Diesel Generator Set

MTU 12V1600 DS650

590 kVA/50 Hz/Prime (Fuel-Optimized)/380 - 415V
Reference MTU 12V1600 DS650 (650 kVA Fuel-Optimized)
for Standby 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>472</td>
<td>472</td>
<td>472</td>
</tr>
<tr>
<td>kVA</td>
<td>590</td>
<td>590</td>
<td>590</td>
</tr>
<tr>
<td>Amps</td>
<td>896</td>
<td>852</td>
<td>821</td>
</tr>
<tr>
<td>skVA@30% voltage dip</td>
<td>1,050</td>
<td>1,200</td>
<td>1,750</td>
</tr>
<tr>
<td>Generator model</td>
<td>573RSL4033</td>
<td>573RSL4033</td>
<td>573RSL4035</td>
</tr>
<tr>
<td>Temp rise</td>
<td>125 °C/40 °C</td>
<td>125 °C/40 °C</td>
<td>125 °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>

** Prime technical data is for a fuel-optimized prime unit.

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 75%.
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
  - 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

Standard equipment *

**Engine**

- Air cleaners
- Oil pump
- Oil drain extension and S/O valve
- Full flow oil filter
- 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 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
- 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

* Represents standard product only. Consult the factory/MTU Distributor for additional configurations.
## Application data

**Engine**
- **Manufacturer**: MTU
- **Model**: 12V1600G10F
- **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**: 524 (703) 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 M20 x 1.5 male adapter provided
- **Fuel return connection size**: -6 JIC 37° female M14 x 1.5 male adapter provided
- **Maximum fuel lift**: 5 (16) ft
- **Recommended fuel**: diesel #2
- **Total fuel flow**: 341.8 (90.3) L/hr (gal/hr)

**Fuel consumption**
- **At 100% of power rating**: 118 (31.2) L/hr (gal/hr)
- **At 75% of power rating**: 92 (24.3) L/hr (gal/hr)
- **At 50% of power rating**: 64 (16.8) 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**: 231 (13,166) kW (BTUM)
- **Heat rejection to after cooler**: 87 (4,947) kW (BTUM)
- **Heat radiated to ambient**: 53.5 (3,042) kW (BTUM)
- **Fan power**: 25.4 (34) kW (hp)

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**Air requirements**
- **Aspirating**: 36 (1,271) m³/min (SCFM)
- **Remote cooled applications; air flow required for dissipation of radiated generator set heat for a maximum of 25 °F rise**: 194 (6,861) m³/min (SCFM)

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

**Exhaust system**
- **Gas temp. (stack)**: 482 (900) °C (°F)
- **Gas volume at stack temp**: 90 (3,178) m³/min (CFM)
- **Maximum allowable back pressure at outlet of engine, before piping**: 8.5 (34.1) kPa (in. H₂O)

**Prime technical data is for a fuel-optimized prime unit.**
Weights and dimensions

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.

<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>

Sound data

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

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

Emissions data

<table>
<thead>
<tr>
<th>NO₂ + 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>

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%.
— Consult your local MTU Distributor for derating information.