Diesel Generator Set

MTU 12V1600 DS650

650 kVA/50 Hz/Standby (Fuel-Optimized)/380 - 415V
Reference MTU 12V1600 DS650 (590 kVA Fuel and Exhaust-Optimized)
for Prime Rating Technical Data

System ratings

<table>
<thead>
<tr>
<th>Voltage (L-L)</th>
<th>380V</th>
<th>400V</th>
<th>415V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PF</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Hz</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>kW</td>
<td>520</td>
<td>520</td>
<td>520</td>
</tr>
<tr>
<td>kVA</td>
<td>650</td>
<td>650</td>
<td>650</td>
</tr>
<tr>
<td>Amps</td>
<td>988</td>
<td>938</td>
<td>904</td>
</tr>
<tr>
<td>skVA@30% voltage dip</td>
<td>1,450</td>
<td>1,600</td>
<td>1,750</td>
</tr>
<tr>
<td>Generator model</td>
<td>573RSL4033</td>
<td>573RSL4033</td>
<td>573RSL4033</td>
</tr>
<tr>
<td>Temp rise</td>
<td>150 °C/40 °C</td>
<td>150 °C/40 °C</td>
<td>150 °C/40 °C</td>
</tr>
<tr>
<td>Connection</td>
<td>4 LEAD WYE</td>
<td>4 LEAD WYE</td>
<td>4 LEAD WYE</td>
</tr>
</tbody>
</table>

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
- 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%.
Standard features

- MTU 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
- Complete range of accessories
- Cooling system
  - Integral set-mounted
  - Engine-driven fan

Generator

- 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
  - NFPA 110 compatible

Digital control panel(s)

Standard equipment

Engine

- Air cleaners
- Oil pump
- Oil drain extension and S/O valve
- Full flow oil filters
- Closed crankcase ventilation
- Jacket water pump
- Thermostats
- Blower fan and fan drive
- Radiator - unit mounted
- Electric starting motor - 24V
- Governor - electronic isochronous
- Base - formed steel
- SAE flywheel and bell housing
- Charging alternator - 24V
- Battery box and cables
- Flexible fuel connectors
- Flexible exhaust connection

Generator

- NEMA MGI, 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
- Brushless alternator with brushless pilot exciter
- 4 pole, rotating field
- 150 °C maximum standby 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
### Application data

#### Engine
- **Manufacturer**: MTU
- **Model**: 12V1600G70F
- **Type**: 4-cycle
- **Arrangement**: 12-V
- **Displacement**: 21 (1,281) L (cu in)
- **Bore**: 12 (4.72) cm (in)
- **Stroke**: 15 (5.91) cm (in)
- **Compression ratio**: 17.5:1
- **Rated rpm**: 1,500
- **Engine governor**: electronic isochronous (ADEC)
- **Maximum power**: 576 (772) kWm (bhp)
- **Speed regulation**: ± 0.25%
- **Air cleaner**: dry

#### Liquid capacity (Lubrication)
- **Total oil system**: 73 (19.3) L (gal)
- **Engine jacket water capacity**: 65 (17.2) L (gal)
- **System coolant capacity**: 106 (28.1) L (gal)

#### 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
- **Fuel return connection size**: -6 JIC 37° female
- **Maximum fuel lift**: 5 (16) m
- **Recommended fuel**: diesel #2
- **Total fuel flow**: 341.8 (90.3) L/hr (gal/hr)

#### Fuel consumption
- **At 100% of power rating**: 130 (34.3) L/hr (gal/hr)
- **At 75% of power rating**: 100 (26.4) L/hr (gal/hr)
- **At 50% of power rating**: 70 (18.4) L/hr (gal/hr)

#### Cooling - radiator system
- **Ambient capacity of radiator**: 50 (122) °C (°F)
- **Maximum restriction of cooling air**: intake and discharge side of radiator: 0.2 (0.8) kPa (in. H₂O)
- **Water pump capacity**: 433 (115) L/min (gpm)
- **Heat rejection to coolant**: 236 (13,421) kW (BTUM)
- **Heat rejection to after cooler**: 104 (5,914) kW (BTUM)
- **Heat radiated to ambient**: 59.4 (3,378) kW (BTUM)
- **Fan power**: 25.4 (34) kW (hp)

#### Air requirements
- **Aspirating**: 48 (1,695) m³/min (SCFM)
- **Air flow required for radiator cooled unit**: 803 (28,350) m³/min (SCFM)
- **Remote cooled applications, air flow required for dissipation of radiated generator set heat for a maximum of 25 °F rise**: 216 (7,618) m³/min (SCFM)

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

#### Exhaust system
- **Gas temp. (stack)**: 484 (903) °C (°F)
- **Gas volume at stack temp.: m³/min (CFM)**: 126 (4,450)
- **Maximum allowable back pressure at outlet of engine, before piping**: 8.5 (34.1) kPa (in. H₂O)

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MTU 12V1600 DS650 (650 kVA) - Standby - Fuel Opt. / 03
Weights and dimensions

<table>
<thead>
<tr>
<th>System</th>
<th>Dimensions (L x W x H)</th>
<th>Weight (dry/less tank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open power unit (OPU)</td>
<td>3,737 x 1,899 x 2,137 mm (147.1 x 74.8 x 84.1 in)</td>
<td>5,249 kg (11,572 lb)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Unit type</th>
<th>Standby full load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 0: Open power unit: dB(A)</td>
<td>C/F</td>
</tr>
</tbody>
</table>

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

Emissions data

<table>
<thead>
<tr>
<th>NOx + NMHC</th>
<th>CO</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>C/F</td>
<td>C/F</td>
<td>C/F</td>
</tr>
</tbody>
</table>

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

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%. Operating hours per year: Max. 500.
— Consult your local MTU Distributor for derating information.