OMRON H3CA Solid-State Timer

Description
OMRON multi-mode/multi-range solid-state timer is digital set with wide 0.1 sec to 9990 hour range in a compact, 1/16 DIN plug-in unit. Easy-to-read LCD time remaining bar graph and output status indicators. Many control modes to match most applications. Thumbwheel switch selects time unit, control mode, and time limit setting. Wide supply range. Timer is UL Recognized and CSA Certified.

Specifications

TIME DELAY
Adjustment ....... 5-digit switches
Range ............ 0.1 sec to 9,990 hours
Repeatability ... +/- 0.3%, +/- 0.05 seconds over specified timing range
Reset Time ........ 0.5 sec max.

POWER
Operating Voltage - 24 to 240 VAC or 24 to 240 VDC
Power Consumption ....... AC 3VA or DC 3W
Frequency ............... 50/60 Hz

OUTPUT
Type .................. Relay S.P.D.T.
Life ............ Mechanical - 10,000,000 operations
Dielectric ...... 2,000 volts RMS at 50/60 Hz between current carrying and non-current carrying parts

ENVIRONMENTAL
Operating Temperature ...... -14 to 131 degrees F
Humidity ............... 35 to 85% RH

MECHANICAL
Termination ............... 11 pin plug
Mounting .....Panel, track, surface

GENERAL SAFETY RECOMMENDATIONS

WARNING
Disconnect power when connecting or disconnecting the timer or its loads.

CAUTION
Do not change the time unit or time range while the timer is in operation. Otherwise, the timer may malfunction or be damaged. Be sure to turn off the power supply to the timer before changing any of the selections.

No Voltage or Dry Contact
The inputs (Start, Reset, Gate, and Check) on this timer are considered a no voltage or dry contact thus requires no external voltage source to activate. Simply connecting them to the common terminal (Pin 3 or 15) via a switch, relay contact, open collector sensor, and etc., is all that is required to activate each input.

Gate Input (Pause)
When the gate input is closed, timing is temporarily stopped. When the gate opens, timing resumes at the point of interruption.

Check Input
When check input is used in ON-delay mode, the elapsed time measurement of the set time is not performed - especially useful where ON-delay override is desired. In Repeat Cycle mode, the check input allows the timer to be used like a binary flip-flop or alternating relay.

GLOSSARY
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Terminal/ Pin Configuration

**Supply Voltage**
- Pins 3 & 7 is the Reset Input
- Pins 3 & 6 is the Start Input
- Pins 3 & 5 is the Gate Input
- Pins 3 & 4 is the Check Input

**Outputs:** Pins 8, 9, and 11 are terminals for the timer's internal output relay.

**Gate**
- Pin 8 is the COM.
- Pin 10 is the NC contact.
- Pin 11 is the NO contact.

**Check**
- Pin 7 is the COM.
- Pin 9 is the NC contact.
- Pin 11 is the NO contact.

**Outputs:** Pins 15, 16, and 18 are the terminals for the timer's internal output relay.
- Pin 15 is the COM.
- Pin 16 is the NC contact.
- Pin 18 is the NO contact.

Timed contact
- Pin 1 is the COM for relay #1.
- Pin 6 is the NO contact for relay #1.
- Pin 5 is the NC contact for relay #1.

Instantaneous contact
- Pin 1 is the COM for relay #2.
- Pin 6 is the NO contact for relay #2.
- Pin 5 is the NC contact for relay #2.

**Outputs:** Pins 1,3,4,5,6, and 8 are the terminals for the H3CA-8H internal output relays.
- Pin 1 is the COM for the H3CA-8H output relay.
- Pin 3 is the NO contact for relay #1.
- Pin 4 is the NC contact for relay #2.
- Pin 8 is the COM for relay #1.
- Pin 6 is the NO contact for relay #1.
- Pin 5 is the NC contact for relay #2.

Because both internal relay outputs are totally different in function. Please make sure not to wire these relays together in an application.
Operation

RANGE SELECTION

There are seven different timing ranges from which to choose. Press the rightmost thumbwheel switch to select the desired time unit. When making your choice the selected time unit will be displayed in the time unit display window.

The seven time units are:

<table>
<thead>
<tr>
<th>Time units</th>
<th>Timing ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 s</td>
<td>0.1 to 99.9 seconds</td>
</tr>
<tr>
<td>s</td>
<td>1 to 999 seconds</td>
</tr>
<tr>
<td>0.1 m</td>
<td>0.1 to 99.9 minutes</td>
</tr>
<tr>
<td>m</td>
<td>1 to 999 minutes</td>
</tr>
<tr>
<td>0.1 h</td>
<td>0.1 to 99.9 hours</td>
</tr>
<tr>
<td>h</td>
<td>1 to 999 hours</td>
</tr>
<tr>
<td>10 h</td>
<td>10 to 9990 hours</td>
</tr>
</tbody>
</table>

Be sure turn off the power supply to the timer before changing any of the selections.

MODE SELECTIONS

There are eight different operating modes from which to choose. Press the leftmost thumbwheel switch to select the desired operation mode. When making your choice the operation mode will be displayed in the operation mode display window.

The eight operation modes are:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>ON-delay</td>
</tr>
<tr>
<td>B</td>
<td>Repeat (50% fixed duty cycle)</td>
</tr>
<tr>
<td>C</td>
<td>Signal Interval/OFF-delay</td>
</tr>
<tr>
<td>D</td>
<td>Signal OFF-delay (I)</td>
</tr>
<tr>
<td>E</td>
<td>Interval</td>
</tr>
<tr>
<td>F</td>
<td>Cycle One-shot</td>
</tr>
<tr>
<td>G</td>
<td>Signal ON-delay/OFF-delay</td>
</tr>
<tr>
<td>H</td>
<td>Signal OFF-delay (II)</td>
</tr>
</tbody>
</table>

Note: The operation mode is fixed to “A” in type H3CA-8 and H3CA-8H timers.

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

Mode A ON-delay (Power-ON Start/Power OFF Reset): Connect start terminals (3 & 6). Upon application of power to the timer, time delay period begins. At the end of time delay period, output contacts switches, either connecting or disconnecting load. Output remains switched until power is removed or a reset input is applied.

Mode B Repeat Cycle - Signal Start (50% fixed duty cycle): Power is continuously applied. The OFF/ON cycle is initiated at the leading edge of the start input. The output relay will be OFF for the set time and ON for the set time. The ON and OFF cycle will continue to alternate until a reset input is applied or power is disconnected.

Mode C Signal Interval/OFF-delay: Power is continuously applied. Time delay period begins on both the leading and trailing edges of the start input. Output contact switches during time delay period, either connecting or disconnecting load. Once the timer has timed out from the trailing edge, it resets and is ready for subsequent start inputs. Refer to Figure 5.
Operation (Continued)

Figure 5
Mode D
Signal OFF-delay (I):
Power is continuously applied. The output relay switches at the leading edge of the start input, either connecting or disconnecting load. Time delay period begins at the trailing edge of the start input. Output relay switches again when accumulated time equals the set time.

Figure 6
Mode E - Interval

Power-ON Start/Power-OFF reset: Connect start terminals (3 & 6). Upon application of power to the timer, timing starts. The output relay is switched during timing, either connecting or disconnecting load. Output remains switched until power is removed or a reset input is applied.

Figure 8
Mode F Cycle One-shot
Power-On Short/Power-OFF Reset: Connect start terminals (3 & 6). Upon application of power to the timer, timing starts. The output relay is OFF for the set time and then ON for the set time for one cycle only. The timer is reset when power is removed or a reset input is applied.

Figure 9
Mode F Cycle One-shot
Signal Start: Power is continuously applied. The OFF/ON cycle is initiated at the leading edge of the start input. The output relay will be OFF for the set time and then ON for the set time for one cycle only. The timer is reset when power is removed or a reset input is applied. Refer to Figure 10.
Operation (Continued)

**Mode G**
**Signal ON-delay/OFF-delay:**
Power is continuously applied. Timing begins on both the leading and trailing edges of the start input. The output relay switches when the accumulated time from the leading edge equals the set time, either connecting or disconnecting load. It also switches for the set amount of time from the trailing edge of the start input.

**Mode H**
**Signal OFF-delay:**
Power is continuously applied. Timing begins at the trailing edge of the start input. The output relay is switched only during timing.
Application

ON-DELAY   Power-ON Start/Power-OFF Reset

Refer to Figures A, B, and C

1. Power is applied to pins 2 and 10.
2. Jumper start input, pins 3 and 6 together.
3. Jumper one side of power (either pin 2 or 10) to COM of output relay (pin 11).
4. Load is activated through pin 9 (normally open contact) and the other side of power not connected to COM (pin 11).
5. Time period begins upon application of power, once the time delay period ends, output relay energizes and contacts transfer, activating load.
6. Reset timer by applying a switch closure to reset input (pins 3 and 7) or by removing power from pins 2 or 10.

ON-DELAY   Signal Start

Refer to Figures A, B, and C

1. Power is applied to pins 2 and 10.
2. Jumper one side of power (either pin 2 or 10) to COM of output relay (pin 11).
3. Load is activated through pin 9 (normally open contact) and the other side of power not connected to COM (pin 11).
4. Once start input is closed (pins 3 and 6), output relay begins cycling, thus activating and deactivating the load.
5. Reset timer by applying a switch closure to reset input (pins 3 and 7) or by removing power from pins 2 or 10.

REPEAT CYCLE - Power ON Start/Power-OFF Reset

Refer to Figures A, B, and C

1. Power is applied to pins 2 and 10.
2. Jumper one side of power (either pin 2 or 10) to COM of output relay (pin 11).
3. Load is activated through pin 9 (normally open contact) and the other side of power not connected to COM (pin 11).
4. Upon application of power, output relay begins cycling, thus activating and deactivating the load.
5. Reset timer by applying a switch closure to reset input (pins 3 and 7) or by removing power from pins 2 or 10.

INTERVAL   Signal Start

Refer to Figures A, B, and C

1. Power is applied to pins 2 and 10.
2. Jumper start input, pins 3 and 6 together.
3. Jumper one side of power (either pin 2 or 10) to COM of output relay (pin 11).
4. Load is activated through pin 9 (normally open contact) and the other side of power not connected to COM (pin 11).
5. Time period begins each time start input is closed and opened. Load is activated only during time period.
6. Reset is established once timer has timed out after start input was opened or power is removed from pins 2 or 10.

SIGNAL INTERVAL/OFF-DELAY

Refer to Figures A, B, and C
Application (Continued)

INTERVAL Power-ON Start/Power-OFF reset
Refer to Figures A, B, and C

1. Power is applied to pins 2 and 10.
2. Jumper start input, pins 3 and 6 together.
3. Jumper one side of power (either pin 2 or 10) to COM of output relay (pin 11).
4. Load is activated through pin 9 (normally open contact) and the other side of power not connected to COM (pin 11).
5. Time period begins upon application of power, the time period begins, output relay energizes and contacts transfer, activating load. The load is activate only during timing period
6. Reset timer by applying a switch closure to reset input (pins 3 and 7) or by removing power from pins 2 or 10.

CYCLE One-Shot
Power-ON Short/Power-OFF Reset
Refer to Figures A, B, and C

1. Power is applied to pins 2 and 10.
2. Jumper one side of power (either pin 2 or 10) to COM of output relay (pin 11).
3. Load is activated through pin 9 (normally open contact) and the other side of power not connected to COM (pin 11).
4. Once start input is closed, output relay cycles OFF for the set time and then ON for only one cycle.
5. Reset timer by applying a switch closure to reset input (pins 3 and 7) or by removing power from pins 2 or 10.

SIGNAL ON-DELAY/OFF-DELAY
Refer to Figures A, B, and C

1. Power is applied to pins 2 and 10.
2. Jumper one side of power (either pin 2 or 10) to COM of output relay (pin 11).
3. Load is activated through pin 9 (normally open contact) and the other side of power not connected to COM (pin 11).
4. Time period begin each time start input is closed and opened. Load is activated when the accumulated time from the last start input closure equals the set time. The load is also activate for the set time period immediately after the start input is opened.
5. Reset timer by applying a switch closure to reset input (pins 3 and 7) or by removing power from pins 2 or 10.

SIGNAL OFF-DELAY (II)
Refer to Figures A, B, and C

1. Power is applied to pins 2 and 10.
2. Jumper one side of power (either pin 2 or 10) to COM of output relay (pin 11).
3. Load is activated through pin 9 (normally open contact) and the other side of power not connected to COM (pin 11).
4. Load is activated for the duration of the set time period only after the start input has been closed then opened.
5. Reset timer by applying a switch closure to reset input (pins 3 and 7) or by removing power from pins 2 or 10.
Wiring Diagrams

Figure A  Figures A, B, and C illustrate how to wire the load to utilize the very same supply voltage going to the timer.

Figure C

Figure D  Figure D illustrates how to wire the load to utilize a separate power source then the one used by the timer.

Figure B  Supply voltage can be either an AC or DC source.
PRODUCT WARRANTY

NOTE: Specifications to change without notice.

Omron certifies all of its products either meet or exceed stipulated specifications. Omron is not liable for stenographic and/or clerical errors.

Omron’s obligation under this warranty is limited solely to repair or replacement at Omron’s discretion. Omron will not be liable for any design furnished by Buyer and incorporated into equipment.

This warranty is voided if the product is altered in any way or suffers consequential damage due to negligence or misuse.

Omron is not to suffer risk due to suitability or unsuitability or the results of the use of its products used in combination with any electrical or electronic components, circuits, systems assemblies, or any other materials or substances or environments.

The foregoing warning is the only warranty which Omron Electronics, Inc. provides with respect to the products listed herein. No other warranties, expressed, implied, or statutory shall apply, whether as to merchantability, fitness for a particular purpose, description, or otherwise.

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