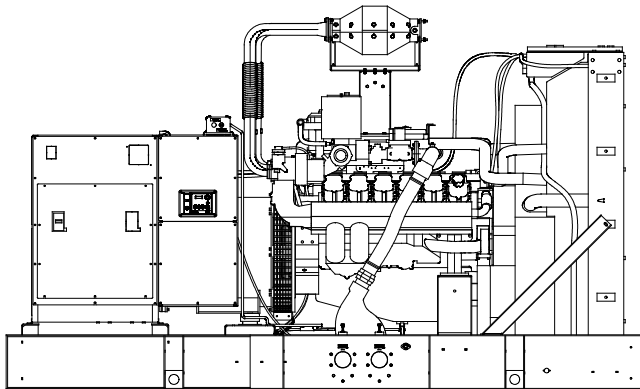




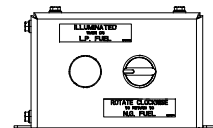
### Ratings Range

Standby:	kW kVA	60 Hz	50 Hz
		295- 400 369- 500	240- 304 300- 380



### 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 generator set systems and components. Two- and five-year extended limited 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.
- Dual fuel model features:
  - Natural gas is the primary fuel. Automatically transfers back to primary fuel when LP fuel becomes low or generator stops and restarts.
  - The patent pending reset box on the generator provides the ability to manually transfer back to natural gas.
  - The natural gas rating is available when running on natural gas.
  - APM603 controller provides load shed for automatic derate to LP ratings to prevent an overload condition.



Dual Fuel Reset Box

### Generator Set Ratings

Alternator	Voltage	Ph	Hz	Rich-Burn Natural Gas		Rich-Burn LP Gas (Vapor)	
				130° C Rise		130° C Rise	
				Standby Rating	Standby Rating	Standby Rating	Standby Rating
				kW/kVA	Amps	kW/kVA	Amps
5M4024	120/208	3	60	400/500	1388	295/369	1025
	127/220	3	60	400/500	1313	295/369	969
	139/240	3	60	400/500	1203	295/369	888
	220/380	3	60	400/500	760	295/369	561
	240/416	3	60	400/500	694	295/369	513
	277/480	3	60	400/500	602	295/369	444
	110/190	3	50	304/380	1155	240/300	912
	115/200	3	50	304/380	1097	240/300	867
	120/208	3	50	304/380	1055	240/300	833
	220/380	3	50	304/380	578	240/300	456
	230/400	3	50	304/380	549	240/300	434
	240/416	3	50	304/380	528	240/300	417

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. 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.

## Generator Set Ratings, Continued

Alternator	Voltage	Ph	Hz	Rich-Burn Natural Gas 130°C Rise Standby Rating		Rich-Burn LP Gas (Vapor) 130°C Rise Standby Rating	
				kW/kVA	Amps	kW/kVA	Amps
5M4027	120/208	3	60	400/500	1388	295/369	1025
	127/220	3	60	400/500	1313	295/369	969
	120/240	3	60	400/500	1203	295/369	888
	139/240	3	60	400/500	1203	295/369	888
	220/380	3	60	400/500	760	295/369	561
	240/416	3	60	400/500	694	295/369	513
	277/480	3	60	400/500	602	295/369	444
	110/190	3	50	304/380	1155	240/300	912
	115/200	3	50	304/380	1097	240/300	867
	120/208	3	50	304/380	1055	240/300	833
	110/220	3	50	304/380	998	240/300	788
	220/380	3	50	304/380	578	240/300	456
	230/400	3	50	304/380	549	240/300	434
	240/416	3	50	304/380	528	240/300	417
5M4160	220/380	3	60	400/500	760	260/325	494
4M4266	347/600	3	60	400/500	482	300/375	361

## Alternator Specifications

Specifications	Alternator
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet Pilot Exciter
Leads: quantity, type	10/12, Reconnectable
Voltage regulator	4, 600 V
Insulation:	Solid State, Volts/Hz
Material	NEMA MG1
Temperature rise	Class H, Synthetic, Nonhygroscopic
Bearing: quantity, type	130°C, 150°C Standby
Coupling	1, Sealed
Amortisseur windings	Flexible Disc
Rotor balancing	Full
Voltage regulation, no-load to full-load	125% (60Hz), 150% (50Hz)
One-step load acceptance	Controller Dependent
Unbalanced load capability	100% of Rating
Peak motor starting kVA:	100% of Rated Standby Current
480 V, 380 V 5M4024 (10 lead)	(35% dip for voltages below)
480 V, 380 V 5M4027 (12 lead)	1350 (60Hz), 880 (50Hz)
380 V 5M4160 (4 lead)	2200 (60Hz), 1655 (50Hz)
600 V 4M4266 (4 lead)	1175 (60Hz)
	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.
- Brushless alternator with brushless pilot exciter for excellent load response.

# Application Data

## Engine

Engine Specifications	60 Hz	50 Hz
Manufacturer	PSI/Doosan	
Engine model	D219L	
Engine type	21.9 L, 4-Cycle, Turbocharged, Charge Air-Cooled	
Cylinder arrangement	V-12	
Displacement, L (cu. in.)	21.9 (1336)	
Bore and stroke, mm (in.)	128 x 142 (5.0 x 5.6)	
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)		
Natural Gas	451 (605)	370 (496)
LP Gas	352 (472)	276 (370)
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	±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)	1932 (2529)	1447 (1708)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	614 (1136)	527 (981)
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, 925	
Battery voltage (DC)	12	

## 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	
§ Kohler recommends the use of Kohler Genuine oil and filters.		

## 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)	1.74-2.74 (7.0-11.0)	
Dual fuel engine, LPG vapor withdrawal fuel supply pressure, kPa (in. H <sub>2</sub> O)	1.74 (7.0)	
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.

## Cooling

Radiator System	60 Hz	50 Hz
Ambient temperature, °C (°F) *	50 (122)	
Engine jacket water capacity, L (gal.)	44 (12)	
Radiator system capacity, including engine, L (gal.)	190 (51)	
Engine jacket water flow, Lpm (gpm)	570 (151)	474 (125)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	516 (29345)	392 (22274)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	65 (3686)	40 (2248)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	1321 (52)	
Fan, kWm (HP)	31 (42)	18 (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 (41°F).

## Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m <sup>3</sup> /min. (scfm)†	870 (30700)	740 (26100)
Combustion air, kg/hr. (cfm)	1821 (829)	1364 (621)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	25 (1437)	21 (1168)
Alternator, kW (Btu/min.)	23 (1309)	20 (1138)

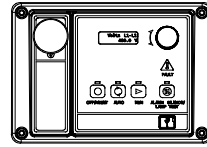
† Air density = 1.20 kg/m<sup>3</sup> (0.075 lbm/ft<sup>3</sup>)

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>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

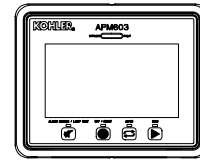


### APM402 Controller

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 G6-161 for additional controller features and accessories.

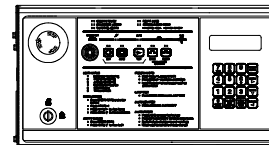


### APM603 Controller

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

- 7-inch graphic display with touch screen and menu control provides easy local data access
- Measurements are selectable in metric or English units
- Paralleling capability to control up to 8 generators on an isolated bus with first-on logic, synchronizer, kW and kVAR load sharing, and protective relays  
Note: Parallel with other APM603 controllers only
- Generator management to turn paralleled generators off and on as required by load demand
- Load management to connect and disconnect loads as required
- Controller supports Modbus® RTU, Modbus® TCP, SNMP and BACnet®
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- UL-listed overcurrent protective device
- NFPA 110 Level 1 capability

Refer to G6-162 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 to control up to 8 generators on an isolated bus with first-on logic, synchronizer, kW and kVAR load sharing, and protective relays  
Note: Parallel with other Decision-Maker® 6000 controllers only
- 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 (CCV) with Filters
- Dual Fuel Reset Box (standard on dual fuel models)
- Integral Vibration Isolation
- Local Emergency Stop Switch
- Low Coolant Level Shutdown
- Oil Drain Extension
- Operation and Installation Literature
- Secondary Gas Solenoid Valve

## Available Options

### Circuit Breakers

- | Type  | Rating   |
|---|--|
| <input type="checkbox"/> Magnetic Trip                            | <input type="checkbox"/> 80%                                     |
| <input type="checkbox"/> Thermal Magnetic Trip                    | <input type="checkbox"/> 100%                                    |
| <input type="checkbox"/> Electronic Trip (LI)                     | <b>Operation</b>   |
| <input type="checkbox"/> Electronic Trip with Short Time (LSI)    | <input type="checkbox"/> Manual                                  |
| <input type="checkbox"/> Electronic Trip with Ground Fault (LSIG) | <input type="checkbox"/> Manual with Shunt Trip                  |
|   | <input type="checkbox"/> Electrically Operated (for paralleling) |

### Circuit Breaker Mounting

- Generator Mounted
- Remote Mounted
- Bus Bar (for remote mounted breakers)

### Enclosed Remote Mounted Circuit Breakers

- NEMA 1 (15- 5000 A)
- NEMA 3R (15- 1200 A)

### Approvals and Listings

- CSA Certified
- 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 includes 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

### Controller

- Common Failure Relay
- Communications Products and PC Software
- Decision-Maker® Paralleling System (DPS) (Decision-Maker® 6000 controller only)
- Dry Contact Kit (isolated alarm) (Decision-Maker® 6000 controller only)
- Two Input/Five Output Module (APM402 controller only)
- Four Input/Fifteen Output Module (APM603 controller only)
- Prime Power Switch (Decision-Maker® 6000 controllers only)
- Remote Audiovisual Alarm Panel (Decision-Maker® 6000 controllers only)
- Remote Emergency Stop
- Remote Serial Annunciator Panel
- Run Relay (standard with APM603 controller)
- Manual Key Switch (APM603 controller only)
- Manual Speed Adjust (APM402 controller only)

### 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) Required for Ambient Temperatures Below 10°C (50°F)
- Radiator Duct Flange

### Electrical System

- Generator Heater
- Battery
- Battery Charger
- Battery Heater

### Miscellaneous

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

### Literature

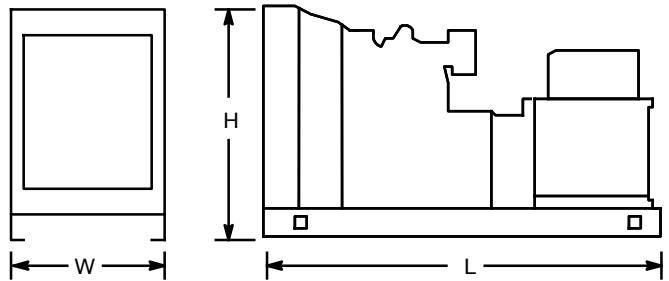
- General Maintenance
- NFPA 110
- Overhaul
- Production

### Warranty

- 2-Year Basic Limited Warranty
- 2-Year Prime Limited Warranty
- 5-Year Basic Limited Warranty
- 5-Year Comprehensive Limited Warranty
- 10-Year Major Components Limited Warranty

### Dimensions and Weights

Overall Size, L x W x H, max., mm (in.):	4100 x 2190 x 2464 (161.4 x 86.2 x 97.0)
Weight (radiator model), wet, max., kg (lb.):	5040 (11115) with 4M4266 5220 (11510) with 5M4024 5260 (11600) with 5M4027 5220 (11510) with 5M4160



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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