120VAC PowerPanel™ System Manual

This manual will outline the Installation, Control Center, Start-Up, Shut-Down, Maintenance, and Lockout procedures for a 120VAC Power Panel. It is intended for use by qualified personnel familiar with all functions of a fueling forecourt.

The first section will cover installation, startup, and shut down procedures of the 120VAC Power Panel. This includes site planning, equipment delivery and setup. It will also explain how to inspect the equipment for damage at the time of delivery. The second section will cover general maintenance, restarting, and various lockout procedures to use during times of routine or emergency maintenance.

Table of Contents

Installation of PowerPanel™ Integrated Systems 3
- Site Template 3
- Equipment Delivery and Acceptance 3
- Setting Up the Equipment 3

Wiring Connections 4

Cashier Control Center-*Optional* 4

Remote Shutoff 6

Initial Start-Up/Commissioning 6
- Initial Start-Up/Commissioning Procedure 6

Restarting System from Power Failure 8
- Restarting System Procedure 8
- Shutting Down a Dispenser for Maintenance 8

Lockout Procedure 8
- Procedure 9

Other Lockouts 11

Maintenance 11
- Monthly: 11
- Semi-Annually: 11
- Annually: 11

Prodedure Updates 12

Installation and Start Up

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

INSTALLATION OF POWERPANEL™ INTEGRATED SYSTEMS

Whether you are installing a full Power Panel™ or a smaller version with the Power Panel™ system, on-site preparation should have taken place prior to delivery of the equipment.

SITE TEMPLATE

Our engineering can send out a template to assist in placement and arranging of the conduit stub-ups prior to the concrete slab pour. This template will be site-specific, and although it is not a required item, we recommend that the template be ordered to ensure a good installation of the equipment.

If you are unsure if you will receive this template, please contact our engineering staff.

Chase drawings are also available once the job has been ordered. Again, contact the engineering staff for more information.

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 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 as having been noted.

SETTING UP THE EQUIPMENT

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.

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 unit can be approved by inspection.*

Proceed with the rest of the equipment installation as per the documentation. The first item to be completed is the permanent securing of the Power Panel ™ to the *concrete mounting pad*.

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

WIRING CONNECTIONS

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

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 Power Panel™ wiring.

CASHIER CONTROL CENTER-*OPTIONAL*

If your system has a remote CCC, find a suitable location for the fuel shutoff and fuel reset station (usually mounted underneath the counter at the check stand). Verify that the fuel shutoff button will not be in an area where it will accidentally be bumped, as this will shut down all fueling operations. See FIG 1 for an image of the Fueling Shutoff and Fueling Reset buttons.



FIG 1 Fueling Shutoff and Fueling Reset buttons

There are 4 wires from the shutoff and fueling reset station that will be connected to the Power Panel™. These wires can be #16AWG or larger. It is recommended that you make the shutoff wires red and the reset wires black to avoid confusion during final termination.

The two wires connected to the shutoff 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.

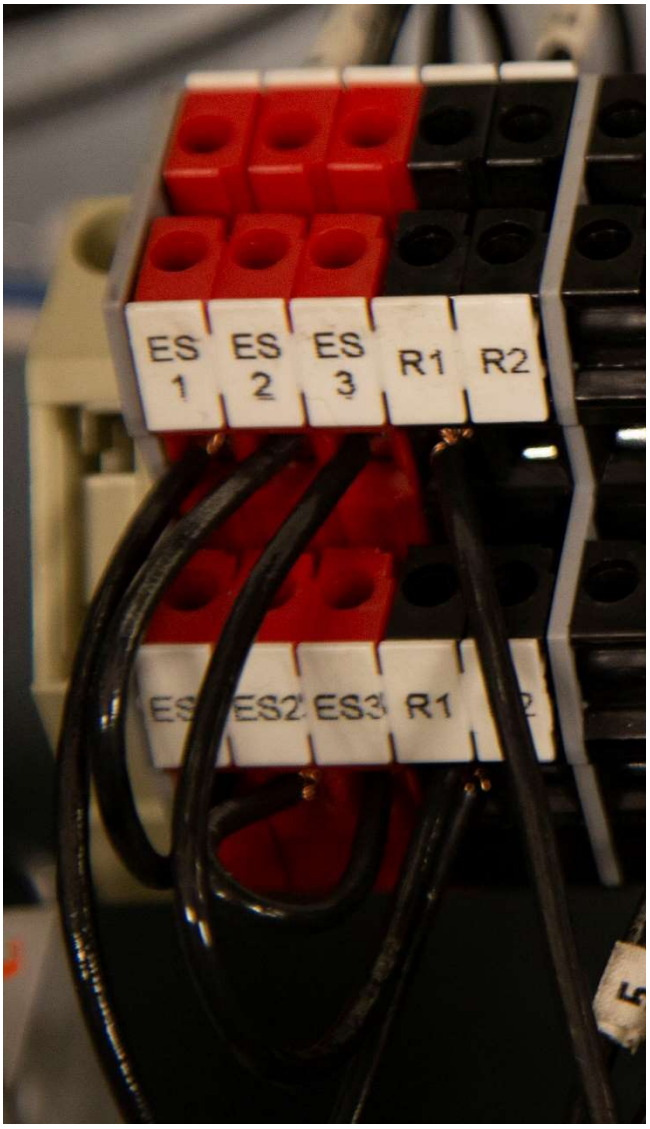


FIG 2 Fueling shutoff and fueling reset button wiring

Now, terminate the 2 wires from the reset button to the black terminal marked R2. The red terminal ES1 and the black terminal R1 are used for the shutoff and reset buttons on the front door of the Power Panel™. See FIG 2 for an image of the fueling shutoff and reset buttons' wiring.

Once connections are made for the fuel shutoff and fuel reset station, place the cover back on the enclosure with the appropriate screws.

REMOTE SHUTOFF

For the remote shutoff pushbuttons, you will be using terminal ES3. 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 shutoff circuit not working properly.

Once all push buttons are terminated, the Fuel Shutoff and Fuel Reset circuits are complete.

System Start-Up & Maintenance

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

INITIAL START-UP AND COMMISSIONING

The Power Panel 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 Shutoff 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 Shutoff button 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 shutoff button's terminal that is furthest away from the reset button. The wire of the shutoff 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 Shutoff button and simulate an emergency fuel shutoff.
    a. If your remote shutoff 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 Shutoff 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/commissioning is now complete.

RESTARTING SYSTEM FROM 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 section for a safe shutoff.

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.

LOCKOUT PROCEDURE

Electrical contractors or anyone qualified to work on the Power Panel 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.



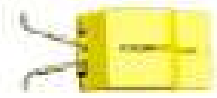


FIG 3 Typical Circuit Breaker and FIG 4 Breaker Lockout/Lockdown Adapter

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. See FIG 5.

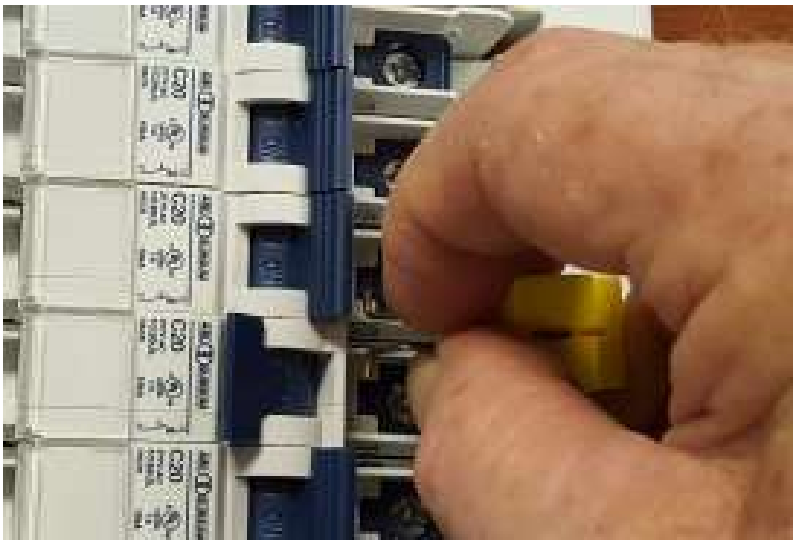


FIG 5: STEP 2 – APPLYING LOCKOUT

3. Slip the retainer pins into the two holes and release. See FIG 6.



FIG 6: 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. See FIG 7.

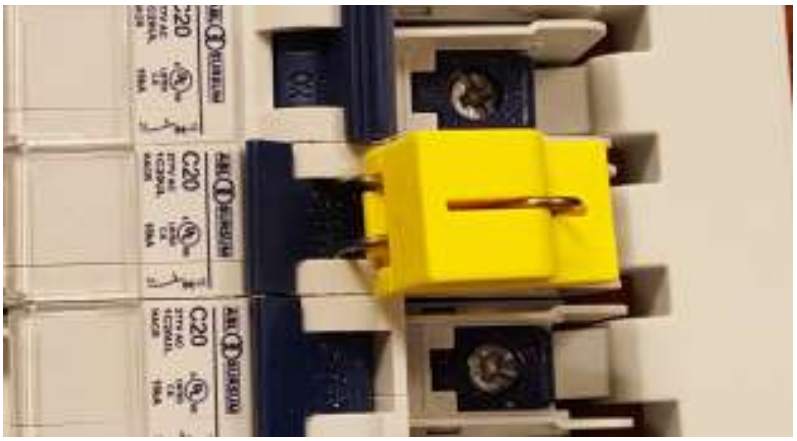


FIG 7: STEP 4 – LOCKOUT IN PLACE

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. See FIG 8.



FIG 8: 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.

OTHER LOCKOUTS

The main breaker that feeds power to the Power Panel 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, review the LOCKOUT PROCEDURE section. 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 regarding the proper method for locking out the breaker.

MAINTENANCE

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

MONTHLY:

1. Perform an Emergency Fuel Shutoff and Reset operation and verify proper operation. If you have more than one shutoff, make sure each shutoff 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-ANNUALLY:

1. Inspect all door gaskets for any damage and if found, replace immediately.
2. Inspect 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 should be. Perform random 'pull' tests on some of the wiring to verify that no loose wiring exists.

PRODEDURE UPDATES

UPDATED 10/18/2026 – CORA BENJAMIN

- Updated for consistency and image labeling

UPDATED 8/16/2026 – CORA BENJAMIN

- Added Installation and Start UP procedure to full manual.
- Rewrote the Introduction.
- Expanded the Table of Contents to include new information.
- Updated font, text size, and layout to be cohesive throughout the document.

UPDATED 8/9/2026 – CORA BENJAMIN

- Moved the Maintenance section to the end of the procedure.
- Added Introduction
- Added Table of Contents

UPDATED 8/2/2026 – CORA BENJAMIN

- Combined sections Initial Startup, Regular Maintenance, Restarting the System, Lockout Procedure, and Other Lockouts into one System Startup & Maintenance document.