Diesel Generator Set

MTU 16V4000 DS2500

380V – 11 kV/50 Hz/prime power for stationary emergency/NEA (ORDE) optimized/16V4000G24F/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: 2120 kVA - 2360 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
- 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
- NEA (ORDE) optimized

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

**Engine**
- **Manufacturer**: MTU
- **Model**: 16V4000G24F
- **Type**: 4-cycle
- **Arrangement**: 16V
- **Displacement**: 76.3 l
- **Bore**: 170 mm
- **Stroke**: 210 mm
- **Compression ratio**: 16.4
- **Rated speed**: 1500 rpm
- **Engine governor**: ECU 9
- **Max power**: kWm
- **Air cleaner**

**Fuel system**
- **Maximum fuel lift**: m
  - 5
- **Total fuel flow**: l/min
  - 20

**Fuel consumption**

<table>
<thead>
<tr>
<th></th>
<th>l/hr</th>
<th>g/kwh</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 100% of power rating:</td>
<td>471.1</td>
<td>199</td>
</tr>
<tr>
<td>At 75% of power rating:</td>
<td>358.7</td>
<td>202</td>
</tr>
<tr>
<td>At 50% of power rating:</td>
<td>247.4</td>
<td>209</td>
</tr>
</tbody>
</table>

**Liquid capacity (lubrication)**
- **Total oil system capacity**: l
  - 300
- **Engine jacket water capacity**: l
  - 175
- **Intercooler coolant capacity**: l
  - 50

**Combustion air requirements**
- **Combustion air volume**: m³/s
  - 2.5
- **Max. air intake restriction**: mbar
  - 50

**Cooling/radiator system**
- **Coolant flow rate (HT circuit)**: m³/hr
  - 68.5
- **Coolant flow rate (LT circuit)**: m³/hr
  - 30
- **Heat rejection to coolant**: kW
  - 660
- **Heat radiated to charge air cooling**: kW
  - 430
- **Heat radiated to ambient**: kW
  - 90
- **Fan power for electr. radiator (40°C)**: kW
  - 70

**Exhaust system**
- **Exhaust gas temp. (after turbocharger)**: °C
  - 480
- **Exhaust gas volume**: m³/s
  - 6.6
- **Maximum allowable back pressure**: mbar
  - 85
- **Minimum allowable back pressure**: mbar
  - 30

---

### Standard and optional features

**System ratings (kW/kVA)**

<table>
<thead>
<tr>
<th>Generator model</th>
<th>Voltage</th>
<th>NEA (ORDE) optimized</th>
<th>with mechanical radiator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>without radiator</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>kWel</td>
<td>kVA*</td>
</tr>
<tr>
<td><strong>Leroy Somer LSA52.3 L12</strong> (Low voltage Leroy Somer standard)</td>
<td>380 V</td>
<td>1888</td>
<td>2360</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>1888</td>
<td>2360</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>1888</td>
<td>2360</td>
</tr>
<tr>
<td><strong>Marathon 744RSL7092</strong> (Low voltage Marathon)</td>
<td>380 V</td>
<td>1832</td>
<td>2290</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>1824</td>
<td>2280</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>1696</td>
<td>2120</td>
</tr>
<tr>
<td><strong>Marathon 1020FDL7093</strong> (Low voltage Marathon oversized)</td>
<td>380 V</td>
<td>1832</td>
<td>2290</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>1824</td>
<td>2280</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>1696</td>
<td>2120</td>
</tr>
<tr>
<td><strong>Marathon 1020FDH7099</strong> (Medium volt. marathon)</td>
<td>11 kV</td>
<td>1880</td>
<td>2350</td>
</tr>
<tr>
<td><strong>Leroy Somer LSA53.2 XL11</strong> (Medium volt. Leroy Somer)</td>
<td>11 kV</td>
<td>1880</td>
<td>2350</td>
</tr>
</tbody>
</table>

* cos phi = 0.8

---

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

Engine

- 4-cycle
- Standard single stage air filter
- Oil drain extension & shut-off valve
- Closed crankcase ventilation
- Governor-electronic isochronous
- Common rail fuel injection
- NEA (ORDE) 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 I, 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 for electrical driven radiator from 45kW – 75kW (PP 600x1000)

- Represents standard features
- Represents optional features
Standard and optional features

Circuit breaker/power distribution

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

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 heavy-duty
☐ Switchable fuel filter with water separator
☐ 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

■ 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>4766 x 1810 x 2330 mm</td>
<td>13395 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 ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. 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: ≤ 85%. Operating hours/year: max. 500.

— Consult your local MTU Distributor for derating information.

Rolls-Royce Group
www.mtu-solutions.com/powergen