Diesel Generator Set

MTU 16V2000 DS1000

380V - 415V/50 Hz/prime power for stationary emergency/fuel consumption optimized/16V2000G16F/air charge air cooling

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
— 85% load factor for continuous 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
— Oversized voltage alternators

Emissions
— Fuel consumption optimized
— TA-Luft, Tier 2 compliant and NEA (ORDE) optimization optionally available

Certifications
— CE certification option
— VDE4110 Certification
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>MTU MTU</td>
<td>16V2000G16F MTU MTU</td>
<td>16V2000G16F</td>
<td>Heat rejection to coolant: kW</td>
<td>41.6</td>
<td>41.6</td>
</tr>
<tr>
<td>Type</td>
<td>4-cycle</td>
<td>4-cycle</td>
<td>4-cycle</td>
<td>Heat radiated to ambient: kW</td>
<td>115</td>
<td>170</td>
</tr>
<tr>
<td>Arrangement</td>
<td>16V</td>
<td>16V</td>
<td>16V</td>
<td>Fan power for mech. radiator (40°C):</td>
<td>43.4</td>
<td>43.4</td>
</tr>
<tr>
<td>Displacement: l</td>
<td>35.7</td>
<td>35.7</td>
<td>35.7</td>
<td>Fan power for mech. radiator (50°C):</td>
<td>43.4</td>
<td>43.4</td>
</tr>
<tr>
<td>Bore: mm</td>
<td>135</td>
<td>135</td>
<td>135</td>
<td>Air flow required for mech. radiator (40°C):</td>
<td>1462</td>
<td>1462</td>
</tr>
<tr>
<td>Stroke: mm</td>
<td>156</td>
<td>156</td>
<td>156</td>
<td>Air flow required for mech. radiator (50°C):</td>
<td>1462</td>
<td>1462</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>17.5</td>
<td>17.5</td>
<td>17.5</td>
<td>cooled unit: m³/min</td>
<td>1462</td>
<td>1462</td>
</tr>
<tr>
<td>Rated speed: rpm</td>
<td>1500</td>
<td>1500</td>
<td>1500</td>
<td>Engine coolant capacity (without cooling equipment): l</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Engine governor</td>
<td>ADEC (ECU 9) ADEC (ECU 9)</td>
<td>ADEC (ECU 9) ADEC (ECU 9)</td>
<td>ADEC (ECU 9)</td>
<td>Radiator coolant capacity (40°C): l</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>Speed regulation</td>
<td>± 0.25%</td>
<td>± 0.25%</td>
<td>± 0.25%</td>
<td>Radiator coolant capacity (50°C): l</td>
<td>106</td>
<td>106</td>
</tr>
<tr>
<td>Max power: kWm</td>
<td>806</td>
<td>806</td>
<td>806</td>
<td>Max. coolant temperature (warning): °C</td>
<td>102</td>
<td>102</td>
</tr>
<tr>
<td>Mean effective pressure: bar</td>
<td>18.1</td>
<td>18.1</td>
<td>18.1</td>
<td>Max. coolant temperature (shutdown): °C</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>Air cleaner</td>
<td>dry</td>
<td>dry</td>
<td>dry</td>
<td>Exhust gas temp. (after turbocharger): °C</td>
<td>540</td>
<td>520</td>
</tr>
<tr>
<td>Fuel system</td>
<td>Maximum fuel lift: m</td>
<td>5</td>
<td>5</td>
<td>Exhaust gas volume: m³/s</td>
<td>2.5</td>
<td>2.85</td>
</tr>
<tr>
<td>Total fuel flow: l/min</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>Maximum allowable back pressure: mbar</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Fuel consumption</td>
<td>At 100% of power rating: l/hr g/kWh</td>
<td>186/192</td>
<td>196/202</td>
<td>Minimum allowable back pressure: mbar</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>At 75% of power rating: l/hr g/kWh</td>
<td>142/195</td>
<td>150/206</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>At 50% of power rating: l/hr g/kWh</td>
<td>99/204</td>
<td>104/214</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lube oil system</td>
<td>Total oil system capacity: l</td>
<td>102</td>
<td>102</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max. lube oil temp. (alarm): °C</td>
<td>103</td>
<td>103</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max. lube oil temp. (shutdown): °C</td>
<td>105</td>
<td>105</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min. lube oil pressure (alarm): bar</td>
<td>4.5</td>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min. lube oil pressure (shutdown): bar</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combustion air requirements</td>
<td>Combustion air volume: m³/s</td>
<td>0.93</td>
<td>1.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max. air intake restriction: mbar</td>
<td>40</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 TA-Luft 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**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>kWel</td>
<td>kVA*</td>
</tr>
<tr>
<td><strong>Leroy Somer LSA 49.3 L10 (Low voltage Leroy Somer standard)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>380 V</td>
<td>728</td>
<td>910</td>
</tr>
<tr>
<td>400 V</td>
<td>728</td>
<td>910</td>
</tr>
<tr>
<td>415 V</td>
<td>728</td>
<td>910</td>
</tr>
<tr>
<td><strong>Leroy Somer LSA 50.2 M6 (Low voltage Leroy Somer oversized)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>380 V</td>
<td>728</td>
<td>910</td>
</tr>
<tr>
<td>400 V</td>
<td>728</td>
<td>910</td>
</tr>
<tr>
<td>415 V</td>
<td>728</td>
<td>910</td>
</tr>
<tr>
<td><strong>Marathon 740RSL7183 (Low voltage Marathon standard)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>380 V</td>
<td>728</td>
<td>910</td>
</tr>
<tr>
<td>400 V</td>
<td>728</td>
<td>910</td>
</tr>
<tr>
<td>415 V</td>
<td>728</td>
<td>910</td>
</tr>
<tr>
<td><strong>Marathon 742RSL7185 (Low voltage Marathon oversized)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>380 V</td>
<td>728</td>
<td>910</td>
</tr>
<tr>
<td>400 V</td>
<td>728</td>
<td>910</td>
</tr>
<tr>
<td>415 V</td>
<td>728</td>
<td>910</td>
</tr>
</tbody>
</table>

* cos phi = 0.8  
** BE, fuel optimized: max. power available up to: open power unit 40°C/400m; TAL, 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  
- Governor-electronic isochronous ADEC/ECU9  
- Common rail fuel injection  
- Dry exhaust manifold  
- Electric starting motor (24V)  
- Fuel consumption optimized engine  
- TA-Luft optimized engine  
- Tier 2 optimized engine  
- NEA (ORDE) optimized engine

### Generator

- Leroy Somer low voltage generator  
- Meets NEMA MG1, B55000, IEC 60034-1, VDE 0530, DIN EN 12601, AS1359 and ISO 8528 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  
- ± 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 ±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

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

Cooling system

- Jacket water pump
- Thermostat(s)
- Air charge air cooling
- Mechanical radiator
- Jacket water heater

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 temperature monitoring
- Generator bearing temperature monitoring
- Differential protection with multi-function protection relay
- Modbus RTU-TCP gateway

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

Starting/charging system

- 24V starter

- Starter batteries, cables, rack, disconnect switch
- Battery charger
- Redundant starter 2x7.5KW

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

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 (L x W x H)</th>
<th>Weight (dry/less tank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open power unit (OPU)</td>
<td>4440 x 1990 x 2200 mm</td>
<td>6550 kg</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 for Stationary Emergency 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. 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%. Operating hours/year: max. 500.

— Consult your local MTU distributor for derating information.