AFC-1000
Fire Alarm Installation Manual

POTTER
The Symbol of Protection

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1. Installation Wiring Documents

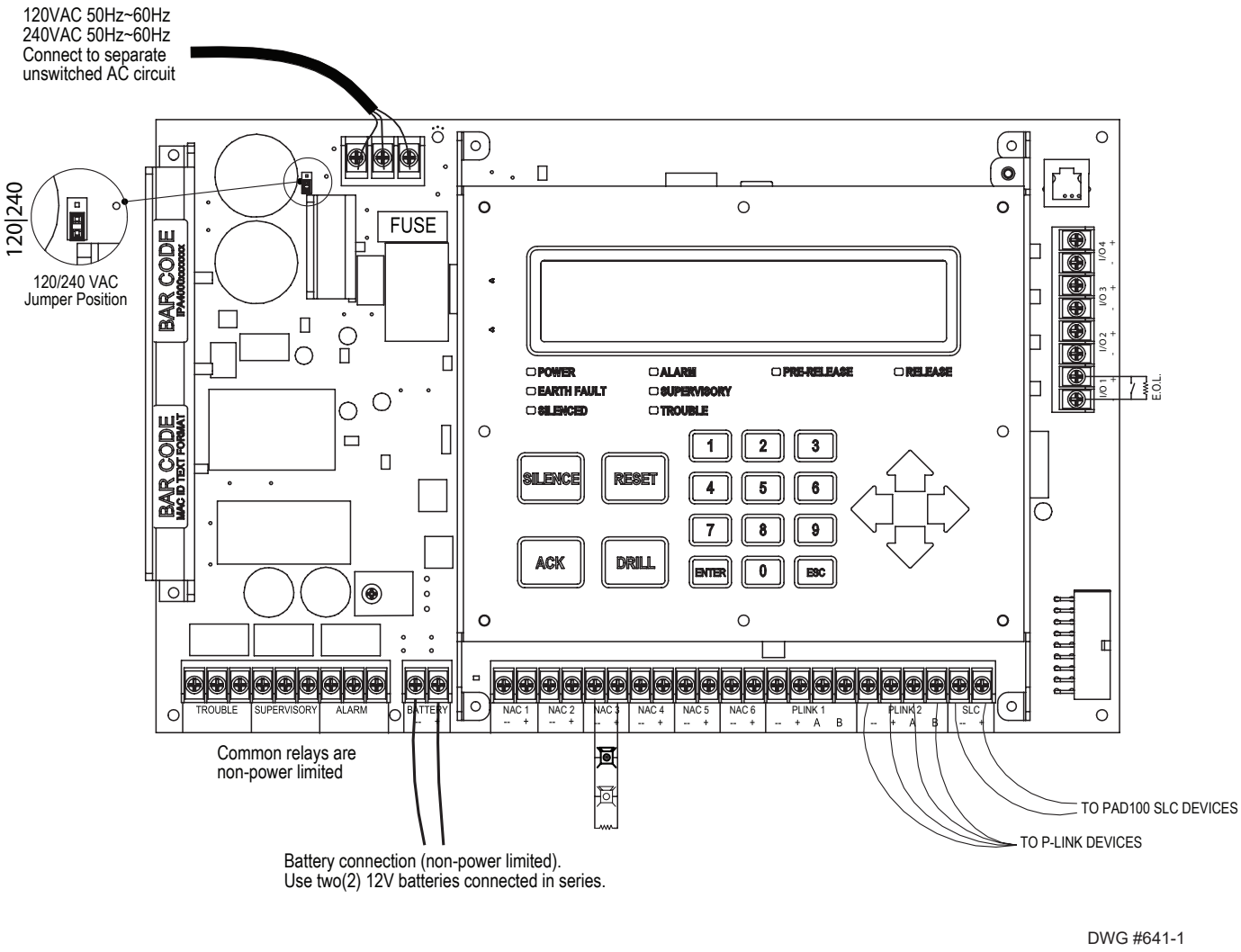

Figure 1. AFC-1000 Addressable Fire Panel Wiring Diagram

Type of Circuit	Voltage Type	Power Type
AC Connection	High Voltage	Non-Power Limited
Battery Connection	Low Voltage	Non-Power Limited
Trouble Relay	High Voltage	Non-Power Limited
Supervisory Relay	High Voltage	Non-Power Limited
Alarm Relay	High Voltage	Non-Power Limited
I/O Circuits	Low Voltage	Power Limited
Notification Device Circuits (NACs)	Low Voltage	Power Limited
P-Link RS-485 Connections	Low Voltage	Power Limited
Signaling Line Circuit	Low Voltage	Power Limited
Phone Line – DACT	High Voltage	Power Limited

Main Supply Circuit

The AC terminals are located in the upper left hand portion of the main board. The main board supervises the main AC power and provides indication that the AC power is absent.

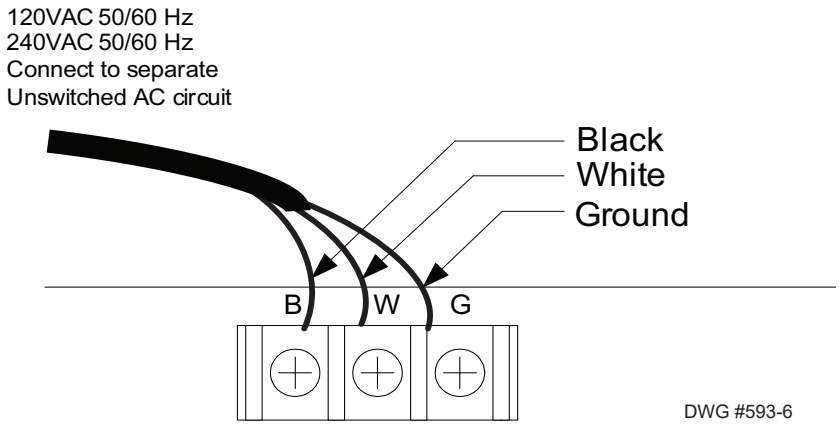

Figure 2. Main Supply Circuit

The terminals are rated at 120 VAC/240 VAC 50/60 Hertz and are marked so accordingly on the board. The earth ground connection is marked as "G" and is the furthest connection from the line voltage connection.

The AC input power ratings:
Maximum of 5A at the nominal 120 VAC rating.
Maximum of 3A at the nominal 240 VAC rating.

Rechargeable Battery Circuit

The battery charging circuit is provided on the main panel in the lower left portion of the board. Terminal connections are provided to connect wire leads for battery connection. The battery must be a recognized or listed sealed lead acid battery or equivalent.

The battery charging voltage is approximately 27.3 VDC and the circuit is supervised. The battery circuit is protected with a non-replaceable 7 amp poly switch located on the main circuit board. The maximum battery charging circuit is 1.0 amp DC.

The battery circuit is rated for 8 to 55 AH batteries and the cabinet will house up to two 18 AH batteries. The batteries will operate the panel for at least 24 hours and 5 minutes of alarm. In order to determine the minimum size batteries for standby and alarm times desired, the installer must complete a battery calculation work sheet in order to determine the minimum battery size for a particular application. For reference, the battery calculation work sheet is attached as Appendix A. Complete standby battery calculations must be completed to ensure adequate battery sizes are provided.

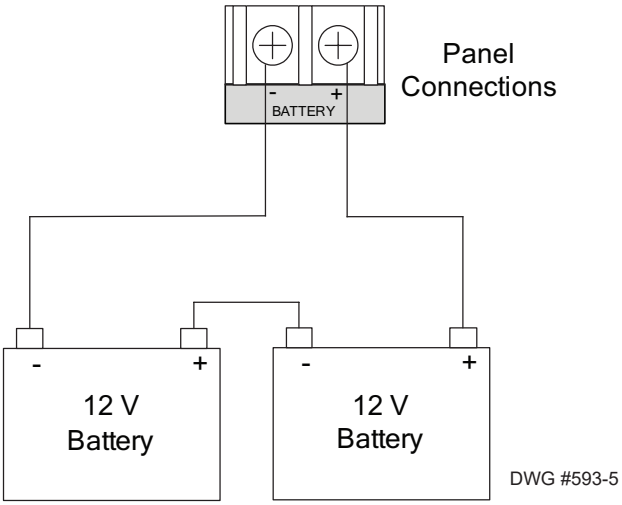

Figure 3. Battery Circuit Connections

Separation of Circuits - Power Limited, Non-Power Limited, High Voltage Wiring

The main AC power connection is considered high-voltage and non-power limited. The phone line connections to the DACT are high-voltage – power limited. Battery conductors, and the alarm, supervisory, and trouble relays are non-power limited. All remaining circuits are low-voltage, power limited connections.

Proper separation must be maintained between the circuits listed above. All separations in the different wiring must be maintained by at least 0.25 inches and the wire insulation must be for the higher voltage.

In the panel there are sufficient knock outs located around the periphery of the cabinet to allow the installer to maintain power limited and non-power limited connections. The main AC power connection should be made on the left side or top left of the cabinet. The DACT wiring connections should be made along the top right side of the cabinet.

Notification Appliance Circuits (NACs)

The panels are equipped with six NAC circuits and each are rated for a continuous 3 amps at 24 VDC. The outputs are supervised and regulated. The NACs reverse polarity upon activation and the board and illustrations are marked accordingly.

The panels can be programmable to allow for addition of a CA-6500 Class-A Expander. This expander allows for Class A operation of the NACs. Each Class A circuit is rated for a continuous 3 amps at 24 VDC. The outputs are supervised and regulated.

NAC circuits are power limited and the type of output is selectable. The NACs may be configured for strobe synchronization with AMSECO, Wheelock, Gentex, or System Sensor strobe devices as shown compatible in this document and the installation instructions.

The maximum impedance is a function of the load being applied to the circuit. In order to calculate the maximum impedance as follows:

(Alarm Current of Notification Appliances) X (Wire Resistance) < 3 volts.

The NAC circuits may be configured for Class A or Class B.

The panel has ground fault detection on the NAC circuits. The impedance to ground for ground fault detection is 0 ohms.

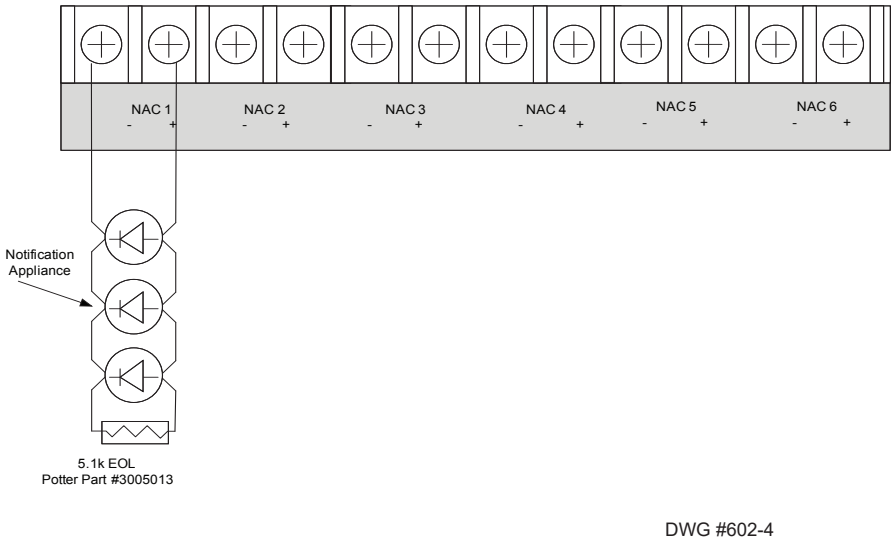

Figure 4. Class B NAC Wiring

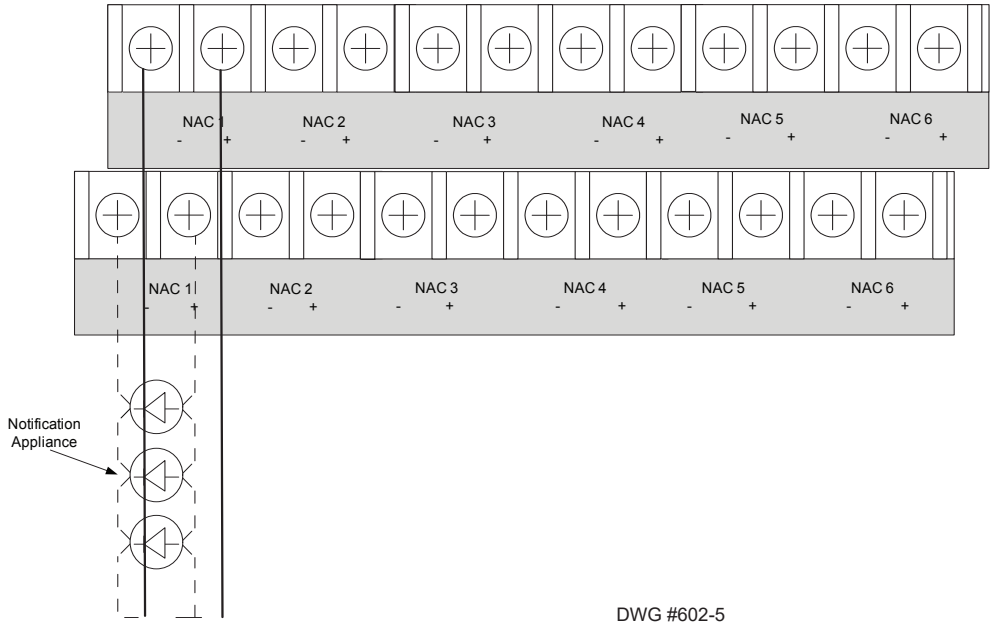

Figure 5. Class A NAC Wiring Requires CA-6500

The end of line resistor is a 5.1K ohm resistor. The resistor assembly has been evaluated in past projects and is a standard in the Potter panel product line. The Potter part number for the listed end of line assembly is 3005013 EOL Resistor Assembly.

I/O Circuits

The panels are equipped with four I/O circuits. The I/O circuits can be configured as either an input or an output. The I/O circuits can be used in Class B mode only.

I/O Circuit as Inputs

As inputs, the I/O circuits are used as a dry contact monitoring inputs, and are power limited and supervised.

Maximum wiring resistance = 100 ohms.
Maximum wiring capacitance = 1 uF.
Maximum wire length = 10,000 feet.
Maximum IDC voltage = 24 VDC
Maximum IDC current = 15 ma

The circuit can be configured for the same selection of contact input functions as the SLC MCM and SCM modules.

I/O Circuit as Outputs (NAC)

As outputs, each of the I/O circuits is rated for 1 amp continuous current at 24 VDC. The outputs are supervised and regulated. The circuits reverse polarity upon activation and the board and illustrations are marked accordingly.

The circuit is power limited and the type of output is selectable. I/O circuits may be configured for strobe synchronization with AMSECO, Wheelock, Gentex, or System Sensor strobe devices as shown compatible in this document and the installation instructions.

The maximum impedance is a function of the load being applied to the circuit. In order to calculate the maximum impedance as follows

(Alarm Current of Notification Appliances) X (Wire Resistance) < 3 volts.

The panels have ground fault detection on the I/O circuits. The impedance to ground for ground fault detection is 0 ohms.

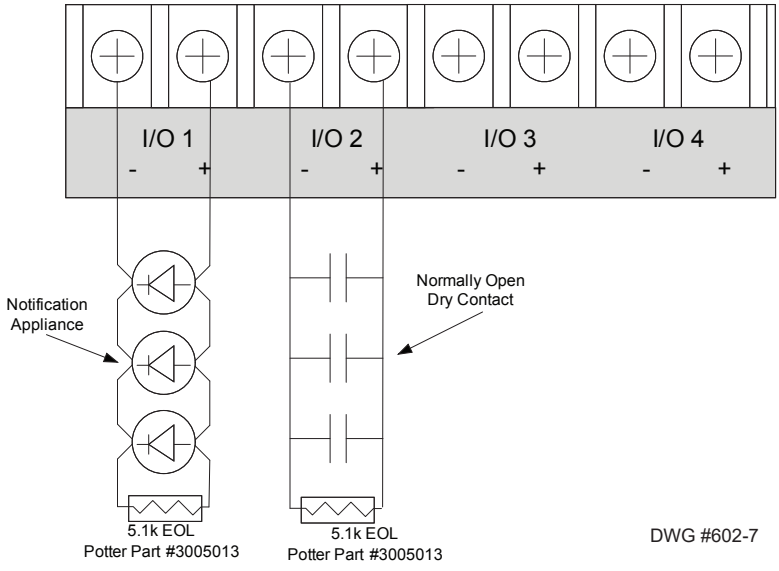

Figure 6. I/O Circuits Shown as Class B NAC / Dry Contact Input

The end of line resistor is a 5.1K ohm resistor. The resistor assembly has been evaluated in past projects and is a standard in the Potter panel product line. The Potter part number for the listed end of line assembly is 3005013 EOL Resistor Assembly.

Signaling Line Circuit (SLC)

The panels are equipped with one built-in SLC loop supporting a maximum of 127 devices. Up to 9 additional SLC loops are supported by adding the PAD100-SLCE or the SLCE-127 loop expander modules. The PAD100-SLCE supports the PAD protocol and the SLCE-127 supports the Nohmi protocol.

The addressable points may be any combination of smoke sensors, heat detectors, input modules or output modules.

The SLC provides power and communication to each of the sensors and modules connected. The SLC is fully supervised in that the communication signal is sent and must be received from each device. The entire loop is polled approximately every 4 seconds.

The voltage range for the SLC is 22-24 VDC. The power is a constant regulated connection with a maximum line resistance of 50 ohms. The SLC has a maximum loop capacitance of 0.5 micro-farads. The maximum SLCE-127 fully loaded loop current is 56.055 mA. The maximum PAD100-SLCE fully loaded loop current is 90.61 mA.

The panels have ground fault detection on the SLC circuits and addressable devices. The impedance to ground for ground fault detection is 0 ohms.

The SLC may be configured and installed as a Class A, Class X or Class B.

If the Nohmi protocol SCI short circuit isolators are installed, a total of 8 devices must be deducted from the total number of devices for each isolator installed.

All SLC wiring is low voltage and power limited.

SLC Address Programming

Addresses for all PAD protocol devices are assigned via a dipswitch on the device.

Addresses for the Nohmi protocol devices are assigned by using the hand-held programmer (part # FZAW004--P/3610053).

SLC Class X Wiring

For the PAD protocol, Class X requires a PAD100-IB to be installed for each sensor and/or PAD100-IM to be installed on each side of each module. The maximum wiring resistance between a PAD100-IB/PAD100-IM and another PAD100-IB/PAD100-IM shall be less than 10 ohms and the total resistance must be below 50 ohms. The maximum wiring resistance shall be calculated based on 0.1 ohm per PAD100-IB/PAD100-IM.

For the Nohmi protocol, Class X requires one AIB to be installed for each sensor and/or SCI to be installed on each side of each module. The maximum wiring resistance between an AIB/SCI shall be less than 10 ohms and the total resistance must be below 50 ohms. The maximum wiring resistance shall be calculated based on 0.1 ohm per AIB/SCI.

> **Note**: Class X requires a close nipple or conduit connection to every module or sensor for both PAD and Nohmi protocols.

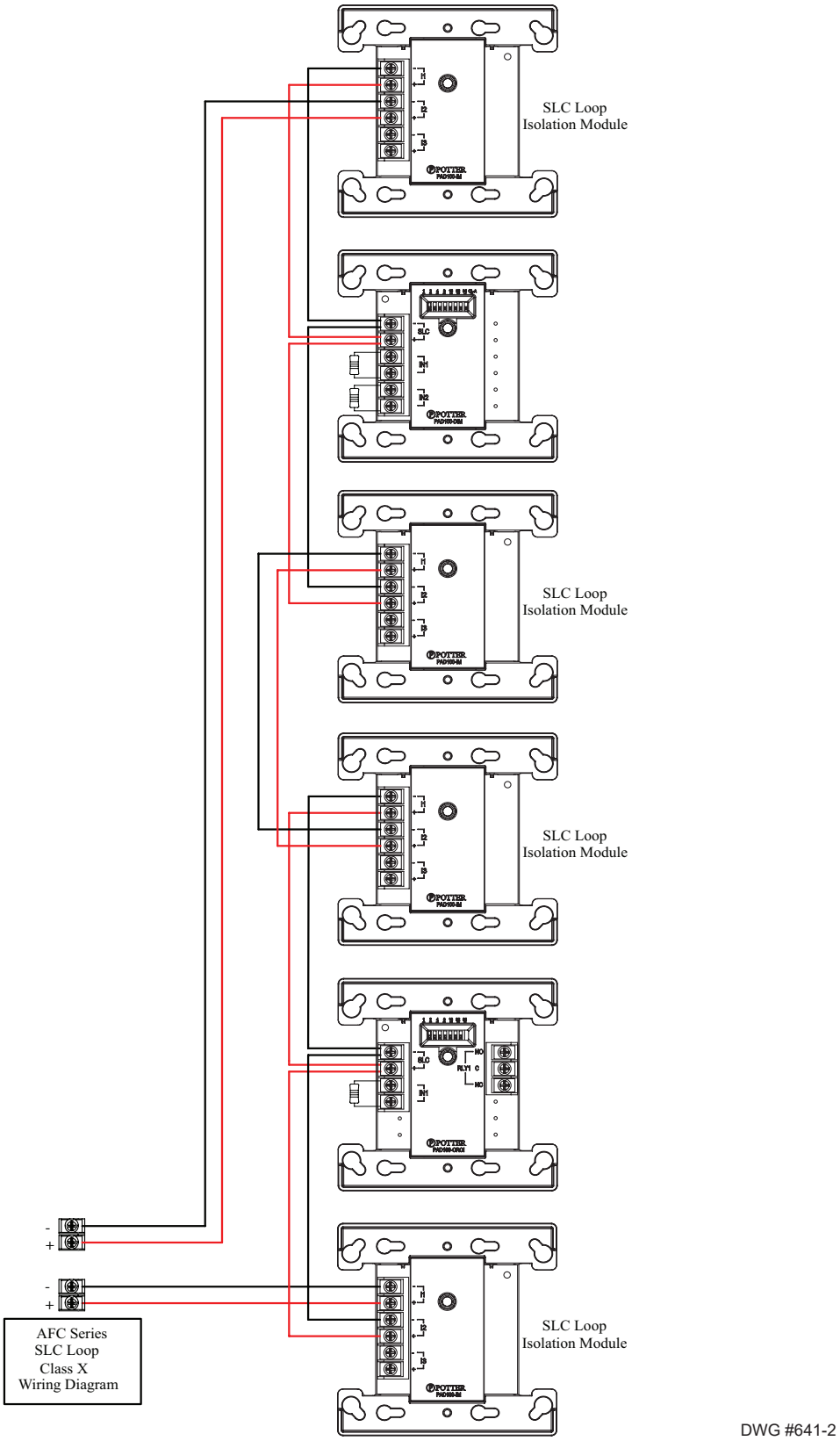

Figure 7. PAD Protocol Class X Showing PAD100-IMs Installed

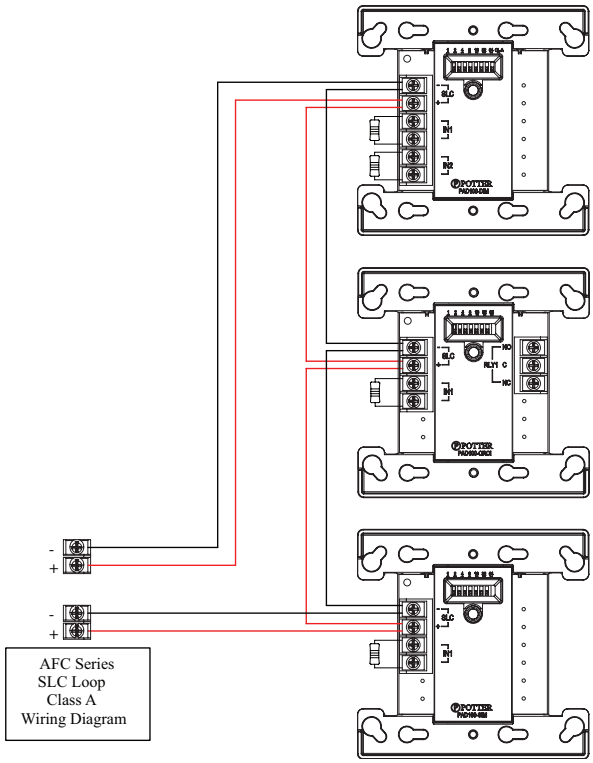

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Figure 8. PAD Protocol Example of SLC as Class A

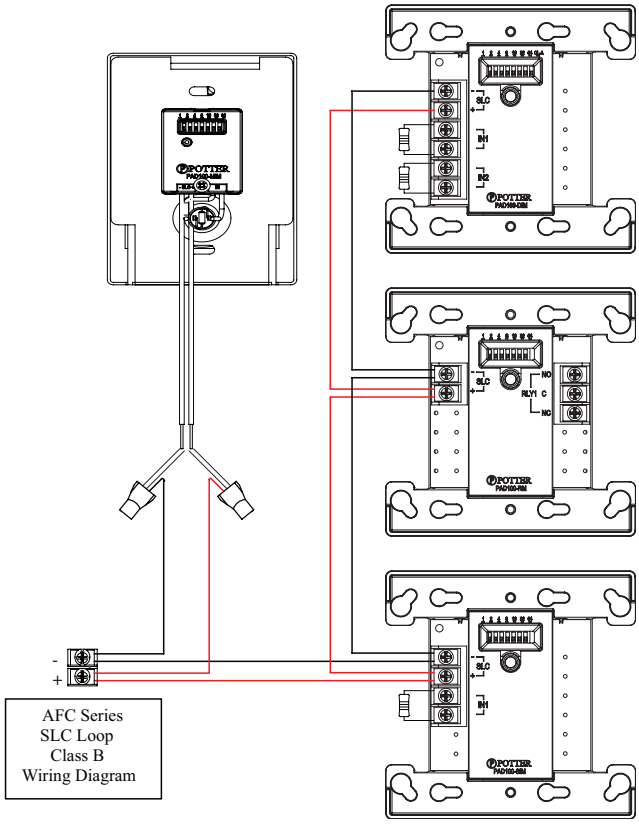

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Figure 9. PAD Protocol Example of SLC as Class B

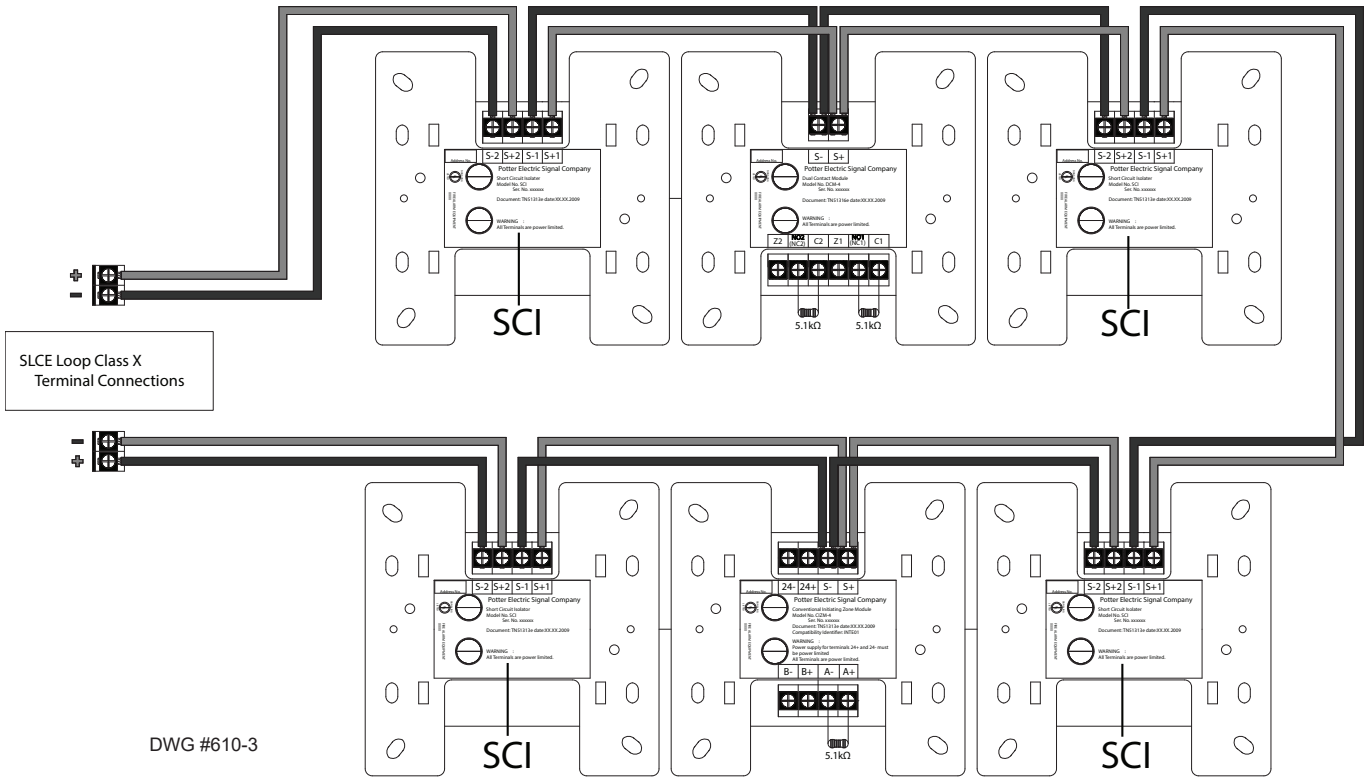

Figure 10. Nohmi Protocol Example of SLC Wired Class X

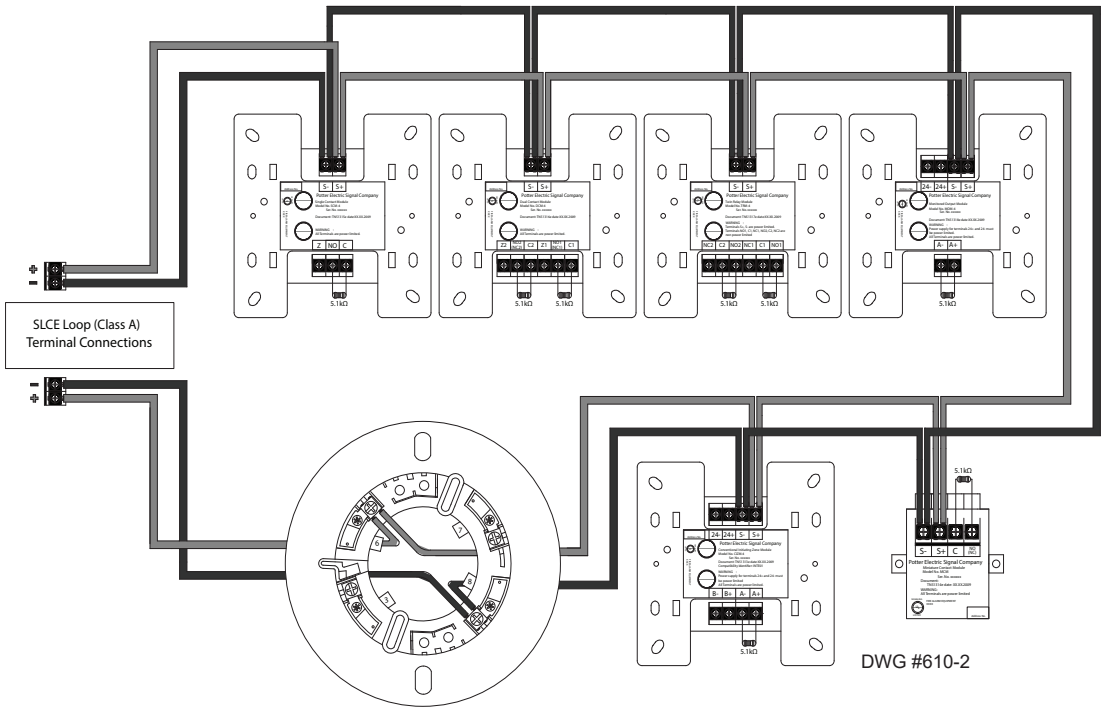

Figure 11. Nohmi Protocol Example of SLC Wired Class A

For Class B, installation of the CA-6500 is not required.

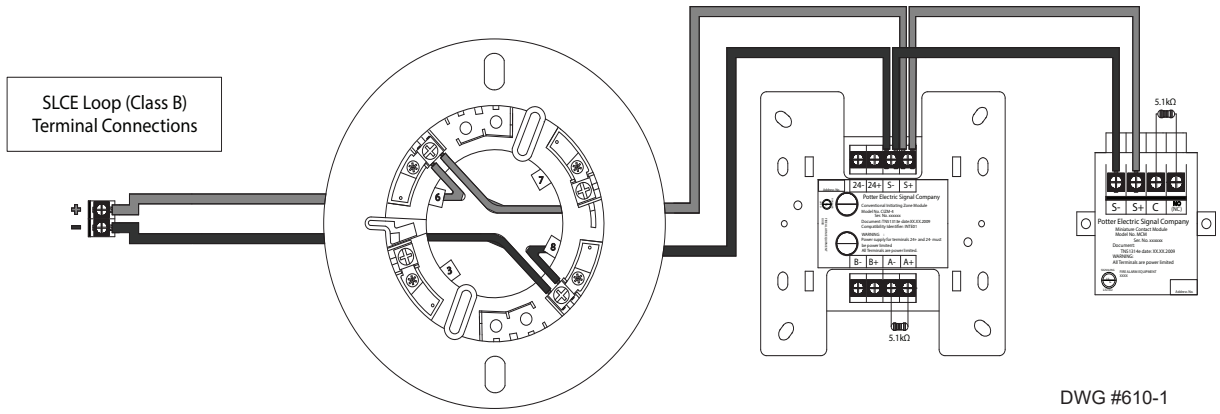

Figure 12. Nohmi Protocol Example of SLC as Class B

P-Link Expansion Bus Circuits

All expansion devices are supervised via the RS-485 connection. Wiring is fully supervised and power limited. Any connection to ground of 0 ohms will be annunciated as a ground fault.

P-Link Current = 1 Amp
P-Link Voltage = 20.0 VDC - 27.3 VDC
Maximum wire length = 6,500 feet.
Maximum wire resistance = Maximum wiring resistance is based on load.
Calculate using the following equation
(Total P-Link Alarm Current) x (Wire Resistance) < 6 volts.

The worst case P-Link current draw cannot exceed the 1 amp. P-Link wiring gauges and lengths are calculated using the worst-case current draw values from the table below. The worst case current draw numbers are used only for wiring calculations, refer to the battery calculation worksheet for normal standby and alarm currents.

P-Link Accessory	Worst Case current draw (ma)
PAD100-SLCE (PAD Protocol)	200
SLCE-127 (Nohmi Protocol)	200
PSN-1000/PSN-1000(E)	10
RA-6075R	25
RA-6500R / RA-6500F	25
UD-1000/UD-2000	25
LED-16/LED-16F	25
DRV-50	25
RLY-5	35
FIB-1000	30
FCB-1000	25
SPG-1000	40
MC-1000	10
IDC-6	20
NCE-1000	50
NCF-1000	95

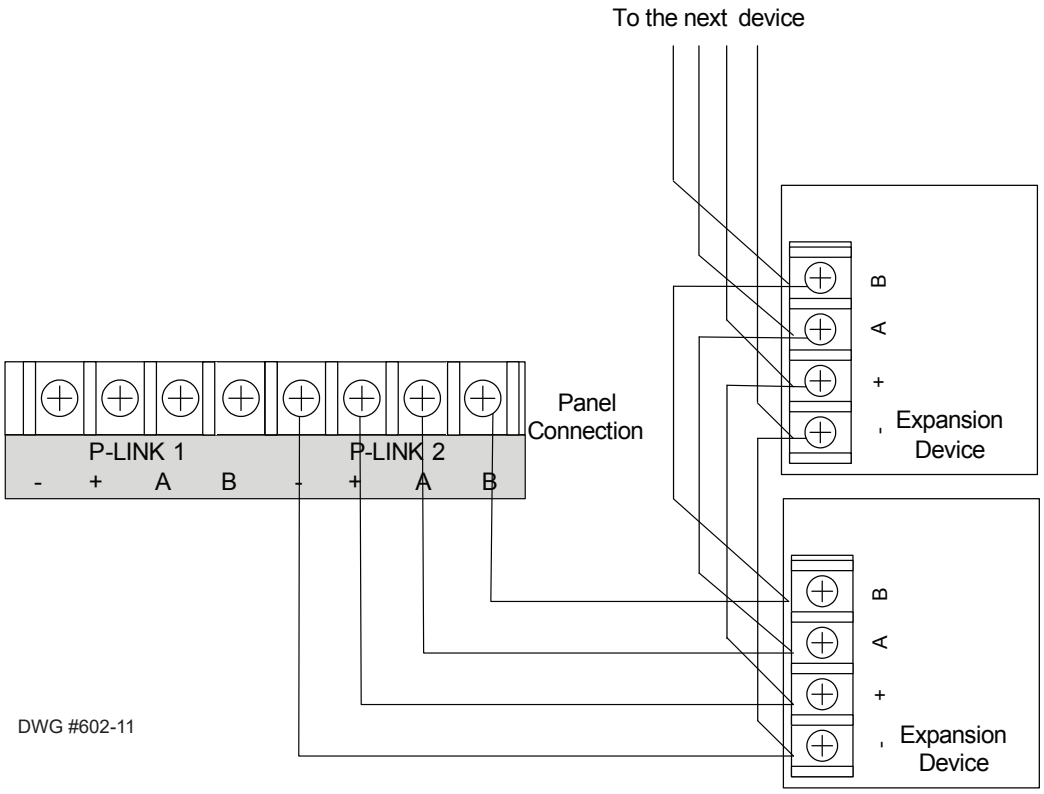

Figure 13. P-Link Class B Wiring Example

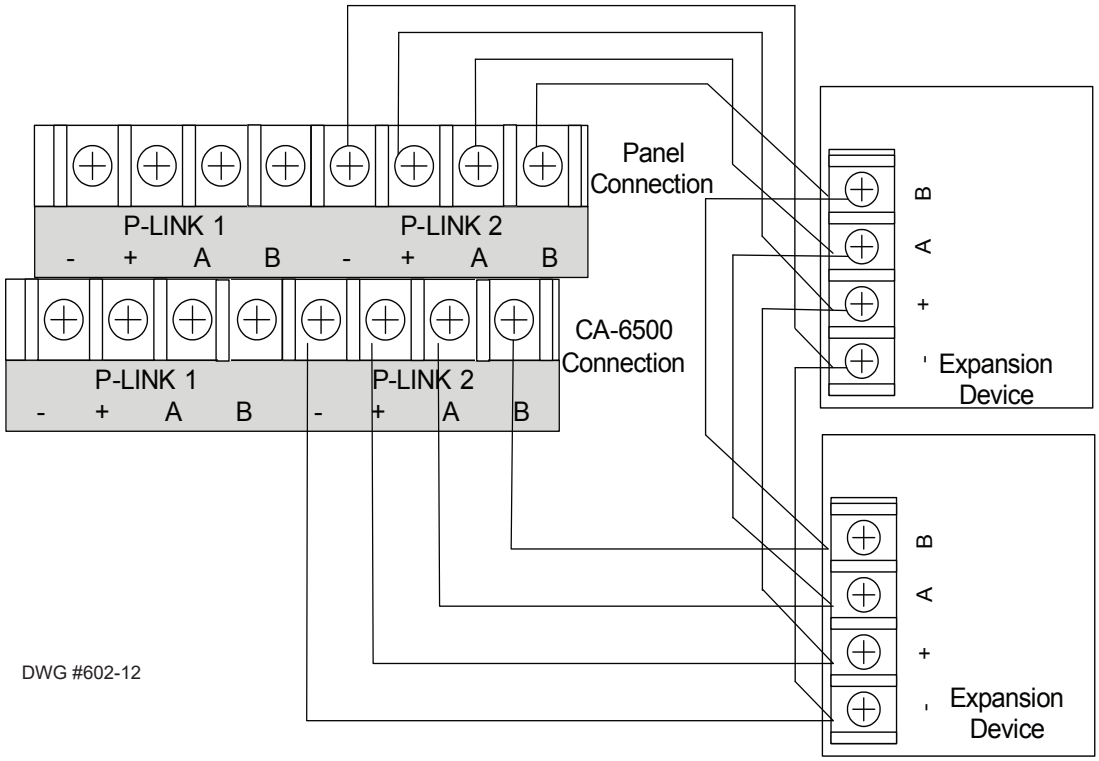

Figure 14. P-Link Class A Wiring Example Requires CA-6500

The panels can be programmed to support the following P-Link devices:

PAD100-SLCE/SLCE-127

The panels can be programmed to support up to 9 PAD100-SLCE (PAD protocol) and/or SLCE-127 (Nohmi protocol) loop expanders. The expansion card provides an additional SLC loop, supporting up to 127 addressable points. The expansion cards support both Class B and Class A wiring.

Remote Annunciator/Keypad Circuits (RA-6500R, RA-6500F, RA-6075R)

A maximum of 31 annunciators in any combination may be connected to the main fire control panel. The RA-6500R and RA-6500F provide a 4x40 character LCD display, along with standard function and numeric keys. The RA-6075R provides a 2x16 character LCD, along with standard function and numeric keys.

UD-1000/UD-2000

The panels can be programmed to support the UD-1000/UD-2000 digital alarm communicator transmitter (DACT). The DACT may be enabled, disabled or bypassed depending on the mode of operation. When the DACT is disabled, the panels are not capable of transmitting any alarms off premises through the DACT.

The DACT provides for up to two phone lines for communication to a monitoring station. The DACT communicates using the SIA-DCS or Ademco Contact ID protocols. When enabled, the DACT automatically monitors each phone line or voltage and has the ability to seize the line and connect with a remote receiver. Once the communication is complete, the DACT will hang up the phone line.

The UD-1000 is provided with an RJ-11 jack for each phone line. The UD-2000 is provided with terminal blocks for each phone line connection. In order for the DACT to work properly, it must be installed on a plain old telephone service (POTS) or equivalent as deemed by the authority having jurisdiction. The DACT must be installed before any other equipment to ensure it can seize the line and disconnect any other lines.

Phone lines are high voltage and should be run in a separate conduit from other circuits. The wire conductors connecting the DACT to the phone system should be 26 AWG or larger.

LED-16/LED-16F (LED Annunciator)

The panels can be programmed to support up to 31 LED-16s. Each LED-16/LED-16F can display alarm/supervisory/trouble conditions for up to 16 zones. Each LED is assigned to a zone, when that zone becomes active, the LED will illuminate. Five (5) non-programmable system LEDs are also provided, which annunciate the overall system condition (Power, Earth, Silenced, Alarm, Supervisory & Trouble).

DRV-50 (LED Driver)

The panels can be programmed to support up to 31 DRV-50 modules. The DRV-50 has 50 LED outputs that can be individually mapped to any zone. The DRV-50 also has four (4) programmable supervised dry contact inputs, and five (5) non-programmable system LED outputs, which annunciate the overall system condition (Power, Earth, Silenced, Alarm, Supervisory, & Troubles).

RLY-5 (Relay Board)

The panels can be programmed to support up to 31 RLY-5 modules. The RLY-5 provides 5 Form-C relay outputs which can be individually mapped to any zone. The Relays have a contact rating of 24VDC / 3.0A, 125VAC / 3A, and Power Factor of 1.0. These outputs are non-power limited and not supervised.

Note: If the power supply connected to the relays is power-limited, then the outputs are power limited.

FCB-1000 (Fire Communications Bridge)

The panels support one FCB-1000. The FCB-1000 provides a remotely-located IP connection into the panel. All IP reporting can be designated to pass through the FCB-1000 instead of through the on-board internet connection.

FIB-1000 (Fiber Interface Bridge)

The panels support up to 31 FIB-1000s. The FIB-1000 can be used to convert the standard 4 wire P-Link bus to/from fiber optic cable. The FIB-1000 uses multi-mode fiber, and is capable of Class A operation.

SPG-1000 (Serial/Parallel Gateway)

The panels support up to 31 SPG-1000 modules. The SPG-1000 can be used to drive a serial and/or parallel printer.

MC-1000 (Multi-Connect)

The panels support up to 31 MC-1000 modules. The MC-1000 allows multiple AFC series panels to report to the central station through a shared phone line or Internet connection.

PSN-1000/E (Power Supply Expander)

The panels can be programmed to support up to 31 PSN-1000/PSN-1000(E) Power Expanders. Each power expander provides 6 NAC circuits (3A max), and 2 dry contact input circuits. The PSN-1000/PSN-1000(E) reconditions/repeats the P-Link bus that provides additional distance and power.

IDC-6 (Initiating Device Circuit)

The panel supports up to 31 IDC-6 modules. Each IDC-6 provides 6 additional conventional Class B inputs or 3 Class A inputs.

NCE-1000 (Network Card Ethernet)

The panel supports up to 31 NCE-1000 and 200 per system. It is used to network the fire alarm panels using CAT5 Ethernet cable. It is fully supervised and is capable of Class B and Class A operation.

NCF-1000 (Network Card Fiber)

The panel supports up to 31 NCF-1000 and 200 per system. It is used to network the fire alarm panels using fiber optic cable. The NCF-1000 allows the user to install SFP (small form-factor pluggable) modules to utilize either single mode or multi-mode fiber. It is fully supervised and is capable of both Class B and Class A operation.

Releasing Device Circuit

The releasing circuit is fully supervised and power limited. The releasing device circuit is a NAC that is programmed to control a releasing device such as a solenoid or squib.

When the control panel is programmed for releasing, additional features are allowed specific to releasing. A PAD100-NAC (NAC) notification appliance circuit may be connected to a releasing device as well and operate as a releasing circuit. When the NAC is used for releasing, it must have a regulated power supply that has a battery back-up equal to that of the panel or greater.

The output is a constant 24 VDC, regulated output. When connected to a releasing device, the circuit is a special application circuit and listed with the devices as outlined in Section 6 of this document.

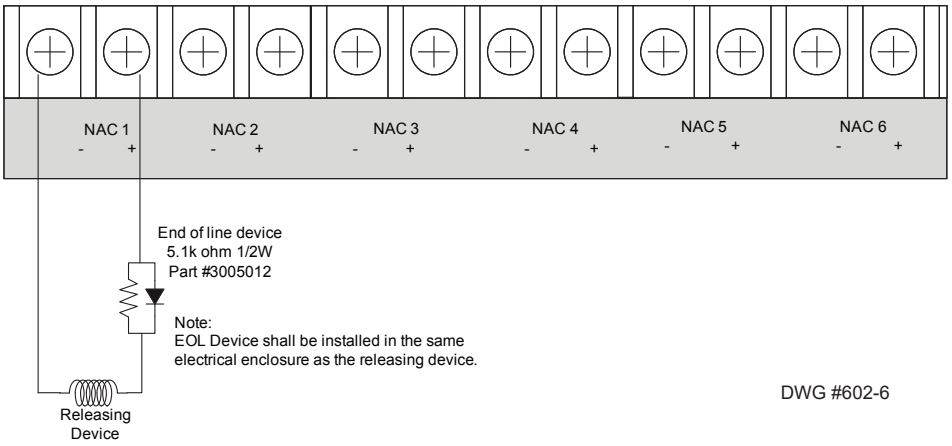

Figure 15. NAC Releasing Circuit Wiring with EOLD Assembly

The maximum current is 3 amps. The maximum line impedance is calculated using the following formula.

Rmax (ohm) = (24V-Vmin-0.95V)/I total
Vmin is the lowest voltage operation of the connected devices.
I total is the total current of the connected devices.

When a NAC is used as a releasing circuit, the End of Line Diode (EOLD) assembly must be installed. The EOLD is Potter part number 3005012 and must be installed in accordance with the installation manual.

According to UL 10th Edition, the disabling of a releasing circuit shall be accomplished by a physical switch activated without the use of the software. When a releasing circuit is disabled a supervisory signal will be annunciated at the FACP.

Municipal Box Connection

When programmed as a municipal box connection, the circuit power is limited, supervised for open and short circuit conditions, and provides a local energy connection.

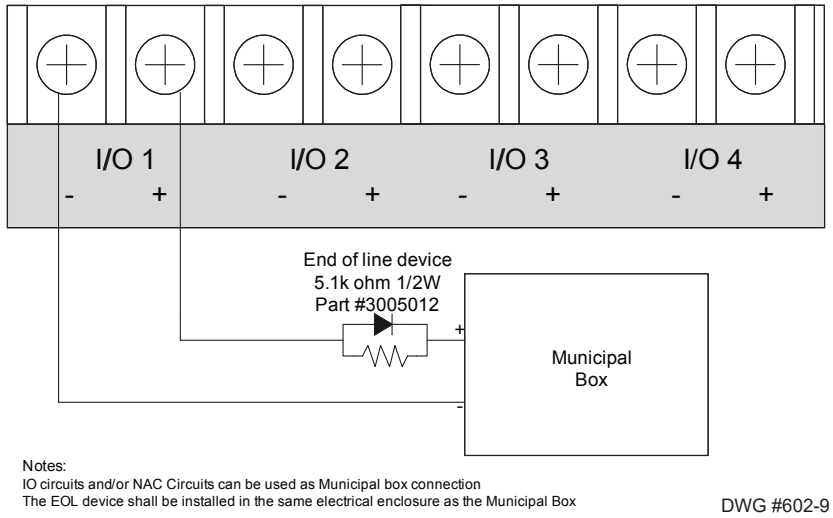

Figure 16. Municipal Box Wiring Example

Trip current = NAC1-NAC6 = 3 Amps, I/O1-I/O4 = 1 Amp

Max Voltage = 24 VDC

The panel has ground fault detection on municipal box connection circuits. The impedance to ground for ground fault detection is 0 ohms.

Reverse Polarity Communication Line Circuit

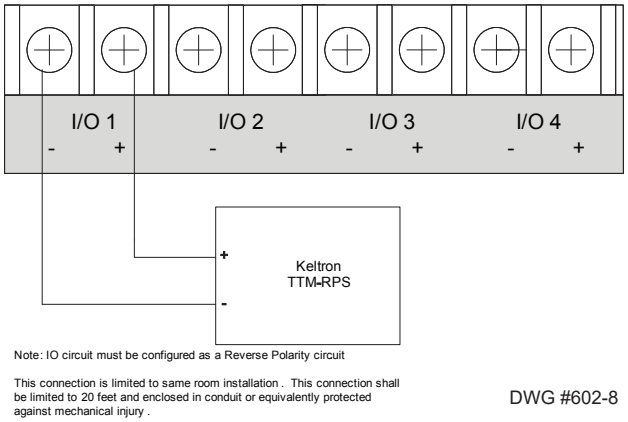

Figure 17. Example of Reverse Polarity I/O Circuit Wiring

Only the I/O circuits on the panel can be programmed as reverse polarity circuits. The short circuit current is rated at *24 VDC and 14 mA maximum*.

When configured for reverse polarity, the panel will indicate alarm and trouble events to a remote site. Alarms will override trouble conditions.

The panels have ground fault detection on reverse polarity circuits. The impedance to ground for ground fault detection is 0 ohms.

The connection between the FACP and the remote device shall be limited to 20 feet and enclosed in conduit or equivalently protected against mechanical injury.

Relay Outputs

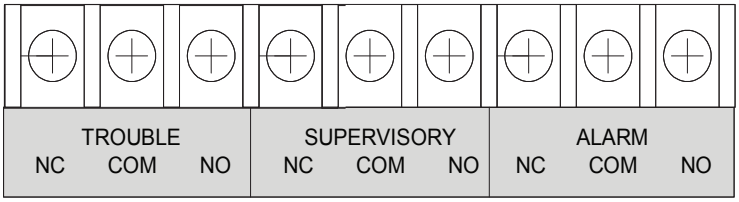

Figure 18. Panel's Dedicated Relay Outputs

The panels have three dedicated common relays. The dedicated trouble relay is a failsafe trouble relay that changes position anytime a trouble condition occurs.

The contact rating is 24VDC / 3.0A, 125VAC / 3A, Power Factor: 1.0. These outputs are non-power limited and not supervised. However, they are power-limited if the power supply to the connected devices is power-limited.

General Wiring Information

The cabinet has various conduit knockouts located around the cabinet for ease of wire installation. In addition, this method provides a means to separate different types of circuit to reduce electrical interference, transient voltage or voltage ratings.

The enclosure requires the use of power limited and non-power limited wiring on the main board as well as within the enclosure. Power limited wiring is to remain separated from non-power limited by a minimum or 0.25 inches and all cabling should be insulated to the higher voltage.

When the panel is installed, the National Electrical Code (NEC, NFPA 70) should be followed for the proper installation and separation of power limited and non-power limited circuits. The mixing of power limited and non-power limited should be avoided. Refer to the following figure for suggested wiring routing.

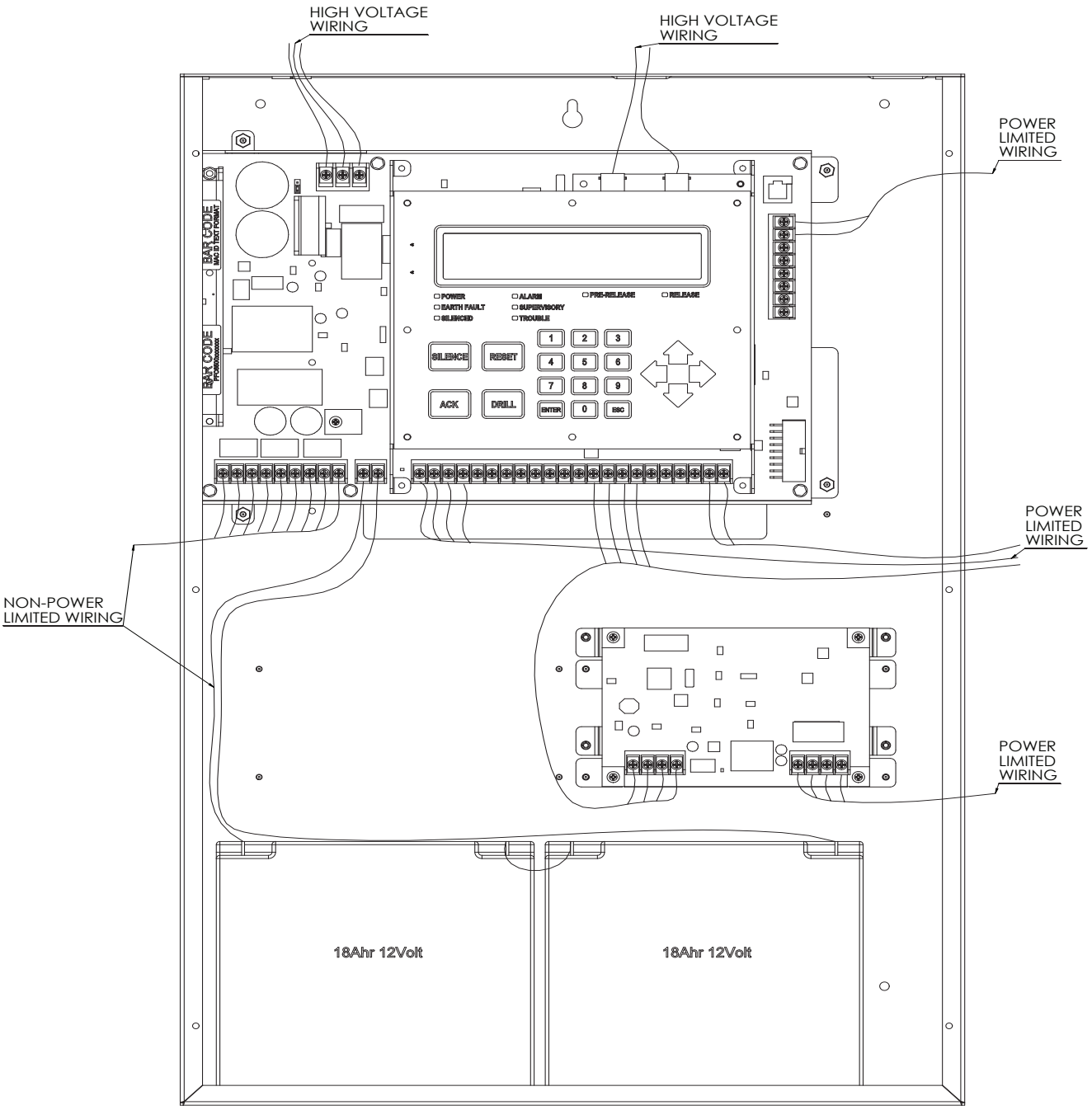

Figure 19. Example of Panel's Wire Routing

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2. Operation

System Type:	Auxiliary Central Station (Protected Premises Unit) Proprietary (Protected Premises Unit) Remote Station (Protected Premises Unit) Local
System Service:	Automatic Fire Alarm Manual Fire Alarm Sprinkler Supervisory Waterflow Alarm Releasing Service for Pre-Action, Deluge
System Signal:	Radio Frequency Digital Alarm Communicator (DAC) March Time Non-Coded Reverse Polarity Other Technologies

3. Functionality

The panel utilizes a signaling line circuit for communication to various sensors and modules. The system polls each loop between every 4 to 5 seconds. The system is completely supervised and is designed to comply with UL 864. The control panel uses a proprietary protocol to digitally communication with various sensors and modules to determine the status of each. When the panel response from the sensor or module is within a pre-determined range or status, the control will process the commands accordingly.

The control panel user interface requires the use of a key to open the outer door. Advanced features will require an additional user code to be entered using a combination of numbers.

The panel is completely programmable through the use of a computer program. Remote programming is detailed later in this section.

The control panel includes three relay contacts for additional monitoring or building functions.

The first relay is a failsafe, dedicated Trouble Relay. This relay changes state during any trouble condition. This relay is not programmable and no additional mapping to this relay can take place.

The second relay is a dedicated Supervisory Relay. This relay changes state during any supervisory condition. This relay is not programmable and no additional mapping to this relay can take place.

The third relay is a dedicated Alarm Relay. This relay changes state during any alarm condition. This relay is not programmable and no additional mapping to this relay can take place.

The AFC-1000 has six NACs and four I/O circuits. Each NAC is rated for 3 amps at 24 VDC. Each I/O circuit is configurable as a NAC rated for 1 amp at 24 VDC, or as a dry contact input. The NACs may be operated in Class A with the addition of a CA-6500 Class A Expander.

NACs may be programmed to provide steady (constant) voltage, a cadence pattern, releasing service or synchronized strobes. Full synchronization is maintained system-wide. The NACs may be programmed as silenceable or non-silenceable. Anytime a NAC has been silenced, the condition will be indicated by the silenced LED. If a NAC that is programmed as silenceable is silenced and another alarm event mapped to that NAC occurs, the NAC will resound and the silenced LED will extinguish.

The Low AC report delay period is programmable from 30 minutes up to 30 hours. For UL installations and applications the installer must set the time delay between 30 minutes and 90 minutes.

Supervisory Signal Operation – Zones programmed as supervisory zones can be programmed as latching or non-latching.

Trouble Signal Operation – Any fault or off normal that would impair the system is annunciated as a trouble condition. The trouble condition is specifically displayed on the LCD display so the trouble can be corrected. When a trouble occurs the buzzer sounds every ten seconds for one second, the trouble LED illuminates and the trouble relay changes state.

The panel transfers from AC to battery instantly upon AC failure or brownout. The trouble relay will indicate the low AC condition after the Low AC Report Delay has elapsed.

The control panel can utilize an optional digital alarm communicator transmitter, (UD-1000/UD-2000). The UD-1000/UD-2000 is a two line dialer with the capability to report in the Ademco Contact ID or the Security Industry Association's Digital Communications Standard (SIA-DCS).

When equipped with a UD-1000, the status changes of the panel are remotely communicated to a monitoring station. Programming options allow for selecting separate accounts for alarm/trouble/supervisory/test events. When a UD-1000/UD-2000 is not installed, the panel will operate as a local system.

The DACT will provide a daily test to a remote monitoring point daily. The daily test time is programmable. If two phone lines are utilized, the DACT will alternate between lines on each daily call. If multiple accounts are programmed, then multiple daily tests will be conducted alternating on each line.

The panels may be equipped with 31 PSN-1000 series intelligent power expanders. The PSN-1000/PSN-1000(E) is a 10 amp notification power supply and P-Link (RS-485) repeater. The power supply connects to the P-Link bus from the control panel and is operated and supervised from the panel.

The power supply has six (6) Class B or three (3) Class A power outputs. Each output is regulated and power limited with a 3 Amp maximum rating. In addition, the PSN-1000s have two (2) programmable dry contact inputs. The dry contact inputs are Class B, supervised inputs.

The power supply operates on either 120 or 220 VAC power and has a regulated 24 VDC output. In addition, the panel can charge up to 55 AH batteries and will house 18 AH batteries.

The power supplies are programmed and controlled through the main control panel P-Link bus. The panel displays any troubles or off normal conditions of the power supply and the events are stored in the panel history buffer.

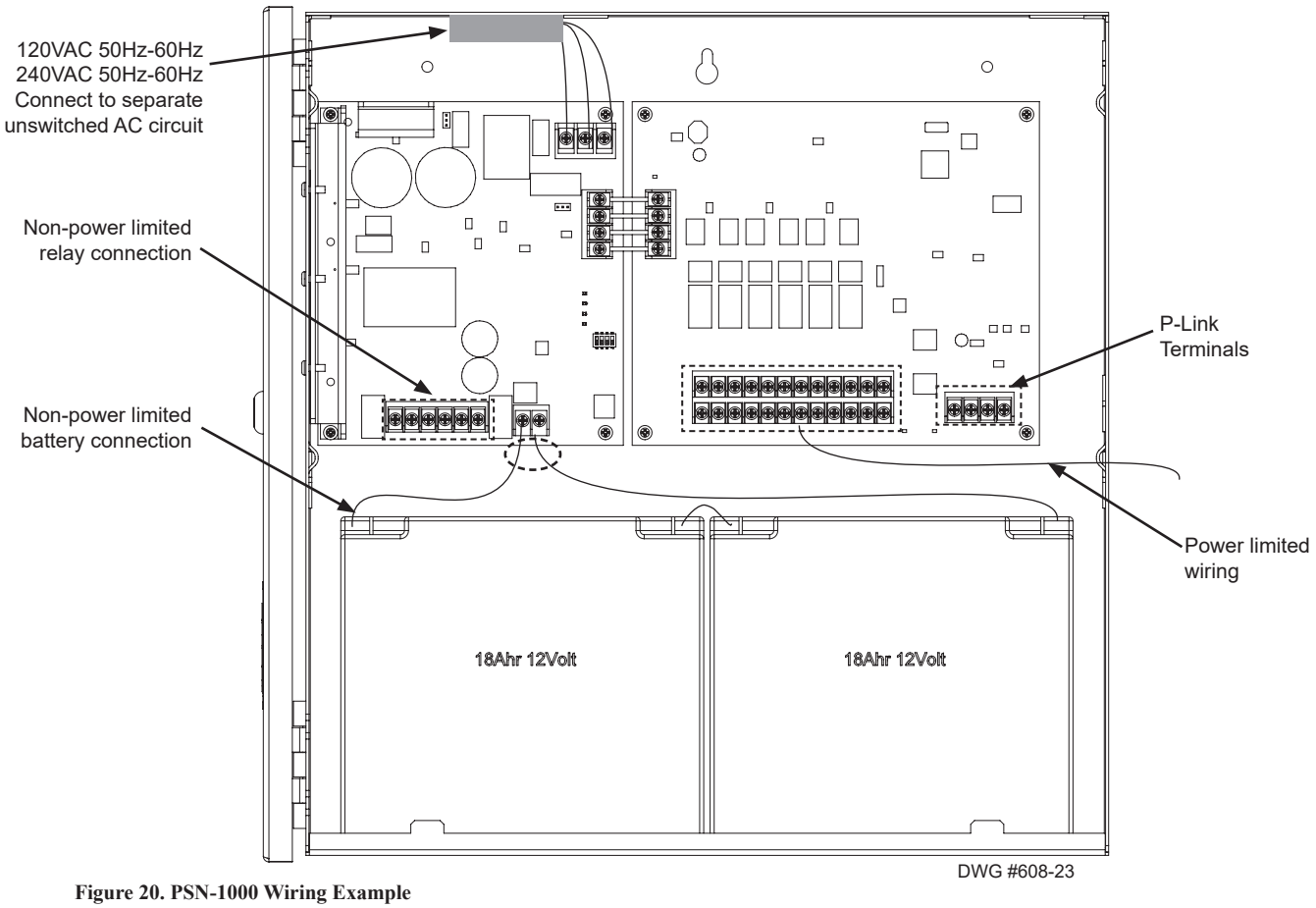


Figure 20. PSN-1000 Wiring Example

The panels may be equipped with 9 additional PAD100-SLCE (PAD Protocol) and/or Nohmi Protocol SLCE-127 boards that utilize a signaling line circuit for communication to various sensors and modules. The system polls each loop between every 4–5 seconds. The PAD100-SLCE and the SLCE-127 supports a maximum of 127 addressable devices configured in any combination of smoke sensors, heat detectors, input modules or output modules.

The PAD100-SLCE and the SLCE-127 outputs are supervised and regulated. Circuits are low voltage and power limited. All wiring must be separated by at least 0.25 inches and the wire insulation must be for the higher voltage. *Refer to Figure 19 for suggested wire routing.*

The PAD100-SLCE and the SLCE-127 are supplied with a mounting bracket which allows it to be mounted into a compatible fire enclosure. Please refer to the figures shown below:

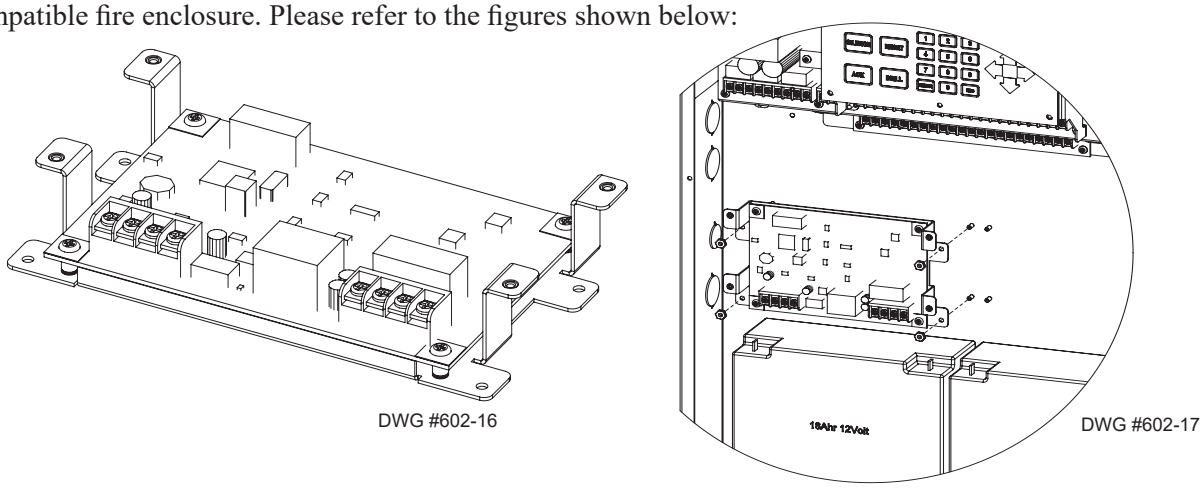


Figure 21. PAD100-SLCE / Nohmi Protocol SLCE-127 Board & Shown Installed in AFC-1000 Cabinet

When the panels are equipped with a LED-16/LED-16(F) module, alarm/supervisory/trouble conditions display for up to 16 zones. Blank zone labels are provided for use with the LED-16s. Zone names/identifiers can be typed or written on the supplied card-stock, and then inserted into the LED-16/LED-16F as shown below.

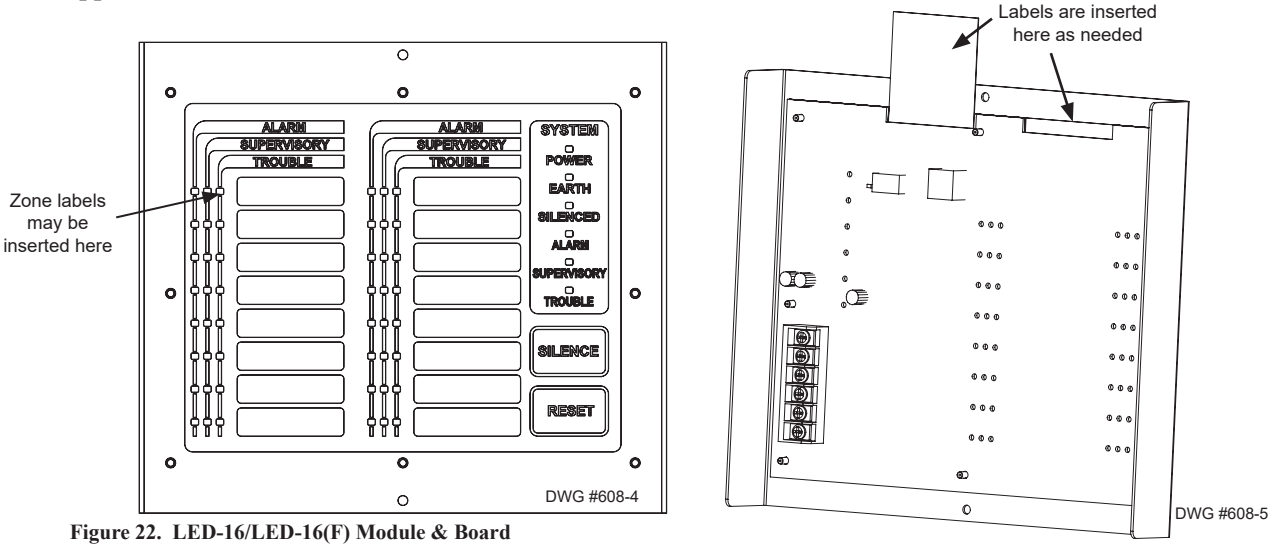


Figure 22. LED-16/LED-16(F) Module & Board

The LED-16s are controlled over the 4-wire P-Link connection. The higher current required for the LED outputs can be provided by the panel, or from an auxiliary power source as shown below. The auxiliary power can be any fire listed 24VDC source, and is fully supervised.

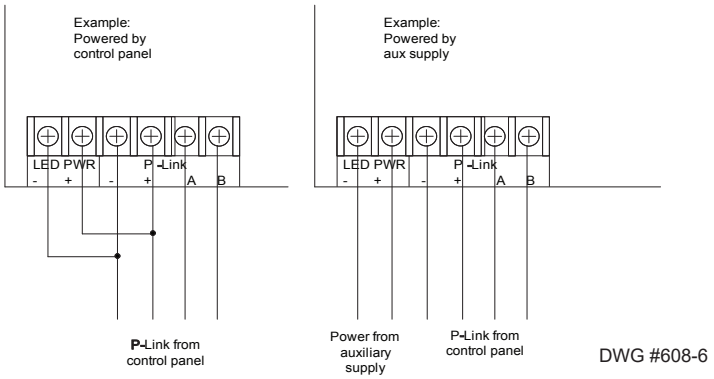


Figure 23. Examples of Wiring a LED-16/LED-16(F) Module to Control Panel or Auxiliary Power Supply

The panels may be equipped with a DRV-50 (LED Driver) module, which can be individually mapped to any zone. The DRV-50 is controlled over the 4-wire P-Link connection. The DRV-50 mounts in a mounting bracket as shown below. This can then be mounted into any of the compatible fire enclosures, or the AE-2, AE-8 or AE-14 accessory cabinets.

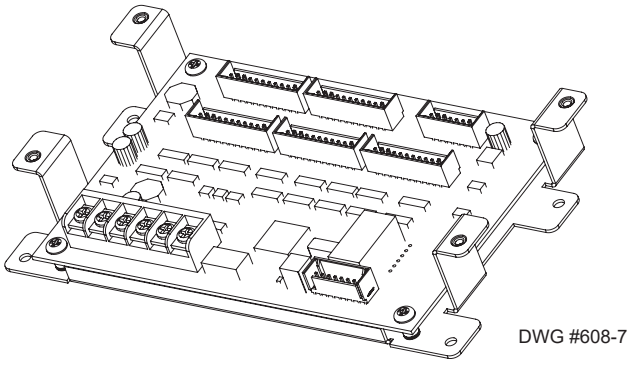


Figure 24. DRV-50 Board Showing Mounting Bracket

The 50 programmable LED outputs are located on connectors P1-P5, each containing 10 LED outputs and two 5VDC outputs. The system LEDs & PZT control outputs are located on connector P6. LEDs are wired as shown below, no external resistor is required. All outputs are power limited. All connections to P1-P6 are limited to same room installation.

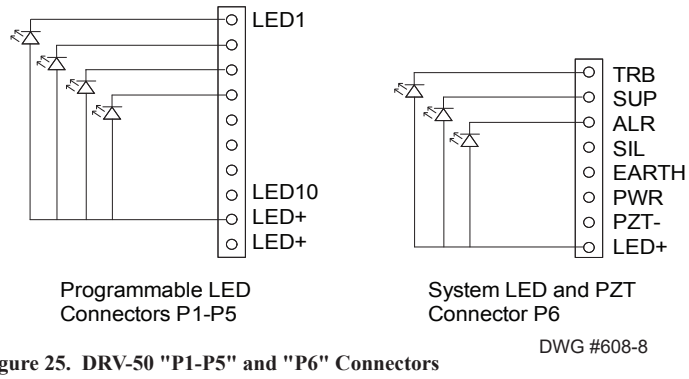
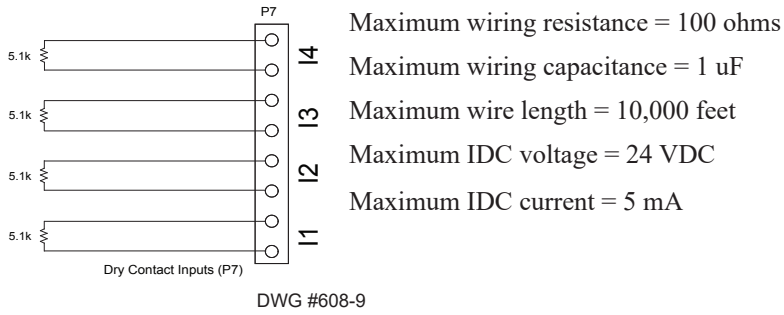


Figure 25. DRV-50 "P1-P5" and "P6" Connectors

The 4 programmable dry-contact inputs are located on connector P7. All input circuits are power limited and use UL listed 5.1k EOL resistor (Potter part #3005013). The inputs can be programmed for any of the contact input functions available for other input circuits available on the panel. Inputs I1-I4 are Class B dry contact inputs only. All contact inputs are fully supervised. Ground fault detection impedance is 0 ohms.



Maximum wiring resistance = 100 ohms
Maximum wiring capacitance = 1 uF
Maximum wire length = 10,000 feet
Maximum IDC voltage = 24 VDC
Maximum IDC current = 5 mA

Figure 26. DRV-50 Dry Contact Input "P7" Connector

The higher current required for the DRV-50 outputs can be provided by the panel, or from an auxiliary power source as shown below. The auxiliary power can be any fire listed 24VDC source, and is fully supervised. Output power must be 16 VDC-33 VDC, and must be power limited.

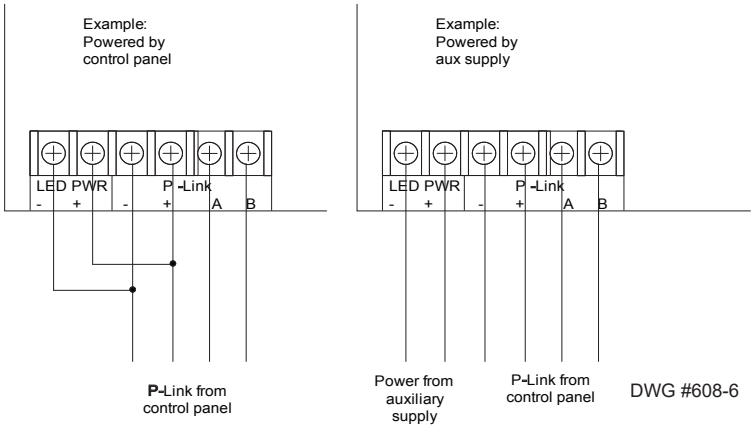


Figure 27. Examples of Wiring DRV-50 from Control Panel or Auxiliary Power Supply

The panels may be equipped with a RLY-5 (Relay Board) module, which is controlled over the 4-wire P-Link connection. The RLY-5 mounts in a mounting bracket as shown below. The RLY-5 can be mounted inside the panel cabinet, or the AE-2, AE-8 or AE-14 accessory cabinets.

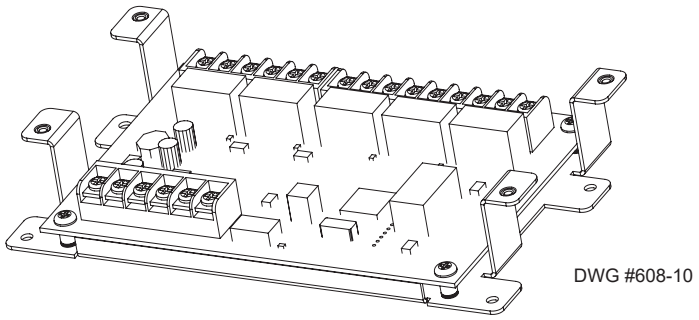


Figure 28. RLY-5 Board Showing Mounting Bracket

The RLY-5 higher current required for the relay outputs can be provided by the panel, or from an auxiliary power source as shown below. The auxiliary power can be any fire listed 24VDC source, and is fully supervised. Output power must be 16VDC-33VDC, and must be power limited.

- Relay contacts are rated for 120VAC/24VDC, 3 Amp (resistive).
- All connections to relay contacts shall be power limited.
- Not to be used for off-premise signaling.

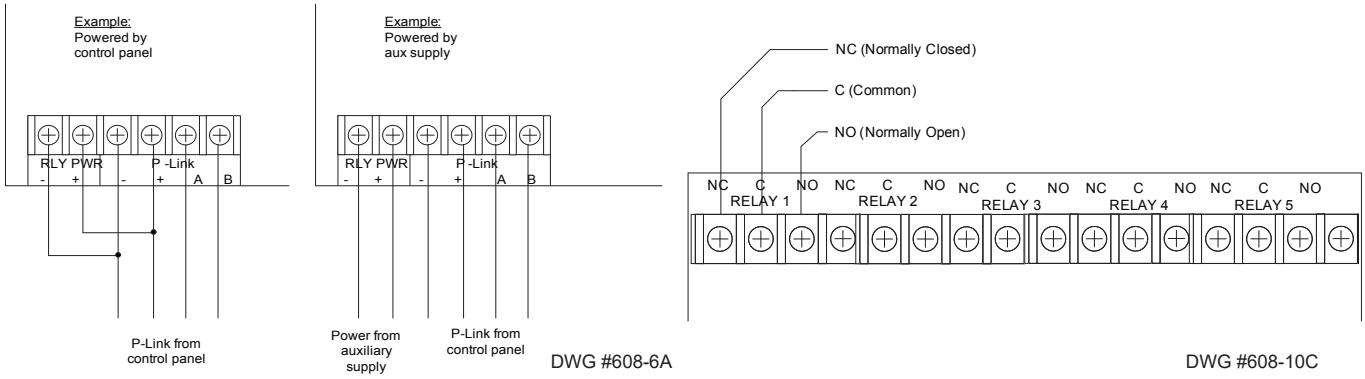


Figure 29. RLY-5 Wiring to Control Panel / Auxiliary Power Supply & RLY-5 Normally Open / Normally Closed Contacts

When the FCB-1000 (Fire Communications Bridge) is added to the panel, a remotely-located IP connection is provided into the panel. The FCB-1000 can be mounted inside the AE-2, AE-8 or AE-14 accessory enclosure. The optional rack-mount kit (FCB-1000RM) includes a standard 19 inch rack-mount enclosure, which can then be installed directly in an equipment rack.

Note: The Ethernet/IP connection is limited to same room installation. This connection shall be limited to 20 feet, and enclosed in conduit or equivalently protected against mechanical injury.

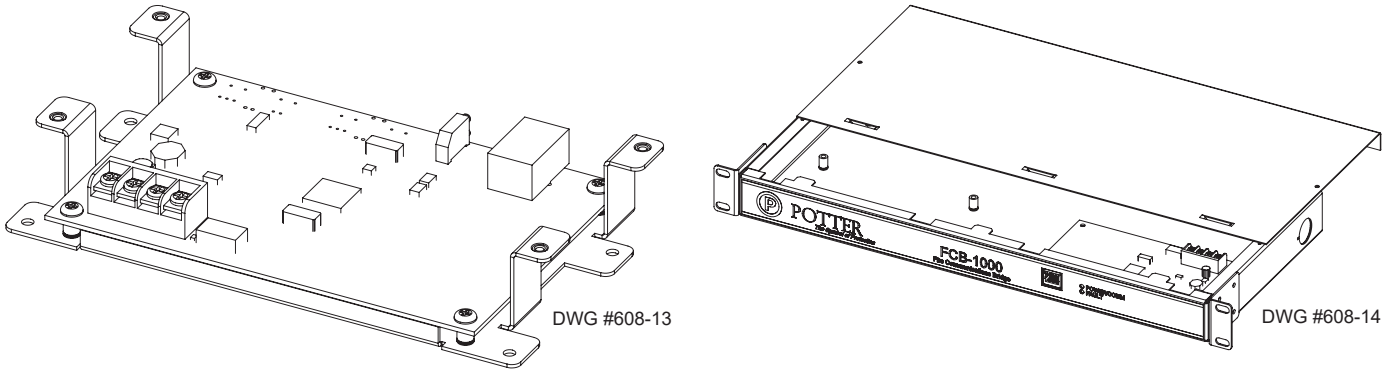


Figure 30. FCB-1000 Bridge & FCB-1000RM Showing Rack Mount

When the panels are equipped with the FIB-1000 (Fiber Interface Bridge) optional board, the standard 4 wire P-Link bus may be converted to/from the fiber optic cable.

The FIB-1000 can be mounted inside the AE-2, AE-8 or AE-14 accessory enclosure. The optional rack-mount kit (FIB-1000RM) includes a standard 19 inch rack-mount enclosure, which can then be installed directly in an equipment rack.

- Utilizes multimode 62.5/125 micron fiber optic cable (wave length = 820 nm)
- Tolerates up to 12 db of signal loss

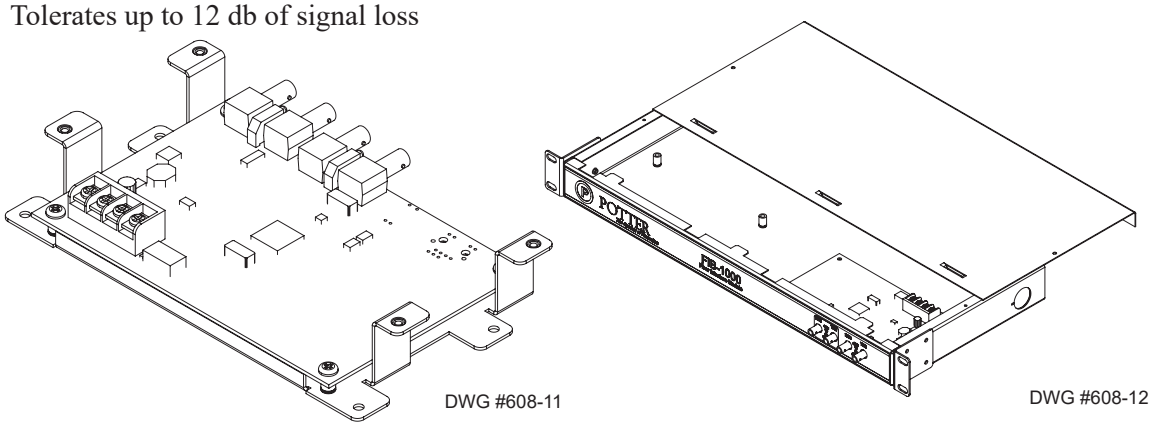


Figure 31. FIB-1000 Bridge & FIB-1000RM Showing Rack Mount

An optional SPG-1000 serial/parallel gateway (printer driver) board can be mounted inside the AE-2, AE-8 or AE-14 accessory enclosure. A rack-mount kit (SPG-1000RM) includes a standard 19 inch rack-mount enclosure, which can then be installed directly in an equipment rack.

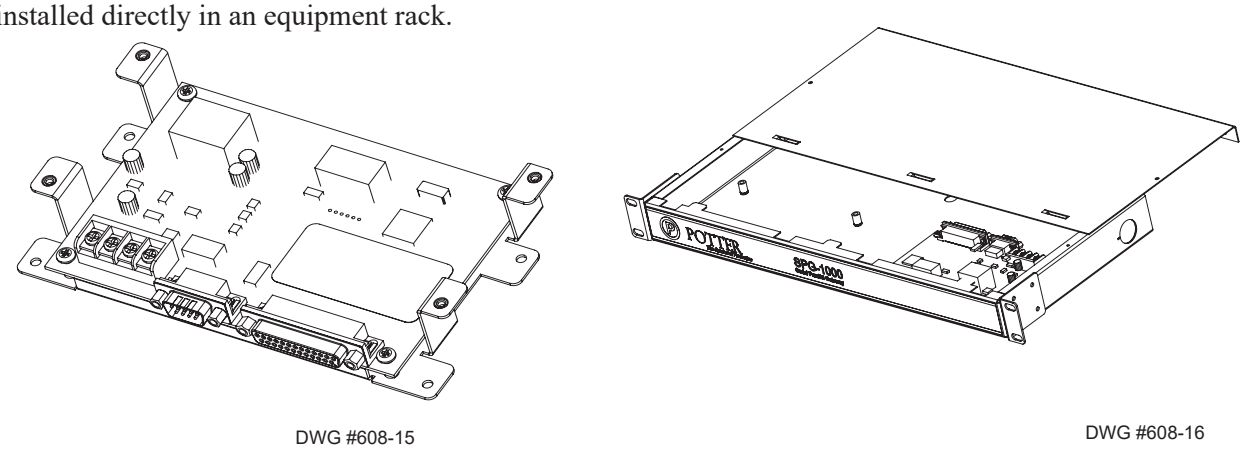


Figure 32. SPG-1000 Serial Parallel Gateway Board & Rack Mount

Note: Serial/Parallel printer connection is limited to same room installation. This connection shall be limited to 20 feet, and enclosed in conduit or equivalently protected against mechanical injury.

When the AFC series panels are equipped with the MC-1000 (Multi-Connect Module) optional board, up to 63 panels may be interconnected to report to the central station through a shared phone line or Internet connection.

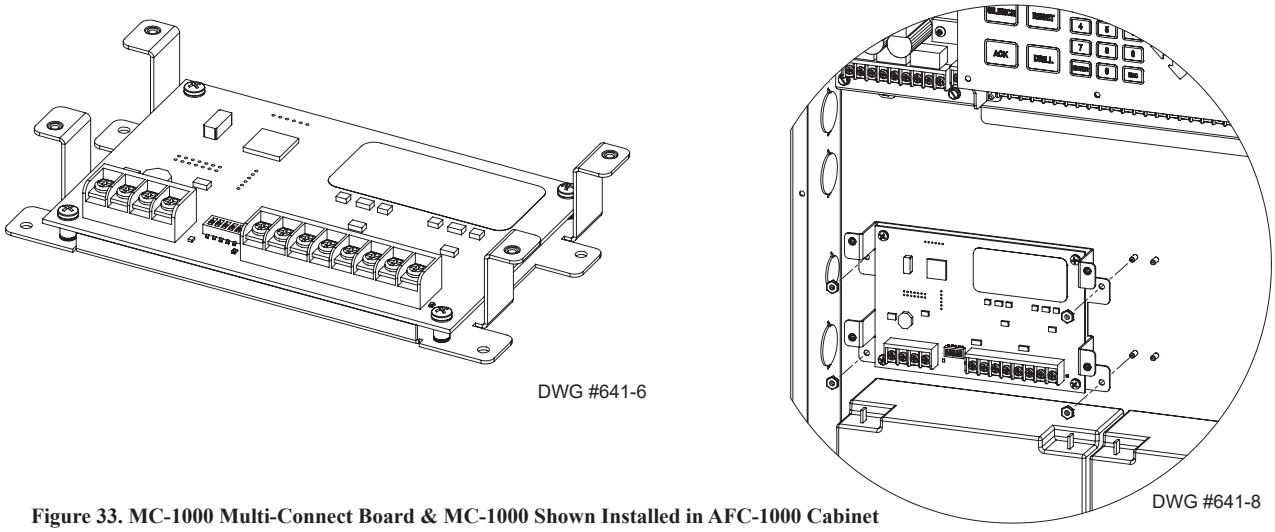


Figure 33. MC-1000 Multi-Connect Board & MC-1000 Shown Installed in AFC-1000 Cabinet

The panel supports up to thirty one (31) IDC-6 modules. The IDC-6 is controlled over the 4 wire P-Link connection. . It can be mounted in the large panel enclosure, the PSN-1000, or either of the AE-2, AE-8 or AE-14 accessory cabinets..

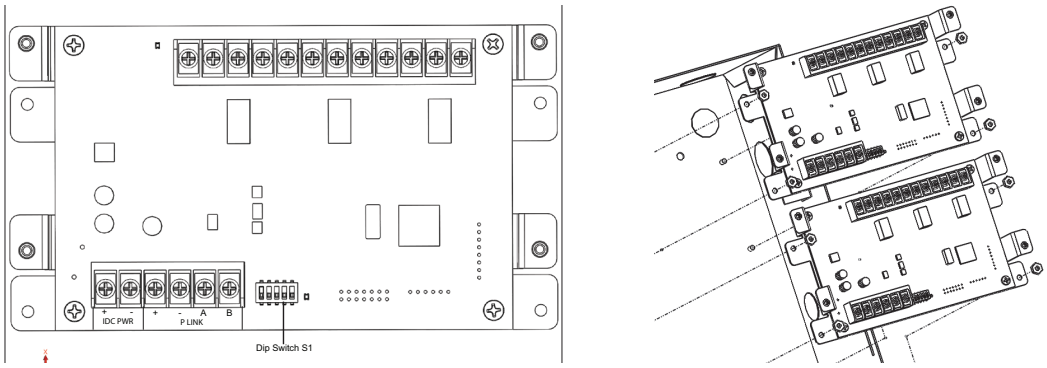


Figure 34. IDC-6 Initiating Device Circuit Expander and IDC-6 Installation

The IDC-6 higher current required for the inputs can be provided by the panel, or from an auxiliary power source as shown below. The auxiliary power can be any fire listed 24VDC source, and is fully supervised. IDC-6 operating voltage range is 15VDC-28VDC, and must be power limited.

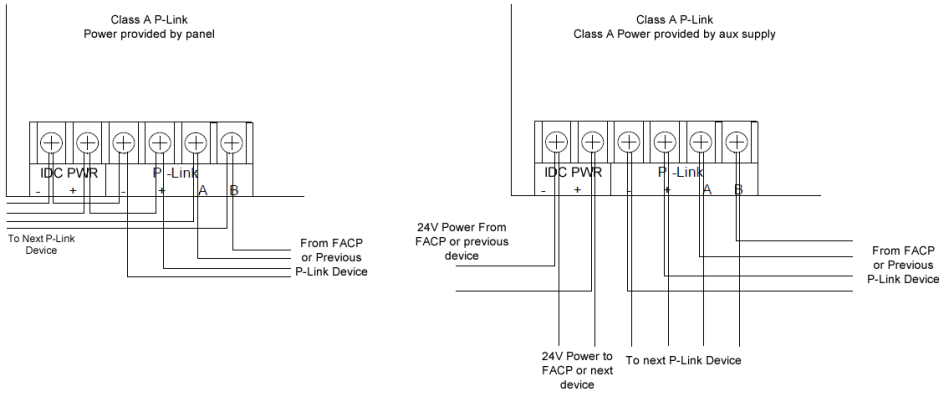


Figure 35. IDC-6 Class A Wiring

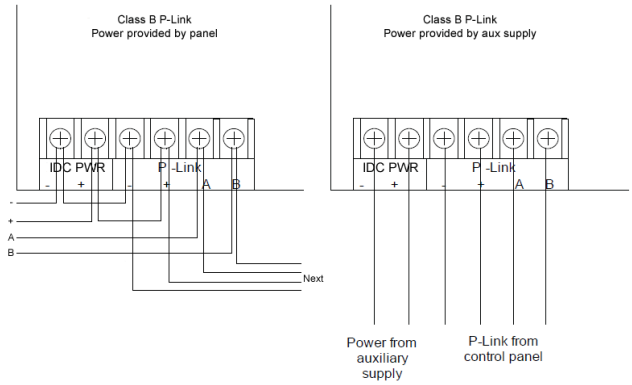


Figure 36. IDC-6 Class B Wiring

The NCE-1000 is used to network the fire alarm control panels via CAT5 Ethernet cable. It is fully supervised and is capable for Class B and Class A operation. The NCE-1000 can be used as a Class A extender which extends the length of the Ethernet connection from 300 feet to 600 feet. The NCE-1000 may be mounted in either the control panel cabinet, the PSN- 1000/E, the AE-2, AE-8 or AE-14. When wiring Class A or B, the connection between the FACP and the module shall be limited to 20 feet and enclosed in conduit or equivalently protected against mechanical injury. A maximum of 31 NCE-1000s can be installed per panel, with a maximum of 200 panels per network. Please refer to installation manual 5406326.

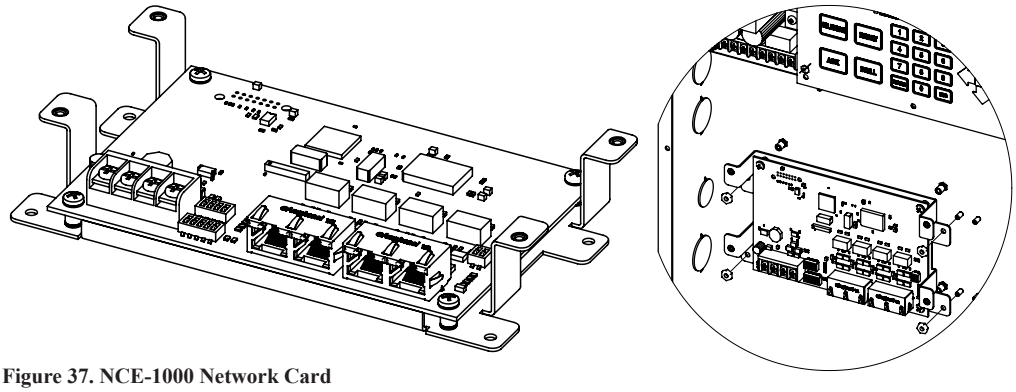


Figure 37. NCE-1000 Network Card

The NCF-1000 is used to network the fire alarm control panels using fiber optic cable. The NCF-1000 allows the user to install SFP (small form-factor pluggable) modules to utilize either single mode or multi-mode fiber. It is fully supervised and is capable of both Class B and Class A operation. The NCF-1000 may be mounted in either the control panel cabinet, the PSN-1000/E, the AE-2, AE-8 or AE-14. The connection between the FACP and the module shall be limited to 20 feet and enclosed in conduit or equivalently protected against mechanical injury. A maximum of 31 NCF-1000s can be installed per panel with a maximum of 200 panels per network. Please refer to installation manual 5406424.

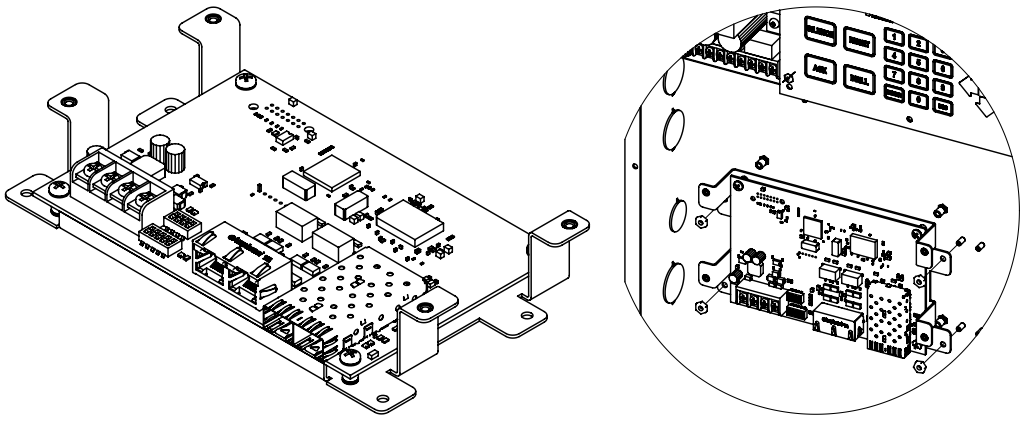


Figure 38. NCF-1000 Network Card Fiber

The control panel has an interface display for allowing users, technicians and installers the ability to recognize the status and input changes to the control panel. The display consists of three parts — the 160 character LCD display, the keypad and LEDs.

The keypad on the control panel is utilized for common user functions and system programming. The common user function buttons the following:

ACK – When pressed acknowledges the status change of the panel.

Signal Silence – When the button is pressed will silence outputs that are programmed as silenceable.

System Reset – When this button is pressed, the system will reset the panel to a normal condition. Once the reset is complete, any off normal status will be displayed.

Fire Drill – When programmed, the Fire Drill button will activate the programmed outputs to simulate an actual alarm without creating an alarm event.

The display has the following LEDs:

Power – A green LED that illuminates any time AC power is present.

Alarm – A red LED that flashes any time an input programmed as an alarm device is active and has not been acknowledged. The LED will illuminate steady after all alarm conditions have been acknowledged.

Pre-Release – An amber LED that illuminates when a releasing zone is in a Pre-Discharge mode.

Release – A red LED that is on steady when a releasing output is active.

Earth Fault – An amber LED that flashes any time a ground fault is present on one of the control panel circuits and has not been acknowledged. The LED will illuminate steady after all earth faults have been acknowledged.

Supervisory – An amber LED that flashes any time an input programmed as supervisory is active and has not been acknowledged. The LED will illuminate steady after all supervisory conditions have been acknowledged.

Signal Silence – An amber LED that will illuminate any time the signal silence is active.

Trouble – An amber LED that flashes any time a trouble condition on the system is present and has not been acknowledged. The LED will illuminate steady after all trouble conditions have been acknowledged.

The control panel has the following functions:

Drift Compensation – The system employs drift compensation as a false alarm preventive measure. The drift compensation is controlled as part of the smoke head and not part of the control panel.

Calibrated Smoke Detector Sensitivity Testing – The control panel polls the smoke sensors for the current AD value approximately once every four seconds. Approximately every 4 minutes, the control panel polls the smoke sensors for the dirty value and compares the dirty value of the sensor to the alarm threshold. If the dirty value is 50% of the alarm threshold, a sensor trouble will be annunciated. A technician may also request the status of any sensor in the system through the front panel menu. In addition, a report can be printed that provides the level of sensitivity and the current level.

Remote Programming – The control panel is capable of being programmed remotely via the optional UD-1000/UD-2000 communicator. The remote modem calls the panel from a remote location and if programmed to answer phone calls it will pick up the call. Before the panel will accept any changes to the configuration data, an on-site user must enable the panel for remote access via the front panel keypad.

Positive Alarm Sequence – The control panel is programmable for Positive Alarm Sequence. When a zone is programmed as positive alarm sequence and an automatic sensor is activated, the user has up to 15 seconds to acknowledge the alarm. Failure to acknowledge the alarm will activate the evacuation appliances. If the alarm is acknowledged, the user has up to 180 seconds to reset the system. Failure to reset the system after the acknowledgment timer will result in the evacuation signal being activated.

Alarm Verification – The control panel is programmable to enable alarm verification in compliance with UL 864 and NFPA 72. Zones with smoke sensors programmed as alarm verification when activated will delay the notification circuits from activating for up to 60 seconds. If the smoke sensor is still in the alarm condition after the programmed delay, the evacuation signals will activate.

Note: Alarm activation requiring activation of two or more automatic detection devices shall not utilize alarm verification or any other time delay.

The control panel maintains the date and time independently of the main or secondary power. The date and time can be changed through the front keypad menu. In addition, daylight savings time may be programmed into the system, the dates of the time change are programmable if this feature is selected.

When an appropriate pass code is entered via the key pad into the control panel, the user may disable a device within the system. Any addressable point, NAC or suppression circuit may be disabled. When a device or circuit is disabled, the panel will indicate the off-normal condition. When the device or circuit is enabled, the trouble will clear and the panel will operate in a normal fashion. More than one device or circuit may be disabled at any one time. The circuits may individually be enabled and not affect the others.

The control panel controls the alarm threshold of the smoke detectors programmed as part of the system. The alarm threshold is limited to the listed value of the smoke detector. The selectable range of sensitivity is 1.5 percent per foot obscuration to 3.5 percent per foot obscuration. The alarm threshold may be adjusted in the computer software.

The control panel may be programmed for Day and Night mode smoke detector alarm threshold. The smoke detectors must be programmed for the day and night mode in addition to the Day/Night mode being enabled. In addition, the programmer must select the days and times for the days and nights. Up to fifty holidays may be programmed for the night mode (more sensitive) setting. The alarm threshold is only programmable for the listed range of the detector.

The control panel utilizes a concept of software zones for mapping inputs to outputs. Inputs and outputs are mapped to a single or multiple zones and when an input activates, all of the outputs within the same zone are activated. The panel also supports Cross Zoning, Counting Zones or a combination of a Cross/Count Zone. Cross zoning requires two inputs from separate zones in order to activate an output. A counting zone requires two inputs within the same zone to activate an output. The combination of a Cross/Counting Zone is two inputs in different zone or two inputs within the same zone to activate an output.

4. Programming Options

The control panel is configured using a PC based programming tool. The panel stores the site specific configuration data in non-volatile memory.

NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION, AND OTHER INVOLVED PARTIES
This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, certain programming features or options must be limited to specific values or not used at all as indicated below.

Topic	Feature or Option	Permitted in UL (Y/N)	Possible Settings	Setting(s) Permitted in UL864?	Comment
Misc	Idle LCD Message	Y	Yes/No	All Settings Allowed	
Misc	Display Events	Y	Initial Event Newest Event	Initial Event	Auto display of first event
Misc	SLC Blink	Y	Normal/Slow/Off	All Settings Allowed	
Misc	Alarm Verification Time	Y	0-60 Sec	All Settings Allowed	
Misc	Waterflow Delay	Y	0-255 Sec	All Settings Allowed	

Topic	Feature or Option	Permitted in UL (Y/N)	Possible Settings	Setting(s) Permitted in UL864?	Comment
Misc	AC Report Delay	Y	30 Minutes to 30 Hours	1-3 Hours	For UL864 use 1-3 Hr
Misc	DH Low AC Dropout Delay	Y	No delay, 15 Sec, 1 minute, 5 minute	All Settings Allowed	
Misc	Autotest Time	Y	Time of Day	All Settings Allowed	
Misc	Autotest Interval	Y	1-24 Hours	All Settings Allowed	
Misc	Strobes Active When Silenced	Y	Yes/No	All Settings Allowed	
Misc	50 Hz AC	Y	Yes/No	All Settings Allowed	
Misc	CO Tone on Annunciators	Y	Yes/No	All Settings Allowed	
Misc	Low Temp Events Are Supervised	Y	Yes/No	All Settings Allowed	
Misc	Disable 24 hours PZT Resound	Y	Yes/No	All Settings Allowed	
Misc	Display AM/PM	Y	AM/PM, 24 Hour	All Settings Allowed	
Misc	Synchronize to Network Time	Y	Yes/No	All Settings Allowed	
Misc	SNTP Server	Y	North-America.Pool.NTP.org	All Settings Allowed	
Misc	Time Zone	Y	24 Time Zone Selections	All Settings Allowed	
Misc	DST Enabled	Y	Yes/No	All Settings Allowed	
Misc	DST Start	Y	Month/Day	All Settings Allowed	
Misc	DST End	Y	Month/Day	All Settings Allowed	
Zone	Zone Style	Y	Alarm Supervisory PAS Auxiliary Releasing Fire Drill Waterflow Alert System Alarm System Supervisory System Trouble CO Alarm CO Supervisory	All Settings Allowed	
Zone	Alarm Count	Y	1-10	All Settings Allowed	
Zone	Silenceable	Y	Yes/No	All Settings Allowed	
Zone	Silence Inhibit	Y	Yes/No	All Settings Allowed	
Zone	Auto Silence	Y	Yes/No	All Settings Allowed	
Zone	Auto Unsilence	Y	Yes/No	All Settings Allowed	
Zone	Restore Delay	Y	0-300 Sec	Full range allowed	
Zone	Latching	Y	Yes/No	All Settings Allowed	
Zone	Local	Y	Yes/No	All Settings Allowed	

Topic	Feature or Option	Permitted in UL (Y/N)	Possible Settings	Setting(s) Permitted in UL864?	Comment
Zone	Output Pattern	Y	Constant ANSI Temp 3 March Code Double Time ANSI Temp 4	All Settings Allowed	
Zone	Day Sensitivity	Y	1.1%-3.5%	Full range allowed	Within listed range of sensor
Zone	Night Sensitivity	Y	1.1 %-3.5%	Full range allowed	Within listed range of sensor
Zone	Heat Setting	Y	135F-185F	Full range allowed	Within listed range of sensor
Zone	Low Temp Heat Sens	Y	0F-135F	Full range allowed	
Zone	Enable PAD100 ROR	Y	Yes/No	All Settings Allowed	
Zone	Combo ROR/ Fixed Setting	Y	135F-174F	All Settings Allowed	Within listed range of sensor
SLC Point	Type PAD Protocol	Y	Photo Detector (PD) Fixed Heat Detector (HD) CO Detector (CO) Combination Photo/Heat Detector (PHD) Duct Detector (DUCT) Duct Detector w/Relay (DUCTR) Duct Detector Remote Test Switch (DRTS) Duct Remote LED Indicator (MS-RA) Duct LED w/Test Switch (MS-KA/P/R) Mini Input Module (MIM) Speaker Module (SM) Pull Station Module Single Action (PSSA) Pull Station Module Dual Action (PSDA) Relay Module (RM) Notification Appliance Circuit (NAC) Twin Relay & Twin Input (TRTI) Double Input Module (DIM) One Relay & One Input (OROI) Zone Module (ZM) Remote LED (LED) Remote LED w/Key (LEDK) Single Input Module (SIM)	All Settings Allowed	Specifies use/type of SLC device for PAD Protocol

Topic	Feature or Option	Permitted in UL (Y/N)	Possible Settings	Setting(s) Permitted in UL864?	Comment
SLC Point	Function PAD Protocol	Y	Sensor Only Sensor with Sound Base (AB) Sensor with Relay Base (RB) Sensor with Low Frequency Sounder Base (LFSB) Sensor with Speaker Base (SPKB) Sensor with Duct Relay Addr Relay General Purpose Addr Relay Zone Trouble Addr Relay HVAC Shutdown Addr Relay Reset Followers Addr NAC General Purpose Addr NAC Release Solenoid Addr Zone Module General Purpose Output Zone Trouble Output	All Settings Allowed	Specifies use/type of SLC device for PAD Protocol
SLC Point	Function Nohmi Protocol	Y	Photo Detector (PSA) Photo Duct Detector (DSA) Photo/Heat Detector (PSHA) Fixed Heat Detector (FHA) Combination Fixed / ROR Heat Detector (RHA) Conv. Zone Module (CIZM) Mini Contact Mod (MCM) Single Contact Mod (SCM) Dual Contact Mod (DCM) Mon. Output Mod (MOM) Twin Relay Mod (TRM) Sounder Base (ASB) Relay Base (ARB)	All Settings Allowed	Specifies use/type of SLC device for Nohmi Protocol
SLC Point	Dry Contact Input Functions PAD and Nohmi Protocol	Y	Pull Station Water Flow Supervisory Tamper Fire Drill Trouble Monitor Aux Abort Release Follower Reset Silence Fire Alarm Disable Inputs Disable Outputs Disable Inputs and Outputs Lamp Test CO Alarm CO Supervisory HVAC Reset Medical Alert Tornado Alert Process Alert Security Alert	All Settings Allowed	Applies to all dry-contact input devices & circuits Disable Inputs, Disable Outputs, and Disable Inputs / Outputs cannot be assigned to a Releasing Zone to comply with UL 10th Edition.
SLC Point	Alarm Verif	Y	Yes/No	All Settings Allowed	

Topic	Feature or Option	Permitted in UL (Y/N)	Possible Settings	Setting(s) Permitted in UL864?	Comment
SLC Point	Supervisory	Y	Yes/No	All Settings Allowed	
NACs	Function	Y	General Purpose AMSECO Sync Gentex Sync Gentex Sync with T4 System Sensor Sync Wheelock Sync Constant Output Resettable Output Door Holder Output ANSII Output City Tie Output Release Solenoid Output Sounder Base Power	All Settings Allowed	Specifies use of NAC circuit(s)
Day/Night	Smoke Sensitivity	Y	Full listed range of smoke detector	All Settings Allowed	Up to 50 holidays where day mode is not active.
DACT	Daily Test Call	Y	Any time of day	All Settings Allowed	Alternates between line 1 and 2 if line 2 is enabled.
E-Mail	Email Status Reports	N	Alarms, Troubles, Supervisory, Test, History & Status Reports		
IP-Reporting	IP Based Central Station Reporting	Y	Alarm, Supervisory, Trouble & Test Reports	All Settings Allowed	

Network Programming

Programming of a networks system uses all the above options. In addition, reference points are used to associate points between panels. Panels are also assigned to buildings allowing interactions between buildings via these reference points. Please refer to 8830161 Network Programming Guide and www.pottersignal.com for more information.

5. Testing/Maintenance

The control panel has one fuse on the board for the AC power over current protection.

The AC fuse is rated at 8A 250VAC Time-Lag and screened onto the main board as F1.

The batteries are to be replaced at least once every four years. The batteries are required to be UL recognized batteries with a date of manufacture permanently marked on the battery. The battery is to be tested at least annually and if the battery is showing signs of failure, it is to be replaced.

The battery is to remain in the cabinet with nothing on or around the batteries. Only properly sized sealed lead acid batteries are to be used with the control panel. Use of another battery or not providing the proper clearance may result in a fire or an explosions.

The control panel is required to be installed in accordance with local and state building codes and NFPA 72 (National Fire Alarm Code).

The control panel and related system is required to be inspected and tested in accordance with NFPA 72.

6. Compatibilities

NAC Appliances

Please refer to Potter document 5403592 NAC Compatibility Document.

Two Wire Smoke Detectors

None listed with the control panel, all devices listed the PAD100-ZM or CIZM, please refer to the PAD100-ZM or CIZM Installation Sheet.

Note: PAD100-ZM and CIZM modules require a 24 VDC power source. When using the CIZM, the power source must be 19.0 VDC – 26.4 VDC. When using the PAD100-ZM, the power source must be 19.6 VDC – 28 VDC. Power source must be power limited, and UL1481 listed.

Releasing Compatibility Refer to Document #5403625.

Network Compatibility

The IPA series, AFC/ARC series and the PFC-4064 can be interconnected via the NCE and NCF network cards.

SLC Devices

Nohmi Protocol	PAD Protocol
PSA – Photoelectric Smoke Detector	PAD100/PAD200-PD – Photo Detector
PSHA – Photoelectric/Heat Smoke Detector	PAD100-HD – Fixed Heat Detector
FHA – Fixed Temperature Heat Detector	PAD100-CD – CO Detector
RHA – Rate of Rise/fixed Temperature Heat Detector	PAD100/PAD200-PHD – Combination Photo/Heat Detector
DSA – Photo Duct Detector	PAD100/PAD200-DUCT – Duct Detector
APS-SA/DA – Addressable Pull Station (Single Action / Dual Action)	PAD100/PAD200-DUCTR – Duct Detector w/Relay
AIB – Addressable Isolator Base	PAD100/PAD200-DD – Duct Detector Sensor
ASB – Addressable Sounder Base	PAD100-DRTS – Duct Detector Remote Test Switch
ARB – Addressable Relay Base	MS-RA – DUCT Remote LED Indicator
MCM – Miniature Contact Module	MS-KA/P/R – DUCT LED w/Test Switch
SCM-4 – Single Contact Module	PAD100-MIM – Mini Input Module
DCM-4 – Dual Contact Module	PAD100-SM – Speaker Module
TRM-4 – Twin Relay Module	PAD100-PSSA – Pull Station Module Single Action
MOM-4 – Monitored Output Module	PAD100-PSDA – Pull Station Module Dual Action
CIZM-4 – Conventional Input Zone Module	PAD100-SB – Addressable Sounder Base
SCI – Short Circuit Isolator	PAD100-RB – Addressable Relay Base
	PAD100-IB – Addressable Isolator Base
	PAD100-IM – Isolator Module
	PAD100-RM – Relay Module
	PAD100-NAC – Notification Appliance Circuit
	PAD100-TRTI – Twin Relay-Twin Input
	PAD100-DIM – Double Input Module
	PAD100-OROI – One Relay-One Input
	PAD100-ZM – Zone Module
	PAD100-LED – Remote LED
	PAD100-LEDK – Remote LED w/Key
	PAD100-SIM – Single Input Module
	PAD100-LFSB - Low Frequency Sounder Base
	PAD100-SPKB - Speaker Base

DACT/DACR Compatibility

UD-1000/UD-2000 DACT

The DACT transmits in Ademco Contact ID and Security Industries Association's Digital Communication Standards (SIA-DCS). Each account may be configured for Contact ID or SIA-DCS independent of the other accounts setting. Therefore some account(s) could be Contact ID and others could be SIA-DCS or vice versa. Similarly, accounts could be the same reporting type.

Compatible Receivers

Silent Knight Model 9500/9800 (Ademco MX8000)

Sur-Gard System III
SG-DRL3 (POTS Line Card)

IP Reporting Compatibility

Sur-Gard System III
SG-DRL3-IPCA (Network Line Card)

Notes:

Where the fire alarm transmitter is sharing on-premises communications equipment, the shared equipment shall be Listed.

Secondary power shall be provided for all equipment necessary for the transmission and reception of alarm, supervisory and trouble signals at the protected premises.

Secondary power shall be provided for all equipment necessary for the transmission and reception of alarm, supervisory and trouble signals at the supervising station.

The connection between the FACP and on-premises communications equipment shall be limited to 20 feet and enclosed in conduit or equivalently protected against mechanical injury.

RS-485 Devices

PAD100-SLCE	Provides an additional PAD protocol SLC loop with a maximum of 127 addressable points.
SLCE-127	Provides an additional Nohmi protocol SLC loop with a maximum of 127 addressable points.
RA-6500R / RA-6500F	4x40 character LCD Remote Annunciator
RA-6075R	2x16 character LCD Remote Annunciator
PSN-1000/E	10 Amp Power Expander
LED-16 / LED-16F	Device that displays alarm/supervisory/trouble conditions for up to 16 zones and five (5) non-programmable system LEDs that annunciate system's overall conditions (Power, Earth, Silenced, Alarm, Supervisory, & Troubles).
DRV-50	Device that provides 50 LED outputs can be individually mapped to any zone, four (4) programmable supervised dry contact inputs, and five (5) non-programmable system LEDs annunciate the overall system condition (Power, Earth, Silenced, Alarm, Supervisory, & Troubles).
RLY-5	Device that provides five (5) Form-C relay outputs which can be individually mapped to any zone.
FCB-1000	Device that provides remote IP connection.
FIB-1000	Device that converts the 4 wire P-Link bus to/from fiber optic cable.
MC-1000	Allows up to 63 AFC series panels to report to the central station through a shared phone line or Internet connection.
IDC-6	Device that provides six (6) additional conventional Class B inputs or three (3) Class A inputs that can be individually mapped to any zone.
NCE-1000	Device that is used to network fire alarm panels using CAT5 Ethernet cable.
NCF-1000	Device that is used to network fire alarm panels using fiber optic cable.

Class A Expander

CA-6500 Class A Expander

Printers

Keltron 90 Series Fire Alarm printer or other UL Listed fire alarm printer (Ancillary).

7. System Configurations

AFC-1000 (4,064 Point System)

Model	Description	Local	Releasing Service	Auxiliary	Remote Station	Central Station	Proprietary
AFC-1000	Main Board/Panel Assembly	Y	Y	Y	Y	Y	Y
CA-6500	Class A Expander	O	O	O	O	O	O
UD-1000/UD-2000	DACT	N	N	N	Y	Y	Y
PAD100-SLCE	PAD Protocol SLC Loop Expander	O	O	O	O	O	O
SLCE-127	Nohmi Protocol SLC Loop Expander	O	O	O	O	O	O
RA-6075R	LCD type remote Annunciator	O	O	O	O	O	O
RA-6500R, RA-6500F	LCD type remote Annunciator	O	O	O	O	O	O
PSN-1000	Fire Power Expander	O	O	O	O	O	O
LED-16/LED-16F	LED Annunciator	O	O	O	O	O	O
DRV-50	LED Driver	O	O	O	O	O	O
RLY-5	Relay Expander	O	O	O	O	O	O
FCB-1000	Fire Communications Bridge	O	O	O	O	O	O
FIB-1000	Fiber Interface Bridge	O	O	O	O	O	O
SPG-1000	Serial/Parallel Gateway	O	O	O	O	O	O
MC-1000	Multi-Connect Module	O	O	O	O	O	O
IDC-6	Initiating Device Circuit	O	O	O	O	O	O
NCE-1000	Network Card Ethernet	O	O	O	O	O	O
NCF-1000	Network Card Fiber	O	O	O	O	O	O
3005013	End of line resistor	Y	Y	Y	Y	Y	Y
3005012	End of line resistor and diode	N	Y	Y	N	N	N

Y = Yes, required for applicable section.
N = No, not required for applicable section.
O = Optional, may or may not be used, has no affect on the applicable section.

8. System Power/Size

Panel	# NACs	Rating per NAC	SLC Power	Notes	Class
AFC-1000	6 up to 10 if all I/O circuits configured as NACs	3 Amp	Maximum Load of 90.61 mA	One built-in SLC Loop, up to 9 additional using PAD100-SLCE and/or SLCE-127 Loop Expanders	SLC – Class A or B NAC – Class A or B P-Link – Class A or B I/O – Class B only All are low voltage and power limited

System Size

Accessories/subassemblies	Maximum System Size
AFC-1000	1,270 maximum points any combination of detectors or modules if 9 PAD100-SLCE and/or SLCE-127 SLC Loop Expanders are added
	6 notification circuits on the main board 4 I/O circuits
UD-1000/UD-2000	1 DACT

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Fire Panel Operating Instructions

Normal Standby	The green AC POWER LED will be illuminated and the user defined message on the LCD will be displayed. If the AC power is removed for more than 5 seconds, the green AC power LED will extinguish.
Acknowledging	Off normal events are acknowledged by pressing the ACK key while reviewing events. After all events have been acknowledged, the buzzer will deactivate and the associated LED will stop flashing and remain on continuously. During Positive Alarm Sequence operation the "ACK" key must be pressed within 15 seconds of the alarm initiation to activate the investigation timer.
Alarm Condition	The red ALARM LED will be illuminated anytime an alarm is occurring in the system. The LCD will display the number of inputs in alarm, and the buzzer will be activated. The buzzer will remain active until all alarms have been acknowledged, or until the Silence key is pressed.
Silencing Alarm	When the system is in Alarm, the notification circuits (strobes and horns) can be shut off by pushing the SILENCE button.
Resetting Alarm	After the condition that caused the alarm has been identified and corrected, the system may be reset to the Normal Standby by pressing the RESET button.
Supervisory Condition	When a supervisory condition is detected, the amber SUPERVISORY LED will illuminate and the buzzer will sound. The LCD display will indicate the number of supervisory events that are active. The local buzzer will sound until all supervisory events have been acknowledged.
Restoring Supervisory Condition	If the Supervisory condition is non-latching, once the device is restored to the normal condition, the supervisory event will clear. If the supervisory condition is latching, the device that was activated must be restored and the RESET pressed.
Trouble Condition	When a fault condition occurs, the amber TROUBLE LED will illuminate and the local buzzer will sound until the fault is removed or the ACK button is pressed acknowledging the trouble condition. If the buzzer is acknowledged and the fault is not removed within 24 hours, the buzzer will resound.
Silencing Trouble(s)	When a trouble is occurring, the local buzzer will sound until either all troubles have been acknowledged or the SILENCE button is pressed.
Ground Fault	When a conductor contacts and earth ground, the amber EARTH FAULT LED will illuminate and the LCD display will provide further information of where the fault is located.
Pre-Release (Releasing Panels Only)	The amber Pre-Release LED will illuminate when the system is in a count down timer for an agent release. Additionally, pre-release events and countdown timers are displayed on the LCD.
Release (Releasing Panels Only)	The red Release LED will illuminate when a release condition is active. Additionally, release events will be displayed on the LCD.
Agent Release Abort (Releasing Panels Only)	If the system is being used as an agent releasing panel and a pre-discharge timer is programmed, the release may be aborted by pressing the abort switch. For ULI installations, pushing the Abort will allow the timer to countdown until 10 seconds and then halt. Releasing and reactivating the Abort will set the timer to 10 seconds.
Testing and Maintenance	Test this system monthly or more frequently as required by the AHJ. Before conducting any testing contact the building personnel and the monitoring facility as applicable. When testing a system configured for releasing, activate the releasing disconnect switch to prevent accidental discharge of a suppression system. Test the circuits as outlined in the Installation Manual. Test in accordance with NFPA 72 Inspection, Testing and Maintenance Chapter(s) and any local requirements. The batteries should be marked with the date of installation and replaced every four years or sooner if battery trouble occurs. Batteries should be checked with a tester acceptable to the AHJ such as a Stone Technologies model STC612A or equivalent. In case of a fuse replacement, refer to the Installation Manual for the proper rating. Contact the agency below for service or operational questions.

For service, contact:

Name: _____

Company: _____

Address: _____

Telephone: _____

Frame and display instructions adjacent to the fire alarm panel.

5409071–Rev B

Appendix A: Battery Calculation Work Sheets

Description	Quantity	Standby (mA)	Total Standby (mA)	Alarm (mA)	Total Alarm (mA)
Main board (AFC-1000)	1	130	**130**	220	
LCD Remote RA-6075R		20		25	
LCD Remote RA-6500R or RA-6500F		20		25	
CA-6500 Class A Expander		12		44	
UD-1000/UD-2000 DACT		16		23	
PSN-1000/E Power Expander		15		15	
LED-16 or LED-16F P-Link Current LED-Current (if applicable, see Note 5)		25 15		25 210	
DRV-50 LED-Current (#LEDs x 5 mA; if applicable, see Note 5)		25 10		25 215	
RLY-5 Relay Current (if applicable, see Note 5)		25 10		35 135	
FCB-1000 Fire Communications Bridge		25		25	
FIB-1000 Fiber Interface Bridge		30		30	
SPG-1000 Serial Parallel Gateway		40		40	
MC-1000 Multi-Connect Module		10		10	
IDC-6 Initiating Device Circuit		20		20	
IDC PWR (See Note 5)					
Class B Input Zones (Per Zone)		5		45	
Class A Input Zones (Per Zone)		5		45	
NCE-1000		50		50	
NCF-1000		95		95	
NAC 1					
NAC 2					
NAC 3					
NAC 4					
NAC 5					
NAC 6					
I/O 1					
I/O 2					
I/O 3					
I/O 4					
Built-in SLC Current Draw - Calculated by SLC worksheet					
SLC Loop# ___					
SLC Loop# ___					
SLC Loop# ___					
SLC Loop# ___					
SLC Loop# ___					
SLC Loop# ___					
SLC Loop# ___					

Description	Quantity	Standby (mA)	Total Standby (mA)	Alarm (mA)	Total Alarm (mA)
SLC Loop# ___					
SLC Loop# ___					
		Total (mA)		Total (ma)	
		Convert to Amps	x 0.001	Convert to Amps	x 0.001
		(*Refer to maximum allowable standby current) Total A:		Total A:	
		Multiply by standby hours	x____	60 minutes per hour Alarm time (minutes) ***Example***: 5 minute alarm: enter 12 10 minute alarm: enter 6	÷ ____
		Total Standby AH		Total Alarm AH	
				+Total Standby AH	
				Total AH	
				Efficiency Factor	÷ 0.80
				Required AH	

*Maximum Allowable Standby Current (UL 24-Hour standby time)	
7 AH	.198 A
18 AH	.565 A
33 AH	1.065 A
55 AH	1.798 A

Important Notes:

1) FACP enclosure can house up to two (2) 18 AH batteries. Larger batteries require accessory enclosure, part #SSU00500.
2) NFPA 72 requires 24 hours of standby power followed by 5 minutes alarm activation.
3) Door holder circuits configured to disconnect upon AC loss need not be included in the battery standby calculation since they will not draw power during that time. Door holders will contribute to standby current draw when AC is present.
4) Total current must not exceed power supply rating (10A).
5) LED/Relay/IDC-6 current must be accounted for in the battery calculation for the supplying source.

Built-in SLC Current Draw Worksheet (PAD Protocol)

Device Type	Qty	Standby (mA)	Total Standby (mA)	Alarm Standby (mA)	Total Alarm (m/A)
Photo detector (PAD100/PAD200-PD)		.300		.300	
Fixed heat detector (PAD100-HD)		.300		.300	
CO detector (PAD100-CD)		.300		.300	
Combination photo/heat detector (PAD100/PAD200-PHD)		.300		.300	
Duct detector (PAD100/PAD200-DUCT)		.300		.300	
Duct detector w/relay (PAD100/PAD200-DUCTR) *Notes 4 & 5		.500		.500	
Duct detector remote test switch (PAD100-DRTS)		10.0		15.0	
Mini input module (PAD100-MIM)		.200		.200	
Speaker Module (PAD100-SM)		.240		.240	
Pull station module single action (PAD100-PSSA)		.200		.200	
Pull station module dual action (PAD100-PSDA)		.200		.200	
Relay module (PAD100-RM)		.240		.240	
Notification appliance circuit (PAD100-NAC) *Note 2		.200		.200	
Twin relay-twin input module (PAD100-TRTI)		.240		.240	
Double input module (PAD100-DIM)		.240		.240	
One relay-one input module (PAD100-OROI)		.240		.240	
Zone module (PAD100-ZM) *Note 1		.240		.240	
Remote LED (PAD100-LED)		.240		.240	
Remote LED with key (PAD100-LEDK)		.200		.200	
Single input module (PAD100-SIM)		.240		.240	
Addressable sounder base (PAD100-SB) *Note 3		.200		.200	
Addressable Low Frequency Sounder Base (PAD100-LFSB) *Note 6		.200		.200	
Addressable relay base (PAD100-RB)		.200		.200	
Isolator base (PAD100-IB)		.150		.150	
Isolator module (PAD100-IM)		.150		.150	
SLC alarm LED Current	n/a	n/a		n/a	36.0
		SLC Standby Current		**SLC Alarm Current**	

* Note 1: PAD100-ZM requires 24VDC power source. Standby Current = 15.0 mA. Alarm Current = 60.0 mA.
* Note 2: PAD100-NAC requires 24VDC power source. Standby Current = 3.0 mA. Alarm Current = 8.0 mA.
* Note 3: PAD100-SB requires 24VDC power source. Standby Current = 4.0 mA. Alarm Current = 30.0 mA.
* Note 4: PAD100-DUCTR requires 24VDC power source. Standby Current = 30.0 mA. Alarm Current = 60.0 mA.
* Note 5: When connecting the MS-RA/MS-KA/P/R power source, Standby Current = 45.0 mA. Alarm Current = 90 mA.
* Note 6: PAD100-LFSB requires 24VDC power source. Standby current = 4.1 mA. Alarm Current = 156.6 mA.

SLC #___ Current Draw Worksheet for PAD100-SLCEs (PAD Protocol)
(Complete one for each configured PAD100-SLCE)

Device Type	Qty	Standby (mA)	Total Standby (mA)	Alarm (mA)	Total Alarm (mA)
PAD100-SLCE Expansion Board (PAD Protocol)		60	60	60	60
Photo detector (PAD100/PAD200-PD)		.300		.300	
Fixed heat detector (PAD100-HD)		.300		.300	
CO detector (PAD100-CD)		.300		.300	
Combination photo/heat detector (PAD100/PAD200-PHD)		.300		.300	
Duct detector (PAD100/PAD200-DUCT)		.300		.300	
Duct detector w/relay (PAD100/PAD200-DUCTR) *Notes 4 & 5		.500		.500	
Duct detector remote test switch (PAD100-DRTS)		10.0		15.0	
Mini input module (PAD100-MIM)		.200		.200	
Speaker module (PAD100-SM)		.240		.240	
Pull station module single action (PAD100-PSSA)		.200		.200	
Pull station module dual action (PAD100-PSDA)		.200		.200	
Relay module (PAD100-RM)		.240		.240	
Notification appliance circuit (PAD100-NAC) *Note 2		.200		.200	
Twin relay-twin input module (PAD100-TRTI)		.240		.240	
Double input module (PAD100-DIM)		.240		.240	
One relay-one input module (PAD100-OROI)		.240		.240	
Zone module (PAD100-ZM) *Note 1		.240		.240	
Remote LED (PAD100-LED)		.240		.240	
Remote LED with key (PAD100-LEDK)		.200		.200	
Single input module (PAD100-SIM)		.240		.240	
Addressable sounder base (PAD100-SB) *Note 3		.200		.200	
Addressable Low Frequency Sounder Base (PAD100-LFSB) *Note 6		.200		.200	
Addressable relay base (PAD100-RB)		.200		.200	
Isolator base (PAD100-IB)		.150		.150	
Isolator module (PAD100-IM)		.150		.150	
SLC alarm LED Current	n/a	n/a		n/a	36.0
	SLC Standby Current			**SLC Alarm Current**	

* Note 1: PAD100-ZM requires 24VDC power source. Standby Current = 15.0 mA. Alarm Current = 60.0 mA.
* Note 2: PAD100-NAC requires 24VDC power source. Standby Current = 3.0 mA. Alarm Current = 8.0 mA.
* Note 3: PAD100-SB requires 24VDC power source. Standby Current = 4.0 mA. Alarm Current = 30.0 mA.
* Note 4: PAD100-DUCTR requires 24VDC power source. Standby Current = 30.0 mA. Alarm Current = 60.0 mA.
* Note 5: When connecting the MS-RA/MS-KA/P/R power source, Standby Current = 45.0 mA. Alarm Current = 90.0 mA.
* Note 6: PAD100-LFSB requires 24VDC power source. Standby current = 4.1 mA. Alarm Current = 156.6 mA.

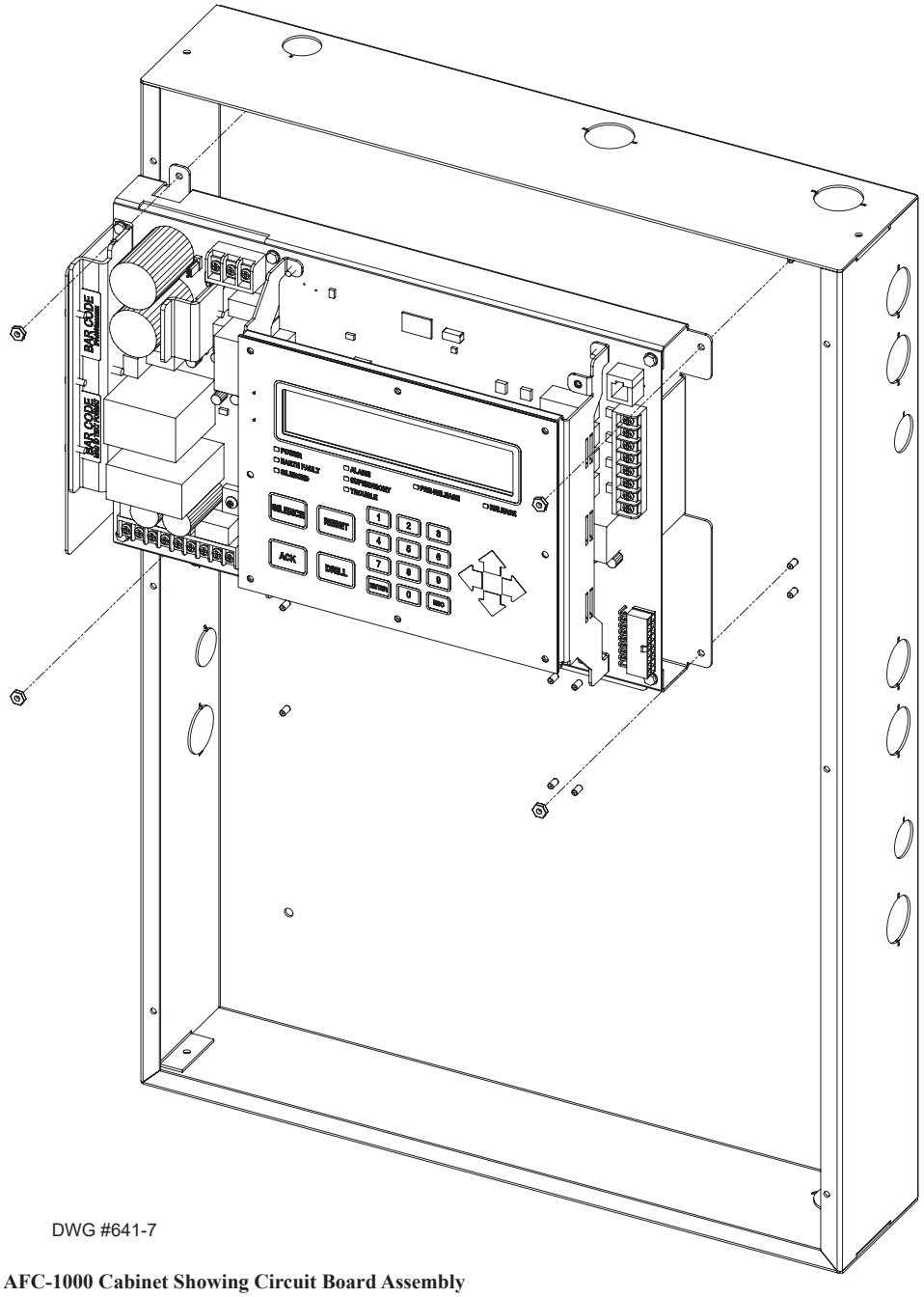
SLC #___ Current Draw Worksheet for SLCE-127s (Nohmi Protocol)
(Complete one for each configured SLCE-127)

Device Type	Qty	Standby (mA)	Total Standby (mA)	Alarm (mA)	Total Alarm (mA)
SLCE-127 Expansion Board (Nohmi Protocol)		60	60	60	60
Analog photo smoke detector (PSA)		0.325		0.325	
Analog photo smoke / fixed heat detector (PSHA)		0.325		0.325	
Analog fixed temperature heat detector (FHA)		0.325		0.325	
Analog rate of rise/fixed temperature heat detector (RHA)		0.325		0.325	
Analog photo DUCT smoke detector (DSA)		0.325		0.325	
Conventional initiating zone module - 4 inch mount (CIZM-4) *Note 1		0.325		1.000	
Miniature contact module (MCM)		0.325		0.325	
Single contact module - 4 inch mount (SCM-4)		0.325		1.000	
Dual contact module - 4 inch mount (DCM-4)		0.325		1.000	
Monitored output module - 4 inch mount (MOM-4) *Note 2		0.325		1.000	
Twin relay module - 4 inch mount (TRM-4)		0.325		1.000	
Short circuit isolator (SCI)		0.325		2.34	
Analog sounder base (ASB) *Note 3		0.325		0.325	
Analog relay base (ARB) *Note 4		0.325		0.325	
Isolator base (AIB)		0.325		2.34	
SLC alarm LED Current	n/a	n/a		n/a	27.0
	SLC Standby Current			**SLC Alarm Current**	

* Note 1: CIZM requires 24VDC power source. Standby Current Class A = 4.90 mA, Class B (8.5 mA). Alarm Current = 50.0 mA
* Note 2: MOM requires 24VDC power source. Standby Current = 1.60 mA. Alarm Current = 1.60 mA
* Note 3: ASB requires 24VDC power source. Standby Current = 5 mA. Alarm Current = 100 mA
* Note 4: ARB requires 24VDC power source. Standby Current = 5 mA. Alarm Current = 50 mA

10. Installation Notes

Circuit board assembly is mounted in the cabinet using four (4) fasteners as shown in the illustration below.



DWG #641-7

Figure 39. AFC-1000 Cabinet Showing Circuit Board Assembly

LOC-1000

Local Operator Console

Features

- Local Operator Console
- Control the system from remote areas
- Programmable ACU and LOC prioritization to grant control to panels with highest priority
- Auxiliary input to interface with external audio sources. The input accepts a 600 ohm, 1VRMS and line level audio sources.
- Equipped with microphone
- Available space to internally mount an LOC-PSN100 power supply

UL LISTED

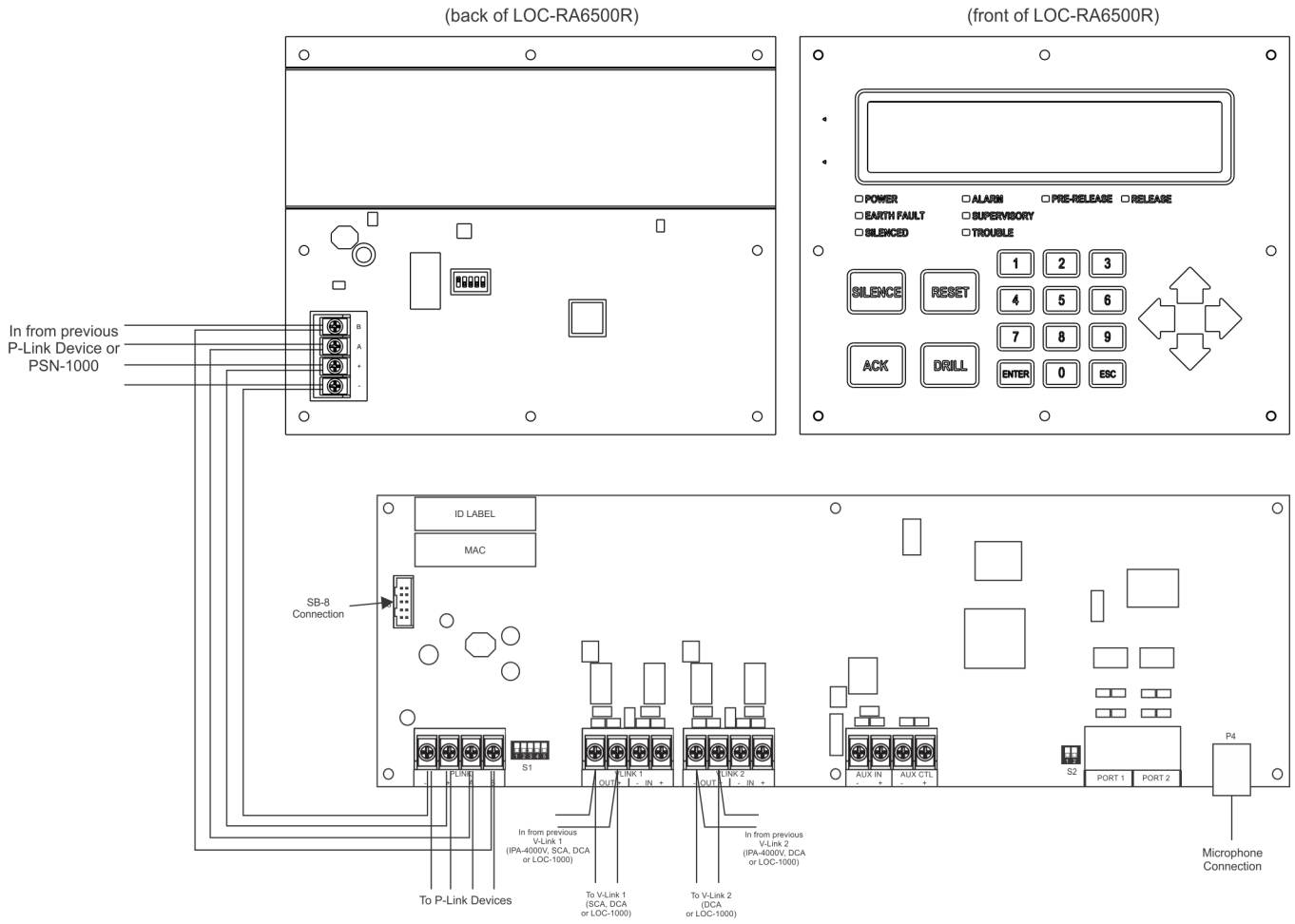
Description

The LOC-1000 local operator console is used to control system operations and ECS from remote areas to navigate the building occupancy safely and effectively to the nearest exits. The Potter Panel Programmer utilizes a priority structure to allow the IPA-4000V or local operator consoles with the highest priority control of the system. Operations such all call, individual zone paging and ECS activation can be made directly at the LOC-1000. The panel is equipped with a supervised auxiliary input to interface with low-level audio sources and background music compatibility. A maximum of 30 LOC-1000's can be linked with the IPA-4000V and AFC-1000V.

Technical Specifications

Dimensions (WxHxD)	21 3/8" x 29 1/8" x 4 7/8"
Standby Current	77 mA
Alarm Current	107 mA
Temperature and Humidity Range	32° to 120° (0°C to 49°C) with a maximum humidity of 93% non-condensing.
Maximum LOC-1000	30

Installation



Ordering Information

Model	Description	Stock No.
LOC-1000	LOC-1000 LOCAL OPERATOR CONSOLE	3520661

SCA/DCA

Single/Dual Channel Amplifiers

Features

- 25W, 50W and 100W amplifier
- 25VRMS and 70VRMS audio power
- 8 Class A or 8 Class B speaker outputs
- P-Link device
- Single channel and dual channel amplifiers
- 120VAC or 240VAC with battery charger circuit
- Maximum of 31 amplifiers

UL LISTED

Description

The SCA and DCA amplifiers are a new addition to the Potter proprietary P-Link device catalog. Potter offers seven variations of amplifiers with wattages up to 100W to support small, medium, and hi-rise applications. The amplifiers have the capability to distribute up to two audio channels simultaneously across multiple speaker zones. Each amplifier is supplied with a stacker terminal block to provide accommodations for 8 Class B or 8 Class A speaker outputs. The SCA and DCA amplifiers offer output power at 25VRMS and 70VRMS.

Up to 31 amplifiers can be linked to the IPA-4000V panel and offer up to 248 Class B or Class A speaker outputs.

The DCA-10025 (Dual Channel, 100W, 25VRMS Amplifier) may be programmed to provide an extraordinary 200W for single channel applications via Potter Fire Panel Programmer.

The 70V-1000 converter module will extend output power to 70VRMS on the DCA dual channel amplifiers. The BUA-1000 backup amplifier provides a failsafe solutions for potential lapse in service and compatible with the DCA dual channel amplifiers.

Technical Specifications

Standby Current	SCA-2525 - 58 mA SCA-2570 - 58 mA SCA-5025 - 58 mA SCA-5070 - 58 mA SCA-10070 - 60 mA DCA-5025 - 48 mA DCA-10025 - 48 mA
Alarm Current	SCA-2525 - 608 mA SCA-2570 - 608 mA SCA-5025 - 608 mA SCA-5070 - 608 mA SCA-10070 - 766 mA DCA-5025 - 520 mA DCA-10025 - 520 mA
Operating Temperature	0°C-49°C (32°F-120°F)
Operating Humidity Range	10%-93% @ 30°C (86°F) noncondensing humidity
Maximum P-Link Length	6500 ft.
Maximum V-Link Length	6500 ft.
Maximum Amplifiers	31
Size (WxHxD)	SCA Enclosures (WxHxD) - 16” x 17” x 3 7/8” DCA Enclosures (WxHxD) - 19” x 27 3/8” x 4 5/8”

Installation

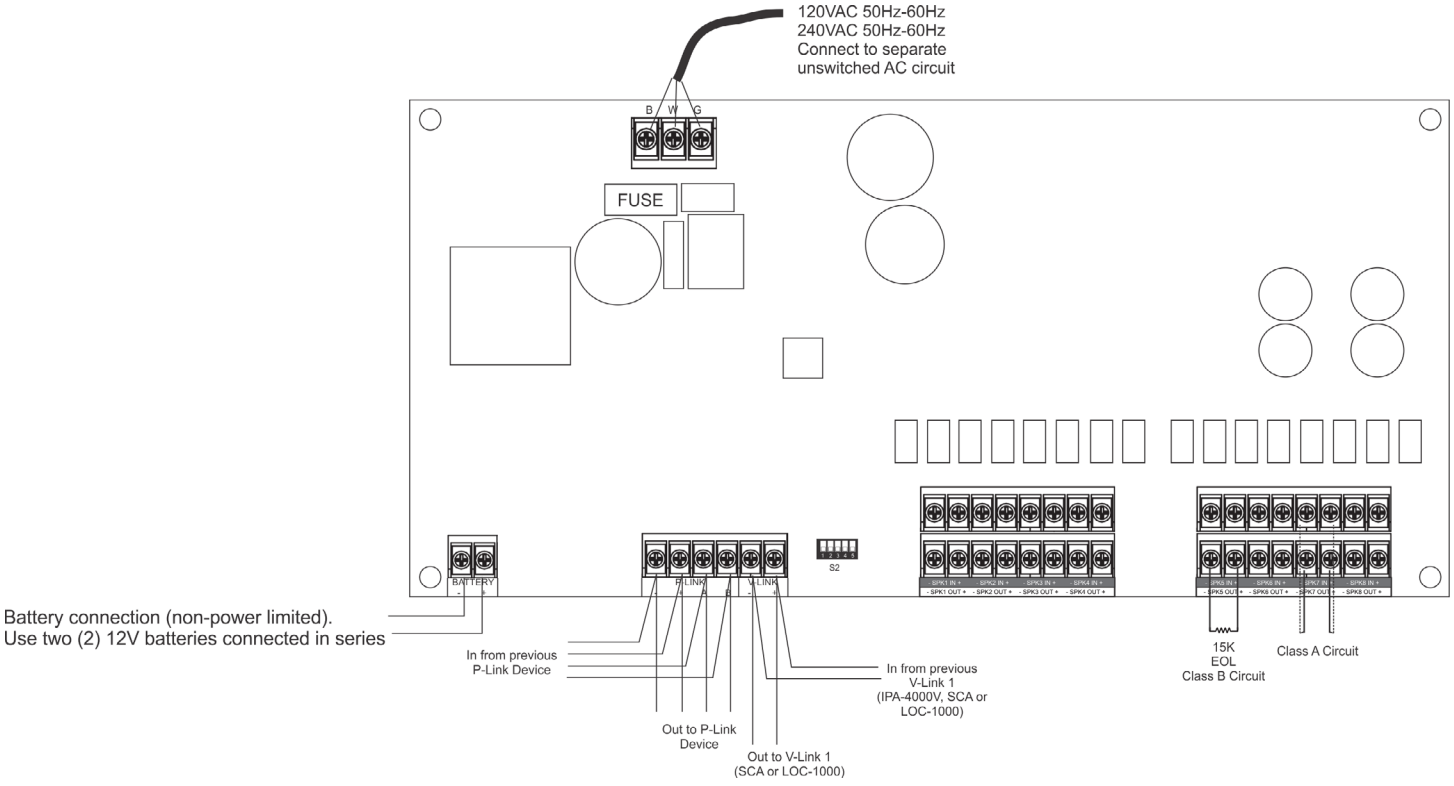
The SCA and DCA amplifiers communicate in conjunction with the IPA-4000V using a RS-485 connection via P-Link. The SCA amplifiers are equipped with one V-Link and the DCA amplifiers provide two V-Link to receive audio from the IPA-4000V.

Accessory List

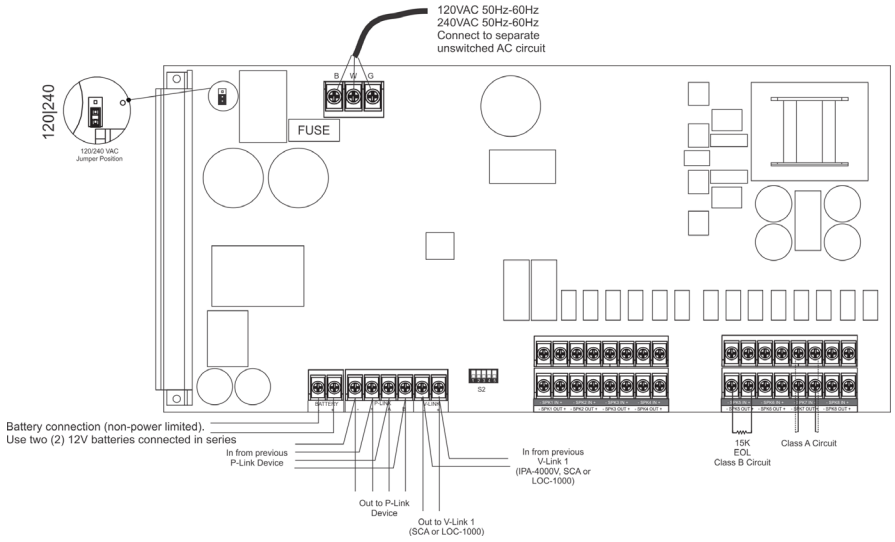
Model	Description	Accessories
SCA-2525	SINGLE CHANNEL 25W, 25V AMPLIFIER	None
SCA-2570	SINGLE CHANNEL 25W, 25V OR 70V SELECTABLE AMPLIFIER	None
SCA-5025	SINGLE CHANNEL 50W, 25V AMPLIFIER	None
SCA-5070	SINGLE CHANNEL 50W, 25V OR 70V SELECTABLE AMPLIFIER	None
SCA-10070	SINGLE CHANNEL 100W, 25V OR 70V SELECTABLE AMPLIFIER	None
DCA-5025	DUAL CHANNEL 50W, 25V AMPLIFIER	70V-1000 BUA-1000
DCA-10025	DUAL CHANNEL 100W, 25V AMPLIFIER	70V-1000 BUA-1000

Wiring Options

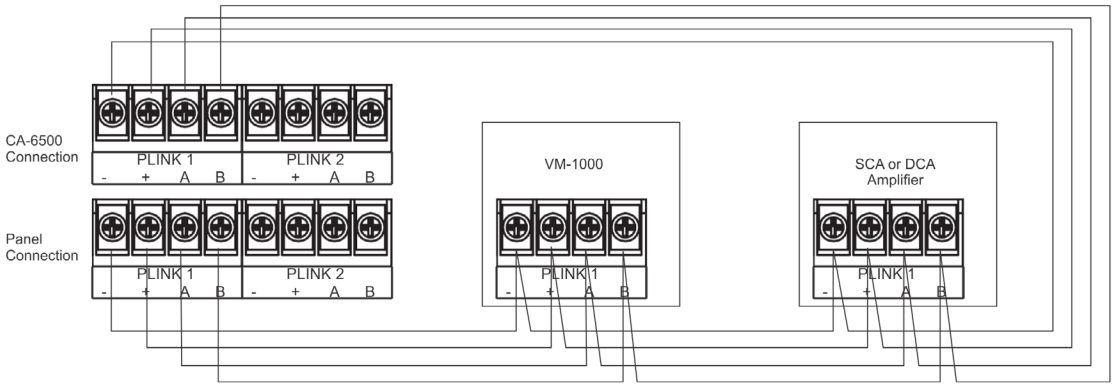
SCA-2525, SCA-2550, SCA-5025 and SCA-5070 Connections



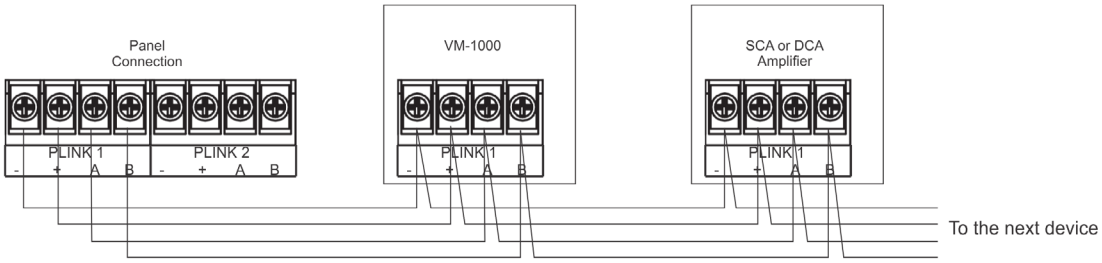
SCA-10070 Connections



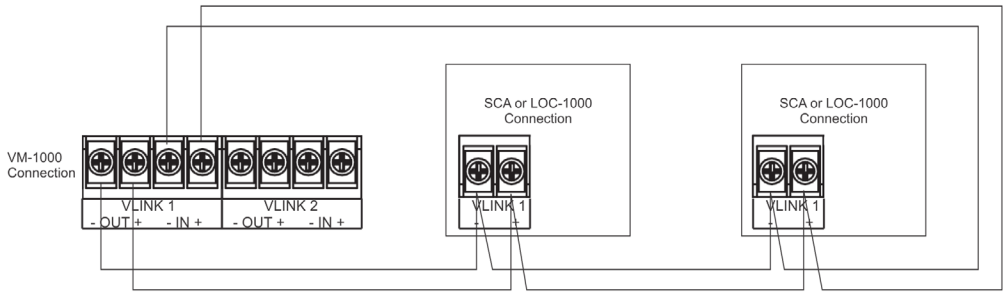
Class A P-Link Wiring



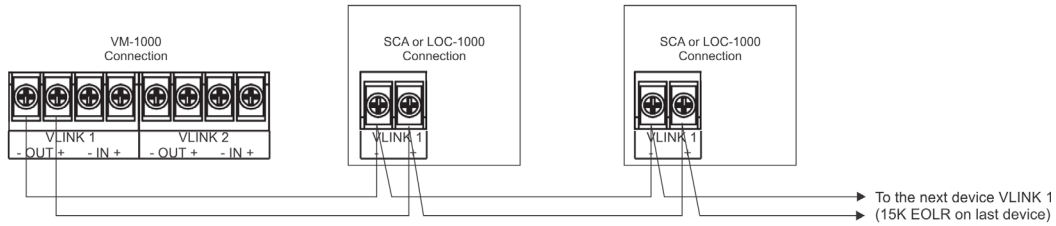
Class B P-Link Wiring



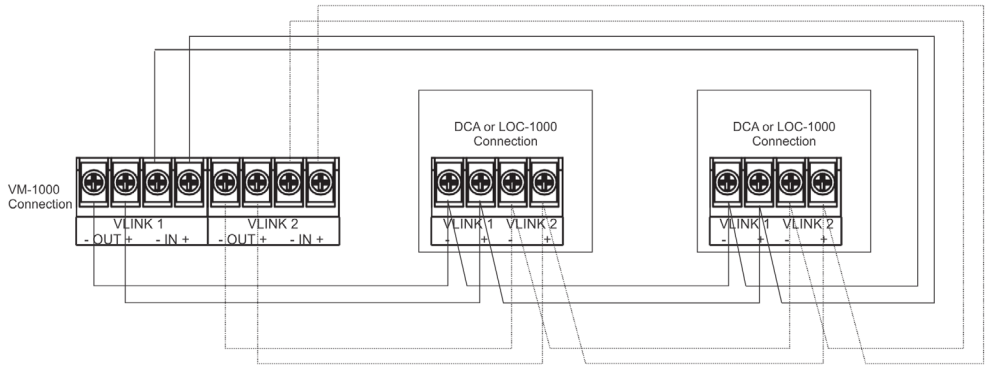
Class A V-Link 1 Wiring



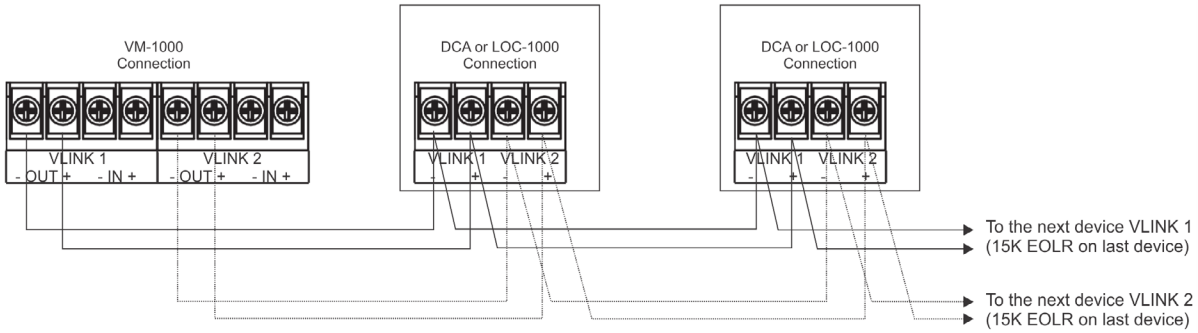
Class B V-Link 1 Wiring



Class A V-Link 1 and V-Link 2 Wiring



Class B V-Link 1 and V-Link 2 Wiring



Ordering Information

Model	Description	Stock No.
SCA-2525	SINGLE CHANNEL 25W, 25V AMPLIFIER	3520667
SCA-2570	SINGLE CHANNEL 25W, 25V OR 70V SELECTABLE AMPLIFIER	3520668
SCA-5025	SINGLE CHANNEL 50W, 25V AMPLIFIER	3520662
SCA-5070	SINGLE CHANNEL 50W, 25V OR 70V SELECTABLE AMPLIFIER	3520663
SCA-10070	SINGLE CHANNEL 100W, 25V OR 70V SELECTABLE AMPLIFIER	3520666
DCA-5025	DUAL CHANNEL 50W, 25V AMPLIFIER	3520659
DCA-10025	DUAL CHANNEL 100W, 25V AMPLIFIER	3520660

POTTER
The Symbol of Protection

PAD300-PCD

Photoelectric Smoke/CO Detector

Features

- Photoelectric Smoke Detection compliant with UL 268 7th Edition
- Carbon Monoxide (CO) detection compliant with UL 2075
- 10 year Carbon Monoxide detection lifespan with built in end of life indication
- Walk Test mode allows for fast easy validation of CO sensor operation
- Low profile, less than 2 inches with the base
- Wide selectable sensitivity range of 1.1 to 3.5%/foot
- Detector communicates sensitivity to control panel
- Optional locking tab to prevent unwanted removal
- Simple DIP switch address setting, no programming tool required
- LED Alarm Indicator
- Product includes 5-year warranty
- UUKL Listed for Smoke Control
- Magnetic Test Switch

Description

The Photoelectric Smoke detector and the Carbon Monoxide (CO)detector are both listed Analog Addressable detectors compatible with fire alarm control panels that utilize the Potter Addressable Device (PAD) protocol.

The CO sensing portion utilizes a proven electrochemical sensor for accurate detection of CO gas for life safety applications. The photoelectric detector complies with UL 268 7th edition enhanced smoke sensitivity tests. It has a wide sensitivity range of 1.1 to 3.5% per foot, and features drift compensation with built in dirty detector warning.

The detector and the control panel communicate over a proven and robust digital communication path and the system analyzes the information at the particular device. The total polling speed is less than five (5) seconds, well under the UL requirements.

The detector is compatible with any of the PAD300 series detector bases and simply twists on. The PAD300-PCD is addressed using DIP switches in the rear of the detector and can be easily programmed in the field without special tools.

Setting the Address

Each addressable device on the SLC loop must have a unique address from 1 to 127 to function properly. The address is set using DIP switches.

Before connecting a device to the SLC loop, take the following precautions to prevent potential damage to SLC or device. Verify the following:

1. Power to the device is removed.
2. Field wiring is correctly installed.
3. Field wiring has no open or short circuits.

Technical Specifications

Voltage Range	24 VDC
Standby Current	300 µA
Alarm Set-point Range	1.1 to 3.5%/ft (3.6 to 11%/m)
Alarm indicator Current	1.4 mA
CO Alarm Rating	70 ppm, 150 ppm, 400 ppm
Installation Temperature Range	32°F to 120°F (0°C to 49°C)
Operating Humidity Range	< 93% (Non-condensing)
Dimensions	3.93 in (100 mm)
Weight	92 g (3.25 oz)
Height	1.42 in (36 mm)

Air Velocity Rating

The PAD300-PCD has an Open Area of Protection air velocity rating of 0 to 300 feet per minute.

The system has a maximum of 30 LEDs that can be turned on simultaneously. If the system already has 30 LEDs on, the PAD300-PCD will operate even though the LED may not illuminate.

Operation

The PAD300-PCD is an analog addressable detector that uses one address on the Signaling Line Circuit (SLC) of a compatible fire alarm control panel. The unit communicates with the control panel as it is polled. The LED flashes every time the unit is polled and they will flash at a fast rate if the unit is in an active status. The polling LED can be turned off if desired for less conspicuous operation.

The PAD300-PCD with the PAD300-4DB or PAD300-6DB has a low profile of less than two (2) inches to blend into the surrounding environment.

Detector Sensitivity

The PAD300-PCD and the compatible control panel work in tandem to keep the sensitivity consistent. As the detector is installed over time, the detector compensates for the dirt in the unit until it is out of range. At that time, the panel will indicate a dirty detector. The detector will then have to be cleaned or replaced.

The PAD300-PCD can be programmed to provide a maintenance alert prior to reaching the dirty detector level which will allow for intervention prior to the detector going into trouble. This allows for detector replacement or cleaning prior to a nuisance trouble occurs.

The PAD300-PCD will provide CO alarm reports at 70 ppm, 150 ppm, and 400 ppm.

Note: As required by NFPA, do not install the detectors until all construction is complete and the work area has been thoroughly cleaned. If the detectors have been installed in a construction environment, they should be cleaned or replaced before the system is placed into service.

Compatible Bases

All bases will mount on a single gang, 3-1/2” octagon, 3-1/2” square, double gang, 4” octagon, 4” square, 50mm c/c, 60mm c/c and 70mm c/c boxes.

Device	Description	Stock No.
PAD300-4DB	4” Detector Base	3992781
PAD300-6DB	6” Detector Base	3992782
PAD300-IB	6” base with an isolator module included	3992783
PAD300-RB	6” base with one Form-C relay contact. 2A @ 30VDC, 0.5A @ 125VAC	3992784
PAD300-SB	6” base with sounder module included. Sound pattern is provided from external source	3992785
PAD300-LFSB	6” base wih 520Hz sounder module included. Sound pattern is provided from external source	3992786

Ordering Information

Model	Description	Stock No.
PAD300-PCD	Photoelectric Smoke/CO Detector	3992779

PAD300-PD

Photoelectric Smoke Detector

Features

- Low profile, less than 2 inches with the base
- Wide selectable sensitivity range of 1.1 to 3.5%/foot
- Detector communicates sensitivity to control panel
- UL listed smoke calibration and sensitivity
- Optional locking tab to prevent unwanted removal
- Simple DIP switch address setting, no programming tool required
- Magnetic test switch
- LED alarm indicator
- Product includes 5-year warranty
- UUKL Listed for Smoke Control
- UL268 7th edition compliant

Description

The Photoelectric Smoke Detector is a listed Analog Addressable smoke detector compatible with fire alarm control panels that utilize the Potter Addressable Device (PAD) protocol. The PAD300-PD is a low profile smoke detector with a wide sensitivity range. The detector and base are made of a durable plastic in an off-white color to blend in with the ceiling.

The PAD300-PD has a sensitivity range of 1.1 to 3.5 % per foot and is UL listed. The PAD300-PD features drift compensation and has built in dirty detector warning as well. The PAD300-PD and the control panel communicate over a proven and robust digital communication path and the system analyzes the information at the particular device. The total polling speed is less than five (5) seconds, well under the UL requirements.

The detector is compatible with any of the PAD300 series detector bases and simply twists on. The PAD300-PD is addressed using DIP switches in the rear of the detector and can be easily programmed in the field without special tools.

Setting the Address

Each addressable device on the SLC loop must have a unique address from 1 to 127 to function properly. The address is set using DIP switches.

Before connecting a device to the SLC loop, take the following precautions to prevent potential damage to SLC or device. Verify the following:

1. Power to the device is removed.
2. Field wiring is correctly installed.
3. Field wiring has no open or short circuits.

Technical Specifications

Operating Voltage	24 VDC
Detector Current Draw	300 µA
Alarm Indicator	1 LED
Alarm Set-point Range	1.1 to 3.5%/ft (3.6 to 11%/m)
Installation Temperature Range	32 to 120 ° F (0 to 49 ° C)
Operating Relative Humidity range	0% to 93% (Non-condensing)
Start-up Time	Max. 1 sec.
Maximum Number of Addresses Per Loop	127
Maximum Number of Lighted Indicators in Alarm Per Loop	30
Color	Eggshell White
Weight (without base)	91g (3.2oz)
Dimensions (without base)	Height: 1.42 in (36mm) Diameter: 3.93 in (100 mm)

Air Velocity Ratings

The PAD300-PD has an Open Area of Protection air velocity rating of 0 to 300 feet per minute.

The system has a maximum of 30 LEDs that can be turned on simultaneously. If the system already has 30 LEDs on, the PAD300-PD will operate even though the LED may not illuminate.

Operation

The PAD300-PD is an analog addressable detector that uses one address on the Signaling Line Circuit (SLC) of a compatible fire alarm control panel. The unit communicates with the control panel as it is polled. The LEDs flash every time the unit is polled and they will flash at a fast rate if the unit is in an active status. The polling LED can be turned off if desired for less conspicuous operation.

The PAD300-PD with the PAD300-4DB or PAD300-6DB has a low profile of less than two (2) inches to blend into the surrounding environment. The detector includes an insect screen to prevent foreign objects from reaching the chamber and can be cleaned to restore operation of a dirty detector.

Detector Sensitivity

The PAD300-PD and the compatible control panel work in tandem to keep the sensitivity consistent. As the detector is installed over time, the detector compensates for the dirt in the unit until it is out of range. At that time, the panel will indicate a dirty detector. The detector will then have to be cleaned or replaced.

The PAD300-PD can be programmed to provide a maintenance alert prior to reaching the dirty detector level which will allow for intervention prior to the detector going into trouble. This allows for detector replacement or cleaning prior to a nuisance trouble occurs.

NOTE: As required by NFPA, do not install the detectors until all construction is complete and the work area has been thoroughly cleaned. If the detectors have been installed in a construction environment, they should be cleaned or replaced before the system is placed into service.

Spacing

The PAD300-PD is UL listed with a recommended maximum spacing of 30 feet. Refer to NFPA 72 for specific information regarding detector spacing, placement and special applications.

Compatible Bases

All bases will mount on a single gang, 3-1/2” octagon, 3-1/2” square, double gang, 4” octagon, 4” square, 50mm c/c, 60mm c/c and 70mm c/c boxes.

Device	Description	Stock No.
PAD300-4DB	4” Detector Base	3992781
PAD300-6DB	6” Detector Base	3992782
PAD300-IB	6” base with an isolator module included	3992783
PAD300-RB	6” base with one Form-C relay contact. 2A @ 30VDC, 0.5A @ 125VAC	3992784
PAD300-SB	6" base with sounder module included. Sound pattern is provided from external source	3992785
PAD300-LFSB	6” base with 520Hz sounder module included. Sound pattern is provided from external source	3992786

Ordering Information

Model	Description	Stock No.
PAD300-PD	Photoelectric Smoke Detector	3992775

PAD100-PSSA/PSDA

Addressable Pull Station
Single/Dual Action

Features

- Single or Dual Action versions
- Durable die-cast construction
- Reset key matches the fire alarm control panels
- Compatible with IPA Series panels
- SLC Class A, Class X & Class B
- Product includes a 5 year warranty

Description

The PAD100-PSSA (Single Action) is activated by simply pulling the white "T" bar handle down. The PAD100-PSDA (Dual Action) is activated by lifting the front cover and then pulling the white "T" bar handle down. Once activated, the "T" bar cannot be reset without opening the front cover. Opening the front cover will also activate the pull station. To reset the PAD100-PS Series, use the Potter WS-93 key to unlock and open the front cover. Once the cover is open, push the "T" bar back into the normal position and re-secure the front cover.

Application

The PAD100-PSSA/PSDA is compatible with Potter's IPA series addressable fire alarm control panels. It is a non-coded addressable pull station available in either a single or dual action model and installs on a single gang box or surface mounts using the P32-BB or P32-DBB (deep) back box.

Technical Specifications

Operating Voltage	24.0 VDC
Max SLC Standby Current	200uA
Max SLC Alarm Current	200uA
Environmental Limitations	32°F - 120°F (0° - 49°C) Indoor Only
Dimensions	4.75" H x 3.25" W x 1.75" D
Relative Humidity Range	0 - 93% (non-condensing)
Mounting Options	Single gang box or Potter P32-BB/DBB
Shipping Weight	APS-SA - 1.22 lbs. APS-DA - 1.46 lbs.

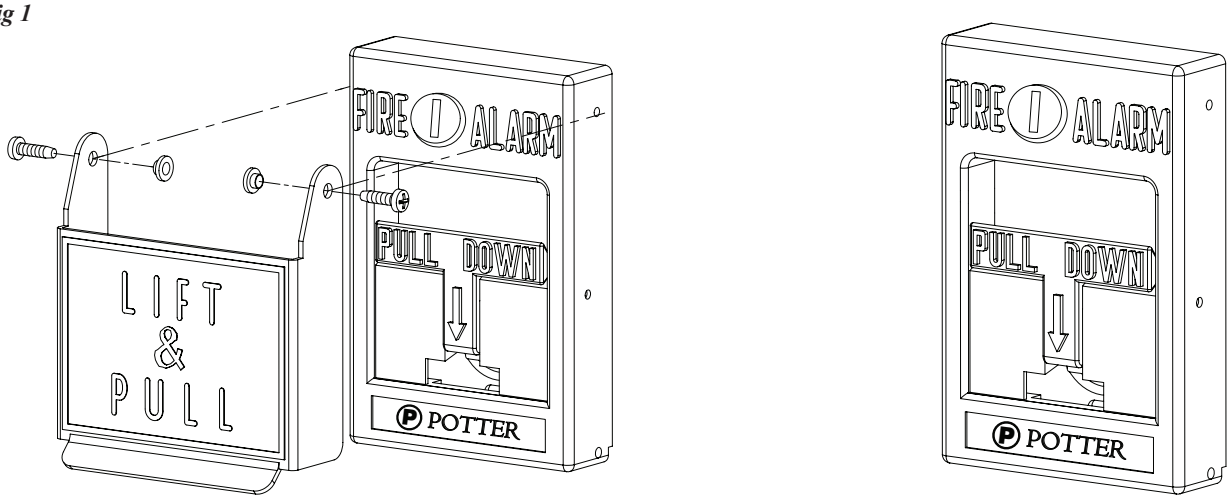
PAD100-PSSA/PSDA

Addressable Pull Station
Single/Dual Action

Setting the Address

The PAD100-PS Series uses one SLC address assigned to the device. The address is set using the DIP switch located on the back of the PAD100-PS device.

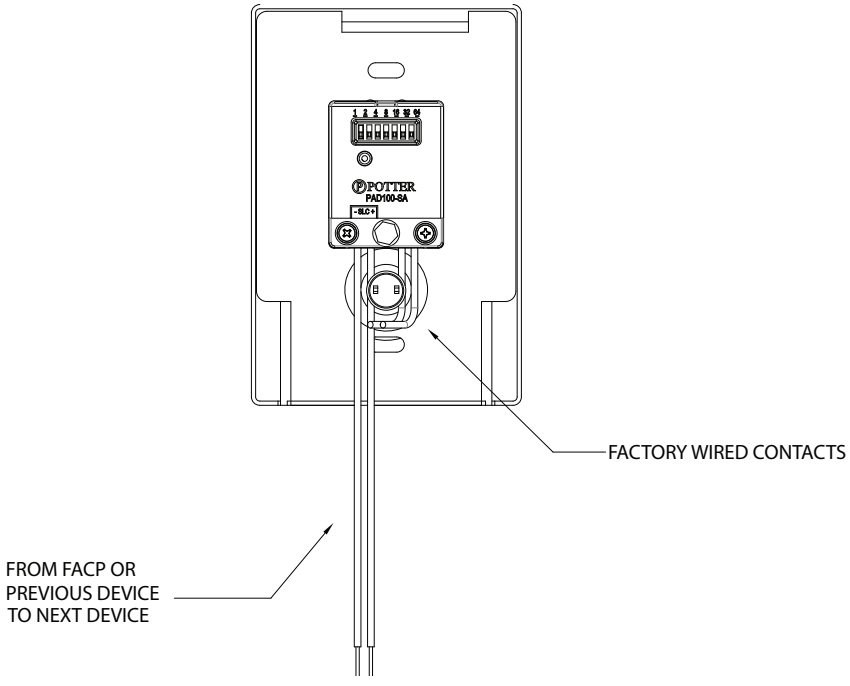
Pull Station Front View
Fig 1



PAD100-PSDA

PAD100-PSSA

Pull Station Back View and Wiring
Fig 2



Ordering Information

Model	Description	Stock No.
PAD100-PSSA	Addressable Pull Station, Single Action	3992721
PAD100-PSDA	Addressable Pull Station, Dual Action	3992720

PAD100-DIM

Dual Input Module

Features

- Single module with dual contact monitoring inputs
- Two (2) Class B or one (1) Class A monitoring inputs
- SLC Class A, Class X & Class B
- Mounts in a standard 4” or double gang box
- Wiring terminals accessible when mounted in box
- All wiring terminals accept 22 to 12 AWG
- Product includes a 5 year warranty
- UUKL Listed for Smoke Control

NOTE: This addressable module does not support 2-wire smoke detectors.

ASSEMBLED IN THE USA

FM APPROVED

Description

The PAD100-DIM uses one (1) SLC loop address when monitoring two (2) Class B circuits or one (1) Class A circuit. The module mounts on either a 4” square or double gang box. The module is capable of monitoring two (2) separate class B circuits making it ideal for monitoring sprinkler waterflow and valve tamper switches when they are located in the same proximity. The PAD100-DIM includes one red LED to indicate the module’s status. In normal condition, the LED flashes when the device is being polled by the control panel. When an input is activated, the LED will flash at a fast rate.

Application

The PAD100-DIM is compatible with Potter’s IPA and AFC/ARC series addressable fire alarm control panels. The PAD100-DIM is an interface module used to monitor dry contact devices such as sprinkler waterflow, valve tamper switches, or conventional pull stations. The module is capable of monitoring two separate Class B or one Class A circuits.

Setting the Address

Each addressable SLC device must be assigned an address. The address is set using the DIP switch located on the PAD100-DIM. When the PAD100- DIM is used to monitor two individual Class B circuits a single device address is assigned, each input is then identified as a sub-point of the module address. For example, if the address number is assigned as “8”, the first input will be “8.1” and the second input will be “8.2”.

Before connecting a device to the SLC loop, take the following precautions to prevent potential damage to the panel or device:

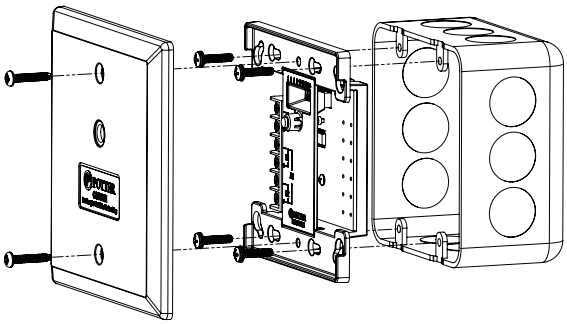
1. Power to the device is removed.
2. Field wiring is correctly installed.
3. Field wiring has no open or short circuits.

Technical Specifications

Operating Voltage	24.0V
Max SLC Standby Current	240µA
Max SLC Alarm Current	240µA
Max Wiring Resistance of IDC	100 Ω
Max Wiring Capacitance of IDC	1µF
EOL Resistor	5.1K Ω
Operating Temperature Range	32 to 120ºF (0 to 49ºC)
Operating Humidity Range	0 to 93% (non-condensing)
Max no. of Module Per Loop	127 units
Dimensions	4.17” (106mm)L × 4.17” (106mm)W × 1.14” (29mm)D
Mounting Options	Standard 4” Square or Double Gang Box
Shipping Weight	0.6 lbs

Installation Using Compatible Electrical Box

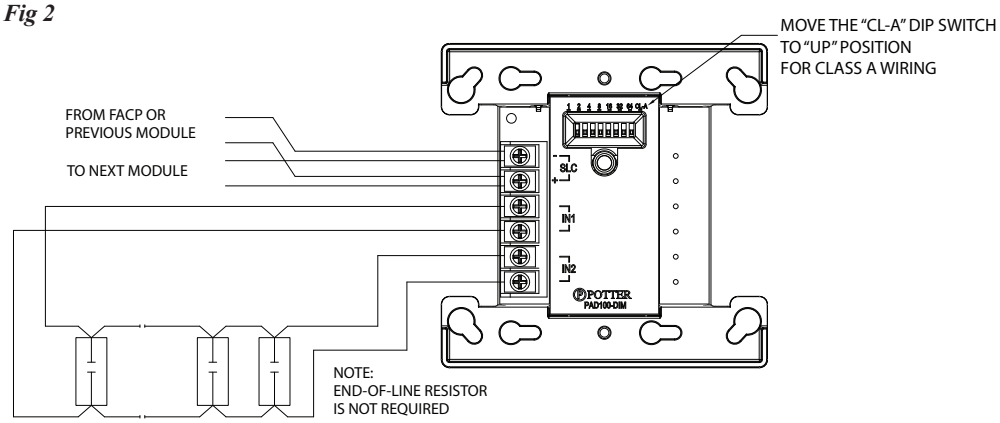
Fig 1



Wiring Diagrams

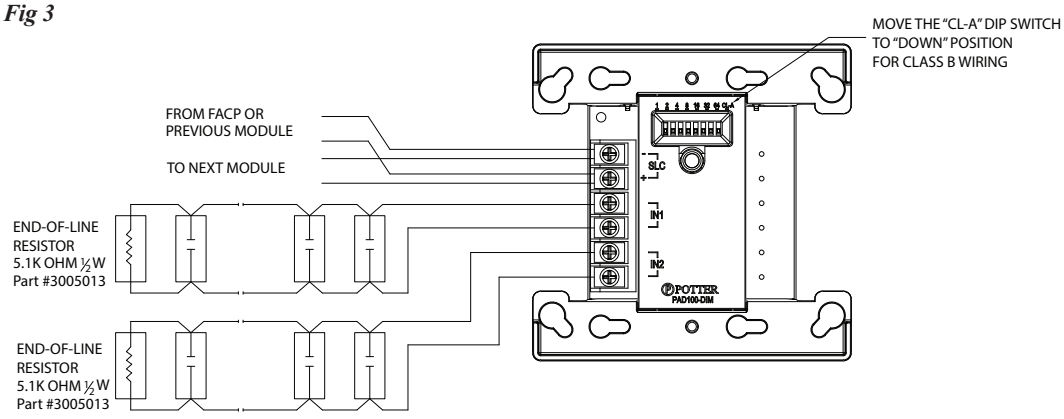
PAD100-DIM With One Class A Circuit

Fig 2



PAD100-DIM With Two Class B Circuits

Fig 3



Ordering Information

Model	Description	Stock No.
PAD100-DIM	Dual Input Module	3992703

Specifications

Eaton ELSPSTWC

Catalog Number: ELSPSTWC

Eaton Eluxa high fidelity speaker strobe, LED, ceiling, white, FIRE, clear lens, 15/30/75/110/150/177 cd, 25/70V, indoor

General specifications

Product Name	**Catalog Number**
Eaton Eluxa high fidelity speaker strobe	ELSPSTWC
UPC	**Product Height**
786697009679	3.64 in
Product Diameter	**Product Weight**
6.2 in	1.86 lb

Compliances

Not Applicable

Powering Business Worldwide

Product specifications

Mounting Method

Ceiling

Housing color

White

Indoor/outdoor

Indoor

Housing material

Plastic

Lettering

FIRE

Voltage

24 V
25 V
70 V

Operating Temperature

32°F to 122°F (0°C to 50°C)

Compliance and standards

UL
ULC
FCC

Strobe specifications

Lamp type

LED

Candela settings

15 cd
30 cd
75 cd
95 cd
150 cd
177 cd

Current draw (DC)

0.022
0.030
0.060
0.086
0.125
0.185

Lens color

Clear

Lens material

Lexan

Speaker specifications

Frequency range - min

300 Hz

Frequency range - max

8000 Hz

Sound level (dBA)

75/79/82/85/87

Taps (Selectable)

1/8, 1/4, 1/2, 1, 2

Resources

Brochures

Eluxa family brochure

Brochures

Eluxa product cross reference

Catalogs

Wheelock life safety notification appliances catalog CA450001EN

Drawings

Eluxa speaker strobe wall drawing

Eluxa speaker strobe ceiling drawing

Installation instructions

Eluxa speaker wall install sheet P85757

Eluxa speaker ceiling install sheet P85758

Selling policy and T&Cs

Eluxa UL listing

Specifications and datasheets

Eaton Specification Sheet - ELSPSTWC

Technical data sheets

Eluxa high fidelity amber lens speaker strobes data sheet

Eluxa high fidelity speaker data sheet

wheelock-mounting-accessories-data-sheet

Eaton Corporation plc
Eaton House
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Eluxa horns, horn strobes, & strobes

Description

The Wheelock Eluxa horns, horn strobes, and strobes by Eaton feature an advanced power saving LED technology with a full range of low and high candela settings for indoor wall and ceiling-mount applications. Designed in sleek, modern enclosures, Eluxa's aesthetically pleasing low profile will blend with the building's interior décor.

High efficiency, LED technology

Eaton's high energy efficient technology leads the industry in lowest current draw for a combined high and low candela device, which reduces overall power consumption. As the first notification appliances in the industry to utilize LED as the light source, this breakthrough optical design, resulting in best-in-class efficiency, enables material and system cost savings, allowing for a greater number of appliances on the notification appliance circuit and fewer power supplies. This reduces installation and operating costs. All strobe models feature six candela settings: 15, 30, 75, 110, 135, 185 cd on wall models and 15, 30, 75, 110, 150, 177 cd on ceiling models.

Low profile design and rich feature set

With the industry's smallest footprint, the Eluxa horns, horn strobes, and strobes are aesthetically pleasing to building owners as the low profile design does not detract from the interior decor. Eluxa is feature rich with 6 candela settings and 3 horn patterns (Continuous, T3, T3/T4) in 1 device, pre-wire/pre-test via mounting plate with hinged feature for ease-of-installation, single-gang design (wall models), and no tools needed for setting changes. The ELST strobe, ELHS horn strobe, and the ELHN horn are for 24V operation. ELHN is suitable for 12V applications.

Approvals and synchronization

Eaton's Eluxa strobes meet the 20 millisecond light pulse duration requirements of the 2016 edition of NFPA 72. By meeting this latest requirement, xenon and LED devices can now be in the same field of view.

The Eluxa notification appliances are listed under UL Standards 1971, 1638, and 464 and under CAN/ULC-S525 and CAN/ULC-S526. The appliances are Restriction of Hazardous Substances (RoHS) compliant and contain no mercury or other hazardous substances.

In addition, the Eluxa product line has been UL/ULC listed as compatible with all Fire Alarm Control Panels (FACP) and accessories that have been determined to be compatible with Exceder LED3 and Wheelock RSS strobe-based products including the RSS, CH, E, EH, ET, ST, HS, MT, S8, SA, STH and Z Series. The listing also includes the ability to install the Eluxa strobes in the same notification zone and field of view with any Wheelock RSS and Exceder LED3 strobe models.

Powering Business Worldwide

Features

- Energy efficient
  - LED technology provides industry's lowest current draw
  - Fewer power supplies required, smaller wire gage, reduced wire runs
- Low-profile design
  - One of the smallest, most compact single-gang designs
  - Sleek, modern aesthetics with no visible mounting screws
- Special lettering available
- 6 Field selectable settings in 1 device
  - Wall: 15, 30, 75, 110, 135, 185 cd
  - Ceiling: 15, 30, 75, 110, 150, 177 cd
- 3 horn patterns
  - Continuous, T3, and T3/T4; Fire and CO signaling in 1 device
- Sound pressure (Anechoic) dBA
  - Low 86, High 91 (for Continuous, T3, and T4)
- Easy-to-install
  - Mounting plate included with all models: Convenient capture hinge allows installers to easily hold the device while fastening the single-mount screw in place.
  - Pre-wire/pre-test capability to check for wiring and ground faults prior to appliance installation
  - Finger slide switches–No tools needed for setting changes
  - IN/OUT screw terminals using #12 to #18 AWG wires
  - Mounting options include ELSBB, any single-gang backbox and to 4" square with adapter kit for wall models and LSPKBB-C backboxes, 4" square, 1 1/2" or 2 1/8"deep and 4" Octagonal, 1 ½" or 2 1/8"deep for ceiling models
- Strobe synchronization
  - Meet synchronizing standards with Wheelock's DSM Sync Modules, PS Power Supplies or SAFEPATH products
  - Ability to mix xenon and LED strobes in the same field of view
- Compliance
  - NFPA 72 2016 - 20 ms flash duration requirements
  - UL 1971, UL 1638, UL 464, ULC-S525, ULC-S526
  - California State Fire Marshal (CSFM)
  - RoHS
  - FCC Part 15, ICES

Note: Please read these specifications and associated installation instructions, before using, specifying, or installing this product. Visit Eaton.com/Lifesafetynotification for current installation instructions.

General Notes

- Strobes are designed to flash at 1 flash per second minimum over their "Regulated Voltage Range." Note that NFPA-72 specifies a flash rate of 1 to 2 flashes per second and ADA Guidelines specify a flash rate of 1 to 3 flashes per second.
- All candela ratings represent minimum effective strobe intensity based on UL 1971.

Drawings

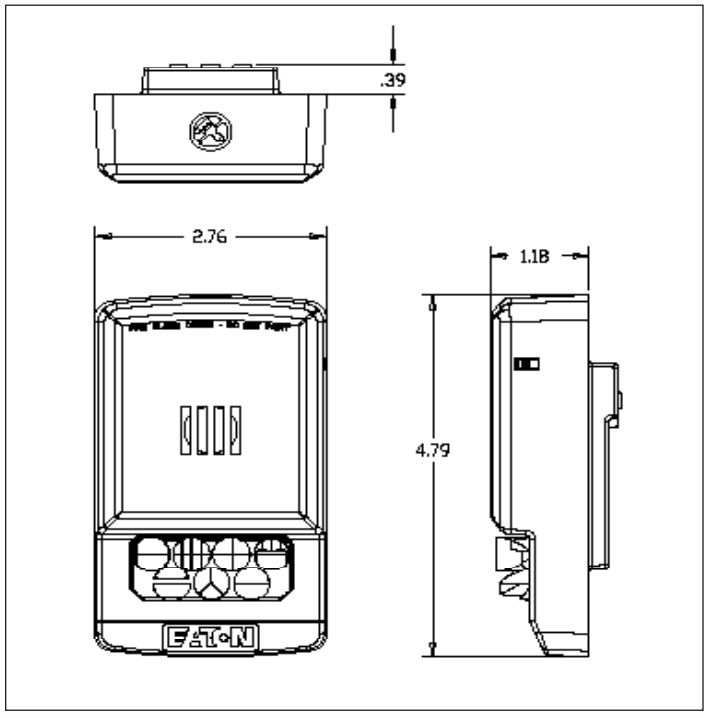

Figure 1. Wall, horn strobe

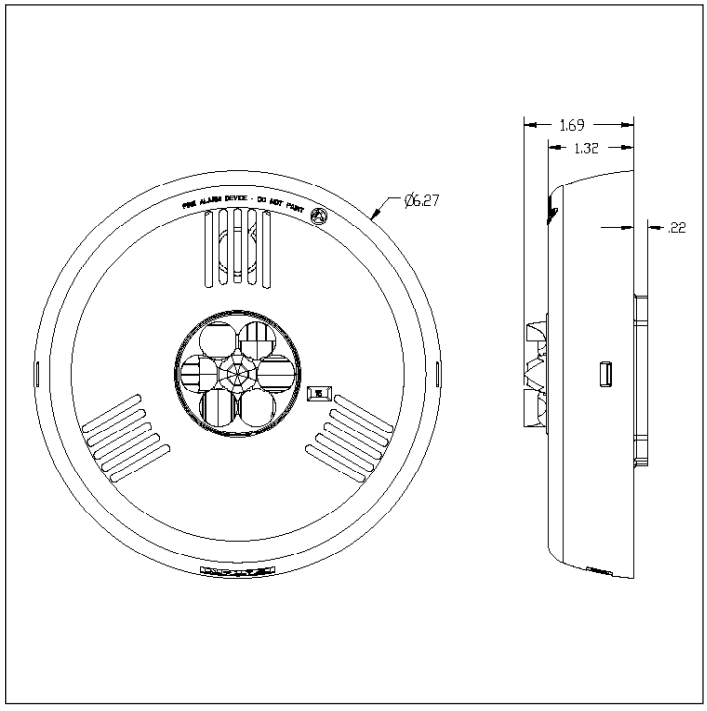

Figure 2. Ceiling, horn strobe

Table 1. Horn ratings per UL/ULC Anechoic

Eluxa Horns			
Model	**Regulated Voltage Range VDC**	**High dB**	**Low dB**
ELHN/ELHNC	8.0 - 17.5	0.025	0.020
ELHN/ELHNC	16.0 - 33.0	0.028	0.021

Table 2. Strobe ratings

		UL/ULC Max Current ①							
		24VDC							
Model	Regulated Voltage Range VDC	15	30	75	110	135	150	177	185
ELST	16.0-33.0	0.022	0.030	0.060	0.086	0.125			0.185
ELSTC	16.0-33.0	0.022	0.030	0.060	0.086		0.125	0.185	

Table 3. Code 3 horn strobe ratings

		UL/ULC Max Current ① at Anechoic High continuous							
Eluxa Horn Strobes		24VDC							
Model	Regulated Voltage Range VDC	15	30	75	110	135	150	177	185
ELHS	16.0-33.0	0.037	0.046	0.077	0.109	0.146			0.208
ELHSC	16.0-33.0	0.037	0.046	0.077	0.109		0.146	0.208	

		UL/ULC Max Current ① at Anechoic Low continuous							
Eluxa Horn Strobes		24VDC							
Model	Regulated Voltage Range VDC	15	30	75	110	135	150	177	185
ELHS	16.0-33.0	0.030	0.039	0.070	0.102	0.139			0.201
ELHSC	16.0-33.0	0.030	0.039	0.070	0.102		0.139	0.201	

Table 4. Specification & Ordering Information

Model	Mounting	Strobe Candela	Red	White	Lettering	Sync w/ DSM or Wheelock Power Supplies
Horn strobes						
ELHSR	Wall	15/30/75/110/135/185	X		FIRE	X
ELHSW	Wall	15/30/75/110/135/185		X	FIRE	X
ELHSR-A	Wall	15/30/75/110/135/185	X		AGENT	X
ELHSR-N	Wall	15/30/75/110/135/185	X		No Lettering	X
ELHSW-A	Wall	15/30/75/110/135/185		X	AGENT	X
ELHSW-AL	Wall	15/30/75/110/135/185		X	ALERT	X
ELHSW-N	Wall	15/30/75/110/135/185		X	No Lettering	X
ELHSW-EV	Wall	15/30/75/110/135/185		X	EVACUATE	X
ELHSRC	Ceiling	15/30/75/110/150/177	X		FIRE	X
ELHSWC	Ceiling	15/30/75/110/150/177		X	FIRE	X
Strobes						
ELSTR	Wall	15/30/75/110/135/185	X		FIRE	X
ELSTW	Wall	15/30/75/110/135/185		X	FIRE	X
ELSTR-A	Wall	15/30/75/110/135/185	X		AGENT	X
ELSTR-AL	Wall	15/30/75/110/135/185	X		ALERT	X
ELSTW-A	Wall	15/30/75/110/135/185		X	AGENT	X
ELSTW-AL	Wall	15/30/75/110/135/185		X	ALERT	X
ELSTW-N	Wall	15/30/75/110/135/185		X	No Lettering	X
ELSTR-N	Wall	15/30/75/110/135/185	X		No Lettering	X
ELSTW-EV	Wall	15/30/75/110/135/185		X	EVACUATE	X
ELSTRC	Ceiling	15/30/75/110/150/177	X		FIRE	X
ELSTWC	Ceiling	15/30/75/110/150/177		X	FIRE	X
ELSTRC-AL	Ceiling	15/30/75/110/150/177	X		ALERT	X
ELSTWC-AL	Ceiling	15/30/75/110/150/177		X	ALERT	X
ELSTWC-EV	Ceiling	15/30/75/110/150/177		X	EVACUATE	X
Horns						
ELHNR	Wall		X		No Lettering	X
ELHNW	Wall			X	No Lettering	X
ELHNRC	Ceiling		X		No Lettering	X
ELHNWC	Ceiling			X	No Lettering	X
Accessories						
ELSBB-R	LED Backbox, wall		X			
ELSBB-W	LED Backbox, wall			X		
ESB-KIT-R	Trim Plate, wall		X			
ESB-KIT-W	Trim Plate, wall			X		
LSPKBB-CR	Backbox, ceiling		X			
LSPKBB-CW	Backbox, ceiling			X		

① RMS current ratings are per UL maximum RMS method. UL max current rating is the maximum RMS current within the listed voltage range (16-33v for 24v units). For strobes the UL max current is usually at the minimum listed voltage (16v for 24v units). For audibles the max current is usually at the maximum listed voltage (33v for 24v units). For unfiltered FWR ratings, see installation instructions.

② Regulated Voltage Range - VDC

Note: Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Cooper Wheelock Inc., dba Eaton standard terms and conditions.

Table 5. Specifications

Physical	
Material	Red or white textured UV stabilized, colored impregnated engineered plastic. Exceeds 94V-0 UL flammability rating
Weight	Wall: 0.35 lbs; Ceiling: 0.55 lbs
Lens	Light Emitting Diode (LED) in a rugged Lexan lens
Dimensions	Wall: 4.79"H x 2.76" W x 1.18" D, Trimplate: 5.25" H x 4.58" W x 0.32" D; Ceiling: 6.27" Diameter x 1.69" D
Operating Temperature	Indoor: 32°F to 122°F (0°C to 50°C) and maximum humidity of 93%
Mounting & Wire Connections	
Mounting (indoor only)	Mounting plate included with all models. ELHS and ELST are for wall-mount applications only. ELHN can be used for wall and ceiling-mount applications. Wall mounting: Single-gang, ELSBB backboxes or to 4" square with adapter kit. ELHN can be used for wall and ceiling-mount applications. ELHSC and ELSTC are for ceiling mount applications only. The ELHNC can also be used for wall-mount applications. Ceiling mounting: LSPKBB-C backboxes or to 4" square, 1 1/2" or 2 1/8"and Octagonal, 1 ½" or 2 1/8"deep
Wire Connections	#12 through #18 AWG
Power & General	
Operating voltage	12 VDC/VFWR: 8 - 17.5 VDC/VFWR; 24 VDC/VFWR: 16 - 33 VDC/VFWR (12 VDC ELHN/ELHNC models only)
Strobe Output Rating	UL 1971, UL 1638, ULC S526: Selectable 15, 30, 75, 110, 135, 185 candela output for wall models; Selectable 15, 30, 75, 110, 150, 177 candela output for ceiling models
Synchronization Models	Strobes can be synchronized with Wheelock's DSM Sync Modules, PS Power Supplies or SAFEPATH products, using Wheelock patented sync protocol

Architects and Engineers Specifications

The LED notification appliances shall be Wheelock® ELHS audible visual strobe appliances, ELST visual strobe appliances and ELHN audible appliances for wall and ceiling-mount applications with a low-profile design or approved equals. Special lettering, including AGENT, ALERT, EVACUATE, and no lettering, shall be available. The ELHS and ELST strobes shall be listed for UL Standard 1971 (Emergency Devices for the Hearing-Impaired) for Indoor Fire Protection Service and UL 1638 (Visible Signaling Devices. The ELHS and ELHN Audibles shall be UL Listed under Standard 464 (Fire Protective Signaling). All models shall meet the requirements of FCC Part 15 and ICES-003. All inputs shall be compatible with standard reverse polarity supervision of circuit wiring by a Fire Alarm Control Panel (FACP) with the ability to operate from 16 to 33 VDC/VFWR.

The ELHS audible strobe and ELST strobe appliances shall produce a flash rate of one (1) flash per second over the Regulated Voltage Range and shall incorporate a Light Emitting Diode (LED) as the light source with a rugged Lexan® lens. The appliances shall be of low current design. The LED strobe flash duration shall be 20 ms. Where Multi-Candela appliances are specified, the strobe intensity shall have 6 field selectable settings at 15, 30, 75, 110, 135 and 185 candela for wall mount applications and 15, 30, 75, 110, 150 and 177 for ceiling applications. The selector switch for selecting the candela shall be tamper resistant. Appliances with candela settings shall show the candela selection in a visible location at all times when installed.

The audible shall have a choice of three (3) horn patterns (high & low output): Continuous, T3, and T3/T4 for fire (T3) and CO (T4) signaling.

The ELHS audible strobe, ELST strobe, and ELHN audible shall include a hinged mounting plate. Mounting options shall include LED backboxes, single-gang backbox and to 4" square with adapter kit for wall-mount models and LED Ceiling backboxes, 4" square, 1 1/2" or 2 1/8"deep and 4" Octagonal, 1 ½" or 2 1/8"deep for ceiling models. Two wire appliance wiring shall be capable of directly connecting to the mounting base. Removal of an appliance shall result in a supervision fault condition by the Fire Alarm Control Panel (FACP). All notification appliances shall be backwards compatible.

The ELHS, ELHN and ELST wall models shall have a low profile measuring 4.79"H x 2.76"W x 1.18"D. The ELHSC, ELHNC and ELSTC ceiling models shall have a low profile measuring 6.27" Diameter with 1.69"D.

When synchronization is required, the appliance shall be compatible with Wheelock®'s DSM Sync Modules, PS Power Supplies, SAFEPATH products or other manufacturer's panels with built-in Wheelock® Patented Sync Protocol. The strobes shall not drift out of synchronization at any time during operation. If the sync protocol fails to operate, the strobe shall revert to a non-synchronized flash-rate and still maintain (1) flash per second over its Regulated Voltage Range. The appliance shall also be designed so that the audible signal may be silenced while maintaining strobe activation when used with Wheelock® patented sync protocol.

NFPA 72 2016, UL 1971, UL, 1638, UL 464 ULC-S525-16, ULC-S526-16, CSFM, FCC, RoHS, ICES

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Powering Business Worldwide

Eluxa outdoor 3R/4X horn, horn-strobe and strobe

EL3RHN/EL4XHN Horn, EL3RST/EL4XST Strobe, EL3RHS/EL4XRHS Horn/Strobe

The Wheelock Eluxa weatherproof series EL3RHN/EL4XHN horn, EL3RST/EL4XST strobe, and EL3RHS/EL4XHS horn/strobe appliances are designed for easy installation with a pre-wire capable EL4XBB back box or EL3RMP mounting plate. All models are for 24V operation. The Eluxa 4X/3R horn is also for 12V operation. All Eluxa 4X/3R models are for indoor/outdoor use and wall or ceiling mount.

Rugged

The cutting-edge solution delivers optimal performance thanks to its NEMA type 3R and 4X ratings, which make it resistant to corrosion, ice formation. The IP54 and IP66 ratings provide superior protection against dust and water, making it ideal for areas of high humidity, extreme heat, or severe cold.

Energy Efficient

With six candela settings in a single device, Eluxa features one of the industry's lowest current draws across the full candela range. The Eluxa outdoor product line reduces overall power consumption, allowing for more appliances on each circuit (NAC) and fewer power supplies.

Compliance and Approvals

- Certified to NEMA type 3R | 4X
- IP54 |IP66 Certified |Tested to IP67
- NFPA 72 2016 (Meets maximum light pulse duration of 20 ms)
- IEC 60529 2nd edition + amendment 3- August 2013
- FCC Part 15B / ICES-003- Class A
- UL 50 13th edition- October 2020
- UL 50E 3rd edition- October 2020
- UL464 11th edition: CAN/ULC 525 5th edition- May 2023
- UL1480 7th edition: CAN/ULC 541 5th edition- May 2023
- UL1638 6th edition: CAN/ULC 526 5th edition- April 2023
- California State Fire Marshal (CSFM) - pending
- Factory Mutual (FM) - pending
- ADA/NFPA/ANSI/OSHA

Complete and Compliant

The Wheelock Eluxa 3R/4X series meets NFPA 2016 20 millisecond light pulse duration code requirements. In addition, the Wheelock Eluxa and LED3 product lines have been UL/ULC listed as compatible with all Fire Alarm Control Panels (FACP) and accessories that have been determined to be compatible with Wheelock model RSS Strobe based products including the RSS, CH, E, EH, ET, ST, HS, MT, S8, SA, STH and Z Series. The maximum number of Eluxa devices per NAC is determined by dividing the maximum current rating of the FACP NAC by the total current rating of one Eluxa device, with a maximum of 105 Eluxa (or LED3) devices per NAC. Refer to FACP installation instructions for more detail. The Wheelock Eluxa Series and Exceder LED3 Series strobes may be installed in the same notification zone and field of view with any RSS Strobe based product.

Powering Business Worldwide

Complete and Compliant

Wheelock Eluxa 3R/4X Multi-Candela Strobes can provide a non-synchronized strobe appliance when connected directly to a Fire Alarm Control Panel (FACP), or provide a synchronized strobe appliance when used in conjunction with an FACP that incorporates the Cooper Wheelock sync protocol, a Dual Sync Module (DSM), or the Wheelock Power Supply.

Drawings

Figure 1. Eluxa outdoor 3R

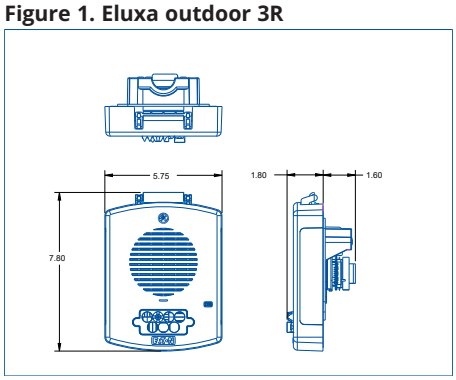

Figure 2. Eluxa outdoor 4X

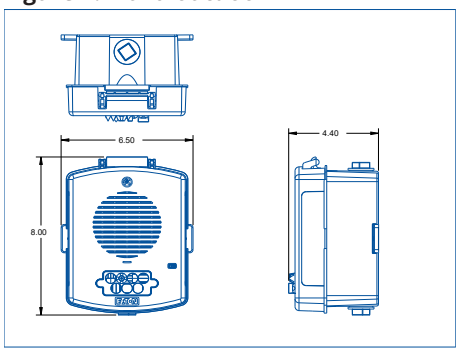

Table 1. EL3RHN/EL4XHN Horn current ratings (AMPS)

Input	Horn Setting	Regulated 12V (8-17.5V)	Regulated 24V (16-33V)
DC	CONT, T3, T3/T4 (H)	0.054	0.052
DC	CONT, T3, T3/T4 (L)	0.034	0.038
FWR	CONT, T3, T3/T4 (H)	0.102	0.102
FWR	CONT, T3, T3/T4 (L)	0.075	0.075

Table 1A: EL4X/3R Horn Sound Pressure Level Ratings (SPL)

Horn Setting	Reverberant dBA at 10Ft per UL464/ULC-525	
	SPL at 12V (HN Only)	SPL at 24V (HN and HS Models)
CONT, T3, T3/T4 (H)	83	90
CONT, T3, T3/T4 (L)	74	86

Table 1B: EL4X/3R Horn Directional Characteristics

-3dB	+/- 43 Degrees Horizontal, +/- 48 Degrees Vertical
-6dB	+/- 53 Degrees Horizontal, +/- 56 Degrees Vertical
-18dB	+/- 90 Degrees Horizontal/Vertical

Table 2. EL3RST/EL4XST Strobe Ratings

		UL/ULC Max Current					
		24VDC |FWR					
Strobe (Clear)	**Regulated Voltage Range VDC**	**15**	**30**	**75**	**110**	**150**	**185**
EL3RST	16.0-33.0	0.026	0.038	0.070	0.097	0.179	0.206
EL4XST	16.0-33.0	0.026	0.038	0.070	0.097	0.179	0.206
	FWR	0.034	0.053	0.098	0.137	0.235	0.308
Strobe (Amber)		**15**	**30**	**75**	**95**	**150**	**177**
EL3RSTA (Amber)	16.0-33.0	0.026	0.038	0.070	0.097	0.179	0.206
EL4XSTA (Amber)	16.0-33.0	0.026	0.038	0.070	0.097	0.179	0.206
	FWR	0.034	0.053	0.098	0.137	0.235	0.308

Table 3. EL3RHS/EL4XHS Horn-Strobe Ratings at 24V (AMPS)

		Strobe Candela Setting					
Input	**Horn Setting**	**15cd**	**30cd**	**75cd**	**95/110cd**	**150cd**	**177/185cd**
DC	CONT, T3, T3/T4 (H)	0.063	0.083	0.105	0.127	0.193	0.230
DC	CONT, T3, T3/T4 (L)	0.045	0.066	0.085	0.107	0.175	0.215
FWR	CONT, T3, T3/T4 (H)	0.095	0.119	0.162	0.197	0.291	0.339
FWR	CONT, T3, T3/T4 (L)	0.076	0.096	0.136	0.169	0.267	0.321

Table 4. Specifications

Physical	
Material	Red or white textured UV stabilized, colored impregnated engineered plastic.
Weight	3R = 1.7 lbs 4X = 2.3
Lens	Light Emitting Diode (LED) in a rugged Lexan lens
Dimensions	3R: 7.8"L x 5.75"W x 1.6"H 4X: 8"L x 6.5"W x 4.5"H
Operating Temperature	Indoor/Outdoor Use. -40° C to 66° C (-40° F to 150° F) 95% R.H.
Mounting & Wire Connections	
Mounting	Wall & Ceiling
Wire Connections	18 to 12 AWG. 2 wire.
Power & General	
Operating voltage	16-33 VDC/FWR. HN only is 12/24 VDC.
Strobe Output Rating	Clear 15/30/75/110/150/185 Cd Amber 15/30/75/95/150/177 Cd
Strobe Flash Rate	1 Hz
Synchronization Models	ALL

Table 5. Accessories

Standard Letter Plates	**Color**	**Description**
ELLP-FR (10Pk)	Red	ELUXA LETTER PLATE, RED, FIRE (10 PAIR PER PKG. - 1 Pair PER DEVICE)
ELLP-FW (10Pk)	White	ELUXA LETTER PLATE, WHITE, FIRE (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-NR (10Pk)	Red	ELUXA LETTER PLATE, RED, NO LETTERING (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-NW (10Pk)	White	ELUXA LETTER PLATE, WHITE, NO LETTERING (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-AR (10Pk)	Red	ELUXA LETTER PLATE, RED, AGENT (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-AW (10Pk)	White	ELUXA LETTER PLATE, WHITE, AGENT (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-ALR (10Pk)	Red	ELUXA LETTER PLATE, RED, ALERT (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-ALW (10Pk)	White	ELUXA LETTER PLATE, WHITE, ALERT (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
Special Project Letter Plates	**Color**	**Description**
ELLP-COR (10Pk)	Red	ELUXA LETTER PLATE, RED, CARBON DIOXIDE (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-COW (10Pk)	White	ELUXA LETTER PLATE, WHITE, CARBON DIOXIDE (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-EVR (10Pk)	Red	ELUXA LETTER PLATE, RED, EVACUATE (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-EVW (10Pk)	White	ELUXA LETTER PLATE, WHITE, EVACUATE (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-MR (10Pk)	Red	ELUXA LETTER PLATE, RED, EMERGENCY (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-MW (10Pk)	White	ELUXA LETTER PLATE, WHITE, EMERGENCY (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-FFR (10Pk)	Red	ELUXA LETTER PLATE, RED, FIRE / FEU (10 PAIR PER PKG. - 1 PAIR PER DEVICE)
ELLP-FFW (10Pk)	White	ELUXA LETTER PLATE, WHITE, FIRE / FEU (10 PAIR PER PKG. - 1 PAIR PER DEVICE)

Table 6. Ordering Information

Model	Strobe Candela	Lens	Red	White	Lettering	Sync w/DSM or Wheelock Power Supplies
Horn Strobe						
EL3RHS - FR	15, 30, 75, 95/110, 150, 177/185	Clear	X		FIRE	X
EL3RHS - FW	15, 30, 75, 95/110, 150, 177/185	Clear		X	FIRE	X
EL4XHS - FR	15, 30, 75, 95/110, 150, 177/185	Clear	X		FIRE	X
EL4XHS - FW	15, 30, 75, 95/110, 150, 177/185	Clear		X	FIRE	X
Strobe						
EL3RST - FR	15, 30, 75, 110, 150, 185	Clear	X		FIRE	X
EL3RST - FW	15, 30, 75, 110, 150, 185	Clear		X	FIRE	X
EL3RSTA-ALW	15, 30, 75, 95, 150, 177	Amber		X	ALERT	X
EL3RSTA-NW	15, 30, 75, 95, 150, 177	Amber		X	No Lettering	X
EL4XST - FR	15, 30, 75, 110, 150, 185	Clear	X		FIRE	X
EL4XST - FW	15, 30, 75, 110, 150, 185	Clear		X	FIRE	X
EL4XSTA-ALW	15, 30, 75, 95, 150, 177	Amber		X	ALERT	X
EL4XSTA-NW	15, 30, 75, 95, 150, 177	Amber		X	No Lettering	X
Horn						
EL3RHN - NR			X		No Lettering	X
EL3RHN - NW				X	No Lettering	X
EL4XHN - NR			X		No Lettering	X
EL4XHN - NW				X	No Lettering	X

Architects and Engineers Specifications

The LED outdoor notification appliances shall be Wheelock® EL3RHS/EL4XHS audible visual strobe appliances, EL3RST/EL4XST visual strobe appliances and EL3RHN/EL4XHN audible appliances for wall and ceiling-mount applications with a low-profile design or approved equals. Special lettering, including AGENT, ALERT, EVACUATE, and no lettering, shall be available. The outdoor series EL3RHN/EL4XHN, EL3RST/EL4XST, EL3RHS/EL4XHS, EL3RSTA/EL4XSTA (Amber) shall be listed for: Certified to NEMA type 3R | 4X, IP54 |IP66 Certified |Tested to IP67, NFPA 72 2016 (Meets maximum light pulse duration of 20 ms), IEC 60529 2nd edition + amendment 3- August 2013, FCC Part 15B / ICES-003- Class A, UL 50 13th edition- October 2020, UL 50E 3rd edition- October 2020, UL464 11th edition: CAN/ULC 525 5th edition- May 2023, UL1480 7th edition: CAN/ULC S541 5th edition- May 2023, UL1638 6th edition: CAN/ULC S526 5th edition- April 2023, California State Fire Marshal (CSFM), Factory Mutual (FM), ADA/NFPA/ANSI/OSHA. All inputs shall be compatible with standard reverse polarity supervision of circuit wiring by a Fire Alarm Control Panel (FACP) with the ability to operate from 16 to 33 VDC/VFWR.

The EL3RHS/EL4XHS audible strobe and EL3RST/EL4XHS strobe appliances shall produce a flash rate of one (1) flash per second over the Regulated Voltage Range and shall incorporate a Light Emitting Diode (LED) as the light source with a rugged Lexan® lens. The appliances shall be of low current design. The LED strobe flash duration shall be 20 ms. Where Multi-Candela appliances are specified, the strobe intensity shall have 6 field selectable settings at 15, 30, 75, 110, 150 and 185 candela for the clear lens and 15, 30, 75, 95, 150, 177cd for the amber lens. The selector switch for selecting the candela shall be tamper resistant. Appliances with candela settings shall show the candela selection in a visible location at all times when installed.

The audible shall have a choice of three (3) horn patterns (high & low output): Continuous, T3, and T3/T4 for fire (T3) and CO (T4) signaling. The EL3RHS/EL4XHS audible strobe, EL3RST/EL4XST strobe (clear and amber), and EL3RHN/EL4XHN audible shall include a hinged mounting plate.

The outdoor series EL3RHN/EL4XHN, EL3RST/EL4XST, EL3RHS/EL4XHS, EL3RSTA/EL4XSTA (Amber)appliances shall include a mounting plate or surface mounting box from the factory. The outdoor series EL3RHN/EL4XHN, EL3RST/EL4XST, EL3RHS/EL4XHS, EL3RSTA/EL4XSTA (Amber) incorporates pre-wire, pre-test mounting plate and back box terminals. The outdoor series EL3RHN/EL4XHN, EL3RST/EL4XST, EL3RHS/EL4XHS, EL3RSTA/EL4XSTA (Amber) rated to NEMA type 3R, IP54 and NEMA type 4X, IP66 respectively, when used with the included mounting accessory. Two wire appliance wiring shall be capable of directly connecting to the mounting plate or back box. Removal of an appliance shall result in a supervision fault condition by the Fire Alarm Control Panel (FACP). All notification appliances shall be backwards compatible.

The outdoor series EL3RHN/EL4XHN, EL3RST/EL4XST, EL3RHS/EL4XHS, EL3RSTA/EL4XSTA (Amber)appliances shall provide installers ease of installation provided by the self-supporting hanging hinge feature.

When synchronization is required, the appliance shall be compatible with Wheelock®'s DSM Sync Modules, PS Power Supplies, Intelligent Notification Controller, SAFEPATH products or other manufacturer's panels with built-in Wheelock® Patented Sync Protocol. The strobes shall not drift out of synchronization at any time during operation. If the sync protocol fails to operate, the strobe shall revert to a non-synchronized flashrate and still maintain (1) flash per second over its Regulated Voltage Range. The appliance shall also be designed so that the audible signal may be silenced while maintaining strobe activation when used with Wheelock® patented sync protocol.

Note: Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Cooper Wheelock Inc., dba Eaton standard terms and conditions apply.

Eaton
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Printed in USA
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July 2024

Powering Business Worldwide

POTTER
The Symbol of Protection

BELLS

PBA-AC & PDC-DC

Features

- Listed for indoor and outdoor use
- Outdoor use requires BBK-1 or HC-BB weatherproof back box
- Indoor use mounts directly to standard 4” box
- Low current draw
- High dB output
- AC and DC models
- DC models are motor driven, polarized, and have built in transient protection for supervised alarm circuits
- Available in 6”, 8” and 10” sizes

UL, ULC*, FM** APPROVED

* ULC on PDC-DC Only
** FM on PBA-AC Only

Description

These vibrating type bells are designed for use as fire or general signaling devices. They have low power consumption and high decibel ratings. The unit mounts on a standard 4” (101mm) square electrical box for indoor use or on a model BBK-1 or HC-BB weatherproof backbox for outdoor applications. Weatherproof backbox model BBK-1 or HC-BB, Stock No. 1500001.

Notes

1. Minimum dB ratings are calculated from integrated sound pressure measurements made at Underwriters Laboratories as specified in UL Standard 464. UL temperature range is -30° to 150°F (-34° to 66°C)
2. Typical dB ratings are calculated from measurements made with a conventional sound level meter and are indicative of output levels in an actual installation.
3. ULC only applies to PDC-DC bells.

Size inches (mm)	Voltage	Model Number	Stock Number	Current (Max.)	Typical dB at 10 ft. (3m) (2)	Minimum dB at 10 ft. (3m) (1)
6 (150)	12VDC	PDC-6-12	1750500	200mA	96	76
8 (200)	12VDC	PDC-8-12	1750502	.200mA	96	77
10 (250)	12VDC	PDC-10-12	1750504	.200mA	96	78
6 (150)	24VDC	PDC-6-24	1750501	.20mA	95	77
8 (200)	24VDC	PDC-8-24	1750503	20mA	83	79
10 (250)	24VDC	PDC-10-24	1750505	20mA	85	80
6 (150)	24VAC	PBA246	1806024*	.17A	91	78
8 (200)	24VAC	PBA248	1808024*	.17A	94	77
10 (250)	24VAC	PBA2410	1810024*	.17A	94	78
6 (150)	120VAC	PBA1206	1806120*	.05A	92	83
8 (200)	120VAC	PBA1208	1808120*	.05A	99	84
10 (250)	120VAC	PBA12010	1810120*	.05A	99	86

All DC bells are polarized and have built-in transient protection. * Does not have ULC listing.

Technical Specifications

Dimensions	6” (150mm), 8” (200mm) and 10” (250mm)
Enclosure	Cover: Steel Finish: Red Powder Coat Base: non-corrosive composite material All parts have corrosion resistant finishes Model BBK-1 or HC-BB weatherproof backbox (optional)
Voltages Available	24VAC 120VAC 12VDC (10.2 to 15.6) Polarized 24VDC (20.4 to 31.2) Polarized
Environmental Limitations	Indoor or outdoor use (See Note 1) -40° to 150°F (-40° to 66°C) (Outdoor use requires weatherproof backbox.)
Termination	AC Bells - 4 No. 18 AWG stranded wires DC Bells - 18 AWG stranded wire
Service Use	NFPA 13, 72, local AHJ

*Specifications subject to change without notice.

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

⚠ WARNING

In outdoor or wet installations, bell must be mounted with weatherproof backbox, BBK-1 or HC-BB. Standard electrical boxes will not provide a weatherproof enclosure. If the bell and/or assembly is exposed to moisture, it may fail or create an electrical hazard.

Installation

The bell shall be installed in accordance with NFPA 13, 72, or local AHJ. The top of the device shall be no less than 90" AFF and not less than 6" below the ceiling.

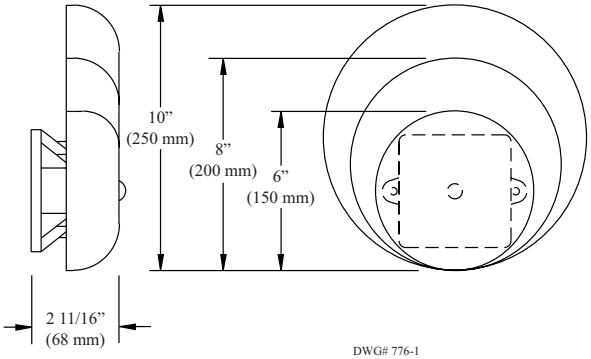
1. Remove the gong.
2. Connect wiring (see Fig. 3).
3. Mount bell mechanism to backbox (bell mechanism must be mounted with the striker pointing down).
4. Reinstall the gong (be sure that the gong positioning pin, in the mechanism housing, is in the hole in the gong).
5. Test all bells for proper operation and observe that they can be heard where required (bells must be heard in all areas as designated by the authority having jurisdiction).

⚠ WARNING

Failure to install striker down will prevent bell from ringing.

Bell Dimension Inches (mm)

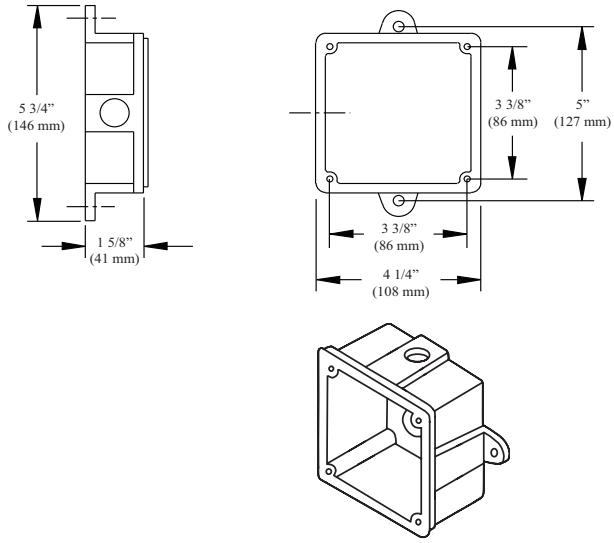
Fig 1



Weatherproof Backbox Dimensions Inches (mm)

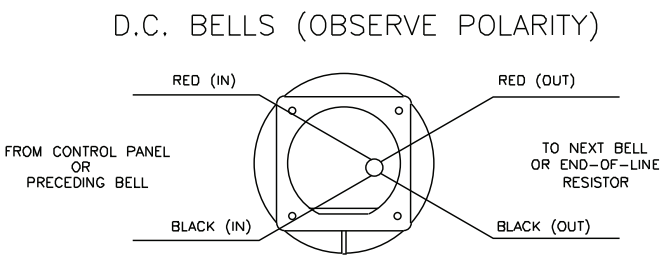
MODEL BBK-1 OR HC-BB

Fig 2



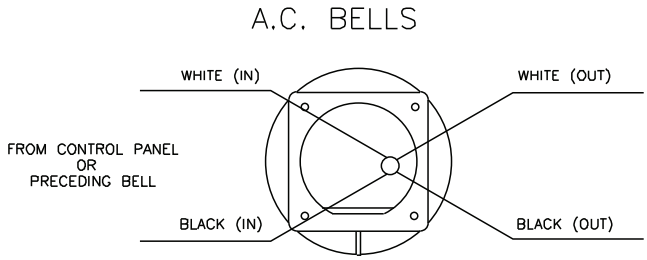
Wiring Rear View

Fig 3



NOTES:

1. OBSERVE POLARITY TO RING D.C. BELLS.
2. RED WIRES POSITIVE (+).
3. BLACK WIRES NEGATIVE (-).
4. EOL RESISTOR IS SUPPLIED BY FIRE ALARM CONTROL PANEL.



NOTES:

1. WHEN USING A.C. BELLS, TERMINATE EACH EXTRA WIRE SEPERATELY AFTER LAST BELL.
2. END-OF-LINE RESISTOR IS NOT REQUIRED ON AC BELLS .

INSTALLATION AND MAINTENANCE INSTRUCTIONS

Innovair flex™

D4120W Duct Smoke Detector

SYSTEM SENSOR®
3825 Ohio Avenue, St. Charles, Illinois 60174
1-800-SENSOR2, FAX: 630-377-6495
www.systemsensor.com

NOTE: The D4120W duct detector consists of a Power Board and Sensor component.

SPECIFICATIONS

Operating Temperature:	–4° to 158° F (–20° to 70° C)
Storage Temperature:	–22° to 158° F (–30° to 70° C)
Environmental Rating:	NEMA 4* Type 4 Enclosure — Watertight
Humidity:	0% to 95% Relative Humidity Non-condensing
Air Velocity:	100 to 4000 ft./min. (0.5 to 20.3 m/sec.)
D4120W Footprint Dimensions:	Rectangular - 14.38 in L x 5 in W x 2.5 in D (37cm L x 12.7cm W x 6.36cm D) Square - 7.75 in L x 9 in W x 2.5 in D (19.7cm L x 22.9cm W x 6.35cm D)
D4120W Weight:	2.5 pounds; 1.14 kg

Electrical

Power supply voltage:	20-29 VDC	24 VAC 50-60-Hz	120 VAC 50-60 Hz
Input capacitance:	270 µF max.	270 µF max.	N/A
Reset Voltage:	3.0 VDC min.	2.0 VAC min.	10 VAC min.
Reset Time (with RTS451/RTS151):	.03 to 0.3 sec.	.03 to 0.3 sec.	.03 to 0.3 sec.
Reset Time (by power down):	0.6 sec. max.	0.6 sec. max.	0.6 sec. max.
Power Up Time:	35 sec. max.	35 sec. max.	35 sec. max.
Alarm response time:	15 sec.	15 sec.	15 sec.
Sensitivity Test:	See detector label	See detector label	See detector label
Current Requirements (Using No Accessories)			
Max. standby current	21 mA @ 24 VDC	65 mA RMS @ 24VAC 60Hz	20 mA RMS @ 120 VAC 60 Hz
Max. alarm current	65 mA @ 24 VDC	135 mA RMS @ 24 VAC 60 Hz	35 mA RMS @ 120 VAC 60 Hz

CONTACT RATINGS

Alarm initiation contacts (SPST)	2.0A @ 30 VDC (resistive)
Alarm auxiliary contatcs (DPDT)	10A @30 VDC (resistive) 10A @250 VAC (resistive) 1/2 HP @240 VAC 1/4 HP @120 VAC
NOTE: Alarm auxiliary contacts shall not be connected to initiating circuits of control panels. Use the alarm initiation contact for this purpose.	
Supervisory Contacts (SPDT)	2.0A @ 30 VDC (resistive) 2.0A @ 125 VAC (resistive)

ACCESSORY CURRENT LOADS AT 24 VDC

DEVICE	STANDBY	TROUBLE	ALARM
APA151/APA451	12.5mA	n/a	30mA Max.
MHR/MHW	0mA	n/a	29mA Max.
RA400Z/RA100Z	0mA	n/a	12mA Max.
RTS451/RTS151	0mA	n/a	12mA Max.
RTS451KEY/RTS151KEY	12mA	n/a	12mA Max.
RTS2	3mA Max.	16mA Max.	30mA Max.
RTS2-AOS	3mA	16mA Max.	55mA Max.

NOTE: Any combination of accessories may be used such that the given accessory loads are: 110mA or less at the Aux output, and 50mA or less at the Alarm output.

IMPORTANT: This detector must be tested and maintained regularly following NFPA 72 requirements. The detector must be tested an maintained regularly following NFPA 72 requirements. According to NFPA, the detector should be visually inspected semiannually and functionally tested at least once a year. This may need to be more frequent depending on the air quality of the duct supply air.

TABLE OF CONTENTS PAGE

BEFORE INSTALLING

To maintain the watertight properties of this duct smoke detector, watertight conduit and fittings must be used. Mount the product with the conduit holes facing downwards, if possible. Read System Sensor's *Applications Guide for Duct Smoke Detectors* (HVAG53), which provides information on detector spacing, placement, zoning, wiring, and special applications. This manual is available online at www.systemsensor.com. NFPA Standards 72 and 90A should also be referenced for detailed information.

[1] LIMITATIONS OF DUCT SMOKE DETECTORS

⚠WARNING

The National Fire Protection Association has established that DUCT DETECTORS MUST NOT BE USED AS A SUBSTITUTE FOR OPEN AREA DETECTOR PROTECTION as a means of providing life safety. Nor are they a substitute for early warning in a building's regular fire detection system.

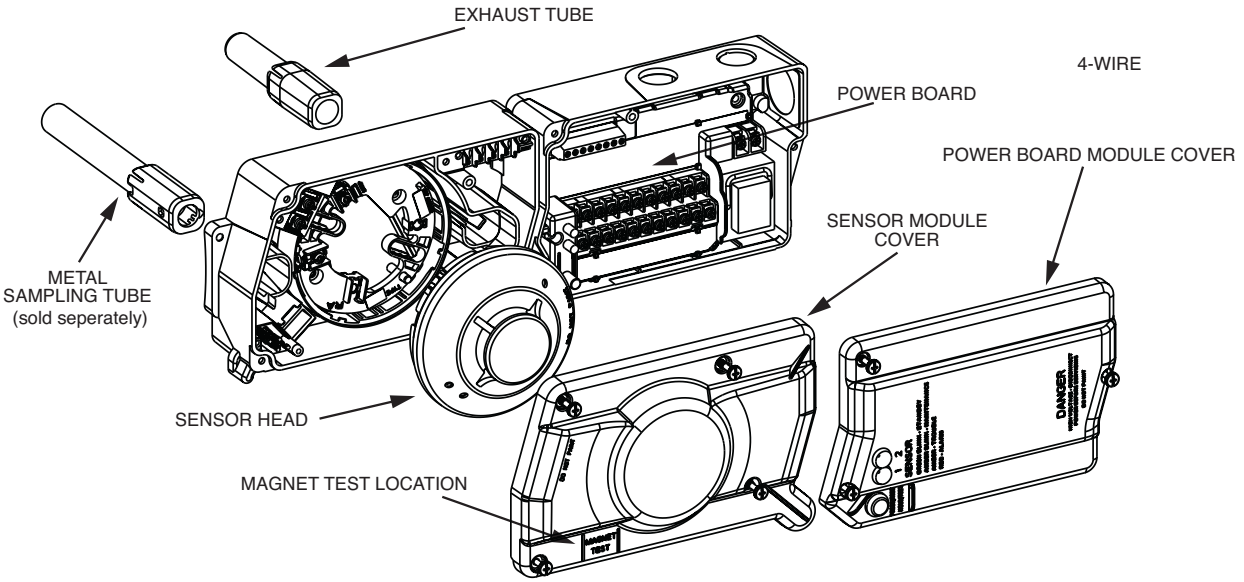
System Sensor supports this position and strongly recommends that the user read NFPA Standards 90A, 72, and 101. The D4120W Air Duct Smoke Detectors are listed per UL 268A.

This device will not operate without electrical power. Fire situations may cause an interruption of power. The system safeguards should be discussed with your local fire protection specialist.

This device will not sense smoke unless the ventilation system is operating and the cover is installed.

For this detector to function properly, it MUST be installed according to the instructions in this manual. Furthermore, the detector MUST be operated within ALL electrical and environmental specifications listed in this manual. Failure to comply with these requirements may prevent the detector from activating when smoke is present in the air duct.

[2] FIGURE 1. EXPLODED VIEW OF DUCT SMOKE DETECTOR COMPONENTS:



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[3] GENERAL DESCRIPTION

Smoke introduced into an air duct system will be distributed throughout the entire building. Smoke detectors designed for use in air duct systems are used to sense the presence of smoke in the duct.

Model D4120W. Duct Smoke Detectors utilize 4-wire photoelectric technology for the detection of smoke. This detection method, when combined with an efficient housing, samples air passing through the duct allowing detection of a developing hazardous condition. When sufficient smoke is sensed, an alarm signal is initiated and appropriate action can be taken to shut off fans, blowers, change over air handling systems, etc. These actions can facilitate the management of toxic smoke and fire gases throughout the areas served by the duct system.

The D4120W detectors are designed to operate on 24 VDC/VAC or 120 VAC. Alarm and supervisory relay contacts are available for control panel interface (alarm initiation), HVAC control, and other auxiliary functions. Auxiliary relays are provided for fan shut down. Detector interconnection provides signaling of up to 50 other detectors in the loop for multiple fan shut down. These detectors are not designed for 2-wire applications.

[3.1] DETECTOR FEATURE SET

-Utilizes 2D51 plug-in head

-2 sensors to 1 power board capability

-Cover missing signal

-Sampling tubes install from front or rear of detector

-Compatible with existing accessories

[4] CONTENTS OF THE DUCT SMOKE DETECTOR KIT

1. Sensor/power board assembly and cover(s)
2. Three #10 sheet metal screws for mounting
3. Drilling template
4. One sampling tube end cap
5. One plastic exhaust tube

NOTE: A sampling tube must be ordered to complete the installation. It must be the correct length for the width of the duct where it will be installed. See Table 1 on page 3 to determine the inlet tube required for different duct widths.

[5] DETECTOR INSTALLATION

[5.1] VERIFY AIR FLOW DIRECTION AND VELOCITY

Model D4120W detectors are designed to be used in air handling systems with air velocities of 100 to 4000 feet per minute. Duct widths from 6 inches to 12 feet can be accommodated. Be sure to check engineering specifications to ensure that the air velocity in the duct falls within these parameters. If necessary, use a velocity meter (anemometer) to check the air velocity in the duct.

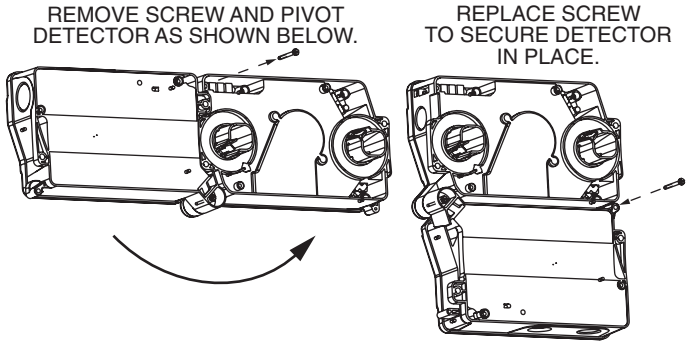
[5.2] DETERMINE MOUNTING LOCATION AND CONFIGURATION

On ducts wider than 18 inches it is recommended that the detector be mounted downstream of a bend, obstruction in the duct, or the supply or return air inlet.

Exception: Installation of duct detectors can be on or within a commercial packaged rooftop heating and air-conditioning system, fire/smoke dampers and economizers. They may be mounted in either the supply and/or return air section as determined by local code.

Once a suitable location is selected, determine if the detector is to be mounted in a side-by-side "rectangular" configuration or a top-over-bottom "square" configuration as shown in **Figure 2**. If mounting in the square configuration, remove the rear attachment screw, rotate the unit at the hinge, and replace the screw into the new attachment hole as shown in **Figure 2**. Do NOT remove the hinge screw during this process. Final installation approval shall be based upon passing section 7.2.2 and/or 8.2.4 tests.

FIGURE 2:



H0550-00

[5.3] DRILL THE MOUNTING HOLES

Remove the paper backing from the mounting template supplied. Affix the template to the duct at the desired mounting location. Make sure the template lies flat and smooth on the duct.

[5.3.1] FOR RECTANGULAR SIDE-BY-SIDE MOUNTING CONFIGURATION:

Center punch at (4) target centers: (2) "A" for sampling tubes and (2) "B" for the rectangular configuration mounting tabs as shown on mounting template. Drill pilot holes at target "A" centers and cut two 1.375 inch diameter holes using a $1^{3}/_{8}$ inch hole saw or punch. Drill .156 inch diameter holes using a $^{5}/_{32}$ inch drill at target "B" centers.

[5.3.2] FOR SQUARE TOP-OVER-BOTTOM MOUNTING CONFIGURATION OR D4S SENSOR COMPONENT MOUNTING:

Center punch at (4) target centers: (2) "A" for sampling tubes and (2) "C" for the square configuration mounting tabs as shown on mounting template. Drill pilot holes at target "A" centers and cut two 1.375 inch diameter holes using a $1^3/_8$ inch hole saw or punch. Drill .156 inch diameter holes using a $^5/_{32}$ inch drill at target "C" centers. If desired, drill an additional .156 inch hole at the location of one of the mounting tabs on the lower housing.

[5.4] SECURE THE DUCT DETECTOR TO THE DUCT

Use two (rectangular configuration) or three (square configuration) of the provided sheet metal screws to screw the duct detector to the duct.

CAUTION: Do not overtighten the screws.

[6] SAMPLING TUBE INSTALLATION

[6.1] SAMPLING TUBE SELECTION

The sampling tube must be purchased separately. Order the correct length, as specified in **Table 1**, for width of the duct where it will be installed. It is recommended that the sampling tube length extend at least $^2/_3$ across the duct width for optimal performance.

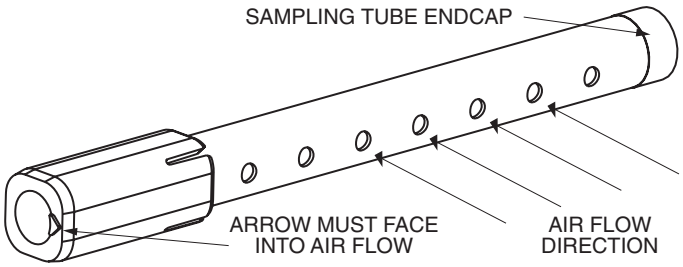
TABLE 1. SAMPLING TUBES RECOMMENDED FOR DIFFERENT DUCT WIDTHS:

Outside Duct Width	Sampling Tube Recommended*
Up to 1 ft.	DST1
1 to 2 ft.	DST1.5
2 to 4 ft.	DST3
4 to 8 ft.	DST5
8 to 12 ft.	DST10 (2-piece)

*Must extend a minimum of $^2/_3$ the duct width. These sampling tubes can only be used with new InnovairFlex duct smoke detectors.

The sampling tube is always installed with the air inlet holes facing into the air flow. To assist proper installation, the tube's connector is marked with an arrow. Make sure the sampling tube is mounted so that the arrow points into the airflow as shown in **Figure 3**. Mounting the detector housing in a vertical orientation is acceptable provided that the air flows directly into the sampling tube holes as indicated in **Figure 3**. The sampling tube and exhaust tube can be mounted in either housing connection as long as the exhaust tube is mounted downstream from the sampling tube.

FIGURE 3. AIR DUCT DETECTOR SAMPLING TUBE:



H0551-00

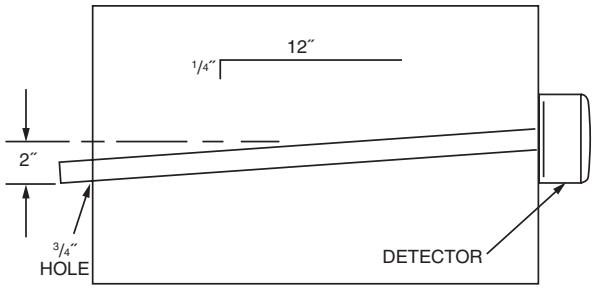
CAUTION: The sampling tube end cap, included with the detector, is critical to proper operation of the duct smoke detector. The end cap is needed to create the proper air flow to the sensor of the duct smoke detector. Once any sampling tube length adjustments are made, plug the end of the sampling tube with the provided end cap.

A plastic exhaust tube is included with the unit to be installed if needed. Install into the housing connection that is downstream from the sampling tube connection. The exhaust tube can be installed from the front or back of the detector. A longer 1 foot exhaust tube, model ETX, is available as an accessory in cases where the molded exhaust tube does not extend at least 2 inches into the duct.

[6.2] SAMPLING TUBE INSTALLATION

1. For tubes shorter than the width of the duct, slide the sampling tube, with installed end cap, into the housing connection that meets the airflow first. Position the tube so the arrow points into the airflow as shown in **Figure 3**. Per NFPA sampling tubes over 3 feet long should be supported at the end opposite the duct detector. In ducts wider than 8 feet, work must be performed inside the duct to couple the other section of the sampling tube to the section already installed using the $^1/_2$ inch conduit fitting. Make sure that the holes on both sections of the air inlet sampling tube are lined up and facing into the airflow.
2. For tubes longer than the width of the duct, the tube should extend out of the opposite side of the duct. Drill a $^3/_4$ inch hole in the duct opposite the hole already cut for the sampling tube. Ensure that the sampling tube is angled downward from the duct smoke detector to allow for moisture drainage away from the detector. The sampling tube should be angled at least 1/4" downward for every 12" of duct width per Figure 4. There should be 10 to 12 holes spaced as evenly as possible across the width of the duct. If there are more than 2 holes in the section of the tube extending out of the duct, select a shorter tube using **Table 1**. Otherwise, trim the tube to leave approximately 1 to 2 inches extending outside the duct. Plug the end with the end cap and tape closed any holes in the protruding section of tube. Be sure to seal the duct where the tube protrudes.

FIGURE 4.



H0215-00

NOTE: Air currents inside the duct may cause excessive vibration, especially when the longer sampling tubes are used. In these cases, a 3 inch floor flange (available at most plumbing supply stores) may be used to fasten the sampling tube to the other side of the duct. When using the flange/connector mounting technique, drill a 1 to $1^1/_4$ inch hole where the flange will be used.

[6.3] MODIFICATIONS OF SAMPLING TUBES

There may be applications where duct widths are not what is specified for the installation. In such cases, it is permissible to modify a sampling tube that is longer than necessary to span the duct width.

Use a 0.193 inch diameter (#10) drill and add the appropriate number of holes so that the total number of holes exposed to the air flow in the duct is 10 to 12. Space the additional holes as evenly as possible over the length of the tube.

NOTE: This procedure should only be used as a temporary fix and is not intended as a substitute for ordering the correct length tubes.

[6.4] REMOTE SAMPLING TUBE INSTALLATION

The detector arrangement can also incorporate remote mounting of the sampling tube and/or exhaust tube. In this case both the detector, sampling tube and exhaust tube (if included) should be rigidly mounted to withstand the pressure and vibrations caused by the air velocity. The location of the detector's sampling tube should be such that there is uniform airflow in the cross section area.

The pressure differential across the sampling and exhaust ports in the detector housing shall be verified to be between 0.01 and 1.11 inches of water. Do so by measuring the pressure difference between the inlet and outlet ports on the detector housing using a manometer as described in **Section 7.1**.

[7] MEASUREMENT TESTS

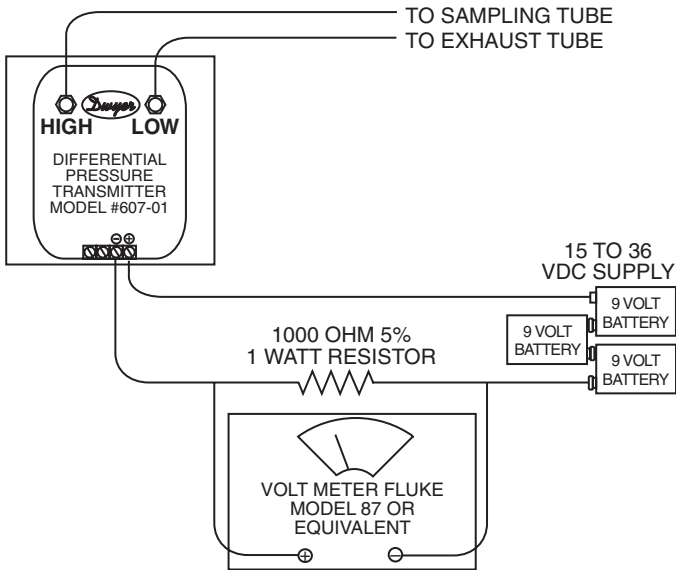
[7.1] AIR FLOW

The D4120W is designed to operate over an extended air speed range of 100 to 4000 FPM. To verify sufficient sampling of ducted air, turn the air handler on and use a manometer to measure the differential pressure between the two sampling tubes. The differential pressure should measure at least 0.01 inches of water and no more than 1.11 inches of water. Because most commercially available manometers cannot accurately measure very low pressure differentials, applications with less than 500 FPM of air speed may require one of the following: 1) the use of a current-sourcing pressure transmitter (Dwyer Series 607) per Section 7.2, or 2) the use of aerosol smoke per section 12.5.3.

[7.2] LOW FLOW AIR FLOW TEST USING DWYER SERIES 607 DIFFERENTIAL PRESSURE TRANSMITTER

Verify the air speed of the duct using an anemometer. Air speed must be at least 100 FPM. Wire the Dwyer transmitter as shown in **Figure 5**. Connect the leads of the meter to either side of the 1000Ω resistor. Allow unit to warm up for 15 seconds. With both HIGH and LOW pressure ports open to ambient air, measure and record the voltage drop across the 1000Ω resistor (measurement 1), 4.00 volts is typical. Using flexible tubing and rubber stoppers, connect the HIGH side of the transmitter to the sampling tube of the duct smoke detector housing, and the LOW side of the transmitter to the exhaust tube of the duct smoke detector housing. Measure and record the voltage drop across the 1000Ω resistor (measurement 2). Subtract the voltage recorded in measurement 1 from the voltage recorded in measurement 2. If the difference is greater than 0.15 volts, there is enough air flow through the duct smoke detector for proper operation.

FIGURE 5. PROCEDURE FOR VERIFYING AIR FLOW LESS THAN 500 FPM:



H0163-01

[8] FIELD WIRING INSTALLATION GUIDELINES

All wiring must be installed in compliance with the National Electrical Code and the local codes having jurisdiction. Proper wire gauges should be used. The conductors used to connect smoke detectors to control panels and accessory devices should be color-coded to prevent wiring mistakes. Improper connections can prevent a system from responding properly in the event of a fire.

For signal wiring, (wiring between interconnected detectors or from detectors to auxiliary devices), it is recommended that single conductor wire be no smaller than 18 gauge.

Smoke detectors and alarm system control panels have specifications for allowable loop resistance. Consult the control panel manufacturer's specifications for the total loop resistance allowed for the particular control panel being used before wiring the detector loop.

[8.1] WIRING INSTRUCTIONS

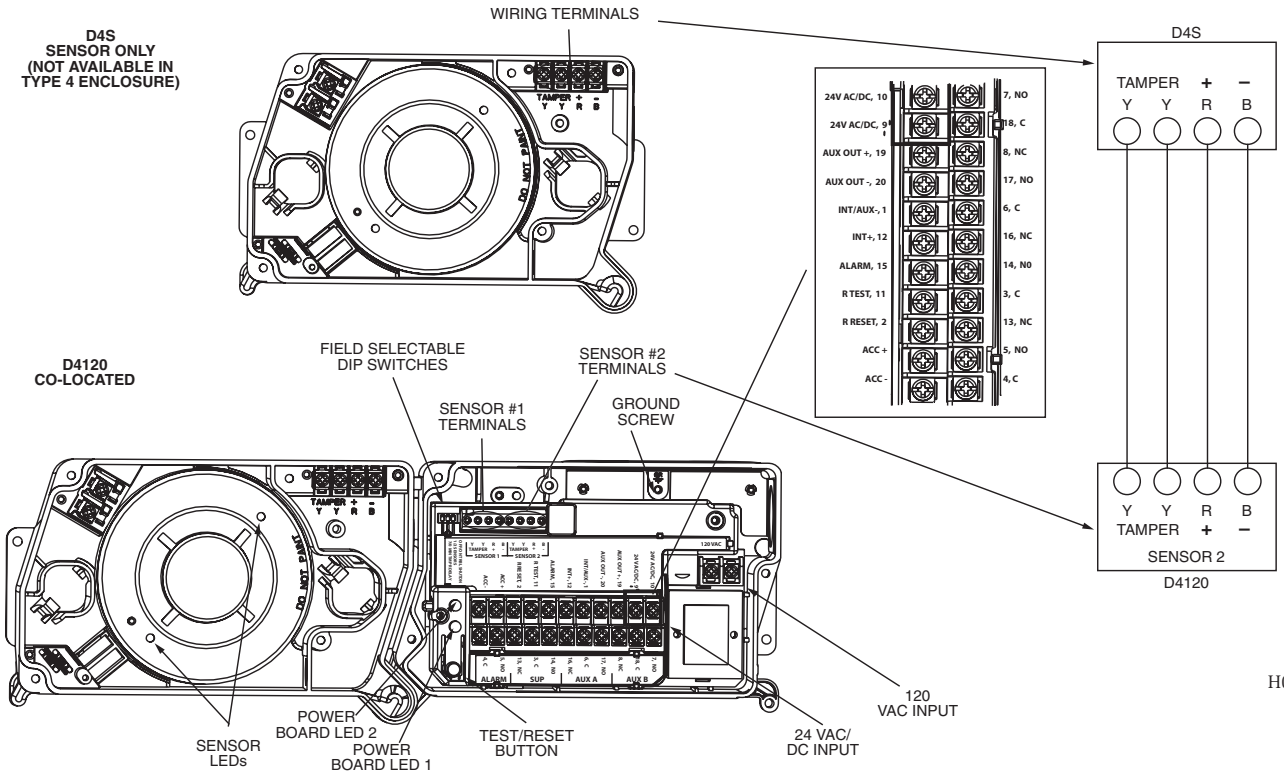
The D4120W detector is designed for easy wiring. The housing provides a terminal strip with clamping plates. The D4S housing provides 4 wiring terminals with clamping plates. Wiring connections are made by sliding the bare end of the wire under the plate, and tightening the clamping plate screw. See **Figure 7** on page 5 for system wiring.

[8.2] SENSOR 2 INSTALLATION/WIRING

The power board is capable of controlling a second housed sensor. The second sensor, model D4S (NOT available in Type 4 enclosure), can be wired to the power board per the following:

1. Connect wires to the four wire terminals in the corner of the D4S sensor housing designated as Tamper (Y,Y), +R, and –B. Route wires through the conduit openings in the sensor housing and D4120W power board housing.
2. Connect the opposing ends of the wires to the terminal connections marked "Sensor 2" on the Power Board. See **Figure 6** for reference. Ensure that wires are connected to the appropriate terminal locations. A No. 0 or 1 phillips screwdriver should be used for terminal connection. The tamper terminals are not polarity sensitive.
3. Adjust the middle dipswitch on the power board to indicate (2) sensors as shown in **Figure 6**.
4. The D4S can only be used with new InnovairFlex models and is not compatible with previously sold detectors.

FIGURE 6. OPTIONAL SENSOR 2 CONFIGURATION AND WIRING:

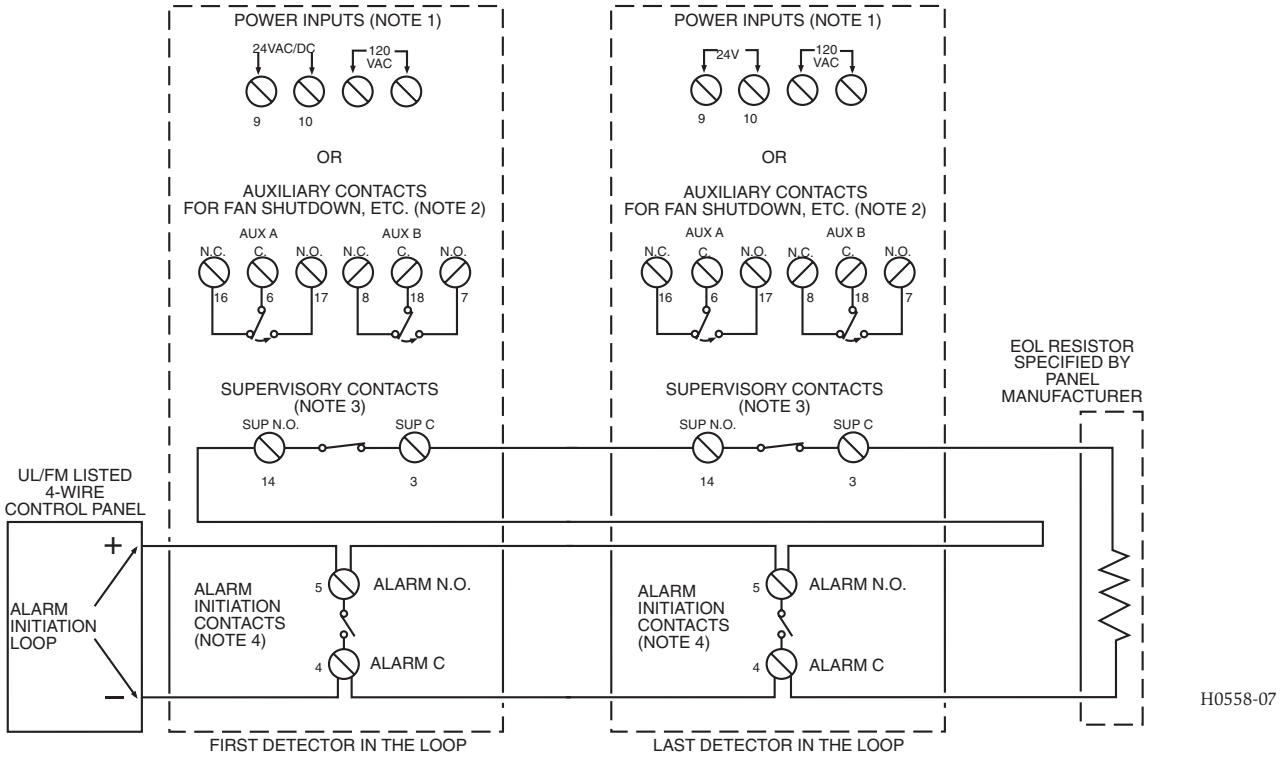


H0557-17

FIGURE 7. SYSTEM WIRING DIAGRAM FOR 4-WIRE DUCT SMOKE DETECTORS:

⚠CAUTION

Do not loop wire under terminals when wiring detectors. Break wire runs to provide system supervision of connections.



NOTE 1: 24V Power Inputs accept a non-polarized 24VDC or 24VAC 50-60Hz. 120VAC Power Inputs accept only 120VAC 50-60Hz. Connect power source to appropriate terminals of each detector. See specifications for additional power supply information.

NOTE 2: Auxiliary contacts shown in standby position. Contacts switch during alarm as indicated by arrows. Auxiliary contacts are not to be used for connection to the control panel. See specifications for contact ratings.

NOTE 3: Supervisory contacts shown in standby position. Open contacts indicate a trouble condition to the panel. See specifications for contact ratings.

NOTE 4: Alarm Initiation contacts shown in standby position. Closed contacts indicate an alarm condition to the panel. See specifications for contact ratings.

[9] UNIT CONFIGURATION:

A three position dipswitch is included in order to configure the setup of the unit. One switch is used to determine it there are one or two sensors connected to the Power Board. The second switch selects an instantaneous or 7-minute tamper delay. A tamper condition indicates that the cover of the sensor housing has been removed or has not been secured properly. The third switch is used to turn the Shutdown On Trouble feature on or off. With this feature turned on, the Aux Relay will switch states when a Trouble Condition occurs.

***Trouble is indicated when the Supervisory Relay, switches state-Terminals 3 and 14 are open in a Trouble Condition**

Causes of a Trouble Condition may be:

- Unit loses power
- Cover Tamper Feature times out
- Wiring Problems between the Sensor and the Power Board
- Mismatch between number of sensors connected to the Power Board and the dipswitch setting

TABLE 2. DIP SWITCH SETTINGS:

Designation	Default	Selection	Features
TRBL SHUTDN	OFF	OFF	Aux relay does not switch states with a Trouble condition
		ON	Aux relay switches states with a Trouble condition
SENSORS	1	1	Only one sensor is connected the Power Board
		2	Two sensors are connected to the Power Board
MIN TMPR DELAY	7	7	Provides a Trouble condition (terminals 3 and 14 open) when sensor housing cover has been removed or has been secured improperly for more than 7 minutes
		0	Provides an instantaneous Trouble condition(terminals 3 and 14 open) upon cover removal

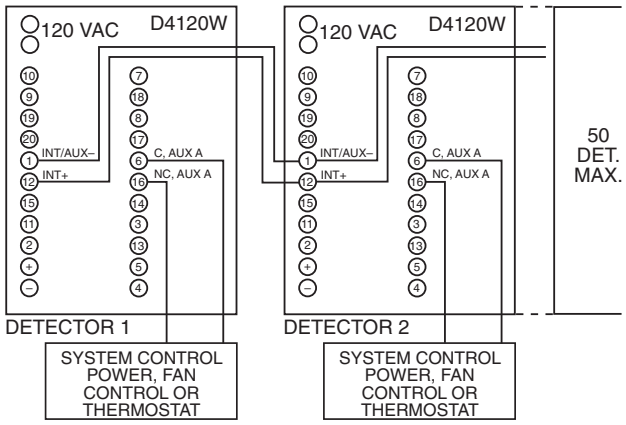
[10] DETECTOR STATUS INDICATION

Detector staus is indicated by the LED sensor, and the correcsponding LED on the power board. The power board has two separate LED's to indicate the status of each sensor connected to it. Refer to Table 3 on page 8 for more details.

[11] INTERCONNECTION (MULTIPLE FAN SHUT DOWN)

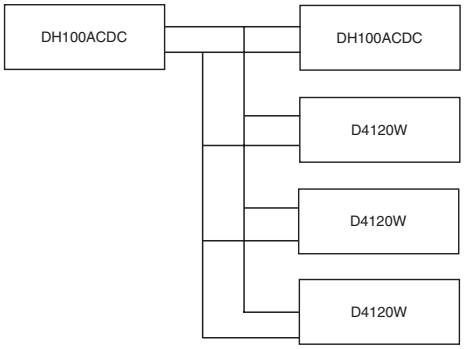
When using the interconnect feature, an alarm from an initiating device will switch the Aux Relays on the other devices interconnected.

FIGURE 8. MULTIPLE FAN SHUTDOWN (INTERCONNECTION OF D4120W'S):



H0552-01

FIGURE 9. MULTIPLE FAN SHUTDOWN (INTERCONNECTION OF D4120W TO DH100ACDC):



H0617-01

[11.1] IMPORTANT INTERCONNECTION NOTES:

- When using the interconnect feature, all interconnected units must be powered using the same independent supply.
- Polarity must be maintained throughout the interconnect wiring. Connect the INT+ terminal on unit 1 to the INT+ terminal on unit 2 and so on. Similarly, connect the INT/AUX- terminal on unit 1 to the INT/AUX- terminal on unit 2 and so on.
- Up to 50 D4120W units may be interconnected.
- Up to 10 DH100ACDC units may be interconnected. Please note that each of the 9 DH100ACDC units interconnected can be substituted by three D4120W units. Therefore, when using the interconnect feature a single DH100ACDC can drive either 9 DH100ACDC's or 27 D4120W units.

NOTE: Alarm can be reset only at the initiating device and not at the devices interconnected.

[12] VERIFICATION OF OPERATION

[12.1] FIELD SELECTABLE SETTINGS

Verify dipswitch settings as per Table 2 on Page 5.

[12.2] POWERING THE UNIT

Apply 24 VDC power to 9 and 10 terminals on the D4120W or apply 120 VAC on terminals named 120VAC. See Figure 7 and electrical specifications for details.

[12.3] PERFORM DETECTOR CHECK

VERIFY STANDBY AND TROUBLE TEST per Table 3 on page 8. The use of a remote accessory for visible indication of power and alarm is recommended.

NOTE: If an instantaneous tamper delay is selected a trouble may be indicated with the cover installed.

[12.4] SENSITIVITY VERIFICATION

The sensitivity of the sensor is confirmed to be operating within its allowable range each time the sensor and power board LEDs blink green every 5 seconds. Note in a maintenance condition the sensor LEDs will blink red every 5 seconds and power board will blink amber as depicted in **Table 3** on page 8. The maintenance condition indicates that the sensor is operating outside its original factory preset sensitivity and shall be cleaned or replaced. See Section 9 for reference. This is a valid UL test.

[12.5] DETECTOR CLEANING PROCEDURES

Notify the proper authorities that the smoke detector system is undergoing maintenance, and that the system will temporarily be out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms and possible dispatch of the fire department.

[12.5.1] ALARM TESTS

1a. Test/Reset Button - Press and hold the test button located on the power board cover for at least 2 seconds.

OR

1b. M02-04-00 Magnet Test (Magnet sold separately) - Place the painted surface of the magnet onto the MAGNET TEST location on the sensor cover of unit (Figure 1).

OR

1c. Remote Test Accessory - See list on page 1.

The red alarm LED on the sensor and the power board should latch on, as should any accessories (i.e. RA400Z/RA100Z, RTS451/RTS151). Verify system control panel alarm status and control panel execution of all intended auxiliary functions (i.e fan shutdown, damper control, etc.).

2. The detector must be reset by the system control panel, front cover Test/Reset button, or remote accessory.
3. To reset using the Test/Reset button on the power board cover simply press and release.
4. Verify airflow test per Section 7 has been performed.

[12.5.2] SMOKE RESPONSE TESTS

To determine if smoke is capable of entering the sensing chamber, visually identify any obstructions. Plug the exhaust and sampling tube holes to prevent ducted air from carrying smoke away from the detector head, then blow smoke such as cigarette, cotton wick, or punk directly at the head to cause an alarm. REMEMBER TO REMOVE THE PLUGS AFTER THIS TEST, OR THE DETECTOR WILL NOT FUNCTION PROPERLY.

[12.5.3] SMOKE ENTRY USING AEROSOL SMOKE

This test is intended for low-flow systems (100-500 FPM). If the air speed is greater than 500 FPM, use a conventional manometer to measure differential pressure between the sampling tubes, as described in Section 7.1.

Drill a ¼ inch hole 3 feet upstream from the duct smoke detector. With the air handler on, measure the air velocity with an anemometer. Air speed must be at least 100 FPM. Spray aerosol smoke* into the duct through the ¼ inch hole for five seconds. Wait two minutes for the duct smoke detector to alarm. If the duct smoke detector alarms, air is flowing through the detector. Remove the duct smoke detector cover and blow out the residual aerosol smoke from the chamber and reset the duct smoke detector. Use duct tape to seal the aerosol smoke entry hole.

*Aerosol smoke can be purchased from Home Safeguard Industries at homesafeguard.com, model 25S Smoke Detector Tester, and Chekkit Smoke Detector Tester model CHEK02 and CHEK06 available from SDi. When used properly, the canned smoke agent will cause the smoke detector to go into alarm. Refer to the manufacturer's published instructions for proper use of the canned smoke agent.

⚠CAUTION

Canned aerosol simulated smoke (canned smoke agent) formulas will vary by manufacturer. Misuse or overuse to these products may have long term adverse effects on the smoke detector. Consult the canned smoke agent manufacturer's published instructions for any further warnings or caution statements.

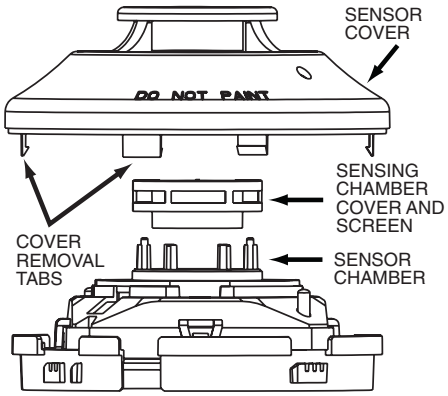
[12.6] INSTALL THE COVER

Install the covers making sure that the cover fits into the base groove. Tighten the seven screws that are captured in the covers.

[13] DETECTOR CLEANING PROCEDURES

Notify the proper authorities that the smoke detector system is undergoing maintenance, and that the system will temporarily be out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms and possible dispatch of the fire department.

FIGURE 10. DETECTOR SENSOR EXPLODED VIEW:



H0584-00

NOTICE: If any unitary packaged air conditioning units are run during the drywall installation phase of any building under construction to accelerate the drying of joint compound, the subsequent sanding of those drywall joints and resulting dust may compromise the sensor heads in duct smoke detectors. To avoid this condition it is recommended that the sensor heads be removed during the construction phase.

For additional information visit www.systemsensor.com for a detailed technical bulletin.

[13.1] DETECTOR SENSOR

1. Remove the sensor to be cleaned from the system.
2. Remove the sensor cover by pulling outward on each of the four removal tabs that hold the cover in place. See **Figure 10**.
3. Vacuum the screen carefully without removing it. If further cleaning is required continue with Step 4, otherwise skip to Step 7.
4. Remove the chamber cover/screen assembly by pulling it straight out.
5. Use a vacuum cleaner or compressed air to remove dust and debris from the sensing chamber.
6. Reinstall the chamber cover/screen assembly by sliding the edge over the sensing chamber. Turn until it is firmly in place.
7. Replace the cover using the holes for the LEDs for alignment and then gently pushing it until it locks into place.
8. Reinstall the detector.

[13.2] REINSTALLATION

1. Reinstall the detector in its housing.
2. Restore system power.
3. Perform Detector Check, Section 12.3.
4. Notify the proper authorities testing has been completed and the smoke detector system is back in operation.

[14] SENSOR REPLACEMENT (PART NO. 2D51)

1. Remove the sensor head by rotating counterclockwise.
2. Pull gently to remove it.
3. To replace the sensor head, align the mounting features and rotate clockwise into place.

[15] OPTIONAL ACCESSORIES

[15.1] RTS451/RTS151/RTS451KEY/RTS151KEY REMOTE TEST STATION

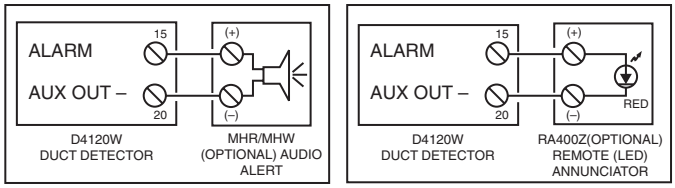
The RTS451/RTS151/RTS451KEY/RTS151KEY Remote Test Station facilitates test of the alarm capability of the duct smoke detector as indicated in the RTS451/RTS151/RTS451KEY/RTS151KEY manual. The D4120W duct smoke detector can be reset by the RTS451/RTS151/RTS451KEY/RTS151KEY. To install the RTS451/RTS151/RTS451KEY/RTS151KEY, connect the device as shown in **Figure 13**; wire runs must be limited to 25 ohms or less per interconnecting wire. If a system control panel is used, the panel itself may require testing.

[15.2] RTS2/RTS2-AOS MULTI-SIGNALING ACCESSORY

The RTS2 and RTS2-AOS multi-signaling accessories are designed for use with InnovairFlex 4-wire conventional duct smoke detectors only. The accessory has two bicolored LEDs that indicate the sensor status of up to two connected duct smoke detectors. The key switch on the unit can be used to select a connected duct detector sensor (either sensor1 or sensor 2), and the selected sensor can be tested or both sensors can be reset simultaneously using the test/reset button. LED status indications include: Standby (green blink), Trouble (amber), Maintenance (amber blink) and Alarm (red). See **Figure 14** for wiring diagram

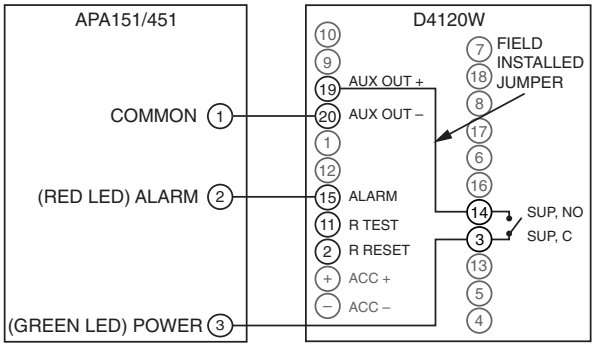
With the key switch selected, there is also the capability of obtaining a sensitivity measurement of the selected sensor using the SENS-RDR sensitivity reader (sold separately).

FIGURE 11. WIRING DIAGRAMS FOR OPTIONAL ACCESSORIES:



H0554-01

FIGURE 12. WIRING DIAGRAM FOR D4120W TO APA151 OR APA451:

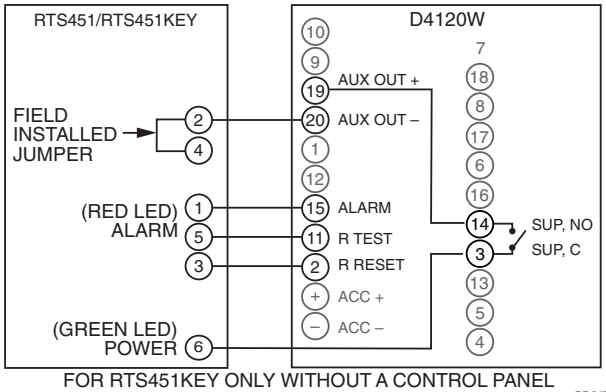


NOTE: WIRING DIAGRAM SHOWN IS FOR D4120W 4-WIRE DUCT SMOKE DETECTOR SYSTEM EQUIPPED WITHOUT A CONTROL PANEL.

NOTE: A TROUBLE CONDITION IS INDICATED BY LOSS OF GREEN LED

HO584-03

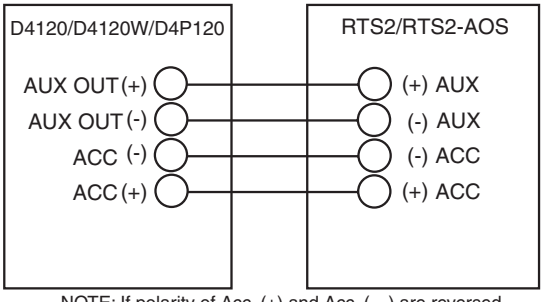
FIGURE 13. WIRING DIAGRAM FOR D4120W TO RTS451/RTS151/ RTS451KEY/RTS151KEY:



FOR RTS451KEY ONLY WITHOUT A CONTROL PANEL

H0582-03

FIGURE 14. WIRING DIAGRAM FOR D4120W TO SSL451/RTS2-AOS:



NOTE: If polarity of Acc. (+) and Acc. (—) are reversed, an Amber LED on sensor 2 of the duct smoke detector power board will exist indicating a trouble condition.

H0583-02

TABLE 3. DETECTOR STATUS INDICATION

NOTE: There are two LED's on the Power Board each indicating the status of the two sensors connected. When there is only one sensor connected, LED2 will remain off.

Status	Description	LED Status		Status of Relays
		Sensor D4S	Power Board D4P120	
Sensor Initialization	At power-up or reset at the panel, the sensor will take approx 35 seconds to initialize. Also occurs if the sensor has been removed and restored in the base in the sensor housing.	RED Blink every 5 seconds	Alternating Green/amber every 1 second	**Supervisory relay**: Terminals 3 and 14 are closed. **Alarm Relay**: Terminals 4 and 5 are open. **Aux Relay** does not switch states:Terminals 6 and 16 are closed,Terminals 8 and 18 are closed
	Sensor is missing during the seven minute tamper Delay, if selected.	Off	Alternating Green/amber every 1 second	**Supervisory relay**: Terminals 3 and 14 are closed **Alarm Relay**: Terminals 4 and 5 are open. **Aux Relay** does not switch states:Terminals 6 and 16 are closed,Terminals 8 and 18 are closed
Maintenance	Sensor D4S is outside it's UL approved sensitivity limits and needs to be cleaned or replaced.	RED Blink every 5 seconds	Amber Blink every 5 seconds	**Supervisory relay**: Terminals 3 and 14 are closed. **Alarm Relay**: Terminals 4 and 5 are open. **Aux Relay** does not switch states:Terminals 6 and 16 are closed,Terminals 8 and 18 are closed
Trouble	.Unit loses Power	Off	Off	**Supervisory relay**: Terminals 3 and 14 are open. **Alarm Relay:** Terminals 4 and 5 are open. **Aux Relay** does not switch states with no shutdown on Trouble selected: Terminals 6 and 16 are closed. Terminals 8 and 18 are closed. **Aux Relay** Switches states with shutdown on Trouble selected: Terminals 6 and 16 are open, Terminals 8 and 18 are open
	.Cover Tamper Delay times out	Green Blink every 5 seconds	Amber solid	
	.Wiring Problems between the Sensor and the Power Board	Off	Amber solid	
	.Mismatch between the number of sensors connected and the Dip Switch setting			
	1 sensor connected,2 selected	Green blink every 5 seconds on first sensor. No second sensor.	LED1 Green blink every 5 seconds LED2 Amber solid	
	2 sensors connected,1 selected	Green blink every 5 seconds on first sensor. LED's off on second sensor	LED1 Green blink every 5 seconds LED2 Amber solid	
Alarm	Unit detects smoke	Solid Red	Solid Red	**Supervisory relay**: Terminals 3 and 14 are closed **Alarm Relay**: Terminals 4 and 5 are closed. **Aux Relay** switches states: Terminals 6 and 16 are open, Terminals 8 and 18 are open
Standby	Unit has Power and it is not in initialization, Trouble, Maintenance or Alarm.	Green Blink every 5 seconds	Green Blink every 5 seconds	**Supervisory relay**: Terminals 3 and 14 are closed **Alarm Relay**: Terminals 4 and 5 are open. **Aux Relay** does not switch states: Terminals 6 and 16 are closed, Terminals 8 and 18 are closed

NOTE: If any other visual indication is noted contact System Sensor technical support at 1-800-SENSOR2.

Please refer to insert for the Limitations of Fire Alarm Systems

THREE-YEAR LIMITED WARRANTY

System Sensor warrants its enclosed product to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for the enclosed product. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the replacement of any part of the product which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: Honeywell, 12220 Rojas Drive, Suite 700, El Paso TX 79936, USA. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

7707 Fire Subscribers

IntelliNet 2.0

Feature Highlights

- Offers flexible power and configuration options.
- Engineered for backward compatibility with legacy systems.
- Enables future ready capabilities.
- Provides instant Subscriber status through front panel with Power and Trouble LEDs, a backlit LCD display, and Menu/Silence button.
- Includes dual communication/multiple communication technology (reporting over RF and IP).
- Improves functionality with an adaptive Graphic User Interface (GUI) for programming via smartphones, tablets, and PCs.

Key Benefits

- Built upon the solid foundation of AES-IntelliNet® patented mesh radio technology for use in private licensed wireless networks.
- Protects Subscriber units against unauthorized access and rogue activity with a password protected Dealer Code.
- Makes programming and streamlined troubleshooting easy with user friendly interface.
- Adds integrated supervision of 7794A AES-IntelliPro full data module.
- Provides versatile power options.

Models

IntelliNet® 2.0 Fire Subscribers	
7707P-88-M	IntelliNet 2.0 Fire Subscriber, 8-Zone with Multiple Communication Technologies (MCT), Red Enclosure
7707P-88-ULP-M	IntelliNet 2.0 Fire Subscriber, 8-Zone with 7794A AES-IntelliPro and Integrated Onboard Local Annunciator, plus Multiple Communication Technologies (MCT), Red Enclosure
7707P-44-M	IntelliNet 2.0 Fire Subscriber, 4x4 Zone (4 Reversing Polarity, 4 Supervised) with Multiple Communication Technologies (MCT), Red Enclosure
7707P-44-ULP-M	IntelliNet 2.0 Fire Subscriber, 4x4 Zone (4 Reversing Polarity, 4 Supervised) with 7794A AES-IntelliPro and Integrated oOnboard Local Annunciator, plus Multiple Communication Technologies MCT, Red Enclosure

Technical Specifications

DIMENSIONS
13”H x 8.5”W x 4.5”D
(33cm H x 21.5cm W x 11.4cm D)

WEIGHT
- 15.85 lbs (7.2 kilograms) with 12Ah battery
- 7 lbs (3.2 kilograms) excluding battery

RADIO FREQUENCY
Standard Frequency Range:
450-470 MHz
Contact AES for other UHF and VHF frequencies

ANTENNA
2.5 dB Tamper resistant antenna included

POWER INPUT
- 16.5V AC Class 2 Transformer
  Transformer not included
- 24V DC External Regulated Power Supply
- 24V DC Regulated Power Supply from FACP AUX Power

BACKUP BATTERY
12 Ah with 7794A; 6 Ah without, UL recognized lead acid gel cell battery
Size based on Subscriber configuration

CURRENT CONSUMPTION
Backup Battery Power
- Standby = .190A
- Transmit = .752A
- Optional 7794A = .165A, Standby and Alarm

ALARM SIGNAL INPUTS/ ZONES
- 8 Individually programmable E.O.L. type zone inputs
- 4x4 Option with 4 reverse polarity input and 4 individually programmable E.O.L. type zone inputs
- Optional 7794A AES-IntelliPro for full data via Contact ID, Pulse, Modem IIe, and Modem IIIa2

UL LISTINGS
- UL 864 Standard for Control Units and Accessories for Fire Alarm Systems, Edition 10
- ULC S559-04 Equipment for Fire Signal Receiving Centers and Systems, Edition 1

TROUBLE OUTPUT—ACK DELAY/ANTENNA CUT
Form C relay, fail secure, rated 24V DC 1A resistive, unsupervised

RESET BUTTON
Located on main circuit board

OPERATING TEMPERATURE
32 to 120°F (0 to 49°C)

STORAGE TEMPERATURE
14 to 140°F (-10 to 60°C)

RELATIVE HUMIDITY
0 to 93%, non-condensing

PORTS
- (1) Ethernet
- (2) USBs

ANNUNCIATOR
Integrated Local Annunciator

PROGRAMMING INTERFACE
Web browser capable device accessible via smartphone, tablet, laptop, or PC

POWER OUTPUT
2 or 5 Watts
Contact AES for other options

ENCLOSURE MATERIAL
Metal with paint finish

FINISH COLOR
Red

VISUAL INDICATORS
- Front panel LCD (2 x 20 alphanumeric character backlit display)
- Power and Trouble LEDs (ALM, Trouble, Tx, Rx, WA)
- Menu/ Silence button

7707_Rev4_10252023

INSTALLATION AND MAINTENANCE INSTRUCTIONS

Innovair flex™

D4120W Duct Smoke Detector

SYSTEM SENSOR®
3825 Ohio Avenue, St. Charles, Illinois 60174
1-800-SENSOR2, FAX: 630-377-6495
www.systemsensor.com

NOTE: The D4120W duct detector consists of a Power Board and Sensor component.

SPECIFICATIONS

Operating Temperature:	–4° to 158° F (–20° to 70° C)
Storage Temperature:	–22° to 158° F (–30° to 70° C)
Environmental Rating:	NEMA 4* Type 4 Enclosure — Watertight
Humidity:	0% to 95% Relative Humidity Non-condensing
Air Velocity:	100 to 4000 ft./min. (0.5 to 20.3 m/sec.)
D4120W Footprint Dimensions:	Rectangular - 14.38 in L x 5 in W x 2.5 in D (37cm L x 12.7cm W x 6.36cm D) Square - 7.75 in L x 9 in W x 2.5 in D (19.7cm L x 22.9cm W x 6.35cm D)
D4120W Weight:	2.5 pounds; 1.14 kg

Electrical

Power supply voltage:	20-29 VDC	24 VAC 50-60-Hz	120 VAC 50-60 Hz
Input capacitance:	270 µF max.	270 µF max.	N/A
Reset Voltage:	3.0 VDC min.	2.0 VAC min.	10 VAC min.
Reset Time (with RTS451/RTS151):	.03 to 0.3 sec.	.03 to 0.3 sec.	.03 to 0.3 sec.
Reset Time (by power down):	0.6 sec. max.	0.6 sec. max.	0.6 sec. max.
Power Up Time:	35 sec. max.	35 sec. max.	35 sec. max.
Alarm response time:	15 sec.	15 sec.	15 sec.
Sensitivity Test:	See detector label	See detector label	See detector label
Current Requirements (Using No Accessories)			
Max. standby current	21 mA @ 24 VDC	65 mA RMS @ 24VAC 60Hz	20 mA RMS @ 120 VAC 60 Hz
Max. alarm current	65 mA @ 24 VDC	135 mA RMS @ 24 VAC 60 Hz	35 mA RMS @ 120 VAC 60 Hz

CONTACT RATINGS

Alarm initiation contacts (SPST)	2.0A @ 30 VDC (resistive)
Alarm auxiliary contatcs (DPDT)	10A @30 VDC (resistive) 10A @250 VAC (resistive) 1/2 HP @240 VAC 1/4 HP @120 VAC
NOTE: Alarm auxiliary contacts shall not be connected to initiating circuits of control panels. Use the alarm initiation contact for this purpose.	
Supervisory Contacts (SPDT)	2.0A @ 30 VDC (resistive) 2.0A @ 125 VAC (resistive)

ACCESSORY CURRENT LOADS AT 24 VDC

DEVICE	STANDBY	TROUBLE	ALARM
APA151/APA451	12.5mA	n/a	30mA Max.
MHR/MHW	0mA	n/a	29mA Max.
RA400Z/RA100Z	0mA	n/a	12mA Max.
RTS451/RTS151	0mA	n/a	12mA Max.
RTS451KEY/RTS151KEY	12mA	n/a	12mA Max.
RTS2	3mA Max.	16mA Max.	30mA Max.
RTS2-AOS	3mA	16mA Max.	55mA Max.

NOTE: Any combination of accessories may be used such that the given accessory loads are: 110mA or less at the Aux output, and 50mA or less at the Alarm output.

IMPORTANT: This detector must be tested and maintained regularly following NFPA 72 requirements. The detector must be tested an maintained regularly following NFPA 72 requirements. According to NFPA, the detector should be visually inspected semiannually and functionally tested at least once a year. This may need to be more frequent depending on the air quality of the duct supply air.

TABLE OF CONTENTS PAGE

BEFORE INSTALLING

To maintain the watertight properties of this duct smoke detector, watertight conduit and fittings must be used. Mount the product with the conduit holes facing downwards, if possible. Read System Sensor's *Applications Guide for Duct Smoke Detectors* (HVAG53), which provides information on detector spacing, placement, zoning, wiring, and special applications. This manual is available online at www.systemsensor.com. NFPA Standards 72 and 90A should also be referenced for detailed information.

[1] LIMITATIONS OF DUCT SMOKE DETECTORS

⚠WARNING

The National Fire Protection Association has established that DUCT DETECTORS MUST NOT BE USED AS A SUBSTITUTE FOR OPEN AREA DETECTOR PROTECTION as a means of providing life safety. Nor are they a substitute for early warning in a building's regular fire detection system.

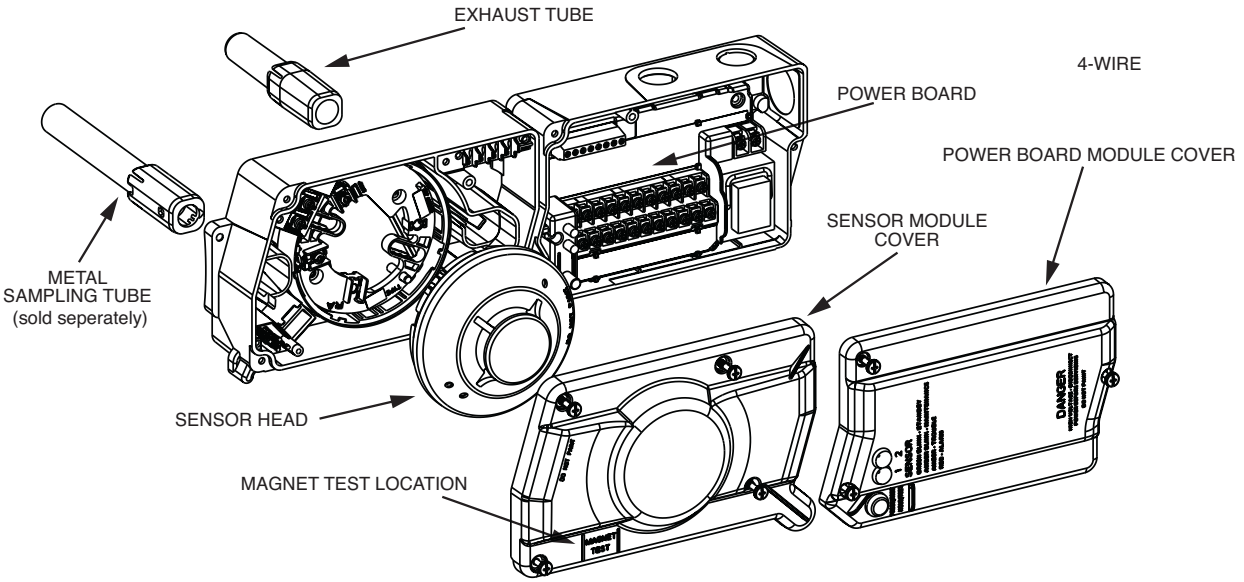
System Sensor supports this position and strongly recommends that the user read NFPA Standards 90A, 72, and 101. The D4120W Air Duct Smoke Detectors are listed per UL 268A.

This device will not operate without electrical power. Fire situations may cause an interruption of power. The system safeguards should be discussed with your local fire protection specialist.

This device will not sense smoke unless the ventilation system is operating and the cover is installed.

For this detector to function properly, it MUST be installed according to the instructions in this manual. Furthermore, the detector MUST be operated within ALL electrical and environmental specifications listed in this manual. Failure to comply with these requirements may prevent the detector from activating when smoke is present in the air duct.

[2] FIGURE 1. EXPLODED VIEW OF DUCT SMOKE DETECTOR COMPONENTS:



H0549-06

[3] GENERAL DESCRIPTION

Smoke introduced into an air duct system will be distributed throughout the entire building. Smoke detectors designed for use in air duct systems are used to sense the presence of smoke in the duct.

Model D4120W. Duct Smoke Detectors utilize 4-wire photoelectric technology for the detection of smoke. This detection method, when combined with an efficient housing, samples air passing through the duct allowing detection of a developing hazardous condition. When sufficient smoke is sensed, an alarm signal is initiated and appropriate action can be taken to shut off fans, blowers, change over air handling systems, etc. These actions can facilitate the management of toxic smoke and fire gases throughout the areas served by the duct system.

The D4120W detectors are designed to operate on 24 VDC/VAC or 120 VAC. Alarm and supervisory relay contacts are available for control panel interface (alarm initiation), HVAC control, and other auxiliary functions. Auxiliary relays are provided for fan shut down. Detector interconnection provides signaling of up to 50 other detectors in the loop for multiple fan shut down. These detectors are not designed for 2-wire applications.

[3.1] DETECTOR FEATURE SET

-Utilizes 2D51 plug-in head

-2 sensors to 1 power board capability

-Cover missing signal

-Sampling tubes install from front or rear of detector

-Compatible with existing accessories

[4] CONTENTS OF THE DUCT SMOKE DETECTOR KIT

1. Sensor/power board assembly and cover(s)
2. Three #10 sheet metal screws for mounting
3. Drilling template
4. One sampling tube end cap
5. One plastic exhaust tube

NOTE: A sampling tube must be ordered to complete the installation. It must be the correct length for the width of the duct where it will be installed. See Table 1 on page 3 to determine the inlet tube required for different duct widths.

[5] DETECTOR INSTALLATION

[5.1] VERIFY AIR FLOW DIRECTION AND VELOCITY

Model D4120W detectors are designed to be used in air handling systems with air velocities of 100 to 4000 feet per minute. Duct widths from 6 inches to 12 feet can be accommodated. Be sure to check engineering specifications to ensure that the air velocity in the duct falls within these parameters. If necessary, use a velocity meter (anemometer) to check the air velocity in the duct.

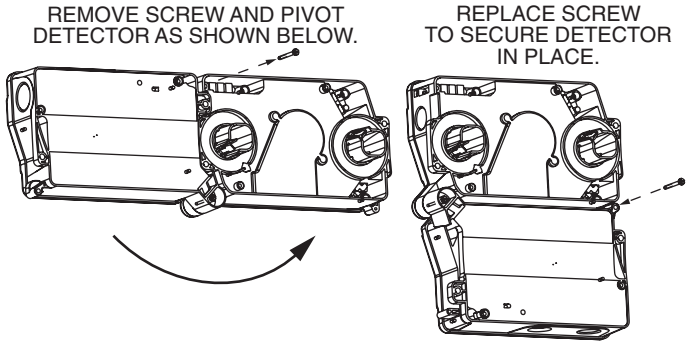
[5.2] DETERMINE MOUNTING LOCATION AND CONFIGURATION

On ducts wider than 18 inches it is recommended that the detector be mounted downstream of a bend, obstruction in the duct, or the supply or return air inlet.

Exception: Installation of duct detectors can be on or within a commercial packaged rooftop heating and air-conditioning system, fire/smoke dampers and economizers. They may be mounted in either the supply and/or return air section as determined by local code.

Once a suitable location is selected, determine if the detector is to be mounted in a side-by-side "rectangular" configuration or a top-over-bottom "square" configuration as shown in **Figure 2**. If mounting in the square configuration, remove the rear attachment screw, rotate the unit at the hinge, and replace the screw into the new attachment hole as shown in **Figure 2**. Do NOT remove the hinge screw during this process. Final installation approval shall be based upon passing section 7.2.2 and/or 8.2.4 tests.

FIGURE 2:



H0550-00

[5.3] DRILL THE MOUNTING HOLES

Remove the paper backing from the mounting template supplied. Affix the template to the duct at the desired mounting location. Make sure the template lies flat and smooth on the duct.

[5.3.1] FOR RECTANGULAR SIDE-BY-SIDE MOUNTING CONFIGURATION:

Center punch at (4) target centers: (2) "A" for sampling tubes and (2) "B" for the rectangular configuration mounting tabs as shown on mounting template. Drill pilot holes at target "A" centers and cut two 1.375 inch diameter holes using a $1^{3}/_{8}$ inch hole saw or punch. Drill .156 inch diameter holes using a $^{5}/_{32}$ inch drill at target "B" centers.

[5.3.2] FOR SQUARE TOP-OVER-BOTTOM MOUNTING CONFIGURATION OR D4S SENSOR COMPONENT MOUNTING:

Center punch at (4) target centers: (2) "A" for sampling tubes and (2) "C" for the square configuration mounting tabs as shown on mounting template. Drill pilot holes at target "A" centers and cut two 1.375 inch diameter holes using a $1^3/_8$ inch hole saw or punch. Drill .156 inch diameter holes using a $^5/_{32}$ inch drill at target "C" centers. If desired, drill an additional .156 inch hole at the location of one of the mounting tabs on the lower housing.

[5.4] SECURE THE DUCT DETECTOR TO THE DUCT

Use two (rectangular configuration) or three (square configuration) of the provided sheet metal screws to screw the duct detector to the duct.

CAUTION: Do not overtighten the screws.

[6] SAMPLING TUBE INSTALLATION

[6.1] SAMPLING TUBE SELECTION

The sampling tube must be purchased separately. Order the correct length, as specified in **Table 1**, for width of the duct where it will be installed. It is recommended that the sampling tube length extend at least $^2/_3$ across the duct width for optimal performance.

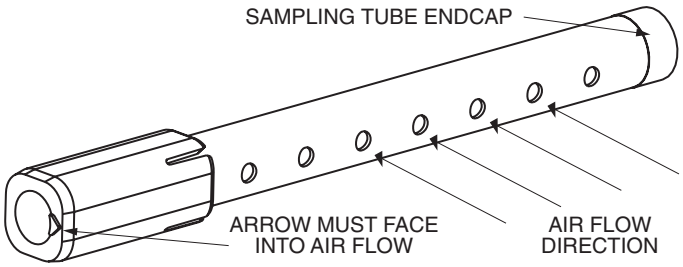
TABLE 1. SAMPLING TUBES RECOMMENDED FOR DIFFERENT DUCT WIDTHS:

Outside Duct Width	Sampling Tube Recommended*
Up to 1 ft.	DST1
1 to 2 ft.	DST1.5
2 to 4 ft.	DST3
4 to 8 ft.	DST5
8 to 12 ft.	DST10 (2-piece)

*Must extend a minimum of $^2/_3$ the duct width. These sampling tubes can only be used with new InnovairFlex duct smoke detectors.

The sampling tube is always installed with the air inlet holes facing into the air flow. To assist proper installation, the tube's connector is marked with an arrow. Make sure the sampling tube is mounted so that the arrow points into the airflow as shown in **Figure 3**. Mounting the detector housing in a vertical orientation is acceptable provided that the air flows directly into the sampling tube holes as indicated in **Figure 3**. The sampling tube and exhaust tube can be mounted in either housing connection as long as the exhaust tube is mounted downstream from the sampling tube.

FIGURE 3. AIR DUCT DETECTOR SAMPLING TUBE:



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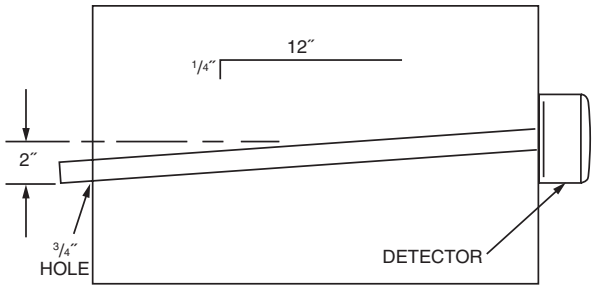
CAUTION: The sampling tube end cap, included with the detector, is critical to proper operation of the duct smoke detector. The end cap is needed to create the proper air flow to the sensor of the duct smoke detector. Once any sampling tube length adjustments are made, plug the end of the sampling tube with the provided end cap.

A plastic exhaust tube is included with the unit to be installed if needed. Install into the housing connection that is downstream from the sampling tube connection. The exhaust tube can be installed from the front or back of the detector. A longer 1 foot exhaust tube, model ETX, is available as an accessory in cases where the molded exhaust tube does not extend at least 2 inches into the duct.

[6.2] SAMPLING TUBE INSTALLATION

1. For tubes shorter than the width of the duct, slide the sampling tube, with installed end cap, into the housing connection that meets the airflow first. Position the tube so the arrow points into the airflow as shown in **Figure 3**. Per NFPA sampling tubes over 3 feet long should be supported at the end opposite the duct detector. In ducts wider than 8 feet, work must be performed inside the duct to couple the other section of the sampling tube to the section already installed using the $^1/_2$ inch conduit fitting. Make sure that the holes on both sections of the air inlet sampling tube are lined up and facing into the airflow.
2. For tubes longer than the width of the duct, the tube should extend out of the opposite side of the duct. Drill a $^3/_4$ inch hole in the duct opposite the hole already cut for the sampling tube. Ensure that the sampling tube is angled downward from the duct smoke detector to allow for moisture drainage away from the detector. The sampling tube should be angled at least 1/4" downward for every 12" of duct width per Figure 4. There should be 10 to 12 holes spaced as evenly as possible across the width of the duct. If there are more than 2 holes in the section of the tube extending out of the duct, select a shorter tube using **Table 1**. Otherwise, trim the tube to leave approximately 1 to 2 inches extending outside the duct. Plug the end with the end cap and tape closed any holes in the protruding section of tube. Be sure to seal the duct where the tube protrudes.

FIGURE 4.



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NOTE: Air currents inside the duct may cause excessive vibration, especially when the longer sampling tubes are used. In these cases, a 3 inch floor flange (available at most plumbing supply stores) may be used to fasten the sampling tube to the other side of the duct. When using the flange/connector mounting technique, drill a 1 to $1^1/_4$ inch hole where the flange will be used.

[6.3] MODIFICATIONS OF SAMPLING TUBES

There may be applications where duct widths are not what is specified for the installation. In such cases, it is permissible to modify a sampling tube that is longer than necessary to span the duct width.

Use a 0.193 inch diameter (#10) drill and add the appropriate number of holes so that the total number of holes exposed to the air flow in the duct is 10 to 12. Space the additional holes as evenly as possible over the length of the tube.

NOTE: This procedure should only be used as a temporary fix and is not intended as a substitute for ordering the correct length tubes.

[6.4] REMOTE SAMPLING TUBE INSTALLATION

The detector arrangement can also incorporate remote mounting of the sampling tube and/or exhaust tube. In this case both the detector, sampling tube and exhaust tube (if included) should be rigidly mounted to withstand the pressure and vibrations caused by the air velocity. The location of the detector's sampling tube should be such that there is uniform airflow in the cross section area.

The pressure differential across the sampling and exhaust ports in the detector housing shall be verified to be between 0.01 and 1.11 inches of water. Do so by measuring the pressure difference between the inlet and outlet ports on the detector housing using a manometer as described in **Section 7.1**.

[7] MEASUREMENT TESTS

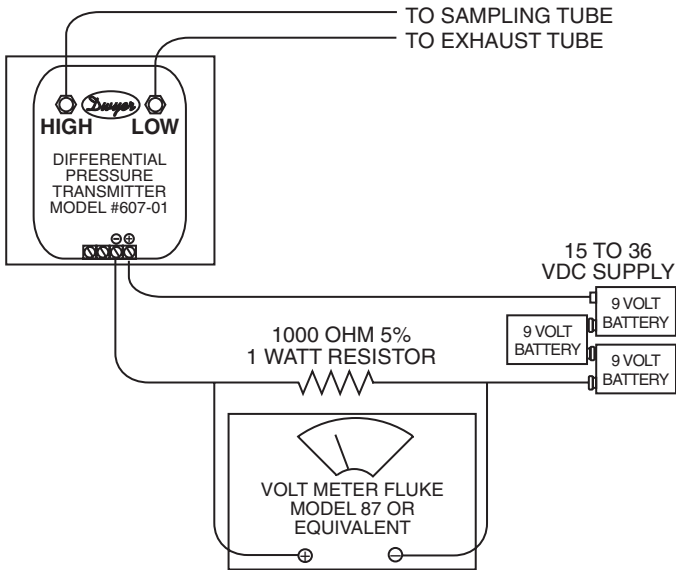
[7.1] AIR FLOW

The D4120W is designed to operate over an extended air speed range of 100 to 4000 FPM. To verify sufficient sampling of ducted air, turn the air handler on and use a manometer to measure the differential pressure between the two sampling tubes. The differential pressure should measure at least 0.01 inches of water and no more than 1.11 inches of water. Because most commercially available manometers cannot accurately measure very low pressure differentials, applications with less than 500 FPM of air speed may require one of the following: 1) the use of a current-sourcing pressure transmitter (Dwyer Series 607) per Section 7.2, or 2) the use of aerosol smoke per section 12.5.3.

[7.2] LOW FLOW AIR FLOW TEST USING DWYER SERIES 607 DIFFERENTIAL PRESSURE TRANSMITTER

Verify the air speed of the duct using an anemometer. Air speed must be at least 100 FPM. Wire the Dwyer transmitter as shown in **Figure 5**. Connect the leads of the meter to either side of the 1000Ω resistor. Allow unit to warm up for 15 seconds. With both HIGH and LOW pressure ports open to ambient air, measure and record the voltage drop across the 1000Ω resistor (measurement 1), 4.00 volts is typical. Using flexible tubing and rubber stoppers, connect the HIGH side of the transmitter to the sampling tube of the duct smoke detector housing, and the LOW side of the transmitter to the exhaust tube of the duct smoke detector housing. Measure and record the voltage drop across the 1000Ω resistor (measurement 2). Subtract the voltage recorded in measurement 1 from the voltage recorded in measurement 2. If the difference is greater than 0.15 volts, there is enough air flow through the duct smoke detector for proper operation.

FIGURE 5. PROCEDURE FOR VERIFYING AIR FLOW LESS THAN 500 FPM:



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[8] FIELD WIRING INSTALLATION GUIDELINES

All wiring must be installed in compliance with the National Electrical Code and the local codes having jurisdiction. Proper wire gauges should be used. The conductors used to connect smoke detectors to control panels and accessory devices should be color-coded to prevent wiring mistakes. Improper connections can prevent a system from responding properly in the event of a fire.

For signal wiring, (wiring between interconnected detectors or from detectors to auxiliary devices), it is recommended that single conductor wire be no smaller than 18 gauge.

Smoke detectors and alarm system control panels have specifications for allowable loop resistance. Consult the control panel manufacturer's specifications for the total loop resistance allowed for the particular control panel being used before wiring the detector loop.

[8.1] WIRING INSTRUCTIONS

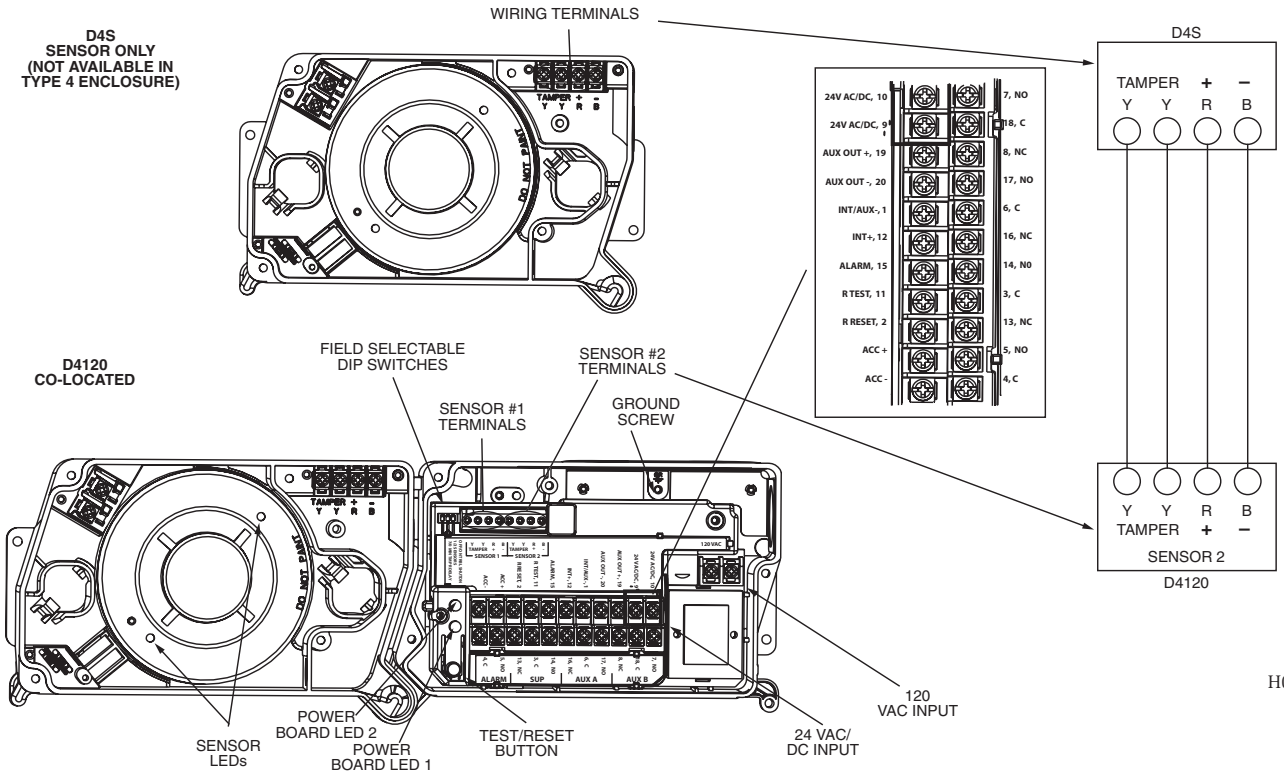
The D4120W detector is designed for easy wiring. The housing provides a terminal strip with clamping plates. The D4S housing provides 4 wiring terminals with clamping plates. Wiring connections are made by sliding the bare end of the wire under the plate, and tightening the clamping plate screw. See **Figure 7** on page 5 for system wiring.

[8.2] SENSOR 2 INSTALLATION/WIRING

The power board is capable of controlling a second housed sensor. The second sensor, model D4S (NOT available in Type 4 enclosure), can be wired to the power board per the following:

1. Connect wires to the four wire terminals in the corner of the D4S sensor housing designated as Tamper (Y,Y), +R, and –B. Route wires through the conduit openings in the sensor housing and D4120W power board housing.
2. Connect the opposing ends of the wires to the terminal connections marked "Sensor 2" on the Power Board. See **Figure 6** for reference. Ensure that wires are connected to the appropriate terminal locations. A No. 0 or 1 phillips screwdriver should be used for terminal connection. The tamper terminals are not polarity sensitive.
3. Adjust the middle dipswitch on the power board to indicate (2) sensors as shown in **Figure 6**.
4. The D4S can only be used with new InnovairFlex models and is not compatible with previously sold detectors.

FIGURE 6. OPTIONAL SENSOR 2 CONFIGURATION AND WIRING:

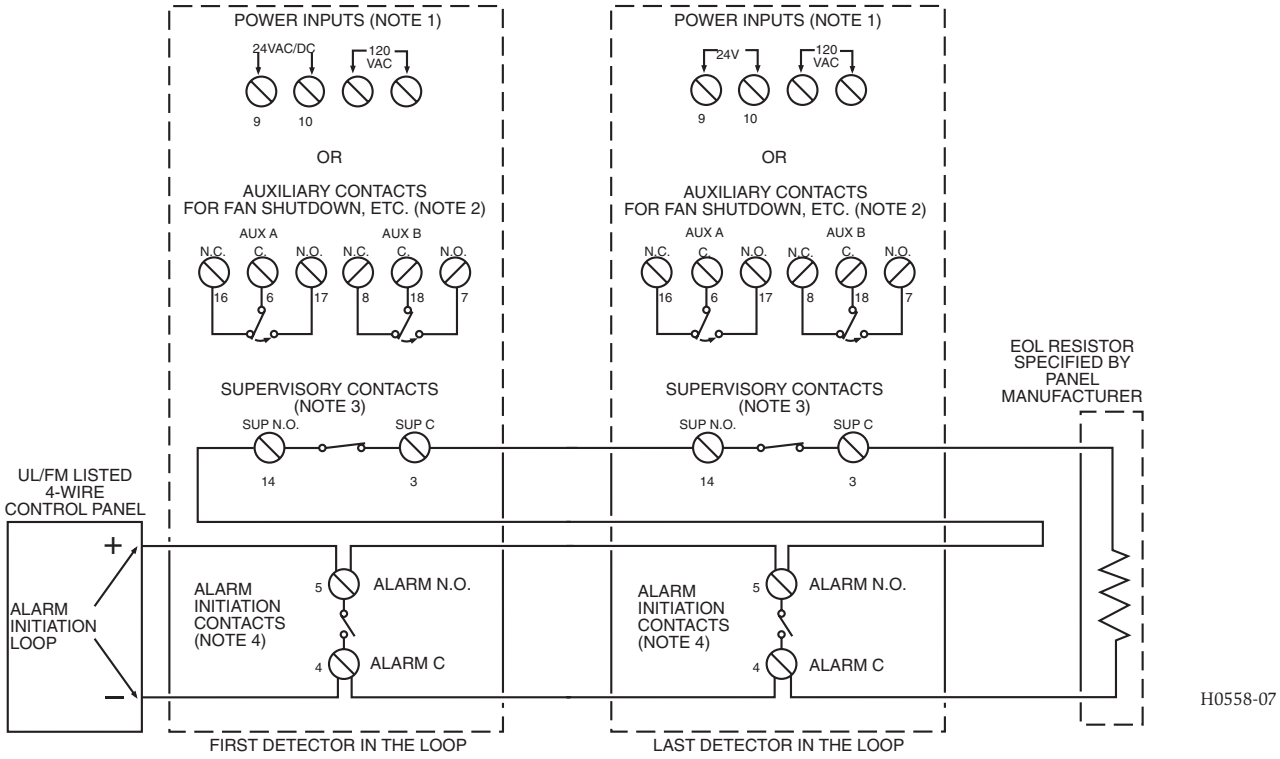


H0557-17

FIGURE 7. SYSTEM WIRING DIAGRAM FOR 4-WIRE DUCT SMOKE DETECTORS:

⚠CAUTION

Do not loop wire under terminals when wiring detectors. Break wire runs to provide system supervision of connections.



NOTE 1: 24V Power Inputs accept a non-polarized 24VDC or 24VAC 50-60Hz. 120VAC Power Inputs accept only 120VAC 50-60Hz. Connect power source to appropriate terminals of each detector. See specifications for additional power supply information.

NOTE 2: Auxiliary contacts shown in standby position. Contacts switch during alarm as indicated by arrows. Auxiliary contacts are not to be used for connection to the control panel. See specifications for contact ratings.

NOTE 3: Supervisory contacts shown in standby position. Open contacts indicate a trouble condition to the panel. See specifications for contact ratings.

NOTE 4: Alarm Initiation contacts shown in standby position. Closed contacts indicate an alarm condition to the panel. See specifications for contact ratings.

[9] UNIT CONFIGURATION:

A three position dipswitch is included in order to configure the setup of the unit. One switch is used to determine it there are one or two sensors connected to the Power Board. The second switch selects an instantaneous or 7-minute tamper delay. A tamper condition indicates that the cover of the sensor housing has been removed or has not been secured properly. The third switch is used to turn the Shutdown On Trouble feature on or off. With this feature turned on, the Aux Relay will switch states when a Trouble Condition occurs.

***Trouble is indicated when the Supervisory Relay, switches state-Terminals 3 and 14 are open in a Trouble Condition**

Causes of a Trouble Condition may be:

- Unit loses power
- Cover Tamper Feature times out
- Wiring Problems between the Sensor and the Power Board
- Mismatch between number of sensors connected to the Power Board and the dipswitch setting

TABLE 2. DIP SWITCH SETTINGS:

Designation	Default	Selection	Features
TRBL SHUTDN	OFF	OFF	Aux relay does not switch states with a Trouble condition
		ON	Aux relay switches states with a Trouble condition
SENSORS	1	1	Only one sensor is connected the Power Board
		2	Two sensors are connected to the Power Board
MIN TMPR DELAY	7	7	Provides a Trouble condition (terminals 3 and 14 open) when sensor housing cover has been removed or has been secured improperly for more than 7 minutes
		0	Provides an instantaneous Trouble condition(terminals 3 and 14 open) upon cover removal

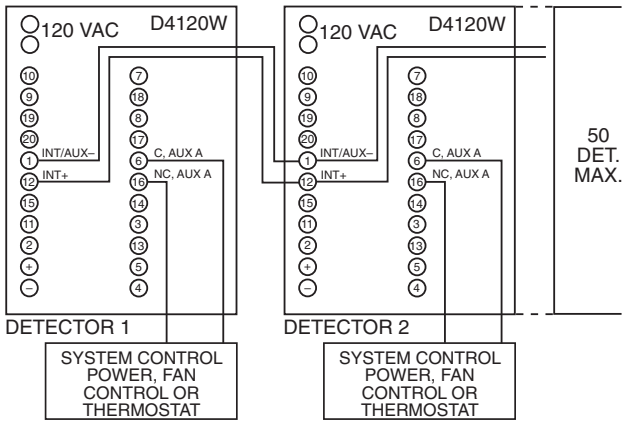
[10] DETECTOR STATUS INDICATION

Detector staus is indicated by the LED sensor, and the correcsponding LED on the power board. The power board has two separate LED's to indicate the status of each sensor connected to it. Refer to Table 3 on page 8 for more details.

[11] INTERCONNECTION (MULTIPLE FAN SHUT DOWN)

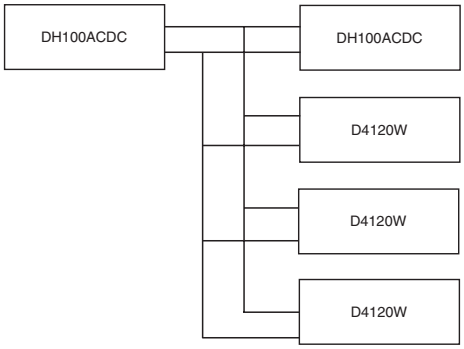
When using the interconnect feature, an alarm from an initiating device will switch the Aux Relays on the other devices interconnected.

FIGURE 8. MULTIPLE FAN SHUTDOWN (INTERCONNECTION OF D4120W'S):



H0552-01

FIGURE 9. MULTIPLE FAN SHUTDOWN (INTERCONNECTION OF D4120W TO DH100ACDC):



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[11.1] IMPORTANT INTERCONNECTION NOTES:

- When using the interconnect feature, all interconnected units must be powered using the same independent supply.
- Polarity must be maintained throughout the interconnect wiring. Connect the INT+ terminal on unit 1 to the INT+ terminal on unit 2 and so on. Similarly, connect the INT/AUX- terminal on unit 1 to the INT/AUX- terminal on unit 2 and so on.
- Up to 50 D4120W units may be interconnected.
- Up to 10 DH100ACDC units may be interconnected. Please note that each of the 9 DH100ACDC units interconnected can be substituted by three D4120W units. Therefore, when using the interconnect feature a single DH100ACDC can drive either 9 DH100ACDC's or 27 D4120W units.

NOTE: Alarm can be reset only at the initiating device and not at the devices interconnected.

[12] VERIFICATION OF OPERATION

[12.1] FIELD SELECTABLE SETTINGS

Verify dipswitch settings as per Table 2 on Page 5.

[12.2] POWERING THE UNIT

Apply 24 VDC power to 9 and 10 terminals on the D4120W or apply 120 VAC on terminals named 120VAC. See Figure 7 and electrical specifications for details.

[12.3] PERFORM DETECTOR CHECK

VERIFY STANDBY AND TROUBLE TEST per Table 3 on page 8. The use of a remote accessory for visible indication of power and alarm is recommended.

NOTE: If an instantaneous tamper delay is selected a trouble may be indicated with the cover installed.

[12.4] SENSITIVITY VERIFICATION

The sensitivity of the sensor is confirmed to be operating within its allowable range each time the sensor and power board LEDs blink green every 5 seconds. Note in a maintenance condition the sensor LEDs will blink red every 5 seconds and power board will blink amber as depicted in **Table 3** on page 8. The maintenance condition indicates that the sensor is operating outside its original factory preset sensitivity and shall be cleaned or replaced. See Section 9 for reference. This is a valid UL test.

[12.5] DETECTOR CLEANING PROCEDURES

Notify the proper authorities that the smoke detector system is undergoing maintenance, and that the system will temporarily be out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms and possible dispatch of the fire department.

[12.5.1] ALARM TESTS

1a. Test/Reset Button - Press and hold the test button located on the power board cover for at least 2 seconds.

OR

1b. M02-04-00 Magnet Test (Magnet sold separately) - Place the painted surface of the magnet onto the MAGNET TEST location on the sensor cover of unit (Figure 1).

OR

1c. Remote Test Accessory - See list on page 1.

The red alarm LED on the sensor and the power board should latch on, as should any accessories (i.e. RA400Z/RA100Z, RTS451/RTS151). Verify system control panel alarm status and control panel execution of all intended auxiliary functions (i.e fan shutdown, damper control, etc.).

2. The detector must be reset by the system control panel, front cover Test/Reset button, or remote accessory.
3. To reset using the Test/Reset button on the power board cover simply press and release.
4. Verify airflow test per Section 7 has been performed.

[12.5.2] SMOKE RESPONSE TESTS

To determine if smoke is capable of entering the sensing chamber, visually identify any obstructions. Plug the exhaust and sampling tube holes to prevent ducted air from carrying smoke away from the detector head, then blow smoke such as cigarette, cotton wick, or punk directly at the head to cause an alarm. REMEMBER TO REMOVE THE PLUGS AFTER THIS TEST, OR THE DETECTOR WILL NOT FUNCTION PROPERLY.

[12.5.3] SMOKE ENTRY USING AEROSOL SMOKE

This test is intended for low-flow systems (100-500 FPM). If the air speed is greater than 500 FPM, use a conventional manometer to measure differential pressure between the sampling tubes, as described in Section 7.1.

Drill a ¼ inch hole 3 feet upstream from the duct smoke detector. With the air handler on, measure the air velocity with an anemometer. Air speed must be at least 100 FPM. Spray aerosol smoke* into the duct through the ¼ inch hole for five seconds. Wait two minutes for the duct smoke detector to alarm. If the duct smoke detector alarms, air is flowing through the detector. Remove the duct smoke detector cover and blow out the residual aerosol smoke from the chamber and reset the duct smoke detector. Use duct tape to seal the aerosol smoke entry hole.

*Aerosol smoke can be purchased from Home Safeguard Industries at homesafeguard.com, model 25S Smoke Detector Tester, and Chekkit Smoke Detector Tester model CHEK02 and CHEK06 available from SDi. When used properly, the canned smoke agent will cause the smoke detector to go into alarm. Refer to the manufacturer's published instructions for proper use of the canned smoke agent.

⚠CAUTION

Canned aerosol simulated smoke (canned smoke agent) formulas will vary by manufacturer. Misuse or overuse to these products may have long term adverse effects on the smoke detector. Consult the canned smoke agent manufacturer's published instructions for any further warnings or caution statements.

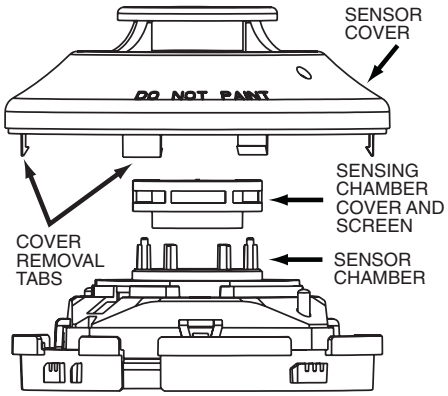
[12.6] INSTALL THE COVER

Install the covers making sure that the cover fits into the base groove. Tighten the seven screws that are captured in the covers.

[13] DETECTOR CLEANING PROCEDURES

Notify the proper authorities that the smoke detector system is undergoing maintenance, and that the system will temporarily be out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms and possible dispatch of the fire department.

FIGURE 10. DETECTOR SENSOR EXPLODED VIEW:



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NOTICE: If any unitary packaged air conditioning units are run during the drywall installation phase of any building under construction to accelerate the drying of joint compound, the subsequent sanding of those drywall joints and resulting dust may compromise the sensor heads in duct smoke detectors. To avoid this condition it is recommended that the sensor heads be removed during the construction phase.

For additional information visit www.systemsensor.com for a detailed technical bulletin.

[13.1] DETECTOR SENSOR

1. Remove the sensor to be cleaned from the system.
2. Remove the sensor cover by pulling outward on each of the four removal tabs that hold the cover in place. See **Figure 10**.
3. Vacuum the screen carefully without removing it. If further cleaning is required continue with Step 4, otherwise skip to Step 7.
4. Remove the chamber cover/screen assembly by pulling it straight out.
5. Use a vacuum cleaner or compressed air to remove dust and debris from the sensing chamber.
6. Reinstall the chamber cover/screen assembly by sliding the edge over the sensing chamber. Turn until it is firmly in place.
7. Replace the cover using the holes for the LEDs for alignment and then gently pushing it until it locks into place.
8. Reinstall the detector.

[13.2] REINSTALLATION

1. Reinstall the detector in its housing.
2. Restore system power.
3. Perform Detector Check, Section 12.3.
4. Notify the proper authorities testing has been completed and the smoke detector system is back in operation.

[14] SENSOR REPLACEMENT (PART NO. 2D51)

1. Remove the sensor head by rotating counterclockwise.
2. Pull gently to remove it.
3. To replace the sensor head, align the mounting features and rotate clockwise into place.

[15] OPTIONAL ACCESSORIES

[15.1] RTS451/RTS151/RTS451KEY/RTS151KEY REMOTE TEST STATION

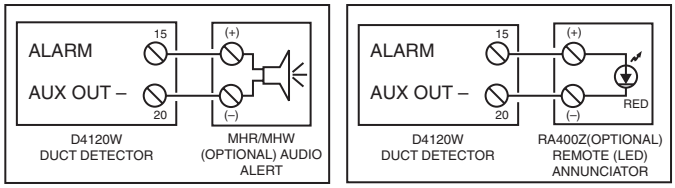
The RTS451/RTS151/RTS451KEY/RTS151KEY Remote Test Station facilitates test of the alarm capability of the duct smoke detector as indicated in the RTS451/RTS151/RTS451KEY/RTS151KEY manual. The D4120W duct smoke detector can be reset by the RTS451/RTS151/RTS451KEY/RTS151KEY. To install the RTS451/RTS151/RTS451KEY/RTS151KEY, connect the device as shown in **Figure 13**; wire runs must be limited to 25 ohms or less per interconnecting wire. If a system control panel is used, the panel itself may require testing.

[15.2] RTS2/RTS2-AOS MULTI-SIGNALING ACCESSORY

The RTS2 and RTS2-AOS multi-signaling accessories are designed for use with InnovairFlex 4-wire conventional duct smoke detectors only. The accessory has two bicolored LEDs that indicate the sensor status of up to two connected duct smoke detectors. The key switch on the unit can be used to select a connected duct detector sensor (either sensor1 or sensor 2), and the selected sensor can be tested or both sensors can be reset simultaneously using the test/reset button. LED status indications include: Standby (green blink), Trouble (amber), Maintenance (amber blink) and Alarm (red). See **Figure 14** for wiring diagram

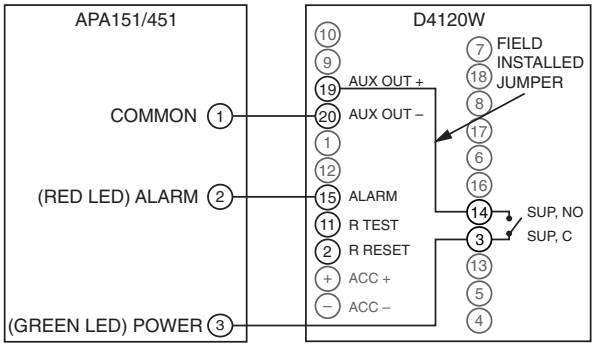
With the key switch selected, there is also the capability of obtaining a sensitivity measurement of the selected sensor using the SENS-RDR sensitivity reader (sold separately).

FIGURE 11. WIRING DIAGRAMS FOR OPTIONAL ACCESSORIES:



H0554-01

FIGURE 12. WIRING DIAGRAM FOR D4120W TO APA151 OR APA451:

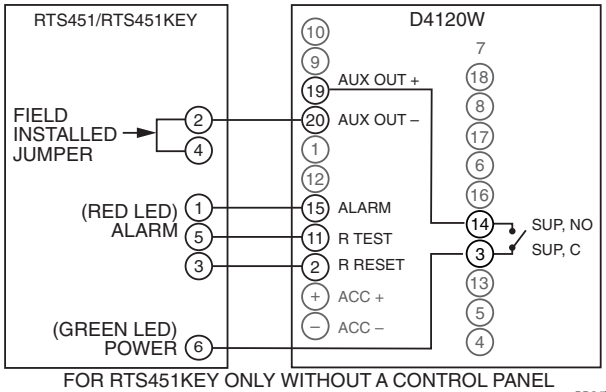


NOTE: WIRING DIAGRAM SHOWN IS FOR D4120W 4-WIRE DUCT SMOKE DETECTOR SYSTEM EQUIPPED WITHOUT A CONTROL PANEL.

NOTE: A TROUBLE CONDITION IS INDICATED BY LOSS OF GREEN LED

HO584-03

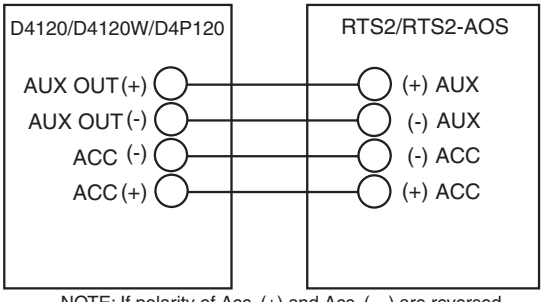
FIGURE 13. WIRING DIAGRAM FOR D4120W TO RTS451/RTS151/ RTS451KEY/RTS151KEY:



FOR RTS451KEY ONLY WITHOUT A CONTROL PANEL

H0582-03

FIGURE 14. WIRING DIAGRAM FOR D4120W TO SSL451/RTS2-AOS:



NOTE: If polarity of Acc. (+) and Acc. (—) are reversed, an Amber LED on sensor 2 of the duct smoke detector power board will exist indicating a trouble condition.

H0583-02

TABLE 3. DETECTOR STATUS INDICATION

NOTE: There are two LED's on the Power Board each indicating the status of the two sensors connected. When there is only one sensor connected, LED2 will remain off.

Status	Description	LED Status		Status of Relays
		Sensor D4S	Power Board D4P120	
Sensor Initialization	At power-up or reset at the panel, the sensor will take approx 35 seconds to initialize. Also occurs if the sensor has been removed and restored in the base in the sensor housing.	RED Blink every 5 seconds	Alternating Green/amber every 1 second	**Supervisory relay**: Terminals 3 and 14 are closed. **Alarm Relay**: Terminals 4 and 5 are open. **Aux Relay** does not switch states:Terminals 6 and 16 are closed,Terminals 8 and 18 are closed
	Sensor is missing during the seven minute tamper Delay, if selected.	Off	Alternating Green/amber every 1 second	**Supervisory relay**: Terminals 3 and 14 are closed **Alarm Relay**: Terminals 4 and 5 are open. **Aux Relay** does not switch states:Terminals 6 and 16 are closed,Terminals 8 and 18 are closed
Maintenance	Sensor D4S is outside it's UL approved sensitivity limits and needs to be cleaned or replaced.	RED Blink every 5 seconds	Amber Blink every 5 seconds	**Supervisory relay**: Terminals 3 and 14 are closed. **Alarm Relay**: Terminals 4 and 5 are open. **Aux Relay** does not switch states:Terminals 6 and 16 are closed,Terminals 8 and 18 are closed
Trouble	.Unit loses Power	Off	Off	**Supervisory relay**: Terminals 3 and 14 are open. **Alarm Relay:** Terminals 4 and 5 are open. **Aux Relay** does not switch states with no shutdown on Trouble selected: Terminals 6 and 16 are closed. Terminals 8 and 18 are closed. **Aux Relay** Switches states with shutdown on Trouble selected: Terminals 6 and 16 are open, Terminals 8 and 18 are open
	.Cover Tamper Delay times out	Green Blink every 5 seconds	Amber solid	
	.Wiring Problems between the Sensor and the Power Board	Off	Amber solid	
	.Mismatch between the number of sensors connected and the Dip Switch setting			
	1 sensor connected,2 selected	Green blink every 5 seconds on first sensor. No second sensor.	LED1 Green blink every 5 seconds LED2 Amber solid	
	2 sensors connected,1 selected	Green blink every 5 seconds on first sensor. LED's off on second sensor	LED1 Green blink every 5 seconds LED2 Amber solid	
Alarm	Unit detects smoke	Solid Red	Solid Red	**Supervisory relay**: Terminals 3 and 14 are closed **Alarm Relay**: Terminals 4 and 5 are closed. **Aux Relay** switches states: Terminals 6 and 16 are open, Terminals 8 and 18 are open
Standby	Unit has Power and it is not in initialization, Trouble, Maintenance or Alarm.	Green Blink every 5 seconds	Green Blink every 5 seconds	**Supervisory relay**: Terminals 3 and 14 are closed **Alarm Relay**: Terminals 4 and 5 are open. **Aux Relay** does not switch states: Terminals 6 and 16 are closed, Terminals 8 and 18 are closed

NOTE: If any other visual indication is noted contact System Sensor technical support at 1-800-SENSOR2.

Please refer to insert for the Limitations of Fire Alarm Systems

THREE-YEAR LIMITED WARRANTY

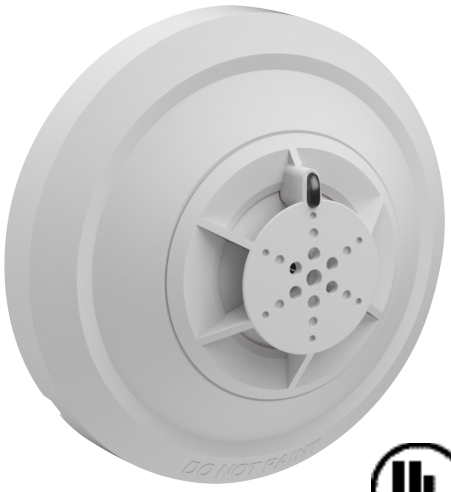
System Sensor warrants its enclosed product to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for the enclosed product. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the replacement of any part of the product which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: Honeywell, 12220 Rojas Drive, Suite 700, El Paso TX 79936, USA. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

PAD300-HD

Heat Detector

Features

- Selectable Rate of Rise and/or Fixed Heat Detector
- Low Profile
- Reliable Detection Technology
- LED Alarm Indicator
- Ambient Temperature Listing of 32°F to 150°F
- Simple DIP Switch Address Setting, No Programming Tool Required
- Magnetic Test Switch
- Product includes 5-year warranty
- UUKL Listed for Smoke Control



0328-0538

Description

The PAD300-HD is a listed analog addressable rate of rise and/or fixed temperature heat detector compatible with any fire alarm control panel that has the Potter Addressable Device (PAD) protocol. The heat sensing portion utilizes a proven thermistor for accurate and reliable heat detection. The detector and base (not included) are made of a durable plastic in an off-white to blend in with the ceiling.

The PAD300-HD is UL listed with a selectable fixed temperature point from 135° to 185° Fahrenheit and can be used for rate of rise applications. See detector spacing limitations below. This flexibility allows the installer to cover a wide variety of applications with a single unit.

The PAD300-HD and the control panel communicate over a proven and robust digital communication path and the system analyzes the information at the particular device. The total polling speed is less than five (5) seconds, well under the UL requirements.

The detector is compatible with any of the PAD300 series detector bases and simply twists on. The PAD300-HD is addressed using DIP switches in the rear of the detector and can be easily programmed in the field without special tools.

Setting the Address

Each addressable device on the SLC loop must have a unique address from 1 to 127 to function properly. The address is set using DIP switches.

Before connecting a device to the SLC loop, take the following precautions to prevent potential damage to SLC or device. Verify the following:

1. Power to the device is removed.
2. Field wiring is correctly installed.
3. Field wiring has no open or short circuits.

Technical Specifications

Operating Voltage	24 VDC
Detector Current Draw	300 µA
Alarm Indicator	1 LED
Alarm Set-point Range	135°F to 185°F (57°C to 85°C)
Rate of Rise Detection (Selectable Option)	15°F/min. (8.3°C/min.)
Installation Temperature Range	32°F to 150°F (0°C to 66°C)
Operating Relative Humidity Range	0% to 93% (Non-condensing)
Start-up Time	Max. 1 sec.
Maximum Number of Addresses Per Loop	127
Maximum Number of Lighted Indicators in Alarm Per Loop	30
Color	Eggshell White
Weight (Without Base)	68 g (2.4 oz)
Dimensions (Without Base)	Height: 1.5 in (38 mm) Diameter 3.93 in (100mm)

PAD300-HD

Heat Detector

Operation

The PAD300-HD is an analog addressable detector that uses one address on the Signaling Line Circuit (SLC) of a compatible fire alarm control panel. The unit communicates with the control panel as it is polled. The LED flashes every time the unit is polled and it will flash at a fast rate if the unit is in an active status. The polling LED can be turned off if desired for less conspicuous operation.

The PAD300-HD with the PAD300-4DB or PAD300-6DB has a low profile to blend into the surrounding environment. The system has a maximum of 30 LEDs that can be turned on simultaneously. If the system already has 30 LEDs on, the PAD300-HD will operate even though the LED will not illuminate.

Spacing

The ANSI/UL listed spacing limitations of PAD300-HD smooth ceiling are dependent on alarm set point.

Alarm Set-Point	Rate of Rise Spacing	Fixed Temperature Spacing
135°F to 185°F (57°C to 85°C)	Max. 70 ft.	Max. 70 ft.

Compatible Bases

All bases will mount on a single gang, 3-1/2” octagon, 3-1/2” square, double gang, 4” octagon, 4” square, 50mm c/c, 60mm c/c and 70mm c/c boxes.

Device	Description	Stock No.
PAD300-4DB	4” Detector Base	3992781
PAD300-6DB	6” Detector Base	3992782
PAD300-IB	6” Base with an Isolator Module Included	3992783
PAD300-RB	6” Base with One Form-C Relay Contact 2A @ 30VDC, 0.5A @ 125VAC	3992784
PAD300-SB	6" Base with sounder module included. Sound pattern is provided from external source	3992785
PAD300-LFSB	6” Base with 520Hz sounder module included. Sound pattern is provided from external source	3992786

Ordering Information

Model	Description	Stock No.
PAD300-HD	Heat Detector	3992776