

Loxahatchee River District

Water Reclamation | Environmental Education | River Restoration

2500 Jupiter Park Drive, Jupiter, Florida 33458

Telephone (561) 747-5700 • Fax (561) 747-9929 • www.loxahatcheeriver.org



D. Albrey Arrington, Ph.D., Executive Director

Lift Station 242 Emergency Generator – ITB#16-008-LS242

Addendum No: 1

Issued By: Loxahatchee River Environmental Control District

DATE: November 2, 2016

The following changes/additions/clarifications have been made to the original Bid Documents for LS 242 Emergency Generator project. All Bidders must acknowledge receipt of this addendum in the Bid Response.

1. Prebid meeting minutes and sign-in sheet, attached to this addendum.
2. Generator submittal data, attached to this addendum.

Stephen B. Rockoff
Board Member

Dr. Matt H. Rostock
Board Member

Gordon M. Boggie
Chairman

Harvey M. Silverman
Board Member

James D. Snyder
Board Member

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Lift Station 242 Emergency Generator Installation - ITB

Pre-Bid Meeting Minutes

November 1, 2016

2:30pm

1. Introductions:
2. Mandatory Meeting (attend or listen to recording):
 - Sign In: Sign-In Sheet will be record of attendance.
3. Intent:
 - Inform bidders about project. Point out items of interest and ensure bidders understand what the project entails.
 - Provide an opportunity for each bidder to visit each site.
 - Nothing said in this meeting changes the Bidding Documents. Bid what you see.
4. Scope: Installation of a natural gas fired standby emergency generator, ATS and appurtenances at Lift Station 242, 1500 Cades Bay Ave, Jupiter, FL 33458 and all associated labor, materials, equipment, permits and maintenance of traffic to result in a complete and functional installation as shown on the construction plans and specifications.
 - Work not included in contract.
 - TECO Gas Service
 - Purchase of the Generator and ATS (Contractor will have to pick up generator and ATS from 2500 Jupiter Park Drive, Jupiter, FL and deliver to the project site).
5. Contract Time
 - 60 days from Notice to Proceed
 - Anticipate NTP issued in late Jan. early Feb.
6. Qualifications
 - Licensed Contractor in the State of Florida
 - 3 references where similar goods and services have been provided in past 5 years.
7. Jurisdiction:
 - Town of Jupiter
 - Abacoa Property Owner's Assembly, Inc.

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Board Member

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Board Member

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Chairman

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Board Member

8. Permits:

- Contractor shall be responsible for acquiring the following.
 - Town of Jupiter

9. Standards and Specifications

- See ITB 16-008-LS242 including Appendix A and B

10. Insurance requirements

- Special Conditions paragraph 12:

11. Contractor shall provide all water, electricity and sanitary facilities.

12. Working hours shall be 7am to 4 pm Mon-Fri excluding District Holidays.

13. Questions

- **Who is responsible for bypassing of the station? The District will be responsible for station bypass. The Contractor shall provide 48 hours minimum notice of need for bypass. Bypass duration will be limited to 1 week.**
- **Does the concrete for the pipe stanchions and pad have to be pour monolithically? No, the concrete pad can be pour separately.**
- **Who makes the final gas connection? The Contractor will make the final gas connection.**
- **Are there concrete slab penetrations for the generator slab? No, concrete slab penetrations are not required.**
- **What is the engineer's estimate? The engineer's estimate for the entire project including Owner purchased equipment is \$55,000.00.**
- **Are start-up services required? Yes, start up services were included in the purchase price of the generator. The Contractor shall schedule accordingly with the generator vendor.**
- **Does the District have equipment to load the generator package for the Contractor at the plant? Yes, the District can load the generator for the Contractor at the plant, however the Contractor will be responsible to transport and unload the generator at the project site.**

Loxahatchee River District

Attendance Sheet

2500 Jupiter Park Drive, Jupiter, Florida 33458
 Telephone: (561) 747-5700, Fax: (561) 747-9929
 e-mail: osprey@loxahatcheeriver.org



Project: Lift Station 242 Emergency Generator Installation

Date: 11-1-16 @ 2:30 P.M.

- Pre-Bid Conference
- Bid Opening
- Pre-Construction Meeting

Name (Print)	Company	Address	Phone/Fax	E-Mail
Gary Williams	Greenearth Solutions USA	6278 N Federal Highway Fort Lauderdale FL 33308	954 326 9300 Fax: 954 803 5450	Greenearth Solutions USA Electric @email.com
Kevin Whitmire	Electric	11		
Tom Tietje	Robert Power	4612 Highway Ave Jacksonville, FL 32254	781-390-7855	Tom.Tietje@RobertPower.com
CHASE ROGERS	HINTERLAUD GROUP, INC.	992 W 15th ST RAVENA BEACH, FL 33404	861-640-3503 F -3504 F	CRGERS@HINTERLAUDGROUP.COM
KAS DEAN	CREED	3500 Jupiter Ave OR Jupiter FL 33458	561-747-5700 ext 111	kris.dean@creed.org
Kevin Skelbeger	ARÉCO	2500 JUPITER PARK DR JUPITER FL 33458	561-444-9084 #199	Kevin.Skelbeger@ARECO.org

TAW POWER SYSTEMS
1500 NW 15TH AVENUE
POMPANO BEACH, FL 33069
(954) 977-0202 / (954) 977-9249 (FAX)

LETTER OF TRANSMITTAL

TO: KEVIN SKELLENGER

DATE: 09/16/2016

P.O. NO. #: 48392

COMPANY: LOXAHATCHEE RIVER ENVIRONMENTAL CONTROL DISTRICT
2500 JUPITER PARK DRIVE
JUPITER, FL 33458

JOB NAME: LOXAHATCHEE LS #242

TAW JOB No#: PD1608-0026

ENGINEERING SUBMITTALS

1 ELECTRONIC COPY

THESE ARE TRANSMITTED as checked below:

FOR APPROVAL

RECORD ONLY

COMMENTS:

1) ONE COPY OF APPROVED SUBMITTAL DATA MUST BE RETURNED TOGETHER WITH YOUR PURCHASE ORDER, WRITTEN RELEASE OF ORDER, NOTICE TO OWNER AND CREDIT APPLICATION (see attached).

2) ALL TECHNICAL QUESTIONS PURSUANT TO THIS SUBMITTAL DATA SHOULD BE DIRECTED TO OUR OFFICE. PHONE (800) 876-0990, FAX (954) 977-9249.

TAW Power Systems

MARIO BRUNO
PROJECT MANAGER

JOHN POTTS AND DANIEL WYATT
ACCOUNT MANAGERS



TAW POWER SYSTEMS, INC.

6312 78TH STREET / RIVERVIEW, FL 33569

P: 813-840-3500 T: 800-456-9449 F: 813-217-8075

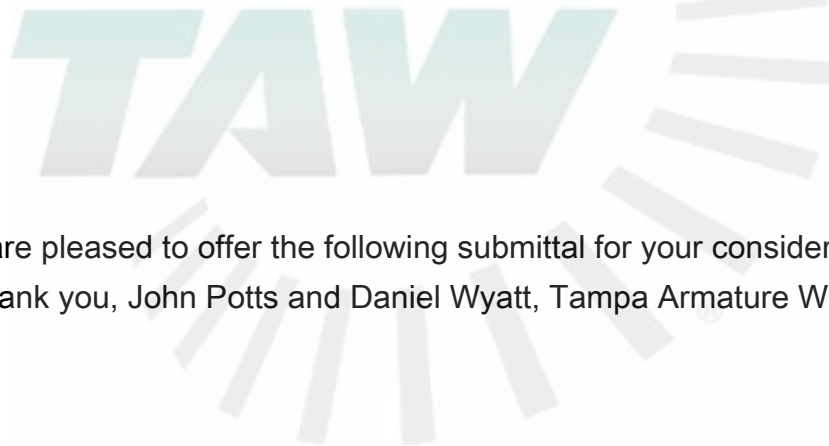
Submittal Package

Job Name: Loxahatchee LS #242

Quote: 0026270820

Proposal: PD1608-0026

Submittal Date: 09/16/2016



We are pleased to offer the following submittal for your consideration.

Thank you, John Potts and Daniel Wyatt, Tampa Armature Works

BILL OF MATERIAL

SERVING FLORIDA SINCE 1921

ONE NEW Kohler Model 45REZG Natural Gas Engine Driven Generator Set. 41 kW, @ 0.8 P.F., 60 Cycles, 3 Phase, 120/240 Volts.

CONTROLLER: DEC3000

Voltmeter, Ammeter
Frequency Meter
Volt/Ammeter Phase Selector Switch
Individual Fault Lamps for:
 High Engine Temperature
 Low Oil Pressure
 Over Speed
 Over Crank
 Switch NOT in Automatic
 System Ready
 Battery Low Volts
 Battery Charger Fault
Pre Alarm Senders to Include:
 Pre-High Engine Temperature
 Pre-Low Oil Pressure
 Low Water Temperature

Alarm Horn
Over Voltage Protection
Oil Pressure Gauge
Water Temperature Gauge
Battery Charge Voltmeter
Running Time Meter
Cool down timer
Run Relay
2 Input/5 Output Module

GENERATOR ACCESSORIES (Mechanical):

Sound Housing -- Aluminum

COOLING:

Unit Mounted Radiator
Low Coolant Level Shutdown
Radiator Duct Flange
Block Heater 120 Volt, 1500 Watt

FUEL SYSTEM:

Flexible Fuel Lines
Gaseous Fuel Filter

GOVERNOR ACCESSORIES:

Electronic Isochronous

GENERATOR ACCESSORIES (Electrical):

Line Circuit Breaker 3 Pole, 100 Amp, HD Frame, T/M, 100% Rated
 with Shunt Trip/Wire to Engine Safeties
 Installed on Generator
Voltage Regulator 0.50%

ENGINE ELECTRICAL ACCESSORIES:

Battery Rack and Cables
Starting Battery, Lead/Acid
Battery Charger: Automatic Float with Alarm contacts

CONTROLLER ACCESSORIES LOOSE:

Remote Emergency Stop, Break Glass
Remote Annunciator Panel

ADDITIONAL ACCESSORIES:

Oil Drain Extension
Lot of Oil and Antifreeze
Corrosion Inhibitor for Radiator
Vibration Isolators - Internal
THREE Engine, Generator Parts, Maintenance Manuals
FIVE Year Warranty
Initial Start Up and Check Out of System,
 Not to Exceed 8 Hours
Certified Factory Test @ 0.8 P.F.
Load Bank Test @ FOUR Hours (on site)

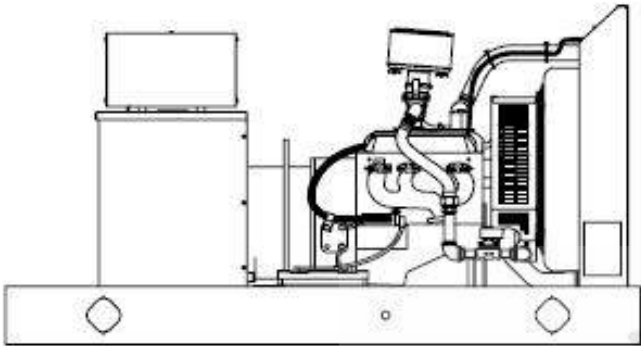
AUTOMATIC TRANSFER SWITCH:

1 Kohler Automatic Transfer Switch 240 Volt, 104 Amp, 3 Phase, 3 Pole, in a NEMA 4X Enclosure
MODEL: KCS-AFTF-0104S

KOHLER Power Systems

Spec Sheets





Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- A one-year limited warranty covers all systems and components. Two- and five-year extended warranties are also available.
- EPA certified for Stationary Emergency Applications

Alternator Features

- The unique Fast-Response™ II excitation system delivers excellent voltage response and short circuit capability using a permanent magnet (PM)-excited alternator.
- The brushless, rotating-field alternator has broad range reconnectability.

Generator Set Ratings

Alternator	Voltage	Ph	Hz	Standby 130C Ratings	
				kW/kVA	Amps
4P7	120/240	3	60	41 / 51	123

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: Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage.

There is no overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271.

Prime Power Ratings: Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited.

A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory.

Obtain the technical information bulletin (TIB-101) on ratings guidelines for the complete ratings definitions.

The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

GENERAL GUIDELINES FOR DERATION: Altitude: Derate 1.3% per 100 m (328 ft.) elevation above 200 m (656 ft.). Temperature: Derate 3.0% per 10°C (18°F) temperature above 25°C (77°F).

Model: 45REZG, continued

Alternator Specifications

Specifications	Alternator
Alternator manufacturer	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet
Leads, quantity	4P7, 4P8: 12, Reconnectable 4Q10: 4, 110-120/220-240
Voltage regulator	Solid State, Volts/Hz
Insulation	NEMA MG1
Insulation: Material	Class H
Insulation: Temperature Rise	130°C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Voltage regulation, no-load to full-load Permanent magnet (PM) alternator	Controller Dependent
One-Step Load Acceptance	100% of rating
Unbalanced load capability	100% of Rated Standby Current
<ul style="list-style-type: none">• NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.• Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.• Sustained short-circuit current enabling down stream circuit breakers to trip without collapsing the alternator field.• Self-ventilated and drip-proof construction.• Vacuum-impregnated windings with fungus-resistant epoxy varnish for dependability and long life.• Superior voltage waveform from a two-thirds pitch stator and skewed rotor.• Fast-Response™ II brushless alternator with brushless exciter for excellent load response.	

Exhaust

Exhaust System

Exhaust Manifold Type	Dry
Exhaust flow at rated kW, m ³ /min. (cfm)	9.3 (327)
Maximum allowable back pressure, kPa (in. Hg)	10.2 (3.0)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	649 (1200)
Exh. outlet size at eng. hookup, mm (in.)	76 (3.0) OD

Engine Electrical

Engine Electrical System

Ignition system	Electronic, Distributor
Battery charging alternator: Ground (negative/positive)	Negative
Battery charging alternator: Volts (DC)	12
Battery charging alternator: Ampere rating	70
Starter motor rated voltage (DC)	12
Battery, recommended cold cranking amps (CCA): Qty., rating for --18 C (0°F)	One, 630
Battery voltage (DC)	12

Fuel

Fuel System

Fuel type	Natural Gas
Fuel supply line inlet	1 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)

Model: 45REZG, continued

Fuel Composition

Fuel Composition

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

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

Lubrication

Lubrication System

Type	Full Pressure
Oil pan capacity, L (qt.)	4.3 (4.5)
Oil pan capacity with filter, L (qt.)	5.7 (6.0)
Oil filter: quantity, type	1, Cartridge

Cooling

Radiator System

Ambient temperature, °C (°F)	50 (122)
Engine jacket water capacity, L (gal.)	6.8 (1.8)
Radiator system capacity, including engine, L (gal.)	19.7 (5.2)
Engine jacket water flow, Lpm (gpm)	106.0 (28)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	40.8 (2320)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	533 (21)
Fan, kWm (HP)	1.5 (2.0)
Max. restriction of cooling air, intake and discharge side of radiator, kPA (in. H2O)	0.125 (0.5)
Enclosure with enclosed silencer reduces ambient temperature capability by 5°C (9°F)	

Operation Requirements

Air Requirements

Radiator-cooled cooling air, m3/min. (scfm) *	142 (5000)
Combustion air, m3/min. (cfm)	2.78 (98)
Heat rejected to ambient air: Engine, kW (Btu/min.)	19.2 (1090)
Heat rejected to ambient air: Alternator, kW (Btu/min.)	7.4 (420)
Radiator-cooled cooling air, m3/min. (scfm) *	142 (5000)
Combustion air, m3/min. (cfm)	2.78 (98)
Heat rejected to ambient air: Engine, kW (Btu/min.)	19.2 (1090)
Heat rejected to ambient air: Alternator, kW (Btu/min.)	7.4 (420)

*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	16.5 m3/hr. (584 cfh)
Standby Fuel Consumption at 75% load	13.8 m3/hr. (486 cfh)
Standby Fuel Consumption at 50% load	10.2 m3/hr. (360 cfh)

Model: 45REZG, continued

Standby Fuel Consumption at 25% load	7.7 m ³ /hr. (272 cfh)
Prime Fuel Consumption at 100% load	15.7 m ³ /hr. (552 cfh)
Prime Fuel Consumption at 75% load	12.7 m ³ /hr. (448 cfh)
Prime Fuel Consumption at 50% load	9.5 m ³ /hr. (336 cfh)
Prime Fuel Consumption at 25% load	7.6 m ³ /hr. (267 cfh)

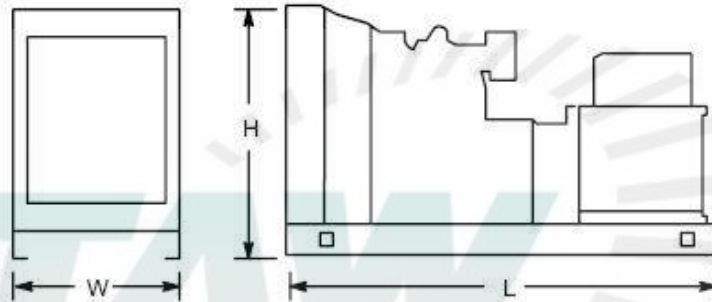
Dimensions and Weights

Dim Weight Spec

Fuel
Engine Manufacturer
Overall Size, L x W x H, mm (in.): Wide Skid
Overall Size, L x W x H, mm (in.): Narrow Skid
Weight (radiator model), wet, kg (lb.):

Dim Weight Value

LP Gas or Natural Gas
General Motors
2200 x 1040 x 1172 (86.6 x 40.9 x 46.1)
2200 x 864 x 1172 (86.6 x 34.0 x 46.1)
655 (1456)



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



Kohler® Decision-Maker® 3000 Controller

General Description and Function

The Decision-Maker® 3000 generator set controller provides advanced control, system monitoring, and system diagnostics for optimum performance.

The Decision-Maker® 3000 controller meets NFPA 110, Level 1 when equipped with the necessary accessories and installed per NFPA standards.

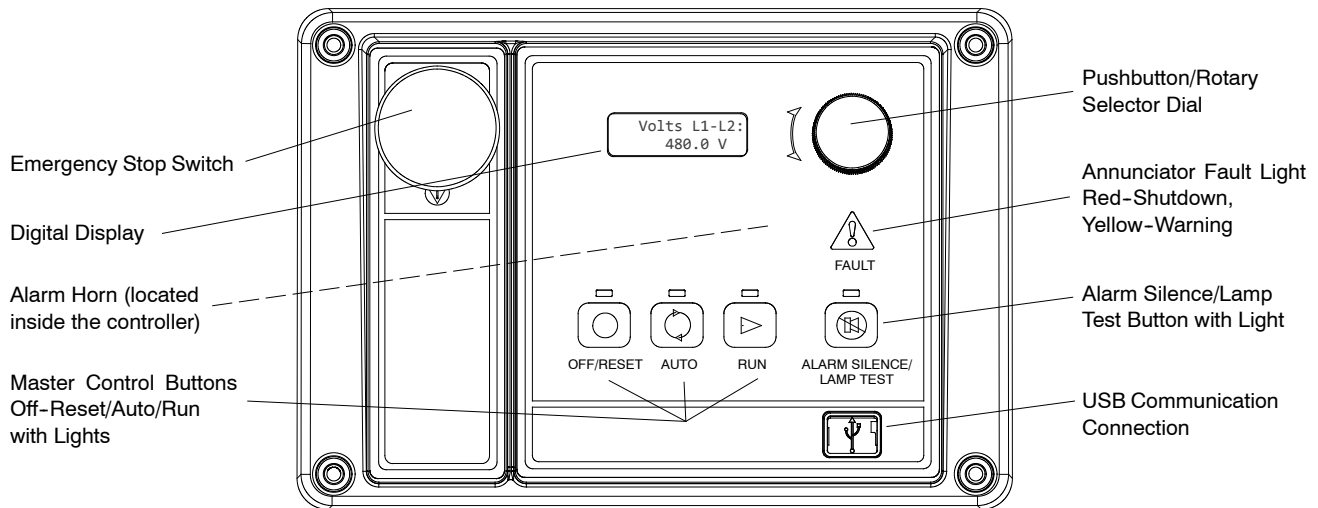
The Decision-Maker® 3000 controller uses a patented hybrid voltage regulator and unique software logic to manage alternator thermal overload protection features normally requiring additional hardware. Additional features include:

- 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.



Decision-Maker® 3000

Modbus® is a registered trademark of Schneider Electric.



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 recrank 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

Controller Displays as Provided by the Engine ECM (availability subject to change by the engine manufacturer)						
Display	GM/PSI	Doosan	John Deere (JDEC)	Volvo (EMS II)	Volvo (EDC III)	DD/MTU (ADEC)
Ambient temperature		X				
Charge air pressure	X	X		X	X	X
Charge air temperature	X	X	X	X	X	
Coolant level				X	X	X
Coolant pressure				X	X	
Coolant temperature	X	X	X	X	X	X
Crankcase pressure				X	X	
ECM battery voltage	X	X				X
ECM fault codes	X	X	X	X	X	X
ECM serial number						X
Engine model number			X			X
Engine serial number			X			X
Engine speed	X	X	X	X	X	X
Fuel pressure				X	X	
Fuel rate	X	X	X	X	X	X
Fuel temperature			X	X	X	X
Oil level					X	
Oil pressure	X	X	X	X	X	X
Oil temperature				X	X	X
Trip fuel				X	X	X

NOTE: 15-60REOZK (Kohler KDI engines) do not include an ECM as standard equipment. REOZMD/ROZMC (Mitsubishi engines) have an ECM but do not send signals to the generator set controller.

Controller Specifications

Decision-Maker® 3000—Software Version 3.11 or higher

- 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.)

Communication and PC Software Available Options

Refer to G6-76 Monitor III Software and the communication literature for additional communication and PC software information including Modbus® communication.

- Monitor III Software for Monitoring and Control (Windows®-based user interface)**
- Converter, Modbus®/Ethernet.** Supports a power system using controllers accessed via the Ethernet. Converter is supplied with an IP address by the site administrator. Refer to G6-79 for converter details.
- Converter, RS-232/RS-485.** Supports a power system using controllers accessed via a serial (RS-232) connection.

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator set distributor for availability.

Decision-Maker® 3000 Available Options

- Float/Equalize Battery Charger** available with 6 or 10 amp DC volt output. The 10 amp models are available with and without NFPA alarm to signal a battery charger fault.
- 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.
- 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 120VAC.
- Two Input/Five Output Module** provides a generator set mounted panel with two inputs and five relay outputs.

Modbus® is a registered trademark of Schneider Electric.

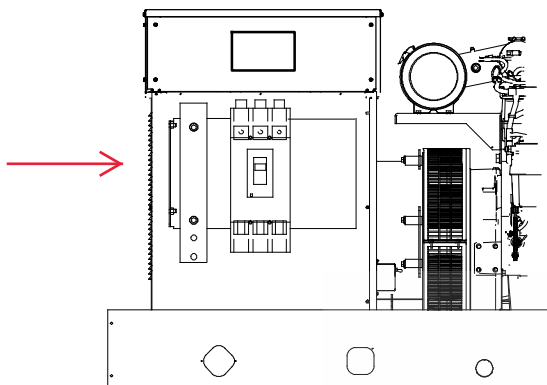
Windows® is a registered trademark of Microsoft Corporation.

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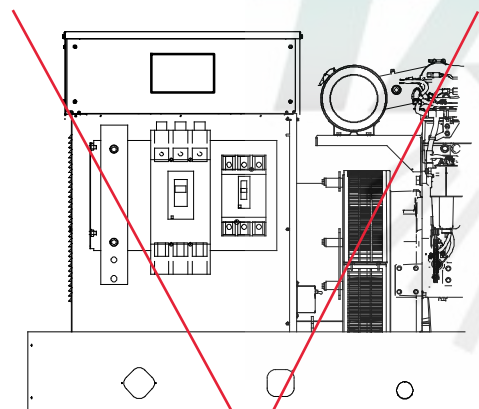


Standard Features

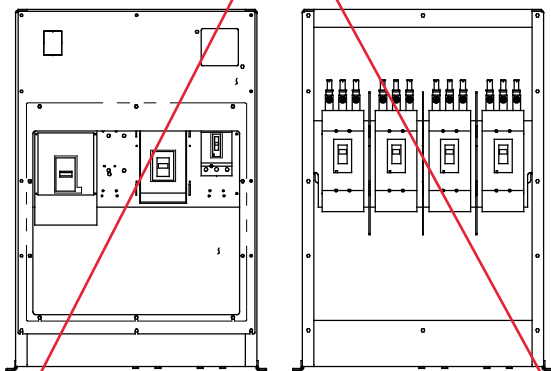
- The line circuit breaker interrupts the generator set output during a short circuit and protects the wiring when an overload occurs. Use the circuit breaker to manually disconnect the generator set from the load during generator set service.
- Circuit breaker kits are mounted to the generator set and 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 (350-2250 kW).
- 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



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



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



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

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 (UL 1077 circuit breakers).

→ 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 dependant 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.

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 (350–2250 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.

350–2250 kW. A bus bar kit is provided on the right side of the unit 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.

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.

Neutral Lugs

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

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.

Undervoltage Trip, 12 VDC or 24 VDC

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

15-300 kW Line Circuit Breaker Specifications

80% Rating Circuit Breaker

Gen. Set kW	Alt. Model	Ampere Range	Trip Type	C. B. Frame Size
15-80	4D/4E/ 4P/4PX/ 4Q/4QX	30-100	Magnetic, UL 1077	E (480 V max.)
			Magnetic, UL 1077 with 12 V shunt trip	
			Magnetic, UL 1077 with 24 V shunt trip	
		15-150	Thermal magnetic	HD
		60-150	Electronic LI	
			Electronic LSIG	
		175-250	Thermal magnetic	JD
		250	Electronic LI	
			Electronic LSIG	
		300-400	Thermal magnetic	LA
60-200	4RX/4S/ 4SX/ 4TX/4V	30-100	Magnetic, UL 1077	E (480 V max.)
			Magnetic, UL 1077 with 12 V shunt trip	
			Magnetic, UL 1077 with 24 V shunt trip	
		15-150	Thermal magnetic	HD
		60-150	Electronic LI	
			Electronic LSIG	
		175-250	Thermal magnetic	JD
		250	Electronic LI	
			Electronic LSIG	
		300-400	Thermal magnetic	LA
		400-600	Electronic LI	LG
			Electronic LSIG	
		700-800	Thermal magnetic	MG
		1000-1200	Thermal magnetic	PG
800-1200	Electronic LSI			
	Electronic LSIG			
200-300	4UA/ 4M6226	15-150	Thermal magnetic	HD
		60-150	Electronic LI	
				Electronic LSIG
		175-250	Thermal magnetic	JD
		250	Electronic LI	
			Electronic LSIG	
		300-400	Thermal magnetic	LA
		400-600	Electronic LI	LG
			Electronic LSIG	
		700-800	Thermal magnetic	MG
1000-1200	Thermal magnetic	PG		
800-1200	Electronic LSI			
		Electronic LSIG		

100% Rating Circuit Breaker

Gen. Set kW	Alt. Model	Ampere Range	Trip Type	C. B. Frame Size
15-80	4D/4E/ 4P/4PX/ 4Q/4QX	15-150	Thermal magnetic	HD
		60-150	Electronic LI	
			Electronic LSIG	
		175-250	Thermal magnetic	JD
		250	Electronic LI	
			Electronic LSIG	
60-200	4RX/4S/ 4SX/ 4TX/4V	15-150	Thermal magnetic	HD
		60-150	Electronic LI	
				Electronic LSIG
		175-250	Thermal magnetic	JD
		250	Electronic LI	
			Electronic LSIG	
200-300	4UA/ 4M6226	15-150	Thermal magnetic	HD
		60-150	Electronic LI	
				Electronic LSIG
		175-250	Thermal magnetic	JD
		250	Electronic LI	
			Electronic LSIG	
600-1200		Electronic LSI	PG	
		Electronic LSIG		
		15-150	Thermal magnetic	HD
		60-150	Electronic LI	
	Electronic LSIG			
175-250		Thermal magnetic	JD	
		250		Electronic LI
			Electronic LSIG	
		400	Electronic LI	LG
	Electronic LSIG			
600-1200		Electronic LSI	PG	
		Electronic LSIG		

Circuit Breaker Lugs Per Phase (Al/Cu)

Frame Size	Ampere Range	Wire Range
E (480 V max.)	30-100	Up to two wire terminals fitting 10-32 or 1/4-20 stud
HD (80%)	15-150	One #14 to 3/0
HD (100%)	15-150	One #14 to 2/0 Cu only
JD (80%)	175	One 1/0 to 4/0
	200-250	One 3/0 to 350 kcmil
JD (100%)	175-250	One 3/0 to 300 kcmil Cu only
LA	300-400	One #1 to 600 kcmil or Two #1 to 250 kcmil
LG	400-600	Two 2/0 to 500 kcmil
MG	700-800	Three 3/0 to 500 kcmil
PG	600-800	Three 3/0 to 500 kcmil
	1000-1200	Four 3/0 to 500 kcmil

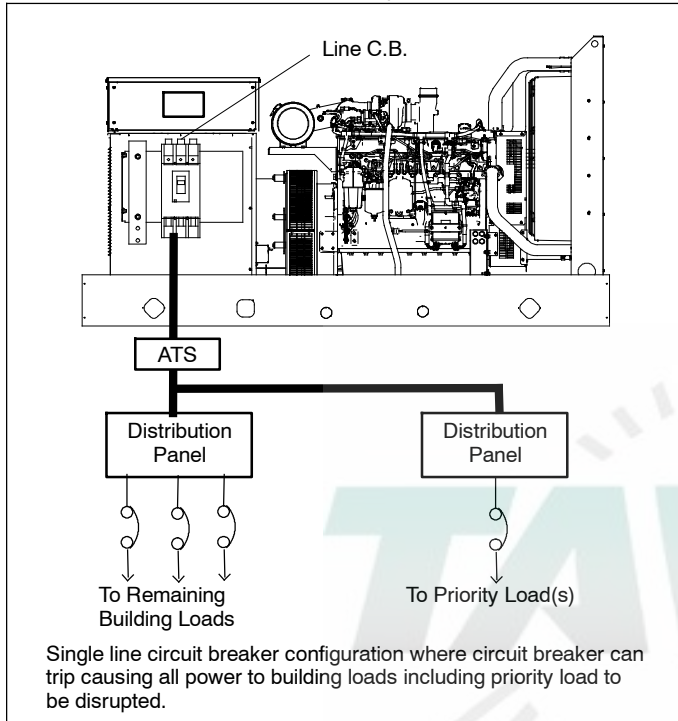
Interrupting Ratings

Circuit Breaker Frame Size	240 Volt, kA	480 Volt, kA	600 Volt, kA
HD	25	18	14
JD			
LA			
LG			
MG			
PG	65	35	18

15-300 kW Line Circuit Breaker Applications

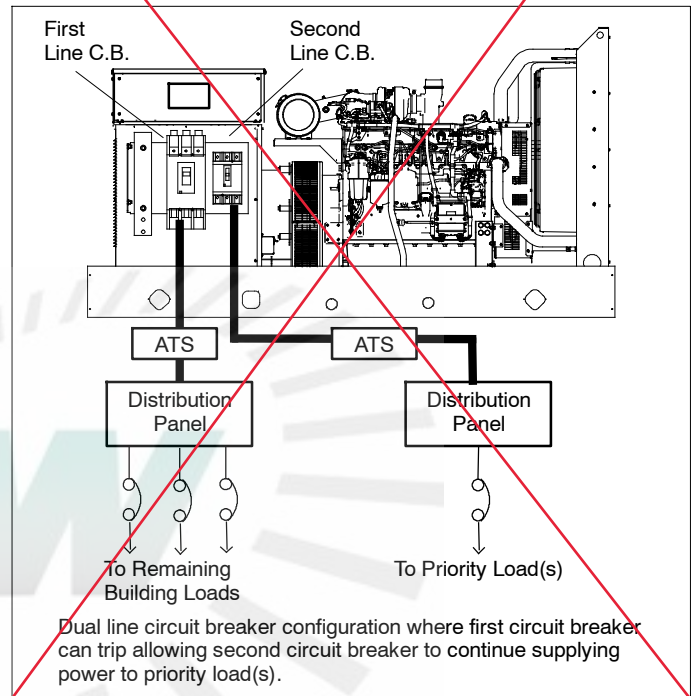
Single Circuit Breaker Installations

A generator set with a single circuit breaker installed typically feeds a single transfer switch and then a distribution panel. This allows protection of the entire system.



Dual Circuit Breaker Installations

A generator set with dual circuit breakers installed is used to separate critical loads. Typically, one circuit breaker will feed a main transfer switch with noncritical loads and the other circuit breaker will feed a second transfer switch that feeds critical or priority loads.



Circuit Breaker Combinations

Alternator Model	First C. B. Frame Size	Second C. B. Frame Size	Comments
All, except 4D/4E	HD	—	Standard or LSIG
	JD	—	Standard only
	LA	—	Standard only
	LG	—	Standard or LSIG
4D/4E	HD	—	Standard only
4D/4E	HD	HD	Standard only
4P/4PX/4Q/ 4QX/4RX/4S/ 4SX/4TX/4V/ 4UA	HD	HD	Standard only
	JD	HD or JD	
	LA	HD or JD	
	LG	HD or JD	
4RX/4S/ 4SX/4TX/4V	MG	—	Standard only
	PG	—	Standard or LSIG
	HD	HD	Standard only
	JD	HD or JD	
	LA	HD, JD, LA	
	LG	HD, JD, LA, or LG	
MG			
PG			

Alternator Model	First C. B. Frame Size	Second C. B. Frame Size	Comments
4UA/4M6226	MG	—	Standard only
	PG	—	Standard or LSIG
	HD	HD	
	JD	HD or JD	
	LA	HD, JD, or LA	Standard only
	LG	HD, JD, LA, or LG	HD, JD, LG (1 or 2 may be standard or LSIG)
	MG		PG and/or HD, JD, LG may be LSIG
	PG		Standard only

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator set distributor for availability.

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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.

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



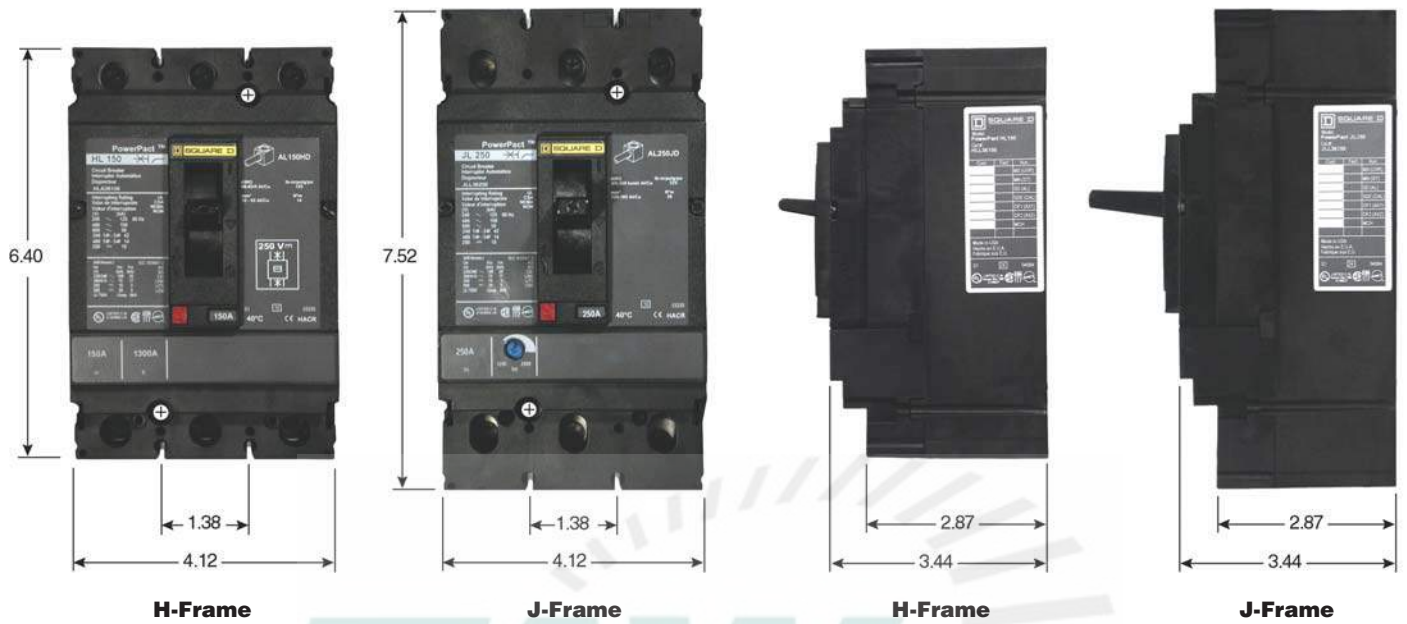
HD and HG 2-Pole



H-Frame 150A



J-Frame 250A



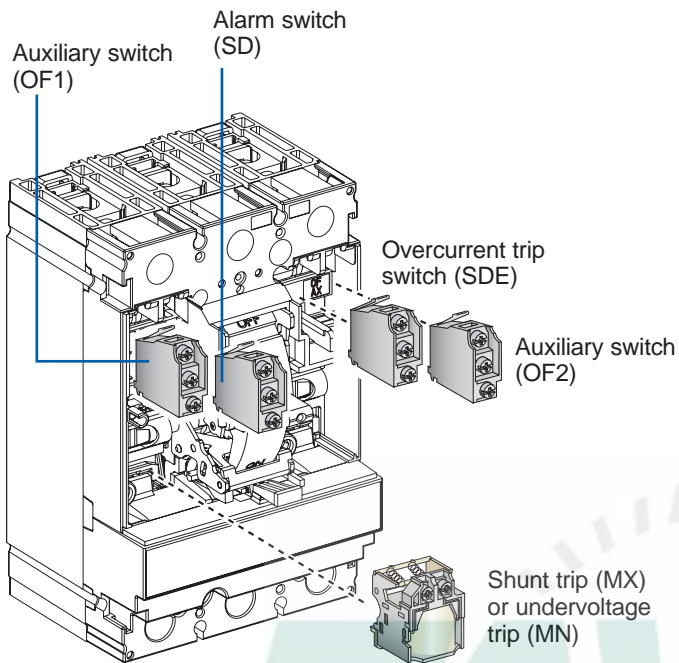
Standardize Designs

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.



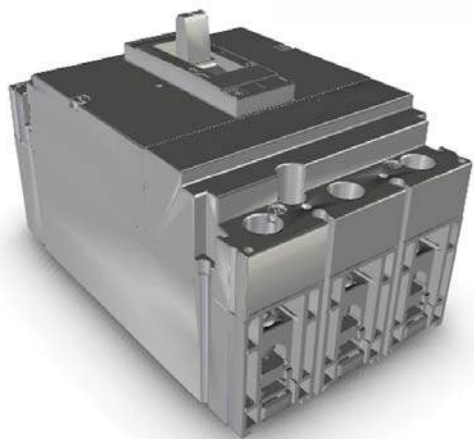
Consolidate Inventory

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

Powerpact® 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

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Palatine, IL 60067
Tel: 847-397-2600
Fax: 847-925-7500

MULTIPLES OF RATED CURRENT

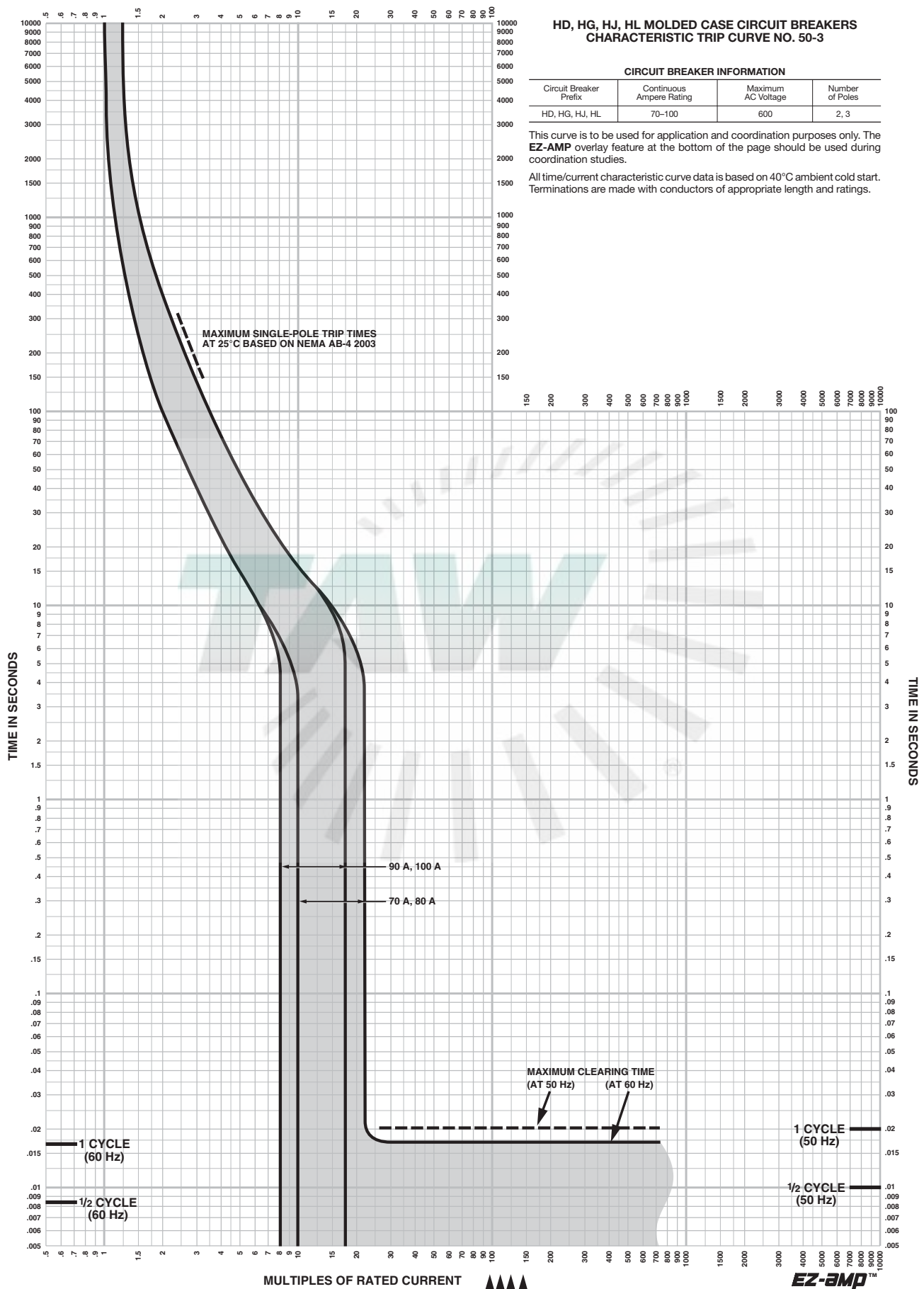
HD, HG, HJ, HL MOLDED CASE CIRCUIT BREAKERS
CHARACTERISTIC TRIP CURVE NO. 50-3

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.



TIME IN SECONDS

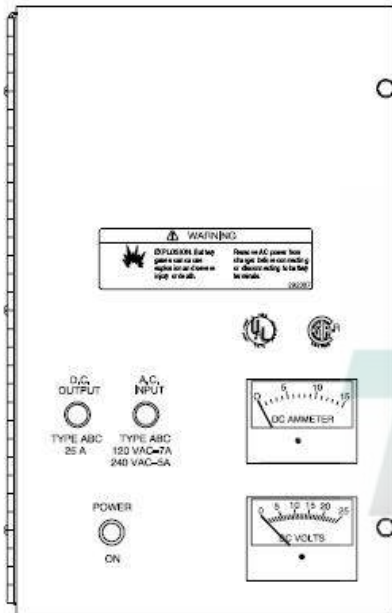
TIME IN SECONDS

MULTIPLES OF RATED CURRENT



EZ-AMP™

ISO 9001
KOHLER
POWER SYSTEMS
 NATIONALLY REGISTERED



Standard Features

- Kohler automatic battery chargers feature two charging modes to keep lead-acid and nickel-cadmium batteries fully charged without overcharging.
- The battery charger automatic float-to-equalize operation maintains battery voltage with no manual intervention.
- Temperature compensation feature prevents overcharging or undercharging battery at high/low ambient temperatures.
- Current-limiting circuitry prevents battery charger from overload at low battery voltage and during a short circuit.
- The ten amp DC current limit allows the battery charger to remain connected to the battery during engine cranking.
- Battery charger complies with NFPA 110 code requirements when equipped with optional alarm circuit board.
- Alarm board features low battery voltage, high battery voltage, and battery charger malfunction alarm contacts.

NFPA 110 Alarm Outputs	Output		Number of Cells	
	Voltage	Amps	Lead Acid	Ni Cd
Yes	12	10	6	9
AC Input Voltage, Frequency	120/240 VAC			
DC Voltage Regulation	±1%			
Weight (battery charger without mounting brackets)	11.8 kg (26 lb.)			
Dimensions, L x D x H (battery charger without mounting brackets)	271 x 143 x 422 mm (10.67 x 5.63 x 16.63 in.)			

Automatic Float to Equalize

When the battery loses its charge, the battery charger operates in the High Rate Constant Current Mode until the battery voltage rises to the preset equalize level.

At the preset equalize level, the battery charger switches to the constant voltage Equalize Mode until the current required to maintain this voltage drops to 50% of the battery charger's high rate current.

The battery charger then switches to the lower constant voltage Float Mode when the battery nears full charge. The battery charger continues to operate in this mode until AC input power disconnects or the current required to maintain the battery at the float voltage setting exceeds 6 amps.

Temperature Compensation

The battery charger compensates for battery temperature using a negative temperature coefficient. The battery charger provides temperature compensation of $-2\text{mV}/^\circ\text{C}$ per cell over the ambient temperature range of -40°C up to 60°C . The temperature compensation automatically adjusts the float and equalize voltage settings to prevent the battery from overcharging at high ambient temperatures and undercharging at low ambient temperatures.

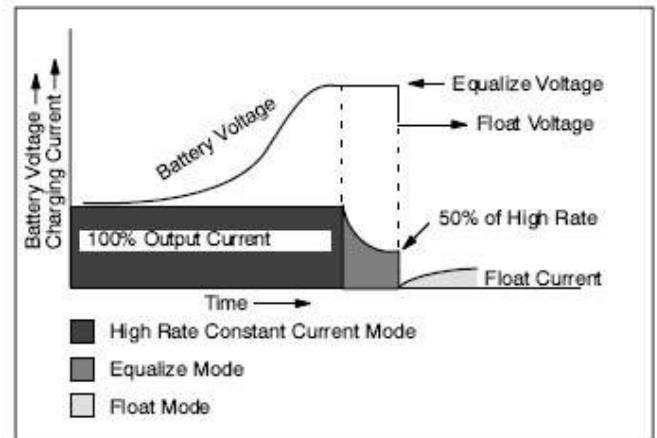


Figure 1

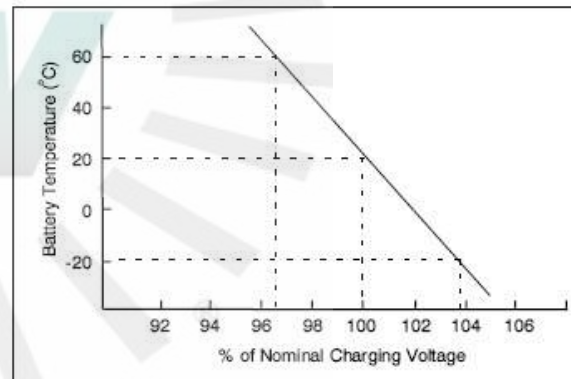


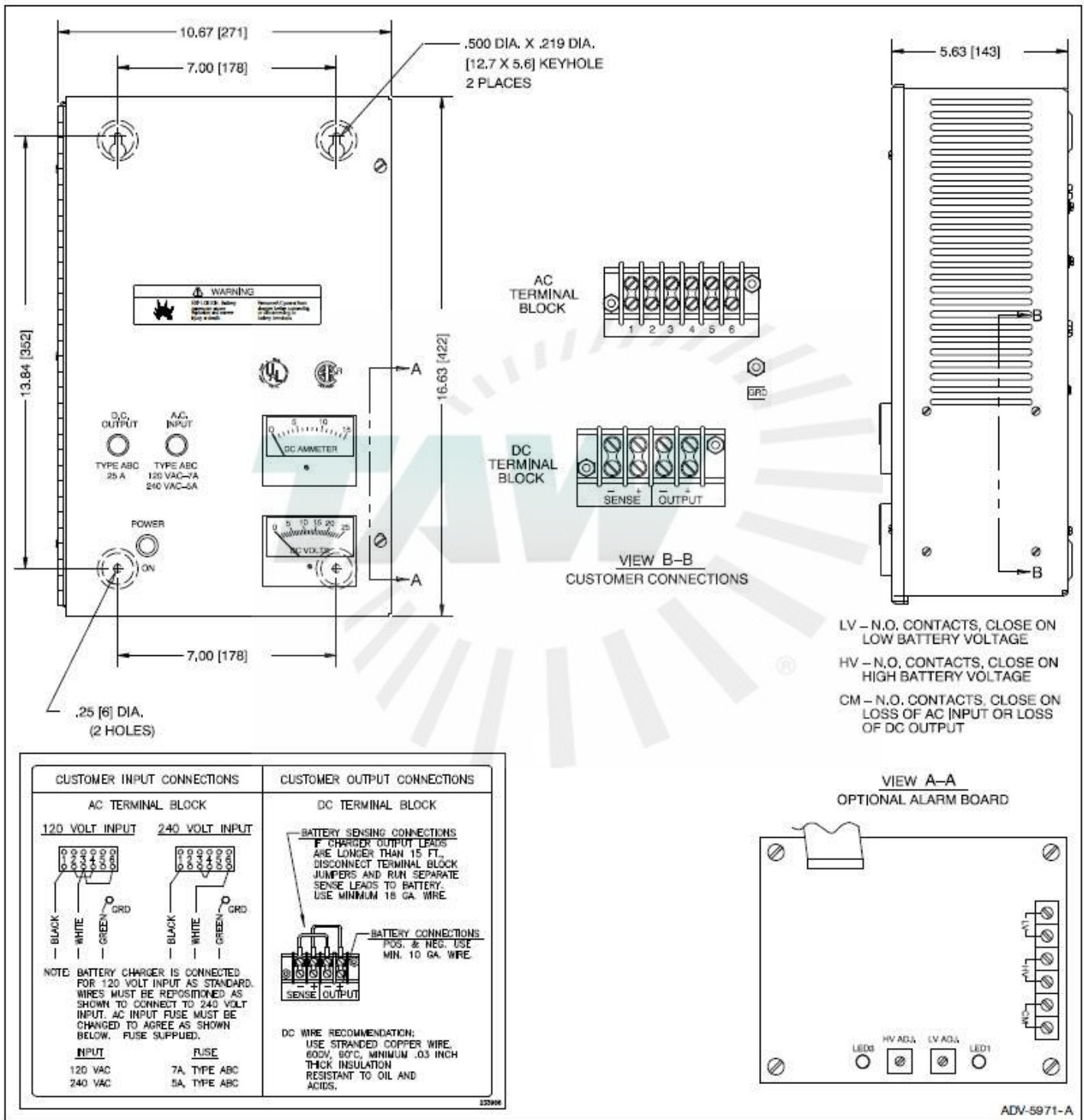
Figure 2

Standard Features

- Ammeter and voltmeter indicate battery charging rate with 5% full-scale accuracy. POWER ON lamp indicates battery charger is operating.
- AC input and DC output fuses prevent battery charger damage from abnormal overload and short-circuit conditions.
- Operational temperature range is from 40°C (-40°F) to 60°C (140°F). Battery charger float equalize voltage automatically adjust throughout the temperature range.
- Reverse polarity protection circuitry prevents battery charger from energizing if improperly connected.
- Internal terminal blocks for AC input and DC output/ sensing lead connections.
- DC voltage regulation of $\pm 1\%$ from no load to full load and AC input line voltage variations of $\pm 10\%$.
- UL-1012 listed/CSA certified.
- Wall-mount, slotted enclosure with knockouts for customer conduit installation.
- Reconnection blocks allow operation at 120 or 240 volts AC, single phase, 50 or 60 hertz.
- Battery charger circuitry protected from AC line and DC load voltage spikes and transients.
- Terminal block for remote battery sensing leads.
- Automatic float-to-equalize operation with individual potentiometer adjustments. Charge up to 12 lead-acid or 18 nickel-cadmium battery cells.
- No adjustments are necessary for lead-acid or nickel-cadmium batteries.
- Oversized transformer and SCR heatsink allow constant current charging at 10 amps up to the equalize voltage setting for fastest battery charging.

Note: The battery charger will discharge the engine starting battery(ies) when the battery charger is connected to the battery(ies) and is not connected to an AC power supply. To prevent engine starting battery(ies) discharge, install battery charger relay kit GM39659.

Float/Equalize Battery Charger, continued

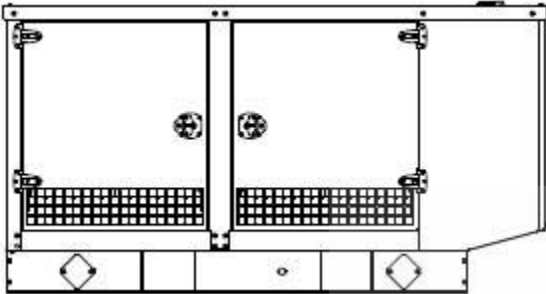


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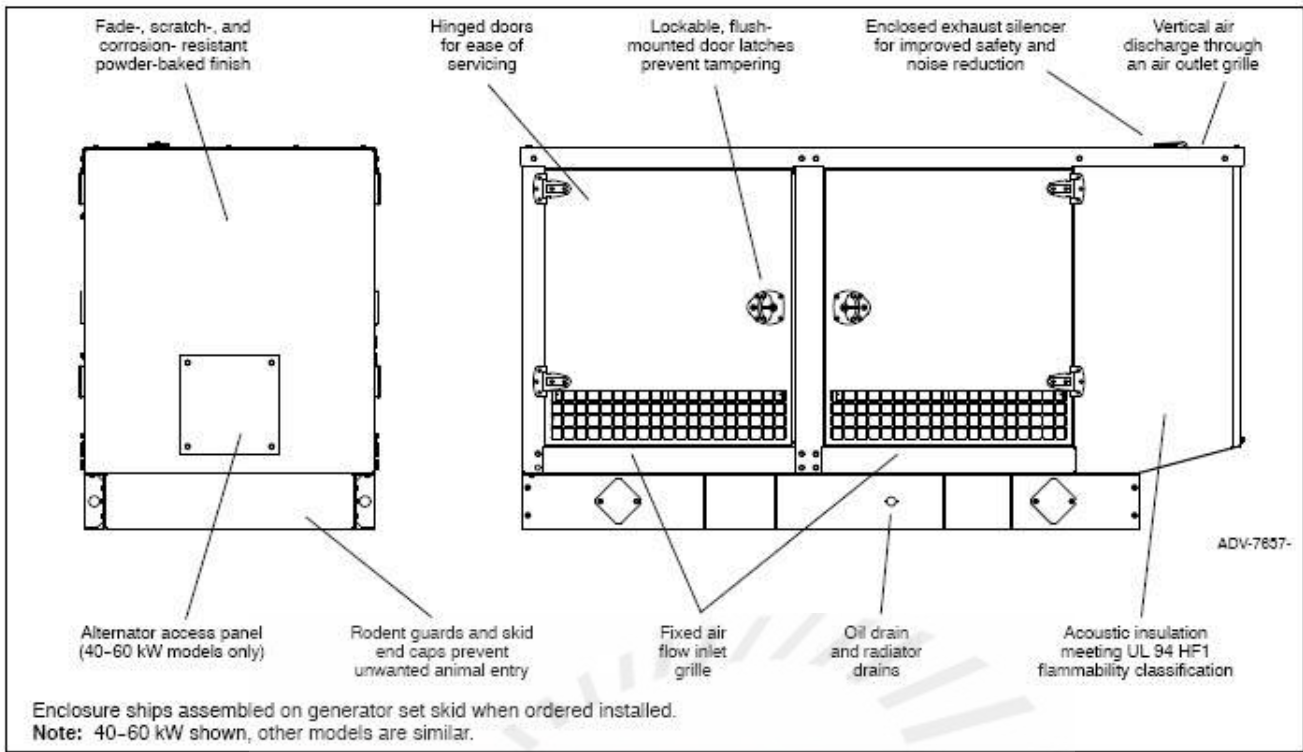
KOHLER Power Systems

ISO 9001
KOHLER
POWER SYSTEMS
NATIONALLY REGISTERED



Sound Enclosure Standard Features

- Internal-mounted critical silencer and flexible exhaust connector.
- Skid-mounted, aluminum construction with hinged doors.
- Fade-, scratch-, and corrosion-resistant Kohler® Power Armor automotive-grade textured finish.
- Enclosure has four access doors which allow for easy maintenance.
- Lockable, flush-mounted door latches.
- Vertical air inlet and outlet discharge to redirect air and reduce noise.
- Sound-attenuated enclosure that offers an average of 75 dB(A) sound level at 7 m (23 ft.) using 51 mm (2 in.) of acoustic insulation, acoustic-lined air inlet hoods, and acoustic-lined air discharge hood.
- 291 kph (181 mph) wind load analyzed for aluminum enclosures only.



Sound Enclosure Features

- Available in aluminum 3.2 mm (0.125 in.) formed panel, solid construction.
- Power-Armor automotive-grade finish resulting in advanced corrosion and abrasion protection as well as enhanced edge coverage and color retention.
- Internal critical exhaust silencer offering maximum component life and operator safety.
- Interchangeable modular panel construction. Allows complete serviceability or replacement without compromising enclosure design.
- Cooling/combustion air intake with a horizontal air inlet. Sized for maximum cooling airflow.
- Service access. Multi-personnel doors for easy access to generator set control and servicing of the oil fill and battery.
- Cooling air discharge. Weather protective design featuring vertical air discharge outlet grille. Redirects cooling air up and above enclosures to reduce noise ambient.
- Sound-attenuating design. Mechanically restrained acoustic insulation UL 94 HF1 listed for flame resistance.
- Cooling air discharge. The sound enclosures include acoustic insulation with urethane film.

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	2585 (101.8)	1078 (42.4)	65	1513 (59.6)	953 (2096)

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

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

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

KOHLER Power Systems

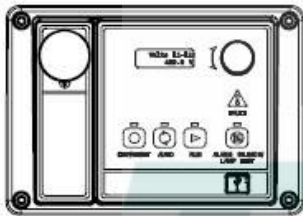


Integral Voltage Regulator with Kohler® Decision-Maker® 3000 and Menu-Driven Selections (15-1000 kW Generator Set Models)

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.



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.

Integral Voltage Regulators with 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

KOHLER Power Systems

Specification/Feature	Integral with 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. 7.8 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 Decision-Maker® 3000 Controller

- The 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

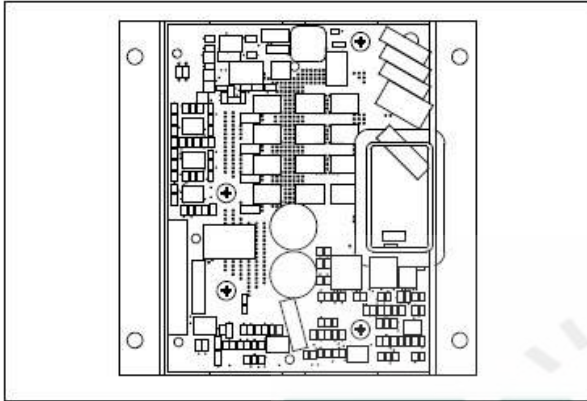
- Voltage adjustment, ±10% of system voltage
- V/Hz cut-in, 42-62 Hz
- Underfrequency unload slope, 0-10% of system voltage

Generator Set Calibration Menu

- 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 Power Systems

Activator Board GM88453



- 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.

COMPLETE

REMOTE EMERGENCY DISCONNECT OPERATOR STATION

BREAK GLASS - RELEASE BUTTON

(PUSH BUTTON and BREAK GLASS - PUSH BUTTON Also Available)

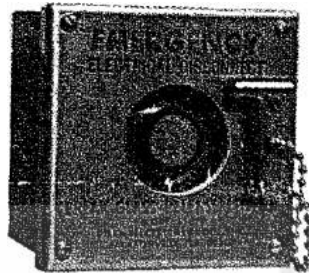
PILLA MODEL SERIES ST120

One COMPLETE Operator Station providing for remote disconnection of up to eight circuits:

- Power Off (Shunt Trip Station) • Alarm and Security • Gas • CHAC and Ventilation • Computer
- Sensitive or Hazardous Equipment • Other Systems - SPECIAL LEGENDS AVAILABLE



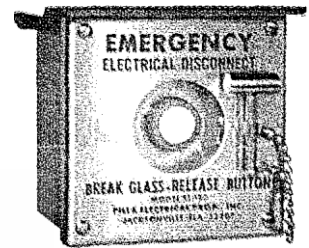
ST120SN3R
Outdoor



ST120SN1
Surface Indoor



ST120FN1
Flush Indoor



ST120SN3RIL
Illuminated (Outdoor Shown)

STANDARD MODELS

- ST120SN3R
- ST120SN1
- ST120FN1
- ST120SN4
- ST120FN4
- ST120SN4XS
- ST120SN4XA
- ST120 BP
- ST120 PB
- ST120 IL
- ST120 XD
- ST120 SL

DESCRIPTION

- Surface mount, NEMA 3R Raintite (shown)
- Surface mount, NEMA 1 (shown)
- Flush mount, NEMA 1 (shown)
- Surface mount, NEMA 4 and 12
- Flush mount, NEMA 4 and 12
- Surface mount, NEMA 4X Stainless Steel
- Surface mount, NEMA 4X Aluminum
- Break Glass - Push Button model, Suffix BP
- Push Button model (no glass or hammer), Suffix PB
- Illuminated model with 120V Lamp, Suffix IL (shown)
- Extra Depth model for 8 contact block maximum, Suffix XD
- Special legend (specify when ordering), Suffix SL

Suffix versions available in all NEMA ratings — add desired suffix(es) to appropriate model number

FEATURES

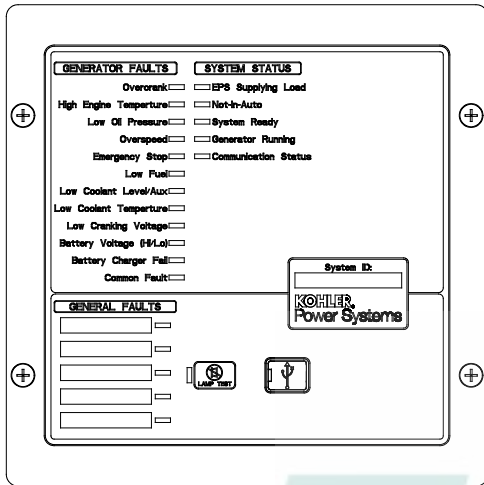
- UL-listed operator releases when glass is broken
- UL-listed 600 VAC rated NC contact block provided - contacts remain open with glass intact
- Accepts up to four NC and/or NO contact blocks in standard 3.5 inch depth backbox
- Extra depth model accepts up to eight NC and/or NO contact blocks: Add model suffix XD
- Compact 4.5 x 4.5 inch backbox has red enamel finish, 1/2 inch knockout provided
- Illuminated model includes 120V lamp. Add model suffix IL
- Two replacement glasses included
- SPECIAL LEGENDS AVAILABLE Add model suffix SL

MANUFACTURED BY :

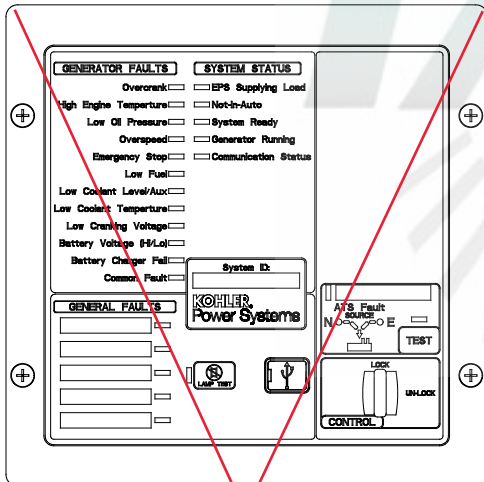
Pilla Electrical Products, Inc.
4076 St. Augustine Rd.
Jacksonville, FL 32207 USA
Tel (904) 396-7371 Fax (904) 396-1391

AVAILABLE FROM:

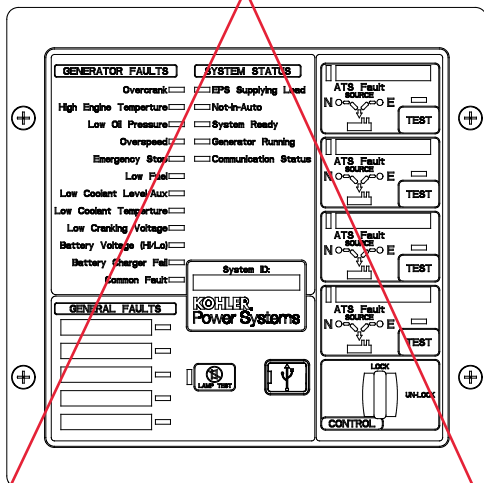
All National and Most Major Electrical Wholesalers --
FOR THE STOCKING DISTRIBUTORS NEAREST YOU, CONTACT
Customer Service Department
Tel (904) 396-7371
Fax (904) 396-1391



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:

- KPC 1000
- Decision-Maker® 3+
- Decision-Maker® 550
- Decision-Maker® 3000
- Decision-Maker® 3500
- Decision-Maker® 6000

- 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

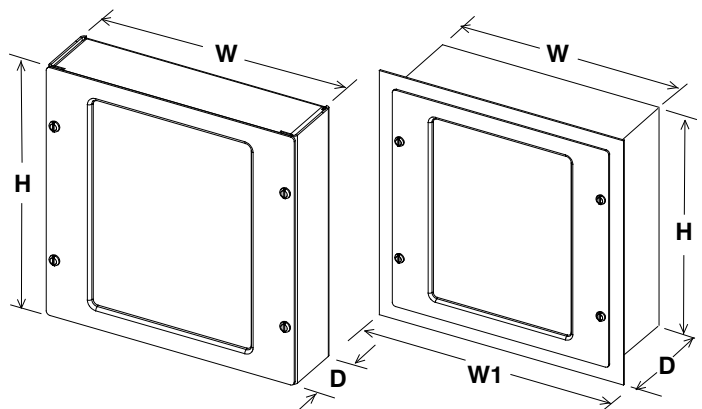
- Dimensions—W x H x D, mm (in.).

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.



Surface Mounted

Flush Mounted

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.

ATS Controls (RSA III with ATS controls only)

- ATS position LED (normal or emergency)
- Power source indicator LED (normal or emergency)
- ATS fault LED
- Key-operated lock/unlock switch for Test feature
- Test pushbutton

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 output current (Decision-Maker® 550, 3000, 3500, and 6000 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 generator set master switch is in RUN or OFF/RESET position.

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.

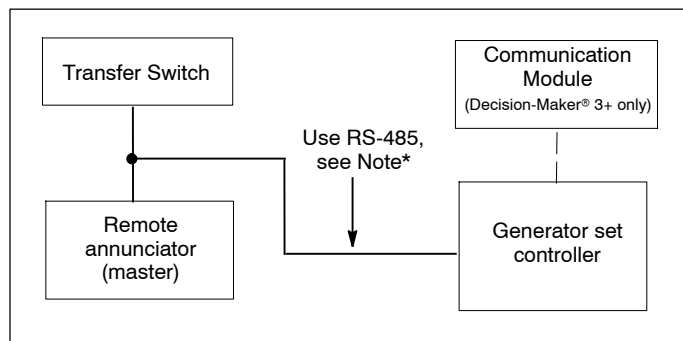
System Ready. Green LED lights when generator set master switch is in AUTO position and the system senses no faults. Red LED indicates system fault.

User-Defined Digital Inputs #1-#5. Monitors five digital auxiliary inputs (warnings or shutdowns). Individual red LEDs flash when a fault occurs or the status changes. 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 at the controller or via PC using SiteTech™ setup software.

Communications (Shown with RSA III with ATS Controls)

Local Single (Master) Connection

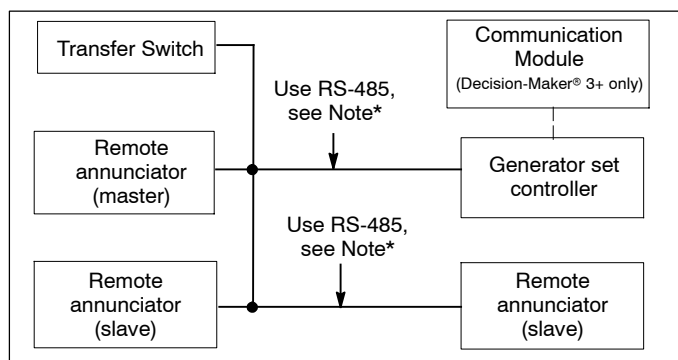
A single RSA III connects directly to the controller's communication port with an RS-485 cable.



Note*: Use RS-485 for a total of up to 1220 m (4000 ft.) maximum from the first device to the last device.

Local Multiple (Master/Slave) Connections

A single RSA III master connects directly to the controller's communication port with an RS-485 cable. Additional RSA III slaves can connect to the single master RSA III. Status of the RSA III master is annunciated on the RSA III slave panel.

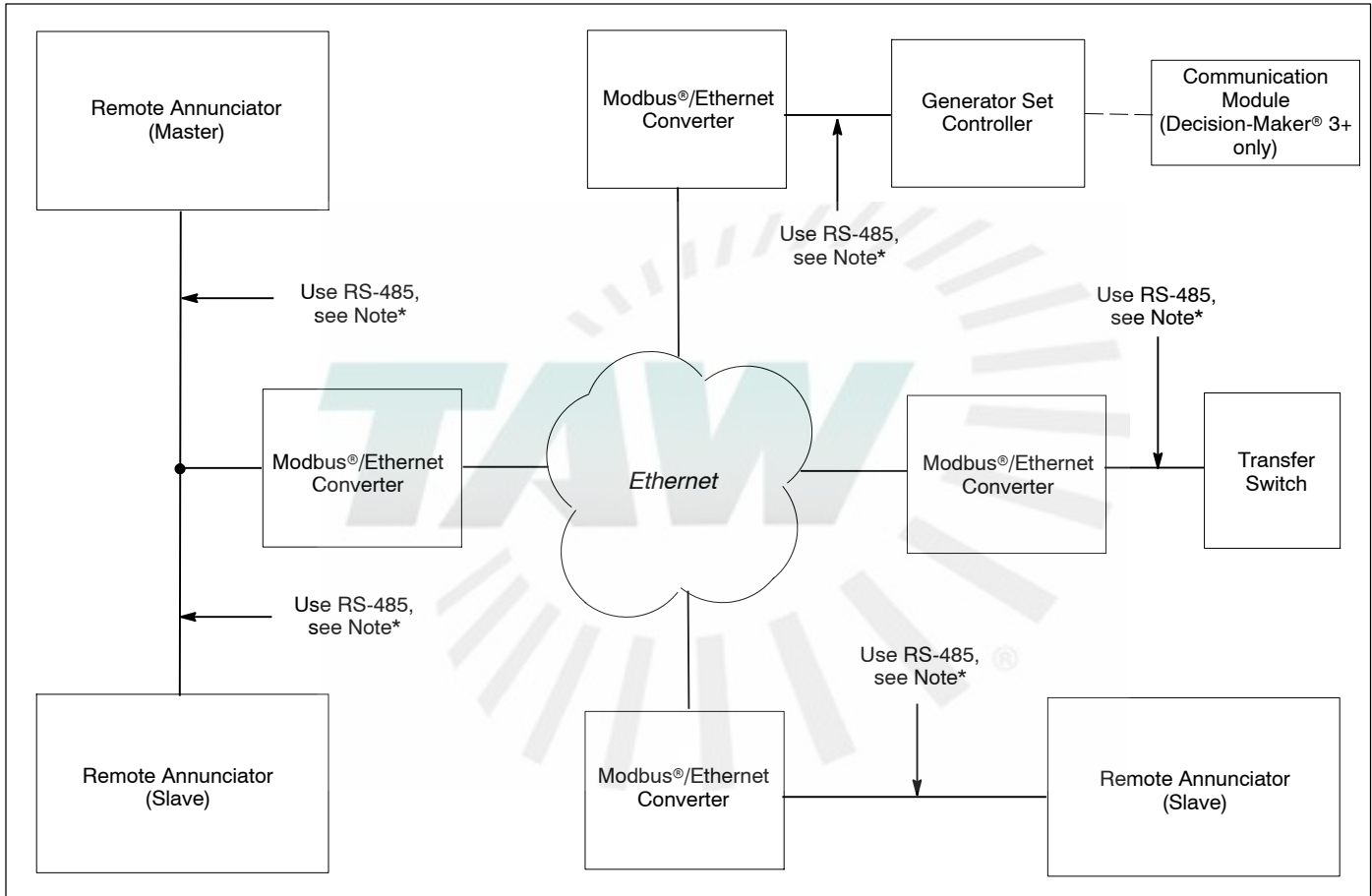


Modbus®/Ethernet, Single Master or Multiple Master/Slave Connections (Shown with RSA III with ATS Controls)

An RSA III master communicates with a controller and RSA III slaves through an Ethernet network. A Modbus®/Ethernet converter is required for each RSA III and controller. RS-485 cable connects the RSA III to the converter. Category 5e (Cat 5e) network cable connects the Modbus®/Ethernet converter to the Ethernet.

Note: Combining RSA III remote annunciators with the RSA II and RSA 1000 is permissible provided that the master remote annunciator is an RSA III remote annunciator.

Note*: Use RS-485 for a total of up to 1220 m (4000 ft.) maximum from the first device to the last device.



Accessories

- Power source adapter kit 120/208 VAC, 50/60 Hz.
- Modbus®/Ethernet converter GM41143-KP2 for serial to Ethernet communication.
- Communication module GM32644-KA1 or GM32644-KP1 is required with Decision-Maker® 3+ controllers.

Modbus® is a registered trademark of Schneider Electric.

DISTRIBUTED BY:

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator set distributor for availability.

KOHLER Power Systems

ISO 9001
 KOHLER
 POWER SYSTEMS
 NATIONALLY REGISTERED



Transfer Switch Standard Features

- UL 1008 listed at 480 VAC file #E58962 (automatic), #E86894 (non automatic)
- CSA certification available at 600 VAC
- IBC seismic certification available
- Available in 2, 3, or 4 pole configurations
- Electrically operated, mechanically held mechanism
- High withstand and close-on ratings
- Design suitable for emergency and standby applications on all classes of load, 100% tungsten rated through 400 amps
- Silver alloy main contacts
- Gold-flashed engine start contacts rated 2 amps @ 30 VDC/250 VAC
- Front-accessible contacts for easy inspection
- Front-replaceable main and arcing contacts (800-4000 amps)
- Reliable, field-proven solenoid mechanism
- Switching mechanisms lubricated for the expected life of the transfer switch
- Internal manual operating handle
- Main shaft auxiliary position-indicating contacts rated 10 amps @ 32 VDC/250 VAC
- NEMA type 1, 12, 3R, 4, and 4X enclosures available
- Standard one-year limited warranty. Extended limited warranties are available

Standard-Transition Models (KCS)

- Standard-transition operation with either automatic or non-automatic control
- Standard-transition transfer time less than 100 milliseconds (6 cycles @ 60 Hz)
- Double-throw, mechanically interlocked design (break-before-make power contacts)
- Solid, switched, or overlapping (make-before-break) neutral

Decision-Maker® MPAC 1200 Controller



- LCD display, 4 lines x 20 characters, backlit
 - Complete programming and viewing capability at the door using the keypad and LCD display
 - LED indicators: Source available, transfer switch position, service required (fault), and "not in auto"
 - Programmable voltage and frequency pickup and dropout settings
 - Programmable time delays
 - Programmable generator exerciser
 - Time-based load control
 - Two programmable inputs and two programmable outputs
 - Up to four I/O extension modules available
 - Modbus communication standard
 - RS-485 communication standard
 - Ethernet communication optional
- For more information about Decision-Maker® MPAC 1200 features and functions, see specification sheet G11-127

Environmental Specifications	
Operating Temperature	-20°C to 70°C (-4°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% noncondensing

Input and Output Connection Specifications	
Component	Wire Size Range
Main board I/O terminals	#12-24 AWG
I/O module terminals	#14-24 AWG

Auxiliary Position Indication Contacts (rated 10 Amps @ 32 VDC/250 VAC)	
Switch Rating, amps	Number of Contacts Indicating Normal, Emergency
104	2, 2

Cable Sizes

Note: Cable size data is subject to change. Refer to the transfer switch dimension drawings and wiring diagrams for planning and installation.

UL-Listed Solderless Screw-Type Terminals for External Power Connections			
Range of Wire Sizes, Copper or Aluminum*			
Switch Rating, Amps	Normal, Emergency, and Load	Neutral	Ground
104	(1) #14 AWG to 4/0 AWG	(3) #14 TO 4/0	(3) #6 TO 3/0
Use 75 degree C minimum Cu/Al wire for power connections.			

Withstand and Close-On Ratings (WCR)

Maximum current in RMS symmetrical amperes when coordinated with customer-supplied fuses or circuit breakers. All values are available symmetrical RMS amperes and tested in accordance with the withstand and close-on requirements of UL 1008. Application requirements may permit higher withstand ratings for certain size switches. Contact the factory for assistance.

Switch Rating, Amps	Withstand Current Ratings in RMS Symmetrical Amperes							Short Time Ratings (sec.)**							
	Current Limiting Fuses				Time-Based Rating*			480 V Max.				600 V Max.			
	Amps @ 480 V	Amps @ 600 V	Amps, Max.	Fuse Class	Amps @ 240 V	Amps @ 480 V	Amps @ 600 V	0.1	0.13	0.3	0.5	0.1	0.13	0.3	0.5
104	200000	35000	200	J	10000	10000	10000	-	-	-	-	-	-	-	-
104	35000	35000	200	RK1	10000	10000	10000	-	-	-	-	-	-	-	-

* Based on a 0.025 seconds (approximately 1.5 cycles) for 30-230 amps and 0.050 seconds for 260-4000 amps. Applicable to breakers with instantaneous trip elements.
 ** Short time ratings are provided for applications involving breakers that utilize trip delay settings for system selective coordination.

Weights and Dimensions

See ADV drawings for weights and dimensions. Allow 15% additional weight for packing materials.

Ratings with Specific Manufacturer's Circuit Breaker

The following charts list power switching device withstand and close-on ratings (WCR) in RMS symmetrical amperes for specific manufacturers' circuit breakers. Circuit breakers are supplied by the customer.

Molded-Case Circuit Breakers					
Switch Rating, Amps	WCR, Amps, RMS	Voltage, Max.	Manufacturer	Type	Max. Size, Amps
104	42000	240	SquareD	QG, QJ	125
104	22000	480	GE	THED	150



Codes and Standards

The ATS meets or exceeds the requirements of the following specifications:

- CSA C22.2 No. 178 certification 208-600 VAC available, file LR58301
- EN61000-4-4 Fast Transient Immunity Severity Level 4
- EN61000-4-5 Surge Immunity Class 4 (voltage sensing and programmable inputs only)
- EIC Specifications for EMI/EMC Immunity:
 - o CISPR 11, Radiated Emissions
 - o IEC 1000-4-2, Electrostatic Discharge
 - o IEC 1000-4-3, Radiated Electromagnetic Fields
 - o IEC 1000-4-4, Electrical Fast Transients (Bursts)
 - o IEC 1000-4-5, Surge Voltage
 - o IEC 1000-4-6, Conducted RF Disturbances
 - o IEC 1000-4-8, Magnetic Fields
 - o IEC 1000-4-11, Voltage Dips and Interruptions
- IEC 609047-6-1, Low Voltage Switchgear and Control Gear; Multifunction Equipment; Automatic Transfer Switching Equipment
- IEEE Standard 446, IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- IEEE 472 (ANSI C37.90A) Ring Wave Test
- NEMA Standards ICS 10-2005, Electromechanical AC Transfer Switch Equipment
- NFPA 70, National Electrical Code
- NFPA 99, Essential Electrical Systems for Health Care Facilities
- NFPA 110, Emergency and Standby Power Systems
- Seismic certification in accordance with the International Building Code is available. (Accessory kit is required for seismic certification)
 - o IBC 2000, referencing ASCE 7-98 and ICC AC-156
 - o IBC 2003, referencing ASCE 7-02 and ICC AC-156
 - o IBC 2006, referencing ASCE 7-05 and ICC AC-156
 - o IBC 2009, referencing ASCE 7-05 and ICC AC-156
 - o IBC 2012, referencing ASCE 7-10 and ICC AC-156
- Underwriters Laboratories UL 1008, Standard for Automatic Transfer Switches for Use in Emergency Standby Systems for #E58962 (automatic), #E86894 (nonautomatic)

Accessories

Accessories are available either factory-installed or as loose kits, unless otherwise noted.

Accessory Modules

The mounting kit holds up to five optional modules. The maximum total current draw is 300 mA. If an External Battery Module is installed, there is no current restriction.

- Alarm Module
- External Battery Supply Module
- Standard I/O Module
- High Power I/O Module

Warranty

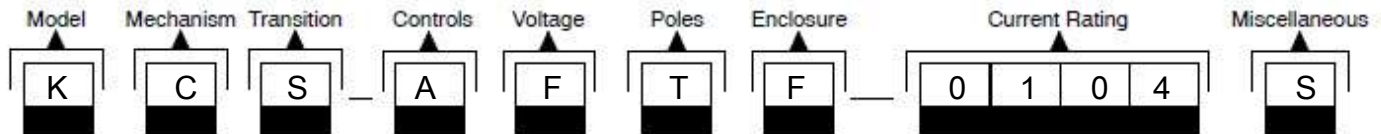
-

Standard Input/Output Module

Inputs	
Available Inputs	2
Input Definition	Contact closure
Current	5 mA Max
Connection Type	Terminal Strip
Wire Size	#14-24 AWG
Max Distance	700 feet
Outputs	
Outputs Available	6
Contact Type	Form C (SPDT)
Contact Voltage Rating	2 A @ 30 VDC 500 mA @ 125 VAC
Connection Type	Terminal Strip
Wire Size	#14-24 AWG

Warranty

Model Designation



Record the transfer switch model designation in the boxes. The transfer switch model designation defines characteristics and ratings as explained below.

Sample Model Designation: ~~KCS-DNTA-0400B~~

Model

→ K: Kohler

Mechanism

→ C: Standard (Any Breaker)

Transition

→ S: Standard
P: Programmed
C: Closed

Controller

→ A: Decision-Maker[®] MPAC 1200, Automatic
B: Decision-Maker[®] MPAC 1200, Non-Automatic
D: Decision-Maker[®] MPAC 1500, Automatic
F: Decision-Maker[®] MPAC 1500, Non-Automatic

Voltage/Frequency

→ C: 208 Volts/60 Hz
D: 220 Volts/50 Hz
→ F: 240 Volts/60 Hz
G: 380 Volts/50 Hz
H: 400 Volts/50 Hz
J: 416 Volts/50 Hz
K: 440 Volts/60 Hz
M: 480 Volts/60 Hz
N: 600 Volts/60 Hz
P: 380 Volts/60 Hz
R: 220 Volts/60 Hz

Number of Poles/Wires

→ N: 2 Poles/3 Wires, Solid Neutral
T: 3 Poles/4 Wires, Solid Neutral
V: 4 Poles/4 Wires, Switched Neutral
W: 4 Poles/4 Wires, Overlapping Neutral

Enclosure

A: NEMA 1
B: NEMA 12
C: NEMA 3R
D: NEMA 4
→ F: NEMA 4X
G: Open Unit

Current, Amps

→ 0030 0230 1200
0070 0260 1600
0104 0400 2000
0150 0600 2600
0200 0800 3000
0225 1000 4000

Connections

→ S: Standard
F: Front (1600 and 2000 amp only)

Note: Some selections are not available for every model. Contact your Kohler distributor for availability.

Alternator Data



TECHNICAL INFORMATION BULLETIN

Alternator Data Sheet

Alternator Model: 4P7

Frequency: 60 Hz

Speed: 1800 RPM

Leads: 12 (6 Lead, 600 Volt)

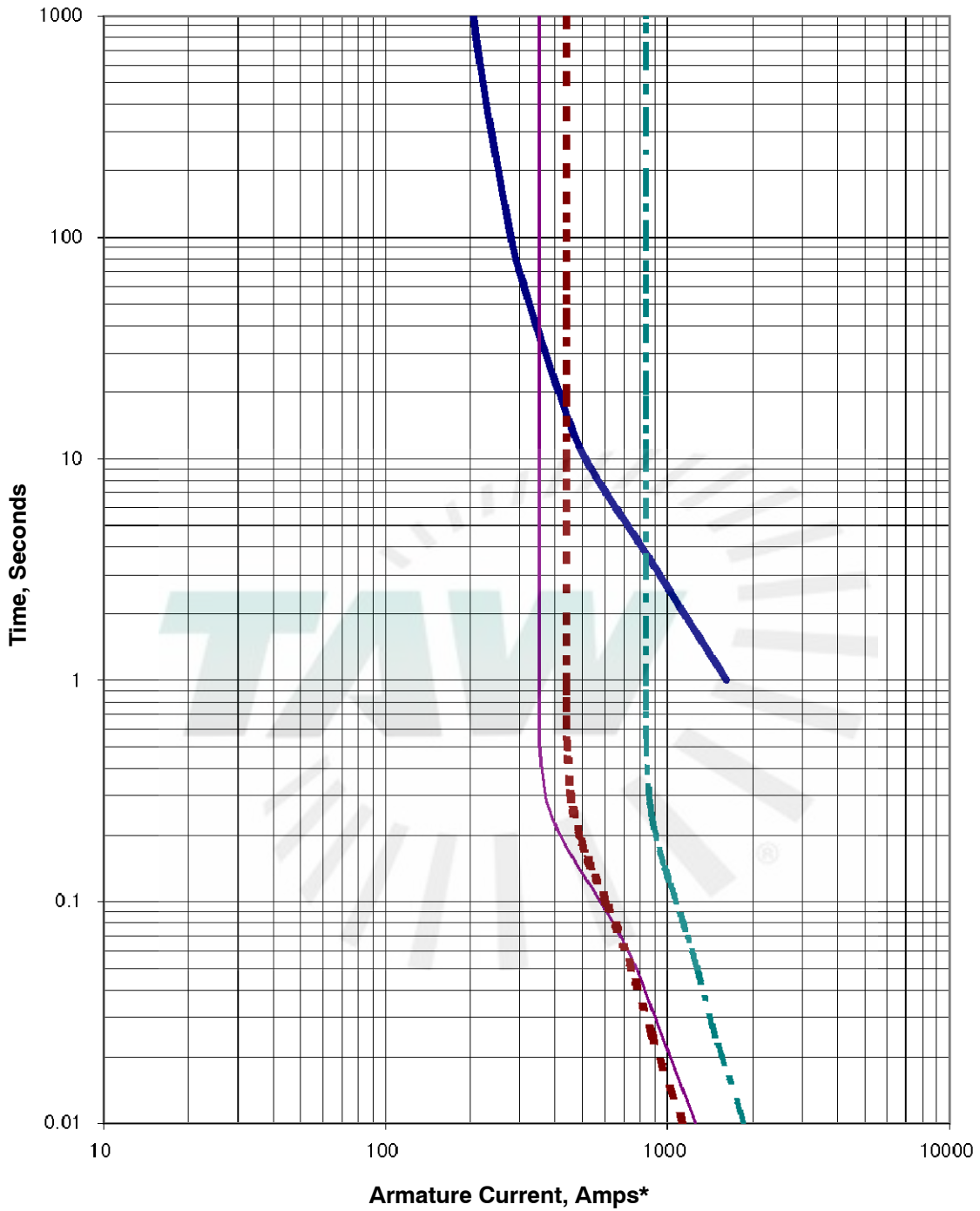
Voltage L-N/L-L	Phase	Power Factor	Connection	kW* (kVA)						
				Class B	Class F			Class H		
				80°C Continuous	90°C Lloyds	95°C ABS	105°C Continuous	130°C Standby	125°C Continuous	150°C Standby
139/240 277/480	3	0.8	Wye	43.8 (54.8)	45.8 (57.3)	46.7 (58.4)	48.5 (60.6)	52.0 (65.0)	51.4 (64.3)	54.1 (67.6)
127/220 254/440	3	0.8	Wye	40.9 (51.2)	42.7 (53.4)	43.6 (54.5)	45.3 (56.6)	48.8 (60.9)	48.2 (60.2)	51.0 (63.8)
120/208 240/416	3	0.8	Wye	39.2 (49.0)	40.9 (51.1)	41.8 (52.3)	43.4 (54.3)	46.8 (58.5)	46.2 (57.8)	49.2 (61.5)
110/190 220/380	3	0.8	Wye	32.0 (40.0)	33.5 (41.9)	34.0 (42.5)	36.0 (45.0)	40.0 (50.0)	39.0 (48.8)	40.0 (50.0)
120/240	3	0.8	Delta	39.2 (49.0)	40.9 (51.1)	41.8 (52.3)	43.4 (54.3)	46.8 (58.5)	46.2 (57.8)	49.2 (61.5)
120/240	1	1.0	Dogleg	29.0 (29.0)	30.5 (30.5)	31.0 (31.0)	33.0 (33.0)	37.5 (37.5)	36.5 (36.5)	37.5 (37.5)
120/240	1	0.8	Dogleg	20.0 (25.0)	20.5 (25.6)	21.0 (26.3)	22.0 (27.5)	25.0 (31.3)	24.0 (30.0)	25.0 (31.3)
347/600	3	0.8	Wye	43.8 (54.8)	45.8 (57.3)	46.7 (58.4)	48.5 (60.6)	52.0 (65.0)	51.4 (64.3)	54.1 (67.6)

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

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

	Symbol	Per Unit	Ohms		Symbol	Value
Typical Resistances				Typical Time Constants		
Phase Resistance		0.036	0.032	Armature Short Circuit	T _a	0.008 sec.
Rotor Resistance		3.611	3.200	Transient Short Circuit	T' _d	0.081 sec.
Typical Reactances				Transient Open Circuit	T' _{do}	0.837 sec.
Synchronous				Typical Field Current		
Direct	X _d	2.997	2.656	Full Load	I _{fFL}	20 amps
Quadrature	X _q	1.456	1.290	No Load	I _{fNL}	5.5 amps
Transient				Typical Short Circuit Ratio		0.557
Unsaturated	X' _{du}	0.330	0.292	Harmonic Distortion		
Saturated	X' _d	0.290	0.257	RMS Total Harmonic Distortion		2.7%
Subtransient				Max. Single Harmonic		5 th
Direct	X'' _d	0.138	0.122	Deviation Factor (No Load, L-L)		4.9%
Quadrature	X'' _q	0.125	0.111	Telephone Influence Factor		<50
Negative Sequence	X ₂	0.132	0.117	Insulation Material Class		
Zero Sequence	X ₀	0.010	0.009	per NEMA MG1-1.66		H
				Phase Rotation		ABC

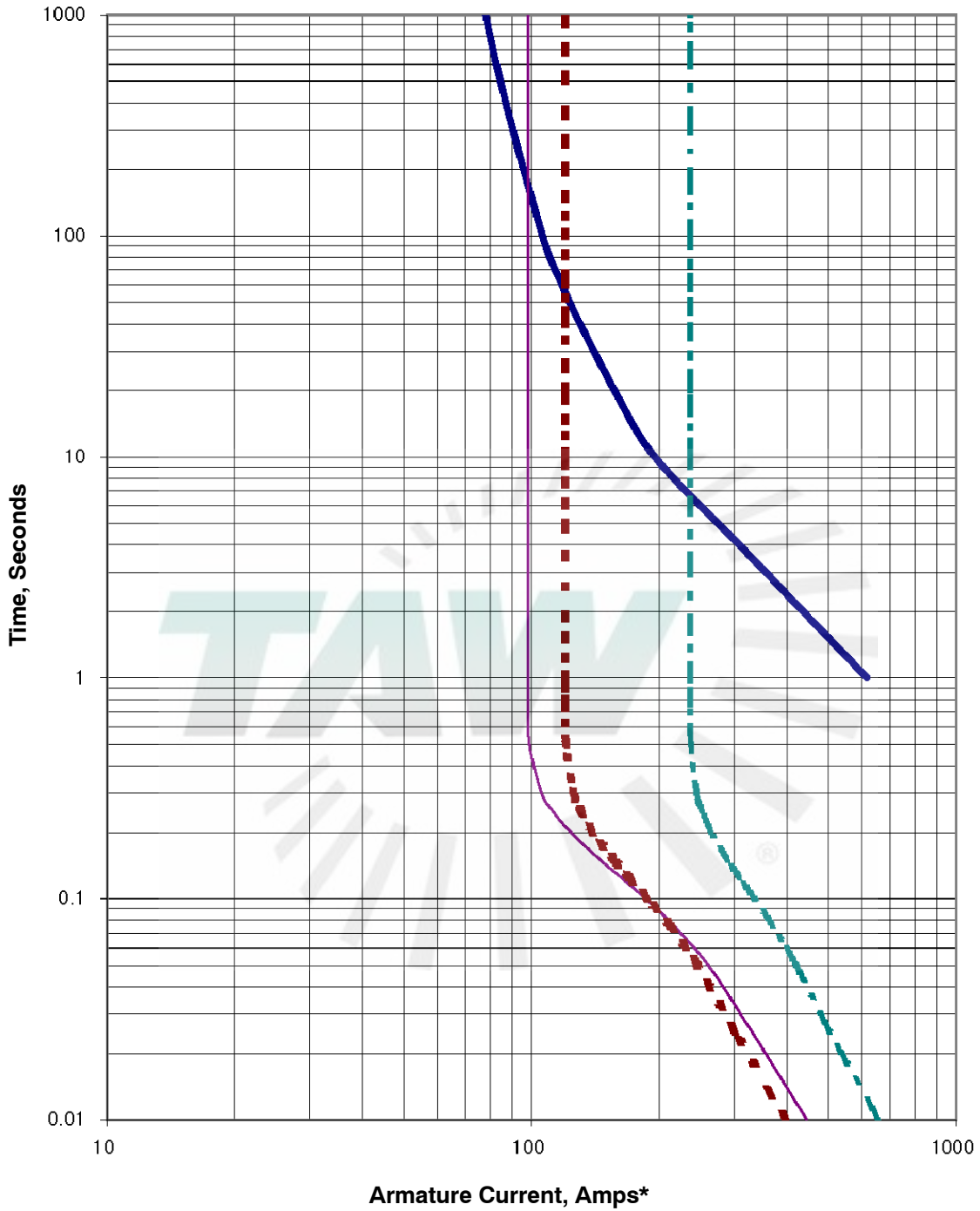
**4P7, 60 Hz, Low Wye or Delta Connection
SHORT CIRCUIT DECREMENT CURVE**



- Alternator Damage Curve
- Line-to-Line 1 Phase
- 3 Phase Symmetrical
- Line-to-Neutral 1 Phase

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

**4P7, 60 Hz, 600 V Connection
SHORT CIRCUIT DECREMENT CURVE**



- Alternator Damage Curve
- 3 Phase Symmetrical
- - Line-to-Line 1 Phase
- . - Line-to-Neutral 1 Phase

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

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	Sound Enclosure
45REZG	60	100% Load	112.7	78.2	76.3	65.7
		No Load	101.1	77.2	75.3	64.6

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.

45REZG	60 Hz
---------------	--------------

Sound Pressure Levels dB(A)				
Load	Distance, m (ft.)	Enclosure	Measurement Position	Overall Level
100% Load	7 (23)	Sound	Right	65.0
			Front-Right	67.8
			Front	65.5
			Front-Left	67.1
			Left	65.7
			Back-Left	65.4
			Back	63.7
			Back-Right	64.2
			8-pos. log avg.	65.7

Sound Pressure Levels dB(A)												
Load	Distance, m (ft.)	Enclosure	Measurement Position	Right	Front-Right	Front	Front-Left	Left	Back-Left	Back	Back-Right	8-pos. log avg.
100% Load	7 (23)	Weather	Overall Levels	74.7	76.7	77.5	78.9	76.2	75.7	72.8	75.1	76.3

Sound Pressure Levels dB(A)												
Load	Distance, m (ft.)		Measurement Position	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
100% Load	7 (23)	Open Unit, Isolated Exhaust	Right	44.4	58.2	69.6	70.0	70.5	70.2	66.5	60.4	76.6
			Front-Right	42.6	54.4	64.3	69.2	76.1	70.2	69.1	62.1	78.6
			Front	55.2	63.5	69.5	72.4	74.1	72.7	70.5	64.4	79.4
			Front-Left	58.7	70.1	68.4	70.0	73.9	75.6	73.8	68.3	80.8
			Left	59.5	67.2	68.7	69.6	71.3	71.8	69.3	66.6	78.1
			Back-Left	54.8	61.3	69.5	69.7	71.3	71.5	68.9	63.7	77.6
			Back	47.1	56.8	66.4	69.4	68.7	67.8	62.6	57.3	74.7
			Back-Right	45.7	57.0	65.3	70.8	71.8	70.8	67.3	60.8	77.0
			8-pos. log avg.	54.8	64.2	67.9	70.3	72.8	71.9	69.5	64.2	78.2

Sound Pressure Levels dB(A)											
Load	Distance, m (ft.)	Exhaust	Octave Band Center Frequency (Hz)								Overall Level
			63	125	250	500	1000	2000	4000	8000	
100% Load	1 (3.3)	Raw Exhaust (No Silencer)	90.0	94.7	107.4	103.6	102.0	105.1	105.5	102.8	112.7

45REZG	60 Hz
---------------	--------------

				Sound Pressure Levels dB(A)	
Load	Distance, m (ft.)	Enclosure	Measurement Position	Overall Level	
No Load	7 (23)	Sound	Right	63.0	
			Front-Right	66.8	
			Front	63.9	
			Front-Left	65.4	
			Left	65.1	
			Back-Left	65.5	
			Back	61.2	
			Back-Right	63.8	
			8-pos. log avg.	64.6	

				Sound Pressure Levels dB(A)								
Load	Distance, m (ft.)	Enclosure	Measurement Position	Right	Front-Right	Front	Front-Left	Left	Back-Left	Back	Back-Right	8-pos. log avg.
No Load	7 (23)	Weather	Overall Levels	73.5	76.1	76.7	78.1	74.4	74.2	71.1	74.5	75.3

				Sound Pressure Levels dB(A)									
Load	Distance, m (ft.)		Measurement Position	Octave Band Center Frequency (Hz)								Overall Level	
				63	125	250	500	1000	2000	4000	8000		
No Load	7 (23)	Open Unit, Isolated Exhaust	Right	37.2	57.0	63.7	68.5	70.0	70.1	65.5	58.1	75.4	
			Front-Right	39.4	51.6	58.6	68.5	75.6	69.6	68.7	60.8	78.0	
			Front	47.0	60.0	65.0	72.2	74.1	72.3	69.5	60.1	78.6	
			Front-Left	51.7	63.5	67.7	70.2	73.7	75.4	73.1	65.1	80.0	
			Left	46.5	57.5	64.9	69.1	70.7	71.1	66.8	59.6	76.3	
			Back-Left	40.9	50.7	62.7	69.5	70.6	71.0	66.6	58.2	76.1	
			Back	43.9	52.2	61.5	67.6	67.8	67.0	61.1	52.0	73.0	
			Back-Right	41.6	54.8	61.7	70.2	71.5	70.6	66.7	59.2	76.4	
			8-pos. log avg.	45.9	58.0	64.0	69.7	72.4	71.5	68.4	60.3	77.2	

				Sound Pressure Levels dB(A)								
Load	Distance, (ft.)		Exhaust	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
No Load	1 (1.1)		Raw Exhaust (No Silencer)	71.1	83.4	98.9	95.2	89.6	86.6	82.9	76.6	101.1

Emissions Data



PSI 2016 Stationary 60 Hz Emergency Standby1 and Prime Certified Power Generation Rating Data													
Generator Model	Engine	Speed	Freq	Fuel	Duty Cycle	Flywheel power ^{2,3}		Engine Family	C02	THC+NOx	CO	bsfc ⁵	Catalyst
		RPM	Hz			HP	kW		(g/KW-hr)	(g/KW-hr)	(g/kW-hr)	(g/kW-hr)	
45REZG	4.3L	1800	60	LP	Emergency	71.4	53.2	GPSIB4.302ED	873.7	8.17	32.02	234.1	No
	4.3L	1800	60	NG	Emergency	66.5	49.6	GPSIB4.302ED	713.29	7.03	21.96	225.7	No
	4.3L	1800	60	LP	Prime	71.4	53.2	GPSIB4.30GLP	800.96	0.07	0.59		Yes
	4.3L	1800	60	NG	Prime	66.5	49.6	GPSIB4.30GLP	824.88	0.92	0.36		Yes

¹ Standby and overload ratings based on ISO3046. Continuous ratings based on ISO 8528.

²

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.

³ Production tolerances in engines and installed components can account for power variations of +/- 5%. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

⁴ Electrical ratings are an estimated based on assumed fan and generator losses and may vary depending on actual equipment losses.

⁵ Bsfc is based on 100% gross flywheel power rating and does not include fan or generator losses.

For additional questions contact:
Power Solutions International, Inc.
 201 Mittel Drive, Wood Dale, IL 60191
 630.350.9400 (Main) – 630.350.9900 (Fax)
www.psiengines.com info@psiengines.com



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2016 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT**

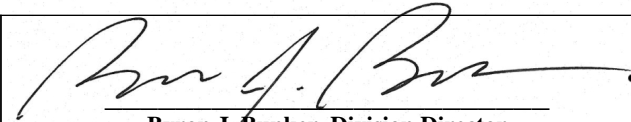
**OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105**

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

Certificate Number: GPSIB4.302ED-006

Effective Date:
11/24/2015

Expiration Date:
12/31/2016


Byron J. Bunker, Division Director
Compliance Division

Issue Date:
11/24/2015

Revision Date:
N/A

Manufacturer: Power Solutions International, Inc.
Engine Family: GPSIB4.302ED
Mobile/Stationary Certification Type: Stationary
Fuel : Natural Gas (CNG/LNG)
LPG/Propane
Emission Standards :
Part 90 Phase I
NMHC + NO_x (g/kW-hr) : 13.4
HC + NO_x (g/kW-hr) : 13.4
CO (g/kW-hr) : 519
Emergency Use Only : Y

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

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

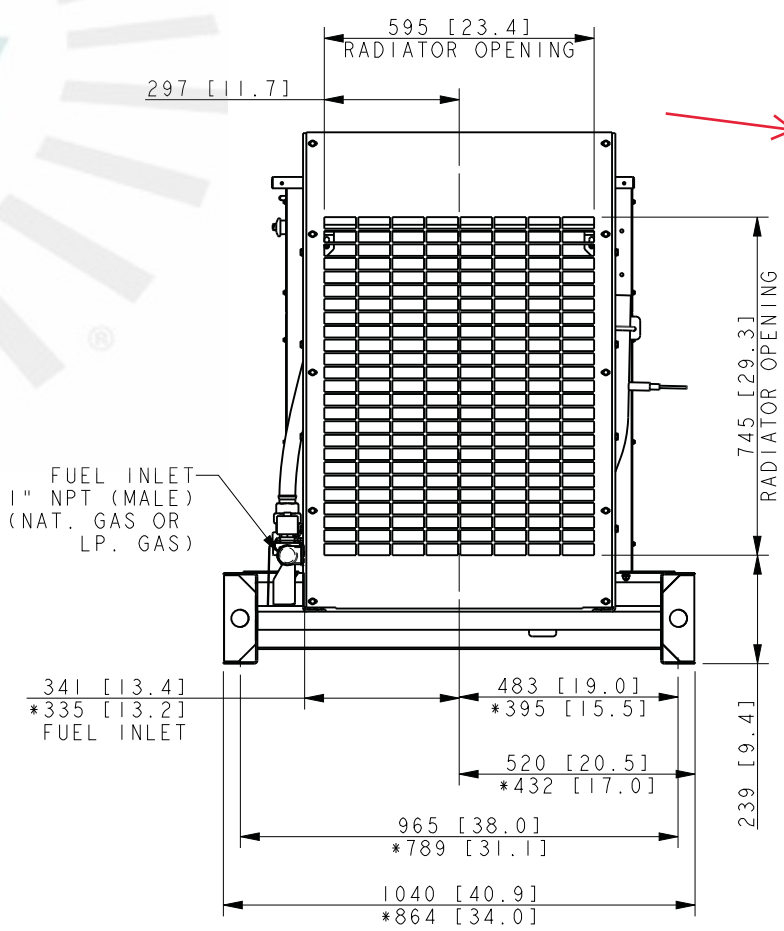
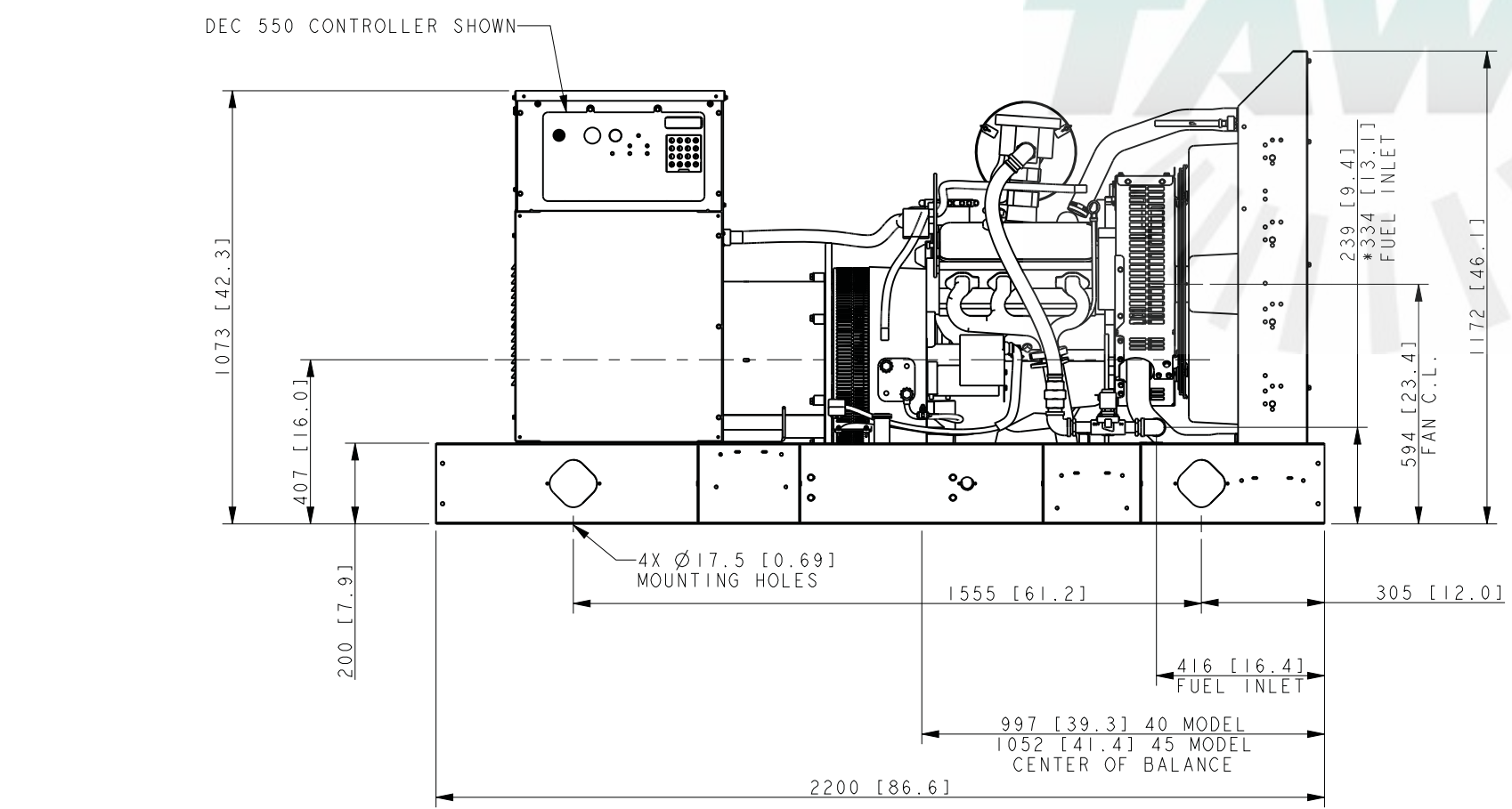
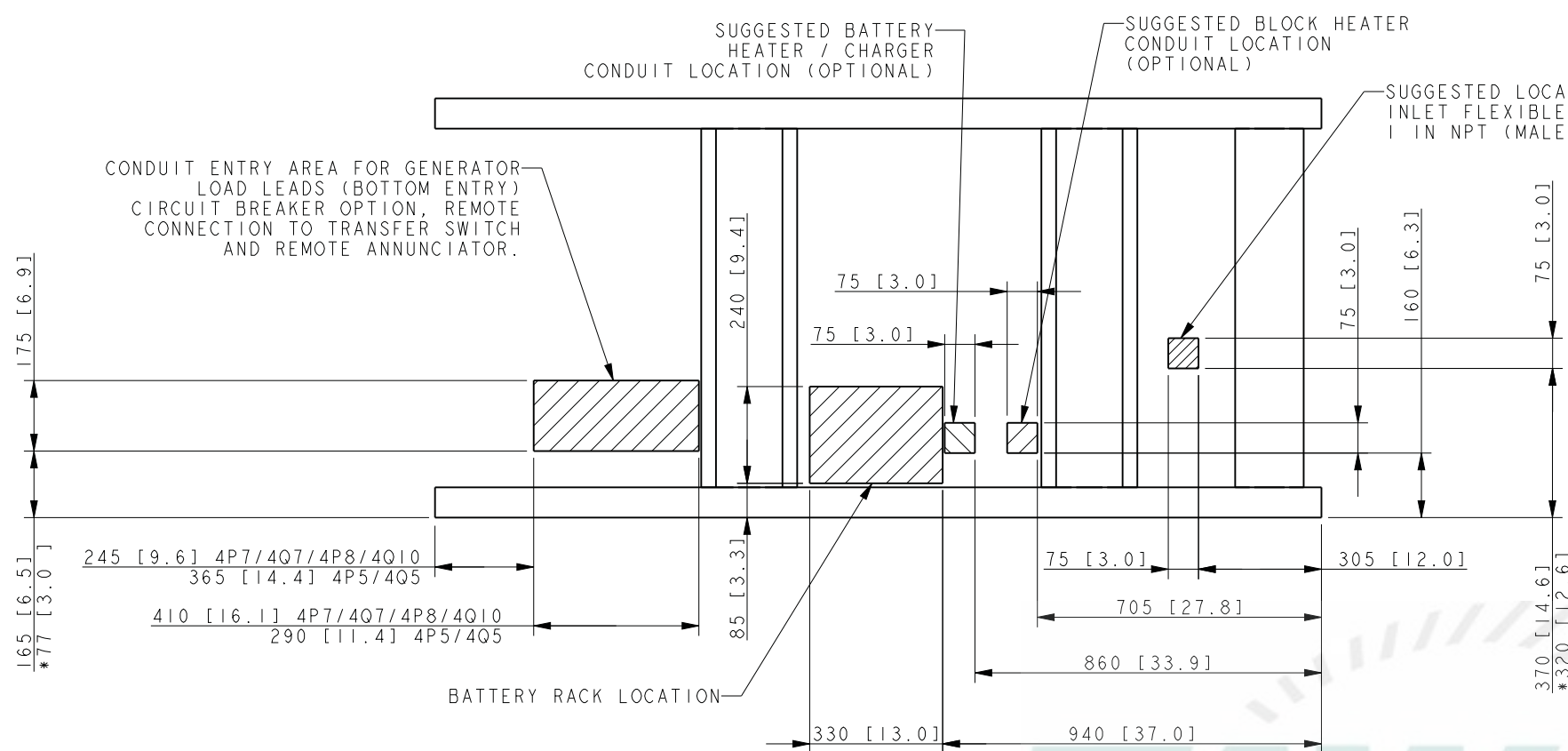
It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons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

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

Dimensional Drawings



Overall Dimensions:
Generator, Enclosure
L: 102"
W: 42"
H: 60"
Dry Weight: 1,962 lbs



MODEL	ALTERNATOR	WEIGHT (WET)
40	4P5/4Q5	692 KG [1525 LBS]
40/45	4P7/4Q7	733 KG [1616 LBS]
45	4P8	753 KG [1660 LBS]
45	4Q10	796 KG [1755 LBS]

- NOTES:
- IF IBC CERTIFICATION IS APPLICABLE OR REQUIRED SEE SEISMIC ADV FOR INSTALLATION INSTRUCTIONS.
 - DIMENSIONS IN [] ARE ENGLISH STANDARD EQUIVALENTS.
 - * - ASTERISK DENOTES 864 [34.0] SKID WIDTH.

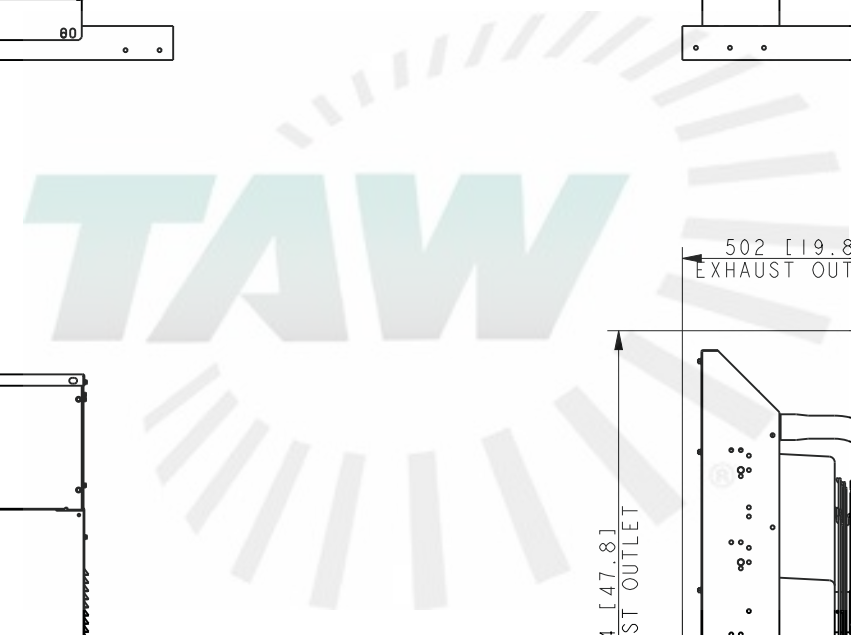
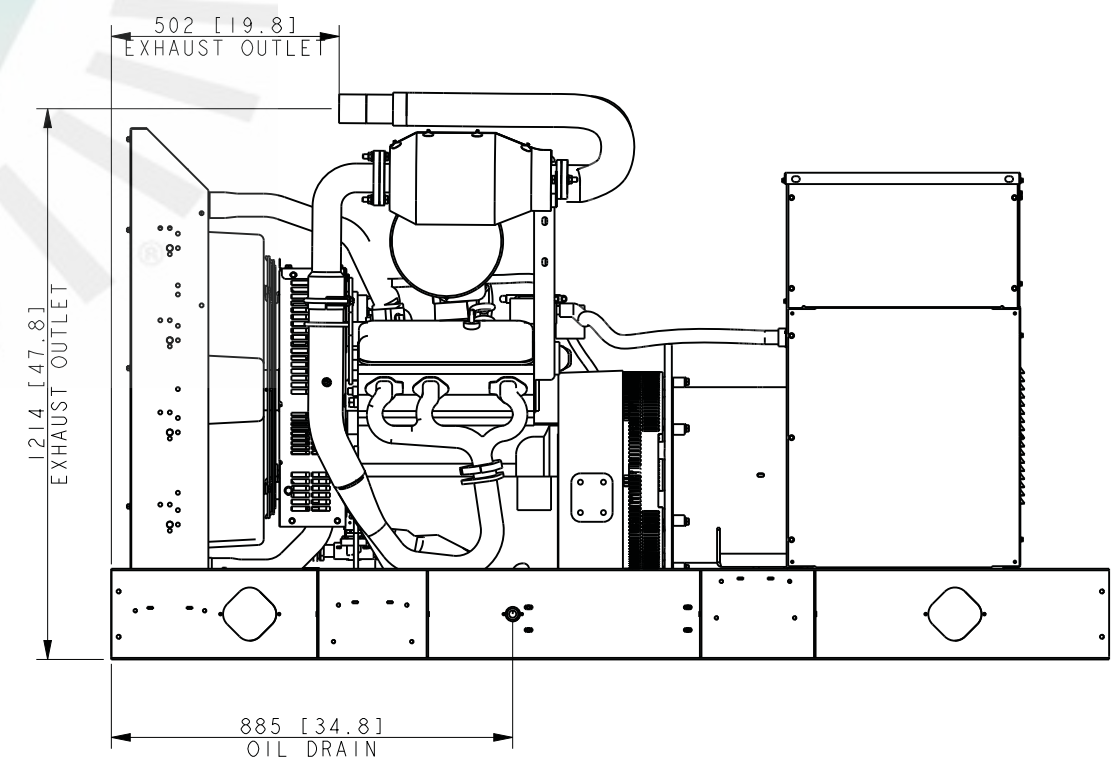
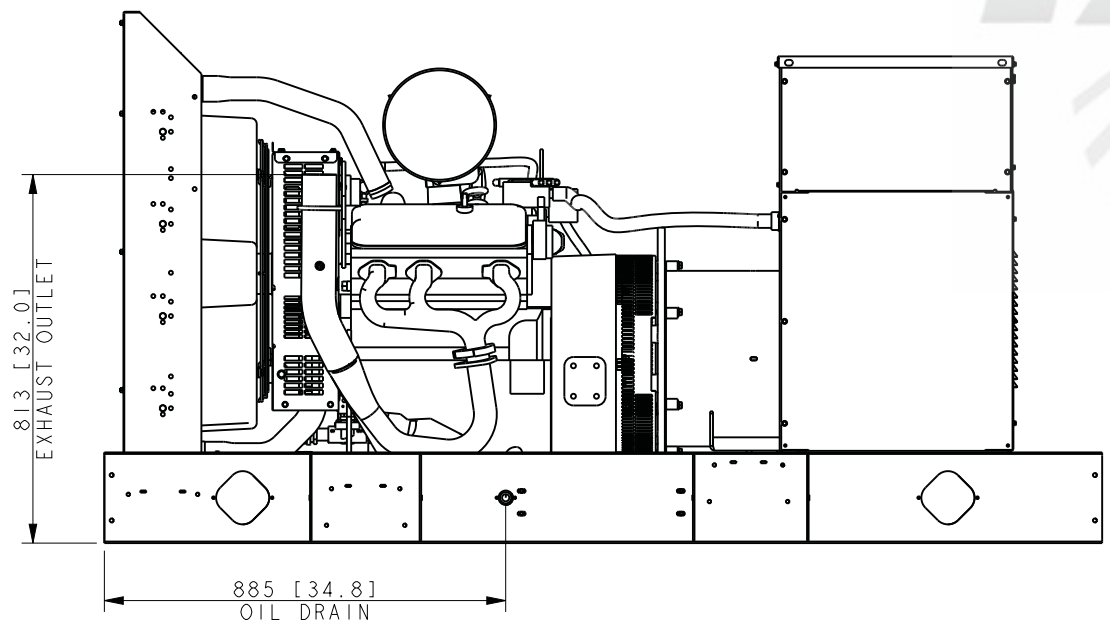
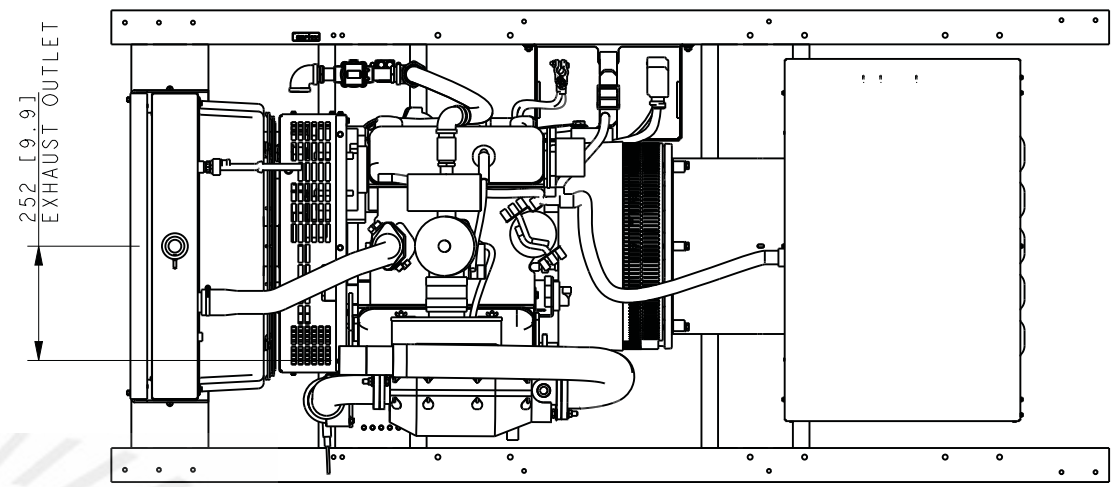
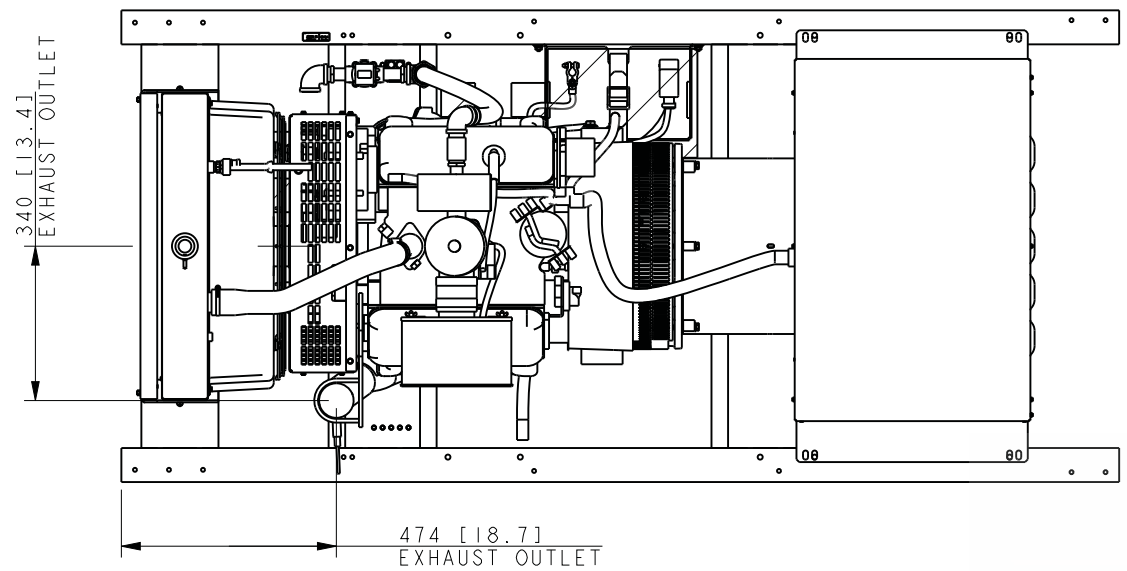
40 MODEL, 4P5/4Q5/4Q7
 45 MODEL 4P7/4P8/4Q10
 RECONNECTABLE,
 IMPROVED MOTOR STARTING (IMS) RECONNECTABLE,
 & 600V ALTERNATOR
 4.3 LITER GM 2009 EMISSIONS

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY
D	5-27-10	(D-2) DEC3000 CONTROLLER VIEW ADDED [89809]	KRH
E	8-8-11	(B-8) DIM 1076 ADDED, DIM 803 & 275 REMOVED, VIEWS UPDATED FOR UL GAP STYLE J-BOX, (C-3) AUX. VIEW FOR DEC 3000 CONTROLLER REMOVED [91290]	KMP
F	1-24-13	(C-8) "*" REMOVED FROM 365 & 290 DIMENSIONS [CT35983]	PKD
G	5-2-13	(C-8) 4Q7 ADDED TO 245 & 410 DIM [CT45388]	SAM
H	9-15-14	SEE SHEET 2 [CT93079]	SAM

KOHLER CO. METRIC PRO-E
 POWER SYSTEMS, KOHLER, WI 53044 U.S.A.
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TITLE: **DIMENSION PRINT**
40/45 GM

SCALE 0.12 CAD NO. SHEET 1 of 2
 DWG NO. **ADV-7670**



PRIME UNITS ONLY

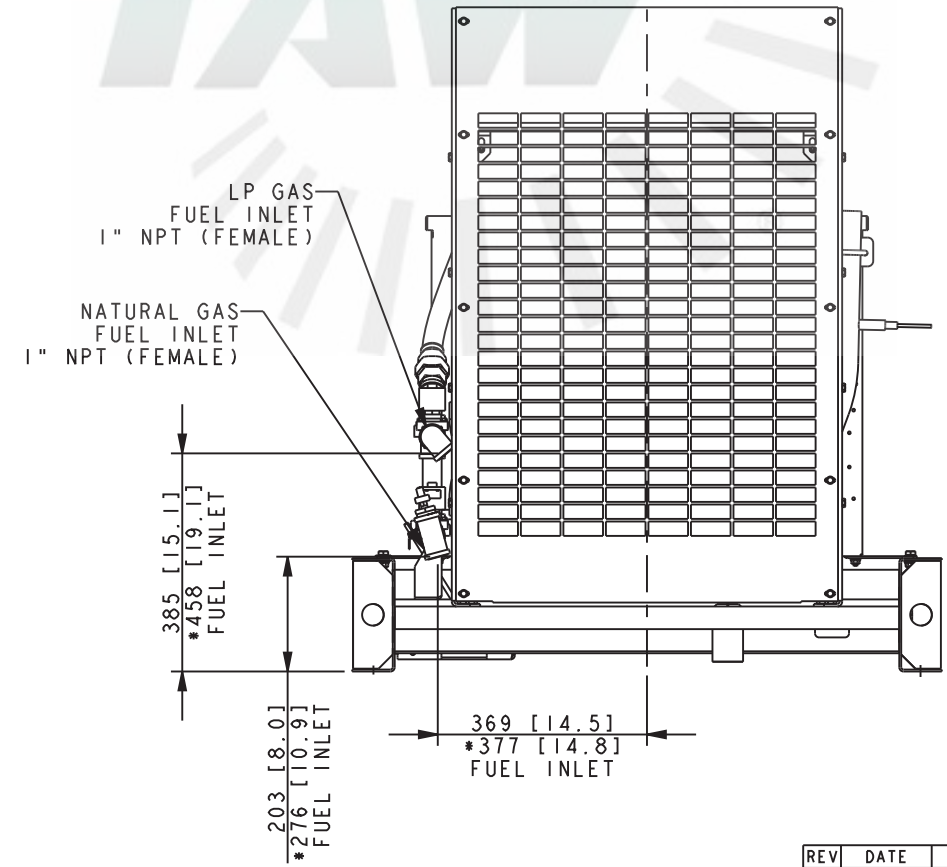
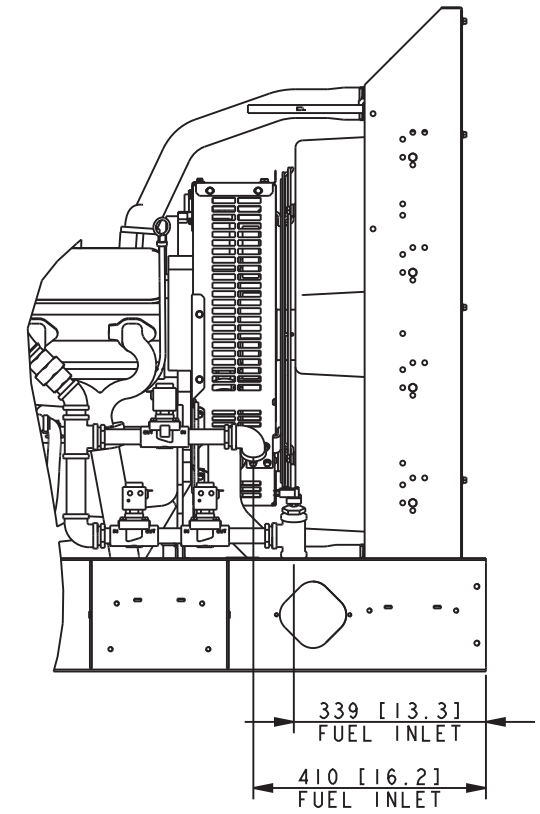
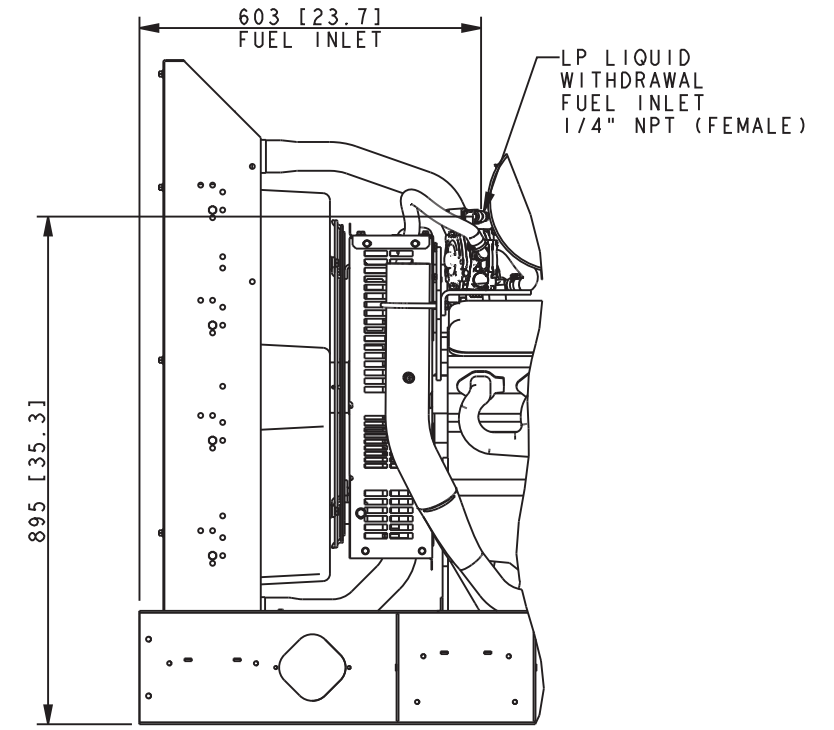
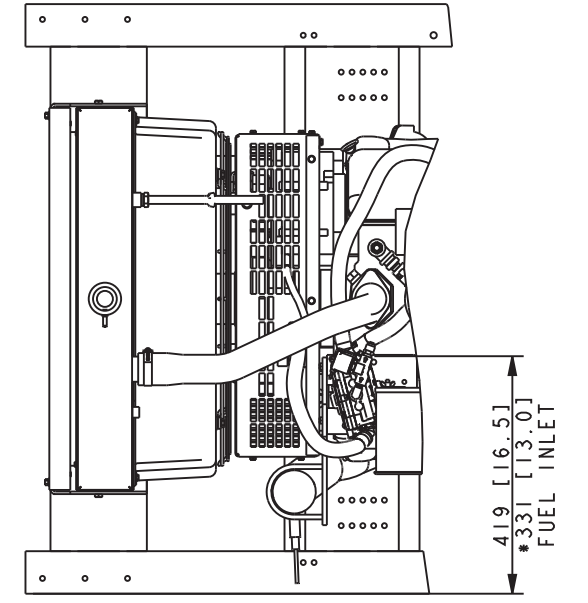
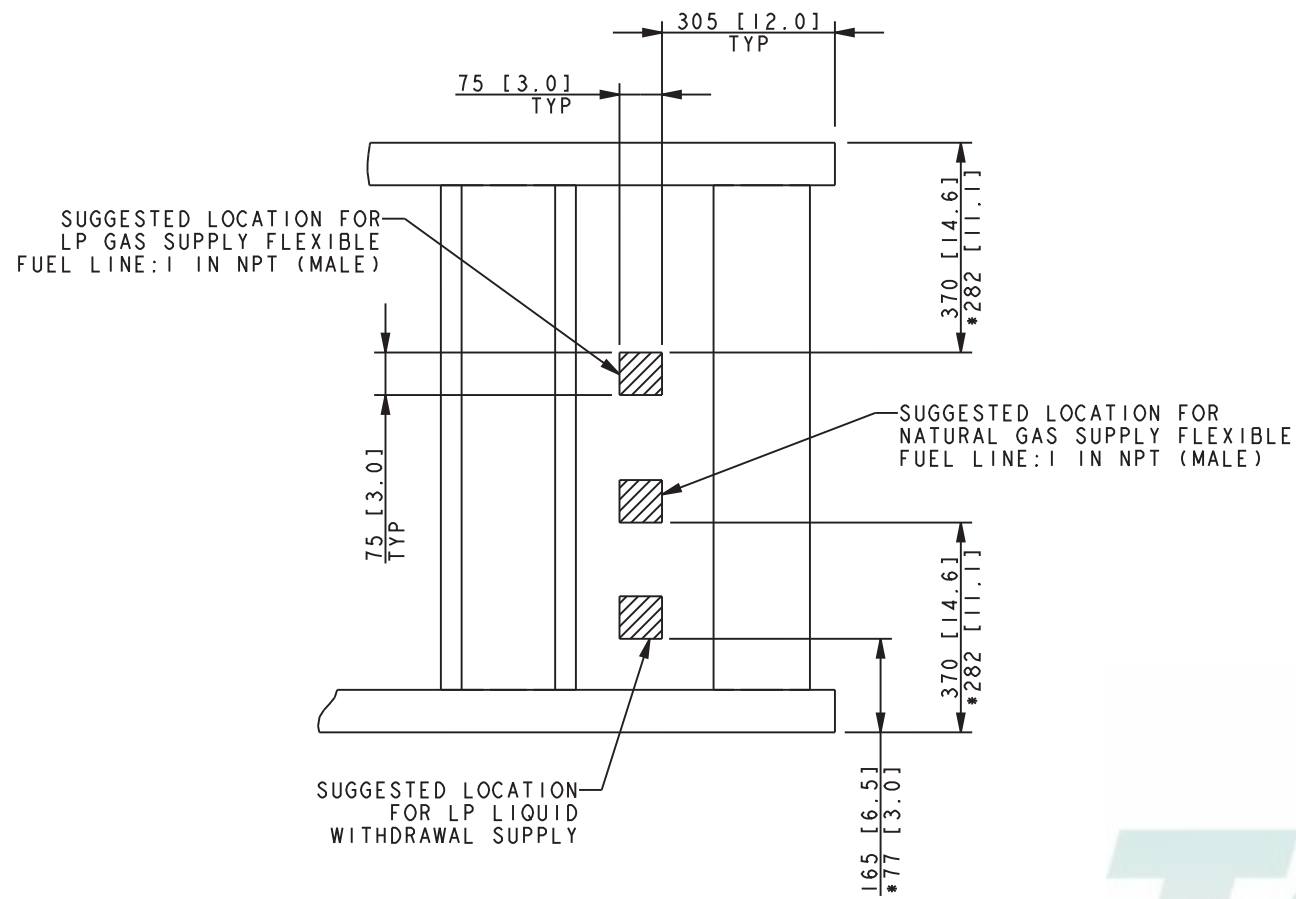
40 MODEL, 4P5/4Q5/4Q7
 45 MODEL 4P7/4P8/4Q10
 RECONNECTABLE,
 IMPROVED MOTOR STARTING (IMS) RECONNECTABLE,
 & 600V ALTERNATOR
 4.3 LITER GM 2009 EMISSIONS

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	UNLESS OTHERWISE SPECIFIED - 1) DIMENSIONS ARE IN MILLIMETERS 2) TOLERANCES ARE:
-	3-3-09	NEW DRAWING [86172-7]	KRH	X.XX ± 0.25
A	8-12-09	(B-4:7) VIEWS UPDATED [88266]	DJV	X.X ± 1.0
B	1-29-10	SEE SHEET 1 [89102]	SAM	X ± 1.5
C	3-24-10	SEE SHEET 1 OF 2. [89097]	GFR	ANGLES ± 0° 30' MAX.
D	5-27-10	SEE SHEET 1 [89809]	KRH	THIRD ANGLE PROJECTION
E	8-8-11	VIEWS UPDATED, SEE SHEET 1 [91290]	KMP	APPROVALS
F	1-24-13	SEE SHEET 1 [CT35983]	PKD	DATE
G	5-2-13	(C-8) 4Q7 ADDED TO 245 & 410 DIM [CT45388]	SAM	3-3-09
H	9-15-14	(A-3) PRIME ONLY VIEW ADDED [CT93079]	SAM	CHECKED CWF 3-3-09 APPROVED JAS 3-3-09

KOHLER CO. METRIC PRO-E
 POWER SYSTEMS, KOHLER, WI 53044 U.S.A.
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TITLE: **DIMENSION PRINT**
40/45 GM

SCALE 0.12 CAD NO. SHEET 2 of 2
 DWG NO. **ADV-7670** D



LP LIQUID WITHDRAWAL

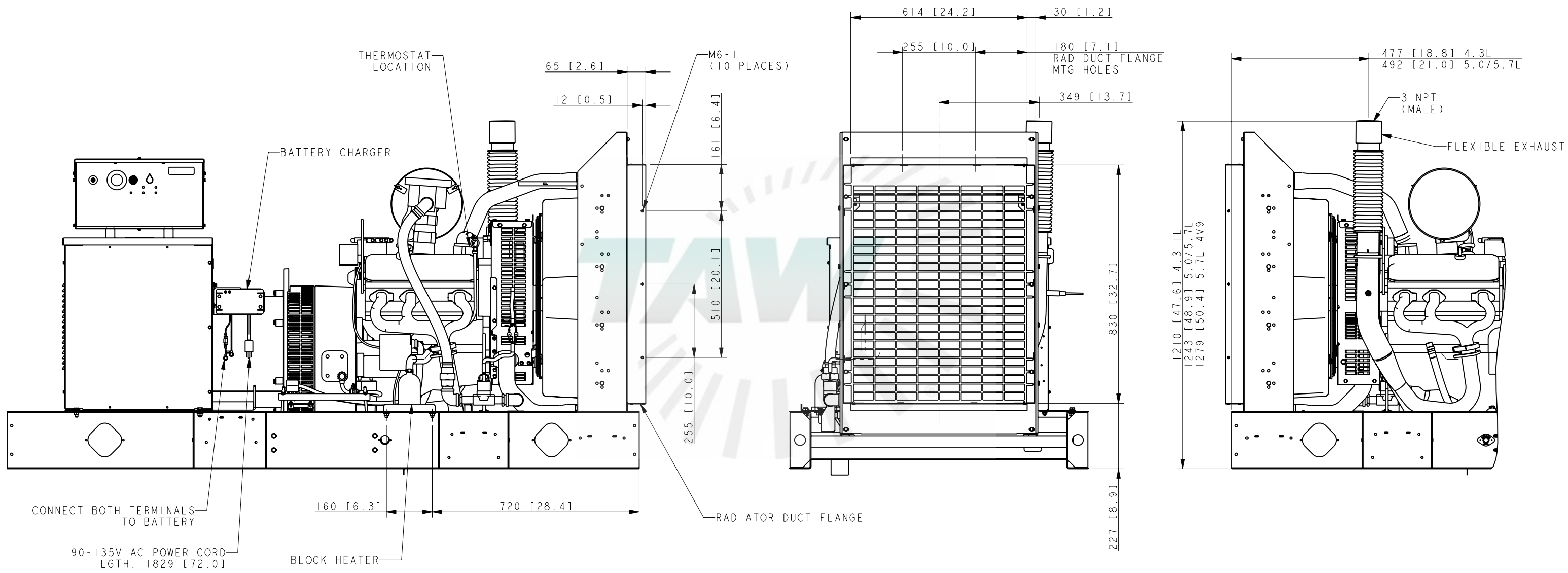
- NOTES:
1. DIMENSIONS IN [] ARE ENGLISH STANDARD EQUIVALENTS.
 2. * - ASTERISK DENOTES 864 [34.0] SKID WIDTH.

SEE GENSET ADV FOR GENSET DIMENSIONS

DUAL FUEL NAT GAS / LPG

**40 MODEL, 4P5/4Q5/4Q7
45 MODEL, 4P7/4P8/4Q10
RECONNECTABLE,
IMPROVED MOTOR STARTING (IMS) RECONNECTABLE,
& 600V ALTERNATOR
4.3 LITER GM 2009 EMISSIONS**

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	UNLESS OTHERWISE SPECIFIED: 1) DIMENSIONS ARE IN MILLIMETERS 2) TOLERANCES ARE:	APPROVALS	DATE	TITLE
-	6-06-09	NEW DRAWING [88019]	KRH	X.XX ± X.X ± ANGLES ±	APPROVED	6-06-09	KOHLER CO. METRIC PRO-E POWER SYSTEMS, KOHLER, WI 53044 U.S.A. THIS DRAWING IN DESIGN AND DETAIL IS KOHLER CO. PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH KOHLER CO. WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED. DIMENSION PRINT 40/45 GM
A	6-8-10	339 [13.3] WAS 273 [10.7], 410 [16.2] WAS 414 [16.3], (A-5) 385 [15.1]/*458 [19.1] WAS 385 [15.1] /312 [12.3]; 203 [8.0] /*276 [10.9] WAS 212 [8.4] /*133 [5.5], (A-4) 369 [14.5] / *377 [14.8] WAS 352 [13.9]/264 [10.4] [89635]	KRH	THIRD ANGLE PROJECTION	CHECKED	6-06-09	
					APPROVED	6-06-09	SCALE 0.15 CAD NO. SHEET 1 of 1 ADV-7742



NOTE:
IF IBC CERTIFICATION IS APPLICABLE
OR REQUIRED SEE SEISMIC ADV FOR
INSTALLATION INSTRUCTIONS.

DIMENSIONS IN [] ARE ENGLISH
STANDARD EQUIVALENTS

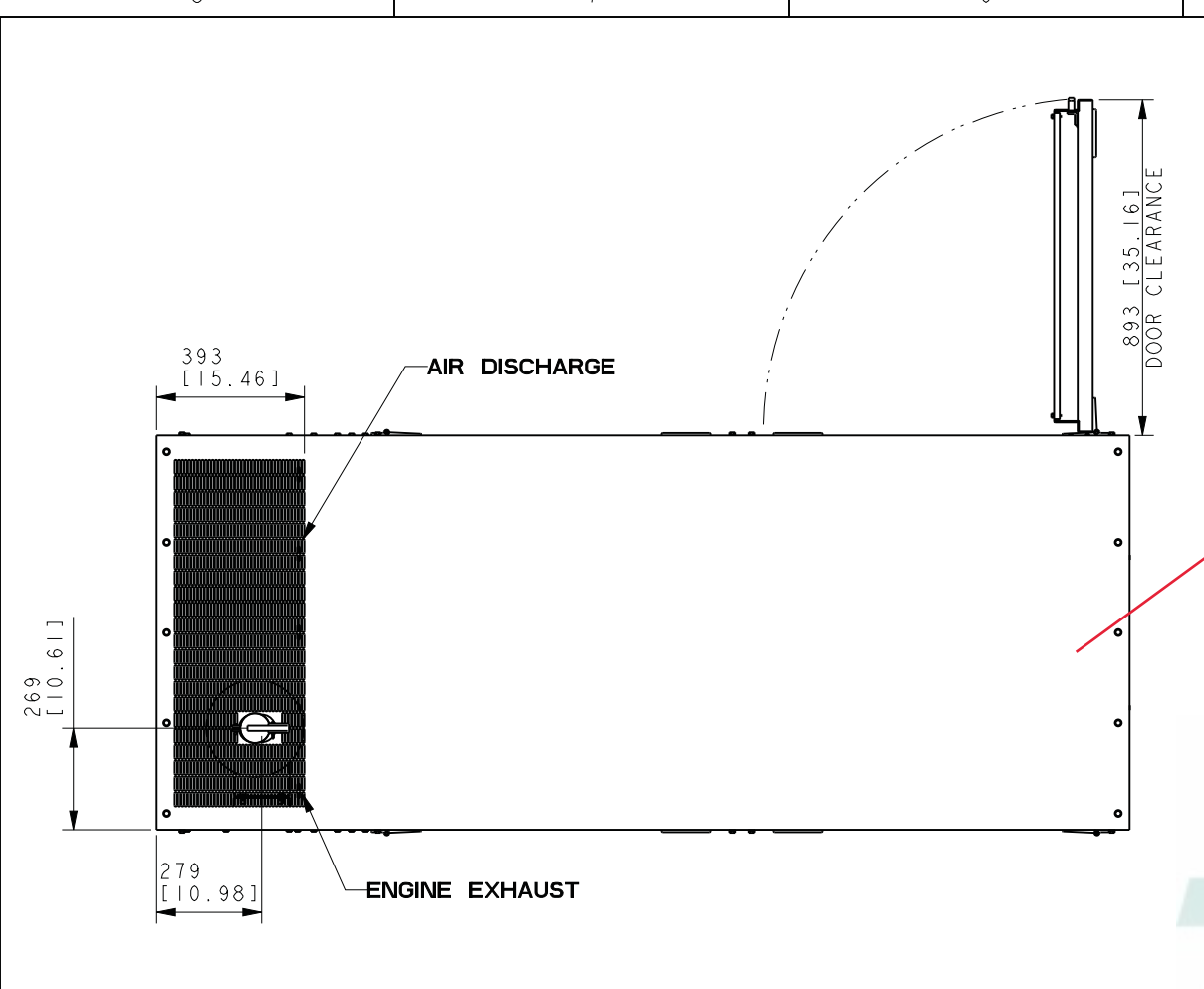
40 MODEL 4P5/4Q5/4Q7
45 MODEL 4P7/4P8/4Q10
50 MODEL 4P7/4Q10
60 MODEL 4P8/4P7/4Q10
60 MODEL 4V9
RECONNECTABLE,
IMPROVED MOTOR STARTING (IMS) RECONNECTABLE,
& 600V ALTERNATOR
4.3/5.0/5.7 LITER GM 2009 EMISSIONS

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY	UNLESS OTHERWISE SPECIFIED - 1) DIMENSIONS ARE IN MILLIMETERS 2) TOLERANCES ARE:	BY	UNLESS OTHERWISE SPECIFIED - 1) DIMENSIONS ARE IN MILLIMETERS 2) TOLERANCES ARE:	
-	2-27-09	NEW DRAWING [86172-7]	KRH	X.XX ± 0.25 X.X ± 1.0 X ± 1.5 ANGLES ± 0° 30'	KRH	X.XX ± 0.25 X.X ± 1.0 X ± 1.5 ANGLES ± 0° 30'	
				SURFACE FINISH MAX.		SURFACE FINISH MAX.	
				THIRD ANGLE PROJECTION		THIRD ANGLE PROJECTION	
APPROVALS		DATE		APPROVALS		DATE	
DRAWN KRH		2-27-09		DRAWN KRH		2-27-09	
CHECKED CWF		2-27-09		CHECKED CWF		2-27-09	
APPROVED JAS		2-27-09		APPROVED JAS		2-27-09	

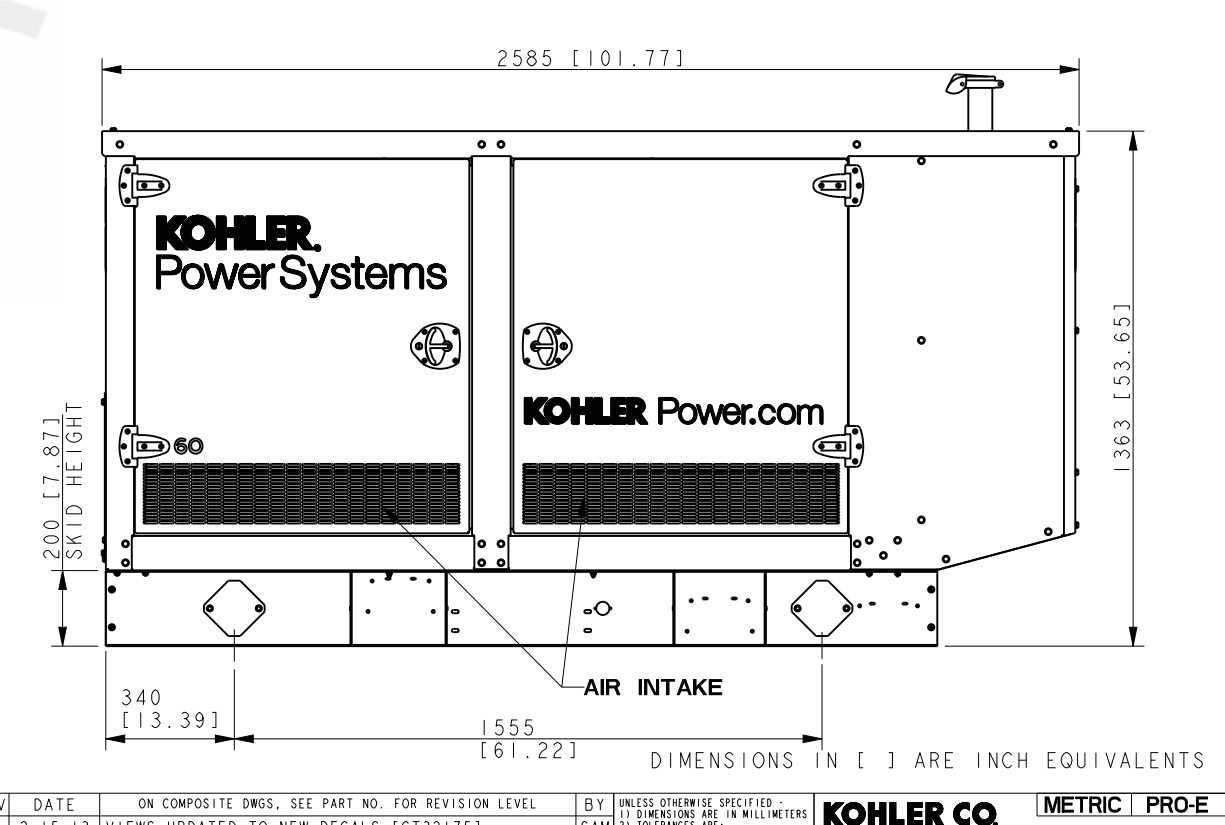
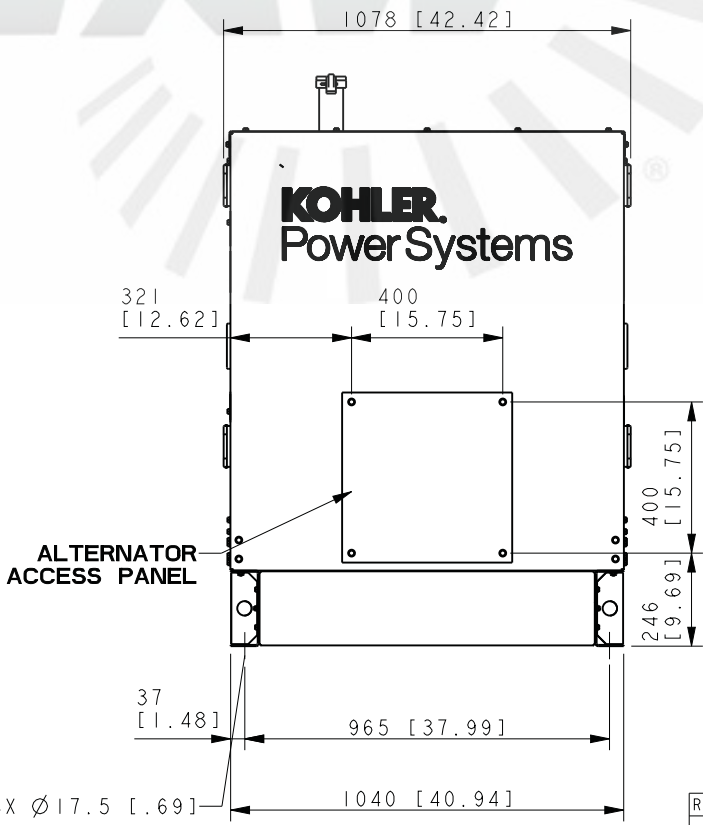
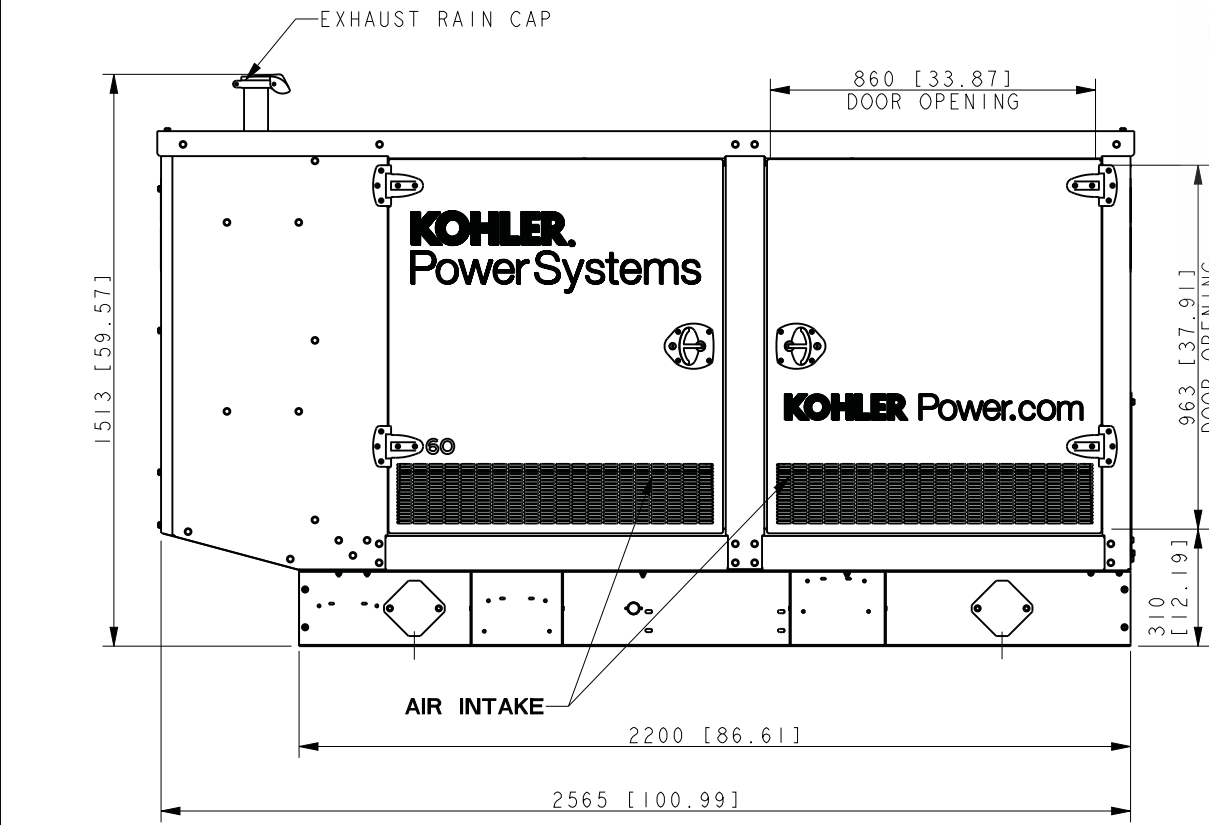
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POWER SYSTEMS, KOHLER, WI 53044 U.S.A.
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TITLE
DIMENSION PRINT
40/45 GM ACCESSORIES

SCALE 0.15 CAD NO. SHEET 1 of 1
DWG NO. **ADV-7689**



MODEL	GENSET WEIGHT (WET) WITH ENCLOSURE		ENCLOSURE ONLY	MODEL	GENSET WEIGHT (WET) WITH ENCLOSURE		ENCLOSURE ONLY
	STEEL WEATHER	STEEL SOUND			STEEL WEATHER	STEEL SOUND	
25kW 4P4/4Q4	STEEL WEATHER	855 Kg [1885 LBS]	239 Kg [527 LBS]	50KW 4P8 60KW 4Q8	STEEL WEATHER	1099 Kg [2423 LBS]	239 Kg [527 LBS]
	STEEL SOUND	860 Kg [1896 LBS]	244 Kg [538 LBS]		STEEL SOUND	1104 Kg [2434 LBS]	244 Kg [538 LBS]
	ALUMINUM SOUND	768 Kg [1693 LBS]	152 Kg [335 LBS]		ALUMINUM SOUND	1012 Kg [2231 LBS]	152 Kg [335 LBS]
30kW 4P5/4Q5	STEEL WEATHER	878 Kg [1936 LBS]	239 Kg [527 LBS]	60KW 4S7/4V7	STEEL WEATHER	1200 Kg [2646 LBS]	239 Kg [527 LBS]
	STEEL SOUND	883 Kg [1947 LBS]	244 Kg [538 LBS]		STEEL SOUND	1205 Kg [2657 LBS]	244 Kg [538 LBS]
	ALUMINUM SOUND	791 Kg [1744 LBS]	152 Kg [335 LBS]		ALUMINUM SOUND	1113 Kg [2454 LBS]	152 Kg [335 LBS]
30kW 4P7/4Q7	STEEL WEATHER	919 Kg [2026 LBS]	239 Kg [527 LBS]	60KW 4P10/4Q10	STEEL WEATHER	1142 Kg [2518 LBS]	239 Kg [527 LBS]
	STEEL SOUND	924 Kg [2037 LBS]	244 Kg [538 LBS]		STEEL SOUND	1147 Kg [2529 LBS]	244 Kg [538 LBS]
	ALUMINUM SOUND	832 Kg [1834 LBS]	152 Kg [335 LBS]		ALUMINUM SOUND	1055 Kg [2326 LBS]	152 Kg [335 LBS]
40kW 4P5/4Q5	STEEL WEATHER	936 Kg [2064 LBS]	239 Kg [527 LBS]	60KW 4S9/4V9	STEEL WEATHER	1253 Kg [2762 LBS]	239 Kg [527 LBS]
	STEEL SOUND	941 Kg [2075 LBS]	244 Kg [538 LBS]		STEEL SOUND	1258 Kg [2773 LBS]	244 Kg [538 LBS]
	ALUMINUM SOUND	849 Kg [1872 LBS]	152 Kg [335 LBS]		ALUMINUM SOUND	1166 Kg [2571 LBS]	152 Kg [335 LBS]
40kW 4Q7 45kW 4P7	STEEL WEATHER	977 Kg [2154 LBS]	239 Kg [527 LBS]	50KW 4P5X	STEEL WEATHER	1020 Kg [2249 LBS]	239 Kg [527 LBS]
	STEEL SOUND	982 Kg [2165 LBS]	244 Kg [538 LBS]		STEEL SOUND	1025 Kg [2260 LBS]	244 Kg [538 LBS]
	ALUMINUM SOUND	890 Kg [1962 LBS]	152 Kg [335 LBS]		ALUMINUM SOUND	933 Kg [2057 LBS]	152 Kg [335 LBS]
45kW 4P8/4Q8	STEEL WEATHER	997 Kg [2198 LBS]	239 Kg [527 LBS]	50KW 4P7BX/4Q7BX	STEEL WEATHER	1059 Kg [2335 LBS]	239 Kg [527 LBS]
	STEEL SOUND	1002 Kg [2209 LBS]	244 Kg [538 LBS]		STEEL SOUND	1064 Kg [2346 LBS]	244 Kg [538 LBS]
	ALUMINUM SOUND	910 Kg [2006 LBS]	152 Kg [335 LBS]		ALUMINUM SOUND	972 Kg [2143 LBS]	152 Kg [335 LBS]
45kW 4P10/4Q10	STEEL WEATHER	1040 Kg [2293 LBS]	239 Kg [527 LBS]	60KW 4P10X/4Q10X	STEEL WEATHER	1122 Kg [2475 LBS]	239 Kg [527 LBS]
	STEEL SOUND	1045 Kg [2304 LBS]	244 Kg [538 LBS]		STEEL SOUND	1127 Kg [2486 LBS]	244 Kg [538 LBS]
	ALUMINUM SOUND	953 Kg [2101 LBS]	152 Kg [335 LBS]		ALUMINUM SOUND	1032 Kg [2283 LBS]	152 Kg [335 LBS]
50 4P7/4Q7	STEEL WEATHER	1079 Kg [2379 LBS]	239 Kg [527 LBS]	50KW 4P8X 50KW 4Q8X	STEEL WEATHER	1070 Kg [2358 LBS]	239 Kg [527 LBS]
	STEEL SOUND	1084 Kg [2390 LBS]	244 Kg [538 LBS]		STEEL SOUND	1075 Kg [2369 LBS]	244 Kg [538 LBS]
	ALUMINUM SOUND	992 Kg [2187 LBS]	152 Kg [335 LBS]		ALUMINUM SOUND	982 Kg [2166 LBS]	152 Kg [335 LBS]
50 4P10/4Q10	STEEL WEATHER	1142 Kg [2518 LBS]	239 Kg [527 LBS]	60KW 4P7BX	STEEL WEATHER	1059 Kg [2335 LBS]	239 Kg [527 LBS]
	STEEL SOUND	1147 Kg [2529 LBS]	244 Kg [538 LBS]		STEEL SOUND	1064 Kg [2346 LBS]	244 Kg [538 LBS]
	ALUMINUM SOUND	1055 Kg [2326 LBS]	152 Kg [335 LBS]		ALUMINUM SOUND	972 Kg [2143 LBS]	152 Kg [335 LBS]
				60KW 4P8X	STEEL WEATHER	1070 Kg [2358 LBS]	239 Kg [527 LBS]
					STEEL SOUND	1075 Kg [2369 LBS]	244 Kg [538 LBS]
					ALUMINUM SOUND	982 Kg [2166 LBS]	152 Kg [335 LBS]



NOTE:
IF IBC CERTIFICATION IS REQUIRED, SEE SEISMIC
ADV FOR INSTALLATION INSTRUCTIONS

25-60 KW GM
2009 EMISSIONS MODELS
3PH RECONNECTABLE, 1PH
AND 600V ALTERNATORS

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY
G	2-15-13	VIEWS UPDATED TO NEW DECALS [CT32175]	SAM
H	4-24-13	DRAWING VOIDED [CT29991]	SAM
J	5-7-13	DRAWING REINSTATED (C-3) 4P8X/4Q8X ADDED [C44496]T	SAM
K	04-03-14	(C-3) 60KW 4Q7BX & 60KW 4Q8X REMOVED; MODEL: 60KW 4P7BX & 60KW 4P8X ADDED; (B-3 & B-7) CLEAN POWER DECALS REMOVED [CT76763]	SSH
L	6-8-15	(C-3) 50KW 4Q8X ADDED [CT114844]	KBS

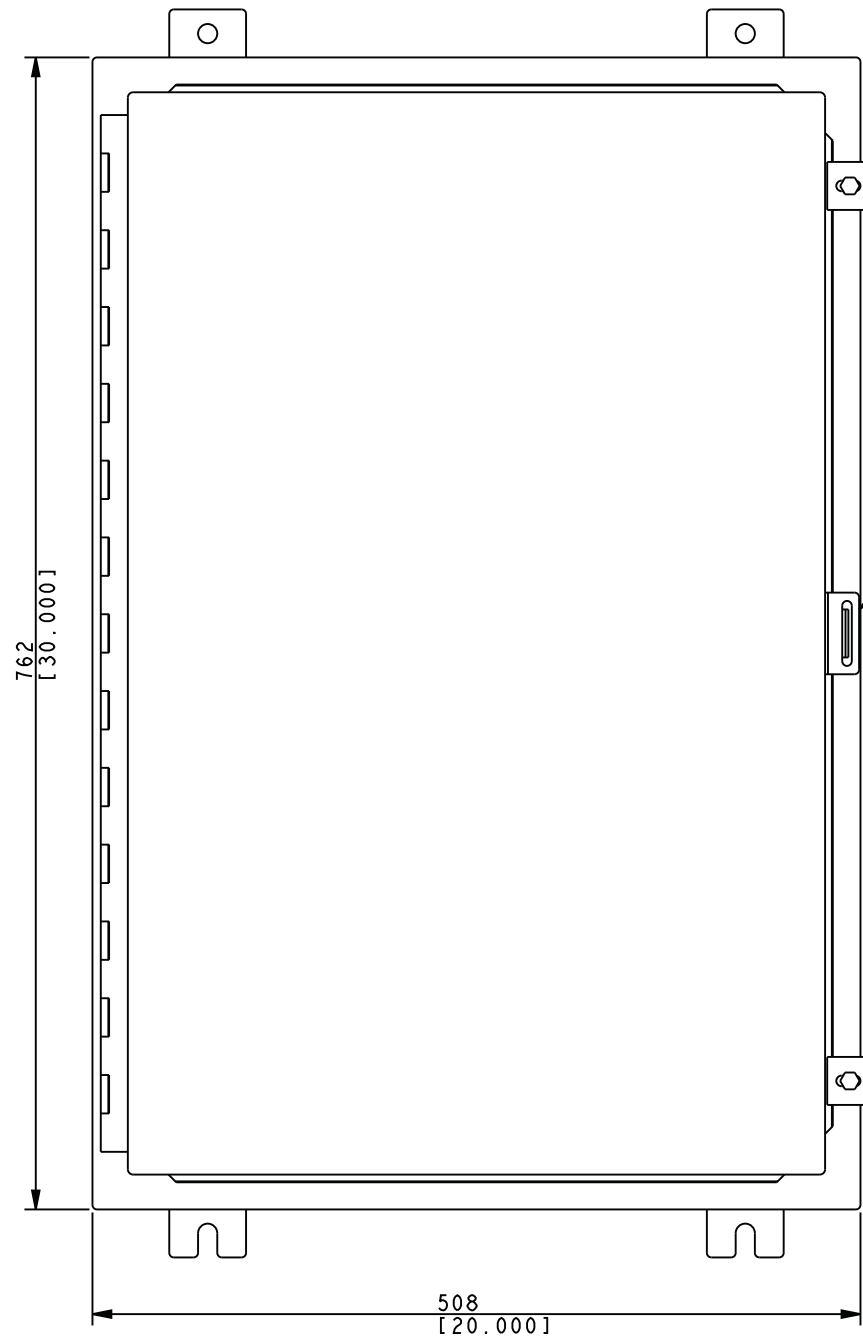
KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.
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TITLE
DIMENSION PRINT,
25-60 KW GM ENCLOSURE

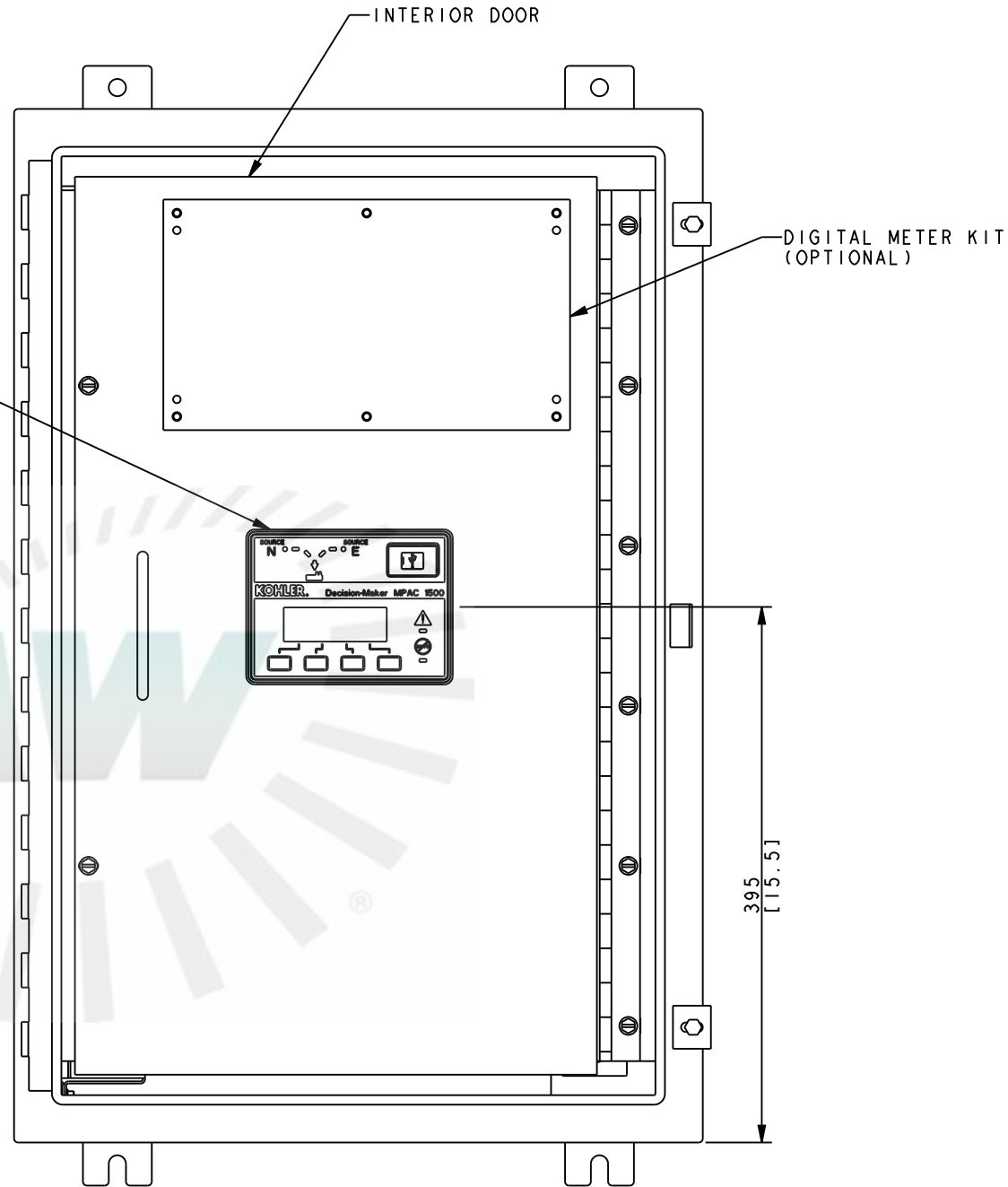
SCALE 0.10 CAD NO. SHEET 1 of 1
DWG NO. **ADV-7657**

APPROVALS: APPROVED RJD 12-9-08
DATE: 12-9-08

DIMENSIONS IN [] ARE INCH EQUIVALENTS



FRONT VIEW
508 [20.0] MINIMUM DOOR SWING SPACE REQUIRED



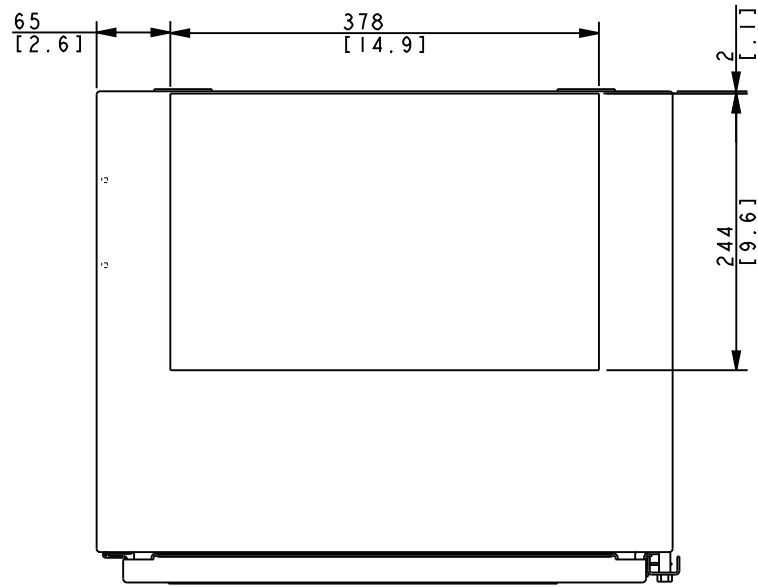
FRONT VIEW
WITH OUTER DOOR REMOVED

- NOTES:
1. DIMENSIONS IN [] ARE INCHES.
 2. FINISH:
NEMA 4 & 12: ANSI 49 GRAY.
NEMA 4X: STAINLESS STEEL.
 3. DOOR CLAMPS VARY WITH NEMA TYPE.
 4. REFER TO OPERATOR'S MANUAL PRIOR TO INSTALLATION & OPERATION OF SWITCH.
 5. FOR SEISMIC CERTIFIED UNITS, REFER TO ADV-7456 AND INSTALLATION INSTRUCTIONS.

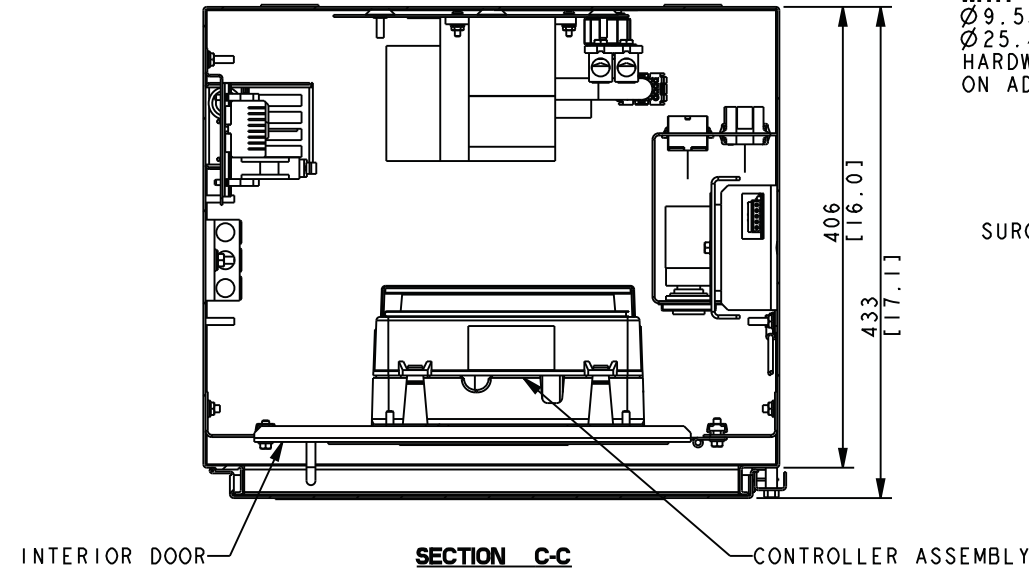
REV	DATE	REVISION	BY	UNLESS OTHERWISE SPECIFIED - 1) DIMENSIONS ARE IN MILLIMETERS 2) TOLERANCES ARE:	TITLE
-	8-15-13	NEW DRAWING [CT54441]	BTW	SURFACE FINISH MAX. THIRD ANGLE PROJECTION	KOHLER CO. METRIC PRO-E POWER SYSTEMS, KOHLER, WI 53044 U.S.A. THIS DRAWING IN DESIGN AND DETAIL IS KOHLER CO. PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH KOHLER CO. WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.
				APPROVALS	DATE
				BTW	8-15-13
				CHECKED	8-15-13
				MTL	8-15-13
				SCALE	CAD NO.
				ADV-8567	
				SHEET 1 of 2	
				D	

SEE ADV-8565 FOR FULL MODEL CODE DEFINITION

STYLE	MECHANISM	TRANSITION	MPAC LOGIC	VOLTS	POLES	NEUTRAL	ENCLOSURE	AMPS	CONNECTION
KCS	STANDARD	STANDARD	1200, 500	208-600	2, 3, 4	SOLID, SW, OVLP	4, 4X, 12	30, 70, 104, 150	STANDARD
KCS	STANDARD	STANDARD	1200, 1500	208-480	2, 3, 4	SOLID, OVLP	4, 4X, 12	200	STANDARD



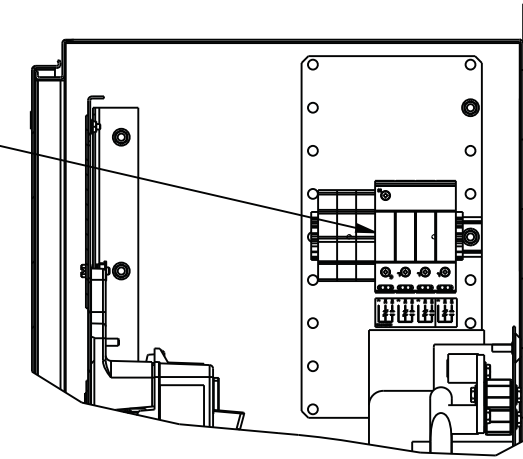
RECOMMENDED ENTRANCE AREA
TOP & BOTTOM



INTERIOR DOOR SECTION C-C CONTROLLER ASSEMBLY

FOR SEISMIC CERTIFIED UNITS, MOUNT WITH THE FOLLOWING HARDWARE:
 Ø9.53 [0.375] BOLT (4)
 Ø25.4 [1.00] X 2.1 [0.083] THICK WASHER (4)
 HARDWARE TO COMPLY WITH SPECIFICATIONS ON ADV-7456.

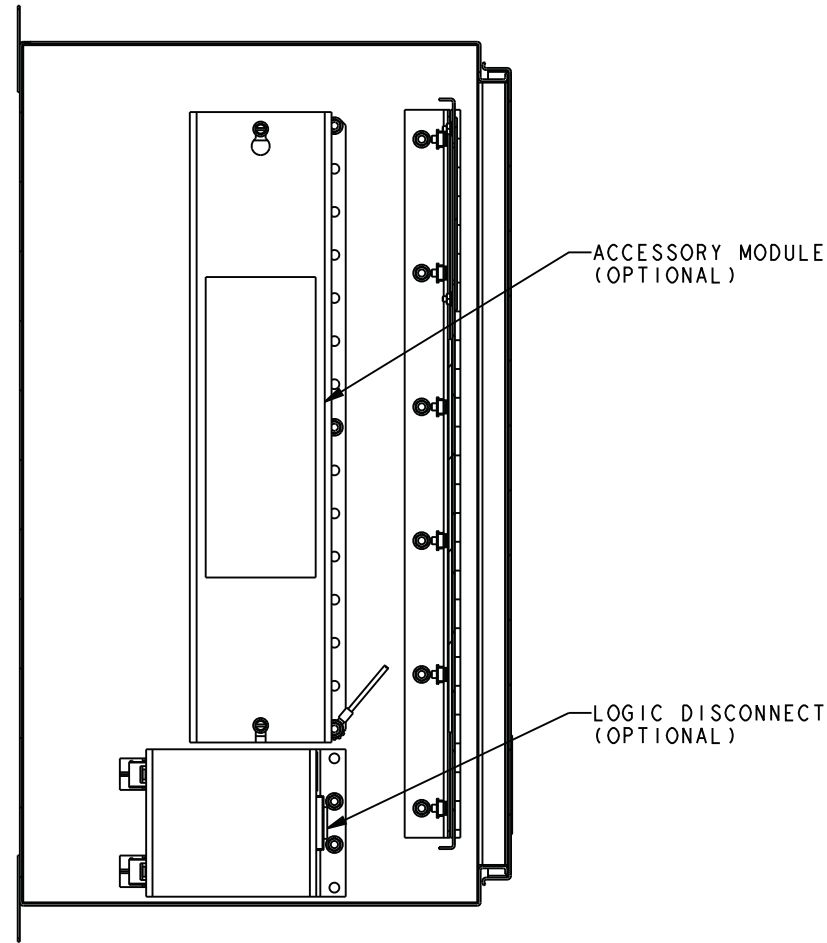
SURGE PROTECTION (OPTIONAL)



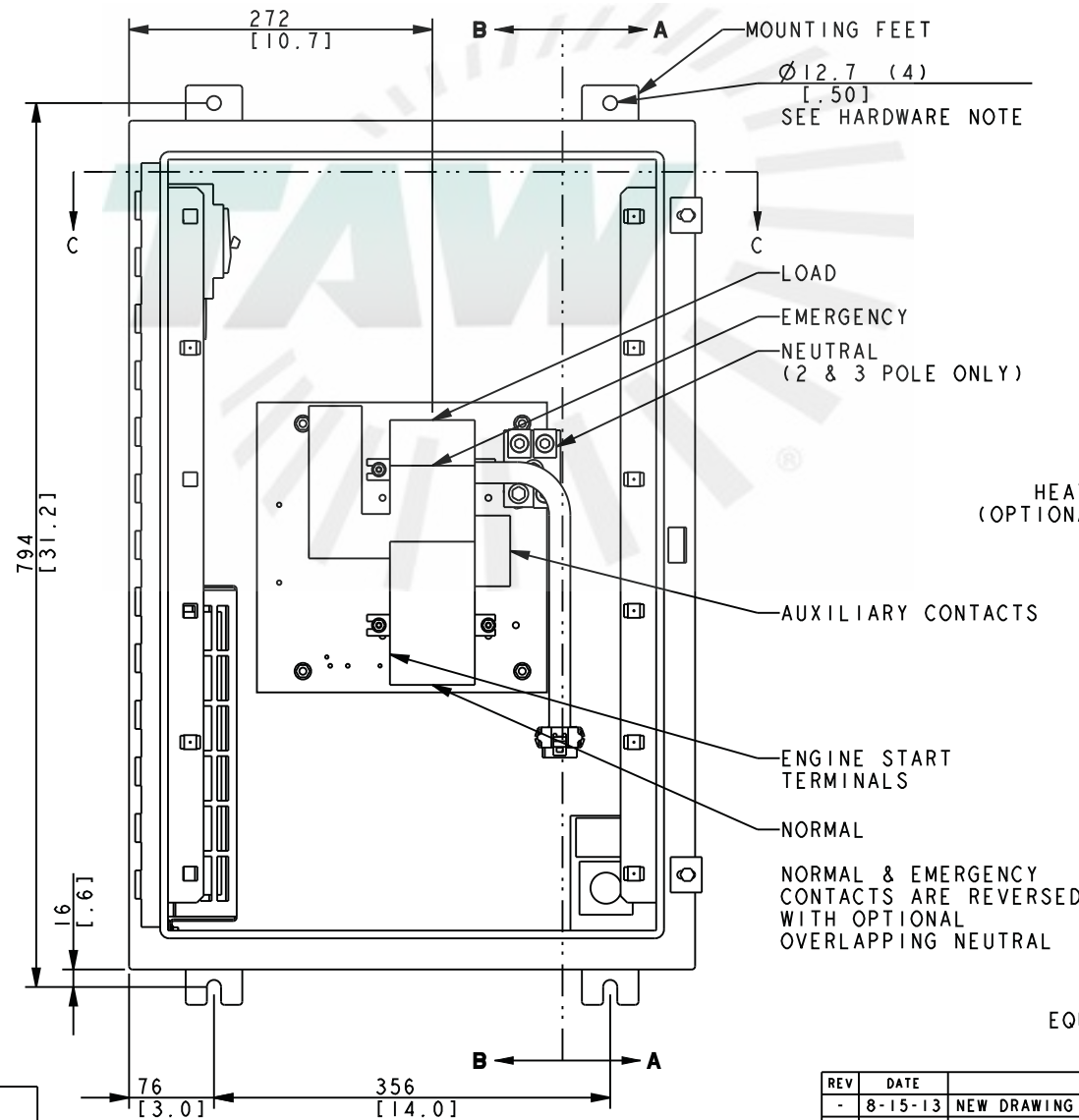
DETAIL D OF SECTION B-B

NOTE: DUE TO THE SPACE LIMITATIONS, SURGE PROTECTION OR HEATER MAY BE ORDERED, BUT NOT BOTH.

SEE DETAIL D



SECTION A-A



FRONT VIEW
DOORS NOT SHOWN

HEATER (OPTIONAL)

EQUIPMENT GROUND

SECTION B-B

LOAD 269 [10.6]
EMERGENCY 310 [12.2]

122 GND [4.8]
255 NORMAL [10.1]

SCREW TYPE TERMINALS FOR EXTERNAL POWER CONNECTION

SWITCH RATING (AMPS)	RANGE OF AL/CU WIRE SIZES		
	CONTACTOR (PER PHASE)	NEUTRAL	GROUND
30-150	ONE #14 TO 4/0	(3) #14-4/0	(3) #6 - 3/0
200	ONE #14 TO 4/0 (COPPER ONLY)		

WEIGHTS KG [LBS]		
2 POLE	3 POLE	4 POLE
38 [84]	40 [88]	42 [93]

REV	DATE	REVISION	BY
-	8-15-13	NEW DRAWING [CT54441]	BTW

APPROVALS	DATE
BTW	8-15-13
BTW	8-15-13
MTL	8-15-13

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 POWER SYSTEMS, KOHLER, WI 53044 U.S.A.
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DIMENSION PRINT

SCALE: CAD NO. SHEET 2 of 2
 Dwg No. **ADV-8567**

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.

KOHLER
Power Systems

KOHLER CO. Kohler, Wisconsin 53044
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales/service outlet in the
US and Canada, phone 1-800-544-2444
KOHLERPower.com

TP-5373 4/15e

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.

KOHLER
Power Systems

KOHLER CO. Kohler, Wisconsin 53044
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales/service outlet in the
US and Canada, phone 1-800-544-2444
KOHLERPower.com

TP-6087 4/15c

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., 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.

KOHLER
Power Systems

KOHLER CO. Kohler, Wisconsin 53044
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales/service outlet in the
US and Canada, phone 1-800-544-2444
KOHLERPower.com

TP-5374 12/15e

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).

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 engine wear, routine tuneups, tuneup parts, adjustments, and periodic service.
2. Damage caused by accidents, improper installation or handling, faulty repairs not performed by an authorized Kohler service representative, or improper storage.
3. Damage caused by operation with improper fuel or at speeds, loads, conditions, modifications, or installation contrary to published specifications or recommendations.
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 expense related to battery service.
7. Engine coolant heaters, heater controls, and circulating pumps after the first year.
8. Additional expenses for repair after normal business hours, i.e. overtime or holiday labor rates.
9. Rental of equipment during performance of warranty repairs.
10. Removal and replacement of non-Kohler-supplied options and equipment.
11. 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.
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17. Expenses incurred investigating performance complaints unless the problem is caused by defective Kohler materials or workmanship.
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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.

KOHLER
Power Systems

KOHLER CO. Kohler, Wisconsin 53044
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales/service outlet in the
US and Canada, phone 1-800-544-2444
KOHLERPower.com

TP-5561 8/13d

Certification



Certificate US95/0189

The management system of

Kohler Power Systems, a Business Unit of Kohler Co.

N7650 Lakeshore Drive (known as Mosel Plant)
Sheboygan, WI, 53083, United States

has been assessed and certified as meeting the requirements of

ISO 9001:2008

For the following activities

**Design, manufacture, and distributor support for electrical generators,
alternators, automatic transfer switches, and switchgear.**

Further clarifications regarding the scope of this certificate and the applicability of
ISO 9001:2008 requirements may be obtained by consulting the organization

This certificate is valid from 6 November 2015 until 15 September 2018 and
remains valid subject to satisfactory surveillance audits.
Recertification audit due a minimum of 60 days before the expiration date.
Issue 12 : 14 October 2015. Certified since November 2003

This is a multi-site certification.
Additional site details are listed on subsequent pages.



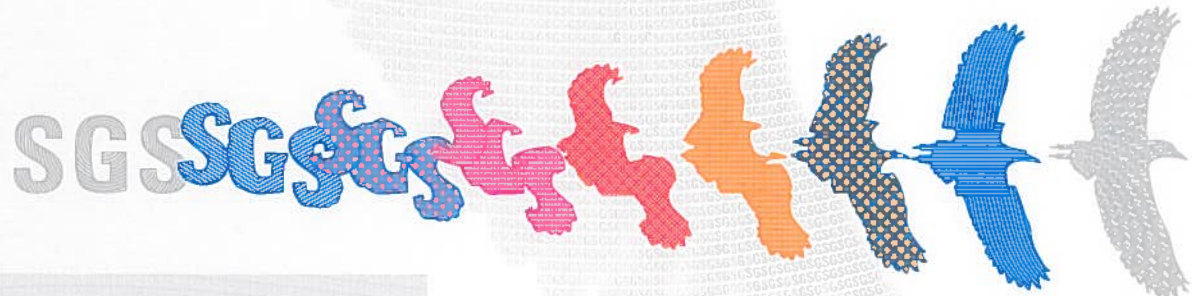
Authorized by

A handwritten signature in blue ink, appearing to read 'John Woodman'.

John Woodman
Senior Vice President SSC, North America
SGS Systems & Services Certification, a Division of SGS North America, Inc.
201 Route 17 North, Rutherford, NJ 07070, USA
t (201) 508-3000 f (201) 935-4555 www.us.sgs.com

This certificate remains the property of SGS and shall be returned upon request

Page 1 of 2



Kohler Power Systems, a Business Unit of Kohler Co.

ISO 9001:2008



Issue 12 : 14 October 2015

Additional facilities

.300 N. Dekora Woods Blvd., Saukville, WI 53080 (Known as Sauk)
Scope: Manufacturer of fuel tanks, skids, fabricated components, enclosures, and assembly of enclosures and generators.

4327 County EE, Sheboygan, WI 53081 (Known as KWIP Warehouse)
Scope: Receiving and storage of generator components & receiving and shipping of generator sets.



Kohler Standby/Prime Generator Set Test Program

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

Prototype Testing

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

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

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

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

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

Production Testing

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

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

KOHLER[®]
POWER SYSTEMS

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

Prestartup Checklist



TAW POWER SYSTEMS

GENERATOR STARTUP CHECK LIST

JOB NAME: Loxahatchee LS #242

DATE: _____

JOBSITE CITY: Jupiter, FL

1. ARE VIBRATION SPRING ISOLATORS INSTALLED? Y___ N___ NA X
 2. IS TRANSFER SWITCH MOUNTED & WIRED? Y___ N___ NA___
 3. IS COMMERCIAL POWER AVAILABLE? Y___ N___ NA___
 4. ARE REMOTE START WIRES PULLED FROM ATS(S) TO THE GENERATOR IN SEPARATE CONDUITS USING STRANDED WIRE? Y___ N___ NA___
 5. IS REMOTE ANNUNCIATOR MOUNTED AND WIRED FROM GENERATOR & ATS(S) USING BELDIN AND STRANDED WIRE? Y___ N___ NA___
 6. IS BATTERY CHARGER MOUNTED AND WIRED WITH BOTH AC WIRES AND DC WIRES USING STRANDED WIRE? Y___ N___ NA___
 7. IS EXHAUST SYSTEM INSTALLED COMPLETELY? Y___ N___ NA X
 8. IS TRANSITION DUCT INSTALLED FROM RADIATOR? Y___ N___ NA X
 9. ARE FUEL LINES CONNECTED AND PRIMED FROM TANK TO ENGINE. (N/A ON SUB BASE TANKS)? Y___ N___ NA___
 10. IS DAYTANK INSTALLED AND WIRED? Y___ N___ NA X
 11. IS FUEL AVAILABLE? (DIESEL OR GAS) Y___ N___
- *NOTE: TO FULLY PERFORM A LOAD BANK TEST, TAW RECOMENDS FOR THE FUEL TANK TO BE FILLED UP 100%
12. IS ALL CONSTRUCTION MATERIAL & DEBRIS REMOVED FROM THE GENERATOR ROOM AND THE GENERATOR CLEANED FROM CONSTRUCTION? Y___ N___ NA___
 13. IF FIRE MARSHALL IS REQUIRED TO WITNESS, HAS THE APPOINTMENT WITH THEM BEEN SCHEDULED? Y___ N___ NA___

*NOTE: ADDITIONAL CHARGES WILL APPLY IF TESTING NEEDS TO BE REDONE.

START UP DATE REQUESTED: _____

CONTACT PHONE #: _____

CONTRACTOR NAME: _____

AUTHORIZED SIGNATURE: _____

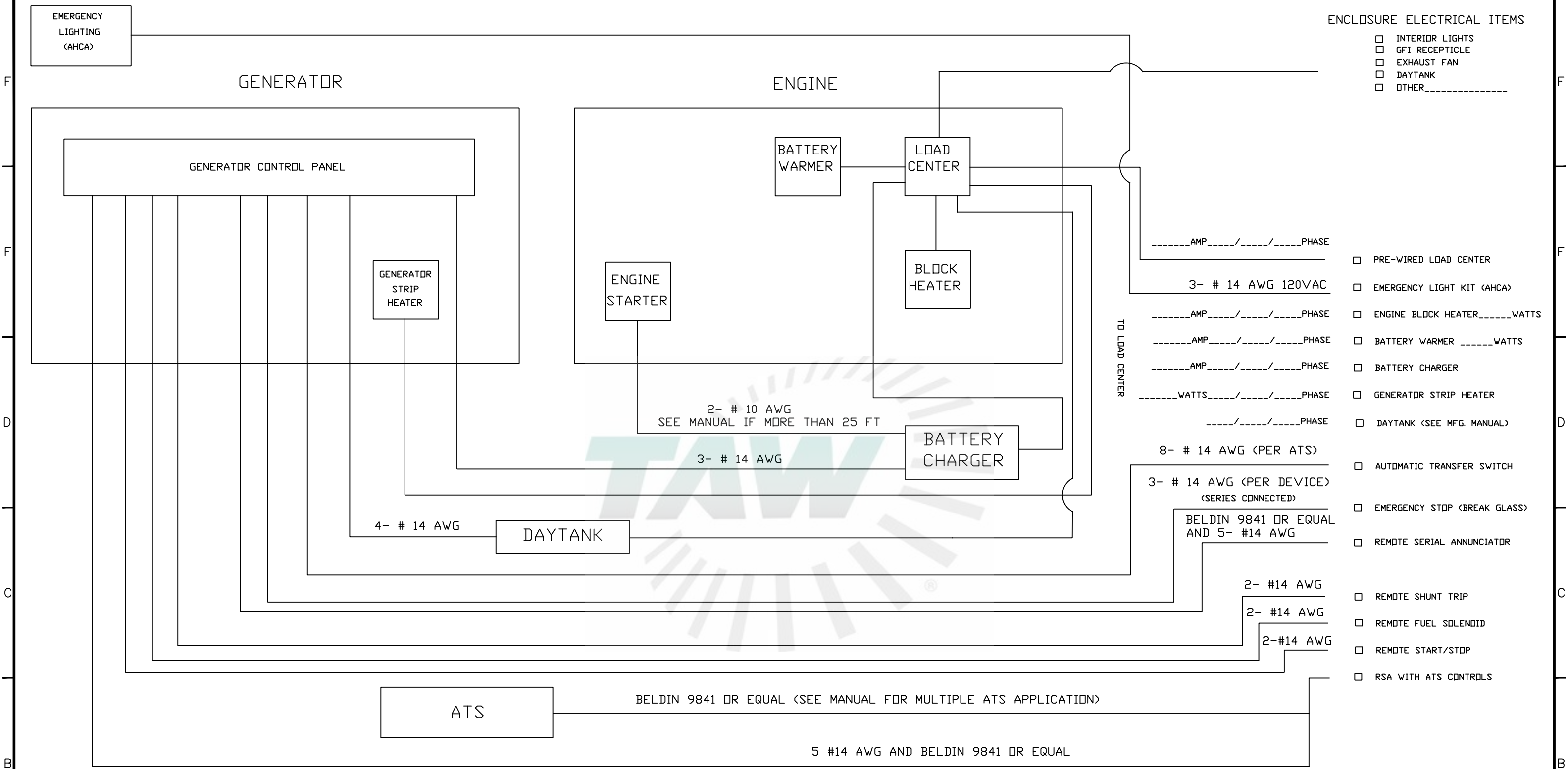
NOTE: MULTIPLE TRIPS DUE TO INCOMPLETE PREPARATION WILL RESULT IN ADDITIONAL CHARGES

ALL CONTROL WIRING MUST BE STRANDED OR BELDEN AS REQUIRED

RETURN THIS FORM VIA EMAIL TO TAW PRIOR TO START UP – startup@tawinc.com

TAW POWER SYSTEMS SALES DEPARTMENT PHONE NUMBER: 800-876-0990

TAW SERVICE DEPARTMENT REQUIRES A MINIMUM OF 5 BUSINESS DAYS TO SCHEDULE STARTUP.



ENCLOSURE ELECTRICAL ITEMS

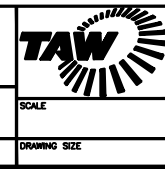
- INTERIOR LIGHTS
- GFI RECEPTICLE
- EXHAUST FAN
- DAYTANK
- OTHER.....
- PRE-WIRED LOAD CENTER
- EMERGENCY LIGHT KIT (AHCA)
- ENGINE BLOCK HEATER.....WATTS
- BATTERY WARMERWATTS
- BATTERY CHARGER
- GENERATOR STRIP HEATER
- DAYTANK (SEE MFG. MANUAL)
- AUTOMATIC TRANSFER SWITCH
- EMERGENCY STOP (BREAK GLASS)
- REMOTE SERIAL ANNUNCIATOR
- REMOTE SHUNT TRIP
- REMOTE FUEL SOLENOID
- REMOTE START/STOP
- RSA WITH ATS CONTROLS

NOTE: 1) Per NFPA 110 section 7.12.4.1 Stranded wire of adequate size shall be used to minimize breakage due to vibration. For underground applications replace Beldin 9841 with Beldin 1075A or equivalent.

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REVISION	DESCRIPTION
A	Modify original
FD	
18 Jan 2010	

PRELIMINARY-WIRING
TAW POWER SYSTEMS
 Conduit & Wire Run



TAW Power Systems
 A Division of Tampa Armature Works, Inc.
 Tampa, Florida

SCALE: _____
 DRAWING SIZE: _____

DATE: 01/18/10
 CHECKED: _____
 APPROVED: _____
 REV: A