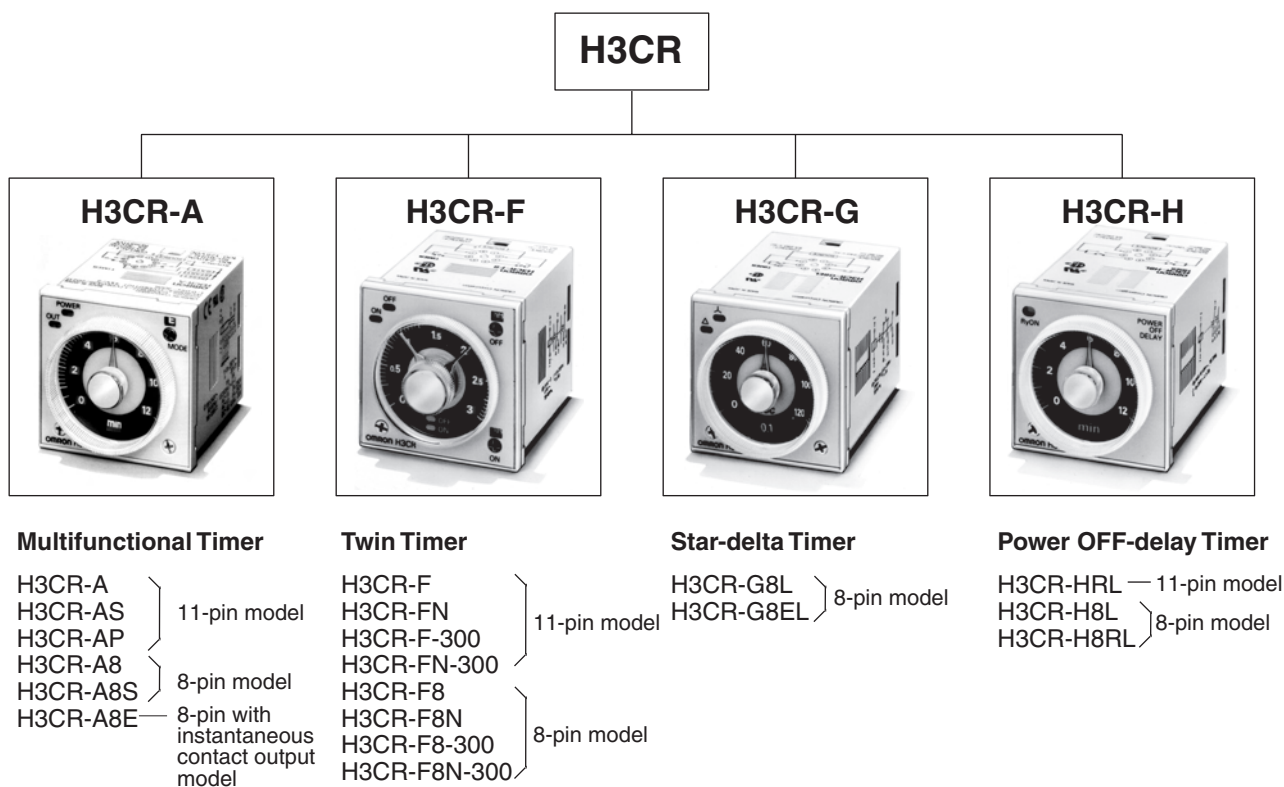# OMRON

Solid-state Timer
H3CR

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments. Refer to *Warranty and Application Considerations* (page 52), and *Safety Precautions* (page 22, 44, 51).

DIN 48 x 48-mm Multifunctional Timer Series

- Conforms to EN61812-1 and IEC60664-1 4 kV/2 for Low Voltage, and EMC Directives.
- Approved by UL and CSA.

- Lloyds/NK approvals.
- Six-language instruction manual provided.

■ Broad Line-up of H3CR Series

H3CR

H3CR-A   **H3CR-F**   **H3CR-G**   **H3CR-H**

Multifunctional Timer

H3CR-A
H3CR-AS   11-pin model
H3CR-AP
H3CR-A8
H3CR-A8S   8-pin model
H3CR-A8E   8-pin with instantaneous contact output model

Twin Timer

H3CR-F
H3CR-FN
H3CR-F-300   11-pin model
H3CR-FN-300
H3CR-F8
H3CR-F8N
H3CR-F8-300   8-pin model
H3CR-F8N-300

Star-delta Timer

H3CR-G8L
H3CR-G8EL   8-pin model

Power OFF-delay Timer

H3CR-HRL ── 11-pin model
H3CR-H8L
H3CR-H8RL   8-pin model

Note: H3CR-AS, H3CR-A8S: Transistor output models

Contents

Solid-state Multi-functional Timer
H3CR-A

DIN 48 x 48-mm State-of-the-art Multifunctional Timer

- A wider power supply range reduces the number of timer models kept in stock.
- A wide range of applications through six or four operating modes.
- Reduced power consumption.
  (Except for H3CR-A8E)
- Enables 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.
- Time Setting Rings enable consistent settings and limit the setting range.
- Panel Covers enable various panel designs.
- PNP input models available.
- Rich variety of inputs: Start, reset, and gate functions (11-pin models and -AP models)
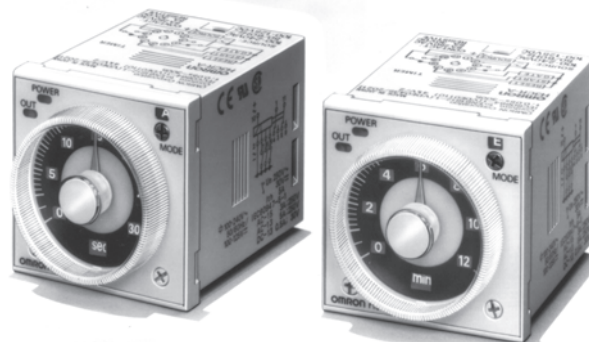
Model Number Structure

■ Model Number Legend

Note: This model number legend includes combinations that are not available. Before ordering, please check the *List of Models* on page 3 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

Note: 1. Specify both the model number and supply voltage when ordering.
Example: H3CR-A <u>100-240AC/100-125DC</u>
⎿————— Supply voltage

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)

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
		Y92F-73
		Y92F-74
Mounting Track	50 cm (ℓ) x 7.3 mm (t)	PFP-50N
	1 m (ℓ) x 7.3 mm (t)	PFP-100N
	1 m (ℓ) x 16 mm (t)	PFP-100N2
End Plate		PFP-M
Spacer		PFP-S
Protective Cover		Y92A-48B
Track Mounting/ Front Connecting Socket	8-pin	P2CF-08
	8-pin, finger safe type	P2CF-08-E
	11-pin	P2CF-11
	11-pin, finger safe type	P2CF-11-E
Back Connecting Socket	8-pin	P3G-08
	8-pin, finger safe type	P3G-08 with Y92A-48G (See note 1)
	11-pin	P3GA-11
	11-pin, finger safe type	P3GA-11 with Y92A-48G (See note 1)
Time Setting Ring	Setting a specific time	Y92S-27
	Limiting the setting range	Y92S-28
Panel Cover (See note 2)	Light gray (5Y7/1)	Y92P-48GL
	Black (N1.5)	Y92P-48GB
	Medium gray (5Y5/1)	Y92P-48GM
Hold-down Clip (See note 3)	For PL08 and PL11 Sockets	Y92H-7
	For PF085A Socket	Y92H-8

Note: 1. Y92A-48G is a finger safe terminal cover which is attached to the P3G-08 or P3GA-11 Socket.
2. The Time Setting Ring and Panel Cover are sold together.
3. Hold-down Clips are sold in sets of two.

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)	x10 h (10 h)
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)	x10 h (10 h)
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 note 1)	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 note 2)
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)　　　　Relay OFF: approx. 1.8 VA (1.7 W) • 24 to 48 VAC/12 to 48 VDC 　(When at 24 VDC) 　　Relay ON: approx. 0.9 W　　　　Relay OFF: approx. 0.3 W 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. if the power supply incorporates a single-phase, full-wave rectifier.

2. Each 24-to-48-VAC/12-to-48-VDC model causes an inrush current of approximately 0.85 A. Pay careful attention when attempting to turn ON power to such a model with non-contact output from a device such as a sensor.

3. 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.

■ Characteristics

Accuracy of operating time	±0.2% FS max. (±0.2%±10 ms max. in a range of 1.2 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)
Influence of temperature	±1% FS max. (±1%±10 ms max. in a range of 1.2 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

Switching operations (x 10³) vs Load current (A)

- 30 VDC L/R = 7 ms
- 250 VAC/30 VDC (cosφ = 1)
- 250 VAC (cosφ = 0.4)
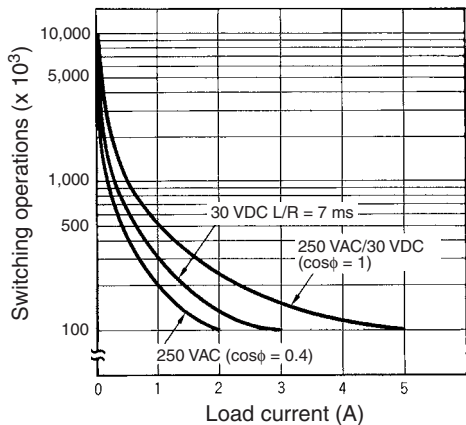
Reference: A maximum current of 0.15 A can be switched at 125 VDC (cosφ = 1) and a maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 10 mA (100 mA for H3CR-A8E) at 5 VDC (failure level: P).

Connections

■ Block Diagrams

H3CR-A/AS
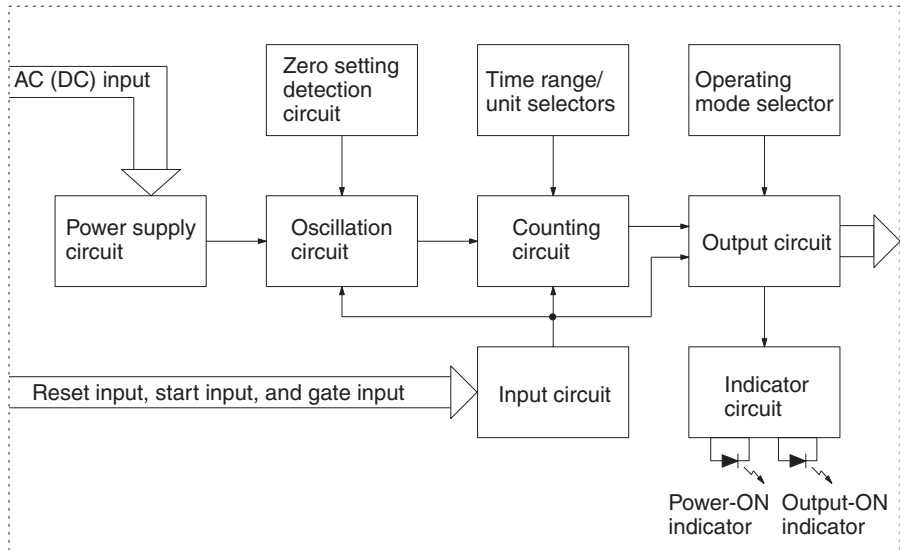
H3CR-AP
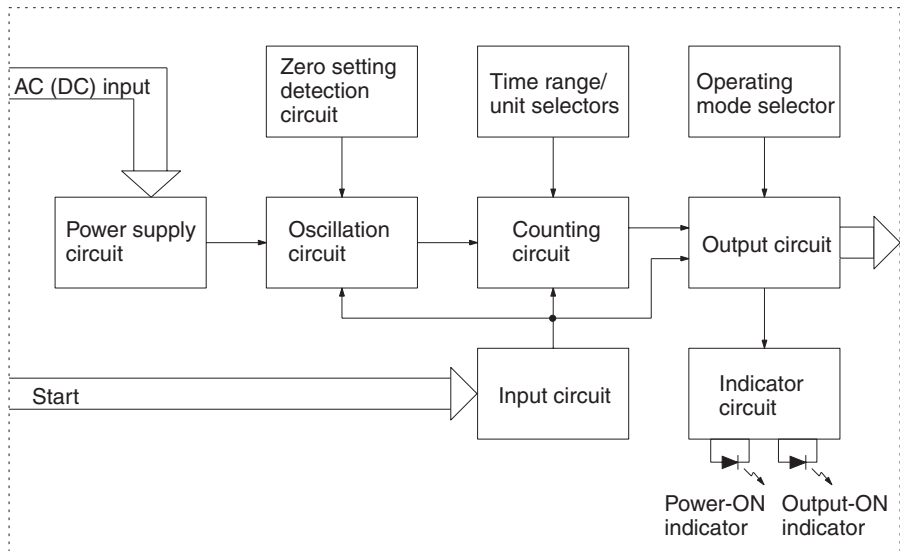
H3CR-A8/A8S
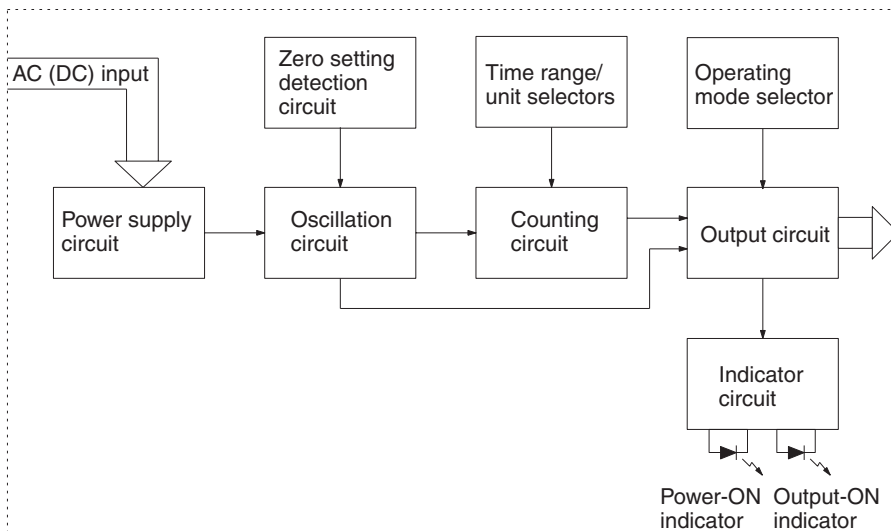
H3CR-A8E
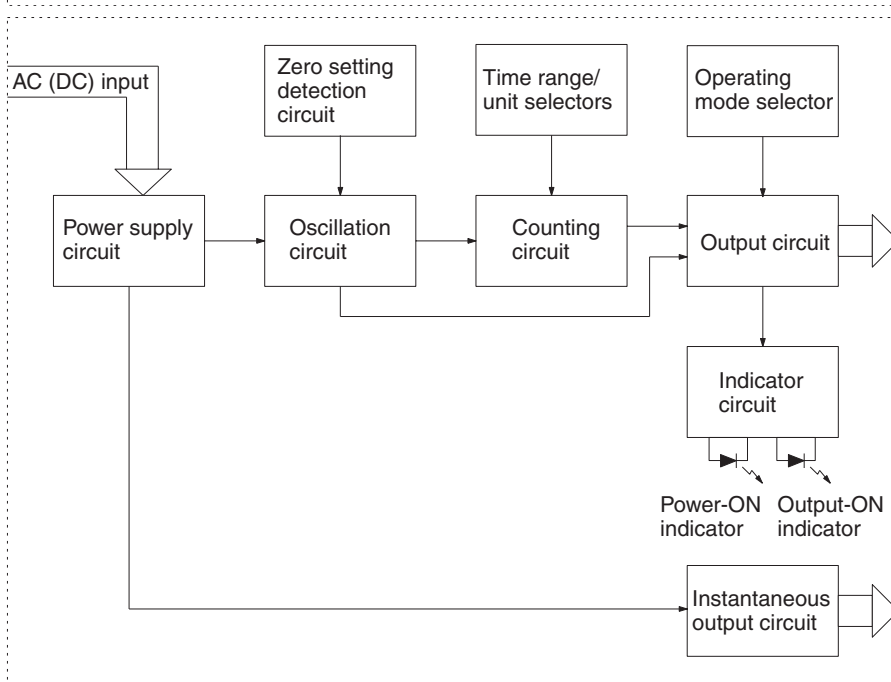
■ I/O Functions

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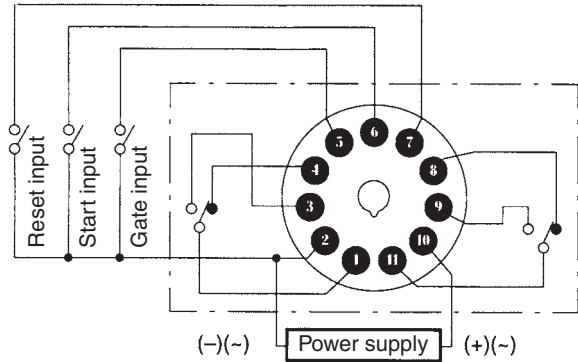
H3CR-AS (Transistor Output)
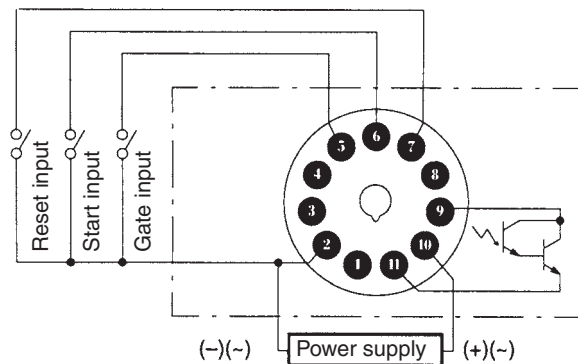
Note: Terminals 1, 3, 4, and 8 are empty. Terminals 2, 5, 6, 7, and 10 are the same as for the H3CR-A.

H3CR-AP (Contact Output)
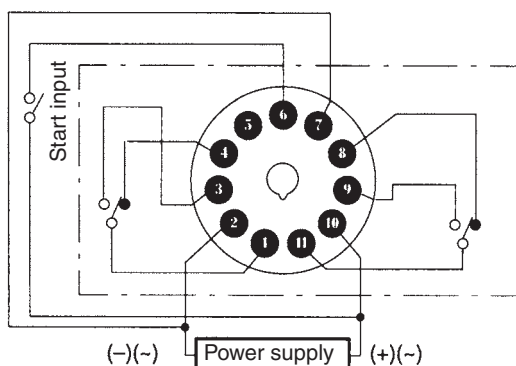
Note: 1. Terminal 5 is empty.
    2. Separate power supplies can be used for the Timer and inputs.

8-pin Models

H3CR-A8/-A8-301 (Contact Output)
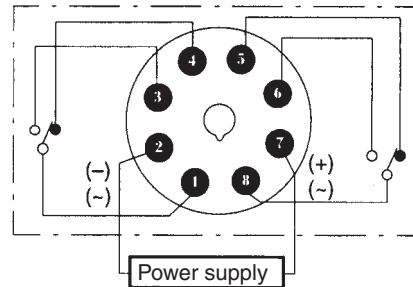
H3CR-A8S (Transistor Output)
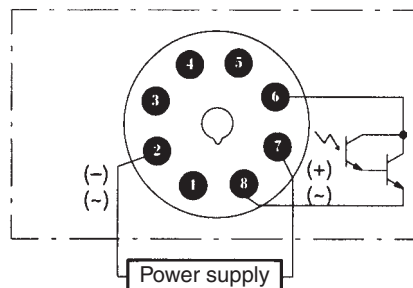
Note: Terminals 1, 3, 4, and 5 are empty. Terminals 2 and 7 are the same as for the H3CR-A8.

H3CR-A8E (Contact Output)

OMRON
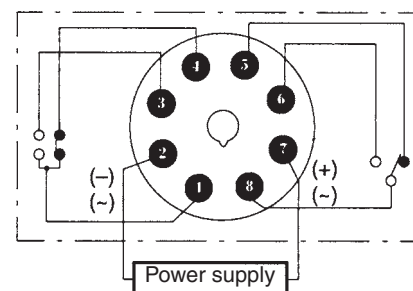
■ Input Connections

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)
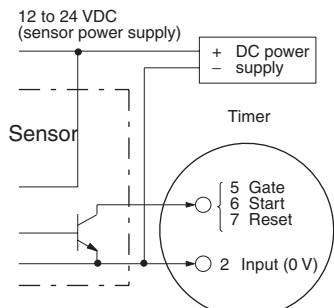
Operates with transistor ON

Contact Input
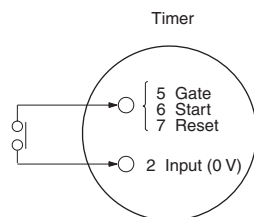
Operates with relay ON

No-contact Input
(Connection to a voltage output sensor.)

12 to 24 VDC (sensor power supply)
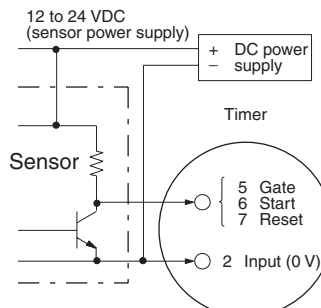
Operates with transistor ON

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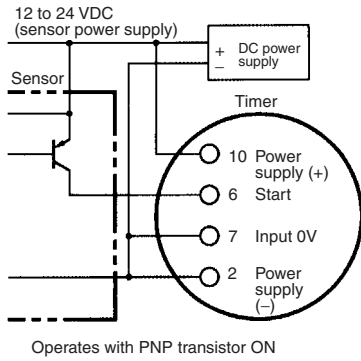
No-contact Input
(Connection to NPN open collector output sensor)

Contact Input

Operates with PNP transistor ON

Operates with NPN transistor ON

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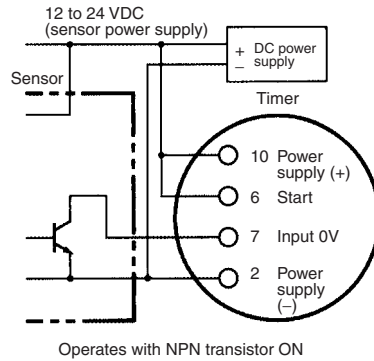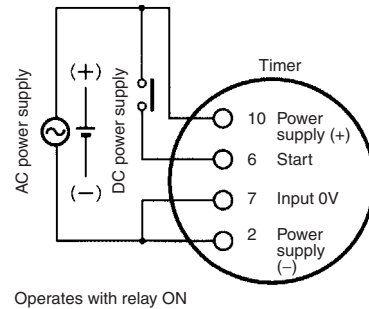
Note: The input circuit is isolated from the power supply circuit. Thus, an NPN transistor can be connected.

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

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

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.

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	Power / Start / Reset / Output relay (NC) / Output relay (NO) (Output indicator) / Power indicator **Basic operation** Power / Start (See note) — t — / Output **Note:** Start input is valid and re-triggerable while the Timer is in operation.
E: Interval	Power / Start / Reset / Output relay (NC) / Output relay (NO) (Output indicator) / Power indicator **Basic operation** Power / Start (See note) — t — / Output **Note:** Start input is valid and re-triggerable while the Timer is in operation.
G: Signal ON/OFF-delay	Power / Start / Reset / Output relay (NC) / Output relay (NO) (Output indicator) / Power indicator **Basic operation** Power / Start (See note) t t t t / Output **Note:** Start input is valid and re-triggerable while the Timer is in operation.
J: One-shot output	Power / Start / Reset / Output relay (NC) 1±0.6 s (Fixed) / Output relay (NO) (Output indicator) / Power indicator **Basic operation** Power / Start (See note) — t — 1±0.6 s (Fixed) / Output **Note:** Start input is valid and re-triggerable while the Timer is in operation.

Gate Signal Input

Power ON OFF
Start ON OFF
Gate ON OFF
Reset ON OFF
Output relay ON OFF

t1   t2
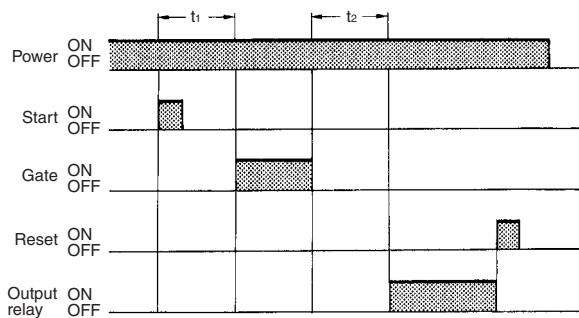
Note: 1. This timing chart indicates the gate input in operating mode A (ON-delay operation).
2. The set time is the sum of t_1 and t_2.
3. H3CR-AP model incorporates start input only.

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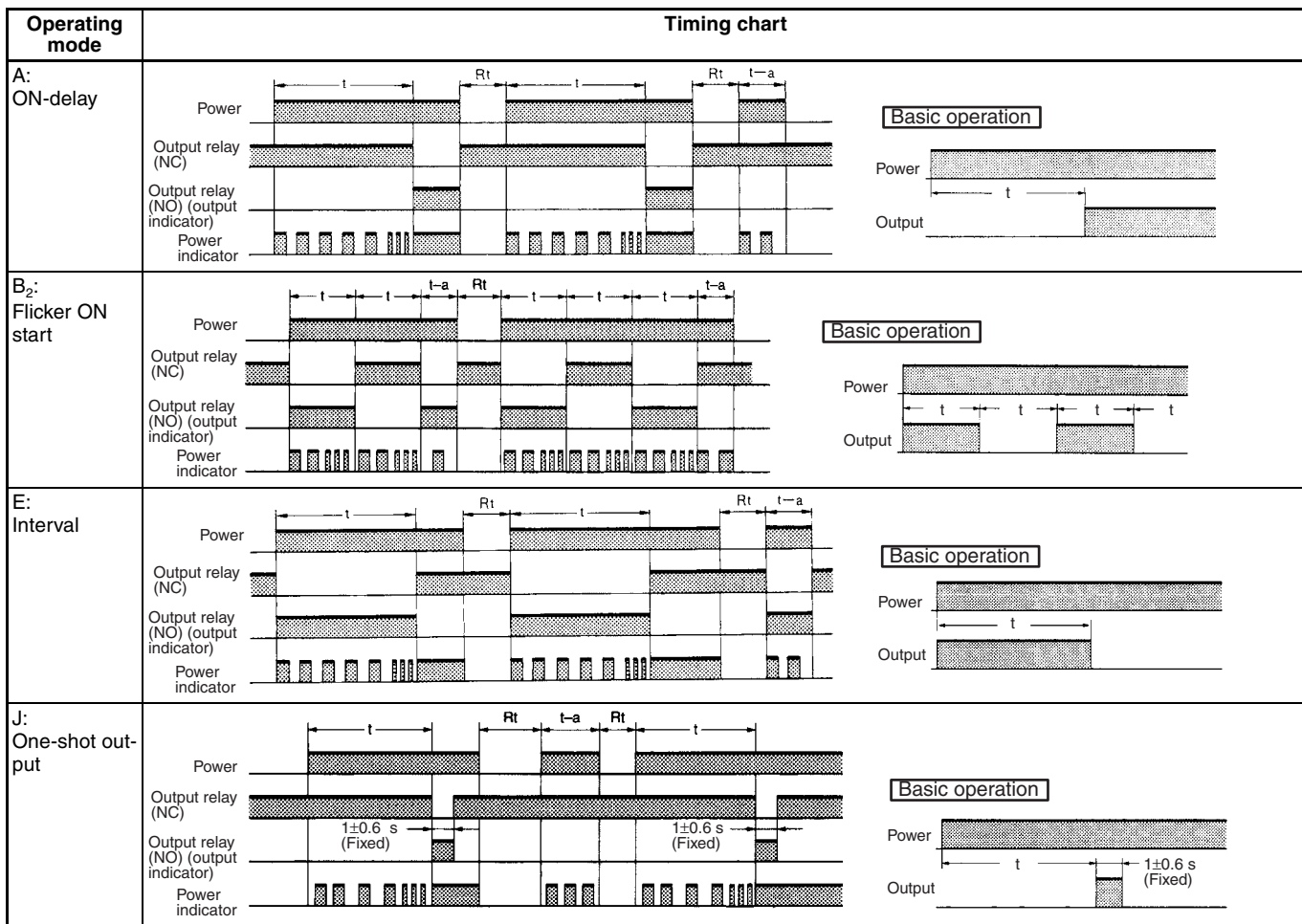
Operating mode	Timing chart
A: ON-delay	
B₂: Flicker ON start	
E: Interval	
J: One-shot output	

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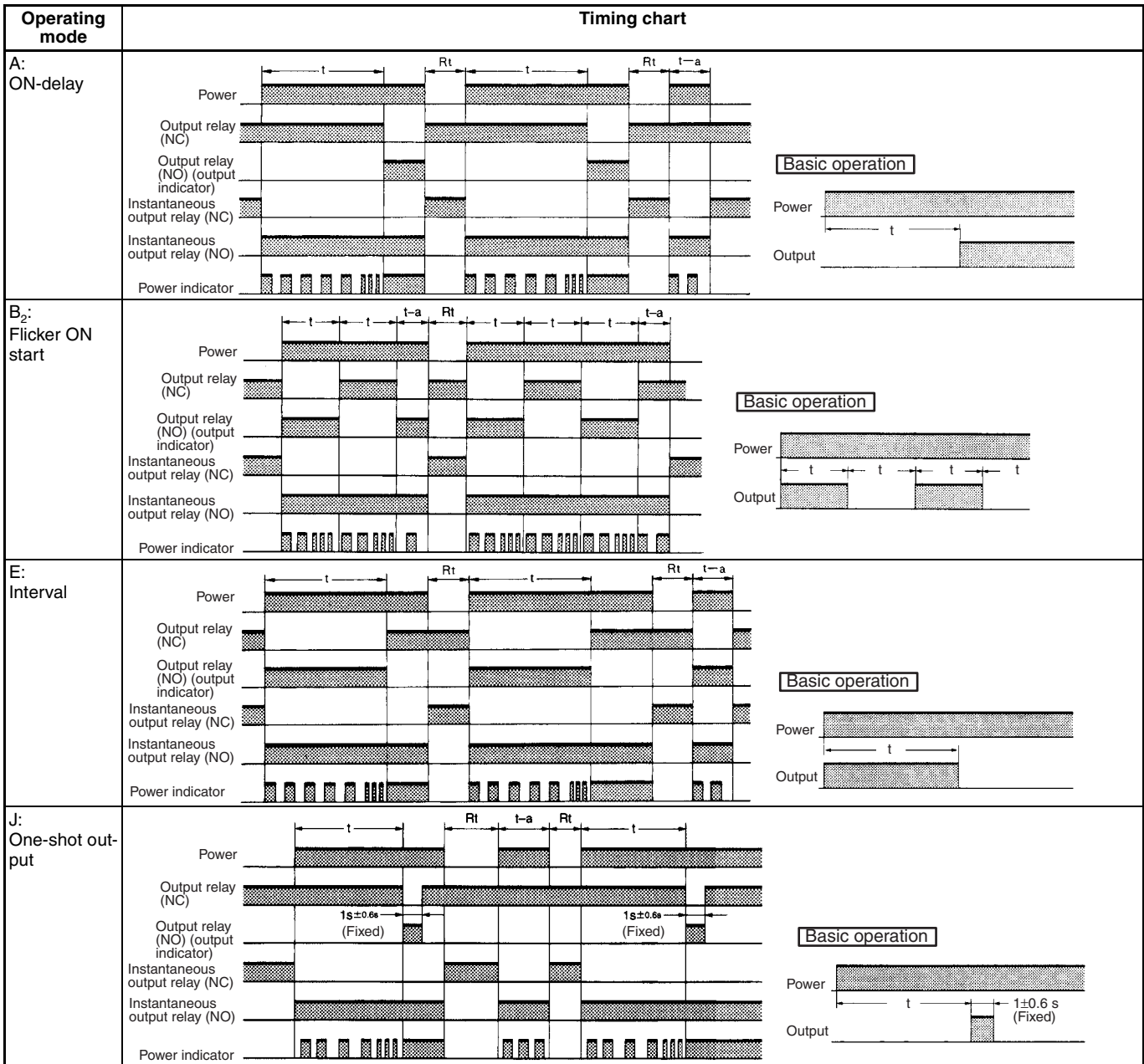
Operating mode	Timing chart
A: ON-delay	Basic operation
B₂: Flicker ON start	Basic operation
E: Interval	Basic operation
J: One-shot output	Basic operation

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)

Output indicator (orange) (Lit when output)

Scale range display windows

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 unit display window

Time setting knob (set time)

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

Dimensions

Note: All units are in millimeters unless otherwise indicated.

H3CR-A
H3CR-AP
H3CR-AS
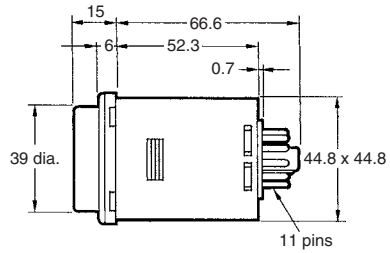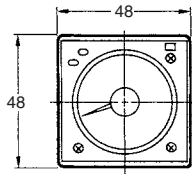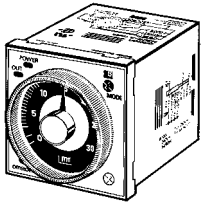
H3CR-A8
H3CR-A8S
H3CR-A8E
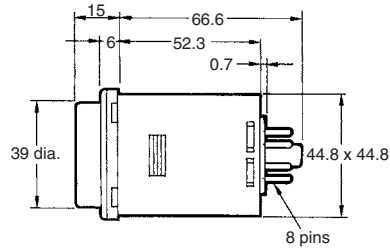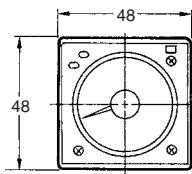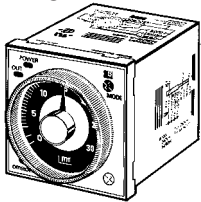
Dimensions with Set Ring

Time Setting Ring   Panel cover
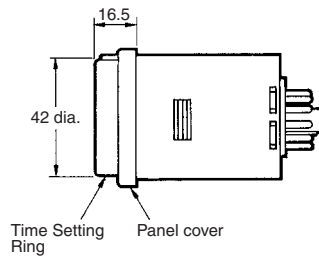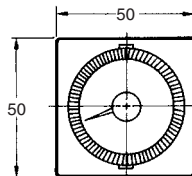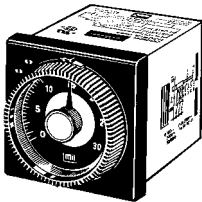
Dimensions with Front Connecting Socket
P2CF-08-□/P2CF-11-□

H3CR-A
H3CR-AS
H3CR-AP

P2CF-11
P2CF-11-E

H3CR-A8□

P2CF-08
P2CF-08-E
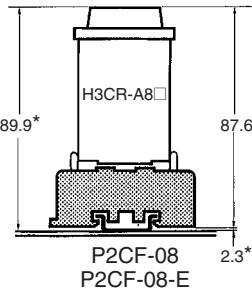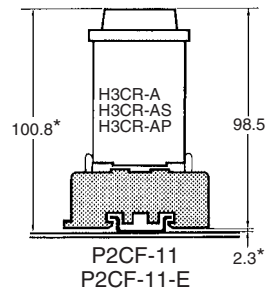
Dimensions with Back Connecting Socket
P3G-08/P3GA-11

H3CR-A
H3CR-AS
H3CR-AP
+
Adapter

Y92F-30

P3GA-11
(When
Y92A-48G
mounted)

H3CR-A8□
+
Adapter

Y92F-30

P3G-08
(When
Y92A-48G
mounted)
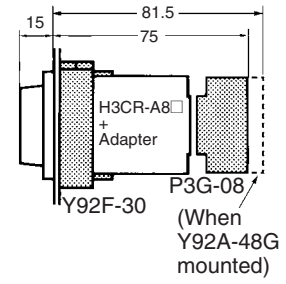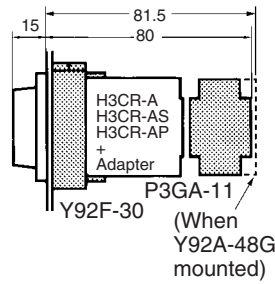
*These dimensions vary with the kind of DIN track (reference value).

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.

Power (2 and 10)
Start (2 and 6)
Reset (2 and 7)
Control output: NC (8 and 11) NC (1 and 4)
Control output: NO (9 and 11) NO (1 and 3)
Power indicator

Flashing Lit

Externally short-circuited

Power supply
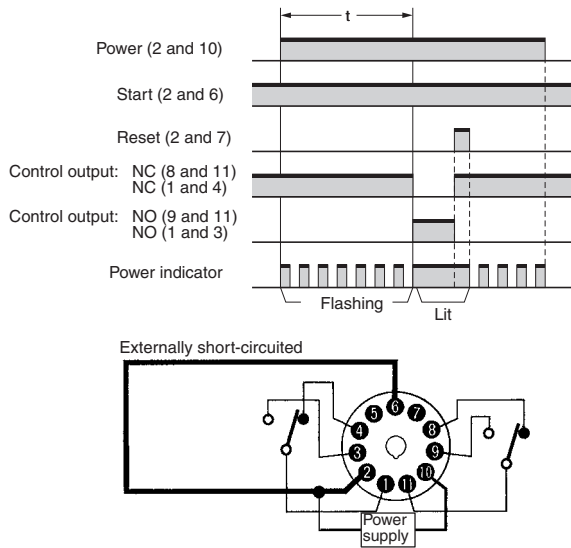
2. Signal Start/Signal Reset

The Signal start/Signal reset operation is useful for remote control of the Timer.

Power (2 and 10)
Start (2 and 6)
Reset (2 and 7)
Control output: NC (8 and 11) NC (1 and 4)
Control output: NO (9 and 11) NO (1 and 3)
Power indicator

Lit Flashing Lit

Start signal (remote control possible)
Reset signal (remote control possible)

Power supply

(Power continuously supplied)
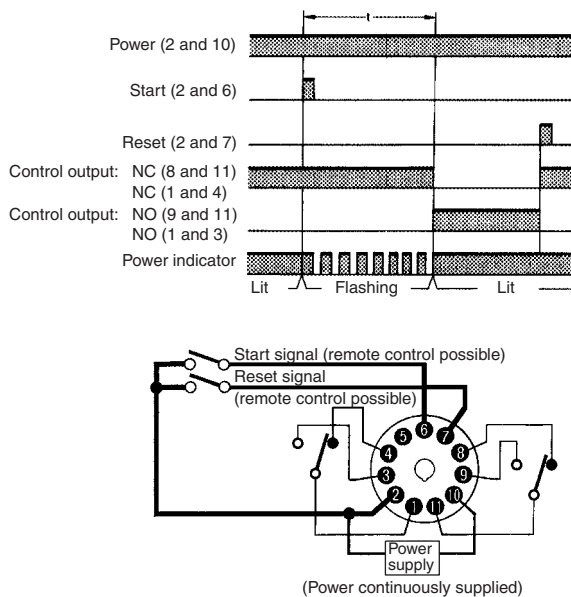
3. Control of Integrated Time with Gate Signal

With a gate signal, the Power-ON start operation and Signal start operation can be controlled (the operation can be interrupted).

t_1 t_2 $t_1 + t_2$: set time

Power (2 and 10)
Start (2 and 6)
Gate (2 and 5)
Control output: NC (8 and 11) NC (1 and 4)
Control output: NO (9 and 11) NO (1 and 3)
Power indicator

Flashing Lit

Gate signal (The operation is interrupted with the gate signal if the Timer detects an abnormal signal.)

Externally short-circuited

Power supply
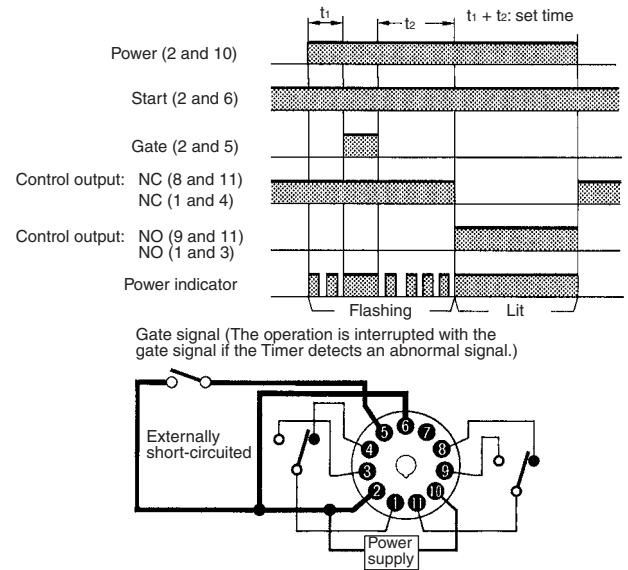
B/B2 Mode: Flicker

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)

Power (2 and 10)
Start (2 and 6)
Control output: NC (8 and 11) NC (1 and 4)
Control output: NO (9 and 11) NO (1 and 3)
Power indicator

Flashing

Externally short-circuited

Power supply
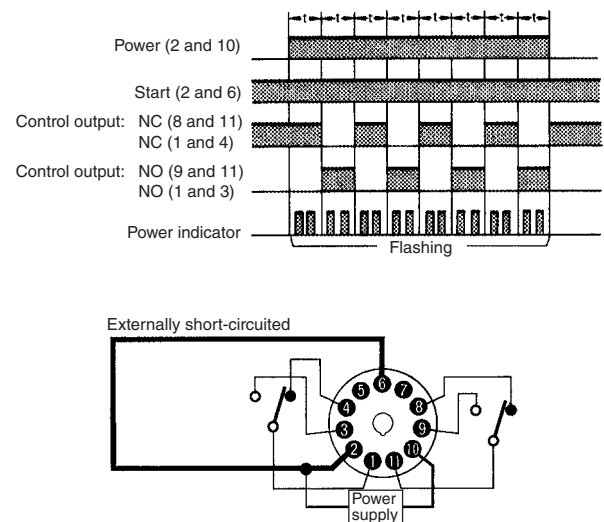
2. Signal Start/Signal Reset (in B Mode)

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

(Power continuously supplied)

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.

(Power supply)

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

(Power continuously supplied)
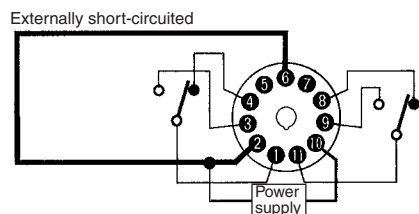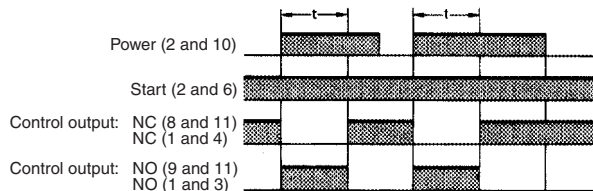
D Mode: Signal OFF-delay

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
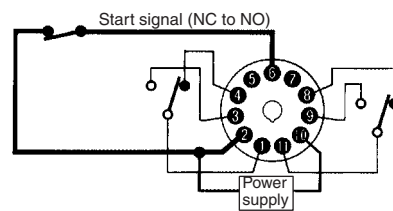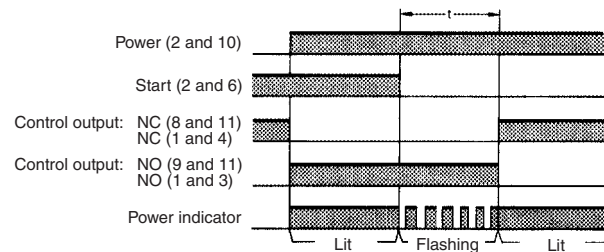
OMRON

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

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.

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.

OMRON
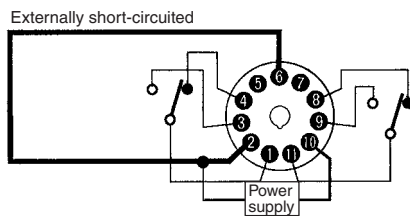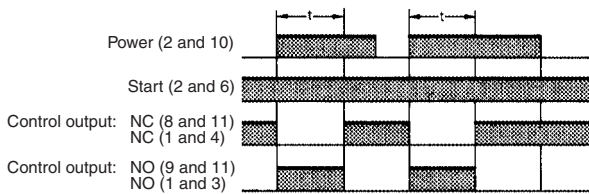
Safety Precautions (H3CR-A)

Note: The undermentioned is common for 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.
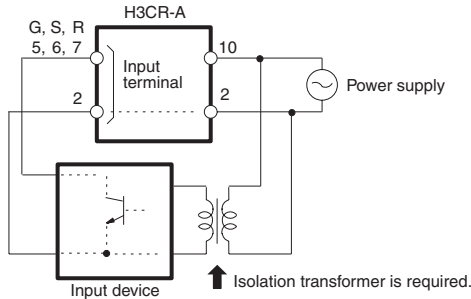
Incorrect
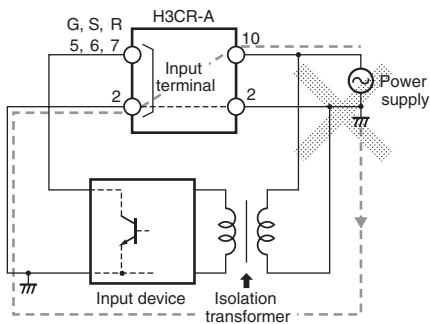
The H3CR-A□/-A□S/AP's power supply terminal 2 is a common terminal for input signals to the Timer. Do not disconnect the wires on terminal 2, otherwise the internal circuitry of the Timer will be damaged.
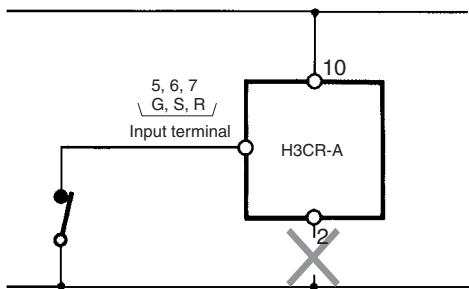
Make sure that the voltage is applied within the specified range, otherwise the internal elements of the Timer may be damaged.

■ 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
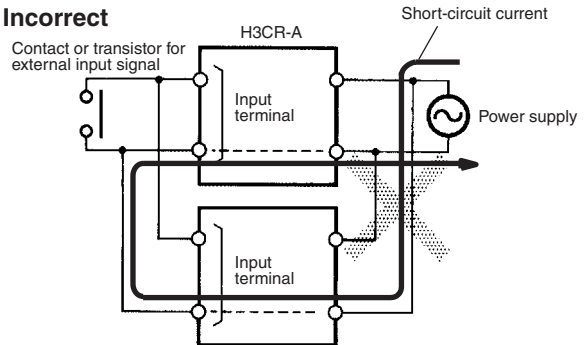
Correct
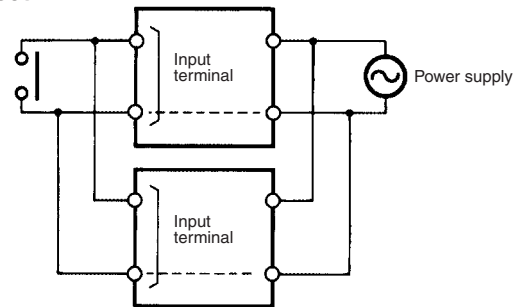
It is impossible to provide two independent power switches as shown below regardless of whether or not the Timers are different in phase.

OMRON
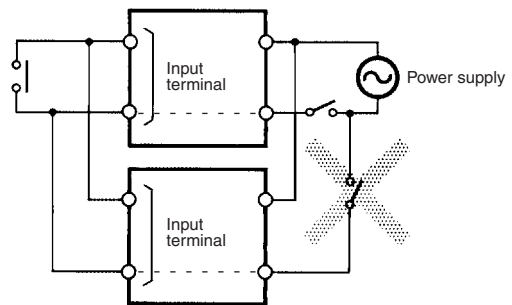
Relationship between Input and Power Supply Circuits (H3CR-A□/-A□S)

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
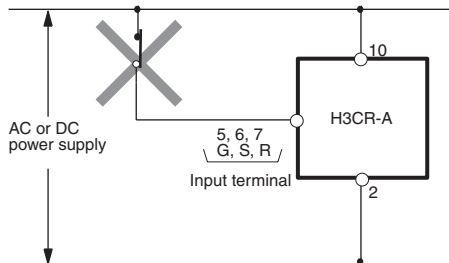
Correct
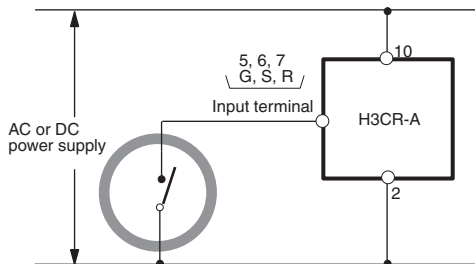
Do not connect a relay or any other load between input terminals, otherwise the internal circuit of the Timer will be damaged due to the high-tension voltage applied to the input terminals.
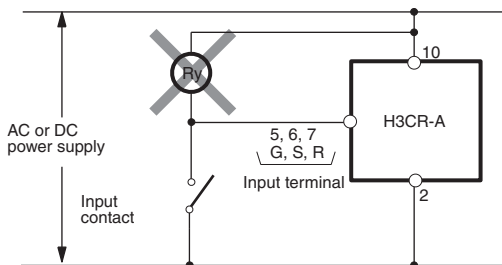
Relationship between Input and Power Supply Circuits (H3CR-AP)
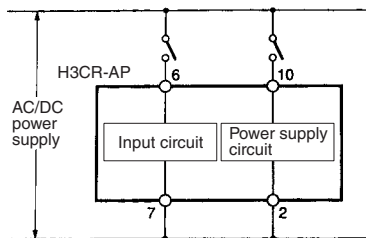
Since the input circuit and the power supply circuit are configured independently, the input circuit can be turned ON or OFF irrespective of the ON/OFF state of the power supply.
It must be noted that a voltage equivalent to the power supply voltage is applied to the input circuit.

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
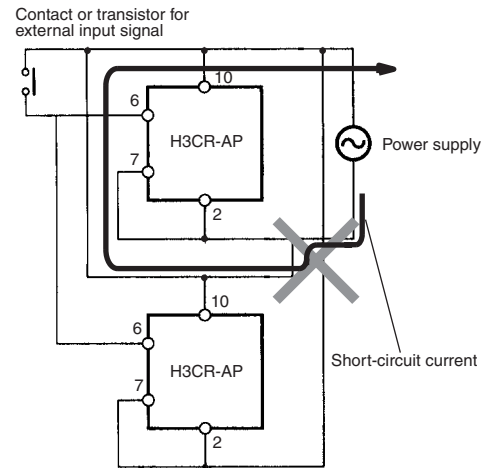
Correct
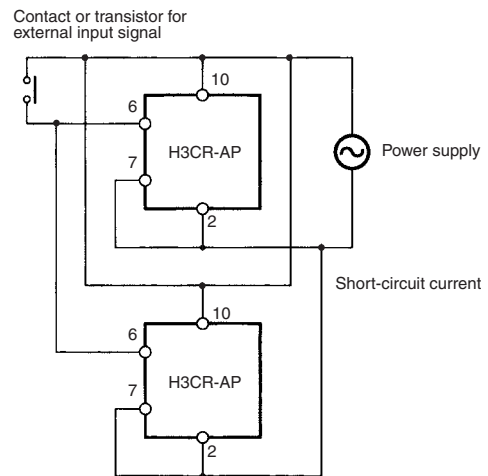
Common to All H3CR-A Models

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.

Operation (Common)

Note: The undermentioned is common for all H3CR models.

■ Basic Setting

Setting of Selectors

The selectors can be turned clockwise and counterclockwise to select the desired time unit, time range, or operating mode. Each selector has a snap mechanism that secures the selector at a given position. Set the selector at a position at which it is secured. Do not set it midway between two securing positions or a malfunction could result from improper setting.

Selection of Operating Mode

• H3CR-A Multifunctional Timer

Turn the operating mode selector with a screwdriver until the desired operating mode (H3CR-A/AP/AS: A, B, B2, C, D, or E, H3CR-A8/ A8S/A8E: A, B2, E or J, H3CR-A-300: G or J) appears in the display window located above the selector.

Operating mode selector

A

Operating mode display window

Groove for screwdriver

(i.e., H3CR-A)

Selection of Time Unit and Time Range

• H3CR-A Multifunctional Timer

The desired time unit (sec, min, hrs, or 10h) is displayed in the window below the time setting knob by turning the time unit selector located at the lower right corner of the front panel. A time range (1.2, 3, 12, or 30/2.4, 6, 24, or 60 for H3CR-A□-301) is selected with the time range selector at the lower left corner of the front panel, and the selected time range appears (in the window at the lower right part) within the plastic frame of the time setting knob.

Time setting knob

Time range selector

Scale range display window

Time unit selector

Time unit display window

• H3CR-F Twin Timers

A time range (0 to 1.2, 0 to 3, 0 to 12, or 0 to 30) is selected for ON- and OFF-time using the time range selector at the lower left corner of the front panel, and the selected time range appears within the plastic frame of the time setting knob (= scale range display windows).

Time range selector
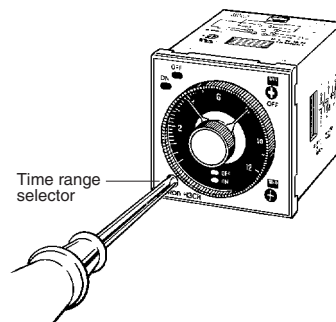
For ON-time, the desired time unit (sec, 10 s, min, and hrs, or 10 s, 10 min, hrs, and 10 h) is indicated in the ON-time unit display window at the lower right corner of the front panel and can be changed by turning the ON-time unit selector located below the ON-time unit display window.

ON-time unit selector

For OFF-time, the desired time unit (sec, 10 s, min, and hrs, or 10 s, 10 min, hrs, and 10 h) is indicated in the OFF-time unit display window at the upper right corner of the front panel and can be changed by turning the OFF-time unit selector located below the OFF-time unit display window.

OFF-time unit selector
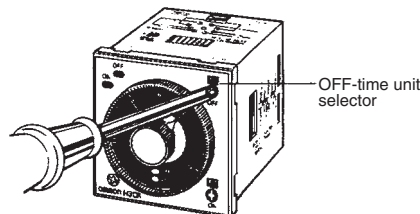
• H3CR-G Star-delta Timers

A star operation time range (0 to 6, 0 to 12, 0 to 60, or 0 to 120 seconds) is selected with the star operation time range selector at the lower left corner of the front panel.

Star operation time range selector
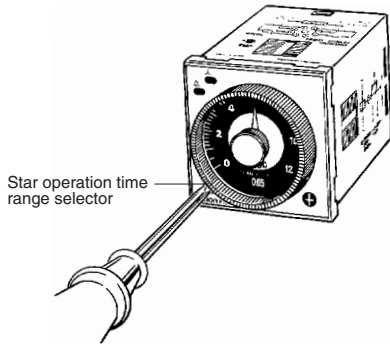
The time required for switching (0.05, 0.1, 0.25, or 0.5 second) from the star operation to the delta operation of the H3CR-G can be selected with the star-delta transfer time selector at the lower right corner of the front panel.

Star-delta transfer time selector
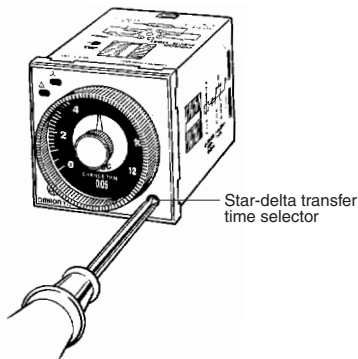
• H3CR-H Power OFF-delay Timers

A time range (0 to 0.6, 0 to 1.2, 0 to 6, and 0 to 12) is selected with the time range selector at the lower left corner of the front panel. No time unit selector is available. When ordering the H3CR-H, specify S (for the second unit) or M (for the minute unit) for your H3CR-H.

Time range selector
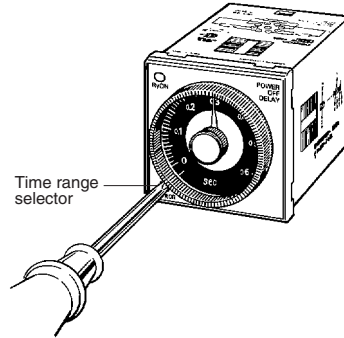
Setting of Time

Use the time setting knob to set the desired time.

■ Using the Time Setting Ring for H3CR-A/-G

Setting a Specific Time

Mount the Panel Cover on the Timer, set the desired time with the time setting knob, and place Time Setting Ring A onto the time setting knob so that the time setting notch of Time Setting Ring A is in the center of the reset lock position of the Panel Cover.

Time setting notch   Reset lock position

Time Setting Ring A   Panel cover

Time setting notch   Setting position
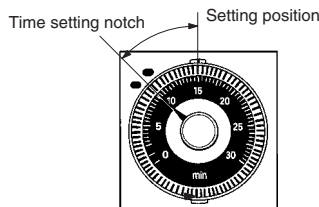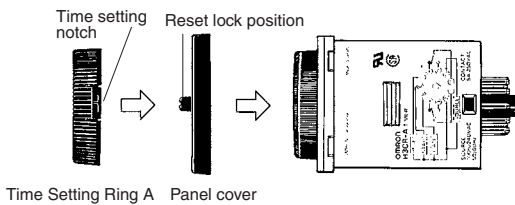
Example: To set the time to 10 s.

Limiting the Setting Range

Example: To set a range of 10 and 20 s.
Mount the Panel Cover on the Timer, set the time setting knob to 10 s (the lower limit of the setting range), and place Time Setting Ring C onto the time setting knob so that the stopper of Time Setting Ring C is on the right edge of the reset lock position of the Panel cover. Next, set the time setting knob to 20 s (the upper limit of the setting range), place Time Setting Ring B onto the time setting knob so that the stopper of Time Setting Ring B is on the left edge of the reset lock position of the Panel Cover.

Stopper   Reset lock position

Time Setting   Time Setting   Panel cover
Ring B   Ring C

Range
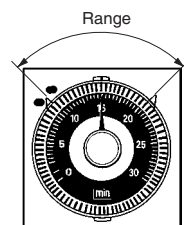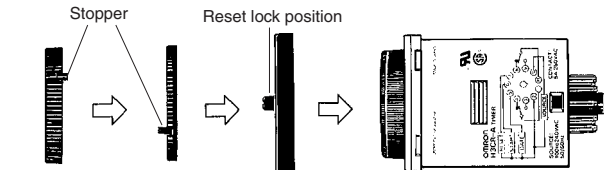
Accessories (Order Separately) (Common)

Note: The undermentioned is common for all H3CR models.

Note: All units are in millimeters unless otherwise indicated.

Flush Mounting Adaptor

Y92F-30

Panel

P3G
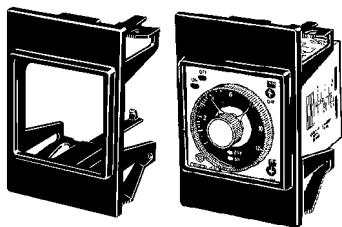Back Connecting Socket

58   52

42
48

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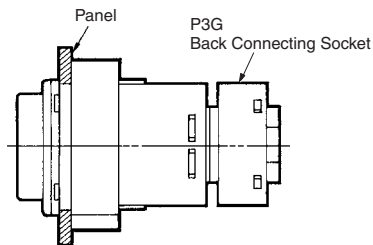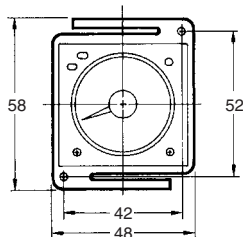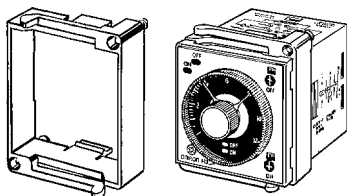
Note: The adapters for two or more timers mounted in a vertical line are different in orientation from those mounted in a horizontal line.

N can be obtained as follows (n: the number of H3CR models arranged side by side)
Without a Cover: $N = (48n - 2.5)^{+1}/_{-0}$
With the Protective Cover: $N = (51n - 5.5)^{+1}/_{-0}$
With the Panel Cover: $N = (50n - 4.5)^{+1}/_{-0}$
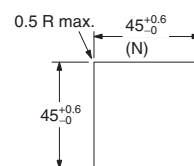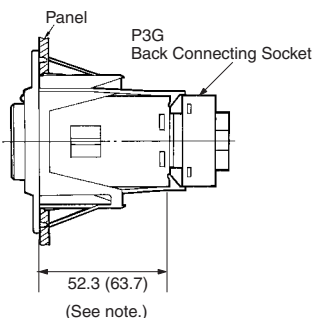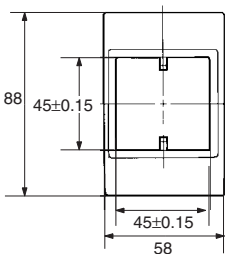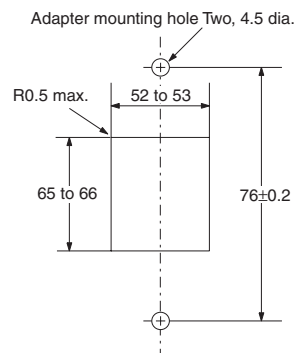
0.5 R max. $45^{+0.6}_{-0}$
(N)

$45^{+0.6}_{-0}$

Y92F-70/-73

Panel

P3G
Back Connecting Socket

88   45 ± 0.15

45 ± 0.15
58

52.3 (63.7)
(See note.)

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

Panel Cutout

Adapter mounting hole Two, 4.5 dia.

R0.5 max.   52 to 53

65 to 66 76 ± 0.2

Note: The mounting panel thickness should be 1 to 3.2 mm.

Y92F-71/-74

56

58   45 ± 0.2 68

43 ± 0.2
$50^{+0.2}_{-0}$

Panel   P3G
Back Connecting Socket

52.3 (63.7)
(See note.)
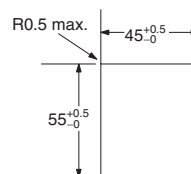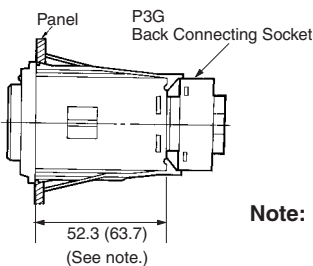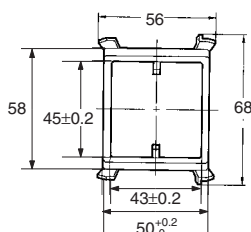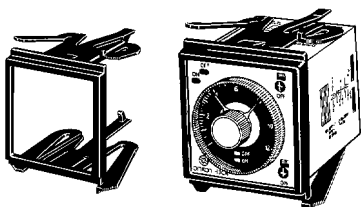
Note: The value shown in parentheses is for the Y92F-71.

R0.5 max. $45^{+0.5}_{-0}$

$55^{+0.5}_{-0}$

Note: The mounting panel thickness should be 1 to 3.2 mm.

Track Mounting/Front Connecting Socket
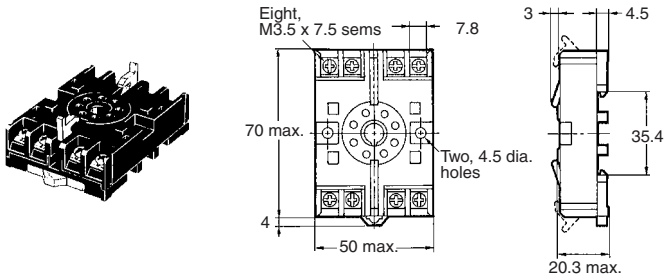
P2CF-08

Eight,
M3.5 x 7.5 sems
7.8
3 — 4.5
70 max.
35.4
Two, 4.5 dia.
holes
4
50 max.
20.3 max.
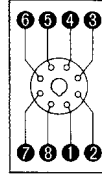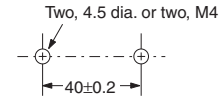
P2CF-08-E (Finger Safe Terminal Type)
Conforming to VDE0106/P100
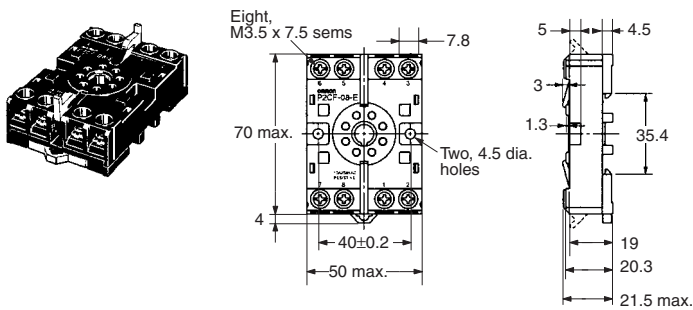
Eight,
M3.5 x 7.5 sems
7.8
5 — 4.5
P2CF-08-E
3
70 max.
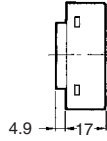1.3
35.4
Two, 4.5 dia.
holes
4
40±0.2
50 max.
19
20.3
21.5 max.

Terminal Arrangement/
Internal Connections
(Top View)

6 5 4 3

7 8 1 2

Surface Mounting Holes

Two, 4.5 dia. or two, M4

40±0.2

Track Mounting/Front Connecting Socket

P2CF-11

Eleven,
M3.5 x 7.5 sems
7.8
3 — 4.5
70 max.
35.4
4
50 max.
31.2 max.
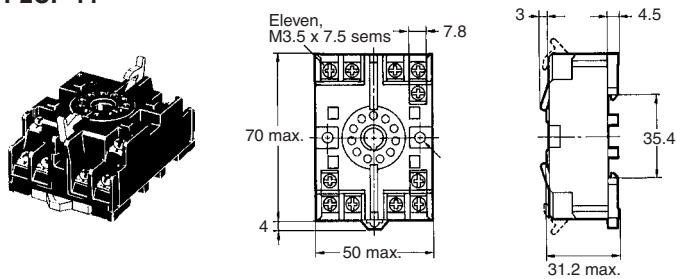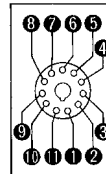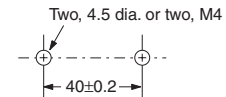
P2CF-11-E (Finger Safe Terminal Type)
Conforming to VDE0106/P100
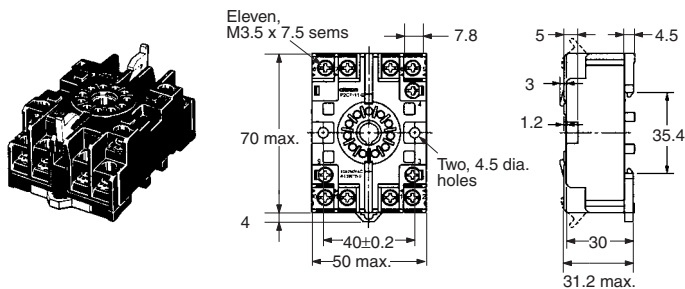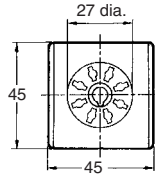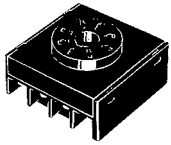
Eleven,
M3.5 x 7.5 sems
7.8
5 — 4.5
P2CF-11-E
3
70 max.
1.2
35.4
Two, 4.5 dia.
holes
4
40±0.2
50 max.
30
31.2 max.

Terminal Arrangement/
Internal Connections
(Top View)

8 7 6 5
4
9 3
10 11 1 2

Surface Mounting Holes

Two, 4.5 dia. or two, M4

40±0.2

Back Connecting Socket

P3G-08

27 dia.
45
45
4.9 — 17

**Terminal Arrangement/
Internal Connections
(Bottom View)**

3 4 5 6
2 1 8 7

P3GA-11

27 dia.
45
45
25.6
4.5 — 16.3 — 6.2

**Terminal Arrangement/
Internal Connections
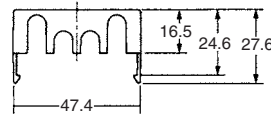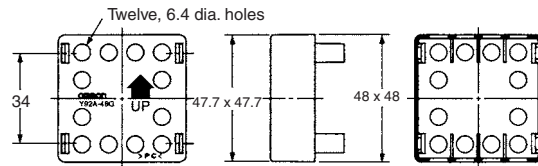(Bottom View)**

5 6 7 8
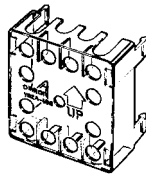4   9
3   9
2 1 11 10
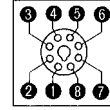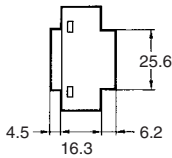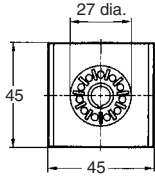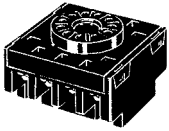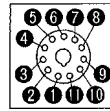
Finger Safe Terminal Cover
Conforming to VDE0106/P100

**Y92A-48G
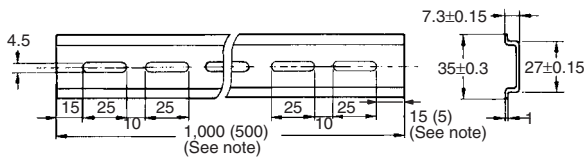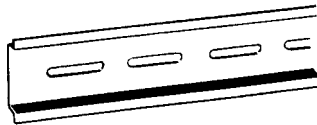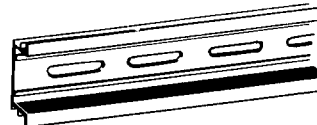(Attachment for P3G-08/P3GA-11
Socket)**

Twelve, 6.4 dia. holes

34   47.7 x 47.7   48 x 48

16.5 24.6 27.6
47.4

Mounting Track

PFP-100N, PFP-50N

7.3±0.15
4.5
35±0.3 27±0.15
15 25 25 25 25 15 (5)
10   1,000 (500)   10   (See note)
(See note)
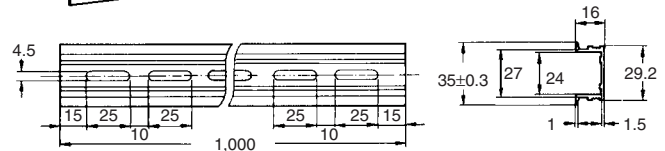
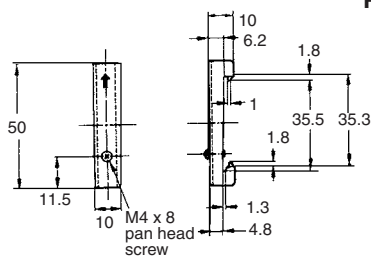**Note:** The value shown in parentheses are for the PFP-50N.

PFP-100N2

4.5
35±0.3 27 24   29.2
15 25 25   25 25 15
10   1,000   10
16
1 — 1.5

End Plate
PFP-M

10
6.2
1.8
50   1
35.5 35.3
1.8
11.5
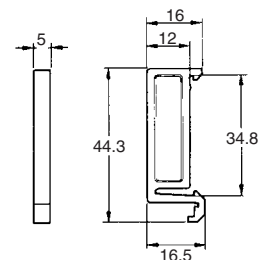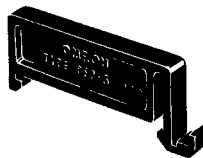10 M4 x 8   1.3
pan head 4.8
screw

Spacer
PFP-S

5
16
12
44.3   34.8
16.5
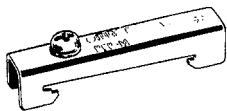
Protective Cover
Y92A-48B

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

Note: 1. The Y92A-48B Protective Cover is made of a hard plastic and therefore it must be removed to change the timer set value.

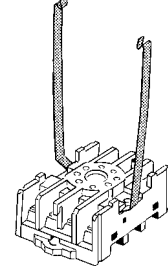**2.** The Protective Cover cannot be mounted if the Panel Cover (sold separately) is used on the Timer.

Y92A-48B
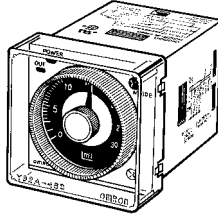
Hold-down Clip

Hold-down clips are sold in sets of two.

Y92H-7/-1
For PL08 and PL11 Sockets

Y92H-8/-2
For PF085A Socket

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

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

When setting a given time for the Timer, use of the Y92S-27 or Y92S-28 Time Setting Ring facilitates the time setting operation and minimizes possible setting errors by operators.

The Y92F-73 or Y92-F-74 Flush Mounting Adapter or the Protective Cover cannot be used.

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

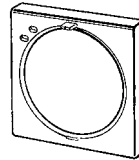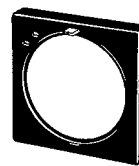| Setting a specific time	Time Setting Ring A (Y92S-27) and Panel Cover (Y92P-48GL, -48GB, or -48GM)
Limiting the setting range	Time Setting Ring B or C (Y92S-28), and Panel Cover (Y92P-48GL, -48GB, or -48GM)

Y92S-27
Time Setting

Y92S-28
Time Setting

Y92S-28
Time Setting C

Y92P-48GL
Light Gray

Y92P-48GB
Black

Y92P-48GM
Medium Gray