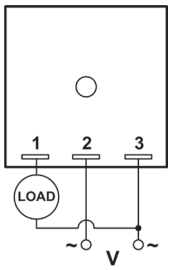
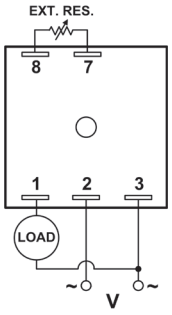
ON DELAY, INTERVAL, FLASHER, CYCLE & DELAYED INTERVAL

SOLID STATE OUTPUT | THS-1 SERIES

- 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 is perfect for high duty cycle/long life applications
- Onboard & remote adjustable or fixed time delays from 0.01 seconds to 100 hours
- Built-in load suppression eliminates need for separate protection
- Pilot duty rating

FUNCTION ■	INPUT VOLTAGE	CATALOG NUMBER **	WIRING ❖
ON DELAY ◘ **A**	24-240V AC 12-125V DC	THS-1024A-** THS-1024D-**	**Onboard Adjustable or Fixed Time Delay**  **DIAGRAM 317**
INTERVAL ON **B**	24-240V AC 12-125V DC	THS-1054A-** THS-1054D-**	
FLASHER (ON Time 1st) **E**	24-240V AC 12-125V DC	THS-1094A-** THS-1094D-**	
REPEAT CYCLE * (OFF Time 1st) **L**	24-240V AC 12-125V DC	THS-1314A-** THS-1314D-**	**Remote Time Delay**  **DIAGRAM 320**
REPEAT CYCLE * (ON Time 1st) **M**	24-240V AC 12-125V DC	THS-1514A-** THS-1514D-**	
DELAYED INTERVAL * **N**	24-240V AC 12-125V DC	THS-1614A-** THS-1614D-**	

■ See "Definitions of Timing Functions".
◘ See Inline (Series-Connection) On Delay.
❖ Diagrams shown are for products with AC input voltage. For products with DC input voltage, the "+" terminal is 2 & the "-" terminal is 3.
* ON & OFF Time Ranges for these functions are the same. See ***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

THS-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., THS-1054A-30 is an Interval On with a time delay range of 0.1-10 seconds. * See ***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., THS-1054A-F5S is an Interval On with a time delay fixed at 5 seconds.
- **Remote Time Delay**--THS-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

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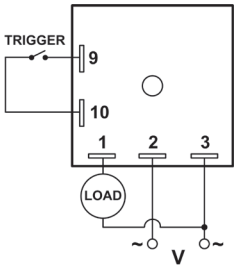
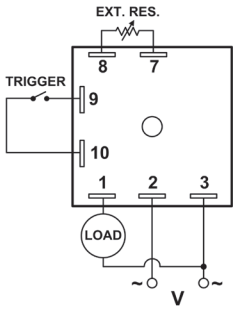
OFF DELAY, SINGLE SHOT, WATCHDOG, SINGLE SHOT FALLING EDGE, ON DELAY/OFF DELAY & DELAYED INTERVAL

SOLID STATE OUTPUT | THS-1 SERIES

Isolated Control Switch

FUNCTION ■	INPUT VOLTAGE	CATALOG NUMBER **	WIRING ❖
OFF DELAY **C**	24-240V AC 12-125V DC	THS-1164A-** THS-1164D-**	**Onboard Adjustable or Fixed Time Delay**  **DIAGRAM 318**
SINGLE SHOT **D**	24-240V AC 12-125V DC	THS-1154A-** THS-1154D-**	
WATCHDOG (Retriggerable Single Shot) **J**	24-240V AC 12-125V DC	THS-1134A-** THS-1134D-**	
SINGLE SHOT FALLING EDGE (Retriggerable) **H**	24-240V AC 12-125V DC	THS-1224A-** THS-1224D-**	**Remote Time Delay**  **DIAGRAM 321**
ON/OFF DELAY * **G**	24-240V AC 12-125V DC	THS-1414A-** THS-1414D-**	
DELAYED INTERVAL * (Retriggerable) **P**	24-240V AC 12-125V DC	THS-1654A-** THS-1654D-**	

■ See “Definitions of Timing Functions”.

❖ Diagrams shown are for products with AC input voltage. For products with DC input voltage, the “+” terminal is 2 & the “-” terminal is 3.

* ON & OFF Time Ranges for these functions are the same. See ***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

THS-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., THS-1164A-30 is an Off Delay with a time delay range of 0.1-10 seconds. * See ***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., THS-1164A-F5S is an Off Delay with a time delay fixed at 5 seconds.
- **Remote Time Delay**--THS-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

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- Microprocessor-based design for greater performance & maximum flexibility
- Encapsulated for protection against harsh environments
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- Pilot duty rating

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

SOLID STATE OUTPUT | THS-1 SERIES

- Cost effective design & compact 2" x 2" enclosure are ideal for volume OEM applications
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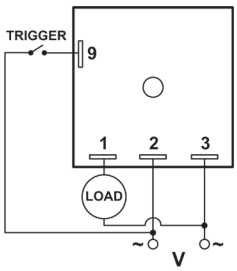
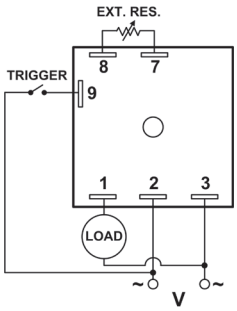
- Onboard & remote adjustable or fixed time delays from 0.01 seconds to 100 hours
- Built-in load suppression eliminates need for separate protection
- Pilot duty rating

c UL us CE

Control Switch Common to Pin 2

FUNCTION ■	INPUT VOLTAGE	CATALOG NUMBER **	WIRING ❖
OFF DELAY **C**	24-240V AC 12-125V DC	THS-1164A-**T THS-1164D-**T	**Onboard Adjustable or Fixed Time Delay**  **DIAGRAM 319**
SINGLE SHOT **D**	24-240V AC 12-125V DC	THS-1154A-**T THS-1154D-**T	
WATCHDOG (Retriggerable Single Shot) **J**	24-240V AC 12-125V DC	THS-1134A-**T THS-1134D-**T	
SINGLE SHOT FALLING EDGE (Retriggerable) **H**	24-240V AC 12-125V DC	THS-1224A-**T THS-1224D-**T	**Remote Time Delay**  **DIAGRAM 322**
ON/OFF DELAY * **G**	24-240V AC 12-125V DC	THS-1414A-**T THS-1414D-**T	
DELAYED INTERVAL * (Retriggerable) **P**	24-240V AC 12-125V DC	THS-1654A-**T THS-1654D-**T	

■ See "Definitions of Timing Functions".

❖ Diagrams shown are for products with AC input voltage. For products with DC input voltage, the "+" terminal is 2 & the "-" terminal is 3.

* ON & OFF Time Ranges for these functions are the same. See ***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

THS-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., THS-1164A-30T is an Off Delay with a time delay range of 0.1-10 seconds. * See ***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., THS-1164A-F5ST is an Off Delay with a time delay fixed at 5 seconds.
- **Remote Time Delay**--THS-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

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THS-1 SERIES
SOLID STATE OUTPUT

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 1VA 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: 50ms
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: 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 1.6V @ 1A for all voltages

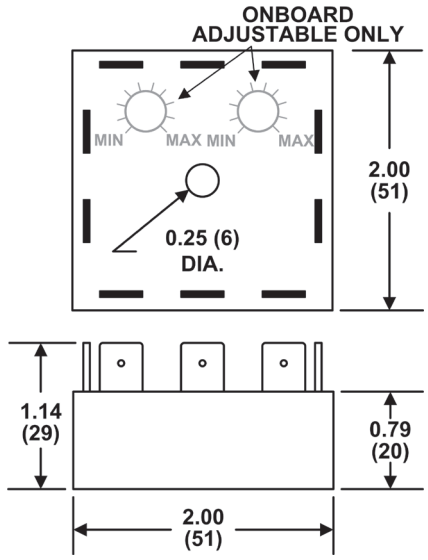
Compatibility:
Using a solid state switch to initiate the time sequence is acceptable. See ***www.macromatic.com/leakage*** or contact Macromatic for information regarding leakage current limits and other solid state design considerations.

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: c UL us File #E236146 CE

DIMENSIONS



All Dimensions in
Inches (Millimeters)

REMOTE TIME DELAY

THS-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., THS-10242-30R1.

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:

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