Diesel Generator Set

mtu 16V2000 DS1100

380V - 415V/50 Hz/standby power/
NOx emission optimized/16V2000G76F

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: 1100 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
— Water Charge-Air-Cooler
— Oversized voltage alternators

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

Emissions
— 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>Engine</th>
<th>Emission optimized&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Combustion air requirements</th>
<th>Emission optimized&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>mtu</td>
<td>Combustion air volume: m³/s</td>
<td>1.28</td>
</tr>
<tr>
<td>Model</td>
<td>16V2000G76F</td>
<td>Max. air intake restriction: mbar</td>
<td>40</td>
</tr>
<tr>
<td>Type</td>
<td>4-cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrangement</td>
<td>16V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Displacement: l</td>
<td>35.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bore: mm</td>
<td>135</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke: mm</td>
<td>156</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compression ratio</td>
<td>17.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated speed: rpm</td>
<td>1500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine governor</td>
<td>ADEC (ECU 9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed regulation</td>
<td>± 0.25%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max power: kWm</td>
<td>979</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean effective pressure: bar</td>
<td>21.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air cleaner</td>
<td>dry</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Combustion air requirements

- Coolant flow rate (HT circuit): m³/hr 41.6
- Coolant flow rate (LT circuit for TB): m³/hr 17.5
- Heat radiated to charge air cooling (TB): kW (NOx) 240
- Input pressure customer radiator (TB): bar (rel.) 1.4
- Max. pressure loss customer radiator (TB): bar 0.7
- Heat dissipated by engine coolant: kW (NOx) 375
- Heat radiated to ambient: kW 40

### Cooling/radiator system TB

- Air flow required for mech. radiator (40°C cooled unit: m³/min) 1462
- Air flow required for mech. radiator (50°C cooled unit: m³/min) 1462
- Engine coolant capacity (without cooling equipment): l 74
- Radiator coolant capacity (40°C): l 106
- Radiator coolant capacity (50°C): l 102
- Max. coolant temperature (warning): °C 105
- Max. coolant temperature (shutdown): °C 105

### Exhaust system

- Exhaust gas temp. (after turbocharger): °C 530
- Exhaust gas volume: m³/s 3.35
- Maximum allowable back pressure: mbar 50
- Minimum allowable back pressure: mbar 30

### Lube oil system

- Total oil system capacity: l 102
- Max. lube oil temperature (alarm): °C 103
- Max. lube oil temperature (shutdown): °C 105
- Min. lube oil pressure (alarm): bar 4.5
- Min. lube oil pressure (shutdown): bar 4

### Fuel consumption<sup>3</sup>

<table>
<thead>
<tr>
<th>At 100% of power rating:</th>
<th>l/hr</th>
<th>g/kwh</th>
</tr>
</thead>
<tbody>
<tr>
<td>237</td>
<td>201</td>
<td></td>
</tr>
<tr>
<td>At 75% of power rating:</td>
<td>180</td>
<td>203</td>
</tr>
<tr>
<td>At 50% of power rating:</td>
<td>124</td>
<td>210</td>
</tr>
</tbody>
</table>

### Fuel system

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

### Generator

- Protection class: IP23
- Insulation class: H
- Voltage regulation (steady state): ± 0.25%

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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**

### 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)
- NOx emission 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 8528-3 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 distorsion
- 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

### 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>Voltage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Leroy Somer LSA 50.2 M6</strong></td>
<td>380 V</td>
<td>880</td>
</tr>
<tr>
<td>(Low voltage Leroy Somer standard)</td>
<td>400 V</td>
<td>880</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>880</td>
</tr>
<tr>
<td><strong>Leroy Somer LSA 50.2 L7</strong></td>
<td>380 V</td>
<td>880</td>
</tr>
<tr>
<td>(Low voltage Leroy Somer oversized)</td>
<td>400 V</td>
<td>880</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>880</td>
</tr>
<tr>
<td><strong>Marathon 740 RSL7183</strong></td>
<td>380 V</td>
<td>880</td>
</tr>
<tr>
<td>(Low voltage Marathon standard)</td>
<td>400 V</td>
<td>880</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>880</td>
</tr>
<tr>
<td><strong>Marathon 742 RSL7185</strong></td>
<td>380 V</td>
<td>880</td>
</tr>
<tr>
<td>(Low voltage Marathon oversized)</td>
<td>400 V</td>
<td>880</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>880</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

Intake air depression/mbar: 15mbar

Exhaust back pressure/mbar: 30mbar

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
### Standard and optional features

#### Cooling system

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

- [ ] Mechanical radiator
- [ ] Jacket water pump

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

- [ ] Coolant pump
- [ ] Manifold with thermostatic valves

#### 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)

- [ ] Expansion tank
- [ ] Fan
- [ ] Thermostat(s)
- [ ] Jacket water heater

- [ ] IP 54 front panel rating with integrated gasket
- [ ] 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

- [ ] 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

- [ ] Mechanical radiator
- [ ] Jacket water pump
- [ ] Flexible fuel connectors mounted to base frame
- [ ] Fuel filter with water separator
- [ ] Switchable fuel filter with water separator
- [ ] 24V starter
- [ ] Starter batteries, cables, rack, disconnect switch
- [ ] Welded base frame
- [ ] Mechanical radiator
- [ ] Jacket water pump
- [ ] Flexible fuel connectors mounted to base frame
- [ ] Fuel filter with water separator
- [ ] Switchable fuel filter with water separator
- [ ] 24V starter
- [ ] Starter batteries, cables, rack, disconnect switch
- [ ] Welded base frame

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- [ ] Represents standard features
- [ ] Represents optional features
Weights and dimensions

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

<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>7300 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>6900 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

Standby power 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/year: max. 500.

Consult your local mtu distributor for derating information.