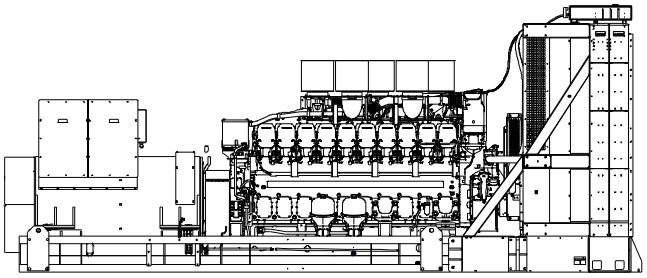
Industrial Diesel Generator Set - KD4000

Emission Optimized -Tier 2 EPA-Certified for Stationary Emergency Applications



Ratings Range

		60 Hz
Standby:	**kW**	4000
	kVA	5000
Prime:	**kW**	3640
	kVA	4550

Standard Features

- Rehlko provides one-source responsibility for the generating system and accessories.
- Approved for use with certified renewable Hydrotreated Vegetable Oil (HVO)/Renewable Diesel (RD) fuels compliant with EN15940/ASTM D975.
- 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.
- A standard three-year unlimited-hour limited warranty for standby applications in the U.S. And Canada. Five-year basic, five-year comprehensive, and ten-year extended limited warranties are also available for purchase in some jurisdictions.
- A standard two-year or 8700-hour limited warranty for prime power applications.
- Other features:
  - Rehlko designed controllers for one-source system integration and remote communication. See Controllers on page 4.

Conscious Care™ Qualified

- Reduce operating costs, fuel consumption, and greenhouse gas emissions with Conscious Care™ maintenance program.

General Specifications

Orderable Generator Model Number	GMKD4000
Manufacturer	Rehlko
Engine: model	KD103V20
Alternator Choices	KH09370TO4D KH10171TO4D
Performance Class	Per ISO 8528-5
One Step Load Acceptance	100%
Voltage	4160 V, 6600 V, 12470 V, 13200 V, 13800 V
Controller	APM603, APM802
Fuel Consumption, L/hr (gal./hr) 100% at Standby	1060 (280.0)
Fuel Consumption, L/hr (gal./hr) 100% at Prime Power	959 (253.3)
Emission Level Compliance (KDxxxx)	Tier 2
Open Unit Noise Level @ 7 m dB(A) at Rated Load	99
Data Center Continuous (DCC) Rating (Refer to TIB-101 for definitions)	Same as the Standby Rating below

Generator Set Ratings

				130°C Rise Standby Rating			105°C Rise Prime Rating		
Alternator	**Voltage**	**Ph**	**Hz**	**kW**	**kVA**	**Amps**	**kW**	**kVA**	**Amps**
KH09370TO4D	2400/4160	3	60	4000	5000	694	3640	4550	631
	3810/6600	3	60	4000	5000	437	3640	4550	398
	7200/12470	3	60	4000	5000	231	3640	4550	211
	7620/13200	3	60	4000	5000	219	3640	4550	199
	7970/13800	3	60	4000	5000	209	3640	4550	190
KH10171TO4D	2400/4160	3	60	4000	5000	694	3640	4550	631
	3810/6600	3	60	4000	5000	437	3640	4550	398
	7200/12470	3	60	4000	5000	231	3640	4550	211
	7620/13200	3	60	4000	5000	219	3640	4550	199
	7970/13800	3	60	4000	5000	209	3640	4550	190

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.

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Industrial Diesel Generator Set - KD4000

Emission Optimized -Tier 2 EPA-Certified for Stationary Emergency Applications

Engine Specifications	60 Hz
Engine: model	KD103V20
Engine: type	4-Cycle, Turbocharged, Intercooled
Cylinder arrangement	20-V
Displacement, L (cu. in.)	103 (6304)
Bore and stroke, mm (in.)	175 x 215 (6.89 x 8.46)
Compression ratio	16.0:1
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	4290 (5753)
Governor: type, make/model	KODEC Electronic Control
Frequency regulation, no-load to full-load	Isochronous
Frequency regulation, steady state	±0.25%
Frequency	Fixed

Lubricating System	60 Hz
Type	Full Pressure
Oil pan capacity with filter (initial fill), L (qt.) §	700 (740)
Oil filter: quantity, type §	10, Cartridge

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

Fuel System	60 Hz
Max. fuel flow, Lph (gph)	1200 (317)
Maximum diesel fuel lift, m (ft.)	3.7 (12)
Fuel filter: quantity, type	3, Primary Engine Filter 2, Fuel/Water Separator
Recommended fuel	#2 Diesel ULSD/HVO/RD

Fuel Consumption**	60 Hz	
At % load of Engine power rating (Standby)	**lph**	**(gph)**
100%	1060	(280.0)
75%	870	(230.0)
50%	580	(153.3)
25%	323	(85.3)
At % load of Engine power rating (Prime)	**lph**	**(gph)**
100%	959	(253.3)
75%	774	(204.5)
50%	530	(140.0)
25%	299	(79.1)

** Assumed volumetric fuel consumption with diesel fuel having an LHV of 42.7kJ/kg and weighing 0.85kg/l.

Radiator System	60 Hz EPA Tier 2	60 Hz Low NO_x EPA Tier 2
Ambient temperature, °C (°F)	50 (122)	45 (113)
Engine jacket water capacity, L (gal.)	400 (106)	
Radiator system capacity, including engine, L (gal.)	1217 (321)	
Engine jacket water flow, Lpm (gpm)	2400 (634)	
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	1370 (77912)	1450 (82462)
Charge cooler water flow, Lpm (gpm)	910 (240)	
Heat rejected to charge cooling water at rated kW, dry exhaust, kW (Btu/min.)	1170 (66538)	1380 (78481)
Fan diameter, including blades, mm (in.)	2438 (96)	
Fan, kWm (HP)	120 (160.9)	
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H_2O)	0.125 (0.5)	

Remote Radiator System	60 Hz
Exhaust manifold type	Dry
Connection sizes:	Class 150 ANSI Flange
Water inlet/outlet, mm (in.)	216 (8.5) Bolt Circle
Intercooler inlet/outlet, mm (in.)	178 (7.0) Bolt Circle
Static head allowable above engine, kPa (ft. H_2O)	250 (83.6)

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Exhaust System	60 Hz EPA Tier II	60 Hz Low NO_x EPA Tier II
Exhaust flow at rated kW, m^3/min. (cfm)	853 (30126)	892 (31499)
Exhaust temperature at rated kW at 25°C (77°F) ambient, dry exhaust, °C (°F)	480 (895)	
Maximum allowable back pressure, kPa (in. Hg)	8.5 (2.5)	
Exh. outlet size at eng. hookup, mm (in.)	See ADV drawing	

Electrical System	60 Hz
Battery charging alternator:	
Ground (negative/positive)	Negative
Volts (DC)	24
Ampere rating	140
Starter motor qty. at starter motor power rating, rated voltage (DC)	Standard: 2 @ 9 kW, 24
Battery, recommended cold cranking amps (CCA):	
Quantity, CCA rating each, type (with standard starters)	4, 1110, AGM
Battery voltage (DC)	12

Air Requirements	60 Hz EPA Tier II	60 Hz Low NO_x EPA Tier II
Radiator-cooled cooling air, m^3/min. (scfm)‡	3888 (137300)	
Cooling air required for generator set when equipped with city water cooling or remote radiator, based on 14°C (25°F) rise, m^3/min. (scfm)‡	1469 (51868)	
Combustion air, m^3/min. (cfm)	322 (11361)	343 (12120)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	220 (12511)	
Alternator, kW (Btu/min.)	193.3 (11000)	

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

Alternator Specifications	60 Hz
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet Pilot Exciter
Voltage regulator	Solid-State, Volts/Hz
Insulation system	Class H, Synthetic, Non-hygroscopic
Ingress Protection rating	IP23
Bearing: quantity, type	1 or 2, Sealed
Coupling type	Flexible Disc or Coupling
Overspeed (rpm)	2250
Voltage regulation, no-load to full-load	±0.25%
Unbalanced load capability	100% of Rated Standby Current

Alternator Standard Features

- The pilot-excited, permanent magnet (PM) alternator provides superior short-circuit capability.
- All models are brushless, rotating-field alternators.
- 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 two-thirds pitch windings and skewed stator.
- Brushless alternator with brushless pilot exciter for excellent load response.

NOTE:
See TIB-102 Alternator Data Sheets for alternator application data and ratings, efficiency curves, voltage dip with motor starting curves, and short circuit decrement curves.

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Controllers

APM802 Controller

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

- 12-inch graphic display with touch screen and menu control provide easy local data access
- Measurements are selectable in metric or English units
- User language is selectable
- Two USB ports allow connection of a flash drive, mouse, or keypad
- Electrical data, mechanical data, and system settings can be saved to a flash drive
- Ethernet port allows connection to a PC type computer or Ethernet switch
- The controller supports Modbus® RTU and TCP protocols
- NFPA 110 Level 1 capability

Refer to G6-152 for additional controller features and accessories.

Modbus® is a registered trademark of Schneider Electric.

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.

BACnet® is a registered trademark of ASHRAE.

Codes and Standards

- Engine-generator set is designed and manufactured in facilities certified to ISO 9001.
- Generator set meets NEMA MG1, BS5000, ISO, DIN EN, and IEC standards, NFPA 110.
- Engine generator set is tested to ISO 8528-5 for transient response.
- The generator set and its components are prototype-tested, factory-built, and production-tested.

Third-Party Compliance

- Tier 2 EPA-Certified for Stationary Emergency Applications

Available Approvals and Listings

- ❑ cULus (UL 2200 and CSA)
- ❑ IBC Seismic Certification

Warranty Information

- A standard three-year unlimited-hour limited warranty for standby applications in the U.S. And Canada. Five-year basic, five-year comprehensive, and ten-year extended limited warranties are also available for purchase in some jurisdictions.
- A standard two-year or 8700-hour limited warranty for prime power applications.

Available Warranties for Standby Applications

- ❑ 5-Year Basic Limited Warranty
- ❑ 5-Year Comprehensive Limited Warranty
- ❑ 10-Year Major Components Limited Warranty

Standard Features

- Industrial water cooled internal combustion Engine
- Single electric starter
- Charging alternator 24Vdc
- Single bearing alternator IP23, T°rise / Insulation class H/H
- Welded steel skid
- Closed Crankcase Ventilation (CCV) Filters
- Standard air filter
- Local Emergency Stop Switch
- Oil Drain and Coolant Drain Extension
- Fuel/Water Separator
- Generator Heater
- Compensators and flanges for exhaust outlets
- Spring Isolation Under the Skid
- Packaging under plastic film
- Operation and Installation Literature
- Delivered with initial oil fill
- Coolant in generator

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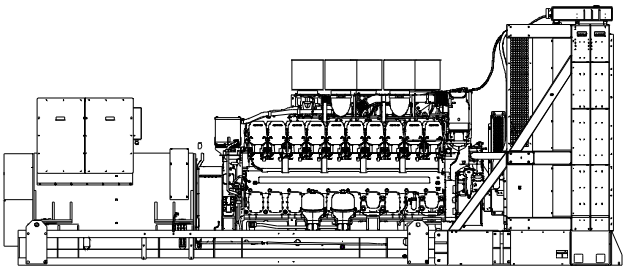
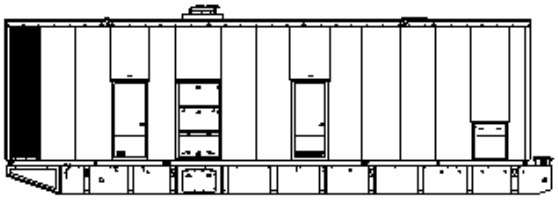
Dimensions and Weights

Compact version without cooling	60 Hz
Overall Size, L x W x H, max., mm (in.):	8263 x 3171.5 x 3451 (325.3 x 124.9 x 135.8)
Weight (radiator model), wet, max., kg (lb.):	35199 (77631)
Fuel tank capacity, L (gal.)	0



Sound Level 2 Walk-In Enclosure	60 Hz
Aluminum frame enclosure with Internal silencer, acoustic-lined air inlet, vertical outlet hood with 90 angles to redirect air and reduce noise.	
Overall Size, L x W x H, max., mm (in.):	17386 x 4157 x 5807 (684.5 x 163.6 x 228.6)
Max. weight, kg (lb.)	59371 (130921)
Fuel tank capacity, L (gal.)	Refer to G6-190.
Sound Pressure Level at 60 Hz with full load, dB	74



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