

# Installation of InfraStruXure for Medium Data Centers with an Emergency Power Off Circuit

Many installations require the use of an Emergency Power Off (EPO) circuit to disconnect power from a room or apparatus. This potential requirement was taken into consideration during the design of the APC InfraStruXure architecture.

Both the InfraStruXure power and cooling base building block components have an integrated EPO function, that when actuated, will shut down all loads, and remove power within the supported area.

One EPO actuating signal must be applied to each InfraStruXure power and cooling base building block component within an installation in order to complete an EPO function. The EPO actuating signal may be any one of the following types:

1. Actuation of a set of Normally Open (NO) set of dry contacts.
2. Actuation of a set of Normally Closed (NC) set of dry contacts.
3. Applying a 24v AC signal (power block only).
4. Applying a 24v DC signal (power block only).

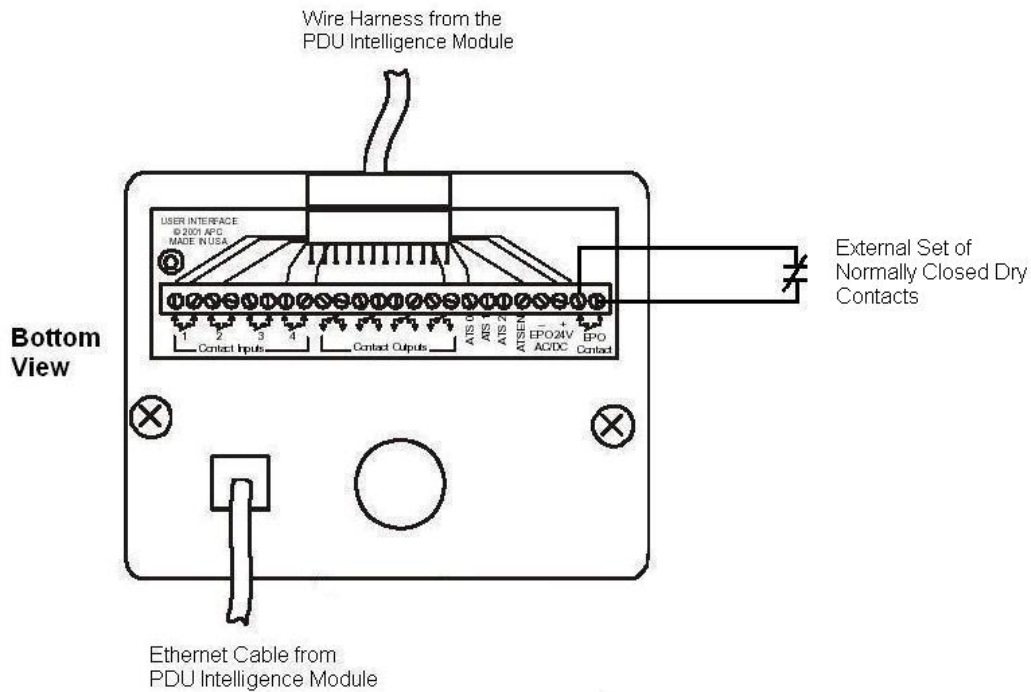
The actuating signal needs to be applied across the proper set of terminals depending on the type of signal used. APC offers a wall mounted EPO actuation switch (APC Part # EP9W), which provides nine mechanically ganged sets of normally open contacts and mechanical actuator. Any reference in this application note to normally open contact actuation could utilize the APC EPO Actuation Switch. A description of the EPO actuation switch and its application is provided later in this application note.

### ISX 40 or 80kW PDU w/ System Bypass

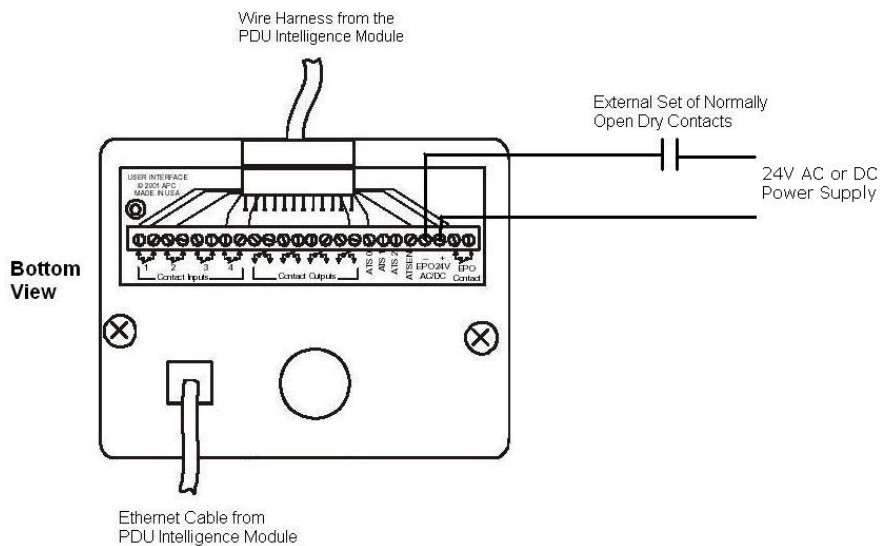
The ISX PDU w/ system bypass performs an integrated EPO function for itself and connected Symmetra PX UPS. It will shunt trip its maintenance bypass breaker, power down the UPS, and shunt trip the UPS battery breaker. The EPO connection point terminals are located on a terminal block, which is attached on the bottom side of a removable plate that is attached to the top of the PDU w/ System Bypass Cabinet. Please see the picture on the next page for location and terminal designations of the EPO terminal block.



## Dry Contacts – Normally Closed

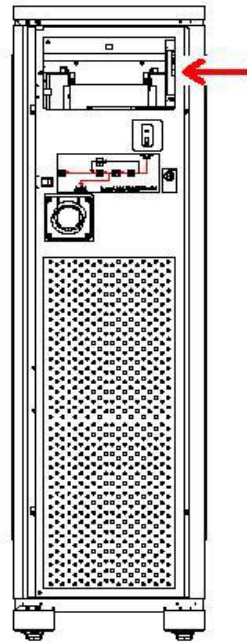


## AC or DC 24Volt – Normally Low

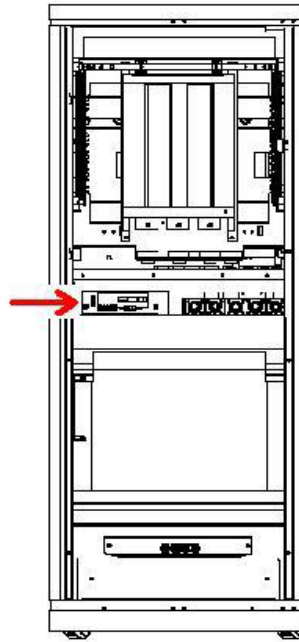


## Set Up the Intelligence Module

The EPO shunt trip action is performed by the PDU Intelligence Module. Please see below for the location of the Intelligence Module in each different PDU frame.

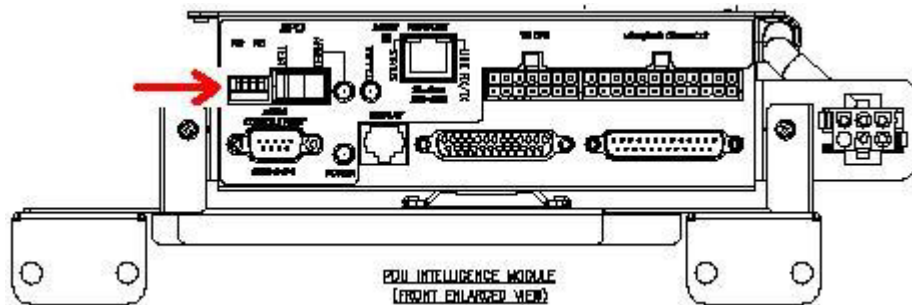


40kW PDU  
Rear View  
Deadfronts  
Partially Removed

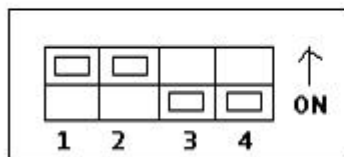


80kW PDU  
Rear View  
Deadfronts Removed

The EPO configuration switches need to be verified for proper positioning based on the signal type used.



PDU INTELLIGENCE MODULE  
(FRONT ENLARGED VIEW)



24V AC/DC  
or  
Normally Open  
Dry Contacts

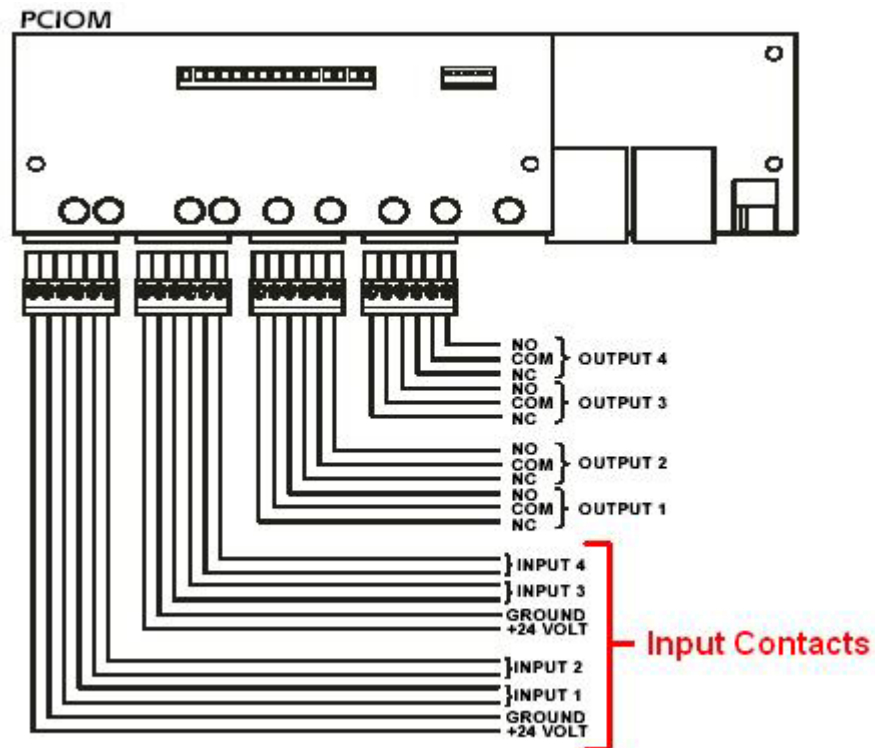
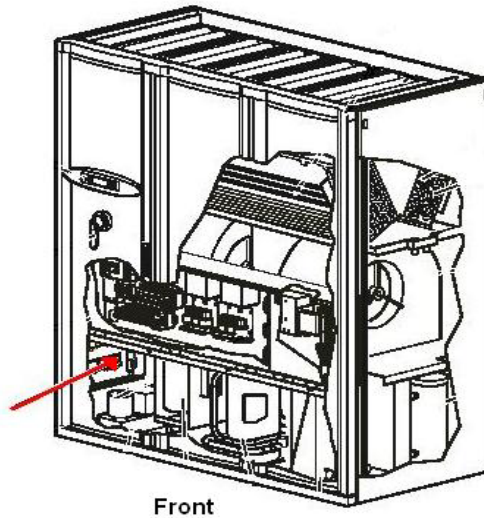
ON ON OFF OFF  
1 2 3 4

Normally Closed  
Dry Contacts

OFF OFF ON ON  
1 2 3 4

## ISX FM Series Computer Room Air Conditioner (CRAC)

The ISX FM Series CRAC has four programmable input contacts located on the PCIOM board that may be programmed to work with a normally open, or normally closed contact EPO input. The PCIOM module is located the lower left corner of the ISX FM Series Cabinet.



The user interface of the FM Series can then be used to configure the contact being used with the following procedure:

**Path: Main > Setup > System > Input/Output > Input Contacts.**

Input: 01oF16  
 Name: Input1  
 Normal: Open  
 Status: Open

Delay: 030 s  
 Alarm Map:  
 Major Alarm

Each Main Module supports up to 16 user-defined input contacts. These contacts monitor sensors and respond to changes in the sensor's state (open or closed).

**Name.** Provide a unique name for each input contact.

**Normal.** Choose the normal state of the sensor. If the state changes, the controller will take the action defined by the **Alarm Map** setting.

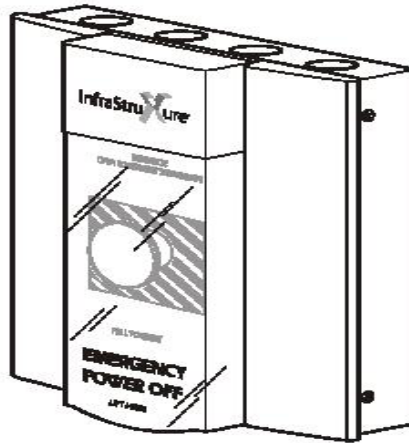
**Delay.** Set how long the contact should be out of its normal state before taking action (controlled by the **Alarm Map** setting below).

**Alarm Map.** Set the System controller to respond to the change of status for an input in one of the following ways:

Map	Description/Function
Status Only	Displays the event on the Active Alarms Screen. Status-only events are not logged.
Minor Alarm	Activates the Warning LED and the alarm beeper. It also creates an entry in the event log.
Major Alarm	Activates the Alarm LED and the alarm beeper. It also creates an entry in the event log.
Remote Run/Stop	Shuts down the Modules normally, waiting for delay timers.
Nonessential Lockout	Deactivates modes set as nonessential and continues operation.
Immediate Shutdown	Shuts down the Modules immediately. It does not wait for the blower delay or compressor timers.

## Integration of APC ISX EPO Actuator Switch

APC can provide a wall mounted EPO actuation switch(s) to perform an EPO function on up to eight zones of ISX distribution, and shunt trip one auxiliary device such as an up-stream breaker.



The wall mount assembly consists of a mechanical actuator which switches 9 sets of normally open contacts. Eight of the contacts are rated for 24V and intended to connect across the “Dry Contact-Normally Open” EPO signal terminals of an InfraStruXure power and cooling base building block. The ninth contact is rated for 240V and can be used to shunt trip an external device such as a breaker. The EPW9 may cascaded as many as needed to provide the required number of actuation points (one located at each exit), with use of CAT-5 Ethernet cable. The cascading cables parallel the contacts of actuator switch so that any one can EPO all connected devices (up to eight in total). See the Installation Manual for the EPW9 for complete installation instructions (990-1611A).

