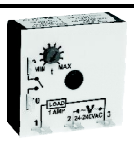
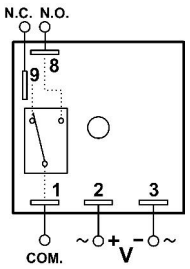
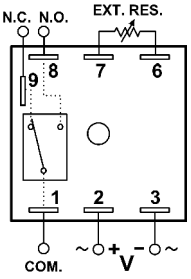
TIME DELAY RELAYS

Product Summary

Macromatic offers a wide variety of time delay relays and accessories. Each one has different features and operating characteristics, allowing you to choose the exact product to meet your needs. Our time delay relays are available in either programmable or non-programmable versions. We offer both single or multiple function time delay relays. Choose between SPDT or DPDT relay outputs & solid state outputs for high duty cycle applications. Time delay relays are available as plug-in units for use with industry standard 8 & 11 pin octal sockets. They also come in 2" x 2" encapsulated & 1/16 DIN mounting configurations. Choose between analog or digital-set time delay relays. Refer to the Selection Table on this page for more information.

Product Series		Mounting Configuration	Time Delay Setting & Ranges	Functions	Input Voltages	Output	See Pages
	**THR Series Relay Output**	2" x 2" Encapsulated Panel Mounted with One Screw	Analog-Set 0.1 SEC - 100 HR	Single-Function	12VDC, 24VAC/DC, 120VAC/DC, 240VAC	10A SPDT Relay	43-49
	**THS Series Solid State Output**		Analog-Set 0.01 SEC - 100 HR	Single-Function	24-240VAC, 12-48VDC	1A SPNO Solid State	50-53
	**THL Series Solid State Inline (Series) Output**		Analog-Set 0.01 SEC - 100 HR	Single-Function	240-240VAC & 12-48VDC	1A SPNO Solid State	54-55
	**TR-5 Series Standard**	Plug-in Utilizing Industry-Standard 8 & 11 Pin Sockets	Analog-Set 0.05 SEC - 2 HR	Single-Function	12VDC, 24VAC/DC, 120VAC/DC, 240VAC	10A DPDT 10A SPDT Relay	56-59 60-61
	**TR-6 Series *Time Ranger* Programmable**		Analog-Set Multi-Range 0.1 SEC - 24 HR	Single-Function	12VAC/DC, 24VAC/DC, 120VAC/DC, 240VAC	10A DPDT Relay	62-65
	**TD-8 Series *Time Ranger* Digital-Set Programmable**		Digital-Set Multi-Range 0.1 SEC - 1,023 HR	Multi-Function (16) & Single-Function	12VAC/DC, 24VAC/DC, 120VAC/DC, 240VAC	10A DPDT 10A SPDT Relay	66-68
	**TD-7 Series *Time Ranger* Digital-Set Programmable**		Digital-Set Multi-Range 0.05 SEC - 999 HR	Multi-Function (10) & Single-Function	12VAC/DC, 24VAC/DC, 120VAC/DC, 240VAC	10A DPDT 10A SPDT Relay	69-71
	**SS-6 & SS-8 Series Compact**		Analog-Set 0.2 - 300 SEC	Single-Function	12VDC, 24VAC/DC, 120VAC	5A SPDT Relay	76
	**TAD Series Digital-Set 1/16 DIN**	1/16 DIN (48mm²)	Digital-Set Multi-Range 0.01 SEC - 9,990 HR	Multi-Function (10)	24-240VAC & 24-240VDC	5A DPDT Relay	72-73
	**TAA Series Analog-Set 1/16 DIN**		Digital-Set Multi-Range 0.05 SEC - 100 HR	Multi-Function (6)--2 Versions	100-240VAC & 24-240VDC	5A DPDT Relay	74-75

Isolated Relay Common

FUNCTION ■	INPUT VOLTAGE	PRODUCT NUMBER **	WIRING
ON DELAY **A**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-10262-** THR-10266-** THR-10268-** THR-10261-**	**Onboard Adjustable or Fixed Time Delay**  **DIAGRAM 300**
INTERVAL ON **B**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-10562-** THR-10566-** THR-10568-** THR-10561-**	
FLASHER (OFF Time 1st) **E**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-10862-** THR-10866-** THR-10868-** THR-10861-**	
FLASHER (ON Time 1st) **F**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-10962-** THR-10966-** THR-10968-** THR-10961-**	**Remote Time Delay**  **DIAGRAM 302**
REPEAT CYCLE * (OFF Time 1st) **L**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-13162-** THR-13166-** THR-13168-** THR-13161-**	
REPEAT CYCLE * (ON Time 1st) **M**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-15162-** THR-15166-** THR-15168-** THR-15161-**	
DELAYED INTERVAL * **N**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-16162-** THR-16166-** THR-16168-** THR-16161-**	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

* 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

THR 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-10262-30 is an On 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., THR-10262-F5S is an On Delay with a time delay fixed at 5 seconds.
- **Remote Time Delay**--THR Series products can be built with two terminals for remote adjustable or fixed time delays. See Page 49 for information.

** 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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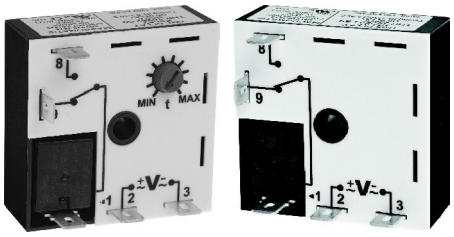

- Cost effective design & compact 2" x 2" enclosure are ideal for volume OEM applications
- Microprocessor-based design for greater performance & maximum flexibility
- Encapsulated for protection against harsh environments
- 10A SPDT relay output contacts can handle most pilot duty & fractional HP loads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

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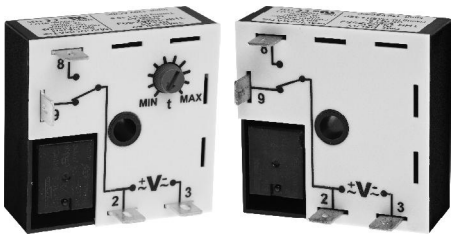
TIME DELAY RELAYS

THR Series Encapsulated--Relay Output

On Delay, Interval, Flasher, Cycle & Delayed Interval



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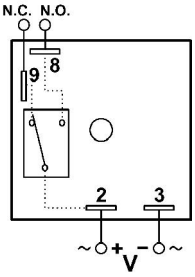
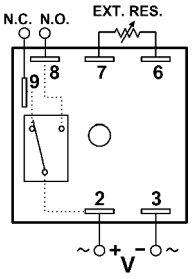
- 10A SPDT relay output contacts can handle most pilot duty & fractional HP loads
- Relay Common internally connected to Pin 2-makes wiring easier
- Onboard & remote adjustable or fixed time delays from 0.05 seconds to 100 hours
- c UL us CE

Relay Common Internally Connected to Pin 2

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

■ See Pages 77-79 for definitions & explanations of Timing Functions.

* 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

THR 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*** 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 Series products can be built with two terminals for remote adjustable or fixed time delays. See Page 49 for information.

** 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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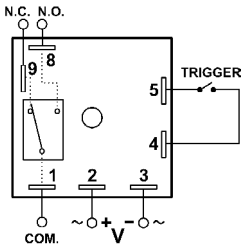
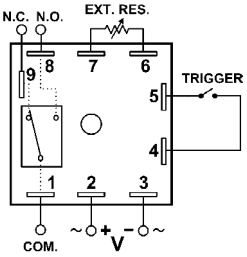
TIME DELAY RELAYS

THR Series Encapsulated--Relay Output

Off Delay, Single Shot, Watchdog, Single Shot Falling Edge, On Delay/Off Delay & Delayed Interval

Isolated Control Switch & Isolated Relay Common

FUNCTION ■	INPUT VOLTAGE	PRODUCT NUMBER **	WIRING
OFF DELAY **C**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11662-** THR-11666-** THR-11668-** THR-11661-**	**Onboard Adjustable or Fixed Time Delay**  **DIAGRAM 304**
SINGLE SHOT **D**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11562-** THR-11566-** THR-11568-** THR-11561-**	
WATCHDOG (Retriggerable Single Shot) **J**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11362-** THR-11366-** THR-11368-** THR-11361-**	
SINGLE SHOT FALLING EDGE (Retriggerable) **H**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-12262-** THR-12266-** THR-12268-** THR-12261-**	**Remote Time Delay**  **DIAGRAM 306**
ON/OFF DELAY * **G**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-14162-** THR-14166-** THR-14168-** THR-14161-**	
DELAYED INTERVAL * (Triggered) **P**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-16562-** THR-16566-** THR-16568-** THR-16561-**	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

* 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.

- 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
- Onboard & remote adjustable or fixed time delays from 0.05 seconds to 100 hours
- c UL us CE

Time Delays

THR 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*** 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 Series products can be built with two terminals for remote adjustable or fixed time delays. See Page 49 for information.

** 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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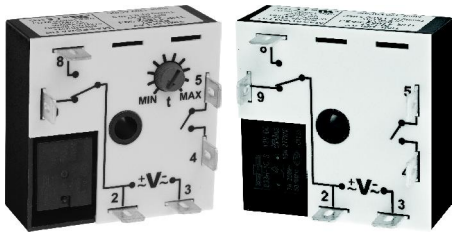
TIME DELAY RELAYS

THR Series Encapsulated--Relay Output

Off Delay, Single Shot, Watchdog, Single Shot Falling Edge, On Delay/Off Delay & Delayed Interval



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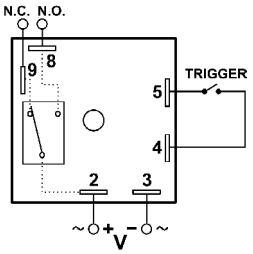
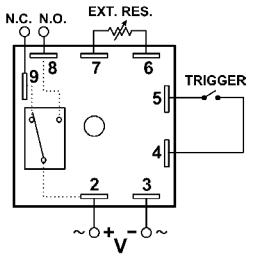
- Encapsulated for protection against harsh environments
- 10A SPDT relay output contacts can handle most pilot duty & fractional HP loads
- Relay Common internally connected to Pin 2-makes wiring easier
- Onboard & remote adjustable or fixed time delays from 0.05 seconds to 100 hours
- c UL us CE

Isolated Control Switch & Relay Common Internally Connected to Pin 2

FUNCTION ■	INPUT VOLTAGE	PRODUCT NUMBER **	WIRING
OFF DELAY **C**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11662-**J THR-11666-**J THR-11668-**J THR-11661-**J	**Onboard Adjustable or Fixed Time Delay**  **DIAGRAM 305**
SINGLE SHOT **D**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11562-**J THR-11566-**J THR-11568-**J THR-11561-**J	
WATCHDOG (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	
SINGLE SHOT FALLING EDGE (Retriggerable) **H**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-12262-**J THR-12266-**J THR-12268-**J THR-12261-**J	**Remote Time Delay**  **DIAGRAM 307**
ON/OFF DELAY * **G**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-14162-**J THR-14166-**J THR-14168-**J THR-14161-**J	
DELAYED INTERVAL * (Triggered) **P**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-16562-**J THR-16566-**J THR-16568-**J THR-16561-**J	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

* 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

THR 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*** 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 Series products can be built with two terminals for remote adjustable or fixed time delays. See Page 49 for information.

** 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

Application Data & Dimensions–Page 49

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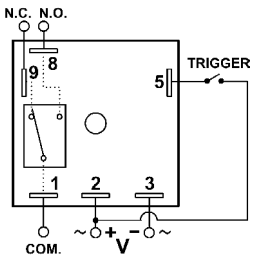
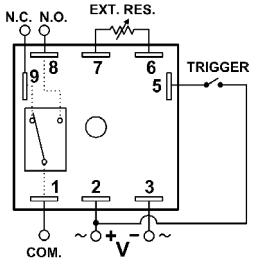
TIME DELAY RELAYS

THR Series Encapsulated--Relay Output

Off Delay, Single Shot, Watchdog, Single Shot Falling Edge, On Delay/Off Delay & Delayed Interval

Control Switch Common to Pin 2 & Isolated Relay Common

FUNCTION ■	INPUT VOLTAGE	PRODUCT NUMBER **	WIRING
OFF DELAY **C**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11662-**T THR-11666-**T THR-11668-**T THR-11661-**T	**Onboard Adjustable or Fixed Time Delay**  **DIAGRAM 308**
SINGLE SHOT **D**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-11562-**T THR-11566-**T THR-11568-**T THR-11561-**T	
WATCHDOG (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	
SINGLE SHOT FALLING EDGE (Retriggerable) **H**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-12262-**T THR-12266-**T THR-12268-**T THR-12261-**T	**Remote Time Delay**  **DIAGRAM 310**
ON/OFF DELAY * **G**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-14162-**T THR-14166-**T THR-14168-**T THR-14161-**T	
DELAYED INTERVAL * (Triggered) **P**	120V AC/DC 12V DC 24V AC/DC 240V AC	THR-16562-**T THR-16566-**T THR-16568-**T THR-16561-**T	

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

Time Delays

THR Series Products have three time delay options:

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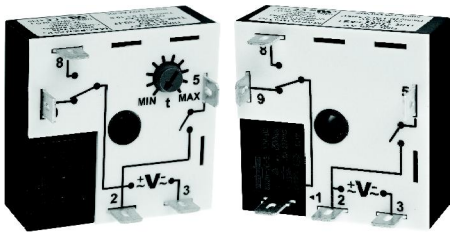
- **Onboard Fixed Time Delay**--replace two-digit Code with suffix "F" followed by delay [0.1 ... 100] followed by (S) seconds, (M) minutes or (H) hours, i.e., THR-11662-F5ST is an Off Delay with a time delay fixed at 5 seconds.
- **Remote Adjustable Time Delay**--THR Series products can be built with two terminals for remote adjustable or fixed time delays. See Page 49 for information.

** 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

Application Data & Dimensions–Page 49



- 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
- Onboard & remote adjustable or fixed time delays from 0.05 seconds to 100 hours
- c UL us CE

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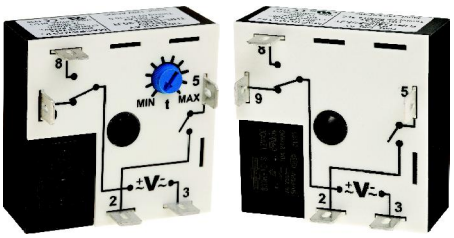
TIME DELAY RELAYS

THR Series Encapsulated--Relay Output

Off Delay, Single Shot, Watchdog, Single Shot Falling Edge, On Delay/Off Delay & Delayed Interval



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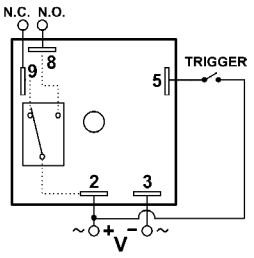
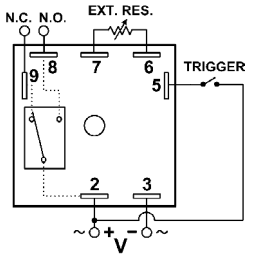
- Encapsulated for protection against harsh environments
- 10A SPDT relay output contacts can handle most pilot duty & fractional HP loads
- Relay Common internally connected to Pin 2-makes wiring easier
- Onboard & remote adjustable or fixed time delays from 0.05 seconds to 100 hours
- c UL us CE

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

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

■ See Pages 77-79 for definitions & explanations of Timing Functions.

* 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

THR 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-11662-30JT 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., THR-11662-F5SJT is an Off Delay with a time delay fixed at 5 seconds.
- **Remote Adjustable Time Delay**--THR Series products can be built with two terminals for remote adjustable or fixed time delays. See Page 49 for information.

** 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

Application Data & Dimensions–Page 49

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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: -28° to 65°C (-18° to 149°F)

Output Contacts:
10A @ 240VAC / 7A @ 28VDC SPDT, ¼hp @ 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*** or contact Macromatic for information regarding leakage current limits and other solid state design considerations.

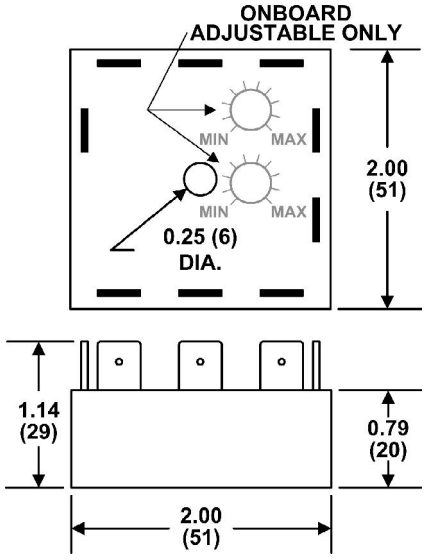
Mounting:
Surface with one #8 or #10 screw

Termination:
0.25" male quick-connect terminals

Approvals:
c UL us
File #E109466

CE

DIMENSIONS



All Dimensions in
Inches (Millimeters)

REMOTE TIME DELAY

Most THR 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

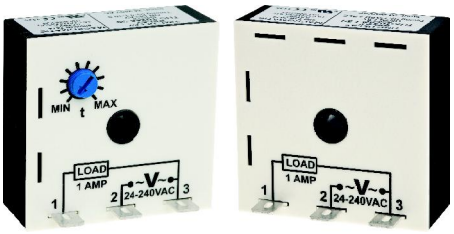
Example: Using time range 0.1-10 seconds, what resistor value is required for a fixed time delay of 5 seconds:

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

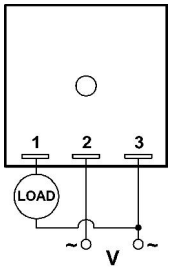
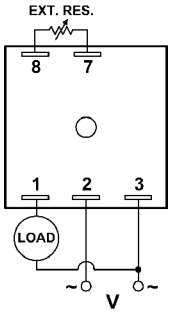
TIME DELAY RELAYS

THS Series Encapsulated--Solid State Output

On Delay, Interval, Flasher, Cycle & Delayed Interval



- 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
- c UL us CE

FUNCTION ■	INPUT VOLTAGE	PRODUCT 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 Pages 77-79 for definitions & explanations of Timing Functions.

◆ See Page 54 for 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 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 Series products can be built with two terminals for remote adjustable or fixed time delays. See Page 53 for information.

** 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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Application Data & Dimensions–Page 53

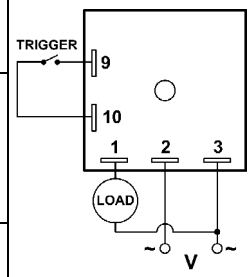
TIME DELAY RELAYS

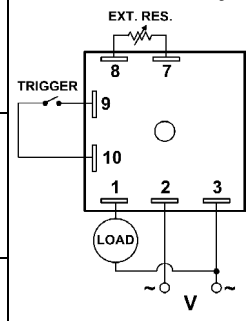
THS Series Encapsulated--Solid State Output

Off Delay, Single Shot, Watchdog, Single Shot Falling Edge, On Delay/Off Delay & Delayed Interval

Isolated Control Switch

FUNCTION ■	INPUT VOLTAGE	PRODUCT NUMBER **	WIRING ●
OFF DELAY **C**	24-240V AC 12-125V DC	THS-1164A-** THS-1164D-**	**Onboard Adjustable or Fixed Time Delay**
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-**	**DIAGRAM 318**
SINGLE SHOT FALLING EDGE (Retriggerable) **H**	24-240V AC 12-125V DC	THS-1224A-** THS-1224D-**	**Remote Time Delay**
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-**	**DIAGRAM 321**





■ See Pages 77-79 for definitions & explanations 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.

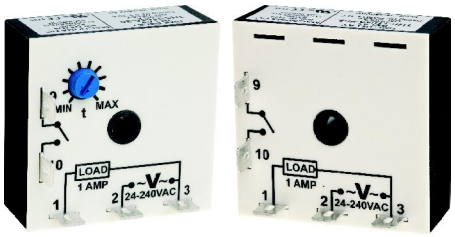
Time Delays

THS 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 Series products can be built with two terminals for remote adjustable or fixed time delays. See Page 53 for information.

** 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

Application Data & Dimensions–Page 53



- 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
- c UL us CE

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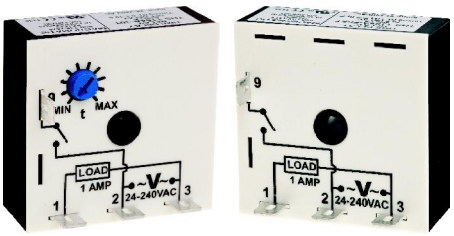
TIME DELAY RELAYS

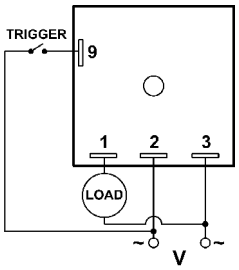
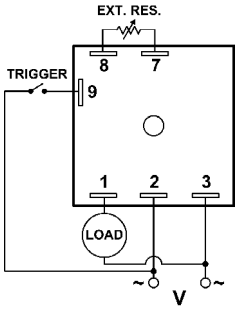
THS Series Encapsulated--Solid State Output

Off Delay, Single Shot, Watchdog, Single Shot Falling Edge, On Delay/Off Delay & Delayed Interval



- 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
- cULus CE

Control Switch Common to Pin 2

FUNCTION ■	INPUT VOLTAGE	PRODUCT 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 Pages 77-79 for definitions & explanations 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 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 Series products can be built with two terminals for remote adjustable or fixed time delays. See Page 53 for information.

**** 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

Application Data & Dimensions–Page 53

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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:
-28° to 65°C (-18° to 149°F)

Output Contacts:
Normally Open Solid State 1A Continuous, 10A Inrush @ 65° C

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

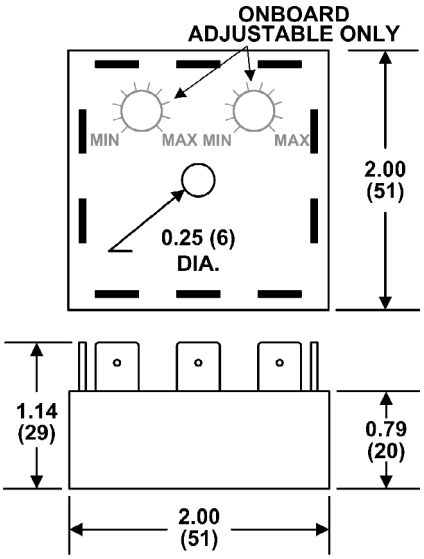
Compatibility:
Using a solid state switch to initiate the time sequence is acceptable. See ***www.macromatic.com/leakage*** or contact Macromatic for information regarding leakage current limits and other solid state design considerations.

Mounting:
Surface with one #8 or #10 screw

Termination:
0.25" male quick-connect terminals

Approvals:
c UL us
File #E236146

DIMENSIONS



All Dimensions in
Inches (Millimeters)

REMOTE TIME DELAY

THS 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

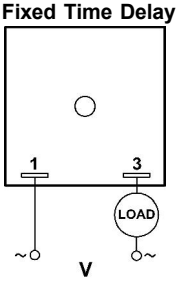
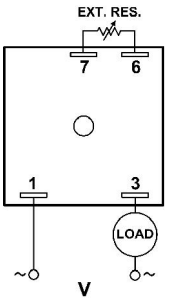
Example: Using time range 0.1-10 seconds, what resistor value is required for a fixed time delay of 5 seconds:

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

TIME DELAY RELAYS

THL Series Encapsulated--Inline (Series Connection)
Solid State Output
On Delay

- 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
- Two-terminal series-connection with the load
- 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
- c UL us CE

FUNCTION ■	INPUT VOLTAGE	PRODUCT NUMBER **	WIRING
ON DELAY **A**	24-240V AC & 12-48V DC	THL-1024U-**	**Onboard Adjustable or Fixed Time Delay**  **DIAGRAM 329** **Remote Time Delay**  **DIAGRAM 330**

■ See Pages 77-79 for definitions & explanations of Timing Functions.
** Complete Product Number using two-digit Code from Table below.

Time Delays

THL 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 Series products can be built with two terminals for remote adjustable or fixed time delays. See Page 55 for information.

** 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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Application Data & Dimensions–Page 55

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:
-28° to 65°C (-18° to 149°F)

Output Contacts:
Normally Open Solid State 1A Continuous, 10A Inrush @ 65° C

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 ***www.macromatic.com/leakage*** or contact Macromatic for information regarding leakage current limits and other solid state design considerations.

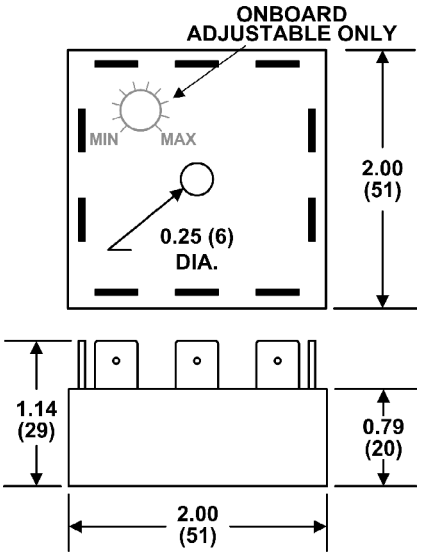
Mounting:
Surface with one #8 or #10 screw

Termination:
0.25" male quick-connect terminals

Approvals:
c UL us
File #E236146

CE

Dimensions



All Dimensions in
Inches (Millimeters)

Remote Time Delay

THL 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:

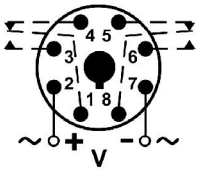
$$R = \frac{5}{10} \times 100{,}000 = 50{,}000 \text{ ohms (50K ohms)}$$

TIME DELAY RELAYS

TR-5 Series Non-Programmable Plug-in

On Delay, Interval & Flasher

- Onboard & remote adjustable or fixed time delays from 0.05 seconds to 2 hours
- Uses industry-standard 8 pin octal sockets
- 10A DPDT output contacts
- with appropriate socket

FUNCTION ■	INPUT VOLTAGE 50/60Hz.	PRODUCT NUMBER **	WIRING/ SOCKETS ▲
ON DELAY **A**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-50222-** TR-50226-** TR-50228-** TR-50221-**	8 PIN OCTAL **70169-D**  **DIAGRAM 1**
INTERVAL ON **B**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TR-50522-** TR-50526-** TR-50528-** TR-50521-**	
FLASHER (OFF 1st) **E**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TR-50822-** TR-50826-** TR-50828-** TR-50821-**	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

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

▲ Note: if these products are ordered with the Remote Adjustable Time Delay modification (suffix -Rx), they will require an 11 pin octal socket–see ***www.macromatic.com/remote*** for information.

Time Delays

TR-5 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., TR-50222-05 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., TR-50222-F5S is an On Delay with a time delay fixed at 5 seconds.
- **Remote Adjustable Time Delay**--Selected TR-5 Series products can be built with two terminals for remote adjustable or fixed time delays. See ***www.macromatic.com/remote*** for information.

** TIMING RANGE TABLE	
Time Delay Range	**Code**
0.05 - 5 Sec.	04
0.1 - 10 Sec.	05
0.3 - 30 Sec.	07
0.6 - 60 Sec.	08
1.2 - 120 Sec.	09
1.8 - 180 Sec.	10
3 - 300 Sec.	12
0.1 - 10 Min.	22
0.3 - 30 Min.	15
0.6 - 60 Min.	16
1.2 - 120 Min.	17

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Sockets & Accessories–Pages 80 & 81

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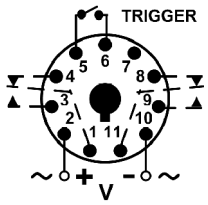
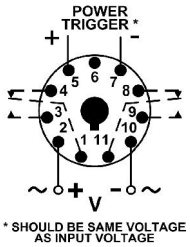
TIME DELAY RELAYS

TR-5 Series Non-Programmable Plug-In

Off Delay, Single Shot, Watchdog & Single Shot Falling Edge

FUNCTION ■ ▲	INPUT VOLTAGE 50/60Hz.	PRODUCT NUMBER **	WIRING/ SOCKETS ▲
OFF DELAY Control Switch Trigger **C**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51622-** TR-51626-** TR-51628-** TR-51621-**	11 PIN OCTAL **70170-D**  **DIAGRAM 2**
SINGLE SHOT Control Switch Trigger **D**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51522-** TR-51526-** TR-51528-** TR-51521-**	
WATCHDOG Control Switch Trigger (Retriggerable Single Shot) **J**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51322-** TR-51326-** TR-51328-** TR-51321-**	
SINGLE SHOT FALLING EDGE Control Switch Trigger **H**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-52222-** TR-52226-** TR-52228-** TR-52221-**	
OFF DELAY Power Trigger **C**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51922-** TR-51926-** TR-51928-** TR-51921-**	11 PIN OCTAL **70170-D**  * SHOULD BE SAME VOLTAGE AS INPUT VOLTAGE **DIAGRAM 4**
SINGLE SHOT Power Trigger **D**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51722-** TR-51726-** TR-51728-** TR-51721-**	
WATCHDOG Power Trigger (Retriggerable Single Shot) **J**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51822-** TR-51826-** TR-51828-** TR-51821-**	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

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

▲ 8 Pin SPDT versions of these functions (except Single Shot Falling Edge) are available–see Page 60.

Time Delays

TR-5 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., TR-51622-05 is an Off 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., TR-51622-F5S is an Off Delay with a time delay fixed at 5 seconds.
- **Remote Time Delay**--Selected TR-5 Series products can be built with two terminals for remote adjustable or fixed time delays. See ***www.macromatic.com/remote*** for information.

** TIMING RANGE TABLE	
Time Delay Range	**Code**
0.05 - 5 Sec.	04
0.1 - 10 Sec.	05
0.3 - 30 Sec.	07
0.6 - 60 Sec.	08
1.2 - 120 Sec.	09
1.8 - 180 Sec.	10
3 - 300 Sec.	12
0.1 - 10 Min.	22
0.3 - 30 Min.	15
0.6 - 60 Min.	16
1.2 - 120 Min.	17

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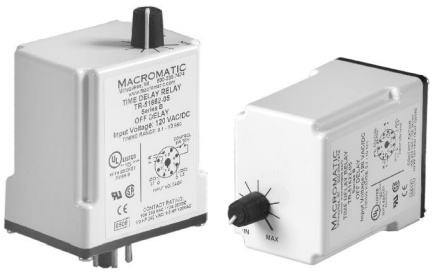

- Onboard & remote adjustable or fixed time delays from 0.05 seconds to 2 hours
- Uses industry-standard 11 pin octal sockets
- 10A DPDT output contacts
- cULus CSA CE

UL LISTED with appropriate socket

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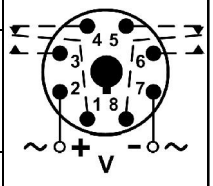
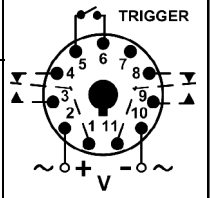
TIME DELAY RELAYS

TR-5 Series Non-Programmable Plug-in

Repeat Cycle & Delayed Interval

- Onboard & remote adjustable or fixed time delays from 0.05 seconds to 2 hours
- Independently adjustable ON & OFF times
- Uses industry-standard 8 or 11 pin octal sockets
- 10A DPDT output contacts
- cULus, CSA, CE

UL LISTED with appropriate socket

FUNCTION ■	INPUT VOLTAGE 50/60Hz.	PRODUCT NUMBER **	WIRING/ SOCKET
REPEAT CYCLE* (OFF Time First Followed By ON Time and Repeating) **L**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-53122-** TR-53126-** TR-53128-** TR-53121-**	8 PIN OCTAL **70169-D**  **DIAGRAM 1**
REPEAT CYCLE* (ON Time First Followed By OFF Time and Repeating) **M**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-55122-** TR-55126-** TR-55128-** TR-55121-**	
DELAYED INTERVAL* (OFF Time Followed by ON Time Followed by OFF State Until Reset) **N**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-56122-** TR-56126-** TR-56128-** TR-56121-**	
ON/OFF DELAY* Control Switch Trigger **G**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-54122-** TR-54126-** TR-54128-** TR-54121-**	11 PIN OCTAL **70170-D**  **DIAGRAM 2**
DELAYED INTERVAL* Control Switch Trigger (OFF Time Followed by ON Time Followed by OFF State Until Reset) **P**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-56522-** TR-56526-** TR-56528-** TR-56521-**	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

* 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

TR-5 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., TR-53122-05 is a Repeat Cycle with both an ON & OFF time delay range of 0.1-10 seconds. See ***www.macromatic.com/onoff*** for information on how to order a unit 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., TR-53122-F5S is a Repeat Cycle with a time delay fixed at 5 seconds.
- **Remote Time Delay**--Selected TR-5 Series products can be built with two terminals for remote adjustable or fixed time delays. See ***www.macromatic.com/remote*** for information.

** TIMING RANGE TABLE	
Time Delay Range	**Code**
0.05 - 5 Sec.	04
0.1 - 10 Sec.	05
0.3 - 30 Sec.	07
0.6 - 60 Sec.	08
1.2 - 120 Sec.	09
1.8 - 180 Sec.	10
3 - 300 Sec.	12
0.1 - 10 Min.	22
0.3 - 30 Min.	15
0.6 - 60 Min.	16
1.2 - 120 Min.	17

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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%

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

Reset Time:
Input Voltage (All Functions) 0.100 Seconds
Triggered Functions only 0.04 Seconds

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 for all units

Temperature:
-28° to 65°C (-18° to 149°F)

Output Contacts:
DPDT 10A @ 240V AC/30V DC,
1/2HP @ 120/240V AC (N.O.), 1/3HP @ 120/240V AC (N.C.)
B300 & R300; AC15 & DC13

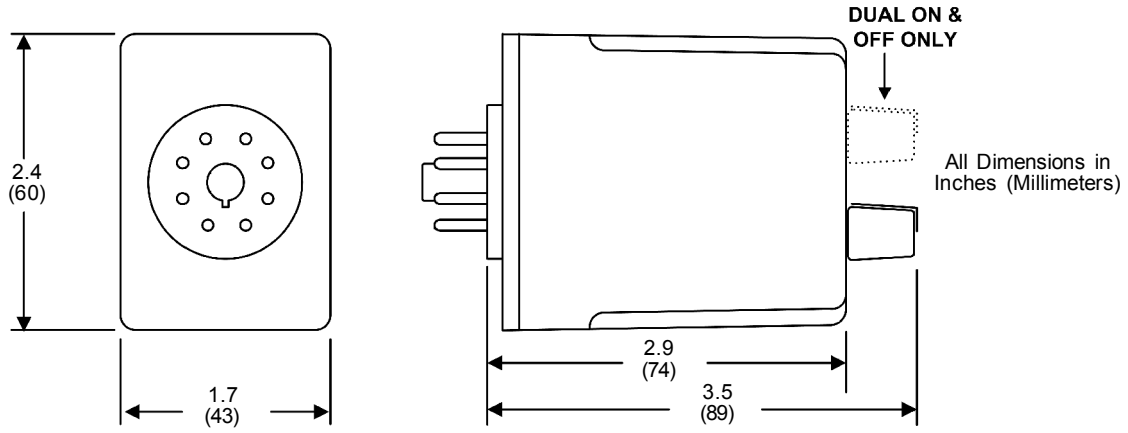
Life:
Mechanical: 10,000,000 operations
Full Load: 100,000 operations

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

Triggering Off Delay, Single Shot or Watchdog Units:
Timing sequence must be initiated only after input voltage is applied to unit. Minimum required trigger switch closure time is 0.05 seconds.

Approvals:
File #E109466 File #LR45565 Low Voltage & EMC Directives EN60947-1, EN60947-5-1 LISTED IND. CONT. EQUIP. 50U7. with appropriate socket File #E109466

Dimensions



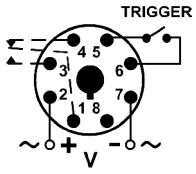
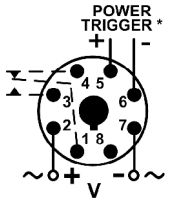
TIME DELAY RELAYS

TR-5 Series Non-Programmable Plug-in 8 Pin SPDT Versions

Off Delay, Single Shot & Watchdog

- These are 8 pin 10A SPDT versions of our standard 11 pin DPDT products
- Onboard & remote adjustable or fixed time delays from 0.05 seconds to 2 hours
- Uses industry-standard 8 pin octal socket
- cULus, CSA, CE

UL LISTED with appropriate socket

FUNCTION ■	INPUT VOLTAGE 50/60Hz.	PRODUCT NUMBER **	WIRING/ SOCKETS ▲
OFF DELAY Control Switch Trigger **C**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51662-** TR-51666-** TR-51668-** TR-51661-**	8 PIN OCTAL **70169-D** ▲  **DIAGRAM 11**
SINGLE SHOT Control Switch Trigger **D**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51562-** TR-51566-** TR-51568-** TR-51561-**	
WATCHDOG Control Switch Trigger (Retriggerable Single Shot) **J**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51362-** TR-51366-** TR-51368-** TR-51361-**	
OFF DELAY Power Trigger **C**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51962-** TR-51966-** TR-51968-** TR-51961-**	8 PIN OCTAL **70169-D** ▲  * SHOULD BE SAME VOLTAGE AS INPUT VOLTAGE **DIAGRAM 37**
SINGLE SHOT PowerTrigger **D**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51762-** TR-51766-** TR-51768-** TR-51761-**	
WATCHDOG Power Trigger (Retriggerable Single Shot) **J**	120V AC/DC 12V DC 24V AC/DC 240V AC	TR-51862-** TR-51866-** TR-51868-** TR-51861-**	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

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

▲ Note: if these products are ordered with the Remote Adjust Potentiometer modification (suffix -Rx), they will require an 11 pin octal socket—see ***www.macromatic.com/remote*** for information.

Time Delays

TR-5 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., TR-51662-05 is an Off 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., TR-51662-F5S is an Off Delay with a time delay fixed at 5 seconds.
- **Remote Time Delay**--Selected TR-5 Series products can be built with two terminals for remote adjustable or fixed time delays. See ***www.macromatic.com/remote*** for information.

** TIMING RANGE TABLE	
Time Delay Range	**Code**
0.05 - 5 Sec.	04
0.1 - 10 Sec.	05
0.3 - 30 Sec.	07
0.6 - 60 Sec.	08
1.2 - 120 Sec.	09
1.8 - 180 Sec.	10
3 - 300 Sec.	12
0.1 - 10 Min.	22
0.3 - 30 Min.	15
0.6 - 60 Min.	16
1.2 - 120 Min.	17

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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%

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

Reset Time:
Input Voltage (All Functions) 0.100 Seconds
Triggered Functions only 0.04 Seconds

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 for all units

Temperature:
-28° to 65°C (-18° to 149°F)

Output Contacts:
SPDT 10A @ 240V AC/30V DC,
1/2HP @ 120/240V AC (N.O.), 1/3HP @ 120/240V AC (N.C.)
B300 & R300; AC15 & DC13

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

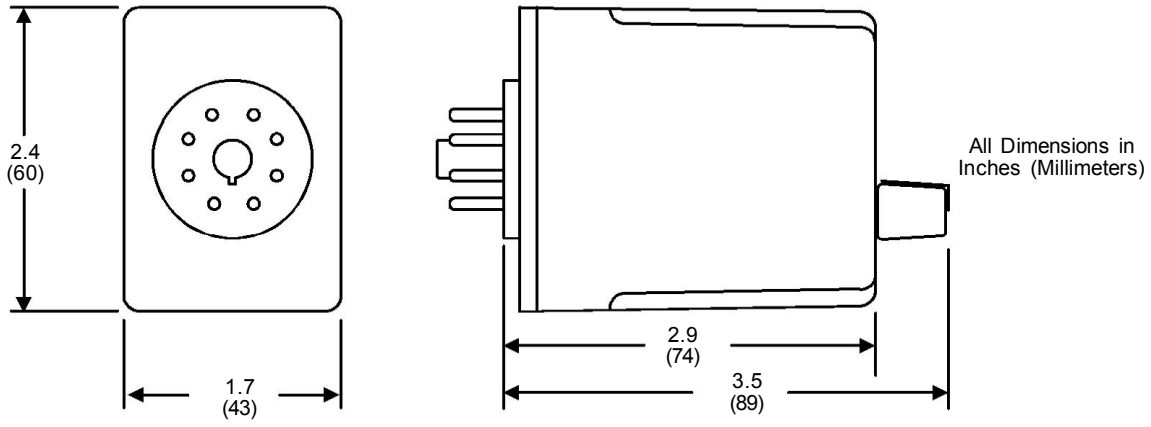
Compatibility:
Using a solid state switch to initiate the time sequence is acceptable. See ***www.macromatic.com/leakage*** or contact Macromatic for information regarding leakage current limits and other solid state design considerations.

Triggering Off Delay, Single Shot or Watchdog Units:
Timing sequence must be initiated only after input voltage is applied to unit. Minimum required trigger switch closure time is 0.05 seconds.

Approvals:

File #E109466 File #LR45565 Low Voltage & EMC Directives EN60947-1, EN60947-5-1 with appropriate socket File #E109466

Dimensions



TIME DELAY RELAYS

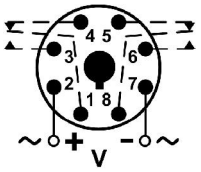
TR-6 SERIES *TIME RANGER*™

PROGRAMMABLE MULTI-RANGE PLUG-IN

ON DELAY, INTERVAL ON, FLASHER & TRUE OFF DELAY

- Each unit has 16 timing ranges built-in (8 on True Off Delay)
- Selecting a range is easy using a rotary switch (no math is required or DIP switches to set)
- Timing ranges up to 2 hours (30 minutes on True Off Delay)
- Uses industry-standard 8 pin octal sockets
- 10A DPDT output contacts
-

with appropriate socket

FUNCTION ■	INPUT VOLTAGE 50/60Hz.	PRODUCT NUMBER	WIRING/ SOCKETS
ON DELAY **A**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TR-60222 TR-60226 TR-60228 TR-60221	8 PIN OCTAL **70169-D**  **DIAGRAM 1**
INTERVAL ON **B**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TR-60522 TR-60526 TR-60528 TR-60521	
FLASHER (OFF 1st) **E**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TR-60822 TR-60826 TR-60828 TR-60821	
FLASHER (ON 1st) **F**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TR-60922 TR-60926 TR-60928 TR-60921	
TRUE OFF DELAY **R**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TR-60622 TR-60626 TR-60628 TR-60621	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

TIMING RANGES

Select one of the 8 or 16 built-in time ranges by setting the rotary switch per a chart on the unit and adjust within that range using the knob on top:

TR-602, 605, 608 & 609 SERIES

Dial Setting	Timing Range
A	0.1 - 0.25 Sec.
B	0.2 - 0.5 Sec.
C	0.3 - 1 Sec.
D	0.5 - 2 Sec.
E	1 - 4 Sec.
F	2 - 8 Sec.
G	4 - 15 Sec.
H	8 - 30 Sec.
I	15 - 60 Sec.
J	30 - 120 Sec.
K	1 - 4 Min.
L	2 - 8 Min.
M	4 - 15 Min.
N	8 - 30 Min.
O	15 - 60 Min.
P	30 - 120 Min.

TR-606 SERIES

Dial Setting	Timing Range
A	0.05 - 5 Sec.
B	0.1 - 10 Sec.
C	0.3 - 30 Sec.
D	0.6 - 60 Sec.
E	1.8 - 180 Sec.
F	3 - 300 Sec.
G	0.1 - 10 Min.
H	0.3 - 30 Min.

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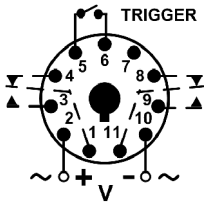
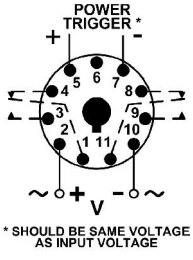
TIME DELAY RELAYS

TR-6 SERIES *TIME RANGER*™

PROGRAMMABLE MULTI-RANGE PLUG-IN

OFF DELAY, SINGLE SHOT & WATCHDOG

FUNCTION ■	INPUT VOLTAGE 50/60Hz.	PRODUCT NUMBER	WIRING/ SOCKETS
OFF DELAY Control Switch Trigger **C**	120V AC/DC	TR-61622	11 PIN OCTAL **70170-D**  **DIAGRAM 2**
	12V AC/DC	TR-61626	
	24V AC/DC	TR-61628	
	240V AC	TR-61621	
SINGLE SHOT Control Switch Trigger **D**	120V AC/DC	TR-61522	
	12V AC/DC	TR-61526	
	24V AC/DC	TR-61528	
	240V AC	TR-61521	
WATCHDOG Control Switch Trigger (Retriggerable Single Shot) **J**	120V AC/DC	TR-61322	
	12V AC/DC	TR-61326	
	24V AC/DC	TR-61328	
	240V AC	TR-61321	
OFF DELAY Power Trigger **C**	120V AC/DC	TR-61922	11 PIN OCTAL **70170-D**  **DIAGRAM 4**
	12V AC/DC	TR-61926	
	24V AC/DC	TR-61928	
	240V AC	TR-61921	
SINGLE SHOT Power Trigger **D**	120V AC/DC	TR-61722	
	12V AC/DC	TR-61726	
	24V AC/DC	TR-61728	
	240V AC	TR-61721	
WATCHDOG Power Trigger (Retriggerable Single Shot) **J**	120V AC/DC	TR-61822	
	12V AC/DC	TR-61826	
	24V AC/DC	TR-61828	
	240V AC	TR-61821	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

TIMING RANGES

Select one of the 16 built-in time ranges by setting the rotary switch per a chart on the unit and adjust within that range using the knob on top:

TR-613, 615, 616, 617, 618 & 619 SERIES

Dial Setting	Timing Range
A	0.1 - 0.25 Sec.
B	0.2 - 0.5 Sec.
C	0.3 - 1 Sec.
D	0.5 - 2 Sec.
E	1 - 4 Sec.
F	2 - 8 Sec.
G	4 - 15 Sec.
H	8 - 30 Sec.
I	15 - 60 Sec.
J	30 - 120 Sec.
K	1 - 4 Min.
L	2 - 8 Min.
M	4 - 15 Min.
N	8 - 30 Min.
O	15 - 60 Min.
P	30 - 120 Min.

Application Data & Dimensions–Page 65
Sockets & Accessories–Pages 80 & 81

- Each unit has 16 timing ranges built-in
- Selecting a range is easy using a rotary switch (no math is required or DIP switches to set)
- Timing ranges up to 2 hours
- Uses industry-standard 11 pin octal sockets
- 10A DPDT output contacts
- UL CSA CE

UL LISTED with appropriate socket

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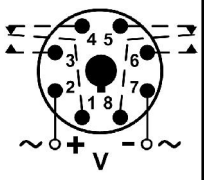
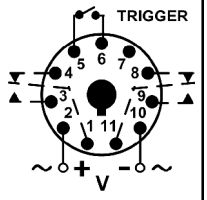
TIME DELAY RELAYS

TR-6 SERIES *TIME RANGER*™ PROGRAMMABLE MULTI-RANGE PLUG-IN

REPEAT CYCLE & DELAYED INTERVAL

- Each unit has 16 timing ranges built-in
- Selecting a range is easy using a rotary switch (no math is required or DIP switches to set)
- Timing ranges up to 24 hours
- Independently selectable & adjustable ON & OFF times
- Uses industry-standard 8 or 11 pin octal sockets
- 10A DPDT output contacts
- UL, CSA, CE

UL LISTED with appropriate socket

FUNCTION ■	INPUT VOLTAGE 50/60Hz.	PRODUCT NUMBER	WIRING/ SOCKET
REPEAT CYCLE* (OFF Time First Followed By ON Time and Repeating) **L**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TR-63122 TR-63126 TR-63128 TR-63121	8 PIN OCTAL **70169-D**  **DIAGRAM 1**
REPEAT CYCLE* (ON Time First Followed By OFF Time and Repeating) **M**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TR-65122 TR-65126 TR-65128 TR-65121	
DELAYED INTERVAL* (OFF Time Followed by ON Time Followed by OFF State Until Reset) **N**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TR-66122 TR-66126 TR-66128 TR-66121	
DELAYED INTERVAL* Control Switch Trigger (OFF Time Followed by ON Time Followed by OFF State Until Reset) **P**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TR-66522 TR-66526 TR-66528 TR-66521	11 PIN OCTAL **70170-D**  **DIAGRAM 2**

* These units have independently selectable & adjustable ON & OFF times. See ***www.macromatic.com/onoff*** for more information.

■ See Pages 77-79 for definitions & explanations of Timing Functions.

TIMING RANGES

Select one of the 16 built-in time ranges by setting the rotary switch per a chart on the unit and adjust within that range using the knob on top:

TR-631, 651, 661 & 665 SERIES

Dial Setting	Timing Range
A	0.6 - 2.5 Sec.
B	1.5 - 5 Sec.
C	2.5 - 10.5 Sec.
D	5 - 21 Sec.
E	10 - 42 Sec.
F	0.4 - 1.4 Min.
G	0.7 - 2.8 Min.
H	1.5 - 5.5 Min.
I	3 - 11 Min.
J	5.5 - 22.5 Min.
K	11 - 45 Min.
L	0.4 - 1.5 Hr.
M	0.8 - 3 Hr.
N	1.5 - 6 Hr.
O	3 - 12 Hr.
P	6 - 24 Hr.

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APPLICATION DATA

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

Load (Burden):
2 VA

Setting Accuracy:
Maximum Setting (Adjustable): +5%, -0%
Minimum Setting (Adjustable): +0%, -50%

Repeat Accuracy (constant voltage and temperature)**:**
> 2 Seconds Delay ±0.1%
0.1 - 2 Seconds Delay ±2%

Reset Time:
On Delay/Interval/Repeat Cycle/Delayed Interval: 0.1 Seconds
Off Delay/Single Shot/Watchdog/
Triggered Delayed Interval: 0.04 Seconds

Start-up Time:
(Time from when power is applied until unit is timing)
120 & 240V units 0.05 Seconds
12, 24 & 48V units 0.08 Seconds

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

Temperature:
12-120V Input Voltage: -28° to 65°C (-18° to 150°F)
240V Input Voltage: -28° to 50°C (-18° to 122°F)

Triggering Off Delay, Single Shot or Watchdog Units:
Timing sequence must be initiated only after input voltage is applied to unit. Minimum required trigger switch closure time is 0.1 seconds.

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.

Output Contacts:
(All TR-6 Series Products except TR-606 True Off Delay)
DPDT 10A @ 240V AC/30V DC,
1/2HP @ 120/240V AC (N.O.), 1/3HP @ 120/240V AC (N.C.)
B300 & R300; AC15 & DC13

(TR-606 True Off Delay)
DPDT 10A @ 240V AC; 8A @ 28V DC,
1/2 HP @ 240V AC, 1/4HP @ 120V AC
B300 & R300

Life:
Mechanical: 10,000,000 operations (2,000,000 operations on TR-606 Series only)
Full Load: 100,000 operations

IMPORTANT FOR TR-606 SERIES ONLY: These relays are shipped from the factory in the OFF state. A shock to the relay during shipping or installation may cause it to change to the ON state. It is recommended that input voltage be applied to the product for at least 0.1 second and removed to cycle the unit to the OFF state prior to use in the application. Please note that it will take as long as the OFF Delay setting to reset the unit once input voltage has been removed.

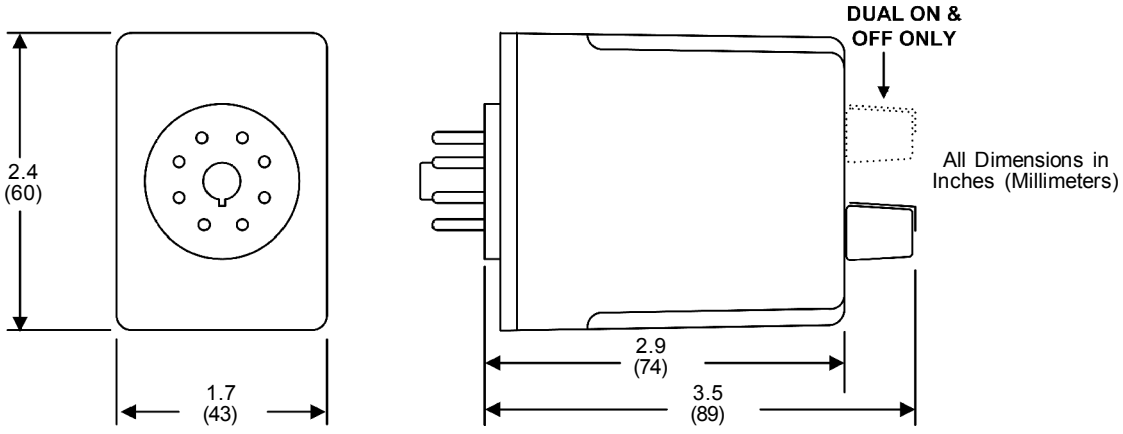
Approvals:
(All TR-6 Series Products except TR-606 True Off Delay) File #E109466 File #LR45565

(TR-606 True Off Delay only) File #E109466

(All TR-6 Series Products) Low Voltage & EMC Directives EN60947-1, EN60947-5-1

LISTED IND. CONT. EQUIP. 50U7 with appropriate socket File #E109466

DIMENSIONS



TIME DELAY RELAYS

TD-8 Series DIP-Switch Digital-Set Plug-In

Multi-Function Programmable

- Sixteen user-selectable modes in one unit
- DIP-Switches for accurate digital set of time delay & selection of function
- 100ms - 1,023 hours programmable time delay (Single Mode functions only)
- Uses industry-standard 11 pin octal socket
- cULus LISTED with appropriate socket
- CE

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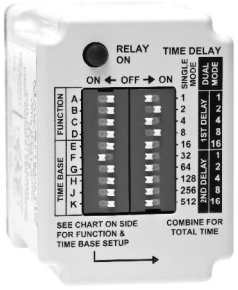
The TD-881 Series offers the digital-set accuracy of DIP-switch setting as well as the flexible programmability of a multi-function & multi-time range relay. These products provide an easy & accurate method to select any of 16 time delay functions and any time delay between 100ms and 1,023 hours (31 hours maximum for Dual Mode functions). Programming is accomplished through the use of two 10-position DIP-switches. This product can literally replace hundreds of different catalog numbers, thereby reducing inventory requirements.



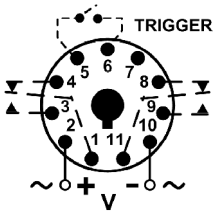
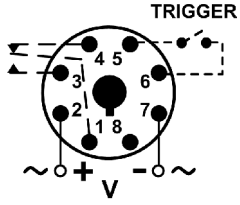
See Page 68 for instructions on how to program functions & time delay.

MULTI-FUNCTION ■
(16 Functions in One Unit)

Single Mode
- On Delay
- Interval On
- Flasher (OFF 1st)
- Flasher (ON 1st)
- Off Delay *
- Single Shot *
- Watchdog *
- Single Shot (Trailing Edge) *
- Triggered On Delay *

Dual Mode
- Repeat Cycle (OFF 1st)
- Repeat Cycle (ON 1st)
- Delayed Interval
- Triggered Delayed Interval *
- On/Off Delay *
- Single Shot-Flasher *
- On Delay/Flasher

* These are the only functions requiring use of the Control Switch shown in Wiring Diagrams below.

OUTPUT	INPUT VOLTAGE	PRODUCT NUMBER	WIRING/ SOCKETS
11 Pin DPDT	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-88122 TD-88126 TD-88128 TD-88121	11 PIN OCTAL **70170-D**  **DIAGRAM 121**
8 Pin SPDT	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-88162 TD-88166 TD-88168 TD-88161	8 PIN OCTAL **70169-D**  **DIAGRAM 169**

■ See Pages 77-79 for definitions & explanations of Timing Functions.

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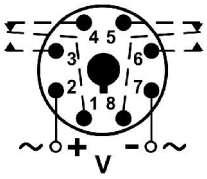
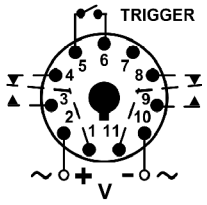
Sockets & Accessories–Pages 80 & 81

TIME DELAY RELAYS

TD-8 Series DIP-Switch Digital-Set Plug-In

Single Function Programmable

The TD-8 Series time delay relays offer an easy & accurate method to select any time delay between 100ms & 1,023 minutes. Programming is accomplished through the use of a 10-position DIP-switch. Each position is marked with a binary time increment. The required delay is selected by moving the switch of each increment to the ON position & adding their corresponding values (see examples below). This method provides a greater setting accuracy than is found on other units with an analog potentiometer. An LED indicates relay status.

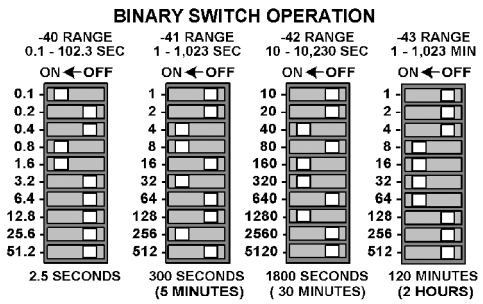
FUNCTION ■	INPUT VOLTAGE 50/60Hz.	PRODUCT NUMBER **	WIRING/ SOCKETS
ON DELAY **A**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-80222-** TD-80226-** TD-80228-** TD-80221-**	8 PIN OCTAL **70169-D**  **DIAGRAM 1**
INTERVAL ON **B**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-80522-** TD-80526-** TD-80528-** TD-80521-**	
REPEAT CYCLE * (OFF Time First Followed By ON Time and Repeating) **L**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-83122-** TD-83126-** TD-83128-** TD-83121-**	
REPEAT CYCLE * (ON Time First Followed By OFF Time and Repeating) **M**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-85122-** TD-85126-** TD-85128-** TD-85121-**	
OFF DELAY Control Switch Trigger **C**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-81622-** TD-81626-** TD-81628-** TD-81621-**	11 PIN OCTAL **70170-D**  **DIAGRAM 2**
SINGLE SHOT Control Switch Trigger **D**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-81522-** TD-81526-** TD-81528-** TD-81521-**	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

* 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.

Timing Ranges

** TIMING RANGE TABLE COMPLETE PRODUCT NUMBER USING TWO DIGIT CODE BELOW: i.e., TD-80222-40	
Time Delay Range	Code
0.1 - 102.3 Sec.	40
1 - 1,023 Sec.	41
10 - 10,230 Sec.	42
1 - 1,023 Min.	43



Application Data & Dimensions–Page 68
Sockets & Accessories–Pages 80 & 81

Single Mode **Dual Mode**

- DIP-Switches for accurate digital set of time delay
- 100ms - 1,023 minute programmable time delay
- Uses industry-standard 8 or 11 pin octal sockets
- 10A DPDT output contacts
- LED indicates relay status
- c UL us LISTED with appropriate socket
- CE

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TIME DELAY RELAYS

TD-8 Series DIP-Switch Digital-Set Plug-In

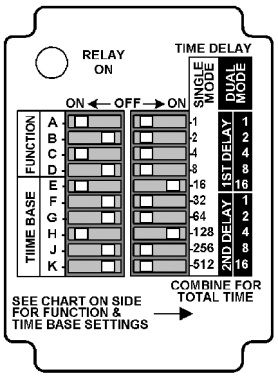
Application Data & Dimensions For Multi- & Single-Function Products

Programming Function & Time Delay

(TD-881 Series Multi-Function Only)

Programming is accomplished through the use of two 10-position DIP-switches (see drawings at right). Switches A-D of the left-mounted DIP-switch are used to select a function (see the descriptions of how each function operates on Pages 77-79 as a guide). Switches E-K of the same DIP-switch are used to select the time base. A convenient chart is on the side of the relay to clearly illustrate how to set both the function & time base.

Top Image



Side Nameplate

SELECT FUNCTION

	FUNCTION	A	B	C	D
SINGLE MODE	ON DELAY	OFF	OFF	OFF	OFF
	INTERVAL ON	ON	OFF	OFF	OFF
	OFF DELAY	OFF	ON	OFF	OFF
	TR. ON DELAY	ON	ON	OFF	OFF
	FLASHER (ON)	OFF	OFF	ON	OFF
	FLASHER (OFF)	ON	OFF	ON	OFF
	WATCHDOG	OFF	ON	ON	OFF
	ONE SHOT T. EDGE	ON	ON	ON	OFF
	SINGLE SHOT	OFF	OFF	OFF	ON
DUAL MODE	CYCLE (ON)	ON	OFF	OFF	ON
	CYCLE (OFF)	OFF	ON	OFF	ON
	DELAYED INTERVAL	ON	ON	OFF	ON
	ON/OFF DELAY	OFF	OFF	ON	ON
	TR. DELAYED INT.	ON	OFF	ON	ON
	ONE SHOT-FLASHER	OFF	ON	ON	ON
	ON DELAY/FLASHER	ON	ON	ON	ON

SELECT TIME BASE

	BASE	E	F	G
SINGLE MODE / DUAL MODE (1ST DELAY)	0.1 S	ON	OFF	OFF
	1S	OFF	ON	OFF
	0.1M	OFF	OFF	ON
	1M	ON	ON	OFF
	0.1H	ON	OFF	ON
	1H	OFF	ON	ON
	BASE	H	J	K
DUAL MODE (2ND DELAY)	0.1 S	ON	OFF	OFF
	1S	OFF	ON	OFF
	0.1M	OFF	OFF	ON
	1M	ON	ON	OFF
	0.1H	ON	OFF	ON
	1H	OFF	ON	ON

NOTE: SWITCHES H, J & K ARE ONLY USED ON DUAL RANGE PRODUCTS

The right-mounted 10-position DIP-switch is used to select the time delay within the time base selected with switches E-K from the first DIP-switch. Each position on the second DIP-switch is marked with a binary time increment. The required delay is selected by moving the switch of each increment to the ON position & adding their corresponding values (see diagram above). Note that dual mode products can either have the same or different ON & OFF times. For more information, see ***www.macromatic.com/onoff***.

Application Data

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

Load (Burden): 2 VA

Setting Accuracy:
±1% of set time or ±50ms, whichever is greater.

Repeat Accuracy (constant voltage and temperature)**:**
±0.1% of set time or ±0.02 seconds, whichever is greater.

Reset Time:
All Functions Triggered by a Control Switch: 0.04 Seconds
All Other Functions: 0.1 Seconds

Start-up Time:
(Time from when power is applied until unit is timing)
120 & 240V units 0.05 Seconds
12, 24 & 48V units 0.08 Seconds

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

Insulation Voltage: 2,000 volts

Temperature: -28° to 65°C (-18° to 149°F)

Output Contacts:
DPDT 10A @ 240V AC/30V DC,
1/2HP @ 120/240V AC (N.O.), 1/3HP @ 120V AC (N.C.)
B300 & R300; AC15 & DC13

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*** or contact Macromatic for information regarding leakage current limits and other solid state design considerations.

Control Switch Triggered Units:
Minimum required trigger switch closure time is 0.02 seconds.

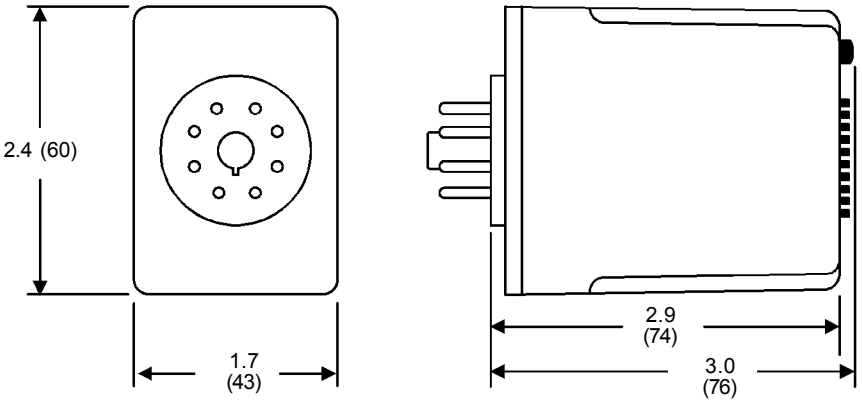
Approvals:

c UL us — File #E109466

UL LISTED IND. CONT. EQUIP. 50U7 — with appropriate socket — File #E109466

CE — Low Voltage & EMC Directives EN60947-1, EN60947-5-1

Dimensions



All Dimensions in Inches (Millimeters)

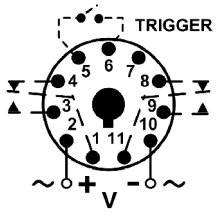
TIME DELAY RELAYS

TD-7 SERIES *TIME RANGER*™ DIGITAL-SET PROGRAMMABLE MULTI-RANGE PLUG-IN

The TD-781 Series offers an easy and accurate way to select a function & any time delay between 50ms & 999 hours. Programming is accomplished by using a pushbutton thumbwheel to select one of seven built-in time ranges and three pushbutton thumbwheels to digitally set the time delay required. This method provides a greater setting accuracy than is found on other units with an analog potentiometer. These units have a fifth pushbutton thumbwheel to select one of ten built-in functions. An LED indicates timing mode and time out condition.

See Page 70 for selected single-function versions.

Multi-Function Product

FUNCTION ■	INPUT VOLTAGE	PRODUCT NUMBER	WIRING/ SOCKETS
MULTI-FUNCTION (10 Functions in One Unit) ◆ On Delay ◆ Interval On ◆ Off Delay * ◆ Single Shot * ◆ Flasher (OFF 1st) ◆ Flasher (ON 1st) ◆ On/Off Delay * ◆ Single Shot Falling Edge * ◆ Watchdog * ◆ Triggered On Delay *	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-78122 TD-78126 TD-78128 TD-78121	11 PIN OCTAL **70170-D**  **DIAGRAM 121**

■ See Pages 77-79 for definitions & explanations of Timing Functions.

* These are the only functions requiring use of the Control Switch shown in Wiring Diagrams above.

Application Data & Dimensions–Page 71
Sockets & Accessories–Pages 80 & 81

- ◆ Ten user-selectable modes in one unit
- ◆ Pushbutton Thumbwheels for digital set of time delay & function
- ◆ 50ms - 999 hour programmable time range
- ◆ Uses industry-standard 11 pin octal socket
- ◆ 10A DPDT output contacts
- ◆ LED indicates timing mode and time out conditions
- ◆ cULus CSA CE

UL LISTED with appropriate socket

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TIME DELAY RELAYS

TD-7 SERIES *TIME RANGER*™ DIGITAL-SET PROGRAMMABLE MULTI-RANGE PLUG-IN

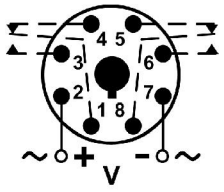
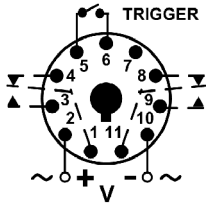
- Pushbutton Thumbwheels for digital set of time delay
- 50ms - 999 hour programmable time range
- Uses industry-standard 8 or 11 pin octal sockets
- 10A DPDT output contacts
- LED indicates timing mode and time out conditions
- cULus CSA CE

UL LISTED with appropriate socket

The TD-7 series of time delay relays offer an easy and accurate way to select any time delay between 50ms & 999 hours. Programming is accomplished by using a pushbutton thumbwheel to select one of seven built-in time ranges and three pushbutton thumbwheels to digitally set the time delay required. This method provides a greater setting accuracy than is found on other units with an analog potentiometer. An LED indicates timing mode and time out condition.

See Page 69 for a multi-function version of these products.

Single Function Products

FUNCTION ■	INPUT VOLTAGE	PRODUCT NUMBER	WIRING/ SOCKETS
ON DELAY **A**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-70222 TD-70226 TD-70228 TD-70221	8 PIN OCTAL **70169-D**  **DIAGRAM 1**
INTERVAL ON **B**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-70522 TD-70526 TD-70528 TD-70521	
FLASHER (OFF 1st) **E**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-70822 TD-70826 TD-70828 TD-70821	
OFF DELAY **C**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-71622 TD-71626 TD-71628 TD-71621	11 PIN OCTAL **70170-D**  **DIAGRAM 2**
SINGLE SHOT **D**	120V AC/DC 12V AC/DC 24V AC/DC 240V AC	TD-71522 TD-71526 TD-71528 TD-71521	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

Application Data & Dimensions–Page 71
Sockets & Accessories–Pages 80 & 81

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TIME DELAY RELAYS

TD-7 SERIES *TIME RANGER*™ DIGITAL-SET PROGRAMMABLE MULTI-RANGE PLUG-IN

APPLICATION DATA & DIMENSIONS

APPLICATION DATA

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

Load (Burden):
3 VA

Setting Accuracy:
±1% of set time or ±50ms, whichever is greater.

Repeat Accuracy (constant voltage and temperature)**:**
±0.1% of set time or ±0.02 seconds, whichever is greater.

Reset Time:
On Delay/Interval/Flasher: 0.1 Seconds
Functions with Control Switches: 0.04 Seconds

Start-up Time:
(Time from when power is applied until unit is timing)
120 & 240V units 0.05 Seconds
12, 24 & 48V units 0.08 Seconds

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

Temperature:
12-120V Input Voltage: -28° to 65°C (-18° to 149°F)
240V Input Voltage: -28° to 50°C (-18° to 122°F)

Insulation Voltage:
2,000 volts

Output Contacts:
DPDT 10A @ 240V AC/30V DC,
1/2HP @ 120/240V AC (N.O.), 1/3HP @ 120/240V AC (N.C.)
B300 & R300; AC15 & DC13

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

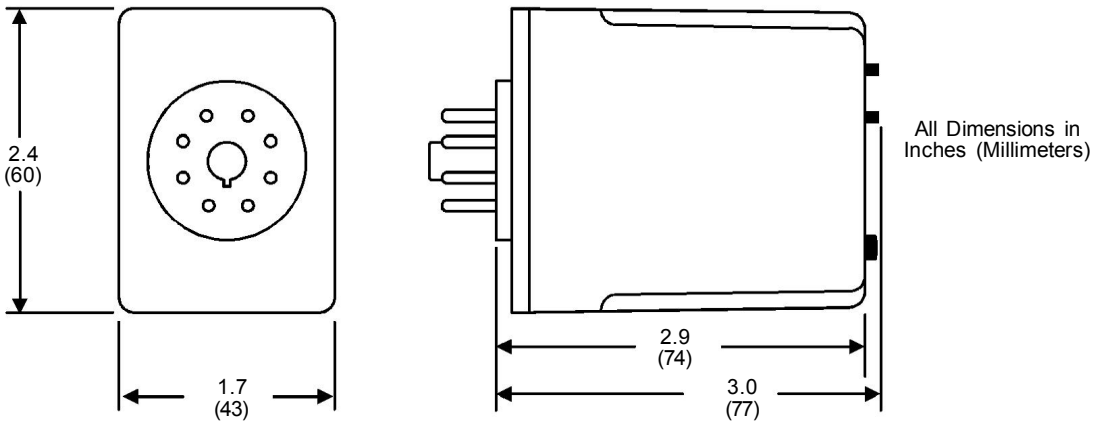
Compatibility:
Using a solid state switch to initiate the time sequence is acceptable. See ***www.macromatic.com/leakage*** or contact Macromatic for information regarding leakage current limits and other solid state design considerations.

Initiating Units with Control Switch Triggers:
Timing sequence must be initiated only after input voltage is applied to unit. Minimum required trigger switch closure time is 0.1 seconds.

LED:
Red LED. Refer to instruction sheet provided with product to determine code for relay & timing status.

Approvals:
File #E109466 File #LR45565 Low Voltage & EMC Directives EN60947-1, EN60947-5-1 LISTED IND. CONT. EQUIP. 80U7 with appropriate socket File #E109466

DIMENSIONS



All Dimensions in Inches (Millimeters)

TIME DELAY RELAYS

TAD Series
Digital-Set Multi-Function Multi-Range
1/16 DIN Mounting

- ◆ Push-button thumbwheels for digital-setting of time delay & selection of function
- ◆ 10 field-selectable functions in one unit
- ◆ 10ms to 9,990 Hours programmable timing range
- ◆ Universal 24-240V AC/DC input voltage
- ◆ LCD display
- ◆ Panel, track or surface mounting
- ◆ 1/16 DIN style case (comes with panel-mounting adapter)
- ◆ 5A SPDT output contacts
- ◆ cULus CE

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MULTI-FUNCTION	INPUT VOLTAGE	PRODUCT NUMBER	WIRING/ SOCKETS ■
10 FIELD-SELECTABLE FUNCTIONS◆	24-240V AC 50/60Hz & 24-240V DC	TAD1U 8 Pin Octal	**SEE DIAGRAMS ON PAGE 73** **(See Below)**

◆ Functions Include: On Delay (2 Versions), Interval, Flicker [Flasher] (2 Versions), One Shot Out Flicker [Delayed Interval/Pulse], Off Delay, On/Off Delay, Interval Delay [Single Shot] & Integration Time [Accumulative On Delay] (see Page 73 for additional details)

■ See below for **Sockets & Accessories.**

Application Data

Voltage Tolerance:
±10% of rated voltage

Load (Burden):
Less than 2.5 VA

Repeat Accuracy:
±0.01%, ±0.05 seconds (includes variation due to voltage and temperature changes)

Recycle Time:
0.2 seconds maximum

Temperature:
-10° to 55°C (14° to 131°F)

LCD Display: Shows time remaining in both digit & bar graph form--also shows relay status & time base. In addition, a switch on the bottom of the unit allows choice of timing up or timing down display.

Output Contacts:
5A SPDT Resistive @ 250V AC

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

Approvals: cULus CE
File #E170213

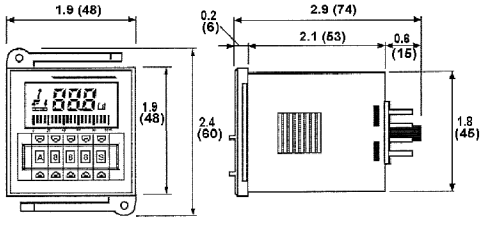
Sockets & Accessories

DESCRIPTION	PRODUCT NUMBER
8 Pin Octal Socket	70169-D■
8 Pin Octal Socket (Back Mounting)	SR6P-M08G
Panel-Mounting Adaptor	Included

■ For Surface or Track Mounting--See Page 80 for additional information

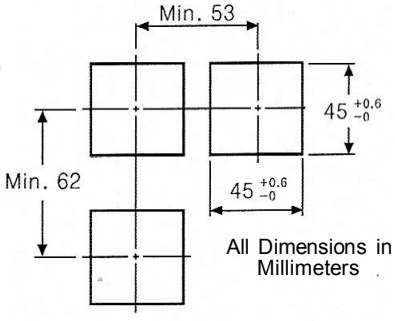
SR6P-M08G

Dimensions



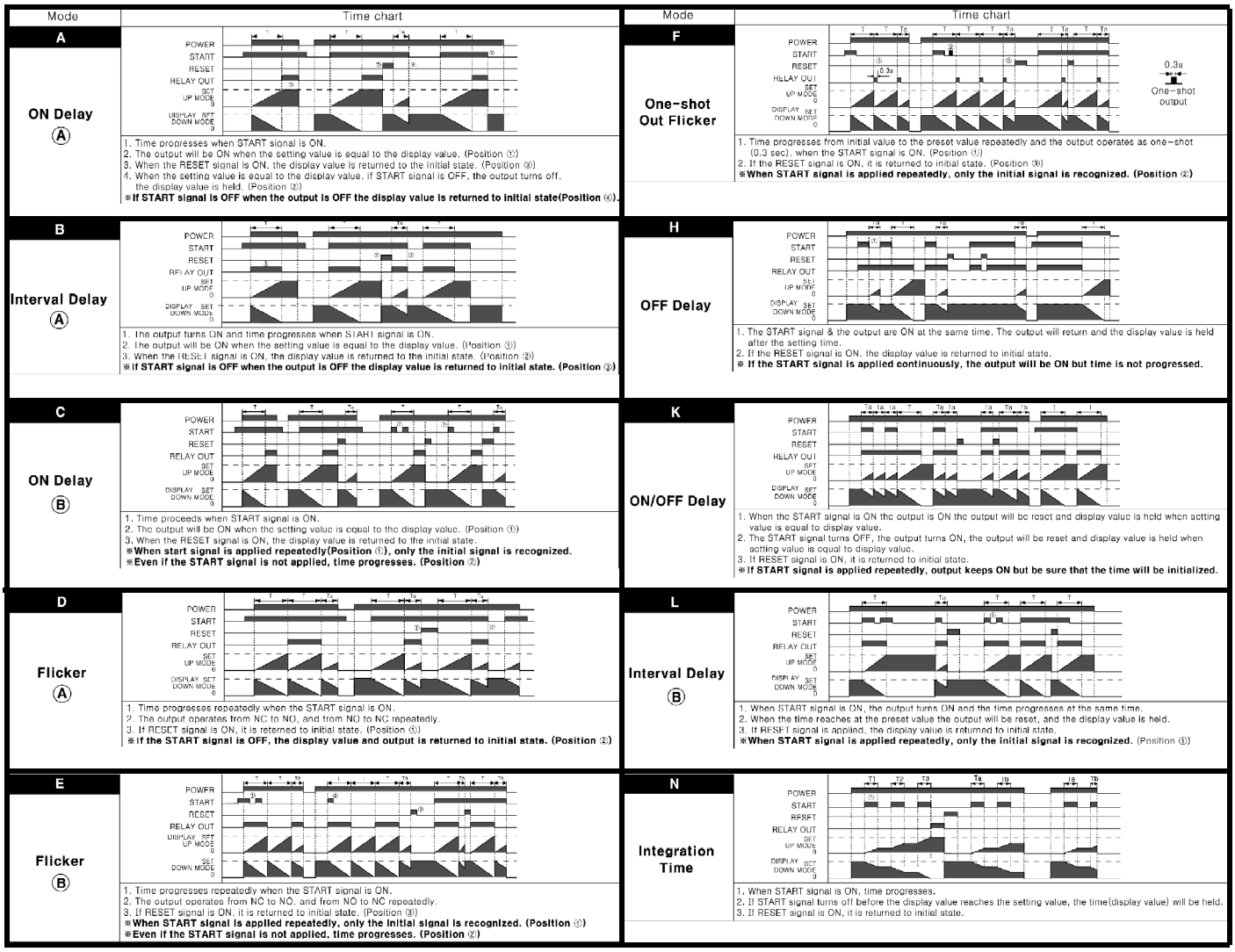
All dimensions are IN (mm)

PANEL CUTOUT



All Dimensions in Millimeters

Functions for TAD1U



NOTE: Timing is paused when the INHIBIT signal is ON during a timing cycle and resumes when it is OFF.

TAD1U All Functions

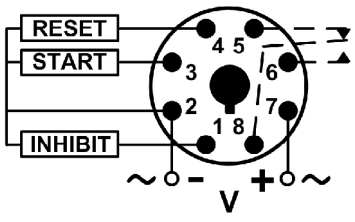


DIAGRAM 171

TIME DELAY RELAYS

TAA Series
Analog-Set Multi-Function Multi-Range
1/16 DIN Mounting

- ◆ 6 field-selectable functions in one unit
- ◆ Large dial for setting of time delay
- ◆ 50ms to 100 Hours programmable timing range
- ◆ Universal 100-240V AC/ 24-240V DC input voltage
- ◆ Panel, track or surface mounting
- ◆ 1/16 DIN style case (comes with panel-mounting adapter)
- ◆ 5A DPDT output contacts
- ◆ c UL us CE

MULTI-FUNCTION ◆	INPUT VOLTAGE	PRODUCT NUMBER	WIRING/ SOCKETS ■
Includes Six (6) Functions Built-in (See Page 75 for additional information)	100-240V AC 50/60Hz & 24-240V DC	TAA1U	**SEE DIAGRAMS ON PAGE 75** 8 Pin Octal **(See Below)**
Includes Six (6) Functions Built-in (See Page 75 for additional information)	100-240V AC 50/60Hz & 24-240V DC	TAA2U	**SEE DIAGRAMS ON PAGE 75** 11 Pin Octal **(See Below)**

◆ See Page 75 for additional details on Functions.

■ See below for **Sockets & Accessories.**

Application Data

Voltage Tolerance:
±10% of rated voltage.

Load (Burden):
Less than 2.5 VA

Repeat Accuracy:
±0.01%, ±0.05 seconds (includes variation due to voltage and temperature changes).

Recycle Time:
0.2 seconds maximum.

Temperature:
-10° to 55°C (14° to 131°F)

LED Indicators: One red LED indicates Input Voltage/Timing (flashing) & a second red LED indicates relay status.

Output Contacts:
5A DPDT Resistive @ 250V AC

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

Approvals: c UL us CE
File #E170213

Sockets & Accessories

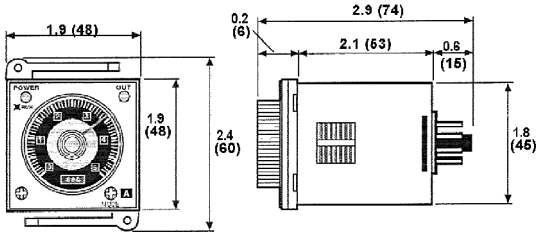
DESCRIPTION	PRODUCT NUMBER
8 Pin Octal Socket	70169-D■
8 Pin Octal Socket (Back Mounting)	SR6P-M08G
11 Pin Octal Socket	70170-D■
11 Pin Octal Socket (Back Mounting)	SR6P-M11G
Panel-Mounting Adaptor	Included

■ For Surface or Track Mounting--See Page 80 for additional information


SR6P-M08G

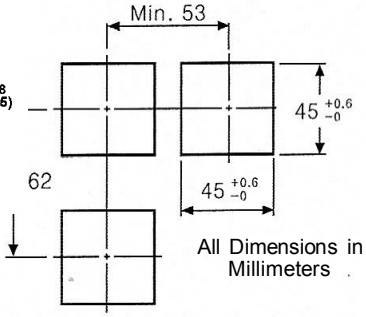

SR6P-M11G

Dimensions



All dimensions are IN (mm)

PANEL CUTOUT



All Dimensions in Millimeters

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Functions for TAA1U

t:Setting time, t > t−a, Rt:Return time(Max. 100ms)

Mode	Time chart
A POWER ON DELAY MODE	Power 2−7 / Time limit contact NC 1−4 (8−5) / Time limit contact NO 1−3 (8−6) / Time limit output operation LED / Operation/power LED
A 1 POWER ON DELAY 1 MODE (One-shot output)	Power 2−7 / Time limit contact NC 8−5 / Time limit contact NO 8−6 / Instantaneous contact NC 1−4 / Instantaneous contact NO 1−3 / Time limit output operation LED / Operation/power LED (0.5sec, 0.5sec) ※One− shot output is 0.5sec fixed.
B POWER ON DELAY 2 MODE	Power 2−7 / Time limit contact NC 8−5 / Time limit contact NO 8−6 / Instantaneous contact NC 1−4 / Instantaneous contact NO 1−3 / Time limit output operation LED / Operation/power LED
F FLICKER MODE	Power 2−7 / Time limit contact NC 1−4 (8−5) / Time limit contact NO 1−3 (8−6) / Time limit output operation LED / Operation/power LED
F 1 FLICKER 1 MODE	Power 2−7 / Time limit contact NC 8−5 / Time limit contact NO 8−6 / Instantaneous contact NC 1−4 / Instantaneous contact NO 1−3 / Time limit output operation LED / Operation/power LED
I INTERVAL MODE	Power 2−7 / Time limit contact NC 8−5 / Time limit contact NO 8−6 / Instantaneous contact NC 1−4 / Instantaneous contact NO 1−3 / Time limit output operation LED / Operation/power LED

※When using F, F1 output operation modes, if the time is set too short, the output may not work properly. Please set the time at least over 100ms.

Functions for TAA2U

t=t1+t2, t>t−a

Mode	Time chart
A SIGNAL ON DELAY MODE	Power 2−10 / START 2−6 / INHIBIT 2−5 / RESET 2−7 / Time limit contact NC / Time limit contact NO / Time limit output operation LED / Operation/power LED
F FLICKER MODE	Power 2−10 / START 2−6 / INHIBIT 2−5 / RESET 2−7 / Time limit contact NC / Time limit contact NO / Time limit output operation LED / Operation/power LED
F 1 FLICKER1 MODE	Power 2−10 / START 2−6 / INHIBIT 2−5 / RESET 2−7 / Time limit contact NC / Time limit contact NO / Time limit output operation LED / Operation/power LED
C SIGNAL OFF DELAY MODE	Power 2−10 / START 2−6 / INHIBIT 2−5 / RESET 2−7 / Time limit contact NC / Time limit contact NO / Time limit output operation LED / Operation/power LED
D SIGNAL ON /OFF DELAY MODE	Power 2−10 / START 2−6 / INHIBIT 2−5 / RESET 2−7 / Time limit contact NC / Time limit contact NO / Time limit output operation LED / Operation/power LED
I INTERVAL MODE	Power 2−10 / START 2−6 / INHIBIT 2−5 / RESET 2−7 / Time limit contact NC / Time limit contact NO / Time limit output operation LED / Operation/power LED

Note) 1. If power is removed or the RESET terminal is short−circuited, the timer will be reset.
2. If the INHIBIT terminal is short−circuited during a timing cycle, the time will stop.
3. When using F, F1 output operation modes, if the time is set too short, the output may not work properly. Please set the time at least over 100ms.

TAA1U Functions A, F

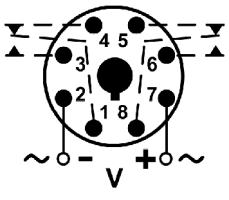

DIAGRAM 134

TAA1U Functions A1, B, F1 & I

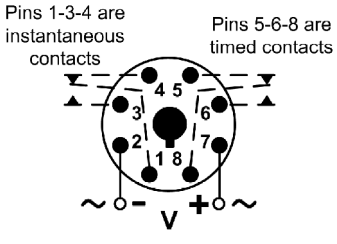

DIAGRAM 182

TAA2U All Functions

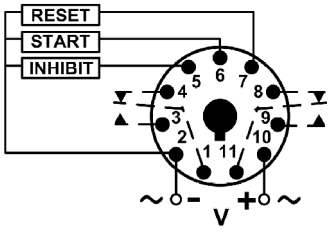

DIAGRAM 183

TIME DELAY RELAYS

Compact Non-Programmable Plug-in

- Compact, economical design with standard features for basic applications
- 6 separate timing ranges from 0.2 to 300 seconds
- 5A SPDT output contacts
- Uses industry-standard 8 pin octal sockets
- c UL us LISTED with appropriate socket

Timing Ranges

**** TIMING RANGE TABLE**

COMPLETE PRODUCT NUMBER USING TWO DIGIT CODE FROM TABLE BELOW

i.e., SS-6262-04

Time Delay Range	Code
0.2 - 5 Sec.	04
0.5 - 15 Sec.	06
1 - 30 Sec.	07
2 - 60 Sec.	08
6 - 180 Sec.	10
10 - 300 Sec.	12

For Fixed Time Delay, add suffix "F" and time delay desired to basic Product Number, i.e., SS-6262-F5S is an On Delay fixed at 5 seconds.

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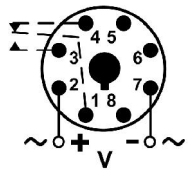
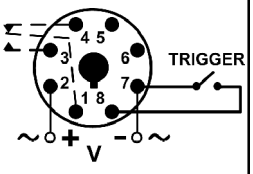
FUNCTION ■	INPUT VOLTAGE	PRODUCT NUMBER **	WIRING/ SOCKET
ON DELAY **A**	120V AC 12V DC 24V AC/DC	SS-6262-** SS-6266-** SS-6268-**	8 Pin Octal **70169-D**  **DIAGRAM 5**
INTERVAL ON **B**	120V AC 12V DC 24V AC/DC	SS-8062-** SS-8066-** SS-8068-**	
OFF DELAY **C**	120V AC 12V DC 24V AC/DC	SS-8562-** SS-8566-** SS-8568-**	8 Pin Octal **70169-D**  **DIAGRAM 6**
SINGLE SHOT **D**	120V AC 12V DC 24V AC/DC	SS-8762-** SS-8766-** SS-8768-**	

■ See Pages 77-79 for definitions & explanations of Timing Functions.

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

Sockets & Accessories–Pages 80 & 81

Application Data

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

Load (Burden): Less than 3 VA

Setting Accuracy:
Maximum Setting: +10%, -0%
Minimum Setting: +0%, -50%

Fixed Time Delay:	> 2 Seconds	±2%
	0.1 - 2 Seconds	±5%

Repeat Accuracy:

> 2 Seconds Delay	±2%
0.1 - 2 Seconds Delay	±5%

Reset Time: 0.2 Seconds

Triggering Off Delay & Single Shot Units:
Timing sequence must be initiated only after input power is applied to unit. Minimum required trigger switch closure time is 0.1 seconds.

Temperature:
0° to 60°C (32° to 140°F)

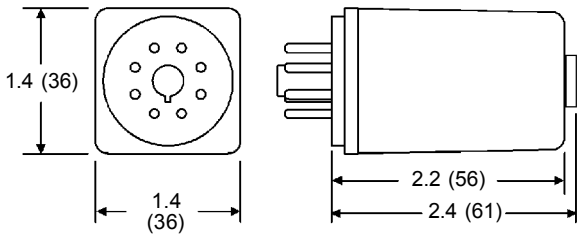
Compatibility:
Using a solid state switch to initiate the time sequence is acceptable. See ***www.macromatic.com/leakage*** or contact Macromatic for information regarding leakage current limits and other solid state design considerations.

Output Contacts:
SPDT 5A @ 120V AC/28V DC, 1/6HP @ 120V AC

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

Approvals:
c UL us LISTED
File #E109466 with appropriate socket File #E109466

Dimensions



All Dimensions in Inches (Millimeters)

TIME DELAY RELAYS

Definition of Timing Functions

Understanding the differences between all the functions available in time delay relays can sometimes be a daunting task. To begin with, time delay relays are simply control relays with a time delay built in. Their purpose is to control an event based on time.

Typically, time delay relays are initiated or triggered by one of two methods, depending on the function:

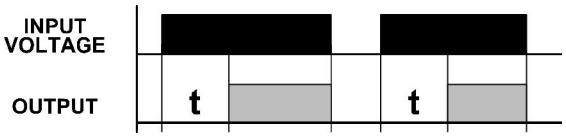
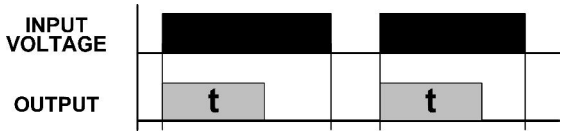
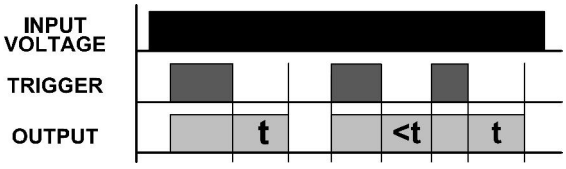
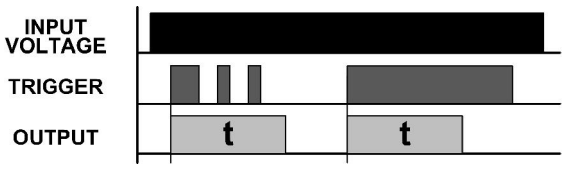
- application of input voltage
- application of a trigger

These triggers can be one of two signals: a control switch (dry contact), i.e., limit switch, push button, float switch, etc., or voltage (commonly known as a power trigger).

To help understand, some definitions are important:

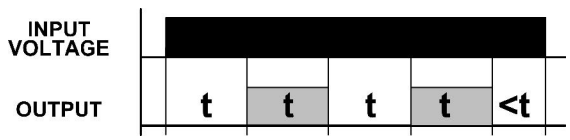
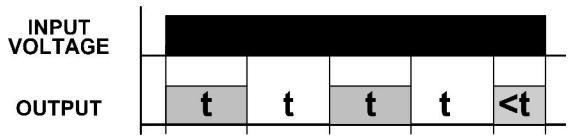
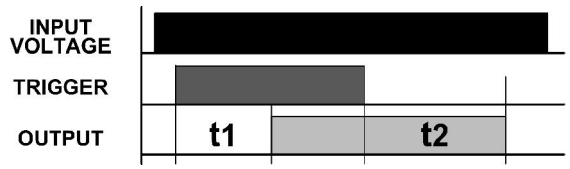
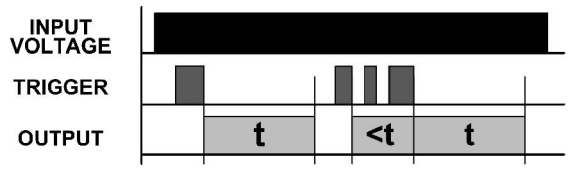
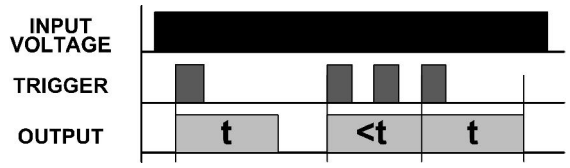
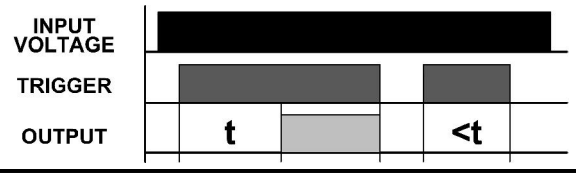
- Input Voltage - control voltage applied to the input terminals. Depending on the function, input voltage will either initiate the unit or make it ready to initiate when a trigger is applied.
- Trigger- on certain timing functions, a trigger is used to initiate the unit after input voltage has been applied. As noted above, this trigger can either be a control switch (dry contact switch) or a power trigger (voltage).
- Output (Load) - every time delay relay has an output (either mechanical relay or solid state) that will open & close to control the load. Note that the user must provide the voltage to power the load being switched by the output contacts of the time delay relay. In all wiring diagrams, the output is shown in the normal de-energized position.

Below and on the following pages are both written and visual descriptions on how the common timing functions operate. A Timing Chart shows the relationship between Input Voltage, Trigger (if present) and Output. If you cannot find a product to fit your requirements or have any questions, Macromatic's Application Engineers offer technical information along with product selection and application assistance. Just call us at 800-238-7474 or e-mail us at tech-help@macromatic.com.

Function/Code	Operation	Timing Chart
ON DELAY Delay on Operate Delay on Make **A**	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..	
INTERVAL ON Interval **B**	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.	
OFF DELAY Delay on Release Delay on Break Delay on De-Energization **C**	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.	
SINGLE SHOT One Shot Momentary Interval **D**	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.	

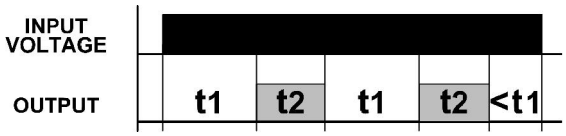
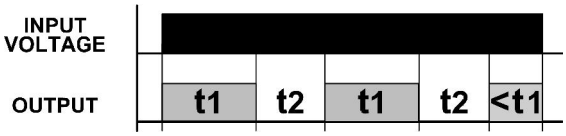
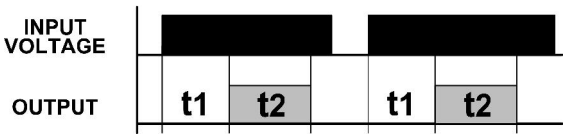
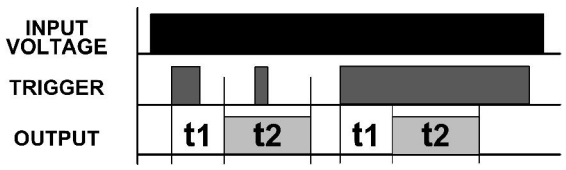
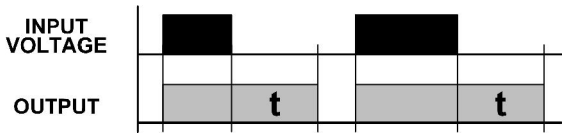
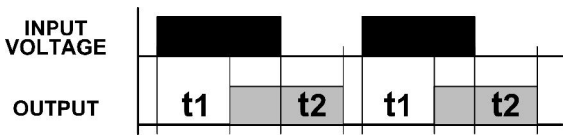
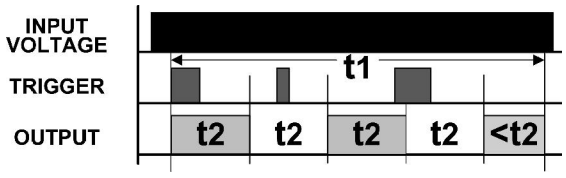
TIME DELAY RELAYS

Definition of Timing Functions

Function/Code	Operation	Timing Chart
FLASHER (Off First) **E**	Upon application of input voltage, the time delay (t) begins. At the end of the time delay (t), the output is energized and in that condition for the time delay (t). At the end of the time delay (t), the output is de-energized and the sequence repeats until input voltage is removed.	
FLASHER (ON First) **F**	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.	
ON/OFF DELAY **G**	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 removed during time delay period (t2), the output will remain energized and the time delay (t2) will reset.	
SINGLE SHOT FALLING EDGE **H**	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.	
WATCHDOG Retriggerable Single Shot **J**	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.	
TRIGGERED ON DELAY **K**	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.	

TIME DELAY RELAYS

Definition of Timing Functions

Function/Code	Operation	Timing Chart
REPEAT CYCLE (OFF 1st) **L**	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.	
REPEAT CYCLE (ON 1st) **M**	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.	
DELAYED INTERVAL Single Cycle **N**	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.	
TRIGGERED DELAYED INTERVAL **P**	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.	
TRUE OFF DELAY **R**	Upon application of input voltage, the output is energized. When the input voltage is removed, the time delay (t) begins. At the end of the time delay (t), the output is de-energized. Input voltage must be applied for a minimum of 0.5 seconds to assure proper operation. Any application of the input voltage during the time delay (t) will reset the time delay. No external trigger is required.	
ON DELAY/ TRUE OFF DELAY **S**	Upon application of input voltage, the time delay (t1) begins. At the end of the time delay (t1), the output is energized. When the input voltage is removed, the output remains energized for the time delay (t2). At the end of the time delay (t2), the output is de-energized. Input voltage must be applied for a minimum of 0.5 seconds to assure proper operation. Any application of the input voltage during the time delay (t2) will keep the output energized & reset the time delay (t2). No external trigger is required.	
SINGLE SHOT-FLASHER **T**	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 and the output is energized for the time delay (t2). At the end of this time delay (t2), the output is de-energized and remains in that condition for the time delay (t2). At the end of the time delay (t2), the output is energized and the sequence repeats until time delay (t1) is completed. During the time delay (t1), the trigger is ignored.	
ON DELAY-FLASHER **X**	Upon application of input voltage, the time delay begins (t1). 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 and remains in that condition for the time delay (t2). At the end of the time delay (t2), the output is energized and the sequence repeats until input voltage is