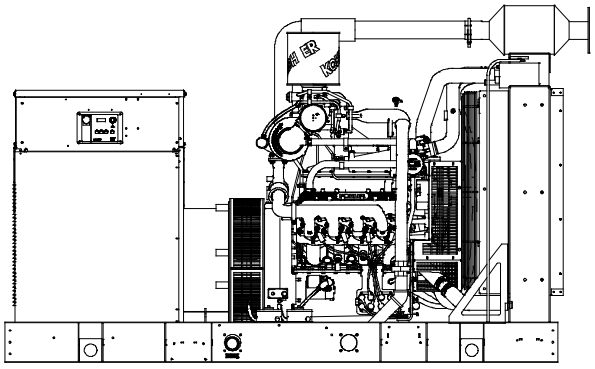
Industrial Generator Set - KG200

208-600 V Gas

EPA-Certified for Stationary Emergency Applications

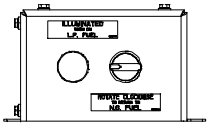
Ratings Range

		50 Hz	60 Hz
Standby:	**kW**	120-160	150-200
	kVA	150-200	150-250



Standard Features

- Rehlko 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 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 for purchase in some jurisdictions.
- Alternator features:
  - The unique Fast-Response® X excitation system delivers excellent voltage response and short-circuit capability using a rare-earth, permanent magnet (PM)-excited alternator. (For 4S13X Alternator)
  - The unique Fast-Response® II excitation system delivers excellent voltage response and short-circuit capability using a permanent magnet (PM)-excited alternator. (For 4UA13 and 4UA9 Alternators)
  - The brushless, rotating-field alternator has broadrange reconnectability.
- Natural gas, LP gas, and dual fuel models are available.
- 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 patented 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

				Natural Gas 130°C Rise Standby Rating		LP Gas 130°C Rise Standby Rating	
Alternator	**Voltage**	**Ph**	**Hz**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**
4S13X	120/208	3	60	180/225	625	150/188	522
	127/220	3	60	190/238	625	150/188	494
	120/240	3	60	180/225	542	150/188	453
	220/380	3	60	165/206	313	150/188	286
	254/440	3	60	190/238	313	150/188	247
	277/480	3	60	200/250	301	150/188	227
	347/600	3	60	180/225	217	150/188	181
	115/200	3	50	160/200	578	120/150	434
	110/220	3	50	156/195	512	120/150	394
	220/380	3	50	156/195	297	120/150	228
	230/400	3	50	160/200	289	120/150	217
	240/416	3	50	160/200	278	120/150	209
4UA9	120/208	3	60	200/250	694	150/188	522
	127/220	3	60	200/250	657	150/188	494
	120/240	3	60	200/250	602	150/188	453
	220/380	3	60	200/250	380	150/188	286
	254/440	3	60	200/250	329	150/188	247
	277/480	3	60	200/250	301	150/188	227
	347/600	3	60	200/250	241	150/188	181
	115/200	3	50	160/200	577	120/150	434
	110/220	3	50	160/200	525	120/150	394
	220/380	3	50	160/200	304	120/150	228
	230/400	3	50	160/200	289	120/150	217
	240/416	3	50	160/200	278	120/150	208

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200 Twin Oaks Road, Kohler, WI 53044 USA
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Generator Set Ratings, continued

Alternator	Voltage	Ph	Hz	Natural Gas 130°C Rise Standby Rating kW/kVA	Amps	LP Gas 130°C Rise Standby Rating kW/kVA	Amps
4UA13	120/208	3	60	200/250	694	150/188	522
	127/220	3	60	200/250	657	150/188	494
	120/240	1	60	190/190	792	150/150	625
	120/240	3	60	200/250	602	150/188	453
	220/380	3	60	200/250	380	150/188	286
	254/440	3	60	200/250	329	150/188	247
	277/480	3	60	200/250	301	150/188	227
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	230/400	3	50	160/200	289	120/150	217
	240/416	3	50	160/200	278	120/150	209

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 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
Exciter type	Brushless, Rare-Earth Permanent Magnet
Leads: quantity, type	
4SX, 4UA	12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation:	NEMA MG1
Material	Class H
Temperature rise	130°C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
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 4UA9 (12 lead)	700 (60 Hz)
480 V 4S13X (12 lead)	570 (60 Hz)
480 V 4UA13 (12 lead)	980 (60 Hz)

- 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.
- Windings are vacuum-impregnated with epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.

Application Data

Engine

Engine Specifications	60 Hz	50 Hz
Engine: model, type	KG10V08T-6DGS, 10.3 L, 4-Cycle, Turbocharged and Aftercooled	
Cylinder arrangement	V-8	
Displacement, L (cu. in.)	10.3 (632)	
Bore and stroke, mm (in.)	116.8 x 120.6 (4.6 x 4.7)	
Compression ratio	9.3:1	
Piston speed, m/min. (ft./min.)	434.3 (1425)	
Main bearings: quantity, type	5, Tri-Metal	
Rated rpm	1800	1500
Max. power at rated rpm (NG), kW (HP)	227 (304)	182 (244)
Max. power at rated rpm (LPG), kW (HP)	178 (239)	143 (192)
Cylinder head material	Cast Iron	
Piston type and material	Dished Top Forged Aluminum	
Crankshaft material	Forged Steel	
Valve (exhaust) material	Inconel	
Governor type	Electronic	
Frequency regulation, no-load to full-load	Isochronous	
Frequency regulation, steady state	±0.75%	
Frequency	Fixed	
Air cleaner type, all models	Dry	

Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust manifold type	Dry	
Exhaust flow at rated kW, m^3/min. (cfm)	41.6 (1469)	32.9 (1162)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	764 (1407)	704 (1300)
Maximum allowable overall back pressure, kPa (in. Hg)	19.8 (5.87)	5.85 (1.74)
Maximum allowable back pressure after catalyst, kPa (in. Hg)	14.3 (4.24)	4.2 (1.25)
Exhaust outlet size at engine hookup, mm (in.)	Flanged Outlet at Catalyst see ADV drawing	

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Engine Electrical

Engine Electrical System	60 Hz	50 Hz
Ignition system	Coil Pack	
Battery charging alternator:		
Ground (negative/positive)	Negative	
Volts (DC)	12	
Ampere rating	130	
Starter motor rated voltage (DC)	12	
Battery, recommended cold cranking amps (CCA):		
Qty., rating for -18°C (0°F)	one, 925	
Battery voltage (DC)	12	

Fuel

Fuel System	60 Hz	50 Hz
Fuel type	Natural Gas, LP Gas, or Dual Fuel	
Fuel supply line inlet	2 NPT	
Natural gas, LPG, and Dual fuel supply pressure, kPa (in. H_2O)	1.74-2.74 (7-11)	

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.

Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, L (qt.) §	11.3 (12)	
Oil pan capacity with filter, L (qt.) §	15.1 (16)	
Oil filter: quantity, type §	1, Cartridge	

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

Cooling

Radiator System	60 Hz	50 Hz
Ambient temperature, °C (°F)*	50 (122)	
Engine jacket water capacity, L (gal.)	11 (2.9)	
Radiator system capacity, including engine, L (gal.)	34 (9)	
Engine jacket water flow, Lpm (gpm)	219 (58)	182 (48)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	102 (5800)	104 (5914)
Heat rejected to charge cooling air at rated kW, dry exhaust, kW (Btu/min.)	20.1 (1143)	23.5 (1336)
Heat rejected to engine oil at rated kW, dry exhaust, kW (Btu/min.)	20.5 (1165)	20 (1137)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	900 (35.4)	
Fan, kWm (HP)	15 (20.1)	9 (12)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H_2O)	0.125 (0.5)	

* Enclosure with enclosed silencer reduces ambient temperature capability by 5°C (9°F).

Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m^3/min. (scfm)†	331 (11700)	275 (9700)
Combustion air, m^3/min. (cfm)	11.33 (400)	9.77 (345)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	58.2 (3309)	40 (2275)
Alternator, kW (Btu/min.)	16 (910)	13.8 (784)

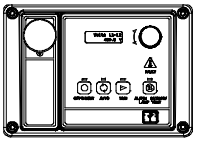
Air density = 1.20 kg/m^3 (0.075 lbm/ft^3)

Fuel Consumption‡	60Hz	50Hz
Natural Gas, m^3/hr. (cfh) at % load	Standby Ratings	
100%	67.9 (2398)	51.9 (1832)
75%	53.1 (1874)	40.7 (1436)
50%	38.2 (1350)	29.4 (1040)
25%	23.4 (826)	18.2 (644)
0%	8.5 (302)	7.0 (248)
LP Gas, m^3/hr. (cfh) at % load	Standby Ratings	
100%	23.5 (829)	18.9 (669)
75%	18.5 (654)	12.6 (443)
50%	13.6 (479)	9.3 (327)
25%	8.6 (304)	6.8 (239)
0%	3.7 (129)	2.8 (100)

‡ Nominal Fuel Rating: Natural gas, 37 MJ/m^3 (1000 Btu/ft.^{3})
LP vapor, 93 MJ/m^3 (2500 Btu/ft.^{3})

LP vapor conversion factors:
8.58 ft.^{3} = 1 lb.
0.535 m^3 = 1 kg.
36.39 ft.^{3} = 1 gal.

Controllers

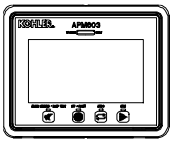


APM402 Controller

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
- 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.

Modbus® is a registered trademark of Schneider Electric.

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208-600 V Gas

Standard Features

- Air Cleaner Restrictor Indicator
- Alternator Protection
- Battery Rack and Cables
- Closed Crankcase Ventilation (CCV) Filter
- Dual Fuel Reset Box (standard on dual fuel models)
- Gas Fuel System (includes fuel mixer, electronic secondary gas regulator, gas solenoid valve, and flexible fuel line between the engine and the skid-mounted fuel system components)
- Integral Vibration Isolation
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Literature
- Open Unit Accessory Kit (Duct Flange, Stone Guard, and Three-Way Exhaust Catalyst)

Available Options

Circuit Breakers

Type

- ❑ Magnetic Trip
- ❑ Thermal Magnetic Trip
- ❑ Electronic Trip (LI)
- ❑ Electronic Trip with Short Time (LSI)
- ❑ Electronic Trip with Ground Fault (LSIG)

Rating

- ❑ 80%
- ❑ 100%

Operation

- ❑ Manual
- ❑ 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
- ❑ NEMA 3R

Approvals and Listings

- ❑ cULus (UL 2200 and CSA)
- ❑ IBC Seismic Certification
- ❑ Hurricane Rated Enclosure (Available with Premium Aluminum Sound Enclosure Only)

Enclosed Unit

- ❑ Sound Enclosure (with enclosed critical silencer)
- ❑ Weather Enclosure (with enclosed critical silencer)

Open Unit

- ❑ Exhaust Silencer, Critical

Fuel System

- ❑ Dual Fuel NG/LPG (automatic changeover)
- ❑ Flexible Fuel Line
- ❑ Fuel Filter Kit
- ❑ Secondary Gas Solenoid Valve (UL Fuel System)

Controller

- ❑ Failure Relay w/Harness,1 Fault (APM603 controller only)
- ❑ Four Input/Fifteen Output Module
- ❑ Lockable Emergency Stop
- ❑ Manual Speed Adjust (APM402 controller only)
- ❑ Manual Key Switch (APM603 controller only)
- ❑ Paralleling, Gen Mounted EOB (APM603 controller only)
- ❑ Paralleling, Remote Mounted EOB (APM603 controller only)
- ❑ Remote Annunciator Panel
- ❑ Remote Emergency Stop Switch
- ❑ Run Relay, 12 V
- ❑ Two Input/Five Output Module (APM402 controller only)

Cooling System

- ❑ Block Heater, 1500 W, 120 V
- ❑ Block Heater, 1500 W, 240 V
  Required for ambient temperatures below 10°C (50°F)

Electrical System

- ❑ Battery
- ❑ Battery Charger (6A or 10A)
- ❑ Temperature Compensation for 10A Battery Charger
- ❑ Battery Heater, 120 V
- ❑ Alternator Strip Heater
- ❑ Basic Electrical package (Includes 30 A terminal strip, DC light switch, 20 A, 240 VAC receptacle , and 20 A, 120 VAC GFI receptacles.)

Miscellaneous

- ❑ Certified Test Report
- ❑ Engine Fluids (oil and coolant) Added
- ❑ Rodent Guards
- ❑ Skid End Caps

Literature

- ❑ General Maintenance
- ❑ NFPA 110
- ❑ Overhaul
- ❑ Production

Warranty

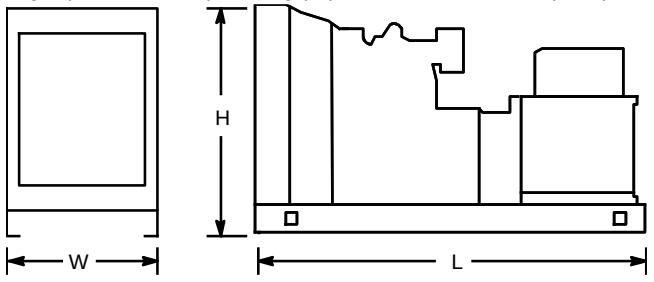
- ❑ 2-Year Basic Limited Warranty
- ❑ 5-Year Basic Limited Warranty
- ❑ 5-Year Comprehensive Limited Warranty
- ❑ 10-Year Extended Warranty

Other Options

- ❑ _____
- ❑ _____

Dimensions and Weights

Overall Size, L x W x H, mm (in.):	2800 x 1340 x 1809 (110.2 x 52.8 x 71.2)
Weight (radiator model), wet, kg (lb.):	2030 (4480)



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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