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

#### Engine

- **Manufacturer**: MTU
- **Model**: 20V4000G94F
- **Type**: 4-cycle
- **Arrangement**: 20V
- **Displacement**: 95.4 l
- **Bore**: 170 mm
- **Stroke**: 210 mm
- **Compression ratio**: 16.4
- **Rated speed**: 1500 rpm
- **Engine governor**: ADEC (ECU 9)
- **Max power**: 3088 kWm
- **Air cleaner**: dry

#### Fuel system

- **Maximum fuel lift**: 5 l/hr
- **Total fuel flow**: 27 l/min

#### Fuel consumption

- **At 100% of power rating**: 818 l/hr, 205 g/kwh
- **At 75% of power rating**: 598 l/hr, 200 g/kwh
- **At 50% of power rating**: 429 l/hr, 215 g/kwh

#### 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**: 4.7 m³/s
- **Max. air intake restriction**: 30 mbar

#### Cooling/radiator system

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

#### Exhaust system

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

### Standard and optional features

#### Generators

<table>
<thead>
<tr>
<th>Generator model</th>
<th>Voltage</th>
<th>NEA (ORDE) + Tier 2 optimized</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>without radiator</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>kWe</strong></td>
<td><strong>kVA</strong></td>
<td><strong>AMPS</strong></td>
</tr>
<tr>
<td>Leroy Somer LSA54.2 ZL12 (Medium volt. Leroy Somer)</td>
<td>11 kV</td>
<td>3160</td>
</tr>
<tr>
<td>Marathon 1040FDH7105 (Medium volt. Marathon)</td>
<td>11 kV</td>
<td>3200</td>
</tr>
<tr>
<td>Leroy Somer LSA54.2 ZL14 (MV Leroy Somer oversized)</td>
<td>11 kV</td>
<td>3160</td>
</tr>
<tr>
<td>Leroy Somer LSA54.2 ZL14 (Engine output optimized)</td>
<td>11 kV</td>
<td>3200</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.
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
- 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
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 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

■ Represents standard features
□ Represents optional features
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 (L x W x H)</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>19,350 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.