

*Thank you for using our products.*


**INSTALLATION INSTRUCTIONS  
 HS-24 APPLIANCE**


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


**GENERAL:**

The HS-24 Appliance can be field set to provide either Continuous Horn or Code 3 Horn. It can provide a continuous horn tone when connected directly to the Fire Alarm Control Panel (FACP), or synchronized Code 3 Horn when used in conjunction with the Sync Module (SM), Dual Sync Module (DSM) or Wheelock’s Power Supplies. Audible Horn Appliance can be field set to provide either High (HI) dBA, Medium (MED) dBA or Low (LO) dBA sound output and can be used on coded systems in which the applied voltage is cycled on and off. The HS-24 Appliance is UL Listed under Standard 464 for Audible Signal Appliances and also ULC Listed under Standard CAN/ULC-S525-99 for Audible Signaling Appliances for Fire Alarm Systems. It is listed for indoor use only and can be mounted to double-gang, 4” backbox, 100mm European backbox or SHBB surface backbox (See Mounting Options).

The HS-24 is designed for use with either filtered DC or unfiltered Full-Wave-Rectified (FWR) input voltage. All inputs are polarized for compatibility with standard reverse polarity supervision of circuit wiring by a Fire Alarm Control Panel (FACP).

**NOTE:** All **CAUTIONS** and **WARNINGS** are identified by the symbol . All warnings are printed in bold capital letters.

** WARNING: PLEASE READ THESE INSTRUCTIONS CAREFULLY BEFORE USING THIS PRODUCT. FAILURE TO COMPLY WITH ANY OF THE FOLLOWING INSTRUCTIONS, CAUTIONS AND WARNINGS COULD RESULT IN IMPROPER APPLICATION, CANDELA SETTING, 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.**

** WARNING: THE HS-24 APPLIANCE IS A “FIRE ALARM DEVICE – DO NOT PAINT.”**

**SPECIFICATIONS:**

**Table 1: UL Listed Models and Ratings**

Model	Regulated Voltage (VDC/VRMS)	Voltage Range Limit Per UL 464		Maximum RMS Current (AMPS)		
				Lo	Med	Hi
HS-24	24	DC	16-33VDC	0.027	0.068	0.110
		FWR	16-33VRMS	0.041	0.050	0.094

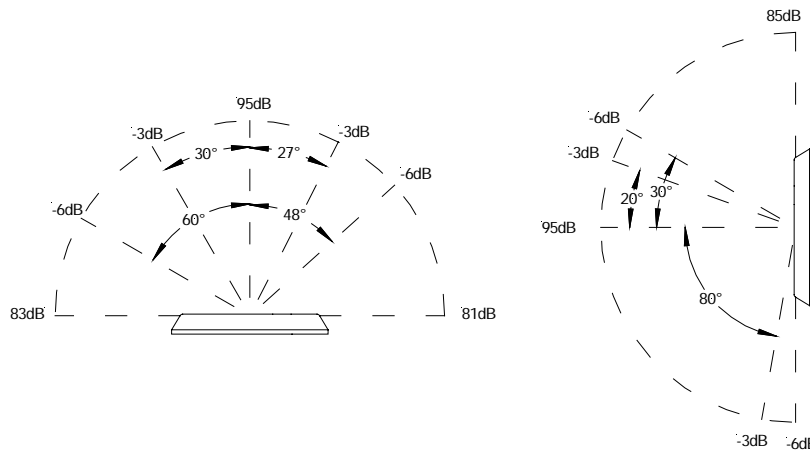
**Table 1A: ULC Current Ratings (AMPS)**

Model	ULC Voltage	Lo		Med		Hi	
		MEAN	RMS	MEAN	RMS	MEAN	RMS
HS-24	20.0VDC	0.014	0.018	0.020	0.033	0.035	0.067
	24.0VDC	0.017	0.024	0.026	0.052	0.055	0.098
	31.0VDC	0.021	0.027	0.035	0.068	0.069	0.110
	20.0VRMS	-----	0.016	-----	0.028	-----	0.052
	24.0VRMS	-----	0.031	-----	0.043	-----	0.075
	31.0VRMS	-----	0.041	-----	0.050	-----	0.094

<b>Table 2: dBA Sound Output for 24VDC Models</b>							
Description	Volume	Reverberant Per UL 464			Anechoic dBA @ 10 Feet		
		16.0VD C	24VDC	33.0VD C	20.0VD C	24VDC	31.0VDC
Continuous Horn	Low	80	83	86	86	90	92
	Medium	85	88	91	91	95	98
	High	88	91	93	95	99	101
Code 3 Horn	Low	75	79	82	86	90	92
	Medium	80	84	86	91	95	98
	High	84	87	89	95	99	101

**⚠ WARNING: 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 APPLIANCES.**

**Figure 1: ULC Directional Characteristics**



**NOTES:**

1. The HS-24 is UL Listed for indoor use with a temperature range of +32°F to +120°F (0°C to +49°C) and maximum humidity of 93% ± 2% RH.

**⚠ WARNING: FOR UL APPLICATIONS THIS APPLIANCE WAS 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.**

**⚠ WARNING: FOR ULC APPLICATIONS THIS APPLIANCE WAS TESTED TO THE OPERATING VOLTAGE LIMITS OF 20-31 VOLTS USING FILTERED (DC) OR UNFILTERED FULL-WAVE-RECTIFIED (FWR). APPLY 80% AND 110% OF THESE VOLTAGE VALUES FOR SYSTEM OPERATION.**

**⚠ WARNING: MAKE SURE THAT THE TOTAL RMS CURRENT AND TOTAL AVERAGE CURRENT REQUIRED BY ALL APPLIANCES THAT ARE CONNECTED TO THE SYSTEM'S PRIMARY AND SECONDARY POWER SOURCES, SIGNALING CIRCUITS, SM, DSM SYNC MODULES AND WHELOCK'S POWER SUPPLIES DO NOT EXCEED THE POWER SOURCES' RATED CAPACITY OR THE CURRENT RATINGS OF ANY FUSES ON THE CIRCUITS TO WHICH THIS APPLIANCE IS WIRED. OVERLOADING POWER SOURCES OR EXCEEDING FUSE RATINGS COULD RESULT IN LOSS OF POWER AND FAILURE TO ALERT OCCUPANTS DURING AN EMERGENCY, WHICH COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

When calculating the total currents: Use Table 1/1A to determine the highest value of “RMS Current” or “Average Current” for an individual horn (across the expected operating voltage range of the horn), then multiply these values by the total number of horns; 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.

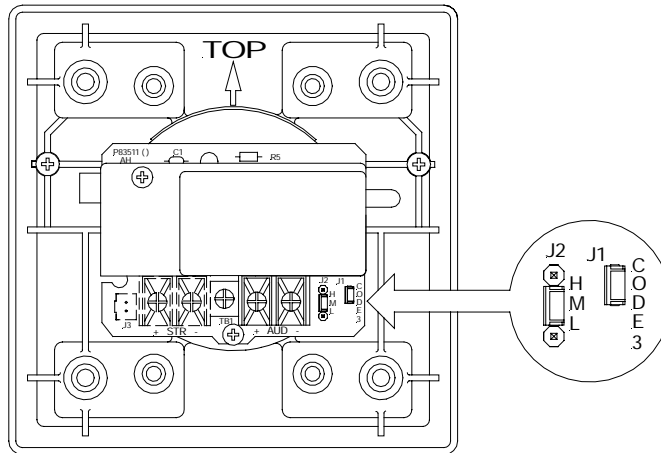
If the peak current exceeds the power supplies’ peak capacity, the output voltage provided by the power supplies may drop below the listed voltage range of the appliances connected to the supply and the voltage may not recover in some types of power supplies. For example, an auxiliary power supply that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

**⚠ WARNING: THE HS-24 APPLIANCE MUST BE FIELD SET TO THE DESIRED TONE AND 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.**

**SOUND OUTPUT (SPL) SETTINGS:**

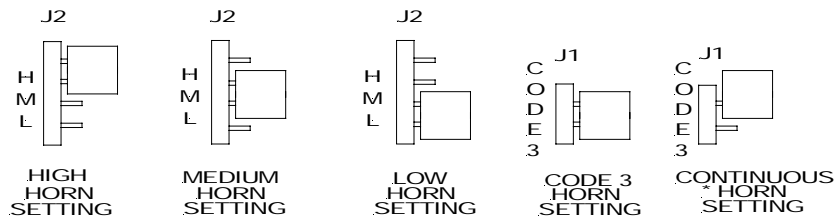
**NOTE:** The Code 3 Horn incorporates the temporal pattern (1/2 second on, 1/2 second off, 1/2 second on, 1/2 second off, 1/2 second on, 1-1/2 off and repeat) specified by ANSI/NFPA for standard emergency evacuation signaling. **The Code 3 Horn should be used only for fire evacuation signaling and not for any other purpose.**

*Figure 2: Showing Location of Jumper Plugs*



Factory setting is on Medium dB and Code 3.

*Figure 3: Jumper Plug Settings for High, Medium, Low dB, Code 3 Horn and Continuous Horn Setting.*

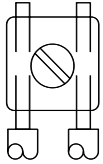


(Use needle nose pliers to pull and properly insert the jumper plug.)

No jumper plug is needed for continuous horn setting. However, it is recommended that the jumper plug be retained in the unit for future use (if needed) as shown in Figure 3.

**NOTE:** The HS-24 must be set for Code 3 horn when used with the sync module. Refer to Sync Module Installation Instruction sheets SM (P83123), DSM (P83177) and Wheelock's Power Supplies for additional information. If the HS-24 is connected to a coded system the continuous horn setting must be used

**Figure 3:**

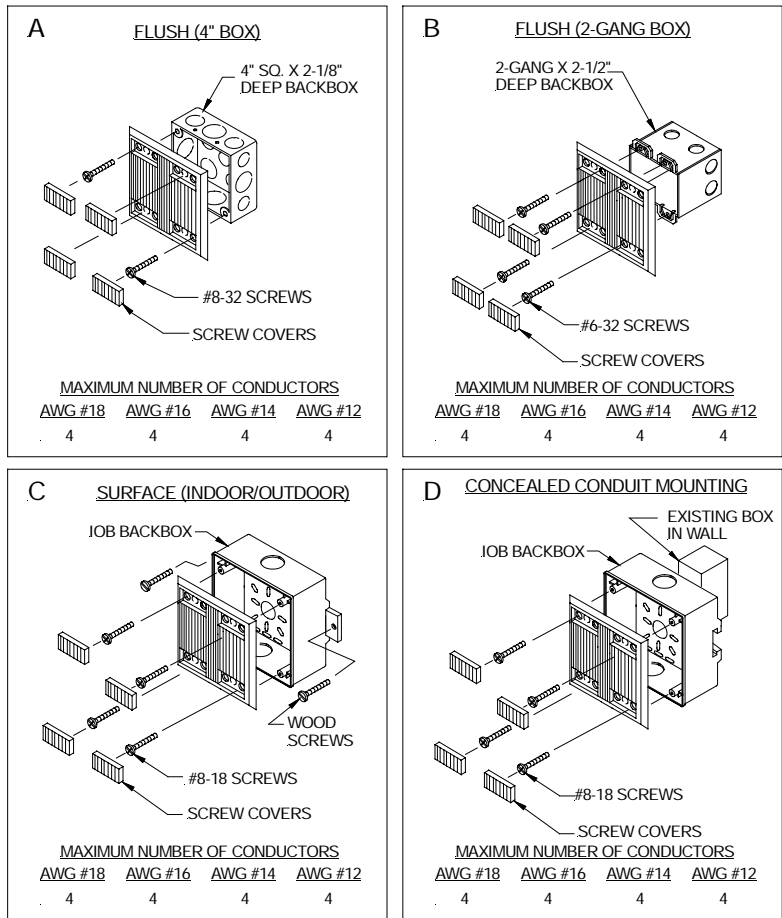


1. HS-24 Appliance has in-out wiring terminals that accept two #12 to #18 American Wire Gauge (AWG) wires at each screw terminal. Strip leads 3/8" inches for connection to screw terminals.
2. Break all in-out wire runs on supervised circuits or circuits in which supervision is used as shown in Figure 3. The polarity shown in the wiring diagrams is for the operation of the appliances. The polarity is reversed by the FACP during supervision.

**MOUNTING OPTIONS:**

**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.

Although the limits shown for each mounting option comply with the National Electrical Code (NEC), Cooper Wheelock 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.



## **MOUNTING PROCEDURES:**

Use this mounting procedure 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.

1. Connect field wires to the HS-24 terminal block (polarity must be observed).
2. Bend the field wires up 90° at the connection to the terminal block.
3. Carefully push the field wires into the backbox by hand.
4. Carefully press the HS-24 to the backbox, verifying that the HS-24 is seated and aligned correctly.
5. Screw the HS-24 to the backbox using the screws supplied. Refer to Mounting Options for screw size.

## **MOUNTING NOTES:**

**⚠ CAUTION:** Check that the installed product will have sufficient clearance and wiring room prior to installing backboxes and conduit, especially if sheathed multiconductor cable or 3/4" conduit fittings are used.

1. Conduit entrances to the backbox should be selected to provide sufficient wiring clearance for the installed product.
2. 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.
3. 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.

**⚠ CAUTION:** If these appliances are operated within 15 inches of a person's ear, they can produce a sound pressure level that exceeds the maximum 120dBA permitted by ADA and OSHA rules. Exposure to such sound levels can result in damage to a person's hearing.

This appliance can produce a distinctive three pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NFPA 72.

**⚠ 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 assure electrical noise immunity (e.g. audio crosstalk).

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital appliance, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: 1) Reorient or relocate the receiving antenna, 2) Increase the separation between the equipment and receiver, 3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected, and 4) Consult the dealer or an experienced radio/TV technician for help.

The HS-24 and these instructions are copyrighted by Cooper Wheelock and the HS-24 contain proprietary, confidential and trade secrets of Cooper Wheelock. No part of the HS-24 product and these instructions may be photocopied, printed or reproduced in any form or modified, adapted, changed or enhanced, or converted to another programming language, or used to create updated, related or derivative works, without the prior written consent of Cooper Wheelock. No part of the HS Series products shall be decomposed, disassembled or reverse engineered.

**ANY MATERIAL EXTRAPOLATED FROM THIS DOCUMENT OR FROM COOPER WHEELOCK MANUALS OR OTHER DOCUMENTS DESCRIBING THE PRODUCT FOR USE IN PROMOTIONAL OR ADVERTISING CLAIMS, OR FOR ANY OTHER USE, INCLUDING DESCRIPTION OF THE PRODUCT'S APPLICATION, OPERATION, INSTALLATION AND TESTING IS USED AT THE SOLE RISK OF THE USER AND COOPER WHEELOCK WILL NOT HAVE ANY LIABILITY FOR SUCH USE.**

## Limited Warranty

Cooper Wheelock, Inc. products must be used within their published specifications and must be PROPERLY specified, applied, installed, operated, maintained, and operationally tested in accordance with these instructions at the time of installation and at least twice a year or more often in accordance with local, state and federal codes, regulations and laws. Specification, application, installation, operation, maintenance, and testing must be performed by qualified personnel for proper operation in accordance with all of the latest National Fire Protection Association (NFPA), Underwriters' Laboratories (UL), Underwriters' Laboratories of Canada (ULC), National Electrical Code (NEC), Occupational Safety and Health Administration (OSHA), local, state, county, province, district, federal and other applicable building and fire standards, guidelines, regulations, laws and codes including, but not limited to, all appendices and amendments and the requirements of the local authority having jurisdiction (AHJ). Cooper Wheelock, Inc. products when properly specified, applied, installed, operated, maintained, and operationally tested as provided above are warranted against mechanical and electrical defects for a period of three years from date of manufacture (as determined by date code). Correction of defects by Cooper Wheelock, Inc providing repairs or a replacement shall be at Cooper Wheelock, Inc.'s sole discretion and shall constitute fulfillment of all warranty obligations. The foregoing limited warranty shall immediately terminate in the event any part not furnished by Cooper Wheelock, Inc. is installed in the product. The foregoing limited warranty specifically excludes any software required for the operation of or included in a product. COOPER WHEELOCK, INC. MAKES NO REPRESENTATION OR WARRANTY OF ANY OTHER KIND, EXPRESS, IMPLIED OR STATUTORY WHETHER AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER MATTER.

Users are solely responsible for determining whether a product is suitable for the user's purposes, or whether it will achieve the user's intended results. There is no warranty against damage resulting from misapplication, improper specification, abuse, accident, or other operating conditions beyond Cooper Wheelock, Inc.'s control.

Some Cooper Wheelock, Inc. products contain software. With respect to those products, Cooper Wheelock, Inc. does not warranty that the operation of the software will be uninterrupted or error-free or that the software will meet any other standard of performance, or that the functions or performance of the software will meet the user's requirements. Cooper Wheelock, Inc. shall not be liable for any delays, breakdowns, interruptions, loss, destruction, alteration, or other problems in the use of a product arising out of or caused by the software.

The liability of Cooper Wheelock, Inc. arising out of the supplying of a product, or its use, whether based on warranty, negligence, or otherwise, shall not in any case exceed the cost of correcting defects as stated in the limited warranty and upon expiration of the warranty period all such liability shall terminate. Cooper Wheelock, Inc. is not liable for labor costs incurred in removal, reinstallation, or for damage of any type whatsoever, including but not limited to, loss of profit or incidental or consequential damages. The foregoing shall constitute the sole remedy of the purchaser and the exclusive liability of Cooper Wheelock, Inc.

In no case will Cooper Wheelock, Inc.'s liability exceed the purchase price paid for a product.

### Limitation of Liability

Cooper Wheelock, Inc.'s liability on any claim of any kind, including negligence, breach of warranty, or otherwise, for any loss or damage resulting from, arising out of, or connected with any contract, or from the manufacture, sale, delivery, resale, repair or use of any product shall be limited to the price applicable to the product or part thereof which gives rise to the claim. Cooper Wheelock, Inc.'s liability on any claim of any kind shall cease immediately upon the installation in the product of any part not furnished by Cooper Wheelock, Inc. In no event shall Cooper Wheelock, Inc. be liable for any claim of any kind unless it is proven that our product was a direct cause of such claim. **FURTHER, IN NO EVENT, INCLUDING IN THE CASE OF A CLAIM OF NEGLIGENCE, SHALL COOPER WHEELOCK, INC. BE LIABLE FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so the preceding limitation may not apply to all purchasers.