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**TD2 Series Time Delay Relay**

TD2 series time delay relays are available for delay on operate or delay on release operation. Either can be supplied as fixed or resistor adjustable types. Both military and commercial versions are offered.

These products consist of solid state timing circuits controlling our PCA-210 series relays, providing 2 Form C (DPDT) output contacts rated 10 amps.

The internal timing circuit uses an R/C controlled oscillator with a programmable digital pulse counter, gating a semiconductor switch to operate the relay. Timing is independent of whether the controlling voltage is a ramp or step function.

For the adjustable models the user specifies a one decade range in seconds, within which the required delay will be set. This range is programmed internally at the time of manufacture. The required delay is obtained by calculating the oscillator timing resistor as follows and connecting it externally to terminals 1D - 3D as below.

\[
R_{\text{EXT}} = \left( \frac{T_1}{T_0} - 1 \right) \times 100 \Omega
\]

**EXAMPLE**

Selected Range = 3-30 sec

Required Time = 15 sec

\[
R_{\text{EXT}} = \left( \frac{15}{3} - 1 \right) \times 100 \Omega = 400 \Omega
\]

### Timing Action and Terminal Wiring

**Delay On Operate:**

The time delay starts on the application of input voltage to X1-X2. The timing circuit energizes the relay at the end of the time delay period.

**Delay On Release:**

The input voltage is continuous to X1-X2. When the control voltage is applied to C1-X2 the timing circuit and the relay are both energized. The time delay relay starts when the control voltage is shut off.

---

**Terminal designations shown in the diagrams above are for reference only. They do not appear on the relay header.**
**Specifications**

**Timing Data**

<table>
<thead>
<tr>
<th>Timing Action</th>
<th>Delay on Operate or Delay on Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Delay, Fixed – M83726/28, /29 and Commercial 28C, 29C</td>
<td>Select from 0.1 to 600 sec for Commercial Models Select from 0.1 to 500 sec for Mil-Spec Models</td>
</tr>
<tr>
<td>Time Delay, Adjustable – M83726/30, /31 and Commercial 30C, 31C</td>
<td>Select one decade between 0.1 to 1.0 and 60 to 600 seconds</td>
</tr>
<tr>
<td>Timing Accuracy (note 1)</td>
<td>±10% of Nominal Value</td>
</tr>
<tr>
<td>Recycle Time (note 2)</td>
<td>50 ms, max., to next cycle.</td>
</tr>
<tr>
<td>Power Interrupts</td>
<td>Accuracy is not affected by power interruptions up to 1 ms spaced at least 10 ms apart.</td>
</tr>
</tbody>
</table>

**Input Data**

| Input Voltage | 28 Vdc nominal, range 20 - 32 Vdc |
| Duty Rating | Continuous |
| Input Current | 110 mA max @ 25°C |
| Control Voltage (applies only to Delay on Release type) | 20 - 32 Vdc |
| Control Current | 15 mA max (applies only to delay on release types) |

**Input Voltage Polarity Protection**

The timer will be inoperative during and undamaged by, reversal of the polarity of the input voltage.

**Output Data**

| Contact Form | 2 Form C (DPDT) |
| Contact Material | Silver Cadmium Oxide, Gold plated |

<table>
<thead>
<tr>
<th>Type of Load</th>
<th>Life (Min.)</th>
<th>Cycles</th>
<th>28 Vdc</th>
<th>115 Vac 400Hz</th>
<th>115/200 Vac – 3 phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistive</td>
<td>100 x 10³</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>2.5</td>
</tr>
<tr>
<td>Inductive</td>
<td>20 x 10³</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>2.5</td>
</tr>
<tr>
<td>Motor</td>
<td>100 x 10³</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Lamp</td>
<td>100 x 10³</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1.0</td>
</tr>
</tbody>
</table>

* 60 Hz loads are rated at 10 x 10³ cycles.

**Overload Current**

40 A@60 Hz.

**Rupture Current**

50 A@80 Hz, 400 Hz.

**Max. Contact Drop at 10A**

Initial 0.150 V; After Life 0.175 V

**Electrical Data**

| Electrostatic Discharge Withstand Voltage | 16,000V |
| Transients (note 3): | |
| Positive Transients | +80V |
| Self-generated Transients | ±50V, Max. |
| Spike Susceptibility | ±600V, 10 µs, Max. |
| Insulation Resistance (note 4) | 1,000 megohms at 500 Vdc, between each pin and case |
| Dielectric Strength (note 4) | 1,000 Vrms at 60 Hz at sea level, between case and all pins connected together |

**Environmental Data**

| Ambient Temperature Range, Operating | -55°C to +125°C |
| Altitude | 30,000 feet |
| Shock Resistance | 100 G’s, 6 ms. |
| Vibration Resistance, Sinusoidal | Z & Y Enclosure: 30 G’s, 33-3000 Hz; X & W Enclosure: 20 G’s, 33-3000 Hz. |

**Mechanical Data**

| Approximate Weight | 2.5 oz. (71g) Max. |

**NOTES**

1. The accuracy requirement applies to any combination of operating temperature and voltage. Add ±0.10 ms for timing less than one second.

2. Recycle time to assure that the next timing cycle will be completed. Units can be recycled during timing and after time-out:
   - Delay on operate models – Power must be OFF the input at least 10 ms.
   - Delay on release models – Power must be ON the control terminal at least 10 ms.

3. Transient specifications are based on a maximum duty cycle of 1/50.

4. All wired terminals must be connected together during this test. Dielectric withstand voltage and insulation resistance are measured between all mutually insulated wired terminals and between all these terminals and case.
Outline Dimensions

The standard terminal types and enclosures are illustrated below with dimensions expressed as inches ± 0.010 and (millimeters ± 0.25).

Terminals

All terminals on 0.200 (5.08) centers.

CODE "P"  
Socket Pins – Tin/Lead Plated

CODE "T"  
Circuit Board Pins – Tin/Lead Plated

CODE "S"  
Solder Hooks

Enclosures

All Enclosures have cupro-nickel cans bright acid tin/lead plated after assembly to terminal headers.

CODE "Z"  

CODE "Y"  

CODE "X"  

CODE "W"  

*Metric threads available. To specify use "M" in place of "W"
### TD2 Series Time Delay Relay (Continued)

#### Part Numbering System

##### Mil-Spec Types (Qualification Pending)

<table>
<thead>
<tr>
<th>Typical Mil-Spec Part Number</th>
<th>TD2 Series: TD2 = Time delay relay with 2 pole, 10A output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mil-Spec Model:</td>
<td></td>
</tr>
<tr>
<td>28 = M83726/28</td>
<td>(Fixed, Delay on Operate)</td>
</tr>
<tr>
<td>29 = M83726/29</td>
<td>(Fixed, Delay on Release)</td>
</tr>
<tr>
<td>30 = M83726/30</td>
<td>(Adjustable, Delay on Operate)</td>
</tr>
<tr>
<td>31 = M83726/31</td>
<td>(Adjustable, Delay on Release)</td>
</tr>
</tbody>
</table>

**Time Delay Range (Within 0.1 to 500 seconds):**

For /28 and /29 types (fixed types), the delay is expressed in milliseconds in a four-digit code. The first three digits are significant. The fourth is the number of zeros following the first three.

Example: 5002 is 50 seconds.

For /30 and /31 types (adjustable types), the delay decade range is expressed in milliseconds in a four-digit code representing the upper limit of the range. The first three digits are significant. The fourth is the number of zeros following the first three.

Example: 1001 is 1 second, so the range is 0.1 to 1 second.

**Terminals:**

- P = Socket Pin Terminals
- S = Solder Hook Terminals

**Note:** Mil-spec models have “Y” type enclosure.

#### Commercial Types

<table>
<thead>
<tr>
<th>Typical Commercial Part Number</th>
<th>TD2 Series: TD2 = Time delay relay with 2 pole, 10A output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mil-Spec Model:</td>
<td></td>
</tr>
<tr>
<td>28C = Fixed, Delay on Operate</td>
<td>(COTS version of M83726/28)</td>
</tr>
<tr>
<td>29C = Fixed, Delay on Release</td>
<td>(COTS version of M83726/29)</td>
</tr>
<tr>
<td>30C = Adjustable, Delay on Operate</td>
<td>(COTS version of M83726/30)</td>
</tr>
<tr>
<td>31C = Adjustable, Delay on Release</td>
<td>(COTS version of M83726/31)</td>
</tr>
</tbody>
</table>

**Time Delay Range (Within 0.1 to 600 seconds):**

For fixed types, the delay is expressed in milliseconds in a four-digit code. The first three digits are significant. The fourth is the number of zeros following the first three.

Example: 5002 is 50 seconds.

For adjustable types, the delay decade range is expressed in milliseconds in a four-digit code representing the upper limit of the range. The first three digits are significant. The fourth is the number of zeros following the first three.

Example: 1001 is 1 second, so the range is 0.1 to 1 second.

**Terminals:**

- P = Socket Pin Terminals
- S = Solder Hook Terminals
- T = Solder Pin Terminals

**Enclosure**

- W = Mounting Studs
- X = Horizontal Flange Mount
- Y = Raised Vertical Flange Mount
- Z = No Mount
CII Time Delay Relays

1600/1700 Series Delay On Operate Timers

Product Facts
- AC/DC input delay on operate timer offered in fixed (1600) and adjustable (1700) types
- Up to 10A loads
- CMOS digital design
- Hermetic package
- Built to MIL-R-83726 environmental standards
- Many customizing options
  - Extended timing ranges
  - Tighter timing tolerances
  - Header and mounting
  - 115Vac, 60 Hz. input types

Electrical Specifications

Timing Range
- 1600 series (fixed) — 50 ms to 600 s
- 1700 series (adjustable) — 50 ms to 240 s
- Tolerance — ±10% or 10 ms, whichever is greater

Input Voltage — 18 to 31Vdc, 105 to 125VVac, 400 Hz

Current Drain (at 25°C, 28Vdc) —
- AC Coils, 1A maximum
- DC Coils, 10A maximum
- AC or DC Coils, 4A contacts —
  - 1-pole — 100mA maximum
  - 2-pole — 150mA maximum
  - 3- and 4-pole — 200mA maximum

Contact Ratings
- DC Coils, 10A contacts —
  - 10A resistive @ 30Vdc
  - 5A inductive @ 30Vdc
  - 5A resistive @ 115 Vrms, 400 Hz
  - 3A inductive @ 115 Vrms, 400 Hz
- AC or DC Coils, 4A contacts —
  - 4A resistive @ 30Vdc
  - 1A inductive @ 30Vdc
  - 2A resistive @ 115 Vrms, 400 Hz
  - 1A inductive @ 115 Vrms, 400 Hz

Environmental Specifications

Temperature Range —
- -55°C to +85°C or -55°C to +125°C

Vibration — 20G’s, 10 to 2000 Hz

Shock — 50 Gs, 11 ± 1ms duration

Insulation Resistance — 1,000 megohms, min., at 500Vdc, all terminals to case

Dielectric Strength — 1,000Vrms, 60 Hz., at sea level, all terminals to case

Sealing — Hermetic, 1.3 in. (33.0mm) of mercury

Life — 100,000 operations, min.

Weight —
- 4A units — 4.5 oz (127.6g) max.
- 10A units — 8.5 oz (240g) max.

Specifications by Model Number — 4 Amp Contact Versions

<table>
<thead>
<tr>
<th>Fixed Timer Model Number</th>
<th>Adjustable Timer Model Number</th>
<th>Input Voltage</th>
<th>Temperature Range</th>
<th>Housing Length (Dim. “A”)</th>
<th>Contact Arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1601</td>
<td>1701</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>1.665 (42.06)</td>
<td>1 Form C (SPDT)</td>
</tr>
<tr>
<td>1602</td>
<td>1702</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>1.665 (42.06)</td>
<td>2 Form C (DPDT)</td>
</tr>
<tr>
<td>1603</td>
<td>1703</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>2.0 (50.8)</td>
<td>3 Form C (DPDT)</td>
</tr>
<tr>
<td>1604</td>
<td>1704</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>2.0 (50.8)</td>
<td>4 Form C (DPDT)</td>
</tr>
<tr>
<td>1621</td>
<td>1721</td>
<td>DC</td>
<td>-55°C to +125°C</td>
<td>1.665 (42.06)</td>
<td>1 Form C (SPDT)</td>
</tr>
<tr>
<td>1622</td>
<td>1722</td>
<td>DC</td>
<td>-55°C to +125°C</td>
<td>1.665 (42.06)</td>
<td>2 Form C (DPDT)</td>
</tr>
<tr>
<td>1623</td>
<td>1723</td>
<td>DC</td>
<td>-55°C to +125°C</td>
<td>2.0 (50.8)</td>
<td>3 Form C (DPDT)</td>
</tr>
<tr>
<td>1624</td>
<td>1724</td>
<td>DC</td>
<td>-55°C to +125°C</td>
<td>2.0 (50.8)</td>
<td>4 Form C (DPDT)</td>
</tr>
<tr>
<td>1651</td>
<td>1751</td>
<td>AC</td>
<td>-55°C to +85°C</td>
<td>2.0 (50.8)</td>
<td>1 Form C (SPDT)</td>
</tr>
<tr>
<td>1652</td>
<td>1752</td>
<td>AC</td>
<td>-55°C to +85°C</td>
<td>2.0 (50.8)</td>
<td>2 Form C (DPDT)</td>
</tr>
<tr>
<td>1653</td>
<td>1753</td>
<td>AC</td>
<td>-55°C to +85°C</td>
<td>2.375 (60.33)</td>
<td>3 Form C (DPDT)</td>
</tr>
<tr>
<td>1654</td>
<td>1754</td>
<td>AC</td>
<td>-55°C to +85°C</td>
<td>2.375 (60.33)</td>
<td>4 Form C (DPDT)</td>
</tr>
<tr>
<td>1671</td>
<td>1771</td>
<td>AC</td>
<td>-55°C to +125°C</td>
<td>2.0 (50.8)</td>
<td>1 Form C (SPDT)</td>
</tr>
<tr>
<td>1672</td>
<td>1772</td>
<td>AC</td>
<td>-55°C to +125°C</td>
<td>2.0 (50.8)</td>
<td>2 Form C (DPDT)</td>
</tr>
<tr>
<td>1673</td>
<td>1773</td>
<td>AC</td>
<td>-55°C to +125°C</td>
<td>2.375 (60.33)</td>
<td>3 Form C (DPDT)</td>
</tr>
<tr>
<td>1674</td>
<td>1774</td>
<td>AC</td>
<td>-55°C to +125°C</td>
<td>2.375 (60.33)</td>
<td>4 Form C (DPDT)</td>
</tr>
</tbody>
</table>

Specifications by Model Number — 10 Amp Contact Versions

<table>
<thead>
<tr>
<th>Fixed Timer Model Number</th>
<th>Adjustable Timer Model Number</th>
<th>Input Voltage</th>
<th>Temperature Range</th>
<th>Housing Length (Dim. “A”)</th>
<th>Contact Arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1610</td>
<td>1710</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>2.419 (61.44)</td>
<td>1 Form C (SPDT)</td>
</tr>
<tr>
<td>1620</td>
<td>1720</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>2.419 (61.44)</td>
<td>2 Form C (DPDT)</td>
</tr>
</tbody>
</table>

Adjustable Timing Formula (1700 types)

The resistance required to obtain timing within this range is determined by using the formula:

\[ R_x = 400K \times (T_{\text{max}}) - 40K \],

where \( R_x \) = External Resistance in Ohms, \( T \) = Desired Time in Seconds, and \( T_{\text{max}} \) = Maximum Time (Code).

A high quality deposited carbon ±1%, 0.1W (min.) resistor is recommended for external resistance.

Part Numbering System

Typical Part Number 1722 –C – 1102

Model Number:

Four digit code from table above.

Mounting (see outline dimension drawings):
- A = Studs on bottom
- B = Studs on top
- C = Studs on side

Timing Code:

Four-digit code for any value between 50ms and 600s for fixed (1600) timers, and 50ms and 240s for adjustable (1700) timers.

The timing code consists of four digits and gives the time in ms. The first three digits are the significant figures and the last digit is the number of zeros following the significant figures: thus 50 ms would be coded 0500, 1.1 s would read 1101, and 1 m (60 s) would be 6002.

Adjustable timers cover one decade, e.g., 62 ms to 620 ms. The upper decade limit is \( T_{\text{max}} \). in the timing formula and is the the value defined by the timing code in the part number.

A typical part number for an adjustable timer would be 1722–C–1102. This is a DC unit in the -55°C to +125°C temperature range with a 2 form C (DPDT) contact arrangement in style “C” mounting, with a maximum time delay of 11s.
1600/1700 Series Delay On Operate Timers (Continued)

Outline Dimensions

10 Amp Units

4 Amp Units

Wiring Diagrams

1600 Series (Fixed)

1 Form C

2 Form C

3 Form C

4 Form C

1700 Series (Adjustable)

1 Form C

2 Form C

3 Form C

4 Form C
2400 Series Delay On Operate Timer, Fixed Timing, Relay Output

Product Facts
- DC input fixed delay on operate timer
- 2 Form C (DPDT), 2A output
- CMOS digital design
- Reverse polarity protection
- Hermetic package
- Built to MIL-R-83726 environmental
- Customizing options include
  - Tighter timing tolerances
  - Header and mounting
  - Different input voltages

Electrical Specifications
- Timing Range — 50 ms to 600 s
- Tolerance — ±10% or 10 ms, whichever is greater
- Recycle Time — 10 ms
- Recovery Time — 20 ms
- Input Data —
  - Input Voltage — 18 to 31Vdc
  - Current Drain — 85mA @ 31Vdc, 25°C
- Output Data —
  - Output Form — 2 Form C (DPDT)
  - Output Rating — 2A resistive at 30Vdc; 125mA resistive at 115Vac, 400 Hz
- Transient Protection — 80Vdc for 50ms

Environmental Specifications
- Temperature Range — -55°C to +85°C or -55°C to +125°C
- Vibration — 20 G’s, 10 - 2,000 Hz
- Shock — 50 G’s, 11 ± 1ms duration
- Insulation Resistance — 1,000 megohms, min., at 500Vdc, all terminals to case
- Dielectric Strength — 500Vrms, 60 Hz, at sea level, all terminals to case
- Sealing — Hermetic, 1.3 in. (33.0mm) of mercury
- Life — 100,000 operations, min.
- Weight — 1.2 oz (30g) max.

Part Numbering System

<table>
<thead>
<tr>
<th>Typical Part Number</th>
<th>2401</th>
<th>2402</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Number</td>
<td>-1</td>
<td>-2</td>
</tr>
<tr>
<td>-55°C to +85°C</td>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>-55°C to +125°C</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Header Style (see Header Options drawings):
- 1 = Hook terminals
- 2 = Straight terminals, short
- 3 = Straight terminals, long

Mounting (see outline dimension drawings):
- A = Plain case
- B = Bracket
- C = Studs on side
- E = Bracket

Timing Code:
Four-digit code for any value between 50ms and 600s.
The timing code consists of four digits and gives the time in ms. The first three digits are the significant figures and the last digit is the number of zeros following the significant figures; thus 50 ms would be coded 0500, 1.1 s would read 1101, and 1 m (60 s) would be 6002.

A typical part number would be 2401-1A-1102. This fixed timer operates at -55°C to +85°C, has hook terminals, style “A” mounting, and a time delay of 11s.

Timing Diagram

Outline Dimensions

Wiring Diagram

Header Options

Plug-in sockets are available
## CII Time Delay Relays

### 5600/5700 Series Delay On Release Timers

#### Product Facts
- DC input delay on release timer offered in fixed (5600) and adjustable (5700) types
- Up to 10A loads
- Reverse polarity protection
- CMOS digital design
- Built to MIL-R-83726 environmental standards
- Many customizing options
  - Extended timing ranges
  - Tighter timing tolerances
  - Header and mounting options
  - Different Aux. voltages
  - Different control line voltages
- Input either 115Vac, 60 Hz or 400 Hz.

#### Electrical Specifications

**Timing Range**
- 5600 series (fixed) — 50 ms to 600 s
- 5700 series (adjustable) — 50 ms to 240 s

**Tolerance** — ±10% or ±15ms, whichever is less

**Recycle Time** — 10 ms

**Reset Time** — 20 ms

**Operate Time (Max.)** — 50 ms

**Reset Time** — 20 ms

**Control Line**
- Minimum duration of 20ms to initiate the delay circuit.

**Ground common to aux. power line.**

**Control Voltage**
- Minimum 10Vdc must be applied for a minimum duration of 20ms to energize output and initiate the timing circuit.

**Input Voltage**
- Input either 115Vac, 60 Hz or 230Vac, 50 Hz.

**InputLineEnergized**
- 10A resistive @ 30Vdc
  - 5A inductive @ 30Vdc
  - 5A resistive @ 115 Vrms, 400 Hz
  - 3A inductive @ 115 Vrms, 400 Hz

**InputLineDe-energized**
- 10A resistive @ 115 Vrms, 400 Hz
  - 3A inductive @ 115 Vrms, 400 Hz

**Contact Ratings**
- 2A contacts
  - 2A resistive @ 30Vdc
  - 1A inductive @ 30Vdc
  - 1A resistive @ 115 Vrms, 400 Hz
  - 0.3A inductive @ 115 Vrms, 400 Hz

- 5A contacts
  - 1A resistive @ 115 Vrms, 400 Hz
  - 3A inductive @ 115 Vrms, 400 Hz
  - 5A inductive @ 30Vdc

- 2A resistive @ 30Vdc
  - 5A resistive @ 115 Vrms, 400 Hz

**Contact Arrangement**
- 1-pole, 2 & 5A models
  - 2-pole, 2 & 5A models
  - 2-pole, 10A models

**Environmental Specifications**

**Temperature Range**
- -55°C to +85°C or -55°C to +125°C

**Vibration**
- 50 G’s, 10 - 2,000 Hz

**Shock**
- 20 G’s, 11 ± 1ms duration

**Insulation Resistance**
- 1,000 megohms, min., at 500Vdc

**Dielectric Strength**
- 1,000Vrms, 60 Hz., at sea level, all terminals to case

**Sealing**
- Hermetic, 1.3 in. (33.0mm) of mercury

**Life** — 100,000 operations, min. (2A and 5A models); 50,000 operations, min. (10A models)

**Weight** — 8.5 oz (240g) max.

#### Adjustable Timing Formula

For 4700 types:

The resistance required to obtain timing within this range is determined by using the formula:

$$ Rx = 400K \left( \frac{T}{T_{max}} \right) + 40K, \text{ where } R_x = \text{External Resistance in Ohms}, T = \text{Desired Time in Seconds}, \text{ and } T_{max} = \text{Maximum Time (Code)}. $$

A high quality deposited carbon ±1%, 0.1W (min.) resistor is recommended for external resistance.

### Specifications by Model Number

<table>
<thead>
<tr>
<th>Fixed Timer Model Number</th>
<th>Adjustable Timer Model Number</th>
<th>Input Voltage</th>
<th>Temperature Range</th>
<th>Contact Rating</th>
<th>Contact Arrangement</th>
<th>Available Enclosures</th>
</tr>
</thead>
<tbody>
<tr>
<td>5601</td>
<td>5701</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>2 Amp</td>
<td>1 Form C (SPDT)</td>
<td>A - C - D - E</td>
</tr>
<tr>
<td>5602</td>
<td>5702</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>2 Amp</td>
<td>2 Form C (DPDT)</td>
<td>A - C - D - E</td>
</tr>
<tr>
<td>5605</td>
<td>5705</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>5 Amp</td>
<td>1 Form C (SPDT)</td>
<td>D - E</td>
</tr>
<tr>
<td>5606</td>
<td>5706</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>5 Amp</td>
<td>2 Form C (DPDT)</td>
<td>D - E</td>
</tr>
<tr>
<td>5610</td>
<td>5710</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>10 Amp</td>
<td>1 Form C (SPDT)</td>
<td>D - E</td>
</tr>
<tr>
<td>5611</td>
<td>5711</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>10 Amp</td>
<td>2 Form C (DPDT)</td>
<td>D - E</td>
</tr>
<tr>
<td>5621</td>
<td>5721</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>2 Amp</td>
<td>1 Form C (SPDT)</td>
<td>A - C - D - E</td>
</tr>
<tr>
<td>5622</td>
<td>5722</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>2 Amp</td>
<td>2 Form C (DPDT)</td>
<td>A - C - D - E</td>
</tr>
<tr>
<td>5625</td>
<td>5725</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>5 Amp</td>
<td>1 Form C (SPDT)</td>
<td>D - E</td>
</tr>
<tr>
<td>5626</td>
<td>5726</td>
<td>DC</td>
<td>-55°C to +85°C</td>
<td>5 Amp</td>
<td>2 Form C (DPDT)</td>
<td>D - E</td>
</tr>
</tbody>
</table>

**See next page for complete ordering information and outline dimensions for the available enclosures.**

### Timing Diagram

**INPUT** OFF

**CONTROL** OFF

**OUTPUT** OFF

Apply input power. Upon application of control power, the output will energize. Remove control power and initiate delay period.

### Special Notes

10Vdc minimum must be applied for a minimum duration of 20ms to energize output and initiate timing.

Units rated 10A have a minimum time delay of 100ms.
5600/5700 Series Delay On Release Timers (Continued)

Part Numbering System

<table>
<thead>
<tr>
<th>Typical Part Number</th>
<th>5722</th>
<th>-C</th>
<th>-1102</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Number:</td>
<td>Four digit code from table on the previous page.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting (see outline dimension drawings):</td>
<td>C = Studs on side of 2.5 in. tall case</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D = Studs on bottom of 1.812 in. tall case</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E = Bracket on side of 1.812 in. tall case</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timing Code:</td>
<td>Four-digit code for any value between 50ms and 600s for fixed (5600) timers and between 50ms and 240s for adjustable (5700) timers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The timing code consists of four digits and gives the time in ms. The first three digits are the significant figures and the last digit is the number of zeros following the significant figures; thus 50 ms would be coded 0500, 1 s would read 1101, and 1 m (60 s) would be 6002.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adjustable timers cover one decade, e.g., 62 ms to 620 ms. The upper decade limit is T_max, in the timing formula and is the the value defined by the timing code in the part number.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: Units with 10A contacts have a minimum time delay of 100ms.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A typical part number for an adjustable timer would be 5722–C–1102. This DC unit is in the -55°C to +125°C temperature range with a 2 amp contacts in a 2 form C (DPDT) arrangement, enclosed in case with a style “C” mounting, with a maximum time delay of 11s.

Outline Dimensions

Wiring Diagrams

5600 Series (Fixed)  
1 Form C  
2 Form C

5700 Series (Adjustable)  
1 Form C  
2 Form C
1800/1900 Series Delay On Operate Digital Timing Modules

Product Facts
- DC input delay on operate timer offered in fixed (1800) and adjustable (1900) types
- 300mA output
- CMOS digital design
- Reverse polarity protection
- Hermetic package
- Built to MIL-R-83726 environments
- Customizing options include:
  - Tighter timing tolerances
  - Header and mounting

Electrical Specifications
Timing Range — 1800 series (fixed) — 50 ms to 600 s
1900 series (adjustable) — 50 ms to 240 s
Tolerance — ±10% or 10 ms, whichever is greater
Repeatability — ±0.1%
Recycle Time — 10 ms
Recovery Time — 20 ms
Input Data —
  - Input Voltage — 18 to 31Vdc
  - Current Drain (at 25°C, 28Vdc) — 10mA, plus load current
Output Data —
  - Output Form — 1 Form A (SPST-NO) solid state switch closure to ground
  - Output Rating — 300mA @ 25°C, 100mA @ 125°C
Minimum Load — 10mA
Saturation Voltage — 2.5Vdc, max.
Leakage — 1µA @ 25°C, 10µA @ 125°C

Environmental Specifications
Temperature Range —
  - -55°C to +85°C or -55°C to +125°C
Vibration — 20 G’s, 10 - 2,000 Hz
Shock — 50 G’s, 11 ± 1 ms duration
Insulation Resistance — 1,000 megohms, min., at 500Vdc, all terminals to case
Dielectric Strength — 500Vrms, 60 Hz, at sea level, all terminals to case
Sealing — Hermetic, 1.3 in. (33.0mm) of mercury
Life — 100,000 operations, min.
Weight — 1 oz (28.3g) max

CII 1800/1900 series delay on operate timer modules combine solid state timing circuits with solid state switch outputs in robust hermetically sealed enclosures. The 1800 types are fixed timers, while the 1900 models are adjustable via an external resistor. The 1 Form A (SPST-NO) switch is rated 300mA.

Adjustable Timing Formula (1900 types)
The resistance required to obtain timing within this range is determined by using the formula:

\[ Rx = 400K \times \left( \frac{T_{\text{Max.}}}{T} \right) - 40K, \]

where

\[ Rx = \text{External Resistance in Ohms}, \ T = \text{Desired Time in Seconds}, \ \text{and} \ T_{\text{Max.}} = \text{Maximum Time (Code)}. \]

A high quality deposited carbon ±1%, 0.1W (min.) resistor is recommended for external resistance.

Part Numbering System
Typical Part Number

<table>
<thead>
<tr>
<th>Model Number</th>
<th>1811</th>
<th>-1</th>
<th>A</th>
<th>-1002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>-1</td>
<td>A</td>
<td>-1002</td>
<td></td>
</tr>
</tbody>
</table>

Timing Code:
Four-digit code for any value between 50ms and 600s for fixed (1800) timers, and 50ms and 240s for adjustable (1900) timers.
The timing code consists of four digits and gives the time in ms. The first three digits are the significant figures and the last digit is the number of zeros following the significant figures; thus 50 ms would be coded 050, 1.1 s would read 1101, and 1 ms (600 s) would be 6002.
Adjustable timers cover one decade, e.g., 62 ms to 620 ms. The upper decade limit is Tmax in the timing formula and is the value defined by the timing code in the part number.

Timing Code:
A typical part number would be 1811-1A-1002. This fixed timing module operates at -55°C to +85°C, has hook terminals, style "A" mounting, and a time delay of 10s.

Outline Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>1800 Series (Fixed)</th>
<th>1900 Series (Adjustable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>802</td>
<td>22.68</td>
<td>1.062</td>
</tr>
<tr>
<td>809 MAX</td>
<td>20.55</td>
<td>120 DIA</td>
</tr>
<tr>
<td>.040 MAX</td>
<td>10.31</td>
<td>,.187 MAX</td>
</tr>
<tr>
<td>.030 DIA</td>
<td>.762</td>
<td>.1002</td>
</tr>
</tbody>
</table>

Wiring Diagrams

<table>
<thead>
<tr>
<th>Wiring Diagram</th>
<th>TIMING RESISTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800 Series (Fixed)</td>
<td>BLUE BEAD</td>
</tr>
<tr>
<td>1900 Series (Adjustable)</td>
<td>BLUE BEAD</td>
</tr>
</tbody>
</table>

Header Options

<table>
<thead>
<tr>
<th>Header Option</th>
<th>188 TYP</th>
<th>.030 DIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(4.77)</td>
<td>(4.77)</td>
</tr>
</tbody>
</table>

Header Options 1

<table>
<thead>
<tr>
<th>Header Option 1</th>
<th>TERMINAL SPACING IS 0.2 in [5.08]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>#4-40 STUDS</td>
</tr>
</tbody>
</table>

Header Options 2

<table>
<thead>
<tr>
<th>Header Option 2</th>
<th>.188 TYP</th>
</tr>
</thead>
<tbody>
<tr>
<td>.030 DIA</td>
<td>(4.77)</td>
</tr>
</tbody>
</table>

www.tycoelectronics.com
CII Time Delay Relays

6001 Series Delay On Operate Digital Timing Module

Product Facts
- Fixed delay on operate timer
- 300mA output
- CMOS digital design
- Voltage surge protection
- Qualified to MIL-R-83726/13

Electrical Specifications

Timing Range — 50 ms to 600 s.
Timing Accuracy — ±10% of nominal timing under all conditions of input voltage and environmental extremes

Recycle Characteristics —
Before Time Out — A power interruption occurring after the start but before completion of the timing cycle shall be for a duration of 0.5% of the nominal time delay or 10ms, whichever is greater, to ensure a loss in timing of no greater than 10%
After Time Out — A power interruption of 0.5% of the nominal time delay or 10ms, whichever is greater, will initiate a new timing cycle with a loss in timing of no greater than 5%

Input Data —
Input Voltage — 28Vdc, nominal; range 18 to 31Vdc
Current Drain (at 25°C, 28Vdc) — 10mA (max.), plus load current
Reverse Polarity Protection — The timer will not be damaged or operate when input voltage polarity is reversed

Output Data —
Configuration — 1 Form A (SPST-NO) solid state switch closure to ground
Load Ratings —
Resistive — 300mA @ +25°C, derated to 100mA @ +125°C
Inductive — Three MIL-R-5757/9 relays (any relay with 26.5Vdc coil)
Lamp Load — Two MS25237-327 lamps per MIL-L-6363
Load Suppression — Suppression for inductive loads for output protection is provided within the unit
Voltage Drop — 2.5Vdc, max. @ -55°C and +25°C; 2.0 Vdc, max. @ +125°C
Leakage Current — 1µA, max. @ +25°C, 10µA, max. @ +125°C

Insulation Resistance — 1,000 megohms, min., @ 500Vdc, measured between all terminals tied together to the case
Dielectric Strength — 500Vrms, 60 Hz, at sea level, measured between all terminals tied together to the case

Transients —
Voltage Surge — Per MIL-STD-704A, figure 9, limit 1, for category B equipment
Self-generated Spikes — ±10V

Environmental Specifications

Temperature Range — -55°C to +125°C
Altitude — 80,000 ft.
Shock — 150 G’s, 11 ± 1ms half-sine wave
Vibration (sinusoidal) — 10 -80 Hz. at0.06 inchDA; 80 - 3,000Hz. at20 G’s
Sealing — MIL-STD-202, method 112, condition C
Materials:
Cover — Nickel
Header — Kovar® Alloy
Pins — Kovar® Alloy, gold plated
Marking — Per MIL-R-83726
Weight — 0.42 oz (12g) max.

Part Numbering System

Typical Part Number

<table>
<thead>
<tr>
<th>Model Number</th>
<th>6001 –6002 C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timing Code</td>
<td>6001 = Fixed timer, -55°C to +125°C</td>
</tr>
<tr>
<td>OptionalSuffix:</td>
<td>C = Commercial version equivalent to M83726/13</td>
</tr>
</tbody>
</table>

Timing Diagram

A typical part number would be 6001–6002C. This solid state output timing module has a time delay of 60s at 28Vdc and is the commercial equivalent to M83726/13.

Outline Dimensions

Special Notes:
- Load is connected between B+ and terminal designated. Delay begins upon application of power to terminals (B+ and B–).
- Always consult latest military specification for changes and additional information.

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4600/4700 Series Interval Timers

CII 4600/4700 series interval timers combine solid state timing circuits with electromechanical output relays in robust hermetically sealed enclosures. The 4600 types are fixed timers, while the 4700 models are adjustable via an external resistor. Numerous output options include 4A rated contacts in 1, 2 and 4 form C (SPDT, DPDT and 4PDT) arrangements and 10A rated contacts in 1-2 form C (SPDT-DPDT) arrangements.

Specifications by Model Number – 4 Amp Contact Versions

<table>
<thead>
<tr>
<th>Fixed Timer Model Number</th>
<th>Adjustable Timer Model Number</th>
<th>Input Voltage</th>
<th>Temperature Range</th>
<th>Contact Rating</th>
<th>Contact Arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td>4610</td>
<td>4710</td>
<td>DC</td>
<td>-55°C to +125°C</td>
<td>10 Amp</td>
<td>1 Form C (SPDT)</td>
</tr>
<tr>
<td>4611</td>
<td>4711</td>
<td>DC</td>
<td>-55°C to +125°C</td>
<td>10 Amp</td>
<td>2 Form C (DPDT)</td>
</tr>
<tr>
<td>4621</td>
<td>4721</td>
<td>DC</td>
<td>-55°C to +125°C</td>
<td>4 Amp</td>
<td>1 Form C (IPDT)</td>
</tr>
<tr>
<td>4622</td>
<td>4722</td>
<td>DC</td>
<td>-55°C to +125°C</td>
<td>4 Amp</td>
<td>2 Form C (IPDT)</td>
</tr>
<tr>
<td>4624</td>
<td>4724</td>
<td>DC</td>
<td>-55°C to +125°C</td>
<td>4 Amp</td>
<td>4 Form C (IPDT)</td>
</tr>
<tr>
<td>4671</td>
<td>4771</td>
<td>AC</td>
<td>-55°C to +125°C</td>
<td>4 Amp</td>
<td>1 Form C (SPDT)</td>
</tr>
<tr>
<td>4672</td>
<td>4772</td>
<td>AC</td>
<td>-55°C to +125°C</td>
<td>4 Amp</td>
<td>2 Form C (DPDT)</td>
</tr>
<tr>
<td>4674</td>
<td>4774</td>
<td>AC</td>
<td>-55°C to +125°C</td>
<td>4 Amp</td>
<td>4 Form C (IPDT)</td>
</tr>
</tbody>
</table>

Timing Diagram

INPUT ON OFF

OUTPUT ON OFF

Apply power and the output will energize. After time-out, the output will revert to de-energized state. Remove and reapply input to cycle.

Adjustable Timing Formula (4700 types)

The resistance required to obtain timing within this range is determined by using the formula:

\[ R_x = 400K \left( \frac{T_{\text{max}}}{T_{\text{max}}} \right) - 40K, \text{ where} \]

\[ R_x = \text{External Resistance in Ohms,} \]

\[ T_{\text{max}} = \text{Maximum Time (Code).} \]

A high quality deposited carbon ±1%, 0.1W (min.) resistor is recommended for external resistance.

Part Numbering System

Typical Part Number: 4722 – C – 1102

Model Number:

Four digit code from table above.

Mounting (see outline dimension drawings):

A = Studs on bottom  B = Studs on top  C = Studs on side

Timing Code:

Four-digit code for any value between 100ms and 600s for fixed (4600) timers, and 100ms and 240s for adjustable (4700) timers.

The timing code consists of four digits and gives the time in ms. The first three digits are the significant figures and the last digit is the number of zeros following the significant figures; thus 50 ms would be coded 0500, 1.1 s would read 1101, and 1 m (60 s) would be 6002.

Adjustable timers cover one decade, e.g., 62 ms to 620 ms. The upper decade limit is T_{\text{max}} in the timing formula and is the value defined by the timing code in the part number.

A typical part number for an adjustable timer would be 4722–C–1102. This is a DC unit in the -55°C to +125°C temperature range with a 2 form C (DPDT) contact arrangement in a style “C” mounting, with a maximum time delay of 11s.

Environmental Specifications

Temperature Range: -55°C to +125°C

Vibration: 20 G’s, 10 – 2000 Hz

Shock: 50 G’s, 11 ± 1ms duration

Insulation Resistance: 1,000 megohms, min., at 500Vdc

Dielectric Strength: 1,000Vrms, 60 Hz, at sea level, all terminals to case

Sealing: Hermetic, 1.3 in. (33.0mm) of mercury

Life: 100,000 operations, min. (4A models); 50,000 operations, min. (10A models)

Weight: 4A units — 4.5 oz (127.6g) max.

10A units — 8.5 oz (240g) max.
4600/4700 Series Interval Timers (Continued)

Outline Dimensions

10 Amp Units

Mounting Option A

Mounting Option B

Mounting Option C

4 Amp Units

Mounting Option A

Mounting Option B

Mounting Option C

Wiring Diagrams

4600 Series (Fixed)

1 Form C

2 Form C

3 Form C

4700 Series (Adjustable)

1 Form C

2 Form C

3 Form C

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.
4800 Series Interval Timer, Fixed Timing, Solid State Output

Product Facts
- DC input fixed delay interval timer
- 1 Form A (SPST-NO), 500mA output
- CMOS digital design
- Reverse polarity protection
- Hermetic package
- Built to MIL-R-83726 environmental standard
- Customizing options include adjustable timing, tighter timing tolerances, header and mounting, relay output, and AC input.

Environmental Specifications
- Temperature Range: -55°C to +85°C or -55°C to +125°C.
- Vibration: 20 G's, 10 - 2,000 Hz.
- Shock: 50 G's, ± 1 ms duration.
- Insulation Resistance: 1,000 megohms, min., at 500Vdc.
- Dielectric Strength: 500Vrms, 60 Hz., at sea level, all terminals to case.
- Sealing: Hermetic, 1.3 in. (33.0mm) of mercury.
- Life: Over 1 million operations.
- Weight: 2 oz (50g) max.

Electrical Specifications
- Timing Range: 100 s. to 600 s.
- Tolerance: ± 10%.
- Repeatability: ± 2%.
- Recycle Time: 0.5% of Max. Delay.
- Input Data:
  - Input Voltage: 18 to 31Vdc.
  - Current Drain: 40mA max.
- Output Data:
  - Output Form: 1 Form A (SPST-NO).
  - Output Rating: 500mA @ +25°C; 200mA @ +125°C.
- Saturation Voltage: 1.0V, 500mA (25°C).
- Leakage: 10µA (125°C).

Timing Diagram
Apply power and the output will energize. After time-out, the output will revert to de-energized state. Remove and reapply power to recycle.

Outline Dimensions

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.500 [38.1] MAX.</td>
<td>Overall height</td>
</tr>
<tr>
<td>.75 [19.0]</td>
<td>Width</td>
</tr>
<tr>
<td>.120 DIA. [3.55]</td>
<td>Diameters</td>
</tr>
<tr>
<td>25 [6.35]</td>
<td>Pin spacing</td>
</tr>
</tbody>
</table>

Wiring Diagram

Header Options

<table>
<thead>
<tr>
<th>Header Option 1</th>
<th>Header Option 2</th>
<th>Header Option 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>188 TYP. [4.77]</td>
<td>188 TYP. [4.77]</td>
<td>3.0 ± .031 [76.2 ± .767]</td>
</tr>
</tbody>
</table>

Plug-in sockets are available.

Part Numbering System

Typical Part Number: 4801 - A - 1102
Model Number:
- 4801 = Fixed timer, -55°C to +85°C
- 4851 = Fixed timer, -55°C to +125°C

Header Style (see Header Options drawings):
1 = Hook terminals
2 = Straight terminals, short
3 = Straight terminals, long

Mounting (see outline dimension drawings):
A = Plain case
B = Bracket B
C = Studs on side
E = Bracket E

Timing Code:
Four-digit code for any value between 50ms and 600s.
The timing code consists of four digits and gives the time in ms. The first three digits are the significant figures and the last digit is the number of zeros following the significant figures; thus 50 ms would be coded 0500, 1.1 s would read 1101, and 1 m (60 s) would be 6002.

A typical part number would be 4801-1A-1102. This fixed timer operates at -55°C to +85°C, has hook terminals, style “A” mounting, and a time delay of 11s.

Typical Part Number: 4801 - A - 1102
Model Number:
- 4801 = Fixed timer, -55°C to +85°C
- 4851 = Fixed timer, -55°C to +125°C

Header Style (see Header Options drawings):
1 = Hook terminals
2 = Straight terminals, short
3 = Straight terminals, long

Mounting (see outline dimension drawings):
A = Plain case
B = Bracket B
C = Studs on side
E = Bracket E

Timing Code:
Four-digit code for any value between 50ms and 600s.
The timing code consists of four digits and gives the time in ms. The first three digits are the significant figures and the last digit is the number of zeros following the significant figures; thus 50 ms would be coded 0500, 1.1 s would read 1101, and 1 m (60 s) would be 6002.

A typical part number would be 4801-1A-1102. This fixed timer operates at -55°C to +85°C, has hook terminals, style “A” mounting, and a time delay of 11s.