Diesel Generator Set

MTU 20V4000 DS4000

11 kV/50 Hz/standby power/NEA (ORDE) + Tier 2 optimized
20V4000G94LF/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: 3950 kVA - 4000 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
— Fuel system
— Fuel connections with shut-off valve mounted to base frame
— Starting/charging system
— Exhaust system
— Electrical driven radiators
— Medium and oversized voltage alternators

Emissions
— Tier 2 optimized engine
— NEA (ORDE) optimized

Certifications
— CE certification option
Application data 1)

<table>
<thead>
<tr>
<th>Engine</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Type</th>
<th>Arrangement</th>
<th>Displacement</th>
<th>Bore</th>
<th>Stroke</th>
<th>Compression ratio</th>
<th>Rated speed</th>
<th>Engine governor</th>
<th>Max power</th>
<th>Air cleaner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MTU</td>
<td>20V4000G94LF</td>
<td>4-cycle</td>
<td>20V</td>
<td>95.4</td>
<td>170</td>
<td>210</td>
<td>16.4</td>
<td>1500</td>
<td>ADEC (ECU 9)</td>
<td>3308</td>
<td>dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leroy Somer LSA54.2 ZL12</td>
<td>(Medium volt. Leroy Somer)</td>
<td>11kV</td>
<td>3160</td>
<td>3950</td>
<td>207</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marathon 1040FDH7105</td>
<td>(Medium volt. Marathon)</td>
<td>11kV</td>
<td>3200</td>
<td>4000</td>
<td>210</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leroy Somer LSA54.2 ZL14</td>
<td>(MV Leroy Somer oversized)</td>
<td>11kV</td>
<td>3160</td>
<td>3950</td>
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<tr>
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<td>Leroy Somer LSA54.2 ZL14</td>
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<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Fuel consumption 2)</th>
<th>l/hr</th>
<th>g/kwh</th>
</tr>
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<tbody>
<tr>
<td>At 100% of power rating:</td>
<td>818</td>
<td>205</td>
</tr>
<tr>
<td>At 75% of power rating:</td>
<td>598</td>
<td>200</td>
</tr>
<tr>
<td>At 50% of power rating:</td>
<td>429</td>
<td>215</td>
</tr>
</tbody>
</table>

Liquid capacity (lubrication)
- Total oil system capacity: 390 l
- Engine jacket water capacity: 260 l
- Intercooler coolant capacity: 50 l

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

Cooling/radiator system
- Coolant flow rate (HT circuit): m³/hr 80
- Coolant flow rate (LT circuit): m³/hr 44
- Heat rejection to coolant: kW 1270
- Heat radiated to charge air cooling: kW 930
- Heat radiated to ambient: kW 105
- Fan power for electr. radiator (40°C): kW 105

Exhaust system
- Exhaust gas temp. (after engine, max.): °C 482
- Exhaust gas temp. (before turbocharger): °C 693
- Exhaust gas volume: m³/s 11.9
- Maximum allowable back pressure: mbar 50

Standard and optional features

System ratings (kW/kVA)

<table>
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<tr>
<th>Generator model</th>
<th>Voltage</th>
<th>NEA (ORDE) + Tier 2 optimized</th>
</tr>
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<tr>
<td></td>
<td></td>
<td>without radiator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kWe</td>
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<th>kWe</th>
<th>kVA*</th>
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* 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
- Tier 2 optimized engine
- 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 1, 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- and bearing 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
- ■ 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
- ○ Redundant starter 2x 15kW

### 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 11 kV 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 (LxWxH)</th>
<th>Weight (dry/less tank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open power unit (OPU)</td>
<td>6339 x 1887 x 2415 mm</td>
<td>19350 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. 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.