Diesel Generator Set

MTU 20V4000 DS3100

380V – 11 kV/50 Hz/prime power/NEA (ORDE) optimized
20V4000G24F/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: 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
— 75% 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)
### Engine

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>MTU</td>
</tr>
<tr>
<td>Model</td>
<td>20V4000G24F</td>
</tr>
<tr>
<td>Type</td>
<td>4-cycle</td>
</tr>
<tr>
<td>Arrangement</td>
<td>20V</td>
</tr>
<tr>
<td>Displacement (l)</td>
<td>95.4</td>
</tr>
<tr>
<td>Bore (mm)</td>
<td>170</td>
</tr>
<tr>
<td>Stroke (mm)</td>
<td>210</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>16.4</td>
</tr>
<tr>
<td>Rated speed (rpm)</td>
<td>1500</td>
</tr>
<tr>
<td>Engine governor</td>
<td>ECU 9</td>
</tr>
<tr>
<td>Max power (kWm)</td>
<td>2420</td>
</tr>
<tr>
<td>Air cleaner</td>
<td>dry</td>
</tr>
</tbody>
</table>

### Fuel system

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum fuel lift (m)</td>
<td>5</td>
</tr>
<tr>
<td>Total fuel flow (l/min)</td>
<td>27</td>
</tr>
</tbody>
</table>

### Fuel consumption

<table>
<thead>
<tr>
<th>Power Rating</th>
<th>l/hr</th>
<th>g/kwh</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>574.4</td>
<td>197</td>
</tr>
<tr>
<td>75%</td>
<td>450.5</td>
<td>206</td>
</tr>
<tr>
<td>50%</td>
<td>319.3</td>
<td>219</td>
</tr>
</tbody>
</table>

### Liquid capacity (lubrication)

<table>
<thead>
<tr>
<th>Capacity (l)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total oil system</td>
<td>390</td>
</tr>
<tr>
<td>Engine jacket water</td>
<td>205</td>
</tr>
<tr>
<td>Intercooler cooling</td>
<td>50</td>
</tr>
</tbody>
</table>

### Combustion air requirements

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustion air volume (m³/s)</td>
<td>2.7</td>
</tr>
<tr>
<td>Max air intake restriction (mbar)</td>
<td>50</td>
</tr>
</tbody>
</table>

### Cooling/radiator system

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolant flow rate (HT circuit) (m³/hr)</td>
<td>80</td>
</tr>
<tr>
<td>Coolant flow rate (LT circuit) (m³/hr)</td>
<td>32.5</td>
</tr>
<tr>
<td>Heat rejection to coolant (kW)</td>
<td>980</td>
</tr>
<tr>
<td>Heat radiated to charge air cooling (kW)</td>
<td>410</td>
</tr>
<tr>
<td>Heat radiated to ambient (kW)</td>
<td>105</td>
</tr>
<tr>
<td>Fan power for electr. radiator (40°C) (kW)</td>
<td>70</td>
</tr>
</tbody>
</table>

### Exhaust system

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust gas temp. (after turbocharger) (°C)</td>
<td>550</td>
</tr>
<tr>
<td>Exhaust gas volume (m³/s)</td>
<td>7.1</td>
</tr>
<tr>
<td>Maximum allowable back pressure (mbar)</td>
<td>85</td>
</tr>
<tr>
<td>Minimum allowable back pressure (mbar)</td>
<td>30</td>
</tr>
</tbody>
</table>

### Liquid capacity (lubrication)

<table>
<thead>
<tr>
<th>System ratings (kW/kVA)</th>
<th>Generator model</th>
<th>Voltage</th>
<th>without radiator</th>
<th>with mechanical radiator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>kWe</td>
<td>kVA</td>
<td>AMPS</td>
</tr>
<tr>
<td>Generator model</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>380 V</td>
<td>Leroy Somer LSA53.2 M12</td>
<td>2320</td>
<td>2900</td>
<td>4406</td>
</tr>
<tr>
<td></td>
<td>(Low voltage</td>
<td>2320</td>
<td>2900</td>
<td>4186</td>
</tr>
<tr>
<td></td>
<td>Leroy Somer standard)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>2320</td>
<td>2900</td>
<td>4034</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>2320</td>
<td>2900</td>
<td>4406</td>
</tr>
<tr>
<td>380 V</td>
<td>Marathon 1030FDL7094</td>
<td>2320</td>
<td>2900</td>
<td>4186</td>
</tr>
<tr>
<td></td>
<td>(Low volt.</td>
<td>2320</td>
<td>2900</td>
<td>4034</td>
</tr>
<tr>
<td></td>
<td>Marathon 1030FDH7101</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Medium volt.</td>
<td>2320</td>
<td>2900</td>
<td>152</td>
</tr>
<tr>
<td></td>
<td>marathon)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11kV</td>
<td>Marathon 1030FDH7101</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Medium volt.</td>
<td>2328</td>
<td>2910</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>Leroy Somer LSA53.2 ZL14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Medium volt.</td>
<td>2320</td>
<td>2900</td>
<td>152</td>
</tr>
<tr>
<td></td>
<td>Leroy Somer LSA53.2 ZL14</td>
<td></td>
<td></td>
<td></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

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
- 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
- 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
- Y-connection-pipe

- 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 (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
— Prime power ratings apply to installations where utility power is unavailable or unreliable. At 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: ≤ 75%.
— Consult your local MTU Distributor for derating information.