INSTALLATION AND MAINTENANCE INSTRUCTIONS

EXITPOINT

SYSTEM SENSOR®

6581 Kitimat Road, Unit 6
Mississauga, Ontario. L5N-3T5
www.systemsensor.ca

PF24VA Directional Sounder with Voice Messaging

Specifications

Mechanical

Input terminals:	12 – 24 AWG
Sounder size:	4 inches (101mm)
Grille Size:	4 7/8″ (127mm)

Electrical

Voltage Input:	Regulated 24 Volts DC
Operation Voltage Range:	16 to 33 Volts
Operating Humidity Range:	10% to 93% relative humidity non-condensing
Frequency range:	707 Hz to 11314 Hz
Operating Temperature range:	32° to 120°F (0° to 49°C)
Power:	Selectable Low, Med-Low, Medium, Medium-High, High
Listings:	ULC

NOTICE: This manual should be left with the owner/user of the equipment.

General Description

Before installing, please read the Directional Sound Applications Guide, available through System Sensor. The installation must meet the requirements of the authority having jurisdiction, CAN/ULC S524 and CSA C22.1. Directional sounders are used as supplemental signals on a fire alarm system to aid in the evacuation of building occupants. Although directional sounders may be connected to notification appliance circuits (NAC) for fire alarm service, they are not a replacement for audible or visible notification appliances as required by the authority having jurisdiction.

The directional sounder can be installed in systems using 24 Volt DC regulated power supplies only. It is not approved for use with FWR unregulated power supplies.

Directional sound is a broadband, multi-frequency sound. The sound source is easily and quickly located by building occupants, making it ideal for rapid building evacuation. The sounder incorporates four different speed settings which consist of broadband noise. The four speed settings can be used to create an egress pathway out of a building. The speed setting should be set faster for units installed at the perimeter exit. In addition to the broadband noise, the sounder is capable of playing an alert message in the form of a recorded voice message or other audible signals. These messages will instruct the occupant of what action to take as they approach the directional sounder. The voice messages include: exit here, stairs up, stairs down, or area of refuge.

Speed settings are made via DIP switches on the back of the sounder.

Power Supply Considerations for Directional Sounders

Panels typically supply DC filtered voltage or FWR (full-wave rectified) voltage. This device is only compatible with DC filtered supplies and must not be used with panel supplies that are FWR. Be certain the sum of all the device currents do not exceed the current capability of the panel power supply. Calculations are based on using the device current found in **Table 1** and must be the current specified for the installed settings of the device.

Wire Sizes

The last device on the circuit must have sufficient voltage to operate the device within its rated voltage range. When calculating the voltage available to the last device, it is necessary to consider the voltage drop due to the resistance of the wire. The thicker the wire, the less the voltage drop. Generally, for purposes of determining the wire size necessary for the system, it is best to consider all of the devices as “lumped” on the end of the supply circuit (simulates “worst case”).

Typical wire size resistance:

18 AWG solid:	Approximately 8 ohms/1,000 ft.
16 AWG solid:	Approximately 5 ohms/1,000 ft.
14 AWG solid:	Approximately 3 ohms/1,000 ft.
12 AWG solid:	Approximately 2 ohms/1,000 ft.

Example: Assume you have 10 devices on a zone and each requires 50mA average and 2000 ft. of 14 AWG wiring (total length = outgoing + return). The voltage at the end of the loop is 0.050 Amps per device × 10 devices × 3 ohms/1000 ft. × 2000 ft. = 3 volts drop.

The same number of devices using 12 AWG wire will produce only a 2 volt drop. The same number of devices using 18 AWG wire will produce an 8 volt drop. Consult your panel manufacturer's specifications, as well as the sounder's operating voltage to determine the acceptable voltage drop.

NOTE: If class "A" wiring is installed the wire length may be up to 4 times the single wire length in this calculation.

Table 1. Current Draw Measurements and Sound Output Guide:

Speed Selection		Power Setting	Maximum DC Operating Current (mA RMS) (16 to 33V)	Audibility (dBA) (16 to 33V) Note 1	Audibility (dBA) (16 to 33V) Note 2
Speed	DIP Switch Selection				
FAST (exit)	10	High	185	98	75
FAST (exit)	10	Med-High	131	95	72
FAST (exit)	10	Med	78	92	69
FAST (exit)	10	Med-Low	76	89	66
FAST (exit)	10	Low	64	86	63
MED-FAST	9	High	170	98	74
MED-FAST	9	Med-High	124	95	71
MED-FAST	9	Med	75	93	68
MED-FAST	9	Med-Low	73	90	65
MED-FAST	9	Low	62	87	62
MED-SLOW	8	High	160	97	73
MED-SLOW	8	Med-High	104	95	70
MED-SLOW	8	Med	76	92	67
MED-SLOW	8	Med-Low	65	89	64
MED-SLOW	8	Low	57	87	61
SLOW	7	High	163	98	72
SLOW	7	Med-High	103	95	69
SLOW	7	Med	76	92	66
SLOW	7	Med-Low	61	89	63
SLOW	7	Low	61	86	60

NOTE 1: Sound output measured in an anechoic room at 10 feet.

NOTE 2: Sound output measured in a reverberant room at 10 feet.

Installation

Consult the *Directional Sound Applications Guide* (A05-1048-XXX) for information regarding the appropriate mounting locations of directional sounders.

DIP Switches for Speed Settings

DIP switch positions 7-10 are used to select the speed setting of the sounder. Switch 10 is the fastest speed and is used to mark perimeter exits and stairwells. The remaining settings are used for egress guidance to the perimeter exits. The egress route would begin with the slow setting (switch 7) and follow medium fast (switch 9) and medium slow (switch 8) and finally the fast setting (switch 10). If more than one switch is selected the sounder will default to the fastest setting.

DIP Switch Settings for Alerting Messages

DIP switch positions 5 and 6 are used to select additional tone pulses that can be inserted between bursts of directional sound pulses. These messages are used to give building occupants instructions. There are four messaging options to choose from. "Stairs Up" (Switch 5 off, Switch 6 on) will notify occupants that they are approaching a stairwell and will need to go up. "Stairs Down" (Switch 5 on, Switch 6 off) will notify occupants that they are approaching a stairwell and will need to go down. "Area of Refuge" (Switches 5 & 6 on) alerts people who need to find these areas of refuge in a building. "Exit Here" (Switches 5 & 6 off) notifies occupants that they have reached the perimeter exit.

Table 2. Additional Tone Selection Guide:

DIP Switch Position 5 Setting	DIP Switch Position 6 Setting	Sound Output
on	on	Area of Refuge
on	off	Stairs DOWN
off	on	Stairs UP
off	off	Exit Here

DIP switch setting 4 enables a directional sound device to become disabled when used in conjunction with devices with dry contacts such as heat sensors or control modules. The sounder has a set of input terminals that can be configured for an "active open" or "active closed" state. When the switch is in the "on" position, the sounder is "on" when the disable connection is closed. When the switch is in the "off" position, the sounder is "on" when the disable connection is open. See **Table 3** for operation modes.

Table 3. Enable/Disable Function Logic Table:

DIP Switch Position 4 Setting	Wiring Terminals 3 & 4	Sound Output
on	open	disabled
on	closed	enabled
off	open	enabled
off	closed	disabled

There are five different power settings for the sound output pressure. Switch settings 1, 2, and 3 set the power setting for the sounder. Switch 1 selects the Med-High setting, switch 2 selects the Medium setting, switch 3 selects the Med-Low setting. If all three switches are "off" this selects the High setting and if all three switches are "on" this selects the Low setting.

Directional Characteristics are as follows:

-3dBA angles- 40, 130 horizontal and vertical

-6dBA angles- 15, 160 horizontal and vertical

Table 4. Power Setting Guide:

DIP Switch Position 1 Setting	DIP Switch Position 2 Setting	DIP Switch Position 3 Setting	Power Setting
off	off	off	High
on	off	off	Med-High
off	on	off	Med
off	off	on	Med-Low
on	on	on	Low

NOTE 1: Any other combinations of switch setting for positions 1, 2, and 3 are invalid and should not be used.

Consult the *Directional Sound Applications Guide* for information regarding the appropriate power, speed, and additional tone selections.

Language Selection

Language selection and audible tones are selected via the rotary code switch. If no language is selected, the device is capable of playing audible tones to alert occupants of stairs up, stairs down, and area of refuge. Refer to **Table 5** language selection and **Figure 3** for diagram.

Table 5. Language/audible tone selection guide:

Rotary Switch Selection	Tone/Language
0	Audible tone/sweep
1	English
2	Spanish
3	French
4	English/Spanish
5	English/French
6	Korean
7	Cantonese
8	Mandarin
9	English/Cantonese
10	English/Mandarin
11	Cantonese/Mandarin
12	English/Korean
13	English/Portuguese
14	English/Russian
15	English/Polish

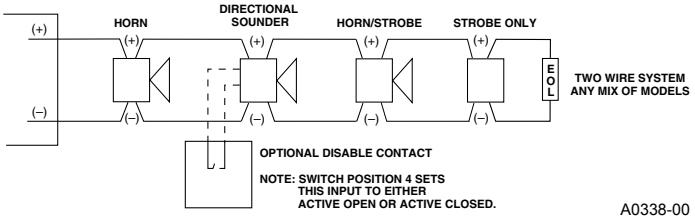
Electrical

Connect the Sounder as shown in **Figure 1** for 2-wire applications. Connect the sounder as shown in **Figure 2** for 4-wire applications.

4-wire notification appliance circuits are circuits that use a separate power supply and pair of wires for sounder and strobe circuits. Some types of notification circuits may provide coded signals to the sounders by pulsing the power supply on and off in specific patterns such as the temporal 3 evacuation signal. The directional sounders should not be connected to 4-wire sounder circuit power supplies where coded signals are used to pulse the sounders. Directional sounders may be used in conjunction with sync modules such as the System Sensor MDLA.

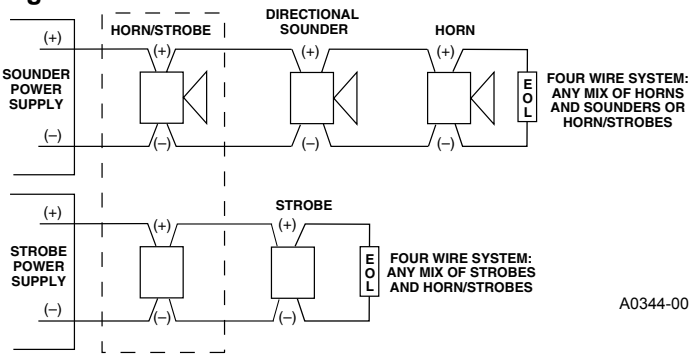
All wiring must be installed in compliance with the Canadian Electrical Code and applicable local codes as well as special requirements of the authority having jurisdiction.

Figure 1.



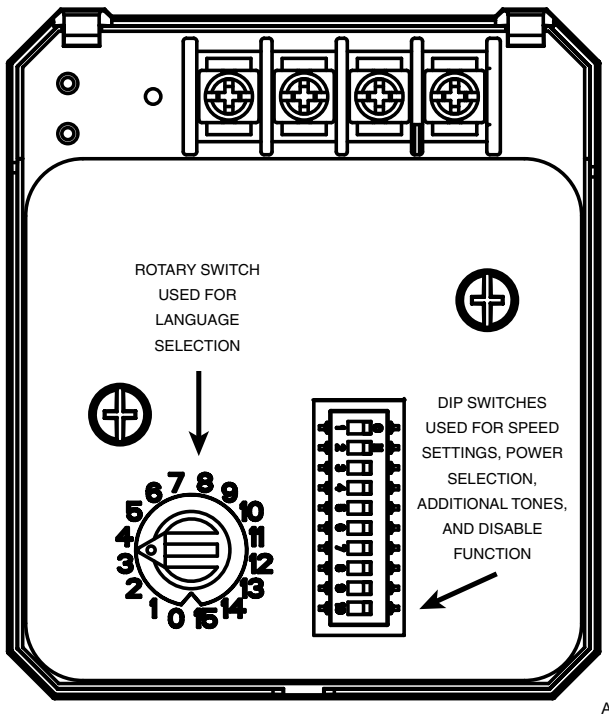
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Figure 2.



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Figure 3.

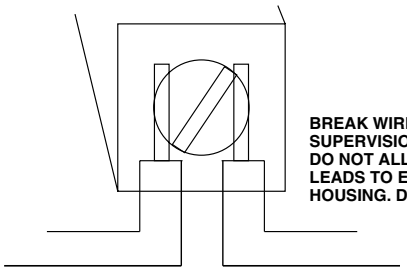


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NOTE: DO NOT loop electrical wiring under terminal screws. Wires connecting the device to the control panel must be broken at the device terminal connection in order

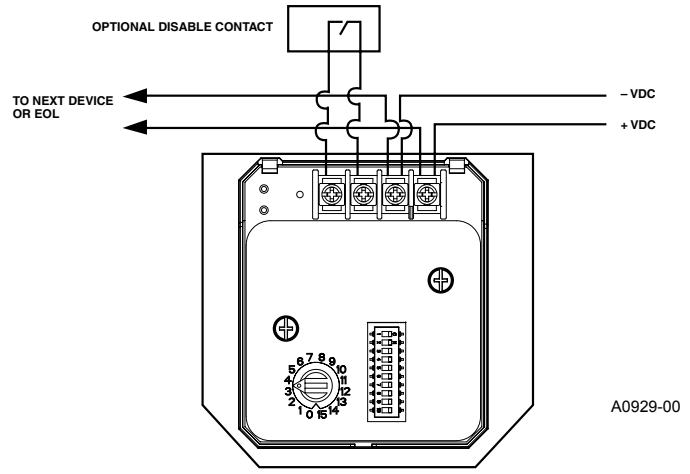
to maintain electrical supervision. See **Figure 4**.

Figure 4.



The sounder has a set of input terminals to provide additional control of the sound output of the directional sounder. These terminals can be connected to the dry relay contacts of control devices such as heat sensors or control modules. When the input is active it will disable the sound output of the Sounder. Connect the disable function as shown in **Figure 5**. Refer to **Table 3** for function switch settings.

Figure 5.



Mechanical

Two screws are included for attaching the sounder to the electrical junction box.

NOTE: If surface mounting is required, an extension ring will be necessary to give proper depth for mounting the sounder. The minimum depth required, in the backbox/extension ring combination, is 2 1/4″. Any combination of 4″ × 4″ backbox and 4″ × 4″ extension ring that gives an interior depth of at least 2 1/4″ may be used.

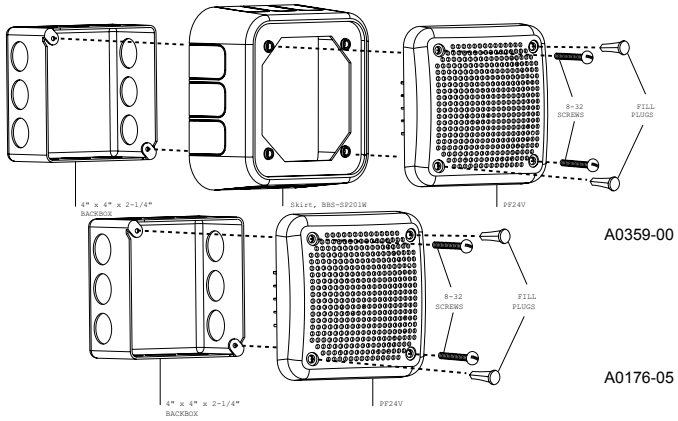
Mounting

See **Figure 6**. The sounder can be flush mounted on a 4″ × 4″ × 2 1/4″ back box, as follows:

A. Use the two 8-32 × 1 3/4″ screws (provided) to attach the Sounder to the back box.

B. Plug the remaining two holes that will not be used for attachment with the plugs provided.

Figure 6.



Please refer to insert for the Limitations of Fire Alarm Systems

⚠WARNING

The Limitations of Directional Sounders

The directional sounder will not work without power. The directional sounder gets its power from the fire/security panel monitoring the alarm system. If power is cut off for any reason, the directional sounder will not provide the desired audio warning.

The directional sounder may not be heard. The directional sounder may not be heard if it is placed on a different floor from the person in hazard or if placed too far away to be heard over the ambient noise such as traffic, air conditioners, machinery or music appliances that may prevent alert persons from hearing the sounder. The Sounder may not be heard by persons who are hearing impaired.

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: System Sensor, Returns Department, RA #_____, 6581 Kitimat Road, #6, Mississauga, Ont. L5N-3T5. 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.

FCC Statement

NOTE: Directional Sounder has been tested and found to comply with the limits for a Class A digital device pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This Class B Digital Apparatus complies with Canadian ICES-003.