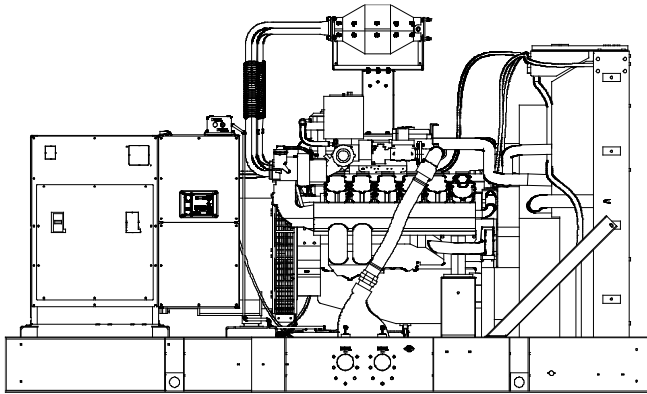


EPA-Certified for Stationary Emergency Applications

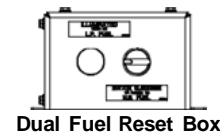
## Ratings Range

		60 Hz
Standby:	kW	500
	kVA	625



## Standard Features

- 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 cULus 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 130°C Rise Standby Rating		Rich-Burn LP Gas (Vapor) 130°C Rise Standby Rating	
				kW/kVA	Amps	kW/kVA	Amps
5M4028	120/208	3	60	500/625	1735	295/369	1025
	127/220	3	60	500/625	1641	295/369	969
	139/240	3	60	500/625	1504	295/369	888
	220/380	3	60	470/587	894	295/369	561
	240/416	3	60	500/625	868	295/369	513
	277/480	3	60	500/625	752	295/369	444
5M4030	120/208	3	60	500/625	1735	295/369	1025
	127/220	3	60	500/625	1641	295/369	969
	139/240	3	60	500/625	1504	295/369	888
	220/380	3	60	485/606	894	295/369	561
	240/416	3	60	500/625	868	295/369	513
	277/480	3	60	500/625	752	295/369	444
5M4270*	347/600	3	60	490/612	589	290/362	349
5M4272	347/600	3	60	500/625	602	295/369	356

\* Only available for IBC and/or OSHPD orders.

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. 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.

### Alternator Specifications

Specifications	Alternator	
Type	4-Pole, Rotating-Field	<ul style="list-style-type: none"> <li>NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.</li> <li>Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.</li> <li>Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.</li> <li>Self-ventilated and dripproof construction.</li> <li>Superior voltage waveform from a two-thirds pitch stator and skewed rotor.</li> <li>Brushless alternator with brushless pilot exciter for excellent load response.</li> </ul>
Exciter type	Brushless, Permanent-Magnet Pilot Exciter	
Leads: quantity, type	10, 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	
Voltage regulation, no-load to full-load	Controller Dependent	
Rotor balancing	125%	
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	5M4028 (10 lead)	2550 (60Hz)
480 V	5M4030 (10 lead)	2550 (60Hz)
600 V	5M4270 (4 lead)	1250 (60 Hz)
600 V	5M4272 (4 lead)	1750 (60Hz)

### Application Data

#### Engine

##### Engine Specifications

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)
Main bearings: quantity, type	14, Precision Half-Shell
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	
Natural Gas	570 (764)
LP Gas	352 (472)
Cylinder head material	Cast Iron
Piston: type, material	--
Crankshaft material	Forged Steel
Valve material	--
Governor: type	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

Exhaust manifold type	Wet
Exhaust flow at rated kW, kg/hr. (cfm)	
Natural Gas	2136 (2980)
LP Gas	1341 (1686)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	
Natural Gas	674 (1244)
LP Gas	577 (1071)
Maximum allowable back pressure overall, kPa (in. Hg)	17.9 (5.3)
Maximum allowable back pressure, after catalyst, kPa (in. Hg)	6.3 (1.9)
Engine exhaust outlet size, mm (in.)	Flanged Outlet at Catalyst, see ADV drawing

#### Engine Electrical

##### Engine Electrical System

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

#### Fuel

##### Fuel System – Rich Burn

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 authorized distributor for further analysis and advice.

### Application Data

#### Lubrication

##### Lubricating System

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

§ Rehiko recommends the use of Rehiko Genuine oil and filters.

#### Cooling

##### Radiator System

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)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	
Natural Gas	561.9 (31957)
LP Gas	402 (22839)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	
Natural Gas	73.9 (4202)
LP Gas	35 (2009)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	1321 (52)
Fan, kWm (HP)	40.8 (54.7)

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 reduces ambient temperature capability by 5°C (41°F).

#### Operation Requirements

##### Air Requirements

Radiator-cooled cooling air, m <sup>3</sup> /min. (scfm)†	1010 (35700)
Combustion air, m <sup>3</sup> /min. (cfm)	
Natural Gas	2013 (917)
LP Gas	1257 (572)
Heat rejected to ambient air:	
Engine, kW (Btu/min.)	27.5 (1565)
Alternator, kW (Btu/min.)	37 (49.6)

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

##### Fuel Consumption‡

Natural Gas, m <sup>3</sup> /hr. (cfh) at % load	Standby Rating
100%	166.7 (5888)
75%	131.1 (4630)
50%	96.7 (3414)
25%	61.6 (2175)
LP Gas, m <sup>3</sup> /hr. (cfh) at % load	Standby Rating
100%	45.2 (1595)
75%	33.3 (1177)
50%	28.1 (991)
25%	19.3 (681)

‡ 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>)

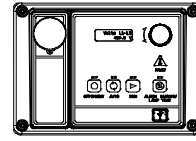
LP vapor conversion factors:

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

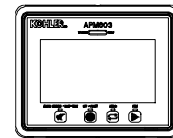


#### APM402 Controller

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<sup>®</sup> 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<sup>®</sup> RTU, Modbus<sup>®</sup> TCP, SNMP and BACnet<sup>®</sup>
- 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.

Modbus<sup>®</sup> is a registered trademark of Schneider Electric.  
BACnet<sup>®</sup> is a registered trademark of ASHRAE.

## Standard Features

- Alternator Protection
- Battery Rack and Cables
- Closed Crankcase Ventilation (CCV) with Filters
- Integral Vibration Isolation
- Local Emergency Stop Switch
- Low Coolant Level Shutdown
- Oil Drain Extension
- Operation and Installation Literature
- Secondary Gas Solenoid Valve
- Three-Way Exhaust Catalyst

## Available Options

- |   |  |               |
|---|--|---------------|
| <b>Circuit Breakers Type</b>                                      |  | <b>Rating</b> |
| <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)
- Enclosures for Remote Mounted Circuit Breakers**
- NEMA 1 (15-5000 A)
  - NEMA 3R (15-1200 A)
- Approvals and Listings**
- cULus (UL 2200 and CSA)
  - Hurricane Rated Enclosure
  - IBC Seismic Certification
- Enclosed Unit**
- Sound Enclosure with internal Silencer (Aluminum)
  - Sound Enclosure with internal Silencer (Steel)
  - Weather Enclosure and internal Silencer (Steel)
- Open Unit**
- Exhaust Silencer, Critical (Kit includes two silencers)
  - Flexible Exhaust Connector, Stainless Steel (Kit contains two flexible exhaust connectors)
- Controller**
- Common Failure Relay
  - Communications Products and PC Software
  - Two Input/Five Output Module (APM402 controller only)
  - Four Input/Fifteen Output Module (APM603 controller only)
  - Lockable Remote Emergency Stop
  - Remote Serial Annunciator Panel
  - Run Relay (standard with APM603)
  - Manual Key Switch (APM603 controller only)
  - Manual Speed Adjust (APM402 controller only)

## Cooling System

- Block Heater, 6000 W, 208 V; 1Ph
- Block Heater, 6000 W, 240 V, (Select 1 Ph or 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 Charger Temperature Compensation
- Battery Heater

## Fuel System

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

## Miscellaneous

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

## Literature

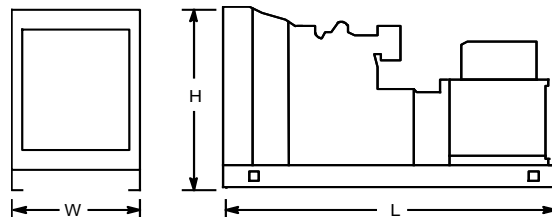
- General Maintenance
- NFPA 110
- Overhaul
- Production

## Warranty

- 2-Year Basic Limited Warranty
- 5-Year Basic Limited Warranty
- 5-Year Comprehensive Limited Warranty
- 10-Year Major Component 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.):	5360 (11820) with 5M4028 5380 (11860) with 5M4030 5260 (11600) with 5M4270 5380 (11860) with 5M4272



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local authorized distributor for more detailed information.