

Diesel Generator Set

mtu 16V2000 DS1000

380V - 415V/50 Hz/prime power/fuel consumption optimized/ NOx emission optimized/16V2000G16F





Optional equipment and finishing shown. Standard may vary.

Product highlights

Renefits

- Low fuel consumption
- Optimized system integration ability
- High reliability and availability of power
- Long maintenance intervals
- Optimized ratio between size and power
- Wide operating range without derating

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 G3 according to ISO 8528
- Generator meets NEMA MG1, BS5000, ISO, DIN EN and IEC standards
- NFPA 110

Power rating

- System rating: 910 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 for prime power applications
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

Complete range of accessories available

- Control panel
- Power panel
- Fuel system
- Fuel connections with shut-off valve mounted to base frame
- Starting/charging system
- Exhaust system
- Mechanical radiator
- Water Charge-Air-Cooler
- Oversized voltage alternators

Cooling System

- Air-to-Air Charge-Air Cooling (TD)
- Water-to-Air Charge-Air Cooling (TB)

Emissions

- Fuel consumption optimized
- NOx emission optimized, Tier 2 compliant and NEA (ORDE) optimization optionally available

Certifications

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



Application data 1)

Engine	Fuel consump. opt.	Emission opt. 2)	Cooling/radiator system TD/TB Fuel consump. opt	Emission opt. 2)
Manufacturer	mtu	mtu	Coolant flow rate (HT circuit): m³/hr 41.6	41.6
Model	16V2000G16F	16V2000G16F	Coolant flow rate (LT circuit for TB): m ³ /hr 17.5	17.5
Туре	4-cycle	4-cycle	Heat radiated to charge air cooling (TB):	
Arrangement	16V	16V	kW (NOx) 115	170
Displacement: l	35.7	35.7	Input pressure customer radiator (TB): bar (rel.) 1.4	1.4
Bore: mm	135	135	Max. pressure loss customer radiator (TB): bar 0.7	0.7
Stroke: mm	156	156	Heat dissipated by engine coolant: kW (NOx) 340	325
Compression ratio	17.5	17.5	Heat radiated to ambient: kW 40	40
Rated speed: rpm	1500	1500	Air flow required for mech. radiator (40°C)	
Engine governor	ADEC	ADEC	cooled unit: m³/min 1462	1462
Speed regulation	± 0.25%	± 0.25%	Air flow required for mech. radiator (50°C)	
Max power: kWm	806	806	cooled unit: m³/min 1462	1462
Mean effective pressure: bar	18.1	18.1	Engine coolant capacity	
Air cleaner	dry	dry	(without cooling equipment): l 70	70
			Radiator coolant capacity (40°C): l 74	74
Fuel system			Radiator coolant capacity (50°C): l 106	106
Maximum fuel lift: m	5	5	Max. coolant temperature (warning): °C 102	102
Total fuel flow: I/min	30	30	Max. coolant temperature (shutdown): °C 105	105
Fuel consumption 3)			Exhaust system	
At 100% of power rating: I/hr	g/kWh 186/192	196/202	Exhaust gas temp. (after turbocharger): °C 540	520
At 75% of power rating: I/hr	g/kWh 142/195	150/206	Exhaust gas volume: m³/s 2.5	2.85
At 50% of power rating: I/hr	g/kWh 99/204	104/214	Maximum allowable back pressure: mbar 50	50
			Minimum allowable back pressure: mbar 30	30
Lube oil system				
Total oil system capacity: l	102	102	Generator	
Max. lube oil temp. (alarm): °C	103	103	Protection class IP23	IP23
Max. lube oil temp. (shutdown):	°C 105	105	Insulation class	Н
Min. lube oil pressure (alarm): b	oar 4.5	4.5	Voltage regulation (steady state) ± 0.25%	± 0.25%
Min. lube oil pressure (shutdow	n): bar 4	4	Rado interference class	N
Combustion air requirements				
Combustion air volume: m³/s	0.93	1.10		
Max. air intake restriction: mba	r 40	40		

All data refers only to the engine and is based on ISO standard conditions (25°C and 100m above sea level).

 $^{2\}qquad \hbox{Emission optimized data refer to NOx emission optimized and NEA (ORDE) optimized/Tier~2~compliant~engines.}$

³ 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	with mechanical radiator (TD) or charge-air-cooler (TB)**		
		kWel	kVA*	AMPS
Leroy Somer LSA 49.3 L10 (Low voltage Leroy Somer standard)	380 V	728	910	1383
	400 V	728	910	1313
	415 V	728	910	1266
Leroy Somer LSA 50.2 M6 (Low voltage Leroy Somer oversized)	380 V	728	910	1383
	400 V	728	910	1313
	415 V	728	910	1266
Marathon 740RSL7183	380 V	728	910	1383
(Low voltage Marathon standard)	400 V	728	910	1313
	415 V	728	910	1266
Marathon 742RSL7185 (Low voltage Marathon oversized)	380 V	728	910	1383
	400 V	728	910	1313
	415 V	728	910	1266

^{*} cos phi = 0.8

Electrical outputs may vary depending on generator voltage and ambient conditions. For power outputs consult your *mtu* dealer. Intake air depression/mbar: 15mbar

Exhaust back pressure/mbar: 30mbar

Engine

- 4-cycle
- Standard single stage air filter
- Oil drain extension & shut-off valve
- Full flow oil filters
- Closed crankcase ventilation
- ADEC electronic isochronous engine governor
- Common rail fuel injection
- Dry exhaust manifold
- Electric starting motor (24V)
- Fuel consumption optimized engine
- $\hfill\square$ NOx emission optimized engine
- ☐ Tier 2 optimized engine
- □ NEA (ORDE) optimized engine

Generator

- Leroy Somer low voltage generator
- Meets NEMA MG1, BS5000, IEC 60034-1,
 VDE 0530, DIN EN 12601, AS1359
 and ISO 8528-3 requirements
- Superior voltage waveform
- Solid state, volts-per-Hertz regulator
- 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 IP 23
- less than 5% harmonic distorsion
- 2/3 pitch stator windings
- No load to full load regulation
- ± 0.25% voltage regulation no load to full load
- Insulation class H, utilization acc. to H
- Radio suppression EN55011, group 1, cl. B
- Short circuit capability 3xln for 10sec

- Sustained short circuit current of up to 300% of the rated current for up to 10 seconds (Leroy Somer generator)
- Winding and bearing RTDs (without monitoring)
- Excitation by AREP + PMI
- Mounting of CT's: 3x 2 core CT's
- Voltage setpoint adjustment ±10V
- ☐ Sustained short circuit current of up to 250% of the rated current for up to 10 seconds (Marathon generator)
- ☐ Marathon low voltage generator
- □ Oversized generator

^{**} BE, fuel optimized: max. power available up to: open power unit 40°C/400m; NOx emission optimized, EPA Tier 2 compl., NEA: standard operating conditions/open power unit 25°C/100m

Standard and optional features

Cooling system

Δir-to-Δir	Charae-Air-Coolina	TD
AII -LO-AII	Charge-Air-Coolling	ID

Represents standard featuresRepresents optional features

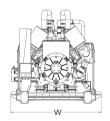
Mechanical radiatorJacket water pump	Expansion tankFan	■ Thermostat(s)□ Jacket water heater
Water-to-Air Charge-Air-Cooling TB		
Coolant pumpManifold with thermostatic valves	■ WCAC-base frame with safety covers	☐ HT-piping with flexible engine connectio
Control panel		
■ Pre-wired control cabinet for 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- and bearing temperature monitoring □ Differential protection with multi-function protection relay □ Modbus TCP-IP
Power panel		
□ Available in 600x600□ Phase monitoring relay 230V/400V	☐ Supply for battery charger☐ Supply for jacket water heater	 Plug socket cabinet for 230V compatible Euro
Fuel system		
■ Flexible fuel connectors mounted to base frame	☐ Fuel filter with water separator ☐ Switchable fuel filter with water separator	☐ Fuel cooler (for TD-only)
Starting/charging system		
■ 24V starter	 Starter batteries, cables, rack, disconnect switch 	☐ Battery charger ☐ Redundant starter 2x 7.5KW
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 with40 dB(A) sound attenuationY-connection-pipe

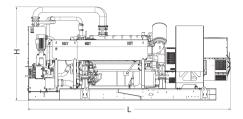
Weights and dimensions

Air-to-Air Charge-Air Cooling (TD)

T L

Water-to-Air Charge-Air Cooling (TB)





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 (incl. engine-oil and coolant)
Open power unit (OPU) Air-to-Air (TD)	4440 x 1990 x 2200 mm	6500 kg
Open power unit (OPU) Water-to-Air (TB)	4447 x 1988 x 2046 mm	6100 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

- 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%. Operating hours/year: unlimited
- Consult your local *mtu* distributor for derating information.