



Woodstock Power Company

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SUBMITTAL ACCEPTANCE

I hereby authorize Woodstock Power Company to use this form as confirmation of acceptance in regard to the equipment shown on aforementioned submittal, which clearly establishes definite specifications of material presented.

Accepted by:

Company Woodstock Power Company

Print Name:

Title:

Signature: _____

Date: _____

Submittal Package



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Battery	244578
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Pre-Startup Checklist

Pre-Startup Checklist	PreStartUpCheckList
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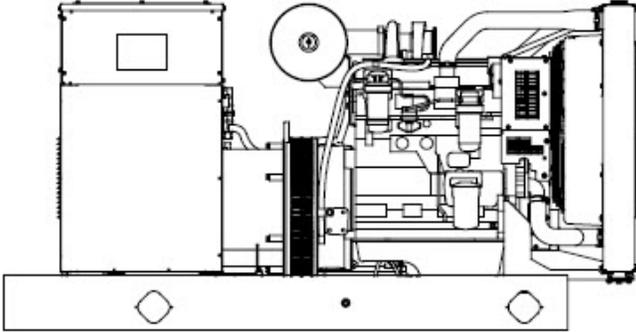
Generator

Kohler Model: 100REOZJF

This diesel generator set equipped with a 4R12X alternator operating at 120/208 volts is rated for 102 kW/128 kVA. Output amperage: 354.

Qty	Description																																																												
100REOZJF Generator System																																																													
3	<p>100REOZJF Generator Set</p> <p>Includes the following:</p> <table border="0"> <tr> <td>Literature Languages</td> <td>English</td> </tr> <tr> <td>Approvals and Listings</td> <td>UL2200 Listing</td> </tr> <tr> <td>Engine</td> <td>100REOZJF, 12V, 60Hz</td> </tr> <tr> <td>Nameplate Rating</td> <td>Standby 130C Rise</td> </tr> <tr> <td>Voltage</td> <td>60Hz, 120/208V, Wye, 3Ph, 4W</td> </tr> <tr> <td>Alternator</td> <td>4R12X</td> </tr> <tr> <td>Cooling System</td> <td>Unit Mounted Radiator, 50C</td> </tr> <tr> <td>Skid and Mounting</td> <td>Skid/Tank</td> </tr> <tr> <td>Air Intake</td> <td>Standard Duty</td> </tr> <tr> <td>Controller</td> <td>APM603</td> </tr> <tr> <td>Enclosure Type</td> <td>Sound</td> </tr> <tr> <td>Enclosure Material</td> <td>Aluminum</td> </tr> <tr> <td>Enclosure Silencer</td> <td>Internal Silencer</td> </tr> <tr> <td>Fuel Tank Type</td> <td>State</td> </tr> <tr> <td>Fuel Runtime (Approx.)</td> <td>24 Hours</td> </tr> <tr> <td>Subbase Fuel Tank Capacity</td> <td>215 Gallons</td> </tr> <tr> <td>Starting Aids, Installed</td> <td>1500W,120V</td> </tr> <tr> <td>Electrical Accy.,Installed</td> <td>Battery, 1/12V, Wet,Battery Charger, 6A,Run Rela</td> </tr> <tr> <td>Rating, LCB 1</td> <td>100% Rated</td> </tr> <tr> <td>Amps, LCB 1</td> <td>400</td> </tr> <tr> <td>Trip Type, LCB 1</td> <td>Electronic, LSI</td> </tr> <tr> <td>Interrupt Rating LCB 1</td> <td>35kA at 480V</td> </tr> <tr> <td>Fuel Lines, Installed</td> <td>Flexible Fuel Lines</td> </tr> <tr> <td>Miscellaneous Accy,Installed</td> <td>Coolant in Genset</td> </tr> <tr> <td>Warranty</td> <td>5 Year Comprehensive</td> </tr> <tr> <td>Testing, Additional</td> <td>Power Factor Test,0.8,3Ph Only</td> </tr> <tr> <td>Total unit width in inches</td> <td>46</td> </tr> <tr> <td>Total unit height in inches</td> <td>86</td> </tr> <tr> <td>Total unit weight (lbs)</td> <td>4,605</td> </tr> <tr> <td>Weight/Dimensions Disclaimer *</td> <td>Estimates-Not for Construction</td> </tr> </table>	Literature Languages	English	Approvals and Listings	UL2200 Listing	Engine	100REOZJF, 12V, 60Hz	Nameplate Rating	Standby 130C Rise	Voltage	60Hz, 120/208V, Wye, 3Ph, 4W	Alternator	4R12X	Cooling System	Unit Mounted Radiator, 50C	Skid and Mounting	Skid/Tank	Air Intake	Standard Duty	Controller	APM603	Enclosure Type	Sound	Enclosure Material	Aluminum	Enclosure Silencer	Internal Silencer	Fuel Tank Type	State	Fuel Runtime (Approx.)	24 Hours	Subbase Fuel Tank Capacity	215 Gallons	Starting Aids, Installed	1500W,120V	Electrical Accy.,Installed	Battery, 1/12V, Wet,Battery Charger, 6A,Run Rela	Rating, LCB 1	100% Rated	Amps, LCB 1	400	Trip Type, LCB 1	Electronic, LSI	Interrupt Rating LCB 1	35kA at 480V	Fuel Lines, Installed	Flexible Fuel Lines	Miscellaneous Accy,Installed	Coolant in Genset	Warranty	5 Year Comprehensive	Testing, Additional	Power Factor Test,0.8,3Ph Only	Total unit width in inches	46	Total unit height in inches	86	Total unit weight (lbs)	4,605	Weight/Dimensions Disclaimer *	Estimates-Not for Construction
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3	Lit Kit, Production, 100REOZJF																																																												

Spec Sheets



Standard Features

- Discovery Energy, LLC and its affiliates dba Rehiko provides one-source responsibility for the generating system and accessories.
- Approved for use with certified renewable Hydrotreated Vegetable Oil (HVO) / Renewable Diesel (RD) fuels compliant with EN15940/ASTM D975.
- The generator set and its components are prototyped, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Tier 3 EPA-certified for Stationary Emergency Applications
- Alternator Protection
- Battery Rack and Cables
- Customer Connection (standard with Decision-Maker 6000 controller only)
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Literature

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.

Other Features

- Rehiko designed controller for guaranteed system integration and remote communication.
- The low coolant level shutdown prevents overheating (standard on radiator models only). Integral vibration isolation eliminates the need for under-unit vibration spring isolators.
- Mount up to three circuit breakers to allow circuit protection of selected priority loads.

Generator Set Rating

Alternator	Voltage	Ph	Hz	Peak kVA	Standby 130C Rise Ratings	
					kW/kVA	Amps
4R12X	120/208	3	60	335	102/128	354

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.

Prime Power Ratings: At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528-1 and ISO-3046-1. For limited running time and continuous ratings, consult the factory. Obtain technical information bulletin (TIB-101) for ratings guidelines, complete ratings definitions, and site condition derates. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

Model: 100REOZJF, continued

Alternator Specifications

Specifications	Alternator
Alternator manufacturer	Rehiko
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, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible disc
Amortisseur windings	Full
Voltage regulation, no-load to full-load RMS	Controller Dependent
One-Step Load Acceptance	100% of rating
Unbalanced load capability	100% of Rated Standby Current
<ul style="list-style-type: none"> • NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting. • Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds. 	
<ul style="list-style-type: none"> • Sustained short-circuit current enabling down stream circuit breakers to trip without collapsing the alternator field. <ul style="list-style-type: none"> • Self-ventilated and dripproof construction. • Vacuum-impregnated windings with fungus-resistant epoxy varnish for dependability and long life. <ul style="list-style-type: none"> • Superior voltage waveform from a two-thirds pitch stator and skewed rotor. 	

Engine

Engine Specification

Engine Manufacturer	John Deere
Engine Model	4045HF285I
Engine: type	4-Cycle, Turbocharged, Charge Air-Cooled
Cylinder arrangement	4 Inline
Displacement, L (cu. in.)	4.5 (276)
Bore and stroke, mm (in.)	106 x 127 (4.19 x 5.00)
Compression ratio	19:01
Piston speed, m/min. (ft./min.)	457 (1500)
Main bearings: quantity, type	5, Replaceable Insert
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	118 (158)
Cylinder head material	Cast Iron
Crankshaft material	Forged Steel
Valve (exhaust) material Intake	Chromium-Silicon Steel
Valve (exhaust) material	Stainless Steel
Governor: type, make/model	JDEC Electronic L16 Denso HP3
Frequency regulation, no-load to-full load	Isochronous
Frequency regulation, steady state	±0.25%
Frequency	Fixed
Air cleaner type, all models	Dry

Model: 100REOZJF, continued

Exhaust

Exhaust System

Exhaust Manifold Type	Dry
Exhaust flow at rated kW, m ³ /min. (cfm)	22.8 (805)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	580 (1076)
Maximum allowable back pressure, kPa (in. Hg)	7.5 (2.2)

Engine Electrical

Engine Electrical System

Battery charging alternator	12 Volt
Battery charging alternator: Ground (negative/positive)	Negative
Battery charging alternator: Volts (DC)	12
Battery charging alternator: Ampere rating	65
Starter motor rated voltage (DC)	12
Battery, recommended cold cranking amps (CCA): Qty., CCA rating each	One, 640
Battery voltage (DC)	12

Fuel

Fuel System

Fuel type	Diesel
Fuel supply line, min. ID, mm (in.)	11.0 (0.44)
Fuel return line, min. ID, mm (in.)	6.0 (0.25)
Max. lift, fuel pump: type, m (ft.)	Engine-Driven, 1.8 (6.0)
Max. fuel flow, Lph (gph)	74.6 (19.7)
Max. return line restriction, kPa (in. Hg)	20 (5.9)
Fuel prime pump	Manual
Fuel Filter Secondary	2 Microns@ 98% Efficiency
Fuel Filter Primary	30 Microns
Fuel Filter Water Separator	Yes
Recommended fuel	#2 Diesel/HVO/RD

Lubrication

Lubrication System

Type	Full Pressure
Oil pan capacity, L (qt.)	14.7 (15.5)
Oil pan capacity with filter, L (qt.)	15.6 (16.5)
Oil filter: quantity, type	1, Cartridge
Oil cooler	Water-Cooled

Model: 100REOZJF, continued

Cooling

Radiator System

Ambient temperature, °C (°F)	50 (122)
Engine jacket water capacity, L (gal.)	8.5 (2.25)
Radiator system capacity, including engine, L (gal.)	20.1 (5.3)
Engine jacket water flow, Lpm (gpm)	182 (48)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	62 (3544)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	20 (1127)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	600 (23.6)
Fan, kWm (HP)	6.6 (8.8)
Max. restriction of cooling air, intake and discharge side of radiator, kPA (in. H2O)	0.125 (0.5)

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

Operation Requirements

Air Requirements

Radiator-cooled cooling air, m3/min. (scfm) *	142 (5000)
Combustion air, m3/min. (cfm)	8.2 (288)
Heat rejected to ambient air: Engine, kW (Btu/min.)	25.0 (1420)
Heat rejected to ambient air: Alternator, kW (Btu/min.)	11.6 (660)

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

Fuel Consumption

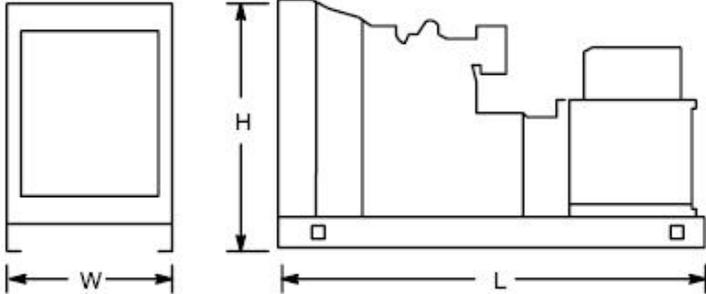
Diesel, Lph (gph), at % load	Rating
Standby Fuel Consumption at 100% load	31.0 Lph (8.2 gph)
Standby Fuel Consumption at 75% load	25.0 Lph (6.6 gph)
Standby Fuel Consumption at 50% load	17.8 Lph (4.7 gph)
Standby Fuel Consumption at 25% load	9.5 Lph (2.5 gph)
Prime Fuel Consumption at 100% load	27.6 Lph (7.3 gph)
Prime Fuel Consumption at 75% load	22.7 Lph (6.0 gph)
Prime Fuel Consumption at 50% load	14.4 Lph (3.8 gph)
Prime Fuel Consumption at 25% load	7.6 Lph (2.0 gph)
Continuous Fuel Consumption at 0% load	

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

Dimensions and Weights

Dim Weight Spec	Dim Weight Value
Fuel	Diesel
Engine Manufacturer	Diesel
Overall Size, L x W x H, mm (in.): Wide Skid	See Enclosure ADV Drawing
Overall Size, L x W x H, mm (in.): Narrow Skid	2334 x 864 x 1216 (91.89 x 34.02 x 47.90)
Weight (radiator model), wet, kg (lb.):	1234 (2720)

Model: 100REOZJF, 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.

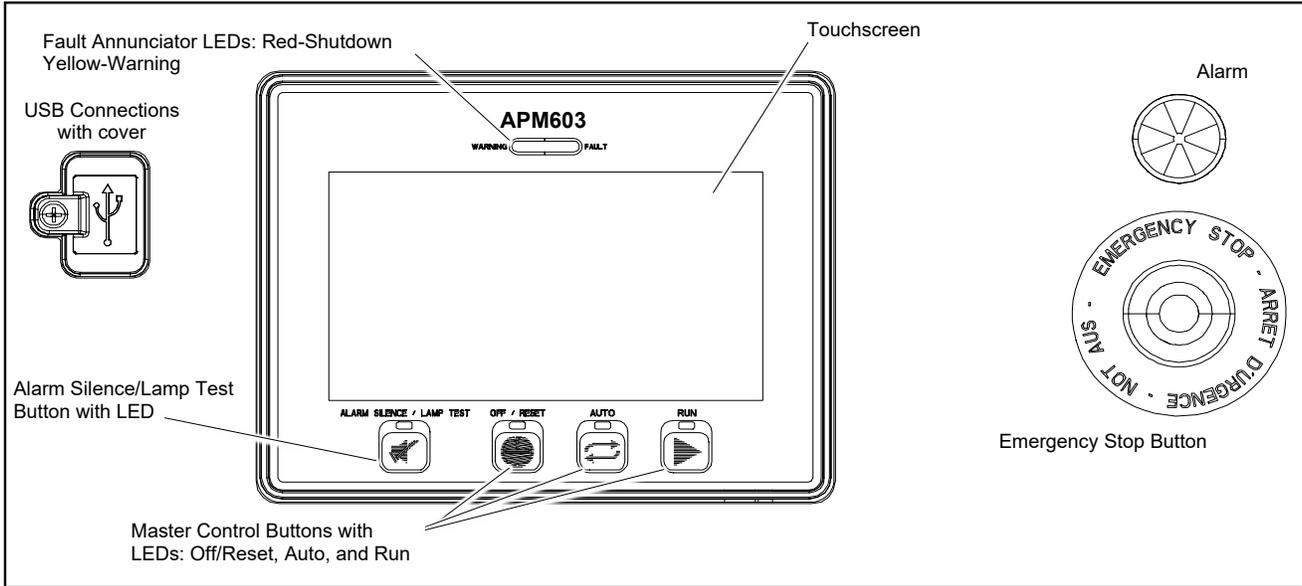
Global Support

- Sales, installation, and service support from more than 800 Rehiko 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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)



Industrial Generator Set Accessories

Generator Set Controller

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.		



**John Deere 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 Open *	
Excitation Over Voltage (350 kW and up)	
Fuel Leak Alarm	
Low Fuel Level Switch	
Remote Emergency Stop	
Remote Engine Start	
Speed Bias	Two-wire input
Voltage Bias	Analog Voltage Input, Scalable up to +/-10 VDC

Standard Dedicated User Outputs	Output Type
Close Breaker *	Relay Driver Output
Common Failure	
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	

JD Engine Data

The following John Deere engine data is displayed on the APM603 controller.

Parameter
Engine Model Number
Engine Serial Number
ECU Serial Number
Coolant Temperature
Engine Speed
Fuel Pressure
Fuel Consumption Rate
Oil Pressure
Run Time Hours

**KD 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 *		
Fuel Leak Alarm		
Fuel Level		
Idle Switch		
Key Switch Enable		
Low Fuel Level Switch		
Low Oil Level		
Remote Emergency Stop		
Remote Reset		
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		
EPS Supplying Load		
Generator Running		
Horn		
Low Coolant Temperature		
Not in Auto		
System Ready		
Trip Breaker/Shunt Trip *		
* Only with remote-mounted electrically operated circuit breakers.		

Optional Configurable User Inputs and Outputs	
User Configurable Inputs	16 Dry Contact Digital
User Configurable Relay Outputs	8 NO/NC Relays
Note: Programmable I/O is configurable by authorized technician.	

KD Engine Data

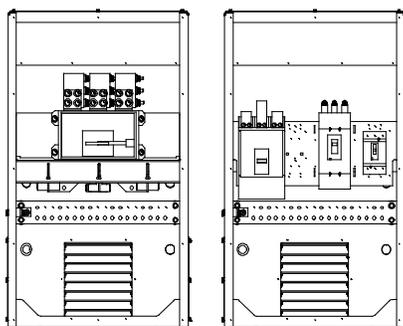
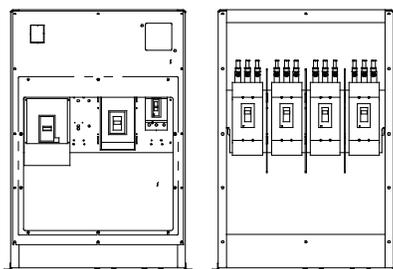
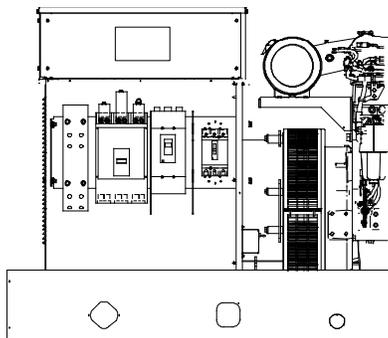
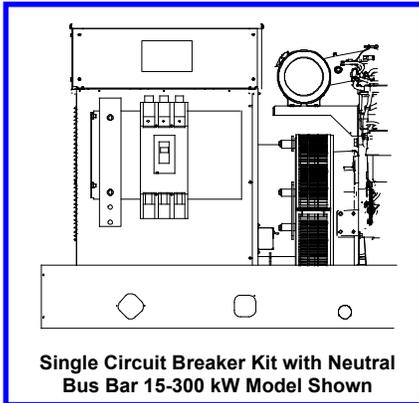
The following Diesel engine data is displayed on the APM603 controller.

Parameter
Engine Model Number
Engine Serial Number
Ambient Temperature
Charge Air Pressure
Charge Air Temperature
Common Rail Fuel Pressure
Coolant Level
Coolant Temperature
Crankcase Pressure
Engine Speed
Fuel Consumption Rate
Fuel Pressure
Fuel Temperature
Intercooler Coolant Temperature (K175 engines only)
Oil Temperature
Oil Pressure
Run Time Hours

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.

Availability is subject to change without notice. Discovery Energy, LLC and its affiliates dba Rehiko 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.



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.



Industrial Generator Set Accessories

Line Circuit Breakers 15-3250 kW

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
	4RX 4S/4SX 4TX 4V 4UA 4M6226	15-150	Thermal magnetic
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
4UA 4M6226		1000-1200	Electronic LSI
	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	65	35	18
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

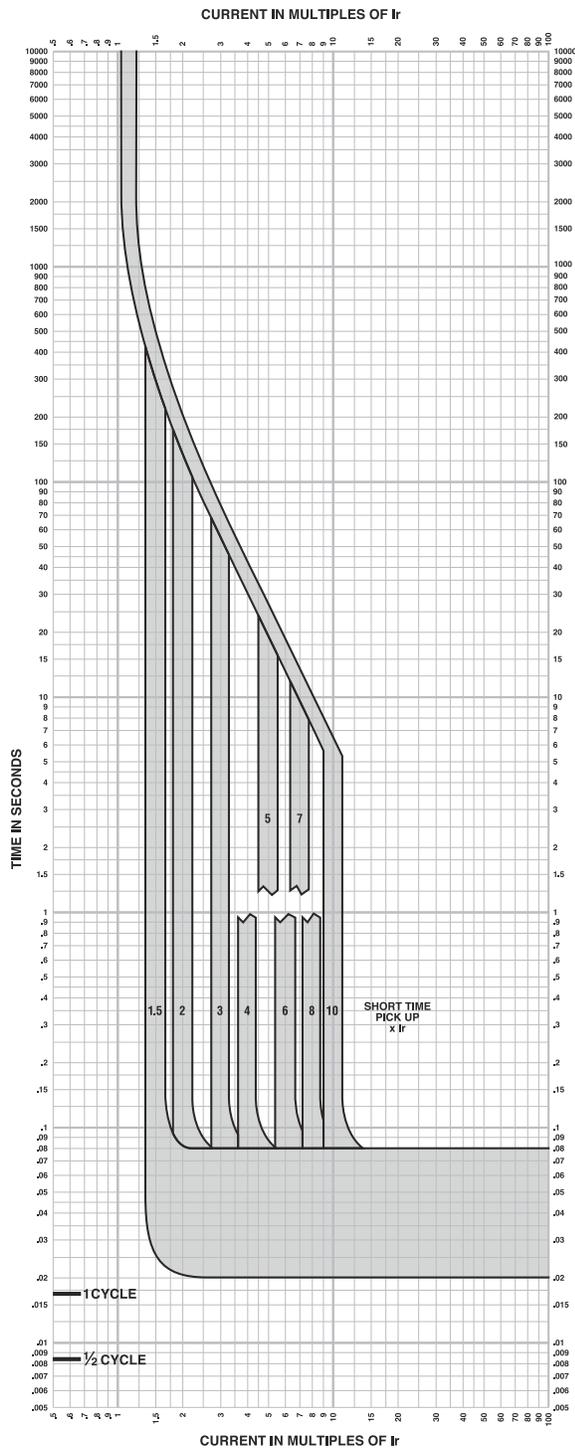
Frame Size	Ampere Range	Wire Range
H	60-150	One #14 to 3/0 AL/CU
J	250	One 3/0 to 350 kcmil AL/CU
LG	400-600	Two 4/0 to 500 kcmil AL/CU



Industrial Generator Set Accessories
Line Circuit Breakers 15-3250 kW

PowerPact™ H-, J-, and L-Frame Circuit Breakers Trip Curves

Figure 96: Micrologic 3.3S and 3.3S-W Electronic Trip Unit Long Time/Short Time Trip Curve



MICROLOGIC™ ELECTRONIC TRIP UNITS Micrologic™ 3.3S and 3.3S-W Long Time/Short Time Trip Curve 250A, 400A L-Frame

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

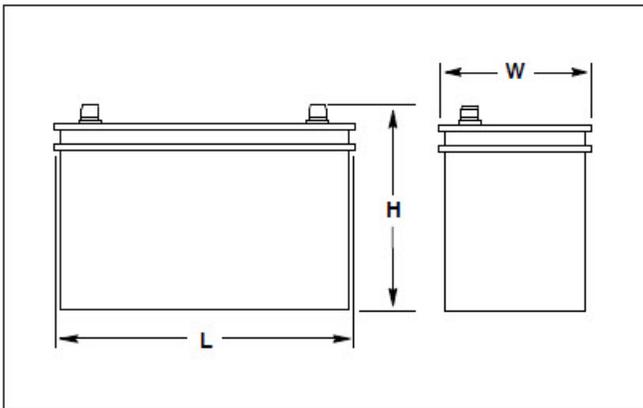
Notes:

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. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.

Curves apply from -35°C to +70°C (-31°F to +158°F) ambient temperature.



Typical Overall Dimensions

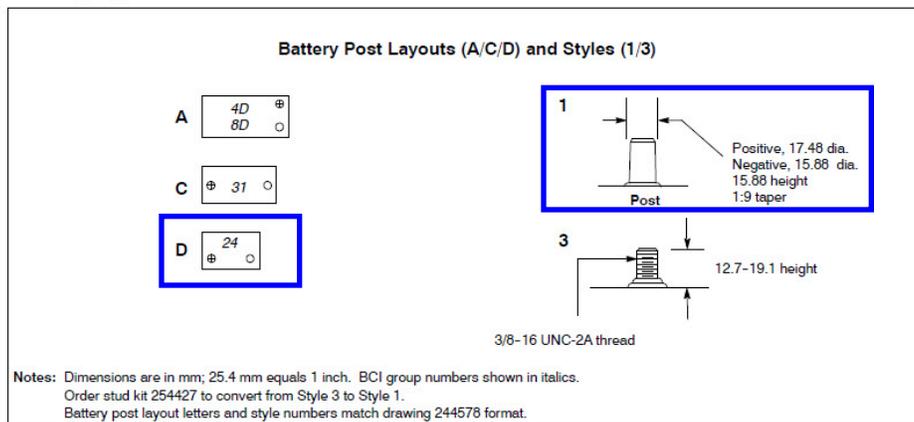


Standard Features

- 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	GM106373	1	24	260.0 (10.3)	171.0 (6.8)	229.0 (9.0)	650	95	D/1

Battery Specifications



Industrial Generator Set Accessories

12/24 Volt, 6 Amp Float/Equalize Battery Charger

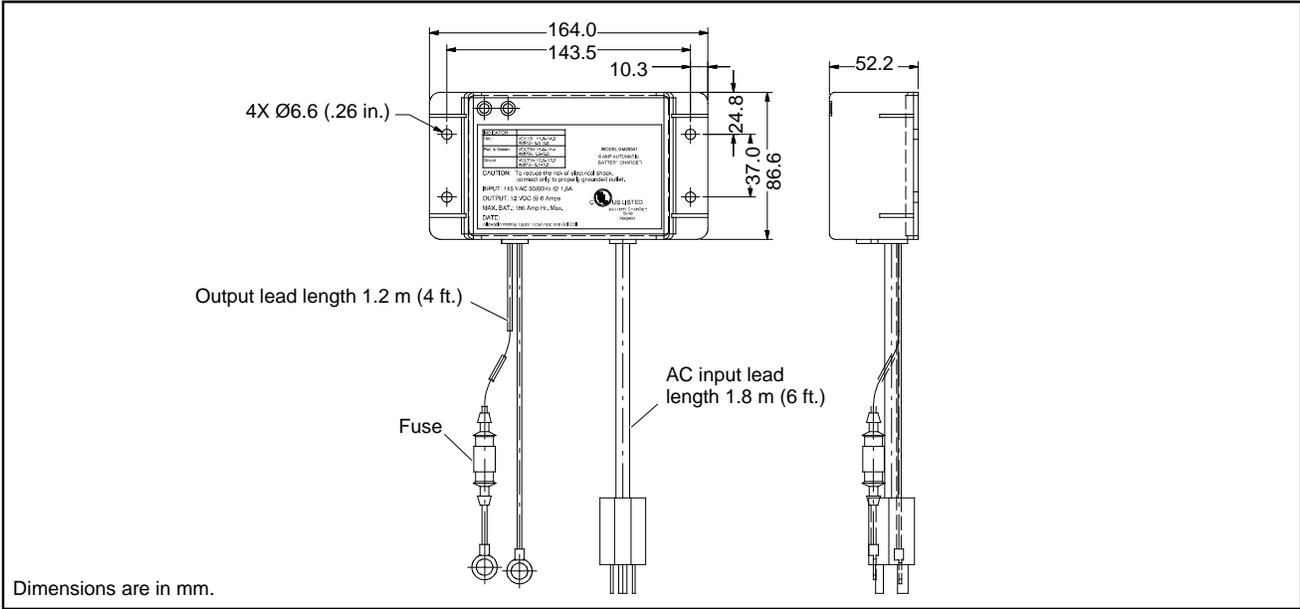


Standard Features

- 12 VDC output. * Use two battery chargers for 24-volt electrical systems
- Automatic 3-stage float/equalize battery charger
- Charges both lead-acid and gel-cell type batteries:
- Indicator lamps: red and green LEDs indicate bulk charge, absorption, and float charge stages
- Durable potted assembly for waterproofing and shockproofing
- Reverse-polarity protection
- Short-circuit protection
- UL 1236 listed
- UL 2200 compliant
- UL 991 compliant for vibration and shock
- UL listed to Canadian safety standards
- UL rated inline fuse
- FCC Class B-compliant for EMI/RFI (Date code 8/26/04 or later)
- One-year warranty
- Easy installation:
 - Integral mounting flanges
 - Ring terminals for battery connection
 - Standard US style 3-prong AC plug

Specifications

Input Voltage	90-135 VAC
Input Frequency	50/60 Hz
DC Output:	
Bulk	11.8-14.0 VDC @ 5.0-6.0 amps
Absorption	14.0-14.5 VDC @ 1.5-5.0 amps
Float	13.3-14.5 VDC @ 0.1-1.5 amps
Steady Full-Load Output Current	6 amps
Current Limit	7 amps
Output Power Limit	70 +2/-5 watts
Line Regulation Across Input Voltage Range	1%
Isolation, Input to Output	2500 V
Dimensions (L x W x D)	164 x 87 x 53 mm (6.4 x 3.5 x 2.1 in)
Weight	1.6 kg (3.5 lb.)
Temperature Range, Operating and Storage	--40° to 70°C (-40° to 158° F)
Humidity	0 to 100% (condensing)



Dimensions are in mm.

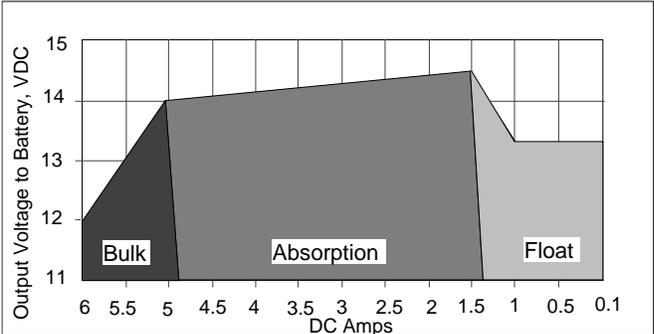
Battery Connections

- Lead Length 1.2 m (4 ft.)
- Battery Connections 9.5 mm (3/8 in.) ring terminals

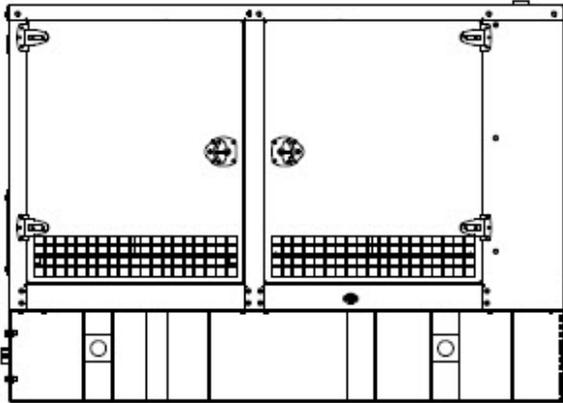
AC Power Connections

- Lead Length 1.8 m (6 ft.)
- Connection **Standard US style 3-prong AC plug**

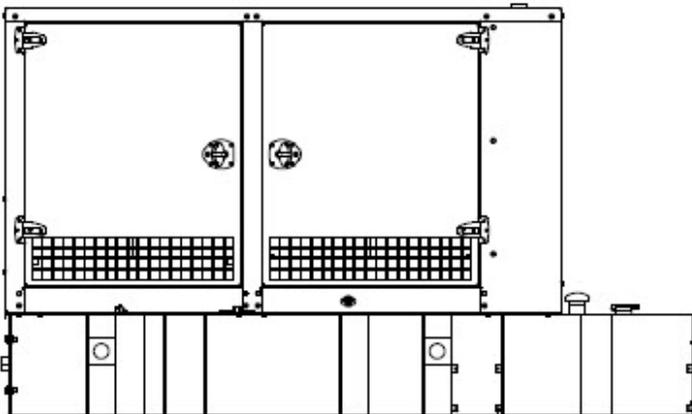
Charging Curves



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Enclosure with Standard Subbase Fuel Tank



Enclosure with State Code Subbase Fuel Tank

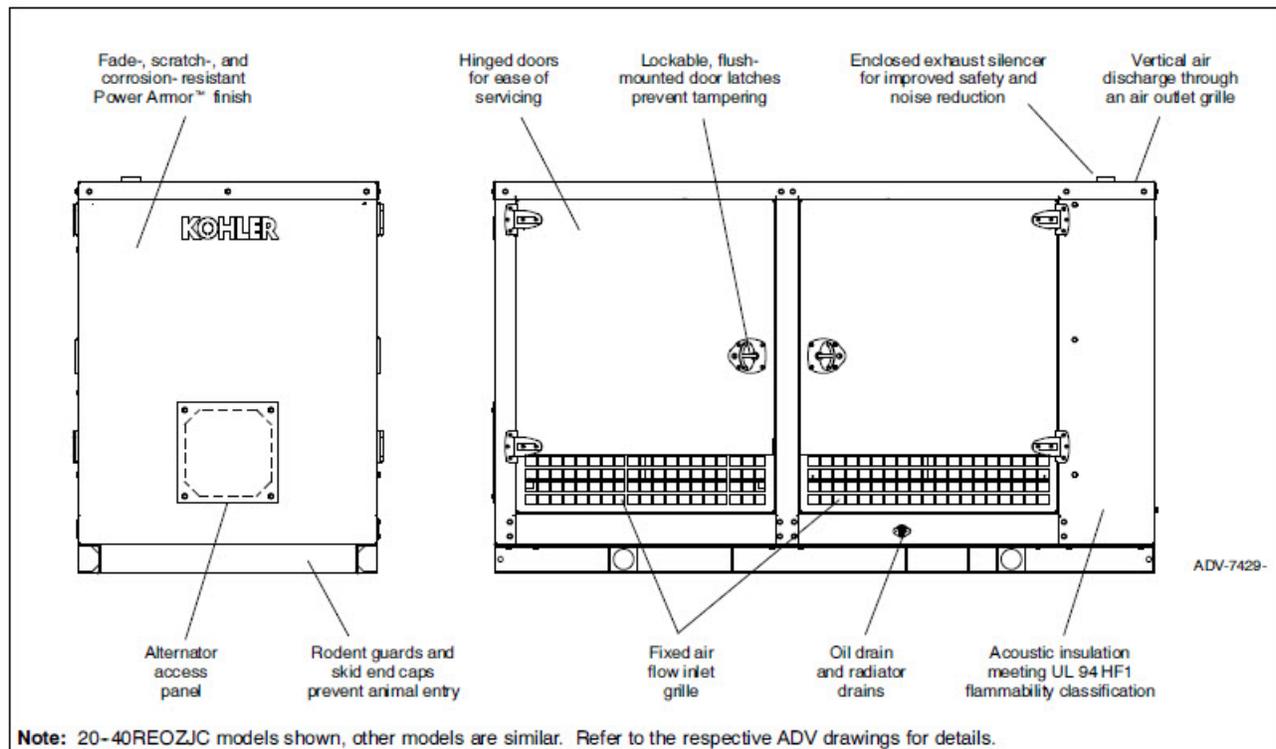
Sound Enclosure Standard Features

- Internal-mounted critical silencer and flexible exhaust connector.
- Lift base-mounted or tank 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.
- Power Armor surpasses 3,000-hour salt spray corrosion tests per ASTM B- 1117
- 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 that uses up to 51 mm (2 in.) of acoustic insulation.
- Aluminum sound enclosure is certified to 186 mph (299 kph) wind load rating for 80-150REOZJ models.

Subbase Fuel Tank Features

- The fuel tank has a Power Armor Plus textured epoxy-based rubberized coating.
- The above-ground rectangular secondary containment tank mounts directly to the generator set, below the generator set skid (subbase).
- Both the inner and outer tanks have emergency relief vents.
- Flexible fuel lines are provided with subbase fuel tank selection.
- The secondary containment generator set base tank meets UL 142 tank requirements. The inner (primary) tank is sealed inside the outer (secondary) tank. The outer tank contains the fuel if the inner tank leaks or ruptures.

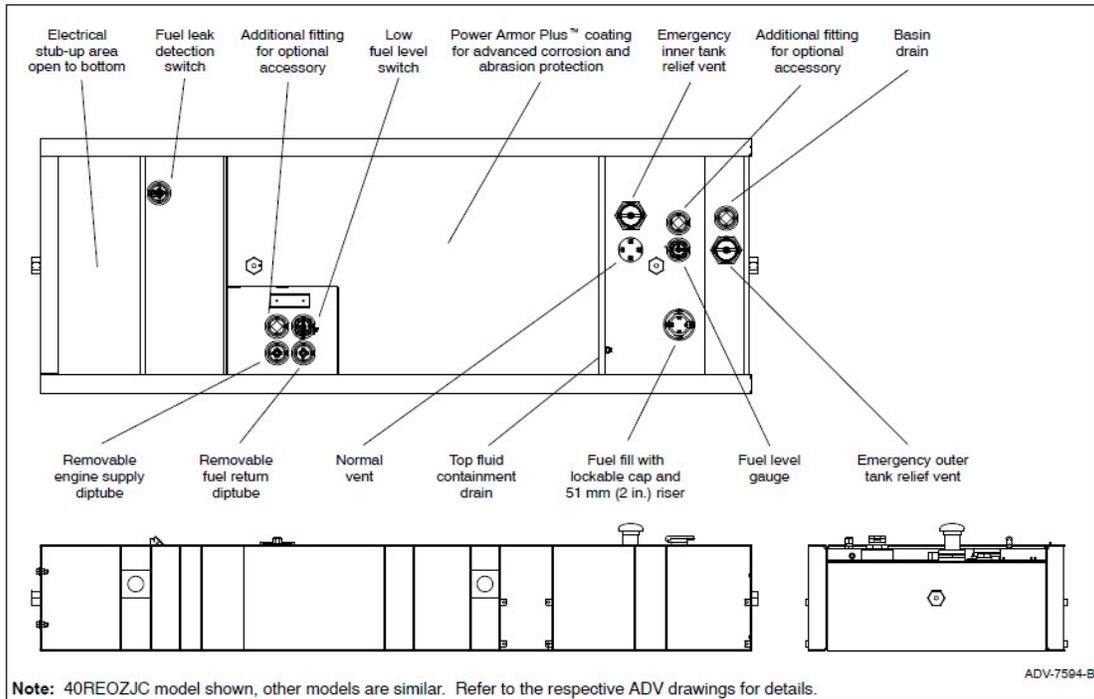
- State tanks with varying capacities are an available option. Florida Dept. of Environmental Protection (FDEP) File No. EQ-634 approved.



Sound Enclosure Features

- Available in aluminum 3.2mm (0.125 in.) formed panel, solid construction. Preassembled package offering corrosion resistant, dent resilient structure mounting directly to lift base or fuel tank.
- Power Armor automotive-grade finish resulting in advanced corrosion and abrasion protection as well as enhanced edge coverage and color retention.
- Internal 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 fuel fill, fuel gauge, oil fill and battery.
- Cooling air discharge. Weather protective design featuring vertical air discharge. Redirects cooling air up and above the enclosure to reduce ambient noise.
- Attenuated design. Acoustic insulation UL 94 HF1 listed for flame resistance offering up to 51 mm (2 in.) mechanically restrained acoustic insulation.
- Cooling air discharge. The sound enclosures include acoustic insulation with urethane film.
- Note: Installing an additional length of exhaust tail pipe may increase backpressure levels. Please refer to the generator set spec sheet for the maximum backpressure value.

State Code Subbase Fuel Tank



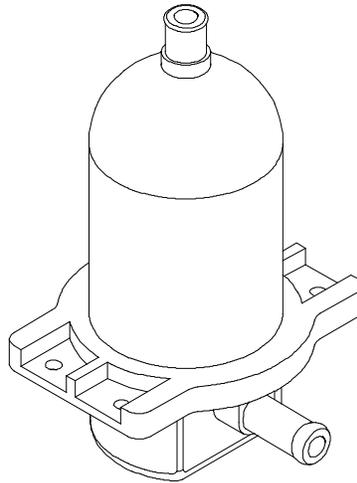
- Extended operation. Usable tank capacities offers full load standby operation of up to 72 hours.
- Power Armor Plus textured epoxy-based rubberized coating that creates an ultra-thick barrier between the tank and harsh environmental conditions like humidity, saltwater, and extreme temperatures, and provides advanced corrosion and abrasion protection.
- UL listed. Secondary containment generator set base tank meeting UL 142 tank requirements.
- NFPA compliant. Designed to comply with the installation standards of NFPA 30 and NFPA 37.
- Integral external lift lugs. Enables crane with spreader-bar lifting of the complete package (empty tank, mounted generator set, and enclosure) to ensure safety.
- Emergency pressure relief vents. Meets UL requirements; ensures adequate venting of inner and outer tank under extreme pressure and/or emergency conditions.
- Normal vent with cap. Vent is raised above lockable fuel fill.
- Low fuel level switch. Annunciates a 50% low fuel level condition at generator set control.
- Leak detection switch. Annunciates a contained primary tank fuel leak condition at generator set control.
- Electrical stub-up.
- State tank designed to comply with the installation standards of the Florida Dept. of Environmental Protection (FDEP) File No. EQ-634.

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	Enclosure and Fuel Tank Length, mm (in.)	Enclosure and Fuel Tank Width, mm (in.)	Enclosure and Fuel Tank Weight, kg (lb.)	Enclosure and Fuel Tank Height, mm (in.)	Fuel Tank Height (H), mm (in.)	Sound Pressure Level, dB(A)
814 (215)	24/26	3400 (133.9)	1156 (45.5)	1974 (4351)	2111 (83.1)	432 (17)	69

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

Note: Refer to TIB-114 for generator set sound data.

Max. weight includes the generator set (wet), enclosure, silencer, and tank (no fuel). The generator set weight represents using the largest alternator option. The enclosure weight is with acoustic insulation added.



Block Heater Kit, typical

Applicable Models

- KD80-KD200
- 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
- 125REOZJG/180REOZJG

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

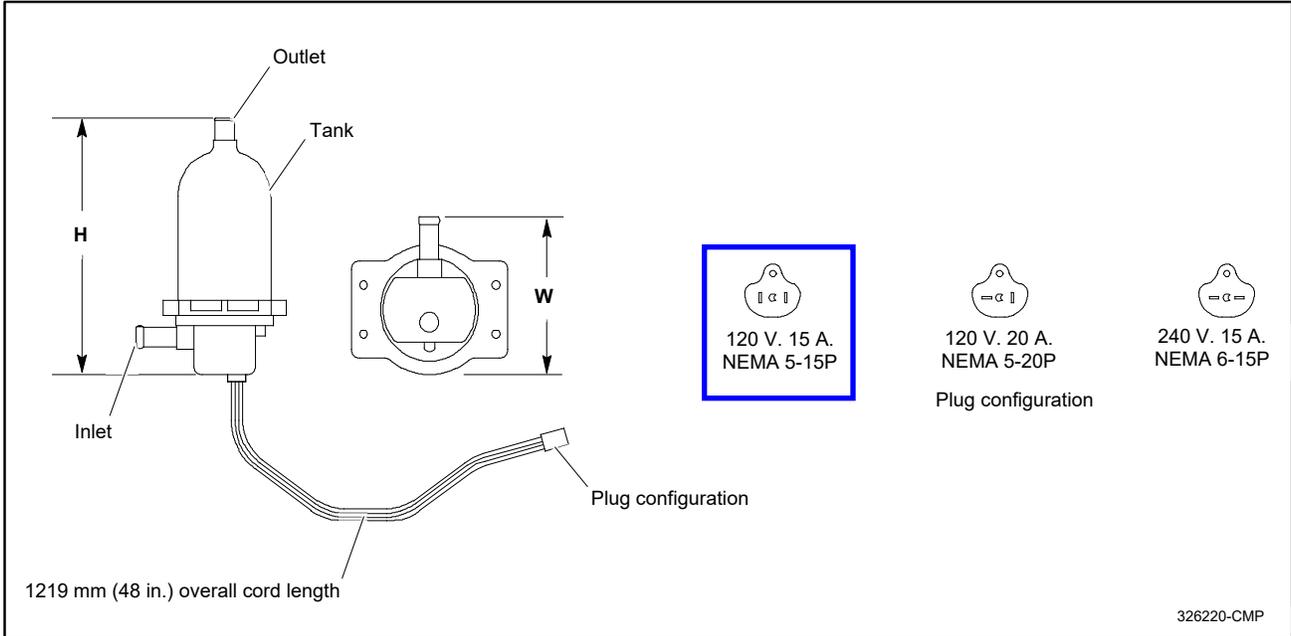
Heating Fluid	Water, Coolant Mix (50% Glycol/50% Water)
Max. Pressure	90 psi (620 kPa)
Heating Element Material	Incoloy 800
Inlet/Outlet Plumbing	0.625 in. hose barb
System Ingress	IP41
Power Connection	NEMA Plug and EURO Plug
Power Chord Length	48 in. (1219 mm)

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			27°C (80°F)	38°C (100°F)
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: **4R12X**
 Frequency: 60 Hz
 Speed: 1800 RPM
 Leads: 12 (6 Lead, 600 Volt)

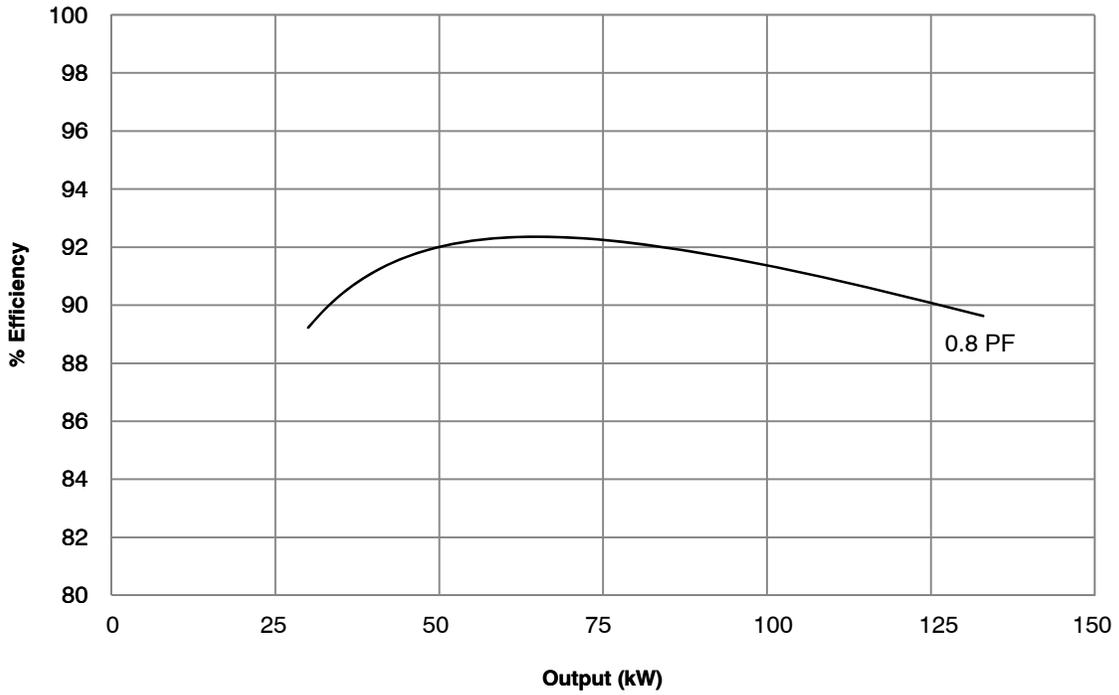
Voltage L-N/L-L	Phase	Power Factor	Connection	kW* (kVA)							
				Class B		Class F			Class H		
				80°C Continuous	90°C Lloyds	95°C ABS	105°C Continuous	130°C Standby	125°C Continuous	150°C Standby	
139/240 277/480	3	0.8	Wye	111.0 (138.5)	116.0 (145.0)	119.0 (148.5)	124.0 (155.0)	134.5 (168.0)	132.5 (165.5)	142.5 (178.0)	
127/220 254/440	3	0.8	Wye	107.5 (134.0)	113.5 (141.5)	115.5 (144.0)	121.5 (151.5)	130.5 (163.0)	128.5 (160.5)	138.0 (172.5)	
120/208 240/416	3	0.8	Wye	104.0 (130.0)	108.5 (135.5)	111.0 (138.5)	115.0 (143.5)	124.0 (155.0)	123.0 (153.5)	131.0 (163.5)	
110/190 220/380	3	0.8	Wye	94.0 (117.5)	98.0 (122.5)	100.0 (125.0)	104.0 (130.0)	112.0 (140.0)	111.0 (138.5)	118.5 (148.0)	
120/240	3	0.8	Delta	104.0 (130.0)	108.5 (135.5)	111.0 (138.5)	115.0 (143.5)	124.0 (155.0)	123.0 (153.5)	131.0 (163.5)	
120/240	1	1.0	Dogleg	76.0 (76.0)	79.5 (79.5)	81.0 (81.0)	84.0 (84.0)	91.0 (91.0)	90.0 (90.0)	96.0 (96.0)	
347/600	3	0.8	Wye	102.0 (127.0)	108.0 (135.0)	111.0 (138.0)	116.0 (145.0)	130.0 (162.0)	127.0 (158.0)	139.0 (173.0)	

* 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.

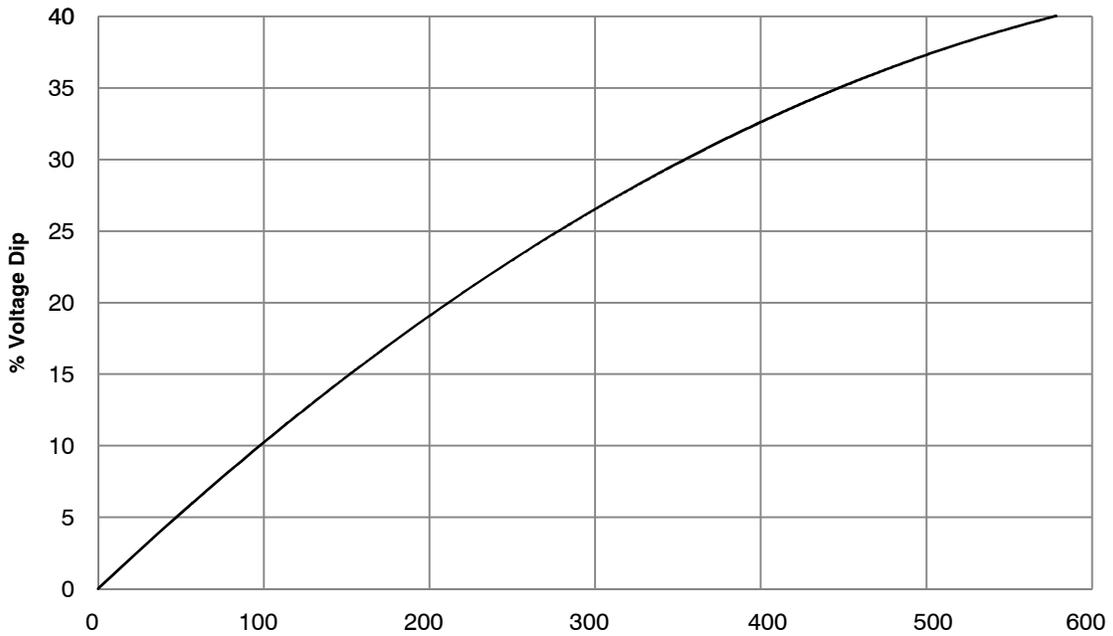
Submittal Data: 139/240 Volts, 0.8 PF, 1800 RPM, 60 Hz, 3 Phase, 130°C Rise

	Symbol	PerUnit	Ohms		Symbol	Value
Typical Cold Resistances				Typical Time Constants		
Phase Resistance		0.029	0.010	Armature Short Circuit	T _a	0.008 sec.
Rotor Resistance		17.83	6.112	Transient Short Circuit	T' _d	0.074 sec.
Typical Reactances				Transient Open Circuit	T' _{do}	0.860 sec.
Synchronous				Typical Field Current		
Direct	X _d	2.973	1.019	Full Load	I _{fFL}	18.9 amps
Quadrature	X _q	1.526	0.523	No Load	I _{fNL}	5.2 amps
Transient				Typical Short Circuit Ratio		0.336
Unsaturated	X' _{du}	0.290	0.099	Harmonic Distortion		
Saturated	X' _d	0.255	0.087	RMS Total Harmonic Distortion		3.25%
Subtransient				Max. Single Harmonic		5th
Direct	X'' _d	0.122	0.042	Deviation Factor (No Load, L-L)		<5%
Quadrature	X'' _q	0.116	0.040	Telephone Influence Factor		<50
Negative Sequence	X ₂	0.119	0.041	Insulation Class		
Zero Sequence	X ₀	0.010	0.003	per NEMA MG1-1.66		H
				Phase Rotation		ABC

**4R12X, 60 Hz, 139/240, 277/480 Volts, Wye
TYPICAL ALTERNATOR EFFICIENCY***

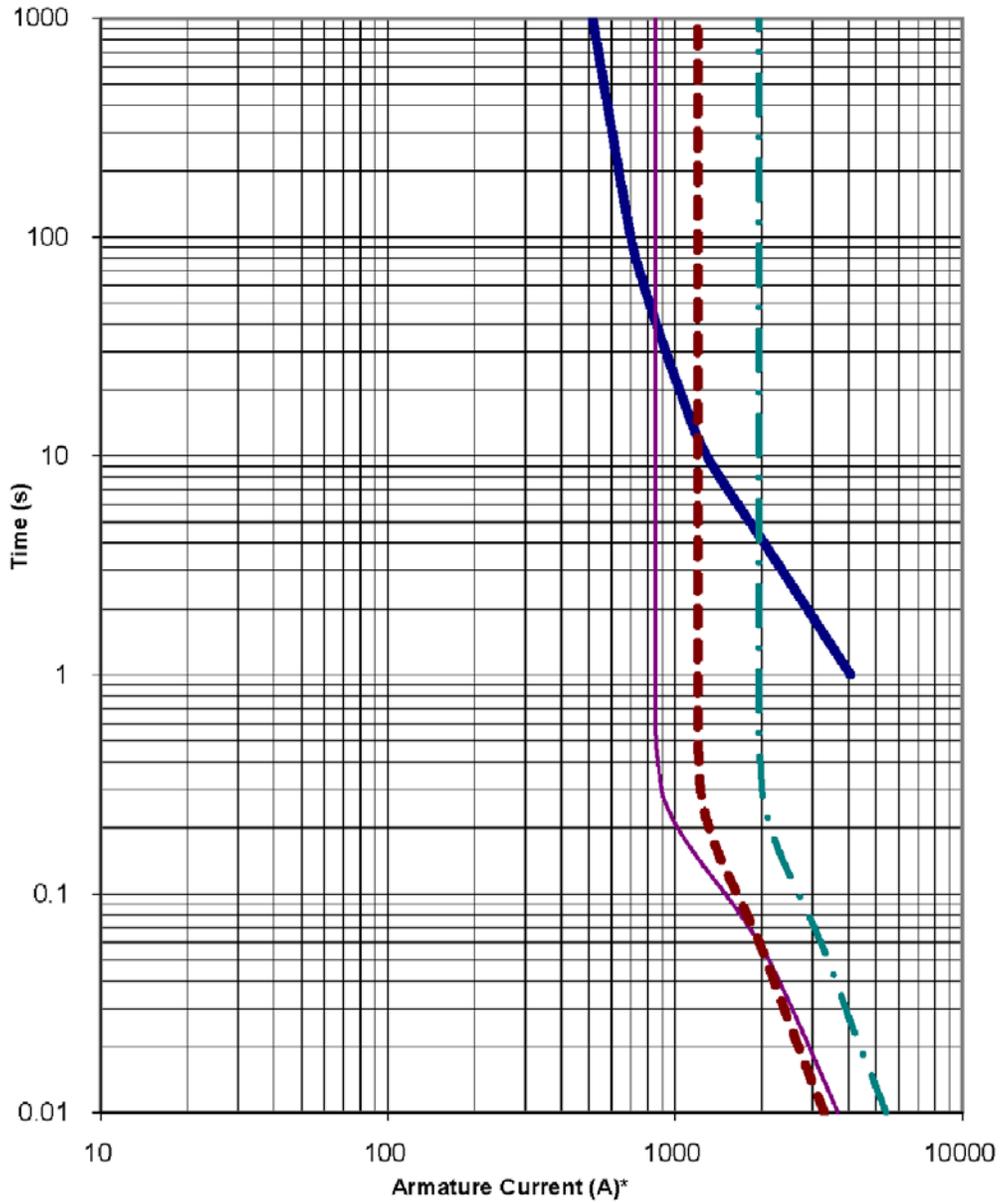


**4R12X, 60 Hz, 139/240, 277/480 Volts, Wye
TYPICAL MOTOR STARTING CHARACTERISTICS***



* 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.

**4R12X, 60 Hz, Low Wye or Delta Connection
SHORT CIRCUIT DECREMENT CURVE**



*Instantaneous current (t=0) is asymmetric. Divide by 1.73 for symmetric.

Cooling Data

TECHNICAL INFORMATION BULLETIN

Generator Set Cooling System Data Sheet

100REOZJF 60Hz (Standby Duty)	50°C Ambient Temperature Cooling System								
	Total external restriction on open unit⁷	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 <i>(°F)</i>	50 (122)	47 (117)	44 (111)	43 (109)	41 (106)	NA (NA)	45 (113)
	Cooling system airflow	m ³ /min <i>(ft³/min)</i>	142 (5000)	133 (4700)	127 (4500)	121 (4300)	115 (4100)	NA (NA)	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. Kohler 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	Open Unit, Isolated Exhaust	Weather Enclosure	Sound Enclosure	Snow Sound Enclosure
100REOZJF	60	100% Load	112.4	84.5	82.6	69.8	69.9
		No Load	100.1	80.9	79.0	68.3	66.1

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.

Continued on next page

100REOZJF	60 Hz
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				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)	Snow Sound	3:00	58.3	61.5	57.1	61.7	57.8	56.0	53.5	44.9	67.3
			1:30	58.2	63.5	60.4	60.3	60.5	58.7	58.0	49.9	68.8
			12:00-Engine	53.3	62.0	62.6	66.9	66.0	66.1	64.7	56.6	73.0
			10:30	54.3	61.8	63.9	67.8	59.5	59.8	55.6	48.6	71.0
			9:00	60.2	65.5	60.9	64.4	61.4	60.1	58.9	51.6	70.8
			7:30	54.7	61.8	59.1	62.8	58.4	57.2	60.3	51.9	68.4
			6:00-Alternator	52.6	61.0	57.1	58.2	57.8	61.3	64.7	58.9	69.2
			4:30	47.8	58.9	55.5	62.2	60.1	58.1	59.4	51.6	67.4
8-pos. log avg.	56.3	62.4	60.4	64.1	61.1	60.8	60.9	53.7	69.9			

				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)	Sound	3:00	41.6	61.3	61.7	63.5	59.3	59.1	56.7	52.6	68.7
			1:30	45.4	59.1	63.1	66.1	63.0	60.4	60.7	54.8	70.6
			12:00-Engine	48.2	59.0	61.5	66.2	62.5	62.9	62.6	57.8	71.0
			10:30	48.9	60.3	63.5	66.3	62.6	60.9	60.6	56.5	70.9
			9:00	46.6	59.4	62.8	63.7	59.8	60.2	59.0	56.3	69.3
			7:30	44.7	59.2	63.6	63.0	60.9	60.6	60.6	58.2	69.8
			6:00-Alternator	49.9	56.7	59.6	64.1	60.0	60.2	58.8	55.0	68.6
			4:30	48.7	55.8	60.6	62.9	61.3	59.8	59.0	54.2	68.4
8-pos. log avg.	47.4	59.1	62.2	64.7	61.4	60.6	60.1	56.0	69.8			

				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	81.6	83.7	80.0	82.5	82.6	83.0	83.8	82.2	82.6

				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)	Open Unit, Isolated Exhaust	3:00	58.3	62.6	72.9	74.1	76.8	78.8	74.3	69.6	83.5
			1:30	58.2	63.5	71.9	72.5	77.2	79.2	77.1	72.6	85.6
			12:00-Engine	53.3	62.0	72.4	75.3	75.1	76.7	71.5	66.0	81.9
			10:30	54.3	61.8	73.1	75.9	78.2	79.3	75.5	70.8	84.4
			9:00	60.2	65.5	73.8	77.7	78.0	78.7	75.2	72.9	84.5
			7:30	54.7	65.6	74.1	76.6	75.8	76.9	76.9	72.7	84.9
			6:00-Alternator	52.6	64.0	72.8	74.8	74.6	75.6	78.3	75.6	85.7
			4:30	47.8	62.1	71.5	75.9	76.8	77.6	75.9	71.0	84.1
8-pos. log avg.	56.3	63.6	72.9	75.6	76.7	78.0	76.0	72.1	84.5			

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Enclosure	Exhaust	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
100% Load	1 (3.3)		Raw Exhaust (No Silencer)	75.2	94.8	98.6	101.4	104.0	103.7	107.8	105.9	112.4

100REOZJF	60 Hz
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				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)	Snow Sound	3:00	49.9	58.6	55.6	56.5	
		1:30	50.3	61.1	58.5		58.6	53.9	49.4	43.0	33.8	65.0
		12:00-Engine	53.3	60.8	63.8		62.1	57.7	60.4	51.9	42.5	68.6
		10:30	48.7	61.4	62.4		67.0	55.2	51.9	45.9	33.6	69.4
		9:00	46.0	65.2	57.6		59.0	55.6	51.5	46.0	33.8	67.2
		7:30	49.5	57.4	51.6		55.2	52.4	46.7	45.4	35.1	61.4
		6:00-Alternator	45.9	58.8	53.8		55.8	54.2	51.4	51.8	42.0	63.0
		4:30	48.8	61.1	54.5		58.3	55.1	50.1	44.1	31.8	64.4
		8-pos. log avg.	49.6	61.2	59.1	61.0	54.9	53.6	47.8	37.6	66.1	

				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)	Sound	3:00	47.9	60.0	62.0	62.3	
		1:30	51.0	58.7	63.3		65.7	62.2	57.0	55.9	43.5	69.7
		12:00-Engine	52.5	58.2	61.1		65.7	61.4	59.9	59.0	47.0	69.6
		10:30	51.9	60.0	63.9		65.4	61.5	56.2	55.0	44.4	69.7
		9:00	49.7	58.3	63.1		62.2	57.2	54.9	51.0	42.7	67.4
		7:30	42.6	60.4	65.1		61.0	58.4	55.8	50.1	42.5	68.3
		6:00-Alternator	46.8	54.3	58.4		62.8	57.5	53.8	50.2	38.5	65.9
		4:30	44.6	55.8	61.1		61.3	59.8	56.1	50.4	40.2	66.6
		8-pos. log avg.	49.5	58.6	62.6	63.7	59.9	56.5	54.1	43.2	68.3	

				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	78.5	79.3	78.9	80.0	

				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)	Open Unit, Isolated Exhaust	3:00	49.9	63.1	73.2	72.7	
		1:30	50.3	63.2	71.9		71.6	76.0	76.1	72.4	64.9	81.2
		12:00-Engine	53.3	63.0	72.4		74.0	74.4	75.4	70.3	62.8	80.8
		10:30	48.7	62.7	72.2		74.5	76.9	75.5	73.0	65.0	81.9
		9:00	46.0	65.4	73.6		76.6	76.6	75.4	71.9	64.2	82.3
		7:30	49.5	61.1	72.6		74.5	73.5	72.5	71.2	64.1	80.2
		6:00-Alternator	45.9	64.3	72.3		72.0	71.6	68.4	71.0	64.8	78.6
		4:30	50.4	63.7	72.1		74.2	75.4	73.8	71.1	62.6	80.7
		8-pos. log avg.	49.8	63.5	72.6	74.0	75.1	74.5	71.5	63.9	80.9	

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Enclosure	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)	70.4	82.5	85.8	90.9	

Exhaust System Data

TECHNICAL INFORMATION BULLETIN

Enclosed Generator Set Exhaust System Data Sheet

Model	Enclosure Type	Consumed Back Pressure (in H2O)	Consumed Back Pressure (in Hg)	Back Pressure Limit(s) (in H2O)	Back Pressure Limit(s) (in Hg)	Flex Exhaust Tube(s)	Silencer	Drawing
100REOZJF	All Weather & Sound Enclosures & Snow Package Enclosure	28.7	2.1	30.0	2.2	GM66733	GM59117	ADV-7647

1. Total system exhaust back pressure is applicable to generator sets equipped with Kohler 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 Kohler 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



100REOZJF

60 HZ. DIESEL INDUSTRIAL GENERATOR SET EMISSION DATA SHEET

ENGINE INFORMATION			
Model:	John Deere, 4045HF285I	Bore:	106mm (4.19 in.)
Nameplate BHP @ 1800 RPM:	158	Stroke:	127mm (5.0 in.)
Type:	4-Cycle, 4 Cylinder, Inline	Displacement:	4.5 L (276 cu. in.)
Aspiration:	Turbocharged, Charge Air-Cooled	EPA Family:	TJDXL04.5119
Compression Ratio	19.0:1	EPA Certificate:	TJDXL04.5119-005

PERFORMANCE DATA:	Table 1			
	1/4 Standby	1/2 Standby	3/4 Standby	Full Standby
Engine bkW @ Stated Load	30	59	89	118
Fuel Consumption (g/kWh)	272	255	237	222
Exhaust Gas Flow (m ³ /min)				23
Exhaust Temperature (°C)				580

EXHAUST EMISSION DATA:	Table 2 EPA D2 Cycle 5-mode weighted	
	HC (Total Unburned Hydrocarbons)	0.15
NOx (Oxides of Nitrogen as NO2)	3.36	
CO (Carbon Monoxide)	1.3	
PM (Particulate Matter)	0.17	

Values are in g/kWh unless otherwise noted

TEST METHODS AND CONDITIONS

The emission data listed is measured from a laboratory test engine according to the test procedures of 40 CFR 89 or 40 CFR 1039, as applicable. The test engine is intended to represent nominal production hardware, and there is no guarantee that every production engine will have identical test results. The family parent data represents multiple ratings and this data may have been collected at a different engine speed and load. Emission results may vary due to engine manufacturing tolerances, engine operating conditions, fuels used, alternate test methods, or other conditions.

Data and specifications subject to change without notice.



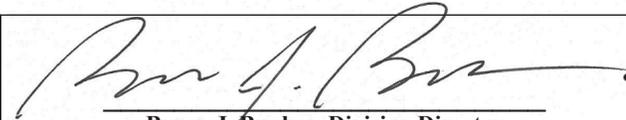
**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2026 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT**

**OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Deere & Company
(U.S. Manufacturer or Importer)
Certificate Number: TJDXL04.5119-005

Effective Date:
07/31/2025

Expiration Date:
12/31/2026


Byron J. Bunker, Division Director
Compliance Division

Issue Date:
07/31/2025

Revision Date:
N/A

Model Year: 2026
Manufacturer Type: Original Engine Manufacturer
Engine Family: TJDXL04.5119

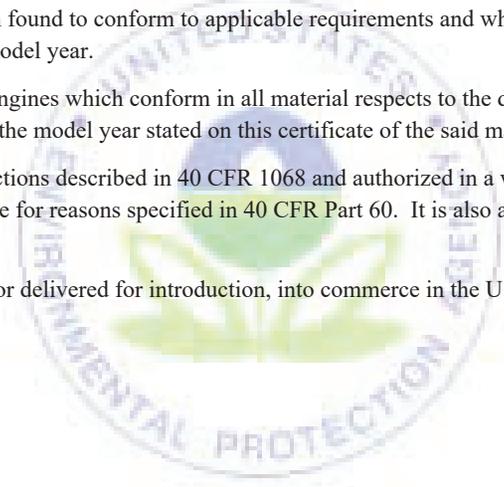
Mobile/Stationary Indicator: Stationary
Emissions Power Category: 75<=kW<130
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Smoke Puff Limiter, Engine Design Modification, Non-standard Non-After Treatment Device Installed

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, 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 engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

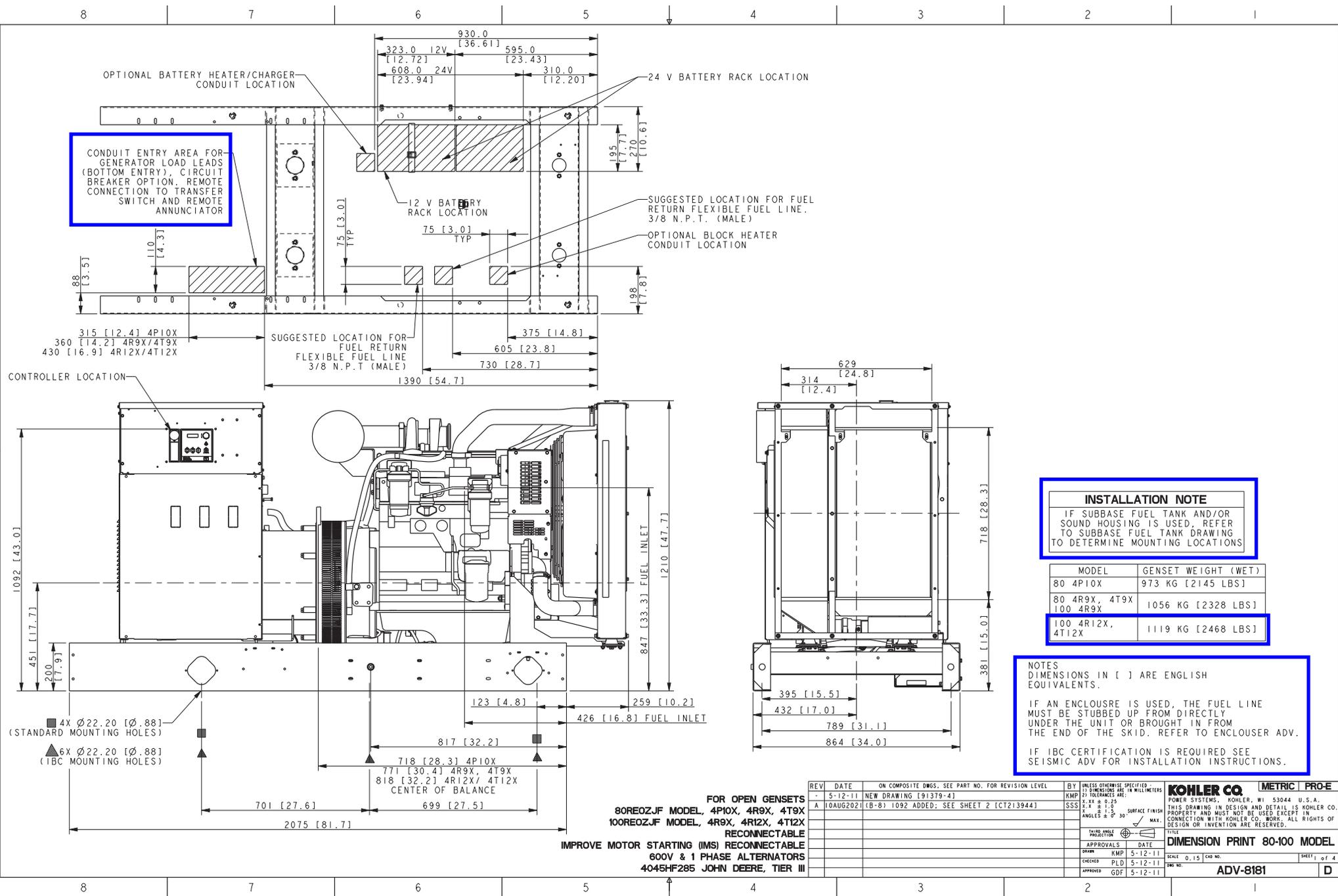
This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 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. 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.

This certificate does not cover 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

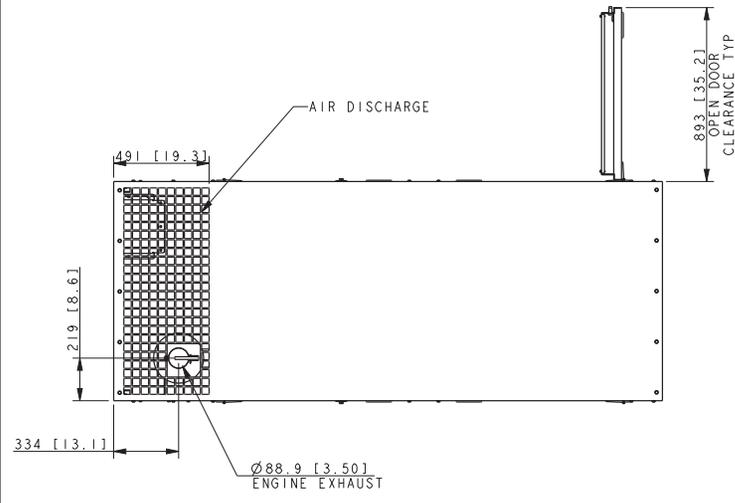


INSTALLATION NOTE
IF SUBBASE FUEL TANK AND/OR SOUND HOUSING IS USED, REFER TO SUBBASE FUEL TANK DRAWING TO DETERMINE MOUNTING LOCATIONS

MODEL	GENSET WEIGHT (WET)
80 4P10X	973 KG [2145 LBS]
80 4R9X, 4T9X 100 4R9X	1056 KG [2328 LBS]
100 4R12X, 4T12X	1119 KG [2468 LBS]

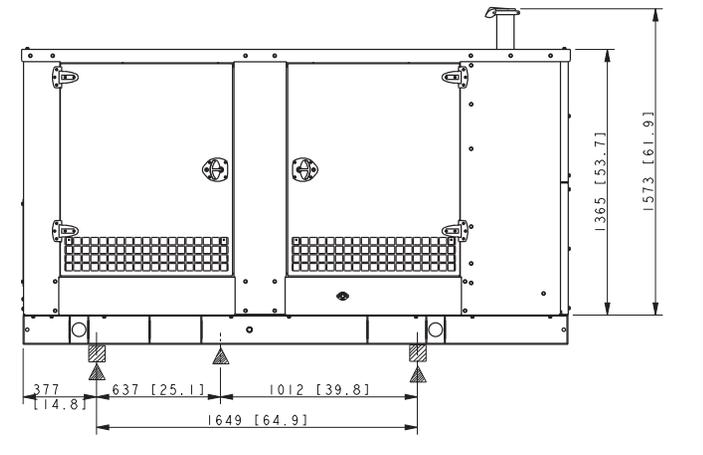
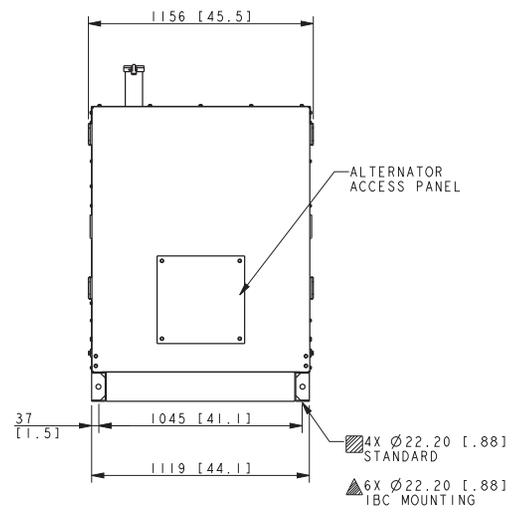
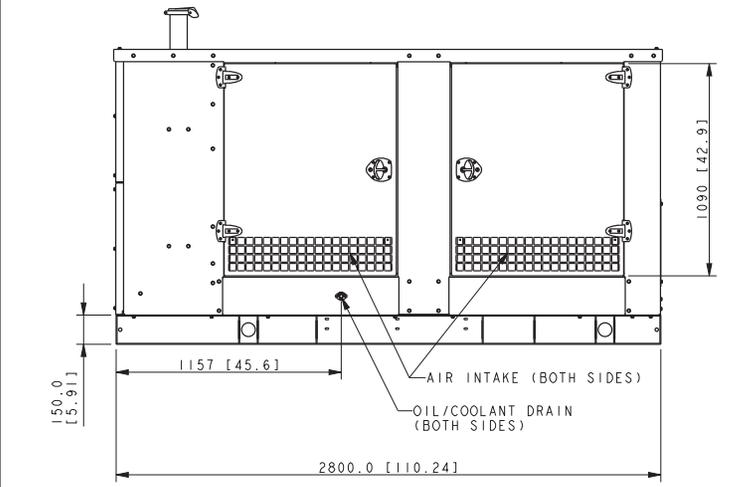
NOTES
DIMENSIONS IN [] ARE ENGLISH EQUIVALENTS.
IF AN ENCLOSURE IS USED, THE FUEL LINE MUST BE STUBBED UP FROM DIRECTLY UNDER THE UNIT OR BROUGHT IN FROM THE END OF THE SKID. REFER TO ENCLOSURE ADV.
IF IBC CERTIFICATION IS REQUIRED SEE SEISMIC ADV FOR INSTALLATION INSTRUCTIONS.

8 7 6 5 4 3 2 1



MODEL	ENCLOSURE WEIGHT KG [LBS]
STEEL WEATHER	318 [700]
STEEL SOUND	329 [725]
ALUMINIUM SOUND	204 [450]

NOTE:
 1. IF TANK IS ORDERED, ENCLOSURE MOUNTS DIRECTLY TO TANK
 2. TANK MAY EXTEND BEYOND ENCLOSURE (DISCHARGE END ONLY)



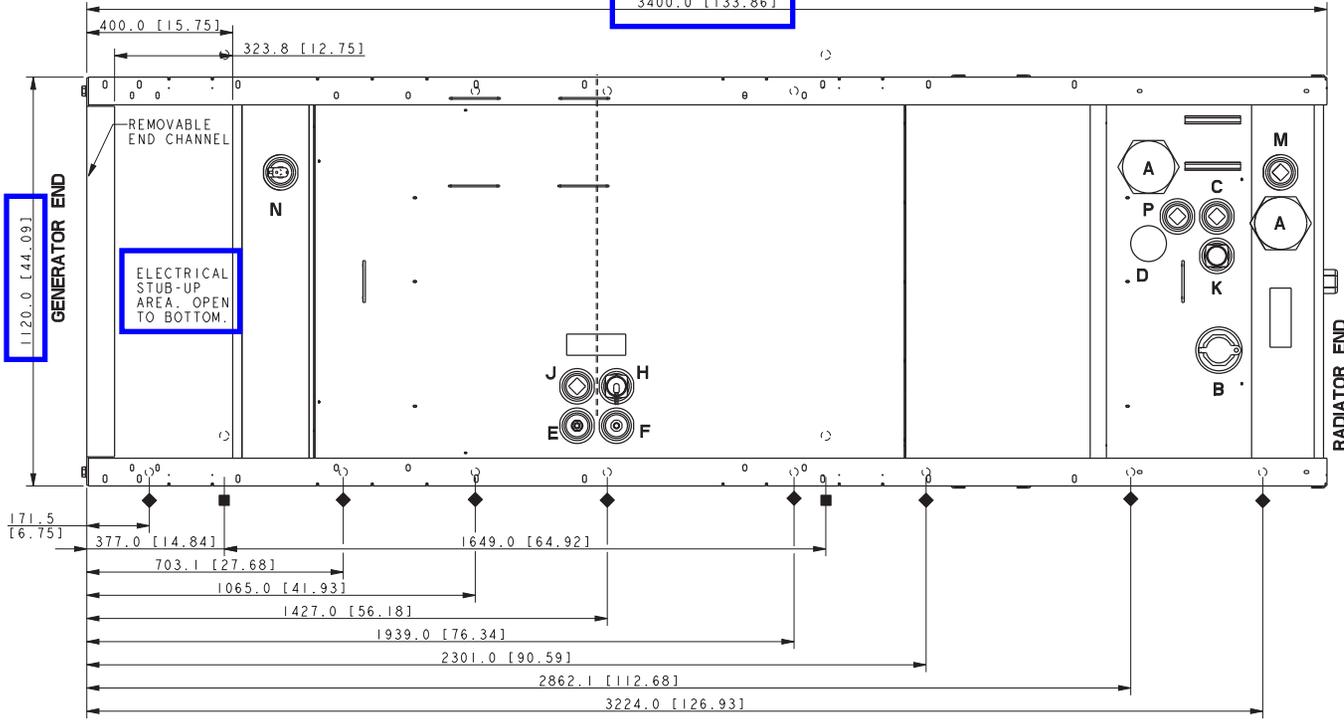
80 MODEL 4S7, 4S9, 4V9, 4P10X, 4R9X, 4T9X
 100 MODEL 4S9, 4S11, 4V11, 4R9X, 4R12X, 4T12X
 RECONNECTABLE
 IMPROVE MOTOR STARTING (IMS)
 600V & 1 PHASE ALTERNATORS
 4045HF285 JOHN DEERE TIER III

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	UNLESS OTHERWISE SPECIFIED: 27 DIMENSIONS ARE IN MILLIMETERS 27 TOLERANCES ARE: FRACTIONAL ± 0.25 DECIMAL ± 0.13 ANGLES ± 0° 30' / MAX.	TITLE
B	9-28-10	(A-4) 6X Ø22.20 ADDED, 4X Ø22.20 WAS 4X Ø25.4 *A-3) DIM 635 AND 1014 ADDED [90301]	SAM		KOHLER CO. METRIC PRO-E POWER SYSTEMS, KOHLER, WI 53044 U.S.A. THIS DRAWING IN DESIGN AND DETAIL IS KOHLER CO. PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH KOHLER CO. WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED. DIMENSION PRINT SCALE 0.08 CAD NO. SHEET 1 of 2 DWG NO. ADV-7647
C	1-31-11	(A-7) 1159 WAS 1084 [90327]	SAM		
D	12-22-11	(A-4) 4P10X, 4R9X, 4T9X ADDED TO 80 MODEL, 4R9X, 4R12X, 4T12X ADDED TO 100 MODEL [92681]	PKD		
E	2-4-13	(A-1) 1-2 WAS 1-2, SEE SHEET 2 [CT32174]	SAM		
F	10-12-17	(C-7) DIM. Ø88.9 [3.50] ADDED [CT177004]	SRM		
			APPROVED		

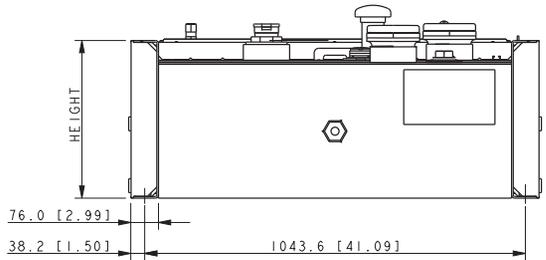
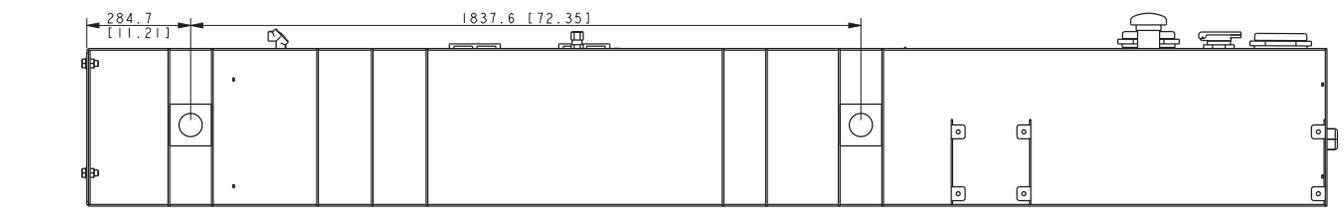
8 7 6 5 4 3 2 1

MODEL	CAPACITY		WEIGHT		HEIGHT	
	LITERS	GAL	KG	LBS	MM	IN
80/100kW	815	215	595	1312	431.8	17.0
80/100kW	1370	415	833	1840	762.0	30.0

3400.0 [133.86]



- TANK FITTINGS:**
- A. 4" NPT EMERGENCY VENT FITTING PER NFPA 30 WITH VENT CAPS (QTY 2)
 - B. 2" NPT FUEL FILL FITTING WITH LOCKABLE CAP & 2" RISER (INSTALL STEEL 2" NPT PIPE PLUG)
 - C. 2" NPT ADDITIONAL FITTING FOR OPTIONAL ACCESSORY (INSTALL STEEL 2" NPT PIPE PLUG)
 - D. 2" NORMAL VENT FITTING WITH MUSHROOM VENT CAP AND 5" RISER
 - E. 2" NPT FITTING FOR REMOVABLE ENGINE SUPPLY DIP TUBE (3/8" NPT FEMALE WITH CHECK VALVE)
 - F. 2" NPT FITTING FOR REMOVABLE FUEL RETURN DIP TUBE (3/8" NPT FEMALE)
 - H. 2" NPT FUEL LEVEL SENDING UNIT
 - J. 2" NPT ADDITIONAL FITTING FOR OPTIONAL ACCESSORY (INSTALL STEEL 2" NPT PIPE PLUG)
 - K. 2" FUEL LEVEL GAUGE FITTING W/DIRECT READING MECHANICAL GAUGE
 - M. 2" NPT BASIN DRAIN (INSTALL STEEL 2" NPT PIPE PLUG)
 - N. 2" NPT FOR FUEL IN BASIN SWITCH (INSTALL STEEL 2" NPT PIPE PLUG)
 - P. 2" NPT ADDITIONAL FITTING FOR OPTIONAL ACCESSORY (INSTALL STEEL 2" PIPE PLUG)



NOTE:
FOR FURTHER TANK DETAIL
SEE INDIVIDUAL DRAWINGS

- 4X Ø25.4 [1.00] STANDARD MOUNTING
- ◆ 16X Ø22.2 [0.875] IBC MOUNTING

STATE TANK

80 MODEL 4S7, 4S9, 4V9, 4P10X, 4R9X, 4T9X
100 MODEL 4S9, 4S11, 4V11, 4R9X, 4R12X, 4T12X
RECONNECTABLE
IMPROVE MOTOR STARTING (IMS) RECONNECTABLE
600V & 1 PHASE ALTERNATORS
4045HF285 JOHN DEERE, TIER III

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: X .XX ± 0.25 Y .Y ± 0.15 Z .Z ± 0.15 SURFACE FINISH ANGLES ± 0° 30' / MAX.
-	9-12-12	NEW DRAWING [CT23454]	JB2	
A	1-25-18	(D-2) FITTING NOTES M & N 2" NPT WAS 1/2" NPT.	JB2	
B	2-22-18	SEE SHEET 2 [CT182424]	PAS	
C	12-5-19	SEE SHEET 2 [CT200428]	YBY	

APPROVALS	DATE
DRWN JB2	9-12-12
CHKD JB2	9-12-12
APPRVD AJD	9-12-12

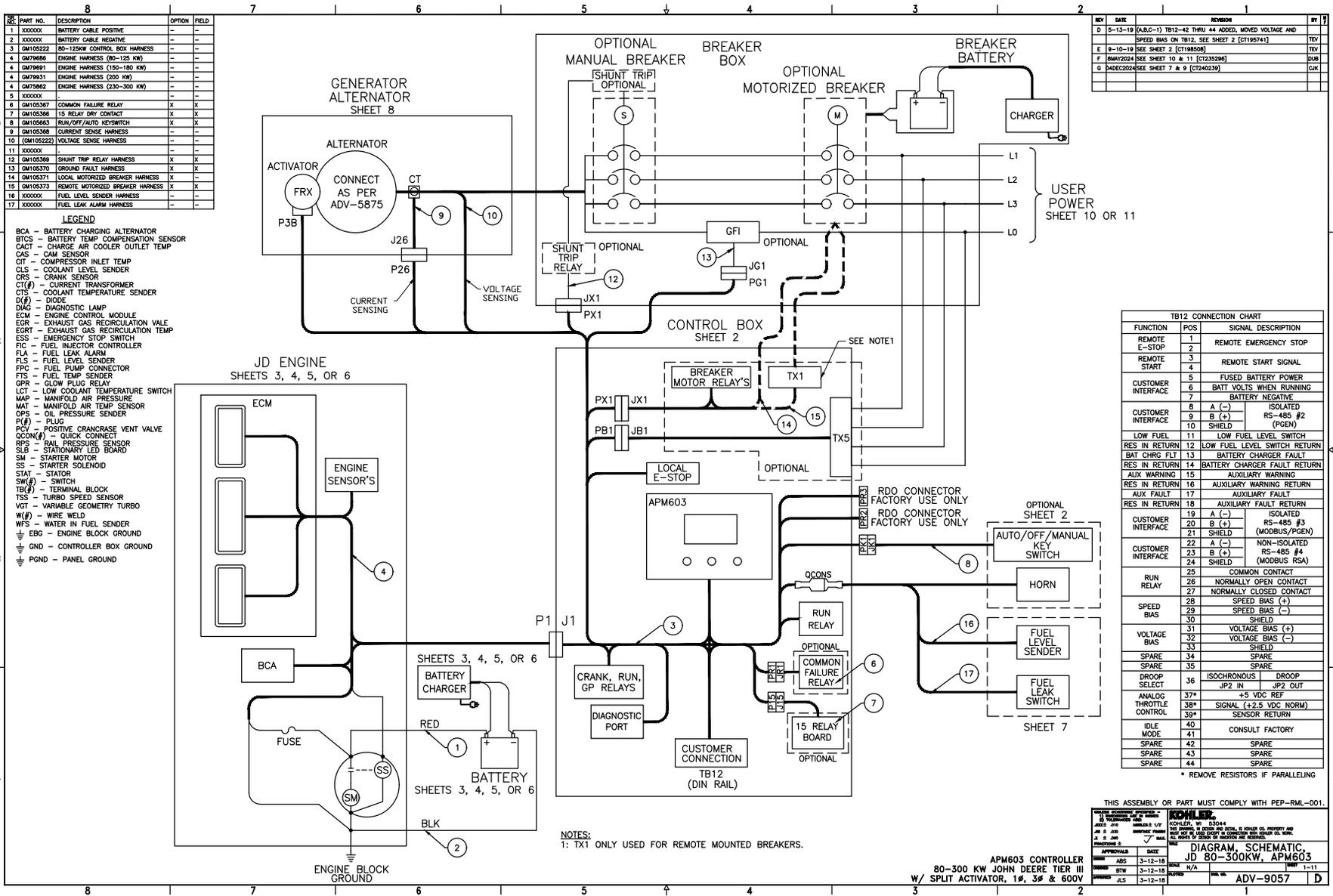
KOHLER CO.	METRIC	PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.		
THIS DRAWING IN DESIGN AND DETAIL IS KOHLER CO. PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH KOHLER CO. WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		
TITLE DIMENSION PRINT, SUBBASE TANK, STATE		
SCALE 0.15	CAD NO.	SHEET 1 of 2
TAG NO. ADV-8522		D

Wiring Schematics

REV	PART NO.	DESCRIPTION	OPTION	FIELD
1	X0000X	BATTERY CABLE POSITIVE	-	-
2	X0000X	BATTERY CABLE NEGATIVE	-	-
3	GM105222	80-125KW CONTROL BOX HARNESS	-	-
4	GM105222	ENGINE HARNESS (80-125 KW)	-	-
4	GM105222	ENGINE HARNESS (150-180 KW)	-	-
4	GM105222	ENGINE HARNESS (200 KW)	-	-
4	GM105222	ENGINE HARNESS (230-300 KW)	-	-
5	X0000X	.	-	-
6	GM105367	COMMON FAILURE RELAY	X	X
7	GM105368	15 RELAY DRY CONTACT	X	X
8	GM105683	RUN/OFF/AUTO KEYSWITCH	X	X
9	GM105368	CURRENT SENSE HARNESS	-	-
10	GM105222	VOLTAGE SENSE HARNESS	-	-
11	X0000X	.	-	-
12	GM105368	SHUNT TRIP RELAY HARNESS	X	X
13	GM105370	GROUND FAULT HARNESS	X	X
14	GM105371	LOCAL MOTORIZED BREAKER HARNESS	X	-
15	GM105373	REMOTE MOTORIZED BREAKER HARNESS	X	X
16	X0000X	FUEL LEVEL SENDER HARNESS	-	-
17	X0000X	FUEL LEAK ALARM HARNESS	-	-

LEGEND

- BCA - BATTERY CHARGING ALTERNATOR
- BTCS - BATTERY TEMP COMPENSATION SENSOR
- CACT - CHARGE AIR COOLER OUTLET TEMP
- CAS - CAM SENSOR
- CT - COMPRESSOR INLET TEMP
- CLS - COOLANT LEVEL SENDER
- CRS - CRANK SENSOR
- CTI - CURRENT TRANSFORMER SENDER
- CTS - COOLANT TEMPERATURE SENDER
- D(Δ) - DIODE
- DIAG - DIAGNOSTIC LAMP
- ECM - ENGINE CONTROL MODULE
- EGR - EXHAUST GAS RECIRCULATION VALE
- EGRT - EXHAUST GAS RECIRCULATION TEMP
- ESS - EMERGENCY STOP SWITCH
- FC - FUEL INJECTOR CONTROLLER
- FLA - FUEL LEAK ALARM
- FLS - FUEL LEVEL SENDER
- FPD - FUEL PUMP CONNECTOR
- FTS - FUEL TEMP SENDER
- GPR - GLOW PLUG RELAY
- LCT - LOW COOLANT TEMPERATURE SWITCH
- MAP - MANIFOLD AIR PRESSURE
- MAT - MANIFOLD AIR TEMP SENSOR
- OPS - OIL PRESSURE SENDER
- P(F) - PLUG
- PCV - POSITIVE CRANCRASE VENT VALVE
- QCON(Δ) - QUICK CONNECT
- RPS - RAIL PRESSURE SENDER
- SLB - STATIONARY LED BOARD
- SM - STARTER MOTOR
- SS - STARTER SOLENOID
- STAT - STATOR
- SW(Δ) - SWITCH
- TR(Δ) - TERMINAL BLOCK
- TSS - TURBO SPEED SENSOR
- VGT - VARIABLE GEOMETRY TURBO
- W(Δ) - WIRE WELD
- WFS - WATER IN FUEL SENDER
- ⊥ EBG - ENGINE BLOCK GROUND
- ⊥ GND - CONTROLLER BOX GROUND
- ⊥ PGND - PANEL GROUND



REV	DATE	REVISION	BY
D	5-13-19	(A,B,C-1) TB12-42 THRU 44 ADDED, MOVED VOLTAGE AND SPEED BIAS ON TB12, SEE SHEET 2 (CT198741)	TEV
E	9-10-19	SEE SHEET 2 (CT198508)	TEV
F	10/20/20	SEE SHEET 10, 11 (CT232998)	DJM
G	10/20/20	SEE SHEET 7 & 9 (CT246239)	GM

FUNCTION	POS	SIGNAL DESCRIPTION
REMOTE E-STOP	1	REMOTE EMERGENCY STOP
REMOTE START	2	REMOTE START SIGNAL
CUSTOMER INTERFACE	5	FUSED BATTERY POWER
CUSTOMER INTERFACE	6	BATT VOLTS WHEN RUNNING
CUSTOMER INTERFACE	7	BATTERY NEGATIVE
CUSTOMER INTERFACE	8	A (-) ISOLATED
CUSTOMER INTERFACE	9	B (+) RS-485 #2 (PGEN)
CUSTOMER INTERFACE	10	SHIELD
RES IN RETURN	11	LOW FUEL LEVEL SWITCH
RES IN RETURN	12	LOW FUEL LEVEL SWITCH RETURN
RES IN RETURN	13	BATTERY CHARGER FAULT
RES IN RETURN	14	BATTERY CHARGER FAULT RETURN
AUX WARNING	15	AUXILIARY WARNING
RES IN RETURN	16	AUXILIARY WARNING RETURN
AUX FAULT	17	AUXILIARY FAULT
RES IN RETURN	18	AUXILIARY FAULT RETURN
CUSTOMER INTERFACE	19	A (-) ISOLATED
CUSTOMER INTERFACE	20	B (+) RS-485 #3 (MODBUS/PGEN)
CUSTOMER INTERFACE	21	SHIELD
CUSTOMER INTERFACE	22	A (-) NON-ISOLATED
CUSTOMER INTERFACE	23	B (+) RS-485 #4 (MODBUS RSA)
CUSTOMER INTERFACE	24	SHIELD
RUN RELAY	25	COMMON CONTACT
RUN RELAY	26	NORMALLY OPEN CONTACT
RUN RELAY	27	NORMALLY CLOSED CONTACT
SPEED BIAS	28	SPEED BIAS (+)
SPEED BIAS	29	SPEED BIAS (-)
VOLTAGE BIAS	30	SHIELD
VOLTAGE BIAS	31	VOLTAGE BIAS (+)
VOLTAGE BIAS	32	VOLTAGE BIAS (-)
SPARE	33	SHIELD
SPARE	34	SPARE
SPARE	35	SPARE
DROOP SELECT	36	ISOCHRONOUS DROOP
ANALOG THROTTLE CONTROL	37*	JP2 IN JP2 OUT
ANALOG THROTTLE CONTROL	38*	+5 VDC REF
ANALOG THROTTLE CONTROL	39*	SIGNAL (+2.5 VDC NORM)
ANALOG THROTTLE CONTROL	39*	SENSOR RETURN
IDLE MODE	40	CONSULT FACTORY
SPARE	41	SPARE
SPARE	42	SPARE
SPARE	43	SPARE
SPARE	44	SPARE

THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001.

APPROVALS	DATE	REVISION
DESIGNED BY	3-12-18	1
CHECKED BY	3-12-18	1
APPROVED BY	3-12-18	1

KOHLER
 80-300 KW JOHN DEERE TIER III
 W/ SPLIT ACTIVATOR, 1#, 3# & 600V

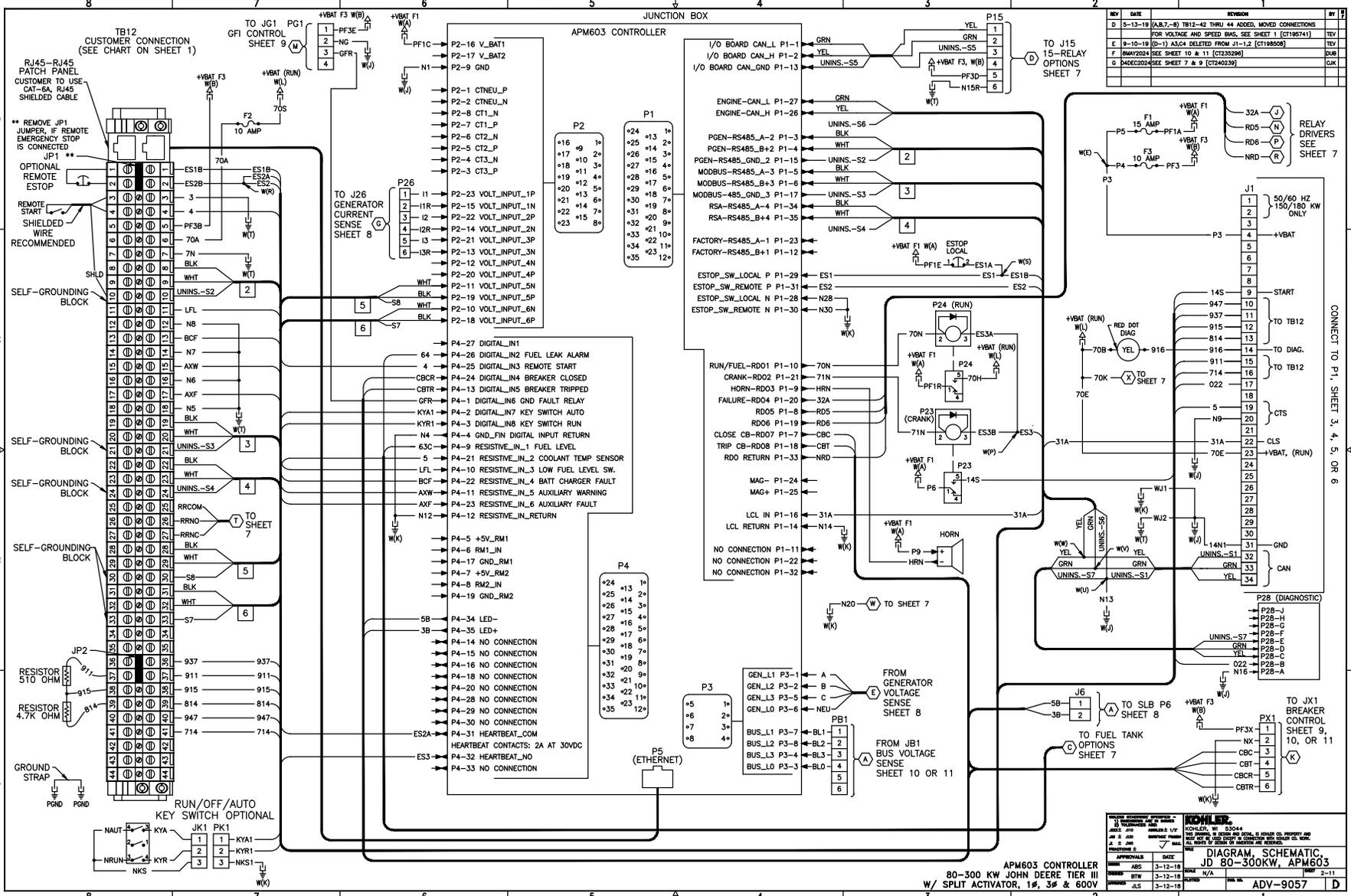
APM603 CONTROLLER
 80-300 KW JOHN DEERE TIER III
 W/ SPLIT ACTIVATOR, 1#, 3# & 600V

DIAGRAM, SCHEMATIC
 JD 80-300KW, APM603

ADV-9057

NOTES:
 1: TX1 ONLY USED FOR REMOTE MOUNTED BREAKERS.

REV	DATE	BY	DESCRIPTION
D	5-13-19	(A,B,7-8)	7B12-42 THRU 44 ADDED, MOVED CONNECTIONS FOR VOLTAGE AND SPEED BAS, SEE SHEET 1 (CT198741)
E	8-10-19	(D-1)	ALSO DELETED FROM J1-1,2 (CT198806)
F	8/20/2024	REVISED	SEE SHEET 10 & 11 (CT232598)
G	4/26/2025	REVISED	SEE SHEET 7 & 9 (CT246239)



KOHLER KOHLER, WI 83044 100% ORIGINAL PARTS ALL PARTS TO BE USED AS SPECIFIED ALL PARTS TO BE USED AS SPECIFIED ALL PARTS TO BE USED AS SPECIFIED	
DATE: 3-12-18 APPROVAL: ABS DRAWN: BTW CHECKED: JLS	DATE: 3-12-18 APPROVAL: N/A DRAWN: N/A CHECKED: N/A
DIAGRAM, SCHEMATIC JD 80-300KW, APM603 ADV-9057	

APM603 CONTROLLER
 80-300 KW JOHN DEERE TIER III
 W/ SPLIT ACTIVATOR, 1#, 3# & 600V

8

7

6

5

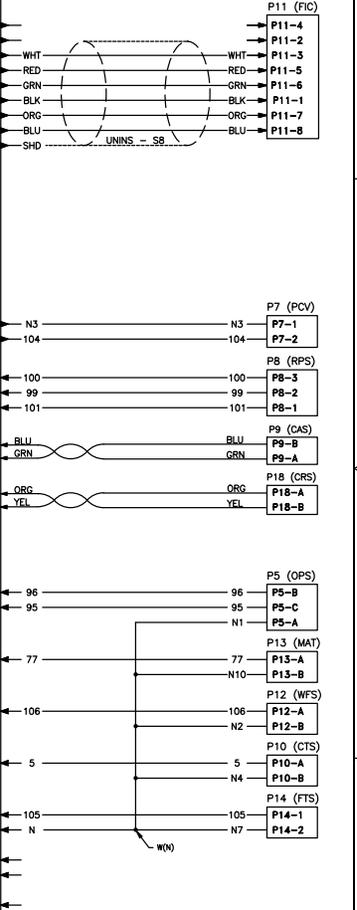
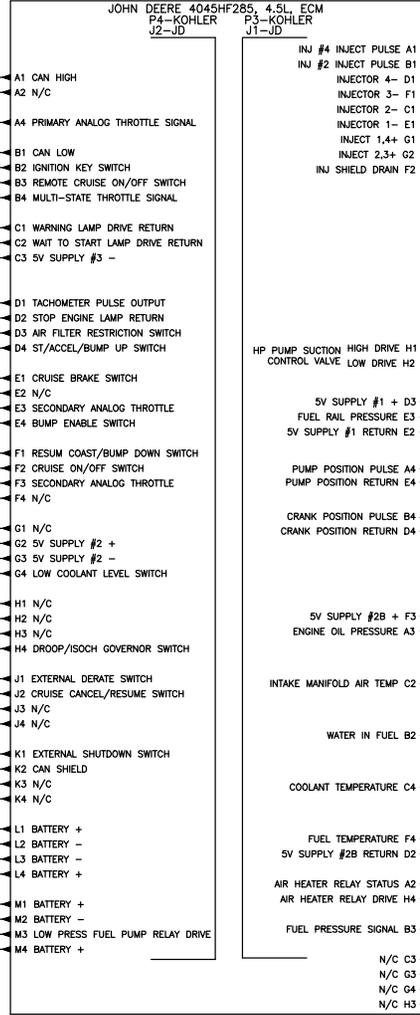
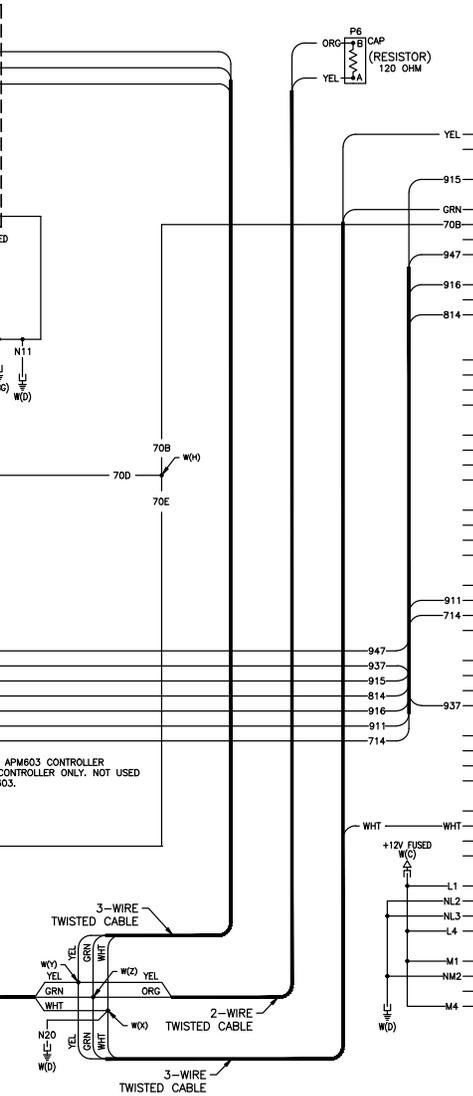
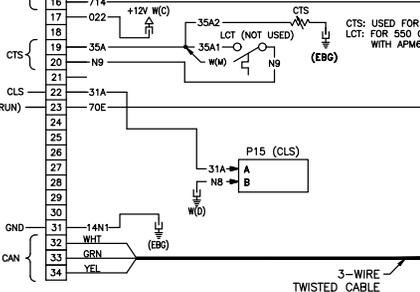
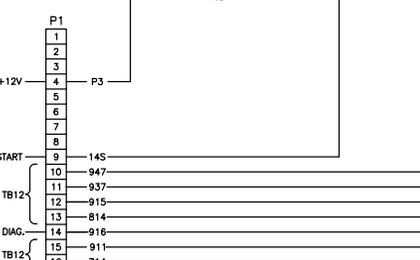
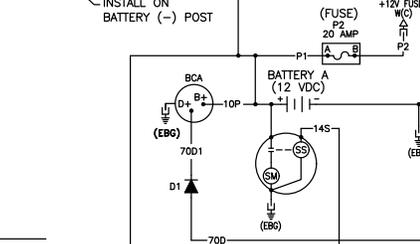
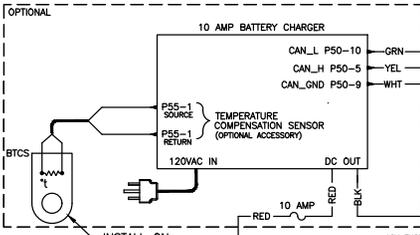
ENGINE

3

2

1

REV	DATE	REVISION	BY
D	5-13-19	SEE SHEETS 1 & 2 (C1195741)	TEV
E	9-10-19	SEE SHEET 2 (C1198506)	TEV
F	04MAY2024	SEE SHEET 10 & 11 (C1235296)	DUB
G	14DEC2024	SEE SHEET 7 & 9 (C1240239)	CKK

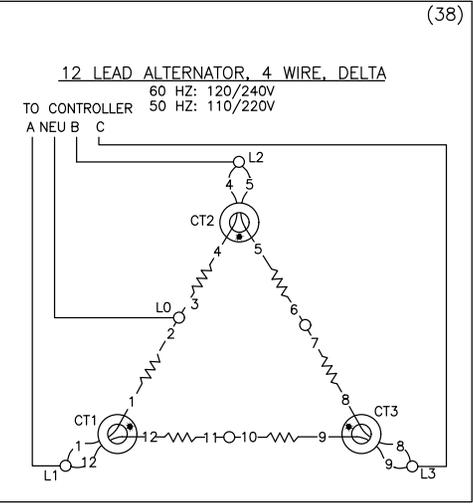
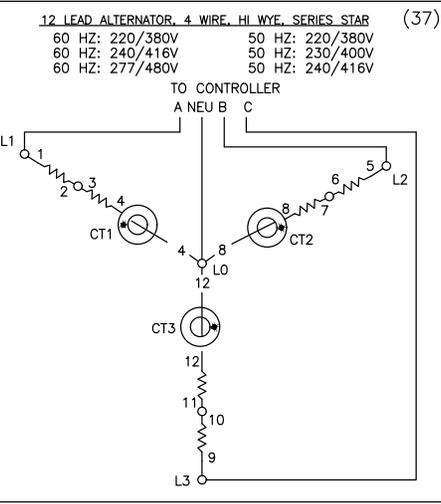
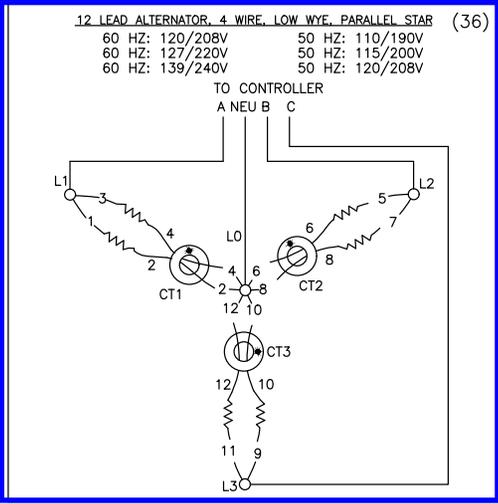


APPROVALS	DATE	DATE	DATE	DATE
DESIGN	ABS	3-12-18	DATE	3-11
CHECKED	BY	3-12-18	DATE	3-11
APPROVED	BY	3-12-18	DATE	3-11

APM603 CONTROLLER
80-125 KW JOHN DEERE TIER III
W/ SPLIT ACTIVATOR, 1#, 3# & 600V

DIAGRAM SCHEMATIC
JD 80-300KW, APM603
ADV-9057

REV	DATE	REVISION	BY
AD	10-14-10	SEE SHEET 4 [C1199071]	SP
AC	02-25-20	SEE SHEET 5 [C1202143]	SP
AD	3-30-23	(A-2,-3) ADDED NOTES, SEE SHEETS 4 & 6 [C1228254]	SP
AE	11-4-23	SEE SHEET 6 [C1231343]	SP
AF	2-28-24	SEE SHEET 7 [C1233796]	PM
AG	70272024	SEE SHEET 2 [C1234467]	CLK
AH	10/04/2025	SEE SHEET 1,11,12,13,14,15,16 [C1240078]	CLK



PHASE ROTATION

A	B	C
L1	L2	L3

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.

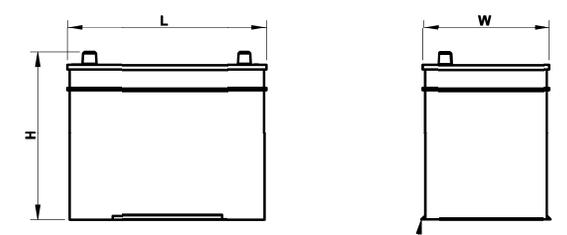
APPROVALS	DATE	DIAGRAM
APM902 CONTROLLER	5-27-04	ALTERNATOR CONNECTIONS
APM603 CONTROLLER	5-27-04	NONE
MECC ALTE ALTERNATOR	5-27-04	REV 10-16

ADV-5875 | D

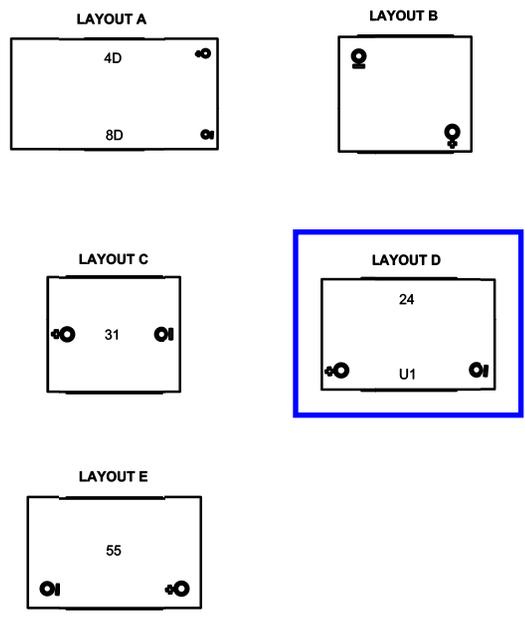
Miscellaneous

PART NO.	REV	SAE DIMENSION			VOLTAGE	COLD CRANKING AMPS AT 0°F MINIMUM	RESERVE CAP MINUTES AT 80°F MINIMUM	POST LAYOUT /STYLE	CHARGE TYPE	BATTERY CONSTRUCTION (SEE SHEET 2)	BCI GROUP	INTERNAL RESISTANCE (MO)
		L	W	H								
244578	BE	333.5 [13.13]	181.1 [7.13]	238.5 [9.39]	6	700	275	B/1	DRY	SEE NOTE 1	-	
244750	BD	342.9 [13.50]	173.2 [6.82]	238.3 [9.38]	12	600	185	D/1	DRY	SEE NOTE 1	-	
239102	BK	198.1 [7.80]	133.4 [5.25]	187.5 [7.38]	12	200	32	D/2	DRY	SEE NOTE 1	-	
289913	BC	439.8 [17.29]	282.7 [11.13]	276.4 [10.88]	12	1150	450	A/1	DRY	SEE NOTE 1	-	
201018	BC	333.2 [13.12]	173.0 [6.81]	239.8 [9.44]	12	700	150	C/3	WET	SEE NOTE 1	-	
299981	BD	333.2 [13.12]	173.0 [6.81]	239.8 [9.44]	12	700	150	C/3	DRY	SEE NOTE 1	-	
254423	BD	333.2 [13.12]	173.0 [6.81]	239.8 [9.44]	12	1000	200	C/3	WET	SEE NOTE 1	-	
299982	BC	333.2 [13.12]	173.0 [6.81]	239.8 [9.44]	12	950	200	C/3	DRY	SEE NOTE 1	-	
324367	BM	206.0 [8.19]	179.4 [7.06]	186.9 [7.35]	12	675	90	C/1	WET	SEE NOTE 1	-	
324368	BC	206.0 [8.19]	186.9 [7.35]	206.2 [8.08]	12	675	90	C/1	DRY	SEE NOTE 1	-	
324369	BU	330.2 [13.00]	173.0 [6.81]	239.8 [9.44]	12	950	185	C/3	WET	SEE NOTE 2	31	
324387	BU	330.2 [13.00]	173.0 [6.81]	239.8 [9.44]	12	950	200	C/3	DRY	SEE NOTE 2	31	
296968	BT	273.0 [10.75]	173.0 [6.81]	228.6 [9.00]	12	650	120	D/1	WET	SEE NOTE 1	24	
225283	BT	273.0 [10.75]	173.0 [6.81]	228.6 [9.00]	12	650	130	D/1	DRY	SEE NOTE 1	24	
345197	BS	273.0 [10.75]	173.0 [6.81]	228.6 [9.00]	12	510	60	E/1	WET	SEE NOTE 2	24E	
354147	BT	330.2 [13.00]	173.0 [6.81]	239.8 [9.44]	12	700	170	C/3	WET	SEE NOTE 2	31	
354148	BU	330.2 [13.00]	173.0 [6.81]	239.8 [9.44]	12	700	150	C/3	DRY	SEE NOTE 2	31	
345309	BR	219.2 [8.63]	153.9 [6.06]	212.9 [8.38]	12	525	-	E/1	WET	SEE NOTE 1	55	
GM22348	BC	525.3 [20.68]	220.5 [8.68]	281.0 [10.88]	12	1000	320	A/1	DRY	SEE NOTE 1	-	
GM22349	BT	527.1 [20.75]	282.4 [11.12]	276.4 [10.88]	12	1150	400	A/1	DRY	SEE NOTE 1	8D	
GM34388	BT	527.1 [20.75]	282.4 [11.12]	276.4 [10.88]	12	1400	450	A/1	WET	SEE NOTE 1	8D	
GM46758	BT	206.0 [8.19]	173.0 [6.81]	186.9 [7.35]	12	525	70	D/1	WET	-	24	
GM74812	BT	238.0 [9.38]	129.0 [5.08]	223.0 [8.81]	12	600	85	D/1	WET	-	51	
1070200701	A	527.1 [20.75]	216.0 [8.50]	258.0 [10.16]	12	1050	290	A/1	WET	-	4D	
10702001800	A	527.1 [20.75]	216.0 [8.50]	254.0 [10.0]	12	1110	380	A/1	AGM	SEE NOTE 3	4D	
GM106681	-	260.0 [10.25]	171.0 [6.75]	208.0 [8.19]	12	690	105	D/1	WET	-	34	
GM106375	-	330.2 [13.00]	171.0 [6.75]	239.8 [9.44]	12	925	180	C/3	WET	SEE NOTE 2	31	
GM106373	-	260.0 [10.25]	171.0 [6.75]	229.0 [9.00]	12	650	95	D/1	WET	SEE NOTE 1	24	
GM106377	A	527.1 [20.75]	279.0 [11.0]	294.0 [11.58]	12	1400	380	A/1	WET	SEE NOTE 1	8D	
GM106369	-	208.0 [8.19]	172.0 [6.77]	200.0 [7.87]	12	500	95	D/1	WET	-	26	
GM106374	-	237.0 [9.32]	125.0 [4.94]	220.0 [8.66]	12	500	70	D/1	WET	-	51	
GM117040	-	286.0 [11.25]	171.0 [6.73]	238.0 [9.37]	12	750	140	D/3	AGM	SEE NOTE 3	24	
GM117041	-	330.2 [13.00]	172.0 [6.77]	241.0 [9.48]	12	950	185	C/3	AGM	SEE NOTE 3	31	
GM117042	-	520.0 [20.47]	269.0 [10.59]	238.0 [9.37]	12	1450	480	A/1	AGM	SEE NOTE 3	8D	
11600006101	-	330.2 [13.00]	171.0 [6.75]	239.8 [9.44]	12	750	155	C/3	WET	SEE NOTE 2	31	
11600006201	-	260.0 [10.25]	171.0 [6.75]	229.0 [9.00]	12	550	100	D/3	WET	SEE NOTE 2	24	
11600006301	-	260.0 [10.25]	171.0 [6.75]	229.0 [9.00]	12	650	125	D/1	WET	SEE NOTE 1	24	
11600006401	-	330.2 [13.00]	171.0 [6.75]	239.8 [9.44]	12	925	180	C/3	WET	SEE NOTE 2	31	
11600006501	-	527.1 [20.75]	279.0 [11.0]	254.0 [10.00]	12	1400	400	A/1	WET	SEE NOTE 1	8D	

NOTE:
DIMENSIONS IN [] ARE ENGLISH EQUIVALENTS.



ALTERNATE CONSTRUCTION ON BOTTOM OF BATTERIES ACCEPTABLE



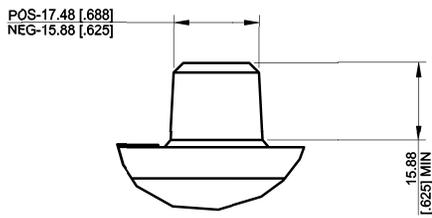
REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL □ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION	BY	DO NOT SCALE. THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001. REFERENCE CAD MODEL FOR UNSPECIFIED DIMENSIONS.	
CC	23JUL2021	(C,D-B) 225289, 324587 & GM22349 VOIDED	PAR	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: XX ± 0.25 XX ± 1.0 SURFACE FINISH X ± 1.5 ANGLES 40° 30' BEND ANGLES ± 1°	
CD	31JAN2023	SEE SHEET 2 [CT225049]	PBG	SCALE: 0.15	MAJOR DIMENSIONS: 0 CRITICAL DIMENSIONS: 0 THIRD ANGLE PROJECTION
CE	03MAR2025	(C-3) GM106377: 8D WAS 80	SPP	SHEET SIZE: B	CHARACTERISTICS COMPLY WITH KPS-8002
CF	26JUN2025	(B-8) 11600006301, 1160000640, 11600006501	AVD	DRAWN: SLR	SHEET: 1 OF 2
CG	11AUG2025	(B-8) 11600006101 & 11600006201 ADDED	RVM	DATE: 4-15-19	TITLE: DWG, BATTERY
APPROVED: SEE PLM SYSTEM				DWG NO.: 244578-CMP	

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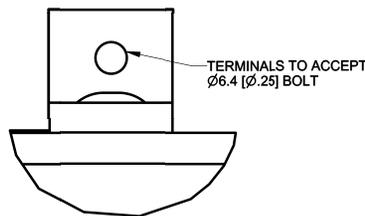
STYLE 1

STYLE 2

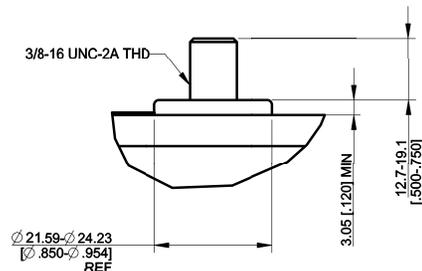
STYLE 3



1:9
TAPER



ACTUAL PART MAY NOT
MATCH DRAWING VIEW



- NOTES:
- 1) STYLE 3 CAN BE CONVERTED TO STYLE 1 BY INSTALLATION OF 254427 STUD CONVERSION KIT.
 - 2) BATTERIES USING "STYLE 3" STUDS MUST HAVE EITHER THE "POS" OR "NEG" STUD CLEARLY IDENTIFIED.
 - 3) STYLE 3 TERMINAL TORQUE 10 Nm [15 FT LBS].
 - 4) "POS" & "NEG" IDENTIFICATION MUST BE MARKED AS SHOWN ON THE PART LAYOUT AND WITHIN 5mm OF THE STUD.

NOTES:

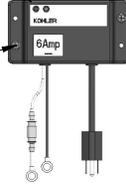
1. (APPLIES TO ALL BATTERIES)
SAE J537 DIMENSIONS ARE MAX ALLOWABLE DIMENSIONS.
COLD CRANKING AMPS ARE MINIMUM ACCEPTABLE VALUES.
HOLD DOWN DESIGN IN COMPLIANCE WITH SAE STANDARDS.
BATTERY WARNING LABEL TO BE LOCATED ON TOP OF BATTERY. (BETWEEN TERMINALS ON LAYOUT D)
MANUFACTURER MUST PROVIDE A CERTIFICATE CONTAINING MFGRS. NAME, MFGRS. PART NUMBER,
AND REHLKO PART NUMBER AND DATE OF MANUFACTURE CERTIFYING THAT THE BATTERY WAS BUIT TO INDUSTRY STANDARDS.
SEE N.F.P.A.-110 FOR SPECIFIC DETAILS. CERTIFICATE REQUIRED ONLY ONCE PER BATTERY PART NUMBER.
MAY NOT BE CALCIUM-CALCIUTYPE.
2. (CHARGE TYPE)
ALL DRY CHARGED BATTERIES MUST BE SUPPLIED WITH ACTIVATION INSTRUCTIONS ADHERED TO BATTERY
AND LOOSE. BATTERY MUST ALSO BE IDENTIFIED ON TOP AS: "DRY CHARGED, MUST ADD BATTERY GRADE
ELECTROLYTE. SEE ACTIVATION INSTRUCTIONS".
BATTERIES SHOULD BE RECEIVED APPROPRIATELY MARKED AS DRYCHARGED OR WET STORAGE.
ONE OF THE BATTERY POSTS MUST BE SHIELDED WHEN BATTERIES ARE WET CHARGED.
BATTERIES WHEN SHIPPED DRY - DO NOT REQUIRE POST PROTECTORS.
3. (BATTERY CONSTRUCTION)
1) MUST BE LEAD-CALCIUM HYBRID OR LEAD-ANTIMONY TYPE.
2) LEAD-CALCIUM GRID.
3) ABSORBED GLASS MAT. (AGM)

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.			
CC	23JUL2021	SEE SHEET 1 [CT212924]	PAR	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: XX ± 0.25 XX ± 1.0 SURFACE FINISH X ± 1.5 ANGLES 40° 30' BEND ANGLES ± 1°	MAJOR ○ = 0	THIRD ANGLE PROJECTION	
CD	31JAN2023	(C-8)NOTE 1 UPDATED [CT225049]	PBG		CRITICAL ✖ = 0		
CE	03MAR2025	SEE SHEET 1	SPP		CHARACTERISTICS COMPLY WITH KPS-80022		
CF	26JUN2025	SEE SHEET 1	AVD		SCALE: 0.15	SHEET SIZE: B	SHEET: 2 OF 2
CG	11AUG2025	SEE SHEET 1	RVM				
				DRAWN: SLR	DATE: 4-15-19	TITLE: DWG, BATTERY	
				APPROVED: SEE PLM SYSTEM		DWG NO.: 244578-CMP	

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.

KIT NUMBER	ITEM 1	VIEW	DESCRIPTION
GM96391-KA1	GM96383	VIEW 1 & 3	6A BATTERY CHARGER 12V, 6A
GM96391-KA2	GM96383 (2)	VIEW 2	6A BATTERY CHARGER 24V, 6A
GM96391-KA3	GM96383 (2)	VIEW 2	6A BATTERY CHARGER 24V, 6A

1



M7985A-06020-20 (2)
M6923-06-80 (2)

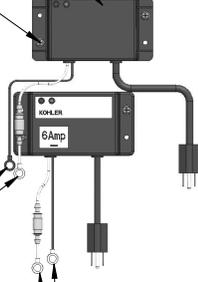
SCALE 0.15

VIEW 1

CONNECT TO BATTERY

M7985A-06020-20 (4)
M6923-06-80 (4)

1



CONNECT TO BATTERY 2

CONNECT TO BATTERY 1

VIEW 2

NOTE:
FOR GM96391-KA2 24V CHARGER IT IS NECESSARY
TO REPLACE 280133 (BATTERY CABLE) GM20748 AND
GM20744 (BATTERY BOOTS) WITH X-646-65 (BATTERY CABLE)
345039 AND 345056 (BATTERY TERMINALS)

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.	MAJOR ○ = 0 CRITICAL ◉ = 0	THIRD ANGLE PROJECTION
-	3-4-15	NEW DRAWING [CT107416]					
A	12-23-18	(C-8) M7985A-06020-20 (2) WAS M933-06020-60 (2); (D-4) M7985A-06020-20 (4) WAS M933-06020-60 (4) [CT168611]	PAS		UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: XX ± 0.25 X ± 1.0 SURFACE FINISH X ± 1.5 ANGLES 45° BY BEND ANGLES ± 1°	CHARACTERISTICS COMPLY WITH KPS-80022	
B	2-14-18	SHEET 2 ADDED; SEE SHEET 2 [CT184362]	SAK		SCALE: 0.20	SHEET SIZE: B	SHEET: 1 OF 2
				DRAWN: SAK	DATE: 3-4-15	TITLE: DWG, ASSY BATTERY CHARGER	
				APPROVED: SEE PLM SYSTEM	DWG NO.: GM96391		

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8 7 6 5 4 3 2 1

D

C

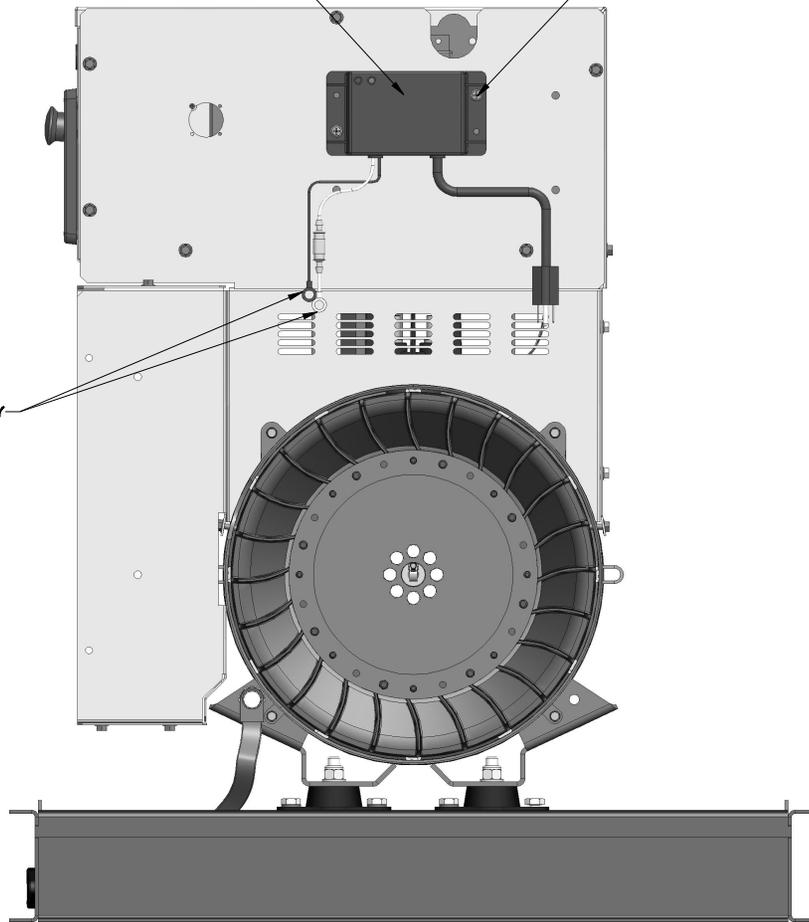
B

A

1

M7985A-06020-20 (2)
M6923-06-80 (2)

CONNECT TO BATTERY



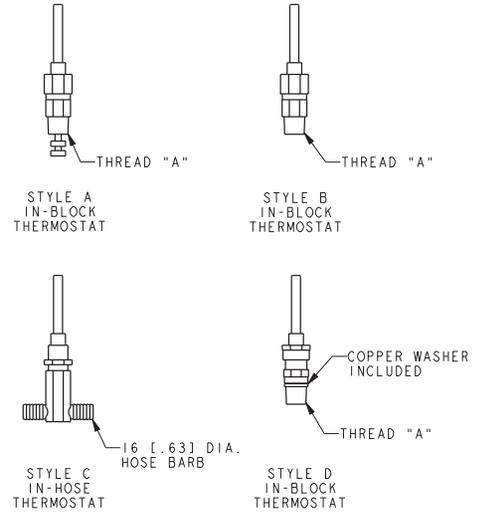
VIEW 3

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.													
B	2-14-18	VIEW 3 ADDED [CT184382]	SAK	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: XX ± 0.25 XX ± 1.0 SURFACE FINISH X ± 1.5 ANGLES 45° BY BEND ANGLES ± 1°		<table border="1"> <tr> <td>MAJOR</td> <td>0 =</td> <td>0</td> </tr> <tr> <td>CRITICAL</td> <td>0 =</td> <td>0</td> </tr> <tr> <td colspan="3">CHARACTERISTICS COMPLY WITH KPS-80022</td> </tr> <tr> <td>SCALE: 0.20</td> <td>SHEET SIZE: B</td> <td>SHEET: 2 OF 2</td> </tr> </table>	MAJOR	0 =	0	CRITICAL	0 =	0	CHARACTERISTICS COMPLY WITH KPS-80022			SCALE: 0.20	SHEET SIZE: B
MAJOR	0 =	0															
CRITICAL	0 =	0															
CHARACTERISTICS COMPLY WITH KPS-80022																	
SCALE: 0.20	SHEET SIZE: B	SHEET: 2 OF 2															
				DRAWN: SAK	DATE: 3-4-15												
				APPROVED: SEE PLM SYSTEM													
TITLE: DWG, ASSY BATTERY CHARGER DWG NO.: GM96391																	

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8 7 6 5 4 3 2 1

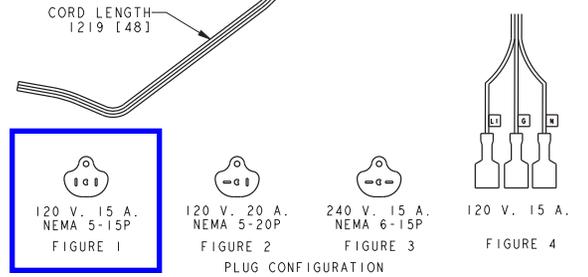
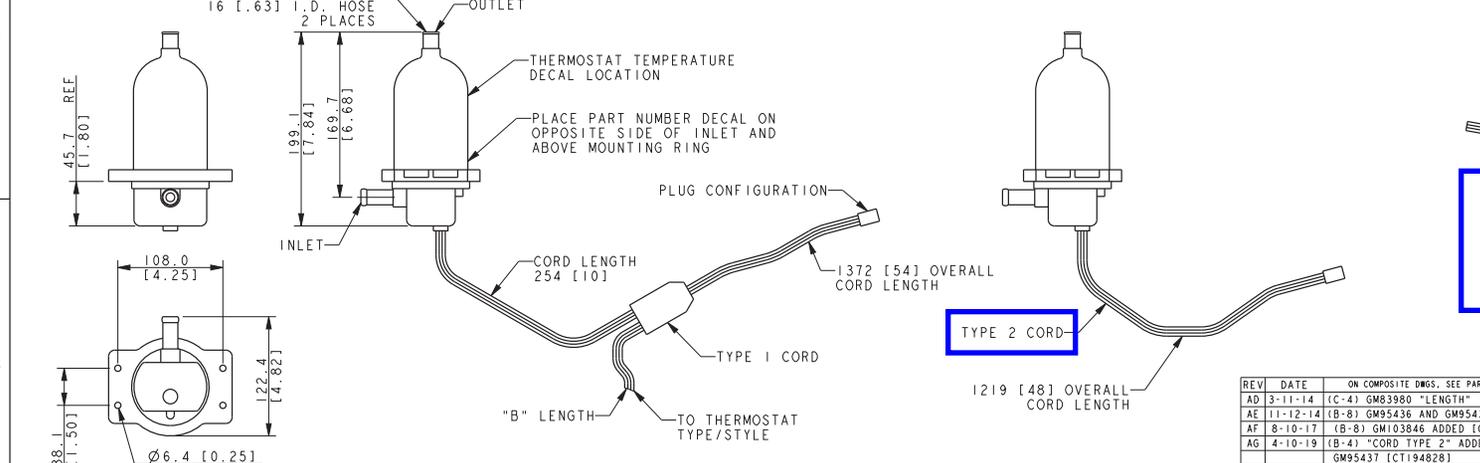
PART NO.	REV	VOLTS	WATTS	AMPS	THERMOSTAT TYPE/STYLE	REMOTE SENSOR TEMP. RANGE	TANK SENSOR TEMP RANGE	THREAD SIZE "A"	PLUG CONFIG.	LENGTH "B"	CORD TYPE	REMARKS
324930	W	120	1800	15.0	IN BLOCK/B	38*/49*C[100*/120*F]	49*/60*C[120*/140*F]	1/2 NPT	FIG-2	1575 [62.0]	1	-
324931	W	240	2000	8.3	IN BLOCK/B	38*/49*C[100*/120*F]	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-89230	-	120	1500	12.5	-	-	38*/49*C[100*/120*F]	-	FIG-1	1524 [60.0]	1	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	-
GM28585	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	-	120	1800	15.0	-	-	16*/27*C[60*/80*F]	-	FIG-2	-	2	IN-BASE SENSING UNIT ONLY



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

TERMINATE EACH LEAD WITH A 1/4 INCH INSULATED FEMALE PUSH-ON TERMINAL

THIS IS AN MANUAL TABLE.



VALUES IN [] ARE ENGLISH EQUIVALENTS.

□ INDICATES PART NUMBERS AFFECTED BY LATEST REVISION

REVISION BLOCK INDICATES REVISION LEVEL OF DRAWING NOT PART REVISION. SEE PART REVISION LEVEL BEHIND PART NUMBER FOR CURRENT PART REVISION LEVEL.

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	UNLESS OTHERWISE SPECIFIED: 25 DIMENSIONS ARE IN MILLIMETERS 27 TOLERANCES ARE:
AD	3-11-14	(C-4) GM83980 "LENGTH" 1524 WAS 1219 [CT74793]	JMR	DRA 2-XX ± 0.25
AE	11-12-14	(B-8) GM95436 AND GM95437 ADDED [CT99196]		2-XX ± 0.15 SURFACE FINISH
AF	8-10-17	(B-8) GM103846 ADDED [CT177684]	SAM	ANGLES ± 0° 30' / MAX.
AG	4-10-19	(B-4) "CORD TYPE 2" ADDED FOR GM95436 & GM95437 [CT194828]	PAS	THIS DRAWING IS UNCONTROLLED
AH	18FEB2021	(C-8) ES-89230 ADDED [CT210046]	AMH	APPROVALS DATE
			SAM	9-22-11
			CF	9-22-11
			CF	9-22-11

KOHLER CO. METRIC PRO-E

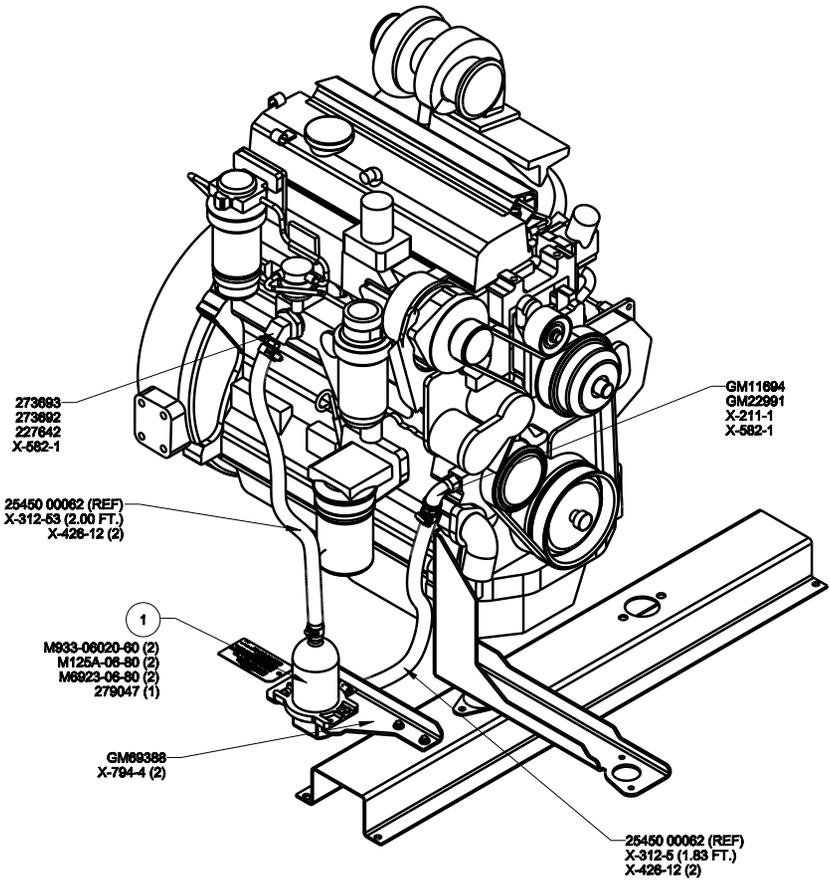
POWER SYSTEMS, KOHLER, WI 53044 U.S.A. THIS DRAWING IN DESIGN AND DETAIL IS KOHLER CO. PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH KOHLER CO. WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.

TITLE: **DWG, HEATER, BLOCK**

SCALE: 0.40 CAD NO. SHEET 1 OF 1

DWG NO: **326220-CMP**

KIT NUMBER	ITEM 1	X-312-5	X-312-53	VOLTAGE	WATTAGE
GM75557-KA1	352945	Y	Y	120	1500
GM75557-KAZ	362946	Y	N	240	



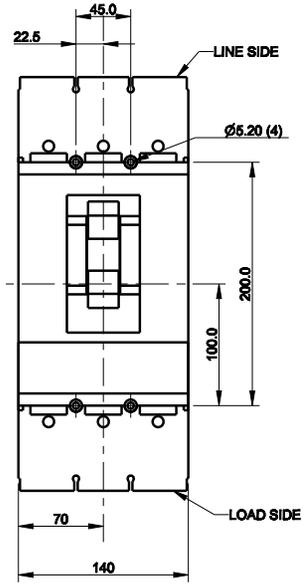
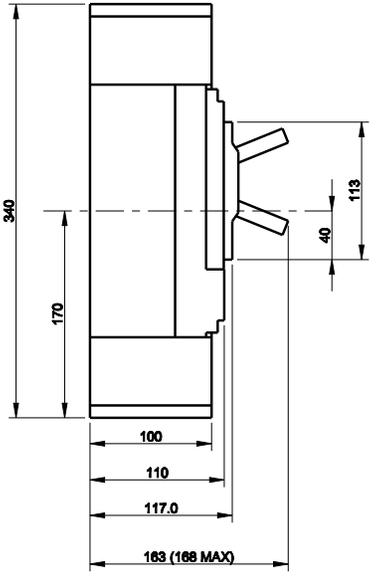
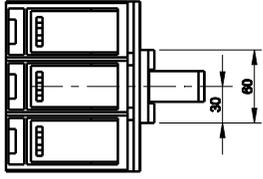
NOTE: FOR PROPER ASSEMBLY METHOD OF HARDWARE, USE G-585 AS A GUIDELINE.

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.	MAJOR	CRITICAL	THIRD ANGLE PROJECTION
-	6-8-10	NEW DRAWING [89926-2]	SAM			0	0	
A	14JAN2021	(B-6) X-312-5 WAS X-312-54 REF, ADDED EF) TO RAW MATERIAL (2 PLACES), 1.83 FT WAS 1.15 FT, 249047 (1) ADDED [CT208513]	CLN		UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: XX ± 0.25 X ± 1.0 X ± 1.5 ANGLES 40° 30' BEND ANGLES ± 1°	0	0	THIRD ANGLE PROJECTION
B	02JUN2025	(B-6) X-312-53 (2.00 FT.) WAS X-312-5 (1.83 FT.); (D-6,7) COLUMN X-312-5 & X-312-53 ADDED; (B-3) (C-6) X-426-12 (2) WAS X-426-10 (2)	ASB		CHARACTERISTICS COMPLY WITH KPS-80022	0	0	THIRD ANGLE PROJECTION
				DRAWN: SAM	DATE: 6-8-10	SCALE: 0.13 SHEET SIZE: B SHEET: 1 OF 1		
				APPROVED: SEE PLM SYSTEM	TITLE: DWG, ASSY			
				DWG NO.: GM75557				

BLOCK HEATER KIT
80-100KW MODELS
4045HF JOHN DEERE TIER III

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.

PART NO.	PART REV	DESCRIPTION	AMPS	INTERRUPT KA @480 VAC	CONNECTION TYPE		POLES	VOLTS	RATING	TRIP TYPE	SQUARE D PART NO.
					LINE	LOAD					
GM85432-10	-	BREAKER, CIRCUIT 250A LGP	250	35	BUS	AL400L61K3 LUGS	3	600	80%	MICROLOGIC 3.3 LJ	LGP36250U31XY029
GM85432-11	-	BREAKER, CIRCUIT 250A LGP								MICROLOGIC 3.3S LSI	LGP36250U33XY029
GM85432-12	-	BREAKER, CIRCUIT 250A LGP								MICROLOGIC 3.3 LJ	LGP36250CU31XY029
GM85432-13	-	BREAKER, CIRCUIT 250A LGP	400	35	BUS	AL600LS52K3 LUGS	3	600	100%	MICROLOGIC 3.3S LSI	LGP36250CU33XY029
GM85432-1	A	BREAKER, CIRCUIT 400A LGP							MICROLOGIC 3.3 LJ	LGP36400U31XY029	
GM85432-2	A	BREAKER, CIRCUIT 400A LGP							MICROLOGIC 3.3S LSI	LGP36400U33XY029	
GM85432-3	A	BREAKER, CIRCUIT 400A LGP	400	65	AL600LS52K3 LUGS	BUS	3	600	80%	MICROLOGIC 6.3A LSI	LGP36400U44XY029
GM85432-4	A	BREAKER, CIRCUIT 400A LGP							MICROLOGIC 3.3 LJ	LGP36400CU31XY029	
GM85432-5	A	BREAKER, CIRCUIT 400A LGP							MICROLOGIC 3.3S LSI	LGP36400CU33XY029	
GM85432-6	A	BREAKER, CIRCUIT 400A LGP	400	100	AL600LS52K3 LUGS	BUS	3	600	100%	MICROLOGIC 6.3A LSI	LGP36400CU44XY029
GM85432-14	-	BREAKER, CIRCUIT 400A LGP							MICROLOGIC 1.3 M (MAG ONLY)	LGP36400M37XY029	
GM85432-16	-	BREAKER, CIRCUIT 400A LJP, 3P							MICROLOGIC 3.2 LJ	LJP36400U31X	
GM85432-17	-	BREAKER, CIRCUIT 400A LJP, 3P	600	35	BUS	AL600LS52K3 LUGS	3	600	100%	MICROLOGIC 3.2 LJ	LJP36400CU31X
GM85432-18	-	BREAKER, CIRCUIT 400A LLP, 3P							MICROLOGIC 3.2 LJ	LLP36400U31X	
GM85432-19	-	BREAKER, CIRCUIT 400A LLP, 3P							MICROLOGIC 3.2 LJ	LLP36400CU31X	
GM85432-7	A	BREAKER, CIRCUIT 600A LGP	600	35	BUS	AL600LS52K3 LUGS	3	600	80%	MICROLOGIC 3.3 LJ	LGP36600U31XY029
GM85432-8	A	BREAKER, CIRCUIT 600A LGP							MICROLOGIC 3.3S LSI	LGP36600U33XY029	
GM85432-9	A	BREAKER, CIRCUIT 600A LGP							MICROLOGIC 6.3A LSI	LGP36600U44XY029	
GM85432-15	-	BREAKER, CIRCUIT 600A LGP	600	35	BUS	AL600LS52K3 LUGS	3	600	80%	MICROLOGIC 1.3 M (MAG ONLY)	LGP36600M37XY029



CONNECTION CHART		
CONNECTION TYPE	CONNECTIONS (PER PHASE)	TORQUE
BUS	(1) M10	50 Nm [442 IN-LB]
AL400L61K3 LUGS	(1) #2-600 KCMIL CU OR (1) #2-500 KCMIL AL	50 Nm [442 IN-LB]
AL600LS52K3 LUGS	(2) 2/0-500 KCMIL AL/CU	50 Nm [442 IN-LB]

NOTE:
 (4) M6 X 85 MOUNTING SCREWS, WASHERS AND NUTS INCLUDED.
 (3) M10 X 25 BUS CONNECTION SCREWS AND SPRING WASHERS INCLUDED.

PART NUMBER TO BE CLEARLY VISIBLE ON CIRCUIT BREAKER AND ON INDIVIDUAL PACKAGING.

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.	
B	25APR2021	(C,D-3-8) ADDED GM85432-16 THRU -19; [CT216232]	ZHK	DO NOT SCALE. UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: XX ± 0.25 X ± 1.0 X ± 1.5 ANGLES 45° 30' BEND RADIUS ± 1"	
DRAWN: WSD		DATE: 4-3-12		APPROVED: SEE PLM SYSTEM	

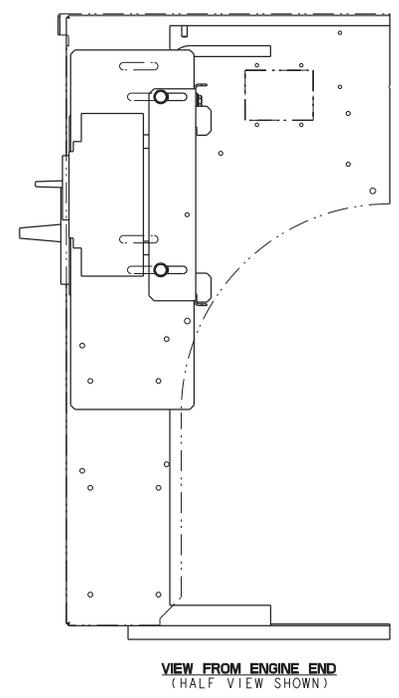
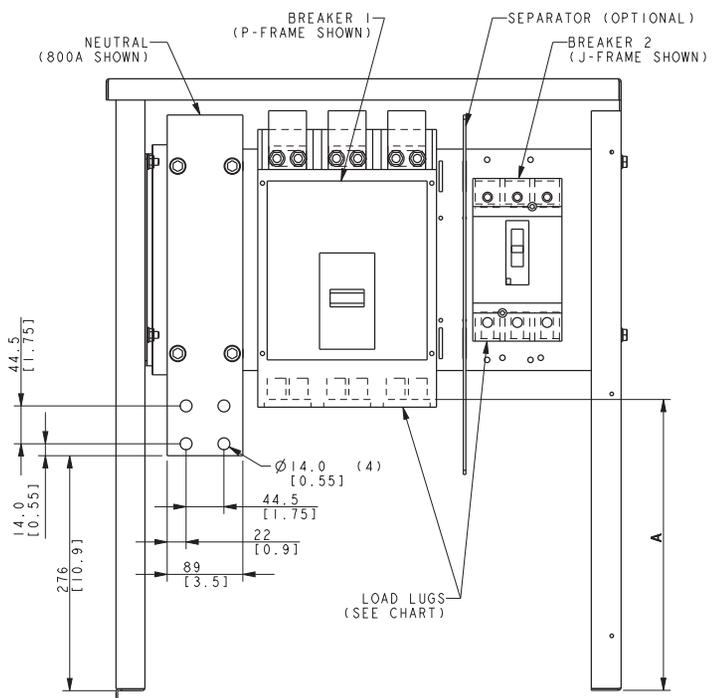
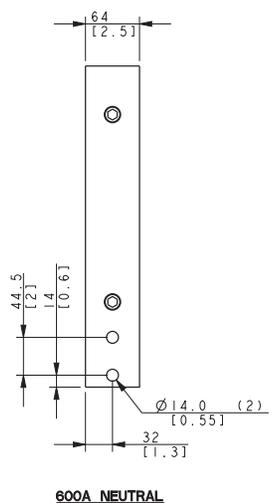
SQUARE D L-FRAME POWERPACT BREAKERS

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.

AL/CU MECHANICAL LOAD LUGS PER PHASE			A
BREAKER FRAME	AMPS	WIRE RANGE	WIRE BENDING SPACE
H	15-150	(1) #14 TO 3/0	427 [16.8]
J	175	(1) 1/0 TO 4/0	413 [16.3]
	200-250	(1) 3/0 TO 350 KCMIL	
LA	300-400	(1) #1 TO 600 KCMIL OR (2) #1 TO 250 KCMIL	369 [14.5]
LG	400-600	(2) 2/0 TO 500 KCMIL AL/CU	362 [14.2]
M	800	(3) 3/0 TO 500 KCMIL	341 [13.4]
P	250-800		
MECHANICAL LOAD LUGS INCLUDED WITH H, J & LG LSI&G NEUTRALS			
H	60-150	(1) #14 TO 3/0 AWG AL/CU	
J	250	(1) 3/0 TO 350 KCMIL AL/CU	
LG	400-600	(2) 4/0 TO 500 KCMIL AL/CU	

STANDARD BREAKER COMBINATIONS			
BREAKER 1	BREAKER 2	BREAKER 3	TRIP TYPE
H OR J	-	-	ALL
LA	-	-	ALL
LG	-	-	ALL
M	-	-	ALL
P	-	-	ALL
H OR J	H OR J	H OR J	NO LSI&G
LA	H, J OR LA	-	NO LSI&G
LG	H, J, LA OR LG	-	NO LSI&G
M OR P	H, J, LA OR LG	-	NO LSI&G

- NOTES:**
- SEE UNIT DIMENSION PRINT (ADV-XXXX) FOR ADDITIONAL DIMENSIONS, JUNCTION BOX AND STUB-UP LOCATION.
 - ADD SKID DEPTH TO WIRE BENDING HEIGHTS ON THIS PRINT TO ARRIVE AT FULL WIRE-BENDING SPACE.
 - CONSULT FACTORY FOR BREAKER COMBINATIONS NOT SHOWN ON THIS PRINT.
 - MECHANICAL LUGS ARE AVAILABLE FOR NON-LSI&G NEUTRAL. SEE ADV-7376. H, J & LG LSI&G NEUTRALS INCLUDE LUGS (SEE CHART).
 - NEUTRALS ARE BONDED TO GROUND AS STANDARD. CONSULT LOCAL CODES OR SYSTEM REQUIREMENTS.
 - CIRCUIT BREAKER FRAMES REFER TO STANDARD SQUARE-D PRODUCT.
 - STANDARD NEUTRALS PROVIDED ARE SIZED FOR MAXIMUM UNIT AMPS. LSI&G NEUTRALS ARE MATCHED TO THEIR CIRCUIT BREAKER AMPS.
 - DIMENSIONS ARE MM, DIMENSIONS IN [] ARE INCHES.



ELECTRONIC TRIP UNITS		
FRAME	TRIP UNIT	
H	LI	MICROLOGIC 3.2
	LSI	MICROLOGIC 3.2S
	LSIG	MICROLOGIC 6.2A
J	LI	MICROLOGIC 3.2
	LSI	MICROLOGIC 3.2S
	LSIG	MICROLOGIC 6.2A
LG	LI	MICROLOGIC 3.3
	LSI	MICROLOGIC 3.3S
	LSIG	MICROLOGIC 6.3A
M	LI	ET 1.0
	I	ET 1.0I
P	LI	MICROLOGIC 3.0
	LSI	MICROLOGIC 5.0
	LSIG	MICROLOGIC 6.0A

UL INTERRUPT KA RATINGS			
BREAKER	240V	480V	600V
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	65	35	18
PG	65	35	18
PJ	100	65	25
PL	125	100	25

ELECTRICALLY OPERATED BREAKERS FOR DEC6000 DPS OR APM603 PARALLELING ONLY NO 2ND BREAKERS ARE ALLOWED			
RATING	AMPS	TRIP TYPE	FRAME
100%	250	ELECTRONIC LI OR LSI	PJ OR PL
	400		
	600		
	800		

LCB KITS
4S, 4V, 4RX, 4TX, 4SX
ALTERNATOR FRAMES

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	DO NOT SCALE. REFERENCE THE MODEL FOR ALL UNSPECIFIED DIMENSIONS
-	5-16-07	NEW DRAWING [79677]	WSD	
A	4-22-08	(D-8) 15-150 WAS 40-150 [84767]	WSD	
B	10-19-12	UPDATED D TO LG. 100% H/J ADDED, LSI&G NEUTRAL LUG CHART ADDED [CT26372]	WSD	
C	11-2-16	(D-8) REMOVED SEPARATE LINES FOR H & J 100% LUGS; (D-4) UPDATED TABLE AND ADDED 3RD LCB'S [CT11426]		
D	3-26-19	(A-6) EOB TABLE ADDED [CT194577]	WSD	APPROVALS DATE
E	5-24-19	(A-6) 1000 & 1200A REMOVED [CT196063]	WSD	WSD 5-16-07
F	6-23-21	(D-8) M 800A WAS 700 & 800, LI WAS 1 [CT212837]	WSD	WSD 5-16-07
			APPROVED	AJH 5-16-07

KOHLER
KOHLER, WISCONSIN 53044
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PRINT, DIMENSION

SCALE 0.35 CAD NO. SHEET 1 of 1
ADV-7371

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	Warranty Coverage
Stationary Standby 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.
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

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

Effective Date: 2024-11-07

Latest Revision Date: 2025-12-03

Expiry Date: 2027-11-06

Page: 1 of 2



...making excellence a habit.™

Certificate No: **FM 727336**

Location	Registered Activities
Discovery Energy Rehiko - 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 Rehiko N7650 Lakeshore Road Sheboygan Wisconsin 53083 USA	Design, manufacture, and distributor support for electrical generators, automatic transfer switches and switchgear.
Discovery Energy Rehiko 300 N Dekora Woods Blvd Saukville Wisconsin 53080 USA	Manufacture of fuel tanks, skids, fabricated components and generators.
Discovery Energy Rehiko Muth Warehouse 2821 Muth Court Sheboygan Wisconsin 53083 USA	The distribution of generator sets.
Discovery Energy Rehiko 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](http://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.

EVALUATION SUBJECT: 80-100REOZJF Sound Aluminum Enclosure
TER-18-6258.5
REPORT HOLDER:

 KOHLER POWER SYSTEMS
 7650 LAKESHORE ROAD
 SHEBOYGAN, WI 53083 USA
 (920) 457-4441 | KOHLERPOWER.COM

KOHLER®

SCOPE OF EVALUATION (compliance with the following codes):

THIS IS A STRUCTURAL (WIND) PERFORMANCE EVALUATION ONLY. NO ELECTRICAL OR TEMPERATURE PERFORMANCE RATINGS OR CERTIFICATIONS ARE OFFERED OR IMPLIED HEREIN.

This Product Evaluation Report is being issued in accordance with the requirements of the **Florida Building Code Sixth Edition (2017)** per FBC Section 104.11.1, FMC 301.15, FBC Building Ch. 16, ASCE-7-10, and FBC Residential M1202.1, FS 471.025. The product noted on this report has been tested and/or evaluated as summarized herein.

IN ACCORDANCE WITH THESE CODES EACH OF THESE REPORTS MUST BEAR THE ORIGINAL SIGNATURE & RAISED SEAL OF THE EVALUATING ENGINEER.

SUBSTANTIATING DATA:
• Product Evaluation Documents

Substantiating documentation has been submitted to provide this TER and is summarized in the sections below.

• Structural Engineering Calculations

Structural engineering calculations have been prepared which evaluate the product based on comparative and/or rational analysis to qualify the following design criteria:

- Maximum allowable unit enclosure wind pressure integrity
- Maximum allowable uplift, sliding, & overturning moment for ground.

Calculation summary is included in this TER and appears below. NOTE: No 33% increase in allowable stress has been used in the design of this product.

INSTALLATION:

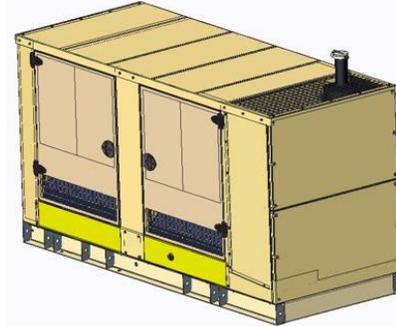
The product(s) listed above shall be installed in strict compliance with this TER & manufacturer-provided enclosure model specifications.

The product components shall be of the material specified in the manufacturer-provided product specifications. All screws, bolts and rivet must be installed in accordance with the applicable provisions & anchor manufacturer's published installation instructions.

LIMITATIONS & CONDITIONS OF USE:

Use of this product shall be in strict accordance with this TER as noted herein. The supporting host structure shall be designed to resist all superimposed loads as determined by others on a site-specific basis as may be required by the Authority Having Jurisdiction. No evaluation is offered for the host supporting structure by use of this document; Adjustment factors noted herein and the applicable codes must be considered, where applicable. All supporting components which are permanently installed shall be protected against corrosion, contamination, and other such damage at all times. This evaluation does not offer any evaluation to meet large missile impact debris requirements if requires.

Yearly inspections, during equipment maintenance or after named storm, all screws, cabinet components, and anchor bolts are to be verified. All damaged cabinet components, loosen, corroded, broken screws or anchor bolts shall be replaced to ensure structural integrity for hurricane wind forces.



NOTE: THE GRAPHICAL DEPICTIONS IN THIS REPORT ARE FOR ILLUSTRATIVE PURPOSES ONLY AND MAY DIFFER IN APPEARANCE.

FINISH:

Baked enamel.

UNIT CASING MATERIAL:

1/8" Al 5052-H32 top panel. 1/8" Al 5052-H32 for side panels and 3/16" steel ASTM A1011 for bottom skids, secured with 3/16" pop rivets grade 51, M8 bolts class 8.8 (see dimensional drawing for specific locations).

OPTIONS:

This evaluation is valid for KOHLER 80-100REOZJF Sound Aluminum Enclosure model dimensions shown on the final page of this report. Contact Factory for Engineering Special (ES) orders. Any structural changes outside of the factory would void this certificate.

STRUCTURAL PERFORMANCE:

Models referenced herein are subject to the following design limitations:

ASCE-710 Exposure Category D
 Risk Category III / IV
 HVHZ Rated* (& NON-HVHZ)
 Only for ground installations
 Flat terrain only

Maximum Wind Speed:
 $V_{(Ultimate)} = 186 \text{ MPH}$

ABOUT THIS DOCUMENT:

ENGINEER CERTIFIED ORIGINALS, VARIATIONS & HELP CAN BE FOUND BY VISITING THE WEB ADDRESS OR SCANNING THE QR CODE TO THE RIGHT >

VISIT ENGINEERINGEXPRESS.COM/STORE FOR MORE REPORTS



ECALC.IO/186258

ORIGINAL SIGNATURE AND RAISED SEAL
 OR DIGITAL SEAL REQUIRED TO BE VALID PER CODE:

P.E. SEAL REQUIRED

April 5, 2019

Frank L. Bennardo, P.E., SECB
 ENGINEERING EXPRESS®

Signed by If Checked:
 TROY BISHOP, PE

FL PE #0046549 FLCA #9885 FL PE #76131

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SECTION 2 SUMMARY

Engineering Express has reviewed the design requirements per the Florida Building Code Sixth Edition (2017) and ASCE 7-10 for the structural integrity of the above referenced Kohler sound aluminum housing unit with steel skid to withstand a $V_{ULTIMATE}$ wind speed=186 MPH, Exposure "D" Risk Category III/ IV. Our analysis includes the unit framing and housing only and requires that a permanent near-grade (non-rooftop) attachment to a concrete, metal, or wood host structure as certified/verified by others. Steel skid tie-down anchor locations shall conform to those illustrated on sheet 3 of this TER. Additionally, the unit shall not be installed in a location susceptible to channeling effects from upwind obstacles. It shall be the installer's responsibility to ensure that the criteria for the unit housing integrity, as listed above, is applicable for use at the location of installation and the mounting method meets or exceeds the requirements of the local code and it is approved by the appropriate local authority before installation.

This certification is intended to certify the structural capacity and integrity of the structural framing members, wall and roof sheet metal skins, generator skid and internal structural connections only for the sound aluminum enclosure aforementioned. Design of the generator itself, mechanical designs, energy/electrical criteria, generator slab support, anchorage and tie-down method accompanying components and all non-structural items shall be verified by others and outside the scope of this certification. Upon analysis of the aluminum housing unit vs. the critical ultimate design loads illustrated below, this engineer has concluded that the aluminum housing enclosure provides adequate resistance to the specified ultimate design loads.

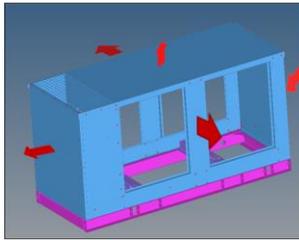
Structural Engineering Calculations

Structural engineering calculations have been prepared which evaluate the aluminum unit housing based on rational analysis using Finite Element Analysis to qualify the following design criteria:

1. Maximum ultimate design pressure as a result of the aforementioned design criteria:

Load Case 1

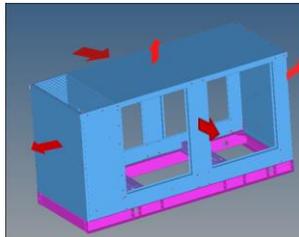
(Wind parallel to long side)



Load Case	Wind Direction	Pressure, psf (x 10 ⁻³ MPa)				
		Rear Wall	Front Wall	Left Wall	Right Wall	Roof
1		61.26 (2.933)	-48.85 (-2.339)	-48.85 (-2.339)	-47.30 (-2.265)	-96.92 (-4.641)

Load Case 2

(Wind perpendicular to long side)

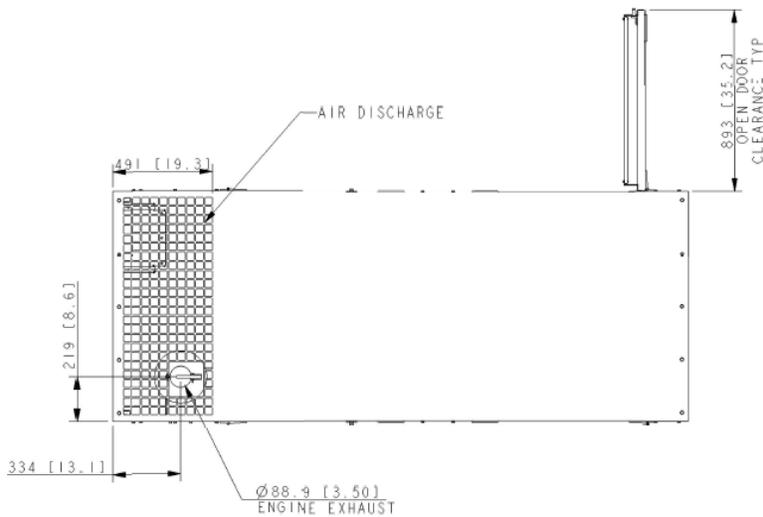
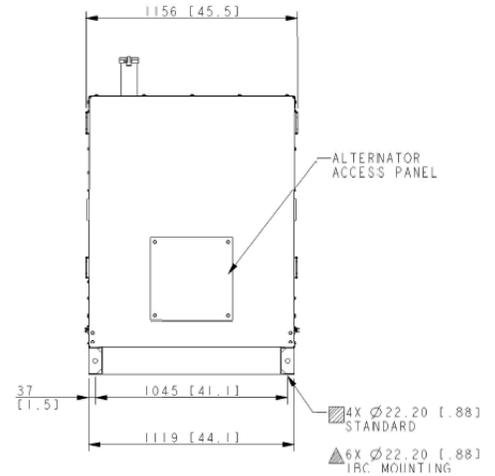
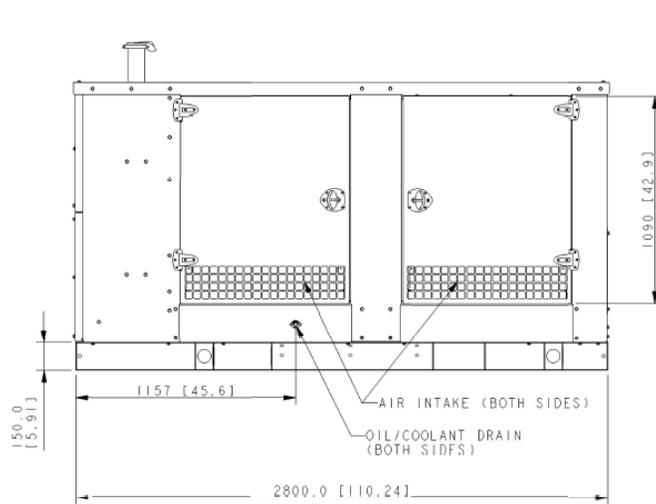


Load Case	Wind Direction	Pressure, psf (x 10 ⁻³ MPa)				
		Rear Wall	Front Wall	Left Wall	Right Wall	Roof
2		-48.85 (-2.339)	-48.85 (-2.339)	61.26 (2.933)	-47.30 (-2.265)	-96.92 (-4.641)

2. Maximum housing unit dimensions: 110.24"L x 44.1"W x 53.7" H.
3. Enclosure materials have been analyzed for yield and ultimate stresses using Von Mises stress criteria in accordance with the 2015 Aluminum Design Manual & AISC Steel Construction Manual 14th Edition. For both load case Von Mises Stress stood below ultimate strength; therefore, the sound aluminum enclosure will provide adequate structural capacity to resist wind pressures shown.
4. All internal connection capacities, including bolted and welded components, have been checked for applicable tension and shear by applying a unity interaction equation where applicable and have been approved by this office.

All installation work shall follow the minimum requirements of the Florida Building Code Sixth Edition (2017) in addition to any additional site-specific requirements for tie-down certification which is not included in this letter. Except as expressly provided herein, no additional affirmations are intended. Thank you for your attention to this matter.

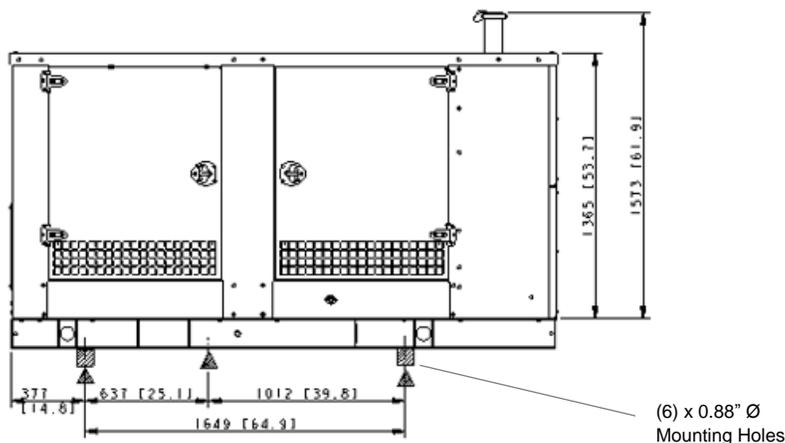
SECTION 3 DIMENSIONS & ELEVATIONS



Note:
Enclosure housing must bear the official insignia of Kohler Power with model name referenced above for applicability and validity of this letter.

All dimensions are in inches

SECTION 4 ANCHORS LOCATION



Note:
Anchors to be calculated on a site-specific basis. (6) anchors location per manufacturer, (3) per long side. Additionally, holes might be added as needed.

IN ALL CONDITIONS IT IS THE RESPONSIBILITY OF THE PERMIT HOLDER TO ENSURE THE HOST STRUCTURE IS CAPABLE OF WITHSTANDING THE RATED GRAVITY, LATERAL, AND UPLIFT FORCES BY SITE-SPECIFIC DESIGN. NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, IS OFFERED BY ENGINEERING EXPRESS AS TO THE INTEGRITY OF THE HOST STRUCTURE TO CARRY DESIGN FORCE LOADS INCURRED BY THIS UNIT.

SECTION 5 ENCLOSURE MODELS INCLUDED

GENERATOR	ENCLOSURE TYPE	ENCLOSURE DRAWING NUMBER	REVISION & DATE	ADV	REVISION & DATE
80REOZJF	80-100REOZJF SOUND ALUMINUM ENCLOSURE	GM87407-KA3	Revision A 10/06/16	ADV-7647	Revision F 10/12/17
100REOZJF					

LIMITATIONS & CONDITIONS OF USE (cnt'd):

Production Drawings:

The following drawings shall be accessible if required for a full permit application to be submitted to the Authority Having Jurisdiction in conjunction with this TER:

- Electrical schematic(s)
- Final assembly drawings and parts lists sufficient to detail primary components, operator controls, and their locations
- Complete set of mechanical drawings for all machined parts
- Complete part specifications (including manufacturer’s model numbers, size, ratings, etc.) for all purchased parts
- Specification sheets for all parts/components
- Drawings showing all construction details
- Product label drawing(s) showing all required marking information. The label drawing shall show the proposed label location on the equipment and artwork showing the manufacturer’s name, address, model and serial numbers, equipment ratings, warning markings.

Drawing and Change Control:

The manufacturer shall establish a system of product configuration control that shall allow no unauthorized changes to the product. Changes to critical documents, identified in this Technical Evaluation Report, must be reported to, and authorized by, this office prior to implementation for production.

Survivability:

This evaluation report is valid for a newly installed unit and does not include certification of the product beyond a design event if impacted, contact this office for any reevaluation needs as designated by the Authority Having Jurisdiction.

Durability

Components or component assemblies shall not deteriorate, crack, fail, or lose functionality due to galvanic corrosion or weathering. Each component or component assembly shall be supported and oriented in its intended installation position. All exposed *plastic* components shall be certified to resist sunlight exposure as specified by ASTM B117, or ASTM G155 in Broward or Miami Dade counties.

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EVALUATION SUBJECT: ANCHORAGE FOR QUALIFYING ENCLOSURE MODELS

TER-24-76917

REPORT HOLDER:
DISCOVERY ENERGY, LLC.
200 TWIN OAKS ROAD
KOHLER, WI 53044, USA



NOTE: THE GRAPHICAL DEPICTIONS IN THIS REPORT ARE FOR ILLUSTRATIVE PURPOSES ONLY AND MAY DIFFER IN APPEARANCE.

THIS ADDENDUM EVALUATION IS ONLY VALID WHEN PAIRED WITH THE SIGNED AND SEALED "UNIFORM (STATIC) WIND LOADING" TECHNICAL EVALUATION REPORT BY THIS FIRM FOR THE RESPECTIVE MODEL.

STRUCTURAL PERFORMANCE:

Models referenced herein are subject to the following design limitations:

Maximum-Rated ASD Wind Pressures*:
± 65 psf Lateral, 65 psf Uplift

Maximum pressure rating determined based on the design parameters of:
Vult = 186 mph, Exposure D, flat terrain, at-grade.

- Required design wind pressures shall be determined on a site-specific basis in accordance with ASCE 7 and applicable sections of the building code(s) being referenced in accordance with ASD methodology.
- Required design wind pressures shall be less than or equal to the maximum pressures listed herein.
- *Maximum-Rated ASD Wind Pressures indicate the maximum pressures that all units listed herein are approved for. Valid for at-grade applications. See limitations herein.
- Valid for use inside and outside the High-Velocity Hurricane Zone (HVHZ).
- Site-specific wind analysis may produce alternate limitations provided that the maximum-rated wind pressures stated herein are not exceeded.

SCOPE OF EVALUATION (compliance with the following codes):

THIS IS A STRUCTURAL (WIND) PERFORMANCE EVALUATION ONLY. NO ELECTRICAL OR TEMPERATURE PERFORMANCE RATINGS OR CERTIFICATIONS ARE OFFERED OR IMPLIED HEREIN. UNDER NO CIRCUMSTANCE DOES THIS PERFORMANCE EVALUATION GUARANTEE, IMPLY, OR STATE PERFORMANCE OF THE UNIT IS MAINTAINED DURING OR AFTER A DESIGN EVENT.

This Product Evaluation Report is being issued in accordance with the requirements of the **Florida Building Code Eighth Edition (2023)** per ASCE 7, FBC Building Ch. 16, FBC Building Sections 104.11 & 1522.2, FBC Existing Building Sections 707.1 & 707.2, FBC Mechanical 301.15, FBC Residential M1202.1 & M1301.1, FS 471.025, and Broward County Administrative Provisions 107.3.4. This report is also in accordance with the **International Building & Residential Codes (2012, 2015, 2018, & 2021)**. The product noted in this report has been tested and/or evaluated as summarized herein.

IN ACCORDANCE WITH THESE CODES EACH OF THESE REPORTS MUST BEAR THE ORIGINAL SIGNATURE & RAISED SEAL OR DIGITAL SEAL OF THE EVALUATING ENGINEER.

SUBSTANTIATING DATA:

• Product Evaluation Documents

Substantiating documentation has been submitted to provide this TER and is summarized in the sections below.

• Structural Engineering Calculations

Structural engineering calculations have been prepared which evaluate the product based on comparative and/or rational analysis to qualify the following design criteria:

- Maximum rated wind pressures stated herein
- Anchor connection integrity, verified by a unity check between tension and shear.

Calculation summary is included in this TER and appears herein.

LIMITATIONS & CONDITIONS OF USE:

Use of the product(s) listed herein shall be in strict accordance with this TER as noted herein and manufacturer-provided model specifications. Installation shall conform to the minimum standards stated in the referenced building code(s) in addition to the specifications and limitations stated herein. See herein for complete limitations & conditions of use.

OPTIONS:

This evaluation is valid for the models listed herein. This evaluation includes standard product only. Contact Rehiko for Engineering Special (ES) orders. Any structural changes outside of the design as described herein would void this certification.

UNIT CASING MATERIALS:

See "Uniform (Static) Wind Loading" Technical Evaluation Report for the respective enclosure model and model-specific unit construction information.

TERMINOLOGY:

See herein for definitions of abbreviations used in this report.

VISIT ECALC.IO/REHLKO

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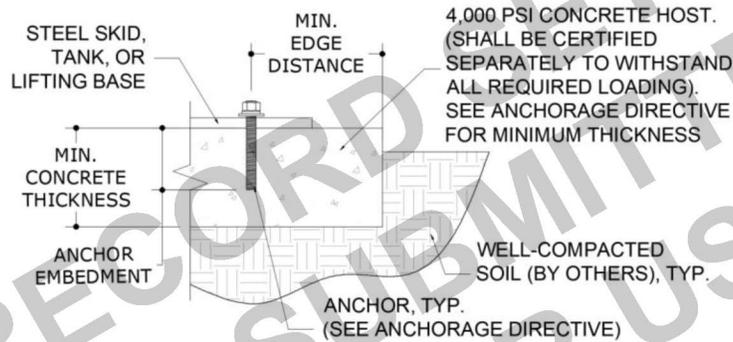
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ANCHORAGE DIRECTIVE INSTRUCTIONS

The following set of instructions is intended for use with the “Anchorage Directive” table shown on the following pages.

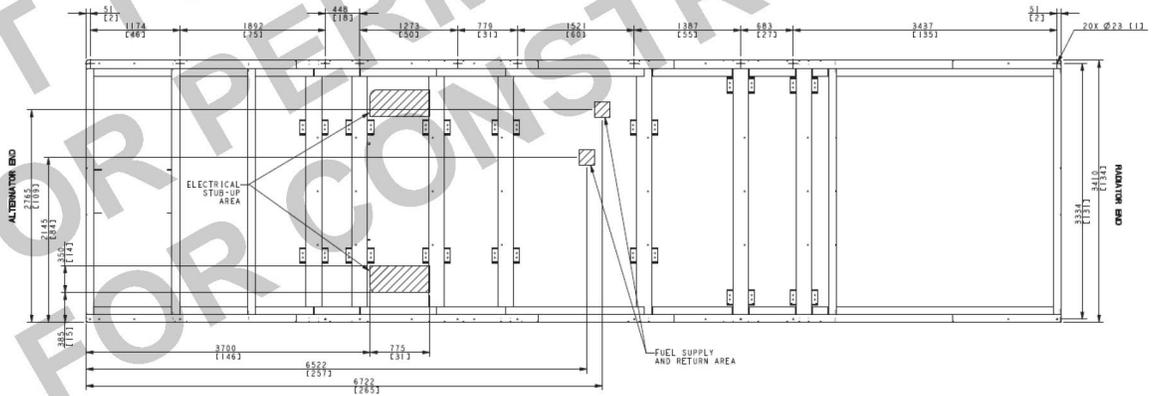
To determine anchorage specifications:

1. Locate the Generator model in the left-most column of the “Anchor Directive” table herein. (Note: “Anchorage Directive” table spans multiple pages.) The two columns right describe the associated Enclosure name and respective dimensional print (ADV).
2. Reading table data from left to right, select the correct size fuel tank where applicable, otherwise select “No Tank”.
3. Continue reading across from left to right for Anchor Specifications, which state: Anchor brand, model, nominal diameter, embedment, minimum edge distance, minimum concrete thickness, and total number of anchors, respectively. See the Anchor Illustration below. Note: Edge distance to concrete applies in all directions (i.e. any edge of concrete).



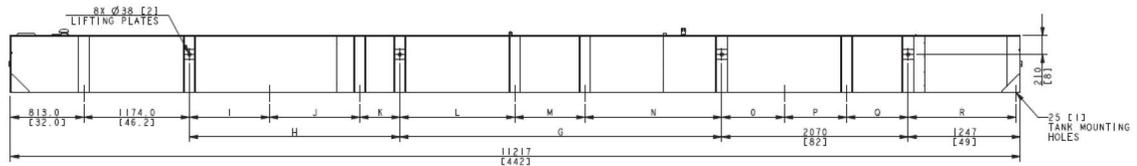
ANCHOR ILLUSTRATION
SCALE: NTS SECTION VIEW

4. **A: For enclosures anchored directly to host without a fuel tank:**
Go to the respective enclosure ADV and install the specified number of anchors at the delineated mounting hole locations. See the below example for the lifting base’s mounting holes: (The sample lifting base shown is for illustration only.)



- B: For enclosures mounted on fuel tanks and tanks anchored to the host:**

Go to the respective fuel tank ADV and install the specified number of anchors at the delineated mounting hole locations. See the below example for the fuel tank’s mounting holes: (The sample fuel tank in the example is for illustration only.)



5. Refer to Rehlko ADV-9107 and the “Wind Installation Requirements” section herein for additional installation instructions and directives.

ANCHORAGE DIRECTIVE

Genset Models	Enclosure		Fuel Tank			Anchor Specifications							
	Name	ADV	Liters	Gal	ADV	Anchoring Brand	Model	Diam. (in)	Embed. (in)	Min. Edge Distance (in)	Min. Concrete Thickness (in)	# of Anchors	
40-60 REOZK	Sound Aluminum	ADV-8740	No Tank			ADV-8753	HILTI	KWIK BOLT TZ2	0.625	4	6	6	4
			505	133	HILTI		KWIK BOLT TZ2	0.625	4	6	6	6	
			868	229									
			1043	275									
			1527	403									
			541	142									
			898	237									
			1057	279									
1520	401	ADV-8753	HILTI	KWIK BOLT TZ2	0.625	4	6	6	8				
KG25	KG25-60 Sound Aluminum Enclosure * *Note: Enclosure design is permitted to have modified internal door intake baffles	ADV-9039	No Tank			HILTI	KWIK BOLT TZ2	0.625	4	6	6	4	
KG30													
KG40													
KG40A													
KG45													
KG50													
KG60													
KG25-60	Sound Aluminum	ADV-10023	No Tank			HILTI	KWIK BOLT TZ2	0.625	4	6	6	4	
KG80	Sound Aluminum	ADV-9083	No Tank			HILTI	KWIK BOLT TZ2	0.625	4	6	6	6	
KG80 w/ Catalyst													
KG80A*	*Same as KG80 offerings listed above, except with modified internal rear intake ducts (permitted change by Engineering Express). See KG80 specifications above.												
KG100-125	Sound Aluminum	ADV-9083	No Tank			HILTI	KWIK BOLT TZ2	0.625	4	6	6	6	
80-100 REZGD	Sound Aluminum	ADV-7892	No Tank			HILTI	KWIK BOLT TZ2	0.625	4	6	6	6	
125-150 REZGC	Sound Aluminum	ADV-8459	No Tank			HILTI	KWIK BOLT TZ2	0.625	4	6	6	6	

SEE NEXT PAGES FOR ADDITIONAL ANCHORAGE DIRECTIVE ENTRIES

ANCHORAGE DIRECTIVE NOTES

See "Anchorage Directive Instructions" on page 2 for additional information on "Anchorage Directive" table. Anchorage calculations were based on ADV-9107 provided by Rehlko. See "Anchorage Directive Instructions" section, Rehlko ADV-9107, and the "Wind Installation Requirements" section herein for additional installation specifications.

ANCHORAGE DIRECTIVE, CONTINUED

Genset Models	Enclosure		Fuel Tank			Anchor Specifications						
	Name	ADV	Liters	Gal	ADV	Ancho r Brand	Model	Diam. (in)	Embed .(in)	Min. Edge Distance (in)	Min. Concrete Thicknes s (in)	# of Anchor s
80-100 REOZJF	Sound Aluminum	ADV- 7647	No Tank			HILTI	KWIK BOLT TZ2	0.75	3.75	6	8	6
			791	209	ADV- 8519	HILTI	KWIK BOLT TZ2	0.75	3.75	6	8	8
			815	215	ADV- 8522	HILTI	KWIK BOLT TZ2	0.75	3.75	6	8	16
			1317	348	ADV- 8519	HILTI	KWIK BOLT TZ2	0.75	3.75	6	8	8
			1570	415	ADV- 8522	HILTI	KWIK BOLT TZ2	0.75	3.75	6	8	16
			1696	448	ADV- 8519	HILTI	KWIK BOLT TZ2	0.75	3.75	6	8	8
			3089	816	ADV- 8522	HILTI	KWIK BOLT TZ2	0.75	3.75	6	8	6
125REOZJG 150REOZJF	Sound Aluminum	ADV- 7825	No Tank			HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	6
			1128	298	ADV- 7881	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	10
			1198	316								
			2207	583								
			2255	595	ADV- 7881	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	8
4402	1163											
180REOZJG 200REOZJF	Sound Aluminum	ADV- 7854	No Tank			HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	10
			1514	400	ADV- 7859	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	12
			2869	758								
			5742	1517	ADV- 7859	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	14
			1576	416								
2896	765											
180-200 REZXB	Sound Aluminum	ADV- 7669	No Tank			HILTI	KWIK BOLT TZ2	0.625	4.75	6	8	8
KG 150-200	Sound Aluminum	ADV- 9110	No Tank			HILTI	KWIK BOLT TZ2	0.625	4.75	6	8	12
230-275 REOZJE	Sound Aluminum	ADV- 7644	No Tank			HILTI	KWIK BOLT TZ2	0.75	4.75	12	14	12
			1787	472	ADV- 7645	HILTI	KWIK BOLT TZ2	0.75	4.75	12	14	14
			2102	555								
			3573	944								

SEE PREVIOUS / NEXT PAGES FOR ADDITIONAL ANCHORAGE DIRECTIVE ENTRIES

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See "Anchorage Directive Instructions" on page 2 for additional information on "Anchorage Directive" table. Anchorage calculations were based on ADV-9107 provided by Rehlko. See "Anchorage Directive Instructions" section, Rehlko ADV-9107, and the "Wind Installation Requirements" section herein for additional installation specifications.

ANCHORAGE DIRECTIVE, CONTINUED

Genset Models	Enclosure		Fuel Tank			Anchor Specifications						
	Name	ADV	Liters	Gal	ADV	Ancho r Brand	Model	Diam. (in)	Embed (in)	Min. Edge Distance (in)	Min. Concrete Thicknes s (in)	# of Anchor s
300REOZJ	Sound Aluminum	ADV-7664	No Tank			HILTI	KWIK BOLT TZ2	0.75	4.75	12	14	12
			2067	546	ADV-7645	HILTI	KWIK BOLT TZ2	0.75	4.75	12	14	14
			2102	555								
			4066	1074								
250REZXB 300REZXC	Sound Aluminum	ADV-7718	No Tank			HILTI	KWIK BOLT TZ2	0.75	4.75	10	12	8
300-350 REZXB	Sound Aluminum	ADV-8162	No Tank			HILTI	KWIK BOLT 3	0.75	5	12	12	8
400-450 REZXB	Sound Aluminum	ADV-8163										
350-500 REOZJB	Sound Level 2 Aluminum	ADV-8515	No Tank			HILTI	KWIK HUS-EZ	0.75	4	6	8	14
			1529-4394	404-1161	ADV-8528	HILTI	KWIK HUS-EZ	0.75	4	6	8	18
			5046	1333	ADV-8528	HILTI	KWIK HUS-EZ	0.75	4	6	8	20
			5765	1523	ADV-8528	HILTI	KWIK HUS-EZ	0.75	4	6	8	22
			6674	1763	ADV-8528	HILTI	KWIK HUS-EZ	0.75	4	6	8	24
			10008	2664								

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ANCHORAGE DIRECTIVE, CONTINUED

Genset Models	Enclosure		Fuel Tank			Anchor Specifications						
	Name	ADV	Liters	Gal	ADV	Ancho r Brand	Model	Diam. (in)	Embed (in)	Min. Edge Distance (in)	Min. Concrete Thicknes s (in)	# of Anchor s
350-500 REOZJ	Sound Level 2 Aluminum	ADV- 7990	No Tank			HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	12
			1507	398	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	14
			1529	404	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	16
			1733	458	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	14
			1772	468	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	16
			2903	767	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	14
			2930	774	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	16
			3346	884	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	14
			3384	894	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	16
			4296	1135	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	14
			4395	1161	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	16
			4974	1314	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	14
			5046	1333	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	18
			5765	1523								
				6674	1763							
	10084	2664	ADV- 8045	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	14		
500REOZVC 550-600 REOZVB	Sound Aluminum	ADV- 8417	No Tank			HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	14
			2048	541	ADV- 8417	HILTI	KWIK BOLT TZ2	0.75	4.75	6	8	20
			2037	538								
			3910	1033								
			3923	1038								
			5727	1513								
			5754	1520								
			7643	2019								
			7658	2023								
			11553	3052								

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KD 800-1000	Sound Level 2 Aluminum	ADV- 8919	No Tank			ADV- 8919	HILTI	KWIK BOLT TZ2	0.75	4.75	8	8	14
			3475	918	HILTI		KWIK BOLT TZ2	0.75	4.75	8	8	20	
			6621	1749									
			10573	2793									
			12969	3426									
			15740	4158	ADV- 8919		HILTI	KWIK BOLT TZ2	0.75	4.75	8	8	22
KD 1250A-1750	Sound Level 2 Aluminum	ADV- 8927	No Tank			ADV- 8927	HILTI	KWIK BOLT TZ2	0.75	4.75	12	12	16
			5863	1549	HILTI		HAD-P	M16	7.5	8	12	18	
			9860	2605									
			11204	2960	ADV- 8927		HILTI	HAD-P	M16	7.5	8	12	20
			19214	5076									
			21985	5808									
KD 2000-2500	Sound Level 2 Aluminum	ADV- 9075	No Tank			ADV- 9075	HILTI	KWIK BOLT TZ2	0.75	4.75	12	12	20
			8577	2266	HILTI		HAD-P	M16	7.5	8	12	24	
			14130	3733									
			16451	4346									

SEE PREVIOUS PAGES FOR ADDITIONAL ANCHORAGE DIRECTIVE ENTRIES

ANCHORAGE DIRECTIVE NOTES

See "Anchorage Directive Instructions" on page 2 for additional information on "Anchorage Directive" table. Anchorage calculations were based on ADV-9107 provided by Rehlko. See "Anchorage Directive Instructions" section, Rehlko ADV-9107, and the "Wind Installation Requirements" section herein for additional installation specifications.

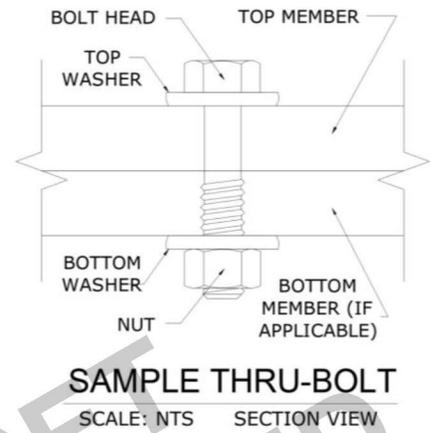
WIND INSTALLATION REQUIREMENTS

The following are requirements for wind-rated installations:

1. The design of post-installed anchors in concrete used for the component anchorage has been evaluated by this engineer for wind applications in accordance with ASCE 7 as referenced herein.
2. Anchors must be installed in minimum 4000 psi compressive strength normal weight concrete. Concrete aggregate must comply with ASTM C33. Installation in structural lightweight concrete is not permitted unless otherwise approved by the structural Engineer of Record.
3. Anchors must be installed to the torque specification as recommended by the anchor manufacturer to obtain maximum capacity.
4. Anchors must be installed in the locations specified in the Rehlko dimensional print (ADV) in correlation with the signed and sealed engineering herein. The more stringent requirement from either document shall apply in cases of uncertainty.
5. Anchor plates from Rehlko must be installed at each anchor location between the anchor head and the equipment for tension load distribution.
6. Concrete floor slab and concrete housekeeping pads must be designed, and rebar reinforced for wind applications in accordance with the current editions of the ACI "Building Code Requirements for Structural Concrete" and ASCE 7 as referenced herein.
7. All housekeeping pad thicknesses must be designed in accordance with pre-qualification test report or a minimum of 1.5x the anchor embedment depth, whichever is largest.
8. All housekeeping pads must be doweled or cast into the building structural floor slab and designed for wind application per appropriate code requirements for the subject jurisdiction and as approved by the structural Engineer of Record.
9. Wall-mounted equipment must be installed to a rebar reinforced structural concrete wall that is designed for wind applications and approved by the Engineer of Record to resist the added wind loads from the components being anchored to the wall.
10. Floor-mounted equipment (with or without housekeeping pad) must be installed to a rebar reinforced structural concrete floor that is designed for wind applications and approved by the Engineer of Record to resist the added wind loads from components being anchored to the floor.
11. When installing to a floor, rebar interference must be considered.
12. Attaching equipment to any floor other than those constructed of structural concrete and designed to accept the wind loads from said equipment is not permitted by this specification and beyond the scope of this certification.
13. Attaching equipment to any concrete block walls or cinder block walls is not permitted by this specification and beyond the scope of this certification.
14. Rooftop installations are not permitted by this specification and are beyond the scope of this certification.
15. Installation upon rooftop curbs shall be coordinated with the curb manufacturer and the Structural Engineer of Record. Any curb or concrete pad that supports the RTU unit is beyond the scope of this certification.
16. Anchor locations, size, type and load requirements shall be as specified on the certified installation specification. Mounting requirement details such as brand, type, embedment depth, edge spacing, anchor spacing, concrete strength, wall bracing, and special inspection must be outlined and approved by the project Structural Engineer of Record to withstand the wind anchor loads as defined on the certified installation specification. The installing contractor is responsible for the proper installation of all anchors and mounting hardware, observing the mounting requirement details outlined by the Engineer of Record. Contact Rehlko if a detailed Wind Installation Calculation Package is required.
17. Electrical wiring, piping, duct and other connections to the equipment is the responsibility of the installing contractor. It is necessary that these remain intact, functional and do not inhibit the functionality of the generator set after a wind event.
18. Concrete pad dimensions are minimum values designed to satisfy only the anchor requirements. The pad must be designed by the project Structural Engineer of Record.

TERMINOLOGY

The following abbreviations may appear in this report: “Addtl.” for “additional”, “AHJ” for “Authority Having Jurisdiction”, “alum” for “aluminum”, “ASCE” for “American Society of Civil Engineers”, “ASD” for “Allowable Stress Design”, “ASTM” for “American Society for Testing and Materials”, “EA” for “each”, “E.D.” for “edge distance”, “EDDS” for “extra deep drawing steel”, “e.g.” for “*exempli gratia*” or “for example”, “equiv.” for “equivalent”, “FBC” for “Florida Building Code”, “FEA” for “Finite Element Analysis”, “FLCA” for “Florida Certificate of Authorization”, “FS” for “Florida Statutes”, “Fu” for “ultimate tensile strength” or “ultimate tensile stress”, “Fy” for “yield strength” or “yield stress”, “GA” for “gauge”, “GR.” or “Gr.” for “grade”, “HVAC” for “heating, ventilation, and air conditioning”, “HVHZ” for “High-Velocity Hurricane Zone”, “i.e.” for “*id est*” or “in other words”, “in” for “inch”, “lb” for “pound (force)”, “max.” for “maximum”, “min.” for “minimum”, “mm” for “millimeter”, “NTS” for “not to scale”, “O.C.” for “on center”, “OD” for “outer diameter”, “pcf” for “pounds (force) per cubic foot”, “PE” for “Professional Engineer”, “qty” for “quantity”, “SAE” for “Society of Automotive Engineering”, “SMS” for “sheet metal screws”, “SS” for “stainless steel”, “TER” for “Technical Evaluation Report”, “typ.” for “typical”, “ult” for “ultimate loads”, “U.N.O.” for “unless noted otherwise”, “UTS” for “ultimate tensile strength” or “ultimate tensile stress”, “WLL” for “working load limit”, “w/o” for “without”, “YS” for “yield strength” or “yield stress”, “#” for “number”, “&” for “and”, and “Ø” for “diameter”. Please visit ecalcul.io/glossary for additional abbreviation clarifications.



Note: The term “Thru-Bolt” or through bolt, if used herein, refers to a bolt passing through the member(s) in contact and is fastened by a nut at the end opposite the screw head. Nut shall be equivalent to or exceed the strength of the bolt U.N.O. Nut shall be sized to accommodate the same nominal diameter as the bolt U.N.O. See diagram above-right for a sample thru-bolt configuration.

Note: For instances herein which list material specifications as “[material type] or stronger”: U.N.O. herein, the term “stronger” refers to a material with a UTS value equal to or greater than the UTS value of the stated material type. Consult appropriate literature for established material UTS values.

Note: Equivalent steel gauge thicknesses as used in this evaluation, U.N.O., are as follows: 22 GA (.030”), 20 GA (.036”), 18 GA (.048”), 16 GA (.060”), 14 GA (.075”), 12 GA (.098”).

LIMITATIONS & CONDITIONS OF USE, CONTINUED

Host Structure: The supporting host structure shall be designed to resist all superimposed loads as determined by others on a site-specific basis as may be required by the Authority Having Jurisdiction. No evaluation is offered for the host supporting structure by use of this document.

Production Drawings: The following drawings shall be accessible if required for a full permit application to be submitted to the Authority Having Jurisdiction in conjunction with this TER:

- Electrical schematic(s)
- Final assembly drawings and parts lists sufficient to detail primary components, operator controls, and their locations
- Complete set of mechanical drawings for all machined parts
- Complete part specifications (including manufacturer’s model numbers, size, ratings, etc.) for all purchased parts
- Specification sheets for all parts/components
- Drawings showing all construction details
- Product label drawing(s) showing all required marking information. The label drawing shall show the proposed label location on the equipment and artwork showing the manufacturer’s name, address, model and serial numbers, equipment ratings, warning markings.

Drawing and Change Control: The manufacturer shall establish a system of product configuration control that shall allow no unauthorized changes to the product. Changes to critical documents, identified in this Technical Evaluation Report, must be reported to, and authorized by, this office prior to implementation for production.

Survivability: Evaluation reports are valid for a newly installed unit and do not include certification of the product beyond a design event or if impacted by any debris. Inspections shall be implemented annually by the end user and after every named storm. All fasteners and cabinet components are to be verified, and all damaged, loose, corroded, and/or broken fasteners and cabinet components shall be replaced to ensure structural integrity against hurricane wind forces. Contact this office for any reevaluation needs or as designated by the Authority Having Jurisdiction.

Durability: Components or component assemblies shall not deteriorate, crack, fail, or lose functionality due to galvanic corrosion or weathering. All supporting components that are permanently installed shall be protected against corrosion, contamination, and other such damage at all times. Each component or component assembly shall be supported and oriented in its intended installation position. All exposed plastic components shall be certified to resist sunlight exposure as specified by ASTM B117, or ASTM G155 in Broward or Miami-Dade counties.

Extent of Certification: Certification pertains to the anchorage of the generator enclosure and/or fuel tank to the host structure by others, subject to the limitations and criteria stated herein. Operability during or after a design event is not included in this certification. Water infiltration is outside the bounds of this certification. No other certifications are intended other than as described herein. This evaluation alone does not offer any evaluation for uniform static wind loading, large missile impact debris, or cyclic wind requirements unless specifically stated herein.

Proj. #	Remarks	By	Checked	Date	Proj. #	Remarks	By	Checked	Date
18-6258.25	Initial Issue	LAO	LAO	04/01/19	24-76917	2023 FBC Update	EPR	EPR	06/21/24
18-6258.25	KG200 Added	LAO	LAO	12/20/19	24-76917	ADV-9107 Revision	MARH	EPR/RWN	03/25/25
20-28238	2020 FBC Update	JC, ER	EPR	05/04/21	24-76917	Branding Changes	MARH	RWN	05/09/25

PROTOTYPE TEST REPORT



Models Covered: **100REOZJF**
Model Tested: **100REOZJE**
Cooling System Tested: **50C**

Alternator Tested: **4S9**
Engine Tested: **4045HF285L**
Voltage Tested: **208V**

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.

± 0.25 % 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.

Full Load Acceptance

32.1 % Voltage Dip

3.90 Seconds of Recovery Time

22.5 % Frequency Dip

3.70 Seconds of Recovery Time

Full Load Rejection

19.1 % Voltage Overshoot

1.50 Seconds of Recovery Time

5.90 % Frequency Overshoot

0.40 Seconds of Recovery Time

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

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)

Models Covered: **100REOZJF**
Model Tested: **100REOZJE**
Cooling System Tested: **50C**

Alternator Tested: **4S9**
Engine Tested: **4045HF285L**
Voltage Tested: **208V**

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®

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