.8 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	105 °C Maximum Prime Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension & S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan & Fan Drive	5% Maximum Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel & Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box & Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

 Remote Communications to RDP-110 Remote Annunciator

 Programmable Input and Output Contacts

 UL Recognized, CSA Certified, CE Approved

 rature rise

 Event Recording

 IP 54 Front Panel Rating with Integrated Gasket

 NFPA110 Compatible

Multilingual Capability

// Engine

Manufacturer	John Deere
Model	6068HF285
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	6.8 (415)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	161 (216)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	20 (5.28)
Engine Jacket Water Capacity: L (gal)	12.3 (3.25)
System Coolant Capacity: L (gal)	22.7 (6)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	107.2 (28.3)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	40.1 (10.6)
At 75% of Power Rating: L/hr (gal/hr)	31.4 (8.3)
At 50% of Power Rating: L/hr (gal/hr)	22.7 (6)

// Cooling - Radiator System

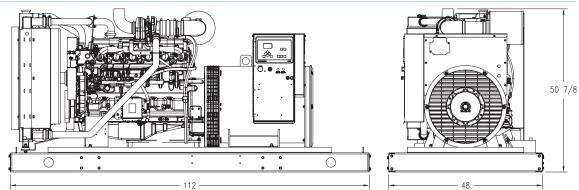
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Allowable Static	
Pressure on Rad. Exhaust: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	180 (48)
Heat Rejection to Coolant: kW (BTUM)	84.3 (4,792)
Heat Rejection to Air to Air: kW (BTUM)	30 (1,702)
Heat Radiated to Ambient: kW (BTUM)	21.8 (1,239)
Fan Power: kW (hp)	10.7 (14.3)

// Air Requirements

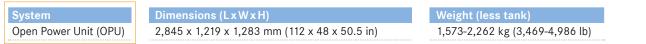
13.3 (470)
304 (10,732)
80 (2,794)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	491 (916)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	33 (1,165)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	7.5 (30)



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Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	86.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R0120 DS150

135 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 6R0120 DS150 (150 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	135	135	135	135	135	135	135
kVA	135	135	169	169	169	169	169
Amps	563	563	468	406	256	203	162
skVA@30%							
Voltage Dip	188	196	296	296	282	394	394
Generator							
Model	431CSL6206	431PSL6224	431CSL6202	431CSL6202	431CSL6204	431CSL6202	431PSL6240
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM926LA Diesel Engine
- 7.2 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	105 °C Max. Prime Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	// Digital Control Panel(s)	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
	Windows @ Desert Or fragment	
EPA Certified Engine	Windows [®] -Based Software	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM926LA
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	7.2 (439)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	225 (302)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	29 (7.7)
Engine Jacket Water Capacity: L (gal)	10 (2.6)
System Coolant Capacity: L (gal)	24.1 (6.4)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.6 (8.5)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	330.5 (87.3)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	36 (9.5)
At 75% of Power Rating: L/hr (gal/hr)	26.9 (7.1)
At 50% of Power Rating: L/hr (gal/hr)	18.5 (4.9)

* Based on 431CSL6202 480 Volt generator set

// Cooling - Radiator System

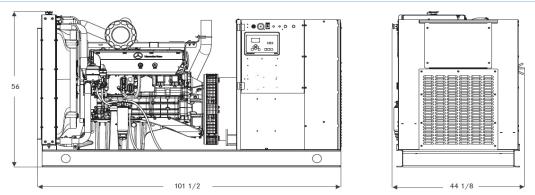
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	143 (37)
Heat Rejection to Coolant: kW (BTUM)	72.7 (4,134)
Heat Rejection to Air to Air: kW (BTUM)	47.4 (2,696)
Heat Radiated to Ambient: kW (BTUM)	28.7 (1,632)
Fan Power: kW (hp)	15.6 (22.1)

// Air Requirements

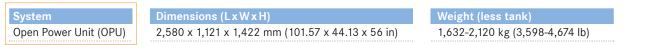
Aspirating: *m ³ /min (SCFM)	12.8 (452)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	408 (14,408)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	104.9 (3,705)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	410 (770)
Gas Volume at Stack	
Temp: m³/min (CFM)	36.8 (1,300)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	10.5 (42)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	88.7

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R0120 DS180

163 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 6R0120 DS180 (180 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	163	163	163	163	163	163	163
kVA	163	163	204	204	204	204	204
Amps	679	679	566	490	310	246	196
skVA@30%							
Voltage Dip	268	366	339	339	362	451	375
Generator							
Model	432CSL6210	432PSL6228	431CSL6204	431CSL6204	431CSL6206	431CSL6204	431PSL6242
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM926LA Diesel Engine
- 7.2 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	105 °C Max. Prime Temperature Rise
Oil Pump	1 Bearing, Sealed
Oil Drain Extension and S/O Valve	Flexible Coupling
Full Flow Oil Filter	Full Amortisseur Windings
Fuel Filter with Water Separator	125% Rotor Balancing
Jacket Water Pump	3-Phase Voltage Sensing
Thermostat	100% of Rated Load - One Step
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion
Radiator - Unit Mounted	
Electric Starting Motor - 12V	
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>
Base - Formed Steel	
SAE Flywheel and Bell Housing	Digital Metering
Charging Alternator - 12V	Engine Parameters
Battery Box and Cables	Generator Protection Functions
Flexible Fuel Connectors	Engine Protection
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications
EPA Certified Engine	Windows [®] -Based Software

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM926LA
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	7.2 (439)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	225 (302)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	29 (7.7)
Engine Jacket Water Capacity: L (gal)	10 (2.6)
System Coolant Capacity: L (gal)	24.1 (6.4)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.6 (8.5)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	330.5 (87.3)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	44.7 (11.8)
At 75% of Power Rating: L/hr (gal/hr)	32.2 (8.5)
At 50% of Power Rating: L/hr (gal/hr)	22 (5.8)

* Based on 431CSL6204 480 Volt generator set

// Cooling - Radiator System

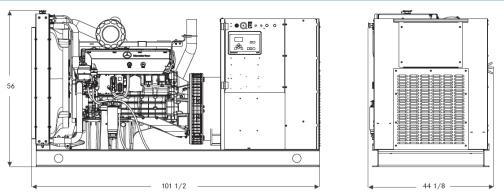
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	143 (37)
Heat Rejection to Coolant: kW (BTUM)	82.4 (4,686)
Heat Rejection to Air to Air: kW (BTUM)	52.7 (2,997)
Heat Radiated to Ambient: kW (BTUM)	32.9 (1,871)
Fan Power: kW (hp)	15.6 (22.1)

// Air Requirements

Aspirating: *m³/min (SCFM)	13.9 (491)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	408 (14,408)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	120.2 (4,245)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	457 (855)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	40.9 (1,444)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	10.5 (42)



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Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	88.8

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	СО	РМ
3.93	1.2	0.06

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R0113 DS 180

180 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 6R0113 DS180 (180 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	C/F	C/F	3	3	3	3
PF	C/F	C/F	0.8	0.8	0.8	0.8
Hz	C/F	C/F	60	60	60	60
kW	C/F	C/F	180	180	180	180
kVA	C/F	C/F	225	225	225	225
Amps	C/F	C/F	625	541	271	217
skVA@30%						
Voltage Dip	C/F	C/F	454	454	577	510
Generator Model	C/F	C/F	431CSL6208	431CSL6208	431CSL6206	431PSL6243
Temp Rise	C/F	C/F	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	C/F	C/F	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions

- EPA Tier 3 Certified
- South Coast Air Quality Management District (SCAQMD)
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

- OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6068HFG85 Diesel Engine
- 6.8 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	105 °C Maximum Prime Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension & S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan & Fan Drive	5% Maximum Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel & Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box & Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

 Windows®-Based Software

 Multilingual Capability

 Remote Communications to RDP-110 Remote Annunciator

 Programmable Input and Output Contacts

 UL Recognized, CSA Certified, CE Approved

 e rise

 Event Recording

 IP 54 Front Panel Rating with Integrated Gasket

 NFPA110 Compatible

// Engine

Manufacturer	John Deere
Model	6068HFG85
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	6.8 (415)
Bore: cm (in)	10.6 (4.2)
Stroke: cm (in)	12.7 (5)
Compression Ratio	17:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	214 (286)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	32.2 (8.5)
Engine Jacket Water Capacity: L (gal)	11.9 (3.3)
System Coolant Capacity: L (gal)	29.3 (7.75)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	93 (24.5)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	51.9 (13.5)
At 75% of Power Rating: L/hr (gal/hr)	40.5 (10.7)
At 50% of Power Rating: L/hr (gal/hr)	27.6 (7.3)

// Cooling - Radiator System

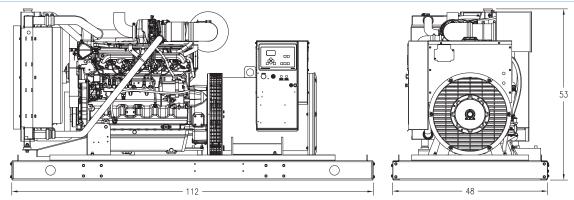
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	265 (70)
Heat Rejection to Coolant: kW (BTUM)	83.7 (4,766)
Heat Rejection to Air to Air: kW (BTUM)	40 (2,298)
Heat Radiated to Ambient: kW (BTUM)	25.5 (1,453)
Fan Power: kW (hp)	8.6 (11.5)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	14.7 (520)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	412 (14,537)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m³/min (SCFM)	93 (3,277)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	528 (982)
Gas Volume at Stack	
Temp: m³/min (CFM)	38.8 (1,371)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	10 (40)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	87.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R0120 DS200

180 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 6R0120 DS200 (200 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	240V	240V	208V	240V	380V	480V	600V
Phase	1	1	3	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	180	180	180	180	180	180	180
kVA	180	180	225	225	225	225	225
Amps	750	750	625	541	342	271	217
skVA@30%							
Voltage Dip	268	366	433	433	373	577	510
Generator							
Model	432CSL6210	432PSL6228	431CSL6206	431CSL6206	431CSL6208	431CSL6206	431PSL6243
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	4 LEAD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified
- CE Marking Provided

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // OM926LA Diesel Engine
- 7.2 Liter Displacement
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	105 °C Max. Prime Temperature Rise	
Oil Pump	1 Bearing, Sealed	
Oil Drain Extension and S/O Valve	Flexible Coupling	
Full Flow Oil Filter	Full Amortisseur Windings	
Fuel Filter with Water Separator	125% Rotor Balancing	
Jacket Water Pump	3-Phase Voltage Sensing	
Thermostat	100% of Rated Load - One Step	
Blower Fan and Fan Drive	5% Max. Total Harmonic Distortion	
Radiator - Unit Mounted		
Electric Starting Motor - 12V		
Governor – Electronic Isochronous	<pre>// Digital Control Panel(s)</pre>	
Base - Formed Steel		
SAE Flywheel and Bell Housing	Digital Metering	
Charging Alternator - 12V	Engine Parameters	
Battery Box and Cables	Generator Protection Functions	
Flexible Fuel Connectors	Engine Protection	
Flexible Exhaust Connection	SAE J1939 Engine ECU Communications	
EPA Certified Engine	Windows [®] -Based Software	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Solid State, Volts-per-Hertz Regulator
±1% Voltage Regulation No Load to Full Load
Brushless Alternator with Brushless Pilot Exciter
4 Pole, Rotating Field

Engine Parameters Generator Protection Functions Engine Protection SAE J1939 Engine ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	Mercedes-Benz
Model	OM926LA
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	7.2 (439)
Bore: cm (in)	10.6 (4.17)
Stroke: cm (in)	13.6 (5.35)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	MR2 / ADM3
Max. Power: kWm (bhp)	225 (302)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	29 (7.7)
Engine Jacket Water Capacity: L (gal)	10 (2.6)
System Coolant Capacity: L (gal)	24.1 (6.4)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-6 JIC
Fuel Supply Hose Size	3/8" ID
Fuel Return Connection Size	-6 JIC
Fuel Return Hose Size	3/8" ID
Max. Fuel Lift: m (ft)	2.6 (8.5)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	330.5 (87.3)

// Fuel Consumption *

At 100% of Power Rating: L/hr (gal/hr)	49.6 (13.1)
At 75% of Power Rating: L/hr (gal/hr)	36 (9.5)
At 50% of Power Rating: L/hr (gal/hr)	24.2 (6.4)

* Based on 431CSL6206 480 Volt generator set

// Cooling - Radiator System

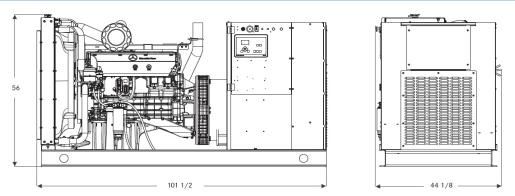
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	143 (37)
Heat Rejection to Coolant: kW (BTUM)	88 (5,004)
Heat Rejection to Air to Air: kW (BTUM)	54 (3,071)
Heat Radiated to Ambient: kW (BTUM)	35.4 (2,013)
Fan Power: kW (hp)	15.6 (22.1)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	14.3 (505)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	408 (14,408)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m³/min (SCFM)	129.4 (4,570)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	487 (908)
Gas Volume at Stack	
Temp: m³/min (CFM)	42.8 (1,511)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	10.5 (42)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	88.8

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
3.93	1.2	0.06

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, overload power in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

/ Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

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C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R1600 DS230

210 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 6R1600 DS230 (230 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	210	210	210	210	210	210
kVA	262	262	262	262	262	262
Amps	729	631	399	344	316	253
skVA@30%						
Voltage Dip	608	608	430	580	604	510
Generator Model	432CSL6210	432CSL6210	432CSL6210	431CSL6208	431CSL6208	431PSL6243
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6R1600 Diesel Engine
 - 10.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter
Oil Pump	4 Pole, Rotating Field
Oil Drain Extension and S/O Valve	105 °C Max. Prime Temperature Rise
Full Flow Oil Filters	1 Bearing, Sealed
Closed Crankcase Ventilation	Flexible Coupling
Jacket Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±1% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Formed Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	
Flexible Fuel Connectors	Digital Metering
Flexible Exhaust Connection	Engine Parameters
EPA Certified Engine	Generator Protection Functions

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Re
and motor starting	Pr
Sustained short circuit current of up to 300% of the rated current for	UI
up to 10 seconds	Εv
Self-Ventilated and Drip-Proof	IP
Superior Voltage Waveform	NI
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	6R1600G10S
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (Cu In)	10.5 (641)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	ECU 8
Max. Power: kWm (bhp)	284 (381)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	45 (11.9)
System Coolant Capacity: L (gal)	82 (21.7)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	198 (60.4)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	62 (16.4)
At 75% of Power Rating: L/hr (gal/hr)	49 (12.9)
At 50% of Power Rating: L/hr (gal/hr)	35 (9.3)

// Cooling - Radiator System

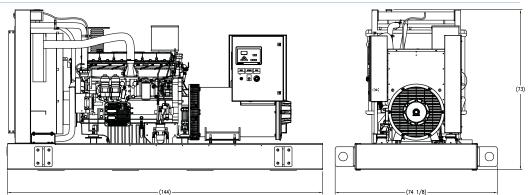
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.2 (0.8)
Water Pump Capacity: L/min (gpm)	277 (73.1)
Heat Rejection to Coolant: kW (BTUM)	129 (7,336)
Heat Rejection to After Cooler: kW (BTUM)	76 (4,322)
Heat Radiated to Ambient: kW (BTUM)	30.2 (1,717)
Fan Power: kW (hp)	14.9 (20)
Fan Power: kW (hp)	14.9 (20

// Air Requirements

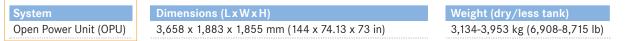
Aspirating: *m³/min (SCFM)	30 (1,059)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	396 (13,985)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	109.7 (3,873)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	440 (824)
Gas Volume at Stack	
Temp: m³/min (CFM)	72 (2,542)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

- // Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R1600 DS250

230 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 6R1600 DS250 (250 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	230	230	230	230	230	230
kVA	287	287	287	287	287	287
Amps	798	692	437	377	346	277
skVA@30%						
Voltage Dip	608	608	430	580	809	740
Generator Model	432CSL6210	432CSL6210	432CSL6210	432CSL6210	432CSL6210	432PSL6246
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6R1600 Diesel Engine
 - 10.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter
Oil Pump	4 Pole, Rotating Field
Oil Drain Extension and S/O Valve	105 °C Max. Prime Temperature Rise
Full Flow Oil Filters	1 Bearing, Sealed
Closed Crankcase Ventilation	Flexible Coupling
Jacket Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±1% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Formed Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	
Flexible Fuel Connectors	Digital Metering
Flexible Exhaust Connection	Engine Parameters
EPA Certified Engine	Generator Protection Functions

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Re
and motor starting	Pr
Sustained short circuit current of up to 300% of the rated current for	U
up to 10 seconds	E١
Self-Ventilated and Drip-Proof	IP
Superior Voltage Waveform	Ν
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	6R1600G10S
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (Cu In)	10.5 (641)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	ECU 8
Max. Power: kWm (bhp)	284 (382)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	45 (11.9)
System Coolant Capacity: L (gal)	82 (21.7)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	198 (60.4)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	67 (17.7)
At 75% of Power Rating: L/hr (gal/hr)	53 (14)
At 50% of Power Rating: L/hr (gal/hr)	38 (10)

// Cooling - Radiator System

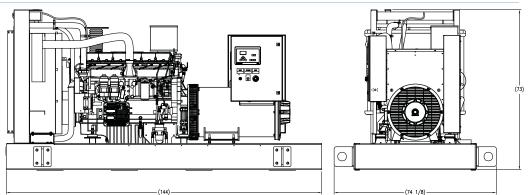
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.2 (0.8)
Water Pump Capacity: L/min (gpm)	277 (73.1)
Heat Rejection to Coolant: kW (BTUM)	129 (7,336)
Heat Rejection to After Cooler: kW (BTUM)	76 (4,322)
Heat Radiated to Ambient: kW (BTUM)	30.2 (1,717)
Fan Power: kW (hp)	14.9 (20)
Fan Power: kW (hp)	14.9 (20

// Air Requirements

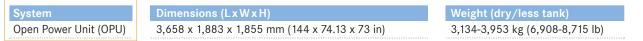
Aspirating: *m³/min (SCFM)	30 (1,059)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	396 (13,985)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	109.7 (3,873)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	440 (824)
Gas Volume at Stack	
Temp: m³/min (CFM)	72 (2,542)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R1600 DS275

250 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 6R1600 DS275 (275 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	250	250	250	250	250	250
kVA	312	312	312	312	312	312
Amps	867	752	475	410	376	301
skVA@30%						
Voltage Dip	930	930	640	860	809	720
Generator Model	433CSL6216	433CSL6216	433CSL6216	433CSL6216	432CSL6210	432PSL6246
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6R1600 Diesel Engine
 - 10.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	105°C Max. Prime Temperature Rise	
Full Flow Oil Filters	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±1% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	
Flexible Exhaust Connection	Engine Parameters	
EPA Certified Engine	Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperatur	e rise Rer
and motor starting	Pro
Sustained short circuit current of up to 300% of the rated current	t for UL
up to 10 seconds	Eve
Self-Ventilated and Drip-Proof	IP 5
Superior Voltage Waveform	NFI
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	6R1600G10S
Туре	4-Cycle
Arrangement	6-Inline
Displacement: L (Cu In)	10.5 (641)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	ECU 8
Max. Power: kWm (bhp)	284 (381)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	45 (11.9)
System Coolant Capacity: L (gal)	82 (21.7)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	198 (60.4)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	72 (19.1)
At 75% of Power Rating: L/hr (gal/hr)	56 (14.8)
At 50% of Power Rating: L/hr (gal/hr)	41 (10.9)

// Cooling - Radiator System

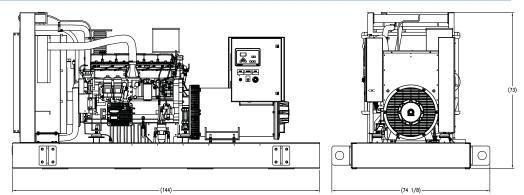
50 (122)
0.2 (0.8)
277 (73.1)
129 (7,336)
76 (4,322)
30.2 (1,717)
14.9 (20)

// Air Requirements

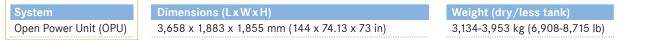
Aspirating: *m ³ /min (SCFM)	18 (635.7)	
Air Flow Required for Rad.		
Cooled Unit: *m ³ /min (SCFM)	396 (13,985)	
Remote Cooled Applications;		
Air Flow Required for Dissipation		
of Radiated Generator Set Heat for a		
Max. of 25 °F Rise: *m ³ /min (SCFM)	109.7 (3,873)	

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	390 (734)
Gas Volume at Stack	
Temp: m³/min (CFM)	60 (2,118.9)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	СО	PM
3.54	0.45	0.04

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

- // Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 6R1600 DS300

275 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 6R1600 DS300 (275 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	275	275	275	275	275	275
kVA	343	343	343	343	343	343
Amps	954	827	522	451	413	331
skVA@30%						
Voltage Dip	930	930	640	860	1238	720
Generator Model	433CSL6216	433CSL6216	433CSL6216	433CSL6216	432CSL6216	432PSL6246
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 6R1600 Diesel Engine
 - 10.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional Permanent Magnet Generator (PMG)
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	Brushless Alternator with Brushless Pilot Exciter		
Oil Pump	4 Pole, Rotating Field		
Oil Drain Extension and S/O Valve	105 °C Max. Prime Temperature Rise		
Full Flow Oil Filters	1 Bearing, Sealed		
Closed Crankcase Ventilation	Flexible Coupling		
Jacket Water Pump	Full Amortisseur Windings		
Thermostats	125% Rotor Balancing		
Blower Fan and Fan Drive	3-Phase Voltage Sensing		
Radiator - Unit Mounted	±1% Voltage Regulation		
Electric Starting Motor - 24V	100% of Rated Load - One Step		
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion		
Base - Formed Steel			
SAE Flywheel and Bell Housing			
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>		
Battery Box and Cables			
Flexible Fuel Connectors	Digital Metering		
Flexible Exhaust Connection	Engine Parameters		
EPA Certified Engine	Generator Protection Functions		

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Re
and motor starting	Pr
Sustained short circuit current of up to 300% of the rated current for	U
up to 10 seconds	E١
Self-Ventilated and Drip-Proof	IP
Superior Voltage Waveform	Ν
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

MTU
6R1600G20S
4-Cycle
6-Inline
10.5 (641)
12.2 (4.8)
15 (5.91)
17.5:1
1,800
ECU 8
312 (418)
±0.25%
Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	45 (11.9)
System Coolant Capacity: L (gal)	82 (21.7)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	950

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	198 (60.4)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	76 (20.2)
At 75% of Power Rating: L/hr (gal/hr)	59 (15.7)
At 50% of Power Rating: L/hr (gal/hr)	45.5 (12)

// Cooling - Radiator System

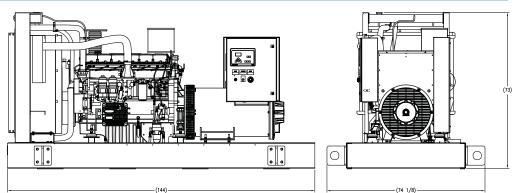
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.2 (0.8)
Water Pump Capacity: L/min (gpm)	277 (73.1)
Heat Rejection to Coolant: kW (BTUM)	154 (8,758)
Heat Rejection to After Cooler: kW (BTUM)	84 (4,777)
Heat Radiated to Ambient: kW (BTUM)	33.1 (1,882)
Fan Power: kW (hp)	14.9 (20)

// Air Requirements

24 (847.6)
396 (13,985)
120.2 (4,245)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	430 (806)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	66 (2,330.8)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	СО	PM
4.14	0.52	0.04

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

- // Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 8V1600 DS350

325 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 8V1600 DS350 (350 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	325	325	325	325	325	325
kVA	407	407	407	407	407	407
Amps	1128	977	617	533	489	391
skVA@30%						
Voltage Dip	930	930	635	850	1238	1100
Generator Model	433CSL6216	433CSL6216	433CSL6216	433CSL6216	433CSL6216	433PSL6248
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 8V1600 Diesel Engine
 - 14.0 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Permanent Magnet Generator (PMG)
 - PMG Standard for 570 frame and larger
 - PMG Optional for 430 frame and smaller
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	105 °C Max. Prime Temperature Rise	
Full Flow Oil Filters	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation (570 frame)	
Electric Starting Motor - 24V	±1% Voltage Regulation (430 frame)	
Governor – Electronic Isochronous	100% of Rated Load - One Step	
Base - Formed Steel	5% Max. Total Harmonic Distortion	
SAE Flywheel and Bell Housing		
Charging Alternator - 24V		
Battery Box and Cables	<pre>// Digital Control Panel(s)</pre>	
Flexible Fuel Connectors		
Flexible Exhaust Connection	Digital Metering	

// Generator

EPA Certified Engine

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Mu
and motor starting	Rer
Sustained short circuit current of up to 300% of the rated current for	Pro
up to 10 seconds	UL
Self-Ventilated	Eve
Superior Voltage Waveform	IP 5
Digital, Solid State, Volts-per-Hertz Regulator	NF
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	8V1600G10S
Туре	4-Cycle
Arrangement	8-V
Displacement: L (Cu In)	14 (854)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	371 (497)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	50 (13.2)
System Coolant Capacity: L (gal)	80.3 (21.2)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	402 (106)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	93 (24.5)
At 75% of Power Rating: L/hr (gal/hr)	78 (20.6)
At 50% of Power Rating: L/hr (gal/hr)	55 (14.5)

// Cooling - Radiator System

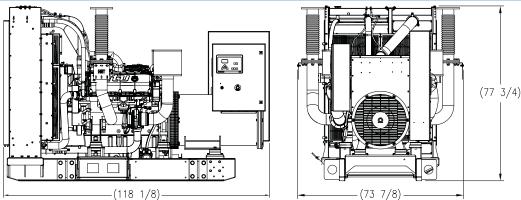
0.2 (0.8)
362 (95)
190 (10,805)
95 (5,403)
40.5 (2,303)
16.9 (22.6)

// Air Requirements

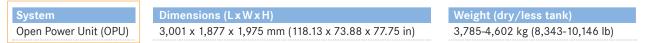
Aspirating: *m ³ /min (SCFM)	30 (1,060)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	510 (18,010)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	147.1 (5,194)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	460 (860)
Gas Volume at Stack	
Temp: m³/min (CFM)	84 (2,966)
Max. Allowable Back Pressure: kPa (in. H ₂ 0)	15 (61)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	СО	РМ
4.06	0.52	0.05

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

C/F = Consult Factory/MTU Onsite Energy Distributor

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

N/A = Not Available

DIESEL GENERATOR SET MTU 8V1600 DS400

365 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 8V1600 DS400 (400 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	365	365	365	365	365	365
kVA	457	457	457	457	457	457
Amps	1266	1098	693	599	549	439
skVA@30%						
Voltage Dip	800	800	640	920	1277	1100
Generator Model	572RSL4025	572RSL4025	572RSL4025	433CSL6220	433CSL6220	433CSL6248
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 8V1600 Diesel Engine
 - 14.0 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Permanent Magnet Generator (PMG)
 - PMG Standard for 570 frame and larger
 - PMG Optional for 430 frame and smaller
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	105 °C Max. Prime Temperature Rise	
Full Flow Oil Filters	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation (570 frame)	
Electric Starting Motor - 24V	±1% Voltage Regulation (430 frame)	
Governor – Electronic Isochronous	100% of Rated Load - One Step	
Base - Formed Steel	5% Max. Total Harmonic Distortion	
SAE Flywheel and Bell Housing		
Charging Alternator - 24V		
Battery Box and Cables	<pre>// Digital Control Panel(s)</pre>	
Flexible Fuel Connectors		
Flexible Exhaust Connection	Digital Metering	

// Generator

EPA Certified Engine

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Ī
and motor starting	F
Sustained short circuit current of up to 300% of the rated current for	F
up to 10 seconds	l
Self-Ventilated	E
Superior Voltage Waveform	I
Digital, Solid State, Volts-per-Hertz Regulator	1
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	8V1600G20S
Туре	4-Cycle
Arrangement	8-V
Displacement: L (Cu In)	14 (854)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	408 (547)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	46 (12.2)
Engine Jacket Water Capacity: L (gal)	50 (13.2)
System Coolant Capacity: L (gal)	80.3 (21.2)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	402 (106)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	99 (26.1)
At 75% of Power Rating: L/hr (gal/hr)	80 (21.2)
At 50% of Power Rating: L/hr (gal/hr)	60 (15.8)

// Cooling - Radiator System

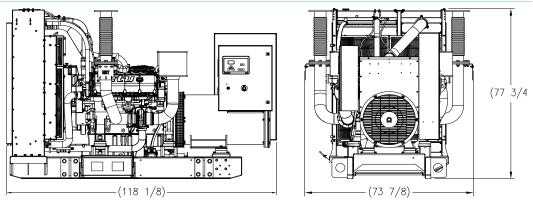
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.2 (0.8)
Water Pump Capacity: L/min (gpm)	362 (95)
Heat Rejection to Coolant: kW (BTUM)	180 (10,237)
Heat Rejection to After Cooler: kW (BTUM)	81 (4,606)
Heat Radiated to Ambient: kW (BTUM)	44.5 (2,531)
Fan Power: kW (hp)	16.9 (22.6)

// Air Requirements

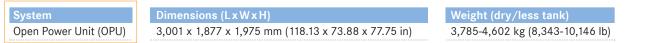
Aspirating: *m ³ /min (SCFM)	31.2 (1,103)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	510 (18,010)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	161.6 (5,708)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	460 (860)
Gas Volume at Stack	
Temp: m³/min (CFM)	84 (2,966)
Max. Allowable Back Pressure: kPa (in. H ₂ 0)	15 (61)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

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OE 23 546 (77 3E) 2017-02

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 10V1600 DS450

400 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 10V1600 DS450 (450 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	400	400	400	400	400	400
kVA	500	500	500	500	500	500
Amps	1388	1203	760	656	601	481
skVA@30%						
Voltage Dip	790	790	650	900	1090	1040
Generator Model	572RSL4025	572RSL4025	572RSL4025	572RSL4025	572RSL4025	572RSS4270
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 3 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 10V1600 Diesel Engine
 - 17.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - PMG (Permanent Magnet Generator) supply to regulator
 - 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	105 °C Max. Prime Temperature Rise	
Full Flow Oil Filters	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	// Digital Control Panel(s)	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	
Flexible Exhaust Connection	Engine Parameters	
EPA Certified Engine	Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self-Ventilated
Superior Voltage Waveform
Digital, Solid State, Volts-per-Hertz Regulator
No Load to Full Load Regulation

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	10V1600G70S
Туре	4-Cycle
Arrangement	10-V
Displacement: L (Cu In)	17.5 (1,068)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	511 (685)
Speed Regulation	±0.25%
Air Cleaner	Dry
•••••••••••••••••••••••••••••••••••••••	

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	61 (16)
Engine Jacket Water Capacity: L (gal)	60 (15.9)
System Coolant Capacity: L (gal)	99.3 (26.2)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	401.3 (106)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	102 (27)
At 75% of Power Rating: L/hr (gal/hr)	82 (21.7)
At 50% of Power Rating: L/hr (gal/hr)	59 (15.7)

// Cooling - Radiator System

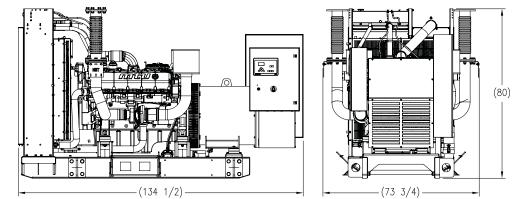
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.2 (0.8)
Water Pump Capacity: L/min (gpm)	466 (123)
Heat Rejection to Coolant: kW (BTUM)	225 (12,795)
Heat Rejection to After Cooler: kW (BTUM)	101 (5,744)
Heat Radiated to Ambient: kW (BTUM)	51.8 (2,946)
Fan Power: kW (hp)	17.9 (24)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	34 (1,187)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	642 (22,672)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	188 (6,643)
of Radiated Generator Set Heat for a	188 (6,643)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	459 (858)
Gas Volume at Stack	
Temp: m³/min (CFM)	95 (3,369)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry/less tank)
Open Power Unit (OPU)	3,416 x 1,873 x 2,032 mm (134.5 x 73.75 x 80 in)	4,175-5,129 kg (9,205-11,308 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	91.9

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
3.31	0.37	0.03

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

- // Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 85%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 10V1600 DS500

450 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 10V1600 DS500 (500 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	450	450	450	450	450	450
kVA	563	563	563	563	563	563
Amps	1561	1353	855	738	677	541
skVA@30%						
Voltage Dip	790	790	660	900	1090	1040
Generator Model	572RSL4029	572RSL4029	572RSL4029	572RSL4025	572RSL4025	572RSS4270
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 10V1600 Diesel Engine
 - 17.5 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - PMG (Permanent Magnet Generator) supply to regulator
 - 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter
Oil Pump	4 Pole, Rotating Field
Oil Drain Extension and S/O Valve	105 °C Max. Prime Temperature Rise
Full Flow Oil Filters	1 Bearing, Sealed
Closed Crankcase Ventilation	Flexible Coupling
Jacket Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Formed Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	
Flexible Fuel Connectors	Digital Metering
Flexible Exhaust Connection	Engine Parameters
EPA Certified Engine	Generator Protection Functions

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Re
and motor starting	Pro
Sustained short circuit current of up to 300% of the rated current for	UL
up to 10 seconds	Ev
Self-Ventilated	IP
Superior Voltage Waveform	NF
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	10V1600G20S
Туре	4-Cycle
Arrangement	10-V
Displacement: L (Cu In)	17.5 (1,068)
Bore: cm (in)	12.2 (4.8)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	511 (685)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	61 (16)
Engine Jacket Water Capacity: L (gal)	60 (15.9)
System Coolant Capacity: L (gal)	99.3 (26.2)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	401.3 (106)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	115 (30.5)
At 75% of Power Rating: L/hr (gal/hr)	91 (24)
At 50% of Power Rating: L/hr (gal/hr)	68 (17.9)

// Cooling - Radiator System

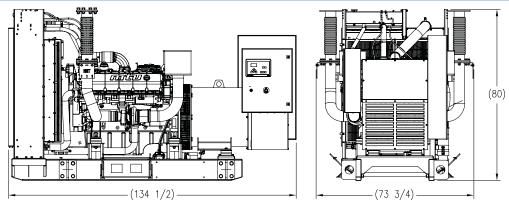
50 (122)
0.2 (0.8)
466 (123)
225 (12,795)
101 (5,744)
51.8 (2,946)
17.9 (24)

// Air Requirements

34 (1,187)
642 (22,672)
188 (6,643)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	459 (858)
Gas Volume at Stack	
Temp: m³/min (CFM)	95 (3,369)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry (less tenk)
System	Dimensions (LX WX H)	Weight (dry/less tank)
Open Power Unit (OPU)	3,416 x 1,873 x 2,032 mm (134.5 x 73.75 x 80 in)	4,175-5,129 kg (9,205-11,308 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	93.4

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	РМ
6.9	0.45	0.03

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

- // Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 12V1600 DS550

500 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 12V1600 DS550 (550 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	500	500	500	500	500	500
kVA	625	625	625	625	625	625
Amps	1735	1504	950	820	752	601
skVA@30%						
Voltage Dip	1040	1040	960	1160	1500	1430
Generator Model	572RSL4033	572RSL4033	573RSL4033	572RSL4031	572RSL4029	572RSS4272
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V1600 Diesel Engine
 - 21.0 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	105 °C Max. Prime Temperature Rise	
Full Flow Oil Filters	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	
Flexible Exhaust Connection	Engine Parameters	
EPA Certified Engine	Generator Protection Functions	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Re
and motor starting	Pro
Sustained short circuit current of up to 300% of the rated current for	UL
up to 10 seconds	Εv
Self-Ventilated and Drip-Proof	IP
Superior Voltage Waveform	NF
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	12V1600G10S
Туре	4-Cycle
Arrangement	12-V
Displacement: L (Cu In)	21 (1,281)
Bore: cm (in)	12 (4.72)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	561 (752)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	73 (19.3)
Engine Jacket Water Capacity: L (gal)	65 (17.2)
System Coolant Capacity: L (gal)	106 (28.1)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	402 (106.2)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	132.5 (35)
At 75% of Power Rating: L/hr (gal/hr)	101.8 (26.9)
At 50% of Power Rating: L/hr (gal/hr)	70.4 (18.6)

// Cooling - Radiator System

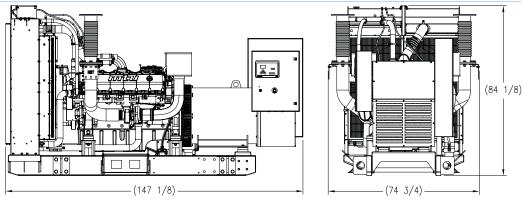
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.2 (0.8)
Water Pump Capacity: L/min (gpm)	517 (137)
Heat Rejection to Coolant: kW (BTUM)	223 (12,681)
Heat Rejection to After Cooler: kW (BTUM)	124 (7,051)
Heat Radiated to Ambient: kW (BTUM)	56.9 (3,236)
Fan Power: kW (hp)	23.1 (31)
Fan Power: kW (hp)	23.1 (31)

// Air Requirements

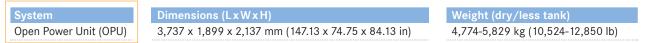
Aspirating: *m ³ /min (SCFM)	47 (1,653)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	756 (26,700)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	207 (7,298)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	401 (754)
Gas Volume at Stack	
Temp: m³/min (CFM)	114 (4,026)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	90.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
5.12	0.3	0.02

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

Energy Pow

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 12V1600 DS600

550 kWe / 60 Hz / Prime 208 - 600V

Reference MTU 12V1600 DS600 (600 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V*	240V*	380V	440V	480V*	600V*
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	550	550	550	550	550	550
kVA	687	687	687	687	687	687
Amps	1908	1654	1045	902	827	662
skVA@30%						
Voltage Dip	1200	1200	1225	1400	1440	1325
Generator Model	573RSL4033	573RSL4033	573RSL4035	573RSL4033	573RSL4033	573RSS4274
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA - Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V1600 Diesel Engine
 - 21.0 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator resilient mounted
- // Complete Range of Accessories

- // Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - PMG (Permanent Magnet Generator) supply to regulator
 - 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter
Oil Pump	4 Pole, Rotating Field
Oil Drain Extension and S/O Valve	105 °C Max. Prime Temperature Rise
Full Flow Oil Filters	1 Bearing, Sealed
Closed Crankcase Ventilation	Flexible Coupling
Jacket Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Formed Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	
Flexible Fuel Connectors	Digital Metering
Flexible Exhaust Connection	Engine Parameters
EPA Certified Engine	Generator Protection Functions

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Re
and motor starting	Pr
Sustained short circuit current of up to 300% of the rated current for	UI
up to 10 seconds	E٧
Self-Ventilated and Drip-Proof	IP
Superior Voltage Waveform	N
Digital, Solid State, Volts-per-Hertz Regulator	
No Load to Full Load Regulation	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	12V1600G20S
Туре	4-Cycle
Arrangement	12-V
Displacement: L (Cu In)	21 (1,281)
Bore: cm (in)	12 (4.72)
Stroke: cm (in)	15 (5.91)
Compression Ratio	17.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	608 (815)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	73 (19.3)
Engine Jacket Water Capacity: L (gal)	65 (17.2)
System Coolant Capacity: L (gal)	106 (28.1)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	1,050

// Fuel System

Fuel Supply Connection Size	-10 JIC 37° Female
	M20 x 1.5 Male Adapter Provided
Fuel Return Connection Size	-6 JIC 37° Female
	M14 x 1.5 Male Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	402 (106.2)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	140 (37)
At 75% of Power Rating: L/hr (gal/hr)	106 (28)
At 50% of Power Rating: L/hr (gal/hr)	75 (19.9)

// Cooling - Radiator System

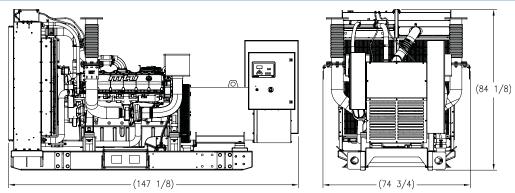
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.2 (0.8)
Water Pump Capacity: L/min (gpm)	517 (136.5)
Heat Rejection to Coolant: kW (BTUM)	242 (13,762)
Heat Rejection to After Cooler: kW (BTUM)	150 (8,530)
Heat Radiated to Ambient: kW (BTUM)	59.7 (3,395)
Fan Power: kW (hp)	23.1 (31)

// Air Requirements

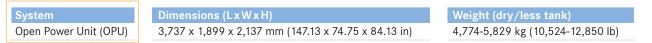
Aspirating: *m ³ /min (SCFM)	53 (1,865)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	756 (26,700)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	217 (7,657)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	414 (777)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	126 (4,450)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	15 (60.2)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	91.9

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
5.36	0.3	0.03

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 12V2000 DS650

615 kWe / 60 Hz / Prime 208 - 4160V

Reference MTU 12V2000 DS650 (650 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V**	240V**	380V	480V**	600V**	4160V
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	615	615	615	615	615	615
kVA	768	768	768	768	768	768
Amps	2133	1849	1168	924	739	106
skVA@30%						
Voltage Dip	1750	1750	1600	1750	1350	1850
Generator Model*	573RSL4033	573RSL4033	574RSL4037	573RSL4033	573RSS4274	574FSM4358
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	12 LEAD HI WYE	4 LEAD WYE	6 LEAD WYE

 * Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA – Optional

- UL 2200 Listed

- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 2000 Diesel Engine
 - 23.9 Liter Displacement
 - Electronic Unit Pump Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension & S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	105 °C Maximum Prime Temperature Rise	
Closed Crankcase Ventilation	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan & Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion	
Base - Structural Steel		
SAE Flywheel & Bell Housing		
Charging Alternator - 24V	// Digital Control Panel(s)	
Battery Box & Cables		
Flexible Fuel Connectors	Digital Metering	

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	
and motor starting	İ
Sustained short circuit current of up to 300% of the rated current for	
up to 10 seconds	l
Self-Ventilated and Drip-Proof	
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	12V 2000 G45 TB
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	23.9 (1,457)
Bore: cm (in)	13 (5.1)
Stroke: cm (in)	15 (5.9)
Compression Ratio	16:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Maximum Power: kWm (bhp)	710 (952)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	77 (20.3)
Engine Jacket Water Capacity: L (gal)	110 (29.1)
After Cooler Water Capacity: L (gal)	20 (5.3)
System Coolant Capacity: L (gal)	274 (72.4)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	3/4" NPT
Fuel Return Connection Size	1/4" NPT
Maximum Fuel Lift: m (ft)	3 (10)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	480 (127)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	176 (46.5)
At 75% of Power Rating: L/hr (gal/hr)	132.9 (35.1)
At 50% of Power Rating: L/hr (gal/hr)	90.5 (23.9)

// Cooling - Radiator System

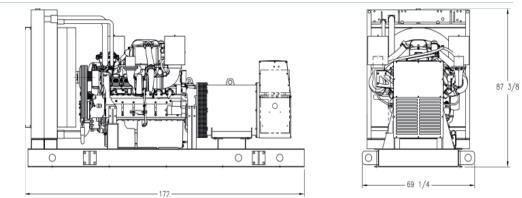
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H ₂ 0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	833 (220)
After Cooler Pump Capacity: L/min (gpm)	257 (68)
Heat Rejection to Coolant: kW (BTUM)	245 (13,932)
Heat Rejection to After Cooler: kW (BTUM)	215 (12,226)
Heat Radiated to Ambient: kW (BTUM)	73.1 (4,157)
Fan Power: kW (hp)	37.9 (50.8)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	60 (2,119)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	784 (27,687)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	265 (9,375)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	535 (995)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	150 (5,297)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	92

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 12V2000 DS750

680 kWe / 60 Hz / Prime 208 - 4160V

Reference MTU 12V2000 DS750 (750 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V**	240V**	380V	480V**	600V**	4160V
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	680	680	680	680	680	680
kVA	850	850	850	850	850	850
Amps	2359	2045	1293	1022	818	118
skVA@30%						
Voltage Dip	2600	2600	1850	2120	3050	1850
Generator Model*	574RSL4037	574RSL4037	575RSL4044	573RSL4035	574RSS4278	574FSM4358
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD LOW WYE	12 LEAD HI DELTA	4 BAR WYE	12 LEAD HI WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA – Optional

- UL 2200 Listed

- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 2000 Diesel Engine
 - 23.9 Liter Displacement
 - Electronic Unit Pump Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension & S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	105 °C Maximum Prime Temperature Rise
Closed Crankcase Ventilation	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan & Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel & Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box & Cables	
Flexible Fuel Connectors	Digital Metering

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature	rise
and motor starting	
Sustained short circuit current of up to 300% of the rated current f	or
up to 10 seconds	
Self-Ventilated and Drip-Proof	
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA 110 Compatible

// Engine

Manufacturer	MTU
Model	12V 2000 G85 TB
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	23.9 (1,457)
Bore: cm (in)	13 (5.1)
Stroke: cm (in)	15 (5.9)
Compression Ratio	16:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Maximum Power: kWm (bhp)	810 (1,086)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	77 (20.3)
Engine Jacket Water Capacity: L (gal)	110 (29.1)
After Cooler Water Capacity: L (gal)	20 (5.3)
System Coolant Capacity: L (gal)	274 (72.4)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	3/4" NPT
Fuel Return Connection Size	1/4" NPT
Maximum Fuel Lift: m (ft)	3 (10)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	480.7 (127)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	199.1 (52.6)
At 75% of Power Rating: L/hr (gal/hr)	149.9 (39.6)
At 50% of Power Rating: L/hr (gal/hr)	101.4 (26.8)

// Cooling - Radiator System

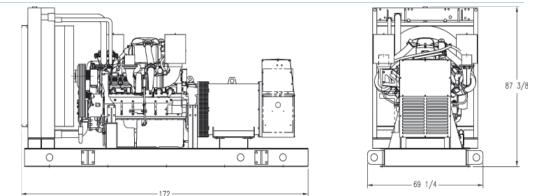
Ambient Capacity of Radiator: °C (°F)	40 (104)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	833 (220)
After Cooler Pump Capacity: L/min (gpm)	257 (68)
Heat Rejection to Coolant: kW (BTUM)	280 (15,923)
Heat Rejection to After Cooler: kW (BTUM)	245 (13,932)
Heat Radiated to Ambient: kW (BTUM)	76.5 (4,350)
Fan Power: kW (hp)	38 (50.9)

// Air Requirements

Aspirating: *m³/min (SCFM)	2,225 (63)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	828 (29,248)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	278 (9,811)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	560 (1,040)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	160 (5,721)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (less tank)
Open Power Unit (OPU)	4,369 x 1,759 x 2,219 mm (172 x 69.3 x 87.4 in)	5,592 kg (12,328 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	91.8

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
4.59	0.37	0.02

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

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www.mtuonsiteenergy.com

DIESEL GENERATOR SET MTU 12V2000 DS800

725 kWe / 60 Hz / Prime 208 - 4160V

Reference MTU 12V2000 DS800 (800 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V**	240V**	380V	480V**	600V**	4160V
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	725	725	725	725	725	725
kVA	906	906	906	906	906	906
Amps	2515	2180	1377	1090	872	126
skVA@30%						
Voltage Dip	1800	1800	1850	2500	2825	2600
Generator Model*	741RSL4045	741RSL4045	575RSL4044	574RSL4038	574RSS4280	742FSM4364
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// UL 2200 / CSA – Optional

- UL 2200 Listed

- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 2000 Diesel Engine
 - 23.9 Liter Displacement
 - Electronic Unit Pump Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	105 °C Max. Prime Temperature Rise
Closed Crankcase Ventilation	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	// Digital Control Panel(s)
Battery Box and Cables	
Flexible Fuel Connectors	Digital Metering

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	
and motor starting	
Sustained short circuit current of up to 300% of the rated current for	
up to 10 seconds	
Self-Ventilated and Drip-Proof	
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V 2000 G85 TB
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	23.9 (1,457)
Bore: cm (in)	13 (5.1)
Stroke: cm (in)	15 (5.9)
Compression Ratio	16:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	810 (1,086)
Speed Regulation	±0.25%
Air Cleaner	Dry
•••••••••••••••••••••••••••••••••••••••	

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	77 (20.3)
Engine Jacket Water Capacity: L (gal)	110 (29.1)
After Cooler Water Capacity: L (gal)	20 (5.3)
System Coolant Capacity: L (gal)	316 (83.5)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#12 JIC 37° Female
	3/4" NPT Adapter Provided
Fuel Return Connection Size	#4 JIC 37° Female
	1/4" NPT Adapter Provided
Max. Fuel Lift: m (ft)	3 (10)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	480.7 (127)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	199.1 (52.6)
At 75% of Power Rating: L/hr (gal/hr)	149.9 (39.6)
At 50% of Power Rating: L/hr (gal/hr)	101.4 (26.8)

// Cooling - Radiator System

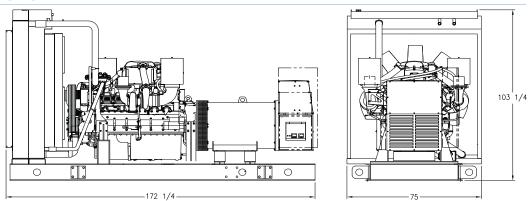
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	833 (220)
After Cooler Pump Capacity: L/min (gpm)	257 (68)
Heat Rejection to Coolant: kW (BTUM)	280 (15,923)
Heat Rejection to After Cooler: kW (BTUM)	245 (13,932)
Heat Radiated to Ambient: kW (BTUM)	76.5 (4,350)
Fan Power: kW (hp)	38 (51)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	63 (2,225)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	1,164 (41,090)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	278 (9,811)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	560 (1,040)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	160 (5,721)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (less tank)
Open Power Unit (OPU)	4,375 x 1,905 x 2,623 mm (172.25 x 75 x 103.25 in)	7,394 kg (16,300 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	88.9

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
4.59	0.37	0.02

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 16V2000 DS1000

900 kWe / 60 Hz / Prime 208 - 4160V

Reference MTU 16V2000 DS1000 (1000 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	208V**	240V**	380V**	480V**	600V**	4160V
Phase	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	900	900	900	900	900	900
kVA	1125	1125	1125	1125	1125	1125
Amps	3123	2706	1709	1353	1083	156
skVA@30%						
Voltage Dip	2475	2475	3205	2830	3625	2800
Generator Model*	LSA 50.2 M6	LSA 50.2 M6	LSA 50.2 M6	LSA 49.1 L11	LSA 50.2 M6	LSA 50.2 UL8
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Compliant
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification

// UL 2200 / CSA – Optional

- UL 2200 Listed

- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 16V 2000 Diesel Engine
 - 35.7 Liter Displacement
 - Electronic Unit Pump Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension & S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	105 °C Maximum Prime Temperature Rise
Closed Crankcase Ventilation	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan & Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Maximum Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel & Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Rack & Cables	
Flexible Fuel Connectors	Digital Metering

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	
and motor starting	
Sustained short circuit current of up to 300% of the rated current for	
up to 10 seconds	
Self-Ventilated and Drip-Proof	
Superior Voltage Waveform	
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	16V 2000 G26S
Туре	4-Cycle
Arrangement	16-V
Displacement: L (in ³)	35.7 (2,179)
Bore: cm (in)	13.5 (5.3)
Stroke: cm (in)	15.6 (6.1)
Compression Ratio	16:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Maximum Power: kWm (bhp)	998 (1,338)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	114 (30.1)
Engine Jacket Water Capacity: L (gal)	70 (18.5)
After Cooler Water Capacity: L (gal)	25 (6.6)
System Coolant Capacity: L (gal)	188 (50)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#12 JIC 37° Male
Fuel Return Connection Size	#12 JIC 37° Male
Maximum Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,500 (396)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	252 (66.6)
At 75% of Power Rating: L/hr (gal/hr)	186 (49.2)
At 50% of Power Rating: L/hr (gal/hr)	132 (34.9)

// Cooling - Radiator System

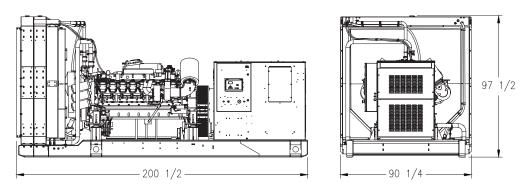
Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	783 (207)
After Cooler Pump Capacity: L/min (gpm)	258 (68)
Heat Rejection to Coolant: kW (BTUM)	390 (22,179)
Heat Rejection to After Cooler: kW (BTUM)	250 (14,217)
Heat Radiated to Ambient: kW (BTUM)	93 (5,289)
Fan Power: kW (hp)	49 (66)
	•••••••••••••••••••••••••••••••••••••••

// Air Requirements

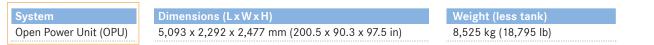
Aspirating: *m³/min (SCFM)	96 (3,390)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	1,709 (60,350)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Gen-set Heat for a	
Max of 25 °F Rise: *m ³ /min (SCFM)	338 (11,925)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	495 (923)
Gas Volume at Stack	
Temp: m³/min (CFM)	252 (8,899)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	95.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 18V2000 DS1250

1000 kWe / 60 Hz / Prime 380 - 4160V

Reference MTU 18V2000 DS1250 (1250 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	380V**	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1000	1000	1000	1000
kVA	1250	1250	1250	1250
Amps	1899	1504	1203	173
skVA@30%				
Voltage Dip	1870	2590	2590	2600
Generator Model*	742RSL4048	741RSL4045	741RSS4284	742FSM4364
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions Fuel consumption optimized
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // UL 2200 / CSA Optional
- // Performance Assurance Certification (PAC)
 - Generator Set Tested to ISO 8528-5 for Transient Response
 - Verified product design, quality and performance integrity
 - All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 18V 2000 Diesel Engine
 - 40.2 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-generator Resilient Mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	Brushless Alternator with Brushless Pilot Exciter	
Oil Pump	4 Pole, Rotating Field	
Oil Drain Extension and S/O Valve	105 °C Max. Prime Temperature Rise	
Full Flow Oil Filter	1 Bearing, Sealed	
Closed Crankcase Ventilation	Flexible Coupling	
Jacket Water Pump	Full Amortisseur Windings	
Thermostat	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Formed Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Rack and Cables		
Flexible Fuel Connectors	Digital Metering	
Flexible Exhaust Connection	Engine Parameters	

// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self-Ventilated
Superior Voltage Waveform
Digital, Solid State, Volts-per-Hertz Regulator
No Load to Full Load Regulation

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	18V2000B76
Туре	4-Cycle
Arrangement	18-V
Displacement: L (in ³)	40.2 (2,448)
Bore: cm (in)	13.5 (5.3)
Stroke: cm (in)	15.6 (6.15)
Compression Ratio	17.5
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	1,097 (1,471)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	122 (32.2)
Engine Jacket Water Capacity: L (gal)	73 (19.3)
System Coolant Capacity: L (gal)	185 (48.9)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#12 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	#12 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	5 (16)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,500 (396)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	254 (67)
At 75% of Power Rating: L/hr (gal/hr)	192 (51)
At 50% of Power Rating: L/hr (gal/hr)	133 (35)

// Cooling - Radiator System

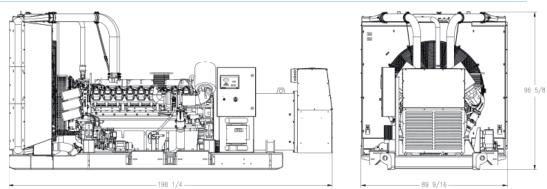
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	950 (251)
Heat Rejection to Coolant: kW (BTUM)	430 (24,454)
Heat Rejection to After Cooler: kW (BTUM)	285 (16,208)
Heat Radiated to Ambient: kW (BTUM)	107 (6,079)
Fan Power: kW (hp)	33.5 (44.9)

// Air Requirements

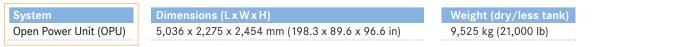
Aspirating: *m³/min (SCFM)	96.6 (3,411)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	1,512 (53,396)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	390 (13,710)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	420 (788)
Gas Volume at Stack	
Temp: m³/min (CFM)	222 (7,840)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	5 (20)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

Prime Full Load

90.2

SOUND DATA

Unit Type	
Level 0: Open Power Unit dB(A)	

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and at 100% load.

Emission levels of the engine may vary as a function of ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data provided are laboratory results from one engine representing this rating. The data was obtained under controlled environmental conditions with calibrated instrumentation traceable to the United States National Bureau of Standards and in compliance with US EPA regulations found within 40 CFR Part 89. The weighted cycle value (not shown) from each engine is guaranteed to be below the US EPA Standards at the US EPA defined conditions.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 12V4000 DS1250

1125 kWe / 60 Hz / Prime 380 - 4160V

Reference MTU 12V4000 DS1250 (1250 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	380V	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1125	1125	1125	1125
kVA	1406	1406	1406	1406
Amps	2136	1691	1353	195
skVA@30%				
Voltage Dip	2700	3100	4650	3100
Generator Model*	743RSL4052	742RSL4048	743RSS4288	742FSM4366
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 4000 Diesel Engine
 - 57.2 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	105 °C Max. Prime Temperature Rise	
Closed Crankcase Ventilation	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostat	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step 5% Max. Total Harmonic Distortion	
Governor – Electronic Isochronous		
Base - Structural Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	F
and motor starting	F
Sustained short circuit current of up to 300% of the rated current for	ί
up to 10 seconds	E
Self-Ventilated and Drip-Proof	I
Superior Voltage Waveform	Ν
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V4000G43
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	57.2 (3,491)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	1,520 (2,038)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	260 (68.7)
Engine Jacket Water Capacity: L (gal)	160 (42.3)
After Cooler Water Capacity: L (gal)	40 (10.6)
System Coolant Capacity: L (gal)	583 (154)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	#16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	960 (254)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	309 (81.5)
At 75% of Power Rating: L/hr (gal/hr)	238 (62.9)
At 50% of Power Rating: L/hr (gal/hr)	176 (46.4)

// Cooling - Radiator System

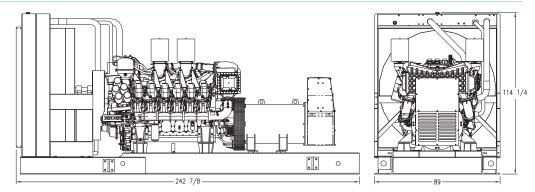
Ambient Capacity of Radiator: °C (°F)	50 (122)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,117 (295)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	504 (28,662)
Heat Rejection to After Cooler: kW (BTUM)	333 (18,937)
Heat Radiated to Ambient: kW (BTUM)	133 (7,562)
Fan Power: kW (hp)	36.7 (49.2)

// Air Requirements

Aspirating: *m³/min (SCFM)	126 (4,450)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	1,416 (49,997)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m³/min (SCFM)	486 (17,054)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

	••••••
Gas Temp. (Stack): °C (°F)	400 (752)
Gas Volume at Stack	······
Gas volume at stack	
Temp: m ³ /min (CFM)	306 (10,806)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)
	0.0 (0 1.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM	
5.26	0.45	0.06	_

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 12V4000 DS1500

1400 kWe / 60 Hz / Prime 380 - 4160V

Reference MTU 12V4000 DS1500 (1500 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	380V	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1400	1400	1400	1400
kVA	1750	1750	1750	1750
Amps	2659	2105	1684	243
skVA@30%				
Voltage Dip	3350	3500	4800	3900
Generator Model*	744RSL4054	742RSL4050	743RSS4290	743FSM4368
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	4 LEAD WYE	12 LEAD HI WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 4000 Diesel Engine
 - 57.2 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	105 °C Max. Prime Temperature Rise	
Closed Crankcase Ventilation	1 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Structural Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	// Digital Control Panel(s)	
Battery Box and Cables		
Flexible Fuel Connectors	Digital Metering	

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Digital, Solid State, Volts-per-Hertz Regulator

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V4000G43
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	57.2 (3,491)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Maximum Power: kWm (bhp)	1,520 (2,038)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	260 (68.7)
Engine Jacket Water Capacity: L (gal)	160 (42.3)
After Cooler Water Capacity: L (gal)	40 (10.6)
System Coolant Capacity: L (gal)	583 (154)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	#16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	960 (254)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	372 (98.2)
At 75% of Power Rating: L/hr (gal/hr)	285 (75.4)
At 50% of Power Rating: L/hr (gal/hr)	200 (52.9)

// Cooling - Radiator System

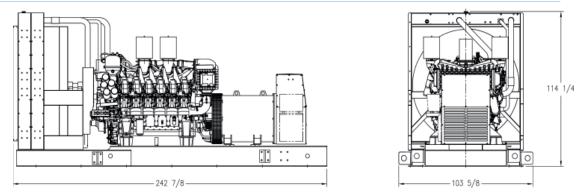
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,117 (295)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	560 (31,847)
Heat Rejection to After Cooler: kW (BTUM)	370 (21,042)
Heat Radiated to Ambient: kW (BTUM)	144 (8,192)
Fan Power: kW (hp)	36.7 (49.2)

// Air Requirements

Aspirating: *m³/min (SCFM)	132 (4,662)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	1,416 (49,997)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m³/min (SCFM)	526 (18,475)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	410 (770)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	312 (11,018)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	92.2
Sound data is provided at 7 m (22 ft). Constrator set too	

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 12V4000 DS 1750

1600 kWe / 60 Hz / Prime 380 - 4160V

Reference MTU 12V4000 DS1750 (1750 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	380V	480V**	600V**	4160V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	1600	1600	1600	1600
kVA	2000	2000	2000	2000
Amps	3042	2406	1925	278
skVA@30%				
Voltage Dip	4200	4700	3600	4000
Generator Model*	744RSL4056	743RSL4052	744RSS4292	743FSM4370
Temp Rise	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C	105 °C/40 °C
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions - EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 12V 4000 Diesel Engine
 - 57.2 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	105 °C Max. Prime Temperature Rise
Closed Crankcase Ventilation	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	
Flexible Fuel Connectors	Digital Metering

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	R
and motor starting	Ρ
Sustained short circuit current of up to 300% of the rated current for up to 10 seconds	U E
Self-Ventilated and Drip-Proof	IF
Superior Voltage Waveform	N
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	12V4000G83
Туре	4-Cycle
Arrangement	12-V
Displacement: L (in ³)	57.2 (3,491)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	1,736 (2,328)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	260 (68.7)
Engine Jacket Water Capacity: L (gal)	160 (42.3)
After Cooler Water Capacity: L (gal)	40 (10.6)
System Coolant Capacity: L (gal)	583 (154)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	#16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	#16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	960 (254)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	420 (111)
At 75% of Power Rating: L/hr (gal/hr)	322 (85)
At 50% of Power Rating: L/hr (gal/hr)	227 (60)

// Cooling - Radiator System

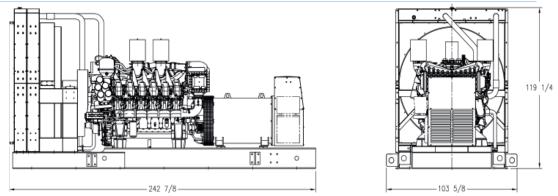
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,117 (295)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	640 (36,396)
Heat Rejection to After Cooler: kW (BTUM)	440 (25,022)
Heat Radiated to Ambient: kW (BTUM)	145.1 (8,254)
Fan Power: kW (hp)	48.7 (65.3)

// Air Requirements

Aspirating: *m³/min (SCFM)	138 (4,873)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	1,574 (55,587)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	530 (18,616)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	435 (815)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	342 (12,078)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



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Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	92.8

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

www.mtuonsiteenergy.com

DIESEL GENERATOR SET MTU 16V4000 DS2000

1800 kWe / 60 Hz / Prime 380 - 13.8kV

Reference MTU 16V4000 DS2000 (2000 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	1800	1800	1800	1800	1800	1800	1800
kVA	2250	2250	2250	2250	2250	2250	2250
Amps	3419	2706	2165	312	104	98	94
skVA@30%							
Voltage Dip	4300	5800	3600	5100	3900	4250	4583
Generator							
Model	744RSL4176	744RSL4054	744RSS4292	744FSM4374	1020FDH 1242	1020FDH1242	1020FDH1242
Temp Rise	105 °C/40 °C						
Connection	4 LEAD WYE	4 LEAD WYE	4 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

// Emissions – EPA Tier 2 Certified

- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- // Seismic Certification Optional
 - IBC Certification
 - OSHPD Pre-Approval

// UL 2200 / CSA – Optional

- UL 2200 Listed
- CSA Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 16V4000 Diesel Engine
 - 76.3 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaner	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	105 °C Max. Prime Temperature Rise
Closed Crankcase Ventilation	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	
Flexible Fuel Connectors	Digital Metering

// Generator

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise
and motor starting
Sustained short circuit current of up to 300% of the rated current for
up to 10 seconds
Self-Ventilated and Drip-Proof
Superior Voltage Waveform
Digital, Solid State, Volts-per-Hertz Regulator

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

// Engine

Manufacturer	MTU
Model	16V4000G43
Туре	4-Cycle
Arrangement	16-V
Displacement: L (in ³)	76.3 (4,656)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	2,020 (2,709)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	300 (79.3)
Engine Jacket Water Capacity: L (gal)	175 (46.2)
After Cooler Water Capacity: L (gal)	50 (13.2)
System Coolant Capacity: L (gal)	547 (145)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,200 (317)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	487 (128.6)
At 75% of Power Rating: L/hr (gal/hr)	381 (100.7)
At 50% of Power Rating: L/hr (gal/hr)	265 (69.9)

// Cooling - Radiator System

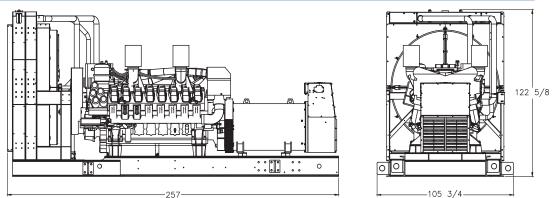
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,350 (357)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	740 (42,083)
Heat Rejection to After Cooler: kW (BTUM)	520 (29,572)
Heat Radiated to Ambient: kW (BTUM)	173.6 (9,871)
Fan Power: kW (hp)	95.4 (128)

// Air Requirements

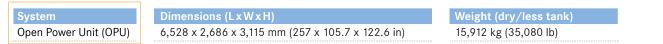
Aspirating: *m ³ /min (SCFM)	180 (6,357)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	2,053 (72,500)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	634 (22,262)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	435 (815)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	426 (15,044)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Loa
Level 0: Open Power Unit dB(A)	98.6

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

NO _x + NMHC	CO	PM
5.26	0.67	0.05

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 16V4000 DS2250

2045 kWe / 60 Hz / Prime 380 - 13.8kV

Reference MTU 16V4000 DS2250 (2250 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2045	2045	2045	2045	2045	2045	2045
kVA	2556	2556	2556	2556	2556	2556	2556
Amps	3888	3078	2463	355	118	112	107
skVA@30%							
Voltage Dip	3625	8400	3900	5000	4120	4120	4900
Generator							
Model	1020FDL1102	744RSL4058	1020FDS1120	744FSM4376	1020FDH1246	1020FDH1246	1020FDH1246
Temp Rise	105 °C/40 °C						
Connection	6 LEAD WYE	4 LEAD WYE	6 LEAD WYE				

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 Listed – Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 16V4000 Diesel Engine
 - 76.3 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	105 °C Max. Prime Temperature Rise
Closed Crankcase Ventilation	1 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	

// Generator	
--------------	--

Flexible Fuel Connectors Flexible Exhaust Connection EPA Certified Engine

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Re
and motor starting	Pro
Sustained short circuit current of up to 300% of the rated current for	UL
up to 10 seconds	Ev
Self-Ventilated and Drip-Proof	IP
Superior Voltage Waveform	NF
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering	
Engine Paramete	ers
Generator Protect	tion Functions
Engine Protectio	n
CANBus ECU Co	mmunications
Windows [®] -Based	I Software
Multilingual Cap	ability
Remote Commu	nications to RDP-110 Remote Annunciator
Programmable Ir	nput and Output Contacts
UL Recognized, 0	CSA Certified, CE Approved
Event Recording	
IP 54 Front Pane	I Rating with Integrated Gasket
NFPA110 Compa	tible

// Engine

Manufacturer	MTU
Model	16V4000G83
Туре	4-Cycle
Arrangement	16-V
Displacement: L (in ³)	76.3 (4,656)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.5:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	2,280 (3,058)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	300 (79.3)
Engine Jacket Water Capacity: L (gal)	175 (46.2)
After Cooler Water Capacity: L (gal)	50 (13.2)
System Coolant Capacity: L (gal)	547 (145)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,800

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,200 (317)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	558 (147)
At 75% of Power Rating: L/hr (gal/hr)	426 (113)
At 50% of Power Rating: L/hr (gal/hr)	299 (79)

// Cooling - Radiator System

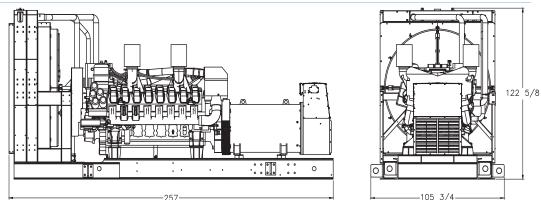
Ambient Capacity of Radiator: °C (°F)	40 (104)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^0)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,350 (357)
After Cooler Pump Capacity: L/min (gpm)	583 (154)
Heat Rejection to Coolant: kW (BTUM)	840 (47,770)
Heat Rejection to After Cooler: kW (BTUM)	610 (34,690)
Heat Radiated to Ambient: kW (BTUM)	186.7 (10,615)
Fan Power: kW (hp)	95.4 (128)

// Air Requirements

Aspirating: *m ³ /min (SCFM)	180 (6,357)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	2,053 (72,500)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	682 (23,940)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	480 (896)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	456 (16,103)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



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Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type	Prime Full Load
Level 0: Open Power Unit dB(A)	98.6
Sound data is provided at 7 m (22 ft) Constrator act tested in	accordonace with ISO 9529 10 and

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 20V4000 DS2500

2250 kWe / 60 Hz / Prime 380 - 13.8kV

Reference MTU 20V4000 DS2500 (2500 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2250	2250	2250	2250	2250	2250	2250
kVA	2812	2812	2812	2812	2812	2812	2812
Amps	4273	3383	2706	390	130	123	117
skVA@30%							
Voltage Dip	3400	4675	5200	5750	4300	4750	5100
Generator							
Model	1020FDL1104	1020RSL1102	1020FDS1122	1020FDM 1180	1020FDH1248	1020FDH1248	1020FDH 1250
Temp Rise	105 °C/40 °C						
Connection	6 LEAD WYE						

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 Listed – Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 20V4000 Diesel Engine
 - 95.4 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filters	105 °C Max. Prime Temperature Rise
Closed Crankcase Ventilation	2 Bearings, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	

Flexible Fuel Connectors	Digital Metering
Flexible Exhaust Connection	Engine Parameters
EPA Certified Engine	Generator Protection Functions
	Engine Protection
	CANBus ECU Communications
// Generator	Windows [®] -Based Software
	Multilingual Capability
NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Remote Communications to RDP-110 Remote Annunciator
and motor starting	Programmable Input and Output Contacts
Sustained short circuit current of up to 300% of the rated current for	UL Recognized, CSA Certified, CE Approved
up to 10 seconds	Event Recording
Self-Ventilated and Drip-Proof	IP 54 Front Panel Rating with Integrated Gasket
Superior Voltage Waveform	NFPA110 Compatible
Digital, Solid State, Volts-per-Hertz Regulator	

// Engine

Manufacturer	MTU
Model	20V4000G43 6 ECT
Туре	4-Cycle
Arrangement	20-V
Displacement: L (in ³)	95.4 (5,822)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.4:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	2,490 (3,339)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	390 (103)
Engine Jacket Water Capacity: L (gal)	205 (54.2)
After Cooler Water Capacity: L (gal)	30 (7.9)
System Coolant Capacity: L (gal)	814 (215)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under - 17.8 °C (0 °F)	4,200

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,620 (428)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	587 (155)
At 75% of Power Rating: L/hr (gal/hr)	462 (122)
At 50% of Power Rating: L/hr (gal/hr)	337 (89)

// Cooling - Radiator System

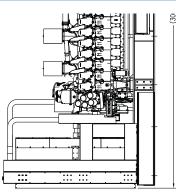
Ambient Capacity of Radiator: °C (°F)	54 (129)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,567 (414)
After Cooler Pump Capacity: L/min (gpm)	567 (150)
Heat Rejection to Coolant: kW (BTUM)	890 (50,613)
Heat Rejection to After Cooler: kW (BTUM)	580 (32,984)
Heat Radiated to Ambient: kW (BTUM)	203.6 (11,581)
Fan Power: kW (hp)	87.5 (117.3)

// Air Requirements

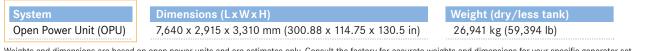
Aspirating: *m ³ /min (SCFM)	228 (8,052)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	2,895 (102,247)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	744 (26,119)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Gas Temp. (Stack): °C (°F)	455 (851)
Gas Volume at Stack	
Temp: m³/min (CFM)	534 (18,858)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type Level 0: Open Power Unit dB(A) Prime Full Load 97.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor **N/A** = Not Available

DIESEL GENERATOR SET MTU 20V4000 DS2800

2500 kWe / 60 Hz / Prime 380 - 13.8kV

Reference MTU 20V4000 DS2800 (2800 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2500	2500	2500	2500	2500	2500	2500
kVA	3125	3125	3125	3125	3125	3125	3125
Amps	4748	3759	3007	434	145	137	131
skVA@30%							
Voltage Dip	4000	4650	5875	5250	4600	5000	5250
Generator							
Model	1030FDL1110	1020FDL1104	1020FDS1124	1020FDM1182	1030FDH 1250	1030FDH1250	1030FDH 1252
Temp Rise	105 °C/40 °C						
Connection	6 LEAD WYE						

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 Listed – Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 20V4000 Diesel Engine
 - 95.4 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Air Cleaners	No Load to Full Load Regulation
Oil Pump	Brushless Alternator with Brushless Pilot Exciter
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field
Full Flow Oil Filter	105 °C Max. Prime Temperature Rise
Closed Crankcase Ventilation	2 Bearing, Sealed
Jacket Water Pump	Flexible Coupling
Inter Cooler Water Pump	Full Amortisseur Windings
Thermostats	125% Rotor Balancing
Blower Fan and Fan Drive	3-Phase Voltage Sensing
Radiator - Unit Mounted	±0.25% Voltage Regulation
Electric Starting Motor - 24V	100% of Rated Load - One Step
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion
Base - Structural Steel	
SAE Flywheel and Bell Housing	
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>
Battery Box and Cables	

11	Generator

Flexible Fuel Connectors

EPA Certified Engine

Flexible Exhaust Connection

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Rer
and motor starting	Pro
Sustained short circuit current of up to 300% of the rated current for	UL
up to 10 seconds	Eve
Self-Ventilated and Drip-Proof	IP 5
Superior Voltage Waveform	NFF
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering Engine Parameters Generator Protection Functions Engine Protection CANBus ECU Communications Windows®-Based Software Multilingual Capability Remote Communications to RDP-110 Remote Annunciator Programmable Input and Output Contacts UL Recognized, CSA Certified, CE Approved Event Recording IP 54 Front Panel Rating with Integrated Gasket NFPA110 Compatible

APPLICATION DATA

// Engine

MTU
20V 4000 G83 6 ECT
4-Cycle
20-V
95.4 (5,822)
17 (6.69)
21 (8.27)
16.4:1
1,800
Electronic Isochronous (ADEC)
2,740 (3,674)
±0.25%
Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	390 (103)
Engine Jacket Water Capacity: L (gal)	205 (54.2)
After Cooler Water Capacity: L (gal)	30 (7.9)
System Coolant Capacity: L (gal)	860 (227)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	4,200

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,620 (428)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	647 (171)
At 75% of Power Rating: L/hr (gal/hr)	511 (135)
At 50% of Power Rating: L/hr (gal/hr)	367 (97)

// Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	48 (118)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_20)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,567 (414)
After Cooler Pump Capacity: L/min (gpm)	567 (150)
Heat Rejection to Coolant: kW (BTUM)	970 (55,162)
Heat Rejection to After Cooler: kW (BTUM)	670 (38,102)
Heat Radiated to Ambient: kW (BTUM)	217.3 (12,360)
Fan Power: kW (hp)	60.6 (81.3)

// Air Requirements

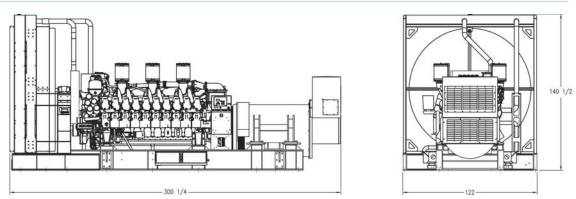
Aspirating: *m ³ /min (SCFM)	240 (8,476)
Air Flow Required for Rad.	
Cooled Unit: *m³/min (SCFM)	3,082 (108,843)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	794 (27,875)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

// Exhaust System

Gas Temp. (Stack): °C (°F)	465 (869)
Gas Volume at Stack	
Temp: m³/min (CFM)	576 (20,341)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)

WEIGHTS AND DIMENSIONS



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.



Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Unit Type Level 0: Open Power Unit dB(A) Prime Full Load 97.5

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations. Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor N/A = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL GENERATOR SET MTU 20V4000 DS3000

2800 kWe / 60 Hz / Prime 380 - 13.8kV

Reference MTU 20V4000 DS3000 (3000 kWe) for Standby Rating Technical Data



SYSTEM RATINGS

Prime

Voltage (L-L)	380V	480V*	600V	4160V	12470V	13200V	13800V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	2800	2800	2800	2800	2800	2800	2800
kVA	3500	3500	3500	3500	3500	3500	3500
Amps	5318	4210	3368	486	162	153	146
skVA@30%							
Voltage Dip	4000	5400	6125	5250	6350	5625	6000
Generator							
Model	1030FDL1110	1020FDL1108	1030FDS1126	1020FDM1184	1040FDH1256	1030FDH1254	1030FDH1254
Temp Rise	105 °C/40 °C						
Connection	6 LEAD WYE						

* UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // Emissions EPA Tier 2 Certified
- // Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Seismic Certification – Optional

- IBC Certification
- OSHPD Pre-Approval

// UL 2200 Listed – Optional

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Accepts Rated Load in One Step Per NFPA 110
- Permissible average power output during 24 hours of operation is approved up to 75%.

STANDARD FEATURES*

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // 2 Year Standard Warranty
- // 20V4000 Diesel Engine
 - 95.4 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) supply to regulator
- 300% Short Circuit Capability
- // Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
- // Cooling System
 - Integral Set-Mounted
 - Engine-Driven Fan

STANDARD EQUIPMENT*

// Engine

Flexible Fuel Connectors

Air Cleaners	No Load to Full Load Regulation	
Oil Pump	Brushless Alternator with Brushless Pilot Exciter	
Oil Drain Extension and S/O Valve	4 Pole, Rotating Field	
Full Flow Oil Filter	105 °C Max. Prime Temperature Rise	
Closed Crankcase Ventilation	2 Bearing, Sealed	
Jacket Water Pump	Flexible Coupling	
Inter Cooler Water Pump	Full Amortisseur Windings	
Thermostats	125% Rotor Balancing	
Blower Fan and Fan Drive	3-Phase Voltage Sensing	
Radiator - Unit Mounted	±0.25% Voltage Regulation	
Electric Starting Motor - 24V	100% of Rated Load - One Step	
Governor – Electronic Isochronous	5% Max. Total Harmonic Distortion	
Base - Structural Steel		
SAE Flywheel and Bell Housing		
Charging Alternator - 24V	<pre>// Digital Control Panel(s)</pre>	
Battery Box and Cables		

Flexible Exhaust Connection	Engine Parameters
EPA Certified Engine	Generator Protection Functions
	Engine Protection
	CANBus ECU Communications
// Generator	Windows [®] -Based Software
	Multilingual Capability
NEMA MG1, IEEE and ANSI standards compliance for temperature rise	Remote Communications to RDP-110 Remote Annunciator
and motor starting	Programmable Input and Output Contacts
Sustained short circuit current of up to 300% of the rated current for	UL Recognized, CSA Certified, CE Approved
up to 10 seconds	Event Recording
Self-Ventilated and Drip-Proof	IP 54 Front Panel Rating with Integrated Gasket
Superior Voltage Waveform	NFPA110 Compatible
Digital, Solid State, Volts-per-Hertz Regulator	

Digital Metering

* Represents standard product only. Consult Factory/MTU Onsite Energy Distributor for additional configurations.

APPLICATION DATA

// Engine

Manufacturer	MTU
Model	20V4000G83L 6 ECT
Туре	4-Cycle
Arrangement	20-V
Displacement: L (in ³)	95.4 (5,822)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression Ratio	16.4:1
Rated RPM	1,800
Engine Governor	Electronic Isochronous (ADEC)
Max. Power: kWm (bhp)	3,010 (4,036)
Speed Regulation	±0.25%
Air Cleaner	Dry
•••••••••••••••••••••••••••••••••••••••	

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	390 (103)
Engine Jacket Water Capacity: L (gal)	205 (54.2)
After Cooler Water Capacity: L (gal)	30 (7.9)
System Coolant Capacity: L (gal)	860 (227)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	4,200

// Fuel System

Fuel Supply Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Fuel Return Connection Size	-16 JIC 37° Female
	1" NPT Adapter Provided
Max. Fuel Lift: m (ft)	1 (3)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,620 (428)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	712 (188)
At 75% of Power Rating: L/hr (gal/hr)	553 (146)
At 50% of Power Rating: L/hr (gal/hr)	390 (103)

// Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	47 (117)
Max. Restriction of Cooling Air: Intake	
and Discharge Side of Rad.: kPa (in. H_2^{0})	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	1,567 (414)
After Cooler Pump Capacity: L/min (gpm)	567 (150)
Heat Rejection to Coolant: kW (BTUM)	1,040 (59,143)
Heat Rejection to After Cooler: kW (BTUM)	770 (43,789)
Heat Radiated to Ambient: kW (BTUM)	221.7 (12,606)
Fan Power: kW (hp)	60.6 (81.3)

// Air Requirements

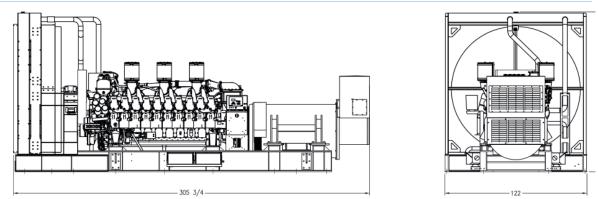
Aspirating: *m ³ /min (SCFM)	252 (8,900)
Air Flow Required for Rad.	
Cooled Unit: *m ³ /min (SCFM)	3,082 (108,843)
Remote Cooled Applications;	
Air Flow Required for Dissipation	
of Radiated Generator Set Heat for a	
Max. of 25 °F Rise: *m ³ /min (SCFM)	799 (28,041)

* Air density = 1.184 kg/m (0.0739 lbm/ft³)

// Exhaust System

Gas Temp. (Stack): °C (°F)	480 (896)
Gas Volume at Stack	
Temp: m ³ /min (CFM)	624 (22,036)
Max. Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)

WEIGHTS AND DIMENSIONS



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Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

Prime Full Load

97.5

SOUND DATA

Unit Type Level 0: Open Power Unit dB(A)

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA



All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values).

Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

// Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.

// Deration Factor:

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C/F = Consult Factory/MTU Onsite Energy Distributor N/A = Not Available

MTU Onsite Energy A Rolls-Royce Power Systems Brand

DIESEL POWER MODULE MTU 16V4000 DS1955

Voltages:

2160 kWe / 2700 kVA / 60 Hz / Standby - 480V 1955 kWe / 2443 kVA / 60 Hz / Prime - 480V 1760 kWe / 2200 kVA / 60 Hz / Continuous - 480V

1900 kWe / 2375 kVA / 50 Hz / Standby - 400V 1721 kWe / 2151 kVA / 50 Hz / Prime - 400V 1500 kWe / 1875 kVA / 50 Hz / Continuous - 400V



SYSTEM RATINGS

Phase 3 <th>00V 3 9.8</th> <th>400V 3</th>	00V 3 9.8	400V 3
PF 0.8	.8	
PF 0.8	.8	
Hz 60 60 60 50 50 kW 2,160 1,955 1,760 1,900 1, kVA 2,700 2,443 2,200 2,375 2, Amps 3,251 2,942 2,649 3,432 3,		0.0
kW2,1601,9551,7601,9001,kVA2,7002,4432,2002,3752,Amps3,2512,9422,6493,4323,		50
kVA2,7002,4432,2002,3752Amps3,2512,9422,6493,4323	,721	1,500
	2,151	1,875
	8,108	2,709
skVA@30%		
	,530	4,530
	44RDL4056	744RDL4056
Temp Rise 150 °C/40 °C 125 °C/40 °C 105 °C/40 °C 150 °C/40 °C 111	25 °C/40 °C	105 °C/40 °C
	BAR WYE	4 BAR WYE

CERTIFICATIONS AND STANDARDS

// Emissions

- Fuel Optimized

// Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004

// Container

- CSC Certified

// Performance Assurance Certification (PAC)

- Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

// Power Rating

- Permissible average power output during 24 hours of operation is approved up to 85% for standby rated unit.
- Permissible average power output during 24 hours of operation is approved up to 75% for prime rated unit.
- Permissible average power output during 24 hours of operation is approved up to 100% for continuous rated unit.

STANDARD FEATURES*

- // MTU Onsite Energy is a single source supplier
- // Global Product Support
- // Consult factory for specific warranty terms
- // 16V 4000 Diesel Engine
 - 76.3 Liter Displacement
 - Common Rail Fuel Injection
 - 4-Cycle
- // Engine-Generator Resilient Mounted
- // Complete Range of Accessories

// Generator

- Brushless, Rotating Field Generator
- 2/3 Pitch Windings
- PMG (Permanent Magnet Generator) Supply to Regulator
- 300% Short Circuit Capability
- // Digital Control Panel
 - Complete System Metering
- LCD Display
- // Cooling System
 - Remote Mounted / Vertical Split Cores
 - Electrically Driven Fans

STANDARD EQUIPMENT*

// Engine

Air Cleaners
Oil Pump
Oil Drain Extension & S/O Valve
Lube Oil Multi-Stage Filter
Closed Crankcase Ventilation
Jacket Water Pump
Thermostats
Radiator - Remote Mounted
Electric Starting Motor - 24V
Governor – Electronic Isochronous
Base - Formed Steel
SAE Flywheel & Bell Housing
Charging Alternator - 24V
Battery Rack & Cables
Fuel Optimized (Both 60 Hz and 50 Hz)

// Generator

Full Amortisseur Windings 125% Rotor Balancing 3-Phase Voltage Sensing ±0.25% Voltage Regulation 100% of Rated Load - One Step 5% Maximum Total Harmonic Distortion

Note: Air filter will cause 5% derate in power output (kWe) and may also affect fuel consumption.

// Digital Control Panel(s)

Digital Metering
Engine/Generator Protection Functions
CANBus ECU Communications
Multilingual Capability
Programmable Contact Outputs

NEMA MG1, IEEE and ANSI standards compliance for temperature rise	1
and motor starting	
Sustained short circuit current of up to 300% of the rated current for	4
up to 10 seconds	R
Self-Ventilated and Drip-Proof	Т
Superior Voltage Waveform	1
Digital, Solid State, Volts-per-Hertz Regulator	E
No Load to Full Load Regulation	tı
Brushless Alternator with Brushless Pilot Exciter	N
4 Pole, Rotating Field	N
2 Bearing, Sealed	2
Close Coupling	F

Container

40' High Cu	ibe ISO Container
Rear Conta	iner Double Doors
Three Locka	able Personnel Access Doors
1,500 Liters	s (400 gallons) UL 142 Certified Diesel Fuel Tank
Externally N	Nounted Critical Grade Exhaust Silencer (stored during
transport b	etween the split core radiator)
NEMA 1 Flo	oor-Standing Generator Set Breaker Panel
Main Line C	Circuit Breaker Rated at 3200 Amps and 65KAIC
24 VDC Inc	andescent Lights
Field Adjust	table Timer, Factory Set to 60 Minutes

* Represents standard product only. Consult Factory/MTU Onsite Energy Distributor for additional configurations.

APPLICATION DATA

// Engine

Manufacturer		MTU
Model 60 Hz Standby		16V 4000 G83 3D
Model 60 Hz Prime		16V 4000 G83 3B
Model 60 Hz Continuous		16V 4000 G83 3A
Model 50 Hz Standby		16V 4000 G63 3D
Model 50 Hz Prime		16V 4000 G63 3B
Model 50 Hz Continuous		16V 4000 G63 3A
Туре		4-Cycle
Arrangement		16-V
Displacement: L (Cu In)		76.3 (4,656)
Bore: cm (in)		17 (6.69)
Stroke: cm (in)		21 (8.27)
Compression Ratio		16.5:1
Rated RPM: 60 Hz		1,800
Rated RPM: 50 Hz		1,500
Engine Governor	Electr	onic Isochronous (ADEC)
Standby Rated Power:	60 Hz: kWm (hp)	2,500 (3,352)
	50 Hz: kWm (hp)	2,185 (2,930)
Prime Rated Power:	60 Hz: kWm (hp)	2,280 (3,057)
	50 Hz: kWm (hp)	1,965 (2,635)
Continuous Rated Power:	60 Hz: kWm (hp)	1,950 (2,614)
	50 Hz: kWm (hp)	1,635 (2,192)
Speed Regulation		±0.25%
Air Cleaner		Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	300 (79.3)
Total Oil Change: L (gal)	240 (63.4)
Engine Jacket Water Capacity: L (gal)	175 (46.2)
After Cooler Water Capacity: L (gal)	50 (13.2)
System Coolant Capacity: L (gal)	852 (225)

// Electrical

Electric Volts DC	24
Cold Cranking Amps Under -17.8 °C (0 °F)	2,600

// Fuel System

Maximum Fuel Lift: m (ft)	3 (10)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	1,200 (317)

// Fuel Consumption

60 Hz	STANDBY	PRIME	CONTINUOUS
At 100% of Power Rating:			
L/hr (gal/hr)	613 (162)	538 (142)	458 (121)
At 75% of Power Rating:			
L/hr (gal/hr)	435 (115)	397 (105)	352 (93)
At 50% of Power Rating:			
L/hr (gal/hr)	303 (80)	276 (73)	254 (67)
50 Hz	STANDBY	PRIME	CONTINUOUS
At 100% of Power Rating:			
L/hr (gal/hr)	500 (132)	435 (115)	367 (97)
At 75% of Power Rating:			
L/hr (gal/hr)	371 (98)	329 (87)	284 (75)
At 50% of Power Rating:			
L/hr (gal/hr)	254 (67)	231 (61)	201 (53)

// Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	55 (131)
Max. Restriction of Cooling Air, Intake,	
and Discharge Side of Rad.: kPa (in. H_20)	0.125 (0.5)
Water Pump Capacity: L/min (gpm)	1,350 (357)
Heat Rejection to Coolant: kW (BTUM)	**960 (54,593)
Heat Rejection to After Cooler: kW (BTUM)	**560 (31,846)
Fan Power: kW (hp)	99.5 (133.4)

// Air Requirements

Aspirating: *(m3/min) SCFM	**192 (6,780)
Air Flow Required for Rad.	
Cooled Unit: *(m3/min) SCFM	3,862 (136,409)

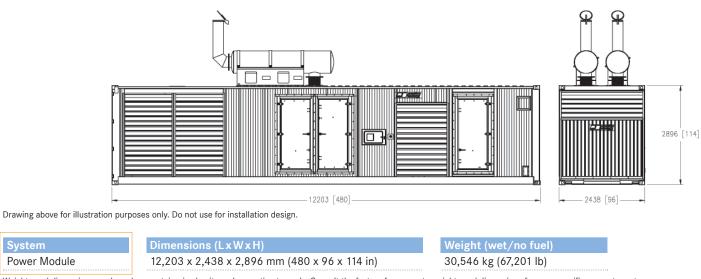
* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

// Exhaust System

Gas Temp. (Stack): °C (°F)	**505 (941)
Gas Volume at Stack	
Temp: m³/min (CFM)	**504 (17,799)
Maximum Allowable	
Back Pressure: kPa (in. H ₂ 0)	8.5 (34.1)
*	

** For 60 Hz Standby Rated Power

WEIGHTS AND DIMENSIONS



Weights and dimensions are based on containerized units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

System

Unit Type	Full Load - Standby	Full Load - Prime	Full Load - Continuous
Power Module dB(A)	C/F	C/F	C/F

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

RATING DEFINITIONS AND CONDITIONS

- // Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO-3046-1, BS 5514, and AS 2789. Average load factor: \leq 85%. Standby 50 Hz operating hours per year: Max. 500.
- // Prime power and continuous ratings apply to installations where utility power is unavailable or unreliable. At varying load for prime power ratings or non-varying load for continuous ratings, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve for both ratings. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, and AS 2789. Average load factor: $\leq 75\%$ (Prime) $\leq 100\%$ (Continuous).
- // Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

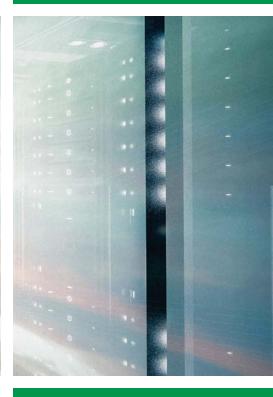
Product intended for use outside of the United States.

C/F = Consult Factory/MTU Onsite Energy Distributor N/A = Not Available

ASCO SERIES 300 Power Transfer Switches









24-hour protection, no matter when trouble strikes

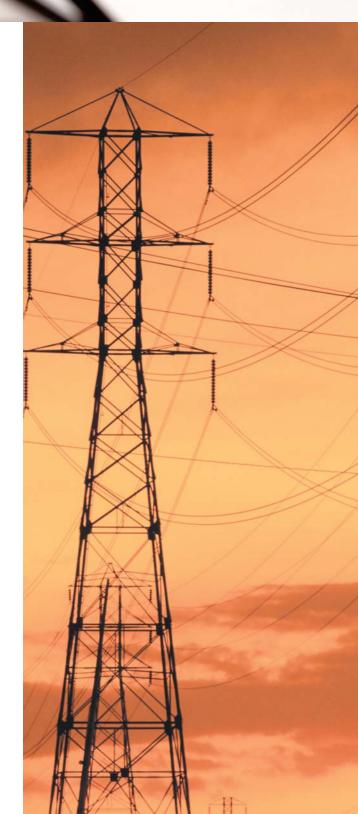
ASCO SERIES 300 Power Transfer Switches for Power Outage Protection

Where would you be without a constant flow of electrical power? We often take for granted that power will always be around when we need it.

In reality, power failures are common, and when the power goes out, your business suffers. Power failures are unpredictable. They can occur at any time and for any number of reasons — a bolt of lightning, a power surge, a blackout, an accident or even equipment failure. They come without warning and often at the most inconvenient times.

It's for this reason that many businesses and other entities have invested in emergency power backup systems. Typically, the system consists of an engine generator and an automatic transfer switch (ATS) that transfers the load from the utility to the generator.

An ATS with built-in control logic monitors your normal power supply and senses interruptions and unacceptable abnormalities. When the utility power fails, the ATS automatically starts the engine generator and transfers the load after the generator has reached proper voltage and frequency. This happens in a matter of seconds after the power failure occurs. When the utility power has been restored, the ATS will automatically switch the load back and, after a time delay, shut down the engine generator. With an ATS, you are protected 24 hours a day, seven days a week.





TYPICAL APPLICATIONS

TELECOM

In the telecommunication industry, providing a high level of service and dependability is crucial. Lost power means an interruption in service for your customers and lost business for your company. For instance, with cell sites scattered across a wide geographical region and in many remote areas, the chances of an interruption in power are increased, making an ATS valuable resource at each location.

To maintain dependable service, each cell site must be monitored 24 hours a day. This can be very difficult without some type of remote monitoring and testing capability. The SERIES 300 Transfer Switch, combined with ASCO's monitoring and control management system, is a cost-effective, packaged solution that can achieve both of these challenging objectives without a major investment at each cell site. With ASCO's connectivity solutions, you can remotely monitor and control numerous sites from around the corner or across the world.

AGRICULTURE

Maintaining electrical power is vital to an agriculture operation. If the flow of power is interrupted, your operation will be at risk unless the backup generator is quickly activated. A prolonged power outage can affect numerous aspects of the operation, from housing and feeding livestock to processing and producing the end product.

With an ASCO SERIES 300 Transfer Switch, power will automatically be transferred over to your backup generator, eliminating the need to manually switch from utility to generator. When power is restored, the ASCO SERIES 300 Transfer Switch will, after an adjustable time delay to allow for utility stabilization, automatically switch the load back to the utility service.

COMMERCIAL/RETAIL, LIGHT INDUSTRIAL

The retail industry is very competitive. An electrical power failure can have a dramatic impact on a retailer's bottom line. If power is interrupted during peak shopping times, the effect can be extremely damagin to present and future business.

A power interruption will not only suspend shopping, it can also create safety problems, result in lost transaction data, lost account information and possible damage to data collection equipment. In addition, retailers who rely on controlled climates to protect valuable inventory could suffer even greater losses, especially if the power failure occurs at a time when no one is available to rectify the situation. To avoid any of these power outage problems, simply install a backup generator with an ASCO SERIES 300 Transfer Switch, and your power outage concerns will be a thing of the past.

MUNICIPAL

The ASCO SERIES 300 Transfer Switch can be a critical component of a municipal government's emergency power backup system. Residents of townships, cities and counties rely on police, fire, ambulance/first aid and other critical public sector services.

An interruption in power can affect the ability of emergency services to effectively respond to the needs of the community. When time is a critical factor, such as when responding to a fire alarm or an emergency call, an ASCO SERIES 300 Transfer Switch can be a lifesaver, by automatically switching to power from the backup generator. While not all municipal services are a matter of life and death, they are always expected to be there.

SERIES 300 POWER TRANSFER SWITCHES

MAXIMUM RELIABILITY & EXCELLENT VALUE

With a SERIES 300 Transfer Switch, you get a product backed by ASCO Power Technologies, the industry leader responsible for virtually every major technological advance in the Transfer Switch industry.

The ASCO SERIES 300 was designed for one purpose-to automatically transfer critical loads in the event of a power outage. Each and every standard component was designed by ASCO engineers for this purpose.

The SERIES 300 incorporates the Group G controller with enhanced capabilities for dependable operation in any environment. A user-friendly control interface with a 128x64 graphical LCD display and intuitive symbols allow for ease of operation while visual LED indicators display the transfer switch status. Operating parameters and feature settings can be adjusted without opening the enclosure door.

The rugged construction and proven performance of the ASCO SERIES 300 assure the user of many years of complete reliability. The SERIES 300 is even designed to handle the extraordinary demands placed on the switch when switching stalled motors and high inrush loads.

ASCO's SERIES 300 modular, compact design makes it easy to install, inspect and maintain. All parts are accessible from the front so switch contacts can be easily inspected.

FEATURES

- The SERIES 300 is listed to UL 1008 standard for total system loads for automatic transfer switches.
- Meets NFPA 110 for Emergency and Standby Power Systems and the National Electrical Code (NEC) Articles 700, 701 and 702.

UL 1008 WITHSTAND AND CLOSE-ON RATINGS FOR ASCO Series 300 GROUP G PRODUCTS ^{1,2}

(RMS Symmetrical Amperes)

FRAME	SWITCH RATINGS (AMPERES)	CURRENT LIMITING FUSES			SPECIFIC BREAKER			
	TRANSFER SWITCHES	480V MAX.	600V MAX.	MAX. SIZE, A	CLASS	240V MAX.	480V MAX.	600V MAX.
D	30	100kA	-	60	J	22kA	22kA	10kA
D	70-104	35kA	35kA	200	RK1	42kA	22kA	10kA
	70-104	200kA	35kA	200	J	42KA	ZZKA	IUKA
D	150	35kA	35kA	200	RK1	65kA	25kA	10kA
	150	200kA	35kA	200	J	UJKA		
D	200	200kA	-	200	J	65kA	25kA	10kA
D	230	100kA	-	300	J	65kA	25kA	10kA
J	150 ⁴ , 200 ⁴ , 230 ⁴ , 206, 400	200kA	200kA	600	J	50kA	50kA	42kA
J	600	200kA	200kA	800	L	50kA	50kA	42kA
н	800-1200	200kA	200kA	1600	L	65kA ³	65kA	65kA
G	1600-2000 ³	200kA	200kA	2500	L	85kA	85kA ³	85kA ³
G	2600-3000	200kA	200kA	4000	L	100kA	100kA	100kA

Notes: 1. All WCR values indicated are tested in accordance with the requirements of UL 1008, 7th Edition. See ASCO Pub. 1128 for

more WCR information. 2. Application requirements may permit higher WCR for certain switch sizes

3. Front connected only.

4. J150, 200, 230 Amperes available in 3ADTS and 3NDTS only.



Fig. 1: ASCO Power Transfer Switch rated 200 Amps

- Restriction of Hazardous Substances (RoHS) compliant controller.
- 30 through 3000 amperes in a compact design.
- Switch operating temperature range of 0 to +40° C.
- Available to 600 VAC, single or three phase.
- True double-throw operation: The single solenoid design is inherently inter-locked and prevents connections to both sources at the same time.
- No danger of the SERIES 300 ATS transferring loads to a dead source because the unique ASCO single-solenoid operator derives power to operate from the source to which the load is being transferred.
- Easy-to-navigate 128x64 graphical LCD display with keypad provides LED indicators for switch position, source availability, not in auto mode, and alert condition.
- Integrated multilingual user interface for configuration and monitoring.
- Delayed transition operation is now available (Dual Operator Configuration).
- Non-automatic operation can be selected using the key pad without opening enclosure door.
- Relay expansion module with extra relays for accessory outputs (optional).
- Includes soft keys for test function and time delay bypass as standard features.
- Emergency source failure alert indication.
- Historical event log (optional).
- Statistical ATS system monitoring information.
- Diagnostic functions.
- Password protection to prevent unauthorized tampering of settings.
- Adjustable time-delay feature prevents switch from being activated due to momentary utility power outages and generator dips.
- Auxiliary contacts to indicate position of main contacts. Two (2) for normal and two (2) emergency position
- Supplied with solid neutral termination.
- Optional switched neutral pole available.
- Field modification accessory kits available.
- Available for immediate delivery.

SERIES 300 POWER TRANSFER SWITCHES

DESIGNED TO FIT ANYWHERE

The ASCO SERIES 300 product line represents the most compact design of automatic power transfer switches in the industry. With space in electrical closets being at a premium, the use of wall-or floor-mounted ASCO Power Transfer Switches assure designers optimum utilization of space.

All transfer switches through 2000 amperes are designed to be completely front accessible. This permits the enclosures to be installed flush against the wall and still allow installation of all power cabling and connections from the front of the switch. Cable entrance plates are also standard on the 1600 and 2000 amperes units to install optional side-mounted pull boxes for additional cable bending space.



Fig. 2: ASCO Power Transfer Switch rated 200 Amps



Fig. 3: ASCO Power Transfer Switch rated 400 Amps



Fig. 4: ASCO Power Transfer Switch rated 600 Amps



Fig. 5: ASCO Power Transfer Switch rated 1000 Amps

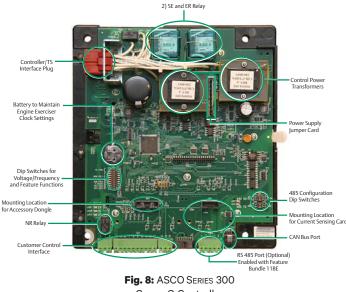


Fig. 6: ASCO Power Transfer Switch rated 2000 Amps shown in Type 3R enclosure



Fig. 7: ASCO Power Transfer Switch rated 3000 Amps





Group G Controller

CONTROL AND DISPLAY PANEL

 Easy-to-navigate 128x64 graphical LCD display with keypad provides LED indicators for switch position, source availability, not in auto mode, and alert condition. It also includes test and time delay bypass soft keys.

VOLTAGE, FREQUENCY & CURRENT SENSING

- 3-phase under and over voltage settings on normal and single phase sensing on emergency source.
- Under and over frequency settings on normal and emergency.
- True RMS voltage sensing with +/-1% accuracy.
- Frequency sensing accuracy is +/- 0.1Hz.
- Voltage and frequency parameters adjustable in 1% increments.
- Selecting settings: single or threephase voltage sensing on normal, and single phase sensing on emergency; 50 or 60Hz. 3-phase voltage unbalance on normal.
- Load current sensing card (optional).

The SERIES 300 incorporates the group "G" controller with enhanced capabilities for dependable operation in any environment.

TIME DELAYS

- Engine start time delay delays engine starting signal to override momentary normal source outages, adjustable from 0 to 6 seconds (Feature 1C).
- Emergency source stabilization time delay to ignore momentary transients during initial generator set loading, adjustable from 0 to 4 seconds (Feature 1F).
- Re-transfer to normal time delay with two settings (Feature 3A).
 - Power failure mode 0 to 60 minutes
 - Test mode 0 to 10 hours
- Unloaded running time delay for engine cooldown, adjustable from 0 to 60 minutes (Feature 2E).
- Pre- and post-signal time delay for selective load disconnect with a programmable bypass on source failures, adjustable from 0 to 5 minutes (specify ASCO optional accessory 31Z).
- Optional fully programmable engine exerciser with seven independent routines to exercise the engine generator, with or without loads, on a daily, weekly, bi-weekly or monthly basis (specify ASCO optional accessory feature bundle 11BE).
- Delayed transition load disconnect time delay, adjusable from 0 to 5 minutes (3ADTS/3NDTS configuration only).

STANDARD SELECTABLE FEATURES

- Inphase monitor to transfer motor loads, without any intentional off time, to prevent inrush currents from exceeding normal starting levels.
- Engine exerciser to automatically test backup generator each week, with or without load 20 minutes not adjustable.
- Commit to transfer.
- Selective load disconnect circuit to provide a pre-transfer and/or posttransfer signal when transferring from emergency to normal and/or normal to emergency.
- Re-transfer to normal through soft keys on user interface permits selection of "manual" or "automatic" operation.
- 60Hz or 50Hz selectable switch. Three-/single- phase selectable switch.

REMOTE CONTROL FEATURES

- External inputs for connecting:
- Remote test switch.
- Remote contact for test or peak shaving applications. If emergency source fails, switch will automatically transfer back to normal source if acceptable.
- Inhibit transfer to emergency.
- Remote time delay bypass switch emergency to normal.

SERIES 300 GROUP G OFFERS SOPHISTICATED FUNCTIONALITY

The new Group G controller offers an intuitive, easy-to-navigate 128*64 graphical LCD display with soft keypad and provides six (6) LED indicators.

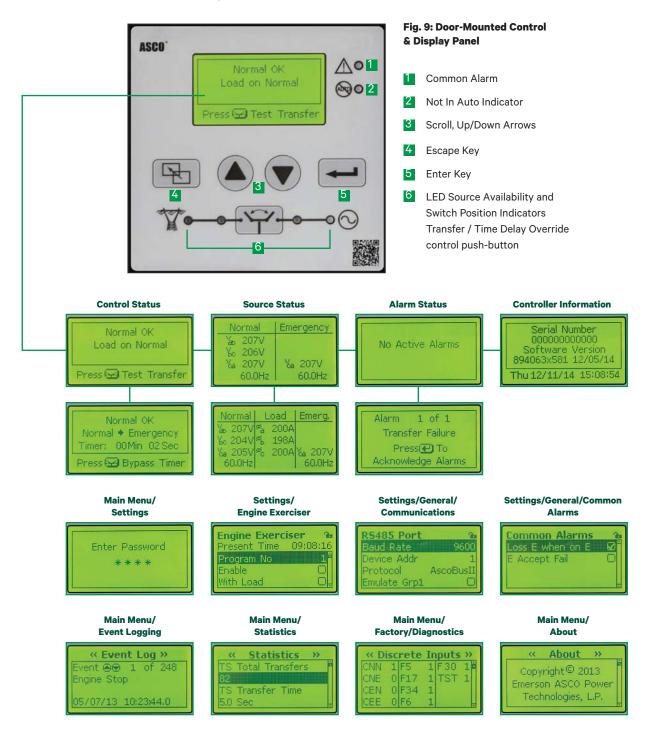
- Switch Position (green for normal, red for emergency LED)
- Source Availability (green for normal, red for emergency LED)
- "Not In Auto" (amber LED)
- Common Alarm (amber LED)

The ASCO group "G" controller is self-contained with an integrated display (no other components are required for efficient operation).

The controller allows for open or delayed transition transfer opertion (both automatic, and non-automatic configurations).

An integrated multilingual user interface for configuration and monitoring (this design approach allowsgreater application flexibility).

Multiple source-sensing capabilities of voltage, frequency (under frequency sensing on normal and emergency sources), and optional current card, single and three phase (does not require an external metering device).



SERIES 300 ATS OPTIONAL ACCESSORIES

ACCESSORY 1UP

UPS back up power to allow controller to run with LCD display for 30 seconds without AC power.

ACCESSORY 11BE FEATURE BUNDLE

A fully programmable engine exerciser with seven independent routines to exercise the engine generator with or without loads, on a daily, weekly, bi-weekly or monthly basis. Engine exerciser setting can be displayed and changed from the user interface keypad.

Event Log display shows the event number, time and date of event, event type, and event reason (if applicable).

A maximum of 300 events can be stored. RS 485 Communications Port Enabled Common Alarm Output Contact

ACCESSORY 18RX

Relay expansion module (REX) provides for some commonly used accessory relays, includes one form C contact for source availability of normal (18G), and one form C contact for availability of emergency (18B) (contact rating 5 amperes @ 30Vdc or @125 VAC resistive). Additional output relay is provided, the default is to indicate a common alarm. (See operator's manual for configurable options.)

ACCESSORY 23GA¹ (SINGLE PHASE) AND 23GB (THREE PHASE)

Load current metering card measures either single or three phase load current.

Note 1: This feature is not available with a Power Meter Option (135L).

ACCESSORY 44A

Strip Heater with thermostat for extremely cold areas to prevent condensation and freezing of this condensation. External 120 volt power source required.

ACCESSORY 44G

Strip Heater with thermostat, wired to load terminals: 208-240, 360-380, 460-480, 550-600 volts. Contains wiring harnesses for all transfer switch sizes.

ACCESSORY 72EE

Connectivity Module enabling remote monitoring and control capabilities includes accessory 11BE featured bundle (pages 12-14).

FIELD CONVERSION KITS FOR SERIES 300 TRANSFER SWITCHES

KIT NO.	DESCRIPTION
935147	Feature Bundle Includes Engine Exerciser/Event Log/RS 485/Common Alarm Output Contact (Acc. 11BE) Dongle
935148	REX Module with Source Availability Contacts (Acc. 18RX)
935149	UPS to allow controller to run for 30 seconds minimum without AC Power (Acc. 1UP)
935150	1/3 Phase load current sensing card only (Acc. 23GA/GB)
K613127-001	Strip Heater (125 watt) 120 volt (Acc. 44A)
K613127-002	Strip Heater (125 watt) 208-480 volt (Acc. 44G)
948551	Quad-Ethernet Module (Acc. 72EE)
K609027	Cable Pull Box (1600-2000 amperes)

ACCESSORY 73

Surge Suppressor (TVSS) Rated 65kA.

ACCESSORY 62W

Audible alarm with silencing feature to signal each time switch transfers to emergency (may require oversize enclosure depending on accessory combination for "D" frame only).

ACCESSORY 37B

6' Extension harness for units shipped open type to accommodate customer mounting of controls and switch.

ACCESSORY 37C

9' Extension harness for units shipped open type to accommodate customer mounting of controls and switch.

ACCESSORY 135L²

Power Meter on load side (includes shorting block and CTs)Note 2: This feature is not available with Load Current Metering Option (23GA or 23GB). **ACCESSORY 30A³**

Shedding circuit initiated by opening of a customer-supplied contact.

ACCESSORY 30B*3

Load-shedding circuit initiated by removal of customer-supplied voltage. (*Specify Voltage)

ACCESSORY 30AA³

Load-shedding circuit initiated by opening of a customer-supplied contact.

ACCESSORY 30BA*3

Load-shedding circuit initiated by removal of customer-supplied voltage. (*Specify Voltage)

Note 3: Accessory 30A and 30B* are only available for 3ATS only; accessory 30AA and 30BA* are only available for 3ADTS.





Fig. 11: Relay Expansion Module (Accessory 18RX)

Fig. 13: Programmable

Engine Exerciser

09:08:1

Engine Exerciser

rogram No nable ith Load

Fig. 10: Strip Heater Kit (Accessory 44G)



Fig. 12: Load Current Card (Accessory 23GA/GB)



Fig. 14: Accessory 1UP UPS Backup Power

SERIES 300 POWER TRANSFER SWITCHES

SERIES 300 NON-AUTOMATIC TRANSFER SWITCHING (3NTS)

ASCO non-automatic transfer switches are generally used in applications in which operating personnel are available and the load is not an emergency type requiring automatic transfer of power. They can also be arranged for remote control via ASCO's connectivity products.



Fig. 15: ASCO 3NTS 400 Amps Type 1 Enclosure

3NTS FEATURES

- ASCO Non-Automatic Transfer Switches are manually initiated via soft keys on the user interface panel.
- Sizes range from 30 through 3000 amperes.
- Group G controller provides for addition of optional accessories.
- Controller prevents inadvertent operation under low voltage condition.
- Source acceptability lights inform operator if sources are available to accept load.
- Source inphase monitor to transfer motor loads between live sources.
- Two auxiliary contacts closed when transfer switch is connected to normal and two closed on emergency standard feature 14AA/14BA.



Fig. 16: ASCO 3ADTS/3NDTS 400 Amps Type 1 Enclosure

SERIES 300 DELAYED TRANSITION TRANSFER SWITCHING (3ADTS/3NDTS)

ASCO Delayed Transition Transfer Switches are designed to provide transfer of loads between power sources with a timed load disconnect position for an adjustable period of time.

3ADTS/3NDTS FEATURES

- Sizes from 150 through 3000 amperes.
- Reliable field proven dual solenoid operating mechanisms.
- Mechanical interlocks to prevent direct connection of both sources.
- Adjustable time delay for load disconnect (0 to 5 minutes).
- Available in manual operation configuration (3NDTS).
- Available with optional load shed feature for (3ADTS).

SERIES 300 TRANSFER SWITCH ORDERING INFORMATION

To order an ASCO SERIES 300 Power Transfer Switch, complete the following catalog number:

	O3ATS						
Frame	Transition Type	Neutral Code	Phase	Amperes	Voltage	Group	Enclosure
			Poles		Code	Code	
Open	Automatic	A = Solid Neutral	2	0030 ¹	A ³ = 115	GO	0 = Open Type (zero)
Transition D = 30A - 230A	03ATS Open Transition	B = Switched	3	0070 ¹	B ³ = 120	No Optional Accessories	C = Type 1 Enclosure
D = 30A - 230A	Transition	Neutral	3	0104 ¹	C = 208	Accessories	C = Type TEnclosure
Open/Delayed Transition	3ADTS Delayed Transition			0150 ^{1, 5}	D = 220	GX Optional	F = Type 3R ¹ Enclosure
J = 150A - 600A	Non Automatic			0200 ^{1, 3, 4}	E = 230	Accessories	
H = 800A - 1200A	03NTS Open Transition			0230 ^{1, 3, 4}	F = 240		G = Type 4 ¹ Enclosure
G = 1600A - 3000A	Transition			0260 ^{1, 4}	H = 380		
	3NDTS Delayed Transition			0400 ^{1, 4}	J = 400		H = Type 4X ¹ Enclosure (304 Stainless Steel)
				0600 ^{1, 4}	K = 415		
				08004	L = 440		L = Type 12 ¹ Enclosure
				10004	M = 460		
				1200 ^{4, 5}	N = 480		M = Type 3R ³ Secure Double Door Enclosure
				1600 ^{4, 5}	P = 550		
				2000 ^{4, 5}	Q = 575		N = Type 4 Secure Double Door Enclosure
				2600 ^{4, 5}	R = 600		
				3000 ^{4, 5}			Q = Type 12 Secure Double Door Enclosure
							R = Type 3RX ^{7,8} Secure
							Double Door Enclosure
							(304 Stainless Steel)

Notes:

1. Switch sizes 30-600 amperes supplied in non-secure enclosures as standard.

2. 115-120 volt available for 30-400 amperes only. For other voltages contact ASCO.

3. 200 and 230 amperes rated switches for use with copper cable only.

4. Switch sizes 800-3000 amperes, and 150-400 amperes 3ADTS/3NDTS provided in secure type outdoor enclosures when required.

5. Use Type 3R secure for 1200, 2000, 2600, and 3000.

6. Type 304 stainless steel is standard. Suitable for indoor or outdoor use where there may be caustic or alkali chemicals in use. To provide an improved reduction in corrosion of salt and some chemicals, optional type 316 stainless steel is recommended. This is the preferred choice for marine environments.

7. Available on switches rated 1200, 2000, 2600, and 3000 amperes.

8. When temperatures below 32⁰F can be experienced, special precautions should be taken, such as the inclusion of strip heaters, to prevent condensation and freezing of this condensation. This is particularly important when environmental (Type 3R, 4) are ordered for installation outdoors.

9. Type 3R enclosures are not suitable for installations subject to wind blown rain or snow. Use type 4 enclosures where available or install supplemental shelter protection around the 3R enclosure.

SERIES 300 EXTERNAL POWER CONNECTIONS

Size UL-Listed Solderless Screw-Type Terminals

SWITCH RATING	RANGES OF AL-CU WIRE SIZES
(AMPERES)	(UNLESS SPECIFIED COPPER ONLY)
30-230 ² ATS and NTS only	One #14 to 4/0 AWG
150*, 260, 400	Two 1/0 AWG to 250 MCM or One #4 AWG to 600 MCM
600	Two 2/0 AWG to 600 MCM
800, 1000, 1200	Four 1/0 to 600 MCM
1600, 2000	Six 1/0 to 600 MCM
2600, 3000	Twelve 1/0 to 750 MCM

Notes:

1. All SERIES 300 switches are furnished with a solid neutral plate (unless switched neutral configuration is specified) and terminal lugs.

2. 200 and 230 amperes rated switches for use with copper cable only. Refer to paragraph 310.15 of the NEC for additional information.

3. Use wire rated 75° C minimum for all power connections.

* 150 for DTS only

EXTENDED WARRANTIES FOR SERIES 300 TRANSFER SWITCHES (3ATS/3NTS/3ADTS/3NDTS)

DESCRIPTION

1 Year Extension (Total of 3 Years)

2 Year Extension (Total of 4 Years)

3 Year Extension (Total of 5 Years)

Notes

1. Standard warranty is (24) months, 2 years from date of shipment, extended warranty is in addition to the two years, for a total of, 3, 4, or 5 years.

2. Refer to Publication 3223 for warranty terms and conditions.

SERIES 300 Transfer Switch Dimensions and Shipping Weights

UL TYPE 1 ENCLOSURE^{1,2,3,4}

витсн	PHASE	NEUTRAL	DIMENSION	NS, IN. (MM)		APPROX. SHIPPING
RATING AMPS	POLES	CODE	WIDTH	HEIGHT	DEPTH	WEIGHT LB. (KG)
	2	A	18 (457)	31 (787)	13 (330)	69 (32)
30 ³ ,70 ³ ,104 ³	2	В	18 (457)	31 (787)	13 (330)	72 (33)
150 ³ , 200 ³	3	A	18 (457)	31 (787)	13 (330)	72 (33)
100 , 200	3	В	18 (457)	31 (787)	13 (330)	75 (34)
	2	A	18 (457)	48 (1219)	13 (330)	117 (53)
	2	B	18 (457)	48 (1219)	13 (330)	125 (57)
230	3	Α	18 (457)	48 (1219)	13 (330)	125 (57)
	3	В	18 (457)	48 (1219)	13 (330)	133 (61)
	2	A	24 (610)	56 (1422)	14 (356)	250 (113)
000 (00	2	В	24 (610)	56 (1422)	14 (356)	260 (118)
260, 400	3	A	24 (610)	56 (1422)	14 (356)	260 (118)
	3	В	24 (610)	56 (1422)	14 (356)	270 (123)
150, 200, 230 SERIES 3ADTS/3NTS only	2	A	24 (610)	56 (1422)	14 (356)	250 (113)
	2	В	24 (610)	56 (1422)	14 (356)	260 (118)
	3	A	24 (610)	56 (1422)	14 (356)	260 (118)
Ully	3	В	24 (610)	56 (1422)	14 (356)	270 (123)
	2	A	24 (610)	63 (1600)	17 (432)	300 (137)
600	2	В	24 (610)	63 (1600)	17 (432)	320 (146)
000	3	A	24 (610)	63 (1600)	17 (432)	320 (146)
	3	В	24 (610)	63 (1600)	17 (432)	320 (151)
	2	A	34 (864)	72 (1829)	20 (508)	431 (196)
800, 1000	2	В	34 (864)	72 (1829)	20 (508)	460 (209)
800, 1000	3	A	34 (864)	72 (1829)	20 (508)	460 (209)
	3	В	34 (864)	72 (1829)	20 (508)	489 (222)
	2	A	38 (965)	87 (2210)	23 (584)	581 (264)
1200	2	В	38 (965)	87 (2210)	23 (584)	611 (277)
1200	3	A	38 (965)	87 (2210)	23 (584)	611 (277)
	3	В	38 (965)	87 (2210)	23 (584)	639 (290)
1600, 2000	3	A	38 (965)	87 (2210)	23 (584)	1160 (525)
1000, 2000	3	В	38 (965)	87 (2210)	23 (584)	1160 (525)
2600, 3000	3	A	38 (965)	91 (2311)	72 (1829)	1430 (649)
2000, 3000	3	В	38 (965)	91 (2311)	72 (1829)	1495 (679)

Notes:

- Unit is designed for top cable entry of emergency and load, and bottom entry of normal. A cable pull box is also available for all top or bottom cable access when required (optional accessory kit #K609027). Not required for type 3R, 4X and 12 enclosures where available.
- 2. Enclosures for 2600, 3000 amperes are freestanding with removable top, sides and back.
- 3. Dimensions for 30-200 amperes when furnished with accessory 135L power meter, 18"W 41"H 13"D
- Dimensional data is approximate and subject to change. Certified dimensions available upon request.

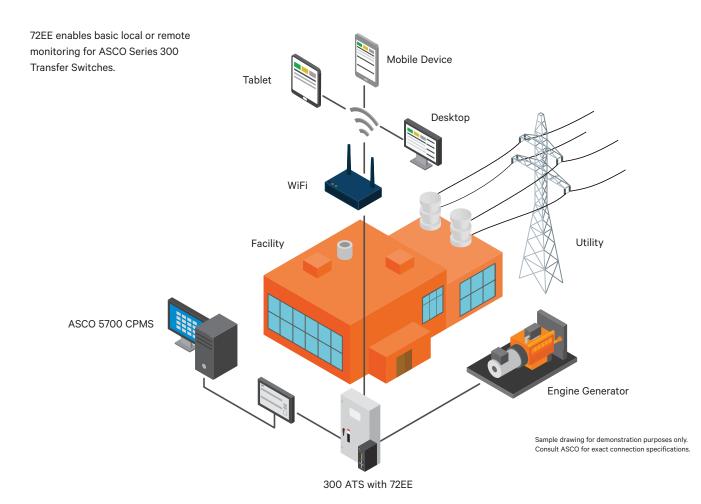
UL TYPE 3R, 4 OR 12 ENCLOSURE^{1,2,3,4}

SWITCH	PHASE	NEUTRAL	DIMENSION	S, IN. (MM)		APPROX. SHIPPING
RATING AMPS	POLES	CODE	WIDTH	HEIGHT	DEPTH	WEIGHT LB. (KG)
30 ² ,70 ² ,104 ²	2	A	17.5 (445)	35 (886)	11.625 (295)	84 (38)
150 ² , 200 ²	2	В	17.5 (445)	35 (886)	11.625 (295)	87 (40)
(Non-Secure	3	A	17.5 (445)	35 (886)	11.625 (295)	87 (40)
Enclosure)	3	В	17.5 (445)	35 (886)	11.625 (295)	90 (41)
	2	A	18 (458)	50.5 (1284)	14.33 (364)	90 (41)
230	2	B ³ or C	18 (458)	50.5 (1284)	14.33 (364)	132 (60)
(Non-Secure	3	A	18 (458)	50.5 (1284)	14.33 (364)	140 (63)
Enclosure)	3	B ³ or C	18 (458)	50.5 (1284)	14.33 (364)	148 (67)
	2	A	24 (610)	63 (1600)	18.2 (462)	320 (146)
000 (00	2	В	24 (610)	63 (1600)	18.2 (462)	340 (155)
260, 400 3	3	A	24 (610)	63 (1600)	18.2 (462)	340 (155)
	3	В	24 (610)	63 (1600)	18.2 (462)	350 (160)
150, 200, 230 SERIES 3ADTS/3NTS 2	2	A	24 (610)	63 (1600)	18.2 (462)	320 (146)
	2	В	24 (610)	63 (1600)	18.2 (462)	340 (155)
only (Non-Secure	3	A	24 (610)	63 (1600)	18.2 (462)	340 (155)
Enclosure)	3	В	24 (610)	63 (1600)	18.2 (462)	350 (160)
	2	A	24 (610)	63 (1600)	18.2 (462)	320 (146)
600	2	В	24 (610)	63 (1600)	18.2 (462)	340 (155)
(Non-Secure Enclosure)	3	A	24 (610)	63 (1600)	18.2 (462)	340 (155)
Enclosed by	3	В	24 (610)	63 (1600)	18.2 (462)	350 (160)
	2	A	34 (859)	72 (1821)	20 (508)	519 (236)
800, 1000	2	В	34 (859)	72 (1821)	20 (506)	543 (246)
800, 1000	3	A	34 (859)	72 (1821)	20 (506)	543 (246)
	3	В	34 (859)	72 (1821)	20 (506)	565 (257)
	2	A	41 (1037)	95.5 (2415)	33.5 (848)	1131 (513)
1200	2	В	41 (1037)	95.5 (2415)	33.5 (848)	1160 (526)
(Secure Enclosure)	3	A	41 (1037)	95.5 (2415)	33.5 (848)	1160 (526)
	3	В	41 (1037)	95.5 (2415)	33.5 (848)	1189 (539)
1600, 2000	3	A	42.5 (1074)	95.5 (2529)	47 (1189)	1705 (775)
(Secure Enclosure)	3	В	42.5 (1074)	95.5 (2529)	47 (1189)	1830 (832)
2600, 3000	3	A	41 (1037)	95.5 (2529)	74 (1872)	2150 (976)
(Secure Enclosure)	3	В	41 (1037)	95.5 (2529)	74 (1872)	2230 (1012)

Notes:

- When climate conditions at installation site present condensation risk, special precautions should be taken, such as the inclusion of space heaters, to prevent interior condensation and freezing of this condensation.
- Dimensions for 30-200 amperes when furnished with a power meter 18"W - 48"H - 13"D
 30-1000 amperes switches are available in secure
- 30-1000 amperes switches are available in secure type enclosures, contact ASCO for details.
- 4. Dimensional data is approximate and subject to change. Certified dimensions available upon request.

SERIES 300 72EE MONITORING AND CONTROL



72EE FEATURES

CONTROL FEATURES

- ATS Transfer/Re-transfer
- ATS Timer Bypass
- Generator Start
- Generator Test

MONITORING FEATURES

- ATS and Generator Stats
- Alarms
- Voltage and Frequency
- Statistics and Activity
- Email Notifications
- Event Log (300 Events)
- Optional Monitoring Features
 - Energy Consumption, Acc 135L Required
 - Power Demand, Acc 135L Required

72EE ALSO ENABLES ENHANCED POWER QUEST CPMS FUNCTIONALITY

- 5310 Series Single Channel Annunciator
- 5350 Series Eight Channel Annunciator
- 5700 Critical Power Management Systems
- 5705 8-Device Annunciator

CONNECTIVITY FEATURES

- Modbus TCP/IP (over Ethernet or Serial)
 SNMP Protocol
- AES 128 Bit Encryption
- Four Port Ethernet Switch

SERIES 300 72EE MONITORING SCREENS

ASCO				POWERQ Power Monitoring	
DASHBOARD	H DEVICES	C EVENTS		O ABOUT	
CONTROLLER					
	SWITCH STATUS				
	NORMAL	LOAD	EMERGENCY	NAME	ASCO
	ACCEPTABLE	CONNECTED	ACCEPTABLE	LOCATION	NYC
	VOLTAGE & FREQUENCY			ACTIVE ALERTS	
	NORMAL	PARAMETER	EMERGENCY	Alarm Condition None	
	215 V	V _{AB}	214 V		
	215V	VBC	214V		
	214 V	VCA	214 V	C ACTIVE TIMERS	
	59.9 Hz	FREQUENCY	59.9 Hz	NORMAL TO EMERGENCY	0 5+
	LATEST ACTIVITY			EMERGENCY TO NORMAL	0 5-
	GENERATOR START DATE & TIME	10/17/2	013 18:15:42:05	TIME DELAYS	
	CAUSE OF TRANSFER :	No ever	nt Cause	NORMAL TO EMERGENCY	3 3+
	TRANSFER DATE & TIME :	10/17/2	013 18:10:58:400	ENERGENCY TO NORMAL	4 3+
	TRANSFER DURATION ;	03.1Se	c		
	RATED :	120 V	NA Amps		
	MONITORED :	214 V	NA Amps		
	MONITORED / RATED :	0 %	178 %		
	III STATISTICS	SET STATISTICS			
	TOTAL TRANSFERS : TRANSFERS DUE TO SOURCE F TIME ON NORMAL(HR:MIN) : TIME ON EMERGENCY(HR:MIN)	800:02			

ASCO							POV	VER	QŲ	EST	
Conserved D	E serces		104003	O con	economics -	0	HOLE				
			rit imanders								
	CURRENT FER FIG						H 100				-
	farmer.		44 Arrent				1.1718	7			1
	11100						1824	- 2		2	4
	1		44 Amps						+	-	-
							LBEE	-	-	-	-
	14.1		-Amps				1.00	-	-		
							1000	1985	10.0	-	
	5 ₈₁		-farges								
	14		0 Ameri					in .		200	
			o samps				*****			-28	
	TOWER BOALTY						644;10				411
	Name of Concession, Name	LINEA	LINER	UNE	Institute	É .	0.841,40			. *	
	CORRECT THE	37.%	-6	- 9	05	1	1 AL 107			1.00	
	VOUNCE THE	0%	-4	- %	8%		1.001.001				
	Real Property lies					i	1.00	411			
	Vil Angeorette		-1				11.6610			4	8,52
	VLN procession		01	/			17.626				6.9
	C vochod & PREQUENCY						Child				-
	STREET, STREET, ST	VALUE			94.01						
	Vice and a	-V	See		296V						
	V _{ed}	-V			296 V						

Fig. 18: Power Metering Screen

			POWERQL
_	104033 A 11404	ts O consumption	O ABOUT
LDG WE	EVENT DATE & THE	EVENT THRE	Extert Done
	16/17/0213 10:11 10:00	Instal Select Parkin.	Switch on normal
1	10773071311310-00100	Digita Star	-
.08	10/17/0012 10 10 40:000	Bighe Rat	Normal Nat. Accepted
4	10/17/02/01 10 10:00:400	Brequery route are accepted	Brergerry Under ontage
. 4	10.017.02012 10 18 20 400	Normal Source Not Accepted	Normal Under Webapo
	16410213 18 11 00 768	States Top	and the second second second
7	1647752133118-10-50-400	Transfer Ets H	
	10/7/03/13 10:10:40:100	Torontor It to E	100
	10/17/02/12 10:10 20:000	Signe Sat	Set I
16	10773013141742908	Station State	
10	KAR/ADDITE HE LY DK DEB	Transme Etta N	
10	NUMBER 141731-000	Topular H to E	
10	10/17/02/13 14:17 20:400	Biglie Bat	Test 17
10	16/12/02/13 14:10:00 000	States Map	
18	1017201214-14-01200	Transfer Ets N	1000
38.	10/12/00/12 14:10 02:000	Stanutor II to E	Set 17
17	10/17/00/17 14:18:20:200	lingine that	But th
18.	10/17/2013 14:10:20:008	States Stop	
16	10/17/02/13 14:16:24:000	Statution 8 to 18	100
38	19/17/09/12 14:19 01:200	Topular No. 6	1000
41	NAMINGENT IN NE DE DEE	Right Rat	Tax 1
#	16415010 He 18 (22 Mil	Bagine Stop	
41	NAMINGENE NAME TEAME	Statuther Etits H	
34	REPORTS IN THE OTHER	Tarofar H to E	
.14	10/17/00/12 14:14:00:200	Boston Dart	Bet 1

Fig. 19: Events Screen

Fig. 17: 72EE Home Page Dashboard

	(F) DEVICES	O EVENTE	-			ASCO	同 DEVICES			
DASHEGARD		49 EVENTS	CONFIGURATION	O ABOUT		CARAGEMED		CVENTS	CONTIGUENTION	0 ABOUT
NER NET ADAPTER CONF	KON # AT ION					EINE GUAD - ETHERNET HO	IDULE			
	ET ETHERNET ADAPTE	R								
	PRIVALEVERION	387104-087.2								
	NAC ADDRESS	99.84.21.00.00.01				1				
	DHCF BODE	C Enable C Diratie					ETHERNET ADAPTER	(
	#ADD#ESE	103.254.1.1					FIRM ABRE VERSION:		907104x007.2	
	EVENET MADE:	255.255.0.0					BOOT LOADER VERSION:		987113-006	
	GATEANY ADDRESS	0.0.0.0					IP ADDRESS:		169.254.1.1	
	TCP PORT NUMBER:	10001					MAC ADDRESS:		00:00:21:00:00:01	
	REPLYTINGOUT	500	e:							
	ARE EXCITING FORT	NA								
	SHTP HODE	C Enable C Disable								
	ARE ENCIPYTICS	C Enable C Disable								
	CAN TERRISON	@ Enable @ Dunble								
		EDIT								
		TVA6								
					_					
	1074	nië Allin Poet Technologies wij nyne waare					Linework 10	CO Free Technologier, HI	Inghia menana li	

Content-rich monitoring screens enable real-time information for power metering, event logs, voltages, time delays and alerts. The 72EE also allows for remote switch transfer.

SERIES 300 72EE CONNECTIVITY MODULE

The ASCO 72EE Connectivity Module offers remote monitoring for SERIES 300 ATSs and 5210 Power Meter. For the ATS, the optional accessory 72EE provides remote ATS and generator control, monitoring and connectivity features via integrated web page dashboards. Once connected to an Ethernet, WiFi or cellular connection, the dashboards can easily be pulled up by any mobile or desktop device on the network by multiple users.

CONTROL

The control capabilities allows remote transfer and retransfer of the ATS while allowing you to view time delays and bypass functions. The generators can also be called to start and stop for emergency situations as well as for testing and maintenance. Running the generator periodically ensures that the battery is charged for power anomalies and increases reliability. Generator pick-up and drop-out set points are also viewable for comprehensive understanding of control events.

MONITORING

Monitor transfer switch and generator health, system state, metering and review calculated transfer statistics and activity. Active control timer information allows the operator to anticipate an automated control action such as generator start or ATS transfer. The device can also interface with an email server to keep users up-to-date on alarms and critical power events with alerts. In addition the 72EE can interface to an optional 5210 Power Meter, (stand-alone or with the ATS Acc. 135L) for enhanced monitoring features such as power metering, demand and energy usage.

CONNECTIVITY

Connect and extract ATS and metering data using industry-standard open protocols such as Modbus and SNMP. An integrated four-port Ethernet switch maximizes connectivity options and flexibility. Embedded password protection will only allow access to appropriate users while utilizing AES 128-bit encryption for enhanced data security per National Institute of Standards and Technology (NIST).



Fig. 22: Accessory 72EE

ADDITIONAL OPTIONAL POWERQUEST COMPONENTS

5160 Connectivity Module



ASCO 5160 Remote Connectivity Unit (RCU) provides 10 Ethernet and Dual-Fiber Optic connections in a NEMA 3R enclosure.

5210, 5220 Power Manager

ASCO 5221 Power Manager Unit



ASCO 5210 (Left) and 5220 (Right) Power Meters measure, displays and provides

single- or 3-phase Energy and Power information

ASCO 5221 Power Manager Unit (PMU) enables power measurement, discrete inputs for status and output relays for control of generators, breakers and other power equipment via 5700 Series CPMS solutions.

5310, 5350 Annunciators



ASCO 5310 (Left) and 5350 (Right) ATS Remote Annunciators provide distributed monitoring of transfer switch position and source availability as well as transfer test and re-transfer control.

5710, 5750, 5790 Display Terminals



5700 Critical Power Management Systems (5790 Shown) provide various levels of monitoring, control and management capability of power equipment. It seamlessly monitors ASCO transfer switches as well as generators, breakers, paralleling busses, panel boards and other power equipment via a 5221 PMU. It consists of servers and touch-screen interfaces.



FULFILL YOUR NEED

Drill down for a closer look - Each transfer switch, generator, breaker and any other power equipment has its own dedicated screens.



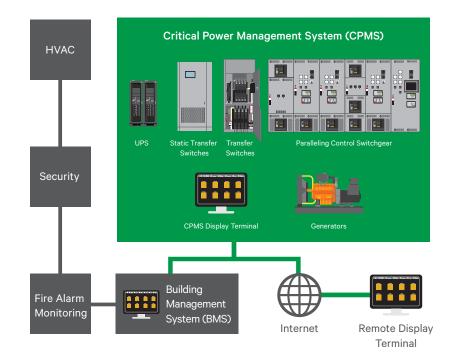
ASCO POWERQUEST® POWER MONITORING AND CONTROL SYSTEMS

The PowerQuest[®] family is the most comprehensive communication, monitoring and control solution ever offered by ASCO Power Technologies. It empowers you. It provides the ability to test, manage loads, optimize the bus bar, remotely monitor and be aware of the status of your facility's utility source and on-site power. It provides reports for events, tests, energy use or settings, and gets data directly from generators and transfer switches.

Whether users require standard monitoring and control or a comprehensive Critical Power Management System, PowerQuest can satisfy your needs.

Hardware. Software. Installation and testing. Service. And upgrades and technology refreshes. A truly complete solution for all your communication, monitoring and control needs.

This web-enabled management system is based on open protocols. As communications among equipment improve, so does the performance of critical power systems.



PowerQuest provides monitoring, alarming and control of Critical Power Management Systems, which comprise transfer switches, paralleling control switchgear, gensets, circuit breakers, UPSs, load banks, distribution and other gear. It also integrates with building management systems.

BE EMPOWERED POWERQUEST CAN ENABLE YOU TO:

- Monitor and control power transfer switches, paralleling control switchgear, gensets, breakers, UPS, bus bars and other equipment.
- Monitor normal and emergency voltages and frequency and their settings.
- Know transfer switch position and source availability.
- Transfer and re-transfer loads for system testing.
- View and adjust transfer switch time-delay settings.
- Receive automatic alerts or selected system alarms on system operation via email or pager.
- View transfer switch event log and know the transfer switch test schedule.
- Generate reports for alarms, energy consumption, settings, historical logs and code-mandated tests.

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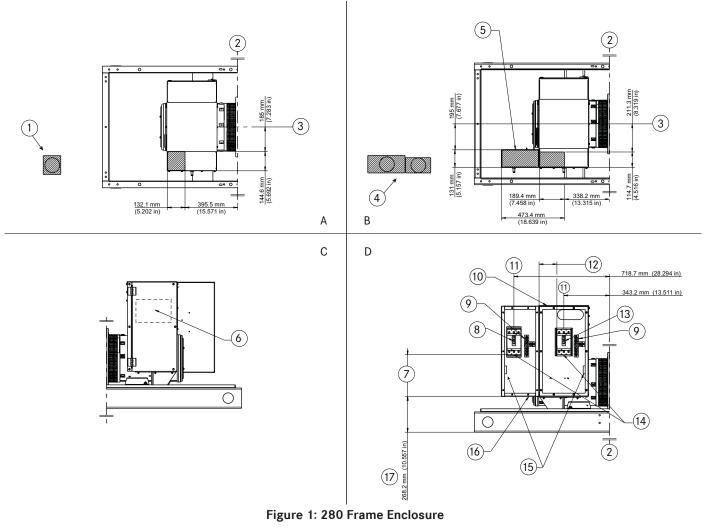


DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the MTU 3R0096 DS30 and MTU 3R0096 DS34 circuit breakers. The dimensional drawings will govern and should be referenced for installation.

280 FRAME ENCLOSURE

- Supplied with all 280 frame alternator applications.
- Right side breakers shown. Left side breakers optional.
- Reference Figure 2 for breaker mounting positions.



- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)
- 1. Possible top entry conduit locations
- 2. Rear face of flywheel housing
- 3. Generator centerline
- 4. Possible bottom entry
- conduit locations
 Optional secondary breaker enclosure
- 6. Optional control panel location
- 7. Dimension A
- 8. Optional second breaker
- 9. Neutral ASM (torque to 275 in/lbs)
- 10. Top entry conduit area
- 11. Breaker center line
- 12. Dimension B

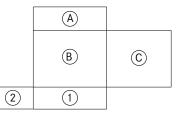
- 13. Primary breaker
- 14. Customer connect end (recommended torque on label)
- 15. Equipment ground terminal (torque to 275 in/lbs)
- 16. Bottom entry conduit area
- 17. See note 4

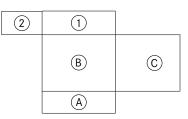


Available Circui	t Breakers	Enclosure Data			a							
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in						
H-Frame	15 - 150	(1) 4 - 3/0	329 (12.95)	134 (5.27)	1	2.5						
J-Frame	175	(1) 4 - 4/0	314 (12.36)	134 (5.27)	1	2.5						
J-Frame	250	(1) 3/0 - 350	314 (12.36)	134 (5.27)	1	3						
 (2) Top entry only avai (3) Based on flexible m 	lable for single bre netal conduit at 40	aker applications % fill using THHN wire	,	 Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B) Top entry only available for single breaker applications Based on flexible metal conduit at 40% fill using THHN wire 								

NOTE: Equipment grounding terminal wire range: 6 AWG - 3/0 AWG

Table 1: 280 Frame Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 2: 280 Frame Enclosure Breaker Mounting Positions

- A. Controls
- Position 1 (Primary)
 Position 2
- B. Outlet boxC. 280 frame alternator



DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the MTU 4R0113 DS40, MTU 4R0113 DS44, and MTU 4R0113 DS50 circuit breakers, including 280 and 360 frame size enclosures. The dimensional drawings will govern and should be referenced for installation.

280 FRAME ENCLOSURE

- Supplied with all 280 frame alternator applications.
- Right side breakers shown. Left side breakers optional.
- Reference Figure 2 for breaker mounting positions.

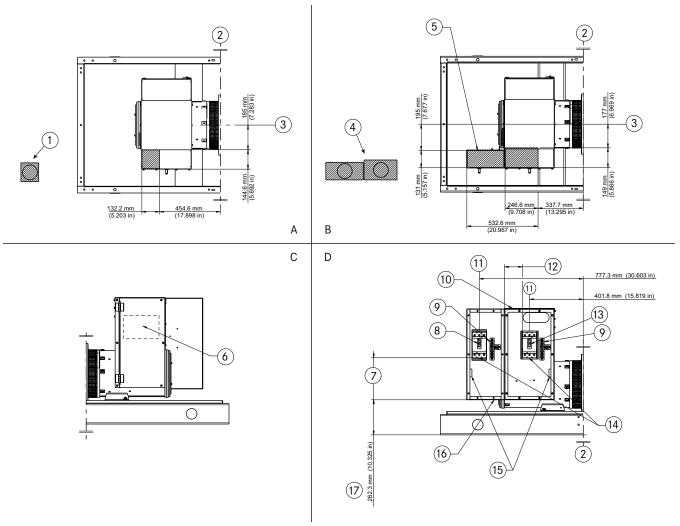


Figure 1: 280 Frame Enclosure

- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)
- Possible top entry conduit locations Rear face of flywheel
- Rear face of flywheel housing
 Generator centerline

1.

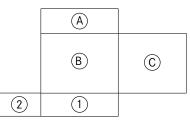
- 4. Possible bottom entry
- conduit locations
- 5. Optional secondary breaker enclosure
- 6. Optional control panel location
- 7. Dimension A
- 8. Optional second breaker
- Neutral ASM (torque to 275 in/lbs)
- 10. Top entry conduit area
- 11. Breaker centerline
- 12. Dimension B

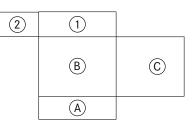
- 13. Primary breaker
- 14. Customer connect end (recommended torque on label)
- 15. Equipment ground terminal (torque to 275 in/lbs)
- 16. Bottom entry conduit area
- 17. See note 4



Available Circui	t Breakers	Enclosure Data				
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in
H-Frame	15 - 150	(1) 4 - 3/0	329 (12.95)	134 (5.27)	1	2.5
J-Frame	175	(1) 4 - 4/0	314 (12.36)	134 (5.27)	1	2.5
J-Frame	250	(1) 3/0 - 350	314 (12.36)	134 (5.27)	1	3
 ⁽²⁾ Top entry only avai ⁽³⁾ Based on flexible m 	lable for single bre netal conduit at 40 n) for bases with ir	% fill using THHN wire ntegrated single wall fu	uel tank (see Figure 1)			

Table 1: 280 Frame Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 2: 280 Frame Enclosure Breaker Mounting Positions

- A. Controls
- 1. Position 1 (Primary)
- B. Outlet box
- 2. Position 2
- C. 280 frame alternator



360 FRAME ENCLOSURE

- Supplied with all 360 frame alternator applications.
- Right side breakers shown. Left side breakers optional.
- Reference Figure 4 for breaker mounting positions.

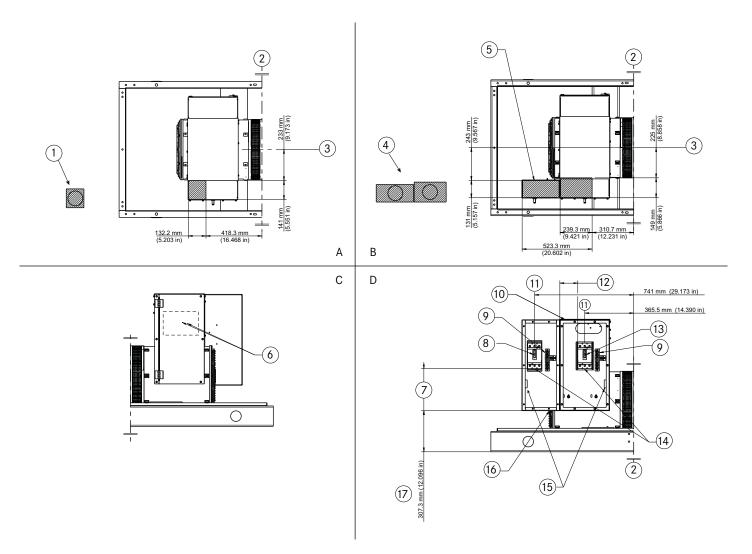


Figure 3: 360 Frame Enclosure

- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)
- 1. Possible top entry conduit locations
- 2. Rear face of flywheel housing
- 3. Generator centerline
- 4. Possible bottom entry
- conduit locations
- 5. Optional secondary breaker enclosure
- 6. Optional control panel location
- 7. Dimension A
- Optional second breaker
 Neutral ASM (torque to 275 in/lbs)
- 10. Top entry conduit area
- 11. Breaker centerline
- 12. Dimension B

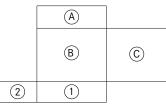
- 13. Primary breaker
- 14. Customer connect end (recommended torque on label)
- 15. Equipment ground terminal (torque to 275 in/lbs)
- 16. Bottom entry conduit area
- 17. See note 4

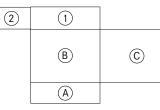


Available Circu	Available Circuit Breakers		Enclosure Data						
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in			
H-Frame	15 - 150	(1) 4 - 3/0	329 (12.95)	134 (5.27)	1	2.5			
J-Frame	175	(1) 4 - 4/0	314 (12.36)	134 (5.27)	1	2.5			
J-Frame	250	(1) 3/0 - 350	314 (12.36)	134 (5.27)	1	3			
 ⁽²⁾ Top entry only av ⁽³⁾ Based on flexible 	 Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B) (2) Top entry only available for single breaker applications (3) Based on flexible metal conduit at 40% fill using THHN wire 								

NOTE: Equipment grounding terminal wire range: 6 AWG - 3/0 AWG

Table 2: 360 Frame Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 4: 360 Frame Enclosure Breaker Mounting Positions

- A. Controls
- Position 1 (Primary)
 Position 2
- B. Outlet box
- C. 360 frame alternator

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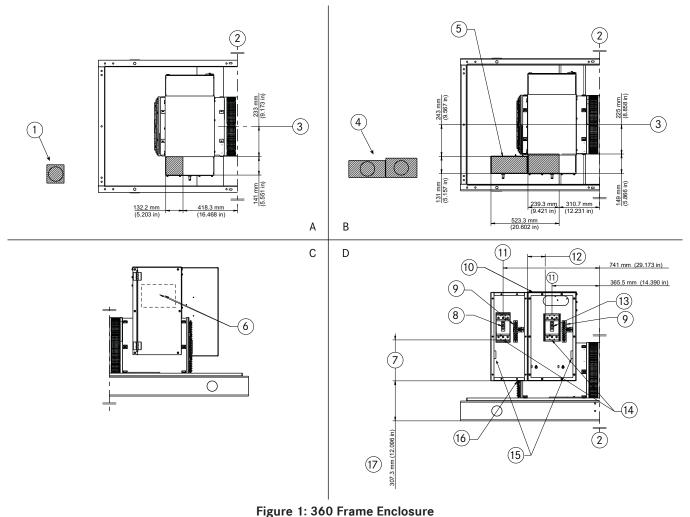


DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the MTU 4R0113 DS55 and MTU 4R0113 DS60 circuit breakers. The dimensional drawings will govern and should be referenced for installation.

360 FRAME ENCLOSURE

- Supplied with all 360 frame alternator applications.
- Right side breakers shown. Left side breakers optional.
- Reference Figure 2 for breaker mounting positions.



- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)
- Possible top entry conduit 6. Op
- locations Rear face of flywheel
- 2. Rear face of flywheel housing

1.

- Generator centerline
 Possible bottom entry
- conduit locations 5. Optional secondary
- breaker enclosure
- 6. Optional control panel location
- 7. Dimension A
- 8. Optional second breaker
- 9. Neutral ASM (torque to 275 in/lbs)
- 10. Top entry conduit area
- 11. Breaker centerline
- 12. Dimension B

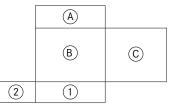
- 13. Primary breaker
- 14. Customer connect end (recommended torque on label)
- 15. Equipment ground terminal (torque to 275 in/lbs)
- 16. Bottom entry conduit area
- 17. See note 4

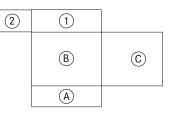


Available Circui	t Breakers		Encl	osure Data								
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in						
H-Frame	15 - 150	(1) 4 - 3/0	329 (12.95)	134 (5.27)	1	2.5						
J-Frame	175	(1) 4 - 4/0	314 (12.36)	134 (5.27)	1	2.5						
J-Frame	250	(1) 3/0 - 350	314 (12.36)	134 (5.27)	1	3						
 (2) Top entry only avai (3) Based on flexible m 	lable for single bre netal conduit at 40	aker applications % fill using THHN wire	,	 Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B) Top entry only available for single breaker applications Based on flexible metal conduit at 40% fill using THHN wire 								

NOTE: Equipment grounding terminal wire range: 6 AWG - 3/0 AWG

Table 1: 360 Frame Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 2: 360 Frame Enclosure Breaker Mounting Positions

- A. Controls
- 1. Position 1 (Primary)
- Outlet box Β.
- 2. Position 2
- C. Alternator

CIRCUIT BREAKER ENCLOSURE - DIESEL 80-125 kW Standby / 72-111 kW Prime Data Sheet



DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the MTU 4R0120 DS80, MTU 4R0120 DS100, and MTU 4R0120 DS125 circuit breakers, including small and large size enclosures. The dimensional drawings will govern and should be referenced for installation.

SMALL ENCLOSURE

- Small enclosure supplied with select 360 frame alternator applications.
- Right side breakers shown. Left side breakers optional.
- Reference Figure 2 for breaker mounting positions.

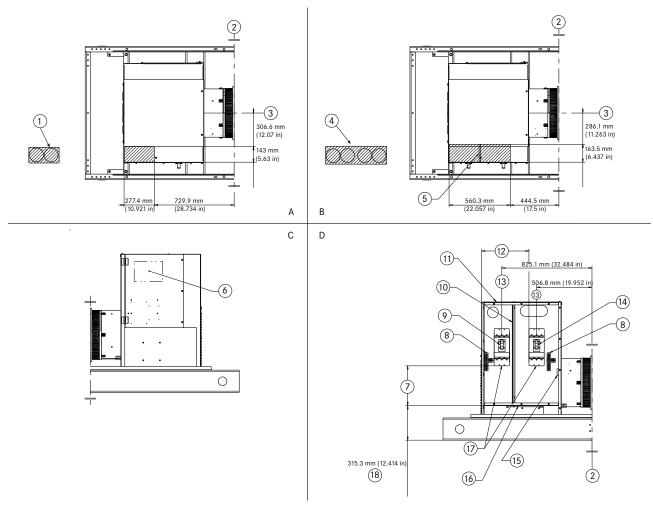


Figure 1: Small Enclosure

Two conduit maximum

Rear face of flywheel

Generator centerline

Four conduit maximum

Second breaker divider

Optional control panel

housing

wall

location

1.

2.

3.

4.

5.

6.

- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)

- 7. Dimension A
 - 8. Neutral ASM (torque to 275 in/lbs)
 - Optional second breaker
 Divider wall included with
 - second breaker 11. Top entry conduit area
 - 12. Dimension B
 - 12. Dimension B
 - 13. Breaker centerline

- 14. Primary breaker
- 15. Equipment ground terminal (torque to 275 in/lbs)
- Bottom entry conduit area
 Customer connect end (recommended torque on label)
- 18. See Note 4

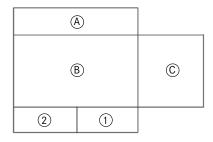
CIRCUIT BREAKER ENCLOSURE - DIESEL 80-125 kW Standby / 72-111 kW Prime Data Sheet



Available Circui	Available Circuit Breakers		Encl	osure Data					
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in			
H-Frame	15 - 150	(1) 4 - 3/0	459 (18.08)	450 (17.72)	1	2.5			
J-Frame	175	(1) 4 - 3/0	445 (17.52)	450 (17.72)	1	2.5			
J-Frame	200 - 250	(1) 3/0 - 350	445 (17.52)	450 (17.72)	1	3			
L-Frame 100%	300 - 400	(2) 2/0 - 500	364 (14.35)	433 (17.03)	2	3.5			
L-Frame 80%	300 - 600	(2) 2/0 - 500	364 (14.35)	433 (17.03)	2	3.5			
 ⁽²⁾ Top entry only avail ⁽³⁾ Based on flexible n 	 Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B) Top entry only available for single breaker applications Based on flexible metal conduit at 40% fill using THHN wire 								

NOTE: Equipment grounding terminal wire range: 6 AWG - 300 kcmil

Table 1: Small Enclosure Data



Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 2: Small Enclosure Breaker Mounting Positions

- A. ControlsB. Outlet box
- Position 1 (Primary)
 Position 2
- C. 360 frame alternator

②
③
③
③
⑥
⑥

CIRCUIT BREAKER ENCLOSURE - DIESEL 80-125 kW Standby / 72-111 kW Prime Data Sheet



LARGE ENCLOSURE

- Large enclosure supplied with all 430 frame alternator applications and select 360 frame alternator • applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 4 and Table 3 for breaker mounting positions. •

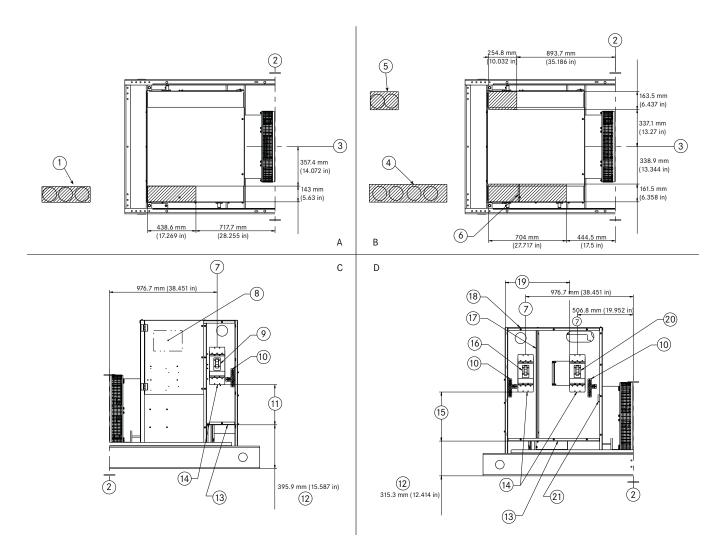


Figure 3: Large Enclosure

- Α. Top view, top entry conduit area
- Top view, bottom entry Β. conduit area
- Left view, breaker C. enclosure detail (enclosure door not shown)
- Right view, breaker D. enclosure detail (enclosure cover not shown)
- Three conduit maximum
- Rear face of flywheel 2. housing

1.

- 3. Generator centerline
- Four conduit maximum 4. (primary breaker side)
- Two conduit maximum 5. (opposite primary breaker) 6.
 - Second breaker divider 14.
- 7. Breaker centerline

wall

- Optional control panel 8. location
- Optional second/third 9. breaker
- 10. Neutral ASM (torque to 275 in/lbs)
- 11. Dimension B
- 12. See note 4
- 13. Bottom entry conduit area
 - Customer connect end (recommended torque on label)

- 15. Dimension A
- 16. Optional second breaker
- 17. Divider wall included with second breaker
- 18. Top entry conduit area
- 19. Dimension C 20. Primary breaker
- 21. Equipment ground terminal (torque to 275 in/lbs)

CIRCUIT BREAKER ENCLOSURE - DIESEL 80-125 kW Standby / 72-111 kW Prime Data Sheet



Available Circu	uit Breakers	Enclosure Data						
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Bending Space ⁽¹⁾ Dimension B mm (in)	Wire Gutter Space ^(1,2) Dimension C mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in	
H-Frame	15 - 150	(1) 4 - 3/0	532 (20.93)	451 (17.76)	602 (23.69)	1	2.5	
J-Frame	175	(1) 4 - 4/0	518 (20.37)	437 (17.2)	602 (23.69)	1	2.5	
J-Frame	200 - 250	(1) 3/0 - 350	518 (20.37)	437 (17.2)	602 (23.69)	1	3	
L-Frame 100%	300 - 400	(2) 2/0 - 500	443 (17.44)	362 (14.27)	584 (23)	2	3.5	
L-Frame 80%	300 - 600	(2) 2/0 - 500	443 (17.44)	362 (14.27)	584 (23)	2	3.5	
M-, P-Frame	250 - 800	(3) 250 - 500	407 (16.01)	N/A	451 (17.74)	3	3.5	
(1) Meets or eve	oode NEDA 70	NEC 312 6(A) an	4 NEC 212 6(B)			·		

Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B)

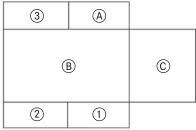
(2) Top entry only available for single breaker applications

(3) Based on flexible metal conduit at 40% fill using THHN wire

(4) Add 205 mm (8.08 in) for bases with integrated single wall fuel tank (see Figure 2)

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 2: Large Enclosure Data



Top View - Right Side Breaker

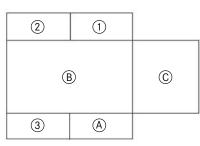
Figure 4: Large Enclosure Breaker Mounting Positions

- A. Controls
- 1. Position 1 (Primary) Position 2
- B. Outlet box 2. C. 360/430 frame alternator 3. Position 3

Breaker Frame							
Position 1 (Primary)	Position 2	Position 3					
H/J/L	-	-					
H/J/L	H/J/L	-					
H/J/L	H/J/L	H/J/L					
P/M	-	-					
P/M	H/J	-					
P/M	H/J	H/J/L					
P/	L						

Table 3: Large Enclosure Breaker Mounting Positions

N/A = Not Available



Top View - Left Side Breaker

// Page 4 of 4

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CIRCUIT BREAKER ENCLOSURE - DIESEL 150-200 kW Standby / 135-180 kW Prime Data Sheet

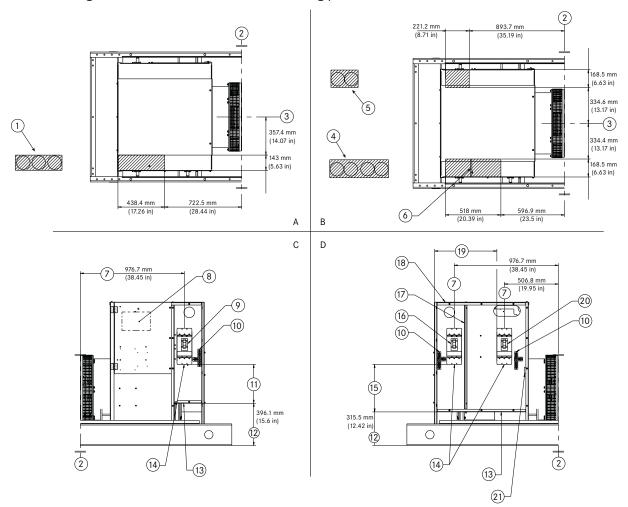


DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the MTU 6R0120 DS150, MTU 6R0120 DS180, and MTU 6R0120 DS200 circuit breakers. The dimensional drawings will govern and should be referenced for installation.

430 FRAME ENCLOSURE

- Enclosure supplied with all 430 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 2 and Table 2 for breaker mounting positions.



- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail (enclosure door not shown)
- D. Right view, breaker enclosure detail (enclosure cover not shown)

- Figure 1: 430 Frame Enclosure
- 1. Three conduit maximum
- 2. Rear face of flywheel housing
- 3. Generator centerline
- 4. Four conduit maximum (primary breaker side)
- 5. Two conduit maximum (opposite primary breaker)
- 6. Second breaker divider wall
- 7. Breaker centerline

- 8. Optional control panel location
- 9. Optional second/third breaker
- 10. Neutral ASM (torque to 275 in-lbs)
- 11. Dimension B
- 12. See note 4
- 13. Bottom entry conduit area
- 14. Customer connect end (recommended torque on label)

- 15. Dimension A
- 16. Optional second breaker
- 17. Divider wall included with second breaker
- 18. Top entry conduit area
- 19. Dimension C
- 20. Primary breaker
- 21. Equipment ground terminal (torque to 275 in-lbs)

CIRCUIT BREAKER ENCLOSURE - DIESEL 150-200 kW Standby / 135-180 kW Prime Data Sheet



Available Circuit Breakers Enclosure Data			ta				
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Bending Space ⁽¹⁾ Dimension B mm (in)	Wire Gutter Space ^(1,2) Dimension C mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in
H-Frame	15 - 150	(1) 4 - 3/0	532 (20.93)	451 (17.76)	602 (23.69)	1	2.5
J-Frame	175	(1) 4 - 4/0	518 (20.37)	437 (17.2)	602 (23.69)	1	2.5
J-Frame	200-250	(1) 3/0 - 350	518 (20.37)	437 (17.2)	602 (23.69)	1	3
L-Frame 100%	300 - 400	(2) 2/0 - 500	443 (17.44)	362 (14.27)	584 (23)	2	3.5
L-Frame 80%	300 - 600	(2) 2/0 - 500	443 (17.44)	362 (14.27)	584 (23)	2	3.5
M-, P-Frame	250 - 800	(3) 250 - 500	407 (16.01)	N/A	451 (17.74)	3	3.5
(1) Meets or exc	ande NEDA 70	NEC 312 6(A) an	4 NEC 212 6(B)				1

⁽¹⁾ Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B)

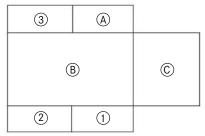
⁽²⁾ Top entry only available for single breaker applications

⁽³⁾ Based on flexible metal conduit at 40% fill using THHN wire

⁽⁴⁾ Add 205 mm (8.08 in) for bases with integrated single wall fuel tank (see Figure 1)

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 1: 430 Frame Enclosure Data



 ②
 ①

 B
 C

 ③
 A

Top View - Left Side Breaker

Top View - Right Side Breaker

Figure 2: 430 Frame Enclosure Breaker Mounting Positions

A. Controls

В. С.

- 1. Position 1 (Primary)
- Outlet box 2. Position 2
- Alternator 3. Position 3

Breaker Frame							
Position 1 (Primary)	Position 2	Position 3					
H/J/L	-	-					
H/J/L	H/J/L	-					
H/J/L	H/J/L	H/J/L					
P/M	-	-					
P/M	H/J	-					
P/M	H/J	H/J/L					
P/	L						

Table 2: 430 Frame Breaker Mounting Positions

N/A = Not Available

M	TU Onsite	Energy	/	
A	Rolls-Royce	Power	Systems	Brand

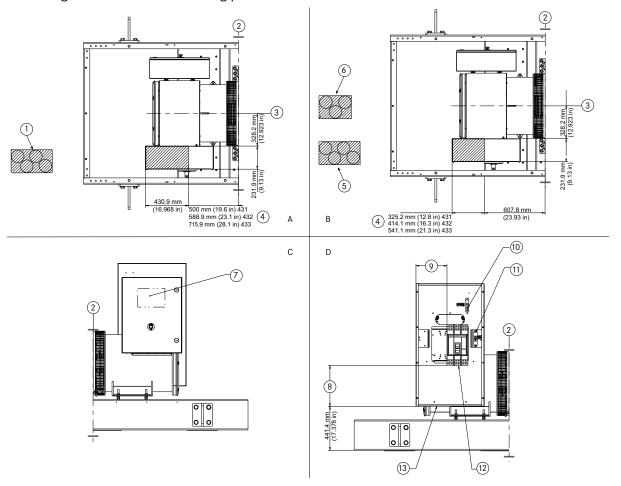


DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the 60 Hz - MTU 6R1600 DS230, MTU 6R1600 DS250, MTU 6R1600 DS275, MTU 6R1600 DS300 and 50 Hz - MTU 6R1600 DS300, MTU 6R1600 DS330 circuit breakers, including single, dual, and triple enclosures. The dimensional drawings will govern and should be referenced for installation.

SINGLE ENCLOSURE

- Single enclosure supplied with all 430 frame alternator applications.
- Right side breakers shown. Left side breakers optional.
- Reference Figure 2 for breaker mounting positions.



- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)

- Figure 1: Single Enclosure
- 1. Four conduit maximum
- 2. Rear face of flywheel housing
- 3. Generator centerline
- 4. Dimensions per generator
- frame 5. Four conduit maximum(432 and 433

generator)

- 6. Three conduit maximum (431 generator)
- 7. Optional control panel location
- 8. Dimension A
- 9. Dimension B
- 10. Equipment ground terminal (torque to 275 in/lbs)
- 11. Neutral ASM (torque to 275 in/lbs)
- Customer connect end (recommended torque on label)
- 13. Bottom entry conduit area

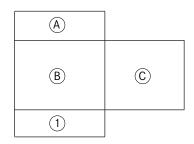


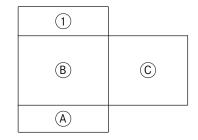
Available Circui	t Breakers	Enclosure Data						
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in		
H-Frame	15 - 150	(1) 4 - 3/0	534.8 (21.1)	364.2 (14.3)	1	2		
J-Frame	175	(1) 4 - 4/0	520.6 (20.5)	364.2 (14.3)	1	2.5		
J-Frame	200 - 250	(1) 3/0 - 350	520.6 (20.5)	364.2 (14.3)	1	3		
L-Frame 100%	300 - 400	(2) 2/0 - 500	446.1 (17.6)	346.2 (13.6)	2	3.5		
L-Frame 80%	300 - 600	(2) 2/0 - 500	446.1 (17.6)	346.2 (13.6)	2	3.5		
M/P-Frame	250-800	(3) 3/0-500	409.5 (16.1)	311.3 (12.3)	3	3.5		
P-Frame	1,000-1,200	(4) 3/0-500	409.5 (16.1)	311.3 (12.3)	4	3.5		
	¹⁾ Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B)							

⁽³⁾ Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 1: Single Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

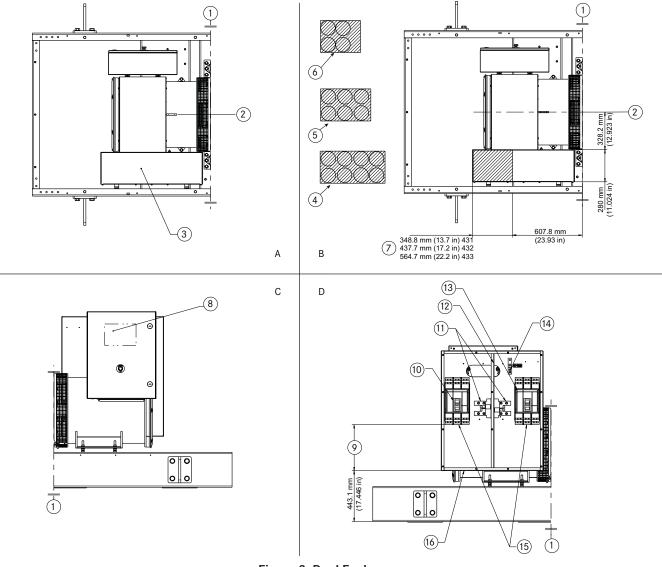
Figure 2: Single Enclosure Breaker Mounting Positions

- A. Controls C. Alternator
- B. Outlet box 1. Breaker



DUAL ENCLOSURE

- Dual enclosure supplied with all 430 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 4 for breaker mounting positions.



- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)

- Figure 3: Dual Enclosure
- conduit 1. Rear face of flywheel housing
 - 2. Generator centerline
 - 3. Top entry not available with dual breakers
 - 4. Eight conduit maximum (433 generator)
 - 5. Six conduit maximum (432 generator)
- 6. Four conduit maximum (431 generator)
- 7. Dimensions per generator frame
- 8. Optional control panel location
- 9. Dimension A
- 10. Primary breaker
- 11. Neutral ASM (torque to 275 in/lbs)
- 12. Divider wall (included with second breaker)
- 13. Secondary breaker
- 14. Equipment ground terminal (torque to 275 in/lbs)
- 15. Customer connect end (recommended torque on label)
- 16. Bottom entry conduit area



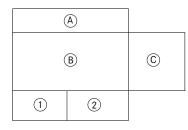
Available Circu	it Breakers	Enclosure Data					
Breaker Frame	aker Frame Amperage		Output Wire Range 90 °C Cu (wires per lug) Wire Bending Space ⁽¹⁾ Dimension A mm (in)		Conduit Size ⁽²⁾ in		
H-Frame	15-150	(1) 4-3/0	526.8 (20.7)	1	2		
J-Frame	175	(1) 4-4/0	512.6 (20.2)	1	2.5		
J-Frame	200-250	(1) 3/0-350	512.6 (20.2)	1	3		
L-Frame 100%	300-400	(2) 2/0-500	438.1 (17.2)	2	3.5		
L-Frame 80%	300-600	(2) 2/0-500	438.1 (17.2)	2	3.5		
M-, P-Frame	250-800	(3) 3/0-500	405.3 (16)	3	3.5		
P-Frame	1,000-1,200	(4) 3/0-500	405.3 (16)	4	3.5		

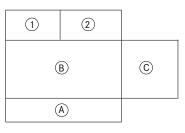
Meets or exceeds NFPA 70 and NEC 312.6(B)

(2) Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 2: Dual Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

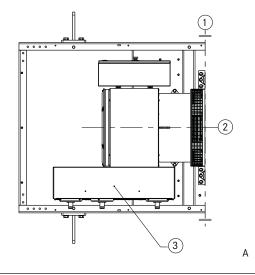
Figure 4: Dual Enclosure Breaker Mounting Positions

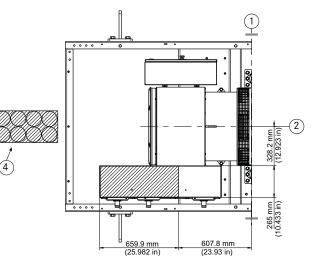
- A. Controls
- 1. Position 1 (Primary) 2. Position 2
- B. Outlet box 3. Position 3
- C. Alternator

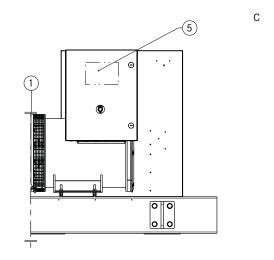


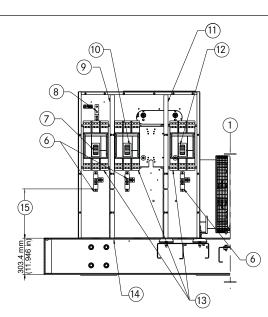
TRIPLE ENCLOSURE

- Triple enclosure supplied with all 430 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 6 for breaker mounting positions.









A. Top view, top entry conduit area

- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)
- Figure 5: Triple Enclosure

 Rear face of flywheel
 6. Neutral A

В

D

housing Generator centerline

1.

- Generator centerline
 Top entry not available with triple breakers
- 4. Ten conduit maximum
- 5. Optional control panel location
- 6. Neutral ASM (torque to 275 in/lbs)
- 7. Primary breaker
- 8. Equipment ground terminal (torque to 275 in/lbs)
- 9. Divider wall (included with second breaker)
- 10. Secondary breaker (800 Amp maximum)
- 11. Divider wall (included with third breaker)
- 12. Third breaker (800 Amp maximum)
- Customer connect end (recommended torque on label)
- 14. Bottom entry conduit area



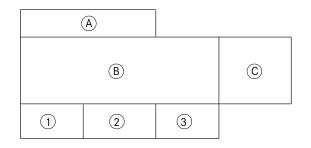
Available Circu	it Breakers	Enclosure Data				
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug) Wire Bending Space ⁽¹⁾ Dimension A mm (in)		Conduit Quantity	Conduit Size ⁽²⁾ in	
H-Frame	15-150	(1) 4-3/0	407.2 (16)	1	2	
J-Frame	175	(1) 4-4/0	407.2 (16)	1	2.5	
J-Frame	200-250	(1) 3/0-350	407.2 (16)	1	3	
L-Frame 100%	300-400	(2) 2/0-500	407.2 (16)	2	3.5	
L-Frame 80%	300-600	(2) 2/0-500	407.2 (16)	2	3.5	
M-, P-Frame	250-800	(3) 3/0-500	407.2 (16)	3	3.5	
P-Frame	1,000-1,200	(4) 3/0-500	407.2 (16)	4	3.5	

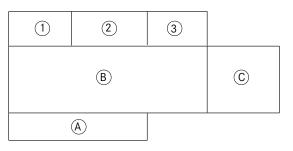
⁽¹⁾ Meets or exceeds NFPA 70 and NEC 312.6(B)

⁽²⁾ Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 3: Triple Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 6: Triple Enclosure Breaker Mounting Positions

A. Controls

Β.

- Position 1 (Primary)
 Position 2
- Outlet box 2. Position
- C. Alternator
- 3. Position 3

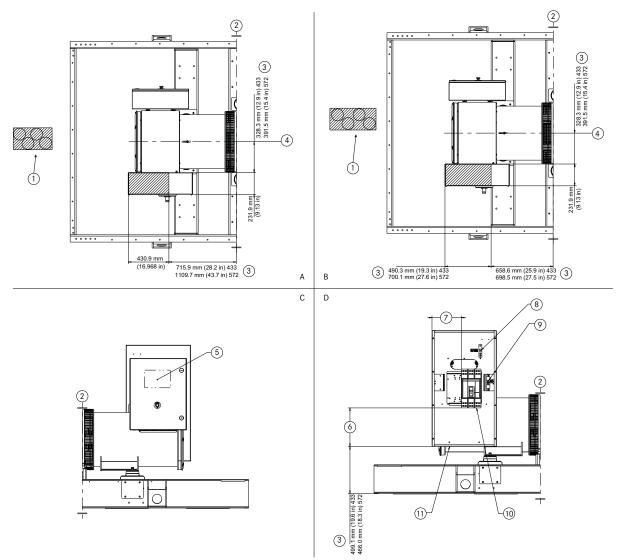


DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the 60 Hz - MTU 8V1600 DS350 and MTU 8V1600 DS400, and 50 Hz - MTU 8V1600 DS400, MTU 8V1600 DS440 circuit breakers, including single (small and large), dual, and triple enclosures. The dimensional drawings will govern and should be referenced for installation.

SMALL SINGLE ENCLOSURE

- Small enclosure supplied with all 430 and 570 frame alternator applications.
- Right side breakers shown. Left side breakers optional. ٠
- Reference Figure 2 for breaker mounting positions.



- Top view, top entry conduit Α. area
- B. Top view, bottom entry conduit area
- С Left view, breaker enclosure detail
- Right view, breaker enclosure detail (enclosure cover not shown)
- Four conduit maximum 1.

D.

- Rear face of flywheel housing 2.
- 3. Dimensions per generator frame
- Figure 1: Small Single Enclosure
 - Generator centerline 4. 5.
 - Optional control panel location Dimension A 6.
 - 7. Dimension B
 - 8.
 - Equipment ground terminal (torque to 275 in/lbs)
- Neutral ASM (torque to 275 in/lbs)
- Customer connect end 10. (recommended torque on label)

9.

11. Bottom entry conduit area



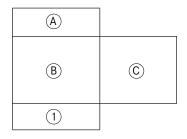
Available Circui	t Breakers	Enclosure Data							
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in			
H-Frame	15 - 150	(1) 4 - 3/0	534.8 (21.1)	364.2 (14.3)	1	2			
J-Frame	175	(1) 4 - 4/0	520.6 (20.5)	364.2 (14.3)	1	2.5			
J-Frame	200 - 250	(1) 3/0 - 350	520.6 (20.5)	364.2 (14.3)	1	3			
L-Frame 100%	300 - 400	(2) 2/0 - 500	446.1 (17.6)	346.2 (13.6)	2	3.5			
L-Frame 80%	300 - 600	(2) 2/0 - 500	446.1 (17.6)	346.2 (13.6)	2	3.5			
M/P-Frame	250-800	(3) 3/0-500	409.5 (16.1)	311.3 (12.3)	3	3.5			
P-Frame	1,000-1,200	(4) 3/0-500	409.5 (16.1)	311.3 (12.3)	4	3.5			

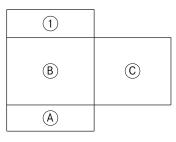
⁽²⁾ Top entry only available for single breaker applications

⁽³⁾ Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 1: Small Single Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 2: Small Single Enclosure Breaker Mounting Positions

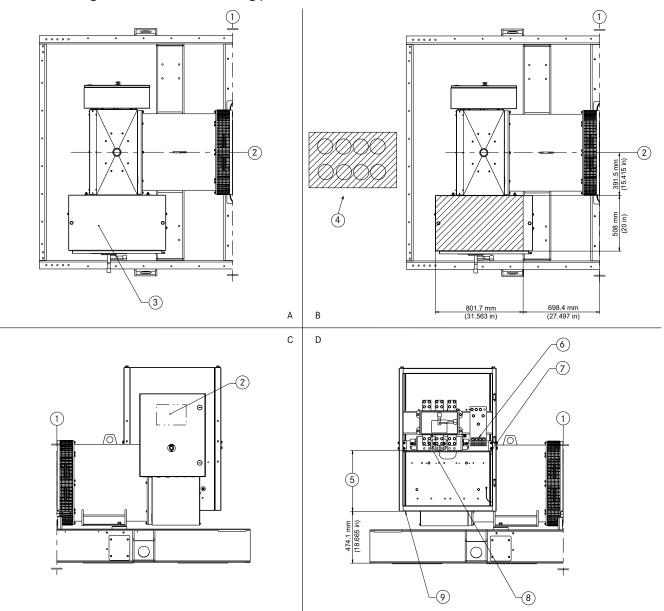
A. ControlsB. Outlet box

- C. Alternator1. Breaker



LARGE SINGLE ENCLOSURE

- Large enclosure supplied with all 570 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 4 for breaker mounting positions.



- Top view, top entry conduit Α. arėa
- Β. Top view, bottom entry conduit area
- Left view, breaker enclosure C. detail
- Right view, breaker enclosure detail (enclosure door not D. shown)

- Figure 3: Large Single Enclosure
- Rear face of flywheel housing 1.
- Generator centerline 2.
- 3.
- Top entry not available with single R/NW breakers 4.
 - Eight conduit displayed
- 5. Dimension A
- Neutral ASM (torque to 275 6. in/lbs)
- 7. Equipment ground terminal (torque to 275 in/lbs)
- Customer connect end (recommended torque on label)

8.

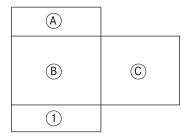
Bottom entry conduit area 9.

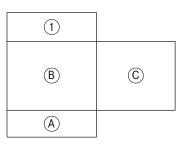


Available Circu	it Breakers	Enclosure Data						
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Conduit Quantity	Conduit Size ⁽²⁾ in			
R-Frame	1,600-2,500	(8) 1/0-750	563.9 (22.2)	8	4			
NW-Frame	1,000-2,000	(8) 1/0-750	545 (21.5)	8	4			
	⁽¹⁾ Meets or exceeds NFPA 70 and NEC 312.6(B)							

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 2: Large Single Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 4: Large Single Enclosure Breaker Mounting Positions

- A. ControlsB. Outlet box
- C. Alternator1. Breaker
- Outlet box 1. B



DUAL ENCLOSURE

- Dual enclosure supplied with all 430 and 570 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 6 for breaker mounting positions.

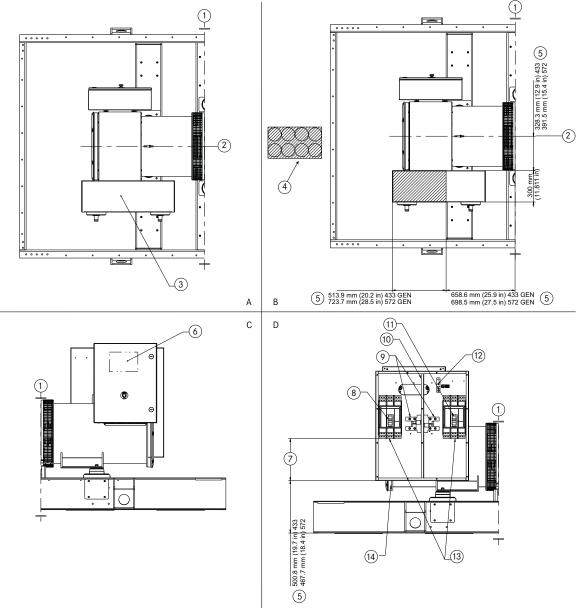


Figure 5: Dual Enclosure

- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)
- 2. Generator centerline

Rear face of flywheel housing

3. Top entry not available with dual breakers

1.

- 4. Eight conduit maximum
- 5. Dimensions per generator
- frameOptional control panel location
- Dimension A
 Primary breaker
- 9. Neutral ASM (torque to 275 in/lbs)
- 10. Divider wall (included with second breaker)
- 11. Secondary breaker
- 12. Equipment ground terminal (torque to 275 in/lbs)
- 13. Customer connect end (recommended torque on label)
- 14. Bottom entry conduit area



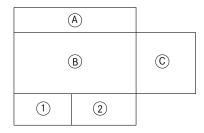
Available Circuit Breakers		Enclosure Data					
Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Conduit Quantity	Conduit Size ⁽²⁾ in			
15-150	(1) 4-3/0	526.8 (20.7)	1	2			
175	(1) 4-4/0	512.6 (20.2)	1	2.5			
200-250	(1) 3/0-350	512.6 (20.2)	1	3			
300-400	(2) 2/0-500	438.1 (17.2)	2	3.5			
300-600	(2) 2/0-500	438.1 (17.2)	2	3.5			
250-800	(3) 3/0-500	405.3 (16)	3	3.5			
1,000-1,200	(4) 3/0-500	405.3 (16)	4	3.5			
	Amperage 15-150 175 200-250 300-400 300-600 250-800	Amperage Output Wire Range 90 °C Cu (wires per lug) 15-150 (1) 4-3/0 175 (1) 4-4/0 200-250 (1) 3/0-350 300-400 (2) 2/0-500 300-600 (2) 2/0-500 250-800 (3) 3/0-500	AmperageOutput Wire Range 90 °C Cu (wires per lug)Wire Bending Space(1) Dimension A mm (in)15-150(1) 4-3/0526.8 (20.7)175(1) 4-4/0512.6 (20.2)200-250(1) 3/0-350512.6 (20.2)300-400(2) 2/0-500438.1 (17.2)300-600(2) 2/0-500438.1 (17.2)250-800(3) 3/0-500405.3 (16)	AmperageOutput Wire Range 90 °C Cu (wires per lug)Wire Bending Space(1) Dimension A mm (in)Conduit Ouantity15-150(1) 4-3/0526.8 (20.7)1175(1) 4-4/0512.6 (20.2)1200-250(1) 3/0-350512.6 (20.2)1300-400(2) 2/0-500438.1 (17.2)2300-600(2) 2/0-500438.1 (17.2)2250-800(3) 3/0-500405.3 (16)3			

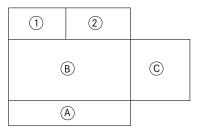
⁽¹⁾ Meets or exceeds NFPA 70 and NEC 312.6(B)

⁽²⁾ Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 3: Dual Enclosure Data





Top View - Right Side Breaker

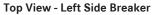


Figure 6: Dual Enclosure Breaker Mounting Positions

A. Controls

Β.

- 1. Position 1 (Primary)
- Outlet box 2. Position 2
- C. Alternator

// Page 6 of 8



TRIPLE ENCLOSURE

- Triple enclosure supplied with all 430 and 570 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 8 for breaker mounting positions.

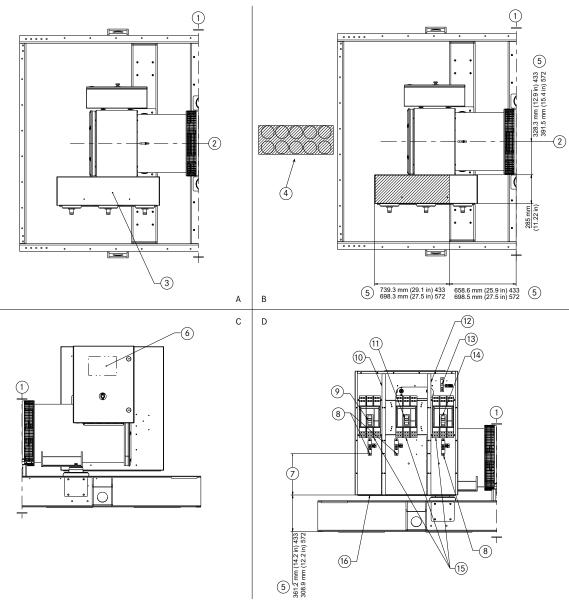


Figure 7: Triple Enclosure

Rear face of flywheel housing

Top entry not available with triple breakers

Dimensions per generator

Optional control panel location

Generator centerline

Ten conduit maximum

1.

2.

3.

4.

5.

6.

frame

- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)

- 7. Dimension A
 - 8. Neutral ASM (torque to 275 in/lbs)
 - 9. Primary breaker
- 10. Divider wall (included with second breaker)
- Second breaker)
 Secondary breaker (800 Amp max)
- 12. Divider wall (included with third breaker)
- 13. Equipment ground terminal (torque to 275 in/lbs)
- Third breaker (800 Amp max)
 Customer connect end
- Customer connect end (recommended torque on label)
 Bottom optimisanduit error
- 16. Bottom entry conduit area



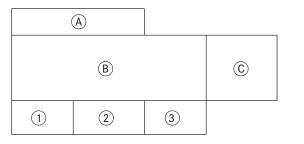
Available Circuit Breakers		Enclosure Data					
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug) Wire Bending Space ⁽¹⁾ Dimension A mm (in)		Conduit Quantity	Conduit Size ⁽²⁾ in		
H-Frame	15-150	(1) 4-3/0	407.2 (16)	1	2		
J-Frame	175	(1) 4-4/0	407.2 (16)	1	2.5		
J-Frame	200-250	(1) 3/0-350	407.2 (16)	1	3		
L-Frame 100%	300-400	(2) 2/0-500	407.2 (16)	2	3.5		
L-Frame 80%	300-600	(2) 2/0-500	407.2 (16)	2	3.5		
M-, P-Frame	250-800	(3) 3/0-500	407.2 (16)	3	3.5		
P-Frame	1,000-1,200	(4) 3/0-500	407.2 (16)	4	3.5		

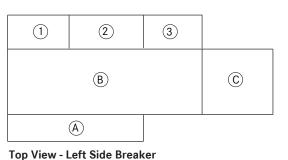
⁽¹⁾ Meets or exceeds NFPA 70 and NEC 312.6(B)

⁽²⁾ Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 4: Triple Enclosure Data





Top View - Right Side Breaker

Figure 8: Triple Enclosure Breaker Mounting Positions

- A. ControlsB. Outlet box
- 1. Position 1 (Primary)
- Outlet box 2.
- 2. Position 2
- C. Alternator
- 3. Position 3

MTU Onsite Energy A Rolls-Royce Power Systems Brand



DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the 60 Hz - MTU 10V1600 DS450 and MTU 10V1600 DS500, and 50 Hz - MTU 10V1600 DS500, MTU 10V1600 DS550 circuit breakers, including single (small and large), dual, and triple enclosures. The dimensional drawings will govern and should be referenced for installation.

SMALL SINGLE ENCLOSURE

- Small enclosure supplied with all 570 frame alternator applications.
- Right side breakers shown. Left side breakers optional.
- Reference Figure 2 for breaker mounting positions.

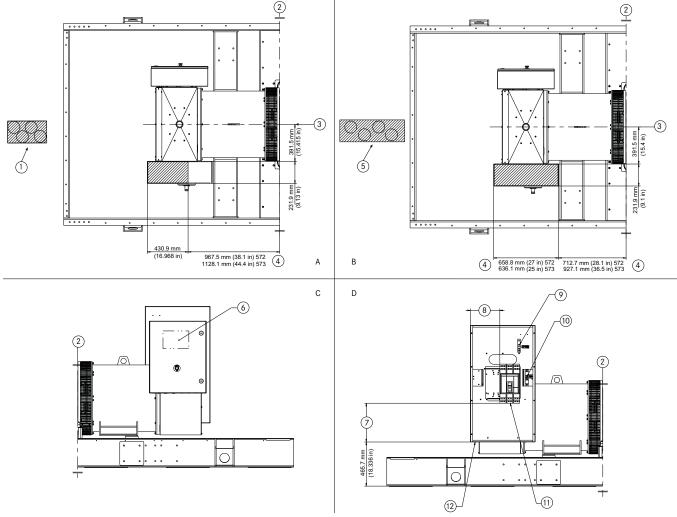


Figure 1: Small Single Enclosure

- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)
- 1. Four conduit maximum
- 2. Rear face of flywheel housing
- 3. Generator centerline
- 4. Dimensions per generator frame
- 5. Four conduit displayed
- 6. Optional control panel location
- 7. Dimension A
- Dimension B
 Equipment gi
 - . Equipment ground terminal (torque to 275 in/lbs)
- Neutral ASM (torque to 275 in/lbs)
- 11. Customer connect end (recommended torque on label)
- 12. Bottom entry conduit area



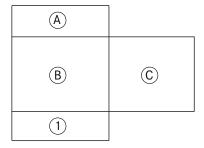
Available Circui	t Breakers	Enclosure Data						
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in		
H-Frame	15 - 150	(1) 4 - 3/0	534.8 (21.1)	364.2 (14.3)	1	2		
J-Frame	175	(1) 4 - 4/0	520.6 (20.5)	364.2 (14.3)	1	2.5		
J-Frame	200 - 250	(1) 3/0 - 350	520.6 (20.5)	364.2 (14.3)	1	3		
L-Frame 100%	300 - 400	(2) 2/0 - 500	446.1 (17.6)	346.2 (13.6)	2	3.5		
L-Frame 80%	300 - 600	(2) 2/0 - 500	446.1 (17.6)	346.2 (13.6)	2	3.5		
M/P-Frame	250-800	(3) 3/0-500	409.5 (16.1)	311.3 (12.3)	3	3.5		
P-Frame	1,000-1,200	(4) 3/0-500	409.5 (16.1)	311.3 (12.3)	4	3.5		
(1) Meets or exceeds	NFPA 70, NEC 312	.6(A), and NEC 312.6(B)					

⁽²⁾ Top entry only available for single breaker applications

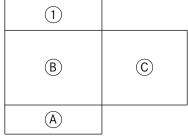
⁽³⁾ Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 1: Small Single Enclosure Data



Top View - Right Side Breaker



Top View - Left Side Breaker

Figure 2: Small Single Enclosure Breaker Mounting Positions

- A. Controls
- C. Alternator
- B. Outlet box
- 1. Breaker



LARGE SINGLE ENCLOSURE

- Large enclosure supplied with all 570 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 4 for breaker mounting positions.

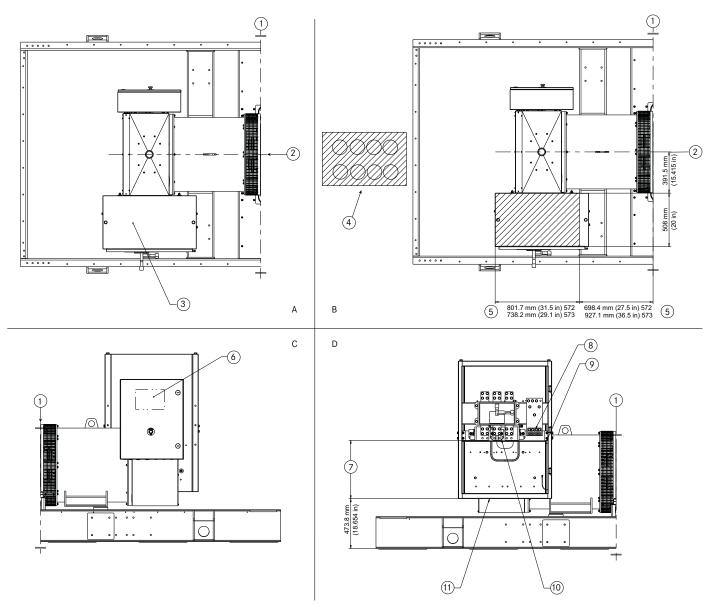


Figure 3: Large Single Enclosure

Rear face of flywheel housing

Top entry not available with single R/NW breakers

Generator centerline

Eight conduit displayed

1.

2.

3.

4.

- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure door not shown)

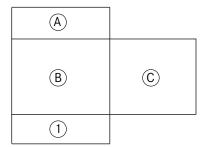
- 5. Dimensions per generator
- frame 6. Optional control panel location
- 7. Dimension A
- 8. Neutral ASM (torque to 275 in/lbs)
- 9. Equipment ground terminal (torque to 275 in/lbs)
- 10. Customer connect end (recommended torque on label)
- 11. Bottom entry conduit area

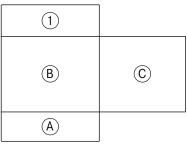


Available Circuit Breakers		Enclosure Data					
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Range 90 °C Cu Dimension A mm (in)		Conduit Size ⁽²⁾ in		
R-Frame	1,600-2,500	(8) 1/0-750	563.9 (22.2)	8	4		
NW-Frame	1,000-2,000	(8) 1/0-750	545 (21.5)	8	4		
 Meets or exceeds NFPA 70 and NEC 312.6(B) Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5 							

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 2: Large Single Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 4: Large Single Enclosure Breaker Mounting Positions

A. Controls Outlet box

Β.

C. Alternator Breaker 1.



DUAL ENCLOSURE

- Dual enclosure supplied with all 570 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 6 for breaker mounting positions.

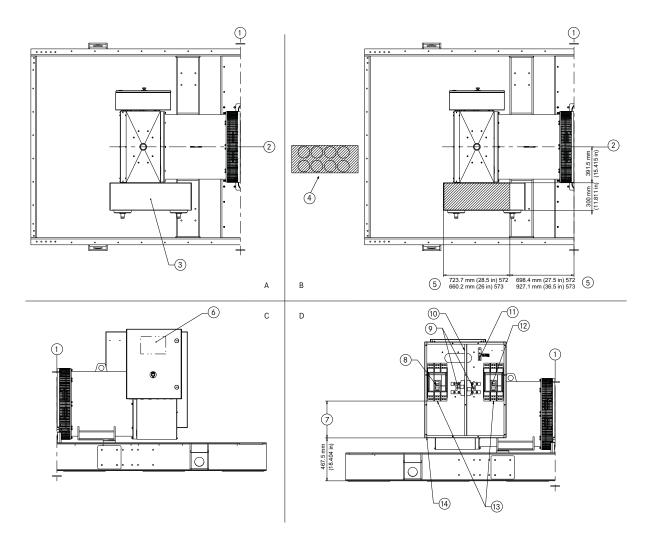


Figure 5: Dual Enclosure

- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- Right view, breaker enclosure detail (enclosure cover not shown)
- Rear face of flywheel housing
- Generator centerline
 Top entry not available with

1.

- dual breakers
- 4. Eight conduits displayed
- 5. Dimensions per generator frame
- 6. Optional control panel location
- 7. Dimension A
- Primary breaker
 Neutral ASM (torque to 275 in/lbs)
- Divider wall (included with second breaker)
- 11. Equipment ground terminal (torque to 275 in/lbs)
- 12. Secondary breaker
- 13. Customer connect end (recommended torque on label)
- 14. Bottom entry conduit area



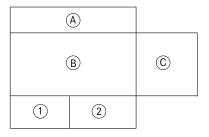
Available Circuit Breakers		Enclosure Data					
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Range 90 °C Cu Dimension A mm (in)		Conduit Size ⁽²⁾ in		
H-Frame	15-150	(1) 4-3/0	526.8 (20.7)	1	2		
J-Frame	175	(1) 4-4/0	512.6 (20.2)	1	2.5		
J-Frame	200-250	(1) 3/0-350	512.6 (20.2)	1	3		
L-Frame 100%	300-400	(2) 2/0-500	438.1 (17.2)	2	3.5		
L-Frame 80%	300-600	(2) 2/0-500	438.1 (17.2)	2	3.5		
M-, P-Frame	250-800	(3) 3/0-500	405.3 (16)	3	3.5		
P-Frame	1,000-1,200	(4) 3/0-500	405.3 (16)	4	3.5		

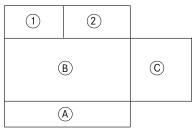
⁽¹⁾ Meets or exceeds NFPA 70 and NEC 312.6(B)

⁽²⁾ Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 3: Dual Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 6: Dual Enclosure Breaker Mounting Positions

- A. Controls
- Position 1 (Primary)
 Position 2
- B. Outlet boxC. Alternator
- 2. 105100112



TRIPLE ENCLOSURE

- Triple enclosure supplied with all 570 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 8 for breaker mounting positions.

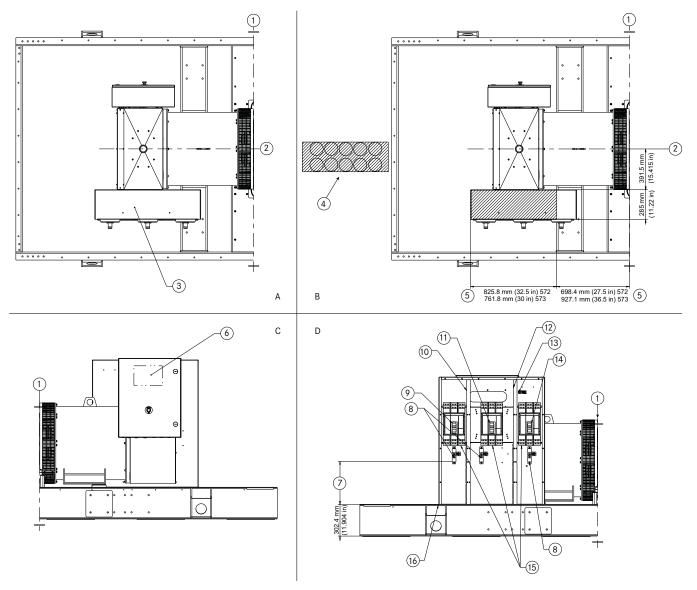


Figure 7: Triple Enclosure

- Top view, top entry conduit Α. arėa Β. Top view, bottom entry
- conduit área C. Left view, breaker enclosure
- detail D.
- Right view, breaker enclosure detail (enclosure cover not shown)
- Rear face of flywheel housing
- Generator centerline 2.

1.

- Top entry not available with triple breakers 3. 4.
- Ten conduit maximum 5.
 - Dimensions per generator frame
- Optional control panel location 6.
- Dimension A 7 8.
 - Neutral ASM (torque to 275 in/lbs)
- 9. Primary breaker 10.
- Divider wall (included with second breaker) 11. Secondary breaker (800 Amp
- max)
- Divider wall (included with third breaker) 12.
- Equipment ground terminal (torque to 275 in/lbs) 13.
- 14. Third breaker (800 Amp max) Customer connect end (recommended torque on label) 15.
- 16. Bottom entry conduit area



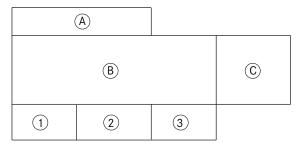
Available Circuit Breakers		Enclosure Data					
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Range 90 °C Cu Dimension A mm (in)		Conduit Size ⁽²⁾ in		
H-Frame	15-150	(1) 4-3/0	407.2 (16)	1	2		
J-Frame	175	(1) 4-4/0	407.2 (16)	1	2.5		
J-Frame	200-250	(1) 3/0-350	407.2 (16)	1	3		
L-Frame 100%	300-400	(2) 2/0-500	407.2 (16)	2	3.5		
L-Frame 80%	300-600	(2) 2/0-500	407.2 (16)	2	3.5		
M-, P-Frame	250-800	(3) 3/0-500	407.2 (16)	3	3.5		
P-Frame	1,000-1,200	(4) 3/0-500	407.2 (16)	4	3.5		

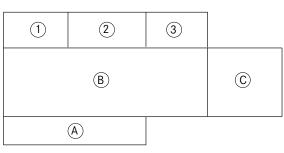
(1) Meets or exceeds NFPA 70 and NEC 312.6(B)

(2) Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 4: Triple Enclosure Data





Top View - Right Side Breaker

Figure 8: Triple Enclosure Breaker Mounting Positions

Α. Controls Outlet box

Β.

- 1. Position 1 (Primary) Position 2 2.
- C. Alternator
- 3. Position 3



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DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the 60 Hz - MTU 12V1600 DS550 and MTU 12V1600 DS600, and 50 Hz - MTU 12V1600 DS650, MTU 12V1600 DS715 circuit breakers, including single (small and large), dual, and triple enclosures. The dimensional drawings will govern and should be referenced for installation.

SMALL SINGLE ENCLOSURE

- Small enclosure supplied with all 570 frame alternator applications.
- Right side breakers shown. Left side breakers optional.
- Reference Figure 2 for breaker mounting positions.

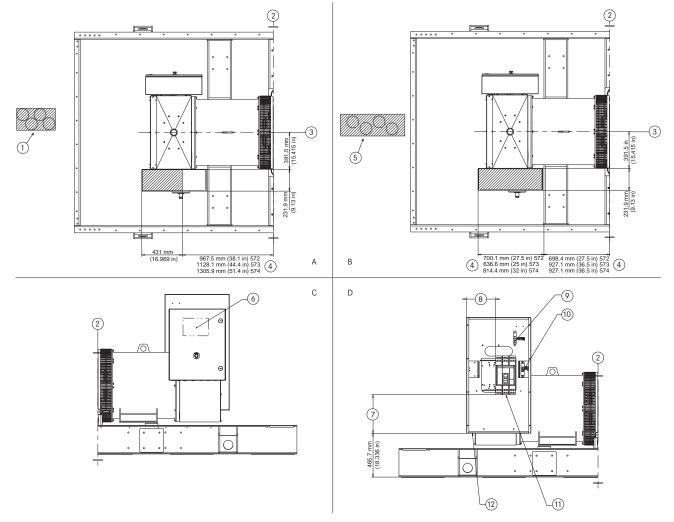


Figure 1: Small Single Enclosure

- A. Top view, top entry conduit arėa
- Β. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- Right view, breaker enclosure detail (enclosure cover not D. shown)
- 1. Four conduit maximum
- 2. Rear face of flywheel housing
- 3. Generator centerline
- 4. Dimensions per generator
- frame 5. Four conduit displayed
- Optional control panel location 6. 7.
 - Dimension A
- Dimension B 8. 9.
 - Equipment ground terminal (torque to 275 in/lbs)
- 10. Neutral ASM (torque to 275 in/lbs)
- 11. Customer connect end (recommended torque on label)
- 12. Bottom entry conduit area

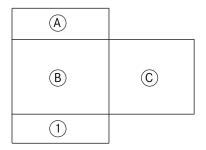


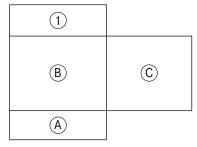
Available Circui	t Breakers	Enclosure Data						
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in		
H-Frame	15 - 150	(1) 4 - 3/0	534.8 (21.1)	364.2 (14.3)	1	2		
J-Frame	175	(1) 4 - 4/0	520.6 (20.5)	364.2 (14.3)	1	2.5		
J-Frame	200 - 250	(1) 3/0 - 350	520.6 (20.5)	364.2 (14.3)	1	3		
L-Frame 100%	300 - 400	(2) 2/0 - 500	446.1 (17.6)	346.2 (13.6)	2	3.5		
L-Frame 80%	300 - 600	(2) 2/0 - 500	446.1 (17.6)	346.2 (13.6)	2	3.5		
M/P-Frame	250-800	(3) 3/0-500	409.5 (16.1)	311.3 (12.3)	3	3.5		
P-Frame	1,000-1,200	(4) 3/0-500	409.5 (16.1)	311.3 (12.3)	4	3.5		
	¹⁾ Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B)							

⁽³⁾ Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 1: Small Single Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

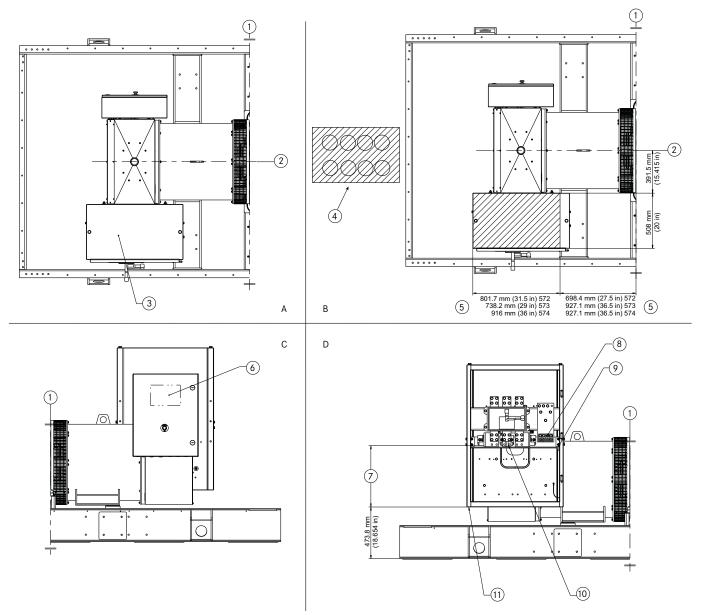
Figure 2: Small Single Enclosure Breaker Mounting Positions

- A. Controls
- C. Alternator
- B. Outlet box 1.
- 1. Breaker



LARGE SINGLE ENCLOSURE

- Large enclosure supplied with all 570 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 4 for breaker mounting positions.



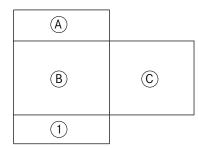
- Α. Top view, top entry conduit arėa
- Β. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail Right view, breaker enclosure
- D. detail (enclosure door not shown)

- Figure 3: Large Single Enclosure
- Rear face of flywheel housing 1.
- 2. Generator centerline
- Top entry not available with single R/NW breakers 3.
- 4. Eight conduit displayed
- Dimensions per generator 5. frame
- Optional control panel location 6. Dimension A 7.
- 8. Neutral ASM (torque to 275 in/lbs)
- Equipment ground terminal (torque to 275 in/lbs) 9.
- 10. Customer connect end (recommended torque on label)
- 11. Bottom entry conduit area



Available Circu	it Breakers		Enclosure Data			
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Range 90 °C Cu Dimension A mm (in)		Conduit Size ⁽²⁾ in	
R-Frame	1,600-2,500	(8) 1/0-750	563.9 (22.2)	8	4	
NW-Frame	1,000-2,000	(8) 1/0-750	545 (21.5)	8	4	
 Meets or exceeds NFPA 70 and NEC 312.6(B) Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5 NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil 						

Table 2: Large Single Enclosure Data



BCA

(1)

Top View - Right Side Breaker

Top View - Left Side Breaker

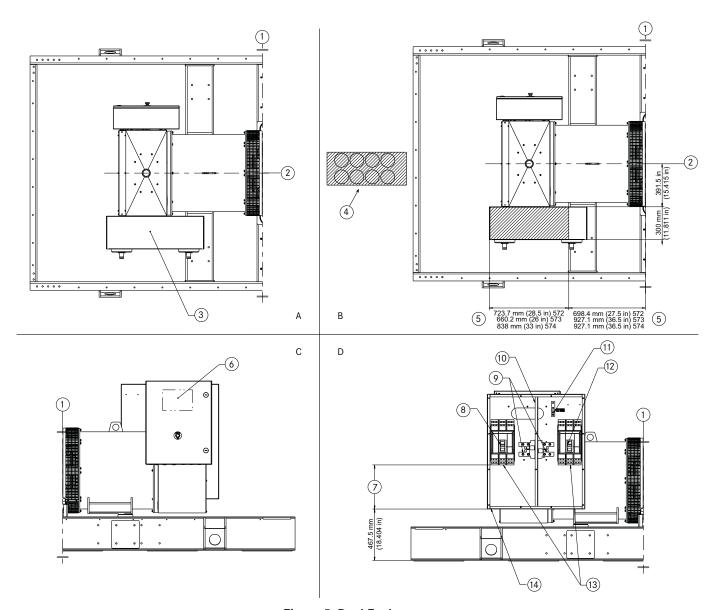
Figure 4: Large Single Enclosure Breaker Mounting Positions

- A. ControlsB. Outlet box
- C. Alternator 1. Breaker



DUAL ENCLOSURE

- Dual enclosure supplied with all 570 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 6 for breaker mounting positions.



- Top view, top entry conduit Α. area
- Top view, bottom entry conduit area B.
- Left view, breaker enclosure C. detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)

- **Figure 5: Dual Enclosure**
- Rear face of flywheel housing 1.
- 2. Generator centerline
- 3.
- Top entry not available with dual breakers
- 4. Eight conduit displayed
- 5. Dimensions per generator
- frame
- Optional control panel location 6.
- 7. Dimension A
- 8. Primary breaker Neutral ASM (torque to 275 9. in/lbs)
- Divider wall (included with second breaker) 10.
- Equipment ground terminal (torque to 275 in/lbs) 11.
- 12. Secondary breaker
- 13. Customer connect end (recommended torque on label)
- 14. Bottom entry conduit area



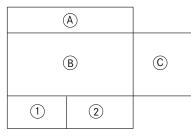
Available Circuit Breakers		Enclosure Data					
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Range 90 °C Cu Dimension A mm (in)		Conduit Size ⁽²⁾ in		
H-Frame	15-150	(1) 4-3/0	526.8 (20.7)	1	2		
J-Frame	175	(1) 4-4/0	512.6 (20.2)	1	2.5		
J-Frame	200-250	(1) 3/0-350	512.6 (20.2)	1	3		
L-Frame 100%	300-400	(2) 2/0-500	438.1 (17.2)	2	3.5		
L-Frame 80%	300-600	(2) 2/0-500	438.1 (17.2)	2	3.5		
M-, P-Frame	250-800	(3) 3/0-500	405.3 (16)	3	3.5		
P-Frame	1,000-1,200	(4) 3/0-500	405.3 (16)	4	3.5		

⁽¹⁾ Meets or exceeds NFPA 70 and NEC 312.6(B)

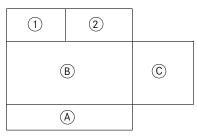
⁽²⁾ Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 3: Dual Enclosure Data



Top View - Right Side Breaker



Top View - Left Side Breaker

Figure 6: Dual Enclosure Breaker Mounting Positions

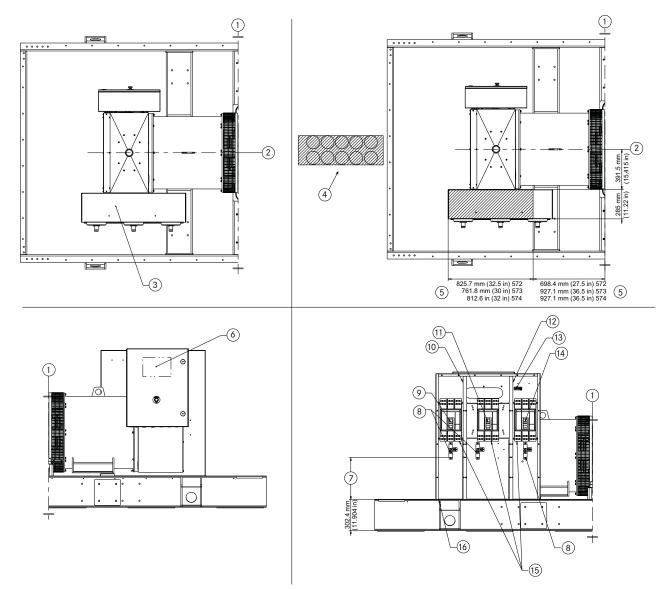
- A. Controls
- Position 1 (Primary)
 Position 2
- B. Outlet boxC. Alternator

// Page 6 of 8



TRIPLE ENCLOSURE

- Triple enclosure supplied with all 570 frame alternator applications.
- Right side primary breaker shown. Left side primary breaker optional.
- Reference Figure 8 for breaker mounting positions.



- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- Right view, breaker enclosure detail (enclosure cover not shown)

- Figure 7: Triple Enclosure
- 1. Rear face of flywheel housing
- Generator centerline
- 3. Top entry not available with
- triple breakers
- 4. Ten conduit maximum
- 5. Dimensions per generator frame
- 6. Optional control panel location
- 7. Dimension A
- Neutral ASM (torque to 275 in/lbs)
- Primary breaker
 Divider wall (included with
- second breaker) 11. Secondary breaker (800 Amp
- max)
- 12. Divider wall (included with third breaker)
- 13. Equipment ground terminal (torque to 275 in/lbs)
- Third breaker (800 Amp max)
 Customer connect end (recommended torque on label)
- 16. Bottom entry conduit area



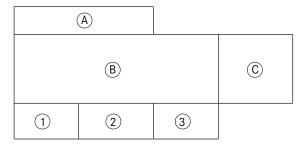
Available Circu	uit Breakers	Enclosure Data					
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Range 90 °C Cu Dimension A mm (in)		Conduit Size ⁽²⁾ in		
H-Frame	15-150	(1) 4-3/0	407.2 (16)	1	2		
J-Frame	175	(1) 4-4/0	407.2 (16)	1	2.5		
J-Frame	200-250	(1) 3/0-350	407.2 (16)	1	3		
L-Frame 100%	300-400	(2) 2/0-500	407.2 (16)	2	3.5		
L-Frame 80%	300-600	(2) 2/0-500	407.2 (16)	2	3.5		
M-, P-Frame	250-800	(3) 3/0-500	407.2 (16)	3	3.5		
P-Frame	1,000-1,200	(4) 3/0-500	407.2 (16)	4	3.5		
(1) Meets or exceeds N	EPA 70 and NEC 312 6	(B)					

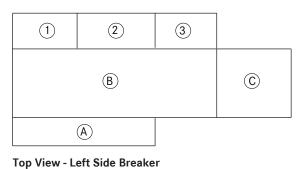
⁽¹⁾ Meets or exceeds NFPA 70 and NEC 312.6(B)

⁽²⁾ Based on flexible metal conduit at 40% fill using THHN wire according to NEC table 4 and 5

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 4: Triple Enclosure Data





Top View - Right Side Breaker

Figure 8: Triple Enclosure Breaker Mounting Positions

- A. Controls
- Position 1 (Primary)
 Position 2
- B. Outlet boxC. Alternator
- 3. Position 3



CIRCUIT BREAKER ENCLOSURE - DIESEL 1,000-1,250 kW Standby / 900 kW Prime Data Sheet

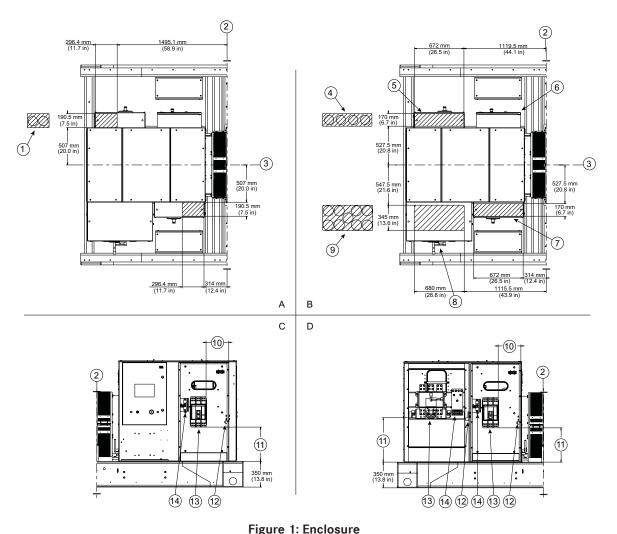


DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the MTU 16V2000 DS1000 and MTU 16V2000 DS1250 circuit breakers, including single, dual, and triple enclosures. The dimensional drawings will govern and should be referenced for installation.

BREAKER LAYOUT

- Left side controls shown. Right side controls optional.
- Reference Figure 2 and Table 2 for available breaker mounting positions.



A. Top view, top entry conduit area

- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail (enclosure cover not shown)
- D. Right view, breaker enclosure detail (enclosure cover not shown)
- 1. Two conduit maximum (top entry)

- rigure 1. Liiciosui
- Rear face of flywheel housing
 Generator centerline
- Generator centerline
 Four conduit maximum (bottom entry, ≤1200 amp
- enclosure) 5. Breaker postion 2 (≤1200 amp enclosure shown)
- Controls position
- Breaker position 3 (≤1200 amp enclosure shown)
- Breaker position 1 (>1200 amp enclosure shown)
 Nine conduit maximum
- Nine conduit maximum (bottem entry, >1200 amp enclosure)
- 10. Dimension B
- 11. Dimension A
- 12. Equipment ground terminal wire binding torque: 500 lb-in
- Customer connect end breaker wire binding torque: 50 lb-in (H-Frame breaker) 225 lb-in (J-Frame Breaker) 442 lb-in (L, M, P-Frame breaker) 46 lb-ft (NW, R-Frame breaker)
- Neutral wire binding torque: 375 lb-in (≤1200 amp) 46 lb-ft (>1200 amp)

CIRCUIT BREAKER ENCLOSURE - DIESEL 1,000-1,250 kW Standby / 900 kW Prime Data Sheet



Available Circui	t Breakers	Enclosure Data						
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in		
H-Frame	20 - 150	(1) 4 - 3/0	591 (23.27)	361 (14.21)	1	2		
J-Frame	175	(1) 4 - 4/0	577 (22.72)	361 (14.21)	1	2.5		
J-Frame	200 - 250	(1) 3/0 - 350	577 (22.72)	361 (14.21)	1	3		
L-Frame 100%	300 - 400	(2) 2/0 - 500	502 (19.76)	344 (13.54)	2	3.5		
L-Frame 80%	300 - 600	(2) 2/0 - 500	502 (19.76)	344 (13.54)	2	3.5		
M/P-Frame	250 - 800	(3) 3/0 - 500	466 (18.35)	N/A	3	3.5		
P-Frame	1,000 - 1,200	(4) 3/0 - 500	466 (18.35)	N/A	4	3.5		
R/NW-Frame	1,600 - 2,500	(8) 1/0 - 750	604 (23.78)	N/A	8	4		
R/NW-Frame 80%	3,000	(8) 1/0 - 750	604 (23.78)	N/A	8	4		
R/NW-Frame 100%	3,000	(9) 1/0 - 750	604 (23.78)	N/A	9	4		

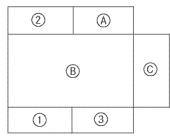
⁽¹⁾ Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B)

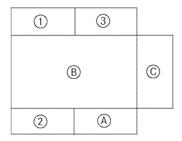
⁽²⁾ Top entry only available for breakers rated for 600 amps and below.

⁽³⁾ Based on flexible metal conduit at 40% fill using THHN wire.

NOTE: Equipment grounding terminal wire range: 2 AWG - 600 kcmil

Table 1: Enclosure Data





Top View - Left Side Controls

Top View - Right Side Controls

Figure 2: Available Breaker Mounting Positions

- A. Controls 1. Position 1
- B.Outlet box2.Position 2C.Alternator3.Position 3

Breaker Frame Size	Position 1 (Primary)	Position 2	Position 3
Н	Х	Х	Х
J	Х	Х	Х
L	Х	Х	Х
М	Х	Х	Х
Р	Х	Х	Х
R	Х	Х	N/A
NW	Х	Х	N/A

Table 2: Available Breaker Mounting Positions

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CIRCUIT BREAKER ENCLOSURE - GAS 30-40 kW Data Sheet



DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the MTU 4R0063 GS30 and MTU 4R0063 GS40 circuit breaker, 280 frame size enclosures. The dimensional drawings will govern and should be referenced for installation.

280 FRAME ENCLOSURE

- Supplied with all 280 frame alternator applications.
- Right side breakers shown. Left side breakers optional.
- Reference Figure 2 for breaker mounting positions.

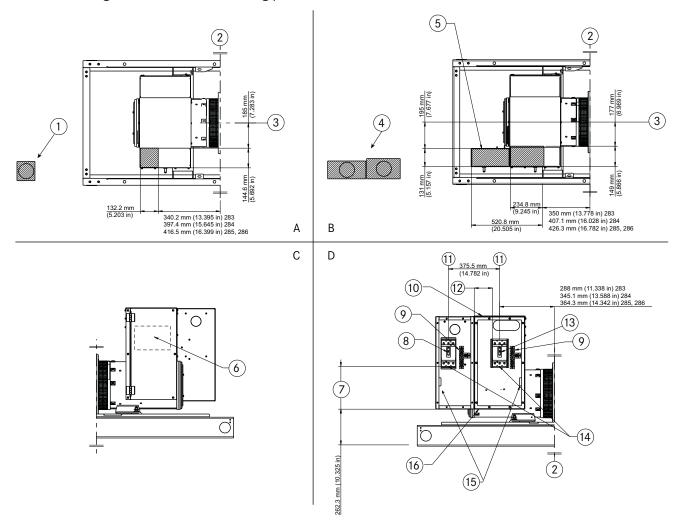


Figure 1: 280 Frame Enclosure

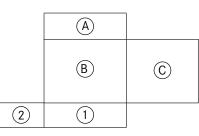
- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)
- 1. Possible top entry conduit locations
- 2. Rear face of flywheel housing
- 3. Generator centerline
- 4. Possible bottom entry conduit locations
- 5. Optional secondary breaker enclosure
- 6. Optional control panel location
- 7. Dimension A
- 8. Optional second breaker
- 9. Neutral ASM (torque to 275 in/lbs)
- 10. Top entry conduit area
- 11. Breaker center line
- 12. Dimension B
- 13. Primary breaker
- 14. Customer connect end (recommended torque on label)
- 15. Equipment ground terminal (torque to 275 in/lbs)
- 16. Bottom entry conduit area

CIRCUIT BREAKER ENCLOSURE - GAS 30-40 kW Data Sheet



Available Circui	t Breakers		Encl	osure Data		
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in
H-Frame	15 - 150	(1) 4 - 3/0	329 (12.95)	134 (5.27)	1	2.5
J-Frame	175	(1) 4 - 4/0	314 (12.36)	134 (5.27)	1	2.5
J-Frame	250	(1) 3/0 - 350	314 (12.36)	134 (5.27)	1	3
 ⁽²⁾ Top entry only avai ⁽³⁾ Based on flexible m 	lable for single bre netal conduit at 40	% fill using THHN wire				
NOTE: Equipment groun	ding terminal wire	range: 6 AWG - 3/0 A	WG			

Table 1: 280 Frame Enclosure Data



② ①
③ ⑧ ③
⑥ ④
④ ④

Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 2: 280 Frame Enclosure Breaker Mounting Positions

- A. ControlsB. Outlet box
- Position 1 (Primary)
 Position 2
- C. 280 frame alternator

CIRCUIT BREAKER ENCLOSURE - GAS 60 kW Data Sheet



DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the MTU 8V0071 GS60 circuit breakers, including the 360 frame size enclosure. The dimensional drawings will govern and should be referenced for installation.

360 FRAME ENCLOSURE

- Supplied with all 360 frame alternator applications.
- Right side breakers shown. Left side breakers optional.
- Reference Figure 2 for breaker mounting positions.

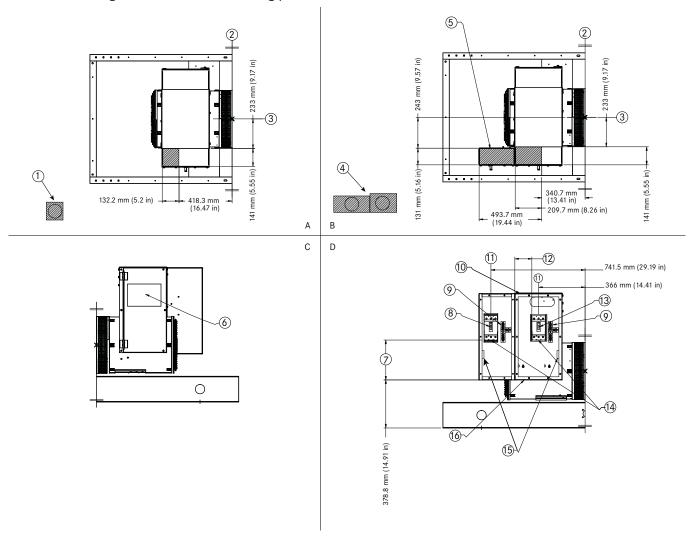


Figure 1: 360 Frame Enclosure

- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail (enclosure cover not shown)
- Possible top entry conduit locations
- 2. Rear face of flywheel housing
- Generator centerline
 Possible bottom entry

1.

- conduit locations
- 5. Optional secondary breaker enclosure
- 6. Optional control panel location
- 7. Dimension A
- 8. Optional second breaker
- 9. Neutral ASM (torque to 275 in/lbs)
- 10. Top entry conduit area
- 11. Breaker centerline
- 12. Dimension B
- 13. Primary breaker
- 14. Customer connect end (recommended torque on label)
- 15. Equipment ground terminal (torque to 275 in/lbs)
- 16. Bottom entry conduit area

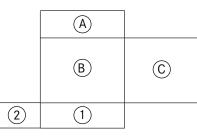
CIRCUIT BREAKER ENCLOSURE - GAS 60 kW Data Sheet

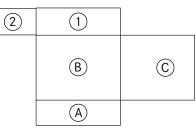


Available Circu	it Breakers		Enclosure Data							
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ^(1,2) Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽³⁾ in				
H-Frame	15 - 150	(1) 4 - 3/0	329 (12.95)	134 (5.27)	1	2.5				
J-Frame	175	(1) 4 - 4/0	314 (12.36)	134 (5.27)	1	2.5				
J-Frame	250	(1) 3/0 - 350	314 (12.36)	134 (5.27)	1	3				
⁽²⁾ Top entry only a	vailable for single	312.6(A), and NEC 312 breaker applications u 40% fill using THHN w	p to 800 amps	1	1	1				

NOTE: Equipment grounding terminal wire range: 6 AWG - 3/0 AWG

Table 1: 360 Frame Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 2: 360 Frame Enclosure Breaker Mounting Positions

- A. Controls
- 1. Position 1 (Primary)
- B. Outlet boxC. 360 Frame alternator
- 2. Position 2



DESCRIPTION

This circuit breaker enclosure data sheet is used in conjunction with dimensional drawings to assist with submittal documentation, specification requirements, and installation. This document summarizes the enclosure dimensions and mounting positions for the MTU 10V0068 GS75, MTU 10V0068 GS100, and MTU 10V0068 GS125 circuit breakers; including small, large, and dual frame sized enclosures. The dimensional drawings will govern and should be referenced for installation.

SMALL SINGLE ENCLOSURE

- Small single breaker enclosure supplied with 15 to 250 amperage H-Frame and J-Frame Square D breaker applications.
- Right side breaker shown. Left side breaker optional.
- Reference Figure 2 for breaker mounting positions. .

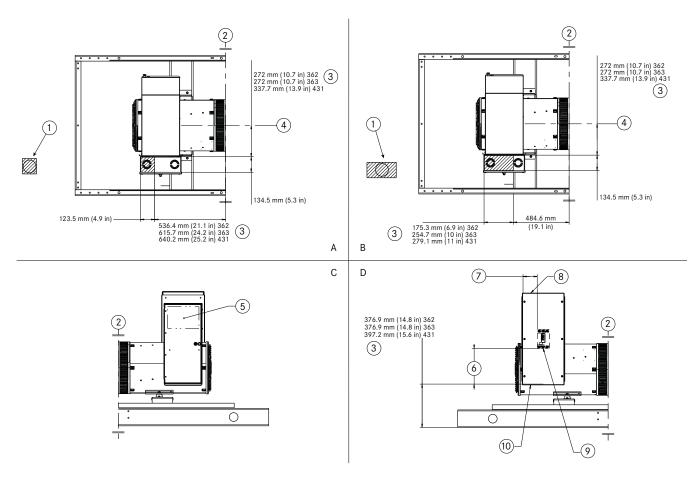


Figure 1: Small Single Enclosure

- Α. Top view, top entry conduit area
- Top view, bottom entry Β. conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail
- One conduit maximum Rear face of flywheel
- 2. housing

1.

- Dimensions per generator 3. frame
- 4. Generator centerline
- 5. Optional control panel location
- Dimension A
- 6.
- 7. Dimension B Top entry conduit area 8.
- Customer connect end (recommended torque on label)

9.

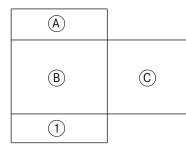
10. Bottom entry conduit area

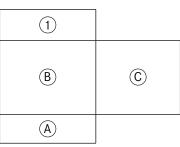


Available Circui	t Breakers		Encl	osure Data			
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ⁽¹⁾ Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽²⁾ in	
H-Frame	15 - 100	(1) 14 - 1/0	310 (12.23)	124 (4.87)	1	2	
H-Frame	110 - 150	(1) 4 - 3/0	310 (12.23)	124 (4.87)	1	2	
J-Frame	175	(1) 4 - 4/0	296 (11.67)	124 (4.87)	1	2.5	
J-Frame	200 - 250	(1) 3/0 - 250	296 (11.67)	124 (4.87)	1	3	
 Meets or exceeds NFPA 70, NEC 312.6(A), and NEC 312.6(B) Based on flexible metal conduit at 40% fill using THHN wire 							
		-					

NOTE: Equipment grounding terminal wire range: 6 AWG - 300 kcmil

Table 1: Small Single Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 2: Small Single Enclosure Breaker Mounting Positions

- A. Controls
- C. Alternator
- B. Outlet box
- 1. Breaker



LARGE SINGLE ENCLOSURE

- Large single breaker enclosure supplied with 300 to 800 amperage L-Frame, M-Frame and P-Frame Square D breaker applications.
- Right side breaker shown. Left side breaker optional.
- Reference Figure 4 for breaker mounting positions.

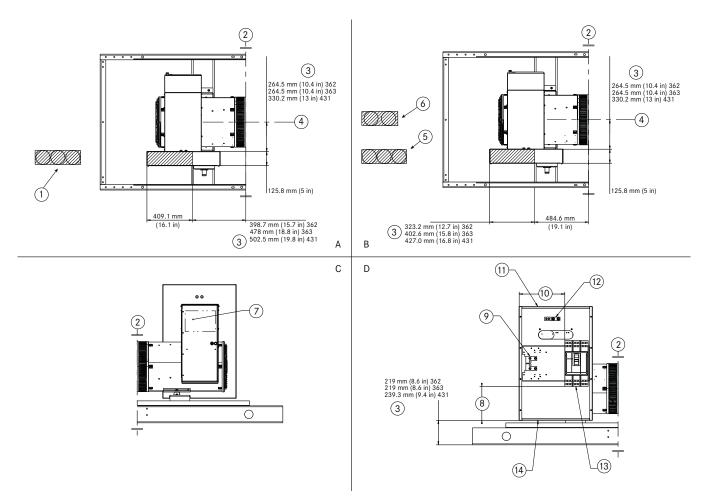


Figure 3: Large Single Enclosure

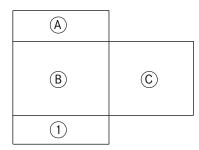
- A. Top view, top entry conduit area
- B. Top view, bottom entry conduit area
- C. Left view, breaker enclosure detail
- D. Right view, breaker enclosure detail
- 1. Three conduit maximum
- 2. Rear face of flywheel housing
- 3. Dimensions per generator frame
- 4. Generator centerline
- 5. Three conduit maximum (363 and 431 generators)
- 6. Two conduit maximum (362 generator)
- 7. Optional control panel location
- 8. Dimension A
- Neutral ASM (torque to 275 in/lbs)
- 10. Dimension B

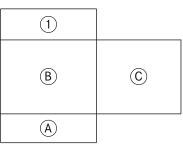
- 11. Top entry conduit area
- 12. Equipment ground terminal (torque to 275 in/lbs)
- Customer connect end (recommended torque on label)
- 14. Bottom entry conduit area



Available Circu	it Breakers	Enclosure Data					
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Wire Gutter Space ⁽¹⁾ Dimension B mm (in)	Conduit Quantity	Conduit Size ⁽²⁾ in	
L-Frame 100%	300 - 400	(2) 2/0 - 400	339.2 (13.35)	423.6 (16.7)	2	3.5	
L-Frame 80%	300 - 600	(2) 2/0 - 400	339.2 (13.35)	423.6 (16.7)	2	3.5	
M-, P-Frame	250 - 800	(3) 250 - 300	311.4 (12.26)	409.1 (16.1)	3	3.5	
⁽²⁾ Based on flexible	e metal conduit at	312.6(A), and NEC 312 40% fill using THHN w vire range: 6 AWG - 2/0	ire				

Table 2: Large Single Enclosure Data





Top View - Right Side Breaker

Top View - Left Side Breaker

Figure 4: Large Single Enclosure Breaker Mounting Positions

- A. Controls
- C. Alternator
- B. Outlet box
- 1. Breaker



DUAL ENCLOSURE

- Dual breaker enclosure supplied with all dual breaker applications.
- Only right side breakers available. •
- Reference Figure 6 for breaker mounting positions. .

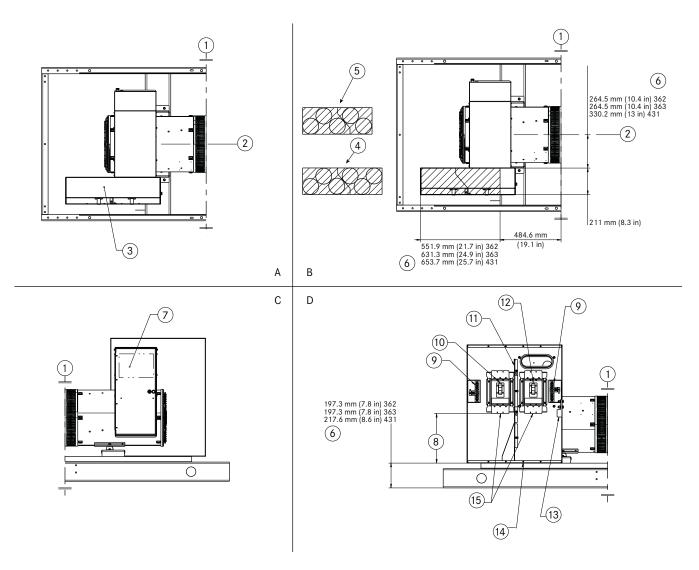


Figure 5: Dual Enclosure

- Α. Top view, top entry conduit area
- Top view, bottom entry Β. conduit area
- Left view, breaker C. enclosure detail
- D. Right view, breaker enclosure detail
- 1. Rear face of flywheel housing Generator centerline
- 2.
- Top entry not available 3. with dual breakers
- Six conduit maximum (363 4. and 431 generators)
- 5. Five conduit maximum (362 generator)
- 6. Dimensions per generator frame
- Optional control panel 7. location
- Dimension A 8.
- Neutral ASM (torque to 9. 275 in/lbs)
- 10. Primary breaker
- 11. Divider wall (included with second breaker)
- 12. Seondary breaker
- 13. Equipment ground terminal (torque to 275 in/lbs)
- 14. Bottom entry conduit area
- 15. Customer connect end (recommended torque on label)

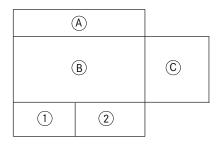


Available Circu	it Breakers		Enclosure Data		
Breaker Frame	Amperage	Output Wire Range 90 °C Cu (wires per lug)	Wire Bending Space ⁽¹⁾ Dimension A mm (in)	Conduit Quantity	Conduit Size ⁽²⁾ in
H-Frame	15 - 150	(1) 4 - 3/0	481 (18.93)	1	2
J-Frame	175	(1) 4 - 4/0	467 (18.37)	1	2.5
J-Frame	200 - 250	(1) 3/0 - 350	467 (18.37)	1	3
L-Frame 100%	300 - 400	(2) 2/0 - 500	392 (15.43)	2	3.5
L-Frame 80%	300 - 600	(2) 2/0 - 500	392 (15.43)	2	3.5
M-, P-Frame	250 - 800	(3) 250 - 400	356 (14)	3	3.5
(1) Meets or exceeds N	FPA 70, NEC 312.6(A), and NEC 312.6(B)		*	•

Based on flexible metal conduit at 40% fill using THHN wire (2)

NOTE: Equipment grounding terminal wire range: 6 AWG - 350 kcmil

Table 3: Dual Enclosure Data



Top View - Right Side Breaker

Figure 6: Dual Enclosure Breaker Mounting Positions

- A. Controls
- 1. Position 1 (Primary) 2. Position 2
- Β. Outlet box C. Alternator

CONNECTION BOX Series 1600 Data Sheet



DESCRIPTION

Connection boxes provide a dedicated wiring space for electrical connection to the generator output when no circuit breaker is provided.

FEATURES

- Accessible enclosure
- Copper busbars

CERTIFICATIONS AND STANDARDS

• Wire bending space conforms to UL, CSA, and NFPA 70 requirements

WIRE LUG DATA

Amperage	Terminal Description	Wire Range (Qty) Cu/Al	Wire Bending Space to Bottom of Enclosure mm (in)	Wire Binding Screw Torque N·m (Ib-ft)	Lug Mounting Fasteners N·m (Ib-ft)
1 200	Busbars	(4) 1/0 AWG-600 kcmil	47 (16)	62 (46)	68 (50)
1,200	Equipment Grounding Terminal	(1) 6 AWG - 250 kcmil	985 (38.7)	23 (17)	43 (32)
2,250	Busbars	(8) 1/0 AWG-750 kcmil	566 (22.2)	62 (46)	68 (50)
2,250	Equipment Grounding Terminal	(1) 4/0 AWG - 500 kcmil	838 (33)	43 (32)	43 (32)

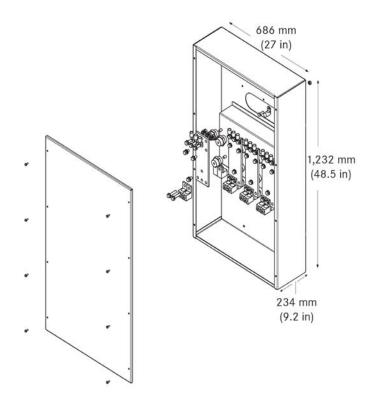
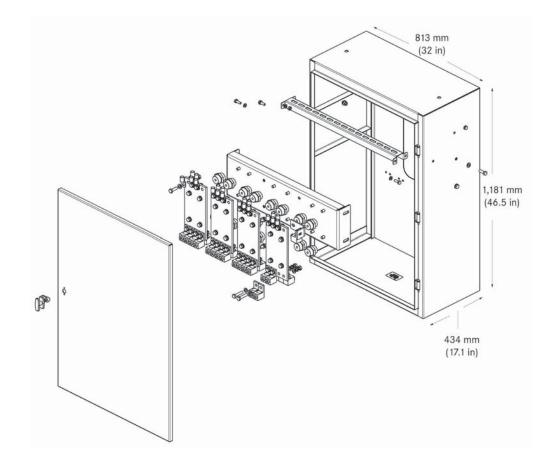


Figure 1: 1,200 Amp Connection Box Diagram

CONNECTION BOX Series 1600 Data Sheet







DESCRIPTION

Automatic solid state engine control (KASSEC) will automatically start and stop diesel, gasoline, natural gas, and LPG engines or generator sets under the control of an automatic transfer switch of load start contact closed to run. KASSEC is manufactured and tested to the highest quality control standards to ensure reliability.

HIGHLIGHTS

- Compatible with virtually all engines in today's marketplace
- Reliable, solid-state design
- External alarm circuit for remote failure indication
- Easy installation, simple mounting bracket

FEATURES

- Adjustable seven to 50 second engine cranking circuit
- Adjustable one or five crank / rest cycles
- Adjustable seven to 50 second oil failure circuit
- External alarm circuit for remote failure indication. Source 2 Amp Resistive
- Four crank disconnects available: Mag pickup, engine alternator, 110 VAC, and auxiliary 12 VDC or 24 VDC. Mag pickup and engine alternator crank disconnects are adjustable.
- · Positive lockout circuits prohibit re-cranking while engine is running
- First failure shutdown lockout
- Unit is sealed with a durable conformal coating

SPECIFICATIONS

- MTU Onsite Energy Part #s:
- Dimensions:
- Consistent operation temperature:
- Negative ground battery systems:
- Start and ignition system relay contacts: 8

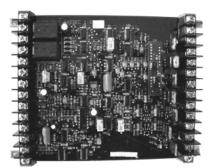
CERTIFICATIONS AND STANDARDS

- Meets requirements for NFPA 110 annunciator for hospital application
- Barrier screw-type terminals: UL and CSA listed, with approved means for solder-less connection of conductors

FUNCTIONS

KASSEC will be in the "standby monitoring" mode whenever terminals #1 and #4 have battery voltage on them. In the "standby monitoring" mode, KASSEC will draw approximately 15 mA of current on the 12 V model and approximately 17 mA of current on the 24 V model.

In the "standby monitoring" mode, when battery voltage is placed on Terminal #8 by the closing of a remote switch, relay or a transfer switch, the logic signal in KASSEC will operate the relays in KASSEC initiating cranking. Terminals #2 and #3 will have battery voltage on during the "cranking" period. During the "cranking rest" period, Terminals #2 and #3 will have zero voltage on them.



(12V) SUA90353 (24V) SUA90354 Length: 185.7 mm (7.31 in) Width: 29.2 mm (1.15 in) Height: 134.6 mm (5.3 in) -30 °C (-22 °F) to 60 °C (140 °F) Available for 12 V or 24 V 8 Amp



If the engine starts, one or more of the crank disconnect terminals (#5, 6, 7, or 12) must have a signal placed on them. The KASSEC "start" relay will then open and Terminal #3 will drop to zero volts. KASSEC is now in the "run" mode.

KASSEC has cyclic cranking which is adjustable. If the engine does not start in the first period of the cranking cycle, cranking will rest for the second period of the cranking cycle. These periods are equal. KASSEC will repeat cycle-cranking for an adjustable amount of cranks (1-5). If the engine has not started, KASSEC will go into an "overcrank failure" mode and both the Common Alarm Terminal #23 and the Overcrank Failure Terminal #13 will activate and battery voltage will be supplied from these terminals to be used for a failure light. Terminals #2 and #3 will go to zero volts. KASSEC is now locked in an "overcrank failure" mode that can be reset by turning the power to Terminal #4 off and on again.

When the engine starts, the Oil Failure Circuit of KASSEC starts timing. If the Oil Failure Sender Terminal #24 does not activate (open from the ground) before the end of the timing period, KASSEC will go into the "low oil pressure failure" mode and shut the engine down. Terminals #2 and #3 will drop to zero volts. The Common Alarm Terminal #23 and the Oil Failure Terminal #14 will activate and battery voltage will be supplied by these terminals to be used for a failure light. KASSEC is now locked in a "low oil pressure failure" mode that can be reset by turning the power to Terminal #4 off and on again. If Terminal #24 is grounded while KASSEC is in the "run" mode, KASSEC will go into the "low oil pressure failure" mode and shut the engine down. Terminals #2 and #3 will drop to zero volts. The Common Alarm Terminal #23 and the Oil Failure Terminals #2 and on again. If Terminal #24 is grounded while KASSEC is in the "run" mode, KASSEC will go into the "low oil pressure failure" mode and shut the engine down. Terminals #2 and #3 will drop to zero volts. The Common Alarm Terminal #23 and the Oil Failure Terminal #14 will activate and battery voltage will be supplied by these terminals to be used for a failure light. KASSEC is now locked in a "low oil pressure failure" mode that can be reset by turning the power to Terminal #4 off and on again.

If any of the Failure Sender Terminals (#18, 19, 21, or 22) go to ground while KASSEC is in a "cranking" or "run mode, KASSEC will go into a "failure" mode and shut the engine down. Terminals #2 and #3 will drop to zero volts. The Failure Lamp Terminal (#16, 20, 17, or 15), respectively coinciding with the Failure Sender, will activate and battery voltage will be supplied by this terminal to be used for a failure light. The Common Alarm Terminal #23 will activate and supply battery voltage. KASSEC is now locked in a "failure" mode that can be reset by turning the power to Terminal #4 off and on again.

NOTE: "Battery voltage" or "supply voltage" will refer to the battery's positive voltage. "Ground" will refer to the negative side of the battery.

- **Terminal #1** supplies battery voltage to the high current requirement sections of the circuit. Battery voltage is supplied by KASSEC to the six Failure Lamps (Terminals #13, 14, 15, 16, 17, and 20), the Common Alarm Terminal #23, the Start Terminal #3, and the "energized to run" terminal #2.
- **Terminal #2** is the "energized to run" terminal. Up to 8 amps is available from this terminal to supply an external engine "run" component such as an ignition coil or fuel solenoid.
- **Terminal #3** is the Starter Solenoid Terminal. Up to 8 amps is available from this terminal to supply a starter solenoid on the engine.
- **Terminal #4** supplies battery voltage to all the logic circuitry. Any time Terminal #4 is brought from the ground to the battery voltage, KASSEC will be reset.

NOTE: Terminal #4 is the main reset terminal for KASSEC.

• **Terminal #5** is the Mag Pickup Crank Disconnect input. This is one of four crank disconnects on KASSEC. When KASSEC is in the "cranking" mode and the input frequency of the mag pickup equals a value set by the adjustable resistor on KASSEC, KASSEC will crank disconnect and go into the "run" mode. If the signal from the mag pickup is lost while KASSEC is in the "run" mode and this is the only crank disconnect being used, KASSEC will go into the "overcrank failure" mode and shut the engine down.

NOTE: Whenever Terminal #5 is not in use, it must be tied to Terminal #9 (Ground) to prevent accidental triggering of the crank disconnect circuitry.



- **Terminal #6** is the Engine Alternator Crank Disconnect Terminal. This is one of four crank disconnects on KASSEC. When an AC signal from the stator terminal of the engine alternator is fed to this terminal and KASSEC is in the "cranking" mode, KASSEC will crank disconnect and go into the "run" mode. With KASSEC in the "run" mode, the unit will not shut down or go into overcrank with loss of the Alternator Crank Disconnect.
- **Terminal #7** is the Auxiliary Crank Disconnect Terminal. This is one of four crank disconnects on KASSEC. When a positive voltage is placed on this terminal and KASSEC is in the "cranking" mode, KASSEC will go into a "run" mode. This is the only crank disconnect being used. Loss of the positive voltage on Terminal #7 will place KASSEC into an "overcrank failure" mode and shut the engine down.
- **Terminal #8** is the Transfer Switch Terminal. This terminal is the main controlling terminal. Any time this terminal is at battery positive, the unit will be in active modes of trying to start, run, and failure. If Terminals #1 and #4 have battery voltage on them and Terminal #8 has no battery voltage present, KASSEC is in a "standby" position. Whenever this terminal is brought to battery voltage, KASSEC will be in an "operate" mode. The only exception to this is when a shutdown failure has occurred. KASSEC can only be reset from a failure mode by bringing Terminal #4 from ground to battery voltage.
- **Terminal #9** is the Ground Terminal for KASSEC. All the grounded points should be common to this terminal.
- Terminal #10 is not connected.
- Terminal #11 is not connected.

NOTE: Terminals #10 and #11 are left open for isolation between Ground and the 120 VAC. These terminals may be used as tie points, if needed.

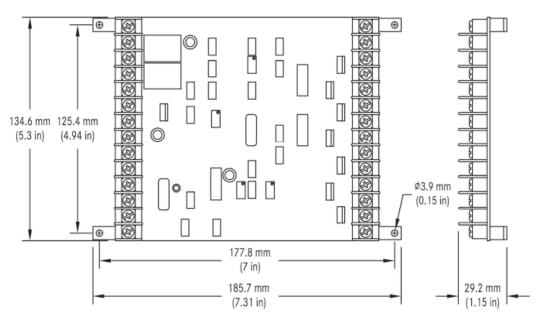
- **Terminal #12** is the 120 VAC Crank Disconnect. This is one of the four crank disconnects on KASSEC. When KASSEC is in the "cranking" mode" and a 120 VAC 60 Hz signal is fed to this terminal, KASSEC will crank disconnect and go into a "run" mode. With KASSEC in the "run" mode, the unit will not shut down or go into "overcrank" mode with loss of the 120 VAC Crank Disconnect.
- **Terminal #13** is the Overcrank Failure Indicator Terminal. When an overcrank failure occurs, the unit has cranked for a preset number of times and failed to start or the loss of the overcrank signal (mag pickup or auxiliary crank disconnect) has occurred. The maximum "on state" load current that Terminal #13 can supply is 2 amps resistive.
- **Terminal #14** is the Oil Failure Indicator Terminal. If Terminal #24 is brought to ground after the oil timer on KASSEC times out, Terminal #14 will supply battery voltage indicating an oil failure. The maximum "on state" load current that Terminal #14 can supply is 2 amps resistive.
- **Terminal #15** is a failure indicator output terminal. If Terminal #22 is brought to ground, Terminal #15 will supply battery voltage for a failure lamp. The maximum "on state" load current that Terminal #15 can supply is 2 amps resistive.
- **Terminal #16** is a failure indicator output terminal. If Terminal #18 is brought to ground, Terminal #16 will supply battery voltage for a failure lamp. The maximum "on state" load current that Terminal #16 can supply is 2 amps resistive.
- **Terminal #17** is a failure indicator output terminal. If Terminal #21 is brought to ground, Terminal #17 will supply battery voltage for a failure lamp. The maximum "on state" load current that Terminal #17 can supply is 2 amps resistive.



- **Terminal #18** is a failure sender input terminal. If this terminal is bought to ground, Terminal #16 will indicate a failure and the engine will shut down.
- **Terminal #19** is a failure sender input terminal. If this terminal is brought to ground, Terminal #20 will indicate a failure, and the engine will shut down supplying battery voltage. This terminal will also supply battery voltage if the number of re-cranks has been satisfied or if a crank disconnect (mag pickup or auxiliary crank disconnect) has been lost. The maximum "on state" load current that Terminal #23 can supply is 2 amps resistive.
- **Terminal #20** is a failure indicator output terminal. If Terminal #19 is brought to ground, Terminal #20 will supply battery voltage for a failure lamp. The maximum "on state" load current that Terminal #20 can supply is 2 amps resistive.
- **Terminal #21** is the failure sender input terminal. If this terminal is brought to ground, Terminal #17 will indicate a failure, and the engine will shut down.
- **Terminal #22** is a failure sender input terminal. If this terminal is brought to ground, Terminal #15 will indicate a failure, and the engine will shut down.
- **Terminal #23** is the Common Alarm Terminal. When any of the failures (Terminal #13, 14, 15, 16, 17, or 20) are supplying battery voltage, Terminal #23 will be supplying battery voltage. This terminal will also supply battery voltage if the number of re-cranks has been satisfied or is a crank disconnect (mag pickup or auxiliary crank disconnect) has been lost. The maximum "on state" load current that Terminal #23 can supply is 2 amps resistive.

NOTE: When an inductive load is connected on Terminal #23, a clamping diode must be connected across the inductive load.

• **Terminal #24** is the Oil Filter Sender Terminal. If this terminal is brought to ground after a preset time delay, set by an adjustable resistor, Terminal #14 will supply battery voltage for a failure lamp, and the engine will shut down.



Dimensions



CRANK DISCONNECT CHART

Terminal #5 Mag Pickup	Terminal #6 Engine Alternator	Terminal #7 Auxiliary	Terminal #12 120 V	Will Shut Down?	For a full understanding of the crank disconnects on KASSEC, refer to the crank disconnect chart. Any combination of crank disconnects may be used. As seen in the chart,
		Х		YES	if the signal on Terminal #5, the Mag Pickup
Х				YES	Crank Disconnect, is lost while KASSEC is
Х		Х		YES ¹	in the "run" mode and this is the only crank disconnect being used, KASSEC will go into
			Х	NO	an "overcrank failure" mode and shut the
		Х	Х	NO	engine down. The same is true for Terminal #7, the Auxiliary Crank Disconnect. When used
Х			Х	NO	by itself, if this signal is lost while KASSEC
Х		Х	Х	NO	is in the "run" mode, KASSEC will go into an overcrank failure" mode and shut the engine
	Х			NO	down.
	Х	Х		NO	When the combination of Terminals #5 and #7
Х	Х			NO	are used together and KASSEC is in the "run"
Х	Х	Х		NO	mode, both crank disconnect signals must be lost, then KASSEC will go into an "overcrank
	Х		Х	NO	failure" mode and shut the engine down.
	Х	Х	Х	NO	When using any other crank disconnect or combination of other crank disconnects, loss of
Х	Х		Х	NO	one or all of the crank disconnects will not shut
Х	Х	Х	Х	NO	the engine down.

¹ Note: Both Terminal #5 (Mag Pickup) and Terminal #7 (Auxiliary) signals must be lost before unit will shut down.

INSTALLATION RECOMMENDATIONS

When solid state electronics are used as engine controls, the majority of the malfunctions are excessive load currents connected to the outputs, low battery voltages (mainly at cranking), and EMI electrical noise. The following information will help alleviate these problems and ensure a proper running system.

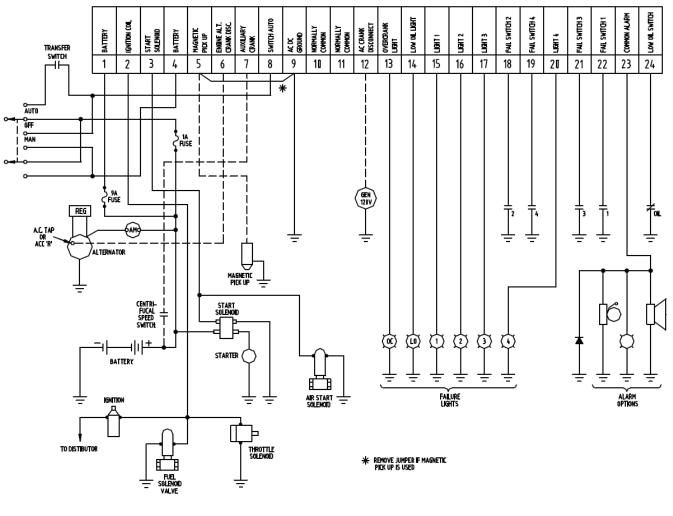
- 1. An auxiliary relay driven by KASSEC should be used whenever the current of an output exceeds the following parameters: total current of starter and ignition outputs, 8 amps; any single failure output 2 amps resistive.
- 2. If the cranking system for a particular engine demands a very high cranking current, another battery which supplies power only to KASSEC may be required.
- 3. When fused properly, the maximum load current that KASSEC can supply is 8 amps and the maximum input operating current for KASSEC is 1 amp. The size of wire used to supply power to KASSEC under maximum load should never be less than #16. Proper sizing of wire will eliminate excessive voltage drops when the system requires maximum power.
- 4. Although KASSEC has been designed to reject induced noise, certain precautions should be taken to reduce the common noise which is present on all engines and generator sets. To prevent false signals from being induced into the magnetic pickup circuitry of KASSEC, the wires to KASSEC from the magnetic pickup should be a twisted, shielded pair.
- 5. Whenever an inductive load is de-energized, a transient spike which can damage solid state components is generated. To alleviate this effect, a clamping diode should be connected across all inductive loads.
- 6. Components such as the ignition system, high and low voltage wiring, starter, AC generator wiring, and



battery charger to alternator all generate a certain amount of noise. If possible, wiring connected to KASSEC should be routed away from these components.

7. A voltmeter, test light, or other appropriate test instrument should be used to check the input and output terminal of KASSEC. Shorting any of KASSEC's terminals to battery positive or negative when testing could create major problems if the wrong terminals are shorted. This type of testing can result in blown fuses and damage to KASSEC's solid state components.

NOTE: Because the KASSEC utilizes electrical control to start and stop the engine, any hydraulic or pneumatic devices, such as starters or fuel solenoids, must have an electrical to mechanical interface to activate them.



KASSEC Diagram

MTU Onsite Energy's Master Control Panel (MCP) offers a robust HMI/PLC which is pre-programmed and tested for interface with an MGC Series digital generator set controller and Automatic Transfer Switch (ATS) paralleling systems. The 15" interactive touch screen displays a single line diagram layout along with color, and symbol status identifiers allowing for complete system monitoring, interface, and load management control from one easy-to-use interface.

PRODUCT HIGHLIGHTS

- System overview and control
- Multiple generator set monitoring •
- Single line diagram format
- Color data point identifiers •
- Symbol identification •
- Control and monitor up to 8 generator sets and 16 Automatic Transfer Switches (delay, open, closed, bypass)*
- Simplified setup and page navigation
- Password protection •
- Start signal management
- Load shed/add* •
- Event log

PRODUCT FEATURES

One Line Monitoring

Generator Status

- Volt (L-L)
- Gen status

ATS Status

- Position*
- Delay

Mains Bus Monitoring

Mains status

Gen Bus Monitoring

- Volts (L-L)
- kVA
- Number of units online

Control

Generator set system mode

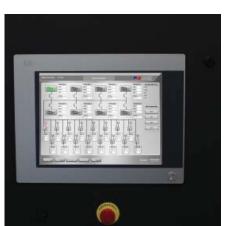
Auto: Changes the mode of all units in the system to Auto Off: Changes the mode of all units in the system to Off Run: Changes the mode of all units in the system to Run Test: Simulates a mains failure and transfers load to emergency gen bus

- Amps
- Gen condition
- Source status
- ATS condition

- kW total
- Breaker position
- Rating
- Mains bus condition
- kW
- Gen bus condition









- Delav
 - Amps
- Gen bus status



PRODUCT FEATURES, One Line Monitoring, Control, continued:

- Gen start signals
- ATS transfer inhibit*
- Load add/shed*

•

*ATS must have required contact signal interface.

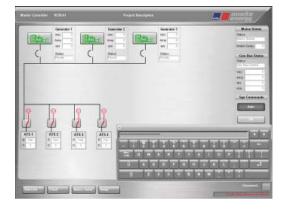
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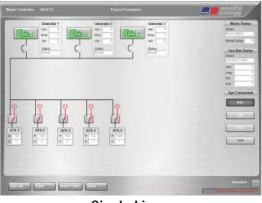
Setup



Generator Set



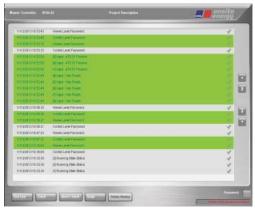
Password Login



Single Line



Automatic Transfer Switch







FUNCTIONS

Generator Set Metering

Monitor an entire system or an individual generator set. The one-line overview provides for system control and monitoring. Each generator set also has a representative page for controlling one generator set independent of the system.

Generator parameters consist of six dynamic gauges displaying pre-alarm and alarm thresholds. Generator
parameters include voltage (L-L), current (Amps), frequency (Hz), real power (kW), apparent power (kVA), and
power factor.

Resting

Unloading

Not in Auto

- Engine parameters consist of three dynamic gauges displaying pre-alarm and alarm thresholds. Engine parameters include oil pressure, coolant temperature, and fuel level (%).
- For greater detail, the user may access a representative page for each generator set that includes comprehensive digital gauges.

Generator Set Status

Alarm

- Cranking
- Cool down
- Running
- ReadyNo Comms

Synching

Control

Generator Set Mode: (status of specific generator set)

- Auto: Changes the mode of specific unit to Auto
- Off: Changes the mode of specific unit to Off
- **Run**: Changes the mode of specific unit to Run

Breaker Commands: (status of specific generator set)

- **Open**: Opens specific generator set circuit breaker
- Close: Closes specific generator set circuit breaker (synchronizes generator set to live bus)

Event Recording

The MCP has an event recorder that provides a record of alarms, pre-alarms, and many other events that are all date and time stamped to help the user determine the cause of issues related to the generator set.

Transfer Switch Control

When utility failure is detected by a system ATS, the indication is transmitted to the MCP via the I/O interface. The MCP will send start requests to the generator set while inhibiting the transfer of loads until there is sufficient generator set capacity available to support the most critical offline ATS loads. Upon emergency system availability, the MCP will begin to transfer loads to the emergency bus. The MCP, in cooperation with the MGC Series contollers, will optimize load management for the number of generator sets operating as well as the number of transfer switches supported by the emergency power system. The standard MCP configuration is set up to interface with time delay bypass, closed transition, and open transition ATS'.

Communications

- Modbus TCP is the standard interface for MCP connection to external building management systems
- Modbus TCP is the standard interface between the MCP and the MGC Series controllers



SPECIFICATIONS

Operating Power

With a nominal operating voltage of 24 VDC, the MCP offers two supply configurations for added reliability. The MCP supply power is sourced through a dual supply configuration allowing two sources to simultaneously or separately power the MCP. In the case of a single source failure, the redundant power sources would then solely power the MCP.

Configuration 1

 24 VDC / 24 VDC: Individual generator set batteries are paralleled through the source selective supply connection.

Configuration 2

• 100 - 240 VAC / 24 VDC: Generator set battery is paralleled through a source selective supply connection with a utility fed power supply.

I/0

Contact inputs and outputs included to provide real time monitoring and control of system critical components. Expandable I/O is configured to adapt to specific system requirement.

Digital output rating

• 30 VDC / 1A

Digital input rating

• 24 VDC connection

WEIGHTS AND DIMENSIONS

<u>Weights</u>

- MCP only: 45.45 kg (100 lb)
- MCP with stand: 72.73 kg (160 lb)

Dimensions

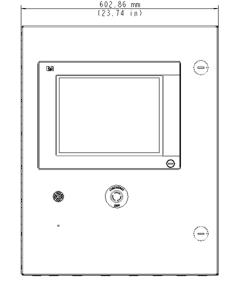
- Height: 761.5 mm (29.98 in)
- Width: 602.86 mm (23.74 in)
- Depth: 247.96 mm (9.76 in)

AGENCY APPROVALS

- UL Listed UL508A Industrial Control Panel
- c-UL Listed CSA C22.2 No. 14 Industrial Control Equipment

ENVIRONMENTAL

- Type 1 / NEMA 1 Enclosure
- Optional Open Frame Construction





DIGITAL GENERATOR SET CONTROLLER MGC Series Comparison Data Sheet



MTU Onsite Energy has a variety of options available when it comes to selecting a reliable, easy-to-use, and rugged generator set control system. This data sheet is intended to be used only as a reference to determine which configuration of our MTU Onsite Energy Generator Set Controllers (MGC) would best fit your needs. Detailed information can be found on the MGC-1500 Series Data Sheet, MGC-2000 Series Data Sheet, and MGC-3000 Series Data Sheet. Please contact your MTU Onsite Energy Account Manager for more information.

GENERATOR PROTECTION

	MGC-1510	MGC-1520	MGC-2010	MGC-2020	MGC-2050	MGC-3010	MGC-3050
Standard							
Phase Imbalance (47)	\checkmark	\checkmark		\checkmark	\checkmark	\checkmark	\checkmark
Overcurrent (50)	\checkmark	\checkmark					
Overvoltage (59)	√	\checkmark	<i>√</i>	<i>√</i>	\checkmark	\checkmark	\checkmark
Undervoltage (27)	\checkmark	\checkmark	<i>√</i>	\checkmark	\checkmark	\checkmark	\checkmark
Underfrequency (81U)	\checkmark	\checkmark	√	\checkmark	\checkmark	\checkmark	\checkmark
Overfrequency (810)	√	\checkmark	√	<i>√</i>	\checkmark	\checkmark	\checkmark
Reverse Power (32)			<i>√</i>	<i>√</i>	\checkmark	\checkmark	\checkmark
Loss of Excitation (40Q)			<i>√</i>	<i>√</i>	\checkmark	\checkmark	\checkmark
Enhanced							
Overcurrent (51)				\checkmark	\checkmark	\checkmark	\checkmark
Vector Shift (78)				\checkmark	\checkmark	\checkmark	\checkmark
Rate of Change of Frequency (81R)				\checkmark	\checkmark	\checkmark	\checkmark
Ground Fault						\checkmark	\checkmark

Note: Numbers in parentheses above are ANSI standard device numbers denoting which features the controllers support.

INPUTS

	MGC-1510	MGC-1520	MGC-2010	MGC-2020	MGC-2050	MGC-3010	MGC-3050
Controller							
Digital	7	7	16	16	16	16	16
Analog (Dedicated)	3	-	3	3	3	3	3
Analog	-	-	-	-	-	2	2
CEM							
Digital	-	10	10	10	10	4x10	4x10
AEM							
Analog	-	-	8	8	8	4x8	4x8
TC	-	-	2	2	2	4x2	4x2
RTD	-	-	8	8	8	4x8	4x8

DIGITAL GENERATOR SET CONTROLLER MGC Series Comparison Data Sheet



OUTPUTS

	MGC-1510	MGC-1520	MGC-2010	MGC-2020	MGC-2050	MGC-3010	MGC-3050
Controller							
Digital Form A, 30 Amp	-	-	3	3	3	3	3
Digital Form A, 5 Amp	3	3	-	-	-	-	-
Digital Form A, 2 Amp	4	4	12	12	12	12	12
Analog	-	-	-	-	-	2	2
CEM	•						
Digital Form C, 4 Amp	-	12	12	12	12	4x12	4x12
Digital Form C, 1 Amp	-	12	12	12	12	4x12	4x12
AEM	•						
Analog	-	-	4	4	4	4x4	4x4
External to Controllers	/ (CEM)						
Digital Form C, 10 Amp (Interposing Relay)	-	10	10	10	10	10	10

COMMUNICATION

	MGC-1510	MGC-1520	MGC-2010	MGC-2020	MGC-2050	MGC-3010	MGC-3050
ModBus RTU (RS-485)			\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
ModBus TCP-IP						\checkmark	\checkmark
RDP-110	√	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
CANBus		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Modem Interface (RS-232)				\checkmark	\checkmark	\checkmark	\checkmark
Ethernet					√ (LSM)	\checkmark	\checkmark

METERING

	MGC-1510	MGC-1520	MGC-2010	MGC-2020	MGC-2050	MGC-3010	MGC-3050
Bus 1 Voltage							•
Single Phase	\checkmark						
Three Phase	\checkmark	\checkmark	✓	✓	\checkmark	\checkmark	√
Bus 2 Voltage							
Single Phase							1
Three Phase							√
Current Transformers							
Generator	3	3	3	3	3	3	3
Auxiliary	-	-	-	-	-	1	4



The MGC-1500 Series controllers include the following models which are described throughout this document.*

- MGC-1510
- MGC-1520

MTU Onsite Energy's Generator Set Controllers (MGC Series) are rugged, reliable, and easy-to-use digital generator set control systems. The MGC-1500 Series is perfectly focused, combining rugged construction and microprocessor technology to offer a product that will hold up to almost any environment and is flexible enough to meet your application's needs.

PRODUCT HIGHLIGHTS

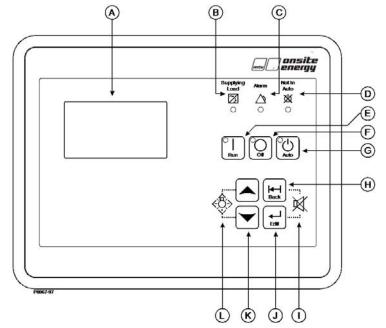
- Three-phase generator metering
- Engine metering
- Generator set control
- Engine amd gemeratpr protection
- BESTCOMSPlus[®]
 - Windows[®]-based software for optional remote operation (Software can be downloaded at www.mtuonsiteenergy.com)
 - Programming and setup software
 - Intuitive and powerful
 - Remote control and monitoring
 - Programmable logic
 - USB communications
- Suitable for rental generator sets with high/low sensing, single or three phase override, wye/delta/grounded delta configurable, and alternate frequency override (50/60 Hz)
- SAE J1939 Engine Control Unit (ECU) communications (Refer to *Configuration Options*.)
- Resistive sender inputs for oil pressure and coolant temperature
- Multilingual capability
- Remote annunciation with RDP-110
- Event recording (up to 30 events in non-volatile memory)
- Extremely rugged, fully potted design
- Seven programmable contact inputs with Input 1 programmed to recognize an emergency stop
- Start, run, and prestart relays with four programmable outputs
- UL recognized, CSA certified, CE approved
- IP56 rating per IEC 60529
- NFPA-110 compatible
- Microprocessor based
- Complete system metering
- Expandable to meet customer needs

*Please refer to the last page of this data sheet for available MGC-1500 Series configuration options. The MGC Series Controller Comparison Data Sheet is available as a reference for all MGC Series configuration options.





DIAGRAM



Front Panel Descriptions

- Liquid Crystal Display (A)
- Supplying Load Indicator (B)
- Alarm Indicator (C)
- Not in Auto Indicator (D)
- Run Pushbutton and Mode Indicator (E)
- Off Pushbutton and Mode Indicator (F)

FUNCTIONS

Generator Set Protection

Generator ANSI Codes

- Overvoltage (59)
- Overfrequency (810)
- Voltage Phase Imbalance (47)

- Auto Pushbutton and Mode Indicator (G)
- Back Pushbutton (H)
- Alarm Silence Pushbutton Combination (I)
- Edit Pushbutton (J)
- Arrow Pushbuttons (K)
- Lamp Test Pushbutton Combination (L)
- Undervoltage (27)
- Underfrequency (81U)
- Overcurrent (50)

All generator set protection features are programmable as alarms, pre-alarms, status, or not used.

Alarms (Shutdowns)

- Low Oil Pressure
- High Coolant Temperature
- Low Coolant Temperature
- Overspeed
- Overcrank

- Coolant Temp Sender Fail (non-ECU engines)
- Oil Pressure Sender Fail (non-ECU Engines)
- Emergency Stop
- Critical Low Fuel Level (Refer to *Configuration Options*.)



FUNCTIONS, Generator Set Protection, continued:

Pre-Alarms (Warnings)

- Low Oil Pressure
- Low Coolant Temperature
- Weak Battery Voltage
- Low Fuel Level

- High Fuel Level
- High Coolant Temperature
- Battery Overvoltage

All alarms and pre-alarms can be enabled or disabled via the BESTCOMS*Plus®* PC software or the front panel. Additional custom alarms and pre-alarms are available upon request.

Generator Set Metering

- Generator parameters include voltage, current, real power (watts), apparent power (VA), and power factor. The view can be programmed to display up to 20 parameters using the scrolling and time delay feature.
- Engine parameters include oil pressure, coolant temperature, RPM, battery voltage, fuel level, engine runtime, and various SAE J1939 supported parameters.

Engine Control

- Cranking Control: Cycle or Continuous (Quantity and Duration fully programmable)
- Engine Cooldown: Smart Cooldown function saves time and fuel
- Successful Start Counter: Counts and records successful engine starts
- Timers:
 - Engine Cooldown Timer
 - Engine Maintenance Timer
 - Pre-Alarm Time Delays for Weak/Low Battery Voltage
 - Alarm Time Delay for Overspeed
 - Alarm Time Delay for Sender Failure
 - Arming Time Delays after Crank Disconnect:
 - Low Oil Pressure
 - High Coolant Temperature
 - Pre-Crank Delay
 - Continuous or Cycle Cranking Time Delay
 - Programmable Logic Timers

Event Recording

The MGC-1500 Series has an event recorder that provides a record of alarms, pre-alarms, engine starts, engine runtime loaded, engine runtime unloaded, last run date, and many other events that are all date and time stamped to help the user determine the cause and effect of issues related to the generator set. Contains up to 30 event records each retaining numerous occurrences in memory. Time, date, and engine hour detail are available for the most current 30 occurrences within each event record.

Transfer Switch Control (Mains Failure) (Refer to Configuration Options.)

The MGC-1500 Series has the ability to detect a mains failure via a single- or three-phase bus input. A mains failure is established when any one of the following conditions are met:

- Any phase of bus voltage falls below the dead bus threshold
- Any phase of bus voltage is unstable due to overvoltage or undervoltage
- Any phase of bus voltage is unstable due to overfrequency or underfrequency



FUNCTIONS, Transfer Switch Control (Mains Failure), continued:

When conditions are met, the MGC-1500 Series will start the generator set and, when ready, will send generator and mains breaker commands to apply power to the load from the generator set. The MGC-1500 Series implements open or closed breaker transitions to and from the mains. When the mains returns and is considered stable, the MGC-1500 Series will transfer the load back to the mains and stop the engine.

USB Port

The USB communication port can be used with BESTCOMS*Plus*[®] software to quickly configure an MGC-1500 Series with the desired settings or retrieve metering values and event log records.

Programmable Logic

The MGC-1500 Series offers a very powerful, yet easy-to-use, programmable logic scheme, BESTlogic[™]*Plus*, for custom programming of the various inputs, outputs, alarms, and pre-alarms. It allows these elements to be integrated into a complete logic scheme so that the user can meet even the most complex specification. The Programmable logic control includes the selection of logic gates and timers with drag-and-drop technology to make it fast and simple.

Remote Display Panel Annunciation (Refer to Configuration Options.)

The MGC-1500 Series can communicate to a remote display panel, Model RDP-110. This requires only two wires to annunciate many of the alarms and pre-alarms required by NFPA-110 Level I and II. External power is required.

SAE J1939 Communications (Refer to Configuration Options.)

SAE J1939 CANBus communications allows the MGC-1500 Series to communicate with the ECU to gather critical engine information like oil pressure, engine coolant temperature, RPM, battery voltage, and much more. By utilizing the ECU, the addition of analog engine senders is no longer required. This can save substantial money for the installer. It also eliminates any errors or discrepancies between the ECU data and the data displayed on the MGC-1500 Series that may be present due to analog sender inaccuracies or incompatibility. An additional benefit is access to the ECU's diagnostic troubleshooting codes (DTCs). The DTCs provide information about the engine's operating conditions and communicate these via SAE J1939 to the MGC-1500 Series, eliminating the need for hand-held service tools to diagnose simple engine issues.

SPECIFICATIONS

Operating Power

- Nominal: 12 or 24 VDC
- Range: 6 to 32 VDC
- Power Consumption:
 - Sleep Mode: 4.5 W
 - Normal Operational Mode: 6.5 W Run mode, LCD heater off, three relays energized
 - Maximum Operational Mode: 14 W Run mode, LCD heater on, seven relays energized
 - Battery Ride-Through: Withstands cranking ride-through down to 0 V for 50 ms (typical)

Current Sensing (5 Amp CT Inputs)

- Continuous Rating: 0.1 to 5.0 Aac
- One Second Rating: 25 Aac
- Burden: 1 VA



SPECIFICATIONS, continued:

Voltage Sensing

- Range: 12 to 576 V rms, line-to-line
- Frequency Range: 10 to 72 Hz
- Burden: 1 VA
- One Second Rating: 720 V rms

Contact Sensing/Input Contacts

• Contact sensing inputs include one emergency stop input and seven programmable inputs. The emergency stop input accepts normally closed, dry contacts. The remote emergency stop is limited to 75 ft. standard. Extended runs are available with an optional relay. All programmable inputs accept normally open, dry contacts. The factory may utilize up to three of these inputs.

Engine System Inputs

- Fuel Level Sensing Resistance Range: 5 to 250 Ω nominal
- Coolant Temperature Sensing Resistance Range: 5 to 2,750 Ω nominal
- Oil Pressure Sensing Resistance Range: 5 to 250 Ω nominal
- Engine Speed Sensing:
 - Magnetic Pickup or CANBus
 - Magnetic Pickup Voltage Range: 3 to 35 V peak (6 to 70 V peak to peak)
 - Magnetic Pickup Frequency Range: 32 to 10,000 Hz

Output Contacts

- (7) Total Outputs: (3) 5 A @ 28 VDC and (4) 2 A @ 28 VDC
- The factory utilizes the following on each generator set which can be reprogrammed as needed:
 - (3) 5 A @ 28 VDC for Pre-start, Start, and Run
 - (4) 2 A @ 28 VDC for general purpose

Metering

- <u>Generator Voltage (rms)</u>
 - Metering Range: 12 to 576 VAC (direct measurement), up to 9,999 VAC (with appropriate voltage transformer)
 - Accuracy: ±1% of programmed rated voltage or ±2 VAC (subject to accuracy of voltage transformer when used)
- <u>Generator Current (rms)</u>
 - Generator current is measured at the secondary windings of 5 A CTs.
 - Metering Range: 0 to 5,000 Aac
 - CT Primary Range: 1-5,000 Aac, in primary increments of 1 Aac
 - Accuracy: ±3% of programmed rated current or ±3 Aac (subject to accuracy of CTs)
- <u>Generator Frequency</u>
 - Metering Range: 10 to 72 Hz
 - Accuracy: ±0.25% or 0.05 Hz
- <u>Apparent Power</u>
 - Indicates total kVA and individual line kVA (four-wire, line-to-neutral or three-wire, line-to-line).
 - Accuracy: ±5% of the full-scale indication or ±4 kVA



SPECIFICATIONS, Metering, continued:

- Power Factor
 - Metering Range: 0.2 leading to 0.2 lagging
 - Accuracy: ±0.02
- <u>Real Power</u>
 - Indicates total kW and individual line kW (four-wire, line-to-neutral or three-wire, line-to-line)
 - Accuracy: ±5% of the full-scale indication or ±4 kW
- Oil Pressure
 - Metering Range: 0 to 150 psi or 0 to 1,034 kPa
 - Accuracy: ±3% of actual indication or ±2 psi or ±12 kPa (subject to accuracy of sender)
- <u>Coolant Temperature</u>
 - Metering Range: 0 °C to 204 °C (32 °F to 410 °F)
 - Accuracy: ±3% or actual indication or ±2° (subject to accuracy of sender)
- <u>Fuel Level</u>
 - Metering Range: 0 to 100%
 - Accuracy: ±3% (subject to accuracy of sender)
- <u>Battery Voltage</u>
 - Metering Range: 6 to 32 VDC
 - Accuracy: ±3% of actual indication or ±0.2 VDC
- Engine RPM
 - Metering Range: 0 to 4,500 rpm
 - Accuracy: ±2% of actual indication or ±2 rpm
- Engine Run Time
 - Engine run time is retained in non-volatile memory.
 - Metering Range: 0 to 99,999 h; Update Interval: 6 min
 - Accuracy: ±1% of actual indication or ±12 min
- <u>Maintenance Timer</u>
 - Maintenance timer indicates the time remaining until generator set service is due. Value is retained in non-volatile memory.
 - Metering Range: 0 to 5,000 h; Update Interval: 6 min
 - Accuracy: ±1% or actual indication or ±12 min

Generator Protection Functions

- Overvoltage (59) and Undervoltage (27)
 - Pickup Range: 70 to 576 VAC
 - Activation Delay Range: 0 to 30 s
- Overfrequency (810) and Underfrequency (81U)
 - Pickup Range: 45 to 66 Hz
 - Pickup Increment: 0.1 Hz
 - Activation Delay Range: 0 to 30 s
- Phase Imbalance (47)
 - Pickup Range: 5 to 100 VAC
 - Pickup Increment: 1 VAC
 - Activation Delay Range: 0 to 30 s
 - Activation Delay Increment: 0.1 s



SPECIFICATIONS, Generator Protection Functions, continued:

- Overcurrent (51)
 - Pickup Range: 0.18 to 1.18 Aac (1 A current sensing)
 - Time Dial Range: 0 to 7,200 s (fixed time curve)

Environmental

- Temperature
 - Operating: -40 °C to 70 °C (-40 °F to 158 °F)
 - Storage: -40 °C to 85 °C (-40 °F to 185 °F)
- Humidity: IEC 68-2-38
- Salt Fog: ASTM B 17-73, IEC 68-2-11 (tested while operational)
- Ingress Protection: IEC IP54 for front panel
- Shock: 15 G in three perpendicular planes
 - Vibration: 5 to 29 to 5 Hz at 1.5 G peak for 5 min 29 to 52 to 29 Hz at 0.036" DECS-A for 2.5 min 52 to 500 to 52 Hz at 5 G peak for 7.5 min
 - Swept over the above ranges for 12 sweeps in each of three mutually perpendicular planes with each 15-minute sweep.

Agency Approvals

- UL/CSA Approvals: "cURus" approved to UL 6200 and CSA C22.2 No.14
- NFPA Compliance: Complies with NFPA Standard 110, Standard for Emergency and Standby Power
- CE Marked: Complies with applicable EC Directives

ADDITIONAL SPECIFICATIONS

Battery Backup for Real Time Clock

The MGC-1500 Series provides a real-time clock with capacitor backup that is capable of operating the clock for up to 24 hours after power is removed from the controller. As the capacitor nears depletion, an internal backup battery takes over and maintains timekeeping. The battery will maintain the clock for approximately 10 years, depending on conditions. The battery is not replaceable. The clock is used by the events recorder function to timestamp events, and the exercise timer is used to start and stop the generator set when the exercise feature is utilized.

Breaker Management

The MGC-1500 Series is capable of controlling the generator breaker and the mains breaker. The status of the breakers is determined by using BESTlogic[™]*Plus* programmable logic to set up the GENBRK and MAINSBRK logic blocks. These logic blocks have outputs that can be configured to energize an output contact and control a breaker, as well as inputs for breaker control and status. The MGC-1500 Series will attempt to close a breaker only after verifying that it can be closed. If the breaker cannot be closed, the close request will be ignored. Only one breaker can be closed at a time. Synchronization is required before closing the breaker to a live bus. Closure to a dead bus can be performed after meeting dead bus threshold and timing requirements set by the user.



OPTIONAL ACCESSORIES (Refer to *Configuration Options.*)

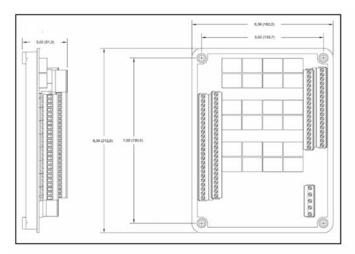
Contact Expansion Module 2020 (CEM-2020)

The CEM-2020 is a remote device that provides additional MGC-1500 Series contact inputs and outputs, giving the user flexibility to use the same model MGC-1500 Series generator set controller for simple functions or more complicated applications that require contact functionality or duplication of contacts for remote annunciation. Its features include:

- <u>10 Contact Inputs</u>: The CEM-2020 provides 10 programmable contact inputs with the same functionality as the contact inputs on the MGC-1500 Series.
- <u>24 Contact Outputs</u>: The CEM-2020 provides 24 Form C programmable output contacts with the same functionality as the output contacts on the MGC-1500 Series. The output ratings of the Form C contacts are:

Output No.	Rating (Cont.)	Additional Information
5-16	1 A @ 30 VDC	This is a gold flash contact for low current circuits.
17-28	4 A @ 30 VDC	

- <u>Communications via CANBus</u>: The CEM-2020 communicates to the MGC-1500 Series via SAE J1939 CANBus communications and allows the user to program the functionality of these inputs and outputs in the BESTCOMSPlus[®] software.
- The user can add labels for the inputs and outputs that appear in BESTCOMS[®]*Plus*, on the front panel, and in programmable logic. All the functionality can be assigned to these inputs and outputs as if they were an integrated part of the MGC-1500 Series. The CEM-2020 module has all of the environmental ratings of the MGC-1500 Series, including a model for UL Class1 Div2 applications. The CEM-2020 terminals accept a maximum wire size of 12 AWG, while the chassis ground requires 12 AWG wire. Flexibility is one of the benefits of the MGC-1500 Series, and this add-on module enhances that benefit even further.



CEM-2020 Overall Dimensions



CONFIGURATION OPTIONS

Generator Protection

	MGC-1510	MGC-1520
Standard		
Phase Imbalance (47)	\checkmark	\checkmark
Overcurrent (50)	\checkmark	\checkmark
Overvoltage (59)	\checkmark	\checkmark
Undervoltage (27)	\checkmark	\checkmark
Underfrequency (81U)	\checkmark	\checkmark
Overfrequency (810)	\checkmark	\checkmark
Reverse Power (32)		
Loss of Excitation (40Q)		
Enhanced		
Overcurrent (51)		
Vector Shift (78)		
Rate of Change of Frequency (81R)		
Ground Fault		

Note: Numbers in parentheses above are ANSI standard device numbers denoting which features the controllers support.

Inputs

	MGC-1510	MGC-1520		
Controller				
Digital	7	7		
Analog (Dedicated)	3	-		
Analog	-	-		
CEM				
Digital	-	10		
AEM				
Analog	-	-		
TC	-	-		
RTD	-	-		

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Outputs

	MGC-1510	MGC-1520	
	WGC-1510	1000-1520	
Controller			
Digital Form A, 30 Amp	-	-	
Digital Form A, 5 Amp	3	3	
Digital Form A, 2 Amp	4	4	
Analog	-	-	
CEM			
Digital Form C, 4 Amp	-	12	
Digital Form C, 1 Amp	-	12	
AEM			
Analog	-	-	
External to Controllers / (CEM)			
Digital Form C, 10 Amp (Interposing Relay)	-	10	
	l	I	

Communication

	MGC-1510	MGC-1520
ModBus RTU (RS-485)		
ModBus TCP-IP		
RDP-110	\checkmark	\checkmark
CANBus		\checkmark
Modem Interface (RS-232)		
Ethernet		

Metering

	MGC-1510	MGC-1520		
Bus 1 Voltage				
Single Phase	\checkmark	\checkmark		
Three Phase	\checkmark	\checkmark		
Bus 2 Voltage				
Single Phase				
Three Phase				
Current Transformers				
Generator	3	3		
Auxiliary	-	-		



The MGC-2000 Series controllers include the following models which are described throughout this document.*

- MGC-2010
- MGC-2020
- MGC-2050

MTU Onsite Energy Generator Set Controllers (MGC Series) are highly advanced integrated digital generator set control systems. The MGC-2000 Series is perfectly focused, combining rugged construction and microprocessor technology to offer a product that will hold up to almost any environment and is flexible enough to meet your application's needs. The MGC-2000 Series provides generator set control, transfer switch control, metering, protection,



and programmable logic in a simple, easy-to-use, reliable, rugged, and cost effective package.

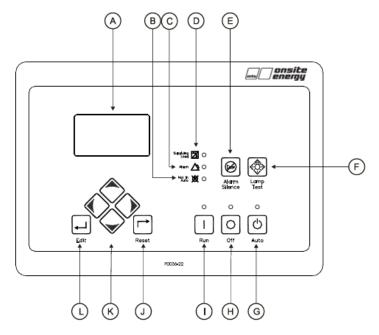
PRODUCT HIGHLIGHTS

- Three-phase generator metering
- Engine metering
- Generator set control
- Engine and generator protection
- Var sharing over Ethernet
- BESTCOMSPlus®
 - Windows[®]-based software for optional remote operation (Software can be downloaded at www.mtuonsiteenergy.com)
 - Programming and setup software
 - Intuitive and powerful
 - Remote control and monitoring
 - Programmable logic
 - USB communications
- Automatic transfer switch compatible
- Exercise timer
- Suitable for use on rental generator sets with high/low line sensing, single or three phase sensing override, and wye/delta/grounded delta
- SAE J1939 Engine Control Unit (ECU) communications
- Automatic generator configuration detection
- Selection of integrating reset of instantaneous reset characteristics for overcurrent protection
- Multilingual capability
- Remote annunciation to RDP-110
- Extremely rugged, fully potted design
- 16 programmable contact inputs, 12 programmable contact outputs
- ModBus[™] communications with RS-485 (Refer to *Configuration Options*.)
- UL recognized, CSA certified, CE approved
- Highly Accelerated Life Tests (HALT) tested
- IP 54 front panel rating with integrated gasket
- NFPA-110 compatible
- Microprocessor based
- Complete system metering
- Expandable to meet customer needs

*Please refer to the last page of this data sheet for available MGC-2000 Series configuration options. The MGC Series Controller Comparison Data Sheet is available as a reference for all MGC Series configuration options.



DIAGRAM



Front Panel Descriptions

- Liquid Crystal Display (A)
- Not in Auto Indicator (B)
- Alarm Indicator (C)
- Supplying Load Indicator (D)
- Alarm Silence Pushbutton (E)
- Lamp Test Pushbutton (F)

FUNCTIONS

Generator Set Protection

Generator ANSI Codes

- Overvoltage (59)
- Overfrequency (810)
- Reverse Power (32)
- Undervoltage (27)
- Underfrequency (81U)

- Auto Pushbutton and Mode Indicator (G)
- Off Pushbutton and Mode Indicator (H)
- Run Pushbutton and Mode Indicator (I)
- Reset Pushbutton (J)
- Arrow Pushbuttons (K)
- Edit Pushbutton (L)
- Loss of Excitation (40Q)
- Phase Imbalance (47)
- Overcurrent (51) (optional)
- Vector Shift (78) (optional)
- Rate of Change of Frequency (ROCOF) (81R) (Refer to *Configuration Options*.)

All generator set protection features are programmable as alarms, pre-alarms, status, or not used.

Alarms (Shutdowns)

- Low Oil Pressure
- High Coolant Temperature
- Low Coolant Level
- Overspeed
- Overcrank

- Coolant Temp Sender Fail (non-ECU engines)
- Oil Pressure Sender Fail (non-ECU engines)
- Emergency Stop
- Critical Low Fuel Level (Refer to *Configuration Options*.)



FUNCTIONS, Generator Set Protection, continued:

Pre-Alarms (Warnings)

- Low Oil Pressure
- High Coolant Temperature
- Low Coolant Temperature
- Battery Overvoltage
- Weak Battery Voltage
- AEM Comms Failure
- Breaker Open Failure
- CEM Comms Failure
- Generator Reverse Rotation

- Engine kW Overload (three levels)
- Loss of Sensing
- Checksum Failure
- ECU Comms Fail
- Low Fuel Level
- High Fuel Level
- Active Diagnostic Trouble Codes (DTC)
- Breaker Close Failure
- Low Battery Voltage

All alarms and pre-alarms can be enabled or disabled via the BESTCOMS*Plus®* PC software or the front panel. Additional custom alarms and pre-alarms are available upon request.

Generator Set Metering

- Generator parameters include voltage, current, real power (watts), apparent power (VA), and power factor (PF).
- Engine parameters include oil pressure, coolant temperature, battery voltage, speed, fuel level, engine load, coolant level (from ECU), ECU specific parameters, and run-time statistics.

Engine Control

- Cranking Control: Cycle or Continuous (Quantity and Duration fully programmable)
- Engine Cooldown: Smart Cooldown function saves fuel and engine life
- · Successful Start Counter: Counts and records successful engine starts
- Timers:
 - Engine Cooldown Timer
 - Engine Maintenance Timer
 - Pre-Alarm Time Delays for Weak/Low Battery Voltage
 - Alarm Time Delay for Overspeed
 - Alarm Time Delay for Sender Failure
 - Arming Time Delays after Crank Disconnect:
 - Low Oil Pressure
 - High Coolant Temperature
 - Pre-Crank Delay
 - Continuous or Cycle Cranking Time Delay
 - Programmable Logic Timers



FUNCTIONS, continued:

Event Recording

The MGC-2000 Series has an event recorder that provides a record of alarms, pre-alarms, engine starts, engine runtime loaded, engine runtime unloaded, last run date, and many other events that are all date and time stamped to help the user determine the cause and effect of issues related to the generator set. Contains 30 event records each retaining up to 99 occurrences in memory. Time, date, and engine hour detail is available for the most current 30 occurrences within each event record.

Transfer Switch Control (Mains Failure)

The MGC-2000 Series has the ability to detect a mains failure via a single- or three-phase bus input. A mains failure is established when any one of the following conditions are met:

- Any phase of bus voltage falls below the dead bus threshold
- Any phase of bus voltage is unstable due to overvoltage or undervoltage
- Any phase of bus voltage is unstable due to overfrequency or underfrequency

When conditions are met, the MGC-2000 Series will start the generator set and, when ready, will send generator and mains breaker commands to apply power to the load from the generator set. The MGC-2000 Series implements open or closed breaker transitions to and from the mains. When the mains returns and is considered stable, the MGC-2000 Series will transfer the load back to the mains and stop the engine.

ModBus[™] RTU

When utilized, the user can send and receive information from the MGC-2000 Series via the RS-485 communications port and ModBus[™] RTU protocol. This feature allows the MGC-2000 Series controlled generator set to be fully integrated into the building management system. Please see the *MGC-2000 Series Controller Manual* for the ModBus[™] register list.

Programmable Logic

The MGC-2000 Series offers a very powerful, yet easy-to-use, programmable logic scheme, BESTlogic[™]*Plus*, for custom programming of the various inputs, outputs, alarms, and pre-alarms. It allows these elements to be integrated into a complete logic scheme so that the user can meet even the most complex specification. The programmable logic control includes the selection of logic gates and timers, with drag-and-drop technology to make it fast and simple.

Remote Display Panel Annunciation

The MGC-2000 Series can communicate to a remote display panel, Model RDP-110. This requires only two wires to annunciate all of the alarms and pre-alarms required by NFPA-110 Level I and II. External power is required.

External Modem Interface

The MGC-2020 and MGC-2050 controllers include an external modem interface permitting an external modem to be connected to the MGC controller via RS-232. A dial-out modem enables remote control, monitoring, and setting of the MGC-2000 Series. When an alarm or pre-alarm condition occurs, the MGC-2000 Series can dial up to four telephone numbers in sequence until an answer is received and the condition is annunciated.

Note: Only an external modem interface is provided. The external modem must be provided by a third party. The external modem is only available on the MGC-2020 and MGC-2050 controller configurations of the MGC-2000 Series.



FUNCTIONS, continued:

SAE J1939 Communications

SAE J1939 CANBus communications allows the MGC-2000 Series to communicate with the ECU to gather critical engine information like oil pressure, engine coolant temperature, RPM, battery voltage, and much more. By utilizing the ECU, the addition of analog engine senders is no longer required. This can save substantial money for the installer. It also eliminates any errors or discrepancies between the ECU data and the data displayed on the MGC-2000 Series that may be present due to analog sender inaccuracies or incompatibility. An additional benefit is access to the ECU's diagnostic troubleshooting codes (DTCs). The DTCs provide information about the engine's operating conditions and communicates these, via SAE J1939, to the MGC-2000 Series, eliminating the need for hand-held service tools to diagnose simple engine issues.

SPECIFICATIONS

Operating Power

- Nominal: 12 or 24 VDC
- Range: 6 to 32 VDC
- Power Consumption:
 - Sleep Mode: 5W with all relays non-energized
 - Normal Operational Mode: 7.9W Run mode, LCD heater off, six relays energized
- Battery Ride-Through: Withstands cranking ride-through down to 0 V for 50 ms, starting at 10 VDC.

Current Sensing (5 A CT Inputs)

- Continuous Rating: 0.1 to 5.0 Aac
- One Second Rating: 10 Aac
- Burden: 1 VA

Voltage Sensing

- Range: 12 to 576 V rms, line-to-line
- Frequency Range: 10 to 72 Hz
- Burden: 1 VA
- One Second Rating: 720 V rms

Input Contacts

Contact sensing inputs include one emergency stop input and 16 programmable inputs. The emergency stop input accepts normally closed, dry contacts. The remote emergency stop is limited to 75 ft. standard. Extended runs are available with optional relay. All programmable inputs accept normally open, dry contacts. The factory utilizes up to three of these inputs.

Engine System Inputs

- Fuel Level Sensing Resistance Range: 0 to 250 Ω nominal
- Coolant Temperature Sensing Resistance Range: 10 to 2,750 Ω nominal
- Oil Pressure Sensing Resistance Range: 0 to 250 Ω nominal
- Engine Speed Sensing:
 - Magnetic Pickup or CANBus
 - Magnetic Pickup Voltage Range: 3 to 35 V peak (6 to 70 V peak to peak)
 - Magnetic Pickup Frequency Range: 32 to 10,000 Hz
 - Generator Frequency (alternate or redundant)
 - Voltage Range: 12 to 576 V rms



SPECIFICATIONS, continued:

Output Contacts

- (15) Total Programmable Outputs: (3) 30 A @ 28 VDC and (12) 2 A @ 30 VDC
- The factory utilizes the following on each generator set which can be reprogrammed as needed:
 - (3) 30 A @ 28 VDC for Pre-start, Start, and Run
 - (12) 2 A @ 30 VDC for General Purpose

Metering

- Generator and Bus Voltage (rms)
 - Metering Range: 0 to 576 VAC (direct measurement); up to 9,999 VAC (with appropriate voltage transformer)
 - Accuracy: ±1% of programmed rated voltage of ±2 VAC (subject to accuracy of voltage transformer when used)
- <u>Generator Current (rms)</u>
 - Generator current is measured at the secondary windings of 5 A CTs.
 - Metering Range: 0 to 5,000 Aac
 - CT Primary Range: 1 to 5,000 Aac, in primary increments of 1 Aac
 - Accuracy: ±1% of programmed rated current or ±2 Aac (subject to accuracy of CTs)
- <u>Generator and Bus Frequency</u>
 - Metering Range: 10 to 72 Hz
 - Accuracy: ±0.25% or 0.05 Hz
- <u>Apparent Power</u>
 - Indicates total kVA and individual line kVA (four-wire, line-to-neutral or three-wire, line-to-line).
 - Accuracy: ±3% or the full-scale indication or ±2 kVA
- Power Factor
 - Metering Range: 0.2 leading to 0.2 lagging
 - Accuracy: ±0.02
- <u>Real Power</u>
 - Indicates total kW and individual line kW (four-wire, line-to-neutral or three-wire, line-to-line)
 - Accuracy: ±3% of the full-scale indication or ±2 kW
- Oil Pressure
 - Metering Range: 0 to 150 psi or 0 to 1,034 kPa
 - Accuracy: ±3% of actual indication or ±2 psi or ±12 kPa (subject to accuracy of sender)
- <u>Coolant Temperature</u>
 - Metering Range: 0 °C to 204 °C (32 °F to 410 °F)
 - Accuracy: ±3% of actual indication or ±2° (subject to accuracy of sender)
- <u>Fuel Level</u>
 - Metering Range: 0 to 100%
 - Accuracy: ±2% (subject to accuracy of sender)
- <u>Battery Voltage</u>
 - Metering Range: 6 to 32 VDC
 - Accuracy: ±3% of actual indication or ±0.2 VDC
- Engine RPM
 - Metering Range: 0 to 4,500 rpm
 - Accuracy: ±2% of actual indication or ±2 rpm



SPECIFICATIONS, Metering, continued:

- Engine Run Time
 - Engine run time is retained in non-volatile memory.
 - Metering Range: 0 to 99,999 h; Update Interval: 6 min
 - Accuracy: ±1% of actual indication or ±12 min
- <u>Maintenance Timer</u>
 - Maintenance timer indicates the time remaining until generator set service is due. Value is retained in non-volatile memory.
 - Metering Range: 0 to 5,000 h; Update Interval: 6 min
 - Accuracy: ±1% of actual indication or ±12 min

Generator Protection Functions

- Overvoltage (59) and Undervoltage (27)
 - Pickup Range: 70 to 576 VAC
 - Activation Delay Range: 0 to 30 s
- Overfrequency (810) and Underfrequency (81U)
 - Pickup Range: 45 to 66 Hz
 - Pickup Increment: 0.1 Hz
 - Activation Delay Range: 0 to 30 s
- <u>Reverse Power (32)</u>
 - Pickup Range: -50 to 5%
 - Pickup Increment: 0.1%
 - Hysteresis Range: 1 to 10%
 - Hysteresis Increment: 0.1%
 - Activation Delay Range: 0 to 30 s
 - Activation Delay Increment: 0.1 s
- Loss of Excitation (40Q)
 - Pickup Range: -150 to 0%
 - Pickup Increment: 0.1%
 - Hysteresis Range: 1 to 10%
 - Hysteresis Increment: 0.1%
 - Activation Delay Range: 0 to 30 s
 - Activation Delay Increment: 0.1 s
- Overcurrent (51)
 - Pickup Range: 0.18 to 1.18 Aac (1 A current sensing)
 - Time Dial Range: 0
- Phase Imbalance (47)
 - Pickup Range: 5 to 100 VAC
 - Pickup Increment: 1 VAC
 - Activation Delay Range: 0 to 30 s
 - Activation Delay Increment: 0.1 s
- <u>ROCOF (81R) (optional)</u>
 - Pickup Range: 0.2 to 10 Hz/s
 - Pickup Increment: 0.1 Hz/s
 - Activation Delay Range: 0 to 10,000 ms
 - Activation Delay Increment: 1 ms
 - Accuracy: 0.2 Hz/s



SPECIFICATIONS, Generator Protection Functions, continued:

- Vector Shift (78) (optional)
 - Pickup Range: 2 to 90°
 - Pickup Increment: 1°
 - Accuracy: ±1°

Environmental

- Temperature
 - Operating: -40 °C to 70 °C (-40 °F to 158 °F)
 - Storage: -40 °C to 85 °C (-40 °F to 185 °F)
- Humidity: IEC 68-2-38
- Salt Fog: ASTM B 17-73, IEC 68-2-11 (tested while operational)
- Ingress Protection: IEC IP54 for front panel
- Shock: 15 G in three perpendicular planes
- Vibration: 5 to 29 to 5 Hz at 1.5 G peak for 5 min.
 - 29 to 52 to 29 Hz at 0.036" DECS-A for 2.5 min. 52 to 500 to 52 Hz at 5 G peak for 7.5 min.
 - Swept over the above ranges for 12 sweeps in each of three mutually perpendicular planes with each 15 minute sweep.

Agency Approvals

- UL/CSA Approvals: "cURus" approved to UL 6200 and CSA C22.2 No.14
- NFPA Compliance: Complies with NFPA Standard 110, Standard for Emergency and Standby Power
- CE Marked: Complies with applicable EC Directives

ADDITIONAL SPECIFICATIONS

Battery Backup for Real Time Clock

The MGC-2000 Series provides a real-time clock with an internal backup battery. The battery will maintain timekeeping for approximately 10 years (depending on conditions) after power is removed from the controller. The clock is used by the event recorder and sequence of events functions to time-stamp events, and the exercise timer is used to start and stop the generator set when the exercise feature is utilized.

Breaker Management

The MGC-2000 Series is capable of controlling the generator breaker and the mains breaker. The status of the breakers is determined by using BESTlogic[™]*Plus* programmable logic to set up the GENBRK and MAINSBRK logic blocks. These logic blocks have outputs that can be configured to energize an output contact and control a breaker, as well as inputs for breaker control and status. The MGC-2000 Series will attempt to close a breaker only after verifying that it can be closed. If the breaker cannot be closed, the close request will be ignored. Only one breaker can be closed at a time. Synchronization is required before closing the breaker to a live bus. Closure to a dead bus can be performed after meeting dead bus threshold and timing requirements set by the user.

OPTIONAL ACCESSORIES (Refer to Configuration Options.)

Analog Extension Module 2020 (AEM-2020)

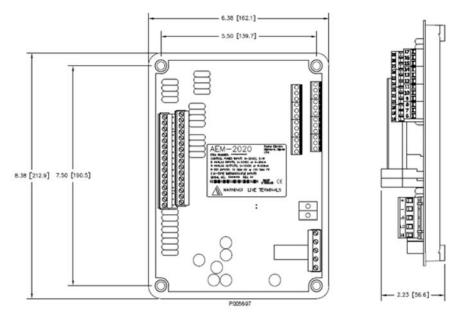
The optional AEM-2020 is a remote auxiliary device that provides additional MGC-2000 Series analog inputs and outputs. Its features include:

• <u>Eight Analog Inputs:</u> The AEM-2020 provides eight analog inputs that are user-selectable for 4 to 20 mA or 0 to 10 VDC. Each analog input has under/over thresholds that can be configured as status only, alarm, or pre-alarm. When enabled, an out of range alarm alerts the user of an open or damaged analog input wire. The label text of each analog input is customizable.



OPTIONAL ACCESSORIES, AEM-2020, continued:

- <u>Eight Resistance Temperature Detector (RTD) Inputs:</u> The AEM-2020 provides eight user-configurable RTD inputs for monitoring generator set temperature. Each RTD input can be configured as status only, alarm, or pre-alarm to protect against high or low temperature conditions. When enabled, an out-of-range alarm alerts the user of an open or damaged RTD input wire. The label text of each RTD input is customizable.
- <u>Two Thermocouple Inputs</u>: The AEM-2020 provides two thermocouple inputs for monitoring generator set temperature. Each thermocouple input can be configured as status only, alarm, or pre-alarm to protect against high or low temperature conditions. When enabled, an out-of-range alarm alerts the user of an open or damaged thermocouple input wire. The label text of each thermocouple input is customizable.
- <u>Four Analog Outputs:</u> The AEM-2020 provides four analog outputs that are user-selectable for 4 to 20 mA or 0 to 10 VDC. A wide selection of parameters including oil pressure, fuel level, generator voltage, and bus voltage can be configured as analog outputs. Refer to *Section 4, BESTCOMSPlus® Software* of the *MGC-2000 Series Controller Manual*, for a full list of parameter selections.
- <u>Communications via CANBus</u>: A Control Area Network (CAN) is a standard interface that enables communication between the AEM-2020 and the MGC-2000 Series.



Input and Output Terminals

Contact Expansion Module 2020 (CEM-2020)

The CEM-2020 is a remote device that provides additional MGC-2000 Series contact inputs and outputs, giving the user flexibility to use the same model MGC-2000 Series generator set controller for simple or complicated applications that require contact functionality or duplication of contacts for remote annunciation. Its features include:

- <u>10 Contact Inputs</u>: The CEM-2020 provides 10 programmable contact inputs with the same functionality as the contact inputs on the MGC-2000 Series.
- <u>24 Output Contacts</u>: The CEM-2020 provides 24 Form C programmable output contacts with the same functionality as the output contacts on the MGC-2000 Series. The output ratings of the Form C contacts are:

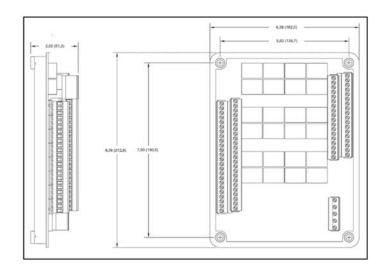


Output No.	Rating (Cont.)	Additional Information
13-24	1 A @ 30 VDC	This is a gold flash contact for low current circuits.
25-36	4 A @ 30 VDC	

OPTIONAL ACCESSORIES, CEM-2020, continued:

 <u>Communications via CANBus</u>: The CEM-2020 communicates to the MGC-2000 Series via SAE J1939 CANBus communications and allows the user to program the functionality of these inputs and outputs in the BESTCOMSPlus[®] software.

 The user can add labels for the inputs and outputs that appear in BESTCOMSPlus[®], show up on the front panel, and in programmable logic. All the functionality can be assigned to these inputs and outputs as if they were an integrated part of the MGC-2000 Series. The CEM-2020 module has all of the environmental ratings of the MGC-2000 Series, including a model for UL Class1 Div2 applications. The CEM-2020 terminals accept a maximum wire size of 12 AWG, while the chassis ground requires 12 AWG wire. Flexibility is one of the benefits of the MGC-2000 Series, and this add-on module enhances that benefit even further.



CEM-2020 Overall Dimensions



CONFIGURATION OPTIONS

Generator Protection

	MGC- 2010	MGC- 2020	MGC- 2050
Standard			
Phase Imbalance (47)		\checkmark	\checkmark
Overcurrent (50)			
Overvoltage (59)	\checkmark	\checkmark	\checkmark
Undervoltage (27)	\checkmark	\checkmark	~
Underfrequency (81U)	\checkmark	\checkmark	\checkmark
Overfrequency (810)	\checkmark	\checkmark	\checkmark
Reverse Power (32)	\checkmark	\checkmark	~
Loss of Excitation (40Q)	\checkmark	\checkmark	~
Enhanced			
Overcurrent (51)		\checkmark	\checkmark
Vector Shift (78)		\checkmark	\checkmark
Rate of Change of Frequency (81R)		\checkmark	\checkmark
Ground Fault			

Inputs

	MGC- 2010	MGC- 2020	MGC- 2050
Controller			
Digital	16	16	16
Analog (Dedicated)	3	3	3
Analog	-	-	-
CEM			
Digital	10	10	10
AEM			
Analog	8	8	8
TC	2	2	2
RTD	8	8	8

Outputs

	MGC- 2010	MGC- 2020	MGC- 2050	
Controller				
Digital Form A, 30 Amp	3	3	3	
Digital Form A, 5 Amp	-	-	-	
Digital Form A, 2 Amp	12	12	12	
Analog	-	-	-	
CEM				
Digital Form C, 4 Amp	12	12	12	
Digital Form C, 1 Amp	12	12	12	
AEM				
Analog	4	4	4	
External to Controllers / (CEM)				
Digital Form C, 10 Amp (Interposing Relay)	10	10	10	

Communication

	MGC- 2010	MGC- 2020	MGC- 2050
ModBus RTU (RS-485)	\checkmark	\checkmark	\checkmark
ModBus TCP-IP			
RDP-110	\checkmark	\checkmark	 ✓
CANBus	\checkmark	\checkmark	 ✓
Modem Interface (RS-232)		\checkmark	\checkmark
Ethernet			√ (LSM)

Metering

	MGC- 2010	MGC- 2020	MGC- 2050
Bus 1 Voltage			
Single Phase	\checkmark	\checkmark	\checkmark
Three Phase	\checkmark	\checkmark	1
Bus 2 Voltage			
Single Phase			
Three Phase			
Current Transformers			
Generator	3	3	3
Auxiliary	-	-	-

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The MGC-3000 Series controllers include the following models which are described throughout this document.*

- MGC-3010
- MGC-3050

MTU Onsite Energy Generator Set Controllers (MGC Series) are rugged, reliable, all-in-one digital generator set control and load share systems. The MGC-3000 Series is designed to be a high end controller that is well suited for mains fail, paralleled units, and systems with multiple buses. The MGC-3000 Series has all of the necessary items for complete generator set control, protection, and metering with a massive, but easy-to-use, programmable logic system.

PRODUCT HIGHLIGHTS

- Three-phase generator metering
- Up to two buses with three-phase voltage metering
- Three dedicated generator CTs with up to four auxiliary CTs
- Engine metering
- Generator set control
- Generator protection
- Residual current Equipment Ground Fault Protection (EGFP) certified to UL 1053
- BESTCOMSPlus®
 - Windows[®]-based software for optional remote operation (Software can be downloaded at www.mtuonsiteenergy.com)
 - Programming and setup software
 - Intuitive and powerful
 - Remote control and monitoring
 - Programmable logic
 - USB communications
- Automatic transfer switch compatible
- Resistor sender inputs for oil pressure and coolant pressure (option for analog senders available)
- Dual CAN bus ports [one for each SAE J1939 Engine Control Unit (ECU) and expansion modules]
- Dual Ethernet ports
- Load sharing capabilities of kW and kVARs over Ethernet
- Load share line compatibility (0-10 VDC)
- Zero power transfer capabilities
- Two analog inputs
- Governor and AVR bias outputs (reprogrammable to general analog outputs)
- 16 programmable contact inputs, 12 programmable contact outputs
- Three programmable LEDs for customized annunciation
- Connects to up to four AEM-2020s and four CEM-2020s
- Configurable protection with up to 371 different parameters
- Configurable elements for customizable alarms
- Real time analysis feature
- UL recognized, CSA certified, CE approved

*Please refer to the last page of this data sheet for available MGC-3000 Series configuration options. The MGC Series Controller Comparison Data Sheet is available as a reference for all MGC Series configuration options.

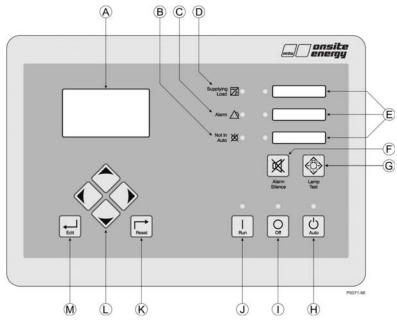




PRODUCT HIGHLIGHTS, continued:

- Multilingual capability
- Remote annunciation with RDP-110
- NFPA-110 compatible
- Microprocessor based
- Expandable to meet customer needs
- Optional accessories for Ethernet communication

DIAGRAM



Front Panel Descriptions

- Liquid Crystal Display (A)
- Not in Auto Indicator (B)
- Alarm Indicator (C)
- Supplying Load Indicator (D)
- Programmable Indicators (E)
- Alarm Silence Pushbutton (F)
- Lamp Test Pushbutton (G)

FUNCTIONS

Generator Set Protection

Generator ANSI Codes

- Overvoltage (59)
- Overfrequency (810)
- Reverse and Forward Power (32)
- Phase Voltage Imbalance (47)
- Vector Shift (78)

- Auto Pushbutton and Mode Indicator (H)
- Off Pushbutton and Mode Indicator (I)
- Run Pushbutton and Mode Indicator (J)
- Reset Pushbutton (K)
- Arrow Pushbuttons (L)
- Edit Pushbutton (M)

- Undervoltage (27)
- Underfrequency (81U)
- Loss of Excitation (40Q)
- Overcurrent (51)
- Rate of Change of Frequency (81R)

Note: All generator set protection features are programmable as alarms, pre-alarms, status, or not used.



FUNCTIONS, Generator Set Protection, continued:

Residual Current - Equipment Ground Fault Protection (EGFP)

The MGC-3000 Series controller offers residual current (ground-strap) equipment ground fault protection when utilized with a ground current transformer and a shunt trip equipped service disconnect (if tripping is required). The main bonding jumper that connects the equipment ground bus to the generator neutral passes through the center of the ground current transformer to allow for detection of ground fault currents. The MGC-3000 series controller may be configured for either ground fault indication only (GFI) or ground fault indication and trip (GFIT).

Alarms (Shutdowns)

- Low Oil Pressure
- High Coolant Temperature
- Low Coolant Level
- Overspeed •
- Overcrank

Pre-Alarms (Warnings)

- Low Oil Pressure
- High Coolant Temperature •
- Low Coolant Temperature
- Battery Overvoltage •
- Weak Battery Voltage
- AEM1 through AEM4 Comms Failure •
- Breaker Open Failure •
- CEM1 through CEM4 Comms Failure •
- Generator Reverse Rotation
- ID Missing •
- Intergenset Communication Failure
- Loss of Voltage Sensing

- Coolant Temp Sender Fail (non-ECU engines)
- Oil Pressure Sender Fail (non-ECU engines)
- **Emergency Stop**
- Critical Low Fuel Level (Refer to Configuration Options.)
- **Checksum Failure**
- ECU Comms Fail
- Low Fuel Level
- **High Fuel Level**
- Active Diagnostic Trouble Codes (DTC)
- Breaker Close Failure
- Bus1 and Bus 2 Reverse Rotation
- Ethernet 1 and Ethernet 2 Link Lost
- High Battery Voltage
- ID Repeat
- Low Battery Voltage
- Synchronizer Failure

All alarms and pre-alarms can be enabled or disabled via the BESTCOMSPlus® PC software or the front panel. Additional custom alarms and pre-alarms are available upon request.

Generator and Bus Protection and Metering

- Multifunction protection guards against overvoltage, undervoltage, excessive forward and reverse power, underfrequency, and overfrequency. Overcurrent, phase imbalance, and loss of mains are available as options. Each protection function has an adjustable pickup and time delay setting. 16 inverse time curves, in addition to user-programmable curves, enable the MGC-3000 Series to offer overcurrent protection in a variety of applications. Each protective element can be assigned to the generator, bus 1, or bus 2.
- Metered generator and bus parameters include voltage, current, real power (watts), apparent power (VA), and power factor (PF).

Engine Protection and Metering

- Engine protection features include oil pressure and coolant temperature monitoring, overcrank protection. ECU-specific protection elements, and diagnostic reporting.
- Metered engine parameters include oil pressure, coolant pressure, battery voltage, speed, fuel level, engine load, coolant level (from ECU), ECU-specific parameters, and run-time statistics.



FUNCTIONS, continued:

Engine Control

- Cranking Control: Cycle or Continuous (Quantity and Duration fully programmable)
- Engine Cooldown: Smart Cooldown function saves fuel and engine life.
- · Successful Start Counter: Counts and records successful engine starts
- Timers:
 - Engine Cooldown Timer
 - Engine Maintenance Timer
 - Pre-Alarm Time Delays for Weak/Low Battery Voltage
 - Alarm Time Delay for Overspeed
 - Alarm Time Delay for Sender Failure
 - Arming Time Delays after Crank Disconnect:
 - Low Oil Pressure
 - High Coolant Temperature
 - Pre-Crank Delay
 - Continuous or Cycle Cranking Time Delay
 - Programmable Logic Timers

Load Sharing

The MGC-3000 Series provides analog outputs to the power system in the form of analog bias signals to the voltage regulator and speed governor. When the generator breaker is closed and load sharing is enabled, the MGC-3000 Series shares the real power load proportionally with other generators in the system. Load sharing can be implemented on the Analog Load Share Line or through Ethernet communications. Reactive power (kVAR) sharing is accomplished through Ethernet communications.

Event Recording

A history of system events are logged in non-volatile memory. The MGC-3000 Series retains records for 128 unique types of events. Each record tracks the number of times that an event has occurred and records a time stamp of the first and last occurrences.

A Sequence of Events (SER) log is also available. This log tracks the internal and external status of the MGC-3000 Series. Events are scanned at five millisecond intervals with 1,023 events stored per record. All changes of state that occur during each scan are time- and date-stamped. SER reports are available through BESTCOMS*Plus*[®]. Over 1,000 records can be retained in non-volatile memory. When the SER memory becomes full, the oldest record is replaced by the latest one acquired.

Transfer Switch Control (Mains Failure)

The MGC-3000 Series has the ability to detect a mains failure via a single- or three-phase bus input. A mains failure is established when any one of the following conditions are met:

- Any phase of bus voltage falls below the dead bus threshold
- Any phase of bus voltage is unstable due to overvoltage or undervoltage
- Any phase of bus voltage is unstable due to overfrequency or underfrequency

When conditions are met, the MGC-3000 Series will start the generator set and, when ready, will send generator and mains breaker commands to apply power to the load from the generator set. The MGC-3000 Series implements open or closed breaker transitions to and from the mains. When the mains returns and is considered stable, the MGC-3000 Series will transfer the load back to the mains and stop the engine. During closed breaker transitions, the Auto Synchronizer can synchronize the generator to the mains before transferring the load from generator power to utility power.



FUNCTIONS, continued:

ModBus™ RTU

MGC-3000 Series controllers can be monitored and controlled via a polled network using the ModBus[™] protocol. The RS-485 port supports a user-selectable baud rate of 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, or 115,200. Seven or eight data bits per character can be selected. Odd, even, or no parity is supported. One or two stop bits are selectable. Please see the *MGC-3000 Series Controller Manual* for the ModBus[™] register list.

Ethernet

Ethernet ports provide communications between the MGC-3000 Series and a PC via BESTCOMS*Plus®* or other MGC-3000 Series controller(s) in a network. An Ethernet connection to a PC running BESTCOMS*Plus®* provides remote metering, setting, annunciation, and control of the MGC-3000 Series. Ethernet communication between MGC-3000 Series controller(s) allows for generator sequencing on an islanded system.

MGC-3000 Series controllers can be monitored and controlled via Ethernet using the ModBus™ TCP/IP.

Programmable Logic

The MGC-3000 Series offers a very powerful, yet easy-to-use, programmable logic scheme, BESTlogic[™]*Plus*, for custom programming of the various inputs, outputs, alarms, and pre-alarms. It allows these elements to be integrated into a complete logic scheme so that the user can meet even the most complex specification. The programmable logic control includes the selection of logic gates and timers with drag-and-drop technology to make it fast and simple.

Remote Display Panel Annunciation (Refer to Configuration Options.)

The MGC-3000 Series can communicate to a remote display panel, Model RDP-110. This requires only two wires to annunciate all of the alarms and pre-alarms required by NFPA-110 Level I and II. External power is required.

External Modem Interface

The MGC-3000 Series includes an external modem interface permitting an external modem to be connected to the MGC controller via RS-232. A dial-out modem enables remote control, monitoring, and setting of the MGC-3000 Series. When an alarm or pre-alarm condition occurs, the MGC-3000 Series can dial up to four telephone numbers in sequence until an answer is received and the condition is annunciated.

Note: Only an external modem interface is provided. The external modem must be provided by a third party.

CAN

MGC-3000 Series controllers have two separate CAN ports: CAN 1 and CAN 2. CAN 1 communicates solely with expansion modules. This port accommodates up to four AEM-2020s and up to four CEM-2020s simultaneously. CAN 2 is dedicated for communication with ECU and related devices.

SAE J1939 Communications

SAE J1939 CANBus communications allows the MGC-3000 Series to communicate with the ECU to gather critical engine information like oil pressure, engine coolant temperature, RPM, battery voltage, and much more. By utilizing the ECU, the addition of analog engine senders is no longer required. This can save substantial money for the installer. It also eliminates any errors or discrepancies between the ECU data and the data displayed on the MGC-3000 Series that may be present due to analog sender inaccuracies or incompatibility. An additional benefit is access to the ECU's diagnostic troubleshooting codes (DTCs). The DTCs provide information about the engine's operating conditions and communicate this information via SAE J1939 to the MGC-3000 Series, eliminating the need for hand-held service tools to diagnose simple engine issues.



SPECIFICATIONS

Operating Power

- Nominal: 12 or 24 VDC
- Range: 6 to 32 VDC
- Power Consumption:
 - Sleep Mode
 - Normal Operational Mode: For specific power consumption scenarios, refer to generator set manual.
 - Battery Ride-Through: Withstands cranking ride-through down to 0 VDC for 50 ms (typical)

Current Sensing (5 Amp CT Inputs)

- Continuous Rating: 0.1 to 7.5 Aac
- One Second Rating: 50 Aac
- Burden: 1 VA

Voltage Sensing

- Range: 12 to 576 V rms, line-to-line
- Frequency Range: 10 to 90 Hz
- Burden: 1 VA
- One Second Rating: 720 V rms

Input Contacts

• Contact sensing inputs include one emergency stop input and 15 additional programmable inputs. The emergency stop input accepts normally closed, dry contacts. The remote emergency stop is limited to 75 ft. standard. Extended runs are available with an optional relay. All programmable inputs accept normally open, dry contacts. The factory may utilize up to three contact inputs.

Engine System Inputs

- Fuel Level Sensing Resistance Range: 5 to 250 Ω nominal
- Coolant Temperature Sensing Resistance Range: 5 to 2,750 Ω nominal
- Oil Pressure Sensing Resistance Range: 5 to 250 Ω nominal
- Engine Speed Sensing:
 - Magnetic Pickup or CANBus
 - Magnetic Pickup Voltage Range: 3 to 35 V peak (6 to 70 V peak to peak)
 - Magnetic Pickup Frequency Range: 32 to 10,000 Hz
 - Generator Frequency (alternate or redundant)
 - Voltage Range: 12 to 576 V rms

Output Contacts

- (15) Total Programmable Outputs: (3) 30 A @ 28 VDC and (12) 2 A @ 30 VDC
- The factory utilizes the following on each generator set which can be reprogrammed as needed:
 - (3) 30 A @ 28 VDC for Pre-start, Start, and Run
 - (12) 2 A @ 30 VDC for general purposes



SPECIFICATIONS, continued:

Metering

- <u>Generator Voltage (rms)</u>
 - Metering Range: 0 to 576 VAC (direct measurement); up to 9,999 VAC (with appropriate voltage transformer)
 - Accuracy: ±1% of programmed rated voltage or ±2 VAC (subject to accuracy of voltage transformer when used)
- <u>Generator Current (rms)</u>
 - Generator current is measured at the secondary windings of 5 A CTs.
 - Metering Range: 0 to 5,000 Aac
 - CT Primary Range: 1 to 5,000 Aac in primary increments of 1 Aac
 - Accuracy: ±1% of programmed rated current or ±2 Aac (subject to accuracy of CTs)
- Generator Frequency
 - Metering Range: 10 to 90 Hz
 - Accuracy: ±0.25% or 0.05 Hz
- <u>Apparent Power</u>
 - Indicates total kVA and individual line kVA (four-wire, line-to-neutral or three-wire, line-to-line).
 - Accuracy: ±2% of the full-scale indication or ±2 kVA
- Power Factor
 - Metering Range: 0.2 leading to 0.2 lagging
 - Accuracy: ±0.01
- <u>Real Power</u>
 - Indicates total kW and individual line kW (four-wire, line-to-neutral or three-wire, line-to-line)
 - Accuracy: ±2% of the full-scale indication or ±2 kW
- <u>Oil Pressure</u>
 - Metering Range: 0 to 145 psi or 0 to 1,000 kPa
 - Accuracy: ±3% of actual indication or ±2 psi or ±12 kPa (subject to accuracy of sender)
- <u>Coolant Temperature</u>
 - Metering Range: 0 °C to 204 °C (32 °F to 410 °F)
 - Accuracy: ±2% of actual indication or ±2° (subject to accuracy of sender)
- <u>Fuel Level</u>
 - Metering Range: 0 to 100%
 - Accuracy: ±2% (subject to accuracy of sender)
- Battery Voltage
 - Metering Range: 6 to 32 VDC
 - Accuracy: ±2% of actual indication or ±0.2 VDC
- Engine RPM
 - Metering Range: 0 to 4,500 rpm
 - Accuracy: ±2% of actual indication or ±2 rpm
- <u>Maintenance Timer</u>
 - Maintenance timer indicates the time remaining until generator set service is due. Value is retained in non-volatile memory.
 - Metering Range: 0 to 5,000 h; Update Interval: 6 min
 - Accuracy: ±1% of actual indication or ±12 min



SPECIFICATIONS, continued:

Generator Protection Functions

- Overvoltage (59) and Undervoltage (27)
 - Pickup Range: 0 to 576 VAC
 - Activation Delay Range: 0 to 600 s
- Overfrequency (810) and Underfrequency (81U)
 - Pickup Range: 37.5 to 66 Hz
 - Pickup Increment: 0.01 Hz
 - Activation Delay Range: 0 to 600 s
- <u>Reverse and Forward Power (32)</u>
 - Pickup Range: 0 to 200%
 - Pickup Increment: 0.1%
 - Activation Delay Range: 0 to 600 s
 - Activation Delay Increment: 0.1 s
- Loss of Excitation (40Q)
 - Pickup Range: -150 to 0%
 - Pickup Increment: 0.1%
 - Activation Delay Range: 0 to 600 s
 - Activation Delay Increment: 0.1 s
- Phase Voltage Imbalance (47)
 - Pickup Range: 5 to 150 VAC
 - Pickup Increment: 1 VAC
 - Activation Delay Range: 0 to 600 s
 - Activation Delay Increment: 0.1 s
- Overcurrent (51)
 - Pickup Range: 0.9 to 7.75 Aac (5 A current sensing)
 - Time Dial Range: 0 to 7,200 s (fixed time curve), 0 to 9.9 (inverse curve time multiplier)
 - Inverse Time Curves: 16 Selectable Time Overcurrent Characteristic Curves
- Vector Shift (78)
 - Pickup Range: 2 to 90°
 - Pickup Increment: 1°
 - Accuracy: ±1°
- <u>ROCOF (81R)</u>
 - Pickup Range: 0.2 to 10 Hz/s
 - Pickup Increment: 0.1 Hz/s
 - Activation Delay Range: 0 to 10,000 ms
 - Activation Delay Increment: 1 ms

Environment

- Temperature
 - Operating: -40 °C to 70 °C (-40 °F to 158 °F)
 - Storage: -40 °C to 85 °C (-40 °F to 185 °F)
- Humidity: IEC 68-2-38
- Salt Fog: IEC 60068
- Ingress Protection: IEC IP56 for front panel
- Shock: 15 G in 3 perpendicular planes
- Vibration: 3 to 25 Hz at 1.6 mm (0.063 in) peak amplitude 25 to 2,000 Hz at 5 G



SPECIFICATIONS, continued:

Agency Approvals

- UL/CSA Approvals: "cURus" approved to UL 6200 and CSA C22.2 No.14
- NFPA Compliance: Complies with NFPA Standard 110, Standard for Emergency and Standby Power
- CE Marked: Complies with applicable EC Directives

ADDITIONAL SPECIFICATIONS

Battery Backup for Real Time Clock

The MGC-3000 Series provides a real-time clock with an internal backup battery. The battery will maintain timekeeping for approximately five years (depending on conditions) after power is removed from the controller. The clock is used by the event recorder and sequence of events functions to time-stamp events, and the exercise timer is used to start and stop the generator set when the exercise feature is utilized.

Breaker Management

MGC-3000 Series units are capable of controlling the generator breaker and the mains breaker. Once it is determined that a breaker close request is valid, the MGC-3000 Series attempts to operate the breaker. The user can choose to control only the generator breaker, both breakers, or none at all. Breaker management settings can be configured using BESTCOMS*Plus*[®] or using the front panel interface.

Synchronizer

The MGC-3000 Series has an integrated automatic synchronizer to perform synchronization. The controller monitors the voltages, frequencies, and phase relationships of both the generator and the bus. It then sends a signal to the governor to increase or decrease the speed of the engine to match the generator frequency and phase angle to the bus frequency and phase angle. It also sends a signal to the voltage regulator to match the voltage levels. Once all of these conditions are met, the controller sends a breaker close signal to the generator circuit breaker.

There are two types of automatic synchronizers available. A phase lock type of automatic synchronizer controls the frequency of the generator and brings it into the predetermined phase angle window. When a time delay expires while in the window, the close signal is given to the generator circuit breaker. The anticipatory style of automatic synchronizer controls the slip frequency between the generator and the bus. The synchronizer calculates the timing of the closing signal to allow the generator breaker to be closed when the phase angle between the two sources is at zero degrees. This calculation takes into account the slip rate, the generator breaker closing time, and the phase angle difference.

Multigen Management

Enabling sequencing on a networked group of load share units allows these units to manage load by starting and stopping appropriate units based on a factor of load demand and available capacity. The mode of operation is used to determine the order in which each generator in a group will contribute to the system's power production upon a demand start/stop request. Modes of operation include:

- Staggered service time
- Balanced service time
- Largest size first
- Smallest size first
- Smallest unit ID

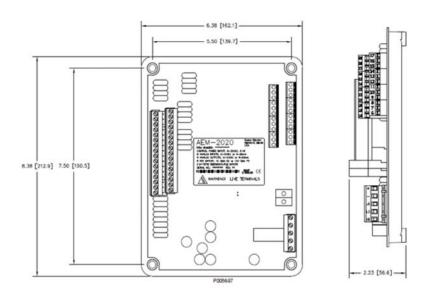


OPTIONAL ACCESSORIES (Refer to *Configuration Options.*)

Analog Extension Module 2020 (AEM-2020)

The optional AEM-2020 is a remote auxiliary device that provides additional MGC-3000 Series analog inputs and outputs. With the MGC-3000 Series, it is possible to have up to four AEM-2020s. Its features include:

- <u>Eight Analog Inputs:</u> The AEM-2020 provides eight analog inputs that are user-selectable for 4 to 20 mA or 0 to 10 VDC. Each analog input has under/over thresholds that can be configured as status only, alarm, or pre-alarm. When enabled, an out-of-range alarm alerts the user of an open or damaged analog input wire. The label text of each analog input is customizable.
- <u>Eight Resistance Temperature Detector (RTD) Inputs:</u> The AEM-2020 provides eight user-configurable RTD inputs for monitoring generator set temperature. Each RTD input can be configured as status only, alarm, or pre-alarm to protect against high or low temperature conditions. When enabled, an out-of-range alarm alerts the user of an open or damaged RTD input wire. The label text of each RTD input is customizable.
- <u>2 Thermocouple Inputs</u>: The AEM-2020 provides two thermocouple inputs for monitoring generator set temperature. Each thermocouple input can be configured as status only, alarm, or pre-alarm to protect against high or low temperature conditions. When enabled, an out-of-range alarm alerts the user of an open or damaged thermocouple input wire. The label text of each thermocouple input is customizable.
- <u>4 Analog Outputs</u>: The AEM-2020 provides four analog outputs that are user-selectable for 4 to 20 mA or 0 to 10 VDC. A wide selection of parameters including oil pressure, fuel level, generator voltage, and bus voltage can be configured as analog outputs. Refer to *Section 4, BESTCOMSPlus® Software* of the *MGC-3000 Series Controller Manual*, for a full list of parameter selections.
- <u>Communications via CANBus:</u> A Control Area Network (CAN) is a standard interface that enables communication between the AEM-2020 and the MGC-3000 Series.



Input and Output Terminals



OPTIONAL ACCESSORIES, continued:

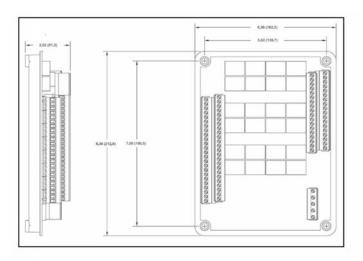
Contact Expansion Module 2020 (CEM-2020)

The CEM-2020 is a remote device that provides additional MGC-3000 Series contact inputs and outputs, giving the user flexibility to use the same model MGC-3000 Series generator set controller for simple or more complicated applications that require contact functionality or duplication of contacts for remote annunciation. With the MGC-3000 Series, it is possible to have up to four CEM-2020s. Its features include:

- <u>10 Contact Inputs</u>: The CEM-2020 provides 10 programmable contact inputs with the same functionality as the contact inputs on the MGC-3000 Series.
- <u>24 Contact Outputs</u>: The CEM-2020 provides 24 Form C programmable contact outputs with the same functionality as the output contacts on the MGC-3000 Series. The output ratings of the Form C contacts are:

Output No.	Rating (Cont.)	Additional Information
1-12	1 A @ 30 VDC	This is a gold flash contact for low current circuits.
13-24	4 A @ 30 VDC	

- <u>Communications via CANBus</u>: The CEM-2020 communicates to the MGC-Series 3000 via SAE J1939 CANBus communications and allows the user to program the functionality of these inputs and outputs in the BESTCOMSPlus[®] software.
- The user can add labels for the inputs and outputs that appear in BESTCOMSPlus[®], on the front panel, and in programmable logic. All the functionality can be assigned to these inputs and outputs as if they were an integrated part of the MGC-3000 Series. The CEM-2020 module has all of the environmental ratings of the MGC-3000 Series, including a model for UL Class 1 Div2 applications. The CEM-2020 terminals accept a maximum wire size of 12 AWG, while the chassis ground requires 12 AWG wire. Flexibility is one of the benefits of the MGC-3000 Series, and this add-on module enhances that benefit even further.



CEM-2020 Overall Dimensions



CONFIGURATION OPTIONS

Generator Protection

	MGC-3010	MGC-3050
Standard		
Phase Imbalance (47)	\checkmark	\checkmark
Overcurrent (50)		
Overvoltage (59)	\checkmark	\checkmark
Undervoltage (27)	\checkmark	\checkmark
Underfrequency (81U)	\checkmark	\checkmark
Overfrequency (810)	\checkmark	\checkmark
Reverse Power (32)	\checkmark	\checkmark
Loss of Excitation (40Q)	\checkmark	\checkmark
Enhanced	<u>.</u>	
Overcurrent (51)	\checkmark	\checkmark
Vector Shift (78)	\checkmark	\checkmark
Rate of Change of Frequency (81R)	\checkmark	\checkmark
Ground Fault	<i>√</i>	\checkmark

Inputs

	MGC-3010	MGC-3050			
Controller					
Digital	16	16			
Analog (Dedicated)	3	3			
Analog	2	2			
CEM	CEM				
Digital	4x10	4x10			
AEM					
Analog	4x8	4x8			
TC	4x2	4x2			
RTD	4x8	4x8			

Outputs

	MGC-3010	MGC-3050		
Controller				
Digital Form A, 30 Amp	3	3		
Digital Form A, 5 Amp	-	-		
Digital Form A, 2 Amp	12	12		
Analog	2	2		
CEM				
Digital Form C, 4 Amp	4x12	4x12		
Digital Form C, 1 Amp	4x12	4x12		
AEM	AEM			
Analog	4x4	4x4		
External to Controllers / (CEM)				
Digital Form C, 10 Amp (Interposing Relay)	10	10		

Communication

	MGC-3010	MGC-3050
ModBus RTU (RS-485)	\checkmark	\checkmark
ModBus TCP-IP	\checkmark	\checkmark
RDP-110	\checkmark	\checkmark
CANBus	\checkmark	\checkmark
Modem Interface (RS-232)	\checkmark	\checkmark
Ethernet	\checkmark	\checkmark

Metering

	MGC-3010	MGC-3050		
Bus 1 Voltage				
Single Phase	\checkmark	\checkmark		
Three Phase	\checkmark	\checkmark		
Bus 2 Voltage				
Single Phase		\checkmark		
Three Phase		\checkmark		
Current Transformers				
Generator	3	3		
Auxiliary	1	4		

REMOTE DISPLAY PANEL RDP-110 Annunciator Data Sheet

HIGHLIGHTS

- Annunciation of eight alarms and seven pre-alarms as detected by the digital generator set controller
- Four programmable LEDs via BESTlogic[™] Plus
- RS-485 communications reduces the number of interconnection wires to four
- Interconnect distance up to 1,219 m (4,000 ft)
- UL Listed
- CSA Certified

DESCRIPTION

The RDP-110 is a remote annunciation device used in conjunction with digital generator set controllers to provide remote annunciation of the emergency standby generator system. This panel allows for two programmable alarms, two programmable pre-alarms, and is compatible with NFPA 110. The digital generator set controller detects an alarm or pre-alarm condition and communicates via RS-485 to the RDP-110. The RDP-110 is available with a universal configuration that can be surface- or semi-flush-mounted.

STANDARD FEATURES

- Eight LED Alarms
 - Low coolant level
 - Low oil pressure
 - Engine overspeed
 - Fuel leak*
- Seven LED Pre-Alarms
 - High coolant temperature
 - Low oil pressure
 - Battery overvoltage*
 - Battery charger failure*
- Three LED operating conditions
 - Switch not in auto
 - EPS supplying load
 - Display panel on
- Audible alarm horn rated at 90 dB (from a distance of two feet)
- Lamp test and alarm silence
- Power supply inputs for 12 VDC, 24 VDC, or 120 VAC (at the RDP-110 location)
- · Available in two mounting configurations: surface- and semi-flush-mounted
- Conduit box included
- Designed for use in harsh environments

* Pre-configured, but can be reprogrammed and relabeled to match the function of the indicator.

- High coolant temperature
- Engine overcrank
- Emergency stop activated
- Sender failure*
- Low coolant temperature
- Low fuel level
- Weak battery





REMOTE DISPLAY PANEL RDP-110 Annunciator Data Sheet



SPECIFICATIONS

Ordering Information

• MTU Onsite Energy Part Number: X00A30100046

Power Input

- DC Voltage: 8-32 VDC (2W)
- AC Voltage: 84-144 VAC (5VA)

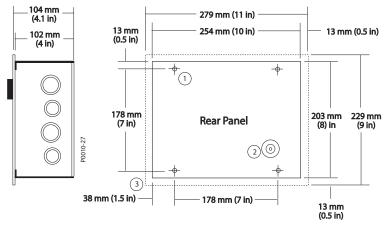
Environmental and Physical

- Operating Temperature: -40 °C to 70 °C (-40 °F to 158 °F)
- Storage Temperature: -40 °C to 85 °C (-40 °F to 185 °F)
- Salt Fog: Qualified to ASTM 117B-1989
- Vibration: The device withstands 2 g in each of the three mutually perpendicular planes, swept over the range of 10 to 500 Hz for a total of six sweeps, 15 minutes each sweep, without structural damage or degradation of performance.
- Shock: 15 g
- Weight: 3 kg (6.6 lb)
- Dimensions:
 - Width: 159 mm (6.3 in)
 - Height: 305 mm (12 in)
 - Depth: 219 mm (8.6 in)

Agency Approvals

- NFPA 110 Level 1 Compliant
- UL Listed to UL 6200, file E97035
- CSA Certified to CSA C22.2 No. 14, file LR 23131

DIMENSIONS



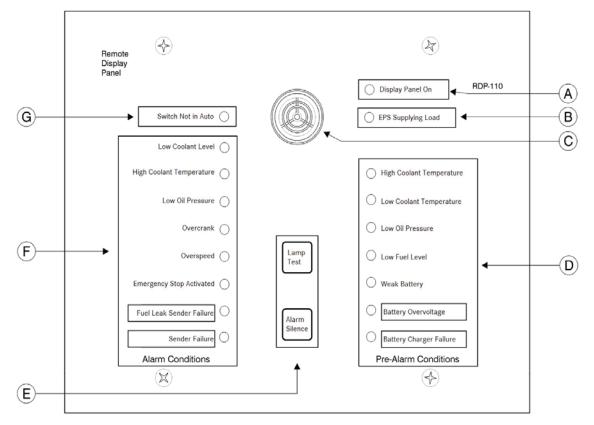
RDP-110 Mounting Dimensions

- 1 Mounting hole diameter (4 places, on rear wall of enclosure) is 7 mm (0.281 in).
- 2 Grounding point is 10-31 threaded hole.
- 3 Dashed line indicates outline of faceplate.

REMOTE DISPLAY PANEL RDP-110 Annunciator Data Sheet



PANEL DISPLAY



Front Panel Controls and Indicators

- A Green LED lights when power is applied to the RDP-110.
- B Green LED turns ON when the generator set is supplying more than 2% of rated load.
- C The horn sounds when an alarm or pre-alarm exists or the connected digital generator set controller is not operating in Auto mode.
- D Pre-Alarm LEDs light when the corresponding pre-alarm setting is exceeded.
- E RDP-110 controls consist of two pushbuttons. The Alarm Silence pushbutton silences the horn. The Lamp Test pushbutton can be used to verify operation of all RDP-110 LEDs and the horn.
- F Alarm LEDs light when the corresponding alarm setting is exceeded.
- G Red LED lights when the digital generator set controller is not operating in Auto mode.

REMOTE EMERGENCY STOP PUSHBUTTON Data Sheet

DESCRIPTION

The remote emergency stop pushbutton provides an added level of safety for generator set shutdown. This sturdy, self-latching mushroom button is assembled in a rugged, handy box.

When the button is in its normal state (released and indicator is green), the contacts are closed. Pressing the button opens the contact, which de-energizes the downstream relay coils.

This action communicates with the generator set controller and/or the ECU to initiate an emergency shutdown. Once actuated, the pushbutton must be manually released (twist-to-release) before the generator set controller alarm can be cleared.

FEATURES

- Heavy-duty steel enclosure
- Self-monitoring contact block opens circuit if detached from the actuator
- 45 mm (1.77 in) mushroom button with mechanical indicator
- Pre-assembled

SPECIFICATIONS

- MTU Onsite Energy Part #:
- Enclosure Dimensions:
- Pushbutton Actuator Dimensions:
- Weight:
- Enclosure Type:
- Contact Configuration:
- Terminal Type:
- Wire Range:
- Approvals:
- Electrical Ratings for MTU Onsite Energy Application:

12 VDC or 24 VDC 1 Amp

SUASA150340

1.36 kg (3 lbs)

Screw clamp

Length: 152.4 mm (6 in) Width: 152.4 mm (6 in) Height: 101.6 mm (4 in)

Diameter (Ø): 45 mm (1.77 in) Length: 48 mm (1.89 in)

1 N.C. (Normally Closed)

Surface-mount, Type 1 (IP 20 equivalent)

4-20 AWG stranded, 14-18 AWG solid

Enclosure: UL Listed, CSA Certified

Switch: UL Listed, CSA Certified, CE Marking, IEC 60947-5-1

CERTIFICATIONS AND STANDARDS

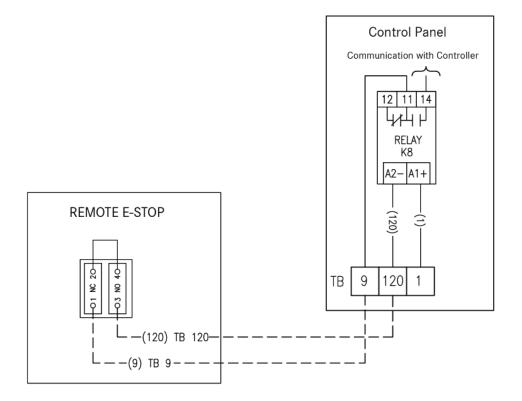
Switch: UL Listed, CSA Certified, CE Marking, IEC 60947-5-1
 Enclosure: UL Listed, CSA Certified





REMOTE EMERGENCY STOP PUSHBUTTON Data Sheet





Electrical Schematic

SAFETY OVERRIDE SWITCH **Data Sheet**



HIGHLIGHTS

- Three customer-selectable settings: OFF, SAFETY OVERRIDE, CRANK
- Protective cover allows for lockout/tagout and prevents unintentional safety override
- Safety Override Switch allows engine to start in the event of dead panel

WARNING! Use of safety override disables all protective alarms and shutdowns and voids manufacturer's warranty. Not offered on UL 2200 units.

DESCRIPTION

The safety override switch allows the operator to override the engine and generator's protective safety pre-alarms and shut-down alarms. When the safety override switch is enabled, the engine will not shut down in the event of an alarm. An audible alarm will sound and the controller will display the alarm, but the engine will keep running. If the generator set controller is inoperable, the safety override switch allows the operator to crank and start the engine. An AC relay is provided to disconnect cranking when the generator builds voltage. The AC relay will also stop the engine if the generator output fails. The safety override switch will bypass the following alarms:

Engine Alarms	Overspeed (non-MTU engines only) High coolant temp Low oil pressure Low coolant level Low fuel level Loss of ECU communications
Sender Failures	Coolant temperature sender failure

Sender Failures	Coolant temperature sender failure
	Oil pressure sender failure
	Fuel sender failure
	Voltage sensing failure
	Speed sensing failure

Generator Protection Over/under voltage Phase imbalance Over/under frequency Overcurrent Reverse power

STANDARD FEATURES

- Heavy duty, three-position switch
- Lockable safety cover
- OFF position keeps all safety alarms active

SPECIFICATIONS

Construction Material: Thermoplastic Terminal Type: Screw terminals Run Circuit Rating: 2.5 Adc continuous @ 32 Vdc Crank Circuit Current Rating: 2.5 Adc continuous @ 32 Vdc 5.7 Adc inrush @ 12 Vdc 2.8 Adc inrush @ 24 Vdc **Disconnect Relay Coil Voltage:** 120, 220, or 240 Vac, 50/60 Hz. Varies with generator voltage.

MTU Onsite Energy A Rolls-Royce Power Systems Brand

- SAFETY OVERRIDE position disables all safety alarms
- CRANK (spring return) allows operator to crank and start the engine



2015-07



SM124 SPEED MONITOR Data Sheet

DESCRIPTION

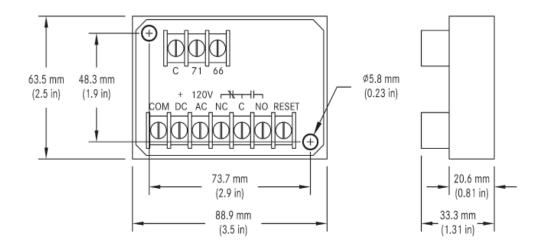
The SM124 Speed Monitor measures the frequency of the generator and protects the generator set from overspeed. When the allowable limit is exceeded, the SM124 changes state to indicate a failure. The limit is selectable for either 66 Hz or 71 Hz.

FEATURES

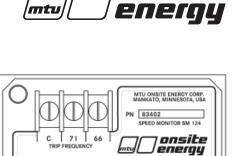
- Generator protection from overspeed
- Epoxy-encapsulated construction
- 120 VAC sensing

SPECIFICATIONS

MTU Onsite Energy Part Number: SUA83402 **Operating Trip Point:** 66 Hz or 71 Hz (selectable) Switch Contact Rating: 0.6 Amps, 120 VAC resistive (2 Amps, 40 V) -40 °C (-40 °F) to 70 °C (158 °F) **Operating Temperature:** Max Current Draw: 0.07 Amps 12 or 24 VDC Voltage: Accuracy: ± 0.5 Hz Mounting: Two holes



Dimensions



120V

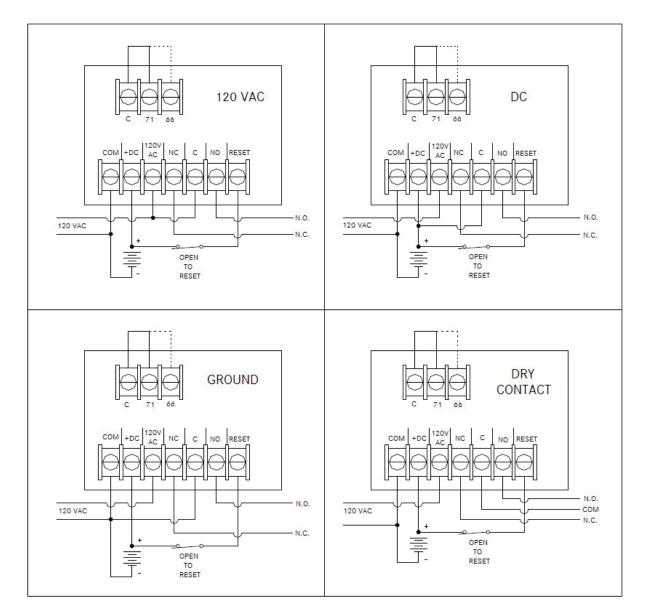
COM DC AC NC C NO

onsite

RESET

SM124 SPEED MONITOR Data Sheet





Typical Applications

OPTIONAL COOLING PACKAGE Data Sheet



The values on this data sheet represent optional cooling package alternatives to the standard cooling packages on our units. For data describing our standard products, please refer to individual spec sheets. Optional cooling packages are only available for the units shown on this data sheet.

Model	Power Node	Ambient Capacity: °C (°F)	Total Coolant Capacity: L (gal)	Fan Power: kW (hp)	Air Flow Required for Rad. Cooled Unit: m ³ /min* (SCFM)	Maxi- mum Cooling Air Flow Static Restric- tion: kPa (in. H ₂ 0)	Level 0: Open Power Unit Sound Level: dB(A)	Dimen- sions Height: mm (in.)	Dimen- sions Length: mm (in.)	Dimen- sions Width: mm (in.)
Series 2000 Prime	•									
MTU 12V2000 DS750	680 kW	50 (122)	294.7 (77.8)	38 (50.9)	1,132 (39,976)	0.125 (0.50)	C/F	2,222 (87.5)	4,395 (173)	1,759 (69.25)
Series 2000 Stand	lby									
MTU 12V2000 DS750	750 kW	50 (122)	294.7 (77.8)	38 (50.9)	1,132 (39,976)	0.125 (0.50)	89.9	2,222 (87.5)	4,395 (173)	1,759 (69.25)
Series 4000 Prime	e									
MTU 12V4000 DS1500	1,400 kW	50 (122)	578.5 (152.8)	82.4 (110.5)	C/F	0.125 (0.50)	C/F	2,902 (114.25)	6,172 (243)	2,632 (103.63)
MTU 12V4000 DS1750	1,600 kW	50 (122)	578.5 (152.8)	76.2 (102.2)	2,027 (71,579)	0.125 (0.50)	C/F	2,902 (114.25)	6,172 (243)	2,632 (103.63)
MTU 16V4000 DS2000	1,800 kW	50 (122)	717 (189.4)	105 (141)	3,089 (109,079)	0.125 (0.50)	94.7	3,353 (132)	6,655 (262)	2,921 (115)
MTU 16V4000 DS2250	2,045 kW	50 (122)	717 (189.4)	105 (141)	3,089 (109,079)	0.125 (0.50)	94.7	3,353 (132)	6,751 (265)	2,921 (115)
Series 4000 Stand	lby									
MTU 12V4000 DS1500	1,500 kW	50 (122)	578.5 (152.8)	82.4 (110.5)	C/F	0.125 (0.50)	C/F	2,902 (114.25)	6,172 (243)	2,632 (103.63)
MTU 12V4000 DS1750	1,750 kW	50 (122)	578.5 (152.8)	76.2 (102.2)	2,027 (71,579)	0.125 (0.50)	C/F	2,902 (114.25)	6,172 (243)	2,632 (103.63)
MTU 16V4000 DS2000	2,000 kW	50 (122)	717 (189.4)	105 (141)	3,089 (109,079)	0.125 (0.50)	94.7	3,353 (132)	6,655 (262)	2,921 (115)
MTU 16V4000 DS2250	2,250 kW	50 (122)	717 (189.4)	105 (141)	3,089 (109,079)	0.125 (0.50)	94.7	3,353 (132)	6,751 (265)	2,921 (115)
MTU 16V4000 DS2500	2,500 kW	50 (122)	780 (206)	99.2 (133)	3,231 (114,120)	0.125 (0.50)	C/F	3,454 (136)	7,315 (288)	3,023 (119)
MTU 20V4000 DS2800	2,800 kW	50 (122)	822.8 (217.4)	112.3 (150.6)	3,621 (127,874)	0.125 (0.50)	C/F	3,810 (150)	8,128 (320)	3,353 (132)
MTU 20V4000 DS3000	3,000 kW	50 (122)	1,012.1 (267.4)	115 (154.2)	3,833 (135,361)	0.125 (0.50)	94.6	3,810 (150)	8,128 (320)	3,353 (132)
MTU 20V4000 DS3250	3,250 kW	50 (122)	1,012.1 (267.4)	115 (154.2)	3,833 (135,361)	0.125 (0.50)	C/F	3,810 (150)	8,128 (320)	3,353 (132)

*Air density = 1.184 kg/ m³ (0.0739 lbm/ft³)

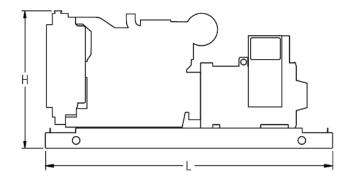
C/F = Consult Factory / MTU Onsite Energy Distributor

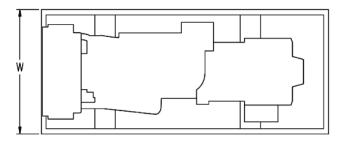
OPTIONAL COOLING PACKAGE Data Sheet



NOTES:

- Data is the result of laboratory tests with engines representing these ratings.
- Site installation variables such as temperature and altitude may impact cooling performance. For site specific data, refer to PS-SPEC at www.mtuonsiteenergy.com.
- All information is based on 25 °C at 100 m operating conditions.
- Consult your MTU Onsite Energy distributor for specific generator set dimensions.





WATER HEATER CB, CL, and WL Series Data Sheet



The CB, CL, and WL tank style engine heaters are designed to preheat diesel and gas engines in generator set applications. With easy start-up regardless of ambient temperature, they feature a built-in thermostat and heat engines from 6L to 25L displacement. Thermosiphon circulation of the coolant delivers heat throughout the entire engine for optimum performance.



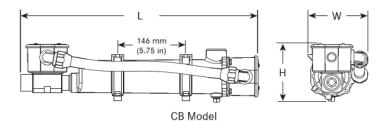
CB Model with thermostat

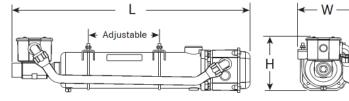


CL Model with thermostat

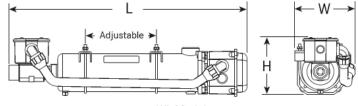


WL Model with thermostat





CL Model



WL Model

CERTIFICATIONS AND STANDARDS

- CB and CL Models: c-UL-us Listed, CSA Certified, and CE Compliant
- WL Model: CE Compliant

SPECIFICATIONS

Height: Length: Width: Weight:	<u>CB Model</u> 132 mm (5.2 in) 510 mm (20.1 in) 129 mm (5.1 in) 3 kg (6.9 lb)	<u>CL Model</u> 147 mm (5.8 in) 597 mm (23.5 in) 158 mm (6.2 in) 4.5 kg (10 lb)	<u>WL Model</u> 147 mm (5.8 in) 597 mm (23.5 in) 158 mm (6.2 in) 4.5 kg (10 lb)
Heating Fluid:	Engine coolant (50% gl	, , ,	
Power:	1.5, 2, 2.5, 3, 4, and 5	kW	
Rated Voltage:	120V – 575V		
Phase:	1 and 3		
Enclosure:	IP44		
Fluid Capacity:			
CL and WL Models	2 L (0.5 gal)		
CB Models	1.2 L (0.3 gal)		

WATER HEATER CB, CL, and WL Series Data Sheet



SPECIFICATIONS, continued

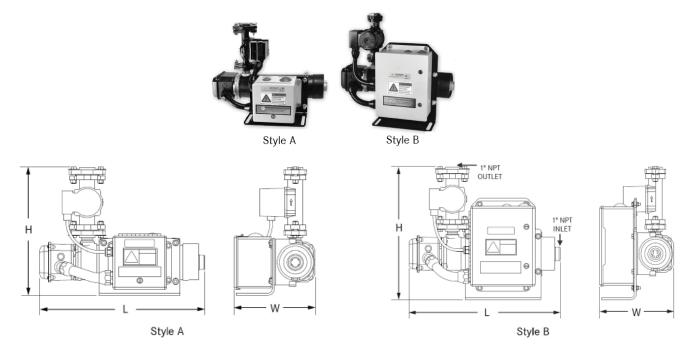
Max Pressure:	8.61 bar (125 psi)
Inlet / Outlet:	1" NPT Male / 1" NPT Female
Thermostat Range:	
On	38 °C (100 °F)
Off	49 °C (120 °F)

Model Number	MTU Onsite Energy Part Number	Watts	Volts	Phase	Hz	Amps
CB115410-200	SUA98952	1,500	480	1	60	3.1
CB120210-200	SUA98996	2,000	240	1	60	8.3
CB120410-200	SUA98953	2,000	480	1	60	4.2
CB120810-200	SUA98404	2,000	208	1	60	9.6
CB125210-200	SUA96723	2,500	240	1	60	10.4
CB125410-200	SUA90334	2,500	480	1	60	5.2
CB125810-200	SUA96727	2,500	208	1	60	12
CL130410-200	SUA97791	3,000	480	1	60	6.3
CL140210-200	SUA99109	4,000	240	1	60	16.7
CL140410-200	SUA52741	4,000	480	1	60	8.3
CL140810-200	SUA99110	4,000	208	1	60	19.2
CL150210-200	SUA98913	5,000	240	1	60	20.8
CL150212-200	SUA82416	5000	240	1	60	20.8
CL150412-200	SUA83334	5000	480	1	60	10.4
CL150810-200	SUA96725	5,000	208	1	60	24
WL325410-200	SUA96568	2,500	480	3	60	3
WL325810-200	SUA97254	2,500	208	3	60	6.9
WL340410-200	SUA96787	4,000	480	3	60	4.8
WL340810-200	SUA99286	4,000	208	3	60	11.1
WL350410-200	SUA98951	5,000	480	3	60	6
WL350810-200	SUA92800	5,000	208	3	60	13.9

WATER HEATER CSM Series Data Sheet



The CSM model is designed to preheat diesel and gas engines in generator set applications. The CSM heating system features a coolant preheater with thermostat, heating engines ranging in size from 15L to 100L displacement, pump, and all required controls. Forced circulation of the coolant delivers uniform heating throughout the entire engine, extends element life, and offers a significant reduction in electrical consumption.



CERTIFICATIONS AND STANDARDS

- c-UL-us Listed (60 Hz)
- CE Compliant (Style B)

SPECIFICATIONS

	<u>Style A</u>	<u>Style B</u>
Height:	383 mm (15 in)	434 mm (17 in)
Length:	493 mm (19.4 in)	493 mm (19.4 in)
Width:	242 mm (9.5 in)	242 mm (9.5 in)
Weight:	16.8 kg (37 lb)	24.5 kg (54 lb)

Heating Fluid:	Engine coolant (50% glycol/50% water)
Power:	3, 6, 9, 10.5, and 12 kW
Rated Voltage:	1 or 3 Phase, 120-690V (50 or 60 Hz)
Fixed Thermostat:	38-49 °C (100-120 °F)
Flow:	2.2 m ³ /hr (10 gpm) at 3 mWc (10 ft/head)
Max Pressure:	860 kPa (125 psi)
Pressure Loss:	1.5 kPa (0.2 psi)
Inlet / Outlet:	1" NPT / 1" NPT
Main Control Box	
Ingress Protection:	NEMA 4 (IP66)
Motor Ingress Protection:	IP44 (50 Hz), NEMA 2 (60 Hz)

WATER HEATER CSM Series Data Sheet



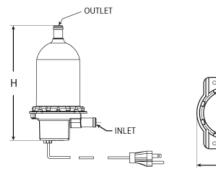
Model Number	MTU Onsite Energy Part Number	Watts	Volts	Phase	Hz	Amps	Style
CSM10302-000	SUA95187	3,000	240	1	60	13.1	А
CSM10308-000	SUA85631	3,000	208	1	60	15.1	А
CSM1060C-000	SUA85778	6,000	220	1	50	26	А
CSM10602-000	SUA85269	6,000	240	1	60	25.6	А
CSM10604-000	SUA87941	6,000	480	1	60	12.8	В
CSM10608-000	SUA86669	6,000	208	1	60	29.6	A
CSM1090C-000	SUA101813	9,000	220	1	50	41.5	A
CSM10902-000	SUA86156	9,000	240	1	60	38.1	A
CSM10904-000	SUA85170	9,000	480	1	60	19.1	В
CSM10908-000	SUA86157	9,000	208	1	60	44	A
CSM11058-000	X52830700001	10,500	208	1	60	51.2	В
CSM11202-000	SUA86158	12,000	240	1	60	50.6	В
CSM11204-000	SUA87538	12,000	480	1	60	25.3	В
CSM11208-000	SUA84406	12,000	208	1	60	58.4	В
CSM3060A-000	SUA88779	6,000	400	3	50	8.9	В
CSM30604-000	SUA88350	6,000	480	3	60	7.4	В
CSM30608-000	SUA88168	6,000	208	3	60	17.1	В
CSM3090A-000	SUA106952	9,000	400	3	50	13.2	В
CSM30904-000	SUA85254	9,000	480	3	60	11	В
CSM30908-000	SUA87710	9,000	208	3	60	25.4	В
CSM31204-000	SUA90111	12,000	480	3	60	14.6	В
CSM31208-000	SUA88155	12,000	208	3	60	33.7	В

WATER HEATER TPS Series Data Sheet



The TPS engine preheater is designed to preheat diesel and gas engines in generator set applications. Simple to install and very lightweight, the TPS engine preheater features a built-in thermostat and heats engines with up to 12L displacement. Thermosiphon circulation of the coolant delivers heat throughout the entire engine.





CERTIFICATIONS AND STANDARDS

- c-UL-us Listed
- CE Compliant

SPECIFICATIONS

Height:	200 mm (7.9 in)
Width:	117 mm (4.6 in)
Weight:	771 g (1.7 lb)
Heating Fluid:	Engine coolant (50% glycol/50% water)
Power:	0.5, 1.5, 1.8 and 2 kW (2 kW available at 240 V only)
Voltage Range:	120 and 240 V
Tank Material:	Polyphenylene Sulfide (PPS)
Heating Element:	Incoloy 800
Enclosure:	IP41
Fluid Capacity:	416 cm ³ (0.11 gal)
Max Pressure:	6.2 bar (90 psi)
Inlet / Outlet:	15.9 mm (0.625 in)
Thermostat Range:	
On	38 °C (100 °F)
Off	49 °C (120 °F)

Model Number	MTU Onsite Energy Part Number	Watts	Volts	Phase	Hz	Amps
TPS101GT10-000	SUA52746	1,000	120	1	60	8.4
TPS151GT10-000	SUA52748	1,500	120	1	60	12.5
TPS181GT10-000	SUA52750	1,800	120	1	60	15

DISTRIBUTION PANEL 30-200 kW Diesel/30-125 kW Gas Data Sheet

DESCRIPTION

The distribution panel provides a single-point connection from a main load center to factory-installed accessories. This is an optional accessory for 30-200 kW diesel and 30-125 kW gas generator sets.

FEATURES

- Flush-mount cover with door
- Automatic flush adjustment
- Corrosion-resistant baked enamel finish

SPECIFICATIONS

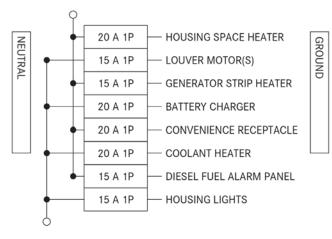
- Ampere rating: 100 A
- Factory installed main lugs
- Maximum number of single pole circuits:
 - 8 using standard circuit breakers
 - 16 using tandem circuit breakers
- Voltage rating: 120/240 VAC, 1-phase, 3 wire
- Environmental rating: Type 1 Enclosure
- Bus material: Tin-plated aluminum

CERTIFICATIONS AND STANDARDS

- UL Listed
- CSA Certified



- Short circuit current rating: 10 kA
- Main lug wire size: #4 to 1 AWG (Al/Cu)
- All lugs suitable for 75 °C (167 °F) copper or aluminum wires
- Dimensions:
 - Height: 317 mm (12.46 in)
 - Width: 226 mm (8.88 in)
 - Depth: 97 mm (3.8 in)



Wiring Schematic*

* **NOTE**: Diagram shows typical wiring configuration with all options included. Unused circuit breakers will be labeled as spare.



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DISTRIBUTION PANEL 230-600 kW Diesel Data Sheet

DESCRIPTION

The distribution panel provides a single-point connection from a main load center to factory-installed accessories. This is an optional accessory for 230-600 kW diesel generator sets.

FEATURES

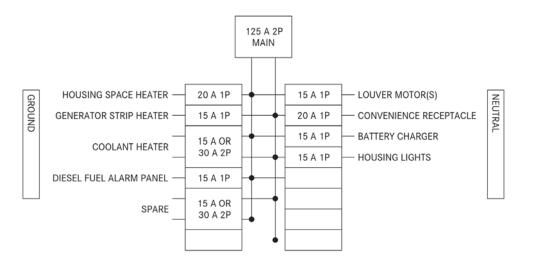
- Flush-mount cover with door
- Corrosion-resistant galvanized enclosure with baked enamel finish cover

SPECIFICATIONS

- Ampere rating: 125 A
- Factory-installed main circuit breaker
- Maximum number of single pole circuits:
 - 1 in THQL circuit breakers (Qty. 16)
 - UL Listed: 1 in THQL circuit breakrs (Qty. 8) *plus* 0.5 in THQP circuit breakers (Qty. 16)
 - CSA Certified: 0.5 in THQP circuit breakers (Qty. 32)
- Voltage rating: 120/240 VAC, 1-phase, 3 wire
- Environmental rating: Type 1 Enclosure

- Bus material: Tin-plated copper
- Short circuit current rating: 22 kA
- Main breaker wire size: #2 to 2/0 AWG AI/Cu
- All lugs suitable for 60 °C/75 °C copper or aluminum wires
- Dimensions:
 - Height: 518 mm (20.38 in)
 - Width: 391 mm (15.38 in)
 - Depth: 99 mm (3.88 in)

- **CERTIFICATIONS AND STANDARDS**
- UL Listed or CSA Certified, depending on system configuration



Wiring Schematic*

* **NOTE**: Diagram shows typical wiring configuration with all options included. Unused circuit breakers will be labeled as spare.





DISTRIBUTION PANEL 750-1,250 kW Diesel Data Sheet

DESCRIPTION

The distribution panel provides a single-point connection from a main load center to factory-installed accessories. This is an optional accessory for 750-1,250 kW diesel generator sets.

FEATURES

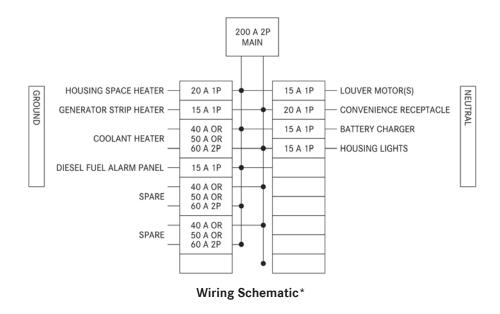
- Surface-mount cover
- · Corrosion-resistant galvanized enclosure with baked enamel finish cover

SPECIFICATIONS

- Ampere rating: 200 A
- Factory-installed main circuit breaker and equipment ground kit
- Single-pole circuits
 - 1 in THQL 1P Spaces (Qty. 20)
 - 0.5 in THQP 1P Spaces (Qty. 40)
- Voltage rating: 120 / 240 VAC, 1-phase, 3 wire
- Environmental rating: NEMA 3R outdoor rated enclosure
- Bus material: Copper
- Short cuircuit current rating: 22 kA
- Dimensions:
 - Height: 830.6 mm (32.7 in)
 - Width: 317.5 mm (12.5 in)
 - Depth: 116.8 mm (4.6 in)

CERTIFICATIONS AND STANDARDS

• UL Listed or CSA Certified, depending on system configuration



* **NOTE**: Diagram shows typical wiring configuration with all options included. Unused circuit breakers will be labeled as spare.

MTU Onsite Energy



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ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 30-60 kW Standby / 27-55 kW Prime 50 Hz: 34-55 kVA Standby / 30-50 kVA Prime





Level 1 Enclosure (pictured)*

Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDENTIFICATION				
Level 1	Basic weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 190 mph wind load rating. Skid-mounted enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of the enclosure.			
Level 2	Enhanced weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 190 mph wind load rating. Skid-mounted enclosure consists of a bolted and welded construction with unit- mounted internal silencer. Hinged, lockable double-door access on both sides of enclosure. UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls where applicable.			
Level 3	Level 2 enclosure with air exhaust scoop with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed where applicable.			

CERTIFICATIONS AND STANDARDS

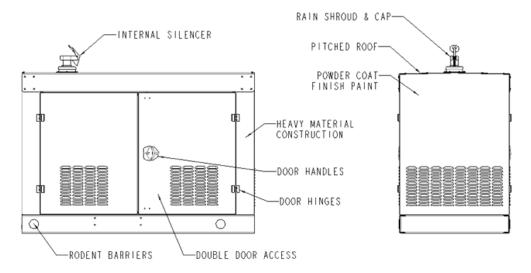
- UL 2200
- CSA

- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 190 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud and rain cap
- Rodent barriers

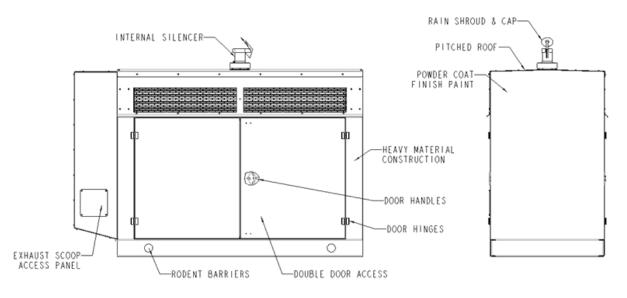
- Exhaust scoop access panel and drain
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
- Internal silencer
 - Internally-insulated space saver design
 - Level 1: Industrial Grade
 - Level 2/3: Hospital Grade

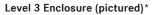


ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 30-60 kW Standby / 27-55 kW Prime 50 Hz: 34-55 kVA Standby / 30-50 kVA Prime



Level 1 Enclosure (pictured)*





OPTIONAL FEATURES (LEVEL 2 AND LEVEL 3 ONLY)

- Door restraints
- LED light package
- Gravity exhaust louvers
- Distribution panel

- Enclosure space heater
- Motorized intake louvers
- For other custom options, please consult factory.



ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 30-60 kW Standby / 27-55 kW Prime 50 Hz: 34-55 kVA Standby / 30-50 kVA Prime

ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER OPU SOUND RATINGS dB(A) AT 1 METER ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

			1 Me	eter		7 Meters	
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3
60 Hz	MTU 3R0096 DS30	30 kW	101.6	84.1	73.3	67	63.8
Standby	MTU 4R0113 DS40	40 kW	105.1	91.6	78.2	73.6	65.1
	MTU 4R0113 DS50	50 kW	105.1	91.6	78.2	71.9	64.7
	MTU 4R0113 DS60	60 kW	107	87.6	76.8	71.1	67.8
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3
60 Hz	MTU 3R0096 DS30	27 kW	92.1	82.6	71.2	68.2	64.3
Prime	MTU 4R0113 DS40	40 kW	104.3	89.3	76.2	71.9	62.8
	MTU 4R0113 DS50	45 kW	104.3	89.3	76.2	70.4	62.6
	MTU 4R0113 DS60	55 kW	103.7	88.4	76.7	70.8	67.4
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3
50 Hz	MTU 3R0096 DS34	34 kVA	96.9	78.6	70.5	64.8	64.5
Standby	MTU 4R0113 DS44	44 kVA	93.3	89.3	76.2	70.4	62.6
	MTU 4R0113 DS55	55 kVA	104.5	88.9	74.4	68.2	65.7
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3
50 Hz	MTU 3R0096 DS34	30 kVA	92.9	76.8	70.4	65.1	63.8
Prime	MTU 4R0113 DS44	40 kVA	94.7	89.5	75.7	70.1	62.2
	MTU 4R0113 DS55	50 kVA	98.9	87.9	74.1	68	65.6
(1) Undamper	ned engine exhaust noise						

NOTE:

- Measurements with infinite exhaust connection
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

C/F = Consult Factory

* **Note**: Visual appearance may differ between power nodes.

ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD



60 Hz: 30-60 kW Standby / 27-55 kW Prime 50 Hz: 34-55 kVA Standby / 30-50 kVA Prime



Level 1 Enclosure (pictured)*

Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDENTIFICATION				
Level 1	Basic weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 190 mph wind load rating. Skid-mounted enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of the enclosure.			
Level 2	Enhanced weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 190 mph wind load rating. Skid-mounted enclosure consists of a bolted and welded construction with unit- mounted internal silencer. Hinged, lockable double-door access on both sides of enclosure. UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls where applicable.			
Level 3	Level 2 enclosure with air exhaust scoop with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed where applicable.			

CERTIFICATIONS AND STANDARDS

- UL 2200
- CSA

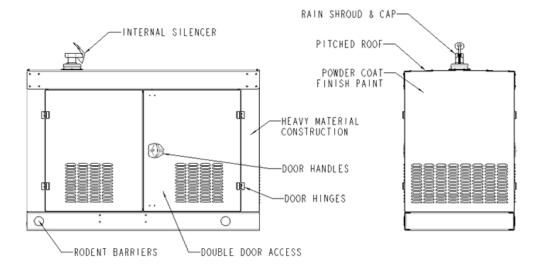
- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 190 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud and rain cap
- Rodent barriers

- Exhaust scoop access panel and drain
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
- Internal silencer
 - Internally-insulated space saver design
 - Level 1: Industrial Grade
 - Level 2/3: Hospital Grade

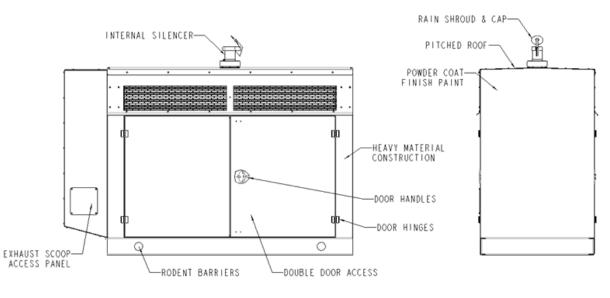


ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD 60 Hz: 30-60 kW Standby / 27-55 kW Prime

50 Hz: 34-55 kVA Standby / 30-50 kVA Prime



Level 1 Enclosure (pictured)*





OPTIONAL FEATURES (LEVEL 2 AND LEVEL 3 ONLY)

- Door restraints
- LED light package
- Gravity exhaust louvers
- Distribution panel

- Enclosure space heater
- Motorized intake louvers
- For other custom options, please consult factory.



ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD

60 Hz: 30-60 kW Standby / 27-55 kW Prime 50 Hz: 34-55 kVA Standby / 30-50 kVA Prime

ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER OPU SOUND RATINGS dB(A) AT 1 METER ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

			1 Me	eter		7 Meters	
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3
60 Hz Standby	MTU 3R0096 DS30	30 kW	101.6	84.1	79.2	72.4	69.6
	MTU 4R0113 DS40	40 kW	105.1	91.6	84.3	77	71
	MTU 4R0113 DS50	50 kW	105.1	91.6	84.6	76.7	71.5
	MTU 4R0113 DS60	60 kW	107	87.6	83.9	77.2	73.4
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3
60 Hz Prime	MTU 3R0096 DS30	27 kW	92.1	82.6	79.2	72.4	69.6
	MTU 4R0113 DS40	40 kW	104.3	89.3	84.3	77	71
	MTU 4R0113 DS50	45 kW	104.3	89.3	84.6	76.7	71.5
	MTU 4R0113 DS60	55 kW	103.7	88.4	83.9	77.2	73.4
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3
50 Hz Standby	MTU 3R0096 DS34	34 kVA	96.9	78.6	C/F	C/F	C/F
	MTU 4R0113 DS44	44 kVA	93.3	89.3	C/F	C/F	C/F
	MTU 4R0113 DS55	55 kVA	104.5	88.9	C/F	C/F	C/F
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3
50 Hz Prime	MTU 3R0096 DS34	30 kVA	92.9	76.8	C/F	C/F	C/F
	MTU 4R0113 DS44	40 kVA	94.7	89.5	C/F	C/F	C/F
	MTU 4R0113 DS55	50 kVA	98.9	87.9	C/F	C/F	C/F
⁽¹⁾ Undampened	⁽¹⁾ Undampened engine exhaust noise						

⁽²⁾ Measurement with infinite exhaust connection

NOTE:

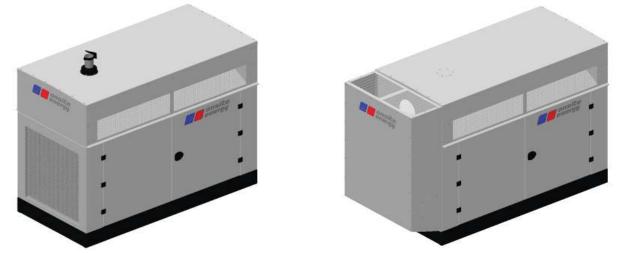
- Measurements include exhaust noise
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- · Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

C/F = Consult Factory

* **Note**: Visual appearance may differ between power nodes.

ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 80-200 kW Standby / 72-180 kW Prime





Level 1 Enclosure (pictured)*

Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDE	ENCLOSURE LEVEL IDENTIFICATION				
Level 1	Skid-mounted weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 190 mph wind load rating. Enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of the enclosure.				
Level 2	Level 1 enclosure with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls.				
Level 3	Level 2 enclosure with air exhaust scoop. UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed in scoop.				

CERTIFICATIONS AND STANDARDS

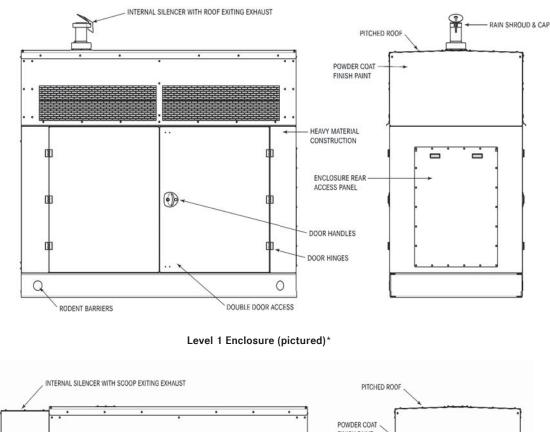
- UL 2200
- CSA

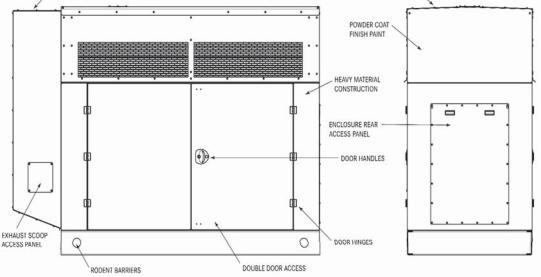
- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 190 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud
- Rain cap (Level 1 and 2 only)
- Rodent barriers

- CE Marking Provided
- Exhaust scoop access panel and drain
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
 - Internal silencer (Hospital Grade)
 - Insulated silencer
 - Stainless steel flexible exhaust connections (where applicable)

ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 80-200 kW Standby / 72-180 kW Prime







Level 3 Enclosure (pictured)*

OPTIONAL FEATURES

- Door restraints
- LED light package
- Motorized intake louvers
- Distribution panel

- Enclosure space heater
- Gravity exhaust louvers
- For other custom options, please consult factory.

ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 80-200 kW Standby / 72-180 kW Prime



ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER OPU SOUND RATINGS dB(A) AT 1 METER ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

			1 Me	ter		7 Meters	
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3
60 Hz	MTU 4R0120 DS80	80 kW	105.2	93.6	C/F	C/F	C/F
Standby	MTU 4R0120 DS100	100 kW	108.4	93.6	C/F	C/F	C/F
[MTU 4R0120 DS125	125 kW	112.4	93.8	C/F	C/F	68.5
[MTU 6R0120 DS150	150 kW	109.1	99.6	C/F	C/F	C/F
	MTU 6R0120 DS180	180 kW	110.8	99.6	C/F	C/F	C/F
	MTU 6R0120 DS200	200 kW	111.5	99.7	C/F	C/F	C/F
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3
60 Hz Prime	MTU 4R0120 DS80	72 kW	104.4	93.9	C/F	C/F	C/F
	MTU 4R0120 DS100	90 kW	106.7	94.2	C/F	C/F	C/F
	MTU 4R0120 DS125	111 kW	110	94.2	C/F	C/F	C/F
	MTU 6R0120 DS150	135 kW	108.8	99.5	C/F	C/F	C/F
	MTU 6R0120 DS180	163 kW	109.7	99.6	C/F	C/F	C/F
	MTU 6R0120 DS200	180 kW	110.8	99.6	C/F	C/F	C/F
⁽¹⁾ Undampen	⁽¹⁾ Undampened engine exhaust noise						

NOTE:

- Measurements with infinite exhaust connection
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

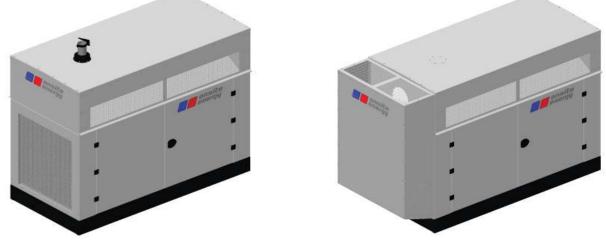
C/F = Consult Factory

* **Note**: Visual appearance may differ between power nodes.

ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD



60 Hz: 80-200 kW Standby / 72-180 kW Prime



Level 1 Enclosure (pictured)*

Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDE	ENCLOSURE LEVEL IDENTIFICATION				
Level 1	Skid-mounted weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 190 mph wind load rating. Enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of the enclosure.				
Level 2	Level 1 enclosure with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls.				
Level 3	Level 2 enclosure with air exhaust scoop. UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed in scoop.				

CERTIFICATIONS AND STANDARDS

- UL 2200
- CSA

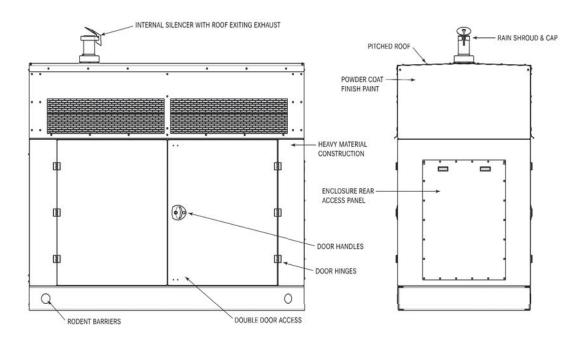
- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 190 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud
- Rain cap (Level 1 and 2 only)
- Rodent barriers

- CE Marking Provided
- Exhaust scoop access panel and drain
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
 - Internal silencer (Hospital Grade)
 - Insulated silencer
 - Stainless steel flexible exhaust connections (where applicable)

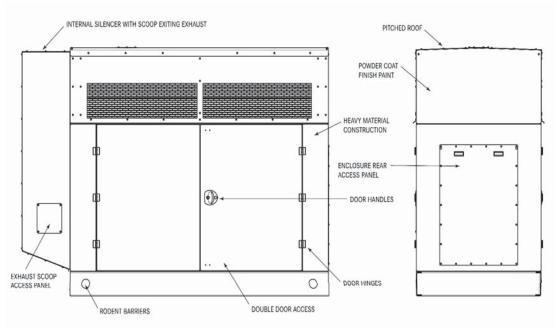
ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD



60 Hz: 80-200 kW Standby / 72-180 kW Prime



Level 1 Enclosure (pictured)*



Level 3 Enclosure (pictured)*

OPTIONAL FEATURES

- Door restraints
- LED light package
- Enclosure space heater
- Motorized intake louvers

- Distribution panel
- Gravity exhaust louvers
- For other custom options, please consult factory.

ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD



60 Hz: 80-200 kW Standby / 72-180 kW Prime

ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER OPU SOUND RATINGS dB(A) AT 1 METER ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

			1 Me	ter		7 Meters	
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3
60 Hz	MTU 4R0120 DS80	80 kW	105.2	93.6	82.2	81.5	73.7
Standby	MTU 4R0120 DS100	100 kW	108.3	93.6	82.2	81.3	74.4
ĺ	MTU 4R0120 DS125	125 kW	112.4	93.8	82.2	81.8	74.5
ĺ	MTU 6R0120 DS150	150 kW	109.1	99.6	91.2	88.4	72.8
	MTU 6R0120 DS180	180 kW	110.8	99.6	91.2	88.7	73
	MTU 6R0120 DS200	200 kW	111.5	99.7	91.2	88.7	73.1
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3
60 Hz	MTU 4R0120 DS80	72 kW	104.4	93.9	82	81.7	73.6
Prime	MTU 4R0120 DS100	90 kW	106.7	94.2	82.1	81.8	74.1
	MTU 4R0120 DS125	111 kW	110.0	94.2	82.7	81.8	74.4
	MTU 6R0120 DS150	135 kW	108.8	99.5	91.1	88.7	72.5
	MTU 6R0120 DS180	163 kW	109.7	99.6	91.1	88.7	72.7
	MTU 6R0120 DS200	180 kW	110.8	99.6	91.1	88.7	73
(1) Undampen	ned engine exhaust noise	*		-			

Undampened engine exhaust noise
 Measurement with infinite exhaust connect

⁽²⁾ Measurement with infinite exhaust connection

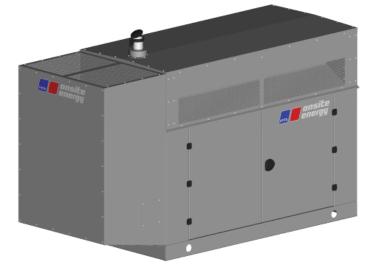
NOTE:

- Measurements include exhaust noise
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

* Note: Visual appearance may differ between power nodes.

ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 80-200 kW Standby / 80-180 kW Prime





Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDENTIFICATION						
Level 1	Skid-mounted weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 130 mph wind load rating. Enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of the enclosure.					
Level 2	Level 1 enclosure with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls.					
Level 3 ^{**}	Level 2 enclosure with air exhaust scoop with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed in scoops where applicable.					
Level 3 with Exhaust Scoop Sound Attenuation Kit ^{***}	Level 3 enclosure with 1.5" thick sound attenuated foam insulation installed in scoop (80-100 kW only).					

CERTIFICATIONS AND STANDARDS

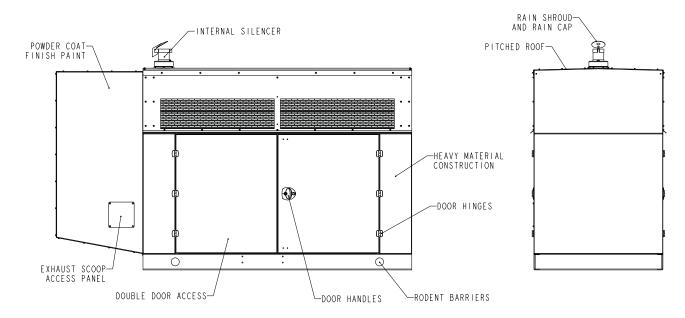
- UL 2200
- CSA

- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 130 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud and rain cap
- Rodent barriers
- Exhaust scoop access panel and drain

- IBC / OSHPD
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
- Internal silencer (Critical grade or better)
 - Insulated or wrapped mufflers and exhaust pipes
 - Stainless steel flexible exhaust connections (where applicable)

ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 80-200 kW Standby / 80-180 kW Prime





Level 3 Enclosure (pictured)*

OPTIONAL FEATURES

- Door restraints
- AC or DC light package
- Motorized / gravity louvers (where available)
- 190 mph wind rating
- For other custom options, please consult factory.

ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER OPU SOUND RATINGS dB(A) AT 1 METER ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

			1 Me	eter	7 Meters				
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3**	Level 3 with Exhaust Scoop Sound Attenuation Kit	
60 Hz	MTU 4R0113 DS80	80 kW	C/F	92	78.9	75.2	70.9	66.7	
Standby	MTU 4R0113 DS100	100 kW	C/F	95.3	80.2	77.1	73.4	69.1	
	MTU 4R0113 DS125	125 kW	C/F	98	83.5	81.7	73.1	N/A	
	MTU 6R0113 DS150	150 kW	C/F	96	84.4	83	74.1	N/A	
	MTU 6R0113 DS180	180 kW	C/F	98	85.1	83.3	74.6	N/A	
	MTU 6R0113 DS200	200 kW	C/F	98	85.1	83.2	74.4	N/A	

ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 80-200 kW Standby / 80-180 kW Prime



			1 Meter 7 Meters						
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3 ^{**}	Level 3 with Exhaust Scoop Sound Attenuation Kit ^{····}	
60 Hz	MTU 4R0113 DS80	80 kW	C/F	92	78.9	75.2	70.9	66.7	
Prime	MTU 4R0113 DS100	90 kW	C/F	95	80.4	76.8	73.3	69	
	MTU 4R0113 DS125	111 kW	C/F	97.9	83.3	81.8	72.9	N/A	
	MTU 6R0113 DS150	135 kW	C/F	96.6	84.2	82.8	73.6	N/A	
	MTU 6R0113 DS180	180 kW	C/F	98.1	85.1	83.3	74.6	N/A	
⁽¹⁾ Undampe	⁽¹⁾ Undampened engine exhaust noise								

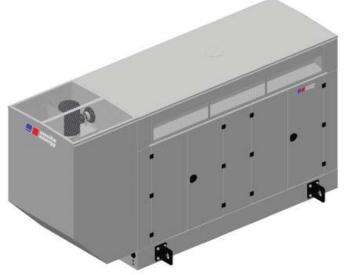
NOTE:

- Measurements with infinite exhaust connection
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- · Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

C/F = Consult Factory N/A = Not Available

- * Note: Visual appearance may differ between power nodes.
- ** 80-100 kW: Without foam in scoop, however it is optional. Refer to Level 3 w/exhaust scoop sound attenuation kit. 125-200 kW: Foam in scoop is standard.
- *** The Level 3 w/exhaust scoop sound attenuation kit is only available for 80-100 kW range.





Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDENTIFICATION					
Level 1	Skid-mounted weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 130 mph wind load rating. Enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of the enclosure.				
Level 2	Level 1 enclosure with air exhaust scoop. Unit-mounted internal silencer moved into scoop.				
Level 3 ^{**}	Level 2 enclosure with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed in scoop and inside enclosure walls, where applicable.				

CERTIFICATIONS AND STANDARDS

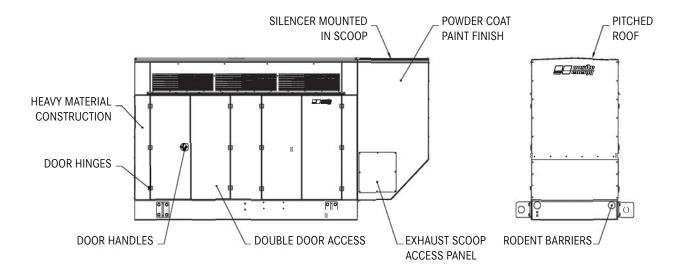
- UL 2200
- CSA

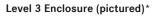
- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 130 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud and rain cap
- Rodent barriers
- Exhaust scoop access panel and drain

- IBC / OSHPD
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
- Internal (Level 1) and scoop-mounted (Level 2-3) silencers
 - Cirtical grade silencers
 - Insulated or wrapped mufflers and exhaust pipes
 - Stainless steel flexible exhaust connections (where applicable)

ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 230-300 kW Standby / 210-275 kW Prime







OPTIONAL FEATURES

- Door restraints
- AC or DC light package
- Motorized / gravity louvers (where available)
- 190 mph wind rating
- For other custom options, please consult factory.

ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER OPU SOUND RATINGS dB(A) AT 1 METER ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

			1 Me	ter		7 Meters		
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3**	
60 Hz	MTU 6R1600 DS230	230 kW	101.3	97.2	C/F	C/F	71.1	
Standby	MTU 6R1600 DS250	250 kW	101.3	97.3	81.1	C/F	71.1	
	MTU 6R1600 DS275	275 kW	101.3	97.6	C/F	C/F	71.1	
	MTU 6R1600 DS300	300 kW	104.9	98	C/F	C/F	72.5	
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3**	
60 Hz	MTU 6R1600 DS230	210 kW	C/F	C/F	C/F	C/F	C/F	
Prime	MTU 6R1600 DS250	230 kW	C/F	97.2	C/F	C/F	71.1	
	MTU 6R1600 DS275	250 kW	C/F	97.3	81.1	C/F	71.1	
	MTU 6R1600 DS300	275 kW	101.3	97.6	C/F	C/F	71.1	
⁽¹⁾ Undampened engine exhaust noise								

ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 230-300 kW Standby / 210-275 kW Prime



NOTE:

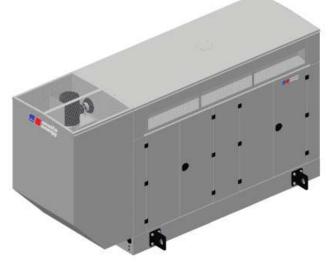
- Measurements with infinite exhaust connection
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

C/F = Consult Factory

- * **Note**: Visual appearance may differ between power nodes.
- ** 230-300 kW: Foam in scoop is standard.



60 Hz: 230-300 kW Standby / 210-275 kW Prime



Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDENTIFICATION					
Level 1	Skid-mounted weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 130 mph wind load rating. Enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of the enclosure.				
Level 2	Level 1 enclosure with air exhaust scoop. Unit-mounted internal silencer moved into scoop.				
Level 3 ^{**}	Level 2 enclosure with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed in scoop and inside enclosure walls, where applicable.				

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CERTIFICATIONS AND STANDARDS

- UL 2200 •
- CSA •

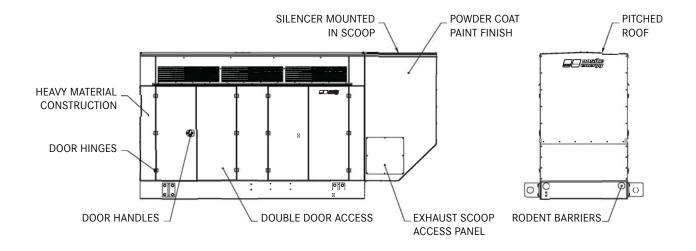
- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 130 mph wind rating
- Service access .
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud and rain cap
- **Rodent barriers**
- Exhaust scoop access panel and drain •

- IBC / OSHPD
- Hardware
 - Powder coated hinges with stainless steel pins _
 - Key-lockable and pad-lockable powder coated _ door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey . standard
 - Custom colors available upon request
- Internal (Level 1) and scoop-mounted (Level 2-3) • silencers
 - Critical grade silencers
 - Insulated or wrapped mufflers and exhaust _ pipes
 - Stainless steel flexible exhaust connections _ (where applicable)

ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD



60 Hz: 230-300 kW Standby / 210-275 kW Prime



Level 3 Enclosure (pictured)*

OPTIONAL FEATURES

- Door restraints •
- AC or DC light package •
- Motorized / gravity louvers (where available) •
- 190 mph wind rating •
- For other custom options, please consult • factory.

ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER OPU SOUND RATINGS dB(A) AT 1 METER ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

			1 Me	1 Meter 7 Meters			
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3**
60 Hz	MTU 6R1600 DS230	230 kW	101.3	97.2	87.1	82	75.7
Standby	MTU 6R1600 DS250	250 kW	101.3	97.3	87.7	82	76
	MTU 6R1600 DS275	275 kW	101.3	97.6	88.5	83	76.5
	MTU 6R1600 DS300	300 kW	104.9	98	88.7	83	76.4
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3**
60 Hz	MTU 6R1600 DS230	210 kW	C/F	C/F	86.2	81	75.6
Prime	MTU 6R1600 DS250	230 kW	C/F	97.2	87.1	82	75.7
	MTU 6R1600 DS275	250 kW	C/F	97.3	87.7	82	76
	MTU 6R1600 DS300	275 kW	101.3	97.6	88.5	83	76.5
 ⁽¹⁾ Undampened engine exhaust noise ⁽²⁾ Measurement with infinite exhaust connection 							

ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD 60 Hz: 230-300 kW Standby / 210-275 kW Prime



NOTE:

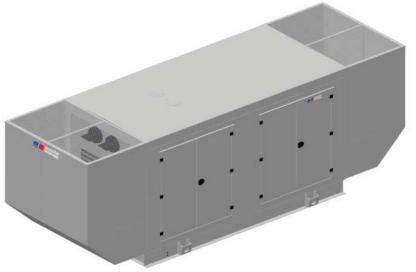
- Measurement includes exhaust noise
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

C/F = Consult Factory

* **Note**: Visual appearance may differ between power nodes.

** 230-300 kW: Foam in scoop is standard.





Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDENTIFICATION						
Level 1	Weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 130 mph wind load rating. Enclosure consists of a bolted and welded construction with unit-mounted internal silencer included. Hinged, lockable double-door access on both sides of the enclosure.					
Level 2	Level 1 enclosure with exhaust scoop.					
Level 3	Level 2 enclosure with air intake scoop with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed in scoops and inside enclosure walls, where applicable.					

CERTIFICATIONS AND STANDARDS

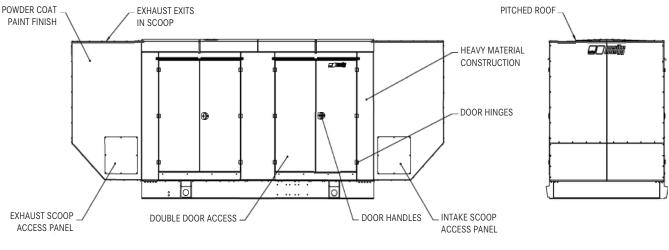
- UL 2200
- CSA

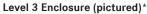
- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 130 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud and rain cap
- Rodent barriers

- IBC / OSHPD
- Scoop access panels and drain
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
- Internal silencer (Critical grade or better)
 - Insulated or wrapped mufflers and exhaust pipes
 - Stainless steel flexible exhaust connections (where applicable)

ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 350-600 kW Standby / 325-550 kW Prime







OPTIONAL FEATURES

- Door restraints
- AC or DC light package
- Motorized / gravity louvers (where available)
- 190 mph wind rating
- For other custom options, please consult factory.

ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER OPU SOUND RATINGS dB(A) AT 1 METER ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

			1 Me	ter		7 Meters	
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3
60 Hz	MTU 8V1600 DS350	350 kW	109.3	98	85.4	C/F	73.5
Standby	MTU 8V1600 DS400	400 kW	109.6	98	86.4	C/F	73.7
	MTU 10V1600 DS450	450 kW	104	C/F	87.7	C/F	76.2
	MTU 10V1600 DS500	500 kW	106	102.8	87.9	C/F	76.3
	MTU 12V1600 DS550	550 kW	108.9	100.5	87	C/F	78.2
	MTU 12V1600 DS600	600 kW	109.9	100.5	87.2	C/F	78
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU	Level 1	Level 2	Level 3
60 Hz	MTU 8V1600 DS350	325 kW	108	C/F	C/F	C/F	C/F
Prime	MTU 8V1600 DS400	365 kW	109.3	C/F	C/F	C/F	C/F
	MTU 10V1600 DS450	400 kW	C/F	101.8	C/F	C/F	C/F
	MTU 10V1600 DS500	450 kW	104	102.8	C/F	C/F	C/F
	MTU 12V1600 DS550	500 kW	107.6	100.1	C/F	C/F	C/F
	MTU 12V1600 DS600	550 kW	108.8	100.3	C/F	C/F	C/F
⁽¹⁾ Undampene	ed engine exhaust noise						

ENCLOSURE AND SOUND DATA SHEET - DIESEL 60 Hz: 350-600 kW Standby / 325-550 kW Prime



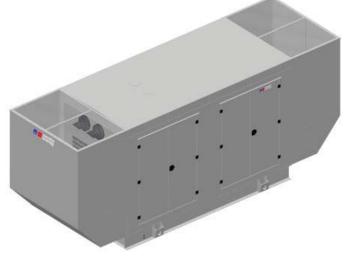
NOTE:

- Measurements with infinite exhaust connection
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

C/F = Consult Factory



60 Hz: 350-600 kW Standby / 325-550 kW Prime



Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDENTIFICATION						
Level 1	Weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 130 mph wind load rating. Enclosure consists of a bolted and welded construction with unit-mounted internal silencer included. Hinged, lockable double-door access on both sides of the enclosure.					
Level 2	Level 1 enclosure with exhaust scoop.					
Level 3	Level 2 enclosure with air intake scoop with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed in scoops and inside enclosure walls, where applicable.					

CERTIFICATIONS AND STANDARDS

- UL 2200
- CSA

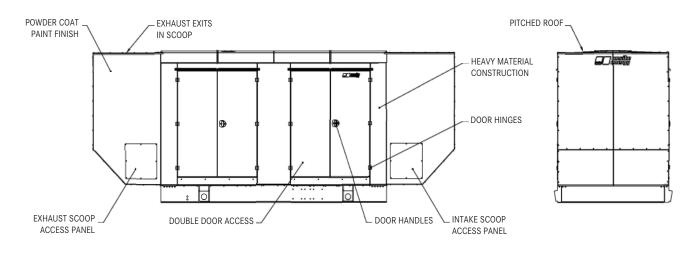
- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 130 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud and rain cap
- Rodent barriers

- IBC / OSHPD
- Scoop access panels and drain
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
 - Internal silencer (Critical grade or better)
 - Insulated or wrapped mufflers and exhaust pipes
 - Stainless steel flexible exhaust connections (where applicable)

ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD



60 Hz: 350-600 kW Standby / 325-550 kW Prime





OPTIONAL FEATURES

- Door restraints
- AC or DC light package
- Motorized / gravity louvers (where available)
- 190 mph wind rating
- For other custom options, please consult factory.

ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER OPU SOUND RATINGS dB(A) AT 1 METER ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

			1 Me	eter	7 Meters		
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3
60 Hz	MTU 8V1600 DS350	350 kW	109.3	98	91.6	84	73.5
Standby	MTU 8V1600 DS400	400 kW	109.6	98	91.5	85	73.4
	MTU 10V1600 DS450	450 kW	104	102.8	91	86.5	74.5
	MTU 10V1600 DS500	500 kW	106	102.8	91	86.6	74.9
	MTU 12V1600 DS550	550 kW	108.9	100.5	92.9	88	81.2
	MTU 12V1600 DS600	600 kW	109.9	100.5	92.8	89	81.5
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3
60 Hz	MTU 8V1600 DS350	325 kW	108	97	91.4	84	73
Prime	MTU 8V1600 DS400	365 kW	109.3	98	91.5	84	73
	MTU 10V1600 DS450	400 kW	C/F	101.8	90.7	86	74
	MTU 10V1600 DS500	450 kW	104	102.8	91	86.5	74.5
	MTU 10V1600 DS500 MTU 12V1600 DS550	450 kW 500 kW	104 107.6	102.8	91 92.8	86.5 88	74.5 81

²⁾ Measurement with infinite exhaust connection

ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD 60 Hz: 350-600 kW Standby / 325-550 kW Prime



NOTE:

- Measurements include exhaust noise
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

C/F = Consult Factory





Weatherproof Enclosure (pictured)*

ENCLOSURE LEVEL IDENTIFICATION						
Weatherproof Enclosure (WPE)Weatherproof enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels. Enclosure consists of a bolted and welded construction with factory-mounted external silencer or internal silencer where applicable. Hinged, lockable double-door access on both sides of the enclosure.						
Weatherproof (WPE) with Sound Attenuation Kit	Weatherproof enclosure with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls.					
Ultra Quiet Enclosure (UQE)	Weatherproof foamed enclosure with additional air intake and exhaust scoops for redirecting noise and air flow upward.					

CERTIFICATIONS AND STANDARDS

- UL 2200
- CSA

STANDARD FEATURES FOR ALL LEVELS

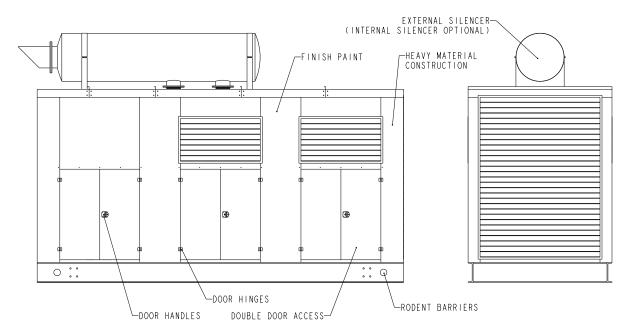
- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- Service access
 - Double door access gives ease of service to all components
- Rain shroud and rain cap
- Rodent barriers
- Scoop access panels

Hardware

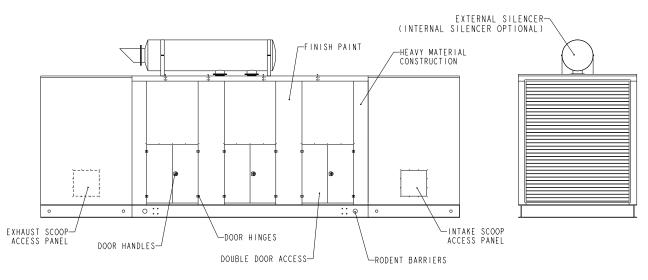
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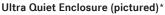
- Powder coated hinges with stainless steel pins
- Key-lockable and pad-lockable powder coated door handles
- Finish Paint: ANSI 61 Grey standard - Custom colors available upon request
- External silencer (Industrial grade or better)
 - Stainless steel flexible exhaust connections (where applicable)





Weatherproof Enclosure (pictured)*





OPTIONAL FEATURES

- Door restraints
- AC or DC light package
- Motorized / gravity louvers (where available)
- Internal silencer (Critical grade or better)
 - Insulated silencers
 - Stainless steel flexible exhaust connections (where applicable)
- For other custom options, please consult factory.



SOUND RATINGS dB(A) AT 7 METERS

Application	Model	Power Node	Weatherproof Enclosure (WPE)	Weatherproof (WPE) with Sound Attenuation Kit	Ultra Quiet Enclosure (UQE)
Standby	MTU 12V2000 DS650	650 kW	89	86.4	73.8
	MTU 12V2000 DS750	750 kW	89	86.4	73.8
	MTU 12V2000 DS800	800 kW	86.9	83.1	73.8
Prime	MTU 12V2000 DS650	615 kW	C/F	C/F	C/F
	MTU 12V2000 DS750	680 kW	C/F	C/F	C/F
	MTU 12V2000 DS800	725 kW	86	82.1	C/F

NOTE:

- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- · Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package
 - Infinite exhaust connection

Refer to the MTU Business Portal Acoustics Data for exhaust noise ratings.

C/F = Consult Factory

ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD



60 Hz: 1,000-1,250 kW Standby / 900 kW Prime



Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDE	ENCLOSURE LEVEL IDENTIFICATION						
Level 1	Weatherproof enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels. Enclosure consists of a bolted and welded construction with factory-mounted internal silencer. Hinged, lockable access doors on both sides of the enclosure.						
Level 2	Weatherproof enclosure with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls.						
Level 3	Weatherproof, foamed enclosure with additional air intake baffles and exhaust scoop redirecting noise and air flow upward.						

CERTIFICATIONS AND STANDARDS

- UL 2200
- CSA

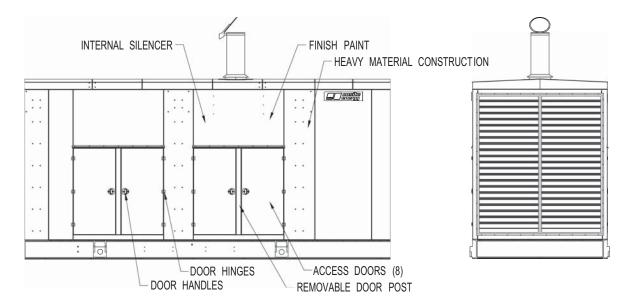
- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- Service access
 - Access doors with removable door posts give ease of service to all components.
- Heavy-duty door gasket
- Door restraints
- Rain shroud and rain cap

- Exhaust scoop access panel (where applicable)
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Finish Paint: RAL 7001 Silver Grey standard - Custom colors available upon request
- Internal silencer (Hospital grade) for all levels
 - Stainless steel flexible exhaust connections (where applicable)

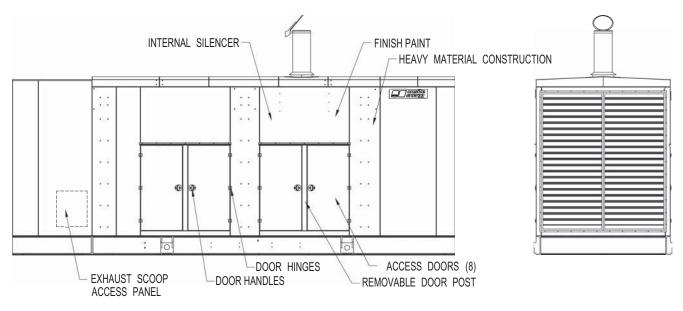
ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD



60 Hz: 1,000-1,250 kW Standby / 900 kW Prime



Level 1 and 2 Enclosure (pictured)*



Level 3 Enclosure (pictured)*

OPTIONAL FEATURES

- AC/DC LED light package
- Motorized intake louver
- Gravity exhaust louver
- Space heater

- 190 mph wind rating
- For other custom options, please consult factory.

ENCLOSURE AND SOUND DATA SHEET - DIESEL OPEN FIELD



60 Hz: 1,000-1,250 kW Standby / 900 kW Prime

ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER OPU SOUND RATINGS dB(A) AT 1 METER ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

			1 M	eter		7 Meters	
Application	Model	Power Node	Engine Exhaust	OPU ⁽²⁾	Level 1	Level 2	Level 3
Standby	MTU 16V2000 DS1000 (G06)	1,000 kW	121.8	105.5	92	86.4	74.7
	MTU 16V2000 DS1250 (G06)	1,250 kW	121.8	106.8	93	86	75
Application	Model	Power Node	Engine Exhaust	OPU ⁽²⁾	Level 3		
Prime	MTU 16V2000 DS1000 (G06)	900 kW	121.3	105.5	92	86	74.7
	ed engine exhaust noise	<u>.</u>			-		

⁽²⁾ Measurement with infinite exhaust connection

NOTE:

- Measurement includes exhaust noise
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- · Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

ENCLOSURE AND SOUND DATA SHEET - GAS OPEN FIELD 60 Hz: 30-40 kW Standby







Level 1 or 2 Enclosure (pictured)*

Level 3 Enclosure (pictured)*

ENCLOSU	RE LEVEL IDENTIFICATION
Level 1	Basic weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 190 mph wind load rating. Skid-mounted enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of the enclosure.
Level 2	Enhanced weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 190 mph wind load rating. Skid-mounted enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of enclosure. UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls where applicable.
Level 3	Level 2 enclosure with air exhaust scoop with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed where applicable.

CERTIFICATIONS AND STANDARDS

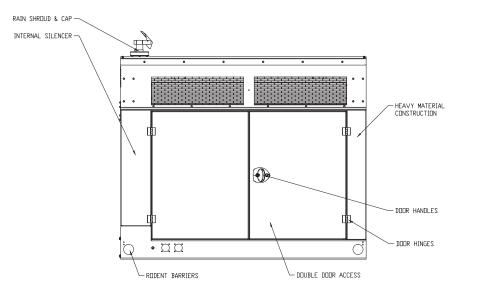
- UL 2200
- CSA

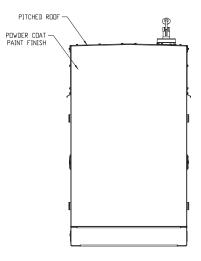
- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 190 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud and rain cap
- Rodent barriers
- Exhaust scoop access panel and drain

- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
 - Internal silencer (Level 1-3) or both internal and scoop mounted silencer (Level 3: 30 kW only)
 - Critical grade silencers
 - Insulated or wrapped silencers and exhaust pipes
 - Stainless steel flexible exhaust connection (where applicable)

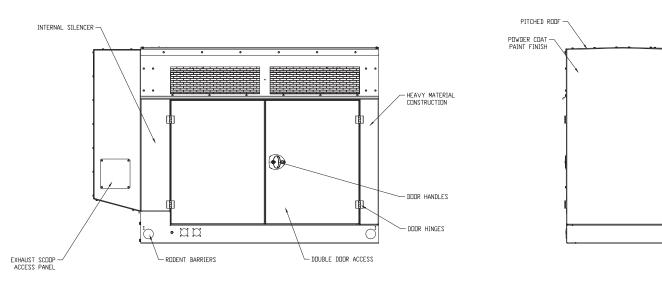
ENCLOSURE AND SOUND DATA SHEET - GAS OPEN FIELD 60 Hz: 30-40 kW Standby







Levels 1 and 2 Enclosure (pictured)*





OPTIONAL FEATURES (LEVELS 2 AND 3 ONLY)

- Door restraints
- LED light package
- Gravity exhaust louvers
- Distribution panel

- Enclosure space heater
- Motorized intake louvers
- For other custom options, please consult factory.

ENCLOSURE AND SOUND DATA SHEET - GAS OPEN FIELD



60 Hz: 30-40 kW Standby

ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER OPU SOUND RATINGS dB(A) AT 1 METER ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

			1 Meter						
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3		
Standby	MTU 4R0063 GS30	30 kW	108.5	85.6	71.5	70.3	64.1		
(Natural Gas)	MTU 4R0063 GS40	40 kW	94.5	84.1	70.7	67.5	61.8		
Application	Model	Power Node	Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3		
Standby	MTU 4R0063 GS30	30 kW	108.5	85.6	71.6	70.4	64.2		
(Liquid Propane)	MTU 4R0063 GS40	40 kW	94.6	84.2	70.8	67.6	61.9		
	⁽¹⁾ Undampened engine exhaust noise								

NOTE:

- Measurements include exhaust noise unless stated otherwise
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- · Generator set is tested on ground without spring isolators installed
- Sound pressure levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

C/F = Consult Factory







ENCLOSURE LEVEL IDE	ENCLOSURE LEVEL IDENTIFICATION						
Level 1	Enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels. Enclosure consists of a bolted and welded construction with factory-mounted external silencer or internal silencer where applicable. Hinged, lockable double-door access on both sides of the enclosure.						
Level 2	Level 1 enclosure with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls.						
Level 3	Enclosure designed for maximum sound attenuation with air intakes above doors and additional baffles to reduce noise. Exhaust scoops utilized for redirecting noise and air flow upward. Enclosure fully lined with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls.						

CERTIFICATIONS AND STANDARDS

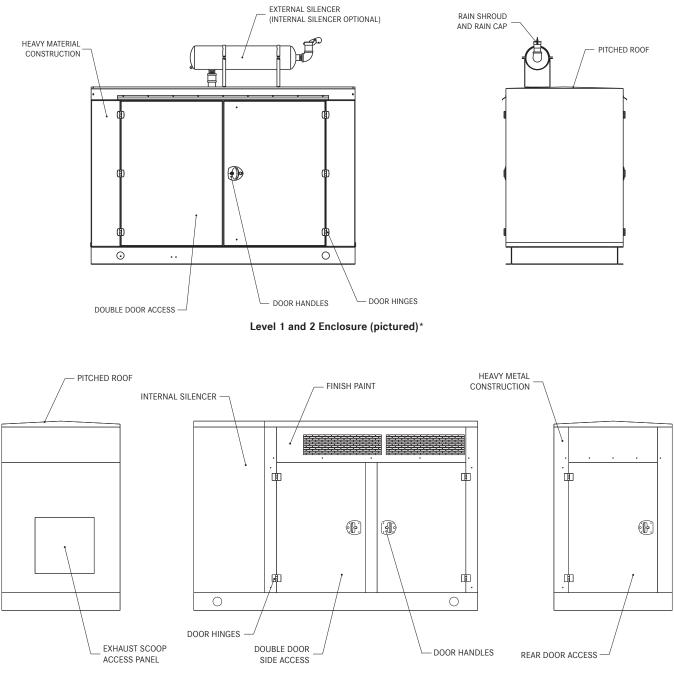
- UL 2200
- CSA

- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- Service access
 - Multiple door access gives ease of service to all components
- Rain shroud and rain cap
- Rodent barriers

- Scoop access panels (where applicable)
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
- External or internal silencer
 - Stainless steel flexible exhaust connections

ENCLOSURE AND SOUND DATA SHEET - GAS 60 Hz: 60 kW Standby





Level 3 Enclosure (pictured)*

OPTIONAL FEATURES

- Door restraints
- LED light package
- Motorized / gravity louvers (where available)
- Enclosure space heater
- For other custom options, please consult factory.



SOUND RATINGS dB(A) AT 7 METERS

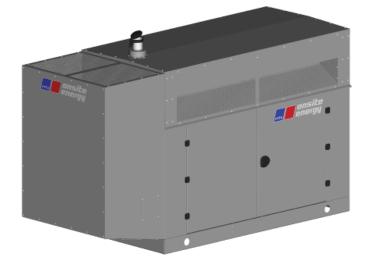
Application	Model	Power Node	Level 1	Level 2	Level 3
Standby (Natural Gas)	MTU 8V0071 GS60	60 kW	C/F	C/F	C/F
Standby (LP)	MTU 8V0071 GS60	60 kW	C/F	69.4	59

NOTE:

- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package
 - Infinite exhaust connection

C/F = Consult Factory





Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDENTIFICATION				
Level 1	Skid-mounted weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 190 mph wind load rating. Enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of the enclosure.			
Level 2	Level 1 enclosure with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls.			
Level 3	Level 1 enclosure with air exhaust scoop with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed in scoop only.			
Level 3 with Housing Sound Attenuation Kit	Level 3 enclosure with 1.5" thick sound attenuated foam insulation installed inside enclosure walls.			

CERTIFICATIONS AND STANDARDS

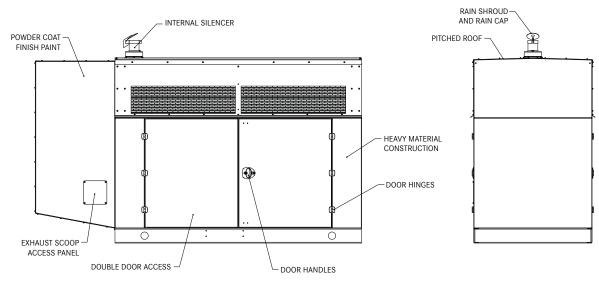
- UL 2200
- CSA

- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 190 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud and rain cap
- Rodent barriers

- Exhaust scoop access panel and drain
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
- Internal silencer (Critical grade or better)
 - Insulated silencer
 - Stainless steel flexible exhaust connections (where applicable)

ENCLOSURE AND SOUND DATA SHEET - GAS 60 Hz: 75-125 kW Standby





Level 3 Enclosure (pictured)*

OPTIONAL FEATURES

- Door restraints
- LED light package
- Motorized / gravity louvers (where available)

SOUND RATINGS dB(A) AT 7 METERS

- Enclosure space heater
- For other custom options, please consult factory

Application	Model	Power Node	Level 1	Level 2	Level 3	Level 3 with Housing Sound Attenuation Kit
Standby (Natural Gas)	MTU 10V0068 GS75	70 kW	73	71.8	67.8	61.5
	MTU 10V0068 GS100	100 kW	76.8	72.8	70.5	62.8
	MTU 10V0068 GS125	125 kW	79.6	79.4	74.7	67.1
Standby (Liquid Propane) -	MTU 10V0068 GS75	75 kW	73.3	72	68.1	61.6
	MTU 10V0068 GS100	100 kW	75	72.3	70.5	62.9
	MTU 10V0068 GS125	125 kW	79.6	79.2	74.3	67.6

NOTE:

- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- · Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- · Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package
 - Infinite exhaust connection
- * **Note**: Visual appearance may differ between power nodes.

ENCLOSURE AND SOUND DATA SHEET - GAS 60 Hz: 150-200 kW Standby / 130-175 kW Prime





Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDENTIFICATION					
Level 1	Weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 130 mph wind load rating. Enclosure consists of a bolted construction with factory-mounted internal or external silencer. Hinged, lockable double-door access on both sides of the enclosure.				
Level 2	Level 1 enclosure with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls.				
Level 3	Level 2 enclosure with air intake and exhaust scoops with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam.				

CERTIFICATIONS AND STANDARDS

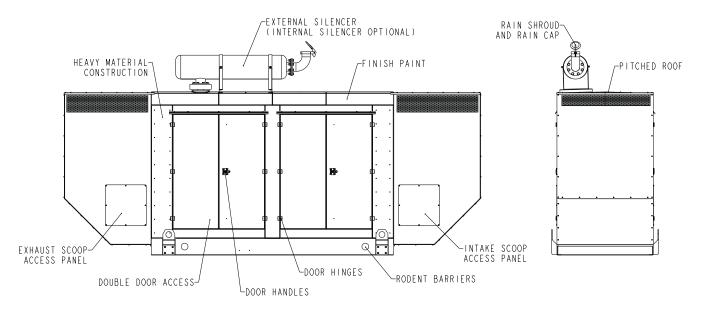
- UL 2200
- CSA

- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 130 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud and rain cap
- Rodent barriers

- Scoop access panels and drain
- Hardware
 - Powder coated hinges with stainless steel pins
 Key-lockable and pad-lockable powder coated
 - door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
- External silencer (Industrial grade or better)
 Wrapped exhaust pipes and catalyst
 - Stainless steel flexible exhaust connections (where applicable)

ENCLOSURE AND SOUND DATA SHEET - GAS 60 Hz: 150-200 kW Standby / 130-175 kW Prime





Level 3 Enlosure (pictured)*

OPTIONAL FEATURES

- Door restraints
- AC or DC light package
- Motorized / gravity louvers (where available)
- Internal silencer (Critical grade)
 - Insulated or wrapped silencers, catalyst, and exhaust pipes
 - Stainless steel flexible exhaust connections (where applicable)

SOUND RATINGS dB(A) AT 7 METERS

Application	Model	Power Node	Level 1	Level 2	Level 3
Standby (Natural Gas)	MTU 6R0135 GS150	150 kW	79	77.3	70.4
	MTU 6R0185 GS200	200 kW	84.1	82.8	71.4
Standby (Liquid Propane)	MTU 6R0135 GS150	100 kW	78	77.8	70
	MTU 6R0185 GS200	130 kW	83.9	83.1	71.6
Prime (Natural Gas)	MTU 6R0135 GS150	130 kW	78.7	77.5	70.3
	MTU 6R0185 GS200	175 kW	84.7	82.8	71

• For other custom options, please consult factory.

ENCLOSURE AND SOUND DATA SHEET - GAS 60 Hz: 150-200 kW Standby / 130-175 kW Prime



NOTE:

- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package
 - Infinite exhaust connection
- * **Note**: Visual appearance may differ between power nodes.

ENCLOSURE AND SOUND DATA SHEET - GAS 60 Hz: 260-400 kW Standby / 235-355 kW Prime





Level 3 Enclosure (pictured)*

ENCLOSURE LEVEL IDENTIFICATION				
Level 1	Weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 130 mph wind load rating. Enclosure consists of a bolted construction with factory-mounted external. Hinged, lockable double-door access on both sides of the enclosure.			
Level 2	Level 1 enclosure with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure walls.			
Level 3	Level 2 enclosure with exhaust scoop with UL 94 HF-1 compliant, 1.5" thick sound attenuated foam. Internal silencers available.			

CERTIFICATIONS AND STANDARDS

- UL 2200
- CSA

STANDARD FEATURES FOR ALL LEVELS

- Heavy material construction
 - Steel Enclosure: 1.9 mm (0.075 in) 14 gauge or greater thickness
 - Aluminum Enclosure: 2.3 mm (0.09 in) or greater thickness
- 130 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud and rain cap
- Rodent barriers
- Scoop access panels and drain

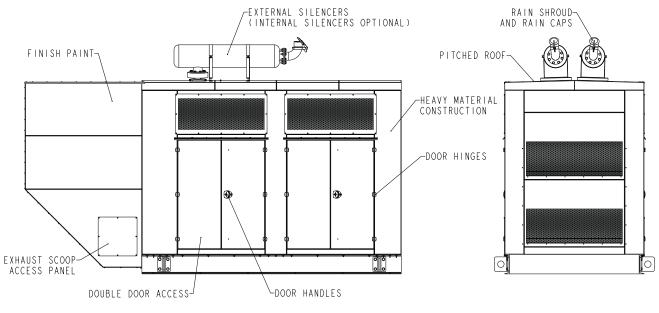
Hardware

•

- Powder coated hinges with stainless steel pins
- Key-lockable and pad-lockable powder coated door handles
- Powder Coat Finish Paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
- External silencer (Industrial grade or better)
 - Stainless steel flexible exhaust connections (where applicable)

ENCLOSURE AND SOUND DATA SHEET - GAS 60 Hz: 260-400 kW Standby / 235-355 kW Prime





Level 3 Enclosure (pictured)*

OPTIONAL FEATURES

- Door restraints
- AC or DC light package
- Motorized / gravity louvers (where available)
- Internal silencer (Critical grade)
 - Insulated or wrapped silencers, catalyst, and exhaust pipes
 - Stainless steel flexible exhaust connections (where applicable)

SOUND RATINGS dB(A) AT 7 METERS

Application	Model	Power Node	Level 1	Level 2	Level 3
Standby (Natural Gas)	MTU 8V0183 GS260	260 kW	80.6	80.1	72.7
	MTU 10V0183 GS350	350 kW	83.9	80.9	73.9
	MTU 12V0183 GS400	400 kW	83.9	81.4	73.6
Standby (Liquid Propane)	MTU 8V0183 GS260	160 kW	81.2	80	72.9
	MTU 10V0183 GS350	245 kW	83.7	80.8	74.5
	MTU 12V0183 GS400	295 kW	83.7	81.3	75.1
Prime (Natural Gas)	MTU 8V0183 GS260	235 kW	80.6	80	72.8
	MTU 10V0183 GS350	300 kW	83.8	80.8	72.3
	MTU 12V0183 GS400	355 kW	83.6	81.2	73

- 190 mph wind rating
- For other custom options, please consult factory.

ENCLOSURE AND SOUND DATA SHEET - GAS 60 Hz: 260-400 kW Standby / 235-355 kW Prime



NOTE:

- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability
- Generator set is tested on level ground without spring isolators installed
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package
 - Infinite exhaust connection
- * **Note**: Visual appearance may differ between power nodes.

LED ENCLOSURE LIGHTING Data Sheet



MTU Onsite Energy's ideal lighting solution for generator enclosures is a general purpose LED light. It capitalizes on the intense brightness of LEDs, while using a fraction of the electrical current required for standard incandescent lights. In the event that utility power is disrupted, the generator set starting battery will power the LED light bar. If battery cables are disconnected for scheduled maintenance or other reasons, the lights will operate from AC to DC power supply. The changeover from one power source to the other takes place automatically with no disruption in illumination.



FEATURES

- Low-profile, space-saving design
- Rugged, water-resistant environmental rating
- Clear, shatterproof lens for maximum brightness
- European-style wiring uses daisy chain connections to power multiple lights (up to four lights in series)
- Bright, closely-spaced LEDs enhance light quality
- Automatic temperature protection built into the unit
- Momentary pushbutton switch activates time delay; lights turn off automatically
- Adjustable time delay is factory set for 30 minutes
- Standard AC and DC power supplies
 - Best source selector uses whichever power source is available
 - System starting battery for DC power
 - High efficiency, regulated power supply for AC to DC power
- Sturdy aluminum housing

SPECIFICATIONS

LED Light Bar

Electrical Characteristics

- Operating voltage 12 to 30 VDC
- Typical current 0.66 A at 12 VDC
- 0.30 A at 24 VDC
- Maximum current 0.8 A
- Supply protection circuitry Protected against reverse polarity and transient voltages

Light Characteristics

- Lumen output 650 (± 5%) per light bar, typical at 25 °C (77 °F)
- Luminous efficacy 90 lumens/watt typical at 24 VDC at 25 °C (77 °F)
 - Lighted length 285 mm (11.2 in)
- Color Cool White
- LED Lifetime Lumen output will decrease less than 30% after 50,000 hours

Environmental Rating

- IEC IP67 / IP69K per DIN 40050
- NEMA 6



LED ENCLOSURE LIGHTING Data Sheet



Pushbutton Switch

- Industrial pilot duty
- Flush 22 mm (0.87 in) green-colored button cap

DC Power Supply

- Fuse Automotive blade-type
- Voltage rating
 12 or 24 VDC nominal
- Fuse current rating 3 A max

AC to DC Power Supply

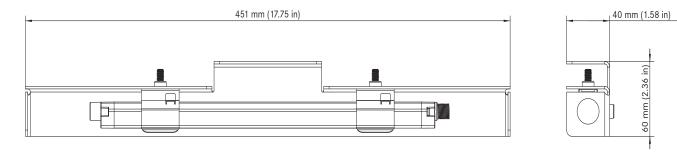
- Input voltage
 100 to 240 VAC
- Input frequency
 45 to 65 Hz
- Input current
 1 A max
- Output voltage 12 VDC
- Output current
 4.6 A

Best Source Selector

• Blocking diodes Type 1N5408

Time Delay Relay

- Activated by pushbutton switch
- Adjustable from 6 to 60 minutes in 10% increments



LED Enclosure Lighting Dimensions

MTU Onsite Energy A Rolls-Royce Power Systems Brand

GENERATOR SET ENCLOSURE HEATER Data Sheet

DESCRIPTION

The generator set enclosure heater is quiet, reliable, space-saving, and surface-mounted. It features a wide range of wattage options that can be customized to the generator set heating requirements and environmental conditions.

FEATURES

- Squirrel cage blower
- 20 gauge steel construction
- Multiple wattages

SPECIFICATIONS

- MTU Onsite Energy Part #: XG3006100004
- Electrical Ratings:

XG3006100004 Supply Voltage: 120 V, 60 Hz Supply Current: 2.1 - 12.6 Amps Output: 250 - 1,500 Watts

A tangential cylindrical blower, delivering 75 CFM

- Blower and Motor:
- Driven by C-frame type motor
- Shaded pole
- Permanently lubricated
- Impedance protection
- Sealed bearings
- Same voltage as heater
- Environmental:
- Elements:
 - Assembly consists of three steel-sheathed heating tubes in a furnace-brazed, plate-finned, block design
 - Sheath tubes contain coiled nichrome wire embedded in an insulator of magnesium oxide

For use in a weather-protected location.

- Element assembly provides a minimum of six possible wattage configurations
- Heater is factory wired for 1,500 watts
- Heater Controls:
 - Thermal Protection
 - Heater is equipped with thermal overload protection. If thermal overload trips due to abnormal
 operating temperatures, the thermal overload remains open until manually reset by turning the heater
 or thermostat off for 15 minutes.
 - Thermostat
 - Adjustable single-pole, single-throw thermostat is included
 - Automatic Shutoff
 - A dedicated relay provided in the MTU Onsite Energy control panel turns off the heater automatically when the generator set is running.

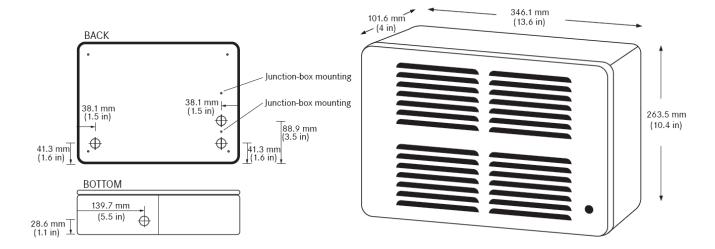
CERTIFICATIONS AND STANDARDS

c-UL-us Listed



GENERATOR SET ENCLOSURE HEATER Data Sheet







GROUND FAULT CONVENIENCE RECEPTACLE Data Sheet

DESCRIPTION

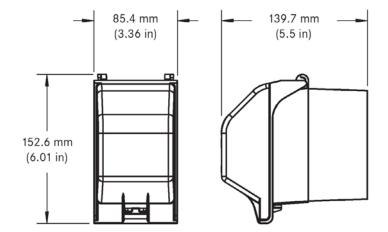
Convenience receptacles provide a 20 Amp Ground Fault Circuit Interrupter (GFCI) receptacle mounted in a weatherproof box including a weatherproof cover, located adjacent to the generator set control panel.

FEATURES

- Limits improper access to energized contacts
- Patented tamper-resistant protection
- Patented self-test diagnostics
- Power indication
- Ground fault indicator
- Open circuit condition eliminates false assumption of protection at face
- Durable, polyester face with V-0 flammability rating
- Vertical latching receptacle cover prevents accidental equipment disconnects
- Box and cover die cast aluminum construction and industrial design provide a rugged and protective enclosure for receptacle

CERTIFICATIONS AND STANDARDS

- Receptacle: c-UL-us Listed
- Box and Cover: UL Listed and CSA Certified



Convenience Receptacle Box and Cover Dimensional Diagram



mtu

FUEL SYSTEM Dual Valve Gas Solenoid Data Sheet



There are two primary types of valves. Valve 1 features two normally closed safety shutoff valves in one housing, as well as a maximum flow adjustment. Valve 2 features two normally closed safety shutoff valves with a gas pressure regulator in one housing. Both valve types are used in single and dual fuel systems to regulate the flow of gaseous fuels to generator systems, and are also fast opening and fast closing.

CERTIFICATIONS AND STANDARDS

All models are:

- CSA Certified
- UL Recognized

PART NUMBER LIST

12 Volt Systems	24 Volt Systems
SUA102426	SUA102427
SUA102428	SUA102429
	SUA97687

SPECIFICATIONS

	Valve 1	Valve 2
Part Numbers	SUA97687	SUA102426, SUA102427, SUA102428, and SUA102429
Gases	Natural Gas, Propane	Natural Gas, Propane
Maximum Operating Pressure	5 psi	5 psi
Maximum Close-Off Pressure	C/F	7 psi
Ambient Temperature	5 °F to 140 °F	-40 °F to 140 °F
Cycle Rate	C/F	60 Cycles/Hour
Operating Time	100% Duty Cycle	100% Duty Cycle
Valve Construction		
Housing	Aluminum, Steel	Aluminum, Steel
Seal on Valve Seats	NBR-based rubber	NBR-based rubber
Valve Response Time		
Opening Time	Less than 1 second	Less than 1 second
Closing Time	Less than 1 second	Less than 1 second

SUPPLEMENTAL HARDWARE

Valve	1 1/2" Flange	2" Flange	Gas Pressure Switch
SUA97687	N/A	SUA97686	N/A
SUA102426	SUA91990	SUA91991	SUA91987
SUA102427	SUA91990	SUA91991	SUA91987
SUA102428	SUA91992	N/A	SUA91987
SUA102429	SUA91992	N/A	SUA91987

FUEL LIFT PUMP Data Sheet



DESCRIPTION

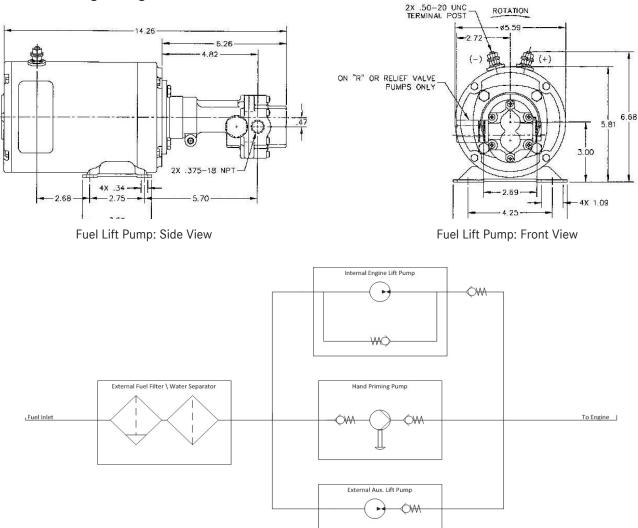
The MTU Onsite Energy-supplied auxiliary fuel lift pump is comprised of a rotary gear pump head coupled to an electric motor. The 24 VDC permanent magnet motor is rated at 1/4 HP. The pump head features a bronze design with 303 stainless steel shafts, Viton lip seals, and an integral relief valve.* The recommended liquid temperature range is from -40 °F to 300 °F.**

This auxiliary fuel lift pump is capable of lifting 20 ft of water when in new condition. For optimum performance, suction lines should be kept as short as possible. When drawing from distances over 3 ft, the suction lines should be sized a minimum of one or two sizes larger than the pump inlet ports.

SPECIFICATIONS

- MTU Onsite Energy Part Number: SUA104114
- · Bronze and stainless steel wetted components
- Viton lip seals
- Self-lubricating bearings

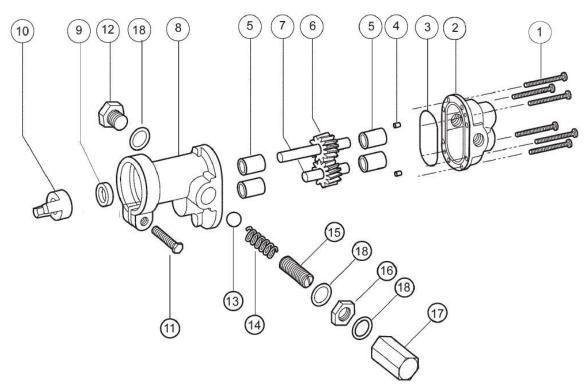
- 24 VDC, 1/4 HP electric motor
- 3/8" NPT ports
- Built-in relief valve



Fuel Lift Pump: Schematic

- * The integral relief valve is designed as a safety against overpressurization and is not intended for continuous duty. Use in continuous duty will cause the pump to overheat.
- ** Liquids should not be allowed to freeze in the pump as this can cause pump damage.





Fuel Lift Pump: Exploded View

PARTS LIST

Each item in the Parts List below corresponds to its number in the diagram above.

Item #	Description	Quantity
1	Screw	6
2	Body	1
3	O-Ring	1
4	Dowel Pin	2
5	Bearing	4
6	Drive Gear Assembly	1
7	Idle Gear Assembly	1
8	Cover	1
9	Lip Seal	1

Item #	Description	Quantity
10	Coupling	1
11	Screw	1
12	Plug Nut	1
13	Ball	1
14	Spring	1
15	Adjustment Screw	1
16	Locknut	1
17	Bypass Nut	1
18	Fiber Washer	3

GASEOUS FUEL SYSTEM Fuel System Specifications Data Sheet



MTU Onsite Energy has developed a custom fuel system using common gaseous fuel system components that features a state-of-the-art Engine Control Module (ECM) which has the latest technology available incorporated.

As today's emissions regulations get stricter on engines, other solutions are necessary to comply. This is accomplished with the new MTU Onsite Energy gaseous generator sets by using a closed loop fuel system utilizing sequential ignition and after treatment (where required). This system is capable of detecting engine faults and protecting itself from harm while also alerting the user with a Malfunction Indicator Light (MIL) through the digital generator set controller. The ECM communicates with the controller to allow a fully integrated system sharing necessary information between components reducing additional sensors. The MTU Onsite Energy fuel system is adept to operating conditions and changes parameters based on its surroundings for variables such as barometric pressure and intake air temperature. Knock sensing is also a built-in function to the fuel system allowing peak power for the environmental conditions of the unit when this protection is deemed necessary.

The MTU Onsite Energy fuel system utilizes a Windows[®]-based interface for viewing the engine parameters along with diagnostic tools for determining component failures, allowing quick solutions in the field.

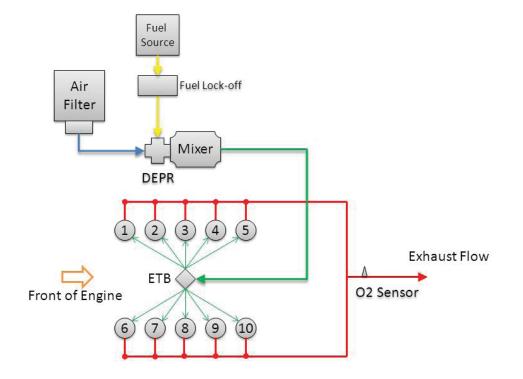
PRODUCT HIGHLIGHTS

MTU Onsite Energy fuel system capabilities include (but are not limited to):

- CAN J-1939 for full communication with the digital generator set controller amongst other devices capable of reading CANBus signals
- Closed Loop Lambda Control for EPA Compliance
- Sequential Ignition System
- Electronic Governing
- Controls engines up to 10 cylinders
- Electronic Fuel Lock-Off Control
- Built-In Engine Data Logger
- Built-In Engine Protection from engine faults
- Every fuel system pre-programmed for single fuel operation on both NG or LPG fuel
- Active Knock Control (where applicable)

GASEOUS FUEL SYSTEM Fuel System Specifications Data Sheet





Fuel System Overview Diagram (10V shown)

**DEPR = Digital Electronic Pressure Regulator

FUEL SYSTEM Single Valve Gas Solenoid Data Sheet



Internal pilot operated solenoid valve used to control the flow of fuel gases in generator systems. This compact valve design exceeds flow requirements and is also capable of withstanding temperatures as low as -40 °F.

DESCRIPTION

- Unique double disc design with overtravel provides redundant sealing for leak tight shutoff
- For on-off control of fuel gas
- 1/8" NPT pipe taps with plugs for routine testing

VALVE CONSTRUCTION

Valve Part Materials			
Body	Aluminum		
Seals and Disc	NBR		
Core Tube	305 Stainless Steel		
Core Guide	Acetal		
Rider Ring	PTFE		
Core and Plugnut	430F Stainless Steel		
Springs	302 Stainless Steel		
Shading Coil	Copper		
Pipe Plug	Zinc-Plated Steel		

ELECTRICAL

Standard Coil and Class of Insulation	В
DC Watts	14.9

VALVE RESPONSE TIME

Opening Time	Less than 1 second
Closing Time	Less than 1 second

APPROVALS

UL Listed to standard 429 "Electrically Operated Valves" Guide YIOZ, File MP618 Safety Shutoff Valves.

CSA Certified to:

- 1. Standard C22.2 No. 139 "Electrically Operated Valves", File 010381
- 2. Automatic Gas Valves Z21.21 (6.5), C/I, File 112872
- 3. Automatic Gas Safety Shutoff Valves (3.9), File 112872

NPT	Voltage	Part Number
3⁄4''	12	SUA46013
1"	12	SUA46021
1 1/2"	12	SUA86725
1 1/2"	24	SUA87895
2"	24	SUA86726

MTU Onsite Energy A Rolls-Royce Power Systems Brand

FUEL SYSTEM Sub-Base Tank Data Sheet



MTU Onsite Energy's sub-base fuel tanks are manufactured and listed per UL142 and ULC-S601 standards for steel above-ground tanks. These certifications assure that our tanks meet the structural and mechanical integrity requirements for mounting generator sets directly on top, providing our customers with a safe and efficient fuel storage system. These tanks are suitable for above-ground storage of non-corrosive, stable, flammable, or combustible liquids that have a specific gravity not exceeding that of water. They are intended for installation and use in accordance with the codes referenced in the *Certifications and Standards* section. The secondary containment construction consists of a steel tank within a closed steel containment dike that is capable of being monitored for leakage.



STANDARD FEATURES

- Fuel fill drop tube
- Normal vent
- Emergency vent
- Manual fill
- Lockable fill cap
- Level alarm
- Basin drain (plugged)
- Removable supply and return dip tubes
- Leak detection
- Black paint finish
- Secondary containment
- · Electrical stub-up area: Provides space for generator set electrical connections and internal wiring capabilities
- Baffles: Separates cold engine supply fuel from hot returning fuel (additional baffling as required for structural integrity)
- Fuel level gauge: A direct-reading fuel level gauge with electric sender

OPTIONAL FEATURES

- High fuel pre-alarm and low fuel level shutdown
- Five-gallon spill/fill containment box with lockable hatch
- Fuel tanks to meet local jurisdictions/codes
- IBC Certification 2006, 2009, and 2012



CERTIFICATIONS AND STANDARDS

United States

- UL 142
- NFPA 30
- NFPA 37
- NFPA 110
- International Fire Code

OPTIONAL REGIONAL CODE KITS

Canada

- ULC-S601
- Part 4: National Fire Code of Canada
- CSA B139
- CSA C282
- CCME PN 1326

MTU Onsite Energy offers pre-engineered kits that can be added to sub-base fuel tanks on 30-600 kW generator sets. These kits meet the regional codes for listed counties and states. Reference the table on page 3 for the contents of each code kit.

FUEL SYSTEM Sub-Base Tank Data Sheet



								Code	Code Kit Contents	ntents								
	Aud	Audible and ¹	Visual Alarm					F	F	F					F	Extended	F	
Code Jurisdiction	Low Fuel Switch (50%)	High Fuel Switch (90%)	Critical High Switch (95%)	Fuel Alarm Panel	Fuel Fill Spill Containment (5 Gallon)	Prevention Valve (OFPV) (95%)*	Fire Rated Fuel Lines	Camlock Fill	Hazmat Label	Vent Whistle	Regional Labeling	Fuel Fill Drop Tube	Supply Check Valve	Supply Ball I Valve	Tank Risers**	Vents (12 ft above grade)	Fuel Leak Switch	IBC (Optional)
California	×	×		×	×	×		×	×			×	×			×	×	×
Colorado	×	×		×	×	×		×	×			×	×		×	×	×	×
Dallas, TX		×		×	×	×			×			×	×			×	×	×
Denver, CO	×	×		×	×	×		×	×			×	×			×	×	×
Florida (FDEP)		×		×	×	×		×	×		×	×	×		×		×	×
Georgia	×	×		×	×	×		×	×			×	×			×	×	×
Georgia (GEFA)	×	×		×	×	×		×	×			×	×			×	×	×
IFC 2003 / 2006 / 2009	×	×		×	×	×		×	×			×	×			×	×	×
lowa	×	×		×	×				×			×	×				×	×
King County, WA	×	×	×	×	×	×		×	×			×	×			×	×	×
Maryland	×	×		×	×	×		×	×			×	×				×	×
Massachusetts	×	×		×	×				×			×	×				×	×
Michigan		×		×	×	×	×	×	×		×	×	×		×	×	×	×
Montana		×		×	×	×			×			×	×		×		×	×
Nassau, NY	×	×		×	×	×		×	×			×	×		×	×	×	
Nebraska	×	×		×	×				×			×	×				×	×
New Hampshire			×	×	×	×			×			×	×	×			×	×
North Carolina	×	×		×		×		×	×			×	×				×	×
Ohio	×	×		×	×	×		×	×			×	×				×	×
Oklahoma	×	×	×	×	×	×		×	×			×	×		×	×	×	×
Ontario	×	×		×	×	×		×	×	×	×	×	×			×	×	×
Phoenix, AZ	×	×		×		×		×	×			×	×			×	×	×
San Francisco, CA	×	×		×	×	×		×	×			×	×			×	×	×
Suffolk, NY	×	×		×	×	×	×	×	×			×	×		×	×	×	
Washington	×	×		×	×	×		×	×			×	×			×	×	×
Wisconsin	×	×		×	×	×		×	×			×	×				×	x
 * Percentage may vary due to tank construction. * Risers meet minimum code requirements. Note: Verify regional code requirements prior to specification. 	lue to ta recode re de requi	ink cons equirem irement:	truction ents. s prior to	, specif	cation.													

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MTU Onsite Energy

A Rolls-Royce Power Systems Brand

1 - D 510 voltage regulator for alternators with SHUNT - AREP or PMG excitation

The D510C is a digital voltage regulator, which monitors and regulates the alternator output voltage. It is designed for alternators with SHUNT, AREP or PMG excitation.

The D510C is an AVR which can be configured using the Easyreg[®] software.

- There are 4 possible regulation modes:
- Voltage, P.F., kVA, manual

A.V.R. D510C

- The I/O can be configured:
 - 2 x I: analog
 - 1 x O: analog
- 2 x I: digital
- 3 x O: digital
- 1 dry contact
- 1 USB port
- DB9 plug for CAN

It complies fully with the requirements of IEC standard 60034-1 and UL 708 and CSA certifications.

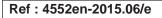
2 - Operating range

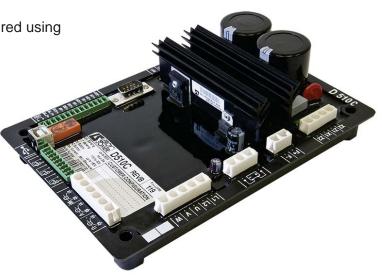
► L	.SA 40 🕨	42.3 🕨	44.3 🕨	46.3 🕨	47.2 🕨	49.3 🕨	50.2 🕨	51.2 🕨	53.1 🕨	54	
Shunt/AREP or PMG						\checkmark					_

3 - Main functions and characteristics

- Voltage regulation: ± 0.25%
- Function: regulation of voltage, PF, kVAR and manual regulation
- Response time depending on PID settings
- Rated field current 6 A
- Maximum field current: 15 A/10 s
- Power supply range for voltage sensing: up to 530 V
- Protection:
 - Short-circuit / Loss of voltage reference / Overvoltage / Overexcitation / High Temperature /
 - Speed drop / Diode fault / Stator current unbalance / Current limitation
- Engine assistance
 - Soft start : 0 100 s
 - U/F adjustable from 0.5 to 3 in increments of 0.1

 - Gradual increase: 0.1 to 30 s/Hz
- Grid code function





Leroy-Somer

A.V.R. D510C

4 - Conditions of use

- Operating temperature: 40°C to + 65°C
- Storage temperature: 55°C to + 85°C
- Shocks on the base: 9 g depending on the 3 axes
- Vibrations:
 - Less than 10 Hz : 2 mm half-peak amplitude
 - 10 Hz to 100 Hz : 100 mm/s
- Above 100 Hz: 8 g

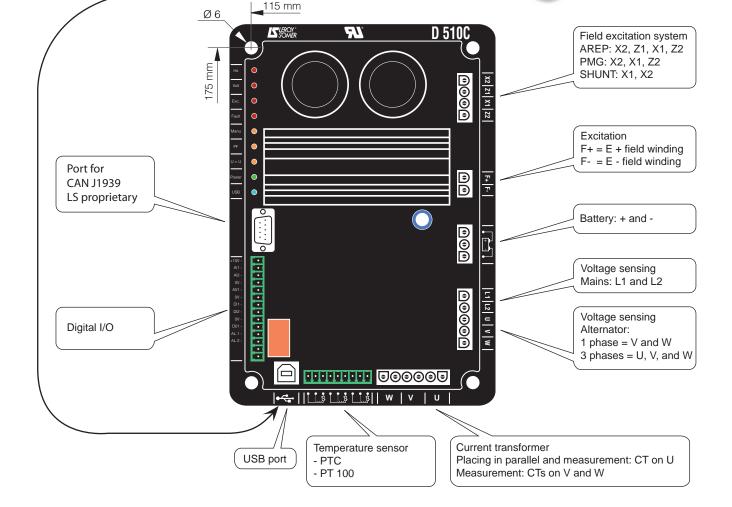


The AVR is set using the Easyreg[®] software.

- This can be used to:
 - Set the AVR parameters
 - Configure the inputs and outputs
 - Display faults and parameter measurements



Leroy-Somer





DVR[®]2000E+

Digital Voltage Regulator

Advanced Features

CAN Bus Communication

Allows for the integration of the DVR®2000E+ as a node on a CAN Network for the purpose of controlling or monitoring regulator performance.



True RMS Single and Three Phase Voltage Sensing

Connect in the sensing mode you prefer. Sense 100 to 600 Volts ±10% at 50 or 60 Hz.

True Three Phase Power Monitoring

Additional CT inputs enable you to sense current on all three phases.

Generator Soft Start

Controlled increase to rated voltage limits overshoot during voltage buildup in AVR regulation modes.

Frame Specific PID Selection

Tuning your regulator for your Marathon Electric generator has never been easier. Simply select the appropriate frame size and your gains are set.

Four Digit HMI Display

Whether you are changing settings or monitoring regulator status, this display provides a more intuitive feedback.

Expandable Platform

Paves the way for adding features like shunt power capability and RTD monitoring through expansion modules.

DVR[®]2000E+ Specifications

Voltage Regulation – 0.25% over load range at rated power factor and constant generator frequency.

Output Power – 75 Vdc, 3.0 Adc continuous rating and 150 Vdc, 7.5 Adc forcing capability for one minute.

Exciter Field DC Resistance – 18 to 25Ω range

Voltage Adjustment – Minimum if ±10% of nominal voltage range. Remote adjustment can be made up to 150 feet from voltage regulator.

Input Power – 180 to 240 Vac, 250 to 300 Hz PMG power supply

Operating Temperature – From -40°C to +70°C (-40°F to +158°F)

Storage Temperature – From -40° to $+85^{\circ}$ (-40°F to $+185^{\circ}$ F)

Ingress Protection – IP52 (front side mounted in conduit box); IP10 (rear side with protective cover)

Shock – 20 Gs in 3 perpendicular planes

Vibration -1 G at 5 to 26 Hz; 0.050" double amplitude (27 to 52 Hz); 7 Gs at 53 to 500 Hz

Weight – 3 lb. (1361 g)

Humidity Testing – Per MIL-STD-705B, Method 711-D

Salt Fog Testing – Per MIL-STD-810E

CAN Protocol – SAE J1939

Regulator Sensing – 100 to 600 Vac, 50/60 Hz, 1-phase/3-phase

EMI Compatibility

Immunity Meets EN 61000-6-2: 2005 Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments. <u>Emission</u> Meets EN 61000-6-4: 2007 Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments

EMI Compatibility Tests

Immunity Electrostatic Discharge (ESD): IEC 61000-4-2 Radiated RF: IEC 61000-4-3 Electrical Fast Transient (EFT) / Burst: IEC 61000-4-4 Conducted RF: IEC 61000-4-6 Power Frequency and Magnetic Field: IEC 61000-4-8 <u>Emmision</u> Radiated RF: EN 61000-6-4: 2007, 30 MHz to 1000 MHz

This regulator meets MIL-STD-461C, Part 9 for radiated and conducted emissions and radiated susceptibility when mounted in the generator conduit box.



Marathon Electric Manufacturing Corp. P.O. Box 8003 Wausau WI 54402-8003 USA www.marathonelectric.com Phone: 715-675-3359 Fax: 715-675-8026

VOLTAGE REGULATOR MAVC63-4 Data Sheet

Rugged and reliable, the MAVC63-4 analog voltage controller regulates voltage on 50 or 60 Hz brushless generators. The controller includes frequency compensation, over-excitation shutdown, solid-state buildup circuitry, and electromagnetic interference (EMI) filtering.

FEATURES AND BENEFITS

- · Integrated circuitry for compact size, simplicity and high reliability
- Rugged and durable with fast response
- Regulation accuracy better than ±1% no-load to full-load
- Exciter field current 4A continuous, 7A forcing
- Voltage regulation performance is constant over operating temperature range without derating or degradation
- Potted design allows installation in harsh environments
- Reliable and rugged construction reduces service calls
- Volts-per-Hertz limiting, over-excitation shutdown, and external voltage adjustments allow the MAVC63-4 to work with most applications
- Compact size for easy installation in most generator terminal boxes
- Designed for simple voltage regulation adjustments

SPECIFICATIONS

MTU Onsite Energy Part Number SUA77199

Input Power (Single Phase)

 Range:
 190 to 240 Vac, ±10%

 Frequency:
 50/60 Hz, ±10%

 Burden:
 500 VA

Sensing Input (Single Phase)

(Common with input power) Range: 190 to 240 Vac, ±10% Frequency: 50/60 Hz, ±10%

Regulation Accuracy

Better than ±1%, no-load to full-load

EMI Suppression

Internal EMI filtering

Voltage Buildup

Automatic voltage buildup occurs for residual generator voltages as low as 6 Vac.

Certifications and Standards

UL Recognized Component CSA Certified

Weight and Dimensions

Weight:	220 g (8 oz)
Dimensions :	
Width:	100.8 mm (3.97 in)
Height:	68.3 mm (2.69 in)
Depth:	55.9 mm (2.2 in)

Output Power

Max Continuous: One-Minute Forcing: 63 Vdc at 4 Adc (252 W) 100 Vdc at 7 Adc (700 W) with 240 Vac power input

171 to 264 Vac

Voltage Adjustment

Range:

Response Time

< 1.5 cycles for $\pm 5\%$ change in sensing voltage

Overexcitation Shutdown

Field voltage shuts down after time delay if exciter field voltage exceeds 100 Vdc, ±5%.

Power Dissipation

8 W maximum

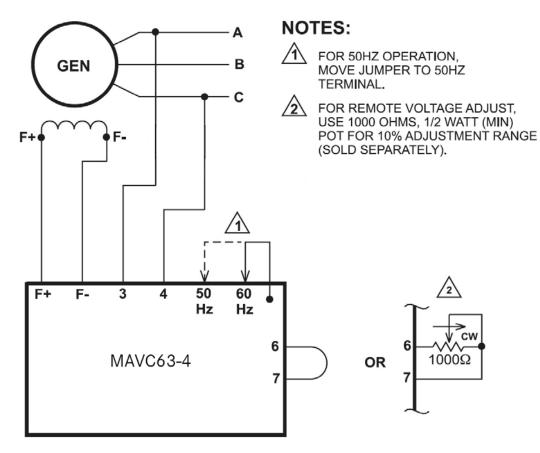
Environmental





VOLTAGE REGULATOR MAVC63-4 Data Sheet





MAVC63-4 Connection Diagram

PERMANENT MAGNET GENERATOR (PMG) Data Sheet

DESCRIPTION

A permanent magnet generator (PMG) is standard on 450 kW and larger units and is available as an optional accessory on most units smaller than 450 kW. The PMG is an improved method of supplying power to the voltage regulator and adds distinct advantages over the alternative shunt type power supply.

FEATURES

Improved Transient Response

When a generator is subject to a large step load, the generator's terminal voltage experiences a sudden voltage dip. With a shunt style regulator,

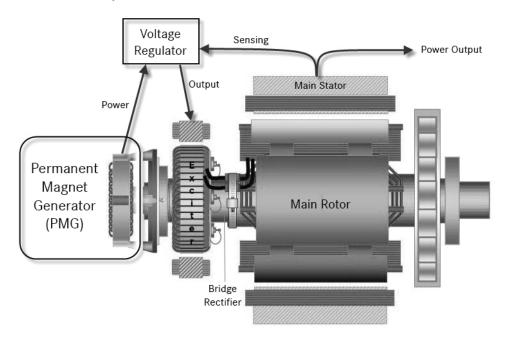
reduced voltage means the regulator's ability to increase excitation is reduced and voltage recovery will take longer. Power from a PMG is only dependent on the speed of rotation so voltage regulator power, and therefore excitation power, is not compromised during a load step.

300% Short Circuit Capability

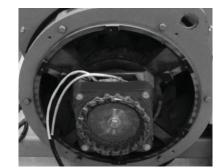
The PMG enables the generator to provide up to 300% short circuit current for 10 seconds. This is important when a fault occurs to ensure current continues to flow long enough for downstream breakers to trip and clear the fault. When a fault occurs with a shunt type regulator, the sudden drop in voltage indicates the regulator has no power to increase excitation to keep current flowing. Without current flow, the downstream breakers may not trip.

Resistant to the Effects of Harmonics

A PMG is also beneficial in applications with harmonic producing loads. When rectifier-type loads are present and cause voltage wave form notching, the disrupted voltage wave form can affect voltage regulator operation on shunt powered regulators. Unlike a shunt regulator, the PMG supplies the regulator with a power source which is isolated from the electrical system.



Generator Equipped with PMG



mtu



PM300E VOLTAGE REGULATOR Data Sheet

The PM300E voltage regulator is an encapsulated electronic voltage regulator which controls the output of a brushless AC generator by regulating the current into the exciter field. Its unique design allows for PMG connectivity for short circuit operation and increased voltage regulation efficiency. The PM300E is a low-cost PMG option on 280, 360, and 430 frame generators.

STANDARD FEATURES

Adjustments for voltage, stability, and V/Hz roll-off

SPECIFICATIONS

MTU Onsite Energy Part Number SUA106154

Sensing Input Voltage: 190-240 V, 50/60 Hz

Power Input Voltage: 190-240 V, 250/300 Hz

Output Power Continuous 63 VDC maximum at 3.0 ADC (190 W)

Exciter Field DC Resistance 15 to 100 ohm

Voltage Regulation < ± 1% (with 4% engine governing)

Voltage Buildup Residual voltage at AVR terminal > 10 VAC

External Volts Adjustment

 \pm 5% with 1,000 ohm rheostat \pm 10% with 2,000 ohm rheostat





Burden 500 VA

EMI Suppression Internal electromagnetic interference filtering

Under Frequency Protection 60 Hz Operation: 54-61 Hz 50 Hz Operation: 45-51 Hz

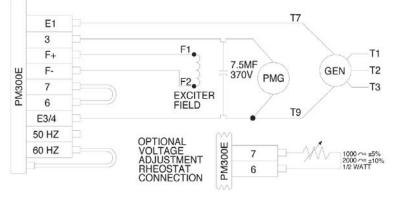
Unit Power Dissipation Maximum 8 W

Surrounding Air Temperature -40 °C (-40 °F) to 60 °C (140 °F)

Storage Temperature -65 °C (-85 °F) to 85 °C (185 °F)

Weight and Dimensions

Weight: ±2% 200 g (7 oz) Dimensions: Width: 99.5 mm (3.92 in) Height: 67 mm (2.64 in) Depth: 47.5 mm (1.87 in)



Interconnection Diagram for 416-480 or 208-240 V WYE Connected Generator

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SCOPE

The purpose of this document is to define a specific paralleling scenario - paralleling MTU Onsite Energy generator sets with a utility power source. Additionally, this document is intended to expand on how MTU Onsite Energy can support this paralleling scenario with simple, integrated solutions.

DEFINITION(S)

Base Loading with Utility Operation

Base loading refers to the application of the system in which the generator set will parallel to a utility power source. The amount of power exported to utility can be determined by a percentage of the generator set rating.

ABBREVIATED SEQUENCE OF OPERATION

- 1. A generator set base loading request is made by the customer.
 - 1.1 The customer initiates a start request to the generator set.
 - 1.2 The generator set starts and builds rated voltage and frequency.
 - 1.3 The generator set synchronizes and closes to the utility power source.
 - 1.4 The generator set begins to ramp on resistive and reactive load until the appointed percentage of load is reached.
 - 1.5 Regardless of fluctuations in the utility power source, the generator set will constantly adjust to maintain the correct percentage of load.
- 2. The generator set base loading request is terminated by the customer.
 - 2.1 The customer removes the start request from the generator set.
 - 2.2 The generator set sheds load until it is producing very little power.
 - 2.3 After unloading, the generator set opens its circuit breaker and disconnects from the utility power source.
 - 2.4 The generator set enters a controller-appointed, cool-down period.
 - 2.5 The generator set stops, returns to standby, and awaits the next start request.

SYSTEM OPERATION

- Real power load sharing
- Reactive power load sharing

PARALLELING CONTROLS, EQUIPMENT, AND INTERFACING (SUPPLIED BY MTU ONSITE ENERGY)

- MGC-3000 Series digital generator set controller (referred to as the controller)
- Meter current transformers (CTs) and potential transformer (PT) (as needed)
- Permanent Magnet Generator (PMG)
 - DVR2000E(+) digital voltage regulator (standard)
 - DVR2000EC(+) digital voltage regulator (optional)
- Motor-operated generator circuit breaker (may or may not be mounted to the generator set)*
 - Shunt trip
 - Shunt close
 - Auxiliary switch (breaker position)
 - Motorized spring charger

*If a circuit breaker is selected, MTU Onsite Energy will supply a motor-operated breaker of the indicated configuration.



ADDITIONAL PARALLELING CONTROLS, EQUIPMENT, AND INTERFACING (SUPPLIED BY THIRD PARTY)

- Paralleling switchgear, circuit breakers, and/or disconnects
- Paralleling bus and cabling
- External start signal source and connection to generator set
- · Utility bus sensing connection to generator set

PROGRAMMING AND LOGIC

- Basic programming and logic will be provided to start, synchronize, and base load with the utility power source.
- Site programming and system tuning are required by the customer for proper onsite operation.

OTHER SYSTEM CONSIDERATIONS

• For generator sets used in non-emergency applications within EPA regulated areas, Tier 4i/T4 Final certified engines must be used.

SEQUENCE OF OPERATION

Base Loading Request to Generator Set

When a customer requires the generator set to parallel to a utility power source for the purpose of supplementing utility power, a base loading request can be made. The customer issues a start request to the generator set. The start signal is a command for the generator set to start, synchronize to utility power source, and close its circuit breaker. All available generator sets will start and achieve nominal frequency and voltage.

Synchronization of Generator Set

The controller on the off-line generator set biases the digital voltage regulator and governor to match its speed and voltage to the utility bus. The controller biases the speed of the engine governor to drive the difference between the phase angle of the generator set and the phase angle of the utility bus to zero. Additionally, the controller biases the voltage regulator to match the generator set voltage to the utility bus voltage. When the synchronization window criteria are met, the generator set is considered synchronized with the utility bus, and the controller issues a command to close its circuit breaker. Once its circuit breaker is closed and the controller receives "breaker closed" feedback from the circuit breaker auxiliary switch, the generator set is considered paralleled. The controller no longer actively attempts to synchronize the generator set.

Base Loading

While paralleled, the generator set is electrically interlocked and will share real load (kW) and reactive load (kVAR) with the utility power source based on a percentage of the load capacity of the generator set. When the generator set circuit breaker is first connected, the generator set produces a negligible amount of real power. The controller will bias the engine governor to begin loading kW on the generator set at a predefined amount of load per second. Load will ramp onto the generator set until the user-defined amount of base load is met. The controller in turn biases the engine governor to control the real load on the generator set.

Reactive load is also precisely shared between the paralleled generator set and the utility power source. When the generator set circuit breaker is first connected, the generator set produces a negligible amount of reactive power. The controller will bias the voltage regulator to begin loading kVARs on the generator set at a predefined amount of load per second. Load will ramp onto the generator set until the user-defined amount of base load is met. Reactive base loading can be defined in either of two manners: percentage of VARs (leading or lagging) or Power Factor (PF) set point (- Leading / + Lagging). The controller in turn biases the voltage regulator to control the reactive load on the generator set.

As the generator set is base loading against the utility power source, the controller will constantly adjust to fluctuations in load and in the utility power source to maintain the base load level requested.



In the event that a generator experiences a fault while supporting the load, it will disconnect itself from the utility bus.

Termination of Base Loading Request to Generator Set

When the customer no longer wants the generator set to base load against the utility power source, the start request signal is removed. The controller will bias the governor and voltage regulator to ramp load off of the generator set. Once the generator set is unloaded and has reached the pre-defined breaker open set point percentage, the circuit breaker will open. The generator set will enter a cool-down period, after which time the generator set will stop, re-enter standby mode, and await the next start request.



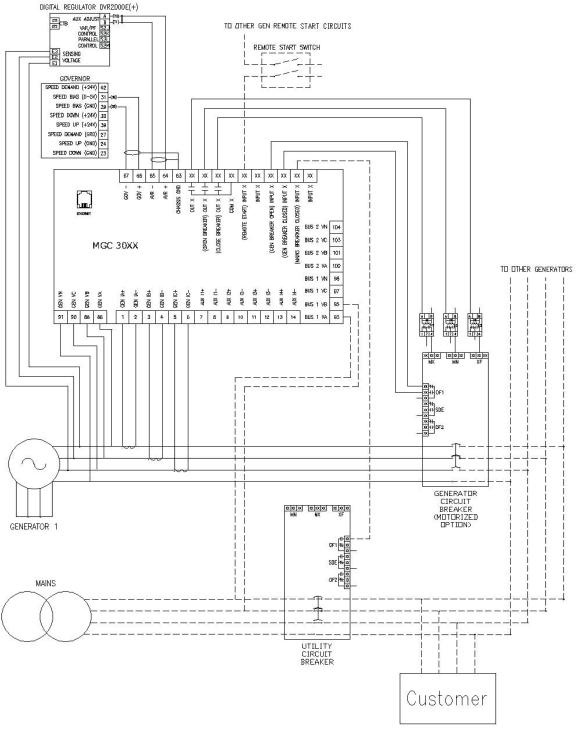


Figure 1: Base Loading with Utility



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SCOPE

The purpose of this document is to define a specific paralleling scenario - paralleling MTU Onsite Energy generator sets with other MTU Onsite Energy generator sets in island operation. Additionally, this document is intended to expand on how MTU Onsite Energy can support this paralleling scenario with simple, integrated solutions.

DEFINITION(S)

Generator to Generator in Island Operation

Island refers to the application of the system. Generator to generator in island refers to an isolated system in which the generator sets will not be paralleled with any source other than the generator sets within the system. The generator sets will be connected to a common bus.

Automatic Transfer Switch (ATS)

An automatic transfer switch connects an electrical load to either of two different sources. Typically, one source is considered Normal, and the other source is considered Emergency. The ATS has the ability to sense the stability and availability of either source and can issue transference of load between either source.

Master Control Panel (MCP)

A master control panel is a third party device responsible for monitoring ATS start requests, issuing transfer inhibits and load priority commands to the ATSs, adding and shedding loads, and issuing start requests to generator sets.

MGC-3000 Series System Manager

The MGC-3000 Series System Manager is an MGC-3000 Series controller with the lowest, non-zero sequencing ID. This controller is responsible for dead bus arbitration between generator sets. The System Manager can be one of any controllers in the generator set system.

Intergenset Communication Network

The intergenset communications network consists of generator set load share modules connected together via Cat5 cable and an industrial ethernet switch. Dead bus arbitration, generator set sequencing, and load sharing commences between generator sets over this network.

ABBREVIATED SEQUENCE OF OPERATION

- 1. Instability or failure of the Normal Power source is detected by the ATS controllers.
 - 1.1 ATS controllers send start requests to the MCP.
 - 1.2 MCP sends individual start requests to the group of generator sets.
 - 1.3 Generator sets start and build rated voltage and frequency.
 - 1.4 Dead bus arbitration commences between the generator sets through the intergenset communication network.
 - 1.4.1 The System Manager grants to the first generator set that reaches the voltage and frequency thresholds the permission to close to the dead bus.
 - 1.4.2 All off-line generator sets at this time are inhibited from closing their circuit breakers to the bus until voltage is sensed.
 - 1.4.3 The highest priority ATS transfers to Emergency power when voltage and frequency are within the ATS controller thresholds.
 - 1.4.4 The remaining off-line generator sets synchronize and close to the live generator bus.
 - 1.5 The remaining ATSs wait for release of transfer inhibit from the MCP before connecting to Emergency power. The MCP monitors the bus and the number of generator sets online to ensure that there are enough generator sets connected to the bus to support the load requirements.
 - 1.6 Online generator sets actively share load via the intergenset communications network.



- 2. ATS controllers detect when the Normal power source has returned to stable conditions, and all delay timers have expired.
 - 2.1 ATSs return to Normal position, removing start signals to the MCP.
 - 2.2 MCP removes all start requests for Emergency power from the generator sets.
 - 2.3 The generator sets open their respective circuit breakers (disconnecting from the generator bus).
 - 2.4 The generator sets enter a controller-appointed, cool-down period.
 - 2.5 The group of generator sets stop, return to standby, and await the next start request.

SYSTEM OPERATION

- Real power load sharing
- Reactive power load sharing
- Dead bus arbitration

PARALLELING CONTROLS, EQUIPMENT, AND INTERFACING (SUPPLIED BY MTU ONSITE ENERGY)

- MGC-3000 Series digital generator set controller (referred to as the controller)
- Meter current transformers (CTs) and potential transformer (PT) (as needed)
- Permanent Magnet Generator (PMG)
 - DVR2000E(+) digital voltage regulator (standard)
 - DVR2000EC(+) digital voltage regulator (optional)
- Motor-operated generator circuit breaker (may or may not be mounted to the generator set)*
 - Shunt trip
 - Shunt close
 - Auxiliary switch (breaker position)
 - Motorized spring charger

*If a circuit breaker is selected, MTU Onsite Energy will supply a motor-operated breaker of the indicated configuration.

ADDITIONAL PARALLELING CONTROLS, EQUIPMENT, AND INTERFACING (SUPPLIED BY THIRD PARTY)

- Master Control Panel (MCP) with connections for monitoring ATS start requests, issuing transfer inhibits and load priority commands to ATSs, adding and shedding loads, and issuing start requests to generator sets
- Automatic transfer switch(es) (ATS), paralleling switchgear, circuit breakers, and/or disconnects
- Paralleling bus and cabling
- Start signal source connection to generator sets
- Main bus sensing connection to generator sets
- Industrial Ethernet switch for intergenset communications network
- Cat5 cable connection from Ethernet switch to all generator sets for intergenset communications network

PROGRAMMING AND LOGIC

- Basic programming and logic will be provided to start, synchronize, and load share with other MTU Onsite Energy supplied generator sets.
- Site programming and system tuning are required by the customer for proper onsite operation.
- MCP integration and programming are required by the customer for proper onsite operation.



SEQUENCE OF OPERATION

Failure of Normal Power Source and Start Request to Emergency Power System

All ATS controllers monitor both Normal and Emergency power sources. Unless programmed otherwise, the ATSs will always be connected to the Normal source. When the voltage or frequency of the Normal source does not meet the predefined voltage and frequency thresholds, each ATS controller sends a start request signal to the MCP. The MCP then issues individual start requests to every unit in the group of generator sets composing the emergency power system. The start signal to each generator set is a command for the generator sets to start, synchronize to the generator bus, close their circuit breakers, and load share. All available generator sets will start and achieve nominal frequency and voltage.

Dead Bus Arbitration

Dead bus arbitration between generator sets commences via the intergenset communication network to ensure that two or more generator sets do not close their circuit breakers to the dead bus at the same time out of phase. The System Manager (the controller with the smallest non-zero sequencing ID) negotiates the dead bus arbitration. The first generator set to reach the voltage and frequency thresholds (adjustable from 85-95%) within the system requests permission to close its circuit breaker and is granted permission by the system manager to close to the dead bus. When this permission is given, all other generator sets are inhibited from closing to the dead bus and will not attempt to close to the bus until voltage and frequency are present and meet the predefined voltage and frequency thresholds.

Synchronization of Generator Sets

The controllers on the remaining off-line generator sets bias their digital voltage regulators and governors to match their speed and voltage to the generator bus. The controller biases the speed of the engine governor to drive the difference between the phase angle of the generator set and the phase angle of the generator bus to zero. Additionally, the controller biases the voltage regulator to match the generator set voltage to the generator bus voltage. When the synchronization window criteria are met, the generator set is considered synchronized with the generator bus, and the controller issues a command to close its breaker. Once its breaker is closed and the controller receives "breaker closed" feedback from the circuit breaker auxiliary switch, the generator set is considered paralleled. The controller no longer actively attempts to synchronize the generator set. The phase and voltage window are adjustable to allow synchronization to happen more aggressively (quickly) or passively (slowly) to meet all customer-defined requirements. Additionally, the controller synchronizer can be configured for two different modes: 1) phase lock loop synchronization for breakers that take longer to close (30 cycles after command is issued), and 2) anticipatory synchronization for reduced synchronization time and breakers that close quickly (five cycles after command is issued).

Load Sharing

While paralleled, generator sets are electrically interlocked and will share real load (kW) and reactive load (kVAR) with other paralleled generator sets. Real load is shared between paralleled generator sets via the intergenset communications network. Generator sets that have closed their circuit breakers to the generator bus broadcast their real power capacity and real power production over the intergenset communications network. The controllers divide the real power production of the system by the real power capacity of the system to produce a unitized percentage of real power to be shared by the connected generator (R. Glenn, Basler Electric). Based on this unitized percentage, the controller biases the engine governor to control the real load on the generator sets.

This method of sharing load does not require an analog load share line between generator sets which is commonly required in paralleling applications. Additionally, the unitized percentage power calculation allows generator sets of different sizes to share load proportionate to their capacities. Reactive load is shared between paralleled generator sets via the intergenset communications network. The generator sets that have closed their breakers to the generator bus broadcast their reactive power capacity and current reactive power production over the intergenset communications network. The controllers divide the reactive power production of the system by the reactive power capacity of the system to produce a unitized percentage of reactive power to be shared by the connected generator sets (R. Glenn, Basler Electric). Based on this unitized percentage, the controller biases the voltage regulator to control the reactive load on the generator sets.



Typically, generator sets that are paralleled together require voltage droop or a cross-current compensation loop to produce reactive power proportionately. Also, it is common for the voltage in these types of systems to droop below nominal, which is not ideal for some loads. However, by controlling reactive power production via the intergenset communication network, MTU Onsite Energy generator sets do not require the system to run in voltage droop and do not require an additional B phase droop current transformer (CT). This results in a generator set system that is easy to interface and has precise control over reactive power production.

Emergency System Operation

As generator sets connect and become available to the generator bus, the ATS controllers sense that the Emergency source is available. The MCP will begin to release the transfer inhibit contacts to the ATS controllers that are servicing priority loads, and these ATSs will transfer loads from the Normal source to the Emergency source. As available power on the generator bus increases (amount of available power is determined by the sum of each online generator set's kW rating), the MCP will release the transfer inhibit contacts to the ATS controllers servicing lower priority loads.

The generator sets support the loads as long as the Normal source is unavailable or does not meet the acceptance thresholds for voltage and frequency. The ATS controllers will continuously monitor Normal source voltage and frequency. Normal source is the preferred power source. If available during non-test procedures, an ATS will connect the loads to the Normal source.

In the event that a generator set experiences a fault while supporting the load, it will disconnect itself from the generator bus. The MCP will determine if there are still enough generator sets online to support the load and will shed a low priority load if necessary to adjust the bus load.

Restoration of Normal Power Source

When the Normal source returns, the ATS controllers sense availability of the Normal source, and all delays have expired (adjustable), the ATS controllers will transfer the ATSs to the Normal source position and remove their start request signals to the MCP. The generator sets remain paralleled and connected to the common bus until all ATSs have transferred back to the Normal source. Once all load has been transferred to the Normal source, the MCP will remove the individual start request signals from all generator sets. The generator sets will open their circuit breakers and enter a controller-appointed, cool-down period (adjustable), after which time they stop, reenter standby mode, and await the next start request.

PARALLELING APPLICATION GUIDE Generator to Generator in Island Operation



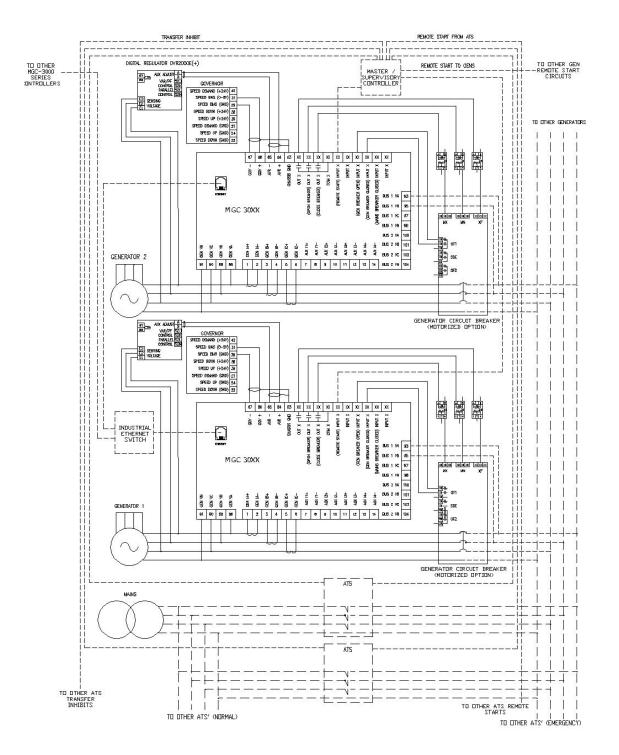


Figure 1: Generator to Generator in Island Operation (MTU Onsite Energy generator sets only)

The dashed line (- - -) denotes wiring/equipment supplied by a third party



SCOPE

The purpose of this document is to define a specific paralleling scenario - paralleling MTU Onsite Energy generator sets with other MTU Onsite Energy generator sets and synchronizing the system of generator sets to a utility power source. Additionally, this document is intended to expand on how MTU Onsite Energy can support this paralleling scenario with simple, integrated solutions.

DEFINITION(S)

Generator to Generator with Utility

Generator to generator with utility refers to the application of the system in which the generator sets will be paralleled with other generator sets on a common bus and then synchronized to another power source other than the remaining generator sets within the system.

Automatic Transfer Switch (ATS)

An automatic transfer switch connects an electrical load to either of two different sources. Typically, one source is considered Normal, and the other source is considered Emergency. ATSs have the ability to sense the stability and availability of either source and can issue transference of load between either source.

Master Control Panel (MCP)

A master control panel is a third party device responsible for monitoring ATS start requests, issuing transfer inhibits and load priority commands to ATSs, adding and shedding loads, issuing start requests to generator sets, and synchronizing the generator sets to another power source.

MGC-3000 Series System Manager

The MGC-3000 Series System Manager is an MGC-3000 Series controller with the lowest, non-zero sequencing ID. This controller is responsible for dead bus arbitration between generator sets. The System Manager can be one of any controllers in the generator set system.

Intergenset Communication Network

The intergenset communication network consists of generator set load share modules connected together via Cat5 cable and an industrial ethernet switch. Dead bus arbitration, generator set sequencing, and load sharing commences between generator sets over this network.

ABBREVIATED SEQUENCE OF OPERATION

- 1. Instability or failure of the Normal power source is detected by the ATS controllers.
 - 1.1 ATS controllers send start requests to the MCP.
 - 1.2 MCP sends individual start requests to the group of generator sets.
 - 1.3 Generator sets start and build rated voltage and frequency.
 - 1.4 Dead bus arbitration commences between the generator sets through the intergenset communication network.
 - 1.4.1 The System Manager grants to the first generator set that reaches the voltage and frequency thresholds the permission to close to the dead bus.
 - 1.4.2 All off-line generator sets, at this time, are inhibited from closing their circuit breakers to the bus until voltage is sensed.
 - 1.4.3 The highest priority ATS transfers to Emergency power when voltage and frequency are within the ATS controller thresholds.
 - 1.4.4 The remaining off-line generator sets synchronize and close to the live generator bus.
 - 1.5 The remaining ATSs wait for release of transfer inhibit from the MCP before connecting to Emergency power. The MCP monitors the bus and the number of generator sets online to ensure that there are enough generator sets connected to the bus to support the load requirements.
 - 1.6 Online generator sets actively share load via the intergenset communications network and analog load share line.



- 2. ATS controllers detect Normal power source has returned to stable conditions, and all delay timers have expired.
 - 2.1 The MCP synchronizes the generator set bus to the Normal power source.
 - 2.2 ATSs return to Normal position, removing start signals to the MCP.
 - 2.3 MCP removes all start requests for Emergency power from the generator sets.
 - 2.4 The generator sets open their respective circuit breakers (disconnecting from the generator bus).
 - 2.5 The generator sets enter a controller-appointed, cool-down period.
 - 2.6 The group of generator sets stops, returns to standby, and awaits the next start request.

SYSTEM OPERATION

- Real power load sharing (via load share line)
- Reactive power load sharing (via intergenset communication network)
- Dead bus arbitration
- Synchronization to other power source

PARALLELING CONTROLS, EQUIPMENT, AND INTERFACING (SUPPLIED BY MTU ONSITE ENERGY)

- MGC-3000 Series digital generator set controller (referred to as the controller)
- Meter current transformers (CTs) and potential transformer (PT) (as needed)
- Permanent Magnet Generator (PMG)
 - DVR2000E(+) digital voltage regulator (standard)
 - DVR2000EC(+) digital voltage regulator (optional)
- Motor-operated generator circuit breaker (may or may not be mounted to the generator set)*
 - Shunt trip
 - Shunt close
 - Auxiliary switch (breaker position)
 - Motorized spring charger

*If a circuit breaker is selected, MTU Onsite Energy will supply a motor-operated breaker of the indicated configuration.

ADDITIONAL PARALLELING CONTROLS, EQUIPMENT, AND INTERFACING (SUPPLIED BY THIRD PARTY)

- Master Control Panel (MCP) with connections for monitoring ATS start requests, issuing transfer inhibits and load priority commands to ATSs, adding and shedding loads, issuing start requests to generator sets, and load sharing (for synchronizing the generator sets to another power source)
- ATSs, paralleling switchgear, circuit breakers, and/or disconnects
- Paralleling bus and cabling
- Start signal source connection to generator sets
- Main bus sensing connection to generator sets
- Industrial Ethernet switch for intergenset communications network
- Cat5 cable connection from Ethernet switch to all generator sets for intergenset communications network
- Load share line between all generator sets and MCP

PROGRAMMING AND LOGIC

- Basic programming and logic will be provided to start, synchronize, and load share with other MTU Onsite Energy supplied generator sets.
- Site programming and system tuning are required by the customer for proper onsite operation.
- MCP integration and programming are required by the customer for proper onsite operation.



SEQUENCE OF OPERATION

Failure of Normal Power Source and Start Request to Emergency Power System

All ATS controllers monitor both Normal and Emergency power sources. Unless programmed otherwise, the ATSs will always be connected to the Normal source. When the voltage or frequency of the Normal source does not meet the predefined voltage and frequency thresholds, each ATS controller sends a start request signal to the MCP. The MCP will then issue individual start requests to every unit in the group of generator sets composing the emergency power system. The start signal to each generator set is a command for the generator sets to start, synchronize to the generator bus, close their circuit breakers, and load share. All available generator sets will start and achieve nominal frequency and voltage.

Dead Bus Arbitration

Dead bus arbitration between generator sets commences via the intergenset communication network to ensure that two or more generator sets do not close their circuit breakers to the dead bus at the same time out of phase. The System Manager (the controller with the smallest non-zero sequencing ID) negotiates the dead bus arbitration. The first generator set to reach the voltage and frequency thresholds (adjustable from 85-95%) within the system requests permission to close its circuit breaker and is granted permission by the System Manager to close to the dead bus. When this permission is given, all other generator sets are inhibited from closing to the dead bus and will not attempt to close to the bus until voltage and frequency are present and meet the predefined voltage and frequency thresholds.

Synchronization of Generator Sets

The controllers on the remaining off-line generator sets bias their digital voltage regulators and governors to match their speed and voltage to the generator bus. The controller biases the speed of the engine governor to drive the difference between the phase angle of the generator set and the phase angle of the generator bus to zero. Additionally, the controller biases the voltage regulator to match the generator set voltage to the generator bus voltage. When the synchronization window criteria are met, the generator set is considered synchronized with the generator bus, and the controller issues a command to close its circuit breaker. Once its circuit breaker is closed and the controller receives "breaker closed" feedback from the circuit breaker auxiliary switch, the generator set is considered paralleled. The controller no longer actively attempts to synchronize the generator set. The phase and voltage window are adjustable to allow synchronization to happen more aggressively (quickly) or passively (slowly) to meet all customer-defined requirements. Additionally, the controller synchronizer can be configured for two different modes: 1) phase lock loop synchronization for breakers that take longer to close (30 cycles after command is issued), and 2) anticipatory synchronization for reduced sync time and breakers that close quickly (five cycles after command is issued).

Load Sharing

While paralleled, generator sets are electrically interlocked and will share real load (kW) and reactive load (kVAR) with other paralleled generator sets. Real load is shared between paralleled generator sets via the intergenset communications network. Generator sets that have closed their circuit breakers to the generator bus broadcast their real power capacity and real power production over the intergenset communications network. The controllers divide the real power production of the system by the real power capacity of the system to produce a unitized percentage of real power to be shared by the connected generator (R. Glenn, Basler Electric). Based on this unitized percentage, the controller biases the engine governor to control the real load on the generator sets.

This method of sharing load does not require an analog load share line between generator sets which is commonly required in paralleling applications. Additionally, the unitized percentage power calculation allows generator sets of different sizes to share load proportionate to their capacities. Reactive load is shared between paralleled generator sets via the intergenset communications network. The generator sets that have closed their breakers to the generator bus broadcast their reactive power capacity and current reactive power production over the intergenset communications network. The controllers divide the reactive power production of the system by the reactive power capacity of the system to produce a unitized percentage of reactive power to be shared by the connected generator sets (R. Glenn, Basler Electric). Based on this unitized percentage, the controller biases the voltage regulator to control the reactive load on the generator sets.



Typically, generator sets that are paralleled together require voltage droop or a cross-current compensation loop to produce reactive power proportionately. Also, it is common for the voltage in these types of systems to droop below nominal, which is not ideal for some loads. However, by controlling reactive power production via the intergenset communication network, MTU Onsite Energy generator sets do not require the system to run in voltage droop and do not require an additional B phase droop current transformer (CT). This results in a generator set system that is easy to interface and has precise control over reactive power production.

Emergency System Operation

As generator sets connect and become available to the generator bus, the ATS controllers sense that the Emergency source is available. The MCP will begin to release the transfer inhibit contacts to the ATS controllers that are servicing priority loads, and these ATSs will transfer loads from the Normal source to the Emergency source. As available power on the generator bus increases (amount of available power is determined by the sum of each online generator set's kW rating), the MCP will release the transfer inhibit contacts to the ATS controllers servicing lower priority loads.

The generator sets support the loads as long as the Normal source is unavailable or does not meet the acceptance thresholds for voltage and frequency. The ATS controllers will continuously monitor Normal source voltage and frequency. Normal source is the preferred power source. If available during non-test procedures, an ATS will connect the loads to the Normal source.

In the event that a generator set experiences a fault while supporting the load, it will disconnect itself from the generator bus. The MCP will determine if there are still enough generator sets online to support the load and will shed a low priority load if necessary to adjust the bus load.

Restoration of Normal Power Source

When the Normal source returns and the ATS controllers sense availability of the Normal source, the MCP will synchronize the generator bus to the Normal source. The MCP will bias the generator set load share line to drive the difference between the phase angle of the generator set and the phase angle of the Normal source to zero. When all delays have expired (adjustable), the ATS controllers will transfer the ATSs to the Normal source position and remove their start request signals to the MCP. The generator sets remain paralleled and connected to the common bus until all ATSs have transferred back to the Normal source. Once all load has been transferred to the Normal source, the MCP will remove the individual start request signals from all generator sets. The generator sets will open their circuit breakers and enter a controller-appointed, cool-down period (adjustable), after which time they stop, re-enter standby mode, and await the next start request.



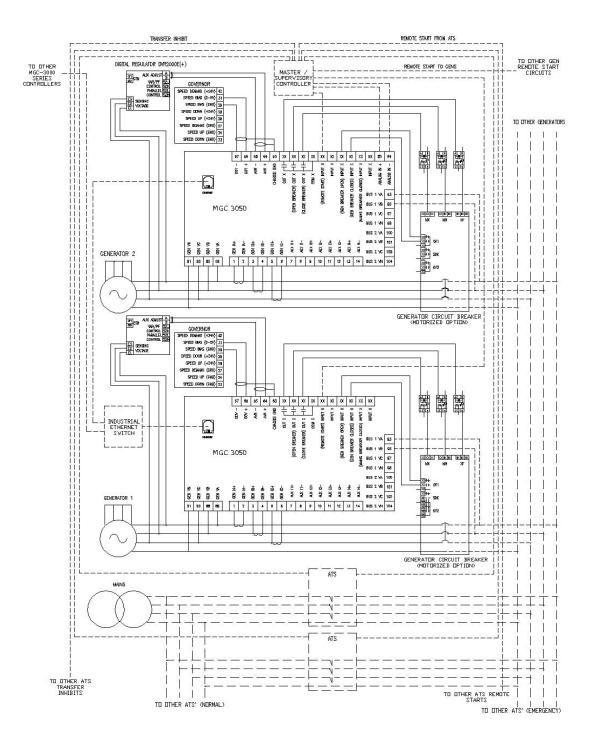


Figure 1: Generator to Generator with Utility (MTU Onsite Energy generator sets only)

The dashed line (- - -) denotes wiring/equipment supplied by a third party

PARALLELING APPLICATION GUIDE Paralleling without MTU Onsite Energy Components



SCOPE

The purpose of this document is to define a specific paralleling scenario - paralleling MTU Onsite Energy generator sets without MTU Onsite Energy supplied or supported components.

DEFINITION(S)

Paralleling without MTU Onsite Energy Components

Paralleling without MTU Onsite Energy components refers to the application of a system in which generator sets will be paralleled without MTU Onsite Energy supplied or supported components.

ABBREVIATED SEQUENCE OF OPERATION

None indicated. Sequence of operation to be specified by customer.

SYSTEM OPERATION

None indicated. System operation to be specified by customer.

PARALLELING CONTROLS, EQUIPMENT, AND INTERFACING (SUPPLIED BY MTU ONSITE ENERGY)

Generator set voltage bias and speed bias contacts will be provided for customer connection.

ADDITIONAL PARALLELING CONTROLS, EQUIPMENT, AND INTERFACING (SUPPLIED BY THIRD PARTY)

- · Synchronizing and load sharing controller
- ATSs, paralleling switchgear, circuit breakers, and/or disconnects
- Paralleling bus and cabling
- Start signal source connection to generator sets

PROGRAMMING AND LOGIC

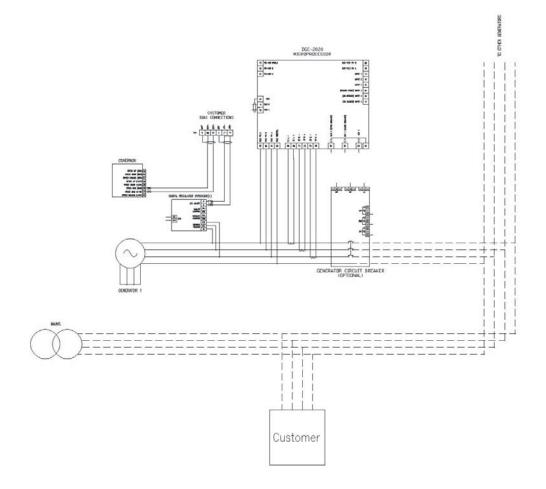
- Basic programming and logic will be provided to start and operate generator set
- Site programming and system tuning are required by the customer for proper onsite for operation

SEQUENCE OF OPERATION

None indicated. Sequence of operation to be specified by customer.

PARALLELING APPLICATION GUIDE Paralleling without MTU Onsite Energy Components







The dashed line (- - -) denotes wiring/equipment supplied by a third party



SCOPE

The purpose of this document is to define a specific paralleling scenario - paralleling MTU Onsite Energy generator sets with a utility power source. Additionally, this document is intended to expand on how MTU Onsite Energy can support this paralleling scenario with simple, integrated solutions.

DEFINITION(S)

Peak Shaving with Utility Operation

Peak shaving refers to the application of the system in which the generator set will parallel to a utility power source to subsidize customer load requirements while still maintaining the contractually agreed limit of power supplied by the utility power source. Typically, this is for the purpose of avoiding excess electrical demand charges.

ELECTRICAL DEMAND CONTROLLER (EDC)

An electrical demand controller is a third-party device responsible for monitoring electrical demand from utility, issuing start requests to generator sets, and biasing generator sets to control the amount of electrical demand on a utility power source.

ABBREVIATED SEQUENCE OF OPERATION

- 1. EDC senses that electrical demand on the utility power source has exceeded the customer-defined threshold, and all timers have elapsed.
 - 1.1 EDC issues the start request to the generator set.
 - 1.2 The generator set starts and builds rated voltage and frequency.
 - 1.3 The generator set synchronizes and closes to the utility power source.
 - 1.4 The EDC monitors the electrical demand on the utility power source and biases the generator set in proportion to the amount of load that must be shaved from the utility power source.
 - 1.5 The generator set begins to ramp on resistive and reactive load in proportion to a bias signal provided by the EDC.
 - 1.6 Regardless of fluctuations in the utility power source or building load, the EDC will constantly make adjustments to the bias signal to the generator set to maintain the agreed electrical demand on the utility power source to avoid peak demand charges.
- 2. EDC senses that electrical demand on the utility power source has fallen below the customer-defined threshold, and all timers have elapsed.
 - 2.1 EDC removes the start request from the generator set.
 - 2.2 The generator set sheds load until it produces very little power.
 - 2.3 After unloading, the generator set opens its breaker and disconnects from the utility power source.
 - 2.4 The generator set enters a controller-appointed, cool-down period.
 - 2.5 The generator set stops, returns to standby and awaits the next start request.

SYSTEM OPERATION

- Real power load sharing
- Reactive power load sharing

PARALLELING CONTROLS, EQUIPMENT, AND INTERFACING (SUPPLIED BY MTU ONSITE ENERGY)

- MGC-3000 Series digital generator set controller (referred to as the controller)
- Meter current transformers (CTs) and potential transformer (PT) (as needed)
- Permanent Magnet Generator (PMG)
 - DVR2000E(+) digital voltage regulator (standard)
 - DVR2000EC(+) digital voltage regulator (optional)



- Motor-operated generator circuit breaker (may or may not be mounted to the generator set)*
 - Shunt trip
 - Shunt close
 - Auxiliary switch (breaker position)
 - Motorized spring charger

*If a circuit breaker is selected, MTU Onsite Energy will supply a motor-operated breaker of the indicated configuration.

ADDITIONAL PARALLELING CONTROLS, EQUIPMENT, AND INTERFACING (SUPPLIED BY THIRD PARTY)

- Electrical Demand Controller (EDC) with connections for monitoring electrical demand from utility, issuing start requests to generator set, and biasing generator set to control the amount of electrical demand on a utility power source
- Paralleling switchgear, circuit breakers, and/or disconnects
- Electrical demand controller with bias capabilities
- Paralleling bus and cabling
- Start signal source connection to generator set
- Utility bus sensing connection to generator set

PROGRAMMING AND LOGIC

- Basic programming and logic will be provided to start, synchronize, and accept a bias signal to peak shave with the utility power source from the EDC.
- Site programming and system tuning are required by the customer for proper onsite operation.

OTHER SYSTEM CONSIDERATIONS

• For generator sets used in non-emergency applications within EPA regulated areas, Tier 4i/T4 Final certified engines must be used.

SEQUENCE OF OPERATION

Peak Shaving Request to Generator Set

The EDC monitors the electrical demand on the utility power source. When electrical demand exceeds a customer-defined threshold (adjustable) and all applicable delay timers have elapsed, the EDC will issue a start request to the generator set. The start request is a command for the generator set to start, synchronize to utility power source, and close its circuit breaker. All available generator sets will start and achieve nominal frequency and voltage.

Synchronization of Generator Set

The controller on the off-line generator set biases its digital voltage regulator and governor to match its speed and voltage to the utility bus. The controller biases the speed of the engine governor to drive the difference between the phase angle of the generator set and the phase angle of the utility bus to zero. Additionally, the controller biases the voltage regulator to match the generator set voltage to the utility bus voltage. When the synchronization window criteria are met, the generator set is considered synchronized with the utility bus, and the controller issues a command to close its circuit breaker. Once its circuit breaker is closed and the controller receives "breaker closed" feedback from the circuit breaker auxiliary switch, the generator set is considered paralleled. The controller no longer actively attempts to synchronize the generator set.



Peak Shaving

While paralleled, the generator set is electrically interlocked and will share real load (kW) and reactive load (kVAR) with the utility power source based on a bias signal supplied by the EDC. When the generator set circuit breaker is first connected, the generator set is producing a negligible amount of real power. The EDC will begin to bias the controller while the controller in turn biases the engine governor to begin loading kW on the generator set with respect to the bias signal from the EDC. Load will ramp onto the generator set until the generator set has shaved enough load off of utility to avoid excess demand charges to the customer.

Reactive load is also precisely shared between the paralleled generator set and the utility power source. When the generator set circuit breaker is first connected, the generator set produces a negligible amount of reactive power. The controller will bias the voltage regulator to begin loading kVARs onto the generator set in proportion to the amount of real power the generator set is producing. Load will ramp onto the generator set until the user-defined Power Factor (PF) set point is met.

As the generator set is peak shaving load off of the utility power source, the controller (in response to the EDC bias signal) will constantly adjust to fluctuations in load and in the utility power source to ensure that electrical demand on the utility source does not exceed the contractually agreed limit.

If a generator set experiences a fault while peak shaving, it will disconnect itself from the utility bus.

Termination of Peak Shaving Request to Generator Set

When the EDC senses that electrical demand on utility has fallen below the customer-defined threshold and all applicable delay timers have elapsed, the EDC will reduce the bias signal to the controller. The controller will bias the governor and voltage regulator to ramp load off of the generator set. Once the generator set is unloaded and has reached the pre-defined (adjustable) breaker open set point percentage, the EDC will remove the start request, and the generator set circuit breaker will open. The generator set will enter a cool-down period, after which time the generator set will stop, re-enter standby mode, and await the next start request.



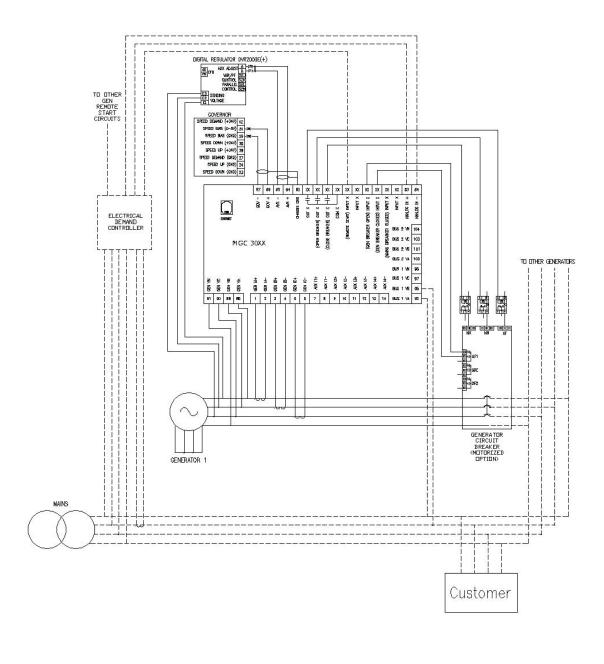


Figure 1: Peak Shaving with Utility



MTU Onsite Energy A Rolls-Royce Power Systems Brand

BATTERY WARMER PLATE Data Sheet

DESCRIPTION

Battery warmer plates improve battery performance in cooler climates by providing heat to warm a battery. The benefits of a warm battery versus a cold battery include better current flow during engine crank cycle, longer battery life by reducing deep cycling, and quicker charging time. A warm battery also allows for less load on the charging system by having more battery power available during the charging cycle.

FEATURES

- Quick-start, pre-set thermostat maintains temperature at 27 °C (80 °F)
- Grounded cord: 2.4 m (8 ft)

SPECIFICATIONS

- MTU Onsite Energy Part #:
- Dimensions:

SUA33218 Length: 228 mm (9 in) Width: 151 mm (6 in) Height: 18 mm (0.75 in) 1 kg (2.2 lbs) 200 Watt, 120 VAC, 60 Hz

- Weight:
- Operation:

CERTIFICATIONS AND STANDARDS

This battery warming plate is not listed or labeled in conformance with UL or CSA standards.

Note: Battery warmer plates are not recommended for nickel cadmium batteries.

mtu DI



COMMERCIAL BATTERY Data Sheet



Extra ruggedness and resistance to vibration, heat, chemicals, and physical abuse are built into every commercial battery that MTU Onsite Energy provides with their generator sets. The battery design features the latest in power storage technology for lead-acid batteries, as well as incorporates proven designs developed with the most experience in the business.

PRODUCT FEATURES

- <u>Case Design</u>: Tough, high-impact reinforced polypropylene case is heat sealed under extreme pressure to
 withstand heavy commercial service usage. This helps to prevent electrolyte leakage, improves reliability, and
 reduces breakage.
- <u>Internal Design</u>: Full-frame power path grids avoid sharp wires protruding through separators and directs the power straight to the lug for low resistance and higher cranking amps.
- <u>Terminals</u>: Standard terminals are solidly built preventing porosity, corrosion, black post, and harmful acid leaks.
- <u>Power Density</u>: Extra heavy-duty batteries deliver more cranking amps per pound.
- <u>Maintenance</u>: The battery uses pure de-mineralized electrolytes for reduced water loss, reduced gassing, longer battery life, and low maintenance.
- <u>Reliability</u>: Narrow ribs reduce separator corrosion to protect against shorts while deep-pocket envelopes dramatically improve reliability and extend service life.
- <u>Quality</u>: Over 250 quality control checks, combined with computer-aided design technology, provide a tough, durable battery in each commercial battery that MTU Onsite Energy provides with their generator sets.

				Overall Dimension					
BCI Group	Terminal Type	MTU Onsite Energy Part	Volt	Cranking Performance	Reserve Capacity	Length	Width	Height	Weight (Wet)
Size		Number		CCA (Cold Cranking Amps) -18° C / 0° F		mm (in)	mm (in)	mm (in)	kg (lbs)
31	Post	SUA120299	12	950	175	330 (13)	171 (6.75)	241 (9.5)	25.7 (56.5)
4D	Post	SUA102493	12	1,050	290	527 (20.75)	216 (8.5)	258 (10.125)	45.2 (99.5)
8D	Post	SUA102492	12	1,400	430	527 (20.75)	279 (11)	254 (10)	59.3 (130.5)

BATTERY CHARGER 2605A Data Sheet

DESCRIPTION

The battery charger is designed to recharge batteries as well as extend the battery's life in applications where it is stored for long periods of time.

FEATURES

- Watertight, shock and corrosion resistant
- Short-circuit and overload protection
- LED status indicator
- Reverse polarity protection

SPECIFICATIONS

- MTU Onsite Energy Part #:
- Output Volts:
- Output Amps:
- Load Banks:
- AC Cable Length:
- DC Cable Lenght:
- Dimensions (L x W x H):
- Input Volts:
- Weight:

CERTIFICATION AND STANDARDS

• c-UL-us Listed

- SUA83442
- 24 Volts
- 5 Amps
- 1 Bank
 - 1.8 m (6 ft) SJT 18-3 with connect-charge plug
 - 1.8 m (6 ft) SJT 18-3 with ring terminals
 - 188 mm (7.4 in) x 160 mm (6.3 in) x 61 mm (2.4 in)
- 120 V, 60 Hz
 - 2.04 mm (4.5 lbs)

mtu **onsite** energy



BATTERY CHARGER EnerGenius[®] IQ 35 Amp Data Sheet

DESCRIPTION

The EnerGenius[®] IQ 35 Amp battery charger is a rugged utility-grade battery charger with microprocessor control.

This battery charger delivers DC power, charges the battery, automatically tests battery performance, logs all relevant site data, and clearly communicates results. A charge control system reduces recharge time and reduces risk of overcharge.

FEATURES

- Built-in intelligence makes it easy to correctly configure charger for battery and site conditions
- Battery-check system automatically tests battery to reduce risk of unexpected application shutdown
- Black box data recorder helps spot previously hidden problems and directs preventive maintenance
- Advanced user interface with USB PC utility that provides easy-to-understand system status and control.
- Dual microprocessors for digital load sharing that minimize risk of single-point failure
- · Modbus communication option provides remote monitoring and administration
- Automatic battery commissioning mode

SPECIFICATIONS

Output

- 24 VDC nominal filtered output
- Suitable for Lead-acid or Ni-Cd batteries
- Battery temperature compensation with adjustable slope
- Adjustable current limit 33% to 110%
- · Timed commission charge with automatic revert to standard settings

Input

• Refer to ORDERING INFORMATION section of this document

User Interface

- · Float, auto, and manual equalized charging modes and LEDs
- Manual and automatic equalize charge timer for 0-256 hours
- All parameters are keypad adjustable with keypad lock

Meters

- 1% accuracy digital DC volt and amp meters; percent nominal AC input voltage
- DC voltmeter displays both volts per cell and total voltage

Remote Alarms and Communications

- Alarm status via individual Form C contact
- Modbus data communications option



BATTERY CHARGER EnerGenius[®] IQ 35 Amp Data Sheet



Battery Check System

- Front panel battery-check button
- Fully adjustable automatic battery-check system

History and Event Logging

- Long-term black box memory
- PC-based event log analysis software

Safety and Reliability

- Fully automatic charge control
- 60 Hz units NEMA PE-5 compliant and high efficiency
- 2-pole AC circuit breaker, 10K AIC
- 2-pole UL-listed DC circuit breaker
- · Electronic soft start and programmable start delay
- Backwards battery protection
- Fault-tolerant dual-microprocessor architecture
- All-digital design, no potentiometers
- Conformal coated, surface-mount technology circuit cards
- Redundant and selective over-voltage shutdown
- Battery temperature compensation
- Surge withstand: ANSI 62.41, ANSI C37.90, IEC 61000-6-2
- Display and alarm relay test

Mechanical

- Rugged steel housing and tough-baked polyester finish
- Housing protection ratings: NEMA Type 1, IP 20
- Weight: 59 kg (129 lbs)
- Operating temperature range: 40 °C (-40 °F) to 50 °C (122 °F) with overtemp current reduction

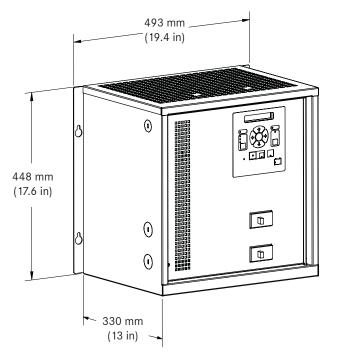
CERTIFICATIONS AND STANDARDS

- 60 Hz: c-UL-us Listed and CSA Certified
- 50/60 Hz: c-UL-us Listed and CE Marked
- Third party certified to IBC 2006-2012
- Optional: OSHPD seismic pre-approval. Contact factory.

BATTERY CHARGER EnerGenius® IQ 35 Amp Data Sheet



DIAGRAMS AND DIMENSIONS



ORDERING INFORMATION

		Output Amps	Voltage	Frequency	NFPA 110 Alarms	Communications
SUA97983	24	35	115-120 / 208 / 230-240	50/60 Hz	Yes ⁽¹⁾	N/A
SUA101148	24	35	480	60 Hz	Yes ⁽¹⁾	N/A
SUA105039	24	35	115-120 / 208 / 230-240	50/60 Hz	Yes ⁽²⁾	Modbus
(1) 7-alarm relays and AC pilot relay (2) 5 alarm relays						

⁽²⁾ 5-alarm relays N/A = Not Available



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MTU Onsite Energy A Rolls-Royce Power Systems Brand



The battery charger designed for heavy-duty industrial service:

- Rugged construction survives tough generator set environments
- Dynamic Boost[™] Charge safely recharges faster than competitor products
- Zero-volt charge automatically recharges fully discharged batteries
- Foolproof design protects against wrong AC input voltage and reverse battery polarity
- High efficiency models exceed new charger efficiency regulations

BENEFITS AND FEATURES

The MicroGenius[®] 150 battery charger's primary application is quick recharge and long-life maintenance of engine start batteries. Designed for emergency generator sets, the MicroGenius[®] 150 outperforms all competitor products with reliability, ease of use, and energy efficiency while performing the work of higher amperage chargers.

Rugged design protects from heat, cold, vibration, and water inside a generator set enclosure. Chargers can be connected to batteries that are dead with polarity reversed or the wrong voltage. MicroGenius[®] 150 and its NRG predecessor are the only generator set chargers that automatically protect the charger from the rigors of generator set duty.

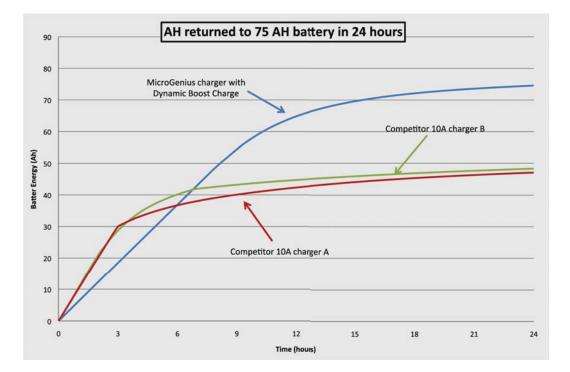
- Universal AC input 100 240 VAC ±10%, 50 60 Hz ±5%
- Output Volts: 12 VDC nominal
- Output Current: 10 Amps
- · Microprocessor controlled with firmware field upgrade capability
- Automatic charge algorithm: Boost mode for quick recharge, float mode for maintenance
- Precision current limiting
- ±0.5% voltage regulation
- Temperature compensated output with options of remote sensing or disabling temperature compensation
- Able to charge a dead battery
- -20 °C to 40 °C operation at full rated output
- High and low temperature output power limiting permits operation at reduced output current up to 70 °C and down to -40 °C
- Conformally coated circuit boards
- Reverse battery protection
- Status indicator LEDs
- Enclosed metal chassis
- LCD display with precision digital ammeter and voltmeter, alarm relay Form C contacts
- Safety Isolated: DC output, alarm relay contacts, and external signal lines are safety isolated from the AC line. Isolation is provided by double-insulated components and by protective grounding of the metal chassis.





The MicroGenius[®] 150 used the unique Dynamic Boost[™] charge which is adaptable to changing DC loads, varying states of battery charge, and differing battery capacities. It provides protection from overcharge and damage; recharging batteries at the maximum possible rate without overcharging, while avoiding battery damage typical of older chargers set for fast recharge.

Dynamic Boost[™] charge automatically and continually adjusts the charge profile, safely minimizing charge time for each generator set's unique combination of DC load, battery capacity, depth of discharge, and other realworld variables. Generator sets equipped with Dynamic Boost[™] charger systems safely perform the work of higher amperage chargers, reducing charger size and cost while extending battery life.



Dynamic Boost Charge Comparison

SPECIFICATIONS



AC Input

Voltage and frequency	Auto ranging 100 - 240 VAC ±10% (90 - 265), 47 - 63 Hz
Input protection	1-pole fuse, transient protected
Inrush limiting	Inrush current limited to prevent fuse blowing or overstress
Efficiency	Exceeds CEC-400-2012-019-CM requirements
Power factor	Active power factor corrected to > 0.99 typical (0.95 min.) at full output

Charger Output

Nominal voltage rating	12 VDC nominal
Voltage adjustment	Three manually selected programs or adjustment in fine increments using optional MicroGenius® Setup Utility Kit
Current	Electronic current limiting to 10 Amps
Charging characteristic	Constant voltage, current limited with variable multiple-rate boost charging
Line and load regulation	±0.5% line and load regulation
Output ripple	<100 mV wideband
Temperature compensation	Enable or disable any time; remote sensor optional
Output protection	Electronic current limit, 1-pole fuse, transient protected
Overvoltage protection	Self-resetting and selective: Overvoltage protection does not activate if the source of excessive voltage is outside the charger
Dead battery charge	Recharges from zero volts without the need for operator intervention
Load dump protection	Output voltage over-shoot is limited to 5% or less to prevent damage to connected devices in case battery is disconnected while charger is running.

Adjustments and Controls

Charge mode control	Fully automatic charging mode control. The Dynamic Boost™ Charge system maintains both lead-acid and Ni-Cad batteries at a high state of charge.
Manual adjustments	Select from three pre-programmed float voltage settings. Configure boost charge: No boost, moderate boost, high performance boost
Computer adjustment	Adjust output voltage, boost charge configuration, and alarm thresholds in fine increments via optional MicroGenius® Setup Utility Kit
Status Indication	

LED status indicator Two front panel LEDs indicate normal and alarm states

Display and Alarms

Display	Digital voltmeter accurate to $\pm 2\%$ and ammeter accurate to $\pm 5\%$ plus 20-character text display of normal and alarm status messages
LCD alpha-numeric display	Displays volts, amps, and alarm conditions
Form C alarm contacts	AC fail, charger fail, output fail, low battery volts, high battery volts
Alarm contact ratings	Rated 2A at 30 VDC, resistive load



Environmental

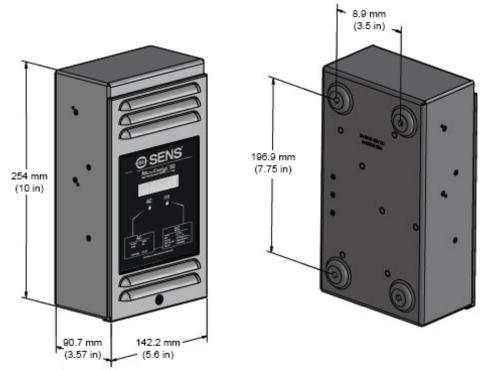
Operating temperature	-20 °C to 40 °C operation at full rated output, -40 °C to 70 °C at reduced output; natural convection cooled
Storage temperature	-40 °C to 85 °C
Over Temp. protection	Output current limit reduces gradually to maintain safe power device temperature
Humidity	5% to 95% non-condensing
Vibration	EN 60068-2-6 (4G, 18-500 Hz)
Shock	EN 60068-2-27 (15G)
Electrical transient immunity	See Regulatory Compliance section of this document
Regulatory Compliance	
North America	c-UL-us Listed to UL 1236 and CSA Standard C22.2 no. 107.2 UL file E109740 NFPA: NFPA 70, NFPA 110
	FCC: Part 15, Class A
European Union	CE Marked
	EMC Directive: 2004/108/EC (EN 61000-60-2 and EN 61000-6-4)
	LVD Directive: 2006/95/EC (EN 60335-1 and EN 60335-2-29) RoHS 2 Directive: 2011/65/EU (EN 50581)
Seismic	Certified for rigid and non-structure wall mounting, maximum S_{DS} of 2.5g International Building Code: 2000, 2003, 2006, 2009, 2012 California Building Code: 2007, 2010
Construction	
Housing configuration Dimensions Weight	IP22 powder coated aluminum; includes three 1/2" conduit openings See <i>Diagrams and Dimensions</i> section of this document 1.5 kg (3.4 lbs)
Electrical connections	Input and Output: Terminal blocks accommodating 14 to 10 AWG Alarms: Terminal blocks accommodating 28 to 16 AWG

Warranty

Standard Warranty	MTU Onsite Energy standard warranty terms apply



DIAGRAMS AND DIMENSIONS



MicroGenius Ordering Information							
MTU Onsite Energy Part #	Output Volts	Output Amps	LCD Screen (Displays volts, amps, alarms)	NFPA 110 Alarm Contacts			
XG3030100057	12	10	Yes	Yes			
All models have auto-ranging AC supply, 100 - 240 volts, 50 - 60 Hz							

HC



MTU Onsite Energy A Rolls-Royce Power Systems Brand

9000

US LISTED



The Smart Choice for Mission-Critical Engine Starting:

- Fast, accurate, mission-critical charging gives best starting reliability
- 4-rate, temperature-compensated output offers longest battery life
- Replace nearly any charger without planning ahead
- Industry-first battery-fault alarm helps dispatch service early
- Lasting reliability field MTBF > 1 million hours with industry-best warranty
- IBC seismic certification meets latest building codes, no installation delays
- Optional OSHPD pre-approval



BENEFITS AND FEATURES

Failure to start due to battery problems is the leading cause of inoperable engine generator sets.

The NRG battery charger maximizes starting system reliability while slashing generator set servicing costs:

- One NRG replaces almost any charger without extra site visits. Installers can select or change at any time 120, 208, or 240 volts AC input, 12 or 24-volt battery and output settings optimized for nearly any lead-acid or nickel cadmium battery.
- Easy to understand user interface provides state-of-the-art system status including digital metering, NFPA 110 alarms, and a battery fault alarm that can send service personnel to the site before failure to start.
- Batteries charged by NRG give higher performance and last longer. In uncontrolled environments, precision charging increases battery life and watering intervals 400% or more.
- NRG meets all relevant industry standards including UL, NFPA 110, and CE. Seismic Certification per International Building Code (IBC) 2000, 2003, 2006. All units are C-UL listed. 50/60 Hz units add CE marking to UL agency marks.

EnerGenius reliability technology built into every charger includes:

- · All-electronic operation with generous component de-rating
- Disconnected/reversed/incorrect voltage battery alarm and protection
- · Protection of connected equipment against load dump transients
- Widest temperature rating and overtemperature protection
- Superior lightning and voltage transient protection
- Demonstrated field MTBF > 1 million hours
- MTU Onsite Energy standard warranty terms apply

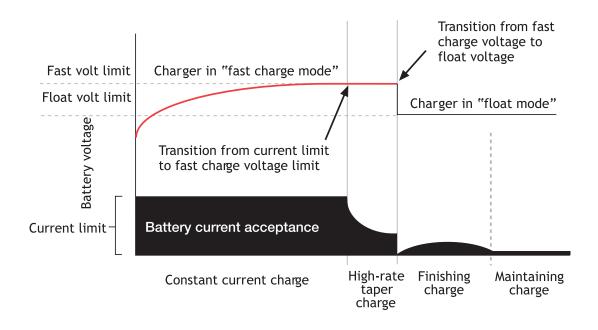




SPECIFICATIONS

AC Input	
Voltage	110-120/208-240 VAC, ±10%, single phase, field selectable
Input current	10A charger: 6.6/3.3 amps maximum
	20A charger: 12.6/6.3 amps maximum
Frequency	60 Hz ±5% standard; 50/60 Hz ±5% optional
Input protection	1-pole fuse, soft-start, transient suppression
Charger Output	

Nominal voltage rating Battery settings	12/24 volt, field selectable Six discrete battery voltage programs - Low or high S.G. flooded - Low or high S.G. VRLA - Nickel cadmium 9, 10, 18, 19 or 20 cells
Regulation	$\pm 0.5\%$ (1/2%) line and load regulation
Current	10 or 20 amps nominal
Electronic current limit	105% rated output typical-no crank disconnect required
Charge characteristic	Constant voltage, current limited, 4-rate automatic equalization
Temperature compensation Output protection	Enable or disable anytime, remote sensor optional Current limit, 1-pole fuse, transient suppression



Standard Four (4) Rate Charging



User Interface, Indication and Alarms

Digital meter Accuracy Alarms Automatic meter alternately displays output volts, amps¹ ±2% volts, ±5% amp LED and Form C contact(s) per table:

	Alarm Code "C" (meets requirements of NFPA 110)	
AC good	LED	
Float mode	LED	
Fast charge	LED	DC AAMETER & SEC. DC VOLTMETER 3 SEC. LOW BOOST
Temp comp active	LED	FAL BATT
AC fail	LED and Form C contact ²	
Low battery volts	LED and Form C contact ²]
High battery volts	LED and Form C contact ²	Front panel
Charger fail	LED and Form C contact ²	status display
Battery Fault ³	LED and Form C contact ²]

1. Three-position jumper allows user to select from three display settings: alternating volts / amps (normal), constant volts, or constant amps

2. Contacts rated 2A at 30 VDC resistive

3. Battery fault alarm indicates these fault conditions:

- Battery disconnected - Battery polarity reversed - Mismatched charger battery voltage - Open or high resistance charger to battery connection

- Open battery cell or excessive internal resistance

Controls

AC input voltage select 12/24-volt output select Battery program select Meter display select Fast charger enable/disable Temp compensation enable

Remote temp comp enable

Environmental

Operating temperature Over temperature protection Humidity Vibration (10A unit) Transient immunity

Seismic Certification

Field-selectable switch Field-selectable two-position jumper Field-selectable six-position jumper Field-selectable three-position jumper Standard. Can be disabled or re-enabled in the field Connect optional remote sensor to temp comp port



Simple field adjustments

-20 °C to 60 °C, meets full specification to 45 °C
Gradual current reduction to maintain safe power device temperature 5% to 95%, non-condensing
UL 991 Class B (2G sinusoidal)
ANSI/IEEE C62.41, Cat. B, EN50082-2 heavy industrial, EN 61000-6-2
IBC 2000, 2003, 2006, 2009; Maximum S_{ds} of 2.28 g; Optional OSHPD pre-approval

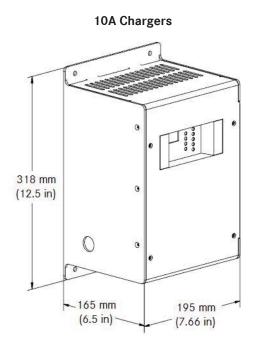


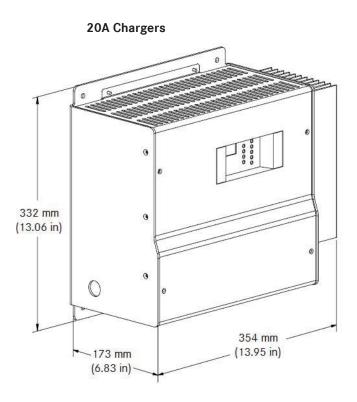
Agency Standards

Agency Stanuarus	
Safety	c-UL-us Listed to UL 1236 and CSA standard 22.2 no. 107.2. UL file E109740
	CE: 50/60 Hz units DOC to EN 60335
Agency marking	60 Hz: c-UL-us Listed
	50/60 Hz: c-UL-us Listed plus CE marked
EMC	Emissions: FCC Part 15, Class B; EN 50081-2
	Immunity: EN 61000-6-2
NFPA standards	NFPA 70, NFPA 110. (NFPA 110 requires Alarms "C")
Optional agency complia	
Construction	
Material	Non-corroding aluminum enclosure
Dimensions	See <i>Diagrams and Dimensions</i> section of this document
Printed circuit card	Surface mount technology, conformal coated
Cooling	Natural convection
Protection degree	Listed housing: NEMA-1 (IP20). Optional IP21 drip shield. Optional
FIOLECTION GEBIEE	NEMA 3R enclosure
Damage prevention	Fully recessed display and controls
Electrical connections	Compression terminal blocks
Warranty	
Standard warranty	MTU Onsite Energy standard warranty terms apply
,	
Optional Features	
Input	Input frequency, 50/60 Hz
Remote temp comp sens	
Drip shield meets s/b (II	
NEMA 3R housing	Enables outdoor installation (remote temp sensor recommended)
NEWA OK HOUSING	



DIAGRAMS AND DIMENSIONS





NRG Ordering Information							
Output Volts	Output Amps	Frequency	Model	Available Configurations	NFPA 110 Alarms	Weight kg (lbs)	
12/24	10	60 Hz	SUA83187	Enclosed	Yes	10.4 (23)	
12/24	20	60 Hz	SUA90170	Enclosed	Yes	19.1 (42)	
12/24	10	50/60 Hz	SUA89983	Enclosed	Yes	10.4 (23)	
12/24	20	50/60 Hz	SUA94705	Enclosed	Yes	19.1 (42)	

All models offer field-selectable input 120/208-240 volts.



MTU Onsite Energy

BATTERY CHARGER MTU Onsite Energy 12-6A Data Sheet



DESCRIPTION

The MTU Onsite Energy 12-6A battery charger is designed to recharge batteries and extend the life of connected batteries that are stored for long periods of time. It is multi-stage, completely automatic, lightweight, and silent with visible red and green LED lights located on the faceplate for easy operation.

FEATURES

- Waterproof (IP68 rating)
- LED charge indicators
- Protected against:
 - Overcurrent
 - Overcharge
 - Reverse polarity
 - Short circuit
- Hermetically sealed ignition
- Thermal protection at 50 °C (122 °F)

SPECIFICATIONS

- MTU Onsite Energy Part #:
- Dimensions:
- Weight:
- AC Input:
- Charger Output:

XG3130100003 Length: 88.9 mm (3.5 in) Width: 162.6 mm (6.4 in) Height: 58.4 mm (2.3 in) 1.8 kg (4 lbs) Input Volts: 115 V for 50 Hz and 60 Hz Input Current: 2 Amps Output Volts: 12 VDC nominal Output Current: 6 Amps

STATUS INDICATION

• LED status indicator: Two front panel LEDs indicate normal and alarm states

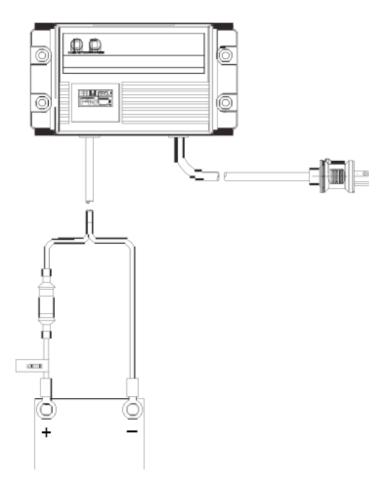
CERTIFICATIONS AND STANDARDS

- c-UL-us Listed to UL 1236 and CSA Standard C22.2 no. 107.2
- CE Marked
- CEC California Energy Commission Compliant
- FCC Labeled
- RoHS Compliant Restriction of Hazardous Substances



BATTERY CHARGER MTU Onsite Energy 12-6A Data Sheet





MTU Onsite Energy 12-6A Battery Charger Schematic

DESCRIPTION

MTU Onsite Energy offers a variety of starter packages to meet the needs of your application. In addition to standard and oversized starter options, we offer a redundant starter system that provides seamless operation in case of a starter failure. This optional starting system is both factory-configurable and field-installable.

STARTER OPTIONS

Standard Starter

- Consists of one or two starters that are required to start the unit (product-dependent)
- Default crank cycle: 3 x 15C x 15R (15 seconds crank/15 seconds rest)
- Minimum requirement with a low-cost design based on engineering economics (cost-effective solution)
- Standard equipment on all MTU Onsite Energy generator sets

Oversized Starter

- Starter either runs cooler or starts the unit faster than the standard starter
- Default crank cycle: 3 x 15C x 15R (15 seconds crank/15 seconds rest)
- Available on MTU Onsite Energy Series 4000 generator sets

Redundant Starter

The optional redundant starting system is designed to function in an alternating configuration using logic programmed in the MGC-3000 Series generator set controller. A second starter of the same model as the one originally installed is added to the generator set. Relays control each starter independently, and both are controlled by the MGC-3000 Series. The generator set controller cycles the starters through crank and rest states according to the specifications of the selected starting system.

- Two redundant starter types are currently available (refer to **REDUNDANT STARTER OPTIONS** for details):
 Alternating starter
 - Primary starter with backup starter
- Each redundant starter option requires two starters
- Available only with MGC-3000 Series generator set controller
- Note: Some redundant starting options on the Series 4000 generator sets may not fulfill the NFPA 110 type 10 requirements.







REDUNDANT STARTER OPTIONS

The two types of redundant starters that are currently available are the alternating starter and the primary starter with backup starter. The following tables give a brief description of each type.

Alternating Starter

Туре	Crank Cycle	Functionality	Availability		
Alternating Starter	 Modified crank cycle: 3 x 15C x 5R (15 seconds crank/5 seconds rest) Rest time between starters prevents starter engagement while engine is spinning down. See Figure 1: Worst- Case Scenario with Alternating Starters 	 Only one starter is needed to start the unit. Starters engage and crank independently. If starter fail occurs, the failed starter is disabled. The alternate starter engages and starts a new crank cycle. Note: The starter rest period on the remaining starter will be approximately five seconds long when the alternate starter has failed. If both starters indicate failure, the alternating 3 X 15C x 5R crank cycle resumes. Note: Upon any starter fail, the generator set start request must momentarily be interrupted to disengage starter, allow for engine standstill, and start a new 15-second crank cycle. Starters alternate with each crank cycle, beginning with Starter A. 	 MTU Series 1600 10V/12V MTU Series 2000 MTU Series 4000 		
Starter A Starter B Rest Total T Total Crank T Total Rest Starter A Crank	st crank cycle 15 15 15 15 15 10 5 5 5 5 5 5 5 5 5 5 5 5 5	665 70 75 80 85 90 95 100 105 115 120 125 130 135 140 145 150 1 tart new crank cycle Start new crank cycle 15 10 15 <t< td=""><td>55 160 165</td></t<>	55 160 165		
Starter B Crank		st-Case Scenario with Alternating Starters			
Note: Crank cycle is different from the NFPA 110 standard. Check with the local authority having jurisdiction for acceptance.					



REDUNDANT STARTER OPTIONS, continued

Primary Starter with Backup Starter

Туре	Crank Cycle	Functionality	Availability		
Primary Starter with Backup Starter	 Default crank cycle: 3 x 15C x 15R (15 seconds crank/15 seconds rest) See Figure 2: Worst- Case Scenario with Primary and Backup Starter 	 Only one starter is needed to start the unit. The primary starter is always cranked first. If primary starter fails, it will be disabled. After a brief pause to ensure engine is at standstill, the backup starter is engaged. If both starters indicate failure, the primary starter 3 x 15C x 15R crank cycle resumes. 	 MTU Series 1600 10V/12V MTU Series 2000 MTU Series 4000 		
Time (s) 5 10 15 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 160 165 170 175 180 185 190 195 200 205 210 215 220 225 Starter A Start new crank cycle Start new crank cycle 15 <td< td=""></td<>					
Starter B Crank Time	e 40 s				
Figure 2: Worst-Case Scenario with Primary and Backup Starter Note: Crank cycle is different from the NFPA 110 standard. Check with the local authority having jurisdiction for acceptance.					



BATTERY OPTIONS

In addition to the starter, the battery is a critical component of the starting system. Several battery options are available. The battery type should be chosen based on the needs of your application and the starter system that is selected.

Standard Battery Set

- A battery or set of batteries capable of starting the unit
- Default, cost-effective solution

Oversized Batteries

• A battery or set of batteries larger than the standard set

Non-Isolated Redundant Batteries

- Starter power is not isolated.
- Consists of two sets of standard or oversized batteries and two battery chargers.
- Each charger is connected to a set of batteries.
- Both sets of batteries are interfaced to the unit via a best battery selector or similar device.
- Only one set of batteries is used to start the unit.
- The battery with the highest voltage provides power to the starters.
- On-engine battery-charging alternator is not required and is removed where possible.
- Under-belly battery cable remains in place between starters.
- May be configured with any of the starter options listed above.

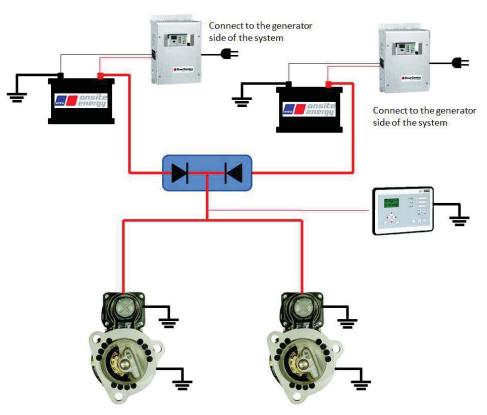


Figure 3: Non-Isolated Redundant Batteries



Isolated Redundant Batteries

- Starter power is isolated.
- Consists of two sets of standard or oversized batteries and two battery chargers.
- Each charger is connected to a set of batteries.
- Both sets of batteries are interfaced to the unit via a control power diode block or similar device.
- Both sets of batteries may or may not be used to start the unit, depending on starter configuration.
- On-engine battery charging alternator is not required and is removed where possible.
- Positive electrical connection between the starters is removed.
- May be configured with any of the above starter options.

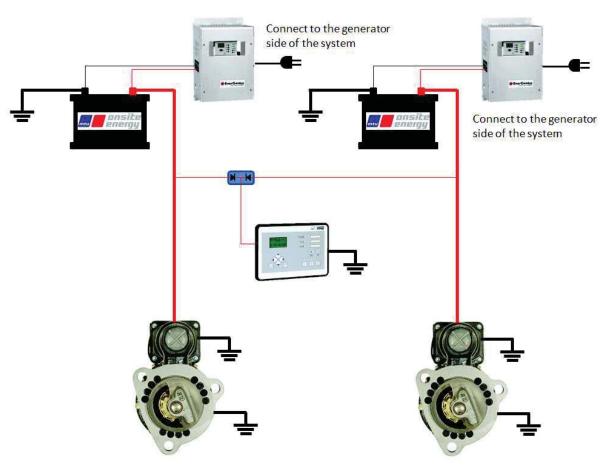


Figure 4: Isolated Redundant Batteries

MTU ONSITE ENERGY CORPORATION TWO (2) YEAR / 3,000 HOUR BASIC STANDBY & PRIME LIMITED WARRANTY



MTU Onsite Energy Corporation ("MTU Onsite Energy") issues the following express Limited Warranty subject to the following terms, conditions, and limitations:

An original consumer ("Owner") who purchases an MTU Onsite Energy engine generator set ("Product") is entitled to coverage under this Limited Warranty. MTU Onsite Energy warrants to the Owner that the Product is free of defects in material and workmanship and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. Any nonconformity to the foregoing is defined as a Warrantable Defect. This Limited Warranty applies to Product shipped by MTU Onsite Energy after January 1, 2014.

1. Limited Warranty Periods

Limited Warranty Period. The Limited Warranty Period for a Warrantable Defect in the Product is twenty-four (24) months after the first commissioning of the Product. In all cases, the Limited Warranty period will expire not later than thirty-six (36) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility or after 3,000 operation hours, whichever occurs first.

Accessories Coverage Period. The Accessories Coverage Period for a Warrantable Defect in cords, receptacles, cord reels, gas flex pipes, housing lights, space heaters, and associated equipment ("Accessories") is twelve (12) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility.

MTU Onsite Energy's warranty obligations under this Limited Warranty are contingent upon distributor completing the following:

- (a) The MTU Onsite Energy warranty and the *Start-Up Validation and Pre-Inspection Form.* Return both to MTU Onsite Energy within sixty (60) days of the start-up date; and
- (b) The engine registration form (when applicable). Return to the manufacturer as stated in the engine registration form instructions.

2. MTU Onsite Energy Responsibilities

If a Warrantable Defect is found during the Limited Warranty Period and/or the Accessories Coverage Period, and provided the Owner has complied with its obligations under Section 3, MTU Onsite Energy will, during normal working hours, through MTU Onsite Energy's authorized distributor, dealer, or service outlet, perform some or all of the following:

- (a) Repair or replace, at MTU Onsite Energy's sole election, the defective part with a new or remanufactured replacement part;
- (b) Provide reasonable or customary labor needed to correct the Warrantable Defect;
- (c) Provide technician travel time of 400 miles to and from the closest MTU Onsite Energy authorized distributor, dealer, or service outlet to the Product location;
- (d) Part removal and re-installation, if necessary and as solely determined by MTU Onsite Energy.

MTU Onsite Energy's obligation to repair or replace defective parts does not include responsibility for reimbursement of incidental or consequential costs. If MTU Onsite Energy repairs or replaces an Accessory, part, or Product under this Limited Warranty, the repaired or replaced Accessory, part, or Product assumes the unexpired portion of the warranty period remaining from the original Accessory, part, or Product. Repair or replacement of an Accessory, part, or Product will not extend the term of the original Limited Warranty Period or Accessories Coverage Period. Parts or Product replaced shall become the property of MTU Onsite Energy.

MTU Onsite Energy's failure to enforce any of the terms or conditions stated herein shall not be construed as a waiver of such provision or of any other terms and conditions of this Limited Warranty.

3. Owner Responsibilities

During the Limited Warranty Period and Accessories Coverage Period, the Owner is responsible for, and MTU Onsite Energy will not reimburse for the following:

- (a) Battery;
- (b) Premium or overtime labor costs;
- (c) Labor and material costs for Product removal and reinstallation;
- (d) Any special access fees required to gain access to MTU Onsite Energy equipment, without limitation, training or safety policy requirement to gain access;
- (e) Transportation costs or travel expenses related to delivery of the Product to the designated distributor, dealer, or service outlet;
- (f) Incidental and consequential costs, damages, or administrative expenses of whatever nature;
 (g) Non-Product repairs, vehicle damage, "downtime" expenses, cargo damage, fines, lost income, any business costs of any
- kind, Owner's travel expenses, and other losses resulting from a Warrantable Defect;(h) Shipping charges for replacement parts/Products in excess of those which are usual and customary; or
- (h) Shipping charges for replacement parts/P(i) Local taxes, if applicable.

In addition, Owner must:

- (a) Operate, use, and maintain the Product in accordance with the applicable Owner's manual and/or any other manuals specified by MTU Onsite Energy, including without limitation handling, inspection, servicing, or operating instructions;
- (b) Promptly notify MTU Onsite Energy or its authorized representative of a Warrantable Defect and make the Product available for repair;
- (c) Comply with MTU Onsite Energy's or MTU Onsite Energy's authorized representative's reasonable directions regarding the timing, sequence, and location of warranty repairs and make the Product available for inspection;

MTU ONSITE ENERGY CORPORATION TWO (2) YEAR / 3,000 HOUR BASIC STANDBY & PRIME LIMITED WARRANTY



- (d) Perform all required maintenance and maintain and provide proof that all required maintenance has been performed;
- (e) Use MTU Onsite Energy specified parts, components, and consumables;
- (f) Promptly return to MTU Onsite Energy all parts replaced under this Limited Warranty;
- (g) Comply with MTU Onsite Energy's long term storage guidelines, if applicable, and maintain and provide proof of compliance;
- (h) Routinely exercise the Product in accordance with operating instructions;
- (i) Install the Product in accordance with the installation guide provided; and
- (j) Reimburse MTU Onsite Energy for all costs incurred in providing warranty service where, following examination, the request or claim for warranty coverage proves to be unfounded or excluded, as well as all incidental costs including those incurred investigating the claim.

4. Limitations

MTU Onsite Energy is not responsible, and this Limited Warranty is not available under any circumstances, for any of the following:

- (a) Failure of Owner to fulfill its obligations under Section 3;
- (b) Failure of Owner to follow MTU Onsite Energy's instructions for Product stored by Owner longer than 180 days from date of shipment from MTU Onsite Energy's Mankato, MN facility;
- (c) Defects caused by adjustments made by Owner to the fuel system or governor system;
- (d) Defects which were obvious or capable of being identified by reasonable inspection and were not reported to MTU Onsite Energy within a reasonable time;
- (e) Rental equipment used during warranty work;
- (f) Defects caused or potentially caused by service work performed by non-MTU Onsite Energy authorized service providers and/or the use of non-genuine MTU Onsite Energy parts;
- (g) Defects resulting from natural wear and tear, external action, negligence, natural disasters, accidents, incorrect use, improper handling or storage, inadequate corrosion-proofing, incorrect assembly or installation, or modification of the Product;
- (h) Defects resulting from abuse or neglect, including unauthorized modifications to the Product;
- (i) Repair or any use or installation which MTU Onsite Energy, in its sole discretion, determines to be improper;
- (j) Defects caused by incorrect maintenance;
- (k) Defects resulting from Owner's delay in making the Product available after being notified of a potential problem or Owner's failure to take immediate measures to avoid or mitigate damage;
- (I) Damage caused by shipping;
- (m) Repair of parts sold by MTU Onsite Energy that are warranted directly to the Owner by the respective part's manufacturer;
- (n) Misapplication of the Product;
- (o) Diesel engine "wet stacking" due to lightly loaded diesel engines;
- (p) Acts of nature or acts of God;
- (q) Any failure, other than those resulting from a defect in material or factory workmanship of the Product;
- (r) Use of the Product for purposes other than those for which it was intended, including without limitation use of the Product under
- extraordinary operating conditions not made known to MTU Onsite Energy in writing at the time of the order; or
- (s) Material provided by or a design specified by the Owner.
- 5. Software Warranty. Where software is included in the Product, MTU Onsite Energy warrants to the Owner that 1) the software will be substantially free from material program errors and material defects in material and workmanship and that 2) it shall function substantially in accordance with MTU Onsite Energy's specification at the time of dispatch from the MTU Onsite Energy manufacturing facility. MTU Onsite Energy does not warrant that the software is error-free or free from "bugs" as commonly categorized by the computer industry. MTU Onsite Energy shall, during the Limited Warranty Period, endeavor to remedy at its cost, in its sole discretion, by repair or replacement of any material program errors or material defects of which Owner has promptly notified MTU Onsite Energy. MTU Onsite Energy, at its option, may elect to provide the most current software at no cost, and in such case MTU Onsite Energy will not cover the cost to install the applicable updated software. MTU Onsite Energy shall have no obligation with respect to any nonconformities resulting from unauthorized modifications to the software or any Owner interfacing.
- 6. Emissions Warranty. The Product may be covered under an emissions warranty specified by the U.S. Environmental Protection Agency and/or the California Air Resources Board. The terms of the warranty, if applicable, may be accessed by following the link: http://www.mtuonsiteenergy.com/technical-info/emissions-warranty/. Any such Emissions Warranty is incorporated herein by reference in its entirety to the extent and with the same force as if fully set forth herein. The Product, if certified, may only be certified to comply with the required country or region specific emission regulations. Where applicable, the Product is only certified to those specific emission regulations/standards which are clearly stated in the respective RRPS/MTU Onsite Energy defined technical specifications. IT IS THE OWNER'S SOLE RESPONSIBILITY TO ENSURE THAT THE EXPORT/IMPORT, INSTALLATION, AND USE OF THE PRODUCT(S) COMPLIES WITH THE APPLICABLE EMISSION REGULATIONS IN THE COUNTRY OR REGION WHERE THE PRODUCT(S) WILL BE USED.

7. Disclaimers

LIMITATION OF WARRANTIES: THIS LIMITED WARRANTY IS GIVEN EXPRESSLY AND IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, FREEDOM FROM INFRINGEMENT OR THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, REPRESENTATIONS, OR WARRANTIES NOT SPECIFIED HEREIN.



THIS LIMITED WARRANTY, THE OBLIGATIONS OF MTU ONSITE ENERGY AND THE RIGHTS AND REMEDIES OF THE OWNER SET FORTH IN THIS LIMITED WARRANTY ARE EXCLUSIVE AND ARE EXPRESSLY IN LIEU OF, AND THE OWNER HEREBY WAIVES AND RELEASES ALL OTHER OBLIGATIONS, WARRANTIES (INCLUDING WARRANTY AGAINST REDHIBITORY DEFECTS), REPRESENTATIONS OR LIABILITIES, EXPRESS OR IMPLIED, ARISING BY LAW IN CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY CLAIMS ARISING OUT OF, CONNECTED WITH OR RESULTING FROM THE PERFORMANCE OF THIS LIMITED WARRANTY OR FROM THE DESIGN, MANUFACTURE, SALE, REPAIR, LEASE OR USE OF THE PRODUCT, ANY COMPONENT THEREOF AND SERVICES DELIVERED OR RENDERED HEREUNDER OR OTHERWISE.

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, ALLEGED NEGLIGENCE, OR OTHERWISE, SHALL MTU ONSITE ENERGY BE SUBJECT TO LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING WITHOUT LIMITATION, DAMAGE TO THE PRODUCT, OR OTHER PROPERTY, COMMERCIAL LOSSES, LOST PROFITS, LOSS OF USE, INCONVENIENCE, LOSS OF TIME, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, DOWNTIME, OR CLAIMS OF CUSTOMERS.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT.

- 8. The Owner is entitled to rectify the defect or to have it rectified by third parties only in urgent cases where operational safety is at risk or in order to prevent disproportionately extensive damage; provided that Owner has informed MTU Onsite Energy and obtained MTU Onsite Energy's prior written consent. In such cases, MTU Onsite Energy shall, in its sole discretion, reimburse the costs incurred by the Owner up to an amount equivalent to the costs MTU Onsite Energy would have incurred had it remedied the defect itself.
- 9. This Limited Warranty gives the Owner specific legal rights, and the Owner may also have other rights, which vary from state to state. Some states do not allow warranty duration limitations and/or certain exclusions or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion(s) may not apply to Owner. If any one or more of the provisions contained in this Limited Warranty shall be invalid, illegal, or unenforceable in any respect, the validity, legality, or enforceability of the remaining provisions contained therein shall not in any way be affected or impaired thereby.
- 10. This Limited Warranty is governed by the laws of the State of Minnesota without regard to its conflicts of law principles and excluding the United Nations Convention for the International Sale of Goods.
- 11. In order to obtain performance of an MTU Onsite Energy warranty obligation, the Owner should contact the nearest MTU Onsite Energy authorized distributor, dealer, or service outlet for instructions. To find the location of the nearest MTU Onsite Energy authorized distributor, dealer, or service outlet call 800-325-5450 or write to: MTU Onsite Energy Onsite Energy Corporation Warranty Department, 100 Power Drive, Mankato, MN 56001.

MTU ONSITE ENERGY CORPORATION TWO (2) YEAR / 6,000 HOUR BASIC EXTENDED PRIME LIMITED WARRANTY



MTU Onsite Energy Corporation ("MTU Onsite Energy") issues the following express Limited Warranty subject to the following terms, conditions, and limitations:

An original consumer ("Owner") who purchases an MTU Onsite Energy engine generator set ("Product") is entitled to coverage under this Limited Warranty. MTU Onsite Energy warrants to the Owner that the Product is free of defects in material and workmanship and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. Any nonconformity to the foregoing is defined as a Warrantable Defect. This Limited Warranty applies to Product shipped by MTU Onsite Energy after January 1, 2014.

1. Limited Warranty Periods

Limited Warranty Period. The Limited Warranty Period for a Warrantable Defect in the Product is twenty-four (24) months after the first commissioning of the Product. In all cases, the Limited Warranty period will expire not later than thirty-six (36) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility or after 6,000 operation hours, whichever occurs first.

Accessories Coverage Period. The Accessories Coverage Period for a Warrantable Defect in cords, receptacles, cord reels, gas flex pipes, housing lights, space heaters, and associated equipment ("Accessories") is twelve (12) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility.

MTU Onsite Energy's warranty obligations under this Limited Warranty are contingent upon distributor completing the following:

- (a) The MTU Onsite Energy warranty and the *Start-Up Validation and Pre-Inspection Form.* Return both to MTU Onsite Energy within sixty (60) days of the start-up date; and
- (b) The engine registration form (when applicable). Return to the manufacturer as stated in the engine registration form instructions.

2. MTU Onsite Energy Responsibilities

If a Warrantable Defect is found during the Limited Warranty Period and/or the Accessories Coverage Period, and provided the Owner has complied with its obligations under Section 3, MTU Onsite Energy will, during normal working hours, through MTU Onsite Energy's authorized distributor, dealer, or service outlet, perform some or all of the following:

- (a) Repair or replace, at MTU Onsite Energy's sole election, the defective part with a new or remanufactured replacement part;
- (b) Provide reasonable or customary labor needed to correct the Warrantable Defect;
- (c) Provide technician travel time of 400 miles to and from the closest MTU Onsite Energy authorized distributor, dealer, or service outlet to the Product location;
- (d) Part removal and re-installation, if necessary and as solely determined by MTU Onsite Energy.

MTU Onsite Energy's obligation to repair or replace defective parts does not include responsibility for reimbursement of incidental or consequential costs. If MTU Onsite Energy repairs or replaces an Accessory, part, or Product under this Limited Warranty, the repaired or replaced Accessory, part, or Product assumes the unexpired portion of the warranty period remaining from the original Accessory, part, or Product. Repair or replacement of an Accessory, part, or Product will not extend the term of the original Limited Warranty Period or Accessories Coverage Period. Parts or Product replaced shall become the property of MTU Onsite Energy.

MTU Onsite Energy's failure to enforce any of the terms or conditions stated herein shall not be construed as a waiver of such provision or of any other terms and conditions of this Limited Warranty.

3. Owner Responsibilities

During the Limited Warranty Period and Accessories Coverage Period, the Owner is responsible for, and MTU Onsite Energy will not reimburse for the following:

- (a) Battery;
- (b) Premium or overtime labor costs;
- (c) Labor and material costs for Product removal and reinstallation;
- (d) Any special access fees required to gain access to MTU Onsite Energy equipment, without limitation, training or safety policy requirement to gain access;
- (e) Transportation costs or travel expenses related to delivery of the Product to the designated distributor, dealer, or service outlet;
- (f) Incidental and consequential costs, damages, or administrative expenses of whatever nature;
 (g) Non-Product repairs, vehicle damage, "downtime" expenses, cargo damage, fines, lost income, any business costs of any
- kind, Owner's travel expenses, and other losses resulting from a Warrantable Defect;(h) Shipping charges for replacement parts/Products in excess of those which are usual and customary; or
- (i) Local taxes, if applicable.

In addition, Owner must:

- (a) Operate, use, and maintain the Product in accordance with the applicable Owner's manual and/or any other manuals specified by MTU Onsite Energy, including without limitation handling, inspection, servicing, or operating instructions;
- (b) Promptly notify MTU Onsite Energy or its authorized representative of a Warrantable Defect and make the Product available for repair;
- (c) Comply with MTU Onsite Energy's or MTU Onsite Energy's authorized representative's reasonable directions regarding the timing, sequence, and location of warranty repairs and make the Product available for inspection;

MTU ONSITE ENERGY CORPORATION TWO (2) YEAR / 6,000 HOUR BASIC EXTENDED PRIME LIMITED WARRANTY



- (d) Perform all required maintenance and maintain and provide proof that all required maintenance has been performed;
- (e) Use MTU Onsite Energy specified parts, components, and consumables;
- (f) Promptly return to MTU Onsite Energy all parts replaced under this Limited Warranty;
- (g) Comply with MTU Onsite Energy's long term storage guidelines, if applicable, and maintain and provide proof of compliance;
- (h) Routinely exercise the Product in accordance with operating instructions;
- (i) Install the Product in accordance with the installation guide provided; and
- (j) Reimburse MTU Onsite Energy for all costs incurred in providing warranty service where, following examination, the request or claim for warranty coverage proves to be unfounded or excluded, as well as all incidental costs including those incurred investigating the claim.

4. Limitations

MTU Onsite Energy is not responsible, and this Limited Warranty is not available under any circumstances, for any of the following:

- (a) Failure of Owner to fulfill its obligations under Section 3;
- (b) Failure of Owner to follow MTU Onsite Energy's instructions for Product stored by Owner longer than 180 days from date of shipment from MTU Onsite Energy's Mankato, MN facility;
- (c) Defects caused by adjustments made by Owner to the fuel system or governor system;
- (d) Defects which were obvious or capable of being identified by reasonable inspection and were not reported to MTU Onsite Energy within a reasonable time;
- (e) Rental equipment used during warranty work;
- (f) Defects caused or potentially caused by service work performed by non-MTU Onsite Energy authorized service providers and/or the use of non-genuine MTU Onsite Energy parts;
- (g) Defects resulting from natural wear and tear, external action, negligence, natural disasters, accidents, incorrect use, improper handling or storage, inadequate corrosion-proofing, incorrect assembly or installation, or modification of the Product;
- (h) Defects resulting from abuse or neglect, including unauthorized modifications to the Product;
- (i) Repair or any use or installation which MTU Onsite Energy, in its sole discretion, determines to be improper;
- (j) Defects caused by incorrect maintenance;
- (k) Defects resulting from Owner's delay in making the Product available after being notified of a potential problem or Owner's failure to take immediate measures to avoid or mitigate damage;
- (I) Damage caused by shipping;
- (m) Repair of parts sold by MTU Onsite Energy that are warranted directly to the Owner by the respective part's manufacturer;
- (n) Misapplication of the Product;
- (o) Diesel engine "wet stacking" due to lightly loaded diesel engines;
- (p) Acts of nature or acts of God;
- (q) Any failure, other than those resulting from a defect in material or factory workmanship of the Product;
- (r) Use of the Product for purposes other than those for which it was intended, including without limitation use of the Product under
- extraordinary operating conditions not made known to MTU Onsite Energy in writing at the time of the order; or
- (s) Material provided by or a design specified by the Owner.
- 5. Software Warranty. Where software is included in the Product, MTU Onsite Energy warrants to the Owner that 1) the software will be substantially free from material program errors and material defects in material and workmanship and that 2) it shall function substantially in accordance with MTU Onsite Energy's specification at the time of dispatch from the MTU Onsite Energy manufacturing facility. MTU Onsite Energy does not warrant that the software is error-free or free from "bugs" as commonly categorized by the computer industry. MTU Onsite Energy shall, during the Limited Warranty Period, endeavor to remedy at its cost, in its sole discretion, by repair or replacement of any material program errors or material defects of which Owner has promptly notified MTU Onsite Energy. MTU Onsite Energy, at its option, may elect to provide the most current software at no cost, and in such case MTU Onsite Energy will not cover the cost to install the applicable updated software. MTU Onsite Energy shall have no obligation with respect to any nonconformities resulting from unauthorized modifications to the software or any Owner interfacing.
- 6. Emissions Warranty. The Product may be covered under an emissions warranty specified by the U.S. Environmental Protection Agency and/or the California Air Resources Board. The terms of the warranty, if applicable, may be accessed by following the link: http://www.mtuonsiteenergy.com/technical-info/emissions-warranty/. Any such Emissions Warranty is incorporated herein by reference in its entirety to the extent and with the same force as if fully set forth herein. The Product, if certified, may only be certified to comply with the required country or region specific emission regulations. Where applicable, the Product is only certified to those specific emission regulations/standards which are clearly stated in the respective RRPS/MTU Onsite Energy defined technical specifications. IT IS THE OWNER'S SOLE RESPONSIBILITY TO ENSURE THAT THE EXPORT/IMPORT, INSTALLATION, AND USE OF THE PRODUCT(S) COMPLIES WITH THE APPLICABLE EMISSION REGULATIONS IN THE COUNTRY OR REGION WHERE THE PRODUCT(S) WILL BE USED.

7. Disclaimers

LIMITATION OF WARRANTIES: THIS LIMITED WARRANTY IS GIVEN EXPRESSLY AND IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, FREEDOM FROM INFRINGEMENT OR THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, REPRESENTATIONS, OR WARRANTIES NOT SPECIFIED HEREIN.



THIS LIMITED WARRANTY, THE OBLIGATIONS OF MTU ONSITE ENERGY AND THE RIGHTS AND REMEDIES OF THE OWNER SET FORTH IN THIS LIMITED WARRANTY ARE EXCLUSIVE AND ARE EXPRESSLY IN LIEU OF, AND THE OWNER HEREBY WAIVES AND RELEASES ALL OTHER OBLIGATIONS, WARRANTIES (INCLUDING WARRANTY AGAINST REDHIBITORY DEFECTS), REPRESENTATIONS OR LIABILITIES, EXPRESS OR IMPLIED, ARISING BY LAW IN CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY CLAIMS ARISING OUT OF, CONNECTED WITH OR RESULTING FROM THE PERFORMANCE OF THIS LIMITED WARRANTY OR FROM THE DESIGN, MANUFACTURE, SALE, REPAIR, LEASE OR USE OF THE PRODUCT, ANY COMPONENT THEREOF AND SERVICES DELIVERED OR RENDERED HEREUNDER OR OTHERWISE.

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, ALLEGED NEGLIGENCE, OR OTHERWISE, SHALL MTU ONSITE ENERGY BE SUBJECT TO LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING WITHOUT LIMITATION, DAMAGE TO THE PRODUCT, OR OTHER PROPERTY, COMMERCIAL LOSSES, LOST PROFITS, LOSS OF USE, INCONVENIENCE, LOSS OF TIME, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, DOWNTIME, OR CLAIMS OF CUSTOMERS.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT.

- 8. The Owner is entitled to rectify the defect or to have it rectified by third parties only in urgent cases where operational safety is at risk or in order to prevent disproportionately extensive damage; provided that Owner has informed MTU Onsite Energy and obtained MTU Onsite Energy's prior written consent. In such cases, MTU Onsite Energy shall, in its sole discretion, reimburse the costs incurred by the Owner up to an amount equivalent to the costs MTU Onsite Energy would have incurred had it remedied the defect itself.
- 9. This Limited Warranty gives the Owner specific legal rights, and the Owner may also have other rights, which vary from state to state. Some states do not allow warranty duration limitations and/or certain exclusions or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion(s) may not apply to Owner. If any one or more of the provisions contained in this Limited Warranty shall be invalid, illegal, or unenforceable in any respect, the validity, legality, or enforceability of the remaining provisions contained therein shall not in any way be affected or impaired thereby.
- 10. This Limited Warranty is governed by the laws of the State of Minnesota without regard to its conflicts of law principles and excluding the United Nations Convention for the International Sale of Goods.
- 11. In order to obtain performance of an MTU Onsite Energy warranty obligation, the Owner should contact the nearest MTU Onsite Energy authorized distributor, dealer, or service outlet for instructions. To find the location of the nearest MTU Onsite Energy authorized distributor, dealer, or service outlet call 800-325-5450 or write to: MTU Onsite Energy Onsite Energy Corporation Warranty Department, 100 Power Drive, Mankato, MN 56001.

MTU ONSITE ENERGY CORPORATION FIVE (5) YEAR / 3,000 HOUR BASIC EXTENDED STANDBY LIMITED WARRANTY



MTU Onsite Energy Corporation ("MTU Onsite Energy") issues the following express Limited Warranty subject to the following terms, conditions, and limitations:

An original consumer ("Owner") who purchases an MTU Onsite Energy engine generator set ("Product") is entitled to coverage under this Limited Warranty. MTU Onsite Energy warrants to the Owner that the Product is free of defects in material and workmanship and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. Any nonconformity to the foregoing is defined as a Warrantable Defect. This Limited Warranty applies to Product shipped by MTU Onsite Energy after January 1, 2014.

1. Limited Warranty Periods

Limited Warranty Period. The Limited Warranty Period for a Warrantable Defect in the Product is twenty-four (24) months after the first commissioning of the Product. In all cases, the Limited Warranty period will expire not later than thirty-six (36) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility or after 3,000 operation hours, whichever occurs first.

<u>Component Only Coverage Period</u>. The Component Only Coverage Period for a Warrantable Defect in the components of the Product is sixty (60) months after the first commissioning of the Product. In all cases, the Component Only Coverage period will expire not later than seventy-two (72) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility or after 3,000 operation hours, whichever occurs first.

Accessories Coverage Period. The Accessories Coverage Period for a Warrantable Defect in cords, receptacles, cord reels, gas flex pipes, housing lights, space heaters, and associated equipment ("Accessories") is twelve (12) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility.

MTU Onsite Energy's warranty obligations under this Limited Warranty are contingent upon distributor completing the following:

- (a) The MTU Onsite Energy warranty and the *Start-Up Validation and Pre-Inspection Form.* Return both to MTU Onsite Energy within sixty (60) days of the start-up date; and
- (b) The engine registration form (when applicable). Return to the manufacturer as stated in the engine registration form instructions.

2. MTU Onsite Energy Responsibilities

If a Warrantable Defect is found during the Limited Warranty Period and/or the Accessories Coverage Period, and provided the Owner has complied with its obligations under Section 3, MTU Onsite Energy will, during normal working hours, through MTU Onsite Energy's authorized distributor, dealer, or service outlet, perform some or all of the following:

- (a) Repair or replace, at MTU Onsite Energy's sole election, the defective part with a new or remanufactured replacement part;
- (b) Provide reasonable or customary labor needed to correct the Warrantable Defect;
- (c) Provide technician travel time of 400 miles to and from the closest MTU Onsite Energy authorized distributor, dealer, or service outlet to the Product location;
- (d) Part removal and re-installation, if necessary and as solely determined by MTU Onsite Energy.

If a Warrantable Defect is found during the Component Only Coverage Period, and provided the Owner has complied with its obligations under Section 3, MTU Onsite Energy will only pay for the cost of the parts repaired or replaced on the defective component (material cost only). All other costs including, but not limited to, labor, transportation, shipping costs, lubricating oil, filters, antifreeze, and other service items rendered by the defect are the Owner's sole responsibility.

MTU Onsite Energy's obligation to repair or replace defective parts does not include responsibility for reimbursement of incidental or consequential costs. If MTU Onsite Energy repairs or replaces an Accessory, part, or Product under this Limited Warranty, the repaired or replaced Accessory, part, or Product assumes the unexpired portion of the warranty period remaining from the original Accessory, part, or Product. Repair or replacement of an Accessory, part, or Product will not extend the term of the original Limited Warranty Period or Accessories Coverage Period. Parts or Product replaced shall become the property of MTU Onsite Energy.

MTU Onsite Energy's failure to enforce any of the terms or conditions stated herein shall not be construed as a waiver of such provision or of any other terms and conditions of this Limited Warranty.

3. Owner Responsibilities

During the Limited Warranty Period, Component Only Coverage Period, and Accessories Coverage Period, the Owner is responsible for, and MTU Onsite Energy will not reimburse for the following:

- (a) Battery;
- (b) Premium or overtime labor costs;
- (c) Labor and material costs for Product removal and reinstallation;
- (d) Any special access fees required to gain access to MTU Onsite Energy equipment, without limitation, training or safety policy requirement to gain access;
- (e) Transportation costs or travel expenses related to delivery of the Product to the designated distributor, dealer, or service outlet;
- (f) Incidental and consequential costs, damages, or administrative expenses of whatever nature;

MTU ONSITE ENERGY CORPORATION FIVE (5) YEAR / 3,000 HOUR BASIC EXTENDED STANDBY LIMITED WARRANTY



- (g) Non-Product repairs, vehicle damage, "downtime" expenses, cargo damage, fines, lost income, any business costs of any kind, Owner's travel expenses, and other losses resulting from a Warrantable Defect;
- (h) Shipping charges for replacement parts/Products in excess of those which are usual and customary; or
- (i) Local taxes, if applicable.

In addition, Owner must:

- (a) Operate, use, and maintain the Product in accordance with the applicable Owner's manual and/or any other manuals specified by MTU Onsite Energy, including without limitation handling, inspection, servicing, or operating instructions;
- (b) Promptly notify MTU Onsite Energy or its authorized representative of a Warrantable Defect and make the Product available for repair;
- (c) Comply with MTU Onsite Energy's or MTU Onsite Energy's authorized representative's reasonable directions regarding the timing, sequence, and location of warranty repairs and make the Product available for inspection;
- (d) Perform all required maintenance and maintain and provide proof that all required maintenance has been performed;
- (e) Use MTU Onsite Energy specified parts, components, and consumables;
- (f) Promptly return to MTU Onsite Energy all parts replaced under this Limited Warranty;
- (g) Comply with MTU Onsite Energy's long term storage guidelines, if applicable, and maintain and provide proof of compliance;
- (h) Routinely exercise the Product in accordance with operating instructions;
- (i) Install the Product in accordance with the installation guide provided; and
- (j) Reimburse MTU Onsite Energy for all costs incurred in providing warranty service where, following examination, the request or claim for warranty coverage proves to be unfounded or excluded, as well as all incidental costs including those incurred investigating the claim.

4. Limitations

MTU Onsite Energy is not responsible, and this Limited Warranty is not available under any circumstances, for any of the following:

- (a) Failure of Owner to fulfill its obligations under Section 3;
- (b) Failure of Owner to follow MTU Onsite Energy's instructions for Product stored by Owner longer than 180 days from date of shipment from MTU Onsite Energy's Mankato, MN facility;
- (c) Defects caused by adjustments made by Owner to the fuel system or governor system;
- (d) Defects which were obvious or capable of being identified by reasonable inspection and were not reported to MTU Onsite Energy within a reasonable time;
- (e) Rental equipment used during warranty work;
- (f) Defects caused or potentially caused by service work performed by non-MTU Onsite Energy authorized service providers and/or the use of non-genuine MTU Onsite Energy parts;
- (g) Defects resulting from natural wear and tear, external action, negligence, natural disasters, accidents, incorrect use, improper handling or storage, inadequate corrosion-proofing, incorrect assembly or installation, or modification of the Product;
- (h) Defects resulting from abuse or neglect, including unauthorized modifications to the Product;
- (i) Repair or any use or installation which MTU Onsite Energy, in its sole discretion, determines to be improper;
- (j) Defects caused by incorrect maintenance;
- (k) Defects resulting from Owner's delay in making the Product available after being notified of a potential problem or Owner's failure to take immediate measures to avoid or mitigate damage;
- (I) Damage caused by shipping;
- (m) Repair of parts sold by MTU Onsite Energy that are warranted directly to the Owner by the respective part's manufacturer;
- (n) Misapplication of the Product;
- (o) Diesel engine "wet stacking" due to lightly loaded diesel engines;
- (p) Acts of nature or acts of God;
- (q) Any failure, other than those resulting from a defect in material or factory workmanship of the Product;
- (r) Use of the Product for purposes other than those for which it was intended, including without limitation use of the Product under extraordinary operating conditions not made known to MTU Onsite Energy in writing at the time of the order; or
- (s) Material provided by or a design specified by the Owner.
- 5. Software Warranty. Where software is included in the Product, MTU Onsite Energy warrants to the Owner that 1) the software will be substantially free from material program errors and material defects in material and workmanship, and that 2) it shall function substantially in accordance with MTU Onsite Energy's specification at the time of dispatch from the MTU Onsite Energy manufacturing facility. MTU Onsite Energy does not warrant that the software is error-free or free from "bugs" as commonly categorized by the computer industry. MTU Onsite Energy shall, during the Limited Warranty Period, endeavor to remedy at its cost, in its sole discretion, by repair or replacement of any material program errors or material defects of which Owner has promptly notified MTU Onsite Energy. MTU Onsite Energy, at its option, may elect to provide the most current software at no cost, and in such case MTU Onsite Energy will not cover the cost to install the applicable updated software. MTU Onsite Energy shall have no obligation with respect to any nonconformities resulting from unauthorized modifications to the software or any Owner interfacing.
- 6. Emissions Warranty. The Product may be covered under an emissions warranty specified by the U.S. Environmental Protection Agency and/or the California Air Resources Board. The terms of the warranty, if applicable, may be accessed by following the link: http://www.mtuonsiteenergy.com/technical-info/emissions-warranty/. Any such Emissions Warranty is incorporated herein by reference in its entirety to the extent and with the same force as if fully set forth herein. The Product, if certified, may only be certified to comply with the required country or region specific emission regulations. Where applicable, the Product is only certified to those specific emission regulations/standards which are clearly stated in the respective RRPS/MTU Onsite Energy defined technical specifications. IT IS THE

MTU ONSITE ENERGY CORPORATION FIVE (5) YEAR / 3,000 HOUR BASIC EXTENDED STANDBY LIMITED WARRANTY



OWNER'S SOLE RESPONSIBILITY TO ENSURE THAT THE EXPORT/IMPORT, INSTALLATION, AND USE OF THE PRODUCT(S) COMPLIES WITH THE APPLICABLE EMISSION REGULATIONS IN THE COUNTRY OR REGION WHERE THE PRODUCT(S) WILL BE USED.

7. Disclaimers

LIMITATION OF WARRANTIES: THIS LIMITED WARRANTY IS GIVEN EXPRESSLY AND IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, FREEDOM FROM INFRINGEMENT OR THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, REPRESENTATIONS, OR WARRANTIES NOT SPECIFIED HEREIN.

THIS LIMITED WARRANTY, THE OBLIGATIONS OF MTU ONSITE ENERGY AND THE RIGHTS AND REMEDIES OF THE OWNER SET FORTH IN THIS LIMITED WARRANTY ARE EXCLUSIVE AND ARE EXPRESSLY IN LIEU OF, AND THE OWNER HEREBY WAIVES AND RELEASES ALL OTHER OBLIGATIONS, WARRANTIES (INCLUDING WARRANTY AGAINST REDHIBITORY DEFECTS), REPRESENTATIONS OR LIABILITIES, EXPRESS OR IMPLIED, ARISING BY LAW IN CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY CLAIMS ARISING OUT OF, CONNECTED WITH OR RESULTING FROM THE PERFORMANCE OF THIS LIMITED WARRANTY OR FROM THE DESIGN, MANUFACTURE, SALE, REPAIR, LEASE OR USE OF THE PRODUCT, ANY COMPONENT THEREOF AND SERVICES DELIVERED OR RENDERED HEREUNDER OR OTHERWISE.

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, ALLEGED NEGLIGENCE, OR OTHERWISE, SHALL MTU ONSITE ENERGY BE SUBJECT TO LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING WITHOUT LIMITATION, DAMAGE TO THE PRODUCT, OR OTHER PROPERTY, COMMERCIAL LOSSES, LOST PROFITS, LOSS OF USE, INCONVENIENCE, LOSS OF TIME, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, DOWNTIME, OR CLAIMS OF CUSTOMERS.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT.

- 8. The Owner is entitled to rectify the defect or to have it rectified by third parties only in urgent cases where operational safety is at risk or in order to prevent disproportionately extensive damage; provided that Owner has informed MTU Onsite Energy and obtained MTU Onsite Energy's prior written consent. In such cases, MTU Onsite Energy shall, in its sole discretion, reimburse the costs incurred by the Owner up to an amount equivalent to the costs MTU Onsite Energy would have incurred had it remedied the defect itself.
- 9. This Limited Warranty gives the Owner specific legal rights, and the Owner may also have other rights, which vary from state to state. Some states do not allow warranty duration limitations and/or certain exclusions or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion(s) may not apply to Owner. If any one or more of the provisions contained in this Limited Warranty shall be invalid, illegal, or unenforceable in any respect, the validity, legality, or enforceability of the remaining provisions contained therein shall not in any way be affected or impaired thereby.
- 10. This Limited Warranty is governed by the laws of the State of Minnesota without regard to its conflicts of law principles and excluding the United Nations Convention for the International Sale of Goods.
- 11. In order to obtain performance of an MTU Onsite Energy warranty obligation, the Owner should contact the nearest MTU Onsite Energy authorized distributor, dealer, or service outlet for instructions. To find the location of the nearest MTU Onsite Energy authorized distributor, dealer, or service outlet call 800-325-5450 or write to: MTU Onsite Energy Onsite Energy Corporation Warranty Department, 100 Power Drive, Mankato, MN 56001.

MTU ONSITE ENERGY CORPORATION FIVE (5) YEAR / 3,000 HOUR COMPREHENSIVE EXTENDED STANDBY LIMITED WARRANTY



MTU Onsite Energy Corporation ("MTU Onsite Energy") issues the following express Limited Warranty subject to the following terms, conditions, and limitations:

An original consumer ("Owner") who purchases an MTU Onsite Energy engine generator set ("Product") is entitled to coverage under this Limited Warranty. MTU Onsite Energy warrants to the Owner that the Product is free of defects in material and workmanship and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. Any nonconformity to the foregoing is defined as a Warrantable Defect. This Limited Warranty applies to Product shipped by MTU Onsite Energy after January 1, 2014.

1. Limited Warranty Periods

Limited Warranty Period. The Limited Warranty Period for a Warrantable Defect in the Product is sixty (60) months after the first commissioning of the Product. In all cases, the Limited Warranty period will expire not later than seventy-two (72) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility or after 3,000 operation hours, whichever occurs first.

Accessories Coverage Period. The Accessories Coverage Period for a Warrantable Defect in cords, receptacles, cord reels, gas flex pipes, housing lights, space heaters, and associated equipment ("Accessories") is twelve (12) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility.

MTU Onsite Energy's warranty obligations under this Limited Warranty are contingent upon distributor completing the following:

- (a) The MTU Onsite Energy warranty and the *Start-Up Validation and Pre-Inspection Form.* Return both to MTU Onsite Energy within sixty (60) days of the start-up date; and
- (b) The engine registration form (when applicable). Return to the manufacturer as stated in the engine registration form instructions.

2. MTU Onsite Energy Responsibilities

If a Warrantable Defect is found during the Limited Warranty Period and/or the Accessories Coverage Period, and provided the Owner has complied with its obligations under Section 3, MTU Onsite Energy will, during normal working hours, through MTU Onsite Energy's authorized distributor, dealer, or service outlet, perform some or all of the following:

- (a) Repair or replace, at MTU Onsite Energy's sole election, the defective part with a new or remanufactured replacement part;
- (b) Provide reasonable or customary labor needed to correct the Warrantable Defect;
- (c) Provide technician travel time of 400 miles to and from the closest MTU Onsite Energy authorized distributor, dealer or service outlet to the Product location;
- (d) Part removal and re-installation, if necessary and as solely determined by MTU Onsite Energy.

MTU Onsite Energy's obligation to repair or replace defective parts does not include responsibility for reimbursement of incidental or consequential costs. If MTU Onsite Energy repairs or replaces an Accessory, part, or Product under this Limited Warranty, the repaired or replaced Accessory, part, or Product assumes the unexpired portion of the warranty period remaining from the original Accessory, part, or Product. Repair or replacement of an Accessory, part, or Product will not extend the term of the original Limited Warranty Period or Accessories Coverage Period. Parts or Product replaced shall become the property of MTU Onsite Energy.

MTU Onsite Energy's failure to enforce any of the terms or conditions stated herein shall not be construed as a waiver of such provision or of any other terms and conditions of this Limited Warranty.

3. Owner Responsibilities

During the Limited Warranty Period and Accessories Coverage Period, the Owner is responsible for, and MTU Onsite Energy will not reimburse for the following:

- (a) Battery;
- (b) Premium or overtime labor costs;
- (c) Labor and material costs for Product removal and reinstallation;
- (d) Any special access fees required to gain access to MTU Onsite Energy equipment, without limitation, training or safety policy requirement to gain access;
- (e) Transportation costs or travel expenses related to delivery of the Product to the designated distributor, dealer, or service outlet;
- (f) Incidental and consequential costs, damages, or administrative expenses of whatever nature;
- (g) Non-Product repairs, vehicle damage, "downtime" expenses, cargo damage, fines, lost income, any business costs of any kind, Owner's travel expenses, and other losses resulting from a Warrantable Defect;
- (h) Shipping charges for replacement parts/Products in excess of those which are usual and customary; or
- (i) Local taxes, if applicable.

In addition, Owner must:

- (a) Operate, use, and maintain the Product in accordance with the applicable Owner's manual and/or any other manuals specified by MTU Onsite Energy, including without limitation handling, inspection, servicing, or operating instructions;
- (b) Promptly notify MTU Onsite Energy or its authorized representative of a Warrantable Defect and make the Product available for repair;

MTU ONSITE ENERGY CORPORATION FIVE (5) YEAR / 3,000 HOUR COMPREHENSIVE EXTENDED STANDBY LIMITED WARRANTY



- (c) Comply with MTU Onsite Energy's or MTU Onsite Energy's authorized representative's reasonable directions regarding the timing, sequence, and location of warranty repairs and make the Product available for inspection;
- (d) Perform all required maintenance and maintain and provide proof that all required maintenance has been performed;
- (e) Use MTU Onsite Energy specified parts, components, and consumables;
- (f) Promptly return to MTU Onsite Energy all parts replaced under this Limited Warranty;
- (g) Comply with MTU Onsite Energy's long term storage guidelines, if applicable, and maintain and provide proof of compliance;
- (h) Routinely exercise the Product in accordance with operating instructions;
- (i) Install the Product in accordance with the installation guide provided; and
- (j) Reimburse MTU Onsite Energy for all costs incurred in providing warranty service where, following examination, the request or claim for warranty coverage proves to be unfounded or excluded, as well as all incidental costs including those incurred investigating the claim.

4. Limitations

MTU Onsite Energy is not responsible, and this Limited Warranty is not available under any circumstances, for any of the following:

- (a) Failure of Owner to fulfill its obligations under Section 3;
- (b) Failure of Owner to follow MTU Onsite Energy's instructions for Product stored by Owner longer than 180 days from date of shipment from MTU Onsite Energy's Mankato, MN facility;
- (c) Defects caused by adjustments made by Owner to the fuel system or governor system;
- (d) Defects which were obvious or capable of being identified by reasonable inspection and were not reported to MTU Onsite Energy within a reasonable time;
- (e) Rental equipment used during warranty work;
- (f) Defects caused or potentially caused by service work performed by non-MTU Onsite Energy authorized service providers and/or the use of non-genuine MTU Onsite Energy parts;
- (g) Defects resulting from natural wear and tear, external action, negligence, natural disasters, accidents, incorrect use, improper handling or storage, inadequate corrosion-proofing, incorrect assembly or installation, or modification of the Product;
- (h) Defects resulting from abuse or neglect, including unauthorized modifications to the Product;
- (i) Repair or any use or installation which MTU Onsite Energy, in its sole discretion, determines to be improper;
- (j) Defects caused by incorrect maintenance;
- (k) Defects resulting from Owner's delay in making the Product available after being notified of a potential problem or Owner's failure to take immediate measures to avoid or mitigate damage;
- (I) Damage caused by shipping;
- (m) Repair of parts sold by MTU Onsite Energy that are warranted directly to the Owner by the respective part's manufacturer;
- (n) Misapplication of the Product;
- (o) Diesel engine "wet stacking" due to lightly loaded diesel engines;
- (p) Acts of nature or acts of God;
- (q) Any failure, other than those resulting from a defect in material or factory workmanship of the Product;
- (r) Use of the Product for purposes other than those for which it was intended, including without limitation use of the Product under extraordinary operating conditions not made known to MTU Onsite Energy in writing at the time of the order; or
- (s) Material provided by or a design specified by the Owner.
- 5. Software Warranty. Where software is included in the Product, MTU Onsite Energy warrants to the Owner that 1) the software will be substantially free from material program errors and material defects in material and workmanship and that 2) it shall function substantially in accordance with MTU Onsite Energy's specification at the time of dispatch from the MTU Onsite Energy manufacturing facility. MTU Onsite Energy does not warrant that the software is error-free or free from "bugs" as commonly categorized by the computer industry. MTU Onsite Energy shall, during the Limited Warranty Period, endeavor to remedy at its cost, in its sole discretion, by repair or replacement of any material program errors or material defects of which Owner has promptly notified MTU Onsite Energy. MTU Onsite Energy, at its option, may elect to provide the most current software at no cost, and in such case MTU Onsite Energy will not cover the cost to install the applicable updated software. MTU Onsite Energy shall have no obligation with respect to any nonconformities resulting from unauthorized modifications to the software or any Owner interfacing.
- 6. Emissions Warranty. The Product may be covered under an emissions warranty specified by the U.S. Environmental Protection Agency and/or the California Air Resources Board. The terms of the warranty, if applicable, may be accessed by following the link: <u>http://www.mtuonsiteenergy.com/technical-info/emissions-warranty/</u>. Any such Emissions Warranty is incorporated herein by reference in its entirety to the extent and with the same force as if fully set forth herein. The Product, if certified, may only be certified to comply with the required country or region specific emission regulations. Where applicable, the Product is only certified to those specific emission regulations/standards which are clearly stated in the respective RRPS/MTU Onsite Energy defined technical specifications. IT IS THE OWNER'S SOLE RESPONSIBILITY TO ENSURE THAT THE EXPORT/IMPORT, INSTALLATION, AND USE OF THE PRODUCT(S) COMPLIES WITH THE APPLICABLE EMISSION REGULATIONS IN THE COUNTRY OR REGION WHERE THE PRODUCT(S) WILL BE USED.



7. Disclaimers

LIMITATION OF WARRANTIES: THIS LIMITED WARRANTY IS GIVEN EXPRESSLY AND IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, FREEDOM FROM INFRINGEMENT OR THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, REPRESENTATIONS, OR WARRANTIES NOT SPECIFIED HEREIN.

THIS LIMITED WARRANTY, THE OBLIGATIONS OF MTU ONSITE ENERGY AND THE RIGHTS AND REMEDIES OF THE OWNER SET FORTH IN THIS LIMITED WARRANTY ARE EXCLUSIVE AND ARE EXPRESSLY IN LIEU OF, AND THE OWNER HEREBY WAIVES AND RELEASES ALL OTHER OBLIGATIONS, WARRANTIES (INCLUDING WARRANTY AGAINST REDHIBITORY DEFECTS), REPRESENTATIONS OR LIABILITIES, EXPRESS OR IMPLIED, ARISING BY LAW IN CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY CLAIMS ARISING OUT OF, CONNECTED WITH OR RESULTING FROM THE PERFORMANCE OF THIS LIMITED WARRANTY OR FROM THE DESIGN, MANUFACTURE, SALE, REPAIR, LEASE OR USE OF THE PRODUCT, ANY COMPONENT THEREOF AND SERVICES DELIVERED OR RENDERED HEREUNDER OR OTHERWISE.

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, ALLEGED NEGLIGENCE, OR OTHERWISE, SHALL MTU ONSITE ENERGY BE SUBJECT TO LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING WITHOUT LIMITATION, DAMAGE TO THE PRODUCT, OR OTHER PROPERTY, COMMERCIAL LOSSES, LOST PROFITS, LOSS OF USE, INCONVENIENCE, LOSS OF TIME, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, DOWNTIME, OR CLAIMS OF CUSTOMERS.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT.

- 8. The Owner is entitled to rectify the defect or to have it rectified by third parties only in urgent cases where operational safety is at risk or in order to prevent disproportionately extensive damage; provided that Owner has informed MTU Onsite Energy and obtained MTU Onsite Energy's prior written consent. In such cases, MTU Onsite Energy shall, in its sole discretion, reimburse the costs incurred by the Owner up to an amount equivalent to the costs MTU Onsite Energy would have incurred had it remedied the defect itself.
- 9. This Limited Warranty gives the Owner specific legal rights, and the Owner may also have other rights, which vary from state to state. Some states do not allow warranty duration limitations and/or certain exclusions or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion(s) may not apply to Owner. If any one or more of the provisions contained in this Limited Warranty shall be invalid, illegal, or unenforceable in any respect, the validity, legality, or enforceability of the remaining provisions contained therein shall not in any way be affected or impaired thereby.
- 10. This Limited Warranty is governed by the laws of the State of Minnesota without regard to its conflicts of law principles and excluding the United Nations Convention for the International Sale of Goods.
- 11. In order to obtain performance of an MTU Onsite Energy warranty obligation, the Owner should contact the nearest MTU Onsite Energy authorized distributor, dealer, or service outlet for instructions. To find the location of the nearest MTU Onsite Energy authorized distributor, dealer, or service outlet call 800-325-5450 or write to: MTU Onsite Energy Onsite Energy Corporation Warranty Department, 100 Power Drive, Mankato, MN 56001.

MTU ONSITE ENERGY CORPORATION TEN (10) YEAR / 3,000 HOUR MAJOR COMPONENT EXTENDED STANDBY LIMITED WARRANTY



MTU Onsite Energy Corporation ("MTU Onsite Energy") issues the following express Limited Warranty subject to the following terms, conditions, and limitations:

An original consumer ("Owner") who purchases an MTU Onsite Energy engine generator set ("Product") is entitled to coverage under this Limited Warranty. MTU Onsite Energy warrants to the Owner that the Product is free of defects in material and workmanship and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. Any nonconformity to the foregoing is defined as a Warrantable Defect. This Limited Warranty applies to Product shipped by MTU Onsite Energy after January 1, 2014.

1. Limited Warranty Periods

Limited Warranty Period. The Limited Warranty Period for a Warrantable Defect in the Product is sixty (60) months after the first commissioning of the Product. In all cases, the Limited Warranty period will expire not later than seventy two (72) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility or after 3,000 operation hours, whichever occurs first.

<u>Major Component Coverage Period</u>. The Major Component Coverage Period for a Warrantable Defect in the (i) cylinder block, camshaft, crankshaft, connecting rods, and flywheel of the engine, (ii) alternator (main rotor), main stator, and drive disk of the generator end, and (iii) the main contacts of the transfer switch (collectively the "Major Components") is one hundred twenty (120) months after the first commissioning of the Product. In all cases, the Major Component Coverage period will expire not later than one hundred thirty two (132) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility or after 3,000 operation hours, whichever occurs first.

Accessories Coverage Period. The Accessories Coverage Period for a Warrantable Defect in cords, receptacles, cord reels, gas flex pipes, housing lights, space heaters, and associated equipment ("Accessories") is twelve (12) months from the date of shipment from MTU Onsite Energy's Mankato, MN facility.

MTU Onsite Energy's warranty obligations under this Limited Warranty are contingent upon distributor completing the following:

- (a) The MTU Onsite Energy warranty and the *Start-Up Validation and Pre-Inspection Form.* Return both to MTU Onsite Energy within sixty (60) days of the start-up date; and
- (b) The engine registration form (when applicable). Return to the manufacturer as stated in the engine registration form instructions.

2. MTU Onsite Energy Responsibilities

If a Warrantable Defect is found during the Limited Warranty Period and/or the Accessories Coverage Period, and provided the Owner has complied with its obligations under Section 3, MTU Onsite Energy will, during normal working hours, through MTU Onsite Energy's authorized distributor, dealer, or service outlet, perform some or all of the following:

- (a) Repair or replace, at MTU Onsite Energy's sole election, the defective part with a new or remanufactured replacement part;
- (b) Provide reasonable or customary labor needed to correct the Warrantable Defect;
- (c) Provide technician travel time of 400 miles to and from the closest MTU Onsite Energy authorized distributor, dealer, or service outlet to the Product location;
- (d) Part removal and re-installation, if necessary and as solely determined by MTU Onsite Energy.

If a Warrantable Defect is found during the Major Component Coverage Period, and provided the Owner has complied with its obligations under Section 3, MTU Onsite Energy will only pay for the cost of the parts repaired or replaced on the defective Major Component (material cost only). All other costs including, but not limited to, labor, transportation, shipping costs, lubricating oil, filters, antifreeze, and other service items rendered by the defect are the Owner's sole responsibility.

MTU Onsite Energy's obligation to repair or replace defective parts does not include responsibility for reimbursement of incidental or consequential costs. If MTU Onsite Energy repairs or replaces an Accessory, part, or Product under this Limited Warranty, the repaired or replaced Accessory, part, or Product assumes the unexpired portion of the warranty period remaining from the original Accessory, part, or Product. Repair or replacement of an Accessory, part, or Product will not extend the term of the original Limited Warranty Period or Major Component Coverage Period or Accessories Coverage Period. Parts or Product replaced shall become the property of MTU Onsite Energy.

MTU Onsite Energy's failure to enforce any of the terms or conditions stated herein shall not be construed as a waiver of such provision or of any other terms and conditions of this Limited Warranty.

3. Owner Responsibilities

During the Limited Warranty Period, Major Component Coverage Period and Accessories Coverage Period, the Owner is responsible for, and MTU Onsite Energy will not reimburse for the following:

- (a) Battery;
- (b) Premium or overtime labor costs;
- (c) Labor and material costs for Product removal and reinstallation;
- (d) Any special access fees required to gain access to MTU Onsite Energy equipment, without limitation, training or safety policy requirement to gain access;
- (e) Transportation costs or travel expenses related to delivery of the Product to the designated distributor, dealer, or service outlet;
- (f) Incidental and consequential costs, damages, or administrative expenses of whatever nature;

MTU ONSITE ENERGY CORPORATION TEN (10) YEAR / 3,000 HOUR MAJOR COMPONENT EXTENDED STANDBY LIMITED WARRANTY



- (g) Non-Product repairs, vehicle damage, "downtime" expenses, cargo damage, fines, lost income, any business costs of any kind, Owner's travel expenses, and other losses resulting from a Warrantable Defect;
- (h) Shipping charges for replacement parts/Products in excess of those which are usual and customary; or
- (i) Local taxes, if applicable.

In addition, Owner must:

- (a) Operate, use, and maintain the Product in accordance with the applicable Owner's manual and/or any other manuals specified by MTU Onsite Energy, including without limitation handling, inspection, servicing, or operating instructions;
- (b) Promptly notify MTU Onsite Energy or its authorized representative of a Warrantable Defect and make the Product available for repair;
- (c) Comply with MTU Onsite Energy's or MTU Onsite Energy's authorized representative's reasonable directions regarding the timing, sequence, and location of warranty repairs and make the Product available for inspection;
- (d) Perform all required maintenance and maintain and provide proof that all required maintenance has been performed;
- (e) Use MTU Onsite Energy specified parts, components, and consumables;
- (f) Promptly return to MTU Onsite Energy all parts replaced under this Limited Warranty;
- (g) Comply with MTU Onsite Energy's long term storage guidelines, if applicable, and maintain and provide proof of compliance;
- (h) Routinely exercise the Product in accordance with operating instructions;
- (i) Install the Product in accordance with the installation guide provided; and
- (j) Reimburse MTU Onsite Energy for all costs incurred in providing warranty service where, following examination, the request or claim for warranty coverage proves to be unfounded or excluded, as well as all incidental costs including those incurred investigating the claim.

4. Limitations

MTU Onsite Energy is not responsible, and this Limited Warranty is not available under any circumstances, for any of the following:

- (a) Failure of Owner to fulfill its obligations under Section 3;
- (b) Failure of Owner to follow MTU Onsite Energy's instructions for Product stored by Owner longer than 180 days from date of shipment from MTU Onsite Energy's Mankato, MN facility;
- (c) Defects caused by adjustments made by Owner to the fuel system or governor system;
- (d) Defects which were obvious or capable of being identified by reasonable inspection and were not reported to MTU Onsite Energy within a reasonable time;
- (e) Rental equipment used during warranty work
- (f) Defects caused or potentially caused by service work performed by non-MTU Onsite Energy authorized service providers and/or the use of non-genuine MTU Onsite Energy parts;
- (g) Defects resulting from natural wear and tear, external action, negligence, natural disasters, accidents, incorrect use, improper handling or storage, inadequate corrosion-proofing, incorrect assembly or installation, or modification of the Product;
- (h) Defects resulting from abuse or neglect, including unauthorized modifications to the Product;
- (i) Repair or any use or installation which MTU Onsite Energy, in its sole discretion, determines to be improper;
- (j) Defects caused by incorrect maintenance;
- (k) Defects resulting from Owner's delay in making the Product available after being notified of a potential problem or Owner's failure to take immediate measures to avoid or mitigate damage;
- (I) Damage caused by shipping;
- (m) Repair of parts sold by MTU Onsite Energy that are warranted directly to the Owner by the respective part's manufacturer;
- (n) Misapplication of the Product;
- (o) Diesel engine "wet stacking" due to lightly loaded diesel engines;
- (p) Acts of nature or acts of God;
- (q) Any failure, other than those resulting from a defect in material or factory workmanship of the Product;
- (r) Use of the Product for purposes other than those for which it was intended, including without limitation use of the Product under extraordinary operating conditions not made known to MTU Onsite Energy in writing at the time of the order; or
- (s) Material provided by or a design specified by the Owner.
- 5. Software Warranty. Where software is included in the Product, MTU Onsite Energy warrants to the Owner that 1) the software will be substantially free from material program errors and material defects in material and workmanship and that 2) it shall function substantially in accordance with MTU Onsite Energy's specification at the time of dispatch from the MTU Onsite Energy manufacturing facility. MTU Onsite Energy does not warrant that the software is error-free or free from "bugs" as commonly categorized by the computer industry. MTU Onsite Energy shall, during the Limited Warranty Period, endeavor to remedy at its cost, in its sole discretion, by repair or replacement of any material program errors or material defects of which Owner has promptly notified MTU Onsite Energy. MTU Onsite Energy, at its option, may elect to provide the most current software at no cost, and in such case MTU Onsite Energy will not cover the cost to install the applicable updated software. MTU Onsite Energy shall have no obligation with respect to any nonconformities resulting from unauthorized modifications to the software or any Owner interfacing.
- 6. Emissions Warranty. The Product may be covered under an emissions warranty specified by the U.S. Environmental Protection Agency and/or the California Air Resources Board. The terms of the warranty, if applicable, may be accessed by following the link: http://www.mtuonsiteenergy.com/technical-info/emissions-warranty/. Any such Emissions Warranty is incorporated herein by reference in its entirety to the extent and with the same force as if fully set forth herein. The Product, if certified, may only be certified to comply with the required country or region specific emission regulations. Where applicable, the Product is only certified to those specific emission regulations/standards which are clearly stated in the respective RRPS/MTU Onsite Energy defined technical specifications. IT IS THE

MTU ONSITE ENERGY CORPORATION TEN (10) YEAR / 3,000 HOUR MAJOR COMPONENT EXTENDED STANDBY LIMITED WARRANTY



OWNER'S SOLE RESPONSIBILITY TO ENSURE THAT THE EXPORT/IMPORT, INSTALLATION, AND USE OF THE PRODUCT(S) COMPLIES WITH THE APPLICABLE EMISSION REGULATIONS IN THE COUNTRY OR REGION WHERE THE PRODUCT(S) WILL BE USED.

7. Disclaimers

LIMITATION OF WARRANTIES: THIS LIMITED WARRANTY IS GIVEN EXPRESSLY AND IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, FREEDOM FROM INFRINGEMENT OR THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, REPRESENTATIONS, OR WARRANTIES NOT SPECIFIED HEREIN.

THIS LIMITED WARRANTY, THE OBLIGATIONS OF MTU ONSITE ENERGY AND THE RIGHTS AND REMEDIES OF THE OWNER SET FORTH IN THIS LIMITED WARRANTY ARE EXCLUSIVE AND ARE EXPRESSLY IN LIEU OF, AND THE OWNER HEREBY WAIVES AND RELEASES ALL OTHER OBLIGATIONS, WARRANTIES (INCLUDING WARRANTY AGAINST REDHIBITORY DEFECTS), REPRESENTATIONS OR LIABILITIES, EXPRESS OR IMPLIED, ARISING BY LAW IN CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY CLAIMS ARISING OUT OF, CONNECTED WITH OR RESULTING FROM THE PERFORMANCE OF THIS LIMITED WARRANTY OR FROM THE DESIGN, MANUFACTURE, SALE, REPAIR, LEASE OR USE OF THE PRODUCT, ANY COMPONENT THEREOF AND SERVICES DELIVERED OR RENDERED HEREUNDER OR OTHERWISE.

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, ALLEGED NEGLIGENCE, OR OTHERWISE, SHALL MTU ONSITE ENERGY BE SUBJECT TO LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING WITHOUT LIMITATION, DAMAGE TO THE PRODUCT, OR OTHER PROPERTY, COMMERCIAL LOSSES, LOST PROFITS, LOSS OF USE, INCONVENIENCE, LOSS OF TIME, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, DOWNTIME, OR CLAIMS OF CUSTOMERS.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT.

- 8. The Owner is entitled to rectify the defect or to have it rectified by third parties only in urgent cases where operational safety is at risk or in order to prevent disproportionately extensive damage; provided that Owner has informed MTU Onsite Energy and obtained MTU Onsite Energy's prior written consent. In such cases, MTU Onsite Energy shall, in its sole discretion, reimburse the costs incurred by the Owner up to an amount equivalent to the costs MTU Onsite Energy would have incurred had it remedied the defect itself.
- 9. This Limited Warranty gives the Owner specific legal rights, and the Owner may also have other rights, which vary from state to state. Some states do not allow warranty duration limitations and/or certain exclusions or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion(s) may not apply to Owner. If any one or more of the provisions contained in this Limited Warranty shall be invalid, illegal, or unenforceable in any respect, the validity, legality, or enforceability of the remaining provisions contained therein shall not in any way be affected or impaired thereby.
- 10. This Limited Warranty is governed by the laws of the State of Minnesota without regard to its conflicts of law principles and excluding the United Nations Convention for the International Sale of Goods.
- 11. In order to obtain performance of an MTU Onsite Energy warranty obligation, the Owner should contact the nearest MTU Onsite Energy authorized distributor, dealer, or service outlet for instructions. To find the location of the nearest MTU Onsite Energy authorized distributor, dealer, or service outlet call 800-325-5450 or write to: MTU Onsite Energy Onsite Energy Corporation Warranty Department, 100 Power Drive, Mankato, MN 56001.

STANDBY LIMITED WARRANTY Two (2) Year Basic Automatic Transfer Switch (ATS)



LIMITED WARRANTY

Your MTU Onsite Energy product has been manufactured and inspected with care by experienced craftspeople. If you are the original consumer, MTU Onsite Energy warrants, for the limited warranty period indicated below, each product will be free from defects in materials and workmanship, and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. This Limited Warranty shall apply only when the product has been properly installed, serviced, and operated in accordance with the applicable MTU Onsite Energy instruction manuals. If this Limited Warranty applies, the liability of MTU Onsite Energy's option. This Limited Warranty does not apply to malfunctions caused by normal wear and tear, or by damage, unreasonable use, misuse, repair, or service by unauthorized persons.

LIMITED ATS WARRANTY PERIOD

Parts and labor for two (2) years from factory invoice date. A valid warranty requires that buyer must provide proof of purchase of the original ATS at the time of request for warranty consideration.

TO OBTAIN WARRANTY SERVICE

Warranty service may only be performed by MTU Onsite Energy authorized service providers. **Service provided by unauthorized persons will void this Limited Warranty. Non-MTU Onsite Energy replacement part(s) will void this Limited Warranty.** Contact your nearest MTU Onsite Energy Service Representative to obtain warranty service. For assistance in locating your nearest authorized service representative, contact MTU Onsite Energy, Attention: Service Department, 100 Power Drive, Mankato, MN 56001, +1 507 625 7973.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. NO WARRANTIES SHALL BE IMPLIED OR OTHERWISE CREATED UNDER THE UNIFORM COMMERCIAL CODE, INCLUDING BUT NOT LIMITED TO A WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT AT ISSUE, AND IN NO EVENT SHALL MTU ONSITE ENERGY BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES. STATE LAWS REGARDING THE RIGHTS OF CONSUMERS MAY VARY FROM STATE TO STATE.

STANDBY LIMITED WARRANTY Five (5) Year Basic Extended Automatic Transfer Switch (ATS)



LIMITED WARRANTY

Your MTU Onsite Energy product has been manufactured and inspected with care by experienced craftspeople. If you are the original consumer, MTU Onsite Energy warrants, for the limited warranty period indicated below, each product will be free from defects in materials and workmanship, and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. This Limited Warranty shall apply only when the product has been properly installed, serviced, and operated in accordance with the applicable MTU Onsite Energy instruction manuals. If this Limited Warranty applies, the liability of MTU Onsite Energy's option. This Limited Warranty does not apply to malfunctions caused by normal wear and tear, or by damage, unreasonable use, misuse, repair, or service by unauthorized persons.

LIMITED ATS WARRANTY PERIOD

Parts for five (5) years from factory invoice date including labor for the first two (2) years from factory invoice date. A valid warranty requires that buyer must provide proof of purchase of the original ATS at the time of request for warranty consideration.

TO OBTAIN WARRANTY SERVICE

Warranty service may only be performed by MTU Onsite Energy authorized service providers. **Service provided by unauthorized persons will void this Limited Warranty. Non-MTU Onsite Energy replacement part(s) will void this Limited Warranty.** Contact your nearest MTU Onsite Energy Service Representative to obtain warranty service. For assistance in locating your nearest authorized service representative, contact MTU Onsite Energy, Attention: Service Department, 100 Power Drive, Mankato, MN 56001, +1 507 625 7973.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. NO WARRANTIES SHALL BE IMPLIED OR OTHERWISE CREATED UNDER THE UNIFORM COMMERCIAL CODE, INCLUDING BUT NOT LIMITED TO A WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT AT ISSUE, AND IN NO EVENT SHALL MTU ONSITE ENERGY BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES. STATE LAWS REGARDING THE RIGHTS OF CONSUMERS MAY VARY FROM STATE TO STATE.

STANDBY LIMITED WARRANTY Five (5) Year Comprehensive Extended Automatic Transfer Switch (ATS)



LIMITED WARRANTY

Your MTU Onsite Energy product has been manufactured and inspected with care by experienced craftspeople. If you are the original consumer, MTU Onsite Energy warrants, for the limited warranty period indicated below, each product will be free from defects in materials and workmanship, and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. This Limited Warranty shall apply only when the product has been properly installed, serviced, and operated in accordance with the applicable MTU Onsite Energy instruction manuals. If this Limited Warranty applies, the liability of MTU Onsite Energy's option. This Limited Warranty does not apply to malfunctions caused by normal wear and tear, or by damage, unreasonable use, misuse, repair, or service by unauthorized persons.

LIMITED ATS WARRANTY PERIOD

Parts and labor for five (5) years from factory invoice date. A valid warranty requires that buyer must provide proof of purchase of the original ATS at the time of request for warranty consideration.

TO OBTAIN WARRANTY SERVICE

Warranty service may only be performed by MTU Onsite Energy authorized service providers. **Service provided by unauthorized persons will void this Limited Warranty. Non-MTU Onsite Energy replacement part(s) will void this Limited Warranty.** Contact your nearest MTU Onsite Energy Service Representative to obtain warranty service. For assistance in locating your nearest authorized service representative, contact MTU Onsite Energy, Attention: Service Department, 100 Power Drive, Mankato, MN 56001, +1 507 625 7973.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. NO WARRANTIES SHALL BE IMPLIED OR OTHERWISE CREATED UNDER THE UNIFORM COMMERCIAL CODE, INCLUDING BUT NOT LIMITED TO A WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT AT ISSUE, AND IN NO EVENT SHALL MTU ONSITE ENERGY BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES. STATE LAWS REGARDING THE RIGHTS OF CONSUMERS MAY VARY FROM STATE TO STATE.

STANDBY LIMITED WARRANTY Ten (10) Year Major Components Extended Automatic Transfer Switch (ATS)



LIMITED WARRANTY

Your MTU Onsite Energy product has been manufactured and inspected with care by experienced craftspeople. If you are the original consumer, MTU Onsite Energy warrants, for the limited warranty period indicated below, each product will be free from defects in materials and workmanship, and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. This Limited Warranty shall apply only when the product has been properly installed, serviced, and operated in accordance with the applicable MTU Onsite Energy instruction manuals. If this Limited Warranty applies, the liability of MTU Onsite Energy's option. This Limited Warranty does not apply to malfunctions caused by normal wear and tear, or by damage, unreasonable use, misuse, repair, or service by unauthorized persons.

LIMITED ATS WARRANTY PERIOD

Major Components: (Main Contacts Only.) For ten (10) years, including parts and labor for the first five (5) years from factory invoice date. A valid warranty requires that buyer must provide proof of purchase of the original ATS at the time of request for warranty consideration.

TO OBTAIN WARRANTY SERVICE

Warranty service may only be performed by MTU Onsite Energy authorized service providers. **Service provided by unauthorized persons will void this Limited Warranty. Non-MTU Onsite Energy replacement part(s) will void this Limited Warranty.** Contact your nearest MTU Onsite Energy Service Representative to obtain warranty service. For assistance in locating your nearest authorized service representative, contact MTU Onsite Energy, Attention: Service Department, 100 Power Drive, Mankato, MN 56001, +1 507 625 7973.

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MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT AT ISSUE, AND IN NO EVENT SHALL MTU ONSITE ENERGY BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES. STATE LAWS REGARDING THE RIGHTS OF CONSUMERS MAY VARY FROM STATE TO STATE.

STANDBY LIMITED WARRANTY One (1) Year Basic Parts



LIMITED WARRANTY

Your MTU Onsite Energy product has been manufactured and inspected with care by experienced craftspeople. If you are the original consumer, MTU Onsite Energy warrants, for the limited warranty period indicated below, each product will be free from defects in materials and workmanship, and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. This Limited Warranty shall apply only when the product has been properly installed, serviced, and operated in accordance with the applicable MTU Onsite Energy instruction manuals. If this Limited Warranty applies, the liability of MTU Onsite Energy's option. This Limited Warranty does not apply to malfunctions caused by normal wear and tear, or by damage, unreasonable use, misuse, repair, or service by unauthorized persons.

LIMITED WARRANTY PERIOD

Parts have a one (1) year limited warranty from invoice date. MTU Onsite Energy's obligation under this warranty is expressly limited to supplying replacement parts and does not cover any other associated costs incurred. Parts replaced under this warranty will carry the remaining warranty time from the original purchased part, and if required, MTU Onsite Energy has the right to request proof-of-purchase of the original purchased part. All parts being considered for warranty must be returned to MTU Onsite Energy for evaluation, unless MTU Onsite Energy authorizes the part to not be returned.

All Automatic Transfer Switches sold by MTU Onsite Energy fall within a different warranty other than the Parts Warranty.

TO OBTAIN WARRANTY SERVICE

Warranty service may only be performed by MTU Onsite Energy authorized service providers. **Service provided by unauthorized persons will void this Limited Warranty. Non-MTU Onsite Energy replacement part(s) will void this Limited Warranty.** Contact your nearest MTU Onsite Energy Service Representative to obtain warranty service. For assistance in locating your nearest authorized service representative, contact MTU Onsite Energy, Attention: Service Department, 100 Power Drive, Mankato, MN 56001, +1 507 625 7973.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. NO WARRANTIES SHALL BE IMPLIED OR OTHERWISE CREATED UNDER THE UNIFORM COMMERCIAL CODE, INCLUDING BUT NOT LIMITED TO A WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT AT ISSUE, AND IN NO EVENT SHALL MTU ONSITE ENERGY BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES. STATE LAWS REGARDING THE RIGHTS OF CONSUMERS MAY VARY FROM STATE TO STATE.

CONTINUOUS (3A) LIMITED WARRANTY Three (3) Year / 6,000 Hour Basic Power Module



LIMITED WARRANTY

Your MTU Onsite Energy product has been manufactured and inspected with care by experienced craftspeople. If you are the original consumer, MTU Onsite Energy warrants, for the limited warranty period indicated below, each product is new and unused and is to be free from defects in materials and workmanship, and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. This Limited Warranty shall apply only when the product has been properly installed, serviced, and operated in accordance with the applicable MTU Onsite Energy instruction manuals. If this Limited Warranty applies, the liability of MTU Onsite Energy shall be limited to the replacement, repair, or appropriate adjustment of the product, at MTU Onsite Energy's option. This Limited Warranty does not apply to malfunctions caused by normal wear and tear, or by damage, unreasonable use, misuse, repair, or service by unauthorized persons.

LIMITED WARRANTY PERIOD

Engine Generator Set

Parts and labor for three (3) years from invoice date or 6,000 hours of use, whichever is earlier. **Accessories:** Parts only for one (1) year from invoice date or 6,000 hours of use, whichever is earlier. The warranty period can be adjusted to the date of start-up if start-up is completed within twelve (12) months of invoice date. In all cases it shall end no later than forty-eight (48) months after MTU Onsite Energy has given notification that the Goods are ready for dispatch. For a description of accessories and items excluded from this Limited Warranty, review the listings below.

Custom Enclosure

Parts only for one (1) year from invoice date or 6,000 hours of use, whichever is earlier. **Accessories:** Parts only for one (1) year from invoice date or 6,000 hours of use, whichever is earlier. The warranty period can be adjusted to the date of start-up if start-up is completed within twelve (12) months of invoice date. In all cases it shall end no later than twenty-four (24) months after MTU Onsite Energy has given notification that the Goods are ready for dispatch. For a description of accessories and items excluded from this Limited Warranty, review the listings below.

LIMITED WARRANTY CONDITIONS

Before there is any protection under this Limited Warranty, the distributor or factory must: (1) complete the MTU Onsite Energy Warranty and the Start-Up Validation and Pre-Inspection form, and return them to MTU Onsite Energy within 60 days of the start-up date, and (2) complete the engine registration form and return it to the manufacturer as stated in the instructions with engine registration form (when applicable). In addition, this Limited Warranty is not valid or enforceable unless: (1) all supporting maintenance records are kept on file with the end user and made available upon request from factory, (2) the generator set is routinely exercised in accordance with operating instructions, and (3) the installation meets the general guidelines, standards, recommendations (as laid out in the Installation Guide provided with the product), and all local standards and codes applicable in the location of installation.

If MTU Onsite Energy deems the repair cannot be completed onsite, Owner/Buyer shall bear the full cost and risk of loss to transport the Product to and from the Seller's factory or other designated service outlet for service provided under this warranty.

Engine generator sets that are stored by Owner/Buyer longer than 180 days from date of shipment are subject to special requirements. Contact MTU Onsite Energy's Service Center for instructions.

CONTINUOUS (3A) LIMITED WARRANTY Three (3) Year / 6,000 Hour Basic Power Module



TO OBTAIN WARRANTY SERVICE

Warranty service may only be performed by MTU Onsite Energy authorized service providers. **Service provided** by unauthorized persons will void this Limited Warranty. Non-MTU Onsite Energy replacement part(s) will void this Limited Warranty. Contact your nearest MTU Onsite Energy Service Representative to obtain warranty service. For assistance in locating your nearest authorized service representative, contact MTU Onsite Energy, Attention: Service Department, 304 Lundin Blvd., Mankato, MN 56001, +1 507 625 7973.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. NO WARRANTIES SHALL BE IMPLIED OR OTHERWISE CREATED UNDER THE UNIFORM COMMERCIAL CODE, INCLUDING BUT NOT LIMITED TO A WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT AT ISSUE, AND IN NO EVENT SHALL MTU ONSITE ENERGY BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES. STATE LAWS REGARDING THE RIGHTS OF CONSUMERS MAY VARY FROM STATE TO STATE.

- 1. The following items are not considered nor will they be covered under this Engine Generator Set and Custom Enclosure Limited Warranty. If there are questions as to coverage under this Limited Warranty, it is advisable to contact the factory in advance of filing a claim.
 - a. Battery or batteries of any type or kind. The battery manufacturer's warranty, if any, is the only warranty that applies to batteries. Any warranty claim should be handled with the manufacturer according to its policies.
 - b. Adjustments to fuel systems or governor system at time of start-up or any time after. A warranty claim for such adjustments is acceptable only when a defective part has been replaced, returned to the factory, and approved as defective.
 - c. Normal maintenance costs, including but not limited to adjustments, loose and/or leaking fittings or clamps, and tune-ups performed during start-up or anytime thereafter.
 - d. Due to shipping, manufacturer is not responsible for loose connections. All connections must be checked at time of start-up.
 - e. Non-MTU Onsite Energy replacement part(s) will void this Limited Warranty.
 - f. Products that are modified in any form without the written consent of MTU Onsite Energy will void this Limited Warranty.
 - g. Shipping damage of any type.
 - h. Any installation errors or damage of the equipment when shipped as ordered.
 - i. Any overtime travel or labor to make repairs under warranty.
 - j. Any special access fees required to gain access to MTU Onsite Energy equipment, including but not limited to any training or safety policy requirements to gain access.
 - k. Additional costs associated with inaccessible installations, including but not limited to removal and reinstallation of the generator set.
 - I. Rental equipment used during warranty work including but not limited to generators, rigging equipment such as a crane or boom truck, load banks, and special test equipment above factory requirements.

CONTINUOUS (3A) LIMITED WARRANTY Three (3) Year / 6,000 Hour Basic Power Module



- m. Excess mileage charges. Any authorized service provider may perform warranty service anywhere, but will only be paid for mileage expenses from the nearest service center and limited to 400 miles/644 Kilometers round-trip.
- n. Any equipment not factory approved and engineered for use on MTU Onsite Energy products. This includes but is not limited to aftermarket items such as special fuel systems, enclosures, exhaust systems, or switch gear that had been sought out and quoted by a third party to be included in billing of the MTU Onsite Energy equipment.
- o. Misuse or abuse during installation and thereafter.
- p. Normal wear and tear, maintenance, and consumable items that are not required as part of a warranty repair. Consumable items include but are not limited to belts, hoses, coolant, oil, filters, and fuses.
- q. Acts of nature or acts of God such as lightning, wind, flood, tornado, hurricane, or earthquake.
- r. Any damage due to situations beyond the control of the manufacturing of the product or workmanship of the product.
- s. Installation or operation outside the guidelines as stated in the Installation Guide and Owner's Manual.
- t. Diesel engine "Wet Stacking" due to lightly loaded diesel engines.
- u. Misapplication of the equipment such as usage outside the original design parameters as stated on the nameplate of the equipment.
- v. Travel expense on portable equipment.
- w. More than one trip to the job site because a service vehicle was not stocked with normal service parts.
- x. Lodging expense of person(s) performing service, unless approved in advance by factory.
- y. Engine fluids.
- z. Units purchased at the standby power rating that are being used in a prime or continuous power application.
- aa. Any repair labor time that is determined to be excessive, e.g., two or more people performing a oneperson job.
- ab. Any expenses associated with investigating performance complaints in which no defect is found.
- ac. Any associated costs for replacing components that are found not to be defective.
- ad. Any adjustments covered in the start-up and inspection forms that are to be completed during start-up.
- ae. Any import duties, taxes, or fees required by another country if equipment is located outside of continental United Sates.
- 2. The Engine Generator Set accessories that are limited to one (1) year parts only from invoice date:
 - a. Oil makeup system and wiring/accessories.
 - b. Block heater(s) and wiring/accessories.
 - c. Fuel priming pump and wiring/accessories.
 - d. Battery charger.
 - e. SAM module.
 - f. Optional sensors/wiring including: ambient air, air inlet restriction, primary and secondary fuel pressure and/or differential, primary water in fuel, exhaust temperature.

PRIME (3B) LIMITED WARRANTY Two (2) Year / 6,000 Hour Basic Power Module



LIMITED WARRANTY

Your MTU Onsite Energy product has been manufactured and inspected with care by experienced craftspeople. If you are the original consumer, MTU Onsite Energy warrants, for the limited warranty period indicated below, each product is new and unused and is to be free from defects in materials and workmanship, and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. This Limited Warranty shall apply only when the product has been properly installed, serviced, and operated in accordance with the applicable MTU Onsite Energy instruction manuals. If this Limited Warranty applies, the liability of MTU Onsite Energy shall be limited to the replacement, repair, or appropriate adjustment of the product, at MTU Onsite Energy's option. This Limited Warranty does not apply to malfunctions caused by normal wear and tear, or by damage, unreasonable use, misuse, repair, or service by unauthorized persons.

LIMITED WARRANTY PERIOD

Engine Generator Set

Parts and labor for two (2) years from invoice date or 6,000 hours of use, whichever is earlier. **Accessories:** Parts only for one (1) year from invoice date or 6,000 hours of use, whichever is earlier. The warranty period can be adjusted to the date of start-up if start-up is completed within twelve (12) months of invoice date. In all cases it shall end no later than thirty-six (36) months after MTU Onsite Energy has given notification that the Goods are ready for dispatch. For a description of accessories and items excluded from this Limited Warranty, review the listings below.

Custom Enclosure

Parts only for one (1) year from invoice date or 6,000 hours of use, whichever is earlier. **Accessories:** Parts only for one (1) year from invoice date or 6,000 hours of use, whichever is earlier. The warranty period can be adjusted to the date of start-up if start-up is completed within twelve (12) months of invoice date. In all cases it shall end no later than twenty-four (24) months after MTU Onsite Energy has given notification that the Goods are ready for dispatch. For a description of accessories and items excluded from this Limited Warranty, review the listings below.

LIMITED WARRANTY CONDITIONS

Before there is any protection under this Limited Warranty, the distributor or factory must: (1) complete the MTU Onsite Energy Warranty and the Start-Up Validation and Pre-Inspection form, and return them to MTU Onsite Energy within 60 days of the start-up date, and (2) complete the engine registration form and return it to the manufacturer as stated in the instructions with engine registration form (when applicable). In addition, this Limited Warranty is not valid or enforceable unless: (1) all supporting maintenance records are kept on file with the end user and made available upon request from factory, (2) the generator set is routinely exercised in accordance with operating instructions, and (3) the installation meets the general guidelines, standards, recommendations (as laid out in the Installation Guide provided with the product), and all local standards and codes applicable in the location of installation.

If MTU Onsite Energy deems the repair cannot be completed onsite, Owner/Buyer shall bear the full cost and risk of loss to transport the Product to and from the Seller's factory or other designated service outlet for service provided under this warranty.

Engine generator sets that are stored by Owner/Buyer longer than 180 days from date of shipment are subject to special requirements. Contact MTU Onsite Energy's Service Center for instructions.

PRIME (3B) LIMITED WARRANTY Two (2) Year / 6,000 Hour Basic Power Module



TO OBTAIN WARRANTY SERVICE

Warranty service may only be performed by MTU Onsite Energy authorized service providers. **Service provided** by unauthorized persons will void this Limited Warranty. Non-MTU Onsite Energy replacement part(s) will void this Limited Warranty. Contact your nearest MTU Onsite Energy Service Representative to obtain warranty service. For assistance in locating your nearest authorized service representative, contact MTU Onsite Energy, Attention: Service Department, 304 Lundin Blvd., Mankato, MN 56001, +1 507 625 7973.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. NO WARRANTIES SHALL BE IMPLIED OR OTHERWISE CREATED UNDER THE UNIFORM COMMERCIAL CODE, INCLUDING BUT NOT LIMITED TO A WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT AT ISSUE, AND IN NO EVENT SHALL MTU ONSITE ENERGY BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES. STATE LAWS REGARDING THE RIGHTS OF CONSUMERS MAY VARY FROM STATE TO STATE.

- 1. The following items are not considered nor will they be covered under this Engine Generator Set and Custom Enclosure Limited Warranty. If there are questions as to coverage under this Limited Warranty, it is advisable to contact the factory in advance of filing a claim.
 - a. Battery or batteries of any type or kind. The battery manufacturer's warranty, if any, is the only warranty that applies to batteries. Any warranty claim should be handled with the manufacturer according to its policies.
 - b. Adjustments to fuel systems or governor system at time of start-up or any time after. A warranty claim for such adjustments is acceptable only when a defective part has been replaced, returned to the factory, and approved as defective.
 - c. Normal maintenance costs, including but not limited to adjustments, loose and/or leaking fittings or clamps, and tune-ups performed during start-up or anytime thereafter.
 - d. Due to shipping, manufacturer is not responsible for loose connections. All connections must be checked at time of start-up.
 - e. Non-MTU Onsite Energy replacement part(s) will void this Limited Warranty.
 - f. Products that are modified in any form without the written consent of MTU Onsite Energy will void this Limited Warranty.
 - g. Shipping damage of any type.
 - h. Any installation errors or damage of the equipment when shipped as ordered.
 - i. Any overtime travel or labor to make repairs under warranty.
 - j. Any special access fees required to gain access to MTU Onsite Energy equipment, including but not limited to any training or safety policy requirements to gain access.
 - k. Additional costs associated with inaccessible installations, including but not limited to removal and reinstallation of the generator set.
 - I. Rental equipment used during warranty work including but not limited to generators, rigging equipment such as a crane or boom truck, load banks, and special test equipment above factory requirements.

PRIME (3B) LIMITED WARRANTY Two (2) Year / 6,000 Hour Basic Power Module



- m. Excess mileage charges. Any authorized service provider may perform warranty service anywhere, but will only be paid for mileage expenses from the nearest service center and limited to 400 miles/644 Kilometers round-trip.
- n. Any equipment not factory approved and engineered for use on MTU Onsite Energy products. This includes but is not limited to aftermarket items such as special fuel systems, enclosures, exhaust systems, or switch gear that had been sought out and quoted by a third party to be included in billing of the MTU Onsite Energy equipment.
- o. Misuse or abuse during installation and thereafter.
- p. Normal wear and tear, maintenance, and consumable items that are not required as part of a warranty repair. Consumable items include but are not limited to belts, hoses, coolant, oil, filters, and fuses.
- q. Acts of nature or acts of God such as lightning, wind, flood, tornado, hurricane, or earthquake.
- r. Any damage due to situations beyond the control of the manufacturing of the product or workmanship of the product.
- s. Installation or operation outside the guidelines as stated in the Installation Guide and Owner's Manual.
- t. Diesel engine "Wet Stacking" due to lightly loaded diesel engines.
- u. Misapplication of the equipment such as usage outside the original design parameters as stated on the nameplate of the equipment.
- v. Travel expense on portable equipment.
- w. More than one trip to the job site because a service vehicle was not stocked with normal service parts.
- x. Lodging expense of person(s) performing service, unless approved in advance by factory.
- y. Engine fluids.
- z. Units purchased at the standby power rating that are being used in a prime or continuous power application.
- aa. Any repair labor time that is determined to be excessive, e.g., two or more people performing a oneperson job.
- ab. Any expenses associated with investigating performance complaints in which no defect is found.
- ac. Any associated costs for replacing components that are found not to be defective.
- ad. Any adjustments covered in the start-up and inspection forms that are to be completed during start-up.
- ae. Any import duties, taxes, or fees required by another country if equipment is located outside of continental United Sates.
- 2. The Engine Generator Set accessories that are limited to one (1) year parts only from invoice date:
 - a. Oil makeup system and wiring/accessories.
 - b. Block heater(s) and wiring/accessories.
 - c. Fuel priming pump and wiring/accessories.
 - d. Battery charger.
 - e. SAM module.
 - f. Optional sensors/wiring including: ambient air, air inlet restriction, primary and secondary fuel pressure and/or differential, primary water in fuel, exhaust temperature.

STANDBY (3D) LIMITED WARRANTY Two (2) Year / 3,000 Hour Basic Power Module



LIMITED WARRANTY

Your MTU Onsite Energy product has been manufactured and inspected with care by experienced craftspeople. If you are the original consumer, MTU Onsite Energy warrants, for the limited warranty period indicated below, each product is new and unused and is to be free from defects in materials and workmanship, and will perform under normal use and service from valid start-up performed by MTU Onsite Energy. This Limited Warranty shall apply only when the product has been properly installed, serviced, and operated in accordance with the applicable MTU Onsite Energy instruction manuals. If this Limited Warranty applies, the liability of MTU Onsite Energy shall be limited to the replacement, repair, or appropriate adjustment of the product, at MTU Onsite Energy's option. This Limited Warranty does not apply to malfunctions caused by normal wear and tear, or by damage, unreasonable use, misuse, repair, or service by unauthorized persons.

LIMITED WARRANTY PERIOD

Engine Generator Set

Parts and labor for two (2) years from invoice date or 3,000 hours of use, whichever is earlier. **Accessories:** Parts only for one (1) year from invoice date or 3,000 hours of use, whichever is earlier. The warranty period can be adjusted to the date of start-up if start-up is completed within twelve (12) months of invoice date. In all cases it shall end no later than thirty-six (36) months after MTU Onsite Energy has given notification that the Goods are ready for dispatch. For a description of accessories and items excluded from this Limited Warranty, review the listings below.

Custom Enclosure

Parts only for one (1) year from invoice date or 3,000 hours of use, whichever is earlier. **Accessories:** Parts only for one (1) year from invoice date or 3,000 hours of use, whichever is earlier. The warranty period can be adjusted to the date of start-up if start-up is completed within twelve (12) months of invoice date. In all cases it shall end no later than twenty-four (24) months after MTU Onsite Energy has given notification that the Goods are ready for dispatch. For a description of accessories and items excluded from this Limited Warranty, review the listings below.

LIMITED WARRANTY CONDITIONS

Before there is any protection under this Limited Warranty, the distributor or factory must: (1) complete the MTU Onsite Energy Warranty and the Start-Up Validation and Pre-Inspection form, and return them to MTU Onsite Energy within 60 days of the start-up date, and (2) complete the engine registration form and return it to the manufacturer as stated in the instructions with engine registration form (when applicable). In addition, this Limited Warranty is not valid or enforceable unless: (1) all supporting maintenance records are kept on file with the end user and made available upon request from factory, (2) the generator set is routinely exercised in accordance with operating instructions, and (3) the installation meets the general guidelines, standards, recommendations (as laid out in the Installation Guide provided with the product), and all local standards and codes applicable in the location of installation.

If MTU Onsite Energy deems the repair cannot be completed onsite, Owner/Buyer shall bear the full cost and risk of loss to transport the Product to and from the Seller's factory or other designated service outlet for service provided under this warranty.

Engine generator sets that are stored by Owner/Buyer longer than 180 days from date of shipment are subject to special requirements. Contact MTU Onsite Energy's Service Center for instructions.

STANDBY (3D) LIMITED WARRANTY Two (2) Year / 3,000 Hour Basic Power Module



TO OBTAIN WARRANTY SERVICE

Warranty service may only be performed by MTU Onsite Energy authorized service providers. **Service provided** by unauthorized persons will void this Limited Warranty. Non-MTU Onsite Energy replacement part(s) will void this Limited Warranty. Contact your nearest MTU Onsite Energy Service Representative to obtain warranty service. For assistance in locating your nearest authorized service representative, contact MTU Onsite Energy, Attention: Service Department, 304 Lundin Blvd., Mankato, MN 56001, +1 507 625 7973.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. NO WARRANTIES SHALL BE IMPLIED OR OTHERWISE CREATED UNDER THE UNIFORM COMMERCIAL CODE, INCLUDING BUT NOT LIMITED TO A WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

MTU ONSITE ENERGY SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT AT ISSUE, AND IN NO EVENT SHALL MTU ONSITE ENERGY BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES. STATE LAWS REGARDING THE RIGHTS OF CONSUMERS MAY VARY FROM STATE TO STATE.

- 1. The following items are not considered nor will they be covered under this Engine Generator Set and Custom Enclosure Limited Warranty. If there are questions as to coverage under this Limited Warranty, it is advisable to contact the factory in advance of filing a claim.
 - a. Battery or batteries of any type or kind. The battery manufacturer's warranty, if any, is the only warranty that applies to batteries. Any warranty claim should be handled with the manufacturer according to its policies.
 - b. Adjustments to fuel systems or governor system at time of start-up or any time after. A warranty claim for such adjustments is acceptable only when a defective part has been replaced, returned to the factory, and approved as defective.
 - c. Normal maintenance costs, including but not limited to adjustments, loose and/or leaking fittings or clamps, and tune-ups performed during start-up or anytime thereafter.
 - d. Due to shipping, manufacturer is not responsible for loose connections. All connections must be checked at time of start-up.
 - e. Non-MTU Onsite Energy replacement part(s) will void this Limited Warranty.
 - f. Products that are modified in any form without the written consent of MTU Onsite Energy will void this Limited Warranty.
 - g. Shipping damage of any type.
 - h. Any installation errors or damage of the equipment when shipped as ordered.
 - i. Any overtime travel or labor to make repairs under warranty.
 - j. Any special access fees required to gain access to MTU Onsite Energy equipment, including but not limited to any training or safety policy requirements to gain access.
 - k. Additional costs associated with inaccessible installations, including but not limited to removal and reinstallation of the generator set.
 - I. Rental equipment used during warranty work including but not limited to generators, rigging equipment such as a crane or boom truck, load banks, and special test equipment above factory requirements.

STANDBY (3D) LIMITED WARRANTY Two (2) Year / 3,000 Hour Basic Power Module



- m. Excess mileage charges. Any authorized service provider may perform warranty service anywhere, but will only be paid for mileage expenses from the nearest service center and limited to 400 miles/644 Kilometers round-trip.
- n. Any equipment not factory approved and engineered for use on MTU Onsite Energy products. This includes but is not limited to aftermarket items such as special fuel systems, enclosures, exhaust systems, or switch gear that had been sought out and quoted by a third party to be included in billing of the MTU Onsite Energy equipment.
- o. Misuse or abuse during installation and thereafter.
- p. Normal wear and tear, maintenance, and consumable items that are not required as part of a warranty repair. Consumable items include but are not limited to belts, hoses, coolant, oil, filters, and fuses.
- q. Acts of nature or acts of God such as lightning, wind, flood, tornado, hurricane, or earthquake.
- r. Any damage due to situations beyond the control of the manufacturing of the product or workmanship of the product.
- s. Installation or operation outside the guidelines as stated in the Installation Guide and Owner's Manual.
- t. Diesel engine "Wet Stacking" due to lightly loaded diesel engines.
- u. Misapplication of the equipment such as usage outside the original design parameters as stated on the nameplate of the equipment.
- v. Travel expense on portable equipment.
- w. More than one trip to the job site because a service vehicle was not stocked with normal service parts.
- x. Lodging expense of person(s) performing service, unless approved in advance by factory.
- y. Engine fluids.
- z. Units purchased at the standby power rating that are being used in a prime or continuous power application.
- aa. Any repair labor time that is determined to be excessive, e.g., two or more people performing a oneperson job.
- ab. Any expenses associated with investigating performance complaints in which no defect is found.
- ac. Any associated costs for replacing components that are found not to be defective.
- ad. Any adjustments covered in the start-up and inspection forms that are to be completed during start-up.
- ae. Any import duties, taxes, or fees required by another country if equipment is located outside of continental United Sates.
- 2. The Engine Generator Set accessories that are limited to one (1) year parts only from invoice date:
 - a. Oil makeup system and wiring/accessories.
 - b. Block heater(s) and wiring/accessories.
 - c. Fuel priming pump and wiring/accessories.
 - d. Battery charger.
 - e. SAM module.
 - f. Optional sensors/wiring including: ambient air, air inlet restriction, primary and secondary fuel pressure and/or differential, primary water in fuel, exhaust temperature.