

SIEMENS

Model ABHW-4BZ

Intelligent Audible Base

Installation

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1 About the Intelligent Audible Base

1.1 Introduction

The Model ABHW-4B audible base from Siemens Industry, Inc. consists of a standard base combined with an audible device. It is an intelligent supervised audible base which provides 6 selectable tone patterns, 2 volume levels and 2 different power types for alarm (loop power or external power) by using system configuration tool when ABHW-4B used with the FD-UL compatible detectors (refer to “Compatible fire alarm control panels”, “Compatible detector”, “Detector Placement” and “Tone and Volume Selection”). The ABHW-4B audible bases in the same device loop are fully synchronized with FD-UL detectors and also support RL-HC, RL-HW remote lamp. The ABHW-4B provides Steady, Temporal 3, Temporal 4, Temporal 4 low power, March time 120 and Canadian March time 30.

ABHW-4B is fully compatible with all Siemens addressable detectors (see Compatible detectors section) and recognizes the detector type automatically.

1.2 Application Note

The ABHW-4B is a UL 268 & ULC-S529 listed smoke detector supplementary device which combines detector base and audible device functions. It meets or exceeds 85 dB at 10-foot audibility requirement as specified in UL 268. When used in conjunction with listed, compatible Siemens equipment, the ABHW-4B may be used in lieu of single/multiple station smoke alarms to achieve enhanced, system-level functionality. The ABHW-4B can also meet requirement specified in UL 464, UL 2075 and ULC-525 except 520 Hz requirements for “Sleeping Area”.

1.3 Specifications

Physical Specifications:

Operating temperature: 32 °F ~120 °F (0 °C ~ 49 °C)

Operating humidity: 10 ~ 95%RH (Non-Condensing)

Compatible electrical mounting boxes: 4” square gang box

ONLY with 2.5-inch depth minimum; 4” octagon box is **NOT** compatible

Sound Output:

High: ≥ 85 dB

Low: ≥ 75 dB

Tones:

Steady

Temporal 3

Temporal 4

Temporal 4 low power

March time 120

Canadian March time 30

Electronic Ratings:

Operating voltage:

Loop power: 16 ~ 33 VDC

External power: 16 ~ 33 VDC

Supervisory current (max):

From loop: 250 µA

From external: 20 uA

Alarm current (RMS max):

Loop powered:

High dBA: 7.5 mA

Low dBA: 4.5 mA

External powered:

High dBA: 8.0 mA

Low dBA: 3.5 mA

Horizontal axis		Vertical axis	
Angle	OSPL (dBA)	Angle	OSPL (dBA)
0° (ref)	0 (ref)	0° (ref)	0 (ref)
+/- 20	-3	+/- 30	-3
+/- 25	-6	+/- 35	-6
+/- 90	-11.6	+/- 90	-12.3

Table 1: Calculated Worst Case Limits

1.4 Constraints

1. If the alarm current of ABHW-4B is energized by an external power supply, any UL listed 24 VDC regulated power supply including the aux power output of FireFinder-XLS/Desigo Fire Safety Modular/Cerberus PRO Modular, FC2005/FC901, FC2025/FC2050/FV2025/FV2050, FC922/FC924/FV922/FV924 and PAD-3/PAD-4/PAD-5 can be used (refer to Figure 3); or a 24 VDC NAC, such as PAD3/PAD-4/PAD-5 (refer to Figure 6), ZIC-4A (FireFinder-XLS/Desigo Fire Safety Modular/Cerberus PRO Modular zone indicating card (NAC), refer to Figure 5) and NAC from FC2005/FC901 (refer to Figure 7) or NAC from FC2025/FC2050/FV2025/FV2050, FC922/ FC924/FV922/FV924 (refer to Figure 8).
2. The alarm current of ABHW-4B **CANNOT** be energized by a 24 V FWR power supply.
3. The maximum number of ABHW-4B is related to the max. current rating and the power line resistance of the external power supplies applied on the ABHW-4B. Refer to the related installation instructions of the auxiliary power supply.
4. Refer to Figure 1 for "Loop Powered". The maximum number of "loop powered" ABHW-4B is limited by the max. load capacity and devices loaded in loop. Refer to APPENDIX-A in this document to calculate the max. number of "loop powered" ABHW-4B audible bases.
5. The maximum device line resistance cannot exceed the maximum device line resistance specified in the compatible panels.
6. T-tapping of the notification appliance circuit is not allowed.
7. The NAC output must be set to a steady DC if it is used for ABHW-4B.

1.5 Configuration

The ABHW-4B must be configured by the panel when it is connected with FD-UL detectors (see Table 3). Failure to configure the ABHW-4B will cause problems. For additional information please refer to the manual of the related panel. Also, for use with H-Series detectors (see Table 4) it does not require panel configuration as it will function the same as an ADBH-11 which will not be synchronized.

1.6 Detector Wiring

(Refer to Figures 9 and 10) Audible base Model ABHW-4B should be interconnected as shown in the Installation/Wiring Diagrams and wired to the specific system modules and control panels following the appropriate

instructions. For operation with FireFinder-XLS/ Desigo Fire Safety Modular/Cerberus PRO Modular, FC2005/FC901, FC2025/FC2050/FV2025/FV2050, FC922/FC924/FV922/FV924 system, note any limitations on the number of audible bases permitted on each notification appliance circuit or 24 VDC regulated power supply, depending on the total cable resistance and load of each circuit. (See Electronic Ratings section.)



Recommended wire size: 18 AWG min.; 14 AWG max. Wire larger than 14 AWG can damage the connector.

1.7 Detector Mounting

The detector base comes from the factory pre-wired. All signaling and initiating circuits are connected directly to the back of the ABHW-4B audible base using the four position terminal blocks.

1.8 Base Mounting

1. Route all wires out from the outlet box.
2. When the alarm LED viewing is critical, position the LED mark on the base in the intended direction (Refer to Figure 11).
3. Make connections directly to the audible base terminals located on the back of the base. Refer to the related Installation/Wiring diagram.
4. After all bases are installed, check loop continuity. For ABHW-4B loop continuity check, refer to the DPU or SDPU Manual, "Testing a FireFinder-XLS".
5. If loop continuity is acceptable, proceed with detector head installation.

1.9 Detector Placement

Use a 30-foot center spacing (900 sq ft), as a starting point referred to in NFPA Standard 72 National Fire Alarm Code and CAN/ULC-S524, in a detector installation layout. This spacing is based on ideal conditions—smooth ceiling, no air movement, and no physical obstructions. In all installations (except in special circumstances like computer room under floors), locate the detector on the ceiling, a minimum of 6 inches from a side wall, or on a wall, between 4 and 6 inches from the ceiling.

If questions arise regarding detector placement, it is extremely important that the drawings provided or approved by Siemens Industry, Inc., or by its authorized distributors be followed. The detector placements shown on these drawings were chosen after careful evaluation of all facets of protecting the area. Environmental factors such as air current, temperature, humidity, air pressure, and the nature of the fire load are carefully considered. Special consideration is given to room or area configuration and the type of ceiling (sloped or flat, smooth or beamed). Siemens Industry, Inc.'s extensive experience in the design of fire detection systems assures optimum detector placement and is reflected in these drawings. Follow sound engineering judgment made by qualified personnel.

1.10 Compatible Devices

Model	System Type	Doc. P/N
DLC (Figure 11, Note 1)	FireFinder® XLS FACP	315-034242
FC2005	Desigo™ Fire Safety 50-point panel	A6V10333722
FC901	Cerberus™ PRO 50-point FACP	A6V10336754

Model	System Type	Doc. P/N
FC2025 / FC2050 / FV2025 / FV2050	Desigo 250 & 500 point Fire Alarm Control Panels	A6V10337045
FC922 / FC924 / FV922 / FV924	Cerberus PRO 250 & 500 point Fire Alarm Control Panels	A6V10356958
XDLC	Desigo Fire Safety Modular System	A6V11231620
	Cerberus PRO Modular System	A6V11231627

Table 2: Compatible fire alarm control panels

Compatible detectors:

Model	Siemens Part #	Doc. P/N	Type / Description
FDO421	S54320-F4-A1	A6V10323926	Desigo optical detector
FDOT421	S54320-F6-A1	A6V10323934	Desigo optical / heat detector
FDT421	S54320-F5-A1	A6V10323930	Desigo heat detector
FDOOT441	S54320-F7-A1	A6V10324655	Desigo dual optical heat detector
FDOOTC441	S54320-F8-A1	A6V10324657	Desigo dual optical heat & CO detector
OOH941	S54320-F7-A2	A6V10324659	Cerberus PRO dual optical heat detector
OOHC941	S54320-F8-A2	A6V10324661	Cerberus PRO dual optical heat & CO detector
OP921	S54320-F4-A2	A6V10323928	Cerberus PRO optical detector
OH921	S54320-F6-A2	A6V10323936	Cerberus PRO optical / heat detector
HI921	S54320-F5-A2	A6V10323932	Cerberus PRO heat detector

Table 3: FD-UL series detectors

Model	Siemens Part #	Doc. P/N	Type / Description
HFP-11	500-033290	315-033290	H-Series optical / heat detector
HFPT-11	500-033380	315-033290	H-Series heat detector
SFP-11	500-033290C	315-033290C	Canada H-Series optical / heat detector
SFPT-11	500-033380C	315-033290C	Canada H-Series heat detector
HFPO-11	500-034800	315-034800	H-Series optical detector
SFPO-11	500-034800C	315-033290C	Canada H-Series optical detector

Table 4: H-series detectors

Model	Siemens Part #	Doc. P/N	Type / Description
RL-HW	500-033310	315-033230	Remote alarm lamp (wall)

Model	Siemens Part #	Doc. P/N	Type / Description
RL-HC	500-033230	315-033230	Remote alarm lamp (ceiling)

Table 5: Compatible remote lamps

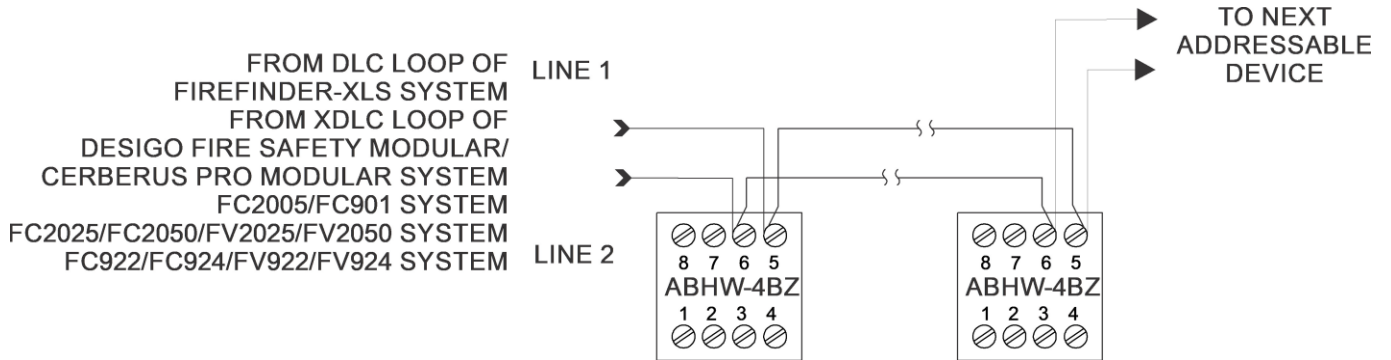


Fig. 1: Typical Non-Isolated Installation/Wiring Diagram for ABHW-4BZ Audible Base Powered by Device Loop

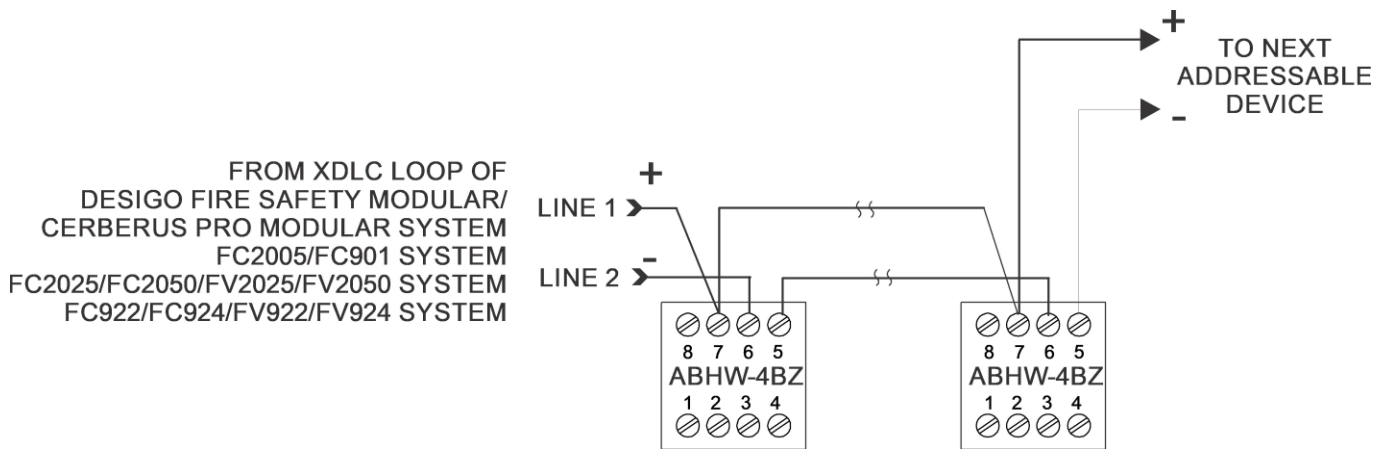


Fig. 2: Typical Isolated Installation/Wiring Diagram for ABHW-4BZ Audible Base Powered by Device Loop

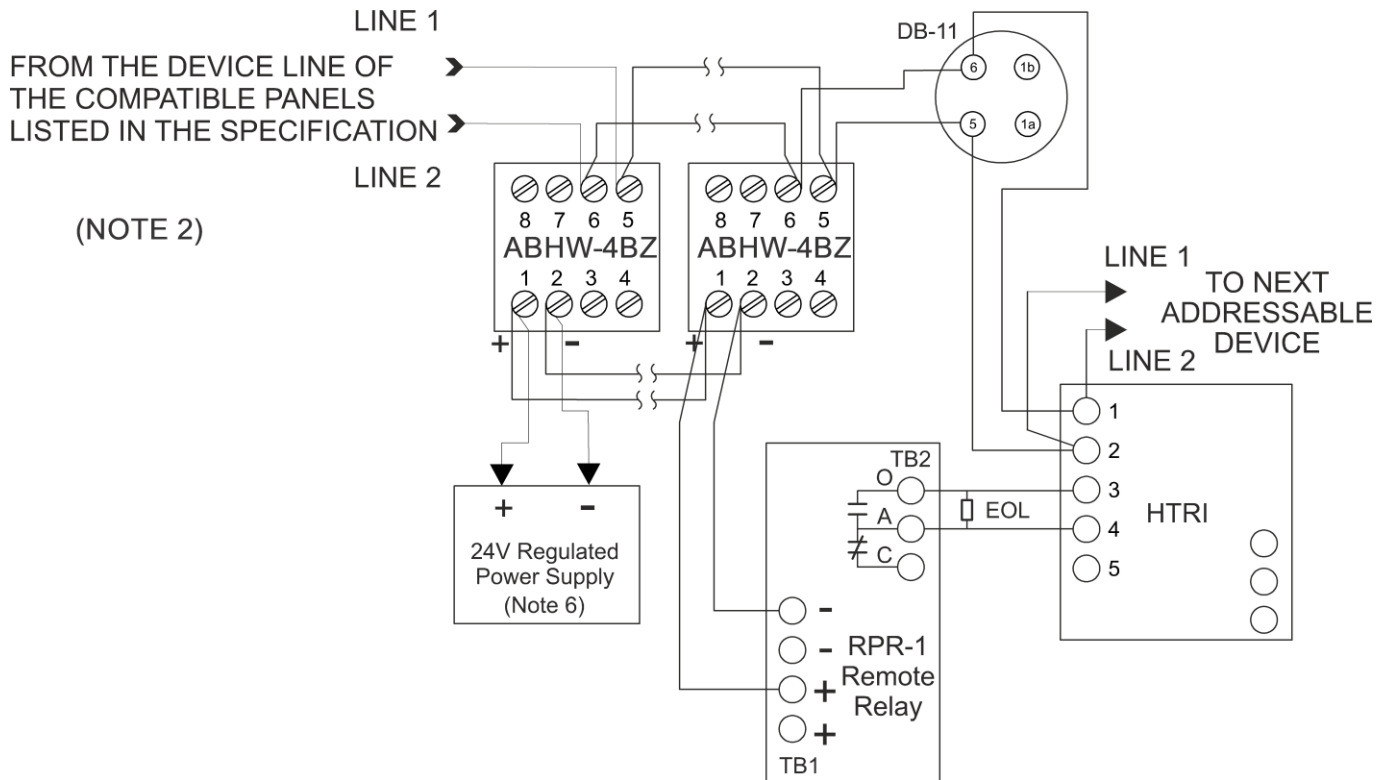


Fig. 3: Typical Non-Isolated Installation/Wiring Diagram for ABHW-4BZ Audible Base Powered by 24V Regulated Power Supply

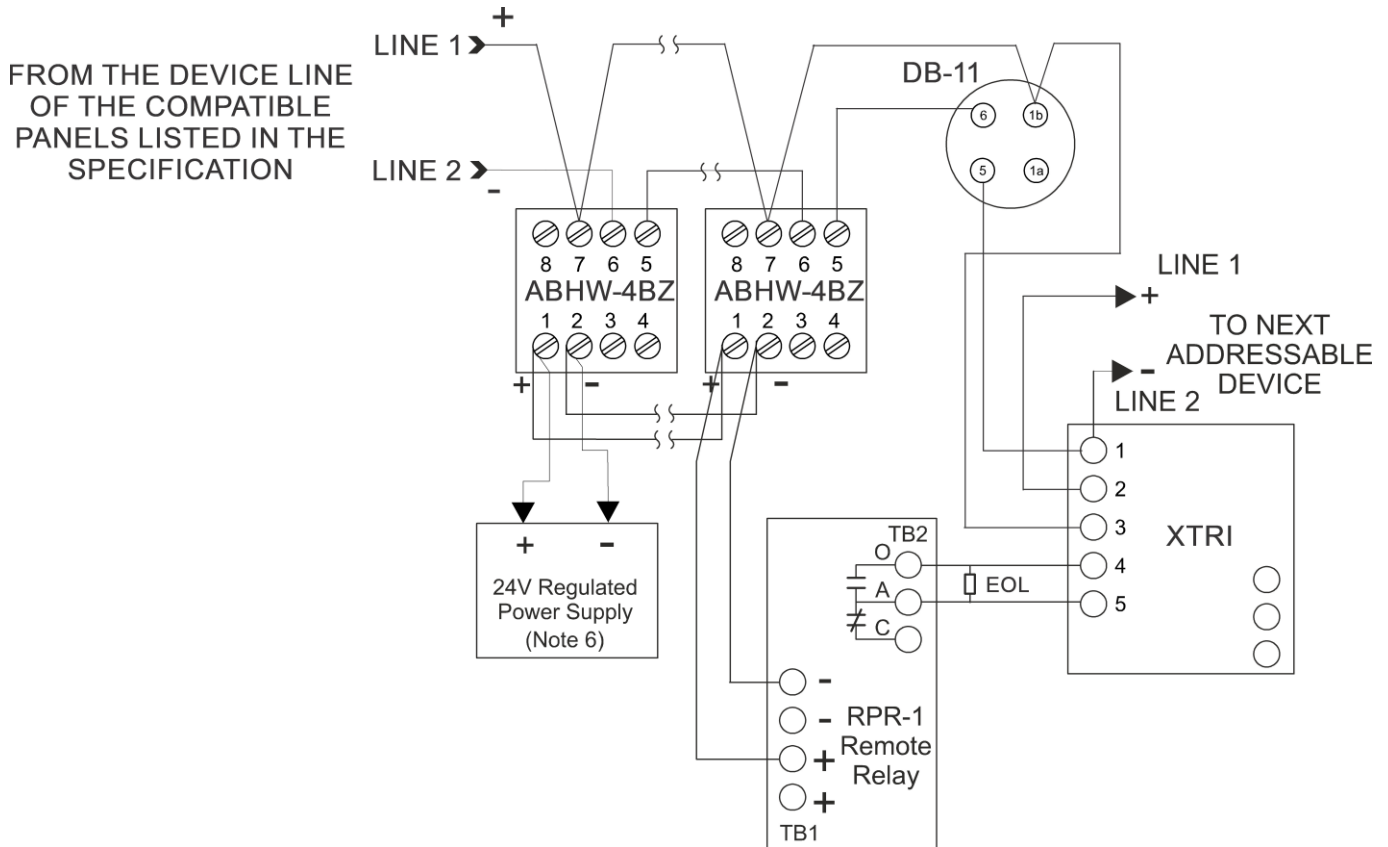


Fig. 4: Typical Isolated Installation/Wiring Diagram for ABHW-4BZ Audible Base Powered by 24V Regulated Power Supply

Figure 3 and 4 Notes:

1. RPR-1 remote relay and HTRI or XTRI are used for 24 VDC power supervision. 24 VDC wire open will cause trouble reported by HTRI. Refer to Installation Instruction of RPR-1 (315- 096055).
2. ABHW-4B terminals 5-6 are polarity insensitive. Line 1 and Line 2 can be either line of device loop.
3. EOL device of HTRI: 3.6 K, 1/4 W resistor, P/N 140-820185.
EOL device of HTRI: 470 Ohm, 1/4 W resistor, P/N 140-820164.
EOL device of XTRI: 470 Ohm, 1% 1/2 W Resistor, P/N A5Q00073045.
4. ABHW-4B can be wired either Style Z (Class A) or Style Y (Class B).
5. For the max load current, refer to the specifications of the compatible panels listed in this document.
6. The 24 VDC regulated power supply could be the Aux Power Output from the compatible panels, or from PAD-3/PAD-4/PAD-5, or other UL listed 24 VDC regulated power supply. 24 V FWR power supply cannot be allowed.

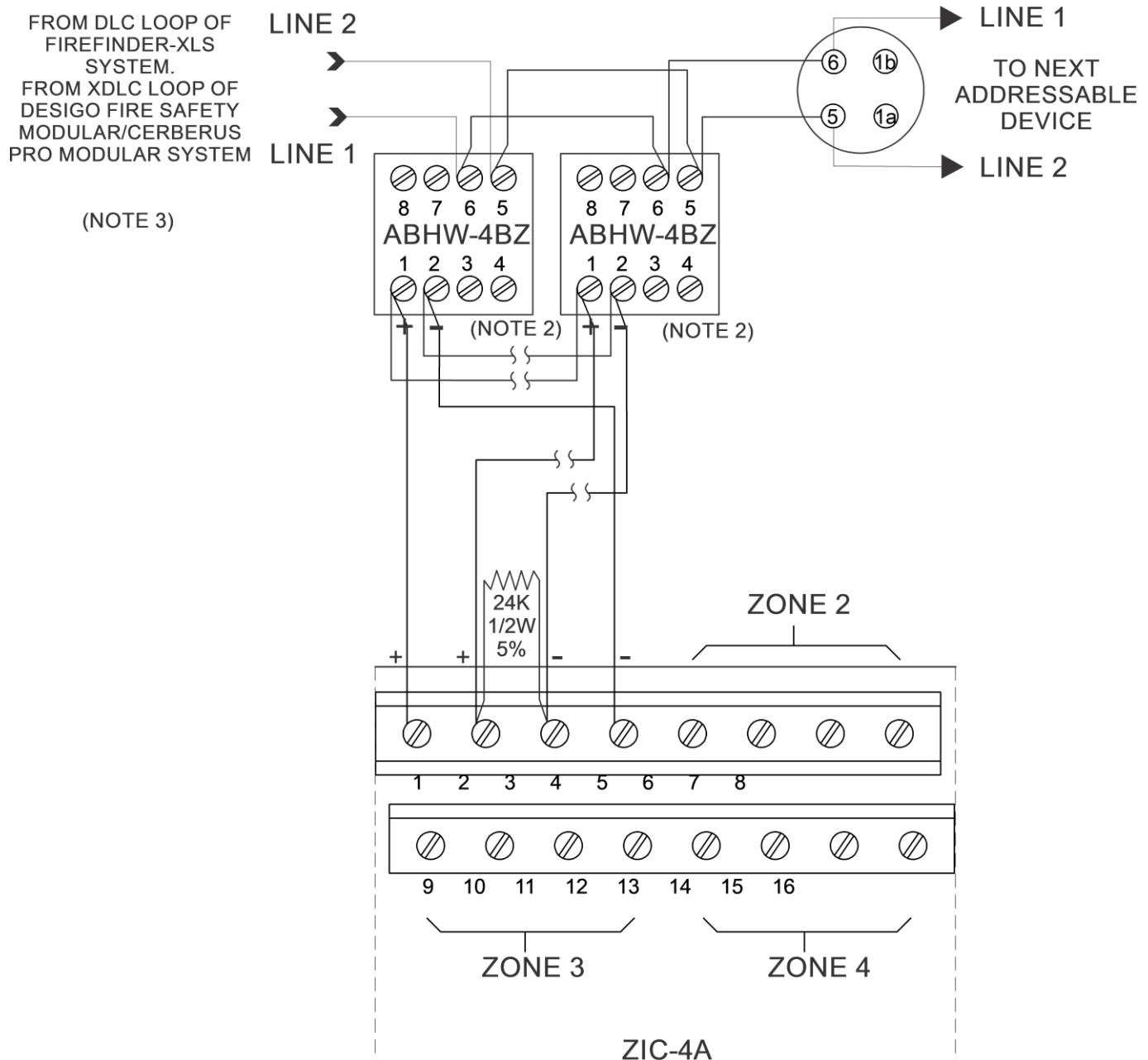


Fig. 5: Installation/Wiring Diagram for ABHW-4BZ Audible Base Powered by ZIC-4A(NAC of FireFinder-XLS/ Desigo Fire Safety Modular/Cerberus PRO Modular System)

Figure 5 Notes:

1. Polarity shown in active state at terminals 1 and 2 of ABHW-4B and 1-4 of ZIC-4A. Proper polarity must be maintained, or the audible base will not operate properly. Each audible base must be tested to verify operation.
2. Tone selection (Refer to page 13, Notes 2 and 3, for more information).
3. ABHW-4B terminals 5-6 are polarity insensitive. Line 1 and Line 2 can be either line of the loop. Non-Isolated wiring shown.
4. ABHW-4B shown Style Z (Class A). It may also be wired as Style Y (Class B).
5. ZIC-4A Notification Appliance Circuits provide 4 outputs that can be configured for Class A. or Class B. Refer to the ZIC-4A Installation Instructions, P/N 315-033050.

6. EOL resistor, 24 k ohms, 1/2 watt, 5%, P/N 140-820405.
7. NAC circuit does not provide isolation.

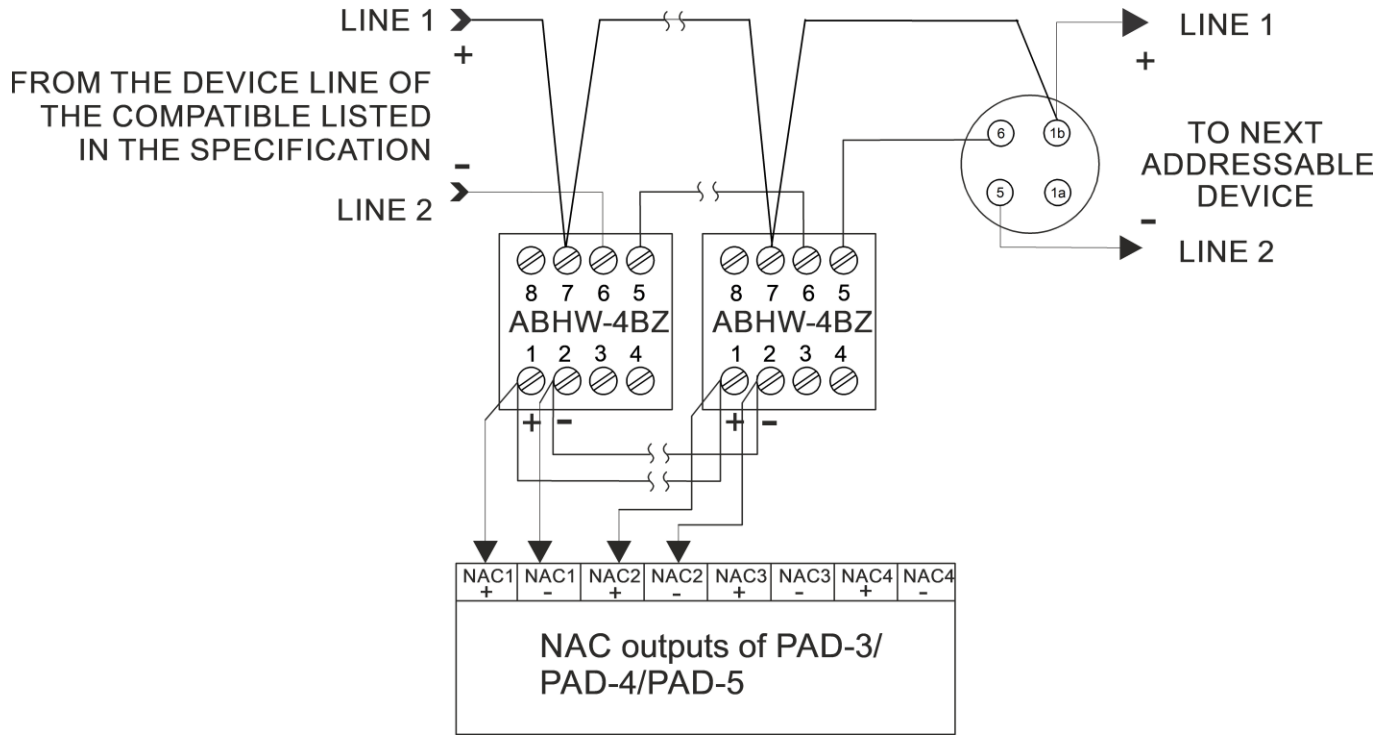


Fig. 6: Typical Isolated Installation/Wiring Diagram for ABHW-4BZ Audible Base Powered by NAC of PAD-3/PAD-4/PAD-5 system

Figure 6 Notes:

1. The NAC circuit shown in the diagram is the active state at terminal 1 and 2 of ABHW-4B.
2. ABHW-4B terminals 5-6-7 are polarity sensitive. Isolated wiring shown.
3. The wiring at NAC of PAD-3/PAD-4/PAD-5 shown in the diagram for ABHW-4B is Style Z (Class A)(No EOL needed). If Style Y (Class B) wiring is used at NAC output, an EOL (24 K, 0.5 W resistor) must be used.
4. For the max load current and max cable resistance, refer to the specifications of PAD3/PAD-4/PAD-5, P/N: 315-099082/315-050217/A6V101030358.
5. NAC circuit does not provide isolation.

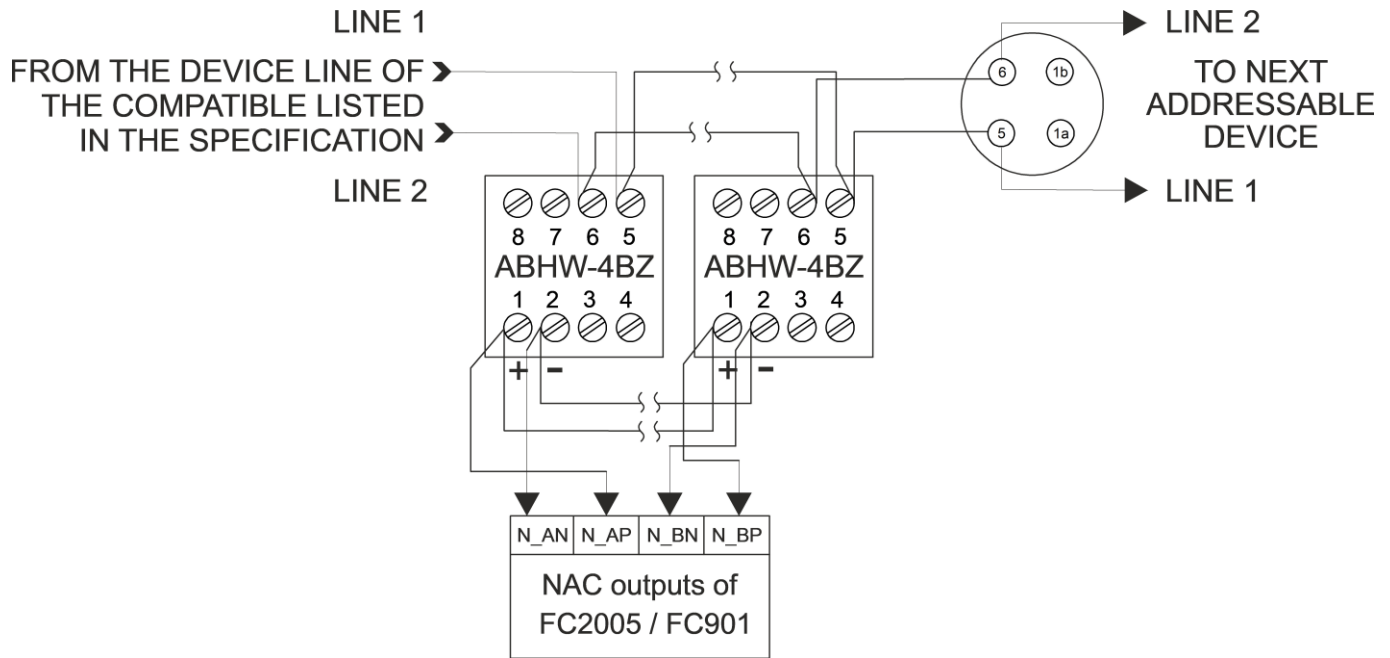


Fig. 7: Installation/Wiring Diagram for ABHW-4BZ Audible Base Powered by NAC of FC2005/FC901

Figure 7 Notes:

1. The NAC circuit shown in the diagram is the active state at terminal 1 and 2 of ABHW-4B.
2. ABHW-4B terminals 5-6 are polarity insensitive. Line 1 and Line 2 can be either line of device loop. Non-Isolated wiring shown.
3. The wiring at NAC of FC2005/FC901 shown in the diagram for ABHW-4B is Style Z (Class A) (no EOL needed). If Style Y (Class B) wiring is used at NAC output, EOL (24 K, 0.5 W resistor) must be used.
4. For the max load current and max cable resistance, refer to the specifications of FC2005/FC901.

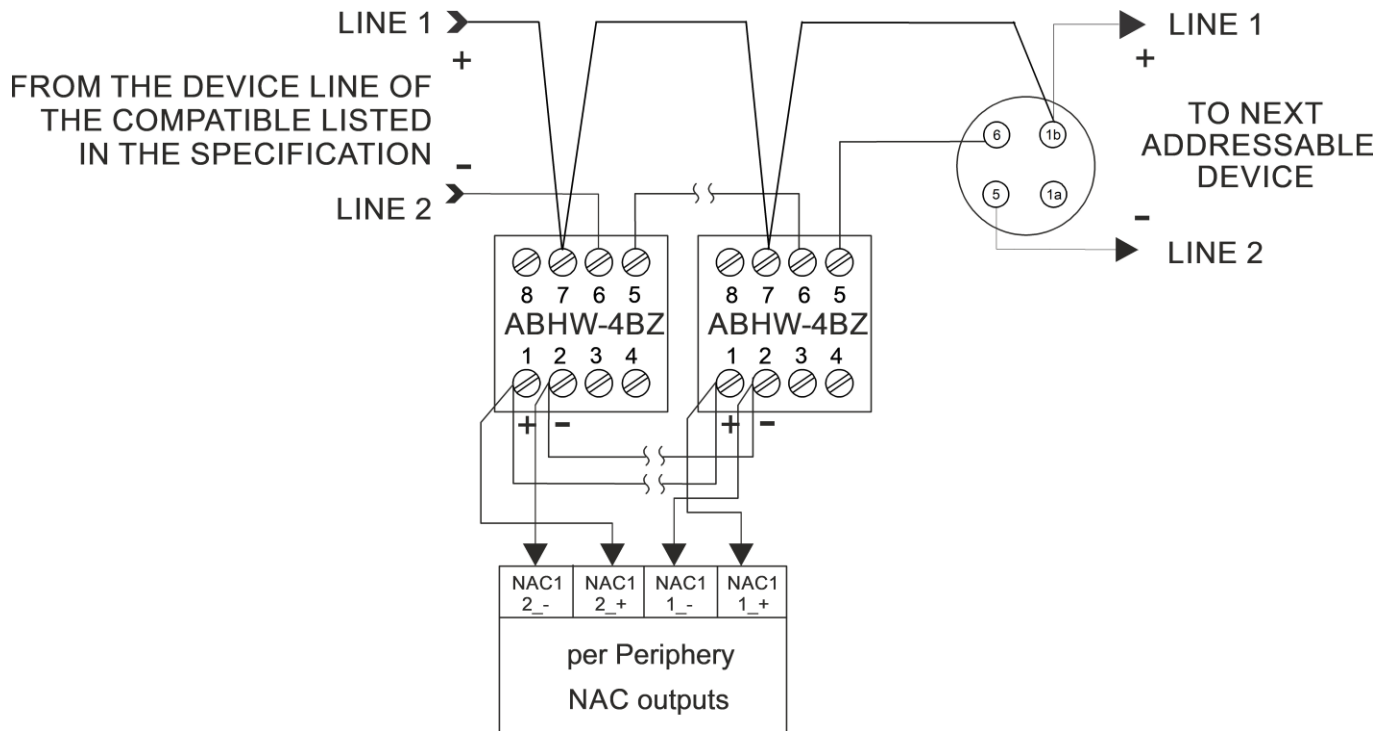


Fig. 8: Isolated Installation/Wiring Diagram for ABHW-4BZ Audible Base Powered by NAC of FC2025/FC2050/FV2025/FV2050 and FC922/FC924/FV922/FV924

Figure 8 Notes:

1. The NAC circuit shown in the diagram is the active state at terminal 1 and 2 of ABHW-4B.
2. ABHW-4B terminals 5-6-7 are polarity sensitive. Isolated wiring shown.
3. The wiring at NAC of FC2025/FC2050/FV2025/FV2050 and FC922/FC924/FV922/FV924 shown in the diagram for ABHW-4B is Style Z (Class A) (no EOL needed). If Style Y (Class B) wiring is used at NAC output, EOL (2.4 K, 0.5 W resistor) must be used.
4. For the max load current and max cable resistance, refer to the specifications of FC2025/FC2050 /FV2025/FV2050 and FC922/FC924/FV922/FV924.
5. NAC circuit does not provide isolation.

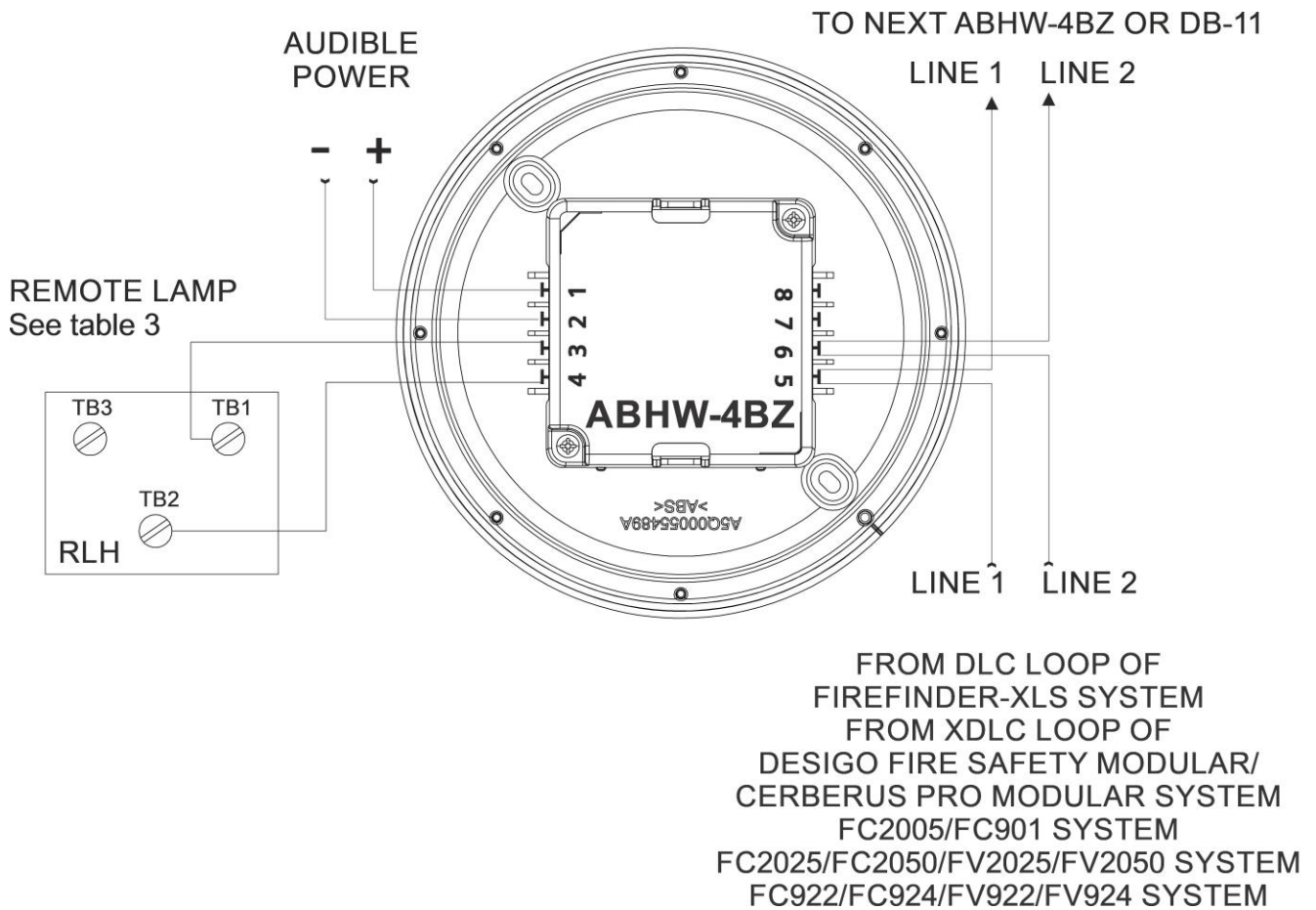


Fig. 10: ABHW-4BZ Audible Base Terminal Blocks (only for FDO421, FDOT421, FDT421, FDOOT441, FDOOTC441, OP921, OH921, HI921, OOH941 and OOH941 detectors.)

Figure 10 Notes:

- The ABHW-4B terminal 3 should be connected to RL-HC/RL-HW TB1
- The ABHW-4B terminal 4 should be connected to RL-HC/RL-HW TB2 or TB3

**ALARM LED LOCATION
WITH DETECTOR
INSTALLED IN BASE**

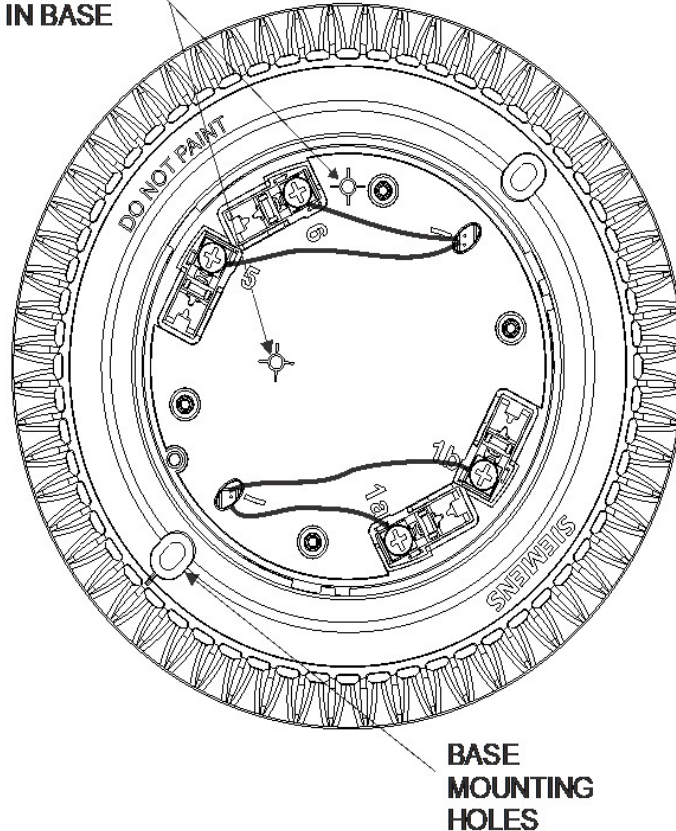


Fig. 11: Positioning the Alarm LED

Figure 11 Notes:

1. When installing FD-UL detectors in a FireFinder-XLS panel, use the following panel versions
 - PMI version 10.02 or later
 - Zeus version 10.02 or later
 - DLC version 06.01 or later
2. When the audible base ABHW-4B works with FD-UL series detectors. Up to 6 tone patterns and 2 volume levels can be selected by user with system configuration tool; there are two power types for ABHW-4B during alarm, “Loop Powered” and “External Powered” which can be configured by system tool.
3. When the audible base ABHW-4B works with H-series detector Only “External Powered” can be used. A fixed 85dB tone is provided and only 2 tones can be selected (steady and Temporal 3, refer to Figure 9): Steady: without a jumper at terminals 3 and 4: Temporal 3: terminals 3 and 4 are shorted with jumper.
4. When using “External Powered” for alarm, the ABHW-4B still takes some power from loop during both supervision and alarm status to keep it alive and external power is only for the alarm current.
5. For additional information on the modules used in an individual system, refer to the Installation Instructions for that particular module or contact your authorized Siemens Industry, Inc. representative.

1.11 APPENDIX A

1. The max. number of loop powered ABHW-4B audible bases in one device loop depends on the available load current for ABHW-4B audible bases. The available load current for loop powered ABHW-4Bs (I) can be calculated by:

$$I = I_{\max} - I_d$$

In which, I_{\max} is the max load current in one loop under the worst-case scenario with 50 Ω cable resistance. I_d is the total load current for the devices loaded in the loop.

2. The max. number of loop powered ABHW-4B for the worst-case scenario (All detectors wired at the end of 50 ohm cable)

Detector Loaded in one DLC	Current available for ABHW-4B	Max number of loop powered ABHW-4B	
		High dBA	Low dBA
252 FD-UL detectors	181 mA	24	40
252 H-series detectors	Note	Note	Note
100 FD-UL detectors and 152 H-detectors	110 mA	14	24



Loop power cannot be used for ABHW-4B with H-series detectors; the external power must be used.

3. How to calculate the max. number of loop powered ABHW-4B.

Step 1:

Calculate the total load current (I_d) for the devices loaded in the device line using the current rating of each device including accessories.

Example:

Current load of 100 FDOT421 detectors = $0.28 \text{ mA} \times 100 = 28 \text{ mA}$

Current load of 152 HFP-11 detectors = $0.75 \text{ mA} \times 152 = 114 \text{ mA}$

Step 2:

Find out the max. device load current (I_{\max}) of device line card at worst case from the user manual of the panel.

Example: For DLC in XLS systems, XDLC in Desigo Fire Safety Modular/Cerberus PRO Modular systems, 252 H-series devices can be loaded at the end of 50 ohms max. line resistance (the worst case) and max. load current is 252 mA (I_{\max}).

Step 3:

Find out the available load current (I) for loop powered ABHW-4B audible bases.

$$I = I_{\max} - I_d$$

Example: If 100 FDOT421/OH921 and 152 HFP-11 detectors are loaded at the end of a 50 ohm cable, $I = 252 - 142 = 110 \text{ mA}$

Step 4:

Find out the max. alarm current rating for the loop powered ABHW-4B (I_a). Find out the max. number of the loop powered ABHW-4B using the charts above, or it is equal to (I/I_a) .

Example: If all ABHW-4Bs are set to Low volume, the max. number of loop powered ABHW-4Bs is 24 (from Figure 13). The max. current rating of ABHW-4B is 4.5mA (from electronic ratings). The max. number of loop powered ABHW-4Bs is equal to $110 \text{ mA} / 4.5 \text{ mA} = 24$. If all ABHW-4Bs are set to high volume, the max. number of loop powered ABHW-4Bs is 14 (from Figure 12). The max. current rating of ABHW-4B is 7.5 mA. The max. number of loop powered ABHW-4Bs is equal to $110 \text{ mA} / 7.5 \text{ mA} = 14$.

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