



## Diesel Generator Set

# mtu 12V4000 DS1750 50 °C

1,600 kWe/60 Hz/Data Center Continuous Power/380 - 13,800V

Reference: **mtu** 12V4000 DS1750 (1,750 kWe) 50 °C for Standby Rating Technical Data

### System ratings

Voltage (L-L)	380V † ‡	416V † ‡	440V † ‡	480V † ‡	600V ‡	4,160V	12,470V
Phase	3	3	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60	60
kW	1,590	1,590	1,590	1,590	1,590	1,585	1,585
kVA	1,985	1,985	1,985	1,985	1,985	1,979	1,979
Amps	3,020	2,758	2,608	2,391	1,913	275	92
skVA@30% voltage dip	3,284	2,649	2,964	3,029	3,346	4,303	2,692
Generator model*	641-M60	641-M60	641-M60	641-S55	641-M60	641-VL75	4P6.6-2300
Temp rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE

Voltage (L-L)	13,200V	13,800V
Phase	3	3
PF	0.8	0.8
Hz	60	60
kW	1,575	1,575
kVA	1,966	1,966
Amps	86	82
skVA@30% voltage dip	3,017	3,297
Generator model*	4P6.6-2300	4P6.6-2300
Temp rise	130 °C/40 °C	130 °C/40 °C
Connection	6 LEAD WYE	6 LEAD WYE

\* Consult the factory for alternate configuration. Generator model may end with -M or -R, depending on selection.

† UL 2200 offered

‡ CSA offered

## Certifications and standards

- Emissions
  - EPA Tier 2 certified
- Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:200
- UL 2200 - optional (refer to *System ratings* for availability)
- CSA - optional (refer to *System ratings* for availability)
  - CSA C22.2 No. 100
  - CSA C22.2 No. 14
- Performance Assurance Certification (PAC)
  - Generator set tested to ISO 8528-5 for transient response
  - Verified product design, quality and performance integrity
  - All engine systems are prototype and factory tested
- Power rating
  - Accepts rated load in one step per NFPA 110
  - Permissible average power output during 24 hours of operation is approved up to 85%

## Standard features\*

- Single source supplier
- Global product support
- Two (2) Year/3,000 Hour Basic Limited Warranty
- 12V4000 diesel engine
  - 57.2 liter displacement
  - Common rail fuel injection
  - 4-cycle
- Complete range of accessories
- Cooling system
  - Integral set-mounted
  - Engine-driven fan
  - Fan belt auto-tensioner
- Generator
  - Brushless, rotating field generator
  - 2/3 pitch windings
  - Permanent Magnet Generator (PMG) supply to regulator
  - 300% short circuit capability
- Digital control panel(s)
  - UL recognized, CSA certified, NFPA 110
  - Complete system metering
  - LCD display

## Standard equipment\*

### Engine

- Air cleaners
- Oil pump
- Oil drain extension and shut-off valve
- Centrifugal oil filtration
- Closed crankcase ventilation
- Jacket water pump
- Inter cooler water pump
- Thermostats
- Blower fan and fan drive
- Radiator - unit mounted
- Electric starting motor - 24V
- Governor - electronic isochronous
- Base - structural steel
- SAE flywheel and bell housing
- Charging alternator - 24V
- Battery box and cables
- Flexible fuel connectors
- Flexible exhaust connection
- EPA certified engine
- After-treatment ready - DPF/SCR factory-supplied

### Generator

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting
- Sustained short circuit current of up to 300% of the rated current for up to 10 seconds
- Self-ventilated and drip-proof
- Superior voltage waveform

- Digital, solid state, volts-per-hertz regulator
- Brushless alternator with brushless pilot exciter
- 4 pole, rotating field
- 1-bearing, sealed
- Flexible coupling
- Full amortisseur windings
- 125% rotor balancing
- 3-phase voltage sensing
- $\pm 0.25\%$  voltage regulation no load to full load
- 100% of rated load - one step
- 5% maximum total harmonic distortion

### Digital control panel(s)

- Digital metering
- Engine parameters
- Generator protection functions
- Engine protection
- CANBus ECU communications
- Windows®-based software
- Multilingual capability
- Communications to remote annunciator
- Programmable input and output contacts
- UL recognized, CSA certified, CE approved
- Event recording
- IP 54 front panel rating with integrated gasket
- NFPA 110 compatible

## Application data

### Engine

Manufacturer	<b>mtu</b>
Model	12V4000G25S
Type	4-cycle
Arrangement	12-V
Displacement: L (in <sup>3</sup> )	57.2 (3,491)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression ratio	16.5:1
Rated rpm	1,800
Engine governor	electronic isochronous (ADEC)
Maximum power: kWm (bhp)	1,745 (2,340)
Steady state frequency band	± 0.25%
Air cleaner	dry

### Liquid capacity

Total oil system: L (gal)	260 (68.7)
Engine jacket water capacity: L (gal)	160 (42.3)
After cooler water capacity: L (gal)	40 (10.6)
System coolant capacity: L (gal)	693 (183)

### Electrical

Electric volts DC	24
Cold cranking amps under -17.8 °C (0 °F)	2,800
Batteries: group size	8D
Batteries: quantity	4

### Fuel system

Fuel supply connection size	#16 JIC 37° female 1" NPT adapter provided
Fuel return connection size	#16 JIC 37° female 1" NPT adapter provided
Maximum fuel lift: m (ft)	1 (3)
Recommended fuel	diesel #2
Total fuel flow: L/hr (gal/hr)	C/F

### Fuel consumption

At 100% of power rating: L/hr (gal/hr)	424 (112)
At 75% of power rating: L/hr (gal/hr)	317 (84)
At 50% of power rating: L/hr (gal/hr)	226 (60)

### DEF consumption

At 100% of power rating: L/hr (gal/hr)	20.4 (5.4)
At 75% of power rating: L/hr (gal/hr)	15.2 (4)
At 50% of power rating: L/hr (gal/hr)	8.7 (2.3)

### Cooling - radiator system

Ambient capacity of radiator: °C (°F)	50 (122)
Maximum restriction of cooling air: intake and discharge side of radiator: kPa (in. H <sub>2</sub> O)	0.12 (0.5)
Water pump capacity: L/min (gpm)	1,067 (282)
After cooler pump capacity: L/min (gpm)	583 (154)
Heat rejection to coolant: kW (BTUM)	665 (37,818)
Heat rejection to after cooler: kW (BTUM)	550 (31,277)
Heat radiated to ambient: kW (BTUM)	158 (8,985)
Heat radiated to ambient EGAT: kW (BTUM)	110 (6,256)
Fan power: kW (hp)	82 (110)

### Air requirements

Aspirating: *m <sup>3</sup> /min (SCFM)	168 (5,933)
Air flow required for radiator cooled unit: *m <sup>3</sup> /min (SCFM)	2,008 (70,945)
Remote cooled applications; air flow required for dissipation of radiated generator set heat for a maximum of 25 °F rise: *m <sup>3</sup> /min (SCFM)	569 (20,225)
- With EGAT	971 (34,507)

\* Air density = 1.184 kg/m<sup>3</sup> (0.0739 lbm/ft<sup>3</sup>)

### Exhaust system

Gas temperature after turbo (continuous power): °C (°F)	425 (797)
Gas temperature after EGAT (continuous power): °C (°F)	400 (752)
Gas volume at exhaust temperature (continuous power): m <sup>3</sup> /min (CFM)	396 (13,985)
Maximum allowable back pressure: kPa (in. H <sub>2</sub> O)	
- After EGAT	4 (16.1)
- Total (after engine)	20.5 (82.4)

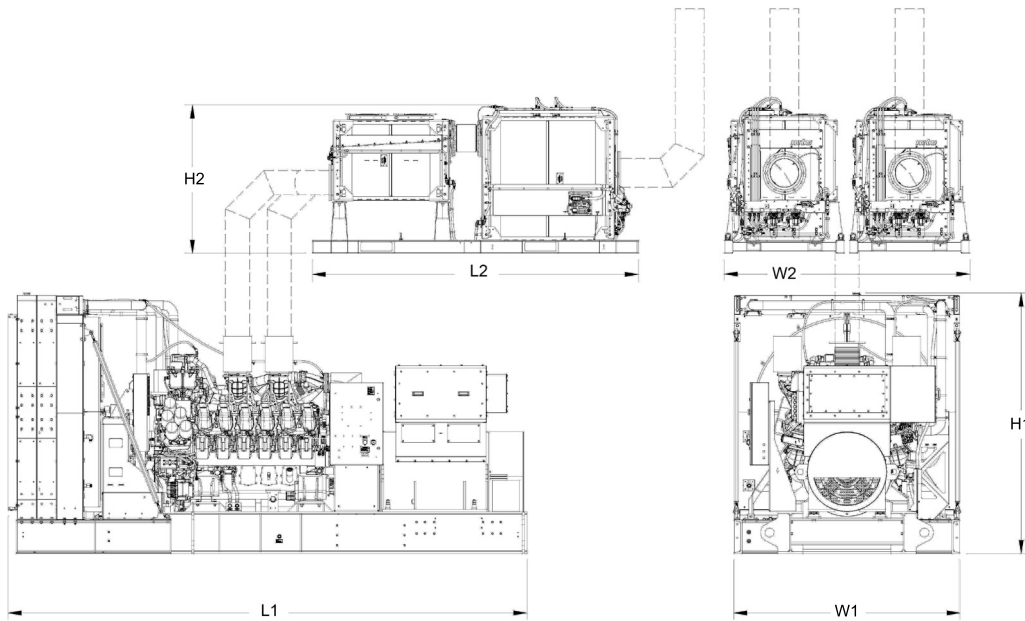
### Emission reducing agent system (DEF)\*

Pressure (Pmin) at customer interface (pre-feed module), minimum: kPa (in. H <sub>2</sub> O)	60 (241)
Pressure (Pmax) at customer interface (pre-feed module), maximum: kPa (in. H <sub>2</sub> O)	150 (603)
Volume flow (Vmin) at customer interface (pre-feed module), minimum: L/min (gpm)	1.5 (.4)
Volume flow (Vmax) at customer interface (pre-feed module), maximum: L/min (gpm)	2 (.53)
Temperature of reducing agent (RA) feed line, maximum: °C (°F)	45 (113)
Pressure of DEF return line, maximum: kPa (in. H <sub>2</sub> O)	150 (603)
Volume flow of return line (Vmax), maximum: L/min (gpm)	2 (.53)
Temperature of reducing agent (RA) return line (at Tmax feed line), maximum: °C (°F)	60 (140)
Height of module frame (distributor unit DU) above pre-feed module (PFM), maximum: m (ft)	5 (25)
Height of pre-feed module (PFM) above tank, maximum: m(ft)	3 (15)

\* For additional System Information, refer to:

- Assembly Instructions M060807
- Operation Manual MS15065

## Weights and dimensions



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (L1xW1xH1)	Weight
Open Power Unit (OPU)	5,851 x 2,565 x 2,934 mm (230.35 x101 x 115.51 in)	16,917 kg (37,303 lb)
System	Dimensions (L2xW2xH2)	Weight
DPF-SCR Modules	3,680 x 2,770 x 1,761 mm (144.9 x 109.1 x 65.8 in)	2,912 kg (6,421 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

## Sound data

Unit type	DCCP full load
Level 0 (OPU): dB(A)	91.6

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

## Emissions data

NO <sub>x</sub> + NMHC	CO	PM
C/F	C/F	C/F

- All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values). Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA standards.

## Rating definitions and conditions

- Data Center Continuous Power (DCCP) ratings apply to data center installations where a 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%.
- Nominal ratings at standard conditions: 25 °C and 300 meters (77 °F and 1,000 feet).
- Deration Factor:
  - Consult your local **mtu** Distributor for altitude derations.
  - Consult your local **mtu** Distributor for temperature derations.

C/F = Consult Factory/**mtu** Distributor