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### Kilovac Time Delay Relays

#### 1600/1700 Series Delay On Operate Timers

Kilovac 1600/1700 series delay on operate timers combine solid state timing circuits with electromechanical output relays in robust hermetically sealed enclosures. The 1600 types are fixed timers, while the 1700 models are adjustable via an external resistor. Numerous output options include 4A rated contacts in 1-4 form C (SPDT - 4PDT) arrangements and 10A rated contacts in 1-2 form C (SPDT-DPDT) arrangements.

#### Specifications by Model Number – 4 Amp Contact Versions

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<th>Adjustable Timer Model Number</th>
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<td>DC</td>
<td>-55°C to +65°C</td>
<td>1.656 (42.06)</td>
<td>1 Form C (SPDT)</td>
</tr>
<tr>
<td>1602</td>
<td>1702</td>
<td>DC</td>
<td>-55°C to +65°C</td>
<td>1.656 (42.06)</td>
<td>2 Form C (SPDT)</td>
</tr>
<tr>
<td>1603</td>
<td>1703</td>
<td>DC</td>
<td>-55°C to +65°C</td>
<td>2.0 (50.8)</td>
<td>3 Form C (SPDT)</td>
</tr>
<tr>
<td>1604</td>
<td>1704</td>
<td>DC</td>
<td>-55°C to +65°C</td>
<td>2.0 (50.8)</td>
<td>4 Form C (APDT)</td>
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<td>1621</td>
<td>1721</td>
<td>DC</td>
<td>-55°C to +125°C</td>
<td>1.656 (42.06)</td>
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<tr>
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<td>1722</td>
<td>DC</td>
<td>-55°C to +125°C</td>
<td>1.656 (42.06)</td>
<td>2 Form C (SPDT)</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 (SPDT)</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 (APDT)</td>
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<tr>
<td>1651</td>
<td>1751</td>
<td>AC</td>
<td>-55°C to +65°C</td>
<td>2.0 (50.8)</td>
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<td>-55°C to +65°C</td>
<td>2.375 (60.33)</td>
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<td>1754</td>
<td>AC</td>
<td>-55°C to +65°C</td>
<td>2.375 (60.33)</td>
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<tr>
<td>1671</td>
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<td>AC</td>
<td>-55°C to +125°C</td>
<td>2.0 (50.8)</td>
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<tr>
<td>1672</td>
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<td>AC</td>
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<td>2.0 (50.8)</td>
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<tr>
<td>1673</td>
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<td>AC</td>
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<td>2.375 (60.33)</td>
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<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 (APDT)</td>
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#### Specifications by Model Number – 10 Amp Contact Versions

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<td>2.410 (61.44)</td>
<td>1 Form C (SPDT)</td>
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<td>1720</td>
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<td>-55°C to +65°C</td>
<td>2.410 (61.44)</td>
<td>2 Form C (SPDT)</td>
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</table>

#### Adjustable Timing Formula (1700 types)

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

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

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.

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 a style “C” mounting, with a maximum time delay of 11s.

### Specifications

**Kilovac 1600/1700 series delay on operate timers**

This product series offers adjustable timing ranges and tighter timing tolerances. It also includes hermetic package environments and many customizing options.

#### 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
- **Recycle Time** — 10 ms (DC input), 50ms (AC input)
- **Recovery Time** — 10 ms (DC input), 50ms (AC input)
- **Input Voltage** — 18 to 31Vdc, 105 to 125Vdc, 400 Hz
- **Current Drain (at 25°C, 28Vdc)** —
  - AC Coil, 10A contacts — 150mA maximum
  - AC or DC Coil, 4A contacts —
    - 1-pole — 100mA maximum
    - 2-pole — 150mA maximum
    - 3- and 4-pole — 200mA maximum
- **Contact Ratings** —
  - DC Coil, 10A contacts —
    - 10A resistive @ 30Vdc
    - 5A inductive @ 30Vdc
    - 5A resistive @ 115 Vrms, 400 Hz
    - 3A inductive @ 115 Vrms, 400 Hz
  - AC or DC Coil, 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** — 20 G’s, 10 - 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.

### Catalog Information

| Catalog | Revision | Dimensions | Contact Change
|---------|----------|------------|-----------------|
| 5-1773450-5 | 3-13 | Dimensions are shown for reference purposes only. Specifications subject to change. | USA: +1 800 522 6752
|          |          | Dimensions are in millimeters unless otherwise specified. | Asia Pacific: +86 0 400 820 6015
|          |          | For additional support numbers please visit www.te.com | UK: +44 800 267 666
Kilovac Time Delay Relays

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

Dimensions are shown for reference purposes only. Specifications subject to change.
Kilovac 2400 series delay on operate timers combine solid state timing circuits with relay outputs in robust hermetically sealed enclosures. They are fixed timers. The 2 Form C (DPDT) output relay is rated 2A.

### Part Numbering System

Typical Part Number | 2401 –1 A –1102
--- | ---
Model Number: | 2401 = Fixed timer, -55°C to +85°C  
2402 = 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  
D = 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 ms (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.

### Environmental Specifications

- **Temperature Range** | -55°C to +85°C or -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, 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.

### 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 31 Vdc
- **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
- **Transistor Protection** | 80Vdc for 50ms

### Timing Diagram

```
ON
| < DELAY > |
OFF
```

### Outline Dimensions

#### Mounting Option A

- 1.500 [38.1] MAX.
- 0.809 MAX. [20.55]
- 0.120 DIA. [3.05]
- 1.062 [26.97]

#### Mounting Option B

- 1.32 MAX. [33.53]
- 1.25 MAX. [31.75]
- 0.809 MAX. [20.55]
- 1.040-047 [26.42-1.19]

#### Mounting Option D

- 1.32 MAX. [33.53]
- 0.375 [9.52]
- 0.488 [12.4]
- 1.297 [32.95]

#### Mounting Option E

- 0.96 DIA. [24.4]
- 1.078 [27.36]
- 0.096 DIA. [2.44]

### Wiring Diagram

#### Header Options

- **Header Option 1**
- **Header Option 2**
- **Header Option 3**

### Plug-in sockets are available for header option 2

- TERMINAL SPACING IS 0.2 [5.08] FOR ALL HEADERS

---

Catalog 5-173450-5  
Revised 3-13  
www.te.com

Dimensions are shown for reference purposes only. Specifications subject to change. Dimensions are in millimeters unless otherwise specified. USA: +1 800 522 6752  
Asia Pacific: +86 0 400 820 6015  
UK: +44 800 267 666

For additional support numbers please visit www.te.com
### Kilovac Time Delay Relays

**Kilovac 5600/6700 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 environments
- Many customizing options
  - Extended timing ranges
  - Tighter timing tolerances
  - Header and mounting
  - 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 ±1.5ms, whichever is less

#### Recycle Time
- 10 ms

#### Reset Time
- 20 ms

#### Operate Time (Max.)
- 10 ms (2A and 5A models), 20s (10A models)

#### Input Voltage
- 18 to 31Vdc

#### Control Voltage
- 10 to 31Vdc. Ground common to aux. power line. 10Vdc minimum must be applied for a minimum duration of 20ms to energize output and initiate the timing circuit.

#### Current Drain (at 25°C, 28Vdc)
- Control Line — 15mA typ., 25mA max.
- Input Line De-energized (after completion of delay period) — 125mA

#### Input Line Energized
- 1-pole, 2 & 5A models — 100mA
- 1-pole, 10A models — 150mA
- 2-pole, 2 & 5A models — 150mA
- 2-pole, 10A models — 240mA

#### Contact Ratings
- 10A contacts
  - 10A resistive @ 30Vdc
  - 5A resistive @ 115 Vrms, 400 Hz
  - 3A inductive @ 115 Vrms, 400 Hz
- 5A contacts
  - 5A resistive @ 30Vdc
  - 1.5A inductive @ 30Vdc
  - 3A resistive @ 115 Vrms, 400 Hz
  - 1A inductive @ 115 Vrms, 400 Hz
- 2A contacts
  - 2A resistive @ 30Vdc
  - 1A inductive @ 30Vdc
  - 1A resistive @ 115 Vrms, 400 Hz
  - 0.3A inductive @ 115 Vrms, 400 Hz

### 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>-5°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>-5°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>-5°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>-5°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>-5°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>-5°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>-5°C to +125°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>-5°C to +125°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>-5°C to +125°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>-5°C to +125°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.

### Environmental Specifications

#### Temperature Range
- -5°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

#### 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

#### (4700 types)

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

\[ R_x = \frac{400K}{T/T_{\text{max.}}} - 40K \]

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.

### Timing Diagram

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.

### Kilovac Time Delay Relays

Numerous output options include 2A, 5A and 10A rated contacts in 1, 2, and adjustable (5600/5700) forms. The 5600 types are fixed timers, while the 5700 models are adjustable via an external resistor.

Kilovac 5600/6700 series delay on release timers combine solid state timing circuits with electromechanical output relays in robust hermetically sealed enclosures. Numerous output options include 2A, 5A and 10A rated contacts in 1, 2, and adjustable (SPDT and DPDT) arrangements.

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

---

**8-5 Kilovac Time Delay Relays**
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></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting (see outline dimension drawings):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A = Studs on bottom of 2.5 in tall case</td>
<td>C = Studs on side of 2.5 in. tall case</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D = Studs on bottom of 1.812 in. tall case</td>
<td>(E = ) Bracket on side of 1.812 in. tall case</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Timing Code:
Four-digit code for any value between 50ms.

Note: Units with 10A contacts have a minimum time delay of 100ms.

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)

- **AUX. INPUT**
- **CONTROL**
- **1 Form C**
- **2 Form C**

5700 Series (Adjustable)

- **AUX. INPUT**
- **CONTROL**
- **RESISTOR**
- **TIMING RESISTOR**
- **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 environmental
- 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 Gs, 10 - 2.000 Hz
- Shock — 50 Gs, 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 oz (28.3g) max

Timing Diagram

Kilovac 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:

\[ R_x = \frac{400K}{T/T_{\text{max.}}} - 40K, \text{ where} \]

- \( R_x \) = 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

<table>
<thead>
<tr>
<th>1811</th>
<th>1 A</th>
<th>1002</th>
</tr>
</thead>
</table>

Model Number:
1811 = Fixed timer, -55°C to +85°C
1821 = Fixed timer, -55°C to +125°C
1911 = Adjustable timer, -55°C to +85°C
1921 = Adjustable timer, -55°C to +125°C

Header Style (see Header Options drawings):
A = Plain case    B = Bracket B    C = Studs on side    E = Bracket E

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 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 0500, 1.1 seconds would read 1101, and 1 minute (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 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

Wiring Diagrams

Header Options

Terminal Spacing is 0.2 in [5.08]
**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**

- **Tracking 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 and 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 Gs, 11 ± 1ms half-sine wave
- **Vibration (sinusoidal)**: 10 - 80 Hz; at 0.06 inch DA; 80 - 3000 Hz; at 20 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.

**Kilovac 6001 series delay on operate timer modules are miniature devices combining solid state timing circuits with solid state switch outputs in robust hermatically sealed DIP enclosures. The 1 Form A (SPST-NO) switch is rated 300mA.**

**Part Numbering System**

- **Model Number**: 6001 = Fixed timer, -55°C to +125°C
- **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.

**Optional Suffix:**

- C = Commercial version equivalent to M83726/13.

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**

<table>
<thead>
<tr>
<th>Width</th>
<th>Height</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>42 MAX.</td>
<td>.018 DIA.</td>
<td>6001 C</td>
</tr>
<tr>
<td>58 MAX.</td>
<td>.018 DIA.</td>
<td>6002 C</td>
</tr>
</tbody>
</table>

**Wiring Diagram**

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

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Kilovac Time Delay Relays

2600 Series Flasher/Repeat-Cycle, Timer-Fixed, Solid State Output

Product Facts
- All solid-state
- Digital timing
- Reverse polarity protection
- Transient/surge protection

Electrical Specifications

Timing Range
- “On” Time (.05 to 600 SEC)
- “Off” Time (.05 to 600 SEC)

Duty Cycle
- D.C. = $\frac{T_{on}}{T_{on} + T_{off}}$

Frequency
- $f = \frac{1}{T_{on} + T_{off}}$

Tolerance
- ±10%

Repeatability
- ±0.1%

Input Data
- Input Voltage
  - 18 to 31 V dc
- Current Drain
  - 30 ma @ 28 V dc

Output Data
- Output
  - 28 V dc
- Vin (dc)
  - 1.5 V dc @ 100 ma
- Load
  - 30 ma max.

Environmental Specifications

Operate Temperature
- -55°C to +125°C

Vibration
- 20 G's, 10 - 2,000 Hz

Shock
- 50 G's, 11 ± 1 milliseconds duration

Insulation Resistance
- 1,000 megohms at 500 Vdc

Dielectric Strength
- 1,000 Vrms, 60 Hz, at sea level. All terminals tied together to case

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

Life
- over 1,000,000 operations

Weight
- 8 oz (200g) max.

Applications
The Hi-G Series 2600 Flasher can be used wherever warning or indicating light, navigation or position lights, panel or control lights must be operated with a maximum of reliability in severe environments. The Series 2600 can also be used to interrupt Tone Generators or other Signaling Devices at a predetermined frequency.

How to Order

The part number consists of four elements. The series number, a letter signifying mounting style and the timing code numbers. The first timing is the “ON” time and the second is “OFF” time. The timing code number consists of four digits and gives the time in milliseconds. The first three digits are the significant figures and the last digit is the number of zeros following the significant figures, thus, 50 milliseconds would be coded 0500. 1.1 seconds would read 1101, and 1 minute (60 seconds) would be 6002.

Example: HI-G Part Number

2601 — A — 2001 — 1001

“OFF” time in milliseconds

“ON” time in milliseconds

Mounting style

Series
### Kilovac Time Delay Relays

#### 4600/4700 Series Interval Timers

Kilovac 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.

### Electrical Specifications

- **Operate Time (Max.)** — 10 ms (4A models), 20 ms (10A models)
- **Input Voltage** — 18 to 31 Vdc, 105 to 125 Vac, 400 Hz
- **Current Drain (at 25°C, 28Vdc)** — 50 ma (AC input), 200 ma (DC input)
- **Recycle Time** — 100 ms to 600 s for adjustable (4700) timers.
- **Tolerance** — ±10%
- **Reverse polarity protection**

### Environmental Specifications

- **Temperature Range** — -55°C to +125°C
- **Humidity** — 50°C, 11% ± 1ms duration
- **Insulation Resistance** — 1,000 megohms, min., at 500Vdc
- **Dielectric Strength** — 1,000 Vrms, 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.

### 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 (SPDT)</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 (DPDT)</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 (4PDT)</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 (4PDT)</td>
</tr>
</tbody>
</table>

### Adjustable Timing Formula (4700 types)

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

\[ Rx = \frac{400K}{T/T_{\text{max.}}} - 40K \]

where

- \( Rx \) = External Resistance in Ohms
- \( T \) = Desired Time in Seconds
- \( T_{\text{max.}} \) = Maximum Time (Code)

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

### Adjustable Timers

- **Adjustable Time Delay Relays**
- **500Vdc series (adjustable) — 100,000 operations, min. (4A models); 50,000 operations, min. (10A models)**
- **4700 types — 1,350Vdc series (adjustable)**

### 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 s 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_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 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.

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**Catalog 5-1773450-5**

**Revised 3-13**

**www.te.com**

**Dimensions are shown for reference purposes only. Specifications subject to change.**

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**For additional support numbers please visit www.te.com**

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**USA: +1 800 522 6732**

**Asia Pacific: +86 0 400 820 6015**

**UK: +44 800 267 666**
### 4600/4700 Series Interval Timers (Continued)

#### Outline Dimensions

**10 Amp Units**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX. SEATED HEIGHT</td>
<td>2.419 [61.44]</td>
</tr>
<tr>
<td>INDEX DOT</td>
<td>0.297 [7.54]</td>
</tr>
<tr>
<td>#6-32 THD 4 PLACES</td>
<td>0.375 [9.53]</td>
</tr>
<tr>
<td>INDEX DOT</td>
<td>0.863 [21.93]</td>
</tr>
</tbody>
</table>

**4 Amp Units**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX.</td>
<td>2.384 [60.55]</td>
</tr>
<tr>
<td>INDEX DOT</td>
<td>0.250 [6.35]</td>
</tr>
<tr>
<td>#4-40 THD 4 PLACES</td>
<td>0.375 [9.53]</td>
</tr>
<tr>
<td>INDEX DOT</td>
<td>0.863 [21.93]</td>
</tr>
</tbody>
</table>

**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 shown for reference purposes only. Specifications subject to change.
Kilovac Time Delay Relays

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
- Customizing options include
  - Adjustable timing
  - Tighter timing tolerances
  - Header and mounting
  - Relay output
  - AC input

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 31 Vdc.
  - 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).

Environmental Specifications
- Temperature Range: -55°C to +85°C or -55°C to +125°C.
- Vibration: 20 Gs, 10 - 2,000 Hz.
- Shock: 50 Gs, 11 ± 1ms 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.

Part Numbering System

Kilovac 4800 series interval timers combine solid state timing circuits with solid state outputs in robust hermetically sealed enclosures. They are fixed timers. The 1 Form A (SPST-NO) output switch is rated 500mA.

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

Wiring Diagram

Plug-in sockets are available