Diesel Generator Set

MTU 16V4000 DS2500

380V – 11 kV/50 Hz/prime power for stationary emergency/
fuel consumption optimized/16V4000G24F/water charge air cooling

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 - 2550 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
— Fuel consumption optimized

Certifications
— CE certification option
— Unit certificate acc. to BDEW (German Grid-Code)
Application data 1)

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

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>Type</th>
<th>Arrangement</th>
<th>Displacement: l</th>
<th>Bore: mm</th>
<th>Stroke: mm</th>
<th>Compression ratio</th>
<th>Rated speed: rpm</th>
<th>Engine governor</th>
<th>Max power: kWm</th>
<th>Air cleaner</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTU</td>
<td>16V4000G24F</td>
<td>4-cycle</td>
<td>16V</td>
<td>76.3</td>
<td>170</td>
<td>210</td>
<td>16.4</td>
<td>1500</td>
<td>ECU 9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Fuel system

<table>
<thead>
<tr>
<th>Maximum fuel lift: m</th>
<th>Total fuel flow: l/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>20</td>
</tr>
</tbody>
</table>

#### Fuel consumption 2)

<table>
<thead>
<tr>
<th>Voltage</th>
<th>l/hr</th>
<th>g/kwh</th>
</tr>
</thead>
<tbody>
<tr>
<td>380 V</td>
<td>1888</td>
<td>2360</td>
</tr>
<tr>
<td>400 V</td>
<td>1888</td>
<td>2360</td>
</tr>
<tr>
<td>415 V</td>
<td>1752</td>
<td>2190</td>
</tr>
<tr>
<td>380 V</td>
<td>1888</td>
<td>2360</td>
</tr>
<tr>
<td>400 V</td>
<td>1888</td>
<td>2360</td>
</tr>
<tr>
<td>415 V</td>
<td>1752</td>
<td>2190</td>
</tr>
</tbody>
</table>

#### Liquid capacity (lubrication)

<table>
<thead>
<tr>
<th>Total oil system capacity: l</th>
<th>Engine jacket water capacity: l</th>
<th>Intercooler coolant capacity: l</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>175</td>
<td>50</td>
</tr>
</tbody>
</table>

#### Combustion air requirements

<table>
<thead>
<tr>
<th>Combustion air volume: m³/s</th>
<th>Max. air intake restriction: mbar</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3</td>
<td>50</td>
</tr>
</tbody>
</table>

#### Cooling/radiator system

<table>
<thead>
<tr>
<th>Coolant flow rate (HT circuit): m³/hr</th>
<th>Heat rejection to coolant: kW</th>
<th>Heat radiated to charge air cooling: kW</th>
<th>Heat radiated to ambient: kW</th>
<th>Fan power for electr. radiator (40°C): kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>68.5</td>
<td>730</td>
<td>320</td>
<td>90</td>
<td>44</td>
</tr>
</tbody>
</table>

#### Exhaust system

<table>
<thead>
<tr>
<th>Exhaust gas temp. (after turbocharger): °C</th>
<th>Exhaust gas volume: m³/s</th>
<th>Maximum allowable back pressure: mbar</th>
<th>Minimum allowable back pressure: mbar</th>
</tr>
</thead>
<tbody>
<tr>
<td>485</td>
<td>5.8</td>
<td>85</td>
<td>30</td>
</tr>
</tbody>
</table>

#### System ratings (kW/kVA)

<table>
<thead>
<tr>
<th>Generator model</th>
<th>Voltage</th>
<th>fuel consumption optimized</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>without radiator</td>
</tr>
<tr>
<td></td>
<td>kWel</td>
<td>kVA*</td>
</tr>
<tr>
<td>Leroy Somer LSA52.3 L12 (Low voltage Leroy Somer standard)</td>
<td>380 V</td>
<td>1888</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>1888</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>1752</td>
</tr>
<tr>
<td>Marathon 744RSL7092 (Low voltage Marathon)</td>
<td>380 V</td>
<td>1888</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>1824</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>1696</td>
</tr>
<tr>
<td>Marathon 1020FDL7093 (Low voltage Marathon oversized)</td>
<td>380 V</td>
<td>1888</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>1824</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>1696</td>
</tr>
<tr>
<td>Marathon 1020FDH7099 (Medium volt. marathon)</td>
<td>11 kV</td>
<td>2040</td>
</tr>
<tr>
<td></td>
<td>11 kV</td>
<td>1880</td>
</tr>
</tbody>
</table>

* 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
- Fuel consumption 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 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
- ☐ 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

- ☐ 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.