Diesel Generator Set

mtu 16V2000 DS1100

380V - 415V/50 Hz/data center continuous power/
fuel consumption optimized/NOx emission optimized/16V2000G26F

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: 1000 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
— 100% 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
— 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 and NEA (ORDE) optimization
optionally available

Certifications
— CE certification option
— Unit certificate acc. to VDE-AR-N 4110
### Application data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>mtu</td>
<td>mtu</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>16V2000G26F</td>
<td>16V2000G26F</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>kW (NOx)</td>
<td>145</td>
<td>205</td>
</tr>
<tr>
<td>Displacement: l</td>
<td>35.7</td>
<td>35.7</td>
<td>Input pressure customer radiator (TB): bar (rel.)</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Bore: mm</td>
<td>135</td>
<td>135</td>
<td>Max. pressure loss customer radiator (TB): bar</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Stroke: mm</td>
<td>156</td>
<td>156</td>
<td>Heat dissipated by engine coolant: kW (NOx)</td>
<td>370</td>
<td>350</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>17.5</td>
<td>17.5</td>
<td>Heat radiated to ambient: kW</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Rated speed: rpm</td>
<td>1500</td>
<td>1500</td>
<td>Air flow required for mech. radiator (40°C): cooled unit: m³/min</td>
<td>1462</td>
<td>1462</td>
</tr>
<tr>
<td>Engine governor</td>
<td>ADEC</td>
<td>ADEC</td>
<td>Air flow required for mech. radiator (50°C): cooled unit: m³/min</td>
<td>1462</td>
<td>1462</td>
</tr>
<tr>
<td>Speed regulation</td>
<td>± 0.25%</td>
<td>± 0.25%</td>
<td>Engine coolant capacity (without cooling equipment): l</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Max power: kWm</td>
<td>890</td>
<td>890</td>
<td>Radiator coolant capacity (40°C): l</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>Mean effective pressure: bar</td>
<td>19.9</td>
<td>19.9</td>
<td>Radiator coolant capacity (50°C): l</td>
<td>106</td>
<td>106</td>
</tr>
<tr>
<td>Air cleaner</td>
<td>dry</td>
<td>dry</td>
<td>Max. coolant temperature (warning): °C</td>
<td>102</td>
<td>102</td>
</tr>
<tr>
<td>Total fuel flow: l/min</td>
<td>30</td>
<td>30</td>
<td>Max. coolant temperature (shutdown): °C</td>
<td>105</td>
<td>105</td>
</tr>
</tbody>
</table>

### Fuel system

<table>
<thead>
<tr>
<th>Fuel consumption</th>
<th></th>
<th></th>
<th>Exhaust system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum fuel lift: m</td>
<td>5</td>
<td>5</td>
<td>Exhaust gas temp. (after turbocharger): °C</td>
</tr>
<tr>
<td>Total fuel flow: l/min</td>
<td>30</td>
<td>30</td>
<td>Exhaust gas volume: m³/s</td>
</tr>
</tbody>
</table>

### Lube oil system

<table>
<thead>
<tr>
<th>Lube oil system</th>
<th></th>
<th></th>
<th>Generator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total oil system capacity: l</td>
<td>102</td>
<td>102</td>
<td>Protection class</td>
</tr>
<tr>
<td>Max. lube oil temp. (alarm): °C</td>
<td>103</td>
<td>103</td>
<td>Insulation class</td>
</tr>
<tr>
<td>Max. lube oil temp. (shutdown): °C</td>
<td>105</td>
<td>105</td>
<td>Voltage regulation (steady state) ± 0.25%</td>
</tr>
<tr>
<td>Min. lube oil pressure (alarm): bar</td>
<td>4.5</td>
<td>4.5</td>
<td>Rado interference class</td>
</tr>
<tr>
<td>Min. lube oil pressure (shutdown): bar</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

### Combustion air requirements

<table>
<thead>
<tr>
<th>Combustion air requirements</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustion air volume: m³/s</td>
<td>1.03</td>
<td>1.19</td>
</tr>
<tr>
<td>Max. air intake restriction: mbar</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>
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></td>
<td>kWel</td>
<td>kVA*</td>
</tr>
<tr>
<td><strong>Leroy Somer LSA 50.2 M6</strong>&lt;br&gt;(Low voltage&lt;br&gt;Leroy Somer standard)</td>
<td>380 V</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>800</td>
</tr>
<tr>
<td><strong>Leroy Somer LSA 50.2 L7</strong>&lt;br&gt;(Low voltage&lt;br&gt;Leroy Somer oversized)</td>
<td>380 V</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>800</td>
</tr>
<tr>
<td><strong>Marathon 740RSL7183</strong>&lt;br&gt;(Low voltage&lt;br&gt;Marathon standard)</td>
<td>380 V</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>800</td>
</tr>
<tr>
<td><strong>Marathon 742RSL7185</strong>&lt;br&gt;(Low voltage&lt;br&gt;Marathon oversized)</td>
<td>380 V</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>800</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
- Governor-electronic isochronous ADEC/ECU9
- 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
- ± 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

*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)  
- [□] 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 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

<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) Air-to-Air (TD)</td>
<td>4440 x 1990 x 2200 mm</td>
<td>7300 kg</td>
</tr>
<tr>
<td>Open power unit (OPU) Water-to-Air (TB)</td>
<td>4447 x 1988 x 2046 mm</td>
<td>6900 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

— Data center continuous power ratings (DCP) apply to data center installations where a reliable utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or 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: ≤ 100%.
— Consult your local mtu distributor for derating information.