KOHLER
Power Systems
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http://www.kohlerpower.com/index.htm

Submittal Package

Job Name: Variant Pricing Sample - GM500REOZVC
Quote: 0026183866
Proposal:

We are pleased to offer the following submittal for your consideration.
Thank you, Michelle, Kohler Co.

KOHLER. Power Systems

TABLE OF CONTENTS

Generator Set

Kohler Model:500REOZVC
This diesel generator set equipped with a 5M4027 alternator operating at 127/220 volts is rated for 500 kW/ 625 kVA.
Output amperage: 1640

Configuration

Qty	Description
00002	500REOZVC Generator System
2	500REOZVC Generator Set
2	Stairs, Freestanding
2	Lit. Kit, General Maintenance, 500REOZVC
2	Lit. Kit, Overhaul, 500REOZVC

Includes the following:

Literature Languages	English
Engine	500REOZVC,24V,50/60Hz, EPA
Nameplate Rating	Standby 130C Rise (25C Amb.)
Voltage	60Hz, 127/220V, Wye, 3Ph, 4W
Alternator	5M4027
Cooling System	Unit Mounted Radiator, 50C
Skid and Mounting	Skid
Air Intake	Standard Duty
Controller	DEC550
Enclosure Type	Weather
Enclosure Material	Steel
Enclosure Silencer	Internal Silencer
Enclosure Air Outlet	Aluminum Gravity Outlet
Subbase Fuel Tank	Assembled to Generator Set
Fuel Tank Type	State
Fuel Runtime (Approx.)	72 Hours
Subbase Fuel Tank Capacity	3052 Gallons
Fill Pipe/Spill Fill Options	5 Gal Spill Fill Containment

Fuel Supply Options	Fire Safety Valve
Electrical Accy.,Installed	Battery, 2/12V, Wet
Electrical Accy.,Installed	Battery Heater, 120V
Electrical Accy.,Installed	Run Relay
Electrical Accy.,Installed	Generator Heater, 120/240V
Rating, LCB 1 Right	80% Rated
Amps, LCB 1 Right	1200
Trip Type, LCB 1 Right	Electronic w/ GFI, UL/IEC/CSA
LCB 1 Right Interrupt Rating	35kA at 480V
Aux Trip, LCB 1 Right	Shunt Trip
Misc. Accy., LCB 1 Right	Alarm Switch
Fuel Lines, Installed	Flexible Fuel Lines, Stainless
Fuel System Acc.,Installed	Fuel Pressure Gauge
Exceeds LTL Shipping Height	Add'l Shipping Charge Accepted
Miscellaneous Accy,Installed	Coolant in Genset
Miscellaneous Accy,Installed	Closed Crankcase Vent
Miscellaneous Accy,Installed	Oil in Genset
Warranty	5 Year Basic

KOHLER. Power Systems

Spec Sheets

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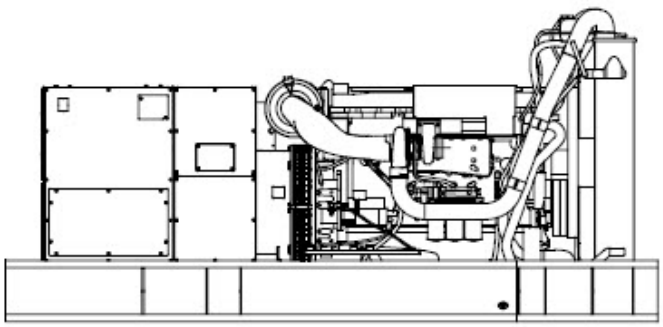
500REOZVC
Diesel



Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Tier 2 EPA-certified for Stationary Emergency Applications

Alternator Features

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

Other Features

- Kohler designed controllers for guaranteed system integration and remote communication.
- The low coolant level shutdown prevents overheating (standard on radiator models only).Integral vibration isolation eliminates the need for under-unit vibration spring isolators.
- An electronic, isochronous governor delivers precise frequency regulation.
- Multiple circuit breaker configurations.

Generator Set Ratings

				Standby130C Ratings	
Alternator	Voltage	Ph	Hz	kW/kVA	Amps
5M4027	127/220	3	60	500 / 625	1640

RATINGS: All three-phase units are rated at 0.8 power factor.
Standby Ratings: Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage.
There is no overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271.
Prime Power Ratings: Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited.
A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory.
Obtain the technical information bulletin (TIB-101) on ratings guidelines for the complete ratings definitions.
The generator setmanufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.
GENERAL GUIDELINES FOR DERATION: Altitude: Derate 0.4% per 100 m (328 ft.) elevation above 1400 m (4593 ft.).

Model: 500REOZVC, continued

Alternator Specifications

Specifications	Alternator
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet
Leads, quantity	10/12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation	NEMA MG1
Insulation: Material	Class H
Insulation: Temperature Rise	130&#65533;C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Voltage regulation, no-load to full-load (with <0.5% drift due to temp. 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.
• Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
• Digital solid-state, volts-per-hertz voltage regulator with +/-0.25% no-load to full-load regulation.
• Brushless alternator with brushless pilot exciter for excellent load response.

Engine

Engine Specification

Engine Manufacturer	Volvo
Engine Model	TAD1641GE
Engine: type	4-Cycle, Turbocharged, Charge Air Cooled
Cylinder arrangement	6,Inline
Displacement, L (cu. in.)	16.12(984)
Bore and stroke, mm (in.)	144 x 165 (5.67 x 6.50)
Compression ratio	16.5:1
Piston speed, m/min. (ft./min.)	594 (1949)
Main bearings: quantity, type	7, Precision Half-Shell
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	565 (757)
Cylinder head material	Cast Iron
Piston: type, material	Swirl Chamber, Graphite-Coated Aluminum
Crankshaft material	Forged Steel
Valve (exhaust) material Intake	Nimonic
Governor: type, make/model	EMSII
Frequency regulation, no-load to-full load	Isochronous
Frequency regulation, steady state	&#65533;0.25%
Frequency	Field-Convertible
Air cleaner type, all models	Dry

Model: 500REOZVC, continued

Exhaust

Exhaust System

Exhaust flow at rated kW, m3/min. (cfm)	92.0 (3249)
Exhaust temperature at rated kW, dry exhaust, ?C (?F)	455 (851)
Maximum allowable back pressure, kPa (in. Hg)	10 (3.0)
Exh. outlet size at eng. hookup, mm (in.)	See ADV Drawing

Engine Electrical

Engine Electrical System

Battery charging alternator: Ground (negative/positive)	Negative
Battery charging alternator: Volts (DC)	24
Battery charging alternator: Ampere rating	80
Starter motor rated voltage (DC)	24
Battery, recommended cold cranking amps (CCA): Qty., CCA rating each	Two, 950
Battery voltage (DC)	12

Fuel

Fuel System

Fuel type	Diesel
Fuel supply line, min. ID, mm (in.)	8 (0.31)
Fuel return line, min. ID, mm (in.)	6 (0.25)
Max. fuel flow, Lph (gph)	204.4 (54)
Max. fuel pump restriction, kPa (in. Hg)	30 (8.9)
Max. return line restriction, kPa (in. Hg)	20 (5.9)
Fuel prime pump	Manual
Fuel filter: quantity, type	2, Primary, 10 Micron Secondary w/Water Separator, 3 Microns
Recommended fuel	#2 Diesel

Lubrication

Lubrication System

Type	Full Pressure
Oil pan capacity, L (qt.)	42.0 (44.4)
Oil pan capacity with filter, L (qt.)	48.1 (50.8)
Oil filter: quantity, type	3, Cartridge
Oil cooler	Water-Cooled

Model: 500REOZVC, continued

Cooling

Radiator System

Ambient temperature, ?C (?F)	50 (122)
Engine jacket water capacity, L (gal.)	33 (8.7)
Radiator system capacity, including engine, L (gal.)	60 (15.9)
Engine jacket water flow, Lpm (gpm)	463.3 (122.4)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	231 (13137)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	147 (8360)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	890 (35)
Fan, kWm (HP)	19 (25.5)
Max. restriction of cooling air, intake and discharge side of radiator, kPA (in. H20)	0.125 (0.5)

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

Operation Requirements

Air Requirements

Radiator-cooled cooling air, m3/min. (scfm) *	598 (21120)
Combustion air, m3/min. (cfm)	46 (1617)
Heat rejected to ambient air: Engine, kW (Btu/min.)	24 (1365)
Heat rejected to ambient air: Alternator, kW (Btu/min.)	29 (1660)

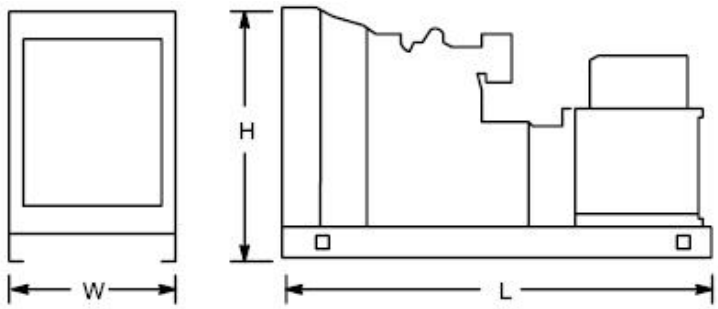
*Air density = 1.20 kg/m3 (0.075 lbm/ft3)

Fuel Consumption

Diesel, Lph (gph), at % load	Rating
Standby Fuel Consumption at 100% load	139.3 Lph (36.8 gph)
Standby Fuel Consumption at 75% load	101.4 Lph (26.8 gph)
Standby Fuel Consumption at 50% load	68.1 Lph (18.0 gph)
Standby Fuel Consumption at 25% load	38.6 Lph (10.2 gph)
Prime Fuel Consumption at 100% load	121.9 Lph (32.2 gph)
Prime Fuel Consumption at 75% load	89.7 Lph (23.7 gph)
Prime Fuel Consumption at 50% load	60.6 Lph (16.0 gph)
Prime Fuel Consumption at 25% load	33.7 Lph (8.9 gph)

Dimensions and Weights

Dim Weight Spec	Dim Weight Value
Weight (40 C radiator model), wet, kg (lb.):	4229 x 1939 x 1942 (166.5 x 76.3 x 76.5)
Enclosed unit weight with 40 gal. tank, wet, max., kg (lb.):	4082 (9000)



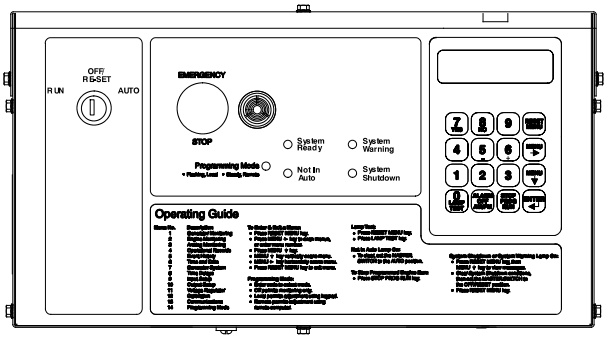
Model: 500REOZVC, continued

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

KOHLER. Power Systems

Generator Set Controller

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED



Decision-Maker® 550

Kohler® Decision-Maker® 550 Controller

General Description and Function

The Decision-Maker® 550 generator set controller provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility with selected engine Electronic Control Modules (ECM).

ECM models only: The Decision-Maker® 550 controller directly communicates with the ECM to monitor engine parameters and diagnose engine problems (see Controller Diagnostics for details).

Standard Features

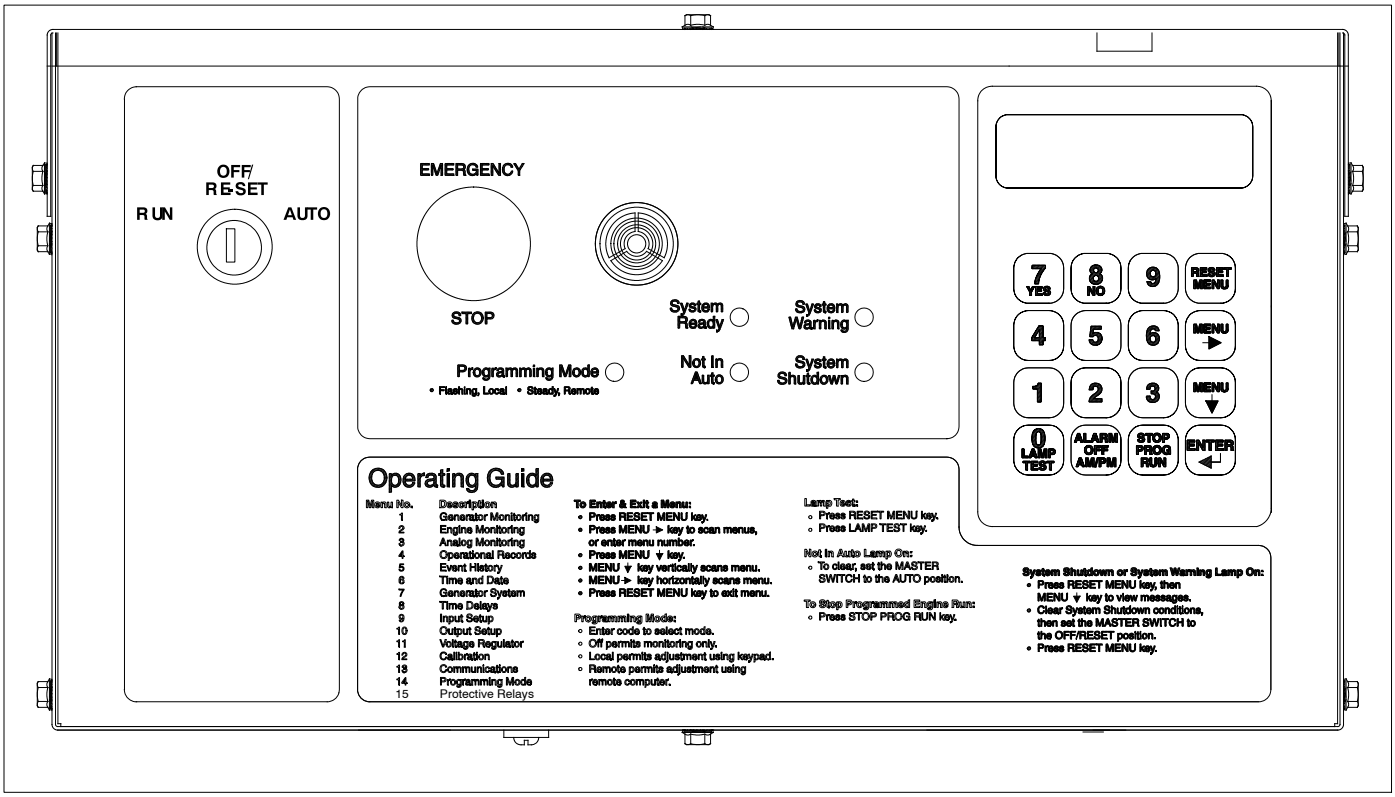
- A digital display and keypad provide access to data. The display provides complete and understandable information, and the keypad allows easy local access.
- Measurements selectable in metric or English units.
- The controller can communicate directly with a personal computer via a network or via a modem configuration.
- The controller supports Modbus® protocol. Use with serial bus or Ethernet networks.
- Integrated voltage regulator providing ±0.25% regulation.
- Built-in alternator thermal overload protection.
- A lockout keyswitch meets appropriate local code requirements.

Optional Features

- Monitor III, an optional menu-driven Windows®-based PC software, monitors engine and alternator parameters and also provides control capability. See G6-76 spec sheet for more information.
- Menu 15 (Protective Relays) is required for optional protective functions and is only available with the Kohler PD-Series switchgear.

Modbus® is a registered trademark of Schneider Electric.

Windows® is a registered trademark of Microsoft Corporation.



Decision-Maker® 550

Controller Features

Decision-Maker® 550—Software Version 2.70 or higher

Specifications

- Power source with circuit protection: 12- or 24-volt DC
- Power drain: 700 milliamps (or 400 milliamps without panel lamps)
- 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:
  - NFPA 99
  - NFPA 110, Level 1
  - CSA 282-09
  - UL 508

Hardware Features

- Vacuum fluorescent display
- Environmentally sealed 16-button membrane keypad
- LED status indicating lights
- Three-position (run, off/reset, auto) keyswitch
- Latch-type emergency stop switch with International Electromechanical Commission (IEC) yellow ring identification
- Alarm horn
- Fuse-protected battery circuits
- Controller mounts locally or remotely up to a distance of 12 m (40 ft.) and viewed from one of four positions
- Dimensions—W x H x D,
  460 x 275 x 291 mm (18.15 x 10.8 x 11.47 in.)

NFPA Requirements

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

NFPA 110 Common Alarm

- Engine functions:
  - Overcrank
  - Low coolant temperature warning
  - High coolant temperature warning
  - High coolant temperature shutdown
  - Low oil pressure shutdown
  - Low oil pressure warning
  - Overspeed
  - Low fuel (level or pressure) *
  - Low coolant level
  - EPS supplying load
  - High battery voltage *
  - Low battery voltage *
  - Air damper indicator
- General functions:
  - Master switch not in auto
  - Battery charger fault *
  - Lamp test
  - Contacts for local and remote common alarm
  - Audible alarm silence switch
  - Remote emergency stop

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

Controller Functions

The control functions apply to both the ECM and non-ECM equipped models unless noted otherwise.

- **AC Output Voltage Adjustment**
  The voltage adjustment provides keypad adjustment in 0.1 volt increments of the average line-to-line AC output voltage with a maximum adjustment of ±10% of the system voltage.

- **Alternator Protection**
  The controller firmware 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 when the generator set slows to less than 390 rpm after a failed start attempt.

- **Battleswitch (Fault Shutdown Override Switch)**
  The *battleswitch* input provides the ability to override the fault shutdowns except emergency stop and overspeed shutdown in emergency situations and during generator set troubleshooting.

- **Clock and Calendar**
  Real-time clock and calendar functions time stamp shutdowns for local display and remote monitor. Also use these functions to determine the generator set start date and days of operation.

- **Cooldown Temperature Override**
  This feature provides the ability to bypass (override) the cooldown temperature shutdown and force the generator set to run for the full engine cooldown time delay. Also see Time Delay Engine Cooldown (TDEC).

- **Cyclic Cranking**
  The controller has programmable cyclic cranking. The customer selects the number of crank cycles (1–6) and the crank time from 10 to 30 seconds. The crank disconnect depends upon the speed sensor input information or the generator frequency information. The default cyclic crank setting is 15 seconds on, 15 seconds off for three cycles.

- **Digital Voltage Regulator**
  The digital voltage regulator provides ±0.25% no-load to full-load regulation.

- **Display Power Shutdown**
  To conserve battery power, the display turns off after 5 minutes of inactivity. Pressing any keypad button activates the display.

- **ECM Communication**
  The controller monitors ECM communication links and provides fault detection for oil pressure signal loss, coolant temperature signal loss, and ECM communication loss. Each of these faults provides local display, alarm horn ON, and relay driver output (RDO) on ECM models only. See Controller Diagnostics following for additional information.

- **Idle Speed Function**
  Idle speed function provides the ability to start and run the engine at idle speed for a selectable time period. The engine will go to normal speed should the temperature reach warm-up before the time delay is complete.

- **Lamp Test**
  Keypad switch verifies functionality of the indicator LEDs, alarm horn, and digital display.

- **Load Shed**
  The load shed function provides a load control output (RDO) with user-selectable load shed level.

- **Master Switch Fault**
  The generator set master switch has fault detection at four levels: 1) master switch to off, 2) master switch open, 3) master switch error, and 4) master switch not in auto. Each of these faults/warnings provides local display, alarm horn on, and activates a relay driver output (RDO). By placing the master switch to the off/reset position, all generator set faults can be reset.

- **Modbus® Interface**
  The Modbus® interface provides industry standard open protocol for communication between the generator set controller and other devices or for network communications.

- **Number of Starts**
  Total number of generator set successful starts is recorded and displayed on the local display and remote PC monitor. This information is a resettable and total record.

- **Programming Access**
  The setup access and programming information is password protected. When locally accessing programming information, the PM (programming mode) LED flashes. When remotely accessing programming information, the PM LED is steady.

- **Programmed Run**
  The programmed run function provides user-selectable time for a one-time exercising of the generator set. The controller does not provide weekly scheduled exercise periods.

- **Remote Reset**
  The remote reset function resets faults and allows restarting of the generator set without going to the master switch off/reset position. The remote reset function is initiated via the remote reset digital input.

- **Running Time Hourmeter**
  The running time hourmeter function is available on the local display and remote monitor. The information displayed uses real time loaded and unloaded run time as an actual and resettable record.

- **Self-Test**
  The controller has memory protection and a microprocessor self-test.

- **Starting Aid**
  The starting aid feature provides control for an ether injection system. This setup has adjustable *on* time before engine crank from 0 to 10 seconds. This feature is also part of the remote communication option.

- **Time Delay Engine Cooldown (TDEC)**
  The TDEC provides a user-selectable time delay before the generator set shuts down. If the engine is *above* the preset temperature and unit is signalled to shut down, unit will continue to run for the duration of the TDEC. If the engine is *at or below* the preset temperature and unit is signalled to shut down or the TDEC is running, unit will shut down without waiting for the time delay to expire. Also see Cooldown Temperature Override.

- **Time Delay Engine Start (TDES)**
  The TDES provides a user-selectable time delay before the generator set starts.

Controller Diagnostics

The controller features warnings and shutdowns as text messages on the vacuum fluorescent display. See the table below.

Warnings show yellow LED and signal an impending problem.
Shutdowns show red LED and stop the generator set.

Note: Menu 15 features are available by purchasing the paralleling switchgear option.

Note: The available user inputs are dependent on factory reserved inputs for specific engine types, engine controls, and paralleling applications.

User-Defined Common Fault and Status. The user customizes outputs through a menu of warnings, shutdowns, and status conditions. User defines up to 31 relay driver outputs **(RDOs)** (relays not included).

	Warning Function	Shutdown Function	User-Defined	User RDOs
Engine Protection				
Air damper control, if equipped			X	X
Air damper indicator, if equipped		X	X	X
Coolant temp. signal loss		X	X	X
High battery voltage	X		X	X
High coolant temperature	X	X	X	X
High oil temp. shutdown		X	X	X
Low battery voltage	X		X	X
Low coolant level		X	X	X
Low coolant temperature	X		X	X
Low fuel level (diesel) *	X		X	X
Low fuel pressure (gas) *	X		X	X
Low oil pressure	X	X	X	X
Oil pressure signal loss		X	X	X
Overcrank		X	X	X
Overspeed		X	X	X
Speed sensor fault	X		X	X
Starting aid			X	X
Weak battery	X		X	X
General Protection				
Auxiliary inputs 0–5 VDC—up to 7 analog	X	X	X	X
Auxiliary inputs—up to 21 digital	X	X	X	X
Battery charger fault *	X		X	X
Defined common fault †			X	X
EEPROM write failure		X	X	X
Emergency stop		X	X	X
Engine cooldown delay			X	X
Engine start delay			X	X
EPS supplying load	X		X	X
Internal fault		X	X	X
Load shed kW overload	X		X	X
Load shed underfrequency	X		X	X
Master switch error		X	X	X
Master switch not in auto	X		X	X
Master switch open		X	X	X
Master switch to off		X	X	X
NFPA 110 common alarm			X	X
SCRDO's 1–4 (software controlled RDOs)			X	X
System ready (status)			X	X
Alternator Protection				
AC sensing loss	X	X	X	X
Critical overvoltage		X	X	X
Generator running			X	X
Ground fault *	X		X	X
Locked rotor		X	X	X
AC Protection (includes Menu 15 Enabled Enhancements)				
Alternator protection (short circuit and overload)		X	X	X
Breaker trip			‡	X
Common protective relay output			X	X
In synchronization			‡	X
Loss of field (reverse VAR)		X	X	X
Overcurrent	X	X	X	X
Overfrequency		X	X	X
Overpower		X	X	X
Overvoltage		X	X	X
Reverse power		X	X	X
Underfrequency		X	X	X
Undervoltage		X	X	X

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

† Factory default settings for the defined common fault are emergency stop, high coolant temperature shutdown, low oil pressure shutdown, overcrank, and overspeed.

‡ Factory set inputs that are fixed and not user changeable.

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

Controller Monitoring

Standard Equipment and Features

- Alarm horn
- Indicators:
  - Not in auto (yellow)
  - Program mode (yellow)
  - System ready (green)
  - System shutdown (red)
  - System warning (yellow)
- Switches and standard features:
  - Keypad, 16-button multi-function sealed membrane
  - Lamp test
  - Keyswitch, auto, off/reset, run (engine start)
  - Switch, emergency stop (normally closed contacts)
- Vacuum fluorescent display with two lines of 20 characters

Displays

Some engine displays are dependent upon enhanced electronic engine control availability.

- Engine monitoring data (metric or English units):
  - Battery voltage
  - Engine model number †
  - Engine serial number †
  - Engine speed
  - Engine start countdown
  - ECM—battery voltage †
  - ECM—fault codes
  - ECM—serial number †
  - Fuel rate
  - Level—coolant †
  - Level—oil †
  - Pressure—crankcase †
  - Pressure—charge air †
  - Pressure—coolant †
  - Pressure—fuel
  - Pressure—oil
  - Rpm
  - Temperature—ambient †
  - Temperature—charge air †
  - Temperature—coolant
  - Temperature—fuel †
  - Temperature—oil †
  - Trip fuel †
- Engine setpoints
  - Coolant—high temperature shutdown and warning setpoints
  - Oil—low pressure shutdown and warning setpoints
  - Temperature—engine cooled down setpoint
  - Temperature—engine warmed up setpoint
- Generator monitoring data:
  - Current (L1, L2, L3), ±0.25% accuracy
  - Frequency, ±0.5% accuracy
  - Kilowatts, total per phase (L1, L2, L3), ±0.5% accuracy
  - KVA, total per phase (L1, L2, L3), ±0.5% accuracy
  - KVAR, total absorbing/generating per phase (L1, L2, L3), ±0.5% accuracy
  - Percent alternator duty level (actual load kW/standby kW rating)
  - Power factor per phase, leading/lagging
  - Voltage (line-to-line, line-to-neutral for all phases), ±0.25% accuracy
- Operational records:
  - Event history (stores up to 100 system events)
  - Last start date
  - Number of starts
  - Number of starts since last maintenance
  - Operating days since last maintenance
  - Operating mode—standby or prime power
  - Run time (total, loaded and unloaded hours, and total kW hours)
  - Run time since maintenance (total, loaded, and unloaded hours and total kW hours)
  - System shutdowns
  - System warnings
  - Time, date, and day of week
- Time delays—general:
  - Crank cycles for on/pause
  - Crank cycles for overcrank shutdown
  - Engine cooldown
  - Engine start
  - Load shed
  - Voltage, over- and under-
  - Starting aid
- Time delays—paralleling relays (PR) for optional switchgear applications:
  - Current—over (PR)
  - Current—over shutdown
  - Frequency—over- and under- (PR and shutdown)
  - Loss of field (PR and shutdown)
  - Loss of field shutdown (PR)
  - Power—over (PR)
  - Power—over shutdown
  - Reverse power (PR)
  - Reverse power shutdown
  - Synch matching—frequency, phase, voltage
  - Voltage—over- and under- (PR and shutdown)
- System parameters:
  - Alternator number
  - Current, rated (based on kW, voltage, connection settings)
  - Frequency
  - Generator set model number
  - Generator set serial number
  - Generator set spec number
  - Rating, kW
  - Phase, single and three (wye or delta)
  - Voltage, AC
  - Voltage configuration, wye or delta

Inputs

- Customer and remote inputs:
  - Analog inputs 0–5 VDC (up to 7 user-defined analog inputs with multiple shutdown and warning levels)
  - Digital contact inputs (up to 21 user-defined digital inputs with shutdown or warning levels)
  - Ground fault detector *
  - Remote emergency stop
  - Remote reset
  - Remote 2-wire start
- Digital inputs (standard):
  - Air damper fault, if equipped
  - Battery charger fault *
  - Battleswitch
  - Emergency stop
  - Field overvoltage (350 kW and higher)
  - High oil temperature
  - Idle mode active (ECM models only) *
  - Low coolant level
  - Low coolant temperature
  - Low fuel warning *
  - Low fuel shutdown *
- Switchgear inputs in Menu 15 (to interface with switchgear system):
  - Circuit breaker closed
  - Enable synch
  - Lockout shutdown
  - Remote reset
  - Remote shutdown
  - VAR/PF mode selection
  - Voltage—raise/lower (or VAR/PF raise/lower in VAR/PF mode)

Outputs

See the Fault Diagnostics section for a breakdown of the available shutdown and warning functions.

- Thirty-one user-defined relay driver outputs (relays not included)
  - Fifteen NFPA 110 faults
  - Defined common faults

Communication

- RS-485 connector for Modbus® RTU communication port
- RS-232 connector for a PC or modem (optional software required)
- SAE J1939 connector for the engine ECM (engine control module)

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

Modbus® is a registered trademark of Schneider Electric.

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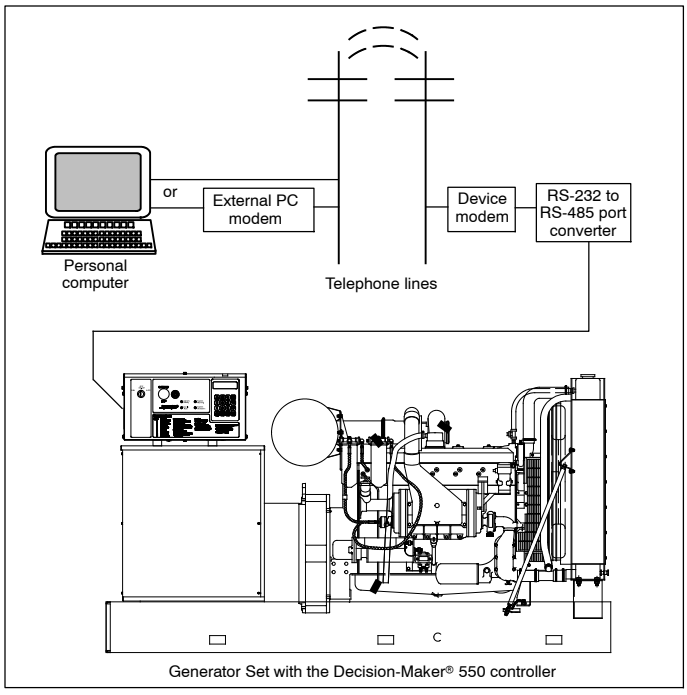
Decision-Maker® 550 Controller Available Options

Communication and PC Software Available Options

Refer to spec sheet G6-76, Monitor III Software for additional communication and PC software information including Modbus® communication.

- ❑ **Local Single Connection.** A PC is connected directly to the device communication module with an RS-232 cable for applications where the PC is within 15 m (50 ft.) of the device or RS-485 cable for applications where the PC is up to 1220 m (4000 ft.) from the device.
- ❑ **Local Area Network (LAN).** A PC is connected directly to the device's local area network. A LAN is a system of connecting more than one device to a single PC.
- ❑ **Remote Network (Ethernet):** A PC with a NIC card uses an Ethernet connection to access a remotely located converter (Modbus®/Ethernet) serving a controller. Refer to G6-79 for system details.
- ❑ **Remote Network (Modem):** A PC uses a modem to connect to a remotely located device modem serving a controller. Monitoring software (Monitor III) runs on the PC to view system operation.
- ❑ **Monitor III Software for Monitoring and Control (Windows®-based user interface)**
- ❑ **Converter, Modbus®/Ethernet.** Supports a power system using a controller accessed via the Ethernet. Converter is supplied with an IP address by the site administrator. Refer to G6-79 for converter details.
- ❑ **RS-232 to RS-485 Port Converters**



Generator Set with the Decision-Maker® 550 controller

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

Other Available Options

- ❑ **Common Failure Relay** remotely signals auxiliary fault, emergency stop, high engine temperature, low oil pressure, overcrank, and overspeed via one single-pole, double-throw relay with 10-amp contacts at 120 VAC or 28 VDC maximum.
- ❑ **Run Relay** provides a three-pole, double-throw relay with 10-amp contacts at 120 VAC or 28 VDC maximum for indicating that the generator set is running.
- ❑ **Controller Cable** enables remote mounting of the controller with distances of up to 12 m (40 ft.) from the generator set.
- ❑ **Controller Connection Kit** provides a cable connecting the controller output terminals to a terminal strip in the junction box.
- ❑ **Dry Contact Kit** interfaces between the controller signals and customer-supplied accessories providing contact closure to activate warning devices such as lamps or horns. Kits are available with either one or ten single-pole, double-throw relays with 10-amp contacts at 120 VAC or 28 VDC maximum.
- ❑ **Float/Equalize Battery Charger with Alarm Feature** signals controller of battery charger fault.
- ❑ **Prealarm Kit for NFPA 110 (gas fuel models only)** warns the operator of low fuel pressure. Select the kit based on LP vapor or natural gas, combination dual fuel, or LP liquid withdrawal.
- ❑ **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 Audiovisual Alarm Panel** warns the operator of fault shutdowns and warning conditions. Kit includes common fault lamp and horn with silence switch.
- ❑ **Remote Emergency Stop Panel** immediately shuts the generator set down from a remote station.
- ❑ **Remote Serial Annunciator (RSA) Panel** 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. Uses Modbus® protocol, an industry standard.

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KOHLER. Power Systems

Line Circuit Breakers 15-2250 kW

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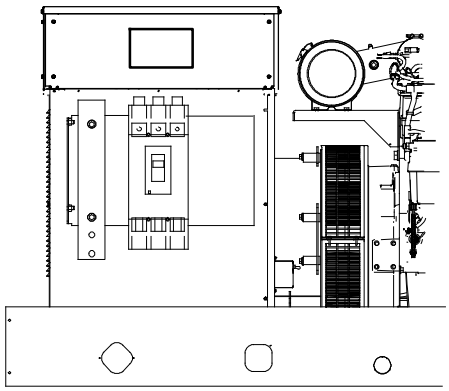
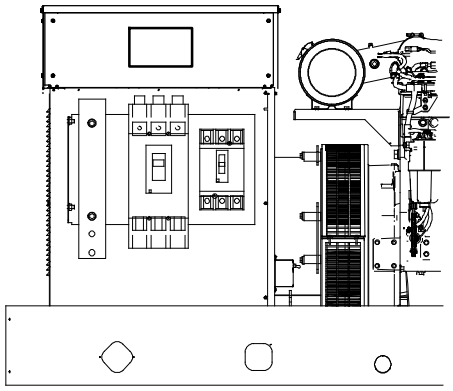
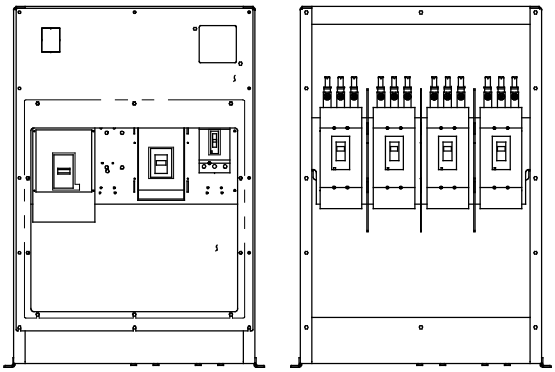


Single Circuit Breaker Kit with Neutral Bus Bar
15-300 kW Model Shown



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



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

Standard Features

- The line circuit breaker interrupts the generator set output during a short circuit and protects the wiring when an overload occurs. Use the circuit breaker to manually disconnect the generator set from the load during generator set service.
- Circuit breaker kits are mounted to the generator set and are provided with load-side lugs and neutral bus bar.
- Kohler Co. offers a wide selection of molded-case line circuit breaker kits including single, dual, and multiple configurations for each generator set.
- Four types of line circuit breakers are available: (see page 2 for definitions and pages 3 and 4 for application details)
  - ○ Magnetic trip
  - ○ Thermal magnetic trip
  - ○ Electronic trip
  - ○ Electronic with ground fault (LSIG) trip
- In addition, line circuit breakers are offered with 80% and 100% ratings.
- Single line circuit breaker kits allow circuit protection of the entire electrical system load.
- Dual line circuit breaker kits allow circuit protection of selected priority loads from the remaining electrical system load.
- Multiple line circuit breaker kits with field connection barrier allow circuit protection for special applications (350–2250 kW).
- Line circuit breakers comply with the following codes and standards unless otherwise stated.
  - ○ UL 489 Molded Case Circuit Breakers
  - ○ UL 1077 Supplementary Protectors
  - ○ UL 2200 Stationary Engine Generator Assemblies

Line Circuit Breaker Types

Magnetic Trip

The magnetic trip features an electromagnet in series with the load contacts and a moveable armature to activate the trip mechanism. When a sudden and excessive current such as a short circuit occurs, the electromagnet attracts the armature resulting in an instantaneous trip (UL 1077 circuit breakers).

Thermal Magnetic Trip

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

Electronic Trip

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

Electronic with Ground Fault Trip

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

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

80% Rated Circuit Breaker

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

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

100% Rated Circuit Breaker

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

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

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

Line Circuit Breaker Options

❑ Alarm Switch

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

❑ Auxiliary Contacts

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

❑ Breaker Separators (350-2250 kW)

Provides adequate clearance between breaker circuits.

❑ Bus Bars

Bus bar kits offer a convenient way to connect load leads to the generator set when a circuit breaker is not present.
15-300 kW. Bus bar kits are available on alternators with leads for connection to the generator set when circuit breakers are not ordered.
350-2250 kW. A bus bar kit is provided on the right side of the unit when no circuit breaker is ordered. Bus bars are also available in combination with circuit breakers or other bus bars on the opposite side of the junction box. On medium voltage (3.3 kV and above) units, a bus bar kit is standard.

❑ Field Connection Barrier

Provides installer wiring isolation from factory connections.

❑ Ground Fault Annunciation

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

❑ Lockout Device (padlock attachment)

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

❑ Neutral Lugs

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

❑ Overcurrent Trip Switch

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

❑ Shunt Trip, 12 VDC or 24 VDC

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

❑ Shunt Trip Wiring

Connects the shunt trip to the generator set controller.

❑ Undervoltage Trip, 12 VDC or 24 VDC

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

15-300 kW Line Circuit Breaker Specifications

80% Rating Circuit Breaker

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

Interrupting Ratings

Circuit Breaker Frame Size	240 Volt, kA	480 Volt, kA	600 Volt, kA
HD	25	18	14
JD			
LA	42	30	22
LG	65	35	18
MG			
PG			

100% Rating Circuit Breaker

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

Circuit Breaker Lugs Per Phase (Al/Cu)

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

350-2250 kW Line Circuit Breaker Specifications

80% Rating Circuit Breaker

Gen. Set kW	Alt. Model	Ampere Range	Trip Type	C. B. Frame Size
350-2250 kW (also available on some 300 kW)	4M/ 5M/ 7M	15-150	Thermal Magnetic	HD
		60-150	Electronic LI	
		60-150	Electronic LSIG	
		175-250	Thermal Magnetic	JD
		250	Electronic LI	
			Electronic LSIG	
		60-150	Electronic LI	HG
		60-150	Electronic LSIG	
		250	Electronic LI	JG
			Electronic LSIG	
		30	9-325 A. Mag. Trip	HJ
		50	84-546 A. Mag. Trip	
		100	180-1040 A. Mag. Trip	
		150	348-1690 A. Mag. Trip	
		250	684-2500 A. Mag. Trip	JJ
		300-400	Thermal Magnetic	LA
		400	500-1000 A. Mag. Trip	
			750-1600 A. Mag. Trip	
			1000-2000 A. Mag. Trip	
			1125-2250 A. Mag. Trip	
			1250-2500 A. Mag. Trip	
			1500-3000 A. Mag. Trip	
			1750-3500 A. Mag. Trip	
			2000-4000 A. Mag. Trip	
		400-600	Electronic LI	LG
		400-600	Electronic LSIG	
		700-800	Thermal Magnetic	MG
		1000-1200	Thermal Magnetic	PG
		800-1200	Electronic LSI	
		800-1200	Electronic LSIG	
		1200	Thermal Magnetic	PJ
		1200	Electronic LSI	
		1200	Electronic LSIG	
		1600-2500	Thermal Magnetic	RJ
		1600-2500	Electronic LSI	
		1600-2500	Electronic LSIG	

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			
PJ	100	65	25
RJ			
NW	100	100	85

100% Rating Circuit Breaker

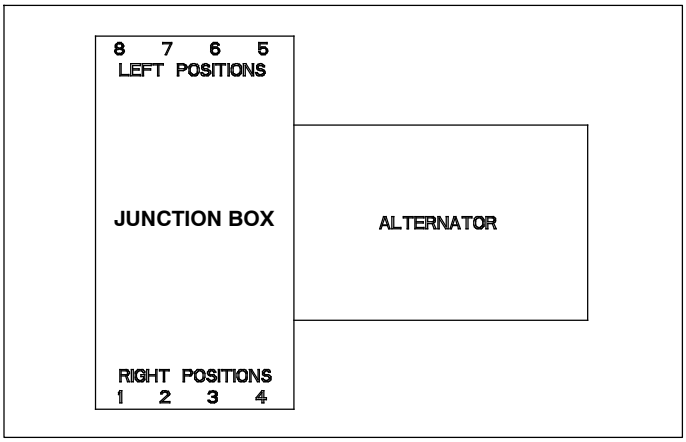
Gen. Set kW	Alt. Model	Ampere Range	Trip Type	C. B. Frame Size
350-2250 kW (also available on some 300 kW)	4M/ 5M/ 7M	15-150	Thermal Magnetic	HD
		60-150	Electronic LI	
		60-150	Electronic LSIG	
		175-250	Thermal Magnetic	JD
		250	Electronic LI	
			Electronic LSIG	
		60-150	Electronic LI	HG
		60-150	Electronic LSIG	
		250	Electronic LI	JG
			Electronic LSIG	
		400	Electronic LI	LG
			Electronic LSIG	
		600-1200	Electronic LSI	PG
		600-1200	Electronic LSIG	
		1200	Electronic LSI	PJ
		1200	Electronic LSIG	
		1600-2500	Electronic LSI	RJ
		1600-2500	Electronic LSIG	
		3000	Electronic LSI	NW
		3000	Electronic LSIG	

Circuit Breaker Lugs Per Phase (Al/Cu)

Frame Size	Ampere Range	Wire Range
HD (80%)	15-150	One #14 to 3/0
HD (100%)	15-150	One #14 to 2/0 Cu only
HG	60-150	One #14 to 3/0
HJ	30-150	One #14 to 3/0
JD (80%)	175	One 1/0 to 4/0
JD (80%)	200-250	One 3/0 to 350 kcmil
JD (100%)	175-250	One 3/0 to 300 kcmil Cu only
JG (80%)	250	One 3/0 to 350 kcmil
JG (100%)	250	One 3/0 to 300 kcmil Cu only
JJ	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
MG	700-800	Three 3/0 to 500 kcmil
PG	600-800	Three 3/0 to 500 kcmil
	1000-1200	Four 3/0 to 500 kcmil
PJ	1200	Four 3/0 to 500 kcmil
RJ	1600-2500	Eight 1/0 to 750 kcmil or (16) 1/0 to 300 kcmil
NW	3000	Eight 1/0 to 750 kcmil or (16) 1/0 to 300 kcmil

350-2250 kW Line Circuit Breaker Specifications

Breaker Positions



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

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

NOTE: H/J in the tables on this page refer to frame sizes HD, HG, HJ, JD, JG, and JJ.

Circuit Breaker Lugs Per Phase (Al/Cu)

Frame Size	Ampere Range	Wire Range
HD (80%)	15-150	One #14 to 3/0
HD (100%)	15-150	One #14 to 2/0 Cu only
HG	60-150	One #14 to 3/0
HJ	30-150	One #14 to 3/0
JD (80%)	175	One 1/0 to 4/0
JD (80%)	200-250	One 3/0 to 350 kcmil
JD (100%)	175-250	One 3/0 to 300 kcmil Cu only
JG (80%)	250	One 3/0 to 350 kcmil
JG (100%)	250	One 3/0 to 300 kcmil Cu only
JJ	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
MG	700-800	Three 3/0 to 500 kcmil
PG	600-800	Three 3/0 to 500 kcmil
	1000-1200	Four 3/0 to 500 kcmil
PJ	1200	Four 3/0 to 500 kcmil
RJ	1600-2500	Eight 1/0 to 750 kcmil or (16) 1/0 to 300 kcmil
NW	3000	Eight 1/0 to 750 kcmil or (16) 1/0 to 300 kcmil

Multiple Circuit Breaker Combinations

Alternator Model	Positions 1 or 5	2 or 6	3 or 7	4 or 8
4M/ 5M/ 7M	H/J			
	H/J	H/J		
	H/J	H/J	H/J	
	H/J	H/J	H/J	H/J
	LA			
	LA	H/J		
	LA	LA		
	LA	H/J	H/J	
	LA	LA	H/J	
	LA	LA	LA	
	LA	H/J	H/J	H/J
	LA	LA	H/J	H/J
	LA	LA	LA	H/J
	LA	LA	LA	LA
	LG			
	LG	H/J		
	LG	LA		
	LG	LG		
	LG	H/J	H/J	
	LG	LA	H/J	
	LG	LA	LA	
	LG	LG	H/J	
	LG	LG	LA	
	LG	LG	LG	
	LG	H/J	H/J	H/J
	LG	LA	H/J	H/J
	LG	LA	LA	H/J
	LG	LA	LA	LA
	LG	LG	H/J	H/J
	LG	LG	LA	H/J
	LG	LG	LA	LA
	LG	LG	LG	H/J
	LG	LG	LG	LA
	LG	LG	LG	LG †
	MG/PG/PJ			
	MG/PG/PJ		H/J	
	MG/PG/PJ		LA	
	MG/PG/PJ		LG	
	MG/PG/PJ		MG/PG/PJ ‡	
	MG/PG/PJ		H/J	H/J
	MG/PG/PJ		LA	H/J
	MG/PG/PJ		LA	LA
	MG/PG/PJ		LG	H/J
	MG/PG/PJ		LG	LA
	MG/PG/PJ		LG	LG †
	RJ			
	NW *			
	NONE OR LOAD BUS KIT			

* Frame size NW is not available with 1219 mm (48 in.) junction box.

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

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

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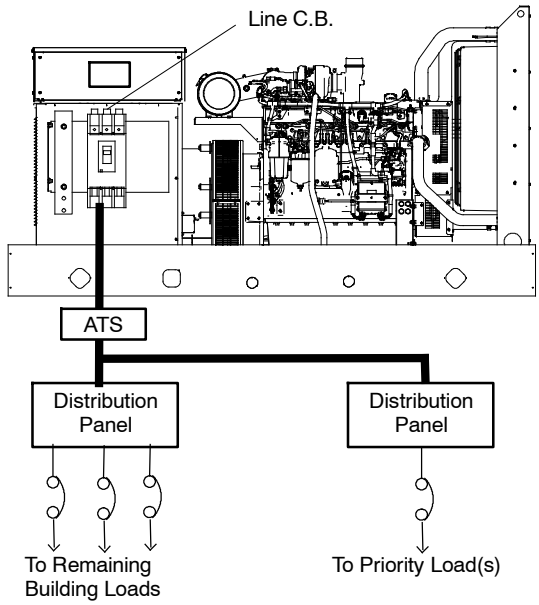
15-300 kW Line Circuit Breaker Applications

Single Circuit Breaker Installations

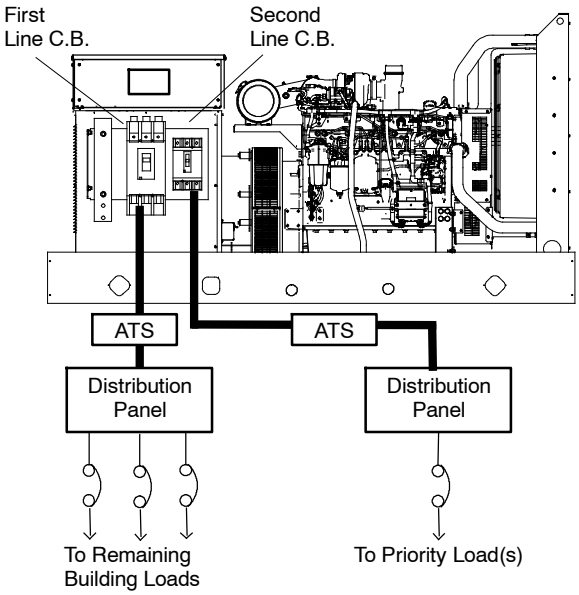
A generator set with a single circuit breaker installed typically feeds a single transfer switch and then a distribution panel. This allows protection of the entire system.



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

Dual Circuit Breaker Installations

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



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

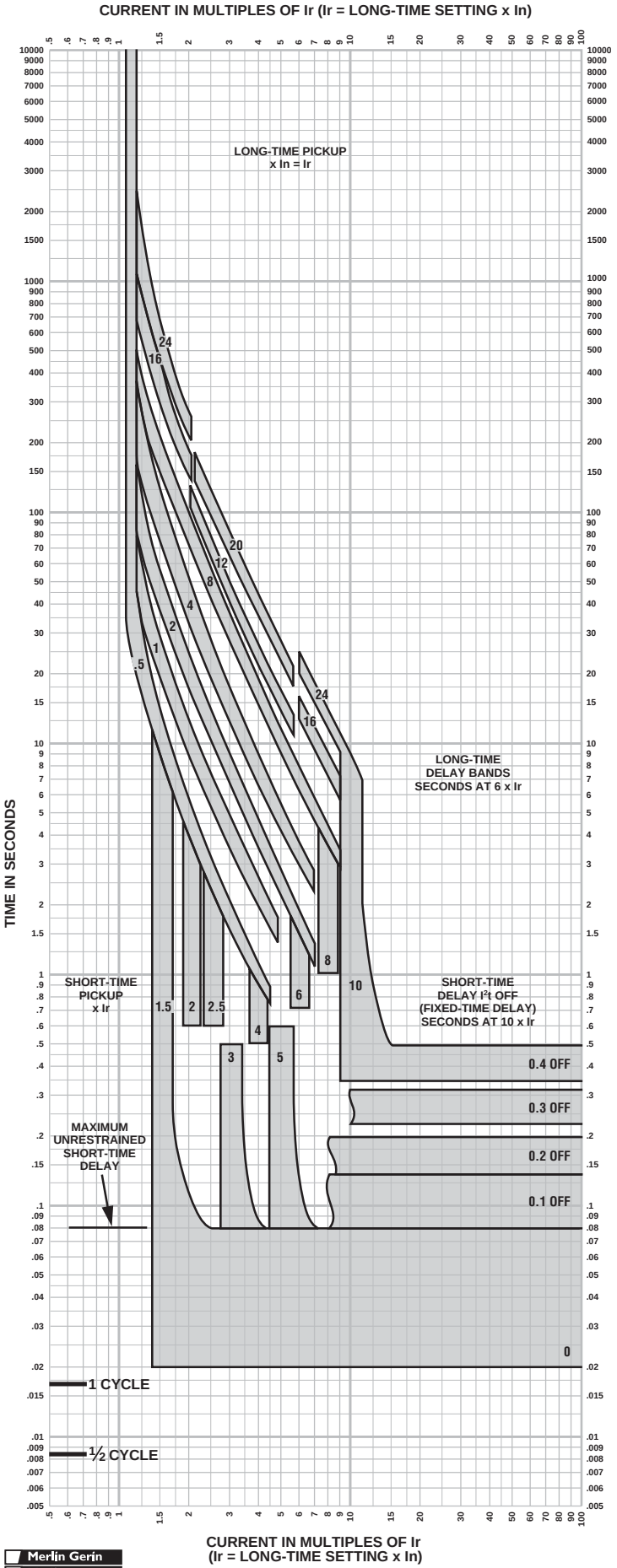
Dual Circuit Breaker Combinations

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

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

DISTRIBUTED BY:

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



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

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

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

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

Notes:

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

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

Schneider Electric

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

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

The most compact and innovative molded case circuit breakers

P-Frame 1200 A

R-Frame

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

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

Full-Featured Performance

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

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

Onboard Intelligence

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

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

MICROLOGIC® Trip Units

Choose the Model that Meets Your Needs

MICROLOGIC 3.0 and 5.0

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

MICROLOGIC 3.0A, 5.0A and 6.0A

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

MICROLOGIC 5.0P and 6.0P

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

MICROLOGIC 5.0H and 6.0H

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

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

Order Number 0612HO0201

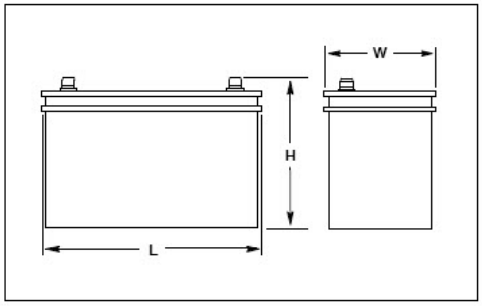
SQUARE D
Schneider Electric

KOHLER. Power Systems

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED

Typical Overall Dimensions

Typical Overall Dimensions



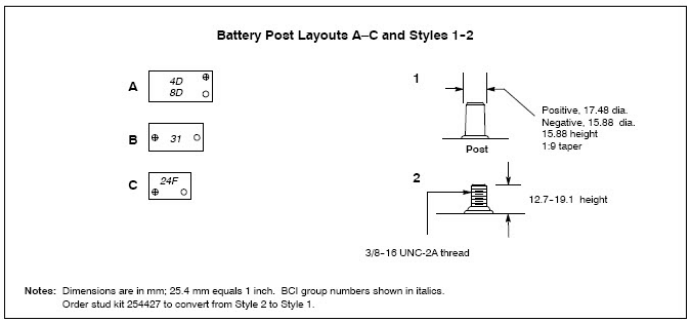
Standard Features

- 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.
- Batteries are rated according to SAE standard J-537. All batteries are 12-volt and have lead-calcium or lead-antimony plates with sulfuric acid electrolyte.
- Most generator set battery kits offer dry-charged or wet-charged batteries.
- Tough polypropylene cases protect against life-shortening vibration and impact damage.
- Removable cell covers allow checking of electrolyte specific gravity.

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

Battery Specifications

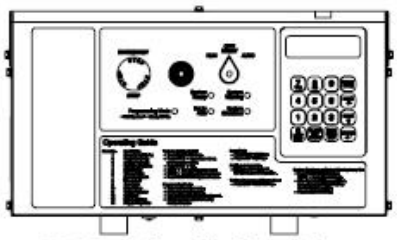
Battery Specifications



KOHLER. Power Systems

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED

Integral Voltage Regulator with Kohler® Decision-Maker® 550 and Menu-Driven Selections (20-3250 kW Generator Set Models)



550 Controller with Menu-Driven Integral Voltage Regulator

The voltage regulator is integral to the controller and uses microprocessor logic providing ±0.25% 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 Decision-Maker® 550 Controllers

Calibration	Digital Display	Range Settings	Default Selection
Voltage Adjustment	Volt Adj	±20% of System Voltage	System Voltage
Controller Gain	Regulator Gain	1-1000	100
Underfrequency Unload or Frequency Setpoint	Frequency Setpoint	40 to 70 Hz	1 Hz Below System Frequency (ECM) 2 Hz Below System Frequency (non-ECM)
Underfrequency Unload Scope	Slope	0-10% of Rated Voltage (Volts per Cycle)	15 volts per Cycle at 480 Volts (3.1%)
Reactive Droop	Voltage Droop	0-10% of System Voltage	4% of System Voltage
VAR Control	kVAR Adj	-35% to 110%	0 kVAR
PF Adjust Control	PF Adj	0.70 to 1.0 to 0.60	0.8 Lagging
VAR/PF Gain Adjustment	VAR/PF Gain	1-10000	100

Specification/Feature	Integral with Decision-Maker® 550
Generator Set Availability	350-2250 kW
Type	Microprocessor Based
Status and Shutdown Indicators	LEDs and Text Vacuum Fluorescent Display (VFD) 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	12 VDC @ 100mA max. 5.0 ADC with GM88453 Activator Board
Maximum Output	12 VDC @ 100mA max. 7.8 ADC with GM88453 Activator Board
Transition Frequency	50-70 Hz
Exciter Field Resistance	4-30 Ohms with GM88453 Activator Board
No-Load to Full-Load Voltage Regulation	±0.25%
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 Keypad
Remote Voltage Adjustment	Digital Input Standard/ Analog 0-5 VDC (±10%) Input Optional
Paralleling Capability	Reactive Droop Standard
VAR/PF Control Input	Standard

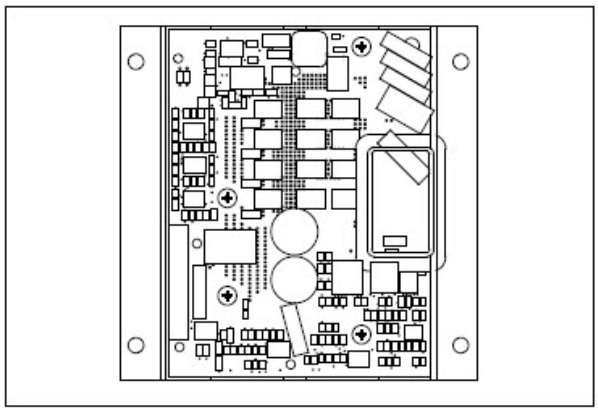
Integral Voltage Regulator with Decision-Maker® 550 Controller

- A digital display and keypad provide access to data. A two-line vacuum fluorescent display provides complete and concise information.
- The controller provides an interface between the generator set and switchgear for paralleling applications incorporating multiple generator set and/or utility feeds.
- The controller can communicate with a personal computer directly or on a network. See spec sheets G6-76, Monitor III Software for more information.
- Using optional menu-driven, Windows®-based PC software, an operator can monitor engine and alternator parameters and also provide control capability.
- The controller supports Modbus® RTU (Remote Terminal Unit), an industry standard open communication protocol.
- These controllers can control Fast Response™ II, Fast Response™ X, and wound field alternators using the GM88453 activator board.

Voltage Regulator Menu 11 Displays

- Voltage Adjust
  - Three-phase voltage display
  - Numeric entry of voltage adjust
- Under frequency unload (V/Hz) settingts
  - Enable/disable
  - Cut-in frequency
  - Numeric entry of V/Hz slope
- Reactive Droop settings
  - Enable/disable
  - Numeric entry of droop settings
- VAR control enabled, yes/no
  - Total kVAR (running), kVAR adjustment
  - Generating/absorbing yes/no
- Power factor control enabled yes/no, droop at rated load 0.8 PF
  - Average power factor (running), PF adjustment
  - Lagging/leading, yes/no
- Voltage regulator gain
- Analog voltage regulator adjust enable

Activator Board GM88453



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

KOHLER. POWER SYSTEMS

Alternator Data

KOHLER Power Systems

TIB-102

TECHNICAL INFORMATION BULLETIN

Alternator Data Sheet

Alternator Model: 5M4027 (8-22-11)

Kilowatt ratings at	1800 RPM	60 Hertz	12 LEADS	Standard 3 phase
kW (kVA)	3 Phase	0.8 Power Factor		Dripproof or Open Enclosure

	Class B	Class F					Class H		
Voltage*	80° C ① Continuous	90° C ① Lloyds	95° C ① ABS	105° C ② British Standard	105° C ① Continuous	130° C ① Standby	125° C ② British Standard	125° C ① Continuous	150° C ① Standby
480/240	440 (550)	465 (581)	475 (594)	500 (625)	500 (625)	515 (644)	515 (644)	515 (644)	560 (700)
460/230	425 (531)	450 (563)	460 (575)	480 (600)	480 (600)	515 (644)	505 (631)	505 (631)	545 (681)
440/220	410 (513)	430 (538)	440 (550)	460 (575)	460 (575)	500 (625)	485 (606)	485 (606)	520 (650)
416/208	400 (500)	415 (519)	415 (519)	445 (556)	445 (556)	475 (594)	470 (588)	470 (588)	505 (631)
380/190	360 (450)	380 (475)	390 (488)	405 (506)	405 (506)	405 (506)	405 (506)	405 (506)	405 (506)

① *Rise by resistance method, Mil-Std-705, Method 680.1b.* ② *British Standard Rating per BS 5000*

Submittal Data: 480 Volts*, 515.2 kW, 644 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase **STD. CONNECTION**

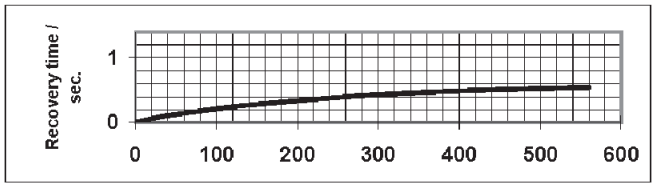
Mil-Std-705B Method	Description	Value
301.1b	Insulation Resistance	>1.5 Meg
302.1a	High Potential Test	
	Main Stator	2000 Volts
	Main Rotor	1500 Volts
	Exciter Stator	1500 Volts
	Exciter Rotor	1500 Volts
	PMG Stator	1500 Volts
401.1a	Stator Resistance, Line to Line	
	High Wye Connection	0.0126 Ohms
	Rotor Resistance	0.398 Ohms
	Exciter Stator	23 Ohms
	Exciter Rotor	0.045 Ohms
	PMG Stator	2.1 Ohms
410.1a	No Load Exciter Field Amps at 240/480 Volts Line to Line	0.7 A DC
420.1a	Short Circuit Ratio	0.591
421.1a	Xd Synchronous Reactance	2.67 pu
		0.955 ohms
422.1a	X2 Negative Sequence React.	0.226 pu
		0.081 ohms
423.1a	X0 Zero Sequence Reactance	0.056 pu
		0.02 ohms
425.1a	X'd Transient Reactance	0.162 pu
		0.058 ohms
426.1a	X"d Subtransient Reactance	0.137 pu
		0.049 ohms
--	Xq Quadrature Synchronous	1.1 pu
		0.393 ohms
427.1a	T'd Transient Short Circuit Time Constant	0.114 sec.
428.1a	T"d Subtransient Short Circuit Time Constant	0.01 sec.
430.1a	T'do Transient Open Circuit Time Constant	1.68 sec.
432.1a	Ta Short Circuit Time Constant of Armature Winding	0.017 sec.

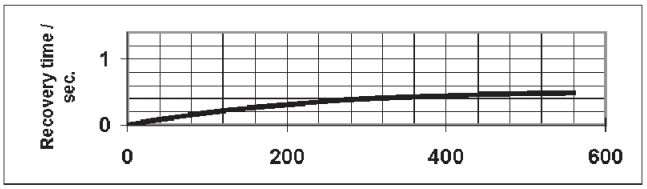
Mil-Std-705B Method	Description	Value
505.3b	Overspeed	2250 RPM
507.1c	Phase Sequence CCW-ODE	ABC
508.1c	Voltage Balance, L-L or L-N	0.20%
601.4a	L-L Harmonic Maximum - Total (Distortion Factor)	5.0%
601.4a	L-L Harmonic Maximum - Single	3.0%
601.1c	Deviation Factor	5.0%
---	TIF (1960 Weightings)	< 50
---	THF (IEC, BS & NEMA Weightings)	< 2 %
652.1a	Shaft Current	< 0.1 ma
---	Main Stator Capacitance to ground	0.03 mfd
	Additional Prototype Mil-Std Methods are Available on Request.	
--	Generator Frame	572
--	Type	MAGNAMAXDVR
--	Insulation	Class H
--	Coupling - Single Bearing	Flexible
--	Amortisseur Windings	Full
--	Excitation	Ext. Voltage Regulated, Brushless
--	Cooling Air Volume	1520 CFM
--	Heat rejection rate	2034 Btu's/min
--	Full load current	775 amps
--	Minimum Input hp required	738.5
	Efficiency at rated load :	93.5%
--	Full load torque	2154 Lb-ft

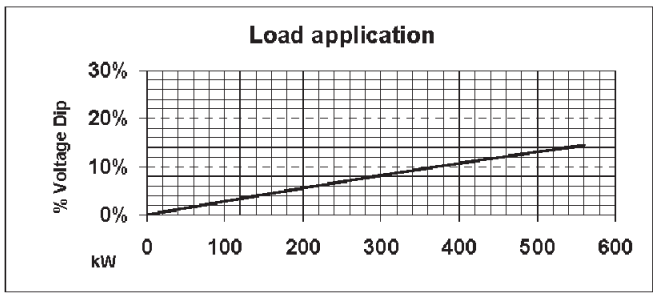
* Voltage refers to wye (star) connection, unless otherwise specified.

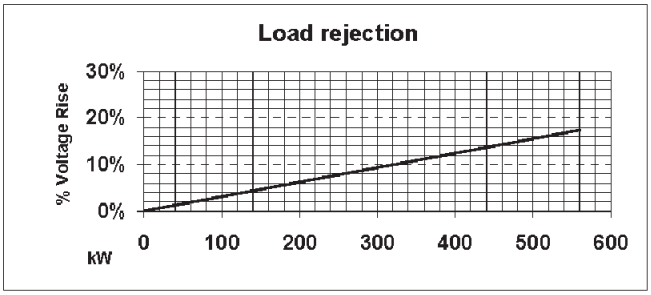
TYPICAL DYNAMIC CHARACTERISTICS

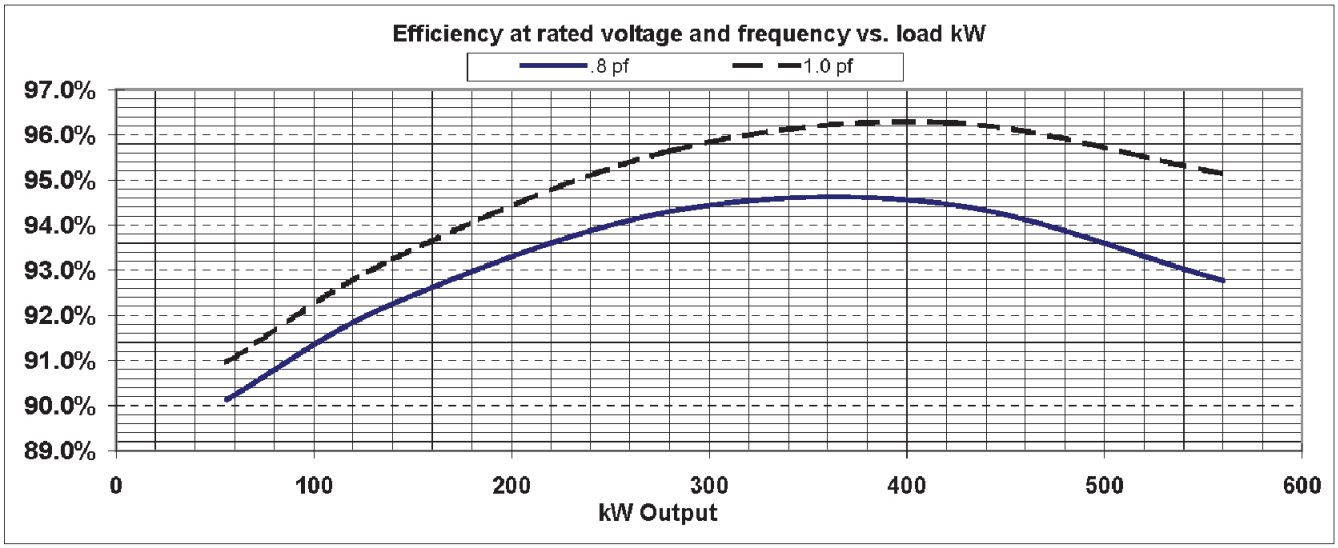
Alternator Model: 5M4027

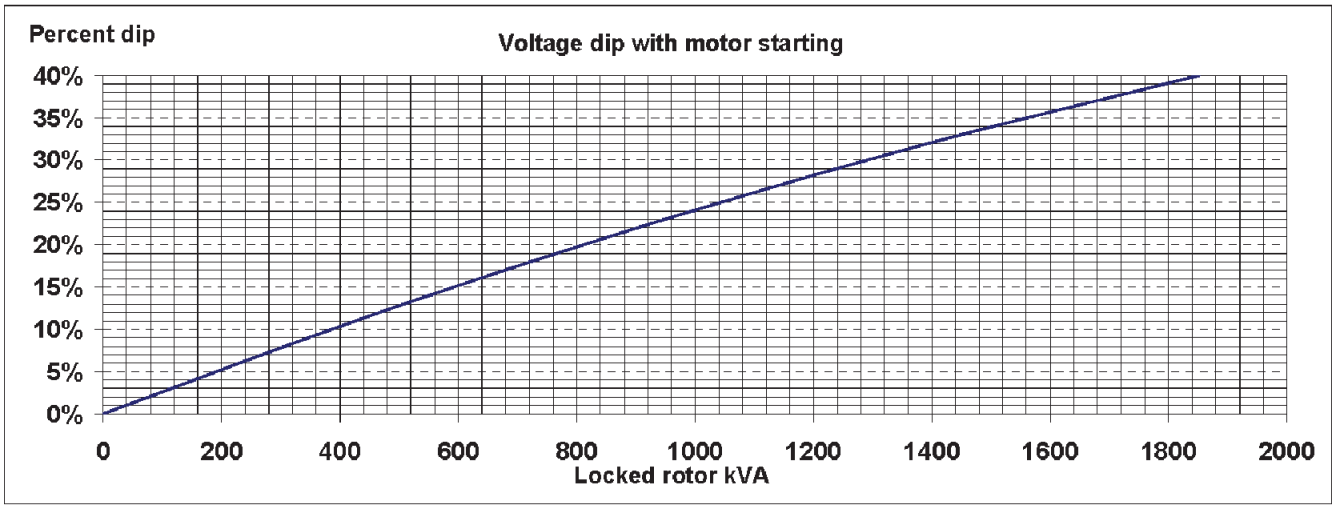








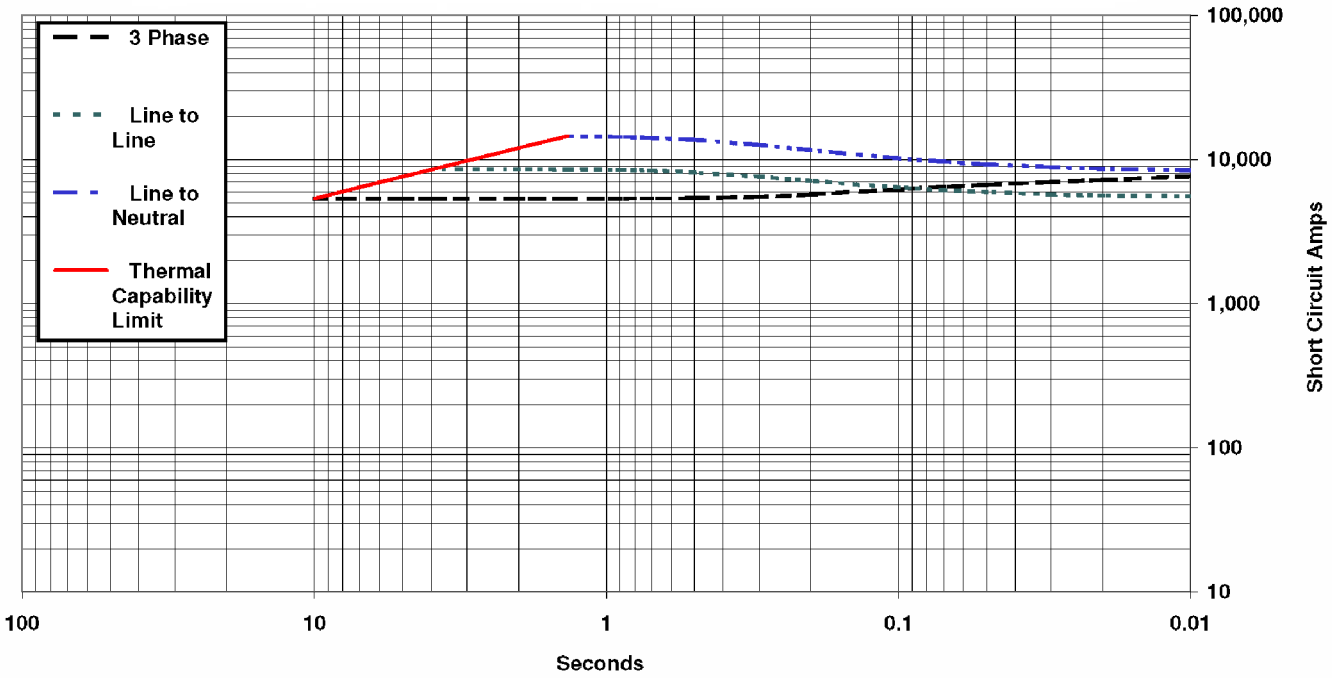




Voltage refers to wye (star) connection, unless otherwise specified.

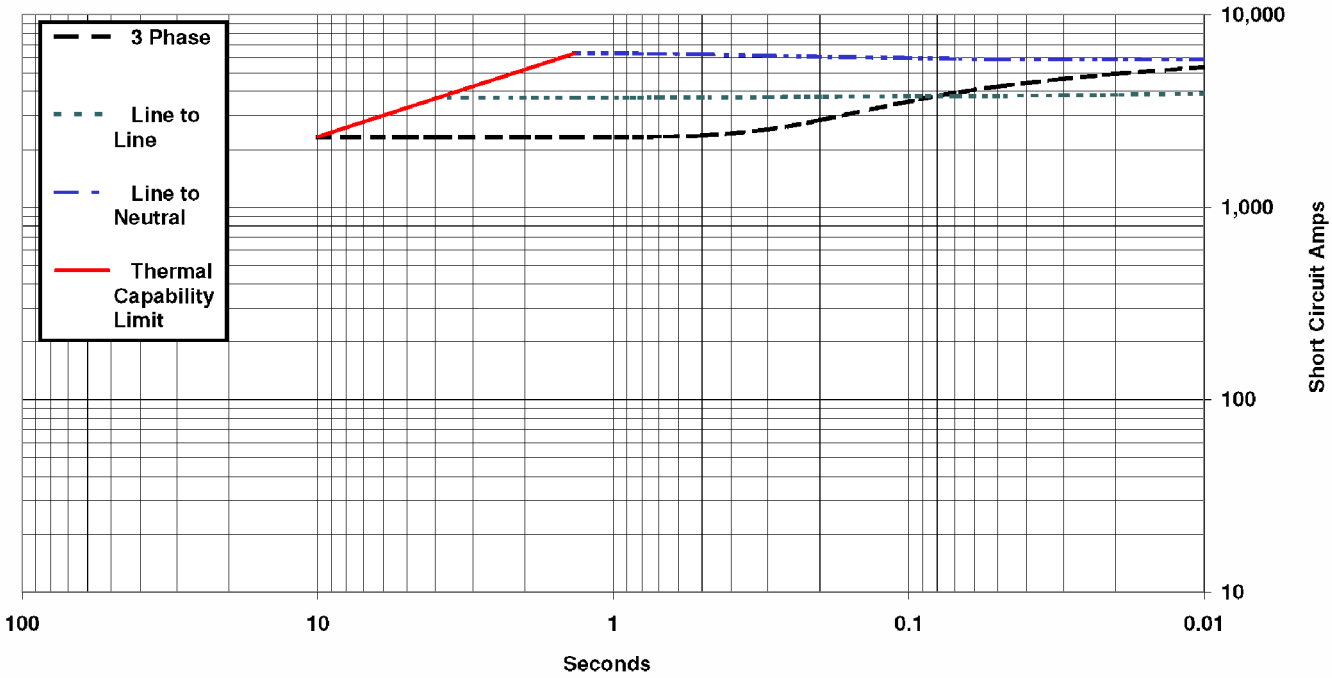
5M4027, 60 Hz, Low Wye or Delta Connection
SHORT CIRCUIT DECREMENT CURVE

Full Load Current: 1788 Amps **Steady State S.C. Current:** 5364 Amps **Max. 3 ph. Symm. S.C. Current:** 9770 Amps



5M4027, 60 Hz, High Wye Connection
SHORT CIRCUIT DECREMENT CURVE

Full Load Current: 775 Amps **Steady State S.C. Current:** 2325 Amps **Max. 3 ph. Symm. S.C. Current:** 5657 Amps



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

KOHLER. POWER SYSTEMS

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**
500REOZVC	60	100% Load	122.4	93.8	91.9	75.1
		No Load	107.8	90.9	89.0	73.8
Note: Sound pressure data is the logarithmic average of eight perimeter measurement points at a distance of 7 m (23 ft.), except Raw Exhaust data which is a single measurement point at 1 m (3.3 ft.) from the mouth of a straight pipe exhaust.						

500REOZVC	**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	56.8	64.8	69.4	69.3	66.3	63.6	58.8	52.5	74.5
			Front-Right	57.1	68.1	67.9	66.7	66.9	63.4	57.9	50.0	74.1
			Front	55.3	66.2	69.0	69.3	68.2	64.3	58.6	50.4	74.9
			Front-Left	57.0	65.7	72.7	71.2	68.9	65.2	57.4	53.4	76.8
			Left	56.3	66.1	70.1	69.3	66.7	66.2	58.0	55.6	75.2
			Back-Left	52.8	63.7	71.2	70.6	69.3	66.4	58.2	51.7	76.1
			Back	59.0	64.3	68.2	66.7	65.7	63.2	57.4	48.8	73.2
			Back-Right	54.7	67.3	68.8	67.9	67.6	65.6	57.1	56.7	74.8
			8-pos. log avg.	56.5	66.0	69.9	69.1	67.6	64.9	58.0	53.2	75.1

				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	93.1	92.7	84.3	90.9	92.1	91.5	91.1	94.4	91.9

				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	71.3	76.6	87.5	83.7	86.5	87.6	85.0	89.6	95.0
			Front-Right	68.1	72.2	80.2	82.3	86.0	88.0	86.4	90.3	94.6
			Front	61.9	68.5	80.3	75.7	78.9	79.7	77.2	75.5	86.2
			Front-Left	60.1	71.2	80.5	82.3	87.9	88.0	84.0	80.2	92.8
			Left	66.3	73.0	84.4	82.7	87.3	89.8	85.8	81.7	94.0
			Back-Left	65.9	73.6	84.4	83.1	87.2	88.2	84.6	81.9	93.4
			Back	71.7	76.9	88.9	81.4	83.6	85.3	83.5	82.8	93.0
			Back-Right	62.3	75.9	86.4	83.1	88.1	89.5	87.5	91.1	96.3
			8-pos. log avg.	67.7	74.3	85.2	82.3	86.4	87.8	85.0	86.9	93.8

			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)	99.3	106.9	110.7	111.1	113.6	116.4	115.3	115.3	122.4

500REOZVC	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	55.3	62.0	67.3	69.4	66.5	61.9	55.4	46.8	73.5
			Front-Right	51.4	65.0	66.2	66.3	67.2	61.5	56.3	46.5	72.8
			Front	52.7	65.1	68.3	68.8	68.3	62.7	57.4	48.8	74.3
			Front-Left	54.2	63.4	70.3	70.6	68.3	63.1	55.9	47.1	75.3
			Left	52.2	61.7	69.3	69.6	66.4	63.8	55.8	47.8	74.2
			Back-Left	48.2	61.7	69.2	70.0	68.5	65.2	54.9	45.9	74.9
			Back	56.2	63.1	64.7	65.1	64.5	58.4	51.6	41.5	70.9
			Back-Right	50.7	63.3	66.8	67.8	67.6	63.3	53.5	45.1	73.3
			8-pos. log avg.	53.3	63.4	68.1	68.8	67.3	62.8	55.4	46.6	73.8

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	89.5	88.5	86.7	89.3	90.6	88.8	87.7	89.9	89.0

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	54.7	71.4	85.2	81.8	85.9	85.8	80.0	73.8	91.4
			Front-Right	58.8	65.1	80.2	78.9	84.3	86.9	80.7	73.5	90.4
			Front	56.4	65.6	82.4	78.6	83.0	82.6	79.0	71.6	88.6
			Front-Left	52.6	69.3	82.8	79.1	86.2	86.7	81.5	73.6	91.2
			Left	55.7	70.5	86.3	81.3	86.0	87.3	83.6	75.2	92.5
			Back-Left	63.6	71.2	84.3	80.4	85.6	84.8	80.3	72.7	90.7
			Back	62.3	70.1	87.5	78.9	79.3	81.5	74.1	66.9	89.6
			Back-Right	57.3	71.8	86.4	80.3	85.6	86.5	81.0	74.9	91.8
			8-pos. log avg.	59.1	69.9	84.9	80.1	84.9	85.7	80.6	73.3	90.9

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)	94.8	100.6	102.3	96.1	99.2	100.5	95.9	90.4	107.8

KOHLER. POWER SYSTEMS

Emissions Data

KOHLER Power Systems

500REOZVC

INDUSTRIAL TOWABLE GENERATOR SET
EMISSION DATA SHEET

ENGINE INFORMATION

Model:	Volvo, TAD1641GE	Bore:	144mm (5.67 in.)
Nameplate BPH @ 1800 RPM:	757	Stroke:	165mm (6.50 in.)
Type:	4-Cycle, 6 Cylinder, Inline	Displacement:	16.12 L (984 cu. in.)
Aspiration:	Turbocharged, Charge Air-Cooled		
Compression Ratio	16.5:1	EPA Family:	FVPXL16.1ACB
Emission Control Device	EM,TC,CAC	EPA Certificate:	FVPXL16.1ACB-006

PERFORMANCE DATA:	1/4 Standby	1/2 Standby	3/4 Standby	Full Standby
Engine bkW @ Stated Load	142.60	285.00	427.50	565.00
Fuel Consumption (g/kWh)	233.00	205.00	203.00	210.00
Exhaust Gas Flow (m^3/s)				1.84
Exhaust Temperature (°C)				479.00
EXHAUST EMISSION DATA:				
HC (Total Unburned Hydrocarbons)	0.322	0.161	0.086	0.061
NOx (Oxides of Nitrogen as NO2)	5.252	5.196	5.064	5.187
CO (Carbon Monoxide)	0.750	0.294	0.542	1.900
PM (Particular Matter)	0.132	0.071	0.069	0.141

Values are in g/kWh

TEST METHODS AND CONDITIONS

40 CFR part 89 - 5 Mode US constant speed test cycle

Data and specifications subject to change without notice
For further information, please contact Bob Apple @ 757 285-1138

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2015 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **AB Volvo Penta**
(U.S. Manufacturer or Importer)

Certificate Number: FVPXL16.1ACB-006

Effective Date: 11/20/2014

Expiration Date: 12/31/2015

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 11/20/2014

Revision Date: N/A

Model Year: 2015
Manufacturer Type: Original Engine Manufacturer
Engine Family: FVPXL16.1ACB

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 560<kW<=2237
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control

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.

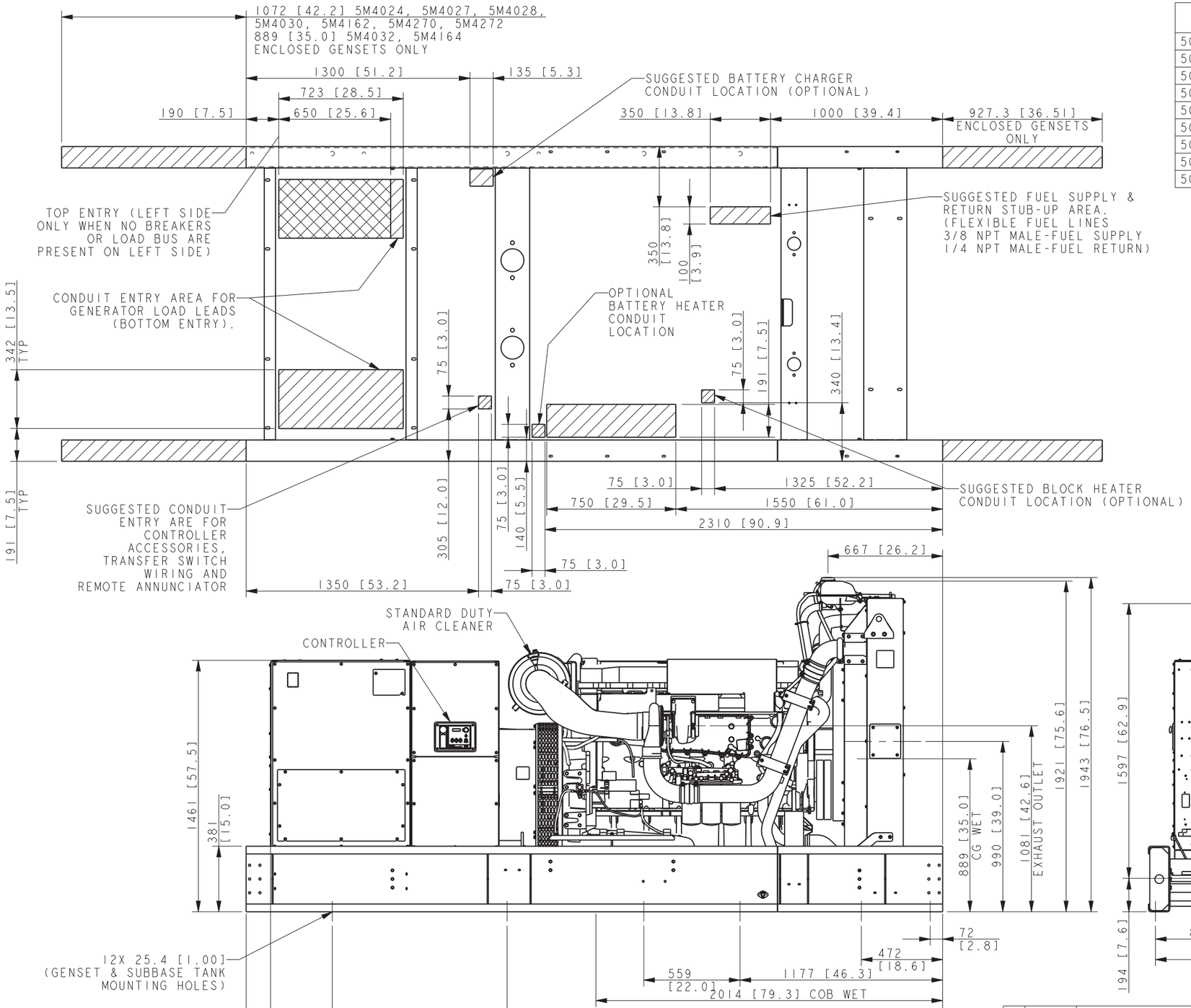
It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified 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. POWER SYSTEMS

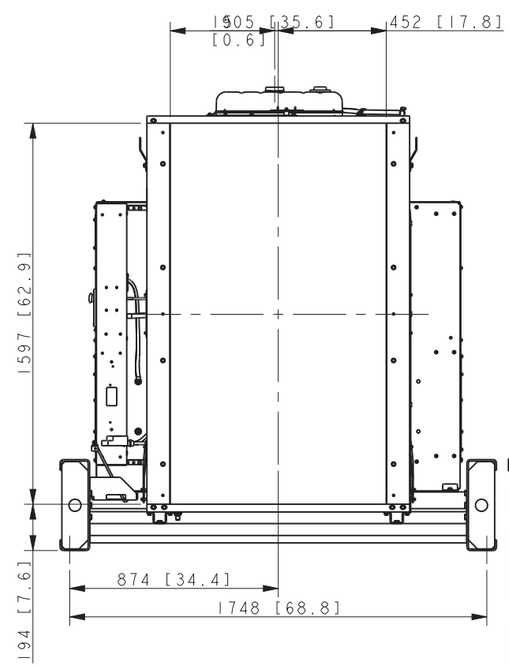
Dimensional Drawings

MODEL	ALTERNATOR FRAME	CONNECTION	GENSET WEIGHT (WET)
500 50/60 HZ	5M4024	10 LEAD	3778 KG [8330 LBS]
500 50/60 HZ	5M4027	12 LEAD	3828 KG [8440 LBS]
500 50/60 HZ	5M4028	10 LEAD	3924 KG [8650 LBS]
500 50/60 HZ	5M4030	10 LEAD	3924 KG [8650 LBS]
500 50/60 HZ	5M4032	10 LEAD	4082 KG [9000 LBS]
500 60 HZ	5M4162	4 LEAD	3828 KG [8440 LBS]
500 60 HZ	5M4164	4 LEAD	4082 KG [9000 LBS]
500 60 HZ	5M4270	4 LEAD	3828 KG [8440 LBS]
500 60 HZ	5M4272	4 LEAD	3924 KG [8650 LBS]



500-550 MODEL 50/60 HZ
5M4024, 5M4027, 5M4028, 5M4030, 5M4032
5M4162, 5M4164, 5M4270, 5M4272
RECONN., 380V, 600V ALTERNATORS, VOLVO

INSTALLATION NOTE
IF SUBBASE FUEL TANK AND/OR ENCLOSURE IS USED, REFER TO SUBBASE FUEL TANK/ENCLOSURE ADV TO DETERMINE MOUNTING LOCATIONS.



NOTES:
1) DIMENSIONS IN [] ARE ENGLISH EQUIVALENTS.

2) IF AN ENCLOSURE IS USED THE FUEL LINE MUST BE STUBBED UP FROM DIRECTLY UNDER THE UNIT. REFER TO ENCLOSURE ADV.

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

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	9-26-14	NEW DRAWING [CT92986]	SAM

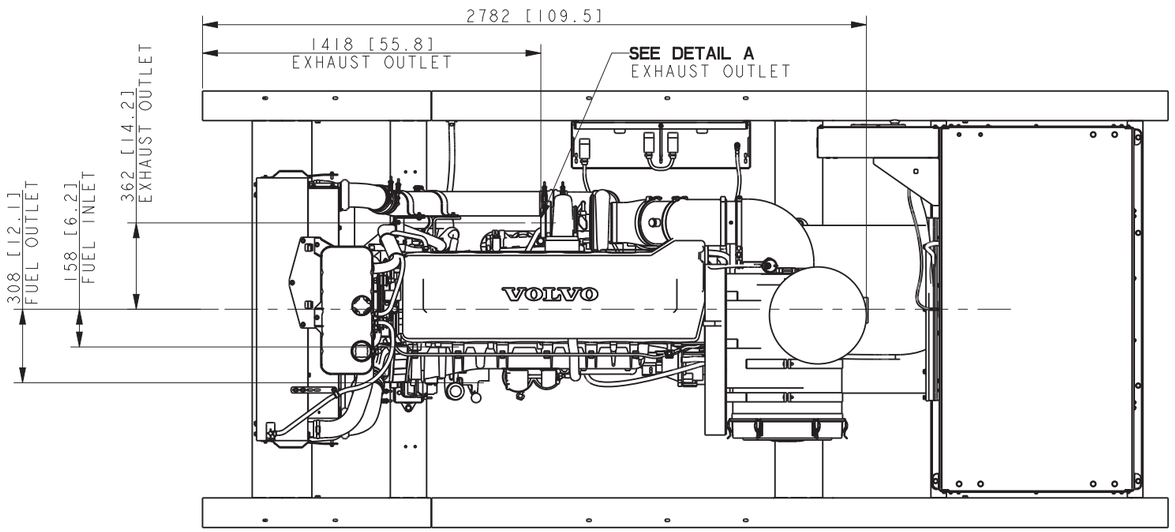
UNLESS OTHERWISE SPECIFIED -
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30'
SURFACE FINISH MAX.
THIRD ANGLE PROJECTION

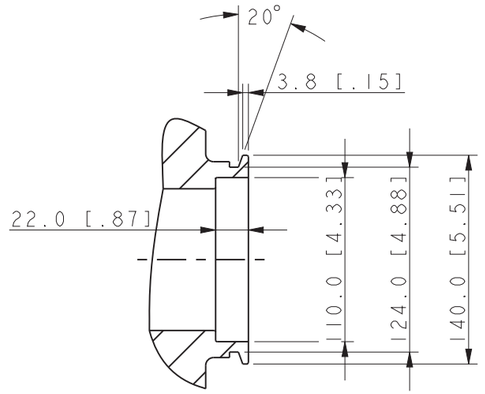
APPROVALS		DATE
DRAWN	SAM	9-26-14
CHECKED	SAM	9-26-14
APPROVED	PBT	9-26-14

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

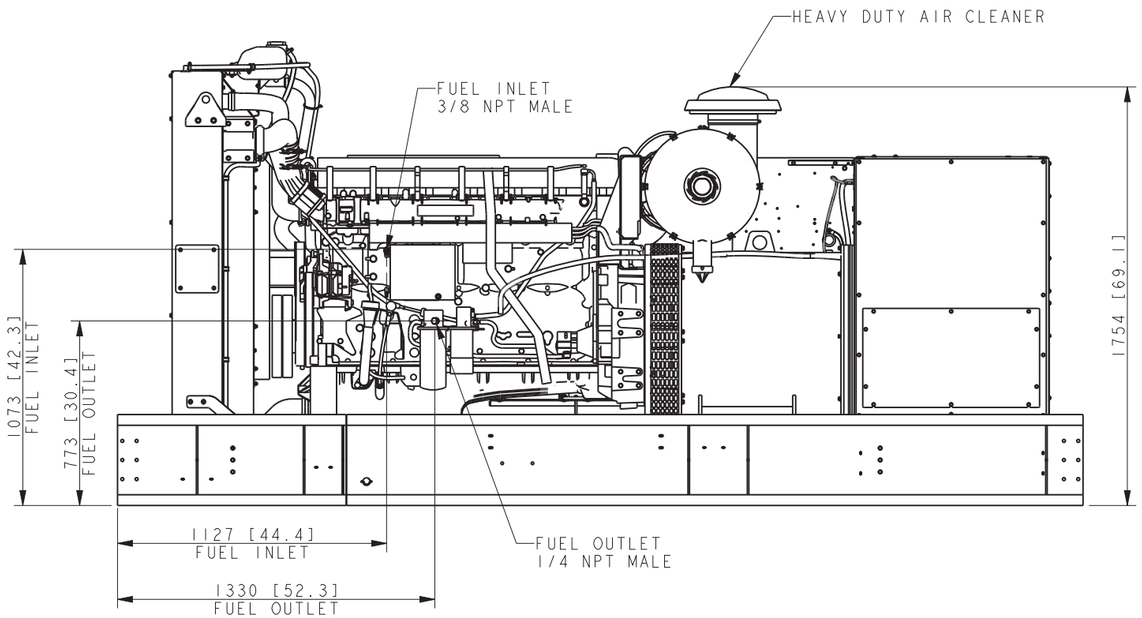
TITLE
DIMENSION PRINT, 500 KW VOLVO

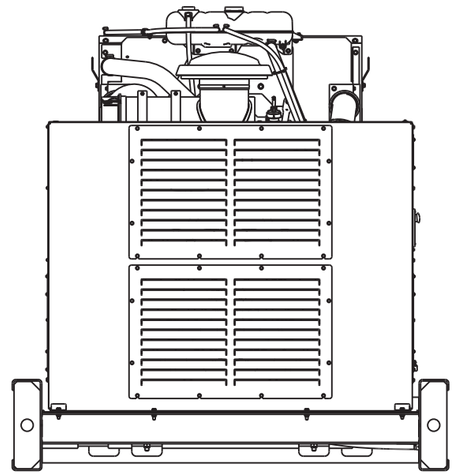
SCALE 0.08 | CAD NO. | SHEET 1 of 2
DWG NO. ADV-8745 | D





DETAIL A





REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	9-26-14	NEW DRAWING [CT92986]	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

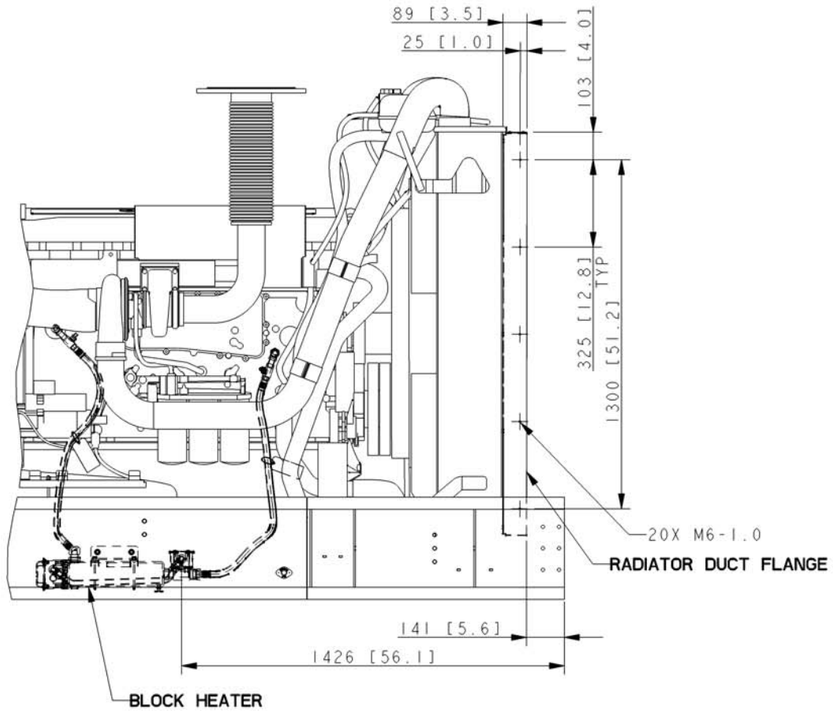
APPROVALS		DATE
DRAWN	SAM	9-26-14
CHECKED	SAM	9-26-14
APPROVED	PBT	9-26-14

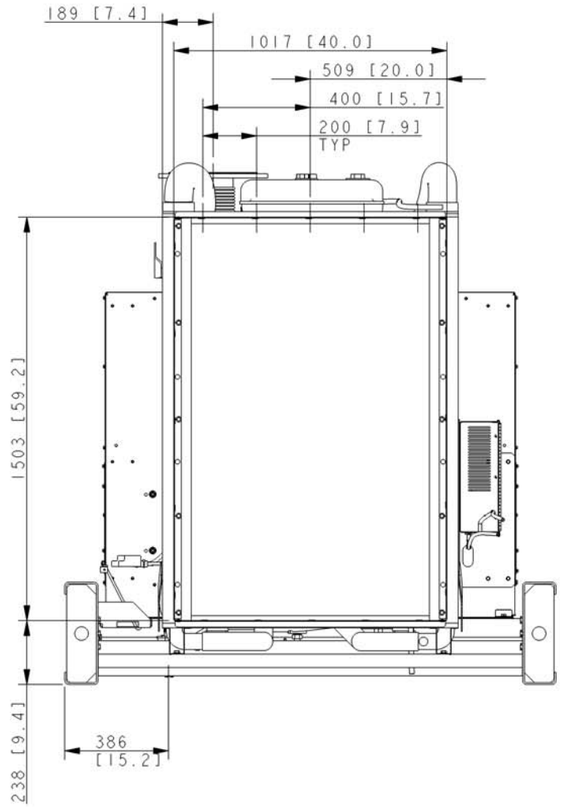
KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

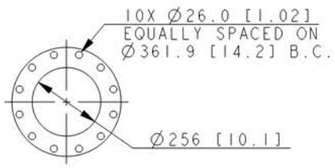
TITLE
DIMENSION PRINT, 500 KW VOLVO

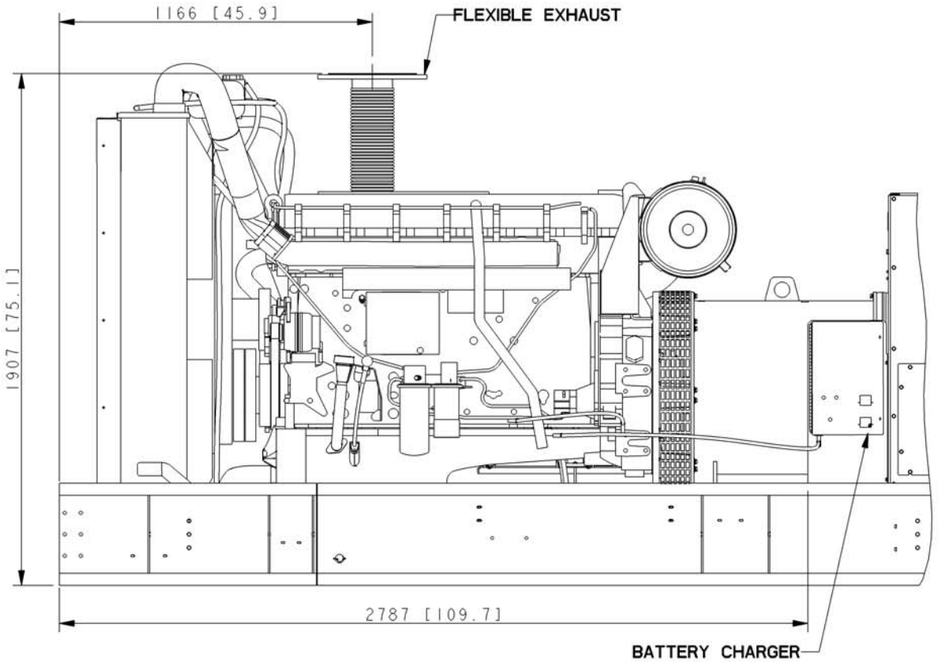
SCALE 0.08 | CAD NO. | SHEET 2 of 2

DWG NO. ADV-8745 | D









500-550 MODEL
RECONNECTABLE
380V & 600V ALTERNATORS

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	6-7-11	NEW DRAWING [91684-3]	DJV
A	1-10-12	VIEWS UPDATED [CT03561]	DJV
B	8-6-12	(B-7) 141 [5.6] WAS 58 [2.3], 1426 [56.1] WAS 1343 [52.9]; (B-3) 2787 [109.7] WAS 2705 [106.5]	
		(C-3) 1166 [45.9] WAS 1083 [42.6] [CT20118]	DJV

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	6-7-11
CHECKED	DJV	6-7-11
APPROVED	JDZ	6-7-11

KOHLER CO. METRIC | PRO-E

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

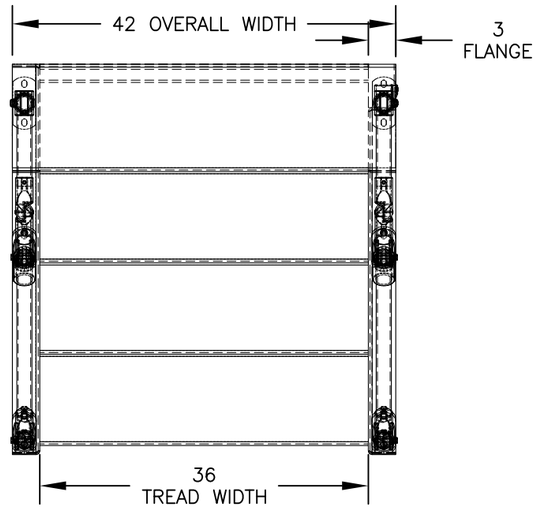
TITLE: **DIMENSION PRINT, 500-550 KW VOLVO ACCY**

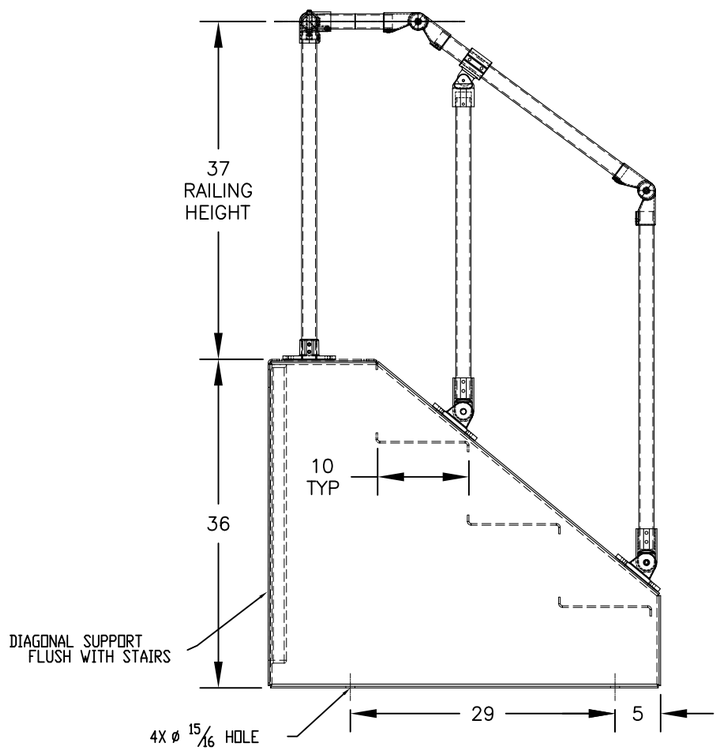
SCALE 0.09 | CAD NO. | SHEET 1 of 1

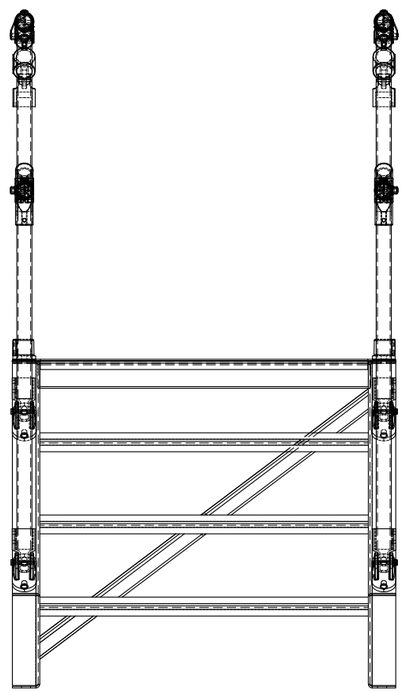
DWG NO. **ADV-8059** | **D**

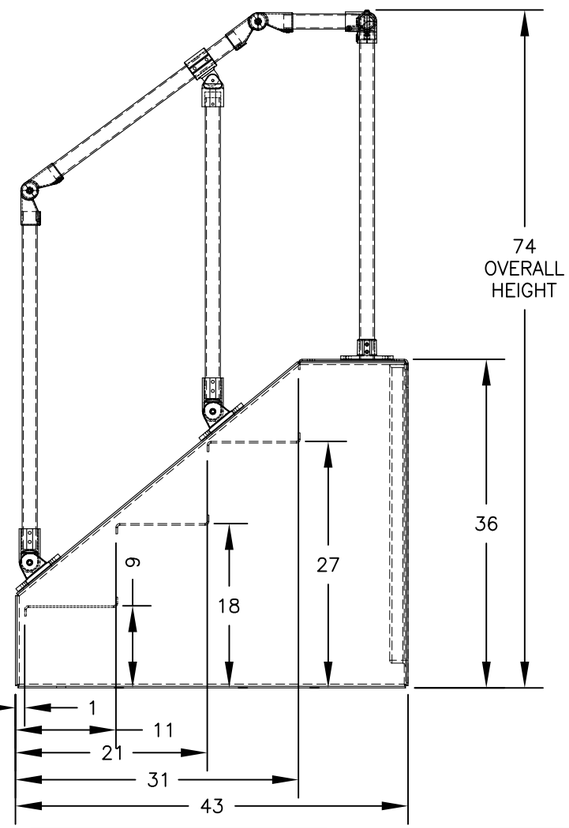
QUOTE #	STAIR HEIGHT	STAIR WIDTH	TANK WEIGHT
870417	36"	36"	X LBS

REV	DATE	REVISION	BY	MF
–	4-16-10	NEW DRAWING [88990-8]	SAM	









GM74974-TPL1
STAIRS WITH HANDRAIL

UNLESS OTHERWISE SPECIFIED –
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES ARE:
.XXX± .010 ANGLES± 1/2°
.XX ± .030 SURFACE FINISH
.X ± .060 √ MAX.
FRACTIONS ±

APPROVALS	DATE
DRAWN SAM	4-16-10
CHECKED AJD	4-16-10
APPROVED	AJD

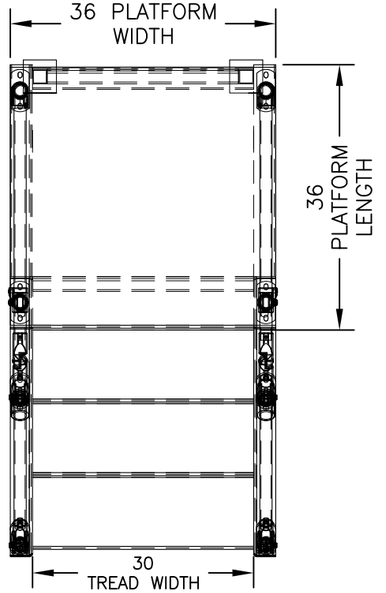
KOHLER CO.
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

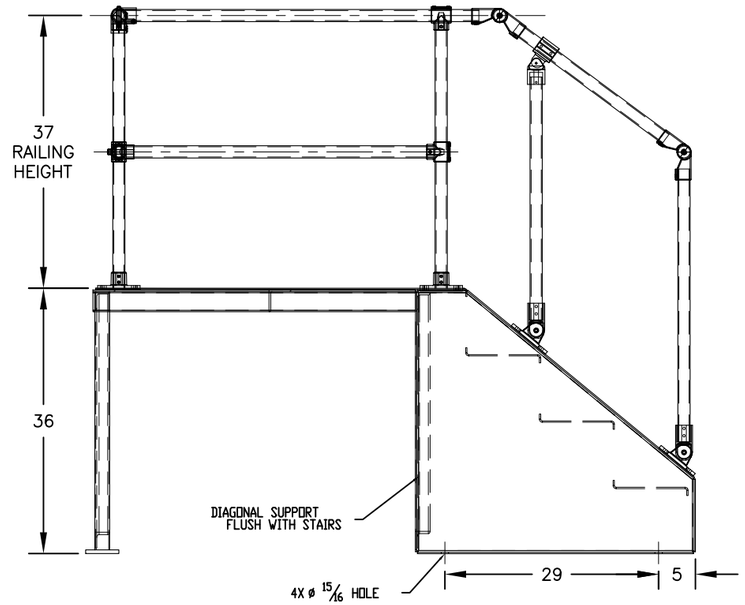
TITLE
STAIRS, FREESTANDING PLATFORM AND CATWALK

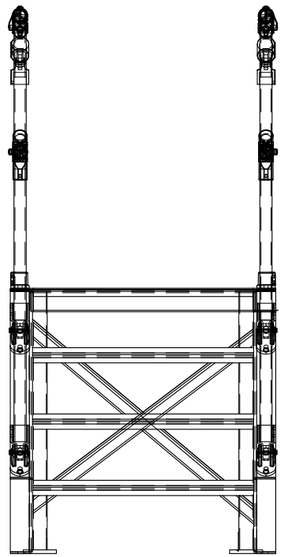
SCALE	CAD NO.	SHEET
/ / /		1-3
PLOTTED	DWG. NO. GM74974	C

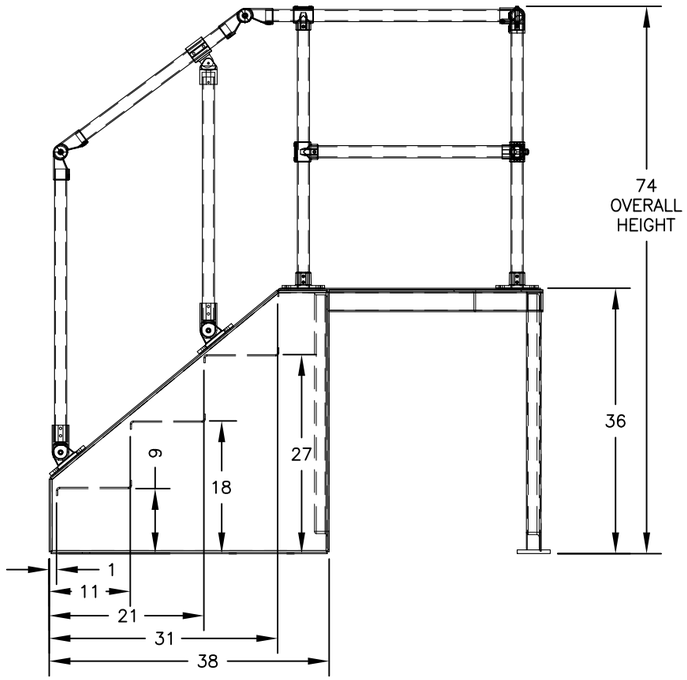
QUOTE #	STAIR HEIGHT	PLATFORM WIDTH	PLATFORM LENGTH	WEIGHT
870418	36"	36"	36"	X LBS

REV	DATE	REVISION	BY	M F
–	4–16–10	NEW DRAWING [88990–8]	SAM	









GM74974–TPL2
STAIRS AND PLATFORM

UNLESS OTHERWISE SPECIFIED –
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES ARE:
.XXX± .010 ANGLES± 1/2°
.XX ± .030 SURFACE FINISH
.X ± .060 √ MAX.
FRACTIONS ±

APPROVALS		DATE
DRAWN	SAM	4–16–10
CHECKED	AJD	4–16–10
APPROVED	AJD	4–16–10

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

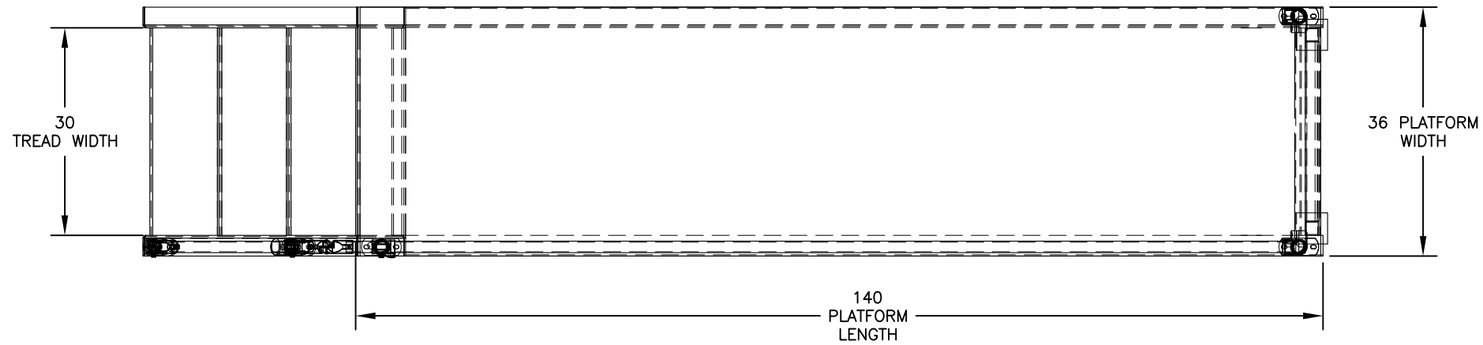
TITLE: STAIRS, FREESTANDING PLATFORM AND CATWALK

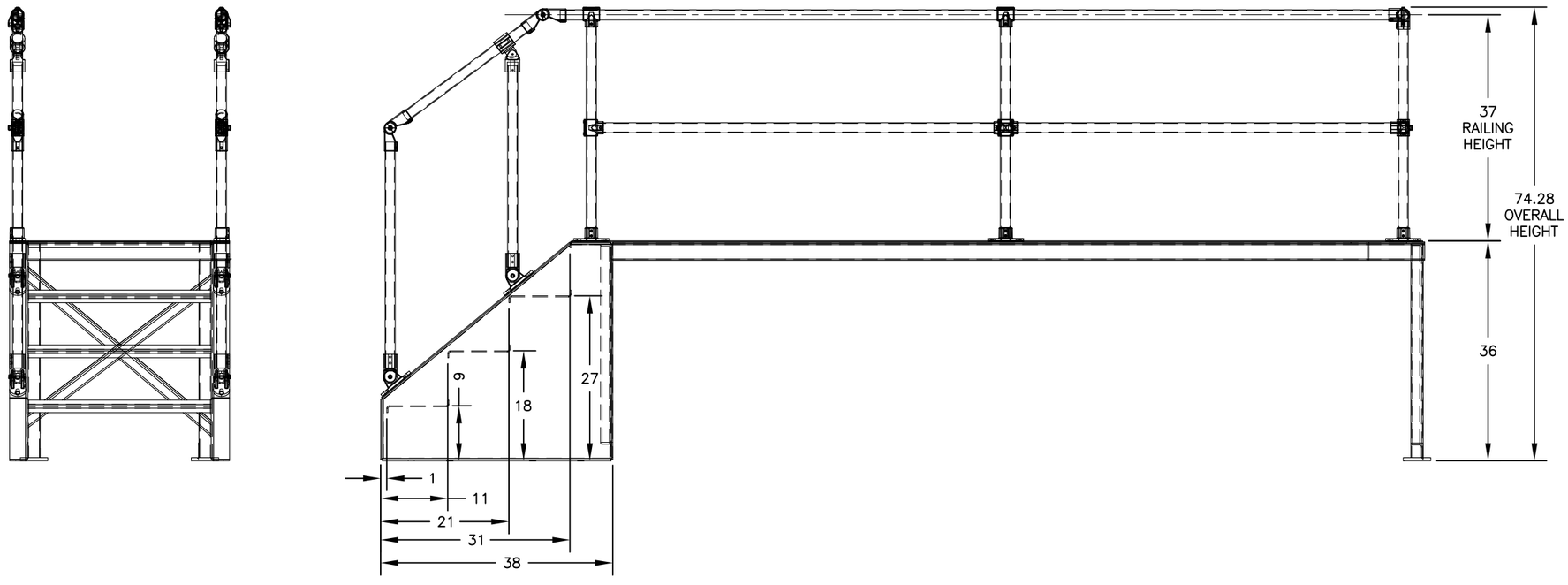
SCALE / / / | CAD NO. | SHEET 2–3

PLOTTED | DWG. NO. GM74974 | C

QUOTE #	STAIR HEIGHT	CATWALK WIDTH	CATWALK LENGTH	WEIGHT
870419	36"	36"	140"	X LBS

REV	DATE	REVISION	BY	M F
–	4–16–10	NEW DRAWING [88990–8]	SAM	





GM74974–TPL3
STAIRS AND CATWALK

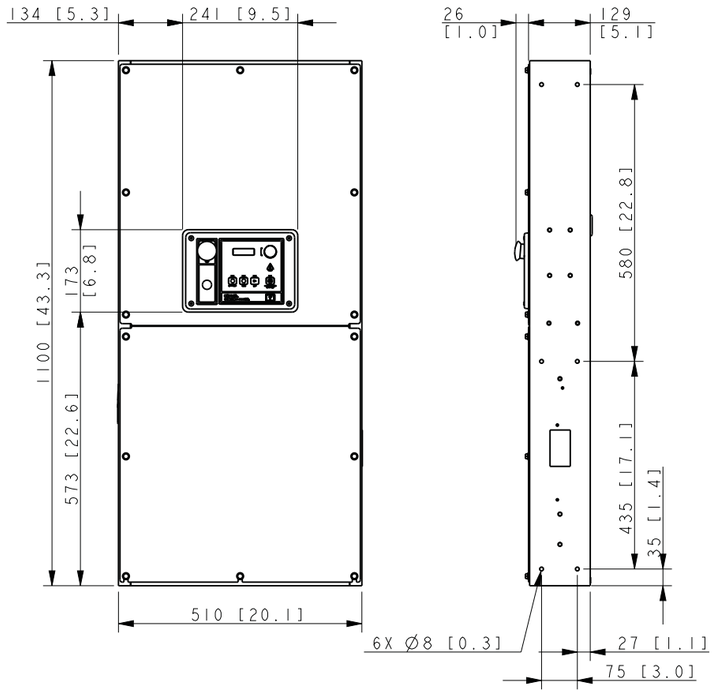
UNLESS OTHERWISE SPECIFIED –
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES ARE:
.XXX± .010 ANGLES± 1/2°
.XX ± .030 SURFACE FINISH
.X ± .060 MAX.
FRACTIONS ±

APPROVALS		DATE
DRAWN	SAM/GPC	4–16–10
CHECKED	AJD	4–16–10
APPROVED	AJD	4–16–10

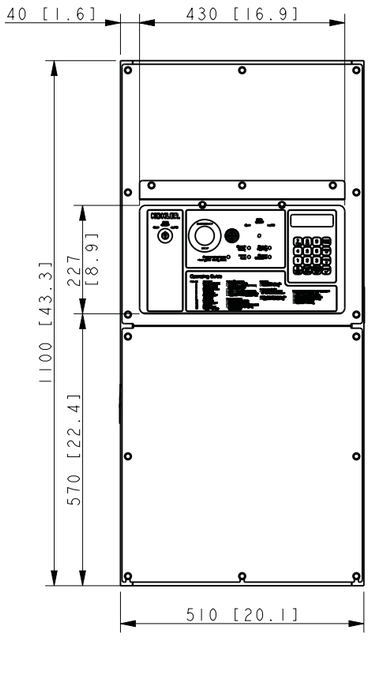
TITLE: STAIRS, FREESTANDING PLATFORM AND CATWALK

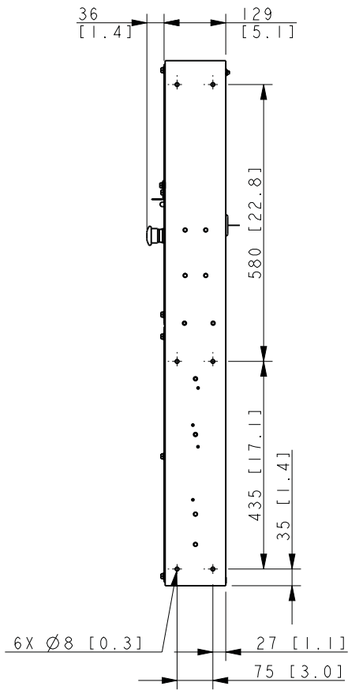
SCALE | CAD NO. | SHEET 3–3

PLOTTED | DWG. NO. GM74974 | D

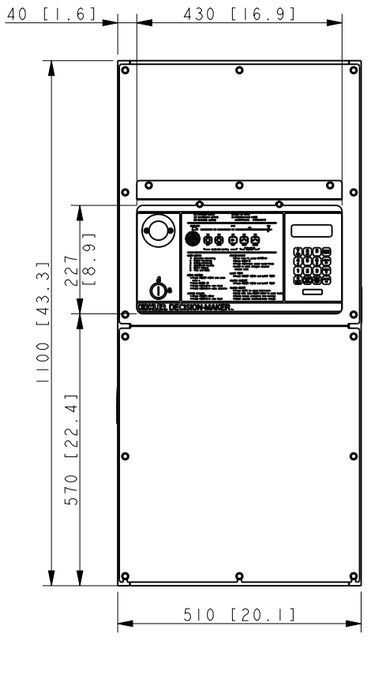


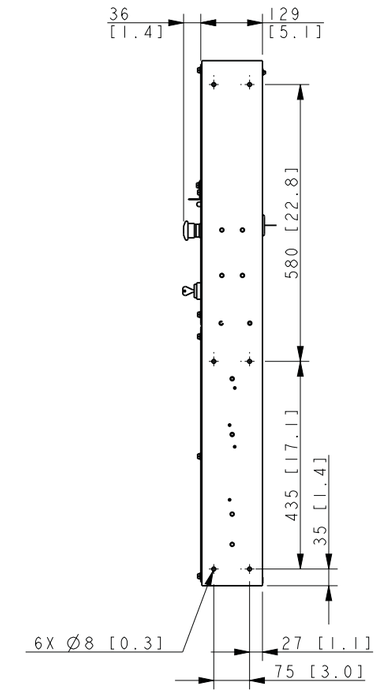
DEC 3000



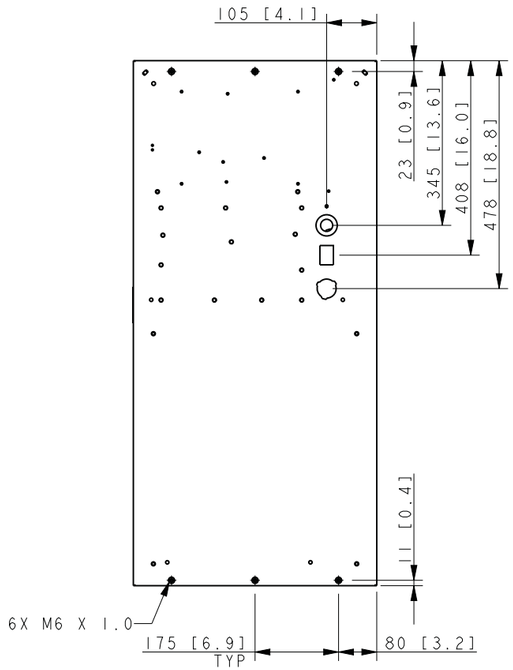


DEC 550





DEC 6000



REAR VIEW OF CONTROLLER
(DEC 3000, DEC 550 & DEC 6000)

DIMENSIONS IN [] ARE ENGLISH EQUIVALENTS

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	1-26-11	NEW DRAWING [90647-3]	DJV
A	2-22-12	(D-2/3) 430 [1.6] WAS 445 [17.5], 40 [1.6]	
		WAS 33 [1.3] (D-5/6) 430 [16.9] WAS 400	
		[15.7], 40 [1.6] WAS 55 [2.2] (CT07212)	KJB

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	1-26-11
CHECKED	DJV	1-26-11
APPROVED	JDZ	1-26-11

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

TITLE
DIMENSION PRINT, CONTROLLER

SCALE 0.16 | CAD NO. | SHEET 1 of 1
DWG NO. **ADV-7985** | **D**

300-2250KW
CONTROLLER

KOHLER. POWER SYSTEMS

Wiring Schematics

REV	DATE	REVISION	BY	MFG
–	3-7-11	NEW DRAWING [90745-4]	CRS	

LEGEND

CIU – CONTROLLER INTERFACE UNIT
CT(#) – CURRENT TRANSFORMER
D(#) – DIODE
ESS – EMERGENCY STOP SWITCH
F(#) – FUSE
INSUL(#) – INSULINK
J(#) – CONNECTOR (JACK)
LCT – LOW COOLANT TEMPERATURE SWITCH
MSA – MANUAL SPEED ADJUST
P(#) – CONNECTOR (PLUG)
PL(#) – PANEL LAMP
PMG – PERMANENT MAGNET GENERATOR
PT(#) – POTENTIAL TRANSFORMER
QCON(#) – QUICK CONNECTOR (TERMINAL)
SM – STARTER MOTOR
SS – STARTER SOLENOID
STAT –STATOR
SW(#) – SWITCH
TB1 – INTERCONNECTION BOARD TERMINAL BLOCK
TB2 – A/D TERMINAL BLOCK
TB3 – OUTPUT TERMINAL BLOCK
TB4 – DIGITAL INPUT TERMINAL BLOCK
TB5 – CONTROLLER A.C. FUSE BLOCK
TB12 – CUSTOMER CONNECTION TERMINAL BLOCK
⏚ – ENGINE BLOCK GROUND

NOTE:
CURRENT TRANSFORMER DOT OR "H1" TOWARD GENERATOR.

APPROVALS	DATE
DRAWN CRS	3-7-11
CHECKED DFS	3-7-11
APPROVED CRS	3-7-11

KOHLER CO.
KOHLER, WI 53044 U.S.A.

TITLE: DIAGRAM, SCHEMATIC
500–600 MODELS

SCALE: /// | SIZE: D | SHEET: 1–2 | DWG. NO.: ADV–7939 | REV.

DECISION–MAKER 550 CONTROLLER
W/ EDCIII ECM

REV	DATE	REVISION	BY	APP'D
–	3-7-11	NEW DRAWING [90745-4]	CRS	

INTERCONNECT BOARD

TB1 INPUT CONNECTIONS
TB1-1 REMOTE START (3)
TB1-2 REMOTE START (4)
TB1-3 EMERGENCY STOP GROUND (1)
TB1-4 EMERGENCY STOP (1A)

TB2 ANALOG INPUT CONNECTIONS
TB2-1 ANALOG CH1
TB2-2 ANALOG CH1(+)
TB2-3 ANALOG CH2
TB2-4 ANALOG CH2(+)
TB2-5 ANALOG CH3
TB2-6 ANALOG CH3(+)
TB2-7 ANALOG CH4
TB2-8 ANALOG CH4(+)
TB2-9 ANALOG CH5
TB2-10 ANALOG CH5(+)
TB2-11 ANALOG CH6
TB2-12 ANALOG CH6(+)
TB2-13 ANALOG CH7
TB2-14 ANALOG CH7(+)
TB2-15 N/C
TB2-16 ANALOG CH1(-)
TB2-17 ANALOG CH1 SHIELD GROUND
TB2-18 ANALOG CH2(-)
TB2-19 ANALOG CH2 SHIELD GROUND
TB2-20 ANALOG CH3(-)
TB2-21 ANALOG CH3 SHIELD GROUND
TB2-22 ANALOG CH4(-)
TB2-23 ANALOG CH4 SHIELD GROUND
TB2-24 ANALOG CH5(-)
TB2-25 ANALOG CH5 SHIELD GROUND
TB2-26 ANALOG CH6(-)
TB2-27 ANALOG CH6 SHIELD GROUND
TB2-28 ANALOG CH7(-)
TB2-29 ANALOG CH7 SHIELD GROUND
TB2-30 N/C

TB4 DIGITAL INPUT CONNECTIONS
TB4-1 DIGITAL INPUT 1
TB4-2 DIGITAL INPUT 2
TB4-3 DIGITAL INPUT 3
TB4-4 DIGITAL INPUT 4
TB4-5 DIGITAL INPUT 5
TB4-6 DIGITAL INPUT 6
TB4-7 DIGITAL INPUT 7
TB4-8 DIGITAL INPUT 8
TB4-9 DIGITAL INPUT 9
TB4-10 DIGITAL INPUT 10
TB4-11 DIGITAL INPUT 11
TB4-12 DIGITAL INPUT 12
TB4-13 DIGITAL INPUT 13
TB4-14 DIGITAL INPUT 14
TB4-15 DIGITAL INPUT 15
TB4-16 DIGITAL INPUT 16
TB4-17 DIGITAL INPUT 17
TB4-18 DIGITAL INPUT 18
TB4-19 DIGITAL INPUT 19
TB4-20 DIGITAL INPUT 20
TB4-21 DIGITAL INPUT 21
TB4-22 COMMON DIGITAL INPUT RETURN
TB4-23 COMMON DIGITAL INPUT RETURN
TB4-24 COMMON DIGITAL INPUT RETURN
TB4-25 COMMON DIGITAL INPUT RETURN
TB4-26 COMMON DIGITAL INPUT RETURN
TB4-27 COMMON DIGITAL INPUT RETURN
TB4-28 COMMON DIGITAL INPUT RETURN
TB4-29 COMMON DIGITAL INPUT RETURN
TB4-30 COMMON DIGITAL INPUT RETURN
TB4-31 COMMON DIGITAL INPUT RETURN
TB4-32 COMMON DIGITAL INPUT RETURN
TB4-33 COMMON DIGITAL INPUT RETURN
TB4-34 COMMON DIGITAL INPUT RETURN
TB4-35 COMMON DIGITAL INPUT RETURN
TB4-36 COMMON DIGITAL INPUT RETURN
TB4-37 COMMON DIGITAL INPUT RETURN
TB4-38 COMMON DIGITAL INPUT RETURN
TB4-39 COMMON DIGITAL INPUT RETURN
TB4-40 COMMON DIGITAL INPUT RETURN
TB4-41 COMMON DIGITAL INPUT RETURN
TB4-42 COMMON DIGITAL INPUT RETURN

TB3 OUTPUT CONNECTIONS
TB3-1 +12 VDC (OEM USE ONLY)
TB3-2 +12 VDC (OEM USE ONLY)
TB3-3 +12 VDC (OEM USE ONLY)
TB3-4 FUSED BATTERY(+) (42A) (5 AMP)
TB3-5 FUSED BATTERY(+) (42A) (5 AMP)
TB3-6 FUSED BATTERY(+) (42A) (5 AMP)
TB3-7 GROUND
TB3-8 GROUND
TB3-9 GROUND
TB3-10 GROUND
TB3-11 GROUND
TB3-12 PANEL LAMP OUTPUT

P1 ENGINE CONNECTIONS
P1-1 ENGINE CRANK (71)
P1-2 SHIELD 1 GROUND
P1-3 ENGINE RUN (70)
P1-4 ENGINE CRANK (71)
P1-5 ENGINE BLOCK GROUND (14N)
P1-6 SHIELD 2 GROUND
P1-7 ENGINE RUN (70)
P1-8 BATTERY(+) (14P)
P1-9 SHIELD GROUND
P1-10 LOW COOLANT LEVEL PTC (31A)
P1-11 N/C
P1-12 BATTERY(+) (14P)
P1-13 MAGNETIC PICKUP INPUT 1
P1-14 N/C
P1-15 N/C
P1-16 PWM1(+)
P1-17 MAGNETIC PICKUP INPUT 2
P1-18 N/C
P1-19 N/C
P1-20 PWM1
P1-21 BATTERY(+) SENSE (P)
P1-22 BATTERY(-) SENSE (N)
P1-23 PWM2
P1-24 PWM2(+)

P23 OUTPUT CONNECTIONS
P23-1 DIGITAL OUTPUT 29
P23-2 DIGITAL OUTPUT 28
P23-3 DIGITAL OUTPUT 30
P23-4 DIGITAL OUTPUT 31
P23-5 GROUND
P23-6 DIGITAL OUTPUT 21
P23-7 DIGITAL OUTPUT 24
P23-8 DIGITAL OUTPUT 22
P23-9 FUSED BATTERY(+) (42A) (5 AMP)
P23-10 DIGITAL OUTPUT 23
P23-11 DIGITAL OUTPUT 25
P23-12 DIGITAL OUTPUT 26
P23-13 DIGITAL OUTPUT 4
P23-14 DIGITAL OUTPUT 14
P23-15 DIGITAL OUTPUT 27
P23-16 DIGITAL OUTPUT 15
P23-17 DIGITAL OUTPUT 5
P23-18 N/C
P23-19 DIGITAL OUTPUT 20
P23-20 DIGITAL OUTPUT 18
P23-21 DIGITAL OUTPUT 3
P23-22 DIGITAL OUTPUT 16
P23-23 DIGITAL OUTPUT 8
P23-24 DIGITAL OUTPUT 7
P23-25 DIGITAL OUPTUT 1
P23-26 N/C
P23-27 DIGITAL OUTPUT 9
P23-28 DIGITAL OUTPUT 17
P23-29 DIGITAL OUTPUT 6
P23-30 N/C
P23-31 DIGITAL OUTPUT 11
P23-32 DIGITAL OUTPUT 19
P23-33 DIGITAL OUTPUT 12
P23-34 DIGITAL OUTPUT 10
P23-35 DIGITAL OUTPUT 2
P23-36 DIGITAL OUTPUT 13

MAIN LOGIC BOARD

P13 MODEM POWER CONNECTIONS
P13-1 GROUND
P13-2 +5 VD

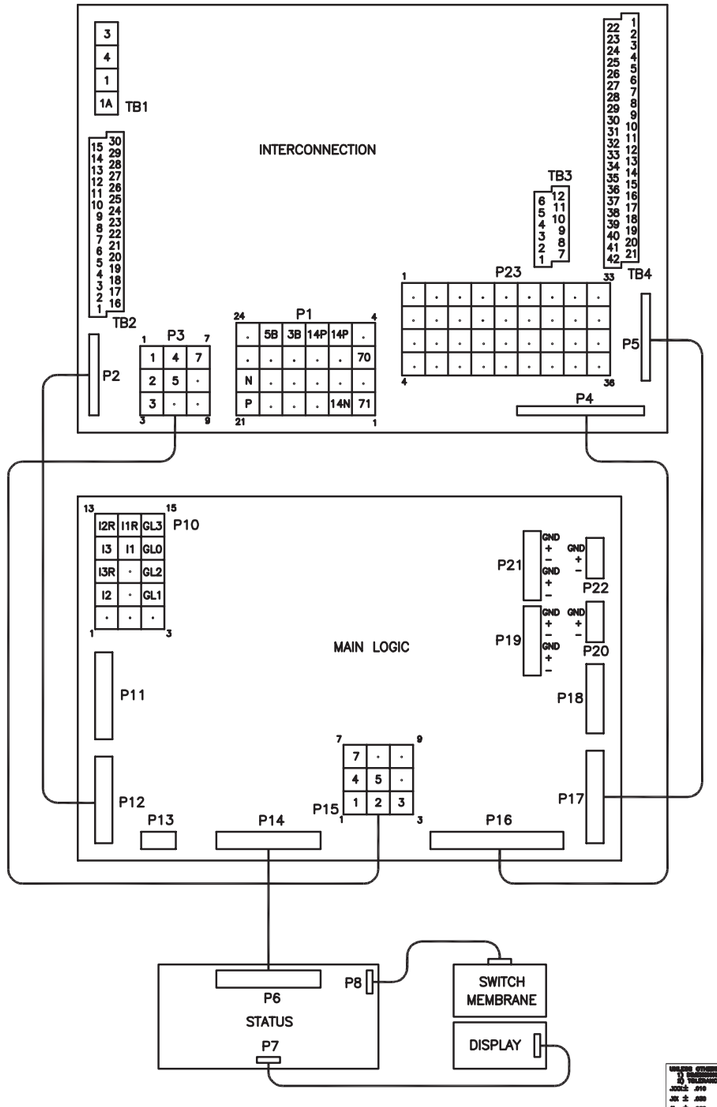
P18 RS232 CONNECTIONS
P18-1 CD
P18-2 RX
P18-3 TX
P18-4 DTR
P18-5 GROUND
P18-6 DSR
P18-7 RTS
P18-8 CTS
P18-9 RI

P19 FACTORY TEST PORT
P19-1 GND
P19-2 +
P19-3 –
P19-4 GND
P19-5 +
P19-6 –

P20 RS485 NON-ISOLATED CONNECTIONS
P20-1 GND
P20-2 +
P20-3 –

P21 RS485A ISOLATED CONNECTIONS
P21-1 GND
P21-2 +
P21-3 –
P21-4 GND
P21-5 +
P21-6 –

P22 J1939 CONNECTIONS
P22-1 GND
P22-2 +
P22-3 –



DECISION-MAKER 550 CONTROLLER
W/ EDCIII ECM

APPROVALS	DATE
DRAWN CRS	3-7-11
CHECKED DFS	3-7-11
APPROVED CRS	3-7-11

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

TITLE: DIAGRAM, SCHEMATIC
500-600 MODELS

SCALE: /// | SHEET 2-2

DRW. NO. ADV-7939 | D

REV	DATE	REVISION	BY	NO.
–	2-23-11	NEW DRAWING [90745-4]	CRS	

CONTROLLER COMPARTMENT

TOP COMPARTMENT (CUSTOMER CONNECTIONS)

MAIN LOGIC

P10 CONNECTIONS

PIN #1	N/C	.
2	N/C	.
3	N/C	.
4	I2	(P1C-11)
5	N/C	.
6	GL1	(TB5-V7)
7	I3R	(P1C-14)
8	N/C	.
9	GL2	(TB5-V8)
10	I3	(P1C-13)
11	I1	(P1C-9)
12	V0	(P1C-4)
13	I2R	(P1C-12)
14	I1R	(P1C-10)
15	GL3	(TB5-V9)

P15 CONNECTIONS

PIN #1	1	(P3-1)
2	2	(P3-2)
3	3	(P3-3)
4	4	(P3-4)
5	5	(P3-5)
6	N/C	.
7	7	(P3-7)
8	N/C	.
9	N/C	.

INTERCONNECTION

P1 CONNECTIONS

PIN #1	N/C	.	13	N/C	.
2	N/C	.	14	N/C	.
3	70B	(P1B-23)	15	N/C	.
4	N/C	.	16	3B	(P1C-21)
5	14N	(W1)	17	N/C	.
6	N/C	.	18	N/C	.
7	70H	(TB12-70)	19	N/C	.
8	14P	(W2)	20	5B	(P1C-22)
9	N/C	.	21	P8	(W2)
10	N/C	.	22	N13	(W1)
11	N/C	.	23	N/C	.
12	14P	(QCON4)	24	N/C	.

P3 CONNECTIONS

PIN #1	1	(P15-1)	5	5	(P15-5)
2	2	(P15-2)	6	N/C	.
3	3	(P15-3)	7	7	(P15-7)
4	4	(P15-4)	8	N/C	.
			9	N/C	.

P1C CONNECTIONS

PIN #1	V7	(TB5-V7)
2	V8	(TB5-V8)
3	V9	(TB5-V9)
4	V0	(P10-12)
5	N/C	.
6	N/C	.
7	N/C	.
8	N/C	.
9	I1	(P10-11)
10	I1R	(P10-14)
11	I2	(P10-4)
12	I2R	(P10-13)
13	I3	(P10-10)
14	I3R	(P10-7)
15	N/C	.
16	N/C	.
17	N/C	.
18	N/C	.
19	N/C	.
20	EOV	(TB4-4)
21	3B	(P1-16)
22	5B	(P1-20)
23	N20	(TB3-7)
24	E12	(TB3-1)

P1B CONNECTIONS

PIN #1	64	(TB4-7)	18	N/C	.
2	63C	(W3)	19	35A	(TB4-3)
3	N/C	.	20	N/C	.
4	P	(W2)	21	N/C	.
5	N/C	.	22	N/C	.
6	N/C	.	23	70B	(P1-3)
7	N18	(TB4-28)	24	N/C	.
8	N17	(TB2-22)	25	N/C	.
9	N/C	.	26	N/C	.
10	N/C	.	27	N/C	.
11	N/C	.	28	N/C	.
12	N/C	.	29	N/C	.
13	N/C	.	30	N/C	.
14	N/C	.	31	14N1	(W1)
15	N/C	.	32	WHT	(QCON2)
16	N/C	.	33	GRN	(P22-(–))
17	N/C	.	34	YEL	(P22-(+))

LEGEND

CIU – CONTROLLER INTERFACE UNIT
CT(#) – CURRENT TRANSFORMER
D(#) – DIODE
EBG – ENGINE BLOCK GROUND
ESS – EMERGENCY STOP SWITCH
F(#) – FUSE
GND – CONTROLLER BOX GROUND
INSUL(#) – INSULINK
J(#) – CONNECTOR (JACK)
LCT – LOW COOLANT TEMPERATURE SWITCH
LFL – LOW FUEL LEVEL
MSA – MANUAL SPEED ADJUST
P(#) – CONNECTOR (PLUG)
PGND – CONTROLLER PANEL GROUND LUG
PL(#) – PANEL LAMP
PMG – PERMANENT MAGNET GENERATOR
QCON(#) – QUICK CONNECT
SM – STARTER MOTOR
SS – STARTER SOLENOID
STAT – STATOR
SW(#) – SWITCH
TB1 – INTERCONNECTION BOARD TERMINAL BLOCK
TB2 – A/D TERMINAL BLOCK
TB3 – OUTPUT TERMINAL BLOCK
TB4 – DIGITAL INPUT TERMINAL BLOCK
TB5 – CONTROLLER A.C. FUSE BLOCK
TB10 – ACCESSORY TERMINAL BLOCK
TB11 – CT INPUT TERMINAL BLOCK
TB12 – VSG TERMINAL BLOCK

FOR SCHEMATIC SEE ADV-7939

DECISION-MAKER 550 CONTROLLER

APPROVALS	DATE
DRAWN CRS	2-23-11
TRACED DFS	2-23-11
APPROVED CRS	2-23-11

KOHLER CO.
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.
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TITLE: DIAGRAM, WIRING 500-600 MODELS

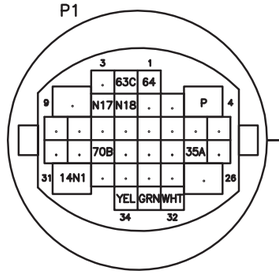
SCALE: /// SHEET 1-2

SPEC NO. PLOTTED DWG NO. GM79876 D

REV	DATE	REVISION	BY	APP'D
–	2-23-11	NEW DRAWING [90745-4]	CRS	

ENGINE

P1



P1 CONNECTIONS

PIN #					
1	64	(QCON18)	18	N/C	.
2	63C	(QCON16)	19	35A	(LCT)
3	N/C	.	20	N/C	.
4	P	(SS)	21	N/C	.
5	N/C	.	22	N/C	.
6	N/C	.	23	70B	(W7)
7	N18	(QCON17)	24	N/C	.
8	N17	(QCON15)	25	N/C	.
9	N/C	.	26	N/C	.
10	N/C	.	27	N/C	.
11	N/C	.	28	N/C	.
12	N/C	.	29	N/C	.
13	N/C	.	30	N/C	.
14	N/C	.	31	14N1	(W8)
15	N/C	.	32	WHT	(P4–3)
16	N/C	.	33	GRN	(P4–2)
17	N/C	.	34	YEL	(P4–1)

70B (P1–23) — W7 — 70B1 (D3)
70B2 (P4–5)
70C (P2–5)

14N1 (P1–31) — W8 — 14N2 (EBG)
N (LCT)

FUEL TANK (OPT)

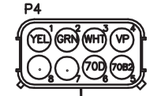
N17 (P1–8) — QCON15 — N2
63C (P1–2) — QCON16 — 63C
N18 (P1–7) — QCON17 — N
64 (P1–1) — QCON18 — 64

FUEL LEVEL SENDER (OPTIONAL)
FUEL LEAK ALARM (OPTIONAL)

P4 CONNECTIONS

PIN #		
1	YEL	YELLOW (P1–34)
2	GRN	GREEN (P1–33)
3	WHT	WHITE (P1–32)
4	VP	(P1–11)
5	70B2	(W7)
6	70D	(D3)
7	N/C	.
8	N/C	.

P4



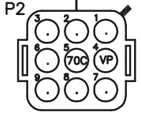
70B1 (W7) — D3 — 70D (P4–6)

DIAGNOSTIC BOX

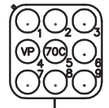
P2 CONNECTIONS

PIN #		
1	N/C	.
2	N/C	.
3	N/C	.
4	VP	(P4–4)
5	70C	(W7)
6	N/C	.
7	N/C	.
8	N/C	.
9	N/C	.

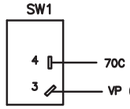
P2



P2A



SW1



70C (P2A–5)
VP (P2A–4)

35A (P1–19) — LCT
N (W8)

450–500 KW

14N2 (W8) — EBG
P (P1–4)

12 VDC BATTERY A
12 VDC BATTERY B

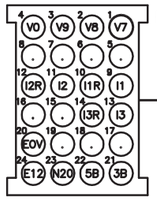
SS
SM

600 KW

EBG
CUSTOMER CONNECTION
14N2 (W8)
NEGATIVE CONNECTION BOX
POSITIVE CONNECTION BOX
CUSTOMER CONNECTION
P (P1–4)
12 VDC BATTERY A
12 VDC BATTERY B

JUNCTION BOX

P1D



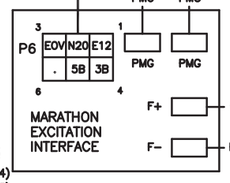
P1D CONNECTIONS

PIN #		
1	V7	(P2D–1)
2	V8	(P2D–2)
3	V9	(P2D–3)
4	V0	(P2D–4)
5	N/C	.
6	N/C	.
7	N/C	.
8	N/C	.
9	I1	(P26–1)
10	I1R	(P26–2)
11	I2	(P26–3)
12	I2R	(P26–4)
13	I3	(P26–5)
14	I3R	(P26–6)
15	N/C	.
16	N/C	.
17	N/C	.
18	N/C	.
19	N/C	.
20	EOV	(P6–3)
21	3B	(P6–4)
22	5B	(P6–5)
23	N20	(P6–2)
24	E12	(P6–1)

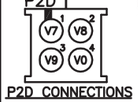
P6 CONNECTIONS

PIN #		
1	E12	(P1D–24)
2	N20	(P1D–23)
3	EOV	(P1D–20)
4	3B	(P1D–21)
5	5B	(P1D–22)
6	N/C	.

P6



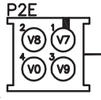
P2D



P2D CONNECTIONS

PIN #		
1	V7	(P1D–1)
2	V8	(P1D–2)
3	V9	(P1D–3)
4	V0	(P1D–4)

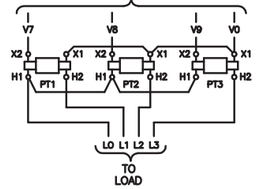
P2E



V0
V7
V8
V9

F2 F1
EXCITER STATOR
EXCITER ROTOR
AC F–
AC
AC F+
RECTIFIER MODULE
PMG ROTOR
MAIN ROTOR
STAT 10 LEAD
PMG STATOR
PMG
PMG
CAPACITOR

TO P2E
(4 LEAD & 6 LEAD GENERATOR ONLY)



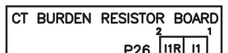
NOTE: FOR GENERATOR CONNECTIONS SEE: ADV–5875 THREE PHASE

P26 CONNECTIONS

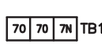
PIN #		
1	I1	(P1D–9)
2	I1R	(P1D–10)
3	I2	(P1D–11)
4	I2R	(P1D–12)
5	I3	(P1D–13)
6	I3R	(P1D–14)

CT BURDEN RESISTOR BOARD

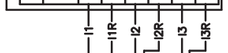
P26



TB10



TB11



I1 I1R I2 I2R I3 I3R
BLACK WHITE BLACK WHITE BLACK WHITE
CT1 CT2 CT3

NOTE: CURRENT TRANSFORMER DOT OR "H1" TOWARD GENERATOR.

DECISION–MAKER 550 CONTROLLER

UNLESS OTHERWISE SPECIFIED — DIMENSIONS ARE IN INCHES — TOLERANCES: .XXX ± .010, .XX ± .020, .X ± .030, FRACTIONS ± 1/64, ANGLES ± 1/2°, SURFACE FINISH 250

APPROVALS		DATE
DRAWN	CRS	2-23-11
CHECKED	DFS	2-23-11
APPROVED	CRS	2-23-11

TITLE: DIAGRAM, WIRING 500–600 MODELS

SIZE D | DWG NO. | REV

SHEET 2-2

SPEC NO. | PLOTTED | GM79876 | D

REV	DATE	REVISION	BY	U E
A	2-15-11	SEE SHEET 2 [91056]	CRS	
B	8-3-11	(C-3) GFA ADDED, SEE SHEETS 2 & 3 [92098]	CRS	
C	11-9-11	(A-1) SHEET 1-4 WAS 1-3 [92522]	DFS	
D	1-24-12	SEE SHEET 3 [92717]	CRS	
E	5-15-14	(C-1,-2) TB4 DIGITAL INPUT FACTORY SETTINGS: TB4-9 DCH9 LOW		
		FUEL SHUTDOWN (GM & DOOSAN ONLY) WAS (GM ONLY) [CT79954]	DFS	

RELAY CONTACTS

(70) BATTERY VOLTAGE PRESENT ONLY WHEN GENERATOR IS OPERATING

RUN RELAY (OPTIONAL)

RED BLK

TB10/12 70 7N

CIRCULATING PUMP BLOCK HEATER

LINE CIRCUIT BREAKER (OPTIONAL)

SHUNT TRIP COIL

TB10/12 P 70 7N

WHT 7N

7N 7N

14P

FUSE 10 AMP WHT

14PF

DCB3 (SHUNT TRIP WIRING) (OPTIONAL)

DCB2 (DRY CONTACT COMMON FAILURE RELAY) (OPTIONAL)

DCB1 (DRY CONTACT SINGLE RELAY) (OPTIONAL)

C NC NO — OUT K1 — TB1 K1 2 42A

OVERSPEED (TYPICAL CONNECTION)

NOTE: TRANSFER SWITCH TERMINAL DESIGNATIONS MAY VARY FROM THOSE SHOWN HERE. VERIFY THE CORRECT DESIGNATIONS USING THE APPROPRIATE TRANSFER SWITCH WIRING DIAGRAM.

(TERMINALS 3 AND 4: REMOTE START SWITCH OR ENGINE START CONTACTS ON TRANSFER SWITCH)

ENGINE START SWITCH (CUSTOMER PROVIDED) 3 4

ES3 (P25-30)

ES4 (P25-26)

REMOTE EMERGENCY STOP SWITCH (OPTIONAL)

LOCAL EMERGENCY STOP SWITCH (STANDARD)

LOCAL EMERGENCY STOP SWITCH (STANDARD) 1 1A

TB1 1 1A

REMOTE EMERGENCY STOP SWITCH CONNECTIONS

TB1 ENGINE START & E-STOP CONNECTIONS

3 4 1 1A

CONTROLLER INTERCONNECTION BOARD

TB2 ANALOG INPUT CONNECTIONS

TB3 OUTPUT CONNECTIONS

TB4 DIGITAL INPUT CONNECTIONS

P1 ENGINE HARNESS CONNECTIONS

P3 DC INPUT CONNECTIONS

P23 OUTPUT CONNECTIONS

TO ENGINE HARNESS

PRIME POWER SWITCH

QCON1 14P

QCON2 14P

BATTERY CHARGER CONNECTIONS (OPTIONAL)

61 BATT. CHARGER FAULT BATTERY GROUND

LFP (OPTIONAL) 63 BATTERY GROUND

63

EBG N

LFL (OPTIONAL) LOCATED IN MAIN TANK AS PROVIDED BY FUEL TANK SUPPLIER

GFA

LOWER RAISE

REMOTE VOLTAGE ADJUST (OPTIONAL)

IDLE MODE SWITCH (CUSTOMER PROVIDED)

LEGEND

CTS – COOLANT TEMPERATURE SENDER
DCB(#) – DRY CONTACT BOARD
GFA – GROUND FAULT ANNUNCIATOR
LFL – LOW FUEL LEVEL SWITCH
LFP – LOW FUEL PRESSURE SWITCH
OPS – OIL PRESSURE SENDER
P(#) – PLUG
QCON(#) – QUICK CONNECT
TB(#) – TERMINAL BLOCK

ANALOG INPUT CONNECTIONS:

TB2-1 ACH1 (CTS) SIGNAL (NON-ECM)
TB2-2 ACH1 (CTS) SUPPLY (NON-ECM)
TB2-3 ACH2 (OPS) SIGNAL (NON-ECM)
TB2-4 ACH2 (OPS) SUPPLY (NON-ECM)
TB2-5 ACH3 SIGNAL
TB2-6 ACH3 SUPPLY
TB2-7 ACH4 SIGNAL
TB2-8 ACH4 SUPPLY
TB2-9 ACH5 SIGNAL
TB2-10 ACH5 SUPPLY
TB2-11 ACH6 SIGNAL
TB2-12 ACH6 SUPPLY
TB2-13 ACH7 SIGNAL
TB2-14 ACH7 SUPPLY
TB2-15 N/C
TB2-16 ACH1 (CTS) RETURN (NON-ECM)
TB2-17 ACH1 (CTS) SHIELD GND (NON-ECM)
TB2-18 ACH2 (CTS) RETURN (NON-ECM)
TB2-19 ACH2 (CTS) SHIELD GND (NON-ECM)
TB2-20 ACH3 RETURN
TB2-21 ACH3 SHIELD GND
TB2-22 ACH4 RETURN
TB2-23 ACH4 SHIELD GND
TB2-24 ACH5 RETURN
TB2-25 ACH5 SHIELD GND
TB2-26 ACH6 RETURN
TB2-27 ACH6 SHIELD GND
TB2-28 ACH7 RETURN
TB2-29 ACH7 SHIELD GND
TB2-30 N/C

NOTE: ACH1 THRU ACH7 ARE CUSTOMER DEFINABLE WITH NON-ECM FACTORY DEFAULTS LISTED. SEE CONTROLLER OPERATION MANUAL TO CHANGE.

RELAY DRIVER OUTPUT (RDO) STANDARD FACTORY SETTINGS

TB6-RD01 OVER SPEED (39)
TB6-RD02 OVER CRANK (12)
TB6-RD03 HIGH COOLANT TEMP SHUTDOWN (36)
TB6-RD04 LOW OIL PRESSURE SHUTDOWN (38)
TB6-RD05 LOW COOLANT TEMP (35)
TB6-RD06 HIGH COOLANT TEMP WARNING (40)
TB7-RD07 LOW OIL PRESSURE WARNING (41)
TB7-RD08 LOW FUEL (63)
TB7-RD09 MASTER SWITCH NOT IN AUTO (80)
TB7-RD010 NFPA-110 COMMON ALARM (32)
TB7-RD011 BATTERY CHARGER FAULT (61)
TB7-RD012 LOW BATTERY VOLTAGE (62)
TB7-RD013 HIGH BATTERY VOLTAGE
TB7-RD014 EMERGENCY STOP (48)
TB7-RD015 GENERATOR RUNNING (70R)
TB7-RD016 COOL DOWN (70C)
TB7-RD017 SYSTEM READY (60)
TB8-RD018 DEFINED COMMON FAULT (32A)
TB8-RD019 LOW COOLANT LEVEL
TB8-RD020 OVER VOLTAGE (26)
TB8-RD021 IDLE MODE
TB8-RD022 EPS SUPPLYING LOAD
TB8-RD023 AIR DAMPER INDICATOR
TB9-RD024 SPEED SENSOR FAULT
TB9-RD025 LOSS OF AC SENSING
TB9-RD026 ECM LOSS OF COMMUNICATION
TB9-RD027 UNDER VOLTAGE
TB9-RD028 OVER FREQUENCY
TB9-RD029 UNDER FREQUENCY
TB9-RD030 LOAD SHED KW OVERLOAD
TB9-RD031 LOAD SHED UNDER FREQUENCY

NOTE: RDO-1 THRU RDO-31 ARE CUSTOMER DEFINABLE WITH FACTORY DEFAULTS LISTED. SEE CONTROLLER OPERATION MANUAL TO CHANGE. DEFINED COMMON FAULT FACTORY DEFAULT SETTING" E-STOP, OVER SPEED, LOW OIL PRESSURE, HIGH COOLANT TEMPERATURE & OVER CRANK.

TB3 ACCESSORY POWER OUTPUT CONNECTIONS

TB3-1 +12VDC (OEM USE ONLY)
TB3-2 +12VDC (OEM USE ONLY)
TB3-3 +12VDC (OEM USE ONLY)
TB3-4 FUSED BATTERY (+) (42A) (5 AMP)
TB3-5 FUSED BATTERY (+) (42A) (5 AMP)
TB3-6 FUSED BATTERY (+) (42A) (5 AMP)
TB3-7 BATTERY (-)
TB3-8 BATTERY (-)
TB3-9 BATTERY (-)
TB3-10 BATTERY (-)
TB3-11 BATTERY (-)
TB3-12 PANEL LAMP OUTPUT

TB4 DIGITAL INPUT FACTORY SETTINGS

TB4-1 DCH1 BATTERY CHARGER FAULT
TB4-2 DCH2 LOW FUEL
TB4-3 DCH3 LOW COOLANT TEMP (ECM MODELS ONLY)
TB4-4 DCH4 EXCITATION OVER VOLTAGE (4M, 5M, 7M ALT. ONLY)
TB4-5 DCH5 BREAKER CLOSED (TIER 1 ONLY)
TB4-6 DCH6 ENABLE SYNCH (TIER 1 ONLY)
TB4-7 DCH7 RSA USER INPUT 1
TB4-8 DCH8 RSA USER INPUT 2
TB4-9 DCH9 LOW FUEL SHUTDOWN (GM & DOOSAN ONLY)
TB4-10 DCH10 RSA USER INPUT 3
TB4-11 DCH11 AFM SHUTDOWN (WAUKESHA ONLY)
TB4-12 DCH12 DETONATION WARNING (WAUKESHA ONLY)
TB4-13 DCH13 DETONATION SHUTDOWN (WAUKESHA ONLY)
TB4-14 DCH14 LOW COOLANT LEVEL (DEUTZ 50-100 ONLY)
TB4-15 DCH15 REMOTE SHUTDOWN
TB4-16 DCH16 REMOTE RESET
TB4-17 DCH17 VAR PF MODE
TB4-18 DCH18 VOLTAGE LOWER
TB4-19 DCH19 VOLTAGE RAISE
TB4-20 DCH20 AIR DAMPER
TB4-21 DCH21 IDLE MODE

TB4-22 THRU TB4-42 ARE COMMON DIGITAL INPUT RETURNS

NOTE: TB4-1 THRU TB4-21 ARE CUSTOMER DEFINABLE WITH FACTORY DEFAULTS LISTED. SEE CONTROLLER OPERATION MANUAL TO CHANGE.

CAVA (COMMON A/V ALARM) CONNECTIONS (OPTIONAL)

42A 2 32

42A (TB8-RD018) 2 (TB8-GND) 42A (TB8-42A)

32A (TB8-RD018) 2 (TB6-GND) 42A (TB6-42A)

WHT (TB6-RD01) 2 (TB6-GND) 42A (TB6-42A)

(DCB1-TB1-42A) (DCB2-TB1-42A) (DCB4-TB1-42A) (DCB5-TB1-42A) (DCB1-TB1-2) (DCB2-TB1-2) (DCB4-TB1-2) (DCB5-TB1-2) (DCB1-TB1-K1) (DCB4-TB1-K1) (DCB4-TB1-K2) (DCB4-TB1-K3) (DCB4-TB1-K4) (DCB4-TB1-K5) (DCB4-TB1-K6) (DCB4-TB1-K7)

(DCB4-TB1-K8) (DCB4-TB1-K9) 32 (CAVA) (DCB4-TB1-K10) (DCB5-TA1-K1) (DCB5-TA1-K2) (DCB5-TA1-K3) (DCB5-TA1-K4) (DCB5-TA1-K5) (DCB5-TA1-K6) (DCB5-TA1-K7)

TB6 42A GND N/C RD01 RD02 RD03 RD04 RD05 RD06 RD07

TB7 RD08 RD09 RD010 RD011 RD012 RD013 RD014 RD015 RD016 RD017

CUSTOMER CONNECTION BOARD

P25

TB8 42A 42A GND GND RD018 RD019 RD020 RD021 RD022 RD023

TB9 RD024 RD025 RD026 RD027 RD028 RD029 RD030 RD031 3 4

ENGINE START/STOP SWITCH (CUSTOMER PROVIDED)

42A (DCB3-TB1-42A) 42A (CAVA)

2 (DCB3-TB1-2) 2 (CAVA)

32A (DCB3-TB1-K1) 32A (DCB2-TB1-K1) K8A (DCB5-TA1-K8) K9A (DCB5-TA1-K9) K10A (DCB5-TA1-K10)

A TO SHEET 3 (10 RELAY DRY CONTACT KIT)

B TO SHEET 3 (20 RELAY DRY CONTACT KIT)

INSTALLATION NOTE:
FOR FIELD INSTALLATION A MAXIMUM OF TWO WIRE TERMINALS PER TERMINAL STRIP SCREW IS RECOMMENDED UNLESS OTHERWISE NOTED ON THE WIRING DIAGRAM. DO NOT EXTEND ABOVE THE TERMINAL STRIP BARRIER.

DECISION-MAKER 550 ACCESSORIES

UNLESS OTHERWISE SPECIFIED: 1) DIMENSIONS ARE IN INCHES 2) TOLERANCES ARE: XXX ± .010, XX ± .030, ± ± .090, FRACTIONS ±, ANGLES ± 1/2°, SURFACE FINISH 125 MAC.

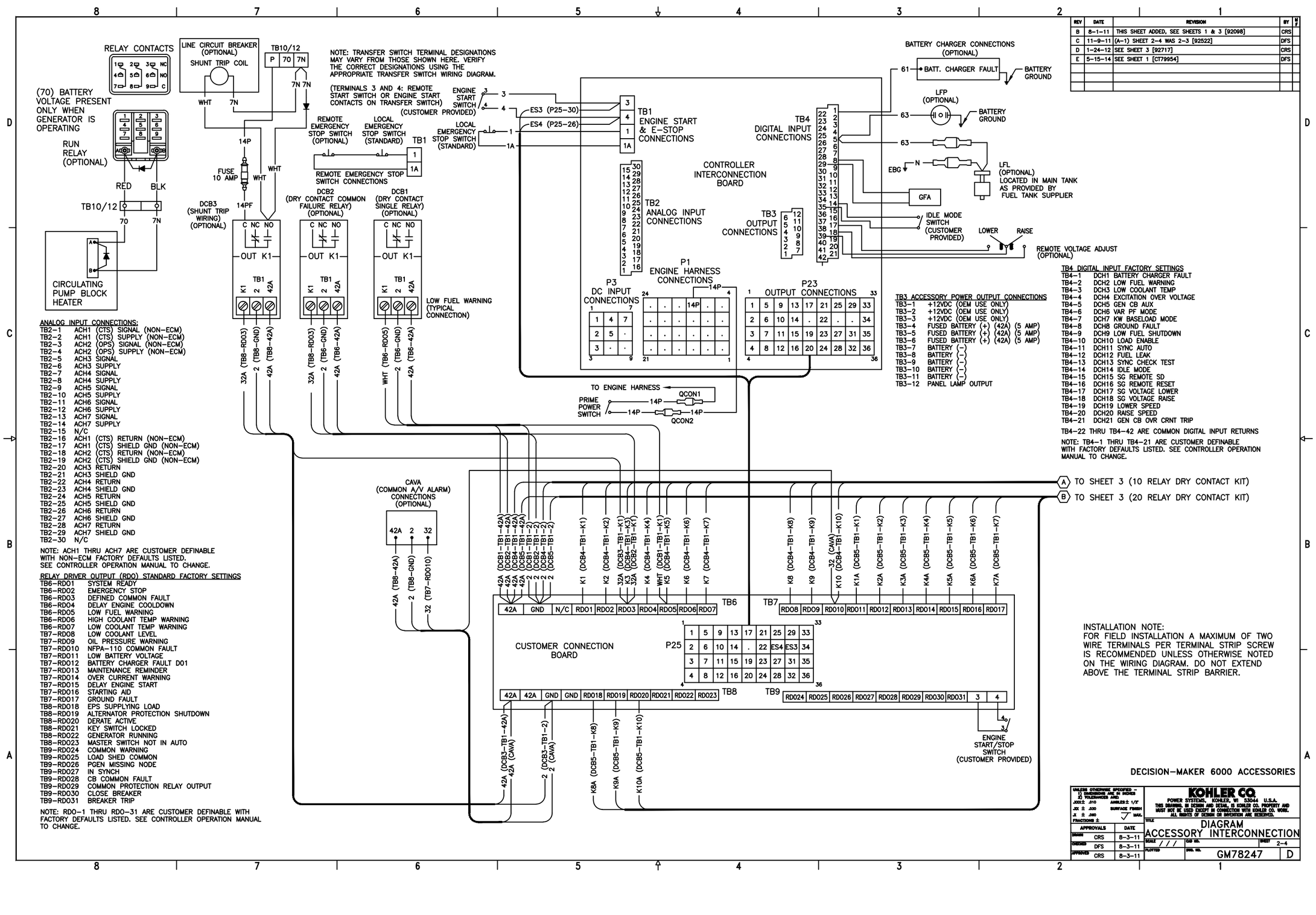
KOHLER CO.
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.
THIS DRAWING, IN DESIGN AND DETAIL IS KOHLER CO. PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH KOHLER CO. WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.

APPROVALS	DATE
DRAWN CRS	9-16-10
CHECKED DFS	9-16-10
APPROVED CRS	9-16-10

TITLE: DIAGRAM, ACCESSORY INTERCONNECTION

SCALE /// DWG NO. SHEET 1-4

PLOTTED DWN. NO. GM78247 D



ANALOG INPUT CONNECTIONS:

TB2–1	ACH1 (CTS) SIGNAL (NON–ECM)
TB2–2	ACH1 (CTS) SUPPLY (NON–ECM)
TB2–3	ACH2 (OPS) SIGNAL (NON–ECM)
TB2–4	ACH2 (OPS) SUPPLY (NON–ECM)
TB2–5	ACH3 SIGNAL
TB2–6	ACH3 SUPPLY
TB2–7	ACH4 SIGNAL
TB2–8	ACH4 SUPPLY
TB2–9	ACH5 SIGNAL
TB2–10	ACH5 SUPPLY
TB2–11	ACH6 SIGNAL
TB2–12	ACH6 SUPPLY
TB2–13	ACH7 SIGNAL
TB2–14	ACH7 SUPPLY
TB2–15	N/C
TB2–16	ACH1 (CTS) RETURN (NON–ECM)
TB2–17	ACH1 (CTS) SHIELD GND (NON–ECM)
TB2–18	ACH2 (CTS) RETURN (NON–ECM)
TB2–19	ACH2 (CTS) SHIELD GND (NON–ECM)
TB2–20	ACH3 RETURN
TB2–21	ACH3 SHIELD GND
TB2–22	ACH4 RETURN
TB2–23	ACH4 SHIELD GND
TB2–24	ACH5 RETURN
TB2–25	ACH5 SHIELD GND
TB2–26	ACH6 RETURN
TB2–27	ACH6 SHIELD GND
TB2–28	ACH7 RETURN
TB2–29	ACH7 SHIELD GND
TB2–30	N/C

NOTE: ACH1 THRU ACH7 ARE CUSTOMER DEFINABLE WITH NON–ECM FACTORY DEFAULTS LISTED. SEE CONTROLLER OPERATION MANUAL TO CHANGE.

RELAY DRIVER OUTPUT (RDO) STANDARD FACTORY SETTINGS

TB6–RD01	SYSTEM READY
TB6–RD02	EMERGENCY STOP
TB6–RD03	DEFINED COMMON FAULT
TB6–RD04	DELAY ENGINE COOLDOWN
TB6–RD05	LOW FUEL WARNING
TB6–RD06	HIGH COOLANT TEMP WARNING
TB6–RD07	LOW COOLANT TEMP WARNING
TB7–RD08	LOW COOLANT LEVEL
TB7–RD09	OIL PRESSURE WARNING
TB7–RD010	NFPA–110 COMMON FAULT
TB7–RD011	LOW BATTERY VOLTAGE
TB7–RD012	BATTERY CHARGER FAULT D01
TB7–RD013	MAINTENANCE REMINDER
TB7–RD014	OVER CURRENT WARNING
TB7–RD015	DELAY ENGINE START
TB7–RD016	STARTING AID
TB7–RD017	GROUND FAULT
TB8–RD018	EPS SUPPLYING LOAD
TB8–RD019	ALTERNATOR PROTECTION SHUTDOWN
TB8–RD020	DERATE ACTIVE
TB8–RD021	KEY SWITCH LOCKED
TB8–RD022	GENERATOR RUNNING
TB8–RD023	MASTER SWITCH NOT IN AUTO
TB9–RD024	COMMON WARNING
TB9–RD025	LOAD SHED COMMON
TB9–RD026	PGEN MISSING NODE
TB9–RD027	IN SYNCH
TB9–RD028	CB COMMON FAULT
TB9–RD029	COMMON PROTECTION RELAY OUTPUT
TB9–RD030	CLOSE BREAKER
TB9–RD031	BREAKER TRIP

NOTE: RDO–1 THRU RDO–31 ARE CUSTOMER DEFINABLE WITH FACTORY DEFAULTS LISTED. SEE CONTROLLER OPERATION MANUAL TO CHANGE.

TB3 ACCESSORY POWER OUTPUT CONNECTIONS

TB3–1	+12VDC (OEM USE ONLY)
TB3–2	+12VDC (OEM USE ONLY)
TB3–3	+12VDC (OEM USE ONLY)
TB3–4	FUSED BATTERY (+) (42A) (5 AMP)
TB3–5	FUSED BATTERY (+) (42A) (5 AMP)
TB3–6	FUSED BATTERY (+) (42A) (5 AMP)
TB3–7	BATTERY (–)
TB3–8	BATTERY (–)
TB3–9	BATTERY (–)
TB3–10	BATTERY (–)
TB3–11	BATTERY (–)
TB3–12	PANEL LAMP OUTPUT

TB4 DIGITAL INPUT FACTORY SETTINGS

TB4–1	DCH1 BATTERY CHARGER FAULT
TB4–2	DCH2 LOW FUEL WARNING
TB4–3	DCH3 LOW COOLANT TEMP
TB4–4	DCH4 EXCITATION OVER VOLTAGE
TB4–5	DCH5 GEN CB AUX
TB4–6	DCH6 VAR PF MODE
TB4–7	DCH7 KW BASELOAD MODE
TB4–8	DCH8 GROUND FAULT
TB4–9	DCH9 LOW FUEL SHUTDOWN
TB4–10	DCH10 LOAD ENABLE
TB4–11	DCH11 SYNC AUTO
TB4–12	DCH12 FUEL LEAK
TB4–13	DCH13 SYNC CHECK TEST
TB4–14	DCH14 IDLE MODE
TB4–15	DCH15 SG REMOTE SD
TB4–16	DCH16 SG REMOTE RESET
TB4–17	DCH17 SG VOLTAGE LOWER
TB4–18	DCH18 SG VOLTAGE RAISE
TB4–19	DCH19 LOWER SPEED
TB4–20	DCH20 RAISE SPEED
TB4–21	DCH21 GEN CB OVR CRNT TRIP

TB4–22 THRU TB4–42 ARE COMMON DIGITAL INPUT RETURNS

NOTE: TB4–1 THRU TB4–21 ARE CUSTOMER DEFINABLE WITH FACTORY DEFAULTS LISTED. SEE CONTROLLER OPERATION MANUAL TO CHANGE.

INSTALLATION NOTE:
FOR FIELD INSTALLATION A MAXIMUM OF TWO WIRE TERMINALS PER TERMINAL STRIP SCREW IS RECOMMENDED UNLESS OTHERWISE NOTED ON THE WIRING DIAGRAM. DO NOT EXTEND ABOVE THE TERMINAL STRIP BARRIER.

DECISION–MAKER 6000 ACCESSORIES

REV	DATE	REVISION	BY	M F
B	8–1–11	THIS SHEET ADDED, SEE SHEETS 1 & 3 [92098]	CRS	
C	11–9–11	(A–1) SHEET 2–4 WAS 2–3 [92522]	DFS	
D	1–24–12	SEE SHEET 3 [92717]	CRS	
E	5–15–14	SEE SHEET 1 [CT79954]	DFS	

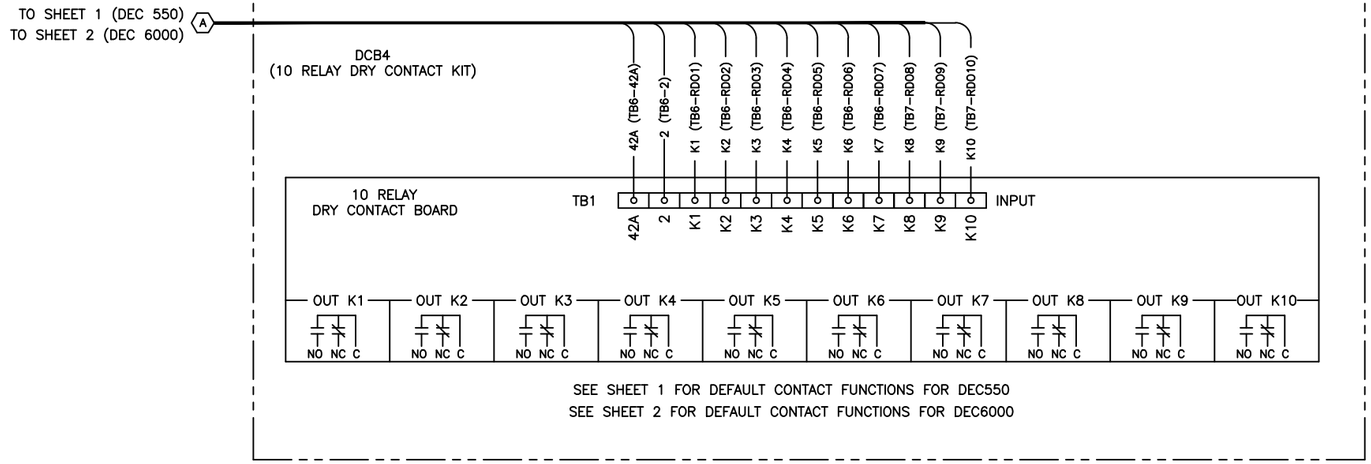
UNLESS OTHERWISE SPECIFIED – 1) DIMENSIONS ARE IN INCHES 2) TOLERANCES ARE: .XXX ± .010, .XX ± .030, X ± .060, FRACTIONS ± 1/16, ANGLES ± 1/2°, SURFACE FINISH 250 MAX.

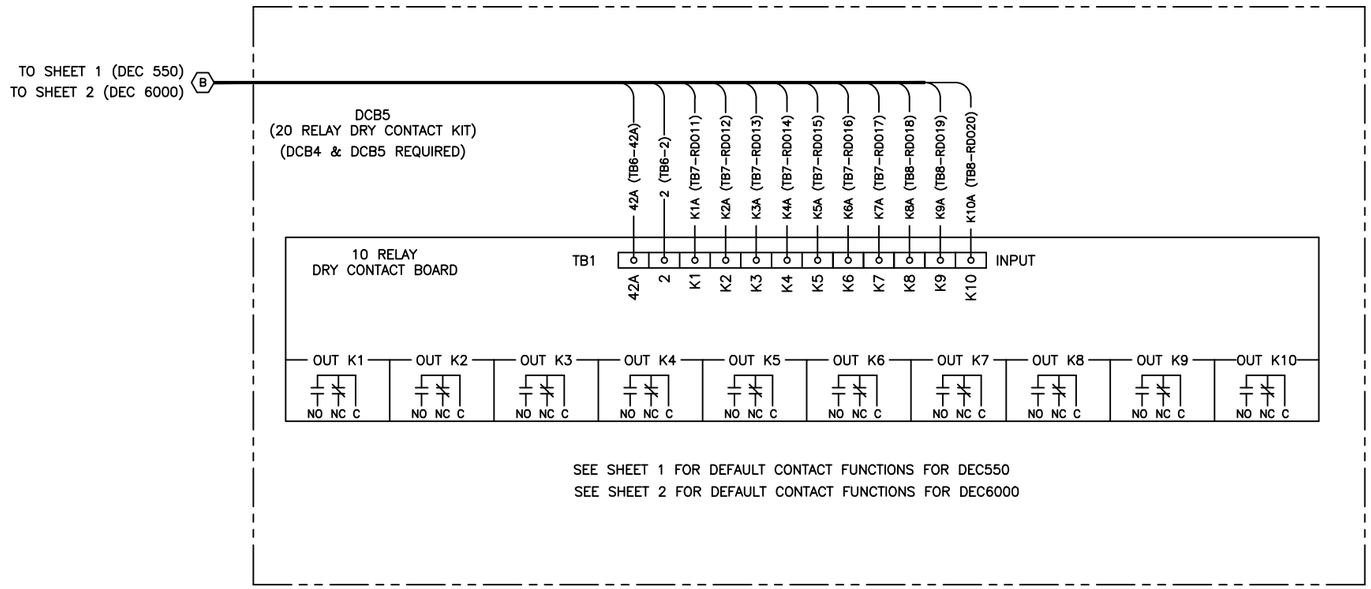
KOHLER CO.
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

APPROVALS	DATE
DRAWN CRS	8–3–11
CHECKED DFS	8–3–11
APPROVED CRS	8–3–11

TITLE: DIAGRAM ACCESSORY INTERCONNECTION
SCALE: /// CAD NO. SHEET 2–4
PLOTTED SPEC. NO. GM78247 D

REV	DATE	REVISION	BY	M/E
A	2-15-11	(B-4) 20 RELAY CONTACT WIRING ADDED [91056]	CRS	
B	8-3-11	SHEET 1 AND SHEET 2 CONTACT FUNCTION NOTES ADDED,		
		SEE SHEETS 1 & 2 [92098]	CRS	
C	11-9-11	(A-1) SHEET 3-4 WAS 3-3 [92522]	DFS	
D	1-24-12	(B-5) K1A-K10A LEADS AND LABELS UPDATED TO MATCH		
		HARNESS [92717]	CRS	
E	5-15-14	SEE SHEET 1 [CT79954]	DFS	





INSTALLATION NOTE:
FOR FIELD INSTALLATION A MAXIMUM OF TWO WIRE TERMINALS PER TERMINAL STRIP SCREW IS RECOMMENDED UNLESS OTHERWISE NOTED ON THE WIRING DIAGRAM. DO NOT EXTEND ABOVE THE TERMINAL STRIP BARRIER.

DECISION-MAKER 550 & 6000 ACCESSORIES

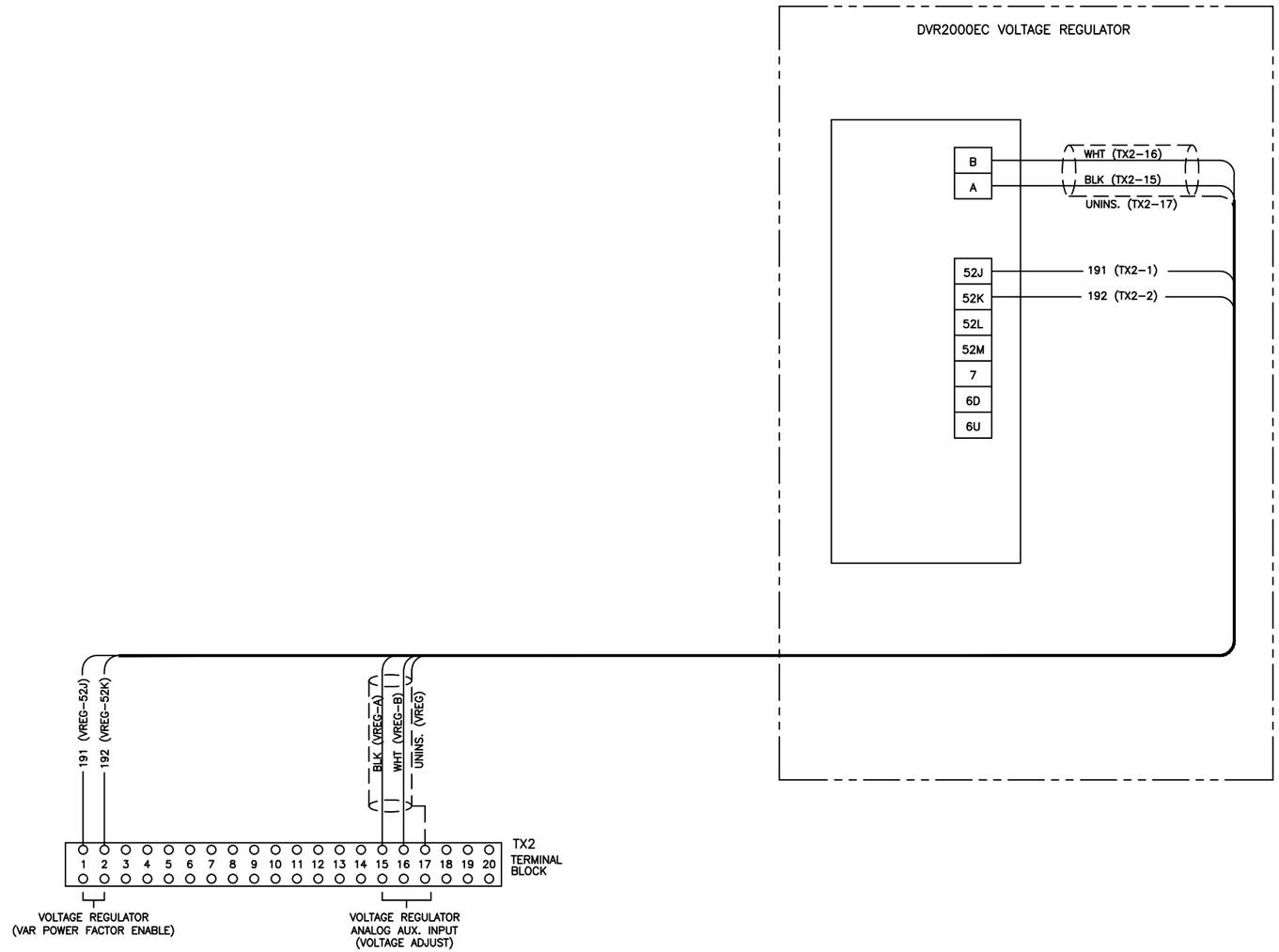
UNLESS OTHERWISE SPECIFIED – 1) DIMENSIONS ARE IN INCHES 2) TOLERANCES ARE .XXX± .010 .XX ± .030 .X ± .060 FRACTIONS ± ANGLES± 1/2° SURFACE FINISH 125 MAX.

APPROVALS		DATE
DRAWN	CRS	9-16-10
CHECKED	DFS	9-16-10
APPROVED	CRS	9-16-10

TITLE: DIAGRAM
ACCESSORY INTERCONNECTION

SCALE: /// | CAD NO. | SHEET 3-4
PLOTTED | DWG. NO. GM78247 | D

REV	DATE	REVISION	BY	CHK
C	11-9-11	THIS SHEET ADDED [92522]	DFS	
D	1-24-12	SEE SHEET 3 [92717]	CRS	
E	5-15-14	SEE SHEET 1 [CT79954]	DFS	



DECISION–MAKER 550 (ONLY) ACCESSORY

UNLESS OTHERWISE SPECIFIED → DIMENSIONS ARE IN INCHES TOLERANCES
.XX± .010 ANGLES± 1/2°
.XX ± .030 SURFACE FINISH
.X ± .060 ✓ MAX.
FRACTIONS ±

APPROVALS	DATE
DRAWN DFS	11-9-11
CHECKED CRS	11-9-11
APPROVED JDZ	11-9-11

TITLE
DIAGRAM,
ACCESSORY INTERCONNECTION

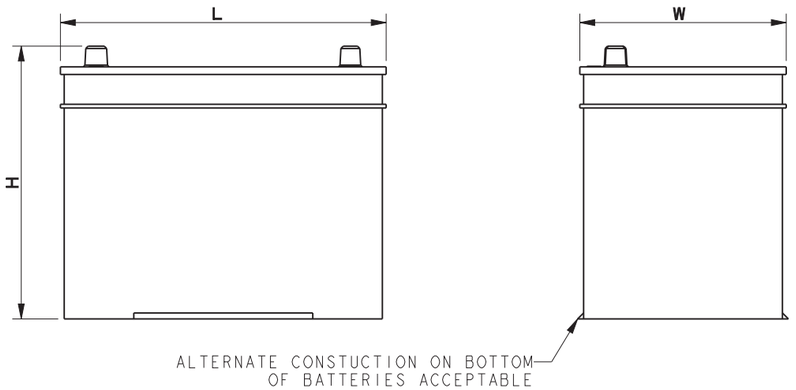
SCALE /// | CAD NO. | SHEET 4–4
PLOTTED | DWG. NO. GM78247 | D

KOHLER. POWER SYSTEMS

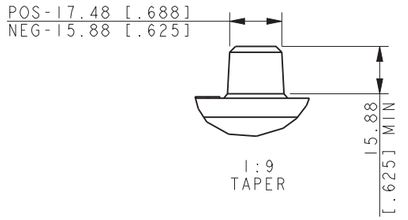
Miscellaneous

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
~~244578~~	~~BT~~		~~333.5 [13.13]~~	~~181.1 [7.13]~~	~~238.5 [9.39]~~	~~6~~	~~700~~	~~275~~	~~B/1~~	~~DRY~~	~~SEE NOTE 1~~	
~~244750~~	~~BD~~		~~342.9 [13.50]~~	~~173.2 [6.82]~~	~~238.3 [9.38]~~	~~12~~	~~600~~	~~165~~	~~D/1~~	~~DRY~~	~~SEE NOTE 1~~	
~~259102~~	~~BK~~		~~198.1 [7.80]~~	~~133.4 [5.25]~~	~~187.5 [7.38]~~	~~12~~	~~200~~	~~32~~	~~D/2~~	~~DRY~~	~~SEE NOTE 1~~	
~~289515~~	~~BC~~		~~539.8 [21.25]~~	~~282.7 [11.13]~~	~~276.4 [10.88]~~	~~12~~	~~1150~~	~~450~~	~~A/1~~	~~DRY~~	~~SEE NOTE 1~~	
~~291918~~	~~BC~~		~~333.2 [13.12]~~	~~173.0 [6.81]~~	~~239.8 [9.44]~~	~~12~~	~~700~~	~~150~~	~~C/3~~	~~WET~~	~~SEE NOTE 1~~	
~~299981~~	~~BD~~		~~333.2 [13.12]~~	~~173.0 [6.81]~~	~~239.8 [9.44]~~	~~12~~	~~700~~	~~150~~	~~C/3~~	~~DRY~~	~~SEE NOTE 1~~	
~~254425~~	~~BD~~		~~333.2 [13.12]~~	~~173.0 [6.81]~~	~~239.8 [9.44]~~	~~12~~	~~1000~~	~~200~~	~~C/3~~	~~WET~~	~~SEE NOTE 1~~	
~~299982~~	~~BC~~		~~333.2 [13.12]~~	~~173.0 [6.81]~~	~~239.8 [9.44]~~	~~12~~	~~950~~	~~200~~	~~C/3~~	~~DRY~~	~~SEE NOTE 1~~	
~~324367~~	~~GM~~		~~208.0 [8.19]~~	~~179.4 [7.06]~~	~~196.9 [7.75]~~	~~12~~	~~675~~	~~90~~	~~C/1~~	~~WET~~	~~SEE NOTE 1~~	
~~324368~~	~~BC~~		~~206.5 [8.13]~~	~~166.9 [6.57]~~	~~205.2 [8.08]~~	~~12~~	~~675~~	~~90~~	~~C/1~~	~~DRY~~	~~SEE NOTE 1~~	
324586	BT	□	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	BR		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~~	~~24T~~
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	BT	□	330.2 [13.00]	173.0 [6.81]	239.8 [9.44]	12	700	150	C/3	DRY	SEE NOTE 2	31
345309	BR		219.2 [8.63]	153.9 [6.06]	212.9 [8.38]	12	525	-	E/1	WET	SEE NOTE 1	55
~~GM22348~~	~~BC~~		~~525.3 [20.68]~~	~~278.5 [10.68]~~	~~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	BR		527.1 [20.75]	282.4 [11.12]	276.4 [10.88]	12	1150	430	A/1	WET	SEE NOTE 1	8D
GM48784	BR		208.0 [8.19]	173.0 [6.81]	196.9 [7.75]	12	525	70	D/1	WET	-	26
GM75512	BS		238.0 [9.38]	129.0 [5.06]	223.0 [8.81]	12	500	85	D/1	WET	-	51

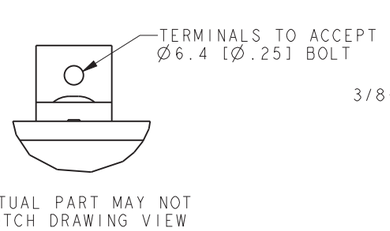
NOTE: DIMENSIONS IN [ ] ARE ENGLISH EQUIVALENTS.
□ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION



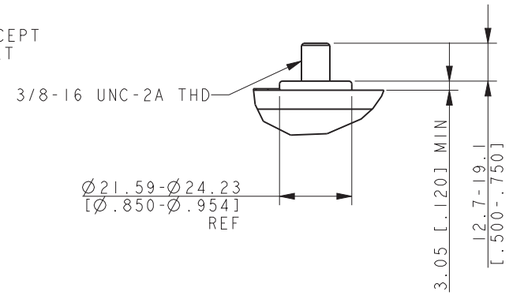
STYLE 1



STYLE 2



STYLE 3



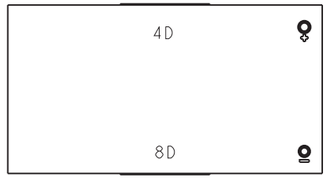
NOTES:
1) STYLE 3 CAN BE CONVERTED TO STYLE 1 BY INSTALLATION OF 254427 STUD CONVERTION KIT.
2) BATTERIES USING ``STYLE 3'' STUDS MUST HAVE EITHER THE ``POS'' OR ``NEG'' STUD CLEARLY IDENTIFIED.
3) STYLE 3 TERMINAL TORQUE 10 Nm [15 FT LBS].
4) "POS" & "NEG" IDENTIFICATION MUST BE MARKED AS SHOWN ON THE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

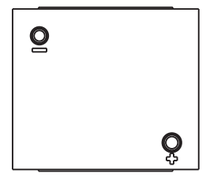
NOTES: (CHARGE TYPE)
ALL DRY CHARGED BATTERIES MUST BE SUPPLIED WITH ACTIVATION INSTRUCTIONS ADHERED TO BATTERY AND LOOSE. BATTERY MUST ALSO BE IDENTIFED ON TOP AS: ``DRY CHARGED, MUST ADD BATTERY GRADE ELECTROLYTE, SEE ACTIVATION INSTRUCTIONS''.
BATTERIES SHOULD BE RECEIVED APPROPRIATELY MARKED AS DRYCHARGED 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.

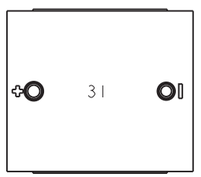
LAYOUT A



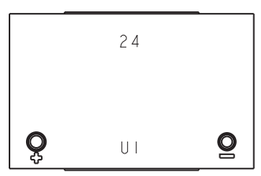
LAYOUT B



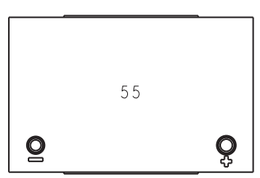
LAYOUT C



LAYOUT D



LAYOUT E



REV	DATE	REVISION (SEE INDIVIDUAL PART NO. FOR REVISION LEVEL)	BY
BS	4-7-10	(C-8) 345197 VOIDED PER 87080, GM75512	
		ADDED [89560]	BAL
BT	3-14-12	(B-8) ADD NOTE 4, (B-3)CHANGE POSITIION OF + & - SYMBOLS IN LAYOUT C, CHANGE DRAWING TITLE TO DWG. BATTERY, DRY CHARGED, CHANGE DRAWING NUMBER TO 244578_CMP. [CT07762]	CEK

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 SLR	2-4-80
CHECKED EB	9-13-83
APPROVED RAD	9-20-83

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

TITLE
DWG, BATTERY

SCALE scale | CAD NO. | SHEET 1 of 1
DWG NO. 244578-CMP | D6

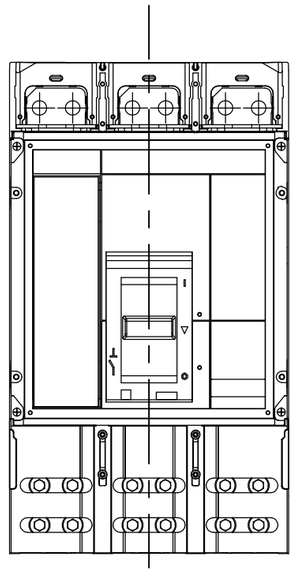
PART NO.	REV	AMPS	% RATING	GFI	VENDOR NO.
GM24181-1	C	600	100	NO	PGP36060CU33A
GM24181-2	C	600	100	YES	PGP36060CU44A
GM24181-3	C	800	80	NO	PGP36080U33A
GM24181-4	C	800	80	YES	PGP36080U44A
GM24181-5	C	800	100	NO	PGP36080CU33A
GM24181-6	C	800	100	YES	PGP36080CU44A
GM24181-7	C	1000	80	NO	PGP36100U33A
GM24181-8	C	1000	80	YES	PGP36100U44A
GM24181-9	C	1000	100	NO	PGP36100CU33A
GM24181-10	C	1000	100	YES	PGP36100CU44A
GM24181-11	C	1200	80	NO	PGP36120U33A
GM24181-12	C	1200	80	YES	PGP36120U44A
GM24181-13	C	1200	100	NO	PGP36120CU33A
GM24181-14	C	1200	100	YES	PGP36120CU44A

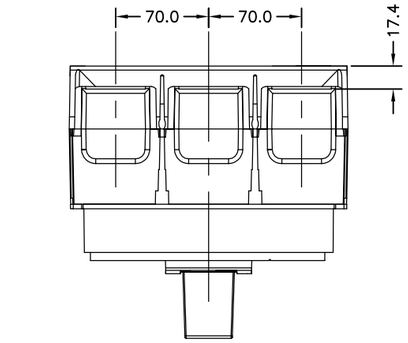
NOTE: (4) #10-32 X 4.5 INCH MOUNTING SCREWS INCLUDED.

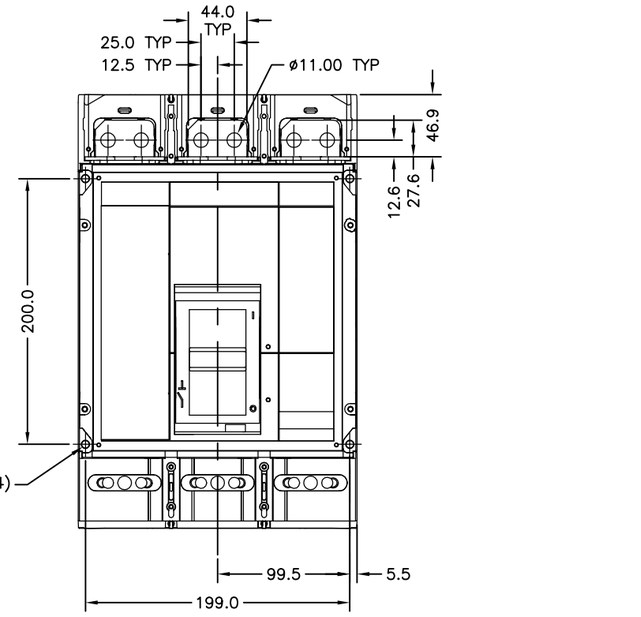
REV	DATE	REVISION	BY
–	3-22-02	NEW DRAWING [66249]	WSD
A	8-12-03	(D-4) THREADED BAR NOTE ADDED. [70090]	SRL
B	11-12-03	(D-7) GM24181-13 GFI: NO WAS YES [70965]	WSD
C	2-23-07	(D-3) KOHLER NOTE ADDED [78285]	GFR

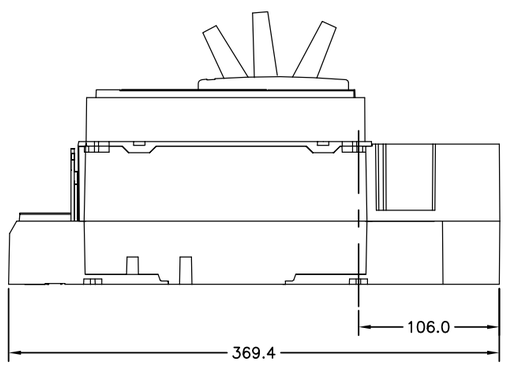
NOTE:
KOHLER PART # TO BE CLEARLY VISIBLE ON CIRCUIT BREAKER AND ON INDIVIDUAL PACKAGING.

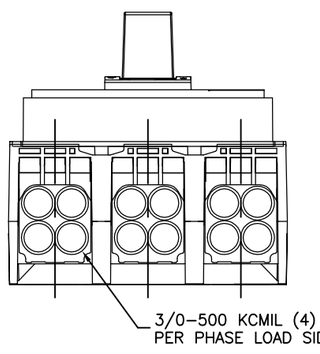
NOTE:
THREADED BAR SUPPLIED WITH BREAKER IS USED WITH LUGS OR WHEN BUS BARS ARE INSTALLED WITH BOLTS INSERTED FROM THE FRONT. REMOVE AND DISCARD BAR WHEN BOLTS ARE INSTALLED FROM THE REAR OF BREAKER.



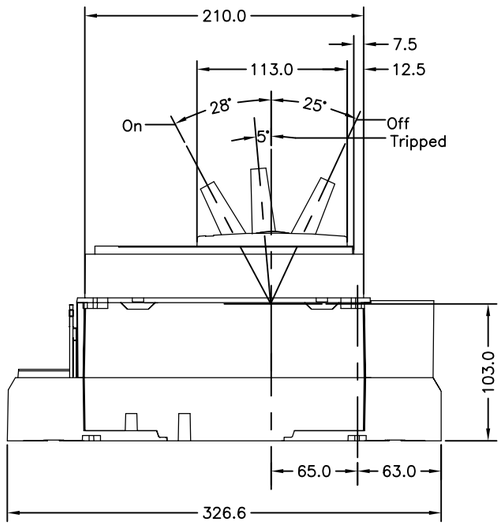


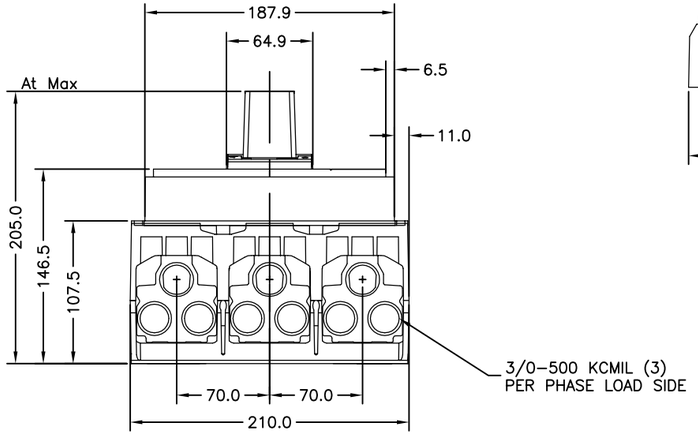






1000-1200A
DIMENSIONS SAME AS 600-800A
EXCEPT WHERE NOTED





600-800A

METRIC CAD FILE

SQUARE D P-FRAME CIRCUIT BREAKER
3 POLE ELECTRONIC TRIP

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	3-22-02
CHECKED WSD	3-22-02
APPROVED AJH	3-22-02

TITLE: BREAKER, CIRCUIT

SCALE .5XP | CAD NO. GM24181.DWG | SHEET 1-1
DWG. NO. GM24181 | D G
PLOTTED DATE

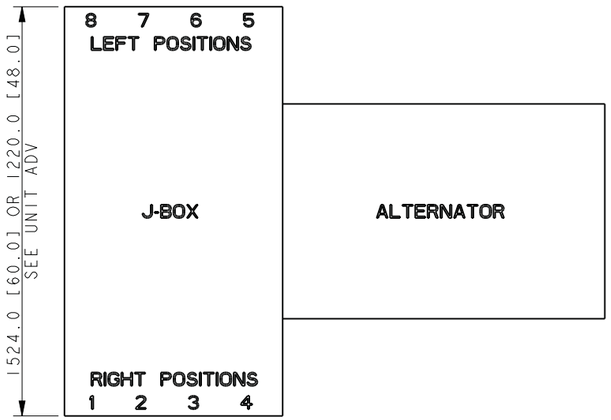
STANDARD BREAKERS				
RATING	AMPS	TRIP TYPE	FRAME	MAG TRIP
80% OR 100%	15	THERMAL MAGNETIC	HD	NA
	20			
	25			
	30			
	35			
	40			
	45			
	50			
	60			
	70			
	80			
	90			
	100			
	110			
	125			
	150			
	175		JD	
	200			
	225			
	250			
80%	60	ELECTRONIC LI	HD/HG	
	100			
	150			
	250		JD/JG	
	60	ELECTRONIC LSIG	HD/HG	
	100			
	150			
	250		JD/JG	
100%	60	ELECTRONIC LI	HD/HG	
	100			
	150			
	250		JD/HG	
	60	ELECTRONIC LSIG	HD/HG	
	100			
	150			
	250		JD/JG	
80%	30	MAGNETIC ONLY	HJ	9-325
	50			84-546
	100			180-1040
	150			348-1690
	250		JJ	684-2500
	300	THERMAL MAGNETIC	LA	NA
	350			
	400			
	400	MAGNETIC ONLY	LA	500-1000
				750-1600
				1000-2000
				1125-2250
				1250-2500
				1500-3000
				1750-3500
				2000-4000

STANDARD BREAKERS CONTINUED			
RATING	AMPS	TRIP TYPE	FRAME
80%	400	ELECTRONIC LI	LG
		ELECTRONIC LSIG	
	600	ELECTRONIC LI	
		ELECTRONIC LSIG	
	700	THERMAL MAGNETIC	MG
	800		
	1000	THERMAL MAGNETIC	PG
	1200		
	800	ELECTRONIC LSI	
	1000		
	1200		
	800	ELECTRONIC LSIG	
	1000		
	1200		
	1200	THERMAL MAG	PJ
		ELECTRONIC LSI	
		ELECTRONIC LSIG	
100%	400	ELECTRONIC LI	LG
		ELECTRONIC LSIG	
	600	ELECTRONIC LSI	PG
	800		
	1000		
	1200		
	600	ELECTRONIC LSIG	
	800		
	1000		
	1200		
	1200	ELECTRONIC LSI	PJ
		ELECTRONIC LSIG	
80%	1600	THERMAL MAGNETIC	RJ
	2000		
	2500		
80% OR 100%	1600	ELECTRONIC LSI	
	2000		
	2500		
	1600	ELECTRONIC LSIG	
	2000		
	2500		
100%	3000	ELECTRONIC LSI	NW
		ELECTRONIC LSIG	

ELECTRONIC TRIP BREAKERS		
FRAME	FUNCTION	TRIP UNIT
H	LI	MICROLOGIC 3.2
	LSIG	MICROLOGIC 6.2A
J	LI	MICROLOGIC 3.2
	LSIG	MICROLOGIC 6.2A
LG	LI	MICROLOGIC 3.3
	LSIG	MICROLOGIC 6.3A
P	LSI	MICROLOGIC 5.0
	LSIG	MICROLOGIC 6.0A
R	LSI	MICROLOGIC 5.0
	LSIG	MICROLOGIC 6.0A
NW	LSI	MICROLOGIC 5.0
	LSIG	MICROLOGIC 6.0A

AL/CU MECHANICAL LOAD LUGS PER PHASE				
BREAKER FRAME	AMPS	WIRE RANGE	WIRE BENDING SPACE 4M/5M	WIRE BENDING SPACE 7M
H	15-150	(1) #14 TO 3/0	653 [25.7]	785 [30.9]
H 100%	15-150	(1) #14 TO 2/0 CU ONLY		
J	175	(1) 1/0 TO 4/0	639 [25.1]	771 [30.3]
	200-250	(1) 3/0 TO 350 KCMIL		
J 100%	175-250	(1) 3/0 TO 300 KCMIL CU ONLY		
LA	300-400	(1) #1 TO 600 KCMIL OR (2) #1 TO 250 KCMIL	551 [21.6]	683 [26.8]
LG	400-600	(2) 2/0 TO 500 KCMIL AL/CU	559 [22.0]	691 [27.2]
M	700-800	(3) 3/0 TO 500 KCMIL	523 [20.5]	655 [25.7]
P	600-800			
P	1000-1200	(4) 3/0 TO 500 KCMIL	480 [18.9]	612 [24.0]
R	1600-2500	(8) 1/0-750 KCMIL OR (16) 1/0-300 KCMIL	483 [19.0]	615 [24.2]
NW	3000	(8) 1/0-750 KCMIL OR (16) 1/0-300 KCMIL	510 [20.0]	642 [25.2]
WIRE BENDING SPACE DIMENSIONS ARE FROM BOTTOM OF LOAD LUGS TO TOP OF ENTRANCE PANEL				

UL INTERRUPT RATINGS			
BREAKER	kA @ 240V	kA @ 480V	kA @ 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
RJ	100	65	25
NW	100	100	85



NOTES:

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

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

3) MECHANICAL LUGS ARE AVAILABLE FOR NEUTRAL. SEE ADV-7376.

4) UNITS ARE SHIPPED WITH NEUTRAL BUS ASSEMBLIES THAT ARE NOT BONDED TO GROUND. IF A GROUND FAULT CIRCUIT BREAKER OR GROUND FAULT RELAY IS PROVIDED THE NEUTRAL WILL BE BONDED TO GROUND. CONSULT NEC AND/OR LOCAL ELECTRICAL CODES FOR THE PROPER INSTALLATION REQUIREMENTS.

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

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

7) DIMENSIONS IN [ ] ARE INCHES.

8) SEE IB29 FOR PART NUMBER CROSS REFERENCE.

9) BREAKER AND LOAD BUS PHASING ON RIGHT IS A-B-C, ON LEFT IS C-B-A.

10) 48" WIDE JUNCTION BOXES ARE NOT AVAILABLE WITH NW FRAME BREAKERS, OR M OR P FRAMES IN POSITION 3 & 4, OR LG FRAME BREAKERS IN POSITION 4.

STANDARD BREAKER COMBINATIONS			
POSITIONS (SEE DIAGRAM)			
1 OR 5	2 OR 6	3 OR 7	4 OR 8
H/J			
H/J	H/J		
H/J	H/J	H/J	
H/J	H/J	H/J	H/J
LA			
LA	H/J		
LA	LA		
LA	H/J	H/J	
LA	LA	H/J	
LA	LA	LA	
LA	H/J	H/J	H/J
LA	LA	H/J	H/J
LA	LA	LA	H/J
LA	LA	LA	LA
LG			
LG	H/J		
LG	LA		
LG	LG		
LG	H/J	H/J	
LG	LA	H/J	
LG	LA	LA	
LG	LG	H/J	
LG	LG	LA	
LG	LG	LG	
LG	H/J	H/J	H/J
LG	LA	H/J	H/J
LG	LA	LA	H/J
LG	LA	LA	LA
LG	LG	H/J	H/J
LG	LG	LA	H/J
LG	LG	LA	LA
LG	LG	LG	H/J
LG	LG	LG	LA
LG	LG	LG	LG
M/P			
M/P		H/J	
M/P		LA	
M/P		LG	
M/P		M/P	
M/P		H/J	H/J
M/P		LA	H/J
M/P		LA	LA
M/P		LG	H/J
M/P		LG	LA
M/P		LG	LG
R			
NW			
LOAD BUS			

NOTE:
H, J AND LG-FRAMES WITH LSIG TRIP REQUIRE (2) SPACES. (ONE FOR BREAKER, ONE FOR LSIG NEUTRAL). THESE COMBINATIONS ARE NOT REFLECTED IN THE CHART ABOVE.

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	4-29-11	NEW DRAWING [91732]	WSD
A	12-12-11	(D-5) H 100% AND J 100% ADDED; SEE SHEET 5 [CN00646]	WSD
B	10-3-12	ELECTRONIC TRIP H/J'S ADDED, WITH HG & JG, LG WAS D, 80% LG 400A ADDED, TRIP CHART ADDED, ALL CHARTS UPDATED TO REFLECT NEW OFFERINGS [CT26372]	WSD
C	11-7-12	(A-5) NOTE 10 ADDED; (C-4) J-BOX WIDTH DIMS ADDED; SHEET 6 ADDED [CT28128]	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	4-29-11
CHECKED	WSD	4-29-11
APPROVED	AJH	4-29-11

KOHLER CO. METRIC | PRO-E

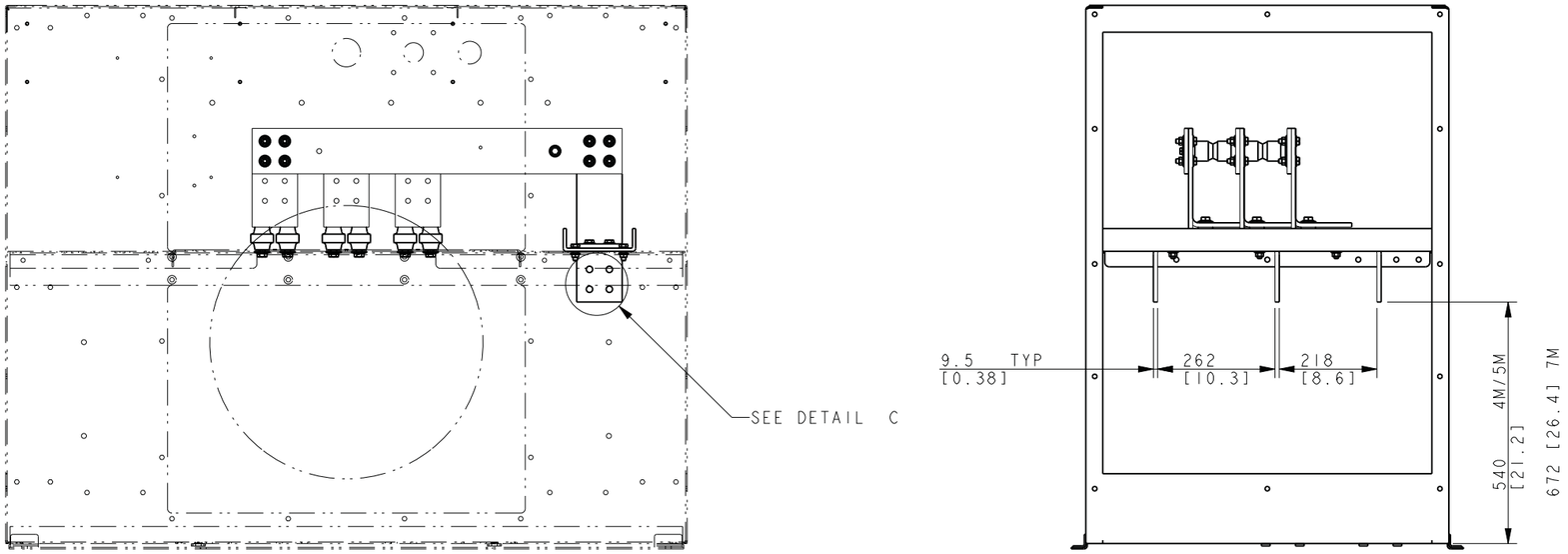
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

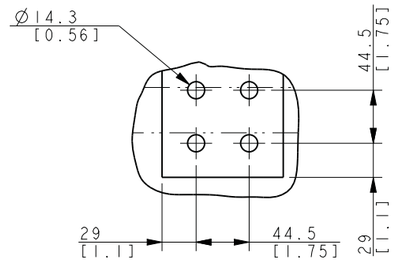
TITLE: DIMENSION PRINT

SCALE 0.15 | CAD NO. | SHEET 1 of 6

DWG NO. ADV-8030 | D

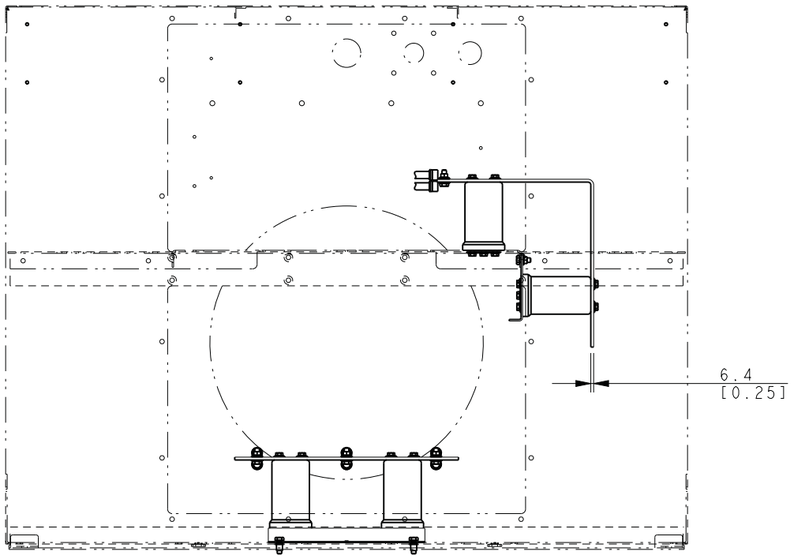
4M/5M/7M GENSETS

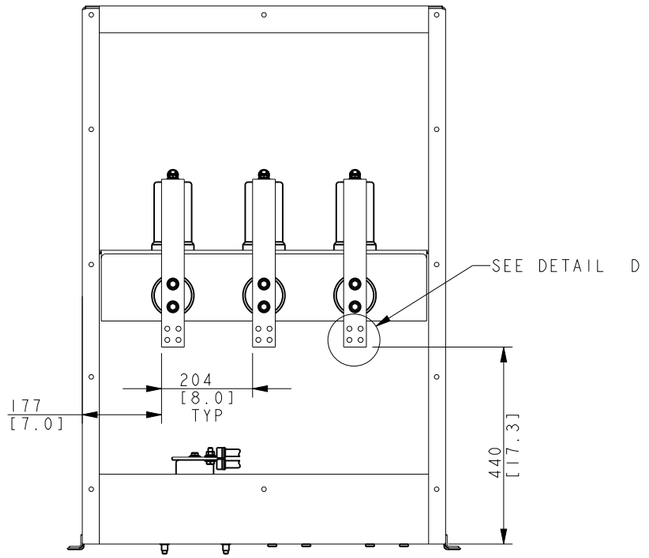


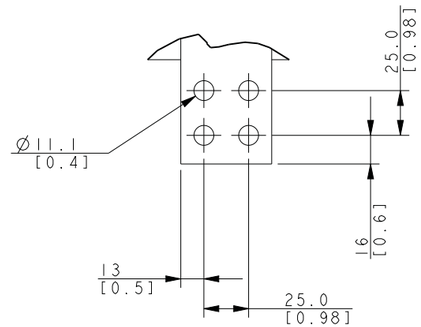


DETAIL C
SCALE 0.400

STANDARD LOW VOLTAGE LOAD BUS KIT
RIGHT-FACING SHOWN, LEFT FACING AND DUAL AVAILABLE







DETAIL D
SCALE 0.600

STANDARD MEDIUM VOLTAGE (5kV) LOAD BUS KIT
RIGHT-FACING ONLY

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	5-4-11	NEW DRAWING [91732]	WSD
A	12-12-11	SEE SHEETS 1 & 5 [CN00646]	WSD
B	10-3-12	SEE SHEETS 1 & 3 [CT26372]	WSD
C	11-7-12	SEE OTHER SHEETS [CT28128]	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	5-4-11
CHECKED WSD	5-4-11
APPROVED AJH	5-4-11

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

TITLE
DIMENSION PRINT

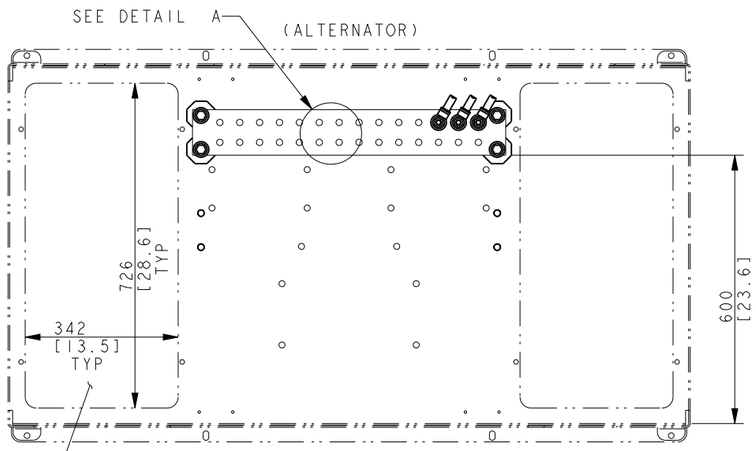
SCALE 0.15 | CAD NO. | SHEET 2 of 6
DWG NO. ADV-8030 | D

BREAKER AND LOAD BUS PHASING

RIGHT		
A	B	C
LEFT		
C	B	A

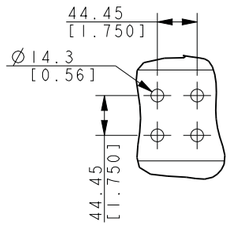
METRIC | PRO-E

4M/5M/7M GENSETS

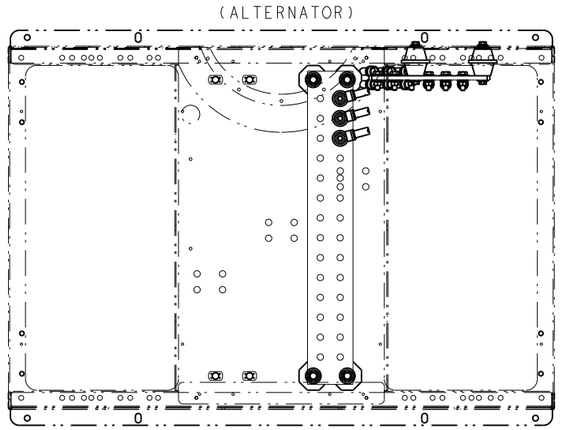


SECTION A-A
STANDARD LOW-VOLTAGE NEUTRAL

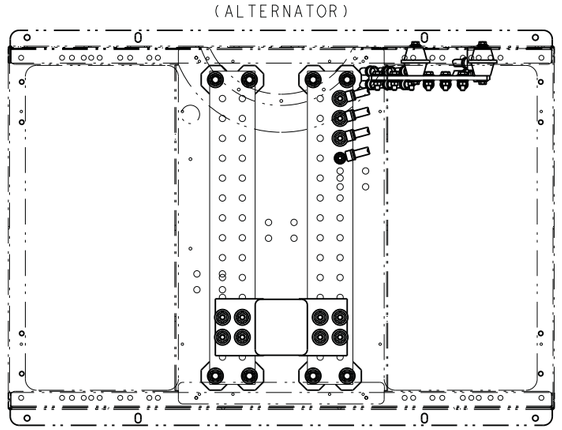
BOTTOM ENTRY (TYP BOTH SIDES)
SEE UNIT ADV FOR RELATION TO GENSET FOOTPRINT



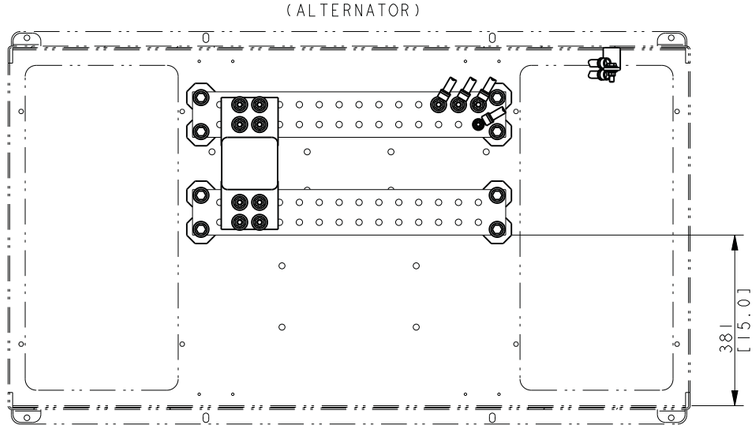
DETAIL A
NEUTRAL BUS
SCALE 0.300



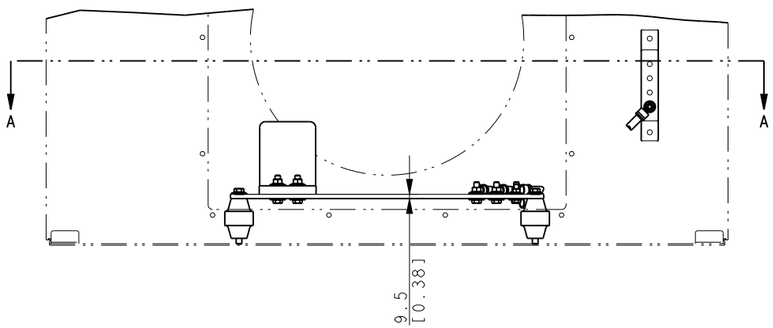
STANDARD LOW-VOLTAGE NEUTRAL
IN 48" WIDE JUNCTION BOX

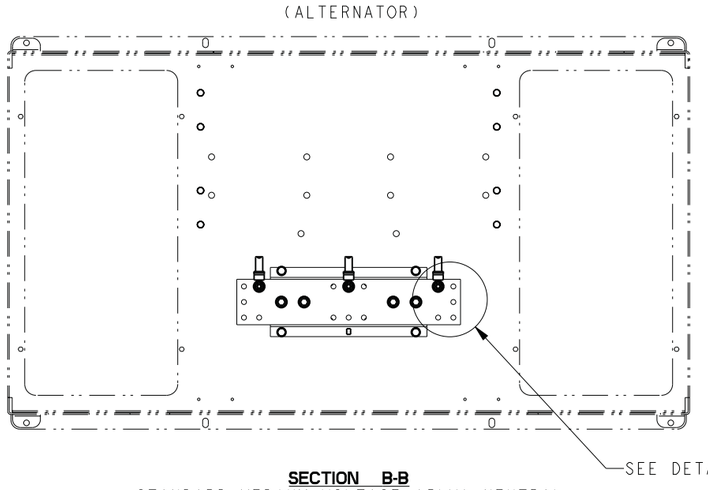


LSIG LOW-VOLTAGE NEUTRAL
IN 48" WIDE JUNCTION BOX

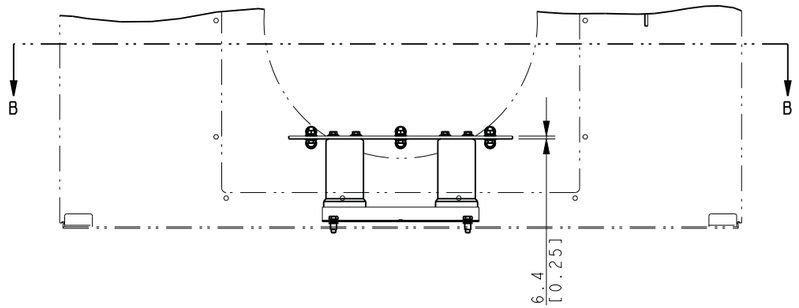


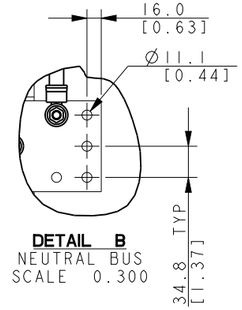
SECTION A-A
R OR NW FRAME LSIG NEUTRAL





SECTION B-B
STANDARD MEDIUM VOLTAGE (5kV) NEUTRAL





DETAIL B
NEUTRAL BUS
SCALE 0.300

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	3-28-11	NEW DRAWING [91732]	WSD
A	12-12-11	SEE SHEETS 1 & 5 [CN00646]	WSD
B	10-3-12	(D-5) H, J, LG GFI NEUTRAL UPDATED, LUG CHART ADDED [CT26372]	WSD
C	11-7-12	48" J-BOX NEUTRAL VIEWS ADDED [CT28128]	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

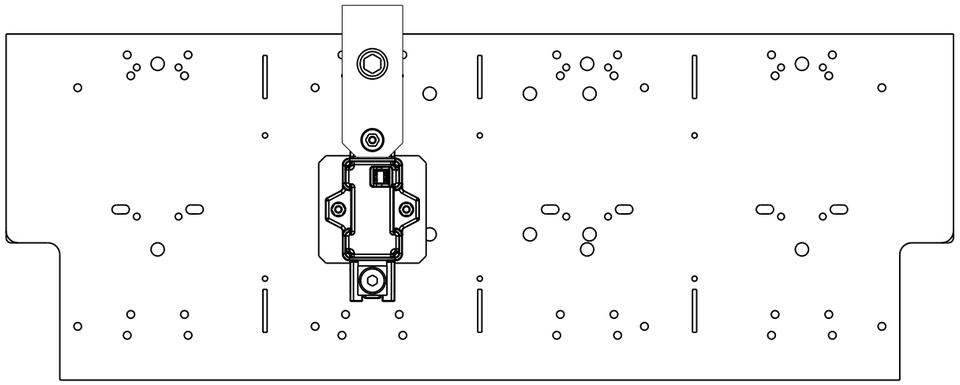
APPROVALS		DATE
DRAWN	WSD	3-28-11
CHECKED	WSD	3-28-11
APPROVED	AJH	3-28-11

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

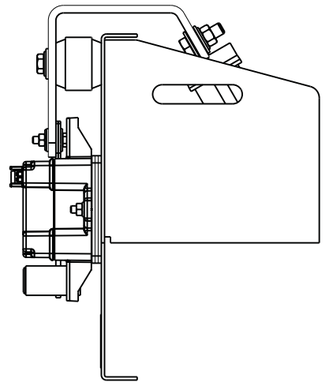
TITLE
DIMENSION PRINT

SCALE 0.15 | CAD NO. | SHEET 3 of 6
DWG NO. **ADV-8030** | **D**

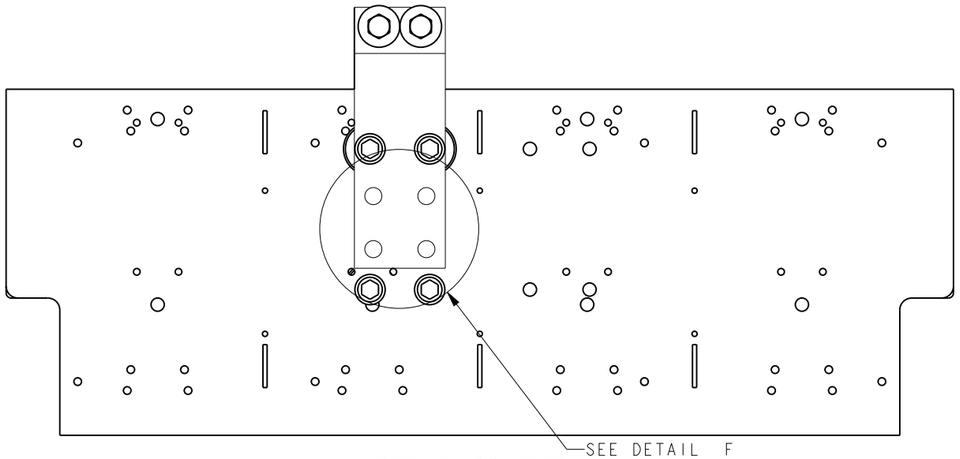
4M/5M/7M GENSETS



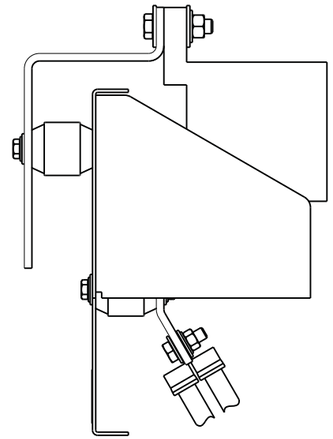
H, J OR LG-FRAME LSIG NEUTRAL
250A J SHOWN
POSITION VARIES BASED ON CONFIGURATION

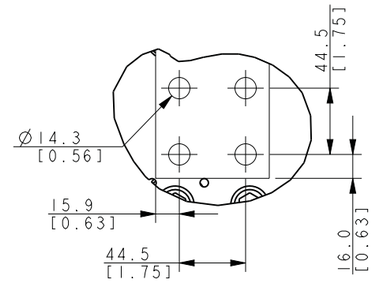


MECHANICAL LOAD LUGS INCLUDED WITH H, J & LG LSIG NEUTRALS		
BREAKER FRAME	**AMPS**	**WIRE RANGE**
H	60-150	(1) #14 TO 3/0 AWG AL/CU
J	250	(1) 3/0 TO 350 KCMIL AL/CU
LG	400-600	(2) 4/0 TO 500 KCMIL AL/CU



P-FRAME LSIG NEUTRAL
POSITION VARIES BASED ON CONFIGURATION





DETAIL F
SCALE 0.500

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	11-7-12	NEW DRAWING []	WSD
C	11-7-12	SEE OTHER SHEETS [CT28128]	WSD

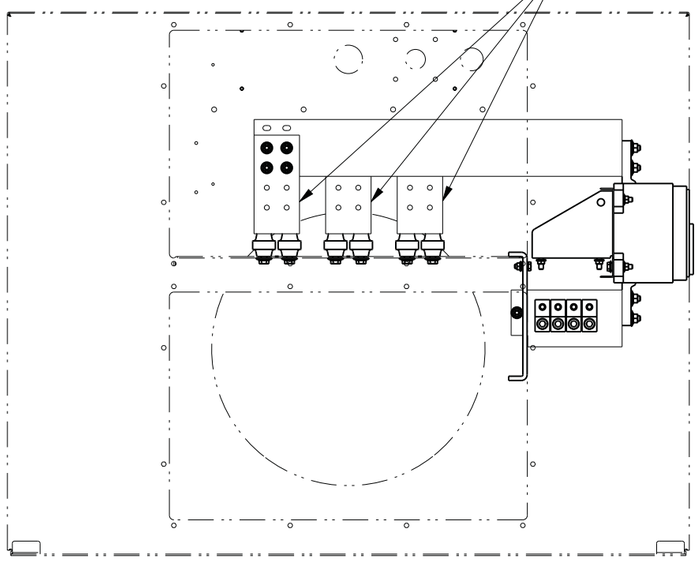
UNLESS OTHERWISE SPECIFIED -
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30'
SURFACE FINISH ✓ MAX.
THIRD ANGLE PROJECTION

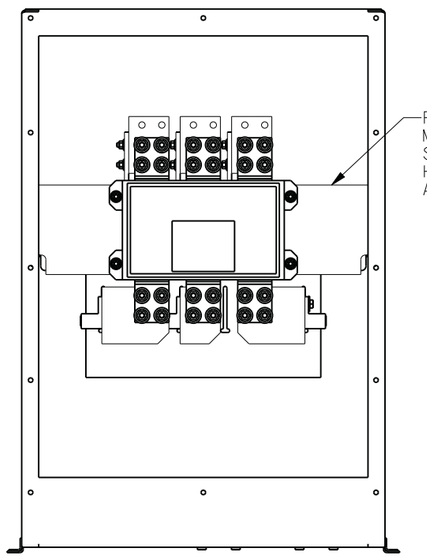
APPROVALS		DATE
DRAWN	WSD	11-7-12
CHECKED	WSD	11-7-12
APPROVED	AJH	11-7-12

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

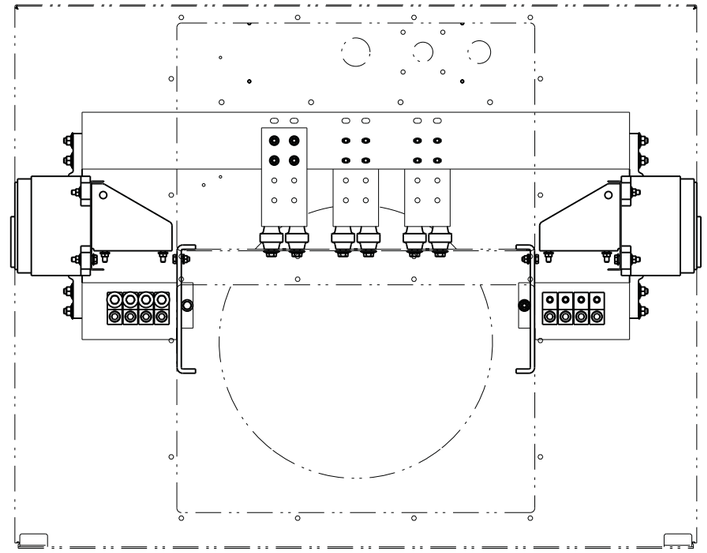
TITLE
DIMENSION PRINT

SCALE 0.15 | CAD NO. | SHEET 4 of 6
DWG NO. **ADV-8030** | **D**

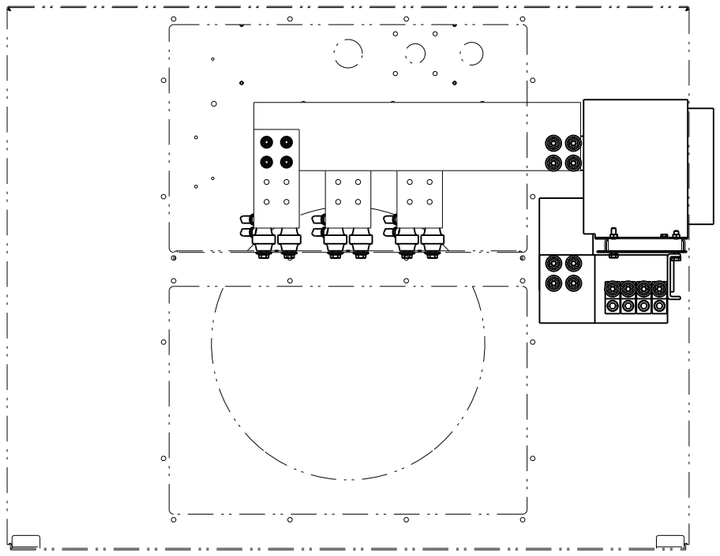


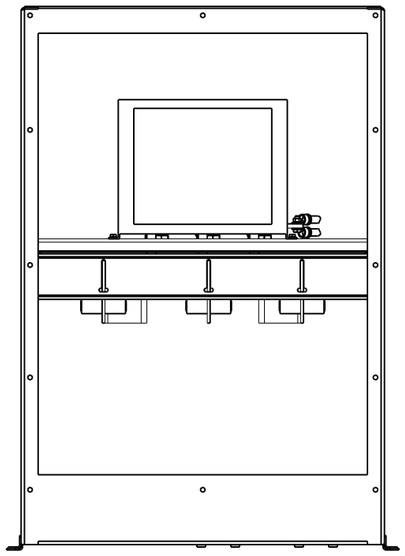


R-FRAME CIRCUIT BREAKER
RIGHT-FACING SHOWN, LEFT FACING AVAILABLE
SEE CHARTS ON PAGE 1 FOR LUGS AND BENDING SPACE

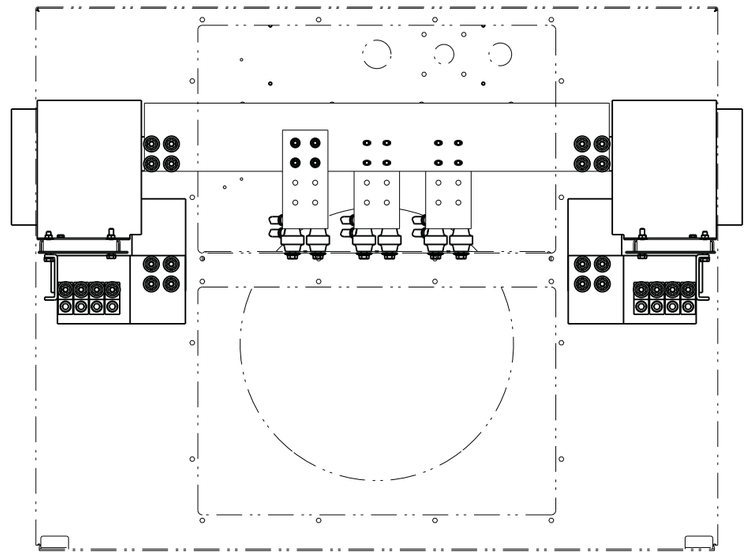


DUAL R-FRAME CIRCUIT BREAKER





NW-FRAME CIRCUIT BREAKER
RIGHT-FACING SHOWN, LEFT FACING AVAILABLE
SEE CHARTS ON PAGE 1 FOR LUGS AND BENDING SPACE



DUAL NW-FRAME CIRCUIT BREAKER

NOTE: COMBINATIONS OF R-FRAME WITH NW-FRAME NOT AVAILABLE.

BREAKER AND LOAD BUS PHASING		
RIGHT		
A	B	C
LEFT		
C	B	A

4M/5M/7M GENSETS

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	5-6-11	NEW DRAWING [91732]	WSD
A	12-12-11	SEE SHEETS 1 & 5 [CN00646]	WSD
B	10-3-12	SEE SHEETS 1 & 3 [CT26372]	WSD
C	11-7-12	SEE OTHER SHEETS [CT28128]	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

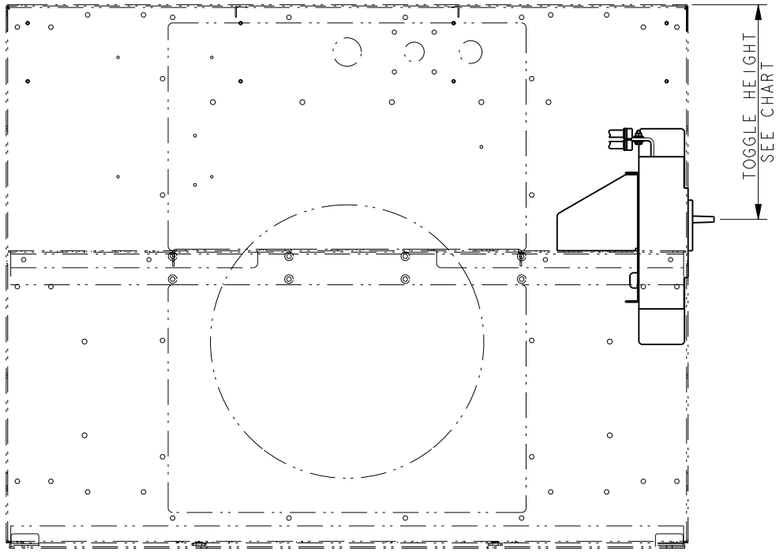
APPROVALS		DATE
DRAWN	WSD	5-6-11
CHECKED	WSD	5-6-11
APPROVED	AJH	5-6-11

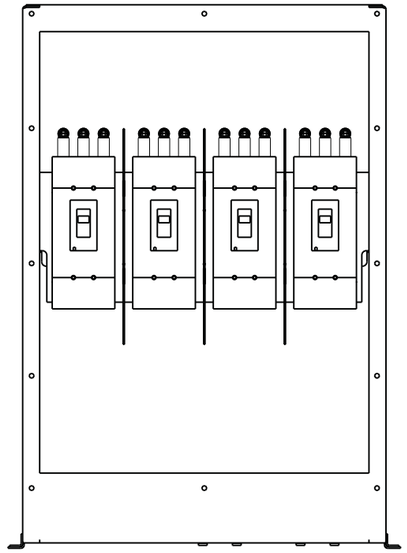
KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

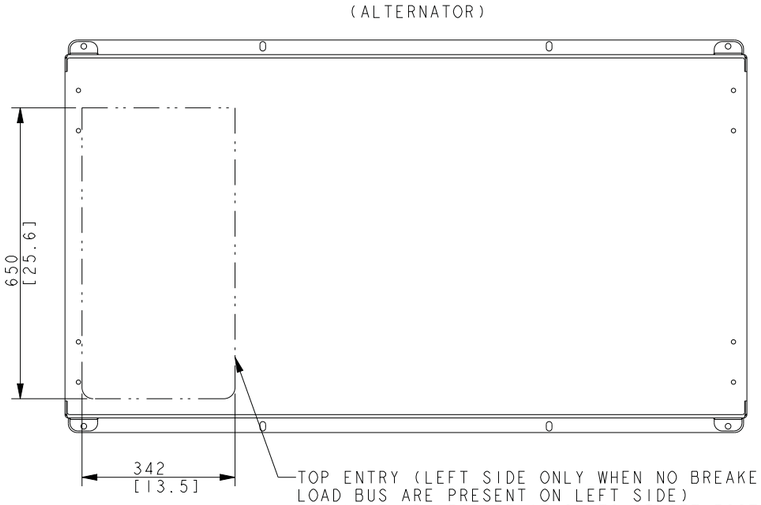
TITLE
DIMENSION PRINT

SCALE 0.40 | CAD NO. | SHEET 5 of 6
DWG NO. ADV-8030 | D

BREAKER AND LOAD BUS PHASING		
RIGHT		
A	B	C
LEFT		
C	B	A



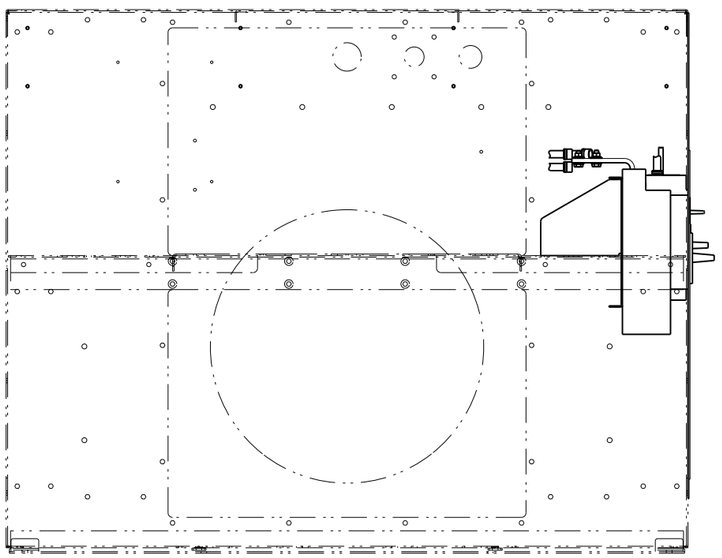


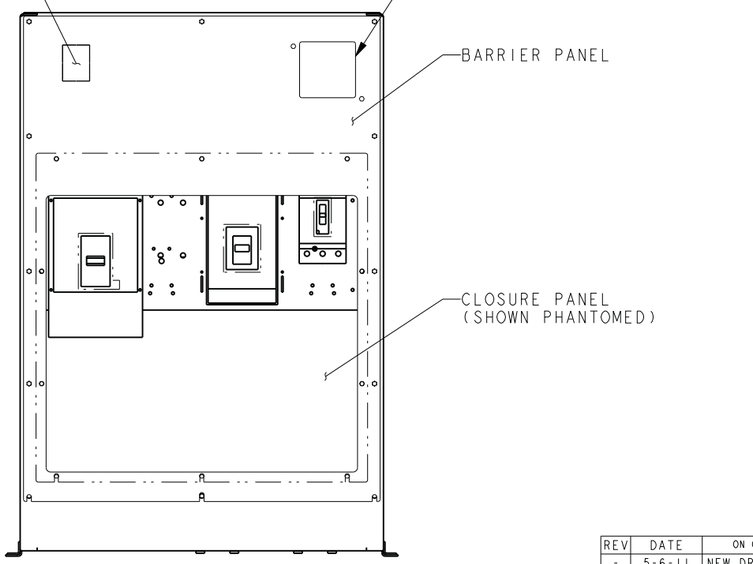


BREAKER	TOGGLE HEIGHT
J/H	453 [17.8]
LA	527 [20.7]
LG	480 [18.9]
P/M	555 [21.8]
RJ	530 [20.9]
NW	228 [9.0]

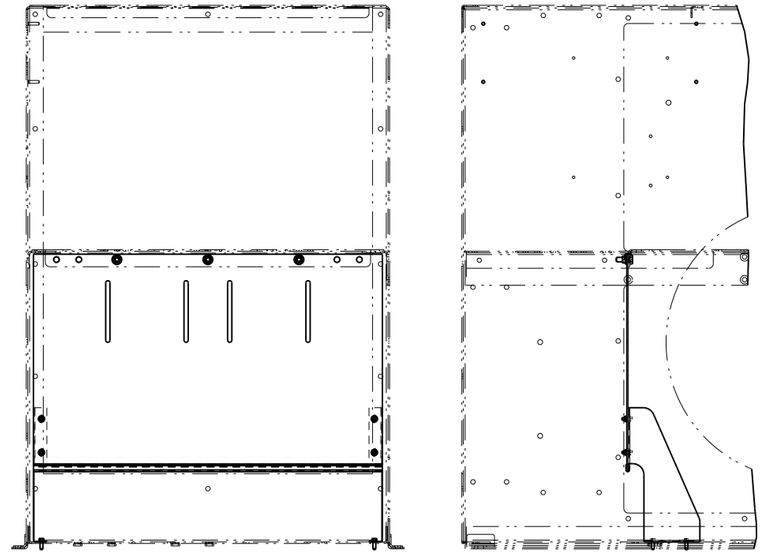
NOTE: TOGGLE HEIGHTS ARE FROM TOP OF J-BOX TO CENTER POSITION. NW DIMENSION IS TO TOP OF CHARGING HANDLE. TO CALCULATE HEIGHT FROM FLOOR, USE THESE HEIGHTS IN COMBINATION WITH DIMENSIONS FROM UNIT ADV'S.

SMALL CIRCUIT BREAKERS
(4) LG-FRAMES SHOWN WITH SEPARATORS
RIGHT-FACING SHOWN, LEFT FACING AVAILABLE
SEE CHARTS ON PAGE 1 FOR LUGS AND BENDING SPACE





SMALL CIRCUIT BREAKERS
P, LA & J-FRAMES SHOWN
RIGHT-FACING SHOWN, LEFT FACING AVAILABLE
SEE CHARTS ON PAGE 1 FOR LUGS AND BENDING SPACE



LOWER COMPARTMENT SEPARATOR
SHOWN ON LEFT SIDE, EITHER SIDE OR BOTH AVAILABLE

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	5-6-11	NEW DRAWING [91732]	WSD
A	12-12-11	(C-7) TOGGLE HEIGHT CHART ADDED; (B-2) LOWER COMPARTMENT SEPARATOR ADDED [CN00646]	WSD
B	10-3-12	SEE SHEETS 1 & 3 [CT26372]	WSD
C	11-7-12	SHEET 6 ADDED [CT28128]	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	5-6-11
CHECKED	WSD	5-6-11
APPROVED	AJH	5-6-11

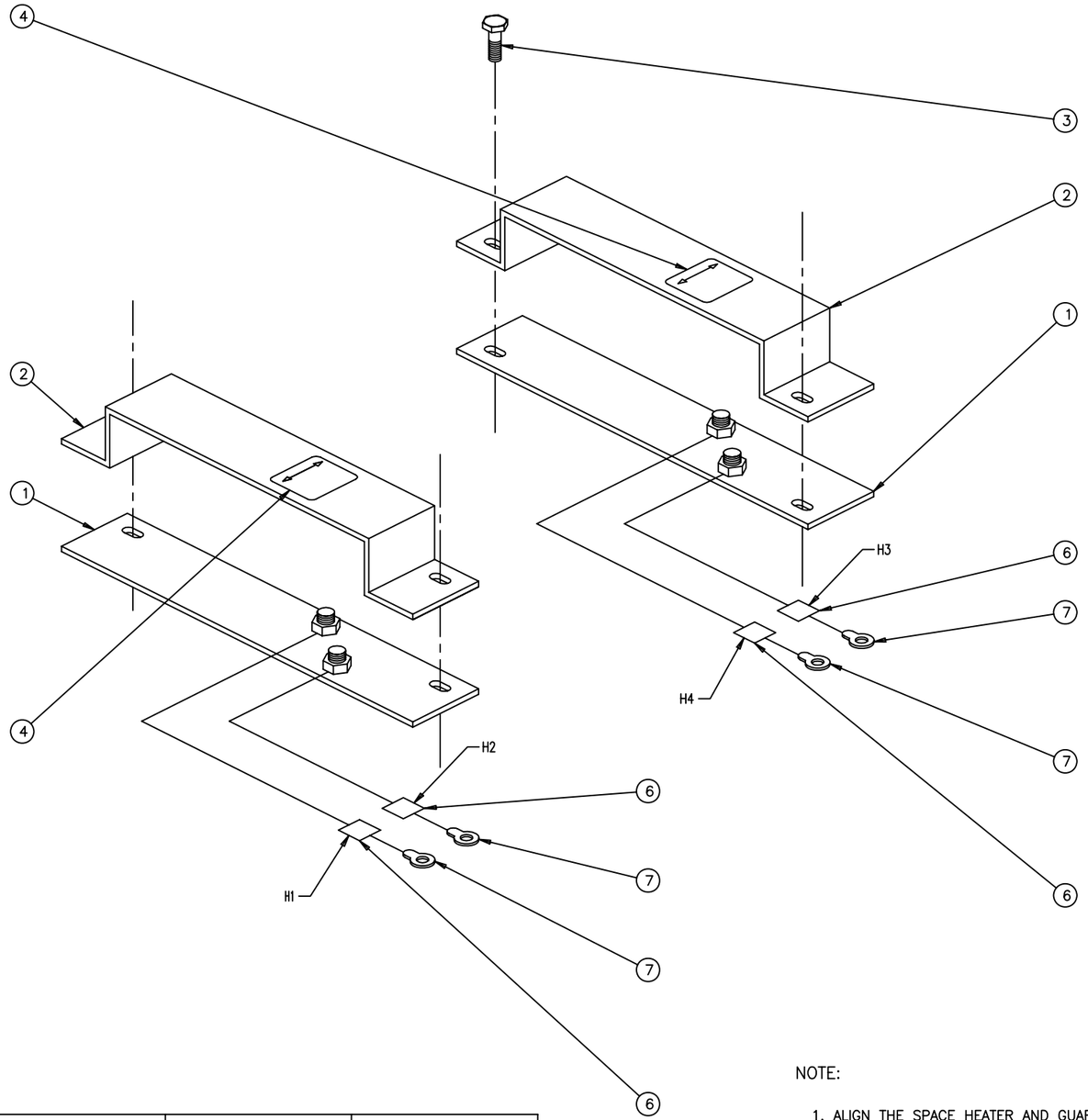
KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE
DIMENSION PRINT

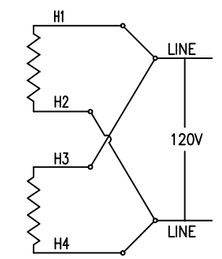
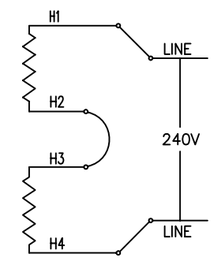
SCALE 0.40 | CAD NO. | SHEET 6 of 6
DWG NO. **ADV-8030** | **D**

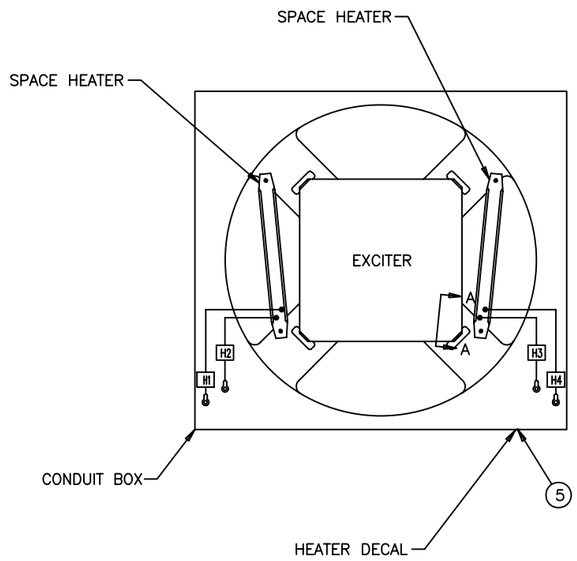
REV	DATE	REVISION	BY	M/F
C	10-7-89	(A-3) KIT 279750 WAS KIT 272750.	DS	
D	6-24-97	(A-2) 1000 KW WAS 800 KW. [50803]	JDH	
E	5-18-98	(A-2,A-7) #572, 573, 574, 575 & 740 WAS #570; #433		
		WAS #430 [54622]	LDS	
F	10-29-98	(A-6,7,8) KIT # AND DESCRIPTION ADDED [56529]	LDS	
G	9-21-09	(B-1) X-101-8 (4), X-465-7 (4) AND X-25-53 (8)		
		REMOVED (C-1) NOTE REVISED [88337]	SAM	

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

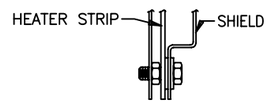


SPACE HEATERS

60/50 HZ. 120 VOLT CONN.	60/50 HZ. 240 VOLT CONN.
	



NOTE:
MOUNTING HARDWARE INCLUDED W/HEATER STRIP



VIEW A–A

KIT NUMBER			272800	279750
DESCRIPTION			FOR #572, 573, 574 575 & 740 FRAMES	FOR #433 FRAME
PURCHASED COMPLETE FROM MARATHON			272803	279749
REVISION LEVEL			G	G
1	2	SPACE HEATER	A-21138-33	A-21138-32
2	2	GUARD	A-525692	A-525591
3	4	SCREW	A-9646-75CC	A-9646-75CC
4	2	DECAL, CAUTION	A-525590	A-525590
5	1	DECAL, CONNECTION	A-510663	A-510663
6	8	MARKERS	A-57829A	A-57829A
7	4	LEAD ASSEMBLY	L6H16W-24EE	L6H16W-24EE
ITEM	QTY	DESCRIPTION	PART NO. MARATHON	PART NO. MARATHON

NOTE:

1. ALIGN THE SPACE HEATER AND GUARDS WITH THE PREDRILLED HOLES IN THE FRONT BRACKET AND MOUNT WITH THE SCREWS PROVIDED IN THE SPACE HEATER KIT.
2. APPLY THE SPACE HEATER CONNECTION DECAL ON THE BOTTOM OF THE CONDUIT BOX IN A VISIBLE LOCATION.
3. WIRE THE SPACE HEATER TO EITHER 120 VOLTS OR 240 VOLTS ACCORDING TO THE CONNECTION DIAGRAM. INSULATE THE CONNECTION.
4. ASSEMBLE CAUTION DECAL IN DIRECTION OF ARROW.

350–1000 KW DDC
120/240 VOLT MARATHON GENERATOR HEATER
TOTAL HEATER WATTAGE 500 WATTS
KIT 272800 FITS #572, 573, 574, 575 & 740 FRAME
KIT 279750 FITS #433 FRAME

MATERIAL: NOTED

UNLESS OTHERWISE SPECIFIED – 1) DIMENSIONS ARE IN INCHES 2) TOLERANCES ARE: XXX± .010 ANGLES± 1/2° XX ± .030 SURFACE FINISH ✓ MAX. X ± .060 FRACTIONS ±

APPROVALS	DATE
DRAWN DCC/RD	10-20-86
CHECKED RLD	10-26-86
APPROVED DRF	11-29-86

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

TITLE: DRAWING, ASSEMBLY

SCALE: / / / | CAD NO. S2720.DWG | SHEET 1-1
PLOTTED | DWG. NO. S-272000 | D

KOHLER. POWER SYSTEMS

Warranty

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 engine wear, routine tuneups, tuneup parts, adjustments, and periodic service.
2. Damage caused by accidents, improper installation or handling, faulty repairs not performed by an authorized Kohler service representative, or improper storage.
3. Damage caused by operation with improper fuel or at speeds, loads, conditions, modifications, or installation contrary to published specifications or recommendations.
4. Damage caused by negligent maintenance such as:
   a. Failure to provide the specified type and sufficient quantity of lubricating oil.
   b. Failure to keep the air intake and cooling fin areas clean.
   c. Failure to service the air cleaner.
   d. Failure to provide sufficient coolant and/or cooling air.
   e. Failure to perform scheduled maintenance as prescribed in supplied manuals.
   f. Failure to regularly exercise the generator set under load (stationary applications only).
5. Original installation charges and startup costs.
6. Starting batteries and the following related expenses:
   a. Labor charges related to battery service.
   b. Travel expense related to battery service.
7. Engine coolant heaters, heater controls, and circulating pumps after the first year.
8. Additional expenses for repair after normal business hours, i.e. overtime or holiday labor rates.
9. Rental of equipment during performance of warranty repairs.
10. Removal and replacement of non-Kohler-supplied options and equipment.
11. Replacement of a failed Kohler part with a non-Kohler part voids the warranty on that part.
12. Radiators replaced rather than repaired.
13. Fuel injection pumps not repaired by an authorized Kohler service representative.
14. Non-Kohler-authorized repair shop labor without prior approval from Kohler Co. Warranty Department.
15. Engine fluids such as fuel, oil, or coolant/antifreeze.
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., Kohler Power Systems Service Department, MS072, Kohler, WI 53044 USA.

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

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

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

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

KOHLER®
Power Systems

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

TP-5374 8/13d

Stationary Standby Industrial Generator Set Extended Five-Year or Three Thousand (3000)-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	Five (5) years from registered startup or three thousand (3000) hours (whichever occurs first). Labor and travel charges are included in the warranty for the first and second year of the five-year warranty.

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

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

1. Normal engine wear, routine tuneups, tuneup parts, adjustments, and periodic service.
2. Damage caused by accidents, improper installation or handling, faulty repairs not performed by an authorized Kohler service representative, or improper storage.
3. Damage caused by operation with improper fuel or at speeds, loads, conditions, modifications, or installation contrary to published specifications or recommendations.
4. Damage caused by negligent maintenance such as:
   a. Failure to provide the specified type and sufficient quantity of lubricating oil.
   b. Failure to keep the air intake and cooling fin areas clean.
   c. Failure to service the air cleaner.
   d. Failure to provide sufficient coolant and/or cooling air.
   e. Failure to perform scheduled maintenance as prescribed in supplied manuals.
   f. Failure to regularly exercise the generator set under load (stationary applications only).
5. Original installation charges and startup costs.
6. Starting batteries and the following related expenses:
   a. Labor charges related to battery service.
   b. Travel expense related to battery service.
7. Engine coolant heaters, heater controls, and circulating pumps after the first year.
8. Additional expenses for repair after normal business hours, i.e. overtime or holiday labor rates.
9. Rental of equipment during performance of warranty repairs.
10. Removal and replacement of non-Kohler-supplied options and equipment.
11. Replacement of a failed Kohler part with a non-Kohler part voids the warranty on that part.
12. Radiators replaced rather than repaired.
13. Fuel injection pumps not repaired by an authorized Kohler service representative.
14. Non-Kohler-authorized repair shop labor without prior approval from Kohler Co. Warranty Department.
15. Engine fluids such as fuel, oil, or coolant/antifreeze.
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. Labor and travel charges for the third, fourth, and fifth years of the warranty.
20. Travel time and mileage exceeding 300 miles round trip.

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

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

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

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

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

KOHLER®
Power Systems

KOHLER CO. Kohler, Wisconsin 53044
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KOHLERPower.com

TP-5498 8/13d

KOHLER. POWER SYSTEMS

Certification

Certificate US95/0189

The management system of

Kohler Power Systems Americas

N7650 CountyRoad LS (Known as Mosel Plant)
Sheboygan, WI, 53083, United States

has been assessed and certified as meeting the requirements of

ISO 9001:2008

For the following activities

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

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

This certificate is valid from 16 November 2012 until 16 November 2015
and remains valid subject to satisfactory surveillance audits.
Recertification audit due a minimum of 60 days before the expiration date.
Issue 9 : 14 November 2012. Certified since February 1995.

Multiple certificates have been issued for this scope.
The main certificate is numbered US95/0189
This is a multi-site certification.
Additional site details are listed on subsequent page.

Authorized by

Zachary C. Pivarnik
Director of Accreditation, North America

Systems and Services Certification, a Division of SGS North America, Inc.
201 Route 17 North, Rutherford, NJ 07070, United States of America
t +1 201 508 3000 f +1 201 925 4555 www.us.sgs.com

Kohler Power Systems Americas

ISO 9001:2008

Issue 9 : 14 November 2012

Additional facilities:

300 N. Dekora Woods Blvd. (Known as Sauk)
Saukville, WI 53080, United States

Scope: Manufacturer of fuel tanks, skids, fabricated components, enclosures, and assembly of enclosures and generators

4327 County EE (Known as KWIP Warehouse)
Sheboygan, WI 53081, United States

Scope: Receiving and storage of generator components & receiving and shipping of generator sets.

Kohler Standby/Prime Generator Set Test Program

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

Prototype Testing

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

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

KOHLER®
POWER SYSTEMS

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KohlerPowerSystemscom

G18-56 12/05a

KOHLER. POWER SYSTEMS

Prestartup Checklist

Generator Set/Transfer Switch Installation Checklist

This document has generic content and some items may not apply to some applications. Check only the items that apply to the specific application. Read and understand all of the safety precautions found in the Operation and Installation Manuals. Make the following installation checks before performing the Startup Checklist.

Note: Use this form as a general guide, along with any applicable codes or standards. Comply with all applicable codes and standards. Improper installation voids the warranty.

Equipment Room or Weather Housing

Yes	Does Not Apply		
❑	❑	1.	Is the equipment installed in a fire-resistant room (made of non-combustible material) or in an outdoor weather housing?
❑	❑	2.	Is there adequate clearance between the engine and floor for service maintenance?
❑	❑	3.	Is there emergency lighting available at the equipment room or weather housing?
❑	❑	4.	Is there adequate heating for the equipment room or outdoor weather housing?
❑	❑	5.	Is the equipment room clean with all materials not related to the emergency power supply system removed?
❑	❑	6.	Is the equipment room protected with a fire protection system?

Engine and Mounting

❑	❑	7.	Is the mounting surface(s) properly constructed and leveled?
❑	❑	8.	Is the mounting surface made from non-combustible material?
❑	❑	9.	Was the generator-to-engine alignment performed after attaching the skid to the mounting base? Generator sets with two-bearing generators require alignment.

Lubrication

❑	❑	10.	Is the engine crankcase filled with the specified oil?

Cooling and Ventilation

❑	❑	11.	Is the cooling system filled with the manufacturer's specified coolant/antifreeze and purged of air?
❑	❑	12.	Is there adequate inlet and outlet air flow (electric louvers adjusted and ventilation fan motor(s) connected to the corresponding voltage)?
❑	❑	13.	Is the radiator duct properly sized and connected to the air vent or louver?
❑	❑	14.	Are flexible sections installed in the cooling water lines?

Fuel

❑	❑	15.	Is there an adequate/dedicated fuel supply?
❑	❑	16.	Are the fuel filters installed?
❑	❑	17.	Are the fuel tanks and piping installed in accordance with applicable codes and standards?
❑	❑	18.	Is there adequate fuel transfer tank pump lift capacity and is the pump motor connected to the corresponding voltage?
❑	❑	19.	Is the fuel transfer tank pump connected to the emergency power source?
❑	❑	20.	Are flexible fuel lines installed between the engine fuel inlet and fuel piping?
❑	❑	21.	Is the specified gas pressure available at the fuel regulator inlet?
❑	❑	22.	Does the gas solenoid valve function?
❑	❑	23.	Are the manually operated fuel and cooling water valves installed allowing manual operation or bypass of the solenoid valves?

Exhaust

❑	❑	24.	Is the exhaust line sized per guidelines and does it have flexible connector(s)? Is the flexible connector(s) straight?
❑	❑	25.	Is there an exhaust line condensate trap with a drain installed?
❑	❑	26.	Is the specified silencer installed and are the hanger and mounting hardware tightened?
❑	❑	27.	Is a heat-isolating thimble(s) installed at points where exhaust lines pass through combustible wall(s) or partition(s)?
❑	❑	28.	Is the exhaust line free of excessive bends and restrictions? Is the backpressure within specifications?
❑	❑	29.	Is the exhaust line installed with a downward pitch toward the outside of the building?
❑	❑	30.	Is the exhaust line protected from entry by rain, snow, and animals?
❑	❑	31.	Does the exhaust system outlet location prevent entry of exhaust gases into buildings or structures?
❑	❑	32.	Are individuals protected from exposure to high temperature exhaust parts and are hot parts safety decals present?

AC Electrical System

❑	❑	33.	Does the nameplate voltage/frequency of the generator set and transfer switch match normal/utility source ratings?
❑	❑	34.	Do the generator set load conductors have adequate ampacity and are they correctly connected to the circuit breakers and/or the emergency side of the transfer switch?
❑	❑	35.	Are the load conductors, engine starting cables, battery charger cables, and remote annunciator leads installed in separate conduits?
❑	❑	36.	Is the battery charger AC circuit connected to the corresponding voltage?

Transfer Switch, Remote Control System, Accessories

❑	❑	37.	Is the transfer switch mechanism free of binding? **Note:** Disconnect all AC sources and operate the transfer switch manually.
❑	❑	38.	Are the transfer switch AC conductors correctly connected? Verify lead designations using the appropriate wiring diagrams.
❑	❑	39.	Is all other wiring connected, as required?

Batteries and DC Electrical System

❑	❑	40.	Does the battery(ies) have the specified CCA rating and voltage?
❑	❑	41.	Is the battery(ies) filled with electrolyte and connected to the battery charger?
❑	❑	42.	Are the engine starting cables connected to the battery(ies)?
❑	❑	43.	Do the engine starting cables have adequate length and gauge?
❑	❑	44.	Is the battery(ies) installed with adequate air ventilation?
❑	❑	45.	Are the ends of all spark plug wires properly seated onto the coil/distributor and the spark plug?

Special Requirements

❑	❑	46.	Is the earthquake protection adequate for the equipment and support systems?
❑	❑	47.	Is the equipment protected from lightning damage?

Generator Set/Transfer Switch Startup Checklist

This document has generic content and some items may not apply to some applications. Check only the items that apply to the specific application. Read and understand all of the safety precautions found in the Operation and Installation Manuals. Complete the Installation Checklist before performing the initial startup checks. Refer to Service Bulletin 616 for Warranty Startup Procedure Requirements regarding generator set models with ECM-controlled engines.

Yes	Does Not Apply		
❑	❑	1.	Verify that the engine is filled with oil and the cooling system is filled with coolant/antifreeze.
❑	❑	2.	Prime the fuel system.
❑	❑	3.	Open all water and fuel valves. Temporarily remove the radiator cap to eliminate air in the cooling system. Replace radiator cap in step 21.
❑	❑	4.	Place the generator set master switch in the OFF/RESET position. Observe Not-in-Auto lamp and alarm, if equipped, on the controller.
❑	❑	5.	Press the lamp test, if equipped on controller. Do all the alarm lamps on the panel illuminate?
❑	❑	6.	Open the main line circuit breakers, open the safeguard breaker, and/or remove fuses connected to the generator set output leads.
❑	❑	7.	Turn down the speed control (electronic governor) or speed screw (mechanical governor).*
❑	❑	8.	Verify the presence of lube oil in the turbocharger, if equipped. See the engine and/or generator set operation manual.
❑	❑	9.	Place the generator set master switch in the RUN position. Allow the engine to start and run for several seconds.
❑	❑	10.	Verify that the day tank, if equipped, is energized.
❑	❑	11.	Place the generator set master switch in the OFF/RESET position. Check for oil, coolant, and exhaust leaks.
❑	❑	12.	Turn on the water/oil heaters and fuel lift pumps.
❑	❑	13.	Check the battery charger ammeter for battery charging indication.
❑	❑	14.	Place the generator set master switch in the RUN position. Verify whether there is sufficient oil pressure. Check for oil, coolant, and exhaust leaks.
❑	❑	15.	Close the safeguard circuit breaker. Adjust the engine speed to 50/60 Hz if equipped with an electronic governor or to 52.8/63 Hz if equipped with a mechanical governor.*
❑	❑	16.	If the speed is unstable, adjust according to the appropriate engine and/or governor manual.*
❑	❑	17.	Adjust the AC output voltage to match the load voltage using the voltage adjusting control. See the generator set/controller operation manual.
❑	❑	18.	Allow the engine to reach normal operating coolant temperature.
❑	❑	19.	Check the operating temperature on city water-cooled models and adjust the thermostatic valve as necessary.
❑	❑	20.	Manually overspeed the engine to cause an engine shutdown (68-70 Hz on 60 Hz models and 58-60 Hz on 50 Hz models). Place the generator set master switch in the OFF/RESET position.*
❑	❑	21.	Check the coolant level, add coolant as necessary, and replace the radiator cap. Verify that all hose clamps are tight and secure.
❑	❑	22.	Place the generator set master switch in the RUN position.
❑	❑	23.	Verify the engine low oil pressure and high coolant temperature shutdowns.*
❑	❑	24.	Check the overcrank shutdown.*
❑	❑	25.	Place the generator set master switch in the OFF/RESET position.
❑	❑	26.	Open the normal source circuit breaker or remove fuses to the transfer switch.
❑	❑	27.	Disconnect the power switching device and logic controller wire harness at the inline disconnect plug at the transfer switch.
❑	❑	28.	Manually transfer the load to the emergency source.
❑	❑	29.	Close the normal source circuit breaker or replace fuses to the transfer switch.
❑	❑	30.	Check the normal source voltage, frequency, and phase sequence on three-phase models. The normal source must match the load.
❑	❑	31.	Open the normal source circuit breaker or remove fuses to the transfer switch.
❑	❑	32.	Manually transfer the load to the normal source.
❑	❑	33.	Close the generator set main line circuit breakers, close the safeguard breaker, and/or replace the fuses connected to the transfer switch.
❑	❑	34.	Place the generator set master switch in the RUN position.
❑	❑	35.	Check the generator set voltage, frequency, and phase sequence on three-phase models. The generator set must match normal source and load.
❑	❑	36.	Place the generator set master switch in the OFF/RESET position.
❑	❑	37.	Open the generator set main line circuit breakers, open the safeguard breaker, and/or remove the fuses connected to the transfer switch.
❑	❑	38.	Reconnect the power switching device and logic controller wire harness at the inline disconnect plug at the transfer switch.
❑	❑	39.	Close the normal source circuit breaker or replace fuses to the transfer switch. Place the generator set master switch to the AUTO position.
❑	❑	40.	Close the generator set main line circuit breakers, close the safeguard breaker, and/or replace the fuses connected to the transfer switch.
❑	❑	41.	Place the transfer switch in the TEST position (load test or open normal source circuit breaker). **NOTE:** Obtain permission from the building authority before proceeding. This procedure tests transfer switch operation and connects building load to generator set power.
❑	❑	42.	Readjust frequency to 50 or 60 Hz with total building loads.*
❑	❑	43.	Verify that the current phase is balanced for three phase systems.
❑	❑	44.	Release the transfer switch test switch or close the normal circuit breaker. The transfer switch should retransfer to the normal source after appropriate time delay(s).
❑	❑	45.	Allow the generator set to run and shut down automatically after the appropriate cool down time delay(s).
❑	❑	46.	Set the plant exerciser to the customer's required exercise period, if equipped.
❑	❑	47.	Verify that all options on the transfer switch are adjusted and functional for the customer's requirements.
❑	❑	48.	If possible, run the building loads on the generator set for several hours or perform the load bank test if required.
❑	❑	49.	Verify that all the wire connections from the generator set to the transfer switch and optional accessories are tight and secure.
❑	❑	50.	Verify that the customer has the appropriate engine/generator set and transfer switch literature. Instruct the customer in the operation and maintenance of the power system.
❑	❑	51.	Fill out the startup notification at this time and send the white copy to the Generator Warranty Dept. Include the warranty form if applicable.

* Some models with an Engine Electronic Control Module (ECM) may limit or prohibit adjusting the engine speed or testing shutdowns. Refer to appropriate documentation available from the manufacturer.