Diesel Generator Set

MTU 12V4000 DS1750

380V – 11 kV/50 Hz/prime power/NOx emission optimized
12V4000G14F/water charge air cooling

Optional equipment and finishing shown. Standard may vary.

Product highlights

Benefits
— Low fuel consumption
— Optimized system integration ability
— High reliability
— High availability of power
— Long maintenance intervals

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 ISO 8528
— Generator meets NEMA MG1, BS5000, ISO, DIN EN and IEC standards
— NFPA 110

Power rating
— System ratings: 1590 kVA - 1700 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
— Verified product design, quality and performance integrity
— All engine systems are prototype and factory tested

Complete range of accessories available
— Control panel
— Power panel
— Circuit breaker/power distribution
— Fuel system
— Fuel connections with shut-off valve mounted to base frame
— Starting/charging system
— Exhaust system
— Mechanical and electrical driven radiators
— Medium and oversized voltage alternators

Emissions
— NOx emission optimized

Certifications
— CE certification option
— Unit certificate acc. to BDEW (German Grid-Code)
### Application data

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>NOx emission optimized</th>
<th>Liquid capacity (lubrication)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>without radiator</td>
<td>with mechanical radiator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kWel</td>
<td>kVA</td>
</tr>
<tr>
<td>Leroy Somer LSA52.3 S5</td>
<td>380 V</td>
<td>1360</td>
<td>1700</td>
</tr>
<tr>
<td>(Low voltage Leroy Somer standard)</td>
<td>400 V</td>
<td>1360</td>
<td>1700</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>1360</td>
<td>1700</td>
</tr>
<tr>
<td>Leroy Somer LSA52.3 S6</td>
<td>380 V</td>
<td>1360</td>
<td>1700</td>
</tr>
<tr>
<td>(Low voltage Leroy Somer oversized)</td>
<td>400 V</td>
<td>1360</td>
<td>1700</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>1360</td>
<td>1700</td>
</tr>
<tr>
<td>Marathon 743RSL7090</td>
<td>380 V</td>
<td>1352</td>
<td>1690</td>
</tr>
<tr>
<td>(Low voltage Marathon)</td>
<td>400 V</td>
<td>1344</td>
<td>1680</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>1272</td>
<td>1590</td>
</tr>
<tr>
<td>Marathon 744RSL7091</td>
<td>380 V</td>
<td>1352</td>
<td>1690</td>
</tr>
<tr>
<td>(Low voltage Marathon oversized)</td>
<td>400V</td>
<td>1344</td>
<td>1680</td>
</tr>
<tr>
<td></td>
<td>415V</td>
<td>1272</td>
<td>1590</td>
</tr>
<tr>
<td>Marathon 1020FDH7095</td>
<td>11 kV</td>
<td>1352</td>
<td>1690</td>
</tr>
<tr>
<td>(Medium volt. Marathon)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leroy Somer LSA53.2 VL6</td>
<td>11 kV</td>
<td>1352</td>
<td>1690</td>
</tr>
<tr>
<td>(Med. volt. Leroy Somer)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Engine**

- **Manufacturer**: MTU
- **Model**: 12V4000G14F
- **Type**: 4-cycle
- **Displacement**: 12V
- **Rated speed**: 57.2 rpm
- **Bore**: 170 mm
- **Stroke**: 210 mm
- **Compression ratio**: 16.4
- **Max power**: 1500 kW
- **Engine governor**: ECU 9
- **Rated speed**: 2240 rpm

**Fuel system**

- **Maximum fuel lift**: 5 l
- **Total fuel flow**: 16 l/min

**Combustion air requirements**

- **Heat rejection to coolant**: 590 kW
- **Heat radiated to ambient**: 75 kW
- **Heat radiated to charge air cooling**: 360 kW
- **Exhaust gas temp. (after turbocharger)**: 470 °C
- **Exhaust gas volume**: 5.2 m³/s

**Cooling/radiator system**

- **Coolant flow rate (HT circuit)**: 56 m³/hr
- **Coolant flow rate (LT circuit)**: 30 m³/hr
- **Fan power for electr. radiator (40°C)**: 70 kW

**Liquid capacity (lubrication)**

- **Total oil system capacity**: 260 l
- **Engine jacket water capacity**: 160 l
- **Intercooler coolant capacity**: 40 l

**Exhaust system**

- **Maximum allowable back pressure**: 85 mbar
- **Minimum allowable back pressure**: 30 mbar

*cos phi = 0.8*
### Standard and optional features

#### Engine
- 4-cycle
- Standard single stage air filter
- Oil drain extension & shut-off valve
- Closed crankcase ventilation
- Governor-electronic isochronous
- Common rail fuel injection
- NOx emission optimized engine

#### Generator
- 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 IP23
- Insulation class H, utilization acc. to H
- Radio suppression EN55011, group 1, cl. B
- Short circuit capability 3xIn for 10sec
- Winding and bearing RTDs (without monitoring)
- Excitation by AREP
- Mounting of CT’s: 2 core CT’s
- Winding pitch: 2/3 winding
- Voltage setpoint adjustment ± 10%
- Meets NEMA MG-1, BS 5000, IEC 60034-1, VDE 0530, DIN EN 12601, AS1359 and ISO 8528 requirements
- Leroy Somer low voltage generator
- Marathon low voltage generator
- Oversized generator
- Medium voltage generator

#### Cooling system
- Jacket water pump
- Thermostat(s)
- Water charge air cooling
- Mechanical radiator
- Electrical driven front-end cooler
- 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
- Modbus TCP-IP

#### Power panel
- Available in 600x600 and 600x1000
- Phase monitoring relay 230V/400V
- Supply for battery charger
- Supply for jacket water heater
- Supply for anti condensation heating
- Plug socket cabinet for 230V compatible Euro/USA
- Supply electrical driven radiator from 45kW – 75kW (PP 600x1000)
Standard and optional features

Circuit breaker/power distribution

- 3-pole circuit breaker
- 4-pole circuit breaker
- Manual-actuated circuit breaker
- Electrical-actuated circuit breaker
- Stand-alone solution in separate cabinet

Fuel system

- Flexible fuel connectors mounted to base frame
- Fuel filter with water separator
- Fuel filter with water separator heavy-duty
- Switchable fuel filter with water separator
- Switchable fuel filter with water separator heavy-duty
- Separate fuel cooler
- Fuel cooler integrated into cooling equipment

Starting/charging system

- 24V starter
- Starter batteries, cables, rack, disconnect switch
- Battery charger

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
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>4059 x 1810 x 2330 mm</td>
<td>10654 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

<table>
<thead>
<tr>
<th>NOx + NMHC</th>
<th>CO</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700</td>
<td>300</td>
<td>50</td>
</tr>
</tbody>
</table>

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%.

— All units are in mg/Nm³

Emission levels of the engine may vary as a function of ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data provided refers to ISO standard ambient conditions (25°C and 100m above sea level). The data provided are laboratory results from one engine representing this rating. The data was obtained under controlled environmental conditions with calibrated instrumentation.