2024

PowerPanel™ Integrated system

INSTALLATION AND MAINTENANCE USER MANUAL

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Introduction

The PowerPanelä is a 120VAC Integrated system. This manual provides the safe start-up or restarting of a PowerPanel after a fuel shutdown or power outage. The system uses the UL489 bus system, ensuring all dispense breakers are on the same phase. Only qualified personnels are to start or restart this system. Please read through this manual carefully before attempting to start or restart the PowerPanel. For further questions, contact relevant authorities.

Safety

This section will describe the various warning labels and their levels of importance as related to installation, start-up and maintenance.

1.0 Regulations and Code Requirements

This system is 120VAC control. 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

1.0-1 NEC 514.11:

Fuel dispensing systems shall have one or more clearly identified emergency shutoff devices or electrical disconnects. Such devices or disconnects should be installed at approved locations no less than 6m (20ft) and no 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, all remote pumps serving the dispensing devices, and all associated power, control, and signal circuits.

All other electrical equipment in hazardous (classified) locations surrounding fuel dispensing devices shall 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 should be interconnected.

Resetting an emergency shutoff condition requires manual intervention. The manner of resetting the condition is approved by the relevant authority.

At attended motor fuel dispensing facilities, the devices or disconnects should be readily accessible to the attendant and labeled with an approved sign stating, “EMERGENCY FUEL SHUTOFF” or the equivalent language.

At unattended motor fuel dispensing facilities, devices or disconnects should 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) should be labeled with an approved sign stating, “EMERGENCY FUEL SHUTOFF” or the equivalent language.

1.0-2 NEC 514.13:

Each dispensing device is provided with a means to remove all external voltage sources, including power, communications, data, and video circuits. Feedback should be provided during periods of maintenance and service of the dispensing equipment.

The location of this means should be outside 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, should be installed on or at the switch, circuit breaker, or other device used. The disconnecting means should remain in place with or without the installation of the lock.

1.1 Warning Label Descriptions

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

1.1-1. DANGER

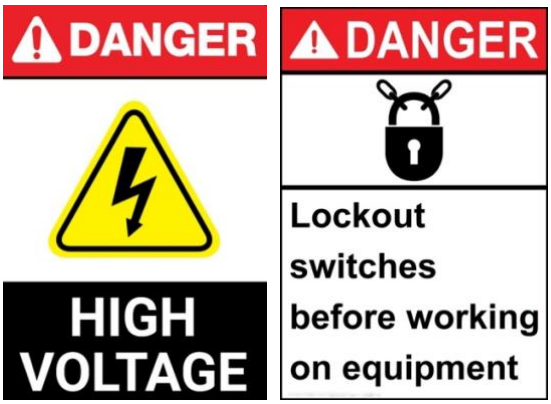

FIG 1.2-1 TYPICAL DANGER LABELS

- This is the highest level of warning; if the instructions are not followed, severe injury or death may occur. The DANGER logo features white lettering, with a red backdrop, against a white or black background.

1.1-2. WARNING

FIG 1.2-2 WARNING LABELS

- This label indicates that serious injury may occur if instructions are not strictly followed. These warnings typically appear when working with live equipment or moving machinery. The labels are orange and black.

1.1-3. CAUTION

FIG 1.2-3 CAUTION LABEL

- This label is displayed with cautionary information indicating that minor injury and potential equipment damage may occur if instructions are not followed. The coloration is usually yellow with black or red lettering.

1.1-4. NOTE/NOTICE

FIG 1.2-4 TYPICAL NOTE LABELS

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

1.1.1 Other Labels

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

HIGH VOLTAGE

FIG 1.1.1-1 HIGH VOLTAGE WARNING LABEL

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

LOCKOUT

FIG 1.1.1-2 LOCKOUT LABEL

- Recommendation to qualified persons that Lockout/Tagout procedures should be used in the area worked on.

Installation and Start Up

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

2.0 Installation of PowerPanelä Integrated Systems

If you are installing a full or smaller PowerPanelä system, on-site preparation should have taken place before delivery of the equipment.

2.1 Site Template

Our engineering department can send out a template to assist with the placement and arrangement of conduit stub-ups before the concrete slab pour. This template is site-specific; although it is not a

required item, we recommend that the template be ordered to ensure good installation of the equipment.

If you are unsure whether or not you will receive this template, please contact our engineering staff.

Chase drawings are also available upon order. Again, contact engineering for more information.

2.2 Equipment Delivery and Acceptance

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

Any discrepancies or damage must be noted on the delivery ticket with the driver's initials.

2.3 Setting Up the Equipment

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

Once the equipment is permanently installed, 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. Seals are included with the equipment and must be installed before the unit is approved for inspection*.

Proceed with the rest of the equipment installation according to the manufacturer's instructions. The first item to be completed is the permanent securing of the PowerPanel ä to the *concrete mounting pad*.

Please check all main breakers, lugs, and feed wire sizes for compatibility before proceeding.

2.4 Wiring Connections

Before terminating any wires in the PowerPanelä panel, a visual inspection of all factory wiring should be performed to identify any damage or possible loose wires.

All the wires were properly torqued at the factory. Go through the panel and perform spot checks of the wiring by tugging gently on the wires to verify that there are no loose wires.

Use the documentation provided for proper wire gauge sizes and insulation types. Wiring of type THHN is generally suited for most PowerPanelä systems.

2.5 Cashier Control Center-*Optional*

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

FIG 2.5-1 FUELING SHUTOFF AND RESET BUTTONS

There are four wires from the shutdown and reset station connected to the PowerPanelä. These wires can be #16AWG or larger. The shutdown and reset wires are recommended to be to be red and black respectively, to avoid confusion during termination.

The two wires connected to the shutdown button are terminated on the lower side of terminal block ES2. When terminating this process, the red jumper wire should be removed.

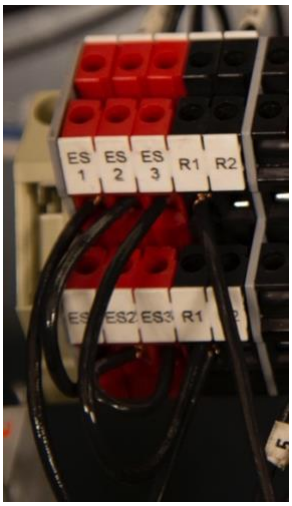

FIG 2.5-2 FUELING SHUTOFF AND RESET TERMINALS (WIRED)

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

Once connections are made to the Fuel Shutdown and Fuel Reset stations, the cover should be placed back on the enclosure with the appropriate screws.

2.6 Remote Shutdown

For the remote shutdown pushbuttons, terminal ES3 is used. Remove the jumper wire from this block and discard it because it will no longer be needed.

Regardless of the number of pushbuttons being wired, the pushbuttons must be connected 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 and Fuel Reset circuits are complete.

Start-Up 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.

3.0 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

1. 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.
2. Verify that all wires are secure and that all trash from the installation has been removed. In particular, scraps of wire and/or insulation must be removed to prevent the shorting out of any components.

3. After making sure all personnel are clear of the equipment, locate and turn on the circuit breaker in the panelboard labelled as E-STOP/FUEL PANEL POWER to the ON position.
4. 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.
5. With a voltmeter set to VAC, measure the voltage at ES1, ES2, and ES3 to neutral.
    a. 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.
    b. 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 have 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.
6. 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.
7. 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.
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. You can now perform line leak detection, if necessary, prior to powering on the dispensers.
10. 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).
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.

The initial start-up and commissioning is now complete.

3.1 Restarting System from Power Failure

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

3.1-1 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.

3.1-2 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 at the end of the chapter for a safe shutdown.

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.

3.2 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 3.2-1 TYPICAL CIRCUIT BREAKER AND BREAKER LOCKOUT/LOCKON ADAPTOR

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

3.2-1Procedure

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

STEP 1: Turn 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.

FIG 3.2-2 STEP 2 – APPLYING LOCKOUT

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

FIG 3.2-3 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.

FIG 3.2-4 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 the notice at this time.

FIG 3.2-5 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.

3.3 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 3.2. The lockouts will be different since they are made to accommodate 2 or 3 pole breakers.

Again, with this optional assembly, there is a separate feed breaker powering the bus assembly. Consult the manufacturer's recommendations for the proper method of locking out the breaker.

3.4 Maintenance

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

3.4-1 MONTHLY:

1. Perform an Emergency Fuel Shutdown and Fuel Reset. Verify proper operation. If you have more than one shutdown, make sure each shutdown turns 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.

3.4-2 SEMI-ANNUALLY:

1. Inspect all door gaskets for any damage. If damage is found, replace immediately.

2. Inspect interior of cabinets (Both LV Section & Fuel Panel sections) for any buildup of moisture or other aggregates. Clean as needed.
3. Check the incoming voltage at the panelboard main breaker for all 3 phases and neutral.

3.4-3 ANNUALLY:

1. Power down the main breaker of the panelboard and go through the wiring connections to verify all connections are secure. Perform random 'pull' tests on some of the wiring to verify that no loose wiring exists.