

Solid-state Timer H3CA

DIN-sized (48 x 48, 45 x 75 mm) Timer with Digital Setting and LCD Display

- Dual power supplies for free AC/DC.
- Eight operation modes selectable with one unit.
- Any desired time can be set digitally within a range from 0.1 seconds to 9,990 hrs.
- Four external signal inputs.
- ON/OFF indicator for control output and bar indicator for remaining time.
- Conforms to UL, CSA, and CE marking.



CE UL LR

Ordering Information

Operation/resetting system	Operation mode	Terminal	Time-limit contact	Instantaneous contact	Mounting	
					Surface mounting/track mounting	Flush mounting
Time-limit operation/self-resetting/external resetting (see note 2)	8 operation modes (selectable) (see note 3)	11-pin round socket	SPDT	---	H3CA-A	H3CA-A
		Front screw			H3CA-FA	---
Time-limit operation/self-resetting	ON-delay operation	8-pin round socket	DPDT	---	H3CA-8	H3CA-8
			SPDT	SPDT	H3CA-8H	H3CA-8H

Note: 1. Specify both the model number and supply voltage when ordering for the H3CA-8H and H3CA-8.

2. The operation/resetting system depends on the selected operation mode. For details, see "Timing Chart".

3. The 8 operation modes are as follows:

A: ON-delay operation

B: Repeat cycle operation

C: Signal ON/OFF-delay operation (1)

D: Signal OFF-delay operation (1)

E: Interval operation

F: One-shot and flicker operation

G: Signal ON/OFF-delay operation (2)

H: Signal OFF-delay operation (2)

Accessories (Order Separately)

Timer	Track mounted socket (See note.)	Back connecting socket	
		Solder terminal	Screw terminal
H3CA-A	P2CF-11	PL11	P3GA-11
H3CA-8H/H3CA-8	P2CF-08	PL08	P3G-08

Note: Track mounted socket can be used as a front connecting socket.

Specifications

Time Ranges

A desired time can be set within a range of 0.1 s to 9,990 hrs by combining the three thumbwheel switch modules for time setting and one module for time unit selection.

Time unit		0.1 s	1 s	0.1 min	1 min	0.1 hrs	1 hr	10 hrs
Time range	1 to 999 (3 digits)	<div> <div>0</div><div>0</div><div>1</div> </div> <div>0.1</div> <div>S</div> <div>to</div> <div>9</div> <div>9</div> <div>9</div> <div>10</div> <div>h</div>						

■ Ratings

Item	H3CA-A/H3CA-FA	H3CA-8	H3CA-8H
Rated supply voltage (See note 2.)	24 to 240 VAC (50/60 Hz), 12 to 240 VDC (permissible ripple: 20% max.)	100/110/120, 200/220/240 VAC, (50/60 Hz), 24 VDC, 110 VDC (permissible ripple: 20% max.) (See note 1.)	
Operating voltage range	90% to 110% of rated supply voltage		85% to 110% of rated supply voltage
Power consumption	AC: approx. 4 VA DC: approx. 2 W	AC: approx. 10 VA/1 W DC: approx. 1 W	AC: approx. 10 VA/1.5 W DC: approx. 2 W
Control outputs	3 A at 250 VAC, resistive load ($\cos\phi = 1$)		

Note: 1. Single-phase, full-wave rectified power sources may be used for 24 to 240 VDC.

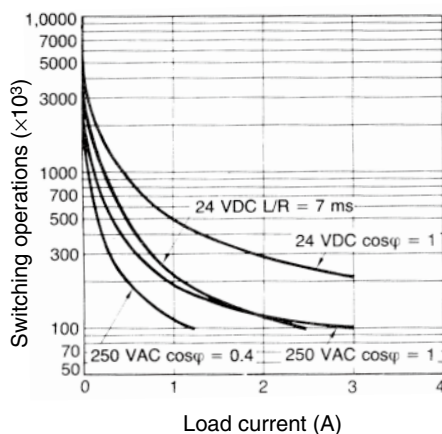
2. Refer to *Safety Precautions for All Times* when combining the Timer with an AC 2-wire proximity sensor.

■ Characteristics

Accuracy of operating time	$\pm 0.3\% \pm 0.05$ s		
Influence of voltage			
Influence of temperature			
Setting error	$\pm 0.5\% \pm 0.05$ s max.		
Reset time	H3CA-A/-FA: 0.5 s max. H3CA-8H/-8: 0.1 s max.		
Insulation resistance	100 M Ω min. (at 500 VDC)		
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts and between contact and control circuit) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)		
Impulse withstand voltage	3 kV		
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude for 1 h each in three directions Malfunction: 10 to 55 Hz with 0.5-mm double amplitude for 10 min each in three directions		
Shock resistance	Destruction: 980 m/s ² Malfunction: 98 m/s ²		
Ambient temperature	Operating: -10°C to 55°C		
Ambient humidity	Operating: 35% to 85%		
Life expectancy	Mechanical: 10,000,000 operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (3 A at 250 VAC, $\cos\phi = 1$ at 1,800 operations/h) See <i>Lift-test Curve</i> for more details.		
Approved standards	UL508, CSA C22.2 No. 14, LR, NK Conforms to EN61010-1.		
EMC	(EMI) Emission Enclosure: Emission AC mains: (EMS) Immunity ESD: Immunity RF-interference: Immunity Conducted Disturbance: Immunity Burst: Immunity Surge: Immunity Voltage Dip/Interruption	EN61326 EN55011 Group 1 class A EN55011 Group 1 class A EN61326 EN61000-4-2: EN61000-4-3: EN61000-4-6: EN61000-4-4: EN61000-4-5: EN61000-4-11:	4 kV contact discharge (level 2) 8 kV air discharge (level 3) 10 V/m (Amplitude-modulated, 80 MHz to 1 GHz) (level 3); 10 V/m (Pulse-modulated, 900 MHz ± 5 MHz) (level 3) 10 V (0.15 to 80 MHz) (according to EN61000-6-2) 2 kV power-line (level 3); 1 kV I/O signal-line (level 4) 1 kV line to lines (power and output lines) (level 3); 2 kV line to ground (power and output lines) (level 3) 0.5 cycle, 100% (rated voltage)
Weight	H3CA-A: approx. 110 g H3CA-FA: approx. 190 g		

Engineering Data

Life-test Curve

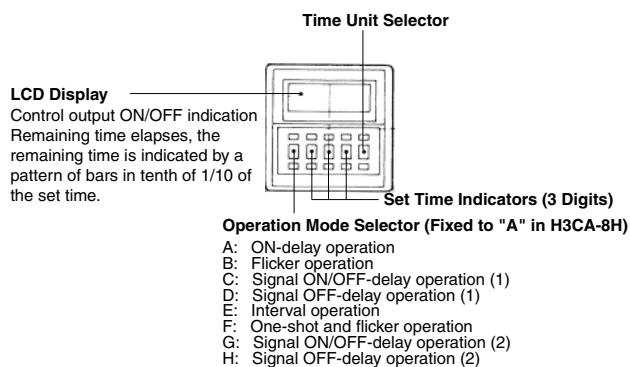


Reference: A maximum current of 0.15 A can be switched at 125 VDC ($\cos\phi = 1$).
Maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.

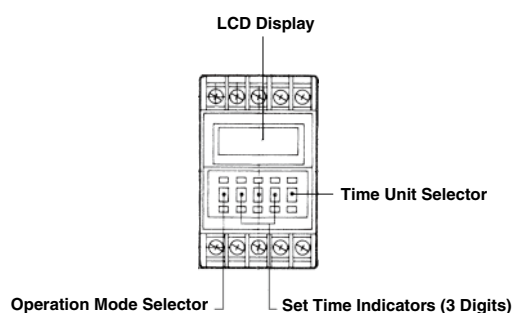
- Note:** 1. The H3CA Series has been tested for the following: impulse voltages, noise (via noise simulator, for L loads, and for relay oscillation), and resistance to static electricity.
2. Minimum applicable load (P reference values):
H3CA-A(FA), H3CA-8H: 100 mA at 5 VDC
H3CA-8: 10 mA at 5 VDC

Nomenclature

H3CA-A/H3CA-8H



H3CA-FA



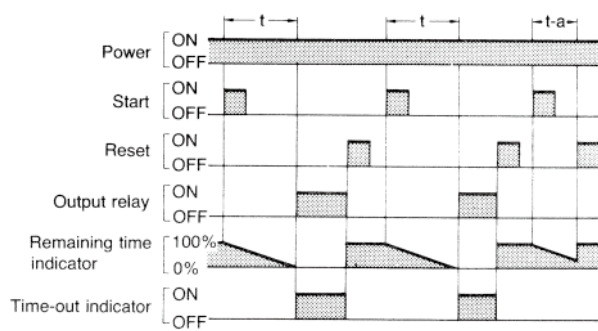
Operation

■ Timing Chart

H3CA-A (FA)

ON-delay Operation (A Mode)

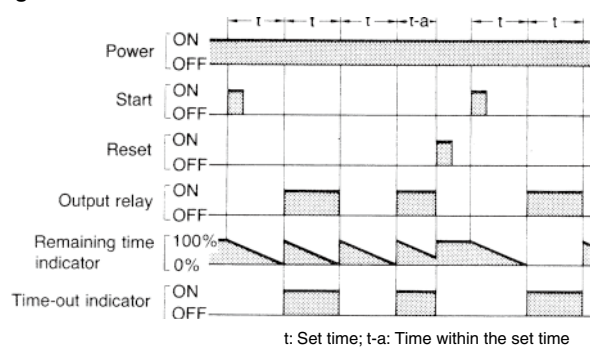
Signal Start



Note: The minimum signal input time is 0.05 s.

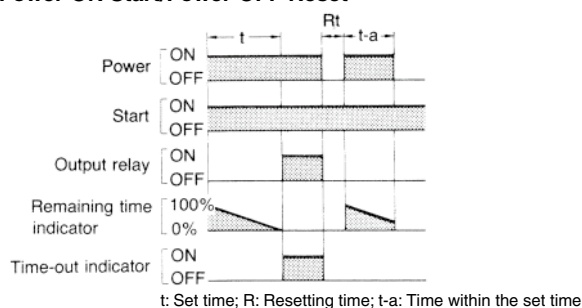
Flicker Operation (B Mode)

Signal Start

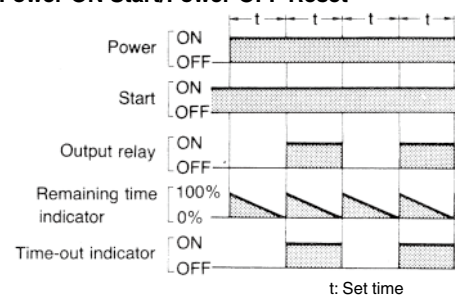


Note: The minimum signal input time is 0.05 s.

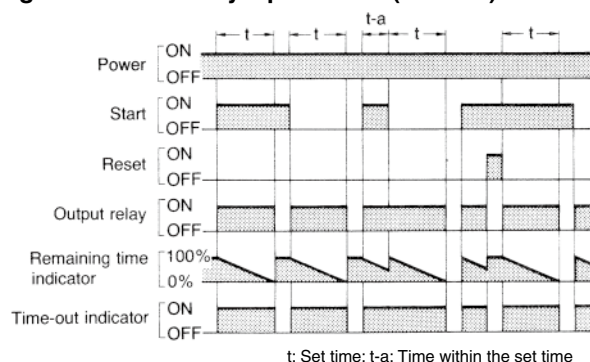
Power-ON Start/Power-OFF Reset



Power-ON Start/Power-OFF Reset

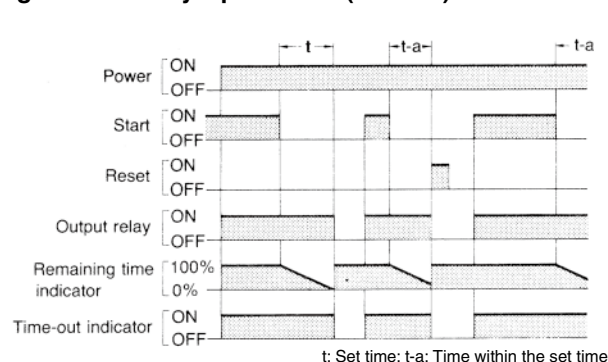


Signal ON/OFF-delay Operation 1 (C Mode)



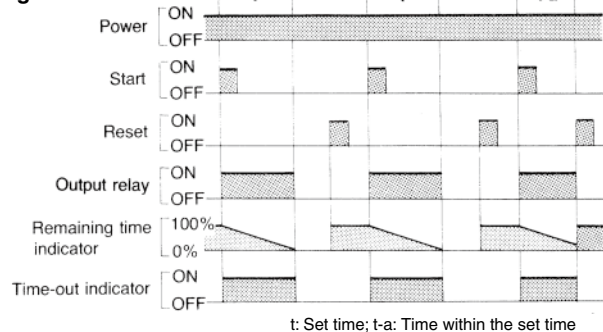
- Note:** 1. The minimum signal input time is 0.05 s.
2. Operation 1 refers to the version in which the output relay operates when the Start signal is ON.

Signal OFF-delay Operation 1 (D Mode)

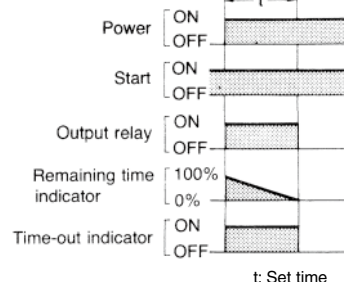


Interval Operation (E Mode)

Signal Start

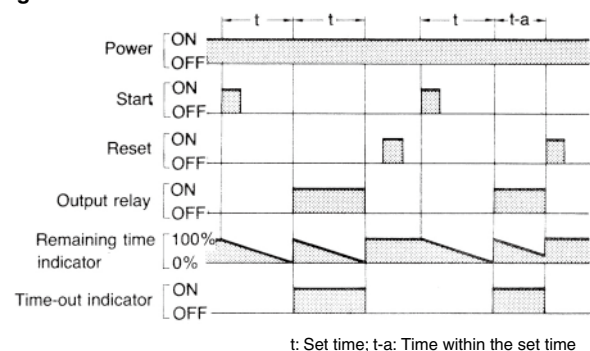


- Note:** The minimum signal input time is 0.05 s.



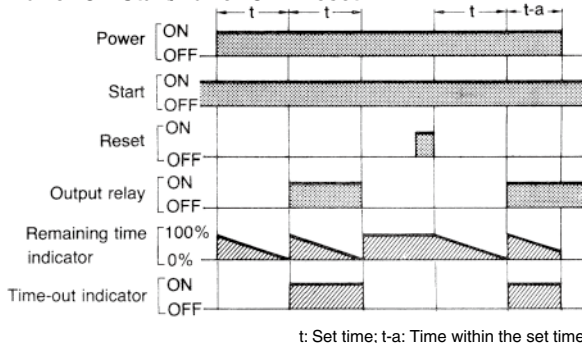
One-shot and Flicker Operation (F Mode)

Signal Start



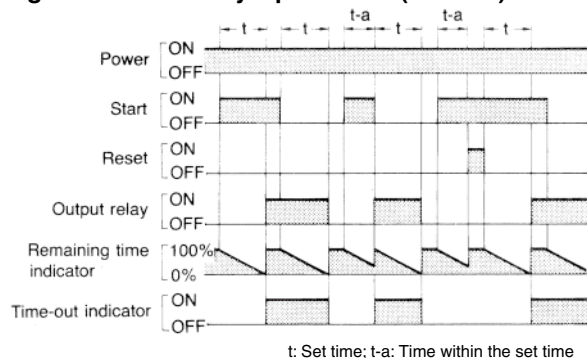
- Note:** The minimum signal input time is 0.05 s.

Power-ON Start/Power-OFF Reset



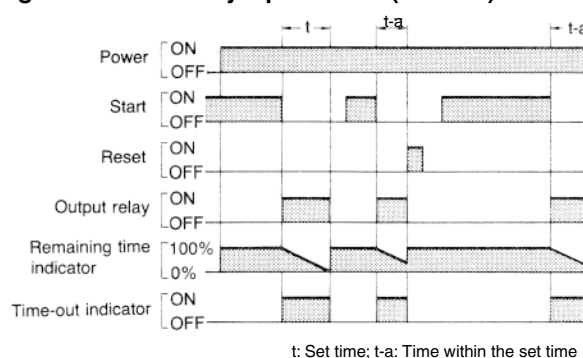
- Note:** The minimum signal input time is 0.05 s.

Signal ON/OFF-delay Operation 2 (G Mode)

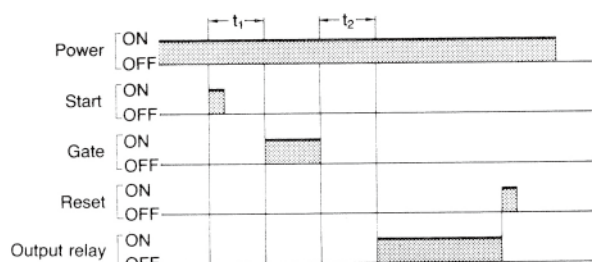


- Note:** 1. The minimum signal input time is 0.05 s.
2. Operation 2 refers to the version in which the output relay does not operate when the Start signal is ON.

Signal ON/OFF-delay Operation 2 (H Mode)



How to Use Gate Signal Input

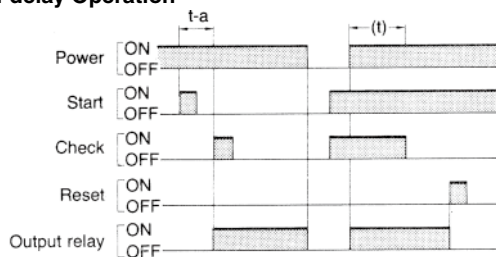


- Note:**
1. This timing chart indicates the gate input in operation mode A (ON-delay operation).
 2. The set time is the sum of t_1 and t_2 .

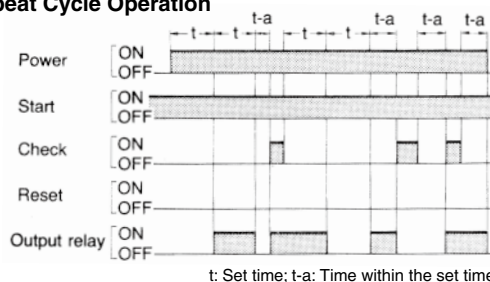
How to Use Check Signal Input

If a check signal is input to the timer during the lapse of a set time, the remaining set time will become 0 and the timer will enter the next control state. Also, while a check signal is being input, the elapsed time measurement of the set time is not performed.

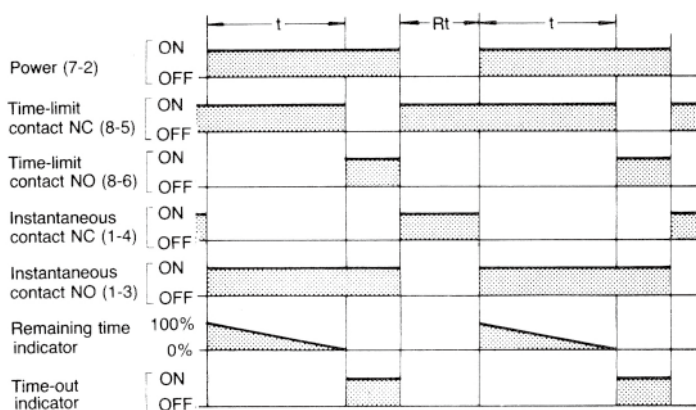
ON-delay Operation



Repeat Cycle Operation



H3CA-8H

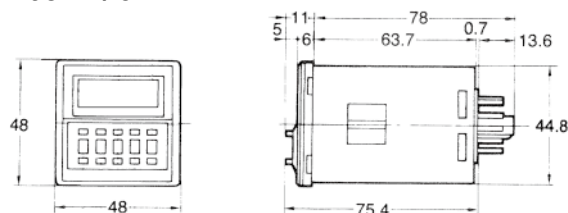


Dimensions

Note: All units are in millimeters unless otherwise indicated.

Timers

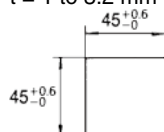
H3CA-A/-8H



Panel Cutouts

When mounting a single unit

$t = 1 \text{ to } 3.2 \text{ mm}$



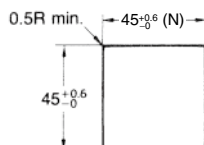
Horizontally connecting n units

No front cover:

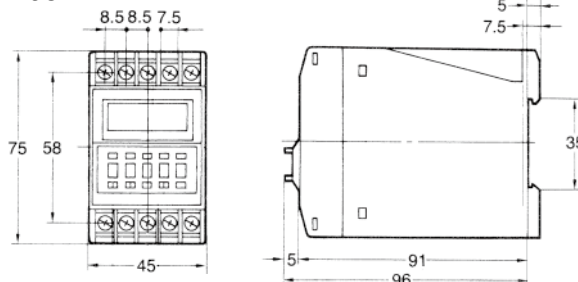
$$N = (48n - 2.5)^{+1/-0}$$

With front cover:

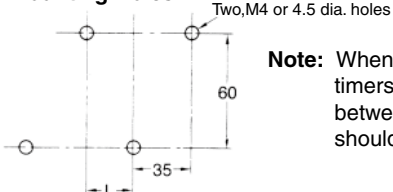
$$N = \{48n - 2.5 + (n - 1) \times 3\}^{+1/-0}$$



H3CA-FA



Mounting Holes

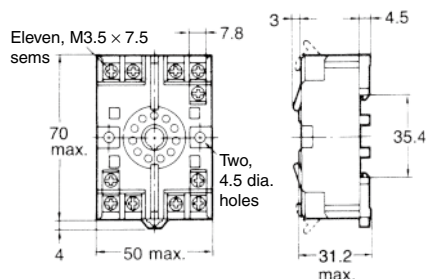


Note: When mounting two or more timers in line, dimension L between two adjacent timers should be 10 mm min.

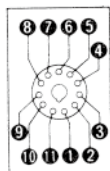
Accessories (Order Separately)

Track Mounted Front Connecting Socket

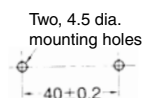
P2CF-11



Terminal Arrangement (Top View)

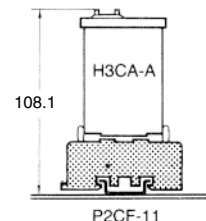


Mounting Holes

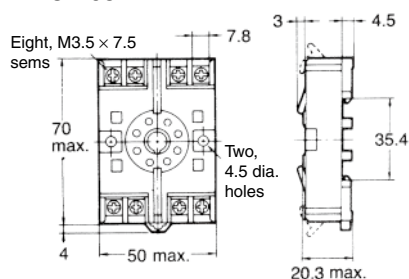


Note: P2CF-11 can be used as a front connecting socket.

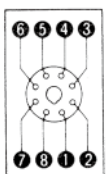
Mounting Height of Timer with Socket



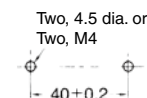
P2CF-08



Terminal Arrangement (Top View)

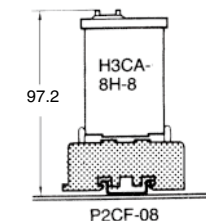


Mounting Holes



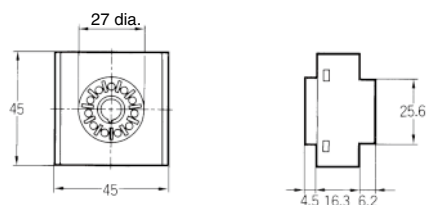
Note: P2CF-08 can be used as a front connecting socket.

Mounting Height of Timer with Socket

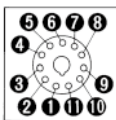


Back Connecting Socket

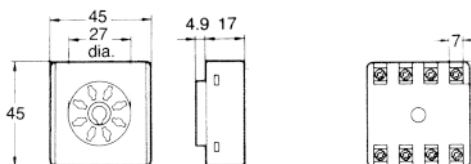
P3GA-11



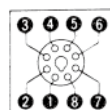
Terminal Arrangement
(Bottom View)



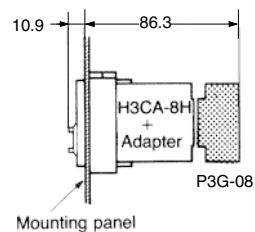
P3G-08



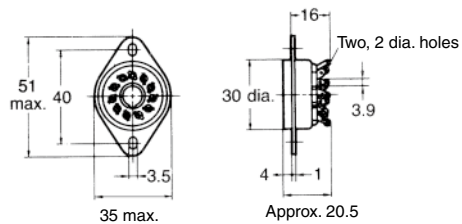
Terminal Arrangement
(Bottom View)



Mounting Height of
Timer with Socket



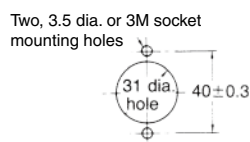
PL11



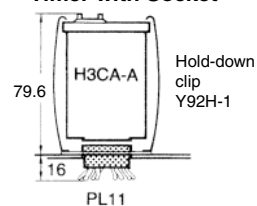
Terminal Arrangement
(Bottom View)



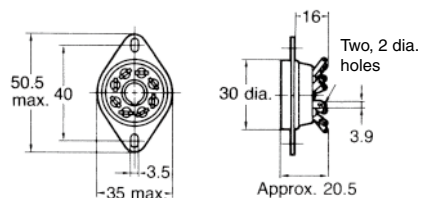
Mounting Holes



Mounting Height of
Timer with Socket



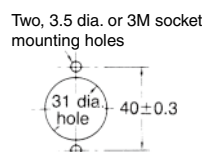
PL08



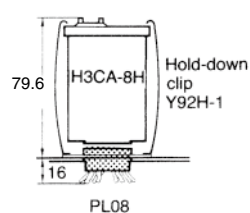
Terminal Arrangement
(Bottom View)



Mounting Holes

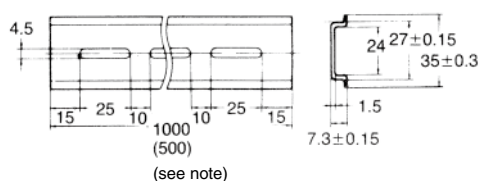


Mounting Height of
Timer with Socket



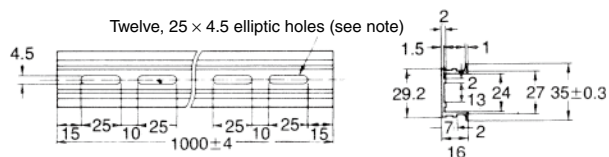
Mounting Track (Meets DIN EN50022)

PFP-100N/PFP-50N



Note: This dimension applied to PFP-50N.

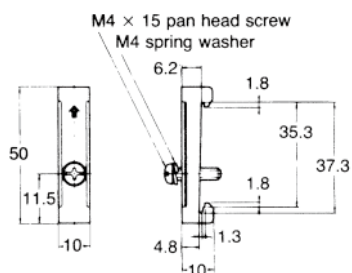
PFP-100N2



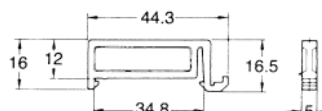
Note: A total of 12-25 × 4.5 elliptic holes are provided with 6 holes cut from each rail end at a pitch of 10 mm between holes.

End Plate

PFP-M

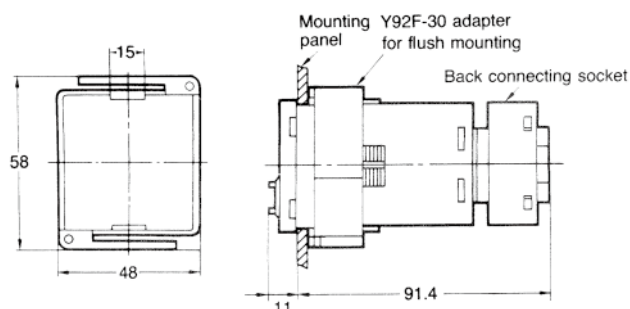


PFP-S



Adapter for Flush Mounting

Y92F-30



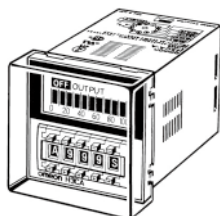
Note: Pay attention to the orientation of the adapter when mounting two or more timers in a vertical or horizontal line.

Protective Cover

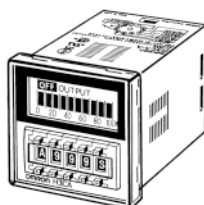
Y92A-48B/Y92A-48D

The protective cover protects the front panel, particularly the time setting section, against dust, dirt and water drip, as well as prevents the set value from being altered due to accidental contact with the time setting knob.

Y92A-48B Hard Plastic Cover



Y92A-48D Soft PVC Cover

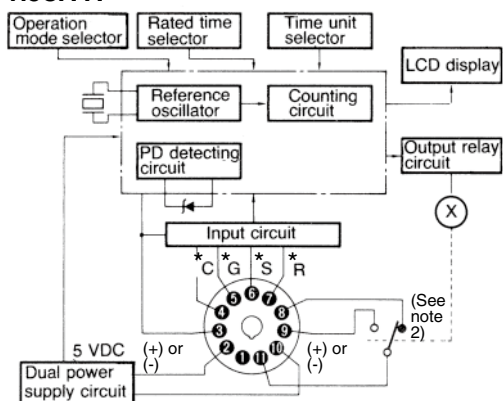


Note: The Y92A-48B Protective Cover is made of a hard plastic and therefore, must be removed to change the timer set value. However, since the Y92A-48D Protective Cover is made of PVC, the set value can be altered by pressing on the surface of the cover. It may be, however, difficult to make setting changes of the Timer with the Y92A-48B Protective Cover attached, which must be taken into consideration before using the Y92A-48B Protective Cover. When attaching the Y92A-48A to the Timer to be panel-mounted, use the Y92F-30 Mounting Adapter along with the Timer. The Protective Cover cannot be, however, used for the H3CA-FA Series.

Installation

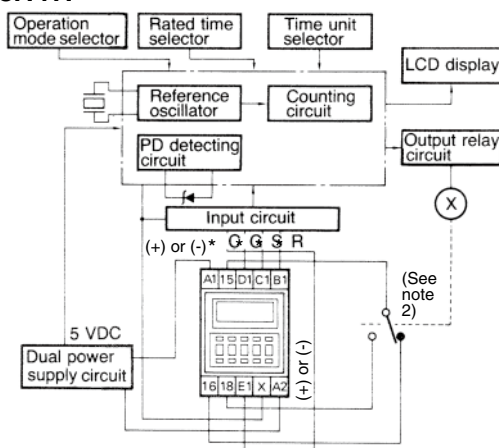
Terminal Arrangement

H3CA-A



- Note:** 1. *C: Check: 3-4
 *G: Gate: 3-5
 *S: Start: 3-6
 *R: Reset: 3-7
2. Conventional time-limit contacts are symbolized as . However, the contacts of H3CA-A are symbolized as because timer has 8 operation modes.

H3CA-FA

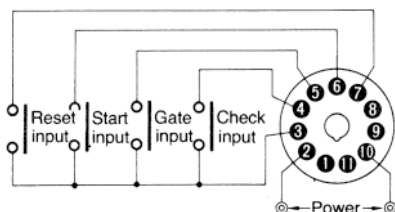


- Note:** 1. *C: Check: X-E1
 *G: Gate: X-D1
 *S: Start: X-C1
 *R: Reset: X-B1
2. Conventional time-limit contacts are symbolized as . However, the contacts of H3CA-FA are symbolized as because timer has 8 operation modes.

Input Connections

Signal Inputs

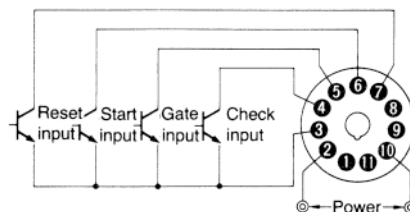
Connect the start input contact between terminals ③ and ⑥, the reset input contact between terminals ③ and ⑦, the gate input contact between terminals ③ and ⑤, and the check input contact between terminals ③ and ④.



For each signal input contact, use a gold-plated contacts with high reliability. Be sure that these input signals satisfy the following requirements: a resistance of 1 k Ω (max.) and a residual voltage of 1 V (max.) when the contact is made.

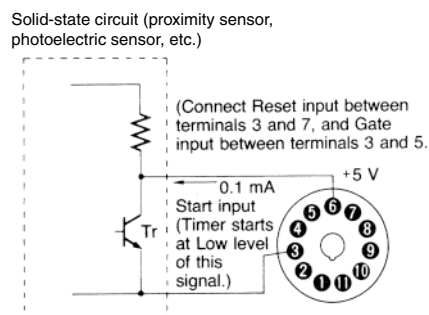
Solid-state Signal Inputs

Connect the start input transistor between terminals ③ and ⑥, the reset input transistor between terminals ③ and ⑦, the gate input transistor between terminals ③ and ⑤, and the check input transistor between terminals ③ and ④.



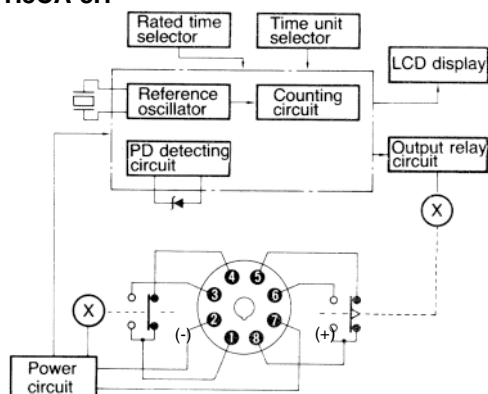
For signal input, use an open collector type transistor with characteristics: $V_{CE0} = 20$ V min., $V_{CE(S)} = 1$ V max., $I_C = 50$ mA min. and $I_{CBO} = 0.5$ μ A max. In addition, be sure that the input signals satisfy the following requirements: a resistance of 1 k Ω (max.) and a residual voltage of 1 V (max.) when the transistor is ON, and a resistance of 200 k Ω (min.) when the transistor is OFF.

From a solid-state circuit (proximity sensor, photoelectric sensor, or the like) with rated power supply voltage ranging from 6 to 30 VDC, input signals can also be applied by other than an open collector type transistor as shown in the following diagram. The input signal from a solid-state circuit is applied when output transistor Tr turns ON. In terms of signal voltage, the signal is input when it goes from a high to low level. Again, the residual voltage should be 1 V (max.) when the transistor is ON. As the current output from the timer to Tr is approximately 0.1 mA, this connection is possible provided the residual voltage is kept to a maximum of 1 V.

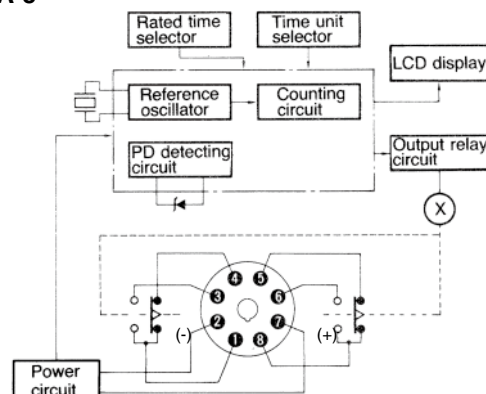


Note: Except for the power supply circuitry, avoid the laying of input signal wires in parallel or in the same conduit with high-tension or power lines. It is recommended to use shielded wires or wiring with independent metal conduits for the shortest possible distance.

H3CA-8H



H3CA-8

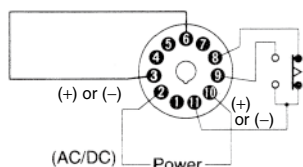
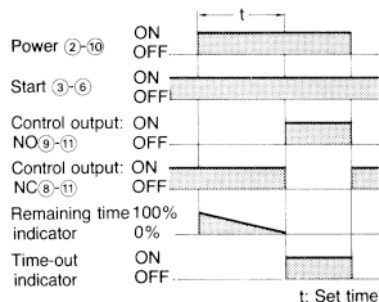


Application Examples

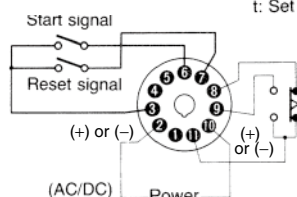
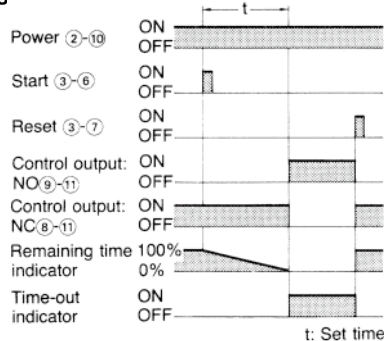
Standard type H3CA is used for the following application examples. In the schematic diagrams, each thick line indicates the wiring necessary for selecting the desired operation mode.

ON-delay Operation (A Mode)

Power-ON Start/Power-OFF Reset

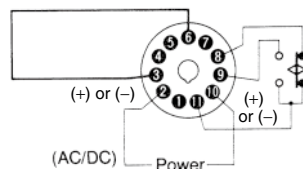
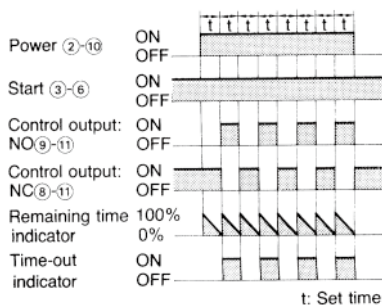


Signal Start/Signal Reset

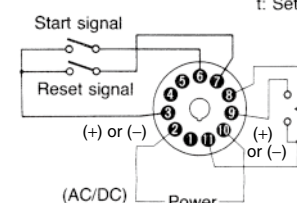
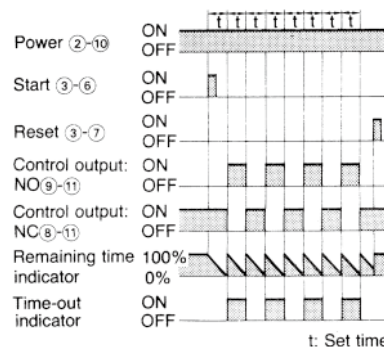


Flicker Operation (B Mode)

Power-ON Start/Power-OFF Reset

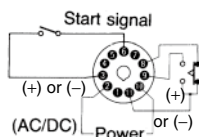
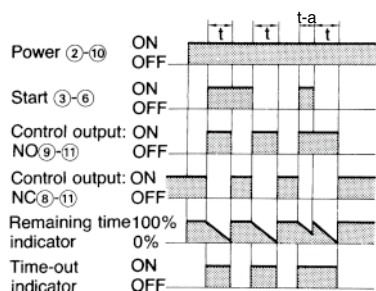


Signal Start/Signal Reset



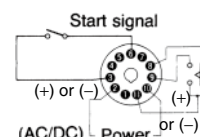
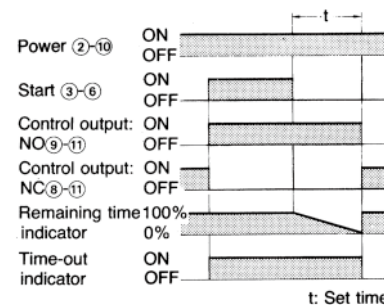
Signal ON/OFF-delay Operation 1 (C Mode)

Signal ON/OFF-start/Instantaneous Operation/ Time-limit Reset



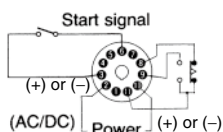
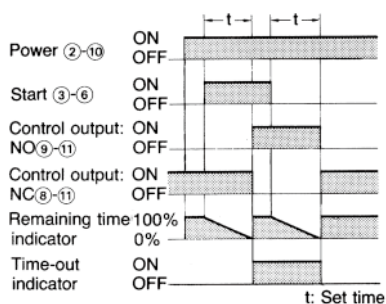
Signal OFF-delay Operation 1 (D Mode)

Signal Start/Instantaneous Operation/Time-limit Reset

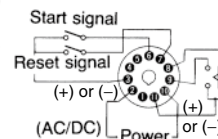
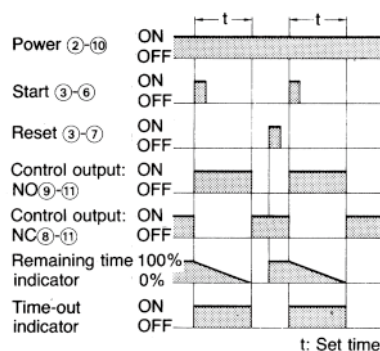


Signal ON/OFF-delay Operation 2 (G Mode)

Signal ON/OFF-start/Instantaneous Operation/
Time-limit Reset

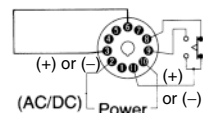
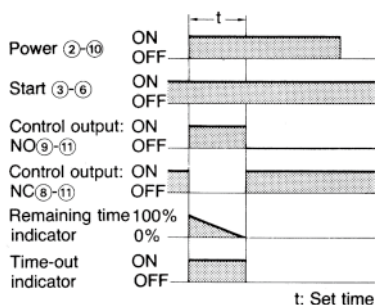


Signal Start/Signal Reset

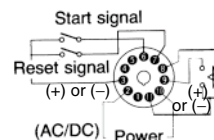
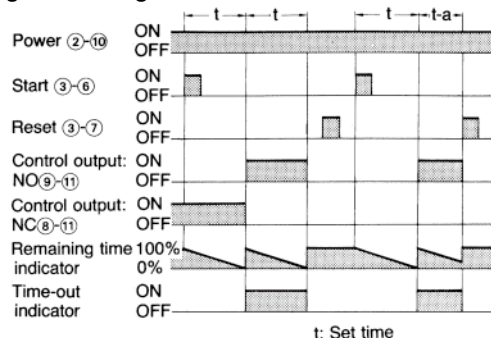


Interval Operation (E Mode)

Power-ON Start/Power-OFF Reset

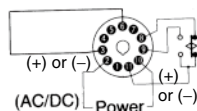
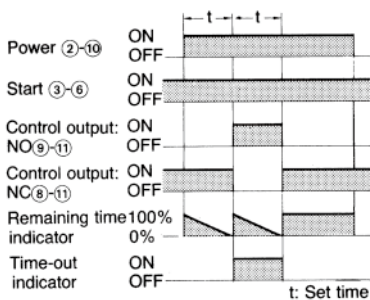


Signal Start/Signal Reset



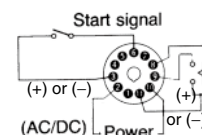
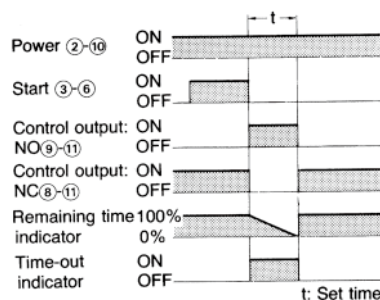
One-shot and Flicker Operation (F Mode)

Power-ON Start/Power-OFF Reset



Signal OFF-delay Operation 2 (H Mode)

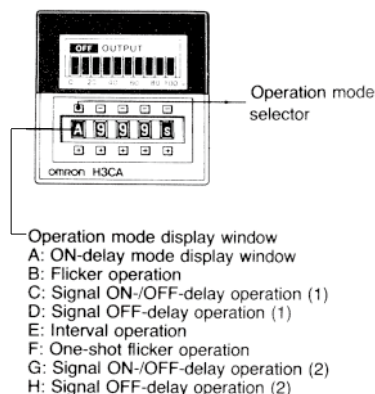
Signal/Instantaneous Operation/Time-limit Reset



Safety Precautions

How to Change Operation Mode

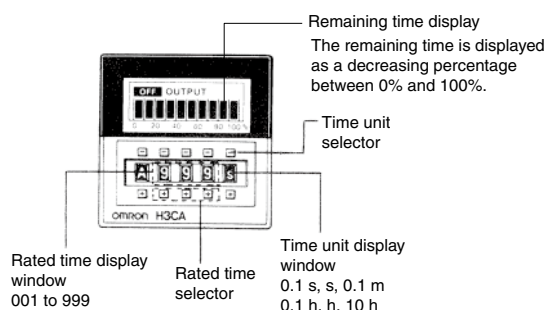
Operate the pushbuttons of the thumbwheel switch, located at the leftmost position on the front panel to set the operation mode. Eight operation modes (A, B, C, D, E, F, G, and H) are selectable and the selected operation mode is displayed in the operation mode display window.



Note: The operation mode is fixed to "A" for H3CA-8H.

How to Change Time Unit and Rated Time

Operate the pushbuttons of the rightmost thumbwheel switch to select the desired time unit. Seven time units (0.1 s, s, 0.1 m, m, 0.1 h, h, or 10 h) are selectable and the selected time unit is displayed in the time unit display window. The desired rated time is specified by operating the three thumbwheel switches in the middle of the front panel. The range of rated time is 001 to 999 for each unit.



Time Unit and Rated Time

Time unit	Rated time
0.1 s	0.1 to 99.9 s
s	1 to 999 s
0.1 m	0.1 to 99.9 m
m	1 to 999 m
0.1 h	0.1 to 99.9 h
h	1 to 999 h
10 h	10 to 9,990 h

CAUTION

- Do not change the time unit, rated time, or operation mode 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 the timer unit, rated time or operation mode.
- Note that output will be generated in C, D, E, G, or H mode even if the rated time is set to 000. No output will be generated in A, B, or F mode.

Connecting the Operating Power Supply

The H3CA-8□ contains a capacitor-drop power circuit. Use a sinusoidal power supply with a commercial frequency. Do not use power supplies with a high frequency component (such as inverter power supplies) for Timers with 100 to 240-VAC specifications. Using these power supplies can damage internal circuits.

The power supply connections to the H3CA-A and H3CA-FA can be made without regard to polarity for both AC and DC power supplies; just connect to the specified terminals (2 and 10, or A1 and A2). When connecting a DC power supply to the H3CA-8 or H3CA-8H, however, the polarity must be connected as indicated.

Although there is a wide range of power connectable to the H3CA-A and H3CA-FA, be sure that there is no inductive voltage or residual voltage applied to the timer power supply terminals (2 and 10, or A1 and A2) when the power switch is turned OFF. (Inductive voltage can be generated in the power supply line if it is placed in parallel with high-voltage or power lines.)

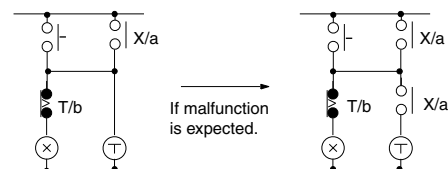
A DC power supply can be connected if its ripple factor is 20% or less and the mean voltage is within the rated operating voltage range of the Timer.

Connect the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value at once or the Timer may not be reset or a timer error could result.

H3CA-8 and H3CA-8H Timers with AC specifications are equivalent to capacitor loads. When switching the Timer power supply with an SSR, use an SSR with a withstand voltage of twice the power supply voltage.

Since the H3CA-8 and H3CA-8H Timers of AC specifications externally discharges a part of internal energy when the power is turned OFF, it may malfunction if an extremely sensitive relay is used with the following sequence circuit.

If such a malfunction occurs, change the circuit configuration as shown below on the right side.

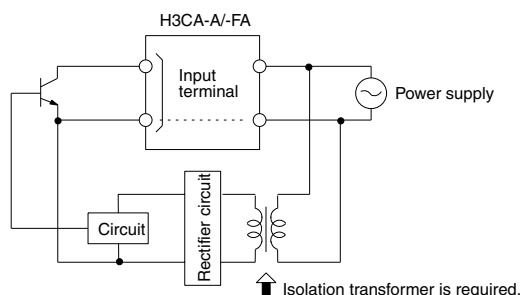


Input/Output

The operation of the output contacts varies with the operation specifications. Before making connections, check the operation specifications and operating conditions using the application examples provided.

The H3CA-A and H3CA-FA do not use transformers. Simultaneous inputting power from two or more power supplies to separate timers or counters from a single input contact or transistor is not possible.

For the power supply of an input device, use an isolating transformer, of which the primary and secondary windings are mutually isolated and the secondary winding is not grounded.



A transformer is not used in the power supplies for the H3CA-A and H3CA-FA. You can therefore receive an electrical shock by touching the input terminals when the power supply voltage is being applied. Take adequate precautions to protect against electrical shock.

Inputs to input signal terminals are made by shorting the individual input terminals to the common terminal (terminal 3 for the H3CA-A or terminal (X) for the H3CA-FA). Internal circuits may be damaged if connections are made to any other terminals or if voltages are applied.

If contacts are used to short the terminals, they will be switching a low voltage (approximately 5 VDC) and current (approximately 100 μ A). You must therefore use high-reliability contacts with a contact resistance of 1 k Ω or less when shorted and residual voltage of 1 V maximum when shorted.

The reset input will take priority if both the set and reset inputs are turned ON simultaneously.

Others

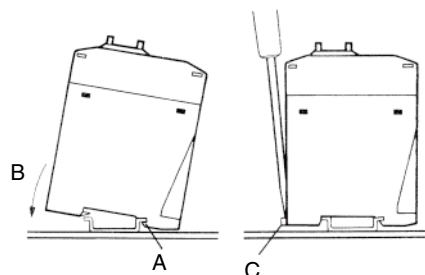
Holding relays are used for outputs on the H3CA-A Series. Dropping the Unit or otherwise subjecting it to shock can cause the relay to reverse or to move to the center position.

How to Mount the Timer on Mounting Track

When mounting a H3CA-FA Timer on a socket mounting track, observe the following procedures:

Mounting

First hook portion A of the timer to an edge of the track and then depress the timer in direction B.



Dismounting

Pull out portion C with a round-blade screwdriver and remove the timer from the mounting track.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

In the interest of product improvement, specifications are subject to change without notice.

Safety Precautions for All Timers

Refer to the *Safety Precautions* for individual Timers for precautions specific to each Timer.

⚠ WARNING

The following Timers contain lithium batteries that are not explosion proof.



1. Timers with Built-in Batteries: H5L
The Timer contains a lithium battery, which may occasionally ignite or rupture. Do not disassemble, deform under pressure, heat to 100°C or higher, or incinerate the Timer.
2. Timers with Replaceable Batteries: Y92S-20 (for H5CN-M)
The battery may occasionally rupture, ignite, or leak fluid. Do not short the positive and negative terminals. Do not charge, disassemble, deform under pressure, or throw the battery into a fire. If a non-specified battery is used, the battery may leak fluid or rupture, occasionally resulting in equipment failure or minor injury. Use only the specified battery.

⚠ CAUTION

The following Timers contain lithium batteries that are explosion proof.



Timers with Built-in Batteries: H5BR, H5AN-4DM, H5S, H5F, and H4KV

The Timer contains a lithium battery, which may occasionally ignite or rupture. Do not disassemble, deform under pressure, heat to 100°C or higher, or incinerate the Timer.

■ Precautions for Safe Use

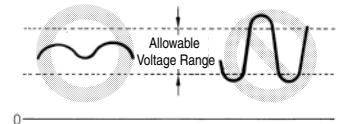
Operating Environment

- Use the Timer within the ratings specified for ambient operating temperature and ambient operating humidity for each model.
- Store the Timer with the specified temperature range for each model. If the Timer has been stored at a temperature of less than -10°C, allow the Timer to stand at room temperature for at least 3 hours before using it.
- Use the Timer within the performance specified for water and oil exposure for each model.
- Do not use the Timer in locations subject to shock and vibration. Long-term usage in such locations may damage the Timer due to stress.
Magnetic contactors generate a shock of 1,000 to 2,000 m/s² when switching a load. When mounting to DIN Track, separate magnetic contactors from the Timer so that the Timer is not subjected to vibration and shock. Use anti-vibration rubber.
- Do not use the Timer in locations subject to excessive dust, corrosive gases, or direct sunlight.
- Do not use organic solvents (such as paint thinner or benzene), strong alkalis, or strong acids because they will damage the external finish of the Timer.
- Separate the input devices, input wiring, and Timer as far as possible from sources of noise and power lines carrying noise.
- When using the Timer in environments subject to large amounts of static electricity (e.g., pipes carrying molding materials, powders, or fluid materials), separate the Timer as far as possible from the sources of static electricity.
- Do not remove the external case from the Timer.
- Do not use the Timer in locations where condensation may occur due to high humidity or sudden temperature changes. Condensation inside the Timer may result in malfunction or damage to Timer elements.
- The life of internal parts may be reduced if Timers are mounted in close proximity to each other.
- Resin and rubber parts (e.g., rubber packing) may deteriorate, shrink, or harden depending on the operating environment (e.g., subjected to corrosive gases, ultraviolet light, or high temperatures). We recommend periodic inspection and replacement.

- Normal operation may not be possible in locations subject to sulfidizing gas, such as in sewer systems or waste incinerators. OMRON does not market any Timers or other control devices for operation in atmospheres containing sulfidizing gas. Seal the Timer so that sulfidizing gas will not enter it. If sealing is not possible, OMRON does provide special Timers with improved resistance to sulfidizing gas. Ask your OMRON representative for details.

Power Supply

- Be sure that the voltage applied is within the specified range, otherwise the internal elements of the Timer may be damaged.
- Install a switch or circuit breaker that allows the operator to immediately turn OFF the power, and label it to clearly indicate its function.
- Maintain voltage fluctuations in the power supply within the specified range.



- Use a commercial power supply for the power supply voltage input to models with AC inputs. Inverters with an output frequency of 50/60 Hz are available, but the rise in the internal temperature of the Timer may result in ignition or burning. Do not use an inverter output for the power supply of the Timer.
- The Timers listed below cannot be directly turned ON and OFF by using an AC 2-wire proximity sensor to turn the Timer's power supply ON and OFF. Use the following countermeasure when using an AC 2-wire proximity sensor with the Timer. (The power supply circuit in the Timer uses half-wave rectification. Only a half AC wave is supplied to the proximity sensor, which may cause operation to be unstable.)

Applicable Models

H3Y, H3YN, H3RN, H3CA-8, RD2P, and H3CR(-A, -A8, -AP, -F, and -G)

Countermeasure

- Wire through a relay and use the relay contacts to turn the power supply ON and OFF.
Confirm the stability of operation after making the connections.
- Install protective measures (such as earth leakage breakers, wiring breakers, or fuses) on the power supply side according to any applicable laws or regulations.

Correctly Handling Input Signals

Malfunction due to noise may occur if input wiring is placed in the same duct or conduit as power lines or high-voltage lines. Separate input wiring from power lines and wire them in a separate system. Also, use shielded cables, use metal conduits, and keep wiring distances as short as possible.

Timers with Relays

- Do not connect a load that exceeds contact ratings, such as the switching capacity (contact voltage or contact current). Insulation faults, contact welding, contact faults, and other failures to achieve specified performance may occur and the relay may be damaged or may burn.
- Continued use with deteriorated performance may ultimately result in insulation breakdown between circuits or relay burning. The life of the built-in relay is greatly affected by switching conditions. Before using the Timer, test operation under actual application conditions and confirm that the switching frequency presents no problems in performance.
- Electrical life depends on the type of load, switching frequency, and ambient environment. Observe the following precautions when using the Timer. When switching a DC load, contact transfer may cause the contacts to stick or may cause contact failure. Confirm applicability and consider using a surge absorbing element. When switching at high frequencies, heat generated by arcing may cause contacts to melt or may cause metal corrosion. Consider connecting an arc absorbing element, reducing the switching frequency, or lowering the humidity.
- The surge current depends on the type of load, which also affects contact switching frequency and the number of operations. Check the rated current and the surge current, and design the circuits with sufficient margin.

Resistive load	Solenoid load	Motor load	Incandescent lamp load
Rated current	10 to 20 times the rated current	5 to 10 times the rated current	10 to 20 times the rated current

Sodium light loads	Capacitor loads	Transformer loads	Mercury light loads
1 to 3 times the rated load	20 to 40 times the rated load	5 to 15 times the rated load	1 to 3 times the rated load

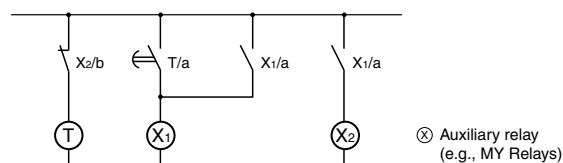
- Arcing when switching and relay heating may result in ignition or explosion. Do not use the Timer in atmospheres subject to inflammable or explosive gases.
- Contact faults may occur. Do not use the Timer in atmospheres subject to sulfidizing gas, chloride gas, or silicon gas.
- The switching capacity for DC voltage loads is lower than that for AC voltage loads.

Timers with Non-contact Outputs

- Short faults or open faults may occur due to destruction of the output element. Do not use the Timer for a load that exceeds the rated output current.
- Short faults or open faults may occur due to destruction of the output element from reverse electromotive force. When using the Timer for a DC inductive load, always connect a diode as a countermeasure against reverse electromotive force.

Other Precautions

- Confirm that you have the correct model before using it.
- Be sure that all terminals are wired correctly.
- Always test the output status with a tester before using a Timer with a built-in keep relay (e.g., the H3CR-H and H3DE-H). Shock resulting from dropping the Timer during transport or handling may cause the output contacts to reverse or to be in a neutral status.
- Leaving the Timer with outputs ON at a high temperature for a long time may hasten the degradation of internal parts (such as electrolytic capacitors). Use the Timer in combination with relays and avoid leaving the Timer with the output turned ON for an extended period of time (e.g., for more than a month). Reference Example (Use the Timer as shown below.)



- Be sure that only a qualified worker (e.g., an electrical engineer) performs electrical work for the Timer.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

In the interest of product improvement, specifications are subject to change without notice.

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Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

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- Systems, machines, and equipment that could present a risk to life or property.

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