

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference. **SPEC.**

# Dayton® Time Delay Relay

## Description

Dayton multi-function/multi-range time delay relay combines solid state digital timing circuits with an electromechanical relay for control of loads. Applications include pilot duty control and limited inductive circuits (motor loads). Relays are not to be used to directly switch tungsten lamps or other high inrush current loads. Relay is UL Recognized (E40944), CSA Certified (33434) and FCC approved.

## Specifications

### TIME DELAY

Adjustment ..... 3-digit switches  
 Range ..... 50 ms to 999 minutes  
 Repeatability ... ±.1%, ±.02 seconds over specified timing range  
 Accuracy ..... ±1% of set time, ±.08 seconds  
 Reset Time ..... 150 milliseconds max. by power interrupt

### INPUT

Operating Voltage... 120 Volts A.C. ±10%  
 Power On Response ..... 50 ms max.  
 Power Consumption ..... 2 VA max.  
 Frequency ..... 50/60 Hz.

### OUTPUT

Type ..... Relay D.P.D.T.  
 Rating ..... 10 amp. resistive at 120 volts A.C.  
 Life ..... Mechanical —  
 10,000,000 operation  
 Full load —  
 500,000 operations

### PROTECTION

Transient Voltage ..... Timer input protected by a 30 joule metal oxide varistor

Dielectric ..... 1500 volts RMS minimum  
 Breakdown at 60 Hz between input and contacts and between contacts

### ENVIRONMENTAL

Storage Temperature ..... -10°F to 160°F  
 Operating Temperature... -10°F to 130°F

### MECHANICAL

Termination ..... 11 pin plug  
 Mounting ..... Socket No. 6X156

## General Safety & Installation

**⚠ WARNING** *Disconnect power when connecting or disconnecting the time delay relay or its loads.*

**⚠ CAUTION** *Relays have a finite life. Normal failure modes include contact sticking and improper operation. Installations where property damage and/or personal injury might result due to the possibility of improper operation require further installation of backup systems.*

1. The time delay relay should be wired by qualified personnel according to the National Electrical Code (NEC) and local codes.
2. Do not connect input or contact terminals to voltages higher than those indicated on time delay relay.

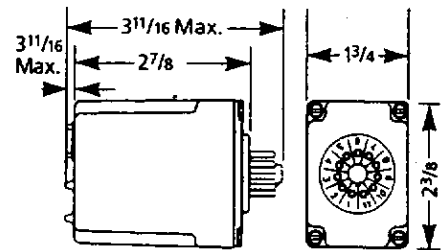


Figure 1

3. Protect the coil and load circuits with properly rated fuses.
4. Do not install in damp or moist locations.
5. When installing control switch, use shielded wire when running close to other wires. Control switch should be a low level pilot duty type. Control switch circuit must be isolated from ground, neutral, or any other voltage source. Maximum length should not exceed 10 ft.
6. Any application of this time delay relay should be designed to prevent bodily injury, or property damage, in the event of product failure or normal wearout of this product.
7. A lockable disconnecting means should be provided to disconnect relay and relay-driven devices from all ungrounded power supply. The disconnecting means should plainly indicate whether it is in open OFF closed ON position.

**Operation**

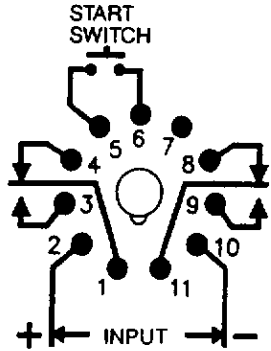


Figure 2

**RANGE SELECTION**

There are five different timing ranges from which to choose. The 3 digit switch selects the amount of time to each range.

SWITCH POSITION	TIME RANGES
1st	0.05 to 9.99 seconds
2nd	0.1 to 99.9 seconds
3rd	1 to 999 seconds
4th	0.1 to 99.9 minutes
5th	1 to 999 minutes

1. The input power should be disconnected when setting the time interval to insure proper operation.
2. Determine the time interval need for your application. (EX. 20.5 seconds)
3. Position the range select switch to the lowest range that meets your needs. (EX: 99.9)
4. Set the three digit time select switches to the desired time. (EX. 205).

**FUNCTION SELECTION**

There are five different functions from which to choose.

**FUNCTION SELECTIONS**

- Repeat . . . . . Repeat cycle (50% fixed duty cycle)
- 1-Shot . . . . . One-Shot
- D.O.B. . . . . Off Delay
- Interval . . . . . Interval
- D.O.M. . . . . On Delay

Read thru the operation and application sections of this manual to determine the proper function selection for your application. To insure proper operation, the input power should be disconnected before changing functions.

**On Delay:** Upon application of voltage to input terminals, time delay period begins. At end of time delay period, output contacts transfer, either connecting or disconnecting load. Reset is accomplished by removing input voltage.

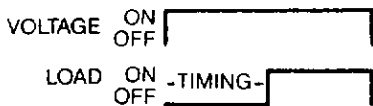


Figure 3

**Interval:** Upon application of voltage to input terminals, output contacts transfer and time delay period begins. At end of time delay period, contacts transfer back, either connecting or disconnecting load. Reset is accomplished by removing input voltage.

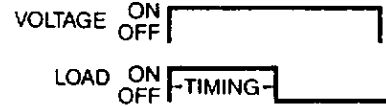


Figure 4

**Off Delay:** Voltage is to be applied to input terminals at all times that this product is in use. Upon closure of control switch, output contacts transfer. Once control switch is "opened," time delay period begins. Control switch closures prior to end of time delay period will immediately reset timer. At end of time delay period, output contacts will transfer back to their original positions, and timer is ready for a new cycle.

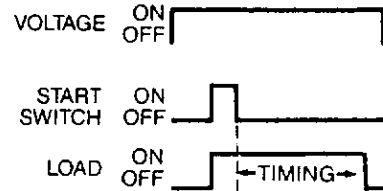


Figure 5

**Repeat Cycle:** Upon application of voltage to the input terminals, the "off" delay is initiated. At the end of the "off" preset time, the contacts transfer from the "off" to the "on" position and the "on" delay starts. At the end of the "on" preset time the contacts transfer from the "on" to the "off" position and a new cycle begins. The "on" and "off" cycles will continue to alternate until input voltage is removed.

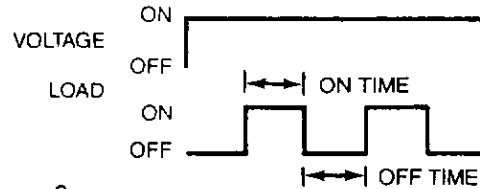


Figure 6

**One Shot:** Voltage is to be applied to input terminals at all times that this product is in use. Upon momentary or maintained closure of control switch, output contacts transfer and time delay period begins. At end of time delay period, output contacts will transfer back to their original positions, and timer is ready for a new cycle.

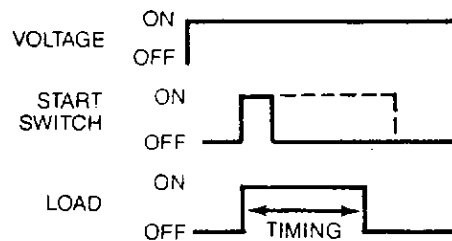


Figure 7

**Operation (Continued)****APPLICATIONS****ON DELAY**

Refer to Figure 8.

1. Voltage is applied to pins 2 and 10.
2. The common terminals, pins 1 and 11, are connected to pins 2 and 10.
3. Load B is activated through pins 4 and 8 (normally closed contacts).
4. After time delay period ends, output relay energizes and contacts transfer to pins 3 and 9, activating load A (normally open contacts).
5. Reset timer by removing voltage from pin 2 or 10.

**INTERVAL**

Refer to Figure 8.

1. Voltage is applied to pins 2 and 10.
2. The common terminals, pins 1 and 11, are connected to pins 2 and 10.
3. Output relay energizes and contacts transfer to pins 3 and 9, activating load A (normally open contacts).
4. Time delay period begins.
5. After time delay period ends, output relay de-energizes and contacts transfer back to pins 4 and 8, activating load B (normally closed contacts).
6. Reset timer by removing voltage from pin 2 or 10.

**OFF DELAY**

Refer to Figure 9.

1. Voltage is applied to pins 2 and 10.
2. The common terminals, pins 1 and 11, are connected to pins 2 and 10.
3. Load B is activated through pins 4 and 8 (normally closed contacts).
4. Once control switch is closed, output relay energizes and contacts transfer to pins 3 and 9, activating load A (normally open contacts).
5. When control switch is "opened", time delay period begins.
6. Any control switch closures prior to end of time delay period will reset timer.
7. At the end of time delay period, output relay de-energizes and contacts transfer back to pins 4 and 8, activating load B (normally closed).
8. Begin new cycle with control switch closure.

**REPEAT CYCLE**

Refer to Figure 8.

1. Voltage is applied to pins 2 and 10.
2. The common terminals, pins 1 and 11, are connected to pins 2 and 10.
3. Load B is activated through pins 4 and 8 (normally closed contacts).
4. After the "off" delay period ends, the output relay energizes and the contacts transfer to pins 3 and 9, activating load A (normally open contacts).
5. After the "on" delay period ends, the output relay is de-energized and load B (normally closed contacts) is again activated through pins 4 and 8 and another "off" period begins.
6. This "off/on" cycle continues uninterrupted until voltage is removed from pin 2 or 10.

**ONE-SHOT**

Refer to Figure 9.

1. Voltage is applied to pins 2 and 10.
2. The common terminals, pins 1 and 11, are connected to pins 2 and 10.
3. Load B is activated through pins 4 and 8 (normally closed contacts).
4. Upon momentary or maintained closure of control switch, output relay energizes and contacts transfer to pins 3 and 9, activating load A (normally open contacts), and time delay period begins.
5. At the end of the time delay period, output relay de-energizes and contacts transfer back to pins 4 and 8, activating load B (normally closed).
6. Begin new cycle with control switch initiation.

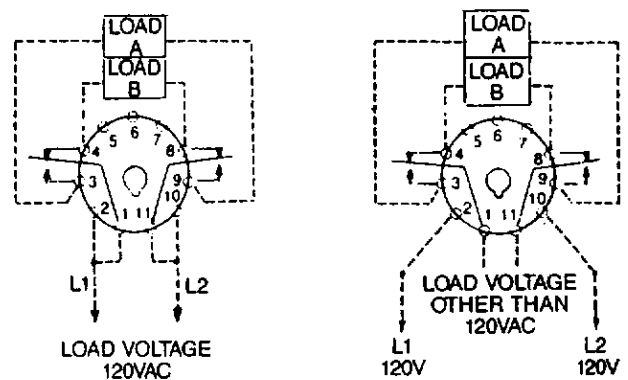


Figure 8

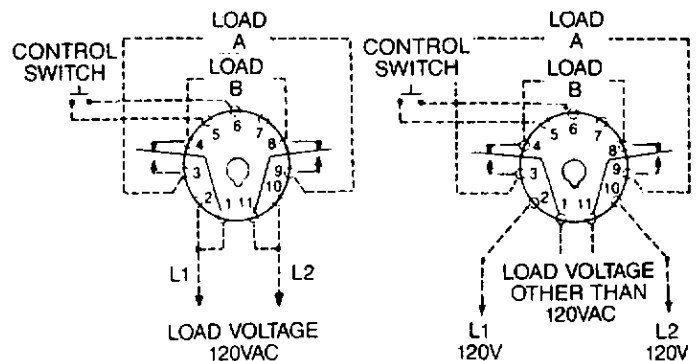


Figure 9

**Troubleshooting**

Should relay fail to operate, check all connections to relay and control circuits, verify that proper voltage connections are made, and check all fuses. For OFF delay or one-shot operation, be sure that control switch is connected to pins 5 and 6 of the socket.