

## INSTALLATION INSTRUCTIONS MULTITONE STROBE WEATHERPROOF APPLIANCES

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

### GENERAL

The Multitone Strobe Weatherproof Appliances are UL-Listed under Standard 464 for Audible Signal Appliances and Standard 1638 for Visual Signaling Appliances - Private Mode Use. All models are suitable for outdoor use. The MTWP-2475W, -2475C, -24MCCH and -24MCWH are UL-Listed to Standard 1971 for Signaling Devices for the Hearing Impaired when installed indoors. The MTWP-2475W is ULC-Listed under Standard CAN/ULC-S526-07 for Visual Signaling and under Standard CAN/ULC-S525-07 for Audible Signal Devices for Fire Alarm Systems. The Multi-High-Candela strobe provides two selectable light output intensities in one unit. An outdoor backbox is required for outdoor installation. The Multitone Strobe Appliances use a Xenon flashtube with solid state circuitry enclosed in a polycarbonate lens to provide maximum visibility and reliability for effective visible signaling.

Multitone Strobe Appliances can be field set to produce any one of eight commonly used alarm tones. Sound output can be field set to provide either HIGH (HI) dBA or STANDARD (STD) dBA sound output level.

All Multitone Strobe models are designed for use with either filtered DC or unfiltered full-wave-rectified (FWR) input voltage. The Multitone Strobe Appliances have separate input terminals for alarm tone activation and strobe activation. Shunt wires are provided to operate both the alarm tone and the strobe simultaneously on a single input circuit (See Wiring Diagram). All inputs are polarized for compatibility with standard reverse polarity supervision of circuit wiring by a fire alarm control panel (FACP).

**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, 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.**

**NOTE:** All Canadian installations should be in accordance with the Canadian Standard for the Installation of Fire Alarm Systems, CAN/ULC-S524 and the Canadian Electrical Code, Part 1. Final acceptance is subject to authorities having jurisdiction (AHJ).

**CAUTION:** Not recommended for use at refrigerator/freezer door entrances or other area with persistent condensation.

### SPECIFICATIONS

Table 1A: UL/ULC Models and Ratings

Model	Regulated Voltage (VDC/FWR)	Voltage Range (UL/ULC)	Maximum Current Rating		Candela Ratings			
			DC-RMS (Amps)	FWR-RMS (Amps)	ULC-S526	UL1971	UL1638 (Note 1)	Cold Ambient (Notes 2, 3)
MTWP-2475W	24	16-33	0.138	0.222	30	30	180	115
MTWP-2475C	24	16-33	0.138	0.222	-	15	180	115
MTWPA-2475W	24	16-33	0.138	0.222	-	24 (Note 4)	145	92
MTWPB-2475W	24	16-33	0.138	0.222	-	-	71	45
MTWPR-2475W	24	16-33	0.138	0.222	-	-	46	29
MTWP-24MCWH	24	16-33	0.3/0.42	0.455/0.645	-	135/185	135/185	86/118
MTWP-24MCCH	24	16-33	0.3/0.42	0.455/0.645	-	115/177	115/177	73/113
MTWPA-24MCCH	24	16-33	0.3/0.42	0.455/0.645	-	100/154 (Note 4)	100/154	64/98
MTWPB-24MCCH	24	16-33	0.3/0.42	0.455/0.645	-	-	75/115	48/73
MTWPG-24MCCH	24	16-33	0.3/0.42	0.455/0.645	-	-	77/118	49/75
MTWPR-24MCCH	24	16-33	0.3/0.42	0.455/0.645	-	-	38/58	24/37

Table 1B: ULC Directional Characteristics

24VDC	Horizontal	-3dBA: 25 degrees left, 25 degrees right
		-6dBA: 45 degrees left, 45 degrees right
	Vertical	-3dBA: 40 degrees upward, 84 degrees down
		-6dBA: 46 degrees upward, 90+ degrees down

### NOTES

- UL1638 is an on axis rating where the following applies: **WARNING: not to be used as a visual public model alarm notification appliance. Use UL1971 and ULC-S526 ratings for all public mode applications.**
- These ratings apply in extreme low ambient conditions as follows: Clear Lens at -40°F (-40°C) all other models at -31°F (-35°C).
- All products are listed for indoor and outdoor use as follows: Clear Lens rated -40°F(-40°C) to 150°F(66°C) with max. humidity of 95% RH. All other models rated -31°F(-35°C) to 150°F(66°C) with max. humidity of 95% RH.
- Effective candela rating per UL1971.
- Strobes will produce 1 flash per second over the regulated voltage range.

**WARNING: These appliances were tested to the regulated voltage limits of 16-33 Volts for 24V models using filtered DC or unfiltered full-wave-rectified voltage. Do not apply voltage outside of this range.**

**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. The maximum wire impedance between strobes shall not exceed 35 ohms.**

Use Tables 1A and 2 to determine the highest value of "Rated Current" for an individual Multitone Strobe (across the expected operating voltage range of the Multitone Strobe). Add strobe current from Table 2B audible appliance current from Table 2A to obtain total current for each unit, if the strobe and audible are wired to operate in unison on a single circuit. 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.

**NOTE:** The maximum number of strobes on a single notification appliance circuit shall not exceed 50.

**WARNING: Make sure the total rated current required by all appliances that are connected to the system's primary and secondary power sources, appliance circuits, SM, DSM sync modules and Cooper Wheelock power supplies does 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.**

Table 2: UL and ULC Current Ratings for Multitone Audible Appliances

Tone	Description	Maximum RMS Current (AMPS)			
		16-33VDC		16-33V <sub>RMS</sub>	
		HI dBA	STD dBA	HI dBA	STD dBA
Horn	Broadband Horn (Continuous)	0.108	0.044	0.087	0.045
Bell	1560 Hz Modulated (0.07 Sec. ON/Repeat)	0.053	0.024	0.051	0.028
March Time	Horn (0.25 Sec. ON/0.25 Sec. OFF/Repeat)	0.104	0.087	0.087	0.045
Code 3 Horn	Horn (ANSI S3.41 Temporal Pattern)	0.091	0.035	0.087	0.045
Code 3 Tone	500 Hz (ANSI S3.41 Temporal Pattern)	0.075	0.025	0.056	0.029
Slow Whoop	500-1200Hz Sweep (4.0 Sec. ON/0.5 Sec. OFF/Repeat)	0.098	0.037	0.092	0.042
Siren	600-1200Hz Sweep (1.0 Sec. ON/Repeat)	0.104	0.036	0.092	0.040
HI/LO	1000/800 Hz (0.25 Sec. ON/Alternate)	0.057	0.025	0.058	0.032

**AUDIBILITY RATINGS**

Table 3: dBA Ratings							
Tone	HI/LO Volume	dBA Reverberant Ratings Per UL 464			dBA Anechoic Ratings Per CAN/ULC S525-07		
		UL 24VDC			ULC 24VDC		
		16V	24V	33V	16V	24V	33V
Horn	HI	89	92	94	95	99	100
	STD	84	87	90	89	93	94
Bell	HI	83	86	88	88	92	93
	STD	76	80	83	83	87	88
March Time	HI	86	89	91	95	99	100
	STD	80	84	87	89	93	94
Code 3 Horn*	HI	85	88	90	95	99	100
	STD	79	83	86	89	93	94
Code 3 Tone*	HI	81	85	86	91	95	96
	STD	76	80	82	86	90	91
Slow Whoop	HI	87	90	92	95	99	100
	STD	81	85	87	90	94	95
Siren	HI	86	89	92	94	98	99
	STD	81	84	87	89	93	94
HI/LO	HI	83	86	89	89	93	94
	STD	77	81	84	84	88	89

\* For ULC applications, only Code 3 Horn and Code 3 Tone are required to meet the ULC minimum of 85 dBA and the audible signal temporal pattern mandated by the National Building Code of Canada.

**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.

**WARNING:** The Multitone Strobe appliances must be field set to the desired dBA sound output level and alarm tone before they are installed. This is done by properly inserting a jumper plug and adjusting a four-position switch in accordance with these instructions. Incorrect settings will result in improper performance and may damage the product, which could result in property damage and serious injury or death to you and/or others.

**LIGHT OUTPUT**

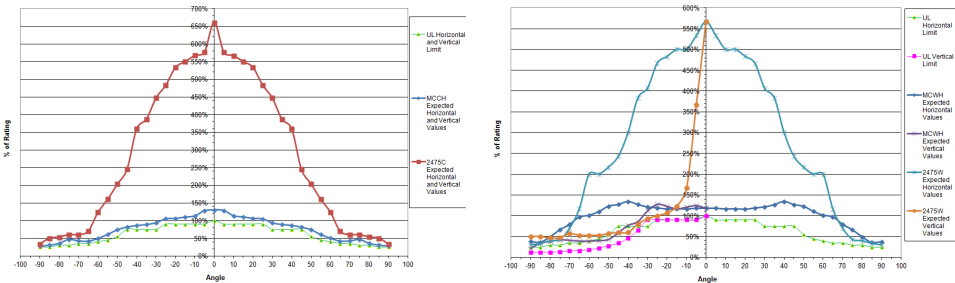


Figure 1: Expected light output for Ceiling (left) and Wall (right) Models

**CANDELA SELECTION**

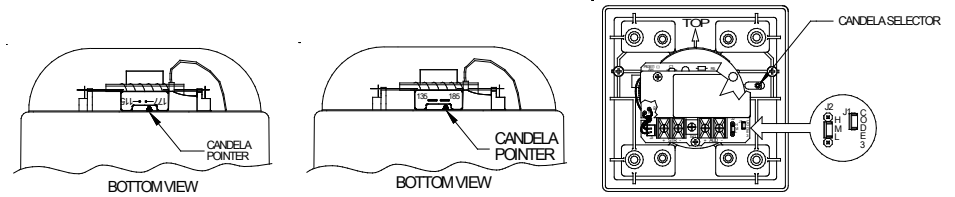


Figure 2: Showing Location of Candela Selector and Jumper Plugs

**NOTE:** The MT Multi High-Candela Ceiling comes preset at 177cd. The MT Multi-High-Candela Wall comes preset at 185 cd. Factory setting is on Medium dB and Code 3.

**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 a current draw exceeding the power supply's capacity.

**MULTITONE SETTINGS**

The Switch (SW1) of the Multitone Appliance, shown in Figure 3, is used to set the dBA sound output level and alarm tone. The factory settings are shown below. Read these instructions carefully before changing any of these factory settings.

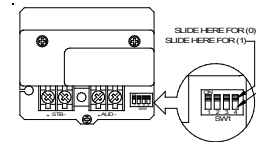


Figure 3: PCB Board Layout Showing Location Switch (SW1)

The factory settings for 24VDC models are: HIGH dBA SW1 POS 1 set on 1 HORN TONE SW1 POS 2, 3, 4 set on 1, 1, 1

**STEP 1:** Set the desired dBA sound output level as follows (Refer to Table 5). Multitone Strobe Appliances cannot be field set for input voltage. Multitone Strobe Appliances are field set for dBA sound output level by adjusting a four position Switch (SW1) as shown in Table 5 and Figure 3. Use SW1 Position 1 to select the dBA sound output level.

Table 5: dBA Sound Output Level Settings	
Input Voltage and Decibel Level	SW1 Settings
24 VDC/HIGH dBA:	Set SW1 POS 1 on 1 (Factory Setting)
24 VDC/STD dBA:	Set SW1 POS 1 on 0

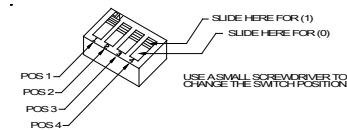


Figure 4: Switch Settings

**WARNING:** Verify the switch (SW1) settings to ensure they are correct. Improper settings can damage the unit or result in no sound output or a dBA sound output level that is below the 75db minimum code requirements for public mode fire protection. This could result in property damage and serious injury or death to you and/or others.

**STEP 2:** Set desired alarm tone as follows (refer to Figure 3 and Table 6). Multitone Strobe Appliances are field set for any one of eight alarm tones by setting a four-position switch (SW1) as shown in Figure 4 and Table 6. Use SW1 POS 2, 3, 4 to select the desired alarm tone.

Table 6: Switch Settings			
Tone	POS 2	POS 3	POS 4
Horn	1	1	1
Bell	1	0	1
March Time Horn	0	0	1
Code 3 Horn	1	1	0
Code 3 Tone	0	1	1
Slow Whoop	0	1	0
Siren	1	0	0
HI/LO	0	0	0

**NOTE:** The Code 3 Horn and Code 3 Tone (set on HIGH dBA) incorporate the temporal pattern specified by ANSI/NFPA for standard emergency evacuation signaling. They should be used only for fire evacuation signaling and not for any other purpose.

The Horn and Bell Tones can be used on coded systems with a minimum On-Time of 1/4 second if the audible and strobe are wired to operate independently. All other tones are recommended for use only on continuous (non-coded)

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

#### WIRING DIAGRAMS

- Multitone 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 and connect to screw terminals.
- Break all in-out wire runs on supervised circuits to ensure the integrity of the circuit supervision as shown in Figure 5. The polarity shown in the wiring diagrams is for operation of the appliances. The polarity is reversed by the FACP during supervision.

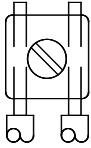


Figure 5

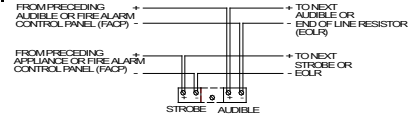


Figure 6: Audible appliance and strobe operate independently.

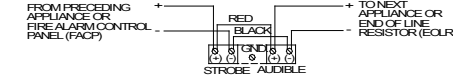


Figure 7: Audible appliance and strobe operate in unison. Red and black shunt-wires are supplied.

**NOTE:** Wiring method shall be in accordance with CSA C22.1, Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations, Section 32.

#### MOUNTING PROCEDURES

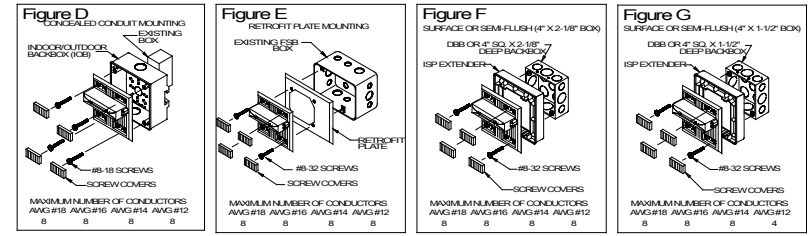
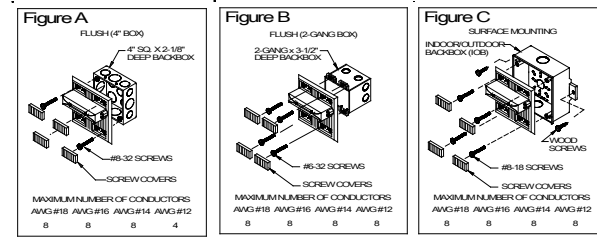
- The MT can be flush mounted to a 100mm backbox (Fig. A) or double-gang backbox (Figure B). It can also be surface mounted to an indoor/outdoor backbox (Figures C and D). It can also be used with a retrofit plate (Figure E) or with an ISP extender (Figures F and G). Mounting hardware for each mounting 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.
- The knock-out opening on the outdoor backbox is sized for a 1/2-inch conduit and matching connector. Ensure a proper watertight conduit fitting is used to connect the backbox for outdoor/severe environment applications.
- When terminating field wires, do not use more lead length than required. Excess lead length could result in insufficient wiring space for the appliance.
- Use care and proper techniques to position the field wires in the backbox so 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.
- Connect field wires to the MT terminal block (polarity must be observed). Bend the field wires up 90° at the connection to the terminal block.
- Carefully push the field wires into the backbox by hand. Press the MT to the backbox, verifying it is seated and aligned correctly.
- Fasten the MT to the backbox using the screws supplied.

#### 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.

**CAUTION:** Verify the installed product has sufficient clearance and wiring room prior to installing backboxes and conduit, especially if sheathed multi-conductor cable or 3/4-inch 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.



**WARNING:** This unit must be mounted on a flat surface, so the surface covers the entire back surface of the backbox. When used in an outdoor application or a NEMA 3R application, use weatherproof rated conduit fitting on all knockouts of the backbox.

**WARNING:** THE MTWP Strobe appliance is a FIRE ALARM DEVICE – DO NOT PAINT.

**WARNING:** The 135cd, 185cd and 177cd settings are listed for use in sleeping or non-sleeping areas when installed in accordance with appropriate NFPA standards and the AHJ.

**WARNING:** When installing strobes in an open office or other areas containing partitions or other viewing obstructions, special attention must be given to the location of the strobes so their operating effect can be seen by all intended viewers, with the intensity, number, and type of strobes being sufficient to ensure the intended viewer is alerted by proper illumination. Failure to do so could result in property damage and serious injury or death to you and/or others.

**WARNING:** A small possibility exists that the use of multiple strobes within a person's field of view, under certain circumstances, might induce a photosensitive 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 Notification strongly recommends the strobes installed must not present a composite flash rate in the field of view that exceeds five (5) hz at the operating voltage of the strobes. Cooper Notification also strongly recommends the intensity and composite flash rate of installed strobes comply with levels established by applicable laws, standards, regulations, codes and guidelines.

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

These appliances 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 ensure immunity from electrical noise (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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