

# **Installation Manual Detector Base:** PAD100-SPKB



**Photoelectric Smoke Detector** PAD100-PD

PAD100-PHD Photoelectric Smoke / Heat Detector Combination

PAD100-HD **Heat Detector** 

PAD100-CD **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-SPKB. The following detectors are compatible with detector base PAD100-SPKB.

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

PAD100-CD: Carbon Monoxide Detector

## 2. Field Wiring Diagram for PAD100-SPKB

Typical field wiring diagrams for the Signaling Line Circuit (SLC) (FIGURE 1). The SLC supports NFPA wiring Class B, A and X. The PAD100-SPKB offers a choice of field selectable power taps: 1/8, 1/4, 1/2, 1, 2 and 4 watts (FIGURE 2) for use with either 25 VRMs or 70.7 VRMs audio amplifiers. The frequency range of the PAD100-SPKB is 400-4000 Hz. The PAD100-SPKB is suitable for line supervision. The PAD100-SPKB includes DC blocking capacitor which allows for supervision voltage of either polarity.

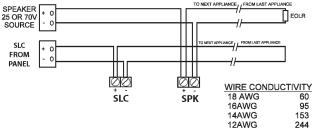


FIGURE 1: PAD100-SPKB Wiring Diagram

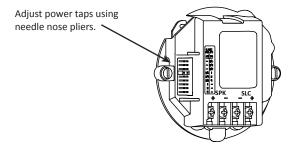


FIGURE 2: PAD100-SPKB Wiring and Power Tap

### 3. Wiring Instruction

- To ensure proper installation of the detector head to the base, wires shall be dressed properly at the time of installation
- When using PAD100-SPKB base, observe the correct polarity of SLC wiring.
- 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.
- DO NOT USE LOOPED WIRE UNDER TERMINALS. BREAK WIRE RUN TO PROVIDE SUPERVISION OF CONNECTION.

### CAUTION!

- Break wire runs to provide supervision for connections made to each wire pair.
- When installing, route field wiring away from sharp projections, corners and internal components.

## **Detector Base Mounting**

PAD100-SPKB should be mounted directly on the electrical box (FIGURE 3a) or to the LFSBBB-W back box (FIGURE 3b). The PAD100-SPKB mounting holes are configured for a 4" x 2-1/8" deep square box. Use a box for each base and run the power circuit to all base locations.

Use 12 to 18 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 PAD100-SPKB OBTAINS THE ADDRESS FROM THE DETECTOR HEAD. THE DETECTORS AND THE PAD100 MODULES MUST HAVE INDIVIDUAL ADDRESS(ES).
- 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 3a).

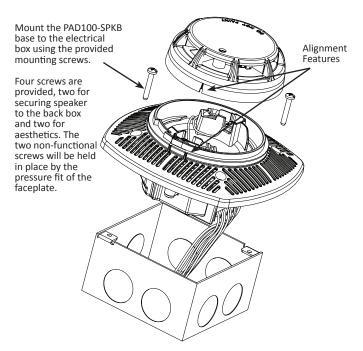


FIGURE 3a: Assembly of Detector on Electrical Box

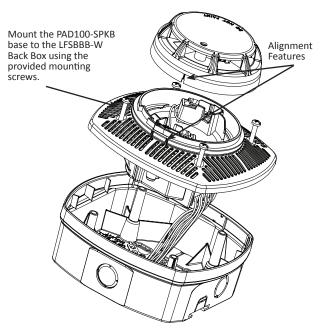


FIGURE 3b: Assembly of Detector on LFSBBB-W Back Box

- 4. After all detector heads, addressable bases and modules have been installed, apply power to the FACP.
- 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.

**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

<u>Operational Testing</u>
When PAD100-PD, PAD100-PHD, PAD100-HD and PAD100-CD are under normal conditions in standby mode, the alarm indicator LEDs 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.

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.

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.		

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
- 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.

- 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
  - Turn off electrical power to the PAD100-PD.
  - Remove the detector from the base. Do not remove the base from the wall.
  - Remove cover from detector by removing the two screws (T10) on back of detector (FIGURE 4).

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

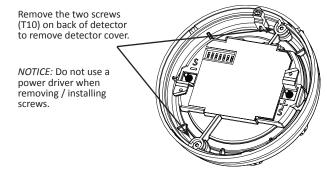


FIGURE 4: Removing Detector Cover (PAD100-PD only)

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

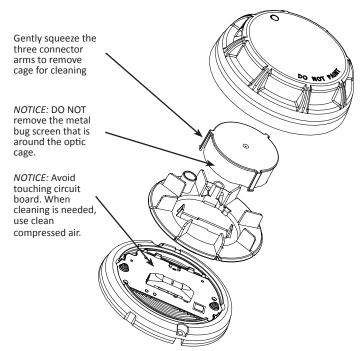


FIGURE 5: Remove Optic Cage from Detector for Cleaning (PAD100-PD only)

- 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 6).

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

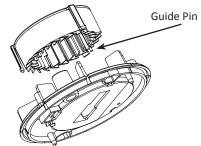


FIGURE 6: Replace Optic Cage into Optic Cage Base

Line up the two pins on the back of optic cage base to the pin holes on the circuit board to place the optic cage base on the circuit board (FIGURE 7).

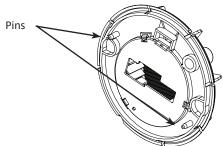


FIGURE 7: Pins on Back of Optic Cage Base

- 9. Place cover back on detector, using the LED indicator 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 and PAD100-CD include a tamperproof feature that locks the detector and does not allow removal without the use of a tool.

1. 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 8) and push the plastic tab while simultaneously turning the detector head counter-clockwise.

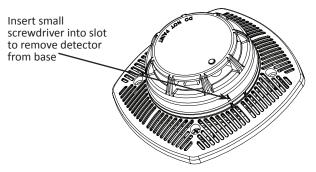


FIGURE 8: Locking Feature

2. The locking feature can be disabled. To disable the locking feature, break off the locking tab before installation (FIGURE 9).

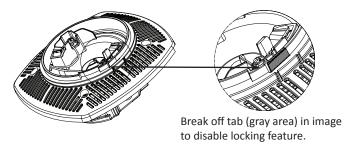


FIGURE 9: Disable Locking Feature

### 8. Detector Base Options

Description		
6 inch detector base. See manual number: 550-0622-000		
4 inch detector base. See manual number: 550-0622-000		
6 inch detector base with short circuit isolator. See manual number: 550-0671-000		
6 inch detector base with relay module. See manual number: 550-0671-000		
6 inch detector base with sounder module. See manual number: 550-0671-000		
6 inch detector base with speaker module		

# 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 or 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 technical 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.
- DO NOT stand close to the device when the alarm is sounding. Exposure at close range could result in hearing damage.
- 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 μΑ					
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)	1.0-3.7 %/ft. (3.6-12%/m) / 135° to 174°F (57° to 79° C)	135° to 174° F (57° to 79° C)	175° to 185° F (80° to 85° C)	135° to 160° F (57° to 71° C)	Fixed 70, 150, 400 PPM
6	Installation Temperature Range		32° to 120° F (0° to 49° C)	32° to 115° F (0° to 46° 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		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	Height	1.35 in (34 mm)	1.94 in (49 mm)	1.94 in (49 mm) 1.43 in (36 i		1.43 in (36 mm)	
12	(without base)	Diameter			3.93 in. (100 mn	n)		
13	Approvals / Listings ANSI/UL 268 ANSI/UL 268, 521 ANSI/UL 521		ANSI/UL 2075					
14	Permitted Mounting Location(s)		Ceiling, Wall	Ceiling, Wall	Ceiling, Wall Ceiling, Wall			

<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.

## 10b. Specifications / Ratings for Use with Detector Bases: PAD100-SPKB

No.	Item		PAD100-SPKB		
1	Working Voltage Range for SI	.c	24 VDC		
2	Standby / Alarm Current for S	SLC (*)	150 μΑ		
3	Active Current (Including Ind	licator)	3.8 mA		
4	Working Voltage for SPK		25 Volts, 70.7 Volts		
5	Power Tap Selection for SPK		1/8 Watt , 1/4 Watt, 1/2 Watt, 1 Watt, 2 Watt, 4 Watt		
6	Active Indicator		1 LED		
7	Applicable SLC Wiring Style		Class B, Class A, Class X		
8	Maximum Number of PAD10	0-SPKB per SLC Loop	127		
9	Installation Temperature Ran	ge	32° to 150° F (0° to 66° C)		
10	Operating Relative Humidity Range		0% - 93% (non-condensing)		
11	Weight (without detector head)		460 g (16.23 oz)		
12	Dimensions (without detector head)	Height	2.75 in (70 mm)		
12		Diameter	6 in x 6 in (153 mm X 153 mm)		
13	3 Approvals / Listings		ANSI/UL 268 and ANSI/UL 1480		

PAD100-SPKB Field Selectable Power Tap Selection - Reverberant (dBA @ 10ft.)						
Voltage	1/8 Watt	1/4 Watt	1/2 Watt	1 Watt	2 Watt	4 Watt
25 Volts	75.0 dBA	78.1 dBA	81.2 dBA	83.8 dBA	86.6 dBA	89.7 dBA
70.7 Volts	75.1 dBA	78.1 dBA	80.9 dBA	83.8 dBA	86.9 dBA	89.6 dBA

#### SYSTEM CONSIDERATIONS

- 1. To select the proper wattage input for the speaker, move the jumper to the appropriate pin.
- 2. Always maintain electrical isolation between speaker wiring and SLC wiring.
- 3. The PAD100-SPKB in conjunction with the Evax EVX-100 amplifier has been tested with and complies with the Low Frequency Signal Format (520 Hz) requirements in ANSI/UL 464 and ANSI/UL 864.
- 4. Do not exceed 130% of rated speaker voltage. If excessive distortion is heard, check amplifier for signal clipping. If clipping exists, reduce either amplifier input or gain.

## 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 located 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 12).

The below examples (FIGURE 10 and FIGURE 11) illustrate a PAD devices dip switch settings. The first example (FIGURE 10) illustrates a device not addressed where all dip switch settings are in the default OFF position. The second example (FIGURE 11) illustrates an addressed PAD device via the dip switch settings.

All dip switches are

shown in the OFF

position

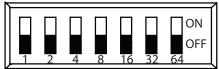
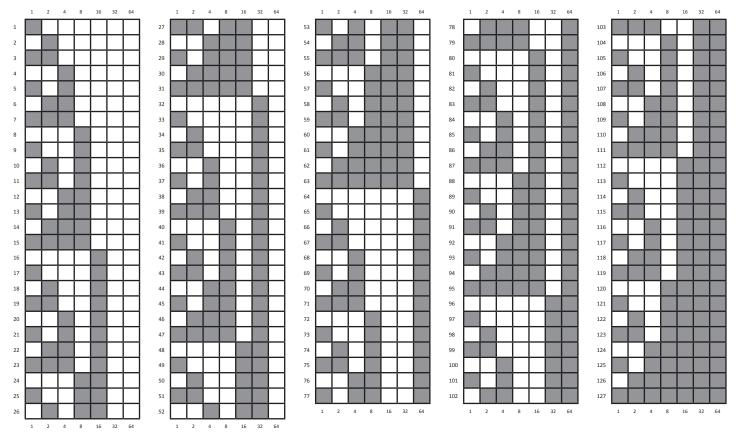


FIGURE 10: Enlarged View of PAD Device with Dip Switch Setting Unaddressed



**FIGURE 11:** 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.



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

FIGURE 12: 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 Electric Signal Company, LLC warrants to you the original purchaser that the appliance described in this product

For a period of 5 years from the date of manufacture (or as long as required by applicable law), Potter Electric Signal Company, LLC warrants to you the original purchaser that the appliance described in this product information booklet will be free from defects in 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 Electric Signal Company, LLC: published guidelines; or service, alteration, maintenance or repairs performed by anyone other than Potter Electric 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 REFEN ARE EXCLUSIVE AND IN ILEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL, WRITTEN, STATUTORY, EXPRESS OR IMPLIED POTTER ELECTRIC 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, AND TO THE EXTENT PERMITTED BY LAW.

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CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. If a defect in workmanship or materials causes your appliance to become inoperable within the warranty period, you must return the appliance to Potter Electric Signal Company, LLC postage prepaid to: Potter Electric Signal Company, LLC, 1609 Park 370, Hazelwood MO 63042. You must prove to the satisfaction of Potter Electric Signal Company, LLC the date of purchase of your appliance. You must also enclose a return address. Warranty service may only be performed by Potter Electric Signal Company, LLC provided in transit. If we receive an appliance in a damaged condition as the result of shipping, we will notify you and you must seek a claim with the shipper. If you submit a valid claim to Potter Electric Signal Company, LLC during the warranty period, Potter Electric Signal Company, LLC will, at its option, repair your appliance or furnish you with a new or rebuilt appliance without charge to you except for postage required to return the appliance to us. Potter Electric Signal Company, LLC will not reimburse you for repairs or replacement parts provided by other parties. Your repaired or replacement appliance will be returned to you free of charge and it will be covered under the warranty for the balance of the warranty period, if any. When a product or part is replaced, any replacement item become your property and the replaced item becomes property of Potter Electric Signal Company, LLC. For additional warranty and product information go to www.pottersignal.com.

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