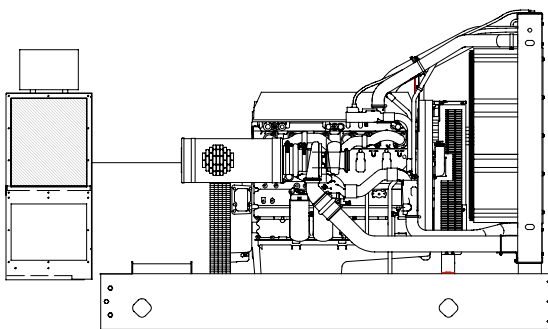




**Ratings Range**

		<b>60 Hz</b>
<b>Standby:</b>	<b>kW</b>	400-450
	<b>kVA</b>	500-563
<b>Prime:</b>	<b>kW</b>	365-410
	<b>kVA</b>	456-513



**Standard Features**

- Kohler Co. 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.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- The 60 Hz generator set engine is certified by the Environmental Protection Agency (EPA) to conform to Tier 3 nonroad emissions regulations.
- 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.

**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
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
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
5M4028	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	450/563	450/563	410/513	410/513
	240/416	3	60	450/563	450/563	410/513	410/513
	277/480	3	60	450/563	450/563	410/513	410/513
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	450/563	450/563	410/513	410/513

**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 (TIB-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 1.5% 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, Pilot Exciter
Leads: quantity, type	10/12, Reconnectable
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%
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	5M4024 (10 lead) 1350
480 V	5M4027 (12 lead) 1550
480 V	5M4028 (10 lead) 1800
380 V	5M4160 (4 lead) 1175
380 V	5M4162 (4 lead) 2100
600 V	5M4270 (4 lead) 1250
600 V	5M4272 (4 lead) 1750

- 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	
Manufacturer	Detroit Diesel
Engine: model, type	S60, 4-Cycle Turbocharged, Charge Air-Cooled
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	16.0:1
Piston speed, m/min. (ft./min.)	604 (1980)
Main bearings: quantity, type	7, Precision Half-Shell
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	511 (685)
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	
Exhaust flow at rated kW, m <sup>3</sup> /min. (cfm)	110.1 (3890)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	570 (1058)
Maximum allowable back pressure, kPa (in. Hg)	10.2 (3.0)
Engine exhaust outlet size, mm (in.)	See ADV Drawing

### Engine Electrical

Engine Electrical System		
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

### Fuel

Fuel System		
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)		346 (91.4)
Fuel prime pump		N/A
Fuel filter: quantity, type		2, Primary/Secondary
Recommended fuel		#2 Diesel

### Lubrication

Lubricating System		
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

# Application Data

## Cooling

Radiator System	
Ambient temperature, °C (°F)	40 (104)
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)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	166 (9420)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	128 (7255)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	965 (38)
Fan, kWm (HP)	22 (30)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H <sub>2</sub> O)	0.125 (0.5)

High Ambient Radiator System	
Ambient temperature, °C (°F)	50 (122)
Engine jacket water capacity, L (gal.)	22.7 (6.0)
Radiator system capacity, including engine, L (gal.)	94.6 (25)
Engine jacket water flow, Lpm (gpm)	363 (96)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	166 (9420)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	128 (7255)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	1118 (44)
Fan, kWm (HP)	25 (33)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H <sub>2</sub> O)	0.125 (0.5)

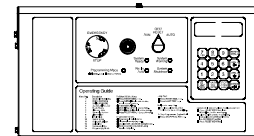
## Operation Requirements

Air Requirements	
Radiator-cooled cooling air, m <sup>3</sup> /min. (scfm)*	561 (19800)
High ambient radiator-cooled cooling air, m <sup>3</sup> /min. (scfm)*	708 (25000)
Combustion air, m <sup>3</sup> /min. (cfm)	39.5 (1395)
Heat rejected to ambient air:	
Engine, kW (Btu/min.)	74 (4200)
Alternator, kW (Btu/min.)	34 (1933)

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

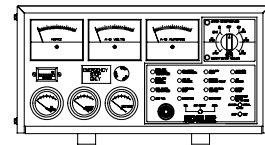
Fuel Consumption	
Diesel, Lph (gph) at % load	Standby Rating
100%	131.0 (34.6)
75%	100.3 (26.5)
50%	68.9 (18.2)
25%	36.3 (9.6)
Diesel, Lph (gph) at % load	Prime Rating
100%	122.6 (32.4)
75%	92.0 (24.3)
50%	62.1 (16.4)
25%	33.3 (8.8)

## Controllers



### Decision-Maker® 550 Controller

Audiovisual annunciation with NFPA 110 Level 1 capability. Programmable microprocessor logic and digital display features. Alternator safeguard circuit protection. 12- or 24-volt engine electrical system capability. Remote start, remote annunciation, and remote communication options. Refer to G6-46 for additional controller features and accessories.



### Decision-Maker® 3+, 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 G6-30 for additional controller features and accessories.

## Standard Features

- Alternator Protection (standard with 550 controller)
- Battery Rack and Cables
- Electronic, Isochronous Governor
- Oil Drain Extension

## Available Accessories

### Enclosed Unit

- Sound Enclosure
- Weather Enclosure
- Weather Housing

### Open Unit

- Exhaust Silencer, Hospital (kit: PA-354905)
- Exhaust Silencer, Critical (kit: PA-354880)
- Flexible Exhaust Connector, Stainless Steel

### Cooling System

- Block Heater
- High Ambient Radiator
- 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

- 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

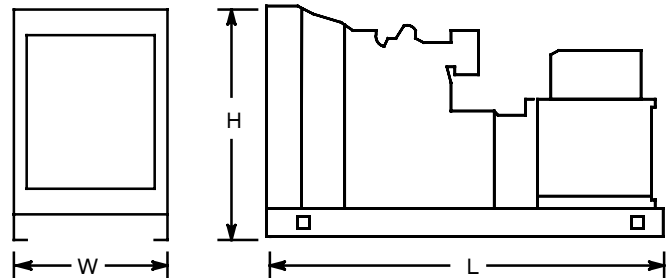
- Common Failure Relay Kit
- Communications Products and PC Software (550 controller only)
- Customer Connection Kit
- Dry Contact Kit (isolated alarm)
- Engine Prealarm Sender Kit
- Remote Annunciator Panel
- Remote Audiovisual Alarm Panel
- Remote Emergency Stop Kit
- Remote Mounting Cable
- Run Relay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

## Miscellaneous Accessories

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

## Dimensions and Weights

Overall Size, L x W x H, mm (in.): 3680 x 1325 x 2008  
 (144.9 x 52.2 x 79.0)  
 Weight (radiator model), wet, kg (lb.): 40°C radiator 3266 (7200)  
 50°C radiator 3629 (8000)



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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