



# INSTALLATION INSTRUCTIONS

## THL-1, THR-1, THS-1, & TH4 SERIES ENCAPSULATED TIME DELAY RELAYS

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901-0000-292

### DANGER!



Potentially hazardous voltages are present. Electrical shock can cause death or serious injury. Installation should be done by qualified personnel following all National, State & Local Codes.



**BE SURE TO REMOVE ALL POWER SUPPLYING THIS EQUIPMENT BEFORE CONNECTING OR DISCONNECTING WIRING. READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. KEEP FOR FUTURE REFERENCE.**

### WIRING

Wire the unit per the connection diagram on the top of the time delay relay. NOTE: For products that use a Trigger to initiate the timing function, a dry-type contact is recommended (**applying improper voltage to the terminals could damage the unit**). For DC Input Voltages, make sure the polarity matches the connection diagram. Using a solid state switch to initiate the time sequence is acceptable. See [www.macromatic.com/leakage](http://www.macromatic.com/leakage) or contact Macromatic for information regarding leakage current limits and other solid state design considerations.

### WARRANTY

All catalog-listed products manufactured by Macromatic are warranted to be free from defects in workmanship or material under normal service and use for a period of five (5) years from the date of manufacture.

### SETTING THE TIME DELAY

All THL-1, THR-1, THS-1 and TH4 Series products, except those with fixed time delays ("-Fxx" suffix), come with a specific single time delay range as indicated on the nameplate and by the suffix to the Product Number. Adjust the time delay within the specific time range by rotating the knob located on the top of the unit (or remotely if "-Rxx" suffix). Note: the dial markings are for reference only.

### TROUBLESHOOTING

If the unit fails to operate properly, check that all connections are correct per the connection diagram on the product. For DC Input Voltages, make sure the polarity matches the connection diagram. Use the descriptions of how each function operates below & on back of this sheet as a guide to determine if the unit is operating properly. If problems continue, visit our website at [www.macromatic.com/contact](http://www.macromatic.com/contact) for more information.

Function	Product Series	Operation	Timing Chart
<b>ON DELAY</b> Delay on Operate	THL-102 THR-102 THS-102 TH402	Upon application of input voltage, the time delay (t) begins. At the end of the time delay (t), the output is energized. Input voltage must be removed to reset the time delay relay & de-energize the output.	
<b>INTERVAL ON</b> Interval	THR-105 THS-105 TH405	Upon application of input voltage, the output is energized and the time delay (t) begins. At the end of the time delay (t), the output is de-energized. Input voltage must be removed to reset the time delay relay.	
<b>FLASHER</b> OFF First	THR-108 THS-108 TH408	Upon application of input voltage, the output is energized and the time delay (t) begins. At the end of the time delay (t), the output is de-energized and remains in that condition for the time delay (t). At the end of the time delay (t), the output is energized and the sequence repeats until input voltage is removed.	
<b>FLASHER</b> ON First	THR-109 THS-109 TH409	Upon application of input voltage, the output is energized and the time delay (t) begins. At the end of the time delay (t), the output is de-energized and remains in that condition for the time delay (t). At the end of the time delay (t), the output is energized and the sequence repeats until input voltage is removed.	
<b>TRIGGERED</b> ON DELAY	THR-112 THS-112 TH412	Upon application of input voltage, the time delay relay is ready to accept a trigger. When the trigger is applied, the time delay (t) begins. At the end of the time delay (t), the output is energized and remains in that condition as long as either the trigger is applied or the input voltage remains. If the trigger is removed during the time delay (t), the output remains de-energized & the time delay (t) is reset.	
<b>WATCHDOG</b> Retriggerable Single Shot	THR-113 THS-113 TH413	Upon application of input voltage, the time delay relay is ready to accept a trigger. When the trigger is applied, the output is energized and the time delay (t) begins. At the end of the time delay (t), the output is de-energized unless the trigger is removed and re-applied prior to time out (before time delay (t) elapses). Continuous cycling of the trigger at a rate faster than the time delay (t) will cause the output to remain energized indefinitely.	
<b>SINGLE SHOT</b> One Shot Momentary Interval	THR-115 THS-115 TH415	Upon application of input voltage, the time delay relay is ready to accept a trigger. When the trigger is applied, the output is energized and the time delay (t) begins. During the time delay (t), the trigger is ignored. At the end of the time delay (t), the output is de-energized and the time delay relay is ready to accept another trigger.	



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Function	Product Series	Operation	Timing Chart
<b>OFF DELAY</b> Delay on Release Delay on Break Delay on De-Energization	THR-116 THS-116 TH416	Upon application of input voltage, the time delay relay is ready to accept a trigger. When the trigger is applied, the output is energized. Upon removal of the trigger, the time delay (t) begins. At the end of the time delay (t), the output is de-energized. Any application of the trigger during the time delay will reset the time delay (t) and the output remains energized.	
<b>SINGLE SHOT (TRAILING EDGE)</b> Retriggerable	THR-122 THS-122 TH422	Upon application of input voltage, the time delay relay is ready to accept a trigger. When the trigger is applied, the output remains de-energized. Upon removal of the trigger, the output is energized and the time delay (t) begins. At the end of the time delay (t), the output is de-energized unless the trigger is removed and re-applied prior to time out (before time delay (t) elapses). Continuous cycling of the trigger at a rate faster than the time delay (t) will cause the output to remain energized indefinitely.	
<b>REPEAT CYCLE</b> OFF First	THR-131 THS-131 TH431	Upon application of input voltage, the time delay (t1) begins. At the end of the time delay (t1), the output is energized and remains in that condition for the time delay (t2). At the end of this time delay, the output is de-energized and the sequence repeats until input voltage is removed.	
<b>ON DELAY/ OFF DELAY</b>	THR-141 THS-141 TH441	Upon application of input voltage, the time delay relay is ready to accept a trigger. When the trigger is applied, the time delay (t1) begins. At the end of the time delay (t1), the output is energized. When the trigger is removed, the output contacts remain energized for the time delay (t2). At the end of the time delay (t2), the output is de-energized & the time delay relay is ready to accept another trigger. If the trigger is removed during time delay period (t1), the output will remain de-energized and time delay (t1) will reset. If the trigger is re-applied during time delay period (t2), the output will remain energized and the time delay (t2) will reset.	<p>* For TD-7 catalog numbers, t1 &amp; t2 are the</p>
<b>REPEAT CYCLE</b> ON First	THR-151 THS-151 TH451	Upon application of input voltage, the output is energized and the time delay (t1) begins. At the end of the time delay (t1), the output is de-energized and remains in that condition for the time delay (t2). At the end of this time delay, the output is energized and the sequence repeats until input voltage is removed.	
<b>DELAYED INTERVAL</b> Single Cycle	THR-161 THS-161 TH461	Upon application of input voltage, the time delay (t1) begins. At the end of the time delay (t1), the output is energized and remains in that condition for the time delay (t2). At the end of this time delay (t2), the output is de-energized. Input voltage must be removed to reset the time delay relay.	
<b>DELAYED INTERVAL</b> (Triggered) Single Cycle	THR-165 THS-165 TH465	Upon application of input voltage, the time delay relay is ready to accept a trigger. When the trigger is applied, the time delay (t1) begins. At the end of the time delay (t1), the output is energized and remains in that condition for the time delay (t2). At the end of the time delay (t2), the output is de-energized & the relay is ready to accept another trigger. During both time delay (t1) & time delay (t2), the trigger is ignored.	