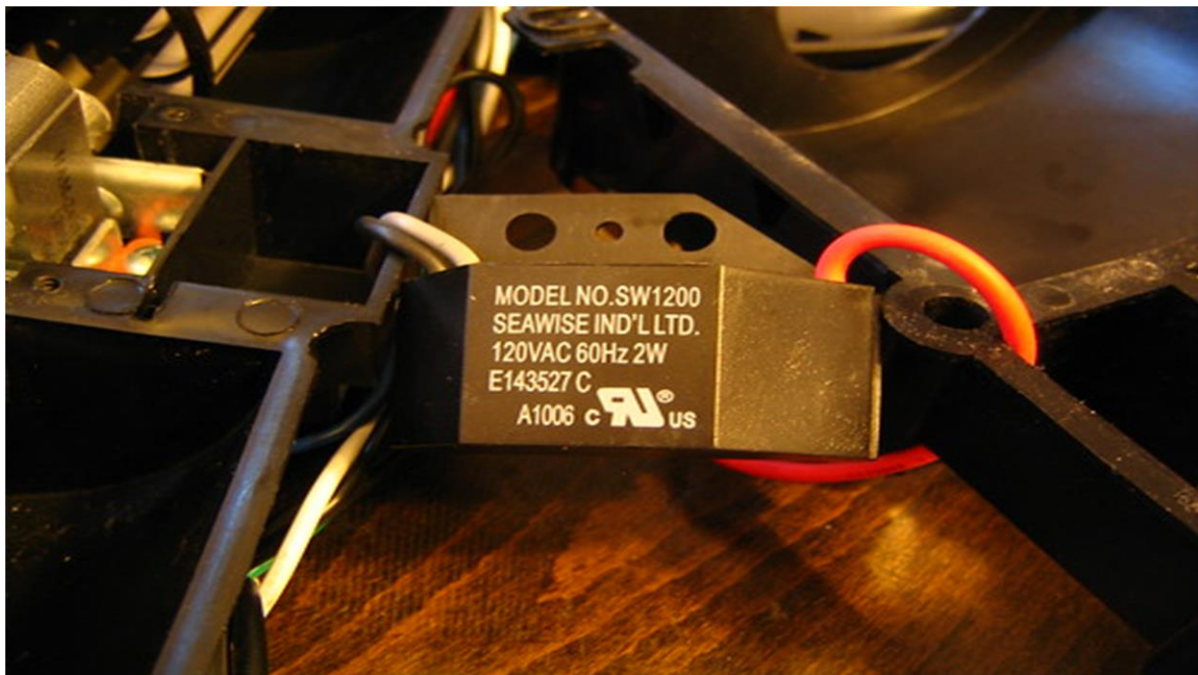


Instruction Manual



PowerPanel™ 120VAC based system

PROCEDURES FOR START-UP / MAINTENANCE / SAFETY

Introduction

PowerPanel utilizes a 120VAC legacy control voltage system. This manual will direct and assist qualified personnel to understand the company systems, which possess a reliable, yet pre-existing installation base. Since PowerPanel will be utilizing the 120VAC, which provides a higher potential voltage, personnel will adopt proper maintenance and safety procedures to ensure successful protocol and long-term reliability.

The 120VAC can be dangerous and potentially lethal. Therefore, electricians and maintenance staff need to understand the start-up, maintenance, and safety procedures to properly estimate the power of 120VAC. This manual will also demonstrate the necessary steps to manage and safeguard the systems, therefore keeping them operating in an effective manner.

Contents

- 1.0 Safety..... 2**
 - 1.1 Regulations and Code Requirements..... 2
 - UL (Underwriters Laboratories) Standards listed under NFPA 30A and 508A..... 2
 - 1.2 Warning Label Descriptions 3
- 2.0 Installation and Start Up 5**
 - 2.1 Installation of PowerPanel Integrated Systems..... 5
 - 2.2 Equipment Delivery and Acceptance 6
 - 2.3 Setting Up the Equipment..... 6
 - 2.4 Wiring Connections..... 7
 - 2.5 Cashier Control Center-*Optional*..... 7
 - 2.6 Remote Shutdown 9
- 3.0 Start-Up and Maintenance 9**
 - 3.1 Initial Start-Up and Commissioning 9
 - 3.2 Restarting System from Power Failure 10
 - 3.3 Lockout Procedure..... 11
 - 3.4 Other Lockouts..... 12
 - 3.5 Maintenance..... 12

1.0 Safety

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

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.

1.1 Regulations and Code Requirements

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.
- 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.
 - 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 and 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 shall be interconnected.
- Resetting from an emergency shutoff condition shall require manual intervention, and the manner or resetting shall be 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 and 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 during periods of maintenance and service of the dispensing equipment, including power, communications, data, and video circuits and feedback.
- 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.

1.2 Warning Label Descriptions

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

DANGER



Figure 1-1



Figure 1-2

- *Figure 1-1* and *Figure 1-2* are labels that demonstrate the highest level of warning; not following the instructions may result in significant injury and even death. The “DANGER” logo uses a red or black and red background with white lettering.

WARNING



Figure 1-3



Figure 1-4

- *Figure 1-3 and Figure 1-4* are labels that demonstrate a level notice that is displayed when significant 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.

CAUTION



Figure 1-5

- *Figure 1-5* is a label that displays cautionary information. Failure to adhere to the information may result in minor injury and potential equipment damage. The coloration is usually yellow with black or red lettering.

NOTE/NOTICE



Figure 1-6

- *Figure 1-6* is a label that indicates vital information of which a technician or operator must be aware. Labels are usually blue and white, but they can also be composed of text with the triangle “alert” icon.

LOCKOUT



Figure 1-7

- *Figure 1-7* is a label that recommends that Lockout/Tagout procedures be used in areas that require work.

HIGH VOLTAGE



Figure 1-8

- *Figure 1-8* is a label that alerts an individual that the shields or guards may contain high voltage. This symbol may also accompany components that may carry a voltage potential that is above 50VHAC_{PP}.

2.0 Installation and Start Up

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

2.1 Installation of PowerPanel Integrated Systems

Whether installing a full PowerPanel or a smaller version with the PowerPanel system, on-site preparation should take place prior to delivery of the equipment.

Site Template

The engineering department can send out a template to assist in placement and arranging of the conduit stub-ups prior to pouring the concrete slab. This template will be site-specific.

1. Order the template to ensure proper installation of the equipment.
2. Contact the engineering department if the template is not received.
3. Locate chase drawings after the job has been ordered.
4. Contact engineering for more information.

2.2 Equipment Delivery and Acceptance

Use the inventory list provided by the company to verify all required equipment has been shipped. On the day of equipment delivery, be sure to:

1. Inspect equipment for any damage.
 - This includes the shipping skid, package bands, boxes, and any items processed in the delivery.
2. Write any discrepancy or damage to the equipment on the delivery ticket.
3. Ensure delivery driver signs and initials all identified discrepancies and damages.
4. Sign the shipping receipt after inspection.

2.3 Setting Up the Equipment

Most of the equipment is delivered on a shipping skid that can be removed by a heavy-duty forklift. Equipment delivered on an open flat-bed trailer can be removed with the use of a crane and lifting hoist.

1. Ensure the equipment is permanently in place.
2. Remove the lifting bars at the top of the unit.
3. Refer to the “**Installation Lifting Drawing**” for special sealing instructions regarding the NEMA 3R design.
4. Install the seals that are included with the equipment.
5. Inspect the unit for approval.



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



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

2.4 Wiring Connections

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

1. Ensure all wires have been torqued properly at the factory.
2. Inspect the panel and perform spot checks of wiring by gently pulling them to verify the presence of loose wires.
3. Use the provided documentation for proper wire gauge sizes and insulation types.



Generally, wiring of type THHN is suited for most PowerPanel wiring.

2.5 Cashier Control Center-Optional

If the 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. See *Figure 2-1*.



Figure 2-1 FUELING SHUTOFF AND FUELING RESET BUTTONS

There are four (4) wires from the shutdown/reset station that will be connected to the PowerPanel. These wires can be #16AWG or larger.

1. Make the shutdown wires red and the reset wires black to avoid confusion during final termination. See *Figure 2-2*.
2. The two wires connected to the shutdown button will be terminated to the lower side of terminal block ES2.
3. Remove the red jumper wire to complete the termination.

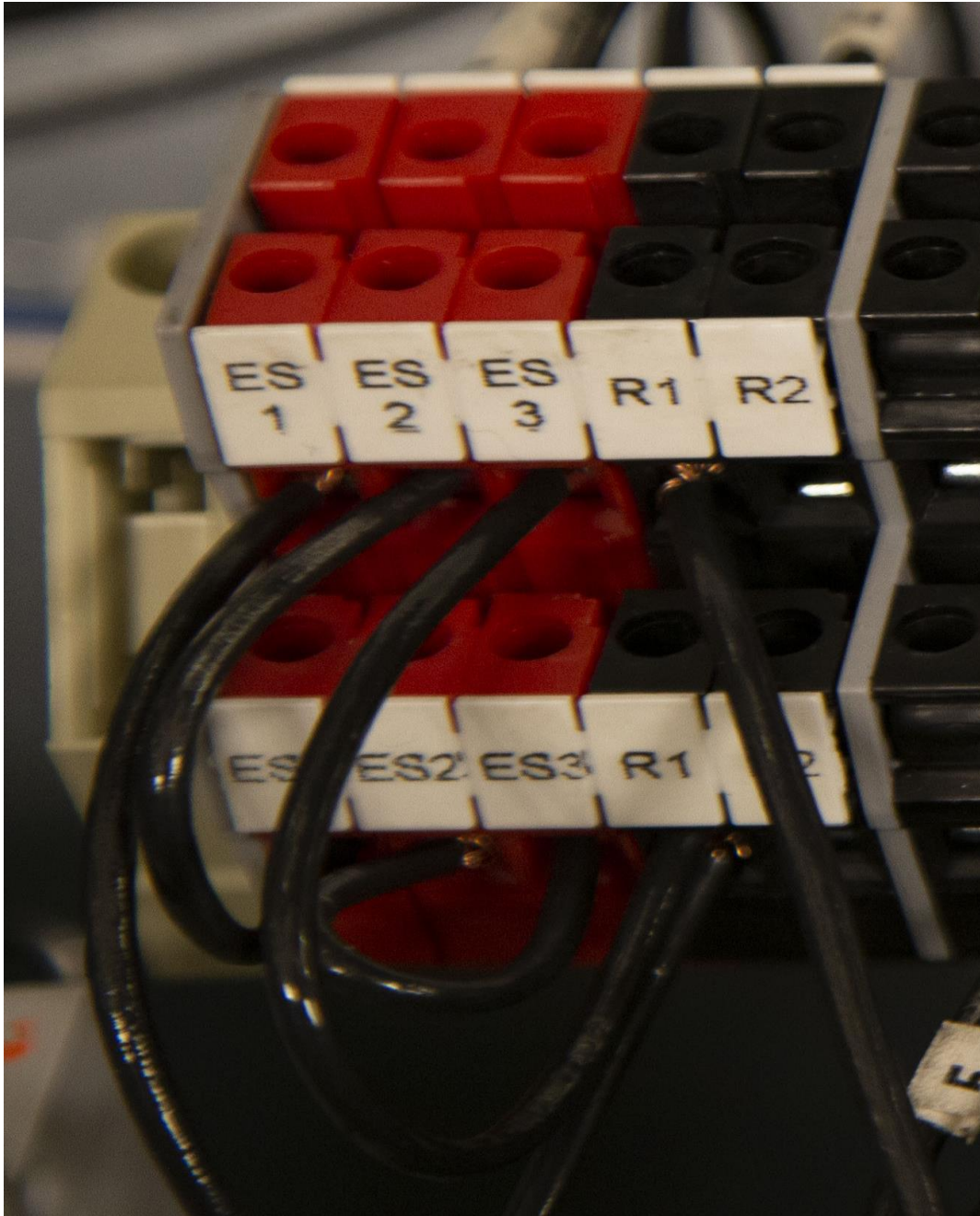


Figure 2.2 FUELING SHUTOFF AND RESET TERMINAL 1

4. Terminate the two (2) wires from the reset button to the black terminal marked R2. See *Figure 2-2*.
5. The red terminal ES1 and the black terminal R1 are used for the shutdown/reset buttons on the front door of the PowerPanel.
6. Place the cover back on the enclosure with the appropriate screws once connections are made for the Fuel Shutdown/Fuel Reset station.

2.6 Remote Shutdown

1. Locate the remote shutdown pushbuttons for terminal ES3.
2. Remove the jumper wire from this block.
3. Discard the jumper wire as it is no longer needed.
4. Wire the pushbuttons in a single series circuit.



There may be several pushbuttons. Wiring multiple pushbuttons in parallel will result in the shutdown circuit working improperly.



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

3.0 Start-Up and Maintenance

This section outlines the basic steps and safety procedures 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.

Procedure

1. Verify all circuit breakers in the fueling panelboard are in the “OFF” position.
2. Verify the ‘CP’ control breaker on the FCP-1 panel is off.
3. Verify all wires are secure and remove all trash from the installation.
 - Remove all scraps of wire and/or insulation to prevent the shorting-out of any components.
4. Locate the panelboard, and ensure all personnel are clear of the equipment.
5. Turn on the circuit breaker labelled as “E-STOP/FUEL PANEL POWER” to the “ON” position.
6. Verifying that 120V is present at terminals ‘L’ and ‘N’.
7. Turn the 10A CP breaker on the panel marked “Control Power” to the “ON” position.
8. Set a voltmeter to “VAC”.
9. Measure the voltage at ES1, ES2, and ES3 to “neutral.”

10. Verify the 24VDC Power Supply is ON.
 - If all Fuel Shutdown pushbuttons are in the operating position, the reading of 120V should be present at all “ESx” terminals.
 - 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.
11. Press the RESET button on either the front door of the PowerFlow panel or the remote reset if wired in.
 - The ES1 & ES2 contactors should energize at this point and all STP contactors will pull in as well.
12. Measure with a meter the terminals marked “2” and “N1” located at either the top right or top left of the panel. The voltmeter reading should be 120VAC.
13. Turn on the 3-pole or 2-pole breakers designated for VFC STP motors.
14. Measure each STP contactor to verify that all phases are present for each drive.
15. Perform line leak detection prior to powering on the dispensers.
16. Turn each dispenser breaker to the “ON” position.
17. Measure the voltage at the dispenser power terminals after switching each breaker.
 - Verify after turning on each dispenser breaker that its associated low voltage relays, and Ethernet module are energized. (Low Voltage section).
 - The system should be up and running,
18. 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/output card (Veeder Root), verify that the program will only send an output if the line leak detector is operational.
19. The initial start-up/commissioning is 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

1. Verify no damage from a lightning strike or other storm-related damage has occurred.
2. Ensure all facility equipment is in proper order.
3. 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, 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 to the “OFF” position.
3. Perform the lockout procedure.

3.3 Lockout Procedure

Electrical contractors, or anyone qualified to work on the PowerPanel, must be familiar with proper lockout procedures. The breakers for this panel are capable of being locked out during maintenance operations or, if otherwise required, of being locked in the “ON” position. 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.

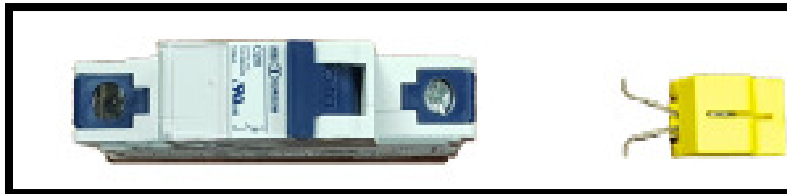


Figure 3-1 TYPICAL CIRCUIT BREAKER AND BREAKER LOCKOUT/LOCK-ON ADAPTOR

Procedure

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

1. Turn designated breaker to the “OFF” position.
2. Locate the two retainer holes just below the breaker handle.
3. Squeeze the retainer clips of the lockout together with thumb and forefinger. See *Figure 3-2*.
4. Slip the retainer pins into the two holes and release. See *Figure 3-3*.



Figure 3-2 APPLYING LOCKOUT



Figure 3-3 LOCKOUT ATTACHED

5. 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 *Figure 3-4*.

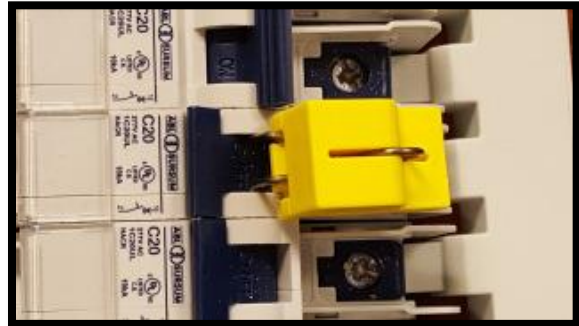


Figure 3-4 LOCKOUT IN PLACE

6. With the lockout loop exposed, apply padlock lock to the device. The lockout will take a lock with an approximate 5/16-inch shank. If a TAG-OUT procedure is in place, immediately apply notice. See *Figure 3-5*.



Figure 3-5 BREAKER LOCKED-OUT

3.4 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.

1. Consult the breaker manufacturer's procedure to perform the lockout.
2. Use the lockout procedure as listed in "3.3 Lockout Procedure" for the optional STP breaker and bus assembly part of the unit. The lockouts will be different since they are made to accommodate two or three pole breakers.
3. Consult the manufacturer's recommendations regarding the proper method for locking out the breaker. With this optional assembly, there will be a separate feed breaker powering the bus assembly.

The PowerPanel needs little maintenance to keep it in good working order. Follow procedural steps and scheduled timings to maintain proper functionality.

Monthly

1. Ensure system is in the “OFF” position. For multiple shutdowns, each system still requires the “OFF” position.
2. Perform an **Emergency Fuel Shutdown and Reset operation** and verify proper operation.
3. Open the “Fueling Panel” section and inner door.
4. Inspect the operational lights on the TVSS to verify that it is in operational mode.
5. Verify the 3-point door latches are properly adjusted for NEMA 3R enclosures. When adjusted properly, the enclosure door will compress approximately half of the door gasket all the way around.

Semi-Annually

1. Inspect all door gaskets for any damage.
2. Replace any damaged door gaskets immediately.
3. Inspect the interior of cabinets (LV Section and Fuel Panel sections) for any buildup of moisture or other aggregates.
4. Clean cabinets required.
5. Check the incoming voltage at the panelboard main breaker for all three phases and neutral.

Annually

1. Power down the main breaker of the panelboard.
2. Inspect all wiring connections to verify that no loose wiring exists.



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