Diesel Generator Set

MTU 12V4000 DS2000

380V – 11 kV/50 Hz/prime power/NOx emission optimized
12V4000G24F/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: 1870 kVA - 1880 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
— NOx emission optimized

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

**Engine**
- **Manufacturer:** MTU
- **Model:** 12V4000G24F
- **Type:** 4-cycle
- **Arrangement:** 12V
- **Displacement:** 57.2 l
- **Bore:** 170 mm
- **Stroke:** 210 mm
- **Compression ratio:** 16.4
- **Rated speed:** 1500 rpm
- **Engine governor:** ECU 9
- **Max power:** 1575 kWm
- **Air cleaner:** dry

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

**Fuel consumption**
- At 100% of power rating: 419.4 l/hr, 221 g/kwh
- At 75% of power rating: 306 l/hr, 215 g/kwh
- At 50% of power rating: 204 l/hr, 215 g/kwh

**Combustion air requirements**
- **Combustion air volume:** 2.2 m³/s
- **Max. air intake restriction:** 670 mbar
- **Heat rejection to coolant:** 30 kW
- **Heat radiated to charge air cooling:** 410 kW
- **Heat radiated to ambient:** 75 kW
- **Fan power for electr. radiator (40°C):** 70 kW

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

**Cooling/radiator system**
- **Coolant flow rate (HT circuit):** 56 l/hr
- **Coolant flow rate (LT circuit):** 30 l/hr
- **Heat rejection to coolant:** 670 kW
- **Heat radiated to charge air cooling:** 410 kW
- **Heat radiated to ambient:** 75 kW
- **Fan power for electr. radiator (40°C):** 70 kW

**Exhaust system**
- **Exhaust gas temp. (after turbocharger):** 480 °C
- **Exhaust gas volume:** 5.6 m³/s
- **Maximum allowable back pressure:** 85 mbar
- **Minimum allowable back pressure:** 30 mbar

**System ratings (kW/kVA)**

<table>
<thead>
<tr>
<th>Generator model</th>
<th>Voltage</th>
<th>NOx emission optimized without radiator</th>
<th>NOx emission optimized with mechanical radiator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Voltage</td>
<td>kWel</td>
<td>kVA*</td>
</tr>
</tbody>
</table>
| Leroy Somer LSA52.3 S6  
(Low voltage Leroy Somer standard) | 380 V | 1504 | 1880 | 2856 | 1440 | 1800 | 2735 |
|                  | 400 V | 1504 | 1880 | 2714 | 1440 | 1800 | 2598 |
|                  | 415 V | 1504 | 1880 | 2615 | 1440 | 1800 | 2504 |
| Leroy Somer LSA52.3 S7  
(Low voltage Leroy Somer oversized) | 380 V | 1504 | 1880 | 2856 | 1440 | 1800 | 2735 |
|                  | 400 V | 1504 | 1880 | 2714 | 1440 | 1800 | 2598 |
|                  | 415 V | 1504 | 1880 | 2615 | 1440 | 1800 | 2504 |
| Marathon 744RSL7091  
(Low voltage Marathon) | 380 V | 1496 | 1870 | 2841 | 1432 | 1790 | 2720 |
|                  | 400 V | 1496 | 1870 | 2714 | 1432 | 1790 | 2584 |
|                  | 415 V | 1504 | 1870 | 2602 | 1432 | 1790 | 2490 |
| Marathon 744RSL7092  
(Low voltage Marathon oversized) | 380 V | 1496 | 1870 | 2841 | 1432 | 1790 | 2720 |
|                  | 400 V | 1504 | 1880 | 2714 | 1432 | 1790 | 2584 |
|                  | 415 V | 1496 | 1870 | 2602 | 1432 | 1790 | 2490 |
| Marathon 1020FDH7096  
(Medium volt. marathon) | 11 kV | 1496 | 1870 | 98 | 1432 | 1790 | 94 |
|                  | 11 kV | 1504 | 1880 | 99 | 1440 | 1800 | 94 |

* 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
- NOx emission 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 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 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

- ■ 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>4059 x 1810 x 2330 mm</td>
<td>10949 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.

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.

Emissions data

<table>
<thead>
<tr>
<th>NOx + NMHC</th>
<th>CO</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700</td>
<td>300</td>
<td>50</td>
</tr>
</tbody>
</table>

— All units are in mg/Nm³
Emission levels of the engine may vary as a function of ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data provided refers to ISO standard ambient conditions (25°C and 100m above sea level). The data provided are laboratory results from one engine representing this rating. The data was obtained under controlled environmental conditions with calibrated instrumentation.