

# 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

// **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
  - // 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  
 Oil Pump  
 Oil Drain Extension & S/O Valve  
 Full Flow Oil Filter  
 Closed Crankcase Ventilation  
 Jacket Water Pump  
 Inter Cooler Water Pump  
 Thermostats  
 Blower Fan & Fan Drive  
 Radiator - Unit Mounted  
 Electric Starting Motor - 24V  
 Governor - Electronic Isochronous  
 Base - Structural Steel  
 SAE Flywheel & Bell Housing  
 Charging Alternator - 24V  
 Battery Box & Cables  
 Flexible Fuel Connectors  
 Flexible Exhaust Connection  
 EPA Certified Engine

### // 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

No Load to Full Load Regulation  
 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  
 ±0.25% Voltage Regulation  
 100% of Rated Load - One Step  
 5% Maximum Total Harmonic Distortion

### // Digital Control Panel(s)

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

\* Represents standard product only. Consult Factory/MTU Onsite Energy Distributor for additional configurations.

## APPLICATION DATA

### // Engine

|                                    |                               |
|------------------------------------|-------------------------------|
| Manufacturer                       | MTU                           |
| Model                              | 12V 2000 G45 TB               |
| Type                               | 4-Cycle                       |
| Arrangement                        | 12-V                          |
| Displacement: L (in <sup>3</sup> ) | 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 <sub>2</sub> O) | 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

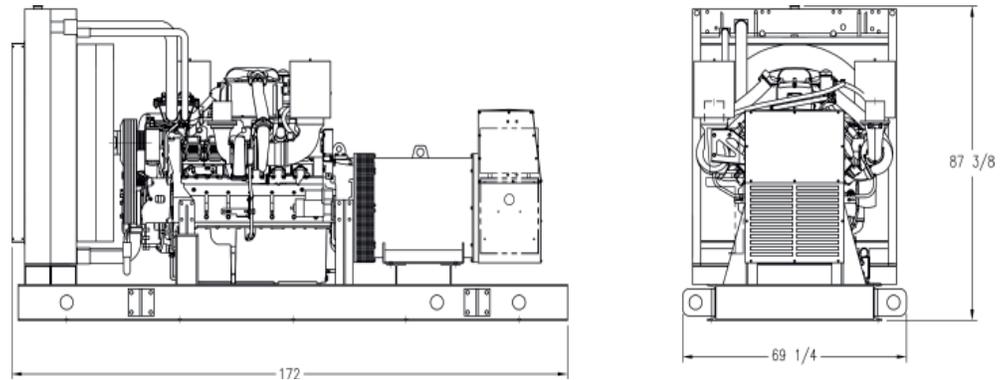
|  |              |
|--|--------------|
| Aspirating: *m <sup>3</sup> /min (SCFM)  | 60 (2,119)   |
| Air Flow Required for Rad.   |              |
| Cooled Unit: *m <sup>3</sup> /min (SCFM)   | 784 (27,687) |
| Remote Cooled Applications;<br>Air Flow Required for Dissipation<br>of Radiated Gen-set Heat for a<br>Max of 25 °F Rise: *m <sup>3</sup> /min (SCFM) | 265 (9,375)  |

\* Air density = 1.184 kg/m<sup>3</sup> (0.0739 lbm/ft<sup>3</sup>)

### // Exhaust System

|  |             |
|--|-------------|
| Gas Temp. (Stack): °C (°F)                                     | 535 (995)   |
| Gas Volume at Stack  |             |
| Temp: m <sup>3</sup> /min (CFM)                                | 150 (5,297) |
| Maximum Allowable<br>Back Pressure: kPa (in. H <sub>2</sub> O) | 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.

### System

Open Power Unit (OPU)

### Dimensions (LxWxH)

4,369 x 1,759 x 2,219 mm (172 x 69.3 x 87.4 in)

### Weight (less tank)

5,492 kg (12,108 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

Level 0: Open Power Unit dB(A)

### Prime Full Load

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<sub>x</sub> + NMHC

4.18

### CO

0.37

### PM

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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