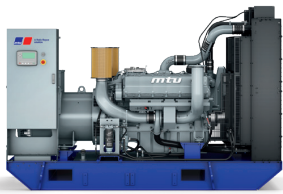




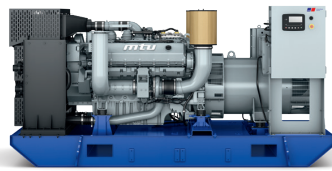
Diesel Generator Set

mtu 12V1600 DS1000

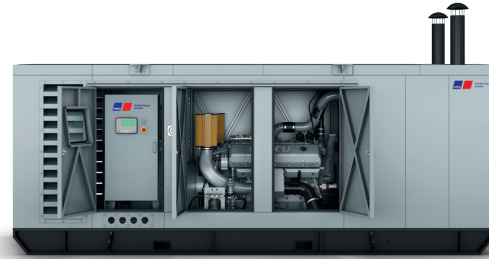
380 - 415 V/900 kVA/50 Hz/data center continuous power/12V1600G31F



Open Power Unit A2A (TD)



Open Power Unit W2A (TB)



Enclosed Power Unit



Optional equipment shown. Standard equipment may vary.

Product highlights

Benefits

- Approved for renewal fuels (e.g. HVO)
- Industry-leading average load factor
- Low fuel consumption
- Emissions optimizations available
- High availability and reliability
- High load acceptance
- Long maintenance intervals
- Best-in-class low load capability

Support

- Global product support offered
- Attractive overhaul solutions

Standards

- Engine-generator set is designed and manufactured in facilities certified to ISO 2008:9001
- Generator set complies to ISO 8528 and fullfills performance level G3
- Generator meets BS5000, ISO, DIN EN and IEC standards

Available emissions optimizations

- Fuel consumption optimized
- EPA Nonroad T2 compliant
- NEA Singapore for Off Road Diesel Engines (ORDE)

Wide standard scope of supply

- 4P circuit breaker
- Island operation control panel
- Battery charger

Complete range of accessories available

- Sound attenuated enclosures
- Fuel system accessories
- AMF/parallel operation control panel
- Range of additional electrical options
- Radiator for hot ambient condition
- VDE certification

Warranty

- Standard 36 months warranty after shipment

Cooling system

- Air-to-air charge air cooling - A2A (TD)
- Water-to-air charge-air cooling - W2A (TB)

For a comprehensive listing of features, please refer to standard and optional features beginning on page 2.



A Rolls-Royce solution

Application data ^{a)}

Engine

Manufacturer	mtu
Model	12V1600G31F
Type	4-cycle
Arrangement	12V
Displacement: l	22.44
Bore: mm	126
Stroke: mm	150
Compression ratio	15.89
Rated rpm	1,500
Engine governor	ECU 9
Gross power: kWm	815
Air cleaner	dry

Fuel specification

EN 590, Grade No.1-D/2-D (ASTM D975-00), EN 15940 (e.g. HVO)

Fuel system

Max. fuel flow: l/hr	336
Fuel tank capacity: OPU (EPU) in l	800 (950)
Autonomy: OPU (EPU) h calculated @100% load	4.7 (5.6)

Fuel consumption

At 100% of power rating:	l/h	170.7
At 75% of power rating:		130
At 50% of power rating:		90.3

Liquid capacity

Total oil system: l	72.5
Total coolant capacity: l	65

Generator

Generator brand	Leroy Somer
Generator type	LSA 49.3 L10
Insulation class	H-class
Bearing	single bearing
Enclosure	IP23
Voltage regulation	digital (D350)
Exciting system	self-excited, brushless (AREP)

Electrical

Electric system volts DC	24
Number of batteries (optional)	2
Capacity: Ah	100 AH, 12 VDC

Air requirements ^{b)}

Aspirating: m ³ /min	56.4
Max. air intake restriction: mbar	30

Exhaust system ^{b)}

Gas temp. (stack): °C	483
Gas volume at stack temp.: m ³ /min	133.2
Maximum allowable back pressure: kPa	8.5

Cooling/radiator system

Ambient capacity of radiator: OPU (EPU) in °C	40 (35)
Pressure on rad. exhaust: kPa	0.2
Heat rejection to coolant: kW	280
Heat rejection to charge air: kW	185
Coolant flow rate (HT circuit): m ³ /hr	26
Coolant flow rate (LT circuit for TB): m ³ /hr	28.8
Heat radiated to charge air cooling (TB): kW	185
Input pressure customer radiator (TB): bar (rel.)	1.4
Max. pressure loss customer radiator (TB): bar	0.7
Heat dissipated by engine coolant: kW	280
Heat radiated to ambient: kW	40
Air flow required for mech. radiator (40°C) cooled unit: m ³ /min	18.7
Engine coolant capacity (without cooling equipment): l	65
Radiator coolant capacity (TD) (40°C): l	58
Radiator coolant capacity (LT circuit for TB): l	23
Max. coolant temperature (warning): °C	102
Max. coolant temperature (shutdown): °C	105

a Technical data is for a fuel-optimized unit.

b Technical data is for 100% power

Standard and optional features

System ratings (kW/kVA)

Generator model	Voltage	mtu 12V1600 DS1000 - data center continuous operation		
		kW ¹	kVA ²	AMPS
Leroy Somer LSA 49.3 L10 (Low voltage Leroy Somer standard) ³	380 V	720	900	1367
	400 V	720	900	1299
	415 V	720	900	1252
Leroy Somer LSA 50.2 M6 (Low voltage Leroy Somer oversized - VDE) ⁴	380 V	720	900	1367
	400 V	720	900	1299
	415 V	720	900	1252

1 cos phi = 1,0

3 with D350 voltage regulator

2 cos phi = 0.8

4 with D550 voltage regulator

Standard and optional features

Engine

- mtu** Series 1600 diesel engine
- Battery charge alternator
- Coolant circulation pump
- Engine mounted fan drive

Alternator

- Premium high efficiency alternator
- 3-Phase, single bearing, synchronous, brushless, self regulating, self ventilating, self exciting (AREP)
- Digital voltage regulation (DVR)
- Insulation class: H
- Protection class: IP 23
- Low voltage 400V
- Low voltage 380V
- Low voltage 415V
- Anti-condensation heater
- Oversized alternator (only for VDE option in OPU)

Cooling system

Air-to-air charge air cooling - A2A (TD):

- Base frame mounted front-type radiator for jacket water and charge air cooling
- Integrated air-to-air charge air cooling unit (A2A)
- Low coolant level sensor
- Integrated expansion tank
- Duct flange

Water-to-air charge air cooling - W2A (TB):

- Coolant pump
- Manifold with thermostatic valves
- Integrated water-to-air heat exchanger on base frame with safety covers
- HT-piping with flexible engine connection

Genset controller & control panel

- Control panel with measurement devices and genset controller (A-side)
- Genset controller for island operation
- Genset controller for island parallel operation
- Genset controller for mains parallel operation
- Modbus RTU-TCP Gateway/Ethernet or bus system
- Without genset controller (only for OPU)

Standard and optional features

Circuit breaker

- 4 pole circuit breaker, motorized with controller (inside power panel)
- Without circuit breaker (only for VDE option in OPU)

Starting and charging system

- 1 x 24V electrical starter
- Electric battery charger (inside control panel)
- Starting batteries with battery rack, battery disconnect and cabling
- Jacket water preheating system

Fuel system

- Common rail fuel injection system
- Fuel main filter
- Standard engine interface
- Heavy duty fuel prefilter with water separator
- Fuel cooler radiator mounted
- Removable fuel tank (only for OPU)

Oil system

- Oil dip stick
- Oil drain
- Pre-filled with premium engine oil
- Lube oil extraction handpump

Air intake system

- Exhaust turbochargers
- Standard dry type air filters
- Charge air intercooler
- Air intake pipework
- Heavy-duty two stage air filters with mechanic dust evacuation

Exhaust system (OPU)

- Standard engine interface
- Exhaust elbows
- Exhaust bellows
- Exhaust silencers 10 db(A)
- Exhaust silencers 30 db(A)
- Exhaust silencers 40 db(A)

Base frame (OPU)

- Resilient mounting for engine and alternator
- Lifting lugs
- Forklift pockets
- Fits in 20" ISO high cube container
- Integrated spill-proof design

Enclosure (EPU) - optional

- Protection class: IP23
- Forklift pockets
- Fits in 20" ISO high cube container
- Integrated fuel tank
- Integrated spill-proof design
- Control panel with genset controller (A-side)
- Power panel including circuit breaker (B-side)
- Basic sound attenuation "Silent" 78 dB(A)
- Integrated exhaust system with silencers inside the enclosure
- Advanced sound attenuation "Super-Silent" 70dB(A)

- Represents standard features
- Represents optional features

Standard and optional features

Certificates & documentation

- CE certificate
- Maintenance schedule, fluids & lubricants specification, genset & components manuals
- VDE-AR-4110 German Grid Code compliance (only for OPU, no circuit breaker)

Packing

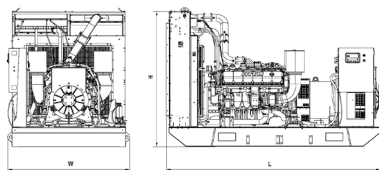
- Standard packing
- Long term/seaworthy packing

Accessories

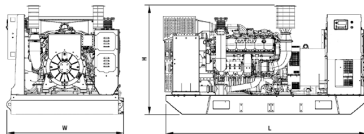
- Spare parts package

- Represents standard features
- Represents optional features

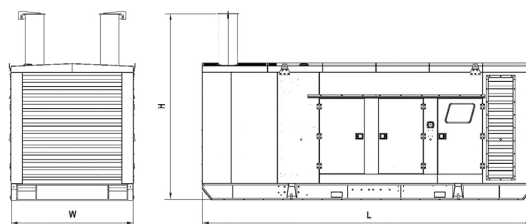
Weights and dimensions



Open Power Unit A2A (TD)



Open Power Unit W2A (TB)



Enclosed Power Unit

Outline drawing above is for reference only. Do not use for installation design. For unit-specific template drawings, please see our website.

System	Dimensions (LxWxH)	Weight (wet/with standard accessories)
Open power unit (OPU) (A2A/TD)	3670 x 2095 x 2525 mm	5700 kg
Open power unit (OPU) (W2A/TB)	3625 x 2115 x 1960 mm	5450 kg
Enclosed power unit (EPU) without tail pipe	5900 x 2210 x 2530 mm	7620 kg
Enclosed power unit (EPU) with tail pipe*	5900 x 2210 x 3500 mm	7820 kg

Consult the factory for accurate weights and dimensions for your specific engine-generator set. Lengths may vary with other voltages. Do not use for installation design.

* Tail pipe will be supplied loose

Sound data

Unit type	Prime 75% load
Open power unit (dB(A) at 1m)	112
Enclosed power unit (dB(A) at 7m)	77,7

Sound data is provided at 7 m (23 ft).

Rating definitions and conditions

- Data center continuous power (DCP) ratings 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: $\leq 100\%$
- Consult your local **mtu** distributor for derating information. Materials and specifications subject to change without notice.