MTU 20V4000 DS4000

3.3 - 11 kV/50 Hz/standby power/fuel consumption optimized
20V4000G94LF/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: 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
- Fuel consumption optimized

Certifications
- CE certification option
Application data

Engine
Manufacturer: MTU
Model: 20V4000G94LF
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: 3308 kW
Air cleaner: dry

Fuel system
Maximum fuel lift: 5 m
Total fuel flow: 27 l/min

Fuel consumption
At 100% of power rating: 806 l/hr, 202 g/kwh
At 75% of power rating: 565 l/hr, 189 g/kwh
At 50% of power rating: 403 l/hr, 202 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: 4.5 m³/s
Max. air intake restriction: 30 mbar

Cooling/radiator system
Coolant flow rate (HT circuit): 80 m³/hr
Coolant flow rate (LT circuit): 44 m³/hr
Heat rejection to coolant: 1220 kW
Heat radiated to charge air cooling: 840 kW
Heat radiated to ambient: 105 kW
Fan power for electr. radiator (40°C): 105 kW

Exhaust system
Exhaust gas temp. (after engine): 481 °C
Exhaust gas temp. (before turbocharger): 693 °C
Exhaust gas volume: 11.5 m³/s
Maximum allowable back pressure: 50 mbar
Minimum allowable back pressure: –

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></td>
<td></td>
<td>without radiator</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

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
- Fuel consumption optimized engine
- Common rail fuel injection

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
- Oversized generator

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

---

- [ ] Represents standard features
- [ ] Represents optional features
Weights and dimensions

Drawing above for illustration purposes only, based on 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.