PowerPanel™ Procedures

This manual includes procedures for installing and maintaining the PowerPanel for all installers and maintenance personnel involved in servicing the PowerPanel. It outlines the steps from startup to shut down, restarting after power failures, ongoing maintenance, and safety regulations

Table of Contents

1.0 Installation and Startup

This section describes the general installation and start-up 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, on-site preparation should have been done before delivery of the equipment.

Site Template
It is recommended to order an optional template to assist in the placement and arrangement of the conduit stub-ups before the concrete slab is poured. This is site-specific and will help ensure a good installation of the equipment.

Please contact our engineering staff to order the template along with chase drawing.

1.2 Equipment Delivery and Acceptance

Before signing off on the receipt on the day of equipment delivery, please make a close visual inspection of any shipping skids, banding, etc., to ensure that the equipment was not damaged in any way in transit. You should have a list of equipment provided by us to verify that all required equipment was shipped.

Any discrepancies or damage must be noted on the delivery ticket and have the driver's initials, indicating it has been noted.

1.3 Setting Up the Equipment

Most of the equipment 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.

Once the equipment is permanently in place, the lifting bars at the top of the unit can be removed. Please refer to the "Installation Lifting Drawing" for special sealing instructions regarding the NEMA 3R design. There are seals that are included with the equipment and must be installed before the unit can be approved by inspection.

Proceed with the rest of the equipment installation as per the documentation, starting with permanently securing the PowerPanel to the concrete mounting pad.

Please check all main breaker sizes, lug sizes, and feed wire sizes for compatibility before proceeding further.

1.4 Wiring Connections

Before terminating any wires to the PowerPanel panel, perform a visual inspection of all factory wiring to look for any damage or possible loose wires.

Although all wires have been torqued properly at the factory, it is a good idea to go through the panel and perform spot checks of wiring by tugging on them gently to verify that there are no loose wires.

Use the documentation provided for proper wire gauge sizes and insulation types. Generally, wiring of type THHN is suited for most PowerPanel wiring.

1.5 Optional Cashier Control Center (CCC)

If your system has a remote CCC, find a suitable location for the fuel shutdown/fuel reset station (usually mounted underneath the counter at the check stand). Verify that the fuel shutdown button will not be in an area where it will accidentally be bumped, as this will shut down all fueling operations.

Figure 1.5-1 Fueling shutoff and reset buttons

Four (4) wires from the shutdown/reset station will be connected to the PowerPanel. These wires can be #16AWG or larger. It is recommended that you make the shutdown wires red and the reset wires black to avoid confusion during final termination.

The two (2) wires connected to the shutdown button will be terminated to the lower side of terminal block ES2. You will need to remove the red jumper wire when you make this termination.

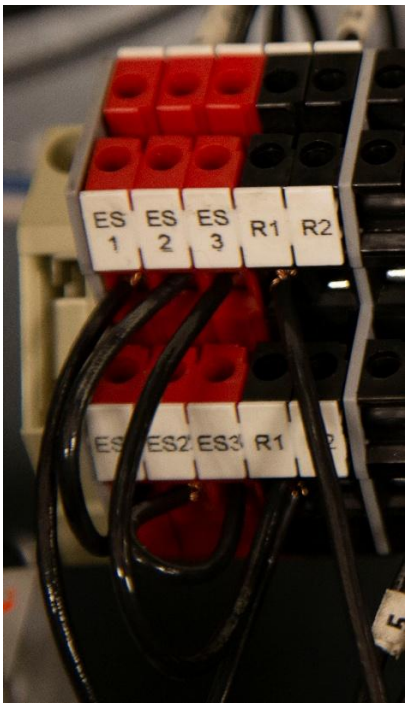

Figure 1.5-2 Fueling shutoff and reset terminals (wired)

Now, terminate the 2 wires from the reset button to the black terminal marked R2. The red ES1 terminal and the black R1 terminal are used for the shutdown/reset buttons on the front door of the PowerPanel.

Once connections are made for the Fuel Shutdown/Fuel Reset station, place the cover back on the enclosure with the appropriate screws.

1.6 Remote Shutdown

Use terminal ES3 for the remote shutdown pushbuttons. 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 pushbuttons in parallel will result in the shutdown circuit not working properly.

Once all pushbuttons are terminated, the Fuel Shutdown/Fuel Reset circuits are complete.

2.0 System Startup and Maintenance

This section outlines the basic steps and procedures for safely starting up the PowerPanel for the first time, restarting the system after a fuel shutdown or power outage, and ongoing maintenance.

2.1 Initial Start-Up/Commissioning Procedure

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.

1. Verify the following are in the off position:
    a. All circuit breakers in the fueling panelboard.
    b. The ‘CP’ control breaker on the FCP-1 panel.
2. Verify that all wires are secure and that all scraps of wire and/or insulation are removed to prevent the shorting out of any components.
3. Ensure all personnel are clear of the equipment.
4. Locate the circuit breaker in the panelboard labelled E-STOP/FUEL PANEL POWER and switch to the ON position.
5. Verify with a voltmeter that 120V is present at terminals ‘L’ and ‘N.’ Turn the 10A CP breaker on the panel marked “Control Power” to the ON position.
6. With a voltmeter set to VAC, measure the voltage at ES1, ES2, and ES3 to neutral.
    a. If all Fuel Shutdown pushbuttons are in the operating position, the reading of 120V should be present at all “ESx” terminals. Verify the 24VDC Power Supply is ON.

b. If 120VAC is present on ES1 only, check whether the wiring of the Cashier Control Shutdown button is correct. If necessary, open the Cashier Control enclosure to troubleshoot.
    i. The bottom wire of ES2 will be landed 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.
    ii. If this is not the case, please check all ground and neutral bonding jumpers to make sure that connections are solid.

7. At this point, press the RESET button on either the front door of the PowerFlow panel or the remote reset if wired in.
    a. Result: The ES1 & ES2 contactors should energize at this point and all STP contactors will pull in as well.
8. With your meter, measure the terminals marked "2" and "N1" located at either the top right or top left of the panel. The voltmeter reading should be 120VAC.
9. 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.
10. Before powering on the dispensers, you can now perform line leak detection, if necessary.
11. Turn each dispenser breaker to the ON position. Measure the voltage at the dispenser power terminals after each breaker is switched.
    a. Verify after turning on each dispenser breaker that its associated low voltage relays, and Ethernet module are energized. (Low Voltage section).
12. 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.
13. 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.

The initial start-up/commissioning is now complete.

2.2 Restarting the System from a Power Failure

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

Restarting System Procedure

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

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 Chapter 3, Section 2.

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

2.3 Lockout Procedure

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

The breakers for this panel can be locked out during maintenance operations or, if otherwise required, they can be locked in the ON position.

Figure 2.3-1, Typical circuit breaker and breaker lockout/lockon adaptor

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.

The following is the typical procedure for locking out a breaker:

STEP 1: Turn the designated breaker to the OFF position.

STEP 2: With your thumb and forefinger, squeeze the retainer clips of the lockout together. Locate the two retainer holes just below the breaker handle.

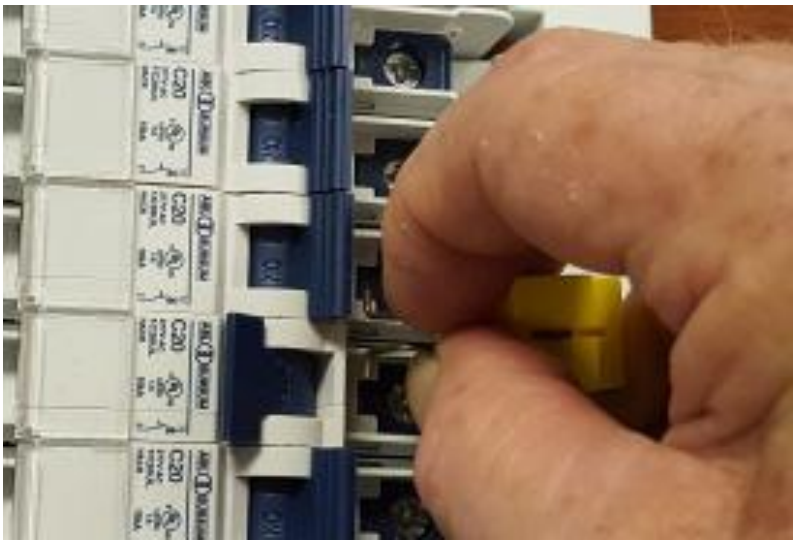

Figure 2.3-2, Step 2 – Applying lockout

STEP 3: Slip the retainer pins into the two holes and release.

Figure 2.3-3, Step 3 – Lockout attached

STEP 4: Now 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.

Figure 2.3-4, Step 4 – Lockout in place

STEP 5: With the lockout loop exposed, apply your padlock lock to the device. The lockout will take a lock with approximately a 5/16” shank. If you have a TAG-OUT procedure in place, apply notice at this time.

Figure 2.3-5, Step 5 – Breaker locked out

2.4 Other Lockouts

The main breaker that feeds power to the PowerPanel must 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 2.3. The lockouts will be different since they are made to accommodate 2- or 3-pole breakers.

Again, with this optional assembly, a separate feed breaker powers the bus assembly. Consult the manufacturer's recommendations regarding the proper method for locking out the breaker.

2.5 Maintenance

The PowerPanel needs minimal maintenance to keep it in good working order.

Monthly

1. Perform an Emergency Fuel Shutdown and Reset operation and verify proper operation. If you have more than one shutdown, make sure each shutdown turns the system off.
2. Open the Fueling Panel section and the inner door. Visually inspect the operational lights on the TVSS to verify that it is operational.
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 gaskets all the way around.

Semi-Annually

1. Inspect all door gaskets for any damage, and if found, replace them immediately.
2. Inspect the interior of cabinets (both LV Section & Fuel Panel sections) for any buildup of moisture or other aggregates. Clean as required.

3. Check the incoming voltage at the panelboard main breaker for all 3 phases and neutral.

Annually

1. Power down the main breaker of the panelboard and go through the wiring connections to verify that all is tightened as it should be. Perform random 'pull' tests on some of the wiring to verify that no loose wiring exists.

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

3.0 Safety

This section defines the emergency shut-off or electrical disconnect procedures and outlines various warning labels and their levels of importance as related to installation, startup, and maintenance.

This system operates on a maximum of 120VAC control voltage. With the UL489 bus system, all dispenser breakers are on the same phase.

3.1 Regulations/Code Requirements

Any equipment that includes product dispensing controls as an integrated component must meet the following UL standards **listed under** NFPA **30A and 508A.**

NEC 514.11
Provide fuel dispensing systems with one or more clearly identified emergency shutoff devices or electrical disconnects. Install these devices or disconnects in approved locations, but not less than 6m (20ft) or more than 30m (100ft) from the fuel dispensing devices that they serve.

Emergency shut-off devices or electrical disconnects cut power to the following:

- All dispensing devices
- All remote pumps serving the dispensing devices
- All associated power, control, and signal circuits
- All other electrical equipment in the hazardous (classified) locations surrounding the fuel dispensing devices.

These devices mechanically or electrically isolate other fluid transfer systems serving the fuel dispensing area. When more than one emergency shut-off device or electrical disconnect is provided, all devices are interconnected.

Resetting from an emergency shutoff requires manual intervention, which must be approved by the authority having jurisdiction.

- At attended motor fuel dispensing facilities, the devices or disconnects must 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 with at least one additional device or disconnect 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 must have access to remove all external voltage sources, including power, communications, data, video circuits, and feedback during periods of maintenance and service of the dispensing equipment.

This access can be inside or adjacent to the dispensing device, but it may be in another location. This access must be locked in an open position.

Install the lock at the switch, circuit breaker, or other device used as the disconnection access. This access must remain in place, whether the lock is installed or not.

3.2 Warning Label Descriptions

There are four levels of warning labels used. The following modified descriptions are from ANSI Z535.

NOTE/NOTICE

Figure 3.2-1, Typical Note Labels

- Points out important information
- Usually blue and white, but can also include text with the triangle “alert” icon

CAUTION

Figure 3.2-2, Caution Label

- Displayed with cautionary information, indicating that minor injury and potential equipment damage may result if instructions are not followed
- Usually yellow with black or red lettering

WARNING

Figure 3.2-2, Caution Label

- Serious injury may occur if the instructions are not strictly followed when working around live equipment with moving machinery
- Orange and black

DANGER

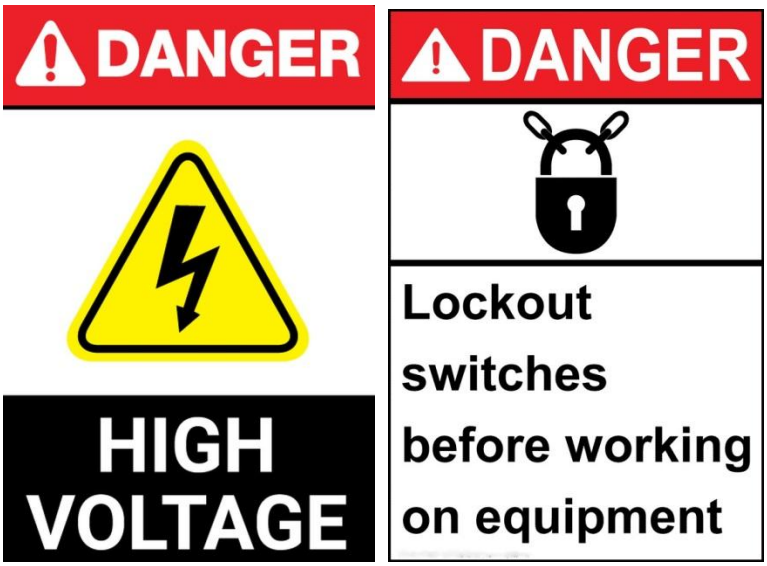

Figure 3.2-3, Typical Caution Labels

- The highest level of warning; if the instructions are not followed, serious injury and even death may occur
- Red or black and red background with white lettering

Other Labels
Some “precautionary” labels may be used in this manual.

LOCKOUT

Figure 3.2-5, Lockout Label

- Recommendation that lockout/tagout procedures should be followed
- Lock image on a blue background

HIGH VOLTAGE

Figure 3.2-6, High Voltage Warning Label

- Often found on shields or guards that prevent contact with high voltage above 50VAC
- Black lightning bolt image on a yellow triangle