Diesel Generator Set

MTU 12V2000 DS1000

380V - 415V/50 Hz/prime/fuel consumption optimized/NOx emission optimized/12V2000G26F/air charge air cooling

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: 800 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
- Oversized voltage alternators

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

Certifications
- CE certification option
- VDE4110 certification
### Application data

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>MTU</td>
<td>MTU</td>
<td>Coolant flow rate (HT circuit): m³/hr</td>
<td>31.6</td>
<td>31.6</td>
</tr>
<tr>
<td>Type</td>
<td>4-cycle</td>
<td>4-cycle</td>
<td>Heat radiated to charge air cooling: kW</td>
<td>120</td>
<td>150</td>
</tr>
<tr>
<td>Arrangement</td>
<td>12V</td>
<td>12V</td>
<td>Heat radiated to ambient: kW</td>
<td>35</td>
<td>35</td>
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<tr>
<td>Displacement: l</td>
<td>26.8</td>
<td>26.8</td>
<td>Fan power for mech. radiator (40°C):</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Bore: mm</td>
<td>135</td>
<td>135</td>
<td>Fan power for mech. radiator (50°C):</td>
<td>51.1</td>
<td>51.1</td>
</tr>
<tr>
<td>Stroke: mm</td>
<td>156</td>
<td>156</td>
<td>Air flow required for mech. radiator (40°C)</td>
<td>969</td>
<td>969</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>17.5</td>
<td>17.5</td>
<td>Air flow required for mech. radiator (50°C)</td>
<td>1328</td>
<td>1328</td>
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<tr>
<td>Rated speed: rpm</td>
<td>1500</td>
<td>1500</td>
<td>cooled unit: m³/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine governor</td>
<td>ADEC (ECU 9)</td>
<td>ADEC (ECU 9)</td>
<td>Engine coolant capacity (without cooling equipment): l</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>Speed regulation</td>
<td>± 0.25%</td>
<td>± 0.25%</td>
<td>Radiator coolant capacity (40°C): l</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td>Max power: kW</td>
<td>709</td>
<td>709</td>
<td>Radiator coolant capacity (50°C): l</td>
<td>140</td>
<td>140</td>
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<tr>
<td>Mean effective pressure: bar</td>
<td>21.2</td>
<td>21.2</td>
<td>Max. coolant temperature (warning): °C</td>
<td>102</td>
<td>102</td>
</tr>
<tr>
<td>Air cleaner</td>
<td>dry</td>
<td>dry</td>
<td>Max. coolant temperature (shutdown): °C</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td><strong>Fuel system</strong></td>
<td></td>
<td></td>
<td><strong>Exhaust system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum fuel lift: m</td>
<td>5</td>
<td>5</td>
<td>Exhaust gas temp. (after turbocharger): °C</td>
<td>540</td>
<td>505</td>
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<tr>
<td>Total fuel flow: l/min</td>
<td>30</td>
<td>30</td>
<td>Exhaust gas volume: m³/s</td>
<td>2.2</td>
<td>2.4</td>
</tr>
<tr>
<td><strong>Fuel consumption</strong></td>
<td></td>
<td></td>
<td>Maximum allowable back pressure: mbar</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>At 100% of power rating: l/hr</td>
<td>g/kWh</td>
<td>162/190</td>
<td>Minimum allowable back pressure: mbar</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>At 75% of power rating: l/hr</td>
<td>g/kWh</td>
<td>124/193</td>
<td><strong>Generator</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At 50% of power rating: l/hr</td>
<td>g/kWh</td>
<td>87/204</td>
<td>Protection class</td>
<td>IP23</td>
<td>IP23</td>
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<tr>
<td><strong>Lube oil system</strong></td>
<td></td>
<td></td>
<td>Insulation class</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Total oil system capacity: l</td>
<td>80</td>
<td>80</td>
<td>Voltage regulation (steady state): ± 0.25%</td>
<td>± 0.25%</td>
<td>± 0.25%</td>
</tr>
<tr>
<td>Max. lube oil temp. (alarm): °C</td>
<td>103</td>
<td>103</td>
<td>Rado interference class</td>
<td>N</td>
<td>N</td>
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<tr>
<td>Max. lube oil temp. (shutdown): °C</td>
<td>105</td>
<td>105</td>
<td><strong>Combustion air requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. lube oil pressure (alarm): bar</td>
<td>4.5</td>
<td>4.5</td>
<td>Combustion air volume: m³/s</td>
<td>0.79</td>
<td>0.91</td>
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<tr>
<td>Min. lube oil pressure (shutdown): bar</td>
<td>4</td>
<td>4</td>
<td>Max. air intake restriction: mbar</td>
<td>40</td>
<td>40</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</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>kWel</td>
</tr>
<tr>
<td>Leroy Somer LSA 49.3 L9 (Low voltage</td>
<td>380 V</td>
<td>640</td>
</tr>
<tr>
<td>Leroy Somer standard)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>640</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>640</td>
</tr>
<tr>
<td>Leroy Somer LSA 50.2 M6 (Low voltage</td>
<td>380 V</td>
<td>640</td>
</tr>
<tr>
<td>Leroy Somer oversized)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>640</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>640</td>
</tr>
<tr>
<td>Marathon 575RSL7181 (Low voltage</td>
<td>380 V</td>
<td>640</td>
</tr>
<tr>
<td>Marathon standard)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>640</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>640</td>
</tr>
<tr>
<td>Marathon 740RSL7183 (Low voltage</td>
<td>380 V</td>
<td>640</td>
</tr>
<tr>
<td>Marathon oversized)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>640</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>640</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.
- 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, 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
## 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- 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

### 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

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- [ ] 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>4120 x 1910 x 2190 mm</td>
<td>5800 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 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.