Diesel Generator Set

**MTU 20V4000 DS4000**

11 kV/50 Hz/data center continuous power/
fuel consumption optimized/20V4000G44LF/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 rating: 3630 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
- 100% 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
- Fuel system
- Fuel connections with shut-off valve mounted to base frame
- Starting/charging system
- Exhaust system
- Electrical driven radiators
- Medium voltage alternators

**Emissions**
- Fuel consumption optimized

**Certifications**
- CE certification option
### Engine

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>MTU</td>
</tr>
<tr>
<td>Model</td>
<td>20V4000G44LF</td>
</tr>
<tr>
<td>Type</td>
<td>4-cycle</td>
</tr>
<tr>
<td>Arrangement</td>
<td>20V</td>
</tr>
<tr>
<td>Displacement</td>
<td>95.4</td>
</tr>
<tr>
<td>Bore: mm</td>
<td>170</td>
</tr>
<tr>
<td>Stroke: mm</td>
<td>210</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>16.4</td>
</tr>
<tr>
<td>Rated speed: rpm</td>
<td>1500</td>
</tr>
<tr>
<td>Engine governor</td>
<td>ADEC (ECU 9)</td>
</tr>
<tr>
<td>Max power: kWm</td>
<td>3007</td>
</tr>
<tr>
<td>Air cleaner</td>
<td>dry</td>
</tr>
</tbody>
</table>

### Fuel system

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum fuel lift: m</td>
<td>5</td>
</tr>
<tr>
<td>Total fuel flow: l/min</td>
<td>27</td>
</tr>
</tbody>
</table>

### Fuel consumption

<table>
<thead>
<tr>
<th>Percentage of Power Rating</th>
<th>l/hr</th>
<th>g/kwh</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 100% of power rating:</td>
<td>711</td>
<td>196</td>
</tr>
<tr>
<td>At 75% of power rating:</td>
<td>517</td>
<td>190</td>
</tr>
<tr>
<td>At 50% of power rating:</td>
<td>368</td>
<td>203</td>
</tr>
</tbody>
</table>

### Liquid capacity (lubrication)

<table>
<thead>
<tr>
<th>Component</th>
<th>Capacity: l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total oil system capacity</td>
<td>390</td>
</tr>
<tr>
<td>Engine jacket water capacity</td>
<td>260</td>
</tr>
<tr>
<td>Intercooler coolant capacity</td>
<td>50</td>
</tr>
</tbody>
</table>

### Combustion air requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustion air volume: m³/s</td>
<td>4.2</td>
</tr>
<tr>
<td>Max. air intake restriction: mbar</td>
<td>30</td>
</tr>
</tbody>
</table>

### Cooling/radiator system

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolant flow rate (HT circuit): m³/hr</td>
<td>80</td>
</tr>
<tr>
<td>Coolant flow rate (LT circuit): m³/hr</td>
<td>50</td>
</tr>
<tr>
<td>Heat rejection to coolant: kW</td>
<td>1040</td>
</tr>
<tr>
<td>Heat radiated to charge air cooling: kW</td>
<td>775</td>
</tr>
<tr>
<td>Heat radiated to ambient: kW</td>
<td>105</td>
</tr>
<tr>
<td>Fan power for electr. radiator (40°C): kW</td>
<td>105</td>
</tr>
</tbody>
</table>

### Liquid capacity (lubrication)

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<tr>
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<td>260</td>
</tr>
<tr>
<td>Intercooler coolant capacity: l</td>
<td>50</td>
</tr>
</tbody>
</table>

### Exhaust system

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust gas temp. (after engine, max.): °C</td>
<td>445</td>
</tr>
<tr>
<td>Exhaust gas temp. (before turbocharger): °C</td>
<td>621</td>
</tr>
<tr>
<td>Exhaust gas volume: m³/s</td>
<td>10.3</td>
</tr>
<tr>
<td>Maximum allowable back pressure: mbar</td>
<td>50</td>
</tr>
<tr>
<td>Minimum allowable back pressure: mbar</td>
<td>–</td>
</tr>
</tbody>
</table>

### System ratings (kW/kVA)

<table>
<thead>
<tr>
<th>Generator model</th>
<th>Voltage</th>
<th>fuel consumption optimized 40°C/300m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>kWel</td>
</tr>
<tr>
<td>Leroy Somer LSA54.2 ZL12</td>
<td>11 kV</td>
<td>2904</td>
</tr>
<tr>
<td>(Med. volt. Leroy Somer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marathon 1040FDH7105</td>
<td>11 kV</td>
<td>2904</td>
</tr>
<tr>
<td>(Medium volt. marathon)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leroy Somer LSA54.2 ZL14</td>
<td>11 kV</td>
<td>2904</td>
</tr>
<tr>
<td>(MV Leroy Somer oversized)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* cos phi = 0.8

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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 and are approximate values.
### 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 I, cl. B
- Short circuit capability 3xIn for 10sec
- Winding and bearing RTDs (without monitoring)
- Excitation by AREP + PMI
- Mounting of CT’s: 3x 2 core CT’s
- Winding pitch: 5/6 winding
- Voltage setpoint adjustment ± 5%
- Meets NEMA MG-1, BS 5000, IEC 60034-1, VDE 0530, DIN EN 12601, AS1359 and ISO 8528 requirements
- Leroy Somer medium voltage generator
- Marathon medium voltage generator
- Oversized generator

#### Cooling system
- Jacket water pump
- Thermostat(s)
- Water charge air cooling
- Electrical driven front-end cooler
- Jacket water heater
- Pulley for fan drive

#### 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
- Remote annunciator
- Daytank control
- Generator winding temperature and temperature monitoring
- Modbus TCP-IP

#### Power panel
- Available in 600x600 mm
- 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

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

#### Fuel system

- **Standard features**
  - Flexible fuel connectors mounted to base frame
  - Fuel filter with water separator
  - Fuel filter with water separator heavy-duty

- **Optional features**
  - 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

- **Standard features**
  - 24V starter
  - Starter batteries, cables, rack, disconnect switch

- **Optional features**
  - Battery charger
  - Redundant starter 2x 15kW

#### Mounting system

- **Standard features**
  - Welded base frame
  - Resilient engine and generator mounting

- **Optional features**
  - Modular base frame design

#### Exhaust system

- **Standard features**
  - Exhaust bellows with connection flange

- **Optional features**
  - 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

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 capability is available for 1 min of duration per event. Ratings are in accordance with ISO 8528-1, ISO-3046-1, BS 5514 and AS 2789.
  Average load factor: 100% unlimited hours.
— Consult your local MTU distributor for derating information.