

PowerPanel Installation and Maintenance Manual

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1.0 Introduction

This manual will outline the safety standards, startup procedures, and maintenance practices necessary for operating the PowerPanel system. It is designed for qualified personnel responsible for the installation, operation, and upkeep of fueling control panels.

Product owners and technicians can reference this manual for clear guidance on compliance with regulatory codes, identification of hazard labels, safe system startup, and scheduled maintenance tasks. It includes a Safety section addressing hazard prevention and legal standards, and a System Startup and Maintenance section offering step-by-step instructions for equipment operation and upkeep.

2.0 Safety

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

2.1 Regulations and Code Requirements

This system is a 120VAC control system, using the UL489 bus system. All dispenser breakers are on the same phase, and 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 must be equipped with one or more clearly identified emergency shutoff devices or electrical disconnects. These devices must be installed in approved locations, not less than 6 meters (20 feet) and not more than 30 meters (100 feet) from the fuel dispensing devices they serve.

Emergency shutoff devices or electrical disconnects must disconnect power to all dispensing devices, remote pumps serving the dispensing devices, and associated power, control, and signal circuits. Additionally, all other electrical equipment in hazardous (classified) locations surrounding the fuel dispensing devices must be disconnected. They should 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, these devices must be interconnected. Resetting from an emergency shutoff condition requires manual intervention, and the manner of resetting 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. They should be labeled with an approved sign stating “EMERGENCY FUEL SHUTOFF” or equivalent language.

At unattended motor fuel dispensing facilities, the devices or disconnects must be readily accessible to patrons. At least one additional device or disconnect must be accessible to each group of dispensing devices on an individual island. The devices

must also 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

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

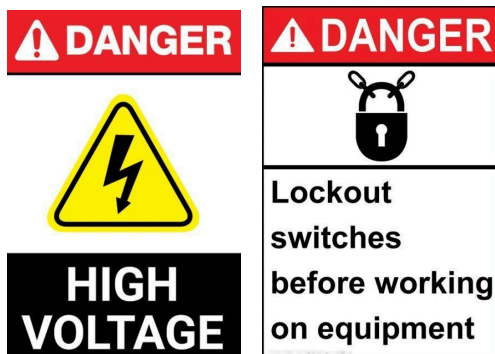


FIG 2.2-1 TYPICAL CAUTION LABELS

2. WARNING

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.



FIG 2.2-2 CAUTION LABEL

3. CAUTION

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.



FIG 2.2-3 CAUTION LABEL

4. NOTE/NOTICE

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.



FIG 2.2-4 TYPICAL NOTE LABELS

2.2.1 Other Labels

Two precautionary labels are also used in this manual:

1. LOCKOUT

Recommendation to the qualified person that Lockout/Tag out procedures should be used in the area to be worked on.



FIG 2.2.1-1 LOCKOUT LABEL

2. HIGH VOLTAGE

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



FIG 2.2.1-2 HIGH VOLTAGE WARNING LABEL

3.0 System Startup and Maintenance

This section will describe the basic steps and procedures that must be followed to ensure a safe start up when starting up the PowerPanel for the first time or restarting the system after a fuel shutdown or power outage event.

3.1 Initial Start-Up 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 Start-Up and Commissioning Procedure

- Verify that all circuit breakers in the fueling panelboard are in the off position and verify that the 'CP' control breaker on the FCP-1 panel is off, as well.
- Verify that all wires are secure and that all trash from the installation has been removed. Scraps of wire and or insulation must be removed to prevent the shorting out of any components.

- After making sure all personnel are clear of the equipment, locate and turn on the circuit breaker in the panelboard labelled as E-STOP and FUEL PANEL POWER to the ON position.
- After verifying with a meter that 120V is present at terminals 'L' and 'N', turn the 10A CP breaker on the panel marked "Control Power" and turn it to the ON position.
- With a voltmeter set to VAC, measure the voltage at ES1, ES2, and ES3 to neutral.
- **Result:** 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.
- If 120VAC is present on ES1 only, check the wiring of the Cashier Control Shutdown button and make sure that it is correct. If necessary, open the Cashier Control enclosure to troubleshoot. 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. If this is not the case, please check all ground and neutral bonding jumpers to make sure that connections are solid.
- At this point, press the RESET button on either the front door of the PowerFlow panel or the remote reset if wired in.
- **Result:** The ES1 & ES2 contactors should energize at this point and all STP contactors will pull in as well.
- 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.
- 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.
- You can now perform line leak detection, if necessary, prior to powering on the dispensers.
- Turn each dispenser breaker to the ON position. Measure the voltage at the dispenser power terminals after each breaker is switched.
 - Verify after turning on each dispenser breaker that its associated low voltage relays, and Ethernet module are energized. (Low Voltage section).
- With the system up and running, go to each Fuel Shutdown button and simulate an emergency fuel shutdown.
 - If your remote shutdown buttons are of the "Break Glass" type, carefully unscrew the cover until the button releases.
 - After each time the panel shuts down, press the RESET button until all Shutdown stations have been tested.

- If your system uses a TLM that has an input and output card (Veeder Root), verify that the program will only send an output if the line leak detector is operational.

The initial start-up and commissioning are now complete.

3.2 Restarting System from Power Failure

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

Restarting System Procedure

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

3.3 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 the next section for a safe shutdown.

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

3.4 Lockout Procedure

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 out during maintenance operations or, if otherwise required, of being locked in the ON position.



FIG 3.4-1 TYPICAL CIRCUIT BREAKER AND BREAKER LOCKOUT and 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.

Procedure

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

1. Turn designated breaker to the OFF position.
2. With your thumb and forefinger, squeeze the retainer clips of the lockout together. Locate the two retainer holes just below the breaker handle.

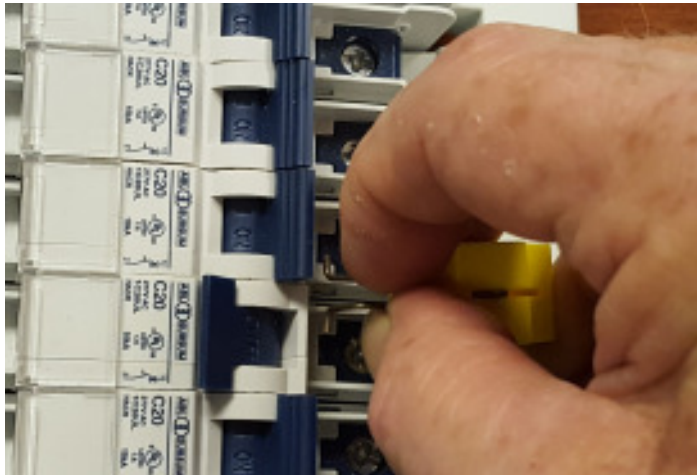


FIG 3.4-2 STEP 2 – APPLYING LOCKOUT

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



FIG 3.4-3 STEP 3 – LOCKOUT ATTACHED

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.

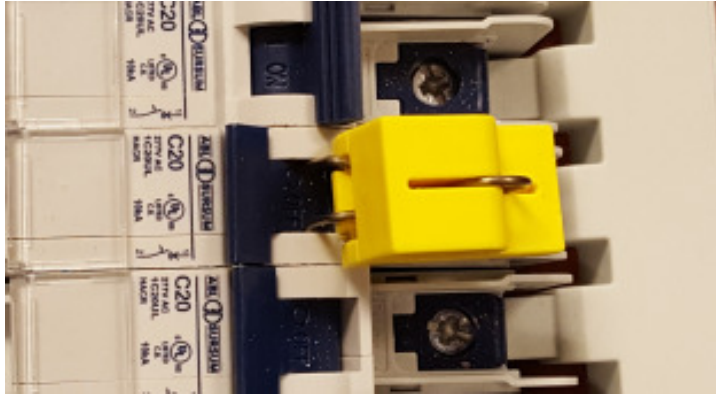


FIG 3.4-4 STEP 4 – LOCKOUT IN PLACE

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.



FIG 3.4-5 STEP 5 – BREAKER LOCKED OUT

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

3.5 Other Lockouts

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 3.4. The lockouts will be different since they are made to accommodate 2 or 3 pole breakers.

Again, with this optional assembly, there will be a separate feed breaker powering the bus assembly. Consult the manufacturer's recommendations in regard to the proper method for locking out the breaker.

3.6 Maintenance

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

Monthly:

- Perform an Emergency Fuel Shutdown and Reset operation and verify proper operation. If you have more than one shutdown, make sure each shutdown will turn the system to the off position.
- Open the Fueling Panel section and inner door. Visually inspect the operational lights on the TVSS to verify that it is in operational mode.
- 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-Annually:

- Inspect all door gaskets for any damage and if found, replace immediately.
- Inspect interior of cabinets (Both LV Section & Fuel Panel sections) for any buildup of moisture or other aggregates. Clean as required.
- Check the incoming voltage at the panelboard main breaker for all 3 phases and neutral.

Annually:

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

4.0 Installation and Start Up

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

4.1 Site Preparation

On-site preparation should be completed before the equipment arrives.

- **Site Template:** Our engineering team can provide a site-specific template to help with placing conduit stub-ups before pouring the concrete slab. While optional,

this template is highly recommended to ensure a smooth installation. Please contact our engineering staff if you are unsure whether you will receive one.

- **Chase Drawings:** These are also available after an order is placed. Contact engineering for more information.

4.2 Equipment Delivery and Acceptance

On the day of delivery, perform a close visual inspection of all shipping materials *before* signing the receipt.

- Check for any damage to skids or banding that may indicate the equipment was damaged in transit.
- Use the provided equipment list to verify that all components have been delivered.
- Crucially, note any damage or discrepancies on the delivery ticket and have the driver initial it.

4.3 Equipment Set-Up

Most equipment arrives on a shipping skid and can be moved with a heavy-duty forklift. In some cases, a crane and lifting hoist may be needed for equipment delivered on a flat-bed trailer.

1. Once the equipment is in its permanent location, the lifting bars at the top of the unit can be removed.
2. Refer to the “Installation Lifting Drawing” for special sealing instructions for NEMA 3R enclosures. The included seals must be installed for the unit to pass inspection.
3. Secure the PowerPanel to the concrete mounting pad.
4. Before proceeding, check that the main breaker sizes, lug sizes, and feed wire sizes are all compatible.

4.4 Wiring Connections

Before terminating any wires, visually inspect all factory wiring for damage or loose connections.

- Although all wires are torqued at the factory, it is good practice to gently tug on them to spot-check for looseness.
- Use the provided documentation to ensure proper wire gauge sizes and insulation types. Generally, THHN wire is suitable for most PowerPanel wiring.

4.5 Optional Cashier Control Center (CCC)

If your system includes a remote CCC, find a suitable location for the fuel shutdown and reset station, such as underneath the counter at the check stand. Ensure the fuel shutdown button is not in a place where it could be bumped accidentally, as this will stop all fueling operations.

1. Four wires (#16AWG or larger) run from the station to the PowerPanel. It is recommended to use red wires for the shutdown and black wires for the reset to avoid confusion.



FIG 4.5-1 FUELING SHUTOFF AND RESET BUTTONS

2. The two 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.

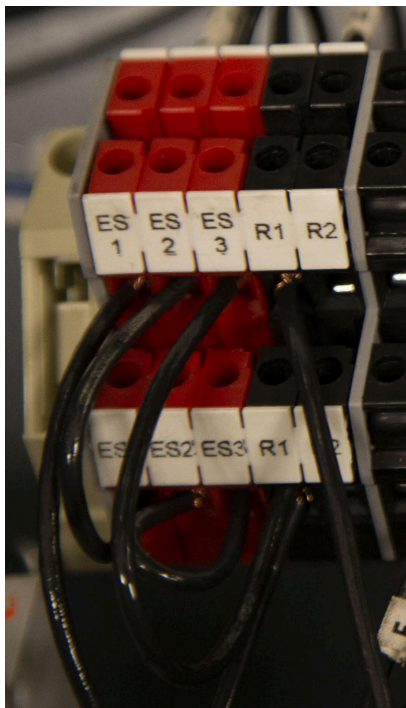


FIG 4.5-2 FUELING SHUTOFF AND RESET TERMINALS (WIRED)

3. Terminate the two reset wires to the black terminal marked **R2**.
4. The red terminal **ES1** and black terminal **R1** are used for the shutdown and reset buttons on the PowerPanel's front door.
5. Once connected, replace the enclosure cover.

4.6 Remote Shutdown

For remote shutdown pushbuttons, you will use terminal **ES3**.

- Remove and discard the jumper wire from this block.
- All pushbuttons must be wired in a single series circuit. Wiring them in parallel will cause the shutdown circuit to fail.

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