Diesel Generator Set

MTU 12V4000 DS2000

380V – 11 kV/50 Hz/prime power/fuel consumption 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
- Fuel consumption optimized

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

| Engine | MTU | 12V4000G24F | 12V | 4-cycle | 57.2 | 170 | 210 | 16.4 | 1500 | ECU 9 | 1575 | dry | 290 | 188 | 290 | 97 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Manufacturer | Model | Type | Arrangement | Displacement: l | Bore: mm | Stroke: mm | Compression ratio | Rated speed: rpm | Engine governor | Max power: kW | kWm | AMPS | AMPS | kW | kW | AMPS | AMPS |
| Leroy Somer LSA52.3 S6 | 380 V | 1504 | 1880 | 2856 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 |
| (Low voltage Leroy Somer standard) | 400 V | 1504 | 1880 | 2714 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 |
| 415 V | 1504 | 1880 | 2615 | 1472 | 1840 | 2650 | 1472 | 1840 | 2650 | 1472 | 1840 | 2650 | 1472 | 1840 | 2650 | 1472 | 1840 | 2650 |
| Leroy Somer LSA52.3 S7 | 380 V | 1504 | 1880 | 2856 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 |
| (Low voltage Leroy Somer oversized) | 400 V | 1504 | 1880 | 2714 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 | 1472 | 1840 | 2796 |
| 415 V | 1504 | 1880 | 2615 | 1472 | 1840 | 2650 | 1472 | 1840 | 2650 | 1472 | 1840 | 2650 | 1472 | 1840 | 2650 | 1472 | 1840 | 2650 |
| Marathon 743RSL7091 | 380 V | 1496 | 1870 | 2841 | 1456 | 1820 | 2765 | 1456 | 1820 | 2765 | 1456 | 1820 | 2765 | 1456 | 1820 | 2765 | 1456 | 1820 | 2765 |
| (Low voltage Marathon) | 400 V | 1504 | 1880 | 2714 | 1456 | 1820 | 2765 | 1456 | 1820 | 2765 | 1456 | 1820 | 2765 | 1456 | 1820 | 2765 | 1456 | 1820 | 2765 |
| 415 V | 1496 | 1870 | 2602 | 1456 | 1820 | 2627 | 1456 | 1820 | 2627 | 1456 | 1820 | 2627 | 1456 | 1820 | 2627 | 1456 | 1820 | 2627 |
| Marathon 744RSL7092 | 380 V | 1496 | 1870 | 2841 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 |
| (Low voltage Marathon oversized) | 400 V | 1504 | 1880 | 2714 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 |
| 415 V | 1496 | 1870 | 2602 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 | 1456 | 1820 | 2532 |
| Marathon 1020FDH7096 | 11kV | 1496 | 1870 | 98 | 1456 | 1820 | 98 | 1456 | 1820 | 98 | 1456 | 1820 | 98 | 1456 | 1820 | 98 | 1456 | 1820 | 98 |
| (Medium volt. marathon) | 11 kV | 1504 | 1880 | 99 | 1472 | 1840 | 97 | 1472 | 1840 | 97 | 1472 | 1840 | 97 | 1472 | 1840 | 97 | 1472 | 1840 | 97 |
| Leroy Somer LSA53.2 VL7 | 11 kV | 1504 | 1880 | 99 | 1472 | 1840 | 97 | 1472 | 1840 | 97 | 1472 | 1840 | 97 | 1472 | 1840 | 97 | 1472 | 1840 | 97 |
| (Medium volt. Leroy Somer) | 11 kV | 1504 | 1880 | 99 | 1472 | 1840 | 97 | 1472 | 1840 | 97 | 1472 | 1840 | 97 | 1472 | 1840 | 97 | 1472 | 1840 | 97 |

Liquid capacity (lubrication)
- Total oil system capacity: l
- Engine jacket capacity: l
- Intercooler coolant capacity: l

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

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

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

Standard and optional features

System ratings (kW/kVA)

Fuel consumption
1. At 100% of power rating: l/hr, g/kwh
2. At 75% of power rating: l/hr, g/kwh
3. At 50% of power rating: l/hr, g/kwh

* 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
- Common rail fuel injection
- Fuel consumption 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  ☐ 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
☐ 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.

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.