Diesel Generator Set

mtu 20V4000 DS3600

3.3 - 11 kV/50 Hz/data center continuous power/
NEA (ORDE) + Tier 2 optimized/20V4000G44F/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: 3380 kVA - 3390 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
— Mechanical driven radiators
— Medium and oversized voltage alternators

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

Certifications
— CE certification option
— Unit conformity and certificate according to AR-N-4110. on request

Optional equipment and finishing shown. Standard may vary.
### Application data

**Engine**
- **Manufacturer**: mtu
- **Model**: 20V4000G44F
- **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**: ECU 9
- **Max power**: 2807 kWm
- **Air cleaner**: dry

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

**Fuel consumption**
1. At 100% of power rating: 674 l/hr, 199 g/kwh
2. At 75% of power rating: 523 l/hr, 206 g/kwh
3. At 50% of power rating: 369 l/hr, 218 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**: 4.3 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**: 1010/1140 kW (100/110%)
- **Heat radiated to charge air cooling**: 780/890 kW (100/110%)
- **Heat radiated to ambient**: 105 kW
- **Fan power for electr. radiator (40°C)**: 105 kW

**Exhaust system**
- **Exhaust gas temp. (after engine, max.)**: 550 °C
- **Exhaust gas temp. (before turbocharger)**: 605 °C
- **Exhaust gas volume**: 10.0 m³/s
- **Maximum allowable back pressure**: 50 mbar
- **Minimum allowable back pressure**: –

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### System ratings (kW/kVA)

#### Generator model

<table>
<thead>
<tr>
<th>Voltage</th>
<th>NEA (ORDE) optimized 40°C/1000m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>without radiator</strong></td>
</tr>
<tr>
<td></td>
<td>kWel</td>
</tr>
<tr>
<td>Leroy Somer LSA54.2 XL11 (Med. volt. Leroy Somer)</td>
<td>11 kV</td>
</tr>
<tr>
<td>Marathon 1040FDH7103 (Medium volt. marathon)</td>
<td>11 kV</td>
</tr>
<tr>
<td>Leroy Somer LSA54.2 ZL12 (MV Leroy Somer oversized)</td>
<td>11 kV</td>
</tr>
<tr>
<td>Marathon 1040FDH7105 (MV marathon oversized)</td>
<td>11 kV</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 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
- 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 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 monitoring
- Generator bearing temperature monitoring
- Modbus TCP-IP

**Power panel**
- Available in 600x600
- 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

<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>6249 x 1887 x 2412 mm</td>
<td>18420 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

- Data center continuous power ratings (DCP) apply to data center installations where a reliable utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. 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: ≤ 100%.
- Consult your local mtu distributor for derating information.