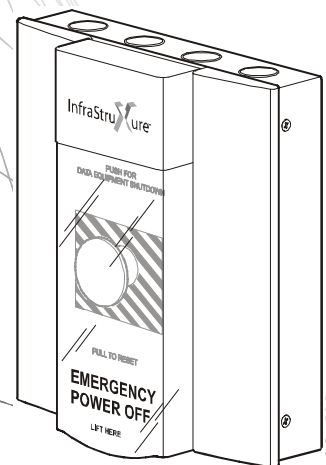


Installation and Operation

Emergency Power Off System





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Safety

IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation, operation, and maintenance of the EPO system.

Safety instructions for North America



Electrical Hazard: Only certified electricians may install the system and the wiring to the products it controls.



Note: Wiring from the system to the products it controls can either be installed in conduits or installed without conduits if the wires are in accordance with Article 725 of the National Electrical Code (NFPA 70) and Section 16 of the Canadian Electrical Code (C22.1).



Caution: Only Class 2 circuits rated 30V or less can be connected to terminals 1–8. Class 2 circuits are defined in Article 725 of the National Electrical Code (NFPA 70) and Section 16 of the Canadian Electrical Code (C22.1). A Class 2 circuit is a source having limited voltage and energy capacity as follows:

- a. If an Inherently Limited Power Source, voltage is limited to 30 VAC or 30 VDC, and energy is limited to 8 A.
- b. If not an Inherently Limited Power Source, voltage is limited to 30 VAC or 30 VDC, energy is limited to 250 VA, and current is limited to 1000/V_{max}. The fuse is limited to 5 A if maximum voltage is 20 V, or 100/V_{max} if voltage is greater than 20 V but less than 30 V.

Safety instructions for Europe, Middle East, and Africa



Electrical Hazard: Only certified electricians may install the system and the wiring to the products it controls.



Note: Wiring from the system to the products it controls can either be installed in conduits or without conduits if the wires are in accordance with IEC/EN 60364-5-52 or equivalent local electric code.

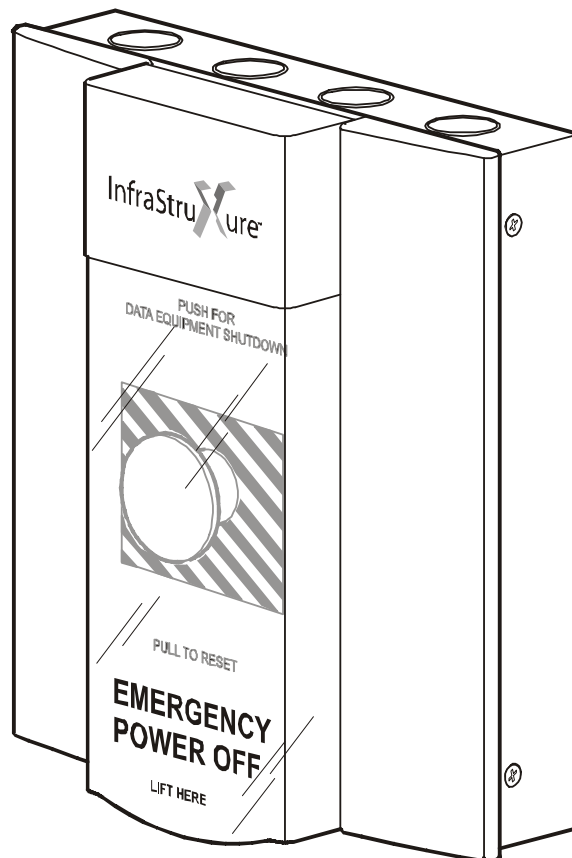


Caution: EPO can be achieved with either a contact closure or application of an external 24 VAC or 24 VDC from a SELV or PELV source. It is important to note that hazardous voltage from the mains voltage must be isolated from the contact closure or 24 VAC, 24 VDC. The EPO circuit contact closure, the 24 VAC, or the 24 VDC are considered SELV circuits as defined in EN60950 “Safety of Information Technology Equipment” or PELV circuits as defined in IEC 60364-4-41 “Electrical Installations of Buildings Protection for Safety—Protection Against Electric Shock.” SELV is an abbreviation for Safety Extra Low Voltage. PELV is an abbreviation for Protective Extra Low Voltage. SELV and PELV circuits are isolated from the mains through a safety isolating transformer, and designed so that under normal conditions the voltage is limited to 42.4 V_{peak} or 60 VDC.

Overview

Emergency Power Off System

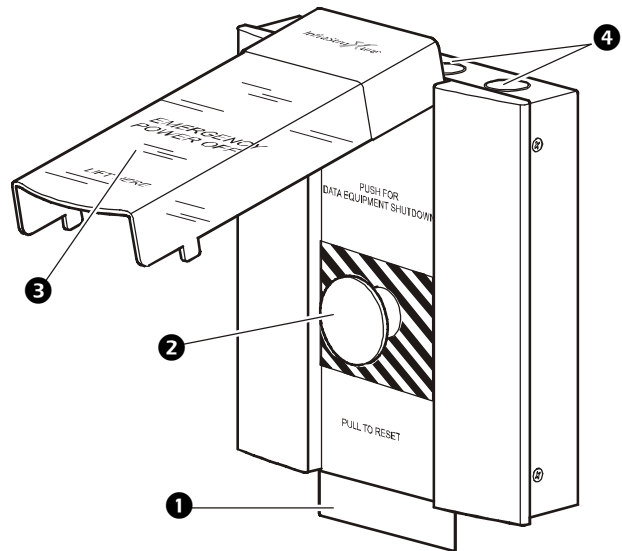
APC's Emergency Power Off (EPO) System consists of one or more wall-mounted, push-button EPO boxes. Each EPO box provides a single point of equipment shutdown for up to eight APC InfraStruXure devices and one third-party device (such as an upstream breaker), using Normally Open (NO) contact closure connections. You can cascade an EPO box with other EPO boxes to support multiple points of equipment shutdown.



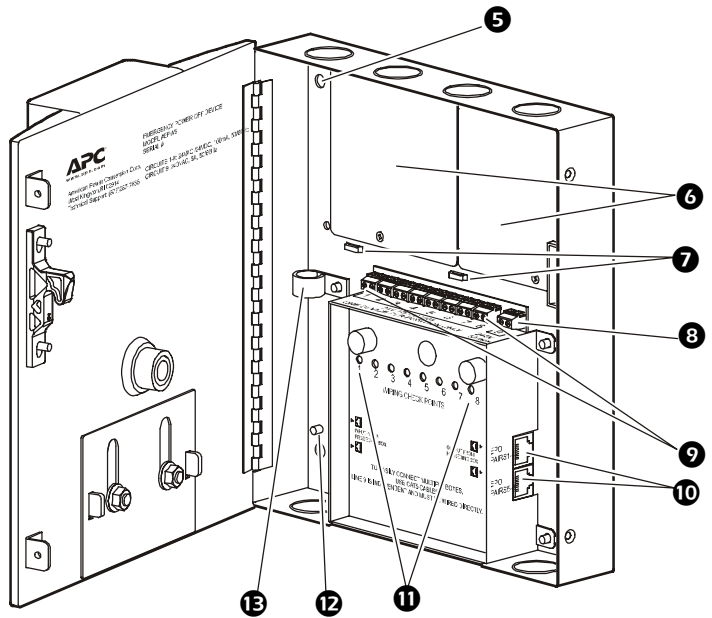
Note: Although the EPO is designed specifically for InfraStruXure products, the system can be used for tripping any devices that fall within its parameters. See “Specifications” on page 16 to confirm proper application. Install the EPO according to the instructions in this manual.

EPO Box Components

- ❶ Flag
- ❷ Button
- ❸ Shield
- ❹ Knockouts



- ❺ Mounting holes
- ❻ Blanking panels
- ❼ Wire anchors
- ❽ Auxiliary device terminal
- ❾ InfraStruXure device terminal block
- ❿ Cascading jacks
- ⓫ Wiring check points
- ⓬ Ground stud
- ⓭ Cable clamps



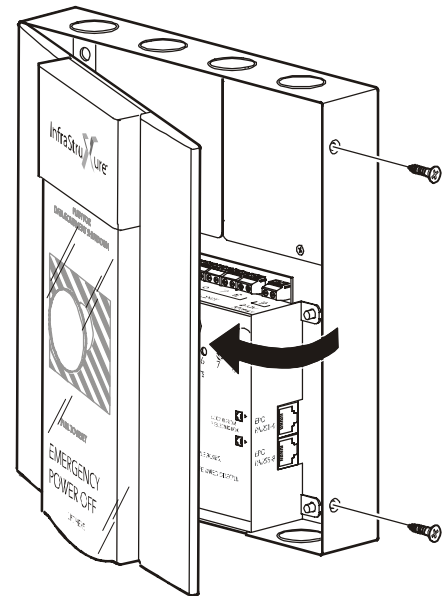
Note: Wiring, conduits, and mounting hardware are not provided.

Installation

How to Mount the EPO

How to prepare the EPO

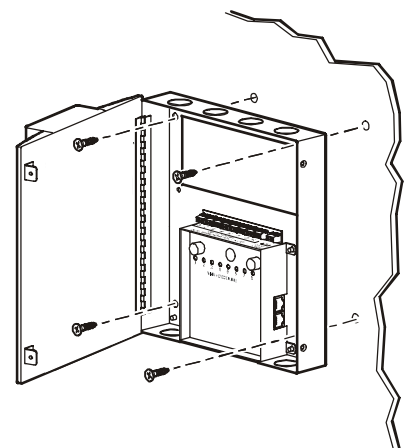
- 1 Open the EPO System box by removing the screws on the side. Keep the screws for use after the system is installed. The box will not close securely without the screws in place.
- 2 Mount the system in a readily-accessible area, on a wall near the principal entrance doors, according to NEC Articles 645.10 and 645.11, IEC/EN 60354-5-537, or equivalent local regulation. There are two different procedures for mounting the system, depending on whether you are running conduits (or cables) along the wall or behind the wall.



Note: If you are not using conduits, run the cables from the connected devices or the cascaded EPO boxes directly to the EPO using Shielding Troughs and Cable Ladders.

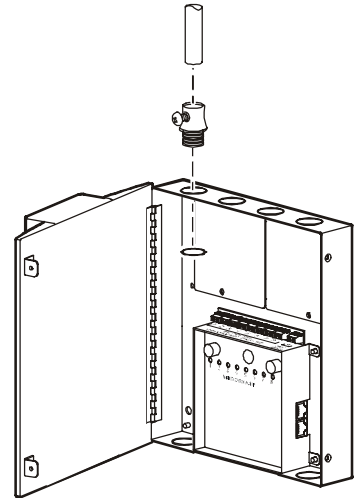
How to mount the EPO if you are running conduits (or cables) along the wall

- 1 Fasten four 6.35 mm ($\frac{1}{4}$ in) screws through the four mounting holes at each corner of the EPO box and into the wall.
- 2 Run the conduits (or cables) for the connected devices to the EPO box. If you are using conduits, it will contain all wiring from the connected devices and all cascading cables. The knockouts in the top and bottom of the EPO box accept 13 mm ($\frac{1}{2}$ in) and 19 mm ($\frac{3}{4}$ in) conduits or clusters of cables. Remove the knockouts required for your installation.



Note: When planning your conduits requirements, consider that two cascading cables will fit in 13 mm ($\frac{1}{2}$ in) conduits and four cascading cables will fit in 19 mm ($\frac{3}{4}$ in) conduits. See “How to cascade multiple EPO boxes” on page 9 for more information.

- 3 Install an appropriate fitting with a lock-nut for each knockout that you are using.
- 4 Connect your conduits to the fittings.

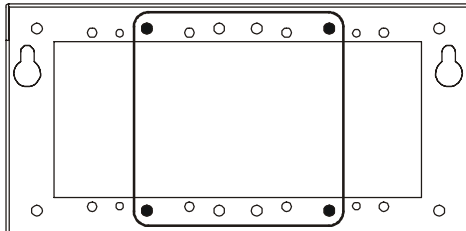


Note: If you are not using conduits, you do not need to install a fitting and lock-nut in the knockout. Run the cables through the knockout directly.

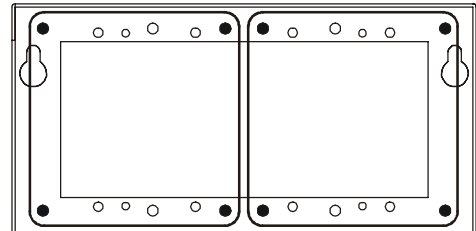
How to mount the EPO if you are running conduits (or cables) behind the wall

- 1 Install a junction box or a switch box behind the wall. The EPO box will fasten directly to the box. You can use one of the following options:

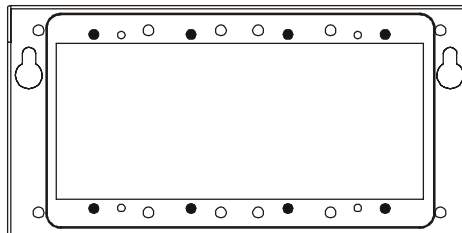
One 120-mm (4-in) square junction box



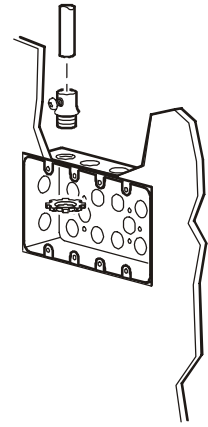
Two 120-mm (4-in) square junction boxes



One switch box up to 4-gang in size



- 2 Run the conduits (or cables) from the connected devices to the junction or switch box. If you are using conduits, it will contain all wiring from the connected devices and all cascading cables. Remove the knockouts required for your installation.



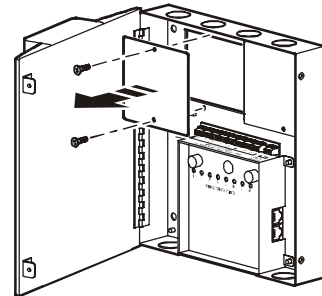
Note: When planning your conduit requirements, consider that two cascading cables will fit in 13 mm ($\frac{1}{2}$ in) conduits and four cascading cables will fit in 19 mm ($\frac{3}{4}$ in) conduits. See “How to cascade multiple EPO boxes” on page 9 for more information.

- 3 Install an appropriate fitting with a lock-nut for each knockout that you are using.
- 4 Connect your conduits to the fitting.

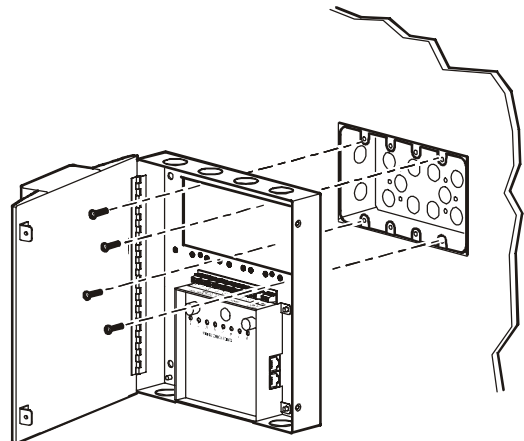


Note: If you are not using conduits, you do not need to install a fitting and lock-nut in the knockout. Run the cables through the knockout directly.

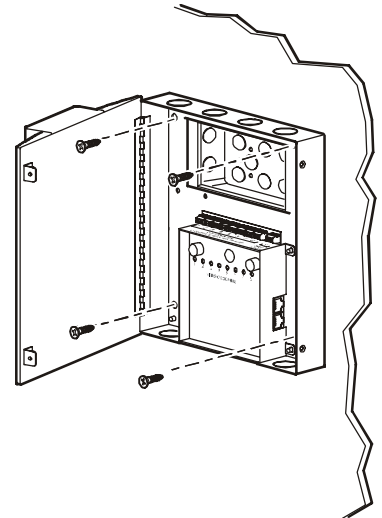
- 5 Remove one or both of the blanking panels covering the window in the back of the box, as required.



- 6 Secure the EPO box directly to the junction box or switch box with the appropriate number of 6-32 screws around the access window.



- 7 Reinforce the EPO box with 6 mm (1/4 in) screws in the corner mounting holes.

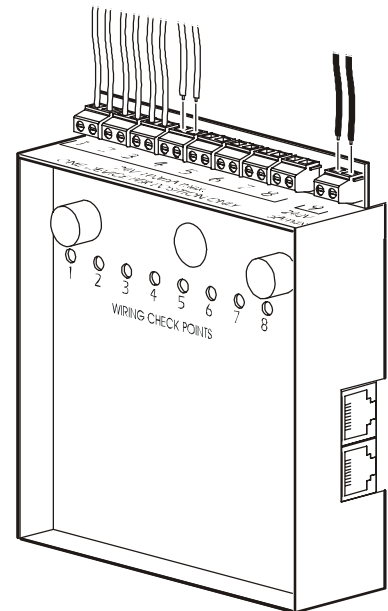


Note: The top two 6 mm (1/4 in) mounting holes may be blocked by some junction boxes. In this instance, use only the bottom two 6 mm (1/4 in) mounting holes for reinforcement.

How to connect devices to the EPO box

Connect APC InfraStruXure devices to terminals 1–8. Connect an auxiliary device to terminal 9. Connect only one 0.10–0.75 mm² (24–18 AWG) wire pair to each terminal block.

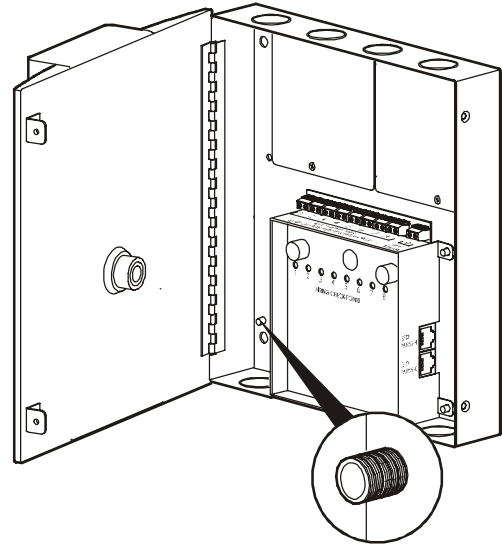
- 1 Attach EPO circuits to each InfraStruXure device according to the specific instructions for that device. Use the Normally Open (NO) contact option.
- 2 Run a suitable 0.10–0.75 mm² (24–18 AWG) wire from the InfraStruXure devices to terminals 1–8 on the EPO box terminal block. If you are using conduits, run the wires through the conduits to the terminal(s). Make the connections to the terminal block in numerical order (terminal 1, and then terminal 2, etc.).
- 3 Run a suitable 0.25–0.10 mm² (22–18 AWG) wire from the contact closure points for any auxiliary device to terminal 9 on the EPO box terminal block. If you are using conduits, run the wires through the conduits to the terminal.



Note: The auxiliary circuit is rated 1 A at 48 VDC/240 VAC.

- 4 If necessary, secure the wires inside the box using the releasable wire ties (provided).

- 5 Connect a suitable ground or PE wire to the #8-32 ground stud in the lower left corner of the EPO box.

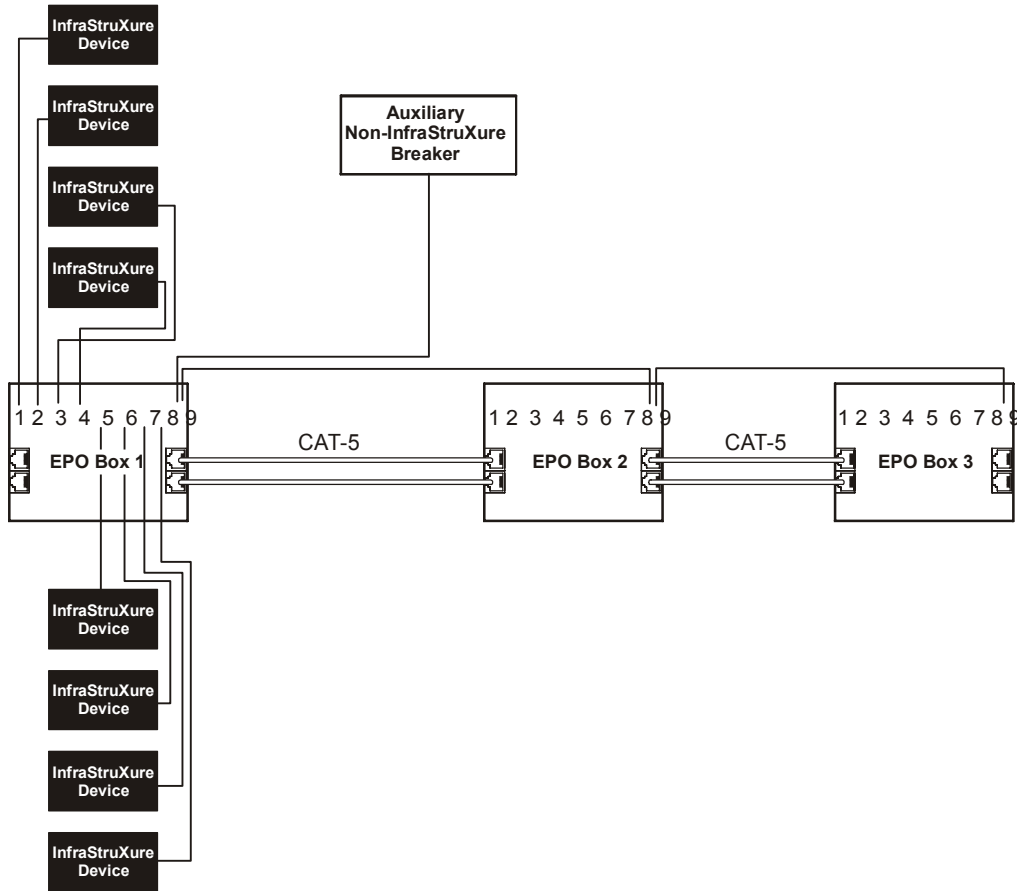


How to mount additional EPO boxes

To mount additional EPO boxes at other exit doors, follow the instructions in “How to Mount the EPO” on page 4. You have two alternatives for wiring your additional EPO boxes. You can cascade the boxes so that you only wire devices to one box (see “How to cascade multiple EPO boxes” on page 9), or you can wire devices directly to each EPO box (see “Direct wiring alternative” on page 10).

How to cascade multiple EPO boxes

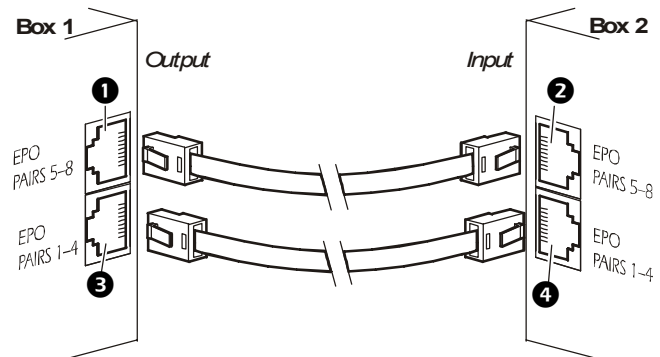
When cascading EPO boxes, connect a wire pair from each device to the first EPO box according to the procedure in “How to connect devices to the EPO box” on page 7. Jumper the subsequent EPO boxes with cascading cables (standard CAT-5 cable)— this procedure will join the EPO boxes in parallel.



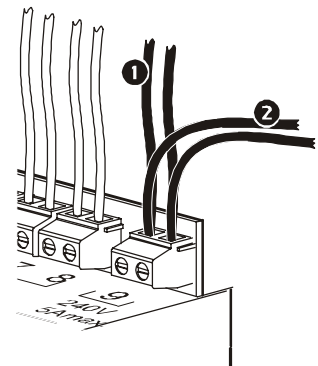
Note: The recommended maximum total distance of wire you can run per circuit is 300 m (1000 feet).

Cascade the InfraStruXure devices with CAT-5 cables. Connect the CAT-5 cables to the jacks inside the EPO box. Each cable can support up to four InfraStruXure device wire pairs. Follow these guidelines when connecting CAT-5 cables:

- Use only the bottom jacks (3 and 4) if you are cascading four (4) or fewer InfraStruXure devices.
- Use both the bottom and the top jacks (1, 2, 3, and 4) if you are cascading five (5) or more InfraStruXure devices.
- Connect the output jacks (1 and 3) of the first EPO box to the input jacks (2 and 4) of the second EPO box.
- Continue until all boxes are connected.
- If necessary, use the white cable clamps to secure the CAT-5 cables.



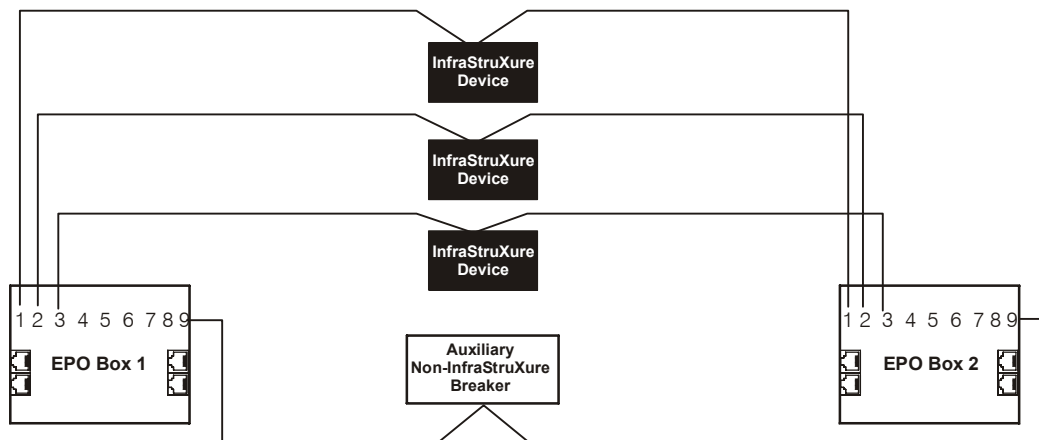
Cascade the auxiliary device with wire pairs. After you have run wires from your auxiliary device (1) to terminal block position 9, run a second set of wires (2) from terminal block position 9 on the first EPO box to terminal block position 9 on the second EPO box. Continue until all boxes are connected. (See the diagram on page 9 for reference.)



Direct wiring alternative

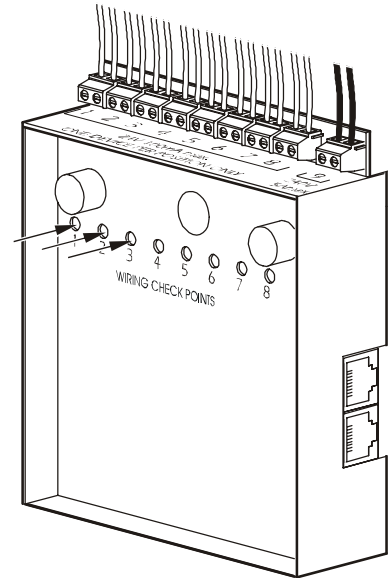
If the InfraStruXure devices are centrally located between exit doors, it may be more practical to run separate wire pairs from the devices to each EPO box. This wiring method requires terminal block connections in every EPO box, rather than cascading cables between boxes.

Connect wire pairs from the Normally Open (NO) contacts on the InfraStruXure devices to each EPO box. Because this alternative results in multiple wire pairs at the terminals of the InfraStruXure devices, APC does not recommend using it with more than three EPO boxes.



How to verify connections at each EPO box

- 1 Verify that the wiring is correct before attaching critical load devices to your InfraStruXure devices:
 - a. With the InfraStruXure devices powered ON, use a small tool to press each check point, one at a time.



Warning: Pressing the check point will shut down the connected device and any load it is supporting.



Note: If you have an APC FM Series Precision Air Conditioning System connected to the EPO box, pressing the check point will shut off functionality to the unit, but the unit will still be powered.

- b. After you have verified the wiring, close the system box, making sure not to pin wires or disturb connections, and secure with the screws you previously removed when opening the box.
- c. As a final test, apply power to all InfraStruXure and auxiliary devices, and then press the EPO button. All connected devices should power OFF immediately. Repeat this final test at every EPO box in your system.

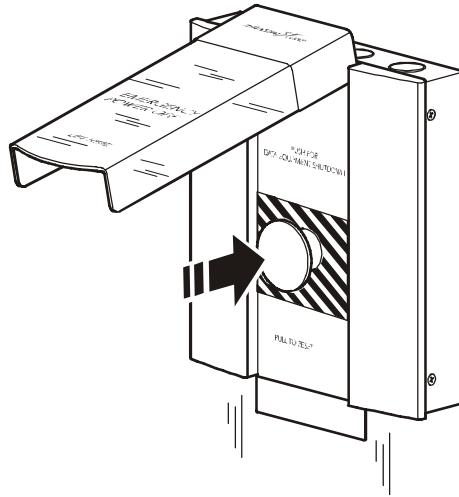


The InfraStruXure PDUs have an EPO test feature that verifies EPO operation without shutting down the connected loads. Refer to your PDU operation manual for instructions on how to test the EPO switch at the InfraStruXure PDU.

Operation

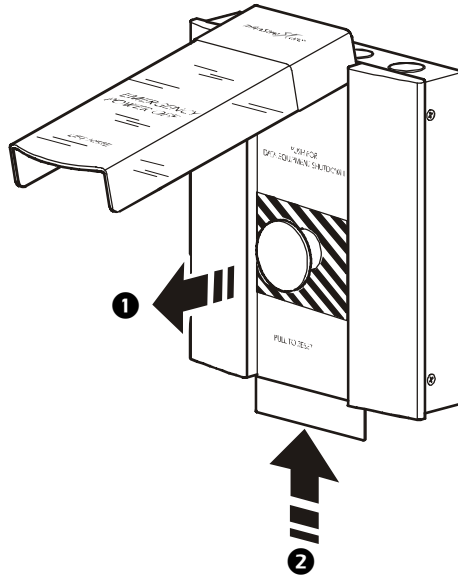
How to Engage the System

Lift the shield on any of the installed EPO boxes and press the button. A red flag will drop down from the box, providing an easy visual mark as to which EPO box in your room has been activated.



How to Reset the EPO system

Pull the button towards you (❶) and push the flag up until it catches (❷). Pulling the button does not bring power back to the connected equipment; it only resets the EPO system. Close the shield after resetting the system.



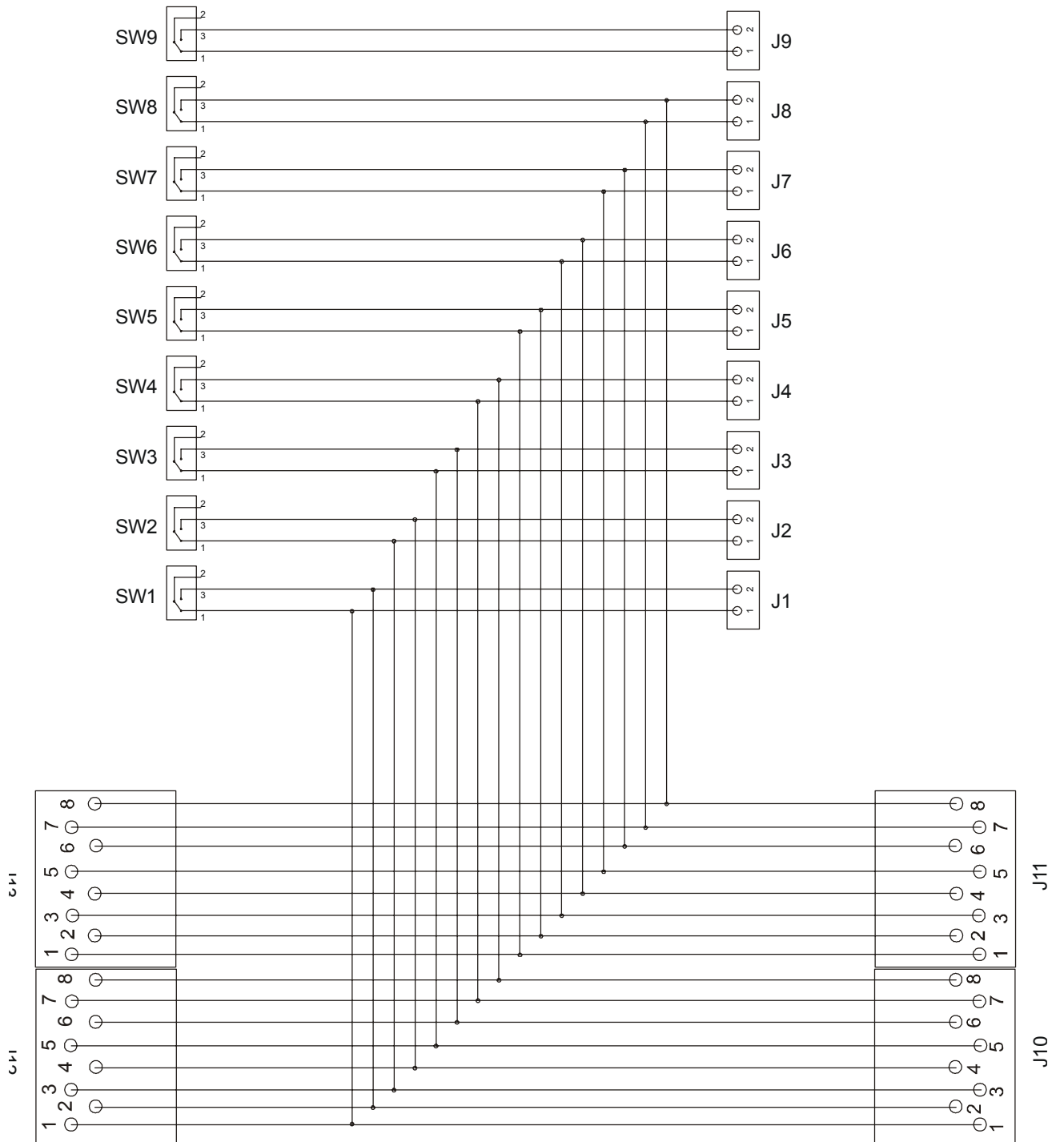
How to Reset your Equipment

Apply power to your devices according to the procedures for each device.



Refer to the operation manual included with each device for specific instructions on how to apply power to the device.

Wiring Diagram



Specifications

Electrical

Input/Output

Voltage	24 VDC (InfraStruXure circuit) 48 VDC/240 VAC (External circuit)
Current	1 A at 24 VDC (InfraStruXure circuit) 1 A at 48 VDC (External circuit)
Frequency	50/60Hz
Circuits (qty)	9
Contact state	Normally Open (NO)

Physical

Dimensions (W×L×D)

EPO box	226×251×66mm (8.9×9.9×2.6 in)
Shipping	305×305×140mm (12×12×5.5 in)

Weight

EPO box	2.9kg (6.4 lb)
Shipping	3.1kg (6.9 lb)

Mounting Surface mount

Connection Removable panels in rear, 13 mm ($\frac{1}{2}$ in) and 6 mm ($\frac{3}{4}$ in) knockouts on top and bottom

Push button Standard, 22 mm metallic body; 40 mm mushroom head; Push/pull

Wire connections 0.10 to 0.75mm² (24 to 18 AWG) wire ground stud for #8 ring lug

Environmental

Temperature -5 to 45°C (23 to 113°F)

Humidity 5 to 95% RH, non-condensing

Elevation 3000m (10000ft) above MSL

Compliance

Standards NFPA 70, NFPA 75, NEC Article 645, 29 CFR 1910.36, 29 CFR 1910.306

Approvals UL, C-UL, CE

How to Obtain Service

To obtain support for problems with your Emergency Power Off (EPO) System:

- ❶ Note the serial number and date of purchase.
- ❷ Contact Customer Support at the phone number on the back of this document. A technician will try to help you solve the problem by phone.
- ❸ If you must return the product, the technician will give you a return material authorization (RMA) number. If the warranty expired, you will be charged for repair or replacement.
- ❹ Pack the unit carefully. The warranty does not cover damage sustained in transit. Enclose a letter with your name, address, RMA number and daytime phone number; a copy of the sales receipt; and a check as payment, if applicable.
- ❺ Mark the RMA number clearly on the outside of the shipping carton.
- ❻ Ship by insured, prepaid carrier to the address provided by the Customer Support technician.



APC Worldwide Customer Support

Customer support for this or any other APC product is available at no charge in any of the following ways:

- Visit the APC Web site to access documents in the APC Knowledge Base and to submit customer support requests.
 - **www.apc.com** (Corporate Headquarters)
Connect to localized APC Web sites for specific countries, each of which provides customer support information.
 - **www.apc.com/support/**
Global support searching APC Knowledge Base and using e-support.
- Contact an APC Customer Support center by telephone or e-mail.
 - Regional centers

Direct InfraStruXure Customer Support Line	(1)(877)537-0607 (toll free)
APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702000 (Ireland)
Western Europe (inc. Scandinavia)	+800 0272 0272
Japan	(0) 3 6402-2001
Australia, New Zealand, South Pacific area	(61) (2) 9955 9366 (Australia)

- Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

Contact the APC representative or other distributor from whom you purchased your APC product for

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990-1611B-001



11/2007