4/20/2023

NIXON POWER SERVICES

SUBMITTAL PACKAGE

HD3026 Lee's Summit, MO - Equipment

CONTRACTOR / INSTALLER: HOME DEPOT

Project Manager: Russell Hyde
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Project Engineer: Joey Salesky
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Russell Hyde
PROJECT MANAGER

CONTACT:

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La Vergne, TN

WORK EXPERIENCE:

RESPONSIBILITIES:

- Internal Project Setup
- Submittal Requests
- Release Equipment
- Vendor POC
- Track Shipping Schedules
- Coordinate Delivery
- Invoice Management
- Close Out Documents

Joey Salesky
PROJECT ENGINEER

CONTACT:

615-330-3693
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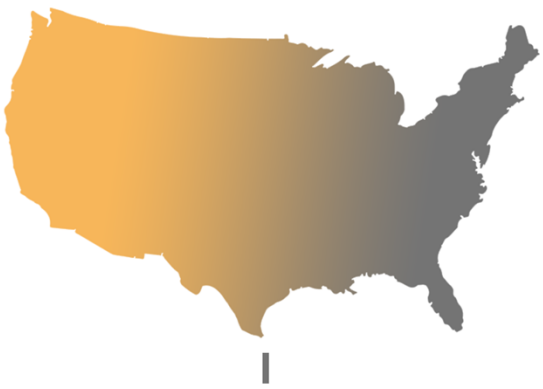
La Vergne , TN

WORK EXPERIENCE:

RESPONSIBILITIES

- Submittal Follow Up
- Submittal Approvals
- On-Site Walk Thru
- Engineering Diagrams
- Oversee Equip. Installation
- Pre-Startup Inspections
- Startup Planning/Scheduling
- Commissioning Assistance



NIXON POWER SERVICES

KOHLER. IN POWER. SINCE 1920.

Project Engineer

T

SUBMITTAL **Preparation**

Project Engineer

I

FOLLOW UP **on Submittal STATUS**

Project Manager

M

Once Submittal Approved RELEASE EQUIPMENT **for MANUFACTURING**

Kohler

E

Build EQUIPMENT

Project Manager

L

COORDINATE **site DELIVERY**

Project Engineer

I

Equipment INSTALLATION

Project Engineer

N

STARTUP

Project Manager

E

JOB CLOSE**OUT**

Nixon Power Services
1440 Lakes Parkway
Suite 600
Lawrenceville, GA 30043
P: 770-448-6687
F: 770-448-6535

Submittal Package

To:

Job Name: HD3026 Lee's Summit, MO - Equipment

Quote: 0026891833

Proposal:

We are pleased to offer the following submittal for your consideration.
Thanks you, Alex Felts, Nixon Power Services LLC

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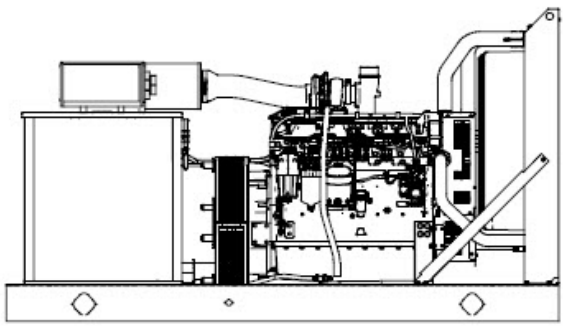
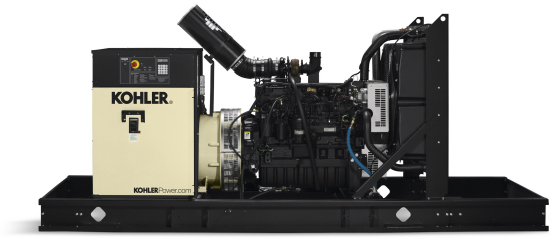
Generator





Kohler Model: 250REOZJE

This diesel generator set equipped with a 4UA13 alternator operating at 277/480 volts is rated for 255 kW/319 kVA. Output amperage: 383

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Standard Features:

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- Approved for use with certified renewable Hydrotreated Vegetable Oil (HVO) / Renewable Diesel (RD) fuels compliant with EN15940/ASTM D975.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- The generator set complies with ISO 8528-5, Class G2, requirements for transient performance in all generator set configurations. Select the Decision-Maker 550 controller for improved voltage regulation and ISO 8528-5, Class G3, compliance.
- The 60 Hz generator set engine is certified by the Environmental Protection Agency (EPA) to conform to Tier 3 nonroad emissions regulations.
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Tier 3 EPA-Certified for Stationary Emergency Applications
- Alternator Protection
- Battery Rack and Cables
- Customer Connection box with field-connection terminal blocks.
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Literature

Other Features:

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

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.

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Qty	Description
	250REOZJE Generator System
1	250REOZJE Generator Set

Includes the following:

Literature Languages	English
Approvals and Listings	UL2200 Listing
Engine	250REOZJE, 24V, 60Hz
Nameplate Rating	Standby 130C Rise
Voltage	60Hz, 277/480V, Wye, 3Ph, 4W
Alternator	4UA13
Cooling System	Unit Mounted Radiator, 50C
Skid and Mounting	Skid
Air Intake	Standard Duty
Controller	APM402
Enclosure Type	Sound
Enclosure Material	Aluminum
Enclosure Silencer	Internal Silencer
Fuel Tank Type	State
Fuel Runtime (Approx.)	48 Hours
Subbase Fuel Tank Capacity	944 Gallons
Fill Pipe/Spill Fill Options	5 Gal Spill Cont w/95% Shutoff
Fuel Tank Options	Fuel in Basin Switch, FDEP
Fuel Tank Vent	Normal Vent, 12' Above Grade
High Fuel Switch	High Fuel Switch
Tank Marking Options	Combust Lqds - Keep Fire Away
Tank Marking Options	NFPA 704 Identification
Tank Marking Options	Tank Number & Safe Fill Height
Starting Aids, Installed	2500W,90-120V,1Ph,w/Valves
Electrical Accy.,Installed	Battery, 2/12V, Wet
Electrical Accy.,Installed	Battery Charger, 10A
Electrical Accy.,Installed	Run Relay
Electrical Accy.,Installed	2 Input/5 OutputModule
Rating, LCB 1	100% Rated
Amps, LCB 1	400
Trip Type, LCB 1	Electronic, LI
Interrupt Rating LCB 1	35kA at 480V
Fuel Lines, Installed	Flexible Fuel Lines
Exceeds LTL Shipping Height	Add'l Shipping Charge Accepted
Miscellaneous Accy,Installed	Air Cleaner Restriction Ind.

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	Miscellaneous Accy,Installed	Coolant in Genset
	Miscellaneous Accy,Installed	Closed Crankcase Vent
	Miscellaneous Accy,Installed	Skid Extension & Caps
	Warranty	5 Year Comprehensive
	Testing, Additional	Power Factor Test,0.8,3Ph Only
1	NEC Remote, E-Stop	
1	Lit Kit, General Maint, 250REOZJE	
1	RSA III, Annunciator only	

Automatic Transfer Switch

Kohler Model: KSS-AMTC-0150S

3 Pole, 4 Wire, Solid Neutral, 150 amp, Kohler Specific Breaker rated Standard automatic transfer switch, Model KSS-AMTC-0150S, rated 480V, 60 Hz complete with all standard equipment and housed in a NEMA Type 3R enclosure.

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Qty	Description
	ATS KSSB Transfer Switch System
2	KSS-AMTC-0150S

Includes the following:

Literature Languages	English
Mechanism	Specific Breaker
Transition	Standard
Logic	1200
Voltage	480V / 60 Hz
Poles & Wires	3 Pole/4 Wire, Solid Neutral
Enclosure	Nema 3R
Amps	150 Amps
Connection	Standard
IBC Seismic Certification	None
CSA Certification	None
Miscellaneous Acc.,Installed	Lockable User Interface Cover
Warranty	5-YR COMPREHENSIVE

2	Lit Kit, ATS Production, KSS

Automatic Transfer Switch

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Kohler Model: KSS-AMTC-0104S

3 Pole, 4 Wire, Solid Neutral, 104 amp, Kohler Specific Breaker rated Standard automatic transfer switch, Model KSS-AMTC-0104S, rated 480V, 60 Hz complete with all standard equipment and housed in a NEMA Type 3R enclosure.

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Qty	Description
	ATS KSSB Transfer Switch System
1	KSS-AMTC-0104S

Includes the following:

Literature Languages	English
Mechanism	Specific Breaker
Transition	Standard
Logic	1200
Voltage	480V / 60 Hz
Poles & Wires	3 Pole/4 Wire, Solid Neutral
Enclosure	Nema 3R
Amps	104 Amps
Connection	Standard
IBC Seismic Certification	None
CSA Certification	None
Miscellaneous Acc.,Installed	Lockable User Interface Cover
Warranty	5-YR COMPREHENSIVE

Qty	Description
1	Lit Kit, ATS Production, KSS

Miscellaneous

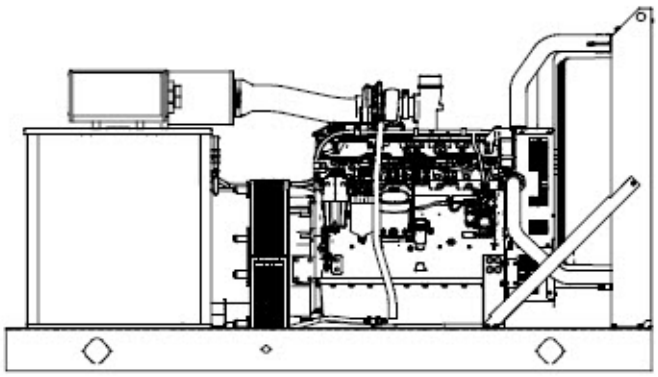
Qty	Description
1	Remote A/V Alarm Panel

KOHLER®

Spec Sheets

KOHLER®

250REOZJE
Diesel



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- Oil Drain Extension
- Operation and Installation Literature

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Other Features

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- The low coolant level shutdown prevents overheating (standard on radiator models only).Integral vibration isolation eliminates the need for under-unit vibration spring isolators.
- Mount up to three circuit breakers to allow circuit portection of selected priority loads.

Generator Set Rating

Standby 130C Rise Ratings

Alternator	Voltage	Ph	Hz	Peak kVA	kW/kVA	Amps
4UA13	277/480	3	60	960	255/319	383

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, BS5514, AS2789, 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 0.5% per 100 m (328 ft.) elevation above 1000 m (3300 ft.). Temperature: Derate 1.0% per 10?C (18?F) temperature above 25?C (77?F).

Alternator Specifications

Specifications	Alternator
Alternator manufacturer	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet
Leads, quantity	12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation	NEMA MG1
Insulation: Material	Class H
Insulation: Temperature Rise	130 ° C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Voltage regulation, no-load to full-load Permanent magnet (PM) alternator	+/-2% Average
550 controller (with 0.5% drift due to temperature variation)	3-Phase Sensing, +/-0.25%
One-Step Load Acceptance	100% of rating
Unbalanced load capability	100% of Rated Standby Current

• 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 dripproof 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.

Engine

Engine Specification

Engine Manufacturer	John Deere
Engine Model	6090HF484B
Engine: type	4-Cycle, Turbocharged, Charge Air Cooled
Cylinder arrangement	6, Inline
Displacement, L (cu. in.)	9.0 (548)
Bore and stroke, mm (in.)	118.4 x 136 (4.66 x 5.35)
Compression ratio	16.0:1
Piston speed, m/min. (ft./min.)	457 (1500)
Main bearings: quantity, type	7, Replaceable Insert
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	287 (385)
Cylinder head material	Cast Iron
Crankshaft material	Forged Steel
Valve (exhaust) material Intake	Chromium-Silicon Steel
Valve (exhaust) material	Stainless Steel
Governor: type, make/model	JDEC Electronic, L14 Denso HP4
Frequency regulation, no-load to-full load	Isochronous
Frequency regulation, steady state	± 0.25%
Frequency	Fixed
Air cleaner type, all models	Dry

Exhaust

Exhaust System

Exhaust Manifold Type	Dry
Exhaust flow at rated kW,m3/min. (cfm)	54.1 (1911)
Exhaust temperature at rated kW, dry exhaust, ° C (° F)	625 (1157)
Maximum allowable back pressure, kPa (in. Hg)	Min. 0 (0) Max. 7.5 (2.2)
Exh. outlet size at eng. hookup, mm (in.)	98 (3.86)

Engine Electrical

Engine Electrical System

Battery charging alternator	24 Volt
Battery charging alternator: Ground (negative/positive)	Negative
Battery charging alternator: Volts (DC)	24
Battery charging alternator: Ampere rating	60
Starter motor rated voltage (DC)	24
Battery, recommended cold cranking amps (CCA): Qty., CCA rating each	Two, 925
Battery voltage (DC)	12

Fuel

Fuel System

Fuel type	Diesel
Fuel supply line, min. ID, mm (in.)	11.0 (0.044)
Fuel return line, min. ID, mm (in.)	6.0 (0.25)
Max. lift, fuel pump: type, m (ft.)	Electronic, 3(10)
Max. fuel flow, Lph (gph)	240 (63.4)
Fuel prime pump	Electronic
Fuel Filter Secondary	2 Microns @ 98% Efficiency
Fuel Filter Primary	10 Microns
Fuel Filter Water Separator	Yes
Recommended fuel	#2 Diesel/HVO/RD

Lubrication

Lubrication System

Type	Full Pressure
Oil pan capacity, L (qt.)	32.5 (34.4)
Oil pan capacity with filter, L (qt.)	33.4 (35.3)
Oil filter: quantity, type	1, Cartridge
Oil cooler	Water-cooled

Cooling

Radiator System

Ambient temperature, ° C (° F)	50 (122)
Engine jacket water capacity, L (gal.)	16 (4.25)
Radiator system capacity, including engine, L (gal.)	36 (9.5)
Engine jacket water flow, Lpm (gpm)	265 (70)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	97 (5521)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	70.5 (4013)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	863.6 (34.0)
Fan, kWm (HP)	9.0 (12.1)
Max. restriction of cooling air, intake and discharge side of radiator, kPA (in. H20)	0.125 (0.5)

Operation Requirements

Air Requirements

Radiator-cooled cooling air, m3/min. (scfm) *	396.4 (14000)
Combustion air, m3/min. (cfm)	21.8 (770)
Heat rejected to ambient air: Engine, kW (Btu/min.)	53.8 (3060)
Heat rejected to ambient air: Alternator, kW (Btu/min.)	20.6 (1170)

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

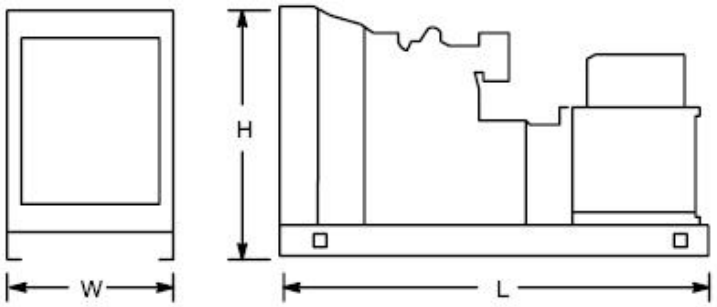
Fuel Consumption

Diesel, Lph (gph), at % load	Rating
Standby Fuel Consumption at 100% load	66.5 Lph (17.6 gph)
Standby Fuel Consumption at 75% load	50.4 Lph (13.3 gph)
Standby Fuel Consumption at 50% load	35.0 Lph (9.2 gph)
Standby Fuel Consumption at 25% load	20.5 Lph (5.4 gph)
Prime Fuel Consumption at 100% load	59.1 Lph (15.6 gph)
Prime Fuel Consumption at 75% load	45.3 Lph (12.0 gph)
Prime Fuel Consumption at 50% load	31.6 Lph (8.3 gph)
Prime Fuel Consumption at 25% load	18.4 Lph (4.9 gph)
Continuous Fuel Consumption at 0% load	** Volumetric Fuel consumption is up to 4% higher when using HVO/RD than #2 ULSD.

Dimensions and Weights

Dim Weight Spec	Dim Weight Value
Fuel	Diesel
Engine Manufacturer	Diesel
Overall Size, L x W x H, mm (in.): Wide Skid	3000 x 1300 x 1891 (118.1 x 51.2 x 74.4)
Weight (radiator model), wet, kg (lb.):	2268-2449 (5000-5400)

Model: 250REOZJE, continued



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

APM402

Kohler® APM402 Controller

General Description and Function

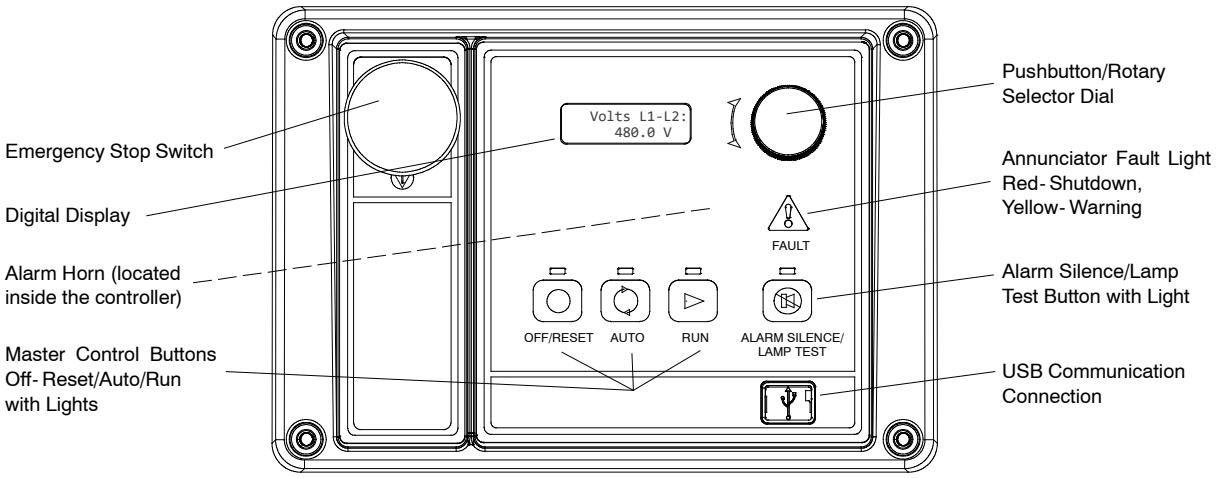
The APM402 generator set controller provides advanced control, system monitoring, and system diagnostics for optimum performance.

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

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

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

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 ±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 ±0.5% no-load to full-load regulation with three-phase sensing.
- **Lamp Test**. Press the alarm silence/lamp test button to verify functionality of the indicator lights.
- **LCD Display.** Adjustable contrast for improving visibility.
- **Measurement Units.** The controller provides selection of English or metric displays.
- **Power Metering**. Controller digital display provides kW and kVA.
- **Programming Access (USB)**. Provides software upgrades and diagnostics.
- **Remote Reset**. The remote reset function resets faults and allows restarting of the generator set without going to the master control switch off/reset position.
- **Remote Monitoring Panel.** The controller is compatible with the Kohler® Remote Serial Annunciator.
- **Run Time Hourmeter**. The generator set run time is displayed.
- **Time Delay Engine Cooldown (TDEC)**. The TDEC provides a time delay before the generator set shuts down.
- **Time Delay Engine Start (TDES)**. The TDES provides a time delay before the generator set starts.
- **Voltage Selection Menu.** This menu provides the capability of quickly switching controller voltage calibrations. Requires initial activation using SiteTech™ software. **NOTE:** Generator set output leads require voltage reconnection.

Controller Functions

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

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

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

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

● Standard function
○ Available user function
* Function requires optional input sensors or kits and is engine dependent; see Controller Displays as Provided by the Engine ECM.
† Items included with common fault shutdown

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KOHLERPower.com

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

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

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

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

Controller Specifications

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

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.

APM402 Available Options

❑ **Float/Equalize Battery Charger** available with 6 or 10 amp output for 12 or 24V DC voltage output. The 10 amp model provides NFPA 110 charging and alarming capability.

❑ **Manual Speed Adjust** available for applications using closed transition ATS. Adjustment range for 60 Hz: 1751-1849 rpm (58.2-61.8 Hz) and for 50 Hz: 1451-1549 rpm (48.2-51.8 Hz).

❑ **Prime Power Switch** prevents battery drain during generator set non-operation periods and when the generator set battery cannot be maintained by an AC battery charger.

❑ **Remote Emergency Stop Switch** available as a wall mounted panel to remotely shut down the generator set.

❑ **Remote Monitoring Panel.** The Kohler® Remote Serial Annunciator (RSA) enables the operator to monitor the status of the generator set from a remote location, which may be required for NFPA 99 and NFPA 110 installations, and up to four Automatic transfer switches.

❑ **Run Relay** provides a relay indicating that the generator set is running.

❑ **Shunt Trip Wiring** provides relay outputs to trip a shunt trip circuit breaker and to signal the common fault shutdowns. Contacts rated at 10 amps at 28 VDC or 120 VAC.

❑ **Two Input/Five Output Module** provides a generator set mounted panel with two inputs and five relay outputs.

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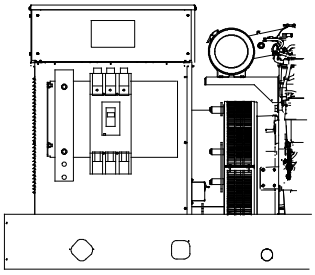
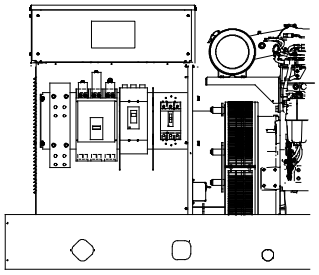
Industrial Generator Set Accessories

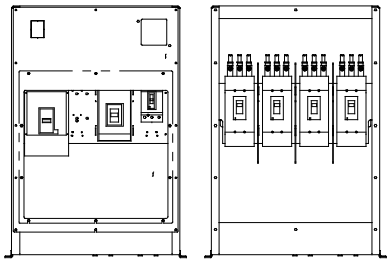
Line Circuit Breakers 15- 3250 kW



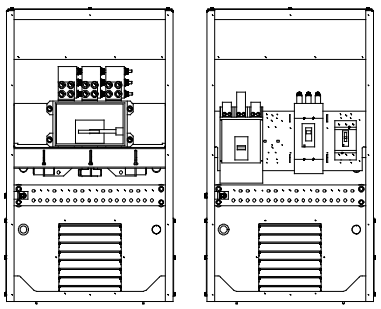
Single Circuit Breaker Kit with Neutral Bus Bar
15- 300 kW Model Shown



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



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



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

Standard Features

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

Line Circuit Breaker Types

Magnetic Trip

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

Thermal Magnetic Trip

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

Electronic Trip

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

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

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

Electronic with Ground Fault Trip

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

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

80% Rated Circuit Breaker

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

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

100% Rated Circuit Breaker

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

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

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

Line Circuit Breaker Options

❑ Alarm Switch

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

❑ Auxiliary Contacts

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

❑ Breaker Separators (350- 2500 kW)

Provides adequate clearance between breaker circuits.

❑ Bus Bars

Bus bar kits offer a convenient way to connect load leads to the generator set when a circuit breaker is not present.
15- 300 kW. Bus bar kits are available on alternators with leads for connection to the generator set when circuit breakers are not ordered.
350- 2500 kW. A bus bar kit is provided when no circuit breaker is ordered. Bus bars are also available in combination with circuit breakers or other bus bars on the opposite side of the junction box. On medium voltage (3.3 kV and above) units, a bus bar kit is standard (not applicable to KD models).

❑ Field Connection Barrier

Provides installer wiring isolation from factory connections.

❑ Ground Fault Annunciation

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

❑ Lockout Device (padlock attachment)

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

❑ Lugs

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

❑ Overcurrent Trip Switch

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

❑ Shunt Trip, 12 VDC or 24 VDC

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

❑ Shunt Trip Wiring

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

❑ Undervoltage Trip, 12 VDC or 24 VDC

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

15- 300* kW Line Circuit Breaker Specifications

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

100% Rating Circuit Breaker

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

100% Rating Electrically Operated Breakers

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

Generator-Mounted P-Frame, 24VDC Electrically Operated			
Alt. Model	**Amps**	**Trip Unit**	**Frame**
4RX 4S/4SX 4TX 4V	250 400 600 800	3.0 LI	PJ
		5.0 LSI	PJ
		3.0 LI	PL
		5.0 LSI	PL
4UA 4M6226	250 400 600 800 1000 1200	3.0 LI	PJ
		5.0 LSI	PJ
		3.0 LI	PL
		5.0 LSI	PL

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

Interrupting Ratings

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

Circuit Breaker Lugs Per Phase (Al/Cu)

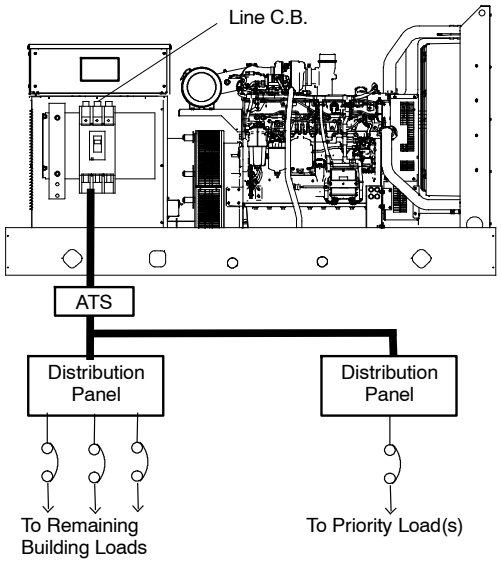
Frame Size	Ampere Range	Wire Range
E (480 V max.)	30- 100	Up to two wire terminals fitting 10-32 or 1/4-20 stud
H	15- 150	One #14 to 3/0
J	175	One 1/0 to 4/0
	200- 250	One 3/0 to 350 kcmil
LA	300- 400	One #1 to 600 kcmil or Two #1 to 250 kcmil
LG	400- 600	Two 2/0 to 500 kcmil AL/CU
M	800	Three 3/0 to 500 kcmil
P	600-800	Three 3/0 to 500 kcmil
	1000-1200	Four 3/0 to 500 kcmil
Mechanical Load Lugs Included with H, J, and LG LSIG Neutrals		
H	60- 150	One #14 to 3/0 AL/CU
J	250	One 3/0 to 350 kcmil AL/CU
LG	400- 600	Two 4/0 to 500 kcmil AL/CU

15- 300* kW Line Circuit Breaker Applications

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

Single Circuit Breaker Installations

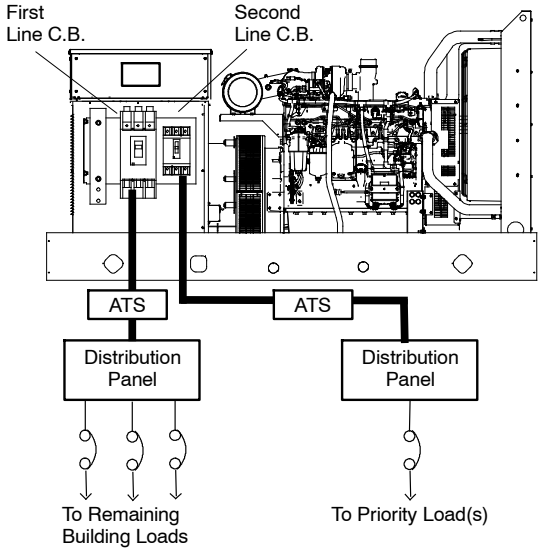
A generator set with a single circuit breaker installed typically feeds a single transfer switch and then a distribution panel. This allows protection of the entire system.



Single line circuit breaker configuration where circuit breaker can trip causing all power to building loads including priority load to be disrupted.

Multiple 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. Multiple circuit breakers allow circuit protection for special applications.



Dual line circuit breaker configuration where first circuit breaker can trip allowing second circuit breaker to continue supplying power to priority load(s).

Circuit Breaker Combinations

Alternator Model	First C. B. Frame	Second C. B. Frame	Third C. B. Frame	Trip Type
ALL except 4D/4E	H	—	—	All
	J	—	—	
	LA	—	—	
	LG	—	—	
4D/4E	H	—	—	Standard or LSIG
	H	H	—	No LSIG
4P/4PX 4Q/4QX	H	H or J	—	No LSIG
	J		—	
	LA		—	
	LG	H, J or LG	—	
4RX 4S/4SX 4TX 4V	M	—	—	All
	P	—	—	All
	H or J	H or J	—	No LSIG
	LA	H, J, or LA	—	
	LG	H, J, LA, or LG	—	
	M			
	P			
	H or J	H or J	H or J	
4UA 4M6226	M or P	—	—	All
	H or J	H or J	—	All
	LA	H, J, or LA	—	
	LG	H, J, LA, or LG	—	
	M or P	H, J, LA, or LG	—	
	P	P	—	No LSIG
	H or J	H or J	H or J	
	LA	H or J	H or J	
		LA	H, J, or LA	
	LG	H or J	H or J	
		LA	H, J, or LA	
		LG	H, J, LA, or LG	
	M or P	H or J	H or J	
		LA	H, J, or LA	
		LG	H, J, or LG	

Section 2—General Information

The PowerPact H-, J-, and L-frame circuit breakers are designed to protect electrical systems from damage caused by overloads and short circuits. H- and J-frame circuit breakers are available with either thermal-magnetic or Micrologic™ electronic trip units. L-frame circuit breakers are available with Micrologic electronic trip unit.

H- and J-frame circuit breakers with thermal-magnetic trip units contain individual thermal (overload) and instantaneous (short circuit) sensing elements in each pole. The amperage ratings of the thermal trip elements are calibrated at 104°F (40°C) free air ambient temperature. Per the National Electric Code® (NEC®) and the Canadian Electrical Code, standard circuit breakers may only be applied continuously at up to 80% of their rating. Circuit breakers rated for 100% operation are available but require specially-designed enclosures, copper lugs, and 194°F (90°C) rated wire.

Devices with the Micrologic electronic trip unit provide adjustable protection settings for greater system flexibility. In addition to electronic protection, Micrologic trip units allow users to monitor both energy and power. Through direct access to in-depth information and networking using open protocols, PowerPact circuit breakers with Micrologic trip units let operators optimize the management of their electrical installations. Far more than a circuit breaker, these circuit breakers are a measurement and communication tool ready to meet energy-efficiency needs through optimized power requirements, increased energy availability, and improved installation management.

Applications

PowerPact H-, J-, and L-frame circuit breakers offer high performance and a wide range of interchangeable trip units to protect most applications.

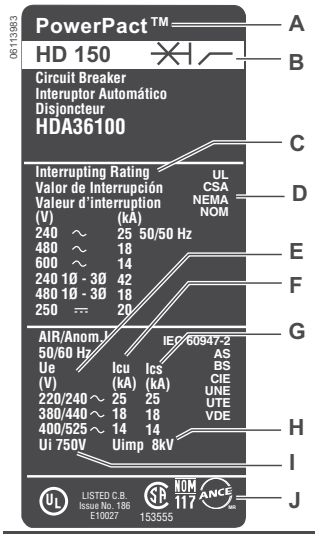
Electronic trip units provide highly accurate protection with wide setting ranges and can integrate measurement, metering and communication functions. They can be combined with the front display module (FDM121) to provide functions similar to a power meter.

Table 3: Applications

	Power Meter	PowerPact H-, J-, and L-frame circuit breakers equipped with Micrologic 5 / 6 trip units offer type A (ammeter) or E (energy) metering functions as well as communication capability. Using Micrologic trip unit sensors and intelligence, PowerPact H-, J-, and L-frame circuit breakers provide access to measurements of all the main electrical parameters on the built-in screen, on a dedicated front display module (FDM121) or through the communication network.
	Operating assistance	Integration of measurement functions provides operators with operating assistance functions including alarms tripped by user-selected measurement values, time-stamped event tables and histories, and maintenance indicators.
	Front display module	The main measurements can be read on the built-in screen of Micrologic 5 / 6 trip units. They can also be displayed on the equipment FDM121 along with pop-up windows signalling the main alarms.
	Communication Network	PowerPact H-, J-, and L-frame circuit breakers equipped with Micrologic 5 / 6 trip units provide communication capabilities. Simple RJ45 cables connect to a Modbus™ communication interface module.

General Characteristics

Faceplate Label



Characteristics indicated on the faceplate label:

A. Circuit breaker type
B. Circuit breaker disconnector symbol
C. Performance levels
D. Standards
E. Ue: Operating voltage per IEC
F. Icu: Ultimate breaking capacity per IEC
G. Ics: Service breaking capacity per IEC
H. Uimp: Rated impulse withstand voltage per IEC
I. Ui: Insulation voltage per IEC
J. Certification marks

NOTE: When the circuit breaker is equipped with an extended rotary handle, the door must be opened to view the faceplate.

Codes and Standards

H-, J-, and L-frame circuit breakers, automatic switches and electronic motor circuit protectors are manufactured and tested in accordance with the following standards.

NOTE: Apply circuit breakers according to guidelines detailed in the National Electric Code (NEC) and other local wiring codes.

Table 4: Codes and Standards (Domestic)

PowerPact H-, J-, and L-Frame Circuit Breakers	H-, J-, and L-Frame Switches	PowerPact H-, J-, and L-Frame Motor Circuit Protectors
UL 489[1]	UL 489[3]	UL 508
IEC 60947-2	IEC 60947-3	IEC 60947-2
CSA C22.2 No. 5[2]	CSA C22.2 No. 5[4]	CSA C22.2 No. 14
Federal Specification W-C-375B/GEN	Federal Specification W-C-375B/GEN	NEMA AB1
NEMA AB1	NEMA AB1	CCC
NMX J-266	NMX J-266	CE Marking
CCC	CE Marking	
CE Marking		

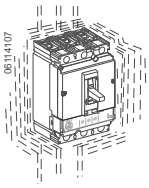
1 PowerPact H- and J-frame circuit breakers are in UL File E10027. PowerPact L-frame circuit breakers are in UL File E63335.

2 PowerPact H- and J-frame circuit breakers are in CSA File LR40970. PowerPact L-frame circuit breakers are in CSA File 69561.

3 PowerPact H- and J-frame switches are in UL File E87159.

4 PowerPact H- and J-frame switches are in CSA File LR32390.

Vibration



PowerPact H-, J-, and L-frame devices resist mechanical vibration.

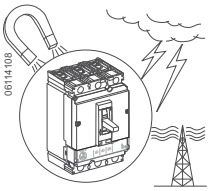
Tests are carried out in compliance with standard UL489 SA and SB for the levels required by merchant-marine inspection organizations (Veritas, Lloyd's, etc.):

PowerPact H-, J-, and L-frame circuit breaker meet IEC 60068-2-6 for vibration:

- 2.0 to 25.0 Hz and amplitude +/- 1.6 mm
- 25.0 to 100 Hz acceleration +/- 4.0 g

Excessive vibration may cause tripping, breaks in connections or damage to mechanical parts.

Electromagnetic disturbances



PowerPact H-, J-, and L-frame devices are protected against:

- overvoltages caused by circuit switching
- overvoltages caused by an atmospheric disturbances or by a distribution-system outage (such as from failure due to lightning)
- devices emitting radio waves (radios, walkie-talkies, radar, etc.)
- electrostatic discharges produced directly by users

PowerPact H-, J-, and L-frame devices have successfully passed the electromagnetic-compatibility tests (EMC) defined by the following international standards:

- IEC/EN 60947-2: Low-voltage switchgear and controlgear, part 2: Circuit breakers:
  - Annex F: Immunity tests for circuit breakers with electronic protection
  - Annex B: Immunity tests for residual current protection
- IEC/EN 61000-4-2: Electrostatic-discharge immunity tests
- IEC/EN 61000-4-3: Radiated, radio-frequency, electromagnetic-field immunity tests
- IEC/EN 61000-4-4: Electrical fast transient/burst immunity tests
- IEC/EN 61000-4-5: Surge immunity tests
- IEC/EN 61000-4-6: Immunity tests for conducted disturbances induced by radio frequency fields
- CISPR 11: Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.

These tests ensure that:

- no nuisance tripping occurs
- tripping times are respected

Tropicalization

The materials used in PowerPact circuit breakers will not support the growth of fungus and mold.

PowerPact circuit breakers have passed the test defined below for extreme atmospheric conditions.

Dry cold and dry heat:

- IEC 68-2-1–dry cold at -55 °C
- IEC 68-2-2–dry heat at +85° C

Damp heat (tropicalization)

- IEC 68-2-30–damp heat (temperature + 55° C and relative humidity of 95%)
- IEC 68-2-52 level 2–salt mist

Special Ratings

The H-frame and J-frame circuit breakers also comply with the following special ratings:

- HACR rating
- SWD switch duty rating (applies only to 15 and 20 A / 277 Vac or less, 2P and 3P)
- HID high intensity discharge lighting rating (15–50 A)

The L-frame circuit breakers complies with the following special rating:

- HACR rating

Marine Ratings

UL Marine Listed/CSA Certified Circuit Breakers (UL489 Supplement SA)

The PowerPact H- and J-frame circuit breakers with thermal-magnetic trip units meet the UL 489 Supplement SA requirements for use on vessels of any length under or over 65 ft. (19.8 m). The PowerPact H-, J-, and L-frame circuit breakers with Micrologic™ electronic trip units meet the UL 489 Supplement SA for use on vessels over 65 ft. (19.8 m) in length. Marine circuit breakers must not use aluminum or aluminum alloys for terminal connections and must be calibrated at an ambient temperature of 104° F (40° C). Standard circuit breakers should not be specified or used in the place of marine rated circuit breakers.

Circuit breakers can be ordered with the Marine SA listing by adding the suffixes “LC” (copper lugs) and “YA” (marine) to the catalog number.

UL Naval Listed/CSA Certified Circuit Breakers (UL 489 Supplement SB)

The PowerPact H-, J-, and L-frame circuit breakers with Micrologic trip units meet the UL 489 Supplement SB requirements for use on naval vessels. These circuit breakers are subject to various vibration tests as described in UL 489 Supplement SB. Naval circuit breakers must not use aluminum or aluminum alloys for terminal connections and must be calibrated at an ambient temperature of 122° F (50° C). Standard circuit breakers should not be specified or used in the place of navel rated circuit breakers.

Circuit breakers can be ordered with the Naval SB listing by adding the suffixes “LC” (copper lugs) and “YA1” (naval) to the catalog number.

American Bureau of Shipping (ABS)

The PowerPact H-, J-, and L-Frame circuit breakers are certified to ABS-NVR (American Bureau of Shipping - Naval Vessel Rules), for use on Naval vessels.

Table 6: Circuit Breakers

Circuit Breaker		**150 A H-Frame**					**250 A J-Frame**					**400 A L-Frame**					**600 A L-Frame**				
Circuit Breaker Type		HD	HG	HJ	HL	HR	JD	JG	JJ	JL	JR	LD	LG	LJ	LL	LR	LD	LG	LJ	LL	LR
Number of poles[1]		2, 3				3	2, 3				3	3, 4					3, 4				
Amperage Range (A)		15-150					70-250					70-400					200-600				
UL 489 Circuit Breaker Ratings																					
UL/CSA/NOM (kA rms)	240 Vac	25	65	100	125	200	25	65	100	125	200	25	65	100	125	200	25	65	100	125	200
	480 Vac	18	35	65	100	200	18	35	65	100	200	18	35	65	100	200	18	35	65	100	200
	600 Vac	14	18	25	50	100	14	18	25	50	100	14	18	25	50	100	14	18	25	50	100
	250 Vdc[2]	20	20	20	20	---	20	20	20	20	---	---	---	---	---	---	---	---	---	---	---
	500 Vdc[2, 3]	---	---	---	---	---	---	20	---	---	---	---	---	---	---	---	---	---	---	---	---
IEC 947-2 Circuit Breaker Ratings																					
Ultimate breaking capacity (Icu) (kA rms)	220/240 Vac	25	65	100	125	150	25	65	100	125	150	25	65	100	125	150	25	65	100	125	150
	380/415 Vac	18	35	65	100	125	18	35	65	100	125	18	35	65	100	125	18	35	65	100	125
	440/480 Vac	18	35	65	100	125	18	35	65	100	125	18	35	65	100	125	18	35	65	100	125
	500/525 Vac	14	18	25	50	75	14	18	25	50	75	14	18	25	50	75	14	18	25	50	75[4]
	690 Vac	---	---	---	---	20	---	---	---	---	20	---	---	---	---	20	---	---	---	---	20
	250 Vdc[2]	---	---	---	---	---	20	20	20	20	---	---	---	---	---	---	---	---	---	---	---
	500 Vdc[2, 3]	---	---	---	---	---	20	20	20	20	---	---	---	---	---	---	---	---	---	---	---
Service breaking capacity (Ics)	% Icu	100%					100%					100%					100%				
Insulation Voltage	V_i	750 Vac					750 Vac					750 Vac					750 Vac				
Impulse Withstand Voltage	V_{imp}	8 kVac					8 kVac					8 kVac					8 kVac				
Operational Voltage	V_e	690 Vac					690 Vac					690 Vac					690 Vac				
Sensor Rating	I_n	150 A					250 A					400 A					600 A				
Utilization Category	---	A					A					A					A				
Operations (Open-Close Cycles)																					
Without Current		4000					5000					5000					5000				
With Current		4000					1000					1000					1000				
Protection and Measurements																					
Short-circuit protection	Magnetic only	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Overload/short-circuit protection	Thermal-magnetic	■	■	■	■	■	■	■	■	■	■	---	---	---	---	---	---	---	---	---	---
	Electronic	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	with neutral protection (Off-0.5-1-OSN)[5]	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	with ground fault protection	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	with zone selective interlocking (ZSI)[6]	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Display / I, V, f, P, E, THD measurements / interrupted-current measurement		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Options	Front display module (FDM121)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Operating assistance	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Counters	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Histories and alarms	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Metering Com	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Device status/control com	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Dimensions / Weight / Connections																					
Dimensions 3P (Unit Mount) in. (mm)	Height	6.4 (163)					7.5 (191)					13.38 (340)					13.38 (340)				
	Width	4.1 (104)					4.1 (104)					5.51 (140)					5.51 (140)				
	Depth	3.4 (86)					3.4 (86)					4.33 (110)					4.33 (110)				
Weight 3P - lb. (Kg)		4.8 (2.2)					5.3 (2.4)					13.2 (6.0)					13.7 (6.2)				
Connections / Terminations	Unit Mount	■					■					■					■				
	I-Line™	■					■					■					■				
	Rear Connection	■					■					■					■				
	Plug-In	■					■					■					■				
	Drawout	■					■					■					■				
	Optional Lugs	■					■					■					■				

1 H and J-frame breakers with Micrologic™ trip units available only with 3P. The HJ, HL and the J-Frame 2P breakers are 3P modules.

2 DC not available with PowerPact H, J or L-frame circuit breakers with Micrologic trip units.

3 500 Vdc specific catalog numbers, ungrounded UPS systems only.

4 I_{cs} for 600 A L-frame circuit breaker at 525 V is 19 kA.

5 OSN: Over Sized Neutral protection for neutrals carrying high currents (e.g. 3rd harmonics).

6 ZSI using restraint wires.

PowerPact H-, J-, and L-frame Circuit Breaker Trip Units

Table 7: Micrologic™ Trip Unit Features

Features	Micrologic Trip Unit (X = Standard Feature, O = Available Option					
	Standard		Ammeter		Energy	
	3.2/3.3	3.2S/3.3S	5.2A/5.3A	6.2A/6.3A	5.2E/5.3E	6.2E/6.3E
LI	X					
LSI[1]		X	X		X	
LSIG/Ground Fault Trip[2]				X		X
Ground-Fault Alarm Trip				X		X
Current Settings Directly in Amperes	X	X	X	X	X	X
True RMS Sensing	X	X	X	X	X	X
UL Listed	X	X	X	X	X	X
Thermal Imaging	X	X	X	X	X	X
LED for Long-Time Pickup	X	X	X	X	X	X
LED for Long-Time Alarm	X	X	X	X	X	X
LED Green “Ready” Indicator	X	X	X	X	X	X
Up to 12 Alarms Used Together			X	X	X	X
Digital Ammeter			X	X	X	X
Zone-Selective Interlocking[3]			X	X	X	X
Communications	O	O	O	O	O	O
LCD Display			X	X	X	X
Front Display Module FDM121			O	O	O	O
Advanced User Interface			X	X	X	X
Neutral Protection			X	X	X	X
Contact Wear Indication[4]			X	X	X	X
Incremental Fine Tuning of Settings			X	X	X	X
Load Profile[4, 5]			X	X	X	X
Power Measurement					X	X
Power Quality Measurements					X	X

1 The LSI with 3.2S/3.3S trip units have fixed short time and long time delays.

2 Requires neutral current transformer on three-phase four-wire loads.

3 ZSI for H/J-frame devices is only IN. ZSI for L-frame devices is IN and OUT.

4 Indication available using the communication system only.

5 % of hours in 4 current ranges: 0–49%, 50–79%, 80–89%, and >90% I_n.

Thermal-Magnetic or Electronic Trip Unit?

Thermal-magnetic trip units (available on H- and J-frame circuit breakers only) protect against overcurrents and short-circuits using tried and true techniques. For applications requiring installation optimization and energy efficiency, electronic trip units offering more advanced protection functions combined with measurements.

Trip units using digital electronics are faster as well as more accurate. Wide setting ranges make installation upgrades easier. Designed with processing capabilities, Micrologic trip units can provide measurement information and device operating assistance. With this information, users can avoid or deal more effectively with disturbances and can play a more active role in system operation. They can manage the installation, anticipate events and plan any necessary servicing.

Accurate Measurements for Complete Protection

PowerPact H-, J-, and L-frame circuit breakers devices offer excellent measurement accuracy from 15 amperes on up to the short-circuit currents. This is made possible by a new generation of current transformers combining “iron-core” sensors for self-powered electronics and “air core” sensors (Rogowski coils) for measurements. The protection functions are managed by an ASIC (Application Specific Integrated Circuit) component that is independent of the measurement functions. This independence ensures immunity to conducted and radiated disturbances and a high level of reliability.

Numerous Security Functions

Torque-limiting screws	The screws secure the trip unit to the circuit breaker. When the correct tightening torque is reached, the screw heads break off. Optimum tightening avoids any risk of temperature rise. A torque wrench is no longer required.
Easy and sure changing of trip units	All trip units are interchangeable, without wiring. A mechanical mismatch-protection system makes it impossible to mount a trip unit on a circuit breaker with a lower rating.
“Ready” LED for a continuous self-test	The LED on the front of the electronic trip units indicates the result of the self-test running continuously on the measurement system and the tripping release. As long as the green LED is flashing, the links between the CTs, the processing electronics and the tripping mechanism are operational. The circuit breaker is ready to protect. A minimum current of 15 to 50 A, depending on the device, is required for this indication function.
A patented dual adjustment system for protection functions.	Available on Micrologic™ 5 / 6 trip units, the system consists of: • an adjustment using rotary switches sets the maximum value • an adjustment using the keypad or made remotely, fine-tunes the setting. This setting may not exceed the first one. It can be read directly on the Micrologic trip unit screen, to within one ampere and a fraction of a second.

Section 6—Trip Units

Available Trip Units

- PowerPact H-, J-, and L-Frame circuit breakers offer a range of thermal-magnetic and Micrologic™ electronic trip units in interchangeable cases. Thermal-magnetic trip units are designed to open automatically under overload or short circuit. H-frame and J-frame thermal-magnetic circuit breakers contain individual thermal (overload) and instantaneous (short circuit) sensing elements in each pole.
- Micrologic electronic trip units provide intelligent operation, with wide setting ranges make installation upgrades easier. Designed with processing capabilities, Micrologic trip units can provide measurement information and device operating assistance to supply all of the information required to manage the electrical installation and optimize energy use.

  Micrologic trip units offer excellent measurement accuracy, using a new generation of current transformers combining “iron-core” sensors for self-powered electronics and “air-core” sensors (Rogowski coils) for measurements. The protection functions are managed by an ASIC component that is independent of the measurement functions. This independence ensures immunity to conducted and radiated disturbances and a high level of reliability.

  An LED on the front of the electronic trip units indicates the result of the self-test running continuously on the measurement system and the tripping release. When the green LED is flashing, the links between the CTs, the processing electronics and the Mitop release are operational. The circuit breaker is ready to protect. A minimum current of 15 to 50 A, depending on the device, is required for this function.

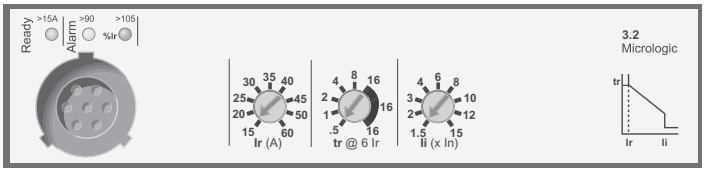
  The dual adjustment for protection functions on Micrologic 5 / 6 consists of:

  — an adjustment using rotary switches sets the maximum value
  — an adjustment, made using the keypad or remotely, fine-tunes the setting. This setting may not exceed the first one. It can be read directly on the Micrologic screen, to within one ampere and a fraction of a second.

NOTE: All the trip units have a transparent sealable cover that protects access to the adjustment rotary switches.

Micrologic™ 3 Trip Units

Micrologic 3 trip units can be used on PowerPact H-, J-, and L-Frame circuit breakers with performance levels D/G/J/L.



They provide:

- standard protection of distribution cables
- indication of:
  - — overloads (using LEDs)
  - — overload tripping (using the SDx relay module).

Circuit breakers equipped with Micrologic 3 trip units can be used to protect distribution systems supplied by transformers.

Protection

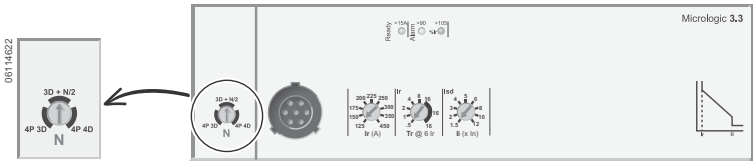
Settings are made using the adjustment rotary switches.

Overloads: Long time protection (I_r)

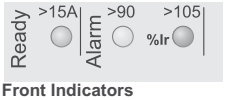
Inverse time protection against overloads with an adjustable current pick-up Ir set using a rotary switch and an adjustable time delay t_r.

Neutral protection

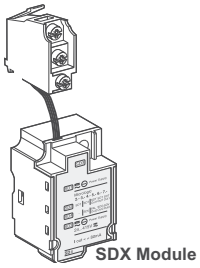
- On 3-pole L-frame circuit breakers, neutral protection is not possible.
- On four-pole L-frame circuit breakers, neutral protection may be set using a three-position switch:
  - — switch position 4P 3D: neutral unprotected
  - — switch position 4P 3D + N/2: neutral protection at half the value of the phase pick-up, (0.5 x Ir)
  - — switch position 4P 4D: neutral fully protected at I_r



Indicators



Front Indicators



SDX Module

Front indicators

- The green “Ready” LED blinks slowly when the electronic trip unit is ready to provide protection. It indicates the trip unit is operating correctly.
- Orange overload pre-alarm LED: steady on when I > 90% I_r
- Red overload LED: steady on when I > 105% I_r

Remote indicators

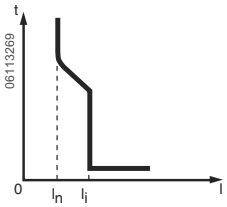
An overload trip signal can be remotely checked by installing an SDx relay module inside the circuit breaker. This module receives the signal from the Micrologic electronic trip unit through an optical link and makes it available on the terminal block. The signal is cleared when the circuit breaker is reclosed. See page 94.

Section 10—Installation Recommendations

Operating conditions

Temperature Derating

- PowerPact H-, J-, and L-frame circuit breakers may be used between -13°F and 158°F (-25 °C and +70 °C). For temperatures higher than 104° F (40° C°) inside the enclosure, devices must be derated.
- Circuit breakers should be put into service under normal ambient, operating-temperature conditions.
- The permissible storage-temperature range for PowerPact H-, J-, and L-frame circuit breakers in the original packing is -58°F[1] and 185°F (-50 °C[1] and +85 °C).



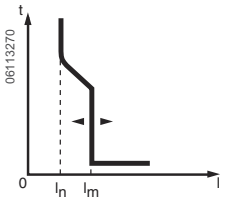
H-Frame Trip Curve

(I_n) Fixed threshold thermal protection against overload
(I_i) **Fixed** threshold instantaneous protection against short circuits

Table 124: Temperature Derating for H-Frame Trip Unit Thermal Protection—Long-Time

Temperature[1]		Rating (A) I_n															
°C	°F																
-10	14	23	30	38	46	53	60	68	76	88	103	112	123	137	160	180	221
0	32	21	28	36	43	49	56	63	71	83	97	107	117	131	151	171	207
10	50	20	26	33	40	46	52	59	66	77	90	101	111	126	141	161	194
20	68	18	24	31	37	42	48	54	62	72	84	96	105	120	132	152	180
30	86	17	22	28	34	39	44	50	56	66	77	88	98	110	121	139	165
40	104	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**125**	**150**
50	122	12	17	21	25	30	34	38	43	53	62	72	80	86	95	109	131
60	140	9	14	17	20	24	28	31	35	46	53	63	70	72	80	93	111

1 Shaded areas indicate temperature rerated values, non-shaded areas inside an enclosure are standard circuit breaker ampere ratings at 104° F (40° C°).



J-Frame Trip Unit

(I_n) Fixed threshold thermal protection against overload
(I_m) Adjustable instantaneous protection against short circuits

Table 125: Temperature Derating for J-Frame Trip Unit Thermal Protection—Long-Time

Temperature[1]		Rating (A) I_n				
°C	°F					
-10	14	221	264	289	330	377
0	32	207	247	273	310	354
10	50	194	230	256	290	330
20	68	180	213	240	270	307
30	86	165	194	220	248	279
40	104	**150**	**175**	**200**	**225**	**250**
50	122	131	150	176	193	214
60	140	111	124	151	160	177

1 Shaded areas indicate temperature rerated values, non-shaded areas are standard circuit breaker ampere ratings at 104° F (40° C°).

1 -40°F (-40 °C) for Micrologic™ trip units with an LCD screen.

PowerPact H-, J- and L-Frame Circuit Breakers Equipped with Electronic Trip Units

Electronic trip units are not affected by variations in temperature. If the trip units are used in high-temperature environments, the Micrologic™ trip unit setting must nevertheless take into account the temperature limits of the circuit breaker.

Changes in temperature do not affect measurements by electronic trip units.

- The built-in CT sensors with Rogowski coils measure the current.
- The control electronics compare the value of the current to the settings defined for 104°F (40°C).

Because temperature has no effect on the CT measurements, the tripping thresholds do not need to be modified.

However, the temperature rise caused by the flow of current combined with the ambient temperature increases the temperature of the device. To avoid reaching the thermal withstand value, it is necessary to limit the current flowing through the device, that is the maximum I_r setting as a function of the temperature.

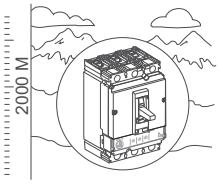
The table below indicates the maximum long-time (LT) protection setting I_r (A) depending on the ambient temperature.

Table 126: Derating Circuit Breakers with Micrologic Trip Units

Type of Device	Rating	Temperature						
		104°F (40°C)	113°F (45°C)	122°F (50°C)	131°F (55°C)	140°F (60°C)	149°F (65°C)	158°F (70°C)
H-Frame								
Unit-mount, plug-in or drawout	60 A	No derating						
	100 A	No derating						
	150 A	No derating						
J-Frame								
Unit-mount	250	250	250	250	245	237	230	225
Plug-in or drawout	250	250	245	237	230	225	220	215
L-Frame								
Unit-mount	400	400	400	400	390	380	370	360
Plug-in or drawout	400	400	390	380	370	360	350	340
Unit-mount	600	600	600	600	585	570	550	535
Plug-in or drawout	600	570	550	535	520	505	490	475

Example. A unit-mount PowerPact L-frame circuit breaker equipped with a Micrologic can have a maximum I_r setting of:

- 400 A up to 122°F (50 °C)
- 380 A up to 140°F (60 °C)



Altitude derating

Altitude does not significantly affect the characteristics of PowerPact H-, J-, and L-frame circuit breakers circuit breakers up to 6560 ft (2000 m). Above this altitude, it is necessary to take into account the decrease in the dielectric strength and cooling capacity of air.

The following table gives the corrections to be applied for altitudes above 6560 ft (2000 m). The breaking capacities remain unchanged.

Table 127: Altitude Derating

Altitude		6560 ft (2000 m)	9840 ft (3000 m)	13120 ft (4000 m)	16400 ft (5000 m)
Dielectric withstand voltage		3000 V	2500 V	2100 V	1800 V
Insulation voltage	V_i	800 V	700 V	600 V	500 V
Maximum operational voltage	V_e	690 V	590 V	520 V	460 V
Average current capacity (A) at 104°F (40°C)	I_n x	1 0.	0.96	0.93	0.9

400 Hz Derating

Application of H- and J-frame circuit breakers at frequencies above 60 Hz requires that special consideration be given to the effects of high frequency on the circuit breaker characteristics. Thermal and instantaneous operations must be treated separately.

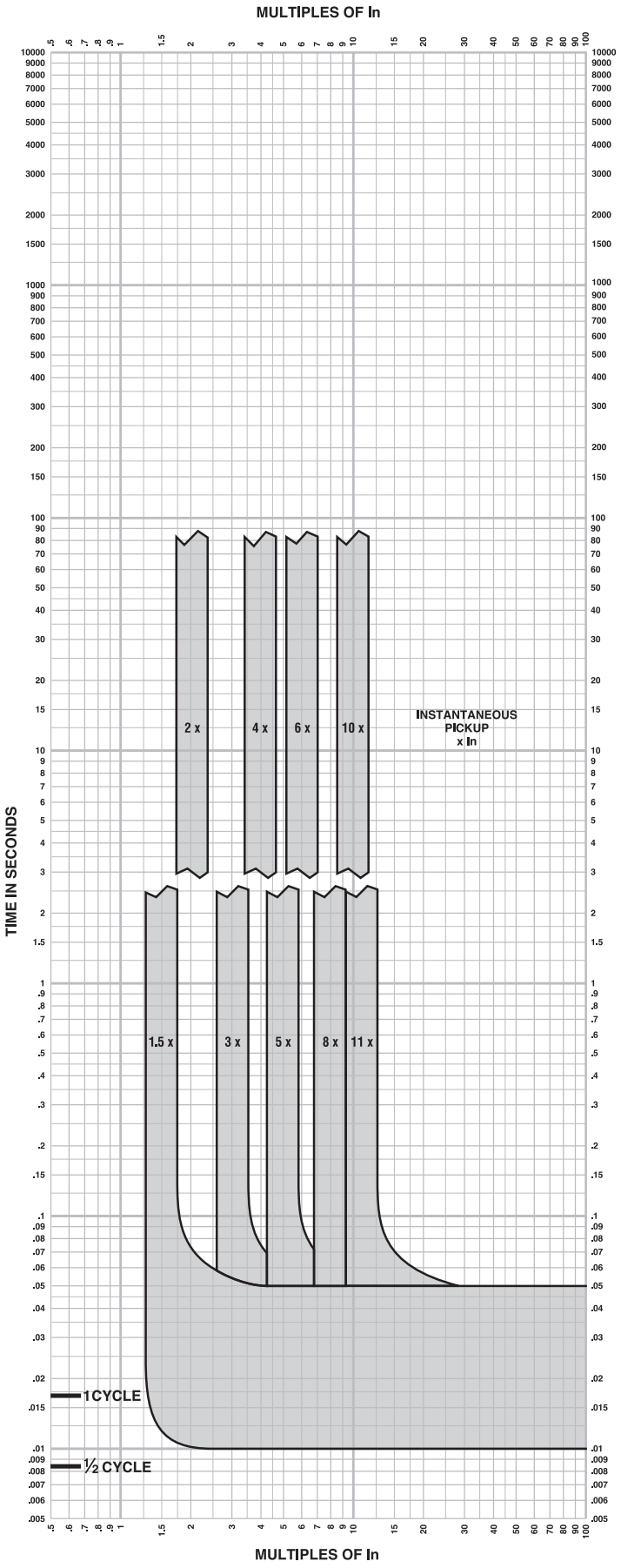
At frequencies below 60 Hz, the thermal derating of PowerPact H and J-frame circuit breakers is negligible. However, at frequencies above 60 Hz, thermal derating is required.

One of the most common high frequency applications is at 400 Hz.

Table 128: 400 Hz Derating

Circuit Breaker	400 Hz Derating Multiplier
H-Frame	0.95
J-Frame	0.90
L-Frame, 400 A	0.80
L-Frame, 600 A	0.65

For more information, refer to Data Bulletin 0100DB0101, *Determining Current Carrying Capacity in Special Applications*.



MICROLOGIC™ ELECTRONIC TRIP UNITS
Micrologic™ 3.3/3.3S/5.3A or E/6.3A or E
Instantaneous Trip Curve
600A L-Frame

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

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. In = Maximum dial setting of Ir.
   600A L-Frame: In = 600A = Max Ir setting

Curves apply from -35ºC to +70ºC (-31ºF to +158ºF) ambient temperature.

Schneider Electric

Drawing No. S1A8147600
March 2011

KOHLER®

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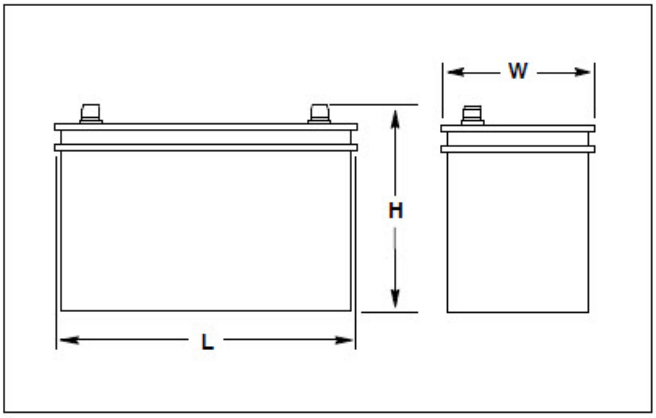
Typical Overall Dimensions

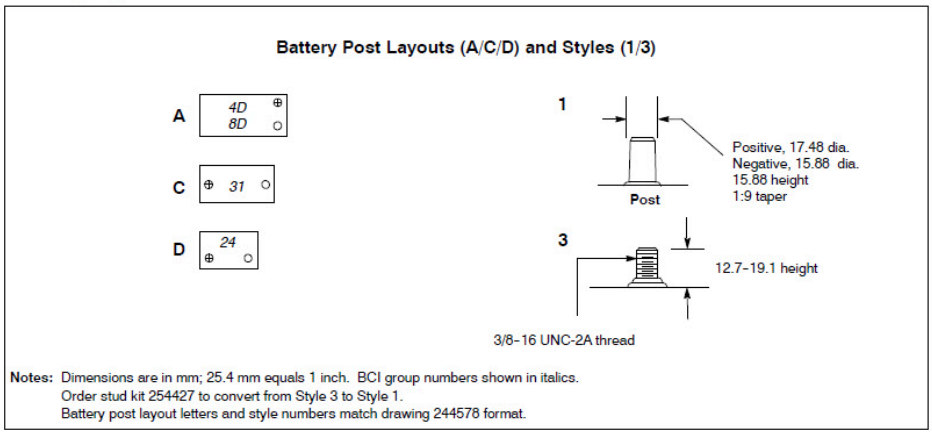


Standard Features

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

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

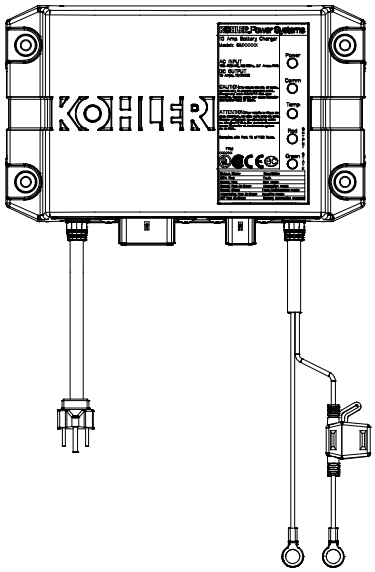
Battery Specifications



KOHLER

Industrial Generator Set Accessories

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



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

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

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

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

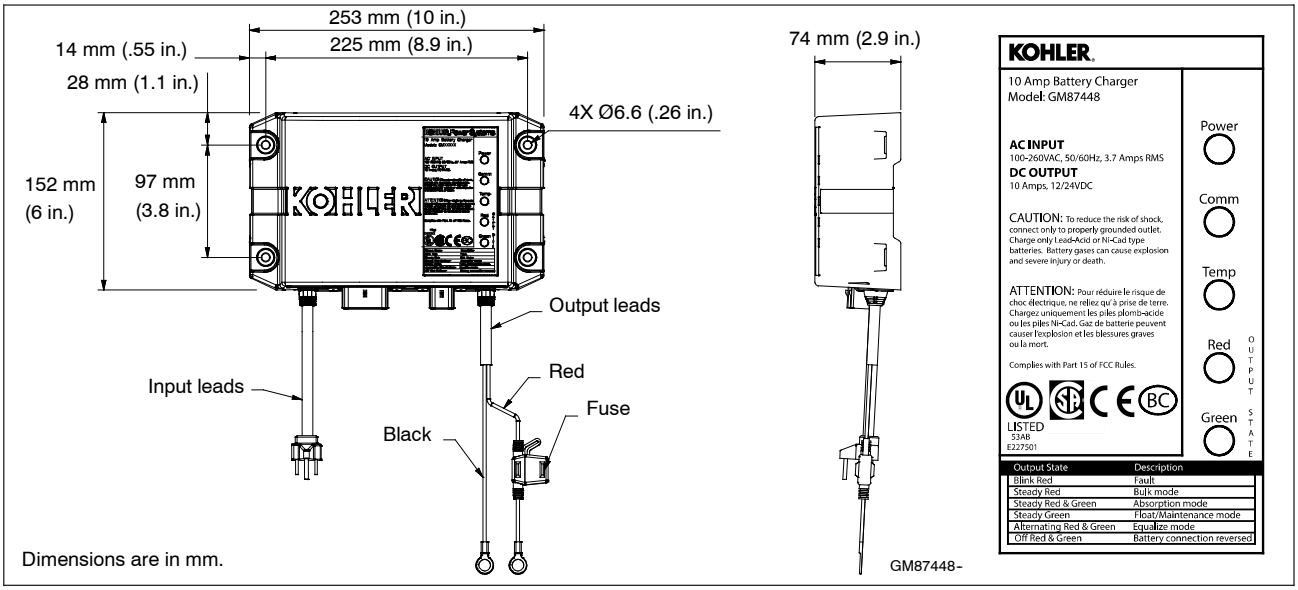
With the optional battery temperature sensor connected, the battery charger can adjust output voltages for optimal charging.

Standard Features

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

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

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



Specifications

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

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

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 distributor for availability.

KOHLER®

Sound Enclosure with Subbase Fuel Tank Package

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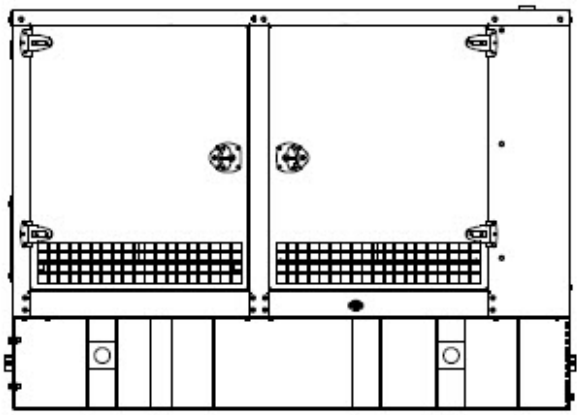
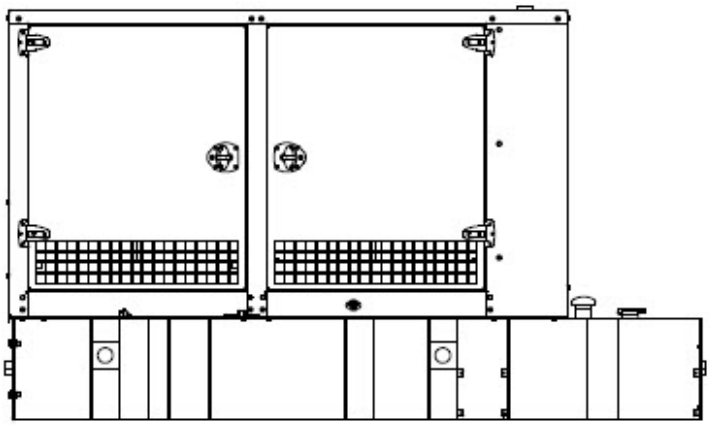


Enclosure with Standard Subbase Fuel Tank



Enclosure with State Code Subbase Fuel Tank

Sound Enclosure Standard Features

• Internal-mounted critical silencer and flexible exhaust connector.

• Lift base-mounted or tank mounted aluminum construction with hinged doors. Aluminum enclosures are recommended for high humidity and/or high salt/coastal regions

• Fade-, scratch-, and corrosion-resistant Kohler® Power Armor automotive-grade textured finish.

• Power Armor surpasses 3,000-hour salt spray corrosion tests per ASTM B- 1117

• Enclosure has four access doors which allow for easy maintenance.

• Lockable, flush-mounted door latches.

• Vertical air inlet and outlet discharge to redirect air and reduce noise.

• Acoustic insulation that meets UL 94 HF1 flammability classification and repels moisture adsorption.

• Sound-attenuated that uses up to 51 mm (2 in.) of acoustic insulation.

• Aluminum sound enclosure is certified to 181 mph (291 kph) wind load rating for 180-300REOZJ models.

Subbase Fuel Tank Features

• The fuel tank has a Power Armor Plus textured epoxy-based rubberized coating.

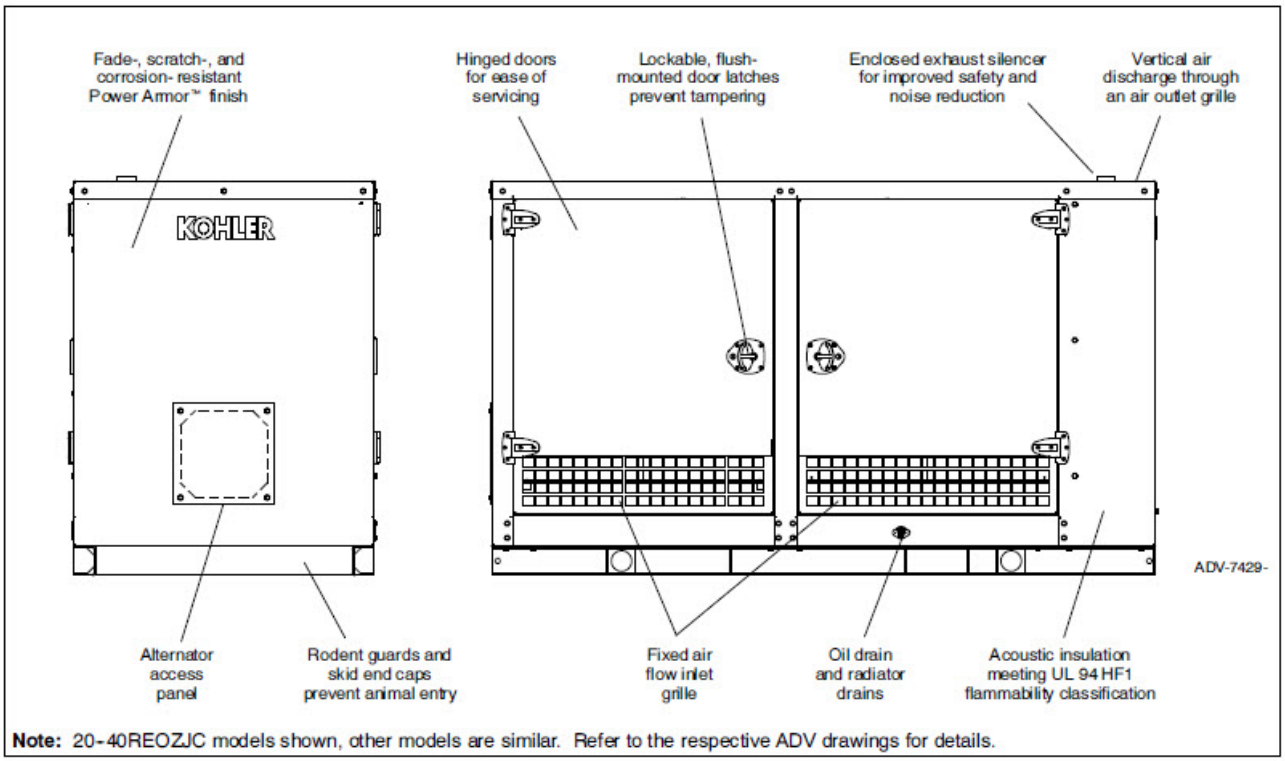
• The above-ground rectangular secondary containment tank mounts directly to the generator set, below the generator set skid (subbase).

• Both the inner and outer tanks have emergency relief vents.

• Flexible fuel lines are provided with subbase fuel tank selection.

• The secondary containment generator set base tank meets UL 142 tank requirements. The inner (primary) tank is sealed inside the outer (secondary) tank. The outer tank contains the fuel if the inner tank leaks or ruptures.

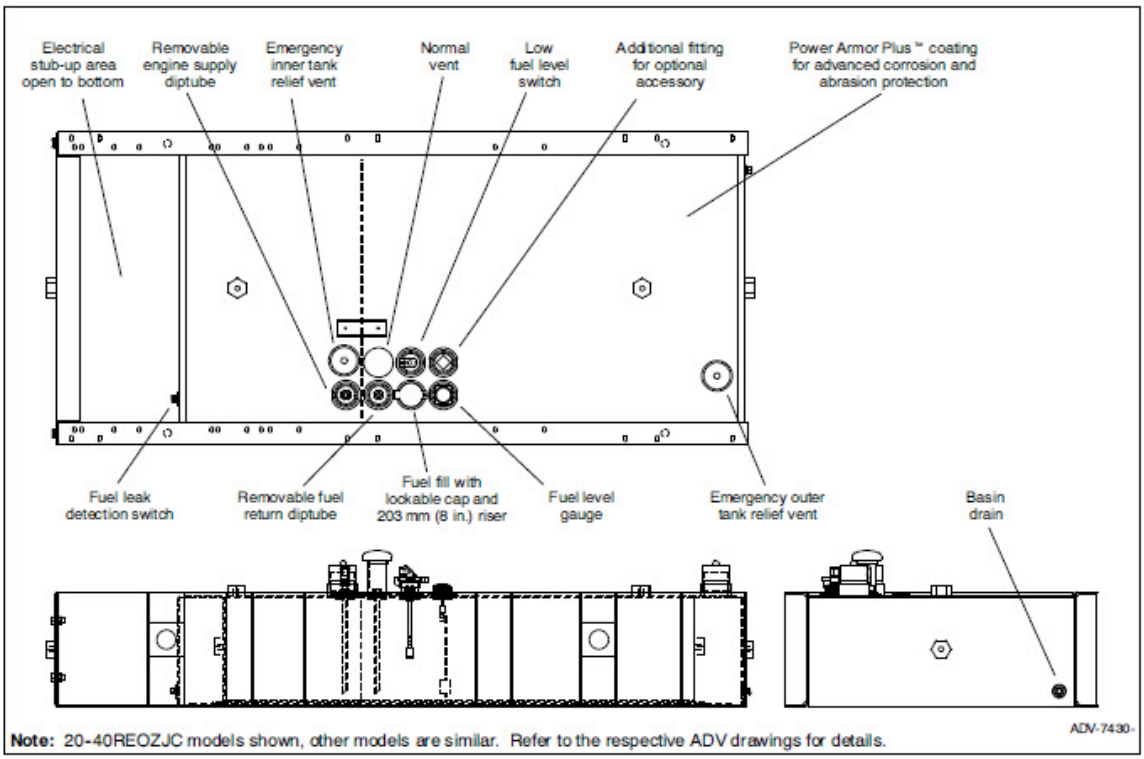
• State tanks with varying capacities are an available option. Florida Dept. of Environmental Protection (FDEP) File No. EQ-634 approved.



Note: 20-40REOZJC models shown, other models are similar. Refer to the respective ADV drawings for details.

Sound Enclosure Features

- Available in aluminum 3.2mm (0.125 in.) formed panel, solid construction. Preassembled package offering corrosion resistant, dent resilient structure mounting directly to lift base or fuel tank.
- Power Armor automotive-grade finish resulting in advanced corrosion and abrasion protection as well as enhanced edge coverage and color retention.
- Internal exhaust silencer offering maximum component life and operator safety.
- Interchangeable modular panel construction. Allows complete serviceability or replacement without compromising enclosure design.
- Cooling/combustion air intake with a horizontal air inlet. Sized for maximum cooling airflow.
- Service access. Multi-personnel doors for easy access to generator set control and servicing of the fuel fill, fuel gauge, oil fill and battery.
- Cooling air discharge. Weather protective design featuring vertical air discharge. Redirects cooling air up and above the enclosure to reduce ambient noise.
- Attenuated design. Acoustic insulation UL 94 HF1 listed for flame resistance offering up to 51 mm (2 in.) mechanically restrained acoustic insulation.
- Note: Installing an additional length of exhaust tail pipe may increase backpressure levels. Please refer to the generator set spec sheet for the maximum backpressure value.



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

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	Max. Length, mm (in.)	Enclosure and Fuel Tank Length, mm (in.)	Enclosure and Fuel Tank Width, mm (in.)	Enclosure and Fuel Tank Weight, kg (lb.)	Enclosure and Fuel Tank Height, mm (in.)	Fuel Tank Height (H), mm (in.)	Sound Pressure Level, dB(A)
Lift base	0	1338 (52.7)	4121 (162.3)	1338 (52.7)	2585 (5700)	2153 (84.8)	260 (10)	75
3573 (944)	48/53	5325 (209.7)	1338 (52.7)	4436 (9780)	3173 (124.9)	914 (36)		75

Note: Refer to the respective ADV drawings for details.
Note: Refer to TIB-114 for generator sound data.
Max. weight includes the generator set (wet), enclosure, silencer, and tank (no fuel). The generator set weight represents using the largest alternator option. The enclosure weight is with acoustic insulation added.

KOHLER®

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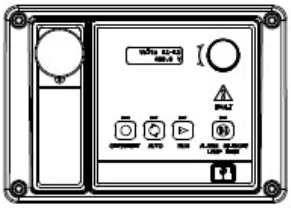
Integral Voltage Regulator with Kohler® APM402/ Decision-Maker® 3000 and Menu-Driven Selections (15-1000 kW Generator Set Models)



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

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

Voltage Regulators

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

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

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

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

KOHLER®

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

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

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

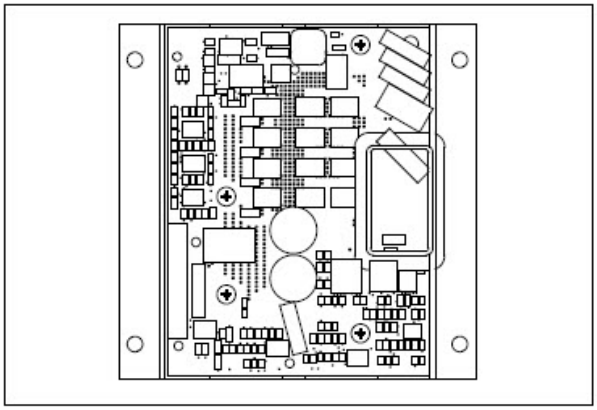
Voltage Regulator Menu

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

Jumpers

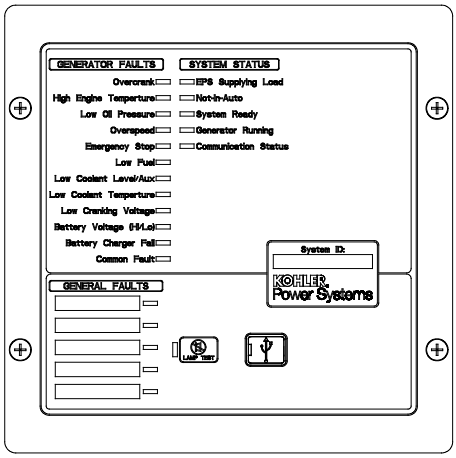
- L1-L2 volts
- L2-L3 volts (3-phase)
- L3-L1 volts (3-phase)
- L1-N volts
- L2-N volts
- L3-N volts (3-phase)

KOHLER®

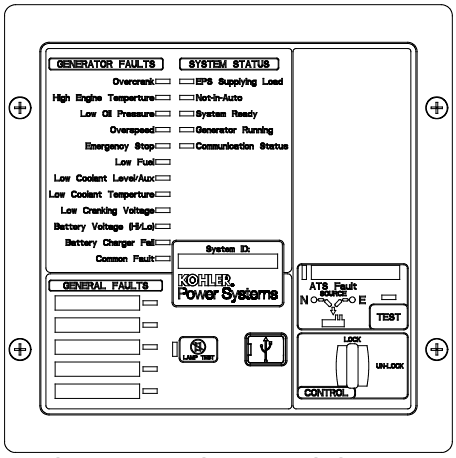


- Interfaces between the controller and alternator assembly using rotor field leads, auxiliary power windings, and optic board leads.
- Allows the Decision-Maker® controllers the ability to control a wound-field alternator using the same control signal as Fast Response™ alternator.
- Permits the generator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

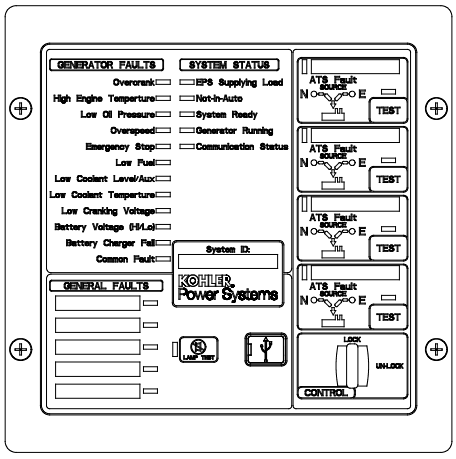
Modbus® is a registered trademark of Schneider Electric.



RSA III



RSA III with a Single ATS Control



RSA III with Four ATS Controls

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

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

APM402	Decision-Maker® 3000
APM603	Decision-Maker® 3500
APM802	Decision-Maker® 6000
Decision-Maker® 3+	Decision-Maker® 8000
Decision-Maker® 550	KPC 1000

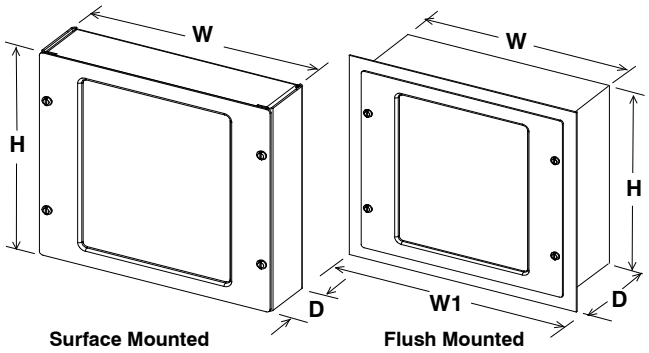
- Allows monitoring of the common alarm, remote testing of the automatic transfer switch, and monitoring of the normal/emergency source for up to four ATS with any of the following controllers:
  - Decision-Maker® MPAC® 750, 1200, and 1500
  - MPAC® 1000 and 1500
- Configuration via a personal computer (PC) software.
- Writable surfaces (white boxes in illustrations) for user-defined selections.
- Uses Modbus® RTU protocol.
- Controller connections:
  - RS-485 for serial bus network
  - USB port. Connect a personal computer and use Kohler® SiteTech™ software to view events and adjust settings. *
  - 12-/24-volt DC power supply
  - 120/208 VAC power supply (available accessory)
- Meets the National Fire Protection Association Standard NFPA 110, Level 1.

Dimensions

- Dimensions—W x H x D, mm (in.).
  - **Surface Mounted:**
    203 x 203 x 83 (8.0 x 8.0 x 3.3)
  - **Flush Mounted (Inside Wall):**
    203 x 203 x 76 (8.0 x 8.0 x 3.0)
    Flush mounting plate W1: 254 (10.0)

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

Modbus® is a registered trademark of Schneider Electric.



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 with120/208 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
  - EN6II-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 the load (APM402, APM603, APM802, and Decision-Maker® 550, 3000, 3500, 6000, and 8000 controllers) or when transfer switch is in the emergency position (Decision-Maker® 3+ controller).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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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.

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KOHLER®

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED

Transfer Switch Standard Features

- UL 1008 listed file #E58962 (automatic), #E86894 (non automatic)
- CSA certification available
- IBC seismic cerfiticaion available
- Available in 2, 3, or 4 pole configurations
- Electrically operated, mechanically held mechanism
- High withstand amd 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 (800-1200 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 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
150	2, 2

Weights and Dimensions

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

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
150	(1) #14 to 4/0 AWG	(3) #14 to 4/0 AWG	(3) #6 to 3/0 AWG
* Use 75 degrees C minimum Cu/Al wire for power connections			

Withstand and Close-On Ratings (WCR)
Ratings Summary

The transfer switch is rated for use on a circuit capable of delivering not more than the RMS symmetrical amperes listed at the specified maximum voltage below, but no greater than the interrupt capacity of the selected circuit breaker or fuse. Circuit breakers and fuses are supplied by the customer.

	Withstand and Close-On Ratings (WCR) Standard, Programmed, and Closed-Transition Models									
	Current Limiting Fuses				Specific Coordinated Breaker			Time-Based Rating		
Switch Rating, Amps	Fuse Class	Max Amps	480 VAC	600 VAC	240 VAC	480 VAC	600 VAC	Time sec.	480 V Max.	600 V. Max
150	J	200	200000	35000	150000	85000	25000	0.025	10000	10000
150	RK1	200	35000	35000	150000	85000	25000	0.025	10000	10000

Ratings with Specific Manufacturer's Circuit Breaker

Withstand and close-on ratings (WCR) in RMS symmetrical amperes for specific manufacturers' circuit breakers.

Molded-Case Circuit Breakers					
Switch Rating, Amps	WCR, Amps, RMS	Voltage, Max.	Manufacturer	Type	Max. Size, Amps
150	150000	240	Square D	HR	250
150	125000	240	Square D	HL	150
150	10000	240	Square D	BJ, HJ	125
150	65000	240	Square D	JG, JJ, JL, JR	200
150	65000	240	Square D	BG, HG	125
150	42000	240	Square D	QG, QJ	200
150	25000	240	Square D	HD	150
150	25000	240	Square D	BD	125
150	22000	480	General Electric	THED	150
150	85000	480	Square D	HL, HR	150
150	50000	480	Square D	BJ	125
150	35000	480	Square D	HG, HJ	150
150	35000	480	Square D	BG	125
150	25000	480	Square D	JG, JJ, JL	200
150	18000	480	Square D	BD, HD	125
150	25000	600	Square D	HJ, HL, HR	150
150	25000	600	Square D	BJ	125
150	18000	600	Square D	HG	150
150	18000	600	Square D	BG	125
150	14000	600	Square D	HD	150
150	14000	600	Square D	BD	125

Codes and Standards

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

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

Accessories

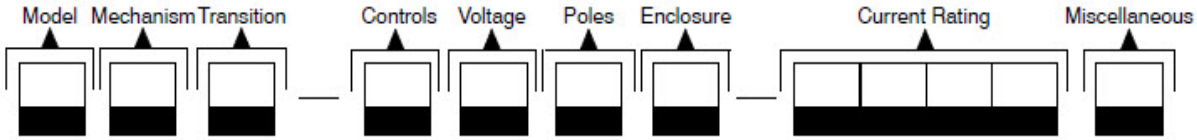
Accessories are available either factory-installed or as loose kits, unless otherwise noted.

Padlockable User Interface Cover

- With or without window
- Cover without window standard on NEMA 3R enclosures

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: KSS-AMTA-0400S

Model

K: Kohler

Mechanism

S: Standard (Specific Breaker)

Transition

S: Standard

Controller

A: Decision-Maker® MPAC 1200, Automatic

B: Decision-Maker® MPAC 1200, Non-Automatic

Voltage/Frequency

C:	208 Volts/60 Hz	K:	440 Volts/60 Hz
D:	220 Volts/50 Hz	M:	480 Volts/60 Hz
F:	240 Volts/60 Hz	N:	600 Volts/60 Hz
G:	380 Volts/50 Hz	P:	380 Volts/60 Hz
H:	400 Volts/50 Hz	R:	220 Volts/60 Hz
J:	416 Volts/50 Hz	S:	400 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	D:	NEMA 4
B:	NEMA 12	F:	NEMA 4X
C:	NEMA 3R	G:	Open Unit

Current, Amps

0030	0200	0600
0070	0230	0800
0104	0260	1000
0150	0400	1200

Connections

S: Standard

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

KOHLER®

Automatic Transfer Switch Controller

Decision-Maker® MPAC 1200

Model KCS with Decision-Maker® MPAC 1200 Controller

Applicable Models

Model	Description
KCS	Standard-Transition Any Breaker ATS ‡
KCP	Programmed-Transition Any Breaker ATS ‡
KCC	Closed-Transition Any Breaker ATS §
KSS	Standard-Transition Specific Breaker ATS ‡

‡ Available with automatic or non-automatic controller
§ Available with automatic controller only

Decision-Maker® MPAC 1200 Controller Standard Features

- Microprocessor-based controller
- Environmentally sealed user interface
- LCD display, 4 lines x 20 characters, backlit
- Dynamic function keypad with tactile feedback pushbuttons allows complete programming and viewing capability at the door
- LED indicators: Source available, transfer switch position, service required (fault), and not in auto
- Broadrange voltage sensing (208- 600 VAC) on all phases
- Phase-to-phase sensing and monitoring with 0.5% accuracy on both sources
- Line-to-neutral monitoring
- Frequency sensing with 0.5% accuracy on both sources
- Anti-single phasing protection
- Phase rotation sensing for three-phase systems
- Real-time clock with automatic adjust for daylight saving time and leap year
- Run time clock and operation counter
- Time-stamped event log
- Fail-safe transfer for loaded test and exercise functions
- DIP switches: password disable and maintenance
- Isolated RS-485 ports for Modbus connections (9.6, 19.2, and 57.6 kbps)
- Modbus® RTU protocol (Modbus register map available)
- USB port. Connect a personal computer and use Kohler® SiteTech™ software to view events and adjust settings. *
- Available in automatic and non-automatic versions; see supervised transfer control switch on page 5

Programmable Features

- Programming and monitoring methods:
  - Monitoring and password-protected programming at the door using the keypad and display
  - Program using a PC with Kohler® SiteTech™ software (available to Kohler-authorized distributors and dealers)
- Over/undervoltage for all phases of the normal and emergency sources
- Over/underfrequency for the emergency source
- Adjustable time delays
- Load/no load/auto-load test and load/no-load exercise functions
- Programmable inputs and outputs
- Load bank control for exercise or test
- Time-based load control, nine individual time delays for selected loads
- In-phase monitor (3-phase only)
- Password protection, three security levels
- See pages 2 and 3 for additional programmable features

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

Modbus is a registered trademark of Schneider Electric.

Decision-Maker® MPAC 1200 Controller Features

User Interface LED Indicators

- Contactor position: source N and source E
- Source available: source N and source E
- Service required (fault indication)
- Not in automatic mode

LCD Display

- System status
- Line-to-line voltage
- Line-to-neutral voltage
- Active time delays
- Source frequency
- Preferred source selection
- System settings
- Common alarms
- Load current, each phase (current sensing kit required)
- Inputs and outputs
- Faults
- Time/date
- Address
- Event history
- Maintenance records
- Exerciser schedule
- Exerciser mode
- Time remaining on active exercise

Dynamic Function Tactile Keypad Operations

- Scroll up/down/forward/back
- Increase/decrease/save settings
- End time delay
- Start/end test or exercise
- Reset fault
- Lamp test

DIP Switches

- Maintenance mode
- Password disable

Event History

- View time and date-stamped events on the display or on a personal computer equipped with Kohler® SiteTech™ software. *****
- Download complete event history files using Kohler SiteTech software and a PC connected to the USB port. *****

Main Logic Board Inputs and Outputs

- Two (2) programmable inputs
- Two (2) programmable outputs

Communications

- Optional Ethernet communications with RJ45 connector for 10/100 Ethernet connection
- Isolated RS-485 ports for Modbus communications
- Modbus® RTU and Modbus® TCP/IP protocols (Modbus® register map available)
- USB Port. Use SiteTech software to upload or download files and adjust transfer switch settings *****
  - Application software
  - Event history files
  - Language files
  - Parameter settings
  - Usage reports
  - Feature configuration

Programmable Features

- System voltage, 208- 600 VAC †
- System frequency, 50/60 Hz †
- Single/three-phase operation †
- Standard/programmed/closed-transition operation †
- Preferred source selection allows the normal or emergency source to be used when both sources are available (alarm module required)
- Phase rotation: ABC/BAC/none selection with error detection
- Overvoltage and undervoltage pickup and dropout settings, both sources
- Overfrequency and underfrequency pickup and dropout settings, Emergency source
- Voltage unbalance, enable/disable
- In-phase monitor: enable/disable and phase angle
- Transfer commit/no commit
- Passwords, system and test
- Time, date, automatic daylight saving time enable/disable
- Time delays (see table)
- Exerciser: calendar mode, loaded/unloaded up to 21 events
- Test: loaded/unloaded/auto load (1- 60 minutes)
- Remote test: loaded/unloaded
- Automatic override on generator failure (loaded test and exercise)
- Peak shave delay enable/disable
- Current monitoring (current sensing kit required)
- Load control pre/post-transfer delays, 9 individual time delays for selected loads
- Resettable historical data

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

† System parameters are factory-set per order.

Modbus is a registered trademark of Schneider Electric.

Decision-Maker® MPAC 1200 Controller Features, Continued

Programmable Inputs

- Forced transfer to OFF (programmed-transition models only; requires load shed accessory)
- Inhibit transfer
- Low battery voltage (external battery supply module required)
- Peak shave/area protection input
- Remote common fault
- Remote test
- Remote end time delay
- Remotely monitored inputs, four (4) available

Programmable Outputs

- Alarm silenced
- Audible alarm
- Chicago alarm control
- Common alarm events
- Contactor position
- Exercise active
- Failure to acquire standby source
- Failure to transfer
- Generator engine start, source E
- I/O module faults
- In-phase monitor synch
- Load bank control
- Load control active (pre/post transfer delay, up to 9 outputs)
- Loss of phase fault, source N and E
- Low battery fault (external battery supply module required)
- Maintenance mode
- Non-emergency transfer
- Not in automatic mode
- Over/undervoltage faults, source N and E
- Peak shave/area protection active
- Phase rotation error, source N and E
- Preferred source supplying load
- Software-controlled relay outputs (four maximum)
- Source available, preferred and standby
- Standby source supplying load
- Test active
- Transfer switch auxiliary contact fault
- Transfer switch auxiliary contact open
- Voltage unbalance, source N and E

Voltage and Frequency Sensing		
Parameter	**Default**	**Adjustment Range**
Undervoltage dropout	90% of pickup	75%- 98%
Undervoltage pickup	90% of nominal	85%- 100%
Overvoltage dropout *	115% of nominal*	106%- 135%
Overvoltage pickup	95% of dropout	95%- 100%
Unbalance enable	Disable	Enable/Disable
Unbalance dropout	20%	5%- 20%
Unbalance pickup	10%	3%- 18%
Voltage dropout time	0.5 sec.	0.1- 9.9 sec.
Underfrequency dropout †	99% of pickup	95%- 99%
Underfrequency pickup †	90% of nominal	80%- 95%
Overfrequency dropout †	101% of pickup	101%- 115%
Overfrequency pickup †	110% of nominal	105%- 120%
Frequency dropout time †	3 sec.	0.1- 15 sec.
* 690 volts, maximum. Default = 110% for 600 volt applications.		
† Emergency source only		

Adjustable Time Delays		
Time Delay	**Default**	**Adjustment Range**
Engine start	3 sec.	0- 6 sec. †
Engine cooldown	5 min.	0- 60 min.
Fail to acquire standby source	1 min.	
Transfer, preferred to standby	3 sec.	
Transfer, standby to preferred	15 min.	
Transfer, off to standby	1 sec.	1 sec. - 60 min.
Transfer, off to preferred	1 sec.	
Fail to synchronize	60 sec.	10 sec - 15 min.
Auto load test termination after transfer	1 sec.	1 sec.- 60 min.
Load Control Time Delays:		
Pretransfer to preferred	0 sec.	0- 60 min.
Post-transfer to preferred	0 sec.	
Pretransfer to standby	0 sec.	
Post-transfer to standby	0 sec.	
Note: Time delays are adjustable in 1 second increments, except as noted.		
† Engine start time delay can be extended to 60 minutes with an External Battery Supply Module Kit.		

Accessory Modules

The mounting kit holds up to five optional modules.

Module Current Draw Specifications, mA	
Alarm Module	75
Standard I/O Module	75
High Power I/O Module	100
Maximum Total Current *	300
* If an External Battery Module is installed, there is no current restriction.	

❑ 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

❑ High-Power 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	3
Contact Type	Form C (SPDT)
Contact Voltage Rating	12 A @ 24 VDC 12 A @ 250 VAC 10 A @ 277 VAC 2 A @ 480 VAC
Connection Type	Terminal Strip
Wire Size	#14- 24 AWG
Environmental Specifications	
Temperature	- 40°C to 85°C (- 40°F to 185°F)
Humidity	35% to 85% noncondensing

❑ Alarm Module

- 90 dB Audible alarm
- Any alarm function can be programmed to trigger the audible alarm
- Chicago alarm function
- Preferred source selection
- Supervised transfer control (supervised transfer control switch required)
- Connection for external alarm

External Alarm Connection Specifications	
Wire Size	#12- 22 AWG Cu
Contact Voltage Rating	500 mA @ 120 VAC
	250 mA @ 240 VAC

❑ External Battery Supply Module

- Energizes the ATS controls using an external battery when no source power is available
- Allows extended engine start time delays
- Allows the use of any combination of accessory modules (no current draw restriction, maximum of five modules total)
- Connects to one or two batteries, 12 VDC or 24 VDC system
- Current draw, 140 mA @ 12 VDC, 86 mA @ 24 VDC
- Provides low external battery voltage indication to the transfer switch controller
- Reverse-polarity protected

Other Controller Accessories

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

❑ Controller Disconnect Switch

- Disconnects power to the controller without disconnecting the load
- Mounts inside the enclosure

❑ Current Sensing Kit

- Monitor current on all phases with 1% accuracy

❑ Digital Meter

- Measure and display voltage, current, frequency, and power
- 35 programmable alarms
- LCD display, 67 x 62.5 mm (2.65 x 2.5 in.)
- Pushbutton operation
- Password- protected programming menus
- Two digital inputs
- Two digital outputs
- Two Form A relay outputs
- Serial port for optional network connections
- Data logging
- Factory- installed

❑ Ethernet Communications

- RJ-45 connector
- Supports Internet Protocol version 4 (IPv4)
- Supports Modbus TCP/IP protocol

❑ Load Shed Kit

- Forced transfer from Emergency to OFF for programmed-transition and closed-transition models
- Customer-supplied signal (contact closure) is required for the forced transfer to OFF function
- Factory-installed and loose kits available for models KCC and KCP
- Factory-installed only for other programmed-transition and closed-transition models

❑ Padlockable User Interface Cover

- Provides additional protection against unauthorized access
- Cover standard on NEMA 3R enclosures

❑ RSA III Remote Serial Annunciator

- Monitors the generator set
- Monitors ATS common alarm, Normal source, and Emergency source status and connection
- Allows remote testing of the ATS
- For more information about RSA III features and functions, see specification sheet G6- 139

❑ Supervised Transfer Control Switch

- Standard on models with non-automatic controls
- Optional for models with automatic controls
- Auto, manual, and transfer positions
- Automatic and non-automatic modes
- Alarm module required

Supervised Transfer Control Switch Operation for Automatic and Non-Automatic Transfer Switches

Switch Position	Automatic Switches	Non-Automatic Switches
AUTO	• Automatically transfers to the standby source, when available, if the preferred source is lost. • Transfers back to the preferred source when it becomes available.	
MANUAL	• Automatically transfers to an available source if the connected source is lost. • Test, peak shave, and loaded exercise commands will transfer to the standby source. • Does not automatically transfer back to preferred when both sources are available.	• Does not automatically transfer to an available source when the connected source is lost. • Test, peak shave, and loaded exercise commands are ignored. • Does not automatically transfer back to preferred when both sources are available. • Transfers only when the switch is manually moved to the TRANSFER position as described below.
TRANSFER (momentary switch position)	• Does not initiate an engine start sequence. Generator set engine must be signalled to start by an event such as a loss of utility, loaded test, loaded exercise, etc. • Allows transfer to the other source, if available. An event such as a loss of utility, loaded exercise, or loaded test must first initiate the transfer sequence. • Time delays will operate. Wait for time delays to expire, or press the End Time Delay button. • Operates pre- and post-transfer load control time delays if both sources are available. • MANUAL TRANSFER is displayed when the ATS is ready to transfer.	

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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

Main Board I/O Specifications	
Output contact type	Isolated form C (SPDT)
Output contact rating	1 amp @ 30 VDC, 500 mA @120 VAC
I/O terminals wire size	#12-24 AWG

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KOHLER®

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED

Transfer Switch Standard Features

- UL 1008 listed file #E58962 (automatic), #E86894 (non automatic)
- CSA certification available
- IBC seismic cerfiticaion available
- Available in 2, 3, or 4 pole configurations
- Electrically operated, mechanically held mechanism
- High withstand amd 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 (800-1200 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 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

Weights and Dimensions

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

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 to 4/0 AWG	(3) #14 to 4/0 AWG	(3) #6 to 3/0 AWG
* Use 75 degrees C minimum Cu/Al wire for power connections			

Withstand and Close-On Ratings (WCR)
Ratings Summary

The transfer switch is rated for use on a circuit capable of delivering not more than the RMS symmetrical amperes listed at the specified maximum voltage below, but no greater than the interrupt capacity of the selected circuit breaker or fuse. Circuit breakers and fuses are supplied by the customer.

	Withstand and Close-On Ratings (WCR) Standard, Programmed, and Closed-Transition Models									
	Current Limiting Fuses				Specific Coordinated Breaker			Time-Based Rating		
Switch Rating, Amps	Fuse Class	Max Amps	480 VAC	600 VAC	240 VAC	480 VAC	600 VAC	Time sec.	480 V Max.	600 V. Max
104	J	200	200000	35000	150000	85000	25000	0.025	10000	10000
104	RK1	200	35000	35000	150000	85000	25000	0.025	10000	10000

Ratings with Specific Manufacturer's Circuit Breaker

Withstand and close-on ratings (WCR) in RMS symmetrical amperes for specific manufacturers' circuit breakers.

Molded-Case Circuit Breakers					
Switch Rating, Amps	WCR, Amps, RMS	Voltage, Max.	Manufacturer	Type	Max. Size, Amps
104	150000	240	Square D	HR	250
104	125000	240	Square D	HL	150
104	100000	240	Square D	BJ, HJ	125
104	65000	240	Square D	BG, HG	125
104	42000	240	Square D	QG, QJ	125
104	25000	240	Square D	HD	150
104	25000	240	Square D	BD	125
104	22000	480	General Electric	THED	150
104	85000	480	Square D	HL, HR	150
104	50000	480	Square D	BJ	125
104	35000	480	Square D	HG, HJ	150
104	35000	480	Square D	BG	125
104	18000	480	Square D	BD, HD	125
104	25000	600	Square D	HJ, HL, HR	150
104	25000	600	Square D	BJ	125
104	18000	600	Square D	HG	150
104	18000	600	Square D	BG	125
104	14000	600	Square D	HD	150
104	14000	600	Square D	BD	125

Codes and Standards

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

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

Accessories

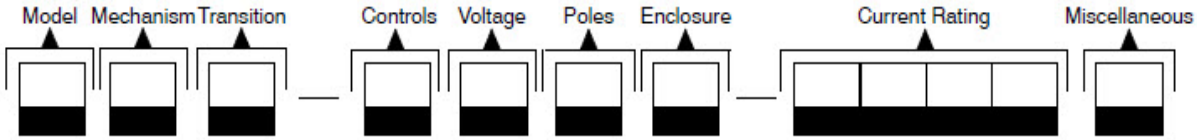
Accessories are available either factory-installed or as loose kits, unless otherwise noted.

Padlockable User Interface Cover

- With or without window
- Cover without window standard on NEMA 3R enclosures

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: KSS-AMTA-0400S

Model

K: Kohler

Mechanism

S: Standard (Specific Breaker)

Transition

S: Standard

Controller

A: Decision-Maker® MPAC 1200, Automatic

B: Decision-Maker® MPAC 1200, Non-Automatic

Voltage/Frequency

C:	208 Volts/60 Hz	K:	440 Volts/60 Hz
D:	220 Volts/50 Hz	M:	480 Volts/60 Hz
F:	240 Volts/60 Hz	N:	600 Volts/60 Hz
G:	380 Volts/50 Hz	P:	380 Volts/60 Hz
H:	400 Volts/50 Hz	R:	220 Volts/60 Hz
J:	416 Volts/50 Hz	S:	400 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	D:	NEMA 4
B:	NEMA 12	F:	NEMA 4X
C:	NEMA 3R	G:	Open Unit

Current, Amps

0030	0200	0600
0070	0230	0800
0104	0260	1000
0150	0400	1200

Connections

S: Standard

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

KOHLER®

Automatic Transfer Switch Controller

Decision-Maker® MPAC 1200

Model KCS with Decision-Maker® MPAC 1200 Controller

Applicable Models

Model	Description
KCS	Standard-Transition Any Breaker ATS ‡
KCP	Programmed-Transition Any Breaker ATS ‡
KCC	Closed-Transition Any Breaker ATS §
KSS	Standard-Transition Specific Breaker ATS ‡

‡ Available with automatic or non-automatic controller
§ Available with automatic controller only

Decision-Maker® MPAC 1200 Controller Standard Features

- Microprocessor-based controller
- Environmentally sealed user interface
- LCD display, 4 lines x 20 characters, backlit
- Dynamic function keypad with tactile feedback pushbuttons allows complete programming and viewing capability at the door
- LED indicators: Source available, transfer switch position, service required (fault), and not in auto
- Broadrange voltage sensing (208- 600 VAC) on all phases
- Phase-to-phase sensing and monitoring with 0.5% accuracy on both sources
- Line-to-neutral monitoring
- Frequency sensing with 0.5% accuracy on both sources
- Anti-single phasing protection
- Phase rotation sensing for three-phase systems
- Real-time clock with automatic adjust for daylight saving time and leap year
- Run time clock and operation counter
- Time-stamped event log
- Fail-safe transfer for loaded test and exercise functions
- DIP switches: password disable and maintenance
- Isolated RS-485 ports for Modbus connections (9.6, 19.2, and 57.6 kbps)
- Modbus® RTU protocol (Modbus register map available)
- USB port. Connect a personal computer and use Kohler® SiteTech™ software to view events and adjust settings. *
- Available in automatic and non-automatic versions; see supervised transfer control switch on page 5

Programmable Features

- Programming and monitoring methods:
  - Monitoring and password-protected programming at the door using the keypad and display
  - Program using a PC with Kohler® SiteTech™ software (available to Kohler-authorized distributors and dealers)
- Over/undervoltage for all phases of the normal and emergency sources
- Over/underfrequency for the emergency source
- Adjustable time delays
- Load/no load/auto-load test and load/no-load exercise functions
- Programmable inputs and outputs
- Load bank control for exercise or test
- Time-based load control, nine individual time delays for selected loads
- In-phase monitor (3-phase only)
- Password protection, three security levels
- See pages 2 and 3 for additional programmable features

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

Modbus is a registered trademark of Schneider Electric.

Decision-Maker® MPAC 1200 Controller Features

User Interface LED Indicators

- Contactor position: source N and source E
- Source available: source N and source E
- Service required (fault indication)
- Not in automatic mode

LCD Display

- System status
- Line-to-line voltage
- Line-to-neutral voltage
- Active time delays
- Source frequency
- Preferred source selection
- System settings
- Common alarms
- Load current, each phase (current sensing kit required)
- Inputs and outputs
- Faults
- Time/date
- Address
- Event history
- Maintenance records
- Exerciser schedule
- Exerciser mode
- Time remaining on active exercise

Dynamic Function Tactile Keypad Operations

- Scroll up/down/forward/back
- Increase/decrease/save settings
- End time delay
- Start/end test or exercise
- Reset fault
- Lamp test

DIP Switches

- Maintenance mode
- Password disable

Event History

- View time and date-stamped events on the display or on a personal computer equipped with Kohler® SiteTech™ software. *****
- Download complete event history files using Kohler SiteTech software and a PC connected to the USB port. *****

Main Logic Board Inputs and Outputs

- Two (2) programmable inputs
- Two (2) programmable outputs

Communications

- Optional Ethernet communications with RJ45 connector for 10/100 Ethernet connection
- Isolated RS-485 ports for Modbus communications
- Modbus® RTU and Modbus® TCP/IP protocols (Modbus® register map available)
- USB Port. Use SiteTech software to upload or download files and adjust transfer switch settings *****
  - Application software
  - Event history files
  - Language files
  - Parameter settings
  - Usage reports
  - Feature configuration

Programmable Features

- System voltage, 208- 600 VAC †
- System frequency, 50/60 Hz †
- Single/three-phase operation †
- Standard/programmed/closed-transition operation †
- Preferred source selection allows the normal or emergency source to be used when both sources are available (alarm module required)
- Phase rotation: ABC/BAC/none selection with error detection
- Overvoltage and undervoltage pickup and dropout settings, both sources
- Overfrequency and underfrequency pickup and dropout settings, Emergency source
- Voltage unbalance, enable/disable
- In-phase monitor: enable/disable and phase angle
- Transfer commit/no commit
- Passwords, system and test
- Time, date, automatic daylight saving time enable/disable
- Time delays (see table)
- Exerciser: calendar mode, loaded/unloaded up to 21 events
- Test: loaded/unloaded/auto load (1- 60 minutes)
- Remote test: loaded/unloaded
- Automatic override on generator failure (loaded test and exercise)
- Peak shave delay enable/disable
- Current monitoring (current sensing kit required)
- Load control pre/post-transfer delays, 9 individual time delays for selected loads
- Resettable historical data

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

† System parameters are factory-set per order.

Modbus is a registered trademark of Schneider Electric.

Decision-Maker® MPAC 1200 Controller Features, Continued

Programmable Inputs

- Forced transfer to OFF (programmed-transition models only; requires load shed accessory)
- Inhibit transfer
- Low battery voltage (external battery supply module required)
- Peak shave/area protection input
- Remote common fault
- Remote test
- Remote end time delay
- Remotely monitored inputs, four (4) available

Programmable Outputs

- Alarm silenced
- Audible alarm
- Chicago alarm control
- Common alarm events
- Contactor position
- Exercise active
- Failure to acquire standby source
- Failure to transfer
- Generator engine start, source E
- I/O module faults
- In-phase monitor synch
- Load bank control
- Load control active (pre/post transfer delay, up to 9 outputs)
- Loss of phase fault, source N and E
- Low battery fault (external battery supply module required)
- Maintenance mode
- Non-emergency transfer
- Not in automatic mode
- Over/undervoltage faults, source N and E
- Peak shave/area protection active
- Phase rotation error, source N and E
- Preferred source supplying load
- Software-controlled relay outputs (four maximum)
- Source available, preferred and standby
- Standby source supplying load
- Test active
- Transfer switch auxiliary contact fault
- Transfer switch auxiliary contact open
- Voltage unbalance, source N and E

Voltage and Frequency Sensing		
Parameter	**Default**	**Adjustment Range**
Undervoltage dropout	90% of pickup	75%- 98%
Undervoltage pickup	90% of nominal	85%- 100%
Overvoltage dropout *	115% of nominal*	106%- 135%
Overvoltage pickup	95% of dropout	95%- 100%
Unbalance enable	Disable	Enable/Disable
Unbalance dropout	20%	5%- 20%
Unbalance pickup	10%	3%- 18%
Voltage dropout time	0.5 sec.	0.1- 9.9 sec.
Underfrequency dropout †	99% of pickup	95%- 99%
Underfrequency pickup †	90% of nominal	80%- 95%
Overfrequency dropout †	101% of pickup	101%- 115%
Overfrequency pickup †	110% of nominal	105%- 120%
Frequency dropout time †	3 sec.	0.1- 15 sec.
* 690 volts, maximum. Default = 110% for 600 volt applications.		
† Emergency source only		

Adjustable Time Delays		
Time Delay	**Default**	**Adjustment Range**
Engine start	3 sec.	0- 6 sec. †
Engine cooldown	5 min.	0- 60 min.
Fail to acquire standby source	1 min.	
Transfer, preferred to standby	3 sec.	
Transfer, standby to preferred	15 min.	
Transfer, off to standby	1 sec.	1 sec. - 60 min.
Transfer, off to preferred	1 sec.	
Fail to synchronize	60 sec.	10 sec - 15 min.
Auto load test termination after transfer	1 sec.	1 sec.- 60 min.
Load Control Time Delays:		
Pretransfer to preferred	0 sec.	0- 60 min.
Post-transfer to preferred	0 sec.	
Pretransfer to standby	0 sec.	
Post-transfer to standby	0 sec.	
Note: Time delays are adjustable in 1 second increments, except as noted.		
† Engine start time delay can be extended to 60 minutes with an External Battery Supply Module Kit.		

Accessory Modules

The mounting kit holds up to five optional modules.

Module Current Draw Specifications, mA	
Alarm Module	75
Standard I/O Module	75
High Power I/O Module	100
Maximum Total Current *	300
* If an External Battery Module is installed, there is no current restriction.	

❑ 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

❑ High-Power 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	3
Contact Type	Form C (SPDT)
Contact Voltage Rating	12 A @ 24 VDC 12 A @ 250 VAC 10 A @ 277 VAC 2 A @ 480 VAC
Connection Type	Terminal Strip
Wire Size	#14- 24 AWG
Environmental Specifications	
Temperature	- 40°C to 85°C (- 40°F to 185°F)
Humidity	35% to 85% noncondensing

❑ Alarm Module

- 90 dB Audible alarm
- Any alarm function can be programmed to trigger the audible alarm
- Chicago alarm function
- Preferred source selection
- Supervised transfer control (supervised transfer control switch required)
- Connection for external alarm

External Alarm Connection Specifications	
Wire Size	#12- 22 AWG Cu
Contact Voltage Rating	500 mA @ 120 VAC
	250 mA @ 240 VAC

❑ External Battery Supply Module

- Energizes the ATS controls using an external battery when no source power is available
- Allows extended engine start time delays
- Allows the use of any combination of accessory modules (no current draw restriction, maximum of five modules total)
- Connects to one or two batteries, 12 VDC or 24 VDC system
- Current draw, 140 mA @ 12 VDC, 86 mA @ 24 VDC
- Provides low external battery voltage indication to the transfer switch controller
- Reverse-polarity protected

Other Controller Accessories

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

❑ Controller Disconnect Switch

- Disconnects power to the controller without disconnecting the load
- Mounts inside the enclosure

❑ Current Sensing Kit

- Monitor current on all phases with 1% accuracy

❑ Digital Meter

- Measure and display voltage, current, frequency, and power
- 35 programmable alarms
- LCD display, 67 x 62.5 mm (2.65 x 2.5 in.)
- Pushbutton operation
- Password- protected programming menus
- Two digital inputs
- Two digital outputs
- Two Form A relay outputs
- Serial port for optional network connections
- Data logging
- Factory- installed

❑ Ethernet Communications

- RJ-45 connector
- Supports Internet Protocol version 4 (IPv4)
- Supports Modbus TCP/IP protocol

❑ Load Shed Kit

- Forced transfer from Emergency to OFF for programmed-transition and closed-transition models
- Customer-supplied signal (contact closure) is required for the forced transfer to OFF function
- Factory-installed and loose kits available for models KCC and KCP
- Factory-installed only for other programmed-transition and closed-transition models

❑ Padlockable User Interface Cover

- Provides additional protection against unauthorized access
- Cover standard on NEMA 3R enclosures

❑ RSA III Remote Serial Annunciator

- Monitors the generator set
- Monitors ATS common alarm, Normal source, and Emergency source status and connection
- Allows remote testing of the ATS
- For more information about RSA III features and functions, see specification sheet G6- 139

❑ Supervised Transfer Control Switch

- Standard on models with non-automatic controls
- Optional for models with automatic controls
- Auto, manual, and transfer positions
- Automatic and non-automatic modes
- Alarm module required

Supervised Transfer Control Switch Operation for Automatic and Non-Automatic Transfer Switches

Switch Position	Automatic Switches	Non-Automatic Switches
AUTO	• Automatically transfers to the standby source, when available, if the preferred source is lost. • Transfers back to the preferred source when it becomes available.	
MANUAL	• Automatically transfers to an available source if the connected source is lost. • Test, peak shave, and loaded exercise commands will transfer to the standby source. • Does not automatically transfer back to preferred when both sources are available.	• Does not automatically transfer to an available source when the connected source is lost. • Test, peak shave, and loaded exercise commands are ignored. • Does not automatically transfer back to preferred when both sources are available. • Transfers only when the switch is manually moved to the TRANSFER position as described below.
TRANSFER (momentary switch position)	• Does not initiate an engine start sequence. Generator set engine must be signalled to start by an event such as a loss of utility, loaded test, loaded exercise, etc. • Allows transfer to the other source, if available. An event such as a loss of utility, loaded exercise, or loaded test must first initiate the transfer sequence. • Time delays will operate. Wait for time delays to expire, or press the End Time Delay button. • Operates pre- and post-transfer load control time delays if both sources are available. • MANUAL TRANSFER is displayed when the ATS is ready to transfer.	

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

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

Main Board I/O Specifications	
Output contact type	Isolated form C (SPDT)
Output contact rating	1 amp @ 30 VDC, 500 mA @120 VAC
I/O terminals wire size	#12-24 AWG

DISTRIBUTED BY:

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Alternator Data

TECHNICAL INFORMATION BULLETIN

Alternator Data Sheet

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

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

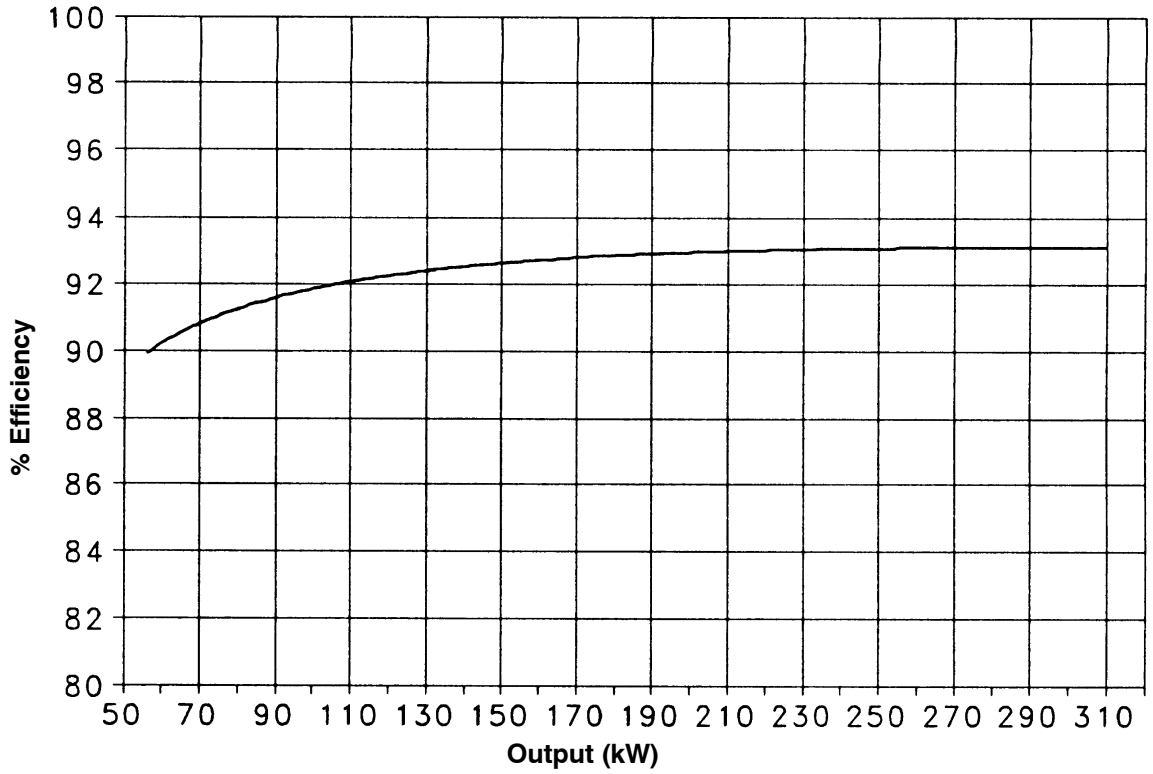
* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

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

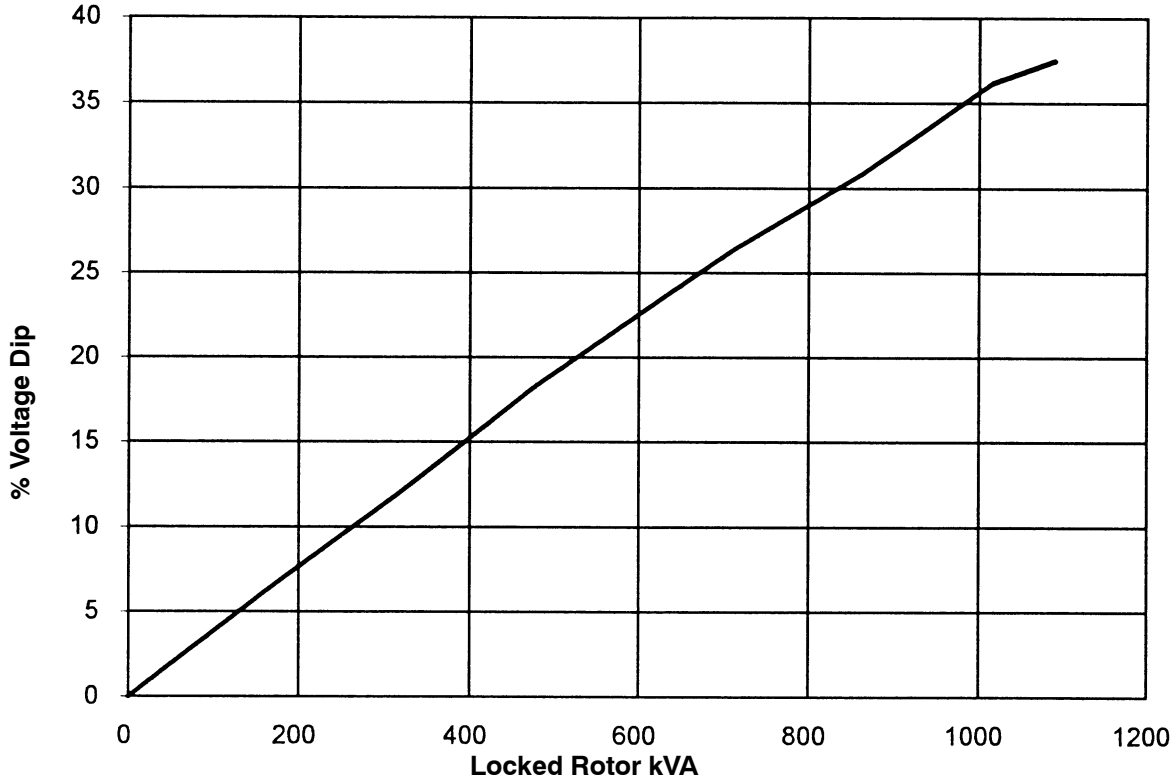
	Symbol	Per Unit	Ohms
Typical Resistances			
Phase Resistance		0.020	0.003
Rotor Resistance		13.854	2.128
Typical Reactances			
Synchronous			
Direct	X_d	3.417	0.525
Quadrature	X_q	1.178	0.273
Transient			
Unsaturated	X'_{du}	0.328	0.050
Saturated	X'_d	0.289	0.044
Subtransient			
Direct	X''_d	0.133	0.020
Quadrature	X''_q	0.139	0.021
Negative Sequence	X_2	0.136	0.021
Zero Sequence	X_0	0.011	0.002

	Symbol	Value
Typical Time Constants		
Armature Short Circuit	T_a	0.018 sec.
Transient Short Circuit	T'_d	0.185 sec.
Transient Open Circuit	T'_{do}	2.184 sec.
Typical Field Current		
Full Load	If_{FL}	29.57 amps
No Load	If_{NL}	8.3 amps
Typical Short Circuit Ratio		0.391
Harmonic Distortion		
RMS Total Harmonic Distortion		2.7%
Max. Single Harmonic		7^{th}
Deviation Factor (No Load, L-L)		4.3%
Telephone Influence Factor		<50
Insulation Material Class per NEMA MG1-1.66		H
Phase Rotation		ABC

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

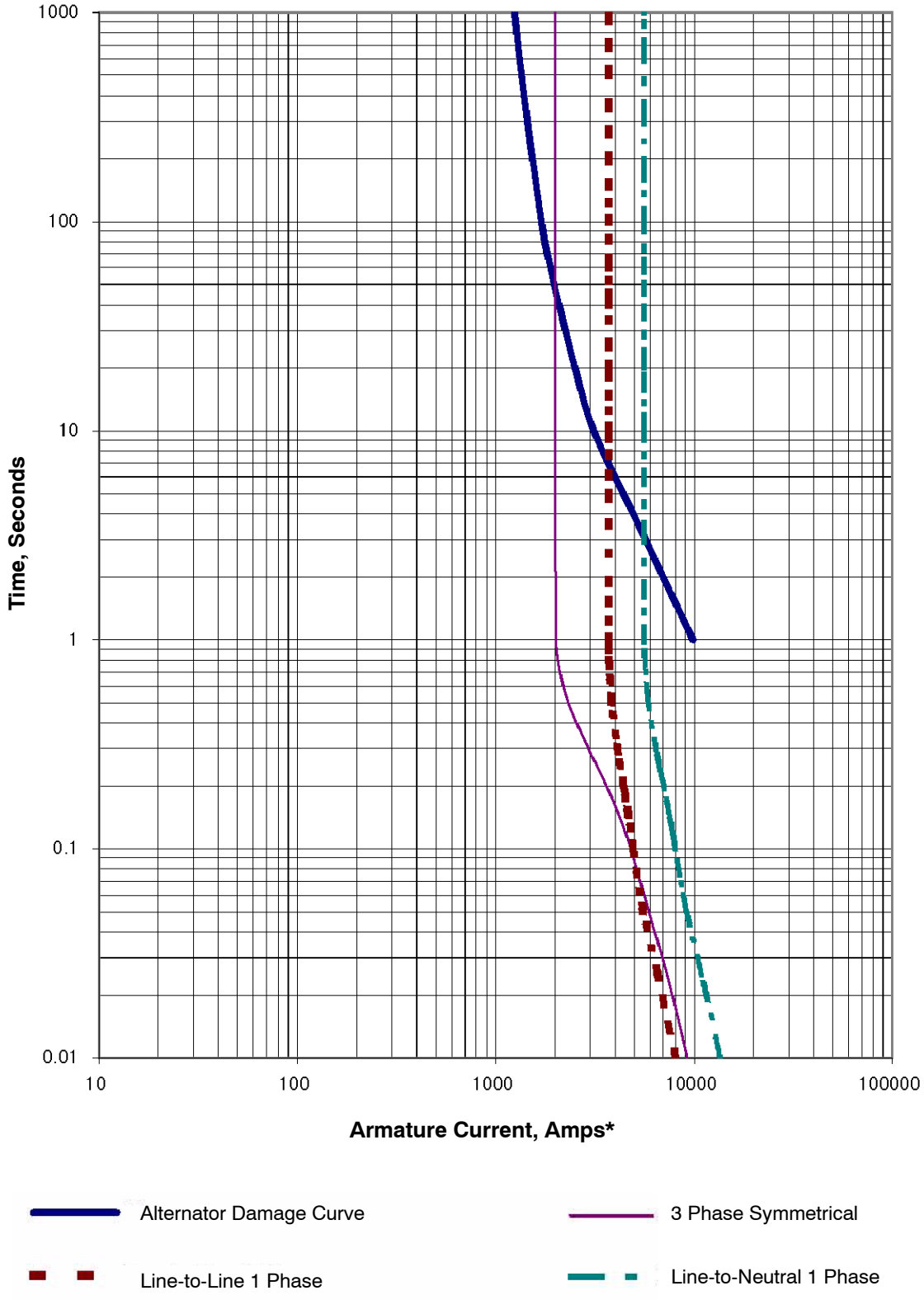


4UA13, 60 Hz, 139/240, 277/480 Volts, Wye
TYPICAL MOTOR STARTING CHARACTERISTICS*



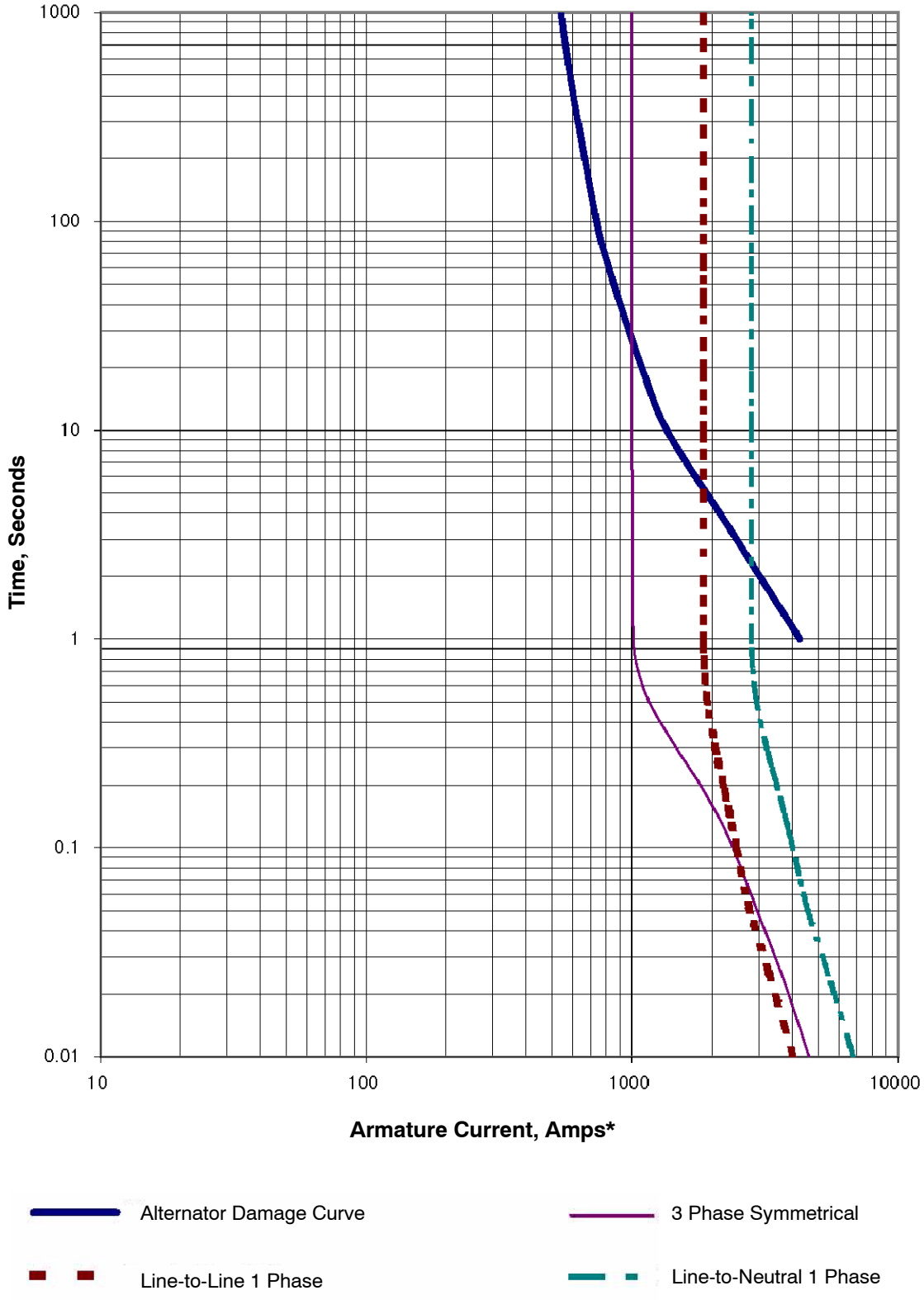
* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

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



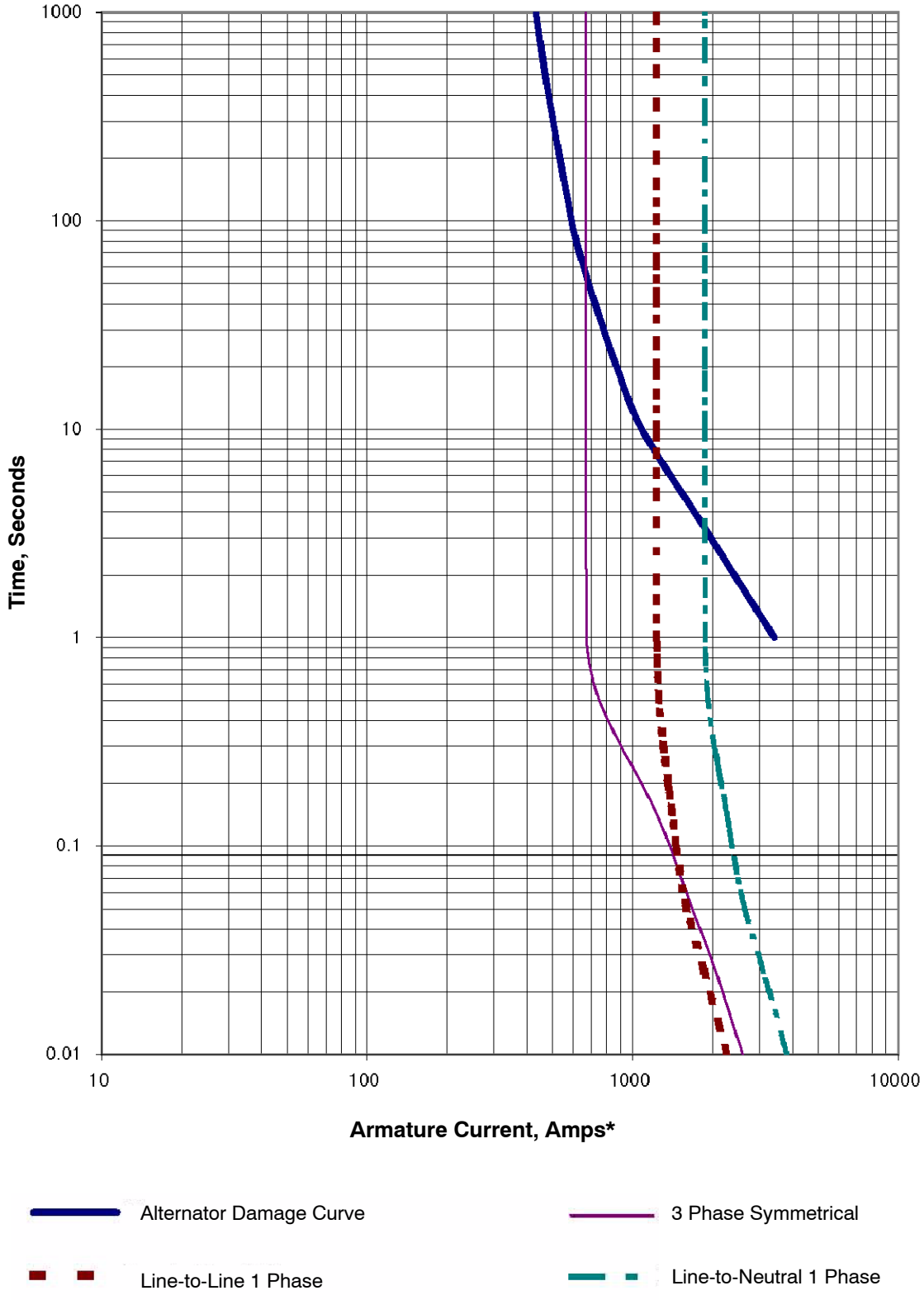
* Instantaneous current (t=0) is asymmetric. Divide by 1.732 for symmetric.

4UA13, 60 Hz, High Wye Connection
SHORT CIRCUIT DECREMENT CURVE



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

4UA13, 60 Hz, 600 V Connection
SHORT CIRCUIT DECREMENT CURVE



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

KOHLER®

Cooling Data

TECHNICAL INFORMATION BULLETIN

Generator Set Cooling System Data Sheet

250REOZJE 60Hz (Standby Duty)	**50°C Ambient Temperature Cooling System**								
	Total external restriction on open unit[7]	Pa *(in.H_2O)*	0 (0)	125 (0.5)	187 (0.75)	250 (1)	312 (1.25)	375 (1.5)	**Enclosed Units**
	Maximum allowable ambient temperature	°C *(°F)*	54 (129)	51 (124)	49 (120)	48 (118)	47 (117)	NA (NA)	48 (118)
	Cooling system airflow	m^3/min *(ft^3/min)*	396 (14000)	372 (13100)	360 (12700)	347 (12300)	335 (11800)	NA (NA)	NA (NA)

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

KOHLER®

Sound Data

TECHNICAL INFORMATION BULLETIN

Generator Set Sound Data Sheet

			Sound Pressure Data in dB(A)			
Generator Set Model	**Hz**	**Load**	**Raw Exhaust**	**Open Unit, Isolated Exhaust**	**Weather Enclosure**	**Sound Enclosure**
250REOZJE	60	100% Load	116.5	91.7	89.8	75.2
		No Load	101.7	84.9	83.0	67.1
Note: Sound pressure data is the logarithmic average of eight perimeter measurement points at a distance of 7 m (23 ft.), except Raw Exhaust data which is a single measurement point at 1 m (3.3 ft.) from the mouth of a straight pipe exhaust.						

250REOZJE	**60 Hz**

				Sound Pressure Levels dB(A)								
				Octave Band Center Frequency (Hz)								Overall Level
Load	Distance, m (ft.)	Enclosure	Measurement Position	63	125	250	500	1000	2000	4000	8000	
100% Load	7 (23)	Sound	Right	62.7	67.4	67.2	71.8	65.1	60.2	59.3	56.4	75.2
			Front-Right	59.4	66.4	70.6	63.6	66.5	63.2	56.6	53.6	74.2
			Front	61.5	64.9	66.1	70.9	65.0	61.2	58.4	54.1	74.2
			Front-Left	63.0	66.7	67.4	72.2	66.4	62.1	57.4	57.0	75.6
			Left	63.2	67.4	66.8	73.3	66.3	63.2	58.7	61.0	74.8
			Back-Left	61.5	65.4	64.4	71.7	65.2	64.5	59.4	57.4	76.3
			Back	63.9	68.9	67.2	72.7	64.2	64.1	61.6	62.1	74.8
			Back-Right	58.4	64.8	66.5	71.2	66.3	64.7	60.0	55.1	76.3
			8-pos. log avg.	62.0	66.7	67.4	71.6	65.7	63.2	59.2	58.1	75.2

				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	88.8	87.2	86.3	91.1	91.9	89.3	82.9	93.1	89.8

				Sound Pressure Levels dB(A)								
				Octave Band Center Frequency (Hz)								Overall Level
Load	Distance, m (ft.)		Measurement Position	63	125	250	500	1000	2000	4000	8000	
100% Load	7 (23)	Open Unit, Isolated Exhaust	Right	60.1	67.5	74.1	74.8	83.3	82.7	79.9	87.8	90.7
			Front-Right	57.0	69.4	75.1	81.6	82.6	83.2	80.4	81.0	89.1
			Front	60.1	70.4	76.6	79.8	83.4	82.4	78.3	76.4	88.2
			Front-Left	68.5	74.9	78.7	83.3	86.4	86.8	82.9	87.2	93.0
			Left	70.1	74.7	77.3	83.1	88.0	88.8	83.3	86.8	93.8
			Back-Left	66.1	74.1	75.6	77.5	84.4	84.6	82.4	86.0	91.2
			Back	62.0	66.4	72.8	76.0	78.6	78.2	76.2	77.2	84.8
			Back-Right	61.7	70.2	74.8	76.3	81.6	82.8	79.2	87.8	95.0
			8-pos. log avg.	65.3	72.0	76.0	80.1	84.3	84.7	80.9	85.5	91.7

			Sound Pressure Levels dB(A)								
			Octave Band Center Frequency (Hz)								Overall Level
Load	Distance, m (ft.)	Exhaust	63	125	250	500	1000	2000	4000	8000	
100% Load	1 (3.3)	Raw Exhaust (No Silencer)	88.8	98.5	105.4	110.5	107.1	109.1	109.7	107.0	116.5

250REOZJE	60 Hz

Load	Distance, m (ft.)	Enclosure	Measurement Position	Sound Pressure Levels dB(A)								
				Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
No Load	7 (23)	Sound	Right	49.3	55.7	58.3	62.5	61.1	54.5	50.0	42.1	66.6
			Front-Right	44.0	58.7	64.2	58.5	60.4	57.0	49.8	40.6	67.7
			Front	48.0	54.5	61.0	62.3	60.3	55.0	50.8	41.5	66.8
			Front-Left	48.9	56.4	60.1	63.9	61.9	56.0	48.6	40.1	67.8
			Left	48.1	56.3	59.3	62.3	61.3	54.9	47.9	43.7	66.8
			Back-Left	48.3	55.7	56.3	60.3	59.9	56.2	49.4	41.1	65.4
			Back	51.4	63.0	63.9	59.6	59.5	58.3	56.2	48.2	68.8
			Back-Right	49.7	59.2	56.1	60.1	60.3	57.3	50.8	40.8	66.1
			8-pos. log avg.	48.9	58.3	60.8	61.5	60.6	56.3	51.3	43.2	67.1

Load	Distance, m (ft.)	Enclosure	Measurement Position	Sound Pressure Levels dB(A)								
				Right	Front-Right	Front	Front-Left	Left	Back-Left	Back	Back-Right	8-pos. log avg.
No Load	7 (23)	Weather	Overall Levels	82.8	84.5	81.1	85.2	83.0	83.3	78.6	82.5	83.0

Load	Distance, m (ft.)		Measurement Position	Sound Pressure Levels dB(A)								
				Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
No Load	7 (23)	Open Unit, Isolated Exhaust	Right	52.3	62.8	71.1	72.9	81.3	79.2	75.6	67.9	84.7
			Front-Right	49.1	63.9	73.1	79.7	81.3	80.9	77.0	69.4	86.4
			Front	50.6	64.4	72.7	73.4	78.9	77.6	72.3	64.6	83.0
			Front-Left	53.4	66.5	73.6	76.1	83.6	81.8	77.1	70.4	87.1
			Left	57.0	65.0	72.1	73.9	81.2	79.8	75.0	68.1	84.9
			Back-Left	56.6	67.7	70.9	72.0	81.9	79.8	75.4	67.7	85.2
			Back	53.7	65.1	68.2	71.2	77.2	72.1	72.9	59.7	80.5
			Back-Right	52.7	65.6	71.9	75.1	80.0	79.1	75.4	67.7	84.4
			8-pos. log avg.	53.9	65.4	72.0	75.1	81.0	79.5	75.4	67.8	84.9

Load	Distance, m (ft.)	Exhaust	Sound Pressure Levels dB(A)								
			Octave Band Center Frequency (Hz)								Overall Level
			63	125	250	500	1000	2000	4000	8000	
No Load	1 (3.3)	Raw Exhaust (No Silencer)	75.4	83.4	89.2	94.3	95.7	95.9	94.5	88.4	101.7

KOHLER®

Emissions Data

KOHLER®

250REOZJE

60 HZ. DIESEL INDUSTRIAL GENERATOR SET
EMISSION DATA SHEET

ENGINE INFORMATION

Model:	John Deere, 6090HF484B	Bore:	118.4mm (4.66 in.)
Nameplate BHP @ 1800 RPM:	385	Stroke:	136mm (5.35 in.)
Type:	4-Cycle, 6 Cylinder, Inline	Displacement:	9.0 L (548 cu. in.)
Aspiration:	Turbocharged, Charge Air-Cooled		
Compression Ratio	16.0:1	EPA Family:	PJDXL09.0114
		EPA Certificate:	PJDXL09.0114-011

Table 1

PERFORMANCE DATA:	1/4 Standby	1/2 Standby	3/4 Standby	Full Standby
Engine bkW @ Stated Load	72	144	215	287
Fuel Consumption (g/kWh)	247	248	232	200
Exhaust Gas Flow (m^3/min)				54
Exhaust Temperature (°C)				625

Table 2

EXHAUST EMISSION DATA:	EPA D2 Cycle 5-mode weighted
HC (Total Unburned Hydrocarbons)	0.05
NOx (Oxides of Nitrogen as NO2)	3.80
CO (Carbon Monoxide)	0.9
PM (Particulate Matter)	0.11

Values are in g/kWh unless otherwise noted

TEST METHODS AND CONDITIONS

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

Data and specifications subject to change without notice.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2023 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Deere & Company**
(U.S. Manufacturer or Importer)

Certificate Number: **PJDXL09.0114-011**

Effective Date: 06/16/2022

Expiration Date: 12/31/2023

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 06/16/2022

Revision Date: N/A

Model Year: 2023
Manufacturer Type: Original Engine Manufacturer
Engine Family: PJDXL09.0114

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 225<=kW<450
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Smoke Puff Limiter, Engine Design Modification, Non-standard Non-After Treatment Device Installed

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

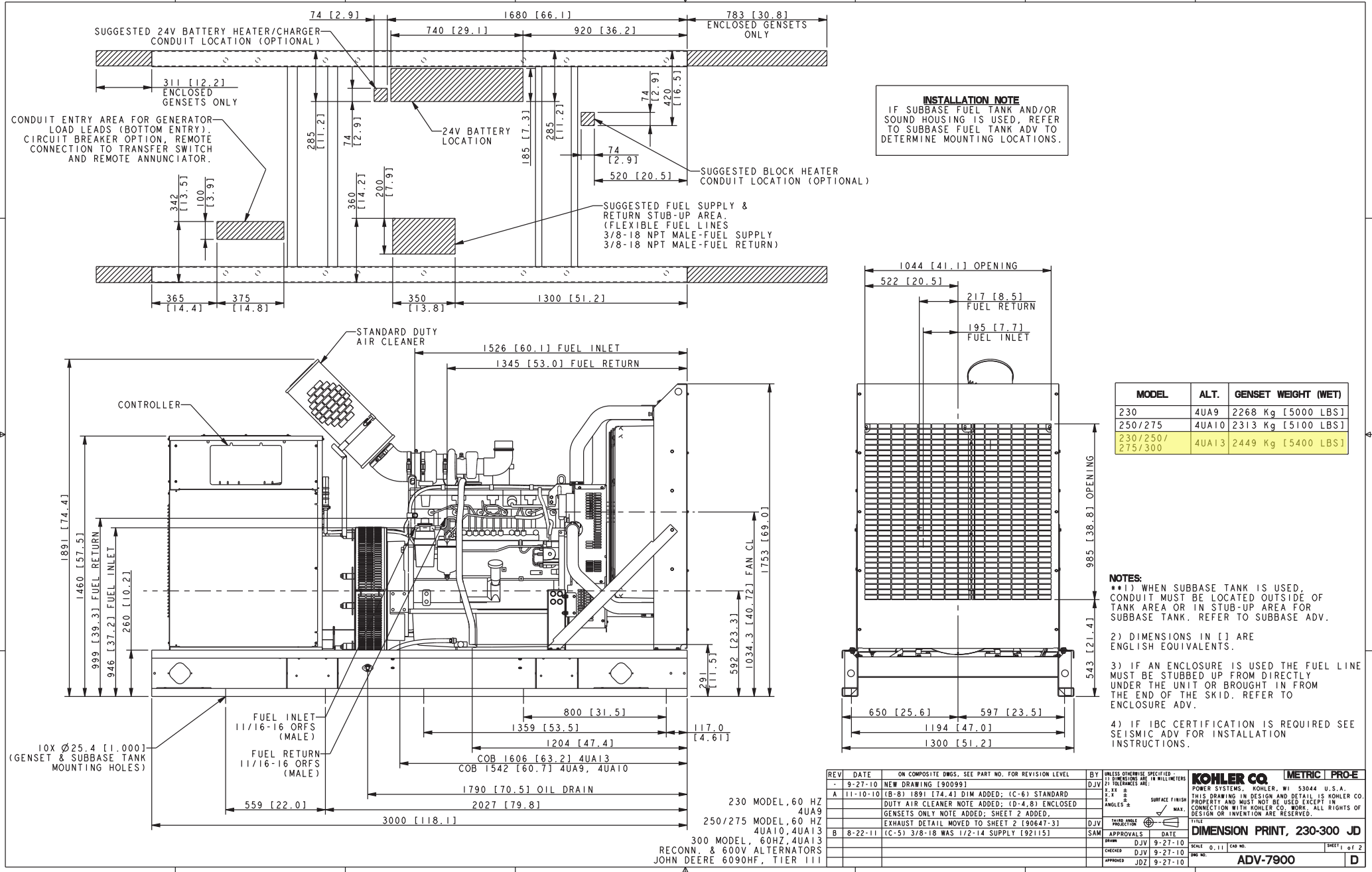
This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate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

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

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

KOHLER®

Dimensional Drawings



MODEL	ALT.	GENSET WEIGHT (WET)
230	4UA9	2268 Kg [5000 LBS]
250/275	4UA10	2313 Kg [5100 LBS]
230/250/275/300	4UA13	2449 Kg [5400 LBS]

NOTES:

**1) WHEN SUBBASE TANK IS USED, CONDUIT MUST BE LOCATED OUTSIDE OF TANK AREA OR IN STUB-UP AREA FOR SUBBASE TANK. REFER TO SUBBASE ADV.

2) DIMENSIONS IN [] ARE ENGLISH EQUIVALENTS.

3) IF AN ENCLOSURE IS USED THE FUEL LINE MUST BE STUBBED UP FROM DIRECTLY UNDER THE UNIT OR BROUGHT IN FROM THE END OF THE SKID. REFER TO ENCLOSURE ADV.

4) IF IBC CERTIFICATION IS REQUIRED SEE SEISMIC ADV FOR INSTALLATION INSTRUCTIONS.

230 MODEL,60 HZ 4UA9
250/275 MODEL,60 HZ 4UA10,4UA13
300 MODEL, 60HZ,4UA13
RECONN. & 600V ALTERNATORS
JOHN DEERE 6090HF, TIER III

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	9-27-10	NEW DRAWING [90099]	DJV
A	11-10-10	(B-8) 1891 [74.4] DIM ADDED; (C-6) STANDARD DUTY AIR CLEANER NOTE ADDED; (D-4,8) ENCLOSED GENSETS ONLY NOTE ADDED; SHEET 2 ADDED, EXHAUST DETAIL MOVED TO SHEET 2 [90647-3]	DJV
B	8-22-11	(C-5) 3/8-18 WAS 1/2-14 SUPPLY [92115]	SAM

UNLESS OTHERWISE SPECIFIED: 1) DIMENSIONS ARE IN MILLIMETERS 2) TOLERANCES ARE: X.XX ±, X.X ±, ANGLES ±. SURFACE FINISH MAX. THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN DJV	9-27-10
CHECKED DJV	9-27-10
APPROVED JDZ	9-27-10

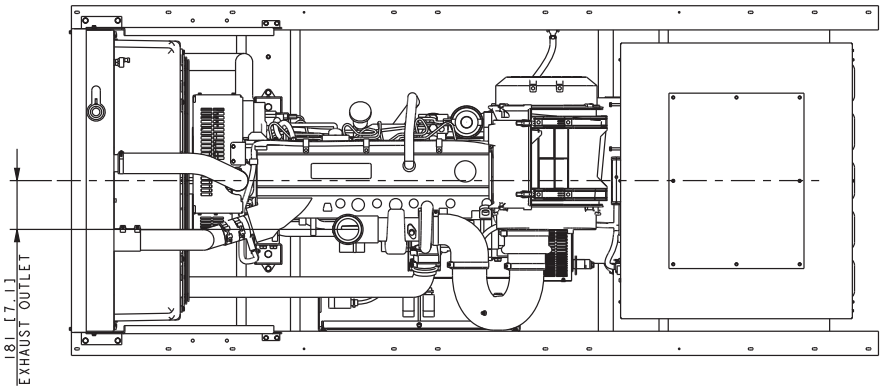
KOHLER CO. METRIC | PRO-E

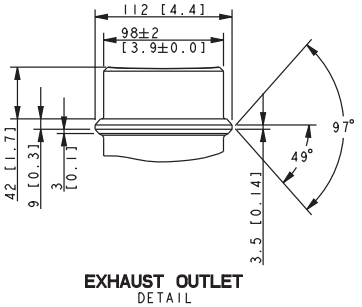
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE: DIMENSION PRINT, 230-300 JD

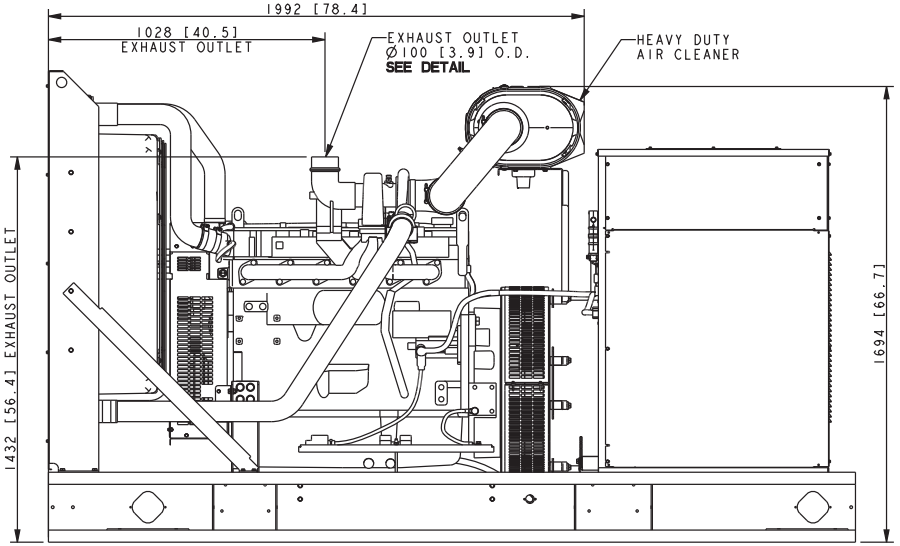
SCALE 0.11 | CAD NO. | SHEET 1 of 2

DWG NO. ADV-7900 | D





EXHAUST OUTLET
DETAIL



REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
A	11-10-10	SHEET 2 ADDED [90647-3]	DJV
B	8-22-11	SEE SHEET 1 [92115]	SAM

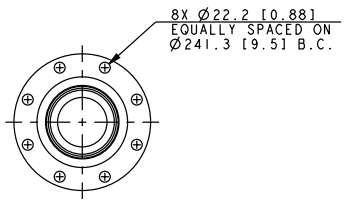
UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X .XX ±
X.X ±
X ±
ANGLES ±
SURFACE FINISH MAX.
THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	DJV	11-10-10
CHECKED	DJV	11-10-10
APPROVED	JDZ	11-10-10

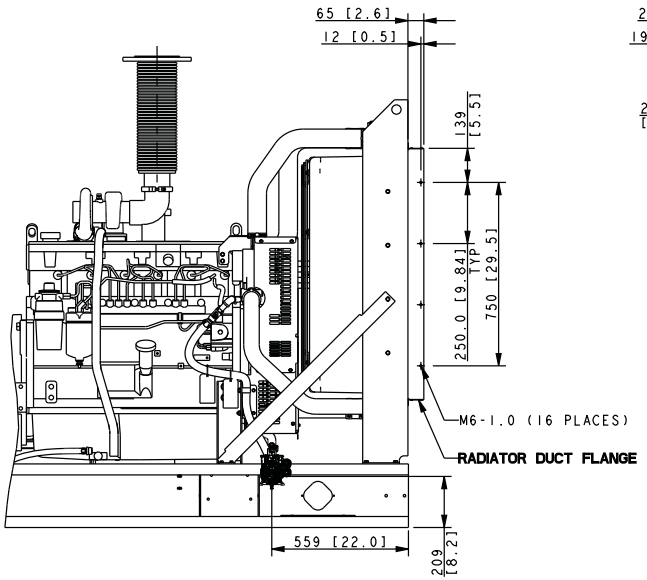
TITLE
DIMENSION PRINT, 230-300 JD

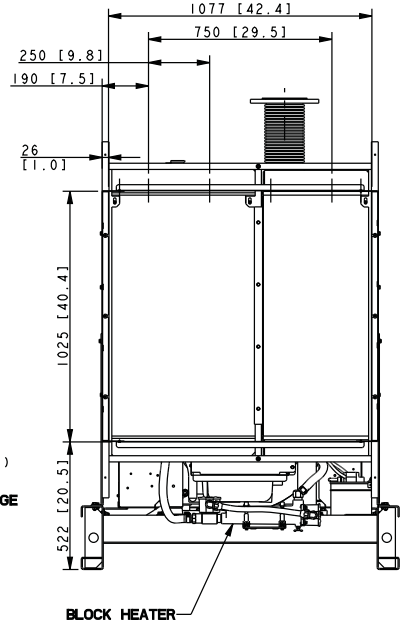
SCALE 0.11 | CAD NO. | SHEET 2 of 2

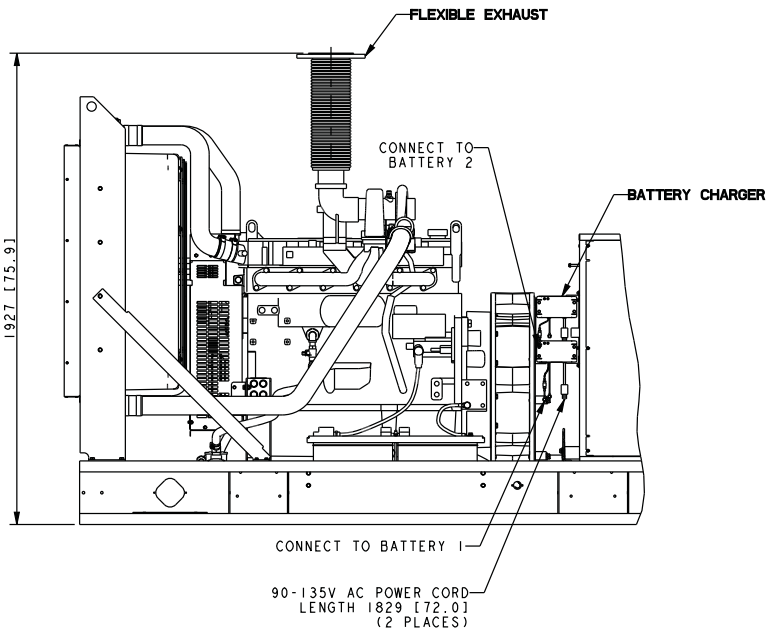
DWG NO. **ADV-7900** | **D**



6" ANSI FLANGE
(B16.5 CLASS 150)
SCALE 0.20







DIMENSIONS IN [ ] ARE INCH EQUIVALENTS

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	10-15-10	NEW DRAWING [90099]	DJV

230 MODEL,60 HZ
4UA9
250/275 MODEL,60 HZ
4UA10,4UA13
300 MODEL, 60HZ,4UA13
RECONN. & 600V ALTERNATORS
JOHN DEERE 6090HF, TIER III

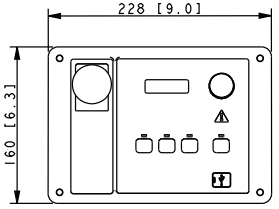
UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.XX ±
X.X ±
X ±
ANGLES ±
SURFACE FINISH MAX.
THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	DJV	10-15-10
CHECKED	DJV	10-15-10
APPROVED	JDZ	10-15-10

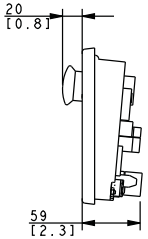
KOHLER CO. METRIC | PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE
DIMENSION PRINT, ACCESSORY, 230-300 JD

SCALE 0.10 | CAD NO. | SHEET 1 of 1
DWG NO. **ADV-7890** | **D**



DEC 3000



DIMENSIONS IN [] ARE ENGLISH EQUIVALENTS.

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	10-15-10	NEW DRAWING [90099]	DJV

20-300KW
CONTROLLER

UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X. XX ±
X.X ±
X ±
ANGLES ±

SURFACE FINISH
MAX.

THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	DJV	10-15-10
CHECKED	DJV	10-15-10
APPROVED	JDZ	10-15-10

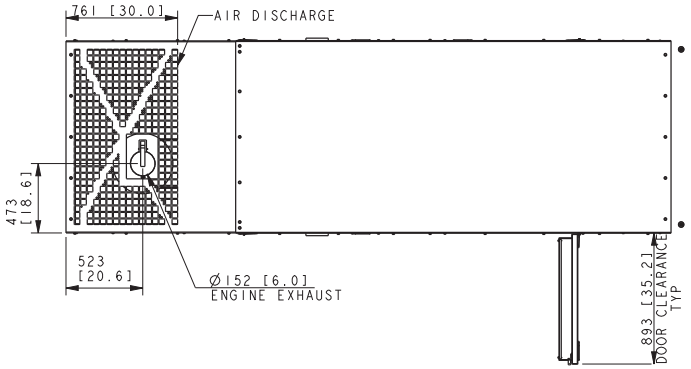
KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

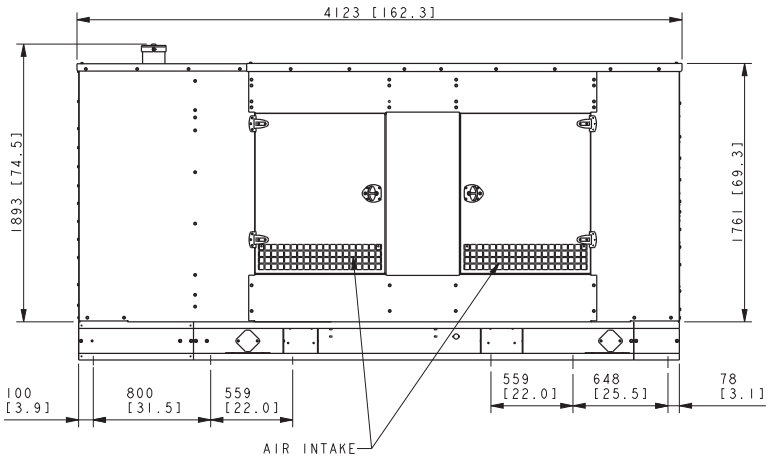
TITLE
DIMENSION PRINT, CONTROLLER

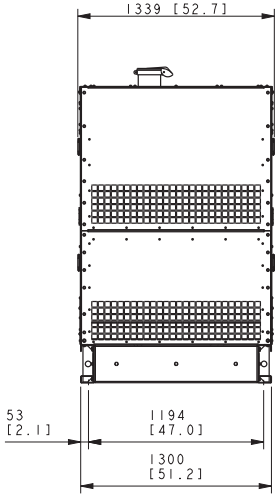
SCALE 0.40 | CAD NO. | SHEET 1 of 1

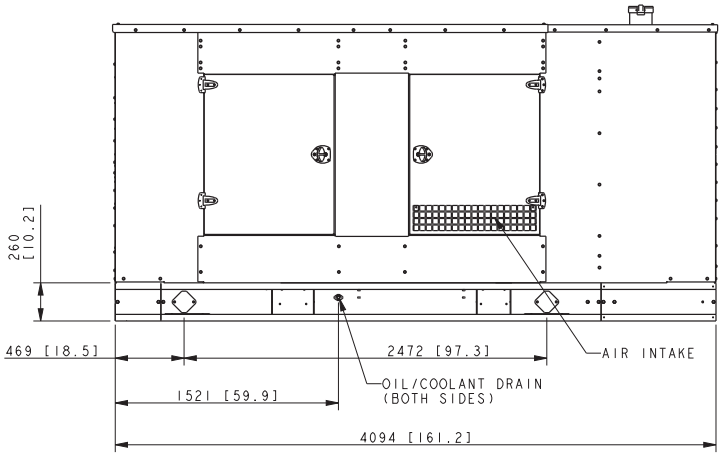
DWG NO. ADV-7935 | D

MODEL	ENCLOSURE WEIGHT KG [LBS]
STEEL WEATHER	363 [800]
STEEL SOUND	386 [850]
ALUMINIUM SOUND	238 [525]









NOTE:

1. IF STANDARD TANK IS ORDERED, ENCLOSURE MOUNTS DIRECTLY TO TANK
2. IF STATE TANK IS ORDERED, TANK MOUNTS BELOW SKID
3. TANK MAY EXTEND BEYOND ENCLOSURE (DISCHARGE END ONLY)
4. FOR STUB-UP ACCESS DURING INSTALLATION THE REAR ENCLOSURE PANEL SHOULD BE REMOVED.

230-300 MODEL
JOHN DEERE TIER III

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
E	10-31-12	SHEET 2 WAS SHEET1, ADDED SHEET 1 [CT28612]	CEK
F	2-5-13	(A-1) 1-4 WAS 1-2, SEE SHEET 3 AND 4 [CT32174]	SAM
G	8-4-17	(D-6) DIM. Ø152.4 (6.00) ADDED [CT177004]	SRM
H	11-22-18	VIEWS UPDATED, SEE SHEET 2,3 & 4 [CT191932]	YPW

UNLESS OTHERWISE SPECIFIED: 1) DIMENSIONS ARE IN MILLIMETERS 2) TOLERANCES ARE: X, XX ± 0.25, X.X ± 1.0, X ± 1.5, ANGLES ± 0° 30' SURFACE FINISH 125 MAX. THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	DJV	10-24-08
CHECKED	CWF	10-24-08
APPROVED	SLJ	10-24-08

KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

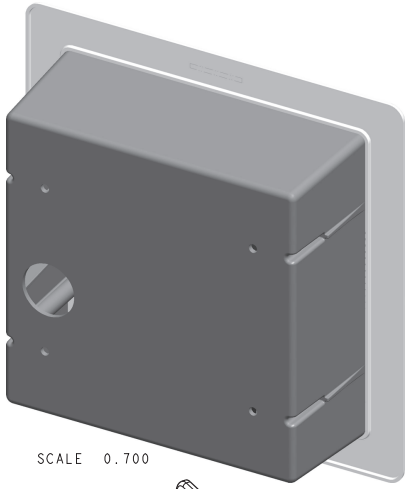
TITLE: DIMENSION PRINT 230-300KW JD

SCALE 0.06 | CAD NO. | SHEET 1 of 4

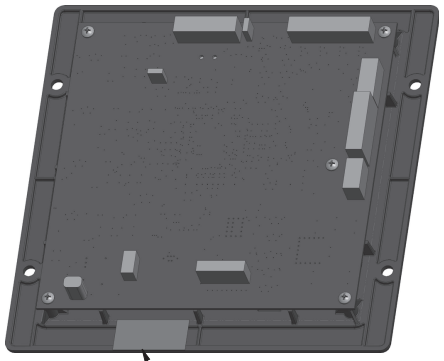
DWG NO. ADV-7644 | D

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

SCALE 0.700

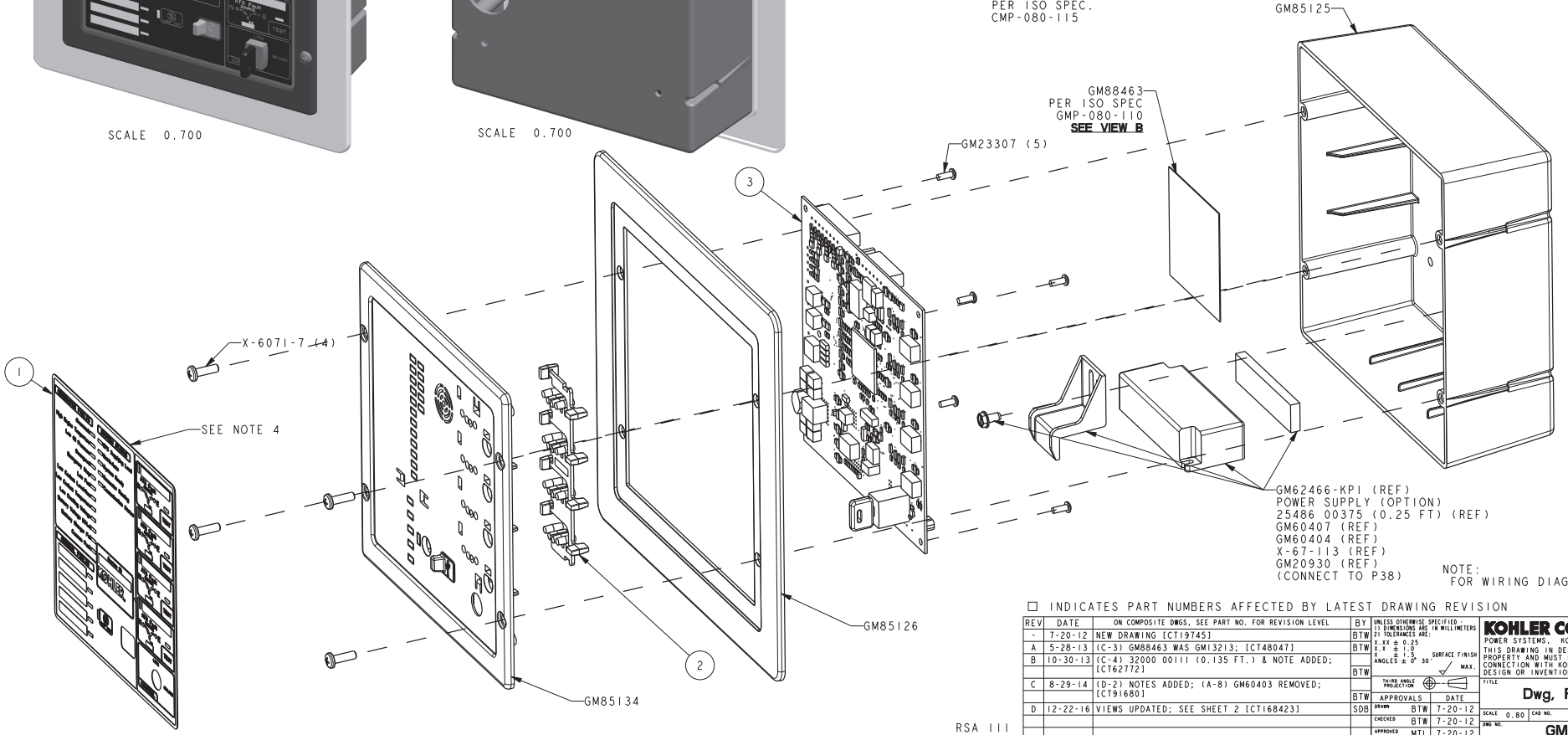


SCALE 0.700



32000 00111 (0.135 FT.)
PER ISO SPEC.
CMP-080-115

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



NOTE:
FOR WIRING DIAGRAM, SEE GM62554.

☐ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	7-20-12	NEW DRAWING [CT19745]	BTW
A	5-28-13	(C-3) GM88463 WAS GM13213; [CT48047]	BTW
B	10-30-13	(C-4) 32000 00111 (0.135 FT.) & NOTE ADDED; [CT62772]	BTW
C	8-29-14	(D-2) NOTES ADDED; (A-8) GM60403 REMOVED; [CT91680]	BTW
D	12-22-16	VIEWS UPDATED; SEE SHEET 2 [CT168423]	SDB

UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X .XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30'
SURFACE FINISH 125 MAX.
THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	BTW	7-20-12
CHECKED	BTW	7-20-12
APPROVED	MTL	7-20-12

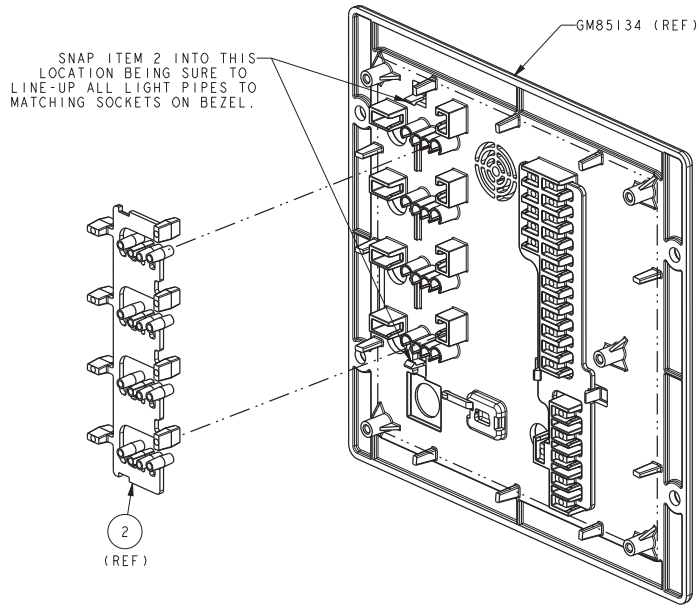
METRIC | PRO-E

TITLE: Dwg, RSA III Assy

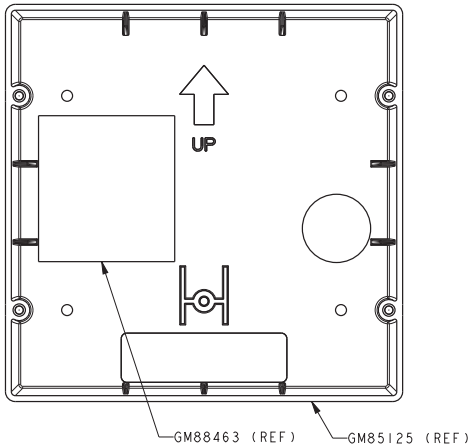
SCALE 0.80 | CAD NO. | SHEET 1 of 2

DWG NO. GM85123 | D

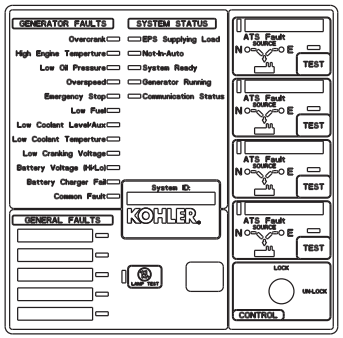
RSA III



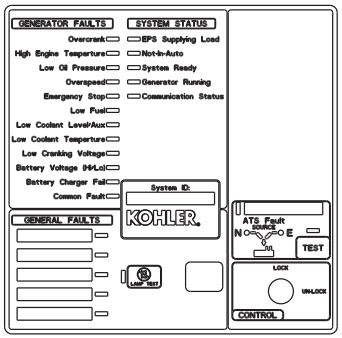
BACK VIEW OF BEZEL
SCALE 1.000



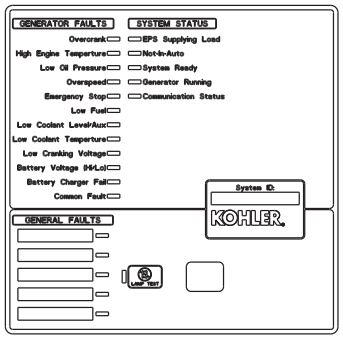
VIEW B
FRONT OF BOX



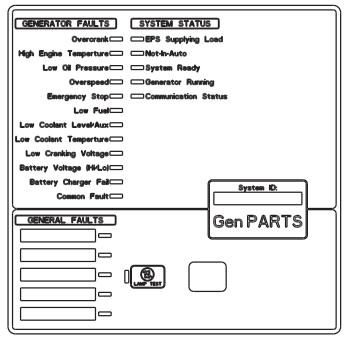
ITEM 1
(P/N: GM85127 REF)



ITEM 1
(P/N: GM85131 REF)



ITEM 1
(P/N: GM85132 REF)



ITEM 1
(P/N: GM85133 REF)

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	7-30-12	NEW DRAWING [CT19745]	BTW
A	5-28-13	(A-8) GM88463 (REF) WAS GM13213 (REF); [CT48047]	BTW
B	10-30-13	SEE SHEET 1 [CT62772]	BTW
C	8-29-14	VIEW A REMOVED; [CT91680]	BTW
D	12-22-16	VIEWS UPDATED; SEE SHEET 1 [CT168423]	SDB

UNLESS OTHERWISE SPECIFIED: (1) DIMENSIONS ARE IN MILLIMETERS (2) TOLERANCES ARE: X.XX ± 0.25, X.X ± 1.0, X ± 1.5, ANGLES ± 0° 30' SURFACE FINISH MAX. THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	BTW	7-30-12
CHECKED	BTW	7-30-12
APPROVED	MTL	7-30-12

KOHLER CO. METRIC | PRO-E

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

TITLE: **Dwg, RSA III Assy**

SCALE 0.80 | CAD NO. | SHEET 2 of 2

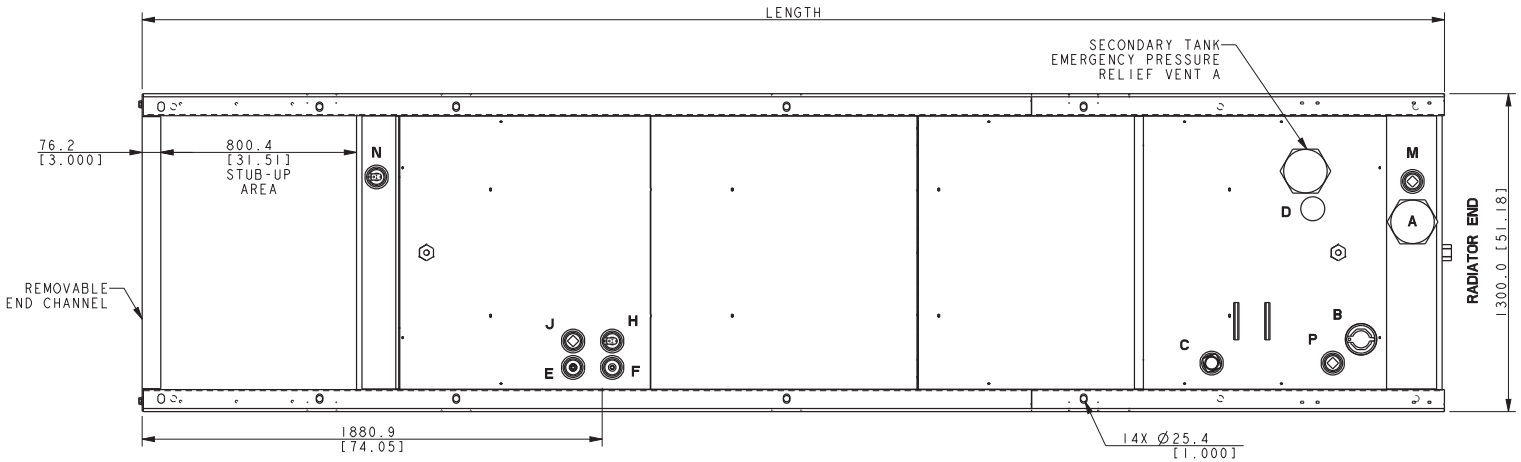
DWG NO. **GM85123** | **D**

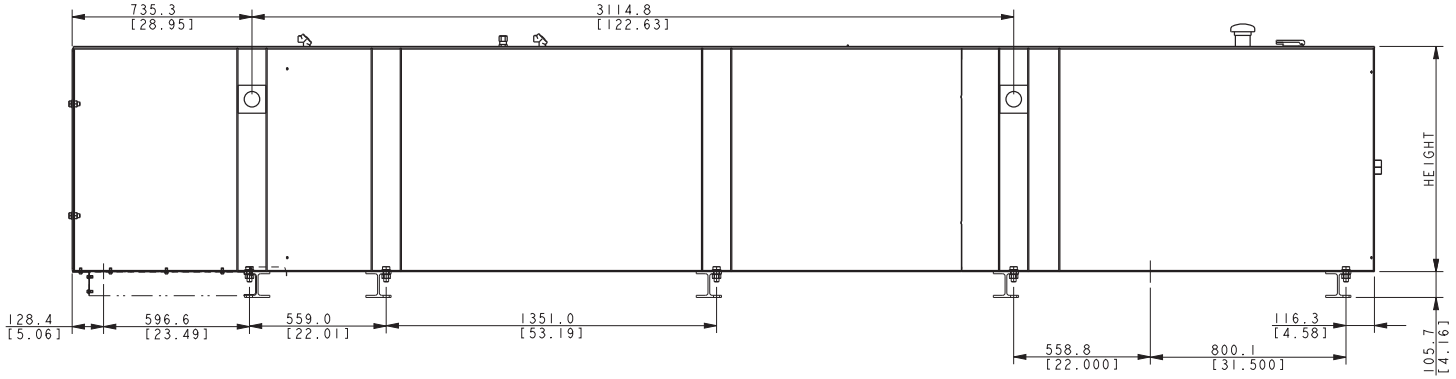
MODEL	CAPACITY L [GAL]	WEIGHT KG [LBS]	HEIGHT MM [IN]	LENGTH MM [IN]	E - VENTS SIZE (QTY)
230-300kW	2102 L [555 GAL]	1242 KG [2738 LBS]	635 MM [25 IN]	5008 MM [197.2 IN]	5 (2)
230-275kW	3573 L [944 GAL]	1851 KG [4081 LBS]	914.4 MM [36 IN]	5325 MM [209.7 IN]	5 (2)

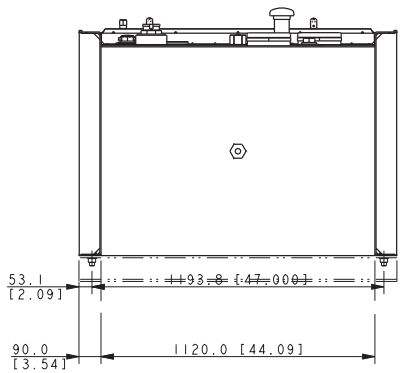
THIS IS AN AUTOMATED TABLE. ALL CHANGES TO THIS TABLE MUST BE MADE IN THE FAMILY TABLE OF THE GENERIC MODEL.

TANK FITTINGS:

A. EMERGENCY VENT FITTING PER NFPA 30 WITH VENT CAPS (QTY 2).
B. 2" NPT FUEL FILL FITTING WITH LOCKABLE CAP AND 2" RISER.
C. 2" NPT FUEL LEVEL GAUGE FITTING WITH DIRECT READING MECHANICAL GAUGE.
D. 2" NPT NORMAL VENT FITTING WITH MUSHROOM VENT CAP AND 5" RISER.
E. 2" NPT FITTING FOR REMOVABLE ENGINE SUPPLY DIP TUBE (3/8" NPT FEMALE WITH CHECK VALVE).
F. 2" NPT FITTING FOR REMOVABLE FUEL RETURN DIP TUBE (3/8" NPT FEMALE).
H. 2" NPT FOR LOW LEVEL SWITCH (SET AT 50% FULL, SILICONE PACKED).
J. 2" NPT ADDITIONAL FITTING FOR OPTIONAL ACCESSORY (INSTALL STEEL 2" NPT PIPE PLUG).
M. 2" NPT BASIN DRAIN (INSTALL STEEL 2" NPT PIPE PLUG).
N. 2" NPT FOR FUEL IN BASIN SWITCH
P. 2" NPT ADDITIONAL FITTING FOR OPTIONAL ACCESSORY (INSTALL STEEL 2" NPT PIPE PLUG).







NOTE:

FOR FURTHER TANK DETAIL SEE INDIVIDUAL DRAWINGS.

230-300KW JOHN DEERE TIER III STATE CODE TANK

DIMENSIONS IN [ ] ARE ENGLISH EQUIVALENTS.

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
A	11-18-09	SEE SHEET 1 OF 2. (D-7) 800.4 ADDED.[88481]	GFR
B	10-7-10	(D-8) STATE TANK TABLE ADDED [90099-6]	RJS
C	12-2-11	VIEWS UPDATED [92417-5]	SDS
D	5-8-12	SEE SHEET 3, (D-8) 300 KW MOVED TO SHEET 3,	
		(D-3) FITTING NOTES REVISED [CT13297]	JB2
E	10-21-15	SEE SHEET 3 OF 3. [CT128239]	GFR
F	11-17-17	SEE SHEET 1 [CT181456]	JB2
G	7-31-19	(D-5) EMERGENCY VENTS FOR 555 GAL: 5"	
		WAS 4" [CT197533]	PAS

UNLESS OTHERWISE SPECIFIED: [1] DIMENSIONS ARE IN MILLIMETERS [2] TOLERANCES ARE: X ± 0.25, X.X ± 0.1, X.XX ± 0.05, ANGLES ± 0° 30' SURFACE FINISH 125 MAX. THIRD ANGLE PROJECTION

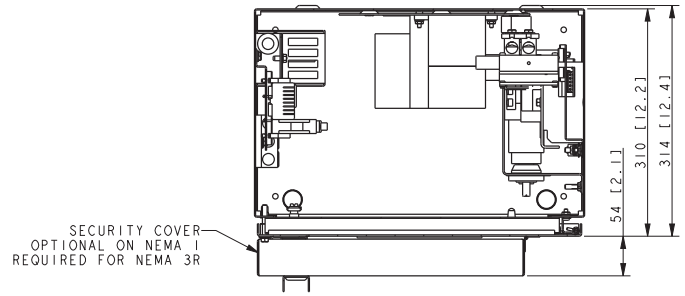
APPROVALS		DATE
DRAWN	JB2	10-27-08
CHECKED	DEF	10-27-08
APPROVED	DEF	10-27-08

KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

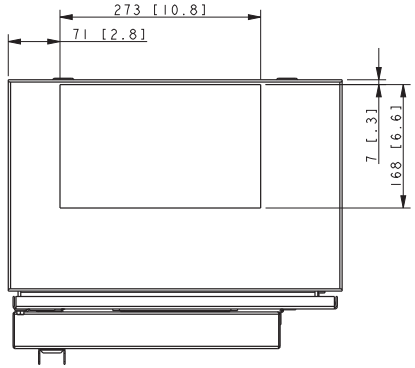
TITLE: **DIMENSION PRINT**

SCALE 0.10 | CAD NO. | SHEET 2 of 3

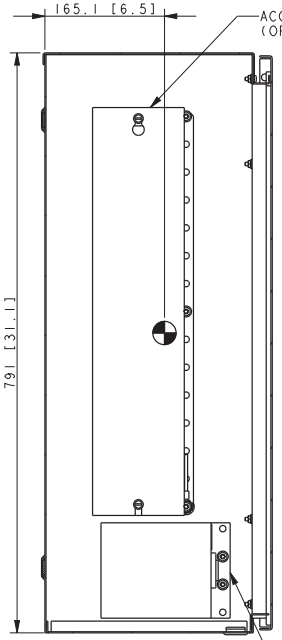
DWG NO. **ADV-7645** | **D**



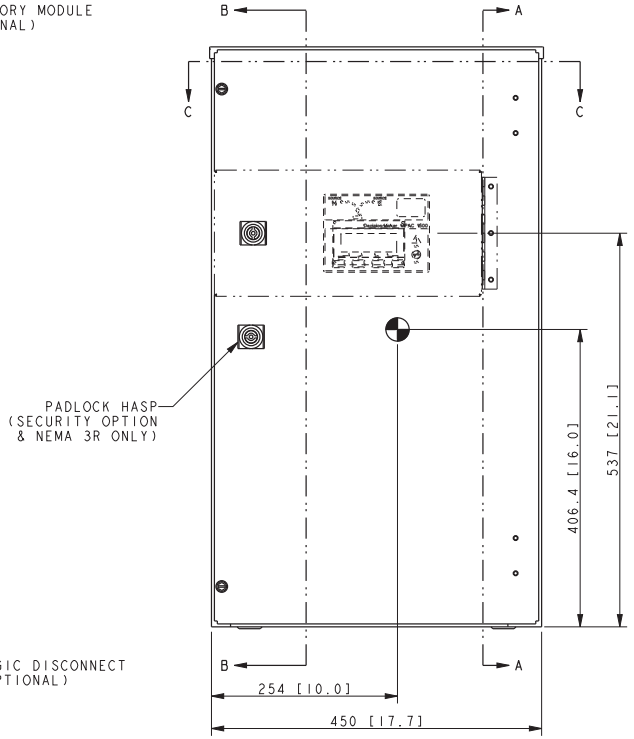
SECTION C-C

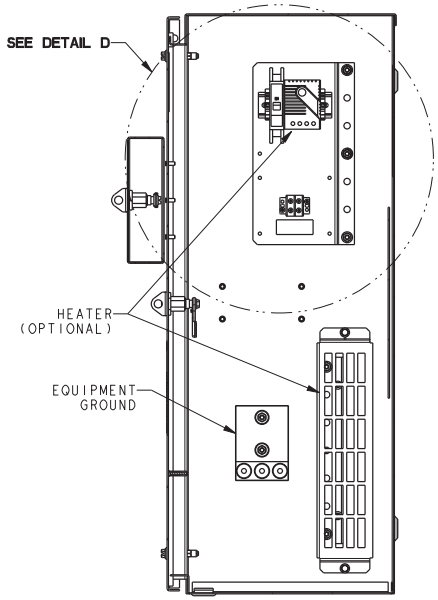


RECOMMENDED ENTRANCE AREA
TOP & BOTTOM

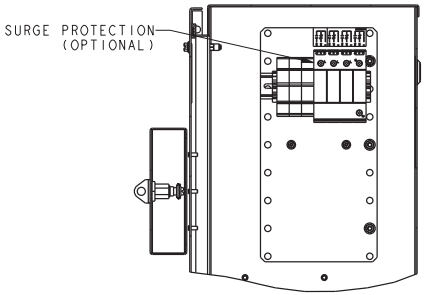


SECTION A-A





SECTION B-B



DETAIL D
OF SECTION B-B

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

DIMENSIONS IN [ ] ARE INCHES.

FINISH: ANSI 49 GRAY.

REFER TO OPERATOR'S MANUAL PRIOR TO INSTALLATION AND OPERATION OF UNIT.

FOR SEISMIC CERTIFIED UNITS, REFER TO ADV-7456 AND INSTALLATION INSTRUCTIONS.

NOTE:
ALLOW FOR MINIMUM DOOR SWING CLEARANCE OF 508 [20.0] IN FRONT OF CABINET.

SEE ADV-8565 FOR FULL MODEL CODE DEFINITION

STYLE	MECHANISM	TRANSITION	MPAC LOGIC	VOLTS	POLES	NEUTRAL	ENCLOSURE	AMPS	CONNECTION
KCS	STANDARD	STANDARD	1200,1500	208-600	2,3,4	SOLID,SW	1,3R	30,70,104,150	STANDARD
KCS	STANDARD	STANDARD	1200,1500	208-480	2,3,4	SOLID,SW	1,3R	200	STANDARD
KSS	SPECIFIC BREAKER	STANDARD	1200	208-600	2,3,4	SOLID,SW	1,3R	30,70,104,150	STANDARD
KSS	SPECIFIC BREAKER	STANDARD	1200	208-480	2,3,4	SOLID,SW	1,3R	200	STANDARD

REV	DATE	REVISION	BY
-	8-15-13	NEW DRAWING [CT54441]	BTW
A	12-11-20	(C-7) FIXED ASSEMBLY; (A-8) ADDED 2 KSS ROWS; (A-5) REMOVED OVLP FROM KCS ROWS; ADDED SW TO KCS ROW; (B-5,6,8) ADDED CG; [CT20803I]	ZHK

UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
SURFACE FINISH MAX.
THIRD ANGLE PROJECTION

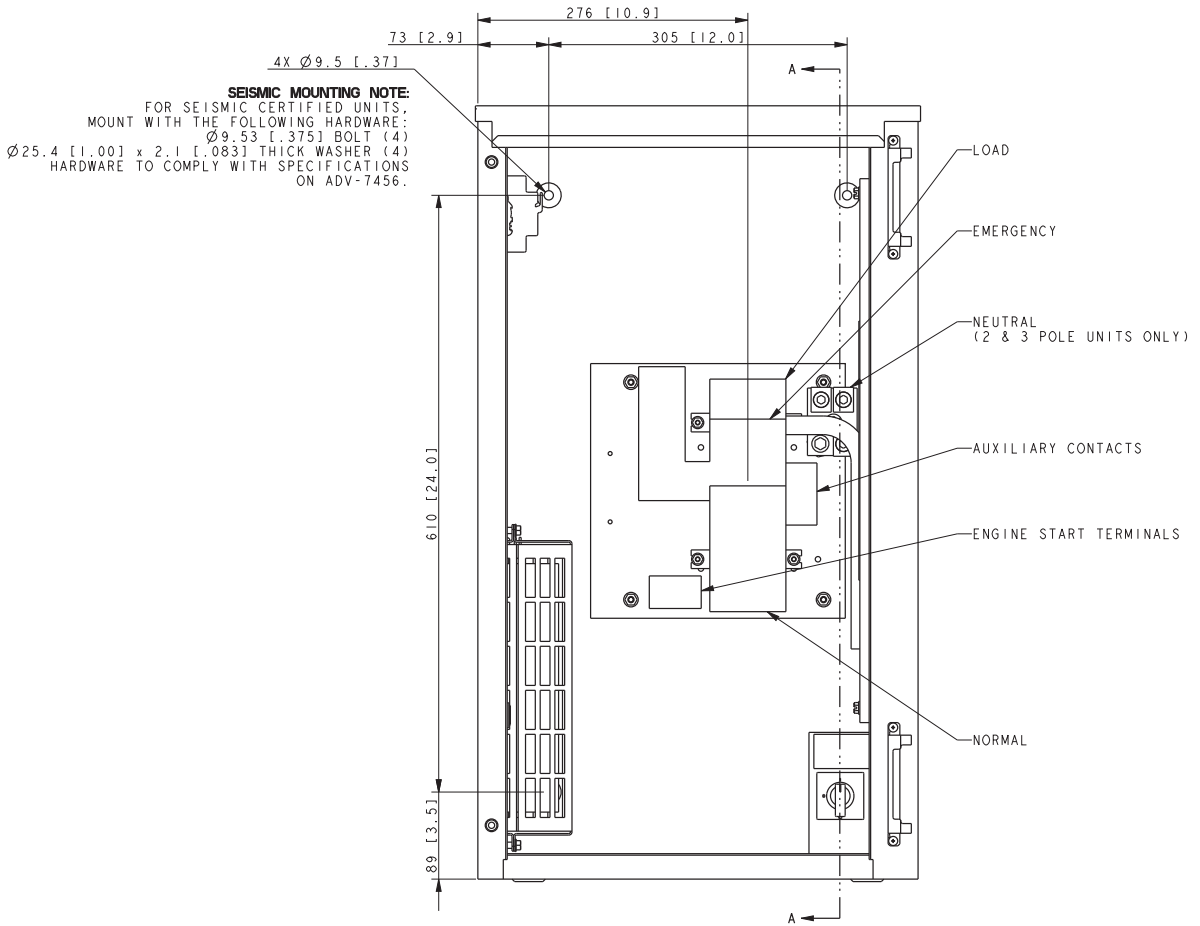
APPROVALS		DATE
DRAWN	BTW	8-15-13
CHECKED	BTW	8-15-13
APPROVED	MTL	8-15-13

KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

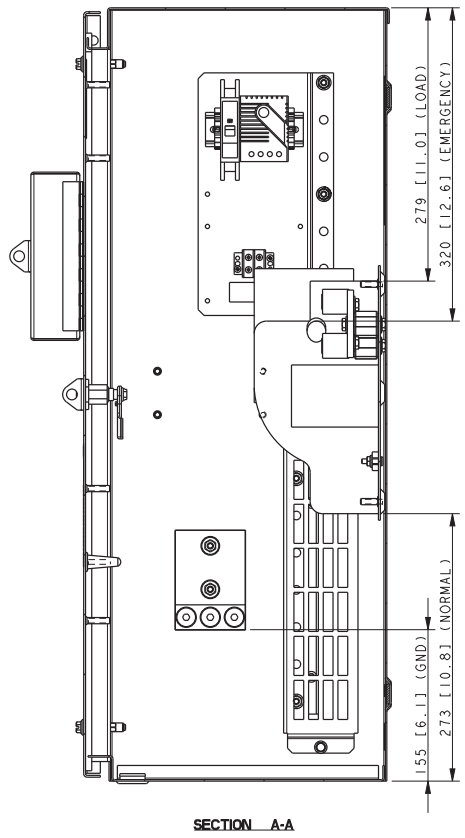
TITLE: DIMENSION PRINT

SCALE | CAD NO. | SHEET 1 of 2

DWG NO. ADV-8566 | D



FRONT VIEW
WITH DOOR REMOVED



SECTION A-A

SCREW TYPE TERMINALS FOR EXTERNAL POWER CONNECTION			
SWITCH RATING (AMPS)	RANGE AL/CU OF WIRE SIZES		
	CONTACTOR PER PHASE	NEUTRAL	GROUND
30-150	(1) #14 TO 4/0	(3) #14 TO 4/0	(3) #6 TO 3/0
200	(1) #14 TO 4/0 (Cu ONLY)	(3) #14 TO 4/0 (Cu ONLY)	

WEIGHTS KG (LBS)		
2 POLE	3 POLE	4 POLE
28 (62)	30 (65)	31 (68)

REV	DATE	REVISION	BY
-	8-15-13	NEW DRAWING [CT54441]	BTW
A	12-11-20	(A-7) UPDATED TABLE; (B-4) UPDATED NOTE	
		[CT20803I]	ZHK

UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
MAX.
THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN BTW	8-15-13
CHECKED BTW	8-15-13
APPROVED MTL	8-15-13

KOHLER CO. METRIC | PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE: **DIMENSION PRINT**

SCALE NONE | CAD NO. | SHEET 2 of 2
DWG NO. **ADV-8566** | **D**

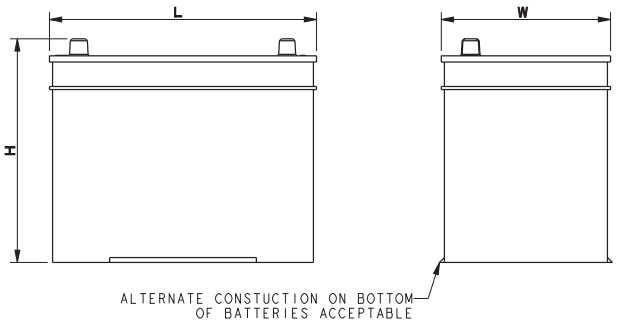
KOHLER®

Miscellaneous

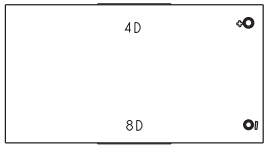
PART NO.	REV		SAE DIMENSION L	SAE DIMENSION W	SAE DIMENSION H	VOLTAGE	COLD CRANKING AMPS AT 0°F MINIMUM	RESERVE CAP MINUTES AT 80°F MINIMUM	POST LAYOUT /STYLE	CHARGE TYPE	BATTERY CONSTRUCTION	BCI GROUP	INTERNAL RESISTANCE (MΩ)
~~244578~~	~~AF~~		~~333.5 [13.13]~~	~~181.1 [7.13]~~	~~238.5 [9.39]~~	~~6~~	~~700~~	~~275~~	~~B/1~~	~~DRY~~	~~SEE NOTE 1~~	~~~~	-
~~244750~~	~~AD~~		~~342.9 [13.50]~~	~~173.2 [6.82]~~	~~238.3 [9.38]~~	~~12~~	~~600~~	~~165~~	~~D/1~~	~~DRY~~	~~SEE NOTE 1~~	~~~~	-
~~239102~~	~~AK~~		~~198.1 [7.80]~~	~~133.4 [5.25]~~	~~187.5 [7.38]~~	~~12~~	~~200~~	~~32~~	~~D/2~~	~~DRY~~	~~SEE NOTE 1~~	~~~~	-
~~289515~~	~~AC~~		~~539.8 [21.25]~~	~~282.7 [11.13]~~	~~276.4 [10.88]~~	~~12~~	~~1150~~	~~450~~	~~A/1~~	~~DRY~~	~~SEE NOTE 1~~	~~~~	-
~~291918~~	~~AC~~		~~333.2 [13.12]~~	~~173.0 [6.81]~~	~~239.8 [9.44]~~	~~12~~	~~700~~	~~150~~	~~C/3~~	~~WET~~	~~SEE NOTE 1~~	~~~~	-
~~299981~~	~~AD~~		~~333.2 [13.12]~~	~~173.0 [6.81]~~	~~239.8 [9.44]~~	~~12~~	~~700~~	~~150~~	~~C/3~~	~~DRY~~	~~SEE NOTE 1~~	~~~~	-
~~254425~~	~~AD~~		~~333.2 [13.12]~~	~~173.0 [6.81]~~	~~239.8 [9.44]~~	~~12~~	~~1000~~	~~200~~	~~C/3~~	~~WET~~	~~SEE NOTE 1~~	~~~~	-
~~299982~~	~~AC~~		~~333.2 [13.12]~~	~~173.0 [6.81]~~	~~239.8 [9.44]~~	~~12~~	~~950~~	~~200~~	~~C/3~~	~~DRY~~	~~SEE NOTE 1~~	~~~~	-
~~324367~~	~~BM~~		~~208.0 [8.19]~~	~~179.4 [7.06]~~	~~196.9 [7.75]~~	~~12~~	~~675~~	~~90~~	~~C/1~~	~~WET~~	~~SEE NOTE 1~~	~~~~	-
~~324368~~	~~AC~~		~~206.5 [8.13]~~	~~166.9 [6.57]~~	~~205.2 [8.08]~~	~~12~~	~~675~~	~~90~~	~~C/1~~	~~DRY~~	~~SEE NOTE 1~~	~~~~	-
~~324586~~	~~BU~~	☐	~~330.2 [13.00]~~	~~173.0 [6.81]~~	~~239.8 [9.44]~~	~~12~~	~~950~~	~~185~~	~~C/3~~	~~WET~~	~~SEE NOTE 2~~	~~31~~	-
324587	BT		330.2 [13.00]	173.0 [6.81]	239.8 [9.44]	12	950	200	C/3	DRY	SEE NOTE 2	31	-
~~256984~~	~~BT~~	☐	~~273.0 [10.75]~~	~~173.0 [6.81]~~	~~228.6 [9.00]~~	~~12~~	~~650~~	~~120~~	~~D/1~~	~~WET~~	~~SEE NOTE 1~~	~~24~~	-
225289	BR		273.0 [10.75]	173.0 [6.81]	228.6 [9.00]	12	650	130	D/1	DRY	SEE NOTE 1	24	-
~~345197~~	~~BS~~		~~273.0 [10.75]~~	~~173.0 [6.81]~~	~~228.6 [9.00]~~	~~12~~	~~510~~	~~80~~	~~E/1~~	~~WET~~	~~SEE NOTE 2~~	~~24F~~	-
354147	BT		330.2 [13.00]	173.0 [6.81]	239.8 [9.44]	12	700	170	C/3	WET	SEE NOTE 2	31	-
~~354148~~	~~BU~~		~~330.2 [13.00]~~	~~173.0 [6.81]~~	~~239.8 [9.44]~~	~~12~~	~~700~~	~~150~~	~~C/3~~	~~DRY~~	~~SEE NOTE 2~~	~~31~~	-
345309	BR		219.2 [8.63]	153.9 [6.06]	212.9 [8.38]	12	525	-	E/1	WET	SEE NOTE 1	55	-
~~GM22348~~	~~AC~~		~~525.3 [20.68]~~	~~220.5 [8.68]~~	~~251.0 [9.88]~~	~~12~~	~~1000~~	~~320~~	~~A/1~~	~~DRY~~	~~SEE NOTE 1~~	~~~~	-
GM22349	BR		527.1 [20.75]	282.4 [11.12]	276.4 [10.88]	12	1150	400	A/1	DRY	SEE NOTE 1	8D	-
~~GM34399~~	~~BT~~	☐	~~527.1 [20.75]~~	~~282.4 [11.12]~~	~~276.4 [10.88]~~	~~12~~	~~1400~~	~~430~~	~~A/1~~	~~WET~~	~~SEE NOTE 1~~	~~8D~~	-
~~GM48784~~	~~BT~~	☐	~~208.0 [8.19]~~	~~173.0 [6.81]~~	~~196.9 [7.75]~~	~~12~~	~~525~~	~~70~~	~~D/1~~	~~WET~~		~~26~~	-
~~GM75512~~	~~BT~~	☐	~~238.0 [9.38]~~	~~129.0 [5.06]~~	~~223.0 [8.81]~~	~~12~~	~~500~~	~~85~~	~~D/1~~	~~WET~~	~~-~~	~~51~~	-
10702000701	A		527.1 [20.75]	216.0 [8.50]	258.0 [10.16]	12	1050	290	A/1	WET	-	4D	-
10702001800	A		527.1 [20.75]	216.0 [8.50]	254.0 [10.0]	12	1110	380	A/1	AGM	SEE NOTE 3	4D	-
GM106681	-	☐	260.0 [10.25]	171.0 [6.75]	208.0 [8.19]	12	690	105	D/1	WET	-	34	4.29
GM106375	-	☐	330.2 [13.00]	171.0 [6.75]	239.8 [9.44]	12	925	180	C/3	WET	SEE NOTE 2	31	3.31
GM106373	-	☐	260.0 [10.25]	171.0 [6.75]	229.0 [9.00]	12	650	95	D/1	WET	SEE NOTE 1	24	4.71
GM106377	-	☐	527.1 [20.75]	279.0 [11.0]	254.0 [10.00]	12	1400	380	A/1	WET	SEE NOTE 1	80	2.53
GM106369	-	☐	208.0 [8.19]	172.0 [6.77]	200.0 [7.87]	12	500	95	D/1	WET	-	26	5.85
GM106374	-	☐	237.0 [9.32]	125.0 [4.94]	220.0 [8.66]	12	500	70	D/1	WET	-	51	5.00

NOTE: DIMENSIONS IN [ ] ARE ENGLISH EQUIVALENTS.

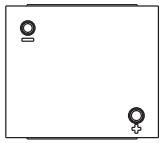
☐ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION



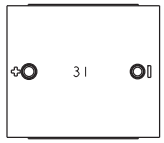
LAYOUT A



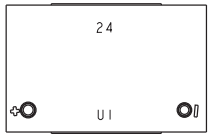
LAYOUT B



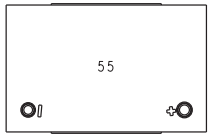
LAYOUT C



LAYOUT D



LAYOUT E



REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
BY	5-6-16	(C-6) 10702001800: COLD CRANKING AMPS 1110	
		WAS 1100 [CTI46053]	BGW
CA	4-15-19	(C-8) GM106681, GM106375, GM106373,	
		GM106377, GM106369 & GM106374 ADDED; (D-3)	
		INTERNAL RESISTANCE (MΩ) COLUMN ADDED;	
		(D-8) 324586 & 256984 VOIDED; (C-8)	
		GM34399, GM48784, GM75512	
		VOIDED;(A,B-8,7,6,5,4) VIEWS & NOTES MOVED	
		TO SHEET 2, SHEET 2 ADDED [CTI94425]	DS

DO NOT SCALE, REFERENCE THE MODEL FOR ALL UNSPECIFIED DIMENSIONS

UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: X.XX ± 0.25, X.X ± 1.0, X ± 1.5, ANGLES ± 0°30' SURFACE FINISH MAX.

THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	SLR	4-15-19
CHECKED	EB	4-15-19
APPROVED	RAD	4-15-19

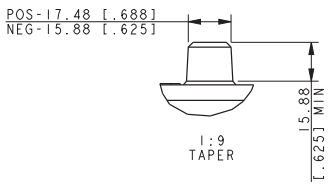
KOHLER.
KOHLER, WISCONSIN 53044

TITLE: DWG, BATTERY, DRY CHARGED

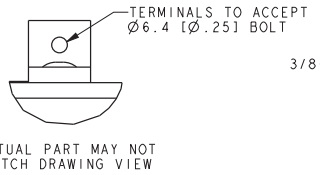
SCALE 0.30 | CAD NO. | SHEET 1 of 2

DWG NO. 244578-CMP | D

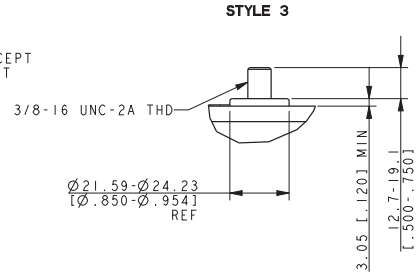
STYLE 1



STYLE 2



STYLE 3



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

NOTES: (APPLIES TO ALL BATTERIES)
SAE J537 DIMENSIONS ARE MAX ALLOWABLE DIMENSIONS.
COLD CRANKING AMPS ARE MINIMUM ACCEPTABLE VALUES.
HOLD DOWN DESIGN IN COMPLIANCE WITH SAE STANDARDS.
BATTERY WARNING LABEL TO BE LOCATED ON TAP OF BATTERY. (BETWEEN TERMINALS ON LAYOUT D)
MANUFACTURER MUST PROVIDE A CERTIFICATE CONTAINING MFGRS. NAME, MFGRS. PART NUMBER,
AND KOHLER PART NUMBER CERTIFYING THAT THE BATTERY WAS BUIT TO INDUSTRY STANDARDS.
SEE N.F.P.A.-110 FOR SPECIFIC DETAILS. CERTIFICATE REQUIRED ONLY ONCE PER BATTERY PART NUMBER.
MAY NOT BE CALCIUM-CALCIUTYPE.

NOTES: (CHARGE TYPE)
ALL DRY CHARGED BATTERIES MUST BE SUPPLIED WITH ACTIVATION INSTRUCTIONS ADHERED TO BATTERY
AND LOOSE. BATTERY MUST ALSO BE IDENTIFED ON TOP AS: ``DRY CHARGED, MUST ADD BATTERY GRADE
ELECTROLYTE, SEE ACTIVATION INSTRUCTIONS''.
BATTERIES SHOULD BE RECEIVED APPROPRIATELY MARKED AS DRYCHARGED OR WET STORAGE.
ONE OF THE BATTERY POSTS MUST BE SHIELDED WHEN BATTERIES ARE WET CHARGED.
BATTERIES WHEN SHIPPED DRY - DO NOT REQUIRE POST PROTECTORS.

NOTES: (BATTERY CONSTRUCTION)
1) MUST BE LEAD-CALCIUM HYBRID OR LEAD-ANTIMONY TYPE.
2) LEAD-CALCIUM GRID.
3) ABSORBED GLASS MAT. (AGM)

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
CA	4-15-19	NEW DRAWING; SEE SHEET 1 [CT194425]	DS

DO NOT SCALE, REFERENCE THE MODEL FOR ALL UNSPECIFIED DIMENSIONS

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN MILLIMETERS
GENERAL TOLERANCES:
X.XX ± 0.25
X.X ± 1.0
X ± 1.3
ANGLES ± 0°30'
SURFACE FINISH 125 MAX.
THIRD-ANGLE PROJECTION

APPROVALS		DATE
DRAWN	DS	4-15-19
CHECKED	GFR	4-15-19
APPROVED	AMM	4-15-19

TITLE
DWG, BATTERY, DRY CHARGED

SCALE 0.30 | CAD NO. | SHEET 2 of 2
DWG NO. **244578-CMP** | **D**

OVERVIEW:
THE AUTOMATIC MULTI-LEVEL FLOAT/ EQUALIZE CHARGER SPECIFIED BELOW IS INTENDED TO CHARGE ENGINE STARTING BATTERIES EITHER INDEPENDENT OR IN CONJUNCTION WITH AN ENGINE DRIVEN CHARGING SYSTEM.

BATTERY TYPES TO BE CHARGED:
- LEAD ACID
  - AGM
  - GEL CELL
  - HIGH PERFORMANCE AGM
  - FLOODED
- NICKEL CADMIUM (NiCd)

INPUT AC:
- INPUT VOLTAGE: 90-265V SINGLE PHASE
- INPUT FREQUENCY: 47-63 Hz

INPUT LEAD:
APPROXIMATELY 1.8M (72") (REF) TYPE SJTOW -40°C TO 105°C UL RATED WIRE AND INSULATION. TERMINATED IN PRE-MOLDED UL RATED 3 PRONG NEMA 5-15 MALE AC PLUG.

DC OUTPUT:
10A @ 12V
10A @ 24V
VOLTAGE REGULATION: +/-1% (VOLTAGE AT EACH STAGE IS TOPOLOGY DEPENDENT)

OUTPUT LEAD:
APPROX. 1.8M (72") (REF) TYPE SJTOOW -40°C TO 105°C UL RATED WIRE WITH RED AND BLACK WIRE INSULATION. TERMINATED IN 9.5 mm (REF) RING STYLE TERMINALS.

FUSES:
THE FUSE MUST BE LOCATED APPROXIMATELY 6" FROM RING TERMINAL ON RED OUTPUT LEAD.
20A ATC

ENVIRONMENTAL:
- STORAGE TEMPERATURE RANGE: -40 TO +85°C (-40 TO +185°F)
- OPERATING TEMPERATURE RANGE: -20 TO +70°C (-4 TO +158°F)
- HUMIDITY: 5 TO 95% (NON-CONDENSING)
- SALT SPRAY TESTING - ASTM B117
- CORROSIN RESISTANT FROM GASSING OF BATTERIES

REVERSE POLARITY PROTECTION:
THE CHARGER SHALL SUSTAIN NO DAMAGE WHEN INCORRECTLY CONNECTED TO THE BATTERY IN REVERSE ORIENTATION.

MOUNTING:
4 NON-THREADED THROUGH HOLES FOR M6 FASTENERS TO PASS THOUGH

ENCLOSURE:
SHALL PROTECT THE CHARGER COMPONENTS FROM RAIN, SNOW, DUST AND DRIPPING WATER AND UNINTENTIONAL INPACTS. ALL INTERNAL COMPONENTS PROTECTED FROM WATER DROPLETS.

INDICATORS:
- POWER: INDICATES THE ACCEPTABILITY OF AC INPUT TO THE CHARGER
- COMMUNICATION: INDICATES THE STATE OF THE COMMUNICATION SYSTEM
- TEMPERATURE COMPENSATION: INDICATES THE STATE OF THE TEMPERATUARE COMPENSATION SUBSYSTEM WHEN INSTALLED
- VOLTAGE OUTPUT: INDICATES THE STATE OF THE BATTERY AND CERTAIN FAULT CONDITIONS.

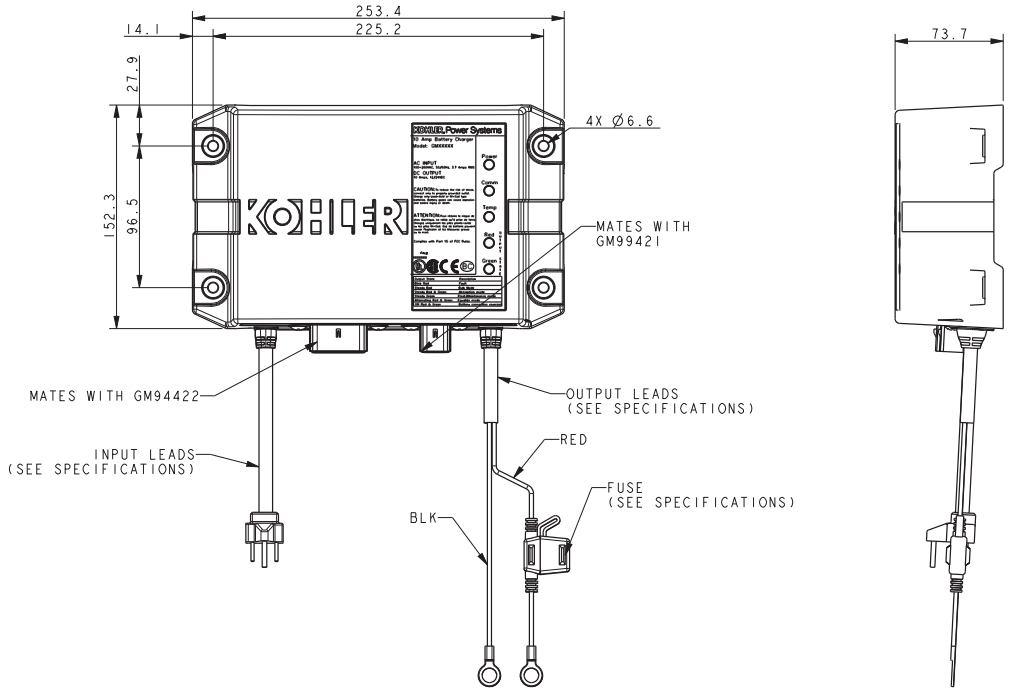
DOCUMENTATION:
THERE SHALL BE AN INSTALLATION / OPERATIONAL MANUAL SUPPLIED WITH EACH CHARGER. PER KOHLER SUPPLIED ARTWORK.

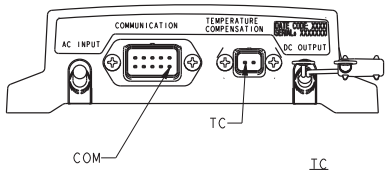
CERTIFICATIONS (US AND CANADA):
- UL1236
- CSA - C22.2 NO 107.2-01
- FCC- TITLE 47, PART 15 CLASS A
- CE
- EN 61000-6-2
- CEC AND DOE
- NFPA-110 LEVEL1 (WHEN SUPPORTED WITH APPLICABLE KOHLER CONTROLLER)
- IBC

PRODUCT LABELING:
THE LABEL ATTACHED TO THE CHARGER SHALL HAVE THE FOLLOWING INFORMATION:
- UL LISTING
- KOHLER PART NUMBER
- DESCRIPTION OF ALL INDICATOR
- OUTPUT CURRENT AND VOLTAGE
- INPUT VOLTAGE AND FREQUENCY

PACKAGING LABEL:
THE PACKAGING LABEL SHALL CONTAIN THE FOLLOWING INFORMATION:
- KOHLER P/N
- DESCRIPTION - BATTERY CHARGER
- MFG. MODEL NO.
- MFG. PART NUMBER
- DATE CODE

WARRANTY:
2 YEAR FROM DATE OF PURCHASE FROM MANUFACTURE.





COM
PIN 1 N/C
2 ID SEL 1
3 ID SEL 2
4 N/C
5 CAN-H
6 N/C
7 ID SEL 1 RTN
8 ID SEL 2 RTN
9 CAN-GND
10 CAN-L

TC
PIN 1 TC SENSOR W1
2 TC SENSOR W2

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	9-22-14	NEW DRAWING [CT91634]	SAM
A	5-9-17	(C-4,2) MATING NOTE ADDED (A-2, 4) PIN CONNECTIONS ADDED [CT174256]	SAM

UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30'
SURFACE FINISH 125 MAX.
THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	SAM	9-22-14
CHECKED	SAM	9-22-14
APPROVED	AGT	9-22-14

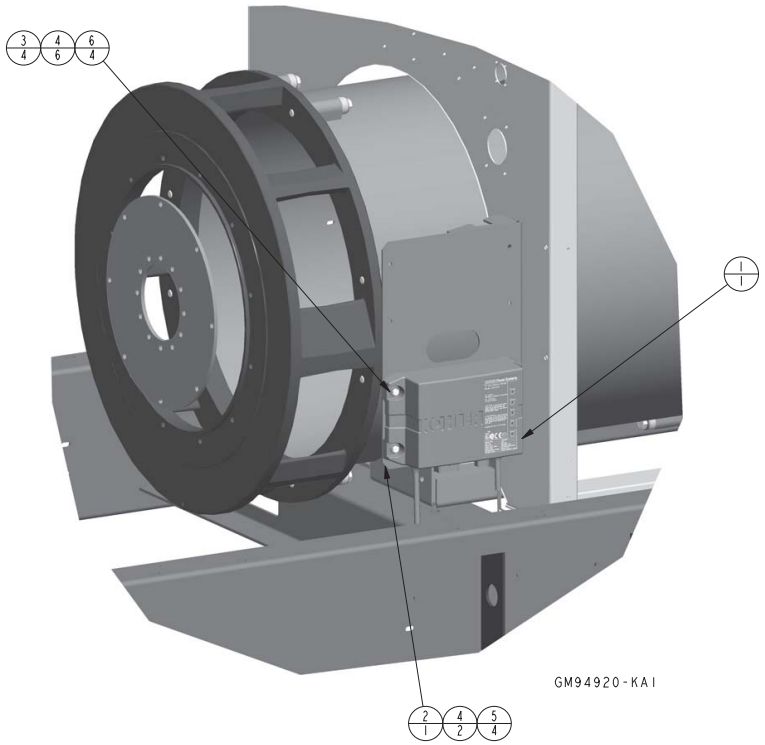
KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE
CHARGER, BATTERY 10 AMP

SCALE 0.50 CAD NO. SHEET 1 of 1
DWG NO. GM87448 D

KIT NO.	ITEM	PART NO	QTY	DESCRIPTION
GM94920-KAI				ASSY BATTERY CHARGER 12/24V-10A
	1	GM87448	1	CHARGER, BATTERY
	2	GM94448	1	BRKT, 10 AMP BATTERY CHARGER
	3	M125A-06-80	4	WASHER, PLAIN 6.4 ID X 12.0 OD
	4	M6923-06-80	8	NUT, HEX 6MM
	5	M933-06016-60	4	SCREW, HEX CAP
	6	M933-06030-60	4	SCREW, HEX CAP
~~GM94920-KA2~~				~~ASSY BATTERY CHARGER 12/24V-10A~~
	1	GM87448	2	CHARGER, BATTERY
	2	GM94448	2	BRACKET, 10 AMP BATTERY CHARGER
	3	M125A-06-80	8	WASHER, PLAIN 6.4 ID X 12.0 OD
	4	M6923-06-80	12	NUT, HEX 6MM
	5	M933-06016-60	4	SCREW, HEX CAP
	6	M933-06030-60	8	SCREW, HEX CAP
	7	GM95017	1	HARNESS, Y

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



GM94920-KAI

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

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	10-2-14	NEW DRAWING [CT95303]	SAM
A	11-28-16	(D-8) M6923-06-80: 8 WAS 6, M933-06016-60:4 WAS 2, GM94920-KA2 VOIDED, VIEW REMOVED [CT166633]	SAM

UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X .XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30'
SURFACE FINISH MAX.
THIRD ANGLE PROJECTION

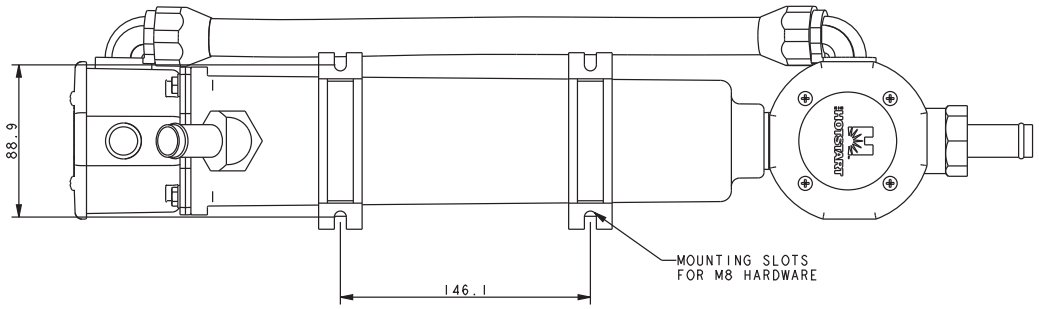
APPROVALS		DATE
DRAWN	SAM	10-2-14
CHECKED	SAM	10-2-14
APPROVED	AGT	10-2-14

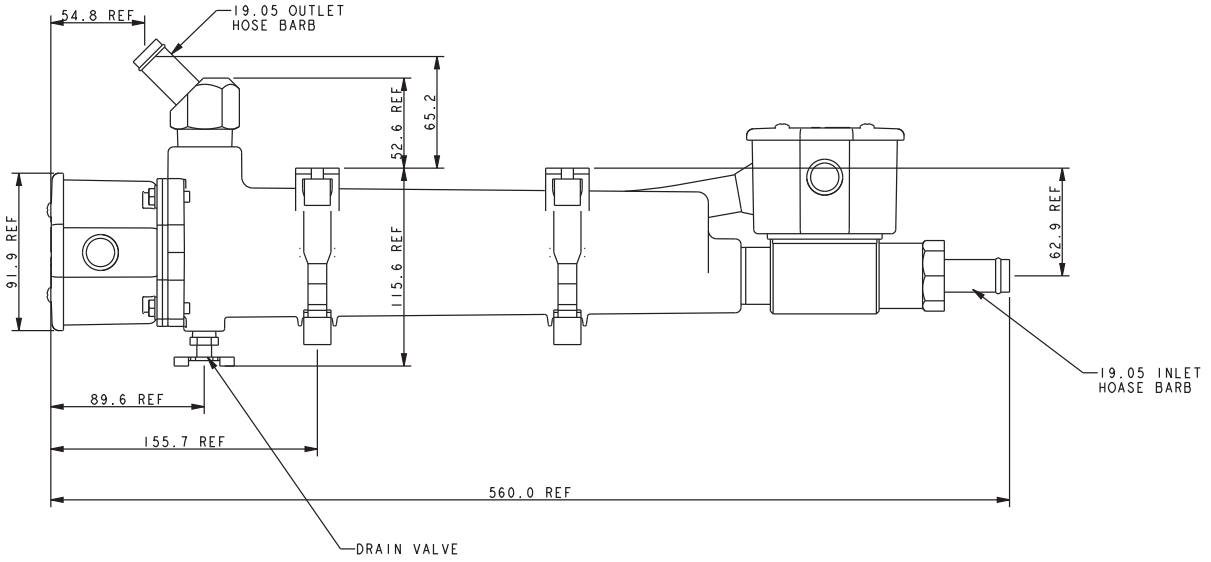
KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE
DWG, ASSY BATTERY CHARGER

SCALE 0.25 | CAD NO. | SHEET 1 of 1
DWG NO. GM94920 | D

PART NO	REV	WATTS	VOLTS	AMPS	TEMP RANGE	REPLACEMENT ELEMENT
GM76113	A	2500	90/120	15.6/20.8	27/38° C [80/100° F]	GM29477
GM76114	A		190/208	11.0/12.0		GM29478
GM76115	A		210/240	9.1/10.4		GM29474
GM76116	A		380/480	4.1/5.2		GM29479
ES-75616	A		240/227	7.8/9.0		ES-75542





200/350 KW JD

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	6-9-10	NEW DRAWING [89933-1]	SAM
A	12-9-10	(D-8) ES-75616 ADDED, GM76113: 15.6/20.8 WAS 27.8/20.8, GM76114: 11.0/12.0 WAS 13.2/12.0, GM76115: 9.1/10.4 WAS 11.9/10.4, GM76116: 4.1/5.2 WAS 6.6/5.2 [90699]	SAM

UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30'
SURFACE FINISH 125 MAX.
THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	SAM	6-9-10
CHECKED	JMS	6-9-10
APPROVED	WRD	6-9-10

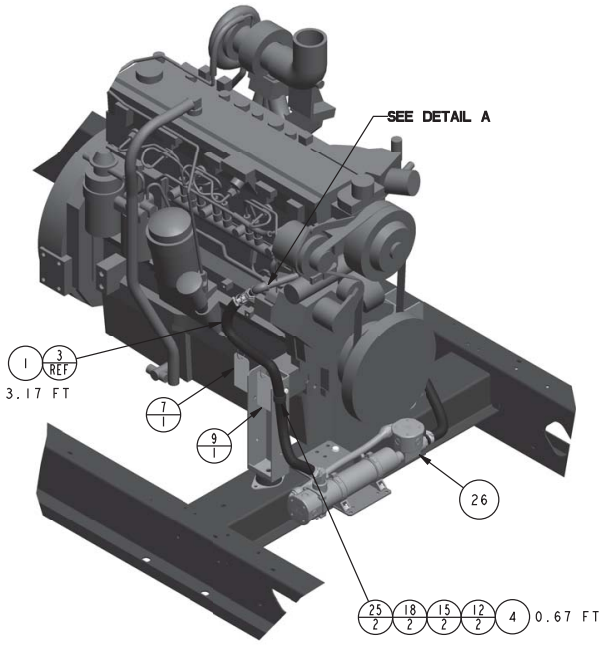
KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

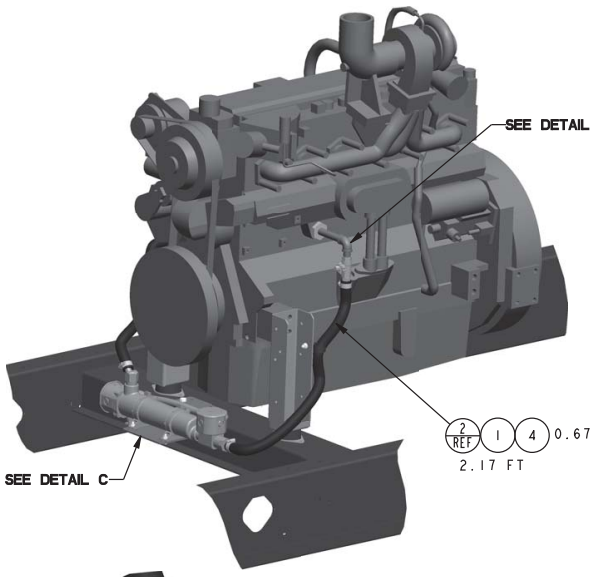
TITLE
HEATER, BLOCK

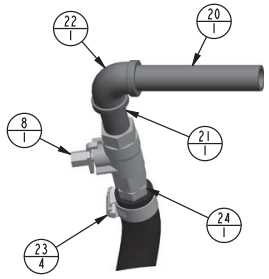
SCALE 0.70 | CAD NO. | SHEET 1 of 1
DWG NO. GM76113 | D

KIT NO.	ITEM	PART NO	QTY	DESCRIPTION
GM76120-KB				BASE GRP, BLOCK HEATER
	1	25452-00075	5.34FT	HOSE, COOLANT
	2	X-6367-6 (REF)	1	HOSE, COOLANT
	3	X-6367-14 (REF)	1	HOSE, COOLANT 29"
	4	29808-00750	1.33FT	SLEEVE, SPLIT WRAP BRAIDED, 3/4" DIA
	5	273692	1	ADAPTER, BUSHING
	6	273693	1	O-RING (1.475" ID)
	7	279047	1	TAG, INSTRUCTION
	8	GM19670	2	VALVE, SHUTOFF (1/2-14NPT)
	9	GM39752	1	TAG, HANG
	10	GM51263	1	BRACKET, BLOCK HEATER
	11	M125A-06-80	4	WASHER, PLAIN
	12	M125A-08-80	2	WASHER, PLAIN 8.4 ID X 16.0 OD
	13	M125A-10-80	2	WASHER, PLAIN 10.5 ID X 20.0 OD
	14	M6923-06-80	4	NUT, HEX 6MM
	15	M6923-08-80	2	NUT, HEX 8MM
	16	M6923-10-80	2	NUT, HEX 10MM
	17	M933-06025-60	4	SCREW, HEX CAP
	18	M933-08025-60	2	SCREW, HEX CAP
	19	M933-10025-60	2	SCREW, HEX CAP,FULLY THRD M10 X 25MM
	20	X-209-21	2	PIPE (1/2"NPT X 4.50")
	21	X-209-5	2	PIPE (1/2"NPT X 1.50")
	22	X-215-1	2	ELBOW, PIPE (90 DEG X 1/2"NPT)
	23	X-426-12	4	CLAMP, HOSE, .69/1.25 IN.
	24	X-582-7	2	CONNECTOR, HOSE + VIBRA SEAL
	25	X-672-20	2	CLAMP, INSULATED, 1.25 IN.
GM76120-KA1				BLOCK HEATER, 2500W, 90/120V 1PH
	26	GM76113	1	BLOCK HEATER
GM76120-KA2				BLOCK HEATER, 2500W,190/208V 1PH
	26	GM76114	1	BLOCK, HEATER
GM76120-KA3				BLOCK HEATER, 2500W,210/240V 1PH
	26	GM76115	1	BLOCK, HEATER
GM76120-KA4				BLOCK HEATER, 2500W,380/480V 1PH
	26	GM76116	1	BLOCK, HEATER

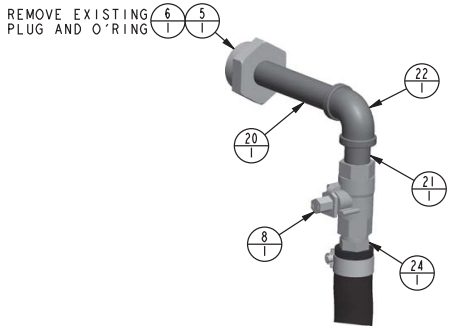
THIS IS AN AUTOMATED TABLE. ALL UPDATES MUST BE MADE IN THE ASSEMBLY. ITEMS 1-3 & 25 ARE FIXED. ITEM 1 IS A MANUAL BALLOONS.



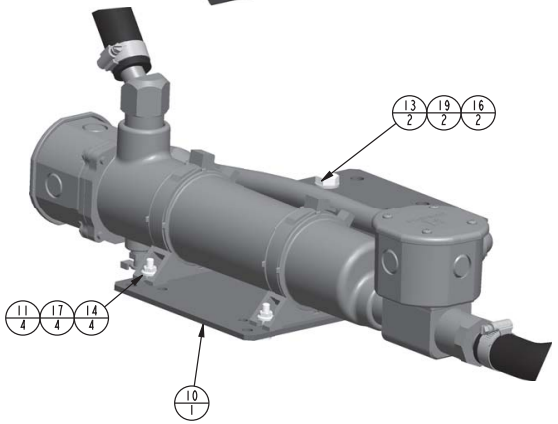




DETAIL A
SCALE 0.50



DETAIL B
SCALE 0.50



DETAIL C
SCALE 0.50

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

BLOCK HEATER KITS
230-300 MODELS
JOHN DEERE

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	6-14-10	NEW DRAWING [89933-2]	SAM
A	9-28-10	(C-5) X-6367-14 WAS X-6367-12; (C-1)	
		X-6367-6 WAS X-6367-11; (C-8) X-209-21 (2)	
		WAS X-209-11 & X-209-18; X-6003-121 REMOVED;	
		VIEWS UPDATED [90099-3]	DJV
B	3-31-11	(C-8) X-672-20 WAS X-672-4 [90379-16]	SAM
C	10-24-11	(C-4) BLOCK HEATER MOVED & ROTATED 180° [92388]	SAM
D	10-18-12	(D-8) 29808-00750 ADDED [CT2707I]	SVP

UNLESS OTHERWISE SPECIFIED: (1) DIMENSIONS ARE IN MILLIMETERS (2) TOLERANCES ARE: X.XX ± 0.25, X.X ± 1.0, X ± 1.5, ANGLES ± 0° 30' MAX. SURFACE FINISH. THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	SAM	6-14-10
CHECKED	JMS	6-15-10
APPROVED	WRD	6-16-10

KOHLER CO. METRIC | PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE: **DWG, ASSY BLOCK HEATER**

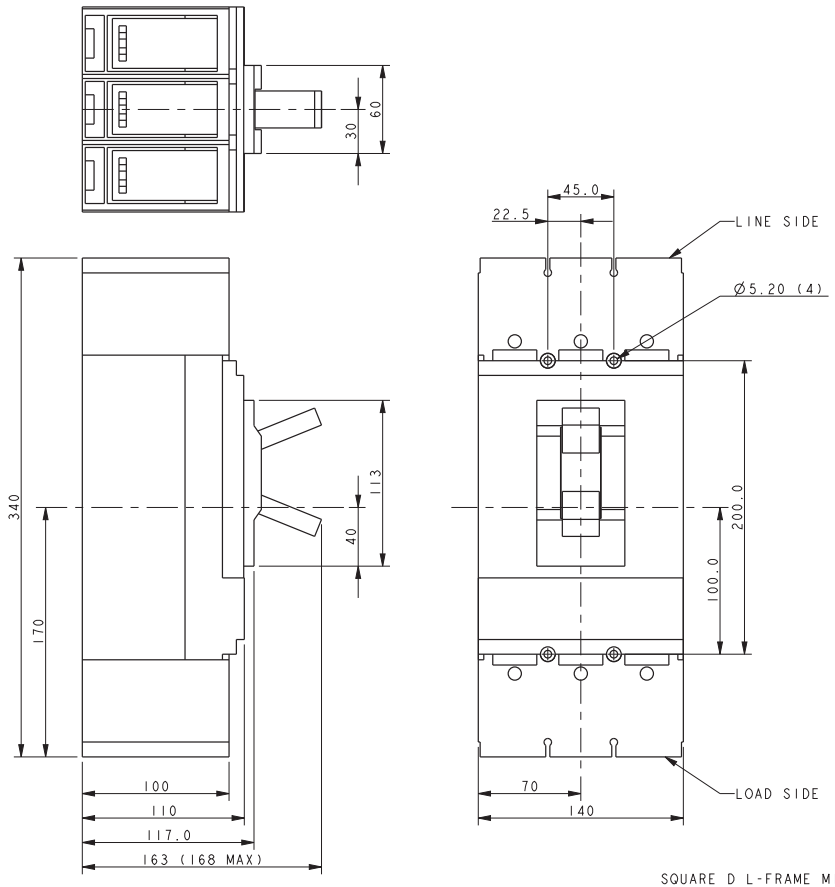
SCALE 0.14 | CAD NO. | SHEET 1 of 1

DWG NO. **GM76120** | **D**

PART NO.	PART REV		DESCRIPTION	AMPS	INTERRUPT kA @480 VAC	CONNECTION TYPE		POLES	VOLTS	RATING	TRIP TYPE	SQUARE D PART NO.
						LINE	LOAD					
GM85432-1	-		BREAKER, CIRCUIT 400A LGP	400	35	BUS	AL600LS52K3 LUGS	3	600	80%	MICROLOGIC 3.3 LI	LGP36400U31X
GM85432-2	-		BREAKER, CIRCUIT 400A LGP							80%	MICROLOGIC 3.3S LSI	LGP36400U33X
GM85432-3	-		BREAKER, CIRCUIT 400A LGP							80%	MICROLOGIC 6.3A LSIG	LGP36400U44X
GM85432-4	-		BREAKER, CIRCUIT 400A LGP							100%	MICROLOGIC 3.3 LI	LGP36400CU31X
GM85432-5	-		BREAKER, CIRCUIT 400A LGP							100%	MICROLOGIC 3.3S LSI	LGP36400CU33X
GM85432-6	-		BREAKER, CIRCUIT 400A LGP							100%	MICROLOGIC 6.3A LSIG	LGP36400CU44X
GM85432-7	-		BREAKER, CIRCUIT 600A LGP	600	35	BUS	AL600LS52K3 LUGS	3	600	80%	MICROLOGIC 3.3 LI	LGP36600U31X
GM85432-8	-		BREAKER, CIRCUIT 600A LGP							80%	MICROLOGIC 3.3S LSI	LGP36600U33X
GM85432-9	-		BREAKER, CIRCUIT 600A LGP							80%	MICROLOGIC 6.3A LSIG	LGP36600U44X

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

NOTE:
(4) M5 X 85 MOUNTING SCREWS, WASHERS AND NUTS INCLUDED.
(3) M10 X 25 BUS CONNECTION SCREWS AND SPRING WASHERS INCLUDED.



SQUARE D L-FRAME MICROLOGIC BREAKERS

▲ DENOTES A CRITICAL CHARACTERISTIC THAT MUST BE ADDRESSED IN THE PRODUCTION CONTROL PLAN.
TOTAL QUANTITY OF CRITICAL CHARACTERISTICS ON THIS DRAWING = 0

◇ DENOTES A MAJOR CHARACTERISTIC THAT MUST BE ADDRESSED IN THE PRODUCTION CONTROL PLAN.
TOTAL QUANTITY OF MAJOR CHARACTERISTICS ON THIS DRAWING = 0

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

☐ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	4-3-12	NEW DRAWING [CT145I6]	WSD

UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30' SURFACE FINISH MAX.
THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	WSD	4-3-12
CHECKED	WSD	4-3-12
APPROVED	AJH	4-3-12

KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE
DWG, CIRCUIT BREAKER

SCALE 0.60 | CAD NO. | SHEET 1 of 1
DWG NO. GM85432-CMP | D

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

AL/CU MECHANICAL LOAD LUGS PER PHASE			
BREAKER FRAME	AMPS	WIRE RANGE	A WIRE BENDING SPACE
H	15-150	(1) #14 TO 3/0	530 [20.8]
J	175	(1) 1/0 TO 4/0	516 [20.3]
	200-250	(1) 3/0 TO 350 KCMIL	
LA	300-400	(1) #1 TO 600 KCMIL OR (2) #1 TO 250 KCMIL	472 [18.6]
LG	400-600	(2) 2/0 TO 500 KCMIL AL/CU	480 [18.9]
M	800	(3) 3/0 TO 500 KCMIL	454 [17.9]
P	250-800		
P	1000-1200	(4) 3/0 TO 500 KCMIL	412 [16.2]
MECHANICAL LOAD LUGS INCLUDED WITH H, J & LG LSIG NEUTRALS			
H	60-150	(1) #14 TO 3/0 AWG AL/CU	
J	250	(1) 3/0 TO 350 KCMIL AL/CU	
LG	400-600	(2) 4/0 TO 500 KCMIL AL/CU	

NOTES:

1) SEE UNIT DIMENSION PRINT (ADV-XXXX) FOR ADDITIONAL DIMENSIONS, JUNCTION BOX AND STUB-UP LOCATION.

2) ADD SKID DEPTH TO WIRE BENDING HEIGHTS ON THIS PRINT TO ARRIVE AT FULL WIRE-BENDING SPACE.

3) CONSULT FACTORY FOR BREAKER COMBINATIONS NOT SHOWN ON THIS PRINT.

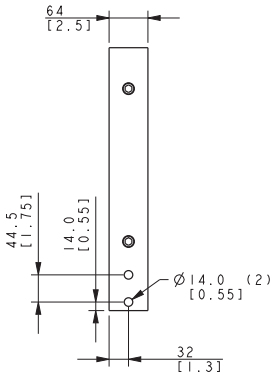
4) MECHANICAL LUGS ARE AVAILABLE FOR NON-LSIG NEUTRAL. SEE ADV-7376. H, J & LG LSIG NEUTRALS INCLUDE LUGS (SEE CHART).

5) NEUTRALS ARE BONDED TO GROUND AS STANDARD. CONSULT LOCAL CODES OR SYSTEM REQUIREMENTS.

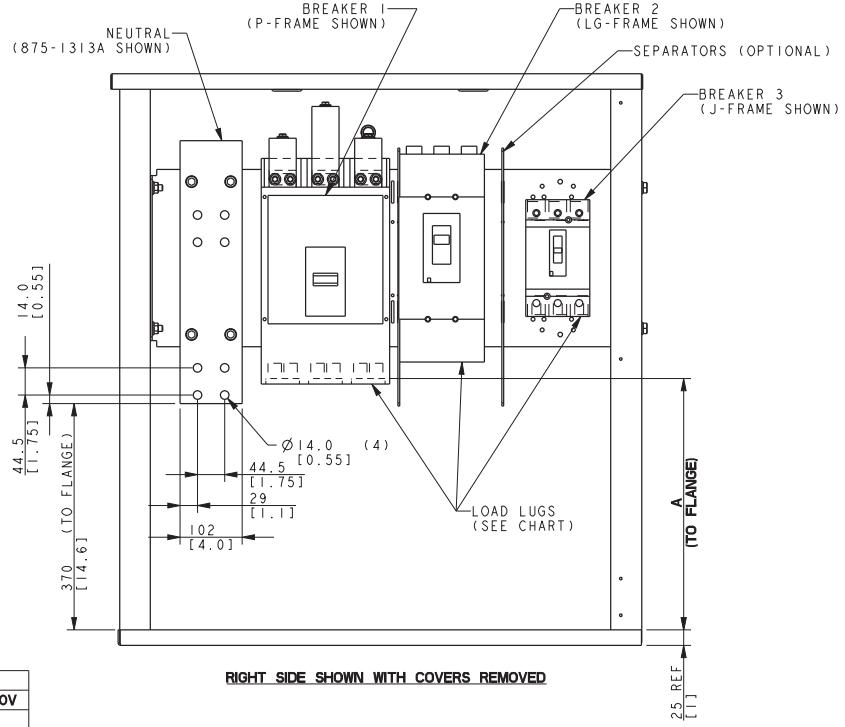
6) CIRCUIT BREAKER FRAMES REFER TO STANDARD SQUARE-D PRODUCT.

7) STANDARD NEUTRALS PROVIDED ARE SIZED FOR MAXIMUM UNIT AMPS. LSIG NEUTRALS ARE MATCHED TO THEIR CIRCUIT BREAKER AMPS.

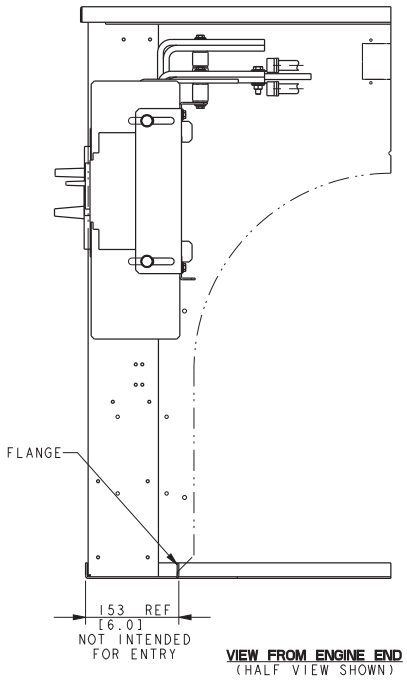
8) DIMENSIONS ARE MM, DIMENSIONS IN [ ] ARE INCHES.



625A NEUTRAL



RIGHT SIDE SHOWN WITH COVERS REMOVED



VIEW FROM ENGINE END
(HALF VIEW SHOWN)

ELECTRONIC TRIP UNITS		
FRAME	TRIP UNIT	
H	LI	MICROLOGIC 3.2
	LSI	MICROLOGIC 3.2S
	LSIG	MICROLOGIC 6.2A
J	LI	MICROLOGIC 3.2
	LSI	MICROLOGIC 3.2S
	LSIG	MICROLOGIC 6.2A
LG	LI	MICROLOGIC 3.3
	LSI	MICROLOGIC 3.3S
	LSIG	MICROLOGIC 6.3A
M	LI	ET 1.0
P	I	ET 1.01
	LI	MICROLOGIC 3.0
	LSI	MICROLOGIC 5.0
	LSIG	MICROLOGIC 6.0A

UL INTERRUPT kA RATINGS			
BREAKER	• 240V	• 480V	• 600V
HD	25	18	14
HG	65	35	18
HJ	100	65	25
JD	25	18	14
JG	65	35	18
JJ	100	65	25
LA	42	30	22
LG	65	35	18
MG	65	35	18
PG	65	35	18
PJ	100	65	25
PL	125	100	25

ELECTRICALLY OPERATED BREAKERS FOR DEC6000 DPS OR APM603 PARALLELING ONLY NO 2ND BREAKERS ARE ALLOWED			
RATING	AMPS	TRIP TYPE	FRAME
100%	250	ELECTRONIC LI OR LSI	PJ OR PL
	400		
	600		
	800		
	1000		
	1200		

LCB KITS
4UA, 4M6226
ALTERNATOR FRAMES

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	7-10-07	NEW DRAWING [79677]	WSD
A	5-26-15	(B-8) 625A WAS 500A, VIEW UPDATED [83690]	WSD
B	4-22-08	(D-8) 15-150 WAS 40-150 [84767]	WSD
C	10-19-12	UPDATED D TO LG, 100% H/J ADDED, LSIG NEUTRAL LUG CHART ADDED [CT26372]	WSD
D	11-2-16	(D-6) REMOVED SEPARATE LINES FOR H & J 100% LUGS; (D-8) UPDATED TABLE AND ADDED 3RD LCBS [CT114236]	WSD
E	3-26-19	(A-6) EOB TABLE ADDED [CT194577]	WSD
F	6-23-21	(D-6) M 800A WAS 700 & 800,LI WAS I [CT212837]	WSD

DO NOT SCALE, REFERENCE THE MODEL FOR ALL UNSPECIFIED DIMENSIONS

THIRD-ANGLE PROJECTION

APPROVALS		DATE
DRAWN	WSD	7-10-07
CHECKED	WSD	7-10-07
APPROVED	AJH	7-10-07

KOHLER
KOHLER, WISCONSIN 53044

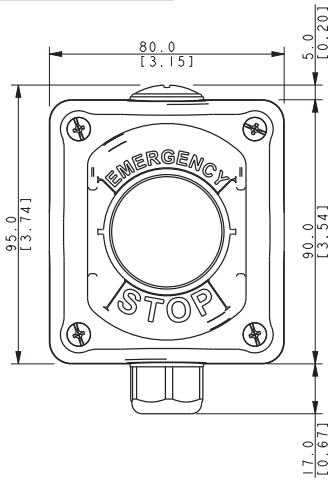
TITLE: DIMENSION PRINT

SCALE 0.25 | CAD NO. | SHEET 1 of 1

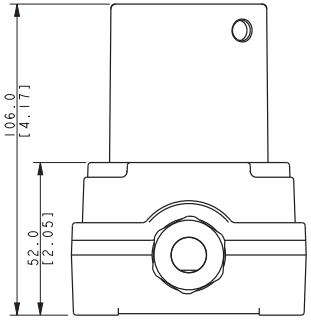
DWG NO. ADV-7372 | D

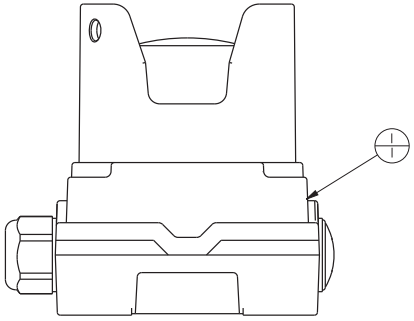
KIT NO.	ITEM	PART NO	QTY	DESCRIPTION
GM103743				E-STOP, NEC REMOTE
	1	GM103743-1	1	E-STOP W/ YELLOW SHROUD, LOTO
	2	GM103743-2	4	#10 X 1.25□ Sheetmetal Screw
	3	GM103743-3	1	TERMINAL, FAST-ON, MALE, 18-22 AWG
	4	GM103743-4	1	TERMINAL, FAST-ON, FEMALE, 18-22 AWG
	5	GM103743-5	2	TERMINAL, SPADE, 22-16 AWG
	6	GM103743-6	1	LITERATURE, TT-1736

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



SCALE 1.50





NOTE:

DIMENSIONS IN [ ] ARE IN INCH EQUIVALENTS.

SCREWS AND TERMINALS ARE TO BE BAGGED AND PLACED IN THE BOX

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	2-12-18	NEW DRAWING [CT176728]	CCL

UNLESS OTHERWISE SPECIFIED:
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30'
SURFACE FINISH 63 MAX.
THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	CCL	2-12-18
CHECKED	KJB	2-12-18
APPROVED	KJB	2-12-18

KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE: E-STOP, NEC REMOTE

SCALE 1.50 | CAD NO. | SHEET 1 of 1

DWG NO. GM103743 | D

KOHLER®

Warranty

Transfer Switch One-Year Limited Warranty

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

Kohler Product	**Warranty Coverage**
Transfer switch and factory-supplied transfer switch accessories	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.
Transfer switch main contacts	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®

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 4/15f

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

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

Kohler Product	**Warranty Coverage**
Stationary Standby Generator Set & Accessories	One (1) year from registered startup or two thousand (2000) hours (whichever occurs first). In any event, the warranty period will expire not later than thirty (30) months from the date of shipment from Kohler Co.'s factory.
Stationary Prime Power Generator Set & Accessories	One (1) year from registered startup or two thousand (2000) hours (whichever occurs first). In any event, the warranty period will expire not later than thirty (30) months from the date of shipment from Kohler Co.'s factory.

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

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

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

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

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

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

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

KOHLER®

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 12/15f

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

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

Kohler Product	**Warranty Coverage**
Stationary Standby Generator Set & Accessories	Five (5) years from registered startup or three thousand (3000) hours (whichever occurs first).

This warranty is effective only upon Kohler Co.'s receipt of an extended warranty registration form and warranty fee within one year of registered startup. The comprehensive limited warranty start date is determined by the standard limited warranty requirements and runs concurrent with the standard limited warranty during the first year. To receive extended comprehensive limited warranty coverage, the provisions of the standard limited warranty registration must be met.

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

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

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

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

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

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

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

KOHLER®

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 8/16f

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	**Warranty Coverage**
Transfer switch and factory-supplied transfer switch accessories	Five (5) years from registered startup date.
Transfer switch main contacts	Ten (10) years from the registered startup date.

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

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

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

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

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

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

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

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

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KOHLERPower.com

TP-6087 4/15d

KOHLER.

Certification

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that:

Kohler Power Systems
N7650 Lakeshore Road
Sheboygan
Wisconsin
53083
USA

Holds Certificate No: **FM 727336**

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

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

For and on behalf of BSI:

Carlos Pitanga, Chief Operating Officer Assurance – Americas

Original Registration Date: 1995-02-28
Effective Date: 2021-11-07
Latest Revision Date: 2021-10-29
Expiry Date: 2024-11-06

...making excellence a habit.™

Certificate No: **FM 727336**

Location	Registered Activities
Kohler Power Systems - GK 900 Highland Drive Bldg 604 Kohler Wisconsin 53004 USA	Manufacture of leads and harness, automatic transfer switches and switchgear. Distribution of generator sets.
Kohler Power Systems N7650 Lakeshore Road Sheboygan Wisconsin 53083 USA	Design, manufacture, and distributor support for electrical generators, automatic transfer switches and switchgear.
Kohler Power Systems 300 N Dekora Woods Blvd Saukville Wisconsin 53080 USA	Manufacture of fuel tanks, skids, fabricated components and generators.
Kohler Power Systems Muth Warehouse 2821 Muth Court Sheboygan Wisconsin 53083 USA	The distribution of generator sets.
Kohler Power Systems KWIP Warehouse 4327 County EE Sheboygan Wisconsin 53081 USA	Receiving, sequencing and warehousing of generator components.

Original Registration Date: 1995-02-28

Latest Revision Date: 2021-10-29

Effective Date: 2021-11-07

Expiry Date: 2024-11-06

PROTOTYPE TEST REPORT

KOHLER

Models Covered: **230, 250, 275REOZJE**
Model Tested: **275REOZJE**
Cooling System Tested: **50C**
Alternator Tested: **4UA10**
Engine Tested: **6090HF484**
Voltage Tested: **208V**

GENSET

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

Meets Rated Load

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

± 0.25 % Frequency Band
± 0.50 % Voltage Deviation

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

Full Load Acceptance	Full Load Rejection
43.7 % Voltage Dip	**32.1** % Voltage Overshoot
2.90 Seconds of Recovery Time	**3.40** Seconds of Recovery Time
26.5 % Frequency Dip	**4.30** % Frequency Overshoot
3.40 Seconds of Recovery Time	**0.50** Seconds of Recovery Time

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

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

Complies with NFPA 110 Type 10

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

Complies

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

Complies

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

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

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

PROTOTYPE TEST REPORT

Models Covered: **230, 250, 275REOZJE**
Model Tested: **275REOZJE**
Cooling System Tested: **50C**

Alternator Tested: **4UA10**
Engine Tested: **6090HF484**
Voltage Tested: **208V**

ALTERNATOR

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

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

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

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

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

Kohler Standby/Prime Generator Set Test Program

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

Prototype Testing

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

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

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.

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KohlerPowerSystemscom

G18-56 12/05b

Kohler Automatic Transfer Switch Test Program
Non-Bypass Models

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

Performance Testing

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

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

EMC/EMI Immunity Verification

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

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

Production Testing

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

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

CSA Certification

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

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

Options Testing

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

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

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

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G18-414 2/20

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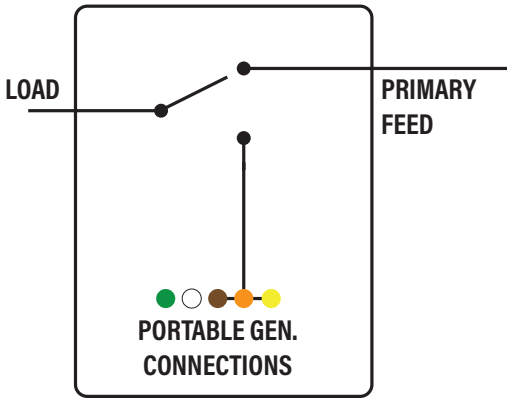
400A SPEC GRADE ROTARY WALL MOUNT QUICK CONNECT PANEL

QCPSW4H2M2WA20G30TRTS400

480/277V 3 PHASE ROTARY SPEC GRADE WALL MOUNT QUICK CONNECT PANEL

Unit picture may differ from actual specifications.



Material: Nema 3RX Powder Coated Aluminum Texture ANSI Gray

Description:
400A Spec Grade Rotary Wall Mount Quick Connect Panel
400A 3 Pole Rotary Transfer Switch
Male Angled Cam-Loks with Flip Covers and Hard Wire Access with Smart Lugs
Pad Lockable and Tamper Resistant While in Use
65 kA Rated Copper Common Buss with Mechanical Lugs
Phase Rotation Monitor with Fuse Block & Fuses
2 Wire Auto-Start Terminals
20A GFCI Receptacle with Circuit Breaker
30A L5-30 Receptacle with Circuit Breaker
Full Width Bottom Conduit Access
Side and Front Access Plates
5 Year Warranty
cETLus Listed, Conforms to UL STD 1008, Certified to CAN/CSA STD C22.2 NO. 178

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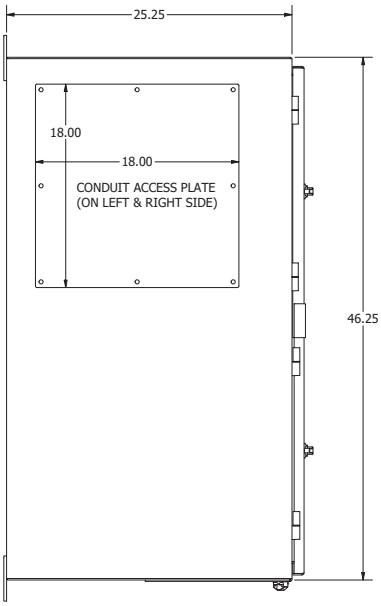
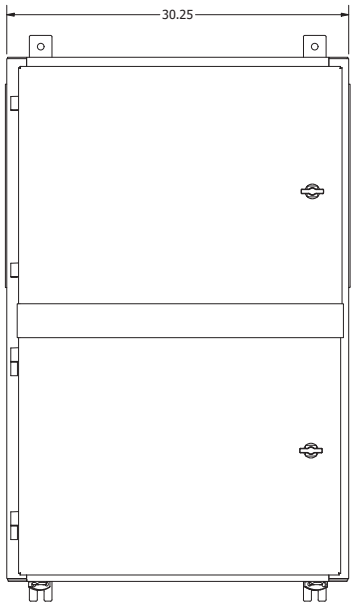
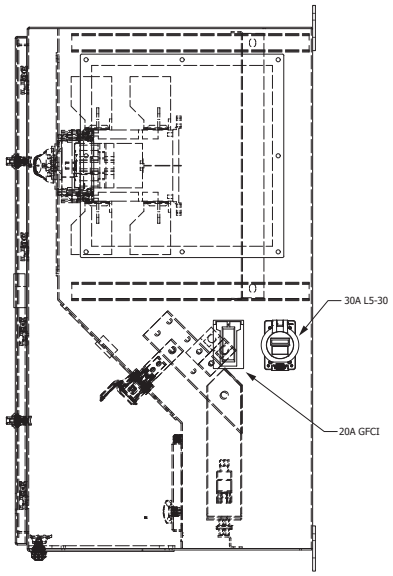


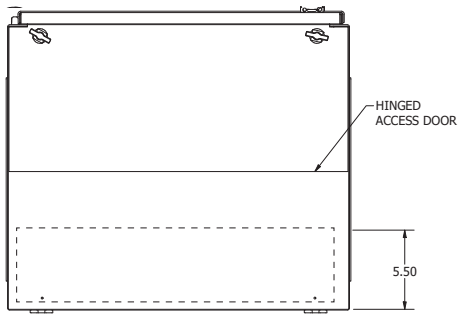
LEFT VIEW



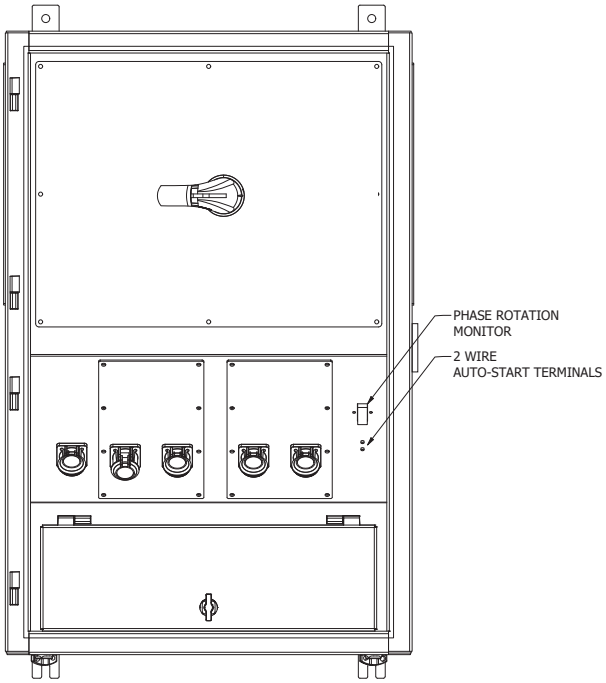
FRONT VIEW



RIGHT VIEW



BOTTOM VIEW



FRONT VIEW
WITHOUT DOORS

GENERAL NOTES

1. TYPE 3RX ENCLOSURE IN 1/8" ALUMINUM, POWDER COATED TEXTURE ANSI GRAY.
2. INLET PANEL IS FOR USE ONLY FOR CONNECTION OF A GENERATOR TO THE SOURCE TERMINALS OF A TRANSFER SWITCH SUCH THAT THE INLETS ARE ENERGIZED FROM THE GENERATOR.
3. cETLus LISTED, CONFORMS TO UL STD 1008, CERTIFIED TO CAN/CSA STD C22.2 NO. 178
4. SHORT CIRCUIT CURRENT RATINGS AS SPECIFIED IN PURCHASE DOCUMENTS.
5. REMOVABLE 11 GAUGE ALUMINUM OR OPTIONAL 316SS HINGE DOOR WITH PADLOCK PROVISIONS.
6. FINISH: ANSI 61 GRAY POWDER COAT.
7. REMOVABLE GASKETED SIDE ACCESS PANELS ARE ADDITIONAL CONDUIT ENTRY AREAS.
8. RECOMMENDED CLEARANCES: FRONT 24 TO 30 INCHES
9. REMOVABLE GROUNDING STRAP(S) ARE INCLUDED CONNECTING THE GREEN CAMLOCKS TO THE ENCLOSURE.
10. NO NEUTRAL TO GROUND BONDING PROVISIONS INCLUDED.
11. CAMLOCK CONNECTORS ARE SERIES 16 COMPATIBLE. 400A RATED.
12. INSTALLATION: SURFACE TO WHICH THE PANEL IS TO BE INSTALLED AND THE INSTALLATION METHOD / HARDWARE MUST BE CAPABLE OF SUPPORTING THE WEIGHT OF THE PANEL AS WELL AS THE WEIGHT OF THE TEMPORARY CABLES TO BE ATTACHED TO IT. THE INSTALLATION IS TO BE DONE BY QUALIFIED PERSONNEL IN ACCORDANCE WITH LOCAL AND NATIONAL CODES AND GOOD ENGINEERING PRACTICES. THE PANEL MUST BE LEVEL AND PLUMB TO ALLOW FOR PROPER DRAINAGE / WATER RUNOFF.

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product specifications for:

CLS 40 Panel Mounts

Item #: CLS40MRB-BB2

Description
CAM CLS 40 Two hole bus bar 5/16"-18 thread Male Panel Mount

Electrical Specifications
Max. Amperage: 400A
Max. Voltage: 600V AC/DC

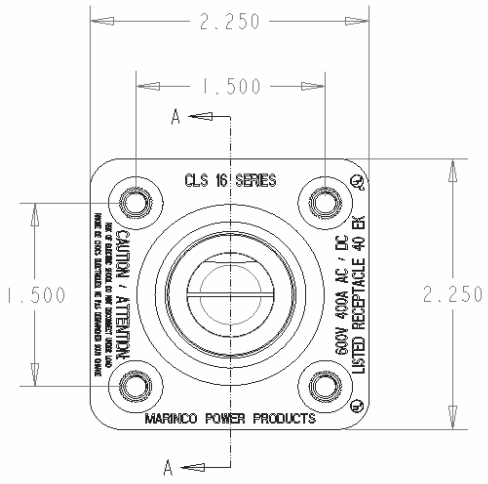
Material Specifications
Housing Material: Santoprene TPV
Contact Material: Brass
Temperature Rating: -40°C to 105°C

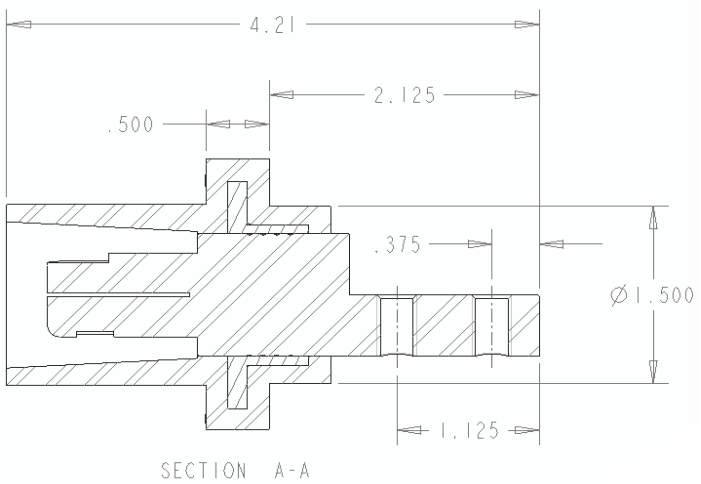
Mechanical Specification
Gender: Male
Connection Type: Two holes 5/16"-18 thread bus bar
(Torque to 100 in.-lbs., do not over tighten)
Mounting: Brass eyelet for #10-32 bolt
(Bolts Not Provided)

Standards and Certifications
UL Listed: File E471676
CSA Certified: 0812900000
Environmental Rating: Type 3R & 4

Example: **CLS40MRB-BB2 +** **A** **= CLS40MRB-BB2-A**

A	B	C	D	E	F	G	H





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product specifications for:

Cam Protective Covers

Item #: CLL3RN

Description
CAM NEMA 3R Enclosure with Gasket

Material Specifications
Housing Material: UV Resistant Polycarbonate
Spring & Hinge Material: Stainless Steel
Temperature Rating: 90°C

Mechanical Specification
Fits 16 and 18 Series Panel Mounts (Male and Female)
Use #8 Plastite Screw or #10-32 Screw for Mounting (not provided)

Standards and Certifications
UL Listed: File E471676
Environmental Rating: Type 3R

c UL us LISTED

Example: **CLL3RN +** **A** **= CLL3RN-A**

A	B	C	D	E	F	G	H	Z
CLEAR								

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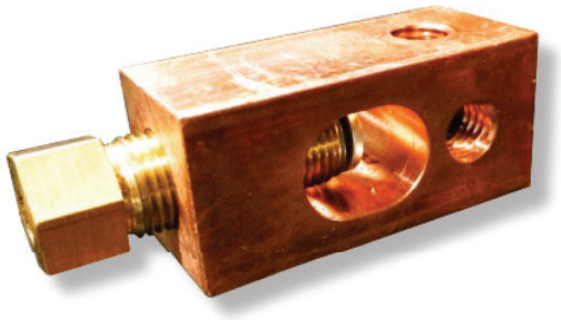
SMART LUG

Alleviates to problems associated with standard allen wrench lugs and extends the life of the lug exponentially.



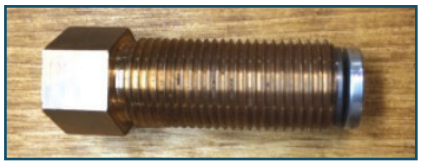
The **Smart Lug** is a patented repetitive and multi-use lug designed to alleviate the problems associated with standard aluminum alien wrench lugs.

The **Smart Lug** can be used for a variety applications that require wiring and unwiring cable on a regular basis. It can accommodale both bare ended or eyelet wire, features an oblong shaped hole which makes connecting frayed cable easier, and allows for greater tourque and cable compression.

The lug bolt features a compression end with a patented spinning tip that stays in place as the cable is compressed and does not twist and knurl the wire, extending the usability of the cable end and reducing the need to trim the cable ends after each use.

Additional Features

- Plated copper or aluminum
- Stud or Bolt, Tang w/ Hole, or Slotted Types
- 1 /2" threaded holes for ring terminals & eyelets
- 2 x 1 /4" threaded holes on Stud Type for anti-Spin
- Square stock for added wrench support & torque
- Rated for 600A and cable sizes #6 to 350 MCM
- Spinning bolt tip compresses wire with no knurling
- UL Listed
- UL Tested to 30,000V



Patented Spinning Bolt End with Hex Head and Allen Insert.

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Product data sheet
Characteristics

RM17TG00
phase control relay RM17-T range 183..528 V AC

Main

Range of product	Zelio Control
Product or component type	Modular measurement and control relays
Relay type	Control relay
Product specific application	For 3-phase supply
Relay name	RM17TG
Relay monitored parameters	Phase sequence Phase failure detection
Time delay	Without
Switching capacity in VA	1250 VA
Measurement range	208...480 V voltage AC

Complementary

Maximum switching voltage	250 V AC 250 V DC
Minimum switching current	10 mA 5 V DC
Supply voltage limits	183…528 V AC
Control circuit voltage limits	- 12 % + 10 % Un
Power consumption in VA	0…22 VA 400 V AC 50 Hz
Voltage detection threshold	< 100 V AC
Control circuit frequency	50...60 Hz +/- 10 %
Output contacts	1 C/O
Nominal output current	5 A
Measurement voltage limits	183…528 V AC
Delay at power up	650 ms
Voltage range	183...528 V
Response time	<= 130 ms in the event of a fault)
Marking	CE
Overvoltage category	III IEC 60664-1
Insulation resistance	> 500 MOhm 500 V DC IEC 60255-5 > 500 MOhm 500 V DC IEC 60664-1
[Ui] rated insulation voltage	400 V IEC 60664-1
Supply frequency	50/60 Hz +/- 10 %
Operating position	Any position without
Connections - terminals	Screw terminals, 1 x 0.5...1 x 4 mm² AWG 20...AWG 11) solid without cable end Screw terminals, 2 x 0.5...2 x 2.5 mm² AWG 20...AWG 14) solid without cable end Screw terminals, 1 x 0.2...1 x 2.5 mm² AWG 24...AWG 12) flexible with cable end Screw terminals, 2 x 0.2...2 x 1.5 mm² AWG 24...AWG 16) flexible with cable end
Tightening torque	5.31…8.85 lbf.in (0.6…1 N.m) IEC 60947-1
Housing material	Self-extinguishing plastic
Local signalling	Relay ON LED yellow)
Mounting support	35 mm symmetrical DIN rail EN/IEC 60715
Electrical durability	100000 cycles
Mechanical durability	30000000 cycles
Operating rate	<= 360 operations/hour full load

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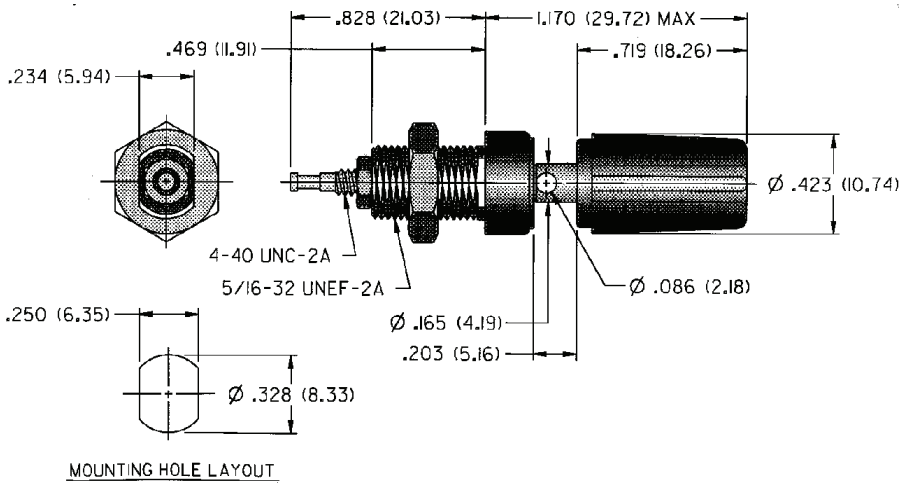
Binding Post - Insulated Standard

SPECIFICATIONS
Stud: Brass per QQ-B-626D
Finish: Silver
Insulating Material: Nylon 6/6 per ASTM D4066
Hardware: Nickel plated nut (unassembled)
Body Thread Stripping Torque: 6.0 lb. in. (7.0 kg cm)
Panel Thickness: Up to .281 (7.15)

RATINGS
Current: 15 amps
Contact Resistance: 0.010 ohms maximum
Breakdown Voltage: 5700 Vrms minimum
Stud-to-Panel: 3.3 pF nominal

SILVER PLATING	
111-0103-001	Black



MOUNTING HOLE LAYOUT

For Standard Banana Plug: .175 (4.44) Dia.
FEATURES:
- Turret terminal
- Captive thumb nut
- Insulated body is flatted to prevent turning
- Nylon UL approved for self-extinguishing

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LEVITON

GFNT2-GY

20 Amp, 125 Volt Receptacle/Outlet, 20 Amp Feed-Through, Self-test SmartlockPro Slim GFCI, monochromatic, Residential/Commercial applications, back and side wired, heavy duty, wallplate/faceplate and self grounding clip included - Gray

- SAFE - Delivers continuous ground fault protection
- SELF TESTING - Automatically self-tests to ensure it can respond to ground fault
- SIMPLE - Status indicator light provides simple, intuitive feedback

Color : Gray

UPC Code : 078477712757

Country Of Origin : China

NEMA : 5-20R

Available Colors :

Black | Brown | Ivory | Light Almond | Red | White

Technical Information

Product Features

Amperage : 20 A
At Rated Voltage : 1 HP
Brand : SmartlockPro
Color : Gray
Feature : Self-Test
Fed Spec WC-596 : Yes
Grade : Residential/Commercial Specification Grade
Grounding : Self-Grounding
NEMA : 5-20R
Pole : 2
Standards and Certifications : UL/CSA, NEMA WD6, NEMA WD1
Strap Material : Galvanized Steel
Tamper Resistant : No
Termination : Back & Side
Trip Level : Class A, 5mA plus or minus 1mA
Type : Standard Duplex
Voltage : 125 VAC
Wallplate : Included
Warranty : 2-Year Limited
Wire : 3

AC Horsepower Ratings

At Rated Voltage : 1 HP
Dielectric Voltage : Withstands 1250VAC per UL 943 and CSA-C22.2 No. 144.1-06
Short Circuit Current Rating : 10KA
Temperature Rise : Max 30C after 100 cycles OL at 150 percent rated current

Electrical Specifications

Dielectric Voltage : Withstands 1250VAC per UL 943 and CSA-C22.2 No. 144.1-06
Operating Temperature : -35C to +66C
Short Circuit Current Rating : 10KA
Temperature Rise : Max 30C after 100 cycles OL at 150 percent rated current

Environmental Specifications

Body Material : Polycarbonate
Clamps : Brass
Grounding Screw : Plated Steel
Line Contacts : Brass Triple-Wipe .031 Thick
Notes : w/ Wallplate
Product ID : Ratings are permanently marked on device
Terminal Accom. : 14-10 AWG
Terminal ID : Brass-Hot, Green-Ground, Silver-Neutral
Terminal Screws : Plated Steel
Yoke : Zinc-Plated Steel

Mechanical Specifications

Amperage : 20 A
Body Material : Polycarbonate
Brand : SmartlockPro
Color : Gray
Face Material : Thermoplastic
Feature : Self-Test
Fed Spec WC-596 : Yes
Grade : Residential/Commercial Specification Grade
Grounding : Self-Grounding
NEMA : 5-20R
Notes : w/ Wallplate
Pole : 2
Product ID : Ratings are permanently marked on device
Standards and Certifications : UL/CSA, NEMA WD6, NEMA WD1
Strap Material : Galvanized Steel
Tamper Resistant : No
Terminal Accom. : 14-10 AWG
Terminal ID : Brass-Hot, Green-Ground, Silver-Neutral
Termination : Back & Side
Torque Range : 14 – 18 in.-lbs
Trip Level : Class A, 5mA plus or minus 1mA
Type : Standard Duplex
Voltage : 125 VAC
Warranty : 2-Year Limited
Wire : 3

Standards and Certifications

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LEVITON

2610

30 Amp, 125 Volt, NEMA L5-30R, 2P, 3W, Flush Mtg Locking Receptacle, Industrial Grade, Grounding, V-0-MAX - BLACK

Leviton's Industrial Grade Locking Devices are built to provide unparalleled quality and superior performance in the most severe industrial settings. Leviton combines the best materials available with superior production standards to produce a broad selection of Locking Devices of unmatched flexibility and dependability.

- Ideal for generators and camper trailers

UPC Code : 078477809471

Country Of Origin : Please Contact Customer Service.

NEMA :  L5-30R

Technical Information

AC Horsepower Ratings

At Rated Voltage : 2 HP

Electrical Specifications

Amperage : 30 A

Current Limiting : Full Rated Current

Dielectric Voltage : Withstands 2000V per UL498

Grounding : Grounding

Pole : 2

Temperature Rise : Max 30C after 250 cycles OL at 200 percent rated current

Voltage : 125 VAC

Wire : 3

Environmental Specifications

Environment : Corrosive

Flammability : Rated V-0 per UL 94

Operating Temperature : -40°C to 60°C

Material Specifications

Base Material : Valox

Body Material : Nylon

Color : Black

Cover Material : Valox 357

Face Material : Ultramid

Ground Contacts : Brass

Grounding Screw : Chromated Brass

Line Contacts : Brass

Strap Material : Nickel-Plated Brass

Terminal Clamps : Nickel-Plated Brass

Terminal Screws : Chromated Brass

Mechanical Specifications

Cord Range : 0.595 to 1.150

Product ID : Ratings and NEMA I.D. permanently marked on device

Terminal Accom. : 14-8 AWG

Terminal ID : Marked on Device

Termination : Back & Side

Product Features

Base Material : Valox

Brand : V-0-Max

Color : Black

Device Type : Locking Receptacle

Face Material : Ultramid

NEMA : L5-30R

Warranty : Lifetime Limited

Standards and Certifications

ANSI : C-73

CSA : C22.2 No. 42

NEMA : WD-1 & WD-6

NOM : 057

UL : 498

UL Fed Spec : W-C-596

Warranty

Warranty : Lifetime Limited

WE PUT THE

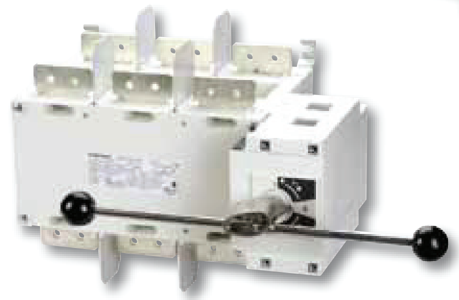
Transfer switches

SIRCOVER UL 98/1008

Manually operated transfer switching equipment
from 100 to 1200 A

svr-ul_014_b_1_cat

svr-ul_013_a_2_cat



The solution for

- Manufacturing industry
- Power distribution
- Domestic

Strong points

- Stable positions
- Compact design
- On-load switching
- Reliability

Conformity to standards

- UL 1008
  guide WPYV
  file 317092
- UL 98
  guide WHTY
  file 201138
- CSA 22.2#4
  class 4651-02

UL 98 and CSA from 600-1200 A. Specific reference from 100 to 400 A on request.

Enclosed solutions

SOCOMEC offers a range of pre-equipped enclosures

Enclosed *SIRCOVER*

Function

SIRCOVER UL 98/1008 are heavy duty manual transfer switches. They ensure switching transfer of sources or transfer of two low voltage circuits on load as well as their safe disconnection.

These switches are extremely durable and are tested and approved for use in the most demanding applications, such as resitive load or total system applications.

Advantages

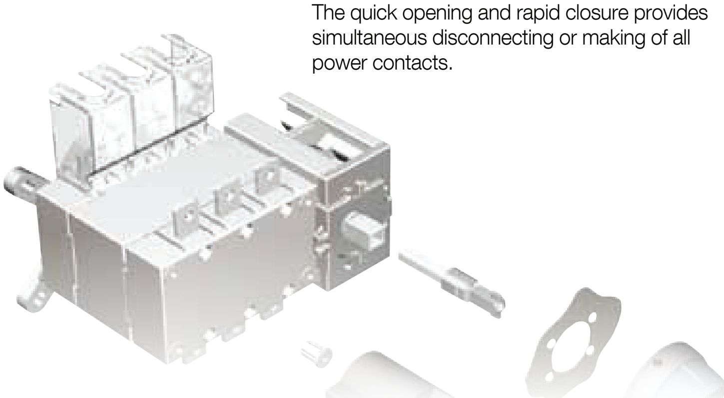
Stable positions
SIRCOVERs have three stable positions which are not affected by voltage drops or vibrations, thus protecting your load against network interference.

Compact design
The SIRCOVER are based on a back-to-back switching technology, providing a compact solution.

On-load switching
The SIRCOVER UL enables secure and reliable switching, without the need for pre-breaking upstream.

Reliability
The SIRCOVER has double breaking per pole achieved through its sliding bar contacts system.

The quick opening and rapid closure provides simultaneous disconnecting or making of all power contacts.



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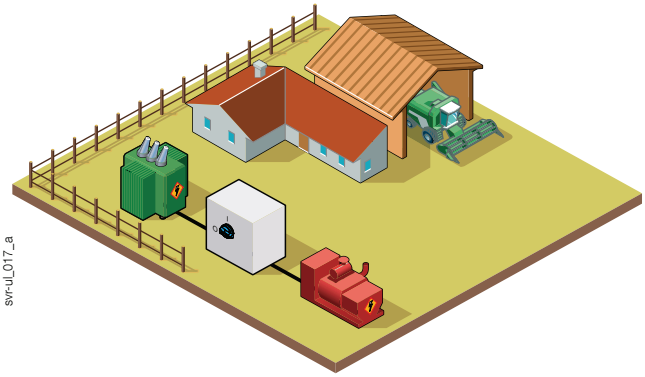
Typical application

The SIRCOVER UL 98/1008 range provides safe transfer and disconnection within your LV installation for optional standby systems (as described in NEC Article 702).

Standard applications also include:

- Transfer from Normal power supply to the backup genset source (emergency supply).
- Safe on load transfer.
- Changing motor phase rotation and equipment grounding connection.



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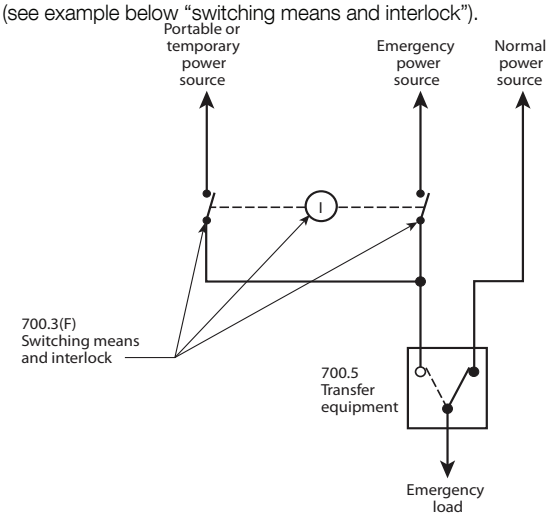
The SIRCOVER UL 98/1008 can also be used as switching means to a temporary power supply in emergency systems (systems needed for human safety) as described in article 700.3(F) of the NEC
(see example below “switching means and interlock”).



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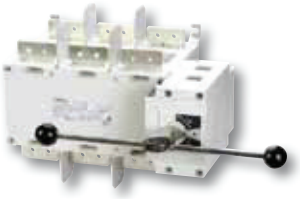
Example of connection for temporary or portable power [1].

(1) National Fire Protection Agency, NFPA 70: National Electrical Code®. 2017 Edition. Quincy, MA: National Fire Protection Agency, 2016, p. 70–581.

SOCOMEC solution up to 1200 A

svr-ul_014_b_2_cat

UL 1008 Manual Transfer Switch
From **100 to 400 A** for resistive and total systems applications.
UL 98 / CSA 22.2#4 versions on request.



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UL 1008 and UL 98 Manual Transfer Switch
From **600 to 1200 A** for resistive and total systems applications.
Has UL 98/CSA 22.2#4 certification.

IEC solution up to 3200 A

The SIRCOVER UL 1008 is part of a large range that includes an IEC products of standalone or enclosed manual transfer switches and manual bypass switches with overlapping options. Contact us for further information on our complete range.

1646 Rankin Road. Suite 300 | Houston, TX 77073 | Office 281.286.3303 | Fax 281.286.3393 | www.powertemp.com

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SIRCOVER UL 98/1008

Manually operated transfer switching equipment
from 100 to 1200 A

References

SIRCOVER UL 98/1008

Rating (A)	Frame size	No. of poles	Switch body	Direct handle	External handle	Shaft for external handle	Bridging bars	Auxiliary contacts	Terminal screens
100 A*	B4	2 P	4150 **2012**	Black 4199 **4012**	S2 type Black I - 0 - II 4, 4X 142D **2113**	S2 type 200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032** 400 mm 15.7 inches 1400 **1040**	2 P 4159 **2021** 3 P 4159 **3021** 4 P 4159 **4021**	Contact NO/NC 4159 **0021** Low level 4159 **0022**	2 / 3 P 4158 **3021** 4 P 4158 **4021**
		3 P	4150 **3012**						
		4 P	4150 **4012**						
200 A*		2 P	4150 **2022**						
		3 P	4150 **3022**						
		4 P	4150 **4022**						
260 A*	B5	2 P	4150 **2026**		S2 type Black I - 0 - II 4, 4X 142D **2113** S3 type Black I - 0 - II 4, 4X 143D **3113**	S2 type 200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032** 400 mm 15.7 inches 1400 **1040**	2 P 4159 **2041** 3 P 4159 **3041** 4 P 4159 **4041**		2 / 3 P 4158 **3041** 4 P 4158 **4041**
		3 P	4150 **3026**						
		4 P	4150 **4026**						
		2 P	4150 **2042**						
400 A*		3 P	4150 **3042**						
		4 P	4150 **4042**						
600 A	B6	3 P	4150 **3060**	Black 4199 **7012**	S3 type Black I - 0 - II 4, 4X 143D **3113**	S3, S4 type 200 mm 7.9 inches 1401 **1520** 320 mm 12.6 inches 1401 **1532** 400 mm 15.7 inches 1401 **1540**	3 P 4159 **3063** 4 P 4159 **4063**	Contact NO/NC as standard	3 P 1609 **3063** 4 P 1609 **4063**
		4 P	4150 **4060**						
800 A	B7	3 P	4150 **3080**	Black 4199 **7062**	S4 type Black I - 0 - II 4, 4X 144D **3813**(1)		3 P 4159 **3080** 4 P 4159 **4080**		3 P 1609 **3080** 4 P 1609 **4080**
		4 P	4150 **4080**						
1200 A		3 P	4150 **3120**						
		4 P	4150 **4120**						

Common accessories - more available on next pages.
** From 100 to 400 A, UL 98 Specific reference upon request.*

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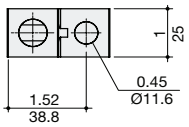
Terminal lugs (in/mm)

100 to 200 A / B4



300 kcmil

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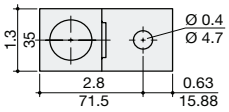
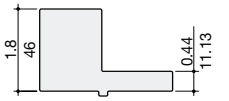
260 to 400 A / B5





600 kcmil

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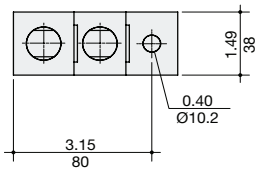
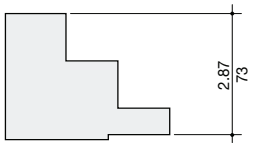
600 to 1200 A / B6 - B7





2 x 600 kcmil

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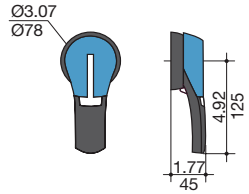
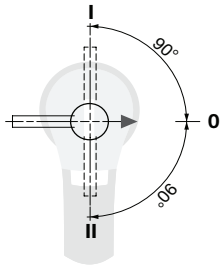
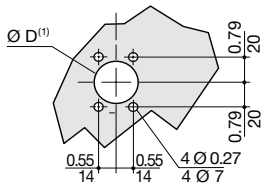
External handles dimensions (in/mm)

100 to 400 A / B4 - B5

Handle type	Front operation Direction of operation	Door drilling
S2 type 		

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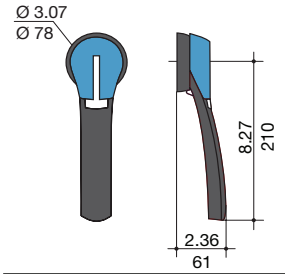
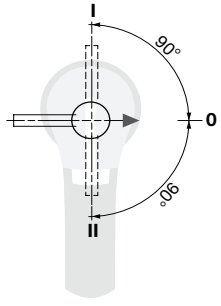
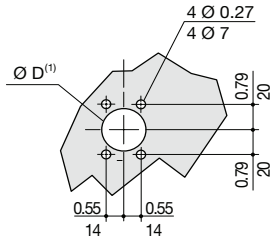
260 and 600 A / B5 - B6

Handle type	Front operation Direction of operation	Door drilling
S3 type 		

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SUBMITTAL REVIEW

❑ APPROVED

❑ APPROVED WITH CHANGES NOTED

❑ REVISE & RESUBMIT

❑ REJECTED

SUBMITTAL WAS REVIEWED FOR DESIGN CONFORMITY

BY: _____ DATE: _____

PRE-STARTUP **CHECKLIST**

Job Name: HD3026 Lee's Summit, MO - Equipment

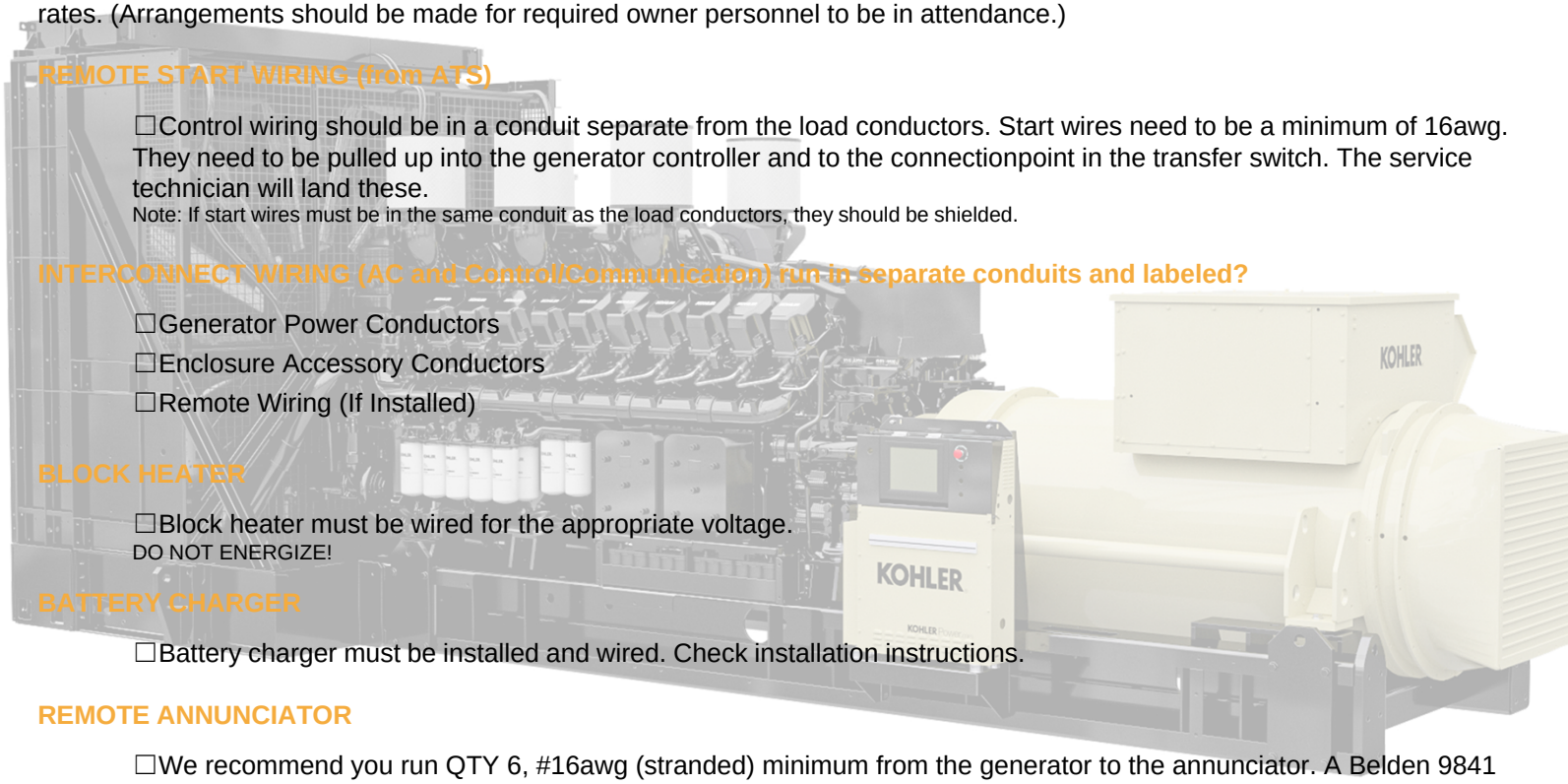
Address: 651 Se Oldham Parkway
City: Lees Summit **State:** MO

Onsite Contact:

START UP CHECKLIST

The Nixon Power Services Kohler Certified Technician will connect batteries, and ensure proper oil and coolant levels. They will test the system for proper operation per the Kohler Start-up Checklist and per the specifications of this project. The technician will notify the customer of any onsite issues.

Unless otherwise specified, demonstration and training will be done during start-up. Return visits will be invoiced at published rates. (Arrangements should be made for required owner personnel to be in attendance.)



REMOTE START WIRING (from ATS)

☐Control wiring should be in a conduit separate from the load conductors. Start wires need to be a minimum of 16awg. They need to be pulled up into the generator controller and to the connectionpoint in the transfer switch. The service technician will land these.
Note: If start wires must be in the same conduit as the load conductors, they should be shielded.

INTERCONNECT WIRING (AC and Control/Communication) run in separate conduits and labeled?

☐Generator Power Conductors
☐Enclosure Accessory Conductors
☐Remote Wiring (If Installed)

BLOCK HEATER

☐Block heater must be wired for the appropriate voltage.
DO NOT ENERGIZE!

BATTERY CHARGER

☐Battery charger must be installed and wired. Check installation instructions.

REMOTE ANNUNCIATOR

☐We recommend you run QTY 6, #16awg (stranded) minimum from the generator to the annunciator. A Belden 9841 cable is also required. On a standard RSA without a key switch, pull one Belden 9841 from the generator to the RSA.If using an RSA with a key switch for testing an ATS, then the one Belden 9841 should be pulled from the generator to the ATS and an additional Belden 9841 from the ATS to the RSA. If using with an Ethernet connection contact the service department for proper installation requirements.

UTILITY POWER

☐Utility power must be connected and available to the transfer switch.
NOTE: DON'T PLUG THE CONTROLLER IN

☐Building loads must be available. Transfer switch must be allowed to be tested. Transfer Switch must be powered down to plug in controller. Power interruptions will occur during testing.

ELEVATOR CONTACTS

☐If programming of Automatic Transfer Switch contacts are required for elevators, wires need to be present at time of start up. Please confirm signals required from elevator vendor. (ie, switch position, time delay until transfer

DIESEL FUEL SYSTEM

☐The tank should be at least 75% full with #2 diesel.
NOTE: IF REQUIRED, FUEL TANK MUST HAVE TAKE PRESSURE TEST COMPLETED BEFORE SCHEDULING STARTUP

☐Tank Pressure Test & Fire Marshall permits (if applicable, by others)

NATURAL GAS / LP ENGINES

☐Fuel system must be installed per the Kohler installation manual, TP-5700, pages 21-24 and 32. Gas pressure MUST be 7-11 inches of water column at the generator fuel inlet on the secondary side of the customer supplied regulator Supply volume must be sized for 100% rated load. Recommended flexible fuel line installed between regulator and customer connection.

☐Have fuel lines been run and is fuel available to the generator set?

☐Is gaseous fuel pressure at the inlet solenoid of the generator set at 7-11 inches water column?

☐Are gaseous fuel lines sized per the generator specifications?

GENERATOR LOCATION & ANCHORING

☐Generator and/or Tank secured to floor/pad according to install manual TP-5700

☐Working clearances are adequate and equipment accessible

☐Loadbank access, if applicable drive up access will be required for trailer mounted loadbanks

END USER CONTACT INFORMATION

Name:

Phone Number:

Email Address:

I have read the above guidelines and have made all the necessary inspections to verify that all these requirements have been completed as specified. Omission of installation of items or devices required for startupmay incur additional cost to the contractor, and are not included in initial job proposal.

Customer/Contractor:

Authorized Signature: **Date:**

NIXON POWER SERVICES

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