

## Diesel Generator Set

# mtu 12V4000 DS2000

380V – 11 kV/50 Hz/data center continuous power/ fuel consumption optimized/12V4000G24F/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: 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
- 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	12V4000G24F	Engine jacket water capacity: l	160
Туре	4-cycle	Intercooler coolant capacity: I	40
Arrangement	12V		
Displacement: I	57.2	Combustion air requirements	
Bore: mm	170	170 Combustion air volume: m³/s	
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): m³/hr	56
Max power: kWm	1575	Coolant flow rate (LT circuit): m³/hr	30
Air cleaner	dry	Heat rejection to coolant: kW	580
		Heat radiated to charge air cooling: kW	260
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	440
		Exhaust gas volume: m³/s	4.5
Fuel consumption 2)	l/hr g/kwh	Maximum allowable back pressure: mbar	85
At 100% of power rating:	364.3 192	Minimum allowable back pressure: mbar	30
At 75% of power rating:	274.7 193		
At 50% of power rating:	189.8 200		

## 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 S6 (Low voltage Leroy Somer standard)	380 V	1504	1880	2856	1472	1840	2796
	400 V	1504	1880	2714	1472	1840	2656
	415 V	1504	1880	2615	1472	1840	2560
Leroy Somer LSA53.2 VL7 (Medium volt. Leroy Somer)	11 kV	1504	1880	99	1472	1840	97

<sup>\*</sup> 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).

<sup>2</sup> 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

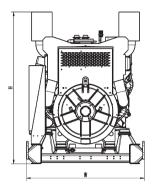
# Standard and optional features

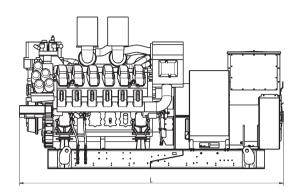
## Connectivity

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 intithe 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			
<ul> <li>Flexible fuel connectors mounted to base frame</li> <li>Fuel filter with water separator</li> <li>Fuel filter with water separator heavy-duty</li> </ul>	<ul> <li>Switchable fuel filter with water separator</li> <li>Switchable fuel filter with water separator heavy-duty</li> <li>Seperate fuel cooler</li> </ul>	☐ Fuel cooler integrated into cooling equipment	
Starting/charging system			
<ul><li>24V starter</li><li>Redundant starting system</li></ul>	☐ Starter batteries, cables, rack, disconnect switch (lockable)	☐ Battery charger ☐ Alternator	
Mounting system			
<ul><li>Welded base frame</li><li>Resilient engine and generator mounting</li></ul>	<ul> <li>Modular base frame design</li> <li>Base frame mounting on foundation/base plate with using clamping brackets</li> </ul>	□ Spring mounts with 95% degree of isolation	
Exhaust system			
<ul><li>Exhaust bellows with connection flange</li><li>Exhaust silencer with</li><li>10 dB(A) sound attenuation</li></ul>	☐ Exhaust silencer with 30 dB(A) sound attenuation	<ul><li>□ Exhaust silencer with</li><li>40 dB(A) sound attenuation</li><li>□ Y-connection-pipe</li></ul>	

- 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.

System	Dimensions (LxWxH)	Weight (dry/less tank)
Open power unit (OPU)	4059 x 1810 x 2330 mm	10949 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

- Data center continuous power ratings (DCP) apply to data center installations where a reliable utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or 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: ≤ 100%.
- Consult your local *mtu* distributor for derating information.