Diesel Generator Set

MTU 20V4000 DS3300

380V – 11 kV/50 Hz/data center continuous power/NEA (ORDE) optimized/20V4000G34F/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: 2770 kVA - 2780 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
- Circuit breaker/power distribution
- Fuel system
- Fuel connections with shut-off valve mounted to base frame
- Starting/charging system
- Exhaust system
- Mechanical and electrical driven radiators
- Medium and oversized voltage alternators

Emissions
- NEA (ORDE) optimized

Certifications
- CE certification option
- Unit certificate acc. to BDEW (German Grid-Code)
**Application data**

**Engine**
- Manufacturer: MTU
- Model: 20V4000G34F
- Type: 4-cycle
- Arrangement: 20V
- Displacement: l 95.4
- Bore: mm 170
- Stroke: mm 210
- Compression ratio: 16.4
- Rated speed: rpm 1500
- Engine governor: ECU 9
- Max power: kWm 2590
- Air cleaner: Dry

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

**Fuel consumption**
- At 100% of power rating: l/hr 617.9, g/kwh 198
- At 75% of power rating: l/hr 479.8, g/kwh 205
- At 50% of power rating: l/hr 333.9, g/kwh 214

**Liquid capacity (lubrication)**
- Total oil system capacity: l 390
- Engine jacket water capacity: l 205
- Intercooler coolant capacity: l 50

**Combustion air requirements**
- Combustion air volume: m³/s 2.9
- Max. air intake restriction: mbar 50

**Cooling/radiator system**
- Coolant flow rate (HT circuit): m³/hr 80
- Coolant flow rate (LT circuit): m³/hr 32.5
- Heat rejection to coolant: kW 1020
- Heat radiated to charge air cooling: kW 480
- Heat radiated to ambient: kW 105
- Fan power for electr. radiator (40°C): kW 70

**Exhaust system**
- Exhaust gas temp. (after turbocharger): °C 560
- Exhaust gas volume: m³/s 8.5
- Maximum allowable back pressure: mbar 85
- Minimum allowable back pressure: mbar 30

**Standard and optional features**

**System ratings (kW/kVA)**

<table>
<thead>
<tr>
<th>Generator model</th>
<th>Voltage</th>
<th>NEA (ORDE) optimized without radiator</th>
<th>NEA (ORDE) optimized with mechanical radiator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leroy Somer LSA53.2 M12 (Low voltage Leroy Somer standard)</td>
<td>380 V</td>
<td>kWel 2336 kVA 2920 AMPS 4436</td>
<td>kWel 2272 kVA 2840 AMPS 4315</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>kWel 2336 kVA 2920 AMPS 4215</td>
<td>kWel 2272 kVA 2840 AMPS 4099</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>kWel 2336 kVA 2920 AMPS 4062</td>
<td>kWel 2272 kVA 2840 AMPS 3951</td>
</tr>
<tr>
<td>Marathon 1030FDL7094 (Low voltage Marathon)</td>
<td>380 V</td>
<td>kWel 2336 kVA 2920 AMPS 4436</td>
<td>kWel 2264 kVA 2830 AMPS 4300</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>kWel 2336 kVA 2920 AMPS 4215</td>
<td>kWel 2264 kVA 2830 AMPS 4085</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>kWel 2336 kVA 2920 AMPS 4062</td>
<td>kWel 2264 kVA 2830 AMPS 3937</td>
</tr>
<tr>
<td>Marathon 1040FDH7102 (Medium volt. marathon)</td>
<td>11 kV</td>
<td>kWel 2336 kVA 2920 AMPS 153</td>
<td>kWel 2272 kVA 2840 AMPS 149</td>
</tr>
<tr>
<td>Leroy Somer LSA54.2 XL11 (Medium volt. Leroy Somer)</td>
<td>11 kV</td>
<td>kWel 2352 kVA 2940 AMPS 154</td>
<td>kWel 2280 kVA 2850 AMPS 150</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 with improved oil separator
- Governor-electronic isochronous
- Common rail fuel injection
- NEA (ORDE) optimized engine
- Centrifugal oil filter

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
- Mounting of CT’s: 2 core CT’s
- Winding pitch: 2/3 winding
- Voltage setpoint adjustment ± 10%
- Meets NEMA MG-1, BS 5000, IEC 60034-1, VDE 0530, DIN EN 12601, AS1359 and ISO 8528 requirements
- Leroy Somer low voltage generator
- Marathon low voltage generator
- Oversized generator
- Medium voltage generator

Cooling system

- Jacket water pump
- Thermostat(s)
- Water charge air cooling
- Mechanical radiator
- Electrical driven front-end cooler
- Jacket water heater
- □ 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
- □ Different expansion modules
- □ Remote annunciator
- □ Daytank control
- □ Generator winding temperature monitoring
- □ Generator bearing temperature monitoring
- □ Modbus TCP-IP

Control panel

- □ Available in 600x600 and 600x1000
- □ 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
- □ Supply for electrical driven radiator from 45kW – 75kW (PP 600x1000)

Power panel

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

### Circuit breaker/power distribution

- [ ] 3-pole circuit breaker
- [ ] 4-pole circuit breaker
- [ ] Manual-actuated circuit breaker
- [ ] Electrical-actuated circuit breaker
- [ ] Stand-alone solution in separate cabinet

### 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
- [ ] Seperate fuel cooler
- [ ] Fuel cooler integrated into cooling equipment

### Starting/charging system

- [ ] 24V starter
- [ ] Starter batteries, cables, rack, disconnect switch
- [ ] Battery charger

### 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
- [ ] Exhaust silencer with 50 dB(A) sound attenuation
- [ ] Y-connection-pipe

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- ■ Represents standard features
- □ Represents optional features
Weights and dimensions

Drawing above for illustration purposes only, based on a standard open power 400 Volt 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>5760 x 1887 x 2332 mm</td>
<td>15819 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 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.

Rolls-Royce Group

www.mtu-solutions.com/powergen