Diesel Generator Set

MTU 12V4000 DS1650

380V – 11 kV/50 Hz/standby power/fuel consumption optimized
12V4000G74F/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: 1650 kVA - 1780 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
— Fuel consumption optimized

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

Engine
Manufacturer MTU
Model 12V4000G74F
Type 4-cycle
Arrangement 12V
Displacement: l 57.2
Bore: mm 170
Stroke: mm 210
Compression ratio 16.4
Rated speed: rpm 1500
Engine governor ECU 9
Max power: kWm 1575
Air cleaner Dry

Fuel system
Maximum fuel lift: m 5
Total fuel flow: l/min 16

Fuel consumption
At 100% of power rating: 358.6 l/hr 189 g/kwh
At 75% of power rating: 276.1 l/hr 194 g/kwh
At 50% of power rating: 189.8 l/hr 200 g/kwh

Liquid capacity (lubrication)
Total oil system capacity: l 260
Engine jacket water capacity: l 160
Intercooler coolant capacity: l 40

Combustion air requirements
Combustion air volume: m³/s 1.8
Max. air intake restriction: mbar 50

Cooling/radiator system
Coolant flow rate (HT circuit): m³/hr 56
Coolant flow rate (LT circuit): m³/hr 30
Heat rejection to coolant: kW 580
Heat radiated to charge air cooling: kW 260
Heat radiated to ambient: kW 75
Fan power for electr. radiator (40°C): kW 38

Exhaust system
Exhaust gas temp. (after turbocharger): °C 440
Exhaust gas volume: m³/s 4.5
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>fuel consumption optimized</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>without radiator</td>
<td>with mechanical radiator</td>
</tr>
<tr>
<td></td>
<td>Voltage</td>
<td>kWel kVA* AMPS</td>
<td>kWel kVA* AMPS</td>
</tr>
<tr>
<td>Leroy Somer LSA52.3 S5</td>
<td>380 V</td>
<td>1424 1780 2704</td>
<td>1376 1720 2613</td>
</tr>
<tr>
<td>(Low voltage</td>
<td>400 V</td>
<td>1424 1780 2569</td>
<td>1376 1720 2483</td>
</tr>
<tr>
<td>Leroy Somer standard</td>
<td>415 V</td>
<td>1424 1780 2476</td>
<td>1376 1720 2393</td>
</tr>
<tr>
<td>Marathon 743RSL7090</td>
<td>380 V</td>
<td>1392 1740 2644</td>
<td>1368 1710 2598</td>
</tr>
<tr>
<td>(Low voltage Marathon)</td>
<td>400 V</td>
<td>1368 1710 2468</td>
<td>1368 1710 2598</td>
</tr>
<tr>
<td>Marathon 744RSL7091</td>
<td>415 V</td>
<td>1320 1650 2295</td>
<td>1320 1650 2295</td>
</tr>
<tr>
<td>(Low voltage Marathon oversized)</td>
<td>380 V</td>
<td>1392 1740 2644</td>
<td>1368 1710 2598</td>
</tr>
<tr>
<td></td>
<td>400 V</td>
<td>1368 1710 2468</td>
<td>1368 1710 2598</td>
</tr>
<tr>
<td></td>
<td>415 V</td>
<td>1320 1650 2295</td>
<td>1320 1650 2295</td>
</tr>
<tr>
<td>Marathon 1020FDH7095</td>
<td>11 kV</td>
<td>1416 1770 93</td>
<td>1368 1710 90</td>
</tr>
<tr>
<td>(Medium volt. Marathon)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leroy Somer LSA53.2 VL6</td>
<td>11 kV</td>
<td>1416 1770 93</td>
<td>1376 1720 90</td>
</tr>
<tr>
<td>(Medium volt. Leroy Somer)</td>
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</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.
**Standard and optional features**

**Engine**
- 4-Cycle
- Standard single stage air filter
- Oil drain extension & shut-off valve
- Closed crankcase ventilation
- Governor-electronic isochronous
- Fuel consumption optimized engine
- Common rail fuel injection

**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 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

- Represents standard features
- Represents optional features
Weights and dimensions

System | Dimensions (L x W x H) | Weight (dry/less tank)
--- | --- | ---
Open power unit (OPU) | 4059 x 1810 x 2330 mm | 10654 kg

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. No overload capability for this rating. 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.