

2015



[INSTALLATION MANUAL]

Patco Electrical Services
ISOFuel Installation Manual

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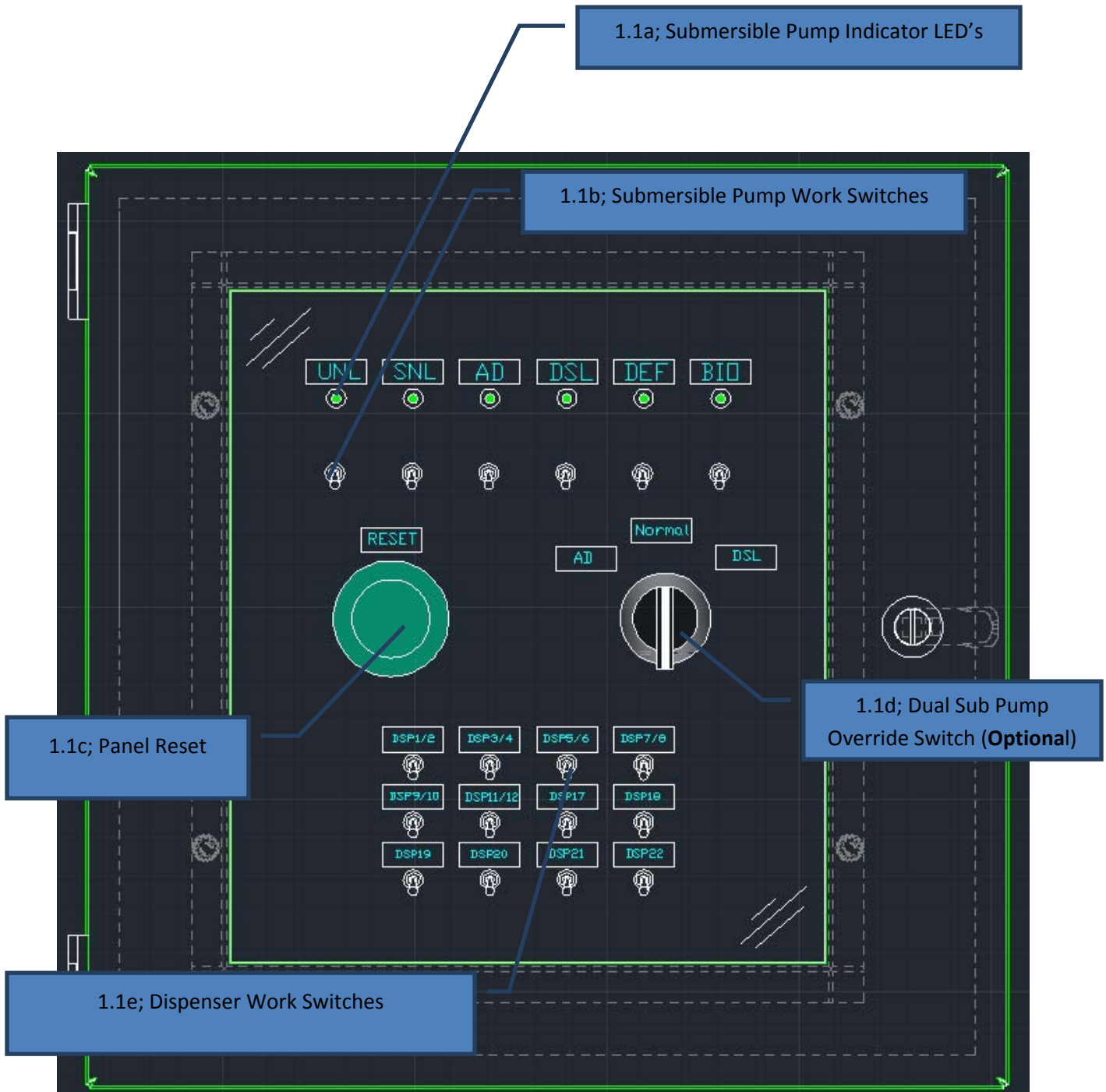
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The ISO Fuel panel has been developed to save time and money in the electrical installation of the fuel equipment while maintaining NEC 2011 compliance for fuel station control systems. This panel contains all of the power, contactors, work switches, and terminals needed for the fuel installation.

The exact hardware placement for your panel may differ from the illustrations in this installation manual due to the site specific design of the ISO Fuel panel.

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1 ISO Fuel Front Door



1.1 Door Switches

All necessary controls for maintenance are located on the front of the ISO Fuel enclosure, contained within a window kit to provide protection for the devices from accidental use or unnecessary damage to any devices. All of the door devices are factory wired to terminals located behind the door to allow for easy replacement.

[1.1a & 1.1b]: At the top of the windows viewing area there are submersible pump work switches with LED pilot devices. The work switches below can be pushed down to turn off the submersible pump for maintenance or to remove from service. This function is in compliance with NEC 2011 requirements for fueling equipment.

[1.1c]: In the middle of the window flush to the left, there is a green, momentary, push button. This button is **ONLY** used to reset the ISO Fuel enclosure if the ESTOP button has been pressed or the ISO Fuel has lost power.

[1.1d]: (This function is optional and not a standard device on all ISO Fuel panels) In the middle of the window flush to the right, there is a 3 position, selector switch for dual submersible pumps. This switch can be used for one of the following operations:

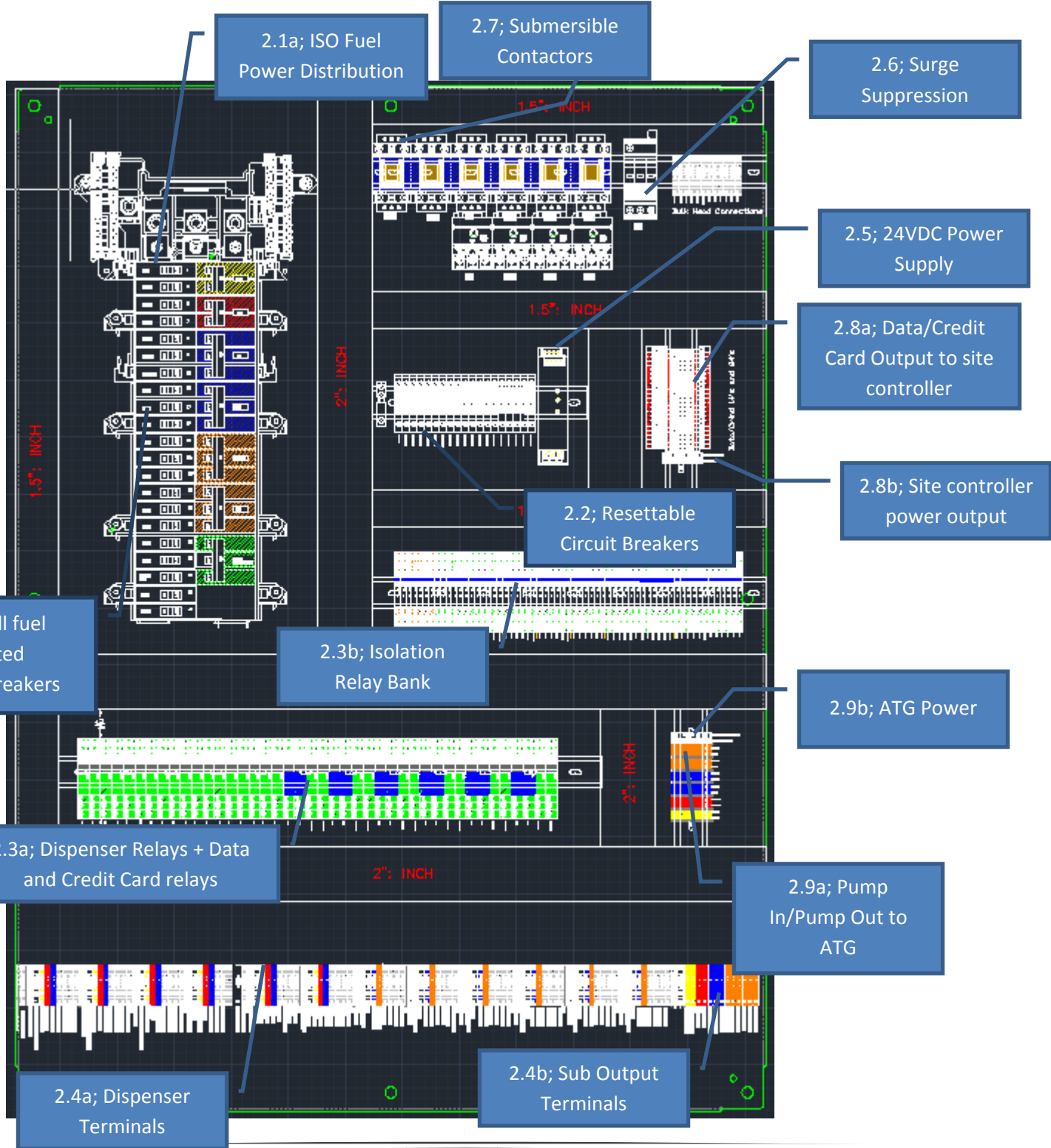
- i. **Center;** This position causes the pumps to run in their “Normal” use. Both submersibles will run to their originally intended dispensers.*
- ii. **Left;** When the switch is turned to the left, only the (Pump A) submersible will run and all dispensers will be fed through the (Pump A) sub pump.*
- iii. **Right;** When the switch is turned to the right, only the (Pump B) submersible will run and all dispensers will be fed through the (Pump B) sub pump.*

[1.1e]: At the bottom of the viewing area, there are work switches for each dispenser. By pressing the switches down, all wiring to the dispenser will be disconnected; power and neutral, data and credit card, and any intercom or CCTV. This function is in compliance with NEC 2011 requirements for fueling equipment.

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2 ISO Fuel Subpanel (Exact layout subject to site specific design)

The sub panel layout is a visual aide to allow for familiarization of the internal working devices and their location.



2.1a ISO Fuel Power Distribution

This is the main power feed for the ISO Fuel control panel. This contains all necessary circuit breakers for fuel operations. ***The ISO Fuel power panel requires a 100A – 120/208 3 phase circuit or a 100A 120/240 1 phase circuit depending on the site design, see panel UL label for the site specific power design.*** Any open spaces in the ISO Fuel main power panel shall not be used for field wiring.

2.1b Fuel Related Circuit Breakers

Circuit protection is provided for fuel related equipment. These circuit breakers feed each dispenser, submersible pump, site controllers, and monitoring system. ***The fueling equipment is feed from opposite phases and mechanical isolation is achieved in the panel. Field alterations can cause damage to dispensing equipment and/or the ISO Fuel panel.***

2.2 Resettable Circuit Breakers

These resettable circuit breakers fuse down the power to 6, 8 and 10 amps. The breaker FU1 will always be your control circuit. Each dispenser has its own breaker.



2.3a & 2.3b Relay Banks

Each relay has the coil voltage listed next to the LED indicator light as well as a description label on the black removal handle. ***Please make note of the coil voltage, if replacing a relay, as the physical properties are common between different voltages.***

2.3a Power Relays (2PDT)

These relays are for each dispenser power/neutral, data and credit card. Each relay has LED indication with amber light. This light will be illuminated if the coil has been energized.

2.3b Isolation Relays (SPDT)

These relays are responsible for STP signal isolation, the control circuit and to break each dispenser neutral wire in the event that the breaker is turned to the off position, rather than the dispenser work switch. Each relay has LED indication with amber light. This light will be illuminated if the coil has been energized.

2.4a Dispenser Terminals

The dispenser terminals are color coded and a legend is installed beneath the terminals for easier installation. Each dispenser block will have 2 data terminals and 2 credit card terminals. The electricians will land the data and credit card wiring to the respective terminal noted by the legend.



2.4b Sub Output Terminals

These terminals are the output terminals for the field connection of the submersible pump motor leads. Depending on the site specific configuration, the output terminals will be designed to feed an intermediate pump control device such as a VFD, VFC, Smart Controller, or some other device. If this design is used, a black and white terminal will accompany each set of output terminals, the black and white terminals will be used as the initiating circuit for the intermediate device. The initiating output voltage is 120VAC.

2.4c All Stop Connections

The connection for the All Stop wiring is on the first 2 terminals on the left end of the main terminal strip. The All Stop circuit is a 24VDC closed loop circuit powered from the ISO Fuel panel and is designed to simultaneously disconnect power and related wiring to all fueling equipment. A single push button and enclosure is provided, additional buttons can be added and must be normally closed and wired in series. Terminal jumpers are installed during the factory testing process and must be removed after the push button installation. A second All Stop connection point is an option and maybe present on some panels. This connection is designed for a secondary input from a device other than a push button, such as a fire suppression system. This connection will also be 2 wires and will be located immediately to the right of the main All Stop terminals and will require a normally closed, dry contact from the secondary device. These terminals will also have factory jumpers and if this secondary connection point is not used, the factory jumpers will need to stay in place in order for the main All Stop to function.

2.5 Power Supply

The power supply is a 120VAC-24VDC regulated source that feeds the control circuit throughout the panel.



2.6 Surge Suppression

The surge suppression is a Type II device. Designed to protect the ISO Fuel, the surge suppression detects high continuous voltage and reroutes any transient voltage to ground. The surge device has a GREEN flag in the status window. If the GREEN turns to RED, then the device must be replaced and is no longer providing TVSS protection. The ISO Fuel panel will continue to work with a failed surge device.



2.7 Submersible Contactors

These contactors are responsible for providing and breaking power to the submersible pumps. Contactors can be used to start and stop each submersible pump or they can be used to provide power to an external device, such as a VFC or Smart Controller. The functionality is per design and site specific.

2.8a Data/Credit Card Wiring Terminals

These terminals are used to bring the credit card and data wiring through the ISO Fuel control panel to tie in with the ESTOP and dispenser work switch. The 2 wire DATA is listed as (DAT) and the 2 wire CREDIT CARD is listed as (CRN)



2.8b Site Controller Terminals

These terminals are used to provide a field connection point for power to the Site Controller (D-Box, Commander, Fusion, etc.). Additional output terminals may be installed for other fuel related devices. These output terminals are for 120VAC devices and are NOT controlled by the ESTOP circuit.

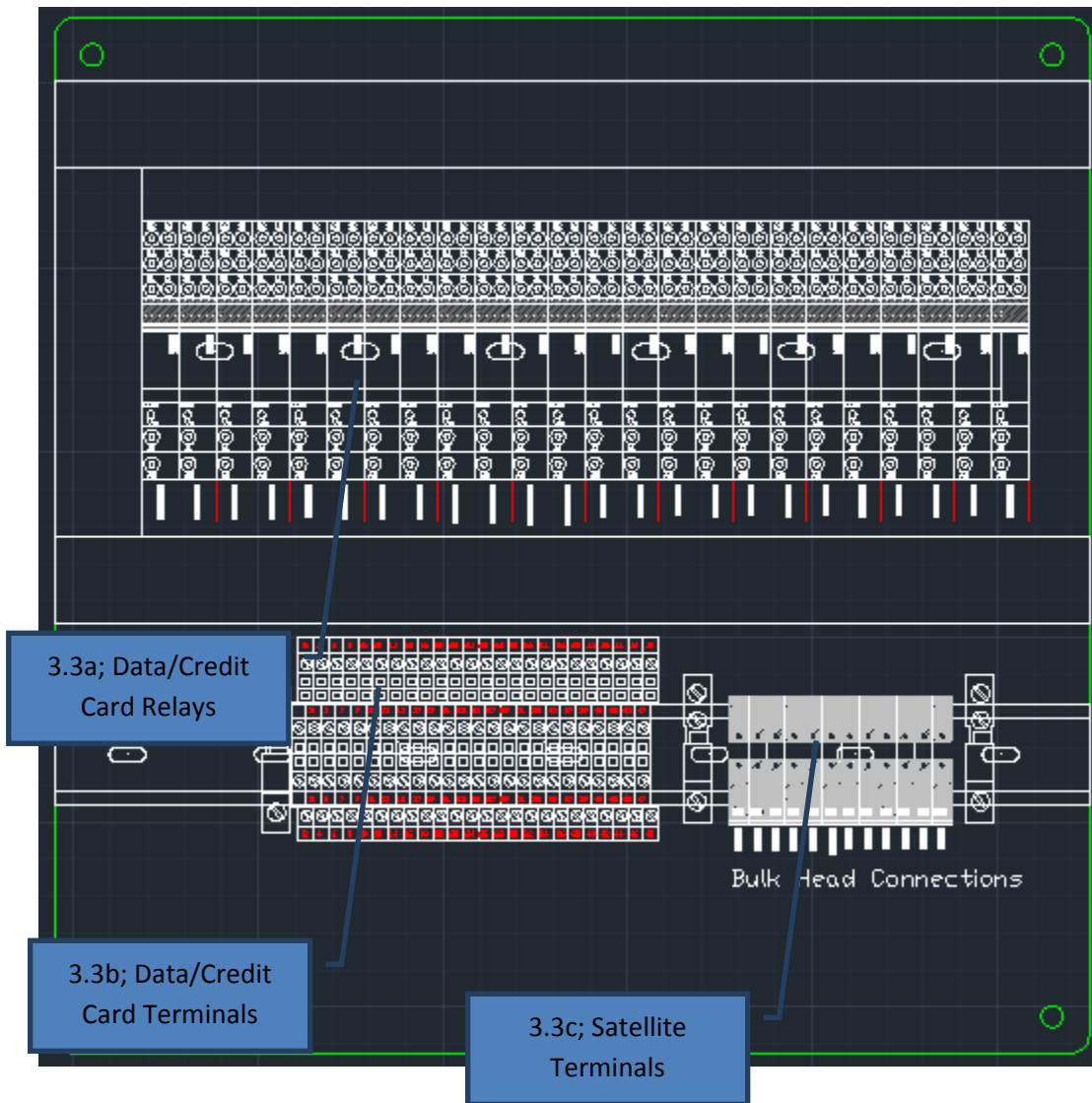
2.9a Pump In/Pump Output Terminals (PI-PO) to ATG

These terminals are used to provide a field connection point for the wiring to the PI and PO terminals in the monitoring system, if applicable to the installation. Jumper terminals are provided for testing and pre-start up line purging. The jumpers must be removed after testing if the monitoring system has PLLDs' installed. If the application does not require PI/PO wiring, there will not be any necessary field wiring and the jumper must remain in place for proper operation. The PI/PO terminals are 120VAC and are phase matched to the ATG output terminals.

2.9b Automatic Tank Gage (Monitoring System)

These Terminals are to provide a field connection point for 120VAC power to the fuel monitoring system (Veeder Root, EVO, In-Con, etc.). The monitoring power circuit is phase matched with the main control power. ***Do not alter the ISO Fuel power distribution as damage to the monitoring system can occur.***

3 Bulk Head Requirements and Satellite Enclosure



3.1 Bulk Head Location on ISOFuel

The bulk head connection is provided in every ISO Fuel and is a field connection point to allow for satellite enclosures for dispenser intercoms and/or dispenser Ethernet wiring. The bulk head connector will require a 12mm hole to be cut in the main enclosure. A SPEEDCON cable will be provided to connect the main panel with the satellite enclosure.

3.2 Bulk Head Location on Satellite Intercom Enclosure

The same process is followed on the satellite enclosure. The bulk head can be mounted on the side or bottom, depending on the location of the satellite enclosure in relation to the ISOFuel enclosure. The satellite enclosure must be mounted within 25' of the main enclosure when using the bulk head connectors and the SPEEDCON cable. Field installations that require a greater length than the provided SPEEDCON cable are achievable by removing the bulk head fittings from each panel and installing a raceway and individual conductors between the Bulk Head Connection terminals.

3.3 Satellite Intercom Enclosure

This enclosure breaks the wiring for the intercom and/or Ethernet to the respective dispenser. The remote design is intended to allow close proximity installation to the intercom system and to create a separation between the low and high voltage systems. The field installer will bring the intercom wires from the dispenser to this box and back out to the intercom system. If the site is using Ethernet wiring to the dispensers, the Satellite box will have 8 pin Data jack bulk head connectors located on the bottom of the enclosure. Each dispenser will have 2 bulk head, 1 labeled as (Input) and one labeled as (Output). The field wiring for the Ethernet cable from the dispenser will need to be routed to the location of the Satellite Enclosure and terminated with an RJ45. The output bulk head will require an Ethernet patch cable connected to the end-users network equipment. (Patch cables are not provided)

4 Field Installation

Below is overview of the field installation requirements. **Installation and termination of the ISO Fuel panel must be done by a licensed electrician and meet the standards of the NEC or the local AHJ.**

4.1 Installation of ISO Fuel

- The ISO Fuel panel has a **NEMA 1** rating and must be installed indoors.
- 100A – 120/208 3 phase or 120/240 1 phase main power to the main lug panel located in the ISO Fuel. **2.1a**
- A grounding bar is included and can be mounted in the fuel piping gutter or in the ISO Fuel panel. Grounding terminals for bonding the panel to the ground bar are provided on the left side of the dispenser terminals.
- All dispenser wiring information is listed below the dispenser terminals. **2.4a**
- Install bulk head connector on ISO Fuel for satellite intercom enclosure. **3.3c**
- Field wiring between site controller and ISO Fuel. **2.8a, 2.8b**
- Field wiring between monitoring system and ISO Fuel. **2.9a, 2.9b**

4.2 Installation of Intercom Enclosure

- The satellite enclosure has a **NEMA 1** rating and must be installed indoors.
- Install bulk head connector on satellite intercom enclosure.
- Install provided SPEEDCON cable between enclosures.
- Bring intercom cables from dispenser to perspective terminals and back out to the intercom system.

4.3 Main Enclosure Mounting

The main enclosure total weight is 100 lbs. to 250 lbs. depending on the site specific configuration. Mounting holes are located, in the corners, in the interior of the enclosure. Use proper mounting hardware for your specific application and use caution during mounting as to not cause personal injury and/or damage to the panel.

5 Support and Hardware

5.1 Replacement Hardware

Spare devices are provided to allow for minimum down time in the event of a product failure. Replacement hardware and warranty replacement shall only be done through ISO Fuel to maintain the UL listing of the panel.

5.2 Technical Support

Call **580-255-0116** and reference the ISO Fuel UL panel number located inside the enclosure door for assistance with installation or trouble shooting.

Panel wiring schematics are proprietary and are only provided to the owner, please contact an ISO Fuel representative if field changes are needed, any unauthorized field wiring will void the warranty.