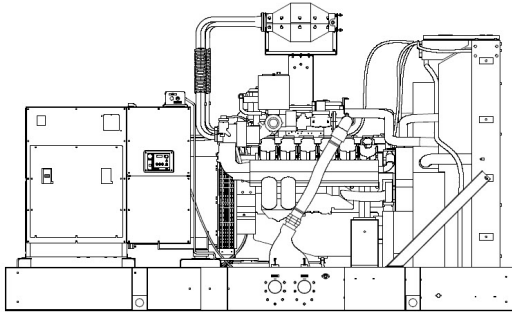




Woodstock Power Company
4055 Richmond Street
Philadelphia, PA 19137
P: 610-658-3242
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Generator



Kohler Model: 350REZXD

This gas generator set equipped with a 4M4019 alternator operating at 120/208 volts is rated for 350 kW/438 kVA. Output amperage: 1216

Standard Features:

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- EPA-Certified for Stationary Emergency Applications
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a cULus listing.
- The generator set accepts rated load in one step.
- The 60 Hz emergency 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-and five-year extended warranties are also available.
- Alternator Protection
- Battery Rack and Cables
- Closed Crankcase Ventilation (CCV) Filters
- Dual Fuel Reset Box (standard on dual fuel models)
- Integral Vibration Isolation
- Local Emergency Stop Switch
- Low Coolant Level Shutdown
- Oil Drain Extension
- Secondary Gas Solenoid Valve
- Three-Way Exhaust Catalyst

Other Features:

- Natural gas is the primary fuel. Automatically transfers back to primary fuel when LP fuel becomes low or generator stops and restarts.
- The patented pending reset box on the generator provides the ability to manually transfer back to natural gas. The natural gas rating is available when running on natural gas.
- APM603 controller provides load shed for automatic derate to LP ratings to prevent an overload condition.

Alternator Features:

- The pilot-excited, permanent-magnet (PM) alternator provides superior short-circuit capability.
- The brushless, rotating-field alternator has broad range reconnectability.

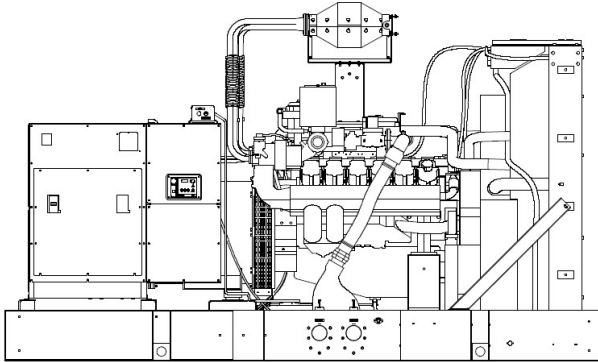


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Qty	Description
	350REZXD Generator System
1	350REZXD Generator Set Includes the following: Literature Languages English Approvals and Listings UL2200 Listing/cUL Genset List Engine 350REZXD,24V,SINGLE FUEL,NG Nameplate Rating Standby 130C Rise Voltage 60Hz, 120/208V, Wye, 3Ph, 4W Alternator 4M4019 Cooling System Unit Mounted Radiator, 50C Skid and Mounting Skid Controller APM402 Enclosure Type Weather Enclosure Material Steel Starting Aids, Installed 6000W,208V,1Ph,w/Valves Electrical Accy.,Installed Battery, 2/12V, Wet Electrical Accy.,Installed Battery Charger, 10A Electrical Accy.,Installed Run Relay Electrical Accy.,Installed 2 Input/5 OutputModule Rating, LCB 1 Right 100% Rated Amps, LCB 1 Right 100 Trip Type, LCB 1 Right Thermal Magnetic LCB 1 Right Interrupt Rating 18kA at 480V Rating, LCB 1 Left 100% Rated Amps, LCB 1 Left 1000 Trip Type, LCB 1 Left Electronic, LSI LCB 1 Left Interrupt Rating 35kA at 480V Exceeds LTL Shipping Height Add'l Shipping Charge Accepted Miscellaneous Accy,Installed Air Cleaner Restriction Ind. Miscellaneous Accy,Installed Coolant in Genset Warranty 5 Year Comprehensive Testing, Additional Power Factor Test,0.8,3Ph Only 1 NEC Remote, E-Stop 1 Flexible Fuel Line 1 Lit Kit, General Maintenance, 350REZXD 1 RSA III, Annunciator only

KOHLER®

Spec Sheets



Standard Features

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- The patented pending reset box on the generator provides the ability to manually transfer back to natural gas. The natural gas rating is available when running on natural gas.
- APM603 controller provides load shed for automatic derate to LP ratings to prevent an overload condition.

Generator Set Rating

Standby 130C Rise Ratings

Alternator	Voltage	Ph	Hz	kW/kVA	Amps
4M4019	120/208	3	60	350/438	1216

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.

Model: 350REZXD, continued

Alternator Specifications

Specifications	Alternator
Alternator manufacturer	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet Pilot Exciter
Leads, quantity	12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation	NEMA MG1
Insulation: Material	Class H, Synthetic, Nonhydroscopic
Insulation: Temperature Rise	130 ° C, 150 ° C Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible disc
Amortisseur windings	Full
Rotor balancing (60Hz)	125%
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. <ul style="list-style-type: none"> • Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds. • 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. • Superior voltage waveform from a two-thirds pitch stator and skewed rotor. • Brushless alternator with brushless pilot exciter for excellent load response. 	

Engine

Engine Specification

Engine Manufacturer	Doosan
Engine Model	D183L
Engine: type	18.3 L, 4-Cycle, Turgocharged, Charge Air-Cooled
Cylinder arrangement	V-10
Displacement, L (cu. in.)	18.273 (1115)
Bore and stroke, mm (in.)	128 x 142 (5.0 x 5.6)
Compression ratio	10.5:1
Piston speed, m/min. (ft./min.)	511 (1677)
Main bearings: quantity, type	12, Precision Half-Shell
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	422 (566)
Cylinder head material	Cast Iron
Crankshaft material	Forged Steel
Governor: type, make/model	Electronic
Frequency regulation, no-load to-full load	Isochronous
Frequency regulation, steady state	± 0.5%
Frequency	Fixed
Air cleaner type, all models	Dry

Model: 350REZXD, continued

Exhaust

Exhaust System

Exhaust Manifold Type	Wet
Exhaust flow at rated kW, kg/hr. (cfm)	1492 (2366)
Maximum allowable back pressure after catalyst, kPa (in. Hg)	5.1 (1.5)
Exhaust temperature at rated kW, dry exhaust, ° C (° F)	600 (1112)
Maximum allowable back pressure, kPa (in. Hg)	10.2 (3)
Exh. outlet size at eng. hookup, mm (in.)	See ADV Drawing

Engine Electrical

Engine Electrical System

Battery charging alternator: Ground (negative/positive)	Negative
Battery charging alternator: Volts (DC)	24
Battery charging alternator: Ampere rating	45
Starter motor rated voltage (DC)	24
Battery, recommended cold cranking amps (CCA): Qty., CCA rating each	Two, 925
Battery voltage (DC)	12

Fuel

Fuel System

Fuel type	Natural Gas
Fuel supply line inlet	3.0 NPTF
Natural gas/LPG fuel supply pressure, kPa (in. H ₂ O). Fuel supply pressure measured at the generator set fuel inlet downstream of any fuel system equipment accessories.	1.74-2.74 (7-11)

Fuel Composition

Fuel Composition

Natural Gas: Methane, % by volume	90 min.
Natural Gas: Ethane, % by volume	4.0 max.
Natural Gas: Propane, % by volume	1.0 max.
Natural Gas: Propene, % by volume	0.1 max.
Natural Gas: C4 and higher, % by volume	0.3 max.
Natural Gas: Sulfur, ppm mass	25 max.
Natural Gas: Lower heating value, kJ/m ³ (Btu/ft ³), min.	33.2 (890)

* Fuels with other compositions may be acceptable. If your fuel is outside the listed specifications, contact your local distributor for further analysis and advice.

Lubrication

Lubrication System

Type	Full Pressure
Oil pan capacity, L (qt.)	35 (37.0)
Oil pan capacity with filter, L (qt.)	42.1 (44.5)
Oil filter: quantity, type	2, Cartridge
Oil cooler	Water-Cooled

Model: 350REZXD, continued

Cooling

Radiator System

Ambient temperature, ° C (° F)	50 (122)
Engine jacket water capacity, L (gal.)	42 (11)
Radiator system capacity, including engine, L (gal.)	177 (46.7)
Engine jacket water flow, Lpm (gpm)	660 (174)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	365 (20784)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	36.2 (2060)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	1321 (52)
Fan, kWm (HP)	20.9 (28)
Max. restriction of cooling air, intake and discharge side of radiator, kPA (in. H2O)	0.125 (0.5)

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

Operation Requirements

Air Requirements

Radiator-cooled cooling air, m3/min. (scfm) *	820 (29000)
Combustion air, kg/hr. (cfm)	1408 (788)
Heat rejected to ambient air: Engine, kW (Btu/min.)	55 (3121)
Heat rejected to ambient air: Alternator, kW (Btu/min.)	21 (1195)

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

Fuel Consumption

Natural Gas, m3/hr. (cfh) at % load	Rating
Standby Fuel Consumption at 100% load	117 m3/hr. (4131 cfh)
Standby Fuel Consumption at 75% load	92.0 m3/hr. (3247 cfh)
Standby Fuel Consumption at 50% load	67.8 m3/hr. (2394 cfh)
Standby Fuel Consumption at 25% load	43.5 m3/hr. (1535 cfh)

Kohler® APM402 Controller**General Description and Function**

The APM402 generator set controller provides advanced control, system monitoring, and system diagnostics for optimum performance.

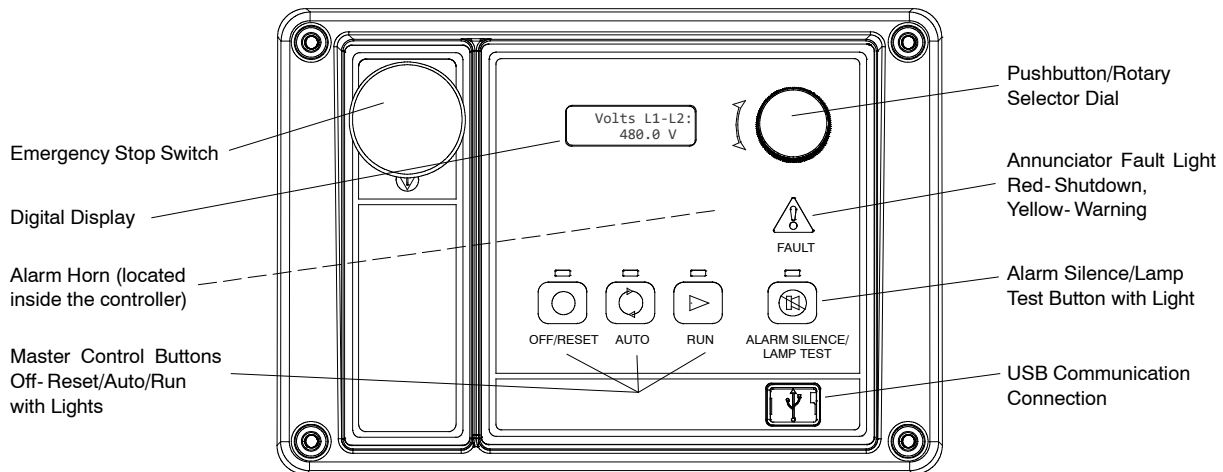
The APM402 controller meets NFPA 110, Level 1 when equipped with the necessary accessories and installed per NFPA standards.

The APM402 controller uses a patented hybrid voltage regulator and unique software logic to manage alternator thermal overload protection features normally requiring additional hardware. Additional features include:

- A digital display and pushbutton/rotary selector dial provide easy local access to data.
- Measurements selectable in metric or English units.
- The controller can communicate directly with a personal computer via a network or serial configuration using SiteTech™ or Monitor III software.
- The controller supports Modbus® protocol. Use with serial bus or Ethernet networks. (Ethernet requires an external Modbus®/Ethernet converter module.)
- Scrolling display shows critical data at a glance.
- Digital display of power metering (kW and kVA).
- Integrated hybrid voltage regulator providing $\pm 0.5\%$ regulation.
- Built-in alternator thermal overload protection.

Modbus® is a registered trademark of Schneider Electric.

**APM402**



User Interface Controls and Components

- Emergency stop switch
- Backlit LCD digital display with two lines of 12 characters (see *User Interface Displays for menus*)
- Alarm horn indicates generator set shutdown and warning faults
- Environmentally sealed membrane keypad with three master control buttons with lights
 - Off/Reset (red)
 - Auto (green)
 - Run (yellow)
- Pushbutton/rotary selector dial for menu navigation
 - Rotate dial to access main menus
 - Push dial and rotate to access sub menus
 - Press dial for 3 seconds to return to top of main menu
- Annunciator fault light
 - System shutdown (red)
 - System warning (yellow)
- Alarm silence/lamp test button
 - Alarm silence
 - Lamp test
- USB and RS-485 connections
 - Allows software upgrades
 - Provides access for diagnostics
 - PC communication using SiteTech™ or Monitor III software
- Dedicated user inputs
 - Remote emergency stop switch
 - Remote 2-wire start for transfer switch
 - Auxiliary shutdown
- Integrated hybrid voltage regulator
- Auto-resettable circuit protection mounted on circuit board.
- One relay output standard. Optional five relay output available.
- One analog and three digital inputs standard. Optional two inputs available.

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 Controller Displays as Provided by the Engine ECM.

User Interface Displays

The listing below has ● denoting main menus and ○ denoting sub-menus.

- Overview
 - Software version
 - Active shutdowns and warnings (if any are present)
 - Engine run time, total hours
 - Average voltage line-to-line
 - Frequency
 - Average current
 - Coolant temperature
 - Fuel level or pressure *
 - Oil pressure
 - Battery voltage
- Engine Metering
 - Engine speed
 - Oil pressure
 - Coolant temperature
 - Battery voltage
- Generator Metering
 - Total power, VA
 - Total power, W
 - Rated power, %
 - Voltage, L-L and L-N for all phases
 - Current, L1, L2, L3
 - Frequency
- GenSet Information
 - Generator set model number
 - Generator set serial number
 - Controller serial number
- GenSet Run Time
 - Engine run time, total hours
 - Engine loaded, hours
 - Number of engine starts
 - Total energy, kWh
- GenSet System
 - System voltage
 - System frequency, 50 or 60 Hz
 - System phase, single or three (wye or delta)
 - Power rating, kW
 - Amp rating
 - Power type, standby or prime
 - Measurement units, metric or English (user selectable)
 - Alarm silence, always or auto only (NFPA 110)
 - Manual speed adjust *
- GenSet Calibration
 - Voltage, L-L and L-N for all phases
 - Current, L1, L2, L3
 - Reset calibration
- Voltage Regulation
 - Adjust voltage, ±10%
- Digital Inputs
 - Input settings and status
- Digital Outputs
 - Output settings and status
- Analog Inputs
 - Input settings and status
- Event Log
 - Event history (stores up to 1000 system events)
- Selector Switch (requires initial activation by SiteTech™)

Controller Features

- **AC Output Voltage Regulator Adjustment.** The voltage adjustment provides a maximum of $\pm 10\%$ of the system voltage.
- **Alarm Silence.** The controller can be set up to silence the alarm horn only when in the AUTO mode for NFPA-110 application or Always for user convenience.
- **Alternator Protection.** The controller provides generator set overload and short circuit protection matched to each alternator for the particular voltage/phase configuration.
- **Automatic Restart.** The controller automatic restart feature initiates the start routine and re crank after a failed start attempt.
- **Common Failure Relay.** This relay is integrated on the controller circuit board. Contacts are rated 2 amps at 32 VDC or 0.5 amp at 120 VAC.
- **Communication.** Controller communication is available.
- **Cyclic Cranking.** The controller has programmable cyclic cranking.
- **ECM Diagnostics.** The controller displays engine ECM fault code descriptions to help in engine troubleshooting.
- **Engine Start Aid.** The starting aid feature provides control for an optional engine starting aid.
- **Event Logging.** The controller keeps a record (up to 1000 entries) for warning and shutdown faults. This fault information becomes a stored record of system events and can be reset.
- **Historical Data Logging.** Total number of generator set successful starts is recorded and displayed.
- **Integrated Hybrid Voltage Regulator.** The voltage regulator provides $\pm 0.5\%$ no-load to full-load regulation with three-phase sensing.
- **Lamp Test.** Press the alarm silence/lamp test button to verify functionality of the indicator lights.
- **LCD Display.** Adjustable contrast for improving visibility.
- **Measurement Units.** The controller provides selection of English or metric displays.
- **Power Metering.** Controller digital display provides kW and kVA.
- **Programming Access (USB).** Provides software upgrades and diagnostics.
- **Remote Reset.** The remote reset function resets faults and allows restarting of the generator set without going to the master control switch off/reset position.
- **Remote Monitoring Panel.** The controller is compatible with the Kohler® Remote Serial Annunciator.
- **Run Time Hourmeter.** The generator set run time is displayed.
- **Time Delay Engine Cooldown (TDEC).** The TDEC provides a time delay before the generator set shuts down.
- **Time Delay Engine Start (TDES).** The TDES provides a time delay before the generator set starts.
- **Voltage Selection Menu.** This menu provides the capability of quickly switching controller voltage calibrations. Requires initial activation using SiteTech™ software. **NOTE:** Generator set output leads require voltage reconnection.

Controller Functions

The following chart shows which functions cause a warning or shutdown. All functions are available as relay outputs.

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

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

	Warning Function	Shutdown Function
Engine Functions		
Critically high fuel level *	○	
ECM communication loss		●
ECM diagnostics	●	●
Engine over speed		●†
Engine start aid active		
Engine under speed		●
Fuel tank leak *	○	○
High battery voltage	●	
High coolant temperature	●	●†
High fuel level *	○	
Low battery voltage	●	
Low coolant level		●
Low coolant temperature	●	
Low cranking voltage	●	
Low engine oil level *	○	○
Low fuel level (diesel models) *	○	○
Low fuel pressure (gas models) *	○	
Low oil pressure	●	●†
No coolant temperature signal		●
No oil pressure signal		●
Overcrank		●†
Speed sensor fault	●	
General Functions		
Alarm horn silenced		
Analog inputs	○	○
Battery charger fault *	●	
Chicago code active *		
Common fault (includes †)		●
Common warning	●	
Digital inputs	○	○
Emergency stop		●†
Engine cooldown (delay) active		
Engine start delay active		
Engine started		
Engine stopped		
EPS supplying load		
Generator running		
Input/output communication loss	●	
Internal failure		●
Master switch not in auto	●	
NFPA 110 alarm active		
Remote start		
System ready		
Generator Functions		
AC sensing loss	●	●
Alternator protection		●
Ground fault input *	●	
kW overload		●
Locked rotor		●
Overfrequency		●
Overvoltage (each phase)		●
Underfrequency		●
Undervoltage (each phase)		●

● Standard function

○ Available user function

* Function requires optional input sensors or kits and is engine dependent; see Controller Displays as Provided by the Engine ECM.

† Items included with common fault shutdown



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 US and Canada, phone 1-800-544-2444
 KOHLERPower.com

Controller Displays as Provided by the Engine ECM	Engine Manufacturer (and Model)						
	Kohler Diesel (KDI M, TM*)	Kohler Diesel (KDI TCR)	Kohler Gas (KG2204, KG2204T)	Kohler Gas (KG6208, KG6208T, KG10V08, KG10V08T)	GM and PSI/Doosan	John Deere	Volvo
Intake air pressure							D
Intake air Temperature		D		D	D	D	D
Coolant level			D	D	D	D	D
Coolant temperature		D	C/S/D	C/S/D	C/S/D	C/S/D	C/S/D
Crankcase pressure							D
ECM battery voltage	S		S/D	S	S		
Engine speed	C/S/D	C/S/D	C/S/D	C/S/D	C/S/D	C/S/D	C/S/D
Fuel pressure		D		C/S/D	C/S/D	C/S†	C/S/D
Fuel temperature		D				S/D	S
Oil level				S†	S†	S†	S†
Oil pressure		C/S/D	D	C/S/D	C/S/D	C/S/D	C/S/D
Oil temperature			S				SD

C = Value displayed on controller, S = Value displayed in Site Tech, D = ECU diagnostic is supported
 * Electronic governor and ECM are optional on KDI M and TM engines.
 † Controller uses local analog input to obtain this information.

Note: REOZMD/ROZMC (Mitsubishi engines) have an ECM but do not send signals to the generator set controller.

Note: See the generator set specification sheet for engine model identification.

Controller Specifications

- Power source with circuit protection: 12- or 24-volt DC
- Power drain: 200 milliamps at 12 VDC or 100 milliamps at 24 VDC
- Humidity range: 5% to 95% noncondensing
- Operating temperature range: -40°C to +70°C (-40°F to +158°F)
- Storage temperature range: -40°C to +85°C (-40°F to +185°F)
- Standards:
 - CE Directive
 - NFPA 99
 - NFPA 110, Level 1
 - CSA 282-09
 - UL 508
 - ASTM B117 (salt spray test)
- Panel dimensions—W x H, 229 x 160 mm (9.0 x 6.3 in.)

APM402 Available Options

- Float/Equalize Battery Charger** available with 6 or 10 amp output for 12 or 24V DC voltage output. The 10 amp model provides NFPA 110 charging and alarming capability.
- Manual Speed Adjust** available for applications using closed transition ATS. Adjustment range for 60 Hz: 1751- 1849 rpm (58.2- 61.8 Hz) and for 50 Hz: 1451- 1549 rpm (48.2- 51.8 Hz).
- Prime Power Switch** prevents battery drain during generator set non-operation periods and when the generator set battery cannot be maintained by an AC battery charger.
- Remote Emergency Stop Switch** available as a wall mounted panel to remotely shut down the generator set.
- Remote Monitoring Panel.** The Kohler® 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.
- Run Relay** provides a relay indicating that the generator set is running.
- 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.
- Two Input/Five Output Module** provides a generator set mounted panel with two inputs and five relay outputs.

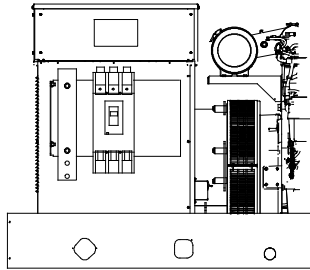
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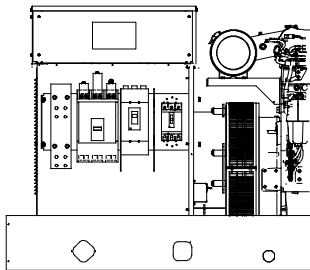
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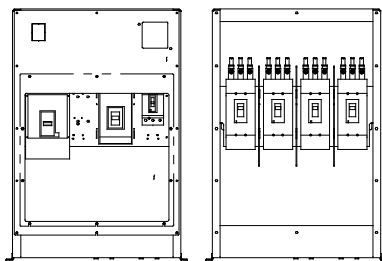
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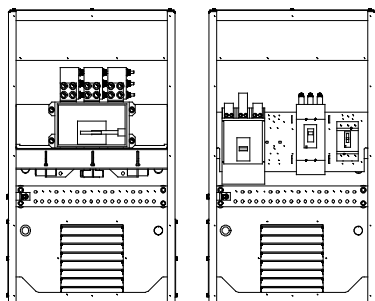
Single Circuit Breaker Kit with Neutral Bus Bar
15-300 kW Model Shown



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



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



Circuit Breaker Kits with Neutral Bus Bar
700-2500 kW KD Model Shown

Standard Features

- The line circuit breaker interrupts the generator set output during a short circuit and protects the wiring when an overload occurs. Use the circuit breaker to manually disconnect the generator set from the load during generator set service.
- Circuit breaker kits are mounted to the generator set and are provided with load-side lugs and neutral bus bar.
- Kohler Co. 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.

300-2250* kW Line Circuit Breaker Specifications

* Includes models 300REZXB and 300RZXB. For models 300REOZJ and 300REZXC, see the 15- 300 kW section. For KD model generator sets, see pages 8 and 9.

80% Rating Circuit Breaker

Alt. Model	Ampere Range	Trip Type	C. B. Frame Size
4M 5M 7M	15- 150	Thermal Magnetic	HD
	60- 150	Electronic LI	HD
		Electronic LSI	
		Electronic LSIG	
	175- 250	Thermal Magnetic	JD
	250	Electronic LI	
		Electronic LSI	
	60- 150	Electronic LI	HG
		Electronic LSI	
		Electronic LSIG	
	250	Electronic LI	JG
		Electronic LSI	
		Electronic LSIG	
	30	9- 325 A. Mag. Trip	HJ
	50	84- 546 A. Mag. Trip	
	100	180- 1040 A. Mag. Trip	
	150	348- 1690 A. Mag. Trip	
	250	684- 2500 A. Mag. Trip	JJ
	300- 400	Thermal Magnetic	LA
	400	500- 1000 A. Mag. Trip	
		750- 1600 A. Mag. Trip	
		1000- 2000 A. Mag. Trip	
		1125- 2250 A. Mag. Trip	
		1250- 2500 A. Mag. Trip	
		1500- 3000 A. Mag. Trip	
		1750- 3500 A. Mag. Trip	
	2000- 4000 A. Mag. Trip		
	400- 600	Electronic LI	LG
		Electronic LSI	
		Electronic LSIG	
800	Electronic LI	MG	
1000- 1200	Thermal Magnetic	PG	
800- 1200	Electronic LSI		
	Electronic LSIG		
1200	Thermal Magnetic	PJ	
	Electronic LSI		
	Electronic LSIG		
1600- 2500	Thermal Magnetic	RJ	
	Electronic LSI		
	Electronic LSIG		

100% Rating Circuit Breaker

Alt. Model	Ampere Range	Trip Type	C. B. Frame Size
4M 5M 7M	15- 150	Thermal Magnetic	HD
	60- 150	Electronic LI	
		Electronic LSI	
		Electronic LSIG	
	175- 250	Thermal Magnetic	JD
	250	Electronic LI	
		Electronic LSI	
	60- 150	Electronic LI	HG
		Electronic LSI	
		Electronic LSIG	
	250	Electronic LI	JG
		Electronic LSI	
		Electronic LSIG	
	400	Electronic LI	LG
		Electronic LSI	
	600- 1200	Electronic LSI	PG
		Electronic LSIG	
	1200	Electronic LSI	PJ
		Electronic LSIG	
	1600- 2500	Electronic LSI	RJ
Electronic LSIG			
1600- 3000	Electronic LSI	NW	
	Electronic LSIG		

100% Rating Electrically Operated Breakers

For use as paralleling breakers.*

Alt. Model	Amps	Trip Unit	Frame
4M 5M 7M	250, 400, 600, 800, 1000, 1200	3.0 LI	PJ
		5.0 LSI	PJ
		3.0 LI	PL
	1600, 2000, 2500, 3000	5.0 LSI	PL
		Electronic LSI	NW
		Electronic LSIG	NW

* P-frame breakers can be used with the Decision-Maker® 6000 Controller/DPS System or APM603 controller. NW breakers are for use with the APM603 only.

All circuit breakers listed in this table include line side bus and load side lugs, 24VDC motor operators, and 1 type C SDE overcurrent switch contact. P-frame breakers include 2 type C auxiliary contacts. NW breakers include 4 auxiliary contacts.

No second breakers are allowed in combination with these breakers.

Load Bus Rating

Gen. Set kW	Alt. Model	Rating, Amperes	Type
350- 2250 kW	4M/ 5M/ 7M	3000	Load Bus

300- 2250* kW Line Circuit Breaker Specifications

* Includes models 300REZXB and 300RZXB. For models 300REOZJ and 300REZXC, see the 15- 300 kW section. For KD model generator sets, see pages 8 and 9.

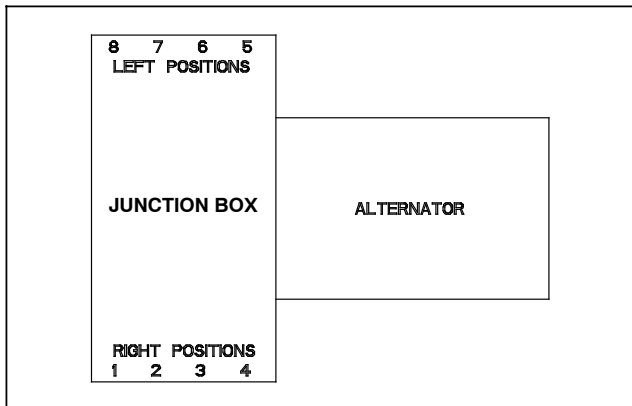
Interrupting Ratings

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			
NW	100	100	85
PG	65	35	18
PJ	100	65	25
PL	125	65	25
RJ	100	65	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
M	800	Three 3/0 to 500 kcmil
	600-800	Three 3/0 to 500 kcmil
P	1000-1200	Four 3/0 to 500 kcmil
RJ	1600-2500	(8) 1/0 to 750 kcmil or (16) 1/0 to 300 kcmil
NW	1600-3000	(10) 1/0 to 750 kcmil or (20) 1/0 to 300 kcmil

Breaker Positions



NOTE: Breaker and load bus phasing on right positions is A- B- C and on left positions is C- B- A.

NOTE: H, HG, J, JG, and LG-frames when selected with LSIG trip require two mounting spaces (one space for the breaker and one space for the LSIG neutral). These combinations are not reflected in the Multiple Circuit Breaker Combinations table on this page.

Multiple Circuit Breaker Combinations

Alternator Model	Positions			
	1 or 5	2 or 6	3 or 7	4 or 8
4M/ 5M/ 7M	H/J			
	H/J	H/J		
	H/J	H/J	H/J	
	H/J	H/J	H/J	H/J
	LA			
	LA	H/J		
	LA	LA		
	LA	H/J	H/J	
	LA	LA	H/J	
	LA	LA	LA	
	LA	H/J	H/J	H/J
	LA	LA	H/J	H/J
	LA	LA	LA	H/J
	LA	LA	LA	LA
	LG			
	LG	H/J		
	LG	LA		
	LG	LG		
	LG	H/J	H/J	
	LG	LA	H/J	
	LG	LA	LA	
	LG	LG	H/J	
	LG	LG	LA	
	LG	LG	LG	
	LG	H/J	H/J	H/J
	LG	LA	H/J	H/J
	LG	LA	LA	H/J
	LG	LA	LA	LA
	LG	LG	H/J	H/J
	LG	LG	LA	LA
	LG	LG	LG	H/J
	LG	LG	LG	LA
LG	LG	LG	LG †	
M/P				
M/P		H/J		
M/P		LA		
M/P		LG		
M/P		M/P ‡		
M/P		H/J	H/J	
M/P		LA	H/J	
M/P		LA	LA	
M/P		LG	H/J	
M/P		LG	LA	
M/P		LG	LG †	
R §				
NW §				
LOAD BUS KIT §				

† Frame size LG is not available in position 4 with 1219 mm (48 in.) junction box.

‡ Frame sizes M/P are not available in position 3 or 4 with 1219 mm (48 in.) junction box.

§ R breakers, NW breakers, and the load bus kit occupy all four positions on a side.

Powerpack® H- and J-Frame 15A to 250A Molded Case Circuit Breakers

Delivering unmatched application flexibility

Well-suited to a wide range of applications, the Powerpack H- and J-Frame Molded Case Circuit Breakers feature a full complement of field installable accessories, field installable trip units and improved interrupting ratings. These Molded Case Circuit Breakers deliver unmatched design flexibility for 15A to 250A applications and share identical mounting holes, handle locations, trim dimensions and accessories, allowing customers to standardize equipment designs for 15A to 250A applications.



HD and HG 2-Pole



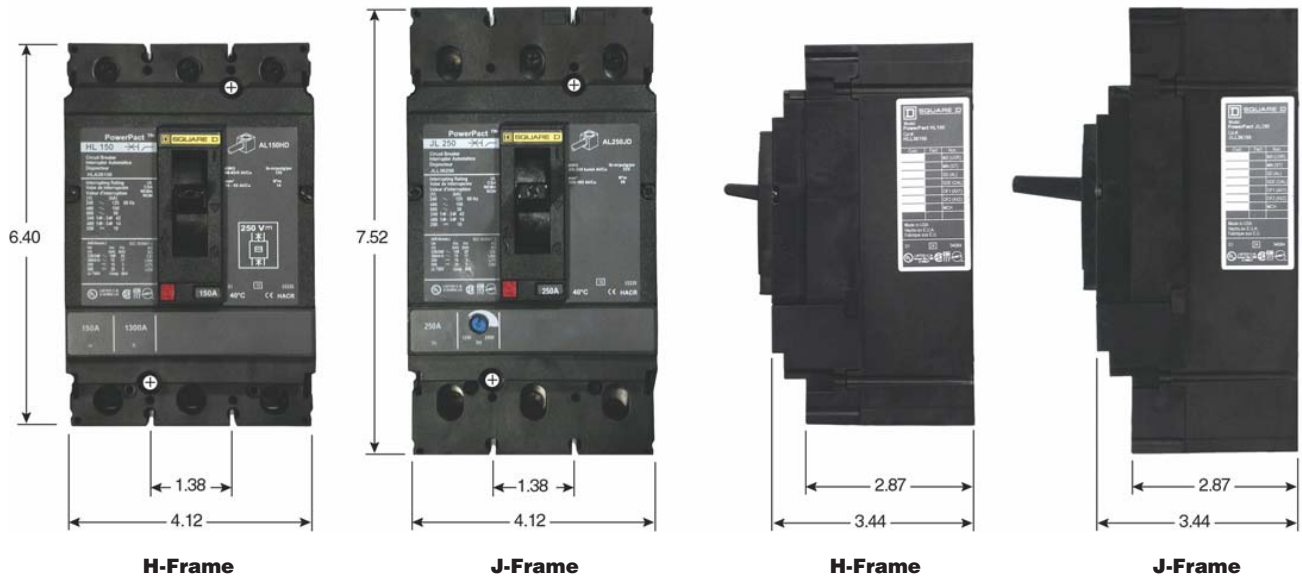
H-Frame 150A



J-Frame 250A

Full-Featured Performance

- H-Frame – 150A available in both standard and 100% ratings with standard amperage ratings from 15 to 150A. Interrupting ratings (AIR) include D-18kA, G-35kA, J-65kA and L-100kA at 480VAC
- J-Frame – 250A available in both standard and 100% ratings with standard amperage ratings from 150A to 250A. Interrupting ratings (AIR) include D-18kA, G-35kA, J-65kA, and L-100kA at 480VAC
- Field installable accessories are common for H- and J-Frame Circuit Breakers to make stocking and installation easy
- Unique snap-in terminals make converting bus bar and lug configurations simple and easy
- Field-installable trip units lower inventory costs and reduce stocking space by configuring products at point of use
- Allows design standardization for 15A to 250A applications with common mounting holes, handle locations, and trim dimensions for both H- and J-Frame Circuit Breakers
- Many configuration options provide application flexibility, with I-Line®, plug-in, drawout, rear connected, distribution lug, crimp lug and din-rail configurations
- Motor operators, rotary handles and cable operators provide options for integrating into a variety of applications
- Certified to global standards, including UL, IEC, CSA and NOM

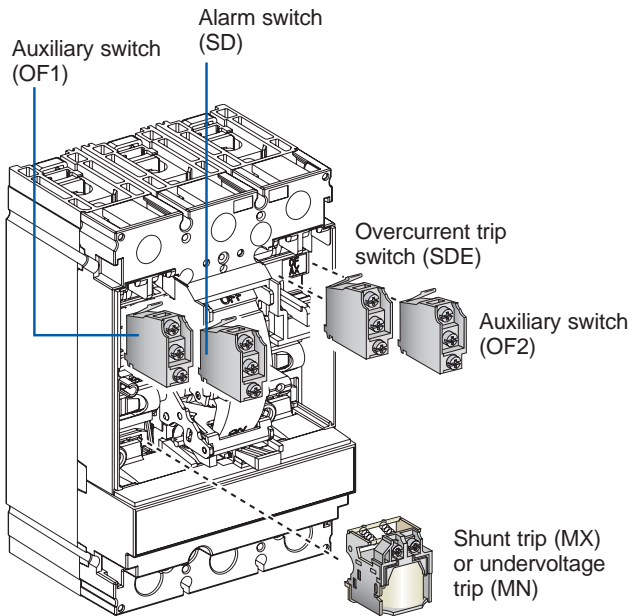


Standardize Designs

Designed to help simplify the design process, the Powerpact H- and J-Frame Molded Case Circuit Breakers feature common mounting holes, handle locations and trim dimensions.

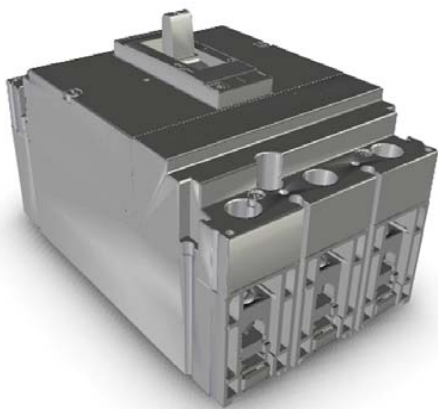
Consolidate Inventory

Reduce inventory costs with the Powerpact H- and J-Frame Molded Case Circuit Breakers. These circuit breakers are designed to work with common components like operating handles, auxiliary switches, shunt trips and many other accessories. They also offer savings in the form of rationalized mounting pans, door trims and enclosures.



Simplify Installation

Field-installable accessories provide flexibility for late specification changes or installation at point of use. Auxiliary switches, shunt trip and undervoltage release are easy to install, reliable and common to many Powerpack Circuit Breakers.



Streamline Design Integration

Comprehensive technical literature, CAD drawings and 3D models are available online to support the Powerpack H- and J-Frame Circuit Breaker line. In addition, 3D models can be downloaded in most CAD formats.

Easy to Convert

Unique snap-in lugs make converting between bus bar and lug options simple and easy. Whether the application calls for lugs on the line side, load side or both, conversions are simple, making the Powerpack H- and J-Frame Molded Case Circuit Breakers ideal for applications that require configuring products at the point of use. The terminal nut or mechanical lug is set on a plastic retainer that slides and snaps into place, without the use of tools.



Bus Bar Option



Lug Option

Powerpack® H- and J-Frame 15A to 250A Molded Case Circuit Breakers

Multiple Configurations



Cradle



Plug-in Base



I-Line



Rear Connected

Ordering Flexibility for Various Applications

- **Purchase Standard Circuit Breaker**
Features fixed trip unit capable of reverse connection.
- **Circuit Breaker and Separate Trip Units***
Save valuable inventory costs by configuring products at point of use. Only three frame sizes are needed to cover the entire range from 15A to 250A (shown below with H-Frame Circuit Breaker).
- **Purchase the Complete Circuit Breaker with Field-Interchangeable Trip Unit***
Respond to last minute specification changes with the flexibility of a field interchangeable trip unit.



**Marked line and load and not suitable for reverse connection*

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

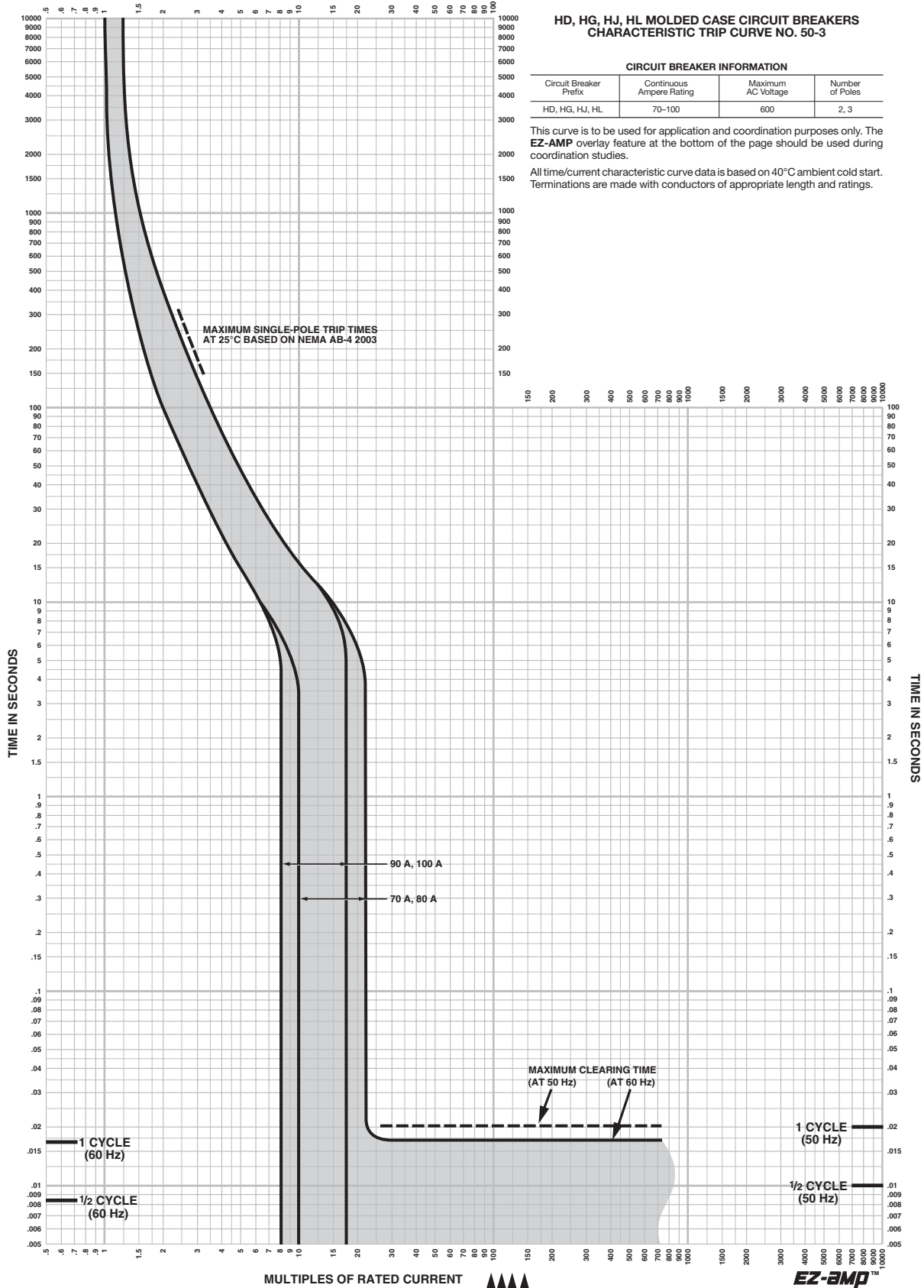
Schneider Electric - North American Operating Division

1415 S. Roselle Road
Palatine, IL 60067
Tel: 847-397-2600
Fax: 847-925-7500

Order Number 0611HO0401

03-04

MULTIPLES OF RATED CURRENT



HD, HG, HJ, HL MOLDED CASE CIRCUIT BREAKERS
CHARACTERISTIC TRIP CURVE NO. 50-3

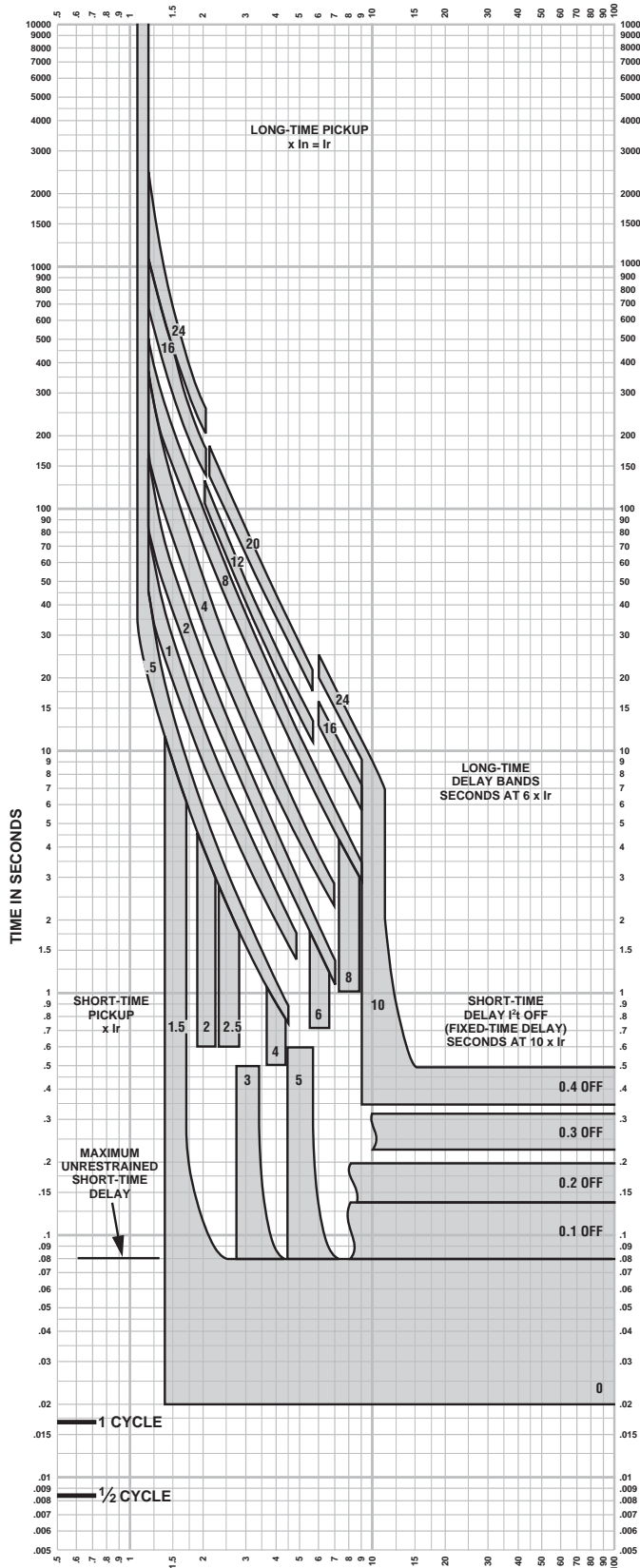
CIRCUIT BREAKER INFORMATION

Circuit Breaker Prefix	Continuous Ampere Rating	Maximum AC Voltage	Number of Poles
HD, HG, HJ, HL	70-100	600	2, 3

This curve is to be used for application and coordination purposes only. The **EZ-AMP** overlay feature at the bottom of the page should be used during coordination studies.

All time/current characteristic curve data is based on 40°C ambient cold start. Terminations are made with conductors of appropriate length and ratings.

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



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

Long-time Pickup and Delay
Short-time Pickup and 1/4 OFF Delay

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

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

Notes:

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

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



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

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

The most compact and innovative molded case circuit breakers



P-Frame 1200 A



R-Frame

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

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

Full-Featured Performance

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

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

Onboard Intelligence

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

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



MICROLOGIC® Trip Units

Choose the Model that Meets Your Needs

MICROLOGIC 3.0 and 5.0

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

MICROLOGIC 3.0A, 5.0A and 6.0A

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

MICROLOGIC 5.0P and 6.0P

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

MICROLOGIC 5.0H and 6.0H

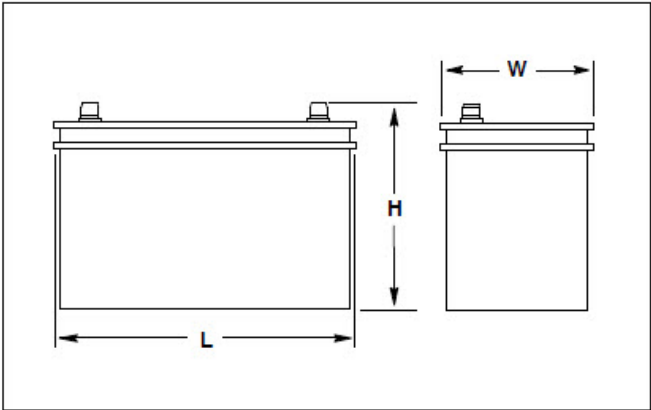
- All 5.0P and 6.0P functions
- Enhanced POWERLOGIC power metering and monitoring capabilities
- Basic power quality (harmonic) measurement
- Waveform capture

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





Typical Overall Dimensions

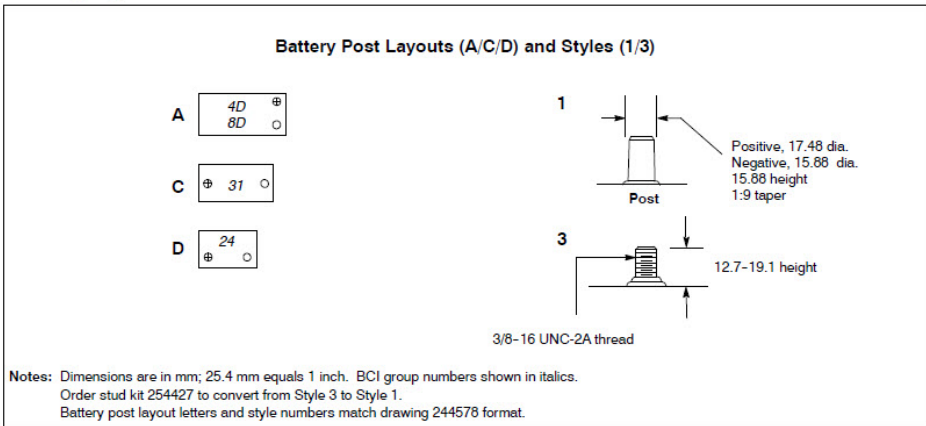


Standard Features

- Kohler Co. 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).

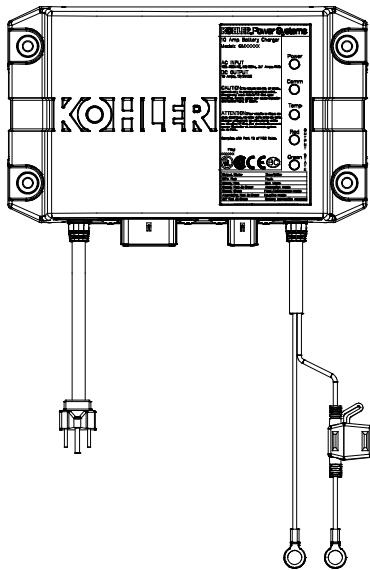
Charge Type*	Battery Part Number	Battery Qty. per Size	BCI Group Size	Battery SAE Dimension, mm (in.)			Cold Cranking Amps at 18°C (0°F) Min.	Reserve Capacity Minutes at 27° (80°F) Min.	Battery Post Layout and Style
				L	W	H			
Wet	324586	2	31	330.2 (13.0)	173.0 (6.8)	239.8 (9.4)	950	185	C/3

Battery Specifications



12/24 Volt, 10 Amp

Automatic Multi-Stage Battery Charger



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

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

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

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

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

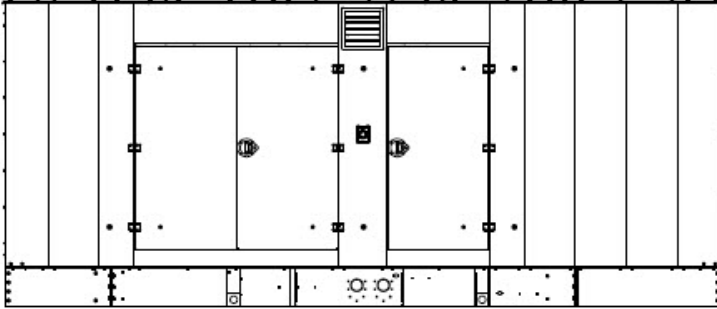
Standard Features

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

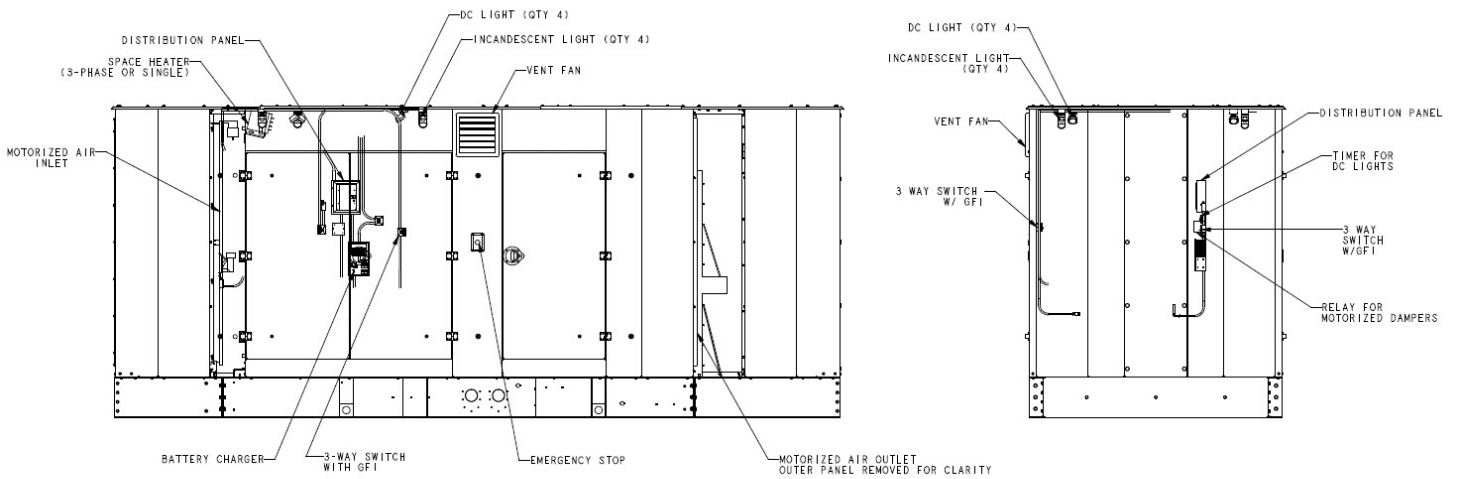
DC Output		AC Input		Overall Dimensions W x D x H	Shipping Weight	
Volts (Nominal)	Amps	Volts (Nominal)	Amps		kgs	lbs
12/24	10	100-260	3.7	253 mm x 152 mm x 74 mm (10.0 in x 6.0 in x 2.9 in)	3.6	7.9



Weather Enclosure Standard Features



- Internal silencer, flexible exhaust connector and rain cap.
- Skid-mounted, steel construction with hinged doors.
- Fade-, scratch-, and corrosion-resistant Kohler® Power Armor automotive-grade textured finish.
- Enclosure has six large access doors which allow for easy maintenance.
- Lockable, flush-mounted door latches.
- Louvered air inlets on alternator end and roof outlet to redirect air and reduce noise.
- Automatic door holders keep doors open during maintenance.
- Steel weather enclosure is designed to 150 mph (241 kph) wind load rating.

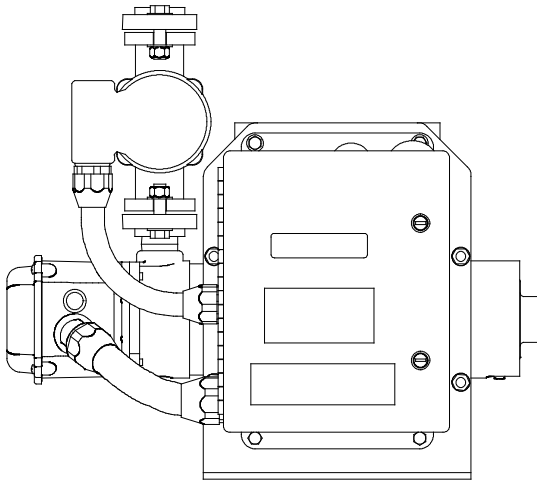


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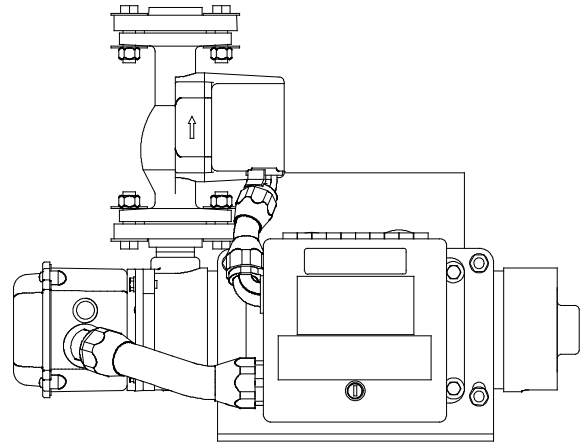
Weather Enclosure Features

- Available in steel formed panel, solid construction. Preassembled package offering corrosion resistant, dent resilient structure mounting directly to skid.
- 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, and includes rain shield and cap.
- 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.
- Interchangeable modular panel construction. Allows complete serviceability or replacement without compromising enclosure design.
- Cooling/combustion air intake with a horizontal air inlet. Sized for maximum cooling airflow.
- Service access. Multi-personnel doors for easy access to generator set control and servicing of the oil fill and battery.
- Cooling air discharge. Weather protective design featuring a vertical air discharge outlet grille. Redirects cooling air up and above enclosures to reduce noise ambient.

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	Max. Length, mm (in.)	Max. Width, mm (in.)	Sound Pressure Level, dB(A)	Max. Height, mm (in.)	Weight, kg (lb.)
Lift base	0	6365 (250.6)	2252 (88.7)	69	2695 (106.1)	6863 (15130)

Engine Block Heater Kits

Type 1 and Type 3



Type 2

Block Heater Kits, typical

Applicable Models

- 250- 400RZXB
- 250- 450REZXB
- 300REZXC
- 300- 400RZXD
- **300- 500REZXD**
- 900- 1250REOZMD
- 1250- 2000ROZMC

Standard Features

- UL- C/US listed (60 Hz Models) - E250789CE
- 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 has a thermostat, pump, and temperature control system. The pump circulates 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 has a fixed setting thermostat that turns ON when the engine coolant temperature reaches 38°C (100°F) and turns OFF when the engine coolant temperature reaches 49°C (120°F).

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

The engine block heater kits are available in 208 V, 240 V, 380 V, and 480 V versions.

Block Heater Specifications

Heating Fluid	Engine Coolant (50% Glycol/50% Water)
Fixed Thermostat	38° - 49°C (100° - 120°F)
Flow	10 GPM (2.2m ³ /hr) @ 10 ft head (3 mWc)
Pump Power	70W (50 Hz), 97W (60 Hz)
Max. Pressure	125 psi (860 kPa)
Pressure Loss	0.2 psi (1.5 kPa)
Inlet Plumbing	1.0 in. NPT
Outlet Plumbing	1.0 in. NPT
Main Control Box Ingress Protection	NEMA 4 (IP66)
Motor Ingress Protection	IP44 (50 Hz), NEMA 2 (60 Hz)

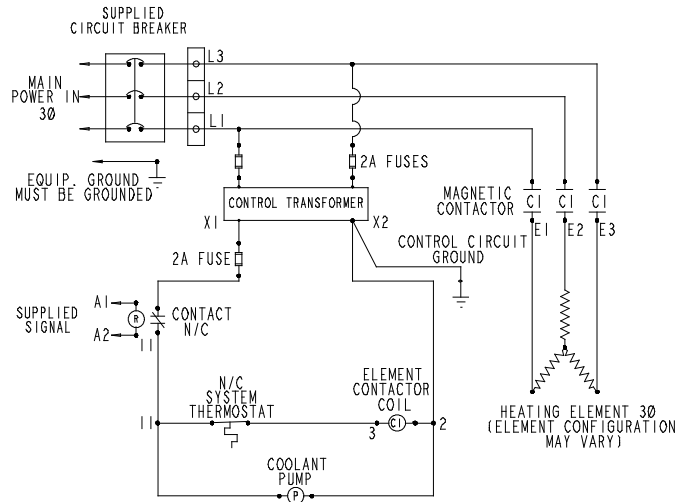
Specifications

Block Heater Kit Number	Component	Watts	Voltage	Phase	Type
GM64396- KA1	GM62499	9000	240	1	2
GM64396- KA2	GM62500	9000	480	1	3
GM64396- KA3	GM62501	9000	240	3	1
GM64396- KA4	GM62502	9000	380	3	1
GM64396- KA5	GM62498	9000	480	3	1
GM64396- KA6	GM62509	9000	208	1	2
GM64396- KP1	GM62499	9000	240	1	2
GM64396- KP2	GM62500	9000	480	1	3
GM64396- KP3	GM62501	9000	240	3	1
GM64396- KP4	GM62502	9000	380	3	1
GM64396- KP5	GM62498	9000	480	3	1
GM64396- KP6	GM62509	9000	208	1	2
GM64397- KA1	GM62499	9000	240	1	2
GM64397- KA2	GM62501	9000	240	3	2
GM64397- KA3	GM62502	9000	380	3	1
GM64397- KA4	GM62498	9000	480	3	1
GM64397- KA5	GM62500	9000	480	1	3
GM64397- KA6	GM62509	9000	208	1	2
GM64397- KP1	GM62499	9000	240	1	2
GM64397- KP2	GM62501	9000	240	3	2
GM64397- KP3	GM62502	9000	380	3	1
GM64397- KP4	GM62498	9000	480	3	1
GM64397- KP5	GM62500	9000	480	1	3
GM64397- KP6	GM62509	9000	208	1	2
GM64398- KA1	GM62499	9000	240	1	2
GM64398- KA2	GM62501	9000	240	3	1
GM64398- KA3	GM62502	9000	380	3	1
GM64398- KA4	GM62498	9000	480	3	1
GM64398- KA5	GM62500	9000	480	1	3
GM64398- KA6	GM62499	9000	240	1	2
GM64398- KA7	GM62501	9000	240	3	1
GM64398- KA8	GM62502	9000	380	3	1
GM64398- KA9	GM62498	9000	480	3	1
GM64398- KA10	GM62500	9000	480	1	3

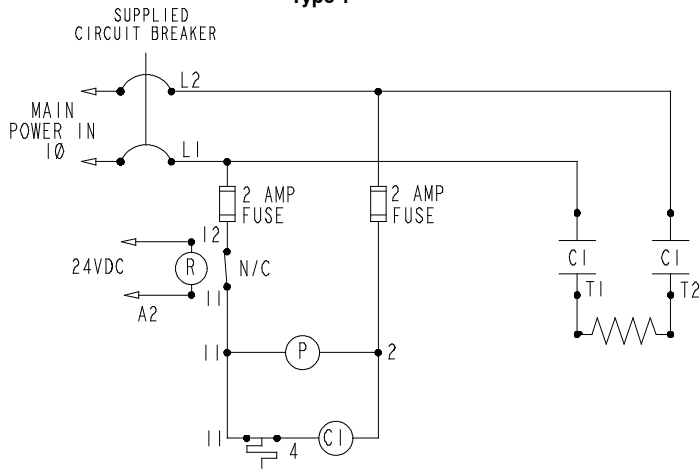
Specifications (Continued)

Block Heater Kit Number	Component	Watts	Voltage	Phase	Type
GM64398- KA11	GM62509	9000	208	1	2
GM64398- KA12	GM62509	9000	208	1	2
GM64398- KP1	GM62499	9000	240	1	2
GM64398- KP2	GM62501	9000	240	3	1
GM64398- KP3	GM62502	9000	380	3	1
GM64398- KP4	GM62498	9000	480	3	1
GM64398- KP5	GM62500	9000	480	1	3
GM64398- KP6	GM62499	9000	240	1	2
GM64398- KP7	GM62501	9000	240	3	1
GM64398- KP8	GM62502	9000	380	3	1
GM64398- KP9	GM62498	9000	480	3	1
GM64398- KP10	GM62500	9000	480	1	3
GM64398- KP11	GM62509	9000	208	1	2
GM64398- KP12	GM62509	9000	208	1	2
GM74160- KA1	GM62511	6000	240	1	2
GM74160- KA2	GM62512	6000	480	1	3
GM74160- KA3	GM62513	6000	240	3	1
GM74160- KA4	GM62514	6000	380	3	1
GM74160- KA5	GM62510	6000	480	3	1
GM74160- KA6	GM77835	6000	208	1	2
GM75287- KA1	GM62511	6000	240	1	2
GM75287- KA2	GM62512	6000	480	1	3
GM75287- KA3	GM62513	6000	240	3	1
GM75287- KA4	GM62514	6000	380	3	1
GM75287- KA5	GM62510	6000	480	3	1
GM75287- KA6	GM77835	6000	208	1	2
GM111086- KA1	GM62511	6000	240	1	2
GM111086- KA2	GM62512	6000	480	1	3
GM111086- KA3	GM62513	6000	240	3	1
GM111086- KA4	GM62510	6000	480	3	1
GM111086- KA5	GM77835	6000	208	1	2
GM111086- KA6	GM62514	6000	380	3	1

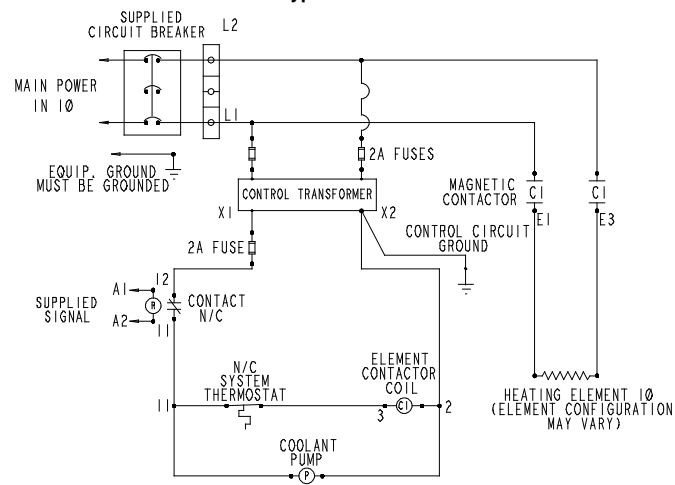
Wiring Diagram



Type 1



Type 2

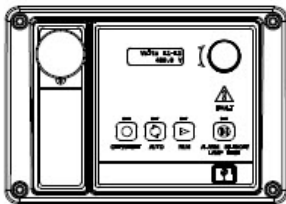


Type 3

GM62498V-



Integral Voltage Regulator with Kohler® APM402/ Decision-Maker® 3000 and Menu-Driven Selections (15-1000 kW Generator Set Models)



APM402 and Decision-Maker® 3000 Controller with Integral Voltage Regulator

The voltage regulator is integral to the controller and uses patented hybrid voltage regulator design providing ±0.5% no-load to full-load regulation using root-mean-square (RMS) voltage sensing. The voltage regulator features three-phase sensing and is available for 12- or 24-volt engine electrical systems.

Voltage Regulators

The following information provides general features, specifications, and functions of available voltage regulators.

This information generally applies to a single generator set and multiple generator sets with paralleling applications. Refer to the respective generator set specification sheet and see your authorized distributor for information regarding specific voltage regulator applications and availability.

Integral Voltage Regulators with APM402/Decision-Maker® 3000 Controllers

Calibration	Digital Display	Range Settings	Default Selection
Voltage Adjustment	Volt Adj	± 10% of System Voltage	System Voltage
Underfrequency Unload or Frequency Setpoint	Frequency Setpoint	42 to 62 Hz	2.5 Hz Below Nominal Frequency
Underfrequency Unload Scope	Slope	0-10% of System Voltage (Volts per Cycle)	5% of System Voltage



Specification/Feature	Integral with APM402/Decision-Maker® 3000
Generator Set Availability	15-1000 kW
Type	Patented Hybrid Design
Status and Shutdown Indicators	LEDs and Text LCD Display
Operating Temperature	-40 ° C to 70 ° C (-40 ° F to 158 ° F)
Storage Temperature	-40 ° C to 85 ° C (-40 ° F to 185 ° F)
Humidity	5-95% Non-Condensing
Circuit Protection	Solid-State, Redundant Software and Fuses
Sensing, Nominal	100-240 Volts (L-L), 50-60 Hz
Sensing Mode	RMS, Single- or 3-Phase
Input Requirements	8-36 VDC
Continuous Output	5 VDC @ 100mA max. 5.0 ADC with GM88453 Activator Board
Maximum Output	5 VDC @ 100mA max. 5.0 ADC with GM88453 Activator Board
Transition Frequency	42.0-62.0Hz
Exciter Field Resistance	4-30 Ohms with GM88453 Activator Board
No-Load to Full-Load Voltage Regulation	± 0.5%
Thermal Drift	<0.5% (-40 ° C to 70 ° C) [-40 ° F to 158 ° F] Range
Response Time	Less than 5µS
System Voltage Adjust.	± 10%
Voltage Adjustment	Controller Menu Knob
Remote Voltage Adjustment	not available
Paralleling Capability	not available
VAR/PF Control Input	not available

Integral Voltage Regulator with APM402/Decision-Maker® 3000 Controller

- The APM402/Decision-Maker® 3000 digital display and pushbutton/rotary dial provide access to data. A two-line LCD display provides complete and concise information. A two-line vacuum fluorescent display provides complete and concise information.
- The Decision-Maker® 3000 graphical display and pushbutton/rotary dial provide access to data. A five-line, 35-characters per line LCD display provides complete and concise information include gain, ramp rate, reactive droop, VAR control (P, I, D gains) and PF control (P, I, D gains).
- The controllers provide ISO 8528-5, Class G3, compliance for transient response on some 20-300 kW generator set models. Both controllers support Modbus®.
- These controllers can control Fast Response™ II, Fast Response™ X, and wound field alternators using the GM88453 activator board.

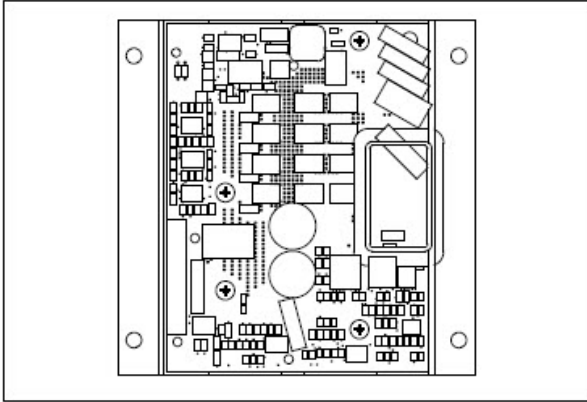
Voltage Regulator Menu

- Voltage adjustment, ± 10% of system voltage
- V/Hz cut-in, 42-62 Hz
- Underfrequency unload slope, 0-10% of system voltage

Jumpers

- L1-L2 volts
- L2-L3 volts (3-phase)
- L3-L1 volts (3-phase)
- L1-N volts
- L2-N volts
- L3-N volts (3-phase)

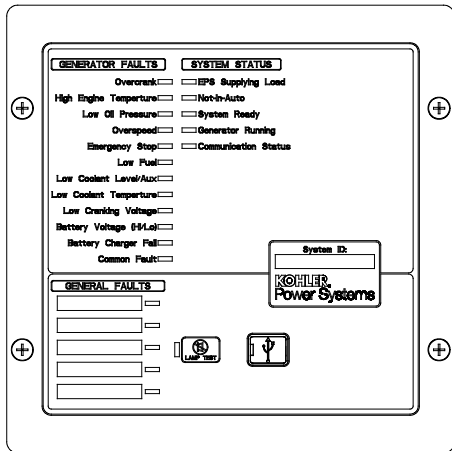
KOHLER®



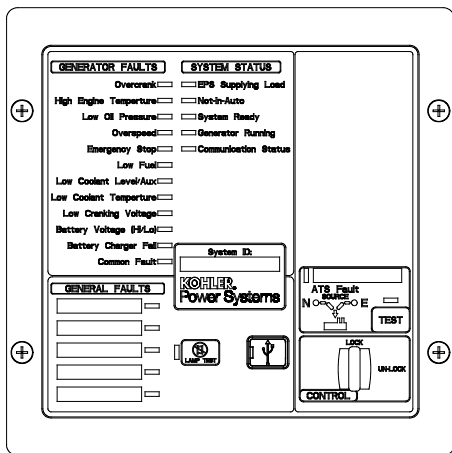
- Interfaces between the controller and alternator assembly using rotor field leads, auxiliary power windings, and optic board leads.
- Allows the Decision-Maker® controllers the ability to control a wound-field alternator using the same control signal as Fast Response™ alternator.
- Permits the generator set controller to control the current to the exciter field of a wound-field excited alternator.
- Contains two isolated relay driver outputs (RDO) rated at 250 mA. Provides RDO outputs indicating a field over-excitation condition and that the alternator is supplying voltage to the activator.

Modbus® is a registered trademark of Schneider Electric.

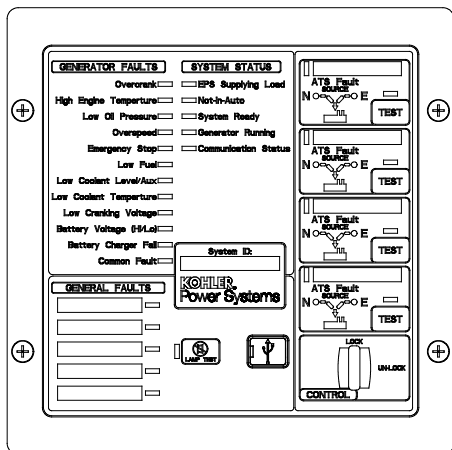
Remote Serial Annunciator III (RSA III)



RSA III



RSA III with a Single ATS Control



RSA III with Four ATS Controls

Remote Serial Annunciator III (RSA III) for Kohler® Controllers

- Monitors the generator set equipped with one of the following controllers:

APM402	Decision-Maker® 3000
APM603	Decision-Maker® 3500
APM802	Decision-Maker® 6000
Decision-Maker® 3+	Decision-Maker® 8000
Decision-Maker® 550	KPC 1000
- Allows monitoring of the common alarm, remote testing of the automatic transfer switch, and monitoring of the normal/emergency source for up to four ATS with any of the following controllers:

Decision-Maker®	MPAC® 750, 1200, and 1500
MPAC®	1000 and 1500
- Configuration via a personal computer (PC) software.
- Writable surfaces (white boxes in illustrations) for user-defined selections.
- Uses Modbus® RTU protocol.
- Controller connections:
 - RS-485 for serial bus network
 - USB port. Connect a personal computer and use Kohler® SiteTech™ software to view events and adjust settings. *
 - 12-/24-volt DC power supply
 - 120/208 VAC power supply (available accessory)
- Meets the National Fire Protection Association Standard NFPA 110, Level 1.

Dimensions

- Dimensions—W x H x D, mm (in.).

Surface Mounted:

203 x 203 x 83 (8.0 x 8.0 x 3.3)

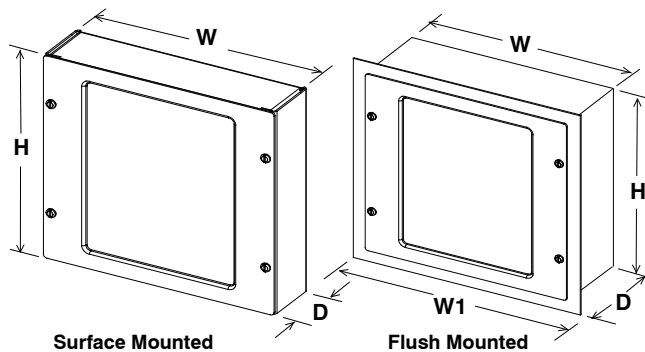
Flush Mounted (Inside Wall):

203 x 203 x 76 (8.0 x 8.0 x 3.0)

Flush mounting plate W1: 254 (10.0)

* SiteTech™ software is available to Kohler authorized distributors and dealers.

Modbus® is a registered trademark of Schneider Electric.



Fault and Status Conditions	Fault LEDs	Fault Horn	System Ready LED	Generator Running LED	Communication Status LED
Overcrank Shutdown	Red	On	Red	Off	Green
High Engine Temperature Warning *	Yellow	On	Red	Green	Green
High Engine Temperature Shutdown	Red	On	Red	Off	Green
Low Oil Pressure Warning *	Yellow	On	Red	Green	Green
Low Oil Pressure Shutdown	Red	On	Red	Off	Green
Overspeed Shutdown	Red	On	Red	Off	Green
Emergency Stop *	Red	On	Red	Off	Green
Low Coolant Level/Aux. Shutdown	Red	On	Red	Off	Green
Low Coolant Temperature *	Yellow	On	Red	Off	Green
Low Cranking Voltage	Yellow	On	Red	Off	Green
Low Fuel—Level or Pressure *	Yellow	On	Red	Green or Off	Green
Not-In-Auto	Red	On	Red	Green or Off	Green
Common Fault	Red	On	Green	Green or Off	Green
Battery Charger Fault (1) *	Yellow	On	Red	Green or Off	Green
Battery Charger Fault (2) *	Yellow	On	Green	Green or Off	Green
High Battery Voltage *	Yellow	Off	Green	Green or Off	Green
Low Battery Voltage *	Yellow	Off	Green	Green or Off	Green
User Input #1 (Warning)	Yellow	Off	Green	Green or Off	Green
User Input #1 (Shutdown)	Red	On	Green	Off	Green
User Input #2 (Warning)	Yellow	Off	Green	Green or Off	Green
User Input #2 (Shutdown)	Red	On	Green	Off	Green
User Input #3 (Warning) (1) †	Yellow	Off	Green	Green or Off	Green
User Input #3 (Shutdown) (1) †	Red	On	Green	Off	Green
User Input #4 (Warning) (1)	Yellow	Off	Green	Green or Off	Green
User Input #4 (Shutdown) (1)	Red	On	Green	Off	Green
User Input #5 (Warning) (1)	Yellow	Off	Green	Green or Off	Green
User Input #5 (Shutdown) (1)	Red	On	Green	Off	Green
EPS Supplying Load	Yellow	Off	Green	Green	Green
Communications Status (Fault mode)	—	Off	Green or Red	Green or Off	Red
ATS Fault (RSA III with ATS Controls only)	Red	On	Red or Yellow	Green or Off	Green

Green LEDs appear as steady on when activated.

Yellow LEDs slow flash when activated except steady on with EPS supplying load and high battery voltage.

Red LEDs slow flash when activated except fast flash with loss of communication and not-in-auto.

Specifications

- LED indicating lights for status, warning, and/or shutdown.
- Power source with circuit protection: 12- or 24-volt DC
- Power source with 120/208 VAC, 50/60 Hz adapter (option)
- Power draw: 200 mA
- Humidity range: 0% to 95% noncondensing
- Operating temperature range: -20°C to +70°C (-4°F to +158°F)
- Storage temperature range: -40°C to +85°C (-40°F to +185°F)
- Standards:
 - NFPA 110, level 1
 - UL 508 recognized
 - CE directive
 - NFPA 99
 - ENS 61000-4-4
 - EN611-4-4 fast transient immunity
- RS-485 Modbus® isolated port @ 9.6/19.2/38.4/57.6 kbps (default is 19.2 kbps)
- USB device port
- NEMA 1 enclosure

(1) All generator set controllers except Decision-Maker® 3+ controller.

(2) Decision-Maker® 3+ controller only.

* May require optional kit or user-provided device to enable function and LED indication.

† Digital input #3 is factory-set for high battery voltage on the Decision-Maker® 3+ controller.

Modbus® is a registered trademark of Schneider Electric.

NFPA Requirements

- NFPA 110 compliant
- Engine functions:
 - High battery voltage warning *
 - High engine temperature shutdown
 - High engine temperature warning *
 - Low battery voltage warning *
 - Low coolant level/aux. shutdown
 - Low coolant temperature warning *
 - Low cranking voltage
 - Low fuel warning (level or pressure) *
 - Low oil pressure shutdown
 - Low oil pressure warning *
 - Overcrank shutdown
 - Overspeed shutdown
- General functions:
 - Audible alarm silence
 - Battery charger fault *
 - Lamp test
 - Master switch not-in-auto

Fault and Status LEDs and Lamp Test Switch

Alarm Horn. Horn sounds giving a minimum 90 dB at 0.1 m (0.3 ft.) audible alarm when a warning or shutdown fault condition exists except on high/low battery voltage or EPS supplying load.

Alarm Silenced. Red LED on lamp test switch lights when alarm horn is deactivated by alarm silence switch.

Alarm Silence Switch. Lamp test switch quiets the alarm during servicing. The horn will reactivate upon additional faults.

ATS Fault. Red LED lights when ATS fails to transfer.

Battery Charger Fail. LED lights if battery charger malfunctions. Requires battery charger with alarm contact.

Battery Voltage Hi/Lo. LED flashes if battery or charging voltage drops below preset level. LED lights steady if battery voltage exceeds preset level.

Common Fault. LED lights when a single or multiple common faults occur.

Communication Status. Green LED lights indicating annunciator communications functional. Red LED indicates communication fault.

EPS Supplying Load. LED lights when the Emergency Power System (EPS) generator set is supplying the load (APM402, APM603, APM802, and Decision-Maker® 550, 3000, 3500, 6000, and 8000 controllers) or when transfer switch is in the emergency position (Decision-Maker® 3+ controller).

Emergency Stop. LED lights and engine stops when emergency stop is made. May require a local emergency stop switch on some Decision-Maker® 3+ controllers.

Generator Running. LED lights when generator set is in operation.

High Engine Temperature. Red LED lights if engine has shut down because of high engine coolant temperature. Yellow LED lights if engine coolant temperature approaches shutdown range. Requires warning sender on some models.

Lamp Test (Switch). Switch tests all the annunciator indicator LEDs and horn.

Low Coolant Level/Aux. LED lights when engine coolant level is below acceptable range on radiator-mounted generator sets only. When used with a Decision-Maker® 3+ controller, the LED indicates low coolant level or an auxiliary fault shutdown. Requires user-supplied low coolant level switch on remote radiator models.

Low Coolant Temperature. LED lights if optional engine block heater malfunctions and/or engine coolant temperature is too low. Requires prealarm sender on some models.

Low Cranking Voltage. LED lights if battery voltage drops below preset level during engine cranking.

Low Fuel (Level or Pressure). LED lights if fuel level in tank approaches empty with diesel models or fuel pressure is low on gas models. Requires customer-supplied switch.

Low Oil Pressure. Red LED lights if generator set shuts down because of insufficient oil pressure. Yellow LED lights if engine oil pressure approaches shutdown range. Requires warning sender on some models.

Not In Auto. LED lights when the generator set controller is not set to automatic mode.

Overcrank. LED lights and cranking stops if engine does not start in either continuous cranking or cyclic cranking modes.

Overspeed. LED lights if generator set shuts down because of overspeed condition.

System Ready. Green LED lights when generator set master switch is in AUTO position and the system senses no faults. Red LED indicates system fault.

User-Defined Digital Inputs #1-#5. Monitors five digital auxiliary inputs (can be configured as warnings or shutdowns). User-defined digital inputs are selected via the RSA III master for local or remote (generator set or ATS). The user-defined digital input can be assigned via PC using SiteTech™ setup software.

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Alternator Data

TECHNICAL INFORMATION BULLETIN

Alternator Data Sheet

Alternator Model: 4M4019

(8-22-11)

Kilowatt ratings at		1800 RPM	60 Hertz	12 LEADS	Standard 3 phase				
kW (kVA)		3 Phase			0.8 Power Factor		Dripproof or Open Enclosure		
Voltage*	Class B	Class F					Class H		
	80° C ∅ Continuous	90° C ∅ Lloyds	95° C ∅ ABS	105° C ∅ British Standard	105° C ∅ Continuous	130° C ∅ Standby	125° C ∅ British Standard	125° C ∅ Continuous	150° C ∅ Standby
480/240	305 (381)	325 (406)	335 (419)	350 (438)	350 (438)	375 (469)	375 (469)	375 (469)	415 (519)
460/230	305 (381)	325 (406)	330 (413)	345 (431)	345 (431)	370 (463)	370 (463)	370 (463)	395 (494)
440/220	300 (375)	310 (388)	320 (400)	335 (419)	335 (419)	360 (450)	360 (450)	360 (450)	375 (469)
416/208	290 (363)	300 (375)	310 (388)	325 (406)	325 (406)	350 (438)	350 (438)	350 (438)	360 (450)
380/190	275 (344)	285 (356)	300 (375)	305 (381)	305 (381)	305 (381)	305 (381)	305 (381)	305 (381)

① Rise by resistance method, Mil-Std-705, Method 680.1b.

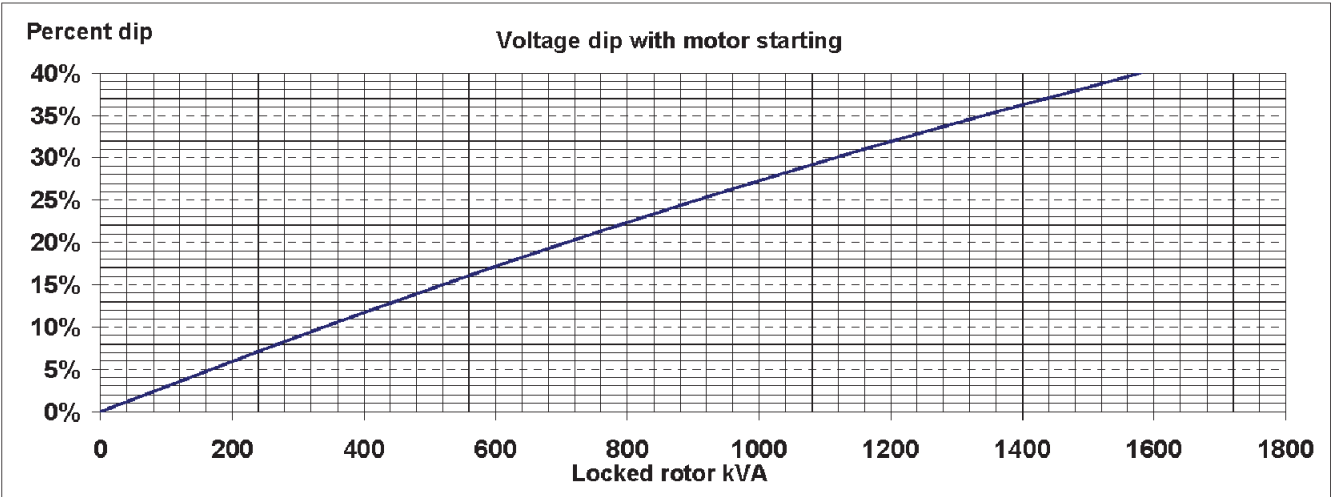
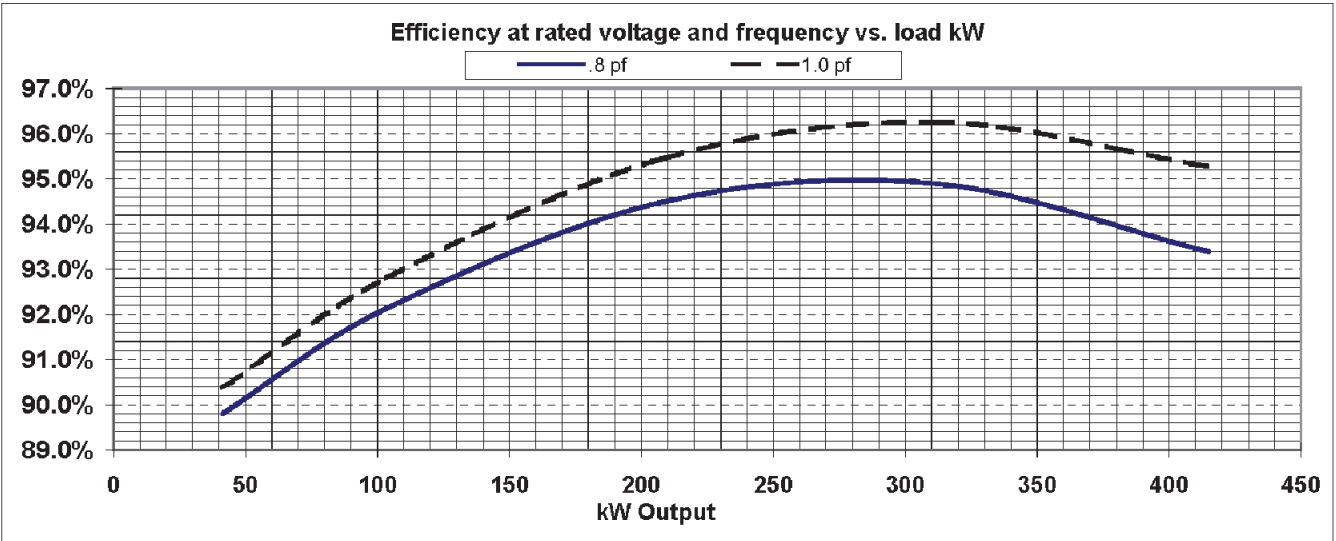
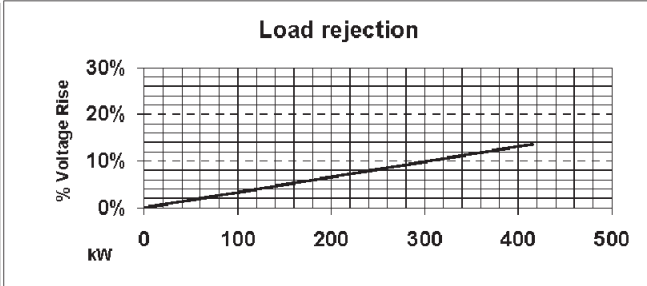
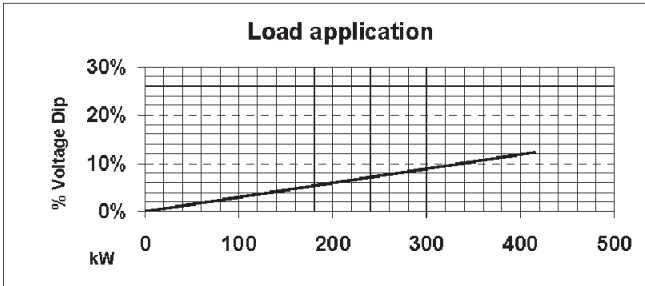
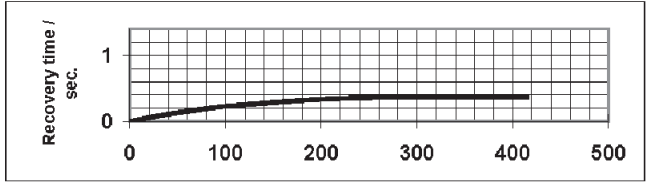
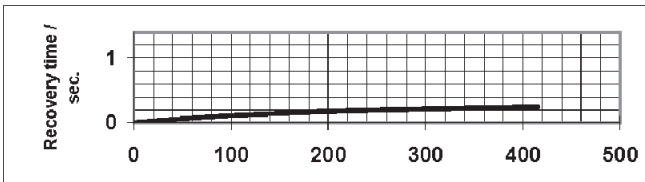
② British Standard Rating per BS 5000

Submittal Data: 480 Volts*, 375.2 kW, 469 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase			STD. CONNECTION		
Mil-Std-705B			Mil-Std-705B		
Method	Description	Value	Method	Description	Value
301.1b	Insulation Resistance	>1.5 Meg	505.3b	Overspeed	2250 RPM
302.1a	High Potential Test		507.1c	Phase Sequence CCW-ODE	ABC
	Main Stator	2000 Volts	508.1c	Voltage Balance, L-L or L-N	0.20%
	Main Rotor	1500 Volts	601.4a	L-L Harmonic Maximum - Total (Distortion Factor)	5.0%
	Exciter Stator	1500 Volts	601.4a	L-L Harmonic Maximum - Single	3.0%
	Exciter Rotor	1500 Volts	601.1c	Deviation Factor	5.0%
	PMG Stator	1500 Volts	---	TIF (1960 Weightings)	< 50
401.1a	Stator Resistance, Line to Line		---	THF (IEC, BS & NEMA Weightings)	< 2%
	High Wye Connection	0.014 Ohms	652.1a	Shaft Current	< 0.1 ma
	Rotor Resistance	0.286 Ohms		Main Stator Capacitance to ground	0.019 mfd
	Exciter Stator	22.5 Ohms		Additional Prototype Mil-Std Methods are Available on Request.	
	Exciter Rotor	0.022 Ohms	--	Generator Frame	433
	PMG Stator	2.1 Ohms	--	Type	MAGNAMAXDVR
410.1a	No Load Exciter Field Amps at 240/480 Volts Line to Line	0.75 A DC	--	Insulation	Class H
420.1a	Short Circuit Ratio	0.620	--	Coupling - Single Bearing	Flexible
421.1a	Xd Synchronous Reactance	2.469 pu	--	Amortisseur Windings	Full
		1.213 ohms	--	Excitation	Ext. Voltage Regulated, Brushless
422.1a	X2 Negative Sequence React.	0.197 pu			
		0.097 ohms			
423.1a	X0 Zero Sequence Reactance	0.036 pu			
		0.018 ohms			
425.1a	X'd Transient Reactance	0.111 pu			
		0.055 ohms			
426.1a	X"d Subtransient Reactance	0.096 pu			
		0.047 ohms			
--	Xq Quadrature Synchronous	0.658 pu	--	Cooling Air Volume	1050 CFM
		0.323 ohms			
427.1a	T'd Transient Short Circuit Time Constant	0.075 sec.	--	Heat rejection rate	1318 Btu's/min
428.1a	T"d Subtransient Short Circuit Time Constant	0.008 sec.	--	Full load current	564 amps
430.1a	T'do Transient Open Circuit Time Constant	1.55 sec.	--	Minimum Input hp required	534.0
432.1a	Ta Short Circuit Time Constant of Armature Winding	0.009 sec.	--	Efficiency at rated load :	94.2%
			--	Full load torque	1558 Lb-ft

* Voltage refers to wye (star) connection, unless otherwise specified.

TYPICAL DYNAMIC CHARACTERISTICS

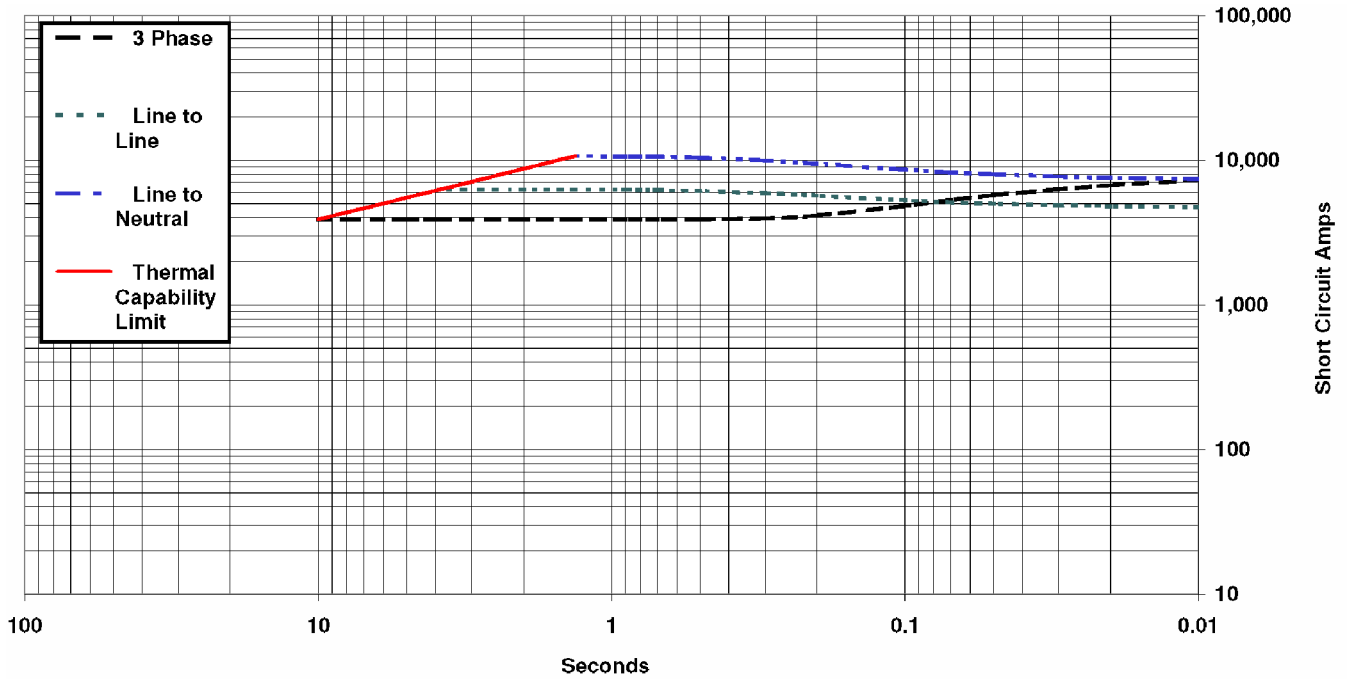
Alternator Model: 4M4019



Voltage refers to wye (star) connection, unless otherwise specified.

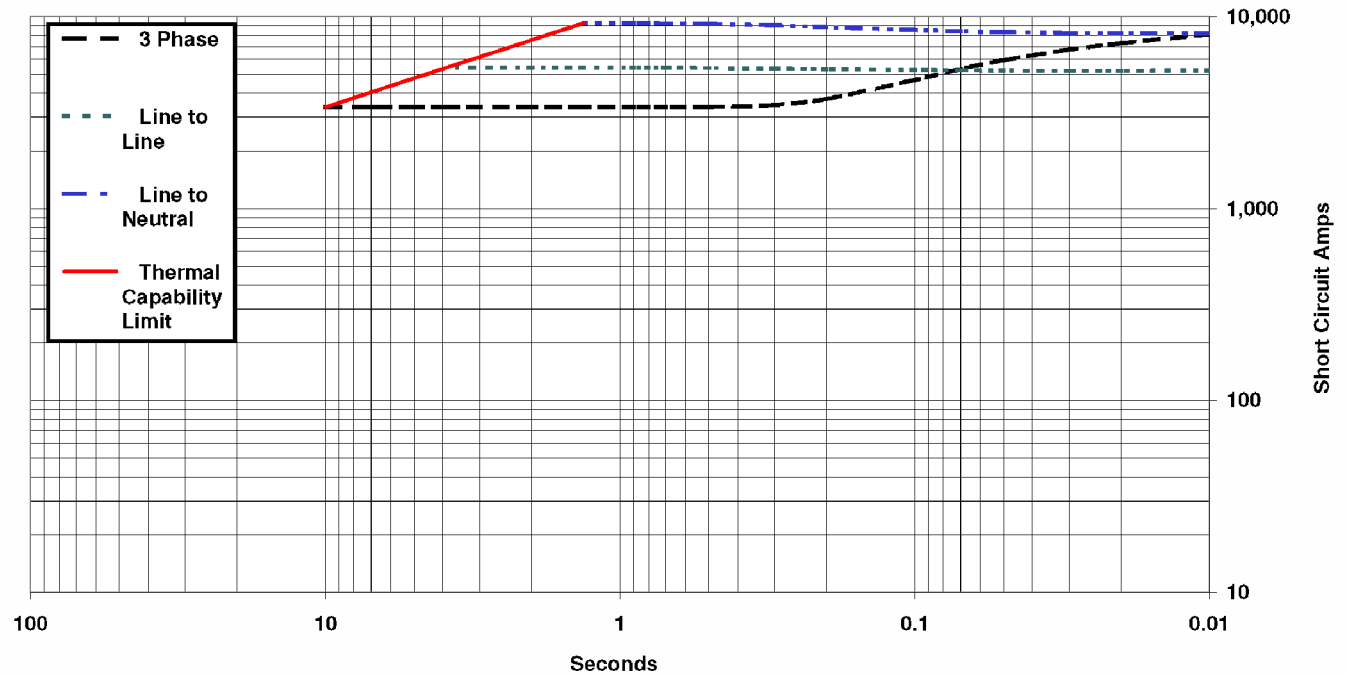
**4M4019, 60 Hz, Low Wye Connection
SHORT CIRCUIT DECREMENT CURVE**

Full Load Current: 1302 Amps **Steady State S.C. Current:** 3906 Amps **Max. 3 ph. Symm. S.C. Current:** 10172 Amps



**4M4019, 60 Hz, Delta Connection
SHORT CIRCUIT DECREMENT CURVE**

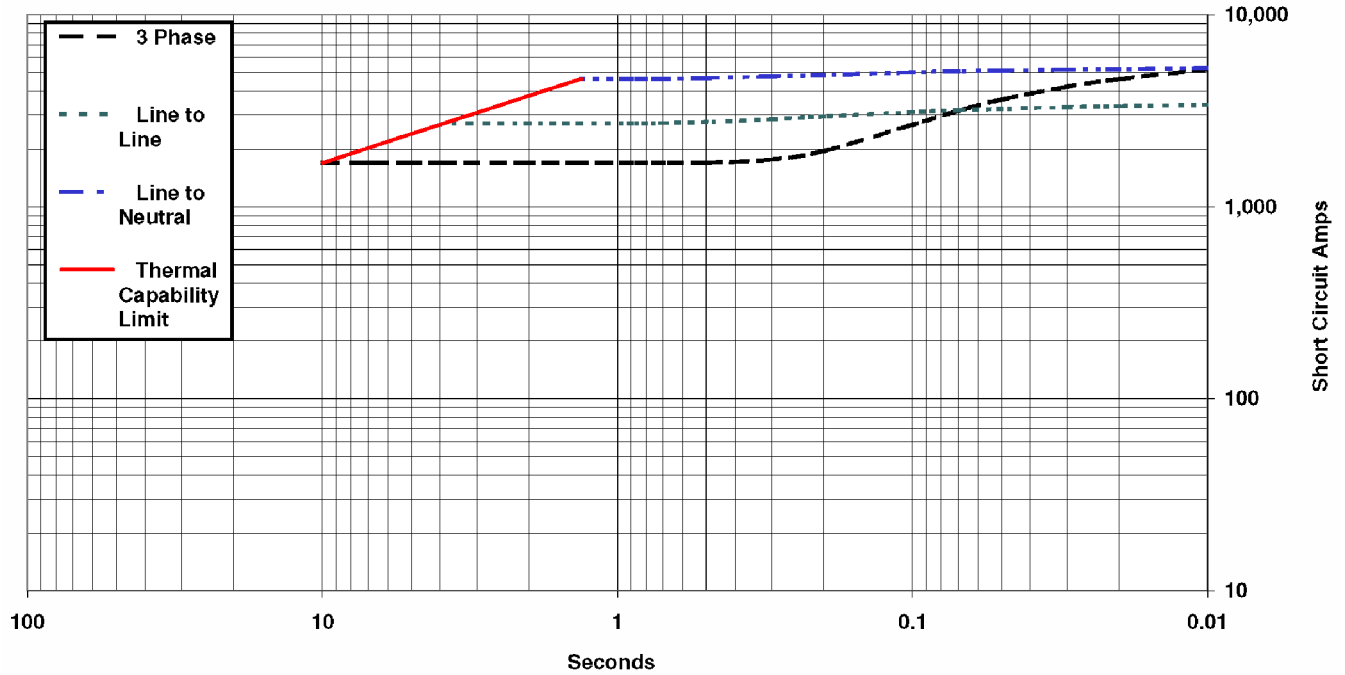
Full Load Current: 1128 Amps **Steady State S.C. Current:** 3384 Amps **Max. 3 ph. Symm. S.C. Current:** 8813 Amps



NOTE: Symmetrical component values are shown, maximum asymmetrical values are 1.732 times the symmetrical values.

**4M4019, 60 Hz, High Wye Connection
SHORT CIRCUIT DECREMENT CURVE**

Full Load Current: 564 Amps **Steady State S.C. Current:** 1692 Amps **Max. 3 ph. Symm. S.C. Current:** 5875 Amps



NOTE: Symmetrical component values are shown, maximum asymmetrical values are 1.732 times the symmetrical values.

The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. © 2015 by Kohler Co. All rights reserved.

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Cooling Data

TECHNICAL INFORMATION BULLETIN

Generator Set Cooling System Data Sheet

350REZXD/ 350RZXD 60Hz (Standby Duty)	50°C Ambient Temperature Cooling System								
	Total external restriction on open unit ⁷	Pa <i>(in. H₂O)</i>	0 (0)	125 (0.5)	187 (0.75)	250 (1)	312 (1.25)	375 (1.5)	Enclosed Units
	Maximum allowable ambient temperature	°C <i>(°F)</i>	50 (122)	47 (117)	46 (115)	44 (111)	43 (109)	41 (106)	45 (113)
	Cooling system airflow	m ³ /min <i>(ft³/min)</i>	820 (29000)	770 (27200)	742 (26200)	713 (25200)	685 (24200)	657 (23200)	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.

KOHLER®

Sound Data

TECHNICAL INFORMATION BULLETIN

Generator Set Sound Data Sheet

			Sound Pressure Data in dB(A)			
Generator Set Model	Hz	Load	Raw Exhaust	Open Unit, Isolated Exhaust	Weather Enclosure	
350REZXD	60	100% Load	97.9	89.8	87.9	
		No Load	95.9	89.3	87.4	

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.

				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	89.4	88.7	87.0	88.0	86.5	88.0	85.8	88.7	87.9

				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	88.7	88.4	86.9	87.9	86.3	87.7	83.1	88.3	87.4

KOHLER®

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
350REZXD	All Weather and Sound Enclosures	38.1	2.8	40.8	3.0	GM74352 Flex Tube (Left Side), GM74351 Flex Tube (Right Side), Doosan Supplied Dual Catalysts and GM73955 Dual Flex Tubes	GM64224 Dual Mufflers	ADV-9197

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.

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Emissions Data



350REZXD

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

ENGINE INFORMATION

Model:	D183TIC, 18.3 L	Bore:	128mm (5.0 in.)
Nameplate kW @ 1800 RPM:	422 (NG) 297 (LPG)	Stroke:	142mm (5.6 in.)
Type:	4-Cycle, V10 Cylinder	Displacement:	18.3 L (1115 cu. in.)
Aspiration:	Turbocharged	EPA Family (LP):	RPSIB18.3NGP
Compression Ratio:	10.5:1	EPA Family (NG):	RPSIB18.3NGP
Catalyst Required:	Yes	EPA Certificate (LP):	RPSIB18.3NGP-021
		EPA Certificate (NG):	RPSIB18.3NGP-021

EXHAUST EMISSION DATA¹:

	<u>LPG</u>	<u>NG</u>	
CO ₂	591.9	777.3	g/kWh
NOx	0.03	0.04	g/kWh
VOC ²	0.00	0.00	g/kWh
CO	0.24	0.28	g/kWh
BSFC	237	217	g/kWh

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

2) For NG, NMHC is reported in place of VOC for this report

TEST METHODS AND CONDITIONS

Standby and overload ratings based on ISO3046. Continuous ratings based on ISO 8528.

All ratings are gross flywheel horsepower corrected to 77°F at an altitude of 328 feet with no cooling fan or alternator losses using heating value for NG of 1015 BTU/SCF.

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

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

BSFC is based on 100% gross flywheel power rating and does not include fan or generator losses.

Data and specifications subject to change without notice.



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2024 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT**

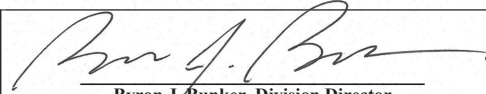
**OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Power Solutions International, Inc.
(U.S. Manufacturer or Importer)

Certificate Number: RPSIB18.3NGP-021

Effective Date:
05/12/2023

Expiration Date:
12/31/2024


 Byron J. Bunker, Division Director
 Compliance Division

Issue Date:
05/12/2023

Revision Date:
N/A

Manufacturer: Power Solutions International, Inc.
Engine Family: RPSIB18.3NGP
Mobile/Stationary Certification Type: Mobile and Stationary
Fuel : LPG/Propane
 Natural Gas (CNG/LNG)

Emission Standards :
 Stationary Part 1048
 HC + NOx (g/kW-hr) : 2.7
 NMHC + NOx (g/kW-hr) : 2.7
 CO (g/kW-hr) : 4.4
 Mobile Part 1048
 NMHC + NOx (g/kW-hr) : 2.7
 CO (g/kW-hr) : 4.4
 HC + NOx (g/kW-hr) : 2.7
 Part 60 Subpart JJJJ Table 1
 NOx (g/Hp-hr) : 1.0
 VOC (g/Hp-hr) : 0.7
 CO (g/Hp-hr) : 2.0
Emergency Use Only : N



Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 1048, 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 1048, 40 CFR Part 60 and produced in the stated model year.

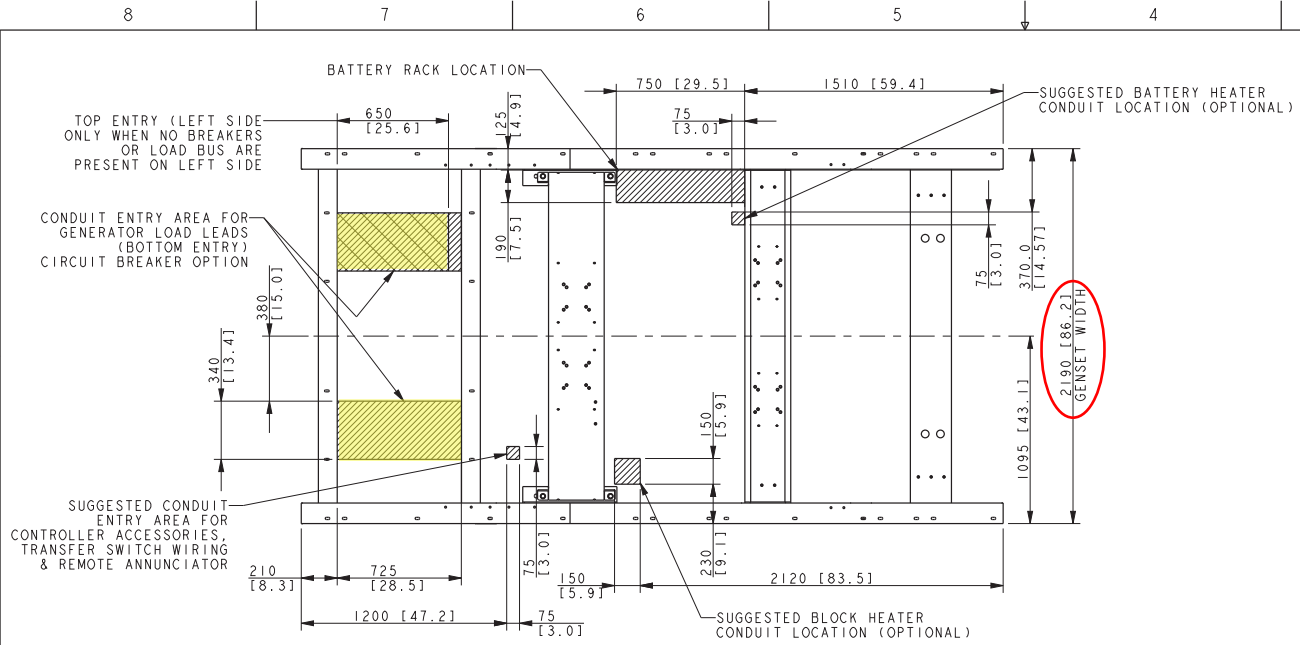
This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 1048, 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 1048, 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 1048, 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 1048, 40 CFR Part 60.

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

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Dimensional Drawings

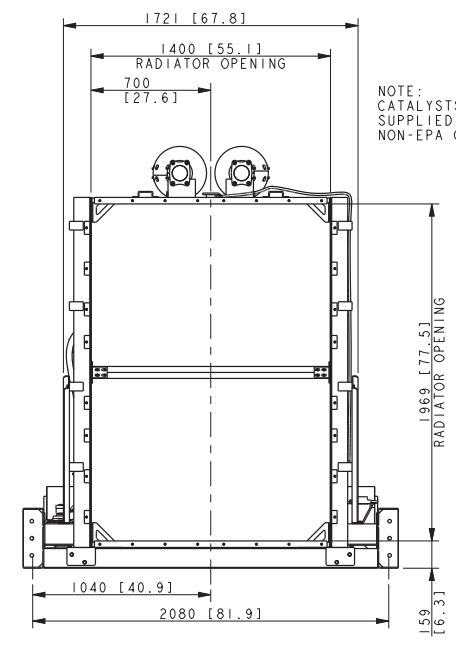
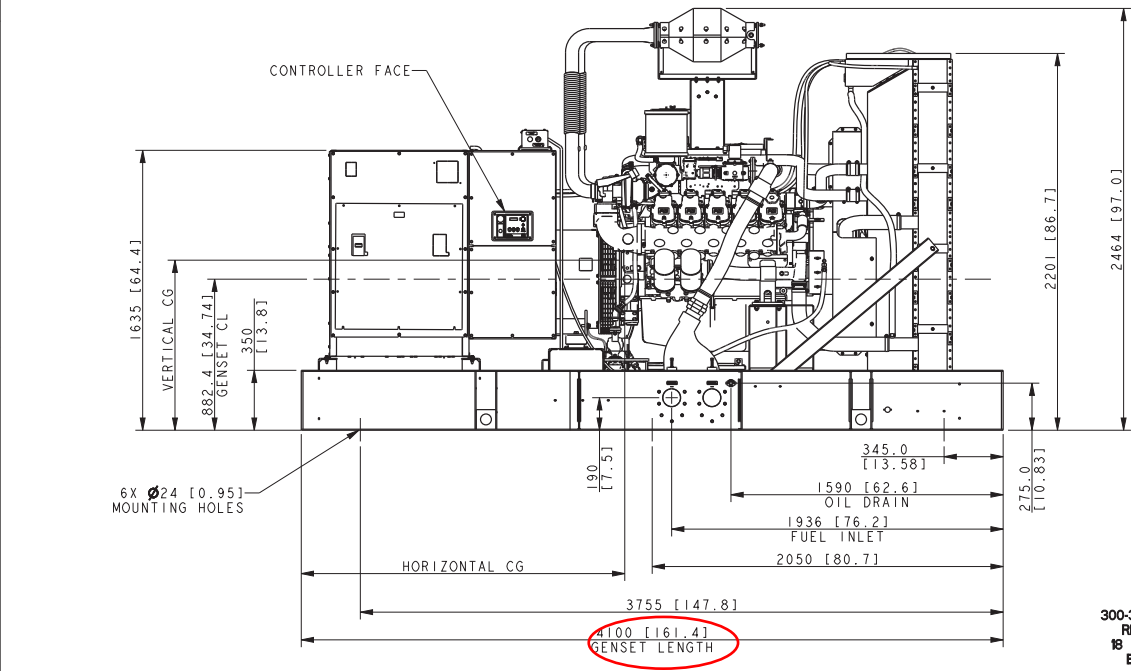


MODEL	ALTERNATOR	GENSET MAX WEIGHT kg [lb]	HORIZONTAL CG mm [in]	VERTICAL CG mm [in]
300/350RZXD 300/350REZXD	4M4019	4,740 [10,450]	2,140 [84.25]	940 [37.00]
350RZXD	4M4158	4,760 [10,495]	2,140 [84.25]	940 [37.00]
300/350RZXD 300/350REZXD	4M4266	4,760 [10,495]	2,140 [84.25]	940 [37.00]
350RZXD/REZXD	5M4027	4,980 [10,980]	2,100 [82.75]	940 [37.00]

WOOD BASE IS AN ADDITIONAL 170kg [375 lb]

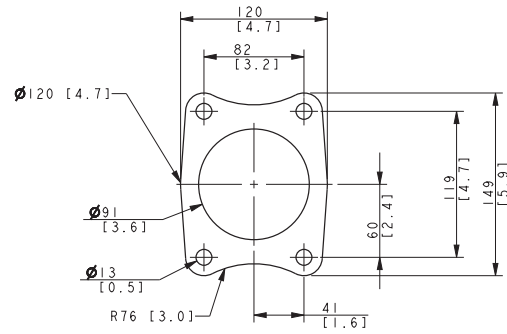
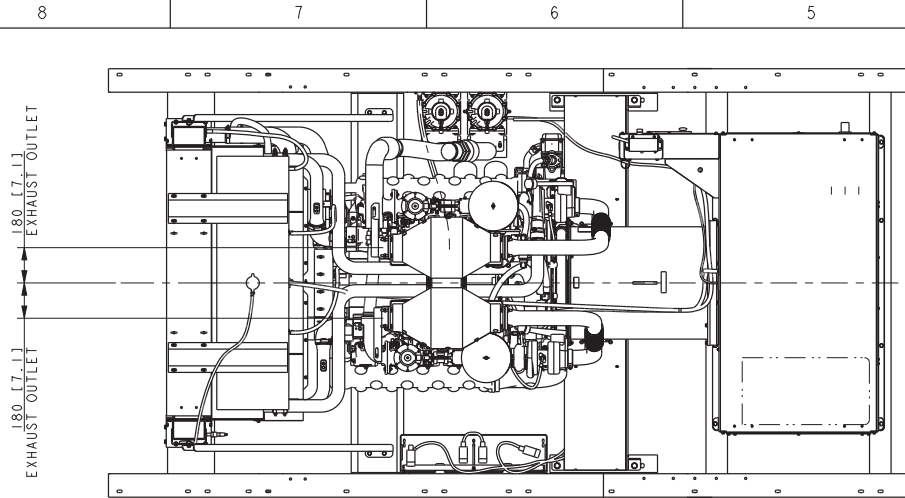
ALL LEAD CONNECTIONS USE 10MM [3/8] HARDWARE.

NOTES:
 CATALYSTS ARE NOT SUPPLIED WITH NON-EPA GENSETS
 DIMENSIONS IN [] ARE ENGLISH EQUIVALENTS.
 THIS ASSEMBLY MUST COMPLY WITH PEP-RML-001.
 SIMILAR TO: ADV-9195

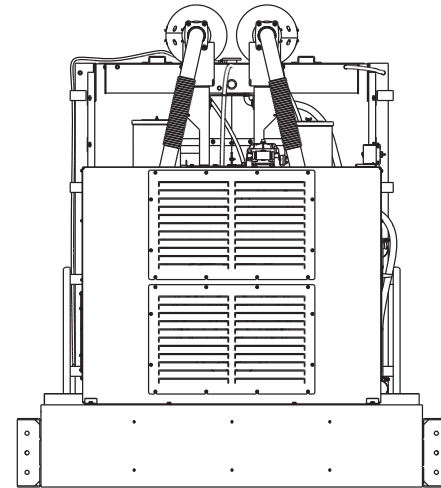
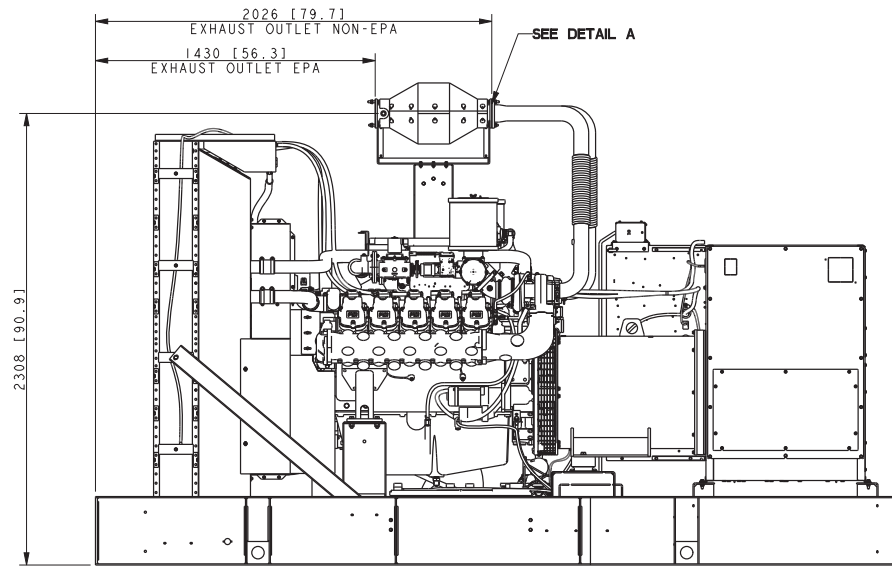


300-350KW MODELS RECONNECTABLE 18 LITER DOOSAN, EPA & NON-EPA

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	DO NOT SCALE. REFERENCE THE MODEL FOR ALL UNSPECIFIED DIMENSIONS
-	3-12-20	NEW DRAWING [CT202960]	PAR	UNLESS OTHERWISE SPECIFIED: GENERAL DIMENSIONS: 10 MILLIMETERS SURFACE FINISH: MAX. ANGLES: 90°
				KOHLER KOHLER, WISCONSIN 53044 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, 300-350 REZXD, RZXD
				APPROVALS: DATE: 3-12-20 CHECKED: D.J.V. 3-12-20 APPROVED: L.A.C. 3-12-20
				SCALE: 0.07 CAD NO. SHEET 1 of 3 TAG NO. ADV-9194



DETAIL A
EXHAUST OUTLETS
SCALE 0.50

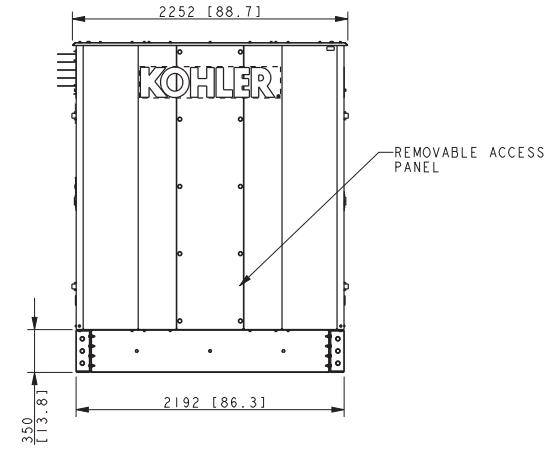
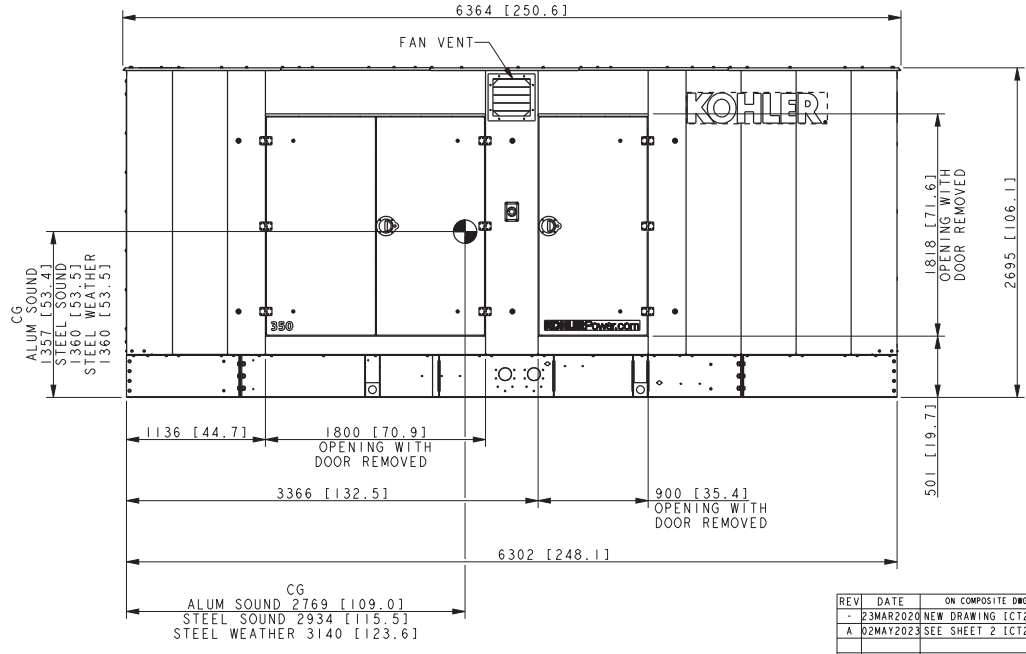
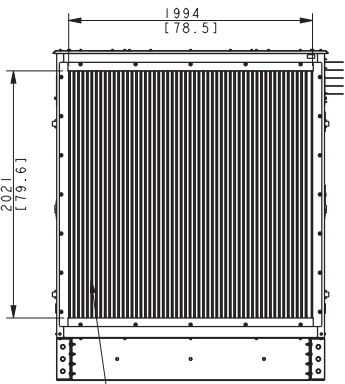
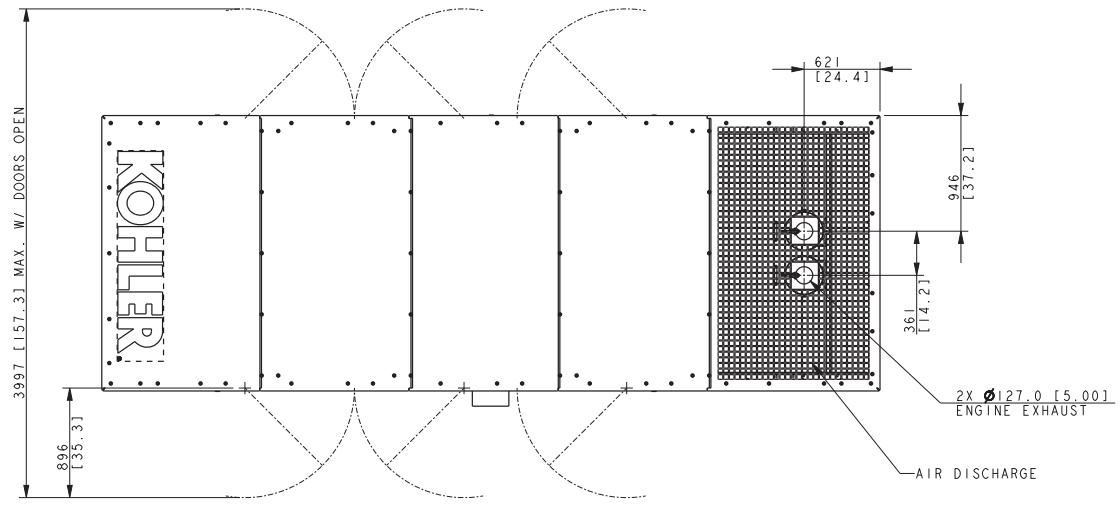


300-350KW MODELS
RECONNECTABLE
18 LITER DOOSAN,
EPA & NON-EPA

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	DO NOT SCALE. REFERENCE THE MODEL FOR ALL UNSPECIFIED DIMENSIONS
-	3-12-20	NEW DRAWING [CT202960]	PAR	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: F. 24 ± 0.25 F. 1.3 ± 1.0 SURFACE FINISH F. ± 0.15 MAX. ANGLES & Ø 30°
				KOHLER KOHLER WISCONSIN 53044 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, 300-350 REZXD, RZXD
				SCALE: 0.08 CAD NO. SHEET 2 of 3
				DWG NO. ADV-9194

APPROVALS	DATE
DRW: PAR	3-12-20
CHKD: D.J.V	3-12-20
APPRD: LAC	3-12-20

MODEL	ENCLOSURE WEIGHT	
300-350 REZXD	STEEL SOUND	2087 Kg [4600 LBS]
	STEEL WEATHER	1882 Kg [4150 LBS]
	ALUM SOUND	1656 Kg [3650 LBS]



REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	DO NOT SCALE. REFERENCE THE MODEL FOR ALL UNSPECIFIED DIMENSIONS
	23MAR2020	NEW DRAWING [CT204468]	TAK	UNLESS OTHERWISE SPECIFIED: DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: N/A
A	02MAY2023	SEE SHEET 2 [CT227188]	APM	

KOHLER
KOHLER WISCONSIN 8394
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.

300-350 DOOSAN ENCL

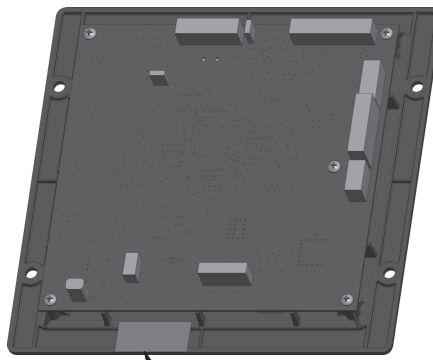
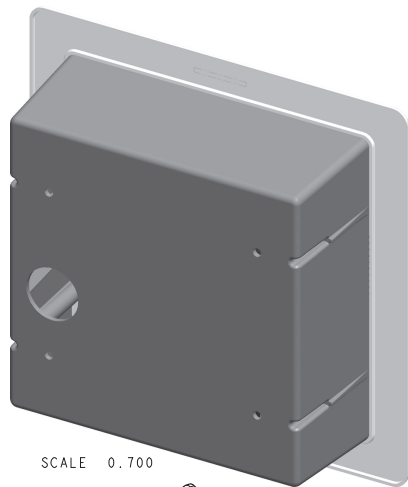
APPROVALS: DATE

DRAWN: TAK 23MAR2020
CHECKED: KJB 23MAR2020
APPROVED: JM 23MAR2020

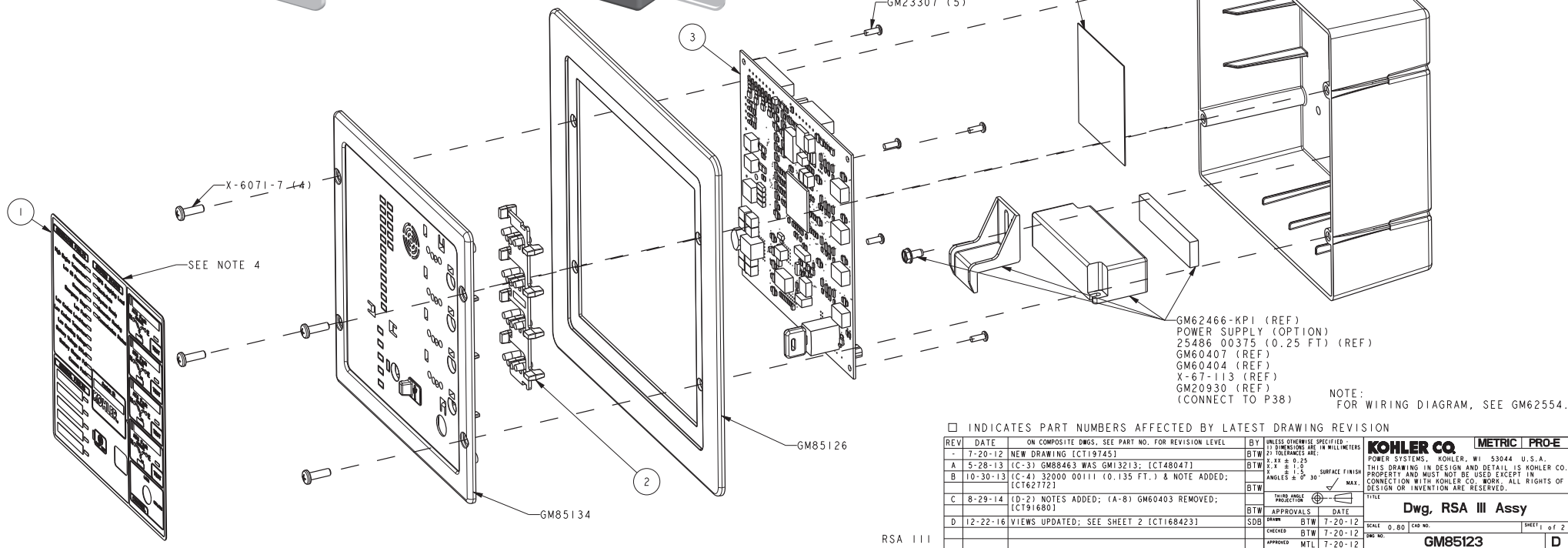
SCALE: 0.05 CAD NO. SHEET 1 of 3

ADV-9197 **D**

PART NO.	REV	ITEM 1	ITEM 2	ITEM 3	COMMENTS
GM85123-1	C	GM85127	GM85129	GM86126-1	MULTIPLE ATS
GM85123-2	C	GM85131	GM85129	GM86126-2	SINGLE ATS
GM85123-3	C	GM85132	-	GM86126-3	ANNUNCIATOR ONLY
GM85123-4	C	GM85133	-	GM86126-3	SDMO - ANNUNCIATOR ONLY



- NOTES:
- FUNCTIONALLY TEST ACCORDING TO ISO DOCUMENT ETF-WI-001, PER SPECIFICATION ETF-TD-003.
 - ASSEMBLE PCBA TO BACK OF BEZEL USING FIXTURE JT-0001.
 - TORQUE ALL SCREWS TO 7-10 in lbs.
 - PEEL BACKING OFF FACE PLATE AND APPLY TO BEZEL. APPLY EVEN PRESSURE TO ENTIRE SURFACE TO ENSURE COMPLETE ADHESION.

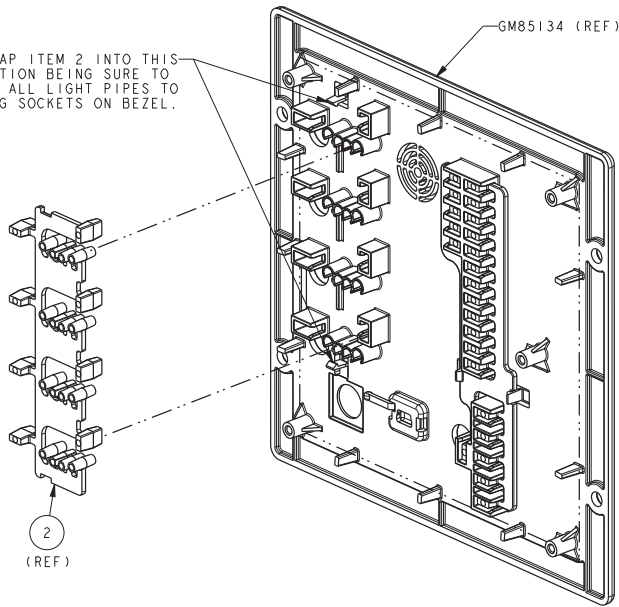


REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	UNLESS OTHERWISE SPECIFIED: 2) DIMENSIONS ARE IN MILLIMETERS	KOHLER CO. METRIC PRO-E POWER SYSTEMS, KOHLER, WI 53044 U.S.A. THIS DRAWING IN DESIGN AND DETAIL IS KOHLER CO. PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH KOHLER CO. WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.
-	7-20-12	NEW DRAWING [CT19745]	BTW	2) TOLERANCES ARE: X .XX ± 0.25 Y .Y ± 0.15 ANGLES ± 0° 30' / MAX.	
A	5-28-13	(C-3) GM88463 WAS GM13213; [CT48047]	BTW		TITLE Dwg, RSA III Assy SCALE 0.80 CAD NO. SHEET 1 of 2 DWG NO. GM85123
B	10-30-13	(C-4) 32000 00111 (0.135 FT.) & NOTE ADDED; [CT62772]	BTW		
C	8-29-14	(D-2) NOTES ADDED; (A-8) GM60403 REMOVED; [CT191680]	BTW		
D	12-22-16	VIEWS UPDATED; SEE SHEET 2 [CT1684231]	BTW		
			APPROVED	DATE	
			CHECKED	DATE	
			APPROVED	DATE	

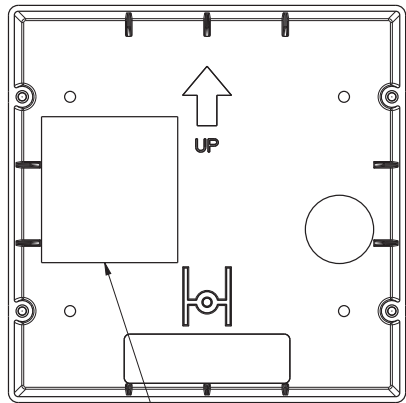
RSA III

8 7 6 5 4 3 2 1

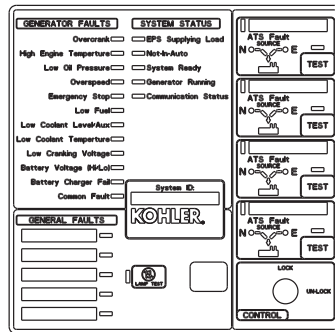
SNAP ITEM 2 INTO THIS LOCATION BEING SURE TO LINE-UP ALL LIGHT PIPES TO MATCHING SOCKETS ON BEZEL.



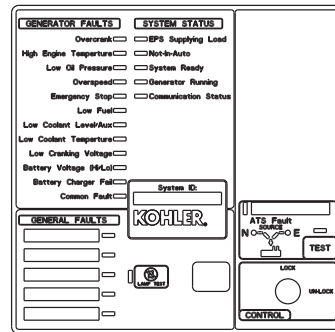
BACK VIEW OF BEZEL
SCALE 1.000



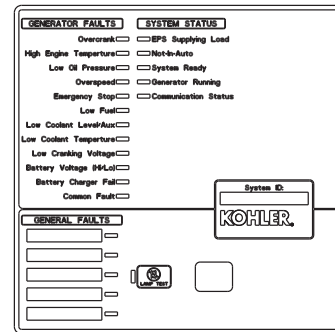
VIEW B
FRONT OF BOX



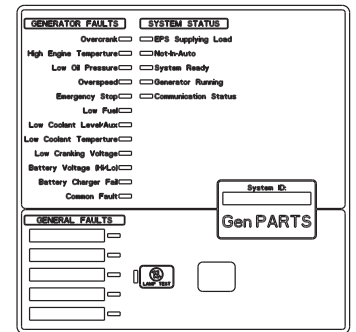
ITEM 1
P/N: GM85127 REF



ITEM 1
P/N: GM85131 REF



ITEM 1
P/N: GM85132 REF



ITEM 1
P/N: GM85133 REF

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 .X ± 1.5 SURFACE FINISH ANGLES ± 0° 30' / MAX.	TITLE
-	7-30-12	NEW DRAWING [CT19745]	BTW		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. Dwg. RSA III Assy SCALE 0.80 CAD NO. SHEET 2 of 2 TAG NO. GM85123
A	5-28-13	(A-8) GM88463 (REF) WAS GM13213 (REF); [CT48047]	BTW		
B	10-30-13	SEE SHEET 1 [CT62772]	BTW		
C	8-29-14	VIEW A REMOVED; [CT91680]	BTW		
D	12-22-16	VIEWS UPDATED; SEE SHEET 1 [CT168423]	SDP		
			APPROVALS	DATE	
			DRW	BTW	7-30-12
			CHECKED	BTW	7-30-12
			APPROVED	MTL	7-30-12

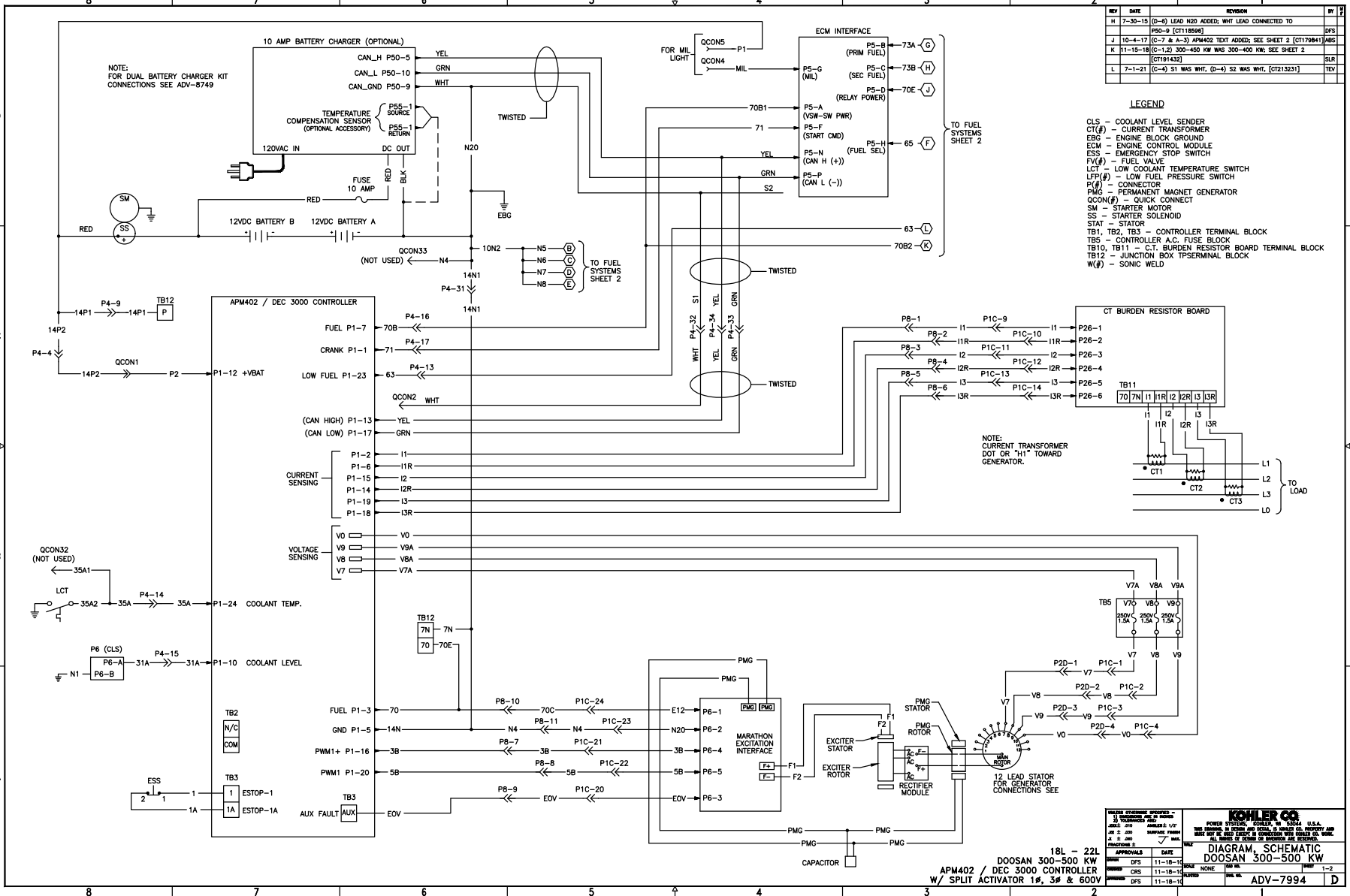
8 7 6 5 4 3 2 1

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Wiring Schematics

REV	DATE	REVISION	BY
H	7-30-15	(C-6) LEAD N20 ADDED; WHT LEAD CONNECTED TO P5-G	DPS
J	10-4-17	(C-7 & X-3) APM402 TEXT ADDED; SEE SHEET 2 [C118596]	AMS
K	11-15-18	(C-12) 300-450 KW WAS 300-400 KW; SEE SHEET 2 [C1191432]	SLR
L	7-1-21	(C-4) S1 WAS WHT, (D-4) S2 WAS WHT, [C1213231]	TEV

- LEGEND**
- CLS - COOLANT LEVEL SENDER
 - CT(#)- CURRENT TRANSFORMER
 - EBG - ENGINE BLOCK GROUND
 - ECM - ENGINE CONTROL MODULE
 - ESS - EMERGENCY STOP SWITCH
 - FV(#)- FUEL VALVE
 - LCT - LOW COOLANT TEMPERATURE SWITCH
 - LFP(#)- LOW FUEL PRESSURE SWITCH
 - P4(#)- CONNECTOR
 - PMG - PERMANENT MAGNET GENERATOR
 - SM - STARTER MOTOR
 - SS - STARTER SOLENOID
 - STAT - STATOR
 - TB1, TB2, TB3 - CONTROLLER TERMINAL BLOCK
 - TB5 - CONTROLLER A.C. FUSE BLOCK
 - TB10, TB11 - C.T. BURDEN RESISTOR BOARD TERMINAL BLOCK
 - TB12 - JUNCTION BOX TERMINAL BLOCK
 - W(#)- SONIC WELD



DOOSAN POWER SYSTEMS

18L - 22L
 APM402 / DEC 3000 CONTROLLER
 W/ SPLIT ACTIVATOR 1#, 3# & 600V

KOHLER CO.
 POWER SYSTEMS DIVISION, COLEBROOK, NC, U.S.A.
 THE MANUFACTURER OF THIS PRODUCT ACCEPTS NO LIABILITY FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THIS PRODUCT.
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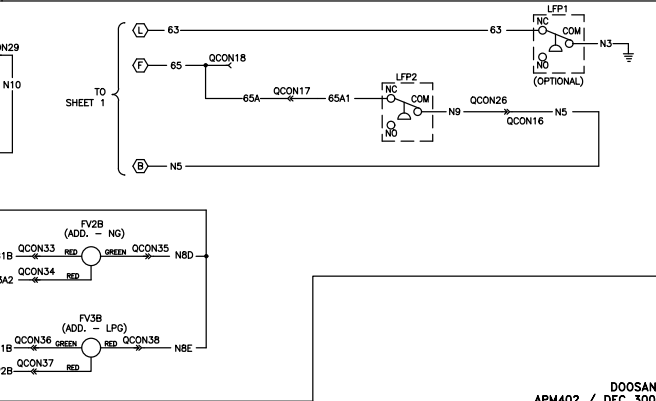
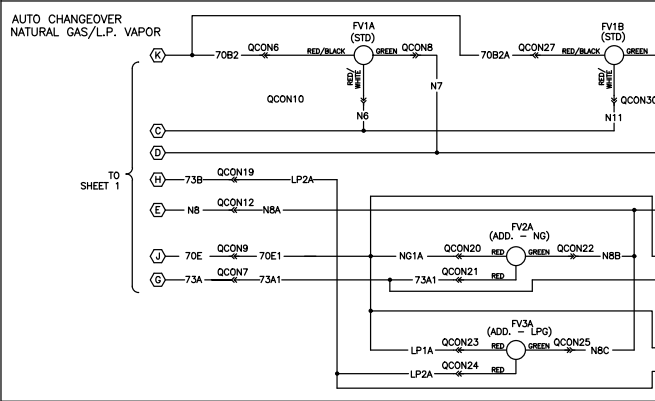
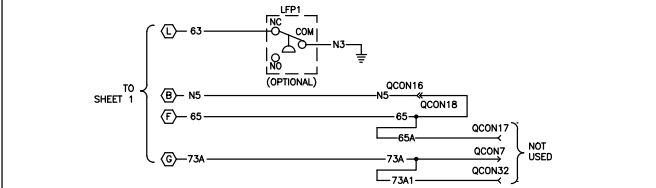
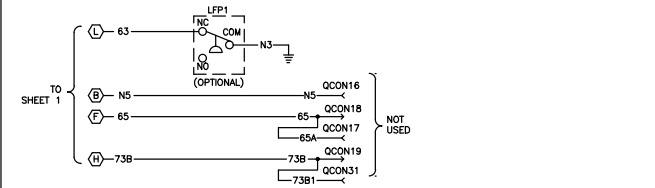
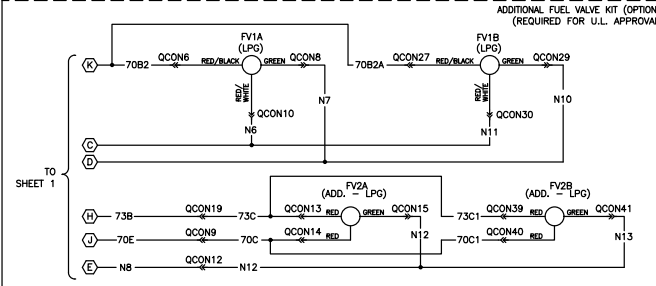
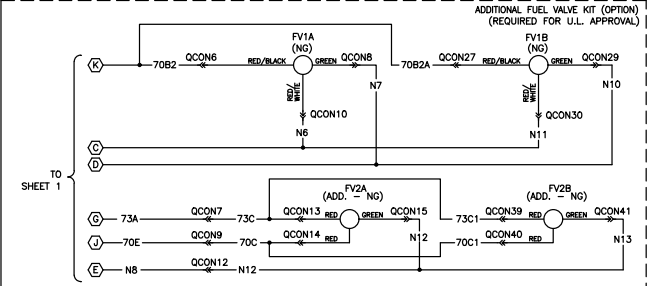
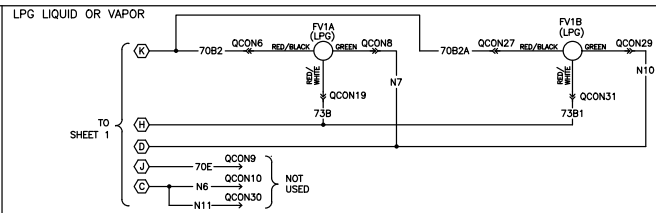
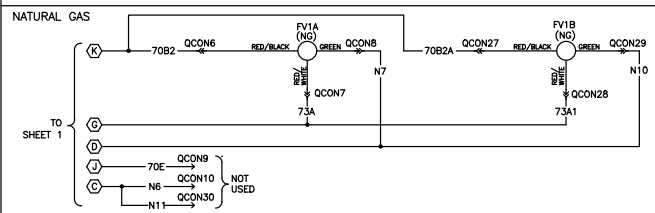
DIAGRAM, SCHEMATIC
DOOSAN 300-500 KW

APPROVALS: DATE: 11-18-15
 DESIGNED: NONE
 DRAWN: NONE
 CHECKED: NONE
 REVISED: NONE

ADV-7994

REV	DATE	REVISION	BY
G	10-2-14	SEE SHEET 1 [CT194120]	DFS
H	7-30-15	SEE SHEET 1 [CT118694]	DFS
J	10-6-17	APM402 TEXT ACCD; SEE SHEET 1 [CT170841]	MS
K	11-15-18	(A-12) 300-400 KW MGS 300-400 KW; SEE SHEET 1 [CT191432]	SLR
L	7-1-21	SEE SHEET 1 [CT213231]	TEV

FUEL SYSTEMS

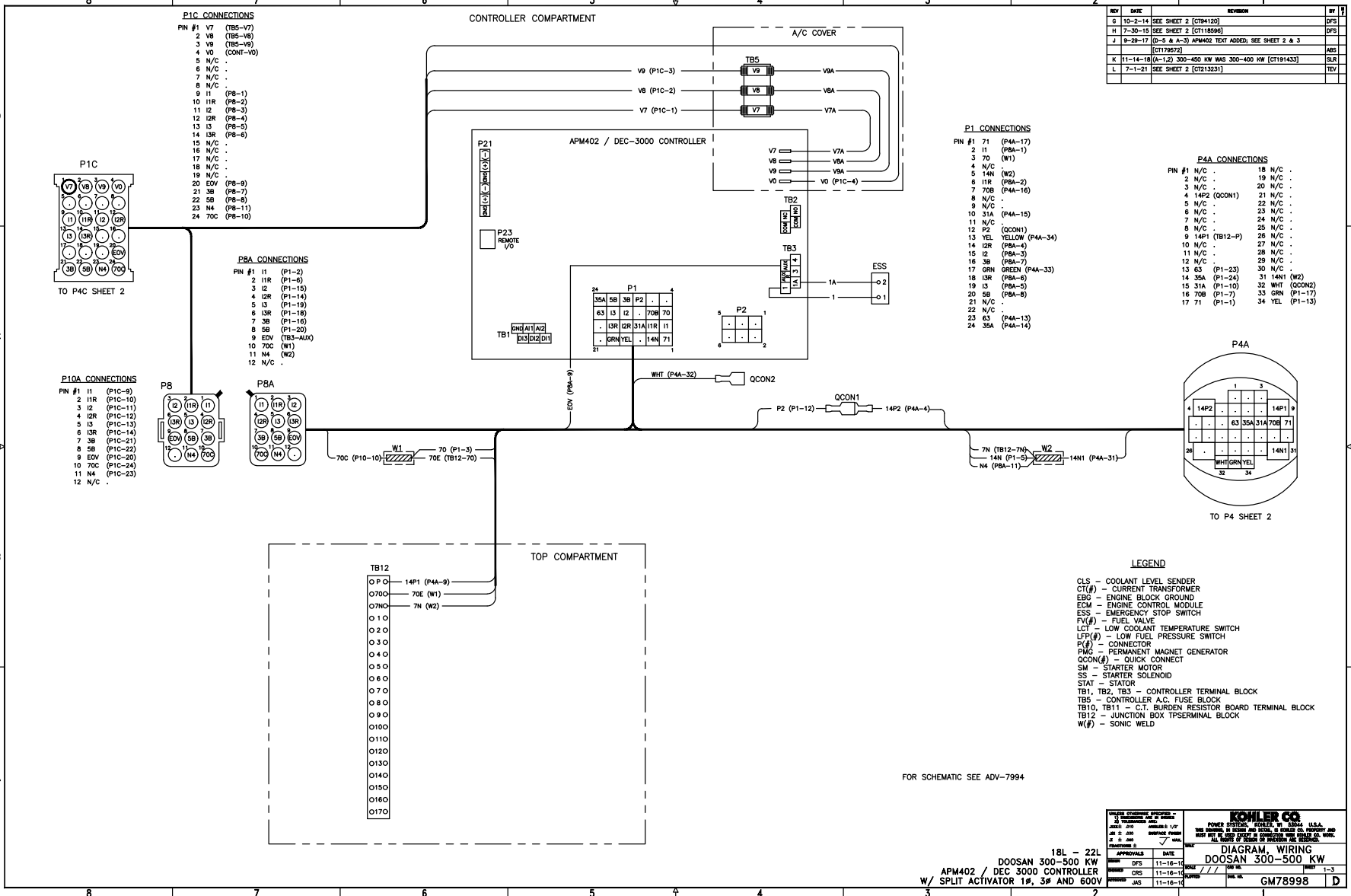


18L - 22L
DOOSAN 300-500 KW
APM402 / DEC 3000 CONTROLLER
W/ SPLIT ACTIVATOR 1#, 5# & 600V

APPROVALS	DATE
DESIGNED: DFS	11-18-15
DRAWN: CRS	11-18-15
CHECKED: JAS	11-18-15

KOHLER CO.
POWER SYSTEMS, COLEBROOK, MASSACHUSETTS, U.S.A.
THE KOHLER COMPANY AND ITS U.S. DIVISIONS ARE NOT RESPONSIBLE FOR THE DESIGN OR CONSTRUCTION OF ANY SYSTEMS OR EQUIPMENT WHICH MAY BE BASED ON THESE DRAWINGS.
ADV-7994

REV	DATE	REVISION	BY
G	10-2-14	SEE SHEET 2 (C114120)	DFS
H	7-30-11	SEE SHEET 2 (C111896)	DFS
J	9-25-11	(2-2, 4-3) APM42 TEXT ADDED; SEE SHEET 2 & 3	
		(C1179872)	
K	11-14-18	(A-1, 2) 300-450 KW WAS 300-400 KW (C1181433)	SLR
L	7-1-21	SEE SHEET 2 (C1213231)	TEV



P1C CONNECTIONS

PIN #1	TERMINAL
1	V7 (TB5-V7)
2	V8 (TB5-V8)
3	V9 (TB5-V9)
4	VO (CONT-VO)
5	N/C
6	N/C
7	N/C
8	N/C
9	I1 (P8-1)
10	I1R (P8-2)
11	I2 (P8-3)
12	I2R (P8-4)
13	I3 (P8-5)
14	I3R (P8-6)
15	N/C
16	N/C
17	N/C
18	N/C
19	N/C
20	EOV (P8-9)
21	3B (P8-7)
22	5B (P8-8)
23	N4 (P8-11)
24	70C (P8-10)

P8A CONNECTIONS

PIN #1	TERMINAL
1	I1 (P1-2)
2	I1R (P1-6)
3	I2 (P1-15)
4	I2R (P1-14)
5	I3 (P1-19)
6	I3R (P1-18)
7	3B (P1-16)
8	5B (P1-20)
9	EOV (TB3-AUX)
10	70C (W1)
11	N4 (W2)
12	N/C

P10A CONNECTIONS

PIN #1	TERMINAL
1	I1 (P1C-9)
2	I1R (P1C-10)
3	I2 (P1C-11)
4	I2R (P1C-12)
5	I3 (P1C-13)
6	I3R (P1C-14)
7	3B (P1C-21)
8	5B (P1C-22)
9	EOV (P1C-20)
10	70C (P1C-24)
11	N4 (P1C-23)
12	N/C

P1 CONNECTIONS

PIN #1	TERMINAL
1	71 (P4A-17)
2	I1 (P8A-1)
3	70 (W1)
4	N/C
5	14N (W2)
6	I1R (P8A-2)
7	70B (P4A-16)
8	N/C
9	N/C
10	31A (P4A-15)
11	N/C
12	P2 (QCON1)
13	YEL YELLOW (P4A-34)
14	I2R (P4A-4)
15	I2 (P8A-3)
16	3B (P8A-7)
17	GRN GREEN (P4A-33)
18	I3R (P8A-6)
19	I3 (P8A-5)
20	5B (P8A-8)
21	N/C
22	N/C
23	63 (P4A-13)
24	35A (P4A-14)

P4A CONNECTIONS

PIN #1	TERMINAL
1	N/C
2	N/C
3	N/C
4	14P2 (QCON1)
5	N/C
6	N/C
7	N/C
8	N/C
9	14P1 (TB12-P)
10	N/C
11	N/C
12	N/C
13	63 (P1-23)
14	35A (P1-24)
15	31A (P1-10)
16	70B (P1-7)
17	71 (P1-1)
18	N/C
19	N/C
20	N/C
21	N/C
22	N/C
23	N/C
24	N/C
25	N/C
26	N/C
27	N/C
28	N/C
29	N/C
30	N/C
31	14N1 (W2)
32	WHI (QCON2)
33	GRN (P1-17)
34	YEL (P1-13)

- LEGEND**
- CLS - COOLANT LEVEL SENDER
 - CT(#)- CURRENT TRANSFORMER
 - EBG - ENGINE BLOCK GROUND
 - ECM - ENGINE CONTROL MODULE
 - ESS - EMERGENCY STOP SWITCH
 - FV(#)- FUEL VALVE
 - LCI - LOW COOLANT TEMPERATURE SWITCH
 - LFP(#)- LOW FUEL PRESSURE SWITCH
 - P(#)- CONNECTOR
 - P(M)- PERMANENT MAGNET GENERATOR
 - QCON(#)- QUICK CONNECT
 - SM - STARTER MOTOR
 - SS - STARTER SOLENOID
 - STAT - STATOR
 - TB1, TB2, TB3 - CONTROLLER TERMINAL BLOCK
 - TB5 - CONTROLLER A.C. FUSE BLOCK
 - TB10, TB11 - C.T. BURDEN RESISTOR BOARD TERMINAL BLOCK
 - TB12 - JUNCTION BOX TPSTERMINAL BLOCK
 - W(#)- SONIC WELD

KOHLER CO.

POWER SYSTEMS

DIAGRAM, WIRING

DOOSAN 300-500 KW

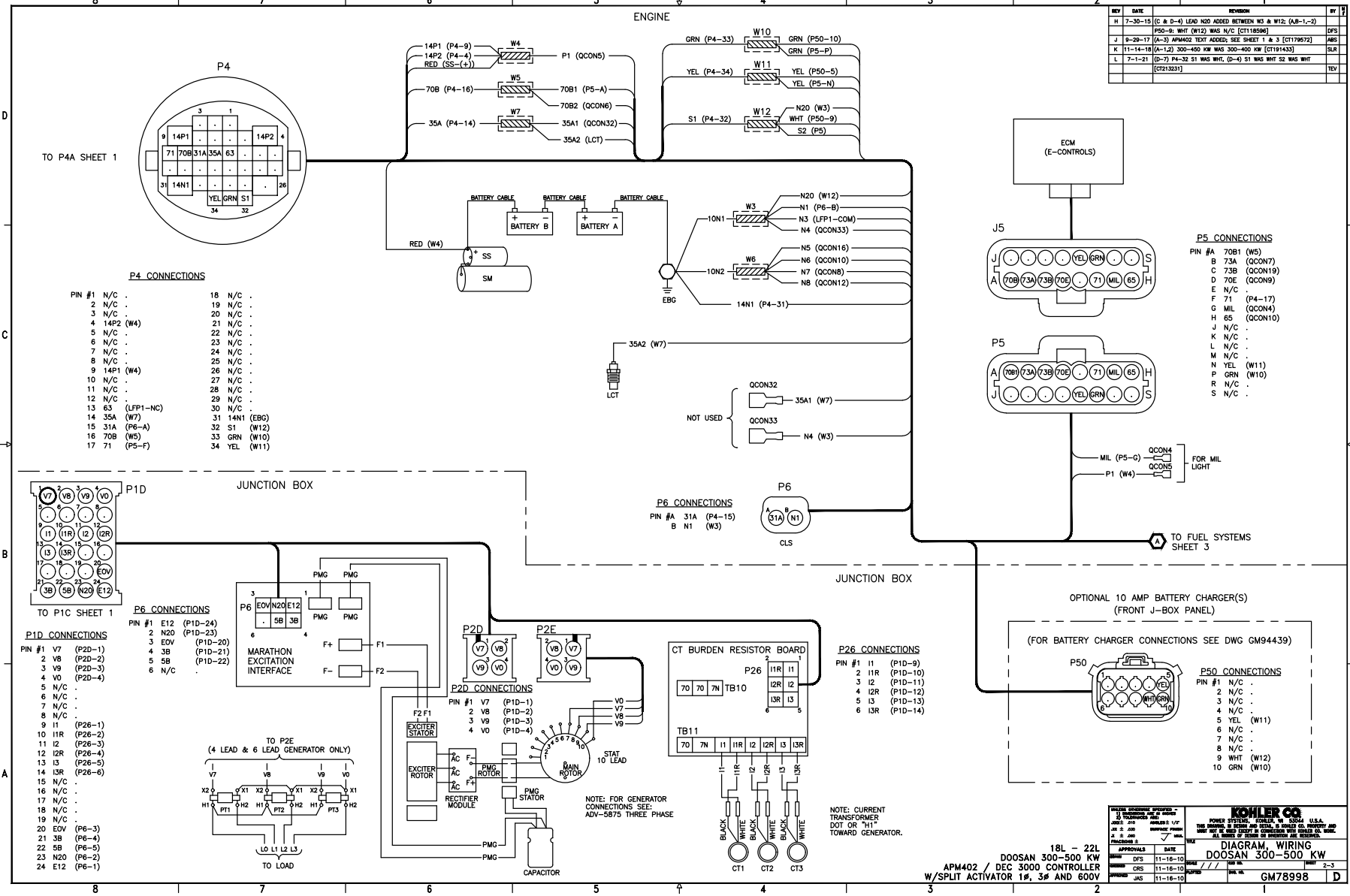
APPROVALS	DATE	BY
DFS	11-16-14	TEV
CRS	11-16-14	TEV
JMS	11-16-14	TEV

18L - 22L
DOOSAN 300-500 KW
APM402 / DEC 3000 CONTROLLER
W/ SPLIT ACTIVATOR 1P, 3P AND 600V

PART NO. GM78998

FOR SCHEMATIC SEE ADV-7994

REV	DATE	REVISION	BY
H	7-30-15	(C & D-4) LEAD N20 ADDED BETWEEN W3 & W12; (A-B-1,-2)	JPS
J	9-29-17	(A-3) APM402 TEXT ADDED; SEE SHEET 1 & 3 [C1179672]	MSJ
K	11-14-18	(A-1,2) 300-450 KW WAS 300-400 KW [C1191433]	SLR
L	7-1-21	(D-7) P4-32 S1 WAS WHT, (D-4) S1 WAS WHT S2 WAS WHT [C1213231]	TEV



18L - 22L
DOOSAN 300-500 KW
APM402 / DEC 3000 CONTROLLER
W/SPLIT ACTIVATOR 1#, 3# AND 600V

APPROVALS

DATE	DATE
DESIGNED	DESIGNED
CHECKED	CHECKED
APPROVED	APPROVED

REVISIONS

NO.	DATE	DESCRIPTION
1	11-16-10	REVISED

DOOSAN 300-500 KW

DIAGRAM WIRING

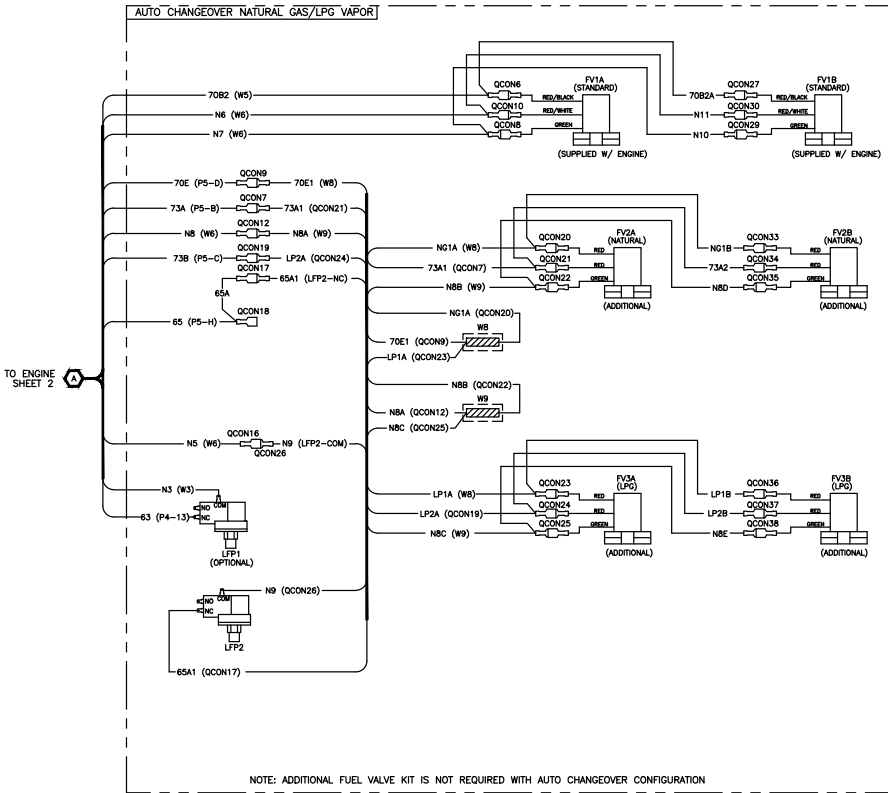
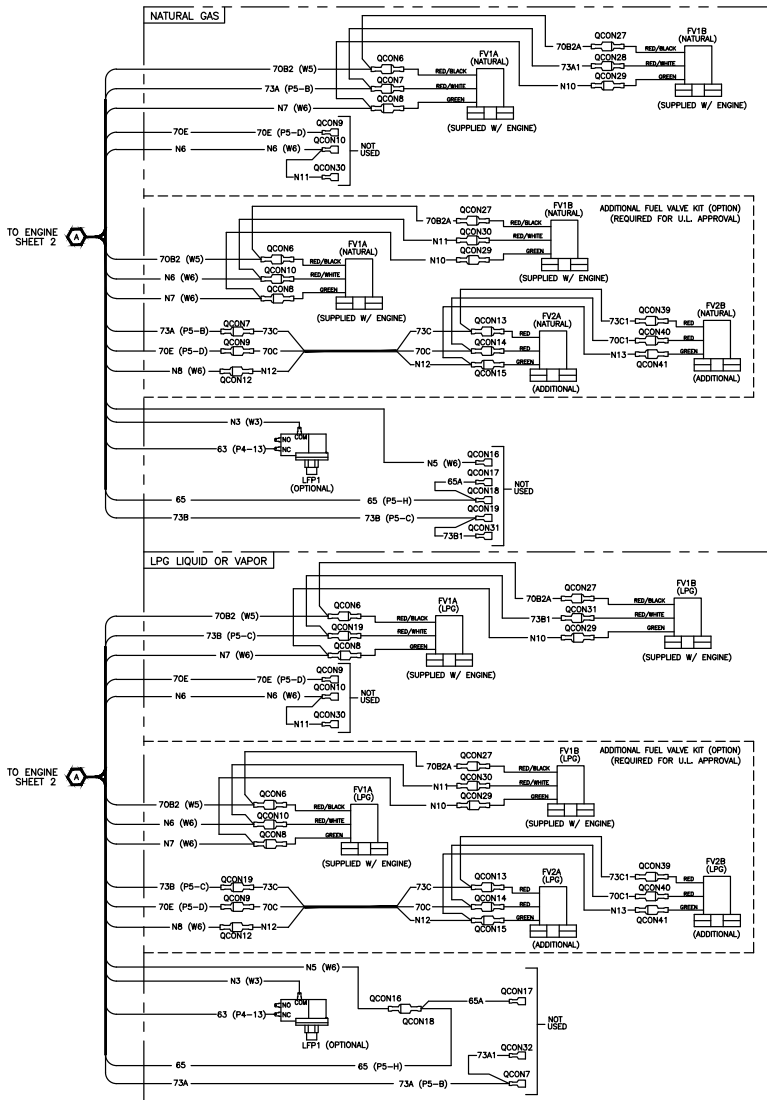
DOOSAN 300-500 KW

REV 2-3

GM78998

FUEL SYSTEMS

REV	DATE	REVISION	BY
G	10-2-14	SEE SHEET 2 (CT194120)	DFS
H	7-20-15	SEE SHEET 2 (CT118096)	DFS
J	19-20-17	(A-3) APM402 TEXT ADDS; SEE SHEET 1 & 2 (CT179572)	AMS
K	11-14-18	(A-1,2) 300-450 KW WAS 300-600 KW (CT191433)	SLR
L	7-1-21	SEE SHEET 2 (CT123231)	DFS



NOTE: ADDITIONAL FUEL VALVE KIT IS NOT REQUIRED WITH AUTO CHANGEOVER CONFIGURATION

<p>POWER SYSTEMS 181 - 22L DOOSAN 300-500 KW APM402 / DEC 3000 CONTROLLER W/ SPLIT ACTIVATOR 1#, 3# AND 600V</p>	<p>KOHLER CO. POWER SYSTEMS GROUP, 6350 N. U.S.A. 181 - 22L DOOSAN 300-500 KW APM402 / DEC 3000 CONTROLLER W/ SPLIT ACTIVATOR 1#, 3# AND 600V</p>
<p>APPROVALS DFS 11-16-15 AMS 11-16-15 SLR 11-16-15</p>	<p>DATE 11-16-15 11-16-15 11-16-15</p>
<p>DIAGRAM WIRING DOOSAN 300-500 KW</p>	<p>REV 3-3 GM78998</p>

P29 2 AMP RELAY OUTPUT (2.1) CONNECTIONS.
 P29-NC 2.1 RELAY NORMALLY CLOSED
 P29-COM 2.1 RELAY COMMON
 P29-NO 2.1 RELAY NORMALLY OPEN

P30 2 AMP RELAY OUTPUT (2.2) CONNECTIONS.
 P30-NC 2.2 RELAY NORMALLY CLOSED
 P30-COM 2.2 RELAY COMMON
 P30-NO 2.2 RELAY NORMALLY OPEN

P31 2 AMP RELAY OUTPUT (2.3) CONNECTIONS.
 P31-NC 2.3 RELAY NORMALLY CLOSED
 P31-COM 2.3 RELAY COMMON
 P31-NO 2.3 RELAY NORMALLY OPEN

P32 10 AMP RELAY OUTPUT (2.4 & 2.5) CONNECTIONS.
 P32-NO 2.4 RELAY NORMALLY OPEN
 P32-COM 2.4 RELAY COMMON
 P32-NC 2.4 RELAY NORMALLY CLOSED
 P32-NO 2.5 RELAY NORMALLY OPEN
 P32-COM 2.5 RELAY COMMON
 P32-NC 2.5 RELAY NORMALLY CLOSED

P27 CAN TERMINATOR CONNECTIONS.
 PLACE THE P27 JUMPER ON THE "IN" PINS

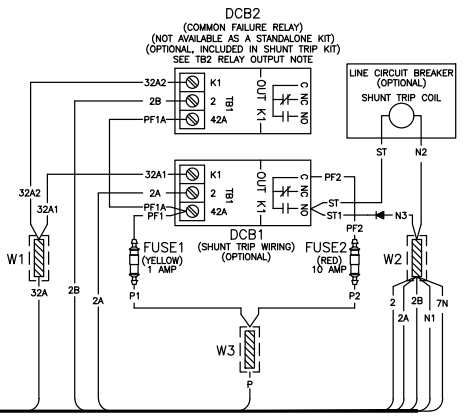
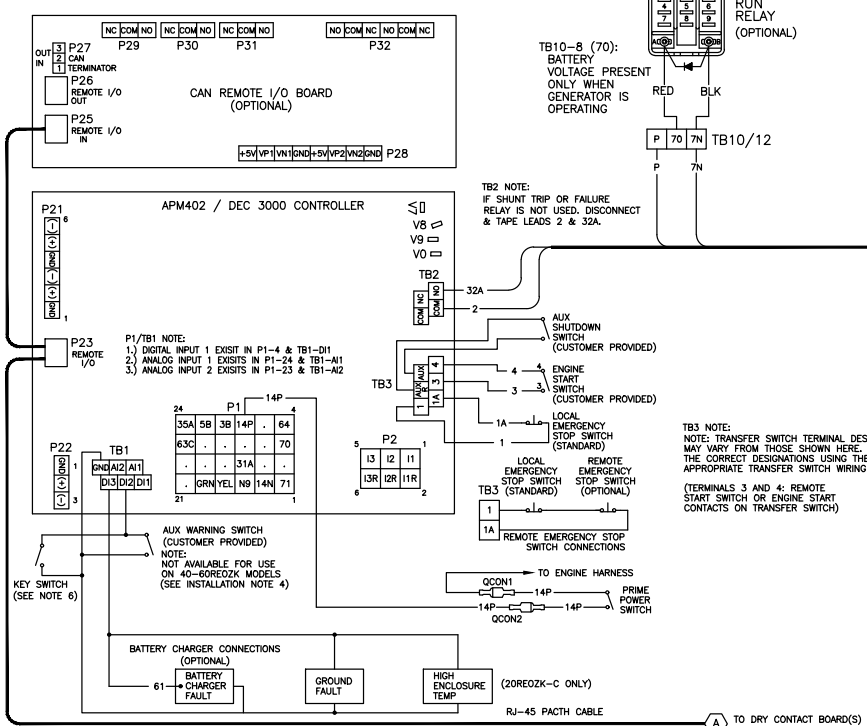
P28 SINGLE-ENDED (0-5V) ANALOG INPUT CONNECTIONS.
 P28-GND AGND ANALOG RETURN
 P28-VN2 NO CONNECTION
 P28-VP2 ACH2 SIGNAL
 P28-+5V SUPPLY (0.05 AMP MAX)
 P28-GND AGND ANALOG RETURN
 P28-VN1 NO CONNECTION
 P28-VP1 ACH1 SIGNAL
 P28-+5V SUPPLY (0.05 AMP MAX)

P28 DIFFERENTIAL (+/-3V) ANALOG INPUT CONNECTIONS.
 P28-GND AGND ANALOG REFERENCE
 P28-VN2 ACH2 NEGATIVE DIFFERENTIAL SIGNAL
 P28-VP2 ACH2 POSITIVE DIFFERENTIAL SIGNAL
 P28-+5V SUPPLY (0.05 AMP MAX)
 P28-GND AGND ANALOG RETURN
 P28-VN1 ACH1 NEGATIVE DIFFERENTIAL SIGNAL
 P28-VP1 ACH1 POSITIVE DIFFERENTIAL SIGNAL
 P28-+5V SUPPLY (0.05 AMP MAX)

NOTE: CONTACT AUTHORIZED DISTRIBUTOR TO DEFINE P28 A/D INPUTS.

REV	DATE	REVISION	BY
F	04-28-10	(0-2-3) COMMENT "NOT AVAILABLE AS A STANDALONE KIT", "OPTIONAL, INCLUDED IN SHUNT TRIP KIT" ARE ADDED. SEE SHEET 2 (01168997)	SSR
G	2-6-10	[A-B-6-7-8] ADDED GROUND FAULT RELAY INPUT; TB1-D11 LOW FUEL PRESSURE WAS EXISTING OVER VOLTAGE (AL3AL2M) [A-B-1-2-3] ADDED NOTE 5 AND 6 IN INSTALLATION NOTES [01193015]	SSR

LEGEND
 P(#)- PLUG
 QCON(#)- QUICK CONNECT
 TB(#)- TERMINAL BLOCK
 W(#)- SONIC WELD



TB2 NOTE:
 IF SHUNT TRIP OR FAILURE RELAY IS NOT USED, DISCONNECT & TAPE LEADS 2 & 32A.

TB3 NOTE:
 NOTE: TRANSFER SWITCH TERMINAL DESIGNATIONS MAY VARY FROM THOSE SHOWN HERE. VERIFY THE CORRECT DESIGNATIONS USING THE APPROPRIATE TRANSFER SWITCH WIRING DIAGRAM.
 (TERMINALS 3 AND 4: REMOTE START SWITCH OR ENGINE START CONTACTS ON TRANSFER SWITCH)

INSTALLATION NOTES:

- FOR FIELD INSTALLATION A MAXIMUM OF TWO WIRE TERMINALS PER TERMINAL STRIP SCREW IS RECOMMENDED UNLESS OTHERWISE NOTED ON THE WIRING DIAGRAM. DO NOT EXTEND ABOVE THE TERMINAL STRIP BARRIER.
- GENERATOR SETS WITH FUEL TANKS HAVE THE FUEL IN BASIN SWITCH TIED TO DIGITAL INPUT 1 (TB1-D11) VIA P1-4 AND FUEL LEVEL SENDER TIED TO ANALOG INPUT 2 (TB1-AI2) VIA P1-23
- COOLANT LEVEL SENSOR ON ALL GENSETS IS TIED TO ANALOG INPUT 1 (TB1-AI2) VIA P1-24.
- 40-60 REOZK MODELS HAVE COLD START IGNITION RELAY TIED TO DIGITAL INPUT 2 (TB1-DI2)
- GROUND FAULT WARNING : CONNECT TO REMOTE I/O BOARD ON 20REOZK-C.
- KEYSWITCH AVAILABLE ON SELECT MODELS ONLY.

P21 RS485 NON-ISOLATED CONNECTIONS.
 P21-1 GND
 P21-2 +
 P21-3 -
 P21-4 GND
 P21-5 +
 P21-6 -

TB1 ANALOG/DIGITAL INPUT FACTORY SETTINGS
 TB1-D11 DCH1 LOW FUEL PRESSURE
 TB1-D12 DCH2 AUX WARNING
 TB1-D13 DCH3 BATTERY CHARGER FAULT WARNING
 TB1-A1 ACH1 NO FUNCTION
 TB1-A2 ACH2 NO FUNCTION
 TB1-GND A/DGND ANALOG/DIGITAL RETURN

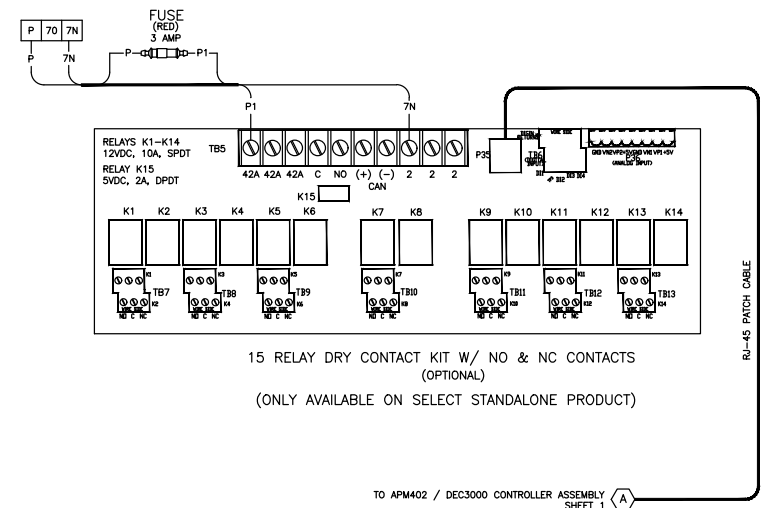
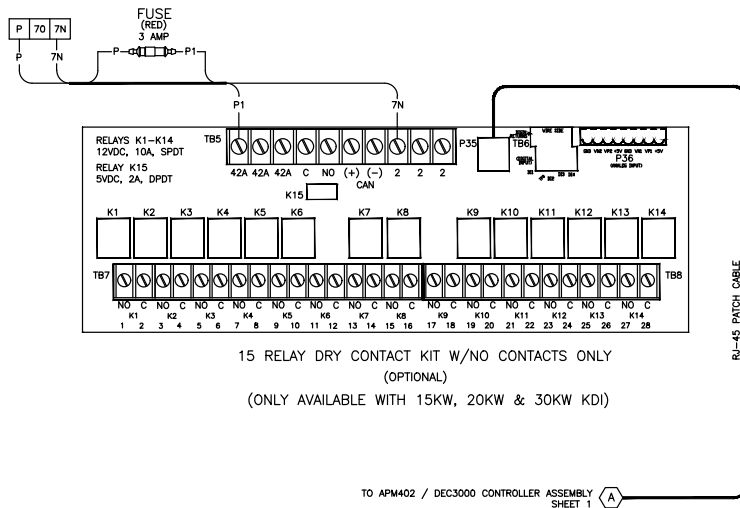
NOTE: TB1 A/D INPUTS MAY BE REDEFINED - FACTORY DEFAULTS LISTED. CONTACT AUTHORIZED DISTRIBUTOR FOR DETAILS.

TB2 RELAY OUTPUT
 TB2-D11 DCH1 COMMON FAULT
 TB2-COM (RELAY COMMON) COMMON FAULT
 TB2-NO (RELAY NORMALLY OPEN) COMMON FAULT
 TB2-NC (RELAY NORMALLY CLOSED) COMMON FAULT

NOTE: TB2 RELAY OUTPUT MAY BE REDEFINED - FACTORY DEFAULTS LISTED. CONTACT AUTHORIZED DISTRIBUTOR FOR DETAILS. CUSTOMER TO CONNECT TO TB2 UNLESS SHUNT TRIP IS USED. IF SHUNT TRIP IS USED, CUSTOMER TO CONNECT TO DCB2 FOR COMMON FAULT.

<p>UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS (INCHES). DIMENSIONS IN PARENTHESES ARE IN INCHES (MILLIMETERS). DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.</p>	
<p>WORLDWIDE POWER SYSTEMS, INC. 3500 W. 100th St., Suite 100, Minneapolis, MN 55428 U.S.A. PHONE: 612-835-1100 FAX: 612-835-1101 WWW: WWW.WORLDWIDEPOWER.COM</p>	
<p>DIAGRAM, DEC3000/APM402 ACCY INTERCONNECTION</p>	
<p>DATE: 09-16-10 DRAWN: DPS CHECKED: CRS APPROVED: CRS</p>	<p>DATE: 09-16-10 DRAWN: // CHECKED: // APPROVED: //</p>
<p>REV: 1-2 PART NO: GM78246</p>	<p>REV: 1-2 PART NO: D</p>

REV	DATE	REVISION	BY
F	04-28-18	(8-6-2) COMMENT "APM402 / DEC 3000 ACCESSORIES" IS ADDED	SRH
		SEE SHEET 1 (C118097)	SRH
G	2-6-19	SEE SHEET 1 (C1182515)	SRH



APM402 / DEC 3000 ACCESSORIES

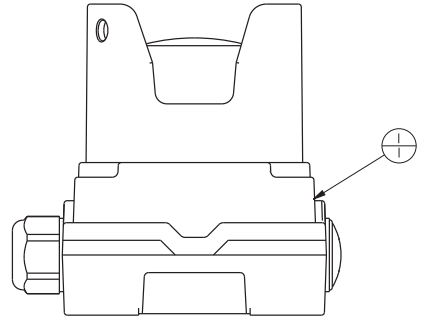
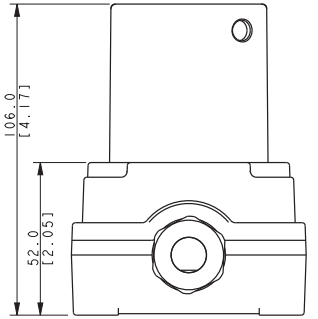
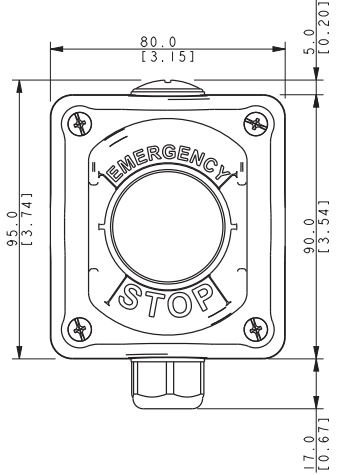
APPROVALS DESIGNED: DFS 9-18-15 CHECKED: CRS 9-18-15 APPROVED: DFS 9-18-15		KOHLER CO. POWER SYSTEMS DIVISION 1000 W. 10TH AVENUE, SUITE 100 DENVER, CO 80202 TEL: 303.733.1000 FAX: 303.733.1001 WWW.KOHLER.COM	
DATE: 9-18-15 DRAWING NO.: 777 SHEET NO.: 2-2		DIAGRAM, DEC3000/APM402 ACCY INTERCONNECTION PAK NO. GM78246	

KOHLER®

Miscellaneous

KIT NO.	ITEM	PART NO	QTY	DESCRIPTION
GMI03743				E-STOP, NEC REMOTE
	1	GMI03743-1	1	E-STOP W/ YELLOW SHROUD, LOTO
	2	GMI03743-2	4	#10 X 1.25 Sheetmetal Screw
	3	GMI03743-3	1	TERMINAL, FAST-ON, MALE, 18-22 AWG
	4	GMI03743-4	1	TERMINAL, FAST-ON, FEMALE, 18-22 AWG
	5	GMI03743-5	2	TERMINAL, SPADE, 22-16 AWG
	6	GMI03743-6	1	LITERATURE, TT-1736

THIS IS AN AUTOMATED TABLE. ALL UPDATES MUST BE MADE IN THE ASSEMBLY.



SCALE 1.50

NOTE:
 DIMENSIONS IN [] ARE IN INCH EQUIVALENTS.
 SCREWS AND TERMINALS ARE TO BE BAGGED
 AND PLACED IN THE BOX

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	UNLESS OTHERWISE SPECIFIED: 1) DIMENSIONS ARE IN MILLIMETERS 2) TOLERANCES ARE: X .XX ± 0.25 Y .Y ± 0.5 Z .Z ± 1.5 SURFACE FINISH ANGLES ± 0° 30' MAX.	TITLES
-	2-12-18	NEW DRAWING [CT176728]	CCL		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 E-STOP, NEC REMOTE
					SCALE 1.50 CAD NO. SHEET 1 of 1
					DWG NO. GMI03743

KOHLER®

Warranty

Transfer Switch One-Year Limited Warranty

Your Kohler product has been manufactured and inspected with care by experienced craftsmen. If you are the original end user, Kohler Co. 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, Kohler Co. will repair, replace, or make appropriate adjustment at Kohler Co.'s option if the product, upon Kohler Co.'s inspection, is found to be properly installed, maintained, and operated in accordance with Kohler Co.'s instruction manuals. A Kohler distributor, dealer, or authorized service representative must perform startup.

Kohler Product

Transfer switch and factory-supplied transfer switch accessories

Transfer switch main contacts

Warranty Coverage

One (1) year from the registered startup date. In any event, the warranty period will expire not later than thirty (30) months from the date of shipment from Kohler Co.'s factory.

Ten (10) years from the registered startup date. In any event, the warranty period will expire not later than eleven (11) years and six (6) months from the date of shipment from Kohler Co.'s factory.

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

1. Normal wear, periodic service, and routine adjustments.
2. Damage, including but not limited to damage caused by accidents, improper installation or handling, faulty repairs not performed by an authorized Kohler service representative, improper storage, or acts of God.
3. Damage caused by:
 - a. Operation above or below rated capacity, voltage, or frequency.
 - b. Modifications.
 - c. Installation contrary to published specifications and codes.
4. Damage caused by negligent maintenance such as:
 - a. Failure to provide a clean, dry environment.
 - b. Failure to perform recommended exercising.
 - c. Failure to perform scheduled maintenance as prescribed in supplied manuals.
 - d. Use of parts and/or procedures other than factory-supplied or -approved replacement parts and/or procedures.
5. Non-Kohler replacement parts. Replacement of a failed Kohler part with a non-Kohler part voids the warranty on that part.
6. Original installation charges and startup costs.
7. Additional expenses for repair after normal business hours, i.e. overtime or holiday labor rates.
8. Rental of equipment during performance of warranty repairs.
9. Removal and replacement of non-Kohler-supplied options and equipment.
10. Non-Kohler-authorized repair shop labor without prior approval from Kohler Co. Warranty Department.
11. Expenses incurred investigating performance complaints unless the problem is caused by defective Kohler materials or workmanship.
12. Maintenance items such as fuses, lamps, and adjustments.
13. Labor and travel charges after the first year of the transfer switch main contacts warranty period.
14. Travel time and mileage exceeding 300 miles round trip.

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

KOHLER CO. 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.

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TP-5373 4/15f

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

Your Kohler product has been manufactured and inspected with care by experienced craftsmen. If you are the original end user, Kohler Co. 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, Kohler Co. will repair, replace, or make appropriate adjustment at Kohler Co.'s option if the product, upon Kohler Co.'s inspection, is found to be properly installed, maintained, and operated in accordance with Kohler Co.'s instruction manuals. A Kohler distributor, dealer, or authorized service representative must perform startup.

Kohler Product

Stationary Standby Generator Set & Accessories

Warranty Coverage

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

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 Kohler 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. Additional expenses for repairs performed after normal business hours, i.e. overtime or holiday labor rates.
8. Rental of equipment during the performance of warranty repairs.
9. Removal and replacement of non-Kohler-supplied options and equipment.
10. Non-Kohler replacement parts. Replacement of a failed Kohler part with a non-Kohler part voids the warranty on that part.
11. Radiators replaced rather than repaired.
12. Fuel injection pumps not repaired by an authorized Kohler service representative.
13. Non-Kohler-authorized repair shop labor without prior approval from Kohler Co. Warranty Department.
14. Engine fluids such as fuel, oil, or coolant/antifreeze.
15. Shop supplies such as adhesives, cleaning solvents, and rags.
16. Expenses incurred investigating performance complaints unless the problem is caused by defective Kohler materials or workmanship.
17. Maintenance items such as fuses, lamps, filters, spark plugs, loose or leaking clamps, and adjustments.
18. Travel time and mileage exceeding 300 miles round trip.

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

KOHLER CO. 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.

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TP-5374 12/15f

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

Your Kohler product has been manufactured and inspected with care by experienced craftsmen. If you are the original end user, Kohler Co. 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, Kohler Co. will repair, replace, or make appropriate adjustment at Kohler Co.'s option if the product, upon Kohler Co.'s inspection, is found to be properly installed, maintained, and operated in accordance with Kohler Co.'s instruction manuals. A Kohler distributor, dealer, or authorized service representative must perform startup.

Kohler 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 Kohler 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-Kohler-supplied options and equipment.
11. Non-Kohler replacement parts. Replacement of a failed Kohler part with a non-Kohler part voids the warranty on that part.
12. Radiators replaced rather than repaired.
13. Fuel injection pumps not repaired by an authorized Kohler service representative.
14. Non-Kohler-authorized repair shop labor without prior approval from Kohler Co. 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 Kohler 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 Kohler service representative or write Kohler Co., Service Department, MS072, Kohler, WI 53044 USA.

KOHLER CO. 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.

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TP-5561 9/23g

Transfer Switch Extended Five-Year Comprehensive Limited Warranty

Your Kohler product has been manufactured and inspected with care by experienced craftsmen. If you are the original end user, Kohler Co. 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, Kohler Co. will repair, replace, or make appropriate adjustment at Kohler Co.'s option if the product, upon Kohler Co.'s inspection, is found to be properly installed, maintained, and operated in accordance with Kohler Co.'s instruction manuals. A Kohler distributor, dealer, or authorized service representative must perform startup.

Kohler Product

Transfer switch and factory-supplied transfer switch accessories

Transfer switch main contacts

Warranty Coverage

Five (5) years from registered startup date.

Ten (10) years from the registered startup date.

This warranty is not effective unless a proper extended warranty registration form and warranty fee have been sent to Kohler Co. within one year of registered startup. The extended warranty start date is determined by the standard warranty requirements and runs concurrent with the standard warranty during the first year. To receive extended warranty coverage, the provisions of the standard warranty registration must be met.

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

1. Normal wear, periodic service, and routine adjustments.
2. Damage, including but not limited to damage caused by accidents, improper installation or handling, faulty repairs not performed by an authorized Kohler service representative, improper storage, or acts of God.
3. Damage caused by:
 - a. Operation above or below rated capacity, voltage, or frequency.
 - b. Modifications.
 - c. Installation contrary to published specifications and codes.
4. Damage caused by negligent maintenance such as:
 - a. Failure to provide a clean, dry environment.
 - b. Failure to perform recommended exercising.
 - c. Failure to perform scheduled maintenance as prescribed in supplied manuals.
 - d. Use of parts and/or procedures other than factory-supplied or -approved replacement parts and/or procedures.
5. Non-Kohler replacement parts. Replacement of a failed Kohler part with a non-Kohler part voids the warranty on that part.
6. Original installation charges and startup costs.
7. Additional expenses for repair after normal business hours, i.e. overtime or holiday labor rates.
8. Rental of equipment during performance of warranty repairs.
9. Removal and replacement of non-Kohler-supplied options and equipment.
10. Non-Kohler-authorized repair shop labor without prior approval from Kohler Co. Warranty Department.
11. Expenses incurred investigating performance complaints unless the problem is caused by defective Kohler materials or workmanship.
12. Maintenance items such as fuses, lamps, and adjustments.
13. Labor and travel charges after the fifth year of the transfer switch main contacts warranty period.
14. Travel time and mileage exceeding 300 miles round trip.

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

KOHLER CO. 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.

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TP-6087 4/15d

KOHLER®

Certification

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that:

Kohler Power Systems
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.

For and on behalf of BSI:



Carlos Pitanga, Chief Operating Officer Assurance – Americas

Original Registration Date: 1995-02-28

Latest Revision Date: 2021-10-29

Effective Date: 2021-11-07

Expiry Date: 2024-11-06

Page: 1 of 2



...making excellence a habit.™

Certificate No: **FM 727336**

Location	Registered Activities
Kohler Power Systems - GK 900 Highland Drive Bldg 604 Kohler Wisconsin 53004 USA	Manufacture of leads and harness, automatic transfer switches and switchgear. Distribution of generator sets.
Kohler Power Systems N7650 Lakeshore Road Sheboygan Wisconsin 53083 USA	Design, manufacture, and distributor support for electrical generators, automatic transfer switches and switchgear.
Kohler Power Systems 300 N Dekora Woods Blvd Saukville Wisconsin 53080 USA	Manufacture of fuel tanks, skids, fabricated components and generators.
Kohler Power Systems Muth Warehouse 2821 Muth Court Sheboygan Wisconsin 53083 USA	The distribution of generator sets.
Kohler Power Systems 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: 2021-10-29

Effective Date: 2021-11-07

Expiry Date: 2024-11-06

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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.

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KohlerPowerSystems.com

Kohler Automatic Transfer Switch Test Program

Non-Bypass Models

Testing is an integral part of quality assurance. In keeping with our uncompromising commitment to quality, safety, and reliability, every Kohler Automatic Transfer Switch (ATS) undergoes an extensive series of performance and production testing.

Performance Testing

All Kohler ATSs are UL1008 listed, which includes the following performance tests:

- General – Normal Operation
- Overvoltage
- Undervoltage
- Overload
- Temperature Rise
- Endurance
- Dielectric Voltage – Withstand
- Short Circuit Withstand
- Short Circuit Close- On
- Dielectric Voltage – Withstand (repeated)
- Strength of insulating base and support

EMC/EMI Immunity Verification

Controls and printed circuit board assemblies are evaluated to IEC and IEEE tests, including:

- EN61000-4-4 Fast Transient Immunity Severity Level 4
- EN61000-4-5 Surge Immunity Class 4 (voltage sensing and programmable inputs only)
- IEC Specifications for EMI/EMC Immunity:
 - CISPR 11, Radiated Emissions
 - IEC 1000-4-2, Electrostatic Discharge
 - IEC 1000-4-3, Radiated Electromagnetic Fields
 - IEC 1000-4-4, Electrical Fast Transients (Bursts)
 - IEC 1000-4-5, Surge Voltage
 - IEC 1000-4-6, Conducted RF Disturbances
 - IEC 1000-4-8, Magnetic Fields
 - IEC 1000-4-11, Voltage Dips and Interruptions
- IEEE 472 (ANSI C37.90A) Ring Wave Test

Production Testing

Every Kohler ATS is fully tested prior to leaving the factory. Visual inspections are also performed by the mechanism manufacturer as well as Kohler personnel during assembly and final test. Production testing includes the following:

- Electrical operation testing on all ATSs
- Verification of controller communication
- Verification of controller settings
- Voltage calibration
- Automatic transfer switch operation when Normal source is lost
 - Verify engine start signal
 - Verify transfer to Emergency position when Emergency source is available
- Automatic Transfer switch operation when Normal source returns
 - Verify transfer to Normal position
 - Verify engine start signal is removed

CSA Certification

CSA Certification is also available upon request. CSA certification includes the following additional test:

- Dielectric test at 1000V plus twice the maximum rated voltage

Options Testing

The operation of all installed options is verified. Tested options include:

- Input/Output Modules
- Supervised Transfer Control Switch
- Preferred Source Switch
- Load Shed, Normal and Emergency
- Line-to- Neutral Monitoring
- Digital Meter setup and operation

Kohler offers other testing at the customer's request at an additional charge. These optional tests include customized load testing for specific application, witness testing, and contact resistance testing. A certified test report is also available at an additional charge.

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