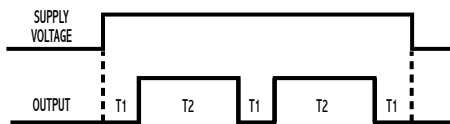


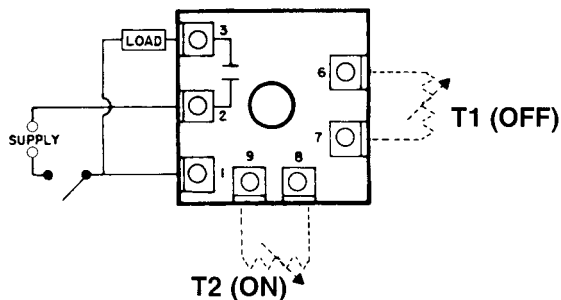
**OPERATION**

Application of voltage to the input of the timer initiates the OFF time. Upon completion of the OFF time, the load energizes and the ON time begins. Upon completion of the ON time, the load de-energizes and one cycle is completed. This OFF/ON cycling continues until voltage is removed from the input. The OFF/ON time periods are independently adjustable.

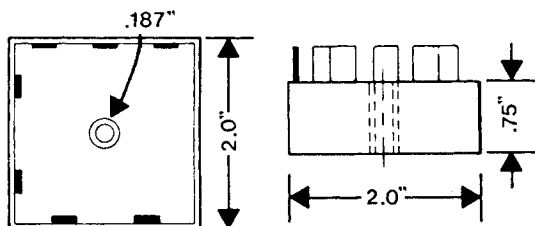


*Repeat Cycle OFF-Time  
First Solid-State Output*

**WIRING**



**DIMENSIONS (INCHES)**



**MODEL NUMBER**

|  |     |     |   |   |   |  |
|--|-----|-----|---|---|---|--|
| <b>MODEL NUMBER</b>  | TSF |     | A |   | C |  |
| <b>SUPPLY VOLTAGE</b>  |     |     |   |   |   |  |
| 24 VAC   |     | 24  |   |   |   |  |
| 120 VAC  |     | 120 |   |   |   |  |
| 240 VAC  |     | 240 |   |   |   |  |
| <b>TYPE OF OPERATION</b>   |     |     |   |   |   |  |
| Fixed  |     |     |   | F |   |  |
| External Resistor Adjustable;<br>See page 73 for resistor selection. |     |     |   | R |   |  |
| <b>DELAY PERIOD</b>  |     |     |   |   |   |  |
| See page 74 for standard ranges available                            |     |     |   |   |   |  |

Example: TSF-24-ARC-300—Repeat cycle, 24 VAC, external resistor adjustable from 3 to 300 seconds, UL Recognized.

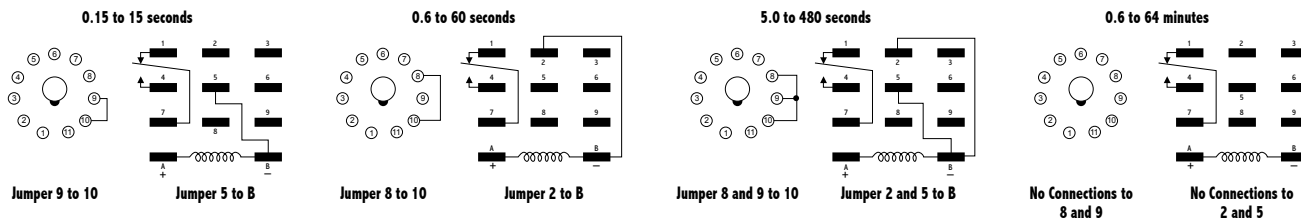
**SPECIFICATIONS**

|                           |   |                               |
|---------------------------|---|-------------------------------|
| <b>TIMING RANGES</b>      | Virtually unlimited.<br>See page 73 for standard ranges available.                            |                               |
| <b>OUTPUT RATING</b>      | Solid-state, SPST-N.O. 1 amp resistive;<br>1250 VA inrush, 125 VA run @ 120 VAC, inductive.   |                               |
| <b>TIMING TOLERANCES</b>  | Minimum Setting   | +0 – 20%                      |
|                           | Maximum Setting   | ±10%                          |
| <b>REPEATABILITY</b>      | 1% maximum; no first cycle effect   |                               |
| <b>RESET TIMES</b>        | Before Time Out   | 100 mSEC                      |
|                           | After Time Out  | 50 mSEC                       |
| <b>RECYCLE TIME</b>       | 40 mSEC   |                               |
| <b>SUPPLY VOLTAGE</b>     | 24, 120, or 240 VAC, 50/60 Hz; ±10%   |                               |
| <b>FALSE TRANSFER</b>     | No  |                               |
| <b>DUTY CYCLE</b>         | Continuous  |                               |
| <b>ENCLOSURE</b>          | Surface mounted; totally encapsulated with a high quality epoxy for environmental protection. |                               |
| <b>TEMPERATURE RATING</b> | Operate   | 32° to 131°F (0° to +55°C)    |
|                           | Storage   | -49° to 185°F (-45° to +85°C) |
| <b>TERMINATIONS</b>       | 1/4" quick disconnect terminals   |                               |
| <b>WEIGHT</b>             | NET: 1.28 oz Shipping: 1.6 oz.  |                               |

## TIMING RANGE SELECTION

**CAUTION: DO NOT PROGRAM WITH POWER ON! WIRE FOR ONE TIMING RANGE ONLY!**

4 different ranges can be obtained by either leaving 2 designated terminals unconnected or by connecting them to the appropriate terminals shown below. Because the Time Delay programming is the same regardless of the mode of operation only the wiring connections affecting the Time Delay are shown here.



## OPERATION—WIRE FOR ONE MODE ONLY!

**INTERVAL:** When voltage is applied to the input terminals, the relay energizes and the time delay begins. Upon completion of the delay period, the relay de-energizes. Reset during or after the delay period is accomplished by removal of the supply voltage.

**ON-DELAY:** The time delay begins when power is applied to the input. Upon completion of the delay period, the relay energizes. Reset during or after the delay period is accomplished by removal of the input voltage. The timer will not false transfer if supply voltage is removed prior to completion of the delay period.

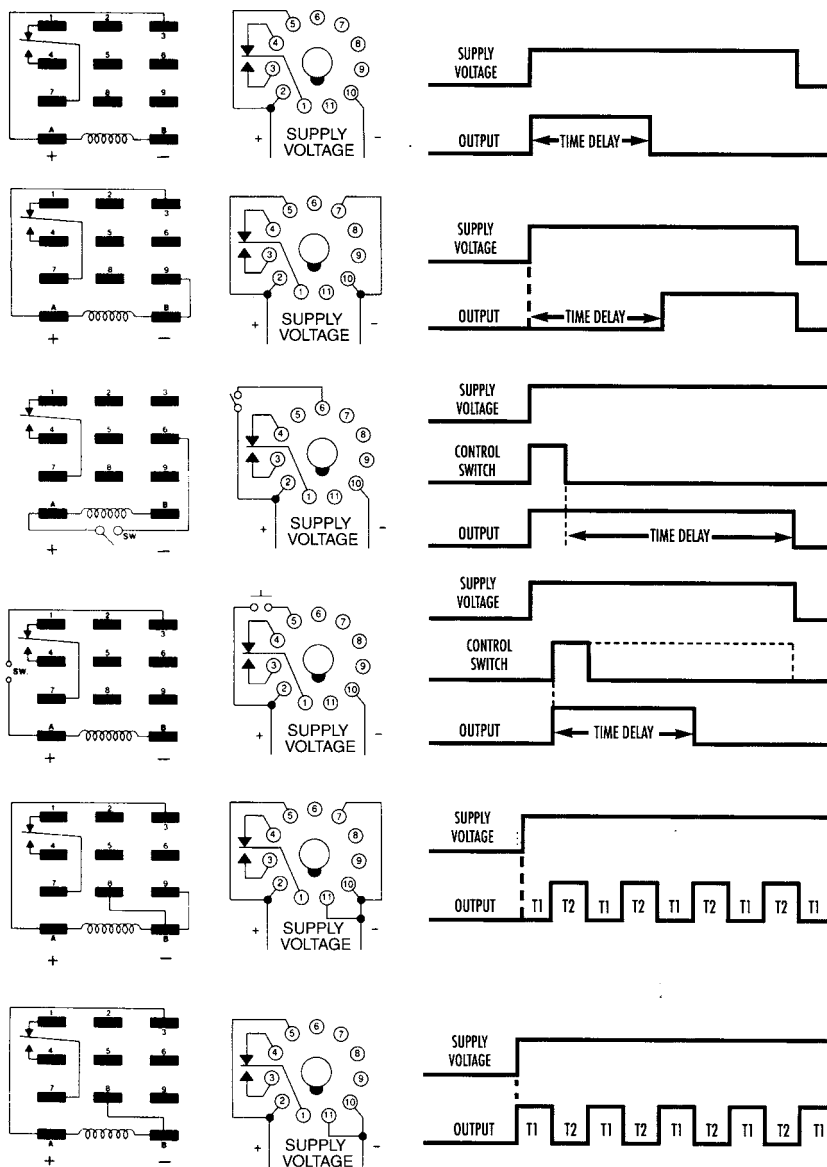
**OFF-DELAY:** Voltage is continuously applied to the input. An external isolated switch controls the timer. When closed, the relay energizes. Opening the switch initiates the delay period. Upon completion of the delay period, the relay de-energizes. If the control switch recloses during the delay period, the relay remains energized and the timer resets to zero.

**SINGLE-SHOT:** Voltage is continuously applied to the input. An external isolated switch controls the timer. When closed (momentary or maintained), the relay energizes and the delay period begins. Upon completion of the delay period, the relay de-energizes.

**FLASHER—OFF TIME FIRST:** When supply voltage is applied to the input, the OFF time begins. Upon completion of the OFF time, the relay energizes and the ON time begins. Upon completion of the ON time, the relay de-energized and one cycle is complete.

This OFF/ON cycling continues until supply voltage is removed from the input. The OFF time always equals the ON time.

**FLASHER—ON TIME FIRST:** When power is applied to the input, the relay energizes and ON time begins. Upon completion of the ON time, the relay de-energizes and the OFF time begins. Upon completion of the OFF time, the relay energizes and one cycle is complete. This ON/OFF cycling continues until supply voltage is removed from the input. The ON time always equals the off time.



### STANDARD DELAY RANGES AVAILABLE

The chart below shows the standard adjustable time delay ranges available. The part number suffix equals the maximum adjustable delay period of the timer. No letters following the suffix number indicates the delay period in seconds; an M indicates minutes; and an H indicates hours.

### STANDARD DELAY RANGE CHART

| PART NUMBER SUFFIX | MINIMUM SETTING | MAXIMUM SETTING |
|--------------------|-----------------|-----------------|
| 010                | 0.1 seconds     | 10 seconds      |
| 030                | 0.3 seconds     | 30 seconds      |
| 060                | 0.6 seconds     | 60 seconds      |
| 100                | 1 second        | 100 seconds     |
| 200                | 2 seconds       | 200 seconds     |
| 300                | 3 seconds       | 300 seconds     |
| 600                | 6 seconds       | 600 seconds     |
| 900                | 9 seconds       | 900 seconds     |
| 30M                | 18 seconds      | 30 minutes      |
| 60M                | 36 seconds      | 60 minutes      |
| 90M                | 54 seconds      | 90 minutes      |
| 2H                 | 1.2 Minutes     | 2 hours         |
| 4H                 | 2.4 Minutes     | 4 hours         |
| 8H                 | 4.8 Minutes     | 8 hours         |
| 12H                | 7.2 Minutes     | 12 hours        |
| 16H                | 9.6 Minutes     | 16 hours        |
| 20H                | 12 Minutes      | 20 hours        |
| 24H                | 14.4 Minutes    | 24 hours        |

Longer delays available upon request. Consult Factory

### EXTERNAL RESISTANCE SELECTION

On models specified as having the external resistor adjustability feature, the delay period is set by placing resistance across designated pins or terminals. One meg ohm resistance provides the maximum delay on all models. The minimum delay is obtained by jumping the terminals together.

The resistor or potentiometer chosen should be a 1/4 watt or larger.

To determine the resistor value required for a specific time delay, use the following formula:

$$R_{ext} = (T_{des}/T_{max}) \times 1000$$

$R_{ext}$  = Resistance value required to obtain  $T_{des}$  (in K ohms)

$T_{des}$  = Desired time delay

$T_{max}$  = Maximum delay period of the timer

Example: Model TDC-120-ARC-300; find the external resistance value required for a 240 second delay:

$$R_{ext} = \frac{240}{300} \times 1000 = 800 \text{ K ohms}$$

### “FIXED” DELAY OPTION

Most ATC Diversified timers are available with the delay period factory preset (“fixed”) for some specified duration. When this option is ordered, the part number should have an “F” in the Type of Operation designation: and the last digits should specify the desired time delay in seconds (S), minutes (M), or hours (H).

Example: TDC 120-AFA-30M—delay-on-operate, 120 Volts AC or DC, 8-pin octal plug-in package with a 30 minute fixed delay.

### OFF/ON DELAY TIMERS

Included in ATC Diversified’s broad line of timers are six (6) models that feature independent OFF/ON delay adjustments. They are TDF, TDH, TDI, TSF, and TSH. Notice in the ordering information section on each of their respective pages the timing range is specified by a three (3) digit suffix. This indicates that both the OFF and ON delay periods have the same timing ranges. Example: TDF-120-ALA-300: Both OFF and ON delay periods are independently adjustable from 3 to 300 seconds.

In the event that two (2) separate delay ranges would be required, the part number is modified to add a slash (/) followed by three (3) more digits. Since the OFF delay (TI) is first in all models, it is specified first in the part number. Example: TDF-120-ALA-12H/30M: the OFF delay is adjustable from 7.2 minutes to 12 hours and the ON delay is adjustable from 18 seconds to 30 minutes.

NOTE: Combinations of various “types of operation” are available: fixed/adjustable, knob/lock nut, etc. Consult factory.

### MODEL NUMBER

|                                |     |     |   |   |   |  |  |
|--------------------------------|-----|-----|---|---|---|--|--|
| <b>MODEL NUMBER</b>            | T   |     |   |   |   |  |  |
| <b>TIME DELAY</b>              |     |     |   |   |   |  |  |
| <b>SERIES</b>                  |     |     |   |   |   |  |  |
| Relay Output                   | D,U |     |   |   |   |  |  |
| Solid State Output             | S   |     |   |   |   |  |  |
| <b>MODE OF OPERATION</b>       |     |     |   |   |   |  |  |
| <b>SUPPLY VOLTAGE</b>          |     |     |   |   |   |  |  |
| 24 Volts                       |     | 24  |   |   |   |  |  |
| 120 Volts                      |     | 120 |   |   |   |  |  |
| 240 Volts                      |     | 240 |   |   |   |  |  |
| <b>TYPE OF VOLTAGE</b>         |     |     |   |   |   |  |  |
| AC                             |     |     | A |   |   |  |  |
| DC                             |     |     | D |   |   |  |  |
| <b>TYPE OF OPERATION</b>       |     |     |   |   |   |  |  |
| Knob Adjustment                |     |     |   | K |   |  |  |
| Lock Nut Adjustment            |     |     |   | L |   |  |  |
| Fixed (Factory Preset)         |     |     |   | F |   |  |  |
| External Resistor Adjustable   |     |     |   | R |   |  |  |
| <b>ENCLOSURE STYLE</b>         |     |     |   |   |   |  |  |
| 8 or 11-pin Round Plug-in      |     |     |   |   | A |  |  |
| Blade Plug-in                  |     |     |   |   | B |  |  |
| Potted Cube                    |     |     |   |   | C |  |  |
| <b>DELAY PERIOD</b>            |     |     |   |   |   |  |  |
| See Standard Delay Range Chart |     |     |   |   |   |  |  |

NOTE: Not all time delays are available with each option shown above. The specific options for each timer type are described on their respective pages.