

# DIESEL GENERATOR SET

## MTU 12V4000 DS1650

380V – 11 kV/50 Hz/Prime Power/NEA (ORDE) Optimized  
MTU 12V4000G14F/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: 1490 kVA - 1600 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

- NEA (ORDE) optimized

#### // Certifications

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

APPLICATION DATA<sup>①</sup>

## // Engine

Manufacturer	MTU
Model	12V4000G14F
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	1420
Air cleaner	Dry

## // Fuel System

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

// Fuel Consumption<sup>②</sup>

	l/hr	g/kwh
At 100% of power rating:	342.2	200
At 75% of power rating:	274.6	214
At 50% of power rating:	200.2	234

## // 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 <sup>3</sup> /s	1.8
Max. air intake restriction: mbar	50

## // Cooling/Radiator System

Coolant flow rate (HT circuit): m <sup>3</sup> /h	56
Coolant flow rate (LT circuit): m <sup>3</sup> /h	30
Heat rejection to coolant: kW	545
Heat radiated to charge air cooling: kW	260
Heat radiated to ambient: kW	75
Fan power for electr. radiator (40°C): kW	55

## // Exhaust System

Exhaust gas temp. (after turbocharger): °C	505
Exhaust gas volume: m <sup>3</sup> /s	4.9
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	NEA (ORDE) optimized					
		without radiator			with mechanical radiator		
		kWel	kVA*	AMPS	kWel	kVA*	AMPS
Leroy Somer LSA52.3 S5	380 V	1280	1600	2431	1216	1520	2309
(Low voltage	400 V	1280	1600	2309	1216	1520	2194
Leroy Somer standard)	415 V	1280	1600	2226	1216	1520	2115
Marathon 743RSL7090	380 V	1272	1590	2416	1224	1530	2325
(Low voltage Marathon)	400 V	1264	1580	2281	1224	1530	2208
	415 V	1192	1490	2073	1192	1490	2073
Marathon 744RSL7091	380 V	1272	1590	2416	1224	1530	2325
(Low voltage	400 V	1264	1580	2281	1224	1530	2208
Marathon oversized)	415 V	1192	1490	2073	1192	1490	2073
Marathon 1020FDH7095	11 kV	1264	1580	83	1216	1520	80
(Medium volt. marathon)							
Leroy Somer LSA53.2 VL6	11 kV	1272	1590	83	1216	1520	80
(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
- NEA (ORDE) 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  $\pm 10\%$
- 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

## STANDARD AND OPTIONAL FEATURES, CONTINUATION

### // Cooling System

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Jacket water pump        | <input type="checkbox"/> Mechanical radiator                |
| <input checked="" type="checkbox"/> Thermostat(s)            | <input type="checkbox"/> Electrical driven front-end cooler |
| <input checked="" type="checkbox"/> Water charge air cooling | <input type="checkbox"/> Jacket water heater                |

### // Control Panel

- |   |   |   |
|---|---|---|
| <input checked="" type="checkbox"/> Pre-wired control cabinet for easy application of customized controller (V1+)         | <input type="checkbox"/> Basler controller  | <input type="checkbox"/> Different expansion modules              |
| <input type="checkbox"/> Island operation (V2)  | <input type="checkbox"/> Deif controller  | <input type="checkbox"/> Remote annunciator                       |
| <input type="checkbox"/> Automatic mains failure operation with ATS (V3a)   | <input checked="" type="checkbox"/> Complete system metering                        | <input type="checkbox"/> Daytank control                          |
| <input type="checkbox"/> Automatic mains failure operation incl. control of generator and mains breaker (V3b)             | <input checked="" type="checkbox"/> Digital metering                                | <input type="checkbox"/> Generator winding temperature monitoring |
| <input type="checkbox"/> Island parallel operation of multiple gensets (V4)   | <input checked="" type="checkbox"/> Engine parameters                               | <input type="checkbox"/> Generator bearing temperature monitoring |
| <input type="checkbox"/> Automatic mains failure operation with short (< 10s) mains parallel overlap synchronization (V5) | <input checked="" type="checkbox"/> Generator Protection Functions                  | <input type="checkbox"/> Modbus TCP-IP                            |
| <input type="checkbox"/> Mains parallel operation of a single genset (V6)   | <input checked="" type="checkbox"/> Engine protection                               |   |
| <input type="checkbox"/> Mains parallel operation of multiple gensets (V7)  | <input checked="" type="checkbox"/> SAE J1939 engine ECU communications             |   |
|   | <input checked="" type="checkbox"/> Parametrization software                        |   |
|   | <input checked="" type="checkbox"/> Multilingual capability                         |   |
|   | <input checked="" type="checkbox"/> Multiple programmable contact inputs            |   |
|   | <input checked="" type="checkbox"/> Multiple contact outputs                        |   |
|   | <input checked="" type="checkbox"/> Event recording                                 |   |
|   | <input checked="" type="checkbox"/> IP 54 front panel rating with integrated gasket |   |

### // Power Panel

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Available in 600x600 and 600x1000 | <input type="checkbox"/> Supply for anti condensation heating             | <input type="checkbox"/> Supply electrical driven radiator from 45kW – 75kW (PP 600x1000) |
| <input type="checkbox"/> Phase monitoring relay 230V/400V  | <input type="checkbox"/> Plug socket cabinet for 230V compatible Euro/USA |   |
| <input type="checkbox"/> Supply for battery charger        |   |   |
| <input type="checkbox"/> Supply for jacket water heater    |   |   |

### // Circuit Breaker/Power Distribution

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> 3-pole circuit breaker | <input type="checkbox"/> Manual-actuated circuit breaker     | <input type="checkbox"/> Stand-alone solution in separate cabinet |
| <input type="checkbox"/> 4-pole circuit breaker | <input type="checkbox"/> Electrical-actuated circuit breaker |   |

## STANDARD AND OPTIONAL FEATURES, CONTINUATION

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### // Fuel System

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

### // Starting/Charging System

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

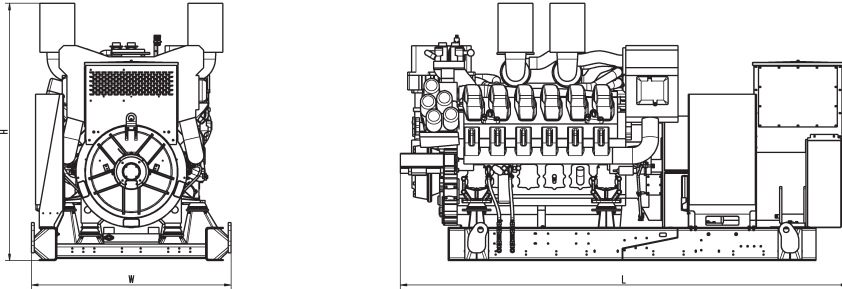
### // Mounting System

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

### // Exhaust System

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

## 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 (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 Onsite Energy distributor for sound data.

## EMISSIONS DATA

// Consult your local MTU Onsite Energy 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:  $\leq 75\%$ .

// Consult your local MTU Onsite Energy Power Generation Distributor for derating information.

Materials and specifications subject to change without notice.