Diesel Generator Set

MTU 12V2000 DS1000

380V - 415V/50 Hz/standby power/fuel consumption optimized
12V2000G86F/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: 1010 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

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

### Engine

- **Manufacturer**: MTU
- **Model**: 12V2000G86F
- **Type**: 4-cycle
- **Arrangement**: 12V
- **Displacement**: 26.8 l
- **Bore**: 135 mm
- **Stroke**: 156 mm
- **Compression ratio**: 17.5
- **Rated speed**: 1500 rpm
- **Engine governor**: ADEC (ECU 9)
- **Speed regulation**: ± 0.25%
- **Max power**: 887 kW
- **Mean effective pressure**: 26.5 bar
- **Air cleaner**: Dry

### Fuel system

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

#### Fuel consumption

<table>
<thead>
<tr>
<th>Power Rating</th>
<th>l/hr</th>
<th>g/kwh</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% of power rating</td>
<td>203</td>
<td>190</td>
</tr>
<tr>
<td>75% of power rating</td>
<td>151</td>
<td>188</td>
</tr>
<tr>
<td>50% of power rating</td>
<td>105</td>
<td>197</td>
</tr>
</tbody>
</table>

#### Lube oil system

- **Total oil system capacity**: 80 l
- **Max. lube oil temperature (alarm)**: 103 °C
- **Max. lube oil temperature (shutdown)**: 105 °C
- **Min. lube oil pressure (alarm)**: 4.5 bar
- **Min. lube oil pressure (shutdown)**: 4 bar

### Combustion air requirements

- **Combustion air volume**: 1.03 m³/s
- **Heat rejection to coolant**: 316 kW
- **Heat rejection to charge air**: 200 kW
- **Heat radiated to ambient**: 35 kW
- **Fan power for mech. radiator (40°C)**: 34 kW
- **Fan power for mech. radiator (50°C)**: 51.1 kW
- **Air flow required for mech. radiator (40°C)**: 969 m³/min
- **Air flow required for mech. radiator (50°C)**: 1328 m³/min

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### Cooling/radiator system

- **Coolant flow rate (HT circuit)**: 31.6 m³/hr
- **Engine coolant capacity (without cooling equipment)**: 63 l
- **Radiator coolant capacity (40°C)**: 59 l
- **Radiator coolant capacity (50°C)**: 140 l
- **Max. coolant temperature (warning)**: 102 °C
- **Max. coolant temperature (shutdown)**: 105 °C

### Exhaust system

- **Exhaust gas temp. (after turbocharger)**: 520 °C
- **Exhaust gas volume**: 2.72 m³/s
- **Maximum allowable back pressure**: 50 mbar
- **Minimum allowable back pressure**: 30 mbar

### Generator

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

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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. 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>kWel</th>
<th>kVA*</th>
<th>AMPs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leroy Somer LSA 49.3 L9</strong> (Low voltage Leroy Somer standard)</td>
<td>380 V</td>
<td>800</td>
<td>1000</td>
<td>1519</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>800</td>
<td>1000</td>
<td>1443</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>800</td>
<td>1000</td>
<td>1391</td>
</tr>
<tr>
<td><strong>Leroy Somer LSA 50.2 M6</strong> (Low voltage Leroy Somer oversized)</td>
<td>380 V</td>
<td>800</td>
<td>1000</td>
<td>1519</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>800</td>
<td>1000</td>
<td>1443</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>800</td>
<td>1000</td>
<td>1391</td>
</tr>
<tr>
<td><strong>Marathon 575RSL7181</strong> (Low voltage Marathon standard)</td>
<td>380 V</td>
<td>808</td>
<td>1010</td>
<td>1535</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>808</td>
<td>1010</td>
<td>1458</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>808</td>
<td>1010</td>
<td>1405</td>
</tr>
<tr>
<td><strong>Marathon 740RSL7183</strong> (Low voltage Marathon oversized)</td>
<td>380 V</td>
<td>808</td>
<td>1010</td>
<td>1535</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>808</td>
<td>1010</td>
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</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

Generator

- Leroy Somer low voltage generator
- Meets NEMA MG1, BS5000, 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 I, 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)
- 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 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

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

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.