

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

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



## Model Number Structure

### ■ Model Number Legend

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

H3CR-A       -      
                   1    2    3                    4    5

#### 1. Number of Pins

None: 11-pin models

8: 8-pin models

#### 2. Input Type for 11-pin Models

None: No-voltage input (NPN type)

P: Voltage input (PNP type)

#### 3. Output

None: Relay output (DPDT)

S: Transistor output (NPN/PNP universal use)

E: Relay output (SPDT) with instantaneous relay output (SPDT)

#### 4. Suffix

300: Dual mode models (signal ON/OFF-delay and one-shot)

301: Double time scale (range) models (0.1 s to 600 h)

#### 5. Supply Voltage

100-240AC/100-125DC: 100 to 240 VAC/100 to 125 VDC

24-48AC/12-48DC: 24 to 48 VAC/12 to 48 VDC

24-48AC/DC: 24 to 48 VAC/VDC (Only for H3CR-A8E)

# Ordering Information

## List of Models

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

### Sockets

Timer	Round Sockets		
	Connection	Terminal	Models
11-pin	Front Connecting	DIN track mounting	P2CF-11
		DIN track mounting (Finger-safe type)	P2CF-11-E
	Back Connecting	Screw terminal	P3GA-11
		Solder terminal	PL11
		Wrapping terminal	PL11-Q
		PCB terminal	PLE11-0
8-pin	Front Connecting	DIN track mounting	P2CF-08
		DIN track mounting (Finger-safe type)	P2CF-08-E
		DIN track mounting	PF085A
	Back Connecting	Screw terminal	P3G-08
		Solder terminal	PL08
		Wrapping terminal	PL08-Q
		PCB terminal	PLE08-0

- Note:** 1. The P2CF-□□-E has a finger-protection structure. Round crimp terminals cannot be used. Use forked crimp terminals.  
 2. The P3GA-11 and P3G-08 Socket can be used together with the Y92A-48G Terminal Cover to implement finger protection.  
 3. For details, refer to *Socket and DIN Track Products*.

### Terminal Cover

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

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

# Specifications

## ■ General

Item	H3CR-A/-AS	H3CR-AP	H3CR-A8/-A8S	H3CR-A8E
Operating mode	A: ON-delay B: Flicker OFF start B2: Flicker ON start C: Signal ON/OFF-delay D: Signal OFF-delay E: Interval G: Signal ON/OFF-delay (Only for H3CR-A-300) J: One-shot (Only for H3CR-A-300)		A: ON-delay (power supply start) B2: Flicker ON start (power supply start) E: Interval (power supply start) J: One-shot (power supply start)	
Pin type	11-pin		8-pin	
Input type	No-voltage input	Voltage input	---	
Time-limit output type	H3CR-A/-A8/-AP: Relay output (DPDT) H3CR-AS/-A8S: Transistor output (NPN/PNP universal)*			Relay output (SPDT)
Instantaneous output type	---			Relay output (SPDT)
Mounting method	DIN track mounting, surface mounting, and flush mounting			
Approved standards	UL508, CSA C22.2 No.14, NK, Lloyds Conforms to EN61812-1 and IEC60664-1 (VDE0110) 4kV/2. Output category according to EN60947-5-1 for Timers with Contact Outputs. Output category according to EN60947-5-2 for Timers with Transistor Outputs.			

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

## ■ Time Ranges

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

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

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

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

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

## ■ Ratings

<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 note3.)
<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</b>	<p><b>No-voltage Input</b>  ON impedance: 1 kΩ max.  ON residual voltage: 1 V max.  OFF impedance: 100 kΩ min.</p> <p><b>Voltage Input</b>  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><b>H3CR-A/-A8</b>  • 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><b>H3CR-AP</b> (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><b>H3CR-A8E</b>  • 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><b>H3CR-AS/-A8S</b>  • 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>	Time limit contacts: 5 A at 250 VAC/30 VDC, 0.15 A at 125 VDC, resistive load ( $\cos\phi = 1$ ) 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 ( $\cos\phi = 1$ )

- Note:** 1. DC ripple rate: 20% max. (A single-phase, full-wave-rectification power supply can be used).  
2. Do not use an inverter output as the power supply. Refer to *Safety Precautions for All Timers* for details.  
3. Models with 24-to-48-VAC or 12-to-48-VDC power supply have inrush current. Caution is thus required when turning ON and OFF power to the Timer with a non-contact output from a device such as a sensor. (Models with an inrush current of approximately 50 mA and a 24-VDC power supply are available (the H3CR-A-302 and H3CR-A8-302).)  
4. The values are for when the terminals 2 and 7 and terminals 10 and 6 are short-circuited, and include the consumption current of the input circuit.  
5. Refer to *Safety Precautions for All Timers* when using the Timer together with a 2-wire AC proximity sensor.

## ■ Characteristics

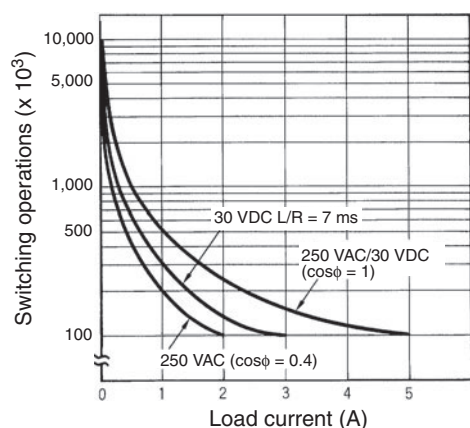
<b>Accuracy of operating time</b>	±0.2% FS max. (±0.2%±10 ms max. in a range of 1.2 s or 3 s)
<b>Setting error</b>	±5% FS ±50 ms (See note 1)
<b>Reset time</b>	Min. power-opening time: 0.1 s max. Min. pulse width: 0.05 s (H3CR-A/-AS)
<b>Reset voltage</b>	10% max. of rated supply voltage
<b>Influence 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>	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
<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: 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)
<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*.

3. Relay output only.

## ■ Life-test Curve

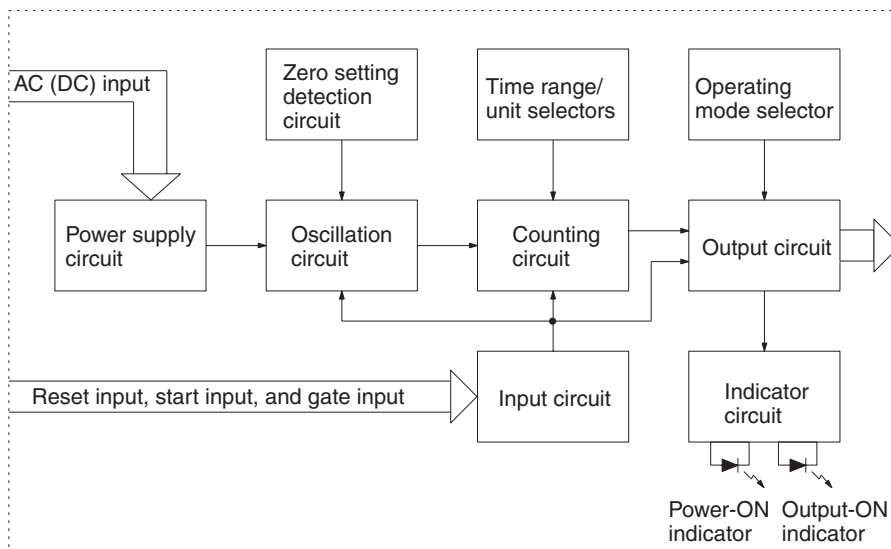


**Reference:** A maximum current of 0.15 A can be switched at 125 VDC ( $\cos\phi = 1$ ) and a maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 10 mA at 5 VDC (failure level: P).

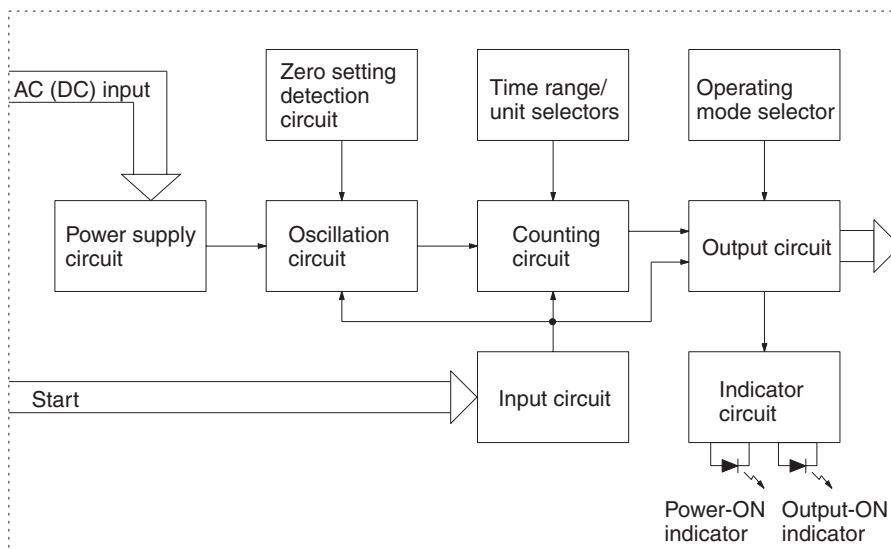
# Connections

## ■ Block Diagrams

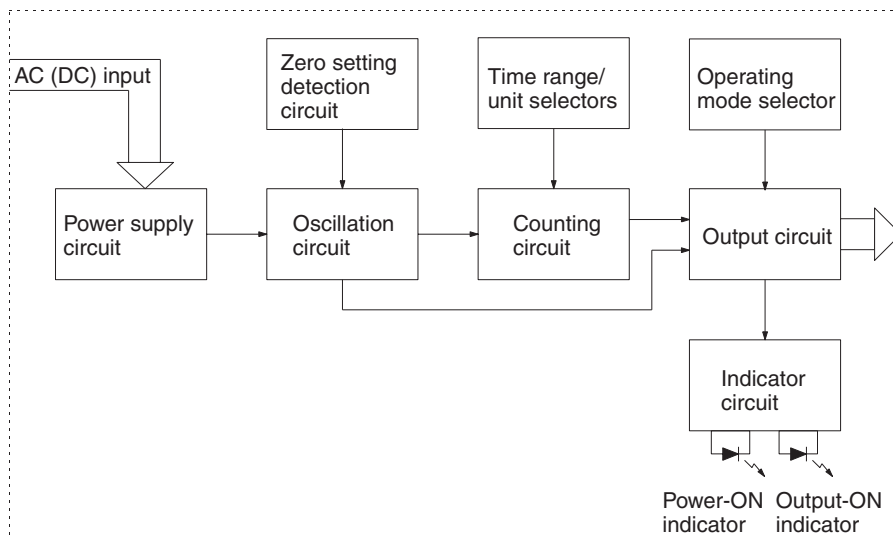
H3CR-A/AS



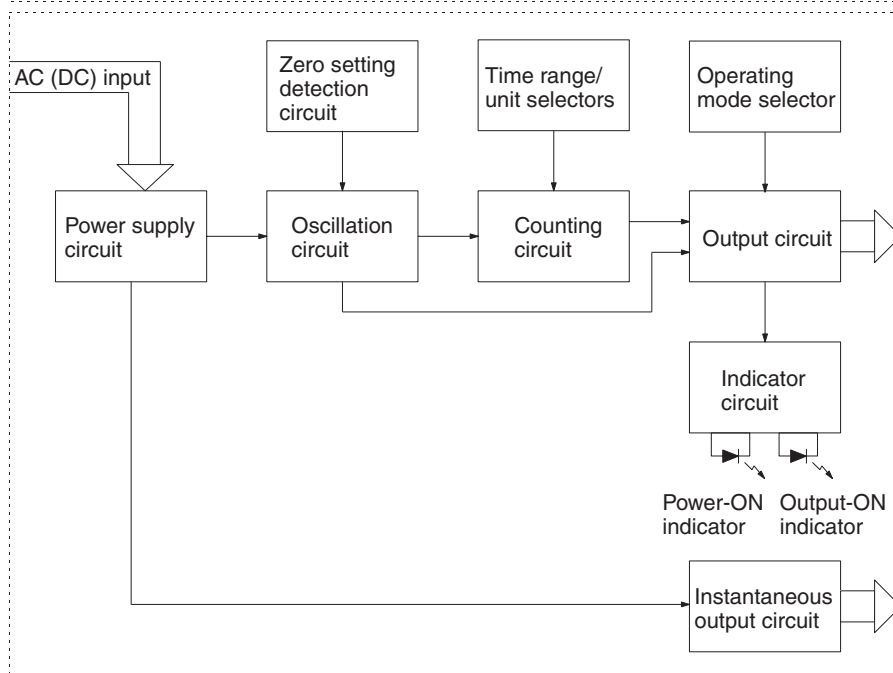
H3CR-AP



## H3CR-A8/A8S



## H3CR-A8E




## ■ I/O Functions

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

**Note:** H3CR-AP incorporates start input only.

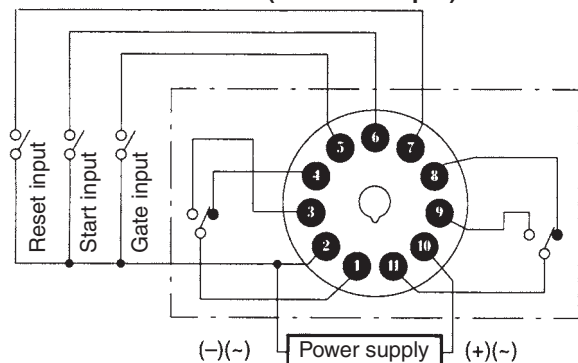
## Terminal Arrangement

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

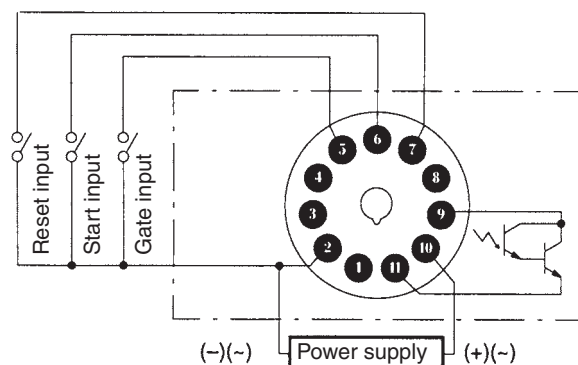
The contact symbol of the H3CR-A is indicated as  because its operating mode is six multi-modes (four multi-modes for the H3CR-A8).

### 11-pin Models

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

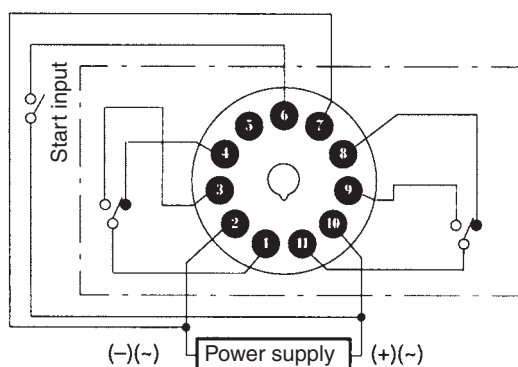


**H3CR-AS (Transistor Output)**



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

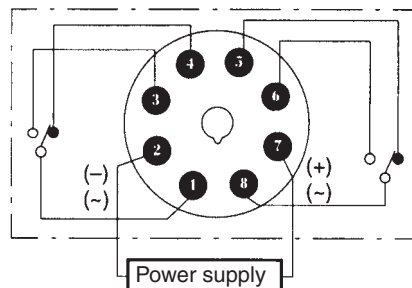
**H3CR-AP (Contact Output)**



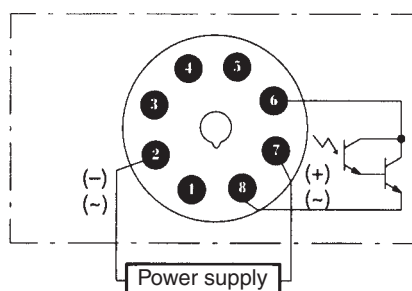
**Note:** 1. Terminal 5 is empty.  
2. Separate power supplies can be used for the Timer and inputs.

### 8-pin Models

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

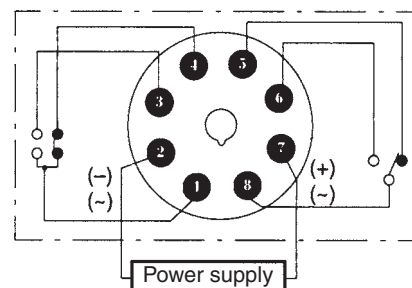


**H3CR-A8S (Transistor Output)**



**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)**



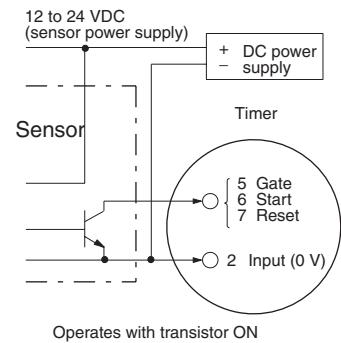
Input Connections

H3CR-A/-AS

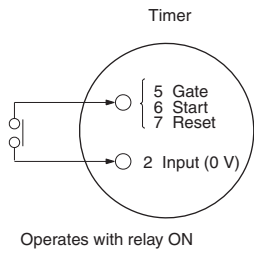
The inputs of the H3CR-A/-AS are no-voltage (short-circuit or open) inputs.

No-voltage Inputs

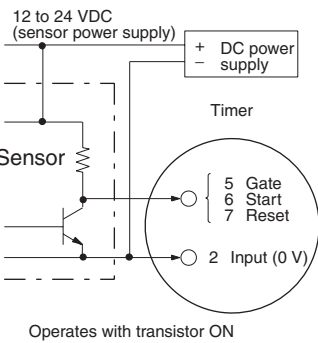
No-contact Input  
(Connection to NPN open collector output sensor.)



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

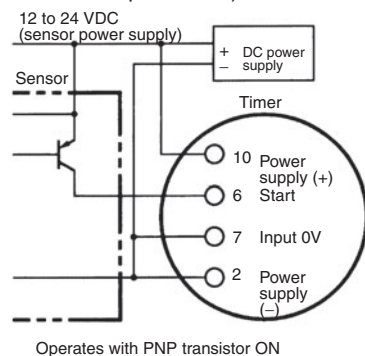
## H3CR-AP

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

### Voltage Inputs

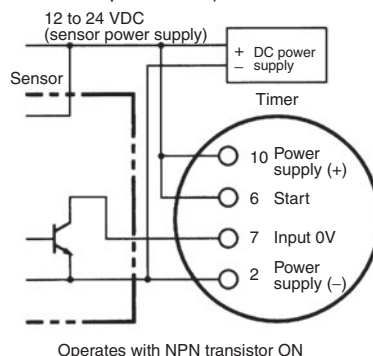
#### No-contact Input

(Connection to PNP open collector output sensor)

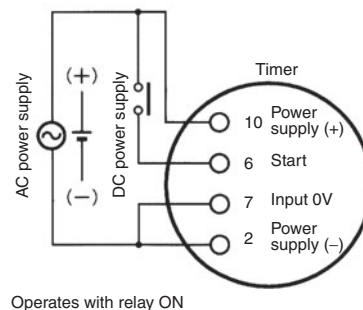


#### No-contact Input

(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

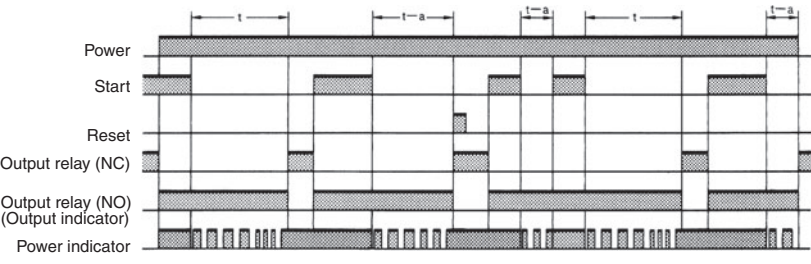
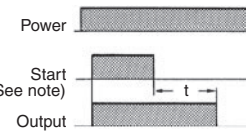
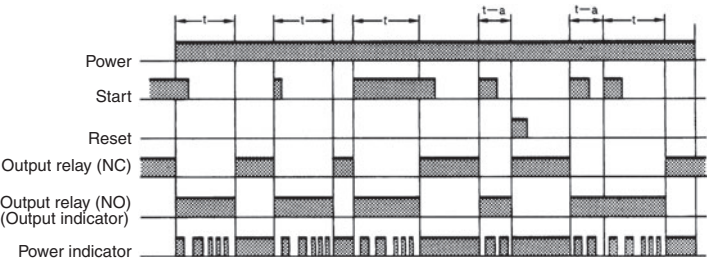
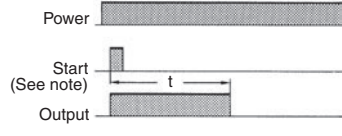
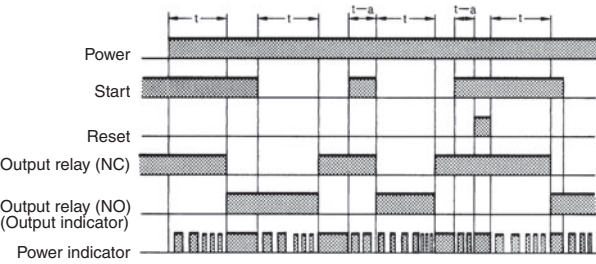
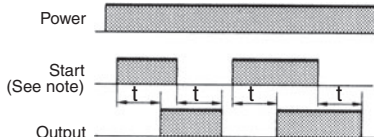
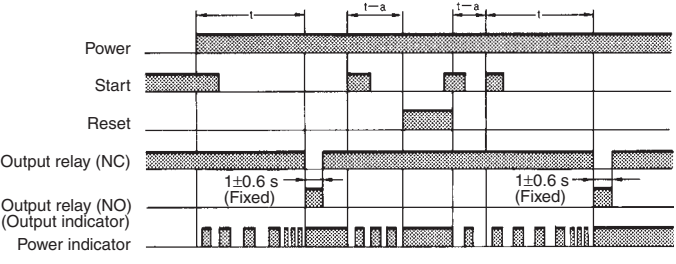
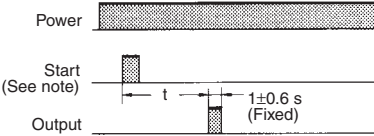
## ■ Timing Chart

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

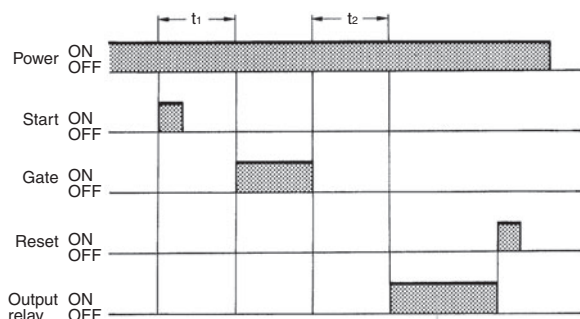
### H3CR-A/-AS/-AP\*

\*H3CR-AP model incorporates start input only.

Operating mode	Timing chart	
A: ON-delay		<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>

Operating mode	Timing chart
D: 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>
E: Interval	 <p><b>Basic operation</b></p>  <p><b>Note:</b> Start input is valid and retriggerable while the Timer is in operation.</p>
G: 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>
J: 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



- 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.

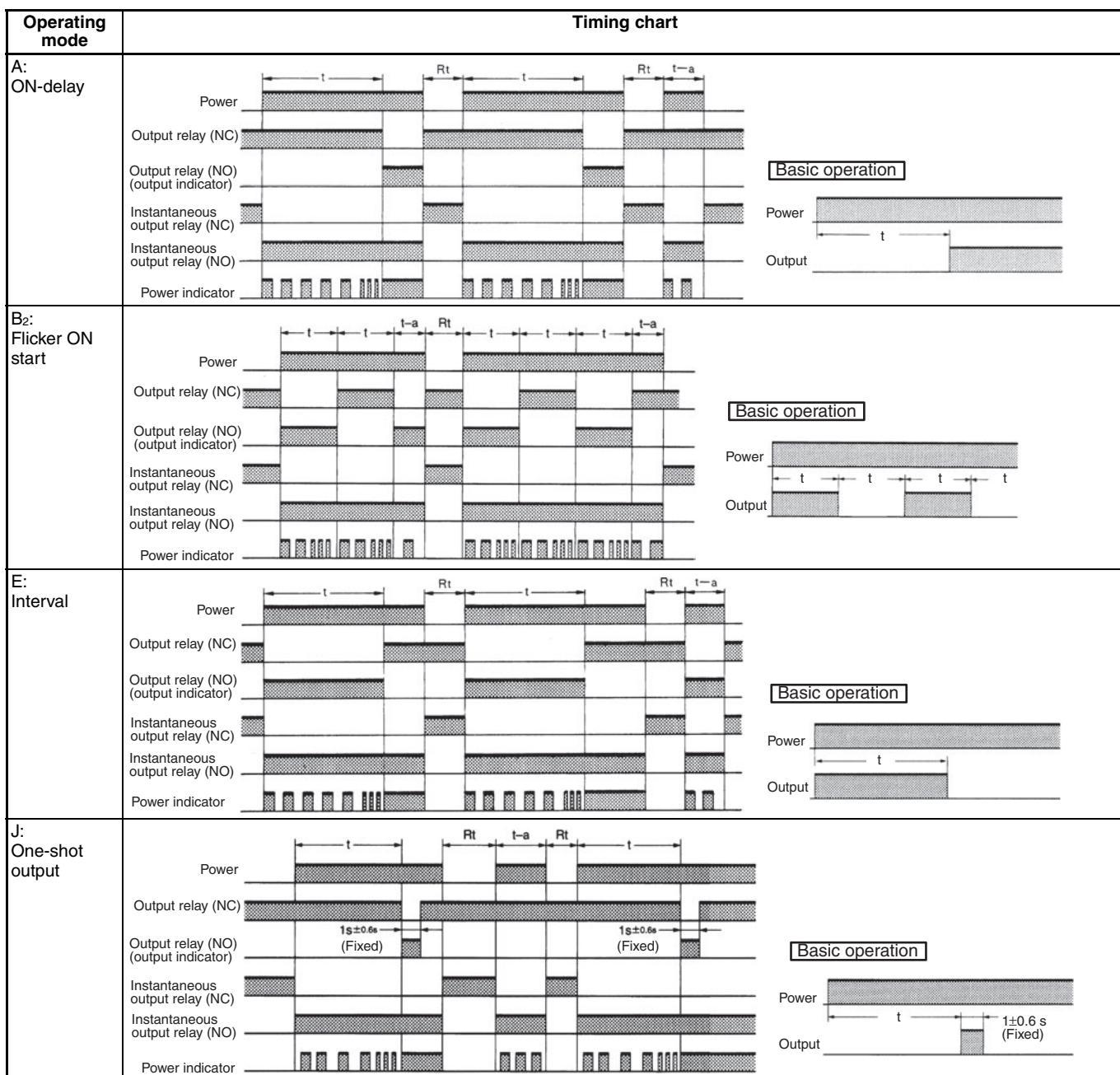
## H3CR-A8/-A8S

Operating mode	Timing chart	
A: ON-delay		
B <sub>2</sub> : 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.

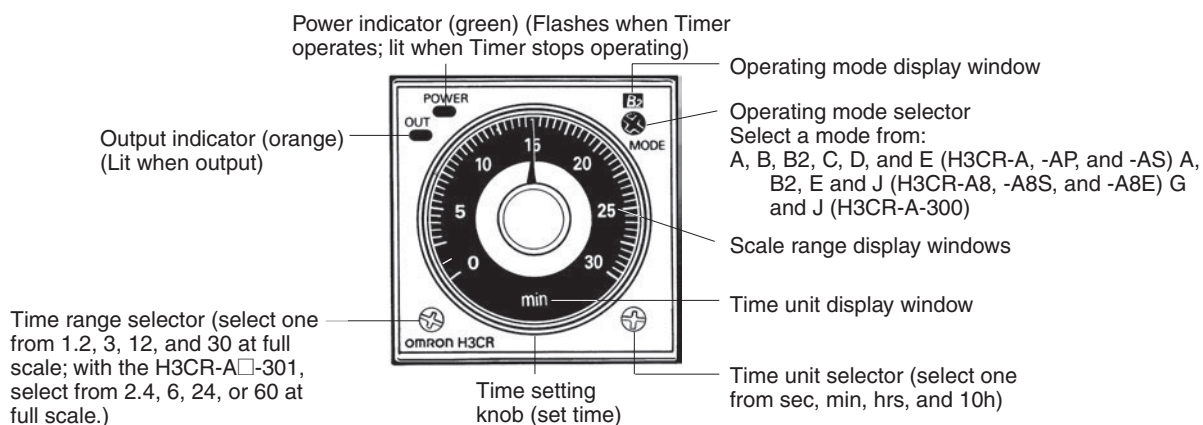
## H3CR-A8E



**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.

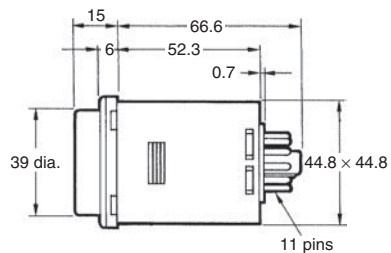
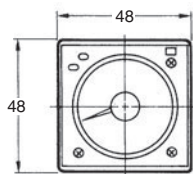
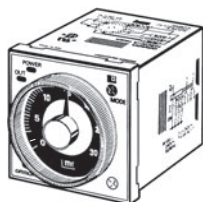
## Nomenclature



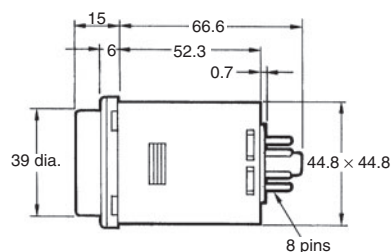
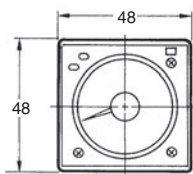
## Dimensions

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

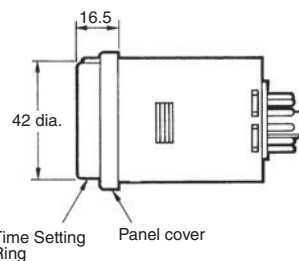
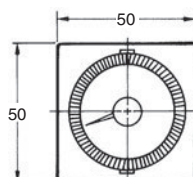
### H3CR-A H3CR-AP H3CR-AS



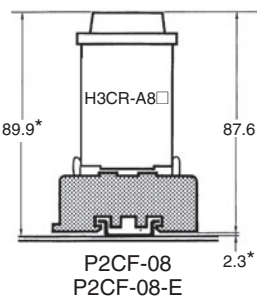
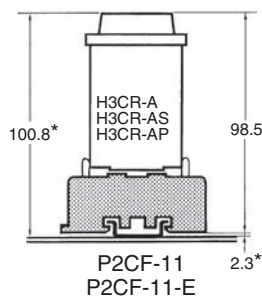
### H3CR-A8 H3CR-A8S H3CR-A8E



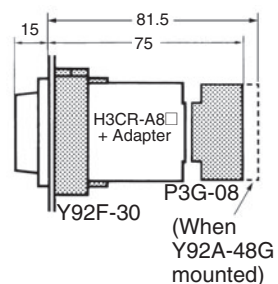
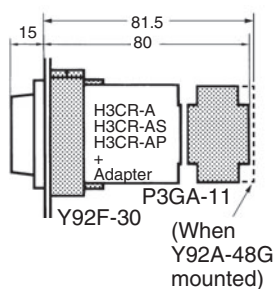
### Dimensions with Set Ring



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



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



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

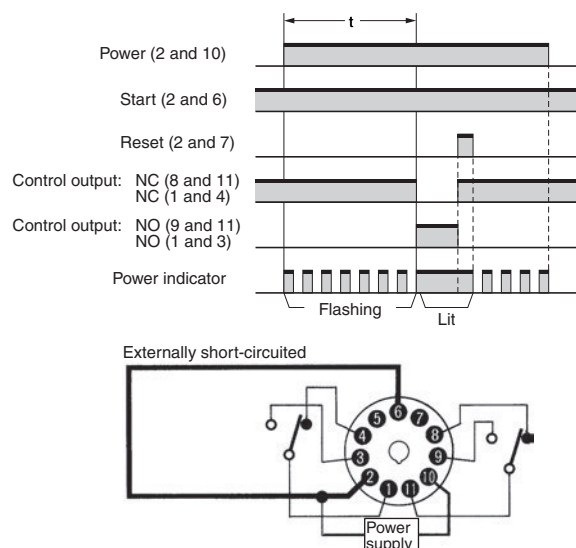
# Application Examples (H3CR-A)

## A Mode: ON-delay

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

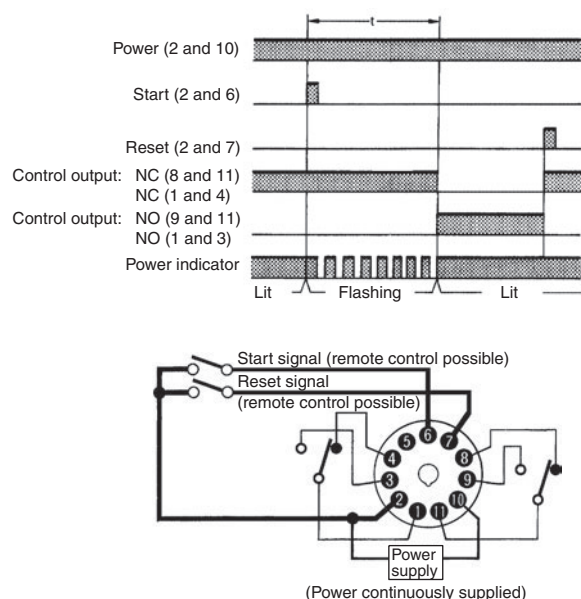
### 1. Power-ON Start/Power-OFF Reset

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



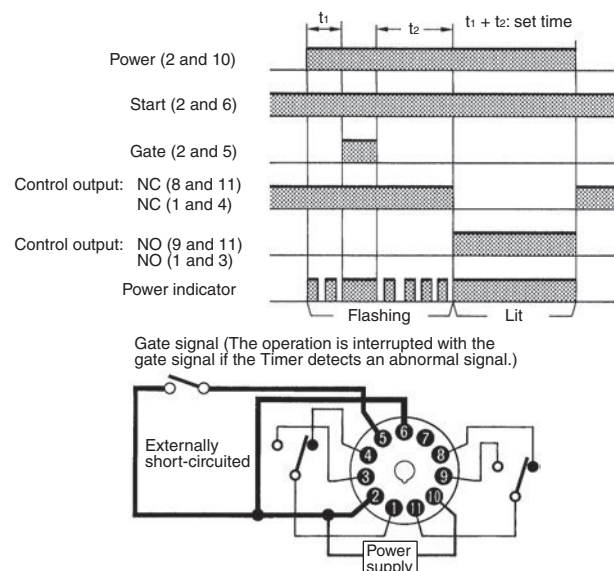
### 2. Signal Start/Signal Reset

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



## 3. Control of Integrated Time with Gate Signal

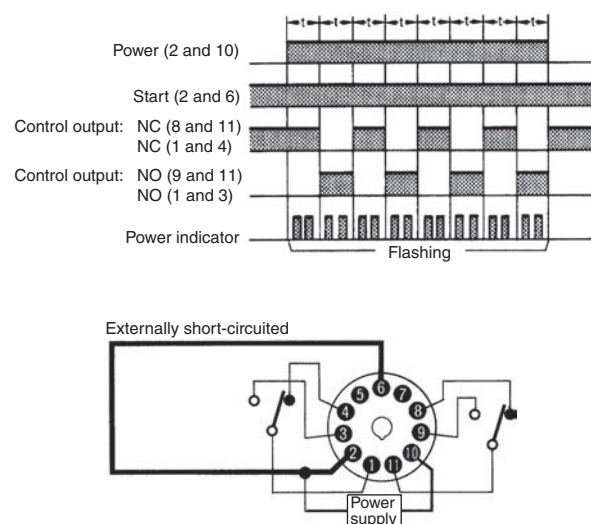
With a gate signal, the Power-ON start operation and Signal start operation can be controlled (the operation can be interrupted).



## B/B2 Mode: Flicker

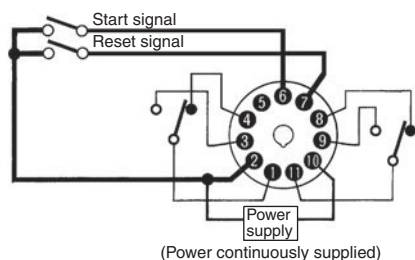
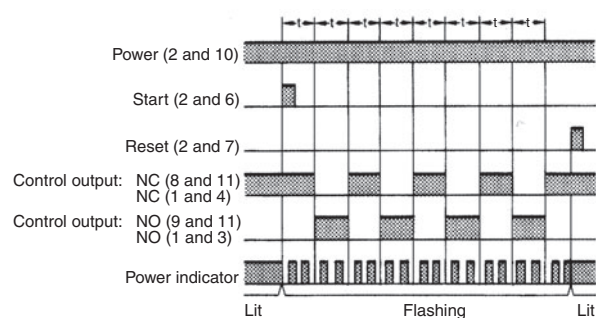
The flicker operation in the B and B2 modes can be effectively applied to lamp or buzzer (ON and OFF) alarms or the monitoring of an intermittent operation with a display.

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

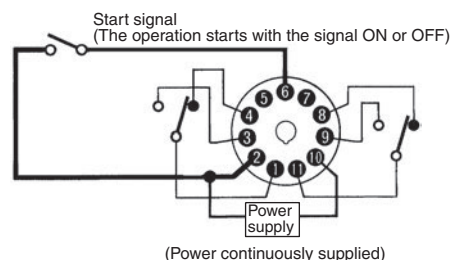
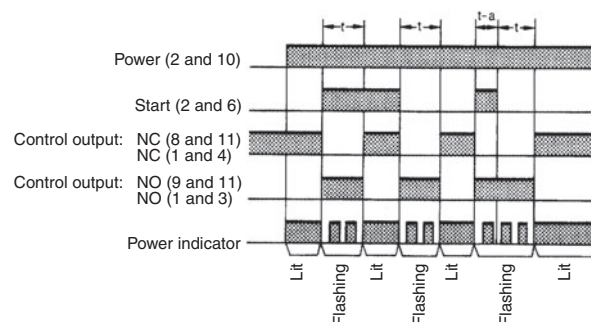


## 2. Signal Start/Signal Reset (in B Mode)

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



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

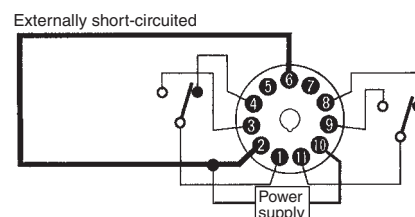
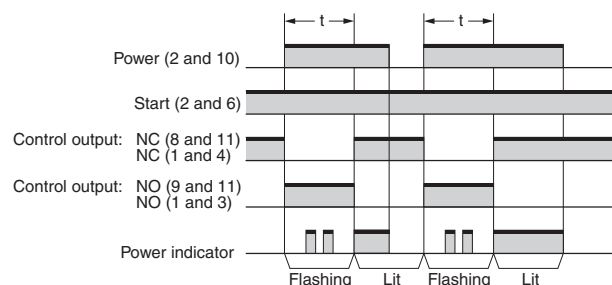


## C Mode: Signal ON/OFF-delay

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

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

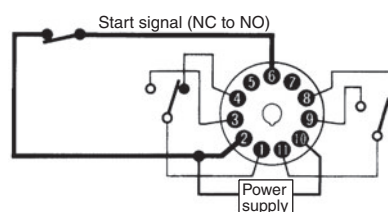
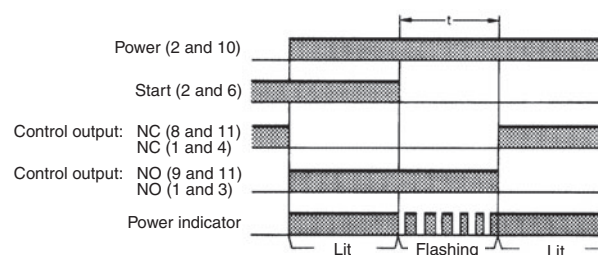
A set of these functions is useful for the operation of a machine for a specified period when power is ON.



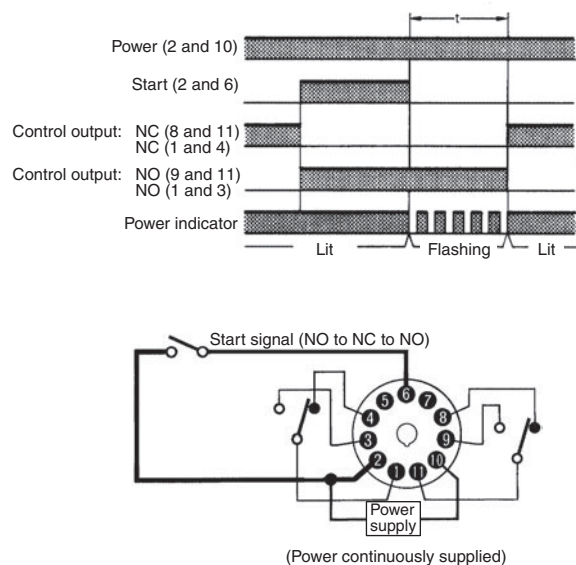
## D Mode: Signal OFF-delay

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

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



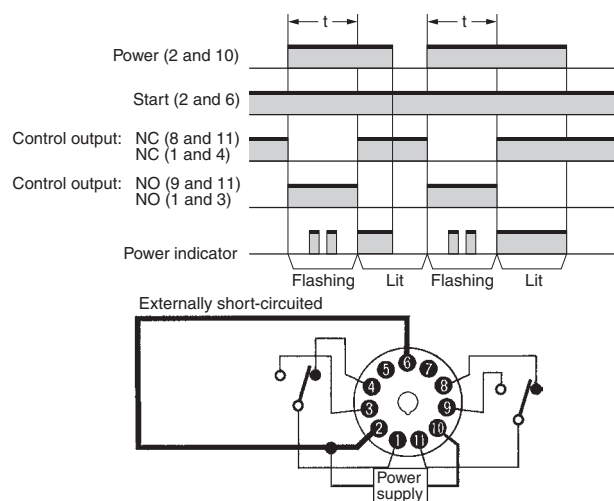
## 2. Signal Start/Instantaneous Operation/ Time-limit Reset



## E Mode: Interval

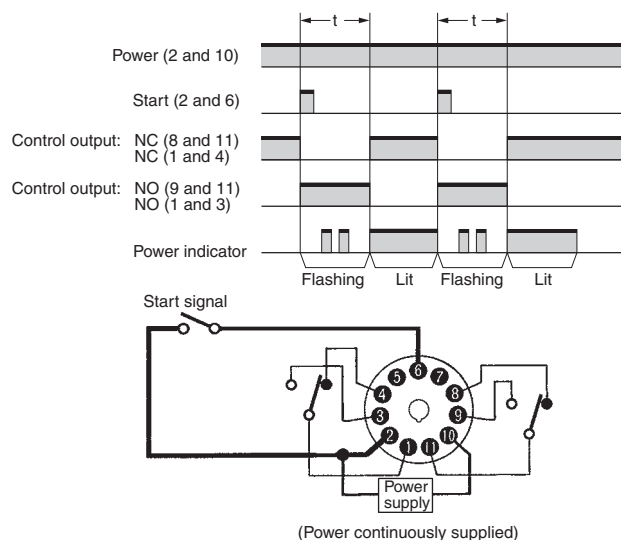
### 1. Power-ON Start/Instantaneous Operation/ Time-limit Reset

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.



# Safety Precautions (H3CR-A)

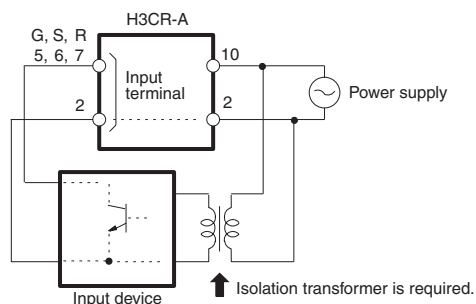
Refer to *Safety Precautions for All Timers*.

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

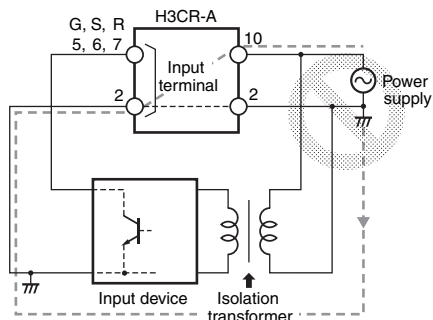
## Power Supplies

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

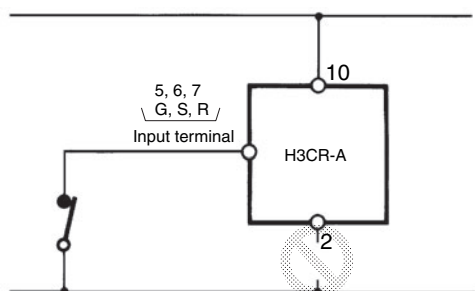
### Correct



### Incorrect



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



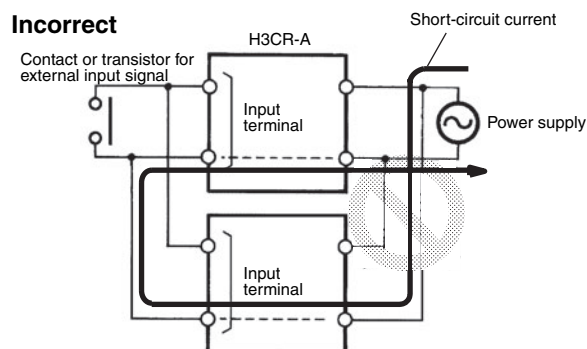
Make sure that the voltage is applied within the specified range, otherwise the internal elements of the Timer may be damaged.

## Input/Output

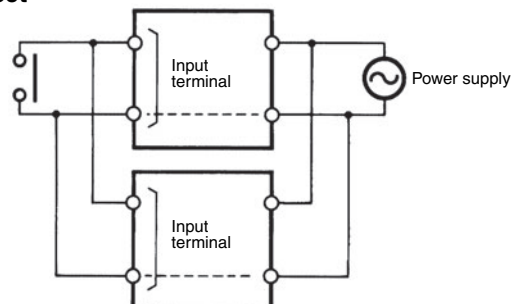
### Relationship between Input and Power Supply Circuits (except for H3CR-A8E)

The H3CR-A (except for H3CR-A8E) uses transformerless power supply. When connecting a relay or transistor as an external signal input device, pay attention to the following points to prevent short-circuiting due to a sneak current to the transformerless power supply. If a relay or transistor is connected to two or more Timers, the input terminals of those Timers must be wired properly so that they will not differ in phase, otherwise the terminals will be short-circuited to one another.

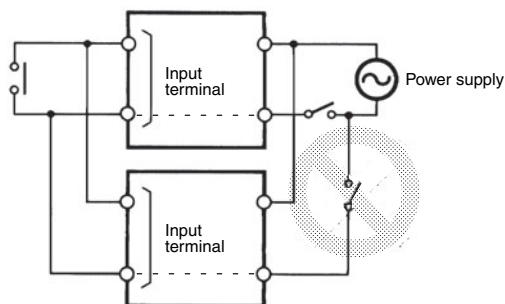
### Incorrect



### Correct



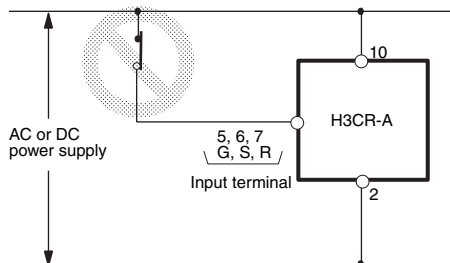
It is impossible to provide two independent power switches as shown below regardless of whether or not the Timers are different in phase.



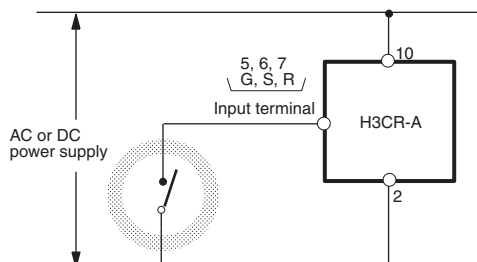
## Relationship between Input and Power Supply Circuits (H3CR-A□/-A□S)

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

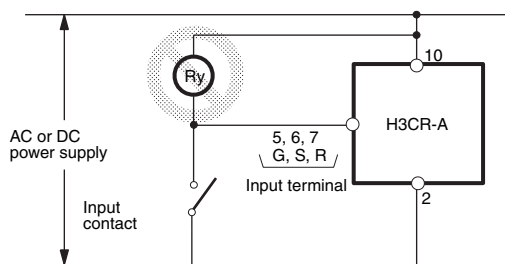
**Incorrect**



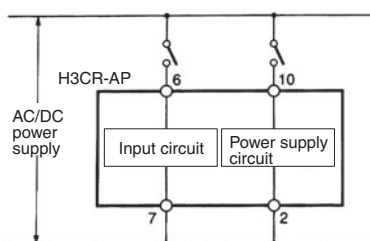
**Correct**



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.



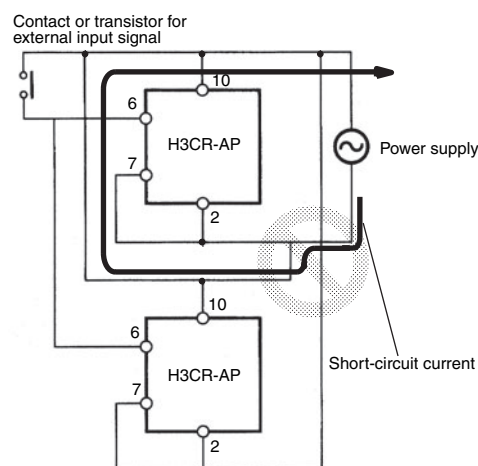
## Relationship between Input and Power Supply Circuits (H3CR-AP)



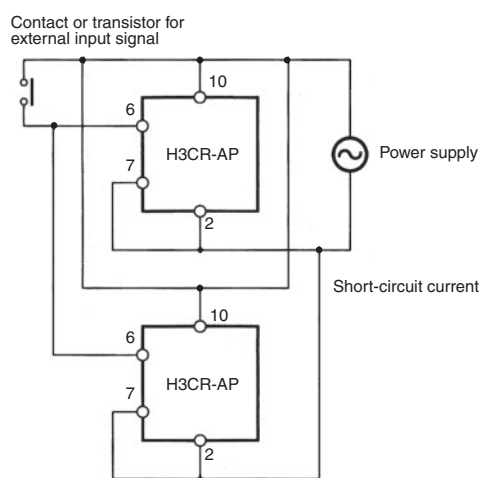
Since the input circuit and the power supply circuit are configured independently, the input circuit can be turned ON or OFF irrespective of the ON/OFF state of the power supply. It must be noted that a voltage equivalent to the power supply voltage is applied to the input circuit.

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.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

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

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- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

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2010.12

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Industrial Automation Company

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