

# System Manual

Installation, Safety, Startup and  
Maintenance

PowerPanel™ Integrated Fuel Dispensing System

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# Introduction

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This manual describes installation, safety protocols and system startup and maintenance procedures of the fuel dispensing system.

The “Installation” section describes the general installation of PowerPanel™ systems. This first topic in this section covers guidelines for a site-specific template, equipment delivery and acceptance, and equipment setup.

The next topic in the “Installation” section describes procedures for wiring connections, including for remote shutdown.

The first topic in the “Safety” section is “Regulations and Code requirements”, which covers the standards that must be met when providing any equipment that includes product dispensing controls as an integrated component.

The next topic in this section presents various warning label descriptions and their levels of importance as related to the installation, startup and maintenance of the fuel dispensing system.

The next section of this document describes “System Startup and Maintenance”. Initial startup and commissioning procedures are discussed first, followed by the procedures to be followed to perform a system restart after a power outage.

Breaker lockout procedures are described next in the “System Startup and Maintenance” section.

Maintenance procedures are discussed last, including the procedures for shutting down a fuel dispenser for in preparation for maintenance.

# 1.0 PowerPanel™ Installation

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This section describes the general installation of PowerPanel™ systems. Please refer to all site-specific documentation for detailed wiring and equipment hookup instructions.

## 1.1 Installation of PowerPanel™ Integrated Systems

Whether you are installing a full PowerPanel™ or a smaller version with the PowerPanel™ system, be sure to complete on-site preparation prior to equipment delivery.

### Site Template

If requested, our engineering staff can send out a site-specific template to assist with placing and arranging the conduit stub-ups prior to pouring the concrete slab.

Although the template is not a required item, we recommend that it be ordered to ensure proper installation of the equipment.

Chase drawings are also available once the job has been ordered.

**If you are unsure whether or not you will receive the site-specific template or the Chase drawings, please contact our engineering staff for more information.**

### Equipment Delivery and Acceptance

You should have a list of all the installation equipment we provide to verify that all of the required equipment is included in your shipment.

Prior to signing off on the receipt for the equipment on the day of delivery, please perform a close visual inspection of any shipping skids, banding, etc. to ensure that the equipment was not damaged in any way during transit.

**You must note any discrepancies or damage on the delivery ticket, and ensure the delivery driver initials each notation. Your notation and the driver's initials will ensure proper documentation of any damage or order discrepancies.**

### Equipment Setup

Most of the equipment we ship will be on a shipping skid that can be removed by a heavy-duty forklift. In some cases, the equipment will be delivered on an open flat-bed trailer and can be removed with the use of a crane and lifting hoist.

The first step to be completed is the permanent securing of the PowerPanel™ to the concrete mounting pad. Once the equipment is permanently in place, the lifting bars at the top of the unit can be removed.

**Note that the seals that are included with the equipment must be installed before the unit can be approved by inspectors.**

Please refer to the “Installation Lifting” image for special sealing instructions regarding the NEMA 3R design.

Proceed with the rest of the equipment installation as described in the product documentation.

## 1.2 Wiring Connections

Before terminating any wires to the PowerPanel™ panel, perform a visual inspection of all factory-set wiring for any potential damage or loose wires. While all wires have been torqued properly at the factory, it is still recommended to inspect the panel and perform spot checks of wiring to verify that there are no loose wires by tugging on them gently.

**Check all main breaker, lug, and feed-wire sizes for compatibility before proceeding further.**

Use the documentation provided for proper wire gauge sizes and insulation types. In general, THHN type wiring is suitable for most PowerPanel™ wiring.

### Cashier Control Center - OPTIONAL

If your system has a remote Cashier Control Center (CCC), find a suitable location for the FUELING SHUTOFF/FUELING RESET station. This station is usually mounted underneath the counter at the check stand.

**Verify that the FUELING SHUTOFF button will not be located where it might accidentally be bumped, as all fueling operations are shut down when this button is pressed.**



Fig. 1.2.1 - FUELING SHUTOFF and FUELING RESET Buttons

There are 4 wires from the FUELING SHUTOFF/FUELING RESET station that will be connected to the PowerPanel™. These wires can be #16AWG or larger.

It is recommended that you use red wires for the FUELING SHUTOFF button and black wires for the FUELING RESET button to avoid confusion during final termination.

The two wires connected to the FUELING SHUTOFF button terminate at the lower side of terminal block ES2. **You must remove the red jumper wire when you make this termination.**

The two wires connected to the FUELING RESET button terminate at the black terminal marked R2.

The red terminal ES1 and the black terminal R1 are used for the FUELING SHUTDOWN and FUELING RESET buttons on the front door of the PowerPanel™.



Fig. 1.2.2 – Wired FUELING SHUTDOWN and FUELING RESET Terminals

Once all connections for the FUELING SHUTOFF/FUELING RESET station have been wired, reattach the panel enclosure cover using the appropriate screws.

## Remote Shutdown Wiring

Use terminal ES3 for the remote FUELING SHUTOFF buttons. Remove the jumper wire from this block and discard it, as it will no longer be needed.

**Regardless of how many pushbuttons will be wired, they must be wired in a single-series circuit.** Accidentally wiring multiple buttons in parallel will result in the FUELING SHUTOFF circuit not working properly.

Once all buttons are terminated, the FUELING SHUTOFF and FUELING RESET circuits are complete.

# 2.0 Safety

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This section describes the various warning labels and their levels of importance as related to installation, startup and maintenance.

## 2.1 Regulations and Code Requirements

This system is 120VAC control, and with the UL489 bus system, all dispenser breakers are on the same phase. The maximum potential of the panel is 120VAC.

When providing any equipment that includes product dispensing controls as an integrated component, the equipment must meet the following standards:

### UL (Underwriters Laboratories) Standards listed under NFPA 30A and 508A

#### NEC 514.11:

Fuel dispensing systems shall be provided with one or more clearly identified emergency shutoff devices or electrical disconnects. Such devices or disconnects shall be installed in approved locations but not less than 6m (20ft) or more than 30m (100ft) from the fuel dispensing devices that they serve.

Emergency shutoff devices or electrical disconnects shall disconnect power to all dispensing devices, to all remote pumps serving the dispensing devices, to all associated power, control, and signal circuits, and to all other electrical equipment in the hazardous (classified) locations surrounding the fuel dispensing devices. Emergency shutoff devices or electrical disconnects shall also mechanically or electrically isolate other fluid transfer systems serving the fuel dispensing area. When more than one emergency shutoff device or electrical disconnect is provided, all devices shall be interconnected.

Resetting from an emergency shutoff condition shall require manual intervention and the manner of resetting shall be approved by the authority having jurisdiction. At attended motor fuel dispensing facilities, the devices or disconnects shall be readily accessible to the attendant and labeled with an approved sign stating “EMERGENCY FUEL SHUTOFF” or equivalent language. At unattended motor fuel dispensing facilities, the devices or disconnects shall be readily accessible to patrons.

At least one additional device or disconnect shall be readily accessible to each group of dispensing devices on an individual island. The device(s) or disconnect(s) shall be labeled with an approved sign stating “EMERGENCY FUEL SHUTOFF” or equivalent language.



### NEC 514.13:

Each dispensing device shall be provided with a means to remove all external voltage sources, including power, communications, data, and video circuits and including feedback, during periods of maintenance and service of the dispensing equipment. The location of this means shall be permitted to be other than inside, or adjacent to, the dispensing device. The means shall be capable of being locked in the open position. The provision for locking or adding a lock to the disconnecting means shall be installed on, or at the switch, circuit breaker or other device used as the disconnecting means, and shall remain in place with or without the lock installed.

## 2.2 Warning Label Descriptions

There are 4 levels of warning labels used. This modified description is from ANSI Z535.

### 1. DANGER

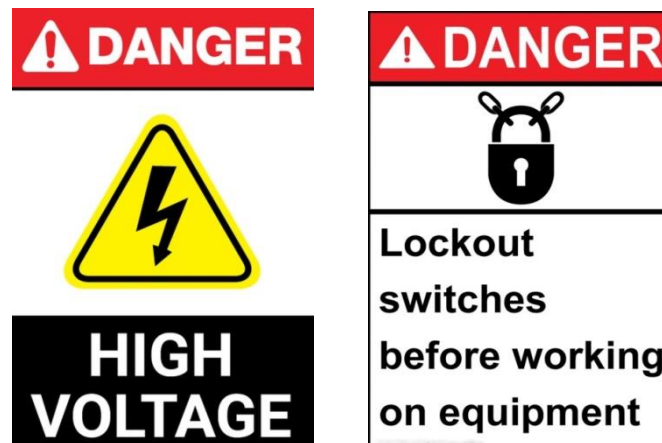


Fig. 2.2.1 TYPICAL DANGER Labels

- This is the highest level of warning; if the instructions are not followed, serious injury and even death may occur. The DANGER logo uses white lettering on a red, or black and red background.

### 2. WARNING



Fig. 2.2.2 WARNING Labels

- This level notice will be displayed when serious injury may occur if the instructions are not strictly followed. These warnings typically appear when working around live equipment with moving machinery. The label is orange and black in color.

### 3. CAUTION



Fig. 2.2.3 CAUTION Label

- This label is displayed with cautionary information which indicates that minor injury and potential equipment damage may result if instructions are not adhered to. Coloration is usually yellow with black or red lettering.

### 4. NOTE/NOTICE



Fig. 2.2.4 Typical NOTE/NOTICE Labels

- This type of label is used to point out important information that a technician or operator needs to be aware of. Labels are usually blue and white, but can also be composed of text with the triangle “Alert” icon.

## 2.3 Other Label Descriptions

There are also two precautionary labels that may be used described in this manual.

### 1. LOCKOUT



Fig. 2.3.1 LOCKOUT Label

- Recommendation that LOCKOUT/TAGOUT procedures should be used in the work area.

### 2. HIGH VOLTAGE



Fig. 2.3.2 HIGH VOLTAGE Warning Label

- This label is often found on shields or guards that prevent any person from coming in contact with High Voltage. This label may also be used on components that carry a voltage potential that is above 50VHAC<sub>PP</sub>.

# 3.0 System Startup and Maintenance

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This section describes the basic procedure that must be followed to ensure safety when starting up the PowerPanel™ system for the first time, or when restarting the system after a fuel shutdown or power outage event.

## 3.1 Initial Startup and Commissioning

The PowerPanel™ is a 120VAC based system. Only qualified personnel familiar with all functions of a fueling forecourt are to perform a start or restart operation.

### Initial Startup and Commissioning Procedure

1. Verify that all circuit breakers in the fueling panel board are in the OFF position and verify that the CP control breaker on the FCP-1 panel is also in the OFF position.
2. Verify that all wires are secure and that all trash from the installation process has been removed. In particular, scraps of wire and/or insulation must be removed to prevent the shorting-out of any components.
3. After verifying all personnel are clear of the equipment, locate the circuit breaker in the panel board labeled “E-STOP/FUEL PANEL POWER” and turn it to the ON position.
4. After verifying with a meter that 120V is present at terminals L and N, locate the 10A CP breaker on the panel labeled “Control Power” and turn it to the ON position.
5. With a voltmeter set to VAC, set the voltage at terminals ES1, ES2, and ES3 to NEUTRAL.
  - a. If all FUEL SHUTDOWN buttons are in the operating position, a reading of 120V should be present at all ESx terminals. Verify the 24VDC Power Supply is set to ON.
  - b. If 120VAC is present on ES1 only, check the wiring of the button labeled “Cashier Control Shutdown” and make sure that it is correct. If necessary, open the Cashier Control enclosure to troubleshoot. The bottom wire of ES2 will land on the SHUTDOWN button’s terminal that is furthest away from the RESET button. The wire of the shutdown closest to the reset will land on the top terminal of ES3.
  - c. If this is not the case, please check all ground and neutral bonding jumpers to verify connections are solid.
6. Press the RESET button on either the front door of the Power Flow panel or the Remote Reset panel if wired in.
  - a. The ES1 & ES2 contactors should energize at this point and all STP contactors will pull in as well.

7. Use the voltmeter to measure the terminals labeled “2” and “N1” located at either the top right or top left of the panel. The voltmeter reading should be 120VAC.
8. Turn on the 3-pole or 2-pole breakers designated for VFC STP motors. Measure each STP contactor to verify that all phases are present for each drive.
9. Perform line-leak detection prior to powering-on the dispensers if necessary.
10. Turn each dispenser breaker to the ON position and measure the voltage at the dispenser power terminals after each breaker is switched.
  - a. After turning on each dispenser breaker, verify that its associated low voltage relays and Ethernet module are energized. (Low Voltage section).
11. With the system up and running, go to each FUEL SHUTDOWN button and simulate an emergency fuel shutdown.
  - a. If your remote shutdown buttons are of the “Break Glass” type, carefully unscrew the cover until the button releases.
  - b. After each time the panel shuts down, press the RESET button until all Shutdown stations have been tested.
12. If your system uses a TLM that has an input/output card (Veeder Root), verify that the program will only send an output as long as the line-leak detector is operational.

**Initial Startup and Commissioning is now complete.**

## 3.2 System Restart after a Power Outage

In the event of a power outage, the ES1 & ES2 contactors will drop out immediately.

### System Restart Procedure

1. Verify that no damage from a lightning strike or other storm-related damage has occurred.
2. If all facility equipment is undamaged, press the green RESET button to start fueling operations again.

## 3.3 Breaker Lockout

Electrical contractors or anyone qualified to work on the PowerPanel™ must be familiar with proper lockout procedures.

The breakers for this panel are capable of being locked in the OUT or ON positions during maintenance operations, depending on requirements.

Critical or life-safety loads require the power source to be locked in the ON position so there will be no accidental disruption of service.



Fig. 3.3.1 Typical Circuit Breaker and Breaker LOCKOUT/LOCKON Adaptor

## Typical Breaker Lockout Procedure

1. Turn the designated breaker to the OFF position.
2. With your thumb and forefinger, squeeze the retainer clips of the lockout together.



Fig. 3.3.2 – Applying LOCKOUT Adapter

3. Locate the two retainer holes just below the breaker handle and slip the retainer pins into the two holes and release.



Fig. 3.3.3 – LOCKOUT Adapter Attached

4. Raise the tab of the lockout and push down towards the retaining clips. The body will slide down over the clips, and the lockout loop will appear near the top.



Fig. 3.3.4 – LOCKOUT Adapter in Place

5. With the lockout loop exposed, attach a padlock to the device. The lockout will take a padlock with approximately a 5/16" shank. If you have a TAGOUT procedure in place, apply notice at this time.



Fig. 3.3.5 – Breaker Locked Out with LOCKOUT Adapter

### Other Breaker Lockout Procedures

The main breaker that feeds power to the PowerPanel™ will need to be locked out if servicing of the panel itself is required.

Consult the breaker manufacturer's procedure to perform the lockout.

If you have the optional STP breaker and bus assembly as part of your unit, use the lockout procedure as listed in Chapter 3, Section 2. The lockouts will be different since they are made to accommodate 2 or 3 pole breakers.

With this optional assembly, there will be a separate feed breaker powering the bus assembly. Consult the manufacturer's recommendations regarding the proper breaker lockout procedure.

## 3.4 Maintenance

The PowerPanel™ needs very little maintenance to keep it in good working order.

### Maintenance procedures

Monthly maintenance:

1. Perform an EMERGENCY FUEL SHUTDOWN AND RESET, and verify proper operation. If you have more than one shutdown, make sure each shutdown will turn the system to the OFF position.
2. Open the Fueling Panel section and inner door. Visually inspect the operational lights on the TVSS to verify that it is in operational mode.
3. For NEMA 3R enclosures, verify that the 3 point door latches are adjusted properly. When adjusted properly, the enclosure door will compress about half of the door gasket all the way around.

Semi-Annual maintenance:

1. Inspect all door gaskets for damage, and if found, replace immediately.
2. Inspect interior of cabinets (both LV and Fuel Panel sections) for buildup of moisture or other aggregates, and clean as required.
3. Inspect the incoming voltage at the panel board main breaker for all 3 phases and neutral.

Annual maintenance:

1. Power down the main breaker of the panel board and go through the wiring connections to verify that all wiring is tightened.
2. Perform random 'Pull' tests on some of the wiring to verify that no loose wiring exists.

## 3.5 Shutting Down a Dispenser for Maintenance

If it is necessary to shut down a single dispenser for maintenance, please follow the lockout procedure located in Section 3.3 for a safe shutdown.

### Dispenser Shutdown Procedure

1. Bag the dispenser according to site protocols.
2. Locate the breaker in the panel board for that dispenser and turn it to the OFF position.
3. Perform the lockout procedure.

*If you are unsure of, or have questions regarding any procedure described in this manual, please contact your local representative.*