DETROIT DIESEL ® mtu

Model: 450DSE-4

190–600 V **Diesel**

Ratings Range

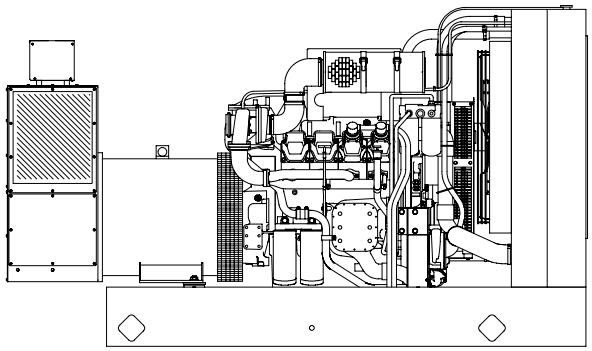
		60 Hz	50 Hz
Standby:	**kW**	400–460	364–408
	kVA	500–575	455–510
Prime:	**kW**	365–420	328–368
	kVA	456–525	410–460

Generator Set Ratings

Alternator	Voltage	Ph	Hz	150°C Rise Standby Rating kW/kVA	130°C Rise Standby Rating kW/kVA	125°C Rise Prime Rating kW/kVA	105°C Rise Prime Rating kW/kVA
5M4024	120/208	3	60	450/563	440/550	410/513	410/513
	127/220	3	60	450/563	450/563	410/513	410/513
	139/240	3	60	450/563	450/563	410/513	410/513
	220/380	3	60	400/500	400/500	365/456	365/456
	240/416	3	60	450/563	440/550	410/513	410/513
	277/480	3	60	450/563	450/563	410/513	410/513
	110/190	3	50	400/500	400/500	364/455	364/455
	115/200	3	50	400/500	388/485	364/455	360/450
	120/208	3	50	380/475	364/455	352/440	328/410
	220/380	3	50	400/500	400/500	364/455	364/455
	230/400	3	50	400/500	388/485	364/455	360/450
	240/416	3	50	380/475	364/455	352/440	328/410
5M4027	120/208	3	60	450/563	450/563	410/513	410/513
	127/220	3	60	450/563	450/563	410/513	410/513
	139/240	3	60	450/563	450/563	410/513	410/513
	220/380	3	60	405/506	405/506	370/463	370/463
	240/416	3	60	450/563	450/563	410/513	410/513
	277/480	3	60	450/563	450/563	410/513	410/513
	110/190	3	50	400/500	400/500	364/455	364/455
	115/200	3	50	400/500	400/500	364/455	364/455
	120/208	3	50	400/500	400/500	364/455	364/455
	220/380	3	50	400/500	400/500	364/455	364/455
	230/400	3	50	400/500	400/500	364/455	364/455
	240/416	3	50	400/500	400/500	364/455	364/455
5M4028	120/208	3	60	455/569	455/569	415/519	415/519
	127/220	3	60	455/569	455/569	415/519	415/519
	139/240	3	60	455/569	455/569	415/519	415/519
	220/380	3	60	455/569	455/569	415/519	415/519
	240/416	3	60	455/569	455/569	415/519	415/519
	277/480	3	60	455/569	455/569	415/519	415/519
	110/190	3	50	408/510	408/510	368/460	368/460
	115/200	3	50	408/510	408/510	368/460	368/460
	120/208	3	50	408/510	408/510	368/460	368/460
	220/380	3	50	408/510	408/510	368/460	368/460
	230/400	3	50	408/510	408/510	368/460	368/460
	240/416	3	50	408/510	408/510	368/460	368/460
5M4160	220/380	3	60	450/563	450/563	410/513	410/513
5M4162	220/380	3	60	450/563	450/563	410/513	410/513
5M4270	347/600	3	60	450/563	450/563	410/513	410/513
5M4272	347/600	3	60	460/575	460/575	420/525	420/525

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.
- The generator set complies with ISO 8528-5, Class G3, requirements for transient performance.
- The generator set accepts rated load in one step.
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Alternator features:
  - The brushless, rotating-field alternator has broadrange reconnectability.
  - The pilot-excited, permanent-magnet (PM) alternator provides superior short-circuit capability.
- Other features:
  - Controllers are available for all applications. See controller features inside.
  - The low coolant level shutdown prevents overheating (standard on radiator models only).
  - Integral vibration isolation eliminates the need for under-unit vibration 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.



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 0.5% per 100 m (328 ft.) elevation above 1000 m (3280 ft.). Maximum altitude capability is 1860 m (6102 ft.). *Temperature:* Derate 1.0% per 10°C (18°F) temperature above 25°C (77°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, 380 V 5M4024 (10 lead)	1350 (60 Hz), 880 (50 Hz)
480 V, 380 V 5M4027 (12 lead)	1550 (60 Hz), 1100 (50 Hz)
480 V, 380 V 5M4028 (10 lead)	1800 (60 Hz), 1250 (50 Hz)
380 V 5M4160 (4 lead)	1175 (60 Hz)
380 V 5M4162 (4 lead)	2100 (60 Hz)
600 V 5M4270 (4 lead)	1250 (60 Hz)
600 V 5M4272 (4 lead)	1750 (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	8V2000 G80 R083-8K36	8V2000 G61 R083-7K06
Engine: type	4-Cycle, Turbocharged, Intercooled	
Cylinder arrangement	8-V	
Displacement, L (cu. in.)	15.94 (972)	
Bore and stroke, mm (in.)	130 x 150 (5.12 x 5.91)	
Compression ratio	16.0:1	14.5:1
Piston speed, m/min. (ft./min.)	540 (1772)	450 (1476)
Main bearings: quantity, type	5, Precision Half Shells	
Rated rpm	1800	1500
Max. power at rated rpm, kWm (BHP)	511 (685)	455 (610)
Cylinder head material	Cast Iron	
Crankshaft material	Forged Steel	
Valve (exhaust) material	Austenitic Steel	
Governor: type, make/model	DDEC 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)	102 (3600)	90 (3180)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	526 (979)	488 (875)
Maximum allowable back pressure, kPa (in. Hg)	10.2 (3.0)	
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 above 0°C (32°F)	Two, 1000	
Qty., CCA rating each below 0°C (32°F)	Four, 700	
Battery voltage (DC)	12	

Fuel

Fuel System	60 Hz	50 Hz
Fuel supply line, min. ID, mm (in.)	16 (0.63)	
Fuel return line, min. ID, mm (in.)	16 (0.63)	
Max. lift, engine-driven fuel pump, m (ft.)	2.1 (6.8)	
Max. fuel flow, Lph (gph)	674 (178)	587 (155)
Max. fuel pump restriction with new filter, kPa (in. Hg)	20 (6)	
Max. fuel pump restriction with used filter, kPa (in. Hg)	41 (12)	
Fuel filter: quantity, type	2, Primary/Secondary	
Recommended fuel	#2 Diesel	

Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, L (qt.)	46.4 (49)	
Oil pan capacity with filter, L (qt.)	53.9 (57)	
Oil filter: quantity, type	2, Cartridge	
Oil cooler	Water-Cooled	

Application Data

Cooling

Radiator System	60 Hz	50 Hz
Ambient temperature, °C (°F)	40 (104)	—
Engine water capacity, L (gal.)	44 (11.6)	—
Radiator system capacity, including engine, L (gal.)	159 (42)	—
Engine jacket water flow, Lpm (gpm)	704 (186)	—
Charge cooler water flow, Lpm (gpm)	322 (85)	—
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	160 (9100)	—
Heat rejected to charge cooling water at rated kW, dry exhaust, kW (Btu/min.)	96 (5450)	—
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	991 (39)	—
Fan, kWm (HP)	17 (23)	—
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H_2O)	0.125 (0.5)	

Radiator System	60 Hz	50 Hz
Ambient temperature, °C (°F)	50 (122)	
Engine jacket water capacity, L (gal.)	44 (11.6)	
Radiator system capacity, including engine, L (gal.)	163 (43)	159 (42)
Engine jacket water flow, Lpm (gpm)	704 (186)	591 (156)
Charge cooler water flow, Lpm (gpm)	322 (85)	246 (65)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	160 (9100)	169 (9580)
Heat rejected to charge cooling water at rated kW, dry exhaust, kW (Btu/min.)	96 (5450)	109 (6180)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	1041 (41)	991 (39)
Fan, kWm (HP)	24 (32)	17 (23)
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, mm (in.)	102 (4)
Water outlet, mm (in.)	77 (3)
Intercooler inlet/outlet, mm (in.)	44.5 (1.75)
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.

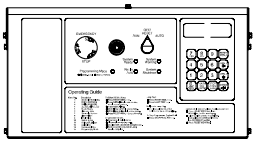
Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m^3/min. (scfm)†	547 (19300) @ 40°C	—
	713 (25150) @ 50°C	527 (18600) @ 50°C
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)†	411 (14500)	312 (11000)
Combustion air, m^3/min. (cfm)	36 (1285)	35 (1230)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	68 (3850)	52 (2985)
Alternator, kW (Btu/min.)	47 (2660)	35 (1980)

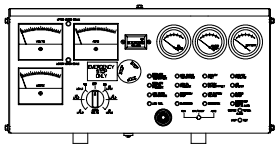
† Air density = 1.20 kg/m^3 (0.075 lbm/ft^3)

Fuel Consumption	60 Hz	50 Hz
Diesel, Lph (gph) at % load	**Standby Rating**	
100%	126.1 (33.3)	110.5 (29.2)
75%	98.8 (26.1)	79.3 (21.0)
50%	69.3 (18.3)	53.2 (14.0)
25%	36.7 (9.7)	29.3 (7.7)
Diesel, Lph (gph) at % load	**Prime Rating**	
100%	110.5 (29.2)	97.0 (25.6)
75%	76.5 (20.2)	71.0 (18.8)
50%	55.6 (14.7)	48.3 (12.8)
25%	31.4 (8.3)	27.3 (7.2)

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
605 North 8th Street, Suite 501
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Phone 920-451-0846, Fax 920-451-0843
ddcmtupowergeneration.com

Additional Standard Features

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

Available Accessories

Open Unit

- ❑ Exhaust Silencer, Critical (Kits: PA-354880-SD, PA-365337-SD, PA-365348-SD, PA-365353-SD)
- ❑ Exhaust Silencer, Hospital (Kits: PA-354905-SD, PA-365343-SD, PA-365349-SD, PA-365354-SD)
- ❑ Exhaust Silencer, Industrial (Kits: PA-354904-SD, PA-365340-SD, PA-343617-SD, PA-365350-SD)
- ❑ Exhaust Silencer, Residential (Kits: PA-3549882-SD, PA-365334-SD, PA-365347-SD, PA-365352-SD)
- ❑ Flexible Exhaust Connector, Stainless Steel
- ❑ Sound Enclosure (with roof-mounted hospital silencer)
- ❑ Weather Enclosure (with roof-mounted critical silencer)

Cooling System

- ❑ Block Heater
- ❑ Radiator Duct Flange
- ❑ 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)
- ❑ 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)

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

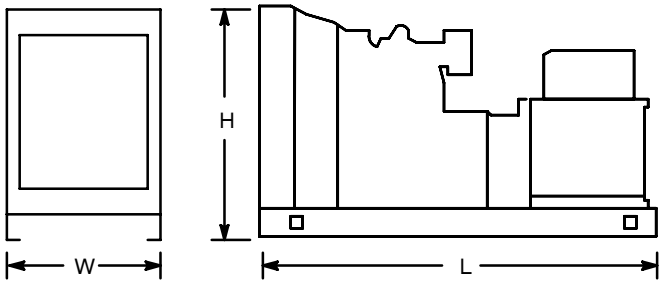
- ❑ Common Failure Relay Kit
- ❑ Communication Products and PC Software (550 controller only)
- ❑ Customer Connection Kit
- ❑ Dry Contact Kit (isolated alarm)
- ❑ Engine Prealarm Sender Kit
- ❑ Prime Power Switch (550 controller only)
- ❑ Remote Annunciator Panel
- ❑ Remote Audiovisual Alarm Panel
- ❑ 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.):
60 Hz, 40°C (105°F): 3647 x 1270 x 2050 (143.58 x 50.00 x 80.70)
60 Hz, 50°C (122°F): 3647 x 1270 x 2144 (143.58 x 50.00 x 84.41)
50 Hz, 50°C (122°F): 3647 x 1270 x 2050 (143.58 x 50.00 x 80.70)
Weight, radiator model, max. wet, kg (lb.): 4000 (8820)



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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