

# Solid-state Timer

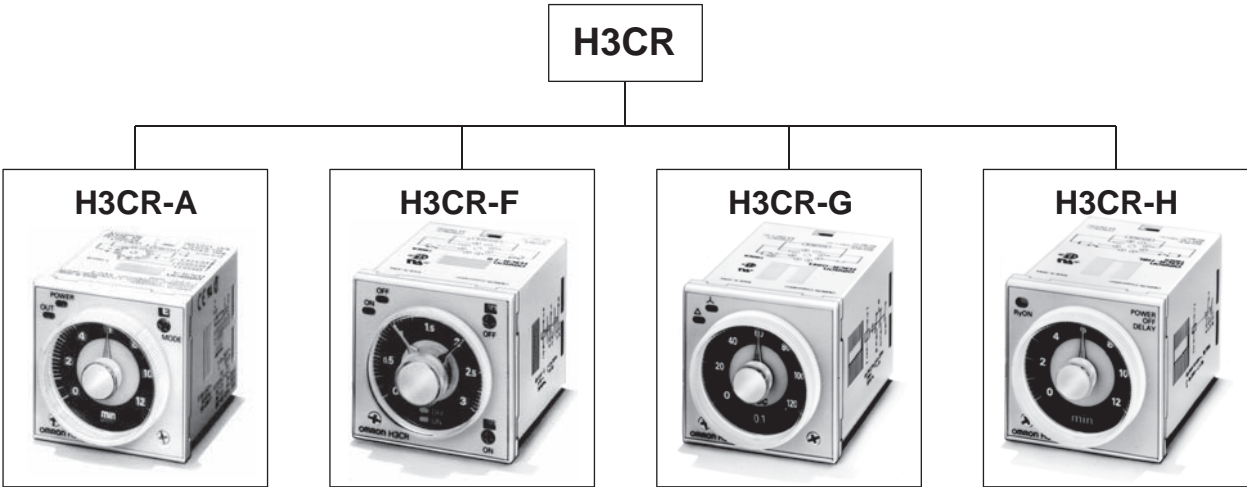
## H3CR

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 × 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



<p><b>Multifunctional Timer</b></p> <p>H3CR-A H3CR-AS H3CR-AP H3CR-A8 H3CR-A8S H3CR-A8E</p> <p>} 11-pin model } 8-pin model } 8-pin with instantaneous contact output model</p>	<p><b>Twin Timer</b></p> <p>H3CR-F H3CR-FN H3CR-F8 H3CR-F8N</p> <p>} 11-pin model } 8-pin model</p>	<p><b>Star-delta Timer</b></p> <p>H3CR-G8L H3CR-G8EL</p> <p>} 8-pin model</p>	<p><b>Power OFF-delay Timer</b></p> <p>H3CR-HRL H3CR-H8L H3CR-H8RL</p> <p>— 11-pin model } 8-pin model</p>
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**Note:** H3CR-AS, H3CR-A8S: Transistor output models

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# H3CR-A

## Multiple Operating Modes and Multiple Time Ranges. DIN 48 x 48-mm Multifunctional Timer.

- 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, eight modes for 11-pin models and five modes for 8-pin models.
- Ecological design with reduced current consumption.
- Easy sequence checking with instantaneous outputs for a zero set value.
- Length of 75 mm or less when panel-mounted with a P3G-08 Socket (H3CR-A8E, 100 to 240 VAC, 100 to 125 VDC)
- PNP input models available.
- Standards: UL, CSA, NK, LR, CCC, EN 61812-1, and CE Marking.



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

## Model Number Structure

### ■ Model Number Legend

**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

- 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 100-240AC/100-125DC

Supply voltage

2. The operating modes are as follows

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  
 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	Eight multi-modes: A, B, B2, C, D, E, G, J	H3CR-A		
	24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC						
	100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC	Voltage input			0.1 s to 600 h	Eight multi-modes: A, B, B2, C, D, E, G, J	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					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	Five multi-modes: A, B, B2, E, J (Power supply start)	H3CR-A8
	24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC		0.1 s to 600 h		H3CR-A8-301
	100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC				
	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 *1
		Y92F-74 *1
Protective Cover		Y92A-48B *2
Hold-down Clip (Sold in sets of two)	For PF085A Socket	Y92H-8
	For PL08 or PL11 Sockets	Y92H-7
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

\*1 The Y92A-48B Protective Cover and the Y92P-48G□ Panel Cover can not be used at the same time with the Y92F-73/-74 Flush Mounting Adapter.

\*2 The Y92A-48B Protective Cover is made from hard plastic. Remove the Protective Cover to change to set value. The Y92F-73/-74 Flush Mounting Adapter and the Y92P-48G□ Panel Cover cannot be used at the same time with Y92A-48B Protective Cover.

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

\*4 The Y92A-48B Protective Cover and the Y92F-73/-74 Flush Mounting Adapter cannot be used at the same time with the Y92P-48G□ Panel Cover.

## Sockets

Timer Pin	Round Sockets		
	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 your OMRON website.

## Terminal Cover

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

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

# Specifications

## ■ General

Item	H3CR-A/-AS/-A-301	H3CR-AP	H3CR-A8/-A8S/-A8-301	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 J: One-shot		A: ON-delay (power supply start) B: Flicker OFF start (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/-A-301/-A8-301: 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, CCC 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.  
For details, refer to your OMRON website.

## ■ 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.  
For details, refer to your OMRON website.

### Standard (0.05-s to 300-h) Models

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

### Double (0.1-s to 600-h) Models

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

## ■ Ratings

<b>Rated supply voltage (See notes 1, 2, and 5.)</b>	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 3.)
<b>Operating voltage range</b>	85% to 110% of rated supply voltage (90% to 110% at 12 VDC)
<b>Power reset</b>	Minimum power-opening time: 0.1 s
<b>Input (See note 6.)</b>	<p><u>No-voltage Input</u>  ON impedance: 1 k<math>\Omega</math> max.  ON residual voltage: 1 V max.  OFF impedance: 100 k<math>\Omega</math> min.</p> <p><u>Voltage Input</u>  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</p>
<b>Power consumption</b>	<p><u>H3CR-A/-A8</u>  • 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</p> <p><u>H3CR-AP</u> (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.)</p> <p><u>H3CR-A8E</u>  • 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</p> <p><u>H3CR-AS/-A8S</u>  • 24 to 48 VAC/12 to 48 VDC  (When at 24 VDC)  Output ON: 0.3 W Output OFF: 0.2 W</p>
<b>Control outputs</b>	<ul style="list-style-type: none"> <li>Models with Contact Outputs  <u>H3CR-A/-A8/-AP</u>  5A at 250 VAC/30 VDC, 0.15A at 125 VDC, resistive load (<math>\cos\phi = 1</math>)  Minimum applied load: 10mA at 5 VDC (failure level: P reference value)  Contact materials: Ag-alloy</li> <li><u>H3CR-A8E</u>  5A at 250 VAC/30 VDC, 0.15A at 125 VDC, resistive load (<math>\cos\phi = 1</math>)  Minimum applied load: 10mA at 5 VDC (failure level: P reference value)  Contact materials: AgSnIn</li> <li>Transistor output: Open collector(NPN/PNP)  <u>H3CR-AS/-A8S</u>  100 mA max at 30 VDC max., residual voltage: 2 VDC max.</li> </ul>

**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 your OMRON website 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).)  
For details, consult your OMRON sales representative.

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

**6.** For details, see *Input Connections: No-voltage Input Signal Levels* on page 11, and *Input Connections: Voltage Input Signal Levels* on page 12.

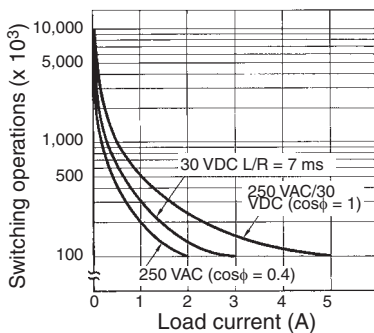
# H3CR-A

## ■ Characteristics

<b>Accuracy of operating time</b>	±0.2% FS max. (±0.2%±10 ms max. in a range of 1.2 s or 3 s)
<b>Setting error</b>	±5% FS ±50 ms (See note 1)
<b>Reset time</b>	Min. power-opening time: 0.1 s max. Min. pulse width: 0.05 s (H3CR-A/-AS)
<b>Reset voltage</b>	10% max. of rated supply voltage
<b>Influence of voltage</b>	±0.2% FS max. (±0.2%±10 ms max. in a range of 1.2 s or 3 s)
<b>Influence of temperature</b>	±1% FS max. (±1%±10 ms max. in a range of 1.2 s or 3 s)
<b>Insulation resistance</b>	100 MΩ min. (at 500 VDC)
<b>Dielectric strength</b>	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
<b>Impulse withstand voltage</b>	5 kV (between power terminals) for 100 to 240 VAC/100 to 125 VDC, 1 kV for 24 to 48 VAC/12 to 48 VDC 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
<b>Noise immunity</b>	±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)
<b>Static immunity</b>	Malfunction: 8 kV Destruction: 15 kV
<b>Vibration resistance</b>	Destruction: 10 to 55 Hz with 0.75-mm single amplitude 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
<b>Shock resistance</b>	Destruction: 1,000 m/s <sup>2</sup> 3 times each in 6 directions Malfunction: 100 m/s <sup>2</sup> 3 times each in 6 directions
<b>Ambient temperature</b>	Operating: -10°C to 55°C (with no icing) Storage: -25°C to 65°C (with no icing)
<b>Ambient humidity</b>	Operating: 35% to 85%
<b>Life expectancy</b>	Mechanical: 20,000,000 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)
<b>EMC</b>	(EMI) EN61812-1 Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A (EMS) EN61812-1 Immunity ESD: IEC61000-4-2 Immunity RF-interference: IEC61000-4-3 Immunity Burst: IEC61000-4-4 Immunity Surge: IEC61000-4-5 Immunity Conducted Disturbance: IEC61000-4-6 Immunity Voltage Dip/Interruption: IEC61000-4-11
<b>Case color</b>	Light gray (Munsell 5Y7/1)
<b>Degree of protection</b>	IP40 (panel surface)
<b>Weight</b>	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 (Reference)*.
  3. Contact output only.

## ■ Life-test Curve (Reference)

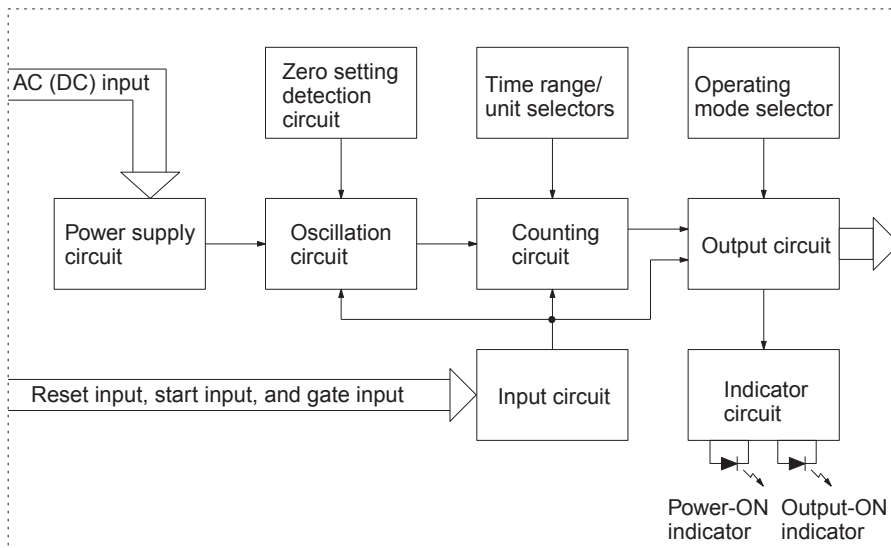


**Reference:** A maximum current of 0.15 A can be switched at 125 VDC ( $\cos\phi = 1$ ) and a maximum current of 0.1 A can be switched at 125V DC and L/R = 7ms. In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 10 mA at 5 VDC (failure level: P).

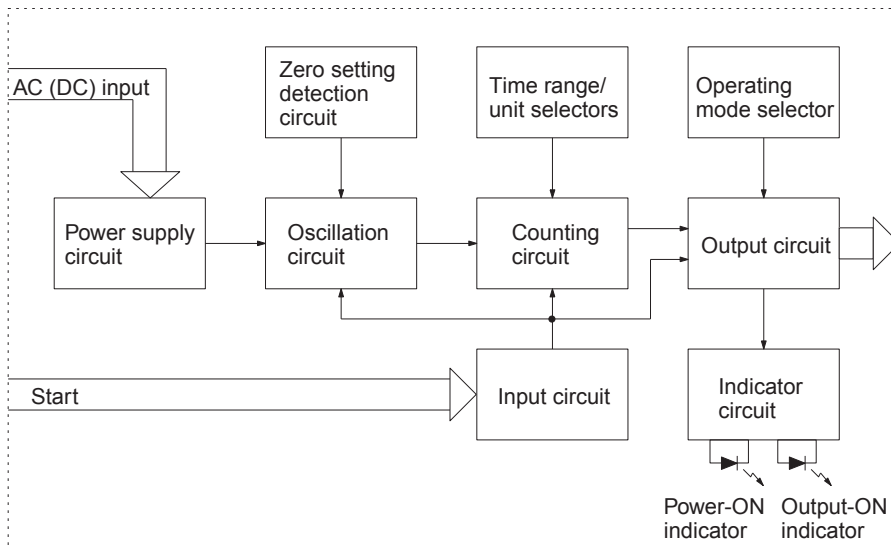
# Connections

## Block Diagrams

H3CR-A/-AS/-A-301



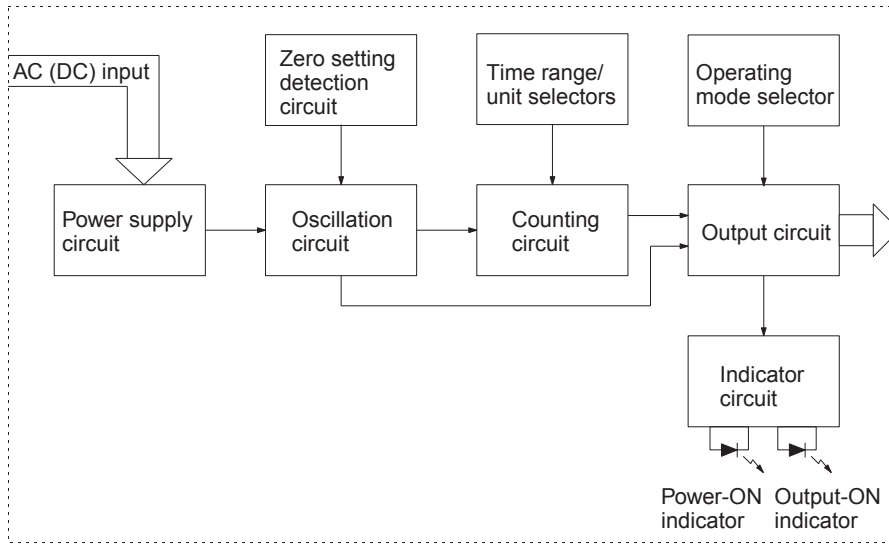
H3CR-AP



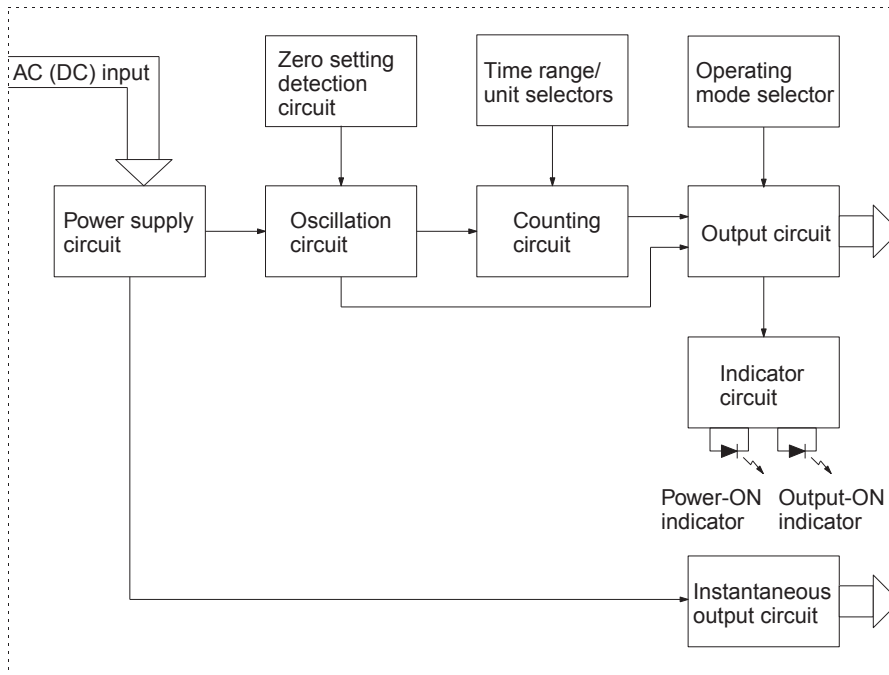


# H3CR-A

H3CR-A8/-A8S/A8-301



H3CR-A8E





## ■ I/O Functions

Inputs (for -A/ -AS models)	Start	Starts time-measurement.
	Reset	Interrupts time-measurement and resets time-measurement value. Timing operation is stopped and the control output turns OFF (it is reset).
	Gate	The timing operation is interrupted while the gate input is active.
Outputs	Control output	Outputs are turned ON according to designated output mode when preset value is reached.

**Note:** H3CR-AP incorporates start input only.  
Models H3CR-A8/-A8E/-A8S/-A8-301 do not have an input function.

## Terminal Arrangement

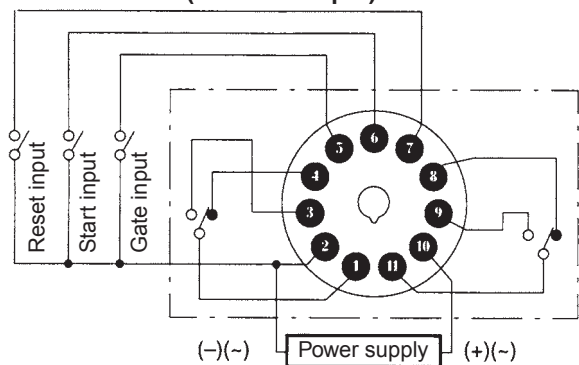
**Note: 1.** The delayed contact of conventional Timers was indicated as 

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).

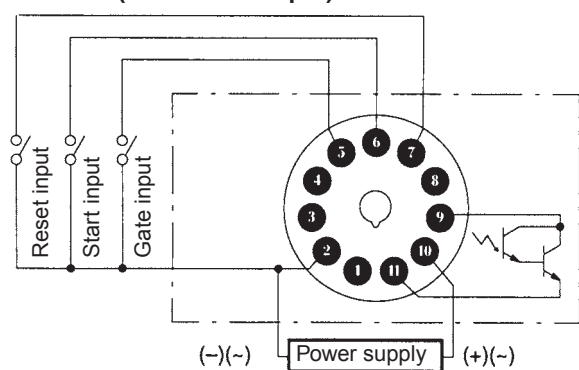
**2.** Do not use an empty terminal on the H3CR-AP/-AS/-A8S as a relay terminal or otherwise.

### 11-pin Models

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

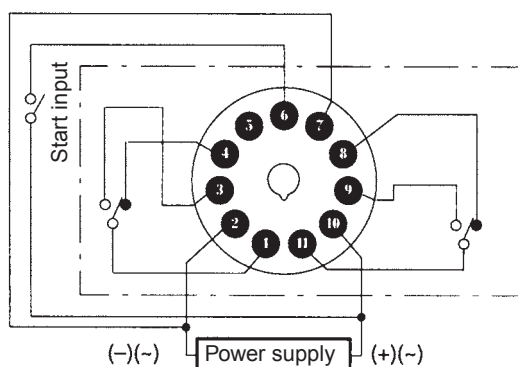


H3CR-AS (Transistor Output)



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

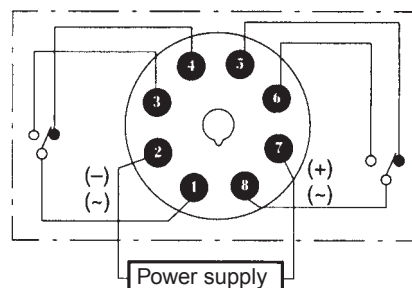
H3CR-AP (Contact Output)



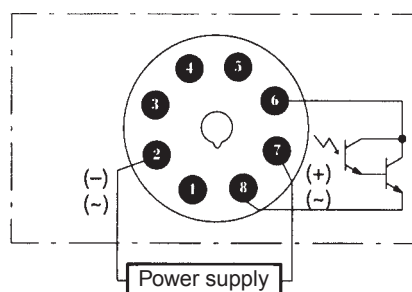
**Note: 1.** Terminal 5 is empty.  
**2.** Separate power supplies can be used for the Timer and inputs.

### 8-pin Models

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

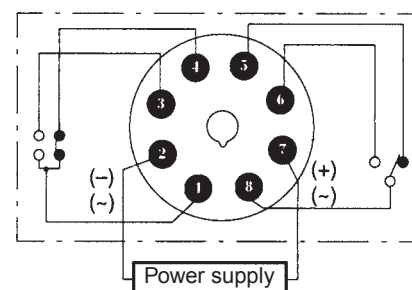


H3CR-A8S (Transistor Output)



**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)



# H3CR-A

## Input Connections

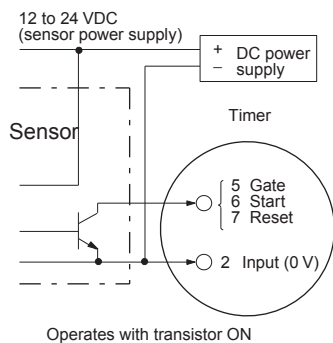
### H3CR-A/-AS/-A-301

The inputs of the H3CR-A/-AS/-A-301 are no-voltage (short-circuit or open) inputs.

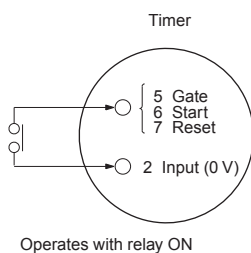
#### No-voltage Inputs

##### No-contact Input

(Connection to NPN open collector output sensor.)

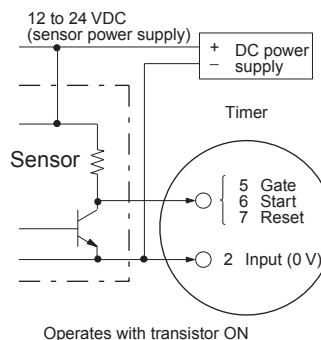


##### Contact Input



##### No-contact Input

(Connection to a voltage output sensor.)



#### 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

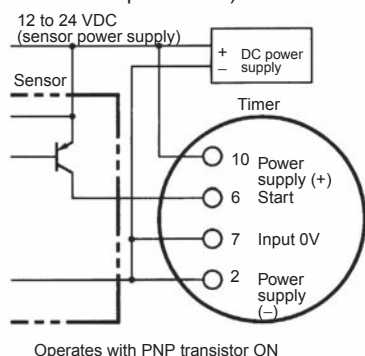
## H3CR-AP

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

### Voltage Inputs

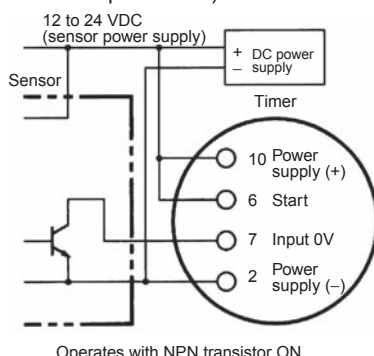
#### No-contact Input

(Connection to PNP open collector output sensor)

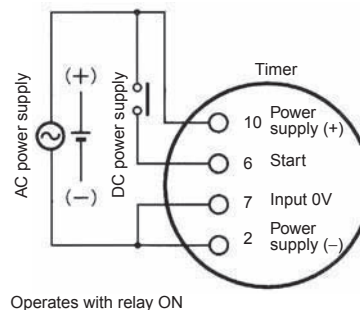


#### No-contact Input

(Connection to NPN open collector output sensor)



#### Contact Input



**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.

**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

# Operation

## ■ Timing Chart (Refer to page 20 for application examples.)

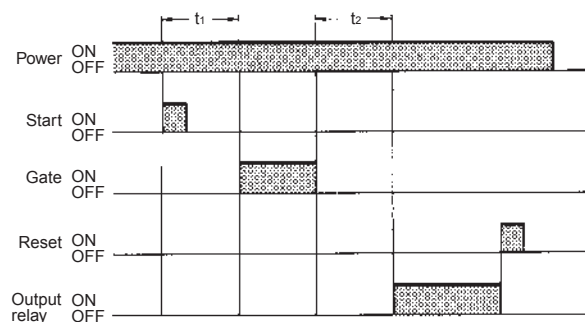
### H3CR-A/-AS/-AP\*/-A-301

Operating mode	Timing chart	
A: ON-delay		<p><b>Basic operation</b></p> <p><b>Note:</b> Start input is invalid while the Timer is in operation.</p>
B: Flicker OFF start		<p><b>Basic operation</b></p> <p><b>Note:</b> Start input is invalid while the Timer is in operation.</p>
B2: Flicker ON start		<p><b>Basic operation</b></p> <p><b>Note:</b> Start input is invalid while the Timer is in operation.</p>
C: Signal ON/OFF-delay		<p><b>Basic operation</b></p> <p><b>Note:</b> Start input is valid and retriggerable while the Timer is in operation.</p>

- Note:**
1. Allow at least 0.1 s for the Timer reset time if the power supply is reset due to an interruption in the power supply.
  2. The minimum input pulse width (for start, reset) is 0.05 s.
  3. The letter "t" in the timing charts indicates the set time, and "t-a" means that the period is less than the set time. ( $t - a < 1$ )
  4. H3CR-AP model incorporates start input only.
  5. Model H3CR-AS only has operation equivalent to time-limit contact: NO.
  6. When the setting dial is turned all the way past 0 for instantaneous output, "t" (set time) in the above time chart is 0-sec operation.

Operating mode	Timing chart	
<b>D:</b> Signal OFF-delay		<p><b>Basic operation</b></p> <p><b>Note:</b> Start input is valid and retriggerable while the Timer is in operation.</p>
<b>E:</b> Interval		<p><b>Basic operation</b></p> <p><b>Note:</b> Start input is valid and retriggerable while the Timer is in operation. (Previous start input will be cancelled.)</p>
<b>G:</b> Signal ON/ OFF-delay		<p><b>Basic operation</b></p> <p><b>Note:</b> Start input is valid and retriggerable while the Timer is in operation.</p>
<b>J:</b> One-shot output		<p><b>Basic operation</b></p> <p><b>Note:</b> Start input is valid and retriggerable while the Timer is in operation. (Previous start input will be cancelled.)</p>

**Gate Signal Input** (This timing chart indicates the gate input in operating mode A (ON-delay operation).)



- Note:**
1. Allow at least 0.1 s for the Timer reset time if the power supply is reset due to an interruption in the power supply.
  2. The minimum input pulse width (for start, reset) is 0.05 s.
  3. The letter "t" in the timing charts indicates the set time, and "t-a" means that the period is less than the set time. (t - a < 1)
  4. In J Mode, there will be only one output even if the start input is longer than the set time.
  5. H3CR-AP model incorporates start input only.
  6. Model H3CR-AS only has operation equivalent to time-limit contact: NO.
  7. When the setting dial is turned all the way past 0 for instantaneous output, "t" (set time) in the above time chart is 0-sec operation.

**Note:** The set time is the sum of t1 and t2.  
Start and reset are also both enabled when the gate signal is ON.



# H3CR-A

## H3CR-A8/-A8S/-A8-301

Operating mode	Timing chart	
<b>A:</b> ON-delay		<div style="border: 1px solid black; padding: 2px; display: inline-block;">Basic operation</div> 
<b>B:</b> Flicker OFF start		<div style="border: 1px solid black; padding: 2px; display: inline-block;">Basic operation</div> 
<b>B2:</b> Flicker ON start		<div style="border: 1px solid black; padding: 2px; display: inline-block;">Basic operation</div> 
<b>E:</b> Interval		<div style="border: 1px solid black; padding: 2px; display: inline-block;">Basic operation</div> 
<b>J:</b> One-shot output		<div style="border: 1px solid black; padding: 2px; display: inline-block;">Basic operation</div> 

**Note: 1.** Allow a timer reset time (Rt) of 0.1 s or longer.

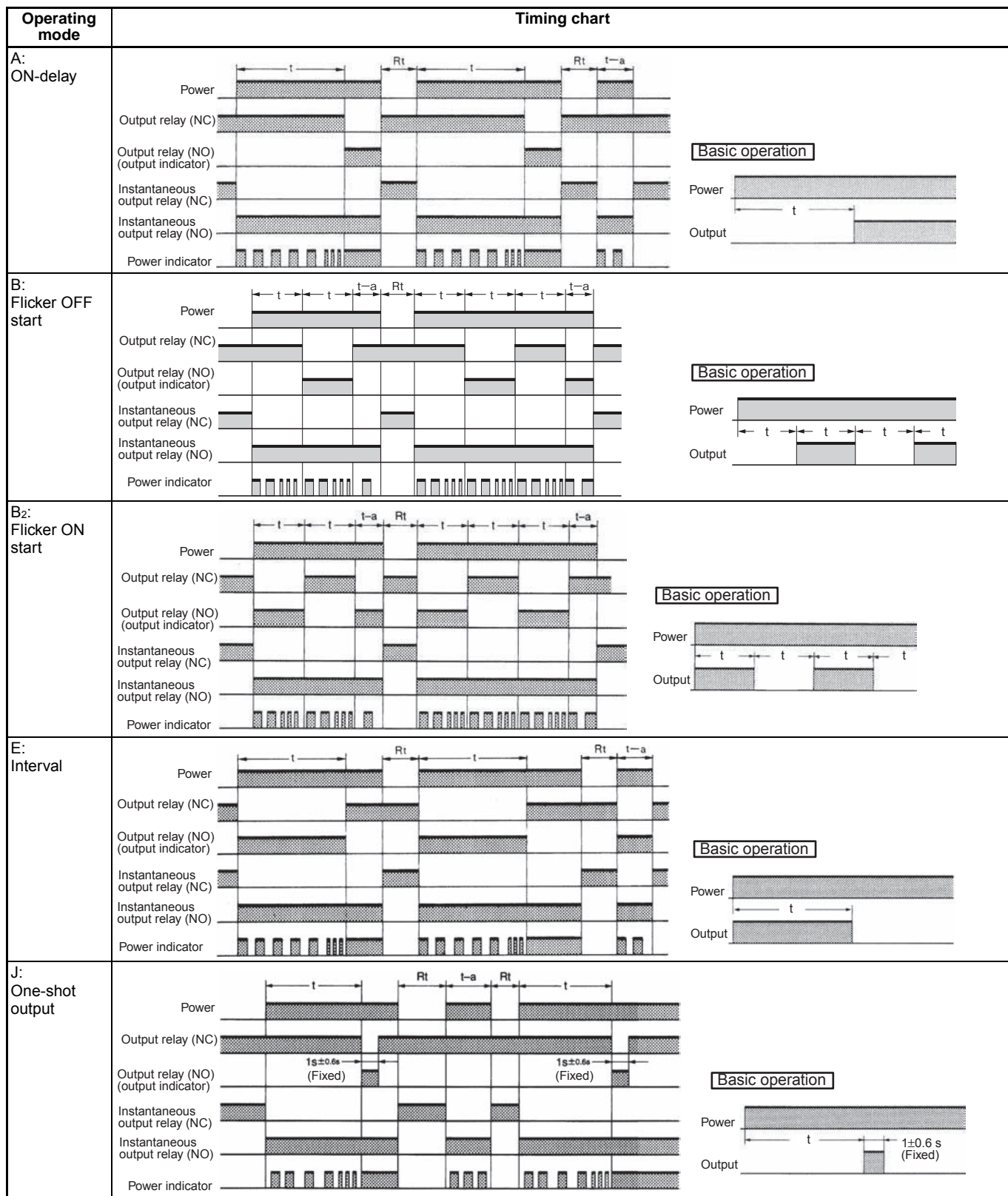
**2.** The letter "t" in the timing charts indicates the set time, and "t-a" means that the period is less than the set time. ( $t - a < 1$ )

**3.** Model H3CR-A8S only has operation equivalent to time-limit contact: NO.

**4.** When the setting dial is turned all the way past 0 for instantaneous output, "t" (set time) in the above time chart is 0-sec operation.

**5.** You can use J Mode to use the power supply as the start input.

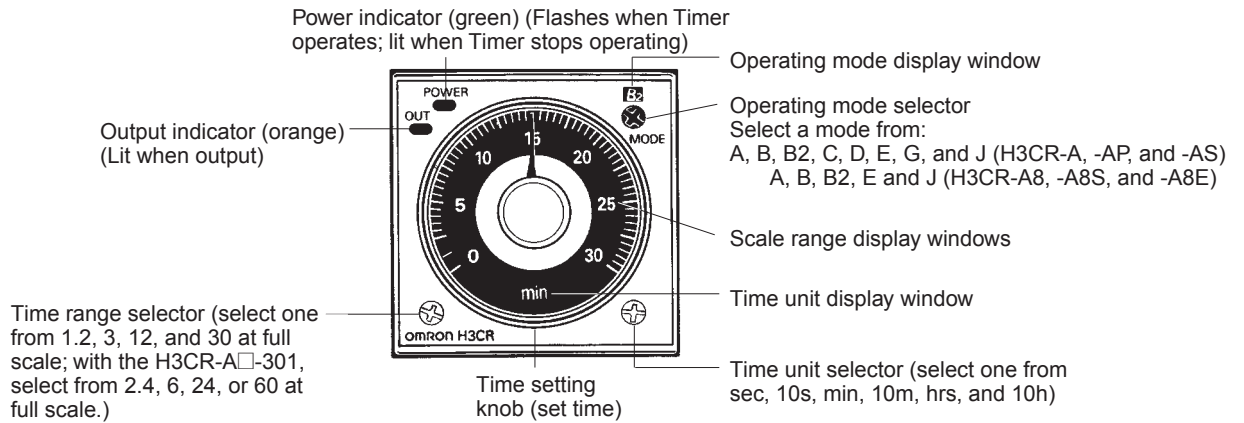
H3CR-A8E



Note: Refer to page 14.



# Nomenclature



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

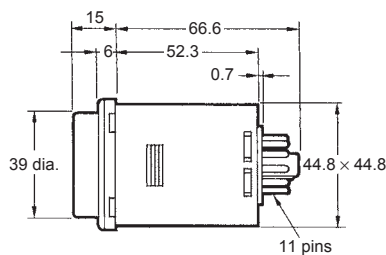
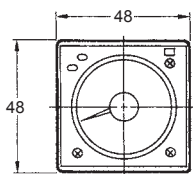
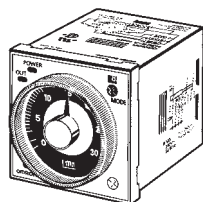
0	0.2	0.4	0.6	0.8	1.0	1.2
0	0.5	1	1.5	2	2.5	3
0	2	4	6	8	10	12
0	5	10	15	20	25	30

\* On the H3CR-A□-301 type, the time is twice as long.

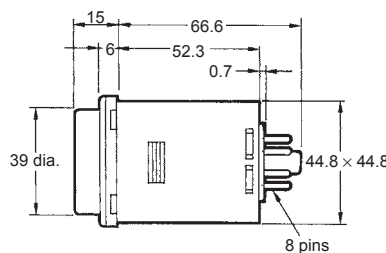
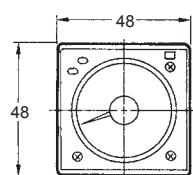
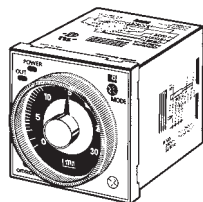
# Dimensions

Note: All units are in millimeters unless otherwise indicated.

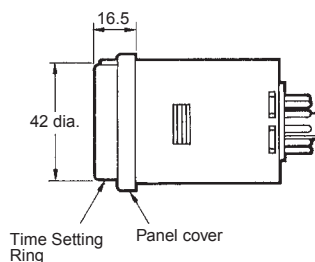
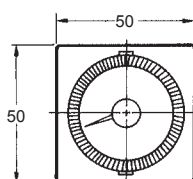
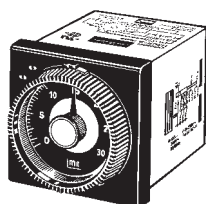
H3CR-A  
H3CR-AP  
H3CR-AS  
H3CR-A-301



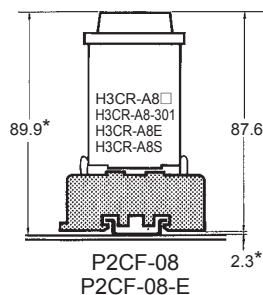
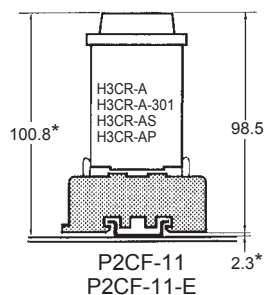
H3CR-A8  
H3CR-A8S  
H3CR-A8E  
H3CR-A8-301



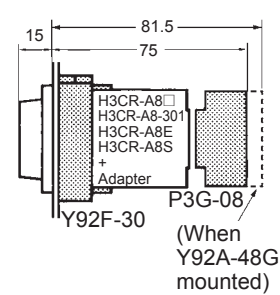
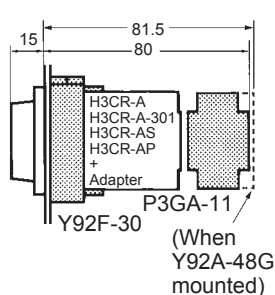
Dimensions with Set Ring  
Y92S-27/-28 (Order Separately)



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



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



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

## H3CR-A

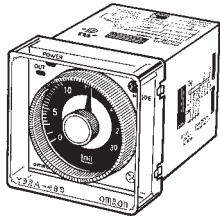
### ■ Accessories (Order Separately)

#### Protective Cover

##### Y92A-48B

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

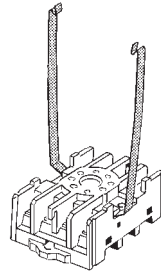
This Protective Cover cannot be used together with the Y92F-73/-74 flush mounting adaptor or the panel cover.



#### Hold-down Clip

##### Y92H-8

The Y92H-8 Hold-down Clip is attached to the PF085A socket.



##### Y92H-7

Y92H-7 Hold-down Clip is attached with screws together with the PL08 socket or the PL11 socket.



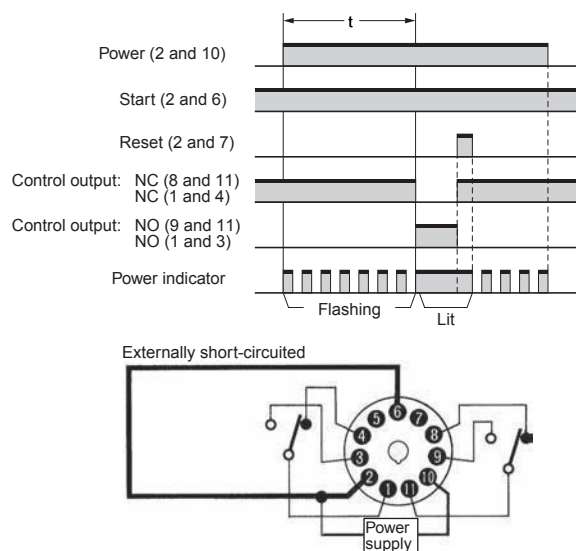
# Application Examples (H3CR-A)

## A Mode: ON-delay

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

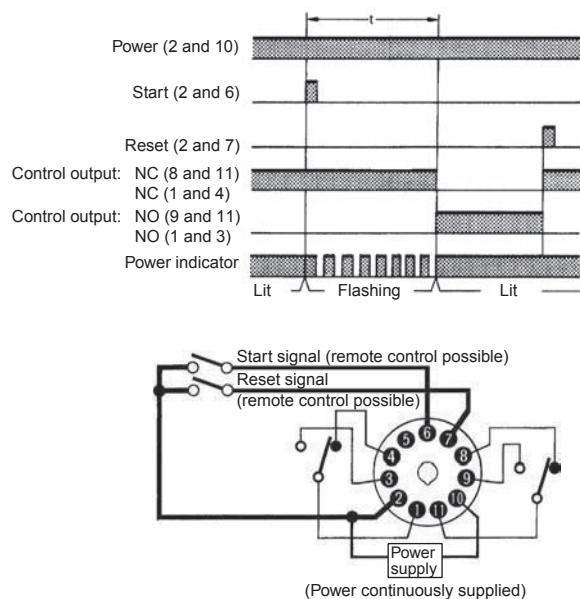
### 1. Power-ON Start/Power-OFF Reset

The Power-ON start/Power-OFF reset operation is a standard operating method.



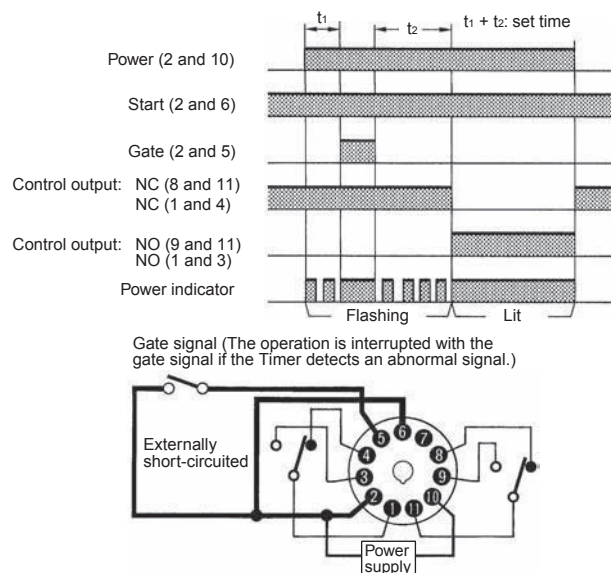
### 2. Signal Start/Signal Reset

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



### 3. Control of Integrated Time with Gate Signal

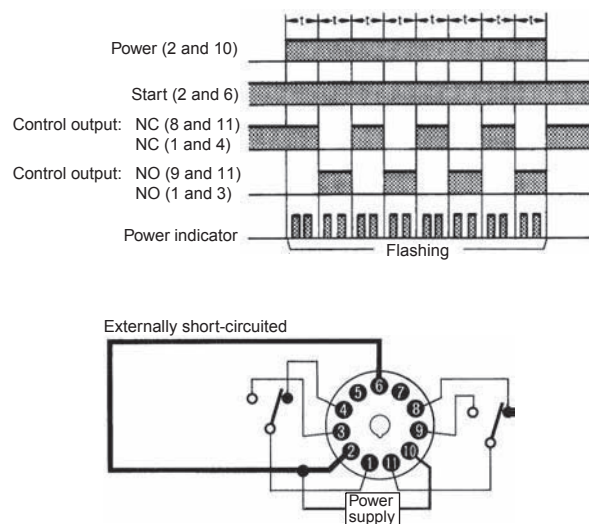
Gate signal processing (during input or a temporary timing stop) is possible with both power start and signal start.



## 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.

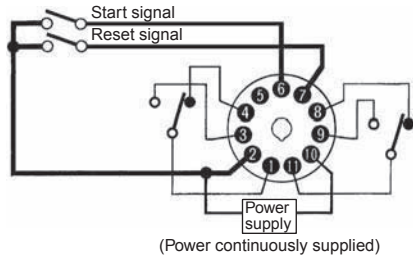
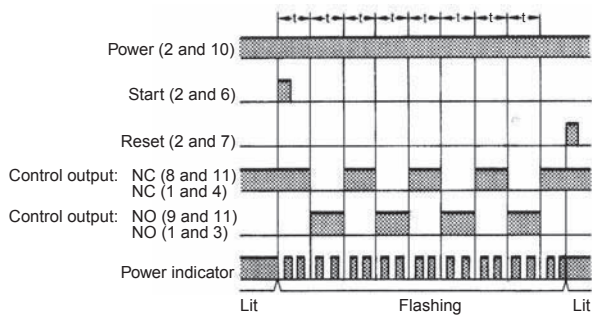
### 1. Power-ON Start/Power-OFF Reset (in B Mode)



# H3CR-A

## 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.

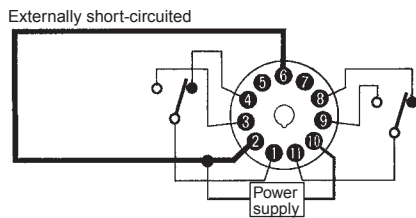
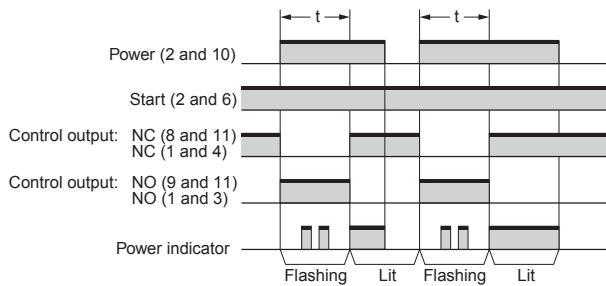


## C Mode: Signal ON/OFF-delay

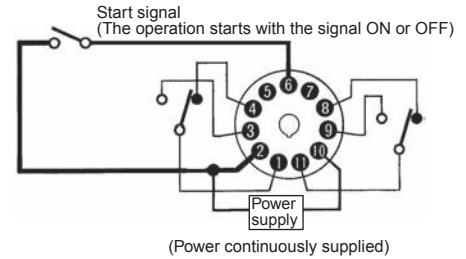
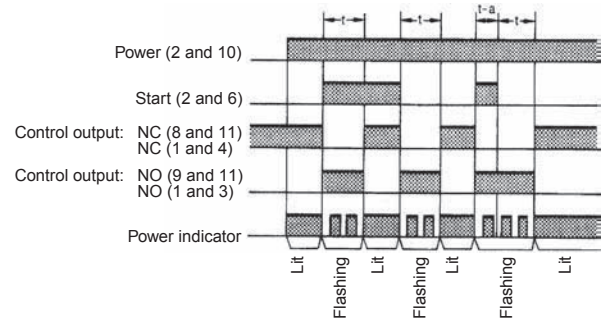
The Signal ON-/OFF-delay operation (C mode) is useful for the control of distribution of products on a production line into boxes by the specified number or time.

### 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.



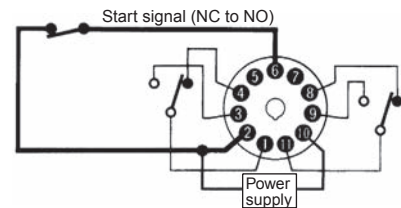
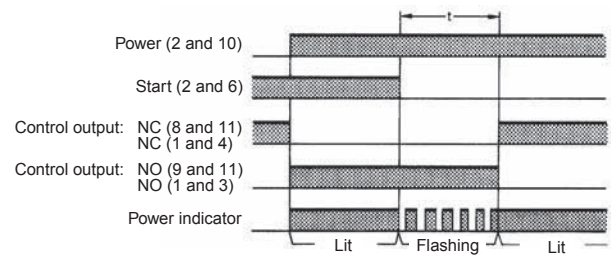
## 2. Signal-ON-OFF Start/Instantaneous Operation/Time-limit Reset



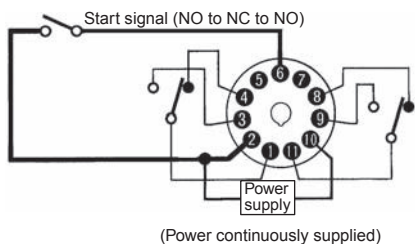
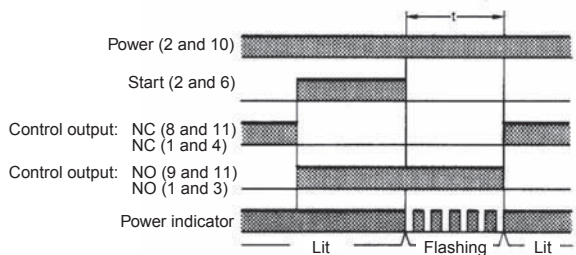
## D Mode: Signal OFF-delay

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

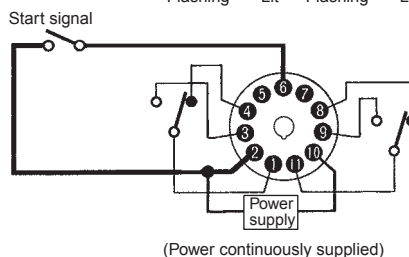
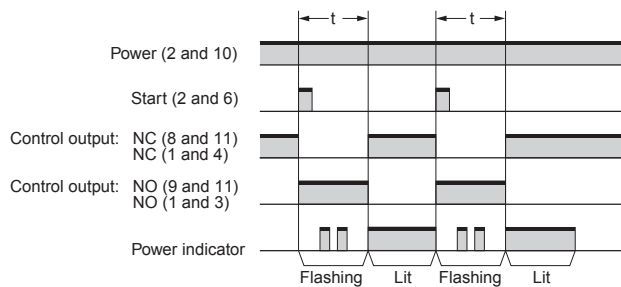


## 2. Signal Start/Instantaneous Operation/ Time-limit Reset



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

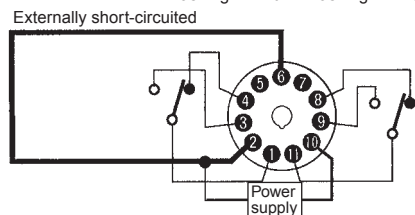
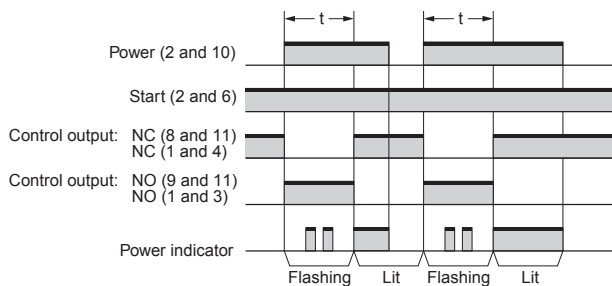
This function is useful for the repetitive control such as the filling of liquid for a specified period after each Signal start input.



## 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)

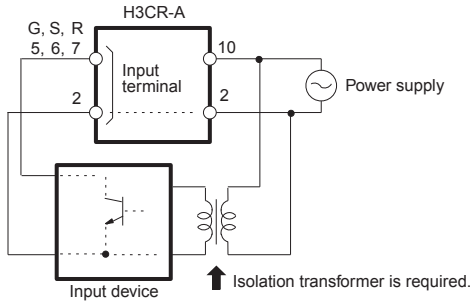
Refer to *Safety Precautions for All Timers*.

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

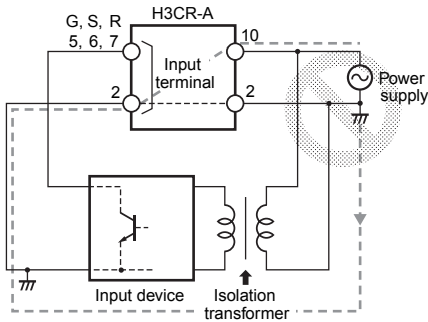
## Power Supplies

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

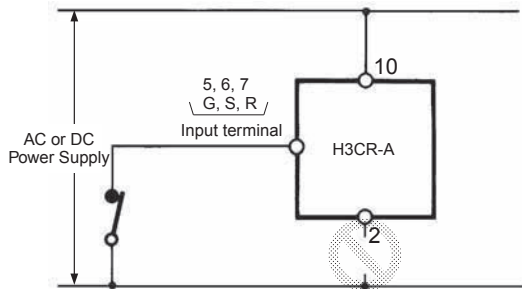
**Correct**



**Incorrect**



The H3CR-A'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.

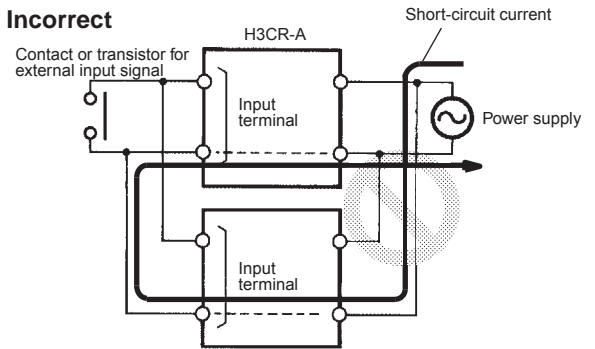


## Input/Output

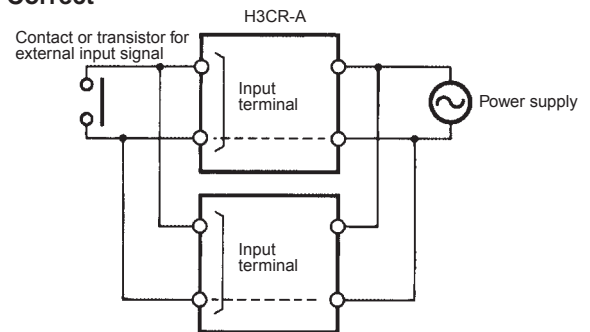
### Relationship between Input and Power Supply Circuits (except for H3CR-A8E)

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.

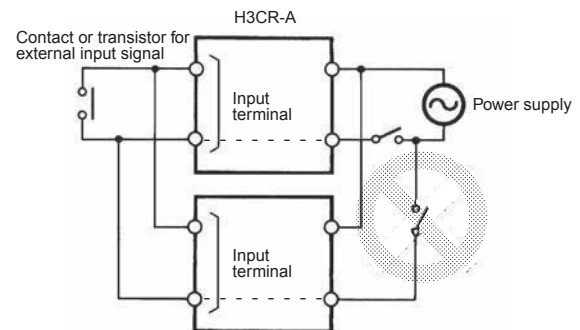
**Incorrect**



**Correct**



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

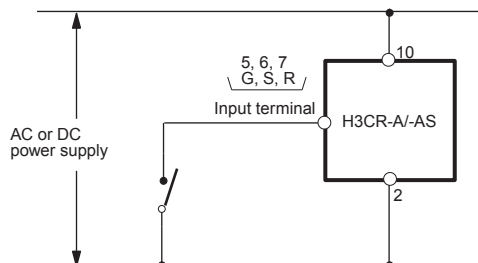




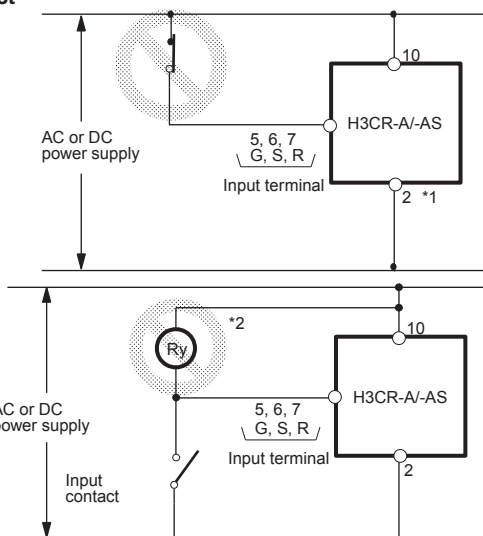
## Relationship between Input and Power Supply Circuits (H3CR-A□/-A□S)

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.

**Correct**

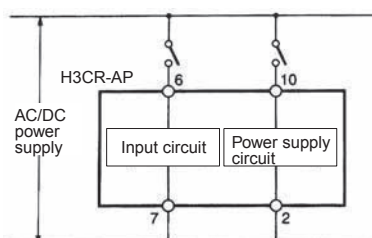


**Incorrect**



- \*1 Power terminal 2 is a common terminal that is also used for the input signal. Do not use terminal 10 as a common terminal as this will damage the internal circuitry.
- \*2 If a relay or other load is connected here, high voltage will be applied to the input terminal and damage the internal circuitry.
- The transistor output of the H3CR-A□S is isolated from the internal circuitry by a photocoupler, and can therefore be used either as an NPN output type or a PNP (equivalent) output type.

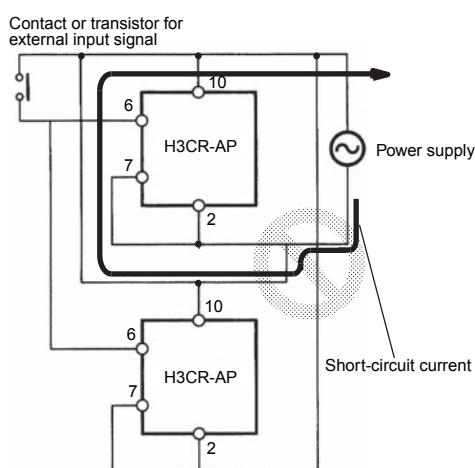
## Relationship between Input and Power Supply Circuits (H3CR-AP)



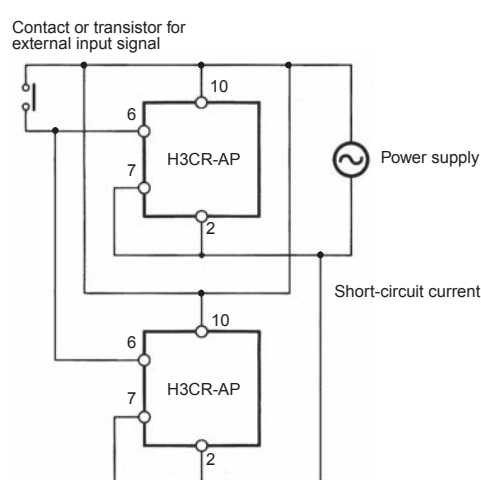
Since the input circuit and the power supply circuit are configured independently, the input circuit can be turned ON or OFF irrespective of the ON/OFF state of the power supply. It must be noted that a voltage equivalent to the power supply voltage is applied to the input circuit.

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**



When using the timer in an environment where considerable noise occurs, keep the input signal source device, timer unit, and wiring as far away as possible from the source of the noise. It is also recommended that shielded wire be used for the input signal wiring as a countermeasure for noise.

## 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.