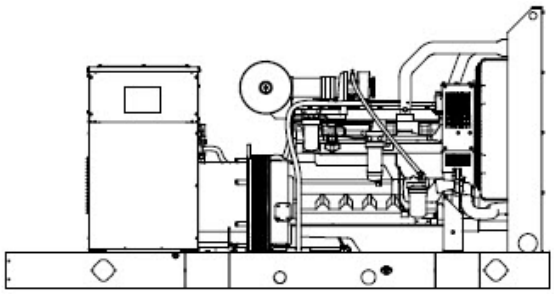
**Woodstock Power Company**
4055 Richmond Street
Philadelphia, PA 19137
**P:** 610-658-3242
**E:** sales@woodstockpower.com
**W:** www.woodstockpower.com

## Generator



Kohler Model: 150REOZJF

This diesel generator set equipped with a 4S12X alternator operating at 120/208 volts is rated for 154 kW/193 kVA. Output amperage: 534

### Standard Features:

- Discovery Energy, LLC and its affiliates dba Rehlko 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.
- A one-year limited warranty covers all systems and components. Two- and five-year extended warranties are also available.
- Tier 3 EPA-certified for Stationary Emergency Applications
- Alternator Protection
- Battery Rack and Cables
- Customer Connection (standard with Decision-Maker&#65533; 6000 controller only)
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Lit

### Other Features:

- Rehlko 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.

### Alternator Features:

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

**Woodstock Power Company**
4055 Richmond Street
Philadelphia, PA 19137
**P:** 610-658-3242
**E:** sales@woodstockpower.com
**W:** www.woodstockpower.com

| Qty | Description |
|---|---|
| | 150REOZJF Generator System |
| 1 | 150REOZJF Generator Set |

Includes the following:

| | |
|---|---|
| Literature Languages | English |
| Approvals and Listings | UL2200 Listing |
| Engine | 150REOZJF, 12V, 60Hz |
| Nameplate Rating | Standby 130C Rise |
| Voltage | 60Hz, 120/208V, Wye, 3Ph, 4W |
| Alternator | 4S12X |
| Cooling System | Unit Mounted Radiator, 50C |
| Skid and Mounting | Skid, 44" |
| 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 | 298 Gallons |
| Starting Aids, Installed | 1800W,110-120V |
| Electrical Accy.,Installed | Battery, 1/12V, Wet,Battery Charger, 10A,Run Relay,2 Input/5 OutputModule |
| Rating, LCB 1 | 100% Rated |
| Amps, LCB 1 | 600 |
| Trip Type, LCB 1 | Electronic, LSI |
| Interrupt Rating LCB 1 | 35kA at 480V |
| Fuel Lines, Installed | Flexible Fuel Lines |
| Miscellaneous Accy,Installed | Air Cleaner Restriction Ind.,Coolant in Genset,Rodent Guards,Skid Extension & Caps |
| Warranty | Standard |
| Testing, Additional | Power Factor Test,0.8,3Ph Only |

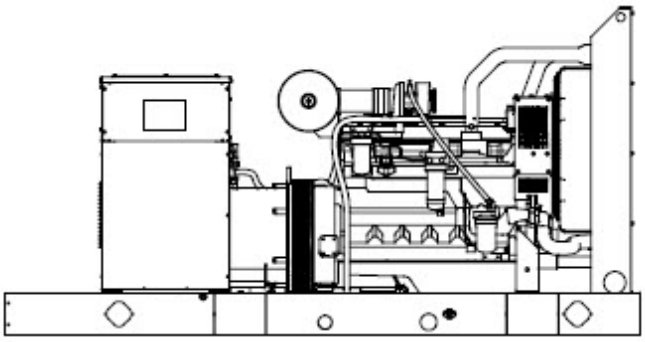
| | |
|---|---|
| 1 | NEC Remote, E-Stop |
| 1 | Lit Kit, 150REOZJF,General Maintenance |

rehlko

# Spec Sheets

rehlko

150REOZJF
Diesel



## Standard Features

- Discovery Energy, LLC and its affiliates dba Rehlko 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.
- A one-year limited warranty covers all systems and components. Two- and five-year extended warranties are also available.
- Tier 3 EPA-certified for Stationary Emergency Applications
- Alternator Protection
- Battery Rack and Cables
- Customer Connection (standard with Decision-Maker® 6000 controller only)
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Literature

## Alternator Features

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

## Other Features

- Rehlko 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 protection of selected priority loads.

## Generator Set Rating

Standby 130C Rise Ratings

| Alternator | Voltage | Ph | Hz | Peak kVA | kW/kVA | Amps |
|---|---|---|---|---|---|---|
| 4S12X | 120/208 | 3 | 60 | 360 | 154/193 | 534 |

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor.
Standby Ratings: The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating.

# Model: 150REOZJF, continued

## Alternator Specifications

| Specifications | Alternator |
|---|---|
| Alternator manufacturer | Rehlko |
| Type | 4-Pole, Rotating-Field |
| Exciter type | Brushless, Rare-Earth Permanent-Magnet |
| Leads, quantity | 4RX: 12, Reconnectable 4TX: 4, 120-240 |
| Voltage regulator | Solid State, Volts/Hz |
| Insulation | NEMA MG1 |
| Insulation: Material | Class H |
| Insulation: Temperature Rise | 130°C, Standby |
| Bearing: quantity, type | 1, Sealed |
| Coupling | Flexible disc |
| Amortisseur windings | Full |
| Voltage regulation, no-load to full-load RMS | Controller Dependent |
| 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.

## Engine

### Engine Specification

| | |
|---|---|
| Engine Manufacturer | John Deere |
| Engine Model | 6068HF285K |
| Engine: type | 4-Cycle, Turbocharged, Charge Air-Cooled |
| Cylinder arrangement | 6 Inline |
| Displacement, L (cu. in.) | 6.8 (415) |
| Bore and stroke, mm (in.) | 106 x 127 (4.19 x 5.00) |
| Compression ratio | 17.0:1 |
| 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) | 177 (237) |
| 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 L16 Denso HP3 |
| Frequency regulation, no-load to-full load | Isochronous |
| Frequency regulation, steady state | ±0.25% |
| Frequency | Fixed |
| Air cleaner type, all models | Dry |

# Model: 150REOZJF, continued

## Exhaust

### Exhaust System

| | |
|---|---|
| Exhaust Manifold Type | Dry |
| Exhaust flow at rated kW, m3/min. (cfm) | 33.9 (1197) |
| Exhaust temperature at rated kW, dry exhaust, °C (°F) | 510 (950) |
| Maximum allowable back pressure, kPa (in. Hg) | 7.5 (2.2) |

## Engine Electrical

### Engine Electrical System

| | |
|---|---|
| Battery charging alternator | 12 Volt/24 Volt |
| Battery charging alternator: Ground (negative/positive) | Negative |
| Battery charging alternator: Volts (DC) | 24-Dec |
| Battery charging alternator: Ampere rating | 65/45 |
| Starter motor rated voltage (DC) | 24-Dec |
| Battery, recommended cold cranking amps (CCA): Qty., CCA rating each | One, 640/Two, 570 |
| Battery voltage (DC) | 12 |

## Fuel

### Fuel System

| | |
|---|---|
| Fuel type | Diesel |
| Fuel supply line, min. ID, mm (in.) | 11.0 (0.44) |
| Fuel return line, min. ID, mm (in.) | 6.0 (0.25) |
| Max. lift, fuel pump: type, m (ft.) | Electronic 1.8 (6.0) |
| Max. fuel flow, Lph (gph) | 96.9 (25.6) |
| Max. return line restriction, kPa (in. Hg) | 20 (5.9) |
| Fuel prime pump | Manual |
| Fuel Filter Secondary | 2 Microns @ 98% Efficiency |
| Fuel Filter Primary | 30 Microns |
| Recommended fuel | #2 Diesel/HVO/RD |

## Lubrication

### Lubrication System

| | |
|---|---|
| Type | Full Pressure |
| Oil pan capacity, L (qt.) | 27.0 (28.5) |
| Oil pan capacity with filter, L (qt.) | 27.9 (29.5) |
| Oil filter: quantity, type | 1, Cartridge |
| Oil cooler | Water-Cooled |

## Cooling

### Radiator System

| | |
|---|---|
| Ambient temperature, °C (°F) | 50 (122) |
| Engine jacket water capacity, L (gal.) | 11.3 (3.0) |
| Radiator system capacity, including engine, L (gal.) | 25.7 (6.8) |
| Engine jacket water flow, Lpm (gpm) | 174 (46) |
| Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.) | 76.3 (4340) |
| Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.) | 31.8 (1810) |
| Water pump type | Centrifugal |
| Fan diameter, including blades, mm (in.) | 660 (26) |
| Fan, kWm (HP) | 7.7 (10.3) |
| Max. restriction of cooling air, intake and discharge side of radiator, kPA (in. H20) | 0.125 (0.5) |

* Enclosure with internal silencer reduces ambient temperature capability by 5°C (9°F).

## Operation Requirements

### Air Requirements

| | |
|---|---|
| Radiator-cooled cooling air, m3/min. (scfm) * | 226.5 (8000) |
| Combustion air, m3/min. (cfm) | 13.6 (480) |
| Heat rejected to ambient air: Engine, kW (Btu/min.) | 35.9 (2040) |
| Heat rejected to ambient air: Alternator, kW (Btu/min.) | 12.3 (700) |

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

## Fuel Consumption

| Diesel, Lph (gph), at % load | Rating |
|---|---|
| Standby Fuel Consumption at 100% load | 44.3 Lph (11.7 gph) |
| Standby Fuel Consumption at 75% load | 35.1 Lph (9.3 gph) |
| Standby Fuel Consumption at 50% load | 26.3 Lph (6.9 gph) |
| Standby Fuel Consumption at 25% load | 16.2 Lph (4.3 gph) |




**APM402**

# 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™.
- 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.


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## 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™
- 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 o 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™)


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## 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 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 * | o | |
| ECM communication loss | | ● |
| ECM diagnostics | ● | ● |
| Engine over speed | | ●† |
| Engine start aid active | | |
| Engine under speed | | ● |
| Fuel tank leak * | o | o |
| High battery voltage | ● | |
| High coolant temperature | ● | ●† |
| High fuel level * | o | |
| Low battery voltage | ● | |
| Low coolant level | | ● |
| Low coolant temperature | ● | |
| Low cranking voltage | ● | |
| Low engine oil level * | o | o |
| Low fuel level (diesel models) * | o | o |
| Low fuel pressure (gas models) * | o | |
| Low oil pressure | ● | ●† |
| No coolant temperature signal | | ● |
| No oil pressure signal | | ● |
| Overcrank | | ●† |
| Speed sensor fault | ● | |
| **General Functions** | | |
| Alarm horn silenced | | |
| Analog inputs | o | o |
| Battery charger fault * | ● | |
| Chicago code active * | | |
| Common fault (includes †) | | ● |
| Common warning | ● | |
| Digital inputs | o | o |
| 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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| Controller Displays as Provided by the Engine ECM | Engine Manufacturer (and Model) | | | | | | |
|---|---|---|---|---|---|---|---|
| | KDI M, TM* | KDI TCR | KG2204, KG2204T | KG4V06T, KG6208, KG6208T, KG10V08, KG10V08T | GM and PSI/Doosan | John Deere | Volvo |
| Intake air pressure | | | | | | | D |
| Intake air | | 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 Remote Serial Annunciator (RSA) enables the operator to monitor the status of the generator set from a remote location, which may be required for NFPA 99 and NFPA 110 installations, and up to four Automatic transfer switches.
- ❑ **Run Relay** provides a relay indicating that the generator set is running.
- ❑ **Shunt Trip Wiring** provides relay outputs to trip a shunt trip circuit breaker and to signal the common fault shutdowns. Contacts rated at 10 amps at 28 VDC or 120 VAC.
- ❑ **Two Input/Five Output Module** provides a generator set mounted panel with two inputs and five relay outputs.

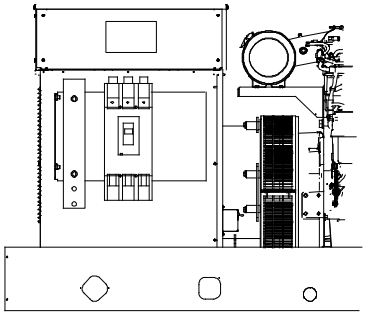
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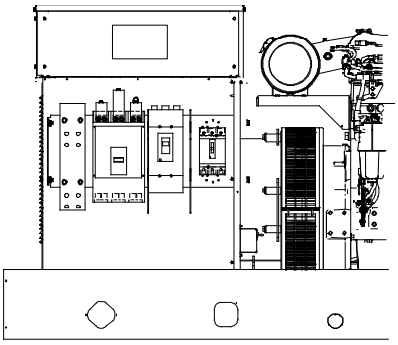

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# Industrial Generator Set Accessories

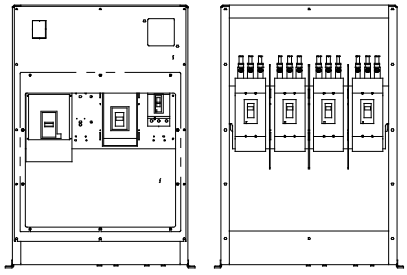
## Line Circuit Breakers 15-3250 kW



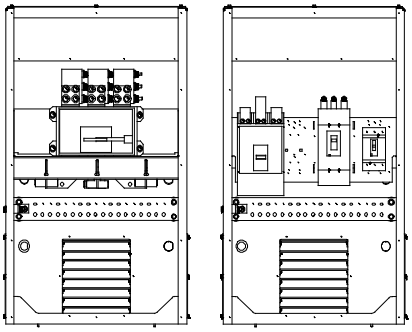
**Single Circuit Breaker Kit with Neutral Bus Bar 15-300 kW Model Shown**



**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 700-3250 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.
- Rehlko 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


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# 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.


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# 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 Operated | | | |
|---|---|---|---|
| **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 these breakers. | | | |

## Interrupting Ratings

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

## Circuit Breaker Lugs Per Phase (Al/Cu)

| Frame Size | Ampere Range | Wire Range |
|---|---|---|
| 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 |

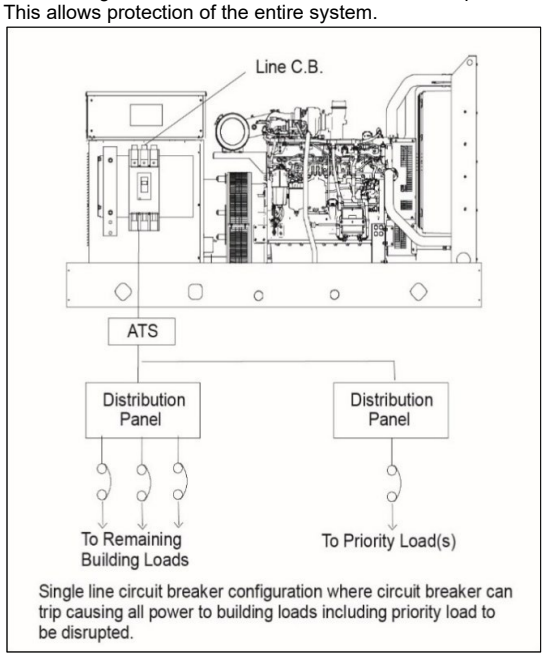

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# 15-300* kW Line Circuit Breaker Applications

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

## Single Circuit Breaker Installations

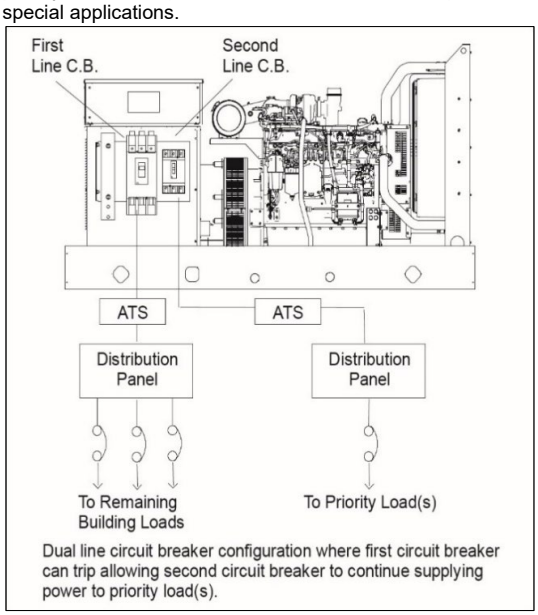
A generator set with a single circuit breaker installed typically feeds a single transfer switch and then a distribution panel. This allows protection of the entire system.




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.

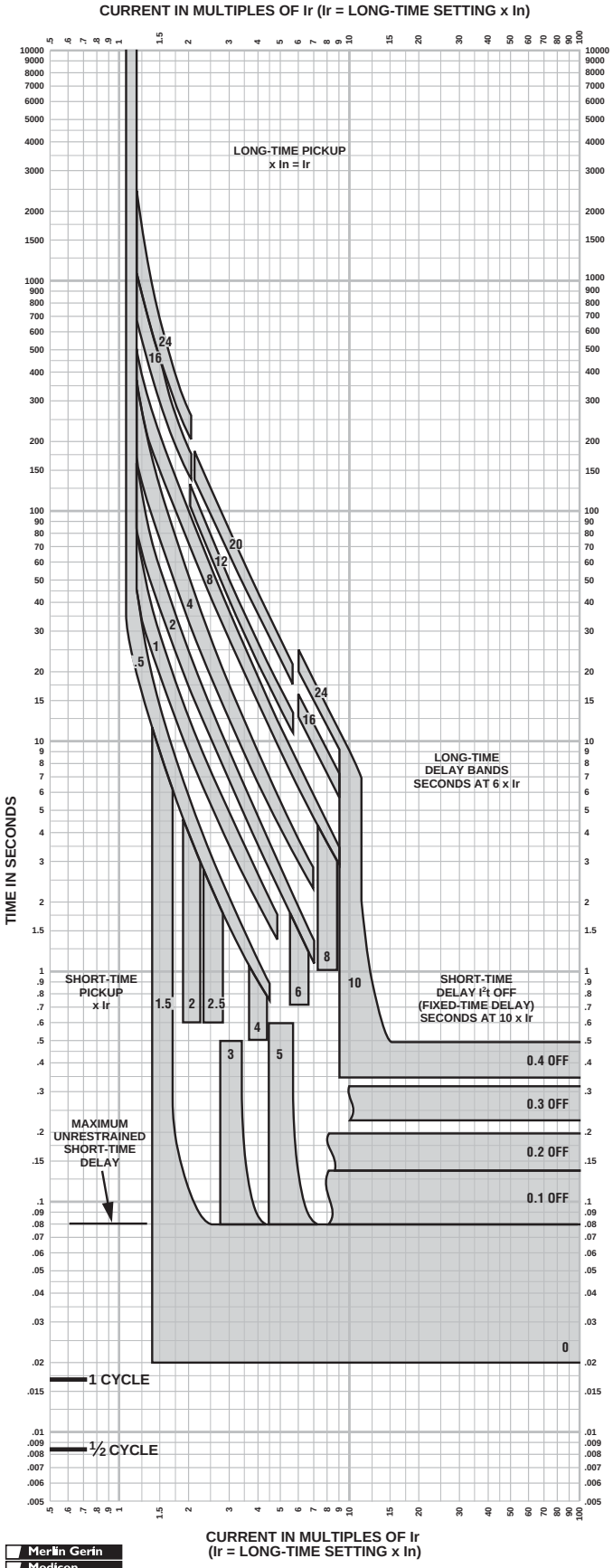



Dual line circuit breaker configuration where first circuit breaker can trip allowing second circuit breaker to continue supplying power to priority load(s).

## 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 | |


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## 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

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

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

***The most compact and innovative molded case circuit breakers***



*P-Frame 1200 A*



*R-Frame*

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

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

### Full-Featured Performance

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

Merlin Gerin
Modicon
Square D
Telemecanique
Schneider Electric

SQUARE D
Schneider Electric

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

### Onboard Intelligence

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

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



*MICROLOGIC® Trip Units*

## Choose the Model that Meets Your Needs

### MICROLOGIC 3.0 and 5.0

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

### MICROLOGIC 3.0A, 5.0A and 6.0A

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

### MICROLOGIC 5.0P and 6.0P

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

### MICROLOGIC 5.0H and 6.0H

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

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

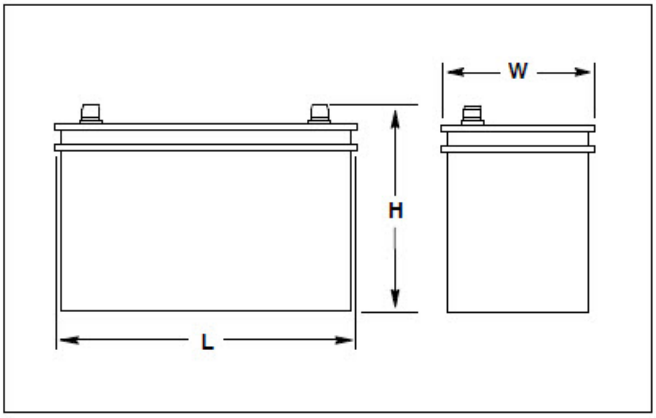
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Schneider Electric

rehlko

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED

## Typical Overall Dimensions

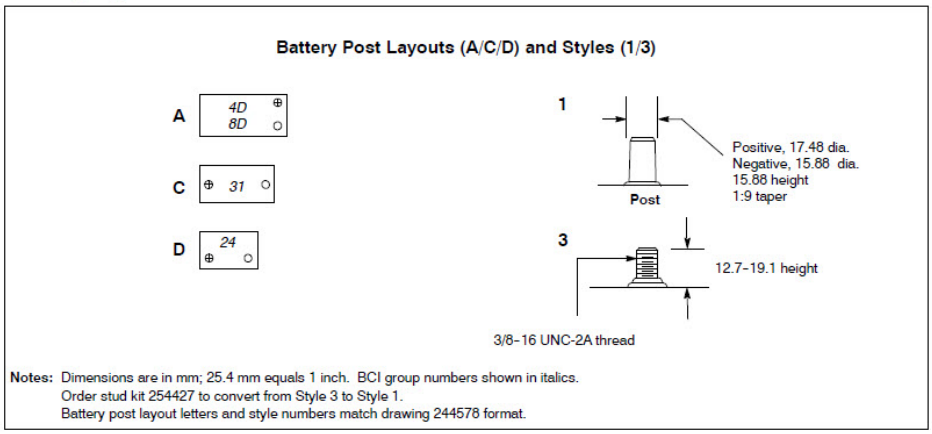



## Standard Features

- Rehlko 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 | GM106375 | 1 | 31 | 330.2 (13.0) | 171.0 (6.8) | 239.8 (9.4) | 925 | 180 | C/3 |

## Battery Specifications



# 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

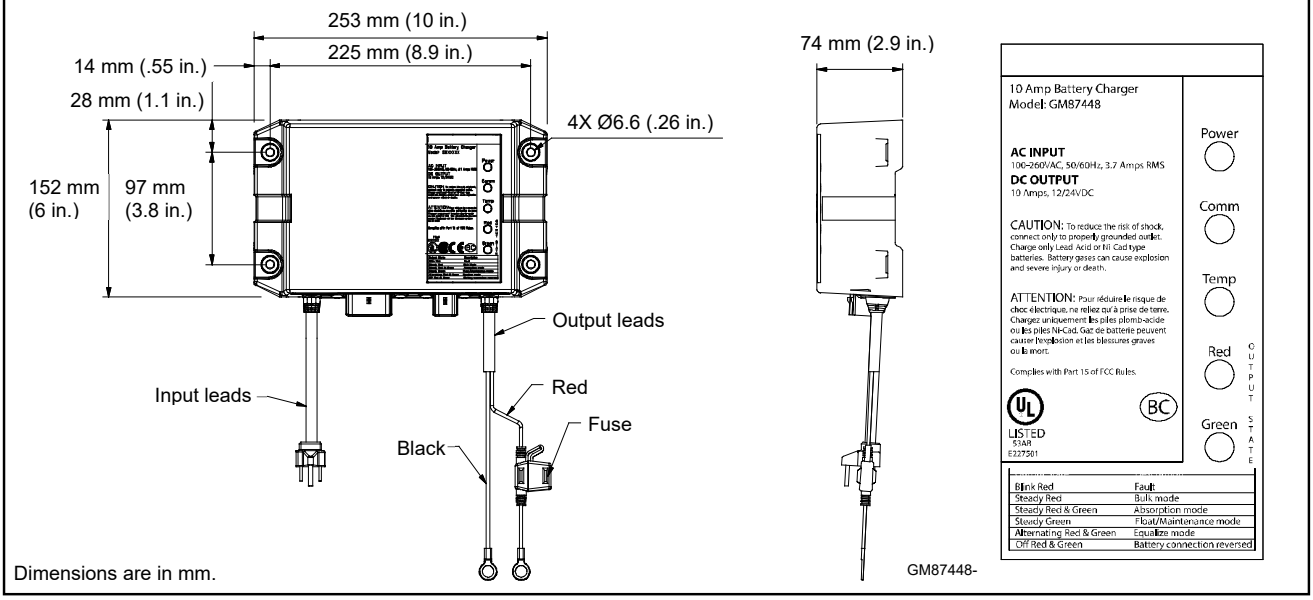
- 12 or 24 VDC output
  - Automatic voltage detection
- Automatic multi-stage charging modes
  - Recovery charge
  - Bulk charge
  - Absorption charge
  - Float charge
  - Equalize charge
- Charges the following type batteries:
  - Flooded lead acid (FLA)
  - AGM
  - Gel cell
  - High performance AGM
  - 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 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 |


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# Industrial Generator Set Accessories

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




## Specifications

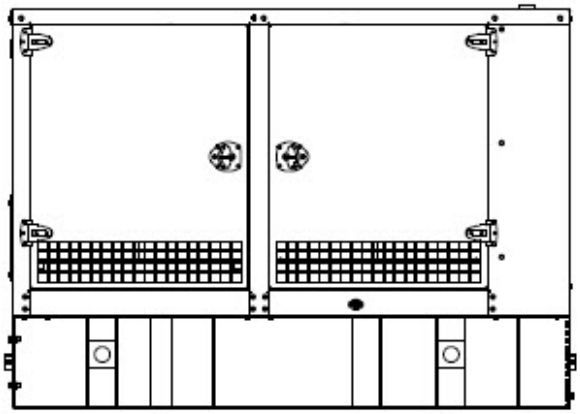
| | |
|---|---|
| **AC Input** | 100-260 VAC |
| **Frequency Input** | 50/60 Hz |
| **DC Output** | 10 Amps @ 12 VDC or<br>10 Amps @ 24 VDC<br>(On battery voltage regulation ±1%; current is electronically limited |
| **Fuse Protection** | 15 amps ATC |
| **Battery Types** | Flooded Lead Acid (FLA)<br>AGM<br>Gel Cell<br>High Performance AGM<br>Nickel-Cadmium (NiCad) |
| **Monitoring** | |
| LED Indications | Power<br>Communication<br>Temperature compensation<br>Output charger curve and charger status:<br>o Red<br>o 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 (IP-64) |
| **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 | |

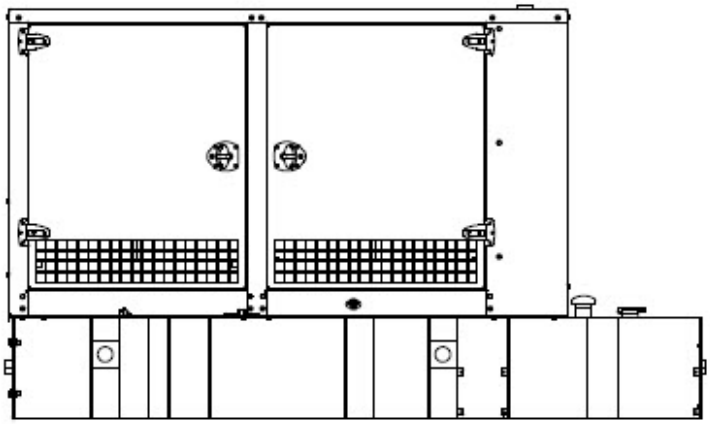
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# Weather Enclosure with Subbase Fuel Tank Package



Enclosure with Standard Subbase Fuel Tank



Enclosure with State Code Subbase Fuel Tank

## Weather 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.

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

## Subbase Fuel Tank Features

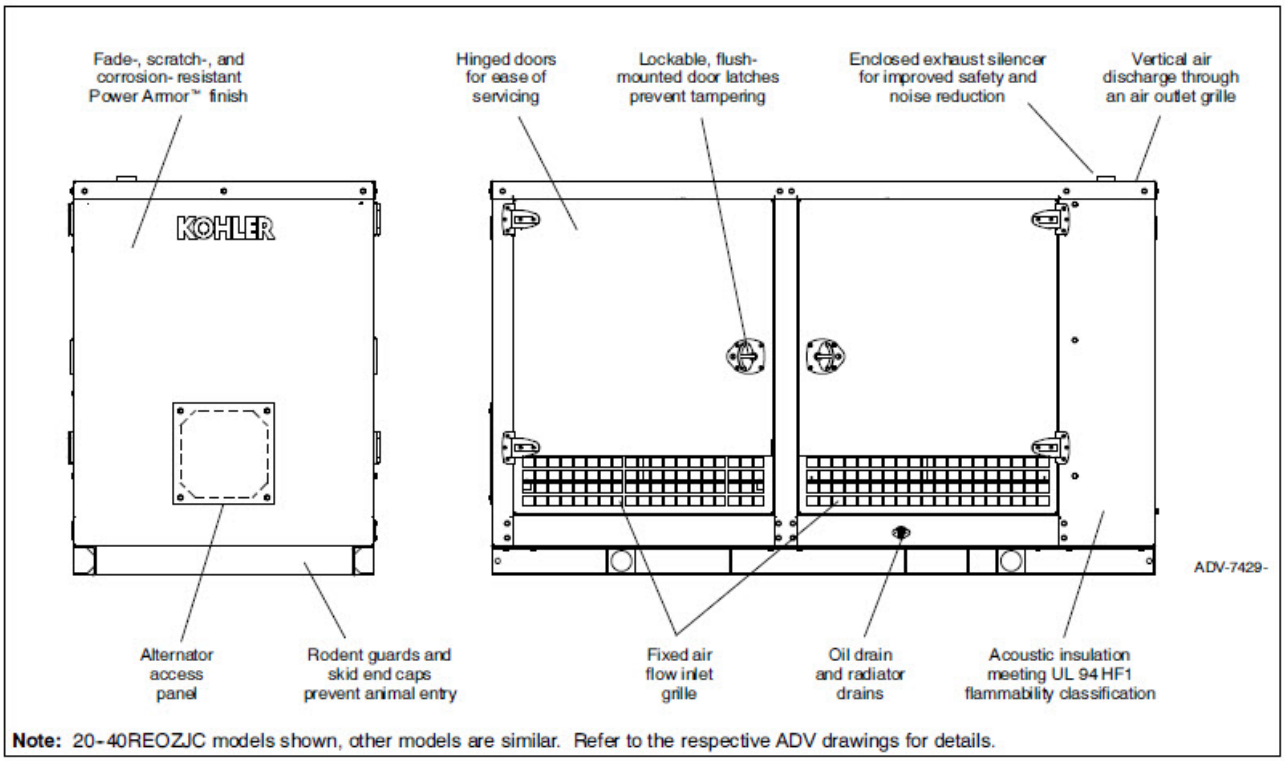
• The fuel tank has a Power Armor Plus textured epoxy-based rubberized coating.

• 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.

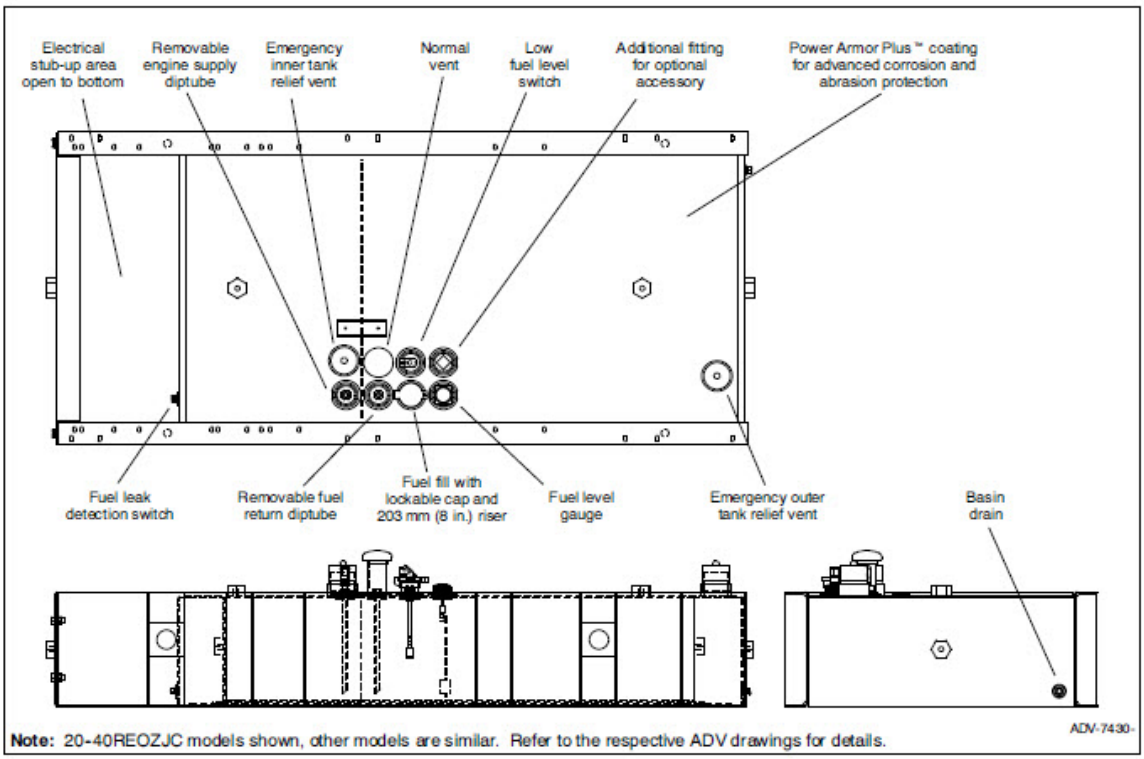
• The secondary containment generator set base tank meets UL 142 tank requirements. The inner (primary) tank is sealed inside the outer (secondary) tank. The outer tank contains the fuel if the inner tank leaks or ruptures.




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

## Weather 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 to reduce ambient noise.
- Note: Installing an additional length of exhaust tail pipe may increase backpressure levels. Please refer to the generator set spec sheet for the maximum backpressure value.




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

| Fuel Tank Capacity, L (gal.) | Est. Fuel Supply Hours at 60 Hz with Full Load | Max. Length, mm (in.) | Enclosure and Fuel Tank Length, mm (in.) | Enclosure and Fuel Tank Width, mm (in.) | Enclosure and Fuel Tank Weight, kg (lb.) | Enclosure and Fuel Tank Height, mm (in.) | Fuel Tank Height (H), mm (in.) | Sound Pressure Level, dB(A) |
|---|---|---|---|---|---|---|---|---|
| Lift base | 0 | 1153 (45.4) | 3532 (139.0) | 1153 (45.4) | 1860 (4101) | 1753 (69) | 0 (0) | 86 |
| 4403 (1163) | 96/95 | 4445 (175.0) | 1829 (72.0) | 3839 (8463) | 2654 (104.5) | 914 (36.0) | 86 | |

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

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# Alternator Data

## TECHNICAL INFORMATION BULLETIN

# Alternator Data Sheet

**Alternator Model: 4S12X**
**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<br>277/480 | 3 | 0.8 | Wye | 146.5<br>(183.0) | 155.0<br>(193.5) | 160.0<br>(200.0) | 168.0<br>(210.0) | 181.0<br>(226.0) | 178.5<br>(223.0) | 189.0<br>(236.0) |
| 127/220<br>254/440 | 3 | 0.8 | Wye | 136.0<br>(170.0) | 143.0<br>(178.5) | 146.5<br>(183.0) | 152.5<br>(190.5) | 164.0<br>(205.0) | 162.0<br>(202.5) | 171.5<br>(214.0) |
| 120/208<br>240/416 | 3 | 0.8 | Wye | 130.0<br>(162.5) | 136.5<br>(170.5) | 139.0<br>(173.5) | 144.0<br>(180.0) | 154.5<br>(193.0) | 152.5<br>(190.5) | 161.5<br>(201.5) |
| 110/190<br>220/380 | 3 | 0.8 | Wye | 118.5<br>(148.0) | 124.5<br>(155.5) | 126.5<br>(158.0) | 131.0<br>(163.5) | 140.5<br>(175.5) | 139.0<br>(173.5) | 147.0<br>(183.5) |
| 120/240 | 3 | 0.8 | Delta | 130.0<br>(162.5) | 136.5<br>(170.5) | 139.0<br>(173.5) | 144.0<br>(180.0) | 154.5<br>(193.0) | 152.5<br>(190.5) | 161.5<br>(201.5) |
| 120/240 | 1 | 1.0 | Dogleg | 81.0<br>(81.0) | 90.5<br>(90.5) | 95.0<br>(95.0) | 105.0<br>(105.0) | 106.0<br>(106.0) | 106.0<br>(106.0) | 106.0<br>(106.0) |
| 347/600 | 3 | 0.8 | Wye | 135.0<br>(169.0) | 143.0<br>(179.0) | 147.0<br>(184.0) | 155.0<br>(194.0) | 172.0<br>(215.0) | 168.0<br>(210.0) | 180.0<br>(225.0) |

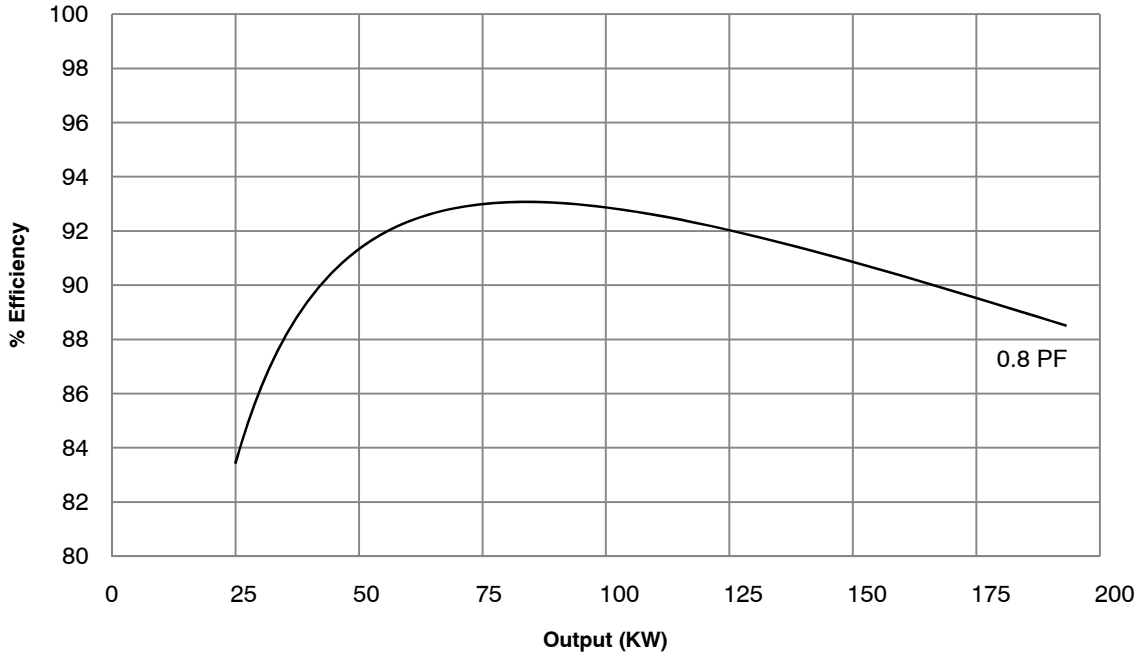
* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

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

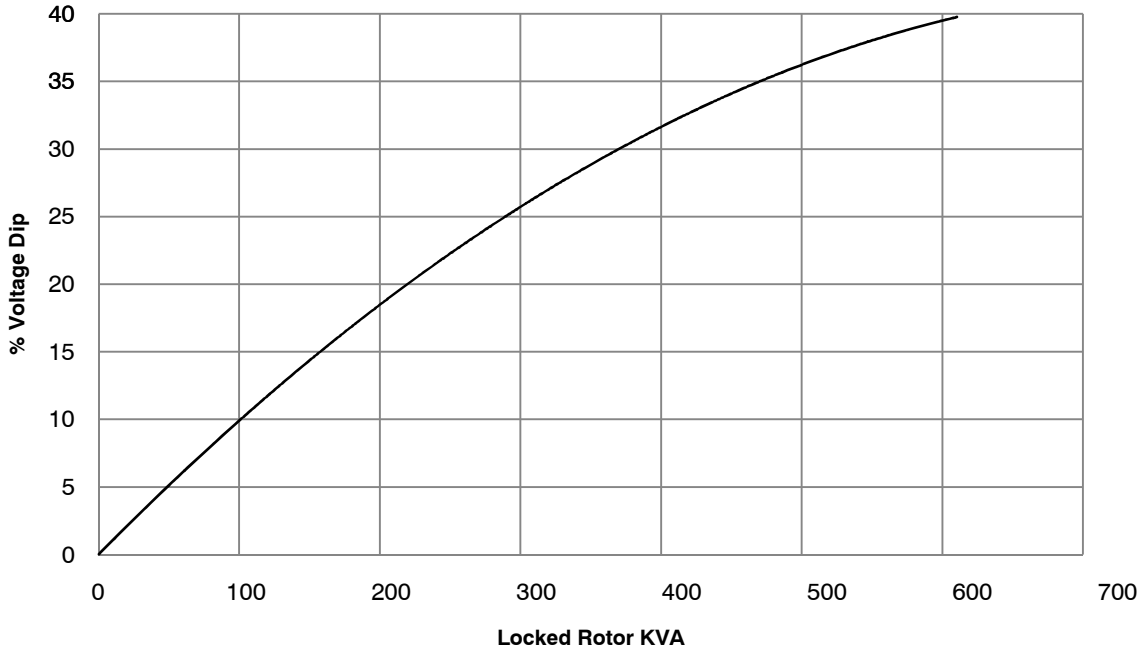
| | Symbol | PerUnit | Ohms |
|---|---|---|---|
| **Typical Cold Resistances** | | | |
| Phase Resistance | | 0.031 | 0.008 |
| Rotor Resistance | | 20.58 | 5.239 |
| **Typical Reactances** | | | |
| Synchronous | | | |
| Direct | $X_d$ | 4.982 | 1.268 |
| Quadrature | $X_q$ | 2.468 | 0.628 |
| Transient | | | |
| Unsaturated | $X'_{du}$ | 0.504 | 0.128 |
| Saturated | $X'_d$ | 0.443 | 0.113 |
| Subtransient | | | |
| Direct | $X''_d$ | 0.171 | 0.044 |
| Quadrature | $X''_q$ | 0.169 | 0.043 |
| Negative Sequence | $X_2$ | 0.17 | 0.043 |
| Zero Sequence | $X_0$ | 0.013 | 0.003 |

| | Symbol | Value |
|---|---|---|
| **Typical Time Constants** | | |
| Armature Short Circuit | $T_a$ | 0.012 sec. |
| Transient Short Circuit | $T'_d$ | 0.154 sec. |
| Transient Open Circuit | $T'_{do}$ | 1.728 sec. |
| **Typical Field Current** | | |
| Full Load | $If_{FL}$ | 21.1 amps |
| No Load | $If_{NL}$ | 3.8 amps |
| **Typical Short Circuit Ratio** | | 0.201 |
| **Harmonic Distortion** | | |
| RMS Total Harmonic Distortion | | 4.04% |
| Max. Single Harmonic | | 5th |
| Deviation Factor (No Load, L-L) | | <5% |
| Telephone Influence Factor | | <50 |
| **Insulation Class** | | |
| per NEMA MG1-1.66 | | H |
| **Phase Rotation** | | ABC |

**4S12X, 60 Hz, 139/240, 277/480 Volts, Wye**
**TYPICAL ALTERNATOR EFFICIENCY***

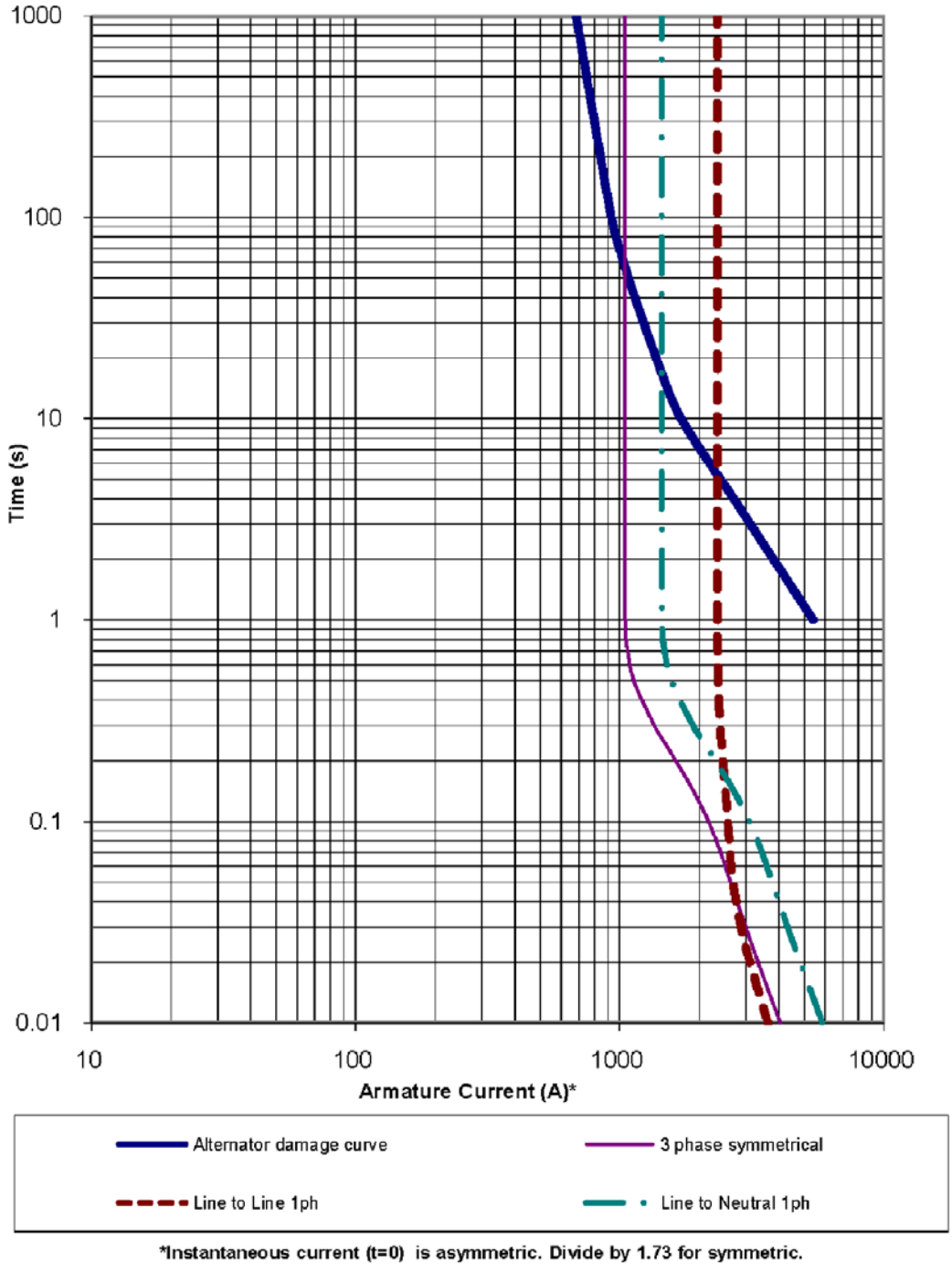



**4S12X, 60 Hz, 139/240, 277/480 Volts, Wye**
**TYPICAL MOTOR STARTING CHARACTERISTICS***



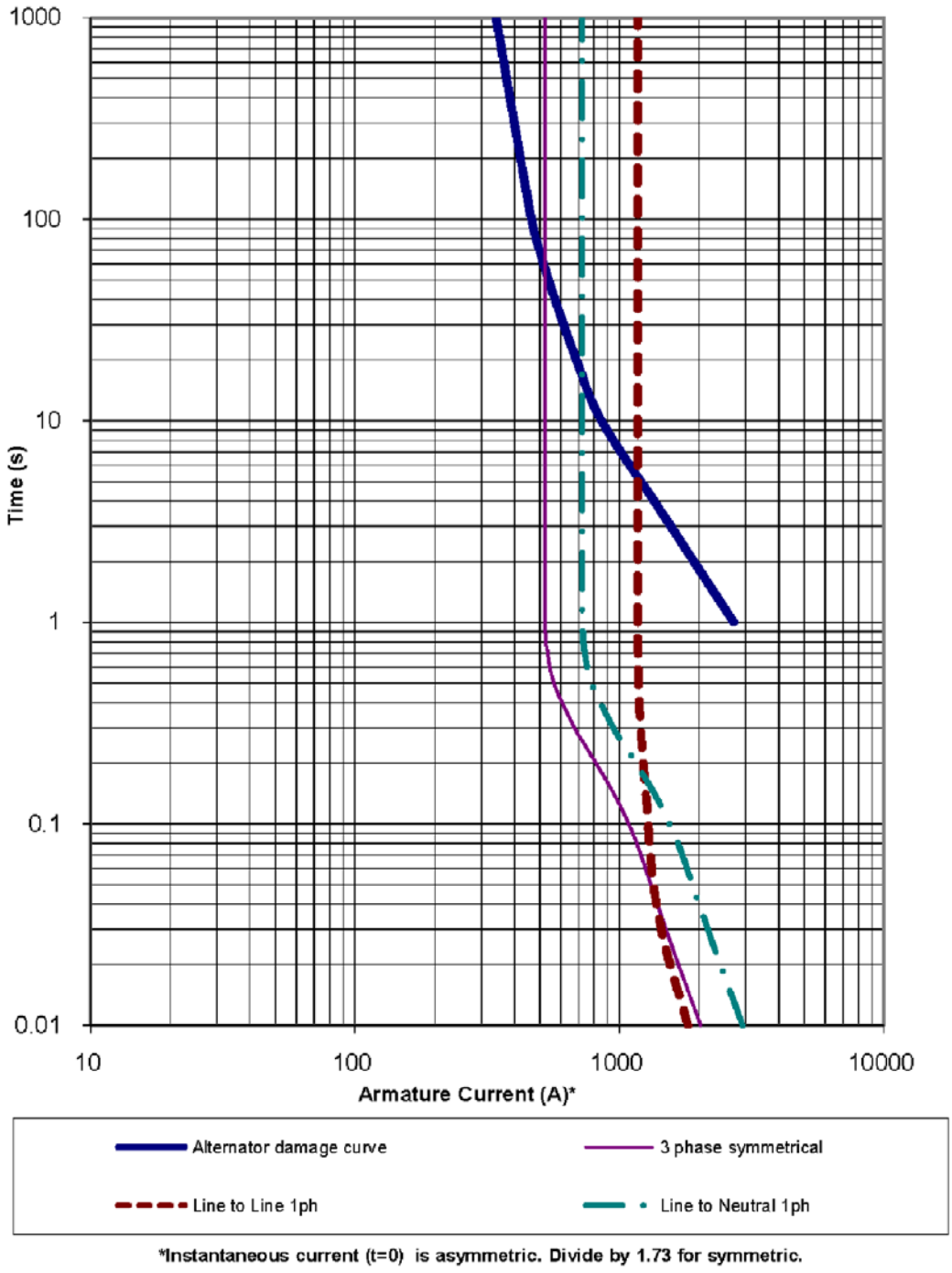

* All data tested in accordance with IEEE Standard 115. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

**4S12X, 60 Hz, Low Wye or Delta Connection**
**SHORT CIRCUIT DECREMENT CURVE**




*Instantaneous current (t=0) is asymmetric. Divide by 1.73 for symmetric.

**4S12X, 60 Hz, High Wye Connection**
**SHORT CIRCUIT DECREMENT CURVE**




*Instantaneous current (t=0) is asymmetric. Divide by 1.73 for symmetric.

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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** | **Snow Sound Enclosure** |
| **150REOZJF** | 60 | 100% Load | 99.6 | 88.4 | 86.5 | 75.6 | 73.3 |
| | | No Load | 90.1 | 87.7 | 85.8 | 73.7 | 70.3 |

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.

**Continued on next page**

| 150REOZJF | 60 Hz |
|---|---|

| Load | Distance, m (ft) | Enclosure | Measurement Clock Position | Sound Pressure Levels, dB(A) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 100% Load | 7 (23) | Snow Sound | 3:00 | 55.4 | 63.4 | 63.3 | 66.9 | 61.8 | 59.8 | 58.1 | 50.5 | 71.2 |
| | | | 1:30 | 58.0 | 65.7 | 61.3 | 69.0 | 66.1 | 63.1 | 62.1 | 53.6 | 73.4 |
| | | | 12:00-Engine | 55.8 | 64.3 | 65.8 | 71.6 | 66.3 | 64.4 | 64.1 | 55.9 | 75.0 |
| | | | 10:30 | 59.2 | 67.2 | 65.0 | 71.0 | 66.6 | 64.1 | 62.0 | 54.1 | 74.9 |
| | | | 9:00 | 57.6 | 65.2 | 63.6 | 68.3 | 65.2 | 64.3 | 64.5 | 54.9 | 73.5 |
| | | | 7:30 | 49.2 | 59.5 | 64.6 | 67.2 | 65.0 | 62.7 | 64.6 | 55.3 | 72.5 |
| | | | 6:00-Alternator | 52.1 | 61.2 | 62.4 | 66.4 | 64.8 | 62.6 | 61.2 | 51.1 | 71.6 |
| | | | 4:30 | 53.9 | 62.1 | 64.6 | 67.8 | 64.6 | 63.0 | 63.1 | 54.1 | 72.7 |
| | | | 8-pos. log avg. | 56.1 | 64.2 | 64.0 | 68.9 | 65.3 | 63.2 | 62.9 | 54.0 | 73.3 |

| Load | Distance, m (ft) | Enclosure | Measurement Clock Position | Sound Pressure Levels, dB(A) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 100% Load | 7 (23) | Sound | 3:00 | 53.2 | 63.0 | 66.7 | 70.3 | 67.0 | 66.9 | 63.2 | 55.4 | 74.8 |
| | | | 1:30 | 61.7 | 66.3 | 67.6 | 72.4 | 66.7 | 65.5 | 61.7 | 52.8 | 75.9 |
| | | | 12:00-Engine | 59.5 | 64.6 | 66.0 | 70.4 | 68.6 | 66.7 | 64.4 | 53.2 | 75.3 |
| | | | 10:30 | 57.5 | 64.1 | 69.1 | 72.2 | 67.4 | 66.6 | 65.1 | 55.8 | 76.2 |
| | | | 9:00 | 59.6 | 66.5 | 70.0 | 69.5 | 66.8 | 66.7 | 65.0 | 57.7 | 75.7 |
| | | | 7:30 | 61.8 | 68.0 | 68.3 | 68.2 | 67.4 | 66.5 | 64.1 | 56.7 | 75.4 |
| | | | 6:00-Alternator | 54.8 | 61.0 | 72.0 | 69.3 | 69.0 | 66.2 | 60.8 | 57.2 | 76.0 |
| | | | 4:30 | 63.5 | 68.0 | 67.6 | 69.1 | 68.0 | 66.0 | 61.3 | 56.4 | 75.4 |
| | | | 8-pos. log avg. | 60.1 | 65.7 | 68.8 | 70.4 | 67.7 | 66.4 | 63.5 | 55.9 | 75.6 |

| Load | Distance, m (ft) | Enclosure | Measurement Clock Position | Sound Pressure Levels, dB(A) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3:00 | 1:30 | 12:00 Eng. | 10:30 | 9:00 | 7:30 | 6:00 Alt. | 4:30 | 8-pos. log avg. |
| 100% Load | 7 (23) | Weather | Overall Levels | 86.5 | 87.4 | 81.3 | 87.6 | 86.9 | 87.3 | 85.4 | 86.6 | 86.5 |

| Load | Distance, m (ft) | Enclosure | Measurement Clock Position | Sound Pressure Levels, dB(A) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 100% Load | 7 (23) | Open Unit, Isolated Exhaust | 3:00 | 54.7 | 64.5 | 79.1 | 79.3 | 80.8 | 82.6 | 78.9 | 75.2 | 88.4 |
| | | | 1:30 | 51.4 | 65.6 | 72.8 | 81.2 | 82.8 | 83.6 | 81.2 | 76.3 | 89.3 |
| | | | 12:00-Engine | 51.6 | 63.0 | 75.6 | 80.0 | 75.4 | 75.0 | 70.9 | 65.3 | 83.2 |
| | | | 10:30 | 48.5 | 61.8 | 74.2 | 79.1 | 85.3 | 83.6 | 81.9 | 76.3 | 89.5 |
| | | | 9:00 | 48.4 | 61.1 | 76.5 | 81.6 | 81.8 | 82.9 | 80.8 | 76.2 | 88.8 |
| | | | 7:30 | 47.5 | 63.3 | 79.6 | 81.0 | 82.4 | 82.4 | 81.2 | 76.1 | 89.2 |
| | | | 6:00-Alternator | 48.4 | 64.2 | 78.1 | 83.0 | 81.6 | 76.9 | 74.8 | 67.8 | 87.3 |
| | | | 4:30 | 52.2 | 65.3 | 80.6 | 81.5 | 81.3 | 82.5 | 79.6 | 73.5 | 88.5 |
| | | | 8-pos. log avg. | 51.0 | 63.8 | 77.8 | 81.0 | 82.1 | 82.0 | 79.7 | 74.6 | 88.4 |

| Load | Distance, m (ft) | Exhaust | Sound Pressure Levels, dB(A) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 100% Load | 1 (3.3) | Raw Exhaust (No Silencer) | 65.9 | 77.8 | 83.6 | 88.2 | 92.8 | 94.7 | 93.6 | 91.2 | 99.6 |

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# Emissions Data

# 150REOZJF

## 60 HZ. DIESEL INDUSTRIAL GENERATOR SET
## EMISSION DATA SHEET

**ENGINE INFORMATION**

| | | | |
|---|---|---|---|
| Model: | John Deere, 6068HF285K | Bore: | 106mm (4.19 in.) |
| Nameplate BHP @ 1800 RPM: | 237 | Stroke: | 127mm (5.0 in.) |
| Type: | 4-Cycle, 6 Cylinder, Inline | Displacement: | 6.8 L (415 cu. in.) |
| Aspiration: | Turbocharged, Charge Air-Cooled | | |
| Compression Ratio | 17.0:1 | EPA Family: | TJDXL06.8120 |
| | | EPA Certificate: | TJDXL06.8120-006 |

**Table 1**

| **PERFORMANCE DATA:** | 1/4 Standby | 1/2 Standby | 3/4 Standby | Full Standby |
|---|---|---|---|---|
| Engine bkW @ Stated Load | 44 | 89 | 133 | 177 |
| Fuel Consumption (g/kWh) | 250 | 244 | 222 | 214 |
| Exhaust Gas Flow ($m^3$/min) | | | | 34 |
| Exhaust Temperature (°C) | | | | 510 |

**Table 2**

| **EXHAUST EMISSION DATA:** | **EPA D2 Cycle 5-mode weighted** |
|---|---|
| HC (Total Unburned Hydrocarbons) | 0.12 |
| NOx (Oxides of Nitrogen as NO2) | 3.79 |
| CO (Carbon Monoxide) | 1.2 |
| PM (Particulate Matter) | 0.12 |

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**
**2026 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:** **TJDXL06.8120-006**

**Effective Date:** 07/31/2025

**Expiration Date:** 12/31/2026

**Byron J. Bunker, Division Director**
**Compliance Division**

**Issue Date:** 07/31/2025

**Revision Date:** N/A

**Model Year:** 2026
**Manufacturer Type:** Original Engine Manufacturer
**Engine Family:** TJDXL06.8120

**Mobile/Stationary Indicator:** Stationary
**Emissions Power Category:** 130<=kW<225
**Fuel Type:** Diesel
**After Treatment Devices:** No After Treatment Devices Installed
**Non-after Treatment Devices:** Electronic Control, Smoke Puff Limiter, Non-standard Non-After Treatment Device Installed, Engine Design Modification

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.

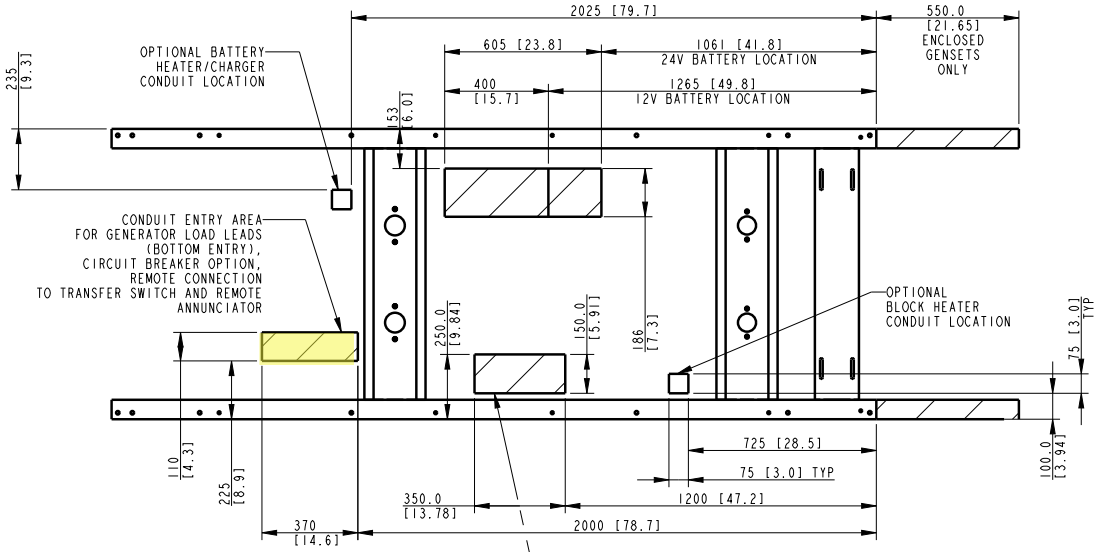
This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate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

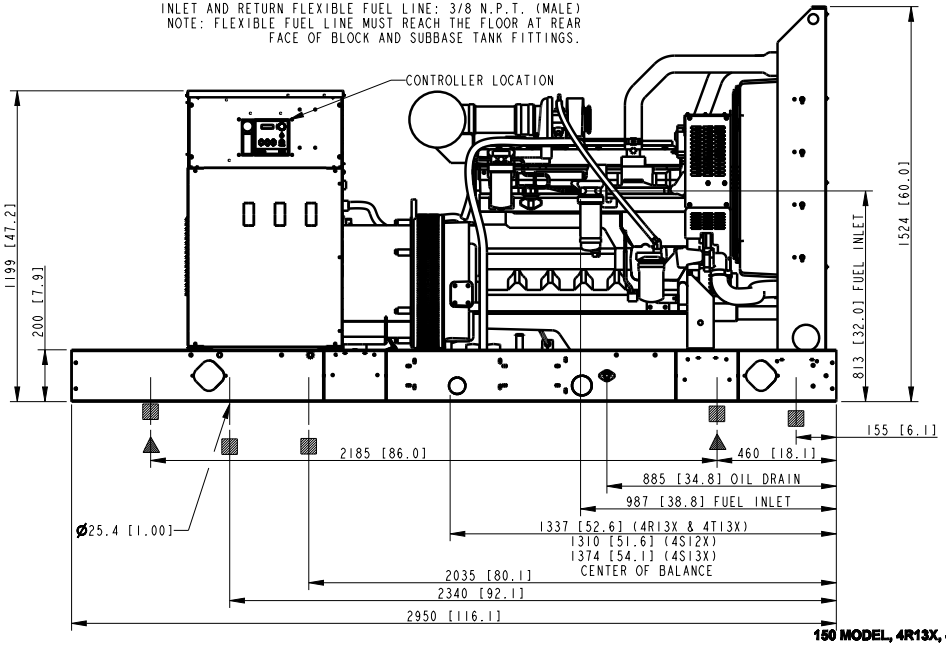
This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

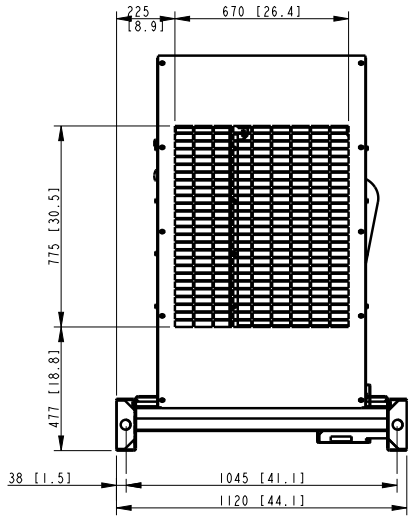
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# Dimensional Drawings




SUGGESTED LOCATION FOR FUEL INLET AND RETURN FLEXIBLE FUEL LINE: 3/8 N.P.T. (MALE)
NOTE: FLEXIBLE FUEL LINE MUST REACH THE FLOOR AT REAR FACE OF BLOCK AND SUBBASE TANK FITTINGS.




**INSTALLATION NOTE**
IF SUBASE FUEL TANK AND/OR SOUND HOUSING IS USED, REFER TO SUBBASE FUEL TANK DRAWING TO DETERMINE MOUNTING LOCATIONS

| MODEL | GENSET WEIGHT (WET) |
|---|---|
| 150 4R13X, 4T13X | 1342 KG [2959 LBS] |
| 150 4S12X | 1295 KG [2855 LBS] |
| 150 4S13X | 1402 KG [3090 LBS] |

**NOTES**
**DIMENSIONS IN [ ] ARE INCH EQUIVALENTS**

**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 HOLES FOR STANDARD MOUNTING Ø25.4 [1.00]**

**10 HOLES FOR IBC MOUNTING Ø25.4 [1.00]**

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

| REV | DATE | ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL ☐ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION | BY |
|---|---|---|---|
| A | 10-7-13 | (A-8) Ø25.4 [1.00] WAS Ø17.5 [.68] [CT59787] | SVP |

DO NOT SCALE.
THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001.
REFERENCE CAD MODEL FOR UNSPECIFIED DIMENSIONS.

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UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN MILLIMETERS
GENERAL TOLERANCES: N/A

MAJOR ○= 0
CRITICAL ◉= 0
CHARACTERISTICS COMPLY WITH KPS-80022

THIRD ANGLE PROJECTION

SCALE: 0.05 SHEET SIZE: B SHEET: 1 OF 2

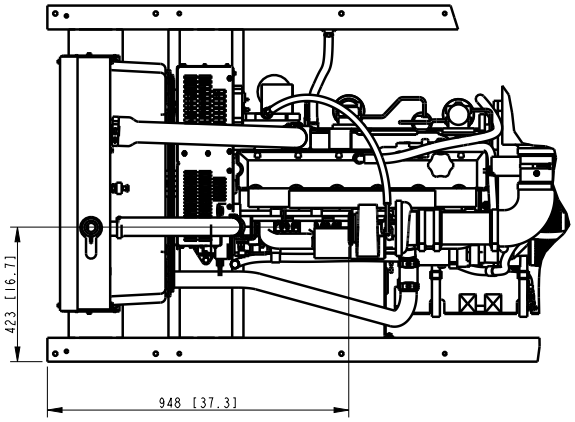
DRAWN: KMP DATE:
APPROVED: SEE PLM SYSTEM 5-20-11

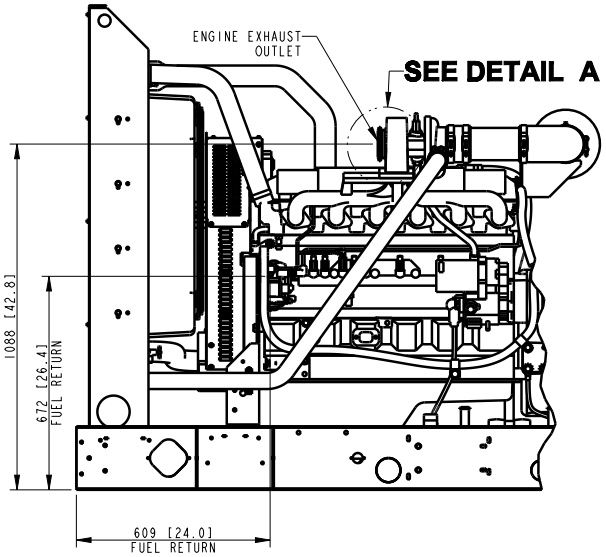
TITLE:
# DIMENSION PRINT, 150 MODEL

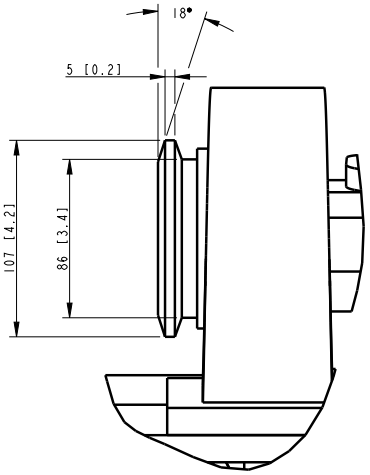
DWG NO.: ADV-8183

**150 MODEL, 4R13X, 4T13X, 4S12X, 4S13X RECONNECTABLE, IMPROVED MOTOR STARTING (IMS), RECONNECTABLE & 600V ALTERNATOR JOHN DEERE 6068HF**

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**DETAIL A**
**SCALE 0.375**

| REV | DATE | ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL ☐ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION | BY |
|---|---|---|---|
| A | 10-7-13 | SEE SHEET 1 [CT59787] | SVP |

DO NOT SCALE.
THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001.
REFERENCE CAD MODEL FOR UNSPECIFIED DIMENSIONS.

rehlko

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN MILLIMETERS
GENERAL TOLERANCES: N/A

MAJOR ○= 0
CRITICAL ◉= 0
CHARACTERISTICS COMPLY WITH KPS-80022

THIRD ANGLE PROJECTION

SCALE: 0.07 SHEET SIZE: B SHEET: 2 OF 2

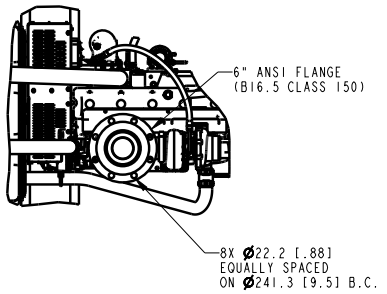
DRAWN: KMP DATE: 5-20-11
APPROVED: SEE PLM SYSTEM

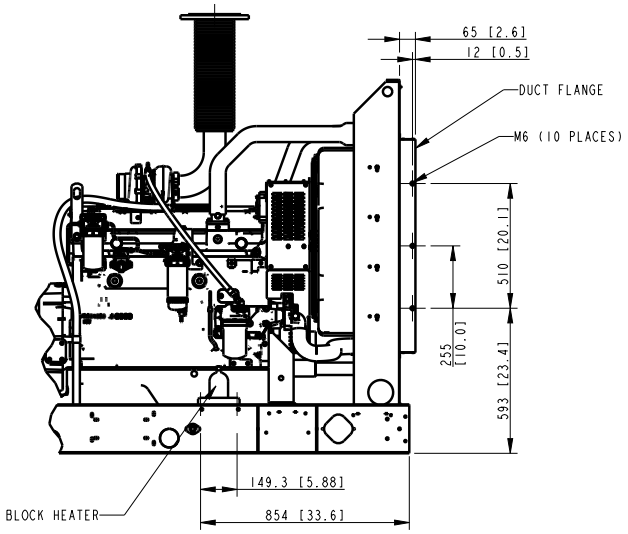
TITLE:
**DIMENSION PRINT, 150 MODEL**

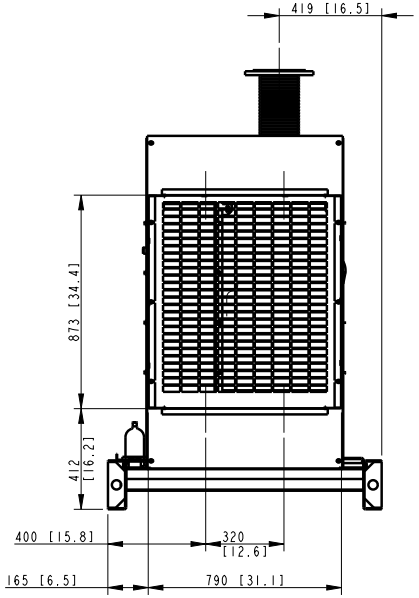
DWG NO.: **ADV-8183**

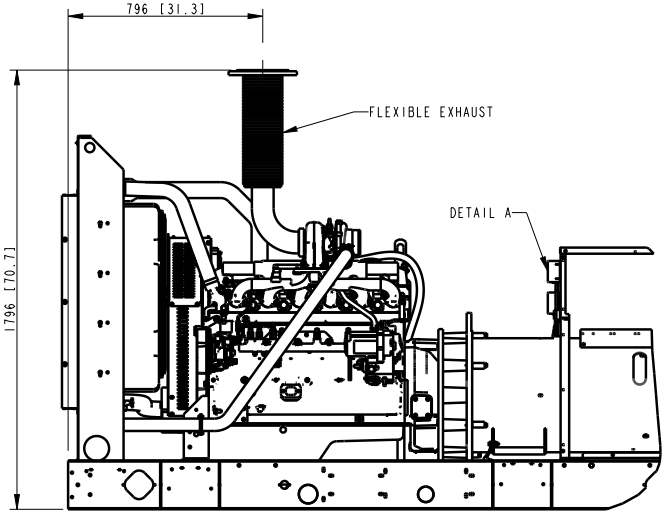
**150 MODEL, 4R13X, 4T13X, 4S12X, 4S13X RECONNECTABLE, IMPROVED MOTOR STARTING (IMS), RECONNECTABLE & 600V ALTERNATOR JOHN DEERE 6068HF**

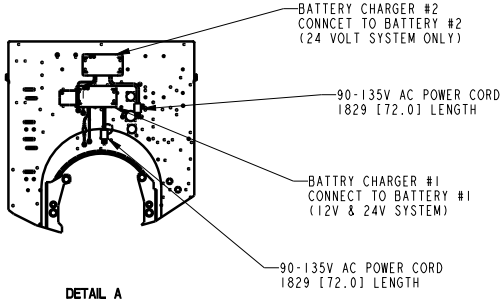
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DETAIL A

**DIMENSIONS IN [ ] ARE INCH EQUIVALENTS**

| REV | DATE | ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL ☐ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION | BY |
|---|---|---|---|
| A | 3-30-10 | (C,D-2,3) FLEXIBLE EXHAUST: 6" ANSI | |
| | | FLANGE WAS 6" NPT. AND TOP VIEW | |
| | | ADDED. 796 [31.3] WAS 811 [31.9] | |
| | | (C-4) 1796 WAS 1853 [89099] | GFR |
| B | 1-6-12 | (A-8) "DETAIL A" ADDED, (A-4) | |
| | | 150 MODEL NOTE UPDATED [92681] | PKD |

DO NOT SCALE.
THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001.
REFERENCE CAD MODEL FOR UNSPECIFIED DIMENSIONS.

rehlko

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN MILLIMETERS
GENERAL TOLERANCES: N/A

MAJOR ○= 0
CRITICAL ◉= 0

THIRD ANGLE PROJECTION

CHARACTERISTICS COMPLY WITH KPS-80022

SCALE: 0.05 SHEET SIZE: B SHEET: 1 OF 1

DRAWN: MRS DATE: 11-6-09

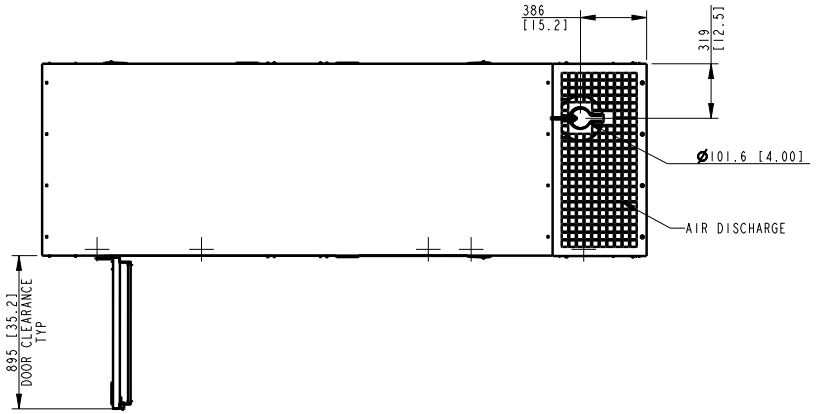
APPROVED: SEE PLM SYSTEM

TITLE:
**DIMENSION PRINT, ACCESSORIES**

DWG NO.: **ADV-7841**

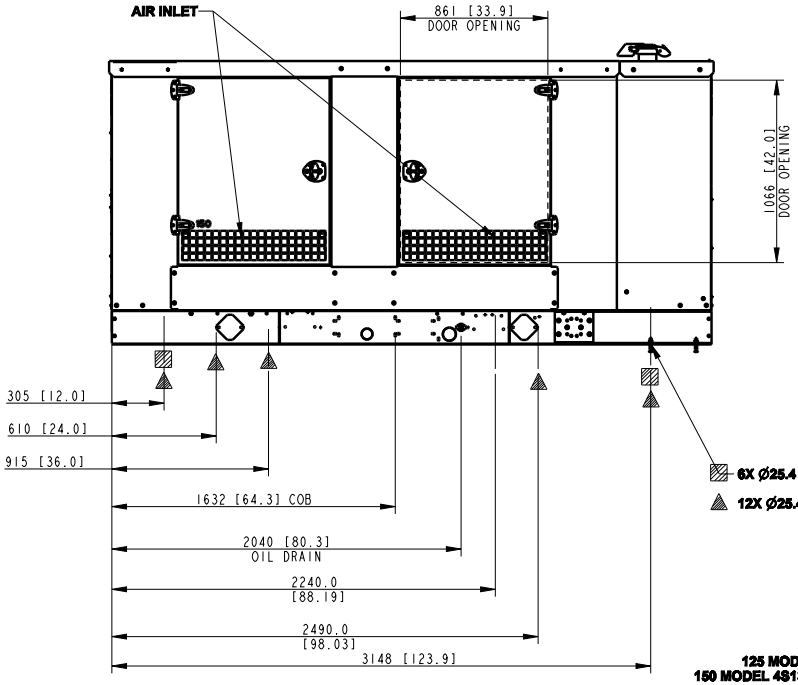
**150 MODEL 4S13, 4S15, 4R13X, 4T13X, 4S12X, 4S13X**
**RECONNECTABLE**
**IMPROVE MOTOR STARTING (IMS) RECONNECTABLE**
**600V & 1 PHASE ALTERNATORS**
**6068HF285 JOHN DEERE TIER III**

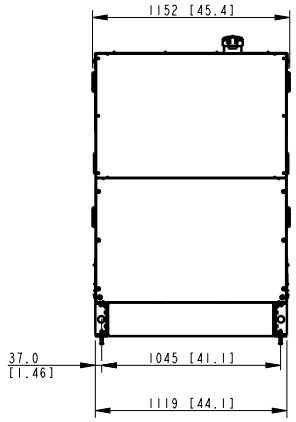
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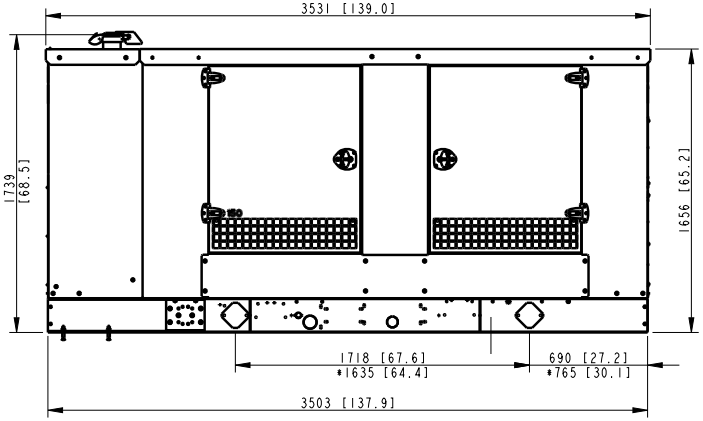



| MODEL | ENCLOSURE WEIGHT KG [LBS] |
|---|---|
| STEEL WEATHER | 340 [750] |
| STEEL SOUND | 363 [800] |
| ALUMINUM SOUND | 227 [500] |

**NOTE:**
1. TANK (IF ORDERED) MOUNTS BELOW SKID
2. TANK MAY EXTEND BEYOND ENCLOSURE (DISCHARGE END ONLY)




**6X Ø25.4 [1.0] STD MOUNTING HOLES**

**12X Ø25.4 [1.0] IBC MOUNTING HOLES**

**DIMENSIONS IN [ ] ARE INCH EQUIVALENTS**

**(*) DESIGNATES 125KW 4045HF ENGINE**

**125 MODEL 4S11, 4S13, 4R12X, 4R13X, 4T13X**
**150 MODEL 4S13, 4S15, 4R13X, 4T13X, 4S12X, 4S13X**
**RECONNECTABLE**
**IMPROVE MOTOR STARTING (IMS) RECONNECTABLE**
**600V & 1 PHASE ALTERNATORS**
**4045HF285 & 6068HF285 JOHN DEERE TIER III**

| REV | DATE | ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL ☐ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION | BY |
|---|---|---|---|
| C | 10-3-13 | (A-5) Ø25.4 [1.0] WAS Ø17.5 [.69]; SEE SHEET 2 [CT190707] | SVP |
| | | ~~(D-6) DIM. Ø101.6 [4.00] ADDED [CT179041]~~ | |
| G | 8-4-17 | ALL VIEWS AND DIMENSIONS UPDATED; SEE SHEET 2 [CT190707] | SRM |
| H | 9-27-18 | | PAR |

DO NOT SCALE.
THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001.
REFERENCE CAD MODEL FOR UNSPECIFIED DIMENSIONS.

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN MILLIMETERS
GENERAL TOLERANCES: N/A

MAJOR ○= 0
CRITICAL ◉= 0
CHARACTERISTICS COMPLY WITH KPS-80022

THIRD ANGLE PROJECTION

SCALE: 0.08 SHEET SIZE: B SHEET: 1 OF 2

DRAWN: MRS DATE: 11-5-09

APPROVED: SEE PLM SYSTEM

TITLE:
**DIMENSION PRINT**

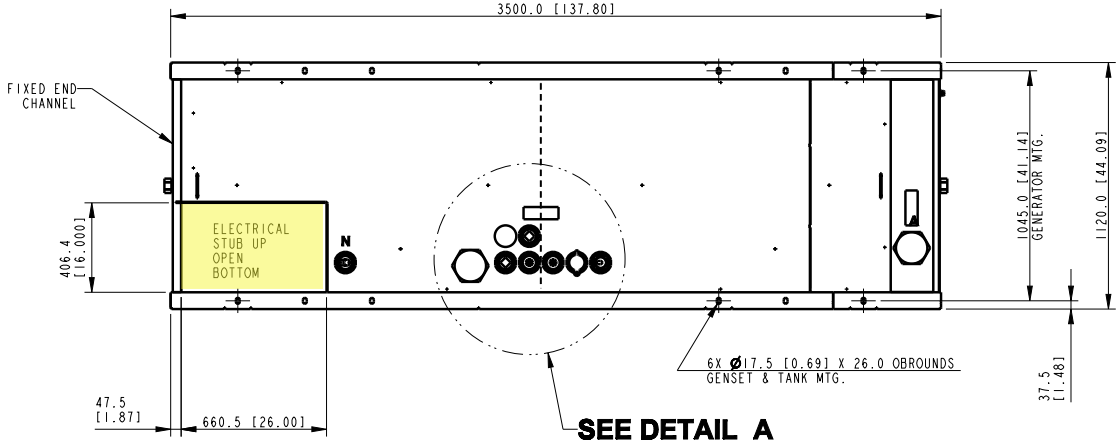
DWG NO.: **ADV-7825**

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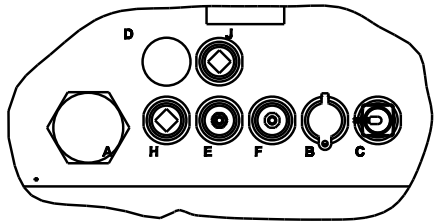
| MODEL | CAPACITY | | WEIGHT | | HEIGHT | | E-Vent | |
|---|---|---|---|---|---|---|---|---|
| | LITERS | GAL | KG | LBS | MM | IN | SIZE (IN) | QTY |
| 125/150kW | 1131 | 298 | 749 | 1650 | 482.6 | 19.0 | 4.0 | 2.0 |
| 125/150kW | 2144 | 583 | 1100 | 2426 | 914.4 | 36.0 | 5.0 | 2.0 |

**TANK FITTINGS:**

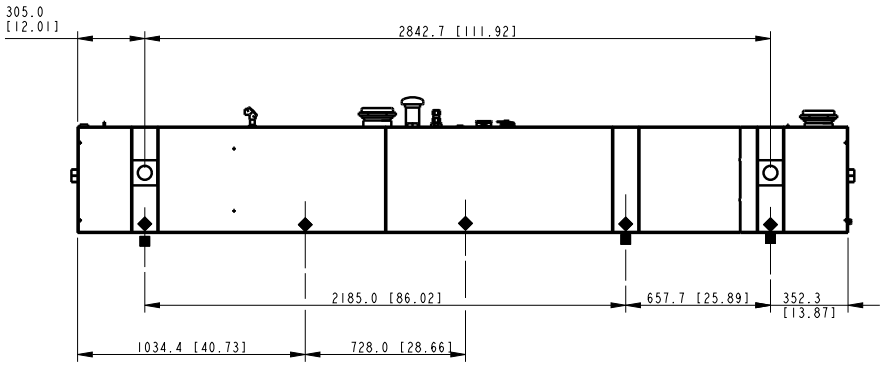
A. 'A' NPT EMERGENCY VENT FITTING PER NFPA 30 WITH VENT CAPS
B. 2" NPT FUEL FILL FITTING WITH LOCKABLE CAP
C. 2" NPT FUEL LEVEL GAUGE FITTING
D. 2" NORMAL VENT FITTING WITH MUSHROOM VENT CAP AND 5" RISER
E. 2" NPT FITTING FOR REMOVABLE ENGINE SUPPLY DIP TUBE (3/8" NPT FEMALE WITH CHECK VALVE)
F. 2" NPT 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)

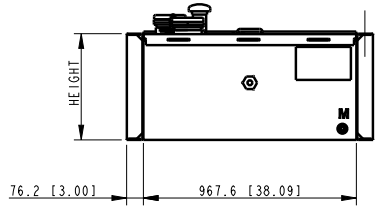



**SEE DETAIL A**




**DETAIL A**
SCALE 0.100




■ 6XØ25.4 [1.0] STANDARD MOUNTING
◆ 10XØ22.2 [0.87] IBC MOUNTING

SUBBASE TANK
125 MODEL 4R12X, 4R13X, 4T13X
150 MODEL 4R13X, 4S12X, 4S13X, 4T13X
RECONNECTABLE
IMPROVED MOTOR STARTING (IMS) & 600V ALTERNATOR
JOHN DEERE 6068HF285, TIER III

| REV | DATE | ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL ☐ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION | BY |
|---|---|---|---|
| B | 11-19-10 | (B-8,B-7) 1034.0,728.0 ADDED [90303] | JOEL |
| C | 6-29-11 | SEE SHEET 2 [91839] | KMP |
| D | 11-22-11 | VIEWS UPDATED [92417-3] | PKD |
| E | 2-7-12 | (A-4) 125 & 150 MODEL NOTE UPDATED, | |
| | | SEE SHEET 2 [92681] | PKD |
| F | 2-19-18 | SEE SHEET 3 [CT184674] | PAS |
| G | 5-25-18 | (A-4) 125 &150 MODEL NOTE UPDATED, | |
| | | SEE SHEET 2 | YPW |

DO NOT SCALE.
THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001.
REFERENCE CAD MODEL FOR UNSPECIFIED DIMENSIONS.

rehlko

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN MILLIMETERS
GENERAL TOLERANCES: N/A

MAJOR ○= 0
CRITICAL ◉= 0
CHARACTERISTICS COMPLY WITH KPS-80022

THIRD ANGLE PROJECTION

SCALE: 0.05 SHEET SIZE: B SHEET: 1 OF 3

DRAWN: PKD DATE: 1-15-10
APPROVED: SEE PLM SYSTEM

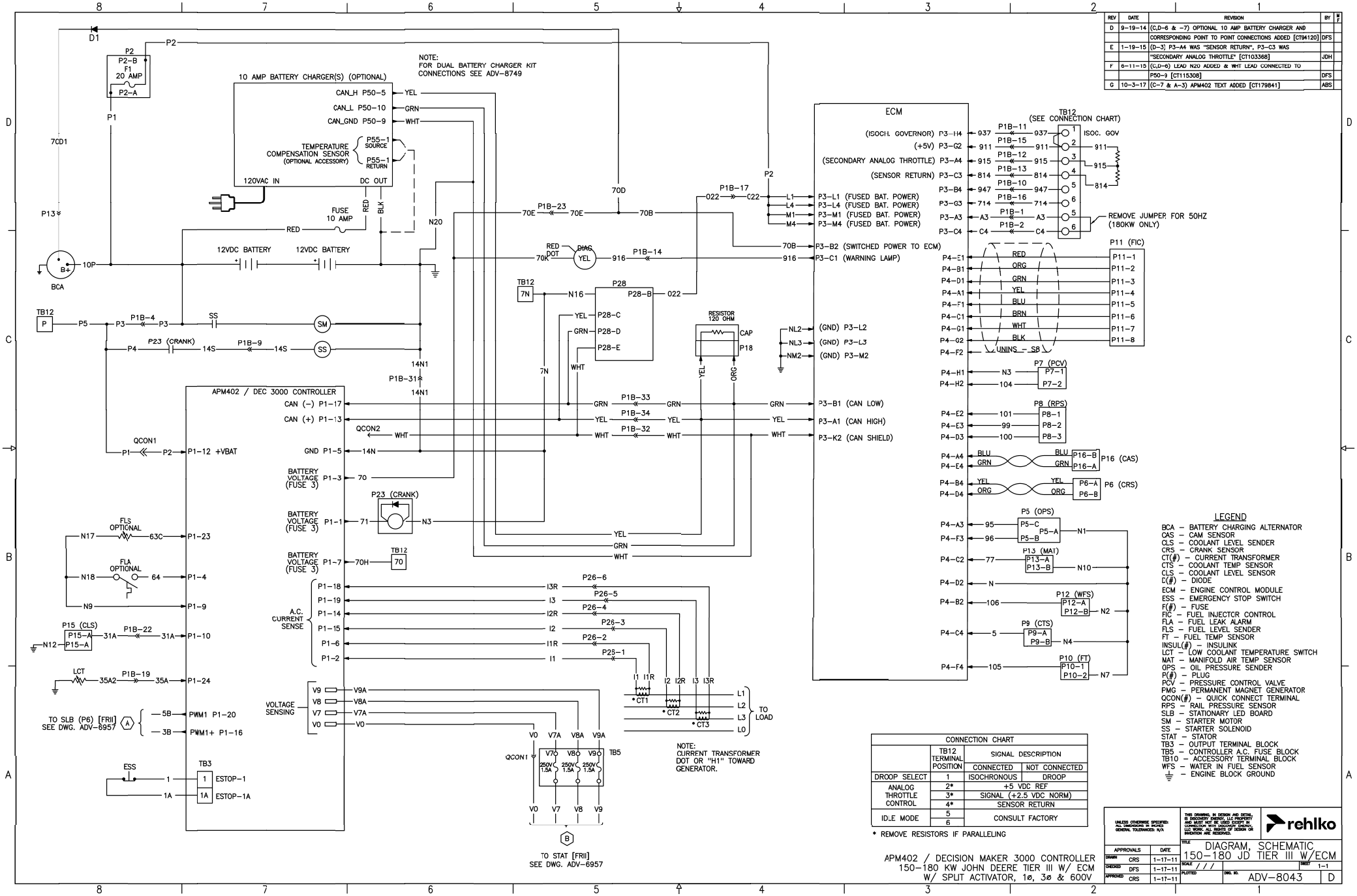
TITLE:
**DIMENSION PRINT, SUBBASE FUEL TANKS**

DWG NO.: **ADV-7881**

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# Wiring Schematics




| REV | DATE | REVISION | BY | H/F |
|---|---|---|---|---|
| D | 9-19-14 | (C,D-6 & -7) OPTIONAL 10 AMP BATTERY CHARGER AND | | |
| | | CORRESPONDING POINT TO POINT CONNECTIONS ADDED [CT94120] | DFS | |
| E | 1-19-15 | (D-3) P3-A4 WAS "SENSOR RETURN", P3-C3 WAS | | |
| | | "SECONDARY ANALOG THROTTLE" [CT103368] | JDH | |
| F | 6-11-15 | (C,D-6) LEAD N20 ADDED & WHT LEAD CONNECTED TO | | |
| | | P50-9 [CT115308] | DFS | |
| G | 10-3-17 | (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

APM402 / DECISION MAKER 3000 CONTROLLER
150–180 KW JOHN DEERE TIER III W/ ECM
W/ SPLIT ACTIVATOR, 1ø, 3ø & 600V

UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN INCHES. GENERAL TOLERANCES: N/A

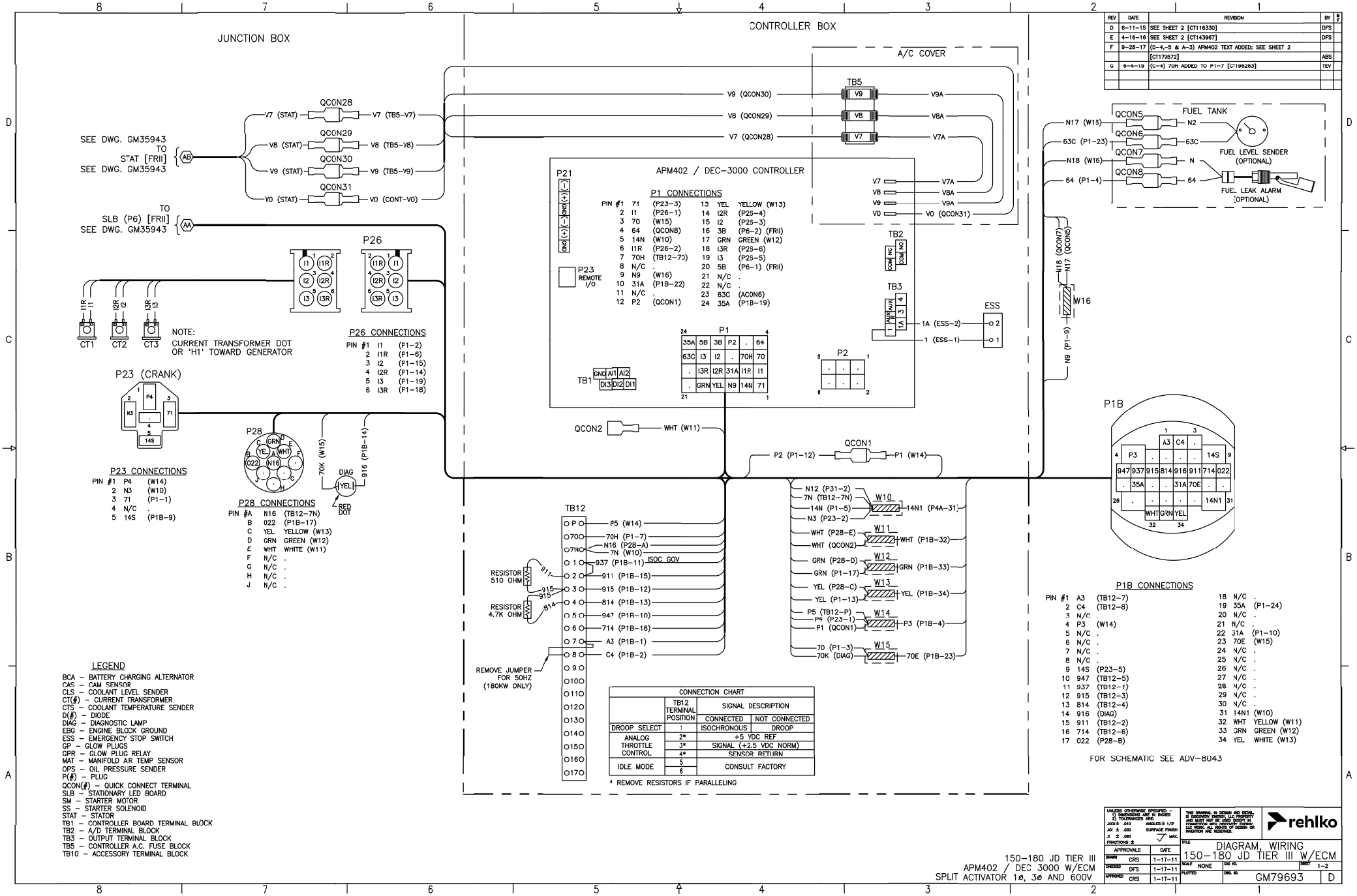
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| APPROVALS | | DATE |
|---|---|---|
| DRAWN | CRS | 1-17-11 |
| CHECKED | DFS | 1-17-11 |
| APPROVED | CRS | 1-17-11 |

TITLE: DIAGRAM, SCHEMATIC
150–180 JD TIER III W/ECM

SCALE: / / / | SHEET: 1-1 | PLOTTED | DWG. NO. ADV-8043 | D




| REV | DATE | REVISION | BY |
|---|---|---|---|
| D | 6-11-15 | SEE SHEET 2 [CT116330] | DFS |
| E | 4-16-16 | SEE SHEET 2 [CT143967] | DFS |
| F | 9-28-17 | (D-4,-5 & A-3) APM402 TEXT ADDED; SEE SHEET 2 | |
| | | [CT179572] | ABS |
| G | 6-4-19 | (C-4) 70H ADDED TO P1-7 [CT196263] | TEV |

P1 CONNECTIONS

| PIN | | | PIN | | |
|---|---|---|---|---|---|
| 1 | 71 | (P23-3) | 13 | YEL | YELLOW (W13) |
| 2 | I1 | (P26-1) | 14 | I2R | (P26-4) |
| 3 | 70 | (W15) | 15 | I2 | (P26-3) |
| 4 | 64 | (QCON8) | 16 | 3B | (P6-2) (FRII) |
| 5 | 14N | (W10) | 17 | GRN | GREEN (W12) |
| 6 | I1R | (P26-2) | 18 | I3R | (P26-6) |
| 7 | 70H | (TB12-7D) | 19 | I3 | (P26-5) |
| 8 | N/C | . | 20 | 5B | (P6-1) (FRII) |
| 9 | N9 | (W16) | 21 | N/C | . |
| 10 | 31A | (P1B-22) | 22 | N/C | . |
| 11 | N/C | . | 23 | 63C | (ACON6) |
| 12 | P2 | (QCON1) | 24 | 35A | (P1B-19) |

P26 CONNECTIONS

| PIN | | |
|---|---|---|
| 1 | I1 | (P1-2) |
| 2 | I1R | (P1-6) |
| 3 | I2 | (P1-15) |
| 4 | I2R | (P1-14) |
| 5 | I3 | (P1-19) |
| 6 | I3R | (P1-18) |

P23 CONNECTIONS

| PIN | | |
|---|---|---|
| 1 | P4 | (W14) |
| 2 | N3 | (W10) |
| 3 | 71 | (P1-1) |
| 4 | N/C | . |
| 5 | 14S | (P1B-9) |

P28 CONNECTIONS

| PIN | | |
|---|---|---|
| A | N16 | (TB12-7N) |
| B | 022 | (P1B-17) |
| C | YEL | YELLOW (W13) |
| D | GRN | GREEN (W12) |
| E | WHT | WHITE (W11) |
| F | N/C | . |
| G | N/C | . |
| H | N/C | . |
| J | N/C | . |

P1B CONNECTIONS

| PIN | | |
|---|---|---|
| 1 | A3 | (TB12-7) |
| 2 | C4 | (TB12-8) |
| 3 | N/C | . |
| 4 | P3 | (W14) |
| 5 | N/C | . |
| 6 | N/C | . |
| 7 | N/C | . |
| 8 | N/C | . |
| 9 | 14S | (P23-5) |
| 10 | 947 | (TB12-5) |
| 11 | 937 | (TB12-1) |
| 12 | 915 | (TB12-3) |
| 13 | 814 | (TB12-4) |
| 14 | 916 | (DIAG) |
| 15 | 911 | (TB12-2) |
| 16 | 714 | (TB12-6) |
| 17 | 022 | (P28-B) |
| 18 | N/C | . |
| 19 | 35A | (P1-24) |
| 20 | N/C | . |
| 21 | N/C | . |
| 22 | 31A | (P1-10) |
| 23 | 70E | (W15) |
| 24 | N/C | . |
| 25 | N/C | . |
| 26 | N/C | . |
| 27 | N/C | . |
| 28 | N/C | . |
| 29 | N/C | . |
| 30 | N/C | . |
| 31 | 14N1 | (W10) |
| 32 | WHT | YELLOW (W11) |
| 33 | GRN | GREEN (W12) |
| 34 | YEL | WHITE (W13) |

| 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 | |

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

| APPROVALS | | DATE |
|---|---|---|
| DRAWN | CRS | 1-17-11 |
| CHECKED | DFS | 1-17-11 |
| APPROVED | CRS | 1-17-11 |

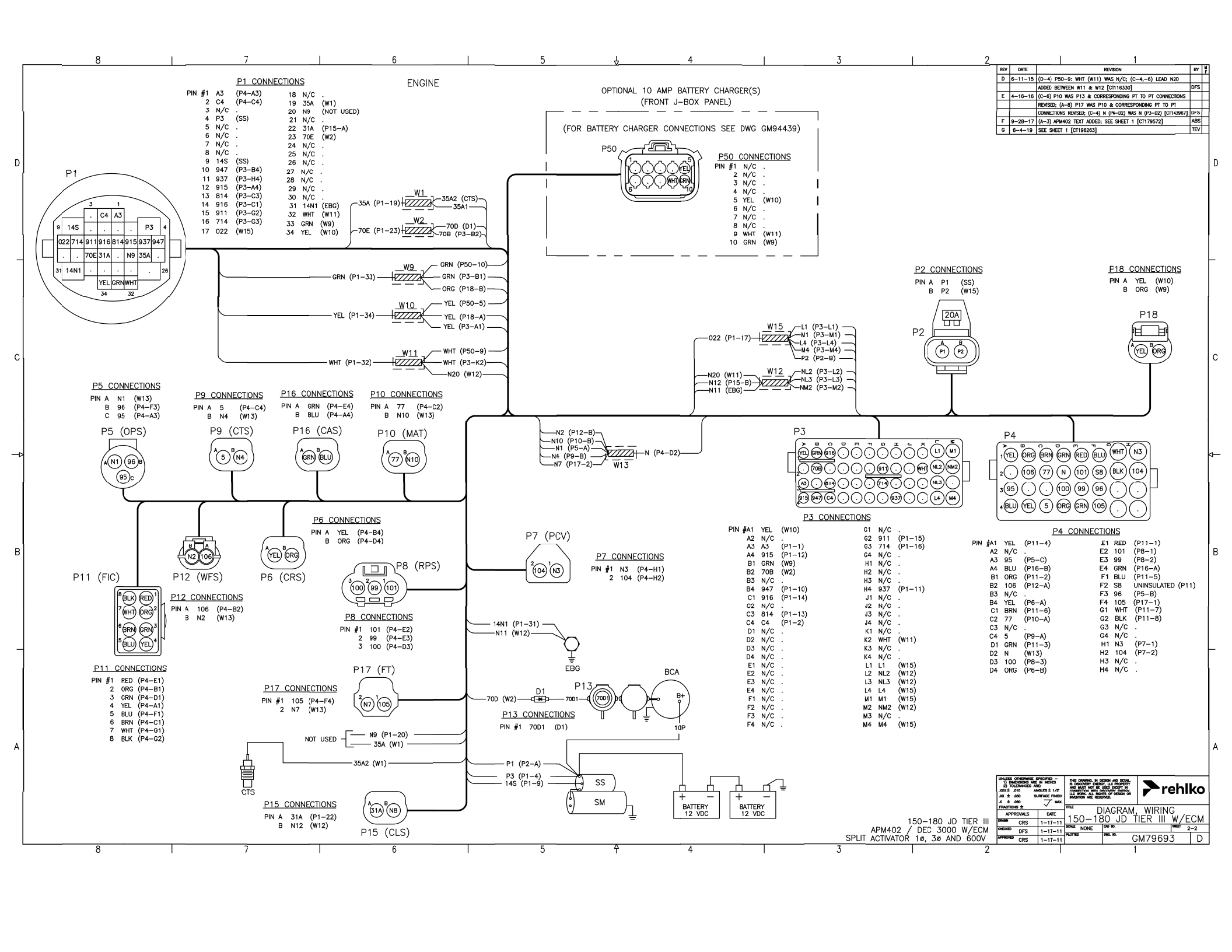
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TITLE: DIAGRAM, WIRING 150-180 JD TIER III W/ECM

SCALE: NONE | CAD NO. | SHEET 1-2

PLOTTED | DWG NO. GM79693 | D




| REV | DATE | REVISION | BY | H F |
|---|---|---|---|---|
| D | 6-11-15 | (D-4) P50-9: WHT (W11) WAS N/C; (C-4,-6) LEAD N20 | | |
| | | ADDED BETWEEN W11 & W12 [CT116330] | DFS | |
| E | 4-16-16 | (C-6) P10 WAS P13 & CORRESPONDING PT TO PT CONNECTIONS | | |
| | | REVISED; (A-8) P17 WAS P10 & CORRESPONDING PT TO PT | | |
| | | CONNECTIONS REVISED; (C-4) N (P4-D2) WAS N (P3-D2) [CT143987] | DFS | |
| F | 9-28-17 | (A-3) APM402 TEXT ADDED; SEE SHEET 1 [CT179572] | ABS | |
| G | 6-4-19 | SEE SHEET 1 [CT196263] | TEV | |

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

| APPROVALS | DATE |
|---|---|
| DRAWN CRS | 1-17-11 |
| CHECKED DFS | 1-17-11 |
| APPROVED CRS | 1-17-11 |

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TITLE DIAGRAM, WIRING
150-180 JD TIER III W/ECM

SCALE NONE CAD NO. SHEET 2-2

PLOTTED DWG. NO. GM79693 D

150-180 JD TIER III
APM402 / DEC 3000 W/ECM
SPLIT ACTIVATOR 1ø, 3ø AND 600V

| REV | DATE | REVISION | BY | H F |
|---|---|---|---|---|
| L | 05JUN2025 | SEE SHEET 2 [CT245006] | SBR | |
| M | 19SEP2025 | (B-2) FOR DCB2 CONNECTION CHANGED FROM PF2/COM TO COM & ST/COM TO NO. SEE SHEET 2. [CT249758] | PBR | |
| N | 30DEC2025 | SEE SHEET 2 [CT250983] | SBR | |

P29 2 AMP RELAY OUPUT (2.1) CONNECTIONS
P29–NC 2.1 RELAY NORMALLY CLOSED
P29–COM 2.1 RELAY COMMON
P29–NO 2.1 RELAY NORMALLY OPEN

P30 2 AMP RELAY OUPUT (2.2) CONNECTIONS
P30–NC 2.2 RELAY NORMALLY CLOSED
P30–COM 2.2 RELAY COMMON
P30–NO 2.2 RELAY NORMALLY OPEN

P31 2 AMP RELAY OUPUT (2.3) CONNECTIONS
P31–NC 2.3 RELAY NORMALLY CLOSED
P31–COM 2.3 RELAY COMMON
P31–NO 2.3 RELAY NORMALLY OPEN

P32 10 AMP RELAY OUPUT (2.4 & 2.5) CONNECTIONS
P32–NO 2.4 RELAY NORMALLY OPEN
P32–COM 2.4 RELAY COMMON
P32–NC 2.4 RELAY NORMALLY CLOSED

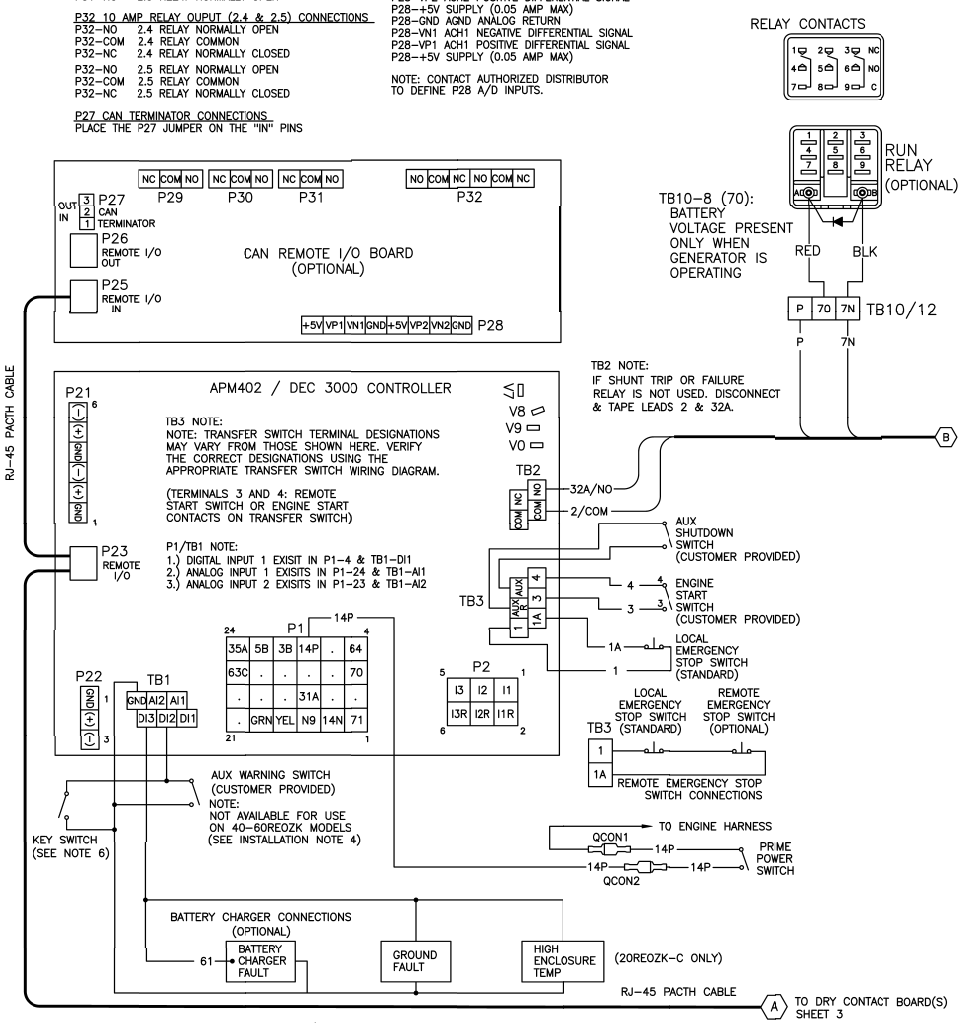
P32–NO 2.5 RELAY NORMALLY OPEN
P32–COM 2.5 RELAY COMMON
P32–NC 2.5 RELAY NORMALLY CLOSED

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

P28 SINGLE-ENDED (0-5V) ANALOG INPUT CONNECTIONS
P28–GND AGND ANALOG RETURN
P28–VN2 NC CONNECTION
P28–VP2 ACH2 SIGNAL
P28–+5V SUPPLY (0.05 AMP MAX)
P28–GND AGND ANALOG RETURN
P28–VN1 NC CONNECTION
P28–VP1 ACH1 SIGNAL
P28–+5V SUPPLY (0.05 AMP MAX)

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

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




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

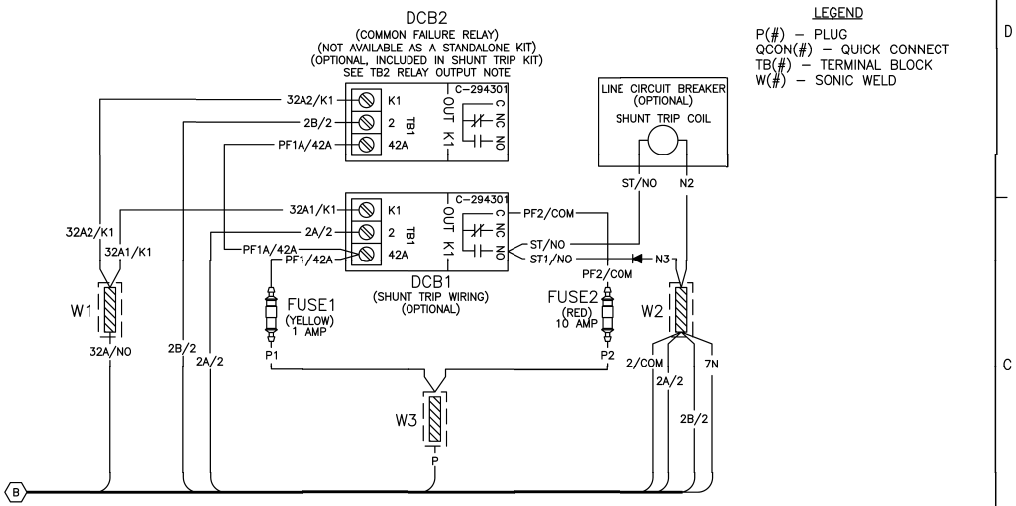
TB1 ANALOG/DIGITAL INPUT FACTORY SETTINGS
TB1–DI1 DCH1 LOW FUEL PRESSURE
TB1–DI2 DCH2 AUX WARNING
TB1–DI3 DCH3 BATTERY CHARGER FAULT WARNING
TB1–AI1 ACH1 NO FUNCTION
TB1–AI2 ACH2 NO FUNCTION
TB1–GND A/DGND ANALOG/DIGITAL RETURN

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

TB2 RELAY OUTPUT
TB2–COM (RELAY COMMON) COMMON FAULT
TB2–COM (RELAY COMMON) COMMON FAULT
TB2–NO (RELAY NORMALLY OPEN) COMMON FAULT
TB2–NC (RELAY NORMALLY CLOSED) COMMON FAULT

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

## USING C-294301 RELAY




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

APM402 / DEC 3000 ACCESSORIES

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

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

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TITLE: DIAGRAM, DEC3000/APM402 ACCY INTERCONNECTION

SCALE / / / | CAD NO. | SHEET 1-3

PLOTTED | DWG NO. GM78246 | D

P29 2 AMP RELAY OUPUT (2,1) CONNECTIONS
P29–NC 2.1 RELAY NORMALLY CLOSED
P29–COM 2.1 RELAY COMMON
P29–NO 2.1 RELAY NORMALLY OPEN

P30 2 AMP RELAY OUPUT (2,2) CONNECTIONS
P30–NC 2.2 RELAY NORMALLY CLOSED
P30–COM 2.2 RELAY COMMON
P30–NO 2.2 RELAY NORMALLY OPEN

P31 2 AMP RELAY OUPUT (2,3) CONNECTIONS
P31–NC 2.3 RELAY NORMALLY CLOSED
P31–COM 2.3 RELAY COMMON
P31–NO 2.3 RELAY NORMALLY OPEN

P32 10 AMP RELAY OUPUT (2,4 & 2,5) CONNECTIONS
P32–NO 2.4 RELAY NORMALLY OPEN
P32–COM 2.4 RELAY COMMON
P32–NC 2.4 RELAY NORMALLY CLOSED

P32–NO 2.5 RELAY NORMALLY OPEN
P32–COM 2.5 RELAY COMMON
P32–NC 2.5 RELAY NORMALLY CLOSED

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

P28 SINGLE–ENDED (0–5V) ANALOG INPUT CONNECTIONS
P28–GND AGND ANALOG RETURN
P28–VN2 N0 CONNECTION
P28–VP2 ACH2 SIGNAL
P28–+5V SJPPLY (0.05 AMP MAX)
P28–GND AGND ANALOG RETURN
P28–VN1 N0 CONNECTION
P28–VP1 ACH1 SIGNAL
P28–+5V SJPPLY (0.05 AMP MAX)

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

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

RELAY CONTACTS

RUN RELAY (OPTIONAL)

CAN REMOTE I/O BOARD (OPTIONAL)

TB10–8 (70): BATTERY VOLTAGE PRESENT ONLY WHEN GENERATOR IS OPERATING

TB10/12

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

APM402 / DEC 3000 CONTROLLER

TB3 NOTE: NOTE: TRANSFER SWITCH TERMINAL DESIGNATIONS MAY VARY FROM THOSE SHOWN HERE. VERIFY THE CORRECT DESIGNATIONS USING THE APPROPRIATE TRANSFER SWITCH WIRING DIAGRAM.

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

P1/TB1 NOTE:
1.) DIGITAL INPUT 1 EXISIT IN P1–4 & TB1–DI1
2.) ANALOG INPUT 1 EXISITS IN P1–24 & TB1–AI1
3.) ANALOG INPUT 2 EXISITS IN P1–23 & TB1–AI2

AUX SHUTDOWN SWITCH (CUSTOMER PROVIDED)

ENGINE START SWITCH (CUSTOMER PROVIDED)

LOCAL EMERGENCY STOP SWITCH (STANDARD)

LOCAL EMERGENCY STOP SWITCH (STANDARD)

REMOTE EMERGENCY STOP SWITCH (OPTIONAL)

REMOTE EMERGENCY STOP SWITCH CONNECTIONS

AUX WARNING SWITCH (CUSTOMER PROVIDED)
NOTE: NOT AVAILABLE FOR USE ON 40–60REOZK MODELS (SEE INSTALLATION NOTE 4)

KEY SWITCH (SEE NOTE 6)

TO ENGINE HARNESS

PRIME POWER SWITCH

BATTERY CHARGER CONNECTIONS (OPTIONAL)

BATTERY CHARGER FAULT

GROUND FAULT

HIGH ENCLOSURE TEMP

(20REOZK–C ONLY)

RJ–45 PACTH CABLE

TO DRY CONTACT BOARD(S) SHEET 3

P2: RS485 NON–ISOLATED CONNECTIONS
P21–1 GND
P21–2 +
P21–3 –
P21–4 GND
P21–5 +
P21–6 –

TB1 ANALOG/DIGITAL INPUT FACTORY SETTINGS
TB1–DI1 DCH1 LOW FUEL PRESSURE
TB1–DI2 DCH2 AUX WARNING
TB1–DI3 DCH3 BATTERY CHARGER FAULT WARNING
TB1–AI1 ACH1 NO FUNCTION
TB1–AI2 ACH2 NO FUNCTION
TB1–GND A/DGND ANALOG/DIGITAL RETURN

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

TB2 RELAY OUTPUT
TB2–COM (RELAY COMMON) COMMON FAULT
TB2–COM (RELAY COMMON) COMMON FAULT
TB2–NO (RELAY NORMALLY OPEN) COMMON FAULT
TB2–NC (RELAY NORMALLY CLOSED) COMMON FAULT

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

## USING GM121395 RELAY W/ DC–DC CONVERTER

DCB2
(COMMON FAILURE RELAY)
(NOT AVAILABLE AS A STANDALONE KIT)
(OPTIONAL, INCLUDED IN SHUNT TRIP KIT)
SEE TE2 RELAY OUTPUT NOTE

DC–DC CONVERTER GM123558

LINE CIRCUIT BREAKER (OPTIONAL) SHUNT TRIP COIL

GM121395

DCB1
(SHUNT TRIP WIRING)
(OPTIONAL)

## USING GM121395 RELAY

DCB2
(COMMON FAILURE RELAY)
(NOT AVAILABLE AS A STANDALONE KIT)
(OPTIONAL, INCLUDED IN SHUNT TRIP KIT)
SEE TB2 RELAY OUTPUT NOTE

INSTALLATION NOTES: SEE SHEET 3

OPTIONAL KIT
APM402 / DEC 3000 ACCESSORIES

| REV | DATE | REVISION | BY |
|---|---|---|---|
| L | 05JUN2025 | CREATED OPTIONAL KIT FOR 24V SHUNT TRIP M/P FRAME | |
| | | [CT245006] | SBR |
| M | 19SEP2025 | (B–2) FOR DCB2 CONNECTION CHANGED FROM PF2/COM TO COM | |
| | | & ST/COM TO NO. SEE SHEET 1. [CT249758] | PBR |
| N | 30DEC2025 | (D–1,2,3) DC–DC CONVERTER CONNECTIONS UPDATED [CT250983] | SBR |

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

| APPROVALS | DATE |
|---|---|
| DRAWN DFS | 9–18–15 |
| CHECKED CRS | 9–18–15 |
| APPROVED DFS | 9–18–15 |

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TITLE: DIAGRAM, DEC3000/APM402 ACCY INTERCONNECTION

SCALE / / / CAD NO. SHEET 2–3

PLOTTED DWG. NO. GM78246 D

| REV | DATE | REVISION | BY | H F |
|---|---|---|---|---|
| L | 05JUN2025 | SEE SHEET 2 [CT245006] | SBR | |
| M | 19SEP2025 | SEE SHEET 1 & 2 [CT249758] | PBR | |
| N | 30DEC2025 | SEE SHEET 2 [CT250983] | SBR | |

INSTALLATION NOTES:

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

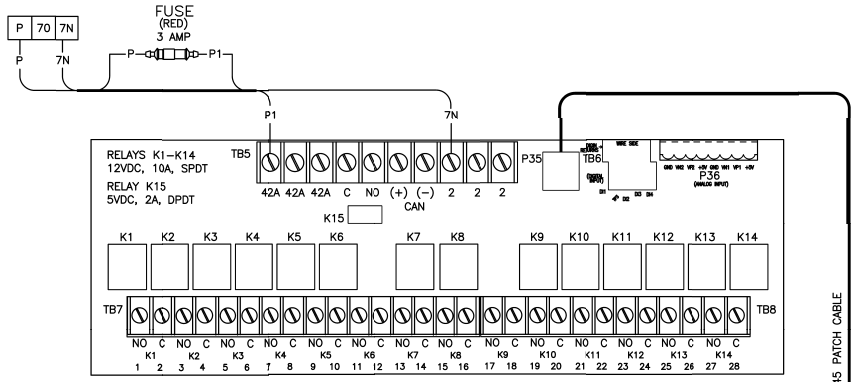
2.) GENERATOR SETS WITH FUEL TANKS HAVE THE FUEL IN BASIN SWITCH TIED TO DIGITAL INPUT 1 (TB1–DI1) VIA P1–4 AND FUEL LEVEL SENDER TIED TO ANALOG INPUT 2 (TB1–AI2) VIA P1–23

3.) COOLANT LEVEL SENSOR ON ALL GENSETS IS TIED TO ANALOG INPUT 1 (TB1–AI2) VIA P1–24.

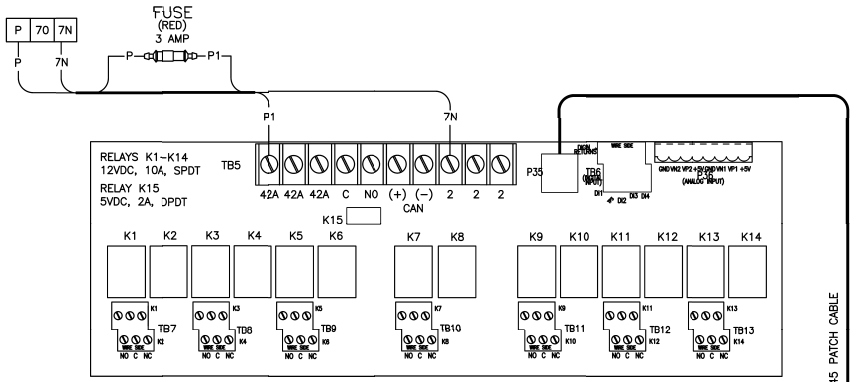
4.) 40–60 REOZK MODELS HAVE COLD START IGNITION RELAY TIED TO DIGITAL INPUT 2 (TB1–DI2)

5.) GROUND FAULT WARNING : CONNECT TO REMOTE I/O BOARD ON 20REOZK–C.

6.) KEYSWITCH AVAILABLE ON SELECT MODELS ONLY.




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)



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

| APPROVALS | | DATE |
|---|---|---|
| DRAWN | DFS | 9-18-15 |
| CHECKED | CRS | 9-18-15 |
| APPROVED | DFS | 9-18-15 |

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TITLE: DIAGRAM, DEC3000/APM402 ACCY INTERCONNECTION

SCALE: / / / | CAD NO. | SHEET 3–3

PLOTTED | DWG NO. GM78246 | D

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# 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 2.5M (96") (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. 2.5M (96") (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.
15A 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.

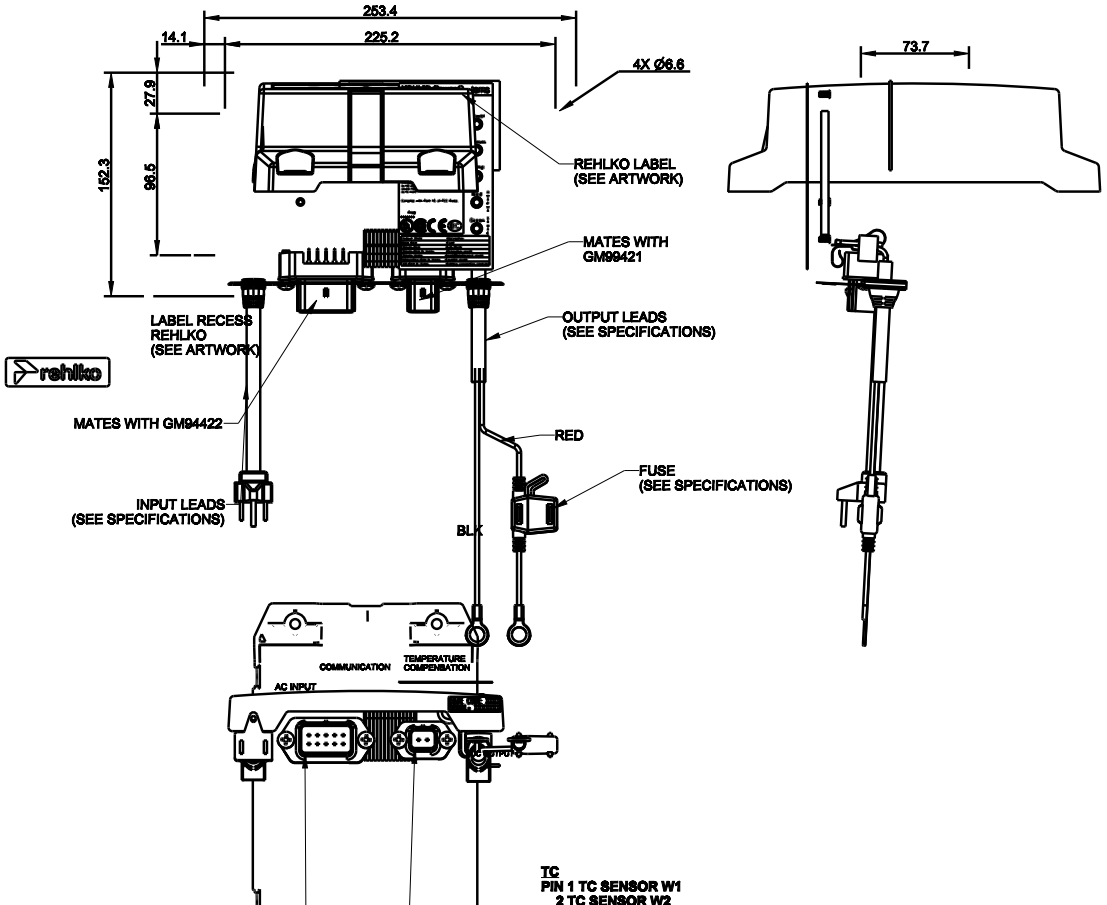
DOCUMENTATION:
THERE SHALL BE AN INSTALLATION / OPERATIONAL MANUAL SUPPLIED WITH EACH CHARGER. PER REHLKO SUPPLIED ARTWORK.

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 REHLKO CONTROLLER)
IBC

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

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

WARRANTY:
2 YEAR FROM DATE OF PURCHASE FROM MANUFACTURE.




TC
PIN 1 TC SENSOR W1
2 TC SENSOR W2

COM PINS:
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

| REV | DATE | ON COMPOSITE: DWGS, SEE PART NO. FOR REVISION LEVEL ☐ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION | BY |
|---|---|---|---|
| A | 5-9-17 | (C-4,2) MATING NOTE ADDED (A-2, 4) PIN CONNECTIONS ADDED [CT174256] | SAM |
| B | 06SEP2025 | (C-6) 20A WAS 15A | PBR |
| | 30OCT2025 | (C&D-8) 2.5M (96") WAS 1.8M (72") | PSC |

DO NOT SCALE.
THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001.
REFERENCE CAD MODEL FOR UNSPECIFIED DIMENSIONS.

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UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN MILLIMETERS
GENERAL TOLERANCES:
X.XX ± 0.25
X.X ± 1.0
X ± 1.0
ANGLES ±0° 30'
BEND ANGLES ± 1°
SURFACE FINISH MAX.

MAJOR ○ = 0
CRITICAL ◉ = 0
THIRD ANGLE PROJECTION
CHARACTERISTICS COMPLY WITH KPS-80022

SCALE: 0.30 SHEET SIZE: B SHEET: 1 OF 1

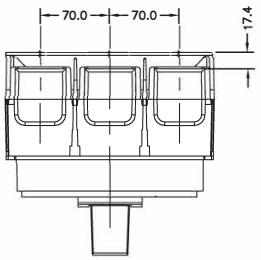
DRAWN: SAM DATE:
APPROVED: SEE PLM SYSTEM 22JAN2025

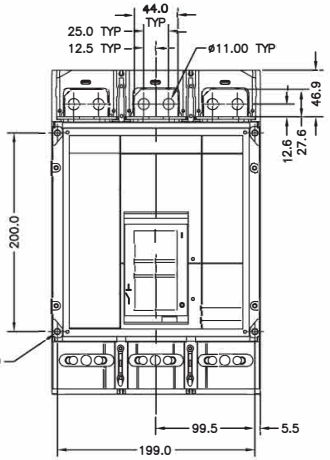
TITLE:
CHARGER, BATTERY 10 AMP
DWG NO.: GM87448

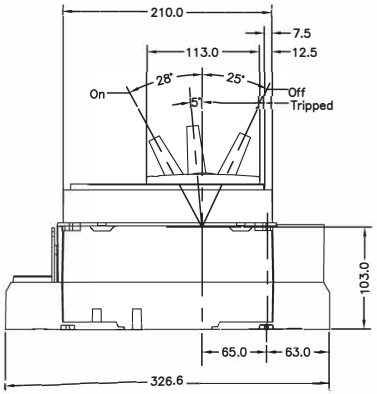
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| PART NO. | REV | AMPS | % RATING | GFI | INT@480V | TRIP | VENDOR NO. |
|---|---|---|---|---|---|---|---|
| GM24181-1 | C | 600 | 100 | NO | 35kA | 5.0 LSI | PGP36060CU33A |
| GM24181-2 | C | 600 | 100 | YES | 35kA | 6.0A LSIG | PGP36060CU44A |
| GM24181-3 | C | 800 | 80 | NO | 35kA | 5.0 LSI | PGP36080U33A |
| GM24181-4 | C | 800 | 80 | YES | 35kA | 6.0A LSIG | PGP36080U44A |
| GM24181-5 | C | 800 | 100 | NO | 35kA | 5.0 LSI | PGP36080CU33A |
| GM24181-6 | C | 800 | 100 | YES | 35kA | 6.0A LSIG | PGP36080CU44A |
| GM24181-7 | C | 1000 | 80 | NO | 35kA | 5.0 LSI | PGP36100U33A |
| GM24181-8 | C | 1000 | 80 | YES | 35kA | 6.0A LSIG | PGP36100U44A |
| GM24181-9 | C | 1000 | 100 | NO | 35kA | 5.0 LSI | PGP36100CU33A |
| GM24181-10 | C | 1000 | 100 | YES | 35kA | 6.0A LSIG | PGP36100CU44A |
| GM24181-11 | C | 1200 | 80 | NO | 35kA | 5.0 LSI | PGP36120U33A |
| GM24181-12 | C | 1200 | 80 | YES | 35kA | 6.0A LSIG | PGP36120U44A |
| GM24181-13 | C | 1200 | 100 | NO | 35kA | 5.0 LSI | PGP36120CU33A |
| GM24181-14 | C | 1200 | 100 | YES | 35kA | 6.0A LSIG | PGP36120CU44A |
| GM24181-15 | D | 1200 | 80 | NO | 65kA | 5.0 LSI | PJP36120U33A |
| GM24181-16 | D | 1200 | 80 | YES | 65kA | 6.0A LSIG | PJP36120U44A |
| GM24181-17 | D | 1200 | 100 | NO | 65kA | 5.0 LSI | PJP36120CU33A |
| GM24181-18 | D | 1200 | 100 | YES | 65kA | 6.0A LSIG | PJP36120CU44A |

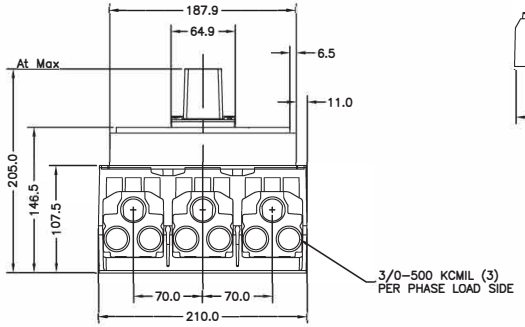
NOTE: (4) #10-32 X 4.5 INCH MOUNTING SCREWS INCLUDED.



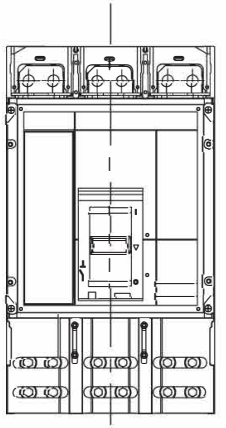



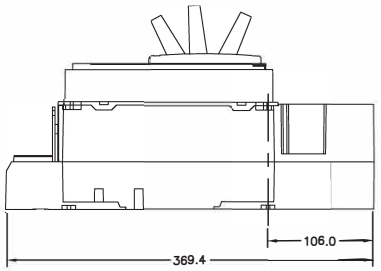

600-800A

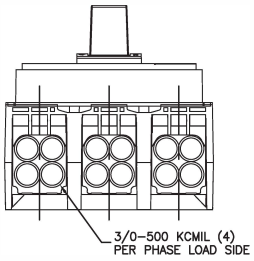



NOTE:
KOHLER PART # TO BE CLEARLY VISIBLE ON
CIRCUIT BREAKER AND ON INDIVIDUAL PACKAGING.

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






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

METRIC CAD FILE

| REV | DATE | REVISION | BY |
|---|---|---|---|
| - | 3-22-02 | NEW DRAWING [58248] | WSD |
| A | 8-12-03 | (D-4) THREADED BAR NOTE ADDED. [70090] | SRL |
| B | 11-12-03 | (D-7) GM24181-13 GFI: NO WAS YES [70985] | WSD |
| C | 2-23-07 | (D-3) KOHLER NOTE ADDED [76285] | GFN |
| D | 1-10-11 | (D-8) GM24181-15 THRU -18 ADDED [80647-15] | WSD |

SQUARE D P-FRAME CIRCUIT BREAKER
3 POLE ELECTRONIC TRIP

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

APPROVALS | DATE
DRAWN WSD 3-22-02
CHECKED WSD 3-22-02
APPROVED AJH 3-22-02

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

TITLE: BREAKER, CIRCUIT

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

| AL/CU MECHANICAL LOAD LUGS PER PHASE | | | |
|---|---|---|---|
| BREAKER FRAME | AMPS | WIRE RANGE | A WIRE BENDING SPACE |
| H | 15-150 | (1) #14 TO 3/0 | 427 [16.8] |
| J | 175 | (1) 1/0 TO 4/0 | 413 [16.3] |
| | 200-250 | (1) 3/0 TO 350 KCMIL | |
| LA | 300-400 | (1) #1 TO 600 KCMIL OR (2) #1 TO 250 KCMIL | 369 [14.5] |
| LG | 400-600 | (2) 2/0 TO 500 KCMIL AL/CU | 362 [14.2] |
| M | 800 | (3) 3/0 TO 500 KCMIL | 341 [13.4] |
| P | 250-800 | | |
| MECHANICAL LOAD LUGS INCLUDED WITH H, J & LG LSIG NEUTRALS | | | |
| H | 60-150 | (1) #14 TO 3/0 AWG AL/CU | |
| J | 250 | (1) 3/0 TO 350 KCMIL AL/CU | |
| LG | 400-600 | (2) 4/0 TO 500 KCMIL AL/CU | |

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

**NOTES:**

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

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

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

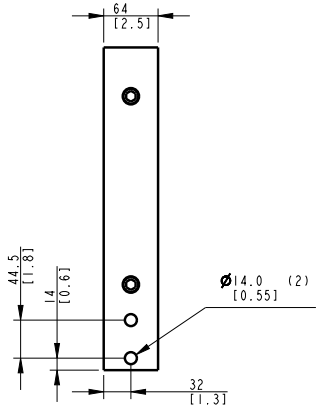
4) MECHANICAL LUGS ARE AVAILABLE FOR NON-LSIG NEUTRAL. SEE ADV-7376. H, J & LG LSIG NEUTRALS INCLUDE LUGS (SEE CHART).

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

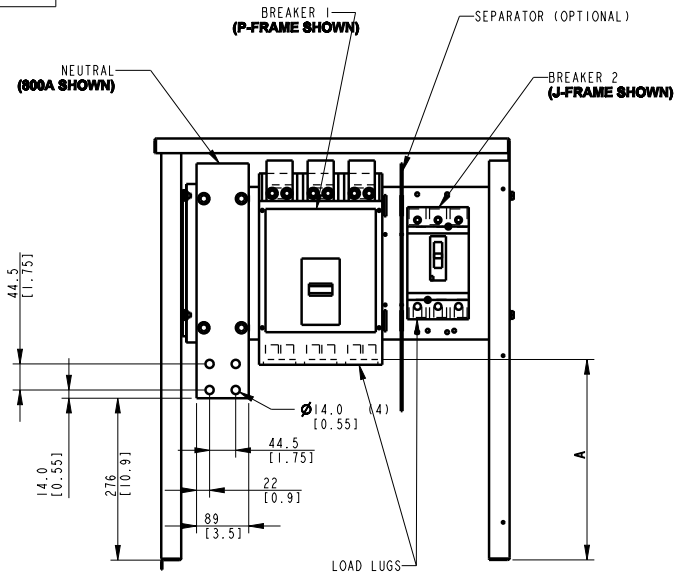
6) CIRCUIT BREAKER FRAMES REFER TO STANDARD SQUARE-D PRODUCT.

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

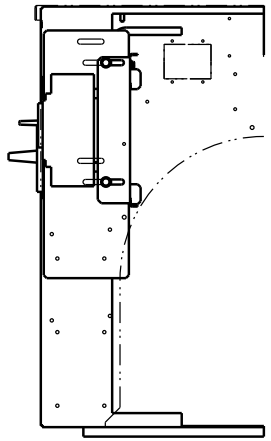
8) DIMENSIONS ARE MM, DIMENSIONS IN [ ] ARE INCHES.




**600A NEUTRAL**
**SCALE 0.175**




**(SEE CHART)**



**VIEW FROM ENGINE END**
**(HALF VIEW SHOWN)**

## RIGHT SIDE SHOWN WITH COVERS REMOVED

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

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

**LCB KITS**
**4S,4V,4RX,4TX,4SX**
**ALTERNATOR FRAMES**

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

| REV | DATE | ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL ☐ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION | BY |
|---|---|---|---|
| C | 11-2-16 | (D-8) REMOVED SEPARATE LINES FOR | |
| | | H & J 100% LUGS; (D-4) UPDATED | |
| | | TABLE AND ADDED 3RD LCBS | WSD |
| D | 3-26-19 | [CT194206] TABLE ADDED [CT194577] | WSD |
| E | 5-24-19 | (A-6) 1000 & 1200A REMOVED [CT196063] | WSD |
| F | 6-23-21 | (D-8) M 800A WAS 700 & 800, LI WAS I | |
| | | [CT212837] | WSD |

DO NOT SCALE.
THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001.
REFERENCE CAD MODEL FOR UNSPECIFIED DIMENSIONS.

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UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN MILLIMETERS
GENERAL TOLERANCES: N/A

MAJOR ○ = 0
CRITICAL ◉ = 0
CHARACTERISTICS COMPLY WITH KPS-80022

THIRD ANGLE PROJECTION

SCALE: 0.12 SHEET SIZE: B SHEET: 1 OF 1

DRAWN: WSD DATE:
APPROVED: SEE PLM SYSTEM 5-16-07

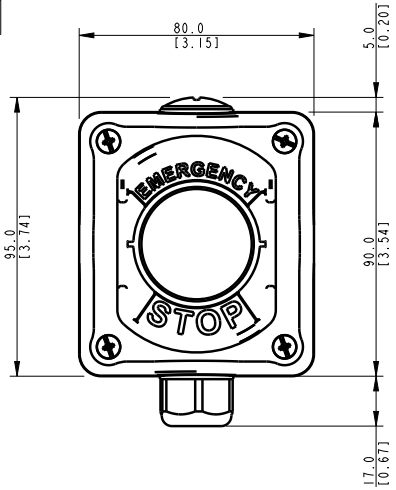
TITLE:
**PRINT, DIMENSION**

DWG NO.: **ADV-7371**

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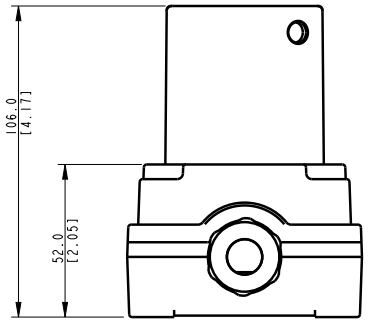
| KIT NO. | ITEM | PART NO | QTY | DESCRIPTION |
|---|---|---|---|---|
| GM103743 | | | | E-STOP, NEC REMOTE |
| | 1 | GM103743-1 | 1 | E-STOP W/ YELLOW SHROUD, LOTO |
| | 2 | GM103743-2 | 4 | #10 X 1.25□ Sheetmetal Screw |
| | 3 | GM103743-3 | 1 | TERMINAL, FAST-ON, MALE, 18-22 AWG |
| | 4 | GM103743-4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

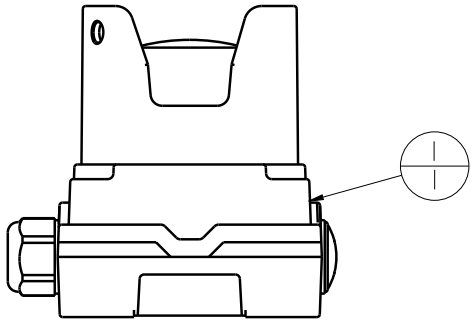
**THIS IS AN AUTOMATED TABLE. ALL UPDATES MUST BE MADE IN THE ASSEMBLY.**






**SCALE 0.75**



NOTE:

DIMENSIONS IN [ ] ARE IN INCH EQUIVALENTS.

SCREWS AND TERMINALS ARE TO BE BAGGED AND PLACED IN BOX

| REV | DATE | ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL □ INDICATES PART NUMBERS AFFECTED BY LATEST DRAWING REVISION | BY |
|---|---|---|---|
| - | 2-12-18 | NEW DRAWING [CTI76728] | CCL |

DO NOT SCALE. THIS ASSEMBLY OR PART MUST COMPLY WITH PEP-RML-001. REFERENCE CAD MODEL FOR UNSPECIFIED DIMENSIONS.

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UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN MILLIMETERS
GENERAL TOLERANCES:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ±0° 30'
BEND ANGLES ± 1°
SURFACE FINISH MAX.

MAJOR ○= 0
CRITICAL ◉= 0
CHARACTERISTICS COMPLY WITH KPS-80022

THIRD ANGLE PROJECTION

SCALE: 0.60 SHEET SIZE: B SHEET: 1 OF 1

DRAWN: BTW DATE: 2-12-18

APPROVED: SEE PLM SYSTEM

TITLE: E-STOP, NEC REMOTE

DWG NO.: GM103743

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# Warranty

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

Your product has been manufactured and inspected with care by experienced craftsmen. If you are the original end user, Discovery Energy, LLC and its affiliates dba Rehlko -hereafter referred to as "the manufacturer"- 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, the manufacturer will repair, replace, or make appropriate adjustment at the manufacturer's option if the product, upon the manufacturer's inspection, is found to be properly installed, maintained, and operated in accordance with the manufacturer's instruction manuals. A distributor, dealer, or authorized service representative must perform startup.

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

**Standby rated generators may only be used in Stationary "emergency" applications, where the generator set is the secondary power source, and a dependable utility is the primary power source. Use of a standby rated generator in a stationary "non-emergency" application, or any non-stationary application, is not allowed and voids all factory warranties.**

---

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

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

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

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

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

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Discovery Energy, LLC
200 Twin Oaks Road, Kohler, WI 53044 USA
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
powersystems.rehlko.com

TP-5374 12/24h

rehlko

# Certification

# Certificate of Registration

## QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that:

Discovery Energy
Rehlko
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, including the manufacture of leads and harness, skids, and fabricated components with distribution of generator sets supported by warehouse operations.

For and on behalf of BSI:

Jessica Patel, Senior Vice President, Assurance Americas

Original Registration Date: 1995-02-28
Effective Date: 2024-11-07
Latest Revision Date: 2025-12-03
Expiry Date: 2027-11-06



...making excellence a habit.™

This certificate remains the property of BSI and shall be returned immediately upon request.
An electronic certificate can be authenticated online. Printed copies can be validated at www.bsigroup.com/ClientDirectory
To be read in conjunction with the scope above or the attached appendix.
Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 345 080 9000
BSI Assurance UK Limited, registered in England under number 7805321 at Seventh and Eighth Floors, The Acre, 90 Long Acre, London, WC2E 9RA, UK.
A Member of the BSI Group of Companies.

Certificate No: **FM 727336**

| Location | Registered Activities |
|---|---|
| Discovery Energy<br>Rehlko<br>- GK<br>200 Twin Oaks Road<br>Kohler<br>Wisconsin<br>53004<br>USA | Manufacture of leads and harness, automatic transfer switches and switchgear. Distribution of generator sets. |
| Discovery Energy<br>Rehlko<br>N7650 Lakeshore Road<br>Sheboygan<br>Wisconsin<br>53083<br>USA | Design, manufacture, and distributor support for electrical generators, automatic transfer switches and switchgear. |
| Discovery Energy<br>Rehlko<br>300 N Dekora Woods Blvd<br>Saukville<br>Wisconsin<br>53080<br>USA | Manufacture of fuel tanks, skids, fabricated components and generators. |
| Discovery Energy<br>Rehlko<br>Muth Warehouse<br>2821 Muth Court<br>Sheboygan<br>Wisconsin<br>53083<br>USA | The distribution of generator sets. |
| Discovery Energy<br>Rehlko<br>KWIP Warehouse<br>4327 County EE<br>Sheboygan<br>Wisconsin<br>53081<br>USA | Receiving, sequencing and warehousing of generator components. |

Original Registration Date: 1995-02-28

Effective Date: 2024-11-07

Latest Revision Date: 2025-12-03

Expiry Date: 2027-11-06



This certificate remains the property of BSI and shall be returned immediately upon request.
An electronic certificate can be authenticated online. Printed copies can be validated at www.bsigroup.com/ClientDirectory
To be read in conjunction with the scope above or the attached appendix.
Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 345 080 9000
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# Technical Evaluation Report

DIVISION: 48 10 00–ELECTRICAL POWER GENERATION EQUIPMENT

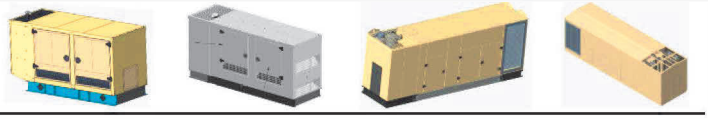
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**EVALUATION SUBJECT:** ANCHORAGE FOR QUALIFYING ENCLOSURE MODELS

TER-24-76917

**REPORT HOLDER:**
DISCOVERY ENERGY, LLC.
200 TWIN OAKS ROAD
KOHLER, WI 53044, USA



NOTE: THE GRAPHICAL DEPICTIONS IN THIS REPORT ARE FOR ILLUSTRATIVE PURPOSES ONLY AND MAY DIFFER IN APPEARANCE.

THIS ADDENDUM EVALUATION IS ONLY VALID WHEN PAIRED WITH THE SIGNED AND SEALED "UNIFORM (STATIC) WIND LOADING" TECHNICAL EVALUATION REPORT BY THIS FIRM FOR THE RESPECTIVE MODEL.

## SCOPE OF EVALUATION (compliance with the following codes):

**THIS IS A STRUCTURAL (WIND) PERFORMANCE EVALUATION ONLY. NO ELECTRICAL OR TEMPERATURE PERFORMANCE RATINGS OR CERTIFICATIONS ARE OFFERED OR IMPLIED HEREIN.**
**UNDER NO CIRCUMSTANCE DOES THIS PERFORMANCE EVALUATION GUARANTEE, IMPLY, OR STATE PERFORMANCE OF THE UNIT IS MAINTAINED DURING OR AFTER A DESIGN EVENT.**

This Product Evaluation Report is being issued in accordance with the requirements of the **Florida Building Code Eighth Edition (2023)** per ASCE 7, FBC Building Ch. 16, FBC Building Sections 104.11 & 1522.2, FBC Existing Building Sections 707.1 & 707.2, FBC Mechanical 301.15, FBC Residential M1202.1 & M1301.1, FS 471.025, and Broward County Administrative Provisions 107.3.4. This report is also in accordance with the **International Building & Residential Codes (2012, 2015, 2018, & 2021).** The product noted in this report has been tested and/or evaluated as summarized herein.

**IN ACCORDANCE WITH THESE CODES EACH OF THESE REPORTS MUST BEAR THE ORIGINAL SIGNATURE & RAISED SEAL OR DIGITAL SEAL OF THE EVALUATING ENGINEER.**

## SUBSTANTIATING DATA:

**• Product Evaluation Documents**
Substantiating documentation has been submitted to provide this TER and is summarized in the sections below.
**• Structural Engineering Calculations**
Structural engineering calculations have been prepared which evaluate the product based on comparative and/or rational analysis to qualify the following design criteria:

- Maximum rated wind pressures stated herein
- Anchor connection integrity, verified by a unity check between tension and shear.

Calculation summary is included in this TER and appears herein.

## LIMITATIONS & CONDITIONS OF USE:

Use of the product(s) listed herein shall be in strict accordance with this TER as noted herein and manufacturer-provided model specifications. Installation shall conform to the minimum standards stated in the referenced building code(s) in addition to the specifications and limitations stated herein. See herein for complete limitations & conditions of use.

## OPTIONS:

This evaluation is valid for the models listed herein. This evaluation includes standard product only. Contact Rehlko for Engineering Special (ES) orders. Any structural changes outside of the design as described herein would void this certification.

## UNIT CASING MATERIALS:

See "Uniform (Static) Wind Loading" Technical Evaluation Report for the respective enclosure model and model-specific unit construction information.

## TERMINOLOGY:

See herein for definitions of abbreviations used in this report.

## STRUCTURAL PERFORMANCE:

Models referenced herein are subject to the following design limitations:

Maximum-Rated ASD Wind Pressures*:
**± 65 psf Lateral, 65 psf Uplift**

Maximum pressure rating determined based on the design parameters of: Vult = 186 mph, Exposure D, flat terrain, at-grade.

- Required design wind pressures shall be determined on a site-specific basis in accordance with ASCE 7 and applicable sections of the building code(s) being referenced in accordance with ASD methodology.
- Required design wind pressures shall be less than or equal to the maximum pressures listed herein.
- *Maximum-Rated ASD Wind Pressures indicate the maximum pressures that all units listed herein are approved for. Valid for at-grade applications. See limitations herein.
- Valid for use inside and outside the High-Velocity Hurricane Zone (HVHZ).
- Site-specific wind analysis may produce alternate limitations provided that the maximum-rated wind pressures stated herein are not exceeded.

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## ANCHORAGE DIRECTIVE INSTRUCTIONS

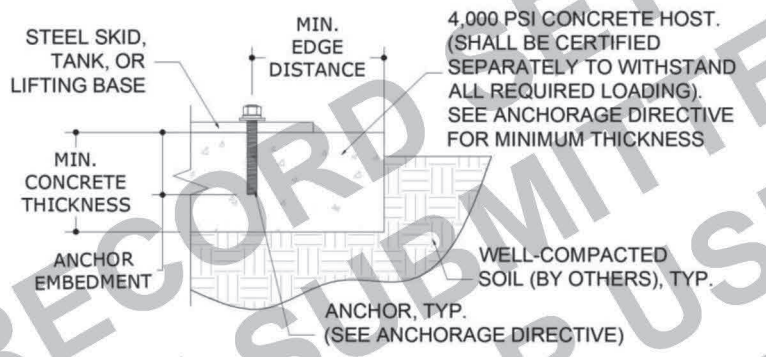
The following set of instructions is intended for use with the "Anchorage Directive" table shown on the following pages.

To determine anchorage specifications:

1. Locate the Generator model in the left-most column of the "Anchor Directive" table herein. (Note: "Anchorage Directive" table spans multiple pages.) The two columns right describe the associated Enclosure name and respective dimensional print (ADV).

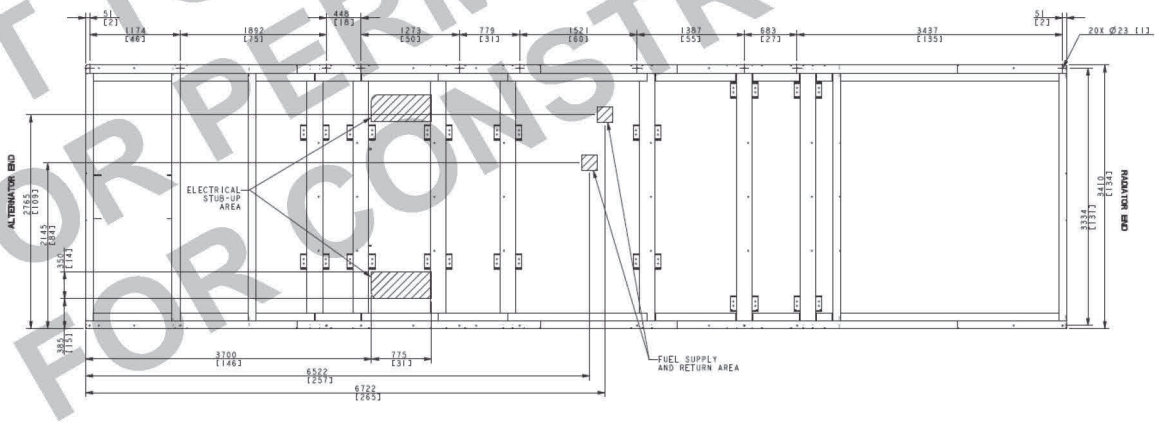
2. Reading table data from left to right, select the correct size fuel tank where applicable, otherwise select "No Tank".

3. Continue reading across from left to right for Anchor Specifications, which state: Anchor brand, model, nominal diameter, embedment, minimum edge distance, minimum concrete thickness, and total number of anchors, respectively. See the Anchor Illustration below. Note: Edge distance to concrete applies in all directions (i.e. any edge of concrete).



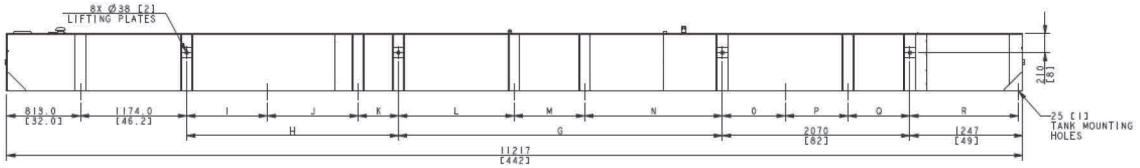

**ANCHOR ILLUSTRATION**
SCALE: NTS SECTION VIEW

4. **A:** **For enclosures anchored directly to host without a fuel tank:**
Go to the respective enclosure ADV and install the specified number of anchors at the delineated mounting hole locations. See the below example for the lifting base's mounting holes: (The sample lifting base shown is for illustration only.)




**B:** **For enclosures mounted on fuel tanks and tanks anchored to the host:**

Go to the respective fuel tank ADV and install the specified number of anchors at the delineated mounting hole locations. See the below example for the fuel tank's mounting holes: (The sample fuel tank in the example is for illustration only.)




5. Refer to Rehlko ADV-9107 and the "Wind Installation Requirements" section herein for additional installation instructions and directives.

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## ANCHORAGE DIRECTIVE

| Genset Models | Enclosure | | Fuel Tank | | | Anchor Specifications | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Name | ADV | Liters | Gal | ADV | Anchor Brand | Model | Diam. (in) | Embed. (in) | Min. Edge Distance (in) | Min. Concrete Thickness (in) | # of Anchors |
| 40-60 REOZK | Sound Aluminum | ADV-8740 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.625 | 4 | 6 | 6 | 4 |
| | | | 505 | 133 | ADV-8753 | HILTI | KWIK BOLT TZ2 | 0.625 | 4 | 6 | 6 | 6 |
| | | | 868 | 229 | | | | | | | | |
| | | | 1043 | 275 | | | | | | | | |
| | | | 1527 | 403 | | | | | | | | |
| | | | 541 | 142 | | | | | | | | |
| | | | 898 | 237 | | | | | | | | |
| | | | 1057 | 279 | | | | | | | | |
| | | | 1520 | 401 | | | | | | | | |
| | | | 2028 | 535 | ADV-8753 | HILTI | KWIK BOLT TZ2 | 0.625 | 4 | 6 | 6 | 8 |
| KG25 | KG25-60 Sound Aluminum Enclosure * *Note: Enclosure design is permitted to have modified internal door intake baffles | ADV-9039 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.625 | 4 | 6 | 6 | 4 |
| KG30 | | | | | | | | | | | | |
| KG40 | | | | | | | | | | | | |
| KG40A | | | | | | | | | | | | |
| KG45 | | | | | | | | | | | | |
| KG50 | | | | | | | | | | | | |
| KG60 | | | | | | | | | | | | |
| KG25-60 | Sound Aluminum | ADV-10023 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.625 | 4 | 6 | 6 | 4 |
| KG80 | Sound Aluminum | ADV-9083 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.625 | 4 | 6 | 6 | 6 |
| KG80 w/ Catalyst | | | | | | | | | | | | |
| KG80A* | *Same as KG80 offerings listed above, except with modified internal rear intake ducts (permitted change by Engineering Express). See KG80 specificaions above. | | | | | | | | | | | |
| KG100-125 | Sound Aluminum | ADV-9083 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.625 | 4 | 6 | 6 | 6 |
| 80-100 REZGD | Sound Aluminum | ADV-7892 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.625 | 4 | 6 | 6 | 6 |
| 125-150 REZGC | Sound Aluminum | ADV-8459 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.625 | 4 | 6 | 6 | 6 |

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**SEE NEXT PAGES FOR ADDITIONAL ANCHORAGE DIRECTIVE ENTRIES**

## ANCHORAGE DIRECTIVE NOTES

See “Anchorage Directive Instructions” on page 2 for additional information on “Anchorage Directive” table. Anchorage calculations were based on ADV-9107 provided by Rehlko. See “Anchorage Directive Instructions” section, Rehlko ADV-9107, and the “Wind Installation Requirements” section herein for additional installation specifications.


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## ANCHORAGE DIRECTIVE, CONTINUED

| Genset Models | Enclosure | | Fuel Tank | | | Anchor Specifications | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Name | ADV | Liters | Gal | ADV | Anchor Brand | Model | Diam. (in) | Embed. (in) | Min. Edge Distance (in) | Min. Concrete Thickness (in) | # of Anchors |
| 80-100 REOZJF | Sound Aluminum | ADV-7647 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.75 | 3.75 | 6 | 8 | 6 |
| | | | 791 | 209 | ADV-8519 | HILTI | KWIK BOLT TZ2 | 0.75 | 3.75 | 6 | 8 | 8 |
| | | | 815 | 215 | ADV-8522 | HILTI | KWIK BOLT TZ2 | 0.75 | 3.75 | 6 | 8 | 16 |
| | | | 1317 | 348 | ADV-8519 | HILTI | KWIK BOLT TZ2 | 0.75 | 3.75 | 6 | 8 | 8 |
| | | | 1570 | 415 | ADV-8522 | HILTI | KWIK BOLT TZ2 | 0.75 | 3.75 | 6 | 8 | 16 |
| | | | 1696 | 448 | ADV-8519 | HILTI | KWIK BOLT TZ2 | 0.75 | 3.75 | 6 | 8 | 8 |
| | | | 3089 | 816 | ADV-8522 | HILTI | KWIK BOLT TZ2 | 0.75 | 3.75 | 6 | 8 | 6 |
| 125REOZJG 150REOZJF | Sound Aluminum | ADV-7825 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 6 |
| | | | 1128 | 298 | ADV-7881 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 10 |
| | | | 1198 | 316 | | | | | | | | |
| | | | 2207 | 583 | | | | | | | | |
| | | | 2255 | 595 | | | | | | | | |
| | | | 4402 | 1163 | ADV-7881 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 8 |
| 180REOZJG 200REOZJF | Sound Aluminum | ADV-7854 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 10 |
| | | | 1514 | 400 | ADV-7859 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 12 |
| | | | 2869 | 758 | | | | | | | | |
| | | | 5742 | 1517 | | | | | | | | |
| | | | 1576 | 416 | ADV-7859 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 14 |
| | | | 2896 | 765 | | | | | | | | |
| 180-200 REZXB | Sound Aluminum | ADV-7669 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.625 | 4.75 | 6 | 8 | 8 |
| KG 150-200 | Sound Aluminum | ADV-9110 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.625 | 4.75 | 6 | 8 | 12 |
| 230-275 REOZJE | Sound Aluminum | ADV-7644 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 12 | 14 | 12 |
| | | | 1787 | 472 | ADV-7645 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 12 | 14 | 14 |
| | | | 2102 | 555 | | | | | | | | |
| | | | 3573 | 944 | | | | | | | | |

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## ANCHORAGE DIRECTIVE, CONTINUED

| Genset Models | Enclosure | | Fuel Tank | | | Anchor Specifications | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Name | ADV | Liters | Gal | ADV | Anchor Brand | Model | Diam. (in) | Embed. (in) | Min. Edge Distance (in) | Min. Concrete Thickness (in) | # of Anchors |
| 300REOZJ | Sound Aluminum | ADV-7664 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 12 | 14 | 12 |
| | | | 2067 | 546 | ADV-7645 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 12 | 14 | 14 |
| | | | 2102 | 555 | | | | | | | | |
| | | | 4066 | 1074 | | | | | | | | |
| 250REZXB 300REZXC | Sound Aluminum | ADV-7718 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 10 | 12 | 8 |
| 300-350 REZXB | Sound Aluminum | ADV-8162 | No Tank | | | HILTI | KWIK BOLT 3 | 0.75 | 5 | 12 | 12 | 8 |
| 400-450 REZXB | Sound Aluminum | ADV-8163 | | | | | | | | | | |
| 350-500 REOZJB | Sound Level 2 Aluminum | ADV-8515 | No Tank | | | HILTI | KWIK HUS-EZ | 0.75 | 4 | 6 | 8 | 14 |
| | | | 1529-4394 | 404-1161 | ADV-8528 | HILTI | KWIK HUS-EZ | 0.75 | 4 | 6 | 8 | 18 |
| | | | 5046 | 1333 | ADV-8528 | HILTI | KWIK HUS-EZ | 0.75 | 4 | 6 | 8 | 20 |
| | | | 5765 | 1523 | ADV-8528 | HILTI | KWIK HUS-EZ | 0.75 | 4 | 6 | 8 | 22 |
| | | | 6674 | 1763 | ADV-8528 | HILTI | KWIK HUS-EZ | 0.75 | 4 | 6 | 8 | 24 |
| | | | 10008 | 2664 | | | | | | | | |

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## ANCHORAGE DIRECTIVE, CONTINUED

| Genset Models | Enclosure | | Fuel Tank | | | Anchor Specifications | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Name | ADV | Liters | Gal | ADV | Anchor Brand | Model | Diam. (in) | Embed. (in) | Min. Edge Distance (in) | Min. Concrete Thickness (in) | # of Anchors |
| 350-500 REOZJ | Sound Level 2 Aluminum | ADV-7990 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 12 |
| | | | 1507 | 398 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 14 |
| | | | 1529 | 404 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 16 |
| | | | 1733 | 458 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 14 |
| | | | 1772 | 468 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 16 |
| | | | 2903 | 767 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 14 |
| | | | 2930 | 774 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 16 |
| | | | 3346 | 884 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 14 |
| | | | 3384 | 894 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 16 |
| | | | 4296 | 1135 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 14 |
| | | | 4395 | 1161 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 16 |
| | | | 4974 | 1314 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 14 |
| | | | 5046 | 1333 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 18 |
| | | | 5765 | 1523 | | | | | | | | |
| | | | 6674 | 1763 | | | | | | | | |
| | | | 10084 | 2664 | ADV-8045 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 14 |
| 500REOZVC 550-600 REOZVB | Sound Aluminum | ADV-8417 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 14 |
| | | | 2048 | 541 | ADV-8417 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 6 | 8 | 20 |
| | | | 2037 | 538 | | | | | | | | |
| | | | 3910 | 1033 | | | | | | | | |
| | | | 3923 | 1038 | | | | | | | | |
| | | | 5727 | 1513 | | | | | | | | |
| | | | 5754 | 1520 | | | | | | | | |
| | | | 7643 | 2019 | | | | | | | | |
| | | | 7658 | 2023 | | | | | | | | |
| | | | 11553 | 3052 | | | | | | | | |

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## ANCHORAGE DIRECTIVE NOTES

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ANCHORAGE DIRECTIVE, CONTINUED

| Genset Models | Enclosure | | Fuel Tank | | | Anchor Specifications | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Name | ADV | Liters | Gal | ADV | Anchor Brand | Model | Diam. (in) | Embed. (in) | Min. Edge Distance (in) | Min. Concrete Thickness (in) | # of Anchors |
| KD 800-1000 | Sound Level 2 Aluminum | ADV-8919 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 8 | 8 | 14 |
| | | | 3475 | 918 | ADV-8919 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 8 | 8 | 20 |
| | | | 6621 | 1749 | | | | | | | | |
| | | | 10573 | 2793 | | | | | | | | |
| | | | 12969 | 3426 | | | | | | | | |
| | | | 15740 | 4158 | | | | | | | | |
| | | | 19381 | 5120 | ADV-8919 | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 8 | 8 | 22 |
| KD 1250A-1750 | Sound Level 2 Aluminum | ADV-8927 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 12 | 12 | 16 |
| | | | 5863 | 1549 | ADV-8927 | HILTI | HAD-P | M16 | 7.5 | 8 | 12 | 18 |
| | | | 9860 | 2605 | | | | | | | | |
| | | | 11204 | 2960 | | | | | | | | |
| | | | 19214 | 5076 | ADV-8927 | HILTI | HAD-P | M16 | 7.5 | 8 | 12 | 20 |
| | | | 21985 | 5808 | | | | | | | | |
| KD 2000-2500 | Sound Level 2 Aluminum | ADV-9075 | No Tank | | | HILTI | KWIK BOLT TZ2 | 0.75 | 4.75 | 12 | 12 | 20 |
| | | | 8577 | 2266 | ADV-9075 | HILTI | HAD-P | M16 | 7.5 | 8 | 12 | 24 |
| | | | 14130 | 3733 | | | | | | | | |
| | | | 16451 | 4346 | | | | | | | | |

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SEE PREVIOUS PAGES FOR ADDITIONAL ANCHORAGE DIRECTIVE ENTRIES

## ANCHORAGE DIRECTIVE NOTES

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## WIND INSTALLATION REQUIREMENTS

The following are requirements for wind-rated installations:

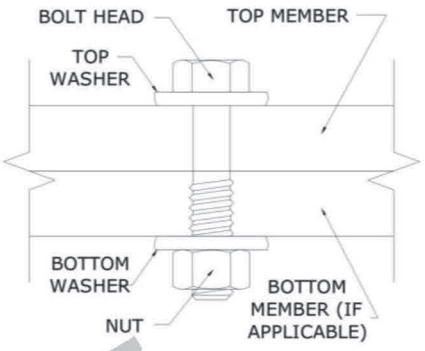
1. The design of post-installed anchors in concrete used for the component anchorage has been evaluated by this engineer for wind applications in accordance with ASCE 7 as referenced herein.
2. Anchors must be installed in minimum 4000 psi compressive strength normal weight concrete. Concrete aggregate must comply with ASTM C33. Installation in structural lightweight concrete is not permitted unless otherwise approved by the structural Engineer of Record.
3. Anchors must be installed to the torque specification as recommended by the anchor manufacturer to obtain maximum capacity.
4. Anchors must be installed in the locations specified in the Rehlko dimensional print (ADV) in correlation with the signed and sealed engineering herein. The more stringent requirement from either document shall apply in cases of uncertainty.
5. Anchor plates from Rehlko must be installed at each anchor location between the anchor head and the equipment for tension load distribution.
6. Concrete floor slab and concrete housekeeping pads must be designed, and rebar reinforced for wind applications in accordance with the current editions of the ACI "Building Code Requirements for Structural Concrete" and ASCE 7 as referenced herein
7. All housekeeping pad thicknesses must be designed in accordance with pre-qualification test report or a minimum of 1.5x the anchor embedment depth, whichever is largest.
8. All housekeeping pads must be doweled or cast into the building structural floor slab and designed for wind application per appropriate code requirements for the subject jurisdiction and as approved by the structural Engineer of Record.
9. Wall-mounted equipment must be installed to a rebar reinforced structural concrete wall that is designed for wind applications and approved by the Engineer of Record to resist the added wind loads from the components being anchored to the wall.
10. Floor-mounted equipment (with or without housekeeping pad) must be installed to a rebar reinforced structural concrete floor that is designed for wind applications and approved by the Engineer of Record to resist the added wind loads from components being anchored to the floor.
11. When installing to a floor, rebar interference must be considered.
12. Attaching equipment to any floor other than those constructed of structural concrete and designed to accept the wind loads from said equipment is not permitted by this specification and beyond the scope of this certification.
13. Attaching equipment to any concrete block walls or cinder block walls is not permitted by this specification and beyond the scope of this certification.
14. Rooftop installations are not permitted by this specification and are beyond the scope of this certification.
15. Installation upon rooftop curbs shall be coordinated with the curb manufacturer and the Structural Engineer of Record. Any curb or concrete pad that supports the RTU unit is beyond the scope of this certification.
16. Anchor locations, size, type and load requirements shall be as specified on the certified installation specification. Mounting requirement details such as brand, type, embedment depth, edge spacing, anchor spacing, concrete strength, wall bracing, and special inspection must be outlined and approved by the project Structural Engineer of Record to withstand the wind anchor loads as defined on the certified installation specification. The installing contractor is responsible for the proper installation of all anchors and mounting hardware, observing the mounting requirement details outlined by the Engineer of Record. Contact Rehlko if a detailed Wind Installation Calculation Package is required.
17. Electrical wiring, piping, duct and other connections to the equipment is the responsibility of the installing contractor. It is necessary that these remain intact, functional and do not inhibit the functionality of the generator set after a wind event.
18. Concrete pad dimensions are minimum values designed to satisfy only the anchor requirements. The pad must be designed by the project Structural Engineer of Record.

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## TERMINOLOGY

The following abbreviations may appear in this report: "Addtl." for "additional", "AHJ" for "Authority Having Jurisdiction", "alum" for "aluminum", "ASCE" for "American Society of Civil Engineers", "ASD" for "Allowable Stress Design", "ASTM" for "American Society for Testing and Materials", "EA." for "each", "E.D." for edge distance", "EDDS" for "extra deep drawing steel", "e.g." for "*exempli gratia*" or "for example", "equiv." for "equivalent", "FBC" for "Florida Building Code", "FEA" for "Finite Element Analysis", "FLCA" for "Florida Certificate of Authorization", "FS" for "Florida Statutes", "Fu" for "ultimate tensile strength" or "ultimate tensile stress", "Fy" for "yield strength" or "yield stress" "GA" for "gauge", "GR." or "Gr." for "grade", "HVAC" for "heating, ventilation, and air conditioning", "HVHZ" for "High-Velocity Hurricane Zone", "i.e. " for "*id est*" or "in other words", "in" for "inch", "lb" for "pound (force)", "max." for "maximum", "min." for "minimum", "mm" for "millimeter", "NTS" for "not to scale", "O.C. " for "on center", "OD" for "outer diameter", "pcf" for "pounds (force) per cubic foot", "PE" for "Professional Engineer", "qty" for "quantity", "SAE" for "Society of Automotive Engineering", "SMS" for "sheet metal screws", "SS" for "stainless steel", "TER" for "Technical Evaluation Report", "typ." for "typical", "ult" for "ultimate loads", "U.N.O." for "unless noted otherwise", "UTS" for "ultimate tensile strength" or "ultimate tensile stress", "WLL" for "working load limit", "w/o" for "without", "YS" for "yield strength" or "yield stress", "#" for "number", "&" for "and", and "Ø" for "diameter". Please visit ecalc.io/glossary for additional abbreviation clarifications.




SAMPLE THRU-BOLT
SCALE: NTS SECTION VIEW

Note: The term "Thru-Bolt" or through bolt, if used herein, refers to a bolt passing through the member(s) in contact and is fastened by a nut at the end opposite the screw head. Nut shall be equivalent to or exceed the strength of the bolt U.N.O. Nut shall be sized to accommodate the same nominal diameter as the bolt U.N.O. See diagram above-right for a sample thru-bolt configuration.

Note: For instances herein which list material specifications as *"[material type] or stronger"*:
U.N.O. herein, the term "stronger" refers to a material with a UTS value equal to or greater than the UTS value of the stated material type. Consult appropriate literature for established material UTS values.

Note: Equivalent steel gauge thicknesses as used in this evaluation, U.N.O., are as follows:
22 GA (.030"), 20 GA (.036"), 18 GA (.048"), 16 GA (.060"), 14 GA (.075"), 12 GA (.098").

## LIMITATIONS & CONDITIONS OF USE, CONTINUED

**Host Structure:** The supporting host structure shall be designed to resist all superimposed loads as determined by others on a site-specific basis as may be required by the Authority Having Jurisdiction. No evaluation is offered for the host supporting structure by use of this document.

**Production Drawings:** The following drawings shall be accessible if required for a full permit application to be submitted to the Authority Having Jurisdiction in conjunction with this TER:

- Electrical schematic(s)
- Final assembly drawings and parts lists sufficient to detail primary components, operator controls, and their locations
- Complete set of mechanical drawings for all machined parts
- Complete part specifications (including manufacturer's model numbers, size, ratings, etc.) for all purchased parts
- Specification sheets for all parts/components
- Drawings showing all construction details
- Product label drawing(s) showing all required marking information. The label drawing shall show the proposed label location on the equipment and artwork showing the manufacturer's name, address, model and serial numbers, equipment ratings, warning markings.

**Drawing and Change Control:** The manufacturer shall establish a system of product configuration control that shall allow no unauthorized changes to the product. Changes to critical documents, identified in this Technical Evaluation Report, must be reported to, and authorized by, this office prior to implementation for production.

**Survivability:** Evaluation reports are valid for a newly installed unit and do not include certification of the product beyond a design event or if impacted by any debris. Inspections shall be implemented annually by the end user and after every named storm. All fasteners and cabinet components are to be verified, and all damaged, loose, corroded, and/or broken fasteners and cabinet components shall be replaced to ensure structural integrity against hurricane wind forces. Contact this office for any reevaluation needs or as designated by the Authority Having Jurisdiction.

**Durability:** Components or component assemblies shall not deteriorate, crack, fail, or lose functionality due to galvanic corrosion or weathering. All supporting components that are permanently installed shall be protected against corrosion, contamination, and other such damage at all times. Each component or component assembly shall be supported and oriented in its intended installation position. All exposed plastic components shall be certified to resist sunlight exposure as specified by ASTM B117, or ASTM G155 in Broward or Miami-Dade counties.

**Extent of Certification:** Certification pertains to the anchorage of the generator enclosure and/or fuel tank to the host structure by others, subject to the limitations and criteria stated herein. Operability during or after a design event is not included in this certification. Water infiltration is outside the bounds of this certification. No other certifications are intended other than as described herein. This evaluation alone does not offer any evaluation for uniform static wind loading, large missile impact debris, or cyclic wind requirements unless specifically stated herein.

| Proj. # | Remarks | By | Checked | Date | Proj. # | Remarks | By | Checked | Date |
|---|---|---|---|---|---|---|---|---|---|
| 18-6258.25 | Initial Issue | LAO | LAO | 04/01/19 | 24-76917 | 2023 FBC Update | EPR | EPR | 06/21/24 |
| 18-6258.25 | KG200 Added | LAO | LAO | 12/20/19 | 24-76917 | ADV-9107 Revision | MARH | EPR/RWN | 03/25/25 |
| 20-28238 | 2020 FBC Update | JC, ER | EPR | 05/04/21 | 24-76917 | Branding Changes | MARH | RWN | 05/09/25 |

FOR RECORD SET
NOT TO BE SUBMITTED
FOR PERMIT OR USED
FOR CONSTRUCTION


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# PROTOTYPE TEST REPORT

KOHLER

Models Covered: **150REOZJF**
Model Tested: **150REOZJE**
Cooling System Tested: **50C**

Alternator Tested: **4S13**
Engine Tested: **6068HF285**
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 |
|---|---|
| **20.3** % Voltage Dip | **1.70** % Voltage Overshoot |
| **2.40** Seconds of Recovery Time | **1.90** Seconds of Recovery Time |
| **21.5** % Frequency Dip | **4.50** % Frequency Overshoot |
| **2.50** Seconds of Recovery Time | **0.40** Seconds of Recovery Time |

**G3** 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

KOHLER

Models Covered: **150REOZJF**
Model Tested: **150REOZJE**
Cooling System Tested: **50C**

Alternator Tested: **4S13**
Engine Tested: **6068HF285**
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

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# PreStartup Checklist

# Generator Set/Transfer Switch Installation Checklist

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

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

## Equipment Room or Weather Housing

Yes / Does Not Apply

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

## Engine and Mounting

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

## Lubrication

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

## Cooling and Ventilation

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

## Fuel

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

## Exhaust

Yes / Does Not Apply

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

## AC Electrical System

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

## Transfer Switch, Remote Control System, Accessories

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

## Batteries and DC Electrical System

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

## Special Requirements

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

# Generator Set/Transfer Switch Startup Checklist

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

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

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