

INSTALLATION INSTRUCTIONS
E70H E90H HIGH FIDELITY MULTI-CANDELA
SPEAKER STROBES

Use this product according to this instruction manual. Please keep this instruction manual for future reference.

GENERAL

The Wheelock Series E70H/E90H High Fidelity Multi-Candela Speaker Strobes are UL Listed under Standard 1971 for Signaling Devices for the Hearing Impaired, UL Standard 1480 for Speaker Appliances and ULC Listed under Standard CAN/ULC-S541-07 and CAN/ULC-S526-07 for indoor Fire Protective Service. They are designed for multiple power requirements with high dBA output at each power tap. All models offer a choice of field selectable taps, 1/8W to 2W, for either 25.0 V_{RMS} or 70.0 V_{RMS} audio systems. The design incorporates a high efficiency speaker for maximum output at minimum power across a frequency range of 300-8000Hz. The speaker strobes can provide non-synchronized strobe operation when connected directly to a Fire Alarm Control Panel (FACP), or provide synchronized strobe operation when used in conjunction with a Dual Sync Module (DSM) or Wheelock Power Supplies. The strobes use a xenon flashtube with solid state circuitry enclosed in a polycarbonate lens to provide maximum visibility and reliability for effective visible signaling. All models are Listed for **indoor use only** with the backboxes specified in these instructions (see Mounting Options). **1/8W tap setting for Private Mode only. E70H-241575W is UL Listed only.**

NOTE: All Canadian Installations should be in accordance with the Canadian Standard for the Installation of Fire Alarm Systems – CAN/ULC-S524-01 and Canadian Electrical Code, Part 1. Final acceptance is subject to Authorities Having Jurisdiction.

WARNING: This appliance is a "FIRE ALARM DEVICE - DO NOT PAINT."

WARNING: Please read these instructions carefully. Failure to comply with any of the following instructions, cautions and warnings could result in improper application, installation and/or operation of these products in an emergency situation, which could result in property damage and serious injury or death to you and/or others.

SPECIFICATIONS

Table 1A: UL/ULC Listed Models and Ratings

Model	Voltage (V _{audio})	Speaker				Anechoic dBA PerCAN/ULC-S541-07					
		1/8	1/4	1/2	1	2	1/8	1/4	1/2	1	2
E70 Speaker Strobes	25/70	71	75	78	81	83	73	76	79	82	85
E90 Speaker Strobes	25/70	74	77	80	82	85	74	77	80	82	85

Table 1B: UL/ULC Listed Models and Ratings

Speaker Model	Strobe		
	Regulated Voltage	Voltage Range	Candela (cd)
	VDC/V _{RMS}	VDC/V _{RMS}	
E70H-24MCW	24	16-33	15/30/75/110
E70H-241575W*	24	16-33	15/75
E70H-24MCWH	24	16-33	135/185
E90H-24MCC	24	16-33	15/30/75/95
E90H-24MCCH	24	16-33	115/177

*241575W models are UL listed at 15cd and meet 75cd on axis.

NOTES

1. Strobes produce 1 flash per second over the "Regulated Voltage" range.
2. All models are Listed for indoor use with a temperature range of +32°F to +120°F (0°C to +49°C) and maximum humidity of 93% RH. The effect of shipping and storage temperatures shall not adversely affect the performance of the appliance when it is stored in the original cartons and is not subjected to misuse or abuse.
3. dBA is rated per UL Standard 1480 and ULC Standard ULC-S541-07 for Speaker Appliances. Frequency range of speakers is 300-8000Hz.
4. These appliances were tested to the operating voltage limits of 16-33 volts using Filtered (DC) or unfiltered Full-Wave-Rectified (FWR). Do not apply 80% and 110% of these voltage values for system operation.
5. Check the minimum and maximum output of the power supply and standby battery and subtract the voltage drop from the circuit wiring resistance to determine the applied voltage to the strobes.

Table 2A: Current Rating for Wall Strobe Only

Maximum RMS Current (AMPS)								
UL	24MCW			24MCWH	241575W			
Voltage	15cd	30cd	75cd	110cd	135cd	185cd	15/75cd	
DC	16-33 VDC	0.060	0.092	0.165	0.220	0.300	0.420	0.090
FWR	16-33 V _{RMS}	0.102	0.155	0.253	0.347	0.455	0.645	0.145

Table 2B: Current Rating for Ceiling Strobe Only

Maximum RMS Current (AMPS)							
UL	24MCC			24MCCH			
Voltage	15cd	30cd	75cd	95cd	115cd	177cd	
DC	16-33 VDC	0.065	0.105	0.189	0.249	0.300	0.420
FWR	16-33 V _{RMS}	0.110	0.170	0.280	0.375	0.455	0.646

NOTE: Candela setting will determine the current draw of the product.

Table 3: ULC Directional Characteristics

25/70V	-3dBA	+/- 33 degrees horizontal; +/- 18 degrees vertical
	-6dBA	+/- 41 degrees horizontal; +/- 31 degrees vertical

NOTE: The maximum wire impedance between strobes shall not exceed 35 OHMS. The maximum number of strobes on a single notification appliance circuit shall not exceed 47.

CAUTION: Speaker Strobes are not designed to be used on coded systems in which the applied voltage is cycled on and off.

NOTE: Make sure the total RMS current required by all appliances that are connected to the system's primary and secondary power sources, NAC Circuits, DSM Sync Modules or Wheelock Power Supplies do not exceed the power sources' rated capacity or the current ratings of any fuses on the circuits to which these appliances are wired.

WARNING: Overloading power sources or exceeding fuse ratings could result in loss of power and failure to alert occupants during an emergency.

When calculating the total currents, use Table 2 to determine the highest value of "RMS Current" for an individual strobe (across the expected operating voltage range of the strobe), then multiply these values by the total number of strobes; be sure to add the currents for any other appliances, including audible signaling appliances, powered by the same source and include any required safety factors.

If the peak current exceeds the power supplies' peak capacity, the output voltage provided by the power supplies may drop below the listed voltage range of the appliances connected to the supply and the voltage may not recover in some types of power supplies. For example, an auxiliary power supply that lacks filtering at its output stage (either via lack of capacitance and/or lack of battery backup across the output) may exhibit this characteristic.

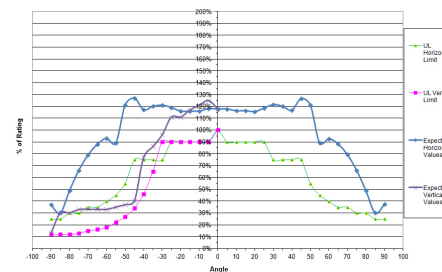


Figure 1: E70H Expected Light Output

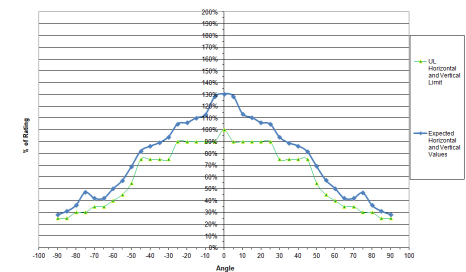


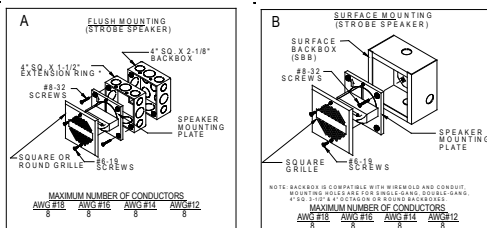
Figure 2: E90H Expected Light Output

NOTE: Does not apply to the 241575W model.

WIRING AND MOUNTING INFORMATION

CAUTION: The following figures show the maximum number of field wires (conductors) that can enter the backbox used with each mounting option. If these limits are exceeded, there may be insufficient space in the backbox to accommodate the field wires and stresses from the wires could damage the product. Check that the installed product has sufficient clearance and wiring room prior to installing backboxes and conduit, especially if sheathed multiconductor cable or 3/4-inch (1.9-cm) conduit fittings are used.

Although the limits shown for each mounting option comply with the National Electrical Code (NEC), Cooper Notification recommends use of the largest backbox option shown and the use of approved stranded field wires, whenever possible, to provide additional wiring room for easy installation and minimum stress on the product from wiring.



NOTE: E90H has a round grille. E70H shown.

- E70H and E90H Speaker Strobe models have in-out wiring terminals that accept two #12 to #18 American Wire Gauge (AWG) wires at each screw terminal. Strip leads 3/8 inches (.95 cm) and connect to screw terminals.
- Break all in-out wire runs on supervised circuits to ensure integrity of circuit supervision as shown in Figure 3. The polarity shown in the wiring diagrams is for operation of the appliances.

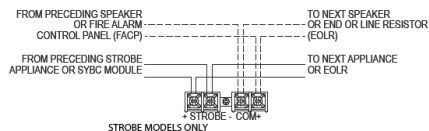


Figure 3

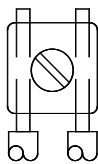


Figure 4

*Refer to Sync Module instruction sheets DSM (P83177) or Wheelock Power Supplies for additional information.

GROUNDING: Connect ground wire to backbox. Install signaling appliance to backbox using mounting screws provided.

WARNING: Check electrical ratings specified in tables 1 and 2 (as appropriate) to ensure proper input. Be sure that the speaker wiring is connected to speaker terminals only and strobe wiring is connected to strobe terminals only. Check to ensure that wiring at the FACP is correct. Improper electrical input can damage the product or cause it to malfunction, which could result in property damage and serious injury or death to you and/or others.

WARNING: The speaker strobe appliance must be field set to the desired dba sound output level before it is installed. This is done by properly inserting jumper plugs in accordance with these instructions. Incorrect settings will result in improper performance, which could result in property damage and serious injury or death to you and/or others.

- Each doubling of rated Watts increases sound output by 3 dBA. Field selectable input terminals are provided on each unit. The following wattage selections are available: 1/8W, 1/4W, 1/2W, 1W and 2W.
- Each letter corresponds to a plug position of the header located on the printed circuit board. Select voltage and wattage as shown in Table 4 below.
- A 1.5µF blocking capacitor for DC supervision of audio lines by the FACP is factory wired in series with the speaker input.

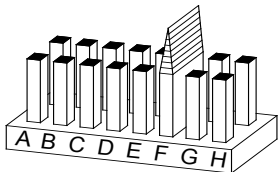


Figure 5: Jumper plug is used to select tap settings which = dBA loudness.

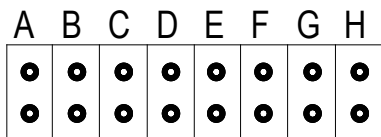


Figure 6: Tap Settings (Factory setting is 70V @ 1/2W (Tap F))

NOTE: Use needle nose pliers to pull and properly insert the jumper plug to the desired tap setting.

Position	25V	70V
A	2	-----
B	1	-----
C	1/2	-----
D	1/4	2
E	1/8	1
F	-----	1/2
G	-----	1/4
H	-----	1/8

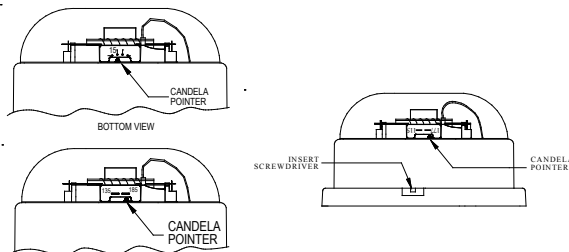


Figure 7: E70H-24MCW/E90H-24MCC; E70H-24MCWH; E90H-24MCCH

NOTE: The E70H-24MCW and E90H-24MCC come pre-set at 15cd. The E70H-24MCWH comes pre-set at 185cd. The E90H-24MCCH comes pre-set at 177cd.

CAUTION: The candela select switch must be field set to the required candela intensity before installation. When changing the setting of the candela select switch make certain that it clicks in place. After changing the candela setting the appliance must be retested to verify proper operation. Improper setting of the candela select switch may result in operation at the wrong candela.

WARNING: Incorrect settings will result in improper performance.

MOUNTING PROCEDURES

- These speakers can be flush mounted to a 4-inch by 2-1/8-inch (10.16-cm - 5.4-cm) sq. to deep backbox with a 4-inch by 1-1/2-inch (10.16-cm - 3.81-cm) square extension ring (Figure A) or surface mounted to a surface backbox (Figure B). Mounting hardware for each mounting option is supplied.
- Conduit entrances to the backbox should be selected to provide sufficient wiring clearance for the installed product. Do not pass additional wires (used for other than the signaling appliance) through the backbox. Such additional wires could result in insufficient wiring space for the signaling appliance.
- When terminating field wires, do not use more lead length than required. Excess lead length could result in insufficient wiring space for the signaling appliance.
- Use care and proper techniques to position the field wires in the backbox so that they use minimum space and produce minimum stress on the product. This is especially important for stiff, heavy gauge wires and wires with thick insulation or sheathing.
- These models have an integrated speaker mounting plate which must be oriented correctly when it is mounted to the backbox. Turn the speaker mounting plate so that the arrow above the words "Horizontal Strobe" points to the top side of the speaker mounting plate.
- To move selector switch, insert screwdriver into slot shown on the bottom side of the strobe. The setting is indicated by a pointer and can be seen on the bottom side of the lens. See Figure 7.
- Mount the speaker mounting plate to the backbox. Next slide the grille over the speaker mounting plate strobe and attach with (2) screws.

CAUTION: Always operate audio amplifiers and speakers within their specified ratings. Excessive input may distort sound quality and may damage audio equipment. Improper input voltage can damage speaker. If distortion is heard, check for clipping of the audio appliance with an oscilloscope and reduce the amplifier input level or gain level to eliminate any clipping.

WARNING: When installing strobes in an open office or other areas containing partitions or other viewing obstructions, special attention should be given to the location of the strobes so that their operating effect can be seen by all intended viewers, with the intensity, number, and illumination, regardless of the viewer's orientation.

The 110cd, 135cd, 177cd and 185cd settings are Listed for use in sleeping or non-sleeping areas when installed in accordance with appropriate NFPA Standards and the Authority Having Jurisdiction.

WARNING: Installers must advise owners and operators of buildings with sleeping occupants, e.g., Hotels and motels, to warn guests, residents and employees to not move the bed location to a position violating points (1) and (2) above or serious injury and or loss of life may occur during a fire emergency.

WARNING: A small possibility exists that the use of multiple strobes within a person's field of view, under certain circumstances, might induce a photo-sensitive response in persons with epilepsy. Strobe reflections in a glass or mirrored surface might also induce such a response. To minimize this possible hazard, cooper wheelock strongly recommends that the strobes installed should not present a composite flash rate in the field of view which exceeds five (5) hz at the operating voltage of the strobes. Cooper wheelock also strongly recommends that the intensity and composite flash rate of installed strobes comply with levels established by applicable laws, standards, regulations, codes and guidelines.

If this appliance is required to produce a distinctive three-pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NFPA 72, the appliance must be used with a fire alarm control unit that can generate the temporal pattern signal. Refer to manufacturer's installation manual for details.

NOTE: NFPA 72/ANSI 117.1 conforms to ADAAG Equivalent Facilitation Guidelines in using fewer, higher intensity strobes within the same protected area.

CAUTION: Check the installation instructions of the manufacturers of other equipment used in the system for any guidelines or restrictions on wiring and/or locating Notification Appliance Circuits (NAC) and notification appliances. Some system communication circuits and/or audio circuits, for example, may require special precautions to ensure electrical noise immunity (e.g., audio crosstalk).

NOTE: This equipment 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 A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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