Diesel Generator Set

**mtu** 16V2000 DS1000

380V - 415V/50 Hz/prime power/fuel consumption optimized/
NOx emission optimized/16V2000G16F

Optional equipment and finishing shown. Standard may vary.

**Product highlights**

**Benefits**
- Low fuel consumption
- Optimized system integration ability
- High reliability and availability of power
- Long maintenance intervals
- Optimized ratio between size and power
- Wide operating range without derating

**Support**
- Global product support offered

**Standards**
- Engine-generator set is designed and manufactured in facilities certified to standards ISO 2008:9001 and ISO 2004:14001
- Generator set complies to G3 according to ISO 8528
- Generator meets NEMA MG1, BS5000, ISO, DIN EN and IEC standards
- NFPA 110

**Power rating**
- System rating: 910 kVA
- Accepts rated load in one step per NFPA 110
- Generator set complies to G3 according to ISO 8528-5
- Generator set exceeds load steps according to ISO 8528-5

**Performance assurance certification (PAC)**
- Engine-generator set tested to ISO 8528-5 for transient response
- 75% load factor for prime power applications
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

**Complete range of accessories available**
- Control panel
- Power panel
- Fuel system
- Fuel connections with shut-off valve mounted to base frame
- Starting/charging system
- Exhaust system
- Mechanical radiator
- Water Charge-Air-Cooler
- Oversized voltage alternators

**Cooling System**
- Air-to-Air Charge-Air Cooling (TD)
- Water-to-Air Charge-Air Cooling (TB)

**Emissions**
- Fuel consumption optimized
- NOx emission optimized, Tier 2 compliant and NEA (ORDE) optimization optionally available

**Certifications**
- CE certification option
- Unit certificate acc. to VDE-AR-N 4110
### Engine Data

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>mtu</td>
<td>mtu</td>
<td></td>
<td>mtu</td>
<td>mtu</td>
</tr>
<tr>
<td>Model</td>
<td>16V2000G16F</td>
<td>16V2000G16F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>4-cycle</td>
<td>4-cycle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrangement</td>
<td>16V</td>
<td>16V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Displacement: l</td>
<td>35.7</td>
<td>35.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bore: mm</td>
<td>135</td>
<td>135</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke: mm</td>
<td>156</td>
<td>156</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compression ratio</td>
<td>17.5</td>
<td>17.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated speed: rpm</td>
<td>1500</td>
<td>1500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine governor</td>
<td>ADEC</td>
<td>ADEC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed regulation</td>
<td>± 0.25%</td>
<td>± 0.25%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max power: kWm</td>
<td>806</td>
<td>806</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean effective pressure: bar</td>
<td>18.1</td>
<td>18.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air cleaner</td>
<td>dry</td>
<td>dry</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Fuel System

- Maximum fuel lift: m | 5 | 5
- Total fuel flow: l/min | 30 | 30

### Fuel Consumption

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>At 100% of power rating: l/hr</td>
<td>g/kWh</td>
<td>kW/1000hrs</td>
</tr>
<tr>
<td>mtu</td>
<td>186/192</td>
<td>196/202</td>
</tr>
<tr>
<td>At 75% of power rating: l/hr</td>
<td>g/kWh</td>
<td>kW/1000hrs</td>
</tr>
<tr>
<td>mtu</td>
<td>142/155</td>
<td>150/206</td>
</tr>
<tr>
<td>At 50% of power rating: l/hr</td>
<td>g/kWh</td>
<td>kW/1000hrs</td>
</tr>
<tr>
<td>mtu</td>
<td>99/204</td>
<td>104/214</td>
</tr>
</tbody>
</table>

### Lube Oil System

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total oil system capacity: l</td>
<td>102</td>
</tr>
<tr>
<td>Max. lube oil temp. (alarm): °C</td>
<td>103</td>
</tr>
<tr>
<td>Max. lube oil temp. (shutdown): °C</td>
<td>105</td>
</tr>
<tr>
<td>Min. lube oil pressure (alarm): bar</td>
<td>4.5</td>
</tr>
<tr>
<td>Min. lube oil pressure (shutdown): bar</td>
<td>4</td>
</tr>
</tbody>
</table>

### Exhaust System

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust gas temp. (after turbocharger): °C</td>
<td>540</td>
</tr>
<tr>
<td>Exhaust gas volume: m³/s</td>
<td>2.5</td>
</tr>
<tr>
<td>Maximum allowable back pressure: mbar</td>
<td>50</td>
</tr>
<tr>
<td>Minimum allowable back pressure: mbar</td>
<td>30</td>
</tr>
</tbody>
</table>

### Generator

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP23</td>
</tr>
<tr>
<td>Insulation class</td>
<td>H</td>
</tr>
<tr>
<td>Voltage regulation (steady state): ± 0.25%</td>
<td>± 0.25%</td>
</tr>
<tr>
<td>Rado interference class</td>
<td>N</td>
</tr>
</tbody>
</table>

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1. All data refers only to the engine and is based on ISO standard conditions (25°C and 100m above sea level).
2. Emission optimized data refer to NOx emission optimized and NEA (ORDE) optimized/Tier 2 compliant engines.
3. Values referenced are in accordance with ISO 3046-1. Conversion calculated with fuel density of 0.83 g/ml. All fuel consumption values refer to rated engine power.
## Standard and optional features

### System ratings (kW/kVA)

<table>
<thead>
<tr>
<th>Generator model</th>
<th>Voltage</th>
<th>with mechanical radiator (TD) or charge-air-cooler (TB)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leroy Somer LSA 49.3 L10 (Low voltage Leroy Somer standard)</td>
<td>380 V</td>
<td>kWe 728, kVA* 910, AMPS 1383</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>728, 910, 1313</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>728, 910, 1266</td>
</tr>
<tr>
<td>Leroy Somer LSA 50.2 M6 (Low voltage Leroy Somer oversized)</td>
<td>380 V</td>
<td>728, 910, 1383</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>728, 910, 1313</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>728, 910, 1266</td>
</tr>
<tr>
<td>Marathon 740RSL7183 (Low voltage Marathon standard)</td>
<td>380 V</td>
<td>728, 910, 1383</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>728, 910, 1313</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>728, 910, 1266</td>
</tr>
<tr>
<td>Marathon 742RSL7185 (Low voltage Marathon oversized)</td>
<td>380 V</td>
<td>728, 910, 1383</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>728, 910, 1313</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>728, 910, 1266</td>
</tr>
</tbody>
</table>

* \( \cos \phi = 0.8 \)

** BE, fuel optimized: max. power available up to: open power unit 40°C/400m; NOx emission optimized, EPA Tier 2 compl., NEA: standard operating conditions/open power unit 25°C/100m

Electrical outputs may vary depending on generator voltage and ambient conditions. For power outputs consult your mtu dealer.

Intake air depression/mbar: 15mbar

Exhaust back pressure/mbar: 30mbar

### Engine

- 4-cycle
- Standard single stage air filter
- Oil drain extension & shut-off valve
- Full flow oil filters
- Closed crankcase ventilation
- ADEC electronic isochronous engine governor
- Common rail fuel injection
- Dry exhaust manifold
- Electric starting motor (24V)
- Fuel consumption optimized engine
- NOx emission optimized engine
- Tier 2 optimized engine
- NEA (ORDE) optimized engine

### Generator

- Leroy Somer low voltage generator
- Meets NEMA MG1, BS5000, IEC 60034-1, VDE 0530, DIN EN 12601, AS1359 and ISO 8528-3 requirements
- Superior voltage waveform
- Solid state, volts-per-Hertz regulator
- 4 pole three-phase synchronous generator
- Brushless, self-excited, self-regulating, self-ventilated
- Digital voltage regulator
- Anti condensation heater
- Stator winding Y-connected, accessible neutral (brought out)
- Protection IP 23
- less than 5% harmonic distortion
- 2/3 pitch stator windings
- No load to full load regulation
- \( \pm 0.25\% \) voltage regulation no load to full load
- Insulation class H, utilization acc. to H
- Radio suppression EN55011, group 1, cl. B
- Short circuit capability 3xIn for 10sec
- Sustained short circuit current of up to 300% of the rated current for up to 10 seconds (Leroy Somer generator)
- Winding and bearing RTDs (without monitoring)
- Excitation by AREP + PMI
- Mounting of CT’s: 3x 2 core CT’s
- Voltage setpoint adjustment \( \pm 10V \)
- Sustained short circuit current of up to 250% of the rated current for up to 10 seconds (Marathon generator)
- Marathon low voltage generator
- Oversized generator

### Notes

- Represents standard features
- Represents optional features
## Standard and optional features

### Cooling system

*Air-to-Air Charge-Air-Cooling TD*

- Mechanical radiator
- Jacket water pump
- Expansion tank
- Fan
- Thermostat(s)
- Jacket water heater

*Water-to-Air Charge-Air-Cooling TB*

- Coolant pump
- Manifold with thermostatic valves
- WCAC-base frame with safety covers
- HT-piping with flexible engine connection

### Control panel

- Pre-wired control cabinet for easy application of customized controller (V1+)
- Island operation (V2)
- Automatic mains failure operation with ATS (V3a)
- Automatic mains failure operation incl. control of generator and mains breaker (V3b)
- Island parallel operation of multiple gensets (V4)
- Automatic mains failure operation with short (< 10s) mains parallel overlap synchronization (V5)
- Mains parallel operation of a single genset (V6)
- Mains parallel operation of multiple gensets (V7)
- Basler controller
- Deif controller
- Complete system metering
- Digital metering
- Engine parameters
- Generator protection functions
- Engine protection
- SAE J1939 engine ECU communications
- Parametrization software
- Multilingual capability
- Multiple programmable contact inputs
- Multiple contact outputs
- Event recording
- IP 54 front panel rating with integrated gasket
- Different expansion modules
- Remote annunciator
- Daytank control
- Generator winding- and bearing temperature monitoring
- Differential protection with multi-function protection relay
- Modbus TCP-IP

### Power panel

- Available in 600x600
- Phase monitoring relay 230V/400V
- Supply for battery charger
- Supply for jacket water heater
- Plug socket cabinet for 230V compatible Euro

### Fuel system

- Flexible fuel connectors mounted to base frame
- Fuel filter with water separator
- Switchable fuel filter with water separator
- Fuel cooler (for TD-only)

### Starting/charging system

- 24V starter
- Starter batteries, cables, rack, disconnect switch
- Battery charger
- Redundant starter 2x 7.5KW

### Mounting system

- Welded base frame
- Resilient engine and generator mounting
- Modular base frame design

### Exhaust system

- Exhaust bellows with connection flange
- Exhaust silencer with 10 dB(A) sound attenuation
- Exhaust silencer with 30 dB(A) sound attenuation
- Exhaust silencer with 40 dB(A) sound attenuation
- Y-connection-pipe

- Represents standard features
- Represents optional features
Weights and dimensions

Air-to-Air Charge-Air Cooling (TD)  

Drawing above for illustration purposes only, based on a standard open power 400 Volt engine-generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

<table>
<thead>
<tr>
<th>System</th>
<th>Dimensions (LxWxH)</th>
<th>Weight (incl. engine-oil and coolant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open power unit (OPU)</td>
<td>4440 x 1990 x 2200 mm</td>
<td>6500 kg</td>
</tr>
<tr>
<td>Air-to-Air (TD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open power unit (OPU)</td>
<td>4447 x 1988 x 2046 mm</td>
<td>6100 kg</td>
</tr>
<tr>
<td>Water-to-Air (TB)</td>
<td></td>
<td></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 engine-generator set.

Sound data

— Consult your local mtu distributor for sound data.

Emissions data

— Consult your local mtu distributor for emissions data.

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%. Operating hours/year: unlimited
— Consult your local mtu distributor for derating information.