

DIESEL GENERATOR SET

MTU 12V4000 DS1650

380V – 11 kV/50 Hz/Standby Power/Fuel Consumption Optimized
MTU 12V4000G23/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

// MTU Onsite Energy is a single-source supplier

// 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^①

// Engine

Manufacturer	MTU
Model	12V4000G23
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	ADEC (ECU 7)
Max power: kWm	1575
Air cleaner	Dry

// Fuel System

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

// Fuel Consumption^②

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

// 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: m ³ /s	1.8
Max. air intake restriction: mbar	50

// Cooling/Radiator System

Coolant flow rate (HT circuit): m ³ /h	56
Coolant flow rate (LT circuit): m ³ /h	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: m ³ /s	4.5
Maximum allowable back pressure: mbar	85
Minimum allowable back pressure: mbar	30

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

// System Ratings (kW/kVA)

Generator model	Voltage	Fuel consumption optimized 40°C/400m					
		without radiator			with mechanical radiator		
		kWel	kVA*	AMPS	kWel	kVA*	AMPS
Leroy Somer LSA52.3 S5	380 V	1424	1780	2704	1376	1720	2613
(Low voltage Leroy Somer standard)	400 V	1424	1780	2569	1376	1720	2483
	415 V	1424	1780	2476	1376	1720	2393
Marathon 743RSL7090	380 V	1392	1740	2644	1368	1710	2598
(Low voltage Marathon)	400 V	1368	1710	2468	1368	1710	2468
	415 V	1320	1650	2295	1320	1650	2295
Marathon 744RSL7091	380 V	1392	1740	2644	1368	1710	2598
(Low voltage Marathon oversized)	400 V	1368	1710	2468	1368	1710	2468
	415 V	1320	1650	2295	1320	1650	2295
n.a.	380 V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
(Low voltage Marathon engine output optimized)	400 V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	415 V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Marathon 1020FDH7095	11 kV	1416	1770	93	1368	1710	90
(Medium volt. marathon)							
Leroy Somer LSA53.2 VL6	11 kV	1416	1770	93	1376	1720	90
(Medium volt. Leroy Somer)							

* cos phi = 0,8

// 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

■ Represents standard features

□ Represents optional features

STANDARD AND OPTIONAL FEATURES, CONTINUATION

// 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)

// 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

STANDARD AND OPTIONAL FEATURES, CONTINUATION

// Fuel System

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> ■ Flexible fuel connectors mounted to base frame <input type="checkbox"/> Fuel filter with water separator <input type="checkbox"/> Fuel filter with water separator heavy-duty | <ul style="list-style-type: none"> <input type="checkbox"/> Switchable fuel filter with water separator <input type="checkbox"/> Switchable fuel filter with water separator heavy-duty <input type="checkbox"/> Seperate fuel cooler | <ul style="list-style-type: none"> <input type="checkbox"/> Fuel cooler integrated into cooling equipment |
|---|--|--|

// Starting/Charging System

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> ■ 24V starter | <ul style="list-style-type: none"> <input type="checkbox"/> Starter batteries, cables, rack, disconnect switch | <ul style="list-style-type: none"> <input type="checkbox"/> Battery charger |
|---|---|--|

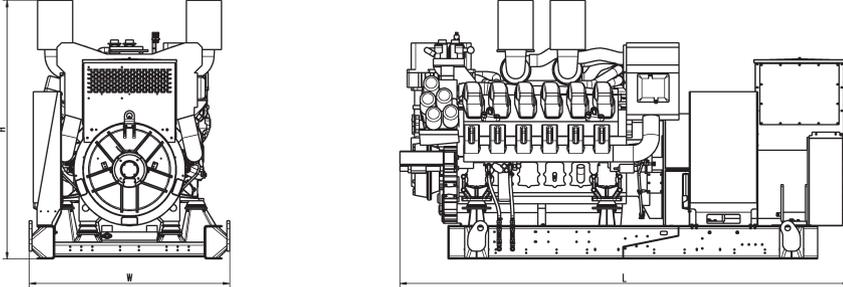
// Mounting System

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> ■ Welded base frame | <ul style="list-style-type: none"> ■ Resilient engine and generator mounting | <ul style="list-style-type: none"> ■ Modular base frame design |
|---|---|---|

// Exhaust System

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> Exhaust bellows with connection flange <input type="checkbox"/> Exhaust silencer with 10 dB(A) sound attenuation | <ul style="list-style-type: none"> <input type="checkbox"/> Exhaust silencer with 30 dB(A) sound attenuation <input type="checkbox"/> Exhaust silencer with 40 dB(A) sound attenuation | <ul style="list-style-type: none"> <input type="checkbox"/> Y-connection-pipe |
|--|--|--|

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.

System	Dimensions (LxWxH)	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 Onsite Energy distributor for sound data.

EMISSIONS DATA

// Consult your local MTU Onsite Energy 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: $\leq 85\%$. Operating hours/year: max. 500.

// Deration factor:

Altitude: Consult your local MTU Onsite Energy Power Generation distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation distributor for temperature derations.

Rated power is available up to 40°C and 400m above sea level.

Materials and specifications subject to change without notice.