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Generator

Kohler Model: 250REOZJE

This diesel generator set equipped with a 4UA10 alternator operating at 120/208 volts is rated for 250 kW/313 kVA. Output amperage: 867.

Qty	Description
	250REOZJE Generator System
8	250REOZJE Generator Set

Includes the following:

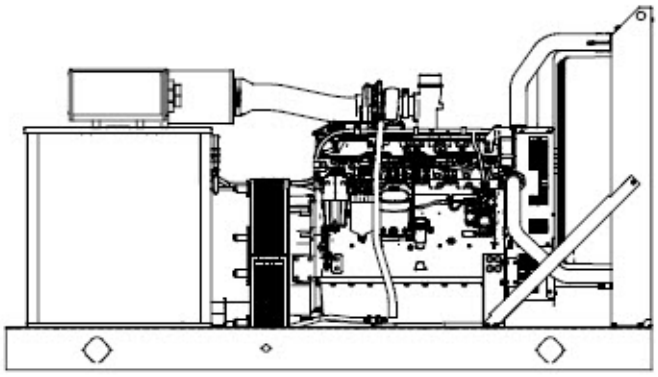
Literature Languages	English
Approvals and Listings	UL2200 Listing
Engine	250REOZJE, 24V, 60Hz
Nameplate Rating	Standby 130C Rise
Voltage	60Hz, 120/208V, Wye, 3Ph, 4W
Alternator	4UA10
Cooling System	Unit Mounted Radiator, 50C
Skid and Mounting	Skid/Tank
Air Intake	Standard Duty
Controller	APM402
Enclosure Type	Sound
Enclosure Material	Steel
Enclosure Silencer	Internal Silencer
Fuel Tank Type	Standard
Fuel Runtime (Approx.)	24 Hours
Subbase Fuel Tank Capacity	472 Gallons
Fuel Tank Options	Inner Tank Leak Alarm
Starting Aids, Installed	2500W,90-120V,1Ph,w/Valves
Electrical Accy.,Installed	Battery, 2/12V, Wet
Electrical Accy.,Installed	Battery Charger, 10A
Rating, LCB 1	100% Rated
Amps, LCB 1	1000
Trip Type, LCB 1	Electronic, LSI
Interrupt Rating LCB 1	35kA at 480V
Fuel Lines, Installed	Flexible Fuel Lines
Exceeds LTL Shipping Height	Add'l Shipping Charge Accepted
Miscellaneous Accy,Installed	Coolant in Genset
Warranty	5 Year Comprehensive
Testing, Additional	Power Factor Test,0.8,3Ph Only
Lit Kit, Production, 250REOZJE	

KOHLER®

Spec Sheets

KOHLER®

250REOZJE
Diesel



Alternator Features

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

Other Features

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

Standard Features

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

Generator Set Rating

Standby 130C Rise Ratings

Alternator	Voltage	Ph	Hz	Peak kVA	kW/kVA	Amps
4UA10	120/208	3	60	590	250/313	867

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor.
Standby Ratings: Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage.
There is no overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS5514, AS2789, and DIN 6271.
Prime Power Ratings: Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited.
A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory.
Obtain the technical information bulletin (TIB-101) on ratings guidelines for the complete ratings definitions.
The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.
GENERAL GUIDELINES FOR DERATION: Altitude: Derate 0.5% per 100 m (328 ft.) elevation above 1000 m (3300 ft.). Temperature: Derate 1.0% per 10?C (18?F) temperature above 25?C (77?F).

Model: 250REOZJE, continued

Alternator Specifications

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

• NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
• Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
• Sustained short-circuit current enabling down stream circuit breakers to trip without collapsing the alternator field.
• Self-ventilated and dripproof construction.
• Vacuum-impregnated windings with fungus-resistant epoxy varnish for dependability and long life.
• Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
• Fast-Response™ II brushless alternator with brushless exciter for excellent load response.

Engine

Engine Specification

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

Model: 250REOZJE, continued

Exhaust

Exhaust System

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

Engine Electrical

Engine Electrical System

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

Fuel

Fuel System

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

Lubrication

Lubrication System

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

Model: 250REOZJE, continued

Cooling

Radiator System

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

Operation Requirements

Air Requirements

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

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

Fuel Consumption

Diesel, Lph (gph), at % load	Rating
Standby Fuel Consumption at 100% load	66.5 Lph (17.6 gph)
Standby Fuel Consumption at 75% load	50.4 Lph (13.3 gph)
Standby Fuel Consumption at 50% load	35.0 Lph (9.2 gph)
Standby Fuel Consumption at 25% load	20.5 Lph (5.4 gph)

APM402

Kohler® APM402 Controller

General Description and Function

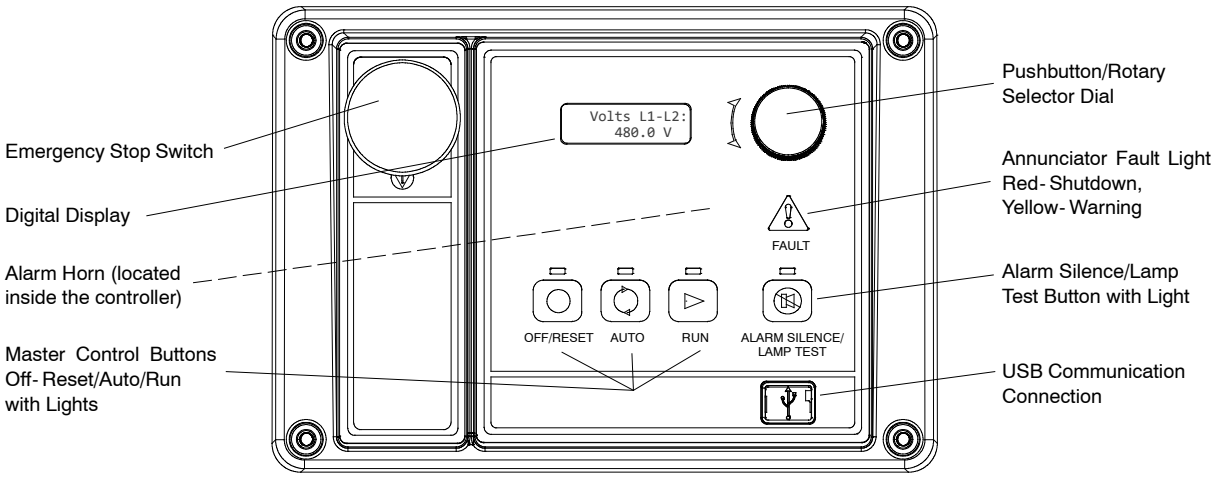
The APM402 generator set controller provides advanced control, system monitoring, and system diagnostics for optimum performance.

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

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

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

Modbus® is a registered trademark of Schneider Electric.



User Interface Controls and Components

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

NFPA 110 Requirements

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

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

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

User Interface Displays

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

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

Controller Features

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

Controller Functions

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

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

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

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

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

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For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
KOHLERPower.com

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

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

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

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

Controller Specifications

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

APM402 Available Options

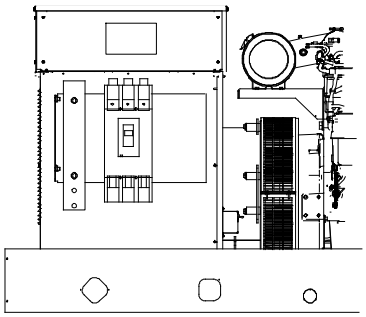
- ❑ **Float/Equalize Battery Charger** available with 6 or 10 amp output for 12 or 24V DC voltage output. The 10 amp model provides NFPA 110 charging and alarming capability.
- ❑ **Manual Speed Adjust** available for applications using closed transition ATS. Adjustment range for 60 Hz: 1751-1849 rpm (58.2-61.8 Hz) and for 50 Hz: 1451-1549 rpm (48.2-51.8 Hz).
- ❑ **Prime Power Switch** prevents battery drain during generator set non-operation periods and when the generator set battery cannot be maintained by an AC battery charger.
- ❑ **Remote Emergency Stop Switch** available as a wall mounted panel to remotely shut down the generator set.
- ❑ **Remote Monitoring Panel.** The Kohler® Remote Serial Annunciator (RSA) enables the operator to monitor the status of the generator set from a remote location, which may be required for NFPA 99 and NFPA 110 installations, and up to four Automatic transfer switches.
- ❑ **Run Relay** provides a relay indicating that the generator set is running.
- ❑ **Shunt Trip Wiring** provides relay outputs to trip a shunt trip circuit breaker and to signal the common fault shutdowns. Contacts rated at 10 amps at 28 VDC or 120 VAC.
- ❑ **Two Input/Five Output Module** provides a generator set mounted panel with two inputs and five relay outputs.

DISTRIBUTED BY:

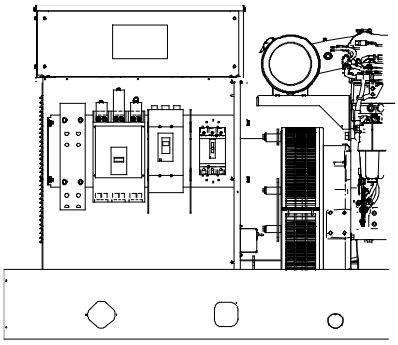
Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator set distributor for availability.

Industrial Generator Set Accessories

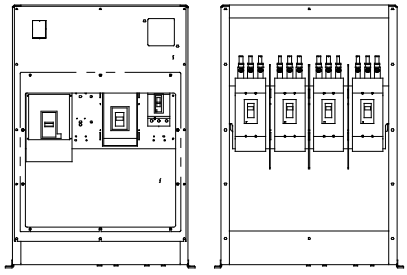
Line Circuit Breakers 15-3250 kW



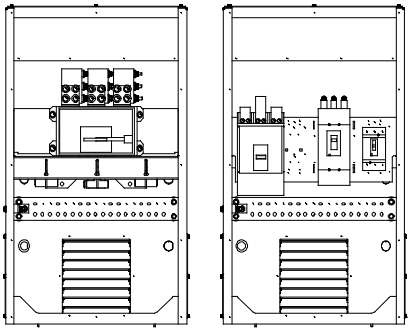
Single Circuit Breaker Kit with Neutral Bus Bar 15-300 kW Model Shown



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



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



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

Standard Features

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

Line Circuit Breaker Types

Magnetic Trip

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

Thermal Magnetic Trip

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

Electronic Trip

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

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

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

Electronic with Ground Fault Trip

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

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

80% Rated Circuit Breaker

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

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

100% Rated Circuit Breaker

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

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

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

Line Circuit Breaker Options

❑ **Alarm Switch**

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

❑ **Auxiliary Contacts**

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

❑ **Breaker Separators (350-2500 kW)**

Provides adequate clearance between breaker circuits.

❑ **Bus Bars**

Bus bar kits offer a convenient way to connect load leads to the generator set when a circuit breaker is not present. **15-300 kW.** Bus bar kits are available on alternators with leads for connection to the generator set when circuit breakers are not ordered.

350-2500 kW. A bus bar kit is provided when no circuit breaker is ordered. Bus bars are also available in combination with circuit breakers or other bus bars on the opposite side of the junction box. On medium voltage (3.3 kV and above) units, a bus bar kit is standard (not applicable to KD models).

❑ **Field Connection Barrier**

Provides installer wiring isolation from factory connections.

❑ **Ground Fault Annunciation**

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

❑ **Lockout Device (padlock attachment)**

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

❑ **Lugs**

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

❑ **Overcurrent Trip Switch**

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

❑ **Shunt Trip, 12 VDC or 24 VDC**

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

❑ **Shunt Trip Wiring**

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

❑ **Undervoltage Trip, 12 VDC or 24 VDC**

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

15-300* kW Line Circuit Breaker Specifications

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

100% Rating Circuit Breaker

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

100% Rating Electrically Operated Breakers

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

Generator-Mounted P-Frame, 24VDC Electrically			
Alt. Model	**Amps**	**Trip Unit**	**Frame**
4RX 4S/4SX 4TX 4V	250 400 600 800	5.0 LSI	PJ
		5.0 LSI	PL
4UA 4M6226	250 400 600 800 1000 1200	5.0 LSI	PJ
		5.0 LSI	PL
All circuit breakers listed in this table include line side bus and load side lugs, 24VDC motor operators, 2 type C auxiliary contacts, and 1 type C SDE overcurrent switch contact. No second breakers are allowed in combination with			

Interrupting Ratings

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

Circuit Breaker Lugs Per Phase (Al/Cu)

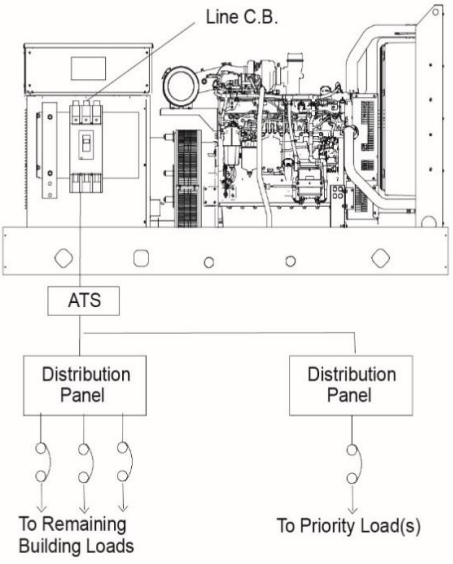
Frame Size	Ampere Range	Wire Range
H	15-150	One #14 to 3/0
J	175	One 1/0 to 4/0
	200-250	One 3/0 to 350 kcmil
LA	300-400	One #1 to 600 kcmil or Two #1 to 250 kcmil
LG	400-600	Two 2/0 to 500 kcmil AL/CU
M	800	Three 3/0 to 500 kcmil
P	600-800	Three 3/0 to 500 kcmil
	1000-1200	Four 3/0 to 500 kcmil
Mechanical Load Lugs Included with H, J, and LG LSIG Neutrals		
H	60-150	One #14 to 3/0 AL/CU
J	250	One 3/0 to 350 kcmil AL/CU
LG	400-600	Two 4/0 to 500 kcmil AL/CU

15-300* kW Line Circuit Breaker Applications

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

Single Circuit Breaker Installations

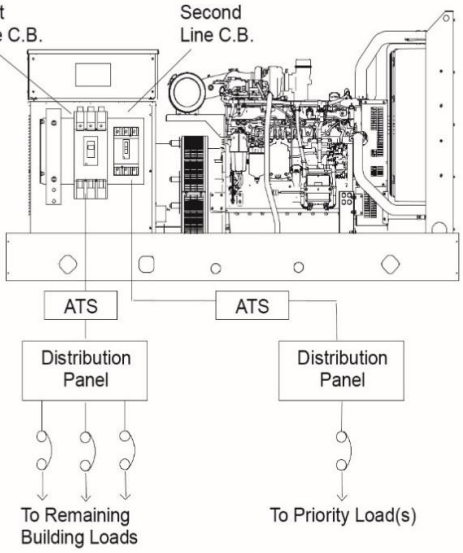
A generator set with a single circuit breaker installed typically feeds a single transfer switch and then a distribution panel. This allows protection of the entire system.



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

Multiple Circuit Breaker Installations

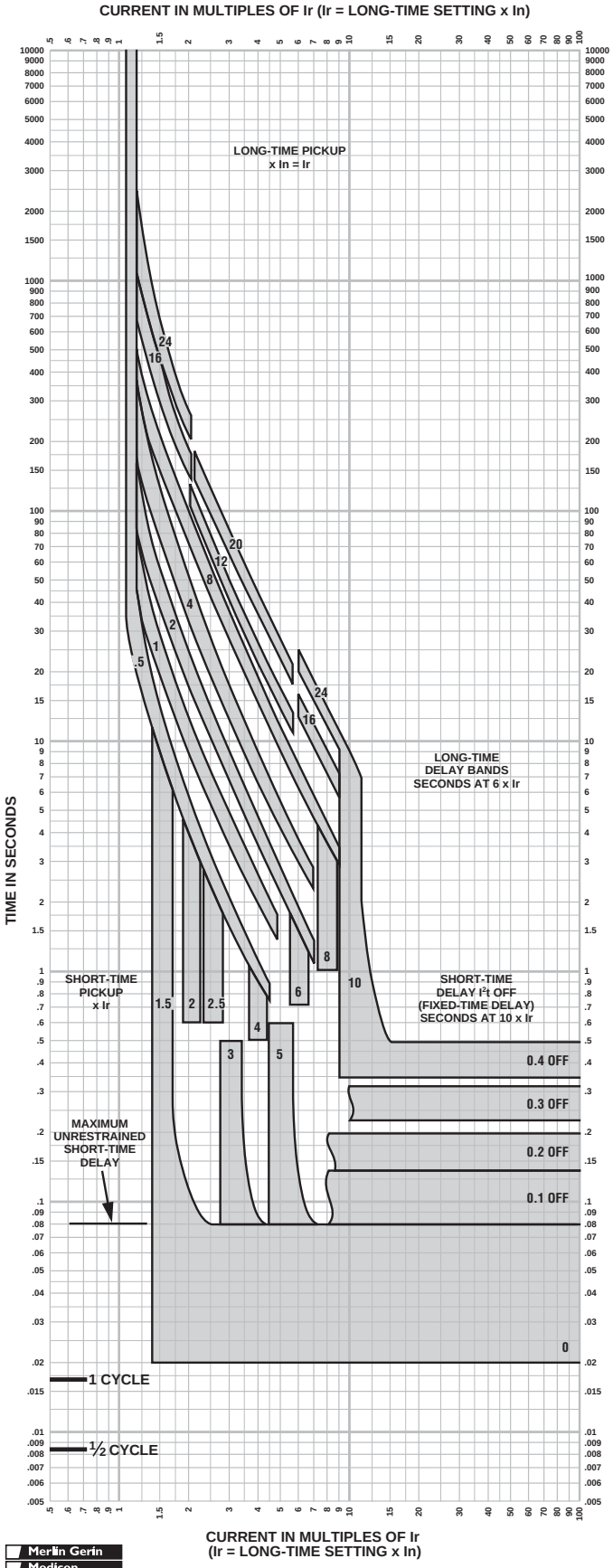
A generator set with dual circuit breakers installed is used to separate critical loads. Typically, one circuit breaker will feed a main transfer switch with noncritical loads and the other circuit breaker will feed a second transfer switch that feeds critical or priority loads. Multiple circuit breakers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



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

Circuit Breaker Combinations

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



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

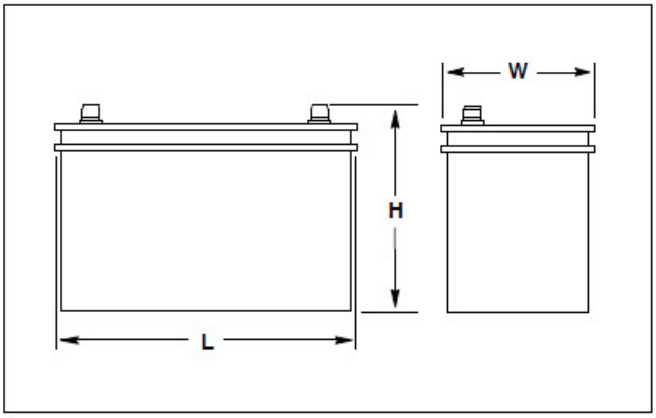
Curve No. 0613TC0004
December 2000
Drawing No. B48095-613-04

KOHLER®

System Batteries

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED

Typical Overall Dimensions

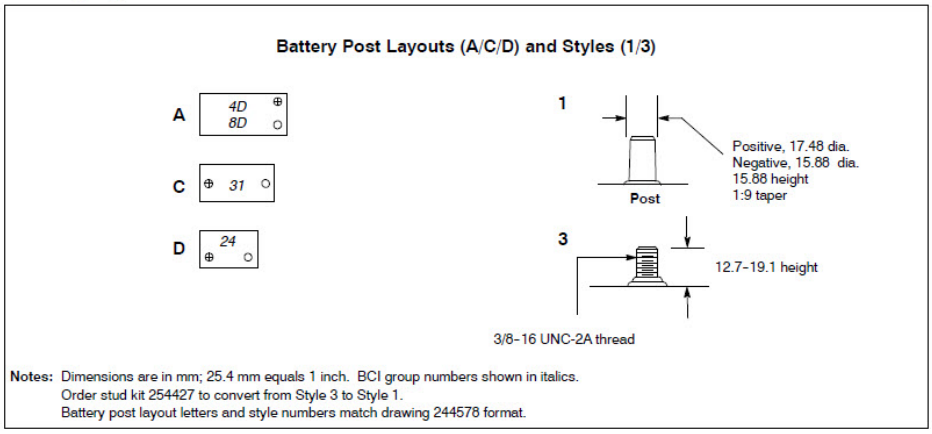


Standard Features

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

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

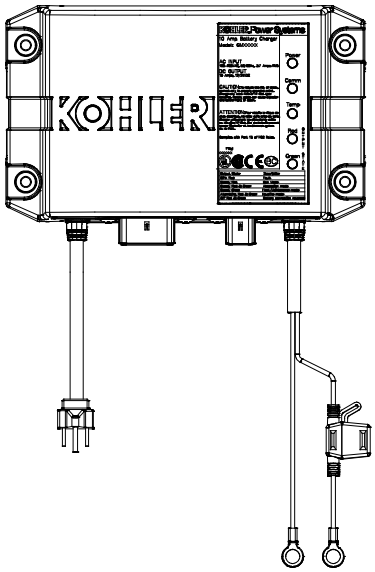
Battery Specifications



KOHLER

Industrial Generator Set Accessories

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



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

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

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

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

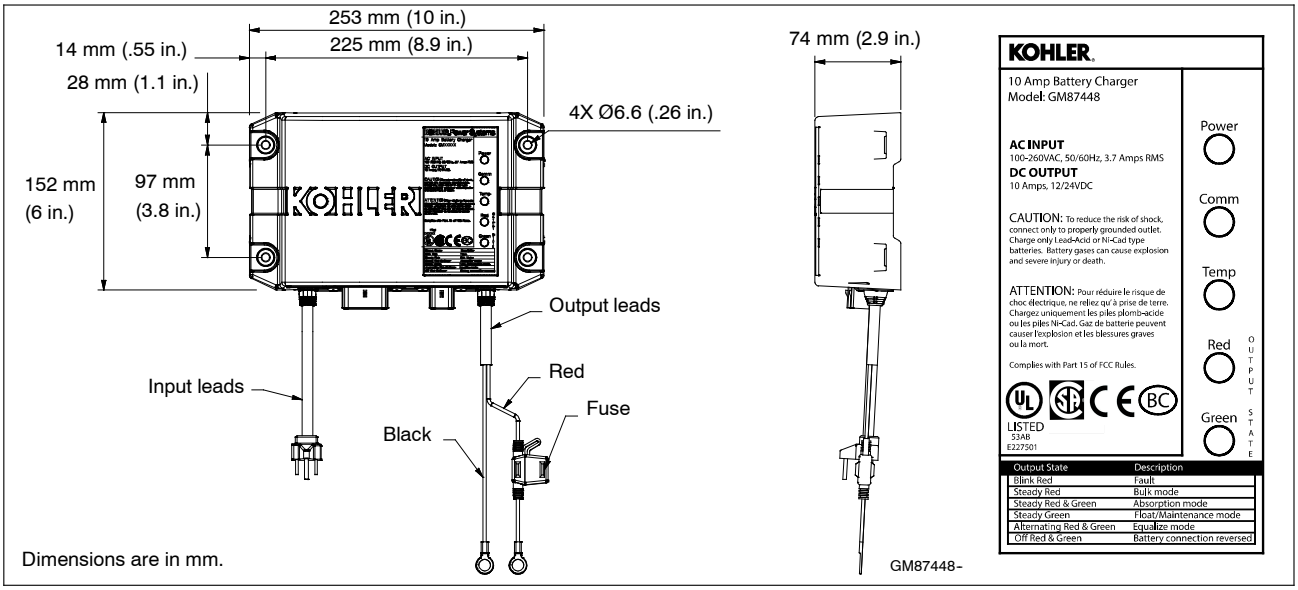
With the optional battery temperature sensor connected, the battery charger can adjust output voltages for optimal charging.

Standard Features

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

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

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



Specifications

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

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

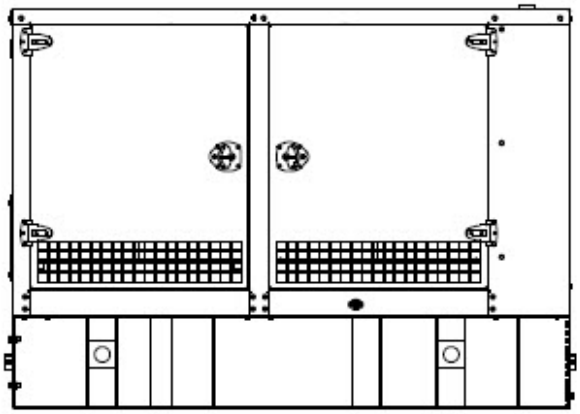
DISTRIBUTED BY:

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

KOHLER®

Sound Enclosure

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED



Enclosure with Standard Subbase Fuel Tank

Sound Enclosure Standard Features

• Internal-mounted critical silencer and flexible exhaust connector.

• Lift base-mounted or tank mounted steel construction with hinged doors.

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

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

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

• Lockable, flush-mounted door latches.

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

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

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

• Steel sound enclosure is designed to 150 mph (241 kph) wind load rating.

Subbase Fuel Tank Features

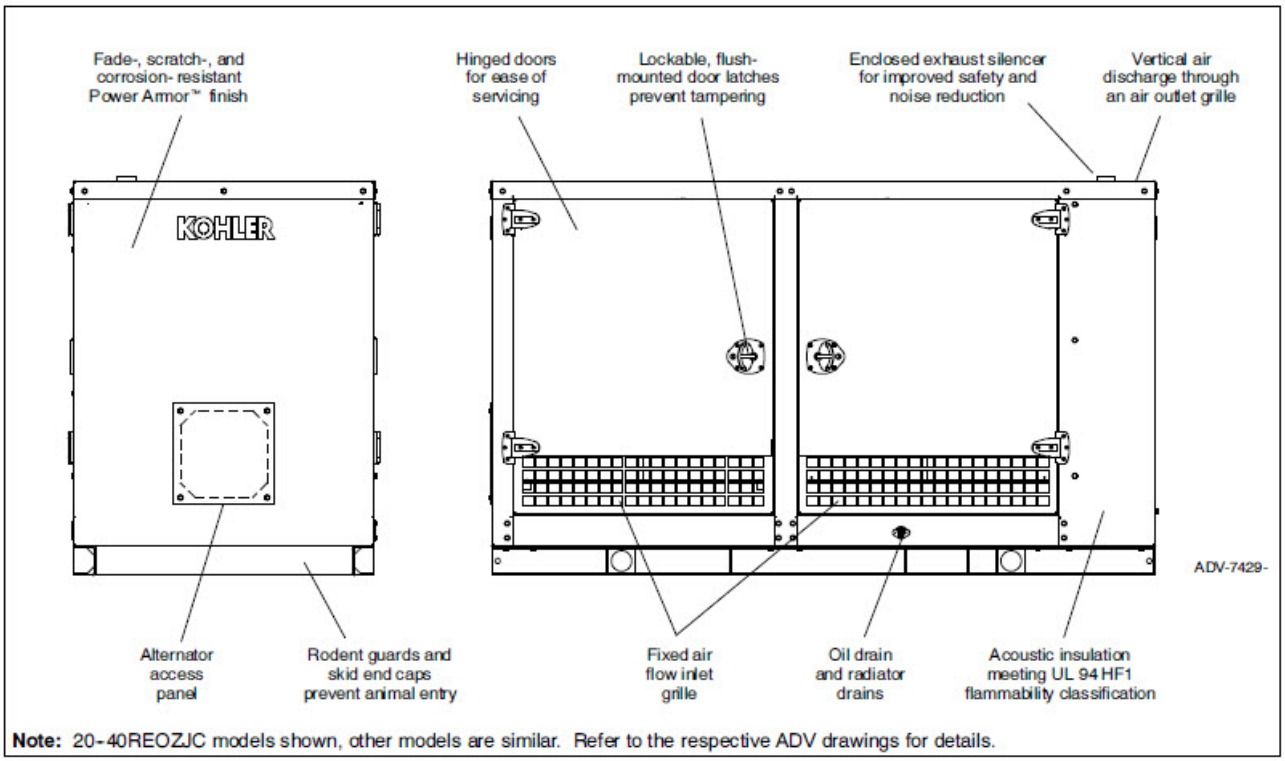
• The fuel tank has a Power Armor Plus textured epoxy-based rubberized coating.

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

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

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

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



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

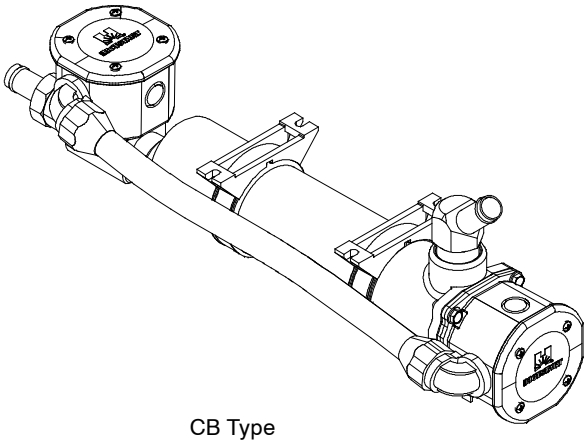
Sound Enclosure Features

- Available in steel (14 gauge) formed panel, solid construction. Preassembled package offering corrosion resistant, dent resilient structure mounting directly to lift base or fuel tank.
- Power Armor automotive-grade finish resulting in advanced corrosion and abrasion protection as well as enhanced edge coverage and color retention.
- Internal exhaust silencer offering maximum component life and operator safety.
- Interchangeable modular panel construction. Allows complete serviceability or replacement without compromising enclosure design.
- Cooling/combustion air intake with a horizontal air inlet. Sized for maximum cooling airflow.
- Service access. Multi-personnel doors for easy access to generator set control and servicing of the fuel fill, fuel gauge, oil fill and battery.
- Cooling air discharge. Weather protective design featuring vertical air discharge. Redirects cooling air up and above the enclosure to reduce ambient noise.
- Attenuated design. Acoustic insulation UL 94 HF1 listed for flame resistance offering up to 51 mm (2 in.) mechanically restrained acoustic insulation.
- Note: Installing an additional length of exhaust tail pipe may increase backpressure levels. Please refer to the generator set spec sheet for the maximum backpressure value.

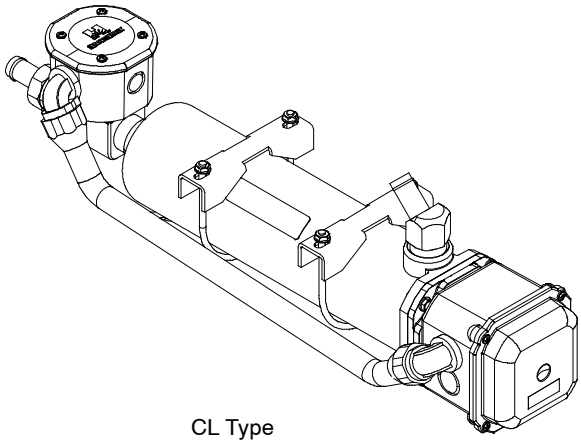
KOHLER

Industrial Generator Set Accessories

Engine Block Heater Kits



CB Type



CL Type

Block Heater Kit, Typical

Applicable Models

- 180- 200RZXB
- 180- 200REZXB
- 230- 275REOZJE
- 300- 500REOZJ
- 350- 500REOZJB
- 350- 500REOZJC
- 350- 400REOZJD
- 500REOZVC
- 550- 600REOZVB

Standard Features

- UL- C/US listed
- CE compliant
- Controls for automatic operation
- Compact design
- Easy to install

Description

The engine block heater kit heats the engine coolant in cold ambient, warming the cylinders, oil, and charge air circuit which all help to give a faster starting time. The engine block heater uses thermosiphon action to circulate warm coolant into the engine and supplies constant heating to the engine. The engine block heater helps to extend element life and gives a significant reduction in electrical consumption.

The engine block heater has a fixed setting thermostat that turns ON when the engine coolant temperature reaches 27°C (80°F) and turns OFF when the engine coolant temperature reaches 38°C (100°F).

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

The engine block heater kits are available in 120 V, 208 V, 240 V, and 480 V versions.

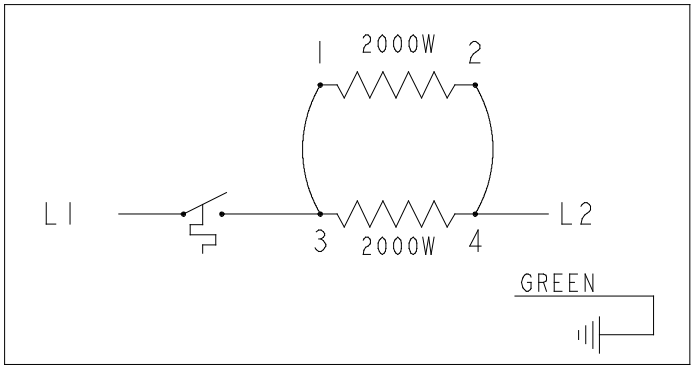
Block Heater Specifications

Heating Fluid	Water, Coolant Mix (50% Glycol/50% Water)
Thermostat Temperature Range	27°- 38°C (80°- 100°F)
Temperature High Limit	96°C (205°F)
Max. Pressure	125 psi (860 kPa)
Inlet/Outlet Plumbing	1 in. NPT
System Ingress	NEMA 4

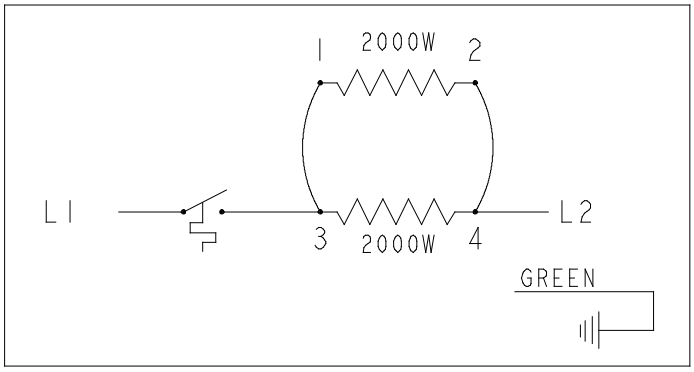
Specifications

Block Heater Kit Number	Component	Watts	Voltage	Phase
GM75809- KA1	GM76113	2500	90- 120	1
GM75809- KA2	GM76114	2500	190- 208	1
GM75809- KA3	GM76115	2500	210- 240	1
GM75809- KA4	GM76116	2500	380- 480	1
GM76120- KA1	GM76113	2500	90- 120	1
GM76120- KA2	GM76114	2500	190- 208	1
GM76120- KA3	GM76115	2500	210- 240	1
GM76120- KA4	GM76116	2500	380- 480	1
GM79186- KA1	GM79182	4000	190- 208	1
GM79186- KA2	GM79183	4000	210- 240	1
GM79186- KA3	GM79184	4000	380- 480	1
GM79186- KP1	GM79182	4000	190- 208	1
GM79186- KP2	GM79183	4000	210- 240	1
GM79186- KP3	GM79184	4000	380- 480	1
GM79187- KA1	GM79182	4000	190- 208	1
GM79187- KA2	GM79183	4000	210- 240	1
GM79187- KA3	GM79184	4000	380- 480	1
GM79187- KP1	GM79182	4000	190- 208	1
GM79187- KP2	GM79183	4000	210- 240	1
GM79187- KP3	GM79184	4000	380- 480	1
GM84820- KA1	GM76113	2500	90- 120	1
GM84820- KA2	GM76114	2500	190- 208	1
GM84820- KA3	GM76115	2500	210- 240	1
GM84820- KA4	GM76116	2500	380- 480	1

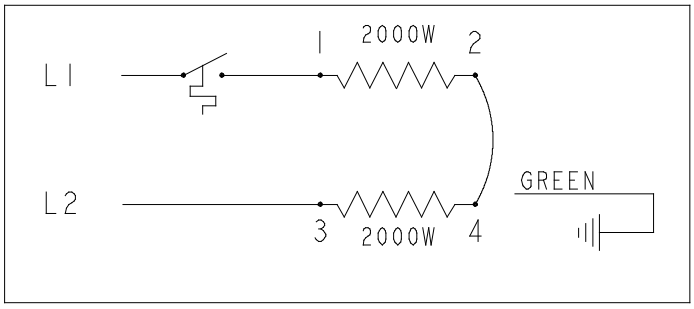
Wiring Diagram



208 VAC single phase- parallel



240 VAC single phase- parallel



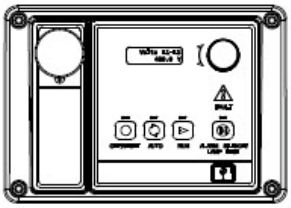
480 VAC single phase- parallel

GM79182

KOHLER®

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED

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



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

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

Voltage Regulators

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

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

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

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

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

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

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

Voltage Regulator Menu

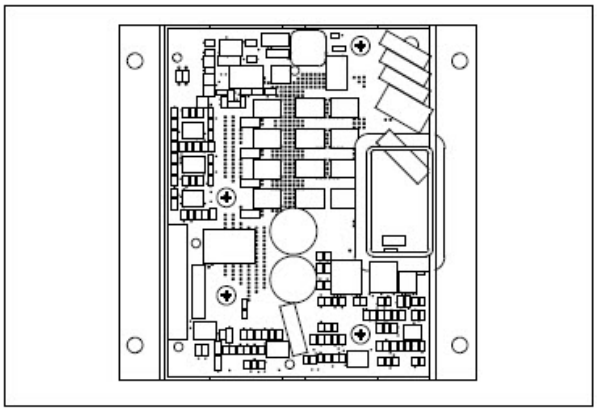
- Voltage adjustment, ±10% of system voltage
- V/Hz cut-in, 42-62 Hz
- Underfrequency unload slope, 0-10% of system voltage

Jumpers

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

KOHLER®

Voltage Regulators



- 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.

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Alternator Data

TECHNICAL INFORMATION BULLETIN

Alternator Data Sheet

Alternator Model: 4UA10
Frequency: 60 Hz
Speed: 1800 RPM
Leads: 12 (6 Lead, 600 Volt)

Voltage L-N/L-L	Phase	Power Factor	Connection	kW* (kVA)						
				Class B	Class F				Class H	
				80°C Continuous	90°C Lloyds	95°C ABS	105°C Continuous	130°C Standby	125°C Continuous	150°C Standby
139/240 277/480	3	0.8	Wye	225.0 (281.3)	237.0 (296.3)	243.0 (303.8)	255.0 (318.8)	275.0 (343.8)	271.0 (338.8)	275.0 (343.8)
127/220 254/440	3	0.8	Wye	220.0 (275.0)	232.0 (290.0)	238.0 (297.5)	250.0 (312.5)	270.0 (337.5)	266.0 (332.5)	270.0 (337.5)
120/208 240/416	3	0.8	Wye	215.0 (268.8)	227.0 (283.8)	233.0 (291.3)	245.0 (306.3)	265.0 (331.3)	261.0 (326.3)	265.0 (331.3)
110/190 220/380	3	0.8	Wye	205.0 (256.3)	217.0 (271.3)	223.0 (278.8)	235.0 (293.8)	250.0 (312.5)	247.0 (308.8)	250.0 (312.5)
120/240	3	0.8	Delta	215.0 (268.8)	227.0 (283.8)	233.0 (291.3)	245.0 (306.3)	265.0 (331.3)	261.0 (326.3)	265.0 (331.3)
347/600	3	0.8	Wye	205.0 (256.3)	217.0 (271.3)	223.0 (278.8)	235.0 (293.8)	260.0 (325.0)	255.0 (318.8)	260.0 (325.0)

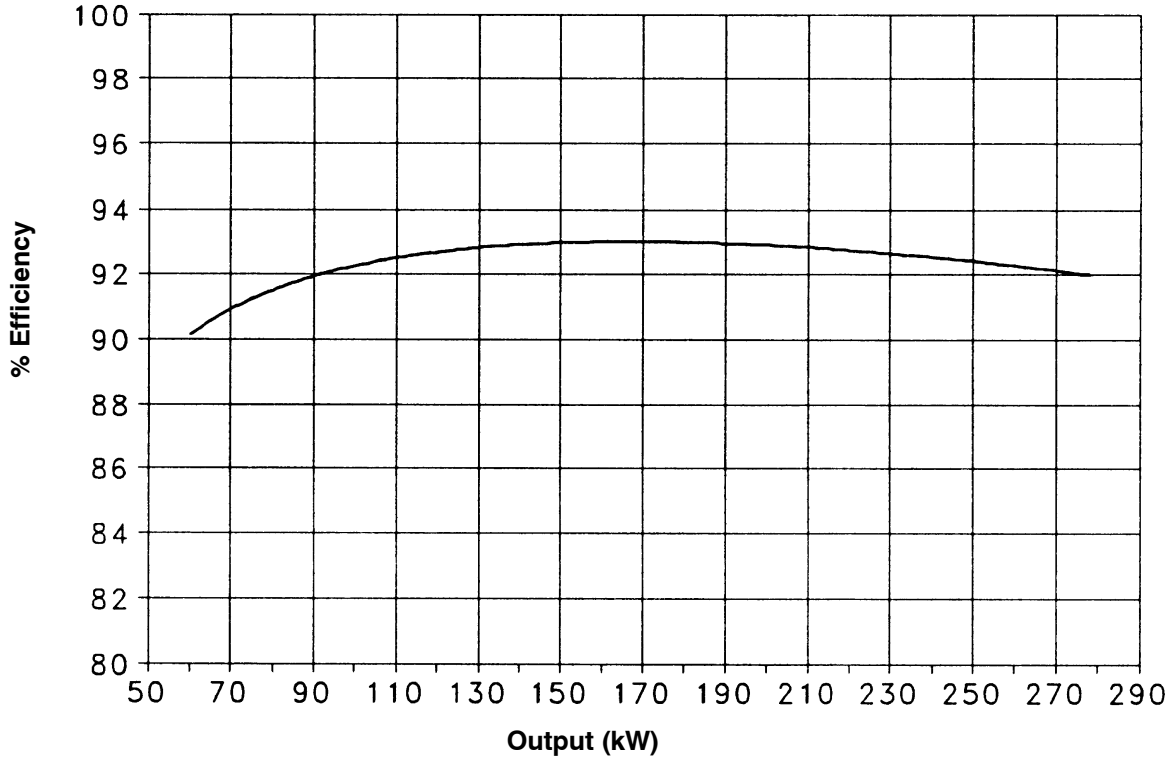
* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

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

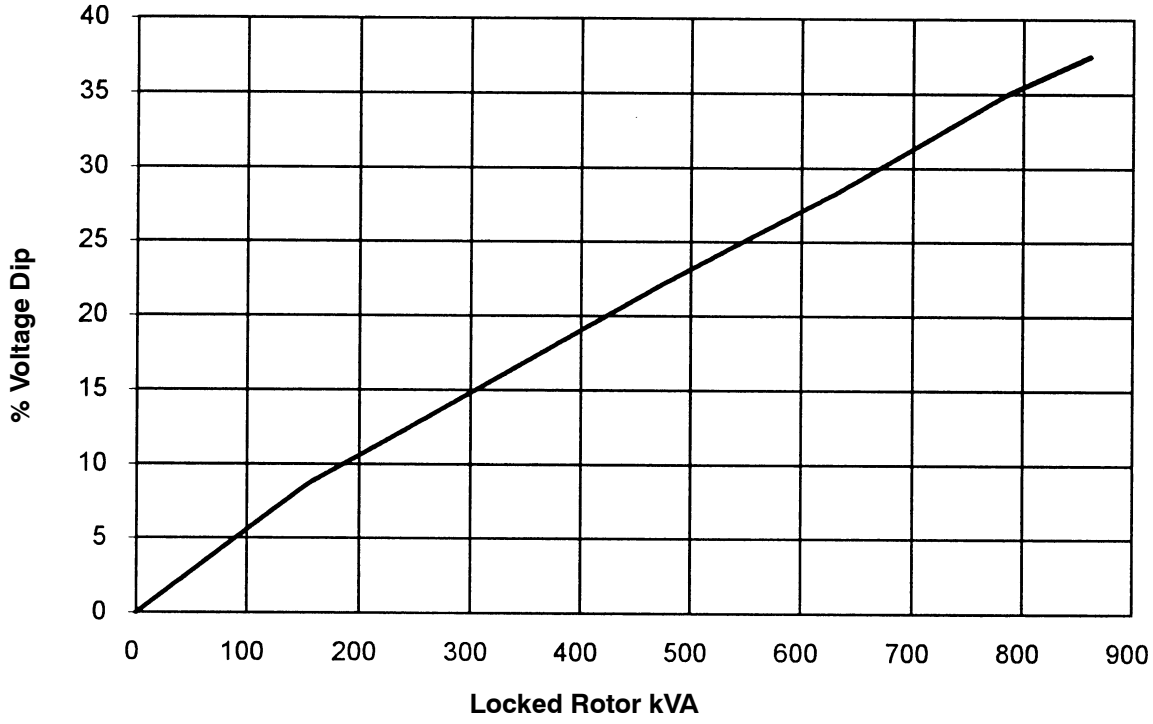
	Symbol	Per Unit	Ohms
Typical Resistances			
Phase Resistance		0.030	0.005
Rotor Resistance		11.202	1.877
Typical Reactances			
Synchronous			
Direct	X_d	4.097	0.686
Quadrature	X_q	2.131	0.357
Transient			
Unsaturated	X'_{du}	0.401	0.067
Saturated	X'_d	0.352	0.059
Subtransient			
Direct	X''_d	0.160	0.027
Quadrature	X''_q	0.155	0.026
Negative Sequence	X_2	0.158	0.026
Zero Sequence	X_0	0.015	0.002

	Symbol	Value
Typical Time Constants		
Armature Short Circuit	T_a	0.016 sec.
Transient Short Circuit	T'_d	0.171 sec.
Transient Open Circuit	T'_{do}	1.988 sec.
Typical Field Current		
Full Load	If_{FL}	35.76 amps
No Load	If_{NL}	8.45 amps
Typical Short Circuit Ratio		0.326
Harmonic Distortion		
RMS Total Harmonic Distortion		2.7%
Max. Single Harmonic		7^{th}
Deviation Factor (No Load, L-L)		4.3%
Telephone Influence Factor		<50
Insulation Material Class per NEMA MG1-1.66		H
Phase Rotation		ABC

4UA10, 60 Hz, 139/240, 277/480 Volts, Wye
TYPICAL ALTERNATOR EFFICIENCY*

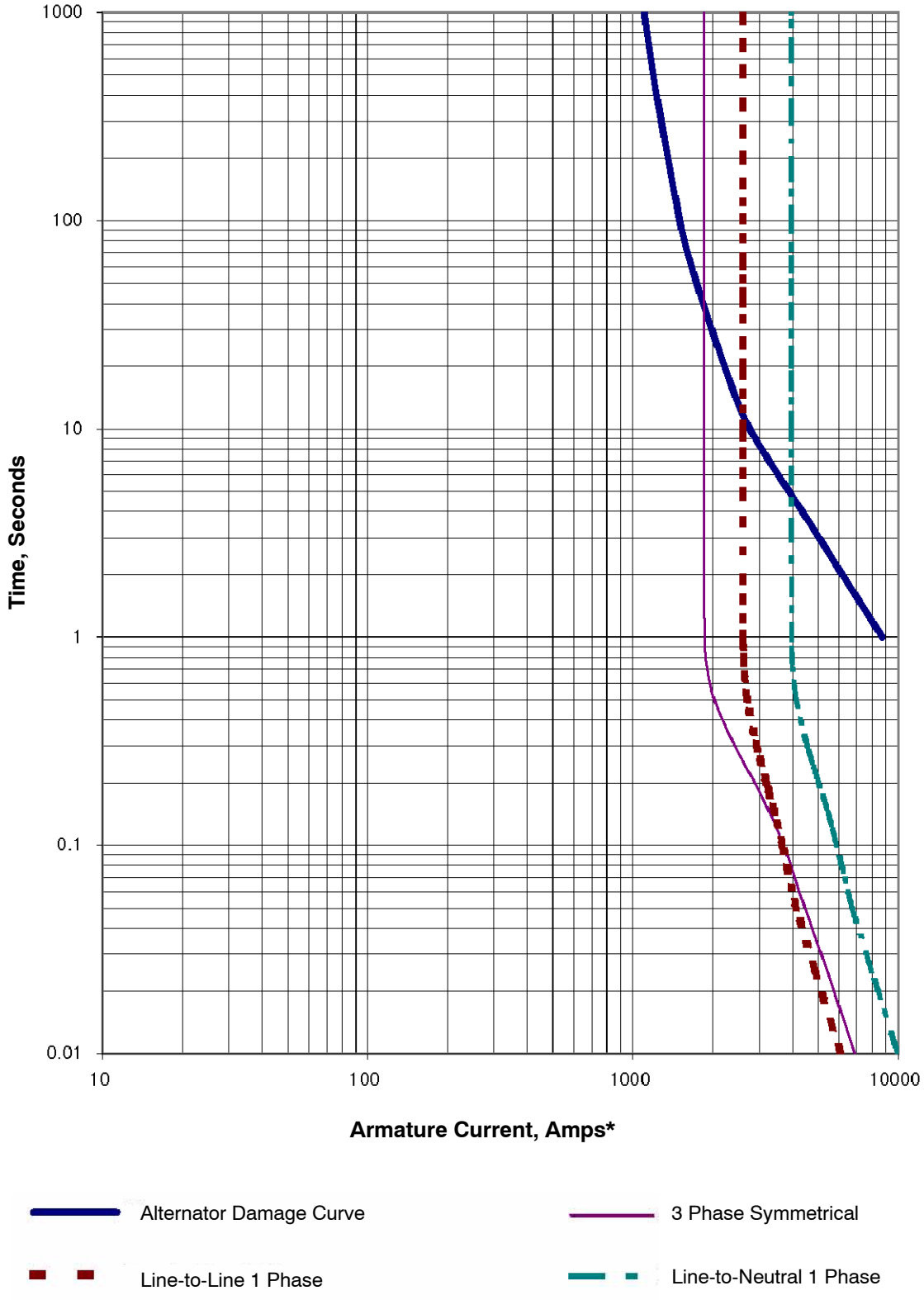


TYPICAL MOTOR STARTING CHARACTERISTICS*
4UA10, 60 Hz, 139/240, 277/480 Volts, Wye



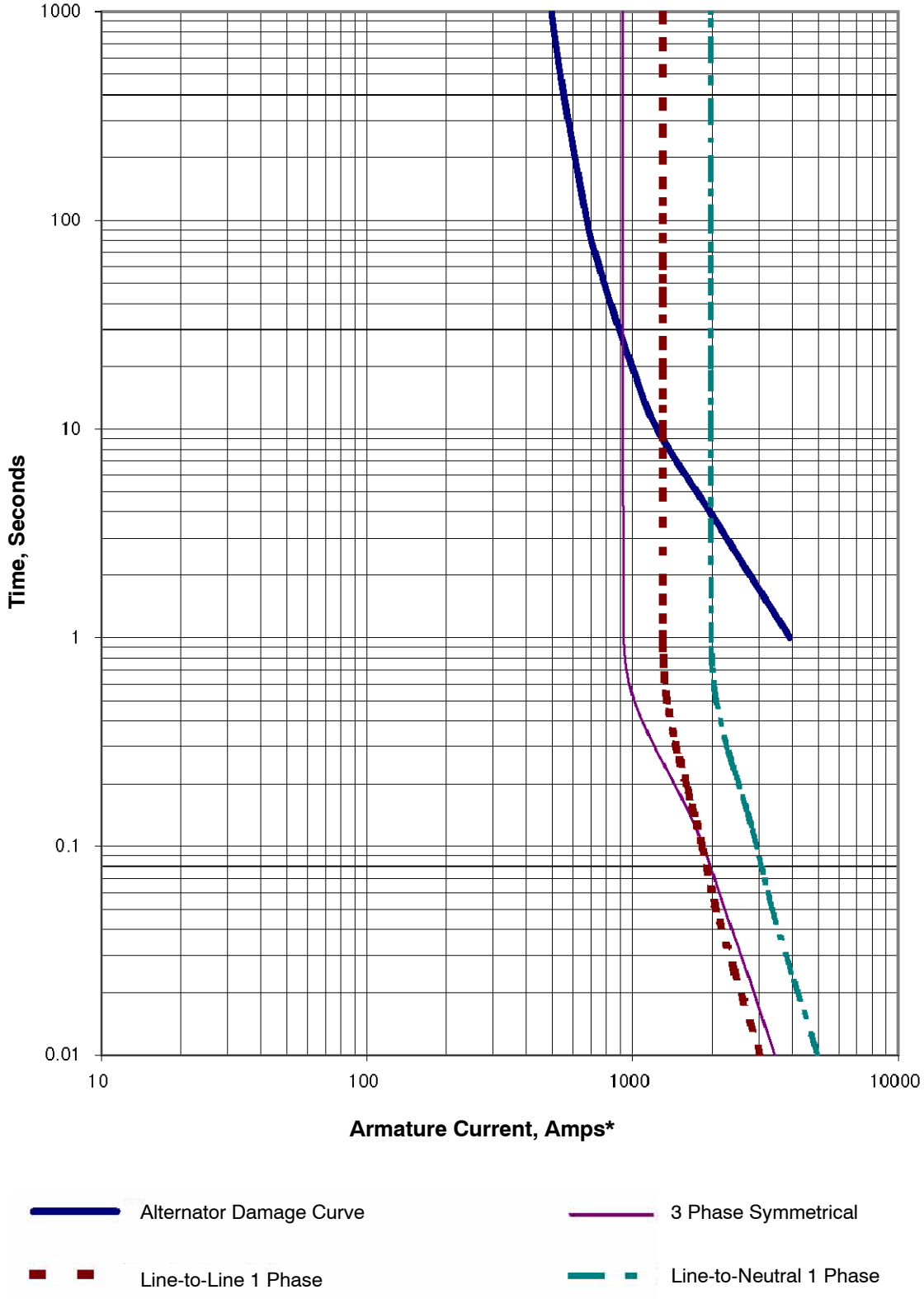
* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

4UA10, 60 Hz, Low Wye or Delta Connection
SHORT CIRCUIT DECREMENT CURVE



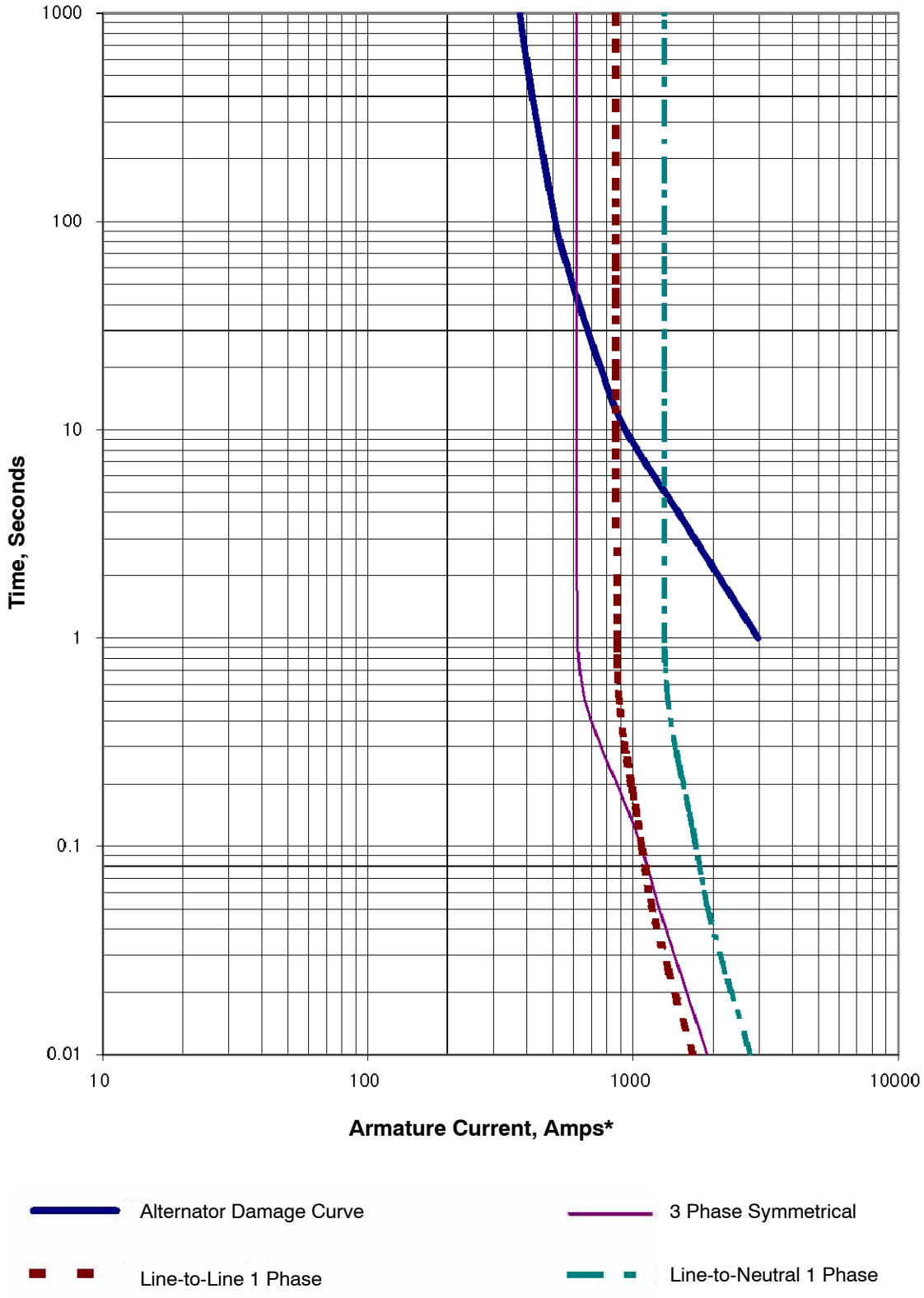
* Instantaneous current (t=0) is asymmetric. Divide by 1.732 for symmetric.

4UA10, 60 Hz, High Wye Connection
SHORT CIRCUIT DECREMENT CURVE



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

4UA10, 60 Hz, 600 V Connection
SHORT CIRCUIT DECREMENT CURVE



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

KOHLER®

Cooling Data

TECHNICAL INFORMATION BULLETIN

Generator Set Cooling System Data Sheet

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

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

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Sound Data

TECHNICAL INFORMATION BULLETIN

Generator Set Sound Data Sheet

			Sound Pressure Data in dB(A)			
Generator Set Model	**Hz**	**Load**	**Raw Exhaust**	**Open Unit, Isolated Exhaust**	**Weather Enclosure**	**Sound Enclosure**
250REOZJE	60	100% Load	116.5	91.7	89.8	75.2
		No Load	101.7	84.9	83.0	67.1

Note: Sound pressure data is the logarithmic average of eight perimeter measurement points at a distance of 7 m (23 ft.), except Raw Exhaust data which is a single measurement point at 1 m (3.3 ft.) from the mouth of a straight pipe exhaust.

250REOZJE	**60 Hz**

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

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

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Emissions Data

KOHLER®

250REOZJE

60 HZ. DIESEL INDUSTRIAL GENERATOR SET
EMISSION DATA SHEET

ENGINE INFORMATION

Model:	John Deere, 6090HF484B	Bore:	118.4mm (4.66 in.)
Nameplate BHP @ 1800 RPM:	385	Stroke:	136mm (5.35 in.)
Type:	4-Cycle, 6 Cylinder, Inline	Displacement:	9.0 L (548 cu. in.)
Aspiration:	Turbocharged, Charge Air-Cooled		
Compression Ratio	16.0:1	EPA Family:	RJDXL09.0114
		EPA Certificate:	RJDXL09.0114-007

Table 1

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

Table 2

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

Values are in g/kWh unless otherwise noted

TEST METHODS AND CONDITIONS

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

Data and specifications subject to change without notice.

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

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

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

Certificate Number: RJDXL09.0114-007

Effective Date: 09/29/2023

Expiration Date: 12/31/2024

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 09/29/2023

Revision Date: N/A

Model Year: 2024
Manufacturer Type: Original Engine Manufacturer
Engine Family: RJDXL09.0114

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

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

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

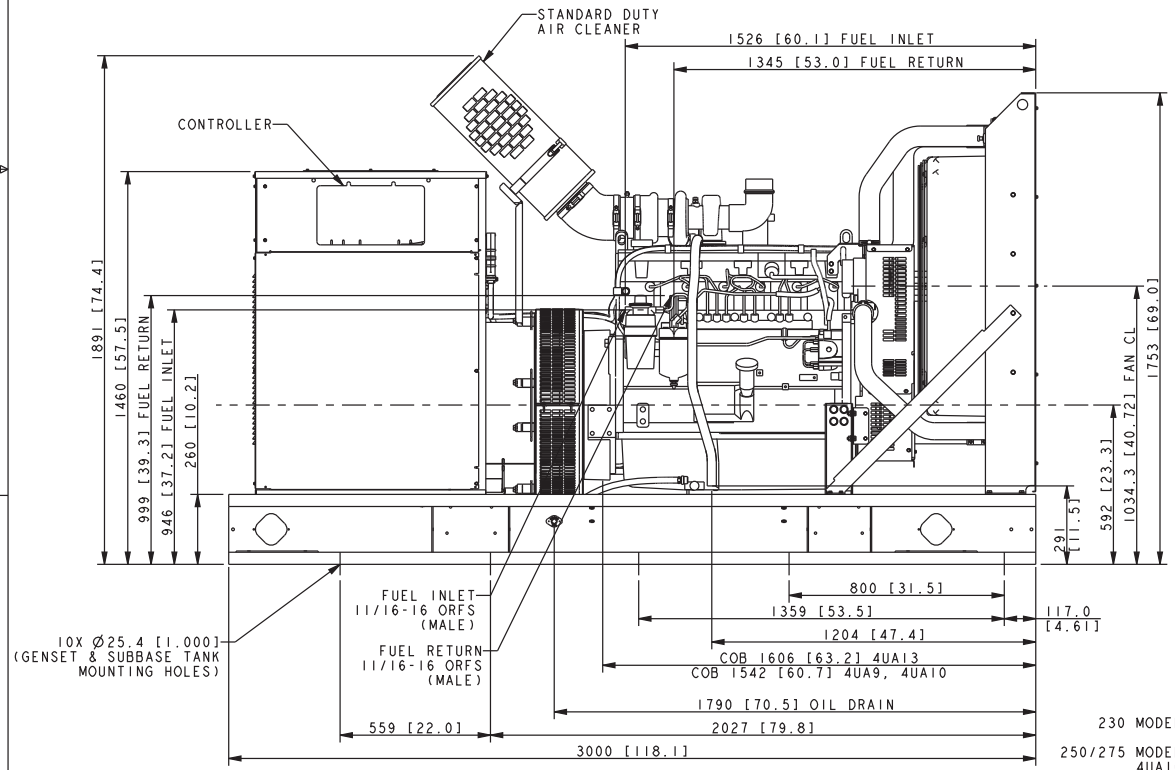
It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified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

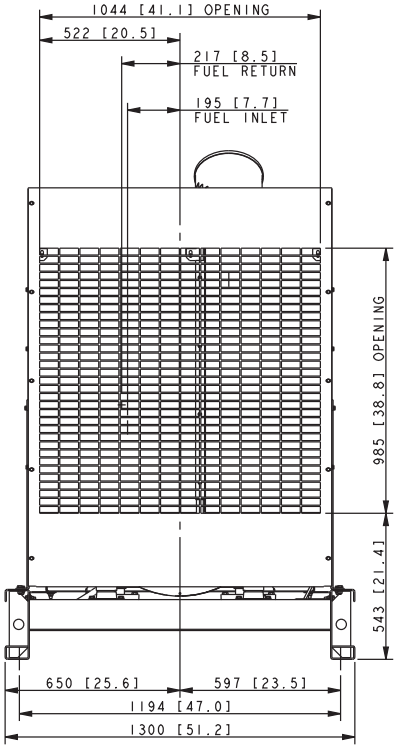
This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

KOHLER®

Dimensional Drawings

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





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

NOTES:

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

2) DIMENSIONS IN [] ARE ENGLISH EQUIVALENTS.

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

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

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

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

UNLESS OTHERWISE SPECIFIED: 1) DIMENSIONS ARE IN MILLIMETERS 2) TOLERANCES ARE: X ±1, X.X ±.5, X.XX ±.25, ANGLES ±1. SURFACE FINISH 125 MAX. THIRD ANGLE PROJECTION

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

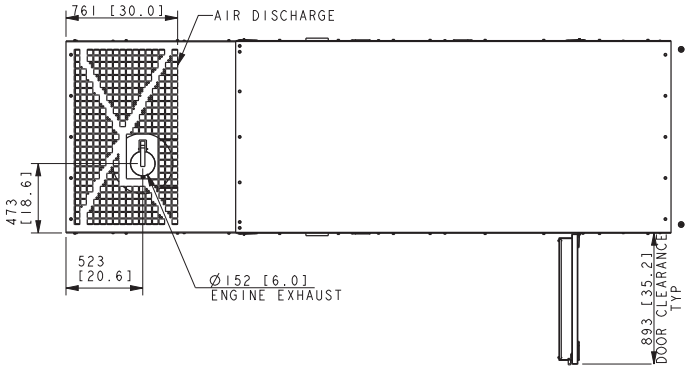
KOHLER CO. METRIC | PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

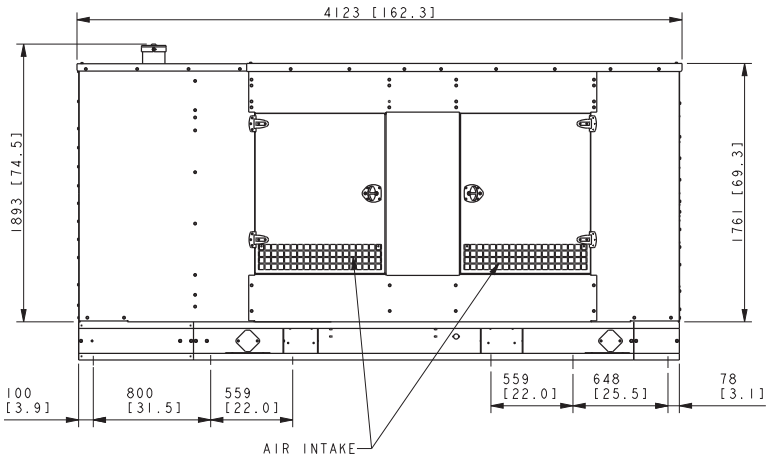
TITLE: DIMENSION PRINT, 230-300 JD

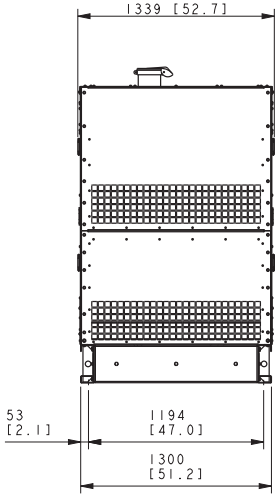
SCALE 0.11 | CAD NO. | SHEET 1 of 2

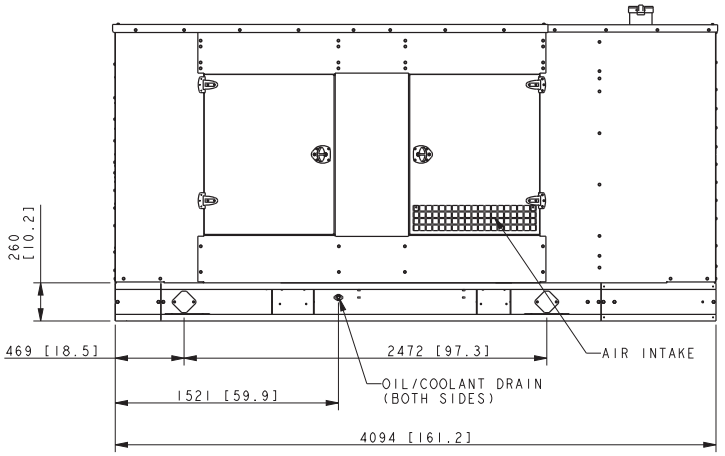
DWG NO. ADV-7900 | D

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









NOTE:

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

230-300 MODEL
JOHN DEERE TIER III

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

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

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

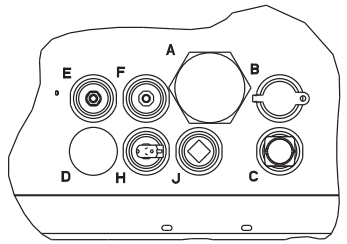
KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE
DIMENSION PRINT 230-300KW JD

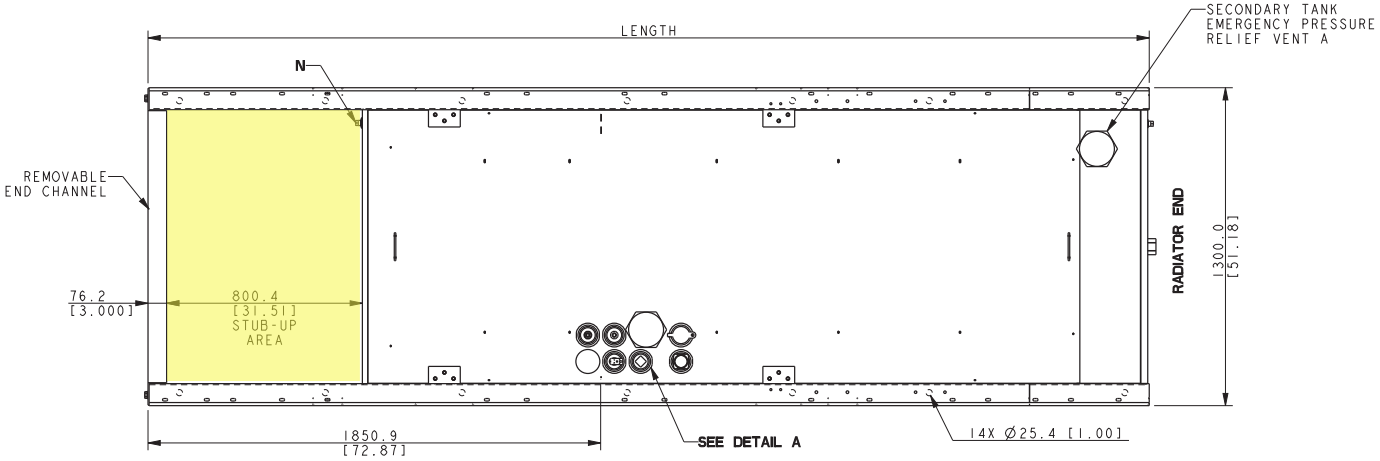
SCALE 0.06 | CAD NO. | SHEET 1 of 4
DWG NO. ADV-7644 | D

MODEL	CAPACITY L [GAL]	WEIGHT KG [LBS]	HEIGHT MM [IN]	LENGTH MM [IN]	EMERGENCY VENT (A) INNER / SECONDARY [IN]
230-275kW	1786 L [472 GAL]	911 KG [2009 LBS]	762 MM [30 IN]	4094 MM [161.2 IN]	4 / 4
300kW	2070 L [546 GAL]	939 KG [2070 LBS]	838.2 MM [33 IN]	4094 MM [161.2 IN]	4 / 5

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

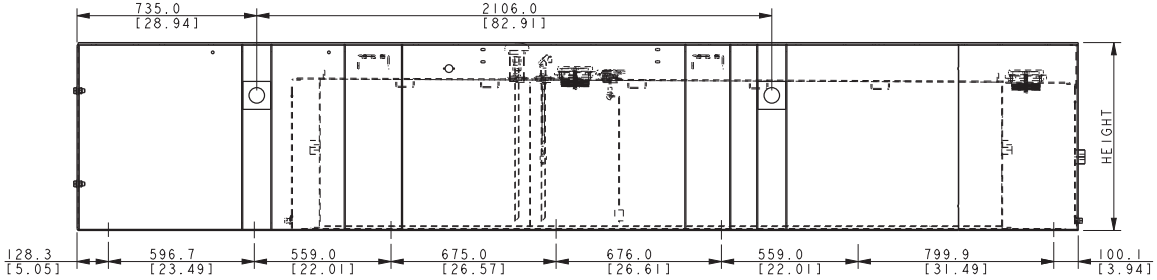


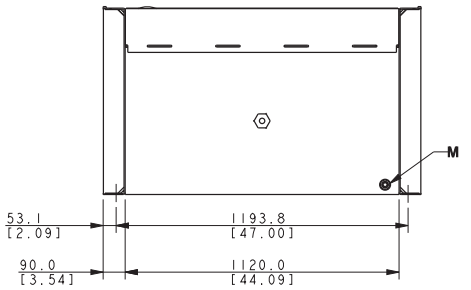
DETAIL A
SCALE 0.200



TANK FITTINGS:

- **A.** EMERGENCY VENT FITTING PER NFPA 30 WITH VENT CAPS (QTY 2).
- **B.** 2" NPT FUEL FILL FITTING WITH LOCKABLE CAP AND 2" RISER.
- **C.** 2" NPT FUEL LEVEL GAUGE FITTING WITH DIRECT READING MECHANICAL GAUGE.
- **D.** 2" NPT NORMAL VENT FITTING WITH MUSHROOM VENT CAP AND 5" RISER.
- **E.** 2" NPT FITTING FOR REMOVABLE ENGINE SUPPLY DIP TUBE (3/8" NPT FEMALE WITH CHECK VALVE).
- **F.** 2" NPT FITTING FOR REMOVABLE FUEL RETURN DIP TUBE (3/8" NPT FEMALE).
- **H.** 2" NPT FOR LOW LEVEL SWITCH (SET AT 50% FULL, SILICONE PACKED).
- **J.** 2" NPT ADDITIONAL FITTING FOR OPTIONAL ACCESSORY (INSTALL STEEL 2" NPT PIPE PLUG).
- **M.** 1/2" NPT BASIN DRAIN (INSTALL STEEL 1/2" NPT PIPE PLUG).
- **N.** 1/2" NPT FOR FUEL IN BASIN SWITCH (INSTALL STEEL 1/2" NPT PIPE PLUG).





NOTE:

FOR FURTHER TANK DETAIL
SEE INDIVIDUAL DRAWINGS.

230-300KW
JOHN DEERE TIER III
STANDARD CODE TANK

DIMENSIONS IN [ ] ARE ENGLISH EQUIVALENTS.

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
A	11-17-09	SEE SHEET 2 OF 2. (C-4) 14X Ø25.4 WAS 12X (A-6) 675.0 AND 676.0 ADDED. [88481]	GFR
B	10-7-10	(D-8) STANDARD TANK TABLE ADDED [90099-6]	RJS
C	12-2-11	VIEWS UPDATED [92417-5]	SDS
D	5-8-12	SEE SHEETS 2 & 3, SHEET 3 ADDED [CT13297]	JB2
E	10-21-15	SEE SHEET 3 OF 3. [CT128239]	GFR
F	11-17-17	(D-5) 546 GAL., SECONDARY VENT 5" WAS 4", TABLE	
		UPDATED [CT181456]	JB2
G	7-31-19	SEE SHEET 2 [CT197533]	PAS

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

APPROVALS		DATE
DRAWN	JB2	10-27-08
CHECKED	DCF	10-27-08
APPROVED	SLJ	10-27-08

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

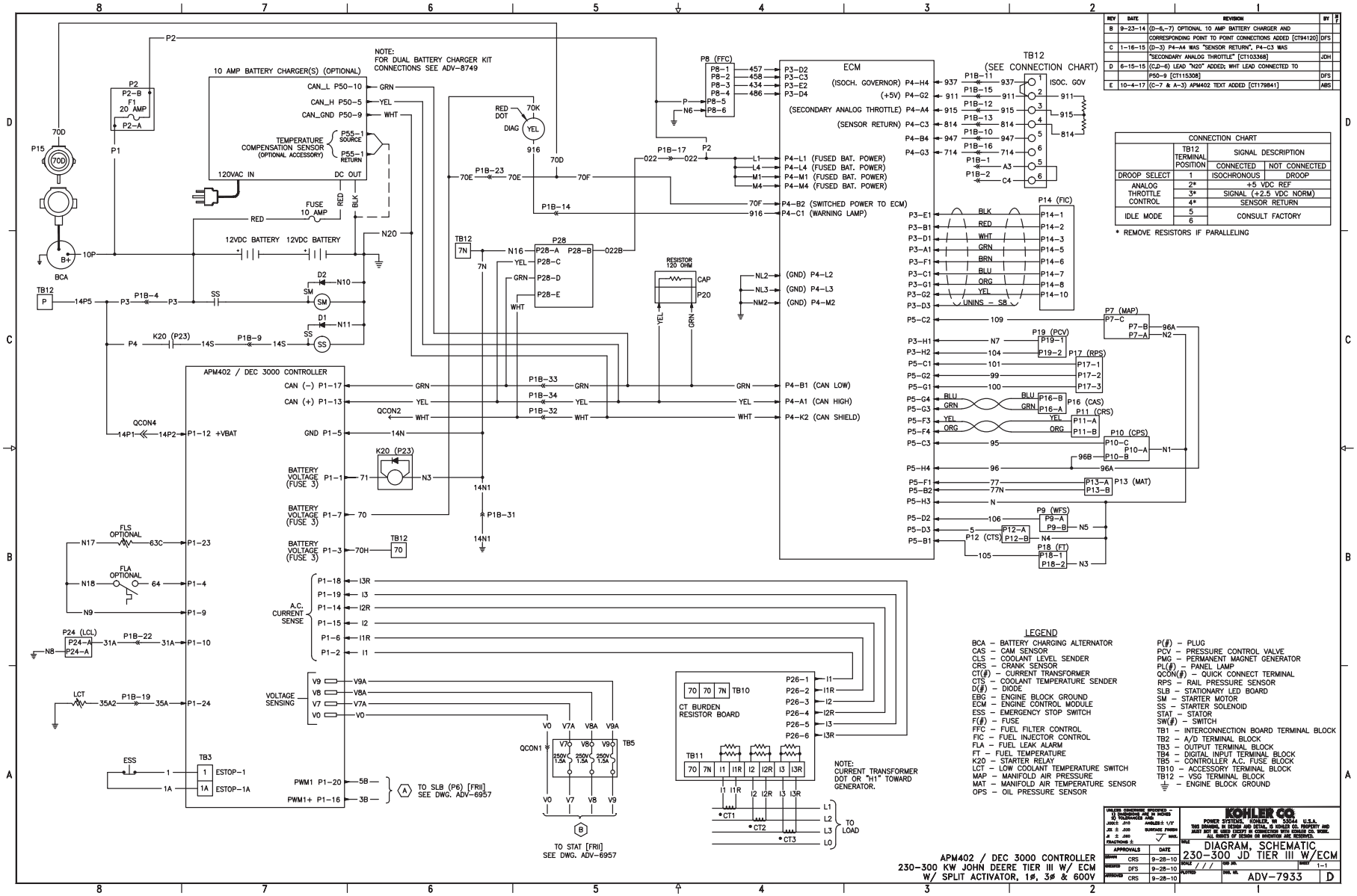
TITLE: **DIMENSION PRINT**

SCALE 0.10 | CAD NO. | SHEET 1 of 3

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

KOHLER®

Wiring Schematics



REV	DATE	REVISION	BY
B	9-23-14	(D-6,-7) OPTIONAL 10 AMP BATTERY CHARGER AND	
		CORRESPONDING POINT TO POINT CONNECTIONS ADDED [CT94120]	DFS
C	1-16-15	(D-3) P4-A4 WAS "SENSOR RETURN", P4-C3 WAS	
		"SECONDARY ANALOG THROTTLE" [CT103368]	JDH
D	6-15-15	(CJD-6) LEAD "N20" ADDED; WHT LEAD CONNECTED TO	
		P50-9 [CT115308]	DFS
E	10-4-17	(C-7 & A-3) APM402 TEXT ADDED [CT179841]	ABS

CONNECTION CHART			
	TB12 TERMINAL POSITION	SIGNAL DESCRIPTION	
		CONNECTED	NOT CONNECTED
DROOP SELECT	1	ISOCHRONOUS	DROOP
ANALOG THROTTLE CONTROL	2*	+5 VDC REF	
	3*	SIGNAL (+2.5 VDC NORM)	
	4*	SENSOR RETURN	
IDLE MODE	5	CONSULT FACTORY	
	6		

* REMOVE RESISTORS IF PARALLELING

LEGEND

BCA – BATTERY CHARGING ALTERNATOR
CAS – CAM SENSOR
CLS – COOLANT LEVEL SENDER
CRS – CRANK SENSOR
CT(#) – CURRENT TRANSFORMER
CTS – COOLANT TEMPERATURE SENDER
D(#) – DIODE
EBG – ENGINE BLOCK GROUND
ECM – ENGINE CONTROL MODULE
ESS – EMERGENCY STOP SWITCH
F(#) – FUSE
FFC – FUEL FILTER CONTROL
FIC – FUEL INJECTOR CONTROL
FLA – FUEL LEAK ALARM
FT – FUEL TEMPERATURE
K20 – STARTER RELAY
LCT – LOW COOLANT TEMPERATURE SWITCH
MAP – MANIFOLD AIR PRESSURE
MAT – MANIFOLD AIR TEMPERATURE SENSOR
OPS – OIL PRESSURE SENSOR
P(#) – PLUG
PCV – PRESSURE CONTROL VALVE
PMG – PERMANENT MAGNET GENERATOR
PL(#) – PANEL LAMP
QCON(#) – QUICK CONNECT TERMINAL
RPS – RAIL PRESSURE SENSOR
SLB – STATIONARY LED BOARD
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
TB12 – VSG TERMINAL BLOCK
⏚ – ENGINE BLOCK GROUND

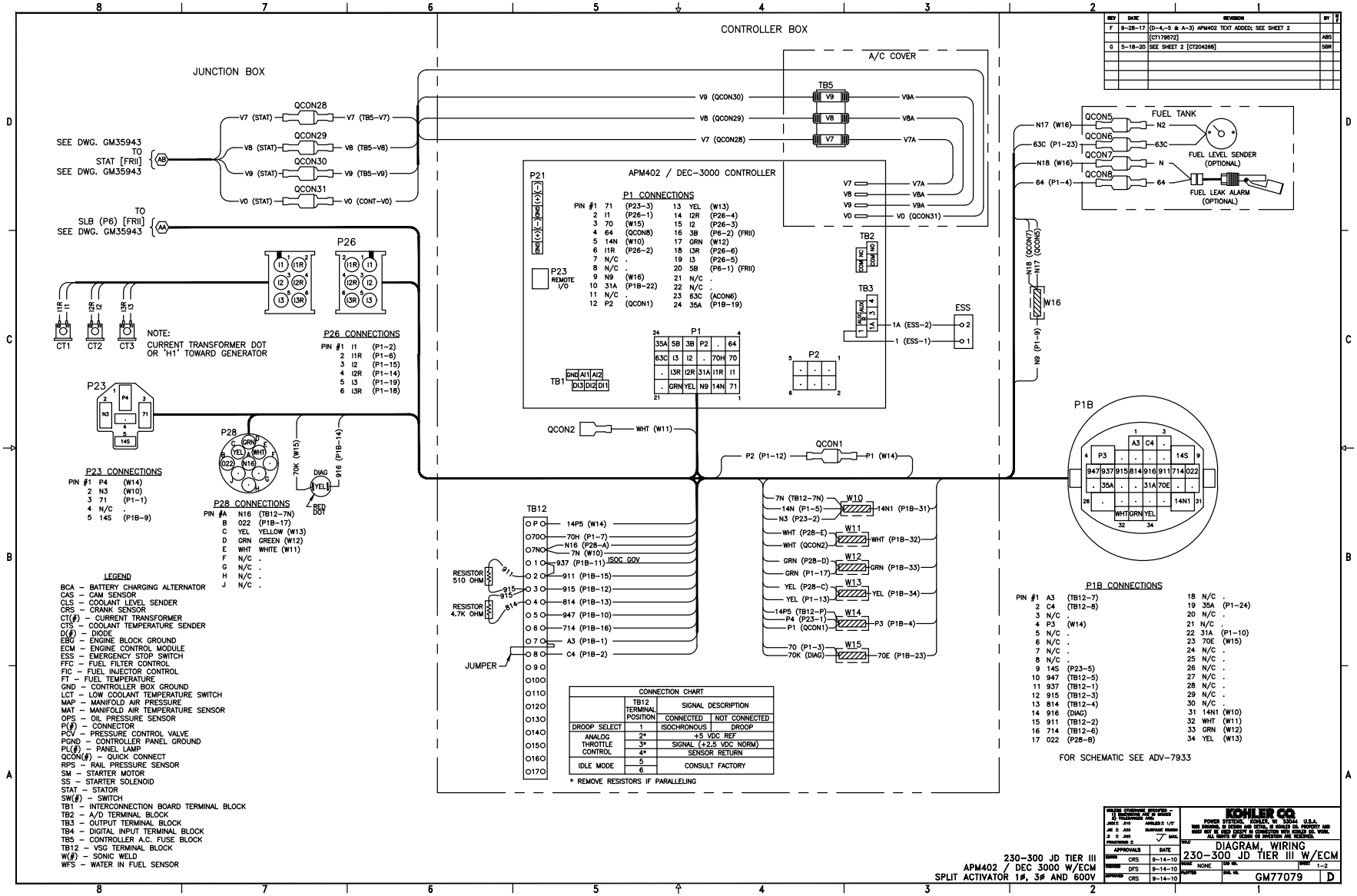
APM402 / DEC 3000 CONTROLLER
230–300 KW JOHN DEERE TIER III W/ ECM
W/ SPLIT ACTIVATOR, 1ø, 3ø & 600V

UNLESS OTHERWISE SPECIFIED – DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
.XXX ± .010 ANGLES ± 1/2°
.XX ± .020 SURFACE FINISH
.# ± .060 MAX.
FRACTIONS ±

APPROVALS	DATE
DRAWN CRS	9-28-10
DESIGNED DFS	9-28-10
APPROVED CRS	9-28-10

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

TITLE: DIAGRAM, SCHEMATIC
230–300 JD TIER III W/ECM
SCALE: NONE | DWG NO. | SHEET 1–1
PLOTTED | DWG. NO. ADV-7933 | D



LEGEND

BCA – BATTERY CHARGING ALTERNATOR
CAS – CAM SENSOR
CLS – COOLANT LEVEL SENDER
CRS – CRANK SENSOR
CT(#) – CURRENT TRANSFORMER
CTS – COOLANT TEMPERATURE SENDER
D(#) – DIODE
EBG – ENGINE BLOCK GROUND
ECM – ENGINE CONTROL MODULE
ESS – EMERGENCY STOP SWITCH
FFC – FUEL FILTER CONTROL
FIC – FUEL INJECTOR CONTROL
FT – FUEL TEMPERATURE
GND – CONTROLLER BOX GROUND
LCT – LOW COOLANT TEMPERATURE SWITCH
MAP – MANIFOLD AIR PRESSURE
MAT – MANIFOLD AIR TEMPERATURE SENSOR
OPS – OIL PRESSURE SENSOR
P(#) – CONNECTOR
PCV – PRESSURE CONTROL VALVE
PGND – CONTROLLER PANEL GROUND
PL(#) – PANEL LAMP
QCON(#) – QUICK CONNECT
RPS – RAIL PRESSURE SENSOR
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 – VSG TERMINAL BLOCK
W(#) – SONIC WELD
WFS – WATER IN FUEL SENSOR

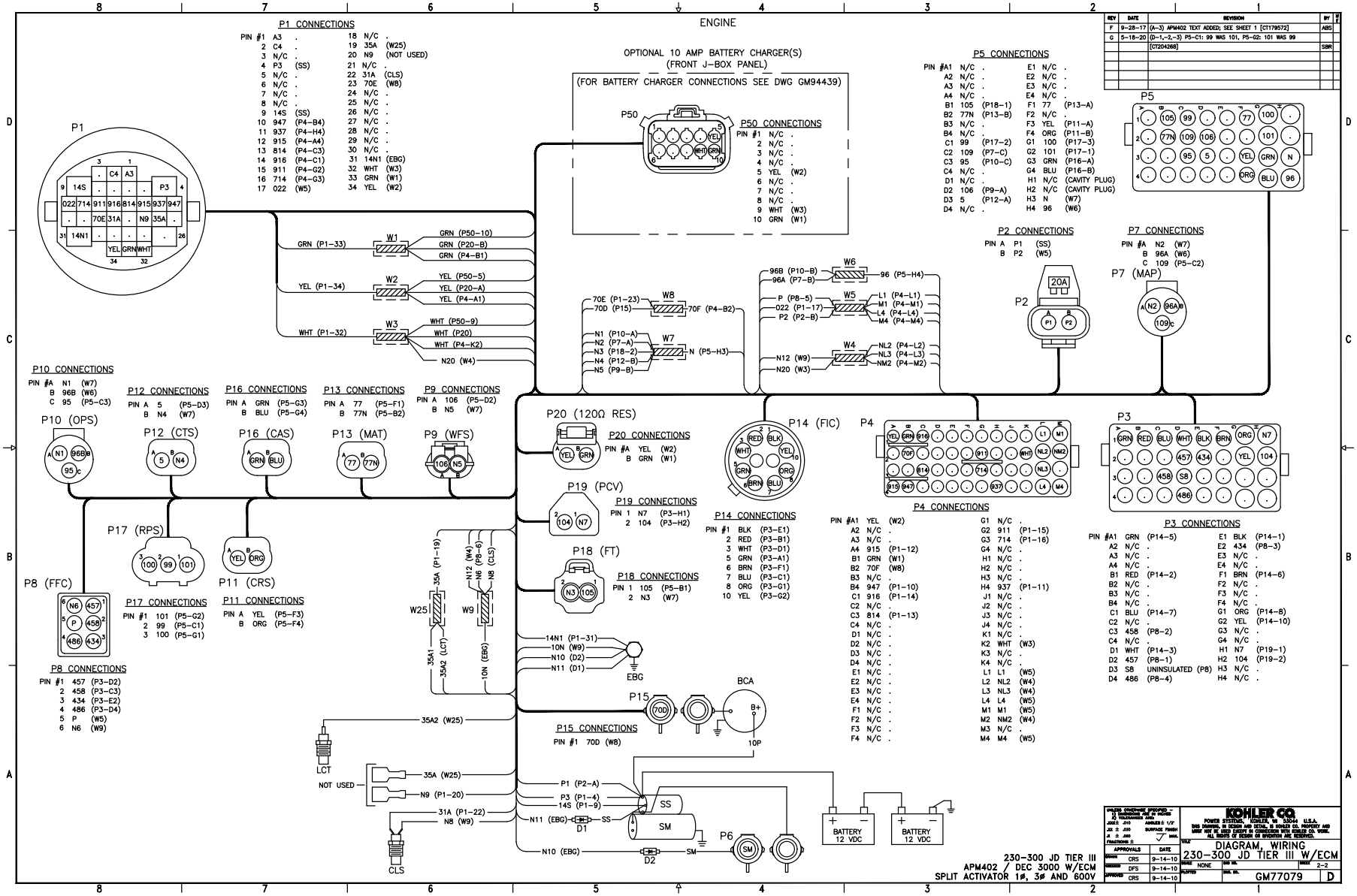
REV	DATE	REVISION	BY
F	9-28-17	(D-4,-5 & A-3) APM402 TEXT ADDED; SEE SHEET 2	
		[CT179572]	ABS
G	5-18-20	SEE SHEET 2 [CT204268]	SBR

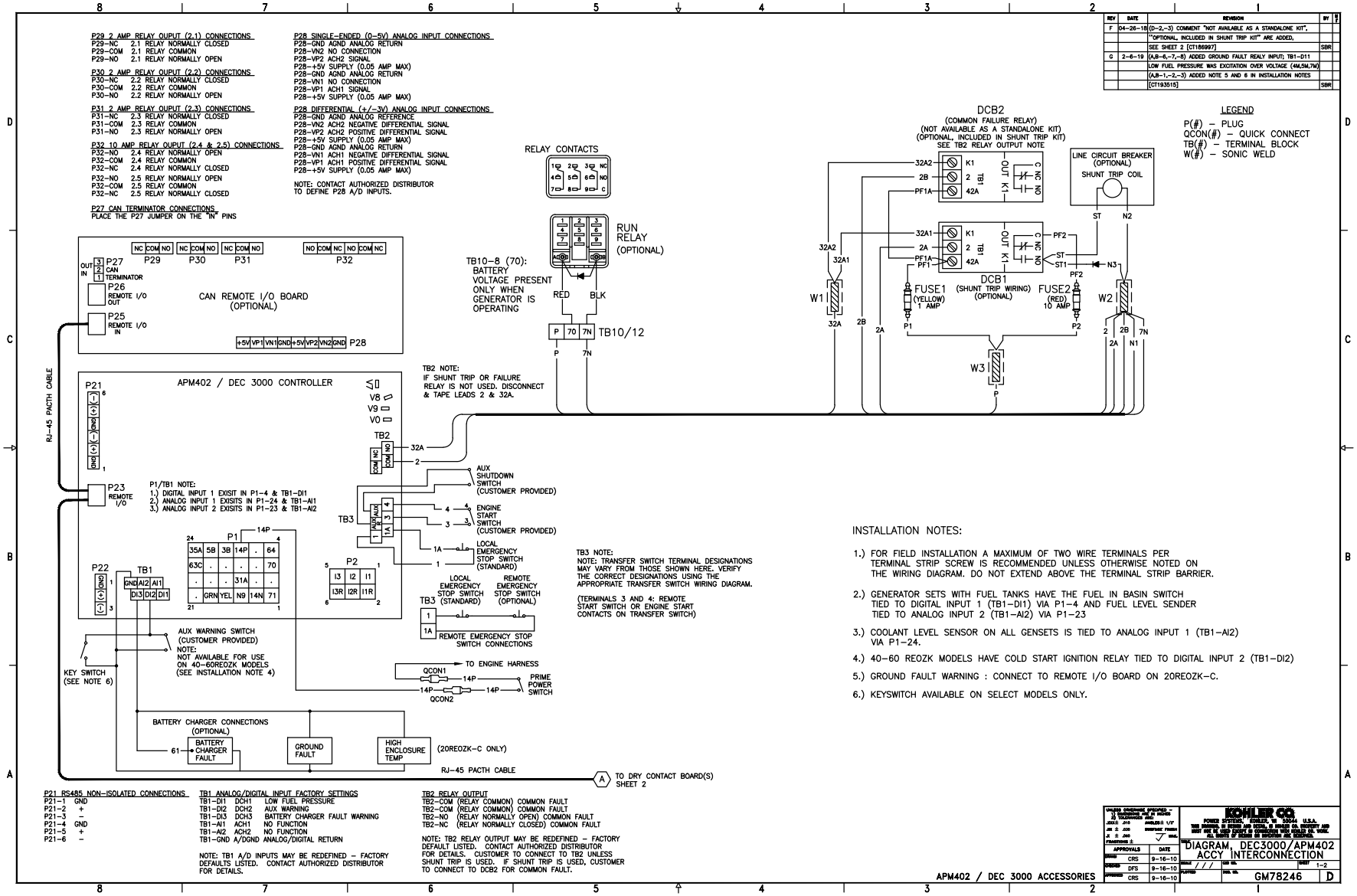
230-300 JD TIER III
APM402 / DEC 3000 W/ECM
SPLIT ACTIVATOR 1ø, 3ø AND 600V

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

APPROVALS	DATE
DRAWN CRS	9-14-10
CHECKED DFS	9-14-10
APPROVED CRS	9-14-10

TITLE: DIAGRAM, WIRING
230-300 JD TIER III W/ECM
SCALE: NONE
SHEET 1-2
DWG NO. GM77079
REV D

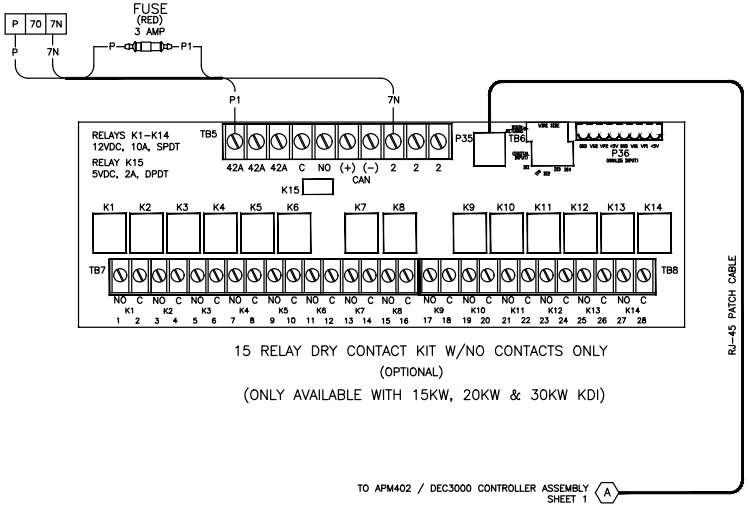

ENGINE
OPTIONAL 10 AMP BATTERY CHARGER(S)
(FRONT J-BOX PANEL)
(FOR BATTERY CHARGER CONNECTIONS SEE DWG GM94439)
P1 CONNECTIONS
PIN #1 A3 . 18 N/C .
2 C4 . 19 35A (W25)
3 N/C . 20 N9 (NOT USED)
4 P3 (SS) 21 N/C .
5 N/C . 22 31A (CLS)
6 N/C . 23 70E (W8)
7 N/C . 24 N/C .
8 N/C . 25 N/C .
9 14S (SS) 26 N/C .
10 947 (P4-B4) 27 N/C .
11 937 (P4-H4) 28 N/C .
12 915 (P4-A4) 29 N/C .
13 814 (P4-C3) 30 N/C .
14 916 (P4-C1) 31 14N1 (EBG)
15 911 (P4-G2) 32 WHT (W3)
16 714 (P4-G3) 33 GRN (W1)
17 022 (W5) 34 YEL (W2)
P50 CONNECTIONS
PIN #1 N/C .
2 N/C .
3 N/C .
4 N/C .
5 YEL (W2)
6 N/C .
7 N/C .
8 N/C .
9 WHT (W3)
10 GRN (W1)
P5 CONNECTIONS
PIN #A1 N/C . E1 N/C .
A2 N/C . E2 N/C .
A3 N/C . E3 N/C .
A4 N/C . E4 N/C .
B1 105 (P18-1) F1 77 (P13-A)
B2 77N (P13-B) F2 N/C .
B3 N/C . F3 YEL (P11-A)
B4 N/C . F4 ORG (P11-B)
C1 99 (P17-2) G1 100 (P17-3)
C2 109 (P7-C) G2 101 (P17-1)
C3 95 (P10-C) G3 GRN (P16-A)
C4 N/C . G4 BLU (P16-B)
D1 N/C . H1 N/C (CAVITY PLUG)
D2 106 (P9-A) H2 N/C (CAVITY PLUG)
D3 5 (P12-A) H3 N (W7)
D4 N/C . H4 96 (W6)
P2 CONNECTIONS
PIN A P1 (SS)
B P2 (W5)
P7 CONNECTIONS
PIN #A N2 (W7)
B 96A (W6)
C 109 (P5-C2)
P10 CONNECTIONS
PIN #A N1 (W7)
B 96B (W6)
C 95 (P5-C3)
P12 CONNECTIONS
PIN A 5 (P5-D3)
B N4 (W7)
P16 CONNECTIONS
PIN A GRN (P5-G3)
B BLU (P5-G4)
P13 CONNECTIONS
PIN A 77 (P5-F1)
B 77N (P5-B2)
P9 CONNECTIONS
PIN A 106 (P5-D2)
B N5 (W7)
P20 CONNECTIONS
PIN #A YEL (W2)
B GRN (W1)
P19 CONNECTIONS
PIN 1 N7 (P3-H1)
2 104 (P3-H2)
P18 CONNECTIONS
PIN 1 105 (P5-B1)
2 N3 (W7)
P14 CONNECTIONS
PIN #1 BLK (P3-E1)
2 RED (P3-B1)
3 WHT (P3-D1)
5 GRN (P3-A1)
6 BRN (P3-F1)
7 BLU (P3-C1)
8 ORG (P3-G1)
10 YEL (P3-G2)
P4 CONNECTIONS
PIN #A1 YEL (W2)
A2 N/C .
A3 N/C .
A4 915 (P1-12)
B1 GRN (W1)
B2 70F (W8)
B3 N/C .
B4 947 (P1-10)
C1 916 (P1-14)
C2 N/C .
C3 814 (P1-13)
C4 N/C .
D1 N/C .
D2 N/C .
D3 N/C .
D4 N/C .
E1 N/C .
E2 N/C .
E3 N/C .
E4 N/C .
F1 N/C .
F2 N/C .
F3 N/C .
F4 N/C .
G1 N/C .
G2 911 (P1-15)
G3 714 (P1-16)
G4 N/C .
H1 N/C .
H2 N/C .
H3 N/C .
H4 937 (P1-11)
J1 N/C .
J2 N/C .
J3 N/C .
J4 N/C .
K1 N/C .
K2 WHT (W3)
K3 N/C .
K4 N/C .
L1 L1 (W5)
L2 NL2 (W4)
L3 NL3 (W4)
L4 L4 (W5)
M1 M1 (W5)
M2 NM2 (W4)
M3 N/C .
M4 M4 (W5)
P3 CONNECTIONS
PIN #A1 GRN (P14-5) E1 BLK (P14-1)
A2 N/C . E2 434 (P8-3)
A3 N/C . E3 N/C .
A4 N/C . E4 N/C .
B1 RED (P14-2) F1 BRN (P14-6)
B2 N/C . F2 N/C .
B3 N/C . F3 N/C .
B4 N/C . F4 N/C .
C1 BLU (P14-7) G1 ORG (P14-8)
C2 N/C . G2 YEL (P14-10)
C3 458 (P8-2) G3 N/C .
C4 N/C . G4 N/C .
D1 WHT (P14-3) H1 N7 (P19-1)
D2 457 (P8-1) H2 104 (P19-2)
D3 S8 UNINSULATED (P8) H3 N/C .
D4 486 (P8-4) H4 N/C .
P8 CONNECTIONS
PIN #1 457 (P3-D2)
2 458 (P3-C3)
3 434 (P3-E2)
4 486 (P3-D4)
5 P (W5)
6 N6 (W9)
P17 CONNECTIONS
PIN #1 101 (P5-G2)
2 99 (P5-C1)
3 100 (P5-G1)
P11 CONNECTIONS
PIN A YEL (P5-F3)
B ORG (P5-F4)
P15 CONNECTIONS
PIN #1 70D (W8)
W1 GRN (P1-33) GRN (P50-10) GRN (P20-B) GRN (P4-B1)
W2 YEL (P1-34) YEL (P50-5) YEL (P20-A) YEL (P4-A1)
W3 WHT (P1-32) WHT (P50-9) WHT (P20) WHT (P4-K2) N20 (W4)
W8 70E (P1-23) 70D (P15) 70F (P4-B2)
W7 N1 (P10-A) N2 (P7-A) N3 (P18-2) N4 (P12-B) N5 (P9-B) N (P5-H3)
W6 96B (P10-B) 96A (P7-B) 96 (P5-H4)
W5 P (P8-5) 022 (P1-17) P2 (P2-B) L1 (P4-L1) M1 (P4-M1) L4 (P4-L4) M4 (P4-M4)
W4 N12 (W9) N20 (W3) NL2 (P4-L2) NL3 (P4-L3) NM2 (P4-M2)
W25 35A (P1-19) 35A1 35A2 (LCT)
W9 N12 (W4) N6 (P8-6) N8 (CLS) 10N (EBG)
14N1 (P1-31) 10N (W9) N10 (D2) N11 (D1) EBG
35A2 (W25) LCT
35A (W25) N9 (P1-20) NOT USED
31A (P1-22) N8 (W9) CLS
P1 (P2-A) P3 (P1-4) 14S (P1-9) N11 (EBG) D1 SS SM
N10 (EBG) D2 SM P6
BCA B+ 10P
BATTERY 12 VDC
BATTERY 12 VDC
230-300 JD TIER III
APM402 / DEC 3000 W/ECM
SPLIT ACTIVATOR 1ø, 3ø AND 600V
REV F 9-28-17 (A-3) APM402 TEXT ADDED; SEE SHEET 1 [CT179572] ABS
REV G 5-18-20 (D-1,-2,-3) P5-C1: 99 WAS 101, P5-02: 101 WAS 99 [CT204268] SBR
KOHLER CO.
POWER SYSTEMS / KOHLER, WI 53044 U.S.A.
DIAGRAM, WIRING
230-300 JD TIER III W/ECM
DRAWN CRS 9-14-10
CHECKED DFS 9-14-10
APPROVED CRS 9-14-10
SIZE D
GM77079 D
SHEET 2-2



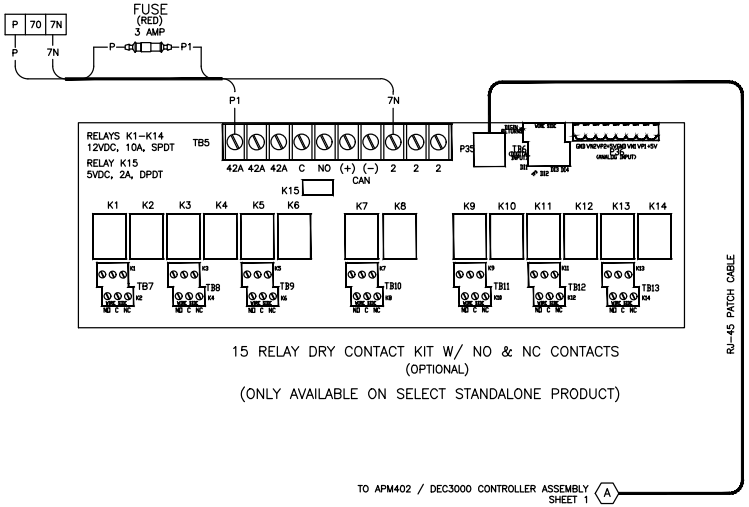
REV	DATE	REVISION	BY
F	04-26-18	(D-2,-3) COMMENT "NOT AVAILABLE AS A STANDALONE KIT",	
		"OPTIONAL, INCLUDED IN SHUNT TRIP KIT" ARE ADDED,	
		SEE SHEET 2 [CT186997]	SBR
G	2-6-19	(AJ-8-,-7,-8) ADDED GROUND FAULT REALY INPUT; TB1-DI1	
		LOW FUEL PRESSURE WAS EXCITATION OVER VOLTAGE (4M,5M,7M)	
		(AJ-8-1,-2,-3) ADDED NOTE 5 AND 6 IN INSTALLATION NOTES	
		[CT193515]	SBR

APPROVALS	DATE
CRS	9-16-10
DFS	9-16-10
CRS	9-16-10

REV	DATE	REVISION	BY	M F
F	04-26-18	(B-6,-2) COMMENT "APM402 / DEC 3000 ACCESSORIES" IS ADDED		
		SEE SHEET 1 [CT186997]	SBR	
G	2-6-19	SEE SHEET 1 [CT193515]	SBR	



15 RELAY DRY CONTACT KIT W/NO CONTACTS ONLY
(OPTIONAL)
(ONLY AVAILABLE WITH 15KW, 20KW & 30KW KDI)



15 RELAY DRY CONTACT KIT W/ NO & NC CONTACTS
(OPTIONAL)
(ONLY AVAILABLE ON SELECT STANDALONE PRODUCT)

APM402 / DEC 3000 ACCESSORIES

APPROVALS	DATE
DFS	9-18-15
CRS	9-18-15
DFS	9-18-15

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

TITLE: DIAGRAM, DEC3000/APM402 ACCY INTERCONNECTION

SCALE: /// DWG NO. GM78246 SHEET 2-2 D

KOHLER®

Miscellaneous

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

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

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

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

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

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

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

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

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

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

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

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

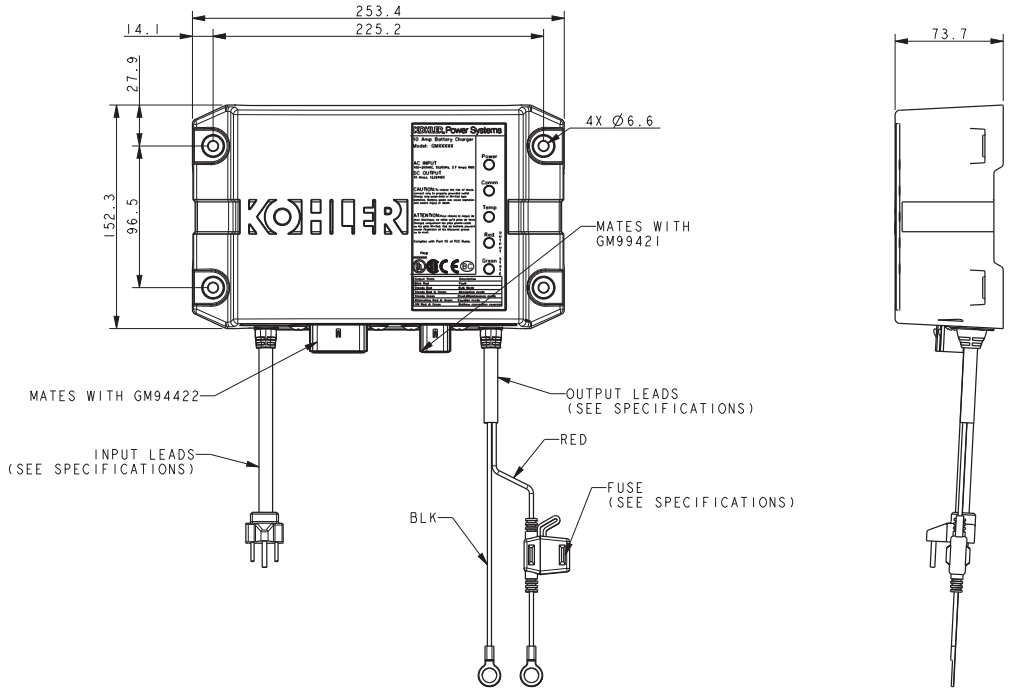
DOCUMENTATION:
THERE SHALL BE AN INSTALLATION / OPERATIONAL MANUAL SUPPLIED WITH EACH CHARGER. PER KOHLER SUPPLIED ARTWORK.

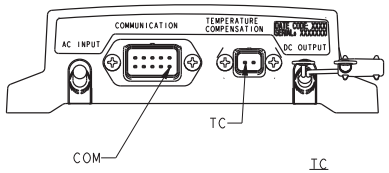
CERTIFICATIONS (US AND CANADA):
- UL1236
- CSA - C22.2 NO 107.2-01
- FCC- TITLE 47, PART 15 CLASS A
- CE
- EN 61000-6-2
- CEC AND DOE
- NFPA-110 LEVEL1 (WHEN SUPPORTED WITH APPLICABLE KOHLER CONTROLLER)
- IBC

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

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

WARRANTY:
2 YEAR FROM DATE OF PURCHASE FROM MANUFACTURE.





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

TC
PIN 1 TC SENSOR W1
2 TC SENSOR W2

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

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

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

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

TITLE
CHARGER, BATTERY 10 AMP

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

KOHLER®

Warranty

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

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

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

Extended warranty purchase must take place prior to expiration of standard warranty. Extended warranty is effective upon submission of purchase order in the online warranty system.

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

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

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

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

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

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

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

KOHLER®

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

TP-5561 9/23g

KOHLER®

Certification

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that:

Kohler Power Systems
N7650 Lakeshore Road
Sheboygan
Wisconsin
53083
USA

Holds Certificate No: **FM 727336**

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

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

For and on behalf of BSI:

Carlos Pitanga, Chief Operating Officer Assurance – Americas

Original Registration Date: 1995-02-28
Latest Revision Date: 2021-10-29

Effective Date: 2021-11-07
Expiry Date: 2024-11-06

...making excellence a habit.™

Certificate No: **FM 727336**

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

Original Registration Date: 1995-02-28

Latest Revision Date: 2021-10-29

Effective Date: 2021-11-07

Expiry Date: 2024-11-06

PROTOTYPE TEST REPORT

KOHLER

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

GENSET

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

Meets Rated Load

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

± 0.25 % Frequency Band
± 0.50 % Voltage Deviation

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

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

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

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

Complies with NFPA 110 Type 10

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

Complies

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

Complies

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

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

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

PROTOTYPE TEST REPORT

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

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

ALTERNATOR

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

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

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

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

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

Kohler Standby/Prime Generator Set Test Program

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

Prototype Testing

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

- Alternator temperature rise test per NEMA MG1-32.6. Standby and prime ratings of the alternator are established during this test.
- Maximum power test to assure that the prime mover and alternator have sufficient capacity to operate within specifications.
- Alternator overload test per NEMA MG1-32.8.
- Steady-state load test to ensure voltage regulation meets or exceeds ANSI C84.1, NEMA MG1-32.17 requirements and to verify compliance with steady-state speed control specifications.
- Transient test to verify speed controls meets or exceeds specifications.
- Transient load tests per NEMA MG1-32.18, and ISO 8528 to verify specifications of transient voltage regulation, voltage dip, voltage overshoot, recovery voltage, and recovery time.
- Motor starting tests per NEMA MG1-32.18.5 to evaluate capabilities of generator, exciter, and regulator system.
- Three-phase symmetrical short-circuit test per NEMA MG1-32.13 to demonstrate short circuit performance, mechanical integrity, ability to sustain short-circuit current.
- Harmonic analysis, voltage waveform deviation per NEMA MG1-32.10 to confirm that the generator set is producing clean voltage within acceptable limits.
- Generator set cooling and air flow tests to verify maximum operating ambient temperature.
- Reliability tests to demonstrate product durability, followed by root cause analysis of discovered failures and defects. Corrective action is taken to improve the design, workmanship, or components.
- Acoustical noise intensity and sound attenuation effects tests.

Production Testing

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

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

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

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

KOHLER®

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

G18-56 12/05b