Diesel Generator Set

MTU 20V4000 DS3100

380V – 11 kV/50 Hz/prime power for stationary emergency/NEA (ORDE) optimized/20V4000G24F/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: 2730 kVA - 2740 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
― 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: 20V4000G24F
- Type: 4-cycle
- Arrangement: 20V
- Displacement: 95.4 l
- Bore: mm 170
- Stroke: mm 210
- Compression ratio: 16.4
- Rated speed: rpm 1500
- Engine governor: ECU 9
- Max power: kWm 2420
- 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 574.4 g/kwh 197
- At 75% of power rating: 450.5 l/hr 206 g/kwh
- At 50% of power rating: 319.3 l/hr 219 g/kwh

**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 2.7
- 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 980
- Heat radiated to charge air cooling: kW 410
- Heat radiated to ambient: kW 105
- Fan power for electr. radiator (40°C): kW 70

**Exhaust system**
- Exhaust gas temp. (after turbocharger): °C 550
- Exhaust gas volume: m³/s 7.1
- 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</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without radiator</td>
<td>with mechanical radiator</td>
</tr>
<tr>
<td></td>
<td>kWe</td>
<td>kVA</td>
</tr>
<tr>
<td>Leroy Somer LSA53.2 M12 (Low voltage Leroy Somer standard)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>380 V</td>
<td>2320</td>
<td>2900</td>
</tr>
<tr>
<td>400 V</td>
<td>2320</td>
<td>2900</td>
</tr>
<tr>
<td>415 V</td>
<td>2320</td>
<td>2900</td>
</tr>
<tr>
<td>Marathon 1030FDL7094 (Low voltage Marathon)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>380 V</td>
<td>2320</td>
<td>2900</td>
</tr>
<tr>
<td>400 V</td>
<td>2320</td>
<td>2900</td>
</tr>
<tr>
<td>415 V</td>
<td>2320</td>
<td>2900</td>
</tr>
<tr>
<td>Marathon 1030FDH7101 (Medium volt. marathon)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 kV</td>
<td>2320</td>
<td>2900</td>
</tr>
<tr>
<td>Leroy Somer LSA53.2 ZL14 (Medium volt. Leroy Somer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 kV</td>
<td>2328</td>
<td>2910</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
- NEA (ORDE) optimized engine
- Standard
- Optional

## 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

## 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
- Different expansion modules
- Remote annunciator
- Daytank control
- Generator winding temperature monitoring
- Generator bearing temperature monitoring
- Modbus TCP-IP

## Power 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)

- 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
- ■ 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

#### 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 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 (L x W x H)</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

— 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. 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: ≤ 85%. Operating hours/year: max. 500.
— Consult your local MTU distributor for derating information.