

# Installation Manual Detector Bases: PAD100-6DB & PAD100-4DB



PAD100-PD PAD100-PHD PAD100-HD PAD100-CD Photoelectric Smoke Detector Photoelectric Smoke / Heat Detector Combination Heat Detector

**Carbon Monoxide Detector** 

(ANSI/UL 268 Listed) (ANSI/UL 268 and ANSI/UL 521 Listed) (ANSI/UL 521 Listed) (ANSI/UL 2075 Listed)

### 1. Description

This document provides instructions for mounting and wiring the Detector Base PAD100-6DB and PAD100-4DB. The following detectors are compatible with Detector Base PAD100-6DB and PAD100-4DB.

PAD100-PD: Photoelectric Smoke Detector
 PAD100-PHD: Photoelectric Smoke / Heat Detector

PAD100-HD: Heat Detector

PAD100-CD: Carbon Monoxide Detector

# 2. Field Wiring Diagrams

Typical field wiring diagrams for the Signaling Line Circuit (SLC) are shown in FIGURE 1. The SLC supports NFPA wiring Class B, A and X.

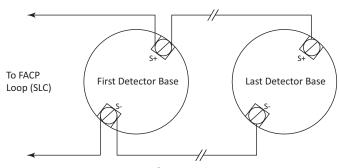


Figure 1 Wiring (Style B) Using PAD100-6DB or PAD100-4DB

FIGURE 1 is typical of NFPA Style B SLC (S+, S-) Wiring using either the PAD100-6DB or PAD100-4DB base. In Style A arrangement two separate conductors would return from the last detector base to a listed compatible Fire Alarm Control Panel (FACP). In Style X, it is required to use PAD100-IB (Addressable Isolator Bases) and typical field diagram is in the PAD100-IB Installation Manual.

# 3. Wiring Instruction

- To ensure proper installation of the detector head to the base, wires shall be dressed properly at the time of installation
- Using PAD100 Bases, observe the correct polarity of SLC wiring. NOTICE:
- THE WIRING TO BE USED SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF ARTICLE 300.3(B) OF THE NATIONAL ELECTRICAL CODE, NFPA 70, AS WELL AS ARTICLE 210.
- THIS EQUIPMENT SHOULD BE INSTALLED IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 72.

**CAUTION!** Break wire runs to provide supervision for connections made to each wire pair.

# **Detector Base Mounting**

PAD100-6DB / PAD100-4DB should be mounted directly on the electrical box. The PAD100-6DB mounting holes are configured for a single gang, double gang, octagon or 4" square box. The PAD100-4DB mounting holes are configured for a 3-1/2" octagon box. Use a box for each base and run the power circuit to all base locations.

Use 12 to 22 AWG conductors to connect to terminals of bases. It is recommended that the SLC conductors be color-coded to avoid wiring errors and assist in system troubleshooting. Improper SLC connections may prevent the system from operating normally. Disconnect power to the SLC until the detectors are installed.

- 1. Wire the detector bases according to Field Wiring Diagrams.
- 2. Use the dip switches (SECTION 11) to set address(es) (1 127) for each detector head.

NOTICE: THE DETECTORS AND THE PAD100 MODULES MUST HAVE INDIVIDUAL ADDRESS(ES).

3. To install the detector head onto the base, match the detector heads to the base using the alignment feature and twist clockwise until the detector heads snap into place (FIGURE 2).

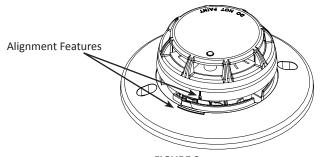


FIGURE 2
Assembly of Detector

- 4. After all detector heads, addressable bases and modules have been installed, apply power to the FACP.
- 5. Test the detectors as described in the Testing Section of this manual.

NOTICE: DO NOT INSTALL DETECTOR HEADS UNTIL AREA HAS BEEN THOROUGHLY CLEANED TO REMOVE CONSTRUCTION DEBRIS, DUST, ETC., AS REQUIRED BY NFPA 72.

# 4. Spacing Limitations

NOTICE: REFER TO NFPA 72 FOR SPECIFIC INFORMATION REGARDING DETECTOR SPACING, MOUNTING LOCATION AND SPECIAL APPLICATIONS.

# PAD100-PD, PAD100-PHD: Photoelectric Smoke Detector

PAD100-PD and PAD100-PHD are ANSI/UL listed on maximum 30ft spacing limitation with alarm set point from 135°-174° F on smooth ceiling. Refer to NFPA 72 for specific information regarding detector spacing, placement and special applications.

## PAD100-HD: Heat Detector

The ANSI/UL listed spacing limitations of PAD100-HD smooth ceiling are dependent on alarm set point.

Alarm Set-Point	Rate of Rise Spacing	Fixed Temperature Spacing
135° to 174° F (57° to 79° C)	Maximum 60 ft.	Maximum 60 ft.
175° to 185° F (80° to 85° C)	Maximum 15 ft.	Maximum 15 ft.
135° to 160° F (57° to 71° C)	Maximum 70 ft.	Maximum 70 ft.

# 5. Testing

Testing shall be performed periodically to determine if each detector operates properly. Detectors will offer maximum performance when tested in compliance with NFPA 72.

NOTICE: REFER TO FIRE ALARM CONTROL PANEL (FACP) MANUAL FOR OPERATION OF DIRTY VALUE READ / PRINT, ALARM SIMULATION AND WALK TEST.

### **Operational Testing**

When PAD100-PD, PAD100-PHD, PAD100-HD and PAD100-CD are under normal conditions in standby mode, the alarm indicator LEDs on the face of the detector will pulse approximately once every 4 seconds. NOTICE: WHEN A PANEL IS CONFIGURED TO NOT FLASH LEDS, THE LEDS ON THE DETECTORS WILL NOT FLASH AT ANY TIME.

### **Sensitivity Testing**

# (Dirty Value Read / Print)

The sensitivity drift value (Dirty Value) of the smoke detector can be checked at the FACP. The Dirty Value can be read and printed out at the FACP.

NOTICE: DETECTOR COMPENSATES SENSITIVITY UNTIL LIMIT OF COMPENSATION. WHEN COMPENSATION RATE REACHES LIMIT, A TROUBLE SIGNAL WILL BE INDICATED ON THE FACP.

### **Functional Testing**

NOTICE: BE SURE TO DIS-ENGAGE ALL ALARM SIGNAL SERVICES, RELEASING DEVICES AND EXTINGUISHING SYSTEMS, PRIOR TO PERFORMING THE FOLLOWING TEST, EXCEPT AUTOMATIC TESTING BY THE FACP. BE SURE TO RE-ENGAGE THESE SYSTEMS WHEN ALL TESTING IS COMPLETE.

### Walk Test

The FACP must be placed into Walk Test Mode and follow the steps below. Use the appropriate steps outlined below for the detector that is to be tested.

**CAUTION!** FAILURE TO ALARM DURING A TEST INDICATES A DEFECTIVE DETECTOR. REPLACE DETECTOR IMMEDIATELY.

- a. PAD100-PD and PAD100-PHD Smoke Detectors: Use a ANSI/UL listed aerosol such as Home Safeguard Model 25S or SDi Smoke Centurion as acceptable to the Authority Having Jurisdiction (AHJ).
- b. PAD100-PHD and PAD100-HD Heat Detectors: NOTICE: TAKE CARE DURING THE HEATING OF THE DETECTOR TO

AVOID OVERHEATING THE PLASTIC HOUSING.

- Use of a low powered heat gun is acceptable.
   CAUTION: Do not heat over 210°F (98.9°C).
- Maintain a minimum of 1 foot between the detector and the heat gun nozzle.
- Heat the detector for a minimum of 10 seconds.
- FACP will indicate with alarm when a sufficient amount of heat has been applied. LED indicator will continuously flash while detector is in alarm.
- c. PAD100-CD: Carbon Monoxide Detectors: Use the Home Safeguard Model HO-CO2 Aerosol with Home Safeguard Model Versa-Test Head VT1 or the SDI Solo C6 Aerosol with SDI Solo 330 Dispenser as acceptable to the Authority Having Jurisdiction (AHJ).

NOTICE: NEVER USE EXHAUST FROM VEHICLE TO TEST CO PORTION OF DETECTOR. EXHAUST MAY CAUSE PERMANENT DAMAGE TO DETECTOR AND VOIDS THE WARRANTY.

# 6. Maintenance

The detector should be cleaned as needed. Detectors installed in environments more prone to dust may need cleaning based on build-up of dust. The Dirty Value Report provides an indication when the detectors should be cleaned.

### NOTICE

- THE DETECTOR IS NOT WASHABLE, DO NOT SUBMERGE THE DETECTOR IN WATER. WATER CAN AFFECT THE SENSOR, CAUSING PERMANENT DAMAGE.
- DO NOT SPRAY CLEANING CHEMICALS OR INSECT SPRAYS DIRECTLY ON OR NEAR THE DETECTOR. DO NOT PAINT OVER THE DETECTOR. DOING SO MAY CAUSE PERMANENT DAMAGE.
- a. PAD100-PHD, PAD100-HD and PAD100-CD: When cleaning is needed, clean cover using a soft cloth.
  - DO NOT vacuum or use compressed air, water, cleaners or solvents to clean the detector.
  - DO NOT disassemble the detector to clean.
  - If the detector is not operating properly after cleaning, replace detector.
- b. PAD100-PD: When cleaning is needed, follow the below steps to remove dust on the detector
  - 1. Turn off electrical power to the PAD100-PD.
  - 2. Remove the detector from the base. Do not remove the base from the wall.
  - 3. Remove cover from detector by removing the two screws (T10) on back of detector (FIGURE 3).

NOTICE: Do not use a power driver when removing /installing screws.

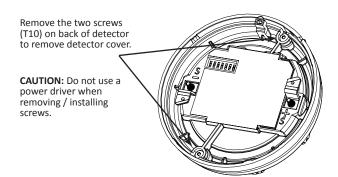


FIGURE 3

Removing Detector Cover (PAD100-PD only)

- Remove optic cage (FIGURE 4) from detector circuit board by gently gripping the sides of the optic cage base and lifting from detector circuit board.
- 5. Remove optic cage from optic cage base, by gently squeezing the three connector arms and very gently lifting from optic cage base (FIGURE 4).

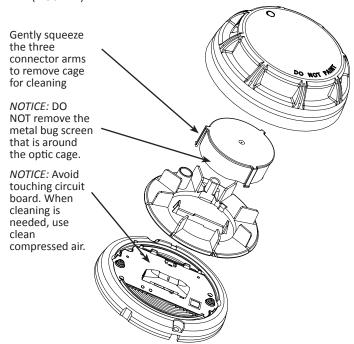


FIGURE 4

Remove Optic Cage from Detector for Cleaning (PAD100-PD only)

- 6. Using clean compressed air, blow out any dust and debris from the center of the optic cage.
  - DO NOT vacuum or use water, cleaners or solvents to clean the detector.
  - DO NOT disassemble any other parts of the detector to clean, other than optic cage.
  - If the detector is not operating properly after cleaning, replace detector.
  - After cleaning with clean compressed air, replace the optic cage by lining up the three connector arms and the guide pin into the optic cage ring and gently pushing until it clicks (FIGURE 5).

NOTICE: USE GUIDE PIN FOR PROPER ALIGNMENT OF REPLACING OPTIC CAGE INTO OPTIC CAGE BASE.

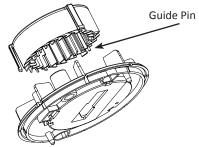
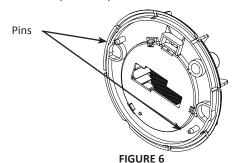


FIGURE 5

Replace Optic Cage into Optic Cage Base

8. Line up the two pins on the back of the optic cage base to the pin holes on the circuit board to place the optic cage base on the circuit board (FIGURE 6)



Pins on Back of Optic Cage Base

Place cover back on detector, using the LED indictor light on base and cover to guide the correct placement. When the cover and base are lined up correctly, the units will fit together.

10. Replace the two screws (T10) on the back of the product. *NOTICE:* Do not use a power driver when removing /installing screws. Tighten screws between 4 and 6 in-lbs.

# 7. Locking Feature

The PAD100-PD, PAD100-PHD, PAD100-HD, PAD100-CD include a tamperproof feature that locks the detector and does not allow removal without the use of a tool.

 Once the detector has been installed the detector locks into the base. To remove the detector from the base, insert a small screwdriver into the slot on the detector (FIGURE 7) and push the plastic tab while simultaneously turning the detector head counter-clockwise.

Insert small screwdriver into slot to remove detector from base

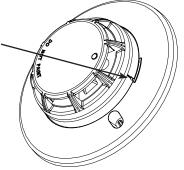
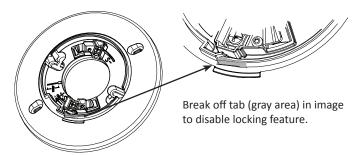


FIGURE 7
Locking Feature

2. The locking feature can be disabled. To disable the locking feature, break off the locking tab before installation (FIGURE 8).



**FIGURE 8** Disable Locking Feature

# 8. Detector Base Options

Model	Description	
PAD100-6DB	6 inch detector base	
PAD100-4DB	4 inch detector base	
PAD100-IB	6 inch detector base with short circuit isolator. See manual number: 550-0671-000	
PAD100-RB	6 inch detector base with relay module. See manual number: 550-0671-000	
PAD100-SB	6 inch detector base with sounder module. See manual number: 550-0671-000	

### NOTE:

- Installation instructions for PAD100-DUCTR, reference document number 5406321-A.
- Installation instructions for PAD100-DUCT, reference document number 5406322-A.

# 9. A WARNING

- Detector will not operate without electrical power. Fire can cause power interruption, discuss with a fire protection specialist for additional safeguards.
- Do not open PAD100-PHD, PAD100-HD, PAD100-CD detector for cleaning. If the detector is opened, product warranty becomes void.
- If the detector does not work properly, do not try and fix it yourself.
   This will void your warranty. For techincal assistance, contact
   Potter Electric Signal Company at 866-956-1211 for instructions to return a detector that does not operate properly.
- Detector will not sense fires that start in areas where smoke or heat cannot reach the detector. Smoke or heat from fires in walls, roofs or on the opposite side of closed doors may not reach the detector.
- Keep supplied dust cover in place during installation and construction. Remove dust cover prior to operation.
- Dust cover is not a substitute for removal of detector during new construction or remodeling.
- The detector cannot detect smoke when the dust cover is in place.
- Never use an open flame of any kind to test your device. You may ignite and damage the detector.
- Do not cover, tape or otherwise block the openings of your detector.
   The openings are designed to allow air to pass through the detector, thus sampling the air around the detector.
- Detectors are not to be used with detector guards unless the combination has been evaluated by a nationally recognized testing laboratory and found suitable for that purpose.
- To ensure proper operation, store detector within the recommended ranges. Allow the detector to stabilize to room temperature before applying power.
- If the detector ever fails to test properly, replace it immediately.
   Products under warranty may be returned to the manufacturer for replacement, see LIMITED WARRANTY.
- For technical assistance, contact Potter Electrical Signal Company at 1-866-956-1211

# 10a. Specifications / Ratings for Use with Detectors: PAD100-PD, PAD100-PHD, PAD100-HD, PAD100-CD

No.	Item		PAD100-PD	PAD100-PHD	PAD100-HD PAD100-CD			
1	Working Voltage Range		24 VDC					
2	Standby Current (*)		300 µА					
3	Alarm Indicator		1 LED					
4	Alarm Indicator Current		1.4 mA					
5	Alarm Set-Point Range	(**)	1.0-3.7 %/ft. (3.6-12%/m)		Fixed 70, 150, 400 PPM			
6	Installation Temperature Range			32° to 115° F (0° to 46° C)	32° to 100° F (0° to 38° C)	32° to 150° F (0° to 66° C)	32° to 100° F (0° to 38° C)	32° to 100° F (0° to 38° C)
7	Operating Relative Humidity Range		0% to 93% (non-condensing)					
8	Start-up Time		1 second					
9	Maximum Number of Addresses per SLC Loop	)	127					
10	Maximum Number of L Indicators in Alarm per	0	30					
11	Weight (without base)		101 g (3.56 oz)	102 g (3.6 oz)	82 g (2.89 oz) 92 g (3.25 oz)			
12	Dimensions (without base)	Height	1.35 in (34 mm)	1.94 in (49 mm)		1.94 in (49 mm)		1.43 in (36 mm)
12		Diameter		3.93 in. (100 mm)				
13	Approvals / Listings		ANSI/UL 268	ANSI/UL 268, 521	ANSI/UL 521 ANSI/UL 2075			
14	Permitted Mounting Lo	cation(s)	Ceiling, Wall	Ceiling, Wall	Ceiling, Wall Ceiling, Wall			

# 10b. Specifications / Ratings for Use with Detector Bases: PAD100-6DB, PAD100-4DB

No.	Item		PAD100-6DB	PAD100-4DB	
1	Installation Temperature Range		32° to 150° F (0° to 66° C)		
2	Operating Relative Humidity Range		0% - 93% (non-condensing)		
3	Weight (without detector head)		87 g (3.07 oz)	52g (1.83 oz)	
_	Dimensions (without	Height	0.75 in (19 mm)	0.72 in (18 mm)	
detector head)	Diameter	6.3 in (166 mm)	3.93 in (100 mm)		
5	Approvals / Listings		ANSI/UL 268, ANSI/UL 521, ANSI/UL 2075		

All dip switches are

shown in the OFF

position

# 11. PAD Protocol Dip Switch Settings

The following information is for setting the dipswitches on the PAD100-PD, PAD100-PHD, PAD100-HD and PAD100-CD detectors and modules.

Setting the Address: All PAD protocol detectors and modules require an address prior to connection to the panel's SLC loop. Each PAD device's address (i.e., detector and/or module) is set by changing the dip switches locatd on the device. PAD device addresses are comprised of a seven (7) position dip switch used to program each device with an address ranging from 1-127 (FIGURE 11).

The below examples (FIGURE 9 and FIGURE 10) illustrate a PAD devices dip switch settings. The first example (FIGURE 9) illustrates a device not addressed where all dip switch settings are in the default OFF position. The second example (FIGURE 10) illustrates an addressed PAD device via the dip switch settings.

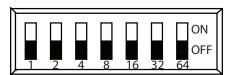


FIGURE 9: Enlarged View of PAD Device with Dip Switch Setting Unaddressed

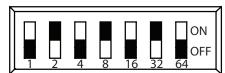
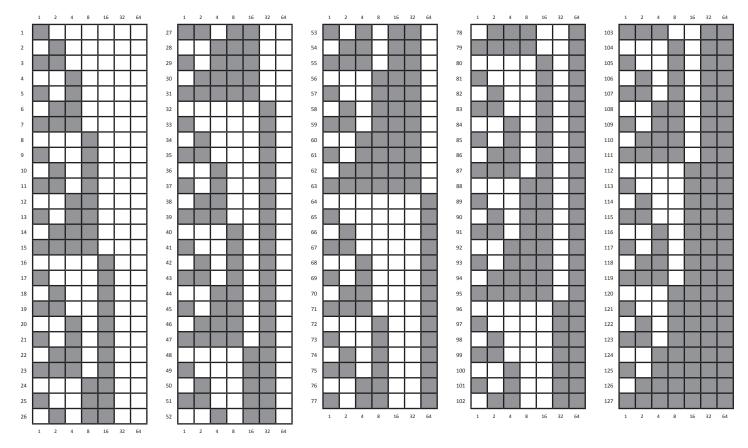


FIGURE 10: Enlarged View of PAD Device with Dip Switch Setting Addressed Shows this PAD device's address is #42. Dip Switch 1, 4, 16 and 64 are OFF. Dip Switch 2, 8 and 32 are ON.

<sup>\*</sup> The standby current is the current that the device consumes when the device is in a non-activated condition and where no communication current is transmitted to the FACP.

<sup>\*\*</sup> Reference spacing requirements in Section 4.



NOTE: Each gray box indicates that the dip switch is ON and each white box indicates the dip switch is OFF.

FIGURE 11: PAD Device Dip Switch Addresses Table (Addresses 1-127)

### LIMITED WARRANTY

For a period of 5 years from the date of manufacture (or as long as required by applicable law), Potter Electrical Signal Company, LLC warrants to you the original purchaser that your appliance will be free from defects workmanship and materials under normal use and service

This warranty does not apply and is void if damage or failure is caused by: accident, abuse, misuse, abnormal use, faulty installation, liquid contact, fire, earthquake or other external cause; operating the appliance outside Potter Electrical Signal Company, LLC's published guidelines; or service, alteration, maintenance or repairs performed by anyone other than Potter Electrical Signal Company, LLC. This warranty also does not apply to: consumable parts, such as batteries; cosmetic damage, including but not limited to scratches or dents; defects caused by normal wear and tear or otherwise due to the normal aging of the appliance, or if any

outside Potter Electrical Signal Company, LLC: Spublished guidelines; or service, alteration, maintenance or repairs performed by anyone other than Potter Electrical Signal Company, LLC. This warranty also does not apply to: consumable parts, such as batteries; cosmetic damage, including but not limited to scratches or dents; defects caused by normal wear and tear or otherwise due to the normal aging of the appliance, or if any serial number has been removed or defaced from the appliance.

TO THE EXTENT PERMITTED BY LAW, THIS WARRANTY AND THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL, WRITTEN, STATUTORY, EXPRESS OR IMPLIED. POTTER ELECTRICAL SIGNAL COMPANY, LLC DISCLAIMS ALL STATUTORY AND IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES AGAINST HIDDEN OR LATENT DEFECTS TO THE EXTENT PERMITTED BY LAW. TO THE EXTENT SUCH WARRANTIES CANNOT BE DISCLAIMED, SUCH IMPLIED WARRANTIES AGAINST HIDDEN OR LATENT DEFECTS TO THE EXTENT PERMITTED BY LAW. TO THE EXTENT SUCH WARRANTIES CANNOT BE DISCLAIMED, SUCH IMPLIED WARRANTIES AGAINST HIDDEN OR LATENT DEFECTS TO THE EXTENT PERMITTED BY LAW. POTTER ELECTRICAL SIGNAL COMPANY, LLC WILL NOT BE LIABLE FOR ANY DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREAD FOR ANY DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREAD FOR ANY ADD TO THE EXTENT PERMITTED BY LAW, POTTER ELECTRICAL SIGNAL COMPANY, LLC WILL NOT BE LIABLE FOR ANY DIRECT, SPECIAL, INCIDENTAL OR ANSINGIN IN CONNECTION WITH THE SALE, USE OR REPRIN OF THE APPLIANCE, OR UNDER ANY OTHER LEGAL THEORY, INCILLDING BUT NOT LIMITED TO LOSS OF USE, LOSS OF REVENUE, LOSS OF R

VARRANTY, POTTER ELECTRICAL SIGNAL COMPANY, LLC DOES NOT LIMIT OR EXCLUDE YOUR RIGHTS EXCEPT AS ALLOWED BY LAW. TO FULLY UNDERSTAND YOUR RIGHTS, YOU SHOULD CONSULT THE LAWS OF YOUR

hese materials have been prepared by Potter Electrical Signal Company, LLC ("Potter") for informational purposes only, are necessarily summary, and are not purported to serve as legal advice and should not be used as such. Potter makes no representations and varranties, express or implied, that these materials are complete and accurate, up-to-date, or in compliance with all relevant local, state and federal laws, regulations and rules. The materials do not address all legal considerations as there is inevitable uncertainty egarding interpretation of laws, regulations and rules and the application of such laws, regulations and rules to particular fact patterns. Each person's activities can differently affect the obligations that exist under applicable laws, regulations or rules. Therefore, these naterials should be used only for informational purposes and should not be used as a substitute for seeking professional legal advice. Potter will not be responsible for any action or failure to act in reliance upon the information contained in this material.

www.pottersignal.com