

Diesel Generator Set

mtu 12V4000 DS1650

380V – 11 kV/50 Hz/grid stability power/ fuel consumption optimized/12V4000G14F/water charge air cooling





Optional equipment and finishing shown. Standard may vary.

Product highlights

Benefits

- Approved for renewable fuels (e.g. HVO)
- 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 EC 60034-1, ISO 8528-3; IEC 60044-1;
 Declaration of conformity; EN55011, group 1, cl. B
- NFPA 110*

Power rating

- System ratings: 1590 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
- 100% 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

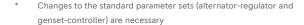
- Fuel consumption optimized

Certifications

- CE certification option
- Unit certificate acc. to VDE-AR-N 4110



Renew able



Application data 1)

Engine		Liquid capacity (lubrication)	
Manufacturer	mtu	Total oil system capacity: l	260
Model	12V4000G14F	Engine jacket water capacity: l	160
Туре	4-cycle	Intercooler coolant capacity: I	40
Arrangement	12V		
Displacement: l	57.2	Combustion air requirements	
Bore: mm	170	Combustion air volume: m³/s	1.6
Stroke: mm	210	Max. air intake restriction: mbar	50
Compression ratio	16.4		
Rated speed: rpm	1500	Cooling/radiator system	
Engine governor	ECU 9	Coolant flow rate (HT circuit): m ³ /hr	56
Max power: kWm	1420	Coolant flow rate (LT circuit): m³/hr	30
Air cleaner	dry	Heat rejection to coolant: kW	540
		Heat radiated to charge air cooling: kW	200
Fuel system		Heat radiated to ambient: kW	75
Fuel specification	EN 590, Grade No.1-D/2-D (ASTM D975-00),	Fan power for electr. radiator (40°C): kW	38
	EN 15940 (e.g. HVO)		
Maximum fuel lift: m	5	Exhaust system	
Total fuel flow: I/min	16	Exhaust gas temp. (after turbocharger): °C	430
		Exhaust gas volume: m³/s	4.0
Fuel consumption 2)	l/hr g/kwh	Maximum allowable back pressure: mbar	85
At 100% of power rating:	323.3 189	Minimum allowable back pressure: mbar	30
At 75% of power rating:	250.2 195		
At 50% of power rating:	173.7 203		

Standard and optional features

System ratings (kW/kVA)

Generator model	Voltage	Fuel consumption optimized					
		without radiator			with mechanical	radiator	
		kWel	kVA*	AMPS	kWel	kVA*	AMPS
Leroy Somer LSA52.3 S5 (Low voltage Leroy Somer standard)	380 V	1280	1600	2431	1240	1550	2355
	400 V	1280	1600	2309	1240	1550	2237
	415 V	1280	1600	2226	1240	1550	2156
Leroy Somer LSA53.2 VL6 (Medium volt. Leroy Somer)	11 kV	1272	1590	83	1240	1550	81

^{*} cos phi = 0.8

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 with improved oil seperator
- Governor-electronic isochronous
- Common rail fuel injection
- Fuel consumption optimized engine
- Centrifugal oil filter

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 EN 55011, 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, AS 1359 and ISO 8528-3 requirements
- Leroy Somer low voltage generator
- ☐ Oversized generator
- ☐ Medium voltage generator

Oil system

☐ Automatic oil refilling system

☐ Extended test run kit (including pre-lubrication pump)

Cooling system

- Jacket water pump
- Thermostat(s)
- Water charge air cooling
- ☐ Mechanical radiator
- ☐ Electrical driven front-end cooler
- $\hfill\Box$ Jacket water heater

- ☐ Jacket water heater with plate heat exchanger
- \Box Pulley for fan drive

Control panel

- Unit cabling with coded plugs for easy connection of customer-specific controls (VO)
- ☐ 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
- $\ \square$ Different expansion modules
- ☐ Remote annunciator
- ☐ Daytank control
- ☐ Generator winding temperature monitoring
- ☐ Generator bearing temperature monitoring
- ☐ Modbus TCP-IP

- Represents standard features
- ☐ Represents optional features

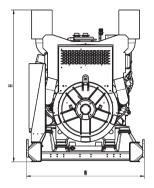
Standard and optional features

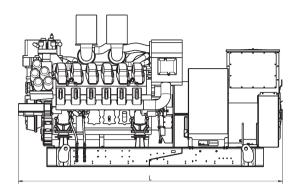
Connectivity

transfers engine data to the manufacturer from time to time. The data is used by the	development and improvement as well as service optimization.	https://mtu-go.com and also gain insight int the data.	
Power panel			
□ Supply electrical driven radiator from 45kW – 75kW			
Circuit breaker/power distribution			
☐ 3-pole circuit breaker ☐ 4-pole circuit breaker	☐ Electrical-actuated circuit breaker	☐ Base frame mounted GCB, pre-wired with generator, ready for commissioning	
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 Seperate fuel cooler 	☐ Fuel cooler integrated into cooling equipment	
Starting/charging system			
24V starterRedundant starting system	☐ Starter batteries, cables, rack, disconnect switch (lockable)	☐ Battery charger ☐ Alternator	
Mounting system			
Welded base frameResilient engine and generator mounting	 Modular base frame design Base frame mounting on foundation/base plate with using clamping brackets 	□ Spring mounts with 95% degree of isolation	
Exhaust system			
Exhaust bellows with connection flangeExhaust silencer with10 dB(A) sound attenuation	☐ Exhaust silencer with 30 dB(A) sound attenuation	□ Exhaust silencer with40 dB(A) sound attenuation□ Y-connection-pipe	

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- ☐ 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.

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* distributor for sound data.

Emissions data

- Consult your local *mtu* distributor for emissions data.

Rating definitions and conditions

- Grid stability power ratings apply to installations serving electric utility programs. At constant or varying load, the number of generator set operating hours is limited to 1000 hours per year with no more than 500 hours per year at 100% load without interruption. 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: ≤ 100%.
- Consult your local *mtu* distributor for derating information.