



January 28, 2025

ADDENDUM NO. 1

PROJECT:

Bid #5038
District office Generator Project
5000 W Cypress Avenue
Visalia, CA 93277

SPECIFICATION DATE: January 28, 2025

The following addendum will be added to and integrated into the specifications and plans for the construction of the project mentioned above.

This addendum takes precedence over and replaces any previous mentions of similar items.

CLARIFICATION:

This Addendum comprises one (1) printed page and the following attachments:

- **Bid 5038 Specification Sheet – Products Ordered by VUSD**
- **SG080 Visalia USD Submittal**

END OF ADDENDUM

Company

Signature

Date: _____

Please sign and return one copy of this Addendum with your bid.

5000 W. Cypress Avenue • Visalia, CA 93277 • (559) 931-8076

Visalia Unified School District

Bid No. 5038

District Office Generator Project



Specification Sheet - Products ordered by VUSD

Qty	Description	Date Shipped	Date Received	Current Promise Date
1	Eaton Floor Mount for UPS Mfg. Part#: P-103000765 UNSPSC: 31162313 Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)	1/2/2025	1/27/2025	
1	Eaton 93PM 50kW External UPS Mfg. Part#: 9PF05N0029E40R2 Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)			4/8/2025
1	Eaton 93PM Sidecar Seismic Kit Mfg. Part#: P-103000766 Contract: MARKET	1/2/2025	1/27/2025	
1	Eaton IBC-LW 480VDC Large Universal Integrated Battery Cabinet for 93PM UPS Mfg. Part#: 9PZVCBE57010200 Contract: MARKET			
1	Eaton 93Pm Iac-D Step-Down Distri Mfg. Part#: 9PZE4S702000001 Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)			4/8/2025
1	Eaton - Seismic Mounting Kit Mfg. Part#: P-103000767 Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)			4/8/2025
1	Eaton 93Pm Certified Test Data Mfg. Part#: CTD93PM Electronic distribution - NO MEDIA Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)			
1	Eaton 93Pm 480V Predictpulse Wireless Kit Mfg. Part#: P-103004440 Contract: MARKET	1/2/2025	1/27/2025	
1	Eaton 93Pm 480V Predictpulse Wireless Kit Mfg. Part#: P-103004440 Contract: MARKET			
	Eaton Powerware Eaton Flex - Extended Service Agreement - 2 - Years- on-site Mfg. Part#: W2FL87NXXX-0050 UNSPSC: 81112307 Contract: MARKET			
2	GENERAC 80KW NATURAL GAS GENERATOR Mfg. Part#: SG080 Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)			4/21-4/28
1	GENERAC TX 150 AUTO TRANSFER SWITCH Mfg. Part#: ATS-DUP1 Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)			2/28-3/7

Visalia Unified School District

Bid No. 5038

District Office Generator Project



Products Ordered Specification Sheet

Qty	Description	Date Shipped	Date Received	Current Promise Date
1	GENERAC 5 YEAR EXT. GENSET WARRANTY Mfg. Part#: 5YR-EXT-W-GEN Electronic distribution - NO MEDIA Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)			
1	GENERAC 5 YEAR EXT. ATS WARRANTY Mfg. Part#: 5YR-EXT-W-ATS Electronic distribution - NO MEDIA Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)			
1	REMOTE ANNUNCIATOR Mfg. Part#: REM-ANN Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)			
1	BLUE PILLAR CELLULAR MONITORING Mfg. Part#: ED-BPCM Electronic distribution - NO MEDIA Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)			
1	FACTORY START-UP AND TRAINING Mfg. Part#: EDP-FC-TRN Electronic distribution - NO MEDIA Contract: Irvine USD 19/20-01 IT Tech & Peripherals (19/20-01 IT)			



Engineering Submittal for Approval

Visalia USD Stationary Standby Generator



80kW Rating, 277/480V, 3 Phase

**Submitted Equipment
Released for Production By:**

Signature

Date

Print Name

CONTACTS



DISTRIBUTOR:

West Coast Energy Systems LLC
7100 S. Longe Street #300 Stockton, CA 95206
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Energy Systems
Service Department
service@energysystems.com
800-845-8519

Bill of Materials

Quantity 1 - Generac Industrial gaseous engine-driven generator, 4.5L in-line 4 cylinder engine, consisting of the following features and accessories:

- Stationary Emergency-Standby rated
- 80 kW rating, wired for 277/480 VAC three phase, 60 Hz
- Brushless Excitation
- MLCB, 80% rated thermal-magnetic
 - 150 Amp
- Natural Gas fuel system
- Level 2 Acoustic Enclosure, Steel
 - Industrial Grey Baked-On Powder Coat Finish
 - Average Sound Level, 65 dBA at 23 ft
- EPA Certified
- IBC Seismic Certified
- Ultra-Low Emissions
- cETLus
- Power Zone Pro Digital Control Panel for Single Generators
 - Meets NFPA 99 and 110 requirements
 - Temp Range -40 to +60 degrees C
 - Humidity 2 – 95% (Non Condensing)
 - UL6200
 - C-ETL-US
 - CE
 - IEC801 (Radiated Emissions, Susceptibility, and Surge Immunity)
 - 4.3" Resistive Color Touchscreen
 - Webserver (via Power Zone Gateway using ethernet)
 - IP65 (front)
 - Auto/Manual/Off key switch, Alarm Indication, Not in Auto Indication, audible alarm, emergency stop switch
 - Dual Core Digital Microprocessor
 - RS485, Ethernet and CANbus ports
 - All engine sensors are 4-20ma for minimal interference
 - Sensors: Oil Pressure, optional Oil Temp, Coolant Temp and Level, Fuel Level/Pressure (where applicable), Engine Speed, DC Battery Voltage, Run-time Hours, Generator Voltages, Amps, Frequency, Power, Power Factor
 - Alarm Status: Low or High AC Voltage, Low or High Battery Voltage, Low or High Frequency, Pre-low or Low Oil Pressure, Pre-high or High Oil Temp (optional), Low Water Level and Temp, Pre-high or High Engine Temp, High, Low, and Critical-low Fuel Level/Pressure (where applicable), Overcrank, Over and Under Speed, Unit Not in Automatic
 - Programmable I/O
 - Built-in PLC for special applications
 - Engine function monitoring and control:
 - Full range standby operation; programmable auto crank, Emergency Stop, Auto-Off-Manual switch
 - Isochronous Governor
 - 0.25% digital frequency regulation with: soft-start ramping - adjustable, gain - adjustable, overshoot limit - adjustable

- 3 Phase RMS Voltage Sensing
 - +/-0.5% digital voltage regulation with: soft-start voltage ramping - adjustable, loss of sensing protection - adjustable, negative power limit - adjustable, Hi/Lo voltage limit - adjustable, V/F slope and gain - adjustable, fault protection
 - Service reminders, trending, fault history (alarm log)
 - I2T function for full generator protection
 - Selectable low-speed exercise
 - 2-wire start controls for any 2-wire transfer switch
 - Remote Emergency Stop Switch, Break-Glass, shipped loose
 - 110 AH, 925 CCA Group 31 Battery, with rack, installed
 - Block Heater, 1500 watt
 - Std Heavy Duty Air Cleaner
 - Battery Charger, 10 Amp, NFPA 110 compliant, installed
 - 120V GFCI and 240V Outlet
 - Baseframe Bottom Cover Plates, Aluminum, for rodent protection and airflow control
 - Engine Run Relay, 10 Amp
 - Fan and Belt Guards
 - Flex Fuel Hose, shipped loose
 - Critical Grade Silencer
 - 3 Owner's Manuals
 - Standard Two-Year Limited Warranty
-

Quantity 1 - TX Series Automatic Transfer Switch consisting of the following features and accessories:

- 150 Amp, 3 pole, 277/480 VAC three phase, 60 Hz, with 2-Wire Start Circuit
 - Utility Voltage Sensing Controls:
 - Adjustable Drop-out and Pick-up
 - Adjustable Utility Interrupt Delay
 - Adjustable Logic Controls:
 - Minimum Standby Voltage
 - Minimum Standby Frequency
 - Engine Warmup
 - Return to Utility
 - Engine Cooldown
 - Transfer on Exercise
- Double Set of Form C Aux Cont
- IBC Seismic Certified
- Withstand and Close-On Rating - 200kA Fuse Rating
- Withstand and Close-On Rating - 22kA Any Breaker
- Withstand and Close-On Rating - 42kA Specific Breaker
- Enclosure Heater
- IO Board - 4 Inputs, 4 Outputs
- CSA - C22.2 No.178

- UL Listed 1008 by ETL
- Controller Cover, Padlockable, Black
- NEMA 3R Enclosure
- Non Service Entrance Rated
- In Phase Only Transfer
- 3 Owner's Manuals
- Standard Two-Year Limited Warranty

Standby Power Rating
 80 kW, 100 kVA, 60 Hz



*Assembled in the USA using domestic and foreign parts

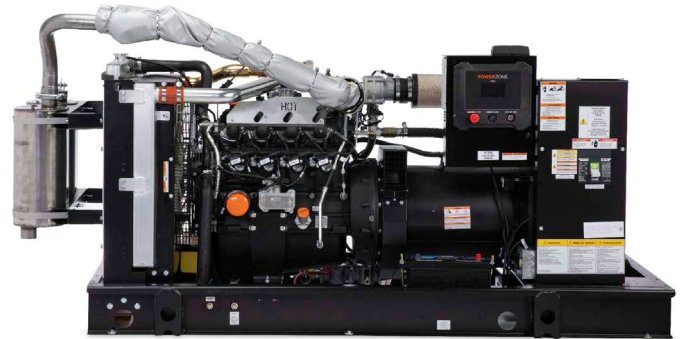


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Codes and Standards

Not all codes and standards apply to all configurations. Contact factory for details.



UL2200, UL6200, UL1236, UL489



CSA C22.2



BS5514 and DIN 6271



SAE J1349



NFPA 37, 70, 99, 110



NEC700, 701, 702, 708



NEMA ICS10, MG1, 250, ICS6, AB1



ANSI C62.41



IBC 2009, CBC 2010, IBC 2012,
 ASCE 7-05, ASCE 7-10, ICC-ES
 AC-156 (2012)



Powering a Smarter World

For over 65 years, Generac has been at the forefront of power generation, pioneering innovative solutions and unparalleled manufacturing excellence. At the heart of our reputation for superior quality lies our commitment to meticulously designing and manufacturing key components of our generators—ranging from alternators and enclosures to base tanks, control systems, and cutting-edge communications software.

Generac's gensets stand out for their unparalleled versatility and reliability. Engineered to offer a wide range of options and configurations, they are tailored to meet the unique demands of virtually any application, seamlessly adapting to its complexity. Our commitment to reliability drives us to globally source only the most dependable engines, selected through stringent criteria for optimal performance under the toughest industrial conditions.

Beyond the sale, Generac's dedication to our customers extends to comprehensive service support, for peace of mind and reliability long after your purchase. Our commitment is to not only provide state-of-the-art power solutions but also enduring success and satisfaction of our customers through ongoing support and service excellence.

STANDARD FEATURES

ENGINE SYSTEM

- Oil Drain Extension
- Heavy Duty Air Cleaner
- Level 1 Fan and Belt Guards (Open Set Only)
- Stainless Steel Flexible Exhaust Connection
- Factory Filled Oil and Coolant
- Critical Silencer
- Oil Temperature Sender with Alarm
- Air Filter Restriction Indicator

FUEL SYSTEM

- NPT Fuel Connection on Frame
- Primary and Secondary Fuel Shutoff

COOLING SYSTEM

- Closed Coolant Recovery System
- UV/Ozone Resistant Hoses
- Factory-Installed Radiator
- 50/50 Ethylene Glycol Antifreeze
- Radiator Drain Extension

ELECTRICAL SYSTEM

- Battery Charging Alternator
- Battery Cables
- Battery Tray
- Rubber-Booted Engine Electrical Connections
- Solenoid Activated Starter Motor

ALTERNATOR SYSTEM

- UL2200 GENprotect™
- Class H Insulation Material
- 2/3 Pitch
- Skewed Stator
- Brushless Excitation
- Sealed Bearing
- Full Load Capacity Alternator

GENERATOR SET

- Internal Genset Vibration Isolation
- Separation of Circuits - High/Low Voltage
- Separation of Circuits - Multiple Breakers
- Wrapped Exhaust Piping
- Standard Factory Testing
- 2 Year Limited Warranty (Standby and Demand Response Rated Units)

ENCLOSURE (IF SELECTED)

- Rust-Proof Fasteners with Nylon Washers to Protect Finish
- High Performance Sound-Absorbing Material (Sound Attenuated Enclosures)
- Gasketed Doors
- Upward Facing Discharge Hoods (Radiator and Exhaust)
- Stainless Steel Lift Off Door Hinges
- Stainless Steel Lockable Handles
- RhinoCoat™ - Textured Polyester Powder Coat Paint

CONTROL SYSTEM



Power Zone® Pro Controller

- NFPA 110 Level 1 Compliant
- Engine Protective Functions
- Alternator Protective Functions
- Digital Engine Governor Control
- Digital Voltage Regulator
- Multiple Programmable Inputs and Outputs
- Remote Display Capability

Power Zone® Pro Controller Continued

- Remote Communication via Modbus® RTU, Modbus TCP/IP, and Ethernet 10/100
- Alarm and Event Logging with Real Time Stamping
- Expandable Analog and Digital Inputs and Outputs
- Remote Wireless Software Update Capable
- Built-In Programmable Logic Eliminates the Need for External Controllers Under Most Conditions
- Programmable I/O Channel Properties
- Built-In Diagnostics

Alarms and Warnings

- High/Low Oil Pressure
- High/Low Coolant Level
- High/Low Coolant Temperature
- Sender/Sensor Failure
- High/Low Oil Temperature
- Over Total kW
- Over/Under Speed
- Over/Under Voltage
- Over/Under Frequency
- Over Current
- High/Low Battery Voltage

Alarms and Warnings Continued

- Battery Charger Current
- Phase to Phase and Phase to Neutral Short Circuits (I²T Algorithm)

4.3 Inch Color Touch Screen Display

- Resistive Color Touch Screen
- Easily Identifiable Icons
- Multi-Lingual
- On Screen Editable Parameters
- Key Function Monitoring
- Three Phase Voltage, Amperage, kW, kVA, and kVAr
- Selectable Line to Line or Line to Neutral Measurements
- Frequency
- Engine Speed
- Engine Coolant Temperature
- Engine Oil Temperature
- Battery Voltage
- Hourmeter
- Warning and Alarm Indication
- Diagnostics
- Maintenance Events/Information

APPLICATION AND ENGINEERING DATA

ENGINE SPECIFICATIONS

General

Make	Generac
Cylinder #	4
Type	In-Line
Displacement - in³ (L)	275.0 (4.5)
Bore - in (mm)	4.5 (114.3)
Stroke - in (mm)	4.25 (107.95)
Compression Ratio	9.1:1
Intake Air Method	Turbocharged
Number of Main Bearings	5
Connecting Rods	Forged Steel, Fractured Split, Bushingless
Cylinder Head	Cast Iron
Cylinder Liners	Cast Iron
Ignition	Coil Near Plug Solid State Inductive
Piston Type	Cast Aluminum Flat Top
Crankshaft Type	Forged Steel
Lifter Type	Hydraulic
Intake Valve Material	Stainless Steel
Exhaust Valve Material	Stainless Steel
Hardened Valve Seats	High Steel Iron Alloy

Engine Governing

Governor	Electronic
Frequency Regulation (Steady State)	± 0.25

Lubrication System

Oil Pump	Gear Driven
Oil Filter Type	Full-Flow Spin-On Cartridge
Engine Oil Capacity: qt (L)	21 (20)

Cooling System

Cooling System Type	Pressurized Closed
Fan Type	Pusher
Fan Speed (rpm)	2,100
Fan Diameter - in (mm)	22 (533)

Fuel System

Fuel Type	Natural Gas
Fuel Injection	Electronic
Fuel Shut Off	Generac
Operating Fuel Pressure - in H ₂ O (kPa)	5 - 14 (1.2 - 3.5)

*When designing the external fuel system, assume a 20% safety factor to the upper and lower limit of the specified fuel pressure range to account for site variation and measurement at the generator test port. Refer to Generac document 1000004620, latest rev. for proper gas supply design guidelines. (Contact Factory for Details)

Engine Electrical System

System Voltage	12 VDC
Battery Charger Alternator	Standard
Battery Size	See Battery Index 0161970SBY
Battery Voltage	12 VDC
Ground Polarity	Negative (-)

ALTERNATOR SPECIFICATIONS

Standard Model	K0080124Y21
Poles	4
Field Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion (THD)	<5% (3-Phase Only)
Telephone Interference Factor (TIF)	<50

Standard Excitation	Synchronous Brushless
Bearings	Sealed Ball
Coupling	Direct via Flexible Disc
Prototype Short Circuit Test	Yes
Voltage Regulator Type	Full Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	±0.25%

OPERATING DATA

POWER RATINGS

Standby		
Single-Phase 120/240 VAC @1.0pf	80 kW/80 kVA	Amps: 333
Three-Phase 120/208 VAC @0.8pf	80 kW/100 kVA	Amps: 278
Three-Phase 120/240 VAC @0.8pf	80 kW/100 kVA	Amps: 241
Three-Phase 277/480 VAC @0.8pf	80 kW/100 kVA	Amps: 120
Three-Phase 346/600 VAC @0.8pf	80 kW/100 kVA	Amps: 96

STARTING CAPABILITIES (skVA)

skVA vs. Voltage Dip					
120/240 VAC 1Ø	30%	277/480 VAC 3Ø	30%	208/240 VAC 3Ø	30%
A0080044N21	58	K0080124Y21	172	K0080124Y21	132
A0130044N21	105	K0130124Y21	327	K0130124Y21	327

FUEL CONSUMPTION RATES*

Percent Load		Natural Gas – scfh (m³/hr)	
		Standby	
25%		290 (8.2)	
50%		538 (15.2)	
75%		795 (22.5)	
100%		1,063 (30.1)	

*1.5X maximum site rated fuel consumption should be used for gas supply design practices. Refer to Generac 1000046207, latest rev, or contact factory for details.

COOLING

		Standby
Air Flow (Fan Air Flow Across Radiator) - Open Set	cfm (m³/min)	4,343 (123)
Coolant Flow	gpm (Lpm)	24 (90)
Coolant System Capacity	gal (L)	9 (34)
Maximum Operating Ambient Temperature	°F (°C)	122 (50)
Maximum Operating Ambient Temperature (Before Derate)	See Bulletin No. 0199270SSD	
Maximum Radiator Backpressure	in H ₂ O (kPa)	0.5 (0.12)

COMBUSTION AIR REQUIREMENTS

	Standby
Flow at Rated Power cfm (m³/min)	178 (5.0)

ENGINE

		Standby
Rated Engine Speed	RPM	1,800
Horsepower at Rated kW**	hp	128
Piston Speed	ft/min (m/min)	1,275 (389)
BMEP	psi (kPa)	214 (1,473)

** Refer to "Emissions Data Sheet" for maximum bHP for EPA and SCAQMD permitting purposes.

EXHAUST

		Standby
Exhaust Flow (Rated Output)	cfm (m³/min)	456 (13.0)
Maximum Allowable Exhaust Backpressure (Post Silencer)	in Hg (Kpa)	0.75 (2.54)
Exhaust Temperature (Rated Output)	°F (°C)	1,425 (774)

Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions.

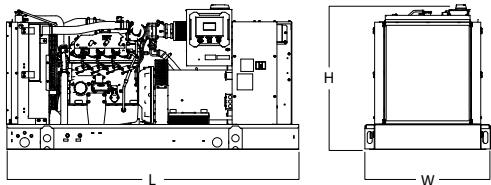
Please contact a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with BS5514 and DIN6271 standards.

Standby - See Bulletin 0187500SSB

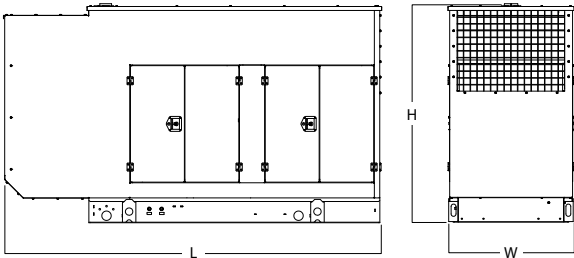
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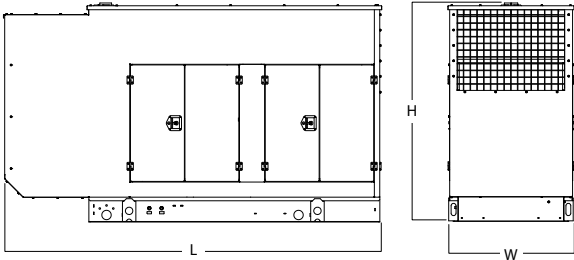
DIMENSIONS AND WEIGHTS*



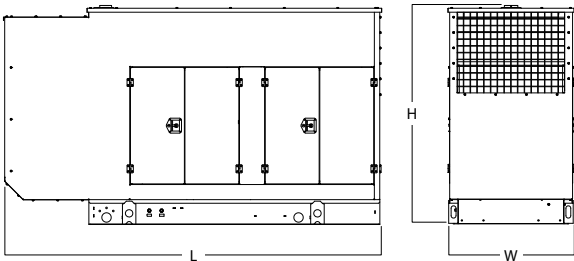
OPEN SET		
L x W x H - in (mm)	92.9 (2,360) x 39.9 (1,014) x 46.0 (1,170)	
Weight - lbs (kg)	2,192 - 2,250 (994 - 1,021)	



LEVEL 0 SOUND ATTENUATED ENCLOSURE		
L x W x H - in (mm)	120.8 (3,068) x 40.5 (1,028) x 69.0 (1,754)	
Weight - lbs (kg)	Steel: 2,932 - 2,989 (1,330 - 1,356) Aluminum: 2,580 - 2,638 (1,170 - 1,196)	



LEVEL 1 SOUND ATTENUATED ENCLOSURE		
L x W x H - in (mm)	120.8 (3,068) x 40.5 (1,028) x 69.0 (1,754)	
Weight - lbs (kg)	Steel: 3,022 - 3,080 (1,371 - 1,397) Aluminum: 2,671 - 2,729 (1,211 - 1,238)	



LEVEL 2 SOUND ATTENUATED ENCLOSURE		
L x W x H - in (mm)	120.8 (3,068) x 40.5 (1,028) x 69.0 (1,754)	
Weight - lbs (kg)	Steel: 3,100 - 3,158 (1,406 - 1,433) Aluminum: 2,727 - 2,785 (1,237 - 1,263)	

* All measurements are approximate and for estimation purposes only.

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a Generac Power Systems Industrial Dealer for detailed installation drawings

POWER ZONE® CONTROL PLATFORM

Power Zone® Pro Controller and Gateway



Features - Power Zone® Pro Controller

The Generac Power Zone® Digital Control Platform is a fully integrated and multipurpose family of controllers for Generac's generator systems.

Standard Single Unit Control Features*

- Engine Protective Functions
- Alternator Protective Functions
- Digital Engine Governor Control
- Digital Voltage Regulator
- 4.3" Color Touch Screen
- Multi-Lingual
- Multiple Programmable Inputs and Outputs
- Remote Display Capability
- Remote Communication via Modbus® RTU, Modbus TCP/IP, Ethernet 10/100, SNMP
- Alarm and Event Logging with Real Time Stamping
- Expandable Analog and Digital Inputs and Outputs
- Wireless Software Update via Remote Computer
- BMS and Remote Telemetry
- E-mail Notifications for Alarm Conditions and Log Data**

Standard System Control Features

- Built-In PLC Logic Eliminates the Need for External Controllers Under Most Conditions
- Programmable I/O Channel Properties
- Built-In Diagnostics

Qualification Testing

- Life Test in Environmental Chamber
- Temperature Rating -40° C to +60° C
- Vibration Tested and Protected

Voltage Regulation (Single or Three Phase Module Options)

- Digital Control
- Single Phase or Three Phase RMS Sensing with Loss of Sensing Protection†
- Variable V/F Slope Settings and Adjustable Gains
- Negative Power Limit
- Soft Start Ramping
- Components Encapsulated for Total Protection
- Fault Protection (I²T Function and GFI)‡

PLC (Built-In Programmable Logic Controller)

- Configurable Through Software Tool
- Customer Configurable for Non-Standard Options
- Up to 8 Simultaneously Running PLC Programs or in Sequence

Communication Ports

- 1 - RS-485 - Power Zone Gateway
- 1 - RS-485 - Remote Annunciator Panel/Remote Relay Panel
- 2 - CANBus - Power Zone® Accessories

* For SG and SD Models

** Requires Use of a Network Accessible Authenticated or Open SMTP Server

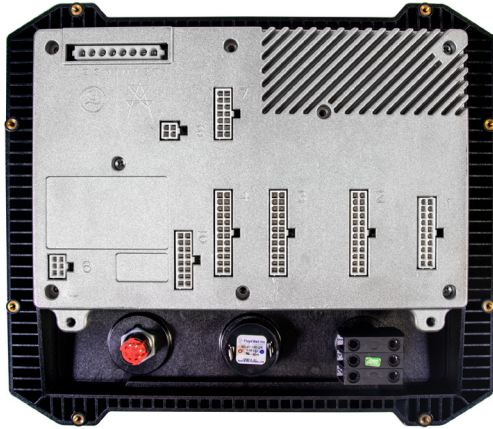
† With Select Voltage Regulators

‡ Configurable Option

POWER ZONE® CONTROL PLATFORM

Power Zone® Pro Controller and Gateway

Features - Power Zone® Pro Controller (Continued)



Display (Touch Screen)

- LCD 4.3" Color Touch Screen
- Easy Identifiable Icons
- Multi-Lingual
- IP65 Rated
- On Screen Editable Parameters
- Key Function Monitoring
 - Three Phase Voltage, Amperage, kW, kVa, and kVA
 - Selectable Line to Line or Line to Neutral Measurements
 - Frequency
 - RPM
 - Engine Coolant Temperature
 - Engine Oil Pressure
 - Engine Oil Temperature
 - Battery Voltage
 - Warning and Alarm Indication
 - Diagnostics
 - Maintenance Events/Information
 - Hourmeter

Codes and Standards

- UL 6200
- UL 2200
- CSA STD C22.2 No. 14
- IEC/EN 61010-1
- NFPA 110 (Software Programmable for Level 1 or 2)[§]

Connections^{§§}

- 21 - Digital Outputs (Open Drain, 35VDC, 1.7A)
 - 7 Fast PWM Capable
 - 1 High Current
- 15 - Digital Inputs Maximum
 - 7 Fast PWM Capable
- 12 - General Purpose Analog Inputs
- 2 - Special Purpose Analog Inputs
- 2 - Analog Outputs (0-10 VDC)
- 1 - E-Stop Relay Output
- 3 - Current Sense Inputs
- 8 - High Voltage Sense Inputs (Three Phase + Neutral)
- 1 - Magnetic Pickup Input
- 1 - Coolant Sensor Input
- 2 - CANBus Channels
- 1 - External RS-485 Port
- 2 - Switchable 12VDC Power Outputs

Protections

- High/Low Oil Pressure
- High/Low Coolant Level
- High/Low Coolant Temperature
- Sender/Sensor Failure
- High/Low Oil Temperature
- Over/Under Speed
- Over/Under Voltage
- Over/Under Frequency
- Over Current
- Over Total kW
- High/Low Battery Voltage
- Battery Charger Current
- Phase to Phase and Phase to Neutral Short Circuits (I²T Algorithm and GFI)

Control Panel and Touch Screen

- Auto/Off/Manual
 - Operation Through Key Switch
 - Indication Through Touch Screen
- Alarm Acknowledge Soft Key
- Audible Alarm and Silence
- Emergency Stop
- Not in Auto Indication Through Touch Screen

[§] With Additional Optional Remote Annunciator
^{§§} Actual I/O May Vary Due to Configuration

POWER ZONE® CONTROL PLATFORM

Power Zone® Pro Controller and Gateway

Features - Power Zone® Gateway



The Power Zone® Connectivity Gateway is a user interface for the Power Zone® system that provides external communication via ethernet to a connected device such as a computer, smart phone or tablet. This external communication allows the user to configure or monitor generator parameters, including building management system connections.

Communications

- 1 - Ethernet Port
- 1 - RS-485 Port - Input to Main Controller
- 1 - RS-485 Port - Building Management
- 2 - Type A USB Port

Power Supply Requirements

- Voltage: 11-13 VDC (12 VDC Nominal)
- Usage: 1.1A (Maximum During Power Up)
- Cable: 2 Wires

Environmental

- Temperature Rating -40°C to +60°C
- UL Type 1 Enclosure
- 5% to 90% Non-condensing Humidity

Codes and Standards

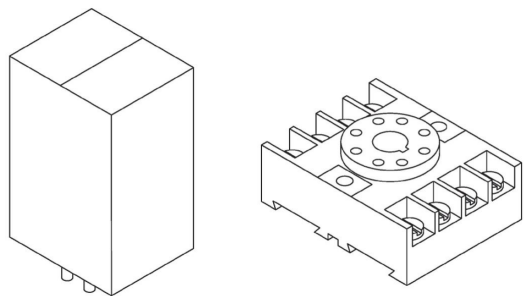
- UL 6200
- CSA STD 222 No. 61010-1
- C-ETL-US
- IEC/EN 61010-1

Features[◊]

- Auto/Off/Manual Indication
- Not in Auto Indication
- Alarm Acknowledge Button
- 2 LED - Power & Communication
- Easily Identifiable Icons
- Multi-Lingual
- On Screen Editable Parameters
- USB Port for Easy Log Data Downloads and Firmware Updates
- SNMP 3 with Traps
- Modbus Passthrough
- Key Function Monitoring
 - Three Phase Voltage, Amperage, kW, kVA, and kVAR
 - Selectable Line to Line or Line to Neutral Voltage Measurements
 - Voltage Frequency
 - Engine Speed
 - Engine Coolant Temperature
 - Engine Oil Pressure
 - Engine Oil Temperature
 - Battery Voltage
 - Warning and Alarm Indication
 - Diagnostics
 - Maintenance Events and Information
 - Engine Hour Meter

[◊] When Viewing on a Connected Computer, Smart Phone, Tablet, or Other Smart Device

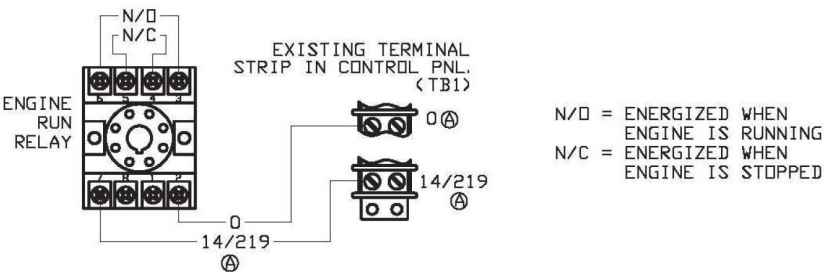
ENGINE RUN RELAY



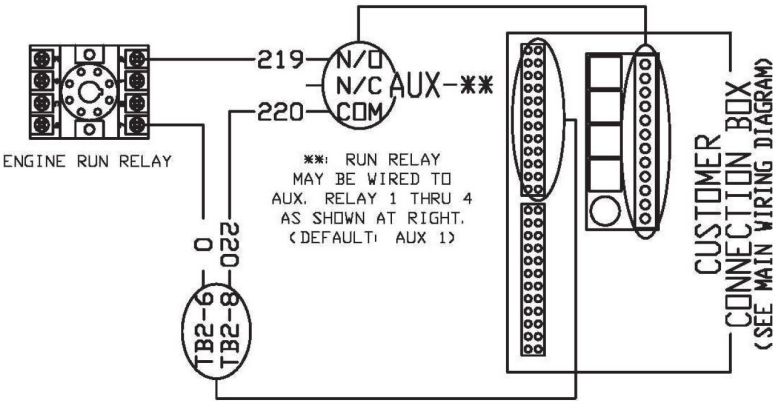
- For use with Generac's Digital Control Platforms
- 10 Amp Contact Rating
- 12 or 24 Volt DC Input
- Contact Open or Closure on Engine Run

Contacts	
Type	DPDT
Material	Silver
Rating	UL 10A @ 240VAC 10A @ 30VDC
Coils	
Input Voltage	24VDC
Resistance	400 Ohms
Nominal Power	1.5W

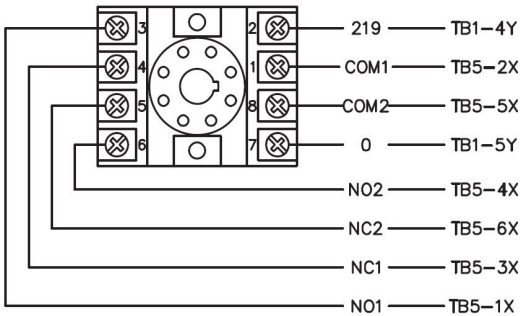
Wiring Diagram with E panel, H-100 Panel



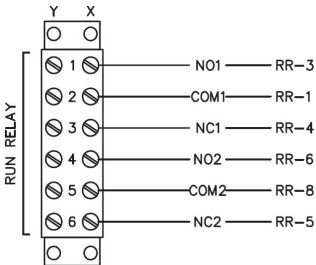
Wiring Diagram with PMDCP



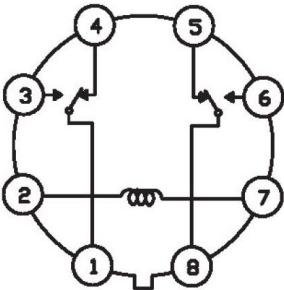
Wiring Diagram with Power Zone Pro Sync



TB5



Pin Detail



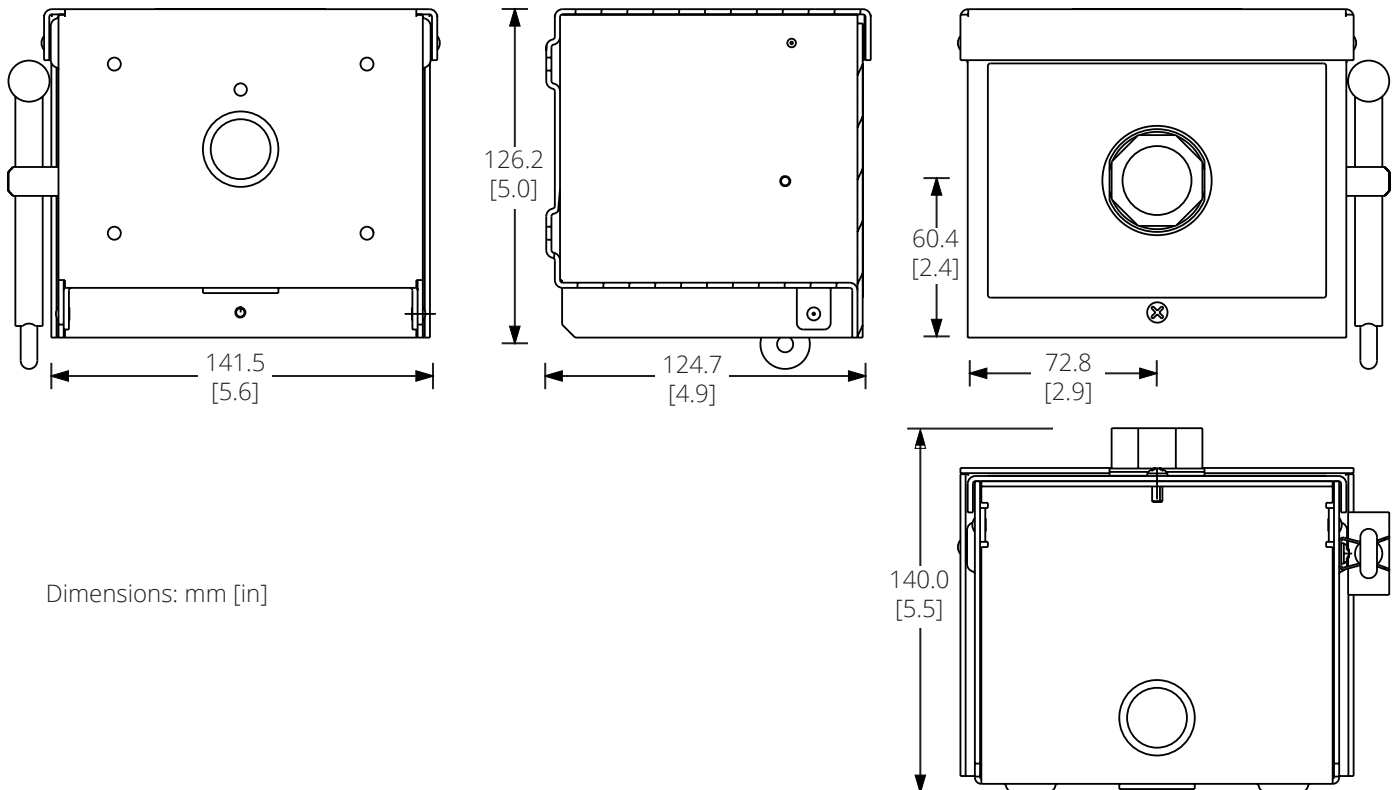
REMOTE EMERGENCY STOP SWITCH

Break Glass - Power Zone® Pro & Pro Sync, G8601

Specifications

Generac Part Number: A0000960234
 Surface Mount, NEMA 3R
 5 Replacement Glasses
 Aluminum Enclosure
 Contact Rating: AC-15 3A 240V, DC-13 1.1A 125V
 Contact Blocks: 3
 Compatible Controllers: Power Zone® Pro, Power Zone® Pro Sync, G8601

Wiring varies by engine; refer to unit specific wiring diagram.



Dimensions: mm [in]

ALTERNATOR DATA SHEET

K0080124Y21

General Characteristics

Voltages (V)	208/240 and 480	Number of Leads	12
Frequency (Hz)	60	Winding Type	Reconnectable
Phases	3	Air Flow (CFM)	597
Speed (RPM)	1,800	Total Harmonic Distortion (%)	<5
Excitation System	PMG/Brushless	Largest Single Harmonic Value (%)	<3.5
Insulation Class	H	Telephone Interference Factor (TIF)	<50
Winding Pitch	2/3	Reference Part Number	0J1382D01R, 0L4173E01R

Ratings @ 0.8 pf Based on 40°C Ambient

Voltage (V)	80°C Rise		105°C Rise		120°C Rise		150°C Rise	
	kW	kVA	kW	kVA	kW	kVA	kW	kVA
208/240	61	76	73	91	80	100	87	109
480	61	76	73	91	80	100	87	109

Base Data at 480V, 100 kVA, 1,800 RPM, 60 Hz, 3Ø

Description	Value
Stator Resistance, Line to Neutral, High Wye Connection (Ω)	0.0605
Rotor Resistance (Ω)	1.3900
Exciter Stator Resistance - PMG/Brushless (Ω)	5.500/6.000
Exciter Rotor Resistance - PMG/Brushless (Ω)	0.5155/0.4565
Excitation Winding Resistance - PMG/Brushless (Ω)	1.5606/0.5108
Xd, Direct Axis Synchronous Reactance (p.u.)	2.730
X2, Negative Sequence Reactance (p.u.)	0.260
X0, Zero Sequence Reactance (p.u.)	0.050
X'd, Direct Axis Transient Reactance (p.u.)	0.210
X''d, Direct Axis Subtransient Reactance (p.u.)	0.170
Xq, Quadrature Axis Synchronous Reactance (p.u.)	1.190
T'd, Direct Axis Transient Short Circuit Time Constant (s)	0.054

Description	Value
T''d, Direct Axis Subtransient Short Circuit Time Constant (s)	0.008
T'do, Direct Axis Transient Open Circuit Time Constant (s)	1.090
Ta, Short Circuit Time Constant of Armature Winding (s)	0.018
Phase Sequence CCW-NDE	T1, T2, T3
Voltage Balance, L-L or L-N (%)	2.5
Deviation Factor (%)	7
High Wye Connection, Sustained 3Ø Short Circuit Current (%) - PMG only	300
X/R	7
Short Circuit Ratio	0.49
Heat Rejection (BTU/hr) - 100% Rated Load, 480V, 0.8pf, 120°C Temperature Rise	45,548

Reference: Mil-STD-705B
All Ratings are Nominal

ALTERNATOR DATA SHEET

K0080124Y21

skVA

	10%	15%	20%	25%	30%	35%
480 V @ 0.3PF	41	63	88	119	155	190
480 V @ 0.6PF	48	72	102	133	172	210
208/240 V @ 0.3PF	31	47	68	90	117	141
208/240 V @ 0.6PF	36	55	76	100	132	161

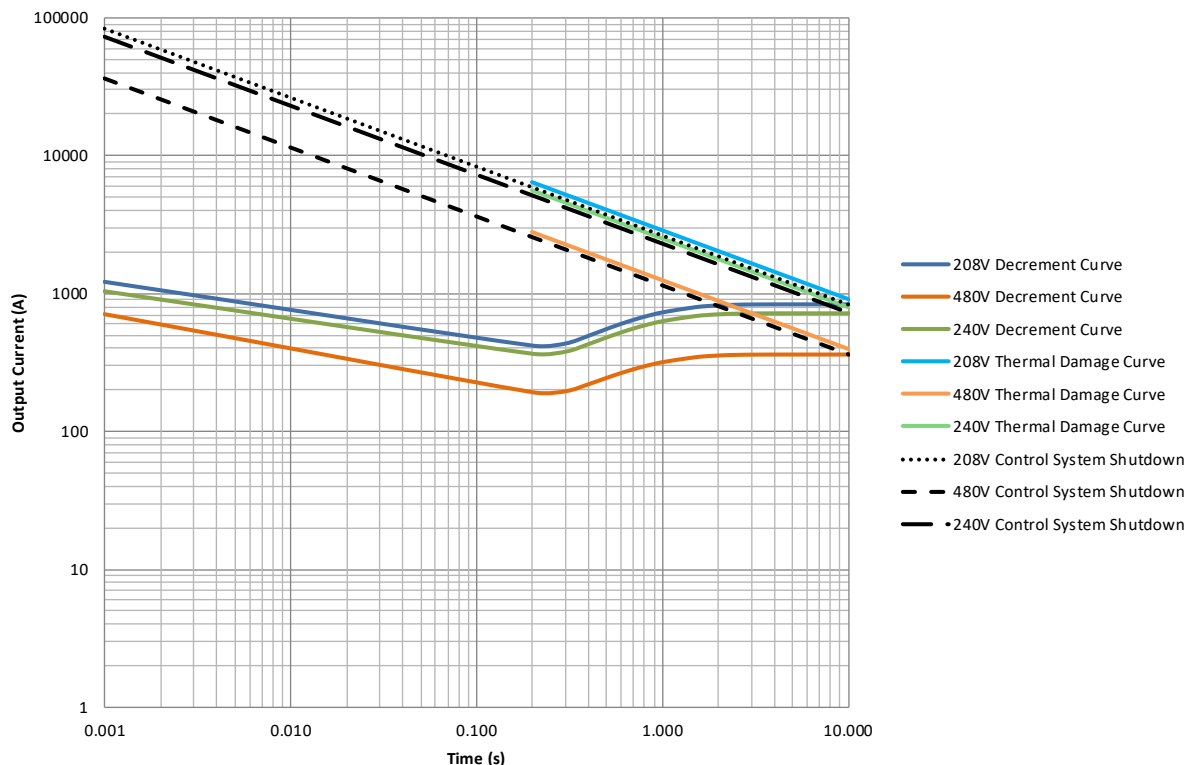
Efficiencies

	480 @ 0.8 PF	480 @ 1.0 PF	208/240 @ 0.8PF	208/240 @ 1.0 PF
20% Rated Power*	83.7	85.3	85.7	87.2
40% Rated Power*	87.8	90.0	87.9	90.5
60% Rated Power*	87.9	90.8	87.1	90.5
80% Rated Power*	87.0	90.5	85.4	89.6
100% Rated Power*	85.7	89.9	83.7	88.4

*Rated Power value is rating kW at 120°C Winding Temperature Rise and 0.8pf

LOG LOG Decrement Curve

Balanced 3-Phase Short Circuit Decrement & Thermal Damage Current Limit Curves



GENprotect™

Seamless Protection for Industrial Power Generators

GENprotect Operation

The design choice of an onsite power system using a Generac Industrial Power Generator assures your emergency power source is protected from unexpected power distribution faults. Typically, a generator will include some type of over-current device, such as a circuit breaker, or be protected by inherent design with the controller protecting the alternator through a protection algorithm. Generac's GENprotect generator protection system monitors the system current output and protects the alternator with extended security against fault scenarios that could occur within the site's downstream distribution system.

It is a common misconception that the alternator's main circuit breaker protects the alternator from a short circuit event. The main output breaker protects the cabling and provides a convenient disconnect. The characteristic trip curve for the industry standard thermal magnetic breaker (MCCB, molded case thermal magnetic or solid state) does not coordinate with the thermal damage limitation for an on-site generator. If circuit breakers are used for generator protection, a solid-state circuit breaker with full adjustments (Long Time, Short Time and Instantaneous, LSI) is required to coordinate the breaker protection curve within the generator thermal damage curve. Historically, this limitation was often accepted in system design since failures of the main generator feeder are extremely rare. Most short circuit events happen at a branch circuit, equipment level, where the fault is easily cleared by the smaller down stream breakers.

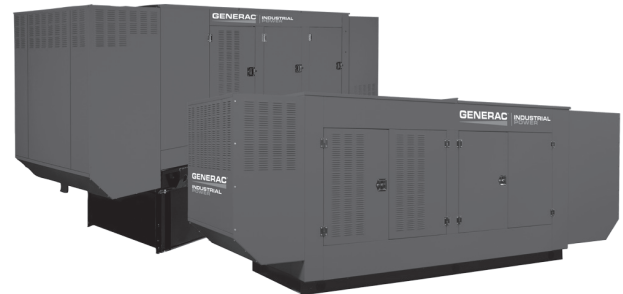
Given the mission critical nature of today's back-up power applications, it is more desirable to protect the system against even relatively rare failure modes. As generator controllers have become more powerful it is feasible for manufactures to supply coordinated short circuit protection integral to the generator control system, negating the need for a main-line circuit breaker.

Generac's GENprotect alternator protection algorithm monitors the generator output. If this monitoring senses short circuit current in excess of rated amps, GENprotect steps in to provide a controlled and safe approach to breaker coordination and alternator protection. GENprotect first limits the alternator short circuit current level to 300%. By limiting the available fault current, GENprotect extends the time the alternator can maintain fault current resulting in consistent breaker coordination. Without this functionality a

line to neutral fault may be at 800% of rated current and need to be cleared within 1.4 seconds. The second function GENprotect performs is I²T thermal protection for the alternator. Since a short circuit event can heat the alternator so rapidly, it is not possible to protect the alternator by monitoring temperature. Instead GENprotect calculates the heat energy of the fault current. When this energy reaches the limits of NEMA MG1, GENprotect trips the generator off-line. This configuration ensures the alternator is protected and the power system is ensured 10 seconds of 300% fault current for breaker coordination.

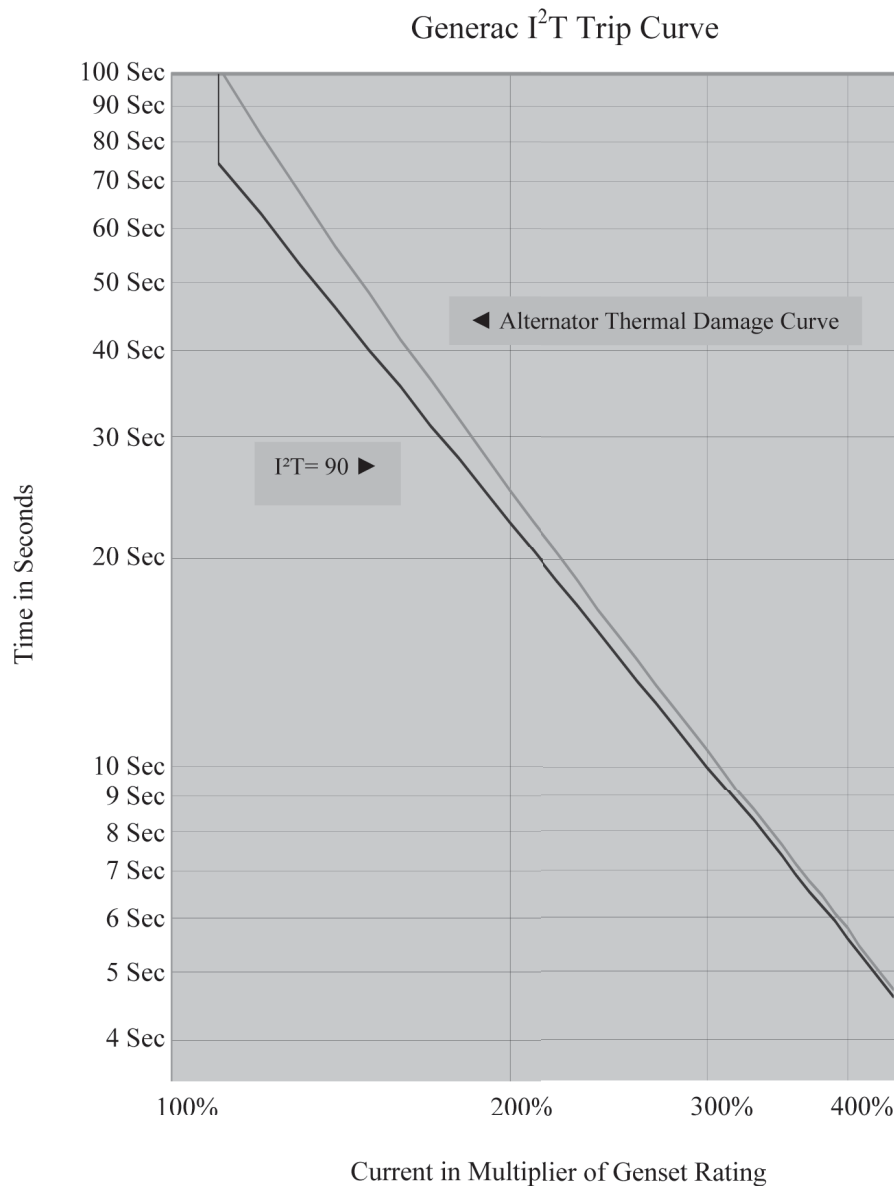
DESCRIPTION

- GENprotect is an alternator protection algorithm approved by UL.
- Protects alternator from damage due to shorts and electrical faults.
- Provides breaker coordination and alternator protection.
- Allows for use of multiple circuit breaker choices, including "no" breaker.



GENprotect™

Seamless Protection for Industrial Power Generators



The above Figure shows the Generac GENprotect thermal protection curve for use in protection and coordination studies. The alternator Thermal Damage Curve is shown just to the right of the GENprotect protection curve. If the alternator load is greater than the thermal damage protection curve for the alternator, the generator set will trip off-line. For example, an overload current of 110% for 75 seconds causes an overload alarm and will trip the generator off-line, shutting down the engine. GENprotect will provide generator protection over a full range of time and current, from instantaneous faults to overloads lasting several minutes. An advantage of GENprotect over a MCCB is that GENprotect allows for downstream breakers to clear faults without tripping the generator off-line, providing selective coordination with the first level of downstream breakers.

GENERATOR ENCLOSURES



DESCRIPTION

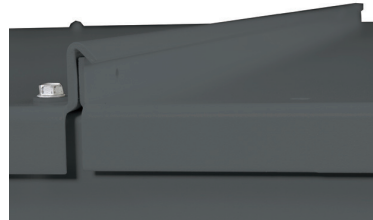
GENERAC POWER SYSTEMS' generator enclosures provide year-round weather protection for your power equipment. Engineered with functionality and value in mind, the enclosure design benefits are unique in that the enclosures utilize dimensionally matched components for either a weather protective configuration or a sound attenuated/acoustic configuration. With common components used between design, modification and on-site upgrades can be accomplished with ease.

The enclosure design offers several benefits over the "standard enclosures" of other manufacturers. Generac's enclosures have been created with the goal of maximizing the customer's product performance satisfaction while maintaining the functionality of reducing exterior noise levels and discouraging product tampering.

Although others may require a "premium" for a self-enclosed exhaust system, rugged steel panel construction or protective polyethylene washers under all exterior panel fasteners, Generac includes these and several other features on every enclosure configuration. Be sure to compare. Generac Enclosures offer additional design enhancement extras that other "standard enclosures" do not.

GENERATOR ENCLOSURES

Post-Free Twin Doors
Provide Large, Unobstructed Service Access



Gasket-Free, Interconnected Roof Panel Joint
Drip-Free, Maintenance-Free

Heavy Gauge, Stainless Steel, Partial Pin Hinges with Nylon Spacers
Durable, Corrosion-Free, Removable Doors



Two-Point Door Latch System
Ensures Proper Seal
Preventing Water Ingress
and Sound Egress



Dense, Closed-Cell Foam Insulation with Reflective Silver Mylar Layer
Improved Sound Attenuation Without Damaging Effects From Radiant Heat Exposure



Lockable Turn and Tuck Stainless Steel Latch Handle
Corrosion-Free, Non-Protruding and Secure



GENERATOR ENCLOSURES

FEATURES:

Dimensional matching of acoustic and non-acoustic enclosure designs

Standardized enclosure components *

Enclosure mounted directly to unit baseframe

Electrostatically painted panels

12 or 14 gauge steel based on kW rating

Aluminum Enclosure optional

Stainless steel door latch and hinge hardware

Stainless steel door latch strike plate

Door hinges utilize slip-pin design

Polyethylene gasketing under door hinges

Keyed door latches

Large removable access doors

Relocation of access doors

Redesigned door gasketing

Weather resistant aluminum roof design with drip ledge

Cabled and gasketed radiator access cover

Acoustic roof panels manufactured with mechanical retention pins

Polyethylene washers under all panel fasteners

Internally fastened enclosure panels (where possible)

Additional roof panel stiffener

Self-enclosed exhaust system

Discharge air duct has been designed with minimal fasteners

Stainless steel exhaust band clamps

Drain holes within air ducts

Rodent-proof, tamper proof enclosure design

Redesigned baseframe lifting lugs

Up to 200 MPH wind kit options (Contact Factory for Availability)

BENEFITS:

Reduces variation in fuel tank pricing, inventory; removes need to change out fuel tank or retrofit

Ease of retrofit or upgrade to acoustic system; reduced parts inventory, costs

Simplified delivery and installation with enclosure and unit in single component design

Maximum protection from weather elements

Maximum sound attenuation, protection and product life

Prevents corrosion in coastal regions

Provides extended component life; maximum protection against rusting

Maximum protection against enclosure paint damage from door latch pin

Provides quick door removal for full-unit access

Additional protection for enclosure paint finish

Protection for equipment and personnel

Ease of maintenance

Provides improved access to MLCB on all units

Improved sealing quality from sound and weather elements

Provides optimum moisture/rain runoff from unit

Provides improved radiator access and additional protection from weather elements

Increased acoustic foam retention within unit

Additional paint finish protection from stainless steel fastener

Provides streamlined unit appearance

Added overall compartment rigidity and acoustic foam panel retention

Provides safe unit operation; no enclosure hot spots; streamlined unit appearance

Ease of removal and access to exhaust system

Provides extended component life; ensures proper exhaust seal

Enables maximum water run-off

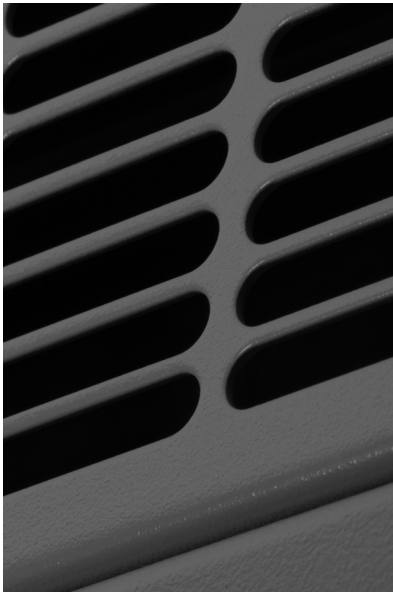
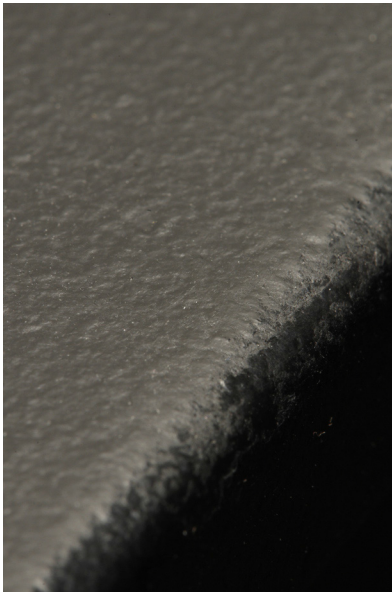
Safety and security for personnel and equipment

Ease of unit relocation; prevents compartment damage from lifting straps

Meets locally enforced wind requirements

* Consult Generac Power Systems, Inc. for installation drawings for specific configurations and dimensions.

RhinoCoat™



Generac's RhinoCoat™ finish system provides superior durability as a standard for all Generac Industrial enclosures, tanks and frames.*

Testing Standards

Generac's RhinoCoat™ finished surfaces are subjected to numerous tests. These include:

- ASTM D - 1186 - 87.....2.5+ MIL Paint Thickness
- ASTM D - 3363 - 92a.....Adequate Material Hardness
- ASTM D 522 - B.....Resistant to Cracking
- ASTM D 3359 - B.....Exceptional Adhesion
- ASTM B117 D 1654.....Resistant to Salt Water Corrosion
- ASTM D1735 D 1654.....Resistant to Humidity
- ASTM 2794 93 (2004).....Exceptional Impact Resistance
- SAEJ1690 - UV Specifications.....UV Protection

In addition to the testing standards above, Generac adds the following test requirements more specific to generator applications:

- Resistant to Typical Oils
- Resistant to Typical Fuels
- Resistant to Typical Antifreeze
- Resistant to Distilled Water

Primary Codes and Standards



*RhinoCoat™ powder coat paint is durable and corrosion resistant however it is not a rust preventative. Generac pretreats all powder coated parts to assist with resistance to corrosion.

INDUSTRIAL GENSET - BATTERY INDEX

• Warranty by Exide Corp. • Exide e-mail: tbгна@exide.com • 800-782-7848 National Hot line

INDUSTRIAL SPARK-IGNITED GENSETS - AVAILABLE BATTERIES			GENERAC PART #					
Engine	System Voltage	Battery Quantity	058208 (Group 24F)	077483 (Group 26)	058665 (Group 27F)	061119 (Group 31)	061104 (Group 8D)	BT0015A02 (Group 8D)
G2.4	12	1		X				
G4.5	12	1			X	X		
G9.0	12	1			X	X		
G14.2	24	2					X	
G21.9	24	2					X	
G25.8	24	2					X	
G33.9	24	4					X	
G49.0	24	4					X	X

INDUSTRIAL DIESEL GENSETS - AVAILABLE BATTERIES			GENERAC PART #			
Engine	System Voltage	Battery Quantity	058665 (Group 27F)	061119 (Group 31)	061104/ BT0015A00 (Group 8D)	BT0015A02 (Group 8D)
D2.2 Perkins	12	1	X	X		
D3.3 Perkins	12	1		X		
D4.5 FPT	12	1		X		
D6.7 FPT 100, 130kW	12	1		X		
D6.7 FPT 150, 175kW	12	2		X		
D8.7 FPT	24	2		X		
D10.3 FPT	24	2		X	X	
D12.9 FPT	24	2		X	X	
D12.5 Perkins	24	2			X	
D15.2 Perkins	24	2			X	
D16.0 Volvo	24	2		X	X	
D18.1 Perkins	24	2			X	
D30.6 Perkins	24	2			X	X
D33.9 MHI	24	2			X	X
D37.1 MHI	24	4			X	X
D49.0 MHI	24	4			X	X
D65.4 MHI	24	4			X	X

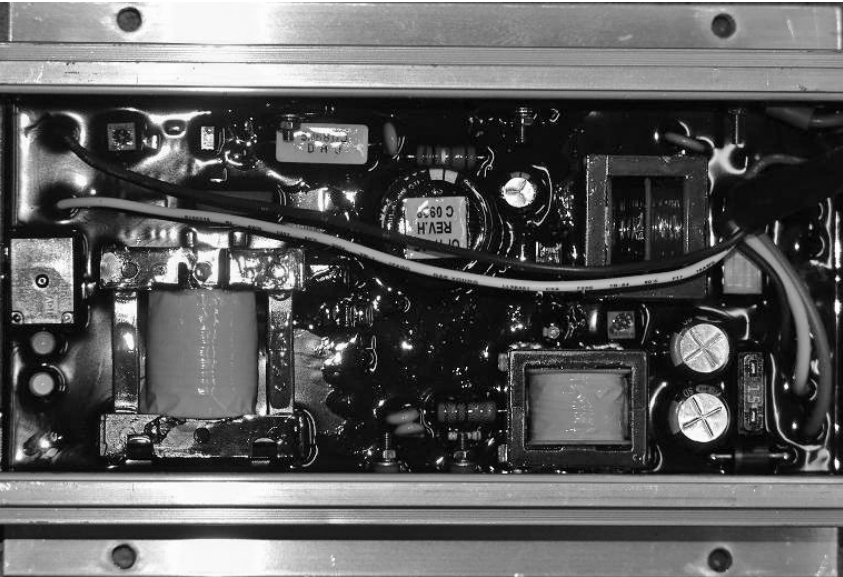
DIMENSIONS (in) NOMINAL					
Part Number	Group Number*	Nominal CCA @ 0° F	L	W	H
058208	24F	525	6.75	10.63	9.00
077483	26	525	6.75	8.25	7.75
058665	27F	700	6.75	12.50	9.00
061119	31	925	6.75	13.00	9.40
061104/ BT0015A00	8D	1,200	11.00	20.80	10.00
BT0015A02	8D	1,400	11.00	20.80	10.00

All batteries are 12V, 6 cell construction, lead calcium type.
For 24V systems, batteries are wired in series.

X Battery available with electrolyte and installed in genset.
* BCI Group Size reference.

BATTERY CHARGER

10 amp



Battery charger shown from inside of control panel enclosure.
Connections are made via an attached harness.

The Generac 10 amp 12/24 volt battery charger is designed to work with Generac Industrial Controls and the G8601 to provide the ultimate in automatic battery voltage maintenance.

The 10 amp charger has automatic float and equalize control. It precisely monitors the battery's voltage and automatically activates the correct charging mode. The charge rate is limited and controlled to efficiently and safely maintain ideal battery levels under varying conditions.

The equalize system uses a control circuit to limit charging current to 10 amps. When battery voltage drops below a preset level, charging current increases to 5 amps and then to the 10 amp charge rate if needed. When the battery reaches maximum charge, the charger switches to float mode to supply just enough current to maintain the battery at or above 13/26 volts. Battery voltage and charging current are read at the control panel digital display.

Specifications	10A
Nominal Input	120 VAC
Operating AC Line Voltage Range	108 to 132 VAC
Input AC Line Frequency	50/60 Hz
Battery Fuse	15 A
Nominal Charge Rate	10 A
Equalize Voltage	13.8/27.6 V
Float Voltage	13.0/26.0 V
Current @ Equalize to Float Transition	5 A
Battery Under-voltage shutdown	11/22 V
LED Indicators	Yes
AC Line Voltage	Green LED
Battery Connected and Charging	Yellow LED
Battery Current Drain	30 mA
AC Line Connection	Connector Plug
Battery Connection	Connector Plug
Control Connection	AC Power Fail Form Relay Form C 2 A Rating
CUL Recognized	Yes
NFPA 110 Compliant	Yes
AGM Compatible	Yes
UL1236	Yes
CSA 22.2 No. 107	Yes

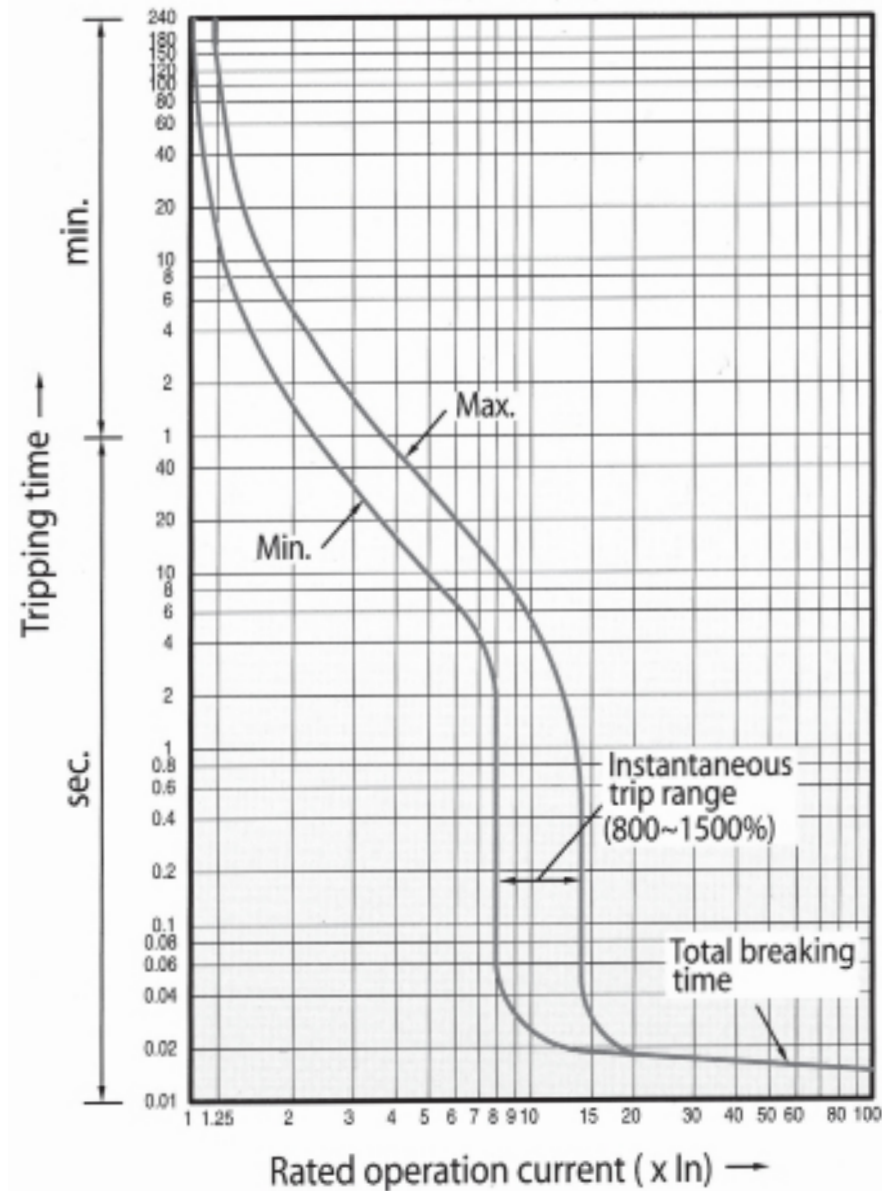
CIRCUIT BREAKER 40-600 AMP

GENERAC CIRCUIT BREAKER INFORMATION							
Circuit Breaker Amps	Generac C.B. Lug Part Number	Lug Description	Wire Size Per 310-16*	Frame	Interrupt Rating	Rating Temperature	Type
40		Single Hole 0.656 Diameter # 6 to 300 MCM Cu/Al Single Conductor Only Mounting Bolt 70 in lbs. Wire Lug is 375 in lbs.	#8				
50			#8				
60			#6				
70			#4				
80			#4				
90			#3				
100			#3				
125			#1				
150	0F8451		1/0	200 Amp Frame	18,000	40 °C	Thermal Magnetic
175			2/0				
200			3/0				
225			4/0				
250	0A7822	(1) - 600 MCM to # 4 Cu/Al or (2) - 250 MCM to (2) - 1/0 Mounting 70 in lb. Wire Lug is 375 in lb	250MCM	400 Amp Frame	25,000		
300			350MCM				
350			500MCM				
400			600MCM				
450	0F9721 Standard Lug	(3) - 2/0 - 400 MCM Cu/Al 480 in lb.	700MCM or 2 - 4/0	600 Amp UL Rated Frame	35,000		
500	0F8452 Optional Lug	(2) - 500-750 mcm Cu/Al	2 - 250 MCM				
600	Lug - 450-600A	Optional Lug	2 - 350MCM or 3-3/0				

All circuit breakers are CUL 489 listed for 120, 208, 240, 480 Volts.
Wire size is based on Amp Ratings at 75 °C from Table 310.16, 2008
NEC. All Lugs Are Rated 75 °C.

Derate by Temperature	
Temperature °C	Rated Trip Current %
20	110
30	105
40	100
50	95

CIRCUIT BREAKER 40-600 AMP



COOLANT HEATER OPTION 1500 WATT, 120VAC

SPECIFICATIONS:

VOLTAGE: 120VAC

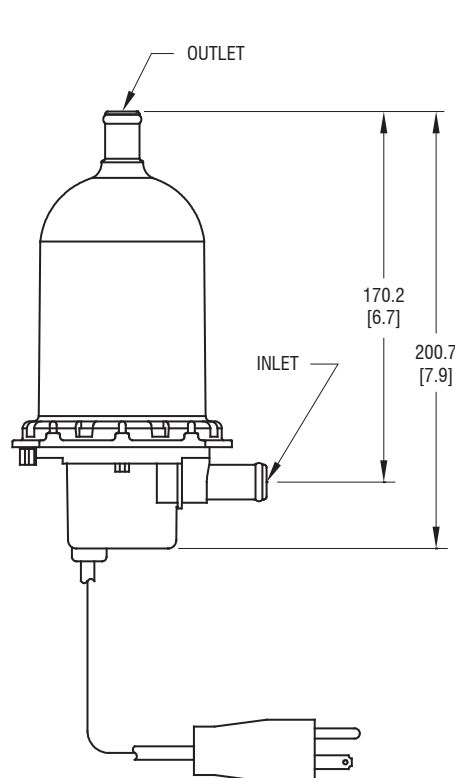
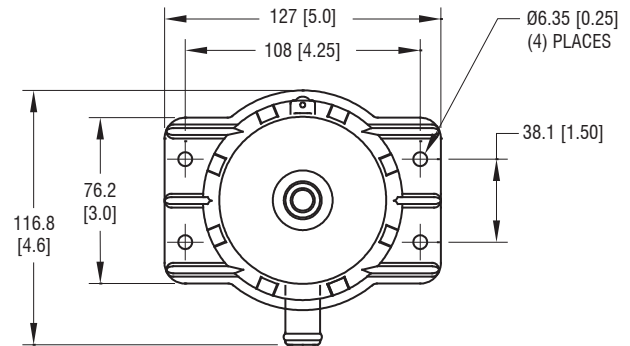
HEAT POWER: 1500W

FIXED THERMOSTAT: 60°-80°F

HEATING ELEMENT: INCOLOY 800

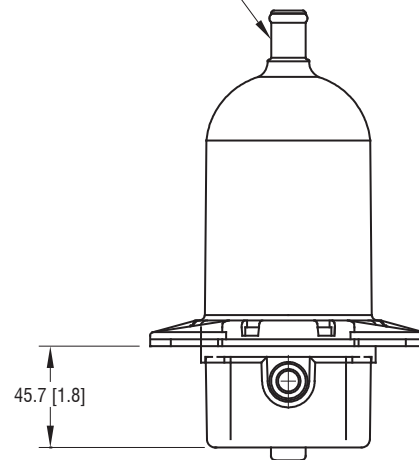
MAXIMUM PRESSURE: 90 PSI (620 kPa)

PLUG NEMA STD: 5-15P



HOSE BARB TO FIT
5/8" I.D. HOSE
(2) PLACES

DIMENSIONS: mm [INCHES]



ELECTRONIC GOVERNOR

Spark-Ignited Engines



Generac’s electronic isochronous governor systems are standard on all Spark-Ignited gensets utilizing Generac’s Digital Control Platforms.

- Isochronous Speed Regulation
- ±0.25% Steady State Regulation
- Factory Installed and Adjusted
- Fully Adjustable
- Quiet-Test™ Low-Speed Exercise Capability
- Fast Response
- High Reliability
- Environmentally Sealed
- RoHS Compliant

ACTUATOR

Die cast enclosure housing the throttle plate and the gear-driven rotary actuator with the interior components sealed against dust, dirt and moisture. The gear drive is directly connected to the throttle plate for fast and precise control. Safety spring-return to a closed position upon loss of power.

Design	Generac
Type.....	Electronically Actuated Throttle Valve
Operating Voltage.....	12VDC
Response Time	< 100 ms
Operating Temperature Range.....	-40°F to 212°F
Output.....	Rotary (internal - no linkage)

CONTROLLER

The governor driver module is located in the generator control panel. A sealed unit with waterproof connections and a feedback circuit from the actuator for throttle plate position. Generac software controls speed governing, and is fully adjustable.

The Generac electronic governor system applies to all spark-ignited gensets with Generac's Digital Control Platforms.

TX611 Series Transfer Switch

100 – 400 Amps

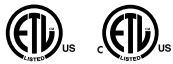
Contactor Type · Open and Delayed Transition

- Automatic Transfer Switch
- 100 – 400 A, up to 480 VAC, 60 Hz
- Single or Three Phase
- 2, 3, or 4 Poles
- UL Type 1 or Type 3R Enclosure
- Open and Inphase or Open with Delayed Transition
- ETLus and cETLus
- 3 Cycle Rated for Easy Upstream Breaker Coordination



Image used for illustration purposes only

Codes and Standards



ETLus and cETLus Listed to UL 1008



NFPA 70, 99, 110



NEC 700, 701, 702, 708



oshpd

OSHPD and Seismic Certified CBC
2019, CBC 2016, IBC 2018, IBC 2015,
IBC 2012, IBC 2009, ASCE 7-10,
ASCE 7-16, ICC-ES AC-156

Description

Generac's patented* contactor is featured in the TX contactor type transfer switch, which is a double-throw robust switch construction with inherent interlocks for safe positive transfer between power sources. Featuring a transition time of less than 20 milliseconds, this high speed transfer is ideal for all applications, including motor load applications. The contacts are silver composite for long life, resisting pitting or burning. The switches are rated for full load transfers in mission critical, emergency, legally required, and optional power systems.

The microprocessor based controller provides the customers with the flexibility to program a comprehensive group of set points to match the application needs. The controller has two programmable inputs and one programmable output as standard and is available with optional expansion boards for up to four programmable inputs and outputs. The LCD displays real time and historical information with time-stamped events. The integrated plant exerciser can be configured in off, daily, day of week, biweekly, and monthly intervals with user selectable run time. Standard features of the controller include three phase sensing on both sources, phase unbalance, phase reversal, load shed, emergency inhibit, and communications.

TX611 Series Transfer Switch

100 – 400 Amps

Contactor Type · Open and Delayed Transition

STANDARD FEATURES

GENERAL

- Small Footprint, Results in Easy Mounting and Installation for Reduced Time and Costs
- Cable Entry is Top or Bottom
- Double-Throw, Stored Energy Transfer Mechanism
- Can be Electrically Isolated while Energized
- Graphical LCD-Based Display for Programming, System Diagnostics and Help Menu Display Mimic
- Diagram with Source Available and Connected LED Indicator
- Method of Transfer: Open with Inphase Transition
- Mechanically Interlocked to Prevent Connection of Both Sources
- Modbus® RTU
- TXC 100 Controller
- Operating Temperature -4 ° to 158 °F (-20 ° to 70 °C)
- Removable Top and Bottom Plates for Ease of Entry
- Voltage Agnostic*
- High Withstand and Closing Ratings
- Heater Kit Standard on All 3R Enclosures
- Auxiliary Output Includes: Two Wire Start, Signal Before Transfer, Fault, and a Programmable Relay Output
- Auxiliary Input Includes: Permissive Inputs (24 VDC)
- General Alarm Indication
- 2 Year Standard Warranty
- IBC 2018, 2015, 2012, 2009

VOLTAGE AND FREQUENCY SENSING

- Three Phase Under and Over Voltage Sensing on Normal and Emergency Sources
- Under and Over Frequency Sensing on Normal and Emergency
- Selectable Settings: Single or Three Phase Voltage
- Sensing on Normal, Emergency and Load 60 Hz
- Phase Sequence Sensing for Phase Sensitive Loads

Start Circuit

- 2-Wire Start
- 3-Wire Start From C Contact for Circuit Monitoring

Digital Outputs

- Signal Before Transfer (Elevator)
- General Alarm

Digital Inputs

- Emergency Inhibit (Permissive & Load Shed)
- Go to Emergency (Demand Response)
- Manual Generator Retransfer

CONTROLS

- Front Programmable Control Reduces PPE Needs and Arc Flash Hazard
- Built in Battery Backup - Increases Switch Reliability and Reduces Switch Transition Time to Alternate Source
- Battery Backup Able to Power the Controller for up to 60 Minutes in the Event of No Source Availability
- Generator Battery Backup for Controller
- Accessible USB Port for Easy Data Downloads, Firmware Updates without Requiring PPE, Reducing the Risk of Arc Flash
- All Amp Nodes Offered with Delayed Transition
- Heater Programmable through Control for Desired Temperature and Humidity Settings
- Front Accessible Customer Connections
- Time-Stamped Event History Log
- Programmable Exerciser - Daily, Weekly, Bi-Weekly, Monthly

* 480 V 3-Wire Systems Must be Specified at Time of Ordering for Transformer Kit to be Included

CONFIGURABLE OPTIONS

- Chicago Code Kit
- 3R Padlockable Cover for Controller (Standard on 3R Enclosure)
- CTs for Integrated Metering
- Heater Option for Temperature and Humidity Control (Standard on 3R)
- Time Delay in Neutral Transition (TDN), or Inphase with a Default to Time Delay in Neutral Transfer
- Expandable Input/Output Board Module Includes: 4 Relay Outputs and 4 Optically Isolated Inputs
- IBC Seismic Certified/Seismic Rated
- 2 Year Extended Limited Warranty
- 5 Year Basic Limited Warranty
- 5 Year Extended Limited Warranty
- 7 Year Extended Limited Warranty
- 10 Year Extended Limited Warranty

Engineered Options

- Transient Voltage Surge Suppressor (TVSS)
- NEMA 4X Stainless Steel (304 or 316) Enclosure
- Manual Generator Retransfer Switch
- Go to Emergency Switch

Conversion Kits

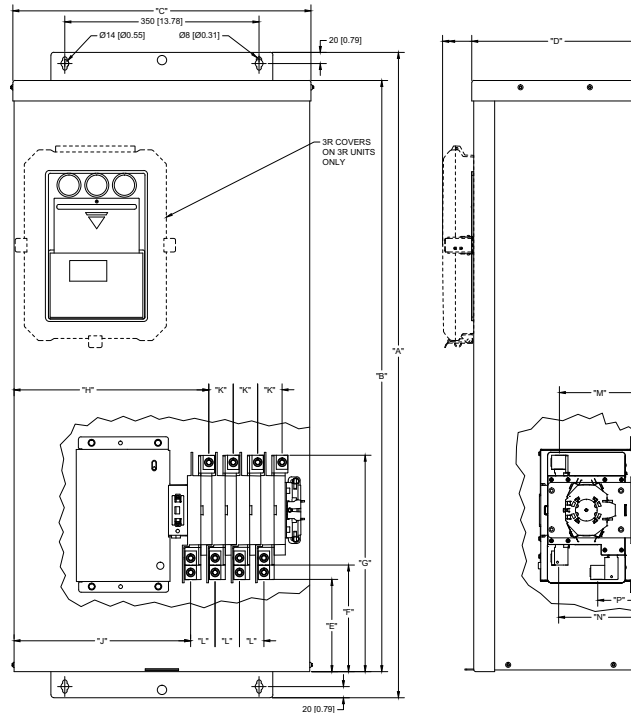
- 480 V Transformer Kit for 3-Wire Systems
- UL Type 1 to Type 3R Kit

TX611 Series Transfer Switch

100 – 400 Amps

Contactor Type · Open and Delayed Transition

UNIT DIMENSIONS*



Contactor Type, Open and Delayed Transition, 100 – 400 A

Description	in (mm)														Cu/Al					lbs (kg)
	A (Height)	B (Height)	C (Width)	D (Depth)	E (Dim)	F (Dim)	G (Dim)	H (Dim)	J (Dim)	K (Dim)	L (Dim)	M (Dim)	N (Dim)	P (Dim)	Normal 75 °C Wire	Standby Source 75 °C Wire	Load 75 °C Wire	Neutral Connection	Ground Connection	Weight
100A NON SER TYPE 1	35.6 (903)	31.7 (806)	21.2 (538)	12.0 (305)	8.9 (226)	9.9 (252)	18.5 (471)	13.7 (348)	12.4 (315)	1.7 (44)	1.7 (44)	5.8 (148)	5.8 (148)	3.1 (79)	(1) 2/0 - 14	(1) 2/0 - 14	(1) 2/0 - 14	(5) 2/0 - 14	(2) 1/0 - 14	105.6 (48)
100A NON SER TYPE 3R	35.6 (903)	31.7 (806)	21.2 (538)	13.9 (355)	8.9 (226)	9.9 (252)	18.5 (471)	13.7 (348)	12.4 (315)	1.7 (44)	1.7 (44)	5.8 (148)	5.8 (148)	3.1 (79)	(1) 2/0 - 14	(1) 2/0 - 14	(1) 2/0 - 14	(5) 2/0 - 14	(2) 1/0 - 14	110.0 (50)
150A NON SER TYPE 1	35.6 (903)	31.7 (806)	21.2 (538)	12.0 (305)	9.3 (236)	10.3 (262)	18.1 (460)	13.7 (348)	12.4 (315)	1.7 (44)	1.7 (44)	6.0 (153)	6.0 (153)	3.3 (84)	(1) 250 - 6	(1) 250 - 6	(1) 250 - 6	(4) 350 - 6	(2) 250 - 6	116.6 (53)
150A NON SER TYPE 3R	35.6 (903)	31.7 (806)	21.2 (538)	13.9 (355)	9.3 (236)	10.3 (262)	18.1 (460)	13.7 (348)	12.4 (315)	1.7 (44)	1.7 (44)	6.0 (153)	6.0 (153)	3.3 (84)	(1) 250 - 6	(1) 250 - 6	(1) 250 - 6	(4) 350 - 6	(2) 250 - 6	121.0 (55)
200A NON SER TYPE 1	35.6 (903)	31.7 (806)	21.2 (538)	12.0 (305)	9.3 (236)	10.3 (262)	18.1 (460)	13.7 (348)	12.4 (315)	1.7 (44)	1.7 (44)	6.0 (153)	6.0 (153)	3.3 (84)	(1) 250 - 6	(1) 250 - 6	(1) 250 - 6	(4) 350 - 6	(2) 250 - 6	116.6 (53)
200A NON SER TYPE 3R	35.6 (903)	31.7 (806)	21.2 (538)	13.9 (355)	9.3 (236)	10.3 (262)	18.1 (460)	13.7 (348)	12.4 (315)	1.7 (44)	1.7 (44)	6.0 (153)	6.0 (153)	3.3 (84)	(1) 250 - 6	(1) 250 - 6	(1) 250 - 6	(4) 350 - 6	(2) 250 - 6	121.0 (55)
300A NON SER TYPE 1	51.4 (1,305)	47.5 (1,206)	24.2 (614)	12.0 (305)	9.7 (246)	11.5 (292)	20.3 (516)	14.8 (377)	13.1 (311)	2.3 (59)	2.3 (59)	6.5 (166)	6.5 (166)	3.3 (84)	(1) 600 - 4 or (2) 250 - 1/0	(1) 600 - 4 or (2) 250 - 1/0	(1) 600 - 4 or (2) 250 - 1/0	(5) 600 MCM - 4 or (10) 250 MCM - 1/0	(2) 250 - 6	173.8 (79)
300A NON SER TYPE 3R	51.4 (1,305)	47.5 (1,206)	24.2 (614)	13.9 (355)	9.7 (246)	11.5 (292)	20.3 (516)	14.8 (377)	13.1 (311)	2.3 (59)	2.3 (59)	6.5 (166)	6.5 (166)	3.3 (84)	(1) 600 - 4 or (2) 250 - 1/0	(1) 600 - 4 or (2) 250 - 1/0	(1) 600 - 4 or (2) 250 - 1/0	(5) 600 MCM - 4 or (10) 250 MCM - 1/0	(2) 250 - 6	178.2 (81)
400A NON SER TYPE 1	51.4 (1,305)	47.5 (1,206)	24.2 (614)	12.0 (305)	9.7 (246)	11.5 (292)	20.3 (516)	14.8 (377)	13.1 (311)	2.3 (59)	2.3 (59)	6.5 (166)	6.5 (166)	3.3 (84)	(1) 600 - 4 or (2) 250 - 1/0	(1) 600 - 4 or (2) 250 - 1/0	(1) 600 - 4 or (2) 250 - 1/0	(5) 600 MCM - 4 or (10) 250 MCM - 1/0	(2) 250 - 6	173.8 (79)
400A NON SER TYPE 3R	51.4 (1,305)	47.5 (1,206)	24.2 (614)	13.9 (355)	9.7 (246)	11.5 (292)	20.3 (516)	14.8 (377)	13.1 (311)	2.3 (59)	2.3 (59)	6.5 (166)	6.5 (166)	3.3 (84)	(1) 600 - 4 or (2) 250 - 1/0	(1) 600 - 4 or (2) 250 - 1/0	(1) 600 - 4 or (2) 250 - 1/0	(5) 600 MCM - 4 or (10) 250 MCM - 1/0	(2) 250 - 6	178.2 (81)

UL 1008 Withstand and Closing Ratings

Ampere Rating	Specific Breaker (kA)**	3-Cycle Rating (kA)	Fuse Rating (Class J)	Fuse Size	Voltage
100	35	22	200 kA	200 A	480V
150	42	22	200 kA	200 A	480V
200	42	22	200 kA	200 A	480V
300	65	35	200 kA	400 A	480V
400	65	35	200 kA	400 A	480V

* All measurements are approximate and for estimation purposes only. Specification characteristics may change without notice. Please contact a Generac Power Systems Industrial Dealer for detailed installation drawings.
** See Specific Breaker List available on GENconnect.

SPECIFIC BREAKER LIST

TX611 Series Transfer Switch

TX611 Series Switches Covered:

150A up to 480V

Short-Circuit Withstand and Closing Fuse Ratings

When protected by a fuse of the specific fuse class and maximum ampere rating as marked below, this transfer switch is suitable for use in a circuit capable of delivering the short-circuit current at the maximum voltage marked.

Switch Ampere Rating	Transfer Switch Short-Circuit Current Rating (RMS Symmetrical Amperes x 1,000)	Voltage (Volts AC, Maximum)	Fuse Class	Rating (Amperes)
150	200	480	J	200

Specific Circuit Breaker Manufacturer and Type Listing

When protected by a circuit breaker of the specific manufacturer, type, and ampere rating as marked below, this transfer switch is suitable for use in circuits capable of delivering short-circuit current at the maximum voltage marked.

Switch Ampere Rating	Transfer Switch Short-Circuit Current Rating (RMS Symmetrical Amperes x 1,000)	Voltage (Volts AC, Maximum)	Manufacturer	Type	Circuit Breaker Rating (Amperes Maximum)
150	25	480	Square D	BJ, BG, BD	125
150	42	480	Square D	HD, HG, HJ, HL, HR	150
150	42	480	Square D	JG, JJ, JL, JR	200
150	30	480	Eaton	FD, FDC, FDCE	200
150	30	480	Eaton	FDE, HFD, HFDE	200
150	42	480	Eaton	EGE, EGC	125
150	42	480	Eaton	EGH, EGS	125
150	35	480	Eaton	HJD, JD, JDB	200
150	35	480	Eaton	JDC, JGC, JGH	200
150	35	480	Eaton	JGS, JGU, JGX	200
150	35	480	Eaton	LGC, LGH, LGS	200
150	35	480	Eaton	LGU, LGX	200
150	35	480	GE/ABB	SGL, SGP	125
150	42	480	GE/ABB	SEL, SEP, PE_N	150
150	42	480	GE/ABB	PE_H, PE_L	150
150	42	480	GE/ABB	THLC1	150
150	42	480	Siemens	3VA52_6	200

Any Breaker (3 Cycle) Withstand and Closing Rating

When protected by a circuit breaker, this transfer switch is suitable for use in a circuit capable of delivering the short-circuit current for the maximum time duration and voltage marked below. The circuit breaker must include an instantaneous trip response unless the available short-circuit current is less than or equal to the short-time rating of the transfer switch and the circuit breaker includes a short-time trip response. The maximum clearing time of the instantaneous trip response must be less than or equal to the time duration shown for the marked short-circuit current. When protected by a circuit breaker with a short-time trip response, the short-time response of the circuit breaker must be coordinated with the short-time current rating of the transfer switch as marked below.

Switch Ampere Rating	Transfer Switch Short-Circuit Current Rating (RMS Symmetrical Amperes x 1,000)	Voltage (Volts AC, Maximum)	Time Duration (Sec, Maximum)
150	22	480	0.050

TX Series Transfer Switch

TXC-100

Automatic Transfer Switch Controller

- Automatic Transfer Switch Controller
- Up to 480 VAC, 50/60 Hz
- Single and Three Phase
- cETLus Recognized Component
- Tested to UL 1008



Image used for illustration purposes only

Codes and Standards

Not all codes and standards apply to all configurations. Contact factory for details.



cETLus Recognized per UL 1008



NFPA 37, 70, 99, 110



NEC 700, 701, 702, 708

Description

Generac's TXC-100 microprocessor based controller provides customers with the flexibility to program a comprehensive group of set points to match the application needs. The controller has 2 programmable inputs and 1 programmable output as standard and is available with an optional expansion board for up to 4 programmable inputs and outputs. The LCD displays real time and historical information with time-stamped events. The integrated plant exerciser can be configured in off, daily, day of week, biweekly, and monthly intervals with user selectable run time. Standard features of the controller include three phase sensing on both sources, phase unbalance, phase reversal, emergency inhibit, and communications.

TX Series Transfer Switch

TXC-100

Automatic Transfer Switch Controller

STANDARD FEATURES

GENERAL

- Graphical LCD-Based Display for Programming, System Diagnostics and Help Menu Display Mimic Diagram with Source Available and Connected LED Indicator
- Time-Stamped Event History Log
- Programmable Exerciser - Daily, Weekly, Bi-Weekly, Monthly
- Methods of Transfer Include: Open with Inphase Transition Only, Time Delay in Neutral Transition, or Inphase with a Default to Time Delay in Neutral Transfer
- Modbus® RTU Communications
- Operating Temperature -4 ° to 158 °F (-20 ° to 70 °C)
- Voltage Agnostic*
- Integrated Anti-condensation Heater Control
- Auxiliary Output Includes: 2WS, SB4T, Fault, and a Programmable Relay Output
- Auxiliary Input Includes: Permissive and Loadshed Inputs (24 VDC)
- Expandable Input/Output Board Module Includes: 4 Relay Outputs and 4 Optically Isolated Inputs
- Front Programmable Control Reduces PPE Needs and Arc Flash Hazard

- Built in Battery Backup - Increases Switch Reliability and Reduces Switch Transition Time to Alternate Source
- Rechargeable Lithium-ion Battery Backup Able to Power the Controller for up to 60 Minutes in the Event of No Source Availability
- Accessible USB Port for Easy Data Downloads, Firmware Updates without Requiring PPE, Reducing the Risk of Arc Flash
- All Amp Nodes Offered with Delayed Transition
- General Alarm Indication
- Heater Programmable through Control for Desired Temperature and Humidity Settings
- Front Accessible Customer Connections and Battery without Arc Flash Exposure
- Auxiliary Generator Battery Backup for Controller

VOLTAGE AND FREQUENCY SENSING

- Three Phase Under and Over Voltage Sensing on Normal and Emergency Sources
- Under and Over Frequency Sensing on Normal and Emergency
- Selectable Settings: Single or Three Phase Voltage
- Sensing on Normal, Emergency and Load 50 or 60 Hz
- Phase Sequence Sensing for Phase Sensitive Loads

PROGRAMMABLE I/O PARAMETERS

Outputs:

- Source 1 – Two Wire Start
- Source 2 – Two Wire Start
- Engine Exercising
- Engine Warmup
- Signal Before Transfer (Elevator Contact)
- General Alarm
- Source 1 Good
- Source 2 Good

Inputs:

- Permissive (Emergency Inhibit)
- Remote Engine Fast Test
- Remote Engine Normal Test
- ATS Timer
- Initiate Demand Response

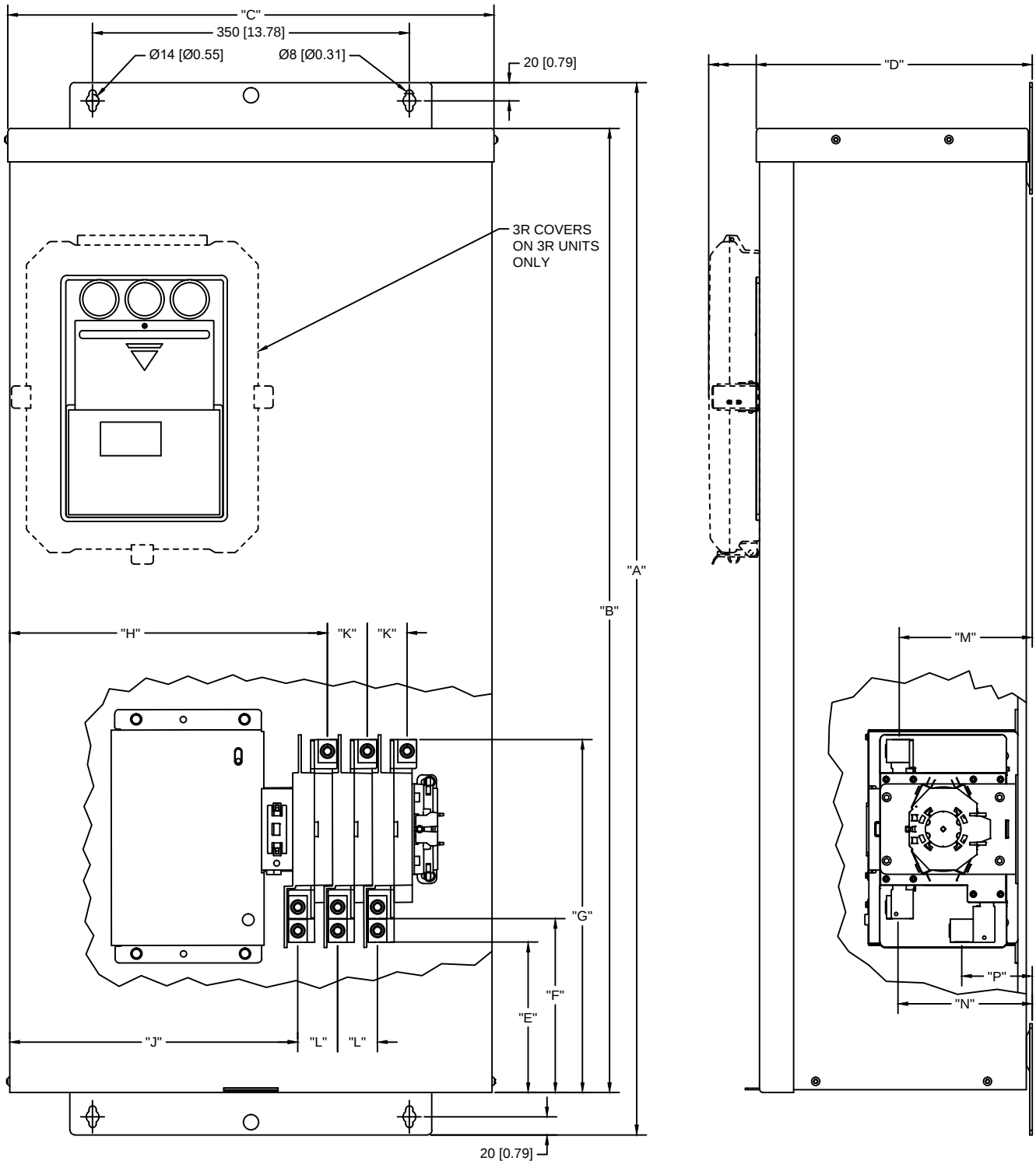
* 480 V Delta Must be Specified at Time of Ordering for Transformer Kit to be Included

AVAILABLE OPTIONS

- Chicago Code Kit
- 3R Padlockable Cover for Controller (Standard on 3R Enclosure)
- Emergency Inhibit
- Selectable Retransfer
- Manual Generator Retransfer
- Type 1 to 3R Conversion Kit

- Heater Option for Temperature and Humidity Control (Standard on 3R Enclosure)
- Input/Output (I/O) Module
- Current Measurements**
- Power in kW**
- Power Factor**

** When Equipped with Current Transformers



ALL DIMENSION ARE: mm [inches]

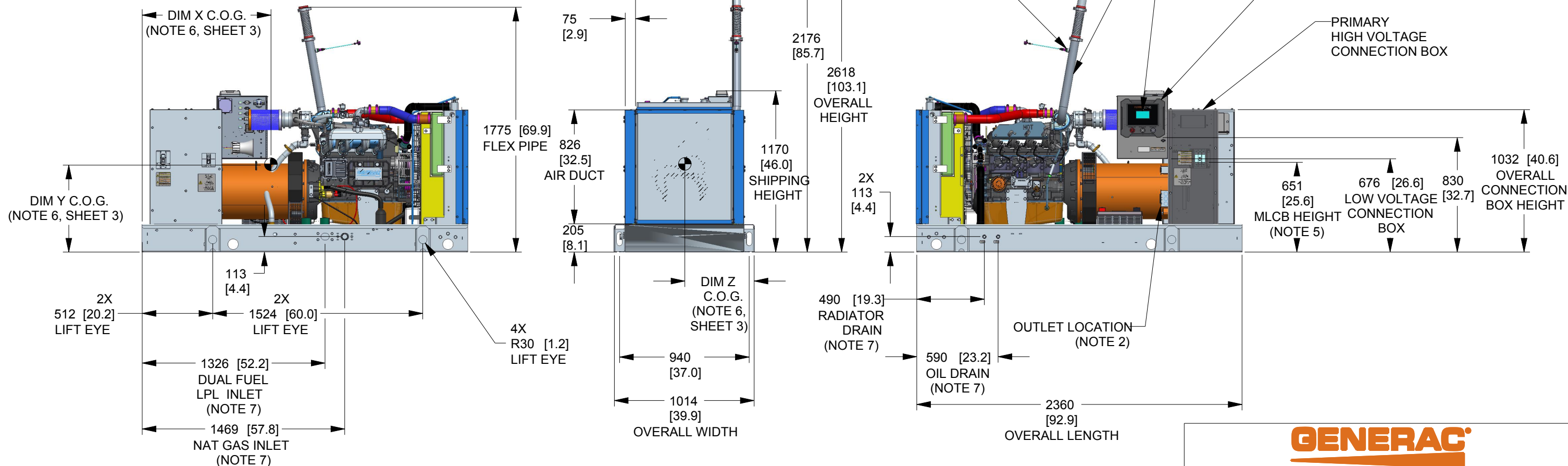
DESCRIPTION	HEIGHT "A"	HEIGHT "B"	WIDTH "C"	DEPTH "D"	DIM "E"	DIM "F"	DIM "G"	DIM "H"	DIM "J"	DIM "K"	DIM "L"	DIM "M"	DIM "N"	DIM "P"	WEIGHT
100A NON SER NEMA 1	903	806	538	305	226	252	471	348	315	44	44	149	149	79	48kg
	[35.55]	[31.71]	[21.16]	[12.00]	[8.89]	[9.91]	[18.54]	[13.70]	[12.40]	[1.73]	[1.73]	[5.88]	[5.88]	[3.11]	105.6lbs
100A NON SER NEMA 3R	903	806	538	355	226	252	471	348	315	44	44	149	149	79	50kg
	[35.55]	[31.71]	[21.16]	[13.99]	[8.89]	[9.91]	[18.54]	[13.70]	[12.40]	[1.73]	[1.73]	[5.88]	[5.88]	[3.11]	110.0lbs
150A NON SER NEMA 1	903	806	538	305	237	263	460	348	315	44	44	153	153	83	53kg
	[35.55]	[31.71]	[21.16]	[12.00]	[9.31]	[10.34]	[18.12]	[13.70]	[12.40]	[1.73]	[1.73]	[6.04]	[6.04]	[3.26]	116.6lbs
150A NON SER NEMA 3R	903	806	538	355	237	263	460	348	315	44	44	153	153	83	55kg
	[35.55]	[31.71]	[21.16]	[13.99]	[9.31]	[10.34]	[18.12]	[13.70]	[12.40]	[1.73]	[1.73]	[6.04]	[6.04]	[3.26]	121.0lbs
200A NON SER NEMA 1	903	806	538	305	237	263	460	348	315	44	44	153	153	83	53kg
	[35.55]	[31.71]	[21.16]	[12.00]	[9.31]	[10.34]	[18.12]	[13.70]	[12.40]	[1.73]	[1.73]	[6.04]	[6.04]	[3.26]	116.6lbs
200A NON SER NEMA 3R	903	806	538	355	237	263	460	348	315	44	44	153	153	83	55kg
	[35.55]	[31.71]	[21.16]	[13.99]	[9.31]	[10.34]	[18.12]	[13.70]	[12.40]	[1.73]	[1.73]	[6.04]	[6.04]	[3.26]	121.0lbs

REVISION: D
REVISION DATE: 10/06/2020

ID TX SWITCH NON SERVICE ENTRANCE 3-POLE 100A-200A
A0000430682 (DRAWING: A0000561085)
NOT TO SCALE

Notes:

1. CONTROL PANEL, (BATTERY CHARGER INSIDE).
2. 120V, 20A GFCI & 250V, 15A OUTLET (OPTIONAL).
3. CONNECTION POINTS FOR CONTROL WIRES PROVIDED IN THE LOW VOLTAGE CONNECTION BOX (USE LOW VOLTAGE STUB-UP AREA).
4. BATTERY (12 VOLT NEGATIVE GROUND SYSTEM).
5. MAIN LINE CIRCUIT BREAKER (MLCB), AC LOAD LEADS. (DIMENSIONS MAY VARY DUE TO UNIT CONFIGURATION)
6. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS. FOR WEIGHT AND CENTER OF GRAVITY DATA SEE SHEET 3
7. ENGINE SERVICE CONNECTIONS:
 - INLET NATURAL GAS = 1-1/4" NPT FEMALE COUPLING
 - INLET DIESEL = N/A
 - INLET LPL = 1/4" NPT
 - RETURN DIESEL = N/A
 - OIL DRAIN = 1/2" NPT COUPLING
 - RADIATOR DRAIN = 1/2 NPT COUPLING,
 - FLEX PIPE OUTLET = 2.5" ID - WELD ON FLANGE PROVIDED
 - EXHAUST OUTLET = 2.5" ID - WELD ON FLANGE PROVIDED***** SEE GENERATOR SIZING GUIDE FOR FUEL PIPE SIZING TO SUIT APPLICATION *****
8. AUXILIARY AC CONNECTION FOR UNIT OPTIONS ARE LOCATED IN HIGH VOLTAGE CONNECTION BOX, UNLESS AN OPTIONAL LOAD CENTER IS INSTALLED.
9. EXHAUST PIPES MAY BE ROTATED TO ALLOW MUFFLER TO POINT OUT TO THE RIGHT OR LEFT SIDE OF GENERATOR. (MAY NOT APPLY TO ALL UNITS)
10. GENERATOR SET MUST BE INSTALLED SUCH THAT FRESH COOLING AIR IS AVAILABLE AND DISCHARGE AIR FROM THE RADIATOR IS NOT RECIRCULATED.
11. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
12. EXHAUST SYSTEM MAXIMUM BACK PRESSURE = 10" H2O (ADDITIONAL).
13. INSTALL EXHAUST BLANKETS ALONG THIS LINE.
14. CONNECT THE OPEN SET EXHAUST PER NFPA 37
15. BLANKETS SHOULD NOT COVER OXYGEN SENSOR.
16. OXYGEN SENSOR (IF EQUIPPED) MUST BE MOUNTED BETWEEN ENGINE OUTLET AND CATALYST INLET IN PORT PROVIDED.
17. CATALYST MUST BE MOUNTED IN DESCRIBED POSITION. FAILING TO FOLLOW THESE INSTRUCTIONS WHEN INSTALLING A CERTIFIED ENGINE IN A PIECE OF STATIONARY EQUIPMENT VIOLATES FEDERAL LAW 40CFR 1068.105(b), SUBJECT TO FINES OR PENALTIES AS DESCRIBED IN THE CLEAN AIR ACT.
18. BOLTS OR STUDS USED TO MOUNT UNIT TO PAD SHALL BE 5/8 - 11 GRADE 5.



DRAWING CREATED FROM PRO/ENGINEER
3D FILE. ECO MODIFICATION TO BE
APPLIED TO SOLID MODEL ONLY.

DIMENSIONS ARE IN MILLIMETERS [INCHES]

INSTALLATION DRAWING

8/28/24

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ELECTRONICALLY APPROVED
INSIDE WINDCHILL

GENERAC

TITLE

OPEN SET
G4.5L 60Hz
SG50, SG60, SG70, SG80

ISSUE DATE:

SIZE
B

CAGE NO
N/A

DWG NO

A0000715598

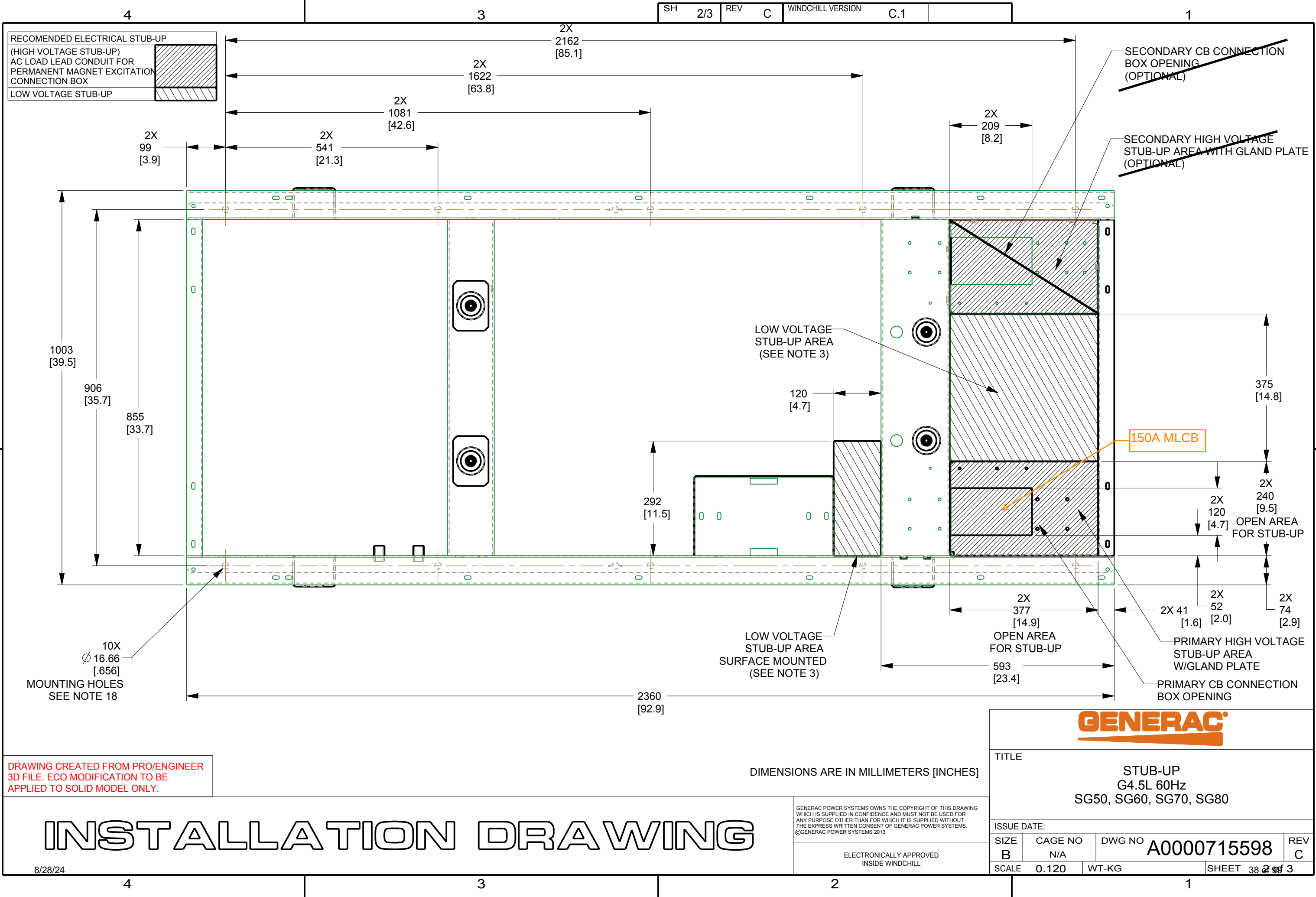
REV
C

SCALE

0.035

WT-KG

SHEET 37 of 3



DRAWING CREATED FROM PRO/ENGINEER 3D FILE. ECO MODIFICATION TO BE APPLIED TO SOLID MODEL ONLY.

DIMENSIONS ARE IN MILLIMETERS [INCHES]

INSTALLATION DRAWING

8/28/24

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ELECTRONICALLY APPROVED
INSIDE WINDCHILL



TITLE				
STUB-UP G4.5L 60Hz SG50, SG60, SG70, SG80				
ISSUE DATE:				
SIZE B	CAGE NO N/A	DWG NO A0000715598	REV C	
SCALE	0.120	WT-KG	SHEET	38 of 3

OPEN SET

MODEL	VOLTAGE	WEIGHT	CENTER OF GRAVITY DIM X	CENTER OF GRAVITY DIM Y	CENTER OF GRAVITY DIM Z
SG050, PG045	1PH	837 kg [1845 lbs.]	1393 [54.8]	462 [18.2]	530 [20.9]
SG060, PG054	1PH	872 kg [1923 lbs.]	1313 [51.7]		
SG070, SG080, PG072	1PH, 80KW UPSIZE	892 kg [1967 lbs.]	1272 [50.1]		
SG060, SG070	1PH, 100KW UPSIZE	935 kg [2061 lbs.]	1187 [46.7]		
SG080, PG072	1PH, 130KW UPSIZE	994 kg [2192 lbs.]	1079 [42.5]		
SG050, PG045	3PH	842 kg [1856 lbs.]	1379 [54.3]		
SG060, PG054	3PH	864 kg [1905 lbs.]	1329 [52.3]		
SG070, SG080, PG072	3PH, 80KW UPSIZE	897 kg [1978 lbs.]	1260 [49.6]		
SG060, SG070	3PH, 100KW UPSIZE	950 kg [2094 lbs.]	1157 [45.6]		
SG080, PG072	3PH, 130KW UPSIZE	1021 kg [2250 lbs.]	1033 [40.7]		

STD ENCLOSURE, ALUMINUM

WEIGHT	CENTER OF GRAVITY DIM X	CENTER OF GRAVITY DIM Y	CENTER OF GRAVITY DIM Z
1013 kg [2232 lbs.]	1395 [54.9]	462 [18.2]	534 [21.0]
1048 kg [2310 lbs.]	1330 [52.4]		
1068 kg [2353 lbs.]	1296 [51.0]		
1111 kg [2449 lbs.]	1226 [48.3]		
1170 kg [2580 lbs.]	1038 [44.8]		
1018 kg [2244 lbs.]	1383 [54.5]		
1040 kg [2293 lbs.]	1343 [52.9]		
1073 kg [2365 lbs.]	1286 [50.6]		
1126 kg [2483 lbs.]	1201 [47.3]		
1196 kg [2638 lbs.]	1098 [43.2]		

STD ENCLOSURE, STEEL

MODEL	VOLTAGE	WEIGHT	CENTER OF GRAVITY DIM X	CENTER OF GRAVITY DIM Y	CENTER OF GRAVITY DIM Z
SG050, PG045	1PH	1172 kg [2584 lbs.]	1382 [54.4]	462 [18.2]	535 [21.1]
SG060, PG054	1PH	1207 kg [2662 lbs.]	1327 [52.2]		
SG070, SG080, PG072	1PH, 80KW UPSIZE	1227 kg [2705 lbs.]	1299 [51.1]		
SG060, SG070	1PH, 100KW UPSIZE	1270 kg [2801 lbs.]	1240 [48.8]		
SG080, PG072	1PH, 130KW UPSIZE	1330 kg [2932 lbs.]	1166 [45.9]		
SG050, PG045	3PH	1177 kg [2596 lbs.]	1372 [54.0]		
SG060, PG054	3PH	1200 kg [2645 lbs.]	1337 [52.7]		
SG070, SG080, PG072	3PH, 80KW UPSIZE	1232 kg [2717 lbs.]	1290 [50.8]		
SG060, SG070	3PH, 100KW UPSIZE	1286 kg [2834 lbs.]	1219 [48.0]		
SG080, PG072	3PH 130KW UPSIZE	1356 kg [2989 lbs.]	1132 [44.6]		

L1A ENCLOSURE, ALUMINUM

WEIGHT	CENTER OF GRAVITY DIM X	CENTER OF GRAVITY DIM Y	CENTER OF GRAVITY DIM Z
1054 kg [2323 lbs.]	1391 [54.8]	462 [18.2]	534 [21.0]
1089 kg [2401 lbs.]	1329 [52.3]		
1109 kg [2444 lbs.]	1297 [51.1]		
1152 kg [2540 lbs.]	1230 [48.4]		
1211 kg [2671 lbs.]	1146 [45.1]		
1059 kg [2335 lbs.]	1380 [54.3]		
1081 kg [2384 lbs.]	1341 [52.8]		
1114 kg [2456 lbs.]	1287 [50.7]		
1167 kg [2573 lbs.]	1206 [47.5]		
1238 kg [2729 lbs.]	1108 [43.6]		

L1A ENCLOSURE, STEEL

MODEL	VOLTAGE	WEIGHT	CENTER OF GRAVITY DIM X	CENTER OF GRAVITY DIM Y	CENTER OF GRAVITY DIM Z
SG050, PG045	1PH	1213 kg [2675 lbs.]	1379 [54.3]	462 [18.2]	536 [21.1]
SG060, PG054	1PH	1249 kg [2753 lbs.]	1327 [52.2]		
SG070, SG080, PG072	1PH, 80KW UPSIZE	1268 kg [2796 lbs.]	1299 [51.1]		
SG060, SG070	1PH, 100KW UPSIZE	1312 kg [2891 lbs.]	1243 [48.9]		
SG080, PG072	1PH, 130KW UPSIZE	1371 kg [3022 lbs.]	1172 [46.1]		
SG050, PG045	3PH	1219 kg [2687 lbs.]	1369 [53.9]		
SG060, PG054	3PH	1241 kg [2735 lbs.]	1336 [52.6]		
SG070, SG080, PG072	3PH, 80KW UPSIZE	1274 kg [2808 lbs.]	1291 [50.8]		
SG060, SG070	3PH, 100KW UPSIZE	1327 kg [2925 lbs.]	1223 [48.1]		
SG080, PG072	3PH, 130KW UPSIZE	1397 kg [3080 lbs.]	1139 [44.8]		

L2A ENCLOSURE, ALUMINUM

WEIGHT	CENTER OF GRAVITY DIM X	CENTER OF GRAVITY DIM Y	CENTER OF GRAVITY DIM Z
1079 kg [2380 lbs.]	1389 [54.7]	462 [18.2]	537 [21.1]
1115 kg [2458 lbs.]	1329 [52.3]		
1135 kg [2502 lbs.]	1297 [51.1]		
1178 kg [2596 lbs.]	1232 [48.5]		
1237 kg [2727 lbs.]	1150 [45.3]		
1085 kg [2391 lbs.]	1378 [54.3]		
1107 kg [2440 lbs.]	1340 [52.8]		
1140 kg [2513 lbs.]	1288 [50.7]		
1193 kg [2630 lbs.]	1209 [47.6]		
1263 kg [2785 lbs.]	1113 [43.8]		

L2A ENCLOSURE, STEEL

MODEL	VOLTAGE	WEIGHT	CENTER OF GRAVITY DIM X	CENTER OF GRAVITY DIM Y	CENTER OF GRAVITY DIM Z
SG050, PG045	1PH	1249 kg [2753 lbs.]	1377 [54.2]	462 [18.2]	540 [21.2]
SG060, PG054	1PH	1284 kg [2831 lbs.]	1326 [52.2]		
SG070, SG080, PG072	1PH, 80KW UPSIZE	1304 kg [2874 lbs.]	1300 [51.2]		
SG060, SG070	1PH, 100KW UPSIZE	1347 kg [2969 lbs.]	1245 [49.0]		
SG080, PG072	1PH, 130KW UPSIZE	1406 kg [3100 lbs.]	1177 [46.3]		
SG050, PG045	3PH	1254 kg [2765 lbs.]	1367 [53.8]		
SG060, PG054	3PH	1276 kg [2814 lbs.]	1336 [52.6]		
SG070, SG080, PG072	3PH, 80KW UPSIZE	1309 kg [2886 lbs.]	1291 [50.8]		
SG060, SG070	3PH, 100KW UPSIZE	1362 kg [3003 lbs.]	1226 [48.3]		
SG080, PG072	3PH, 130KW UPSIZE	1433 kg [3158 lbs.]	1145 [45.1]		

DRAWING CREATED FROM PRO/ENGINEER
3D FILE. ECO MODIFICATION TO BE
APPLIED TO SOLID MODEL ONLY.

DIMENSIONS ARE IN MILLIMETERS [INCHES]



TITLE
WEIGHT AND CENTER OF GRAVITY
G4.5L 60Hz
SG50, SG60, SG70, SG80

ISSUE DATE:

SIZE B	CAGE NO N/A	DWG NO A0000715598	REV C
SCALE	0.035	WT-KG	SHEET 39 of 3

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ELECTRONICALLY APPROVED
INSIDE WINDCHILL

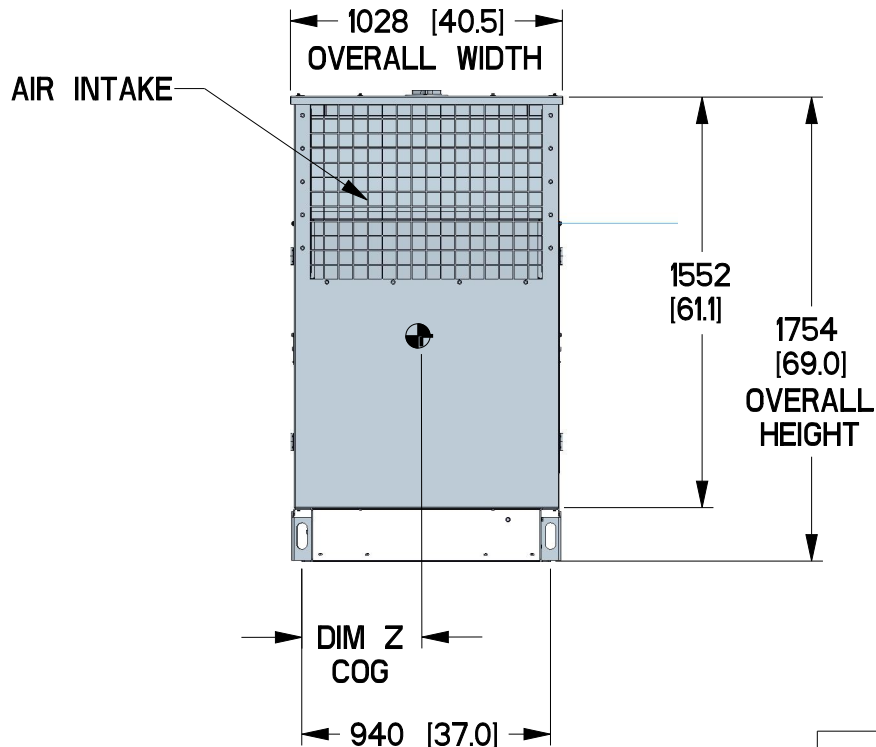
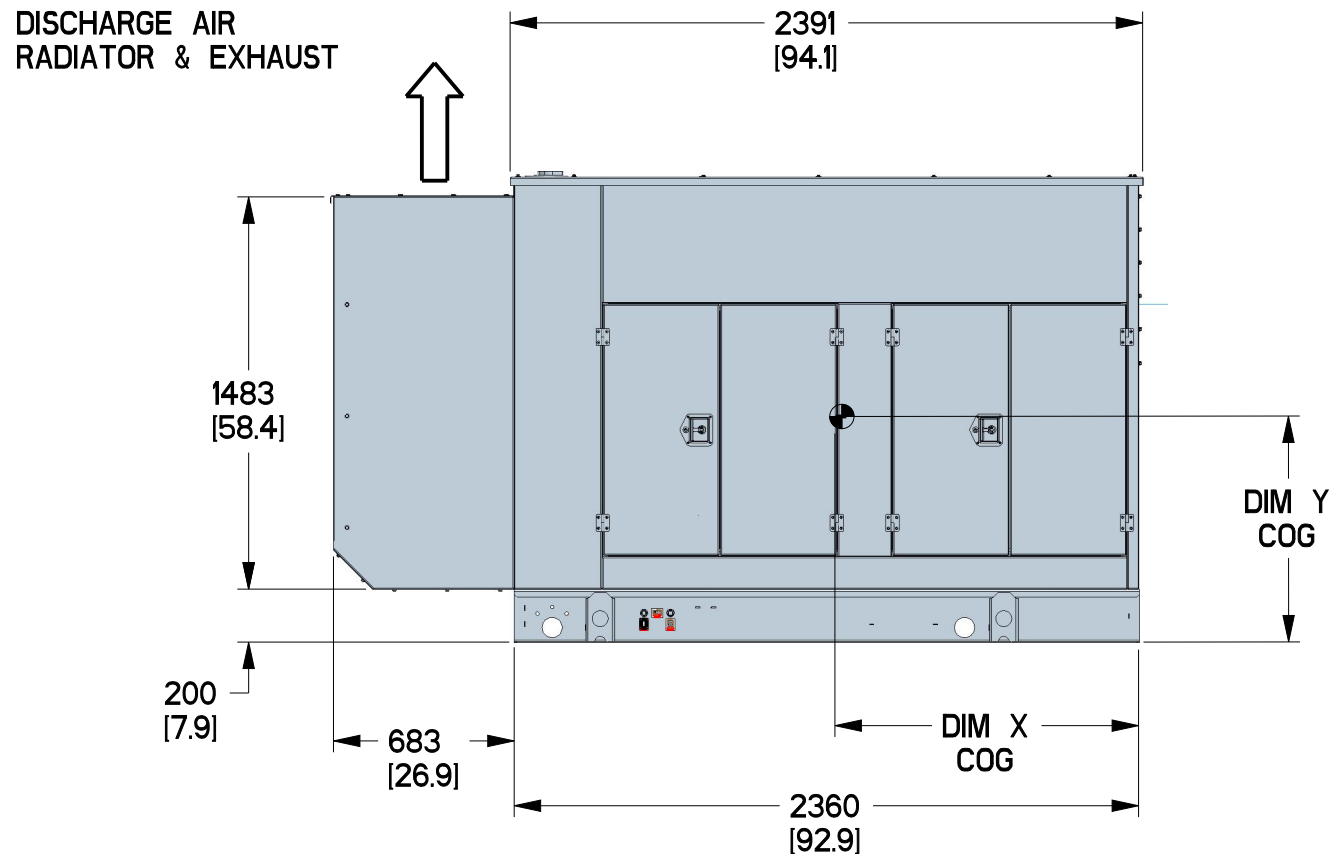
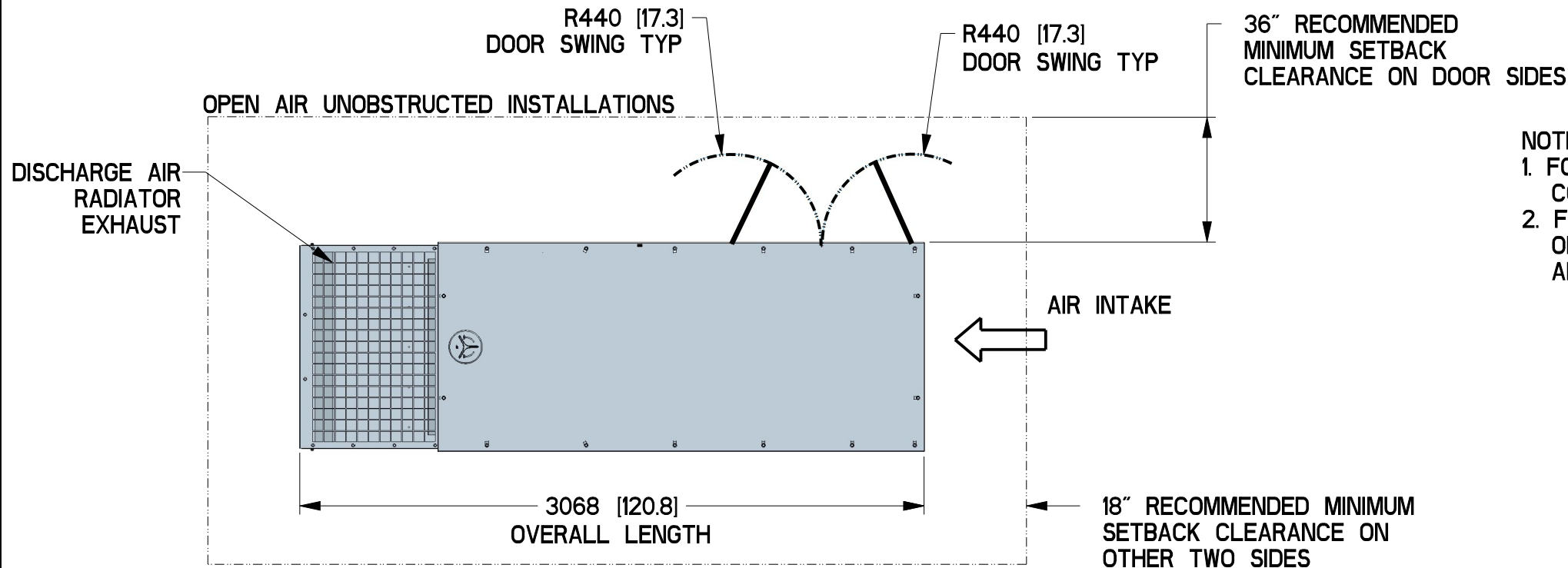
INSTALLATION DRAWING

B

B

A

A



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INSTALLATION DRAWING

8/28/24

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INSIDE WINDCHILL

GENERAC

TITLE
INSTALL B-GRP ENCLOSED
G4.5L 50&60Hz

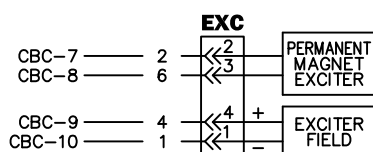
ISSUE DATE:			
SIZE B	CAGE NO N/A	DWG NO A0000747623	REV B
SCALE 0.035	WT-KG	SHEET 40 of 99	

LEGEND

AFPS - AIR FILTER PRESSURE SENSOR
 AH1 - ALARM HORN
 ALT - DC CHARGE ALTERNATOR
 AVR - AUTOMATIC VOLTAGE REGULATOR
 BCC - BATTERY CHARGER CONNECTOR
 BCH - BATTERY CHARGER
 BPC - BATTERY CHARGER POWER CONNECTOR
 BS - POWERZONE BASE STATION
 BS_ - BASE STATION CONNECTOR
 BSG - BASE STATION CHASSIS GROUND
 CAMS - CAMSHAFT POSITION SENSOR
 CB - CIRCUIT BREAKER PME
 CBC - (MLCB) CIRCUIT BREAKER CONNECTOR
 CRKS - CRANKSHAFT POSITION SENSOR
 CT_ - CURRENT TRANSFORMER
 CTC - CURRENT TRANSFORMER CONNECTOR
 CAC - CHARGE AIR COOLER BYPASS
 DB - DIODE BRIDGE
 DGND - CONTROL PANEL DOOR GROUND
 DPR - DRIVER POWER RELAY

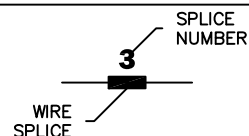
ECM - ENGINE CONTROL MODULE
 EMC - ELECTRONIC MIXER CONTROL VALVE
 ES1 - EMERGENCY STOP SWITCH
 ETC - ELECTRONIC THROTTLE CONTROL VALVE
 EXC - EXCITER
 FB_ - FUSE BLOCK
 FPS - FUEL PRESSURE SENSOR
 FS_ - FUEL SOLENOID
 FSP - FUEL SOLENOID PLUG
 FSR - FUEL SOLENOID RECEPTACLE
 GFCI - GROUND FAULT CURRENT INTERRUPT
 GND - GROUND BAR CONNECTION
 IC_ - IGNITION COIL
 IR - IGNITION RELAY
 LFP - LOW FUEL PRESSURE SWITCH/SENSOR
 MLCB - MAIN LINE CIRCUIT BREAKER
 NEU - NEUTRAL BUS
 OPS - OIL PRESSURE SENDER
 OS - OXYGEN SENSOR
 OTS - OIL TEMPERATURE SENDER

PWR - POWER ZONE POWER CONNECTOR
 PZC - MAIN POWER ZONE CONNECTOR
 PZCS - POWER ZONE CONNECTIVITY SERVER
 R1 - RESISTOR
 RB_ - RELAY BOARD
 RB_A - RELAY BOARD CONNECTOR
 SC - START CONTACTOR
 SM - STARTER MOTOR
 ST - SHUNT TRIP
 SW1 - OFF/AUTO/MANUAL SWITCH
 SWC - OPERATOR SWITCH CONNECTOR
 TB_ - TERMINAL BLOCK
 TMAP - MANIFOLD TEMPERATURE & PRESSURE
 TPS - MIXER POSITION SENSOR
 VSC - VOLTAGE SENSING CONNECTOR
 WLS - COOLANT LEVEL SENDER
 WM - WIFI MODULE
 WM_ - WIFI MODULE CONNECTOR
 WTS - COOLANT TEMPERATURE SENDER

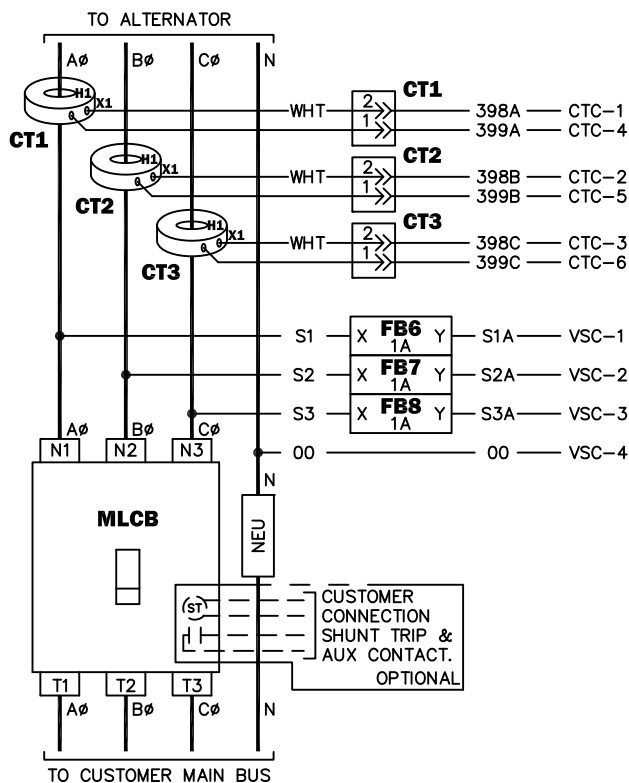
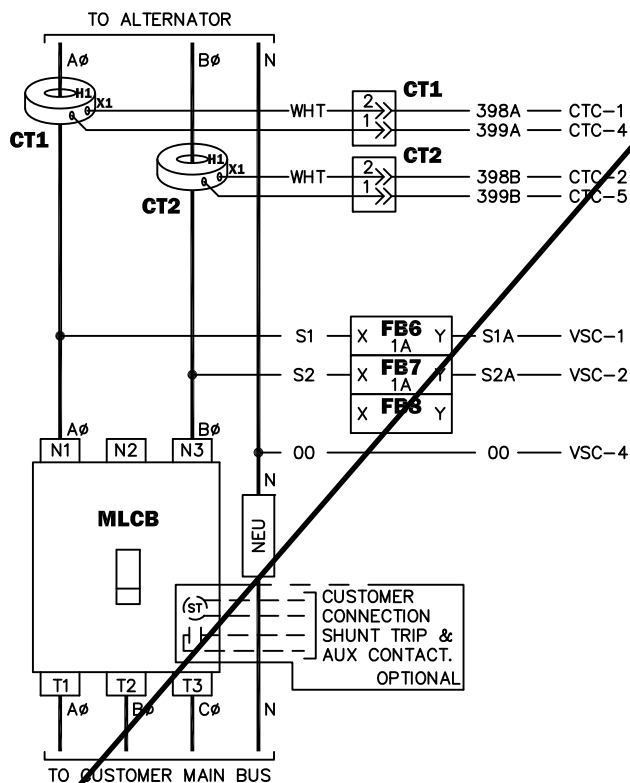
ALTERNATOR EXCITATION

NOTE: ALL WIRES 18 AWG
300V UL LISTED UNLESS
SHOWN OTHERWISE

12 AWG SIZE

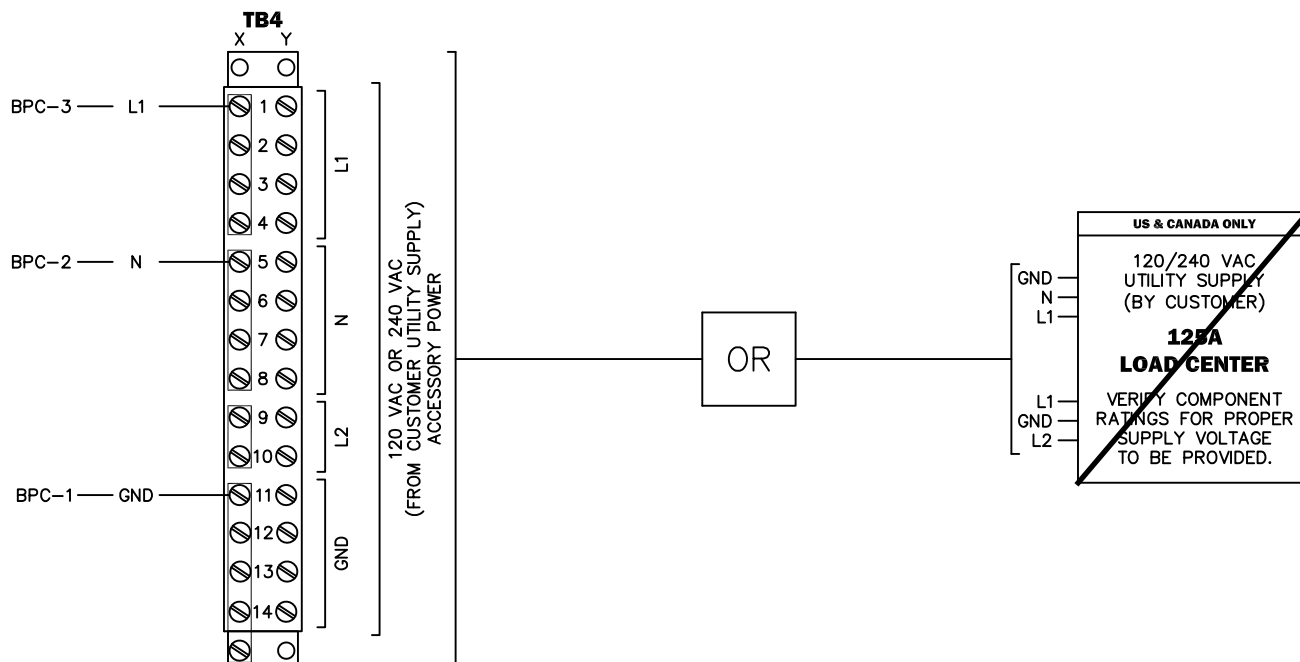
**COMPONENTS LOCATED IN HIGH VOLTAGE CUSTOMER CONNECTION MODULE****CONNECTIONS
FOR 1Ø UNIT**

NOTE: ALL WIRES IN THIS
SECTION ARE 600V RATED

**CONNECTIONS
FOR 3Ø UNIT**

COMPONENTS LOCATED IN HIGH VOLTAGE CUSTOMER CONNECTION MODULE

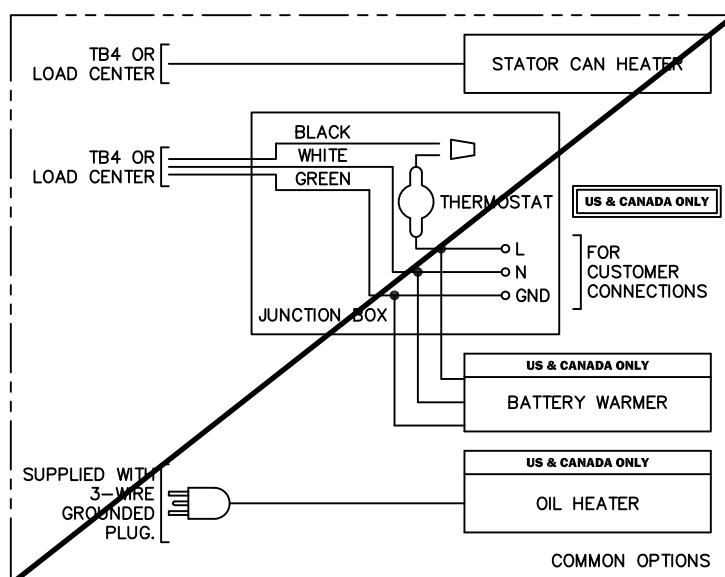
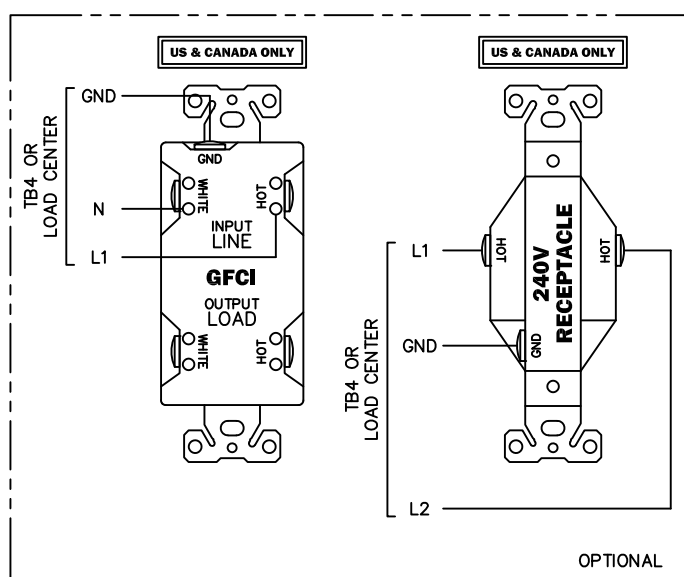
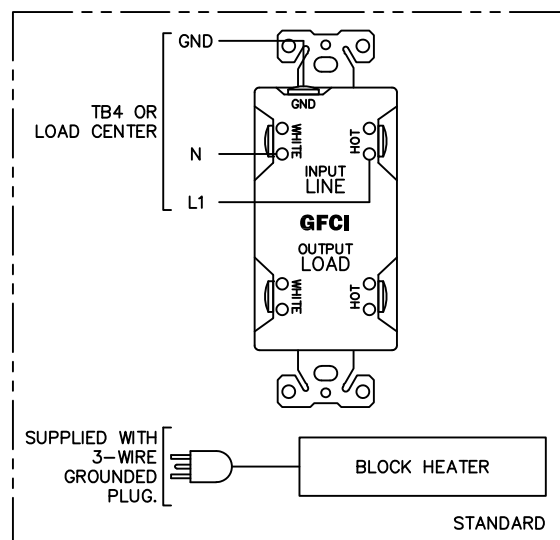
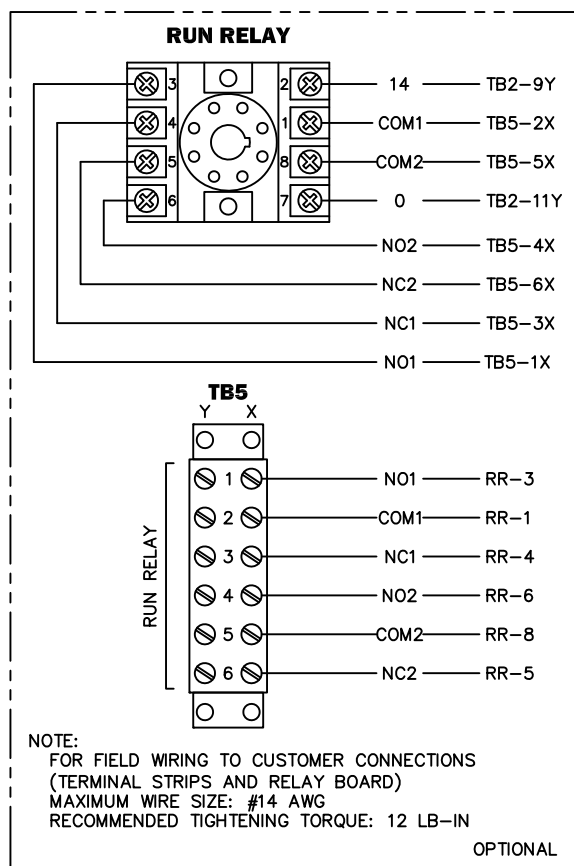
NOTE: ALL WIRES ON THIS
PAGE ARE 600V RATED



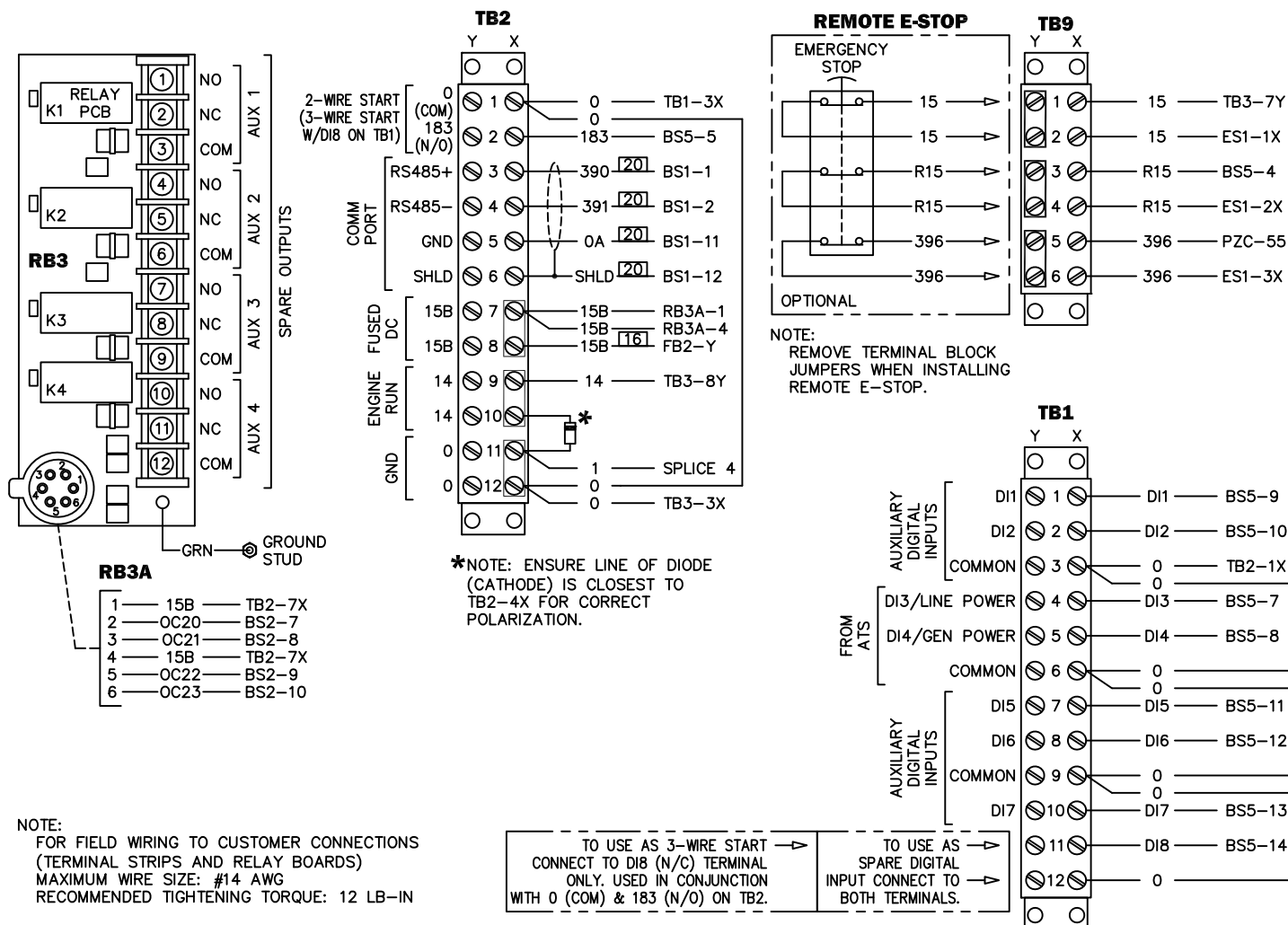
NOTE:
FOR FIELD WIRING TO CUSTOMER CONNECTIONS
(TERMINAL STRIP)
MAXIMUM WIRE SIZE: #10 AWG
RECOMMENDED TIGHTENING TORQUE: 14 LB-IN

COMPONENTS LOCATED IN HIGH VOLTAGE CUSTOMER CONNECTION MODULE

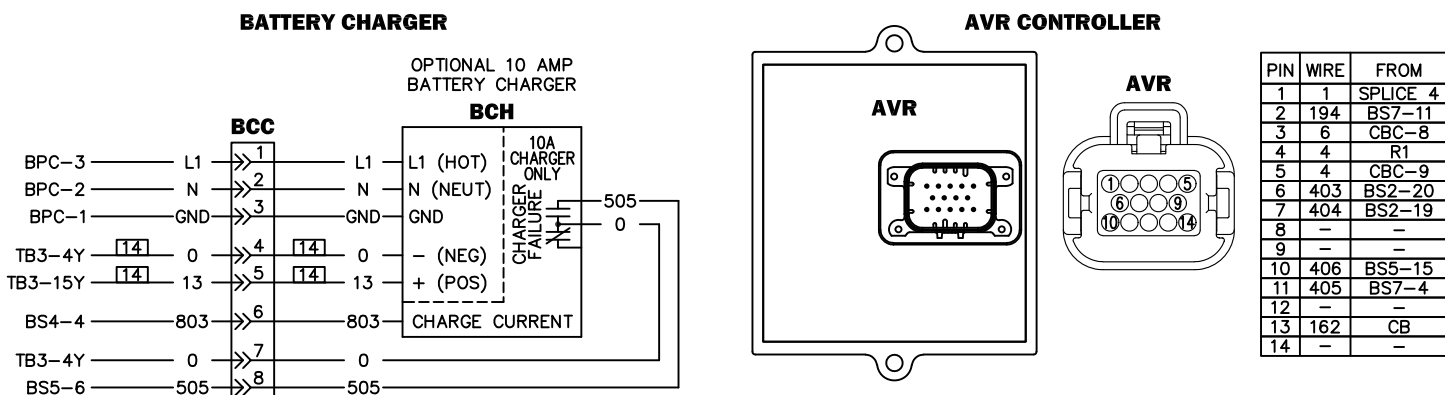
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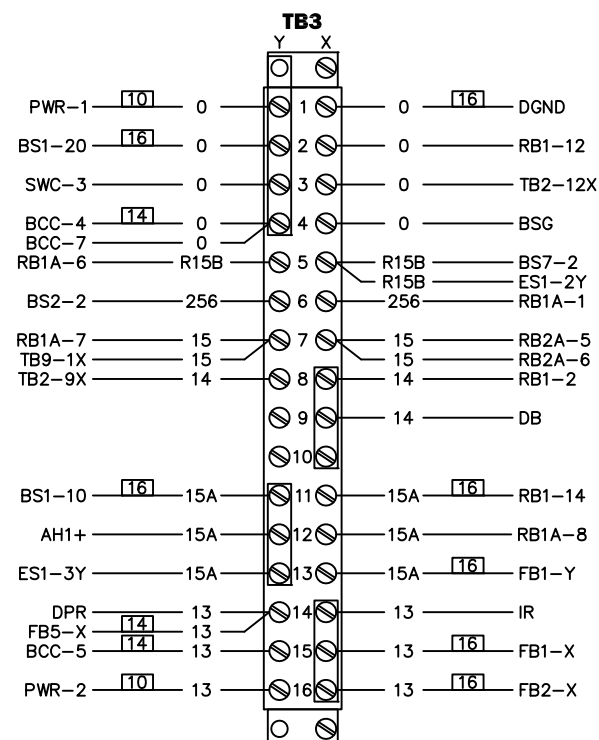
COMPONENTS LOCATED ON LOW VOLTAGE CUSTOMER CONNECTION PANEL



COMPONENTS LOCATED IN CONTROL PANEL



COMPONENTS LOCATED IN CONTROL PANEL



R1

AVR-4

DB

CB

CBC-7

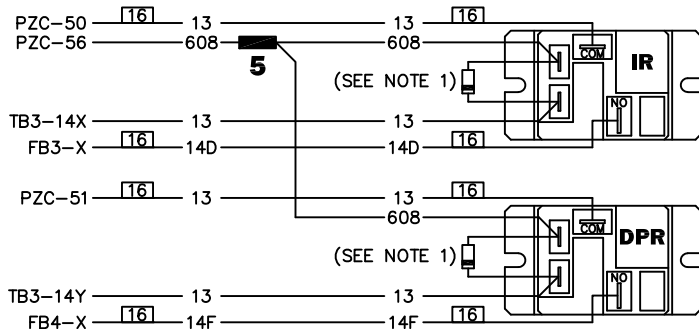
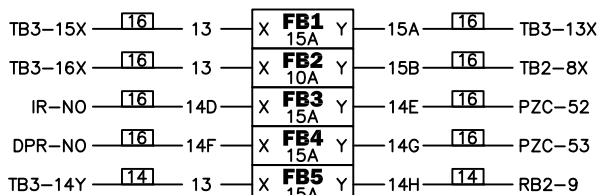
AVR-13

DB

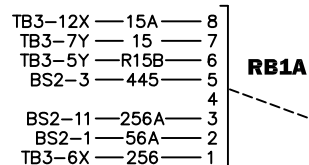
R1

TB3-9X

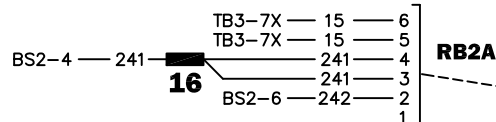
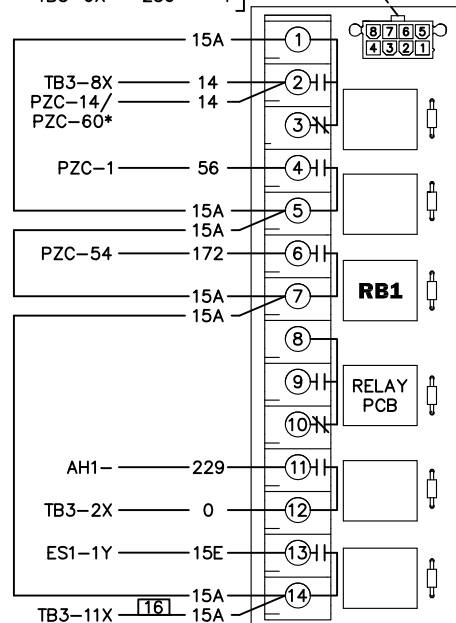
PZC-49



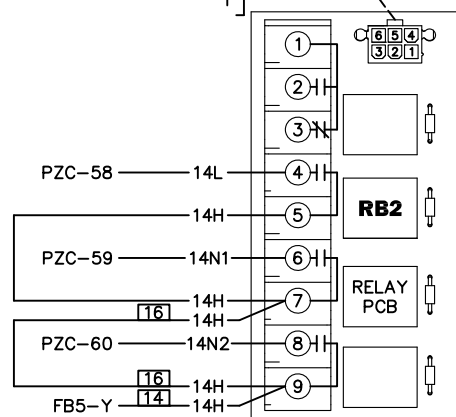
*WIRE #14 WIRED TO PZC-60 FOR FSP 6 POSITION CONNECTOR SCENARIO.



RB1A



RB2A



NOTE:

- 1A, 1000V DIODE. ENSURE LINE OF DIODE (CATHODE) IS CLOSEST TO WIRE #13 FOR CORRECT POLARIZATION.

COMPONENTS LOCATED ON CONTROL PANEL BACK WALL

PIN	WIRE	FROM	TO
1	56	RB1-4	SC
2	-	-	-
3	-	-	-
4	-	-	-
5	-	-	-
6	601	BS5-3	FSP-1
7	573	BS3-12	WLS-A
8	573A	BS3-11	WLS-B
9	-	-	-
10	-	-	-
11	-	-	-
12	-	-	-

PIN	WIRE	FROM	TO
13	-	-	-
14	14	RB1-2	SPLICE 3
15	-	-	-
16	-	-	-
17	-	-	-
18	-	-	-
19	-	-	-
20	-	-	-
21	-	-	-
22	-	-	-
23	-	-	-
24	-	-	-

PIN	WIRE	FROM	TO
25	-	-	-
26	-	-	-
27	-	-	-

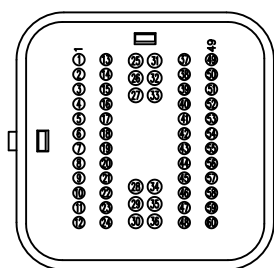
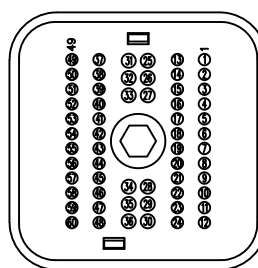
PIN	WIRE	FROM	TO
28	-	-	-
29	-	-	-
30	-	-	-

PIN
NUMBERS

1 13 25 31 37 49
12 24 30 36 48 60

PIN
NUMBERS

49 37 31 25 13 1
60 48 36 30 24 12

CONTROLLER SIDE
CONTROL PANELENGINE SIDE
CONTROL PANEL

PIN	WIRE	FROM	TO
31	-	-	-
32	-	-	-
33	-	-	-

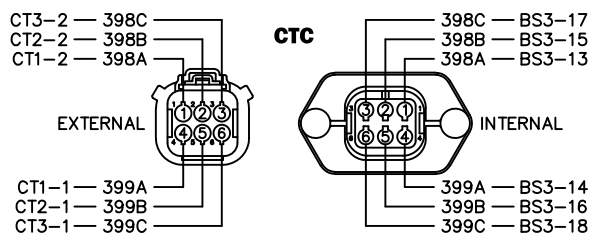
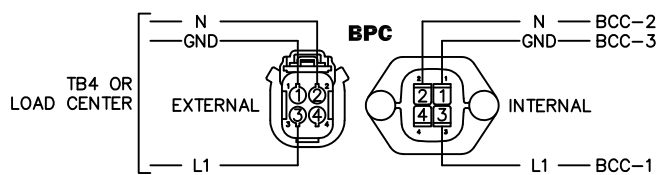
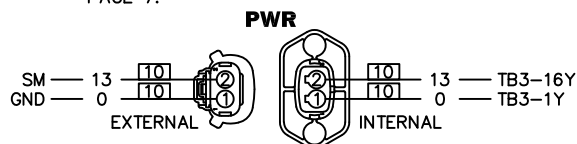
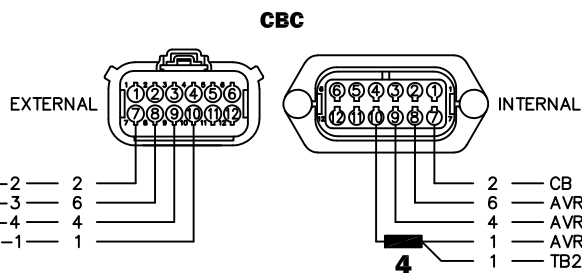
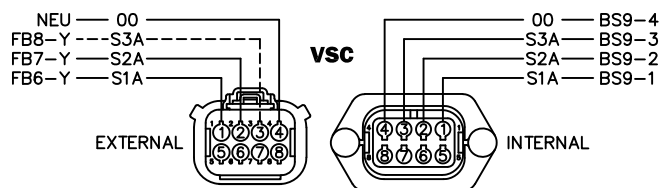
PIN	WIRE	FROM	TO
34	-	-	-
35	-	-	-
36	-	-	-

PIN	WIRE	FROM	TO
37	-	-	-
38	-	-	-
39	-	-	-
40	797S	BS4-1	FSP-2
41	797R	BS4-13	FSP-3
42	797V	BS4-9	FSP-4
43	743A	BS8-3	ECM-2C
44	744A	BS8-4	ECM-2B
45	SHLD	BS8-2	ECM (CUT)
46	-	-	-
47	-	-	-
48	-	-	-

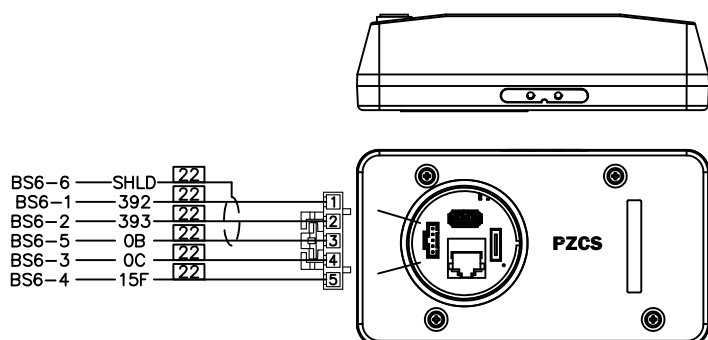
PIN	WIRE	FROM	TO
49	49	DB	ALT
50	13	IR-COM	SPLICE 1
51	13	DPR-COM	SPLICE 1
52	14E	FB3-Y	SPLICE 6
53	14G	FB4-Y	SPLICE 13
54	172	RB1-6	ECM-20
55	396	TB9-5X	ECM-3J
56	608	SPLICE 5	ECM-1H
57	609	BS2-13	ECM-3K
58	14L	RB2-4	FSP-8 *
59	14N1	RB2-6	FSP-9 *
60	14N2	RB2-8	FSP-10 *

*SEE ALTERNATIVE WIRING TO FSP
FOR 6 POSITION CONNECTOR ON
PAGE 7.

NOTE:
THE DASHED S3A WIRE IN
VSC CONNECTOR IS
POPULATED IN 3 PHASE
APPLICATION.

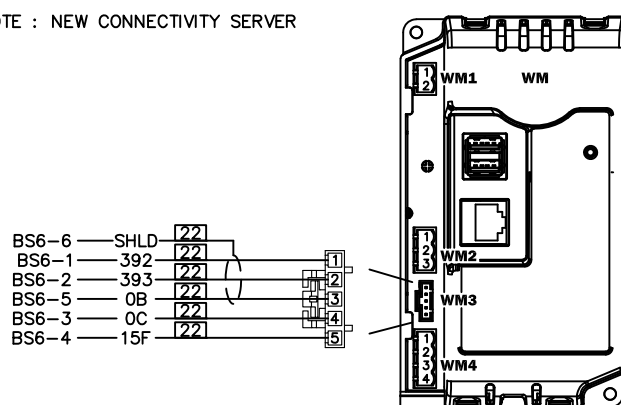


NOTE : OLD CONNECTIVITY SERVER

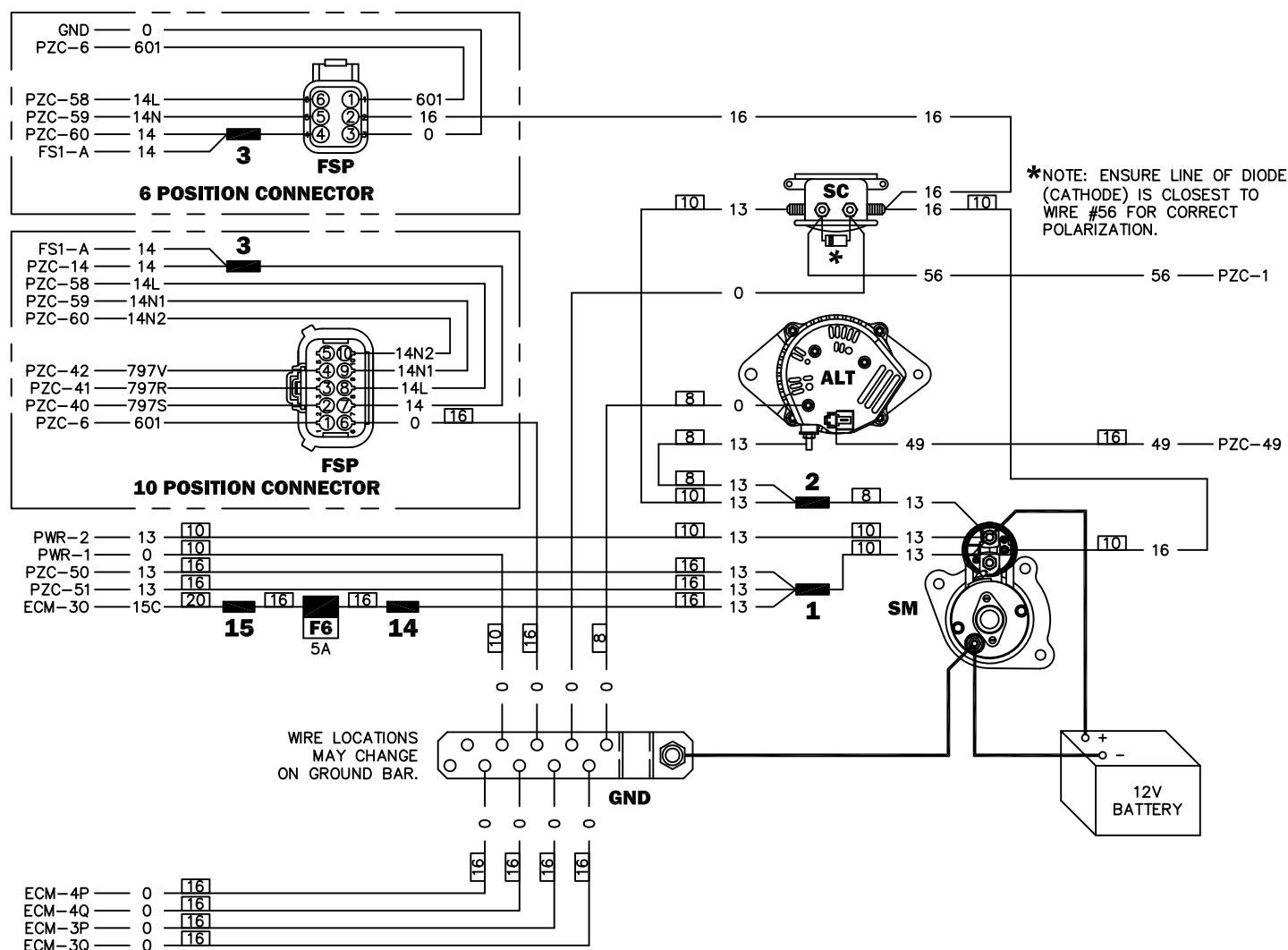


COMPONENTS LOCATED INSIDE THE CONTROL PANEL

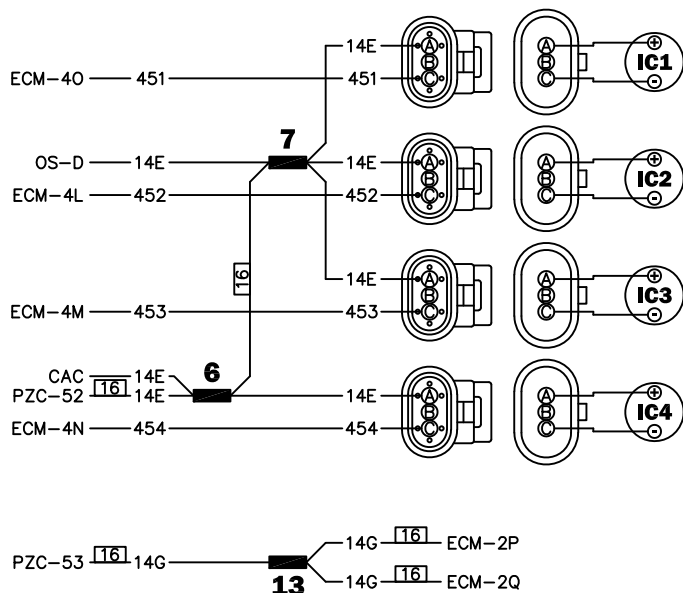
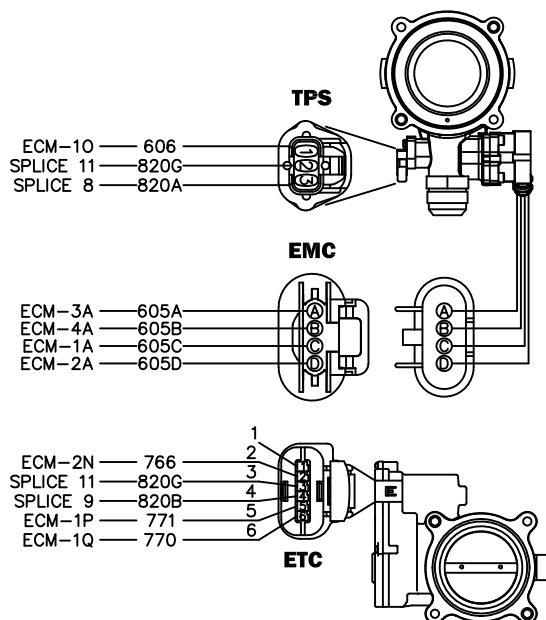
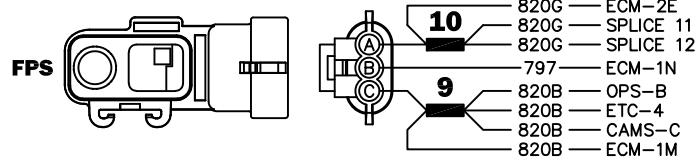
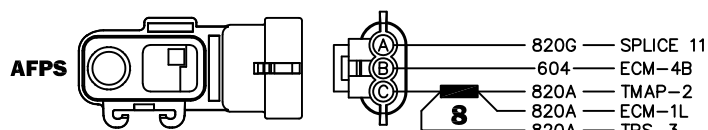
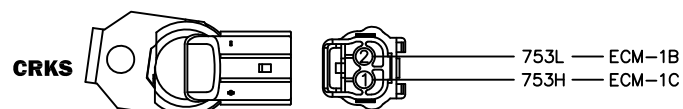
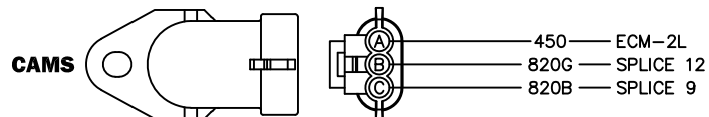
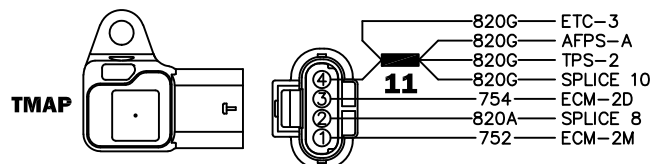
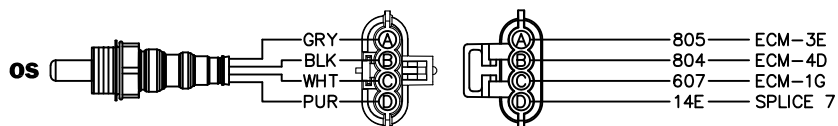
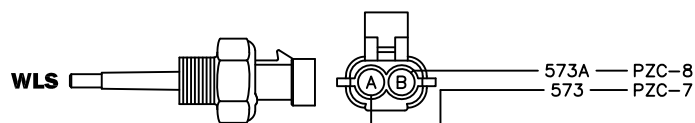
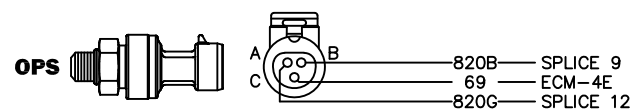
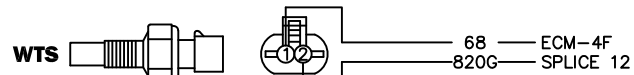
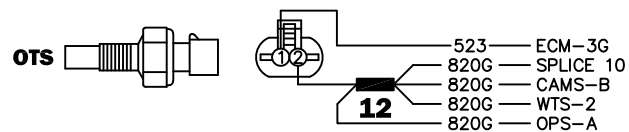
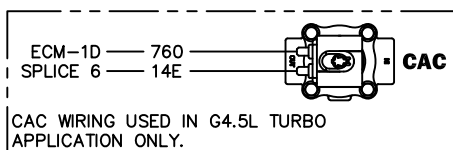
NOTE : NEW CONNECTIVITY SERVER



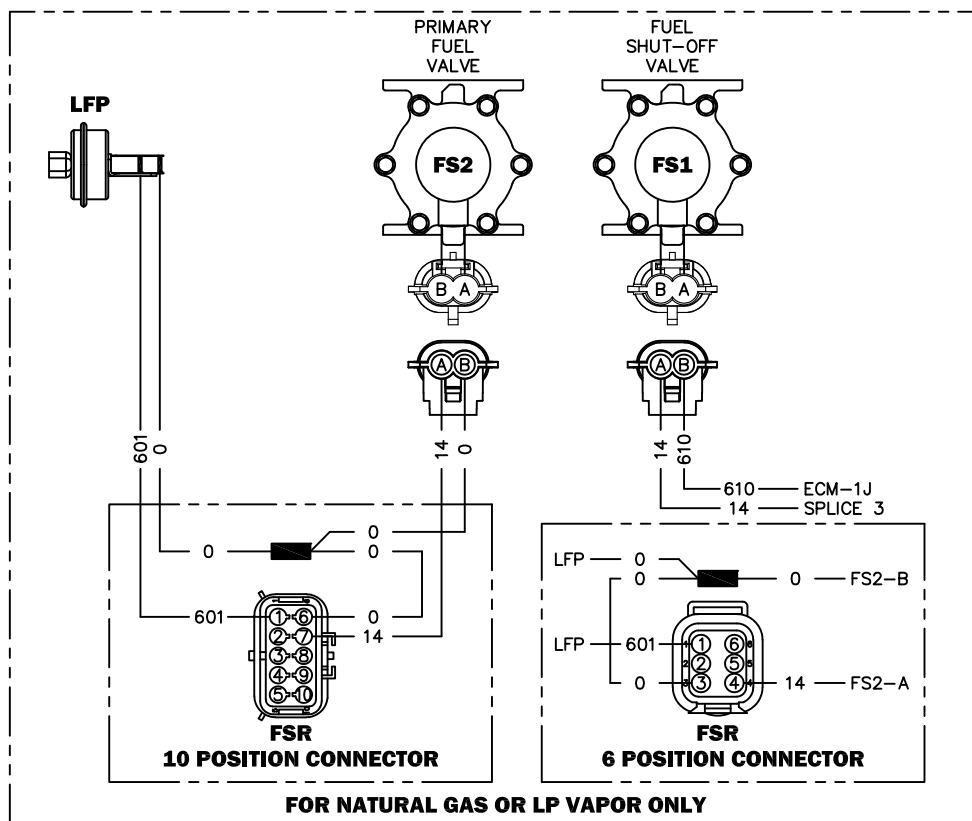
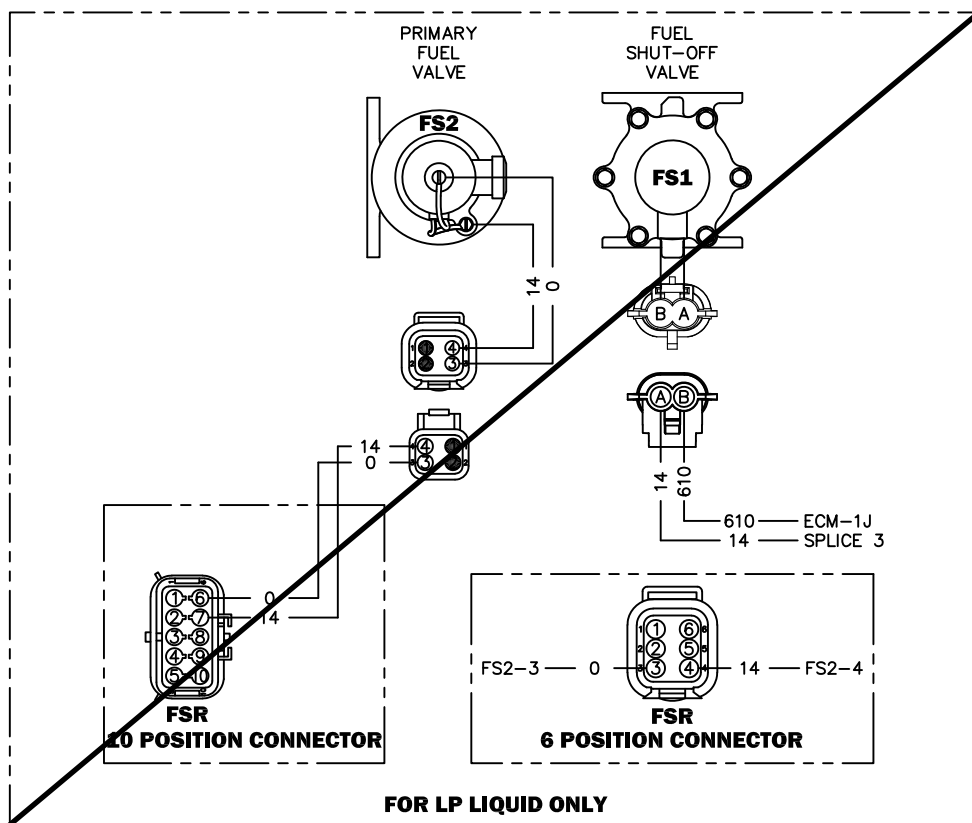
COMPONENTS LOCATED ON ENGINE



COMPONENTS LOCATED ON ENGINE

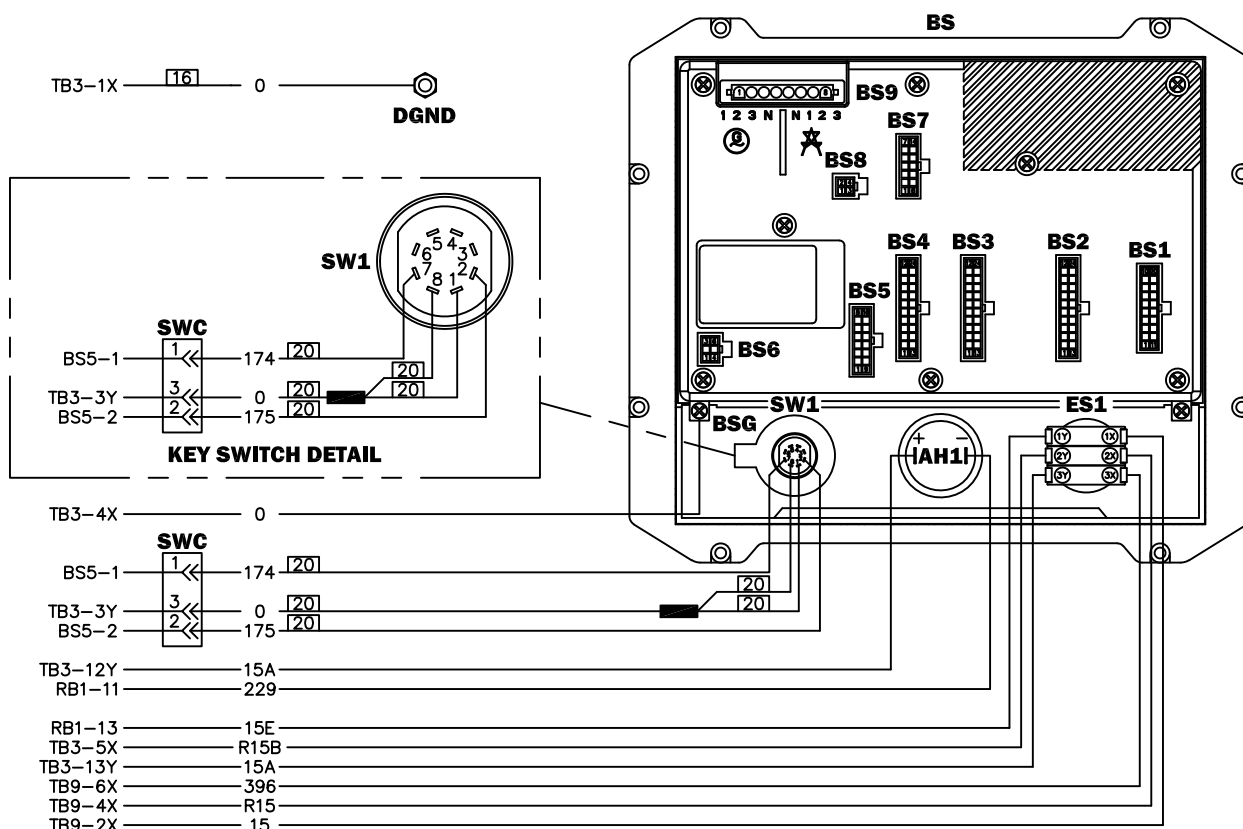


COMPONENTS LOCATED ON ENGINE





COMPONENTS LOCATED IN CONTROL PANEL



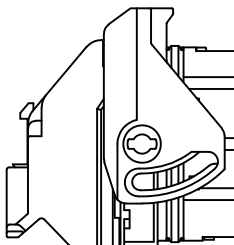
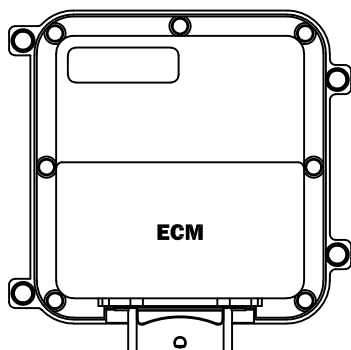
BS1			BS2			BS3		
FROM	WIRE	PIN	FROM	WIRE	PIN	FROM	WIRE	PIN
TB3-11Y	15A	10	TB3-2Y	0	20	PZC-7	573	12
-	-	9	-	-	12	PZC-8	573A	11
-	-	8	RB1A-3	256A	11	-	-	10
-	-	7	RB3A-6	0C23	10	-	-	9
-	-	6	RB3A-5	0C22	9	-	-	8
-	-	5	RB3A-3	0C21	8	-	-	7
-	-	4	RB3A-2	0C20	7	-	-	6
-	-	3	RB2A-2	242	6	-	-	5
TB2-4X	391	2	-	-	5	-	-	4
TB2-3X	390	1	SPLICE 16	241	4	-	-	3
			RB1A-5	445	3	-	-	2
			TB3-6Y	256	2	-	-	1
			RB1A-2	56A	1	-	-	

BS4			BS5			BS6		
FROM	WIRE	PIN	FROM	WIRE	PIN	FROM	WIRE	PIN
-	-	12	TB1-5X	DI4	8	PZCS-4/MM3-4	0C	3
-	-	11	TB1-4X	DI3	7	PZCS-2/MM3-2	393	2
-	-	10	BCC-8	505	6	PZCS-1/MM3-1	392	1
PZC-42	797H	9	TB2-2X	183	5			
-	-	8	TB9-3X	R15	4			
-	-	7	PZC-6	601	3			
-	-	6	SWC-2	175	2			
-	-	5	SWC-1	174	1			
BCC-6	803	4						
-	-	3						
-	-	2						
PZC-40	797S	1						

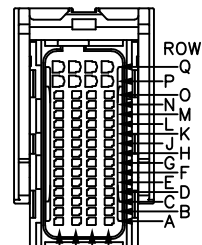
BS7			BS8			BS9		
FROM	WIRE	PIN	FROM	WIRE	PIN	PIN	WIRE	FROM
-	-	7	PZC-45	SHLD	2	1	S1A	VSC-1
-	-	6	-	-	1	2	S2A	VSC-2
-	-	5				3	S3A	VSC-3
AVR-11	405	4				4	00	VSC-4
-	-	3				5	-	-
TB3-5X	R15B	2				6	-	-
-	-	1				7	-	-
						8	-	-

BS9		
PIN	WIRE	FROM
1	S1A	VSC-1
2	S2A	VSC-2
3	S3A	VSC-3
4	00	VSC-4
5	-	-
6	-	-
7	-	-
8	-	-

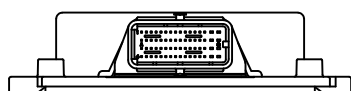
**COMPONENTS LOCATED ON ENGINE
ELECTRONIC CONTROL MODULE**



SIDE VIEW OF
CONNECTOR W/COVER



TOP VIEW
OF CONNECTOR
W/O COVER

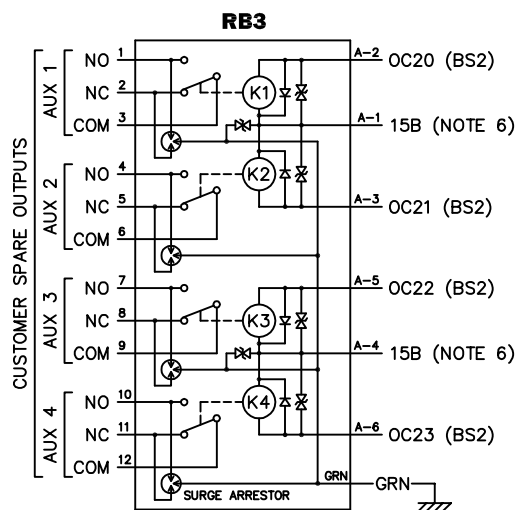


PIN	WIRE	TO
1A	605C	EMC-C
1B	753L	CRKS-2
1C	753H	CRKS-1
1D	760	CAC
1E	-	-
1F	-	-
1G	607	OS-C
1H	608	PZC-56
1J	610	FS1-B
1K	-	-
1L	820A	SPLICE 8
1M	820B	SPLICE 9
1N	797	FPS-B
1O	606	TPS-1
1P	771	ETC-5
1Q	770	ETC-6

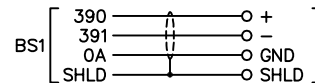
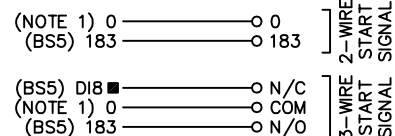
PIN	WIRE	TO
2A	605D	EMC-D
2B	744A	PZC-44
2C	743A	PZC-43
2D	754	TMAP-3
2E	820G	SPLICE 10
2F	-	-
2G	-	-
2H	-	-
2J	-	-
2K	-	-
2L	450	CAMS-A
2M	752	TMAP-1
2N	766	ETC-2
2O	172	PZC-54
2P	14G	SPLICE 13
2Q	14G	SPLICE 13

PIN	WIRE	TO
3A	605A	EMC-A
3B	-	-
3C	-	-
3D	-	-
3E	805	OS-A
3F	-	-
3G	523	OTS-1
3H	-	-
3J	396	PZC-55
3K	609	PZC-57
3L	-	-
3M	-	-
3N	-	-
3O	15C	SPLICE 15
3P	0	GND
3Q	0	GND

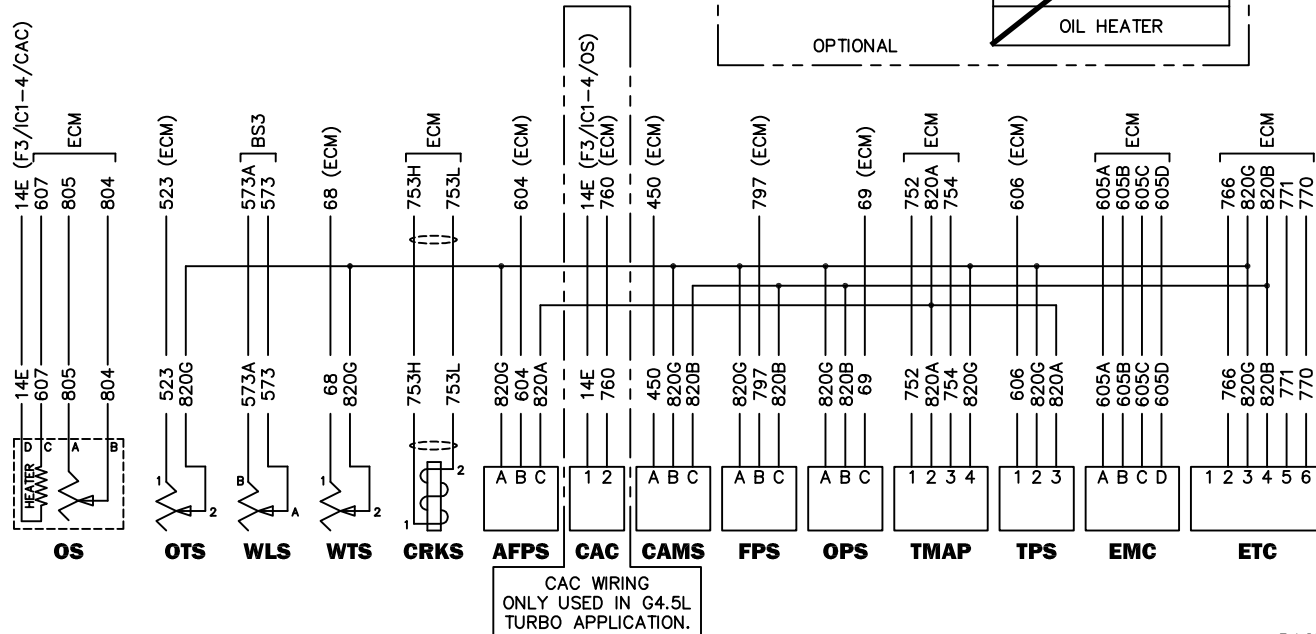
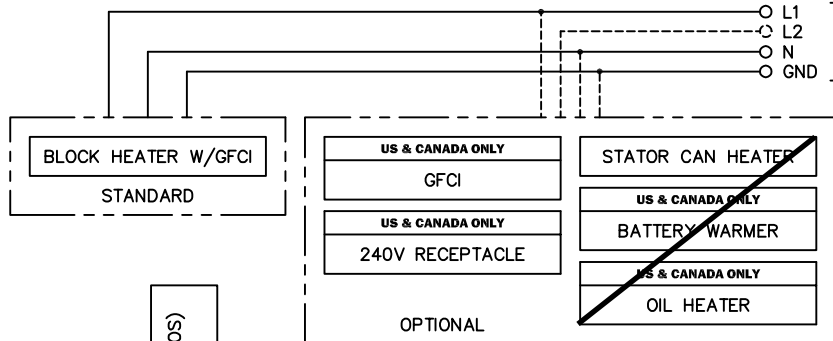
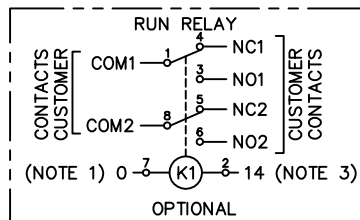
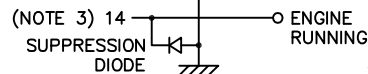
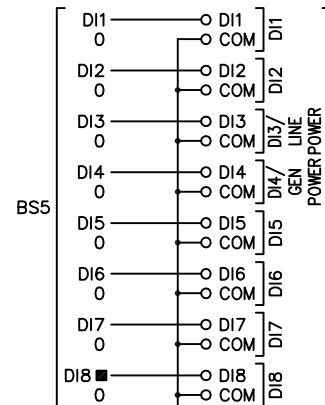
PIN	WIRE	TO
4A	605B	EMC-B
4B	604	AFPS-B
4C	-	-
4D	804	OS-B
4E	69	OPS-C
4F	68	WTS-1
4G	-	-
4H	-	-
4J	-	-
4K	-	-
4L	452	IC2-C
4M	453	IC3-C
4N	454	IC4-C
4O	451	IC1-C
4P	0	GND
4Q	0	GND

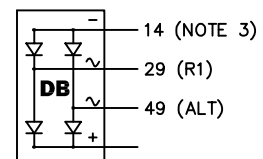
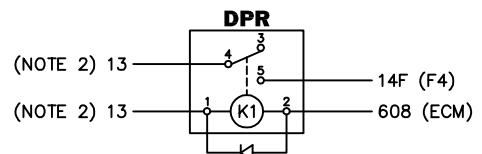
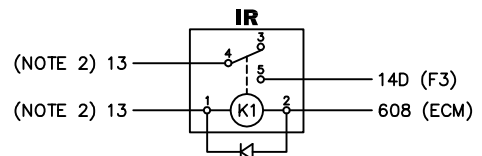
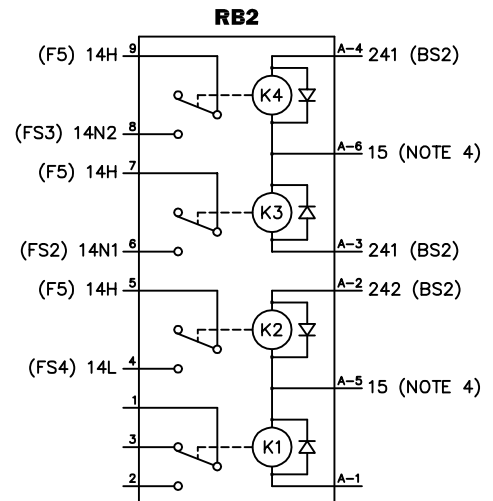
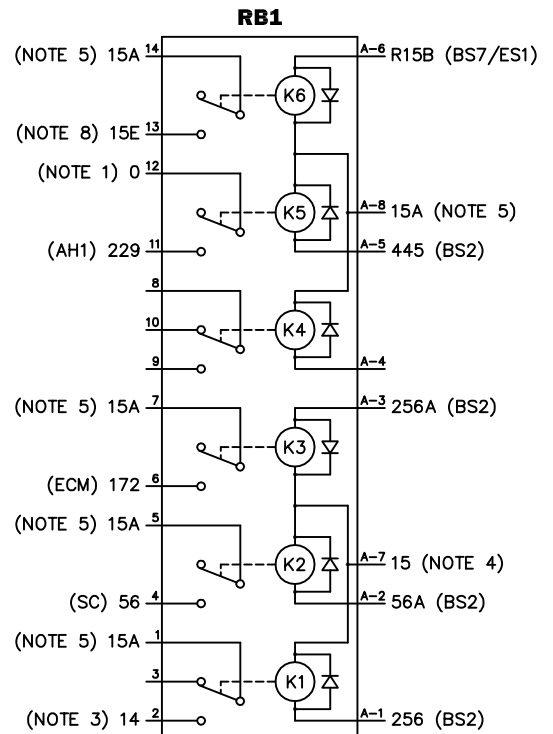
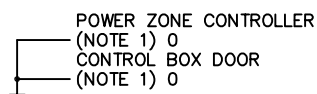
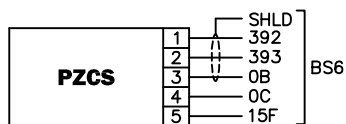
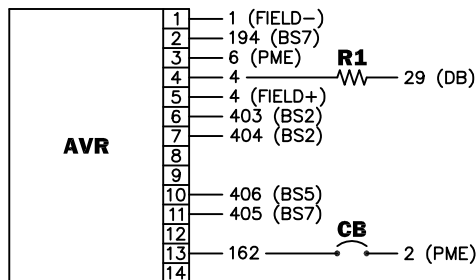
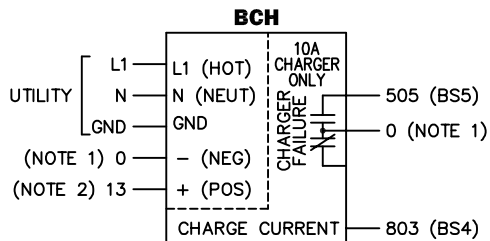
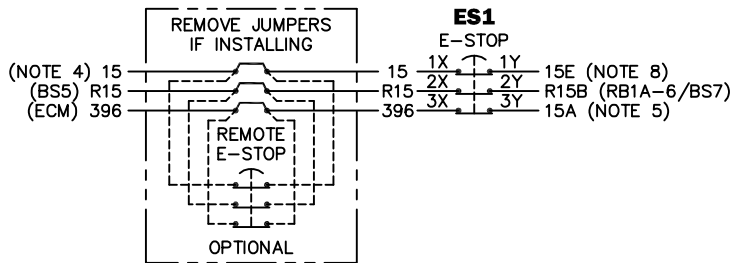
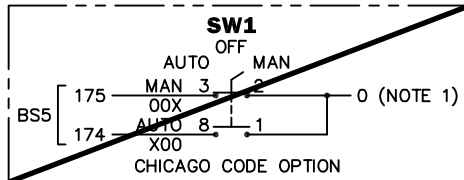
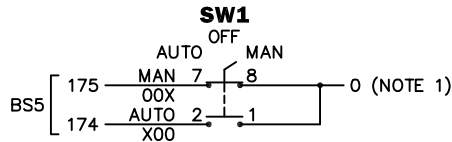
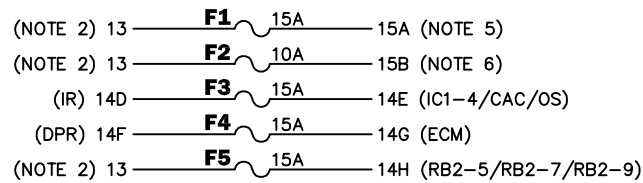


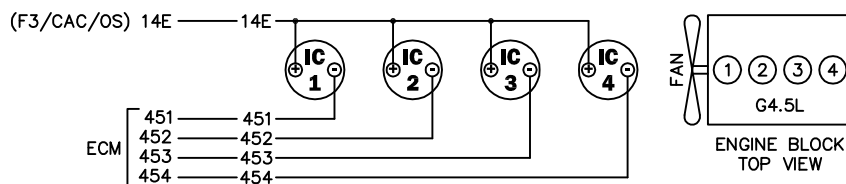
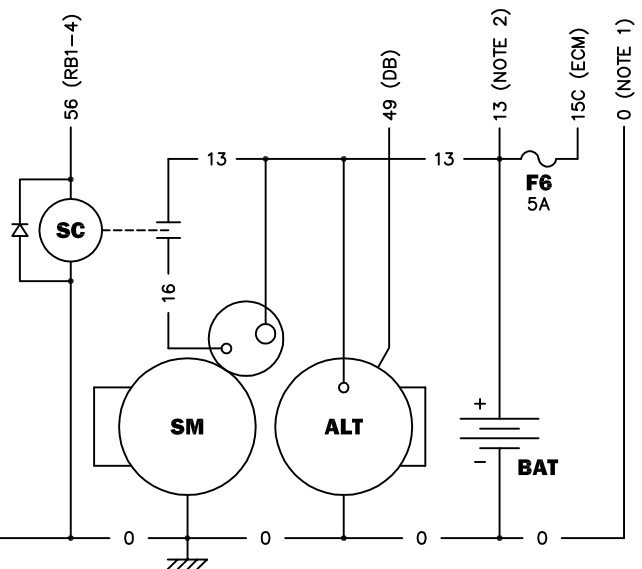
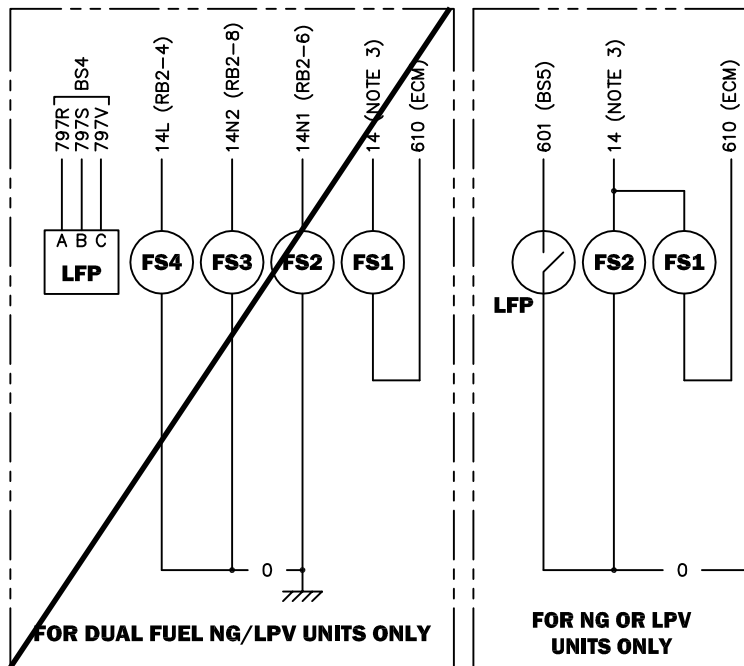
■ NOTE:
DI8 CAN BE USED WITH 3-WIRE START
OR AS A SPARE DIGITAL INPUT.

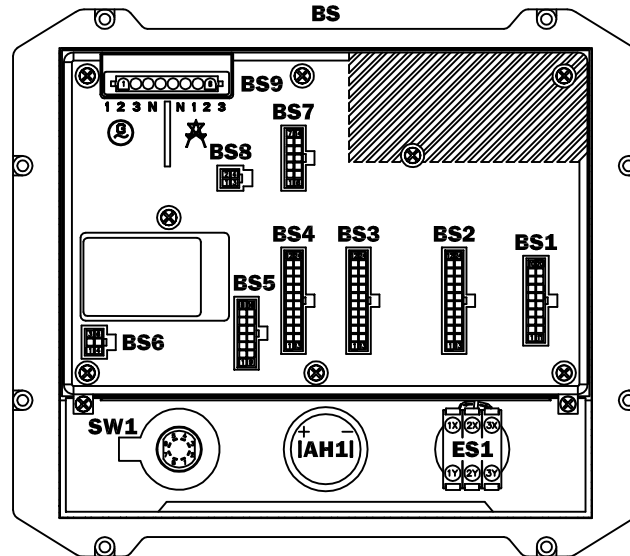


(NOTE 6) 15B — +12 VDC







**BS1**

PIN	WIRE	TO	FUNCTION
1	390	CUST CONN	RS485+ (TRANSFER SWITCH)
2	391	CUST CONN	RS485- (TRANSFER SWITCH)
10	15A	F1	NOTE 5
11	0A	CUST CONN	RS485 GND (TRANSFER SWITCH)
12	SHLD	CUST CONN	RS485 DRAIN (TRANSFER SWITCH)
20	0	GND	NOTE 1

BS2

PIN	WIRE	TO	FUNCTION
1	56A	RB1A-2	START RELAY
2	256	RB1A-1	FUEL RELAY
3	445	RB1A-5	ALARM RELAY
4	241	RB2A-3/RB2A-4	NG SOLENOID RELAY (DUAL FUEL ONLY)
6	242	RB2A-2	LPV/LPL SOLENOID RELAY (DUAL FUEL ONLY)
7	0C20	RB3A-2	SPARE RELAY 1
8	0C21	RB3A-3	SPARE RELAY 2
9	0C22	RB3A-5	SPARE RELAY 3
10	0C23	RB3A-6	SPARE RELAY 4
11	256A	RB1A-3	ECM RUN RELAY
13	609	ECM-3K	FUEL SELECT
19	404	AVR-7	AVR GATE TRIGGER A
20	403	AVR-6	AVR GATE TRIGGER B

BS3

PIN	WIRE	TO	FUNCTION
11	573A	WLS-B	COOLANT LEVEL (-)
12	573	WLS-A	COOLANT LEVEL (+)
13	398A	CT1-2	GEN PHASE A CURRENT (+)
14	399A	CT1-1	GEN PHASE A CURRENT (-)
15	398B	CT2-2	GEN PHASE B CURRENT (+)
16	399B	CT2-1	GEN PHASE B CURRENT (-)
17	398C	CT3-2	GEN PHASE C CURRENT (+)
18	399C	CT3-1	GEN PHASE C CURRENT (-)

BS4

PIN	WIRE	TO	FUNCTION
1	797S	LFP-B	FUEL PRESSURE SENSOR SIGNAL
4	803	BCH	BATTERY CHARGER CURRENT
9	797V	LFP-C	FUEL PRESSURE SENSOR 5V SUPPLY
13	797R	LFP-A	FUEL PRESSURE SENSOR GROUND

BS5

PIN	WIRE	TO	FUNCTION
1	174	SW1	AUTO START
2	175	SW1	MANUAL START
3	601	LFP	LOW FUEL PRESSURE SWITCH
4	R15	ES1-2X	EMERGENCY STOP
5	183	CUST CONN	REMOTE START
6	505	BCH	BATTERY CHARGER FAIL
7	D13	CUST CONN	AUXILIARY DI3/LINE POWER
8	D14	CUST CONN	AUXILIARY DI4/GENERATOR POWER
9	D11	CUST CONN	AUXILIARY DIGITAL INPUT 1
10	D12	CUST CONN	AUXILIARY DIGITAL INPUT 2
11	D15	CUST CONN	AUXILIARY DIGITAL INPUT 5
12	D16	CUST CONN	AUXILIARY DIGITAL INPUT 6
13	D17	CUST CONN	AUXILIARY DIGITAL INPUT 7
14	D18	CUST CONN	AUXILIARY DIGITAL INPUT 8
15	406	AVR-10	AVR ZERO CROSSING INPUT

BS6

PIN	WIRE	TO	FUNCTION
1	392	PZCS-1	RS485+ (POWER ZONE CONNECTIVITY SERVER)
2	393	PZCS-2	RS485- (POWER ZONE CONNECTIVITY SERVER)
3	0C	PZCS-4	POWER ZONE CONNECTIVITY SERVER GROUND
4	15F	PZCS-5	POWER ZONE CONNECTIVITY SERVER +12VDC
5	0B	PZCS-3	RS485 GND (POWER ZONE CONNECTIVITY SERVER)
6	SHLD	PZCS (CUT)	RS485 DRAIN (POWER ZONE CONNECTIVITY SERVER)

BS7

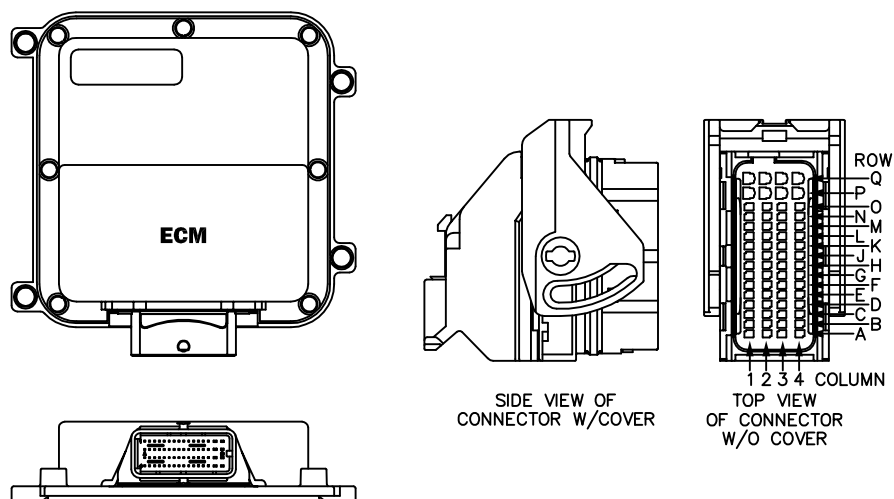
PIN	WIRE	TO	FUNCTION
2	R15B	RB1A-6/ES1-2Y	OVERSPEED /WATCHDOG
4	405	AVR-11	AVR GROUND
11	194	AVR-2	AVR +12VDC

BS8

PIN	WIRE	TO	FUNCTION
2	SHLD	ECM (CUT)	CAN COMMS TO ECM (SHIELD)
3	743A	ECM-2C	CAN COMMS TO ECM (HIGH)
4	744A	ECM-2B	CAN COMMS TO ECM (LOW)

BS9

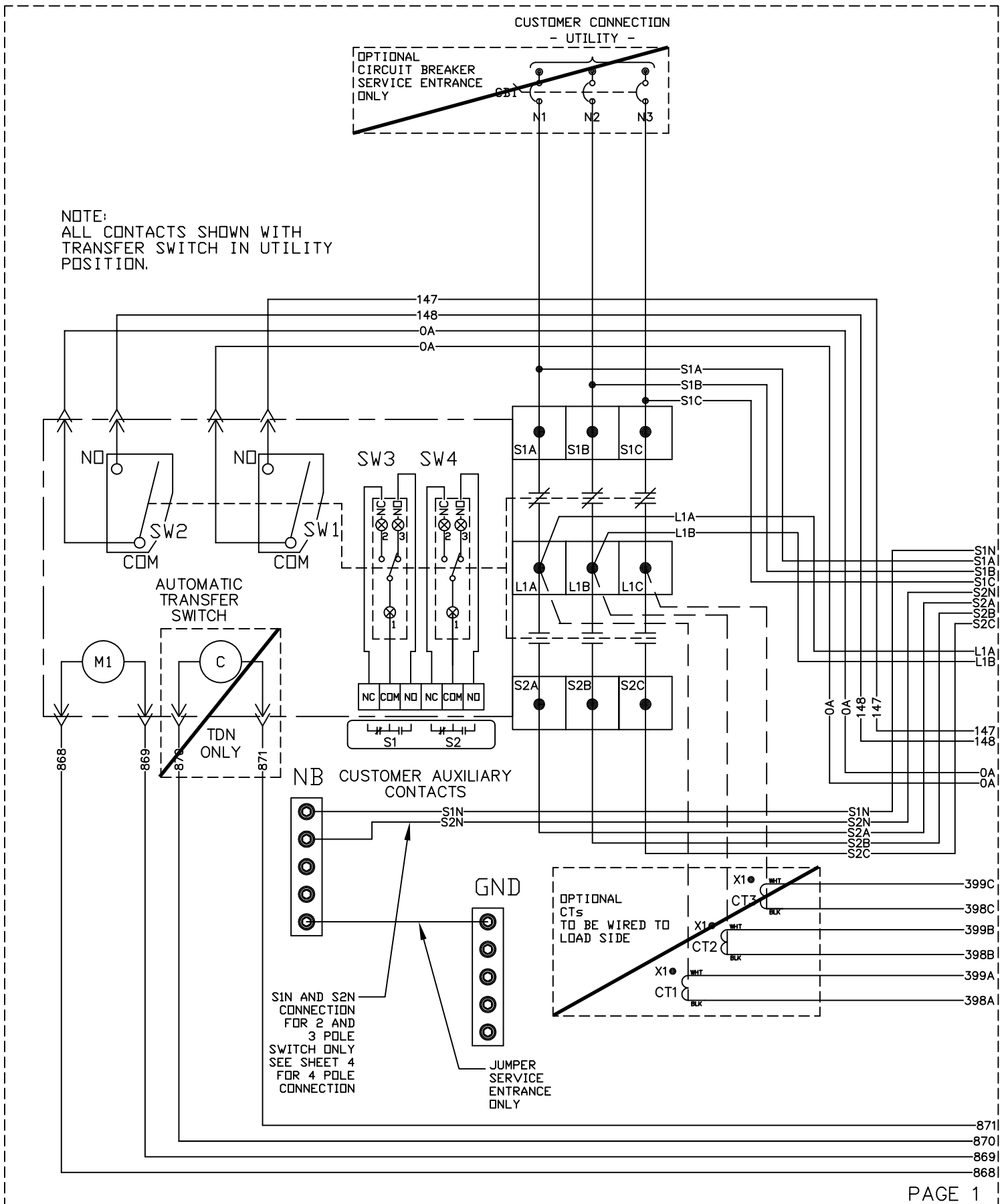
PIN	WIRE	TO	FUNCTION
1	S1A	FB6-Y	PHASE A VOLTAGE SENSING
2	S2A	FB7-Y	PHASE B VOLTAGE SENSING
3	S3A	FB8-Y	PHASE C VOLTAGE SENSING
4	00	NEUTRAL	NEUTRAL VOLTAGE SENSING

**ECM**

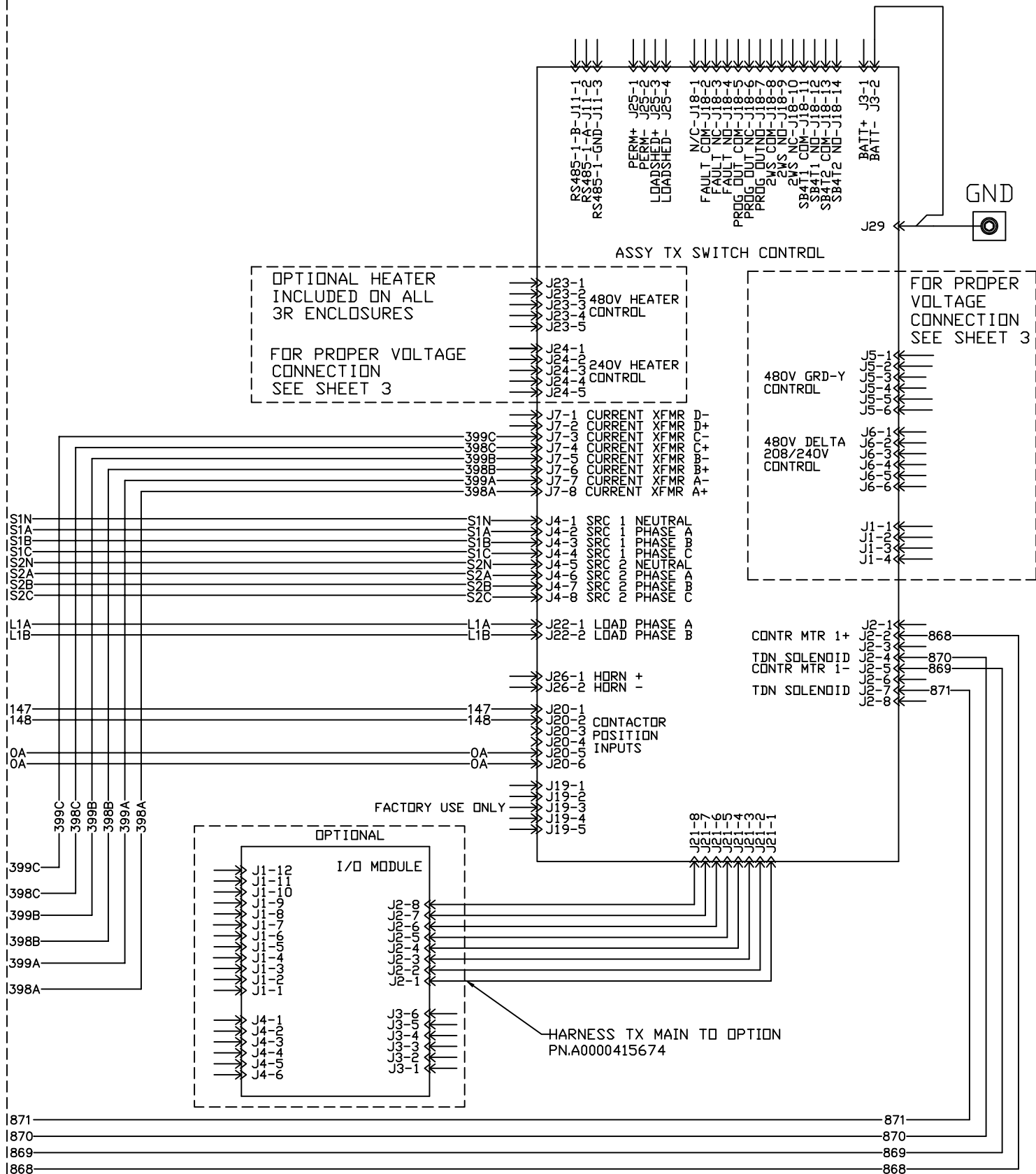
PIN	WIRE	TO	FUNCTION
1A	605C	EMC-C	ELECTRONIC MIXER CONTROL VALVE B (+)
1B	753L	CRKS-2	CRANKSHAFT POSITION SENSOR (-)
1C	753H	CRKS-1	CRANKSHAFT POSITION SENSOR (+)
1D	760	CAC	CHARGE AIR COOLER BYPASS
1G	607	OS-C	OXYGEN HEATER
1H	608	IR/DPR	ECM POWER RELAY COIL
1J	610	FS1-B	FUEL SHUT OFF VALVE
1L	820A	AFPS/TMAP/TPS	SENDER POWER 1
1M	820B	CAMS/ETC/FPS/OPS	SENDER POWER 2
1N	797	FPS-B	FUEL PRESSURE SENSOR
1O	606	TPS-1	MIXER POSITION SENSOR
1P	771	ETC-5	ELECTRONIC THROTTLE CONTROL VALVE (-)
1Q	770	ETC-6	ELECTRONIC THROTTLE CONTROL VALVE (+)
2A	605D	EMC-D	ELECTRONIC MIXER CONTROL VALVE B (-)
2B	744A	BS8-4	CAN COMMS TO BASE STATION (LOW)
2C	743A	BS8-3	CAN COMMS TO BASE STATION (HIGH)
2D	754	TMAP-3	INTAKE AIR TEMPERATURE
2E	820G	AFPS/CAMS/ETC/FPS OPS/OTS/TMAP/TPS/WTS	SENDER GROUND
2L	450	CAMS-A	CAMSHAFT POSITION SENSOR
2M	752	TMAP-1	MANIFOLD AIR PRESSURE
2N	766	ETC-2	ELEC. THROTTLE CONTROL VALVE POSITION
2O	172	RB1-6	RUN SIGNAL
2P	14G	F4	DRIVER POWER
2Q	14G	F4	DRIVER POWER

ECM

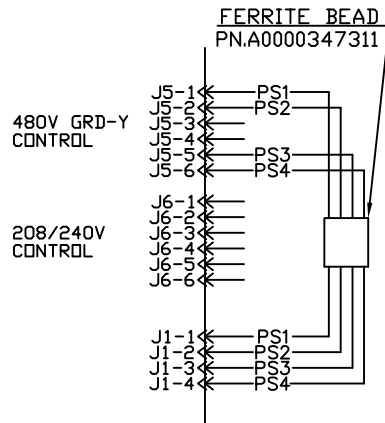
PIN	WIRE	TO	FUNCTION
3A	605A	EMC-A	ELECTRONIC MIXER CONTROL VALVE A (+)
3E	805	OS-A	OXYGEN SENSOR (-)
3G	523	OTS-1	OIL TEMPERATURE SENSOR
3J	396	ES1-3X	EMERGENCY STOP
3K	609	BS2-13	FUEL SELECT
3O	15C	F5	NOTE 7
3P	0	GND	NOTE 1
3Q	0	GND	NOTE 1
4A	605B	EMC-B	ELECTRONIC MIXER CONTROL VALVE A (-)
4B	604	AFPS-B	AIR FILTER PRESSURE SENSOR
4D	804	OS-B	OXYGEN SENSOR
4E	69	OPS-C	OIL PRESSURE SENSOR
4F	68	WTS-1	COOLANT TEMPERATURE SENSOR
4L	452	IC2-C	IGNITION COIL 2
4M	453	IC3-C	IGNITION COIL 3
4N	454	IC4-C	IGNITION COIL 4
4O	451	IC1-C	IGNITION COIL 1
4P	0	GND	NOTE 1
4Q	0	GND	NOTE 1



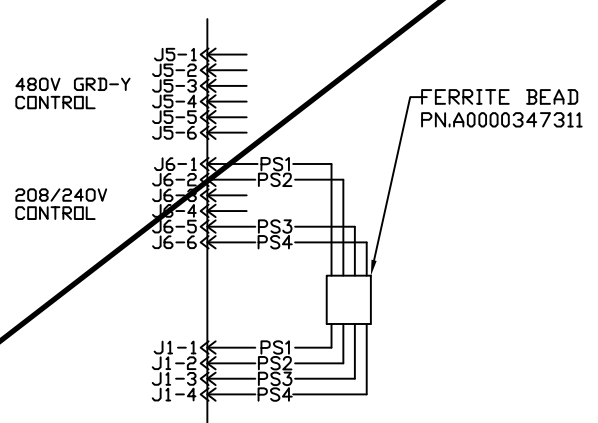
IF AN EXTERNAL 12/24V POWER SUPPLY IS PROVIDED, THE JUMPER BETWEEN J29 AND J3-2 IS TO BE REMOVED AND DISCARDED.
THIS EXTERNAL POWER SUPPLY MUST BE CHASSIS GROUNDED.
THE LOCAL CHASSIS GROUND WIRE MUST BE RE-ATTACHED TO J29.



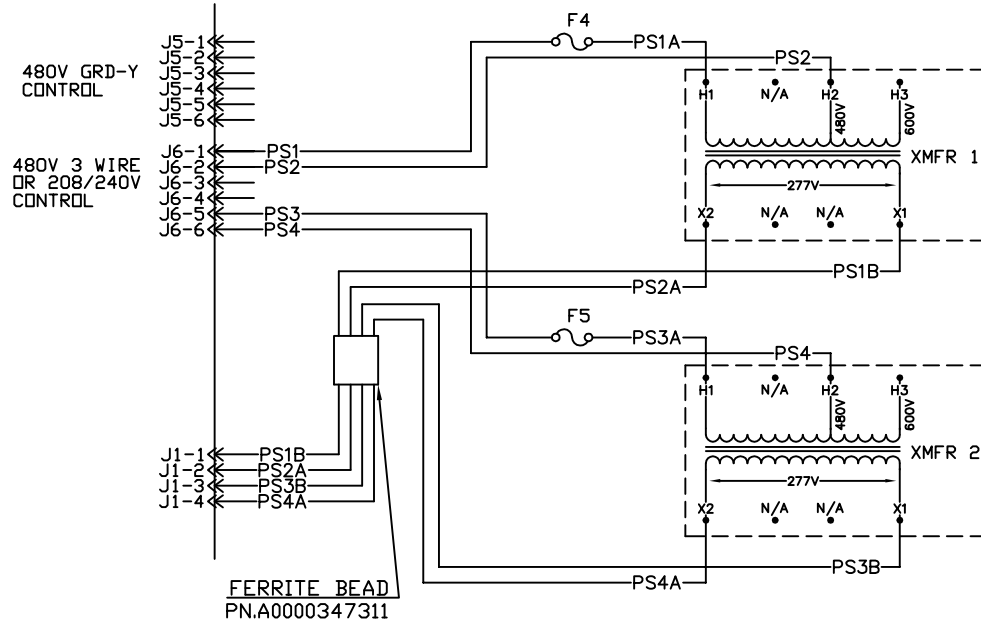
480V GRD-Y CONTROL



208/240V CONTROL

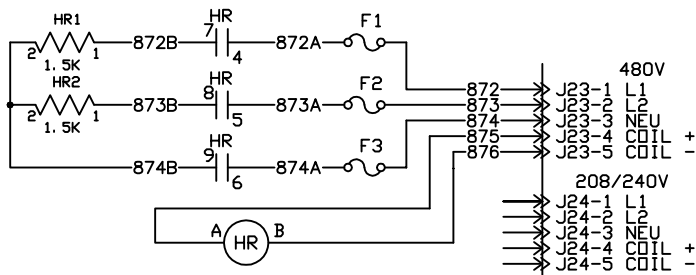


480V 3 WIRE CONNECTION WITH TRANSFORMERS



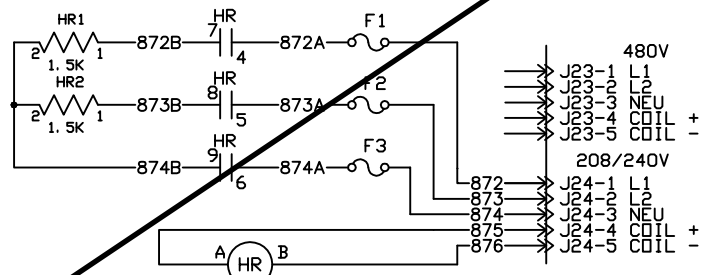
480V HEATER CONTROL

OPTIONAL HEATER
INCLUDED ON ALL 3R ENCLOSURES

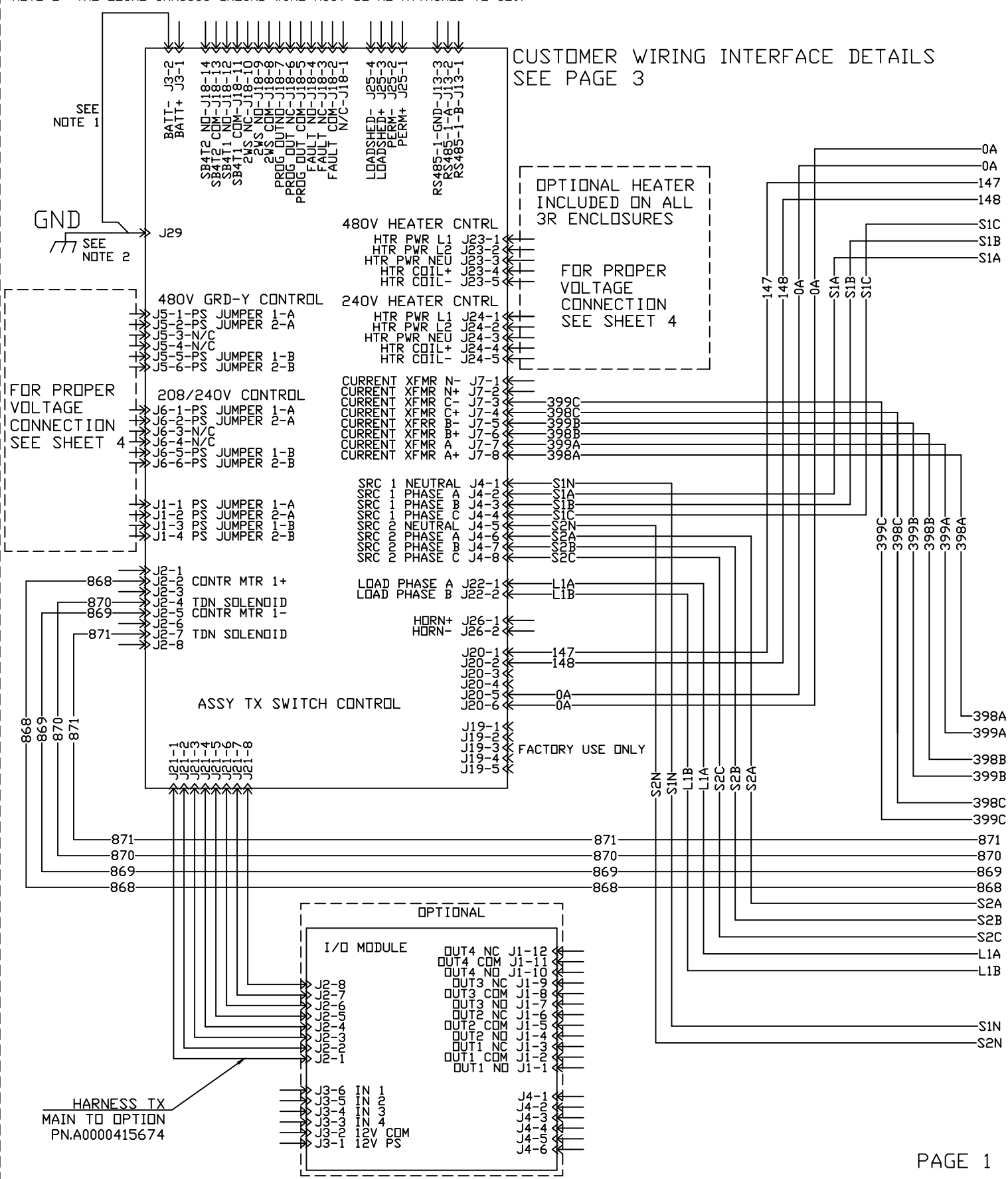


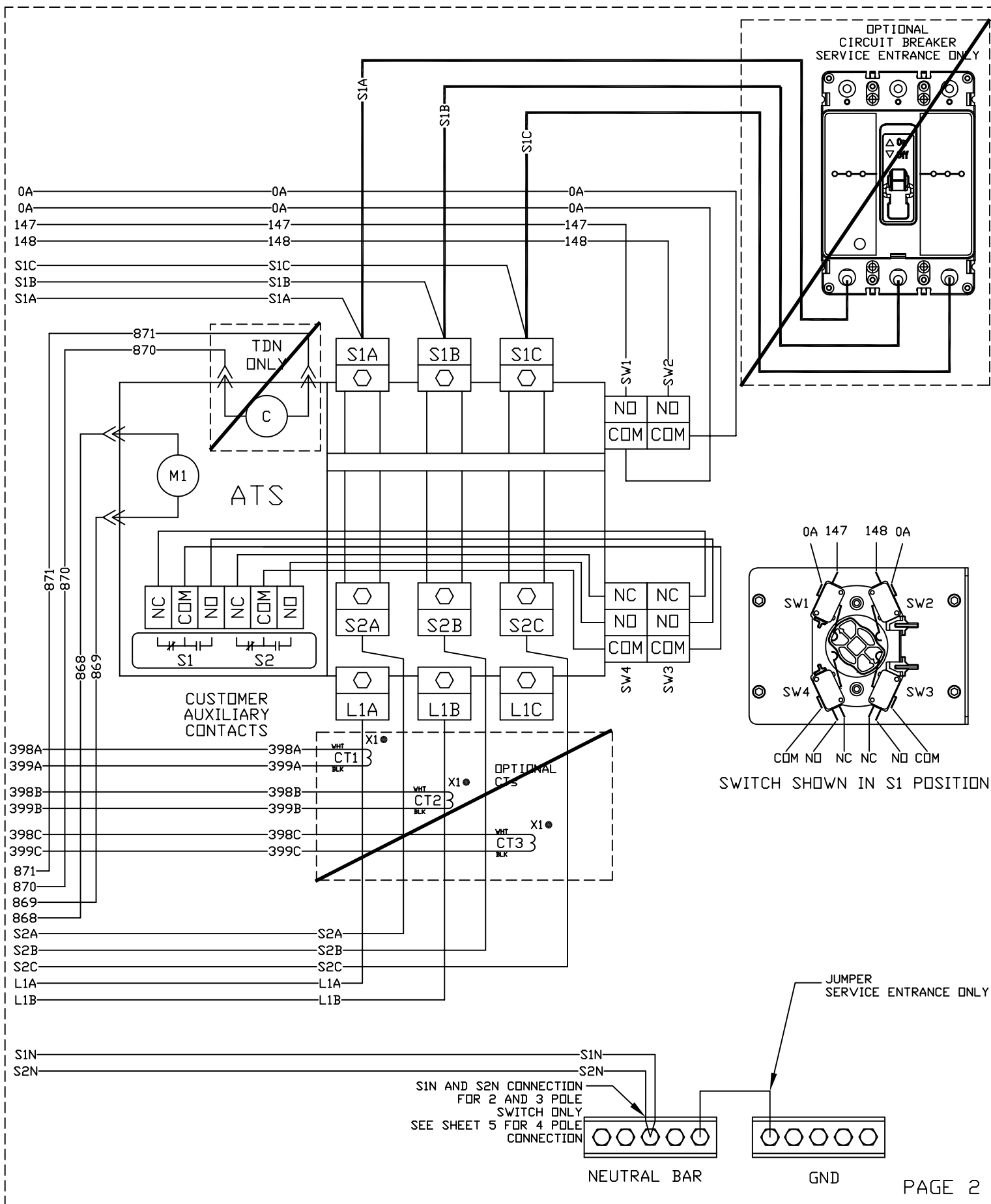
208/240V HEATER CONTROL

OPTIONAL HEATER
INCLUDED ON ALL 3R ENCLOSURES

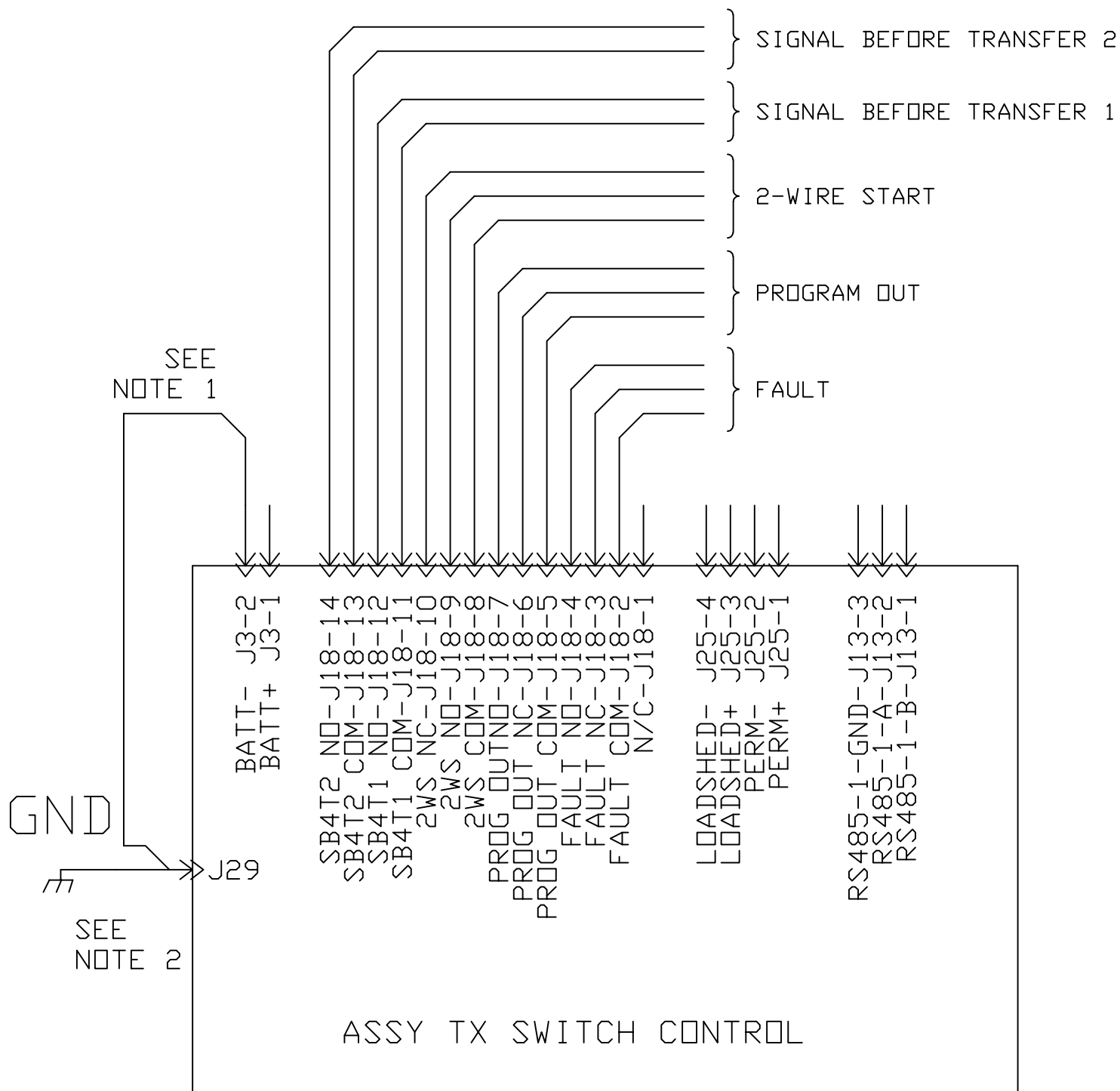


NOTE 1: IF AN EXTERNAL 12/24V POWER SUPPLY IS PROVIDED, THE JUMPER BETWEEN J29 AND J3-2 IS TO BE REMOVED AND DISCARDED.
 NOTE 2: THE LOCAL CHASSIS GROUND WIRE MUST BE RE-ATTACHED TO J29.

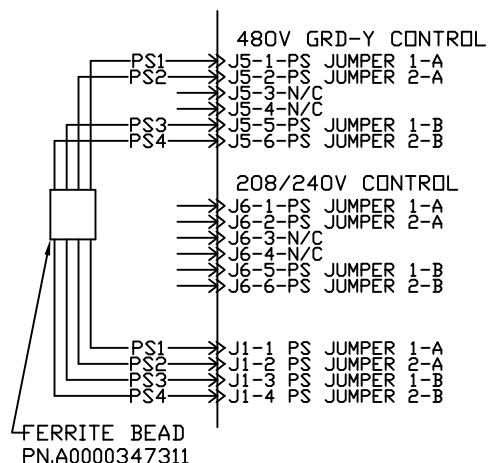




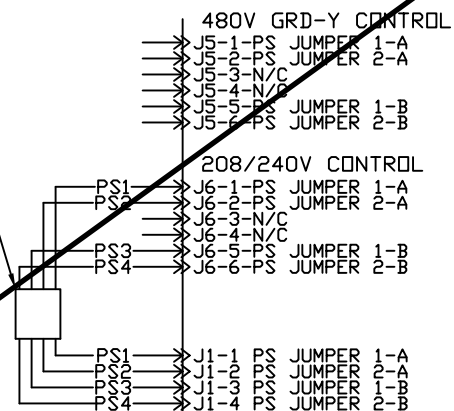
- NOTE 1: IF AN EXTERNAL 12/24V POWER SUPPLY IS PROVIDED, THE JUMPER BETWEEN J29 AND J3-2 IS TO BE REMOVED AND DISCARDED.
- THIS EXTERNAL POWER SUPPLY MUST BE CHASSIS GROUNDED.
- NOTE 2: THE LOCAL CHASSIS GROUND WIRE MUST BE RE-ATTACHED TO J29.



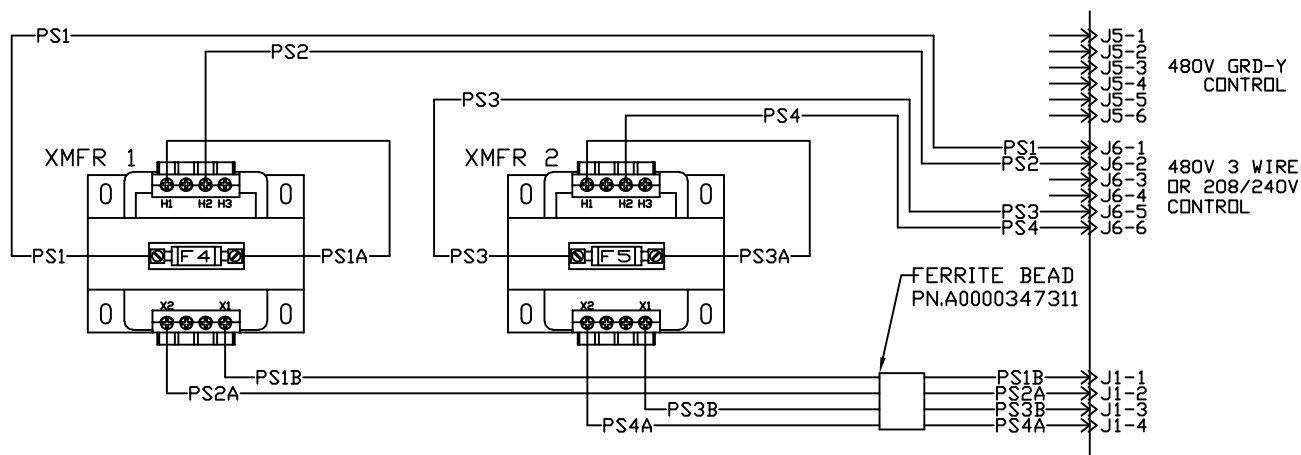
480V GRD-Y CONTROL



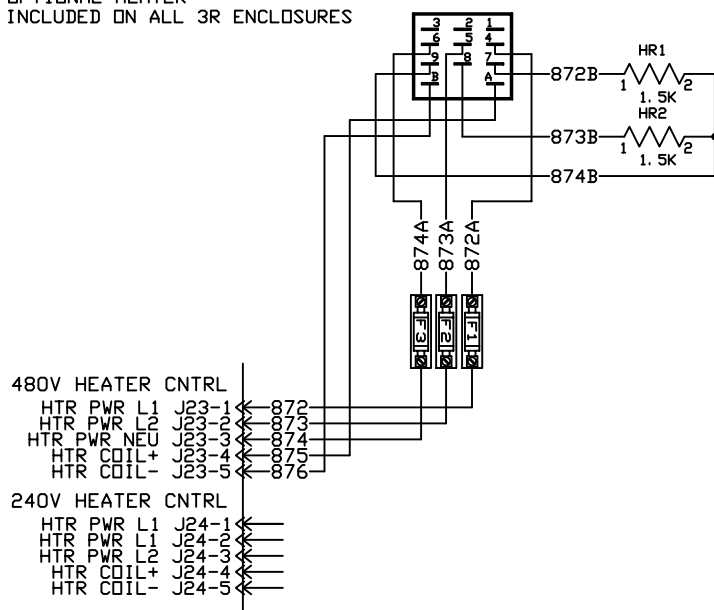
208/240V CONTROL

FERRITE BEAD
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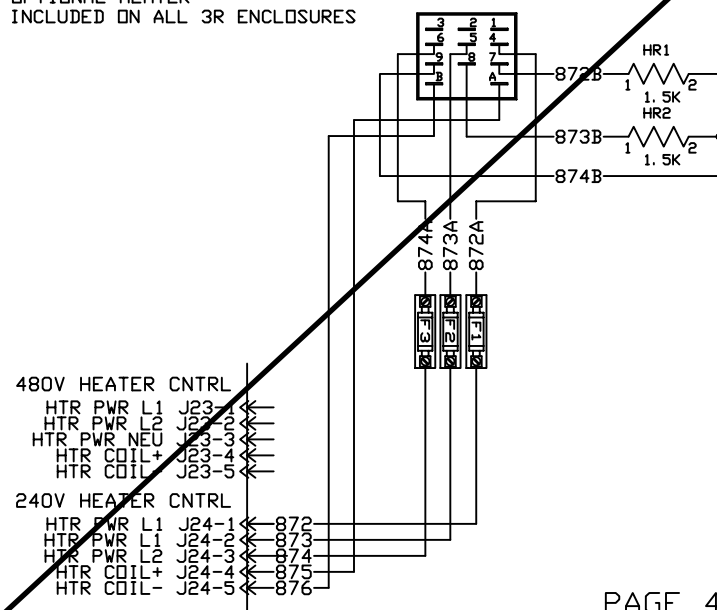
480V 3 WIRE CONNECTION WITH TRANSFORMERS



480V HEATER CONTROL

OPTIONAL HEATER
INCLUDED ON ALL 3R ENCLOSURES

208/240V HEATER CONTROL

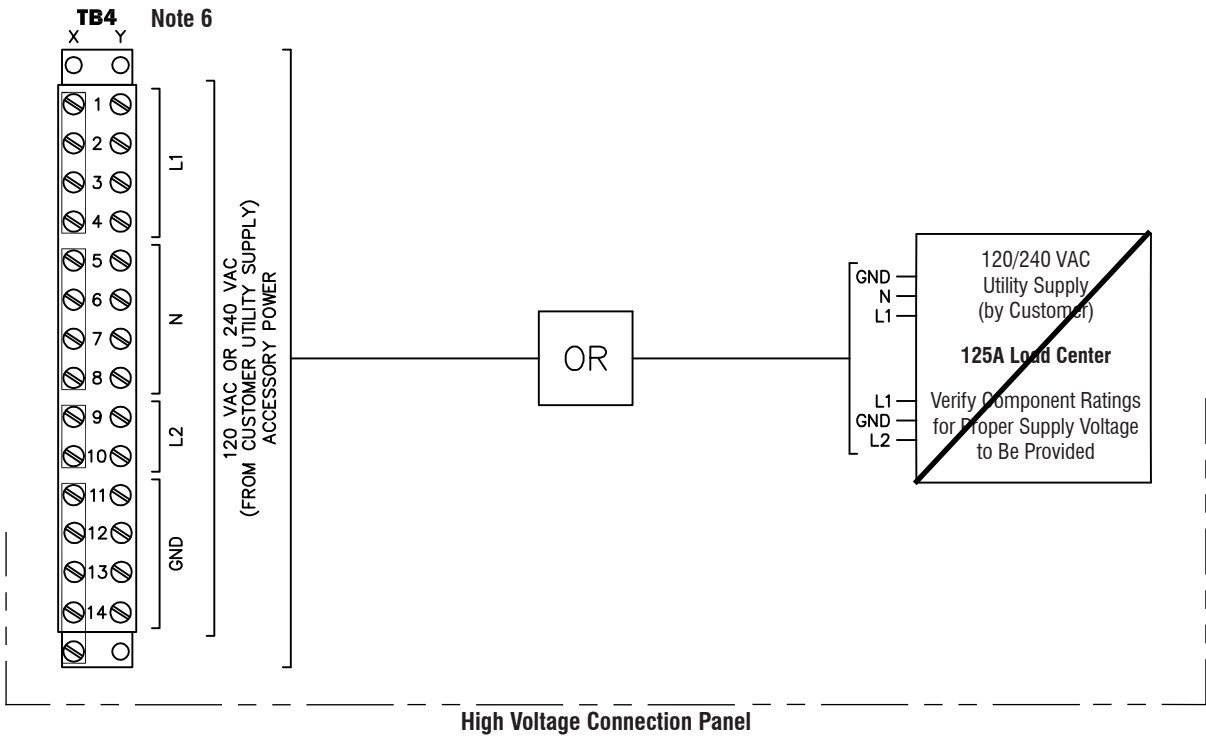
OPTIONAL HEATER
INCLUDED ON ALL 3R ENCLOSURES

PAGE 4

WIRING - DIAGRAM

POWER ZONE® CONTROL PLATFORM

Power Zone® Pro Control Interconnections



DESIGN GUIDELINES

Natural Gas Supply System Design Guide for Generac Industrial Spark Ignited Generators

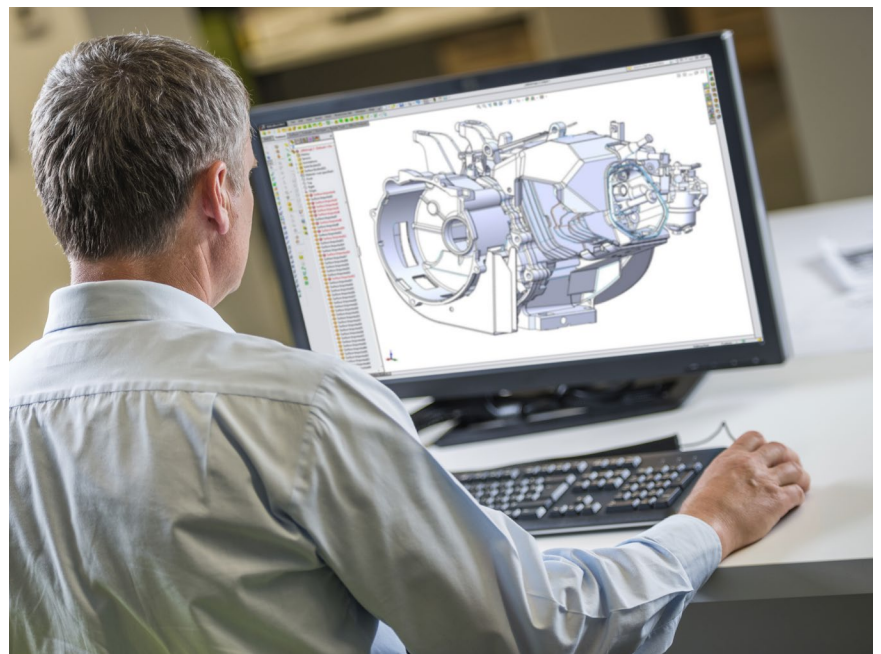
DESIGN GUIDE

Natural Gas Supply System Design Guide for Generac Industrial Spark Ignited Generators

INTRODUCTION

This design guidance document is to be provided to the consulting engineer during the project design phase and again at the time of submittal to the engineer and mechanical contractor for all Generac Industrial natural gas and propane fueled generator sets.

The following pages provide information and design best practices that have been demonstrated to minimize gas pressure instability and flow deficiency problems in the field. These design guidelines are to be used in combination with applicable national standards,¹ local fuel gas piping codes, and Generac's Installation Guidelines for Stationary Industrial Generators (Document #046622).



1. DESIGN OBJECTIVES

1.1. Provide the generator with a stable gas supply pressure over varying gas flow demand conditions. Maximum gas flow for all Generac generators are listed on the unit nameplate and generator data sheets.²

1.2. The pressure difference measured at the generator fuel pressure test port should typically be less than 2" water column (w.c.) from no-load running to full-load running condition.

1.3. The gas pressure must remain above the minimum specified for the generator set at all times, under all operating conditions. Failure to maintain adequate gas pressure and flow will result in operational problems such as extended crank cycles, inability to carry full load, and unstable engine speed.

1.4. Maintain a pressure and flow margin to allow for seasonal pressure variation on the upstream gas system. The emergency system must be before the facility shutoff.

1.5. Other facility loads must be factored in while sizing the Generator fuel system. It is recommended that the generator should have a dedicated fuel supply, which is not shared with any other appliances (furnace, water heaters, ranges, etc.) and the Generator fuel supply line shall be installed away from a high heat source so that the fuel temperature must remain at an acceptable operating range.

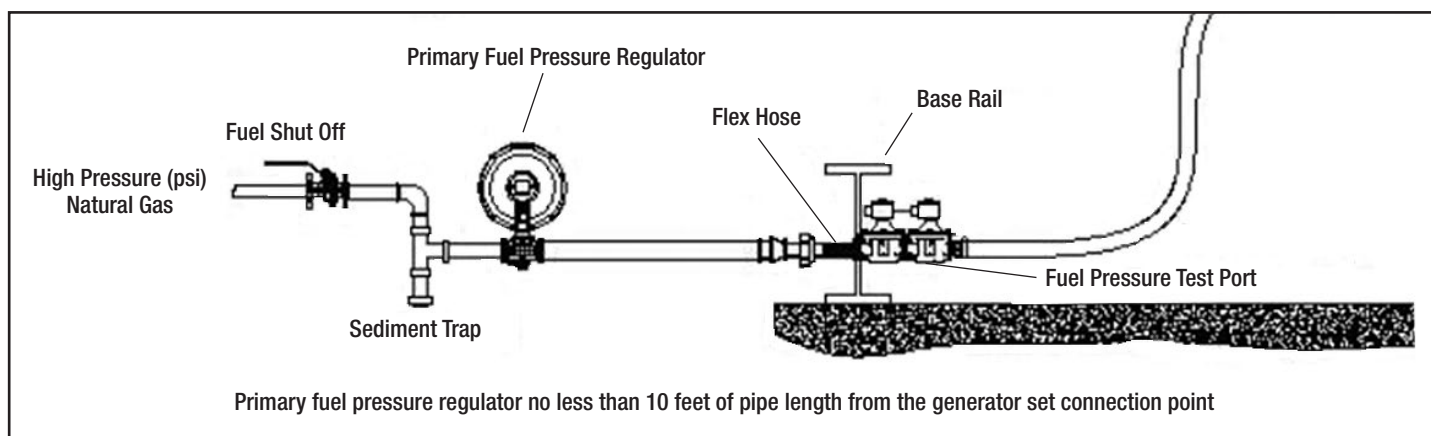


Figure 1: Typical natural gas supply regulator and piping configuration.

2. REGULATOR PERFORMANCE ATTRIBUTES³

2.1. Regulator Body Size: The inlet and outlet ports on a regulator are typically a single metal casting. The “body size” refers to the nominal diameter of the inlet and outlet pipe threads (or flange).

The regulator body size should never be larger than the pipe size, but it may be smaller provided the required flow can be obtained through the smaller regulator body size.

2.2. Pressure differential: The maximum flow rate of a service regulator is constrained by the gas pressure differential across the inlet and outlet port. When selecting a regulator for a specific gas flow requirement, it must correspond to the expected nominal upstream and downstream gas pressures. Consult manufacturers' published flow rate tables at various inlet and outlet pressure values to select an appropriate regulator (See the example in Table 1).

2.3. Flow and droop: Select a direct acting regulator that will deliver approximately 1.5 times the maximum gas flow required by the generator with 1" – 2" water column (w.c.) pressure droop at the expected nominal upstream and downstream gas pressures. Direct acting regulators provide the quick

response required for controlling fast changing gas flow demands encountered in engine-generator applications.

For example, a Generac SG500 generator, configured for 7" – 11" w.c. nominal gas pressure, requires 6,000 CFH of gas at full load. The selected regulator must be rated to flow approximately 9,000 CFH (1.5 X 6000 CFH = 9000 CFH). Given an upstream gas pressure of 2 psi, a 1½" Model 122-12 regulator with a blue spring would be the first choice. However, assume there is a substantial risk of seasonal pressure variation where the upstream gas pressure may fall closer to 1 psi, a larger 2" Model 122-12 regulator with a blue spring will still provide the required flow at the lower upstream pressure.

INLET PRESSURE	Set Point 5" w.c.	Set Point 7" w.c.	Set Point 11" w.c.	Set Point 18" w.c.	Set Point 28" w.c.	Set Point 2 w.c.	REGULATOR SIZE AND MODEL
	Red Spring 1" w.c. DROOP	Blue Spring 1" w.c. DROOP	Green Spring 2" w.c. DROOP	Orange Spring 2" w.c. DROOP	Orange Spring 3" w.c. DROOP	Black Spring 1/4" PSI DROOP	
8" w.c.	4000	3000	-	-	-	-	1 ½" Model 122-12
14" w.c.	4900	4500	3700	-	-	-	
1 psi	6600	6500	6000	5750	-	-	
2 psi	10500	10000	9800	9000	9500	-	
3 psi	12000	12000	11100	10000	10500	8900	
5 psi	14500	14500	13900	12000	12700	10000	
10 psi	16000	16000	15000	13500	14000	12700	
15 psi	18000	18000	19000	19000	20000	18000	2 ½" Model 122-12
8" w.c.	5000	4000	-	-	-	-	
14" w.c.	8800	8000	6600	-	-	-	
1 psi	12200	12000	11500	10700	-	-	
2 psi	18200	18000	17300	16500	16900	-	
3 psi	25000	25000	24000	22300	23000	18000	
5 psi	32000	32000	30000	28100	29000	27400	
10 psi	38000	38000	35000	32200	33000	30000	
15 psi	38000	38000	40000	39000	40000	36000	

Table 1: Typical regulator flow capacity table. Note how the same model regulator will flow larger volumes of gas with a higher inlet pressure while maintaining a set downstream pressure. Courtesy of Sensus.

Gas pressure regulators are feedback control systems driven by the pressure differential across the diaphragm and the case spring. When gas flow on the low-pressure side of the regulator causes a pressure drop, spring force in the regulator case pushes on the diaphragm and opens the valve to increase gas flow to maintain the set pressure.

The dynamic pressure maintained by the regulator decreases slightly as gas flow rate increases (Figure 2). This phenomenon is known as pressure droop or, more simply, “droop”. Regulator manufacturers design products to minimize pressure droop while still maintaining regulator stability for a given gas flow rate.

Regulators tend to exhibit the best stability and response time when they operate near the middle of their proportional band. Selecting a regulator with a published maximum gas flow of approximately 1.5 times the full-load gas flow required by the generator avoids operation very close to the fully open or fully closed position, minimizing the probability of unstable operation. A regulator that is too large, capable of flowing several times the maximum gas flow required by the generator, will operate very close to its fully closed position which may also result in unstable operation.

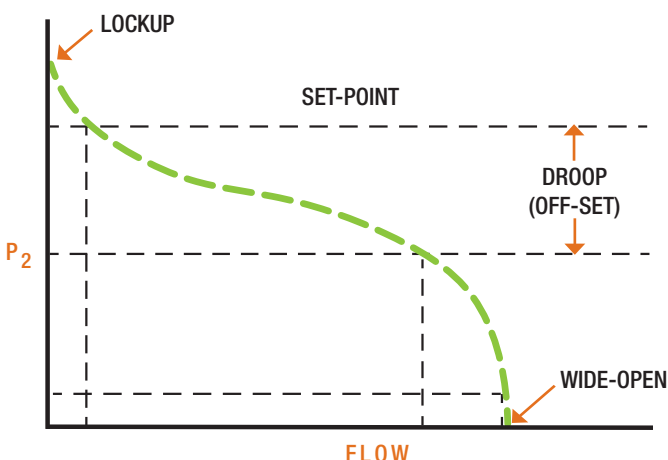


Figure 2: Pressure droop characteristic of a typical direct-operated regulator. Courtesy of Emerson-Fisher Natural Gas Application Guide.

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2.4. Spring Rate, Accuracy, and Response Time:⁴

The regulator spring provides the force required to open the regulator valve and maintain the desired operating pressure. There may be more than one spring covering a desired operating pressure. Spring selection plays a role in regulator accuracy and response time.

In general, using the lightest spring rate (*a blue spring from the prior example referencing Figure 2*) that achieves the desired operating pressure will provide the best accuracy, minimizing pressure droop across the range of expected gas flow rates. However, a response that is “too fast” can introduce oscillation and instability. If instability is experienced during operation, moving to the next higher spring (*a green spring from the prior example referencing Table 1*) that includes the desired operating pressure is one potential method to mitigate oscillations.

2.5. Orifice size: For regulators where various orifice sizes are available, select the smallest orifice that will provide approximately 1.5 times the maximum gas flow required by the generator. Selecting an orifice that is significantly larger than necessary will result in the valve operating very close to the seat (nearly closed) and may result in pressure instability, increased seal wear, or audible noise from the regulator.

2.6. Lockup or hard shutoff: A regulator with a lockup or hard shutoff feature must be used. Lockup is the pressure above the regulator setpoint that is required to shut the regulator off tight so no gas flows. Typically, the lockup pressure is 1"-3" W.C. above the dynamic pressure setpoint measured when a small volume of gas is flowing (*i.e. no-load running condition on the generator*). The lockup feature prevents the low-pressure side of the regulator from

creeping up to the regulator line side pressure during long periods of zero gas flow when the generator is not running. If excessive gas pressure is allowed to build up on the low-pressure side of the regulator, the generator solenoid valves may be unable to open against the excessive pressure and the engine will not start.

2.7. Internal vs. external pressure registration:

Internally registered regulators are recommended because they generally have fewer operational problems in the field.

The diaphragm case of a regulator must have a connection to the low-pressure side in order to function. Internally registered regulators have a passage built into the body casting which provides a path for low-pressure gas to act against the diaphragm and spring force. Externally registered regulators lack this internal connection path but instead have an additional pipe fitting on the regulator case where a smaller diameter pipe is field-fabricated to a downstream location on the low-pressure side of the main gas piping system. Because all the pipe fabrication is done in the field, variation in the main gas piping system and the remote pressure registration line can cause unpredictable performance that is difficult to troubleshoot.

Externally registered regulators can be used, but the engineer and installation contractor must be aware of the dynamic effects introduced by variables such as; flow turbulence, length and diameter of the sensing line, location of the sensing point in the low pressure piping system, increases and decreases in pipe diameter.

If an externally registered regulator is used, locate the remote sensing point 8 to 10 pipe diameters downstream of the regulator in the largest diameter pipe section. The start of 8 to 10 pipe diameters is

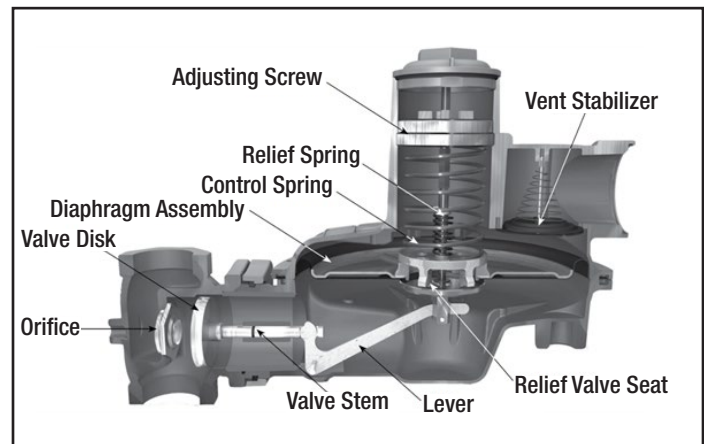


Figure 3: Major components of a direct-acting lever-type regulator, internally registered.
 (Courtesy Emerson Fisher).

after the transition to the largest diameter pipe or any other throttling devices, component and/or fittings that will disrupt flow and create turbulence. The sensing line should be taken off the top of the main line to keep it free of debris and condensate. If possible, it should horizontally slope back to the main so that any condensate will drain back into the main rather than accumulate in the regulator's diaphragm case. Minimize the fittings used in running the sensing line. An externally registered regulator will respond to the pressure changes sensed at the remote tap rather than within the regulator body. It is advisable to install a pressure gauge at the sensing line tap on the main as this will be the control point of the regulator.

2.8. Recommended gas regulators:

The list of regulators below is not an exhaustive list of all suitable regulators that are available in the market, nor is it a list of "Generac Approved" regulators. The list is intended to help design engineers and mechanical contractors identify a range of products that have demonstrated their suitability for engine-generator service in past projects. Consult your Generac Distributor or gas regulator supplier for additional information.

- Sensus⁵
- Emerson Fisher
- Itron

3. FLOW CHARACTERISTICS OF GAS PIPING SYSTEMS:

3.1. Elbows and Tees: Minimize the number of elbows and tee fittings that increase pressure drop and flow turbulence in the system. Where more than three elbows and/or tees are required, use of swept radius elbows (typical for welded pipe sections) will help reduce pressure loss.

3.2. Reducing bushings (swages): Pipe reducing bushings are the transition from a larger to smaller pipe diameter or vice versa. Gas flow velocity is slower in a larger diameter pipe compared to a smaller diameter pipe moving the same volume of gas. If a remote sensing regulator is used, it is important to understand the dynamic pressure effects caused by the gas flow velocities in different sized pipe sections and design accordingly.⁶

In some installations where it is impractical to run approximately 10 feet of pipe, swaging up to a larger diameter pipe is a practical method to increase the gas volume between the service regulator and the generator fuel system. For installations where this method is used, an internally registered regulator is strongly recommended.

3.3. Flexible fuel lines: Flexible fuel lines are intended to isolate the rigid gas piping system from vibrations on the generator set and must be installed as straight as possible. They are not intended to correct misaligned pipe sections or to serve as an elbow.

3.4. Regulator vent lines: Regulator vents must open downward and be screened to prevent insects and water from entering the regulator case. Regulator vent lines should be kept as short as possible to reduce the possibility of affecting the regulator response time.

4. DESIGN REQUIREMENTS:

4.1. Use Generac's Power Design Pro⁷ gas pipe sizing module to determine the minimum recommended pipe size for the selected generator's gas flow given the anticipated length of the pipe run between the service regulator and the generator fuel inlet, including all elbows. Select the option to design for <0.5" water column pressure drop. Refer to the Table 1 for more detail.

4.2. The flexible fuel line shall be installed at the generator fuel inlet located on the frame rail and must exit the generator perpendicular to the frame rail. No pipe fittings (elbows or swages) are permitted between the flexible fuel line and the generator fuel inlet port.

4.3. The flexible fuel line must be as straight as possible. It is designed to isolate the rigid gas piping system from vibrations on the generator set. It is not intended to correct misaligned pipe sections or to serve as an elbow.

4.4. Given the combined effects of pipe friction loss and regulator droop, gas pressure should typically not drop more than 2" w.c. from no-load running to full-load running. Under no circumstances shall the gas pressure measured at the test port on the inside frame rail of the generator set drop below the minimum rated gas pressure listed on the generator nameplate.

4.5. Full-port ball valves, the same diameter as the pipe which they are connected to, are to be used for all shut-offs.

4.6. For multiple generator set installations (Generac MPS), each generator set must have its own regulator installed. Do not share a single large regulator across multiple generator sets.

Table 2: Natural Gas Fuel Pipe Sizing

KW	PIPE SIZE (inches)							
	1.00"	1.25"	1.5"	2"	2.5"	3"	4"	5"
25	10	95	220	739				
30		60	147	565				
40		25	75	315	790			
50			50	220	560			
60			25	145	390	1185		
70			5	75	225	710		
80				65	195	630		
100				40	140	460		
130					50	215		
150					30	150		
200					15	95	475	
250						62	315	1020
300						35	255	850
350						10	145	535
400							107	452
500							42	245
625								120
750								112

TABLE VALUES ARE MAXIMUM PIPE RUN IN (feet)

NOTE: Pipe sizing is based on 0.5" H₂O pressure drop for Natural Gas. Also sizing includes nominal number of elbows and tees. Please verify adequate service and meter sizing.

5. RECOMMENDED DESIGN BEST PRACTICES:

5.1. Provide approximately 10 feet of pipe between the regulator and generator gas inlet. This does not have to be a single straight run. The pipe volume decouples the dynamic response of the generator throttle control system and the service regulator, reducing the probability of oscillation and unstable operation.

5.2. Avoid installing elbows or pipe swages immediately upstream or downstream of a regulator, unless specifically allowed by the regulator manufacturer. This will increase the turbulence of the gas flow, having a negative impact on pressure regulation accuracy and stability. Regulator

manufacturers typically recommend 10 pipe diameters of straight pipe run upstream and downstream of a regulator. For example, on a regulator with 2" diameter pipe fittings, 20" of straight pipe should be fitted upstream and downstream of the regulator. When field conditions prohibit meeting both constraints, place the elbow on the high-pressure side of the regulator. The straight run on the low-pressure side is more critical for proper regulator operation.

5.3. Avoid installing pipe swages immediately before or after an elbow. The combined flow turbulence of the swage and elbow in close proximity can cause unexpectedly large pressure drops at high flow rates.

5.4. Minimize the number of 90-degree elbows.

If more than three elbows are needed downstream of the regulator to accommodate the design, swept radius elbows are recommended to minimize pressure drop.

5.5. Use of an internally registered regulator is strongly recommended. Regulators with external pressure registration lines add an additional variable into the system that can be difficult to troubleshoot should the gas pressure become unstable under high-flow conditions.

5.6. For more stable gas flow with longer gas piping, the high pressure side may be raised as high as code allows and regulate it down to generator operating pressure at the generator. (This is the same design concept used in the electrical industry; “high voltage for long distances, transformation at the loads”). This may also help reduce cost as pipe diameters can be smaller, saving material and installation costs.

6. INSTALLATION AND COMMISSIONING RECOMMENDATIONS:

6.1. Refer to Generac’s Installation Guidelines for Stationary Industrial Generators (Document #046622) for additional installation details.

6.2. Pig all gas pipes after installation to remove pipe dope, weld slag and other contaminants that could damage the regulator valve seat and cause pressure creep.

6.3. Install a dirt trap and/or screen before the gas regulator.

6.4. Set the regulator pressure with the generator running at no-load. Measurements are taken at the generator fuel pressure test port on the inside of the frame rail. For units configured for 7"-11" w.c. operating pressure, set the regulator to 11" w.c. no-load running. For units configured for 11-14" w.c. operating pressure, set the regulator to 14" w.c.

no-load running. Pressure droop at full-load running will be a combination of regulator droop and pipe friction loss. Proper design will limit the no-load to full-load running pressure drop to no more than 2" w.c. and at no time can the gas pressure fall below the minimum pressure listed on the generator nameplate. Expect the lockup static pressure typically to be higher than the no-load running dynamic pressure.

7. METHODS FOR CORRECTING UNDESIRABLE PERFORMANCE:

7.1. Pressure surging and cycling: Should the regulator experience “hunting” or other unstable operating behavior, an extended vent line may be creating resonant condition on the atmospheric side of the regulator diaphragm. If this is suspected, temporarily disconnect the vent line or remove the cap from the regulator spring case and observe if the unstable behavior stops. Shortening the length or increasing the diameter of the vent line will often correct an instability caused by vent line resonance.

The pipe volume between the service regulator and the generator may be insufficient to decouple the control action of the regulator and the generator’s throttle control system. Increase the pipe volume between the regulator and the generator.

Change the response time of the regulator. In some cases, a small adjustment of the regulator spring (up or down 1 w.c.) will be enough to restore stability to the system. If available for the selected regulator, using the next higher spring is another inexpensive and easy to implement option. This will slow the regulator response and can reduce or eliminate the instability. Keep in mind that changing to a higher spring rate will also increase pressure droop and reduce the regulator’s maximum flow capacity which limits the applicability of this corrective measure.

7.2. Low gas pressure under high load: There are several potential causes of low gas pressure under high load.

Pipe runs with excessive friction loss caused by a pipe diameter that is too small for the required gas flow and pipe length and/or a large number of elbows. The only corrective action for this is to increase the pipe diameter between the regulator and the generator or to raise the pressure of the high pressure gas. Avoid this problem by using a gas pipe sizing tool during the design phase.

Insufficient regulator capacity. Confirm the upstream gas main and regulator flow capabilities for a given upstream gas pressure. If the upstream gas pressure is lower than originally anticipated, investigate the possibility adjusting the utility regulator (if present). If increasing upstream gas pressure is not possible, a larger orifice and/or different spring combination may be available for the existing regulator to increase flow and reduce pressure droop. If the previous steps fail to correct the situation, a larger regulator will be required. Avoid this problem by thoroughly reviewing the regulator manufacturer's flowrate tables prior to ordering.

7.3. Excessive transient pressure drop during generator crank cycle or block load application: If the transient pressure drop during a generator crank cycle or block load application is large enough to impact performance, speeding up the regulator response will reduce the transient pressure drop. Avoid this problem by using a direct-acting regulator that is suitable for engine-generator applications. If available for the selected regulator, using a lighter spring will increase the regulator response speed and reduce transient pressure dip. Finally, if a remotely registered regulator is used, increase the pipe diameter of the remote sensing line.

7.4. Pressure creep: Ensure the selected regulator has a lockup or hard-shutoff feature. Pressure creep is almost always caused by contaminants in the pipe system upstream of the regulator. The contaminants either get caught on the regulator valve disk or cause physical damage to the valve disk, making it impossible to achieve a hard shutoff. Avoid this problem by pigging all pipe components prior to installing the regulator and ensure a dirt trap is installed upstream of the regulator.

7.5. Failure to start, run smoothly, or accept 100% load: Barring a mechanical failure on the generator, failure to make 10-second start, run smoothly, or carry full load is almost always caused by an underlying gas supply problem.

8. PROPANE VAPOR AND LIQUID:

8.1. Propane vapor system: This type of system uses the vapors formed above the liquid fuel in the supply tank. The maximum tank liquid capacity is 80% and a minimum of approximately 20% of the tank capacity is required to boil off liquid into the vapor state. Gas pressure and volume requirements for an LPG system at the connection point of the generator are listed on the unit specification sheet. The piping system connecting the outlet of the first stage regulator to the connection point on the second stage regulator must be properly sized to provide the fuel volume required by the unit at 100% load.

The piping system between the outlet of the second stage regulator and the generator connection point must be sized to provide the fuel volume required by the generator at 100% load while also staying within the pressure range noted on the unit specification sheet.

8.2. Tank vaporization rate: In addition to sizing the gas piping system in a similar manner to natural gas, LP-vapor systems must also size the propane storage tanks to ensure a sufficient volume of gas will boil off

GAS SUPPLY CHECK LIST

- **Gas Service Meter and Serving Utility**

- Available on site and reliable
- Rated for the combined loading of the facility and the generator (total BTU)
- Maintains generator minimum pressure requirements while under maximum loading

- **Step Down Pressure Regulators**

- Selected for the pressure and flow needs of the generator
- Direct acting type with good dynamic response (no significant time lags in regulation)
- Selected for minimum no-load to full load pressure droop (< 1-2" w.c. desired)
- Located near the generator (allows the long piping runs to be at higher pressure)
- Located at least 10' away from generator connection (avoids regulator oscillations)
- Dedicated to a single generator (increases system reliability)

- **Piping**

- Sized large enough to minimize pressure drops to acceptable levels under full gas flow
- Minimize the number of elbows to avoid unwanted pressure drops
- Ensure entire gas supply system maintains acceptable generator pressure under full gas flow conditions
- Should be connected to generator with a flexible connection
- Should include a drip leg (sediment trap)

- **LP**

- LP tank's boil off rate (BTU capacity) needs to support rated BTU at minimum ambient
- LP liquid withdrawal systems should be considered: cold ambients, small tanks, large generators
- LP liquid systems require pressure rated piping and vaporization outside a building

- **Generac Design Resources**

- "Installation Guidelines for Stationary Industrial Generators" manual 046622 (detailed information)
- "Power Design Pro" software -- mechanical design tab (gas piping pressure drop calculator)

- **National Codes and Standards**

- NFPA 37 "Installation and use of Stationary Combustion Engines"
- NFPA 54 "National Fuel Gas Code"
- NFPA 58 "LP Gas Code"

FUEL SPECIFICATION

Natural Gas

Generac products are designed to run on natural gas and are tested for performance and reliability with clean, dry, pipeline quality natural gas. The properties presented in this standard represent the natural gas used in product testing. The performance and reliability of Generac products using non-conforming fuels are unknown and cannot be guaranteed.

Natural gas is, by definition, any gas that occurs organically, but this standard focuses on natural gas that intended for use as fuel in reciprocating internal combustion engines. This natural gas is generally assumed to have specific properties, but compositional differences and contaminants greatly influence the fuel's quality and combustion stability. This variation can lead to lower power output, pre-ignition, detonation, and corrosion if the fuel does not meet this standard. This standard identifies an acceptable fuel composition for use in Generac products.

Fuel Specifications

The fuel used by Generac is clean, dry, pipeline quality natural gas adhering to the following:

Component / Property	Unit	Range
Methane	% Volume	80 Minimum
Ethane	% Volume	0-10
Propane	% Volume	0-5
Butanes	% Volume	0-2
Pentanes and Heavier	% Volume	0-0.5
Nitrogen and Other Inerts	% Volume	0-3
Carbon Dioxide	% Volume	0-3
Total Diluents Gases	% Volume	0-5
Hydrogen Sulfide	g/100scf (mg/m3)	0.25-0.3 (6-7)
Total Sulfur	g/100scf (mg/m3)	5-20 (115-460)
Water Vapor	lb/MMscf (mg/m3)	4-7 (60-110)
High Heating Value	Btu/scf (kJ/m3)	950-1,150 (35,400-42,800)
Methane Number	MN	80 Minimum

Notes:

- The fuel must be free of liquid water and hydrocarbons at delivery temperature and pressure.
- The fuel must be free of particulate matter.

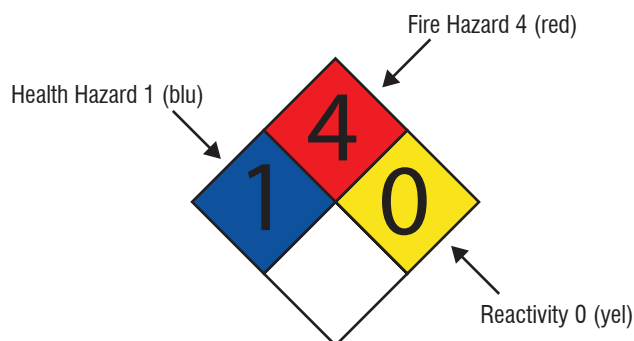
Hazards Information

Emergency Overview

DANGER!
EXTREMELY FLAMMABLE GAS - MAY CAUSE FLASH FIRE OR EXPLOSION!

High concentrations may exclude oxygen and cause dizziness and suffocation. Contact with pressurized vapor may cause frostbite or freeze burn.

NFPA 704 Hazard Identification System

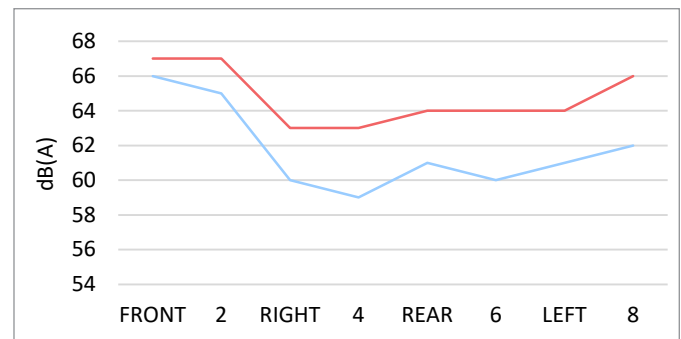
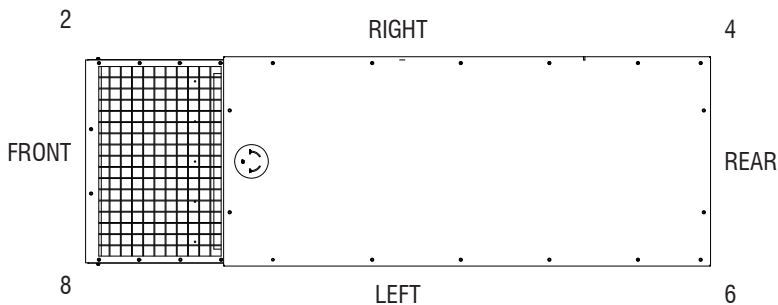


4 - Severe	3 - Serious	2 - Moderate	1 - Slight	0 - Minimal
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LEVEL 2 SOUND ATTENUATED ENCLOSURE G4.5L Generac, SG080

60Hz NO-LOAD, dB(A)										DISTANCE: 7 METERS
MICROPHONE LOCATION	OCTAVE BAND CENTER FREQUENCY (Hz)									
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	dB(A)
FRONT	29	45	51	61	62	61	52	53	45	66
2	33	45	50	62	61	58	52	49	46	65
RIGHT	33	42	52	54	55	55	48	49	45	60
4	28	44	49	55	55	54	49	47	43	59
REAR	29	45	52	54	54	56	56	50	46	61
6	29	44	49	55	54	55	50	47	45	60
LEFT	30	43	51	57	57	55	48	50	46	61
8	28	45	50	57	59	57	50	48	46	62
AVERAGE	30	44	51	57	57	56	51	49	45	62

60Hz FULL-LOAD, dB(A)										DISTANCE: 7 METERS
MICROPHONE LOCATION	OCTAVE BAND CENTER FREQUENCY (Hz)									
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	dB(A)
FRONT	30	62	52	60	61	60	52	52	47	67
2	31	61	52	63	62	58	54	50	48	67
RIGHT	30	57	53	55	59	57	49	50	47	63
4	27	61	51	55	56	55	50	49	47	63
REAR	27	60	53	55	55	57	57	52	52	64
6	28	60	52	57	58	56	51	52	49	64
LEFT	30	59	54	58	59	55	50	52	50	64
8	31	62	53	59	60	57	52	50	50	66
AVERAGE	29	60	52	58	59	57	52	51	49	65



- All positions at 23 feet (7 meters) from side faces of generator set.
- Test conducted on a 100 foot diameter asphalt surface.
- Sound pressure levels are subject to instrumentation, installation and testing conditions.
- Sound levels are ± 2 dB(A).

STATEMENT OF EXHAUST EMISSIONS

2024 Spark-Ignited Generators

Industrial Series - SCAQMD Certified, Stationary Emergency

	Model	Engine (L)	Engine Emissions Designation	EPA Engine Family	Fuel	Catalyst Required	SCAQMD CEP #	EPA Certificate #	Grams/bhp-hr.				Rated RPM	BHP	Fuel Flow (lb/hr)
									THC	NMHC	NOx	CO			
Small Spark Ignited Engine (SSIE) Small Off-Road Engines (SORE)	QTA25	2.4	A02.4GCN029A0	RGNXB02.4MDI	NG	No	Not Required	RGNXB02.4MDI-046	1.40	N/A	4.32	85.00	1,800	38	16.52
	QTA25	2.4	A02.4GCV032A0	RGNXB02.4MDI	LPG			RGNXB02.4MDI-046	N/A	2.11	2.33	92.66	1,800	43	17.59
	SG035, 40, 45, 50NA	4.5	C04.5SPN054A0	RGNXB04.5MJJ	NG		618432	RGNXB04.5MJJ-043	0.20	0.02	0.05	0.92	1,800	76	23.7
	SG035, 40, 45, 50NA	4.5	C04.5SPV054A0	RGNXB04.5MJJ	LPG		618432	RGNXB04.5MJJ-043	0.02	0.01	0.17	0.13	1,800	76	26
	SG050T, 60, 70, 80	4.5	C04.5SPN099A0	RGNXB04.5MJJ	NG	Yes	623270	RGNXB04.5MJJ-043	0.11	0.01	0.17	0.16	1,800	132	43.68
	SG050T, 60, 70, 80	4.5	C04.5SPV099A0	RRGNXB04.5MJJ	LPG		623270	RGNXB04.5MJJ-043	0.03	N/A	0.13	0.20	1,800	132	46.61
Large Spark Ignited Engines (LSIE)	SG080, 100	9.0	E08.9GSN111A1	RGNXB08.9201	NG		598551	RGNXB08.9201-047	0.18	0.00	0.01	0.25	1,800	153	53.1
	SG080, 100 (LPF)	9.0	E08.9MSN116A1	RGNXB08.9201	NG		598558	RGNXB08.9201-047	0.11	0.00	0.12	0.03	1,800	153	53.24
	SG080, 100	9.0	F08.9GSV106A0	RGNXB08.9202	LPV		642064	RGNXB08.9202-028	0.01	N/A	0.21	0.22	1,800	156	54.36
	SG080, 100	9.0	F08.9GSV106A0	RGNXB08.9202	LPL		642064	RGNXB08.9202-028	0.03	N/A	0.00	0.36	1,800	156	55.27
	SG130, 150	9.0	E08.9MSN170A0	RGNXB08.9203	NG		618434	RGNXB08.9203-029	0.14	0.00	0.10	0.74	1,800	229	86.37
	SG130, 150	9.0	F08.9MSV169A0	RGNXB08.9204	LPV		606652	RGNXB08.9204-030	0.02	N/A	0.03	0.09	1,800	230	85.37
	SG175	14.2	E14.2MSN227A3	RGNXB14.22C1	NG		618436	RGNXB14.22C1-031	0.24	0.00	0.12	0.21	1,800	304	101.16
	SG/MG150, 200	14.2	E14.2MSN227A3	RGNXB14.22C1	NG		618436	RGNXB14.22C1-031	0.24	0.00	0.12	0.21	1,800	304	101.16
	SG230, 250	14.2	E14.2MSN279A3	RGNXB14.22C1	NG		618438	RGNXB14.22C1-031	0.15	0.00	0.35	0.41	1,800	374	141.71
	SG/MG250	14.2	E14.2MSN279A3	RGNXB14.22C1	NG		618438	RGNXB14.22C1-031	0.15	0.00	0.35	0.41	1,800	374	141.71
	SG275,300	14.2	E14.2MSN343A3	RGNXB14.22C1	NG		618440	RGNXB14.22C1-031	0.03	0.00	0.04	0.32	1,800	460	140.33
	MG300	14.2	E14.2MSN343A3	RGNXB14.22C1	NG		618440	RGNXB14.22C1-031	0.03	0.00	0.04	0.32	1,800	460	140.33
	SG/MG350, 400	21.9	E21.9MSN474A4	RGNXB21.92C1	NG		618441	RGNXB21.92C1-032	0.07	0.00	0.26	0.21	1,800	636	176
	SG/MG350,400 (LPF)	21.9	E21.9MSN474A5	RGNXB21.92C1	NG		618442	RGNXB21.92C1-032	0.30	0.00	0.06	0.12	1,800	636	214
	SG/MG400,450	21.9	E21.9MSN0502A4	RGNXB21.92C3	NG		618441	RGNXB21.92C3-033	0.08	0.00	0.06	0.10	1,800	673	209
	SG/MG400,450 (LPF)	21.9	E21.9MSN0502A5	RGNXB21.92C3	NG		618441	RGNXB21.92C3-033	0.19	0.00	0.05	0.17	1,800	673	224
	SG/MG500	25.8	E25.8MSN580A4	RGNXB21.92C3	NG		593192	RGNXB21.92C3-034	0.16	0.00	0.03	0.60	1,800	778	280
	SG/MG500 (LPF)	25.8	E25.8MSN580A5	RGNXB25.82C1	NG		606658	RGNXB25.82C1-034	0.19	0.00	0.06	0.57	1,800	778	280
	SG/MG625	33.9	E33.9MSN677A0	RGNXB33.92C1	NG		601949	RGNXB33.92C1-035	0.13	0.00	0.01	0.22	1,800	909	325
	SG/MG750	33.9	E33.9MSN803A0	RGNXB33.92C1	NG		606655	RGNXB33.92C1-035	0.18	0.00	0.15	0.92	1,800	1077	417
	SG/MG1000	49.0	E49.0ASN1100A0	RGNXB49.02C1	NG		625240	RGNXB49.02C1-036	0.11	0.00	0.03	0.65	1,800	1475	427

NG: Natural Gas
LPV: Liquid Propane Vapor
LPL: Liquid Propane Liquid

LPG: Liquid Propane Vapor or Liquid Propane Liquid
LPF: Units with Optional Low Pressure Fuel System
Refer to Page 2 for Definitions and Advisory Notes

N/A: Not Applicable
Engine BHP is taken from Engine Emissions Certification Results

STATEMENT OF EXHAUST EMISSIONS

2024 Spark-Ignited Generators

Industrial Series - SCAQMD Certified, Stationary Emergency

2024 EPA SPARK-IGNITED EXHAUST EMISSIONS DATA

Effective since 2009, the EPA has implemented exhaust emissions regulations on stationary spark-ignited (gaseous) engine generators for emergency applications. All Generac spark-ignited gensets, including SG, MG, QTA, QT and RG series gensets that are built with engines manufactured in 2009 and later meet the requirements of 40CFR part 60 subpart JJJJ and are EPA certified. These generator sets are labeled as EPA Certified with decals affixed to the engines' valve covers.

The attached documents summarize the general information relevant to EPA certification on these generator sets. This information can be used for submittal data and for permitting purposes, if required. These documents include the following information:

EPA Engine Family

The EPA Engine Family is assigned by the Manufacturer under EPA guidelines for certification purposes and appears on the EPA certificate.

Catalyst Required

Indicates whether a three-way catalyst (TWC) and Air/Fuel Ratio control system are required on the generator set to meet EPA certification requirements. Generally, units rated 80kW and smaller do not require a TWC to meet EPA certification requirements. Please note that some units that do not require a TWC to meet EPA requirements do need one if the California SCAQMD option is selected. Please see "California SCAQMD" below for additional information on this option.

Combination Catalyst or Separate Catalyst

SG and MG series generator sets typically utilize a single combination catalyst/silencer as part of meeting EPA certification requirements. Many QT and RG series generator sets use the same engines as SG series units, but have different exhaust configurations that require the use of conventional silencers with additional separate catalysts installed.

EPA Certificate Number

Upon certification by the EPA, a Certificate Number is assigned by the EPA.

Emissions Actuals - Grams/bhp-hr

Actual exhaust emission data for Total Hydrocarbons (THC), Nitrogen Oxides (NOx) and Carbon Monoxide (CO) that were submitted to EPA and are official data of record for certification. This data can be used for permitting if necessary. Values are expressed in grams per brake horsepower-hour; to convert to grams/kW-hr, multiply by 1.341. Please see advisory notes below for further information.

California Units, SCAQMD CEP Number

A separate low-emissions option is available on many Generac gaseous-fueled generator sets to comply with the more stringent South Coast Air Quality Management District requirements that are recognized in certain areas in California. Gensets that include this option are also EPA Certified.

General Advisory Note to Dealers

The information provided here is proprietary to Generac and its' authorized dealers. This information may only be disseminated upon request, to regulatory governmental bodies for emissions permitting purposes or to specifying organizations as submittal data when expressly required by project specifications, and shall remain confidential and not open to public viewing. This information is not intended for compilation or sales purposes and may not be used as such, nor may it be reproduced without the expressed written permission of Generac Power Systems, Inc.

Advisory Notes on Emissions Actuals

- The stated values are actual exhaust emission test measurements obtained from units representative of the generator types and engines described.
- Values are official data of record as submitted to the EPA and SCAQMD for certification purposes. Testing was conducted in accordance with prevailing EPA protocols, which are typically accepted by SCAQMD and other regional authorities.
- No emission values provided are to be construed as guarantees of emissions levels for any given Generac generator unit.
- Generac Power Systems, Inc. reserves the right to revise this information without prior notice.
- Consult state and local regulatory agencies for specific permitting requirements.
- The emissions performance data supplied by the equipment manufacturer is only one element required toward completion of the permitting and installation process. State and local regulations may vary on a case-by-case basis and must be consulted by the permit applicant/equipment owner prior to equipment purchase or installation. The data supplied herein by Generac Power Systems, Inc. cannot be construed as a guarantee of installability of the generator set.
- The emission values provided are the result of multi-mode, weighted scale testing in accordance with EPA testing regulations, and may not be representative of any specific load point.
- The emission values provided are not to be construed as emission limits.



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

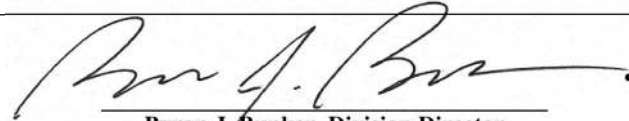
OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: Generac Power Systems, Inc.
(U.S. Manufacturer or Importer)

Certificate Number: RGNXB04.5MJJ-043

Effective Date:
11/16/2023

Expiration Date:
12/31/2024


Byron J. Bunker, Division Director
Compliance Division

Issue Date:
11/16/2023

Revision Date:
N/A

Manufacturer: Generac Power Systems, Inc.
Engine Family: RGNXB04.5MJJ
Mobile/Stationary Certification Type: Stationary
Fuel : Natural Gas (CNG/LNG)
LPG/Propane
Emission Standards :
Part 60 Subpart JJJJ Table 1

Part 90 Phase I
CO (g/kW-hr) : 519.0
HC + NO_x (g/kW-hr) : 13.4
NMHC + NO_x (g/kW-hr) : 13.4
Emergency Use Only : Y

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

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60, 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, 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60, 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, 40 CFR Part 60.

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

Certification of Quality

Generac Power Systems certifies that the products we manufacture have been built and tested in accordance with strict internal and external standards for quality. Our quality management system has been registered with the internationally recognized ISO 9001:2008 standard and our products comply with external standards that include, but are not limited to, CSA, NEMA, EGSA, ISO, and UL.

The Generac Quality Management System (GQMS) ensures the highest standards of quality at every level of production, from raw materials to the finished product. This includes receiving inspection, in-process checks, product and process audits, testing, final inspections, and shipping standards.

Tests of our products are performed in accordance with our internal procedures and controlled through the GQMS to ensure accuracy and effectiveness. The testing process and product designs comply with external standards which may include, but are not limited to: ISO 8528-5, ISO 3046, NFPA 99, NFPA 110, BS 5514, SAE J1349, and DIN 6271.

Generac Power Systems has over one million square feet of manufacturing space and over 2000 employees dedicated to designing and manufacturing power generation equipment in our multiple State of Wisconsin, USA factories. All of our installed and mobile generators are built with pride by our skilled American workforce to ensure our customers receive the quality that they expect from Generac.

We are committed to producing quality products for both our internal and external customers. We will continuously improve our processes and diligently measure all aspects of our business.

Daniel Waschow

Vice President of Quality
Generac Power Systems, Inc.
Waukesha, Wisconsin USA



CERTIFICATE



This is to certify that

Generac Power Systems, Inc.

S45 W29290 Hwy. 59
Waukesha, WI 53189
United States of America

with the organizational units/sites as listed in the annex

has implemented and maintains a **Quality Management System**.

Scope:

Design, Manufacture, and Distribution of Power Products and Solutions.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

ISO 9001 : 2015

Certificate registration no.	10012920 QM15
Date of original certification	2021-06-25
Date of certification	2024-06-06
Valid until	2027-07-15



DQS Inc.

David Tellez
Managing Director

DQS IS A MEMBER OF



062624

Accredited Body: DQS Inc., 1500 McConnor Parkway, Suite 400, Schaumburg, IL 60173 USA
The validity of the certification can only be verified by the QR-code.



Annex to certificate Registration No. 10012920 QM15

Generac Power Systems, Inc.

S45 W29290 Hwy. 59
Waukesha, WI 53189
United States of America

Location

10012920
Generac Power Systems, Inc.
S45 W29290 Hwy. 59
Waukesha, WI 53189
United States of America

10012922
Generac Power Systems, Inc.
211 Murphy Dr.
Eagle, WI 53119
United States of America

10012923
Generac Power Systems, Inc.
757 N. Newcomb St.
Whitewater, WI 53190
United States of America

10012924
Generac Power Systems, Inc.
900 N. Parkway
Jefferson, WI 53549
United States of America

10013528
Generac Power Systems
3815 Oregon St.
Oshkosh, WI 54902
United States of America

10014175
Generac Power Systems, Inc.
351 Collins Road
Jefferson, WI 53549
United States of America

10017103
Generac Mobile
215 Power Drive
Berlin, WI 54923
United States of America

Scope

Design and Support of Power Products and Solutions.

Manufacture and Distribution of Power Products and Solutions.

Manufacture and Distribution of Power Products and Solutions.

Manufacture of Power Products and Solutions.

Manufacture and Distribution of Power Products.

Parts and Components Receiving, Warehousing, Return and Reconditioning of Product, and Distribution to Generac Locations.

Manufacture and Distribution of Power Products.



Annex to certificate
Registration No. 10012920 QM15

Generac Power Systems, Inc.

S45 W29290 Hwy. 59
Waukesha, WI 53189
United States of America

Remote Location

10017439
Generac Mobile
745 E. Knopf St.
Berlin, WI 54923
United States of America

Scope

The remote location at Belin, WI performs the following primary functions: Parts and Components Receiving, Warehousing, and Shipping.

GENERAC DIESEL & BI-FUEL GENERATORS GENERAC / OLYMPIAN GAS GENERATORS SPECIAL SEISMIC CERTIFICATION

*Buehler Project No. 2017-0460.00
April 20, 2020*

Generac and Olympian Gas Generators and Generac Diesel and Bi-Fuel Generators (listed in Table 1) are seismically certified in accordance with the 2018 International Building Code (IBC), 2019 California Building Code (CBC), and American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures, ASCE 7-16. This product line is also preapproved in accordance with PIN 55: Office of Statewide Health Planning and Development (OSHPD) Special Seismic Certification Preapproval (OSP-0282-10), dated 04/08/2020.

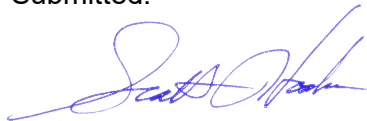
The basis of this seismic certification is through successful tri-axial shake table testing at the US Army Construction Engineering Research Laboratory (Report 2012-0211.00), Curtiss-Wright QualTech NP testing lab (Report Q1218.0 – Rev 2 and amendment dated 09/12/2019), and University of Buffalo testing lab, SEESL (Report No: UB CSEE/SEESL-2019-05 Rev2), and the analytic evaluation by Buehler Engineering, Inc. The shake table testing and operability tests were conducted in accordance with ICC-ES AC 156 (2018).

Units are qualified for seismic applications when properly installed utilizing a **rigid base mounted** configuration, used as intended and located in the United States where the “design 5 percent damped spectral response acceleration at short periods adjusted for site class effects”, S_{DS} , is less than or equal to values in **Table 1**. Below grade, at grade, or above grade installations are permitted and included in this certification. This certification may be valid for additional S_{DS} levels where the height factor, z/h , is less than listed in **Table 1**. This certification is valid for a component importance factor, I_P , of 1.0 or 1.5.

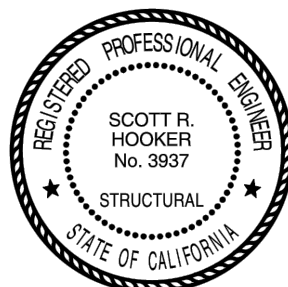
For anchorage requirements, refer to the manufacturer supplied installation instructions for seismic applications. Anchorage requirement details such as brand, type, embedment, edge spacing, anchor spacing, support structure strength, special inspection, and attachment to building and non-building structures must be outlined and approved by the Structural Engineer of Record (SEOR) for the project or building. Structural floors and housekeeping pads must also be designed to resist seismic forces and approved by SEOR. The installing contractor is responsible for the proper installation of units, observing and complying with the mounting requirements, and any additional requirements outlined by the SEOR.

This certification applies only to the manufacture model numbers noted herein, and further limited to the internal components certified by qualified shake table testing. For additional information, refer to the supplemental analysis report.

Submitted:



Scott R. Hooker
President
For Buehler Engineering, Inc.



$S_{DS} = 0.80g @ z/h = 1.0$ $F_p / W_p = 1.80$
 $S_{DS} = 2.44g @ z/h = 0.0$ $F_p / W_p = 1.83$
Table 1B. Gas Generator Certified Product Matrix Cont.

Model Number	Kw Rating	Level 2A Enclosure					Level 3 Enclosure				
		Unit Dimensions (mm)			Operating Weight (lbs)		Unit Dimensions (mm)			Operating Weight (lbs)	
		H	W	L	Steel	Alum	H	W	L	Steel	Alum
SG0035*G54 ¹	35	1574	965	2409	2,328	1,974	n/a	n/a	n/a	n/a	n/a
SG0035*G54 ¹	35	1574	965	2409	2,328	1,974	n/a	n/a	n/a	n/a	n/a
SG0035*G45 ¹	35	1461	965	2409	2,353	2,083	n/a	n/a	n/a	n/a	n/a
SG0040*G54 ¹	40	1574	965	2409	2,328	1,974	n/a	n/a	n/a	n/a	n/a
SG0040*G45 ¹	40	1461	965	2409	2,353	2,083	n/a	n/a	n/a	n/a	n/a
SG0045*G54 ¹	45	1574	965	2409	2,328	1,974	n/a	n/a	n/a	n/a	n/a
SG0045*G45 ¹	45	1461	965	2409	2,353	2,083	n/a	n/a	n/a	n/a	n/a
SG0050*G54 ¹	50	1574	965	2409	2,328	2,070	n/a	n/a	n/a	n/a	n/a
SG0050*G45 ¹	50	1461	965	2409	2,353	2,083	n/a	n/a	n/a	n/a	n/a
SG0050*G68 ¹	50	1722	1016	2840	2,811	2,499	n/a	n/a	n/a	n/a	n/a
SG0060*G45 ¹	60	1779	1028	2839	2,756	2,475	n/a	n/a	n/a	n/a	n/a
SG0060*G68 ¹	60	1722	1016	2840	2,811	2,530	n/a	n/a	n/a	n/a	n/a
SG0070*G45 ¹	70	1779	1028	2839	2,756	2,475	n/a	n/a	n/a	n/a	n/a
SG0070*G68 ¹	70	1722	1016	2840	2,811	2,530	n/a	n/a	n/a	n/a	n/a
SG0080*G45 ¹	80	1779	1028	2839	2,756	2,475	n/a	n/a	n/a	n/a	n/a
SG0080*G68 ²	80	2054	1028	3671	3,600	3,240	n/a	n/a	n/a	n/a	n/a
SG0080*G90 ²	80	1743	1028	2840	3,100	2,802	n/a	n/a	n/a	n/a	n/a
SG0100*G68 ²	100	2054	1028	3671	3,600	3,240	n/a	n/a	n/a	n/a	n/a
SG0100*G90 ²	100	1743	1028	2840	3,100	2,756	n/a	n/a	n/a	n/a	n/a
SG0130*G68 ²	130	2054	1028	3671	3,600	3,240	n/a	n/a	n/a	n/a	n/a
SG0130*G90 ²	130	2054	1028	3671	3,400	2,928	n/a	n/a	n/a	n/a	n/a
SG0150*G68 ²	150	2330	1280	3633	4,190	3,771	n/a	n/a	n/a	n/a	n/a
SG0150*G90 ²	150	2330	1280	3633	4,050	2,928	n/a	n/a	n/a	n/a	n/a
SG0150*G129 ²	150	2372	1371	3923	7,236	n/a	n/a	n/a	n/a	n/a	n/a
SG0150*G133 ²	150	2726	1463	4588	8,000	n/a	n/a	n/a	n/a	n/a	n/a
SG0150*G142 ²	150	2370	1371	3923	6,980	6,122	3274	1617	5269	10,602	8,386
SG0175*G129 ²	175	2372	1371	3923	7,236	n/a	n/a	n/a	n/a	n/a	n/a
SG0175*G133 ²	175	2726	1463	4588	8,000	n/a	n/a	n/a	n/a	n/a	n/a
SG0175*G142 ²	175	2370	1371	3923	6,980	6,122	3274	1617	5269	10,602	8,386
SG0200*G129 ²	200	2372	1371	3923	7,236	n/a	n/a	n/a	n/a	n/a	n/a
SG0200*G133 ²	200	2726	1463	4588	8,000	n/a	n/a	n/a	n/a	n/a	n/a
SG0200*G142 ²	200	2370	1371	3923	6,980	6,206	3274	1617	5269	10,602	8,386
SG0200*G142 ²	200	2726	1463	4588	8,395	6,731	3274	1617	5269	10,905	9,096
SG0230*G129 ²	230	2726	1463	4588	9,169	n/a	n/a	n/a	n/a	n/a	n/a
SG0230*G133 ²	230	2726	1463	4588	9,200	n/a	n/a	n/a	n/a	n/a	n/a
SG0230*G142 ²	230	2726	1463	4588	8,251	7,117	3274	1617	5269	10,602	9,618
SG0250*G129 ²	250	2726	1463	4588	9,169	n/a	n/a	n/a	n/a	n/a	n/a
SG0250*G133 ²	250	2726	1463	4588	9,200	n/a	n/a	n/a	n/a	n/a	n/a
SG0250*G142 ²	250	2726	1463	4588	8,251	7,247	3274	1617	5269	10,905	9,793
SG0250*G142 ²	250	2726	1450	4588	8,502	7,652	3274	1617	5269	11,080	10,340
SG0275*G129 ²	275	2726	1463	4588	9,421	n/a	n/a	n/a	n/a	n/a	n/a
SG0275*G133 ²	275	2726	1463	4588	9,200	n/a	n/a	n/a	n/a	n/a	n/a
SG0275*G142 ²	275	2726	1463	4588	8,502	7,201	3274	1617	5269	11,080	10,340
SG0300*G129 ²	300	2726	1463	4588	9,421	n/a	n/a	n/a	n/a	n/a	n/a
SG0300*G133 ²	300	2726	1463	4588	9,200	1,974	n/a	n/a	n/a	n/a	n/a
SG0300*G142 ²	300	2726	1463	4588	8,502	7,487	3274	1617	5269	11,080	10,340
SG0350*G219 ²	350	2899	1803	5268	11,100	9,510	3281	1954	5890	13,577	11,888
SG0350*G219 ²	350	2899	1803	5268	11,808	10,210	3281	1954	5890	14,285	12,763
SG0400*G219 ²	400	2899	1803	5268	11,100	9,510	3281	1954	5890	13,577	11,888
SG0400*G219 ²	400	2899	1803	5268	11,808	10,210	3281	1954	5890	14,285	12,763
SG0450*G219 ²	450	2899	1803	5268	11,808	10,210	3281	1954	5890	14,285	12,763
SG0500*G258 ²	500	2899	1803	5268	13,274	11,419	3281	1954	5890	15,635	14,274

1. Available in Prime Modular (MPS) configuration (MG vs SG). See Nomenclature.

2. Available in MPS configuration (MG vs SG) AND in Olympian Brand (LG). See Nomenclature.

Generac Power Systems 2 Year (2B) Limited Warranty for Industrial Standby Generators

For the period of warranty noted below, which begins upon the successful start-up and/or on-line activation of the unit, Generac Power Systems, Inc. "Generac" warrants that its Generator will be free from defects in material and workmanship for the items and period set forth below. Generac will, at its discretion, repair or replace any part(s) which, upon evaluation, inspection and testing by Generac or an Independent Authorized Service Dealer, is found to be defective. Any equipment that the purchaser/owner claims to be defective must be evaluated by the nearest Independent Authorized Service Dealer. Emissions components are excluded from coverage under this extended warranty. Emissions warranty coverage is detailed in a separate emissions warranty.

Warranty Coverage: Warranty coverage period is for Two (2) years or two-thousand (2,000) hours, whichever occurs first.

Warranty Coverage in Year(s): 1	Warranty Coverage in Year(s): 2
Parts, Labor and Limited Travel	Limited Parts Only

Limited Gearbox Coverage:

Year(s): 1-5 Coverage	Year(s): 6-10 Coverage
Limited Parts and Labor	Limited Parts Only

Guidelines:

- Unit must be registered and proof of purchase available.
- Any and all warranty repairs and/or concerns must be performed and/or addressed by an Independent Authorized Service Dealer, or branch thereof. Repairs or diagnostics performed by individuals other than Independent Authorized Service Dealers not authorized in writing by Generac will not be covered.
- This Warranty is transferable between ownership of original install site.
- Generac supplied engine coolant heaters (block-heaters), heater controls and circulating pumps are only covered during the first year of the warranty provision.
- Generac may choose to repair, replace or refund a piece of equipment in its sole discretion.
- Enclosures are warranted against rust for the first year of ownership only. Damage caused after receipt of generator is the responsibility of the owner and is not covered by this warranty. Nicks, scrapes, dents or scratches to the painted enclosure should be repaired promptly by the owner.
- Warranty only applies to permanently wired and mounted units.
- Damage to any covered components or consequential damages caused by the use of a non-OEM part will not be covered by the warranty.
- Proof of performance of all required maintenance must be available.
- Travel allowance is limited to 300 miles maximum and seven and one half (7.5) hours maximum (per occurrence, whichever is less) round trip from the nearest Independent Authorized Service Dealer. Any additional travel required will not be covered.
- Engines, driven components and fuel tanks used in Generac's standby power products system can carry a separate manufacturer's (OEM) warranty (the "OEM Warranties"), unless otherwise expressly stated. OEM Warranties are in addition to this Warranty. All warranty claims for defects in material and/or workmanship on Generac product OEM components, may be directed through the OEM distributor/dealer network. OEM Warranties may vary and are subject to change. Generac shall have no liability under OEM warranties.

The following will NOT be covered by this warranty:

- Costs of normal maintenance (i.e. tune-ups, associated part(s), adjustments, loose/leaking clamps, installation and start-up).
- Damage/failures to the generator and/or transfer switch system caused by accidents, shipping, handling, or improper storage.
- Damage/failures caused by operation with improper fuels, speeds, loads or installations other than what's recommended or specified by Generac Power Systems.
- Damage to the generator and/or transfer switch due to the use of non-Generac parts and/or equipment, contaminated fuels, oils, coolants/antifreeze or lack of proper fuels, oil or coolants/antifreeze.
- Failures due to normal wear and tear, accident, misuse, abuse, neglect, improper installation, improper sizing, or rodent, reptile, and/or insect infestation.
- Rental equipment used while warranty repairs are being performed and/or any extraordinary equipment used for removal and/or reinstallation of generator (i.e. cranes, hoists, lifts, et. al.).
- Planes, ferries, railroad, buses, helicopters, snowmobiles, snowcats, off-road vehicles or any other mode of transport deemed not standard by Generac.
- Products that are modified or altered in a manner not authorized by Generac in writing.
- Starting batteries, fuses, light bulbs, engine fluids and any related labor.
- Steel enclosures that rust as a result of improper installation, location in a harsh or salt water environment, or are scratched where the integrity of applied paint is compromised.
- Units sold, rated or used for "Prime Power", "Trailer Mounted" or "Rental Unit" applications as defined by Generac. Contact an Independent Authorized Service Dealer for definitions.
- Shipping costs associated with expedited shipping.
- Additional costs for overtime, holiday or emergency labor costs for repairs outside of normal business hours.
- Any incidental, consequential or indirect damages caused by defects in materials or workmanship, or any delay in repair or replacement of the defective part(s).
- Failures caused by any act of God or external cause including without limitation, fire, theft, freezing, war, lightning, earthquake, windstorm, hail, water, tornado, hurricane, or any other matters which are reasonably beyond the manufacturer's control.

THIS WARRANTY SUPERSEDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. SPECIFICALLY, GENERAC MAKES NO OTHER WARRANTIES AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY IMPLIED WARRANTIES WHICH ARE ALLOWED BY LAW, SHALL BE LIMITED IN DURATION TO THE TERMS OF THE EXPRESS WARRANTY PROVIDED HEREIN. SOME JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. GENERAC'S ONLY LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF PART(S) AS STATED ABOVE. IN NO EVENT SHALL GENERAC BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A DIRECT RESULT OF GENERAC'S NEGLIGENCE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU ALSO HAVE OTHER RIGHTS UNDER APPLICABLE LAW.

FOR AUSTRALIA ONLY: Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

FOR NEW ZEALAND ONLY: Nothing in this warranty statement excludes, restricts or modifies any condition, warranty right or remedy which pursuant to the New Zealand Legislation (Commonwealth or State) including the Fair Trading Practices Act of 1986 or the Consumer Guarantees Act 1993 ("CGA") applies to this limited warranty and may not be so excluded, restricted or modified. Nothing in this statement is intended to have the effect of contracting out of the provisions of the CGA, except to the extent permitted by that Act, and these terms are to be modified to the extent necessary to give effect to that intention. If you acquire goods from Generac Power Systems or any of its authorized resellers and distributors for the purposes of a business, then pursuant to section 43(2) of the CGA, it is agreed that the provisions of the CGA do not apply.

GENERAC POWER SYSTEMS, INC. • P.O. BOX 8 • Waukesha, WI, USA 53187
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To locate the nearest Independent Authorized Service Dealer and to download schematics, exploded views and parts lists
visit our website: www.generac.com

Part No. 0K3486

Revision E (2/16)

Generac Power Systems 2 Year (2B) Limited Warranty for Industrial Transfer Switch Systems

For the period of warranty noted below, which begins upon the successful start-up and/or on-line activation/registration of the unit, Generac Power Systems, Inc. "Generac" warrants that its transfer switch will be free from defects in material and workmanship for the items and period set forth below. Generac will, at its discretion, repair or replace any part(s) which, upon evaluation, inspection and testing by Generac or an Independent Authorized Service Dealer, is found to be defective. Any equipment that the purchaser/owner claims to be defective must be evaluated by the nearest Independent Authorized Service Dealer.

Warranty Coverage in Year(s): 1	Warranty Coverage in Year(s): 2
Parts, Labor and Limited Travel	Limited Parts Only

Guidelines:

- Unit must be registered and proof of purchase available.
- Any and all warranty repairs and/or concerns must be performed and/or addressed by an Independent Authorized Service Dealer, or branch thereof. Repairs or diagnostics performed by individuals other than Independent Authorized Service Dealers not authorized in writing by Generac will not be covered.
- Warranty is transferable between ownership of original installation site.
- Generac may choose to repair, replace or refund a piece of equipment in its sole discretion.
- Warranty only applies to permanently wired and mounted units.
- Enclosures are warranted for the first year of ownership only. Damage caused after receipt of generator is the responsibility of the owner and is not covered by this warranty. Nicks, scrapes, dents or scratches to the painted enclosure should be repaired promptly by the owner.
- Proof of performance of all required maintenance must be available.
- Travel allowance is limited to 300 miles maximum or seven and a half (7.5) hours maximum (per occurrence, whichever is less) round trip from the nearest Independent Authorized Service Dealer. Any additional travel required will not be covered.

The following will NOT be covered by this warranty:

- Costs of normal maintenance (i.e. associated part(s), adjustments, installation or start-up).
- Damage to the transfer switch system caused by accidents, shipping, handling or improper storage.
- Damage/failures caused by operation with loads or installations other than what's recommended or specified by Generac. Unauthorized modification/misapplication will not be warranted unless authorized by Generac in writing.
- Rental equipment used while warranty repairs are being performed and/or any extraordinary equipment used for removal and/or reinstallation of transfer switch (i.e. cranes, hoists, lifts, et. al.).
- Planes, ferries, railroad, buses, helicopters, snowmobiles, snow-cats, off-road vehicles or any other mode of transport deemed not standard by Generac.
- Failures due to normal wear and tear, accident, misuse, abuse, neglect, improper installation, or improper sizing.
- Damage to any covered components or consequential damages caused by the use of a non-OEM part will not be covered by this warranty.
- Damage related to rodent, reptile, and/or insect infestation.
- Repairs or diagnostics performed by individuals other than Independent Authorized Service Dealers not authorized in writing by Generac.
- Steel enclosures that rust as a result of improper installation, location in a harsh or salt water environment, or are scratched where the integrity of applied paint is compromised.
- Fuses, light bulbs and any related labor.
- Units sold, rated or used for "Prime Power," "Trailer Mounted" or "Rental Unit" applications as defined by Generac. Contact an Independent Authorized Service Dealer for definitions.
- Failures caused by any act of God or external cause including without limitation, fire, theft, freezing, war, lightning, earthquake, windstorm, hail, water, tornado, hurricane, or any other matters which are reasonably beyond the manufacturer's control.
- Shipping costs associated with expedited shipping.
- Any incidental, consequential or indirect damages caused by defects in materials or workmanship, or any delay in repair or replacement of the defective part(s).
- Any unit built/manufactured prior to 2014 models.
- Overtime, holiday or emergency labor.
- Living or travel expenses of person(s) performing service, except as specifically included within the terms of a specific unit warranty period.

THIS WARRANTY SUPERSEDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. SPECIFICALLY, GENERAC MAKES NO OTHER WARRANTIES AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY IMPLIED WARRANTIES WHICH ARE ALLOWED BY LAW, SHALL BE LIMITED IN DURATION TO THE TERMS OF THE EXPRESS LIMITED WARRANTY PROVIDED HEREIN. SOME JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. GENERAC'S ONLY LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF PART(S) AS STATED ABOVE. IN NO EVENT SHALL GENERAC BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A DIRECT RESULT OF GENERAC'S NEGLIGENCE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU COULD ALSO HAVE OTHER RIGHTS UNDER APPLICABLE LAW.

FOR AUSTRALIA ONLY: Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

FOR NEW ZEALAND ONLY: Nothing in this warranty statement excludes, restricts or modifies any condition, warranty right or remedy which pursuant to the New Zealand Legislation (Commonwealth or State) including the Fair Trading Practices Act of 1986 or the Consumer Guarantees Act 1993 ("CGA") applies to this limited warranty and may not be so excluded, restricted or modified. Nothing in this statement is intended to have the effect of contracting out of the provisions of the CGA, except to the extent permitted by that Act, and these terms are to be modified to the extent necessary to give effect to that intention. If you acquire goods from Generac Power Systems or any of its authorized resellers and distributors for the purposes of a business, then pursuant to section 43(2) of the CGA, it is agreed that the provisions of the CGA do not apply.

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Part No. 0J4302

Revision H (4/21)

START-UP CHECKLIST TO SCHEDULE INITIAL START-UP AND TESTING

Company Name:

Generator Voltage:

of Phases:

Site Name:

Generator Model:

Generator Serial No:

Site Address:

Generator kW:

Generator kVA:

If multiple generators or ATS record below in Additional Info

On-site Contact:

Phone No:

ATS Model:

ATS Serial No:

On-site Contact E-mail:

Fuel Type:

ALL ITEMS MUST BE FILLED OUT BEFORE CHECKLIST REVIEW

Utility Power

Utility voltage present at time of start-up

 YES ☐ NO ☐

 Voltage No. of Phases

Building load available at time of start-up

 YES ☐ NO ☐

 Expected Load [Amps]

 Phase rotation: CW ☐ CCW ☐ N/A ☐

AC Powered Auxiliaries

AC power supply for AC powered auxiliaries must be sourced from building load side of the transfer switch
All wiring must be labeled and terminated in the customer connection box at the generator.
All wiring must be in a separate conduit(s) than the generator power cables. All wiring must be stranded.

Wiring for battery charger labeled and terminated

 YES ☐ NO ☐ N/A ☐ Voltage

Wiring for block heater labeled and terminated

 YES ☐ NO ☐ N/A ☐ Voltage
DO NOT ENERGIZE THE CIRCUITS UNTIL THE ES START-UP TECHNICIAN REQUESTS POWER

Automatic Transfer Switch (ATS)

Utility breaker installed for the ATS is of equal or lesser value than the ATS current rating.

 Utility breaker current rating [Amps]

 ATS current rating [Amps]

ATS voltage matches Utility Voltage

 YES ☐ NO ☐ No. of Phases

ATS is energized and ready for start-up

 YES ☐ NO ☐

All power cables are pulled and terminated

 YES ☐ NO ☐

All control wires are labeled and terminated

 YES ☐ NO ☐

ATS is installed and secured in accordance with local codes

 YES ☐ NO ☐

Additional switch position outputs or relays needed, i.e. for a BMS or elevator controls

 YES ☐ NO ☐ N/A ☐

Annunciator

All wiring must be labeled and terminated in the customer connection box at the generator.
All wiring must be in a separate conduit(s) than the generator power cables. All wiring must be stranded.
Use Shielded CAT 5 or CAT 6 for Power Zone Pro and Pro Sync Panels.
Required 14awg (min) for power supply AND Belden 3105A or equivalent for communications (2-pair shielded).

Annunciator(s) installed with wires labeled and terminated

 YES ☐ NO ☐ N/A ☐

Control and Output Relay Wiring

All wiring must be labeled and terminated in the customer connection box at the generator.
All wiring must be in a separate conduit(s) than the generator power cables. All wiring must be stranded.

2-wire start wires labeled and terminated

 YES ☐ NO ☐ N/A ☐

Remote e-stop wires labeled and terminated

 YES ☐ NO ☐ N/A ☐

Wiring labeled and terminated to (4) output relays

 YES ☐ NO ☐ N/A ☐

Desired function of output relays:

Relay 1

Relay 2

Relay 3

Relay 4

Batteries	Lead Acid starter batteries only. Batteries will ship with the generator unless noted on the quote.			
	Batteries received with unit	YES ☐	NO ☐	
	If NO do you wish ES to supply them	YES ☐	NO ☐	
DO NOT CONNECT BATTERIES. THE ES START-UP TECHNICIAN WILL DO THIS				
Outdoor Installation	Generator enclosure secured to mounting pad	YES ☐	NO ☐	N/A ☐
	Installation allows clearance for all doors to open/panels to be removed	YES ☐	NO ☐	
	Installation allows for proper cooling airflow into the enclosure	YES ☐	NO ☐	
	Installation allows for proper outlet airflow from the enclosure	YES ☐	NO ☐	
	Installation allows for unobstructed exhaust flow	YES ☐	NO ☐	
Indoor Installation	Generator secured to mounting pad	YES ☐	NO ☐	N/A ☐
	Installation allows clearance for all doors to open/panels to be removed if applicable	YES ☐	NO ☐	N/A ☐
	Installation allows for proper cooling airflow into the room (min 2x size of the radiator)	YES ☐	NO ☐	
	Installation allows for proper outlet airflow from the room (min 1.5x size of the radiator)	YES ☐	NO ☐	
	- Air inlet and air outlet should not share the same wall			
	Ducting used to direct air into and out of the room	YES ☐	NO ☐	
	Installation allows for unobstructed engine exhaust flow	YES ☐	NO ☐	
	- Exhaust system must be plumbed outdoors and comply with local codes			
	Diesel Fuel units: fuel tank vents are plumbed outside of the room	YES ☐	NO ☐	N/A ☐
Load Testing	Is start-up to be performed using building load or a load bank			
		Bldg. Load ☐	Load Bank ☐	
	If <u>Bldg. load</u> , what is the anticipated load [Amps]			
	If <u>Load bank</u> , distance from where the load bank will be operated to the cable connection point [Feet]			
	Where will the cables be connected			
		Gen breaker ☐	Docking station ☐	Other ☐
	If <u>Load bank</u> , what is the duration of testing required [Hours]			
	If <u>Load bank</u> , are there specific requirements for % of load, load steps, etc.			
	YES ☐	NO ☐		
	If <u>YES</u> , please describe testing requirements:			
Fuel Supply	Fuel must be available at time of start-up and for the duration of the start-up and testing.			
	Refer to the Generac installation guide and engine spec sheet for fuel supply requirements.			
	Natural Gas	☐		
	Propane Vapor LPG [vaporized fuel delivered from propane tank to generator skid]	☐		
	Propane Liquid LPL [liquid fuel delivery from propane tank to generator skid]	☐		
	Propane Tank(s) Size [Gallons]: Tank 1 Tank 2 Tank 3 Tank 4 Tank 5			
PLEASE FILL OUT THE FUEL WORKSHEET BELOW				
Air Permit	California requires an air permit to install and operate stationary engines ≥50 bhp (≥37 kW). If the air permit has not been obtained from the local air district prior to startup, Energy Systems is not liable for any notice of violation (NOV) or fines associated with equipment startup and/or operation			
	The Authority to Construct Permit or Permit to Construct Air Permit has been issued	YES ☐	NO ☐	N/A ☐
Witness Testing	Please coordinate all parties required to witness test the system.			
	If witness testing is required, describe what is necessary to perform the testing:			
Training	One hour of system operation training included at time of start-up. A return trip to complete training is not included unless agreed to at time of equipment order. Please verify training time with ES start-up technician upon arrival on site.			
	Note: Rescheduling training may take 2-3 weeks			

FUEL SYSTEM WORKSHEET

NG and LPV Fuel Systems:

The final connection to the generator base frame must use the supplied flexible gas line to allow for vibration (this line must remain straight). **There should be a minimum of 10' of pipe length from the secondary regulator to the generator skid for proper operation of the engine.** Fuel piping and pressure regulator(s) must be sized to provide the required BTU, fuel volume and pressure for full load operation.

LPL Fuel Systems:

The correct vaporizer (negative or positive pressure) must be used for proper operation of the engine.

Refer to the engine spec sheet and Generac installation manual and/or Generac piping guideline manual.

Note 1: The generator(s) require their own fuel supply. NG or LP fuel lines must not tee off to additional equipment after the primary regulator. This could adversely affect the generator performance.

Note 2: Fuel supply must be turned on and available to the generator with rough adjustment of the supply pressure having been made. A manual shutoff valve and safety valves have been installed per local codes along with a manual shutoff valve and pressure test port installed near the generator set to aide with fine adjustment of the supply fuel pressure.

Gas System Information

Fuel Type: Engine Fuel Requirements @100% Load [from engine spec sheet]:
CFH/BTU's: Pressure:

Primary Regulator [natural gas and LPG applications]

Regulator Manufacturer: Regulator Model:
BTU Rating @ the Required Pressure: Regulator Body Size (must match size of pipe being used):

Piping Design [from primary regulator to secondary regulator or generator skid]

Length: Diameter: Qty of Elbows: Qty of Tees: Outlet pressure setting [" WC]:

Secondary Regulator [natural gas and LPG applications, if applicable]

Regulator Manufacturer: Regulator Model:
BTU Rating @ the Required Pressure: Regulator Body Size (must match size of pipe being used):

Piping Design [from secondary regulator to generator skid if applicable]

Length: Diameter: Qty of Elbows: Qty of Tees: Outlet pressure setting [" WC]:

Vaporizer [for applications with liquid propane delivery to generator skid]

Vaporizer Manufacturer: Vaporizer Model:

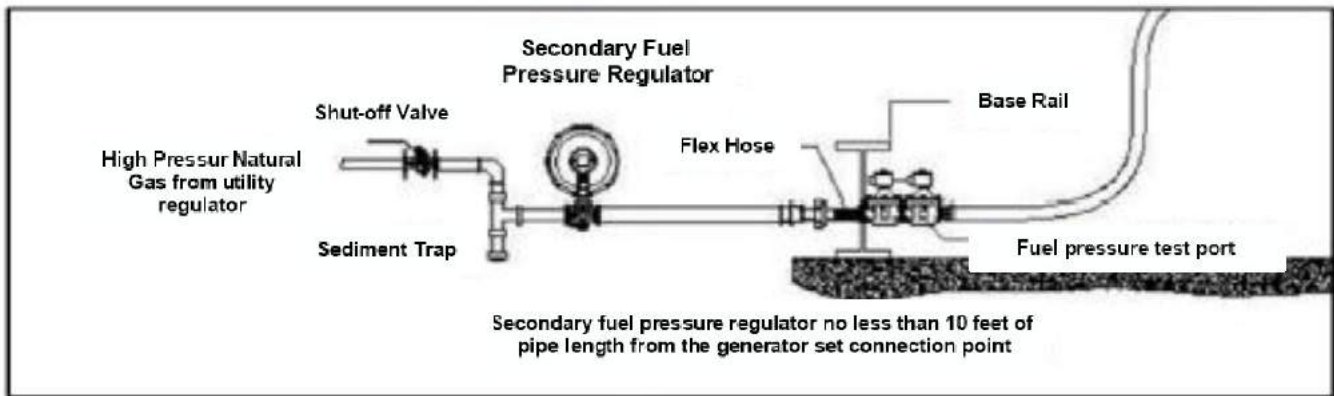
Piping Design [from propane tank to vaporizer]

Length: Diameter: Qty of Elbows: Qty of Tees:

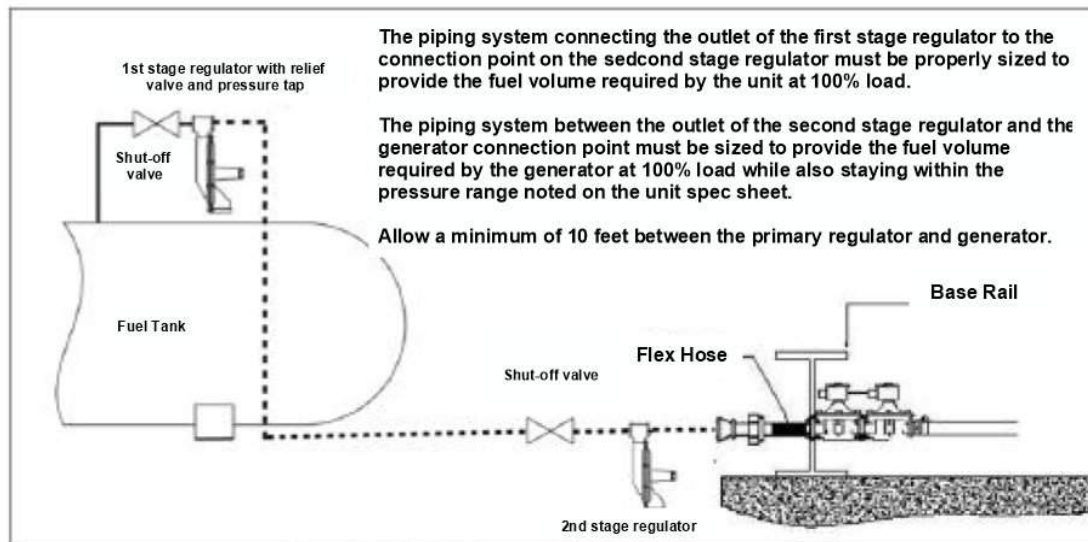
Piping Design [from vaporizer to generator skid]

Length: Diameter: Qty of Elbows: Qty of Tees: Outlet pressure setting [" WC]:

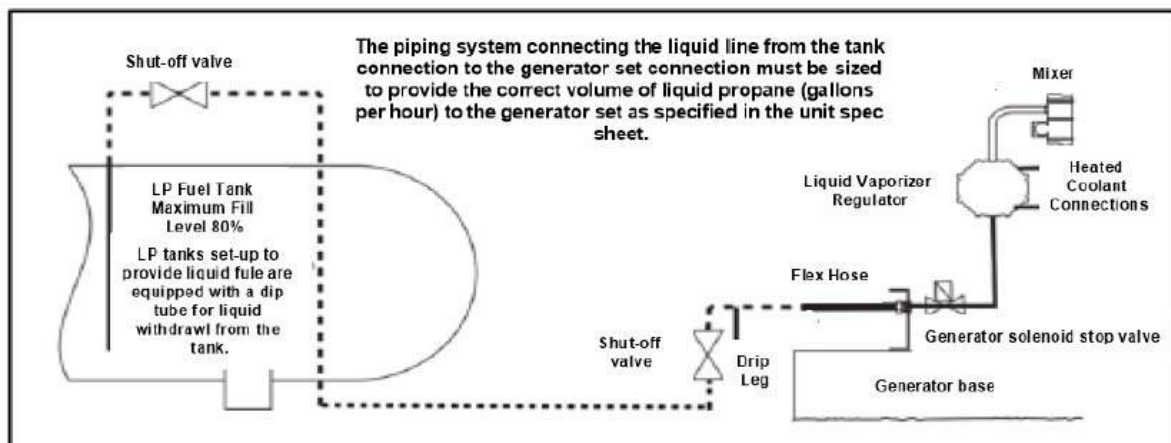
FUEL SYSTEM EXAMPLES



Typical natural gas supply regulator and piping configuration



Typical propane vapor (LPG) tank and regulator withdrawal system



Typical propane liquid (LPL) tank and vaporizer withdrawal system

ATS ELECTRICAL CONNECTIONS

1. Power cables between the generator output breaker, automatic transfer switch(es) and Neutral are properly installed and terminated
2. Power cables, auxiliary AC power supply wiring, control and communication wiring is ran in separate conduits.
3. If ATS is a 2-wire start type switch (i.e. Generac TX, GTS or PSTS or ASCO, Cutler Hammer, etc.) run qty (5) 14awg **stranded** wires between the ATS and generator for remote start and switch position. If a TX series only, (2) additional 14awg **stranded** wires should be provided for back-up power to the TX controller in the event its on-board rechargeable battery depletes.
4. If ATS is a Generac HTS model a 2 conductor twisted shielded pair (18 awg Belden 3105A) is needed for communications to the generator panel. Also run a 4 conductor for DC voltage from the generator to ATS and 2-wire start. All wire to be **stranded**. Wires should be labeled.
5. Verify the specs if any additional ATS communications/contacts are needed. Typically this is only needed if the ATS has a separate remote annunciator, ATS metering or monitoring is needed or if elevators controls require switch position monitoring.

GENERATOR MOUNTING

1. The generator set must be securely mounted and anchored onto a concrete pad. For unit dimensions, weight, conduit stub up locations and fuel connection locations refer to the detailed installation drawing for the specific unit being installed.
2. The concrete pad should be a minimum of 12" longer and wider than the generator mounting skid or sub-base fuel tank to provide at least a 6" apron around the unit.
3. If the generator set is being installed indoors consult the submittal documentation and installation manual.

SITE LOCATION / ACCESS

Location of Generator(s)[parking garage, rooftop, etc.]:

If Rooftop, Describe Access [ladder, elevator, staircase, etc.]:

Site Access Restrictions [parking garage height, etc.]:

Location of Transfer Switch(s):

Distance from Service Vehicle Parking to Generator:

Specific Directions, Instructions or Access Not Already Noted:

PHOTOS REQUIRED TO BE SENT WITH CHECKLIST

1. Generator skid or generator enclosure anchoring (both sides)	YES	☐	NO	☐	N/A	☐
2. Show accessibility to all sides of the skid or enclosure; room to doors to open maintenance activities	YES	☐	NO	☐	N/A	☐
3. Show installation of ATS and accessibility	YES	☐	NO	☐	N/A	☐
4. Show ATS power cable terminations	YES	☐	NO	☐	N/A	☐
5. Show ATS labeled and terminated control wiring	YES	☐	NO	☐	N/A	☐
6. Show Generator power cable terminations at generator breaker	YES	☐	NO	☐	N/A	☐
7. Indoor install: ventilation - inlet air	YES	☐	NO	☐	N/A	☐
8. Indoor install: ventilation - outlet air	YES	☐	NO	☐	N/A	☐
9. Indoor install: engine exhaust piping	YES	☐	NO	☐	N/A	☐
10. Generator customer connection panel - AC auxiliary power wiring terminations	YES	☐	NO	☐	N/A	☐
11. Generator customer connection panel - 2-wire start / relay output wiring terminations	YES	☐	NO	☐	N/A	☐
12. Generator customer connection panel - annunciator wiring terminations	YES	☐	NO	☐	N/A	☐
13. Annunciator - wiring terminations at annunciator	YES	☐	NO	☐	N/A	☐
14. Generator(s) data tag	YES	☐	NO	☐	N/A	☐
15. ATS(s) data tag	YES	☐	NO	☐	N/A	☐
16. Show gas system: primary NG regulator/meter or LP tank/primary regulator	YES	☐	NO	☐	N/A	☐
17. Show gas system: secondary NG or LP regulator and connection to enclosure or LPL vaporizer	YES	☐	NO	☐	N/A	☐
18. Show gas system: pictures of piping	YES	☐	NO	☐	N/A	☐
19. Misc.	YES	☐	NO	☐	N/A	☐
20. Misc.	YES	☐	NO	☐	N/A	☐
21. Misc.	YES	☐	NO	☐	N/A	☐
22. Misc.	YES	☐	NO	☐	N/A	☐
23. Misc.	YES	☐	N	☐	N/A	☐

Warranty Registration Request Form

This information is mandatory. The equipment can not be registered for warranty without the below fields completed

Owner Information

Name:	Company Name:		
Street Address (P.O. Boxes not accepted):	City:	State:	Zip Code:
Phone:	Email:		

Installing Contractor Information

Name:	Company Name:		
Street Address (P.O. Boxes not accepted):	City:	State:	Zip Code:
Phone:	Email:		

Site Information (can be the same as the Owner Information)

Name:	Company Name:		
Street Address (P.O. Boxes not accepted):	City:	State:	Zip Code:
Phone:	Email:		

Additional Information

APPROVED SERVICE DATE AND TIME: Energy Systems will not be able to schedule a technician until this completed and signed checklist is received by our office. If upon arrival for the scheduled work the system is not installed correctly and completely as per these guidelines, the start-up technician will document and review the needed corrections with the site contact before demobilizing from the site. A trip charge per occurrence will be assessed and the start-up rescheduled.

Please return the signed and completed checklist along with requested pictures to our Service Dept. for review and scheduling. For technical support prior to start-up, call our Service Dept at or email us at

Date:	Signature:

CANCELLATION REQUEST

**Please submit your cancellation request to your Generac Inside Sales Representative.
The ISR will review the request and confirm the cancellation along with any charges.**

CONTACT INFORMATION

Distributor/Dealer Name:	Cancellation Request Date:	
Contact Name:	Contact Phone:	Email:

ORDER INFORMATION

SO Number:	Scheduled Ship Date:
PO Number:	Current Shipping Window:
Reason for Cancellation:	

Will this be reordered? Yes or No:

COST ADJUSTMENT

Order Total	Amount: \$
Order Cancellation Fee (See below)	Amount: \$

Order Cancellation charges are based on the original shipping window and enforced at the discretion of Generac.

DISTRIBUTOR/DEALER AUTHORIZATION

Signature: (Sign and Date Below)

FOR INTERNAL USE ONLY

Inside Sales Representative:		
Date:	Approved or Denied:	Amount:

CANCELLATION REQUEST

For Orders ≤ \$100,000 in Total Price:

20 weeks prior to ship date	10% of Selling Price
18 weeks prior to ship date	20% of Selling Price
16 weeks prior to ship date	30% of Selling Price
15 weeks prior to the ship date or less	40% of Selling Price
Discontinued Product (Engine)	No Cancellations Accepted
Non-Standard Tanks	
Special Engineering (Upon Generac SEQ Approval)	Incremental 10% of Selling Price

For Orders > \$100,000 in Total Price:

20 Weeks Prior to Ship Date	10% of Selling Price
18 Weeks Prior to Ship Date	15% of Selling Price
16 Weeks Prior to Ship Date	20% of Selling Price
14 Weeks Prior to Ship Date	30% of Selling Price
13 Weeks Prior to Ship Date	40% of Selling Price
12 Weeks Prior to Ship Date	50% of Selling Price
10 weeks prior to the ship date or less.	60% of Selling Price
Discontinued Product (Engine)	No Cancellations Accepted
Special Engineering (Upon Generac SEQ Approval)	10% of Selling Price

Cancellation For PSTS Transfer Switch Orders:

PSTS Products ≤ 1000 Amps:

> 18 Weeks Prior to Ship Date	0% of Selling Price
14-18 Weeks Prior to Ship Date	25% of Selling Price
Less than 14 Weeks Prior to Ship Date	100% of Selling Price

PSTS Products > 1000 Amps:

> 13 Weeks Prior to Ship Date.	0% of Selling Price
12-13 Weeks Prior to Ship Date	25% of Selling Price
Less than 12 Weeks Prior to Ship Date	100% of Selling Price

Residential Products:

Cancellation of stock item products is permitted provided the cancellation request is executed by Generac sales and order entry prior to shipment. Cancellations are subject to the following fees:

2 – 4 Weeks Prior to Ship Date	2% of Selling Price
1 Day – 2 Weeks Prior to Ship Date	5% of Selling Price