

Power is knowledge.

**LifeSafety Power**<sup>®</sup>



# R8 Access Power Installation Guide

## **FPV4-R8E1**

4 amp @ 12VDC or 3A/24VDC  
Eight (8) Fused outputs

## **FPV4-R8PE1**

4 amp @ 12VDC or 3A/24VDC  
Eight (8) Class II Power Limited outputs

## **FPV6-R8E1**

6 amp @ 12VDC or 24VDC  
Eight (8) Fused outputs

## **FPV6-R8PE1**

6 amp @ 12VDC or 24VDC  
Eight (8) Class II Power Limited outputs

## **FPV102-R8E1**

10 amp @ 12VDC  
Eight (8) Fused outputs

## **FPV102-R8PE1**

10 amp @ 12VDC  
Eight (8) Class II Power Limited outputs

## **FPV104-R8E1**

10 amp @ 24VDC  
Eight (8) Fused outputs

## **FPV104-R8PE1**

10 amp @ 24VDC  
Eight (8) Class II Power Limited outputs

For 230VAC input add "/E" to model number - example *FPV6-R8E1/E*

For larger enclosure change E1 suffix to E2 in model number - example *FPV6-R8E2*



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## Symbol Definitions

The following symbols are used throughout this manual:

-  This symbol is intended to alert the installer of shock hazards within the enclosure. Service should only be performed by qualified service personnel.
-  This symbol is intended to alert the installer of important information intended to help the installer avoid personal injury or property damage.

## Warnings

-  Installation and service should be performed only by qualified service personnel and should conform to all local codes.
-  To reduce the risk of electric shock or fire, do not expose this equipment to rain or moisture.
-  This equipment shall be installed in a manner which prevents unintentional operation by employees, cleaning personnel, or others working in the premises, by falling objects, customers, building vibration, or similar causes.
-  This equipment is not intended for use within the patient care areas of a Health Care Facility.
-  Replace fuses only with the same type and rating as indicated in the specifications section of this manual.
-  To prevent impaired operation, ensure that all wiring is routed and secured to prevent accidental open or short circuit conditions.
-  The system and any batteries (if used) should be tested at least once per year to ensure proper operation.

## Enclosure Mounting

### Mounting an Enclosure

Use the following procedure when mounting a wall-mount enclosure.

1. (Optional) Remove the enclosure's cover.
2. Locate the top keyhole mounting holes in the back of the enclosure.
3. Mark and pre-drill the locations for the keyholes in the mounting surface.
4. Partially install two fasteners appropriate for the surface on which the enclosure is being installed. Leave the heads of the fasteners approximately 1/4" out from the surface. Minimum fastener size should be #10 or larger.
5. Hang the enclosure on the two fasteners and mark the locations of the remaining mounting holes.
6. Remove the enclosure and pre-drill the locations for the remaining mounting holes.
7. Re-hang the enclosure on the top mounting fasteners, start the remaining fasteners and tighten all fasteners.
8. Reinstall the enclosure's cover, if removed in step 1.

-  Batteries (if used) should be maintained at an ambient temperature of between 32 and 120 degrees Fahrenheit (0-49 Celsius) or premature loss of battery power could occur.
-  Test and verify output voltage before connecting the load.

The equipment discussed within this manual has been tested to the following standards:

- UL294, UL603, UL1076
- ULC S318, ULC S319
- CSA C22.2 #107.1

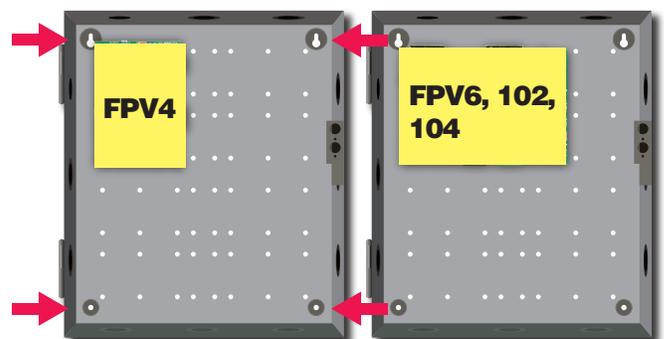
### FCC Information

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules and ICES-003. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### Conventions Used Within this Manual

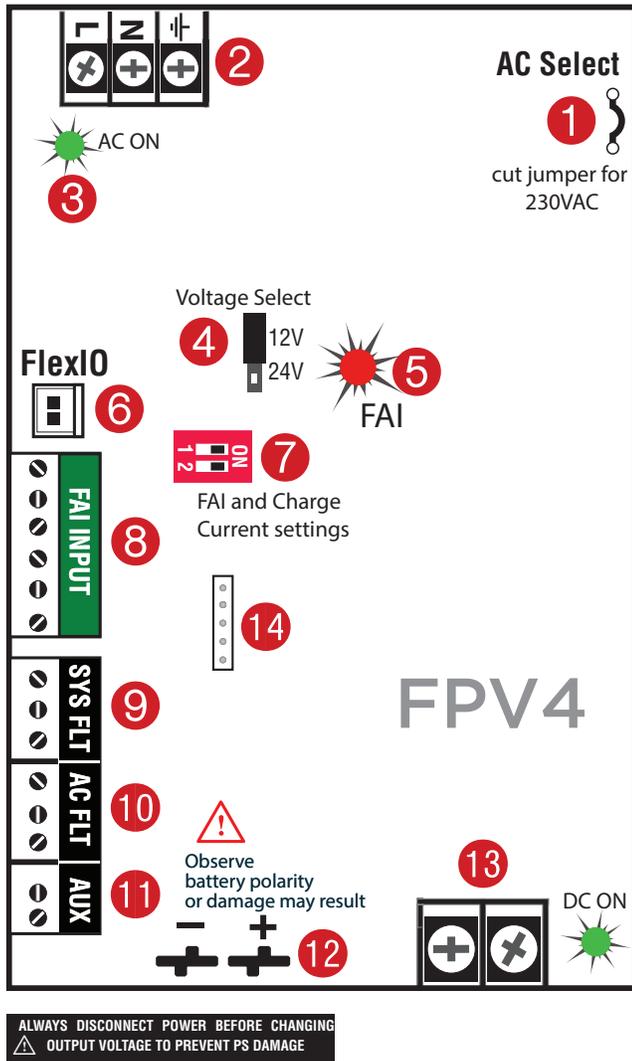
Positional information (e.g. top, bottom, up, down, left, right, etc.) is referenced with the board or enclosure in the orientation shown in the illustrations in this manual.

-  It is the installer's responsibility to determine the appropriate fastening system for use with the surface the enclosure is being mounted to.
-  For UL1076 applications, after installation is complete, the installer must install the two supplied 1" long screws to the edge of the enclosure's cover for additional security.



## FPV4 Power Supply Overview - ⚠️ Read before Power Up

This guide gives the basic information needed to install a system containing a single Vantage Power Supply for most applications.



### 1 AC Voltage Select Jumper

Leave INTACT for 120V input. CUT for 230V input.

⚠️ Failure to cut this jumper when using the FPV with a 230VAC input will result in damage to the system and void the warranty.

### 2 AC Input primary AC connection.

### 3 AC LED (GREEN) indicates a valid AC input voltage is present. Missing AC is indicated by this LED extinguishing.

⚠️ Always confirm the absence of AC power with a meter before servicing to prevent electric shock.

### 4 Voltage Selection Jumper selects the output voltage between 12V and 24V DC.

⚠️ **Remove AC input power before changing the voltage select switch to avoid damaging the power supply or connected equipment.**

### 5 FAI LED (RED) indicates activation of the Fire Alarm Input.

⚠️ *For FAI wiring see page 9.*

### 6 Flex IO Connector Supplies FAI status to any accessory boards. Receives fault signal from accessory boards.

### 7 FAI and Charge Current Configuration Switches

#### Switch 1 - FAI Selection

Off = Constant Output

On = Output switches on FAI

#### Switch 2 - Charge Current

Off = High Charge Current

On = Low Charge Current

### 8 FAI Input The input from the FACP. Can be wired to accept a NO, NC, Open Collector, or Voltage input.

*See page 6 for FAI wiring information.*

### 9 System Fault Contact - Contact labeling is adjacent to the terminals and shown in the unpowered (FAULT) condition.

### 10 AC Fault Contact Contact labeling is adjacent to the terminals and shown in the unpowered (FAULT) condition. AC fault is indicated on a missing AC Input voltage.

### 11 Auxiliary Voltage is a fixed Class 2 DC output.

⚠️ *For FPV6, FPV102, FPV104 - see page 4*

### 12 Battery Terminal Connection for the optional battery backup. Battery set voltage must match the DC output voltage setting.

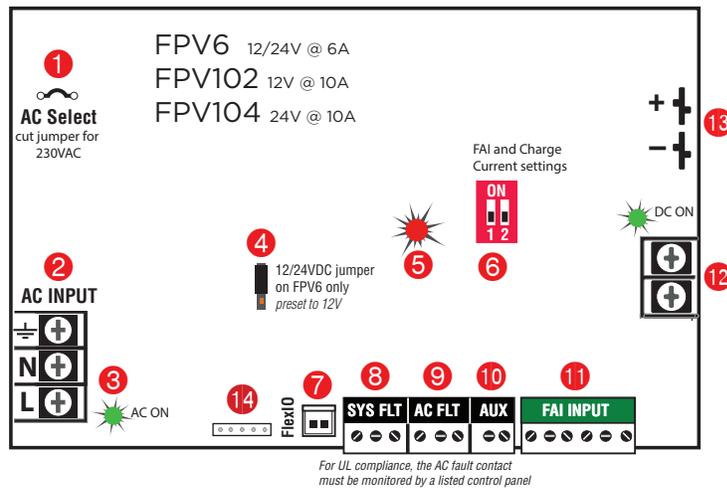
### 13 Main DC Output of the power supply. The output can either be constant or switched based on the configuration setting of switch.

- *The DC ON LED will be green with voltage present.*

### 14 DataLink Connection - This connector allows optional programming and monitoring of the FPV power supply via an optional NetLink network module. See the instructions for the Netlink module for more information.

## FPV6, 102, 104 Power Supply Overview - ⚠️ Read before Power Up

This guide gives the basic information needed to install a system containing a single Vantage Power Supply for most applications.



### 1 AC Input Voltage Selection

Leave INTACT for 120V input. CUT for 230V input (models ending in "E" have jumper pre-cut for 230VAC input).

⚠️ Failure to cut this jumper when using FPV power supply with a 230VAC input will result in damage to the system and void the warranty.

### 2 AC Input Terminal Block

The primary AC connection. Connect Hot Line to terminal "L", neutral to terminal "N" and earth ground to terminal . For 230VAC input cut JP1 Jumper (see #1 above).

⚠️ Models ending in "E" are factory pre-set for 230VAC input.

### 3 AC ON LED (green)

Indicates a valid AC input voltage is present. Missing AC is indicated by this LED extinguishing.

⚠️ Always confirm the absence of AC power with a meter before servicing to prevent electric shock.

### 4 FAI LED (red)

Indicates activation of the Fire Alarm Input.

### 5 12/24V Selection Jumper (model FPV6 only)

This selects the output voltage between 12V and 24V DC on FPV6 models. The FPV power supply must be completely powered down before changing this setting. Voltage markings are printed on the PC Board adjacent to the selector.

⚠️ **Remove AC input power before changing the voltage select jumper to avoid damaging the power supply or connected equipment.**

⚠️ Models FPV102 and FPV104 are a fixed output voltage:

**FPV102: 12V / 10 Amps**

**FPV104: 24V / 10 Amps**

### 6 Charge Current / Main output FAI Configuration Switches

**Switch 1 - FAI Selection** ⚠️ *Switch must remain Off.*

*FAI selection made on R8 board - page 9.*

### Switch 2 - Charge Current

Off = High Charge Current | On = Low Charge Current

### 7 FLEX IO Connector

Supplies FAI status to any accessory boards. Receives fault signal from accessory boards.

### 8 System Fault Contact

The System Fault contact output. Contact labeling is adjacent to the terminals. When at fault, the NO-C contact is open, NC-C contact is closed (relay not energized).

### 9 AC Fault Contact

The AC Fault contact output. Contact labeling is adjacent to the terminals. When AC is lost, the NO-C contact is open, NC-C contact is closed (relay not energized).

### 10 AUX Output

The auxiliary voltage is fixed Class 2 Power Limited DC output.

### 11 FAI Input

The input from the FACP. Can be wired to accept a NO, NC, Open Collector, or Voltage input.

*See page 6 for FAI wiring information.*

### 12 Main Output

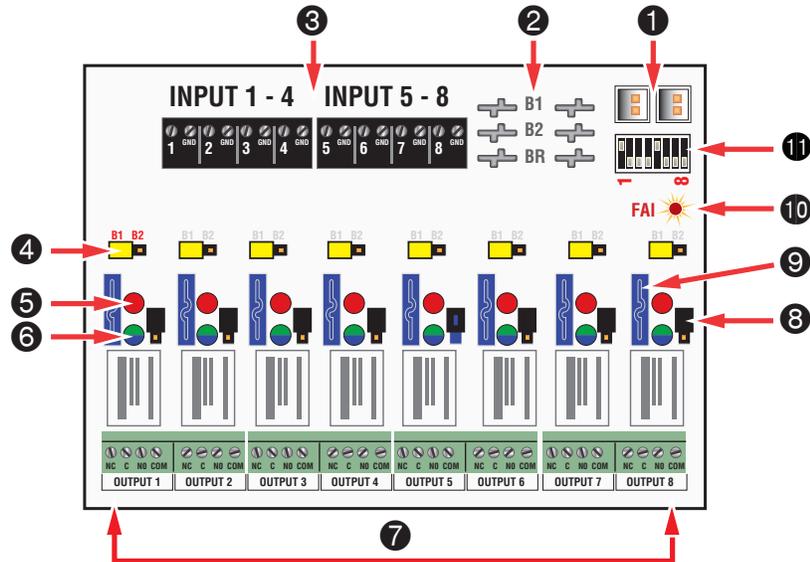
This is the main DC output of the power supply.

### 13 Battery Terminal Connection

The connection for the optional backup battery. Battery set voltage must match the DC output voltage setting.

**14 DataLink Connection** - This connector allows optional programming and monitoring of the FPV power supply via an optional NetLink network module. See the instructions for the Netlink module for more information.

## R8 Power Control Accessory Module Overview



 The relay contact outputs have suppression diodes across them. For a dry contact output, the output diodes must be cut and the yellow and black jumpers removed.

### 1 FlexIO Connectors

These connectors pass the FAI signal to the R8/R8P board and pass the FlexIO buss on to other accessory boards in the system.

### 2 B1, B2, and BR Connectors

These connectors are the voltage inputs for the R8/R8P board. BR is the DC Common buss in the system. B1 is the positive voltage input for the first power supply. In dual voltage systems, B2 is the input for the second power supply.

### 3 Zone Inputs (IN1 – IN8)

These are the zone input terminal strips. These terminal strips are removable and accept wire sizes from AWG14 – AWG22. The terminals are labeled on the PC board near the terminal strip. See the Input Wiring section of this manual for more information.

- When using a normally open relay contact input, the contact is connected across the IN and GND terminals.
- When using an open collector (transistor) input, the open collector is connected to the IN terminal. Note that the input source must be common grounded with the R8/R8P board's power source.

### 4 Voltage Selection Jumpers (Yellow)

These jumpers select the power input to be used for each output. For single voltage systems, this jumper should stay in the B1 position. This jumper should be removed on any zones where a dry contact output is needed.

### 5 Relay State LEDs (Red)

These LEDs indicate the state of the output relay. The LED will be lit when the relay is active and extinguished when the relay is not active.

### 6 Output Voltage LEDs (Dual Color - Blue/Green)

These LEDs indicate the voltage of the zone's output.

- **Blue** The output is set to 24V
- **Green** The output is set to 12V
- **Off** Fuse or PTC open or dry contact output selected

### 7 Zone Outputs (O1 – O8)

These are the zone output terminal strips. These terminal strips are removable and accept wire sizes from AWG14 – AWG22. The terminals are labeled on the PC board near the terminal strip. See the Output Wiring section for more information.

- C, NC, and NO are the relay output.
  - The C terminal will always have voltage present when the yellow jumper is installed, regardless of relay state.
  - NC will have voltage when the relay is NOT ACTIVE. Use for Fail Safe locks.
  - NO will have voltage when the relay is ACTIVE. Use for Fail Secure locks.
- COM is the DC common terminal for the output

 **CAUTION** When powering magnetic loads such as maglocks, door strikes, solenoids, etc, each of these loads must have a reverse protection diode either built-

## R8 Power Control Accessory Overview - continued

in or external to the device.

 **NOTE** When a dry contact output is needed, the Yellow and Black jumpers must be removed and the output diodes must be cut.

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### 8 **Dry Output Selection (Black)**

When a dry contact output is needed, this jumper must be removed in addition to the yellow jumper for the zone. The output diodes must also be cut for the zone.

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### 9 **Output Fuses (F1 - F8)**

When using the fused version of the R8, these are the fuses for each zone output. Fuse numbers correspond with the zone number (e.g. F1 is the fuse for OUTPUT1). When using the PTC version of the R8, the fuse will be replaced with a soldered-in PTC. Fuses or PTCs are not in the circuit when the zone is being used as a relay contact output.

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### 10 **FAI LED (Red)**

These LED indicates that the R8/R8P has received an FAI signal from the FPV power supply through the FlexIO connector. When lit, any zones selected to respond to FAI will unlock.

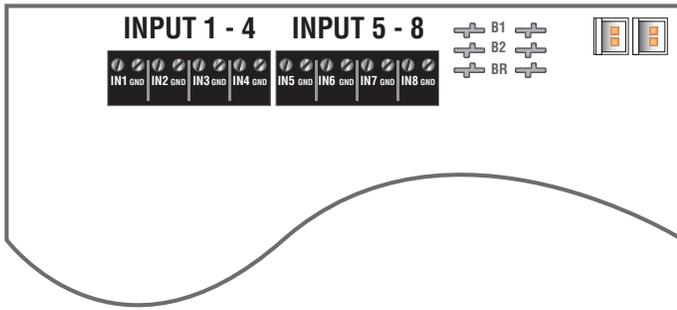
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### 11 **FAI Selection Switches (SW1)**

These switches select FAI for each output. Switch 1 is for zone 1, switch 2 for zone 2, etc. When the switch is ON, the zone will unlock when an FAI is received.

**R8 Power Control Accessory Input and Output Wiring**

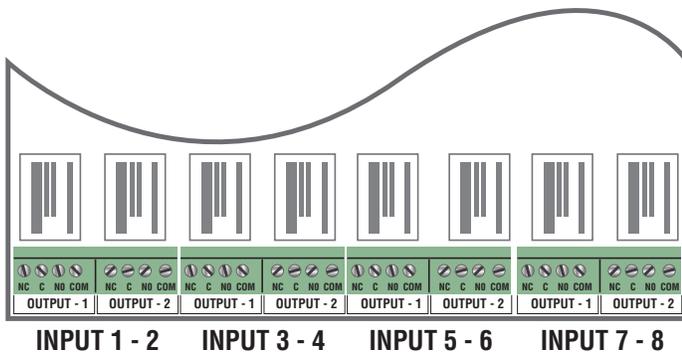
**INPUT WIRING**



Each input on the **R8 / R8P** has an “**IN**” terminal and a “**GND**” terminal.

- When using a NO relay contact to activate the input, the contact is placed across these terminals.
- To use a DC ground or an open collector (transistor) as an input, connect the ground/open collector to the “**IN**” terminal to activate the input. Note that the input source must be common grounded with the R8/R8P board’s power source.

**OUTPUT WIRING**



Each output on the **R8 / R8P** has “**NC**”, “**C**”, “**NO**”, and “**COM**” terminals.

- When set for a dry contact output, the C, NC, and NO terminals may be used as any relay would. C to NC will have a connection when the red LED for the zone is not lit. C to NO will have a connection when the red LED is lit.
- ⚠ **NOTE:** To set the output as a dry contact, the yellow and black jumpers for the zone must be removed and the output diodes must be cut.
- When set for a voltage output, the terminal use is as follows:
  - COM** - This is the DC Common for the device being powered
  - C** - This terminal always has voltage, regardless of the relay state. This terminal may be used to power auxiliary devices such as REX or readers.
  - NC** - This output has voltage when the relay is NOT ACTIVE. This terminal is used for FAIL SAFE locks
  - NO** - This output has voltage when the relay is ACTIVE. This terminal is used for FAIL SECURE locks

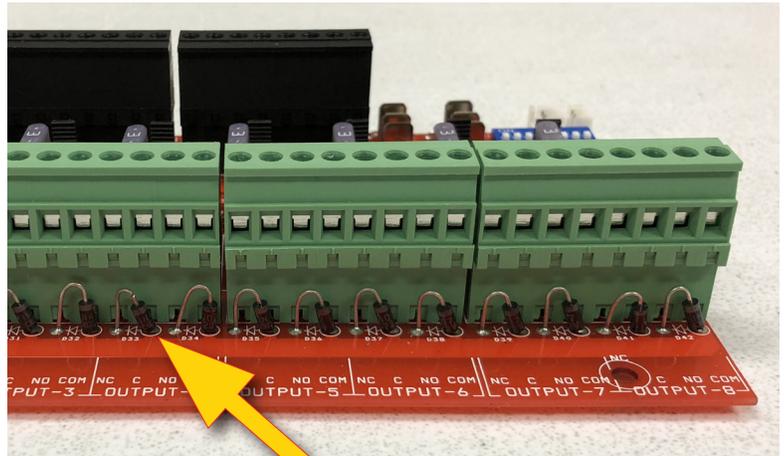
## R8 Power Control Dry Contact Output

The outputs of the R8/R8P have built-in reverse protection diodes. If a delay in lock release is present or if the zone is being used as a dry contact output, the diode from that zone may be removed from the circuit as shown below.

**⚠ NOTE:** Only remove the diodes from outputs requiring their removal.

### *Diode Removal*

The diodes on the R8/R8P are on the top side of the board between the output terminals and the edge of the board. To remove the diode from the output circuit, simply cut the exposed diode lead for the desired output zone - leave the diode body soldered to the pcb.



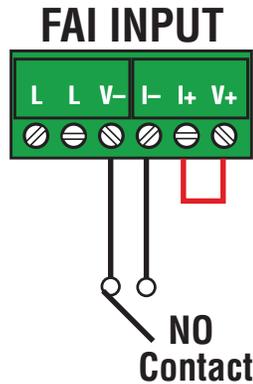
Topside of board

**Vantage Power Supply/Charger FAI Input Usage**

This section provides more detailed information on the connection and usage of the FAI Input located on the main power supply board.

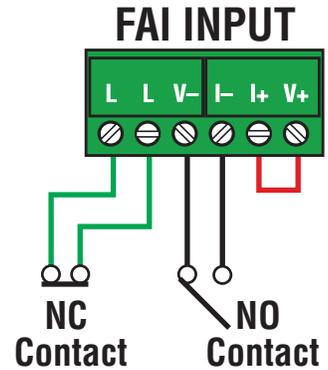
**Activation with a Normally Open Relay Contact**

FAI Activates when the NO contact CLOSES.  
FAI Deactivates when the NO contact OPENS.



**Latching the FAI Input**

Latching of the FAI Input is achieved by placing a NC contact across the two 'L' terminals. The FAI may be activated by any of the methods listed. FAI Deactivates when the input is deactivated AND the NC Latching contact is momentarily OPENED.

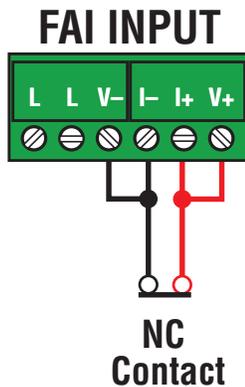


Example – NO Contact activation with latching

FAI Activates when the NO contact CLOSES. FAI Deactivates when the NO contact OPENS AND the NC contact momentarily OPENS.

**Activation with a Normally Closed Relay Contact**

FAI Activates when the NC contact OPENS.  
FAI Deactivates when the NC contact CLOSES.



**Note:** FAI with a NC contact cannot be tested by removing the terminal strip, as this will remove the jumper wires from V+ and V- as well. To test, remove one wire going to the NC Contact.

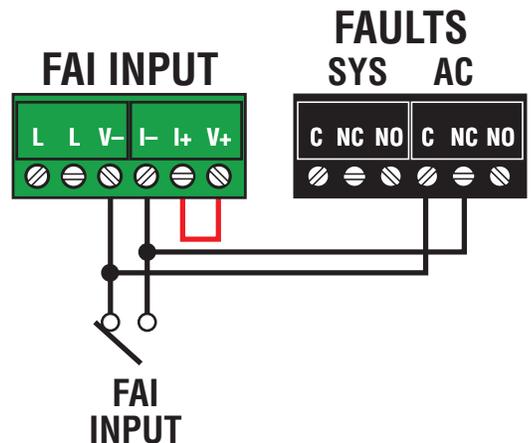
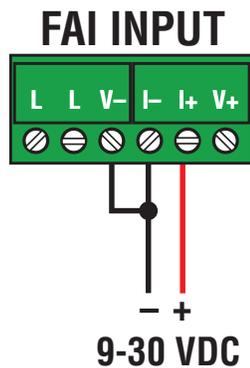
**FAI Activation with a Normally Open Relay Contact and FPV AC Fault Lock Over Ride**

FAI Activates either, when the Fire Alarm NO contact CLOSES, *or* when the AC Fault NC contact CLOSES

FAI Deactivates either, when the Fire Alarm NO contact OPENS, *or* when the FPV AC Fault NC contact OPENS

**Activation with a Voltage Input**

FAI Activates when voltage is APPLIED in the correct polarity. FAI Deactivates when voltage is REMOVED. Do not connect a polarity reversal circuit (NAC) to the FPV.



## Tamper Switch Wiring

Vantage power supply systems with an enclosure may include a normally closed tamper switch for monitoring by the host panel.

The tamper switch can either be brought into a dedicated input in the panel (see the panel's instructions), or the tamper switch may be series connected into the System Fault relay in the FPV supply (see Figure 1).

Any UL1076 installation must use the tamper switch to indicate the opening or removal of the front door of the enclosure.

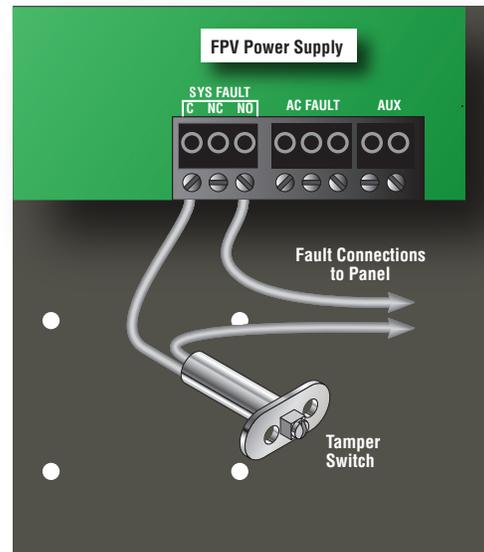


Figure 1 - Tamper switch fault relay wiring

## Typical Installation and Wire Routing

Figure 2 shows a typical installation.

Actual configuration and wire routing will vary based on the components installed in your system.

The following guidelines should be followed for installation:

- Class 2 Power limited wiring must be separated from non-power limited wiring by a minimum of 1/4 inch and must use separate knockouts.
- Any wiring passing through knockouts in the bottom or top surfaces of the enclosure must be enclosed in rigid or flexible metal conduit.
- **Canadian Installations** - For permanently connected equipment, a readily accessible disconnect device shall be incorporated external to the equipment. Output circuits not connected to removable terminal strips shall also utilize a readily accessible disconnect device.

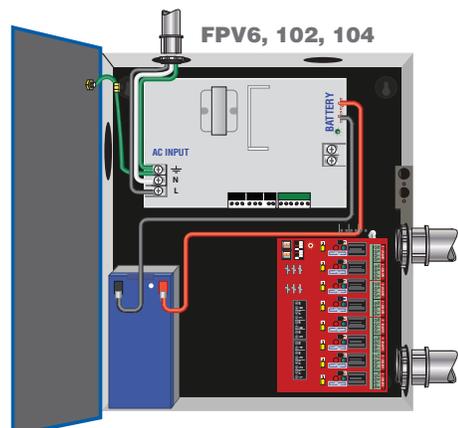
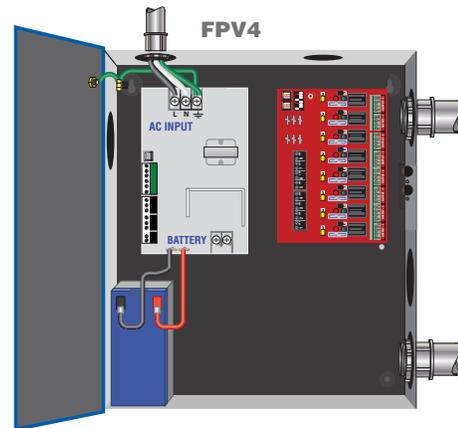


Figure 2 - Wiring

**FPV4-R8E1 / FPV6-R8E1 Electrical / Mechanical Specifications**

		FPV4-R8E1	FPV6-R8E1
<b>AC Input</b>	Voltage	120VAC or 230VAC at 50-60Hz	120VAC or 230VAC at 50-60Hz
	Current	1.8A maximum	3.7A maximum
<b>Standby</b>	Current	80mA	150mA
<b>DC Output at 12V Setting</b> <i>(Auxiliary power-limited output rated at 1.5A. Total current must not exceed max current)</i>	Voltage	11.3 - 12.0V	11.2 - 12.0V
	Max Current	4A	6A
	Ripple & Noise	120mV	120mV
	Regulation	±2%	±2%
	Efficiency	82% (120VAC 60Hz In, Full Load, No Batt)	88% (120VAC 60Hz In, Full Load, No Batt)
<b>Auxiliary Output (12V)</b>	Current	1.5 A max	1.5 A max
<b>DC Output at 24V Setting</b> <i>(Auxiliary power-limited output rated at 1.5A. Total current must not exceed max current)</i>	Voltage	23.5 - 24.0	23.2 - 24.0
	Max Current	3A	6A
	Ripple & Noise	240mV	240mV
	Regulation	±2%	±2%
	Efficiency	83% (120VAC 60Hz In, Full Load, No Batt)	85% (120VAC 60Hz In, Full Load, No Batt)
<b>Auxiliary Output (24V)</b>	Current	1.5 A max	1.5 A max
<b>Battery</b>	Size & Type	4-40AH Lead Acid or Gel Cell	4-80AH Lead Acid or Gel Cell
	Charge Current	1A (±10%) maximum adjustable via DIP switch. 1.0A high setting, 0.5A low setting.	1.6A (±10%) maximum adjustable via DIP switch. 1.6A high setting, 0.8A low setting.
	Low battery disconnect to prevent deep discharge	70% of nominal battery voltage	70% of nominal battery voltage
<b>Fuse Rating</b>	Battery	ATM 15A	ATM 15A
<b>BTU Output</b>	BTU/Hr	34-41	44-62
<b>Fault Setpoints</b>	Low AC	95V (±6%)	95V (±6%)
	Output Voltage	±10% of nominal	±10% of Nominal
<b>Fault Relay Contacts</b>	AC FLT	1A at 24VDC	1A at 24VDC
	SYS FLT	1A at 24VDC	1A at 24VDC
<b>Operating Temperature</b>		0 – 49C°	0 – 49C°
<b>Enclosure Size / Weight</b>		14H x 12W x 4.5"D   14 lbs	14H x 12W x 4.5"D   14 lbs

**FPV102-R8E1 / FPV104-R8E1 Electrical / Mechanical Specifications**

		FPV102-R8E1	FPV104-R8E1
<b>AC Input</b>	Voltage	120VAC or 230VAC at 50-60Hz	120VAC or 230VAC at 50-60Hz
	Current	3A	5.7A
<b>Standby</b>	Current	110mA	160mA
<b>DC Output</b> <i>(Auxiliary power-limited output rated at 1.5A. Total current must not exceed max current)</i>	Voltage	11.3 - 12.0V	23.4 - 25.0V
	Max Current	10A	10A
	Ripple & Noise	120mV	240mV
	Regulation	±2%	±2%
	Efficiency	89% (120VAC 60Hz In, Full Load, No Batt)	91% (120VAC 60Hz In, Full Load, No Batt)
<b>Auxiliary Output</b>	Current	1.5 A max	1.5 A max
<b>Battery</b>	Size & Type	4-80AH Lead Acid or Gel Cell	4-80AH Lead Acid or Gel Cell
	Charge Current	1.6A (±10%) maximum. Charger current is 1.6A max for high setting, 0.8A max for low setting.	1.6A (±10%) maximum. Charger current is 1.6A max for high setting, 0.8A max for low setting.
	Low battery disconnect to prevent deep discharge	70% of nominal battery voltage	70% of nominal battery voltage
<b>Fuse Rating</b>	Battery	ATM 15A	ATM 15A
<b>BTU Output</b>	BTU/Hr	55	92
<b>Fault Setpoints</b>	Low AC	95V (±6%)	95V (±6%)
	Output Voltage	±10% of Nominal	±10% of Nominal
<b>Fault Relay Contacts</b>	AC FLT	1A at 24VDC	1A at 24VDC
	SYS FLT	1A at 24VDC	1A at 24VDC
<b>Operating Temperature</b>		0 – 49C°	0 – 49C°
<b>Enclosure Size / Weight</b>		14H x 12W x 4.5"D   14 lbs	14H x 12W x 4.5"D   14 lbs

**R8 Power Control Accessory Board Specifications**

<b>Power Input</b>	Voltage	12 or 24VDC nominal ±15%
	Current	12A maximum
	Standby Current	700mA (R8) All lock control relays active
<b>Zone Input</b>	Zone Count	8
	Max Current	10mA
<b>Zone Output</b>	Zone Count	8
	Voltage	Same as input
	R8 Current	3.0A resistive
	R8P Current	2.5A resistive (Class 2 Power Ltd) (R8P)
<b>Fuse</b>		3A ATM automotive style (R8)

## General Applications

1. The power supply must be installed within the protected area.
2. The LifeSafety Model EB-80 must be used to house the required battery(ies) when capaaacites of 40 to 80Ah are required. The EB-80 shall be mounted within 6ft of the power supply and the wiring enclosed in conduit.
3. Connections to the SYS FLT, AC FLT, and FAI inputs shall be completed within the same room, not exceeding a length of 100 ft.
4. Do not connect equipment to an AC power source that is controlled by a switch.
5. The power supplies shall be mounted in a Listed LifeSafety Power enclosure.
6. Trouble contacts shall be monitored by a listed alarm system.

*The following sections cover specific requirements based on application:*

### **UL1076, Proprietary Burglar Alarm Applications:**

1. The LifeSafety tamper switch must be employed to monitor the power supply.
2. To achieve 4 hours of standby at full load current, 80Ah min. battery capacity is required for the FPV102 or FPV104. To achieve 4 hours of standby at full load current, 40Ah min. battery capacity is required for the FPV4 and FPV6.

### **S319, Access Control Applications:**

1. The LifeSafety tamper switch must be employed to monitor the power supply.

### **For UL Compliance:**

Any locking device shall be configured for fail safe operation upon occurrence of an alarm as shown in Activation with a Normally Closed Relay Contact in page 6, FAI Input Usage.

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