



## Ratings Range

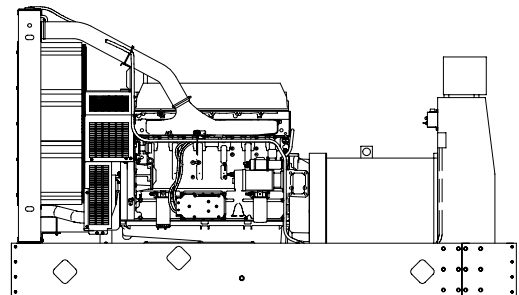
		60 Hz	50 Hz
Standby:	kW	350-425	288-364
	kVA	438-531	360-455
Prime:	kW	325-385	268-332
	kVA	406-481	335-415

## Generator Set Ratings

Alternator	Voltage	Ph	Hz	150°C	130°C	125°C	105°C	
				Rise Standby Rating kW/kVA	Rise Standby Rating kW/kVA	Rise Prime Rating kW/kVA	Rise Prime Rating kW/kVA	
4M4019	120/208	3	60	360/450	350/438	350/438	325/406	
	127/220	3	60	375/469	360/450	360/450	335/419	
	139/240	3	60	415/519	375/469	375/469	350/438	
	240/416	3	60	360/450	350/438	350/438	325/406	
	277/480	3	60	415/519	375/469	375/469	350/438	
	110/190	3	50	324/405	300/375	300/375	284/355	
	115/200	3	50	324/405	292/365	292/365	272/340	
	120/208	3	50	312/390	288/360	288/360	268/335	
	220/380	3	50	324/405	300/375	300/375	284/355	
	230/400	3	50	324/405	292/365	292/365	272/340	
4M4021	240/416	3	50	312/390	288/360	288/360	268/335	
	120/208	3	60	395/494	370/463	365/456	345/431	
	127/220	3	60	410/513	390/488	375/469	360/450	
	139/240	3	60	420/525	405/506	380/475	380/475	
	240/416	3	60	395/494	370/463	365/456	345/431	
	277/480	3	60	420/525	405/506	380/475	380/475	
	110/190	3	50	340/425	320/400	312/390	292/365	
	115/200	3	50	340/425	324/405	320/400	300/375	
	120/208	3	50	328/410	320/400	312/390	292/365	
	220/380	3	50	340/425	320/400	312/390	292/365	
5M4024	230/400	3	50	340/425	324/405	320/400	300/375	
	240/416	3	50	328/410	320/400	312/390	292/365	
	120/208	3	60	415/519	415/519	375/469	375/469	
	127/220	3	60	415/519	415/519	375/469	375/469	
	139/240	3	60	420/525	420/525	380/475	380/475	
	220/380	3	60	400/500	400/500	365/456	365/456	
	240/416	3	60	415/519	415/519	375/469	375/469	
	277/480	3	60	420/525	420/525	380/475	380/475	
	110/190	3	50	360/450	360/450	328/410	328/410	
	115/200	3	50	360/450	360/450	328/410	328/410	
5M4027	120/208	3	50	360/450	360/450	328/410	328/410	
	220/380	3	50	360/450	360/450	328/410	328/410	
	230/400	3	50	360/450	360/450	328/410	328/410	
	240/416	3	50	360/450	360/450	328/410	328/410	
	120/208	3	60	420/525	420/525	380/475	380/475	
	127/220	3	60	420/525	420/525	380/475	380/475	
	139/240	3	60	420/525	420/525	380/475	380/475	
	220/380	3	60	405/506	405/506	370/463	370/463	
	240/416	3	60	420/525	420/525	380/475	380/475	
	277/480	3	60	420/525	420/525	380/475	380/475	
5M4160	110/190	3	50	360/450	360/450	328/410	328/410	
	115/200	3	50	360/450	360/450	328/410	328/410	
	120/208	3	50	360/450	360/450	328/410	328/410	
	220/380	3	50	360/450	360/450	328/410	328/410	
	230/400	3	50	360/450	360/450	328/410	328/410	
	240/416	3	50	360/450	360/450	328/410	328/410	
	220/380	3	60	420/525	420/525	380/475	380/475	
	5M4162	220/380	3	60	420/525	420/525	380/475	380/475
	4M4266	347/600	3	60	420/525	400/500	380/475	375/469
	5M4272	347/600	3	60	425/531	425/531	385/481	385/481

## 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 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).
  - Integral vibration isolation eliminates the need for under-unit vibration spring isolators.
  - An electronic, isochronous governor delivers precise frequency regulation.
  - Electronic engine controls manage the engine.



**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. NOTE: Order separate generator set specs for 50 or 60 Hz as this model cannot change frequency. **GENERAL GUIDELINES FOR DERATION:** *Altitude:* Derate 1.5% per 305 m (1000 ft.) elevation above 183 m (600 ft.) up to a maximum elevation of 3660 m (12000 ft.). *Temperature:* Derate 1.0% per 5.5°C (10°F) temperature above 25°C (77°F). For radiator cooling system capacity, derate 1.4°C (2.5°F) per 305 m (1000 ft.) elevation above 183 m (600 ft.).

# Alternator Specifications

Specifications	Alternator
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet
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 at 60 Hz	100% of Rating
Unbalanced load capability	100% of Rated Standby Current
Peak motor starting kVA:	(35% dip for voltages below)
480 V/380 V 4M4019 (12 lead)	1325 (60Hz), 865 (50Hz)
480 V/380 V 4M4021 (12 lead)	1350 (60Hz), 825 (50Hz)
480 V/380 V 5M4024 (10 lead)	1350 (60Hz), 880 (50Hz)
480 V/380 V 5M4027 (12 lead)	1550 (60Hz), 1100 (50Hz)
380 V 5M4160 (4 lead)	1175 (60Hz)
380 V 5M4162 (4 lead)	2100 (60Hz)
600 V 4M4266 (4 lead)	1300 (60Hz)
600 V 5M4272 (4 lead)	1750 (60Hz)

- 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 drip-proof 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	
Engine: model, type	S60, 4-Cycle, Turbocharged, Intercooled	
Cylinder arrangement	6, Inline	
Displacement, L (cu. in.)	14.0 (855)	
Bore and stroke, mm (in.)	133 x 168 (5.24 x 6.61)	
Compression ratio	15.0:1	
Piston speed, m/min. (ft./min.)	604 (1980)	504 (1655)
Main bearings: quantity, type	7, Precision Half-Shell	
Rated rpm	1800	1500
Max. power at rated rpm, kWm (BHP)	474 (635)	411 (551)
Cylinder head material	Cast Iron	
Crankshaft material	Forged Steel	
Valve material:		
Intake	Iron-Based Seat	
Exhaust	Nickel-Based Seat	
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 <sup>3</sup> /min. (cfm)	98.8 (3490)	81.0 (2860)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	524 (975)	538 (1000)
Maximum allowable back pressure, kPa (in. Hg)	10.2 (3.0)	7.1 (2.1)
Engine exhaust outlet size, 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	40	
Starter motor rated voltage (DC)	24	
Battery, recommended cold cranking amps (CCA):		
Qty., CCA rating each	Two, 950	
Battery voltage (DC)	12	

# Application Data

## Fuel

Fuel System	60 Hz	50 Hz
Fuel supply line, min. ID, mm (in.)	13 (0.50)	
Fuel return line, min. ID, mm (in.)	8 (0.31)	
Max. lift, engine-driven fuel pump, m (ft.)	2.1 (6.8)	
Max. fuel flow, Lph (gph)	335 (88.5)	
Fuel prime pump	N/A	
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.)	30 (32)	
Oil pan capacity with filter, L (qt.)	36 (38)	
Oil filter: quantity, type	2, Cartridge	
Oil cooler	Water-Cooled	

## Cooling

Radiator System	60 Hz	50 Hz
Ambient temperature, °C (°F)	50 (122)	
Engine jacket water capacity, L (gal.)	22.7 (6.0)	
Radiator system capacity, including engine, L (gal.)	45.4 (12)	
Engine jacket water flow, Lpm (gpm)	363 (96)	303 (80)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	172 (9800)	154 (8785)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	99 (5650)	80 (4535)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	965 (38)	
Fan, kWm (HP)	22 (30)	20 (27)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H <sub>2</sub> O)	0.125 (0.5)	

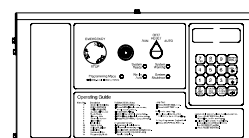
## Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m <sup>3</sup> /min. (scfm)*	561 (19800)	467 (16500)
Combustion air, m <sup>3</sup> /min. (cfm)	36 (1270)	28 (996)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	102 (5800)	92 (5225)
Alternator, kW (Btu/min.)	31 (1775)	31 (1760)

\* Air density = 1.20 kg/m<sup>3</sup> (0.075 lbf/ft<sup>3</sup>)

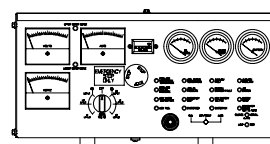
Fuel Consumption	60 Hz	50 Hz
<b>Diesel, Lph (gph) at % load</b>		
100%	114.5 (30.3)	98.8 (26.1)
75%	83.1 (22.0)	68.9 (18.2)
50%	55.0 (14.5)	46.6 (12.3)
25%	30.1 (8.0)	25.4 (6.7)
<b>Diesel, Lph (gph) at % load</b>		
100%	103.1 (27.2)	87.9 (23.2)
75%	75.4 (19.9)	62.8 (16.6)
50%	50.5 (13.3)	42.7 (11.3)
25%	27.8 (7.3)	23.5 (6.2)

## 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.

**Standard Features**

- Alternator Protection (standard with 550 controller)
- Battery Rack and Cables
- Oil Drain Extension
- Operation and Installation Literature

**Available Accessories**

**Enclosed Unit**

- Exhaust Silencer, Critical (kit: PA-354258)
- Exhaust Silencer, Residential (kit: PA-354257)
- Silencer Mounting Kit for Weather Housing
- Sound Enclosure (with roof-mounted hospital silencer)
- Tail Pipe and Rain Cap Kit
- Weather Enclosure (with roof-mounted critical silencer)
- Weather Housing (with roof-mounted silencer)

**Open Unit**

- Exhaust Silencer, Hospital (kits: PA-354903, PA-354905)
- Exhaust Silencer, Critical (kits: PA-354880, PA-354881)
- Exhaust Silencer, Residential (kits: PA-354882, PA-354883)
- Exhaust Silencer, Industrial (kits: PA-354904, PA-354906)
- Flexible Exhaust Connector, Stainless Steel

**Cooling System**

- Block Heater
- Radiator Duct Flange

**Fuel System**

- Flexible Fuel Lines
- Fuel Pressure Gauge
- Fuel/Water Separator with Prime Feature
- Hand Primer Pump
- Subbase Fuel Tanks
- Subbase Fuel Tank with Day Tank

**Electrical System**

- Battery
- Battery Charger, Equalize/Float Type
- Battery Heater

**Engine and Alternator**

- Air Cleaner, Heavy Duty
- Air Cleaner Restriction Indicator
- Alternator Strip Heater
- Bus Bar Kits
- Crankcase Emission Canister
- Line Circuit Breaker (NEMA1 enclosure)
- Line Circuit Breaker with Shunt Trip (NEMA1 enclosure)
- Optional Alternators
- Rated Power Factor Testing
- Safeguard Breaker (not available with 550 controller)
- Skid End Caps

**Paralleling System**

- Load-Sharing Module
- Reactive Droop Compensator
- Voltage Regulator Relocation Kit

**Maintenance and Literature**

- General Maintenance Literature Kit
- Maintenance Kit (includes air, oil, and fuel filters)
- NFPA 110 Literature
- Overhaul Literature Kit
- Production Literature Kit

**Controller**

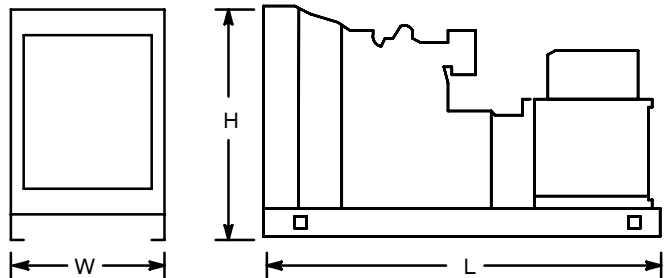
- Common Failure Relay Kit
- Communications Products and PC Software (550 controller only)
- Customer Connection Kit
- Dry Contact Kit (isolated alarm)
- Engine Prealarm Sender Kit
- Remote Annunciator Panel
- Remote Audiovisual Alarm Panel
- Remote Emergency Stop Kit
- Remote Mounting Cables
- Run Relay Kit

**Miscellaneous Accessories**

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

**Dimensions and Weights**

Overall Size, L x W x H, mm (in.): 3416 x 1270 x 1953  
 (134.5 x 50.0 x 76.9)  
 Weight (radiator model), wet, kg (lb.): 3461 (7630)



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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