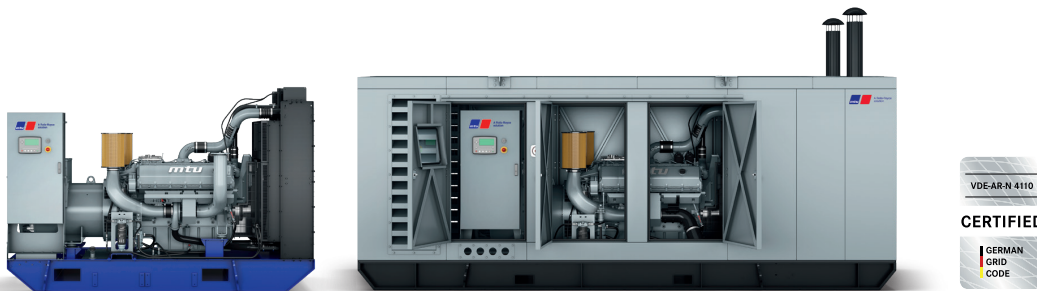




## Diesel Generator Set

# mtu 12V1600 DS650

380 - 415 V/650 kVA/50 Hz/standby power/12V1600G70F



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 fulfills 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)

### 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 <sup>1)</sup>

### Engine

Manufacturer	<b>mtu</b>
Model	12V1600G70F
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	576
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	3.5 ( 6.0)

### Fuel consumption <sup>2)</sup>

At 100% of power rating: l/h / g/kWh	133.2 / 192
At 75% of power rating: l/h / g/kWh	102.5 / 197
At 50% of power rating: l/h / g/kWh	71.5 / 206

### 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	48
Max. air intake restriction: mbar	30

### Exhaust system

Gas temp. (stack): °C	484
Gas volume at stack temp.: m³/min	126
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 - standby operation		
		kWel <sup>1</sup>	kVA <sup>2</sup>	AMPS
Leroy Somer LSA 47.3 L10 (Low voltage Leroy Somer standard) <sup>3</sup>	380 V	520	650	988
	400 V	520	650	938
	415 V	520	650	904
Leroy Somer LSA 49.3 M8 (Low voltage Leroy Somer oversized - VDE) <sup>4</sup>	380 V	520	650	988
	400 V	520	650	938
	415 V	520	650	904

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-condensation heater
- ☐ Oversized alternator (only for VDE option in OPU)

### Cooling system

- 50°C 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

### 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 disconnecter 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

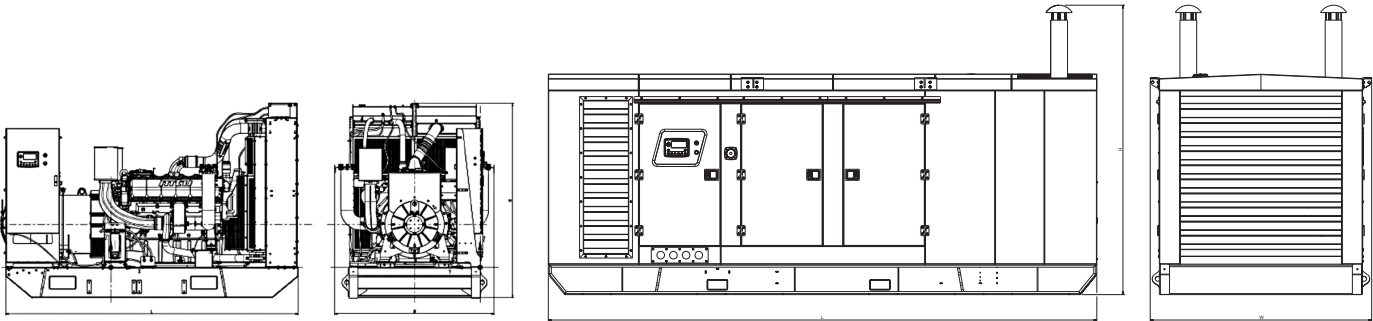
- Standard seaworthy packing

### 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

- Standby power ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514, AS 2789 and DIN 6271.  
Average load factor: < 85%, max. 500h/year.
- Consult your local **mtu** distributor for derating information.

Materials and specifications subject to change without notice.