Diesel Generator Set

MTU 20V4000 DS3100

380V – 11 kV/50 Hz/data center continuous power/
fuel consumption 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: 2820 kVA - 2910 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
— Fuel consumption 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**: 1 l
- **Bore**: mm 170
- **Stroke**: mm 210
- **Compression ratio**: 16.4
- **Rated speed**: rpm 1500
- **Engine governor**: ECU 9
- **Max power**: kW 2420
- **Air cleaner**: dry

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

### Fuel consumption
1. **At 100% of power rating**: l/hr 554, g/kwh 190
2. **At 75% of power rating**: l/hr 422, g/kwh 193
3. **At 50% of power rating**: l/hr 294.5, g/kwh 202

### 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/h 80
- **Coolant flow rate (LT circuit)**: m³/h 32.5
- **Heat rejection to coolant**: kW 890
- **Heat radiated to charge air cooling**: kW 350
- **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 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>fuel consumption optimized</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without radiator</td>
<td>with mechanical radiator</td>
</tr>
<tr>
<td></td>
<td>kWeL</td>
<td>kVA*</td>
</tr>
<tr>
<td>Leroy Somer LSA53.2 M12 (Low voltage Leroy Somer standard)</td>
<td>380 V</td>
<td>2328</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>2328</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>2328</td>
</tr>
<tr>
<td>Marathon 1030FDL7094 (Low voltage Marathon)</td>
<td>380 V</td>
<td>2328</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>2320</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>2320</td>
</tr>
<tr>
<td>Marathon 1030FDH7101 (Medium volt. marathon)</td>
<td>11 kV</td>
<td>2320</td>
</tr>
<tr>
<td>Leroy Somer LSA53.2 ZL14 (Medium volt. Leroy Somer)</td>
<td>11 kV</td>
<td>2328</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
- Fuel consumption 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 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)

Represent standard features
Represent optional features
Standard and optional features

Circuit breaker/power distribution

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

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
☐ Switchable fuel filter with water separator
☐ 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

☑ 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

— 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.