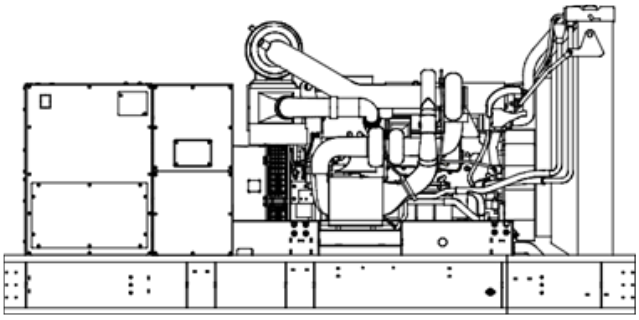
Industrial Generator Set - 600REOZVB

208-600 V **Diesel**

Tier 2 EPA-Certified for Stationary EmergencyApplications

Ratings Range

		60 Hz
Standby:	**kW**	485-600
	kVA	606-750
Prime:	**kW**	485-555
	kVA	606-694



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 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 standard one-year limited warranty covers all generator set systems and components. Two-, five-, and ten-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.
- Other features:
  - Rehlko designed controllers for one-source system integration and remote communication. See Controllers on page 3.
  - The low coolant level shutdown prevents overheating (standard on radiator models only).
  - Integral vibration isolation eliminates the need for under-unit vibration spring isolators.
  - An electronic, isochronous governor delivers precise frequency regulation.
  - Multiple circuit breaker configurations.

Generator Set Ratings

				150°C Rise Standby Rating		130°C Rise Standby Rating		125°C Rise Prime Rating		105°C Rise Prime Rating	
Alternator	**Voltage**	**Ph**	**Hz**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**
	120/208	3	60	600/750	2082	565/706	1960	550/688	1910	525/656	1821
	127/220	3	60	600/750	1969	590/738	1937	550/688	1806	545/681	1788
5M4030	139/240	3	60	600/750	1805	600/750	1805	550/688	1656	550/688	1656
	240/416	3	60	600/750	1041	565/706	980	550/688	955	525/656	911
	277/480	3	60	600/750	903	600/750	903	550/688	828	550/688	828
	120/208	3	60	600/750	2082	600/750	2082	555/694	1927	555/694	1927
	127/220	3	60	600/750	1969	600/750	1969	555/694	1822	555/694	1822
5M4032	139/240	3	60	600/750	1805	600/750	1805	555/694	1670	555/694	1670
	240/416	3	60	600/750	1041	600/750	1041	555/694	964	555/694	964
	277/480	3	60	600/750	903	600/750	903	555/694	835	555/694	835
5M4164†	220/380*	3*	60*	600/750*	1140*	600/750*	1140*	550/688*	1046*	550/688*	1046*
5M4272	347/600	3	60	600/750	722	600/750	722	550/688	663	550/688	663
5M4276	347/600	3	60	600/750	722	600/750	722	555/694	668	555/694	668

† Only available for IBC and/or OSHPD orders.
* For GM114579-GA1 generator set spec.

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.

Discovery Energy, LLC
200 Twin Oaks Road, Kohler, WI 53044 USA
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444 - powersystems.rehlko.com

Alternator Specifications

Specifications		Alternator
Type		4-Pole, Rotating-Field
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
Rotor balancing		125%
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	5M4030 (10 lead)	1775
480 V	5M4032 (10 lead)	2200
380 V	5M4164 (4 lead)	2300
600 V	5M4272 (4 lead)	1750
600 V	5M4276 (4 lead)	2800

- 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 windings and skewed stator.
- Digital solid-state, volts-per-hertz voltage regulator with ±0.25% no-load to full-load regulation.
- Brushless alternator with brushless pilot exciter for excellent load response.

Application Data

Engine

Engine Specifications	
Manufacturer	Volvo
Engine type	4-Cycle, Turbocharged, Charge Air-Cooled
Cylinder arrangement	6 Inline
Displacement, L (cu. in.)	16.12 (984)
Bore and stroke, mm (in.)	144 x 165 (5.67 x 6.50)
Compression ratio	16.8:1
Piston speed, m/min. (ft./min.)	594 (1949)
Main bearings: quantity, type	7, Precision Half-Shell
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	674 (903)
Cylinder head material	Cast Iron
Piston: type, material	Steel
Crankshaft material	Forged Steel
Valve material	Nimonic
Governor type	EMS 2.3
Frequency regulation, no-load to full-load	Isochronous
Frequency regulation, steady state	±0.25%
Frequency	Fixed
Air cleaner type, all models	Dry

Exhaust

Exhaust System	
Exhaust manifold type	Dry
Exhaust flow at rated kW, m^3/min. (cfm)	114.5 (4044)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	495 (923)
Maximum allowable back pressure, kPa (in. Hg)	10 (2.95)
Exhaust outlet size at engine hookup, mm (in.)	See ADV drawing

Engine Electrical

Engine Electrical System	
Battery charging alternator:	
Ground (negative/positive)	Negative
Volts (DC)	24
Ampere rating	80
Starter motor rated voltage (DC)	24V, 7kW
Battery, recommended cold cranking amps (CCA):	
Quantity, CCA rating each	Two, 925
Battery voltage (DC)	12

Fuel

Fuel System	
Fuel supply line, min. ID, mm (in.)	10 (0.38)
Fuel return line, min. ID, mm (in.)	6 (0.25)
Max. fuel flow, Lph (gph)	185 (48.9)
Max. fuel pump restriction, kPa (in. Hg)	10 (3.0)
Max. return line restriction, kPa (in. Hg)	20 (5.9)
Fuel filter: quantity,	2
Primary type	30 Micron
Secondary type, w/water separator	5 Micron
Recommended fuel	#2 Diesel/HVO/RD

Lubrication

Lubricating System	
Type	Full Pressure
Oil pan capacity, L (qt.) §	42.0 (44.4)
Oil pan capacity with filter, L (qt.) §	48.1 (50.8)
Oil filter: quantity, type §	3, Cartridge
Oil cooler	Water-Cooled

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

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Application Data

Cooling

Radiator System	
Ambient temperature, °C (°F)*	50 (122)
Engine jacket water capacity, L (gal.)	25 (6.6)
Radiator system capacity, including engine, L (gal.)	151.1 (39.9)
Engine jacket water flow, Lpm (gpm)	360 (95.4)
Charge cooler water flow, Lpm (gpm)	126 (33)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	246 (13990)
Heat rejected to charge cooler water at rated kW, dry exhaust, kW (Btu/min.)	147 (8360)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	965 (38.0)
Fan, kWm (HP)	34 (46)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H_2O)	0.125 (0.5)

* Weather and sound enclosures with internal silencer and weather housing with external silencer reduce ambient temperature capability by 5°C (9°F).

Operation Requirements

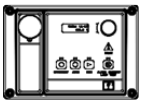
Air Requirements	
Radiator-cooled cooling air, m^3/min. (scfm) ‡	798 (28200)
Combustion air, m^3/min. (cfm)	48 (1649)
Heat rejected to ambient air:	
Engine, kW (Btu/min.)	24 (1342)
Alternator, kW (Btu/min.)	45 (2560)

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

Fuel Consumption**		
Diesel, Lph (gph) at % load	**Standby Rating**	
100%	157.0	(41.5)
75%	118.4	(31.3)
50%	80.1	(21.2)
25%	45.0	(11.9)
Diesel, Lph (gph) at % load	**Prime Rating**	
100%	144.2	(38.1)
75%	108.2	(28.6)
50%	73.9	(19.5)
25%	42.6	(11.3)

** Volumetric Fuel consumption is up to 4% higher when using HVO/RD than #2 ULSD.

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 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.

Modbus® is a registered trademark of Schneider Electric.

BACNet® is a registered trademark of ASHRAE.

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Standard Features

- Alternator Protection
- Battery Rack and Cables
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Literature

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)

Approvals and Listings
- ❑ California OSHPD Pre-Approval
- ❑ CSA Certified
- ❑ IBC Seismic Certification
- ❑ Hurricane Rated Enclosure
- ❑ UL 2200 Listing

Enclosed Unit
- ❑ Sound Enclosure/Tank Package
- ❑ Weather Enclosure/Tank Package

Open Unit
- ❑ Exhaust Silencer, Hospital (kit: PA-354907)
- ❑ Exhaust Silencer, Critical (kit: PA-354894)
- ❑ Flexible Exhaust Connector, Stainless Steel

Fuel System
- ❑ Flexible Fuel Lines, Rubber
- ❑ Flexible Fuel Lines, Stainless Steel
- ❑ Fuel Pressure Gauge

Controller
- ❑ Common Failure Relay (APM603 controllers only)
- ❑ Communications Products and PC Software
- ❑ Customer Connection
- ❑ Two Input/Five Output Module (APM402 controller only)
- ❑ Four Input/Fifteen Output Module (APM603 controller only)
- ❑ Remote Emergency Stop
- ❑ Remote Mounting Cable
- ❑ Remote Serial Annunciator Panel
- ❑ Run Relay (standard with APM603, optional with others)
- ❑ Manual Key Switch (APM603 controller only)
- ❑ Manual Speed Adjust (APM402 controllers only)

Cooling System
- ❑ Block Heater, 4000 W, 190/208 V, 1 Ph
- ❑ Block Heater, 4000 W, 210/240 V, 1 Ph
- ❑ Block Heater, 4000 W, 380/480 V, 1 Ph
  Required for ambient temperatures below 0°C (32°F)
- ❑ Radiator Duct Flange

Electrical System
- ❑ Generator Heater
- ❑ Battery
- ❑ Battery Charger, Equalize/Float Type
- ❑ Battery Heater
- ❑ Bus Bar
- ❑ Line Circuit Breaker (NEMA type 1 enclosure)
- ❑ Line Circuit Breaker with Shunt Trip (NEMA type 1 enclosure)

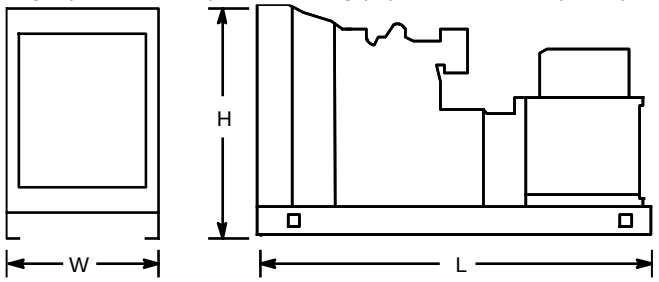
Miscellaneous
- ❑ Air Cleaner, Heavy Duty
- ❑ Air Cleaner Restriction Indicator
- ❑ Engine Fluids (oil and coolant) Added
- ❑ Rated Power Factor Testing

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.):	4229 x 1829 x 1985 (166.5 x 72.0 x 78.1)
Weight (radiator model), wet, max., kg (lb.):	4885 (10770)



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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