

# ON DELAY, INTERVAL, FLASHER, CYCLE & DELAYED INTERVAL

## RELAY OUTPUT | THR-1 SERIES

TIME DELAY RELAYS | ENCAPSULATED



- ◆ Cost effective design & compact 2" x 2" enclosure are ideal for volume OEM applications
- ◆ Microprocessor-based design for greater performance & maximum flexibility
- ◆ Encapsulated for protection against harsh environments
- ◆ 10A SPDT relay output contacts can handle most pilot duty & fractional HP loads
- ◆ Relay Common internally connected to Pin 2-makes wiring easier
- ◆ Onboard & remote adjustable or fixed time delays from 0.05 seconds to 100 hours



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Relay Common Internally Connected to Pin 2

FUNCTION ■	INPUT VOLTAGE	CATALOG NUMBER **	WIRING
<b>ON DELAY</b> <b>A</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-10262-**J THR-10266-**J THR-10268-**J THR-10261-**J	<p><b>Onboard Adjustable or Fixed Time Delay</b></p> <p><b>DIAGRAM 301</b></p> <p><b>Remote Time Delay</b></p> <p><b>DIAGRAM 303</b></p>
<b>INTERVAL ON</b> <b>B</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-10562-**J THR-10566-**J THR-10568-**J THR-10561-**J	
<b>FLASHER</b> (OFF Time 1st) <b>E</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-10862-**J THR-10866-**J THR-10868-**J THR-10861-**J	
<b>FLASHER</b> (ON Time 1st) <b>F</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-10962-**J THR-10966-**J THR-10968-**J THR-10961-**J	
<b>REPEAT CYCLE</b> * (OFF Time 1st) <b>L</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-13162-**J THR-13166-**J THR-13168-**J THR-13161-**J	
<b>REPEAT CYCLE</b> * (ON Time 1st) <b>M</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-15162-**J THR-15166-**J THR-15168-**J THR-15161-**J	
<b>DELAYED INTERVAL</b> * <b>N</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-16162-**J THR-16166-**J THR-16168-**J THR-16161-**J	

■ See "Definitions of Timing Functions".

\* ON & OFF Time Ranges for these functions are the same. See [www.macromatic.com/onoff](http://www.macromatic.com/onoff) for information on how to order a unit with different ON & OFF time ranges.

\*\* Complete Product Number using two-digit Code from Table below.

### TIME DELAYS

THR-1 Series Products have three time delay options:

- **Onboard Adjustable Time Delay**--complete Product Number by adding two-digit Code from Table at right, i.e., THR-10262-30J is an On Delay with a time delay range of 0.1-10 seconds. \* See [www.macromatic.com/onoff](http://www.macromatic.com/onoff) for information on how to order these functions with different ON & OFF time ranges.
- **Onboard Fixed Time Delay**--replace two-digit Code with suffix "F" followed by delay [0.1 ... 100] followed by (S) seconds, (M) minutes or (H) hours, i.e., THR-10262-F5SJ is an On Delay with a time delay fixed at 5 seconds.
- **Remote Adjustable Time Delay**--THR-1 Series products can be built with two terminals for remote adjustable or fixed time delays.

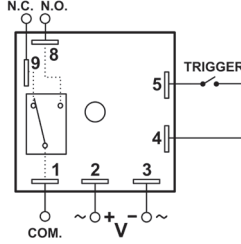
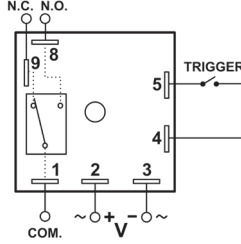
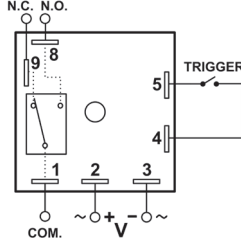
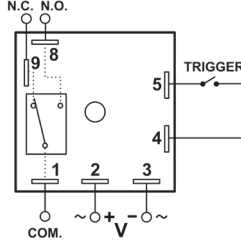
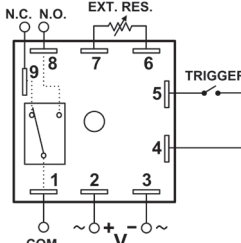
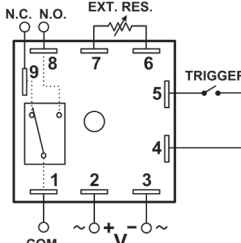
** TIMING RANGE TABLE	
Time Delay Range	Code
0.05 - 5 Sec.	04
0.1 - 10 Sec.	30
1 - 100 Sec.	31
10 - 1,000 Sec.	36
0.1 - 10 Min.	32
1 - 100 Min.	33
10 - 1,000 Min.	37
1 - 100 Hr.	35

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# OFF DELAY, SINGLE SHOT, WATCHDOG, SINGLE SHOT FALLING EDGE, ON DELAY/OFF DELAY & DELAYED INTERVAL

## RELAY OUTPUT | THR-1 SERIES

Isolated Control Switch & Isolated Relay Common

FUNCTION ■	INPUT VOLTAGE	CATALOG NUMBER **	WIRING
<b>OFF DELAY</b> ■ <b>C</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11662-** THR-11666-** THR-11668-** THR-11661-**	<b>Onboard Adjustable or Fixed Time Delay</b> 
<b>SINGLE SHOT</b> ■ <b>D</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11562-** THR-11566-** THR-11568-** THR-11561-**	
<b>WATCHDOG</b> (Retriggerable Single Shot) ■ <b>J</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11362-** THR-11366-** THR-11368-** THR-11361-**	
<b>SINGLE SHOT FALLING EDGE</b> (Retriggerable) ■ <b>H</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-12262-** THR-12266-** THR-12268-** THR-12261-**	
<b>ON/OFF DELAY *</b> ■ <b>G</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-14162-** THR-14166-** THR-14168-** THR-14161-**	
<b>DELAYED INTERVAL *</b> (Triggered) ■ <b>P</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-16562-** THR-16566-** THR-16568-** THR-16561-**	



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- ◆ Encapsulated for protection against harsh environments
- ◆ 10A SPDT relay output contacts can handle most pilot duty & fractional HP loads
- ◆ Onboard & remote adjustable or fixed time delays from 0.05 seconds to 100 hours



- See "Definitions of Timing Functions".
- \* ON & OFF Time Ranges for these functions are the same. See [www.macromatic.com/onoff](http://www.macromatic.com/onoff) for information on how to order a unit with different ON & OFF time ranges.
- \*\* Complete Product Number using two-digit Code from Table below.

## TIME DELAYS

THR-1 Series Products have three time delay options:

- **Onboard Adjustable Time Delay**--complete Product Number by adding two-digit Code from Table at right, i.e., THR-11662-30 is an Off Delay with a time delay range of 0.1-10 seconds.  
\* See [www.macromatic.com/onoff](http://www.macromatic.com/onoff) for information on how to order these functions with different ON & OFF time ranges.
- **Onboard Fixed Time Delay**--replace two-digit Code with suffix "F" followed by delay [0.1 ... 100] followed by (S) seconds, (M) minutes or (H) hours, i.e., THR-11662-F5S is an Off Delay with a time delay fixed at 5 seconds.
- **Remote Adjustable Time Delay**--THR-1 Series products can be built with two terminals for remote adjustable or fixed time delays.

\*\* TIMING RANGE TABLE

Time Delay Range	Code
0.05 - 5 Sec.	04
0.1 - 10 Sec.	30
1 - 100 Sec.	31
10 - 1,000 Sec.	36
0.1 - 10 Min.	32
1 - 100 Min.	33
10 - 1,000 Min.	37
1 - 100 Hr.	35



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TIME DELAY RELAYS | ENCAPSULATED

# OFF DELAY, SINGLE SHOT, WATCHDOG, SINGLE SHOT FALLING EDGE, ON DELAY/OFF DELAY & DELAYED INTERVAL

## RELAY OUTPUT | THR-1 SERIES



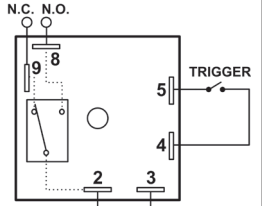
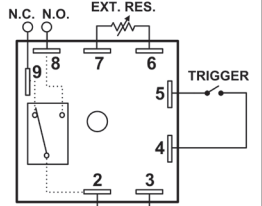
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Isolated Control Switch & Relay Common Internally Connected to Pin 2

FUNCTION ■	INPUT VOLTAGE	CATALOG NUMBER **	WIRING
<b>OFF DELAY</b> C	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11662-**J THR-11666-**J THR-11668-**J THR-11661-**J	<b>Onboard Adjustable or Fixed Time Delay</b> 
<b>SINGLE SHOT</b> D	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11562-**J THR-11566-**J THR-11568-**J THR-11561-**J	
<b>WATCHDOG</b> (Retriggerable Single Shot) J	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11362-**J THR-11366-**J THR-11368-**J THR-11361-**J	
<b>SINGLE SHOT FALLING EDGE</b> (Retriggerable) H	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-12262-**J THR-12266-**J THR-12268-**J THR-12261-**J	
<b>ON/OFF DELAY *</b> G	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-14162-**J THR-14166-**J THR-14168-**J THR-14161-**J	
<b>DELAYED INTERVAL *</b> (Triggered) P	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-16562-**J THR-16566-**J THR-16568-**J THR-16561-**J	<b>Remote Time Delay</b> 

■ See "Definitions of Timing Functions".

\* ON & OFF Time Ranges for these functions are the same. See [www.macromatic.com/onoff](http://www.macromatic.com/onoff) for information on how to order a unit with different ON & OFF time ranges.

\*\* Complete Product Number using two-digit Code from Table below.

## TIME DELAYS

THR-1 Series Products have three time delay options:

- **Onboard Adjustable Time Delay**--complete Product Number by adding two-digit Code from Table at right, i.e., THR-11662-30J is an Off Delay with a time delay range of 0.1-10 seconds.  
\* See [www.macromatic.com/onoff](http://www.macromatic.com/onoff) for information on how to order these functions with different ON & OFF time ranges.
- **Onboard Fixed Time Delay**--replace two-digit Code with suffix "F" followed by delay [0.1 ... 100] followed by (S) seconds, (M) minutes or (H) hours, i.e., THR-11662-F5SJ is an Off Delay with a time delay fixed at 5 seconds.
- **Remote Adjustable Time Delay**--THR-1 Series products can be built with two terminals for remote adjustable or fixed time delays.

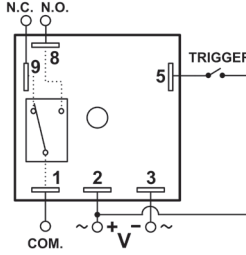
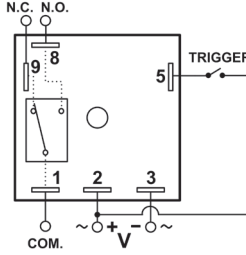
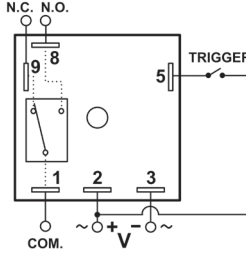
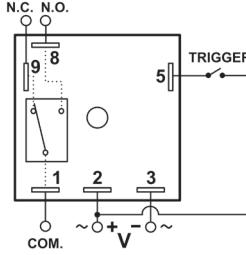
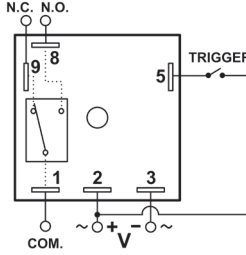
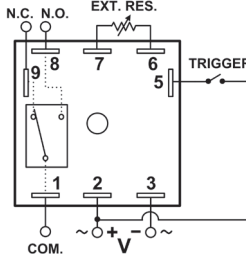
** TIMING RANGE TABLE	
Time Delay Range	Code
0.05 - 5 Sec.	04
0.1 - 10 Sec.	30
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# OFF DELAY, SINGLE SHOT, WATCHDOG, SINGLE SHOT FALLING EDGE, ON DELAY/OFF DELAY & DELAYED INTERVAL

## RELAY OUTPUT | THR-1 SERIES

Control Switch Common to Pin 2 & Isolated Relay Common

FUNCTION ■	INPUT VOLTAGE	CATALOG NUMBER **	WIRING
<b>OFF DELAY</b> C	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11662-**T THR-11666-**T THR-11668-**T THR-11661-**T	<b>Onboard Adjustable or Fixed Time Delay</b> 
<b>SINGLE SHOT</b> D	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11562-**T THR-11566-**T THR-11568-**T THR-11561-**T	
<b>WATCHDOG</b> (Retriggerable Single Shot) J	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11362-**T THR-11366-**T THR-11368-**T THR-11361-**T	
<b>SINGLE SHOT FALLING EDGE</b> (Retriggerable) H	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-12262-**T THR-12266-**T THR-12268-**T THR-12261-**T	
<b>ON/OFF DELAY *</b> G	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-14162-**T THR-14166-**T THR-14168-**T THR-14161-**T	
<b>DELAYED INTERVAL *</b> (Triggered) P	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-16562-**T THR-16566-**T THR-16568-**T THR-16561-**T	<b>Remote Time Delay</b> 

■ See "Definitions of Timing Functions".

\* ON & OFF Time Ranges for these functions are the same. See [www.macromatic.com/onoff](http://www.macromatic.com/onoff) for information on how to order a unit with different ON & OFF time ranges.

\*\* Complete Product Number using two-digit Code from Table below.



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## TIME DELAYS

THR-1 Series Products have three time delay options:

- **Onboard Adjustable Time Delay**--complete Product Number by adding two-digit Code from Table at right, i.e., THR-11662-30T is an Off Delay with a time delay range of 0.1-10 seconds. \* See [www.macromatic.com/onoff](http://www.macromatic.com/onoff) for information on how to order these functions with different ON & OFF time ranges.
- **Onboard Fixed Time Delay**--replace two-digit Code with suffix "F" followed by delay [0.1 ... 100] followed by (S) seconds, (M) minutes or (H) hours, i.e., THR-11662-F5ST is an Off Delay with a time delay fixed at 5 seconds.
- **Remote Adjustable Time Delay**--THR-1 Series products can be built with two terminals for remote adjustable or fixed time delays.

\*\* TIMING RANGE TABLE

Time Delay Range	Code
0.05 - 5 Sec.	04
0.1 - 10 Sec.	30
1 - 100 Sec.	31
10 - 1,000 Sec.	36
0.1 - 10 Min.	32
1 - 100 Min.	33
10 - 1,000 Min.	37
1 - 100 Hr.	35



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Control Switch Common to Pin 2 &  
 Relay Common Internally Connected to Pin 2

FUNCTION ■	INPUT VOLTAGE	CATALOG NUMBER **	WIRING
<b>OFF DELAY</b> <b>C</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11662-**JT THR-11666-**JT THR-11668-**JT THR-11661-**JT	<p><b>DIAGRAM 309</b></p> <p><b>DIAGRAM 311</b></p>
<b>SINGLE SHOT</b> <b>D</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11562-**JT THR-11566-**JT THR-11568-**JT THR-11561-**JT	
<b>WATCHDOG</b> (Retriggerable Single Shot) <b>J</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11362-**JT THR-11366-**JT THR-11368-**JT THR-11361-**JT	
<b>SINGLE SHOT FALLING EDGE</b> (Retriggerable) <b>H</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-12262-**JT THR-12266-**JT THR-12268-**JT THR-12261-**JT	
<b>ON/OFF DELAY *</b> <b>G</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-14162-**JT THR-14166-**JT THR-14168-**JT THR-14161-**JT	
<b>DELAYED INTERVAL *</b> (Triggered) <b>P</b>	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-16562-**JT THR-16566-**JT THR-16568-**JT THR-16561-**JT	

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## TIME DELAYS

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- **Onboard Adjustable Time Delay**--complete Product Number by adding two-digit Code from Table at right, i.e., THR-11662-30JT is an Off Delay with a time delay range of 0.1-10 seconds.  
 \* See [www.macromatic.com/onoff](http://www.macromatic.com/onoff) for information on how to order these functions with different ON & OFF time ranges.
- **Onboard Fixed Time Delay**--replace two-digit Code with suffix "F" followed by delay [0.1 ... 100] followed by (S) seconds, (M) minutes or (H) hours, i.e., THR-11662-F5SJT is an Off Delay with a time delay fixed at 5 seconds.
- **Remote Adjustable Time Delay**--THR-1 Series products can be built with two terminals for remote adjustable or fixed time delays.

** TIMING RANGE TABLE	
Time Delay Range	Code
0.05 - 5 Sec.	04
0.1 - 10 Sec.	30
1 - 100 Sec.	31
10 - 1,000 Sec.	36
0.1 - 10 Min.	32
1 - 100 Min.	33
10 - 1,000 Min.	37
1 - 100 Hr.	35

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# THR-1 SERIES

## RELAY OUTPUT

### APPLICATION DATA

#### Voltage Tolerance:

AC Operation: +10/-15% of nominal at 50/60 Hz  
 DC Operation: +10/-15% of nominal

**Load (Burden):** Maximum of 2 VA for all voltages

#### Setting Accuracy:

Maximum Setting (Adjustable): +5%, -0%  
 Minimum Setting (Adjustable): +0%, -50%  
 Fixed Time Delay: ±2% or 50ms, whichever is greater

**Repeat Accuracy** (constant voltage and temperature):  
 ±0.1% or ± 0.04 seconds, whichever is greater

#### Reset Time:

Triggered with Input Voltage: 100ms  
 Triggered with Control Switch: 40ms

**Start-up Time** (Time from when power is applied until unit is timing): 0.05 Seconds

**Maintain Function Time** (Time unit continues to operate after power is removed): 0.01 Seconds

#### Units Triggered by a Control Switch:

Minimum required trigger switch closure time is 50ms.

#### Temperature:

Operate: -28° to 65°C (-18° to 149°F)  
 Storage: -45° to 85°C (-49° to 185°F)

#### Output Contacts:

10A @ 240VAC / 7A @ 28VDC SPDT, 1/4hp @ 120VAC (N.O.)

#### Life:

Mechanical: 10,000,000 operations  
 Full Load: 100,000 operations

#### Compatibility:

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.

#### Mounting:

Surface with one #8 or #10 screw and a maximum tightening torque of 15 in-lbs.

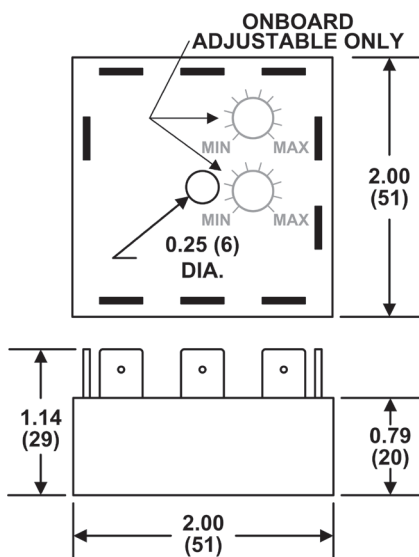
#### Termination:

0.25" male quick-connect terminals

#### Approvals:



### DIMENSIONS



All Dimensions in Inches (Millimeters)

### REMOTE TIME DELAY

Most THR-1 Series products can be built with two terminals for remote adjustable or fixed time delays. To order a product with a remote time delay, complete the Product Number by adding the two-digit Code from the Table shown on the appropriate product selection page followed by the suffix "R1", i.e., THR-10262-30R1. Contact Macromatic for information on limitations of remote time delays on functions with ON & OFF timing ranges.

#### Adjustable Time Delay

A 100K ohm potentiometer is required to obtain the maximum time delay for all standard ranges. To use other values of remote potentiometers, contact Macromatic.

#### Fixed Time Delay

A fixed time delay can be set by connecting a resistor across the two terminals. To determine the resistor value required, use the following equation:

$$R = \frac{T}{T_{\max}} \times 100,000$$

$R$  = Resistance value required to obtain  $T$   
 $T$  = Desired time delay  
 $T_{\max}$  = Maximum time delay of range

**Example:** Using time range 0.1-10 seconds, what resistor value is required for a fixed time delay of 5 seconds:

$$R = \frac{5}{10} \times 100,000 = 50,000 \text{ ohms (50K ohms)}$$