

# ON DELAY | INLINE (SERIES CONNECTION)

SOLID STATE OUTPUT | ANALOG-SET | THL-1 SERIES



- ◆ Universal input voltage: 24-240V AC & 12-48V DC
- ◆ Onboard & remote adjustable or fixed time delays from 0.01 seconds to 100 hours
- ◆ Two-terminal series-connection with the load
- ◆ 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
- ◆ Output rated 1A continuous/10A inrush pilot duty is perfect for high duty cycle/long life applications



FUNCTION	VOL	INPUT TAGE	PRODUCT NUMBER **	WIRING
ON DELAY 12-48V <b>A</b>		24-240V AC & DC	THL-1024U-**	<p>Onboard Adjustable or Fixed Time Delay</p> <p>DIAGRAM 329</p> <p>Remote Time Delay</p> <p>DIAGRAM 330</p>

■ See "Definitions of Timing Functions".

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

## TIME DELAYS

THL-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., THL-1024U-30 is an On Delay with a time delay range of 0.1-10 seconds.
- **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., THL-1024U-F5S is an On Delay with a time delay fixed at 5 seconds.
- **Remote Time Delay**--THL-1 Series products can be built with two terminals for remote adjustable or fixed time delays.

** TIMING RANGE TABLE	
Time Delay Range	Code
0.01 - 1 Sec.	02
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

Build your Time Delay Relays with the [Online Product Builder](#)

# THL-1 SERIES

## SOLID STATE OUTPUT | ANALOG-SET

### APPLICATION DATA

#### Voltage Tolerance:

AC Operation: +10 to -15% of nominal voltage, 50/60 Hz  
 DC Operation: +10 to -15% of nominal voltage

**Load (Burden):** Maximum of 1 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 ± 0.01 seconds, whichever is greater

**Reset Time:** 50ms

#### Start-up Time:

(Time from when power is applied until unit is timing)  
 0.02 Seconds

#### Maintain Function Time:

(Time unit continues to operate after power is removed)  
 0.01 Seconds

**Temperature:** Operating: -28° to 65°C (-18° to 149°F)  
 Storage: -40° to 85°C (-40° to 185°F)

#### Output Contacts:

Normally Open Solid State 1A Continuous, 10A Inrush @ 65° C, Pilot Duty

#### Life:

No predictable failure if used within operating parameters.

**Leakage Current (OFF-State):** < 5ma @ 240V AC

**Minimum Load Current:** 20ma

**Effective Voltage Drop (ON-State):** Maximum 3V @ 1A for all voltages

#### Compatibility:

Using a solid state switch to initiate the time sequence is acceptable. See or contact Macromatic for information regarding leakage current limits and other solid state design considerations.

#### Mounting:

Surface with one #8 or #10 screw

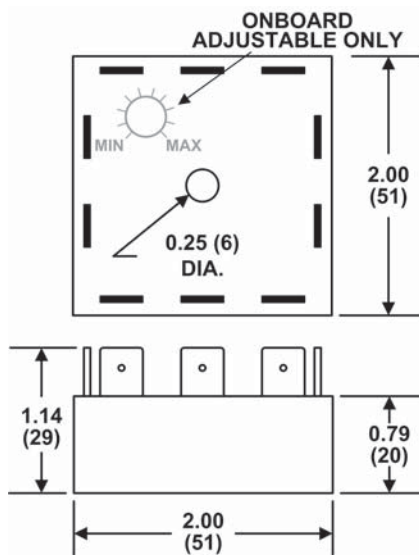
#### Termination:

0.25" male quick-connect terminals

#### Approvals:



### DIMENSIONS



All Dimensions in Inches (Millimeters)

### REMOTE TIME DELAY

THL-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., THL-1024U-30R1.

#### 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:

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