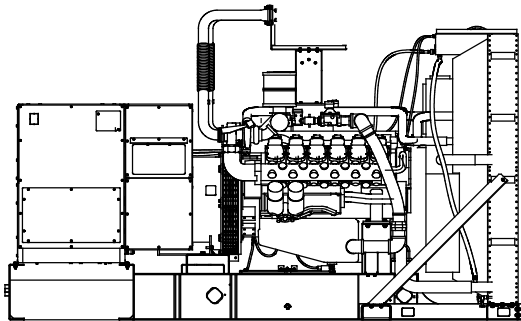




**Ratings Range**

		60 Hz	50 Hz
Standby:	kW	295-400	240-304
	kVA	369-500	300-380
Prime:	kW	360-365	272
	kVA	450-456	340



**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 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.
- A one-year limited warranty covers all systems and components. Two- and five-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.

**Generator Set Ratings**

Alternator	Voltage	Ph	Rich-Burn Natural Gas				Rich-Burn LP Gas (Vapor)			
			Hz	130° C Rise		105° C Rise		130° C Rise		
				Standby Rating	Prime Rating	Standby Rating	Prime Rating			
			kW/kVA	Amps	kW/kVA	Amps	kW/kVA	Amps		
5M4024	120/208	3	60	400/500	1388	360/450	1249	295/369	1024	
	127/220	3	60	400/500	1312	360/450	1181	295/369	968	
	139/240	3	60	400/500	1203	360/450	1083	295/369	887	
	220/380	3	60	400/500	760	360/450	684	295/369	560	
	240/416	3	60	400/500	694	360/450	625	295/369	512	
	277/480	3	60	400/500	601	360/450	541	295/369	444	
	110/190	3	50	304/380	1155	272/340	1033	240/300	912	
	115/200	3	50	304/380	1097	272/340	981	240/300	866	
	120/208	3	50	304/380	1055	272/340	944	240/300	833	
	220/380	3	50	304/380	577	272/340	517	240/300	456	
5M4027	230/400	3	50	304/380	548	272/340	491	240/300	433	
	240/416	3	50	304/380	527	272/340	472	240/300	416	
	120/208	3	60	400/500	1388	360/450	1249	295/369	1024	
	127/220	3	60	400/500	1312	360/450	1181	295/369	968	
	120/240	3	60	400/500	1203	360/450	1083	295/369	887	
	139/240	3	60	400/500	1203	360/450	1083	295/369	887	
	220/380	3	60	400/500	760	360/450	684	295/369	560	
	240/416	3	60	400/500	694	360/450	625	295/369	512	
	277/480	3	60	400/500	601	360/450	541	295/369	444	
	110/190	3	50	304/380	1155	272/340	1033	240/300	912	
5M4160	115/200	3	50	304/380	1097	272/340	981	240/300	866	
	120/208	3	50	304/380	1055	272/340	944	240/300	833	
	110/220	3	50	304/380	997	272/340	892	240/300	787	
	220/380	3	50	304/380	577	272/340	517	240/300	456	
	230/400	3	50	304/380	548	272/340	491	240/300	433	
	240/416	3	50	304/380	527	272/340	472	240/300	416	
	5M4160	220/380	3	60	400/500	760	360/450	684	260/325	494
	4M4266	347/600	3	60	400/500	481	365/456	439	300/375	361

RATINGS: All three-phase units are rated at 0.8 power factor. *Standby Ratings:* The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. *Prime Power Ratings:* 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 and ISO-3046-1. For limited running time and continuous ratings, consult the factory. Obtain technical information bulletin (TIB-101) for ratings guidelines, complete ratings definitions, and site condition derates. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. For dual fuel engines, use the LP gas ratings for both the primary and secondary fuels.

# Alternator Specifications

Specifications	Alternator
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet Pilot Exciter
Leads: quantity, type	10/12, Reconnectable 4, 600 V
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% (60Hz), 150% (50Hz)
Voltage regulation, no-load to full-load	Controller Dependent
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 (60Hz), 880 (50Hz)
480 V, 380 V 5M4027 (12 lead)	1550 (60Hz), 1100 (50Hz)
380 V 5M4160 (4 lead)	1175 (60Hz)
600 V 4M4266 (4 lead)	1300 (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 dripproof construction.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
- Digital solid-state, volts-per-hertz voltage regulator with  $\pm 0.25\%$  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	Doosan	
Engine model	D219TIC	
Engine type	21.9 L, 4-Cycle, Turbocharged, Charge Air-Cooled	
Cylinder arrangement	V-12	
Displacement, L (cu. in.)	21.9 (1338)	
Bore and stroke, mm (in.)	128 x 142 (5.04 x 5.59)	
Compression ratio	10.5:1	
Piston speed, m/min. (ft./min.)	511 (1677)	426 (1398)
Main bearings: quantity, type	14, Precision Half-Shell	
Rated rpm	1800	1500
Max. power at rated rpm, kWm (BHP)	451 (605)	370 (496)
Cylinder head material	Cast Iron	
Piston: type, material	—	
Crankshaft material	Forged Steel	
Valve material	—	
Governor: type, make/model	Electronic	
Frequency regulation, no-load to full-load	Isochronous	
Frequency regulation, steady state	$\pm 0.5\%$	
Frequency	Fixed	
Air cleaner type, all models	Dry	

### Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust manifold type	Wet	
Exhaust flow at rated kW, kg/hr. (cfm)	1787 (2546)	1448 (2063)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	600 (1112)	
Maximum allowable back pressure, kPa (in. Hg)	10.2 (3)	
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		45
Starter motor rated voltage (DC)		24
Battery, recommended cold cranking amps (CCA):		
Qty., CCA rating each		Two, 1000
Battery voltage (DC)		12

### Fuel

Fuel System	60 Hz	50 Hz
Fuel type	Natural Gas, LP Gas, or Dual Fuel	
Fuel supply line inlet	3.0 NPTF	
Natural gas fuel supply pressure, kPa (in. H <sub>2</sub> O)	1.74-2.74 (7.0-11.0)	
LPG vapor withdrawal fuel supply pressure, kPa (in. H <sub>2</sub> O)	1.24-2.74 (5.0-11.0)	
Dual fuel engine, LPG vapor withdrawal fuel supply pressure, kPa (in. H <sub>2</sub> O)	1.24 (5.0)	
Fuel supply pressure, measured at the generator set fuel inlet downstream of any fuel system equipment accessories.		

Fuel Composition Limits *	Nat. Gas	LP Gas
Methane, % by volume	90 min.	—
Ethane, % by volume	4.0 max.	—
Propane, % by volume	1.0 max.	85 min.
Propene, % by volume	0.1 max.	5.0 max.
C <sub>4</sub> and higher, % by volume	0.3 max.	2.5 max.
Sulfur, ppm mass	25 max.	
Lower heating value, MJ/m <sup>3</sup> (Btu/ft <sup>3</sup> ), min.	33.2 (890)	84.2 (2260)

\* Fuels with other compositions may be acceptable. If your fuel is outside the listed specifications, contact your local distributor for further analysis and advice.

# Application Data

## Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, L (qt.)	40 (42.3)	
Oil pan capacity with filter, L (qt.)	47.1 (49.7)	
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.)	53 (14)	
Radiator system capacity, including engine, L (gal.)	242 (64)	
Engine jacket water flow, Lpm (gpm)	660 (174)	550 (145)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	453 (25760)	377 (21451)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	38 (2150)	25 (1450)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	1321 (52)	
Fan, kWm (HP)	31.3 (42)	17.9 (24)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H <sub>2</sub> O)	0.125 (0.5)	

\* Weather and sound enclosures with internal silencer reduce ambient temperature capability by 5°C (9°F).

## Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m <sup>3</sup> /min. (scfm)†	821 (29000)	736 (26000)
Combustion air, kg/hr. (cfm)	1682 (841)	1362 (681)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	66 (3765)	55 (3138)
Alternator, kW (Btu/min.)	23 (1309)	20 (1138)

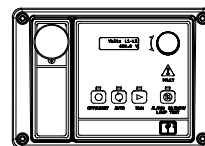
† Air density = 1.20 kg/m<sup>3</sup> (0.075 lbm/ft<sup>3</sup>)

Fuel Consumption ‡	60 Hz	50 Hz
<b>Natural Gas, m<sup>3</sup>/hr. (cfh) at % load</b>	<b>Standby Rating</b>	
100%	119.8(4231)	107.1(3782)
75%	93.4 (3298)	81.9 (2892)
50%	65.6 (2317)	56.4 (1992)
25%	40.0 (1413)	34.1 (1204)
<b>Natural Gas, m<sup>3</sup>/hr. (cfh) at % load</b>	<b>Prime Rating</b>	
100%	109.2(3856)	97.0 (3426)
75%	85.1 (3005)	74.3 (2624)
50%	60.5 (2137)	51.9 (1833)
25%	37.7 (1331)	32.7 (1155)
<b>LP Gas, m<sup>3</sup>/hr. (cfh) at % load</b>	<b>Standby Rating</b>	
100%	39.9 (1409)	33.6 (1187)
75%	34.0 (1201)	26.1 (922)
50%	22.9 (809)	19.4 (685)
25%	14.5 (512)	12.0 (424)

‡ Nominal fuel rating: Natural gas, 37 MJ/m<sup>3</sup> (1000 Btu/ft.<sup>3</sup>)  
LP vapor, 93 MJ/m<sup>3</sup> (2500 Btu/ft.<sup>3</sup>)

LP vapor conversion factors:  
8.58 ft.<sup>3</sup> = 1 lb.  
0.535 m<sup>3</sup> = 1 kg.  
36.39 ft.<sup>3</sup> = 1 gal.

## Controllers

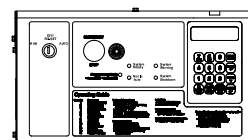


### Decision-Maker® 3000 Controller

Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.

- Digital display and menu control provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or serial configuration
- Controller supports Modbus® protocol
- Integrated hybrid voltage regulator with ±0.5% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-100 for additional controller features and accessories.

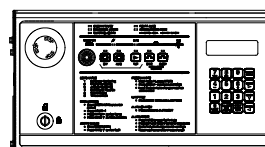


### Decision-Maker® 550 Controller

Provides advanced control, system monitoring, and system diagnostics with remote monitoring capabilities.

- Digital display and keypad provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or modem configuration
- Controller supports Modbus® protocol
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-46 for additional controller features and accessories.



### Decision-Maker® 6000 Paralleling Controller

Provides advanced control, system monitoring, and system diagnostics with remote monitoring capabilities for paralleling multiple generator sets.

- Paralleling capability with first-on logic, synchronizer, kW and kVAR load sharing, and protective relays
- Digital display and keypad provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or modem configuration
- Controller supports Modbus® protocol
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-107 for additional controller features and accessories.

Modbus® is a registered trademark of Schneider Electric.

## Standard Features

- Alternator Protection
- Battery Rack and Cables
- Closed Crankcase Ventilation
- Integral Vibration Isolation
- Local Emergency Stop Switch
- Low Coolant Level Shutdown
- Oil Drain Extension
- Operation and Installation Literature

## Available Options

### Approvals and Listings

- CSA Approval
- UL 2200 Listing

### Enclosed Unit

- Sound Enclosure with Internal Silencer (Aluminum)
- Sound Enclosure with Internal Silencer (Steel)
- Weather Enclosure with Internal Silencer (Steel)

### Open Unit

- Exhaust Silencer, Critical (kit: PA-324470)  
(Unit requires two silencers)
- Flexible Exhaust Connector, Stainless Steel  
(Kit contains two flexible exhaust connectors)

### Fuel System

- Dual Fuel NG/LPG (Automatic Changeover)
- Flexible Fuel Lines  
(required when the generator set skid is spring mounted)
- Gas Filter
- Secondary Gas Solenoid Valve

### Controller

- Common Failure Relay
- Communications Products and PC Software
- Customer Connection (Decision-Maker® 550 controller only)
- Decision-Maker® Paralleling System (DPS)  
(Decision-Maker® 6000 controller only)
- Dry Contact Kit (isolated alarm)  
(Decision-Maker® 550 and 6000 controllers only)
- Input/Output Module (Decision-Maker® 3000 controller only)
- Prime Power Switch  
(Decision-Maker® 550 and 6000 controllers only)
- Remote Audiovisual Alarm Panel  
(Decision-Maker® 550 and 6000 controllers only)
- Remote Emergency Stop
- Remote Serial Annunciator Panel
- Run Relay

### Cooling System

- Block Heater, 6000 W, 208 V, 1 Ph
- Block Heater, 6000 W, 240 V, (Select 1 Ph or 3 Ph)
- Block Heater, 6000 W, 380 V, 3 Ph
- Block Heater, 6000 W, 480 V, (Select 1 Ph or 3 Ph)  
Recommended for Ambient Temperatures Below 10°C (50°F)
- Radiator Duct Flange

### Electrical System

- Alternator Strip Heater
- Battery
- Battery Charger, Equalize/Float Type
- Battery Heater
- Line Circuit Breaker (NEMA1 enclosure)
- Line Circuit Breaker with Shunt Trip (NEMA1 enclosure)

### Miscellaneous

- Air Cleaner Restriction Indicator
- Certified Test Report
- Engine Fluids Added
- Rated Power Factor Testing

### Literature

- General Maintenance
- NFPA 110
- Overhaul
- Production

### Warranty

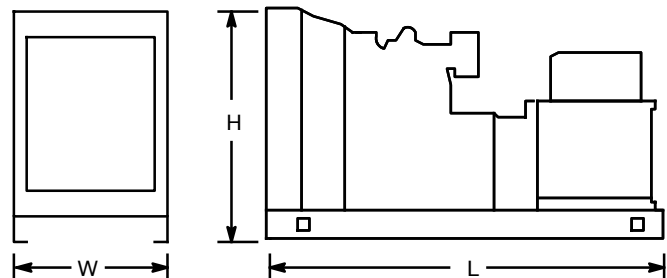
- 2-Year Basic
- 2-Year Prime
- 5-Year Basic
- 5-Year Comprehensive

### Other Options

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

## Dimensions and Weights

Overall Size, L x W x H, max., mm (in.): 3900 x 1975 x 2464  
 (153.5 x 77.8 x 97.0)  
 Weight (radiator model), wet, max., kg (lb.): 4162 (9175)



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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