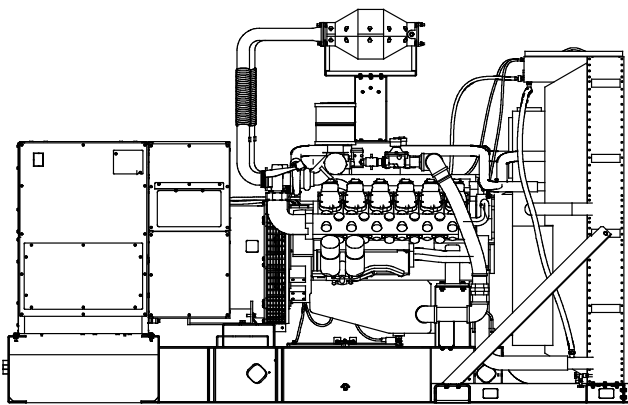




EPA-Certified for Stationary and Mobile Emergency and Non-Emergency Applications

Ratings Range

		60 Hz
Standby:	kW	295- 400
	kVA	369- 500
Prime:	kW	360- 365
	kVA	450- 456



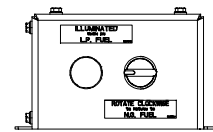
Standard Features

- 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 LPG 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 LPG ratings to prevent an overload condition.

Generator Set Ratings

Alternator	Voltage	Ph	Hz	Rich-Burn Natural Gas				Rich-Burn LP Gas (Vapor)	
				130° C Rise		105° C Rise		130° C Rise	
				Standby Rating	Prime Rating	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	
5M4027	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	
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.



Dual Fuel Reset Box

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
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	5M4024 (10 lead) 1350 (60Hz)
480 V	5M4027 (12 lead) 1550 (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.
- Brushless alternator with brushless pilot exciter for excellent load response.

Application Data

Engine

Engine Specifications	
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)
Main bearings: quantity, type	14, Precision Half-Shell
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	451 (605)
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)	1787 (2546)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	600 (1112)
Maximum allowable back pressure overall, kPa (in. Hg)	10.2 (3)
Maximum allowable back pressure after catalyst, kPa (in. Hg)	5.1 (1.5)
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 ₂ O)		1.74- 2.74 (7.0- 11.0)
LPG vapor withdrawal fuel supply pressure, kPa (in. H ₂ O)		1.24- 2.74 (5.0- 11.0)
Dual fuel engine, LPG vapor withdrawal fuel supply pressure, kPa (in. H ₂ 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 ₄ and higher, % by volume	0.3 max.	2.5 max.
Sulfur, ppm mass		25 max.
Lower heating value, MJ/m ³ (Btu/ft ³), 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

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.	

Cooling

Radiator System

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)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	453 (25760)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	38 (2150)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	1321 (52)
Fan, kWm (HP)	31.3 (42)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H ₂ 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

Radiator-cooled cooling air, m ³ /min. (scfm) †	821 (29000)
Combustion air, kg/hr. (cfm)	1682 (841)
Heat rejected to ambient air:	
Engine, kW (Btu/min.)	66 (3765)
Alternator, kW (Btu/min.)	23 (1309)

† Air density = 1.20 kg/m³ (0.075 lbm/ft³)

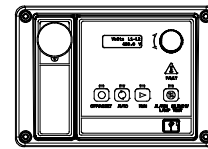
Fuel Consumption‡

Natural Gas, m ³ /hr. (cfh) at % load	Standby Rating
100%	119.8 (4231)
75%	93.4 (3298)
50%	65.6 (2317)
25%	40.0 (1413)
Natural Gas, m ³ /hr. (cfh) at % load	Prime Rating
100%	109.2 (3856)
75%	85.1 (3005)
50%	60.5 (2137)
25%	37.7 (1331)
LP Gas, m ³ /hr. (cfh) at % load	Standby Rating
100%	39.9 (1409)
75%	34.0 (1201)
50%	22.9 (809)
25%	14.5 (512)

‡ Nominal fuel rating: Natural gas, 37 MJ/m³ (1000 Btu/ft.³)
LP vapor, 93 MJ/m³ (2500 Btu/ft.³)

LP vapor conversion factors:
8.58 ft.³ = 1 lb.
0.535 m³ = 1 kg.
36.39 ft.³ = 1 gal

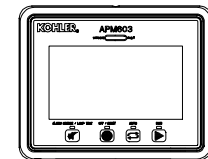
Controllers



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

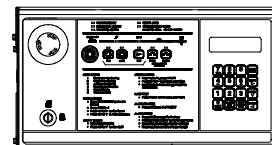
Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.

- 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
- Integral Vibration Isolation
- Local Emergency Stop Switch
- Low Coolant Level Shutdown
- Oil Drain Extension
- Operation and Installation Literature
- Three-Way Exhaust Catalyst
- Dual Fuel Reset Box (standard on dual fuel models)

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) | Operation |
| <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
- IBC Seismic Certification
- UL 2200 Listing
- Hurricane Rated Enclosure

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)

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 only)
- Two Input/Five Output Module (APM402 controller only)
- Four Input/Fifteen Output Module (APM603 controller only)
- Prime Power Switch (Decision-Maker® 6000 only)
- Pre-Alarms, NFPA110
- Remote Emergency Stop
- 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, 1 Ph
- 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
- Secondary Gas Solenoid Valve

Miscellaneous

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

Literature

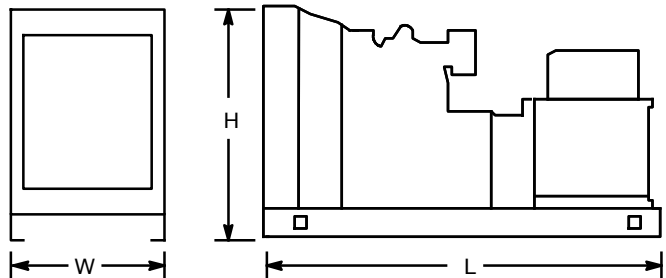
- General Maintenance
- NFPA 110
- Overhaul
- Production

Warranty

- 2-Year Basic Limited Warranty
- 2-Year Prime Limited Warranty
- 5-Year Basic Limited Warranty
- 5-Year Comprehensive Limited Warranty

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.): 4257 (9385)



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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