

# PROGRAMMABLE | MULTI-FUNCTION

## TR-6 SERIES TIME RANGER™



- ◆ Four or eight timing functions in one unit easily selectable with rotary switch
- ◆ Each unit has 16 timing ranges built-in covering 0.05 seconds-100 hours
- ◆ Selecting a range is easy using a 16-position rotary switch (no math is required or DIP switches to set)
- ◆ Universal input voltage: 24-240V AC & 12-125V DC
- ◆ Utilizes industry-standard 8 or 11 pin octal sockets
- ◆ 10A SPDT or DPDT output contacts can handle most pilot duty and fractional HP loads



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The TR-681 & TR-682 Series offer the flexible programmability of a multi-function and multi-range time delay relay together with a universal input voltage. These products provide an easy method to select one of eight (TR-681) or four (TR-682) time delay functions and any time range between 0.05 seconds and 100 hours. Programming is accomplished through the use of two rotary switches to select function and time range. The actual time delay is then set by using the potentiometer to adjust within the selected time range. This product can literally replace hundreds of different catalog numbers, thereby reducing inventory requirements.

| FUNCTION ■   | OUTPUT      | INPUT VOLTAGE 50/60Hz.  | CATALOG NUMBER | WIRING/ SOCKETS  |
|--|-------------|-------------------------|----------------|--|
| <b>ON DELAY</b><br><b>INTERVAL ON</b><br><b>OFF DELAY</b><br><b>SINGLE SHOT</b><br><b>FLASHER (ON 1st)</b><br><b>SINGLE SHOT</b><br>(Falling Edge)<br><b>WATCHDOG</b><br><b>ON DELAY (Triggered)</b> | 11 Pin DPDT | 24-240V AC & 12-125V DC | TR-6812U       | 11 PIN OCTAL<br><b>70170-D</b><br><br><b>DIAGRAM 210</b> |
|  | 8 Pin SPDT  | 24-240V AC & 12-125V DC | TR-6816U       | 8 PIN OCTAL<br><b>70169-D</b><br><br><b>DIAGRAM 211</b>  |
| <b>ON DELAY</b><br><b>INTERVAL ON</b><br><b>FLASHER</b><br>(OFF 1st)<br><b>FLASHER</b><br>(ON 1st)   | 8 Pin DPDT  | 24-240V AC & 12-125V DC | TR-6822U       | 8 PIN OCTAL<br><b>70169-D</b><br><br><b>DIAGRAM 1</b>    |

■ See "Definitions 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 (see right) and then adjust within that range using the knob on top.

| Dial Setting | Timing Range    | Dial Setting | Timing Range |
|--------------|-----------------|--------------|--------------|
| A            | 0.05 - 0.5 Sec. | I            | 1 - 10 Min.  |
| B            | 0.1 - 1 Sec.    | J            | 3 - 30 Min.  |
| C            | 0.5 - 5 Sec.    | K            | 6 - 60 Min.  |
| D            | 1 - 10 Sec.     | L            | 0.2 - 2 Hr.  |
| E            | 3 - 30 Sec.     | M            | 0.5 - 5 Hr.  |
| F            | 6 - 60 Sec.     | N            | 1 - 10 Hr.   |
| G            | 0.2 - 2 Min.    | O            | 2.4 - 24 Hr. |
| H            | 0.5 - 5 Min.    | P            | 10 - 100 Hr. |

Sockets & Accessories available

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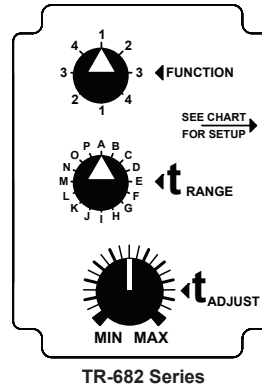
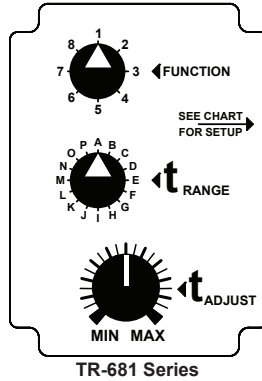
# PROGRAMMABLE | MULTI-FUNCTION

## TR-6 SERIES TIME RANGER™

### PROGRAMMING FUNCTION & TIME DELAY

**Setting Function:** To set the function, first select one of the eight (TR-681 Series) or four (TR-682 Series) functions from the Select Function Chart located on the side of the relay (see right). Position the eight-position rotary switch to the number that corresponds to the desired function. **NOTE:** Because the TR-682 Series comes with only four functions, but uses an eight-position rotary switch to select a function, each function can be selected with the same number in two positions. **NOTE: Function cannot be changed with power applied to unit.**

**Setting Time Delay and Time Range:** To set the desired time delay, first select one of the 16 time ranges from the Timing Range Chart located on the side of the relay. Position the rotary switch to the letter that corresponds to the desired time range. Then adjust the time delay within the selected time range by rotating the large knob of the potentiometer located on top of the unit. **Note:** The tick marks are for reference only.



#### TR-681 Series

| Select Function |                       |
|-----------------|-----------------------|
| 1               | On Delay              |
| 2               | Interval On           |
| 3               | Flasher - On 1st      |
| 4               | Triggered On Delay    |
| 5               | Watchdog              |
| 6               | Single Shot           |
| 7               | Off Delay             |
| 8               | One Shot Falling Edge |

#### TR-682 Series

| Select Function |                   |
|-----------------|-------------------|
| 1               | On Delay          |
| 2               | Interval On       |
| 3               | Flasher - Off 1st |
| 4               | Flasher - On 1st  |

### APPLICATION DATA

#### Voltage Tolerance:

AC Operation: 20.4 – 264V at 50/60 Hz  
DC Operation: 10.2 – 137.5V

#### Load (Burden):

Maximum of 3 VA for all voltages

#### Setting Accuracy:

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

#### Repeat Accuracy (constant voltage and temperature):

±0.1% or ±50ms, whichever is greater

#### Reset Time:

Functions Triggered with Input Voltage: 0.1 Seconds  
Functions Triggered with Control Switch: 0.04 Seconds

**Start-up Time:** (Time from when power is applied until unit is timing): 50ms

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

#### Temperature:

Operating: -28° to 65°C (-18° to 150°F)  
Storage: -40° to 85°C (-40° to 185°F)

#### Functions Triggered By A Control Switch:

Minimum required trigger switch closure time is 50ms.

#### Compatibility:

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

#### Output Contacts:

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

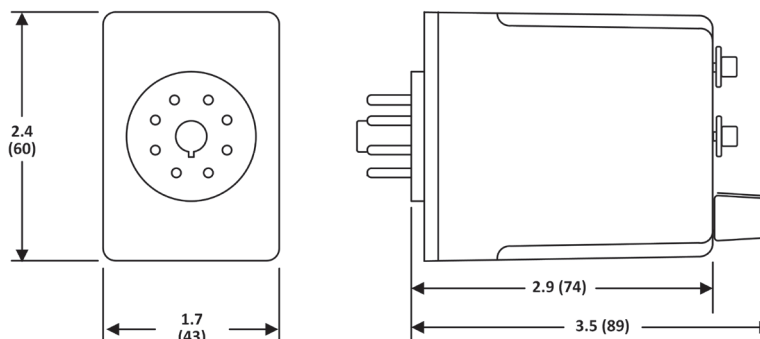
#### Life:

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

#### Approvals:



### DIMENSIONS



All Dimensions in Inches (Millimeters)

# PROGRAMMABLE | MULTI-RANGE ON DELAY, INTERVAL ON & FLASHER

## TR-6 SERIES TIME RANGER™

The TR-6 Series offers the flexible programmability of a multi-range time delay relay together with a universal input voltage. These products provide an easy method to select one of 16 time ranges between 0.05 seconds and 100 hours using a rotary switch. The actual time delay is then set by using the potentiometer to adjust within the selected time range.



- ◆ Each unit has 16 timing ranges built-in covering 0.05 seconds-100 hours
- ◆ Selecting a range is easy using a rotary switch (no math is required or DIP switches to set)
- ◆ Universal input voltage: 24-240V AC & 12-125V DC
- ◆ Uses industry-standard 8 pin octal sockets
- ◆ 10A DPDT output contacts can handle most pilot duty & fractional HP loads



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| FUNCTION ■                              | INPUT VOLTAGE<br>50/60Hz.  | CATALOG<br>NUMBER | WIRING/<br>SOCKETS      |
|---|----------------------------|-------------------|-------------------------|
| <b>ON DELAY</b><br><b>A</b>             | 24-240V AC &<br>12-125V DC | TR-6022U          | <p><b>DIAGRAM 1</b></p> |
| <b>INTERVAL ON</b><br><b>B</b>          | 24-240V AC &<br>12-125V DC | TR-6052U          |                         |
| <b>FLASHER</b><br>(OFF 1st)<br><b>E</b> | 24-240V AC &<br>12-125V DC | TR-6082U          |                         |
| <b>FLASHER</b><br>(ON 1st)<br><b>F</b>  | 24-240V AC &<br>12-125V DC | TR-6092U          |                         |

■ See "Definitions 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 (see below) and then adjust within that range using the knob on top.

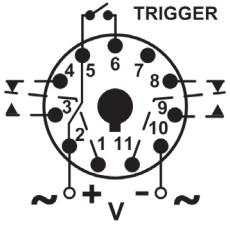
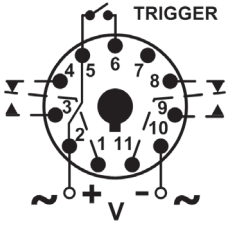
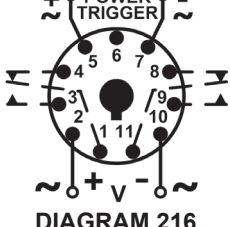
| Dial Setting | Timing Range    |
|--------------|-----------------|
| A            | 0.05 - 0.5 Sec. |
| B            | 0.1 - 1 Sec.    |
| C            | 0.5 - 5 Sec.    |
| D            | 1 - 10 Sec.     |
| E            | 3 - 30 Sec.     |
| F            | 6 - 60 Sec.     |
| G            | 0.2 - 2 Min.    |
| H            | 0.5 - 5 Min.    |
| I            | 1 - 10 Min.     |
| J            | 3 - 30 Min.     |
| K            | 6 - 60 Min.     |
| L            | 0.2 - 2 Hr.     |
| M            | 0.5 - 5 Hr.     |
| N            | 1 - 10 Hr.      |
| O            | 2.4 - 24 Hr.    |
| P            | 10 - 100 Hr.    |

Sockets & Accessories available

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# PROGRAMMABLE | MULTI-RANGE OFF DELAY, SINGLE SHOT & WATCHDOG TR-6 SERIES TIME RANGER™

The TR-6 Series offers the flexible programmability of a multi-range time delay relay together with a universal input voltage. These products provide an easy method to select one of 16 time ranges between 0.05 seconds and 100 hours using a rotary switch. The actual time delay is then set by using the potentiometer to adjust within the selected time range.

| FUNCTION ■   | INPUT VOLTAGE 50/60Hz.     | CATALOG NUMBER | WIRING/SOCKETS   |
|--|----------------------------|----------------|--|
| <b>OFF DELAY ▲</b><br>Control Switch Trigger<br><b>C</b>                             | 24-240V AC &<br>12-125V DC | TR-6162U       | 11 PIN OCTAL<br><b>70170-D</b><br><br><b>DIAGRAM 212</b>  |
| <b>SINGLE SHOT</b><br>Control Switch Trigger<br><b>D</b>                             | 24-240V AC &<br>12-125V DC | TR-6152U       | 11 PIN OCTAL<br><b>70170-D</b><br><br><b>DIAGRAM 212</b>  |
| <b>WATCHDOG</b><br>Control Switch Trigger<br>(Retriggerable Single Shot)<br><b>J</b> | 24-240V AC &<br>12-125V DC | TR-6132U       |  |
| <b>OFF DELAY ▲</b><br>Power Trigger<br><b>C</b>                                      | 24-240V AC &<br>12-125V DC | TR-6192U       | 11 PIN OCTAL<br><b>70170-D</b><br><br><b>DIAGRAM 216</b> |
| <b>SINGLE SHOT</b><br>Power Trigger<br><b>D</b>                                      | 24-240V AC &<br>12-125V DC | TR-6172U       |  |
| <b>WATCHDOG</b><br>Power Trigger<br>(Retriggerable Single Shot)<br><b>J</b>          | 24-240V AC &<br>12-125V DC | TR-6182U       |  |

■ See "Definitions of Timing Functions".

▲ See TR-606 Series for True Off Delay function.

## TIMING RANGES

Select one of the 16 built-in time ranges by setting the rotary switch per a chart on the unit (see below) and then adjust within that range using the knob on top.

| Dial Setting | Timing Range    |
|--------------|-----------------|
| A            | 0.05 - 0.5 Sec. |
| B            | 0.1 - 1 Sec.    |
| C            | 0.5 - 5 Sec.    |
| D            | 1 - 10 Sec.     |
| E            | 3 - 30 Sec.     |
| F            | 6 - 60 Sec.     |
| G            | 0.2 - 2 Min.    |
| H            | 0.5 - 5 Min.    |
| I            | 1 - 10 Min.     |
| J            | 3 - 30 Min.     |
| K            | 6 - 60 Min.     |
| L            | 0.2 - 2 Hr.     |
| M            | 0.5 - 5 Hr.     |
| N            | 1 - 10 Hr.      |
| O            | 2.4 - 24 Hr.    |
| P            | 10 - 100 Hr.    |

Sockets & Accessories available



- ◆ Each unit has 16 timing ranges built-in covering 0.05 seconds-100 hours
- ◆ Selecting a range is easy using a rotary switch (no math is required or DIP switches to set)
- ◆ Universal input voltage: 24-240V AC & 12-125V DC
- ◆ Uses industry-standard 11 pin octal sockets
- ◆ 10A DPDT output contacts can handle most pilot duty & fractional HP loads



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# PROGRAMMABLE | MULTI-RANGE REPEAT CYCLE & DELAYED INTERVAL

## TR-6 SERIES TIME RANGER™

The TR-6 Series offers the flexible programmability of a multi-range time delay relay together with a universal input voltage. These products provide an easy method to select one of 16 time ranges between 0.05 seconds and 100 hours using a rotary switch. The actual time delay is then set by using the potentiometer to adjust within the selected time range.



- ◆ Each unit has 16 timing ranges built-in covering 0.05 seconds-100 hours
- ◆ Selecting a range is easy using a rotary switch (no math is required or DIP switches to set)
- ◆ Independently selectable & adjustable ON & OFF times
- ◆ Universal input voltage: 24-240V AC & 12-125V DC
- ◆ Uses industry-standard 8 or 11 pin octal sockets
- ◆ 10A DPDT output contacts can handle most pilot duty & fractional HP loads



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| FUNCTION ■  | INPUT VOLTAGE 50/60Hz.  | CATALOG NUMBER | WIRING/SOCKET   |
|---|-------------------------|----------------|---|
| <b>REPEAT CYCLE*</b><br>(OFF Time First Followed By ON Time and Repeating) <b>L</b>   | 24-240V AC & 12-125V DC | TR-6312U       | 8 PIN OCTAL<br><b>70169-D</b><br><br><b>DIAGRAM 1</b>               |
| <b>REPEAT CYCLE*</b><br>(ON Time First Followed By OFF Time and Repeating) <b>M</b>   | 24-240V AC & 12-125V DC | TR-6512U       |   |
| <b>DELAYED INTERVAL*</b><br>(OFF Time Followed by ON Time Followed by OFF State Until Reset) <b>N</b>                           | 24-240V AC & 12-125V DC | TR-6612U       |   |
| <b>DELAYED INTERVAL*</b><br>Control Switch Trigger<br>(OFF Time Followed by ON Time Followed by OFF State Until Reset) <b>P</b> | 24-240V AC & 12-125V DC | TR-6652U       | 11 PIN OCTAL<br><b>70170-D</b><br>TRIGGER<br><br><b>DIAGRAM 212</b> |

\* These units have independently selectable & adjustable ON & OFF times. See [www.macromatic.com/onoff](http://www.macromatic.com/onoff) for more information.

■ See "Definitions 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 (see below) and then adjust within that range using the knob on top.

| Dial Setting | Timing Range    |
|--------------|-----------------|
| A            | 0.05 - 0.5 Sec. |
| B            | 0.1 - 1 Sec.    |
| C            | 0.5 - 5 Sec.    |
| D            | 1 - 10 Sec.     |
| E            | 3 - 30 Sec.     |
| F            | 6 - 60 Sec.     |
| G            | 0.2 - 2 Min.    |
| H            | 0.5 - 5 Min.    |
| I            | 1 - 10 Min.     |
| J            | 3 - 30 Min.     |
| K            | 6 - 60 Min.     |
| L            | 0.2 - 2 Hr.     |
| M            | 0.5 - 5 Hr.     |
| N            | 1 - 10 Hr.      |
| O            | 2.4 - 24 Hr.    |
| P            | 10 - 100 Hr.    |

Sockets & Accessories available

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# PROGRAMMABLE | MULTI-RANGE

## TR-6 SERIES TIME RANGER™

### APPLICATION DATA

**Voltage Tolerance:**

AC Operation: 20.4 – 264V at 50/60 Hz  
DC Operation: 10.2 – 137.5V

**Load (Burden):**

Maximum of 3 VA for all voltages

**Setting Accuracy:**

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

**Repeat Accuracy** (constant voltage and temperature):

±0.1% or ±50ms, whichever is greater

**Reset Time:**

Functions Triggered with Input Voltage: 0.1 Seconds  
Functions Triggered with Control Switch: 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

**Temperature:**

Operating: -28° to 65°C (-18° to 150°F)  
Storage: -40° to 85°C (-40° to 185°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](http://www.macromatic.com/leakage) or contact Macromatic for information regarding leakage current limits and other solid state design considerations.

**Output Contacts:**

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

**Life:**

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

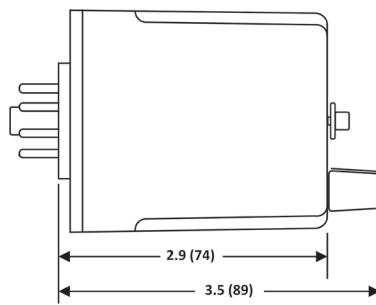
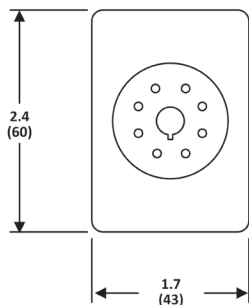
**Approvals:**

with Appropriate  
Macromatic Socket

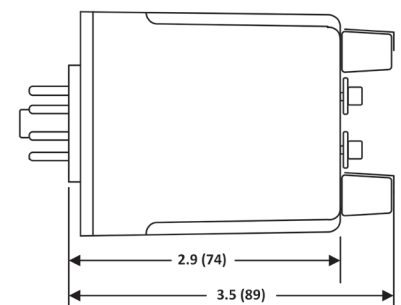
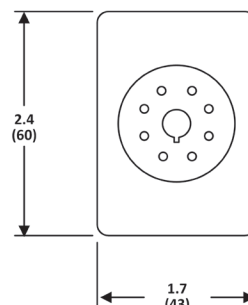
Low Voltage &  
EMC Directives  
EN60947-1, EN60947-5-1

### DIMENSIONS

TR-602, TR-605, TR608, TR609, TR-613, TR-615, TR-616,  
TR-617, TR-618 & TR-619



TR-631-TR-651, TR-661 & TR-665



All Dimensions in  
Inches (Millimeters)

# PROGRAMMABLE | MULTI-RANGE TRUE OFF DELAY

## TR-6 SERIES TIME RANGER™



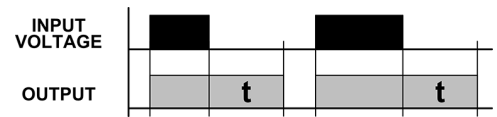
- ◆ Each unit has 8 timing built-in covering 0.05 seconds - 30 minutes
- ◆ Selecting a range is easy using a rotary switch (no math is required or DIP switches to set)
- ◆ Uses industry-standard 8 pin octal sockets
- ◆ 10A DPDT output contacts can handle most pilot duty & fractional HP loads



A True Off Delay time delay relay is designed to replace the functionality of pneumatic time delay relays which are very large, expensive and not very accurate. Unlike standard electronic Off Delay time delay relays (see page 29), a True Off Delay does not require a trigger switch or the continuous application of input voltage. Instead, these products keep the logic circuit and relay energized during the Off Delay (Delay on De-energization) period with an onboard power source.

The Macromatic TR-606 Series is a perfect product to use when a trigger switch is not available in the circuit or when the application is to replace the functionality of a pneumatic time delay relay. These products come with 8 separate timing ranges covering 0.5 seconds – 30 minutes which are easy to select & setup with one rotary switch & potentiometer.

**Operation:** 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.

| FUNCTION ■     | INPUT VOLTAGE 50/60Hz.                                    | CATALOG NUMBER   | WIRING/SOCKETS                          |
|----------------|---|--|---|
| TRUE OFF DELAY | 120V AC/DC<br>12V DC<br>24V AC/DC<br>240V AC<br>48V AC/DC | TR-60622<br>TR-60626<br>TR-60628<br>TR-60621<br>TR-60624 | 8 PIN OCTAL<br>70169-D<br><br>DIAGRAM 1 |

■ See “Definitions of Timing Functions”.

## TIMING RANGES

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

| 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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# PROGRAMMABLE | MULTI-RANGE TRUE OFF DELAY

## TR-6 SERIES TIME RANGER™

### 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. These products draw a brief inrush current on power-up of 1A to charge the internal circuitry.

#### Setting Accuracy:

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

**Repeat Accuracy** (constant voltage and temperature):  
±50ms

**Reset Time:** 0.1 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 150°F)

#### Compatibility:

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

#### Output Contacts:

DPDT 10A @ 240V AC; 8A @ 28V DC,  
1/2 HP @ 240V AC, 1/4HP @ 120V AC  
B300 & R300

#### Life:

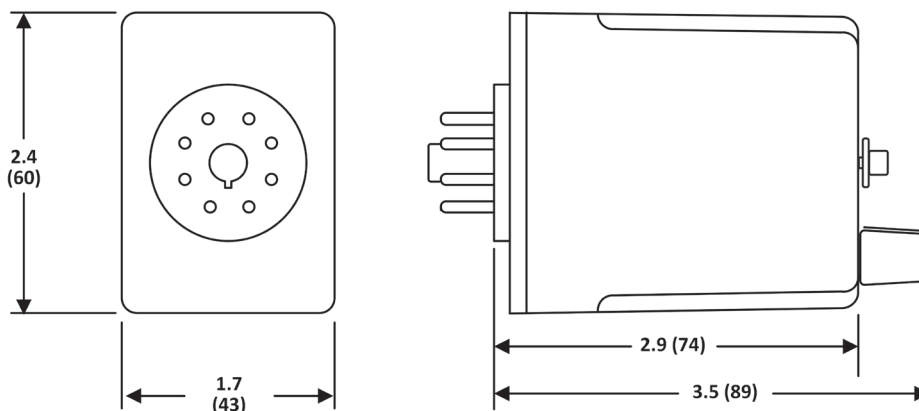
Mechanical: 2,000,000 operations  
Full Load: 100,000 operations

**IMPORTANT:** 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:



### DIMENSIONS



All Dimensions in Inches (Millimeters)