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INSTALLATION INSTRUCTIONS MULTITONE STROBE APPLIANCES

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

GENERAL:

The Multitone Strobe Appliances are UL Listed under Standard 1638 for Fire Protective Service, private mode and UL Standard 464 for Audible Signal Appliances. They are Listed for indoor/outdoor use, wall or ceiling mount, with the backbox specified in these instructions (see Mounting Options). The Multitone Strobe Appliances use a Xenon flashtube with solid state circuitry enclosed in a rugged Lexan® 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 Information). 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, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.

SPECIFICATIONS:

Table 1: UL Ratings for Multitone Strobe Appliances									
Model	Rated Input Voltage (VDC)			Rated	Strobe Input (AMPS)	Rated Strobe ¹ Candela Per UL 1638 (cd)			
	Min	Nom	Max	Min	Nom	Max			
MT-12-WH		12			.150		15.0cd		
MT-24-WH	18	24	31	.075	.075	.078	15.0cd		
MT-24-RH	18	24	31	.075	.075	.078	6.0cd		
MT-24-WM	18	24	31	.088	.088	.096	117.0cd		

Strobe candela at -35° Centigrade is reduced to 7.5 candela for WH models, 78 candela for WM models and 3.0 candela for RH models.

The UL Listed "Rated Voltage" range is 18-31VDC for MT-24-WM/WH/RH and 12VDC for MT-12-WH using either filtered (DC) or unfiltered full-wave-rectified (FWR) voltage. 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 signaling device.

⚠ WARNING: ALTHOUGH UL TESTING HAS VERIFIED THAT THESE PRODUCTS FUNCTION EVEN AT 80% OF THEIR MINIMUM RATING AND 110% OF THEIR MAXIMUM RATING, WHEELOCK STRONGLY RECOMMENDS THAT THE VOLTAGE APPLIED TO THESE PRODUCTS BE WITHIN THEIR RATED VOLTAGE RANGE. THE APPLICATION OF IMPROPER VOLTAGE MAY RESULT IN DEGRADED OPERATION OR DAMAGE TO THESE PRODUCTS.

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Table 2: Current Ratings for Multitone Audible Appliances								
			Average	Rated Average				
Tone	Tone Description	Curren	t (Amps)	Current (Amps)				
		24VDC		12VDC				
		HI dBA	STD dBA	HI dBA	STD dBA			
Horn	Broadband Horn (Continuous)	0.040	0.023	0.100	0.020			
Bell	1560 Hz Modulated (0.07 Sec. ON/Repeat)	0.014	0.012	0.031	0.010			
March Time Horn	Horn (0.25 Sec. ON/0.25 Sec. OFF/Repeat)	0.040	0.023	0.100	0.020			
Code-3 Horn	Horn (ANSI S3.41 Temporal Pattern)	0.040	0.023	0.100	0.020			
Code-3 Tone	500 Hz (ANSI S3.41 Temporal Pattern)	0.028	0.017	0.060	0.015			
Slow Whoop	500-1200 Hz Sweep (4.0 Sec. ON/0.5 Sec. OFF/Repeat)	0.048	0.026	0.100	0.025			
Siren	600-1200 Hz Sweep (1.0 Sec. ON/Repeat)	0.036	0.023	0.082	0.020			
HI/LO	1000/800 Hz (0.25 Sec. ON/Alternate)	0.020	0.014	0.044	0.012			

Add 25% more input current than shown in Table 2 when operating the unit at maximum input voltage.

Add strobe current from Table 1 to audible appliance current from Table 2 to obtain total current for each unit, if the strobe and audible are wired to operate in unison on a single circuit.

Table 3: dBA Multitone With Strobe									
	Anec	choic	Reverberant						
	dBA @ 10'		dBA @ 10' Per UL 464						
Tone	Nominal		Min	imum	Maximum				
	Voltage		Vo	ltage	Voltage				
	HI	STD	HI	STD	HI	STD			
Horn	99	93	85	79	88	82			
Bell	92	87	79	75	82	75			
March Time Horn	99	93	82	75	85	79			
Code-3 Horn	99	93	79	75	82	75			
Code-3 Tone	95	90	75	*70	79	*73			
Slow Whoop	99	94	82	75	85	79			
Siren	98	93	82	75	85	79			
HI/LO	93	88	79	75	82	75			

Anechoic dBA is measured on-axis in a non-reflective (free field) test room using fast meter response. For peak dBA (measured with peak meter response), add 5 dBA to anechoic values shown in Table 3. Reverberant dBA is a minimum UL rating based on sound power measurements in a reverberant test room.

⚠ WARNING: MULTITONE STROBE MODELS SET ON "CODE-3 TONE" WITH STANDARD dBA DO NOT MEET THE 75 dBA MINIMUM UL REVERBERANT SOUND LEVEL REQUIRED FOR PUBLIC MODE FIRE PROTECTION SERVICE (NOTED BY * IN TABLE 3). MODELS WITH SETTINGS WHICH PRODUCE LESS THAN 75 dBA MAY NOT BE HEARD. THIS SETTING IS ACCEPTABLE ONLY FOR GENERAL SIGNALING (NON-FIRE ALARM) USE. USE THE "HIGH" dBA SETTING WITH THIS TONE OR USE A DIFFERENT TONE FOR PUBLIC MODE SERVICE.

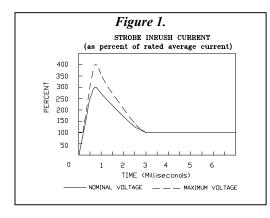


Table 4.								
Models Voltage								
	18	20	22	24	26	28	31	12
MT-24-WM/WH/RH DC/FWR	0.7	0.8	0.9	1.0	1.1	1.2	1.3	
MT-12-WH DC/FWR								0.6

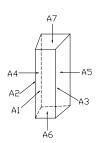
(For full-wave-rectified input voltage, multiply 1.41 by percent value shown in Figure 1.)

⚠ WARNING: MAKE SURE THAT THE TOTAL CURRENT REQUIRED BY ALL DEVICES THAT ARE CONNECTED TO THE SYSTEM'S PRIMARY AND SECONDARY POWER SOURCES AND SIGNALING CIRCUITS DOES NOT EXCEED THEIR RATED CURRENT. OVERLOADING THESE SOURCES COULD RESULT IN LOSS OF POWER AND FAILURE TO ALERT OCCUPANTS DURING AN EMERGENCY.

When calculating the total current: use Table 1 to determine the highest value of "Rated Strobe Average Current" for an individual strobe (across the expected operating voltage range of the strobe); then multiply this value by the total number of strobes; be sure to add the current for any other devices, including audible signaling devices, powered by the same source and include any required safety factors. Use Table 2 to calculate the total audible appliance current in the same manner.

WARNING: MAKE SURE THAT ALL FUSES USED ON SIGNALING CIRCUITS ARE RATED TO HANDLE THE MAXIMUM INRUSH OR PEAK CURRENT FROM ALL DEVICES ON THOSE CIRCUITS. FAILURE TO DO THIS MAY RESULT IN LOSS OF POWER TO THE SIGNALING CIRCUIT AND THE FAILURE OF ALL DEVICES ON THAT CIRCUIT TO OPERATE.

When calculating the maximum inrush: use Figure 1 to determine the highest value of "Rated Inrush Current" for an individual strobe (across the expected operating voltage range of the strobe); then multiply that value by the total number of strobes on the circuit; be sure to add the inrush currents from any other devices on that circuit and include any required safety factors. The time duration of the maximum strobe inrush current is shown in Figure 1. Calculate the maximum inrush current for all Multitone audible appliances in the same manner. The Multitone audible appliances produce a brief inrush current that lasts for just 2 microseconds but can reach a peak value of 8.0 Amps (11.2 Amps for FWR input).



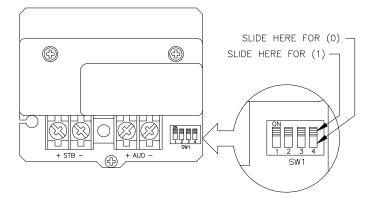
	D . 1		Candela At Various Angles						
Model	Rated	Per UL 1638							
	Candela	A1	A2	A3	A4	A5	A6/A7		
MT-24-WH	15.0cd	15.0	18.8	13.7	15.6	7.4	0.9		
MT-12-WH	15.0cd	15.0	16.8	14.4	14.6	6.9	0.6		
MT-24-RH	6.0cd	6.0	7.5	5.5	6.2	3.0	0.37		
MT-24-WM	117.0cd	117.0	15.2	16.4	6.0	7.0	1.2		

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

MULTITONE SETTINGS:

The Switch (SW1) of the Multitone Strobe Appliances, shown in Figure 2, is used to set the desired alarm tone and dBA sound output level. The factory settings are shown below. **Read these instructions carefully before changing any of these factory settings.**

Figure 2.
PC Board Layout Showing Location of Switch (SW1)



The factory settings are:

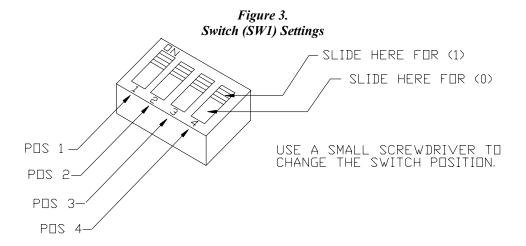
HIGH dBA: SW1 POS 1 = 1
HORN TONE: SW1 POS 2, 3, 4 = 1, 1, 1

STEP 1:

Set desired dBA sound output level as follows (Refer to Figure 3):

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 desired dBA sound output level.

Table			
HIGH	(Factory Setting)		
STANDARD	dBA:	Set SW1 POS $1 = 0$	



⚠ WARNING: DOUBLE CHECK THE SWITCH (SW1) SETTINGS TO MAKE SURE THEY ARE CORRECT. IMPROPER SETTINGS CAN RESULT IN A dBA SOUND OUTPUT LEVEL THAT IS BELOW THE 75 dBA MINIMUM CODE REQUIREMENT FOR PUBLIC MODE FIRE PROTECTION.

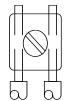
STEP 2:

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 3 and Table 6. Use SW1 POS 2, 3, 4 to select the desired alarm tone.

Table 6: Switch Settings								
Tone	POS	POS	POS					
	2	3	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					

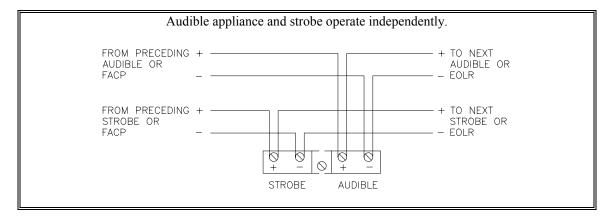
- Multitone Strobe models have in-out wiring terminals that accept two #12 to #18 American Wire Gauge (AWG) wires at each screw terminal. Strip leads 3/8 inches and connect to screw terminals.
- 2) Break all in-out wire runs on supervised circuits to assure integrity of circuit supervision as shown on right. The polarity shown in the wiring diagrams is for operation of the appliances. The polarity is reversed by the FACP during supervision.

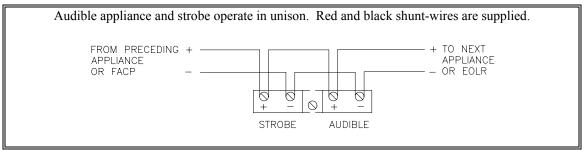


NOTE: The Code-3 Horn and Code-3 Tone (set on HIGH dBA) incorporate the temporal pattern specified by ANSI/NFPA for standard emergency evacuation signaling. They should be used only for fire evacuation signaling and not for any other purpose.

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) systems.

WIRING INFORMATION:

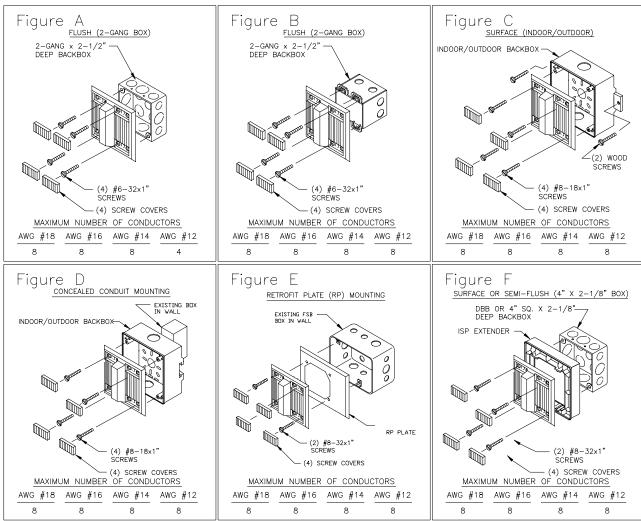


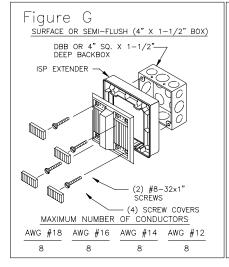


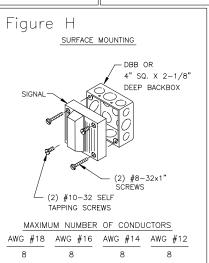
MOUNTING OPTION:

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.







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. Multitone Strobe models can be flush mounted to a standard 4 inch square by 2-1/8 inch deep electrical box (Figure A) or a standard 2-gang by 3-1/2" inch minimum deep electrical box (Figure B).
- 2. All models can also be surface mounted to Wheelock's model IOB backbox (Figure C or D) or to a 4" square backbox (model DBB or BB) with Wheelock's model ISP extender (Figure F and G).
- 3. Multitone Strobe models can also be retrofitted to an existing FSB backbox to replace Wheelock's model 7001 Strobe Horn when used with Wheelock adaptor plate model RP (Figure E).
- 4. All models are supplied with four snap-in covers to hide the mounting holes and provide an attractive installation. The snap-in covers are interchangeable and have slots on each end so they can be removed if necessary (by prying them up with a thin blade screwdriver). To insert snap-in cover, slide the outside edge of the cover (furthest edge from the strobe lens) partially into the mounting hole recess; then align the cover so it is parallel to the grille (not tilted) and snap cover into place.
- 5. The IOB surface backbox has 1/2 inch conduit knockouts on two sides. It has a variety of knockouts on the back for mounting it to recessed electrical boxes and for wire entrances (Figure D). It can also be mounted to a surface with the two mounting ears that are supplied. The ears slide into slots on the back of the box (Figure C). Use appropriate anchors for the wood screws that are supplied with the box (if necessary).
- 6. The IOB includes a prefastened gasket and four hole plugs. Make sure the condensation drain holes on the box face down and that the box is vertical to permit drainage of any moisture. Use the mounting ears to secure the box (do not use the back knockouts). Use the hole plugs to seal the unused mounting holes on the Multitone grille (press them in securely from the back side of the grille). Mount the unit to the IOB with the four #8-18 screws supplied with the box.
- 7. Mounting hardware for each mounting option is supplied.
- 8. Conduit entrances to the backbox should be selected to provide sufficient wiring clearance for the installed product. When extension rings are required, conduit should enter through the backbox, not the extension ring. Use Steel City #53151 (1-1/2" deep) or #53171 (2-1/8" deep) extension rings (as noted in the mounting options) or equal with the same cut-out area.
- 9. When terminating field wires, do not use more lead length than required. Excess lead length could result in insufficient wiring space for the signaling device.
- 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.
- 11. Do not pass additional wires (used for other than the signaling device) through the backbox. Such additional wires could result in insufficient wiring space for the signaling device.
- 12. All models are UL Listed for indoor outdoor use with a temperature range of: $32^{\circ}F$ to $120^{\circ}F$ ($0^{\circ}C$ to $+49^{\circ}C$) and maximum humidity of 85% RH for indoor use and $-31^{\circ}F$ to $150^{\circ}F$ ($-35^{\circ}C$ to $+66^{\circ}C$) and maximum humidity of 95% RH for outdoor use.

⚠ WARNING: MULTITONE STROBE APPLIANCES ARE NOT TO BE USED AS AN INDOOR VISUAL EVACUATION APPLIANCE OR FOR THE HEARING IMPAIRED.

⚠ WARNING: IF MULTITONE STROBE APPLIANCES ARE OPERATED WITHIN 15 INCHES OF A PERSON'S EAR, THEY CAN PRODUCE A SOUND PRESSURE LEVEL THAT EXCEEDS THE MAXIMUM 120 dBA PERMITTED BY ADA AND OSHA RULES. EXPOSURE TO SUCH SOUND LEVELS CAN RESULT IN DAMAGE TO A PERSON'S HEARING.

⚠ 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 (SEE TABLE 4). 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.

⚠ 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.

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

These appliances can produce a distinctive three pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NFPA 72, 1993 Edition.

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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