Solid-state Multi-functional Timers
H3CR-A

Multiple Operating Modes and Multiple Time Ranges. DIN 48 x 48-mm Multifunctional Timer with Wide AC/DC Power Supply Range for Both High and Low Voltages.

- A wide AC/DC power supply range greatly reduces the number of timer models kept in stock.
- A wide range of applications with multiple operating modes, six modes for 11-pin models and four modes for 8-pin models.
- Ecological design with reduced current consumption.
- Easy sequence checking with instantaneous outputs for a zero set value.
- Length of 80 mm or less when panel-mounted with a P3GA-11 Socket (H3CR-A8E, 100 to 240 VAC, 100 to 125 VDC)
- PNP input models available.
- Standards: UL, CSA, NK, LR, EN 61812-1, and CE Marking.

CE 🆄 🆂 LR ⓒⓒⓒs

Model Number Structure

■ Model Number Legend

Note: This model number legend includes combinations that are not available. Before ordering, please check the *List of Models* on page 2 for availability.

H3CR-A☐ ☐ ☐ - ☐ ☐
       1 2 3 4 5

1. Number of Pins
None: 11-pin models
8: 8-pin models

2. Input Type for 11-pin Models
None: No-voltage input (NPN type)
P: Voltage input (PNP type)

3. Output
None: Relay output (DPDT)
S: Transistor output (NPN/PNP universal use)
E: Relay output (SPDT) with instantaneous relay output (SPDT)

4. Suffix
300: Dual mode models (signal ON/OFF-delay and one-shot)
301: Double time scale (range) models (0.1 s to 600 h)

5. Supply Voltage
100-240AC/100-125DC: 100 to 240 VAC/100 to 125 VDC
24-48AC/12-48DC: 24 to 48 VAC/12 to 48 VDC
24-48AC/DC: 24 to 48 VAC/VDC (Only for H3CR-A8E)

Ordering Information

■ List of Models

    2. The operating modes are as follows

A:	ON-delay	D: Signal OFF-delay
B:	Flicker OFF start	E: Interval
B2:	Flicker ON start	G: Signal ON/OFF-delay
C:	Signal ON/OFF-delay	J: One-shot

11-pin Models

Output	Supply voltage	Input type	Time range	Operating mode (See note 2)	Model (See note 1.)
Contact	100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC	No-voltage input	0.05 s to 300 h	Six multi-modes: A, B, B2, C, D, E	H3CR-A
	24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC				
	100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC			Dual-modes: G, J	H3CR-A-300
	24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC				
	100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC	Voltage input		Six multi-modes: A, B, B2, C, D, E	H3CR-AP
	24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC				
	100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC	No-voltage input	0.1 s to 600 h		H3CR-A-301
	24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC				
Transistor (Photocoupler)	24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC		0.05 s to 300 h		H3CR-AS

8-pin Models

Output	Supply voltage	Input type	Time range	Operating mode (See note 2)	Model (See note 1.)
Contact	100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC	No-input available	0.05 s to 300 h	Four multi-modes: A, B2, E, J (Power supply start)	H3CR-A8
	24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC				
	100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC		0.1 s to 600 h		H3CR-A8-301
	24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC				
Transistor (Photocoupler)	24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC		0.05 s to 300 h		H3CR-A8S
Time-limit contact and instantaneous contact	100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC				H3CR-A8E
	24 to 48 VAC/VDC (50/60 Hz)				

■ Accessories (Order Separately)

Adapter, Protective Cover, Hold down Clip, Setting Ring and Panel Cover

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
		Y92F-73
		Y92F-74
Protective Cover		Y92A-48B
Hold-down Clip (Sold in sets of two)	For PF085A Socket	Y92H-8
	For PL08 and PL11 Sockets	Y92H-7
Setting Ring A		Y92S-27
Setting Ring B and C		Y92S-28
Panel Cover	Light gray (5Y7/1)	Y92P-48GL
	Black (N1.5)	Y92P-48GB
	Medium gray (5Y5/1)	Y92P-48GM

Sockets

Timer	Round Sockets		
Pin	Connection	Terminal	Models
11-pin	Front Connecting	DIN track mounting	**P2CF-11**
		DIN track mounting (Finger-safe type)	**P2CF-11-E**
	Back Connecting	Screw terminal	**P3GA-11**
		Solder terminal	**PL11**
		Wrapping terminal	**PL11-Q**
		PCB terminal	**PLE11-0**
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-□□-E has a finger-protection structure. Round crimp terminals cannot be used. Use forked crimp terminals.

2. The P3GA-11 and 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-A/-AS	H3CR-AP	H3CR-A8/-A8S	H3CR-A8E
Operating mode	A: ON-delay B: Flicker OFF start B2: Flicker ON start C: Signal ON/OFF-delay D: Signal OFF-delay E: Interval G: Signal ON/OFF-delay (Only for H3CR-A-300) J: One-shot (Only for H3CR-A-300)		A: ON-delay (power supply start) B2: Flicker ON start (power supply start) E: Interval (power supply start) J: One-shot (power supply start)	
Pin type	11-pin		8-pin	
Input type	No-voltage input	Voltage input	---	
Time-limit output type	H3CR-A/-A8/-AP: Relay output (DPDT) H3CR-AS/-A8S: Transistor output (NPN/PNP universal)*			Relay output (SPDT)
Instantaneous output type	---			Relay output (SPDT)
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 for Timers with Contact Outputs. Output category according to EN60947-5-2 for Timers with Transistor Outputs.			

*The internal circuits are optically isolated from the output. This enables universal application as NPN or PNP transistor.

■ Time Ranges

Note: When the time setting knob is turned below "0" until the point where the time setting knob stops, the output will operate instantaneously at all time range settings.

Standard (0.05-s to 300-h) Models

Time unit		s (sec)	min (min)	h (hrs)	×10 h (10 hrs)
Full scale setting	1.2	0.05 to 1.2	0.12 to 1.2		1.2 to 12
	3	0.3 to 3			3 to 30
	12	1.2 to 12			12 to 120
	30	3 to 30			30 to 300

Double (0.1-s to 600-h) Models

Time unit		s (sec)	min (min)	h (hrs)	×10 h (10 hrs)
Full scale setting	2.4	0.1 to 2.4	0.24 to 2.4		2.4 to 24
	6	0.6 to 6			6 to 60
	24	2.4 to 24			24 to 240
	60	6 to 60			60 to 600

■ Ratings

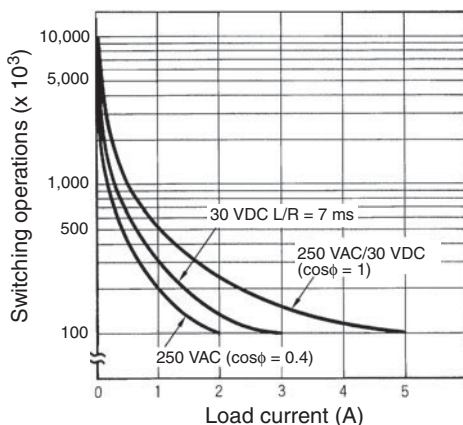| Rated supply voltage (See notes 1, 2, and 5.)	100 to 240 VAC (50/60 Hz)/100 to 125 VDC, 24 to 48 VAC (50/60 Hz)/12 to 48 VDC (24 to 48 VAC/VDC for H3CR-A8E) (See note3.)
Operating voltage range	85% to 110% of rated supply voltage (90% to 110% at 12 VDC)
Power reset	Minimum power-opening time: 0.1 s
Input	No-voltage Input ON impedance: 1 kΩ max. ON residual voltage: 1 V max. OFF impedance: 100 kΩ min. Voltage Input Max. permissible capacitance between inputs lines (terminals 6 and 7): 1,200 pF Load connectable in parallel with inputs (terminals 6 and 7). • 100 to 240 VAC/100 to 125 VDC High (logic) level: 85 to 264 VAC/85 to 137.5 VDC Low (logic) level: 0 to 10 VAC/0 to 10 VDC • 24 to 48 VAC/12 to 48 VDC High (logic) level: 20.4 to 52.8 VAC/10.8 to 52.8 VDC Low (logic) level: 0 to 2.4 VAC/0 to 1.2 VDC
Power consumption	H3CR-A/-A8 • 100 to 240 VAC/100 to 125 VDC (When at 240 VAC, 60 Hz) Relay ON: approx. 2.0 VA (1.6 W) Relay OFF: approx. 1.3 VA (1.1 W) • 24 to 48 VAC/12 to 48 VDC (When at 24 VDC) Relay ON: approx. 0.8 W Relay OFF: approx. 0.2 W H3CR-AP (See note 3) • 100 to 240 VAC/100 to 125 VDC (When at 240 VAC, 60 Hz) Relay ON: approx. 2.5 VA (2.2 W) (See note 4.) Relay OFF: approx. 1.8 VA (1.7 W) (See note 4.) • 24 to 48 VAC/12 to 48 VDC (When at 24 VDC) Relay ON: approx. 0.9 W (See note 4.) Relay OFF: approx. 0.3 W (See note 4.) H3CR-A8E • 100 to 240 VAC/100 to 125 VDC (When at 240 VAC, 60 Hz) Relay ON/OFF: approx. 2 VA (0.9 W) • 24 to 48 VAC/VDC (When at 24 VDC) Relay ON/OFF: approx. 0.9 W H3CR-AS/-A8S • 24 to 48 VAC/12 to 48 VDC (When at 24 VDC) Output ON: 0.3 W Output OFF: 0.2 W
Control outputs	Time limit contacts: 5 A at 250 VAC/30 VDC, 0.15 A at 125 VDC, resistive load (cosφ = 1) Transistor output: Open collector (NPN/PNP), 100 mA max. at 30 VDC max., residual voltage: 2 V max. Instantaneous contact: 5 A at 250 VAC/30 VDC, 0.15 A at 125 VDC, resistive load (cosφ = 1)

Note: 1. DC ripple rate: 20% max. (A single-phase, full-wave-rectification power supply can be used).

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

3. Models with 24-to-48-VAC or 12-to-48-VDC power supply have inrush current. Caution is thus required when turning ON and OFF power to the Timer with a non-contact output from a device such as a sensor. (Models with an inrush current of approximately 50 mA and a 24-VDC power supply are available (the H3CR-A-302 and H3CR-A8-302).)

4. The values are for when the terminals 2 and 7 and terminals 10 and 6 are short-circuited, and include the consumption current of the input circuit.

5. 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. (±0.2%±10 ms max. in a range of 1.2 s or 3 s)
Setting error	±5% FS ±50 ms (See note 1)
Reset time	Min. power-opening time: 0.1 s max. Min. pulse width: 0.05 s (H3CR-A/-AS)
Reset voltage	10% max. of rated supply voltage
Influence of voltage	±0.2% FS max. (±0.2%±10 ms max. in a range of 1.2 s or 3 s)
Influence of temperature	±1% FS max. (±1%±10 ms max. in a range of 1.2 s or 3 s)
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC (1,000 VAC for H3CR-A□S), 50/60 Hz for 1 min (between current-carrying metal parts and exposed non-current-carrying metal parts) 2,000 VAC (1,000 VAC for H3CR-A□S), 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) 2,000 VAC, 50/60 Hz for 1 min (between input and control output terminals and operation circuit) for H3CR-AP
Impulse withstand voltage	3 kV (between power terminals) for 100 to 240 VAC/100 to 125 VDC, 1 kV for 24 to 48 VAC/12 to 48 VDC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC/100 to 125 VDC, 1.5 kV for 24 to 48 VAC/12 to 48 VDC and 24 to 48 VAC/VDC
Noise immunity	±1.5 kV (between power terminals) and ±600 V (between no-voltage input 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 each in 3 directions for 2 hours each Malfunction: 10 to 55 Hz with 0.5-mm single amplitude each in 3 directions for 10 minutes each
Shock resistance	Destruction: 1,000 m/s² 3 times each in 6 directions Malfunction: 100 m/s² 3 times each in 6 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: 20,000,000 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 2)
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	Approx. 90 g

Note: 1. The value is ±5% FS +100 ms to −0 ms max. when the C, D, or G mode signal of the H3CR-AP is OFF.
    2. Refer to the *Life-test Curve*.
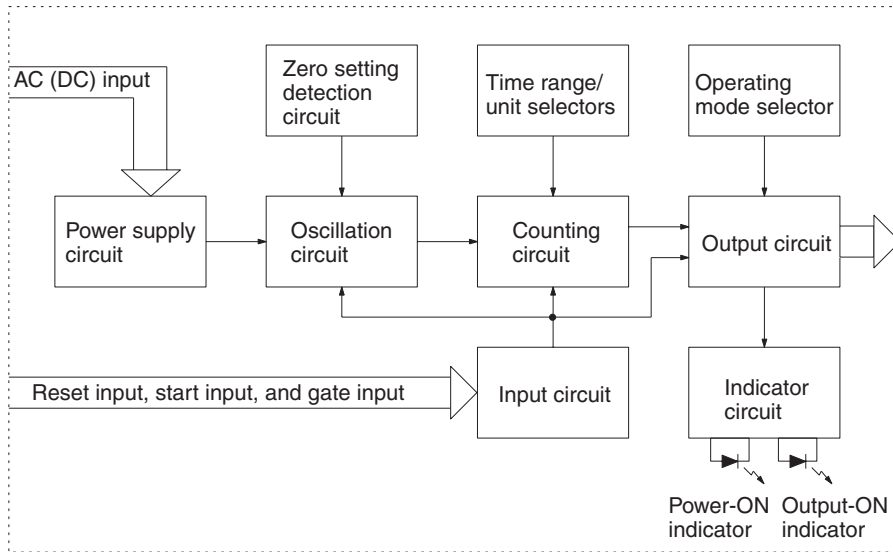
■ Life-test Curve

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).
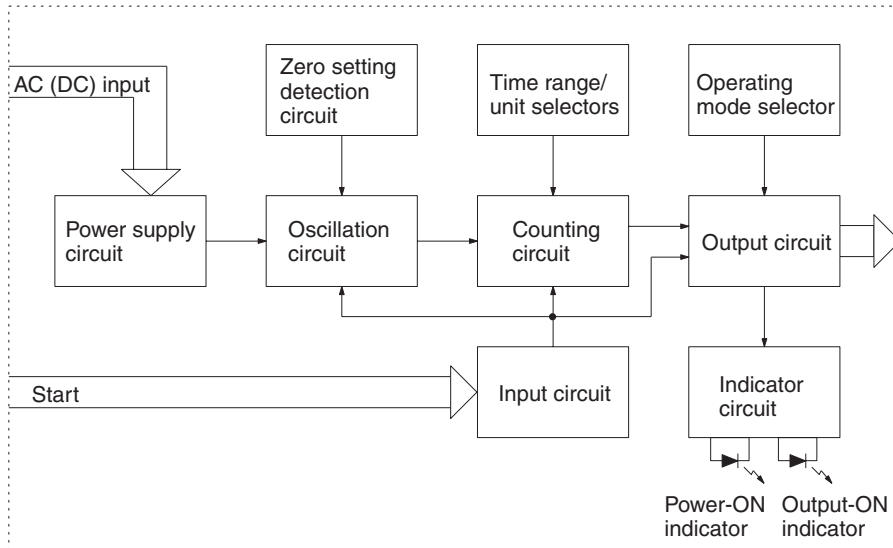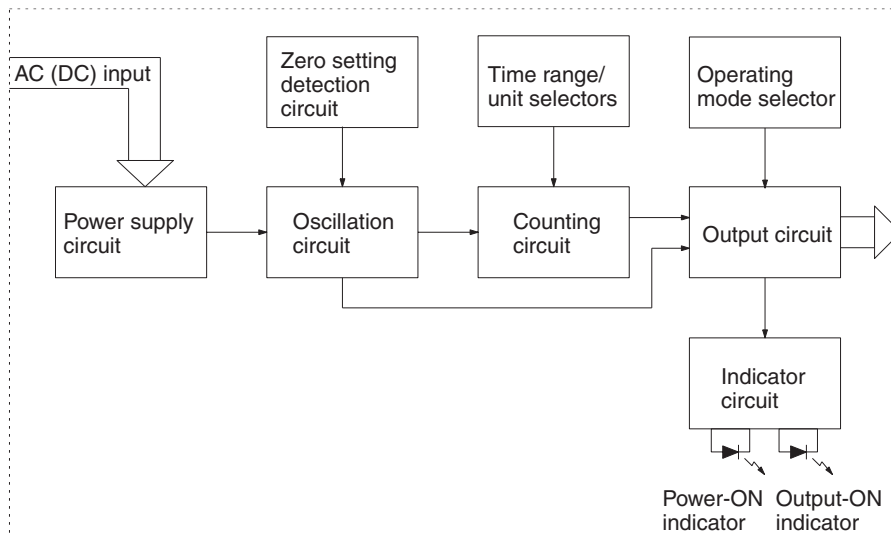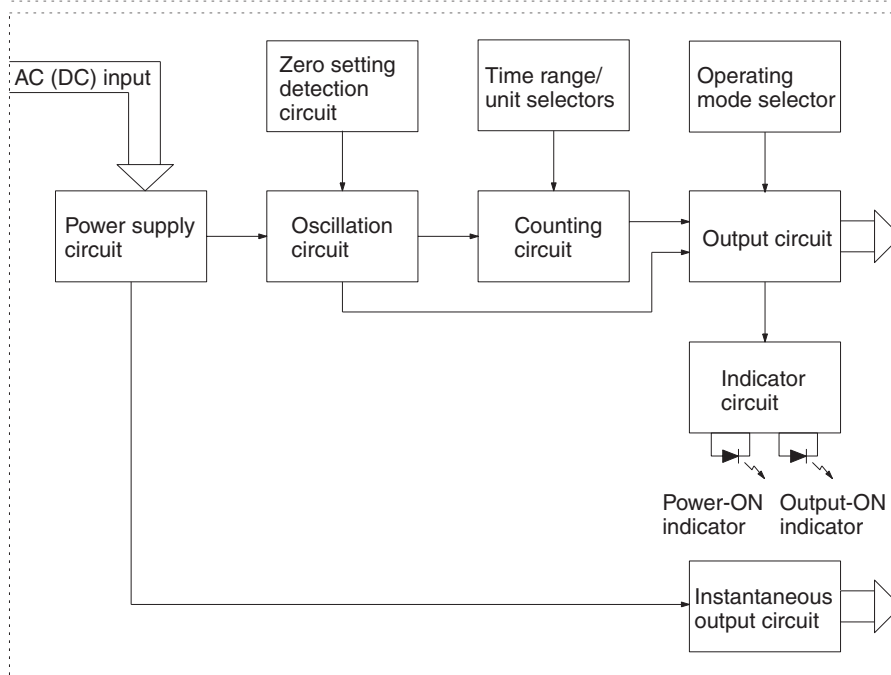
Connections

■ Block Diagrams

H3CR-A/AS

AC (DC) input → Power supply circuit → Oscillation circuit → Counting circuit → Output circuit

Zero setting detection circuit → Oscillation circuit

Time range/ unit selectors → Counting circuit

Operating mode selector → Output circuit

Reset input, start input, and gate input → Input circuit

Output circuit → Indicator circuit

Indicator circuit → Power-ON indicator / Output-ON indicator

H3CR-AP

AC (DC) input → Power supply circuit → Oscillation circuit → Counting circuit → Output circuit

Zero setting detection circuit → Oscillation circuit

Time range/ unit selectors → Counting circuit

Operating mode selector → Output circuit

Start → Input circuit

Output circuit → Indicator circuit

Indicator circuit → Power-ON indicator / Output-ON indicator

H3CR-A8/A8S

```
AC (DC) input ──┐     Zero setting      Time range/        Operating
                │     detection         unit selectors     mode selector
                │     circuit
                ▼        │                  │                 │
          ┌──────────┐ ┌──────────┐ ┌──────────┐     ┌──────────┐
          │ Power    │ │Oscillation│ │ Counting │     │ Output   │──▷
          │ supply   │─│ circuit   │─│ circuit  │────▶│ circuit  │
          │ circuit  │ │          │ │          │     │          │
          └──────────┘ └──────────┘ └──────────┘     └──────────┘
                           └──────────────────────────┘  │
                                                          ▼
                                                   ┌──────────┐
                                                   │ Indicator│
                                                   │ circuit  │
                                                   └──────────┘
                                                     ▼      ▼
                                              Power-ON   Output-ON
                                              indicator  indicator
```

H3CR-A8E

```
AC (DC) input ──┐     Zero setting      Time range/        Operating
                │     detection         unit selectors     mode selector
                │     circuit
                ▼        │                  │                 │
          ┌──────────┐ ┌──────────┐ ┌──────────┐     ┌──────────┐
          │ Power    │ │Oscillation│ │ Counting │     │ Output   │──▷
          │ supply   │─│ circuit   │─│ circuit  │────▶│ circuit  │
          │ circuit  │ │          │ │          │     │          │
          └──────────┘ └──────────┘ └──────────┘     └──────────┘
             │             └──────────────────────────┘  │
             │                                            ▼
             │                                     ┌──────────┐
             │                                     │ Indicator│
             │                                     │ circuit  │
             │                                     └──────────┘
             │                                       ▼      ▼
             │                                Power-ON   Output-ON
             │                                indicator  indicator
             │                                 ┌──────────────┐
             └────────────────────────────────│Instantaneous │──▷
                                               │output circuit│
                                               └──────────────┘
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■ I/O Functions

Inputs (for -A/-AS models)	Start	Starts time-measurement.
	Reset	Interrupts time-measurement and resets time-measurement value. No time-measurement is made and control output is OFF while the reset input is ON.
	Gate	Prohibits time-measurement.
Outputs	Control output	Outputs are turned ON according to designated output mode when preset value is reached.

Note: H3CR-AP incorporates start input only.

■ Terminal Arrangement

Note: The delayed contact of conventional Timers was indicated as ⌇

The contact symbol of the H3CR-A is indicated as ∘⌇ because its operating mode is six multi-modes (four multi-modes for the H3CR-A8).

11-pin Models

H3CR-A/-A-300/-A-301 (Contact Output)

Reset input Start input Gate input

(−)(~) Power supply (+)(~)

H3CR-AS (Transistor Output)

Reset input Start input Gate input
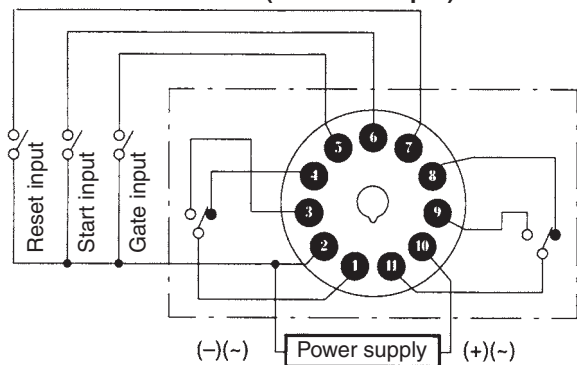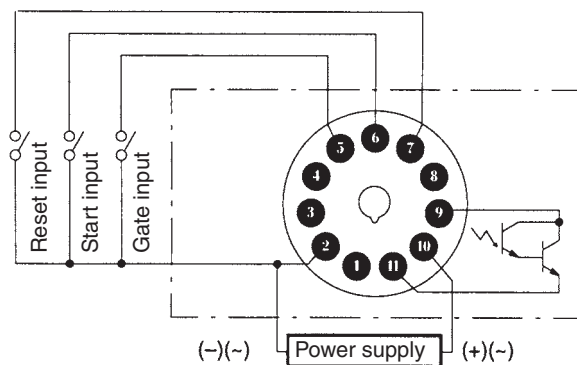
(−)(~) Power supply (+)(~)

Note: Terminals 1, 3, 4, and 8 are empty. Terminals 2, 5, 6, 7, and 10 are the same as for the H3CR-A.

H3CR-AP (Contact Output)

Start input
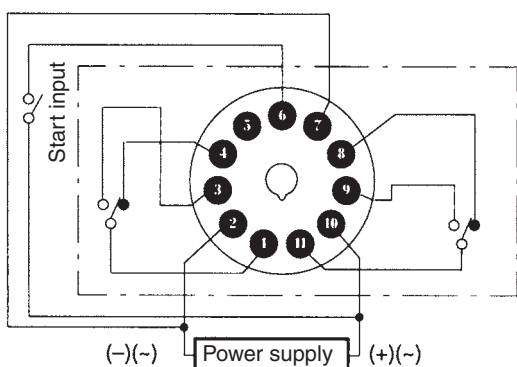
(−)(~) Power supply (+)(~)

Note: 1. Terminal 5 is empty.
  2. Separate power supplies can be used for the Timer and inputs.

8-pin Models

H3CR-A8/-A8-301 (Contact Output)

(−) (+)
(~) (~)

Power supply
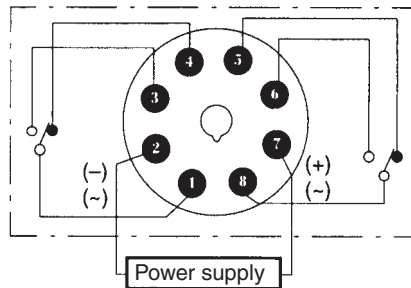
H3CR-A8S (Transistor Output)

(−) (+)
(~) (~)

Power supply
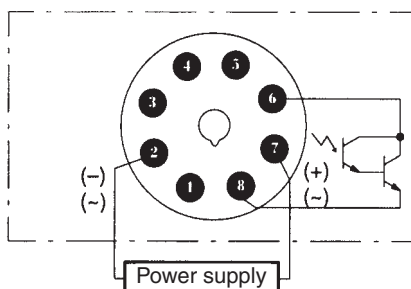
Note: Terminals 1, 3, 4, and 5 are empty. Terminals 2 and 7 are the same as for the H3CR-A8.

H3CR-A8E (Contact Output)

(−) (+)
(~) (~)

Power supply
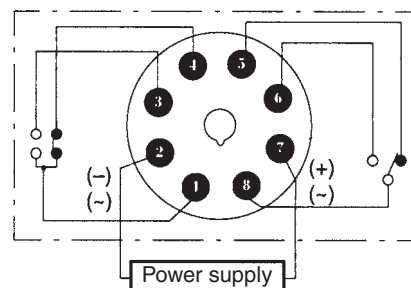
■ Input Connections

H3CR-A/-AS

The inputs of the H3CR-A/-AS are no-voltage (short-circuit or open) inputs.

No-voltage Inputs

No-contact Input

(Connection to NPN open collector output sensor.)

12 to 24 VDC
(sensor power supply)

+ − DC power supply

Sensor

Timer

5 Gate
6 Start
7 Reset

2 Input (0 V)

Operates with transistor ON

Contact Input

Timer

5 Gate
6 Start
7 Reset

2 Input (0 V)

Operates with relay ON
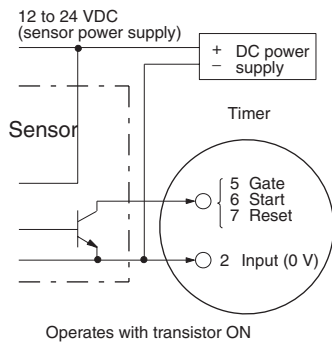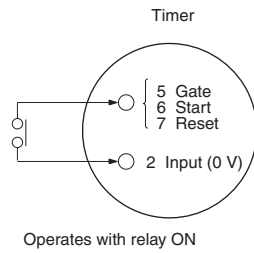
No-contact Input

(Connection to a voltage output sensor.)

12 to 24 VDC
(sensor power supply)

+ − DC power supply

Sensor

Timer

5 Gate
6 Start
7 Reset

2 Input (0 V)

Operates with transistor ON
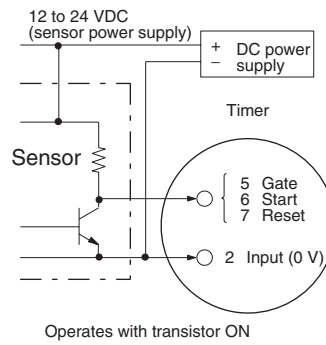
No-voltage Input Signal Levels

No-contact input	1. Short-circuit level Transistor ON Residual voltage: 1 V max. Impedance when ON: 1 kΩ max.
	2. Open level Transistor OFF Impedance when OFF: 100 kΩ min.
Contact input	Use contacts which can adequately switch 0.1 mA at 5 V

H3CR-AP

The start input of the H3CR-AP is voltage input. (Voltage imposition or open)

Voltage Inputs

No-contact Input
(Connection to PNP open collector output sensor)
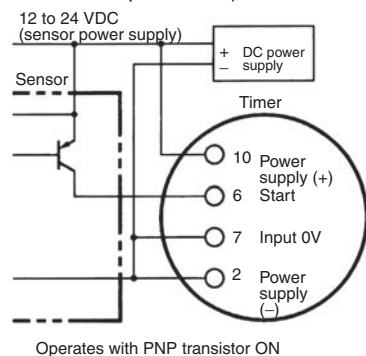
Operates with PNP transistor ON

No-contact Input
(Connection to NPN open collector output sensor)

Operates with NPN transistor ON
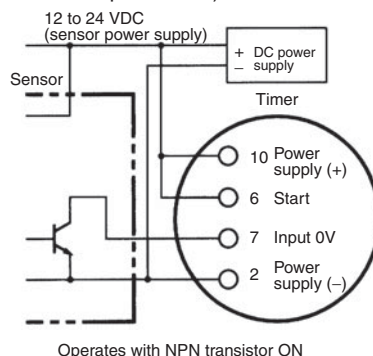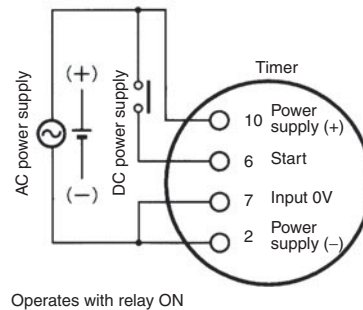
Note: The input circuit is isolated from the power supply circuit. Thus, an NPN transistor can be connected.

Contact Input

Operates with relay ON

Note: Refer to the signal levels in the following table and be aware of the minimum applicable load of the relay.

Note: Before making connections, refer to *Safety Precautions (H3CR-□)*.

Voltage Input Signal Levels

No-contact input	1. Transistor ON Residual voltage: 1 V max. The voltage between terminals 6 and 7 must be 10.8 VDC min.
	2. Transistor OFF Leakage current: 0.01 mA max. The voltage between terminals 6 and 7 must be 1.2 VDC max.
Contact input	Use contacts that can adequately switch 0.1 mA at each operating voltage. The voltage between terminals 6 and 7 with contacts ON or OFF must satisfy the specified value. Contacts ON 100-to-240-VAC and 100-to-125-VDC models: 85 to 264 VAC or 85 to 137.5 VDC 24-to-48-VAC and 12-to-48-VDC models: 20.4 to 52.8 VAC or 10.8 to 52.8 VDC Contacts OFF 100-to-240-VAC and 100-to-125-VDC models: 0 to 10 VAC or 0 to 10 VDC 24-to-48-VAC and 12-to-48-VDC models: 0 to 2.4 VAC or 0 to 1.2 VDC

OMRON

Operation

■ Timing Chart

Note: 1. The minimum power-opening time ("Rt") is 0.1 s.
    2. The minimum input pulse width (for start, reset) is 0.05 s.
    3. The letter "t" in the timing charts stands for the set time and "t–a" means that the period is less than the time set.
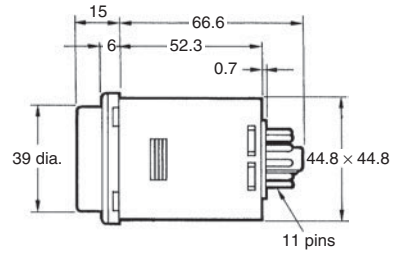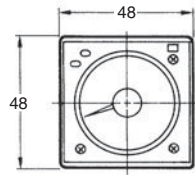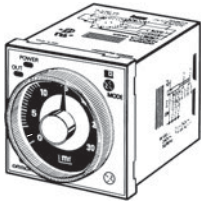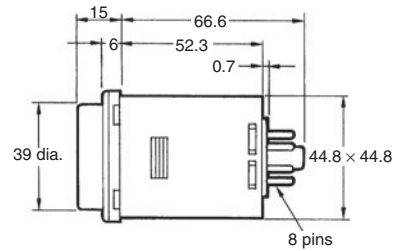   **4.** Power supply start in mode J is also possible for H3CR-A8/-A8E/-A8S/-A8-301 models.
    5. Refer to page 17 for application examples.

H3CR-A/-AS/-AP*

*H3CR-AP model incorporates start input only.

Operating mode	Timing chart
A: ON-delay	
B: Flicker OFF start	
B2: Flicker ON start	
C: Signal ON/ OFF-delay	

Operating mode	Timing chart
D: Signal OFF-delay	**Basic operation** — Power, Start (See note), Output. **Note:** Start input is valid and retriggerable while the Timer is in operation.
E: Interval	**Basic operation** — Power, Start (See note), Output. **Note:** Start input is valid and retriggerable while the Timer is in operation.
G: Signal ON/OFF-delay	**Basic operation** — Power, Start (See note), Output. **Note:** Start input is valid and retriggerable while the Timer is in operation.
J: One-shot output	**Basic operation** — Power, Start (See note), Output. 1±0.6 s (Fixed). **Note:** Start input is valid and retriggerable while the Timer is in operation. (Previous start input will be cancelled.)

In D, E, G, J charts the rows are labelled: Power, Start, Reset, Output relay (NC), Output relay (NO) (Output indicator), Power indicator. The J chart indicates 1±0.6 s (Fixed) intervals.

Gate Signal Input

Rows: Power ON/OFF, Start ON/OFF, Gate ON/OFF, Reset ON/OFF, Output relay ON/OFF. Intervals t_1 and t_2.
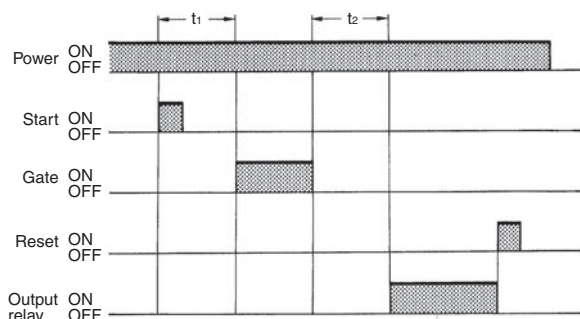
Note:
1. This timing chart indicates the gate input in operating mode A (ON-delay operation).
2. The set time is the sum of t_1 and t_2.
3. H3CR-AP model incorporates start input only.

H3CR-A8/-A8S
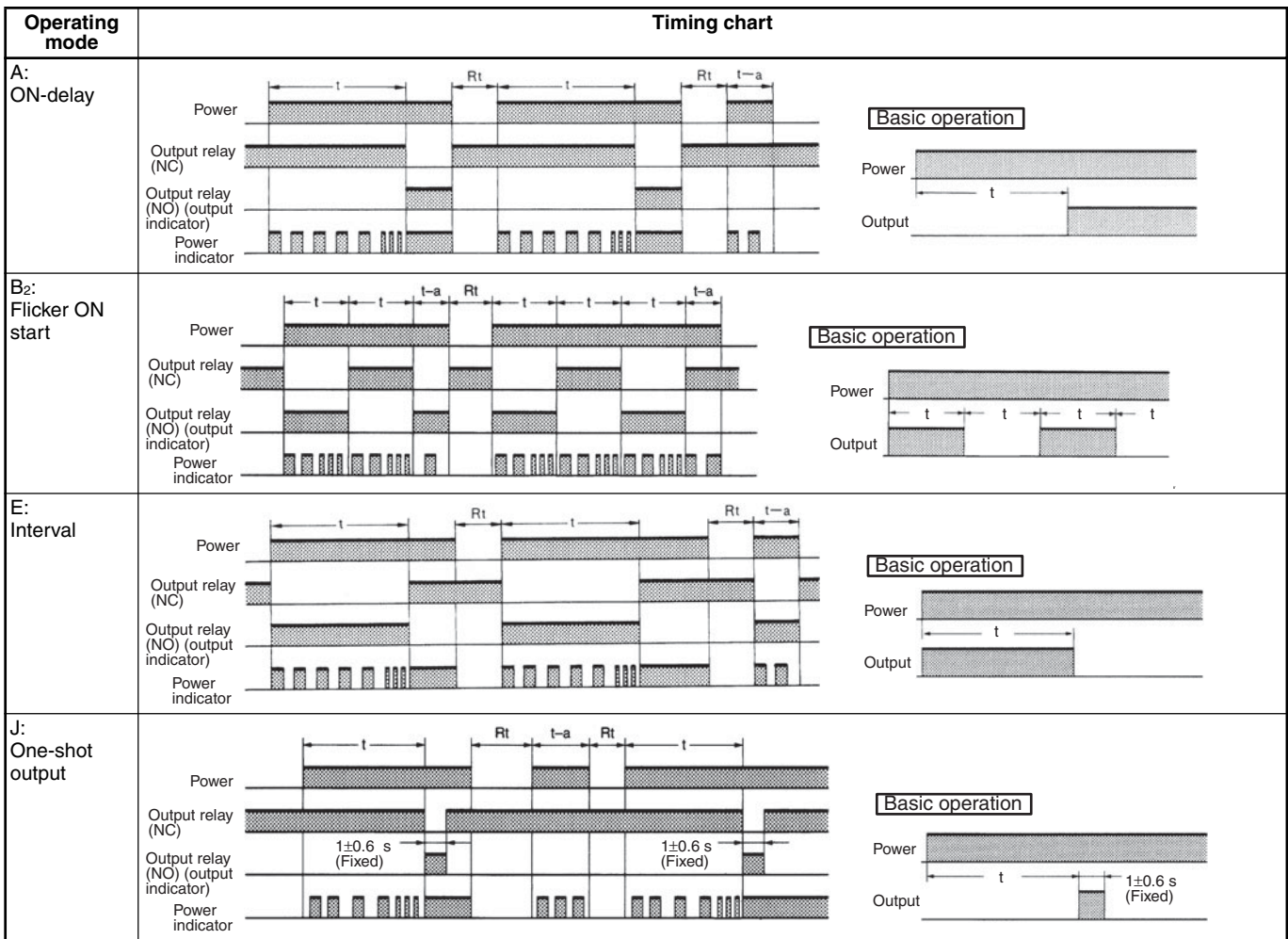
Operating mode	Timing chart
A: ON-delay	
B₂: Flicker ON start	
E: Interval	
J: One-shot output	

Note: 1. The minimum power-opening time ("Rt") is 0.1 s.

2. The letter "t" in the timing charts stands for the set time and "t–a" means that the period is less than the time set.

H3CR-A8E
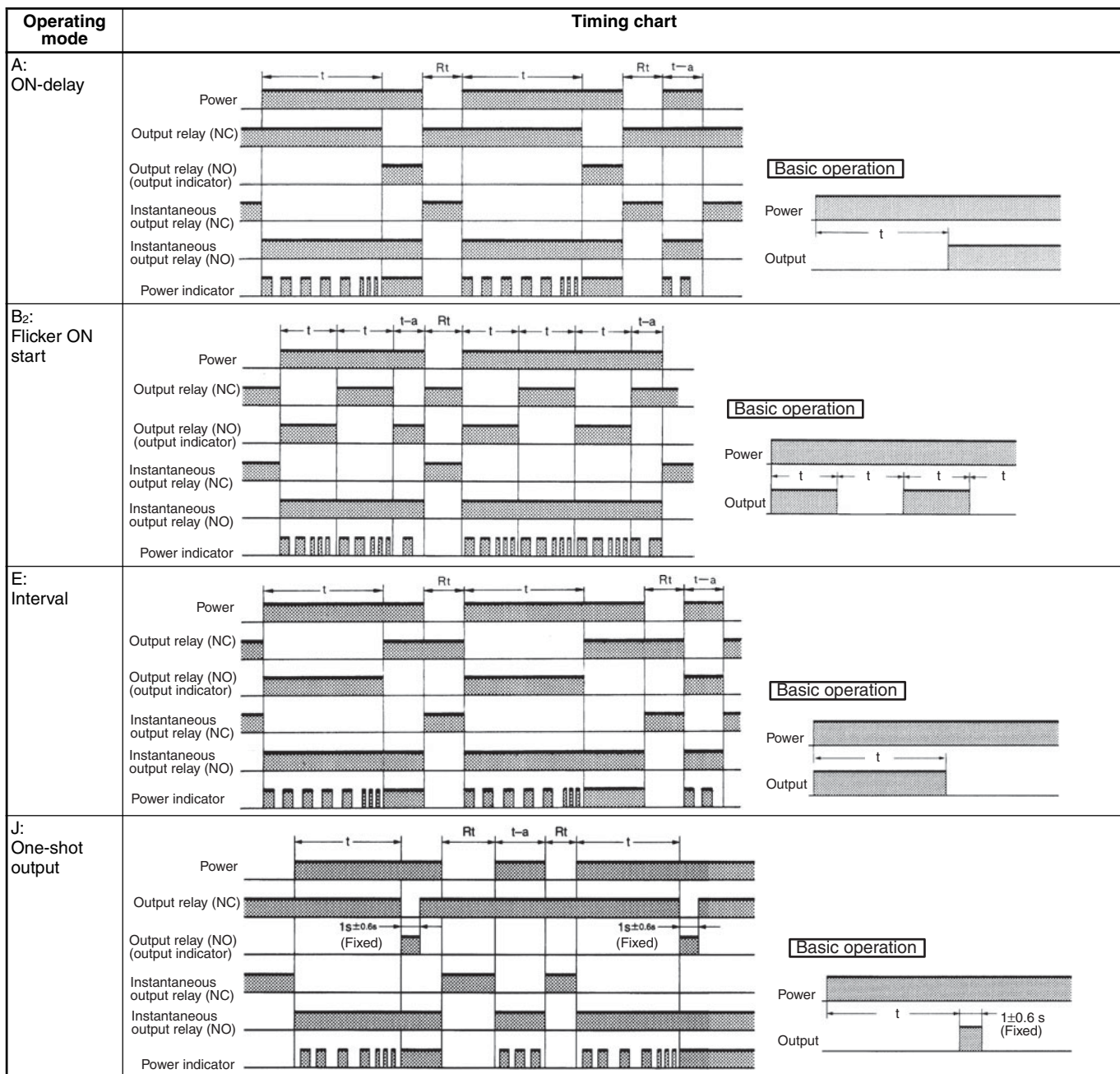
Operating mode	Timing chart
A: ON-delay	
B2: Flicker ON start	
E: Interval	
J: One-shot output	

Note: 1. The minimum power-opening time ("Rt") is 0.1 s.

 2. The letter "t" in the timing charts stands for the set time and "t–a" means that the period is less than the time set.

Nomenclature

Power indicator (green) (Flashes when Timer operates; lit when Timer stops operating)

Operating mode display window

Operating mode selector
Select a mode from:
A, B, B2, C, D, and E (H3CR-A, -AP, and -AS) A, B2, E and J (H3CR-A8, -A8S, and -A8E) G and J (H3CR-A-300)

Scale range display windows

Time unit display window

Time unit selector (select one from sec, min, hrs, and 10h)

Output indicator (orange) (Lit when output)

Time range selector (select one from 1.2, 3, 12, and 30 at full scale; with the H3CR-A□-301, select from 2.4, 6, 24, or 60 at full scale.)

Time setting knob (set time)

Dimensions

Note: All units are in millimeters unless otherwise indicated.

H3CR-A
H3CR-AP
H3CR-AS

15 | 66.6
6 | 52.3
0.7
48
48
39 dia. | 44.8 × 44.8
11 pins

H3CR-A8
H3CR-A8S
H3CR-A8E
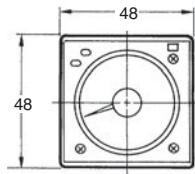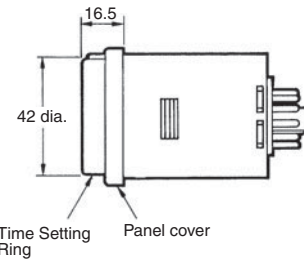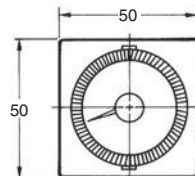
15 | 66.6
6 | 52.3
0.7
48
48
39 dia. | 44.8 × 44.8
8 pins

Dimensions with Set Ring

50
50
16.5
42 dia.

Time Setting Ring | Panel cover

Dimensions with Front Connecting Socket
P2CF-08-□/P2CF-11-□

H3CR-A
H3CR-AS
H3CR-AP
100.8* | 98.5

P2CF-11
P2CF-11-E | 2.3*

H3CR-A8□
89.9* | 87.6

P2CF-08
P2CF-08-E | 2.3*

Dimensions with Back Connecting Socket
P3G-08/P3GA-11

15 | 81.5
80

H3CR-A
H3CR-AS
H3CR-AP
+ Adapter

P3GA-11

Y92F-30 | (When Y92A-48G mounted)

15 | 81.5
75

H3CR-A8□
+ Adapter

P3G-08

Y92F-30 | (When Y92A-48G mounted)
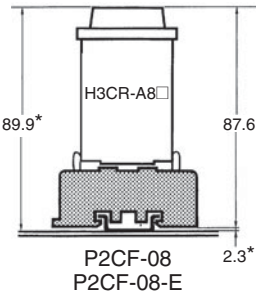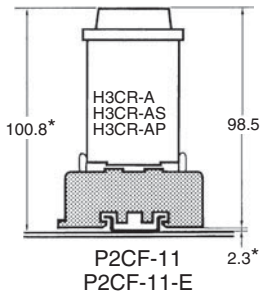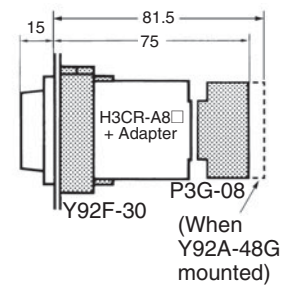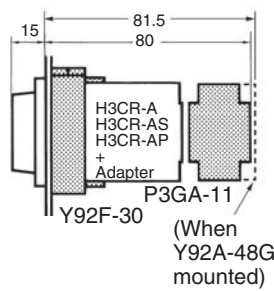
*These dimensions vary with the kind of DIN track (reference value).

Application Examples (H3CR-A)

A Mode: ON-delay

ON-delay operation (A mode) is a basic mode.

1. Power-ON Start/Power-OFF Reset

The Power-ON start/Power-OFF reset operation is a standard operating method.
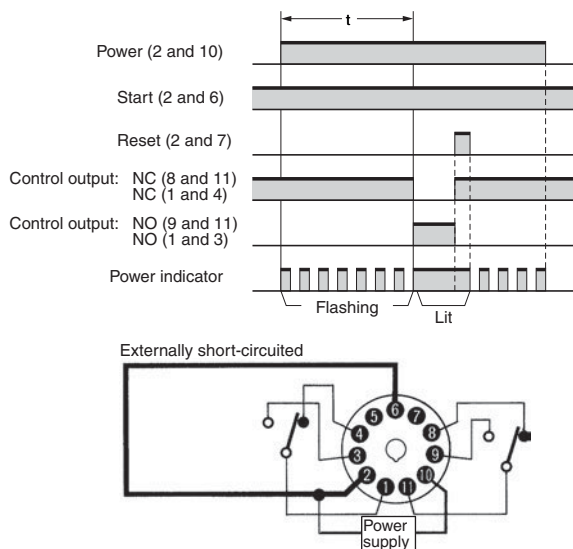
2. Signal Start/Signal Reset

The Signal start/Signal reset operation is useful for remote control of the Timer.
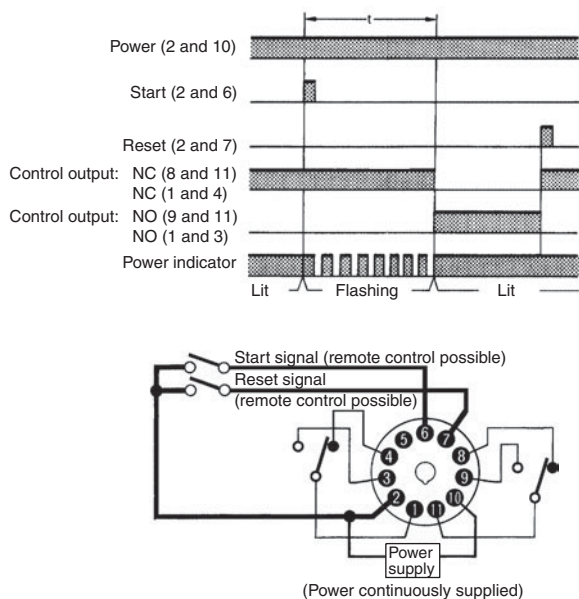
3. Control of Integrated Time with Gate Signal

With a gate signal, the Power-ON start operation and Signal start operation can be controlled (the operation can be interrupted).
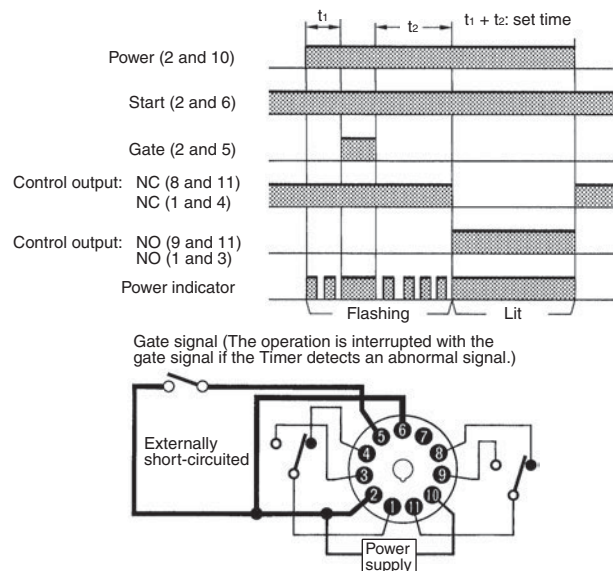
B/B2 Mode: Flicker

The flicker operation in the B and B2 modes can be effectively applied to lamp or buzzer (ON and OFF) alarms or the monitoring of an intermittent operation with a display.

1. Power-ON Start/Power-OFF Reset (in B Mode)
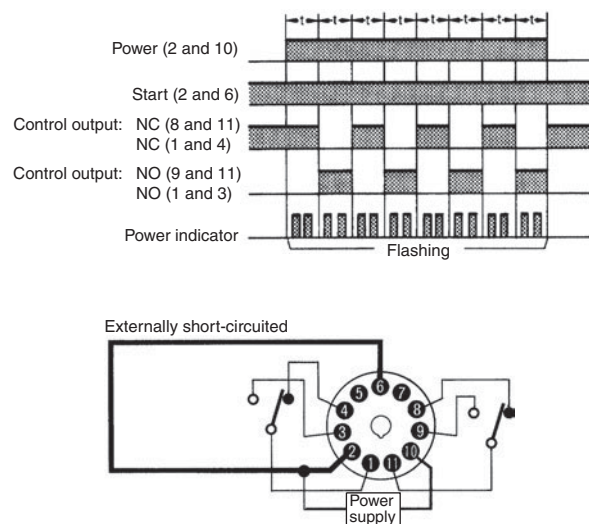
2. Signal Start/Signal Reset (in B Mode)

If there is an abnormal signal, flashing starts. When the abnormal condition is restored, a reset signal stops the display flashing.

2. Signal-ON-OFF Start/Instantaneous Operation/Time-limit Reset

C Mode: Signal ON/OFF-delay

The Signal ON-/OFF-delay operation (C mode) is useful for the control of distribution of products on a production line into boxes by the specified number or time.

1. Power-ON Start/Instantaneous Operation/Time-limit Reset

A set of these functions is useful for the operation of a machine for a specified period when power is ON.
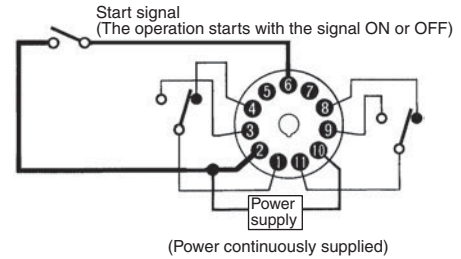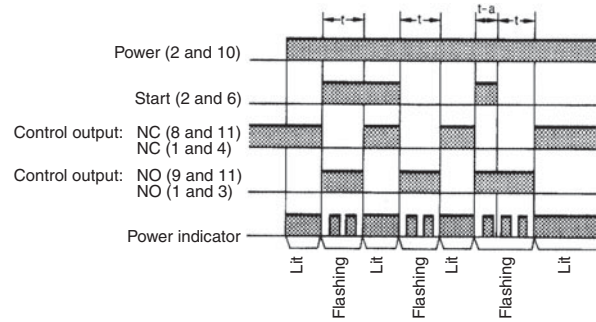
D Mode: Signal OFF-delay

Signal OFF-delay operation (D mode) can be effectively used to keep a load operating for a certain period. For example, this function enables the cooling fan for a lamp or heater to operate for a certain period after the lamp or heater is switched OFF.

1. Power-ON Start/Instantaneous Operation/Time-limit Reset
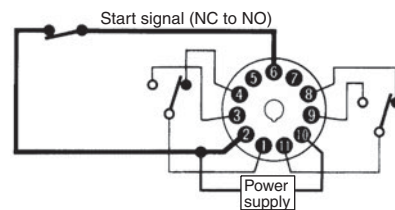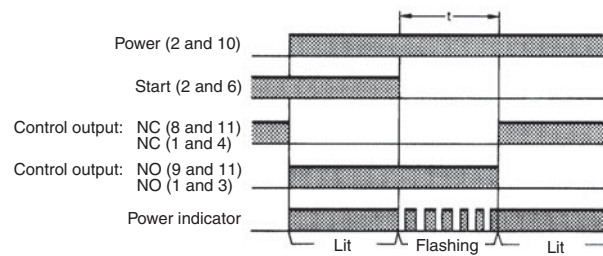
2. Signal Start/Instantaneous Operation/ Time-limit Reset
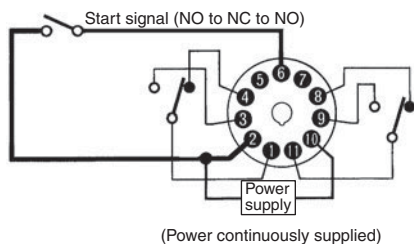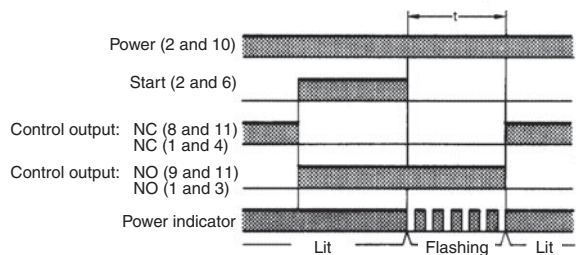
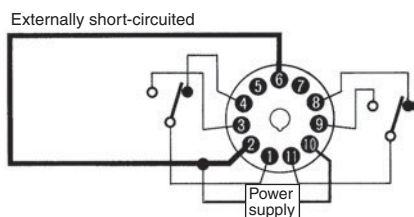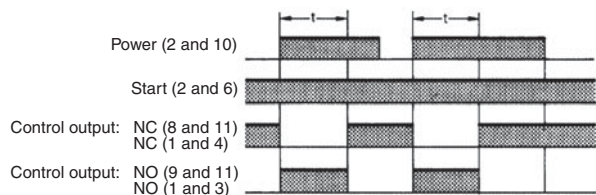## 2. Signal Start/Instantaneous Operation/ Time-limit Reset

This function is useful for the repetitive control such as the filling of liquid for a specified period after each Signal start input.
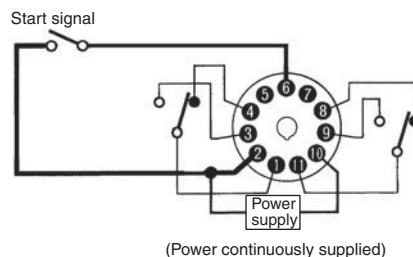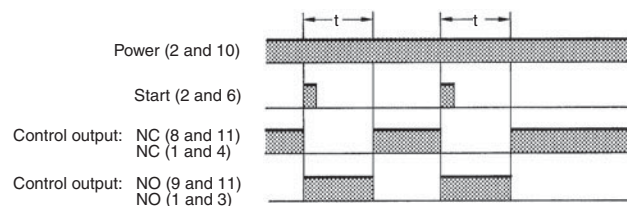
E Mode: Interval

1. Power-ON Start/Instantaneous Operation/ Time-limit Reset

This function is useful for the operation of a machine for a specified period after power is ON.

Safety Precautions (H3CR-A)

Refer to *Safety Precautions for All Timers*.

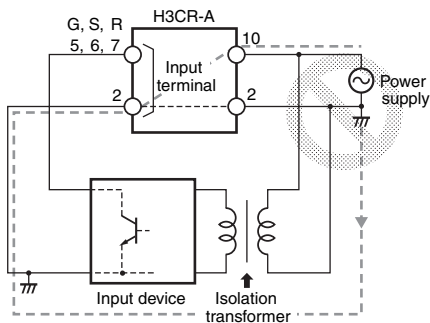**Note:** The following precautions apply to all H3CR-A models.

■ Power Supplies

For the power supply of an input device of the H3CR-A☐/-A☐S/-AP, use an isolating transformer with the primary and secondary windings mutually isolated and the secondary winding not grounded.
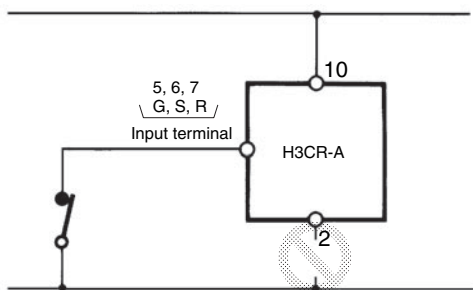
Correct

Isolation transformer is required.
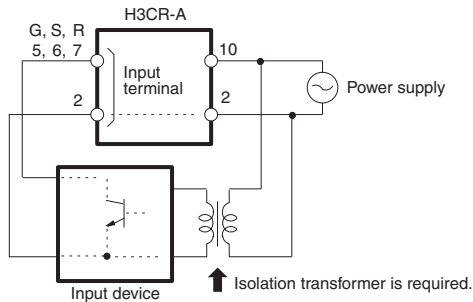
Incorrect

The H3CR-A☐/-A☐S/AP's power supply terminal 2 is a common terminal for input signals to the Timer. Do not disconnect the wires on terminal 2, otherwise the internal circuitry of the Timer will be damaged.


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

■ Input/Output

Relationship between Input and Power Supply Circuits (except for H3CR-A8E)

The H3CR-A (except for H3CR-A8E) uses transformerless power supply. When connecting a relay or transistor as an external signal input device, pay attention to the following points to prevent short-circuiting due to a sneak current to the transformerless power supply. If a relay or transistor is connected to two or more Timers, the input terminals of those Timers must be wired properly so that they will not differ in phase, otherwise the terminals will be short-circuited to one another.
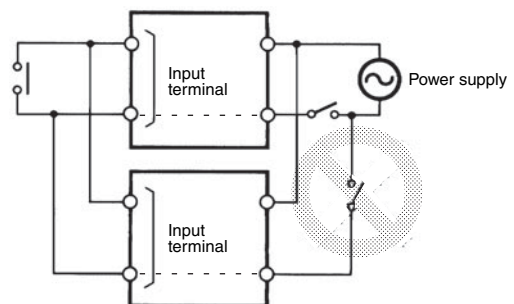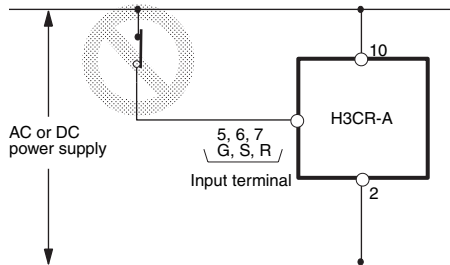
Incorrect
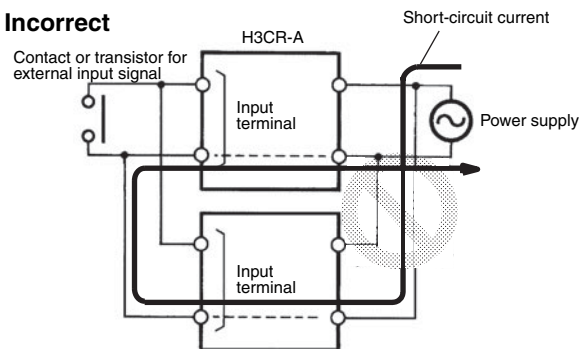
Correct
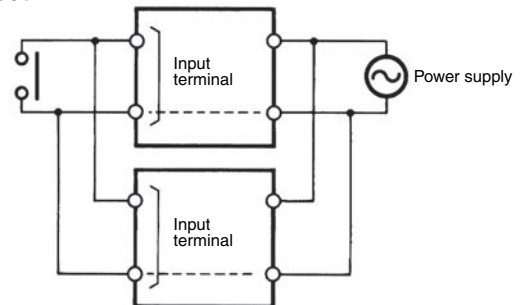
It is impossible to provide two independent power switches as shown below regardless of whether or not the Timers are different in phase.
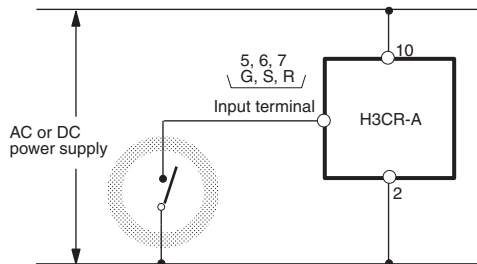
Relationship between Input and Power Supply Circuits (H3CR-A□/-A□S)

An appropriate input is applied to the input signal terminals of the H3CR-A□/-A□S when one of the input terminals is short-circuited with the common terminal (terminal 2) for the input signals. Never use terminal 10 as the common terminal for this purpose, otherwise the internal circuit of the Timer will be damaged.
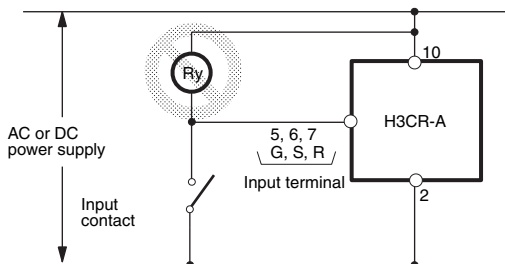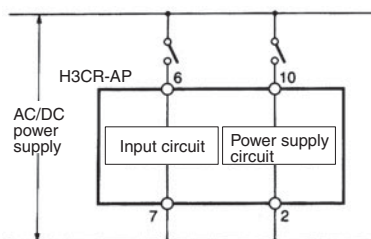
Incorrect

AC or DC power supply

5, 6, 7 G, S, R
Input terminal

H3CR-A

10

2

Correct

5, 6, 7 G, S, R
Input terminal

AC or DC power supply

H3CR-A

10

2

Do not connect a relay or any other load between input terminals, otherwise the internal circuit of the Timer will be damaged due to the high-tension voltage applied to the input terminals.
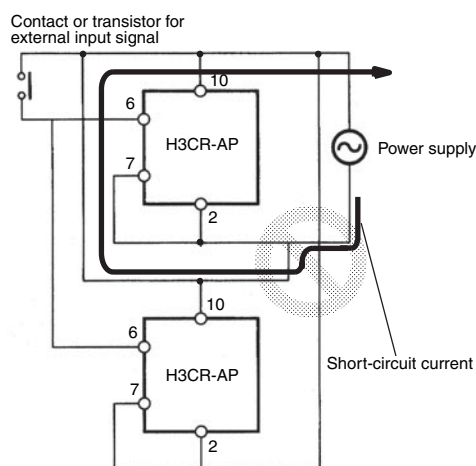
AC or DC power supply

Ry

5, 6, 7 G, S, R
Input terminal

Input contact

H3CR-A

10

2

Relationship between Input and Power Supply Circuits (H3CR-AP)

H3CR-AP

AC/DC power supply

6   10

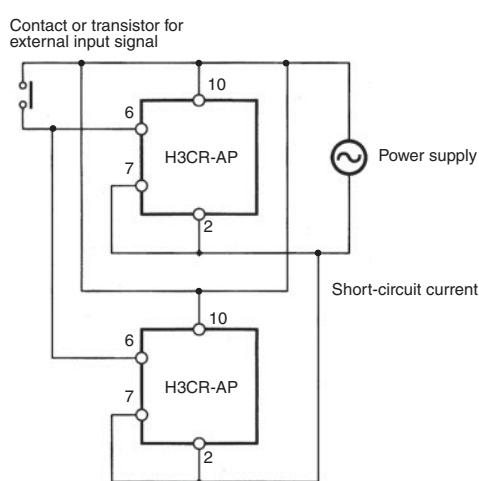Input circuit | Power supply circuit

7   2

Since the input circuit and the power supply circuit are configured independently, the input circuit can be turned ON or OFF irrespective of the ON/OFF state of the power supply.
It must be noted that a voltage equivalent to the power supply voltage is applied to the input circuit.

If a relay or transistor is connected to two or more Timers, the input terminals of those Timers must be wired properly so that they will not be different in phase or the terminals will be short-circuited to one another (refer to the figures below).

Incorrect

Contact or transistor for external input signal

10
6
H3CR-AP
7
2

Power supply

Short-circuit current

10
6
H3CR-AP
7
2

Correct

Contact or transistor for external input signal

10
6
H3CR-AP
7
2

Power supply

Short-circuit current

10
6
H3CR-AP
7
2

Common to All H3CR-A Models

With the H3CR-AP, input wires must be as short as possible. If the floating capacity of wires exceeds 1,200 pF (approx. 10 m for cables with 120 pF/m), the operation will be affected. Pay particular attention when using shielded cables.

The H3CR-A□S transistor output is isolated from the internal circuitry by a photocoupler. Therefore, either NPN or PNP output is possible.

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.

Solid-state Twin Timers
H3CR-F

DIN 48 × 48-mm Twin Timers

- Wide power supply ranges of 100 to 240 VAC and 48 to 125 VDC respectively.
- ON- and OFF-times can be set independently and so combinations of long ON- or OFF-time and short OFF- or ON-time settings are possible.
- Fourteen time ranges from 0.05 s to 30 h or from 1.2 s to 300 h depending on the model to be used.
- Models with a flicker ON start or flicker OFF start are available.
- Easy sequence checks through instantaneous outputs for a zero set value at any time range.
- Length, when panel-mounted with a Socket, of 80 mm or less.
- 11-pin and 8-pin models are available.

Model Number Structure

■ Model Number Legend

H3CR - F ☐☐ - ☐☐
        1 2 3   4 5

1. Classification
F: Twin timers
2. Configuration
None: 11-pin socket
8:     8-pin socket

3. Twin Timer Mode
None: Flicker OFF start
N: Flicker ON start
4. Time Range
None: 0.05 s to 30 h models
300:   1.2 s to 300 h models

5. Supply Voltage
100-240AC: 100 to 240 VAC
24AC/DC: 24 VAC/VDC
12DC: 12 VDC
48-125DC: 48 to 125 VDC

Ordering Information

■ List of Models

Operating modes	Supply voltage	0.05 s to 30 h models		1.2 s to 300 h models	
		11-pin models	8-pin models	11-pin models	8-pin models
Flicker OFF start	100 to 240 VAC	H3CR-F 100-240AC	H3CR-F8 100-240AC	H3CR-F-300 100-240AC	H3CR-F8-300 100-240AC
	24 VAC/DC	H3CR-F 24AC/DC	H3CR-F8 24AC/DC	H3CR-F-300 24AC/DC	H3CR-F8-300 24AC/DC
	12 VDC	H3CR-F 12DC	H3CR-F8 12DC	H3CR-F-300 12DC	H3CR-F8-300 12DC
	48 to 125 VDC	H3CR-F 48-125DC	H3CR-F8 48-125DC	H3CR-F-300 48-125DC	H3CR-F8-300 48-125DC
Flicker ON start	100 to 240 VAC	H3CR-FN 100-240AC	H3CR-F8N 100-240AC	H3CR-FN-300 100-240AC	H3CR-F8N-300 100-240AC
	24 VAC/DC	H3CR-FN 24AC/DC	H3CR-F8N 24AC/DC	H3CR-FN-300 24AC/DC	H3CR-F8N-300 24AC/DC
	12 VDC	H3CR-FN 12DC	H3CR-F8N 12DC	H3CR-FN-300 12DC	H3CR-F8N-300 12DC
	48 to 125 VDC	H3CR-FN 48-125DC	H3CR-F8N 48-125DC	H3CR-FN-300 48-125DC	H3CR-F8N-300 48-125DC

Note: Specify both the model number and supply voltage when ordering.
       Example: H3CR-F <u>100-240AC</u>
                         └── Supply voltage

■ Accessories (Order Separately)

Adapter, Protective Cover and Hold-down Clip

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
		Y92F-73 *1
		Y92F-74 *1
Protective Cover		Y92A-48B *2
Hold-down Clip (Sold in sets of two)	For PF085A Socket	Y92H-8
	For PL08 and PL11 Sockets	Y92H-7

Note: Refer to H3CR-A datasheet for details.

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

*2 The Y92F-48B Front Cover is made from hard plastic.
Remove the Front Cover to change the set value.
The Y92F-48B Front Cover and the Y92F-73/-74 Flush Mounting Adapter also cannot be used at the same time.

Sockets

Timer	Round Sockets		
Pin	Connection	Terminal	Models
11-pin	Front Connecting	DIN track mounting	P2CF-11
		DIN track mounting (Finger-safe type)	P2CF-11-E
	Back Connecting	Screw terminal	P3GA-11
		Solder terminal	PL11
		Wrapping terminal	PL11-Q
		PCB terminal	PLE11-0
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-□□-E has a finger-protection structure. Round crimp terminals cannot be used. Use forked crimp terminals.
2. The P3GA-11 and 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*.

OMRON

Specifications

■ General

Item	H3CR-F	H3CR-F8	H3CR-FN	H3CR-F8N
Operating mode	Flicker OFF start		Flicker ON start	
Pin type	11-pin	8-pin	11-pin	8-pin
Operating/Reset method	Time-limit operation/Time-limit reset or self-reset			
Output type	Relay output (DPDT)			
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

0.05 s to 30 h Models

Time unit		s (sec)	×10 s (10 sec)	min (min)	h (hrs)
Setting	1.2	0.05 to 1.2	1.2 to 12	0.12 to 1.2	
	3	0.3 to 3	3 to 30	0.3 to 3	
	12	1.2 to 12	12 to 120	1.2 to 12	
	30	3 to 30	30 to 300	3 to 30	

Note: Instantaneous output is available at any time range. To obtain instantaneous output, set to below 0.

1.2 s to 300 h Models

Time unit		×10 s (10 sec)	×10 min (10 min)	h (hrs)	×10 h (10 hrs)
Setting	1.2	1.2 to 12	1.2 to 12	0.12 to 1.2	1.2 to 12
	3	3 to 30	3 to 30	0.3 to 3	3 to 30
	12	12 to 120	12 to 120	1.2 to 12	12 to 120
	30	30 to 300	30 to 300	3 to 30	30 to 300

Note: Instantaneous output is available at any time range. To obtain instantaneous output, set to below 0.

■ Ratings

Rated supply voltage (See notes 1, 2, and 3.)	100 to 240 VAC (50/60 Hz),12 VDC, 24 VAC/DC (50/60 Hz), 48 to 125 VDC
Operating voltage range	85% to 110% of rated supply voltage; 90% to 110% with 12-VDC models
Power reset	Minimum power-opening time: 0.1 s
Power consumption	100 to 240 VAC: approx. 10 VA (2.1 W) at 240 VAC 24 VAC/VDC: approx. 2 VA (1.7 W) at 24 VAC approx. 1 W at 24 VDC 48 to 125 VDC: approx. 1.5 W at 125 VDC 12 VDC: approx. 1 W at 12 VDC
Control outputs	Contact output: 5 A at 250 VAC/30 VDC, resistive load (cosφ = 1)

Note: 1. A power supply with a ripple of 20% max. (single-phase power supply with full-wave rectification) can be used with each DC Model.

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

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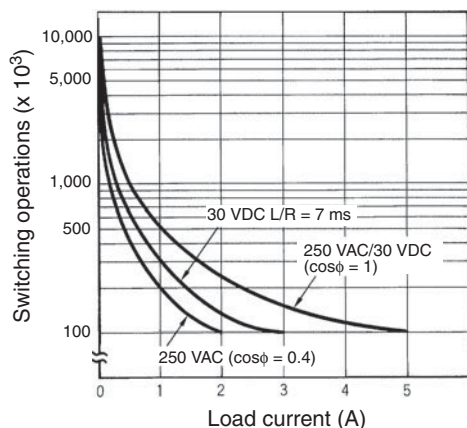
■ Characteristics

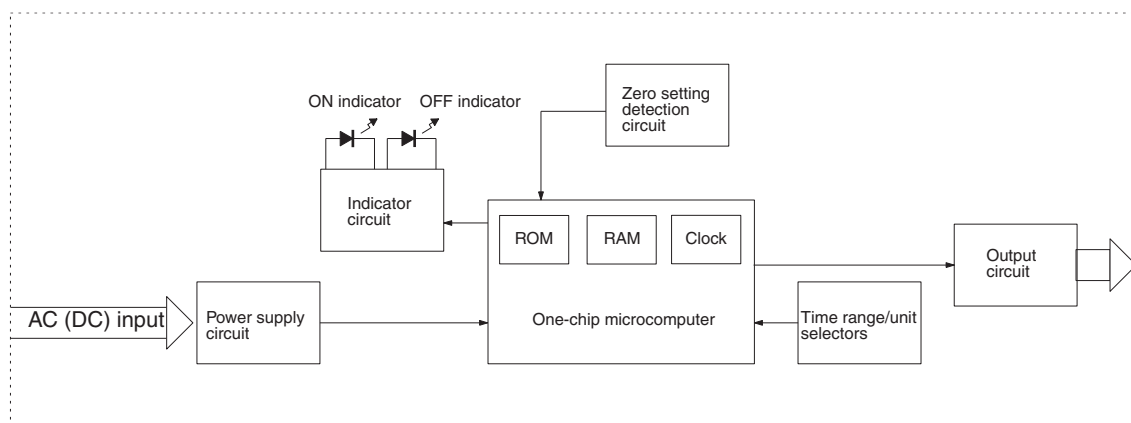|	
Accuracy of operating time	±0.2% FS max. (±0.2% FS ±10 ms max. in ranges of 1.2 and 3 s)
Setting error	±5% FS ±50 ms max.
Reset time	0.1 s max.
Reset voltage	10% max. of rated voltage
Influence of voltage	±0.2% FS max. (±0.2% FS ±10 ms max. in ranges of 1.2 and 3 s)
Influence of temperature	±1% FS max. (±1% FS ±10 ms max. in ranges of 1.2 and 3s)
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) for 100 to 240 VAC, 48 to 125 VDC 1 kV for 12 VDC, 24 VAC/DC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC, 48 to 125 VDC 1.5 kV for 12 VDC, 24 VAC/DC
Noise immunity	±1.5 kV (between power terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±400 V for 12 VDC
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: 98 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	Approx. 100 g

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

■ Life-test Curve

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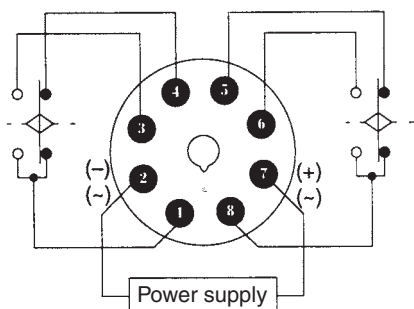
Connections

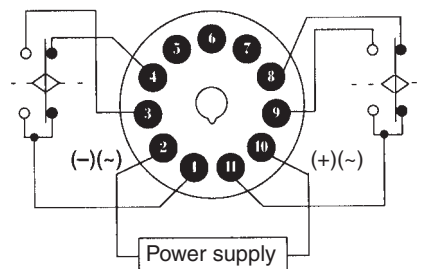## ■ Block Diagrams

■ I/O Functions

Inputs		---
Outputs	Control output	Outputs are turned ON/OFF according to the time set by the ON- and OFF-time setting knob.

■ Terminal Arrangement

H3CR-F8
H3CR-F8
NH3CR-F8-300
H3CR-F8N-300

H3CR-F
H3CR-FN
H3CR-F-300
H3CR-FN-300

Note: Leave terminals 5, 6, and 7 open.
Do not use them as relay terminals.

Operation

■ Timing Chart

t_{ON}: ON set time
t_{OFF}: OFF set time

Operating mode	Timing chart
Flicker OFF start	
Flicker ON start	
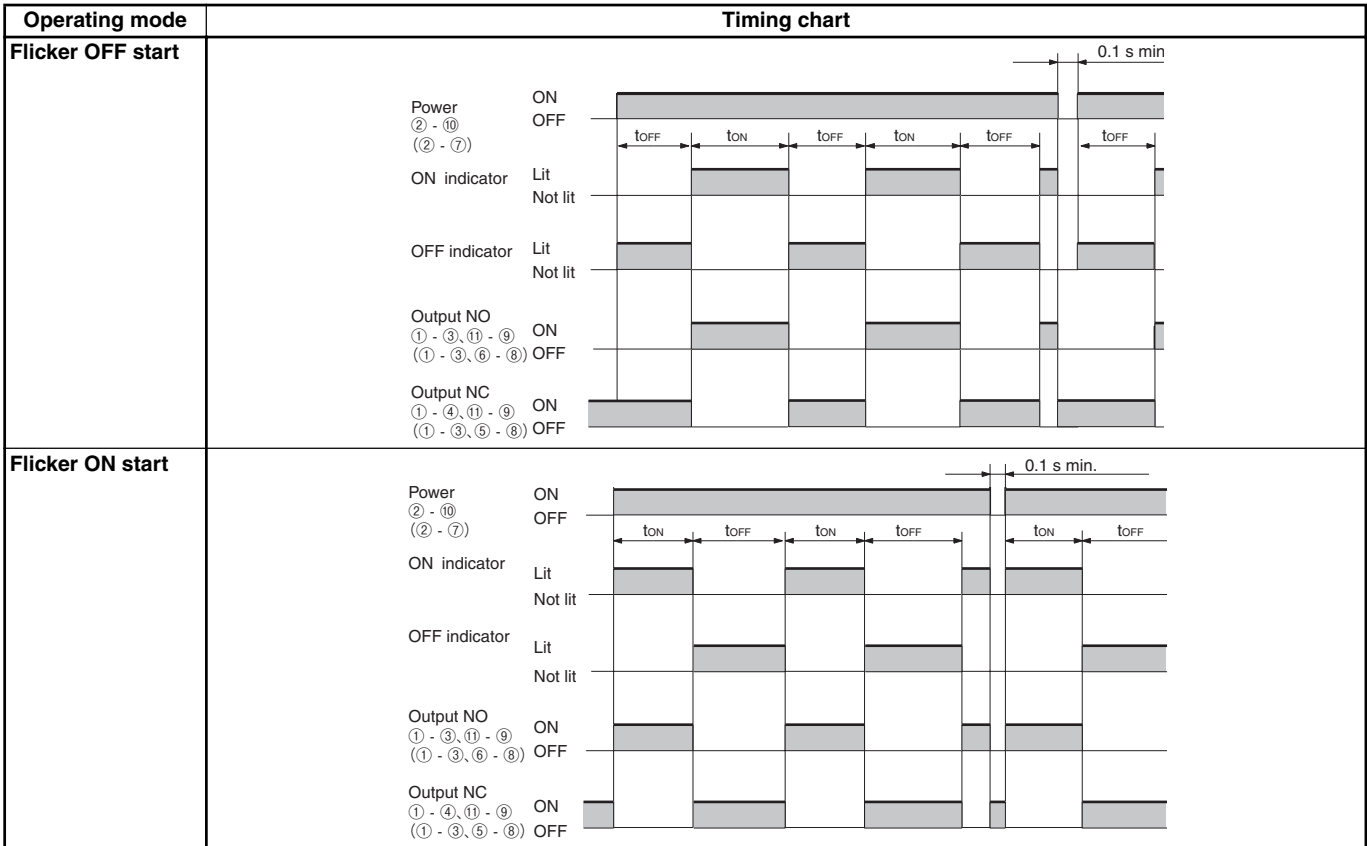
Note: 1. The reset time requires a minimum of 0.1 s.

2. When power is supplied in flicker ON start mode, the OFF indicator lights momentarily. This, however, has no effect on the performance of the Timer.
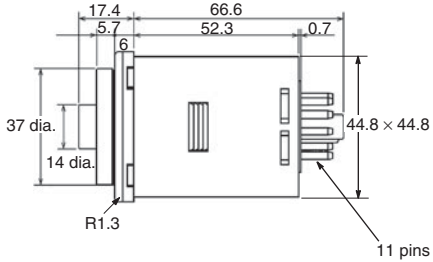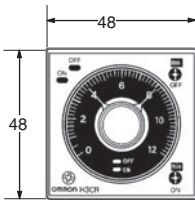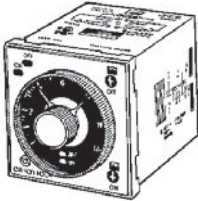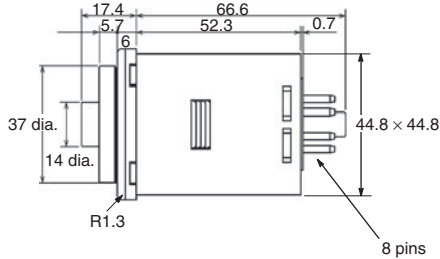
Nomenclature

OFF indicator (green)
Lit when the output is OFF.

ON indicator (orange)
Lit when the output is ON.

Scale range display windows

Time range selector (select one from 1.2, 3, 12, and 30 at full scale)
For both ON-time and OFF-time.

OFF-time unit display window

OFF-time unit selector (select one from sec.
10 s, min., and hrs, or from 10 s, 10 min, hrs, and 10 h)

ON-time setting knob (with orange pointer)
For ON-time setting

OFF-time setting knob (with green pointer)
For OFF-time setting

ON-time unit display window

ON-time unit selector (select one from sec, 10 s, min, and hrs, or from 10 s, 10 min, hrs, and 10 h)
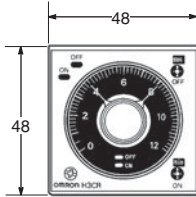
Dimensions

Note: All units are in millimeters unless otherwise indicated.

H3CR-F
H3CR-FN
H3CR-F-300
H3CR-FN-300
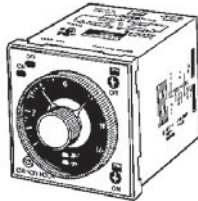
48

48

17.4
5.7
6
66.6
52.3
0.7

37 dia.
14 dia.
44.8 × 44.8

R1.3

11 pins

H3CR-F8
H3CR-F8N
H3CR-F8-300
H3CR-F8N-300

48

48

17.4
5.7
6
66.6
52.3
0.7

37 dia.
14 dia.
44.8 × 44.8

R1.3

8 pins

Dimensions with Front Connecting Socket
P2CF-08-▢/P2CF-11-▢

H3CR-F
H3CR-FN

103.2*   100.9

P2CF-11
P2CF-11-E   2.3*

H3CR-F8
H3CR-F8N

92.3*   90.0

P2CF-08
P2CF-08-E   2.3*

Dimensions with Back Connecting Socket
P3G-08/P3GA-11

17.4   81.5
80

H3CR-F
H3CR-FN

Y92F-30   P3GA-11
(When
Y92A-48G
mounted)

17.4   81.5
75

H3CR-F8
H3CR-F8N

Y92F-30   P3G-08
(When
Y92A-48G
mounted)

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

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

Solid-state Star-delta Timers
H3CR-G
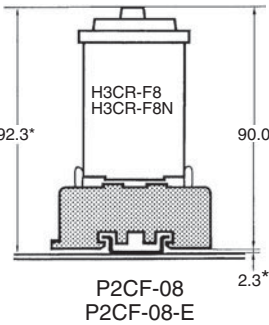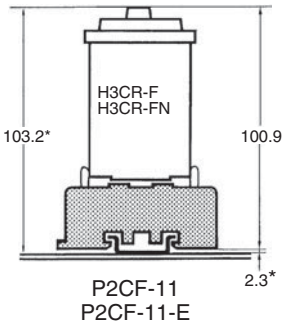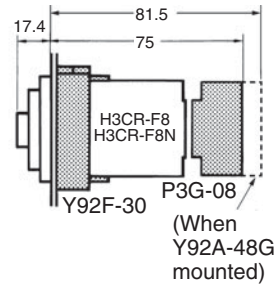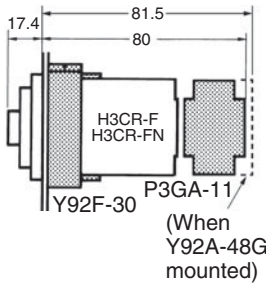
DIN 48 × 48-mm Star-delta Timer

• 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 <u>100-120AC</u>
            └────── 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 (cosϕ = 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.
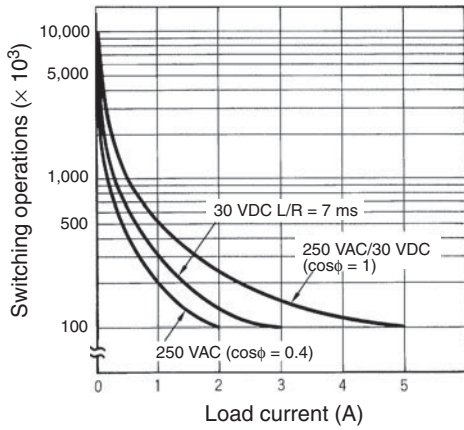
■ Characteristics

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)
Electric 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*.
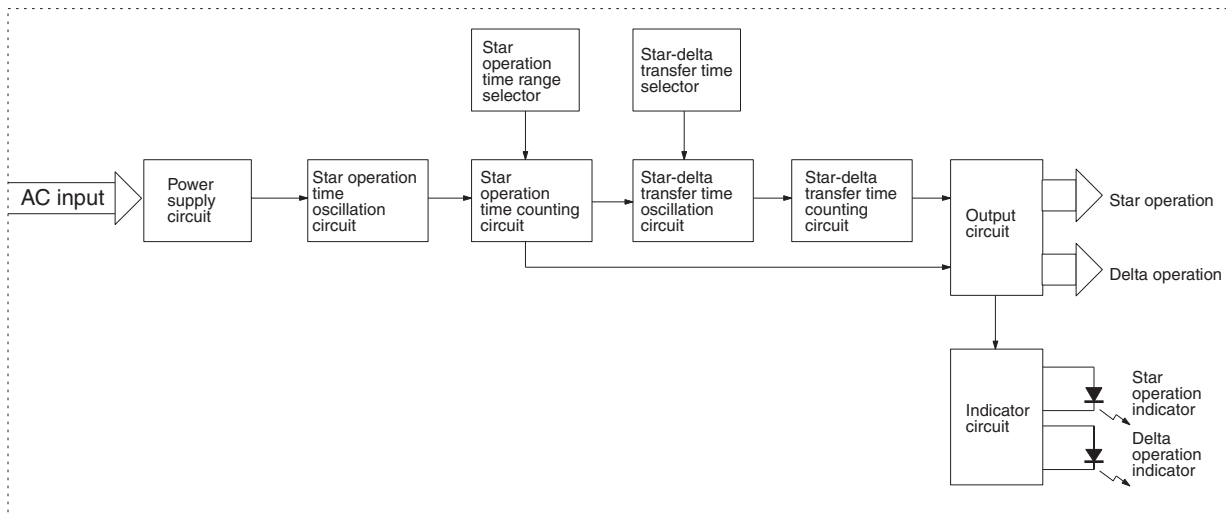
■ Life-test Curve

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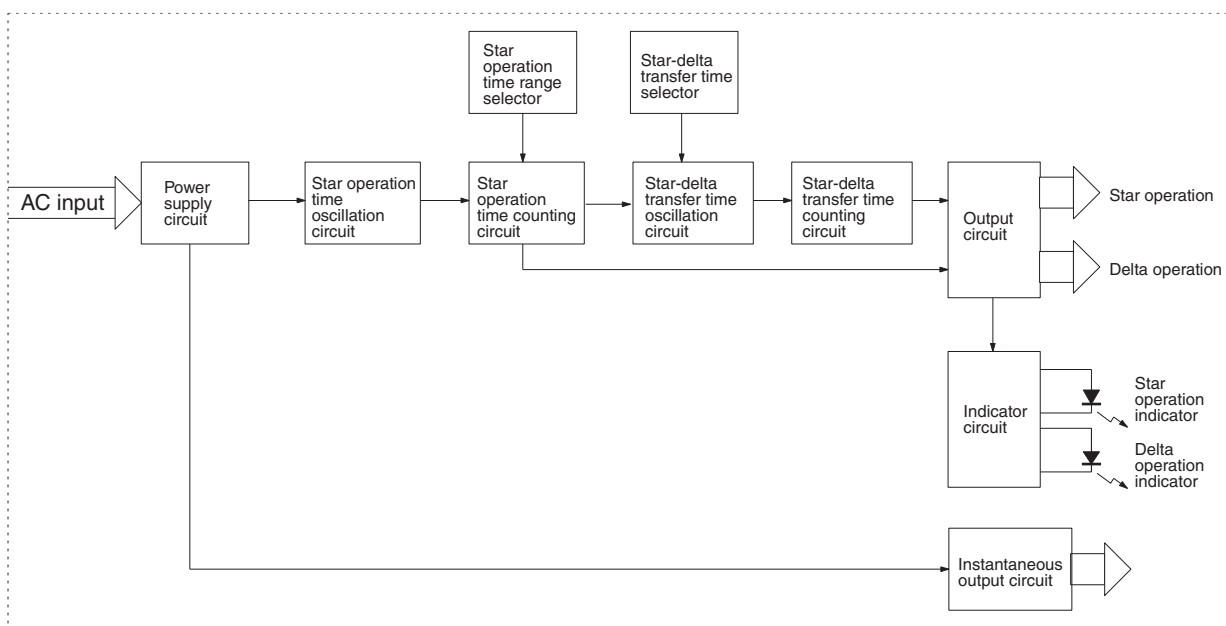
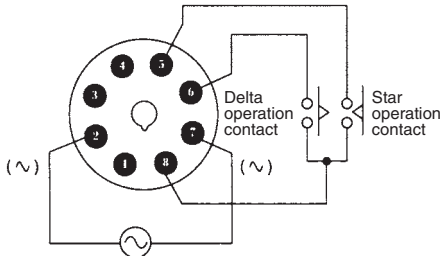# Connections

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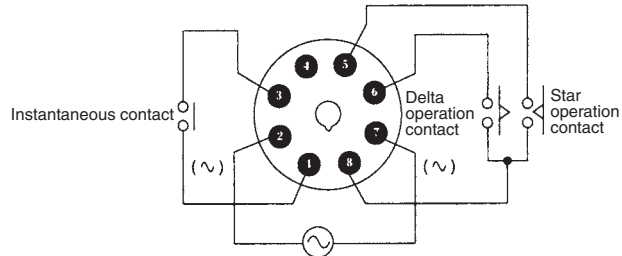
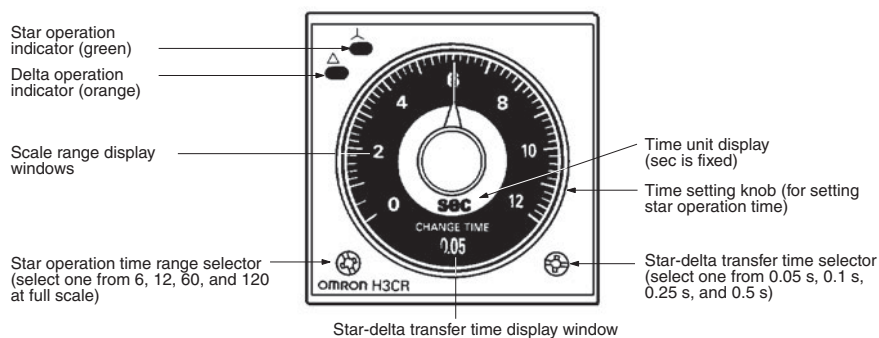**Note:** Leave terminal 4 open. Do not use them as relay terminals.

Operation

■ Timing Chart

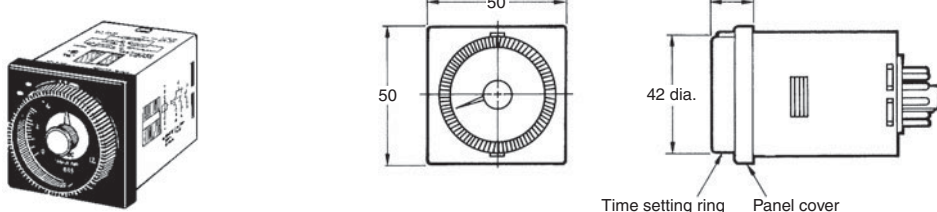t1: Star operation time setting
t2: Star-delta transfer time

Model	Timing chart
H3CR-G8L/-G8EL	

Nomenclature

Dimensions

Note: All units are in millimeters unless otherwise indicated.
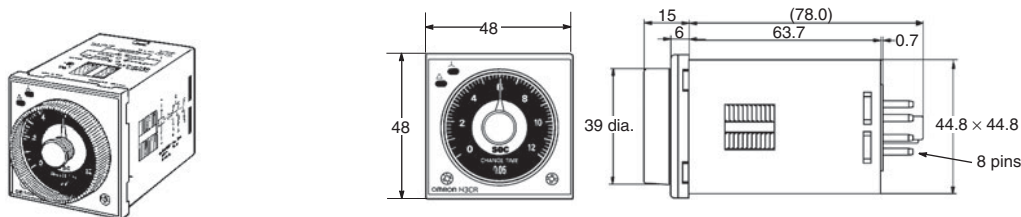
48

48

15 (78.0)
6 63.7 0.7

39 dia.

44.8 × 44.8

8 pins

Dimensions with Set Ring

50

50

16.5

42 dia.

Time setting ring   Panel cover

Dimensions with Front Connecting Socket P2CF-08-□

101.3*   H3CR-G8□L   99

P2CF-08
P2CF-08-E   2.3*

Dimensions with Back Connecting Socket P3G-08

15   92.9
86.4

H3CR-G8□L

Y92F-30   P3G-08
(When Y92A-48G mounted)

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

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

OMRON
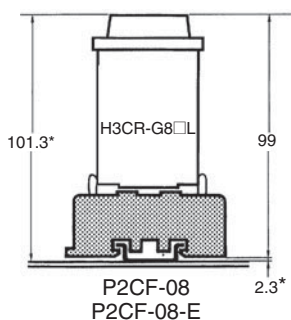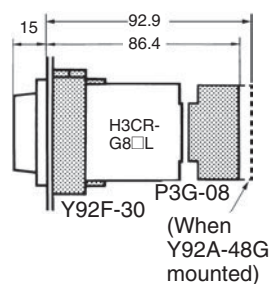
DIN 48 × 48-mm Power OFF-delay Timer

- Long power OFF-delay times;
  S-series: up to 12 seconds,
  M-series: up to 12 minutes.
- Models with forced-reset input are available.
- 11-pin and 8-pin models are available.

CE UL CSA CCCs

Model Number Structure

■ Model Number Legend

Note: This model number legend includes combinations that are not available. Before ordering, please check the *List of Models* on page 1 for availability.

H3CR - H ☐ ☐ L ☐ ☐
      1 2 3 4 5 6

Note: Specify the model number, supply voltage, and time range (S or M) when ordering.

1. Classification
H: Power OFF-delay timer

2. Configuration
None: 11-pin socket
8:      8-pin socket

3. Input
None: Without reset input
R: With reset input

4. Dimensions
L: Long-body model

5. Supply Voltage
100-120AC: 100 to 120 VAC
200-240AC: 200 to 240 VAC
48DC: 48 VDC
100-125DC: 100 to 125 VDC

6. Time Range
S: 0.05 to 12 s
M: 0.05 to 12 min

■ List of Models

Input	Output	Supply voltage	S-series		M-series	
			11-pin models	**8-pin models**	**11-pin models**	**8-pin models**
Without reset input	DPDT	100 to 120 VAC	---	H3CR-H8L 100-120AC S	---	H3CR-H8L 100-120AC M
		200 to 240 VAC		H3CR-H8L 200-240AC S		H3CR-H8L 200-240AC M
		24 VAC/DC		H3CR-H8L 24AC/DC S		H3CR-H8L 24AC/DC M
		48 VDC		H3CR-H8L 48DC S		H3CR-H8L 48DC M
		100 to 125 VDC		H3CR-H8L 100-125DC S		H3CR-H8L 100-125DC M
With reset input		100 to 120 VAC	H3CR-HRL 100-120AC S	---	H3CR-HRL 100-120AC M	---
		200 to 240 VAC	H3CR-HRL 200-240AC S		H3CR-HRL 200-240AC M	
		24 VAC/DC	H3CR-HRL 24AC/DC S		H3CR-HRL 24AC/DC M	
		48 VDC	H3CR-HRL 48DC S		H3CR-HRL 48DC M	
		100 to 125 VDC	H3CR-HRL 100-125DC S		H3CR-HRL 100-125DC M	
	SPDT	100 to 120 VAC	---	H3CR-H8RL 100-120AC S	---	H3CR-H8RL 100-120AC M
		200 to 240 VAC		H3CR-H8RL 200-240AC S		H3CR-H8RL 200-240AC M
		24 VAC/DC		H3CR-H8RL 24AC/DC S		H3CR-H8RL 24AC/DC M
		48 VDC		H3CR-H8RL 48DC S		H3CR-H8RL 48DC M
		100 to 125 VDC		H3CR-H8RL 100-125DC S		H3CR-H8RL 100-125DC M

Note: Specify the model number, supply voltage, and time range (S or M) when ordering.
    Example: H3CR-H8L 100-120AC S
                      Time range
                      Supply voltage
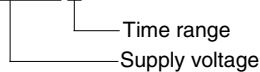
■ Accessories (Order Separately)

Adapter, Protective Cover and Hold-down Clip

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
Protective Cover		Y92A-48B
Hold-down Clip	For PF085A Socket	Y92H-2
	For PL08 and PL11 Sockets	Y92H-1

Note: Refer to H3CR-A datasheet for details.
✻ The Y92F-48B Front Cover is made from hard plastic. Remove the Front Cover to change the set value.

Sockets

Timer	Round Sockets		
Pin	Connection	Terminal	Models
11-pin	Front Connecting	DIN track mounting	P2CF-11
		DIN track mounting (Finger-safe type)	P2CF-11-E
	Back Connecting	Screw terminal	P3GA-11
		Solder terminal	PL11
		Wrapping terminal	PL11-Q
		PCB terminal	PLE11-0
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-☐☐-E has a finger-protection structure. Round crimp terminals cannot be used. Use forked crimp terminals.
 2. The P3GA-11 and 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-H8L	H3CR-H8RL	H3CR-HRL
Operating/Reset method	Instantaneous operation/Time-limit reset	Instantaneous operation/Time-limit reset/Forced reset	
Pin type	8-pin		11-pin
Input type	---	No-voltage	
Output type	Relay output (DPDT)	Relay output (SPDT)	Relay output (DPDT)
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		S-series	M-series
		s (sec)	min (min)
Setting	0.6	0.05 to 0.6	
	1.2	0.12 to 1.2	
	6	0.6 to 6	
	12	1.2 to 12	
Min. power ON time		0.1 s min.	2 s min.
Time-up operation repeat period		3 s min.	
Forced-reset repeat period		3 s min.	

Note: 1. If the above minimum power ON time is not secured, the H3CR may not operate. Be sure to secure the above minimum power ON time.
 2. Do not use the Timer with a repeat period of less than 3 s. Doing so may result in abnormal heating or burning. Refer to *Safety Precautions (H3CR-H)* on page 8 for details.

■ Ratings

Rated supply voltage (See notes 1 and 2.)	100 to 120 VAC (50/60 Hz), 200 to 240 VAC (50/60 Hz), 24 VAC/VDC (50/60 Hz), 48 VDC, 100 to 125 VDC
Operating voltage range	85% to 110% of rated supply voltage
No-voltage input (See note 3.)	ON-impedance: 1 kΩ max. ON residual voltage: 1 V max. OFF impedance: 500 kΩ min.
Power consumption	100 to 120 VAC: approx. 0.23 VA (0.22 W) at 120 VAC 200 to 240 VAC: approx. 0.35 VA (0.3 W) at 240 VAC 24 VAC/DC: approx. 0.17 VA (0.15 W) at 24 VAC approx. 0.1 W at 24 VDC 48 VDC: approx. 0.18 W at 48 VDC 100 to 125 VDC: approx. 0.5 W at 125 VDC
Control outputs	Contact output: 5 A at 250 VAC/30 VDC, resistive load (cosϕ = 1)

Note: 1. A power supply with a ripple of 20% max. (single-phase power supply with full-wave rectification) can be used with each DC Model.

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

3. For contact input, use contacts which can adequately switch 1 mA at 5 V.

■ Characteristics

Accuracy of operating time	±0.2% FS max. (±0.2% FS ±10 ms max. in ranges of 0.6 and 1.2 s)
Setting error	±5% FS ±50 ms max.
Operation start voltage	30% max. of rated voltage
Influence of voltage	±0.2% FS max. (±0.2% FS ±10 ms max. in ranges of 0.6 and 1.2 s)
Influence of temperature	±1% FS max. (±1% FS ±10 ms max. in ranges of 0.6 and 1.2 s)
Insulation resistance	100 MΩ min. (at 500 VDC)
Electric 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) for 100 to 120 VAC, 200 to 240 VAC, 100 to 125 VDC; 1 kV for 24 VAC/DC, 48 VDC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 120 VAC, 200 to 240 VAC, 100 to 125 VDC; 1.5 kV for 24 VAC/DC, 48 VDC
Noise immunity	±1.5 kV (between power terminals) and ±600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise); ±1 kV (between power terminals) for 48 VDC
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/s² three times each in six directions Malfunction: 98 m/s² 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: 10 million operations min. (under no load at 1,200 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 1,200 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	Approx. 120 g

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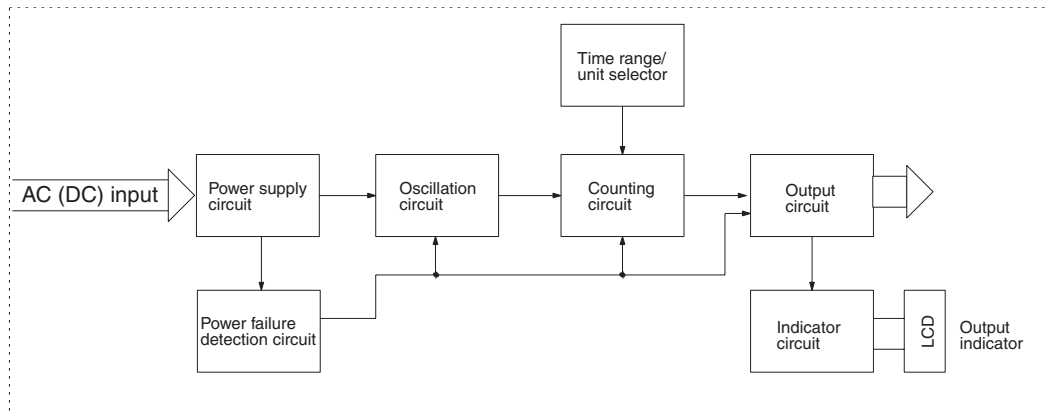
■ Life-test Curve

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 for H3CR-H8L/-HRL and 100 mA at 5 VDC for H3CR-H8RL (failure level: P).
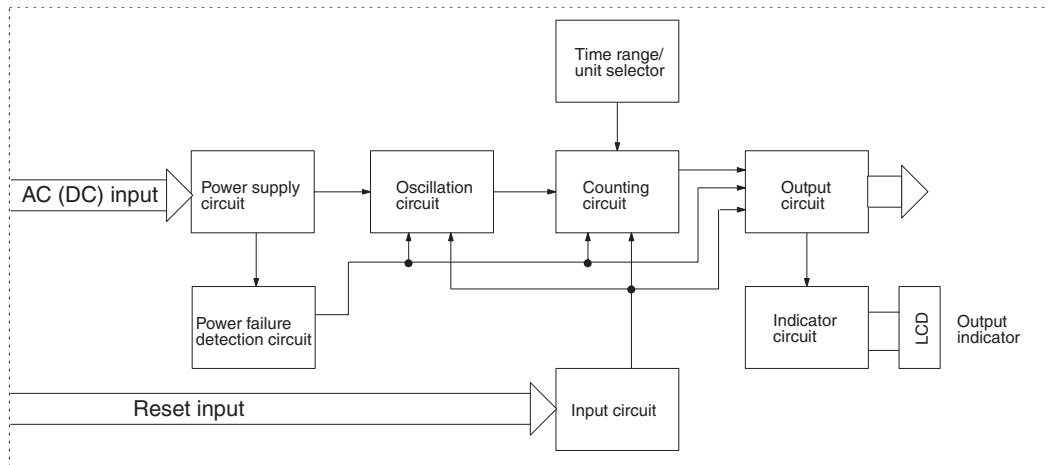
Connections

■ Block Diagrams

Without Reset Input (H3CR-H□8L)
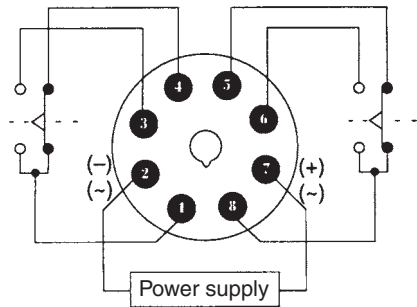

With Reset Input (H3CR-H□8RL/-HRL)

■ I/O Functions

Inputs	Reset	Turns off the control output and resets the elapsed time.
Outputs	Control output	Operates instantaneously when the power is turned on and time-limit resets when the set time is up after the power is turned off.

■ Terminal Arrangement

Note: DC models, including 24 VAC/DC models, have polarity.

8-pin Models

Without Reset Input (H3CR-H 8L)

With Reset Input (H3CR-H 8RL)
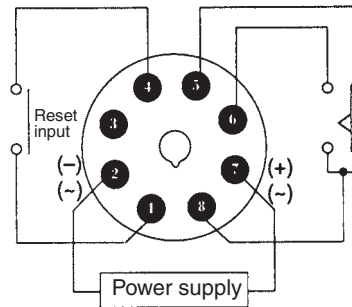
Note: Leave terminal 3 open. Do not use them as relay terminals.

11-pin Model

With Reset Input (H3CR-HRL)
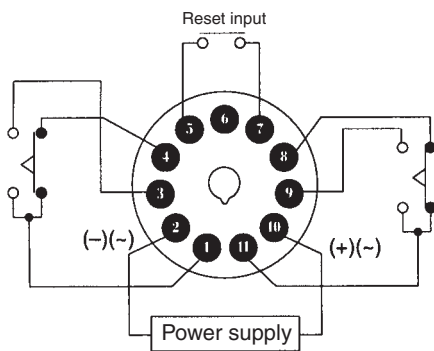
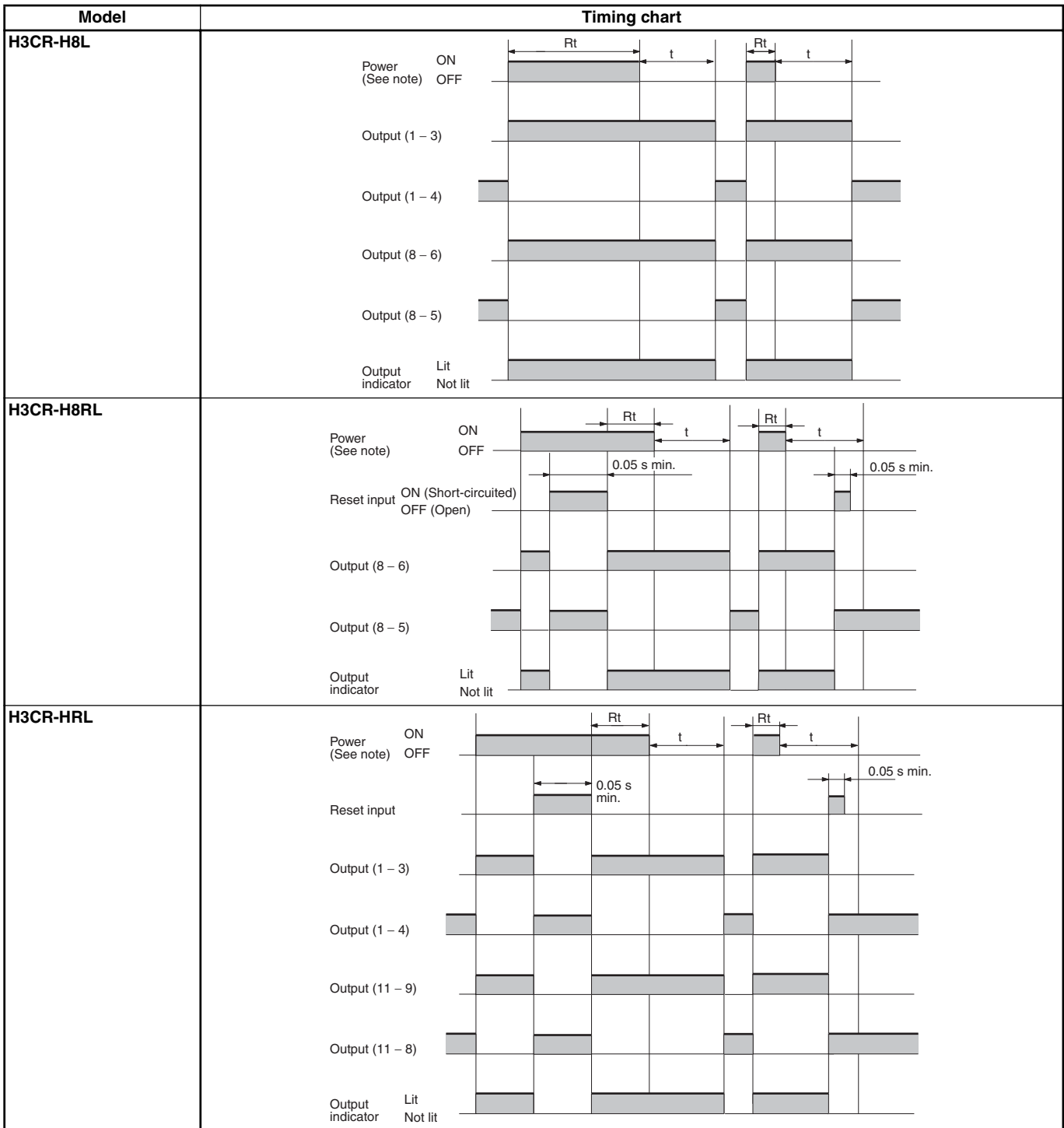**Note:** Leave terminal 6 open. Do not use them as relay terminals.

Operation
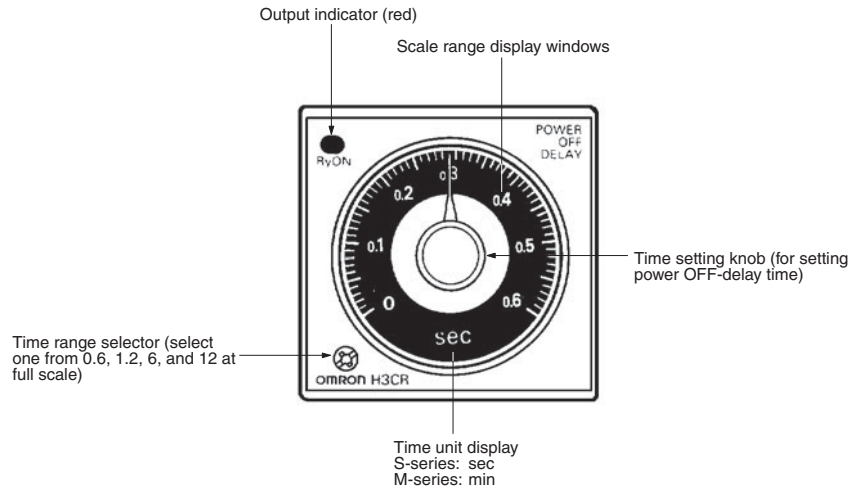
■ Timing Chart

t: Set time
Rt: Minimum power ON time (S-series: 0.1 s min.; M-series: 2 s min.)
If the power ON time is less than this value, the Timer may not operate (i.e., output may not turn ON).

Model	Timing chart
H3CR-H8L	
H3CR-H8RL	
H3CR-HRL	

Note: If the power is turned ON until the set time is up, the timer will be retriggered.

Nomenclature

Output indicator (red)

Scale range display windows

POWER OFF DELAY

RyON

Time setting knob (for setting power OFF-delay time)

Time range selector (select one from 0.6, 1.2, 6, and 12 at full scale)

sec

OMRON H3CR

Time unit display
S-series: sec
M-series: min

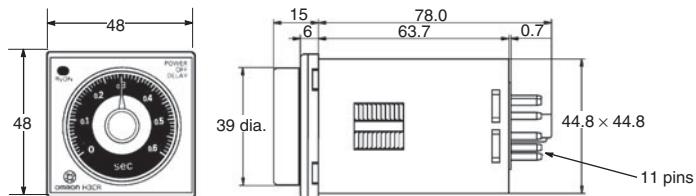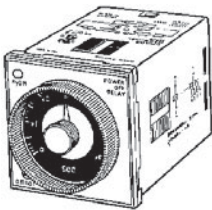# Dimensions

Note: All units are in millimeters unless otherwise indicated.

H3CR-H8L
H3CR-H8RL
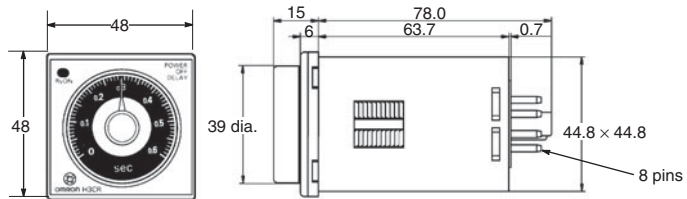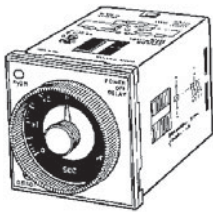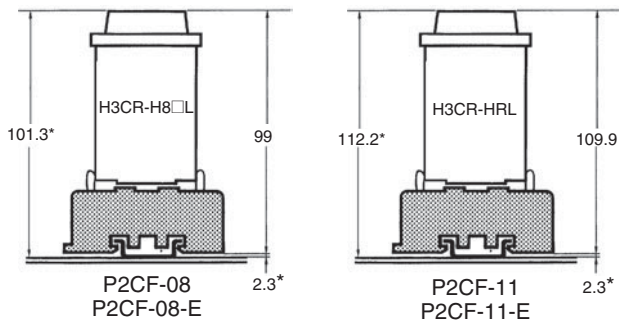
48 × 48
39 dia.
15 / 6 / 78.0 / 63.7 / 0.7
44.8 × 44.8
8 pins

H3CR-HRL

48 × 48
39 dia.
15 / 6 / 78.0 / 63.7 / 0.7
44.8 × 44.8
11 pins

Dimensions with Front Connecting Socket
P2CF-08-□/P2CF-11-□

H3CR-H8□L
101.3* / 99
P2CF-08
P2CF-08-E / 2.3*

H3CR-HRL
112.2* / 109.9
P2CF-11
P2CF-11-E / 2.3*

Dimensions with Back Connecting Socket
P3G-08/P3GA-11

15 / 92.9 / 86.4
H3CR-H8□L
Y92F-30 / P3G-08 (When Y92A-48G mounted)

15 / 92.9 / 91.4
H3CR-HRL
Y92F-30 / P3GA-11 (When Y92A-48G mounted)
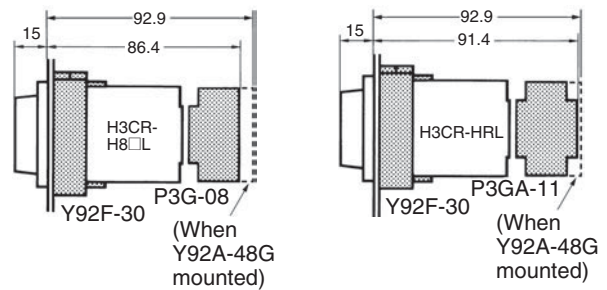
*These dimensions vary with the kind of DIN track (reference value).

Safety Precautions (H3CR-H)

Note: The undermentioned is common for all H3CR-H models.

■ Power Supplies

The H3CR-H has a large inrush current; provide sufficient power supply capacity. If the power supply capacity is too small, there may be delays in turning ON the output.

With the H3CR-H□RL, 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.

Correct

Isolation transformer is required.
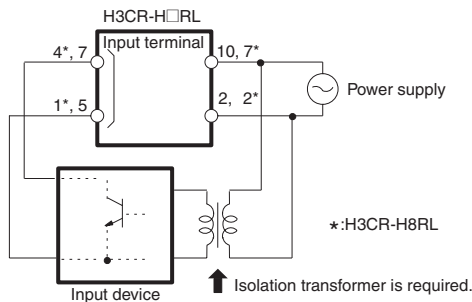
Incorrect
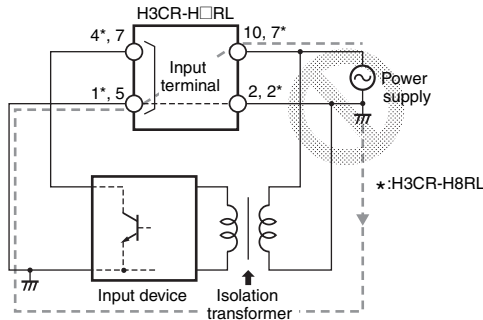
## ■ Input/Output (H3CR-H□RL)

An appropriate input is applied to the input signal terminal of the Timer when the input terminal for the input signal is short-circuited. Do not attempt to connect any input terminal to any terminal other than the input terminal or to apply voltage across other than the specified input terminals or the internal circuits of the Timer may be damaged.

The H3CR-H□RL uses transformerless power supply. When connecting a relay or transistor as an external signal input device, pay attention to the following points to prevent short-circuiting due to a sneak current to the transformerless power supply.

If input is made simultaneously from one input contact or a transistor to the H3CR-H and a Timer whose common input terminals are used as power terminals, such as the H3CR-A, a short-circuit current will be generated. Either input through isolated contacts, or isolate the power supply for one of the Timers.
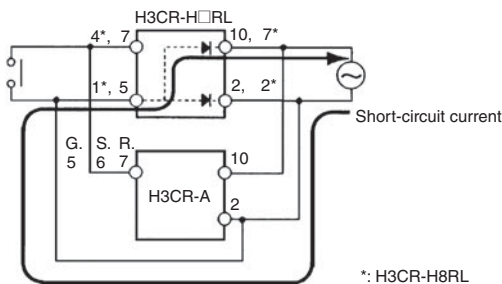

■ Wiring

The H3CR-H has a high impedance circuit. Therefore, the H3CR-H may not be reset if the H3CR-H is influenced by inductive voltage. In order to eliminate any influence of inductive voltage, the wires connected to the H3CR-H must be as short as possible and should not be installed alongside power lines. If the H3CR-H is influenced by inductive voltage that is 30% or more of the rated voltage, connect a CR filter with a capacitance of approximately 0.1 μF and a resistance of approximately 120 Ω or a bleeder resistor between the power supply terminals. If there is any residual voltage due to current leakage, connect a bleeder resistor between the power supply terminals.

■ Operation

An interval of 3 s minimum is required to turn on the H3CR-H after the H3CR-H is turned off. If the H3CR-H is turned on and off repeatedly with an interval of shorter than 3 s, abnormal heating or burning may occur in internal elements.
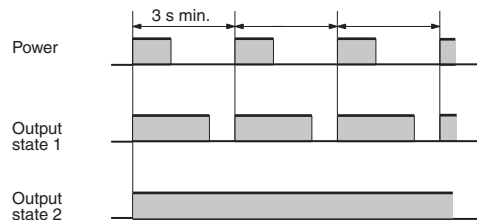
After the forced reset function of the H3CR-H is activated, an interval of 3 s minimum is required to activate the forced reset function again. If the forced reset function is activated repeatedly with an interval of shorter than 3 s, the internal parts of the H3CR-H may deteriorate and the H3CR-H may malfunction.
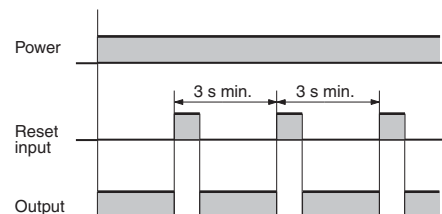
If it is required that the output be turned on repeatedly with an interval of shorter than 3 s, consider use of the H3CR-A in mode D (signal OFF-delay).

■ Others

If the H3CR-H is dropped or experiences some other kind of shock, because a latching relay is used for output, contacts may be reversed or go into a neutral state. If the H3CR-H is dropped, reconfirm correct operation.

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.