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Thank you for using our products.

INSTALLATION INSTRUCTIONS
ET80 VANDAL RESISTANT SPEAKER AND STROBE SPEAKERS

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

GENERAL:
Wheelock's Series ET80 Low Profile Vandal Resistant Speaker and Speaker Strobes are UL Listed under Standard 1971 for (Signaling Devices for the Hearing Impaired) for indoor fire protection service. The ET80-24MCW is designed for multiple power requirements with high dBA output at each power tap and offer a choice of field selectable taps, 1/8W to 8W for either 25.0VRMS or 70.0VRMS audio systems. The Low Profile design incorporates a high efficiency speaker for maximum output at minimum power across a frequency range of 400Hz to 4000Hz, and features a sealed back construction for extra protection and improved audibility. The ET80-24MCW Multi-Candela provides four selectable light output intensities in one unit and incorporates a Speaker Mounting Plate attached to the speaker for ease of installation. The Low Profile Speaker Strobe can provide a non-synchronized strobe appliance when connected directly to a Fire Alarm Control Panel (FACP), or provide a synchronized strobe appliance when used in conjunction with a Sync Module (SM), Dual Sync Module (DSM) or Wheelock's Power Supplies. The Strobe uses a Xenon flashtube with solid state circuitry enclosed in a rugged Lexan® lens to provide maximum visibility and reliability for effective visible signaling. The ET80-24MCW is Listed for ***indoor use, wall mount only*** with the backboxes specified in these instructions (see Mounting Options).

NOTE: "Lexan" is a registered trademark of General Electric Company.

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

⚠**WARNING: THE SPEAKER STROBE 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, 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.**

SPECIFICATIONS:

Table 1: UL Listed Models and Ratings

Models	Speaker								Strobe			Mounting Options
	Voltage (VRMS)	dBA at 10 Feet (Rated Watts)							Regulated Voltage (VDC/VRMS)	Voltage Range (VDC/VRMS)	Candela	
		1/8	1/4	1/2	1	2	4	8				
ET80-24MCW	25/70	78	81	84	87	90	92	94	24	16.0-33.0	15/30/75/110	A,B

NOTES:
1. The strobe will produce 1 flash per second over the "Regulated Voltage" range.
2. The ET80-24MCW 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 85% RH.

NOTE: THE MAXIMUM WIRE IMPEDENCE BETWEEN STROBES SHALL NOT EXCEED 35 OHMS. THE MAXIMUM NUMBER OF STROBES ON A SINGLE NOTIFICATION APPLIANCE CIRCUIT SHALL NOT EXCEED 47.

⚠**WARNING: FOR UL APPLICATIONS 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.**

⚠**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 STROBES.**

⚠**WARNING: CANDELA SETTING WILL DETERMINE THE CURRENT DRAW OF THE PRODUCT.**

Table 2: UL Current Ratings					
Maximum RMS Current Draw					
UL Voltage		15cd	30cd	75cd	110cd
DC	16-33VDC	0.060	0.092	0.165	0.220
FWR	16-33VRMS	0.102	0.155	0.253	0.347

⚠**WARNING: MAKE SURE THAT THE TOTAL RMS CURRENT REQUIRED BY ALL APPLIANCES THAT ARE CONNECTED TO THE SYSTEM'S PRIMARY AND SECONDARY POWER SOURCES, NAC CIRCUITS, SM, DSM SYNC MODULES OR WHEELOCKS 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. 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 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.

⚠**CAUTION:** The Speaker Strobe is not designed to be used on coded systems in which the applied voltage is cycled on and off.

LIGHT DISTRIBUTION:

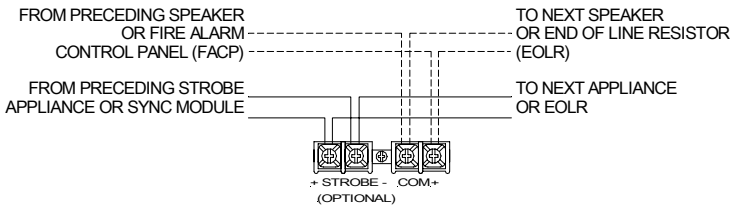
Table 3A: Horizontal Plane								
Horizontal	15cd		30cd		75cd		110cd	
Angle (in deg.)	UL Min.	Typ. 15cd	UL Min.	Typ. 30cd	UL Min.	Typ. 75cd	UL Min.	Typ. 110cd
0	15.0	22	30.0	44	75.0	110	110.0	158
5	13.5	22	27.0	42	67.5	114	99.0	162
10	13.5	23	27.0	42	67.5	110	99.0	156
15	13.5	22	27.0	41	67.5	110	99.0	153
20	13.5	21	27.0	40	67.5	108	99.0	153
25	13.5	20	27.0	38	67.5	102	99.0	139
30	11.3	20	22.5	38	56.3	103	82.5	142
35	11.3	18	22.5	36	56.3	97	82.5	135
40	11.3	18	22.5	35	56.3	93	82.5	130
45	11.3	20	22.5	39	56.3	103	82.5	143
50	8.3	19	16.5	37	41.3	93	60.5	133
55	6.8	14	13.5	27	33.8	71	49.5	98
60	6.0	15	12.0	30	30.0	73	44.0	102
65	5.3	15	10.5	28	26.3	71	38.5	97
70	5.3	14	10.5	25	26.3	64	38.5	88
75	4.5	12	9.0	23	22.5	54	33.0	76
80	4.5	10	9.0	17	22.5	47	33.0	64
85	3.8	5	7.5	10	18.8	25	27.5	33
90	3.8	7	7.5	15	18.8	39	27.5	52

Table 3B: Vertical Plane								
Vertical	15cd		30cd		75cd		110cd	
Angle (in deg.)	UL Min.	Typ. 15cd	UL Min.	Typ. 30cd	UL Min.	Typ. 75cd	UL Min.	Typ. 110cd
0	15.0	23	30.0	45	75.0	113	110.0	160
5	13.5	24	27.0	48	67.5	119	99.0	166
10	13.5	21	27.0	39	67.5	101	99.0	143
15	13.5	19	27.0	39	67.5	102	99.0	136
20	13.5	19	27.0	37	67.5	98	99.0	122
25	13.5	18	27.0	35	67.5	88	99.0	122
30	13.5	15	27.0	31	67.5	80	99.0	106
35	9.8	17	19.5	31	48.8	84	71.5	112
40	6.9	13	13.8	24	34.5	62	50.6	86
45	5.1	7	10.2	12	25.5	33	37.4	44
50	4.1	6	8.1	11	20.3	29	29.7	41
55	3.3	6	6.6	11	16.5	28	24.2	38
60	2.7	5	5.4	10	13.5	27	19.8	37
65	2.4	5	4.8	10	12.0	27	17.6	37
70	2.3	6	4.5	10	11.3	27	16.5	37
75	2.0	5	3.9	10	9.8	26	14.3	36
80	1.8	5	3.6	9	9.0	25	13.2	33
85	1.8	5	3.6	9	9.0	24	13.2	33
90	1.8	2	3.6	5	9.0	12	13.2	17

WIRING INFORMATION:

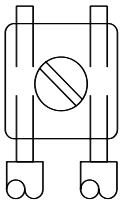
1. Each doubling of rated Watts increases sound output by 3 dBA. Field selectable input terminals are provided on each unit. The following wattage selections are available: 1/8W, 1/4W, 1/2W, 1W, 2W, 4W and 8W. Frequency range of speakers is 400-4000Hz.
2. A 10µF blocking capacitor for DC supervision of audio lines by the FACP is factory wired in series with the speaker input. The maximum supervision voltage is 33 volts DC.

Figure 1:



* Refer to Sync Module instruction sheets SM (P83123), DSM (P83177) or Wheelock's Power Supplies for additional information.

Figure 2:



1. The Low Profile Speaker Strobe model 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 and connect to screw terminals.
2. Break all in-out wire runs on supervised circuits to assure integrity of circuit supervision as shown in Figure 2. The polarity shown in the wiring diagrams is for operation of the appliances.

⚠**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.**

Figure 3: Jumper plug is used to select tap settings which = dBA loudness.

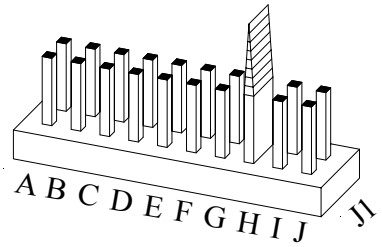
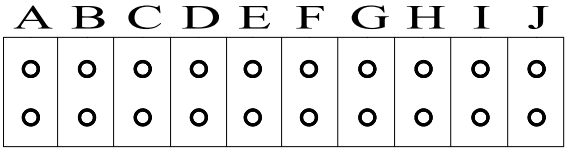


Figure 4: Tap Settings (Factory setting is 70V @ 0.5W (H))



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

Connect speaker wires to common and positive of terminal block and select the power tap terminal for 1/8W, 1/4W, 1/2W, 1W, 2W, 4W or 8W; 25V or 70V as required (see Figures 1, 2, 3, 4 and Table 4).

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.

Table 4: Speaker Voltage and Wattage Connection Chart

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

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 ELECTRICAL INPUT. BE SURE THAT SPEAKER WIRING IS CONNECTED TO SPEAKER TERMINALS ONLY AND STROBE WIRING IS CONNECTED TO STROBE TERMINALS ONLY. CHECK TO INSURE THAT WIRING AT 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.

MOUNTING PROCEDURES:

⚠**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. ET80-24MCW model has an integrated Speaker Mounting Plate.

2. The Speaker Mounting Plate 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.

3. First mount the Speaker Mounting Plate to the backbox. Next slide the grille over the Speaker Mounting Plate strobe and attach with (2) screws. Tamper-resistant Pan Torx screws have been provided.

4. 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.

5. 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 5.

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

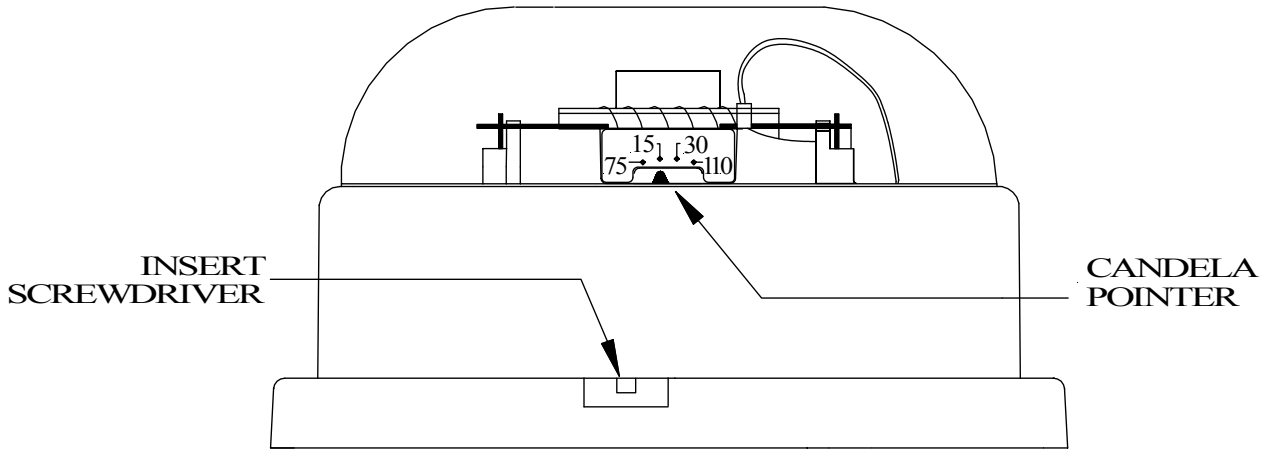
7. Do not pass additional wires (used for other than the signaling appliance) through the backbox. Such additional wires could result in insufficient wiring space for the signaling appliance.

8. Mounting hardware for each mounting option is supplied.

9. The ET80-24MCW can be flush mounted to a 4” square by 2-1/8” deep backbox with a 4” square 1-1/2” extension ring (Figure A) or surface mounted to a Surface Backbox (Figure B).

10. 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.

Figure 5:



NOTE: The ET80-24MCW comes pre-set at 15cd.

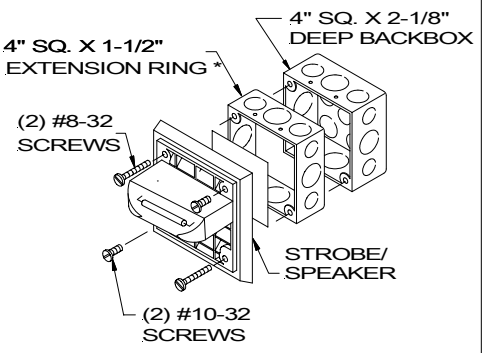
⚠**WARNING: THE CANDELA SELECT SWITCH MUST BE FIELD SET TO THE REQUIRED CANDELA INTENSITY BEFORE INSTALLATION. WHEN CHANGING THE SETTING OF THE CANDELA SELECT SWITCH, MAKE CERTAIN THAT IT “CLICKS” IN PLACE. AFTER CHANGING THE CANDELA SETTING, THE APPLIANCE MUST BE RETESTED TO VERIFY PROPER OPERATION. IMPROPER SETTING OF THE CANDELA SELECT SWITCH, MAY RESULT IN OPERATION AT THE WRONG CANDELA, WHICH COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

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), 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.

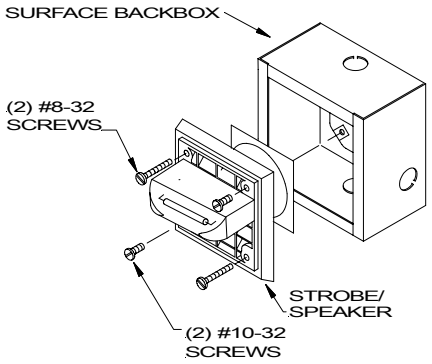
A FLUSH MOUNTING



MAXIMUM NUMBER OF CONDUCTORS

EXT. RING DEPTH *	AWG #18	AWG #16	AWG #14	AWG #12
1-1/2"	8	8	8	8

B SURFACE MOUNTING



NOTE: BACKBOX IS COMPATIBLE WITH WIREMOLD AND CONDUIT. MOUNTING HOLES ARE FOR SINGLE-GANG, DOUBLE-GANG, 4" SQ. 3-1/2" & 4" OCTAGON OR ROUND BACKBOXES.

MAXIMUM NUMBER OF CONDUCTORS

AWG #18	AWG #16	AWG #14	AWG #12
8	8	8	8

⚠**CAUTION:** Always operate audio amplifiers and speakers within their specified ratings. Excessive input may distort sound quality and may damage audio equipment. Do not exceed +100% of speaker input voltage per UL 1480. 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 TYPE OF STROBES BEING SUFFICIENT TO MAKE SURE THAT THE INTENDED VIEWER IS ALERTED BY PROPER ILLUMINATION, REGARDLESS OF THE VIEWER'S ORIENTATION. FAILURE TO DO SO COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

The 110 candela strobe model is Listed for use in sleeping or non-sleeping areas when installed in accordance with appropriate NFPA Standards and the Authority Having Jurisdiction.

⚠**WARNING: INSTALLATION OF WHEELOCK 110 CANDELA STROBE PRODUCTS IN SLEEPING AREAS SHOULD BE WALL MOUNTED AT LEAST 24" BELOW THE CEILING AS FOLLOWS: (1) THE ON-AXIS (DIRECTLY IN FRONT OF LENS) LIGHT OUTPUT SHOULD BE DIRECTED AT THE EYE-LIDS OF THE SLEEPING PERSON, E.G. PILLOW END OF BED, BED HEAD; (2) NO PART OF THE BED SHALL BE MORE THAN SIXTEEN (16) FEET FROM THE STROBE NOTIFICATION APPLIANCE. 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, 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. 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 conform 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 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 device, 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.

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IMPORTANT: READ SEPARATE "GENERAL INFORMATION" SHEET FOR INFORMATION ON THE PLACEMENT, LIMITATIONS, INSTALLATION, FINAL CHECKOUT, AND PERIODIC TESTING OF NOTIFICATION APPLIANCES.

Limited Warranty

Wheelock 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 and 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). Wheelock 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 repair or replacement shall be at Wheelock's sole discretion and shall constitute fulfillment of all obligations under this warranty. THE FOREGOING LIMITED WARRANTY SHALL IMMEDIATELY TERMINATE IN THE EVENT ANY PART NOT FURNISHED BY WHEELOCK IS INSTALLED IN THE PRODUCT. THE FOREGOING LIMITED WARRANTY SPECIFICALLY EXCLUDES ANY SOFTWARE REQUIRED FOR THE OPERATION OF OR INCLUDED IN A PRODUCT. WHEELOCK 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.

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3/04