

Submittal Package

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Misc

Battery	244578
Battery Charger	GM87448
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Warranty	TP-5561

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Pre-Startup Checklist

Pre-Startup Checklist	PreStartUpCheckList
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Generator

Kohler Model: KG200

This gas generator set equipped with a 4UA13 alternator operating at 120/208 volts is rated for 200 kW/250 kVA. Output amperage: 694.

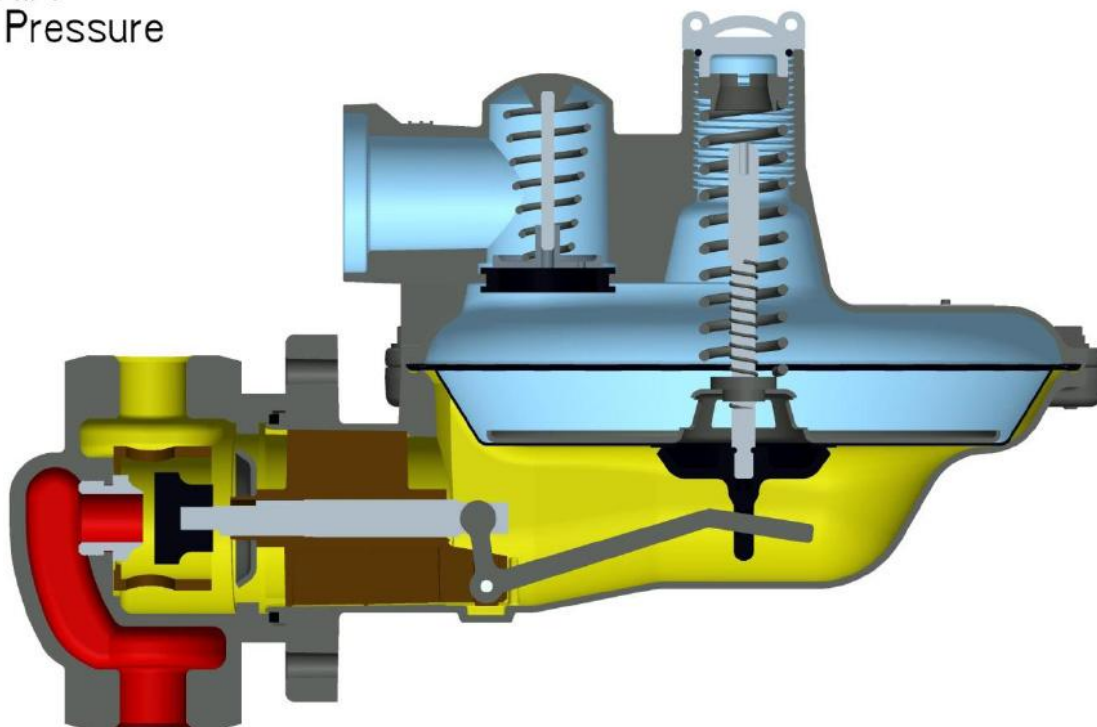
Qty	Description
	KG200 Generator System
3	KG200 Generator Set Includes the following: Literature Languages English Approvals and Listings UL2200 Listing/cUL Genset List Engine SnglFuel,UL,PreAlarm,NG,Stdby Nameplate Rating Standby 130C Rise Voltage 60Hz, 120/208V, Wye, 3Ph, 4W Alternator 4UA13 Cooling System Unit Mounted Radiator, 50C Skid and Mounting Skid, 53" Air Intake Standard Duty Controller APM603 Enclosure Type Sound Enclosure Material Aluminum Starting Aids, Installed 1500W,120V Electrical Accy.,Installed Battery, 1/12V, Wet Electrical Accy.,Installed Battery Charger, 10A Electrical Accy.,Installed Run Relay Rating, LCB 1 100% Rated Amps, LCB 1 800 Trip Type, LCB 1 Electronic, LSI Interrupt Rating LCB 1 35kA at 480V Miscellaneous Accy,Installed Coolant in Genset Warranty 5 Year Comprehensive Testing, Additional Power Factor Test,0.8,3Ph Only Total unit length in inches 172 Total unit width in inches 54 Total unit height in inches 83 Total unit weight (lbs) 6,194 Weight/Dimensions Disclaimer * Estimates-Not for Construction
3	Flexible Fuel Line
3	Lit Kit, KG200 Production

RECOMMENDED GAS REGULATOR

NOTE: REGULATOR IS NOT INCLUDED WITH THE GENERATOR PURCHASE

FULL LOCK UP STYLE (LEVER ACTUATED) REGULATOR IS RECOMMENDED FOR ALL **KOHLER** GENERATORS

- Inlet Pressure
- Outlet Pressure
- Atmospheric Pressure



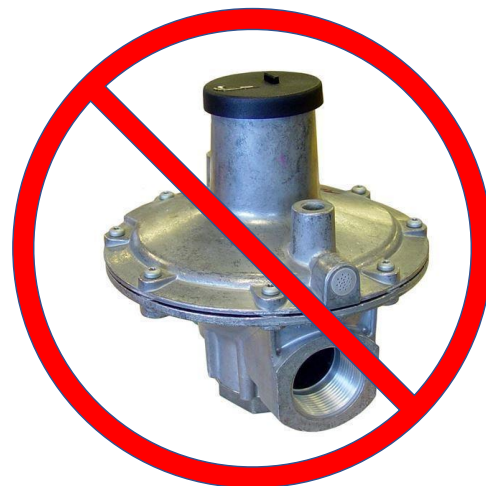
Contact below for LEVER actuated regulators

Jason Rosen

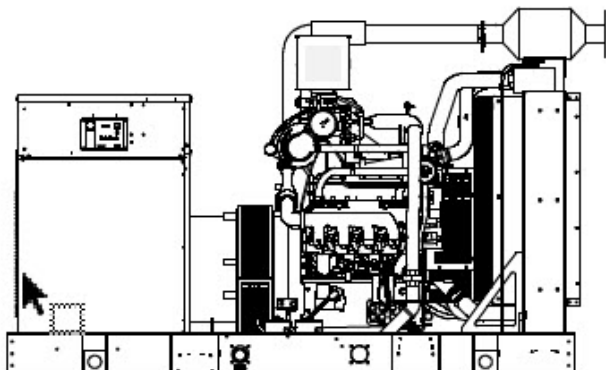
Accumet Corporation
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JRosen@accumetcorp.com
<https://www.accumetcorp.com/>

DO NOT USE



Spec Sheets



Standard Features

- EPA-Certified for Stationary Emergency Applications
- Discovery Energy, LLC and its affiliates dba Rehiko 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 purchases in some jurisdictions.
- Natural gas, LP gas, and dual fuel models are available.
- Air Restriction
- Alternator Protection
- Battery Rack and Cables
- Closed Crankcase Ventilation (CCV) Filters
- 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)

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.
- The brushless, rotating-field alternator has broad range reconnectability.

Generator Set Rating

Alternator	Voltage	Ph	Hz	Peak kVA	Standby 130C Rise Ratings	
					kW/kVA	Amps
4UA13	120/208	3	60		200/250	694

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.

Model: KG200, continued

Alternator Specifications

Specifications	Alternator
Alternator manufacturer	Rehlko
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Rare-Earth Permanent-Magnet
Leads, quantity	12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation	NEMA MG1
Insulation: Material	Class H
Insulation: 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
One-Step Load Acceptance	100% of rating
Unbalanced load capability	100% of rating current
• NEMA MG1, IEEE, and ANSI standards compliances 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.	

Engine

Engine Specification

Engine Manufacturer	Kohler
Engine Model	KG10V08T- 6DGS
Engine: type	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
Max. power at rated rpm, kWm (BHP)	227 (304)
Cylinder head material	Cast Iron
Piston: type, material	Dished Top Forged Aluminum
Crankshaft material	Forged Steel
Valve (exhaust) material	Inconel
Governor: type, make/model	Electronic
Frequency regulation, no-load to-full load	Isochronous
Frequency regulation, steady state	±0.75%
Frequency	Fixed
Air cleaner type, all models	Dry

Model: KG200, continued

Exhaust	
Exhaust System	
Exhaust Manifold Type	Dry
Exhaust flow at rated kW,m3/min. (cfm)	41.6 (1469)
Exhaust temperature at rated kW, dry exhaust, EPA certified, °C (°F)	764 (1407)
Maximum allowable back pressure after catalyst, kPa (in. Hg)	14.3 (4.24)
Maximum allowable back pressure, kPa (in. Hg)	19.8 (5.87)

Engine Electrical	
Engine Electrical System	
Ignition system	Coil Pack
Battery charging alternator: Ground (negative/positive)	Negative
Battery charging alternator: Volts (DC)	12
Battery charging alternator: 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	
Fuel type	Natural Gas
Fuel supply line inlet	2 NPT
Natural gas/LPG fuel supply pressure, kPa (in. H20). Fuel supply pressure measured at the generator set fuel inlet downstream of any fuel system equipment accessories.	1.74-2.74 (7-11)

Fuel Composition	
Fuel Composition	
Natural Gas: Methane, % by volume	90 min.
Natural Gas: Ethane, % by volume	4.0 max.
Natural Gas: Propane, % by volume	1.0 max.
Natural Gas: Propene, % by volume	0.1 max.
Natural Gas: C4 and higher, % by volume	0.3 max.
Natural Gas: Sulfur, ppm mass	25 max.
Natural Gas: Lower heating value, kJ/m3 (Btu/ft3), min.	33.2 (890)

* 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	
Lubrication System	
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

Model: KG200, continued

Cooling	
Radiator System	
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)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	102 (5800)
Heat rejected to charge air cooling water at rated kW, dry exhaust, Kw Btu/min.	20.1 (1143)
Heat rejected to engine oil at rated kW,kW (Btu/min.)	20.5 (1165)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	900 (35.4)
Fan, kWm (HP)	15 (20.1)
Max. restriction of cooling air, intake and discharge side of radiator, kPA (in. H2O)	0.125 (0.5)
* Enclosure with enclosed silencer reduces ambient temperature capability by 5°C (9°F).	

Operation Requirements

Air Requirements	
Radiator-cooled cooling air, m3/min. (scfm) *	331 (11700)
Combustion air, m3/min. (cfm)	11.33 (400)
Heat rejected to ambient air: Engine, kW (Btu/min.)	58.2 (3309)
Heat rejected to ambient air: Alternator, kW (Btu/min.)	16 (910)
*Air density = 1.20 kg/m3 (0.075 lbm/ft3)	

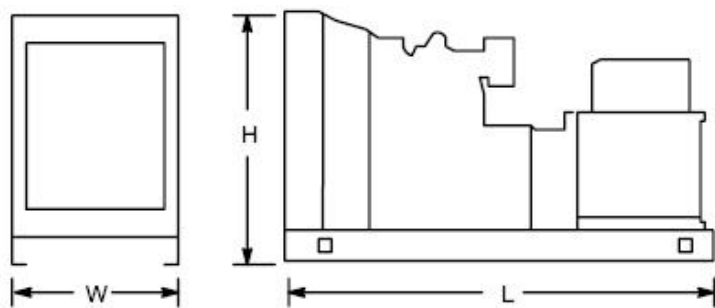
Fuel Consumption

Natural Gas, m3/hr. (cfh) at % load	Rating
Standby Fuel Consumption at 100% load	67.9 m3/hr. (2398 cfh)
Standby Fuel Consumption at 75% load	53.1 m3/hr. (1874 cfh)
Standby Fuel Consumption at 50% load	38.2 m3/hr. (1350 cfh)
Standby Fuel Consumption at 25% load	23.4 m3/hr. (826 cfh)
Standby Fuel Consumption at 0% load	8.5 m3/hr. (302 cfh)

Dimensions and Weights

Dim Weight Spec	Dim Weight Value
Fuel	All
Engine Manufacturer	Rehiko
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)

Model: KG200, continued



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



The APM603 generator set controller provides advanced control, system monitoring, and system diagnostics for a single generator set or paralleling multiple generator sets. The APM603 interfaces the generator set to other power system equipment and network management systems using standard industry network communications. It uses a patented digital voltage regulator and unique software logic to manage alternator thermal overload protection as well as serves as an overcurrent protective relay, features normally requiring additional hardware. The APM603 controller meets NFPA 110, Level 1.

Display, Interface, and Accessibility

- A 7-inch color TFT touchscreen for easy local access to data.
 - Home screen can be customized to show critical data at a glance.
 - Create a custom favorites list for quick access to important data
- Measurements are selectable in metric or English units.
- Supports Modbus® protocol through serial bus and Ethernet networks, and supports SNMP and BACnet® through Ethernet networks.

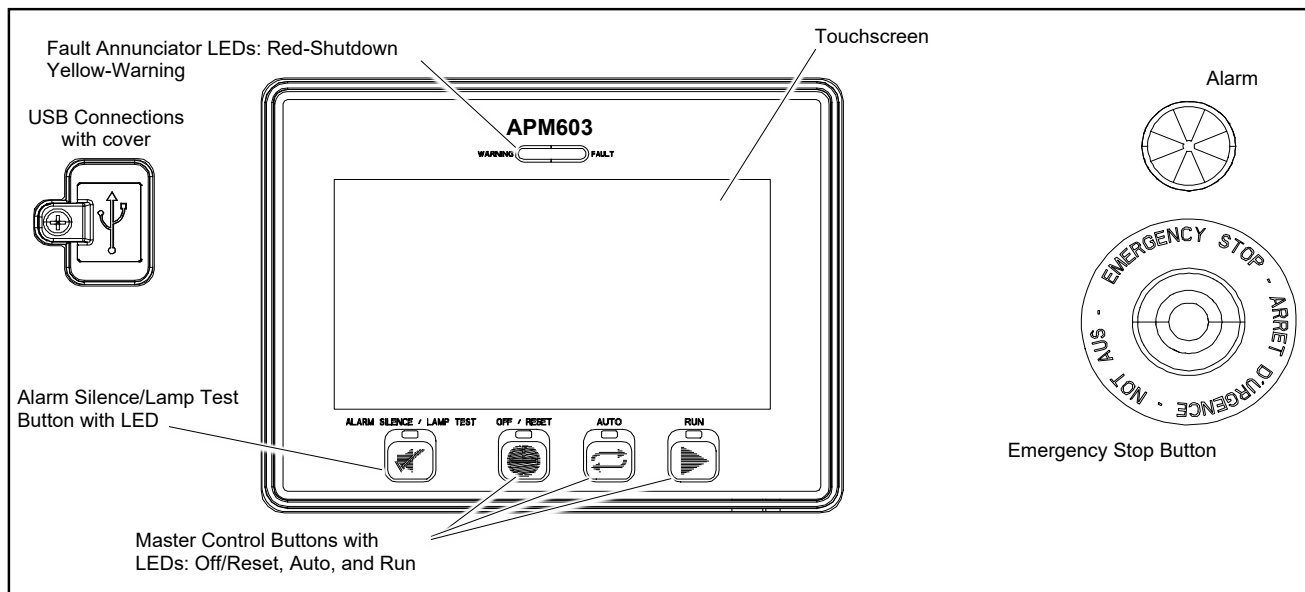
Global Support

- Sales, installation, and service support from more than 800 Rehlko and SDMO service providers around the world.

On-board Diagnostics

- Immediate visibility of warnings and faults with text description and code display.
 - 15 seconds of critical data are captured around each warning and fault
 - Critical data can be viewed on the display and downloaded
- Store up to 10,000 events locally along with historical data logging of successful starts.
 - Accurate time stamp from real-time clock
 - Event log can be downloaded
- Data logging of customized parameter list for report generation and advanced troubleshooting.
 - Store to external USB drive for easy transfer to another device

Modbus® is a registered trademark of Schneider Electric.
BACnet® is a registered trademark of ASHRAE.



Controller Features

AC Output Voltage Regulator Adjustment	Maximum of $\pm 10\%$ of the system voltage
Alarm Horn	Indicates a generator set warning or shutdown condition
Alarm Silence	For NFPA-110 application or user convenience
Alternator Protection	Generator set overload and short circuit protection
Cyclic Cranking	Provides automatic restart after a failed start attempt with programmable on/off time and number of attempts
ECU Diagnostics	Displays engine ECU fault codes and descriptions for engine troubleshooting
Emergency Stop Button	Shuts down the generator set immediately, for emergency situations
Engine Start Aid	Control for an optional engine starting aid
Environmentally Sealed Membrane Keypad	Three master control buttons with LEDs: Off/Reset, Auto, and Run
Patented High-Speed RMS Digital Voltage Regulator	$\pm 0.25\%$ no-load to full-load regulation with three-phase true RMS sensing
Lamp Test	Verifies functionality of the indicator LEDs
Real-time Clock	Includes battery back-up to retain date and time through controller power cycle
Remote Reset	Allows remote fault resets and restarting of the generator set
Remote Monitoring Panel	Compatible with the Remote Serial Annunciator
Run Time Hourmeter	Displays generator set run time
Run Relay	Indicates that the generator set is running
Time Delay Engine Cooldown (TDEC)	Time delay before the generator set shuts down
Time Delay Engine Start (TDES)	Time delay before the generator set starts

Controller Features

Emergency Battle Mode	- Allows critical emergency operation where uninterrupted power is essential. - Overrides most shutdowns and warnings except for E-Stop, Overspeed, Maintenance Mode, or shutdown faults from the ECU.
Maintenance mode	- Lowers the fault threshold which reduces fault setting times and activates a trip - Acts as a safety device like an E-Stop - Adjustable from 0-150% of rated current

Communication

USB Port	(1) Mini-USB port for PC connection (1) USB port for storage device
Serial (RS-485) Port	(1) Non-isolated for RSA III (1) Isolated for Modbus devices (1) Isolated for paralleling communication
Ethernet Port	(1) RJ45 for Modbus TCP, SNMP, and BACnet

Controller Specifications

Nominal voltage	12 or 24 VDC protected against reverse battery connection
Power	800 mAmps at 12 VDC 400 mAmps at 24 VDC
Operating Temperature	-40°C to 70°C (-40°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 158°F)
Humidity	5% to 95% non-condensing
Display Size, W x H	154 x 86 mm (6.0 x 3.4 inches)
Protection Index	IP65 Front

Paralleling Features

- Isochronous control with real and reactive load sharing with other APM603 controller equipped generator sets
 - Supports paralleling up to 8 generators
- Random first-on logic to prevent two or more generator sets from closing to a dead bus and provides the fastest response for a single generator online
- Automatic synchronizer with dead bus closing
- Soft loading and unloading for generator management
- Protective relay functions:
 - Synch check (25C)
 - Over current (51)
 - Over frequency (81O)
 - Over power (32O)
 - Over voltage (59)
 - Reverse power (32R)
 - Reverse reactive power (32RQ)
 - Under frequency (81U)
 - Under voltage (27)
- Generator management to allow the start and stop of generators based on load demand or state of other generators
 - Fuel level
 - Run time
 - Manual order
 - Time of day
 - Efficiency
- Simplified paralleling system view from any generator controller in the system

Overcurrent Protective Device

- Provides protection against line-to-line and line-to-neutral faults
- Uses thermal and instantaneous current limit settings for alternator protection

Load Management Features

- Programmable outputs included to command the connect and disconnect of loads based on generator or paralleling system state
 - Loads connected based on available capacity
 - Loads disconnected at system startup
 - Loads disconnected based on a maximum kW setting or underfrequency setting
- Supports up to 16 prioritized load steps per system
 - Can be used on a single generator system
 - Can be combined in a paralleling system for a total system load control capability
- Simplified load management system view from any generator controller in the system
- Requires input/output module option

Advanced Programmable I/O

- Configurable inputs and outputs can be programmed for customer specific use
- PLC-like capability for applying logic to customize generator system behavior

Troubleshooting Features

- 15 seconds of key data automatically captured around each warning and shutdown
 - Data can be exported for detailed analysis
 - Data can be viewed on controller for convenient on-site troubleshooting support
- Configurable data logger will allow you to select parameters to monitor
 - Data stored to USB device for flexibility on amount of data stored and ability to export for detailed analysis
 - Data capture controlled by user to allow capturing specific data required

NFPA 110 Requirements

In order to meet NFPA 110, Level 1 requirements, the generator set controller monitors the engine/generator functions/faults shown below.

- Engine functions:
 - Overcrank
 - Low coolant temperature warning
 - High coolant temperature warning
 - High coolant temperature shutdown
 - Low oil pressure shutdown
 - Low oil pressure warning
 - High engine speed
 - Low fuel (level or pressure) *
 - Low coolant level
 - EPS supplying load
 - High battery voltage
 - Low battery voltage
 - General functions:
 - Master switch not in auto
 - Battery charger fault *
 - Lamp test
 - Contacts for local and remote common alarm
 - Audible alarm silence button
 - Remote emergency stop *
- * Function requires optional input sensors or kits and is engine dependent, see Engine Data.

Standards

The generator set controller has been tested and verified for compliance with the following standards.

- NFPA 99
- NFPA 110, Level 1
- CSA 282-09
- UL 6200
- ASTM B117 (salt spray test)

Controller Functions

The controller displays warning, shutdown, and status messages. **All functions are available as relay outputs.**

Warning causes the yellow fault LED to show and sounds the alarm horn, signaling an impending problem.

Shutdown causes the red fault LED to show, sounds the alarm horn, and stops the generator set.

The controller communicates with the engine ECU and supports a large number of warning and shutdown events that are not listed here.

This table highlights the items required for NFPA 110.

Event	Warning	Shutdown
Alternator Thermal Protection †		•
Battery Charger Fault *	▲	
CAN Option Board1 Comm Loss	▲	
Critically Low Fuel Level (diesel) *	▲	
ECU Diagnostic Event	▲	
ECU Mismatch Shutdown †		•
Fuel Leak Alarm (diesel) *	▲	
High Battery Voltage Warning	▲	
High Coolant Temperature Shutdown †		•
High Coolant Temperature Warning	▲	
High Fuel Level Warning (diesel) *	▲	
High Oil Temperature Shutdown †		•
High Oil Temperature Warning	▲	
Local Emergency Stop Shutdown †		•
Loss ECU Comms Shutdown †		•
Loss of Signal Low Coolant Level Voltage	▲	
Low Battery Voltage Warning	▲	
Low Coolant Level Shutdown †		•
Low Coolant Temperature Warning	▲	
Low Fuel Level Shutdown (diesel) * †		•
Low Fuel Level Warning (diesel) *	▲	
Low Fuel Pressure Warning (gas) *	▲	
Low Oil Pressure Shutdown †		•
Low Oil Pressure Warning	▲	
Low RTC (clock) Battery Voltage	▲	
Maintenance Reminder1	▲	
Maintenance Reminder2	▲	
Maintenance Reminder3	▲	
Maximum Power Shutdown †		•
Maximum Power Warning	▲	
Not In Auto Alarm	▲	
Over Crank Shutdown †		•
Over Current Shutdown (L1, L2, L3) †		•
Over Current Warning (L1, L2, L3)	▲	
Over Frequency Shutdown †		•
Over Frequency Warning	▲	
Over Power Shutdown †		•
Over Power Warning	▲	
Over Speed Shutdown †		•
Over Voltage Shutdown (L-L, L-N, each phase) †		•
Over Voltage Warning (L-L, L-N, each phase)	▲	

Event	Warning	Shutdown
Remote Emergency Stop Shutdown †		•
Reverse Power Shutdown †		•
Reverse VAR Shutdown †		•
Under Frequency Shutdown †		•
Under Frequency Warning	▲	
Under Voltage Shutdown (L-L, L-N, each phase) †		•
Under Voltage Warning (L-L, L-N, each phase)	▲	
Weak Cranking Battery	▲	
Status Messages		
Auto Button Pressed		
EPS Supplying Load		
Generator Running		
Generator Started		
Generator Stopped		
GFCI Warning *		
Load Shed Overload		
Load Shed Under Frequency		
Off Button Pressed		
RSA Event Programmable Digital Inputs, 1-8		
Run Button Pressed		
* Function requires optional input sensors or kits		
† Items included with common fault shutdown 10		
‡ Shutdown overrides are designated by engine supplier and may vary between generator set models. An event, outside of Overspeed, E-stop, Maintenance Mode, and ECU-forced shutdown, may cause the generator to shutdown.		



Industrial Generator Set Accessories

Generator Set Controller

KG Engine-Powered Models Inputs and Outputs

Standard Dedicated User Inputs	Input Type
Auxiliary Fault (Shutdown)	Digital Input
Auxiliary Warning	
Battery Charger Fault	
Breaker Closed *	
Breaker Tripped/Open *	
Emergency Stop, Local	
Emergency Stop, Remote	
Excitation Over Voltage	
Ground Fault Relay	
Fuel Type	
Low Fuel Pressure	
Remote Engine Start	Two-wire input
Speed Bias	Analog Voltage Input, Scalable up to +/-10 VDC
Voltage Bias	

Standard Dedicated User Outputs	Output Type
Close Breaker *	Relay Driver Output
Common Failure	
Common Warning	
Crank	
High Coolant Temperature	
Horn	
Run	
Trip Breaker/Shunt Trip *	
* Only with remote-mounted electrically operated circuit breakers.	

Optional Configurable User Inputs and Outputs	
User Configurable Inputs	2 Analog, 0-5 VDC 4 Dry Contact Digital
User Configurable Relay Outputs	14 NO/NC Relays 1 Common Fault Relay
Note: Programmable I/O is configurable by authorized technician	

KG Engine Data

The following KG engine data is displayed on the APM603 controller.

Parameter
Coolant Temperature
ECU Runtime Hours
Engine Speed
Intake Manifold Pressure
Intake Manifold Temperature
Intercooler Temperature
Fuel Pressure
Oil Pressure
Oil Temperature

PSI/Doosan Engine-Powered Models Inputs and Outputs

Standard Dedicated User Inputs	Input Type
Auxiliary Fault (Shutdown)	Digital Input
Auxiliary Warning	
Battery Charger Fault	
Breaker Closed *	
Breaker Tripped/Open *	
Emergency Stop, Local	
Emergency Stop, Remote	
Excitation Over Voltage	
Ground Fault Relay	
Fuel Type	
Low Fuel Pressure	
Remote Engine Start	Two-wire input
Speed Bias	Analog Voltage Input, Scalable up to +/-10 VDC
Voltage Bias	

Standard Dedicated User Outputs	Output Type
Close Breaker *	Relay Driver Output
Common Failure	
Common Warning	
Crank	
High Coolant Temperature	
Horn	
Run	
Trip Breaker/Shunt Trip *	
* Only with remote-mounted electrically operated circuit breakers.	

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PSI/Doosan Engine Data

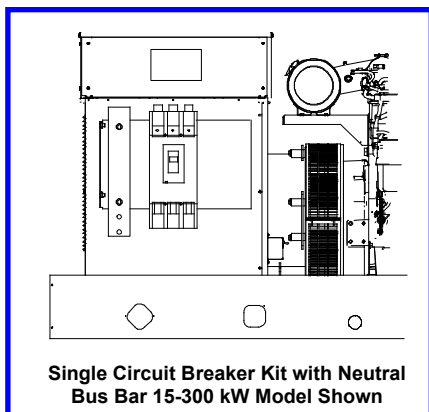
The following engine data is displayed on the APM603 controller.

Parameter
Ambient Temperature
Coolant Temperature
ECU Runtime Hours
Engine Speed
Intake Manifold Pressure
Intake Manifold Temperature
Intercooler Temperature
Fuel Pressure
Mechanical Engine Load
Oil Pressure
Oil Temperature

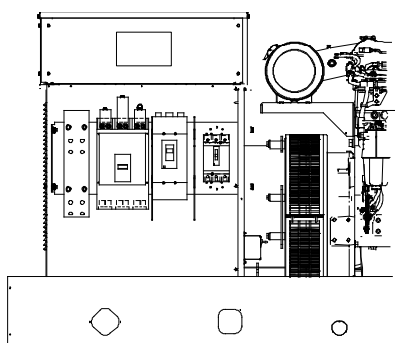
APM603 Available Options

- ☐ **Common Failure Relay** provides a relay output to signal a generator set fault.
- ☐ **Battery Charger** available with 6 amp, 10 amp, and 20 amp output for 12 and 24V DC voltage output. (Availability is generator model dependent.) The 10 amp and 20 amp models provide NFPA 110 charging and alarming capability.
- ☐ **Electrically Operated Circuit Breakers**
 - For paralleling systems
 - Available generator-mounted or remote-mounted
 - 24VDC
- ☐ **Ground Fault Relay** provides a relay output to signal a ground fault is detected.
- ☐ **Input/Output Module** for Diesel (KD) and Mitsubishi models provides:
 - 16 digital input connections with connection to ground
 - 8 relay output connections (Form C, rated 8A, 240 VAC or rated 0.5 A, 48 VDC)
- ☐ **Input/Output Module** for models other than KD or Mitsubishi provides:
 - 2 analog inputs (0-5 VDC)
 - 4 digital input connections with connection to ground
 - 14 relay output connections (Form C, rated 10A, 120V)
 - 1 common fault relay output (NO, rated 2A, 24VDC)
- ☐ **Key Switch** to allow selection of RUN, OFF and AUTO modes. Lockable in the AUTO position by removing the key.
- ☐ **Remote Emergency Stop Switch** available as a wall mounted panel to remotely shut down the generator set.
- ☐ **Remote Monitoring Panel.** The Remote Serial Annunciator (RSA) enables the operator to monitor the status of the generator set from a remote location, which may be required for NFPA 99 and NFPA 110 installations, and up to four Automatic transfer switches.
- ☐ **Shunt Trip Wiring provides** relay outputs to trip a shunt trip circuit breaker and to signal the common fault shutdowns. Contacts rated at 10 amps at 28 VDC or 120 VAC.

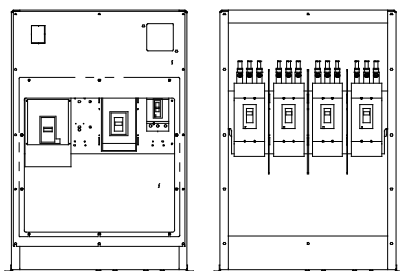
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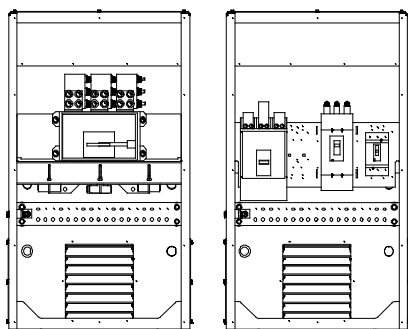
Single Circuit Breaker Kit with Neutral Bus Bar 15-300 kW Model Shown



Multiple Circuit Breaker Kit with Neutral Bus Bar 180-300 kW Model Shown



**Multiple Circuit Breaker Kits with Neutral Bus Bar 350-2250 kW Model Shown
(also applies to some 300 kW models)**



Circuit Breaker Kits with Neutral Bus Bar 700-3250 kW KD Model Shown

Standard Features

- The line circuit breaker interrupts the generator set output during a short circuit and protects the wiring when an overload occurs. Use the circuit breaker to manually disconnect the generator set from the load during generator set service.
- Circuit breaker kits are mounted to the generator set and are provided with load-side lugs and neutral bus bar.
- Rehlko offers a wide selection of molded-case line circuit breaker kits including single, dual, and multiple configurations for each generator set.
- Four types of line circuit breakers are available: (see page 2 for definitions and pages 3 and 4 for application details)
 - Magnetic trip
 - Thermal magnetic trip
 - **Electronic trip**
 - Electronic with ground fault (LSIG) trip
- In addition, line circuit breakers are offered with 80% and 100% ratings.
- Single line circuit breaker kits allow circuit protection of the entire electrical system load.
- Dual line circuit breaker kits allow circuit protection of selected priority loads from the remaining electrical system load.
- Multiple line circuit breaker kits with field connection barrier allow circuit protection for special applications (350-2500 kW models and selected 80-300 kW models).
- Up to four line circuit breakers can be used on 350-2500 kW models.
- Line circuit breakers comply with the following codes and standards unless otherwise stated.
 - UL 489 Molded Case Circuit Breakers
 - UL 1077 Supplementary Protectors
 - UL 2200 Stationary Engine Generator Assemblies

Line Circuit Breaker Types

Magnetic Trip

The magnetic trip features an electromagnet in series with the load contacts and a moveable armature to activate the trip mechanism. When a sudden and excessive current such as a short circuit occurs, the electromagnet attracts the armature resulting in an instantaneous trip.

Thermal Magnetic Trip

Thermal magnetic trip contains a thermal portion with a bimetallic strip that reacts to the heat produced from the load current. Excessive current causes it to bend sufficiently to trip the mechanism. The trip delay is dependent on the duration and excess of the overload current. Elements are factory-calibrated. A combination of both thermal and magnetic features allows a delayed trip on an overload and an instantaneous trip on a short circuit condition.

Electronic Trip

These line circuit breakers use electronic controls and miniature current transformers to monitor electrical currents and trip when preset limits are exceeded.

LI breakers are a combination of adjustable trip functions including long-time ampere rating, long-time delay, and instantaneous pickup. LSI breakers have all of the LI breaker features plus short-time pickup, short-time delay, and defeatable instantaneous pickup. LSIG breakers have all of the LSI breaker features plus ground-fault pickup and delay.

NOTE: MG-frame does not have a long-time delay when selected with LI breakers.

Electronic with Ground Fault Trip

The ground fault trip feature is referred to as LSIG in this document. Models with LSIG compare current flow in phase and neutral lines, and trip when current unbalance exists.

Ground fault trip units are an integral part of the circuit breaker and are not available as field-installable kits. The ground fault pickup switch sets the current level at which the circuit breaker will trip after the ground fault delay. Ground fault pickup values are based on circuit breaker sensor plug only and not on the rating plug multiplier. Changing the rating plug multiplier has no effect on the ground fault pickup values.

80% Rated Circuit Breaker

Most molded-case circuit breakers are 80% rated devices. An 80% rated circuit breaker can only be applied at 80% of its rating for continuous loads as defined by NFPA 70. Circuit conductors used with 80% rated circuit breakers are required to be rated for 100% of the circuit breaker's rating.

The 80% rated circuit breakers are typically at a lower cost than the 100% rated circuit breaker but load growth is limited.

100% Rated Circuit Breaker

Applications where all UL and NEC restrictions are met can use 100% rated circuit breakers where 100% rated circuits can carry 100% of the circuit breaker and conductor current rating.

The 100% rated circuit breakers are typically at a higher cost than the 80% rated circuit breaker but have load growth possibilities.

When applying 100% rated circuit breakers, comply with the various restrictions including UL Standard 489 and NEC Section 210. If any of the 100% rated circuit breaker restrictions are not met, the circuit breaker becomes an 80% rated circuit breaker.

Line Circuit Breaker Options

❑ Alarm Switch

The alarm switch indicates that the circuit breaker is in a tripped position caused by an overload, short circuit, ground fault, the operation of the shunt trip, an undervoltage trip, or the push-to-trip pushbutton. The alarm resets when the circuit breaker is reset.

❑ Auxiliary Contacts

These switches send a signal indicating whether the main circuit breaker contacts are in the open or closed position.

❑ Breaker Separators (350-2500 kW)

Provides adequate clearance between breaker circuits.

❑ Bus Bars

Bus bar kits offer a convenient way to connect load leads to the generator set when a circuit breaker is not present. **15-300 kW.** Bus bar kits are available on alternators with leads for connection to the generator set when circuit breakers are not ordered.

350-2500 kW. A bus bar kit is provided when no circuit breaker is ordered. Bus bars are also available in combination with circuit breakers or other bus bars on the opposite side of the junction box. On medium voltage (3.3 kV and above) units, a bus bar kit is standard (not applicable to KD models).

❑ Field Connection Barrier

Provides installer wiring isolation from factory connections.

❑ Ground Fault Annunciation

A relay contact for customer connection indicates a ground fault condition and is part of a ground fault alarm.

❑ Lockout Device (padlock attachment)

This field-installable handle padlock attachment is available for manually operated circuit breakers. The attachment can accommodate three padlocks and will lock the circuit breaker in the OFF position only.

❑ Lugs

Various lug sizes are available to accommodate multiple cable sizes for connection to the neutral or bus bar.

❑ Overcurrent Trip Switch

The overcurrent trip switch indicates that the circuit breaker has tripped due to overload, ground fault, or short circuit and returns to the deenergized state when the circuit breaker is reset.

❑ Shunt Trip, 12 VDC or 24 VDC

A shunt trip option provides a solenoid within the circuit breaker case that, when momentarily energized from a remote source, activates the trip mechanism. This feature allows the circuit breaker to be tripped by customer-selected faults such as alternator overload or overspeed. The circuit breaker must be reset locally after being tripped. Tripping has priority over manual or motor operator closing.

❑ Shunt Trip Wiring

Connects the shunt trip to the generator set controller. (standard on KD models with the APM802 controller)

❑ Undervoltage Trip, 12 VDC or 24 VDC

The undervoltage trips the circuit breaker when the control voltage drops below the preset threshold of 35%-70% of the rated voltage.

15-300* kW Line Circuit Breaker Specifications

* Includes models 300REOZJ and 300REZXC. For other 300 kW models, see the 300-2250 kW section.

100% Rating Circuit Breaker

Alt. Model	Ampere Range	Trip Type	C. B. Frame Size
4D/4E	15-150	Thermal magnetic	HD
	60-150	Electronic LSI	
	60-150	Electronic LSI	HG
4P/4PX 4Q/4QX	15-150	Thermal magnetic	HD
	60-150	Electronic LSI	
	60-150	Electronic LSI	HG
	175-250	Thermal magnetic	JD
	250	Electronic LSI	JD
	250	Electronic LSI	JG
	400	Electronic LSI	LG
	400	Electronic LSI	LG
4RX 4S/4SX 4TX 4V 4UA 4M6226	15-150	Thermal magnetic	HD
	60-150	Electronic LSI	
	60-150	Electronic LSI	HG
	175-250	Thermal magnetic	JD
	250	Electronic LSI	
	250	Electronic LSI	JG
	400	Electronic LSI	LG
	600-800	Electronic LSI	PG
4UA 4M6226	1000-1200	Electronic LSI	PG
	1200	Electronic LSI	PJ

Interrupting Ratings

Circuit Breaker Frame Size	240 Volt, kA	480 Volt, kA	600 Volt, kA
HD	25	18	14
HG	65	35	18
HJ	100	65	25
JD	25	18	14
JG	65	35	18
JJ	100	65	25
LA	42	30	22
LG	65	35	18
MG			
PG	65	35	18
PJ	100	65	25
PL	125	100	25

Circuit Breaker Lugs Per Phase (Al/Cu)

Frame Size	Ampere Range	Wire Range
H	15-150	One #14 to 3/0
J	175	One 1/0 to 4/0
	200-250	One 3/0 to 350 kcmil
LA	300-400	One #1 to 600 kcmil or Two #1 to 250 kcmil
LG	400-600	Two 2/0 to 500 kcmil AL/CU
M	800	Three 3/0 to 500 kcmil
P	600-800	Three 3/0 to 500 kcmil
	1000-1200	Four 3/0 to 500 kcmil

100% Rating Electrically Operated Breakers

For use as paralleling breakers with the Decision-Maker® 6000 Controller/DPS System or APM603 controller.

Generator-Mounted P-Frame, 24VDC Electrically Operated			
Alt. Model	Amps	Trip Unit	Frame
4RX 4S/4SX 4TX 4V	250	5.0 LSI	PJ
	400		
	600	5.0 LSI	PL
	800		
4UA 4M6226	250	5.0 LSI	PJ
	400		
	600		
	800	5.0 LSI	PL
	1000		
	1200		

All circuit breakers listed in this table include line side bus and load side lugs, 24VDC motor operators, 2 type C auxiliary contacts, and 1 type C SDE overcurrent switch contact. No second breakers are allowed in combination with these breakers.

Mechanical Load Lugs Included with H, J, and LG LSI

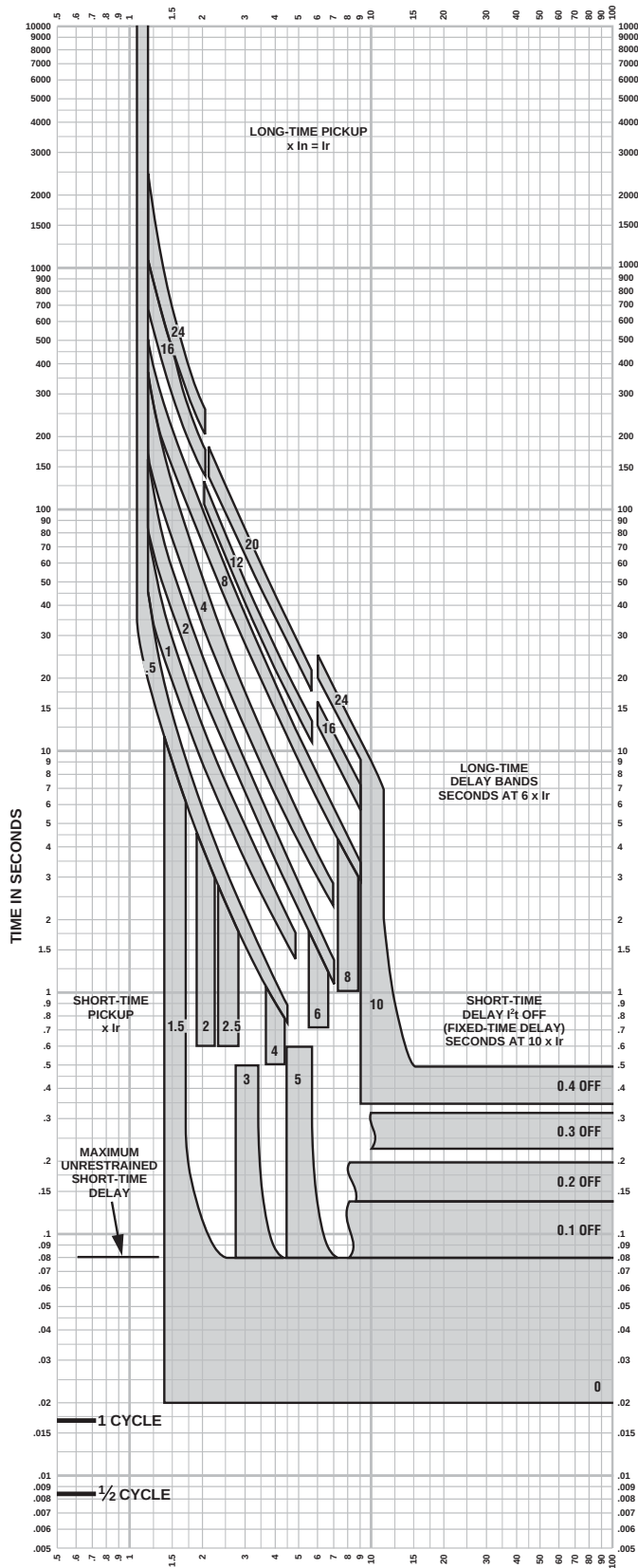
Neutrals		
H	60-150	One #14 to 3/0 AL/CU
J	250	One 3/0 to 350 kcmil AL/CU
LG	400-600	Two 4/0 to 500 kcmil AL/CU



Industrial Generator Set Accessories

Line Circuit Breakers 15-3250 kW

CURRENT IN MULTIPLES OF I_r (I_r = LONG-TIME SETTING $\times I_n$)



MICROLOGIC® 5.0/6.0 A/P/H TRIP UNIT CHARACTERISTIC TRIP CURVE NO. 613-4

Long-time Pickup and Delay
Short-time Pickup and I^2t OFF Delay

The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -30°C to +60°C ambient temperature.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal-imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. With zone-selective interlocking on, short-time delay utilized and no restraining signal, the maximum unrestrained short-time delay time band applies regardless of the setting.
4. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
5. For a withstand circuit breaker, instantaneous can be turned OFF. See 613-7 for instantaneous trip curve. See 613-10 for instantaneous override values.
6. Overload indicator illuminates at 100%.

Merlin Gerin
Modicon
Square D
Telemecanique
Federal Pioneer
Federal Pacific
Schneider Electric Brands

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Electric

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Curve No. 0613TC0004
December 2000
Drawing No. B48095-613-04

POWERPACT® P- and R-Frame Molded Case Circuit Breakers (Standard or 100% rated up to 2500 A)

The most compact and innovative molded case circuit breakers



P-Frame 1200 A



R-Frame

POWERPACT Molded Case Circuit Breakers lead the industry with proven, reliable protection and innovative design. Providing unparalleled performance and control, this generation of P- and R-frame circuit breakers features exclusive MICROLOGIC® Trip Units, which allow for a range of sophisticated applications for metering and monitoring. In addition, units can be interchanged to allow for maximum flexibility and are field-installable for easy upgrades as needed.

The compact P- and R-frame circuit breakers permit smaller footprint and higher density installations using I-LINE® Panelboards and Switchboards. These circuit breakers are available in 100% rated construction up to 2500 A to meet a broad range of commercial and industrial application needs.

Full-Featured Performance

- P-frame – 1200 A available in both standard and 100% ratings with sensor sizes 250–1200 A. Interrupting ratings (AIR) G-35kAIR, J-65kAIR and L-100kAIR at 480 VAC
- R-frame – 2500 A available in both standard and 100% ratings with sensor sizes 600–2500 A. Interrupting ratings (AIR) G-35kAIR, J-65kAIR and L-100kAIR at 480 VAC
- Compact breaker size allows for smaller footprint installations using I-LINE Panelboards and Switchboards. 9" width on P-frame designs and 15" width on R-frame designs provide increased density installations
- Most field-installable accessories are common to all frame sizes for easier stocking and installation
- Selection of four interchangeable MICROLOGIC Trip Units with POWERLOGIC® power metering and monitoring capabilities available in advanced trip units
- Compatible with POWERLOGIC® systems and high amperage power circuit breakers
- Built-in MODBUS® protocol provides an open communications platform and eliminates the need to purchase additional, proprietary network solutions
- Connection options include bus, cable or I-Line for installation flexibility
- Additional options are available for 5-cycle closing, stored energy mechanisms and draw-out mounting of 1200 A breakers

POWERPACT® P- and R-Frame Molded Case Circuit Breakers (Standard or 100% rated up to 2500 A)

Onboard Intelligence

For “smarter breakers,” a range of MICROLOGIC® Trip Units provides advanced functionality, such as a communications interface, and power metering and monitoring capabilities. With the appropriate MICROLOGIC Trip Unit, you can communicate with breakers, gather power information, monitor events and remotely control breakers based on predetermined conditions, leading to substantial savings in electrical system operating costs.

These interchangeable, microprocessor-controlled, plug-in devices provide the next generation of protection, measurement and control functions, delivering not only greater electrical system safety but also improved system integration and coordination.



MICROLOGIC® Trip Units

Choose the Model that Meets Your Needs

MICROLOGIC 3.0 and 5.0

- Basic circuit protection including long-time, instantaneous and optional short-time adjustments

MICROLOGIC 3.0A, 5.0A and 6.0A

- Long-time, instantaneous and optional short-time adjustments
- Integrated ammeter and phase loading bar graph
- LED trip indicator
- Zone selective interlocking with downstream and upstream breakers
- Optional ground-fault protection
- Optional MODBUS® communications interface

MICROLOGIC 5.0P and 6.0P

- Long-time, instantaneous and optional short-time adjustments
- Advanced relay protection (current imbalance, under/over voltage, etc.)
- Inverse Definite Minimum Time Lag (IdmtL) long-time delay curve shaping for improved coordination
- Basic power metering and monitoring functions
- Standard MODBUS communications interface compatibility with POWERLOGIC® installations
- Standard GF alarm on 5.0P. 6.0P has equipment ground-fault tripping protection

MICROLOGIC 5.0H and 6.0H

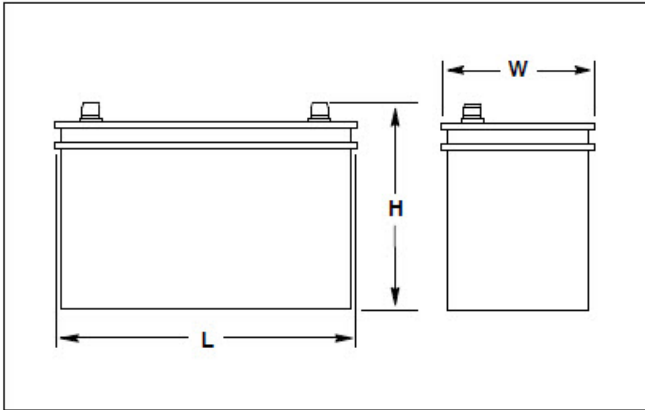
- All 5.0P and 6.0P functions
- Enhanced POWERLOGIC power metering and monitoring capabilities
- Basic power quality (harmonic) measurement
- Waveform capture

Contact your Square D sales representative for additional information. Or, visit www.SquareD.com.





Typical Overall Dimensions

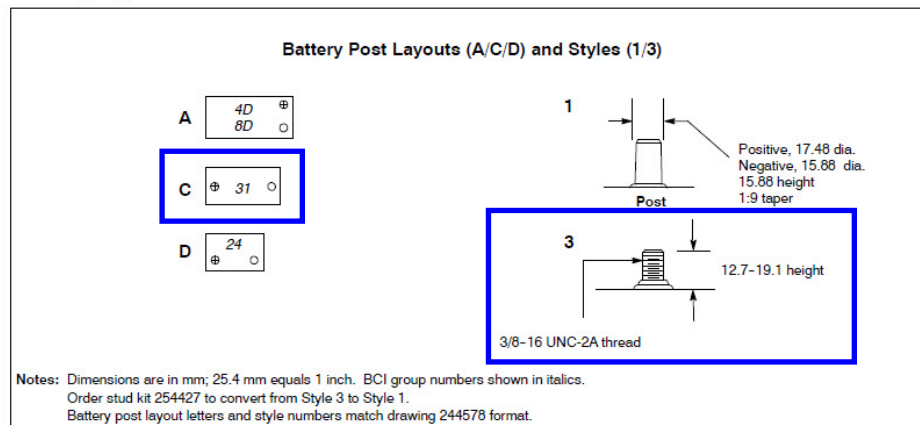


Standard Features

- Rehko selects batteries to meet the engine manufacturer's specifications and to comply with NFPA requirements for engine-cranking cycles.
- Heavy-duty starting batteries are the most cost-effective means of engine cranking and provide excellent reliability in generator set applications.
- Tough polypropylene cases protect against life-shortening vibration and impact damage.
- Batteries are rated according to SAE standard J-537.
- All batteries are 12-volts. Kits that contain two or four batteries are available for 24-volt systems and/or systems with redundant starters.
- Wet- and dry-charged batteries have lead-calcium or lead-antimony plates and use sulfuric acid electrolyte. Removable cell covers allow checking of electrolyte specific gravity.
- Absorbant glass mat (AGM) batteries are sealed and maintenance free.
- Batteries are for applications below and above 0°C (32°F).

Charge Type*	Battery Part Number	Battery Qty. per Size	BCI Group Size	Battery SAE Dimension, mm (in.)			Cold Cranking Amps at 18°C (0°F) Min.	Reserve Capacity Minutes at 27° (80°F) Min.	Battery Post Layout and Style
				L	W	H			
Wet	GM106375	1	31	330.2 (13.0)	171.0 (6.8)	239.8 (9.4)	925	180	C/3

Battery Specifications





Industrial Generator Set Accessories

12/24 Volt, 10 Amp Automatic Multi-Stage Battery Charger



The battery charger is a fully-automatic, high efficiency battery charger that charges batteries rapidly and safely. The battery charger is designed for an industrial environment.

The battery charger is designed for operation with an engine cranking battery.

The battery charger is universal voltage input capable, comes with a standard 120 V/60 Hz AC plug, and charges 12 VDC or 24 VDC battery systems.

Five LED lights indicate power, communication status, temperature compensation status, charge curve, and charger status.

With the optional battery temperature sensor connected, the battery charger can adjust output voltages for optimal charging.

Standard Features

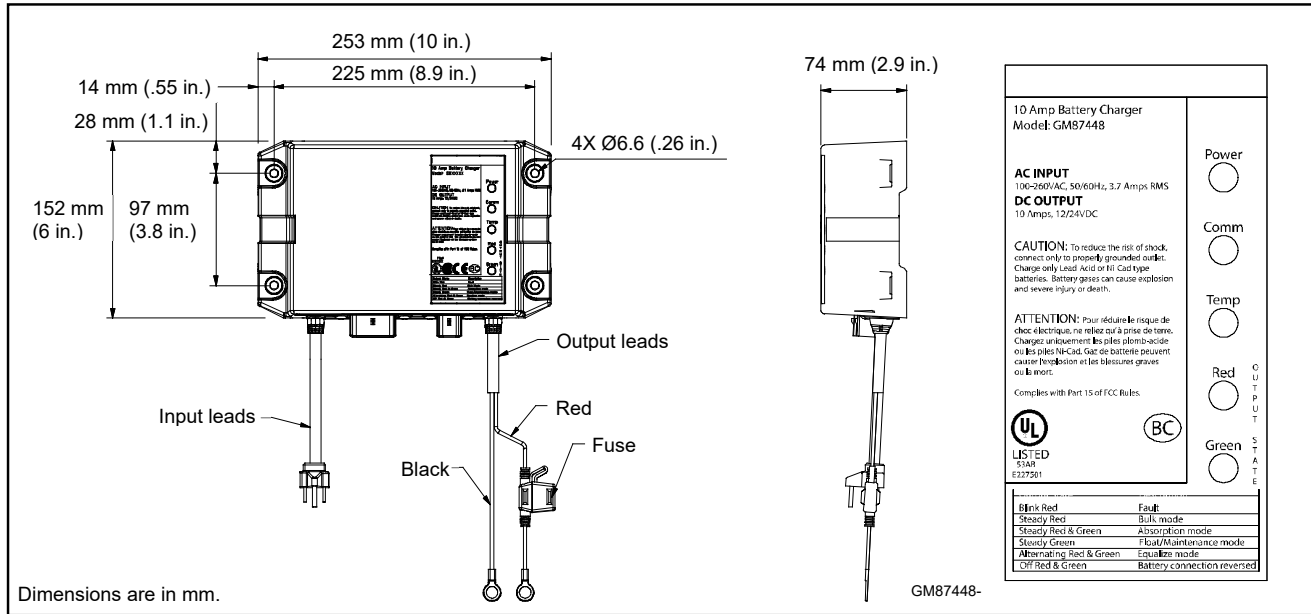
- 12 or 24 VDC output
 - Automatic voltage detection
- Automatic multi-stage charging modes
 - Recovery charge
 - Bulk charge
 - Absorption charge
 - Float charge
 - Equalize charge
- Charges the following type batteries:
 - Flooded lead acid (FLA)
 - AGM
 - Gel cell
 - High performance AGM
 - Nickel-cadmium (NiCad)
- 5 LED status indicators
- Durable potted assembly for waterproofing and vibration resistance
- Reverse-polarity protection
- Short-circuit protection
- Electronically limited output current
- Optional temperature compensation (FLA only)
- User adjustable parameters to support optimal manufacturer recommended charge curve.
- Code compliance:
 - UL 1236 Listed
 - NFPA 110, Level 1 compatible (when used with controller and connected to engine harness)
 - CSA-C22.2 No. 107.2-01
 - FCC-Title 47, Part 15 Class A
 - CE
 - IBC 2015
 - OSHPD

DC Output		AC Input		Overall Dimensions W x D x H	Shipping Weight	
Volts (Nominal)	Amps	Volts (Nominal)	Amps		kgs	lbs
12/24	10	100-260	3.7	253 mm x 152 mm x 74 mm (10.0 in x 6.0 in x 2.9 in)	3.6	7.9



Industrial Generator Set Accessories

12/24 Volt, 10 Amp Automatic Multi-Stage Battery Charger

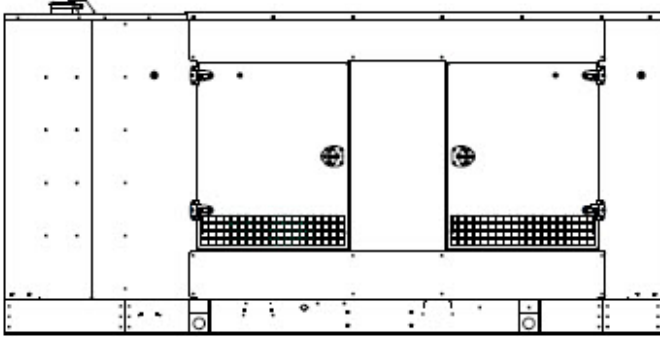


Specifications

AC Input	100-260 VAC
Frequency Input	50/60 Hz
DC Output	10 Amps @ 12 VDC or 10 Amps @ 24 VDC (On battery voltage regulation $\pm 1\%$; current is electronically limited)
Fuse Protection	15 amps ATC
Battery Types	Flooded Lead Acid (FLA) AGM Gel Cell High Performance AGM Nickel-Cadmium (NiCad)
Monitoring LED Indications	Power Communication Temperature compensation Output charger curve and charger status: - Red - Green
Environmental Operating Storage Relative Humidity Salt Spray Testing Corrosion Resistant	-20° to 70°C (-4° to 158° F) -40° to 85°C (-40° to 185° F) 5 to 95% (non-condensing) ASTM B117 From battery gases

Enclosure Environmental Resistant	From rain, snow, dust, and dripping water (IP-64)
Battery Connections Lead Length Battery Connections	1.8 m (6 ft.) red and black leads 9.5 mm (3/8 in.) ring terminals
AC Power Connections Lead Length Storage	1.8 m (6 ft.) Standard US style 3-prong AC plug
Available Options Temperature compensation	

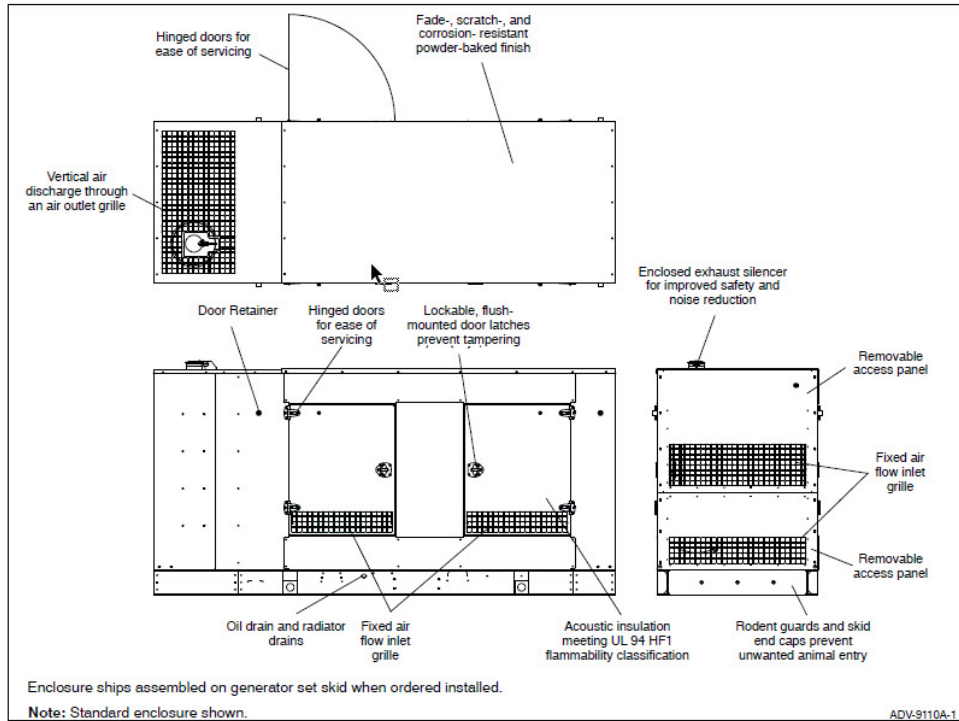
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**Standard Enclosure**

Sound Enclosure Standard Features

- Internal-mounted critical silencer and flexible exhaust connector.
 - Skid-mounted, aluminum construction with hinged doors.
- Aluminum enclosures are recommended for high humidity and or high salt/coastal regions.
- Fade-, scratch-, and corrosion-resistant Kohler® Power Armor automotive-grade textured finish.
 - Enclosure has four access doors which allow for easy maintenance.
 - Lockable, flush-mounted door latches.
 - Vertical air inlet and outlet discharge to redirect air and reduce noise.
 - Acoustic insulation that meets UL 94 HF1 flammability classification and repels moisture adsorption.
 - Sound attenuated enclosure that uses up to 51 mm (2 in.) of acoustic-lined air discharge hood.
 - Aluminum sound enclosure is certified to 186 mph (299 kph) wind load rating.

Standard Weather and Sound Enclosure



Sound Enclosure Features

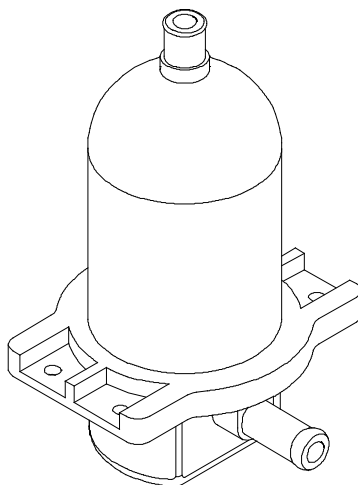
- Formed panel, solid construction. Preassembled package offering corrosion resistant, dent resilient structure mounting directly to skid.
- Available in 3.2 mm aluminum 14 gauge.
- Power Armor automotive-grade finish resulting in advanced corrosion and abrasion protection as well as enhanced edge coverage and color retention.
- Internal critical exhaust silencer offering maximum component life and operator safety.
- Interchangeable modular panel construction. Allows complete serviceability or replacement without compromising enclosure design.
- Cooling/combustion air intake with a horizontal air inlet. Sized for maximum cooling airflow.
- Service access. Multi-personnel doors for easy access to generator set control and servicing of the oil fill and battery.
- Cooling air discharge, The sound enclosures include acoustic insulation with urethane film.
- Enclosed critical silencer and three-way catalyst standard on KG100 and KG125 (optional on KG80)
- Sound attenuating design. Mechanically restrained acoustic insulation UL 94 HF1 listed for flame resistance.

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	Max. Length, mm (in.)	Max. Width, mm (in.)	Sound Pressure Level, dB(A)	Max. Height, mm (in.)	Weight, kg (lb.)
Lift base	0	3848 (151.5)	1340 (52.8)	73	1949 (76.7)	2637 (5819)

Note: Data in table is for reference only, refer to the respective ADV drawings for details.

Max. weight includes the generator set (wet) with largest alternator option, enclosure, and silencer.

Log average sound pressure level of 8 measured positions around perimeter of the unit at a distance of 7 m (23 ft). Refer to TIB-114 for details.



Block Heater Kit, typical

Applicable Models

- KD80-KD200
- KG25-KG40A
- KG40-KG125
- KG80A
- **KG150-KG200**
- KG150R
- 25-45REZG
- 25-60REZGB
- 50REZGC/125REZGC/150REZGC
- 50-60REOZJD
- 50REOZJE
- 80REZGD/100REZGD
- 80RZGD/100RZGD
- 80-200REOZJF
- 80-150REOZJG4
- 125RZGC/150RZGC

Standard Features

- UL-C/US listed
- CE compliant
- Controls for automatic operation
- Compact design
- Easy to install

Description

The engine block heater kit heats the engine coolant in cold ambient, warming the cylinders, oil, and charge air circuit which all help to give a faster starting time. The engine block heater uses thermosiphon action to circulate warm coolant into the engine and supplies constant heating to the engine. The engine block heater kit helps to extend element life and gives a significant reduction in electrical consumption.

The engine block heater kit is recommended for ambient temperatures below 10°C (50°F).

The engine block heater kits are available in 120 V, 240 V, and 277 V versions.



Industrial Generator Set Accessories

Engine Block Heater Kits

Block Heater Specifications

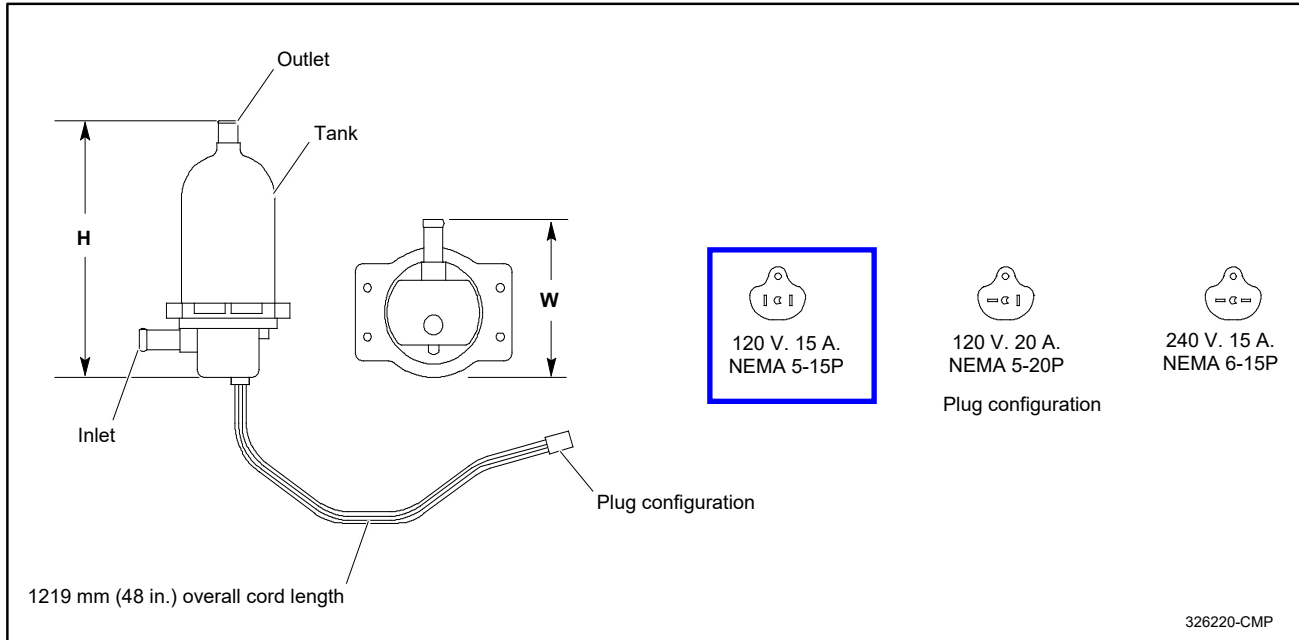
Heating Fluid	Water, Coolant Mix (50% Glycol/50% Water)
Max. Pressure	90 psi (620 kPa)
Heating Element Material	Incoloy 800
Inlet/Outlet Plumbing	0.625 in. hose barb
System Ingress	IP41
Power Connection	NEMA Plug and EURO Plug
Power Chord Length	48 in. (1219 mm)

Specifications

Block Heater Kit Number	Component	Watts	Voltage	Phase	Thermostat Temperature	
					ON	OFF
GM58098-KA1	358311	1000	120	1	27°C (80°F)	38°C (100°F)
GM75536-KA1	326228	1500	120		49°C (120°F)	60°C (140°F)
GM75555-KA5	GM75552	1800	120			
GM75555-KA6	GM75553	2000	240			
GM75556-KA1	352945	1500	120			
GM75557-KA1	352945	1500	120			
GM75564-KA1	358311	1000	120			
GM75565-KA1	352945	1500	120			
GM77944-KA1	352945	1500	120			
GM77944-KA2	352946	1500	240			
GM85060-KA1	GM75552	1800	120			
GM85060-KA2	GM75553	2000	240			
GM89427-KA2	GM75552	1800	120			
GM91708-KA1	352945	1500	120			
GM94248-KA1	352945	1500	120			
GM104799-KA1	352945	1500	120			
GM105165-KA1	352945	1500	120			
GM105165-KA2	352946	1500	240			
GM105409-KA1	352945	1500	120			
GM105409-KA2	352946	1500	240			
GM115370-KA1	352945	1500	120			
GM115370-KA2	352946	1500	240			
10210000401-KA1	GM95436	500	120			
10305010400-KA1	352945	1500	120			
10305011301-KA1	352945	1500	120			
10305011401-KA1	GM75552	1800	120			
10305011401-KA2	GM75553	2000	240			

Dimensions and Weights

Overall Size, H x W, mm (in): 199 x 122 (7.8 x 4.8)
 Weight, kg (lb): 0.77 (1.7)





Industrial Generator Set Accessories

Engine Block Heater Kits

Availability is subject to change without notice. Discovery Energy, LLC and its affiliates dba Rehko reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local authorized generator set distributor for availability.

Alternator Data

TECHNICAL INFORMATION BULLETIN
Alternator Data Sheet
Alternator Model: 4UA13
Frequency: 60 Hz
Speed: 1800 RPM
Leads: 12 (6 Lead, 600 Volt)

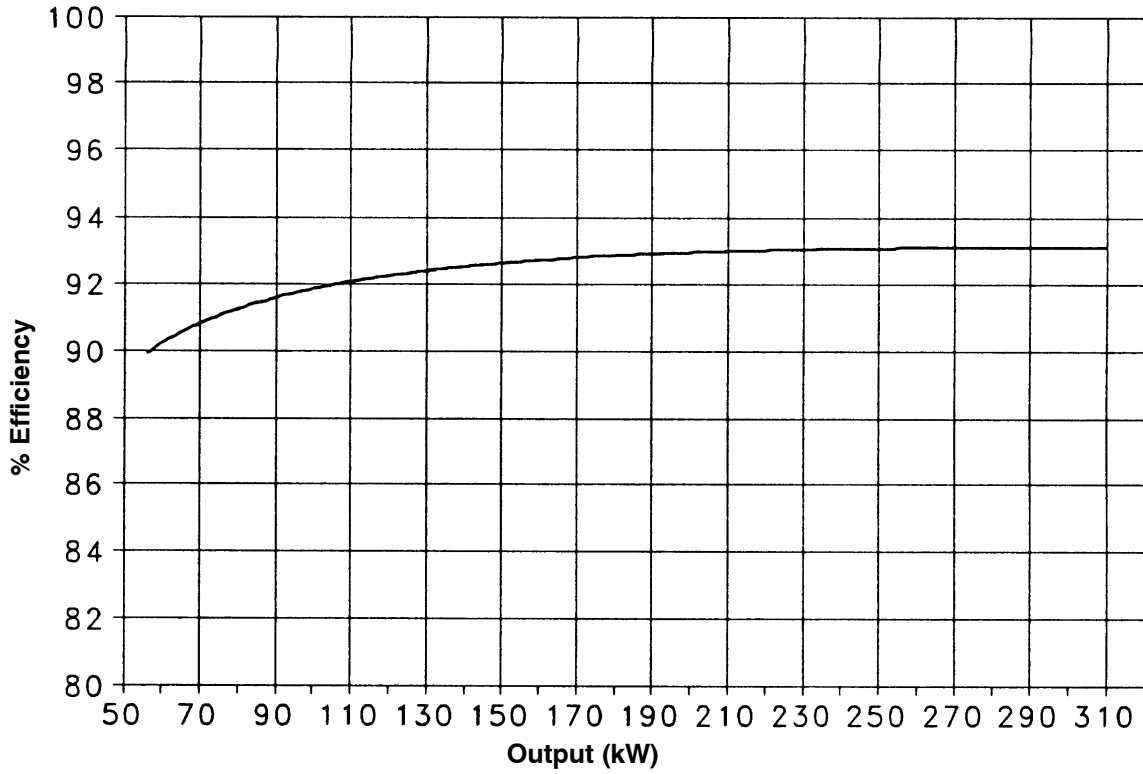
Voltage L-N/L-L	Phase	Power Factor	Connection	kW* (kVA)						
				Class B	Class F				Class H	
				80°C Continuous	90°C Lloyds	95°C ABS	105°C Continuous	130°C Standby	125°C Continuous	150°C Standby
139/240 277/480	3	0.8	Wye	275.0 (343.8)	285.0 (356.3)	290.0 (362.5)	300.0 (375.0)	300.0 (375.0)	300.0 (375.0)	300.0 (375.0)
127/220 254/440	3	0.8	Wye	272.0 (340.0)	283.0 (353.8)	288.5 (360.6)	300.0 (375.0)	300.0 (375.0)	300.0 (375.0)	300.0 (375.0)
120/208 240/416	3	0.8	Wye	272.0 (340.0)	283.0 (353.8)	288.5 (360.6)	300.0 (375.0)	300.0 (375.0)	300.0 (375.0)	300.0 (375.0)
110/190 220/380	3	0.8	Wye	245.0 (306.3)	259.0 (323.8)	266.0 (332.5)	280.0 (350.0)	280.0 (350.0)	280.0 (350.0)	280.0 (350.0)
120/240	3	0.8	Delta	264.0 (330.0)	278.0 (347.5)	285.5 (356.9)	300.0 (375.0)	300.0 (375.0)	300.0 (375.0)	300.0 (375.0)
120/240	1	1.0	Dogleg	190.0 (190.0)	198.0 (198.0)	202.0 (202.0)	210.0 (210.0)	230.0 (230.0)	226.0 (226.0)	230.0 (230.0)
120/240	1	0.8	Dogleg	140.0 (175.0)	146.0 (182.0)	150.0 (188.0)	156.0 (195.0)	185.0 (231.3)	169.0 (211.0)	185.0 (231.3)
347/600	3	0.8	Wye	275.0 (343.8)	285.0 (356.3)	290.0 (362.5)	300.0 (375.0)	300.0 (375.0)	300.0 (375.0)	300.0 (375.0)

* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

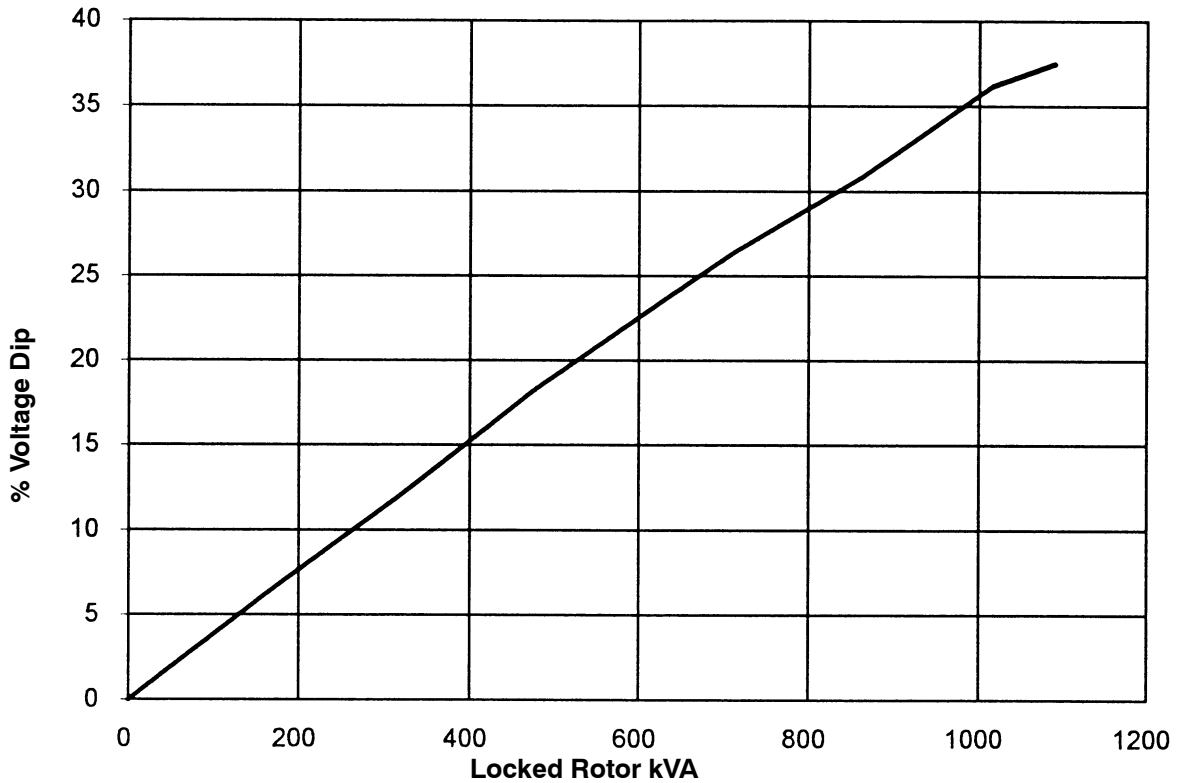
Submittal Data: 139/240 Volts, 0.8 PF, 1800 RPM, 60 Hz, 3-Phase, 130°C Rise

	Symbol	Per Unit	Ohms		Symbol	Value
Typical Resistances				Typical Time Constants		
Phase Resistance		0.020	0.003	Armature Short Circuit	T _a	0.018 sec.
Rotor Resistance		13.854	2.128	Transient Short Circuit	T' _d	0.185 sec.
Typical Reactances				Transient Open Circuit	T' _{do}	2.184 sec.
Synchronous				Typical Field Current		
Direct	X _d	3.417	0.525	Full Load	I _{fFL}	29.57 amps
Quadrature	X _q	1.178	0.273	No Load	I _{fNL}	8.3 amps
Transient				Typical Short Circuit Ratio		
Unsaturated	X' _{du}	0.328	0.050			0.391
Saturated	X' _d	0.289	0.044	Harmonic Distortion		
Subtransient				RMS Total Harmonic Distortion		2.7%
Direct	X'' _d	0.133	0.020	Max. Single Harmonic		7 th
Quadrature	X'' _q	0.139	0.021	Deviation Factor (No Load, L-L)		4.3%
Negative Sequence	X ₂	0.136	0.021	Telephone Influence Factor		<50
Zero Sequence	X ₀	0.011	0.002	Insulation Material Class		
				per NEMA MG1-1.66		H
				Phase Rotation		
						ABC

**4UA13, 60 Hz, 139/240, 277/480 Volts, Wye
TYPICAL ALTERNATOR EFFICIENCY***

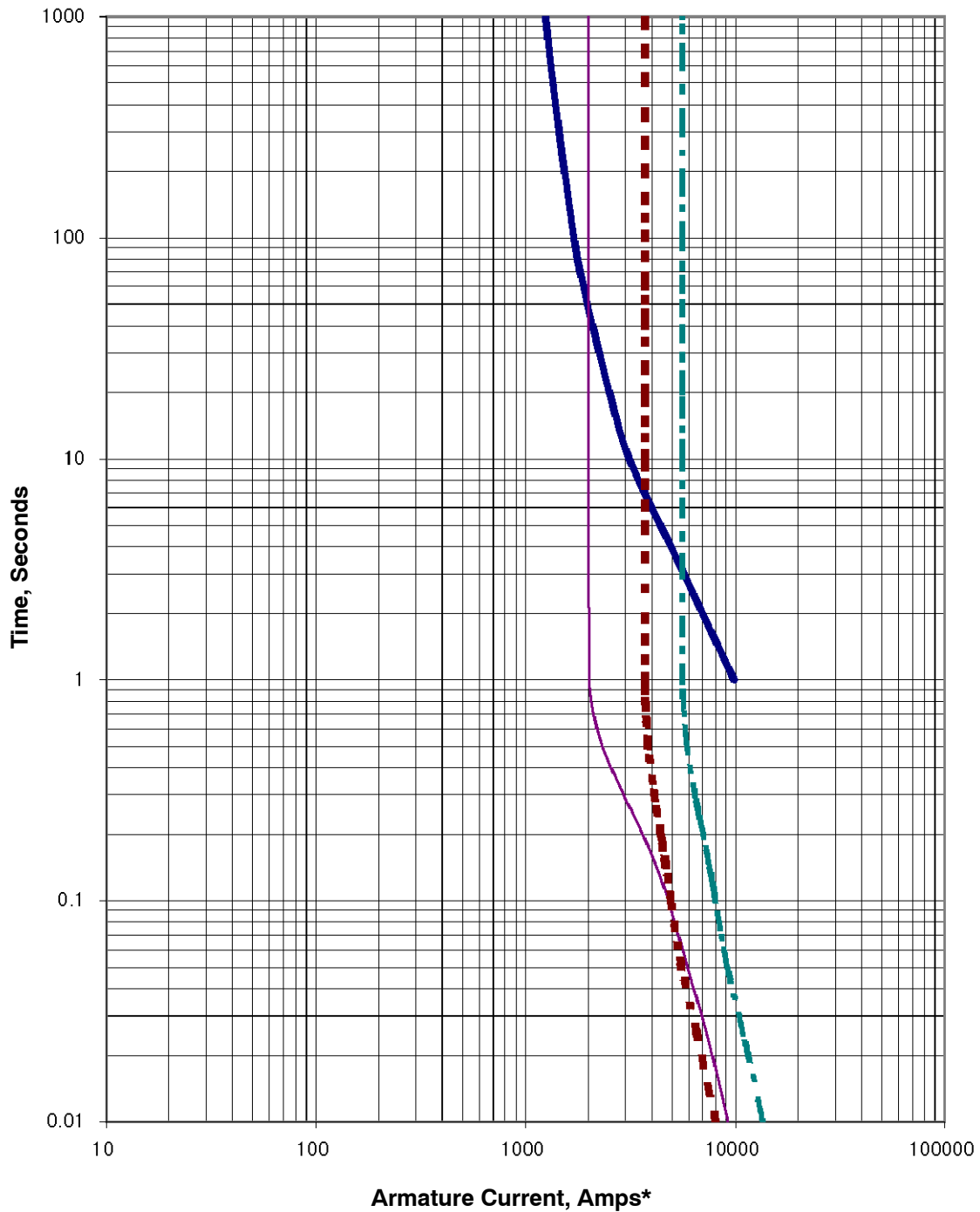


**4UA13, 60 Hz, 139/240, 277/480 Volts, Wye
TYPICAL MOTOR STARTING CHARACTERISTICS***



* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

4UA13, 60 Hz, Low Wye or Delta Connection SHORT CIRCUIT DECREMENT CURVE



— Alternator Damage Curve

— 3 Phase Symmetrical

- - - Line-to-Line 1 Phase

- . - Line-to-Neutral 1 Phase

* Instantaneous current (t=0) is asymmetric. Divide by 1.732 for symmetric.

Cooling Data

TECHNICAL INFORMATION BULLETIN

Generator Set Cooling System Data Sheet

KG200 60Hz (Standby Duty)	50°C Ambient Temperature Cooling System								
	Total external restriction on open unit ⁷	Pa <i>(in.H₂O)</i>	0 (0)	125 (0.5)	187 (0.75)	250 (1)	312 (1.25)	375 (1.5)	Enclosed Units
	Maximum allowable ambient temperature	°C (°F)	50 (122)	48 (118)	47 (117)	45 (113)	43 (109)	41 (106)	45 (113)
	Cooling system airflow	m³/min <i>(ft³/min)</i>	330 (11700)	308 (10900)	295 (10400)	282 (10000)	268 (9500)	253 (8900)	NA (NA)

1. The data shown above is the anticipated cooling performance for a typical generator set when following proper installation techniques.
2. Cooling performance is based on operation at 100 m (328 ft.) above sea level. For elevations higher than 100 m (328 ft.), typical cooling performance derate is 1°C (1.8°F) per 250 m (820 ft.).
3. For high ambient conditions, check TIB-101 for the generator set power output derate schedule.
4. Incorrect installation, improper operation, fouling of the cooling system, and other variable conditions may reduce cooling performance.
5. The company-manufactured sound-enclosed models are rated in free air with no additional restriction. Consult factory for other variants or conditions such as additional ducting or hoods.
6. Performance is based on a 50/50 water and ethylene glycol mixture.
7. Total external restriction includes restriction upstream and downstream of the unit – any ducting supplying intake air to the unit and any ducting for the discharge.

Sound Data

TECHNICAL INFORMATION BULLETIN

Generator Set Sound Data Sheet

Generator Set Model	Hz	Load	Sound Pressure Data in dB(A)					
			Raw Exhaust (No Catalyst, No Silencer)	Raw Exhaust (Open Unit Catalyst, No Silencer)	Open Unit, Isolated Exhaust	Weather Enclosure	Standard Sound	Premium Sound
KG200	60	100% Load	110.8	103.5	87.4	85.5	73.4	70.8
		No Load	95.9	94.5	82.8	80.9	68.5	65.8

Note: Sound pressure data is the logarithmic average of eight perimeter measurement points at a distance of 7 m (23 ft.), except Raw Exhaust data which is a single measurement point at 1 m (3.3 ft.) from the mouth of a straight pipe exhaust.

KG200		60 Hz		Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Enclosure	Measurement Clock Position	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
100% Load	7 (23)	Premium Sound	3:00	52.2	61.6	62.8	63.3	62.8	61.1	56.2	50.7	69.7
			1:30	48.0	62.5	61.9	65.1	65.3	61.7	58.1	50.7	70.9
			12:00-Engine	50.5	62.4	62.7	65.1	65.1	62.4	60.9	54.6	71.3
			10:30	52.0	62.9	61.2	65.8	66.4	63.0	60.7	54.5	71.8
			9:00	50.5	59.2	60.5	63.7	64.4	62.0	58.3	51.9	69.8
			7:30	51.2	61.4	61.7	63.1	64.8	64.1	56.9	51.2	70.5
			6:00-Alternator	53.6	63.1	64.9	63.5	65.2	64.4	58.5	54.2	71.7
			4:30	51.0	62.5	63.9	62.5	64.1	63.0	55.6	51.3	70.5
			8-pos. log avg.	51.4	62.1	62.7	64.2	64.9	62.8	58.5	52.7	70.8

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Enclosure	Measurement Clock Position	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
100% Load	7 (23)	Standard Sound	3:00	54.9	63.2	64.8	68.6	63.7	61.0	57.4	53.6	72.3
			1:30	51.6	63.0	63.5	68.1	65.3	63.0	58.8	53.2	72.3
			12:00-Engine	53.6	62.6	62.7	66.7	66.0	63.6	62.1	56.1	72.3
			10:30	53.8	62.6	63.3	68.6	65.7	63.2	60.8	56.5	72.8
			9:00	53.0	63.8	65.1	68.8	65.9	64.3	62.0	57.3	73.5
			7:30	54.8	63.5	65.8	69.5	65.3	63.6	60.8	57.6	73.6
			6:00-Alternator	54.5	66.7	70.2	70.4	66.3	63.7	62.6	60.2	75.6
			4:30	54.4	65.5	65.3	70.6	63.9	62.6	60.1	55.5	73.9
			8-pos. log avg.	53.9	64.1	65.8	69.1	65.4	63.2	60.9	56.8	73.4

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Enclosure	Measurement Clock Position	3:00	1:30	12:00 Eng.	10:30	9:00	7:30	6:00 Alt.	4:30	8-pos. log avg.
100% Load	7 (23)	Weather	Overall Levels	85.8	86.0	84.9	85.9	86.8	85.9	82.6	84.9	85.5

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)		Measurement Clock Position	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
100% Load	7 (23)	Open Unit, Isolated Exhaust	3:00	50.2	65.9	75.2	80.5	80.0	82.3	80.4	77.0	87.7
			1:30	54.3	66.1	76.9	81.0	81.0	82.4	79.3	75.7	87.9
			12:00-Engine	53.3	67.8	76.6	79.9	82.4	79.9	74.6	74.2	86.8
			10:30	53.2	67.4	73.9	80.3	81.0	81.9	80.1	78.4	87.8
			9:00	54.6	71.2	76.6	81.0	79.5	84.5	80.5	77.9	88.7
			7:30	52.3	67.7	76.5	81.3	79.6	81.6	79.7	78.1	87.8
			6:00-Alternator	50.7	65.8	76.8	78.2	76.8	77.2	75.8	74.2	84.5
			4:30	56.2	65.5	75.3	79.9	79.4	80.9	79.3	76.4	86.8
			8-pos. log avg.	53.5	67.6	76.1	80.4	80.2	81.8	79.1	76.8	87.4

				Sound Pressure Levels, dB(A)							
Load	Distance, m (ft)	Exhaust	Octave Band Center Frequency (Hz)								Overall Level
			63	125	250	500	1000	2000	4000	8000	
100% Load	1 (3.3)	Raw Exhaust (Open Unit Catalyst, No Silencer)	69.4	90.4	98.6	94.5	95.5	98.0	90.9	79.7	103.5

				Sound Pressure Levels, dB(A)							
Load	Distance, m (ft)	Exhaust	Octave Band Center Frequency (Hz)								Overall Level
			63	125	250	500	1000	2000	4000	8000	
100% Load	1 (3.3)	Raw Exhaust (No Catalyst, No Silencer)	76.3	88.2	98.9	104.5	104.7	105.6	101.8	94.5	110.8

KG200		60 Hz		Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Enclosure	Measurement Clock Position	Octave Band Center Frequency (Hz)							Overall Level	
				63	125	250	500	1000	2000	4000		8000
No Load	7 (23)	Premium Sound	3:00	47.1	54.9	60.0	58.9	56.3	53.8	46.4	37.4	64.5
			1:30	44.3	56.8	57.7	59.9	58.5	55.4	48.1	37.4	65.1
			12:00-Engine	45.1	56.5	60.2	58.7	59.0	56.3	48.0	39.9	65.5
			10:30	46.2	57.4	61.7	60.8	57.6	54.6	48.1	38.9	66.2
			9:00	46.5	53.4	57.6	57.3	55.2	53.9	47.8	39.5	63.1
			7:30	47.3	57.7	61.4	58.5	58.1	57.3	47.1	37.2	66.0
			6:00-Alternator	50.2	58.2	63.5	60.8	62.0	59.7	51.2	42.9	68.3
			4:30	46.7	57.1	60.8	58.3	58.0	55.9	47.1	37.8	65.5
8-pos. log avg.			47.0	56.7	60.8	59.3	58.5	56.3	48.2	39.3	65.8	

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Enclosure	Measurement Clock Position	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
No Load	7 (23)	Standard Sound	3:00	48.9	59.1	62.9	64.5	58.0	53.1	47.8	41.6	68.2
			1:30	45.7	59.7	60.8	63.6	58.5	54.7	47.5	37.9	67.4
			12:00-Engine	48.1	59.1	60.2	61.5	59.4	55.7	47.1	38.4	66.7
			10:30	46.5	57.8	61.6	63.4	58.1	56.1	47.3	39.0	67.3
			9:00	49.7	59.3	62.1	64.0	57.4	55.9	49.6	41.9	67.9
			7:30	50.3	59.4	63.6	63.3	58.4	56.3	48.4	39.2	68.2
			6:00-Alternator	53.1	62.8	69.5	65.2	60.4	56.1	49.5	42.0	72.0
			4:30	51.6	60.6	62.8	63.1	56.7	54.6	48.1	38.6	67.8
8-pos. log avg.			49.9	60.0	64.1	63.7	58.5	55.4	48.3	40.1	68.5	

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Enclosure	Measurement Clock Position	3:00	1:30	12:00 Eng.	10:30	9:00	7:30	6:00 Alt.	4:30	8-pos. log avg.
No Load	7 (23)	Weather	Overall Levels	80.6	82.6	80.2	81.6	81.5	81.0	78.2	80.0	80.9

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)		Measurement Clock Position	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
No Load	7 (23)	Open Unit, Isolated Exhaust	3:00	49.3	64.5	72.7	76.3	77.1	76.0	73.3	64.7	82.5
			1:30	49.2	64.4	75.1	76.7	79.0	79.5	74.6	65.3	84.5
			12:00-Engine	48.4	65.1	74.6	74.1	76.8	76.1	71.4	63.5	82.1
			10:30	48.8	63.5	72.7	76.0	78.5	77.6	74.6	66.1	83.5
			9:00	50.1	64.2	74.5	77.7	76.4	77.2	74.4	65.8	83.4
			7:30	48.6	64.7	74.6	76.7	76.6	76.6	73.4	65.0	82.9
			6:00-Alternator	48.6	63.9	74.8	74.3	73.5	71.4	67.3	58.5	80.1
			4:30	49.7	64.5	73.5	75.0	76.9	75.1	71.9	62.4	81.9
8-pos. log avg.			49.1	64.4	74.2	76.0	77.1	76.7	73.1	64.4	82.8	

			Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Exhaust	Octave Band Center Frequency (Hz)								Overall Level
			63	125	250	500	1000	2000	4000	8000	
No Load	1 (3.3)	Raw Exhaust (No Silencer)	60.9	83.1	82.7	88.6	89.0	88.1	83.7	75.2	94.5

			Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Exhaust	Octave Band Center Frequency (Hz)								Overall Level
			63	125	250	500	1000	2000	4000	8000	
No Load	1 (3.3)	Raw Exhaust (No Catalyst, No Silencer)	56.9	77.2	85.9	90.0	90.8	90.0	83.0	75.3	95.9

Exhaust System Data

TECHNICAL INFORMATION BULLETIN

Enclosed Generator Set Exhaust System Data Sheet

Model	Enclosure Type	Consumed Back Pressure in. Hg (in. H ₂ O)	Consumed Back Pressure kPa	Back Pressure Limit(s) in. Hg (in. H ₂ O)	Back Pressure Limit(s) kPa	Flex Exhaust Tube(s)	Silencer	Drawing
KG200	All Weather and Sound Enclosures	3.1 (43.5)	10.5	5.8 (80.0)	19.8	GM105539 Flex Tube	GM107092 Catalyst Muffler	ADV-9045

1. Total system exhaust back pressure is applicable to generator sets equipped with standard enclosure packages.
2. For generator sets with multiple exhaust outlets, total system exhaust back pressure value represents each outlet.
3. The total system back pressure should not exceed the manufacturer's recommended limit.
4. The total back pressure only includes exhaust components installed inside the enclosure. Customers must calculate any additional back pressure caused by piping, extensions, or components added after the silencer outlet. Refer to the installation manual for additional details.

Emissions Data



KG200

60 Hz. Gas Generator Set EPA Certified for Stationary Emergency Applications EMISSION DATA SHEET

ENGINE INFORMATION

Model:	KG10V08T-6DGS	Bore:	116.8mm (4.6 in.)
Nameplate kW @ 1800 RPM:	227 (NG) 178 (LPG)	Stroke:	120.6mm (4.7 in.)
Type:	4-Cycle, V8 Cylinder	Displacement:	10.3 L (632 cu. in.)
Aspiration:	Turbocharged	EPA Family:	TKHXB10.3TNL
Compression Ratio:	9.3:1	EPA Certificate:	TKHXB10.3TNL-010
Catalyst Required:	Yes		

EXHAUST EMISSION DATA (g/kW-hr):

	<u>LPG</u>	<u>NG</u>
CO ₂	833	600
NO _x	0.15	0.2
THC/VOC ²	0.03	0.03
CO	0.54	0.4
BSFC	294	219

1) Emissions shown are certified third-party zero-hour data points suitable for site permitting calculations

2) LPG as THC, NG as VOC

TEST METHODS AND CONDITIONS

Standby and overload ratings based on ISO 3046. Continuous ratings based on ISO 8528.

Nameplate power rating is measured at the flywheel operating at standard conditions in a test cell.

Production tolerances in engines and installed components can account for power variations of +/- 5%. Corrections for altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

Electrical ratings are an estimate based on assumed fan and generator losses and may vary depending on actual equipment losses.

Emission rates are based on multi-mode, cycle-weighted testing in accordance with EPA regulations.

BSFC is based on cycle-weighted gross flywheel power rating and does not include fan or generator losses.

Data was taken from a single engine test according to EPA engine test methods, fuel specifications and reference conditions and is subject to instrumentation and engine-to-engine variability. Tests conducted with alternate test methods, instrumentation, fuel or reference conditions may yield different results.

Data and specifications subject to change without notice.

07/2026

Rev. -



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2026 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

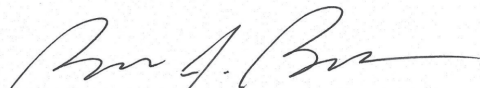
OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: Discovery Energy, LLC.
(U.S. Manufacturer or Importer)

Certificate Number: TKHXB10.3TNL-010

Effective Date:
12/30/2025

Expiration Date:
12/31/2026


Byron J. Bunker, Division Director
Compliance Division

Issue Date:
12/30/2025

Revision Date:
N/A

Manufacturer: Discovery Energy, LLC.

Engine Family: TKHXB10.3TNL

Mobile/Stationary Certification Type: Stationary

Fuel : LPG/Propane
Natural Gas (CNG/LNG)

Emission Standards :

Part 60 Subpart JJJJ Table 1

VOC (g/Hp-hr) : 1.0

CO (g/Hp-hr) : 4.0

NOx (g/Hp-hr) : 2.0

Stationary Part 1048

NMHC + NOx (g/kW-hr) : 2.7

HC + NOx (g/kW-hr) : 2.7

CO (g/kW-hr) : 4.4

Emergency Use Only : Y

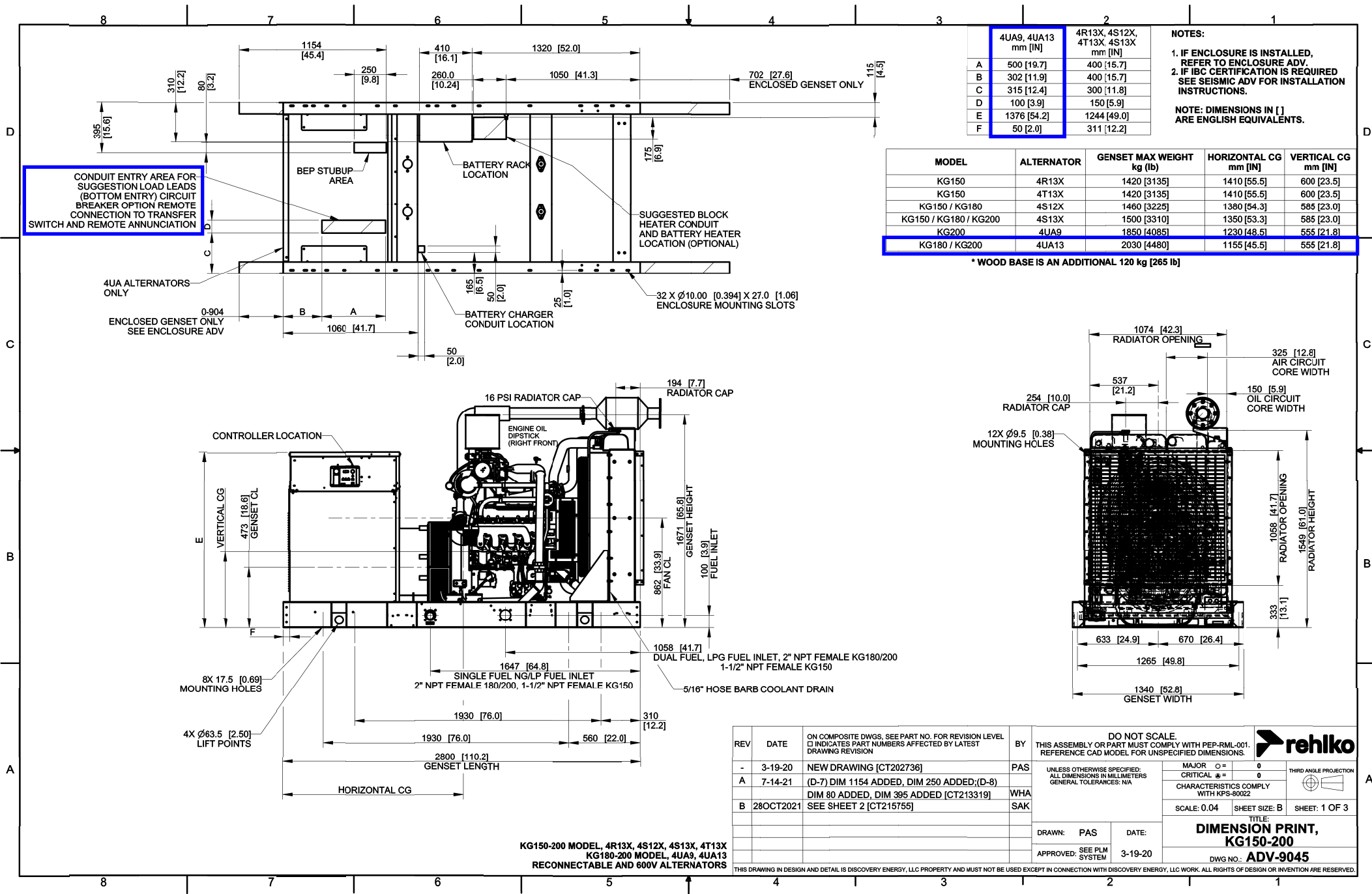
Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60, 40 CFR Part 60 and produced in the stated model year.

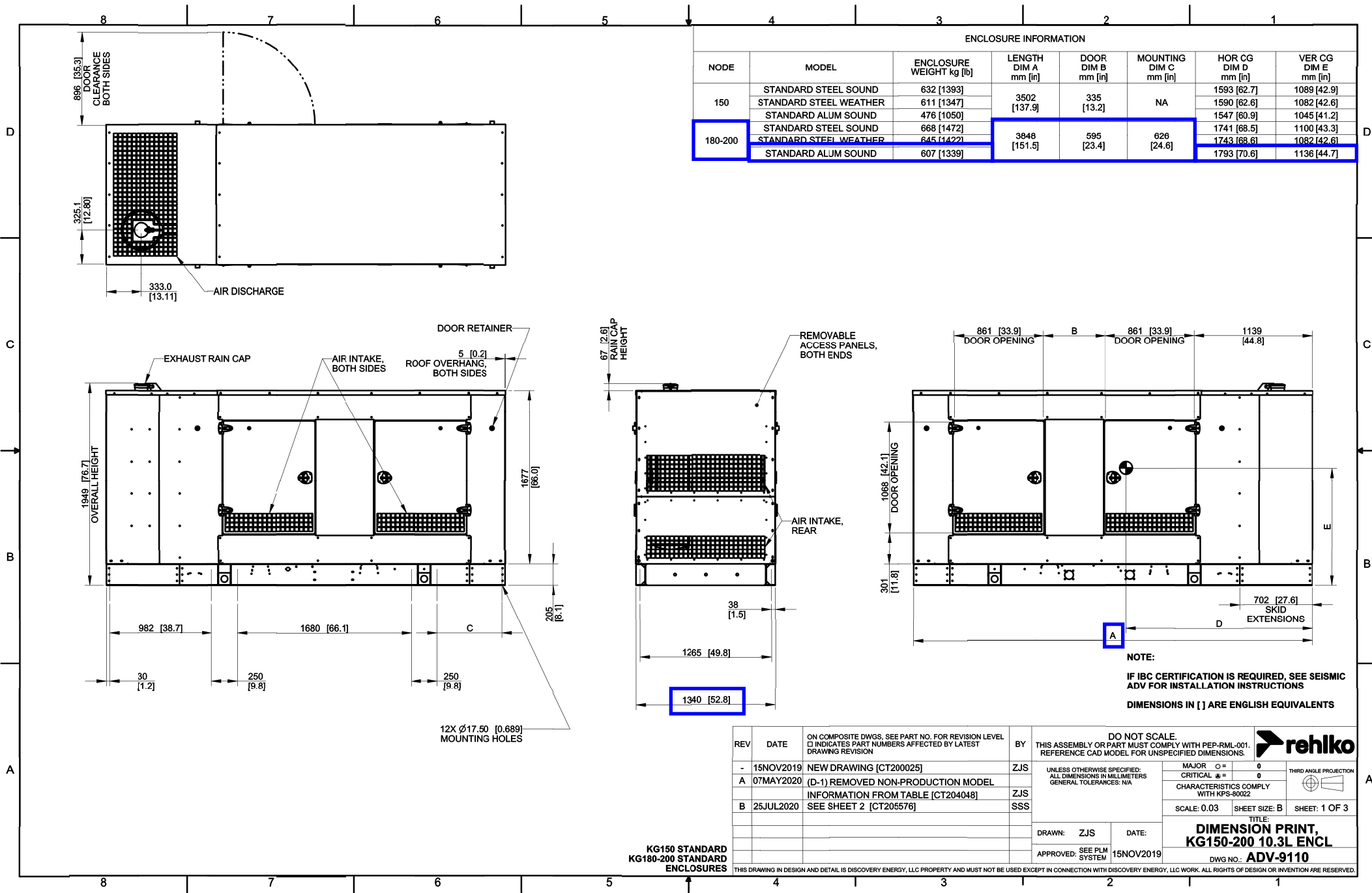
This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60, 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60, 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60, 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60, 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

Dimensional Drawings





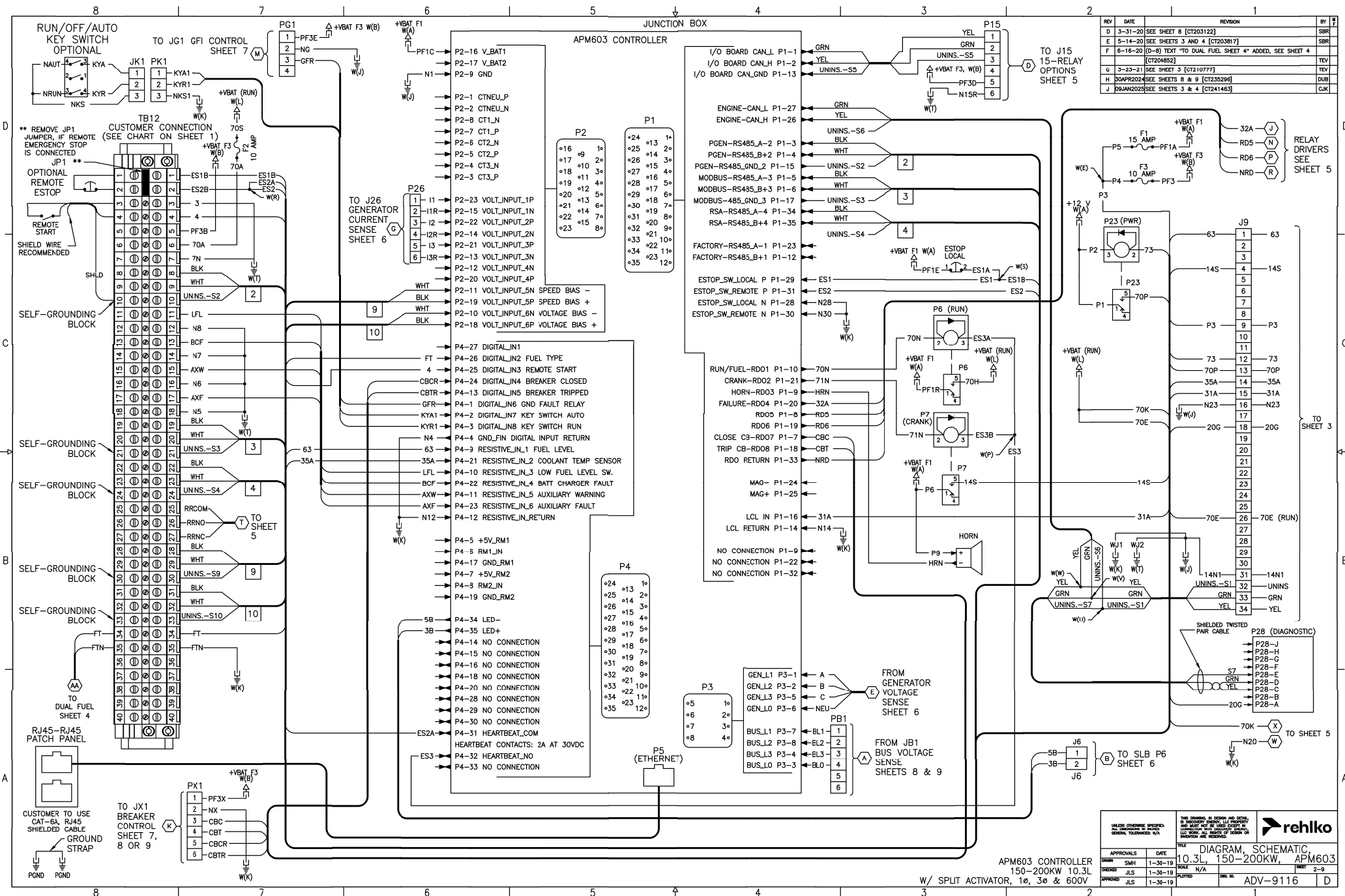
Wiring Schematics

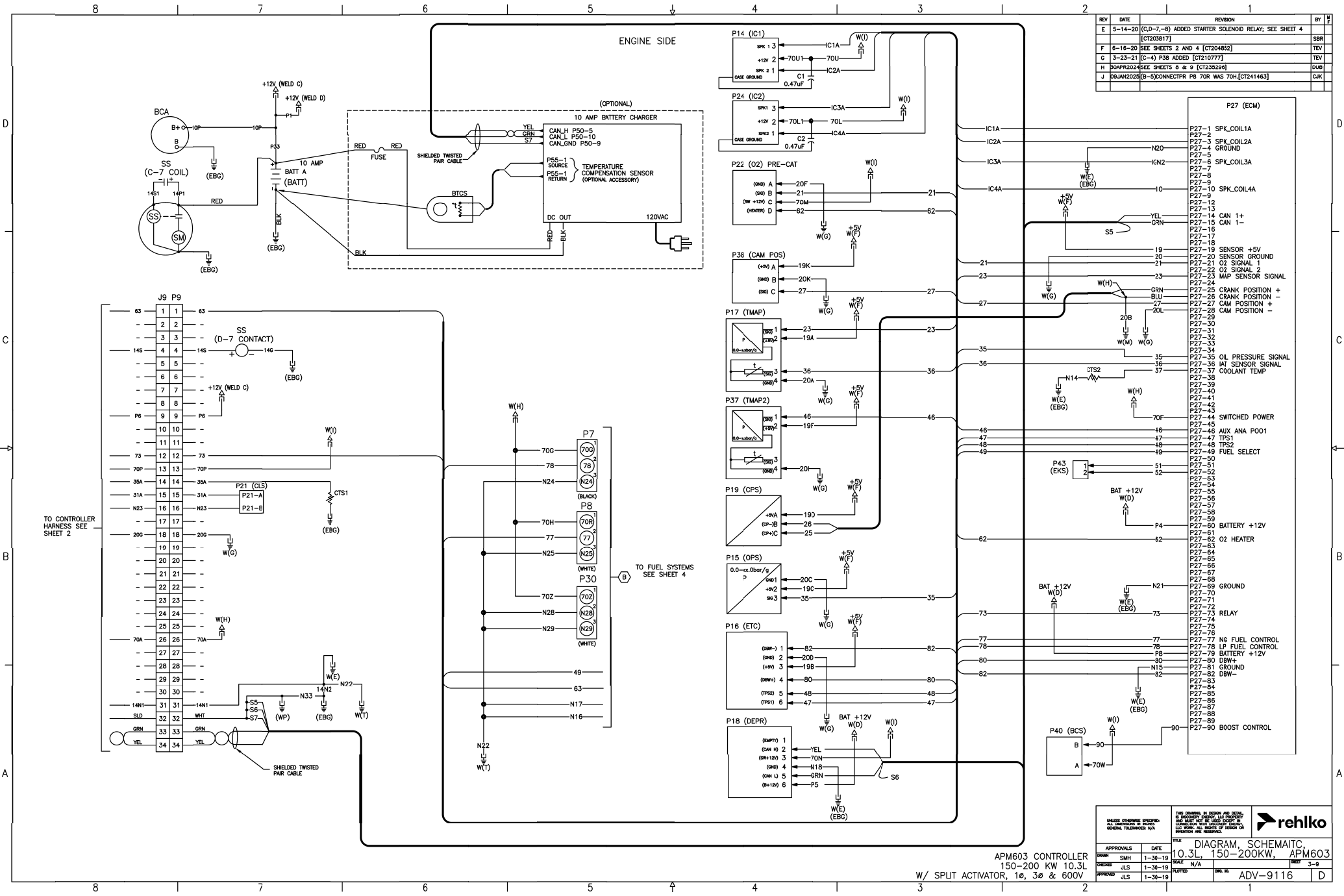
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* REMOVE RESISTORS IF PARALLELING







REV	DATE	REVISION	BY
E	5-14-20	(C,D-7,-8) ADDED STARTER SOLENOID RELAY; SEE SHEET 4	SBR
F	6-16-20	SEE SHEETS 2 AND 4 [C1204852]	TEV
G	3-23-21	(C-4) P38 ADDED [C1210777]	TEV
H	10/20/2024	SEE SHEETS 8 & 9 [C1232249]	DAUB
J	02/20/2025	(B-5) CONNECTOR P8 FOR WAS 70H [C1241463]	CJK

UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES AND DECIMALS THEREOF. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.		THIS DRAWING IS THE PROPERTY OF REHLIKO. IT IS TO BE USED ONLY FOR THE PROJECT AND QUANTITY SPECIFIED. IT IS NOT TO BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF REHLIKO.		reliko	
APPROVALS		DATE	SCALE	DWG. NO.	SHEET
DESIGNED	SMH	1-30-19	N/A	ADV-9116	3-9
CHECKED	JLS	1-30-19	PLotted		
APPROVED	JLS	1-30-19			D

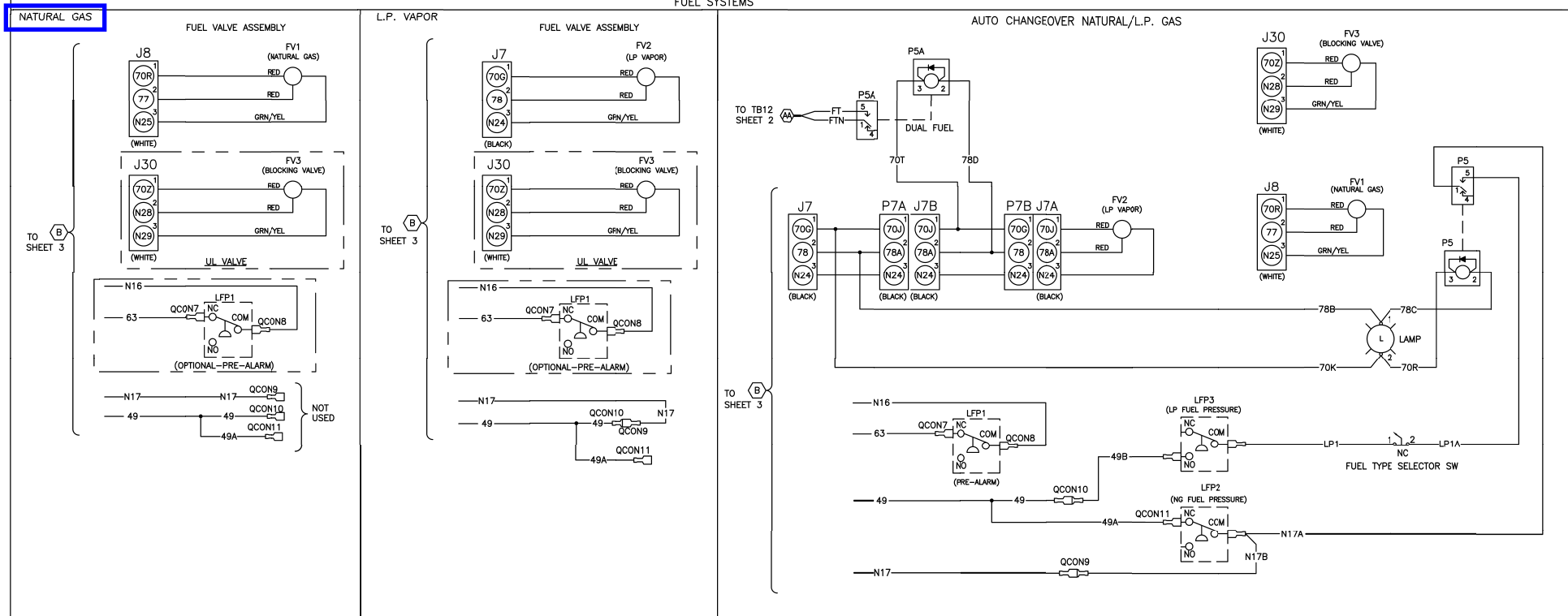
APM603 CONTROLLER
150-200 KW 10.3L
W/ SPLIT ACTIVATOR, 1ø, 3ø & 600V

DIAGRAM, SCHEMATIC
10.3L 150-200KW, APM603

FUEL SYSTEMS

REV	DATE	REVISION	BY
E	5-14-20	(A,B,C-1 TO 3) DELETED AUTO CHANGEOVER OPTION; SEE SHEET 3 [CT203817]	SBR
F	6-16-20	(D-2,3,4) AUTO CHANGEOVER OPTION ADDED; SEE SHEET 1 [CT204852]	TEV
G	3-23-21	SEE SHEET 3 [CT210777]	TEV
H	10/20/2024	SEE SHEETS 8 & 9 [CT235298]	DAUB
J	29/JAN/2025	(C-2)(C-8) CONNECTOR J8 70R WAS 70H.[CT241463]	CLK

FUEL SYSTEMS

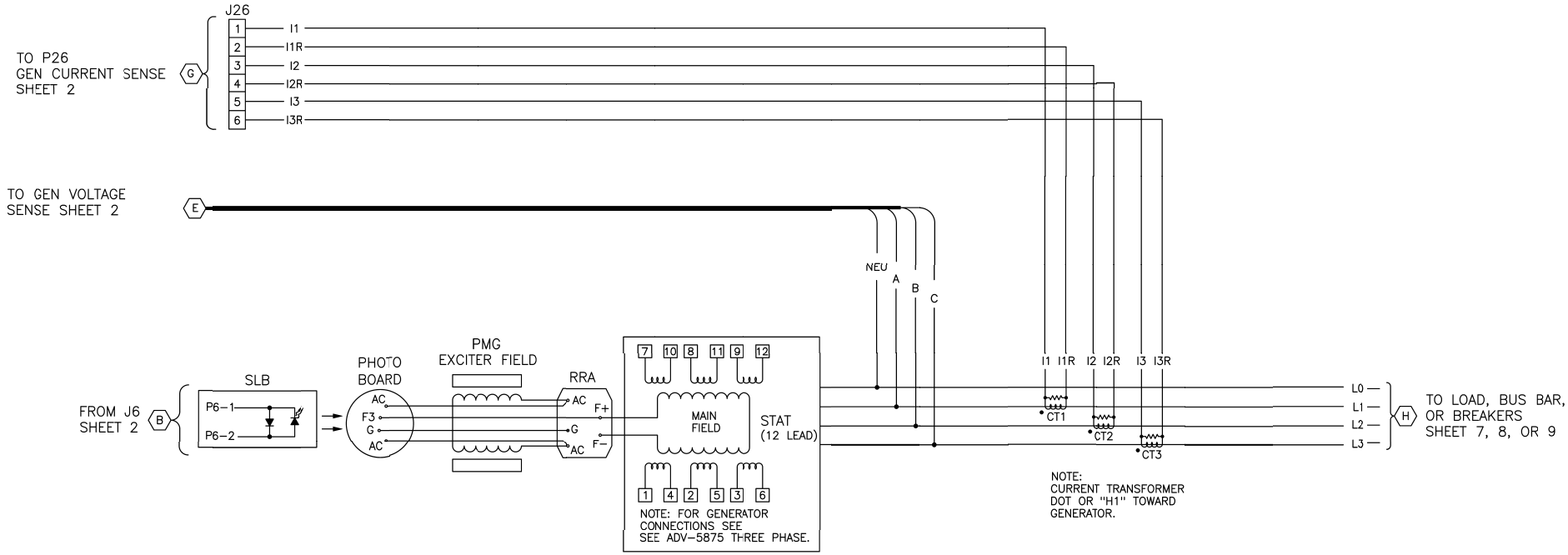


UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN INCHES GENERAL TOLERANCES: FRA		THIS DRAWING IS DESIGN AND DETAIL. IT IS THE PROPERTY OF REHLKO, INC. AND NOT BE LOANED, REPRODUCED, COPIED, OR IN ANY MANNER USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN CONSENT OF REHLKO, INC.		rehlko	
APPROVALS		DATE		SHEET	
DESIGN	SMH	1-30-19		10.3L	
CHECKED	JLS	1-30-19		SCALE	N/A
APPROVED	JLS	1-30-19		PLotted	4-9
TITLE				ADV-9116	D

APM603 CONTROLLER
150-200 KW 10.3L
W/ SPLIT ACTIVATOR, 1ø, 3ø & 600V

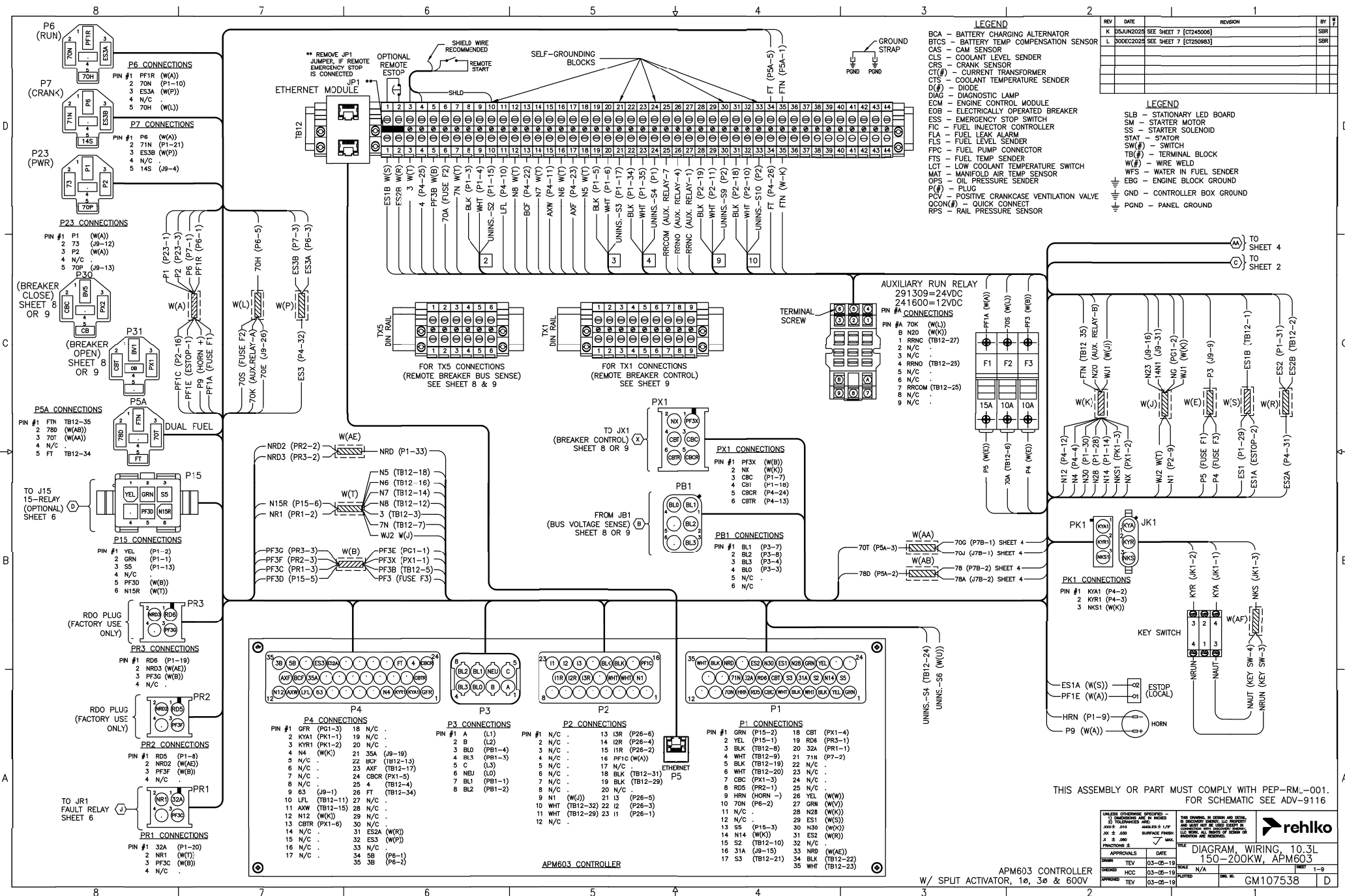
REV	DATE	REVISION	BY
D	3-31-20	SEE SHEET 8 [CT203122]	SBR
E	5-14-20	SEE SHEETS 3 AND 4 [CT203817]	SBR
F	6-16-20	SEE SHEETS 2 AND 4 [CT204852]	TEV
G	3-23-21	SEE SHEET 3 [CT210777]	TEV
H	JANUARY 2024	SEE SHEETS 6 & 9 [CT220290]	JOE
J	JANUARY 2025	SEE SHEETS 3 & 4 [CT241463]	CJK

ALTERNATOR



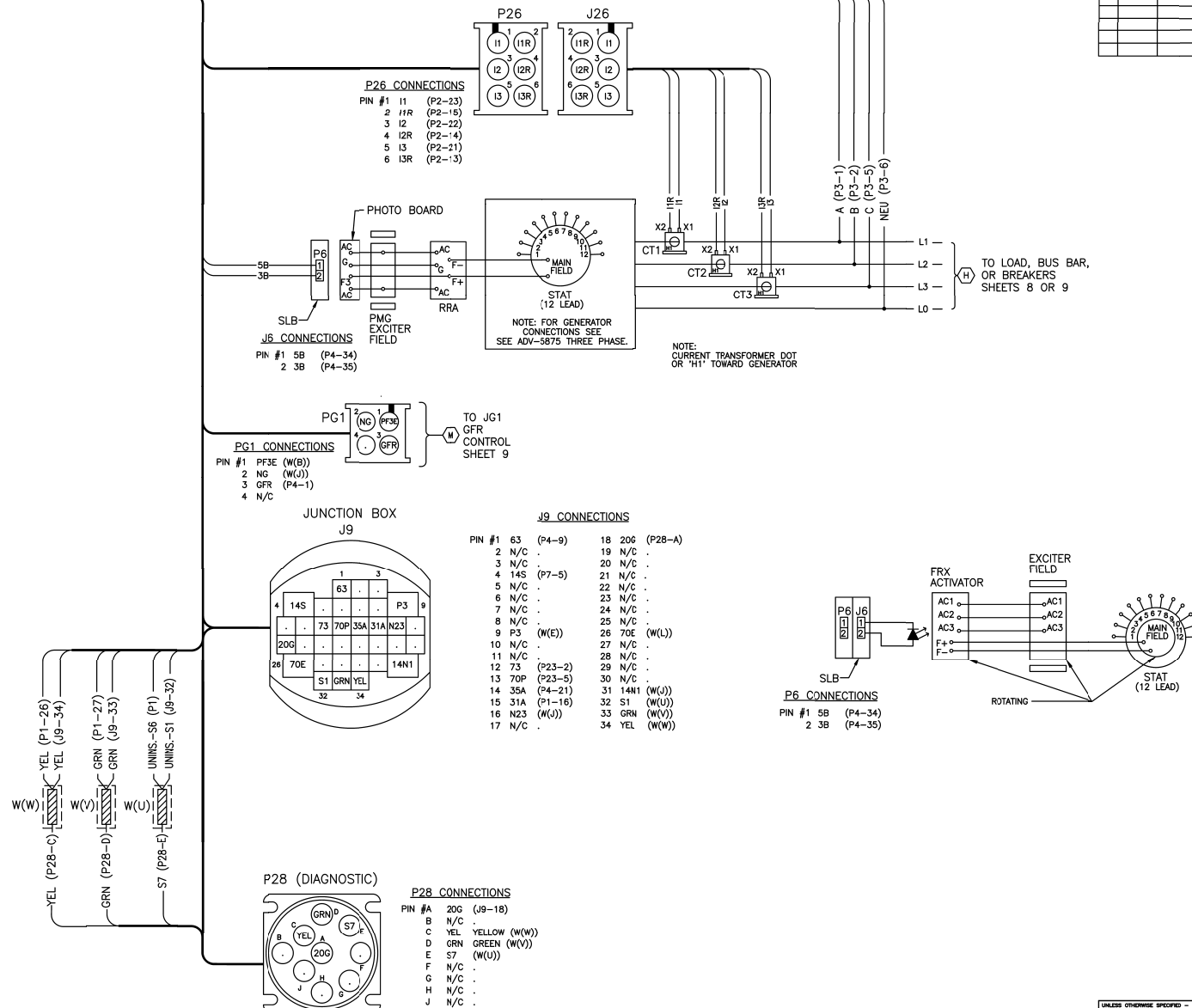
UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN INCHES GENERAL TOLERANCES: N/A		THIS DRAWING IS DESIGN AND DETAIL. IT REPRESENTS THE FINAL DESIGN. ALL DIMENSIONS ARE TO BE MAINTAINED. ALL WORK AND RESULTS OF DESIGN OR CONSTRUCTION ARE TO BE MAINTAINED.		rehlko	
APPROVALS		DATE		TITLE	
DESIGNED: SMH		1-30-19		DIAGRAM, SCHEMATIC, 10.3L, 150-200KW, APM603	
CHECKED: JLS		1-30-19		SCALE: N/A	
APPROVED: JLS		1-30-19		PLotted	
				DWG. NO. ADV-9116	
				SHEET 6-9	

ALTERNATOR SIDE
APM603 CONTROLLER
150-200KW 10.3L
W/ SPLIT ACTIVATOR, 1ø, 3ø & 600V

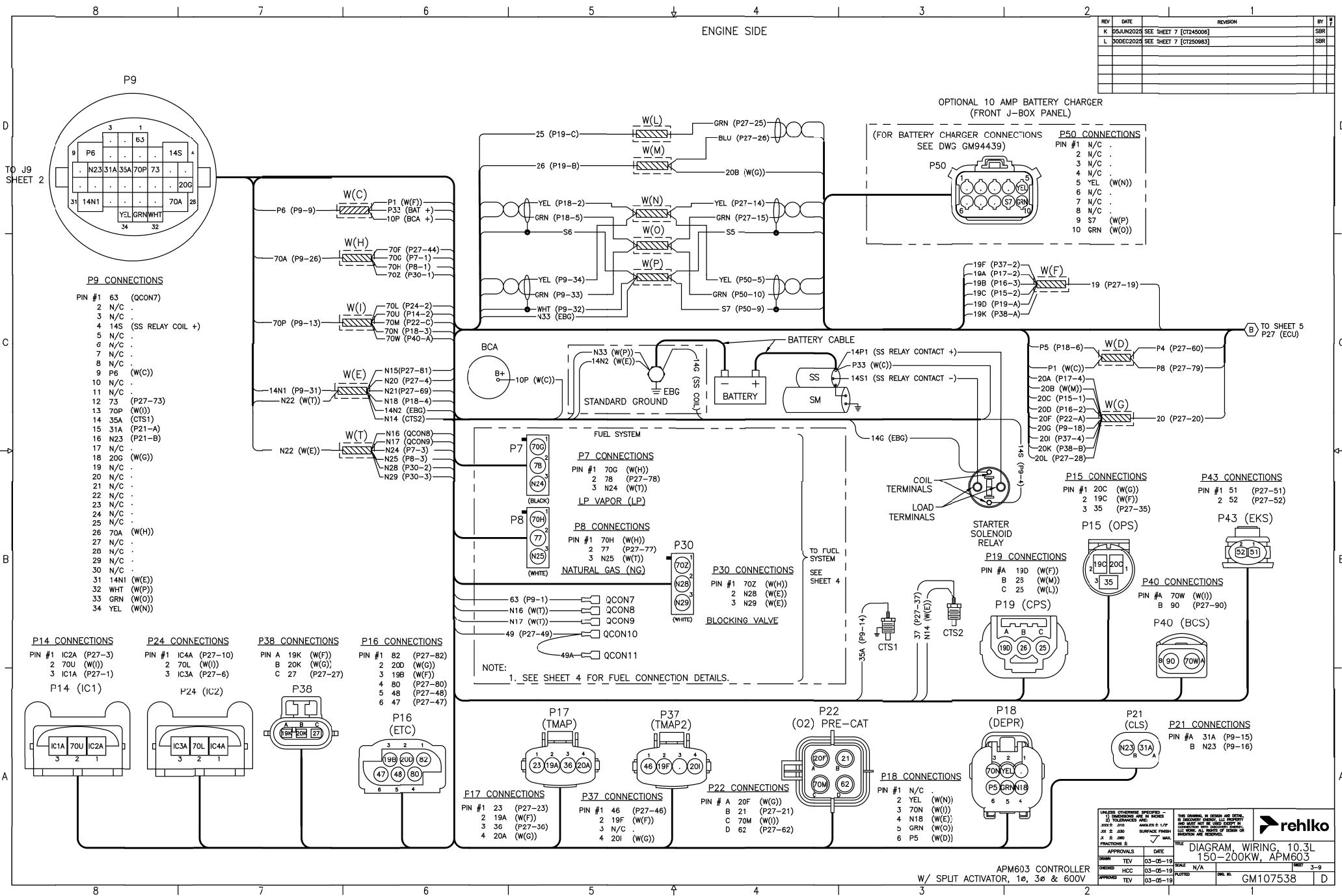


FROM
SHEET 1

REV	DATE	REVISION	BY
K	05JUN2025	SEE SHEET 7 [CT245006]	SBR
L	00DEC2025	SEE SHEET 7 [CT250983]	SBR

APM603 CONTROLLER
W/ SPLIT ACTIVATOR, 1ø, 3ø & 600V

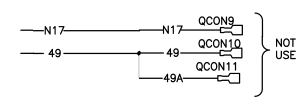
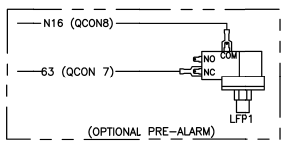
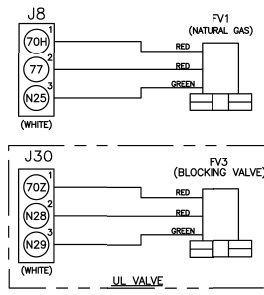
UNLESS OTHERWISE SPECIFIED - 1) DIMENSIONS ARE IN INCHES 2) TOLERANCES ARE: DIMENSIONS: .010 HOLE DIA: .010 SURFACE FINISH: FRACTIONS: 1/16		THIS DRAWING IS DESIGN AND DETAIL. IT IS THE RESPONSIBILITY OF THE DESIGNER TO VERIFY THAT ALL DIMENSIONS AND TOLERANCES ARE CORRECT AND CONFORM TO THE REQUIREMENTS OF THE CUSTOMER AND THE DRAWING IS CORRECT.		rehlko	
APPROVALS		DATE		REV	
DESIGNED	TEV	03-05-19	SCALE	N/A	SHEET 2-9
CHECKED	HCC	03-05-19	PLotted		
APPROVED	TEV	03-05-19	DRG. NO.	GM107538	D



REV	DATE	REVISION	BY
K	05JUN2025	SEE SHEET 7 [C1245006]	SBR
L	06DEC2025	SEE SHEET 7 [C1250983]	SBR

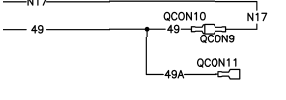
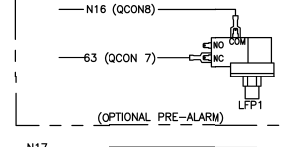
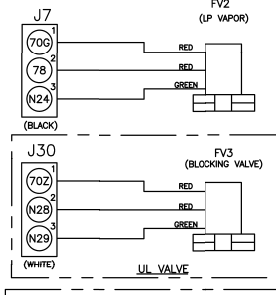
NATURAL GAS

FUEL VALVE ASSEMBLY

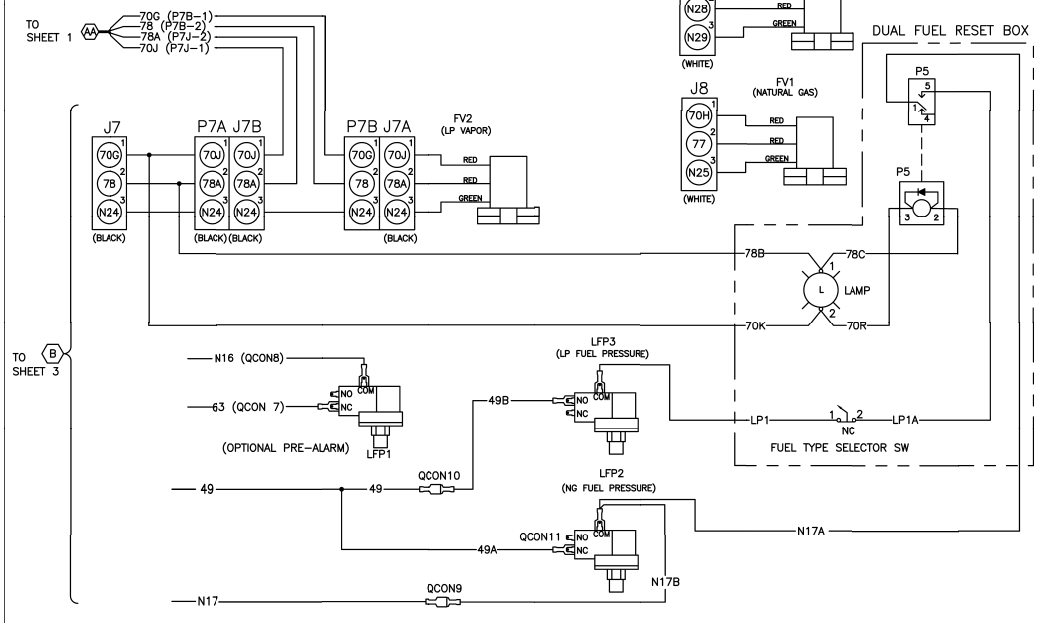


L.P. VAPOR

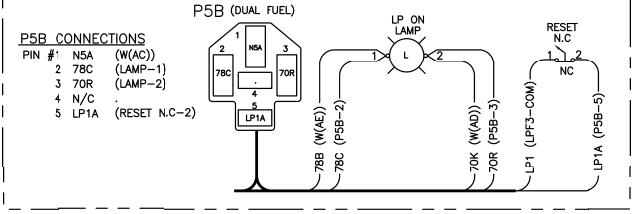
FUEL VALVE ASSEMBLY



AUTO CHANGEOVER NATURAL/L.P. GAS



(DETAIL) DUAL FUEL RESET BOX



- P5B CONNECTIONS**
- PIN #1: N5A (W(AC))
 - 2: 78C (LAMP-1)
 - 3: 70R (LAMP-2)
 - 4: N/C
 - 5: LP1A (RESET N.C-2)

UNLESS OTHERWISE SPECIFIED - 1) DIMENSIONS ARE IN INCHES 2) TOLERANCES ARE: DIMENSIONS < 1/4" .010 DIMENSIONS 1/4" - 1/2" .015 DIMENSIONS 1/2" - 1" .020 DIMENSIONS 1" - 2" .030 DIMENSIONS > 2" .040		THIS DRAWING IS DESIGNED AND DEVELOPED BY REHLKO. IT IS THE PROPERTY OF REHLKO. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREON. ANY REUSE OR MODIFICATION OF THIS DRAWING WITHOUT THE WRITTEN PERMISSION OF REHLKO IS PROHIBITED.			
APPROVALS DESIGNED: TEV CHECKED: HCC APPROVED: TEV		DATE 3-5-19 3-5-19 3-5-19		SCALE 1" = 1'-0"	
PROJECT APM603 CONTROLLER W/ SPLIT ACTIVATOR, 1ø, 3ø & 600V		SHEET 4-9		REV. NO. GM107538	

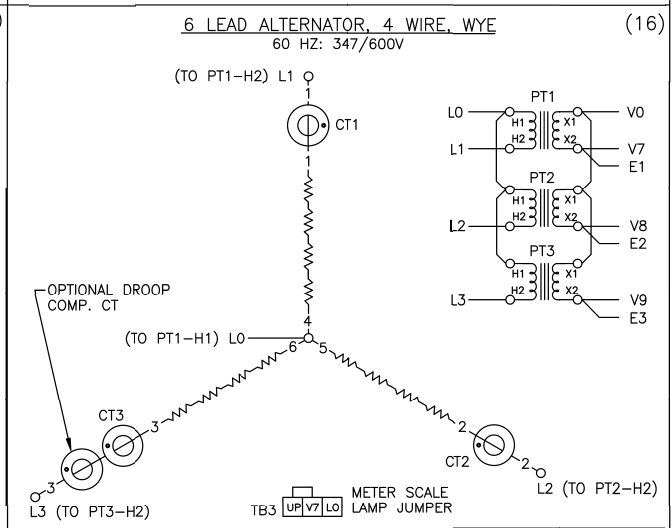
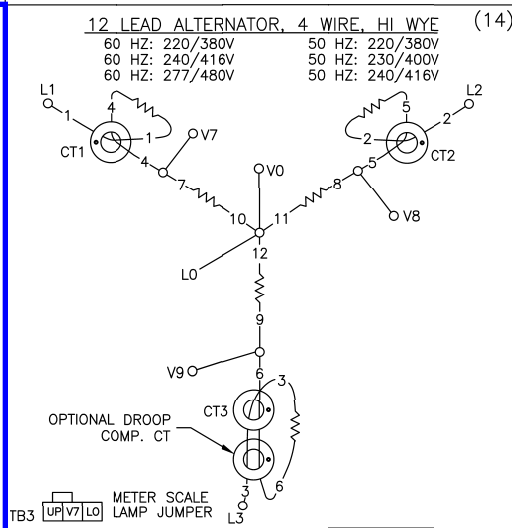
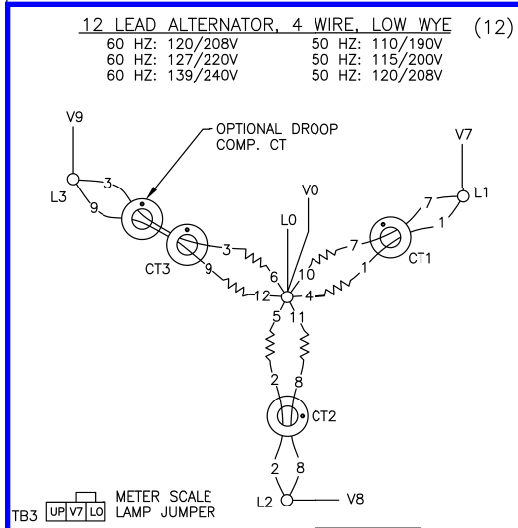
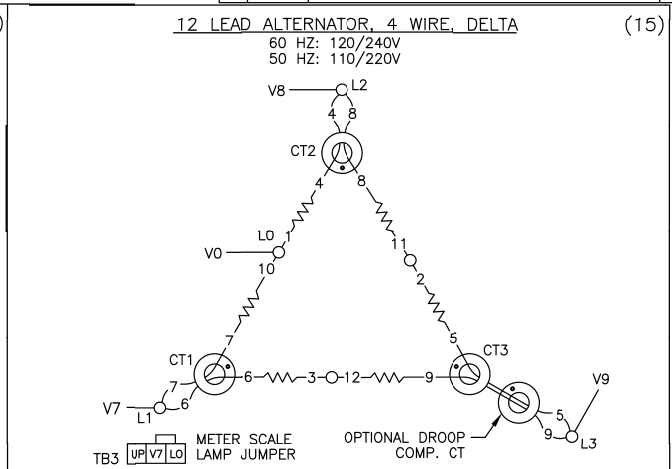
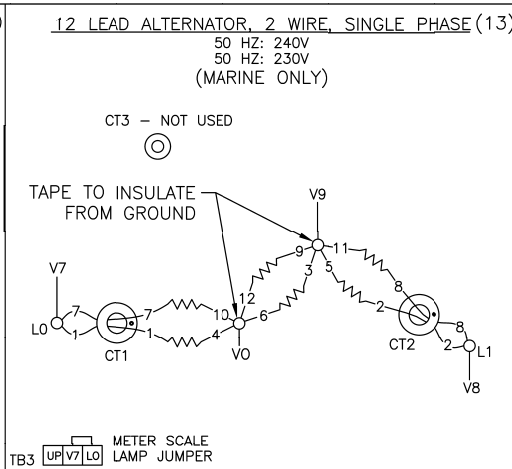
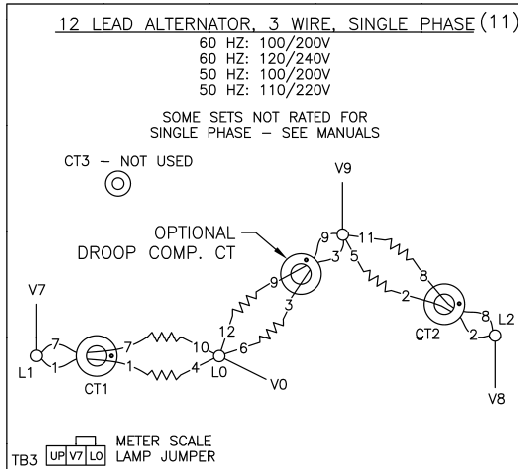


REV	DATE	REVISION	BY
K	05JUN2025	SEE SHEET 7 [CT245006]	SBR
L	00DEC2025	SEE SHEET 7 [CT250983]	SBR

UNLESS OTHERWISE SPECIFIED - 1) DIMENSIONS ARE IN MILLIMETERS 2) TOLERANCES ARE: DIMENSIONS > 10mm ± 0.1mm DIMENSIONS ≤ 10mm ± 0.05mm 3) SURFACE FINISH: 4) DIMENSIONS ± 0.1mm		THIS DRAWING IS DESIGN AND DETAIL. IT IS THE RESPONSIBILITY OF THE DESIGNER TO VERIFY THAT THE PARTS MANUFACTURED TO THIS DRAWING WILL BE USED IN THE INTENDED APPLICATION AND THAT THE PARTS ARE SUITABLE FOR THE INTENDED USE.		reliko	
APPROVALS		DATE		TITLE	
DESIGNED BY		03-05-19		DIAGRAM, WIRING, 10.3L	
CHECKED BY		03-05-19		150-200KW, APM603	
APPROVED BY		03-05-19		SHEET 5-9	
				DWG. NO. GM107538	
				D	

APM603 CONTROLLER
W/ SPLIT ACTIVATOR, 1ø, 3ø & 600V

REV	DATE	REVISION	BY	W
AE	11-4-23	SEE SHEET 6 [CT231345]	SBR	
AF	2-28-24	SEE SHEET 7 [CT233796]	PM	
AG	07OCT2024	(D-2) 12 LEAD ALTERNATOR, 2 WIRE, SINGLE PHASE 50HZ		
		240V AND 50HZ 230V WAS 12 LEAD ALTERNATOR, 3 WIRE,		
		SINGLE PHASE 60HZ 240V AND 50HZ 220V. [CT239467]		
AH	18AUG2025	SEE SHEET 1,11,12,13,14,15,16 [CT240078]	CJK	



NOTES:

CURRENT TRANSFORMER DOT OR "H1" TOWARD GENERATOR.

CURRENT TRANSFORMERS NOT USED ON ALL SETS.

SOME STATORS HAVE DUAL LEADS. ALWAYS CONNECT LEADS OF THE SAME LABEL TOGETHER.

PHASE ROTATION

A	B	C
L1	L2	L3

60 (I.M.S.)-300 KW WOUND EXCITER FIELD
600V FRII
ALTERNATORS

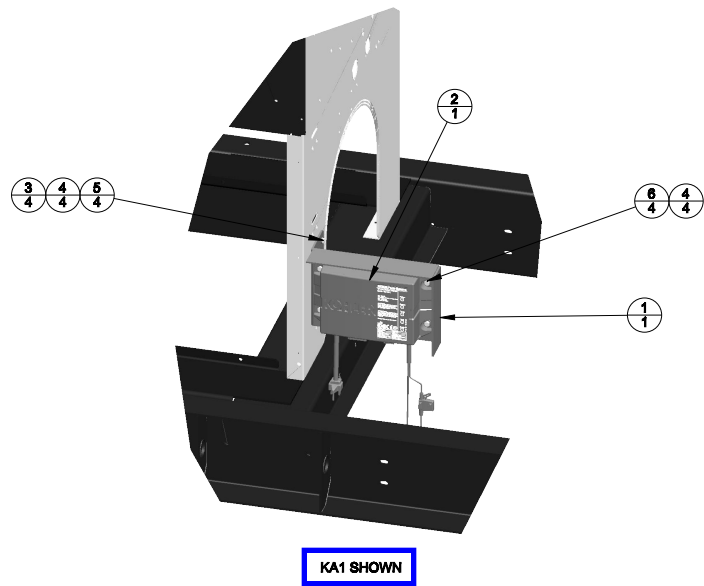
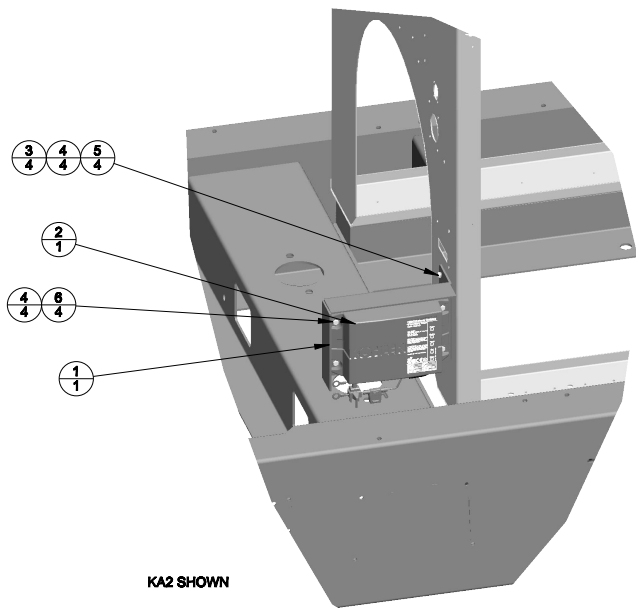
UNLESS OTHERWISE SPECIFIED - 1) DIMENSIONS ARE IN INCHES 2) TOLERANCES ARE: 30K+: .010 ANGLES ± 1/2° 30K ± .030 SURFACE FINISH 3) ± .000 FRACTIONS ±		THIS DRAWING, IN DESIGN AND DETAIL, IS DISCOVERY ENERGY, LLC PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH DISCOVERY ENERGY, LLC WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.	
APPROVALS	DATE	TITLE DIAGRAM, ALTERNATOR CONNECTIONS	
DRAWN LDS	8-25-98	SCALE NONE	SHEET 4-16
CHECKED TLK	6-23-99	PLOTTED	DWG. NO. ADV-5875
APPROVED JMH	6-23-99		C

Miscellaneous

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GROUP NO.	ITEM	PART NO	QTY	DESCRIPTION
GM103365-KA1	1	GM103339	1	BATTERY CHARGER, 12V 10A
	2	GM87448	1	BRACKET, BATTERY CHARGER
	3	M125A-06-80	4	CHARGER, BATTERY
	4	M6823-06-80	8	WASHER, PLAIN 6.4 ID X 12.0 OD
	5	M933-06016-80	4	NUT, HEX 6MM
	6	M933-06025-80	4	SCREW, HEX CAP
GM103365-KA2	1	GM103340	1	BATTERY CHARGE, 12V 10A
	2	GM87448	1	BRACKET, BATTERY CHARGER
	3	M125A-06-80	4	CHARGER, BATTERY
	4	M6823-06-80	8	WASHER, PLAIN 6.4 ID X 12.0 OD
	5	M933-06016-80	4	NUT, HEX 6MM
	6	M933-06025-80	4	SCREW, HEX CAP
THIS IS AN AUTOMATED TABLE. ALL UPDATES MUST BE MADE IN THE ASSEMBLY. ITEM 7 IS FIXED				



NOTE: FOR PROPER ASSEMBLY METHOD OF HARDWARE, USE G-585 AS A GUIDELINE.

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL □ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION	BY	THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001. REFERENCE CAD MODEL FOR UNSPECIFIED DIMENSIONS.	DO NOT SCALE.	rehlko
-	5-1-17	NEW DRAWING [CT173023]	SAM		UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: XXX ± 0.25 XX ± 1.0 X ± 1.5 ANGLES 40° BY BEND ANGLES ± 1°	MAJOR ○ = 0 CRITICAL ● = 0 THIRD ANGLE PROJECTION
A	8-2-17	(D-8) GM103365-KA1: 361567 & X-488-1 REMOVED [CT177080]	MVT		SURFACE FINISH ✓ MAX.	CHARACTERISTICS COMPLY WITH KPS-80022
						SCALE: 0.10 SHEET SIZE: B SHEET: 1 OF 1
						TITLE: DWG, ASSY BATTERY CHARGER 10A
						DWG NO.: GM103365

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		8			7			6			5			4			3			2			1		
PART NO.	REV	VOLTS	WATTS	AMPS	THERMOSTAT TYPE/STYLE	REMOTE SENSOR TEMP. RANGE	TANK SENSOR TEMP RANGE	THREAD SIZE "A"	PLUG CONFIG.	LENGTH "B"	CORD TYPE	REMARKS													
324930	W	120	1800	15.0	IN BLOCK/B	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	1/2 NPT	FIG-2	1575 [62.0]	1	-	-	-	-	-	-	-	-	-	-	-			
324931	W	240	2000	8.3	IN BLOCK/B	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	1/2 NPT	FIG-3	1575 [62.0]	1	-	-	-	-	-	-	-	-	-	-	-			
326220	W	120	1000	8.3	IN BLOCK/A	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	5/8-18 UNF 2A	FIG-1	1372 [54.0]	1	-	-	-	-	-	-	-	-	-	-	-			
326221	W	240	1000	4.2	IN BLOCK/A	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	5/8-18 UNF 2A	FIG-3	1372 [54.0]	1	-	-	-	-	-	-	-	-	-	-	-			
326222	W	120	1000	8.3	IN HOSE/C	27°/38°C[80°/100°F]	38°/49°C[100°/120°F]	-	FIG-1	1372 [54.0]	1	-	-	-	-	-	-	-	-	-	-	-			
326224	Z	240	1000	4.2	IN HOSE/C	27°/38°C[80°/100°F]	38°/49°C[100°/120°F]	-	FIG-3	1372 [54.0]	1	-	-	-	-	-	-	-	-	-	-	-			
326228	W	120	1500	12.5	IN BLOCK/A	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	1/2 NPT	FIG-1	1372 [54.0]	1	-	-	-	-	-	-	-	-	-	-	-			
326229	W	240	1500	6.3	IN BLOCK/A	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	1/2 NPT	FIG-3	1372 [54.0]	1	-	-	-	-	-	-	-	-	-	-	-			
326234	W	120	1800	15.0	IN BLOCK/A	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	1/2 NPT	FIG-2	1575 [62.0]	1	-	-	-	-	-	-	-	-	-	-	-			
326235	W	240	2000	8.3	IN BLOCK/A	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	1/2 NPT	FIG-3	1575 [62.0]	1	-	-	-	-	-	-	-	-	-	-	-			
326247	W	120	1500	12.5	IN BLOCK/A	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	5/8-18 UNF 2A	FIG-1	1372 [54.0]	1	-	-	-	-	-	-	-	-	-	-	-			
326248	W	240	1500	6.3	IN BLOCK/A	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	5/8-18 UNF 2A	FIG-3	1372 [54.0]	1	-	-	-	-	-	-	-	-	-	-	-			
336703	W	120	1500	12.5	IN HOSE/C	16°/27°C[60°/80°F]	38°/49°C[100°/120°F]	-	FIG-1	1372 [54.0]	1	-	-	-	-	-	-	-	-	-	-	-			
352945	Y	120	1500	12.5	-	-	27°/38°C[80°/100°F]	-	FIG-1	1524 [60.0]	2	IN-BASE SENSING UNIT ONLY													
ES-59230	-	120	1500	12.5	-	-	38°/49°C[100°/120°F]	-	FIG-1	1524 [60.0]	2	IN-BASE SENSING UNIT ONLY													
352946	W	240	1500	6.3	-	-	27°/38°C[80°/100°F]	-	FIG-3	1219 [48.0]	2	IN-BASE SENSING UNIT ONLY													
358311	Y	120	1000	8.3	-	-	27°/38°C[80°/100°F]	-	FIG-1	-	2	IN-BASE SENSING UNIT ONLY													
358327	W	240	1000	4.2	-	-	27°/38°C[80°/100°F]	-	FIG-3	-	2	IN-BASE SENSING UNIT ONLY													
GM23005	W	120	1800	15.0	IN BLOCK/D	27°/38°C[80°/100°F]	49°/60°C[120°/140°F]	28-1.25 6g METRIC	FIG-2	762 [30.0]	1	-	-	-	-	-	-	-	-	-	-	-			
GM23006	W	240	2000	8.3	IN BLOCK/D	27°/38°C[80°/100°F]	49°/60°C[120°/140°F]	28-1.25 6g METRIC	FIG-3	762 [30.0]	1	-	-	-	-	-	-	-	-	-	-	-			
GM24947	W	240	2000	8.3	IN BLOCK/A	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	M14-1.5 METRIC	FIG-3	1575 [62.0]	1	-	-	-	-	-	-	-	-	-	-	-			
GM24948	W	120	1800	15.0	IN BLOCK/A	38°/49°C[100°/120°F]	49°/60°C[120°/140°F]	M14-1.5 METRIC	FIG-2	1575 [62.0]	1	-	-	-	-	-	-	-	-	-	-	-			
GM28558	W	120	1000	8.3	-	-	27°/38°C[80°/100°F]	-	FIG-1	-	2	CORD THERMOSTAT [40°/60°F]													
GM31942	Y	120	1000	8.3	IN BLOCK/A	27°/38°C[80°/100°F]	49°/60°C[120°/140°F]	1/2 NPT	FIG-1	1372 [54.0]	1	-	-	-	-	-	-	-	-	-	-	-			
GM31943	Y	240	1000	4.2	IN BLOCK/A	27°/38°C[80°/100°F]	49°/60°C[120°/140°F]	1/2 NPT	FIG-3	1372 [54.0]	1	-	-	-	-	-	-	-	-	-	-	-			
GM62682	Y	120	1000	8.3	-	-	27°/38°C[80°/100°F]	-	FIG-4	-	3	-	-	-	-	-	-	-	-	-	-	-			
GM75552	AA	120	1800	15.0	-	-	27°/38°C[80°/100°F]	-	FIG-2	-	2	IN-BASE SENSING UNIT ONLY													
GM75553	AA	240	2000	8.3	-	-	27°/38°C[80°/100°F]	-	FIG-3	-	2	IN-BASE SENSING UNIT ONLY													
GM83980	AD	120	1000	8.3	-	-	16°/27°C[60°/80°F]	-	FIG-1	1524 [60.0]	2	IN-BASE SENSING UNIT ONLY INCLUDES THERMOSTAT TEMPERATURE DECAL													
GM83981	AB	120	1500	12.5	-	-	16°/27°C[60°/80°F]	-	FIG-1	1219 [48.0]	2	IN-BASE SENSING UNIT ONLY INCLUDES THERMOSTAT TEMPERATURE DECAL													
GM95436	-	120	500	4.2	-	-	27°/38°C[80°/100°F]	-	FIG-1	-	2	IN-BASE SENSING UNIT ONLY													
GM95437	-	240	500	2.1	-	-	27°/38°C[80°/100°F]	-	FIG-3	-	2	IN-BASE SENSING UNIT ONLY													
GM103846	A	120	1800	15.0	-	-	16°/27°C[60°/80°F]	-	FIG-2	-	2	IN-BASE SENSING UNIT ONLY													

STYLE A
IN-BLOCK
THERMOSTAT

STYLE B
IN-BLOCK
THERMOSTAT

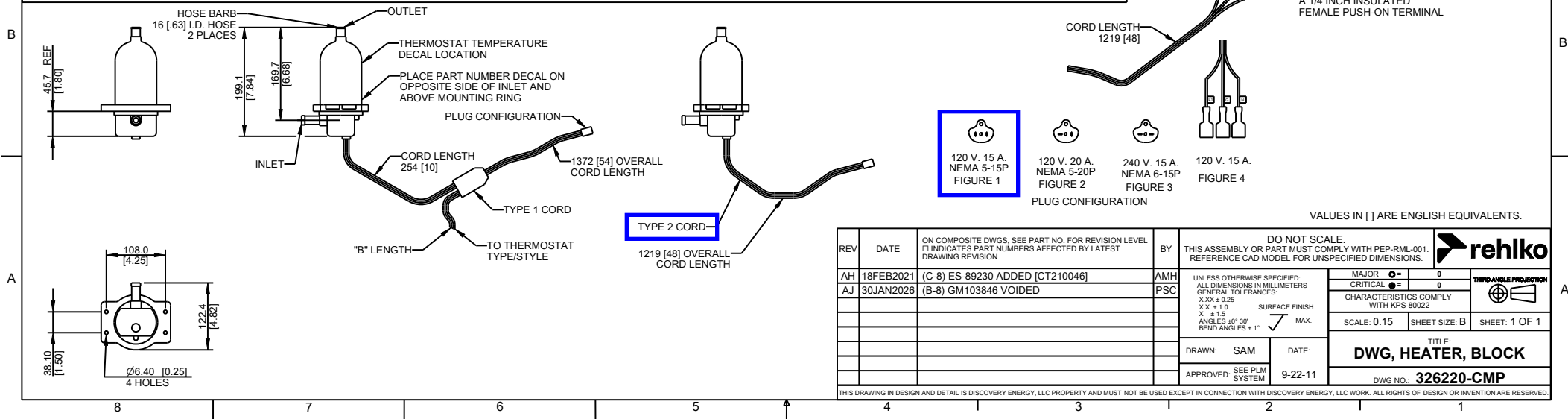
STYLE C
IN-HOSE
THERMOSTAT

STYLE D
IN-BLOCK
THERMOSTAT

LEADS TO BE LABELED
WITH WIRE MARKERS BY
SUPPLIER, LABEL
"N", "G", & "L1"

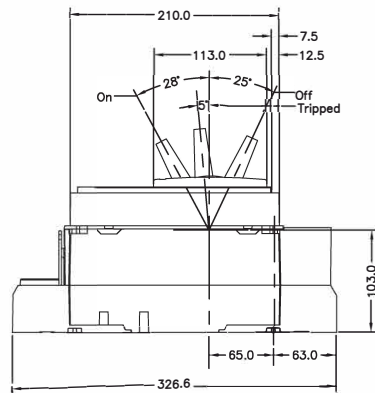
TERMINATE EACH LEAD WITH

THIS IS AN MANUAL TABLE.



PART NO.	REV	AMPS	% RATING	GFI	INT@480V	TRIP	VENDOR NO.
GM24181-1	C	600	100	NO	35kA	5.0 LSI	PGP36060CU33A
GM24181-2	C	600	100	YES	35kA	6.0A LSIG	PGP36060CU44A
GM24181-3	C	800	80	NO	35kA	5.0 LSI	PGP36080CU33A
GM24181-4	C	800	80	YES	35kA	6.0A LSIG	PGP36080CU44A
GM24181-5	C	800	100	NO	35kA	5.0 LSI	PGP36080CU33A
GM24181-6	C	800	100	YES	35kA	6.0A LSIG	PGP36080CU44A
GM24181-7	C	1000	80	NO	35kA	5.0 LSI	PGP36100CU33A
GM24181-8	C	1000	80	YES	35kA	6.0A LSIG	PGP36100CU44A
GM24181-9	C	1000	100	NO	35kA	5.0 LSI	PGP36100CU33A
GM24181-10	C	1000	100	YES	35kA	6.0A LSIG	PGP36100CU44A
GM24181-11	C	1200	80	NO	35kA	5.0 LSI	PGP36120CU33A
GM24181-12	C	1200	80	YES	35kA	6.0A LSIG	PGP36120CU44A
GM24181-13	C	1200	100	NO	35kA	5.0 LSI	PGP36120CU33A
GM24181-14	C	1200	100	YES	35kA	6.0A LSIG	PGP36120CU44A
GM24181-15	D	1200	80	NO	65kA	5.0 LSI	PJP36120CU33A
GM24181-16	D	1200	80	YES	65kA	6.0A LSIG	PJP36120CU44A
GM24181-17	D	1200	100	NO	65kA	5.0 LSI	PJP36120CU33A
GM24181-18	D	1200	100	YES	65kA	6.0A LSIG	PJP36120CU44A

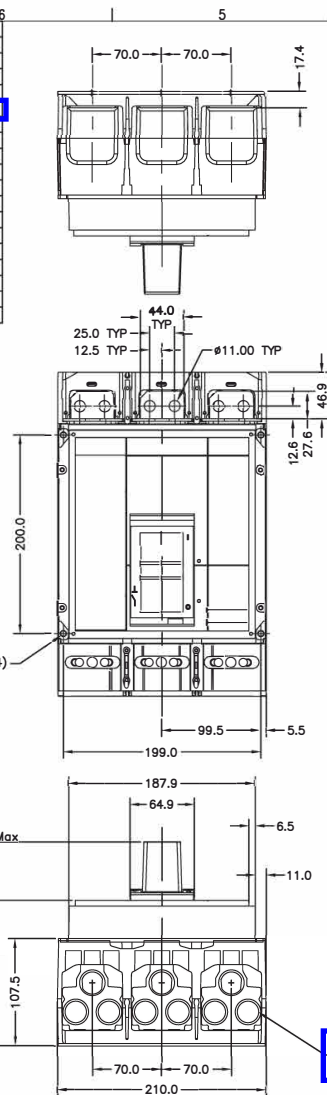
NOTE: (4) #10-32 X 4.5 INCH MOUNTING SCREWS INCLUDED.



CLEARANCE FOR #10 SCREW (4)

At Max
205.0
146.5
107.5

600-800A

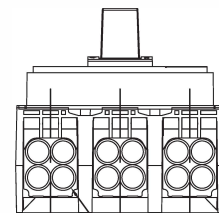
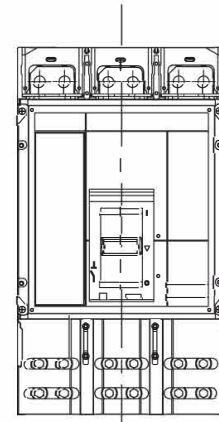


3/0-500 KCMIL (3)
PER PHASE LOAD SIDE

NOTE:
KOHLER PART # TO BE CLEARLY VISIBLE ON
CIRCUIT BREAKER AND ON INDIVIDUAL PACKAGING.

NOTE:
THREADED BAR SUPPLIED WITH BREAKER IS USED WITH LUGS OR WHEN
BUS BARS ARE INSTALLED WITH BOLTS INSERTED FROM THE FRONT.
REMOVE AND DISCARD BAR WHEN BOLTS ARE INSTALLED FROM THE REAR
OF BREAKER.

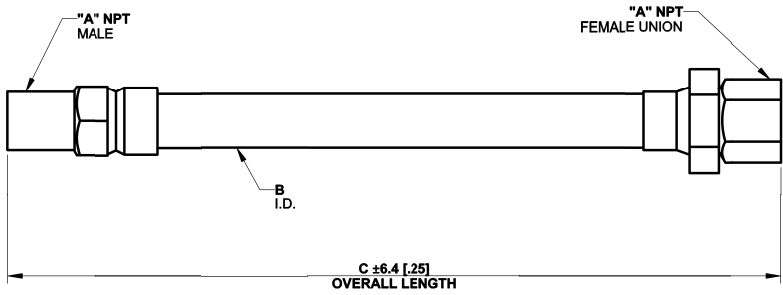
REV	DATE	REVISION	BY
1	3-22-02	NEW DRAWING [86246]	WSD
2	8-12-03	(2-5) THREADED BAR NOTE ADDED. [70080]	WSD
3	11-12-03	(2-7) GM24181-13 GFI: NO WAS YES [70080]	WSD
4	2-23-07	(2-3) KOHLER NOTE ADDED [76285]	WSD
5	1-10-11	(2-5) GM24181-19 THRU -18 ADDED [80427-15]	WSD



METRIC CAD FILE

SQUARE D P-FRAME CIRCUIT BREAKER 3 POLE ELECTRONIC TRIP		KOHLER CO POWER SYSTEMS, KOHLER, WI 53044 U.S.A. THE COMPANY IS NOT RESPONSIBLE FOR ANY DAMAGE TO PROPERTY AND EQUIPMENT CAUSED BY THE USE OF THIS PRODUCT.	
ORDER CHANGES - (1) THREADED BAR & MOUNTING LUGS & LUGS P & LUG PHASES & GFI		SURFACE MOUNT N/A	
MODEL APPROVALS WSD WSD ARI	DATE 3-22-02 3-22-03 3-22-03	BREAKER GM24181-19	SHEET 1-1 GM24181

PART NO.	REV		A	B	C		SERVICE ONLY
					MM	IN	
X-504-1	AT	☐	1/2	1/2	304.8	12	
X-504-2	AS		3/4	3/4	304.8	12	X
X-504-12	AS		3/8	3/8	385.8	15 3/16	
X-504-16 *	AT	☐	2	2	457.2	18	
X-504-17	AS		1	1	508.0	20	X
X-504-18	AS		3/4	3/4	730.3	28 3/4	X
X-504-20 *	AT	☐	1	1	736.6	29	
X-504-21 *	AV	☐	1	1	457.2	18	
X-504-22 *	AV	☐	1 1/2	1 1/2	717.6	28 1/4	
X-504-23	AS		1	1	342.9	13 1/2	
X-504-25 *	AU	☐	1/4	3/8	1066.8	42	
X-504-26 *	AU	☐	3	3	838.2	33	
X-504-27 *	A	☐	2	2	825	32 1/2	
THIS IS A MANUAL TABLE							



NOTE:
PAINT MALE ENDS OF FUEL LINE
1200° F, HIGH TEMPERATURE BLACK.

MATERIAL:
ANNULAR CORRUGATED BRONZE/STAINLESS STEEL HOSE WITH BRONZE/
STAINLESS STEEL TUBULAR WIRE BRAID OR EQUIV.

FITTINGS:
FEMALE UNION - STEEL OR BRASS (NO GALVANIZED FITTING)
ALL FLUX USED IN BRAZING MUST BE REMOVED.
INSTALL HAND TIGHT.
* PRODUCT SHALL MEET UL 536 AND
ULC ORD-C536 FOR CANADA
-USE-
NATURAL GAS, LP FUEL, GASOLINE, DIESEL FUEL, WATER & OIL.

REV		DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL □ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION	BY	DO NOT SCALE. THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001. REFERENCE CAD MODEL FOR UNSPECIFIED DIMENSIONS.				
BA	10-9-19	(B-1,2) NOTE "PRODUCT SHALL MEET UL 536...CANADA" WAS "MUST MEET CSA B149"; (C-1,2) MATERIAL NOTE UPDATED; (D-4) X-504-1: "" SYMBOL REMOVED; (B-4) "PEP-RML-001" NOTE ADDED; (D-1,2) VIEW & NOTES UPDATED [CT199012]		DKO	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: X-XX ± 0.25 X-X ± 1.0 X ± 1.5 ANGLES 40° 30' BEND ANGLES ± 1° SURFACE FINISH MAX.	MAJOR ○ = 0 CRITICAL * = 0	THIRD ANGLE PROJECTION 		
						CHARACTERISTICS COMPLY WITH KPS-80022			
						SCALE: 0.85		SHEET SIZE: B	SHEET: 1 OF 1
				YBY	DRAWN: DKO APPROVED: SEE PLM SYSTEM	DATE: 11-19-62	TITLE: DWG, LINE, FLEX FUEL		
					DWG NO.: X-504				
THIS DRAWING IN DESIGN AND DETAIL IS DISCOVERY ENERGY, LLC PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH DISCOVERY ENERGY, LLC WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.									

Warranty

Stationary Standby and Prime Power Industrial Generator Set One-Year or Two Thousand (2000)-Hour Limited Warranty

Your product has been manufactured and inspected with care by experienced craftsmen. If you are the original end user, Discovery Energy, LLC and its affiliates dba Rehlko -hereafter referred to as "the manufacturer"- warrants, for the period indicated below, each product to be free from defects in materials and workmanship. In the event of a defect in materials or workmanship, the manufacturer will repair, replace, or make appropriate adjustment at the manufacturer's option if the product, upon the manufacturer's inspection, is found to be properly installed, maintained, and operated in accordance with the manufacturer's instruction manuals. A distributor, dealer, or authorized service representative must perform startup.

Product

Stationary Standby Generator Set & Accessories

Warranty Coverage

One (1) year from registered startup or two thousand (2000) hours (whichever occurs first). In any event, the warranty period will expire not later than thirty (30) months from the date of shipment from the manufacturer's factory.

Stationary Prime Power Generator Set & Accessories

One (1) year from registered startup or two thousand (2000) hours (whichever occurs first). In any event, the warranty period will expire not later than thirty (30) months from the date of shipment from the manufacturer's factory.

Standby rated generators may only be used in Stationary "emergency" applications, where the generator set is the secondary power source, and a dependable utility is the primary power source. Use of a standby rated generator in a stationary "non-emergency" application, or any non-stationary application, is not allowed and voids all factory warranties.

The following will **not** be covered by the warranty:

1. Normal wear, routine tuneups, tuneup parts, adjustments, and periodic service.
2. Damage, including but not limited to damage caused by accidents, improper installation or handling, faulty repairs not performed by an authorized service representative, improper storage, or acts of God.
3. Damage caused by operation at speeds, or with fuel, loads, conditions, modifications or installation contrary to published specifications.
4. Damage caused by negligent maintenance such as:
 - a. Failure to provide the specified type and sufficient quantity of lubricating oil.
 - b. Failure to keep the air intake and cooling fin areas clean.
 - c. Failure to service the air cleaner.
 - d. Failure to provide sufficient coolant and/or cooling air.
 - e. Failure to perform scheduled maintenance as prescribed in supplied manuals.
 - f. Failure to regularly exercise the generator set under load (stationary applications only).
5. Original installation charges and startup costs.
6. Starting batteries and the following related expenses:
 - a. Labor charges related to battery service.
 - b. Travel expenses related to battery service.
7. Engine coolant heaters, heater controls, and circulating pumps after the first year of the warranty period.
8. Additional expenses for repairs performed after normal business hours, i.e. overtime or holiday labor rates.
9. Rental of equipment during the performance of warranty repairs.
10. Removal and replacement of non-Rehlko-supplied options and equipment.
11. Non-Rehlko replacement parts. Replacement of a failed part with a non-Rehlko part voids the warranty on that part.
12. Radiators replaced rather than repaired.
13. Fuel injection pumps not repaired by an authorized service representative.
14. Non-authorized repair shop labor without prior approval from the manufacturer Warranty Department.
15. Engine fluids such as fuel, oil, or coolant/antifreeze.
16. Shop supplies such as adhesives, cleaning solvents, and rags.
17. Expenses incurred investigating performance complaints unless the problem is caused by defective materials or workmanship.
18. Maintenance items such as fuses, lamps, filters, spark plugs, loose or leaking clamps, and adjustments.
19. Travel time and mileage exceeding 300 miles round trip.

To obtain warranty service, call 1-800-544-2444 for your nearest authorized service representative or write the manufacturer Service Department, MS072, Kohler, WI 53044 USA.

THE MANUFACTURER SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL, AND/OR CONSEQUENTIAL DAMAGES OF ANY KIND including, but not limited to, incidental and/or consequential labor costs, installation charges, telephone charges, or transportation charges in connection with the replacement or repair of defective parts.

This is our exclusive written warranty. We make no other express warranty nor is anyone authorized to make any on our behalf.

ANY IMPLIED OR STATUTORY WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS EXPRESSLY LIMITED TO THE DURATION OF THIS WARRANTY. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental and/or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



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

TP-5374 12/24h

Stationary Standby Industrial Generator Set Extended Five-Year or Three Thousand (3000)-Hour Comprehensive Limited Warranty

Your product has been manufactured and inspected with care by experienced craftsmen. If you are the original end user, Discovery Energy, LLC and its affiliates dba Rehlko -hereafter referred to as "the manufacturer"- warrants, for the period indicated below, each product to be free from defects in materials and workmanship. In the event of a defect in materials or workmanship, the manufacturer will repair, replace, or make appropriate adjustment at the manufacturer's option if the product, upon the manufacturer's inspection, is found to be properly installed, maintained, and operated in accordance with the manufacturer's instruction manuals. A distributor, dealer, or authorized service representative must perform startup.

Product

Stationary Standby Generator Set & Accessories

Warranty Coverage

Five (5) years from registered startup or three thousand (3000) hours (whichever occurs first).

Extended warranty purchase must take place prior to expiration of standard warranty. Extended warranty is effective upon submission of purchase order in the online warranty system.

The following will **not** be covered by the warranty:

1. Normal wear, routine tuneups, tuneup parts, adjustments, and periodic service.
2. Damage, including but not limited to damage caused by accidents, improper installation or handling, faulty repairs not performed by an authorized service representative, improper storage, or acts of God.
3. Damage caused by operation at speeds, or with fuel, loads, conditions, modifications or installation contrary to published specifications.
4. Damage caused by negligent maintenance such as:
 - a. Failure to provide the specified type and sufficient quantity of lubricating oil.
 - b. Failure to keep the air intake and cooling fin areas clean.
 - c. Failure to service the air cleaner.
 - d. Failure to provide sufficient coolant and/or cooling air.
 - e. Failure to perform scheduled maintenance as prescribed in supplied manuals.
 - f. Failure to regularly exercise the generator set under load (stationary applications only).
5. Damage to exterior or interior components resulting from extreme environmental conditions, including but not limited to heat, cold, humidity, flooding, salt, and high winds.
6. Damage caused by operation when emergency battle mode is enabled.
7. Original installation charges and startup costs.
8. Starting batteries and the following related expenses:
 - a. Labor charges related to battery service.
 - b. Travel expenses related to battery service.
9. Engine coolant heaters, heater controls, and circulating pumps after the first year of the warranty period.
10. Additional expenses for repairs performed after normal business hours, i.e. overtime or holiday labor rates.
11. Rental of equipment during the performance of warranty repairs.
12. Removal and replacement of non-Rehlko-supplied options and equipment.
13. Non-Rehlko replacement parts. Replacement of a failed part with a non-Rehlko part voids the warranty on that part.
14. Radiators replaced rather than repaired.
15. Fuel injection pumps not repaired by an authorized service representative.
16. Non-Rehlko-authorized repair shop labor without prior approval from the manufacturer Warranty Department.
17. Engine fluids such as fuel, oil, or coolant/antifreeze.
18. Shop supplies such as adhesives, cleaning solvents, and rags.
19. Expenses incurred investigating performance complaints unless the problem is caused by defective materials or workmanship.
20. Maintenance items such as fuses, lamps, filters, spark plugs, loose or leaking clamps, and adjustments.
21. Travel time and mileage exceeding 300 miles round trip.

To obtain warranty service, call 1-800-544-2444 for your nearest authorized service representative or write the manufacturer Service Department, MS072, Kohler, WI 53044 USA.

THE MANUFACTURER SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL, AND/OR CONSEQUENTIAL DAMAGES OF ANY KIND including, but not limited to, incidental and/or consequential labor costs, installation charges, telephone charges, or transportation charges in connection with the replacement or repair of defective parts.

This is our exclusive written warranty. We make no other express warranty nor is anyone authorized to make any on our behalf.

ANY IMPLIED OR STATUTORY WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS EXPRESSLY LIMITED TO THE DURATION OF THIS WARRANTY. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental and/or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



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

TP-5561 6/25i

Certification

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that:

Discovery Energy
Rehko
N7650 Lakeshore Road
Sheboygan
Wisconsin
53083
USA

Holds Certificate No:

FM 727336

and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

Design, manufacture, and distributor support for electrical generators, alternators, fuel tanks, automatic transfer switches and switchgear, including the manufacture of leads and harness, skids, and fabricated components with distribution of generator sets supported by warehouse operations.

For and on behalf of BSI:



Jessica Patel, Senior Vice President, Assurance Americas

Original Registration Date: 1995-02-28

Latest Revision Date: 2025-12-03

Effective Date: 2024-11-07

Expiry Date: 2027-11-06

Page: 1 of 2



...making excellence a habit.™

Certificate No: **FM 727336**

Location	Registered Activities
Discovery Energy Rehlko - GK 200 Twin Oaks Road Kohler Wisconsin 53004 USA	Manufacture of leads and harness, automatic transfer switches and switchgear. Distribution of generator sets.
Discovery Energy Rehlko N7650 Lakeshore Road Sheboygan Wisconsin 53083 USA	Design, manufacture, and distributor support for electrical generators, automatic transfer switches and switchgear.
Discovery Energy Rehlko 300 N Dekora Woods Blvd Saukville Wisconsin 53080 USA	Manufacture of fuel tanks, skids, fabricated components and generators.
Discovery Energy Rehlko Muth Warehouse 2821 Muth Court Sheboygan Wisconsin 53083 USA	The distribution of generator sets.
Discovery Energy Rehlko KWIP Warehouse 4327 County EE Sheboygan Wisconsin 53081 USA	Receiving, sequencing and warehousing of generator components.

Original Registration Date: 1995-02-28

Latest Revision Date: 2025-12-03

Effective Date: 2024-11-07

Expiry Date: 2027-11-06

Page: 2 of 2

This certificate remains the property of BSI and shall be returned immediately upon request.

An electronic certificate can be authenticated [online](https://www.bsigroup.com/ClientDirectory). Printed copies can be validated at www.bsigroup.com/ClientDirectory

To be read in conjunction with the scope above or the attached appendix.

Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 345 080 9000

BSI Assurance UK Limited, registered in England under number 7805321 at Seventh and Eighth Floors, The Acre, 90 Long Acre, London, WC2E 9RA, UK.

A Member of the BSI Group of Companies.

PROTOTYPE TEST REPORT



Models Covered: **KG200**
Model Tested: **KG200**
Cooling System Tested: **50C**

Alternator Tested: **4UA13**
Engine Tested: **KG10.3L**
Voltage Tested: **480V**

GENSET

Maximum power test to assure that the prime mover and alternator have sufficient capacity to operate within specifications.

Meets Rated Load

Steady-state load test to ensure voltage stability meets or exceeds ISO8528-5 requirements and to verify compliance with steady state speed control specifications.

Natural Gas

±0.75 % Frequency Band

±0.50 % Voltage Deviation

LP Gas

±0.75 % Frequency Band

±0.50 % Voltage Deviation

Transient load tests per NEMA MG1-32.18, and ISO 8528 to verify specifications of transient voltage regulation, voltage dip, voltage overshoot, recovery voltage, and recovery time. Values shown for model tested above. Please contact factory for additional details.

Natural Gas

Full Load Acceptance

-44.3 % Voltage Dip

6.11 Seconds of Recovery

-24.16 % Frequency Dip

8.65 Seconds of Recovery Time

Full Load Rejection

12.2 % Voltage Overshoot **1.90**

Seconds of Recovery Time **6.72**

% Frequency Overshoot **4.40**

Seconds of Recovery Time

G2 ISO8528-5 Class (G1, G2, G3)

LP Gas

Full Load Acceptance

-23.2 % Voltage Dip

2.01 Seconds of Recovery

-14.25 % Frequency Dip

1.81 Seconds of Recovery Time

Full Load Rejection

10.6 % Voltage Overshoot **3.33**

Seconds of Recovery Time **6.57**

% Frequency Overshoot **2.08**

Seconds of Recovery Time

G3 ISO8528-5 Class (G1, G2, G3)

PROTOTYPE TEST REPORT



Models Covered ☐ **KG200**
Model Tested ☐ **KG200**
Cooling System Tested ☐ **50C**

Alternator Tested ☐ **4UA13**
Engine Tested ☐ **KG10.3L**
Voltage Tested ☐ **480V**

GENSET

NFPA 110 one step testing to determine the amount of time required for the generator set to reach 90% voltage and frequency to allow the ATS to transfer.

Complies with NFPA 110 Type 10

Vibrational analysis to verify that generator vibrations are within acceptable limits per ISO 8528-9.
Complies

Torsional analysis data to verify torsional effects are not detrimental and that the generator set will provide dependable service as specified.

Complies

Generator set cooling and air flow tests to verify maximum operating ambient temperature.
(Cooling system test results are available on TIB-118)

Acoustical noise intensity and sound attenuation effects tests (Acoustical noise results are available on TIB-114 & 115)

Exhaust Back Pressure test completed to demonstrate within engine limitation
(Exhaust back pressure test results are available on TIB-119)

ALTERNATOR

Alternator temperature rise test per NEMA MG1-32.6. Standby and prime ratings of the alternator are established during this test.

Alternator overload test per NEMA MG1-32.8. Motor starting tests per NEMA MG1-32.18.5 to evaluate capabilities of generator, exciter, and regulator system.

Three-phase symmetrical short-circuit test per NEMA MG1-32.13 to demonstrate short circuit performance, mechanical integrity, ability to sustain short-circuit current.

Harmonic analysis, voltage waveform deviation per NEMA MG1-32.10 to confirm that the generator set is producing clean voltage within acceptable limits.

(Alternator detailed test results are available on TIB-102)

Kohler Standby/Prime Generator Set Test Program

Testing is an integral part of quality assurance. In keeping with our uncompromising commitment to quality, safety, and reliability, every Kohler Standby/Prime power generator set undergoes an extensive series of prototype and production testing.

Prototype Testing

Prototype testing includes the potentially destructive tests necessary to verify design, proper function of protective devices and safety features, and reliability expectations. Kohler's prototype testing includes the following:

- Alternator temperature rise test per NEMA MG1-32.6. Standby and prime ratings of the alternator are established during this test.
- Maximum power test to assure that the prime mover and alternator have sufficient capacity to operate within specifications.
- Alternator overload test per NEMA MG1-32.8.
- Steady-state load test to ensure voltage regulation meets or exceeds ANSI C84.1, NEMA MG1-32.17 requirements and to verify compliance with steady-state speed control specifications.
- Transient test to verify speed controls meets or exceeds specifications.
- Transient load tests per NEMA MG1-32.18, and ISO 8528 to verify specifications of transient voltage regulation, voltage dip, voltage overshoot, recovery voltage, and recovery time.
- Motor starting tests per NEMA MG1-32.18.5 to evaluate capabilities of generator, exciter, and regulator system.
- Three-phase symmetrical short-circuit test per NEMA MG1-32.13 to demonstrate short circuit performance, mechanical integrity, ability to sustain short-circuit current.
- Harmonic analysis, voltage waveform deviation per NEMA MG1-32.10 to confirm that the generator set is producing clean voltage within acceptable limits.

Torsional analysis data, to verify torsional effects are not detrimental and that the generator set will provide dependable service as specified, is available upon request.

Kohler offers other testing at the customer's request at an additional charge. These optional tests include power factor testing, customized load testing for specific application, witness testing, and a broad range of MIL-STD-705c testing. A certified test report is also available at an additional charge.

- Generator set cooling and air flow tests to verify maximum operating ambient temperature.
- Reliability tests to demonstrate product durability, followed by root cause analysis of discovered failures and defects. Corrective action is taken to improve the design, workmanship, or components.
- Acoustical noise intensity and sound attenuation effects tests.

Production Testing

In production, Kohler Standby/Prime generator sets are built to the stringent standards established by the prototype program. Every Kohler generator set is fully tested prior to leaving the factory. Production testing includes the following:

- Stator and exciter winding high-potential test on all generators. Surge transient tests on stators for generators 180 kW or larger. Continuity and balance tests on all rotors.
- One-step, full-load pickup tests to verify that the performance of each generator set, regulator, and governor meets published specifications.
- Regulation and stability of voltage and frequency are tested and verified at no load, 1/4 load, 1/2 load, 3/4 load, and full-rated load.
- Voltage, amperage, frequency and power output ratings verified by full-load test.
- The proper operation of controller logic circuitry, prealarm warnings, and shutdown functions is tested and verified.
- Any defect or variation from specification discovered during testing is corrected and retested prior to approval for shipment to the customer.

KOHLER®

KOHLER CO. Kohler, Wisconsin 53044
Phone 920-565-3381, Fax 920-459-1646
For the nearest sales/service outlet in the
US and Canada, phone 1-800-544-2444
KohlerPowerSystems.com

O&M Manual

All O&M Manuals and warranty statements will be submitted electronically, no hard copies will be supplied unless otherwise noted. Completed O&M manuals will be supplied post start-up. All OEM manuals will not be edited and are considered generic. Job specific O&M manuals must be arranged prior to submittal approval.