



### FEATURES

- Small size and weight
- High-reliability design
- Hermetically sealed
- High transient immunity
- Long life
- Low-power consumption
- Adjustable Time Delays
- Reverse Polarity Protection

### PRINCIPLE TECHNICAL CHARACTERISTICS

<b>Seal:</b> Hermetically Tested per MIL-STD-883, Method 1014	1x10 <sup>-6</sup> atm, cm <sup>3</sup> /s max leakage
<b>Finish:</b>	Tin Lead Plate
<b>Terminals:</b> TDH 6061 (Tin Lead Plate) TDH 6060 (Gold Plate)	Solder-lug Plug-In
<b>Weight</b>	1.9 oz. MAX

**APPLICATION NOTE :**  
101

**APPLICABLE SOCKETS:**  
SO-1055-8690 (TDH-6060 ony)

### DESCRIPTION

The TDH-6060/61 Time Delay Relays have been designed with thick film hybrid microelectronics timing circuits and MIL-PRF-6106 relays, packaged in a hermetically sealed military style enclosure. The TDH-6060/61 series are designed to withstand severe environmental conditions encountered in military/aerospace applications. These relays are suited for use in power control, communication circuits and many other applications where power switching and high reliability are required over a wide temperature range.

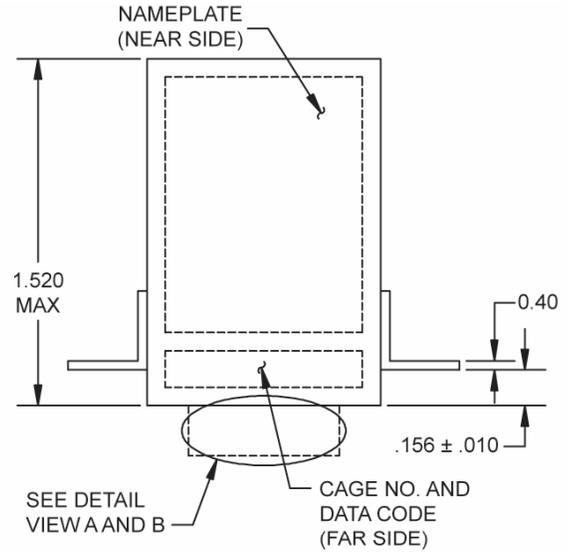
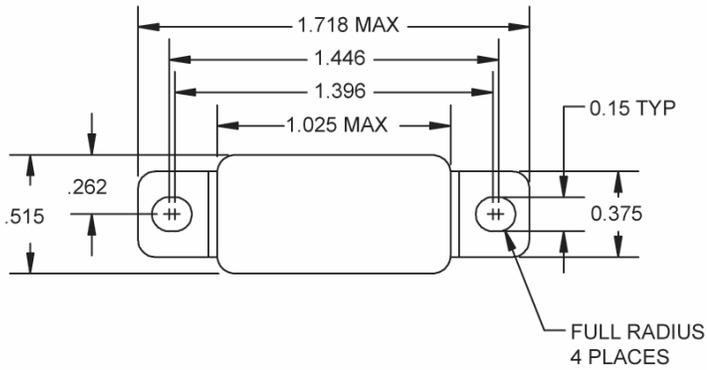
## ELECTRICAL SPECIFICATION

Input (Control) Parameters	
Timing:	
a. Operation, Time Delay on	Operate
b. Method	Adjustable Period
c. Range	0.1 to 600 Seconds [6]
d. Accuracy	±10% [1]
Recycle Time	50 ms, Max [5]
Operations: (X1-X2)	
a. Input & Control Voltage	20-30 Vdc
b. Operating Current	150 mA, Max @ +25° C
Transients:	
a. Positive, MIL-STD-704A, Figure9, Limit 1	+80 Volts Max
b. Spike, MIL-STD-704A, 0-10 µs	±600 Volts Max
c. Self-Generated	±50 Volts Max
d. Susceptibility	+80; -600 Volts Max
Electromagnetic Interference Per MIL-STD-461A	Class 1D [3]
Power Loss	500 µs [2]
Output (Load) Parameters	
Contact Form	2 PDT
Contact Rating:	
a. Resistive	10A
b. Inductive	8A
c. Motor	4A
d. Lamp	2A
Dielectric Strength	
a. @ Sea Level, 60 Hz	1,000 Vrms [4]
b. @ 80,000 ft., 60 Hz	350 Vrms
Insulation Resistance @ 500 Vdc	1,000 MΩ [4]

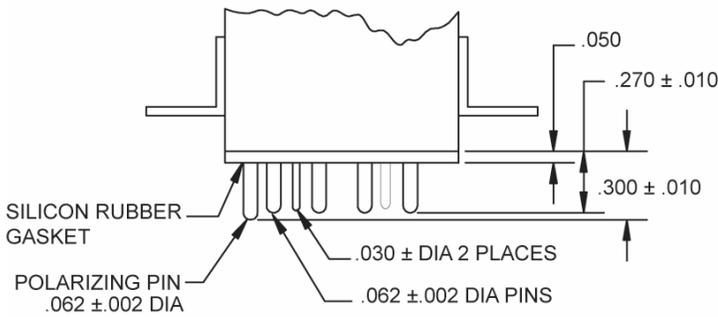
## GENERAL CHARACTERISTICS

Ambient Temperatures Range:	
a. Operating	-55 to +125° C
b. Non-Operating	-65 to +125° C
Vibration:	
a. Sinusoidal, 10-2000 Hz	20 G
b. Random: 50-2000 Hz, MIL-STD-810	0.2 G <sup>2</sup> /Hz
Shock @ 6 ± 1 MS, 1/2 Sine, 3 Axis	100 G
Acceleration, in any Axis	20 G
Life at Rated Resistive Load; Minimum	100,000 operations

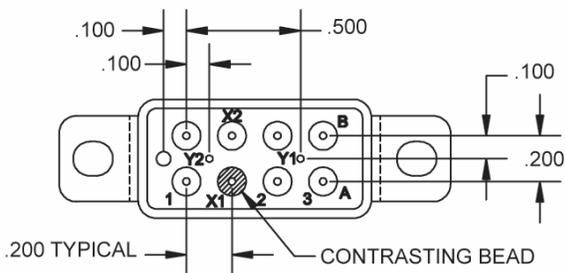
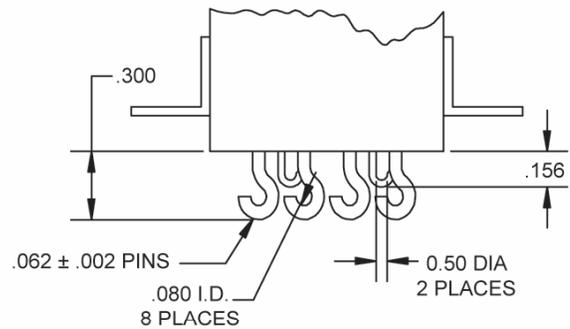
## MECHANICAL SPECIFICATIONS



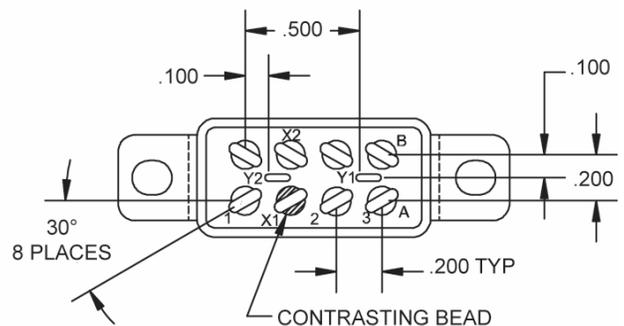
## PLUG-IN W/POLARIZING PIN



## HOOK PIN

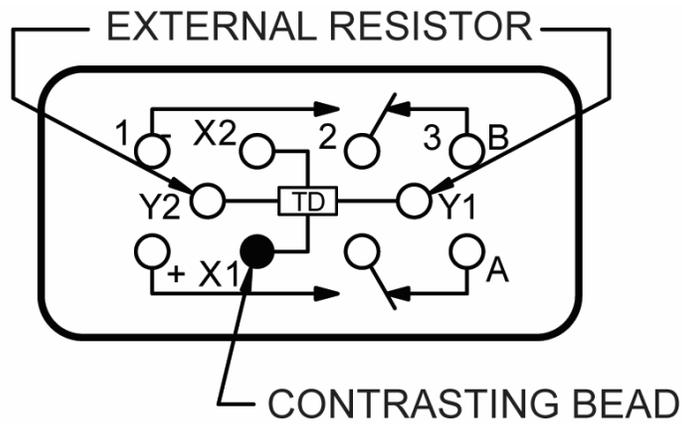


DETAIL VIEW A

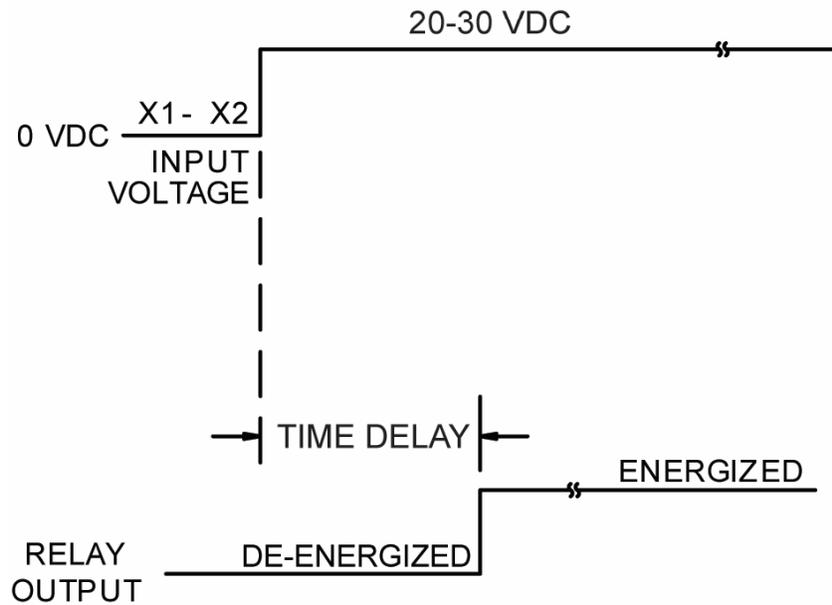


DETAIL VIEW B

### DIAGRAMS



### ADJUSTABLE TIME DELAY



### TIME DELAY ON OPERATE

## NUMBERING SYSTEM

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### Plug-in Terminal

TDH-6060 - 1001

1	2	3

### Solder Hook Terminal

TDH-6061 - 1001

1	2	3

1. Model Number.
2. Pin Style Number.
3. Additional Adjustable Timing Range: 50 milliseconds to 500 seconds. (See Note 6).

## NOTES

- [1] The accuracy specification applies for any combination of operating temperature and voltage. For units with a timing range less than 1 second, add  $\pm 10$  milliseconds to the  $\pm 10\%$  tolerance.
- [2] Transient and power loss specification are based on a maximum duty cycle of 1/50.
- [3] EMI test limits will not be exceeded during the timing interval or when continuously energized under steady state conditions, per paragraph 3.23, MIL-PRF-83726C.
- [4] Terminals X1, X2, Y1 and Y2 must be connected together during the test. Dielectric withstanding voltage and insulation resistance are measured at sea level between all mutually insulated terminals and between all terminals and case.
- [5] Recycle time is defined as the minimum time power must be removed from terminal X1 to assure that a new cycle can be completed within the specified timing tolerance.
- [6] A four digit number defines the time delay in seconds (or milliseconds). The first three digits are significant figures, used to define the upper limit of a DECADE RANGE. The fourth digit represents the number of zeros to follow the first three digits.

#### SPECIFY STANDARD DECADE RANGE

- 1001 = 0.1 to 1 second (100 to 1,000 milliseconds)
- 1002 = 1.0 to 10 seconds
- 5002 = 5 to 50 seconds
- 5003 = 50 to 500 seconds

An external resistor is used to obtain a specific time delay within the specified decade range. The formula below provides the proper resistance value to achieve the desired time delay:

$$R_{\text{ext}} = \left( \frac{T_1}{T_0} - 1 \right) 100,000 \text{ Ohms} \quad \text{Where: } R_{\text{ext}} = \text{External resistance value (Ohms)}$$

$T_1$  = Desired time in seconds  
 $T_0$  = Minimum time (low end of the decade range) in seconds.

As an example, if using a 5 to 50 second adjustable timer and a 30 second delay is desired, the calculation is:

$$R_{\text{ext}} = \left( \frac{30}{5} - 1 \right) 100,000 \text{ Ohms or } R_{\text{ext}} = 500 \text{ K Ohms}$$

Recommended resistors IAW MIL-R-55182 1/8 Watt, 1% (RNC60HXXXXFS).  
External resistor not supplied.