

## DIN 48 × 48-mm Star-delta Timer



- A wide star-time range (up to 120 seconds) and star-delta transfer time range (up to 1 seconds).



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

## Model Number Structure

### Model Number Legend

H3CR - G 8 □ □ L □ □  
 1 2 3 4 5

#### 1. Classification

G: Star-delta timer

#### 2. Configuration

8: 8-pin socket

#### 3. Outputs

None: Star-delta operation contact

E: Star-delta operation contact and instantaneous contact

#### 4. Dimensions

L: Long-body model

#### 5. Supply Voltage

100-120AC: 100 to 120 VAC

200-240AC: 200 to 240 VAC

**Note:** When your order, specify the power supply voltage.

## Ordering Information

### List of Models

Outputs	Supply voltage	8-pin models
Time-limit contact	100 to 120 VAC	H3CR-G8L 100-120AC
	200 to 240 VAC	H3CR-G8L 200-240AC
Time-limit contact and instantaneous contact	100 to 120 VAC	H3CR-G8EL 100-120AC
	200 to 240 VAC	H3CR-G8EL 200-240AC

**Note:** Specify both the model number and supply voltage when ordering.

Example: H3CR-G8L 100-120AC

Supply voltage

## Accessories (Order Separately)

### ■ Accessories (Order Separately)

#### Adapter, Protective Cover, Setting Ring and Panel Cover

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
		Y92F-70 *1
		Y92F-71 *1
Protective Cover		Y92A-48B *2
Hold-down Clip	For PF085A Socket	Y92H-2
	For PL08 Sockets	Y92H-1
Setting Ring A		Y92S-27 *3
Setting Ring B and C		Y92S-28 *3
Panel Cover	Light gray (5Y7/1)	Y92P-48GL *4
	Black (N1.5)	Y92P-48GB *4

**Note:** Refer to Operation (Common) datasheet for detail.

\*1 The Y92A-48B Protective Cover and the Y92P-48G□ Panel Cover can not be used at the same time with the Y92F-70/-71 Flush Mounting Adapter.

\*2 The Y92A-48B Protective Cover is made from hard plastic. Remove the Protective Cover to change to set value. The Y92F-70/-71 Flush Mounting Adapter and the Y92P-48G□ Panel Cover cannot be used at the same time with Y92A-48B Protective Cover.

\*3 The Y92S-27/-28 Setting Ring cannot be used alone. It must be used together with the Y92P-48G□ Panel Cover.

\*4 The Y92A-48B Protective Cover and the Y92F-70/-71 Flush Mounting Adapter cannot be used at the same time with the Y92P-48G□ Panel Cover.

### Sockets

Timer Pin	Round Sockets		
	Connection	Terminal	Models
8-pin	Front Connecting	DIN track mounting	P2CF-08
		DIN track mounting (Finger-safe type)	P2CF-08-E
		DIN track mounting	PF085A
	Back Connecting	Screw terminal	P3G-08
		Solder terminal	PL08
		Wrapping terminal	PL08-Q
		PCB terminal	PLE08-0

**Note:** 1. The P2CF-08-E has a finger-protection structure. Round crimp terminals cannot be used. Use forked crimp terminals.

2. The P3G-08 Socket can be used together with the Y92A-48G Terminal Cover to implement finger protection.

3. For details, refer to your OMRON website.

### Terminal Cover

Application	Model	Remarks
For back connecting socket	Y92A-48G	For P3G-08 and P3GA-11

**Note:** For details, refer to your OMRON website.

# Specifications

## ■ General

Item	H3CR-G8L	H3CR-G8EL
Functions	Star-delta timer	Star-delta timer with instantaneous output
Pin type	8-pin	
Operating/Reset method	Time-limit operation/Self-reset	
Output type	Time-limit: SPST-NO (star operation circuit) SPST-NO (delta operation circuit)	Time-limit: SPST-NO (star operation circuit) SPST-NO (delta operation circuit) Instantaneous: SPST-NO
Mounting method	DIN track mounting, surface mounting, and flush mounting	
Approved standards	UL508, CSA C22.2 No.14, NK, Lloyds, CCC: GB/T 14048.5 * Conforms to EN61812-1 and IEC60664-1 (VDE0110) 4kV/2. Output category according to EN60947-5-1.	

**Note:** For details, refer to your OMRON website.

\* CCC certification requirements

Recommended fuse	0216005 (250VAC, 5A) manufactured by Littelfuse
Rated operating voltage Ue	AC-15: Ue: 250 VAC, Ie: 5 A
Rated operating current Ie	DC-13: Ue: 30 VDC, Ie: 1.5 A
Rated insulation voltage	250 V
Rated impulse withstand voltage (altitude: 2,000 m max.)	4 kV (at 240 VAC)
Conditional short-circuit current	1000 A

## ■ Time Ranges

Time unit	Star operation time ranges
Scale number (max.)	
6	Set time range 0.5 to 6 s
12	1 to 12 s
60	5 to 60 s
120	10 to 120 s

Star-delta transfer time	Programmable at 0.05 s, 0.1 s, 0.25 s, 0.5 s, 0.75 s, or 1.0 s
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## ■ Ratings

Rated supply voltage (See notes 1 and 2.)	100 to 120 VAC (50/60 Hz), 200 to 240 VAC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-opening time: 0.5 s (See note 3)
Power consumption	100 to 120 VAC: approx. 6 VA (2.6 W) at 120 VAC 200 to 240 VAC: approx. 12 VA (3.0 W) at 240 VAC
Control outputs	Contact output: 5 A at 250 VAC/30 VDC, resistive load ( $\cos\phi = 1$ ) The minimum applicable load is 10mA at 5VDC (P reference value). Contact materials : Ag-alloy

**Note: 1.** Do not use an inverter output as the power supply. Refer to your OMRON website for details.

**2.** Refer to your OMRON website when using the Timer together with a 2-wire AC proximity sensor.

**3.** This is longer than the minimum time for H3CR-A/H3CR-F. Be careful when using an instantaneous contact for the self-holding circuit.

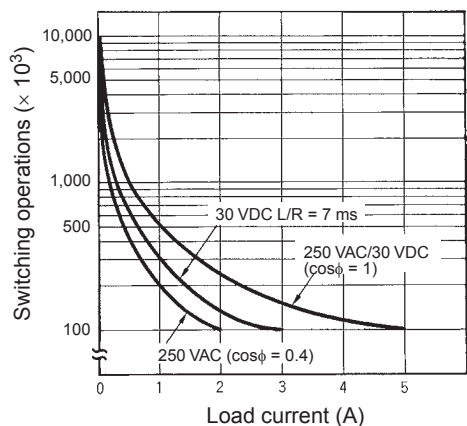
# H3CR-G

## ■ Characteristics

<b>Accuracy of operating time</b>	±0.2% FS max.
<b>Setting error</b>	±5% FS ±50 ms max.
<b>Accuracy of Star-delta transfer time</b>	±25% FS + 5 ms max.
<b>Reset voltage</b>	10% max. of rated voltage
<b>Influence of voltage</b>	±0.2% FS max.
<b>Influence of temperature</b>	±1% FS max.
<b>Insulation resistance</b>	100 MΩ min. (at 500 VDC)
<b>Dielectric strength</b>	2,000 VAC, 50/60 Hz for 1 min (between current-carrying metal parts and exposed non-current-carrying metal parts) 2,000 VAC, 50/60 Hz for 1 min (between control output terminals and operating circuit) 2,000 VAC, 50/60 Hz for 1 min (between contacts of different polarities) 1,000 VAC, 50/60 Hz for 1 min (between contacts not located next to each other)
<b>Impulse withstand voltage</b>	5 kV (between power terminals) 5 kV (between current-carrying terminal and exposed non-current-carrying metal parts)
<b>Noise immunity</b>	±1.5 kV (between power terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
<b>Static immunity</b>	Malfunction: 8 kV Destruction: 15 kV
<b>Vibration resistance</b>	Destruction: 10 to 55 Hz with 0.75-mm single amplitude for 2 hrs each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude for 10 min each in three directions
<b>Shock resistance</b>	Destruction: 980 m/s <sup>2</sup> three times each in six directions Malfunction: 294 m/s <sup>2</sup> three times each in six directions
<b>Ambient temperature</b>	Operating: -10°C to 55°C (with no icing) Storage: -25°C to 65°C (with no icing)
<b>Ambient humidity</b>	Operating: 35% to 85%
<b>Life expectancy</b>	Mechanical: 20 million operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 1,800 operations/h) (See note)
<b>EMC</b>	(EMI) EN61812-1 Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A (EMS) EN61812-1 Immunity ESD: IEC61000-4-2 Immunity RF-interference: IEC61000-4-3 Immunity Burst: IEC61000-4-4 Immunity Surge: IEC61000-4-5 Immunity Conducted Disturbance: IEC61000-4-6 Immunity Voltage Dip/Interruption: IEC61000-4-11
<b>Case color</b>	Light Gray (Munsell 5Y7/1)
<b>Degree of protection</b>	IP40 (panel surface)
<b>Weight</b>	H3CR-G8L: approx. 110 g; H3CR-G8EL: approx. 130 g

**Note:** Refer to the *Life-test Curve (Reference)*.

## Life-test Curve (Reference)

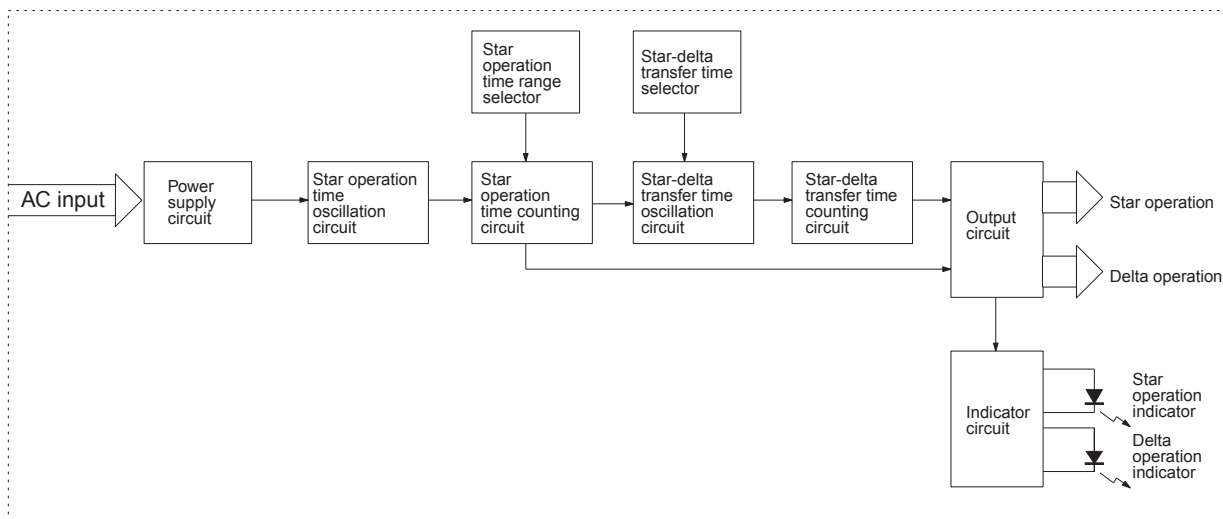


Reference: A maximum current of 0.15 A can be switched at 125 VDC ( $\cos\phi = 1$ ) and a maximum current of 0.1A can be switched at 125V DC and L/R = 7ms. In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 10 mA at 5 VDC (failure level: P).

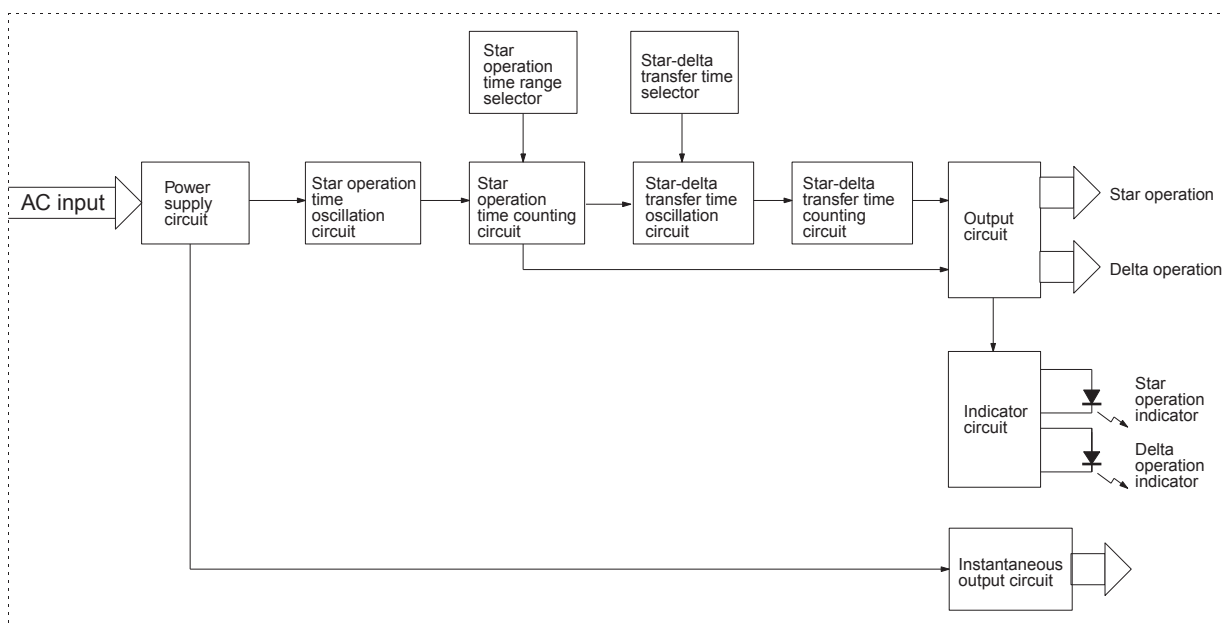
## Connections

### Block Diagrams

H3CR-G8L



H3CR-G8EL



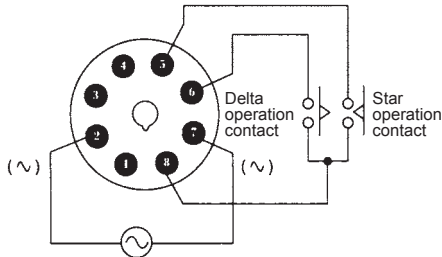
# H3CR-G

## I/O Functions

<b>Inputs</b>	---	
<b>Outputs</b>	<b>Control output</b>	If the time reaches the value set with the time setting knob, the star operation output will be turned OFF and there will be delta operation output after the set star-delta transfer time has elapsed.

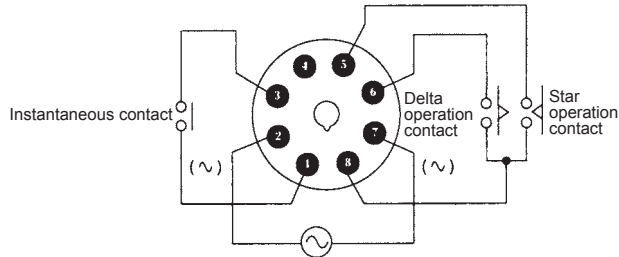
## Terminal Arrangement

H3CR-G8L



**Note:** Leave terminals 1, 3, and 4 open. Do not use them as relay terminals.

H3CR-G8EL

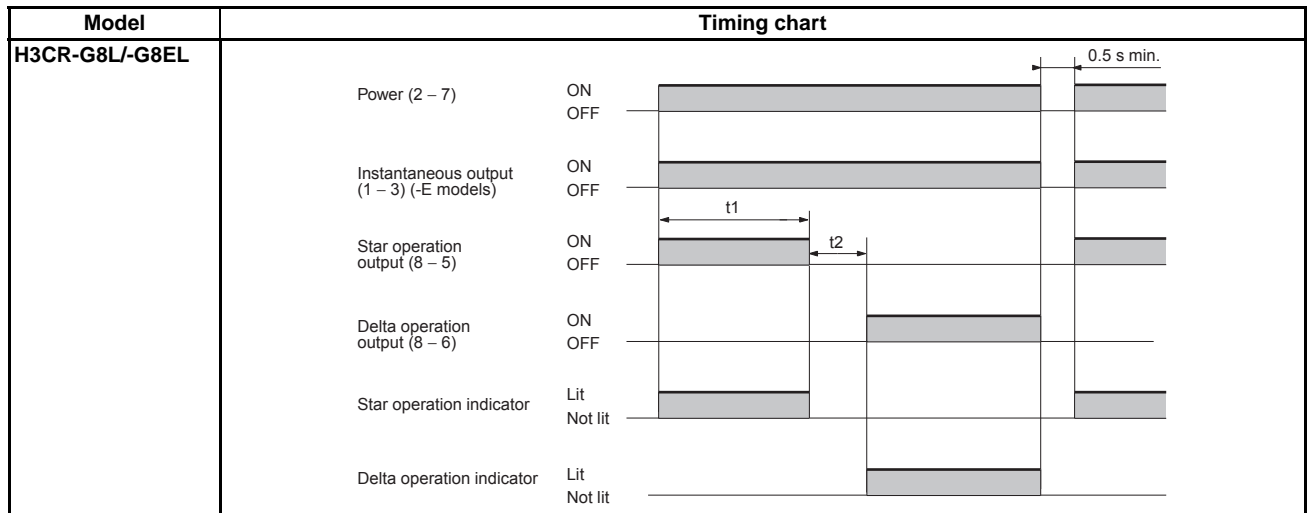


**Note:** Leave terminal 4 open. Do not use them as relay terminals.

## Operation

### Timing Chart

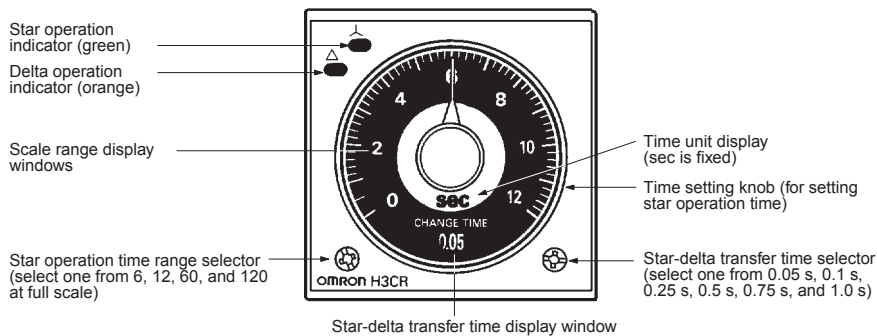
- t1: Star operation time setting
- t2: Star-delta transfer time



## Nomenclature

Scale range display windows changes as below by turning the Time range selector clockwise.

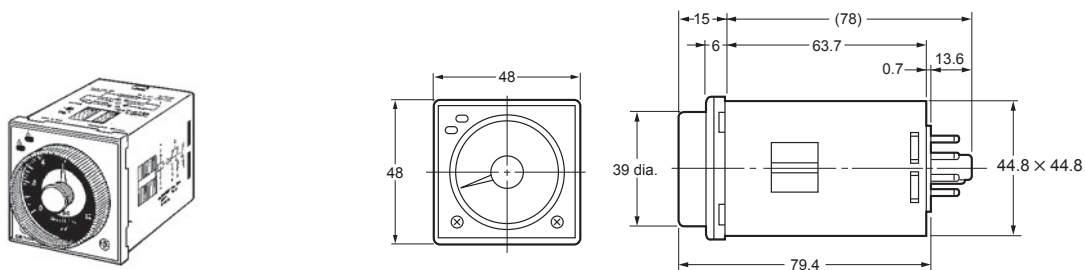
0	1	2	3	4	5	6
0	2	4	6	8	10	12
0	10	20	30	40	50	60
0	20	40	60	80	100	120



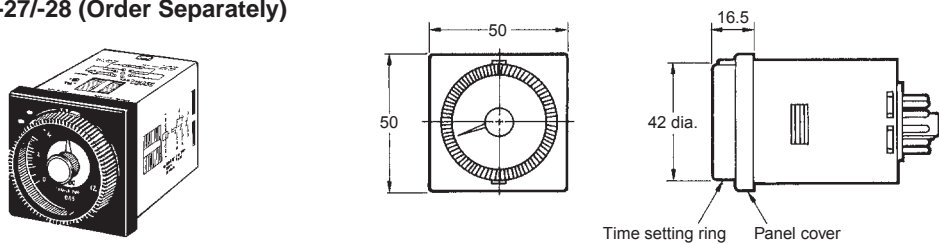
# Dimensions

**Note:** All units are in millimeters unless otherwise indicated.

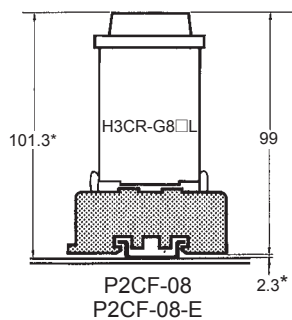
## Dimension of Timer main unit



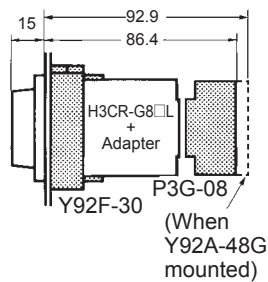
## Dimensions with Set Ring and Panel Cover Y92S-27/-28 (Order Separately)



## Dimensions with Front Connecting Socket P2CF-08-□



## Dimensions with Back Connecting Socket P3G-08



**Note:** There are no restrictions to the mounting direction.  
\* These dimensions vary with the kind of DIN track (reference value).

## H3CR-G

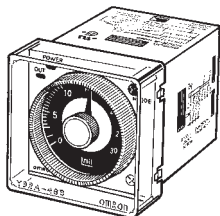
### ■ Accessories (Order Separately)

#### Protective Cover

##### Y92A-48B

To use the Protective cover with a flush mounting, use the Y92F-30 flush mounting adaptor.

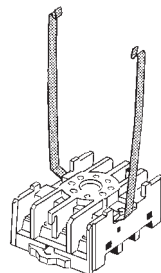
This Protective cover cannot be used together with the Y92F-70/-71 flush mounting adaptor or the panel cover.



#### Hold-down Clip

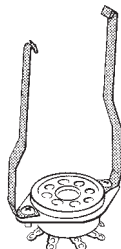
##### Y92H-2

The Y92H-2 Hold-down Clip is attached to the PF085A socket.



##### Y92H-1

Y92H-1 Hold-down Clip is attached with screws together with the PL08 socket.



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.



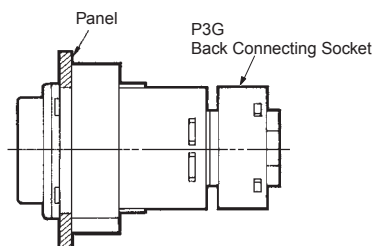
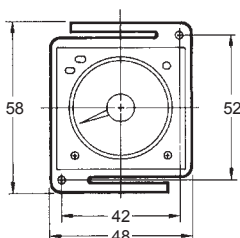
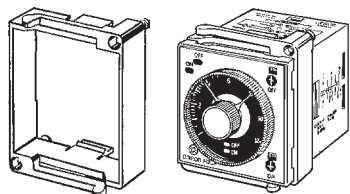
# Accessories (Order Separately) (Common)

**Note:** The undermentioned is common for all H3CR models.

**Note:** All units are in millimeters unless otherwise indicated.

## Flush Mounting Adaptor

### Y92F-30



**Note1:** The adapters for two or more timers mounted in a vertical line are different in orientation from those mounted in a horizontal line.

N can be obtained as follows (n: the number of H3CR models arranged side by side)

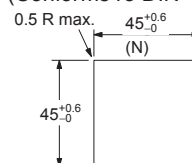
Without a Cover:  $N = (48n - 2.5)^{+1/-0}$

With the Protective Cover:  $N = (51n - 5.5)^{+1/-0}$

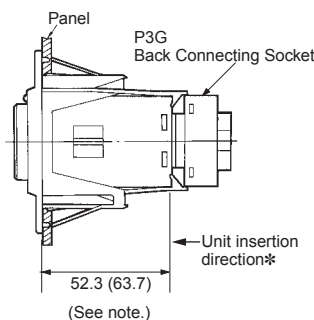
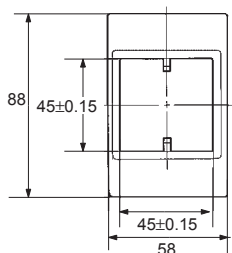
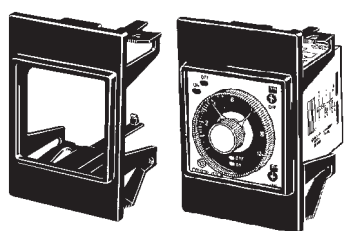
With the Panel Cover:  $N = (50n - 4.5)^{+1/-0}$

**Note2:** The applicable thickness of the mounting panel must be 1 to 5 mm.

### Panel Cutout (Conforms to DIN 43700)

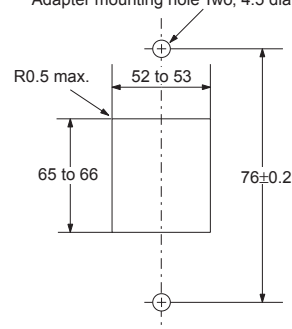


### Y92F-70/-73



### Panel Cutout

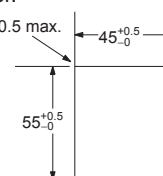
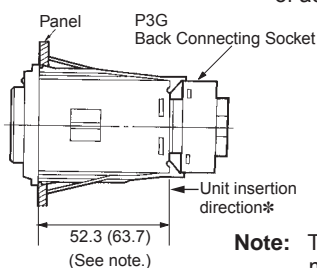
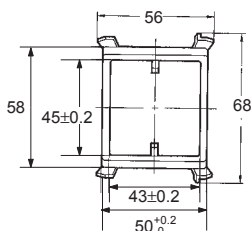
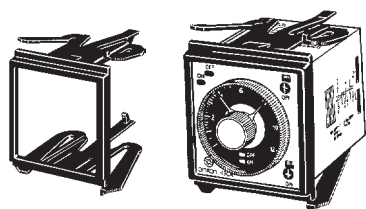
Adapter mounting hole Two, 4.5 dia.



**Note:** The value shown in parentheses is for the Y92F-70.

**Note:** The applicable thickness of the mounting panel must be 1 to 3.2 mm.  
\* Insert timer unit from back side of adaptor.

### Y92F-71/-74

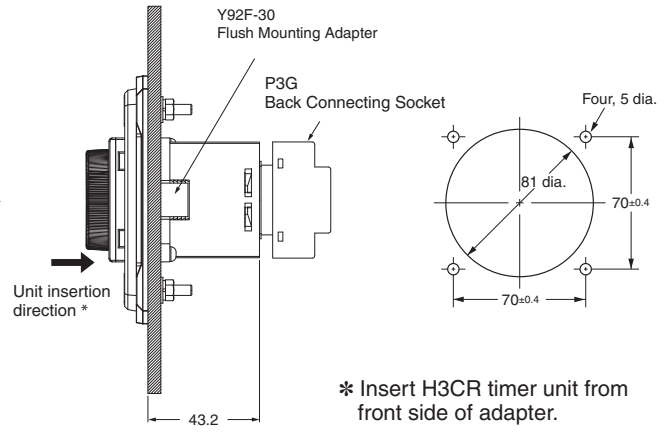
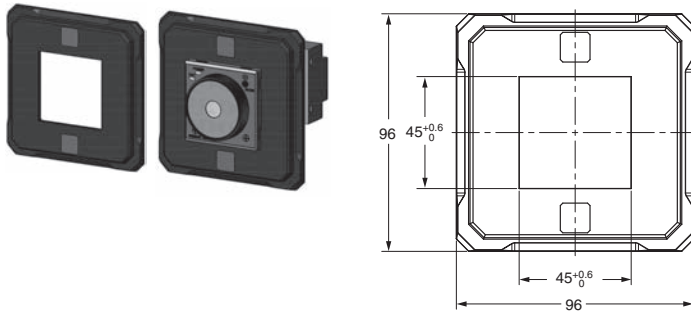


**Note:** The value shown in parentheses is for the Y92F-71.

**Note:** The applicable thickness of the mounting panel must be 1 to 3.2 mm.  
\* Insert timer unit from back side of adaptor.

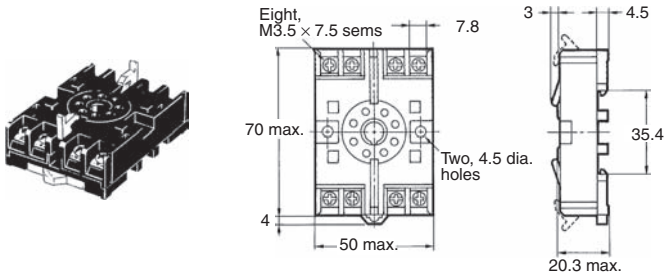
# H3CR

Y92F-38

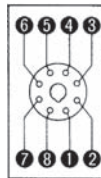


## Track Mounting/Front Connecting Socket

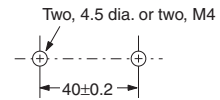
P2CF-08



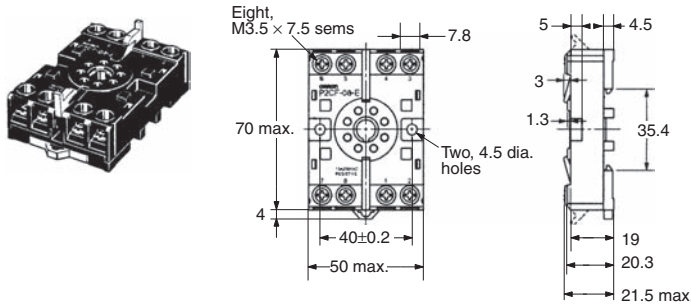
Terminal Arrangement/  
Internal Connections  
(Top View)



Surface Mounting Holes

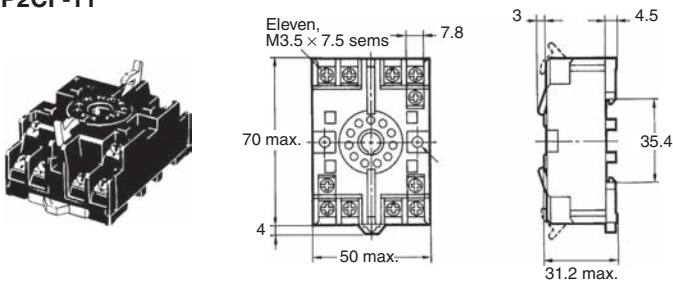


P2CF-08-E (Finger Safe Terminal Type)  
Conforming to VDE0106/P100

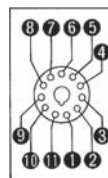


## Track Mounting/Front Connecting Socket

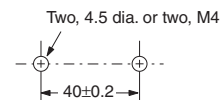
P2CF-11



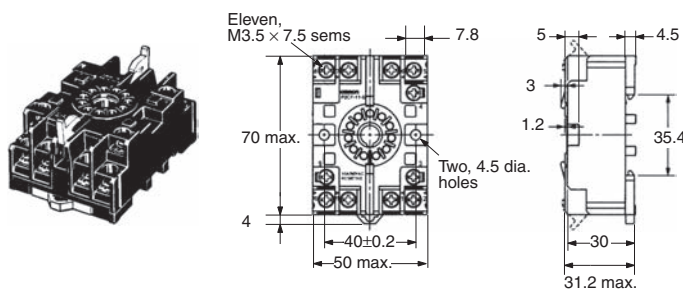
Terminal Arrangement/  
Internal Connections  
(Top View)



Surface Mounting Holes

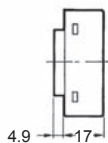
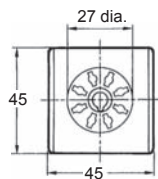
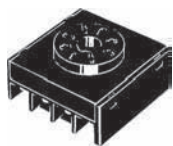


P2CF-11-E (Finger Safe Terminal Type)  
Conforming to VDE0106/P100

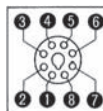


## Back Connecting Socket

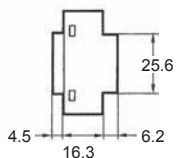
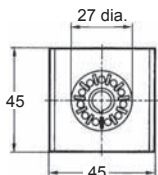
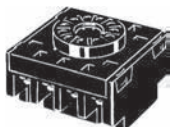
P3G-08



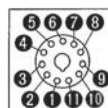
Terminal Arrangement/  
Internal Connections  
(Bottom View)



P3GA-11



Terminal Arrangement/  
Internal Connections  
(Bottom View)

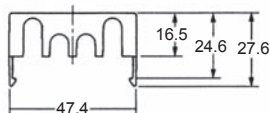
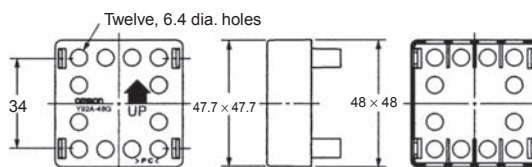
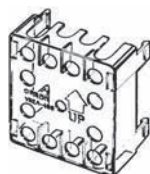


## Finger Safe Terminal Cover

Conforming to VDE0106/P100

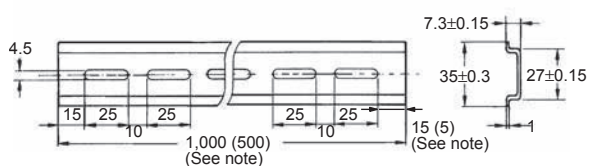
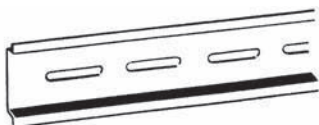
Y92A-48G

(Attachment for P3G-08/P3GA-11  
Socket)

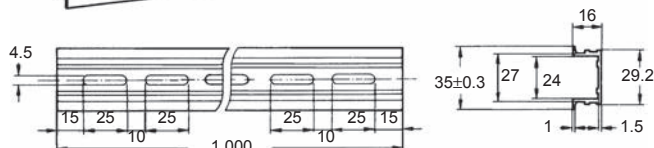


## Mounting Track

PFP-100N, PFP-50N



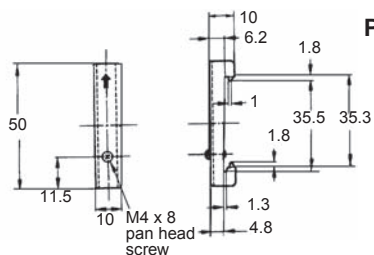
PFP-100N2



Note: The values shown in parentheses are for the PFP-50N.

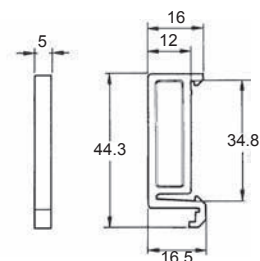
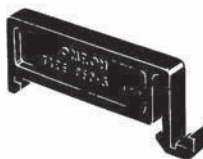
## End Plate

PFP-M



## Spacer

PFP-S



# H3CR

## Time Setting Ring/Panel Cover for H3CR-A/-G

There are two types of Panel Covers (Y92P-48GL, and Y92P-48GB), all of which are available in two colors. Use the most suitable type of Panel Cover with the design of the scaling plate according to the application.

To lock the set time, you can lock the setting dial by using a Y92S-27 Setting Ring and a Y92P-48GL/-48GB Panel Cover. This will help to prevent the set time from being changed accidentally.

To restrict the set time range, you can restrict the rotating range of the setting dial by using a Y92S-28 Setting Ring and a Y92P-48GL/-48GB Panel Cover. Use them to restrict the upper and lower limits of the setting range.

Refer to *Using the Time Setting Ring for H3CR-A/-G* on page 53 for the procedure to attach the Setting Ring.

The Flush Mounting Adapter Y92F-70/Y92F-71 for H3CR-G, Y92F-73/Y92F-74 for H3CR-A or the Protective Cover cannot be used.

**Note:** The Time Setting Ring/Panel Cover cannot be used for H3CR-F model or H3CR-H model.

The Time Setting Ring and Panel Cover should be used as a pair.

<b>Locking the Set Time</b>	Time Setting Ring A (Y92S-27) and Panel Cover (Y92P-48GL, or -48GB)
<b>Limiting the setting range</b>	Time Setting Ring B or C (Y92S-28), and Panel Cover (Y92P-48GL, or -48GB)

**Y92S-27**  
Time Setting A



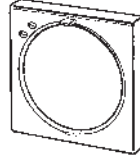
**Y92S-28**  
Time Setting B



**Y92S-28**  
Time Setting C



**Y92P-48GL**  
Light Gray




**Y92P-48GB**  
Black







# Safety Precautions for All H3CR Models

**Note:** The undermentioned is common for all H3CR models.

## Warning Indications

 <b>CAUTION</b>	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.
<b>Precautions for Safe Use</b>	Supplementary comments on what to do or avoid doing, to use the product safely.
<b>Precautions for Correct Use</b>	Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance.

## Meaning of Product Safety Symbols

	Used to warn of the risk of electric shock under specific conditions.
	Used for general prohibitions for which there is no specific symbol.
	Use to indicate prohibitions when there is a risk of minor injury from electrical shock or other source if the product is disassembled.
	Used for general mandatory action precautions for which there is no specified symbol.

### CAUTION

Risk of fire and explosion due to arcing and relay heat generation that accompanies switching. Do not use in an environment where flammable or explosive gas is present.



The H3CR series uses a transformer-less power supply. Exercise full caution as there is a risk of electrical shock if input terminal is touched when power voltage is applied.



The service life of the output relay varies widely depending on switching capacity and switching conditions. Use only within the rated load and electrical life count, based on actual conditions of use. Risk of contact sticking and burning if used past the service life. Always use a load current that does not exceed the rating, and if a heater is used, use a thermal switch in the load circuit.



Do not remove the outer casing.



In rare circumstances there is a risk of slight electrical shock, fire, or device damage. Do not disassemble, modify, repair, or otherwise touch the inside.



In rare circumstances there is a risk of fire if the screws become loose. Tighten the terminal screws to the specified torque (1.08N·m).



### Precautions for Safe Use

- Do not use the Timer in the following locations.
  - Locations with radical temperature changes.
  - Locations with high humidity that may result in condensation.
  - Locations with excessive vibration or shock.
  - Locations with corrosive gas or dust.
  - Locations where the Timer is exposed to sprayed water, oil, or chemicals.
- Pay the utmost attention not to make mistakes in polarity when wiring the Timer.
- Do not connect anything to terminals that are not used.
- Risk of internal element damage if a voltage that exceeds the rating is applied.
- Using a surge absorber is recommended if surge voltages occur.
- Verify that the power and output LEDs (LCD) are operating normally. In some usage environments, the LEDs/LCD/ resin components may deteriorate faster than normal, resulting in display failure. Inspect and replace regularly.
- When disposing of this product, follow the procedures for disposal of industrial waste that apply in your region.
- Verify that the product is the desired product before use.
- Exercise caution as the outer casing of the timer may be immersed in organic solvents (thinner, benzene, etc.), strong alkali, or strong acids.

### Precautions for Correct Use

## Changing the Setting

Do not change the time unit, time range, or operation mode while the Timer is in operation, otherwise the Timer may malfunction.

The time unit and time range can be set with the respective selectors turned clockwise or counterclockwise.

The selectors are of notched so that they will snap when they are properly set. Do not set the selectors midway between notches, otherwise the Timer may break or malfunction.

Do not use H3CR-A models (except for H3CR-A□S) in flicker mode at the lowest selector setting, or H3CR-F models at the lowest selector setting. Doing so may result in damage to contacts.

# H3CR

## Power Supplies

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.

An AC power supply can be connected to the power input terminals without regard to polarity. A DC power supply must be connected to the power input terminals as designated according to the polarity of the terminals.

Make sure that the voltage is applied within the specified range, otherwise the internal elements of the Timer may be damaged.

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

Be aware that the operating voltage will rise by 5% if the rated voltage is applied to the Timer continuously while the ambient temperature is close to the maximum permissible ambient temperature.

The power supply circuit of any H3CR-A model (except for H3CR-A□S), H3CR-F 100-to-240-VAC model, and H3CR-G model is a switching circuit. If the power line connected to the power supply circuit has a transformer with high inductance, a counter-electromotive voltage will be induced by the inductance. To suppress the voltage, apply a CR filter to the power supply line.

Apply the power voltage at once through the switch and relay contacts. If not applied at once, power reset may not take place or time-up may occur.

When the power is turned on, a rush current (refer to your OMRON website) may flow briefly and the timer may not start if there is insufficient power capacity. Use a power supply with sufficient capacity.

## Mounting Direction

There are no restrictions to the mounting direction.

## Precautions for EN61812-1 Conformance

The H3CR Series as a built-in timer conforms to EN61812-1 provided that the following conditions are satisfied.

Make sure that no voltage is applied to any terminals before dismantling the Timer from the Socket.

The output section of the H3CR is provided only with basic isolation.

The H3CR itself is designed under the following conditions:

- Overvoltage category III
- Pollution degree 2
- Isolation
  - Operation parts: Reinforced isolation
    - With clearance of 5.5 mm and creepage distance of 5.5 mm at 230 VAC
  - Output: Basic isolation (See note)
    - With clearance of 3 mm and creepage distance of 3 mm at 230 VAC

**Note:** The 11-pin model ensures basic isolation by itself and also ensures basic isolation with the 11-pin model mounted to the OMRON P2CF-11-□ or P3GA-11 Socket.

Connect the two output contacts different in polarity to the loads so that they will be the same in potential.

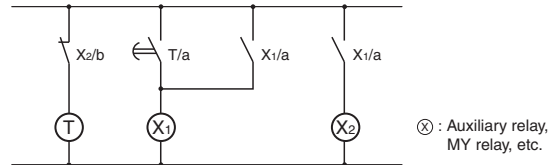
## Others

If the Timer is mounted to a control board, dismantle the Timer from the control board or short-circuit the control board circuitry before carrying out a voltage withstand test between the electric circuitry and non-charged metal part of the Timer. This protects the internal circuitry of the Timer from damage.

If the timer is left for an extended time at high temperature in the time-up state (internal relay ON), the internal components (electrolytic capacitors, etc.) may deteriorate faster than normal. For this reason, use in combination with a relay, and avoid leaving in the time-up state for an extended time (for example, one month or longer). (Excluding H3CR-H)

### Reference example

Use as shown below.



## Cleaning

Do not use solvents such as thinner. Use commercially available alcohol.

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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