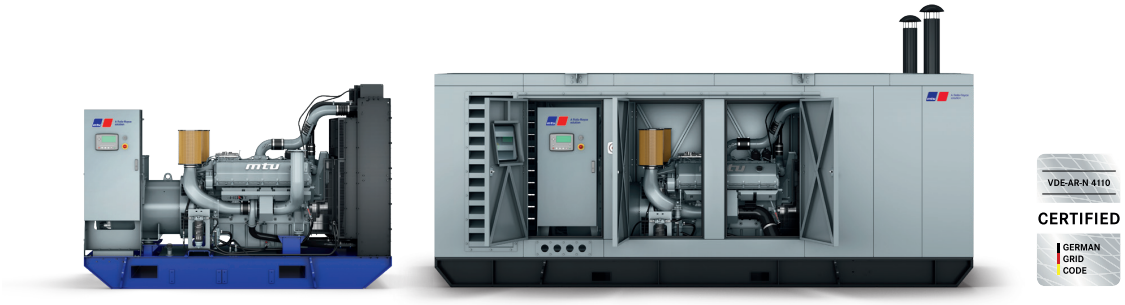
Diesel Generator Set

mtu 12V1600 DS650

380 - 415 V/590 kVA/50 Hz/data center continuous power/12V1600G10F



Optional equipment shown. Standard equipment may vary.

Product highlights

Benefits
- Approved for renewable fuels (e.g. HVO)
- Industry-leading average load factor
- Low fuel consumption
- Emission 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 standards ISO 2008:9001
- Generator set complies to ISO 8528 and fullfills performance level G3
- Generator meets BS 5000, ISO, DIN EN and IEC standards
- NFPA 110

Available emissions optimizations
- Fuel consumption optimized
- NEA Singapore for Off Road Diesel Engines (ORDE)
- NOx optimized

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 electronical options
- Radiator for hot ambient condition
- VDE certification

Warranty
- Standard 36 months warranty after shipment

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

A Rolls-Royce solution

Application data [1)]

Engine

Manufacturer	***mtu***
Model	12V1600G10F
Type	4-cycle
Arrangement	12V
Displacement: l	21
Bore: mm	122
Stroke: mm	150
Compression ratio	17.5
Rated: rpm	1,500
Engine governor	ECU 8
Gross power: kWm	524
Air cleaner	dry

Fuel system

Fuel specification:	EN 590, Grade No.1-D/2-D (ASTM D975-00), EN 15940 (e.g. HVO)
Max. fuel flow: l/h	342
Fuel tank capacity: OPU (EPU) in l	470 (800)
Autonomy: OPU (EPU) h calculated @100% load	3.9 (6.6)

Fuel consumption [2)]

At 100% of power rating: l/h / g/kWh	121.2 / 192
At 75% of power rating: l/h / g/kWh	94.2 / 199
At 50% of power rating: l/h / g/kWh	65.3 / 207

Liquid capacity

Total oil system: l	72.5
Total coolant capacity: l	99

Generator

Generator brand	Leroy Somer
Generator type	LSA 47.3 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

Aspirating: m³/min	36
Max. air intake restriction: mbar	30

Exhaust system

Gas temp. (stack): °C	482
Gas volume at stack temp.: m³/min	90
Maximum allowable back pressure: kPa	8.5

Cooling/radiator system

Ambient capacity of radiator: OPU (EPU) in °C	50 (50)
Pressure on rad. exhaust: kPa	0.2
Heat rejection to coolant: kW	236
Cooling air flow: m³/s	11.7

Standard and optional features

System ratings (kW/kVA)

Generator model	Voltage	***mtu*** 12V1600 DS650 - data center continous operation		
		kWel[1]	kVA[2]	AMPS
Leroy Somer LSA 47.3 L10 (Low voltage Leroy Somer standard)[3]	380 V	472	590	896
	400 V	472	590	852
	415 V	472	590	821
Leroy Somer LSA 49.3 M8 (Low voltage Leroy Somer oversized - VDE)[4]	380 V	472	590	896
	400 V	472	590	852
	415 V	472	590	821

1 cos phi = 1,0
2 cos phi = 0.8
3 with D350 voltage regulator
4 with D550 voltage regulator

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

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-condesation heater
- □ Oversized alternator (only for VDE option in OPU)

Cooling system

- ■ 50°C base frame monunted 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

Genset controller & control panel

- ■ Control panel with measurement devices and genset controller (B-Side)
- ■ Genset controller for island operation
- □ Control panel with measurement devices and genset controller (A-Side, only for OPU)
- □ 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)

Circuit breaker

- ■ 4 pole circuit breaker, motorized with controller (inside control 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 disconnector and cabling
- □ Jacket water preheating system
- □ Redundant starting system (2x 24V electric starters, 2x starting battery sets, 2x electric battery charger)

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

■ Represents standard features
□ Represents optional features

Standard and optional features

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 standard 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 (B-Side)
- ■ Circuit breaker (integrated in control panel, B-Side)
- ■ Basic sound attenuation “Silent” 77 db(A)
- ■ Integrated exhaust system with silencers inside the enclosure
- ☐ Advanced sound attenuation “Super-Silent” 70db(A)

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

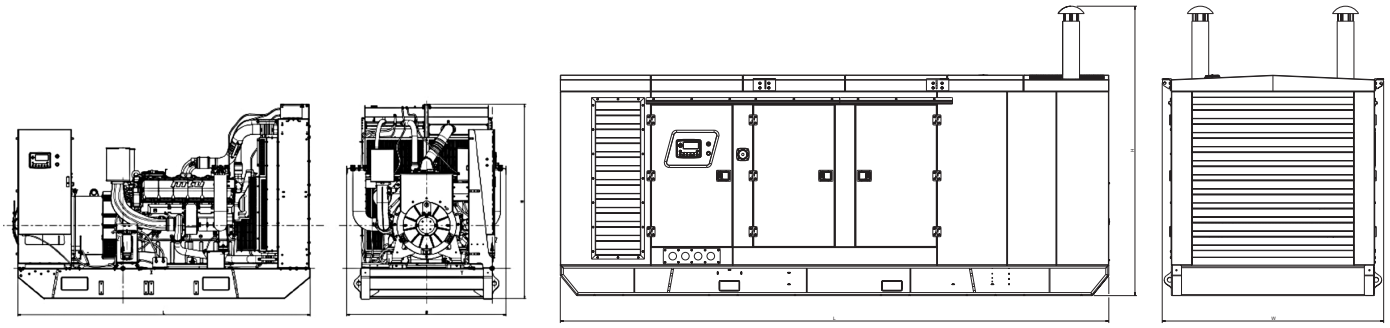
- ■ Standard seaworthy packing

Accessories

- ☐ Spare parts package

■ Represents standard features
☐ Represents optional features

Weights and dimensions



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)	3360 x 1645 x 2230 mm	5340 kg
Enclosed power unit (EPU) without tail pipe	5400 x 2140 x 2175 mm	8125 kg
Enclosed power unit (EPU) with tail pipe*	5400 x 2140 x 2760 mm	8155 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)	109
Enclosed power unit (dB(A) at 7m)	77

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: ≤ 100%.
- Consult your local ***mtu*** distributor for derating information.

Materials and specifications subject to change without notice.

Subject to change. | 16120975 | Edition 01/25 | BMC 2025-04.