Solid-state Star-delta Timers

H3CR-G

CSM_H3CR-G_DS_E_2_3

DIN 48 × 48-mm Star-delta Timer

- A wide star-time range (up to 120 seconds) and star-delta transfer time range (up to 0.5 seconds).

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

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
	Medium gray (5Y5/1)	Y92P-48GM ✻4

Note: Refer to page 11 to 12 for details on *Dimension*.

✻1 The Y92F-48B Front Cover and the Y92P-48G□ Panel Cover cannot be used at the same time.

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

✻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 Front Cover and the Y92F-70/-71 Flush Mounting Adapter also cannot be used at the same time.

Sockets

Timer	Round Sockets		
Pin	**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 *Socket and DIN Track Products*.

Terminal Cover

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

Note: For details, refer to *Socket and DIN Track Products.*

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 Conforms to EN61812-1 and IEC60664-1 (VDE0110) 4kV/2. Output category according to EN60947-5-1.	

■ Time Ranges

Time unit		Star operation time ranges
Full scale setting	**6**	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 or 0.5 s

■ 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
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 ($\cos\phi = 1$)

Note: 1. Do not use an inverter output as the power supply. Refer to *Safety Precautions for All Timers* for details.

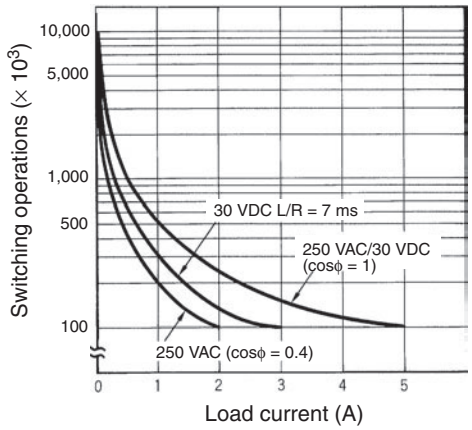
2. Refer to *Safety Precautions for All Timers* when using the Timer together with a 2-wire AC proximity sensor.

■ Characteristics

Accuracy of operating time	±0.2% FS max.
Setting error	±5% FS ±50 ms max.
Accuracy of Star-delta transfer time	±25% FS + 5 ms max.
Reset voltage	10% max. of rated voltage
Influence of voltage	±0.2% FS max.
Influence of temperature	±1% FS max.
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	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)
Impulse withstand voltage	3 kV (between power terminals) 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts)
Noise immunity	±1.5 kV (between power terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Malfunction: 8 kV Destruction: 15 kV
Vibration resistance	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
Shock resistance	Destruction: 980 m/s^2 three times each in six directions Malfunction: 294 m/s^2 three times each in six directions
Ambient temperature	Operating: –10°C to 55°C (with no icing) Storage: –25°C to 65°C (with no icing)
Ambient humidity	Operating: 35% to 85%
Life expectancy	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)
EMC	(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: 6 kV contact discharge (level 3), 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: IEC61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity RF-interference from Pulse-modulated Radio Waves: IEC61000-4-3: 10 V/m (900±5 MHz) (level 3) Immunity Conducted Disturbance: IEC61000-4-6: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC61000-4-4: 2 kV power-line (level 3), 2 kV I/O signal-line (level 4) Immunity Surge: IEC61000-4-5: 1 kV line to line (level 3), 2 kV line to ground (level 3)
Case color	Light Gray (Munsell 5Y7/1)
Degree of protection	IP40 (panel surface)
Weight	H3CR-G8L: approx. 110 g; H3CR-G8EL: approx. 130 g

Note: Refer to the *Life-test Curve*.

■ Life-test Curve

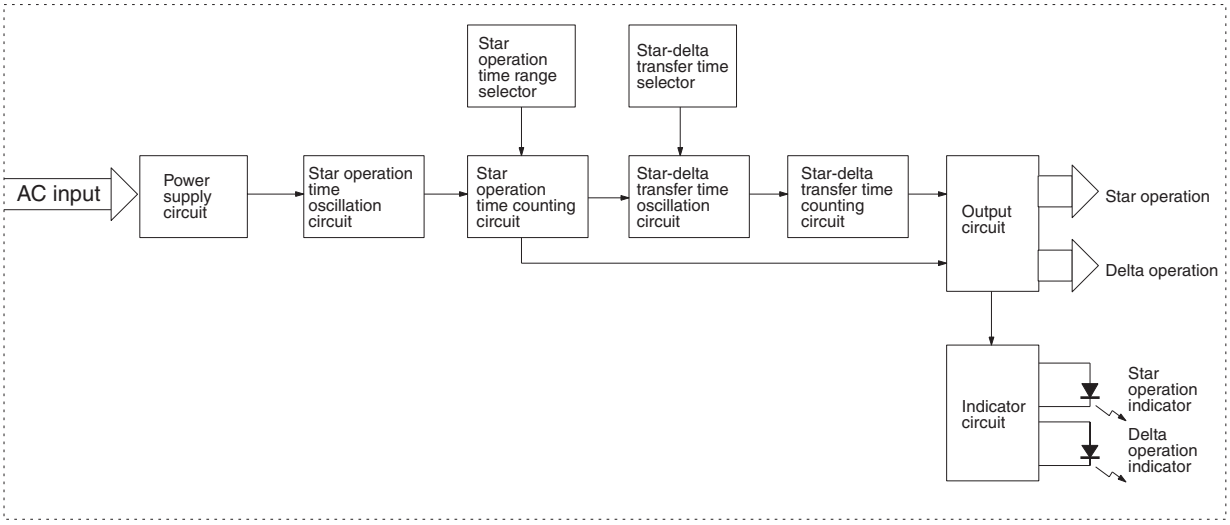


Reference: A maximum current of 0.15 A can be switched at 125 VDC (cosϕ = 1) and a maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.
The minimum applicable load is 10 mA at 5 VDC (failure level: P).

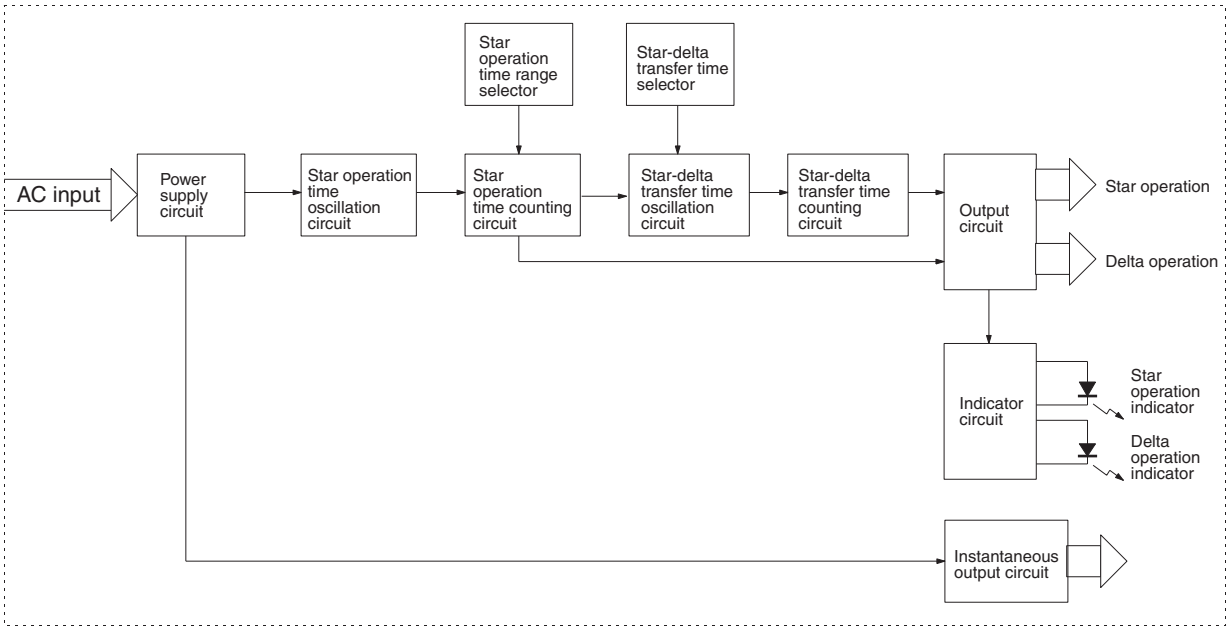
Connections

■ Block Diagrams

H3CR-G8L



H3CR-G8EL

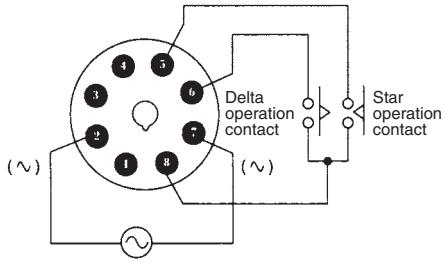


■ I/O Functions

Inputs		---
Outputs	**Control output**	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.

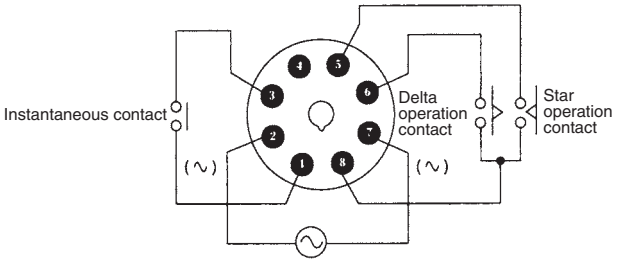
■ Terminal Arrangement

H3CR-G8L



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

H3CR-G8EL

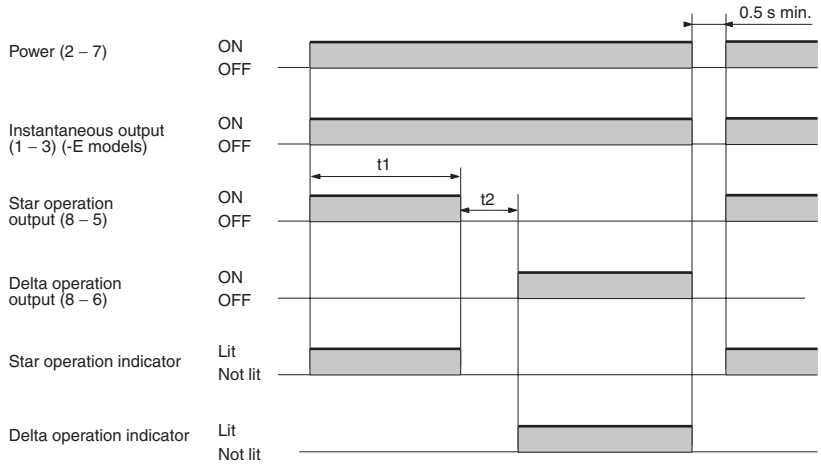


Note: Leave terminal 4 open. Do not use them as relay terminals.

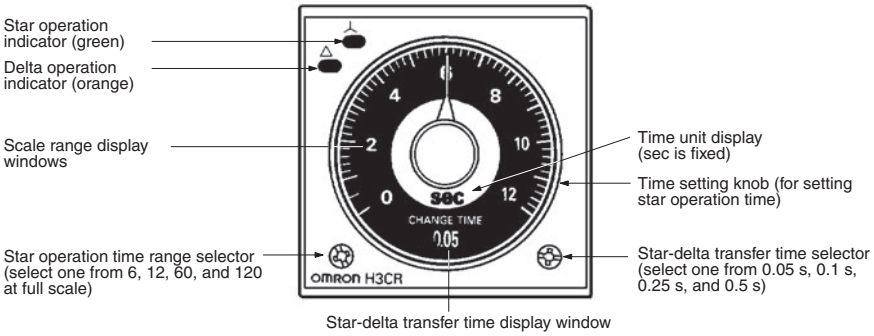
Operation

■ Timing Chart

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

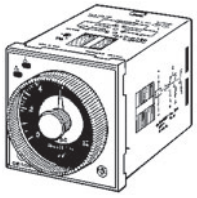
Model	Timing chart
H3CR-G8L/-G8EL	

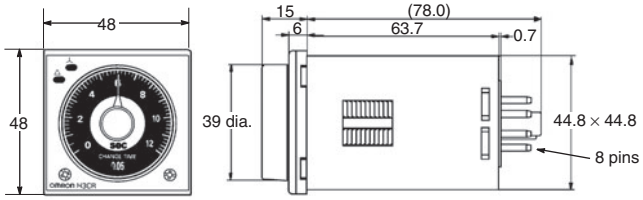
Nomenclature



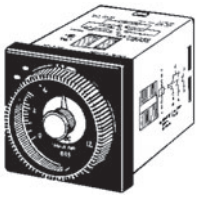
Dimensions

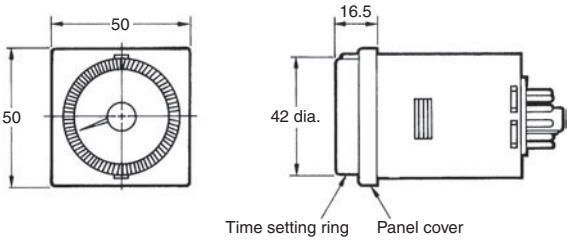
Note: All units are in millimeters unless otherwise indicated.



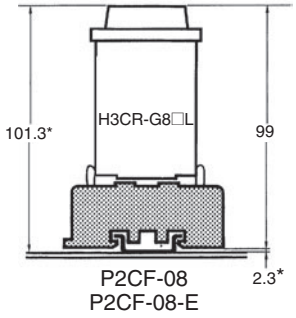


Dimensions with Set Ring

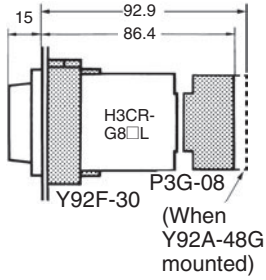




Dimensions with Front Connecting Socket P2CF-08-□



Dimensions with Back Connecting Socket P3G-08



*These dimensions vary with the kind of DIN track (reference value).

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

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