



**SYSTEM
SENSOR®**



6581 Kitimat Rd., Unit #6, Mississauga, Ontario, L5N 3T5

1-800-SENSOR2, FAX: 905-812-0771

Selectable Output Strobes, Horns, and Horn/Strobes

www.systemsensor.ca

For use with the following models: P2RA, P2RHA, P2RKA, P2RHKA, P2WA, P2WHA, P4RA, P4RHA, P4RKA, P4RHKA, P4WA, P4WHA, SRA, SRHA, SRKA, SRHKA, SWA, SWHA, PC2RA, PC2RHA, PC2RKA, PC2RHKA, PC2WA, PC2WHA, PC4RA, PC4RHA, PC4RKA, PC4RHKA, PC4WA, PC4WHA, SCRA, SCRHA, SCRKA, SCRHKA, SCWA, SCWHA, HRA, HRKA

Add suffix “-F” for French, “-B” for bilingual

Also use for P2WA-P, P2WHA-P, SWA-P, SCWA-P and SWHA-P plain models (not ULC listed)

Product Specifications

Operating Temperature:	Standard Products	0°C to 49°C (32°F to 120°F)
	K Series	-40°C to 66°C (-40°F to 151°F)
Humidity Range:	Standard Products	10 to 93% non-condensing
	K Series	10 to 98% non-condensing (Meets NEMA 4X requirements)
Strobe Flash Rate:		1 flash per second
Nominal Voltage:		Regulated 12VDC/FWR or regulated 24DC/FWR
Operating Voltage Range (includes fire alarm panels with built in sync):		8 to 17.5V (12V nominal) or 16 to 33V (24V nominal)
Operating Voltage with MDLA Sync Module:		9 to 17.5V (12V nominal) or 17 to 33V (24V nominal)
Input terminal wire gauge:		12 to 18 AWG

NOTE 1: Strobes will operate at 12 V nominal for 15 & 15/75 candela settings only. Switching between ranges is automatic.

Dimensions for Products and Accessories

WALL PRODUCTS	LENGTH	WIDTH	DEPTH	CEILING PRODUCTS	DIAMETER	DEPTH
Strobes and Horn/Strobes (including lens)	5.6"	4.7"	2.5"	Strobes and Horn/Strobes (including lens)	6.8"	2.5"
	142 mm	119 mm	64 mm		173 mm	64 mm
Horns	5.6"	4.7"	1.3"	SA-WBBC Weatherproof Back Box	7.1"	2.0"
	142 mm	119 mm	33 mm		180 mm	51 mm
SA-WBB Weatherproof Back Box	5.7"	5.1"	2.0"	BBSC-2 BBSCW-2 Back Box Skirt	7.1"	2.2"
	145 mm	130 mm	51 mm		180 mm	57 mm
BBS-2 BBSW-2 Back Box Skirt	5.0"	5.9"	2.2"	NOTE: SA-WBB and SA-WBBC dimensions do not include the two mounting tabs		
	130 mm	152 mm	57 mm			

Mounting Box Options

2-Wire Indoor Products	4-Wire Indoor Products	K Series Products
4 × 4 × 1.5, Single Gang, Double Gang, 4" Octagon	4 × 4 × 1.5, Double Gang, 4" Octagon	SA-WBB (wall), SA-WBBC (ceiling)

NOTICE: This manual shall be left with the owner/user of this equipment.
General Description

The SpectrAlert Advance series of notification appliances offers a wide range of horns, strobes, and horn/strobes, for wall and ceiling applications, indoors and outdoors. They are designed to be used in 12 or 24 volt, DC or FWR (full wave rectified) systems. These products are electrically backward compatible with the previous generation of SpectrAlert notification appliances. Horn/strobe products are available in two versions. The 2-wire products fit systems where a single NAC controls both horn and strobe. The 4-wire products are intended for systems which have separate wiring circuits for the horn and strobe. All SpectrAlert Advance products are suitable for use in synchronized systems. The System Sensor MDLA module may be used to provide synchronization.

K Series products are designed to be used over a wider range of temperatures and are suitable for use in wet locations.

Wall and ceiling products may be used interchangeably (wall products may be used on the ceiling and ceiling products may be used on the wall.)

The products in this manual may be covered by one or more of the following patents:

5,914,665; 5,850,178; 5,598,139; 6,049,446; 6,522,261; 6,661,337; 6,822,400; 6,833,783; 6,856,241, 7,053,766

Fire Alarm System Considerations

The National Building Code and CAN/ULC S525, requires that all horns, used for building evacuation produce temporal coded signals. Signals other than those used for evacuation purposes do not have to produce the temporal coded signal. System Sensor recommends spacing notification appliances in compliance with CAN/ULC S524.

Loop Design and Wiring

The system designer must make sure that the total current drawn by the devices on the loop does not exceed the current capability of the panel supply, and that the last device on the circuit is operated within its rated voltage. The current draw information for making these calculations can be found in the tables within this manual. For convenience and accuracy, use the voltage drop calculator on the System Sensor website (www.systemsensor.com) or CD-ROM.

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 smaller the voltage drop. Wire resistance tables can be obtained from electrical handbooks. Note that if Class A wiring is installed, the wire length may be up to twice as long as it would be for circuits that are not fault tolerant. Wiring is to be accordance with CSA C22.1 Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations, Sec. 32

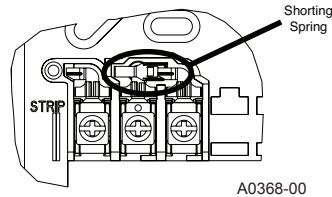
WIRING DIAGRAMS

NOTE: For 24 volt applications, the total number of strobes on a single NAC must not exceed 40, with a maximum loop resistance of 120 ohms. For 12 volt applications, the total number of strobes must not exceed 12, with a maximum loop resistance of 30 ohms.

For 4-Wire installations, terminals 1, 2, and 3 connect to the strobe; terminals 4 and 5 connect to the horn. The horn and strobe circuits must be wired independently, and each circuit must be terminated with the appropriate EOL device. Removal of a notification device will result in an open circuit indication on the strobe loop.

NOTE: A shorting spring is provided between terminals 2 and 3 of the mounting plate to enable wiring checks after the system has been wired, but prior to installation of the final product. This spring will automatically disengage when the product is installed, to enable supervision of the final system.

Figure 3. Shorting Spring:



Candela Selection

Adjust the slide switch on the rear of the product to position the desired candela setting in the small window on the front of the unit. All products meet the light output profiles specified in the appropriate ULC Standards. For K series products used outdoors at low temperatures, listed candela ratings must be reduced in accordance with Table 2. Use Table 1 to determine the current draw for each candela setting.

NOTE: SpectrAlert products set at 15 and 15/75 candela automatically work on either 12V or 24V power supplies. The products are not listed for 12V operating voltages when set to any other candela settings. For 4-Wire products, total current draw may be determined by adding current draw for the specific candela selection in Table 1 with the current draw for the specific horn selection in Table 3.

Table 1. Strobe Current Draw (mA) for S, SC, P4 & PC4 Series:

	Candela	8–17.5 Volts		16–33 Volts	
		DC	FWR	DC	FWR
Standard Candela Range	15	123	128	66	71
	15/75	142	148	77	81
	30	NA	NA	94	96
	75	NA	NA	158	153
	95	NA	NA	181	176
	110	NA	NA	202	195
High Candela Range	115	NA	NA	210	205
	135	NA	NA	228	207
	150	NA	NA	246	220
	177	NA	NA	281	251
	185	NA	NA	286	258

Figure 1. Wiring 2-Wire Products:

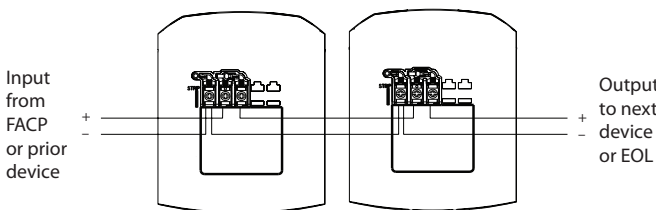


Figure 2. Wiring 4-Wire Products:

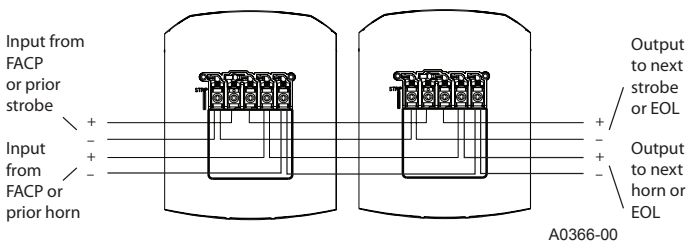


Table 2. Candela Derating:

Listed Candela	Candela rating at –40°F (K Series Outdoor Applications Only)
15	Do not use below 32°F
15/75	
30	
75	44
95	70
110	110
115	115
135	135
150	150
177	177
185	185

Horn Selection

Turn the rotary switch on the back of the product to the desired setting. For horn and 4-wire horn/strobe products, the current draw for each setting is listed in Table 3. For 2-wire horn/strobe products (P2 series), current draws are listed in Tables 4 and 5. The sound output measurement for each horn setting is shown in Table 6.

Table 3. Horn Current Draw (mA) for H, P4 & PC4 Series:

Pos	Sound Pattern	dB Out	8–17.5 Volts		16–33 Volts	
			DC	FWR	DC	FWR
1	Temporal	High	57	55	69	75
2	Temporal	Medium	44	49	58	69
3	Temporal	Low	38	44	44	48
4	Non-temporal	High	57	56	69	75
5	Non-temporal	Medium	42	50	60	69
6	Non-temporal	Low	41	44	50	50
7	Coded	High	57	55	69	75
8	Coded	Medium	44	51	56	69
9	Coded	Low	40	46	52	50

NOTE: In positions 7, 8, and 9, temporal coding must be provided by the NAC. If the NAC voltage is held constant, the horn output will remain constantly on. Positions 7, 8, and 9 are not available on 2-wire horn/strobe products.

WARNING: Finish is not to be painted or altered in any way.

Mounting Indoor Wall or Ceiling Products

1. Attach mounting plate to junction box as shown in Figures 4 and 5. The mounting plate is compatible with 4" square, double gang, and 4" octagon junction boxes (2-wire products may be used with a single gang box). If using a back box skirt, attach the mounting plate to the skirt and then attach the entire assembly to the junction box (see Figures 6 and 7).
2. Connect field wiring to terminals, as shown in Figures 1 and 2.
3. If the product is not to be installed at this point, use the paint cover to prevent contamination of the mounting plate.
4. To attach product to mounting plate, remove the paint cover, then hook tabs on the product housing into the grooves on mounting plate.
5. Then, swing product into position to engage the pins on the product with the terminals on the mounting plate. Make sure that the tabs on the back of the product housing fully engage with the mounting plate.
6. Secure product by tightening the single mounting screw in the front of the product housing. For tamper resistance, the standard captivated mounting screw may be replaced with the enclosed Torx screw.

K Series Mounting- (also see page 3)

1. K Series products may be used indoors or outdoors. They must be installed using the proper SpectrAlert Advance weatherproof back box (SA-WBB or SA-WBBC). Do not attempt to use boxes other than the ones supplied with the product.
2. The wall mount box (SA-WBB) must be mounted with its internal post in the lower left corner, as shown in Figure 8.
3. Two threaded holes are provided in the sides of the box for ¼ inch conduit adapters. Knockout plugs in the back of the box can be used for ½ or ¾ inch rear entry. Unused holes **MUST** be sealed. Plugs are

Table 4. 2-Wire Horn/Strobe Current Draw (mA) for P2 and PC2 Standard Candela Series:

DC Input	8–17.5 Volts		16–33 Volts						
	15 cd	15/75 cd	15 cd	15/75 cd	30 cd	75 cd	95 cd	110 cd	115 cd
Temporal High	137	147	79	90	107	176	194	212	218
Temporal Medium	132	144	69	80	97	157	182	201	210
Temporal Low	132	143	66	77	93	154	179	198	207
Non-temporal High	141	152	91	100	116	176	201	221	229
Non-temporal Medium	133	145	75	85	102	163	187	207	216
Non-temporal Low	131	144	68	79	96	156	182	201	210
FWR Input									
Temporal High	136	155	88	97	112	168	190	210	218
Temporal Medium	129	152	78	88	103	160	184	202	206
Temporal Low	129	151	76	86	101	160	184	194	201
Non-temporal High	142	161	103	112	126	181	203	221	229
Non-temporal Medium	134	155	85	95	110	166	189	208	216
Non-temporal Low	132	154	80	90	105	161	184	202	211

Table 5. 2-Wire Horn/Strobe Current Draw (mA) for P2 and PC2 High Candela Range Series:

Sound Pattern	16–33 Volts Volts DC				16–33 Volts Volts FWR			
	135 cd	150 cd	177 cd	185 cd	135 cd	150 cd	177 cd	185 cd
Temporal High	245	259	290	297	215	231	258	265
Temporal Medium	235	253	288	297	209	224	250	258
Temporal Low	232	251	282	292	207	221	248	256
Non-temporal High	255	270	303	309	233	248	275	281
Non-temporal Medium	242	259	293	299	219	232	262	267
Non-temporal Low	238	254	291	295	214	229	256	262

Table 6. Horn Output (dBA) in ULC Anechoic Room:

Switch Position	Sound Pattern	dB	8–17.5 Volts**		16–33 Volts**		24 V Nominal Measurements	
			DC	FWR	DC	FWR	DC	FWR
1	Temporal	High	93	93	94	94	99	98
2	Temporal	Medium	89	89	92	92	96	96
3	Temporal	Low	88	87	90	88	94	89
4	Non-temporal	High	92	92	97	97	100	100
5	Non-temporal	Medium	88	88	95	94	98	98
6	Non-temporal	Low	79	80	91	90	96	92
7*	Coded	High	92	92	98	98	101	101
8*	Coded	Medium	88	88	95	95	97	98
9*	Coded	Low	85	85	91	91	96	92

*Horn & 4-wire Horn/Strobe only. ** Minimum dB rating for Operational Voltage Range.

provided with the box for this purpose.

- It is the responsibility of the installer to make sure that all openings and connections are sealed properly. Outdoor installations that are protected from direct exposure to rain are still subject to condensation or leakage through hidden areas, such as a soffit.
- Water may pool on the back box due to condensation or direct exposure to rain or snow. Use watertight fittings for all wiring connections, including the knock-out plugs on the back of the box. When using plastic plugs to fill unused threaded holes, apply teflon tape and/or silicon sealant to reduce the chance of leakage.
- Attach the mounting plate to the weatherproof box using the 4 unpainted screws.
- Follow steps 2-6 of the indoor mounting instructions to wire and attach the product.

**Directional Sound Characteristics
Horn only**

Horizontal Angle	
30	-3 dBA
70	-6 dBA

Vertical Angle	
50	-3 dBA
75	-6 dBA

Horn/Strobe

Horizontal Angle	
30	-3 dBA
69	-6 dBA

Vertical Angle	
52	-3 dBA
75	-6 dBA

Table 7. Horizontal Plane Light Distribution for Wall and Ceiling Applications:

Horizontal Angle	% of rated light output
0	100
45	75
90	25

Table 8. Vertical Plane Light Distribution for Wall Applications:

Vertical Angle	% of rated light output
0	100
45	34
90	12

Figure 4. Wall mount product:

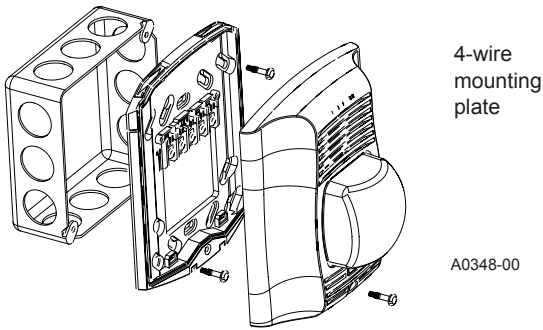


Figure 5. Ceiling mount product:

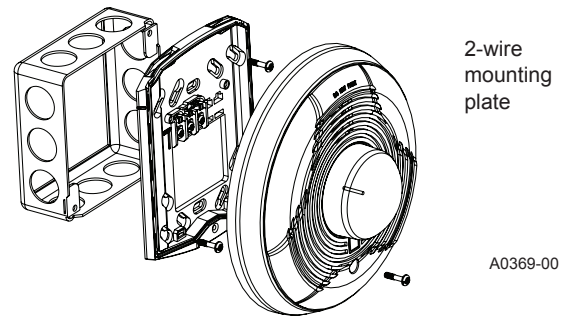


Figure 6. Wall Mount Product with back box skirt:

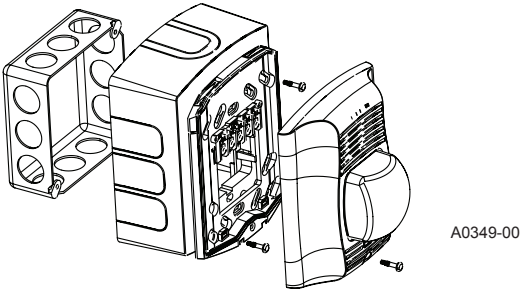


Figure 7: Ceiling Mount Product with back box skirt:

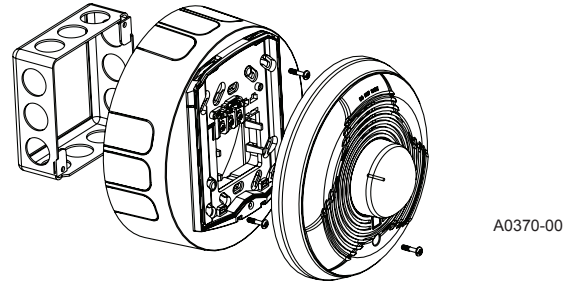


Figure 8. Wall mount horn/strobe with weatherproof backbox:

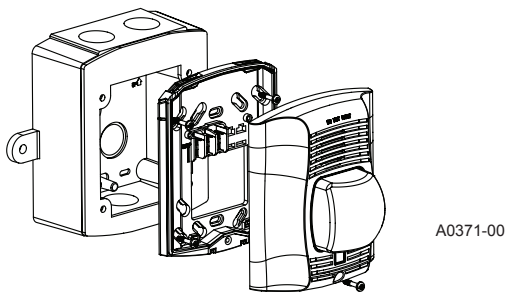
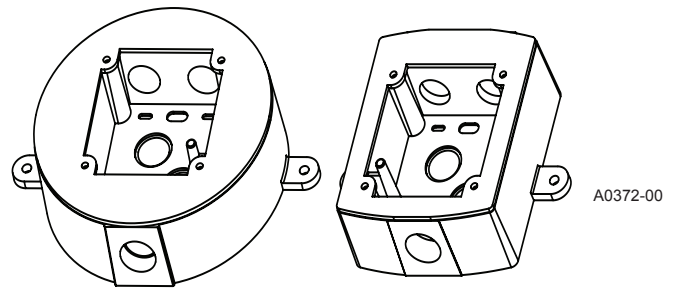


Figure 9. Wall and Ceiling Mount Weatherproof backbox:



Note: Use all 4 mounting plate screws when installing outdoor units

Please refer to insert for the Limitations of Fire Alarm Systems



The Limitations of Horn/Strobes

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

The horn may not be heard. The loudness of the horn meets (or exceeds) current Underwriters Laboratories' standards. However, the horn may not alert a sound sleeper or one who has recently used drugs or has been drinking alcoholic beverages. The horn 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 alarm. The horn may not be heard by persons who are hearing impaired.

The signal strobe may not be seen. The electronic visual warning sig-

nal uses an extremely reliable xenon flash tube. It flashes at least once every second. The strobe must not be installed in direct sunlight or areas of high light intensity (over 60 foot candles) where the visual flash might be disregarded or not seen. The strobe may not be seen by the visually impaired.

The signal strobe may cause seizures. Individuals who have positive photoic response to visual stimuli with seizures, such as persons with epilepsy, should avoid prolonged exposure to environments in which strobe signals, including this strobe, are activated.

The signal strobe cannot operate from coded power supplies. Coded power supplies produce interrupted power. The strobe must have an uninterrupted source of power in order to operate correctly. System Sensor recommends that the horn and signal strobe always be used in com-

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 this smoke detector. 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 repair or replacement of any part of the smoke detector 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 1-800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: System Sensor, Repair

Department, RA # _____, 6581 Kitimat Rd., Unit #6, Mississauga, Ontario, L5N 3T5. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to repair or 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 under common law.

FCC Statement

SpectrAlert Strobes and Horn/Strobes have been tested and found to comply with the limits for a Class B 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, This class B digital apparatus complies with Canadian ICES-003

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.