DETROIT DIESEL

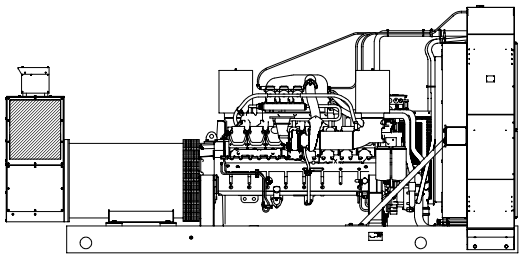
mtu

# Model: 1000DSEB

**380–600 V** **Diesel**

## Ratings Range

| | | 60 Hz | 50 Hz |
|---|---|---|---|
| **Standby:** | **kW** | 945–1000 | 800 |
| | **kVA** | 1181–1250 | 1000 |
| **Prime:** | **kW** | 860–910 | 728–732 |
| | **kVA** | 1075–1138 | 910–915 |



## Standard Features

- Your DDC/MTU Power Generation product distributor provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- At 60 Hz, the generator set accepts rated load in one step.
- The generator set complies with ISO 8528-5, Class G3, requirements for transient performance.
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Alternator features:
  - The pilot-excited, permanent-magnet (PM) alternator provides superior short-circuit capability.
  - The brushless, rotating-field alternator has broadrange reconnectability.
- Other features:
  - Controllers are available for all applications. See controller features inside.
  - The low coolant level shutdown prevents overheating (standard on radiator models only).
  - The generator set-to-skid mounting options are either integral vibration isolation or direct mounting with spring isolators.
  - An electronic, isochronous governor delivers precise frequency regulation.
  - Electronic engine controls and a generator set microprocessor controller combine to deliver one of the most advanced control systems in today's market.

## Generator Set Ratings

| | | | | 150°C Rise Standby Rating | | 130°C Rise Standby Rating | | 125°C Rise Prime Rating | | 105°C Rise Prime Rating | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alternator** | **Voltage** | **Ph** | **Hz** | **kW/kVA** | **Amps** | **kW/kVA** | **Amps** | **kW/kVA** | **Amps** | **kW/kVA** | **Amps** |
| 5M4044 | 240/416 | 3 | 60 | 1000/1250 | 1735 | 975/1219 | 1691 | 910/1138 | 1579 | 890/1113 | 1544 |
| | 277/480 | 3 | 60 | 1000/1250 | 1504 | 1000/1250 | 1504 | 910/1138 | 1368 | 910/1138 | 1368 |
| | 220/380 | 3 | 50 | 800/1000 | 1519 | 800/1000 | 1519 | 728/910 | 1383 | 728/910 | 1383 |
| | 230/400 | 3 | 50 | 800/1000 | 1443 | 800/1000 | 1443 | 728/910 | 1313 | 728/910 | 1313 |
| | 240/416 | 3 | 50 | 800/1000 | 1388 | 800/1000 | 1388 | 728/910 | 1263 | 728/910 | 1263 |
| 7M4046 | 220/380 | 3 | 60 | 945/1181 | 1795 | 945/1181 | 1795 | 860/1075 | 1633 | 860/1075 | 1633 |
| | 240/416 | 3 | 60 | 1000/1250 | 1735 | 1000/1250 | 1735 | 910/1138 | 1579 | 910/1138 | 1579 |
| | 277/480 | 3 | 60 | 1000/1250 | 1504 | 1000/1250 | 1504 | 910/1138 | 1368 | 910/1138 | 1368 |
| | 220/380 | 3 | 50 | 800/1000 | 1519 | 800/1000 | 1519 | 728/910 | 1383 | 728/910 | 1383 |
| | 230/400 | 3 | 50 | 800/1000 | 1443 | 800/1000 | 1443 | 728/910 | 1313 | 732/915 | 1321 |
| | 240/416 | 3 | 50 | 800/1000 | 1388 | 800/1000 | 1388 | 728/910 | 1263 | 728/910 | 1263 |
| 7M4170 | 220/380 | 3 | 60 | 1000/1250 | 1899 | 1000/1250 | 1899 | 910/1138 | 1728 | 910/1138 | 1728 |
| 7M4282 | 347/600 | 3 | 60 | 1000/1250 | 1203 | 1000/1250 | 1203 | 910/1138 | 1095 | 910/1138 | 1095 |
| 7M4284 | 347/600 | 3 | 60 | 1000/1250 | 1203 | 1000/1250 | 1203 | 910/1138 | 1095 | 910/1138 | 1095 |

RATINGS: All three-phase units are rated at 0.8 power factor. *Standby Ratings:* Standby 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. There is no overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. *Prime Power Ratings:* 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, overload power in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory. Obtain the technical information bulletin (TIS-101) on ratings guidelines for the complete ratings definitions. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. GENERAL GUIDELINES FOR DERATION: *Altitude:* Derate 1.0% per 100 m (328 ft.) elevation above 400 m (1312 ft.). *Temperature:* Derate 3.0% per 5.0°C (9°F) temperature above 40°C (104°F).

# Alternator Specifications

| Specifications | Alternator |
|---|---|
| Type | 4-Pole, Rotating-Field |
| Exciter type | Brushless, Permanent-Magnet Pilot Exciter |
| Voltage regulator | Solid-State, Volts/Hz |
| Insulation: | NEMA MG1 |
| Material | Class H, Synthetic, Nonhygroscopic |
| Temperature rise | 130°C, 150°C Standby |
| Bearing: quantity, type | 1, Sealed |
| Coupling | Flexible Disc |
| Amortisseur windings | Full |
| Rotor balancing | 125% 60 Hz, 150% 50 Hz |
| Voltage regulation, no-load to full-load (with < 0.5% drift due to temp. variation) | 3-Phase Sensing, ±0.25% |
| One-step load acceptance | 100% of Rating |
| Unbalanced load capability | 100% of Rated Standby Current |
| Peak motor starting kVA: | (35% dip for voltages below) |
| 480 V, 416 V 5M4044 (4 bus bar) | 3900 (60 Hz), 3100 (50 Hz) |
| 480 V, 416 V 7M4046 (4 bus bar) | 3900 (60 Hz), 3050 (50 Hz) |
| 380 V 7M4170 (4 bus bar) | 2600 (60 Hz) |
| 600 V 7M4282 (4 bus bar) | 1850 (60 Hz) |
| 600 V 7M4284 (4 bus bar) | 3200 (60 Hz) |

- 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.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Superior voltage waveform from two-thirds pitch windings and skewed stator.
- Digital solid-state, volts-per-hertz voltage regulator with ±0.25% no-load to full-load regulation.
- Brushless alternator with brushless pilot exciter for excellent load response.

# Application Data

## Engine

| Engine Specifications | 60 Hz | 50 Hz |
|---|---|---|
| Manufacturer | Detroit Diesel/MTU | |
| Engine: model | 16V2000 G83 R163-7M36 | 16V2000 G63 R163-7M38 |
| Engine: type | 4-Cycle, Turbocharged, Intercooled | |
| Cylinder arrangement | 16-V | |
| Displacement, L (cu. in.) | 31.84 (1943) | |
| Bore and stroke, mm (in.) | 130 x 150 (5.12 x 5.91) | |
| Compression ratio | 14.0:1 | 16.0:1 |
| Piston speed, m/min. (ft./min.) | 540 (1772) | 450 (1476) |
| Main bearings: quantity, type | 9, Precision Half Shells | |
| Rated rpm | 1800 | 1500 |
| Max. power at rated rpm, kWm (BHP) | 1115 (1495) | 895 (1200) |
| Cylinder head material | Cast Iron | |
| Crankshaft material | Forged Steel | |
| Valve (exhaust) material | Austenitic Steel | |
| Governor: type, make/model | MDEC Electronic Control | |
| Frequency regulation, no-load to-full load | Isochronous | |
| Frequency regulation, steady state | ±0.25% | |
| Frequency | Fixed | |
| Air cleaner type, all models | Dry | |

## Exhaust

| Exhaust System | 60 Hz | 50 Hz |
|---|---|---|
| Exhaust flow at rated kW, $m^3$/min. (cfm) | 240 (8475) | 180 (6357) |
| Exhaust temperature at rated kW, dry exhaust, °C (°F) | 590 (1094) | 570 (1058) |
| Maximum allowable back pressure, kPa (in. Hg) | 5.1 (1.5) | |
| Exh. outlet size at eng. hookup, mm (in.) | See ADV drawing | |

## Engine Electrical

| Engine Electrical System | 60 Hz | 50 Hz |
|---|---|---|
| Battery charging alternator: | | |
| Ground (negative/positive) | Negative | |
| Volts (DC) | 24 | |
| Ampere rating | 70 | |
| Starter motor rated voltage (DC) | 24 | |
| Battery, recommended cold cranking amps (CCA): | | |
| Qty., CCA rating each | Two, 1150 | |
| Battery voltage (DC) | 12 | |

## Fuel

| Fuel System | 60 Hz | 50 Hz |
|---|---|---|
| Fuel supply line, min. ID, mm (in.) | 12 (0.5) | |
| Fuel return line, min. ID, mm (in.) | 6 (0.25) | |
| Max. fuel flow, Lph (gph) | 450 (119) | |
| Min./max. fuel pressure at engine supply connection, kPa (in. Hg) | -30/50 (-8.8/14.8) | |
| Fuel filter: quantity, type | 1, Secondary | |
| Recommended fuel | #2 Diesel | |

## Lubrication

| Lubricating System | 60 Hz | 50 Hz |
|---|---|---|
| Type | Full Pressure | |
| Oil pan capacity dipstick mark max., L (qt.) | 92 (97.2) | |
| Oil pan capacity, initial filling, L (qt.) | 102 (108) | |
| Oil filter: quantity, type | 2, Cartridge | |
| Oil cooler | Water-Cooled | |

# Application Data

## Cooling

| Radiator System | 60 Hz | 50 Hz |
|---|---|---|
| Ambient temperature, standby rating, °C (°F) | 40 (104) | 45 (113) |
| Ambient temperature, prime rating, °C (°F) | 45 (113) | 50 (122) |
| Engine water capacity, L (gal.) | 130 (34) | |
| Radiator system capacity, including engine, L (gal.) | 257 (68) | |
| Engine jacket water flow, Lpm (gpm) | 967 (255) | 817 (216) |
| Charge cooler water flow, Lpm (gpm) | 283 (75) | 233 (62) |
| Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.) | 480 (27297) | 370 (21041) |
| Heat rejected to charge cooling water at rated kW, dry exhaust, kW (Btu/min.) | 290 (16492) | 200 (11374) |
| Water pump type | Centrifugal | |
| Fan diameter, including blades, mm (in.) | 1372 (54) | |
| Fan, kWm (HP) | 51 (68) | 44 (59) |
| Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. $H_2O$) | 0.125 (0.5) | |

| High Ambient Radiator System | 60 Hz | 50 Hz |
|---|---|---|
| Ambient temperature, °C (°F) | 50 (122) | — |
| Engine water capacity, L (gal.) | 130 (34) | — |
| Radiator system capacity, including engine, L (gal.) | 322 (85) | — |
| Engine jacket water flow, Lpm (gpm) | 967 (255) | — |
| Charge cooler water flow, Lpm (gpm) | 283 (75) | — |
| Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.) | 480 (27297) | — |
| Heat rejected to charge cooling water at rated kW, dry exhaust, kW (Btu/min.) | 290 (16492) | — |
| Water pump type | Centrifugal | — |
| Fan diameter, including blades, mm (in.) | 1524 (60) | — |
| Fan, kWm (HP) | 70 (94) | — |
| Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. $H_2O$) | 0.125 (0.5) | — |

| Remote Radiator System* | 60 Hz | 50 Hz |
|---|---|---|
| Exhaust manifold type | Dry | |
| Connection sizes: | | |
| Water inlet/outlet, mm (in.) | 77 (3) | |
| Intercooler inlet/outlet, mm (in.) | 51 (2) | |
| Static head allowable above engine, kPa (ft. $H_2O$) | 149 (50) | |

*Contact your local distributor for cooling system options and specifications based on your specific requirements.

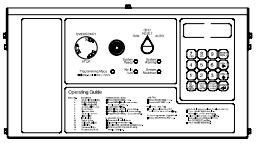
## Operation Requirements

| Air Requirements | 60 Hz | 50 Hz |
|---|---|---|
| Radiator-cooled cooling air, $m^3$/min. (scfm)† | 1161 (41000) | 991 (35000) |
| High ambient radiator-cooled cooling air, $m^3$/min. (scfm)† | 1404 (49600) | — |
| Cooling air required for generator set when equipped with city water cooling or remote radiator, based on 14°C (25°F) rise, $m^3$/min. (scfm)† | 391 (13800) | 340 (12000) |
| Combustion air, $m^3$/min. (cfm) | 87 (3072) | 67 (2366) |
| Heat rejected to ambient air: | | |
| Engine, kW (Btu/min.) | 45 (2559) | 50 (2843) |
| Alternator, kW (Btu/min.) | 64 (3640) | 45 (2560) |

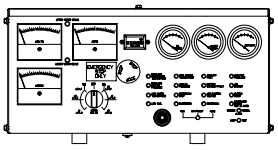
† Air density = 1.20 kg/$m^3$ (0.075 lbm/$ft^3$)

| Fuel Consumption | 60 Hz | 50 Hz |
|---|---|---|
| **Diesel, Lph (gph) at % load** | **Standby Rating** | |
| 100% | 267.2 (70.6) | 205.0 (54.2) |
| 75% | 202.4 (53.5) | 153.7 (40.6) |
| 50% | 138.2 (36.5) | 104.6 (27.6) |
| 25% | 75.7 (20.0) | 57.6 (15.2) |
| **Diesel, Lph (gph) at % load** | **Prime Rating** | |
| 100% | 247.6 (65.4) | 185.3 (49.0) |
| 75% | 189.3 (50.0) | 139.7 (36.9) |
| 50% | 128.6 (33.9) | 95.0 (25.1) |
| 25% | 71.5 (18.9) | 53.0 (14.0) |

## Controllers



**Digital 550 Controller**
Audiovisual annunciation with NFPA 110 Level 1 capability.
Programmable microprocessor logic and digital display features.
Safeguard circuit protection standard.
12- or 24-volt engine electrical system capability.
Remote start, remote annunciation, and remote communication options.
Refer to M6-46 for additional controller features and accessories.



**Microprocessor-Plus, 16-Light Controller**
Audiovisual annunciation with NFPA 110 Level 1 capability.
Microprocessor logic, AC meters, and engine gauge features.
12- or 24-volt engine electrical system capability.
Remote start, prime power, and remote annunciation options.
Refer to M6-30 for additional controller features and accessories.

DDC/MTU Power Generation
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ddcmtupowergeneration.com

## Additional Standard Features

- Alternator Protection (standard with 550 controller)
- Hand Prime Pump
- Oil Drain Extension
- Operation and Installation Literature
- Radiator Duct Flange

## Available Accessories

**Open Unit**

- ❑ Exhaust Silencer, Critical, Kit: PA-354880-SD
- ❑ Exhaust Silencer, Hospital, Kit: PA-354905-SD
- ❑ Flexible Exhaust Connector, Stainless Steel
- ❑ Sound Enclosure (with roof-mounted hospital silencer)
- ❑ Weather Enclosure (with roof-mounted critical silencer)

**Cooling System**

- ❑ Block Heater
- ❑ High Ambient Radiator
- ❑ Remote Radiator Cooling

**Fuel System**

- ❑ Flexible Fuel Lines
- ❑ Fuel Filter
- ❑ Fuel Pressure Gauge
- ❑ Subbase Fuel Tank with Day Tank

**Electrical System**

- ❑ Battery
- ❑ Battery Charger, Equalize/Float Type
- ❑ Battery Heater
- ❑ Battery Rack and Cables

**Engine and Alternator**

- ❑ Air Cleaner, Heavy Duty
- ❑ Air Cleaner Restriction Indicator
- ❑ Alternator Strip Heater
- ❑ Bus Bar Kits (standard on 7M alternators, 380–600 volt only)
- ❑ Direct Mounting
- ❑ Integral Vibration Isolation Mounting
- ❑ Line Circuit Breaker (NEMA type 1 enclosure)
- ❑ Line Circuit Breaker with Shunt Trip (NEMA type 1 enclosure)
- ❑ NFPA 110 Literature
- ❑ Optional Alternators
- ❑ Rated Power Factor Testing
- ❑ Safeguard Breaker (not available with 550 controller)
- ❑ Spring Isolators

**Paralleling System**

- ❑ Load-Sharing Module
- ❑ Reactive Droop Compensator
- ❑ Remote Speed Adjust Control/Electronic Governor (550 controller only)
- ❑ Voltage Adjust Control
- ❑ Voltage Regulator Relocation Kit

**Maintenance**

- ❑ General Maintenance Literature Kit
- ❑ Maintenance Kit (includes air, oil, and fuel filters)
- ❑ Overhaul Literature Kit
- ❑ Production Literature Kit

**Controller**

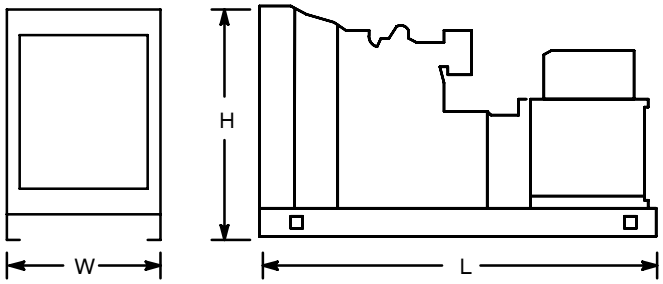
- ❑ Common Failure Relay Kit
- ❑ Communication Products and PC Software (550 controller only)
- ❑ Customer Connection Kit
- ❑ Dry Contact Kit (isolated alarm)
- ❑ Prime Power Switch (550 controller only)
- ❑ Remote Annunciator Panel
- ❑ Remote Audiovisual Alarm Panel
- ❑ Remote Emergency Stop Kit
- ❑ Remote Mounting Cable
- ❑ Run Relay Kit

**Miscellaneous Accessories**

- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____

## Dimensions and Weights

| | |
|---|---|
| Overall Size, max., L x W x H, mm (in.): | 4863 x 1659 x 2326 (191.5 x 65.3 x 91.6) |
| Weight, radiator model, max. wet, kg (lb.): | |
| 40°C (60 Hz) and 45°C (50 Hz) radiator | 7200 (15873) |
| 45°C (60 Hz) and 50°C (50 Hz) radiator | 7610 (16773) |




NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

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