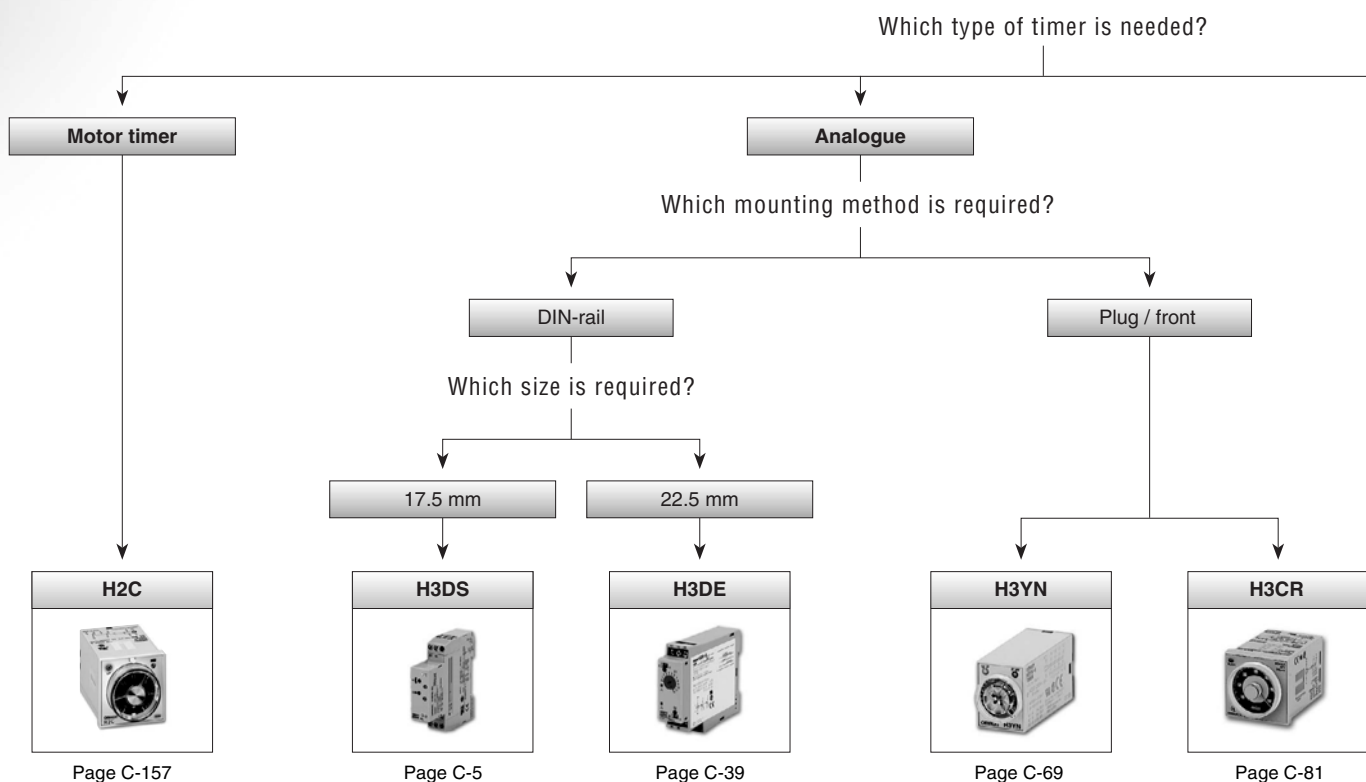


With over 70 years experience in timers, Omron knows exactly how to satisfy every timer function need. Our range includes motor timers, electronic timers, standard and digital timers, all available in a wide variety of housing and mounting methods to suit any customer requirement.

- An extensive range of motor timers, electronic timers and digital timers
- A wide range of timer function modes
- Conformance with all safety standards
- A wide range of housing varieties to suit every application
- Timer range from 0.001 seconds to 9999 hours
- Relay outputs, contact and transistor outputs



H5CX series – designed to your specifications

The H5CX series is a complete range of digital timers offering multiple time ranges and covering basically all timing functions, including real twin-timer function, memory function, an intuitive way of programming, and a two-colour, back-lit negative transmissive LCD display.

Every model features a crystal-clear display for excellent visibility in all lighting conditions, dust- and water-proof front casing (IP66) that guarantees top performance under adverse conditions, and extensive functionality in its class.

In addition, each unit in this series has the same “look and feel” with its uniform display design, the same front-panel rocker-keys for easy set-up and operation, and the same intuitive way of programming.



Timers

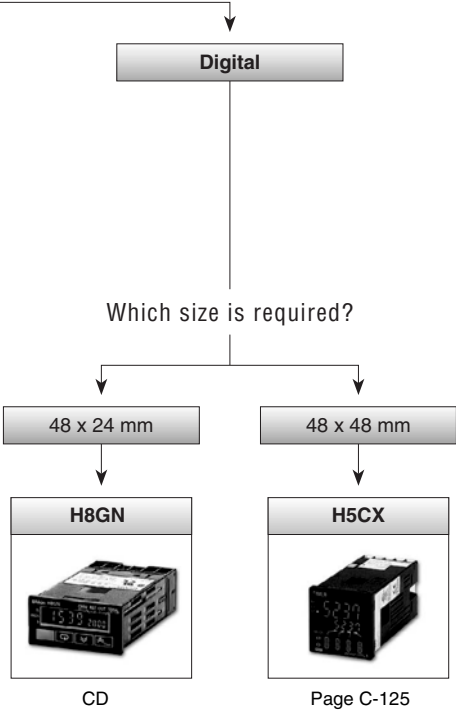


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Selection table		C-2
Analogue solid state timers	H3DS	C-5
	Common to all H3DS	CD
	H3DE	C-39
	Common to all H3DE	CD
	H3YN	C-69
	H3RN	CD
	H3CR	C-81
	Common to all H3CR	CD
	H3Y	CD
	H3JA	CD
Digital timers	H5CX	C-125
	H8GN	CD
	K3NP	CD
Motor timers	H2A	CD
	H2C	C-157
	H3AM	CD
PCB Timers	H3FA	CD
Technical Information	Timers	CD

Selection Table

Category			Analogue solid state timer										
Selection criteria													
	Model	H3DS-M	H3DS-S	H3DS-A	H3DS-F	H3DS-G	H3DS-X	H3DE-M	H3DE-S	H3DE-F	H3DE-G	H3DE-H	
	Mounting	DIN-rail											
	Size	17.5 mm						22.5 mm					
	Type	Multi-functional			Twin timer	Star delta	Two-wired	Multi-functional		Twin timer	Star delta	Power OFF delay	
Contact configuration	Time limit	■	■	■	■	■	■	■	■	■	■	■	
	Instantaneous							■	■				
	Programmable contacts							■	■				
	14 pins												
	11 pins												
	8 pins												
	Screw terminals	■	■	■	■	■	■	■	■	■	■	■	
	Screw-less clamp terminals	□	□	□	□	□	□						
Inputs	Screw-less clamp sockets												
	Voltage input	□	□	□				□	□				
Outputs	Transistor												
	Relay	■	■	■	■	■		■	■	■	■	■	
	SCR						■						
	Relay output type	SPDT	■	■	■	■			□	■	■	■ (2X)	■
		SPST-NO					■ (2X)						
		DPDT							□	■			
4PDT													
Features	Time range	Total time range	0.1 s to 120 h	1 s to 120 h	2 s to 120 h	0.1 s to 120 h	1 s to 120 h	0.1 s to 120 h	0.1 s to 120 h	0.1 s to 120 h	1 s to 120 h	0.1 s to 120 h	
		Number of sub ranges	7	7	7	6	2	7	8	8	8	2	2 (model dependent)
	Supply voltage		24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 12 VDC	24 to 230 VAC / DC or 12 VDC	24 to 230 VAC / DC	24 to 230 VAC / DC	100 to 120 VAC, 200 to 230 VAC, 24 VAC / DC, 48 VAC / DC
	Number of operating modes		8	4	1	2	1	1	8	4	1	1	1
Functions	ON-delay		■	■				■	■				
	Flicker OFF start		■			■		■		■			
	Flicker ON start		■	■		■		■	■	■			
	Signal ON / OFF-delay		■					■					
	Signal OFF-delay		■					■				■	
	Interval (signal or power start)		■	■				■	■				
	One-shot output (ON-delay)		■	■				■	■				
	ON-delay (fixed)				■						■		
	Independent ON / OFF time												
	Star-delta						■						
Re-marks	Transistor						■						
	Page	C-5						C-39					

Analogue solid state timer					Digital timer		Motor timer		
									
H3YN	H3CR-A	H3CR-F	H3CR-G	H3CR-H	H5CX	H8GN	H2A	H2C	H3AM
Socket/on panel									
21.5 mm	1/16 DIN					1/32 DIN	40 x 50 mm	1/16 DIN	1/4 DIN
Miniature	Multi-functional	Twin timer	Star delta	Power OFF-delay	Multi-functional	Preset counter / timer	Miniature high performance motor timer	Motor timer	
■	■	■	■	■	■	■	■	■	■
	■		■	■			□	■	■
					■	■			■
■									
	□	□	□	□	□			□	
■	□	□	□	□	□		■	□	
					□	■		□	■
□									
	□								■
	□				□				
■	□	■	■	■	□	■	■	■	■
	□			□	□	■	■	■	
			■ (2X)				□		
□	□	■		□					■
□									
0.1 s to 10 h (model dependent)	0.05 s to 300 h, 0.1 s to 600 h (model dependent)	0.05 s to 30 h or 1.2 s to 300 h (model dependent)	0.5 s to 120 s	0.05 s to 12 s, 1.2 s to 12 min	0.001 s to 9999 h (configurable)	0.000 s to 9999 h (configurable)	0.2 s to 24 h (frequency dependent)	0.2 s to 30 h	0.5 s to 12 h
2	9	14	4	4	10	9	13	15	15
24, 100 to 120, 200 to 230 VAC, 12, 23, 48, 100 to 110, 125 VDC	100 to 240 VAC, 100 to 125 VDC, 24 to 48 VAC, 12 to 48 VDC	100 to 240 VAC, 12 VDC, 24 VAC / DC, 48 to 125 VDC	100 to 120 VAC, 200 to 240 VAC	100 to 120 VAC, 200 to 240 VAC, 24 VAC / DC, 48 VDC, 100 to 125 VDC	100 to 240 VAC, 24 VAC, 12 to 24 VDC	24 VDC	100, 110, 200, 220 VAC (50Hz), 100 / 110, 200 / 220 VAC (60 Hz)	24, 48, 100, 110, 115, 120, 200, 220, 240 VAC	100 to 240 VAC
4	6 (model dependent)		2	1	12	6	1	2	2
■	□				■	■	■	■	■
■	□	■			■	■			
■	□	■			■				
	□			■	■				
	□				■	■		■	■
■	□				■	■			
	□				■				
					■	■			
	□		■		■				
	□				■				
C-69	C-81				C-125	CD	CD	C-157	CD

☒ Standard
 ☐ Available
 ☐ No / not available

LEADING IN SERVICE

Focussed, progressive, distinctive. Be assured, choose Omron

At Omron we set high standards for ourselves. Our products are known all over the world for their unrivalled quality. But we offer more than just excellent quality. In an environment that places ever greater demands with regard to service, quality and costeffectiveness, other things are important too. Providing a top-quality service is what we do every day, including extra service as standard. This helps to ensure that we can provide tailor-made solutions for applications more effectively and more quickly.

More and more companies are choosing Omron as they seek to work in a partnership that is based on reliability and certainty.

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International standards and approvals

Our products carry all relevant international standards and approvals, including CCC (Chinese Compulsory Certification), which makes exporting your system much easier.

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- Maximum flexibility
- Confidence



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The majority of standard Omron products are provided in digital EPLAN format, which means that a few clicks of your mouse are all that is needed to design the right product into your switching panel.

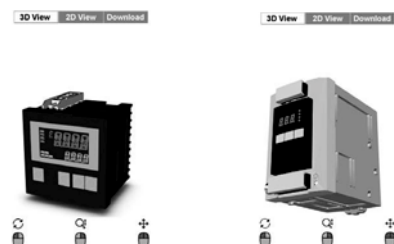
For more information please visit: <http://omron-industrial.com/en/eplan/>

- Very easy to use
- Always the right product
- Reduced engineering time

Downloadable 2-D and 3-D CAD drawings

Designers of switching panels and machines can download clear 2-D and 3-D CAD drawings for all current products from <http://omron-industrial.com/en/2D3D>, which can easily be incorporated into your design.

- Large number of formats supported for greater flexibility
- Readily available
- Convenience that saves you time



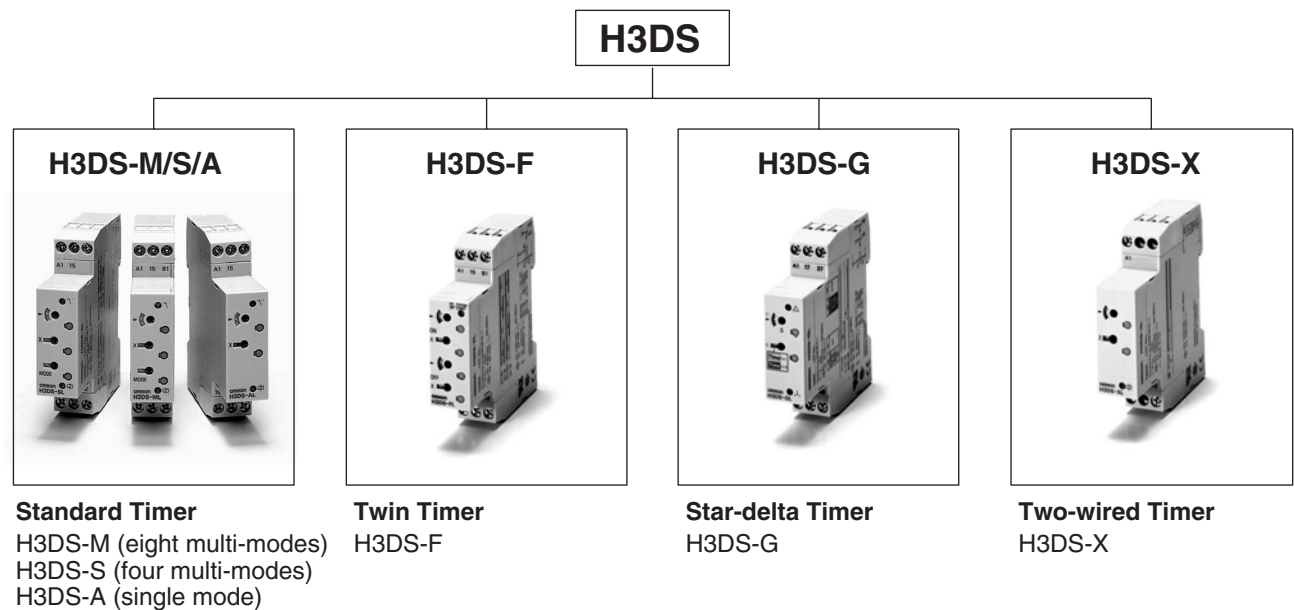
Solid-state Timer

H3DS

DIN-rail Mounted, Standard 17.5-mm Width Timer Range

- A wide AC/DC power supply range (24 to 230 VAC/ 24 to 48 VDC) reduces the number of timer models kept in stock. (24 to 230 VAC/VDC with H3DS-XL□)
- Smart Dial/Selector-locking Mechanism: Prevents the dials and selectors on the Timer's front panel from being inadvertently operated or being operated without authorization. The lock can only be unlocked and locked with an optional pen-type Lock Key.
- Screw-Less Clamp type available. (H3DS-□LC)
- Sticker provided for easy timer identification and management.
- Terminal clamp left open when delivered (screw terminal type).
- Finger protection terminal block to meet VDE0106/P100.
- Enables easy sequence checks through instantaneous outputs for a zero set value at any time range.
- Incorporates environment-friendly, cadmium-free contacts.
- Conforms to EN61812-1 and IEC60664-1 4 kV/2 for Low Voltage, and EMC Directives.

■ Broad Line-up of H3DS Series



Contents

Solid-state Timer	
H3DS-M/-S/-A.....	C-7
H3DS-F.....	C-17
H3DS-G.....	C-25
H3DS-X	C-33

Solid-state Multi-functional Timer

H3DS-M/-S/-A

- Eight operating modes (H3DS-M) and four operating modes (H3DS-S) cover a wide range of applications.
- A wide time setting range of 0.10 s to 120 h.
- Two LEDs indicate power and relay status respectively.



Model Number Structure

Model Number Legend

H3DS - L
 1 2 3

1. M: Multi-function type
 S: Standard type
 A: Single-function type
2. L: Smart lock mechanism
3. None: Screw terminal type
 C: Screw-Less Clamp type

Ordering Information

List of Models

Supply voltage	Control output	Input type	Operating mode (see note)	Model	
				Screw terminal type	Screw-Less Clamp type
24 to 230 VAC (50/60Hz)/ 24 to 48 VDC	Contact output: SPDT (time-limit output SP-DT)	Voltage input	Eight multi-modes: A, B, B2, C, D, E, G, J	H3DS-ML	H3DS-MLC
		No-input available	Four multi-modes: A, B2, E, J	H3DS-SL	H3DS-SLC
			Single mode: A	H3DS-AL	H3DS-ALC

Note: 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 |

Accessories (Order Separately)

Lock Key		Y92S-38
Mounting DIN-rail	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		PEP-S

Specifications

■ General

Item	H3DS-ML□	H3DS-SL□	H3DS-AL□
Operating mode	A: ON-delay (Signal or Power) B: Flicker OFF start (Signal or Power) B2: Flicker ON start (Signal or Power) C: Signal ON/OFF-delay D: Signal OFF-delay E: Interval (Signal or Power) G: Signal ON/OFF-delay J: One-shot (Signal or Power)	A: ON-delay B2: Flicker ON start E: Interval J: One-shot	A: ON-delay (fixed)
Input type	Voltage input	---	
Output type	Relay: SPDT		
External connections	Screw terminal, Screw-Less Clamp		
Terminal block	Screw terminal type: Clamps two 2.5-mm ² max. bar terminals without sleeves. Screw-Less Clamp type: Clamps two 1.5-mm ² max. bar terminals without sleeves.		
Terminal screw tightening torque	0.98 N·m max.		
Mounting method	DIN-rail mounting (see note)		
Attachment	Nameplate label		
Approved standards	UL508, CSA C22.2 No.14 Conforms to EN61812-1, IEC60664-1 4 kV/2, VDE0106/P100 Output category according to IEC60947-5-1 (AC-13; 250 V 1 A/AC-14; 250 V 1 A/AC-15; 250 V 1 A/DC-13; 30 V 0.1 A/DC-14; 30 V 0.05 A)		

Note: Can be mounted to 35-mm DIN-rail with a plate thickness of 1 to 2.5 mm.

■ Time Ranges

Time scale display	Time range
0.1 s	0.1 to 1.2 s
1 s	1 to 12 s
0.1 m	0.1 to 1.2 min
1 m	1 to 12 min
0.1 h	0.1 to 1.2 h
1 h	1 to 12 h
10 h	10 to 120 h

Note: When the time setting dial is set to "0" for any time scale, the output will operate instantaneously.

■ Ratings

Rated supply voltage (see notes 1 and 2)	24 to 230 VAC (50/60 Hz)/24 to 48 VDC
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-off time: 0.1 s
Reset voltage	2.4 VAC/DC max.
Power consumption (see note 3)	AC: 32 VA max./3.0 W max. (typical: 30 VA/2.7 W) at 230 VAC 14 VA max./2.2 W max. (typical: 13 VA/2.1 W) at 100 to 120 VAC DC: 0.7 W max. (typical: 0.6 W) at 24 VDC 1.4 W max. (typical: 1.3 W) at 48 VDC
Voltage input	Max. permissible capacitance between inputs lines (terminals B1 and A2): 2,000 pF Load connectable in parallel with inputs (terminals B1 and A1). H-level: 20.4 to 253 VAC/20.4 to 52.8 VDC L-level: 0 to 2.4 VAC/DC
Control output	Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$) 5 A at 30 VDC with resistive load ($\cos\phi = 1$)
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%

Note: 1. DC ripple rate: 20% max.

2. Since an inrush current of 0.5 A will occur when using the power supply voltage at 24 VDC, pay careful attention when turning on or off the power supply to the Timer with a solid-state output such as a sensor.
3. The power consumption is for mode A after the Timer counts the time-up time and for the AC input at 50 Hz. The power consumption of the H3DS-ML includes the input circuit with the B1 and A1 terminals short-circuited.

■ Characteristics

Accuracy of operating time	±1% max. of FS (±1% ±10 ms max. at 1.2-s range)																															
Setting error	±10% ±50 ms max. of FS																															
Signal input time	50 ms min.																															
Influence of voltage	±0.7% max. of FS (±0.7% ±10 ms max. at 1.2-s range)																															
Influence of temperature	±5% max. of FS (±5%±10 ms max. at 1.2-s range)																															
Insulation resistance	100 MΩ min. at 500 VDC																															
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC for 1 min. Between control output terminals and operating circuit: 2,000 VAC for 1 min. Between contacts not located next to each other: 1,000 VAC for 1 min.																															
Vibration resistance	Malfunction: 0.5-mm single amplitude at 10 to 55 Hz Destruction: 0.75-mm single amplitude at 10 to 55 Hz																															
Shock resistance	Malfunction: 100 m/s² 3 times each in 6 directions Destruction: 1,000 m/s² 3 times each in 6 directions																															
Impulse withstand voltage	3 kV (between power terminals) 4.5 kV (between current-carrying metal parts and exposed non-current-carrying metal parts)																															
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±1.5 kV																															
Static immunity	Malfunction: 4 kV Destruction: 8 kV																															
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h) (see note)																															
EMC	<table><tr><td>(EMI)</td><td>EN61812-1</td><td></td></tr><tr><td>Emission Enclosure:</td><td>EN55011 Group 1 class B</td><td></td></tr><tr><td>Emission AC Mains:</td><td>EN55011 Group 1 class B</td><td></td></tr><tr><td>Harmonic Current:</td><td>EN61000-3-2</td><td></td></tr><tr><td>Voltage Fluctuation and Flickering:</td><td>EN61000-3-3</td><td></td></tr><tr><td>(EMS)</td><td>EN61812-1</td><td></td></tr><tr><td>Immunity ESD:</td><td>EN61000-4-2:</td><td>6 kV contact discharge (level 3) 8 kV air discharge (level 3)</td></tr><tr><td>Immunity RF-interference from AM Radio Waves:</td><td>EN61000-4-3:</td><td>10 V/m (80 MHz to 1 GHz) (level 3)</td></tr><tr><td>Immunity Burst:</td><td>EN61000-4-4:</td><td>2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3)</td></tr><tr><td>Immunity Surge:</td><td>EN61000-4-5:</td><td>2 kV common mode (level 3) 1 kV differential mode (level 3)</td></tr></table>		(EMI)	EN61812-1		Emission Enclosure:	EN55011 Group 1 class B		Emission AC Mains:	EN55011 Group 1 class B		Harmonic Current:	EN61000-3-2		Voltage Fluctuation and Flickering:	EN61000-3-3		(EMS)	EN61812-1		Immunity ESD:	EN61000-4-2:	6 kV contact discharge (level 3) 8 kV air discharge (level 3)	Immunity RF-interference from AM Radio Waves:	EN61000-4-3:	10 V/m (80 MHz to 1 GHz) (level 3)	Immunity Burst:	EN61000-4-4:	2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3)	Immunity Surge:	EN61000-4-5:	2 kV common mode (level 3) 1 kV differential mode (level 3)
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Immunity Surge:	EN61000-4-5:	2 kV common mode (level 3) 1 kV differential mode (level 3)																														
Case color	Light gray (5Y7/1)																															
Degree of protection	IP30 (Terminal block: IP20)																															
Weight	Approx. 70 g																															

Note: For reference:

A maximum current of 0.15 A can be switched at 125 VDC (cosφ=1).

A maximum current of 0.1 A can be switched if L/R is 7 ms.

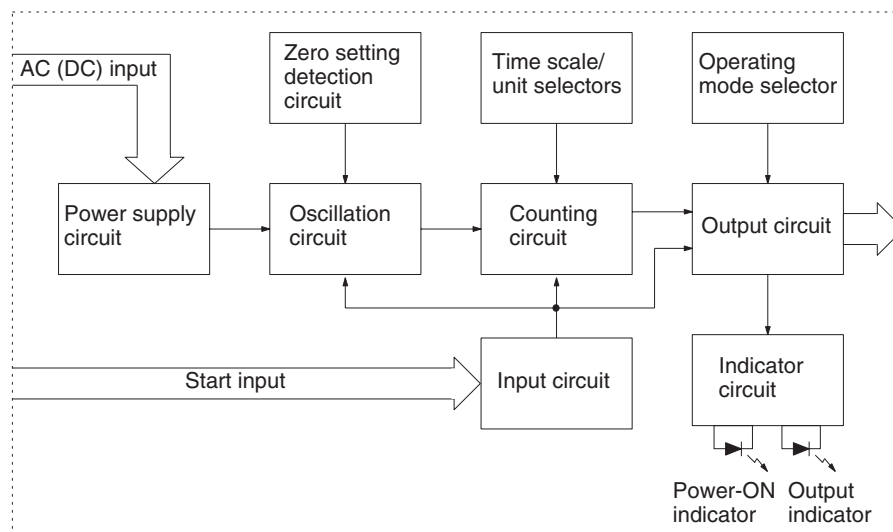
In both cases, a life of 100,000 operations can be expected.

The minimum applicable load is 10 mA at 5 VDC (failure level: P).

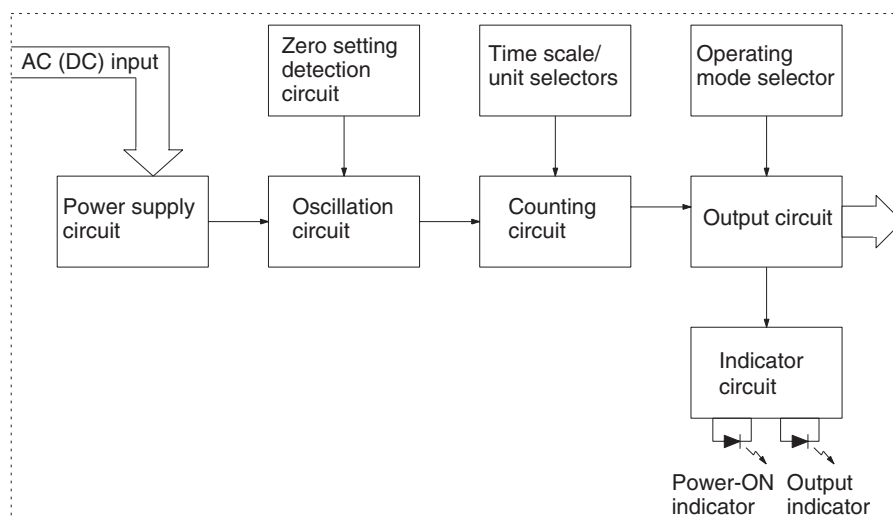
Connections

■ Block Diagram

H3DS-ML□



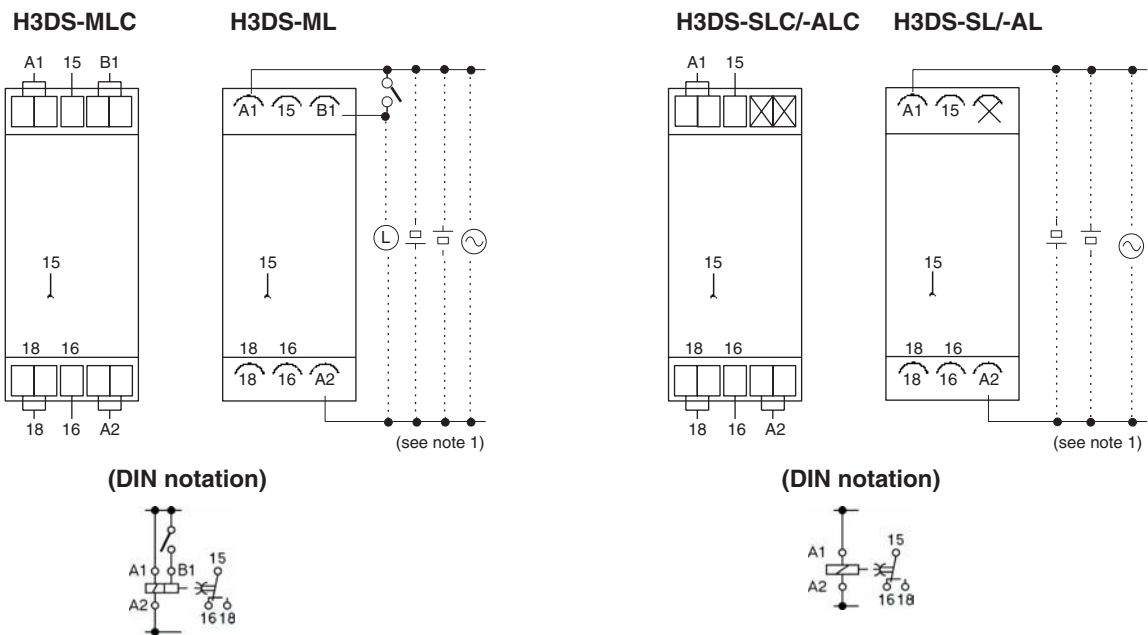
H3DS-SL□/-AL□



■ I/O Functions

Item		H3DS-ML□	H3DS-SL□/-AL□
Input	Start	Starts operation.	No input is available.
Output	Control output	Outputs are turned ON according to designated output mode when preset value is reached.	Outputs are turned ON according to designated output mode when preset value is reached.

■ Terminal Arrangement



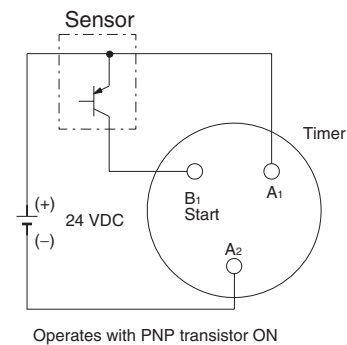
Note: 1. DC supply voltage does not require the designation of polarity.

2. The contact symbol for the H3DS is indicated with  because it offers multiple operating modes and is different from the delayed contact for conventional timers.

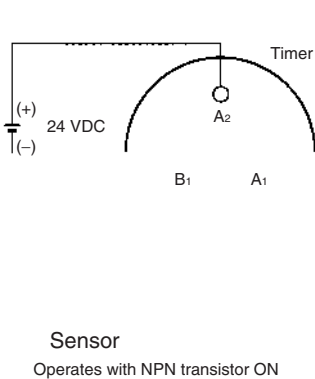
■ Input Connections

The inputs of the H3DS-ML are voltage (voltage imposition or open) inputs.

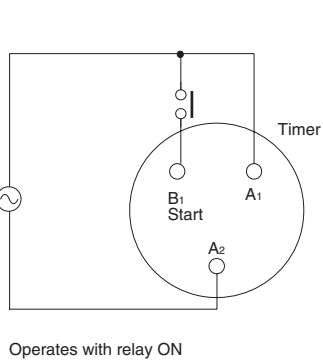
No-contact Input
(Connection to PNP output sensor.)



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



Contact Input



Voltage Input Signal Levels

No-contact input	1. Transistor ON Residual voltage: 1 V max. (Voltage between terminals B ₁ and A ₂ must be more than the rated "H-level" voltage (20.4 VDC min.).)
	2. Transistor OFF Leakage current: 0.01 mA max. (Voltage between terminals B ₁ and A ₂ must be less than the rated "L-level" voltage (2.4 VDC max.).)
Contact input	Use contacts that can adequately switch 0.1 mA at each voltage to be imposed. (When the contacts are ON or OFF, voltage between terminals B ₁ and A ₂ must be within the following ranges: When contacts are ON: 20.4 to 253 VAC/20.4 to 52.8 VDC When contacts are OFF: 0 to 2.4 VAC/DC

Operation

■ Basic Operation

Setting of Selector

The selectors can be turned clockwise and counterclockwise to select the desired time scale, 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 (except for H3DS-AL)

The H3DS-ML/-SL can be set to any one of the operating modes A to J. Turn the operating mode selector with a screwdriver until the desired operating mode appears in the operating mode display window.

H3DS-ML (8 modes): A, B, B2, C, D, E, G, J
(In order of appearance)

H3DS-SL (4 modes): A, E, B2, J, E, E, J, J
(In order of appearance)

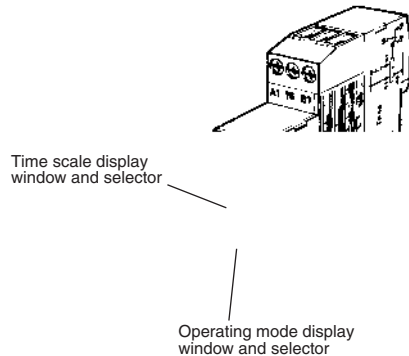
Note: Letters that appear more than once indicate exactly the same operating mode.

Selection of Time Scale

The time scale is selected by turning the time scale selector. The time scales will appear in the following order in the time scale display window on the left of the selector:

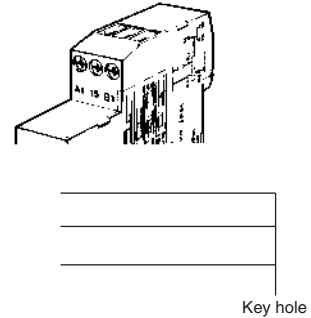
1 s, 0.1 s, 1 h, 0.1 h, 10 h, 1 h, 1 m, 0.1 m.

Note: The time scale "1h" appears twice. Both instances indicate exactly the same time scale.



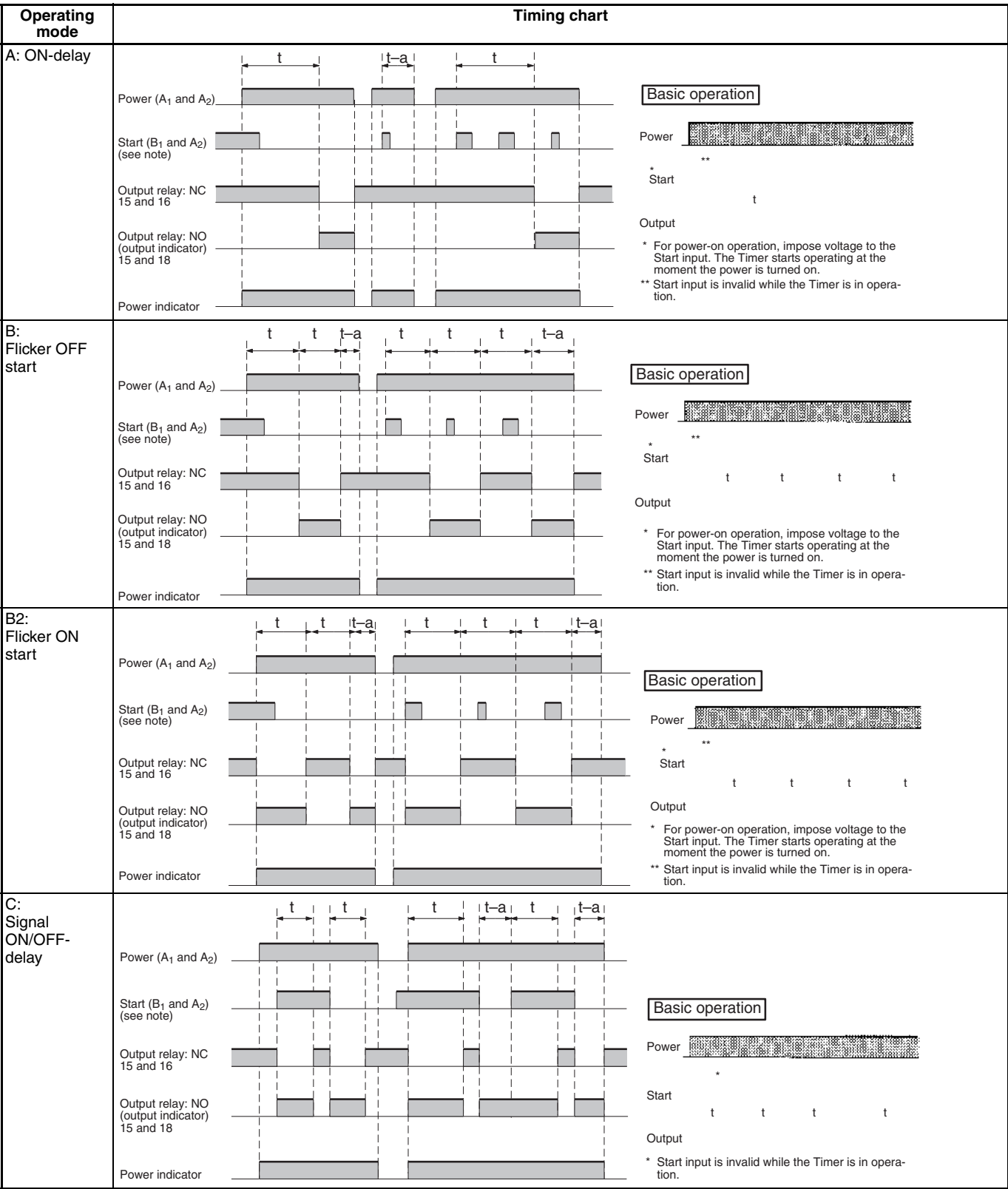
Locking/Unlocking of Selectors and Time Setting Dial

The time setting dial, time scale selector, and operating mode selector can be locked using the Y92S-38 Lock Key, a special pen type tool that is sold separately. To lock the dial or selectors, insert the Lock Key in the keyhole to the lower right of the dial or selector and turn it clockwise until the dial or selector is completely covered with the red cover. To unlock, turn the Lock Key in the opposite direction.

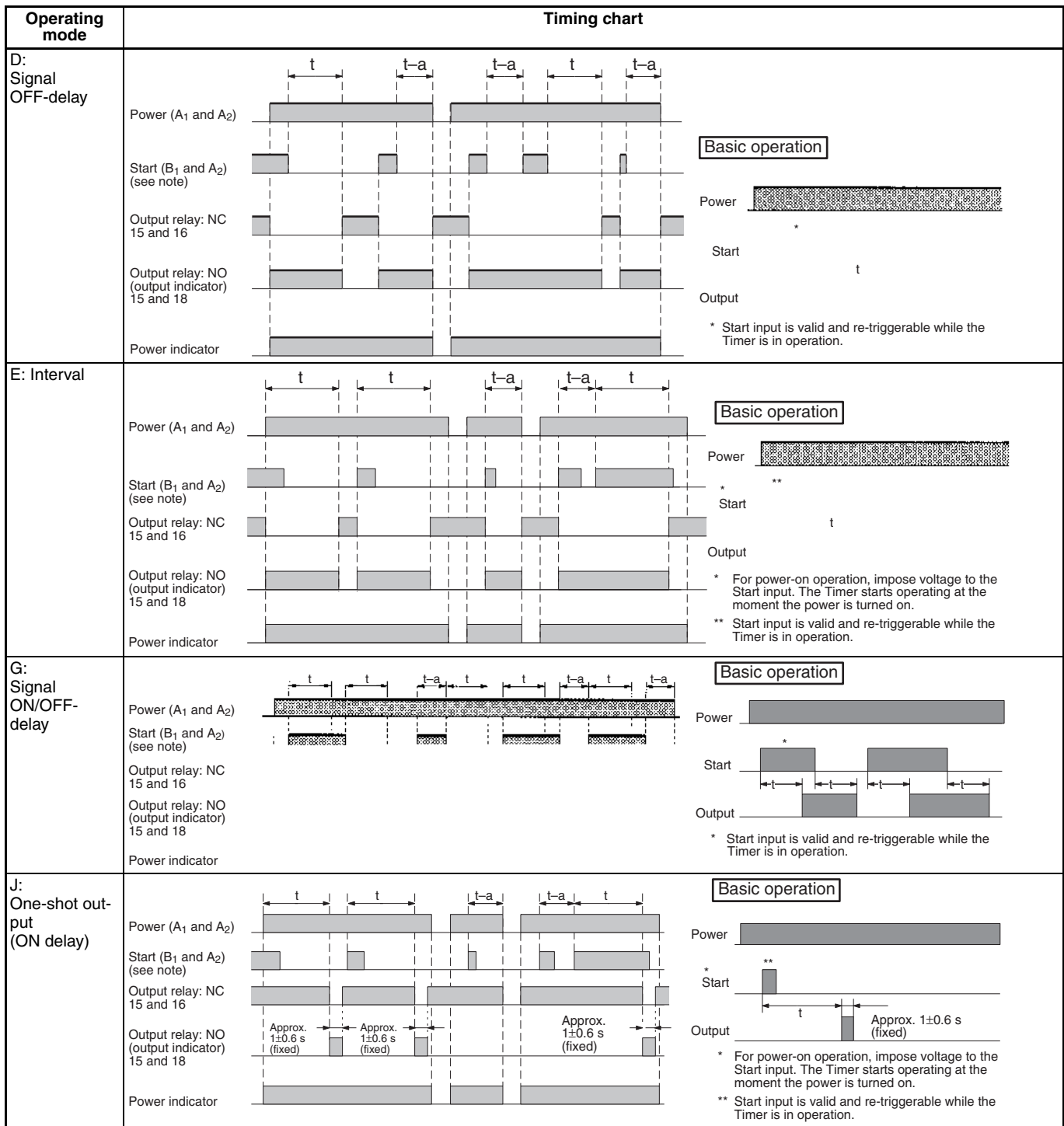


■ Timing Chart

- Note:** 1. The minimum power reset time is 0.1 s and the minimum signal input time is 0.05 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.
3. There is no start input for H3DS-SL□/-AL□ models. Operation starts at power-on.



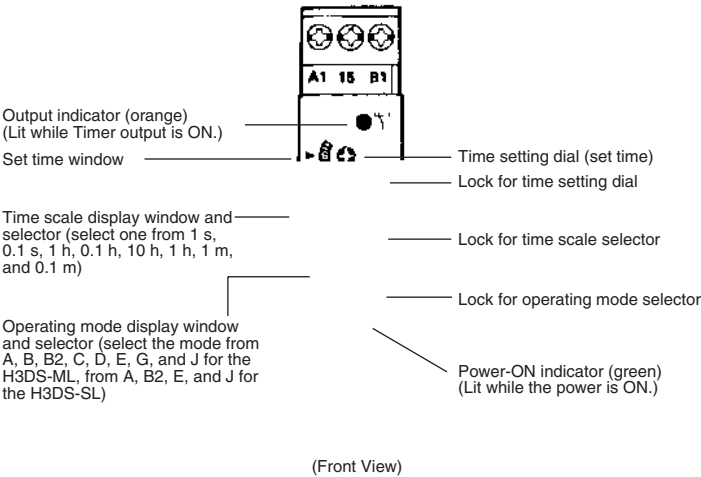
Note: The start input of the H3DS-ML□ model is activated by applying a voltage to B1 and A2 terminals.
The voltage can be applied by turning on the contact between B1 and A1 (Refer to *Terminal Arrangement*).



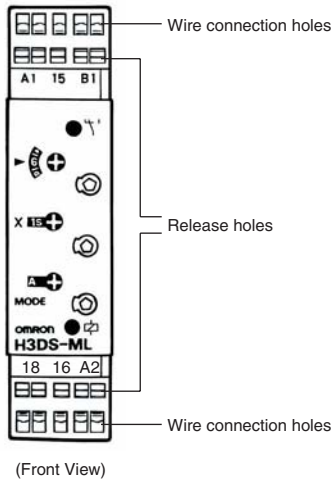
Note: The start input of the H3DS-ML□ model is activated by applying a voltage to B1 and A2 terminals.
The voltage can be applied by turning on the contact between B1 and A1 (Refer to *Terminal Arrangement*).

Nomenclature

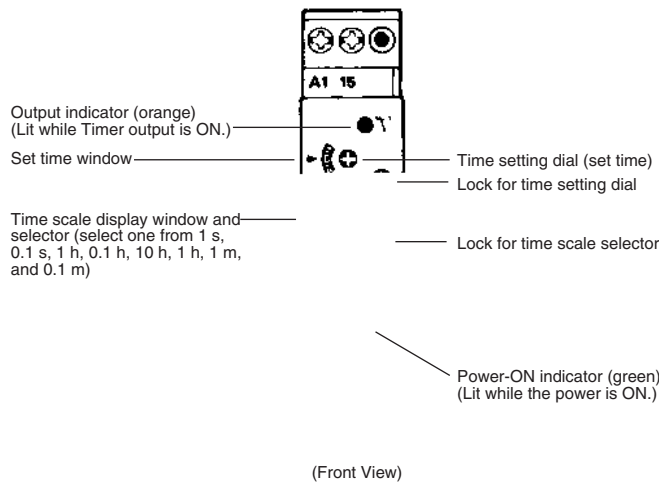
H3DS-ML□/-SL□



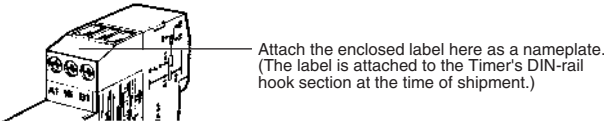
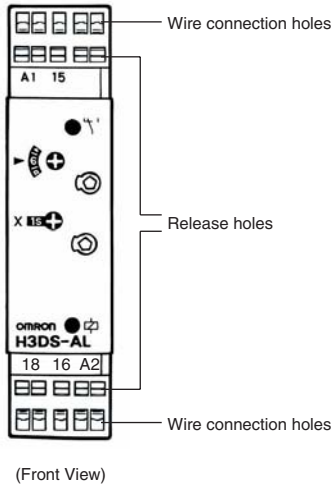
H3DS-MLC/-SLC



H3DS-AL□



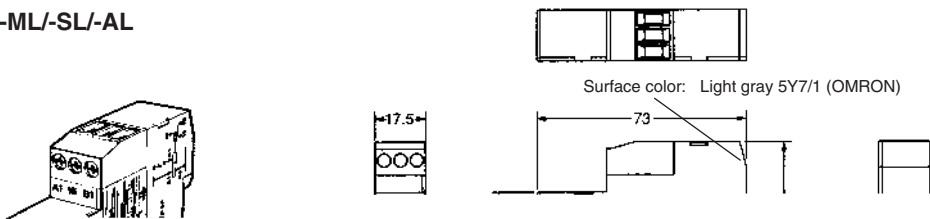
H3DS-ALC



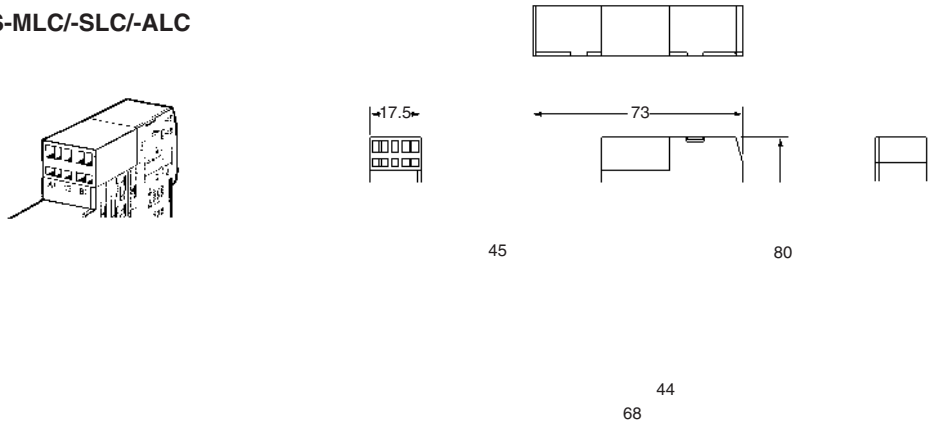
Dimensions

Note: All units are in millimeters unless otherwise indicated.

H3DS-ML/-SL/-AL



H3DS-MLC/-SLC/-ALC



Solid-state Twin Timer

H3DS-F

- Operates in flicker-OFF or flicker-ON start mode with one Unit.
- Independent ON- and OFF-time settings.
Combinations of long ON- or OFF-time and short OFF- or ON-time setting are possible.
- Long time range from 0.1 s to 12 h for both ON and OFF time settings.



Model Number Structure

Model Number Legend

H3DS -F L ☐

1 2 3

- 1. F: Twin timers
- 2. L: Smart lock mechanism
- 3. None: Screw terminal type
C: Screw-Less Clamp type

Ordering Information

List of Models

Operating mode	Supply voltage	Model	
		Screw terminal type	Screw-Less Clamp type
Flicker-OFF/Flicker-ON start	24 to 230 VAC (50/60 Hz)/24 to 48 VDC	H3DS-FL	H3DS-FLC

Accessories (Order Separately)

Lock Key		Y92S-38
Mounting DIN-rail	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		PEP-S

Specifications

■ General

Item	H3DS-F
Operating mode	Flicker-OFF/Flicker-ON start
Output type	Relay: SPDT
External connections	Screw terminal, Screw-Less Clamp
Terminal block	Screw terminal type: Clamps two 2.5-mm ² max. bar terminals without sleeves. Screw-Less Clamp type: Clamps two 1.5-mm ² max. bar terminals without sleeves.
Terminal screw tightening torque	0.98 N·m max.
Mounting method	DIN-rail mounting (see note)
Attachment	Nameplate label
Approved standards	UL508, CSA C22.2 No.14 Conforms to EN61812-1, IEC60664-1 4 kV/2, VDE0106/P 100 Output category according to IEC60947-5-1 (AC-13; 250 V 5A/AC-15; 250 V 1 A/DC-13; 30 V 0.1 A)

Note: Can be mounted to 35-mm DIN-rail with a plate thickness of 1 to 2.5 mm.

■ Time Ranges

Time scale display	Time range
0.1 s	0.1 to 1.2 s
1 s	1 to 12 s
0.1 m	0.1 to 1.2 min
1 m	1 to 12 min
0.1 h	0.1 to 1.2 h
1 h	1 to 12 h

Note: When the time setting dial is set to "0" for any time scale, the output will operate instantaneously.

■ Ratings

Rated supply voltage (See note.)	24 to 230 VAC (50/60 Hz)/24 to 48 VDC
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-off time: 0.1 s
Reset voltage	2.4 VAC/DC max.
Power consumption	AC: 33 VA max./2.2 W max. (typical: 31 VA/2.0 W) at 230 VAC 11 VA max./1.9 W max. (typical: 9.7 VA/1.7 W) at 100 to 120 VAC DC: 0.7 W max. (typical: 0.6 W) at 24 VDC 1.4 W max. (typical: 1.2 W) at 48 VDC
Voltage input	Max. permissible capacitance between inputs lines (terminals B1 and A2): 2,000 pF Load connectable in parallel with inputs (terminals B1 and A1). H-level: 20.4 to 253 VAC/20.4 to 52.8 VDC L-level: 0 to 2.4 VAC/DC
Control output	Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$) 5 A at 30 VDC with resistive load ($\cos\phi = 1$)
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%

Note: DC ripple rate: 20% max.

■ Characteristics

Accuracy of operating time	±1% max. of FS (±1% ±10 ms max. at 1.2-s range)		
Setting error	±10% ± 50 ms max. of FS		
Influence of voltage	±0.5% max. of FS (±0.5% ±10 ms max. at 1.2-s range)		
Influence of temperature	±5% max. of FS (±5% ± 10 ms max. at 1.2-s range)		
Insulation resistance	100 MΩ min. at 500 VDC		
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC (50/60 Hz) for 1 min. Between control output terminals and operating circuit: 2,000 VAC (50/60 Hz) for 1 min. Between contacts not located next to each other: 1,000 VAC (50/60 Hz) for 1 min.		
Impulse withstand voltage	3 kV (between power supply terminals) 4.5 kV (between current-carrying metal parts and exposed non-current-carrying metal parts)		
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±1.5 kV		
Static immunity	Malfunction: 4 kV Destruction: 8 kV		
Vibration resistance	Malfunction: 0.5-mm single amplitude at 10 to 55 Hz Destruction: 0.75-mm single amplitude at 10 to 55 Hz		
Shock resistance	Malfunction: 200 m/s², 3 times each in 6 directions Destruction: 300 m/s², 3 times each in 6 directions		
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h) (see note)		
EMC	(EMI) Emission Enclosure: Emission AC Mains: Harmonic Current: Voltage Fluctuation and Flickering: (EMS) Immunity ESD: Immunity RF-interference from AM Radio Waves: Immunity Burst: Immunity Surge:	EN61812-1 EN55011 Group 1 class B EN55011 Group 1 class B EN61000-3-2 EN61000-3-3 EN61812-1 EN61000-4-2: EN61000-4-3: EN61000-4-4: EN61000-4-5:	6 kV contact discharge (level 3) 8 kV air discharge (level 3) 10 V/m (80 MHz to 1 GHz) (level 3) 2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3) 2 kV common mode (level 3) 1 kV differential mode (level 3)
Case color	Light gray (5Y7/1)		
Degree of protection	IP30 (IP20 for terminal block)		
Weight	Approx. 70 g		

Note: For reference:

A maximum current of 0.15 A can be switched at 125 VDC (cosφ=1).

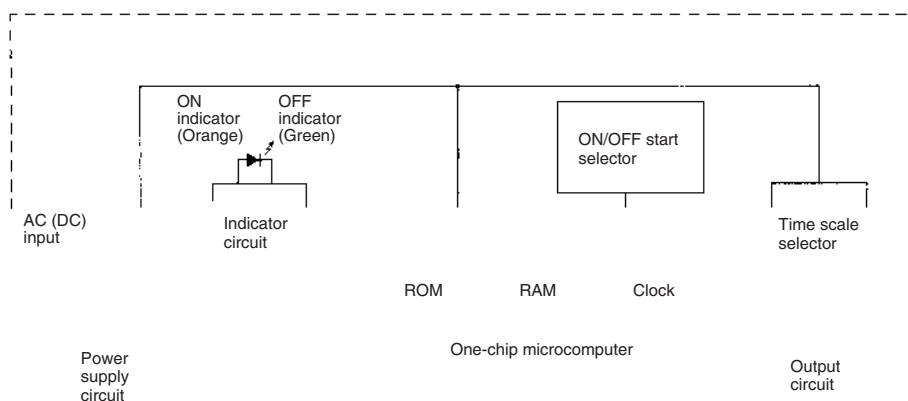
A maximum current of 0.1 A can be switched if L/R is 7 ms.

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

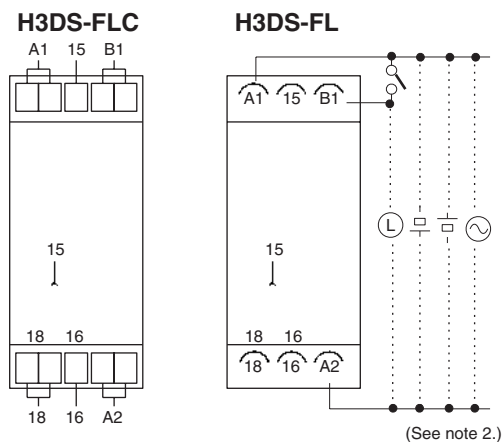
■ Block Diagram



■ I/O Function

Inputs		Flicker-ON start operation begins when inputs are turned ON.
Outputs	Control output	Outputs are turned ON/OFF according to the time set by the ON-and OFF-time setting dial.

■ Terminal Arrangement



- Note:** 1. If voltage is applied to terminal B1, or if terminals A1 and B1 are shorted, the operating mode is switched to flicker-ON start mode. If these terminals are disconnected, the mode switches to flicker-OFF start mode.
2. DC supply voltage does not require the designation of polarity.

Operation

Basic Operation

Setting of Selector

The selectors can be turned clockwise and counterclockwise to select the desired time scale, 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.

Settings for ON/OFF Start

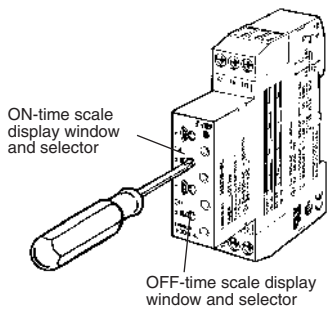
If voltage is applied to terminal B1, or if terminals A1 and B1 are shorted, the operating mode is switched to flicker-ON start mode. If these terminals are disconnected, the mode switches to flicker-OFF start mode. The operating mode will not change if the state of the applied voltage changes during timer operation.

Selection of Time Scale

The time scale is selected by turning the ON-time scale selector and OFF-time scale selector. The time scales will appear in the following order in each time scale display window on the left of the selector:

0.1 s, 1 h, 0.1 h, 1 m, 1 s, 0.1 h, 0.1 m, 1 s.

Note: The time scales “1 s” and “0.1 h” appear twice. Both instances indicate exactly the same time scale.

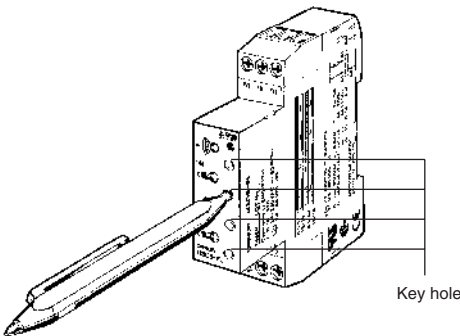


Time Setting

Use the ON/OFF-time setting dials to set the ON/OFF time.

Locking/Unlocking of Selectors and Time Setting Dial

The ON/OFF-time setting dials and time scale selectors can be locked using the Y92S-38 Lock Key, a special pen type tool that is sold separately. To lock the dials or selectors, insert the Lock Key in the keyhole to the lower right of the dial or selector and turn it clockwise until the dial or selector is completely covered with the red cover. To unlock, turn the Lock Key in the opposite direction.



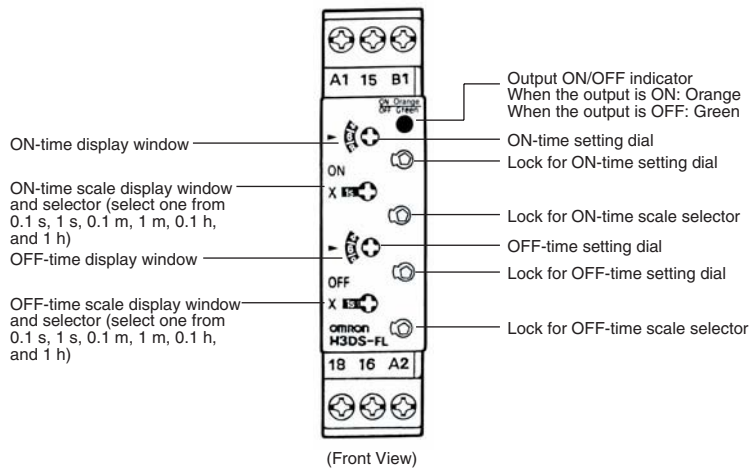
Timing Charts

Operating mode	Timing chart	
Flicker-OFF start (See note 1.)	Power (A₁ and A₂) ON OFF Output relay: NO 15 and 18 (ON indicator) ON OFF Output relay: NC 15 and 16 ON OFF OFF indicator ON OFF 0.1 s min. tON: ON set time tOFF: OFF set time	
Flicker-ON start (See note 1.)	Power (A₁ and A₂) ON OFF Signal (B₁ and A₂) ON OFF Output relay: NO 15 and 18 (ON indicator) ON OFF Output relay: NC 15 and 16 ON OFF OFF indicator ON OFF 0.1 s min. tON: ON set time tOFF: OFF set time	

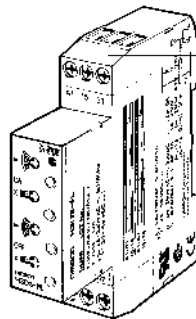
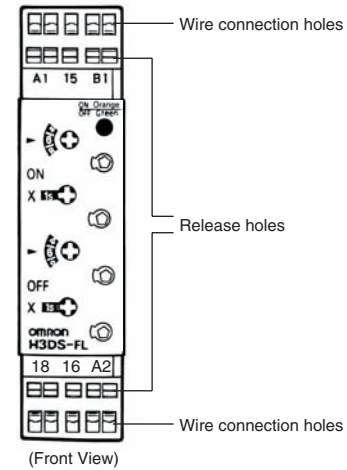
- Note:** 1. If voltage is applied to terminal B1, or if terminals A1 and B1 are shorted, the operating mode is switched to flicker-ON start mode. If these terminals are disconnected, the mode switches to flicker-OFF start mode.
2. The reset time requires a minimum of 0.1 s.
3. When power is supplied in flicker-ON start mode, the OFF indicator lights momentarily. This, however, has no effect on the performance of the Timer.

Nomenclature

H3DS-FL□



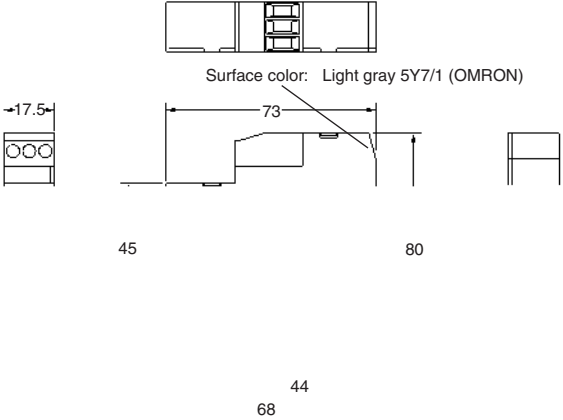
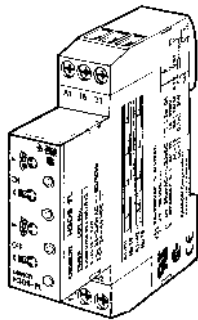
H3DS-FLC



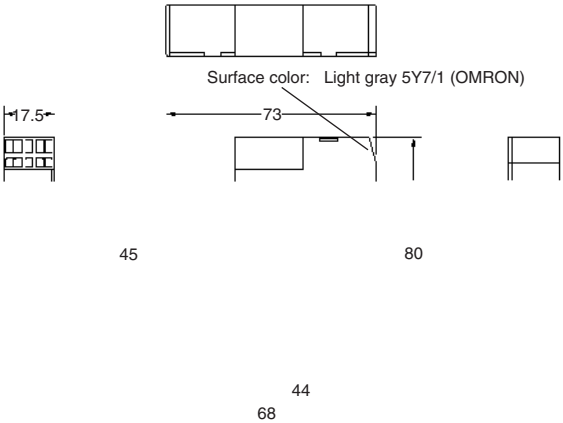
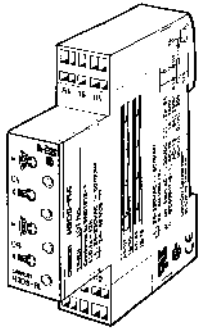
Attach the enclosed label here as a nameplate.
(The label is attached to the Timer's DIN-rail hook section at the time of shipment.)

Dimensions

H3DS-FL



H3DS-FLC



Solid-state Star-delta Timer

H3DS-G

- A wide star-time range (up to 120 seconds) and star-delta transfer time range (up to 1 second)



Model Number Structure

Model Number Legend

H3DS -G L □
1 2 3

- 1. G: Star-delta timer
- 2. L: Smart lock mechanism
- 3. None: Screw terminal type
C: Screw-Less Clamp type

Ordering Information

List of Models

Operating mode	Supply voltage	Model	
		Screw terminal type	Screw-Less Clamp type
Star-delta operation	24 to 230 VAC (50/60 Hz)/24 to 48 VDC	H3DS-GL	H3DS-GLC

Accessories (Order Separately)

Lock Key		Y92S-38
Mounting DIN-rail	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		PEP-S

Specifications

■ General

Item	H3DS-G
Operating mode	Star-delta operation
Operating/Reset method	Time-limit operation/Self-reset
External connections	Screw terminal, Screw-Less Clamp
Terminal block	Screw terminal type: Clamps two 2.5-mm ² max. bar terminals without sleeves. Screw-Less Clamp type: Clamps two 1.5-mm ² max. bar terminals without sleeves.
Terminal screw tightening torque	0.98 N·m max.
Output type	(Star operation circuit) Relay: SPST-NO (Delta operation circuit) Relay: SPST-NO
Mounting method	DIN-rail mounting (see note)
Attachment	Nameplate label
Approved standards	UL508, CSA C22.2 No.14 Conforms to EN61812-1, IEC60664-1 4 kV/2, VDE0106/P100 Output category according to IEC60947-5-1 (AC-13; 250 V 5A/AC-15; 250 V 1 A/DC-13; 30 V 0.1 A)

Note: Can be mounted to 35-mm DIN-rail with a plate thickness of 1 to 2.5 mm.

■ Time Ranges

Time scale	Star operation time ranges
x 1	1 to 12 s
x 10	10 to 120 s

Star-delta transfer time	Programmable at 0.05 s, 0.1 s, 0.5 s, or 1 s
--------------------------	--

■ Ratings

Rated supply voltage (see note)	24 to 230 VAC (50/60 Hz)/24 to 48 VDC
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-off time: 0.5 s
Reset voltage	2.4 VAC/DC max.
Power consumption	AC: 21 VA max./1.7 W max. (typical: 20 VA/1.6 W) at 230 VAC 11 VA max./2.0 W max. (typical: 8.6 VA/1.5 W) at 100 to 120 VAC DC: 1.3 W max. (typical: 1.2 W) at 24 VDC 0.7 W max. (typical: 0.6 W) at 48 VDC
Control output	Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$) 5 A at 30 VDC with resistive load ($\cos\phi = 1$)
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%

Note: DC ripple rate: 20% max.

■ Characteristics

Accuracy of operating time	±1% max. of FS
Setting error	±10% ± 50 ms max. of FS
Total tolerance of transfer time	± (25% FS + 5 ms) max.
Influence of voltage	±0.5% max. of FS
Influence of temperature	±5% max. of FS
Insulation resistance	100 MΩ min. at 500 VDC
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC (50/60 Hz) for 1 min. Between control output terminals and operating circuit: 2,000 VAC (50/60 Hz) for 1 min. Between contacts not located next to each other: 1,000 VAC (50/60 Hz) for 1 min.
Impulse withstand voltage	3 kV (between power supply terminals) 4.5 kV (between current-carrying metal parts and exposed non-current-carrying metal parts)
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±1.5 kV
Static immunity	Malfunction: 4 kV Destruction: 8 kV
Vibration resistance	Malfunction: 0.5-mm single amplitude at 10 to 55 Hz Destruction: 0.75-mm single amplitude at 10 to 55 Hz
Shock resistance	Malfunction: 200 m/s ² , 3 times each in 6 directions Destruction: 300 m/s ² , 3 times each in 6 directions
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h) (see note)
EMC	(EMI) Emission Enclosure: EN61812-1 Emission AC Mains: EN55011 Group 1 class B Harmonic Current: EN55011 Group 1 class B Voltage Fluctuation and Flickering: EN61000-3-2 (EMS) Immunity ESD: EN61000-3-3 EN61812-1 EN61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3) Immunity Surge: EN61000-4-5: 2 kV common mode (level 3) 1 kV differential mode (level 3)
Case color	Light gray (5Y7/1)
Degree of protection	IP30 (IP20 for terminal block)
Weight	Approx. 70 g

Note: For reference:

A maximum current of 0.15 A can be switched at 125 VDC (cosφ=1).

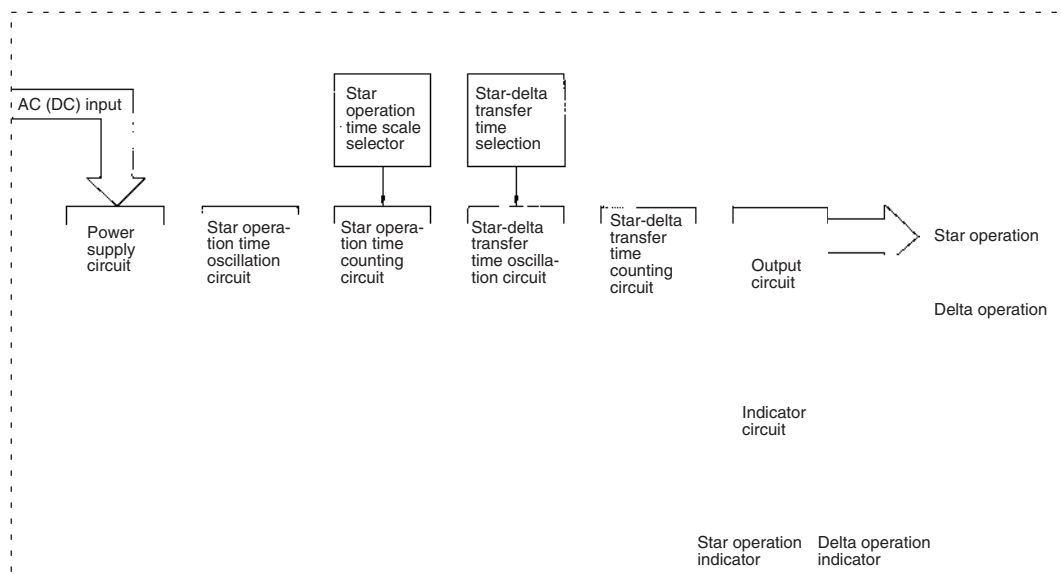
A maximum current of 0.1 A can be switched if L/R is 7 ms.

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

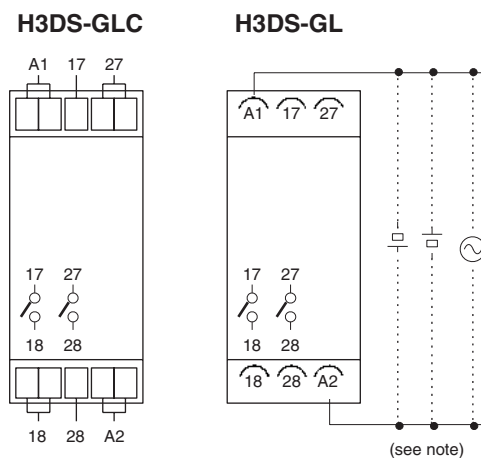
■ Block Diagram



■ I/O Functions

Inputs	---
Outputs	Control output
	Star output is turned OFF when the dial set value is reached and delta output is ON after the preset transfer time elapses

■ Terminal Arrangement



Note: DC supply voltage does not require the designation of polarity.

Operation

Basic Operation

Setting of Selector

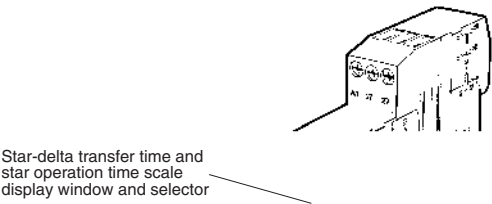
The selectors can be turned clockwise and counterclockwise to select the desired time scale, or operating mode.

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 Time Unit and Time Scale

The star-delta transfer time and star operation time scale are set with the same selector. The star-delta transfer time can be set to 0.05, 0.1, 0.5, or 1. The star operation time scale can be set to a multiplication factor of 1 or 10. If the star-delta transfer time is displayed in the display window in white letters, this means that the star operation time scale is "x10". Refer to the example below.

Star-delta transfer time	Star operation time scale
0.05 s	x1
0.1 s	
0.5 s	
1 s	
0.05 s	x10
0.1 s	
0.5 s	
1 s	

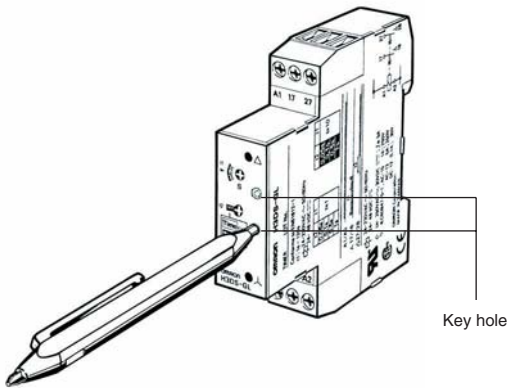


Time Setting

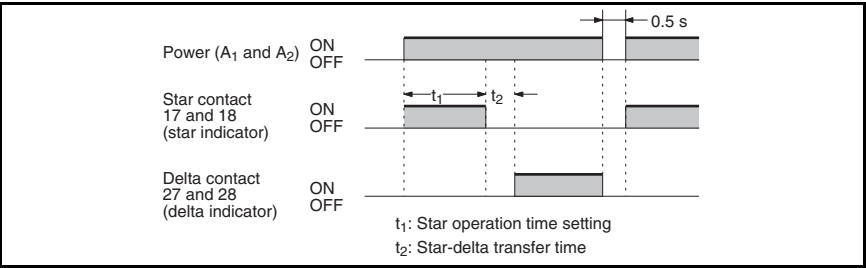
The star operation time of the Timer is set with the time setting dial.

Locking/Unlocking of Selectors and Time Setting Dial

The time setting dial and time scale selector can be locked using the Y92S-38 Lock Key, a special pen type tool that is sold separately. To lock the dial or selectors, insert the Lock Key in the keyhole to the lower right of the dial or selector and turn it clockwise until the dial or selector is completely covered with the red cover. To unlock, turn the Lock Key in the opposite direction.



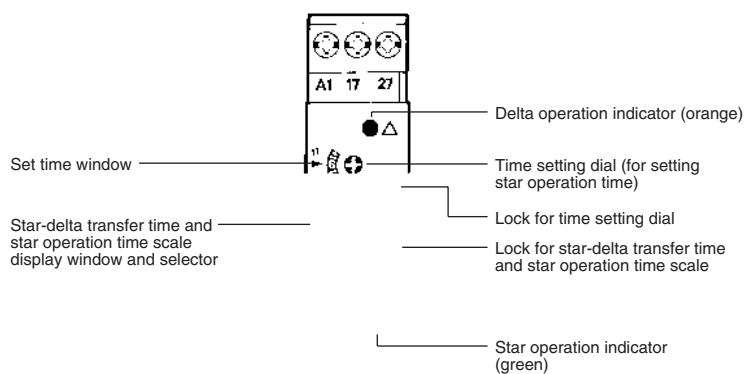
Timing Charts



Note: The reset time requires a maximum of 0.5 s.

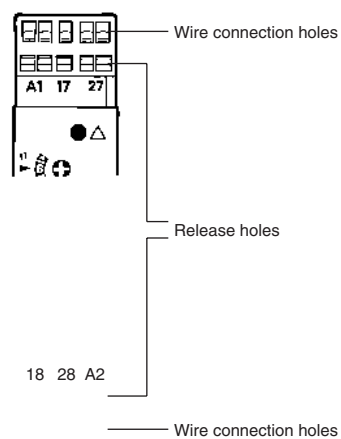
Nomenclature

H3DS-GL□

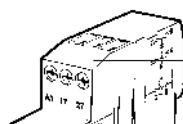


(Front View)

H3DS-GLC



(Front View)

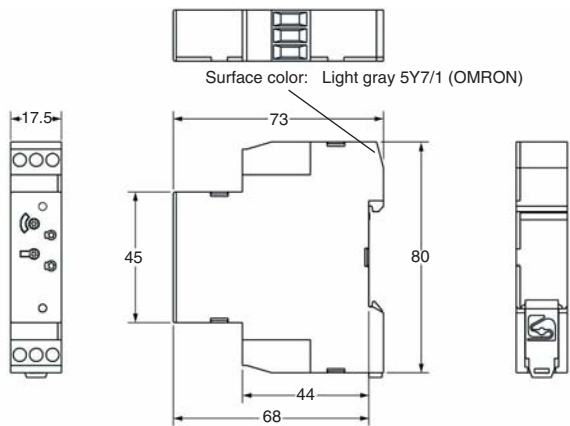
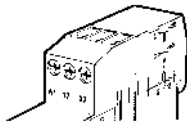


Attach the enclosed label here as a nameplate.
(The label is attached to the Timer's DIN-rail hook section at the time of shipment.)

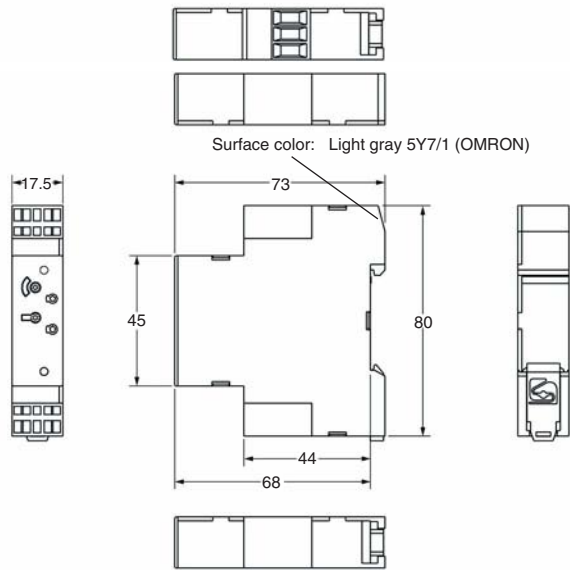
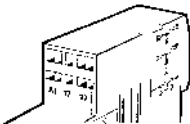
Dimensions

Timers

H3DS-GL



H3DS-GLC



Solid-state Two-wired Timer

H3DS-X

- Covers wide range of supply voltage (24 to 230 VAC/VDC).



Timers

Model Number Structure

Model Number Legend

H3DS -X L ☐
1 2 3

- 1. X: Two-wired timer
- 2. L: Smart lock mechanism
- 3. None: Screw terminal type
C: Screw-Less Clamp type

Ordering Information

List of Models

Supply voltage	Input type	Operating mode	Model	
			Screw terminal type	Screw-Less Clamp type
24 to 230 VAC/VDC (50/60 Hz)	No-input available	ON-delay	H3DS-XL	H3DS-XLC

Accessories (Order Separately)

Lock Key		Y92S-38
Mounting DIN-rail	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		PEP-S

Specifications

■ General

Item	H3DS-X
Operating mode	ON-delay
Operating/Reset method	Time-limit operation/self-resetting
Output type	SCR output
External connections	Screw terminal, Screw-Less Clamp
Terminal block	Screw terminal type: Clamps two 2.5-mm ² max. bar terminals without sleeves. Screw-Less Clamp type: Clamps two 1.5-mm ² max. bar terminals without sleeves.
Terminal screw tightening torque	0.98 N·m max.
Mounting method	DIN-rail mounting (see note)
Attachment	Nameplate label
Approved standards	UL508, CSA C22.2 No.14 Conforms to EN61812-1, IEC60664-1 4 kV/2, VDE0106/P100

Note: Can be mounted to 35-mm DIN-rail with a plate thickness of 1 to 2.5 mm.

■ Time Ranges

Time scale display	Time range
0.1 s	0.1 to 1.2 s
1 s	1 to 12 s
0.1 m	0.1 to 1.2 min
1 m	1 to 12 min
0.1 h	0.1 to 1.2 h
1 h	1 to 12 h
10 h	10 to 120 h

Note: When the time setting dial is set to "0" for any time scale, the output will operate instantaneously.

■ Ratings

Rated supply voltage (see note)	24 to 230 VAC/VDC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-off time: 0.1 s
Reset voltage	1.0 VAC/VDC max.
Reset current	5 mA max.
Power consumption	5 mA max.
Control output	SCR output: 5 mA to 0.7 A
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%

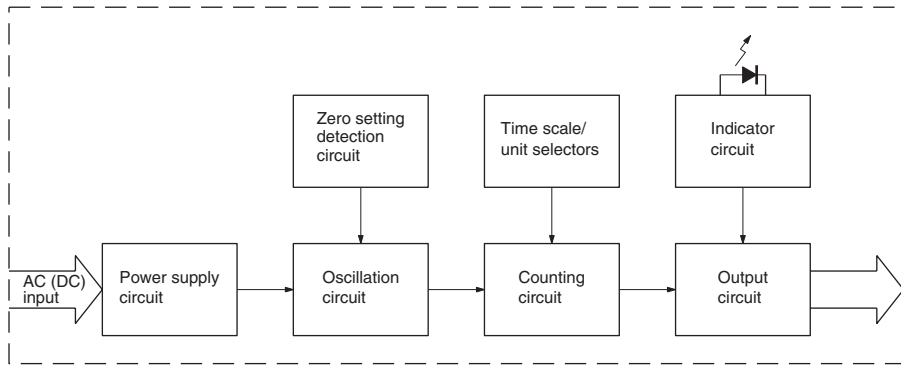
Note: The ripple in DC power supply must be 5% max.

■ Characteristics

Accuracy of operating time	±1% max. of FS (±1% ±10 ms max. at 1.2-s range)	
Setting error	±10% ± 50 ms max. of FS	
Reset time	0.1 s max.	
Influence of voltage	±0.5% max. of FS (±0.5%±10 ms max. at 1.2-s range)	
Influence of temperature	±5% max. of FS (±5%±10 ms max. at 1.2-s range)	
Insulation resistance	100 MΩ min. at 500 VDC	
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC for 1 min	
Impulse withstand voltage	3 kV (between power supply terminals) 4.5 kV (between current-carrying metal parts and exposed non-current-carrying metal parts)	
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±1.5 kV (between power supply terminals)	
Static immunity	Malfunction: 4 kV Destruction: 8 kV	
Vibration resistance	Malfunction: 0.5-mm single amplitude at 10 to 55 Hz Destruction: 0.75-mm single amplitude at 10 to 55 Hz	
Shock resistance	Malfunction: 200 m/s ² , 3 times each in 6 directions Destruction: 300 m/s ² , 3 times each in 6 directions	
EMC	(EMI) Emission Enclosure: EN61812-1 Emission AC Mains: EN55011 Group 1 class B Harmonic Current: EN55011 Group 1 class B Voltage Fluctuation and Flickering: EN61000-3-2 (EMS) Immunity ESD: EN61000-3-3 EN61812-1 EN61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3) Immunity Surge: EN61000-4-5: 2 kV common mode (level 3) 1 kV differential mode (level 3)	
Case color	Light gray (5Y7/1)	
Degree of protection	IP30 (IP20 for terminal block)	
Weight	Approx. 70 g	

Connections

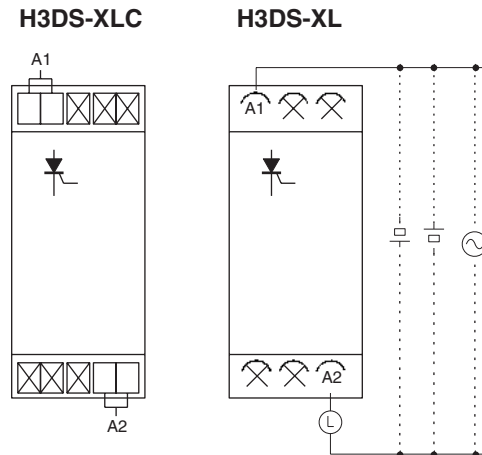
■ Block Diagram



■ I/O Functions

Inputs	---	
Outputs	Control output	Outputs are turned ON when the preset value is reached.

■ Terminal Arrangement



Note: DC supply voltage does not require the designation of polarity.

Operation

■ Basic Operation

Setting of Selector

The selectors can be turned clockwise and counterclockwise to select the desired time scale, or operating mode.

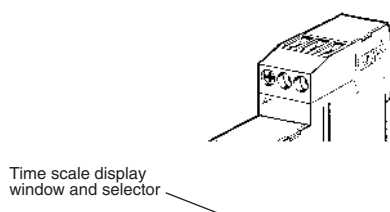
Each selector has a snap mechanism that secures the selector at a given position. Set the selector at a position at which it is secured. Do not set it midway between two securing positions or a malfunction could result from improper setting.

Selection of Time Scale

The time scale is selected by turning the time scale selector. The time scales will appear in the following order in the time scale display window on the left of the selector:

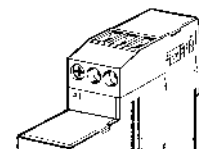
1 s, 0.1 s, 1 h, 0.1 h, 10 h, 1 h, 1 m, 0.1 m.

Note: The time scale “1h” appears twice. Both instances indicate exactly the same time scale.

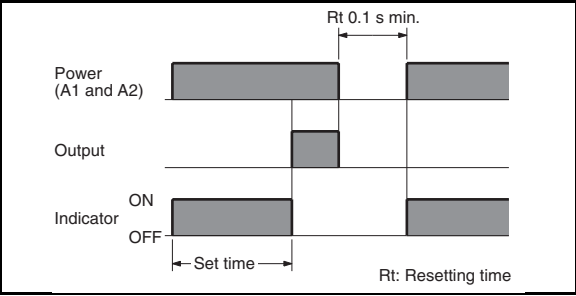


Locking/Unlocking of Selectors and Time Setting Dial

The time setting dial and time scale selector can be locked using the Y92S-38 Lock Key, a special pen type tool that is sold separately. To lock the dial or selectors, insert the Lock Key in the keyhole to the lower right of the dial or selector and turn it clockwise until the dial or selector is completely covered with the red cover. To unlock, turn the Lock Key in the opposite direction.

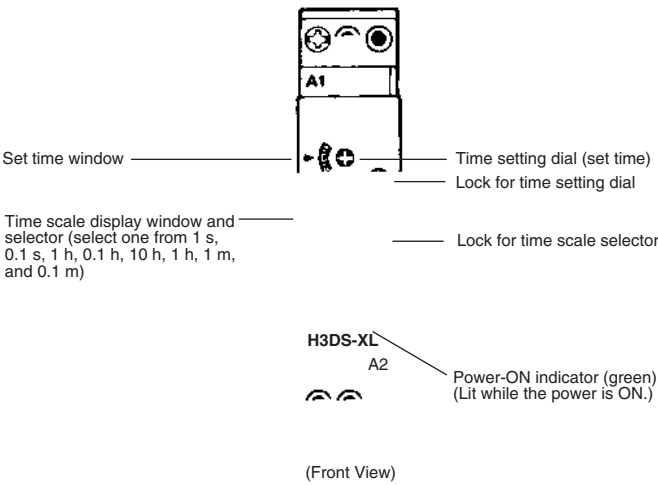


■ Timing Charts

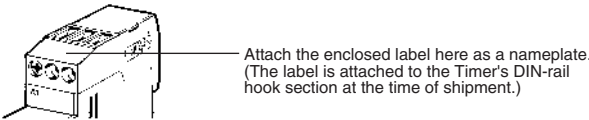
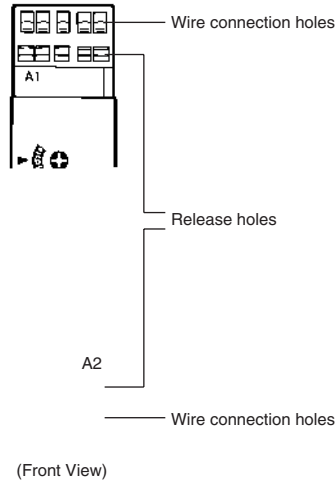


Nomenclature

H3DS-XL□

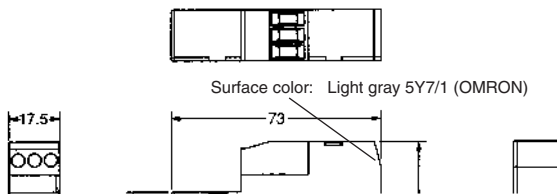
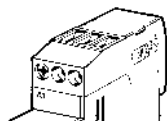


H3DS-XLC

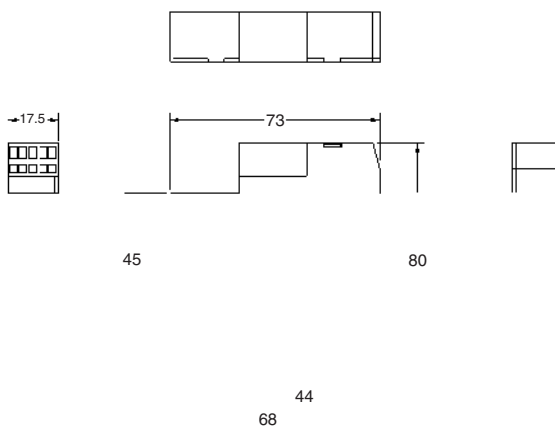
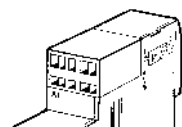


Dimensions

H3DS-XL



H3DS-XLC



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

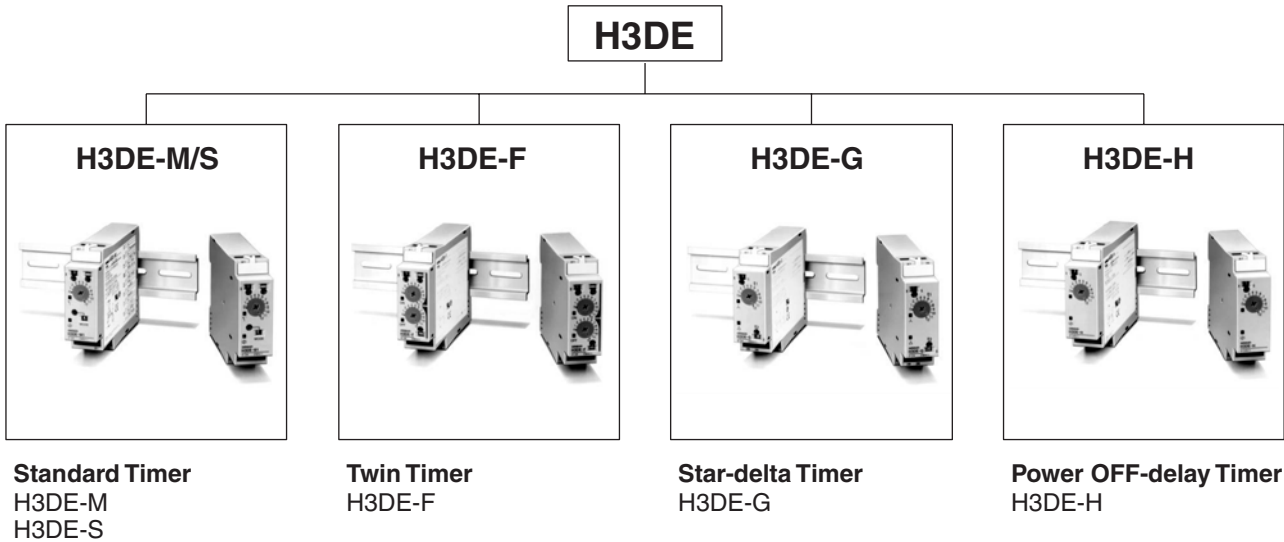
Solid-state Timer

H3DE

DIN-rail Mounted, Standard 22.5-mm Width Timer Range

- A wide AC/DC power supply range (24 to 230 VAC/DC) reduces the number of timer models kept in stock. (except for H3DE-H)
- 12-VDC model available for a specific application. (H3DE-M2)
- Nameplate provided for easy timer identification and management.
- Terminal clamp left open when delivered.
- Finger protection terminal block to meet VDE0106/P100.
- Enables easy sequence checks through instantaneous outputs for a zero set value at any time range.
- Incorporates environment-friendly, cadmium-free contacts. (except for H3DE-H)
- High immunity to inverter noise.
- Approved by UL and CSA.
- Conforms to EN61812-1 and IEC60664-1 4 kV/2 for Low Voltage, and EMC Directives.

■ Broad Line-up of H3DE Series



Contents

Solid-state Timer	
H3DE-M/-S.....	C-41
H3DE-F	C-51
H3DE-G	C-57
H3DE-H.....	C-63

- Eight operating modes (H3DE-M) and four operating modes (H3DE-S) cover a wide range of applications.
- Programmable contact enables the building of a self-holding relay circuit (-□2 models).
- A wide time setting range of 0.10 s to 120 h.



■ Model Number Legend

1. M: Multi-function type
S: Standard type
2. 2: DPDT
1: SPDT

■ List of Models

Supply voltage	Control output	Model	
		Multi-function type	Standard type
12 VDC	Contact output: DPDT (time-limit output SPDT and switchable SPDT (time-limit $\longleftrightarrow$ instantaneous))	H3DE-M2 (see note)	---
24 to 230 VAC/DC	Contact output: DPDT (time-limit output SPDT and switchable SPDT (time-limit $\longleftrightarrow$ instantaneous))	H3DE-M2 (see note)	H3DE-S2
	Contact output: SPDT (time-limit output SPDT)	H3DE-M1	H3DE-S1

Example: H3DE-M2 24 to 230 VAC/DC

Supply voltage

■ Accessories (Order Separately)

Mounting DIN-rail	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	

Specifications

■ General

Item	H3DE-M2	H3DE-M1	H3DE-S2	H3DE-S1
Operating mode	A: ON-delay (Signal or Power) B: Flicker OFF start (Signal or Power) B2: Flicker ON start (Signal or Power) C: Signal ON/OFF-delay D: Signal OFF-delay E: Interval (Signal or Power) G: Signal ON/OFF-delay J: One-shot (Signal or Power)		A: ON-delay B2: Flicker ON start E: Interval J: One-shot	
Terminal block	Clamps two 2.5 mm ² max. bar terminals without sleeves.			
Terminal screw tightening torque	0.98 N·m max. {approx. 10 kgf·cm max.}			
Input type	Voltage input		---	
Output type	Relay: DPDT	Relay: SPDT	Relay: DPDT	Relay: SPDT
Mounting method	DIN-rail mounting (see note)			
Attachment	Nameplate			
Approved standards	UL508, CSA 22.2 No.14 Conforms to EN61812-1, IEC60664-1 4 kV/2, VDE0106/P100 Output category according to IEC60947-5-1 (AC-13; 250 V 5A/AC-15; 250 V 3 A/DC-13; 30 V 0.1 A)			

Note: Can be mounted to 35-mm DIN-rail with a plate thickness of 1 to 2.5 mm.

■ Time Ranges

Time scale display	Time unit display			
	sec	min	hrs	10 h
x 0.1	0.1 to 1.2 s	0.1 to 1.2 min	0.1 to 1.2 h	1 to 12 h
x 1	1 to 12 s	1 to 12 min	1 to 12 h	10 to 120 h

Note: When the main dial is set to "0" for all settings, the output will operate instantaneously.

■ Ratings

Rated supply voltage (see notes 1 and 2)		24 to 230 VAC/DC (50/60 Hz) 12 VDC (H3DE-M2 model only)
Operating voltage range		85% to 110% of rated supply voltage
Power reset		Minimum power-off time: 0.1 s
Reset voltage		2.4 VAC/DC max.
Power consumption (see note 3)	H3DE-M1	AC: approx. 4.3 VA (2.2 W) at 230 VAC DC: approx. 0.7 W at 24 VDC
	H3DE-M2	AC: approx. 4.8 VA (2.4 W) at 230 VAC DC: approx. 1.0 W at 24 VDC
	H3DE-S1	AC: approx. 2.7 VA (1.6 W) at 230 VAC DC: approx. 0.7 W at 24 VDC
	H3DE-S2	AC: approx. 3.2 VA (1.9 W) at 230 VAC DC: approx. 1.0 W at 24 VDC
Voltage input		Max. permissible capacitance between input lines (terminals B1 and A2): 2000 pF Load connectable in parallel with inputs (terminals B1 and A2) H-level: 20.4 to 253 VAC/DC L-level: 0 to 2.4 VAC/DC
Control output		Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$) 5 A at 30 VDC with resistive load ($\cos\phi = 1$)
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%

Note: 1. DC ripple rate: 20% max.

- Since an inrush current of 0.25 A will occur when using the power supply voltage at 24 VDC, pay careful attention when turning on or off the power supply to the Timer with a solid-state output such as a sensor.
- The power consumption is for mode A after the Timer counts the time-up time and for the AC input at 50 Hz. The power consumption of the H3DE-M□ includes the input circuit with the B1 and A1 terminals short-circuited.

■ Characteristics

Accuracy of operating time	±1% max. of FS (±1% ±10 ms max. at 1.2-s range) (see note 1)
Setting error	±10% ±50 ms max. of FS (see note 1)
Signal input time	50 ms min. (see note 1)
Influence of voltage	±0.5% max. of FS (±0.5% ±10 ms max. at 1.2-s range)
Influence of temperature	±2% max. of FS (±2% ±10 ms max. at 1.2-s range)
Insulation resistance	100 MΩ min. at 500 VDC
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC for 1 min. Between control output terminals and operating circuit: 2,000 VAC for 1 min. Between contacts of different polarities: 2,000 VAC for 1 min. Between contacts not located next to each other: 1,000 VAC for 1 min.
Vibration resistance	Malfunction: 0.5-mm single amplitude at 10 to 55 Hz Destruction: 0.75-mm single amplitude at 10 to 55 Hz
Shock resistance	Malfunction: 100 m/s ² Destruction: 1,000 m/s ²
Contact material	AGNi+gold plating (Use the G6RN-1 at 12 VDC.)
Impulse withstand voltage	3 kV (between power terminals) 4.5 kV (between current-carrying metal parts and exposed non-current-carrying metal parts)
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±1.5 kV
Static immunity	Malfunction: 4 kV Destruction: 8 kV
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h) (see note 2)
EMC	(EMI) Emission Enclosure: EN61812-1 Emission AC Mains: EN55011 Group 1 class B Harmonic Current: EN55011 Group 1 class B Voltage Fluctuation and Flickering: EN61000-3-2 (EMS) Immunity ESD: EN61000-3-3 EN61812-1 EN61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3) Immunity Surge: EN61000-4-5: 2 kV common mode (level 3) 1 kV differential mode (level 3)
Degree of protection	IP30 (Terminal block: IP20)
Weight	120 g

Note: 1. With the H3DE-M□, if the voltage exceeds 26.4 VAC/DC, the following hold at signal OFF for C, D, and G modes:

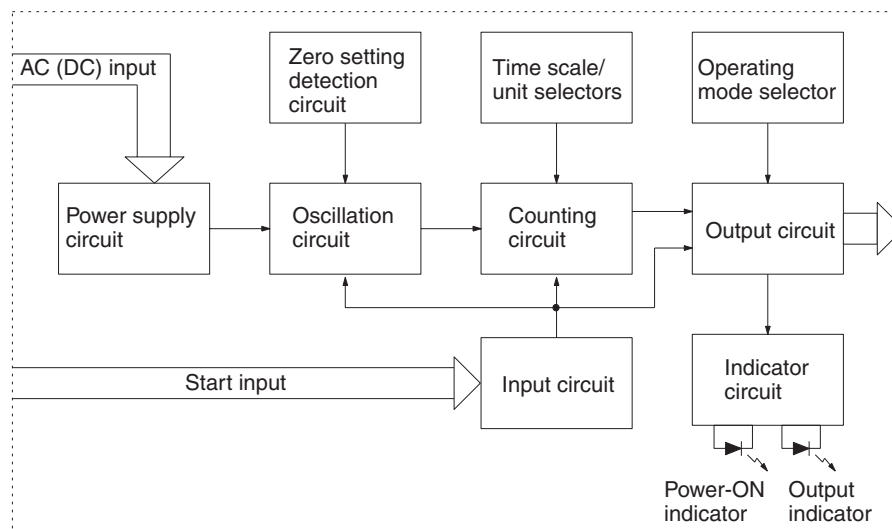
Accuracy of operating time: ±1% ±50 ms max. at 1.2-s range
Setting error: ±10% +100/-50 ms max.
Signal input time: 100 ms min.

- 2.** For reference: A maximum current of 0.15 A can be switched at 125 VDC (cosφ=1).
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).

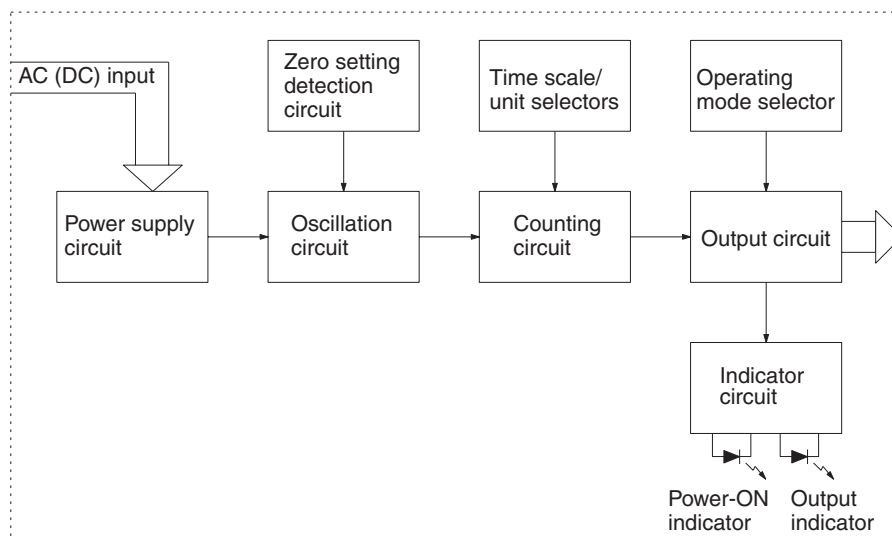
Connections

■ Block Diagram

H3DE-M1/-M2



H3DE-S1/-S2

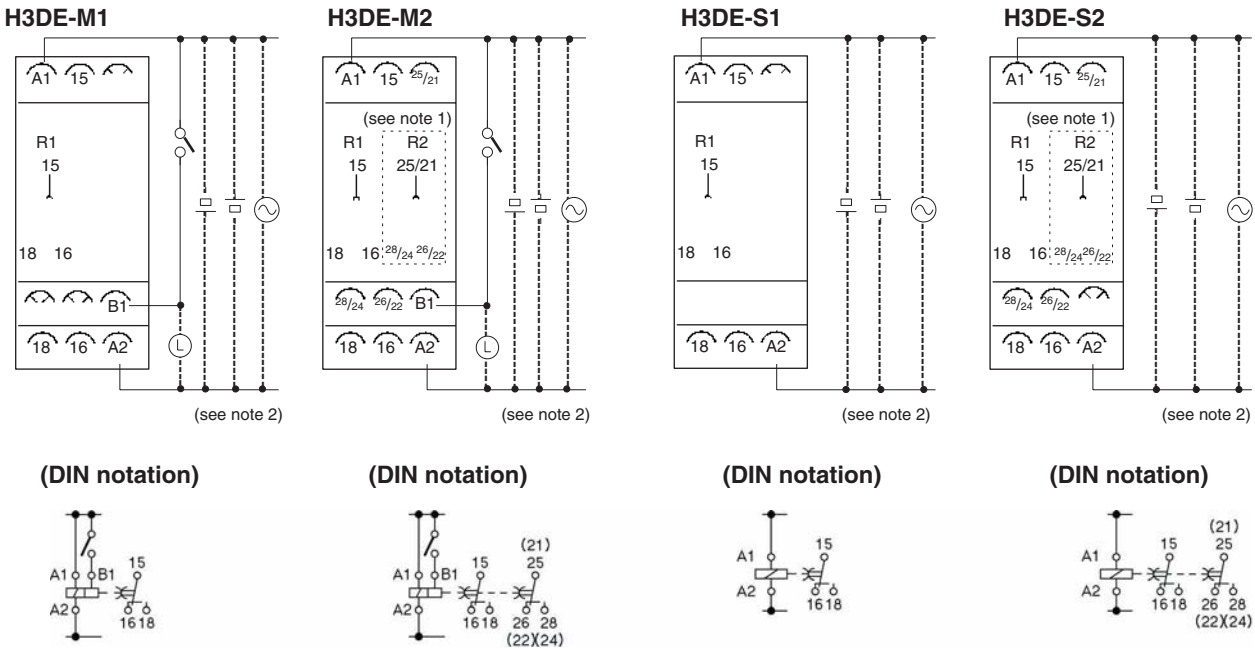


■ I/O Functions

Item		H3DE-M1/-M2	H3DE-S1/-S2
Input	Start	Starts operation.	No input is available.
Output	Control output	Outputs are turned ON according to designated output mode when preset value is reached. (See note.)	Outputs are turned ON according to designated output mode when preset value is reached. (see note.)

Note: When the output type selector switch on the bottom of the Timer is set to the instantaneous side, the relay R2 (terminal numbers 21/25, 22/26, and 24/28) becomes an instantaneous contact and turns ON/OFF in synchronization with the changes in the power supply.

Terminal Arrangement



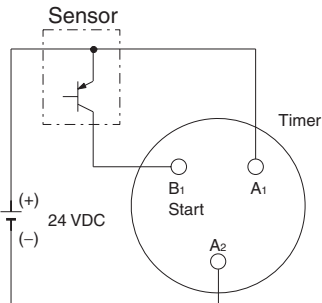
- Note:** 1. The relay R2 can be set to either instantaneous or time-limit contact using the switch located on the bottom of the Timer.
2. DC supply voltage does not require the designation of polarity.
3. The contact symbol for the H3DE is indicated with  because it offers multiple operating modes and is different from the delayed contact for conventional timers.

Input Connections

The inputs of the H3DE-M1/-M2 are voltage (voltage imposition or open) inputs.

No-contact Input

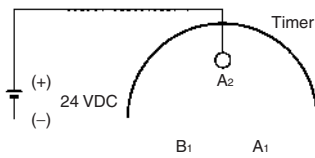
(Connection to PNP output sensor.)



Operates with PNP transistor ON

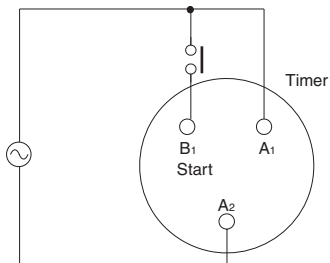
No-contact Input

(Connection to NPN output sensor.)



Sensor
Operates with NPN transistor ON

Contact Input



Operates with relay ON

Voltage Input Signal Levels

No-contact input	1. Transistor ON Residual voltage: 1 V max. (Voltage between terminals B1 and A2 must be more than the rated "H-level" voltage (20.4 VDC min.).)
	2. Transistor OFF Leakage current: 0.01 mA max. (Voltage between terminals B1 and A2 must be less than the rated "L-level" voltage (2.4 VDC max.).)
Contact input	Use contacts that can adequately switch 0.1 mA at each voltage to be imposed. (When the contacts are ON or OFF, voltage between terminals B1 and A2 must be within the following ranges: When contacts are ON: 20.4 to 253 VAC/DC When contacts are OFF: 0 to 2.4 VAC/DC

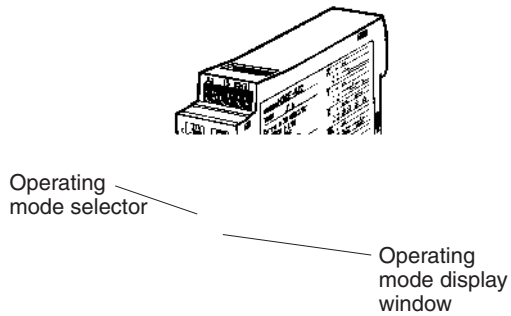
Operation

■ Basic Operation

Setting of Selector

The selectors can be turned clockwise and counterclockwise to select the desired time unit, time scale, 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.

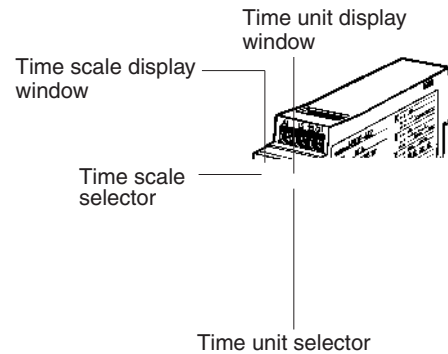


Selection of Operating Mode

The H3DE-M/-S can be set to any one of the operating modes A to J. Turn the operating mode selector with a screwdriver until the desired operating mode (A, B, C, B2, D, E, J, or G for the H3DE-M and A, E, J, or B2 for the H3DE-S) appears in the operating mode display window located below the selector.

Selection of Time Unit and Time Scale

The desired time unit (s, m, h, or 10h) can be displayed in the time unit display window above the time setting dial by turning the time unit selector located at the upper right corner of the front panel. Time scale (0.1 or 1) is selected with the time scale selector at the upper left corner of the front panel, it appears in the time scale display window above the selector.

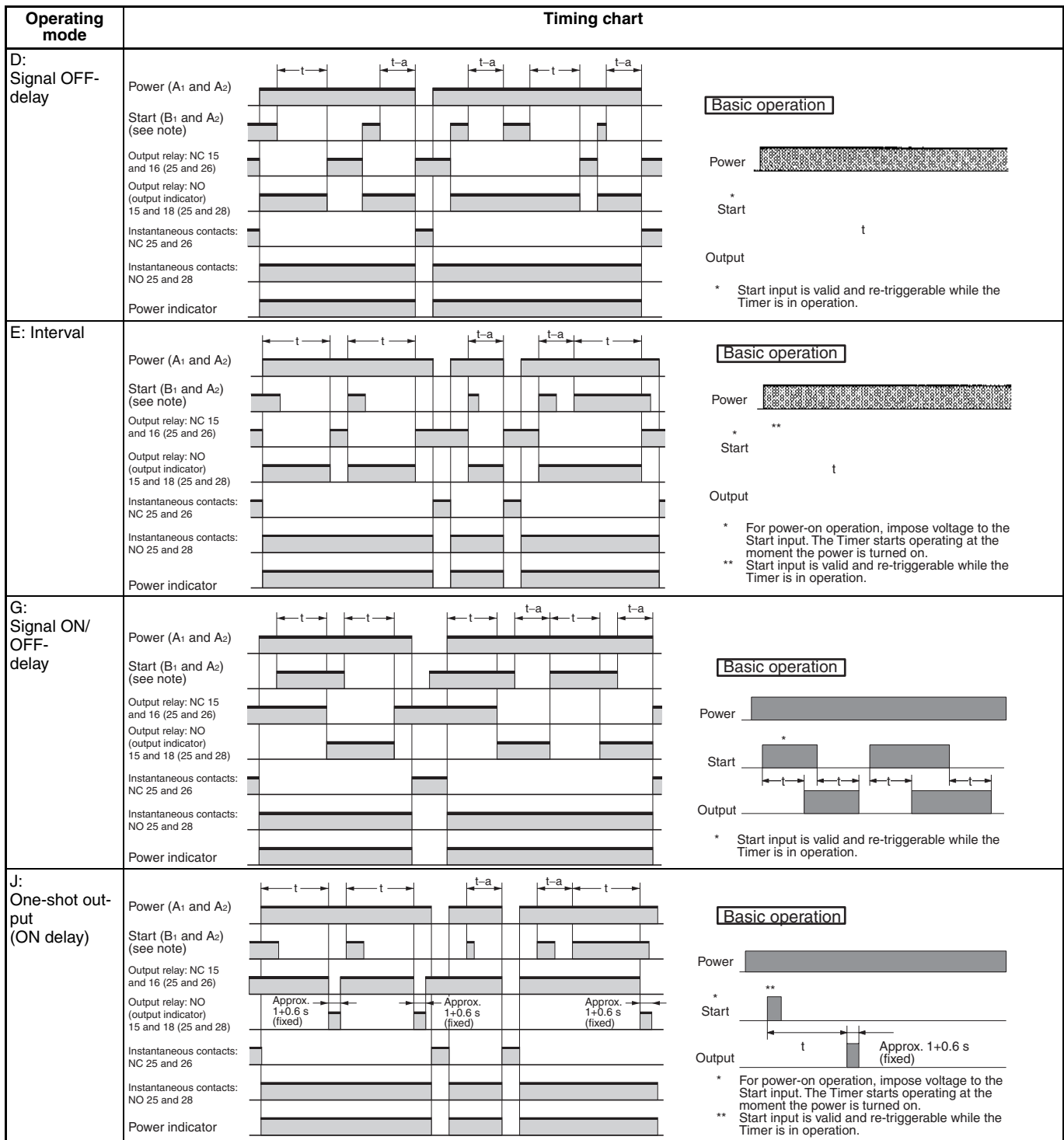


Timing Chart

- Note:** 1. The minimum power reset time is 0.1 s and the minimum signal input time is 0.05 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.
3. There is no start input with H3DE-S□ models. Operation starts when the power is turned ON.
4. There is no instantaneous output with H3DE-M1/-S1 models.

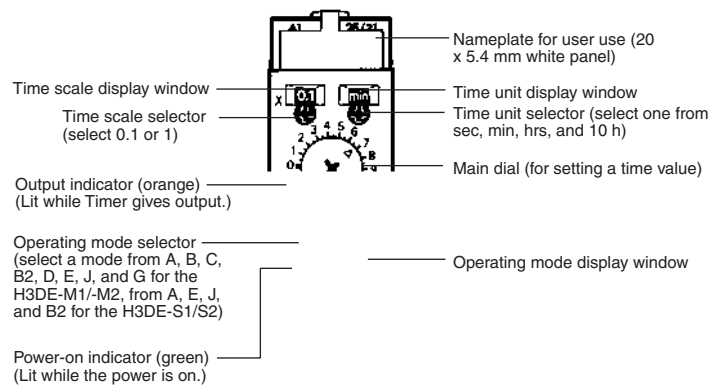
Operating mode	Timing chart
A: ON-delay	Power (A₁ and A₂) Start (B₁ and A₂) (see note) Time-limit contacts: NC 15 and 16 (25 and 26) Time-limit contacts: NO (output indicator) 15 and 18 (25 and 28) Instantaneous contacts: NC 25 and 26 Instantaneous contacts: NO 25 and 28 Power indicator Basic operation Power Start Output * For power-on operation, impose voltage to the Start input. The Timer starts operating at the moment the power is turned on. ** Start input is invalid while the Timer is in operation.
B: Flicker OFF start	Power (A₁ and A₂) Start (B₁ and A₂) (see note) Output relay: NC 15 and 16 (25 and 26) Output relay: NO (output indicator) 15 and 18 (25 and 28) Instantaneous contacts: NC 25 and 26 Instantaneous contacts: NO 25 and 28 Power indicator Basic operation Power Start Output * For power-on operation, impose voltage to the Start input. The Timer starts operating at the moment the power is turned on. ** Start input is invalid while the Timer is in operation.
B2: Flicker ON start	Power (A₁ and A₂) Start (B₁ and A₂) (see note) Output relay: NC 15 and 16 (25 and 26) Output relay: NO (output indicator) 15 and 18 (25 and 28) Instantaneous contacts: NC 25 and 26 Instantaneous contacts: NO 25 and 28 Power indicator Basic operation Power Start Output * For power-on operation, impose voltage to the Start input. The Timer starts operating at the moment the power is turned on. ** Start input is invalid while the Timer is in operation.
C: Signal ON/OFF-delay	Power (A₁ and A₂) Start (B₁ and A₂) (see note) Output relay: NC 15 and 16 (25 and 26) Output relay: NO (output indicator) 15 and 18 (25 and 28) Instantaneous contacts: NC 25 and 26 Instantaneous contacts: NO 25 and 28 Power indicator Basic operation Power Start Output * Start input is valid and re-triggerable while the Timer is in operation.

Note: The start input of the H3DE-M1 or H3DE-M2 model is activated by applying a voltage to B1 and A2 terminals. The voltage can be applied by turning on the contact between B1 and A1 (Refer to *Terminal Arrangement*)



Note: The start input of the H3DE-M1 or H3DE-M2 model is activated by applying a voltage to B1 and A2 terminals. The voltage can be applied by turning on the contact between B1 and A1 (Refer to *Terminal Arrangement*).

Nomenclature



(Front View)



(Bottom View)

Output type selector switch for H3DE-M2/-S2 (default setting is time-limit output)

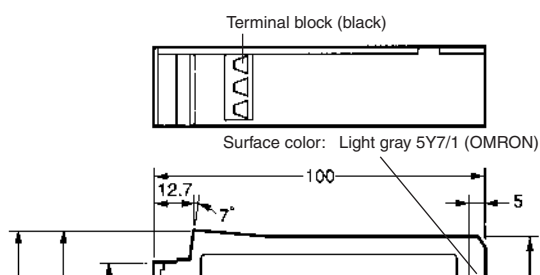
Output Type Selector Switch Settings

Setting	Output type
	Time-limit output (terminal numbers 25, 26 and 28) (default setting)
	Instantaneous output (terminal numbers 21, 22 and 24)

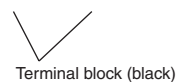
Dimensions

Note: All units are in millimeters unless otherwise indicated.

H3DE-M/-S



Output type selector switch (default setting: Time-limit output)



Solid-state Twin Timer

H3DE-F

- Operates in flicker-OFF or flicker-ON start mode with one Unit.
- Independent ON- and OFF-time settings.
Combinations of long ON- or OFF-time and short OFF- or ON-time setting are possible.
- Long time range from 0.1 s to 12 h for both ON and OFF time settings.



Timers

Model Number Structure

Model Number Legend

H3DE -
1

1. F: Twin timers

Ordering Information

List of Models

Operating mode	Supply voltage	Model
Flicker-OFF/Flicker-ON start	24 to 230 VAC/VDC	H3DE-F

Accessories (Order Separately)

Mounting DIN-rail	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	

Specifications

■ General

Item	H3DE-F
Operating mode	Flicker-OFF/Flicker-ON start
Operating/Reset method	Time-limit operation/Time-limit reset or self-reset
Terminal block	Clamps two 2.5 mm ² max. bar terminals without sleeves
Terminal screw tightening torque	0.98 N·m max. {approx. 10 kgf·cm max.}
Output type	Relay: SPDT
Mounting method	DIN-rail mounting (see note)
Attachment	Nameplate
Approved standards	UL508, CSA 22.2 No.14 Conforms to EN61812-1, IEC60664-1 4 kV/2, VDE0106/P 100 Output category according to IEC60947-5-1 (AC-13; 250 V 5A/AC-15; 250 V 3 A/DC-13; 30 V 0.1 A)

Note: Can be mounted to 35-mm DIN-rail with a plate thickness of 1 to 2.5 mm.

■ Time Ranges

Time scale display (see note 1)	Time unit display			
	sec	10 s	min	hrs
x 0.1	0.1 to 1.2 s	1 to 12 s	0.1 to 1.2 min	0.1 to 1.2 h
x 1	1 to 12 s	10 to 120 s	1 to 12 min	1 to 12 h

Note: 1. Time scale display is applied commonly for ON and OFF time.
2. When the main dial is set to "0" for all settings, the output will operate instantaneously.

■ Ratings

Rated supply voltage (see note)	24 to 230 VAC/VDC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-off time: 0.1 s
Reset voltage	2.4 VAC/DC max.
Power consumption	AC: Approx. 3.1 VA (1.8 W) at 230 VAC DC: Approx. 0.8 W at 24 VDC
Control output	Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$) 5 A at 30 VDC with resistive load ($\cos\phi = 1$)
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%

Note: DC ripple rate: 20% max.

■ Characteristics

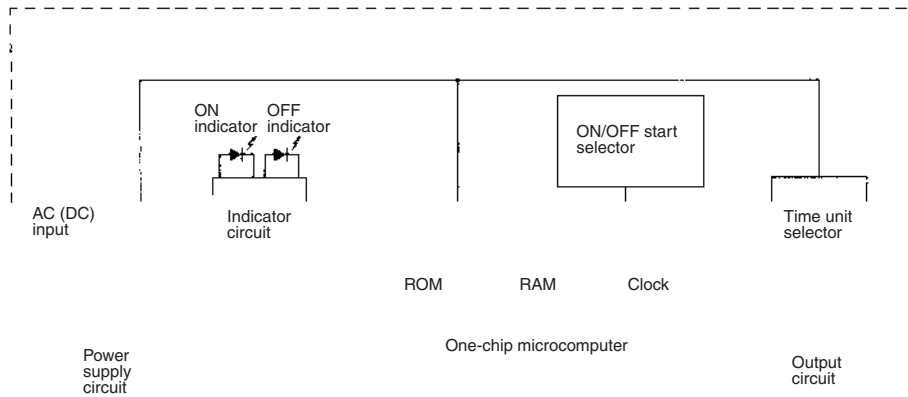
Accuracy of operating time	±1% max. of FS (±1% ±10 ms max. at 1.2-s range)																				
Setting error	±10% ± 0.05 s max. of FS																				
Influence of voltage	±0.5% max. of FS (±0.5% ±10 ms max. at 1.2-s range)																				
Influence of temperature	±2% max. of FS (±2% ± 10 ms max. at 1.2-s range)																				
Insulation resistance	100 MΩ min. at 500 VDC																				
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC (50/60 Hz) for 1 min. Between control output terminals and operating circuit: 2,000 VAC (50/60 Hz) for 1 min. Between contacts not located next to each other: 1,000 VAC (50/60 Hz) for 1 min.																				
Impulse withstand voltage	3 kV (between power supply terminals) 4.5 kV (between current-carrying metal parts and exposed non-current-carrying metal parts)																				
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±1.5 kV																				
Static immunity	Malfunction: 4 kV Destruction: 8 kV																				
Vibration resistance	Malfunction: 0.5-mm single amplitude at 10 to 55 Hz Destruction: 0.75-mm single amplitude at 10 to 55 Hz																				
Shock resistance	Malfunction: 100 m/s ² Destruction: 1,000 m/s ²																				
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h)																				
EMC	<table> <tr> <td>(EMI)</td><td>EN61812-1</td></tr> <tr> <td>Emission Enclosure:</td><td>EN55011 Group 1 class B</td></tr> <tr> <td>Emission AC Mains:</td><td>EN55011 Group 1 class B</td></tr> <tr> <td>Harmonic Current:</td><td>EN61000-3-2</td></tr> <tr> <td>Voltage Fluctuation and Flickering:</td><td>EN61000-3-3</td></tr> <tr> <td>(EMS)</td><td>EN61812-1</td></tr> <tr> <td>Immunity ESD:</td><td>EN61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3)</td></tr> <tr> <td>Immunity RF-interference from AM Radio Waves:</td><td>EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3)</td></tr> <tr> <td>Immunity Burst:</td><td>EN61000-4-4: 2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3)</td></tr> <tr> <td>Immunity Surge:</td><td>EN61000-4-5: 2 kV common mode (level 3) 1 kV differential mode (level 3)</td></tr> </table>	(EMI)	EN61812-1	Emission Enclosure:	EN55011 Group 1 class B	Emission AC Mains:	EN55011 Group 1 class B	Harmonic Current:	EN61000-3-2	Voltage Fluctuation and Flickering:	EN61000-3-3	(EMS)	EN61812-1	Immunity ESD:	EN61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3)	Immunity RF-interference from AM Radio Waves:	EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3)	Immunity Burst:	EN61000-4-4: 2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3)	Immunity Surge:	EN61000-4-5: 2 kV common mode (level 3) 1 kV differential mode (level 3)
(EMI)	EN61812-1																				
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Immunity RF-interference from AM Radio Waves:	EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3)																				
Immunity Burst:	EN61000-4-4: 2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3)																				
Immunity Surge:	EN61000-4-5: 2 kV common mode (level 3) 1 kV differential mode (level 3)																				
Degree of protection	IP30 (IP20 for terminal block)																				
Weight	Approx. 110 g																				

Note: For reference:

A maximum current of 0.15 A can be switched at 125 VDC (cosφ=1).
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

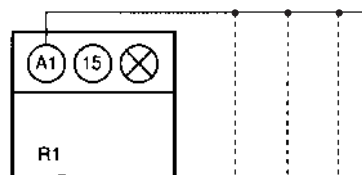
■ Block Diagram



■ I/O Function

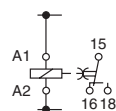
Inputs	---
Outputs	Control output
Outputs are turned ON/OFF according to the time set by the ON-and OFF-time setting dial.	

■ Terminal Arrangement



• • •

(DIN notation)



Note: DC supply voltage does not require the designation of polarity.

Operation

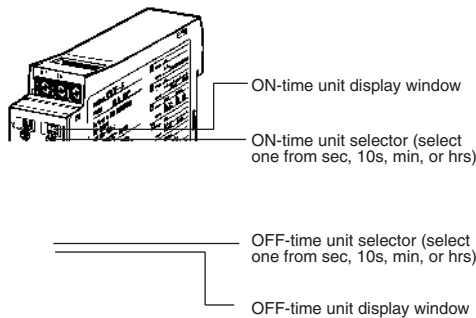
Basic Operation

Time Unit Selection

The time unit display window for output ON is located on the upper-right side of the front panel above the corresponding time unit selector.

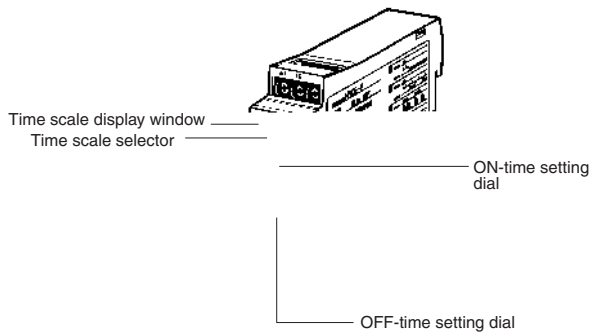
The time unit display window for output OFF is located on the lower-right side of the front panel below the corresponding time unit selector.

According to the setting of each time unit selector, “sec” for seconds, “10s” for 10 seconds, “min” for minutes, or “hrs” for hours will appear in the corresponding time unit display window.



Time Scale Selection

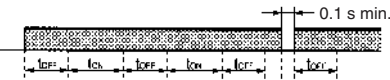
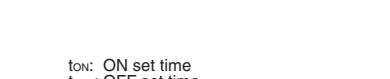
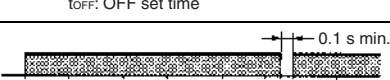
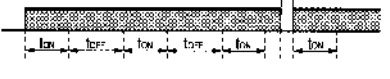
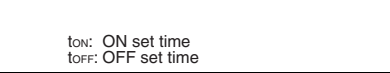
The time scale selector on the upper-left side of the front panel can be set to 0.1 or 1 as a magnification coefficient.



Time Setting

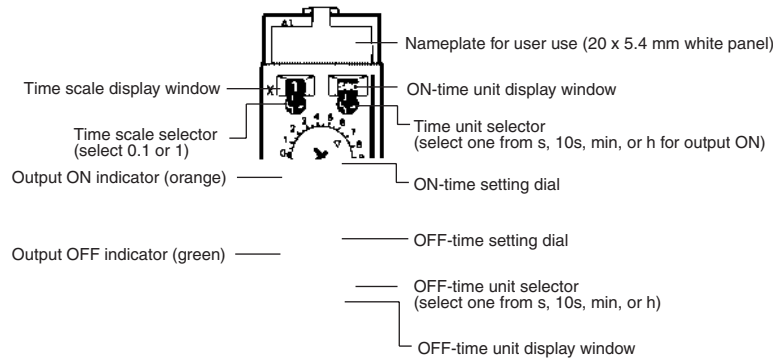
Use the ON/OFF-time setting dial to set the ON/OFF time.

Timing Charts

Operating mode	Timing chart			
Flicker-OFF start	Power (A ₁ and A ₂)	ON OFF		
	Output relay: NO 15 and 18 (ON indicator)	ON OFF		
	Output relay: NC 15 and 16	ON OFF		
	OFF indicator	ON OFF		
	tON: ON set time tOFF: OFF set time			
Flicker-ON start	Power (A ₁ and A ₂)	ON OFF		
	Output relay: NO 15 and 18 (ON indicator)	ON OFF		
	Output relay: NC 15 and 16	ON OFF		
	OFF indicator	ON OFF		
	tON: ON set time tOFF: OFF set time			

- Note:** 1. The reset time requires a minimum of 0.1 s.
2. When power is supplied in flicker-ON start mode, the OFF indicator lights momentarily. This, however, has no effect on the performance of the Timer.

Nomenclature



(Front View)



ON/OFF start selector
(default is flicker-OFF start)

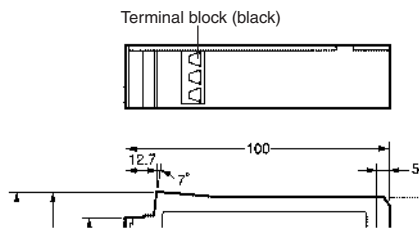
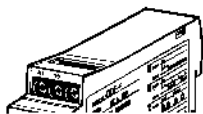
ON/OFF Start Selector Switch Settings

Setting	Operating mode
	Flicker-ON start
	Flicker-OFF start

(Bottom View)

Dimensions

H3DE-F



Terminal block (black)

Surface color:
Light gray 5Y7/1
(OMRON)

Terminal block (black)

Solid-state Star-delta Timer

H3DE-G

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



Model Number Structure

Model Number Legend

H3DE -
 1

1. G: Star-delta timer

Ordering Information

List of Models

Supply voltage	Model
24 to 230 VAC/VDC	H3DE-G

Accessories (Order Separately)

Mounting DIN-rail	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	

Specifications

■ General

Item	H3DE-G
Operating mode	Star-delta operation
Operating/Reset method	Time-limit operation/Self-reset
Terminal block	Clamps two 2.5 mm ² max. bar terminals without sleeves
Terminal screw tightening torque	0.98 N·m max. {approx. 10 kgf·cm max.}
Output type	(Star operation circuit) Relay: SPDT (Delta operation circuit) Relay: SPDT
Mounting method	DIN-rail mounting (see note)
Attachment	Nameplate
Approved standards	UL508, CSA 22.2 No.14 Conforms to EN61812-1, IEC60664-1 4 kV/2, VDE0106/P100 Output category according to IEC60947-5-1 (AC-13; 250 V 5A/AC-15; 250 V 3 A/DC-13; 30 V 0.1 A)

Note: Can be mounted to 35-mm DIN-rail with a plate thickness of 1 to 2.5 mm.

■ Time Ranges

Time scale display	Star operation time ranges
x 1	1 to 12 s
x 10	10 to 120 s

Star-delta transfer time	Programmable at 0.05 s, 0.1 s, 0.25 s or 0.5 s
--------------------------	--

■ Ratings

Rated supply voltage (see note)	24 to 230 VAC/VDC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-off time: 0.5 s
Reset voltage	24 VAC/DC max.
Power consumption	AC: Approx. 3 VA (1.8 W) at 230 VAC DC: Approx. 0.8 W at 24 VDC
Control output	Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$) 5 A at 30 VDC with resistive load ($\cos\phi = 1$)
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%

Note: DC ripple rate: 20% max.

■ Characteristics

Accuracy of operating time	±1% max. of FS
Setting error	±10% ± 0.05 s max. of FS
Total tolerance of transfer time	± (25% FS + 5 ms) max.
Influence of voltage	±0.5% max. of FS
Influence of temperature	±2% max. of FS
Insulation resistance	100 MΩ min. at 500 VDC
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC (50/60 Hz) for 1 min. Between control output terminals and operating circuit: 2,000 VAC (50/60 Hz) for 1 min. Between contacts not located next to each other: 1,000 VAC (50/60 Hz) for 1 min.
Impulse withstand voltage	3 kV (between power supply terminals) 4.5 kV (between current-carrying metal parts and exposed non-current-carrying metal parts)
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±1.5 kV
Static immunity	Malfunction: 4 kV Destruction: 8 kV
Vibration resistance	Malfunction: 0.5-mm single amplitude at 10 to 55 Hz Destruction: 0.75-mm single amplitude at 10 to 55 Hz
Shock resistance	Malfunction: 100 m/s ² Destruction: 1,000 m/s ²
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h)
EMC	(EMI) EN61812-1 Emission Enclosure: EN55011 Group 1 class B Emission AC Mains: EN55011 Group 1 class B Harmonic Current: EN61000-3-2 Voltage Fluctuation and Flickering: EN61000-3-3 (EMS) EN61812-1 Immunity ESD: EN61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3) Immunity Surge: EN61000-4-5: 2 kV common mode (level 3) 1 kV differential mode (level 3)
Degree of protection	IP30 (IP20 for terminal block)
Weight	Approx. 120 g

Note: For reference:

A maximum current of 0.15 A can be switched at 125 VDC ($\cos\phi=1$).

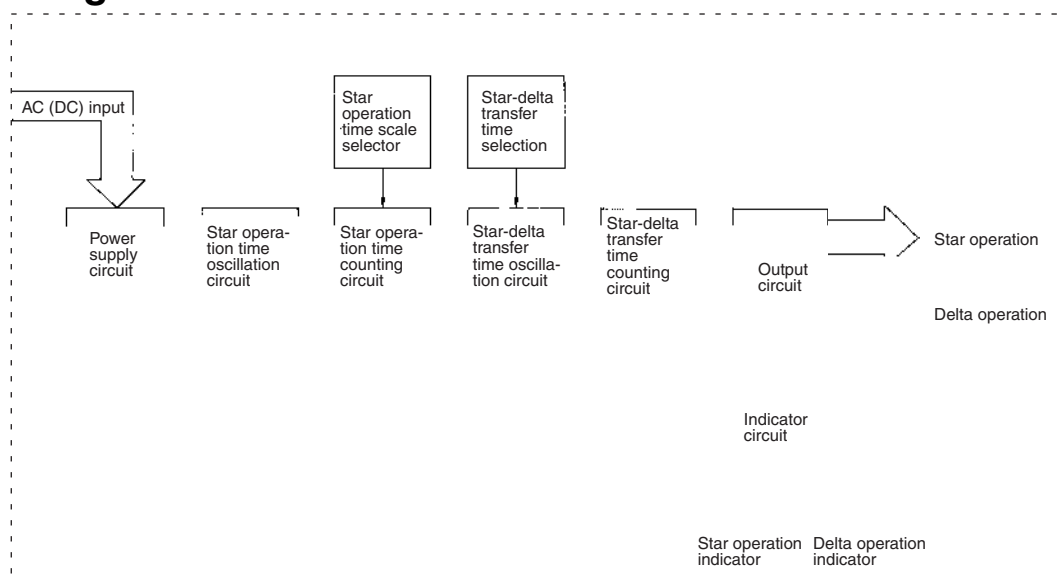
A maximum current of 0.1 A can be switched if L/R is 7 ms.

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

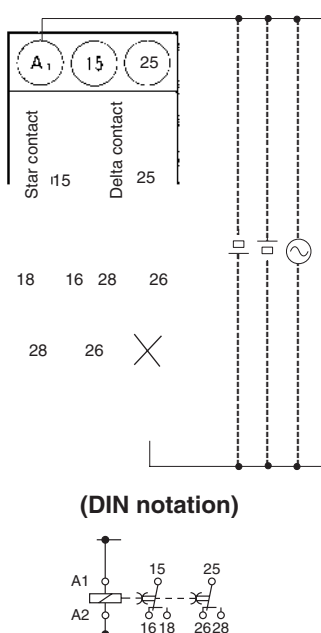
■ Block Diagram



■ I/O Functions

Inputs		---
Outputs	Control output	Star output is turned OFF when the dial set value is reached and delta output is ON after the preset transfer time elapses

■ Terminal Arrangement



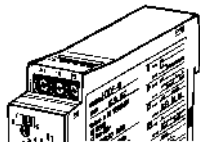
Note: DC supply voltage does not require the designation of polarity.

Operation

Basic Operation

Time Unit Setting

The star-delta transfer time is set to 0.05, 0.1, 0.25 or 0.5 with the star-delta transfer time selector on the lower-right side of the front panel and the set value appears in the star-delta transfer time display window below the selector.



Star-delta transfer time selector
Star-delta transfer time display window

Time Scale Selection

The star operation time scale selector on the upper-left side of the front panel can be set to 1 or 10 as a magnification.

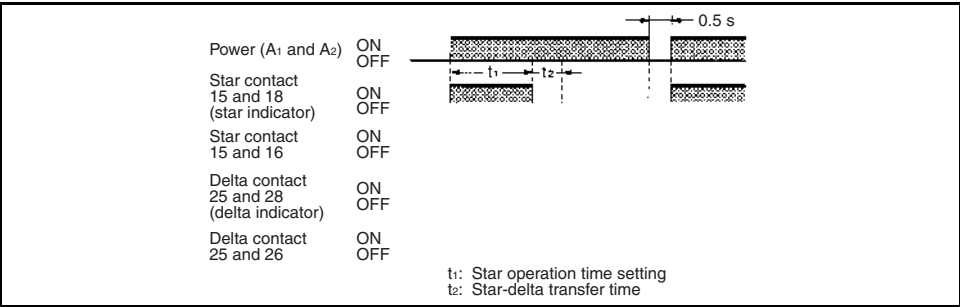


Star operation time scale display window
Star operation time scale selector
Time setting dial

Time Setting

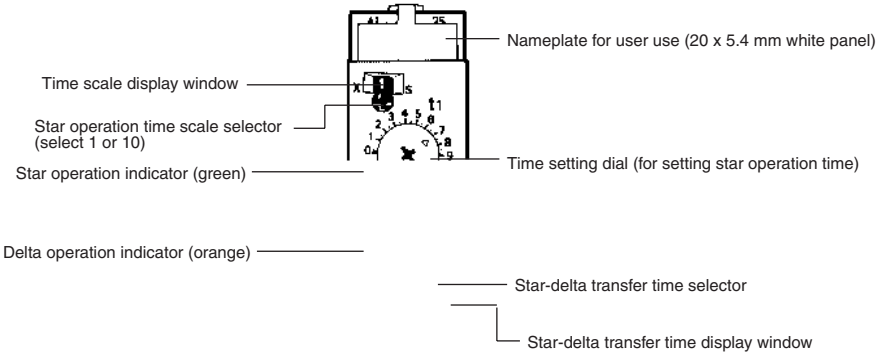
The operation time of the Timer is set with the time setting dial.

Timing Charts



Note: The reset time requires a maximum of 0.5 s.

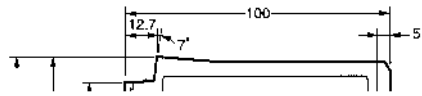
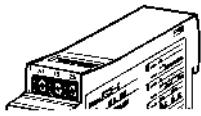
Nomenclature



(Front View)

Dimensions

H3DE-G



Terminal block (black)



Surface color:
Light gray 5Y7/1
(OMRON)

Terminal block (black)

Solid-state Power OFF-delay Timer

H3DE-H

- Two delay-time models available.
0.1 to 12 seconds (S Series)
1 to 120 seconds (L Series)
- Covers wide range of supply voltage.



Timers

Model Number Structure

Model Number Legend

H3DE -

1

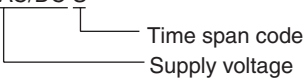
1. H: Power OFF-delay timer

Ordering Information

List of Models

Supply voltage	Model	
	S Series (time range: 0.1 to 12 s)	L Series (time range: 1 to 120 s)
100 to 120 VAC	H3DE-H	H3DE-H
200 to 230 VAC		
24 VAC/VDC		
48 VAC/VDC		

Note: Specify both the model number and supply voltage when ordering.
Example: H3DE-H 24 VAC/DC S



Accessories (Order Separately)

Mounting DIN-rail	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	

Specifications

■ General

Item	H3DE-H
Operating mode	Power OFF-delay
Operating/Reset method	Instantaneous operation/Time-limit reset
Terminal block	Clamps Two 2.5 mm ² max. bar terminals without sleeves
Terminal screw tightening torque	0.98 N·m max. {approx. 10 kgf·cm max.}
Output type	Relay: SPDT
Mounting method	DIN-rail mounting (see note)
Attachment	Nameplate
Approved standards	UL508, CSA 22.2 No.14 Conforms to EN61812-1, IEC60664-1 4 kV/2, VDE0106/P100 Output category according to IEC60947-5-1 (AC-13; 250 V 5A/AC-15; 250 V 3 A/DC-13; 30 V 0.1 A)

Note: Can be mounted to 35-mm DIN-rail with a plate thickness of 1 to 2.5 mm.

■ Time Ranges

Time scale display		Time ranges	Min. power ON time
S series	x 0.1 s	0.1 to 1.2 s	0.1 s minimum
	x 1 s	1 to 12 s	
L series	x 1 s	1 to 12 s	0.3 s minimum
	x 10 s	10 to 120 s	

Note: The Timer will not operate if the specified power-on time is not kept. Be sure to supply power for at least the period specified.

■ Ratings

Rated supply voltage (see note)		100 to 120 VAC (50/60 Hz) 200 to 230 VAC (50/60 Hz) 24 VAC/VDC (50/60 Hz) 48 VAC/VDC (50/60 Hz)
Operating voltage range		85% to 110% of rated supply voltage
Power consumption	24 VAC/VDC Type	AC: Approx. 0.3 VA (0.2 W) at 24 VAC DC: Approx. 0.2 W at 24 VDC
	48 VAC/VDC Type	AC: Approx. 0.5 VA (0.5 W) at 48 VAC DC: Approx. 0.5 W at 48 VDC
	100 to 120 VAC Type	AC: Approx. 0.8 VA (0.7 W) at 120 VAC
	200 to 230 VAC Type	AC: Approx. 1.6 VA (1.0 W) at 230 VAC
Control output		Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$) 5 A at 30 VDC with resistive load ($\cos\phi = 1$)
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%

Note: The ripple in DC power supply must be 20% max. A single-phase, full-wave rectifying power supply can be connected if the ripple output of the power supply is a maximum of 20% of the whole output.

■ Characteristics

Accuracy of operating time	±1% max. of FS (±1% ±10 ms max. at 1.2-s range)
Setting error	±10% ± 0.05 s max. of FS
Influence of voltage	±0.5% max. of FS (±0.5% ±10 ms max. at 1.2-s range)
Influence of temperature	±2% max. of FS (±2% ± 10 ms max. at 1.2-s range)
Insulation resistance	100 MΩ min. at 500 VDC
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC (50/60 Hz) for 1 min. Between control output terminals and operating circuit: 2,000 VAC (50/60 Hz) for 1 min. Between contacts not located next to each other: 1,000 VAC (50/60 Hz) for 1 min.
Impulse withstand voltage	3 kV (or 1 kV for 24/48 VAC/VDC models) (between power supply terminals) 4.5 kV (or 1.5 kV for 24/48 VAC/VDC models) (between current-carrying metal parts and exposed non-current-carrying metal parts)
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±1.5 kV (between power supply terminals)
Static immunity	Malfunction: 4 kV Destruction: 8 kV
Vibration resistance	Malfunction: 0.5-mm single amplitude at 10 to 55 Hz Destruction: 0.75-mm single amplitude at 10 to 55 Hz
Shock resistance	Malfunction: 100 m/s ² Destruction: 1,000 m/s ²
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,200 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 1,200 operations/h)
EMC	(EMI) Emission Enclosure: EN61812-1 EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Harmonic Current: EN61000-3-2 Voltage Fluctuation and Flickering: EN61000-3-3 (EMS) Immunity ESD: EN61812-1 EN61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3) Immunity Surge: EN61000-4-5: 2 kV common mode (level 3) 1 kV differential mode (level 3)
Degree of protection	IP30 (IP20 for terminal block)
Weight	Approx. 120 g

Note: For reference:

A maximum current of 0.15 A can be switched at 125 VDC (cosφ=1).

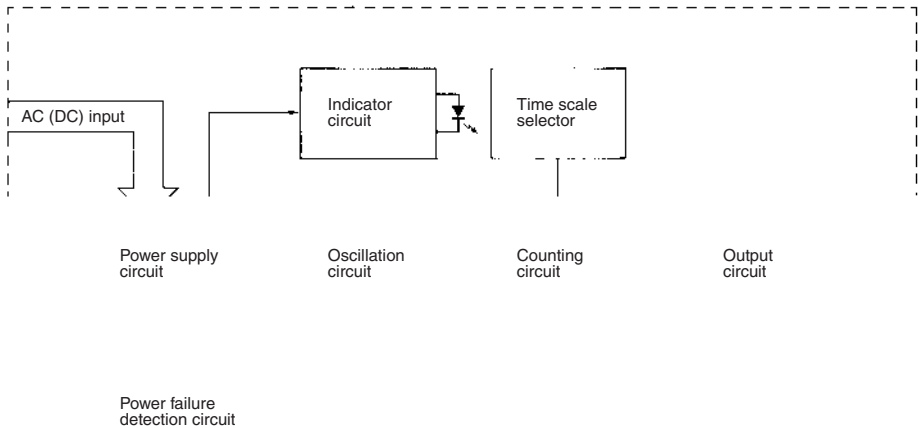
A maximum current of 0.1 A can be switched if L/R is 7 ms.

In both cases, a life of 100,000 operations can be expected.

The minimum applicable load is 100 mA at 5 VDC (failure level: P).

Connections

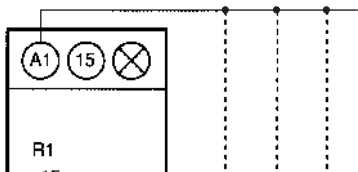
■ Block Diagram



■ I/O Functions

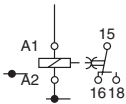
Inputs	---
Outputs	Control output
The Timer operates instantaneously when the Timer is turned ON. The Timer is in counting operation after the Timer is turned OFF and the output of the Timer is turned OFF when the preset time elapses.	

■ Terminal Arrangement



• • •

(DIN notation)



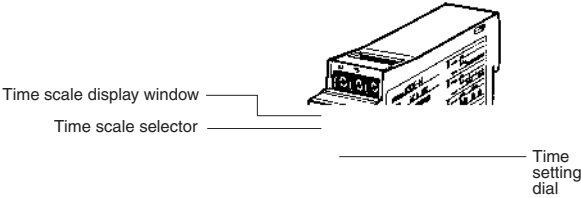
Note: DC supply voltage does not require the designation of polarity.

Operation

Basic Operation

Time Scale Selection

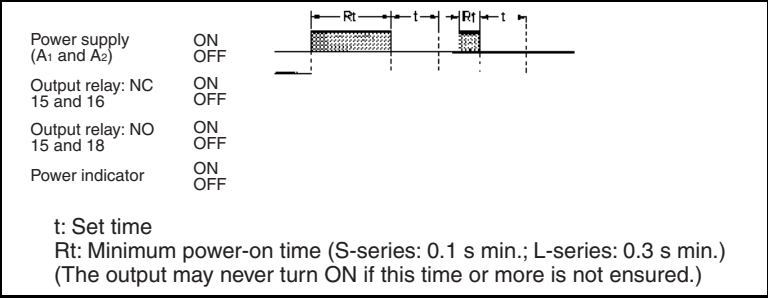
The time scale selector on the upper left-hand side of the front panel of the S Series can be set to 0.1 or 1 and that of the L Series can be set to 1 or 10 as magnification coefficients.



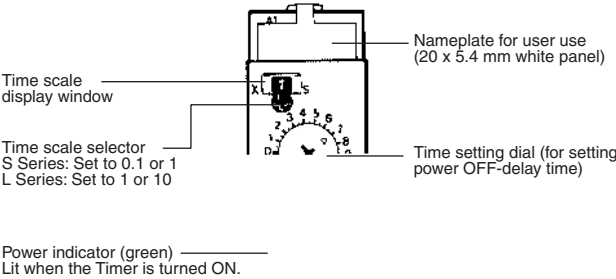
Time Setting

The operating time of the Timer is set with the time setting dial.

Timing Charts



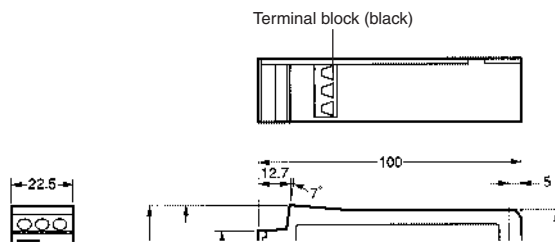
Nomenclature



(Front View)

Dimensions

H3DE-H



Terminal block (black)

Surface color:
Light gray 5Y7/1
(OMRON)

Terminal block (black)

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Solid-state Timer H3YN

Miniature Timer with Multiple Time Ranges and Multiple Operating Modes

- Minimizes stock.
- Pin configuration compatible with MY Power Relay.
- Standard multiple operating modes and multiple time ranges.
- Conforms to EN61812-1 and IEC60664-1 for Low Voltage, and EMC Directives.



Timers

Model Number Structure

Model Number Legend

H3YN-□□-□
1 2 3

1. Output

- 2: DPDT
- 4: 4PDT

2. Time Range

- None: Short-time range (0.1 s to 10 min)
- 1: Long-time range (0.1 min to 10 hrs)

3. Contact Type

- None: Single contact
- Z: Twin contacts

Ordering Information

List of Models

Supply voltage	Time-limit contact	Short-time range model (0.1 s to 10 min)	Long-time range model (0.1 min to 10 h)
24, 100 to 120, 200 to 230 VAC; 12, 24, 48, 100 to 110, 125 VDC	DPDT	H3YN-2	H3YN-21
	4PDT	H3YN-4	H3YN-41
24 VDC	4PDT (Twin contacts)	H3YN-4-Z	H3YN-41-Z

Note: Specify both the model number and supply voltage when ordering.

Example: H3YN-2 24 VAC

Supply voltage

Accessories (Order Separately)

Connecting Socket

Timer	DIN-rail mounting/Front Connecting Socket	Back Connecting Socket		
		Solder terminal	Wire-wrap terminal	PC terminal
H3YN-2/-21	PYF08A, PYF08A-N, PYF08A-E	PY08	PY08QN(2)	PY08-02
H3YN-4/-41 H3YN-4-Z/-41-Z	PYF14A, PYF14A-N, PYF14A-E	PY14	PY14QN(2)	PY14-02

Hold-down Clips

Model	Applicable Socket
Y92H-3	PYF08A, PYF08A-N, PYF08A-E PYF14A, PYF14A-N, PYF14A-E
Y92H-4	PY08, PY08QN(2), PY08-02 PY14, PY14QN(2), PY14-02

Specifications

■ Ratings

Item	H3YN-2/-4/-4-Z	H3YN-21/-41/-41-Z
Time ranges	0.1 s to 10 min (1 s, 10 s, 1 min, or 10 min max. selectable)	0.1 min to 10 h (1 min, 10 min, 1 h, or 10 h max. selectable)
Rated supply voltage	24, 100 to 120, 200 to 230 VAC (50/60 Hz) 12, 24, 48, 100 to 110, 125 VDC (see note 1)	
Pin type	Plug-in	
Operating mode	ON-delay, interval, flicker OFF start, or flicker ON start (selectable with DIP switch)	
Operating voltage range	85% to 110% of rated supply voltage (12 VDC: 90% to 110% of rated supply voltage) (see note 2)	
Reset voltage	10% min. of rated supply voltage (see note 3)	
Power consumption	100 to 120 VAC: Relay ON: approx. 1.8 VA (1.6 W) at 120 VAC, 60 Hz Relay OFF: approx. 1 VA (0.6 W) at 120 VAC, 60 Hz 200 to 230 VAC: Relay ON: approx. 2.2 VA (1.8 W) at 230 VAC, 60 Hz Relay OFF: approx. 1.5 VA (1.1 W) at 230 VAC, 60 Hz 24 VAC: Relay ON: approx. 1.8 VA (1.4 W) at 24 VAC, 60 Hz Relay OFF: approx. 0.3 VA (0.2 W) at 24 VAC, 60 Hz 12 VDC: Relay ON: approx. 1.1 W at 12 VDC Relay OFF: approx. 0.1 W at 12 VDC 24 VDC: Relay ON: approx. 1.1 W at 24 VDC Relay OFF: approx. 0.1 W at 24 VDC 48 VDC: Relay ON: approx. 1.2 W at 48 VDC Relay OFF: approx. 0.3 W at 48 VDC 100 to 110 VDC: Relay ON: approx. 1.6 W at 110 VDC Relay OFF: approx. 0.4 W at 110 VDC 125 VDC: Relay ON: approx. 1.6 W at 125 VDC Relay OFF: approx. 0.4 W at 125 VDC	
Control outputs	DPDT: 5 A at 250 VAC, resistive load (cosφ = 1) 4PDT: 3 A at 250 VAC, resistive load (cosφ = 1)	

Note: 1. Single-phase, full-wave-rectified power supplies can be used.

2. When using the H3YN continuously in any place where the ambient temperature is in a range of 45°C to 50°C, supply 90% to 110% of the rated supply voltages (supply 95% to 110% with 12 VDC type).
3. Set the reset voltage as follows to ensure proper resetting.
 - 100 to 120 VAC: 10 VAC max.
 - 200 to 230 VAC: 20 VAC max.
 - 100 to 110 VDC: 10 VDC max.

■ Characteristics

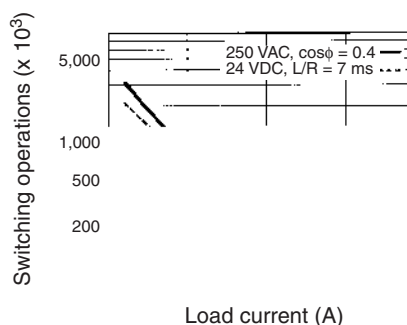
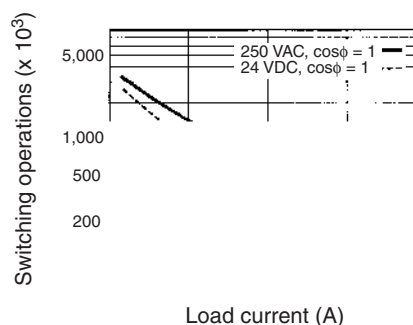
Item	H3YN-2/-21/-4/-41
Accuracy of operating time	±1% FS max. (1 s range: ±1%±10 ms max.)
Setting error	±10%±50 ms FS max.
Reset time	Min. power-opening time: 0.1 s max. (including halfway reset)
Influence of voltage	±2% FS max.
Influence of temperature	±2% FS max.
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying terminals and exposed non-current-carrying metal parts) (see note 1) 2,000 VAC, 50/60 Hz for 1 min (between operating power circuit and control output) 2,000 VAC, 50/60 Hz for 1 min (between different pole contacts; 2-pole model) 1,500 VAC, 50/60 Hz for 1 min (between different pole contacts; 4-pole model) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 10 to 55 Hz, 0.75-mm single amplitude for 1 h each in 3 directions Malfunction: 10 to 55 Hz, 0.5-mm single amplitude for 10 min each in 3 directions
Shock resistance	Destruction: 1,000 m/s ² Malfunction: 100 m/s ²
Ambient temperature	Operating: -10°C to 50°C (with no icing) Storage: -25°C to 65°C (with no icing)
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 10,000,000 operations min. (under no load at 1,800 operations/h) Electrical: DPDT: 500,000 operations min. (5 A at 250 VAC, resistive load at 1,800 operations/h) 4PDT: 200,000 operations min. (H3YN-4-Z/-41-Z: 100,000 operations min.) (3 A at 250 VAC, resistive load at 1,800 operations/h) (see note 2)
Impulse withstand voltage	Between power terminals: 3 kV for 100 to 120 VAC, 200 to 230 VAC, 100 to 110 VDC, 125 VDC 1 kV for 12 VDC, 24 VDC, 48 VDC, 24 VAC Between exposed non-current-carrying metal parts: 4.5 kV for 100 to 120 VAC, 200 to 230 VAC, 100 to 110 VDC, 125 VDC 1.5 kV for 12 VDC, 24 VDC, 48 VDC, 24 VAC
Noise immunity	±1.5 kV, square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Destruction: 8 kV Malfunction: 4 kV
Degree of protection	IP40
Weight	Approx. 50 g
EMC	(EMI) Emission Enclosure: EN61812-1 EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A (EMS) EN61812-1 Immunity ESD: EN61000-4-2: 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4) Immunity Surge: EN61000-4-5: 2 kV line to ground (level 3) 1 kV line to line (level 3)
Approved standards	UL508, CSA C22.2 No. 14, Lloyds Conforms to EN61812-1 and IEC60664-1. (2.5 kV/2 for H3YN-2/-21, 2.5 kV/1 for H3YN-4/-41, H3YN-4-Z/-41-Z) Output category according to EN60947-5-1.

Note: 1. Terminal screw sections are excluded.

2. Refer to the *Life-test Curve*.

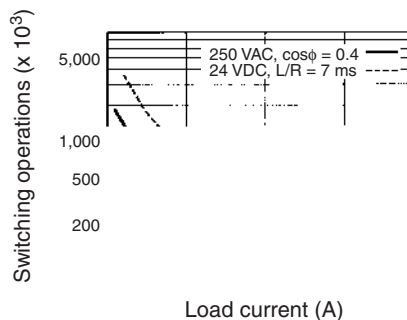
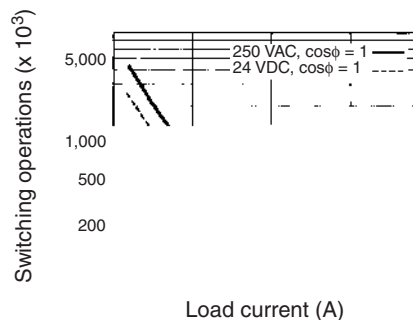
Life-test Curve (Reference Value)

H3YN-2/-21



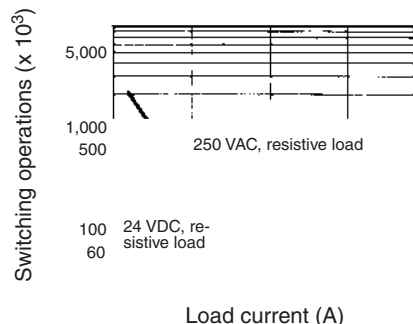
Reference: A maximum current of 0.6 A can be switched at 125 VDC ($\cos\phi = 1$).
Maximum current of 0.2 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.
The minimum applicable load is 1 mA at 5 VDC (P reference value).

H3YN-4/-41



Reference: A maximum current of 0.5 A can be switched at 125 VDC ($\cos\phi = 1$).
Maximum current of 0.2 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 1 mA at 1 VDC (P reference value).

H3YN-4-Z/-41-Z

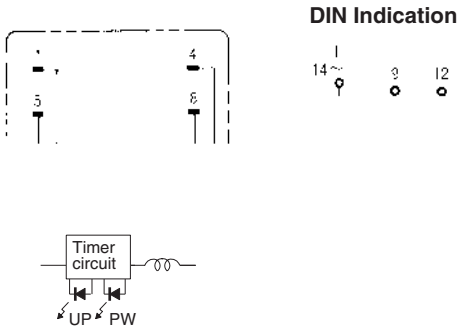


Reference: A maximum current of 0.5 A can be switched at 125 VDC ($\cos\phi = 1$).
Maximum current of 0.2 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.
The minimum applicable load is 0.1 mA at 1 VDC (P reference value).

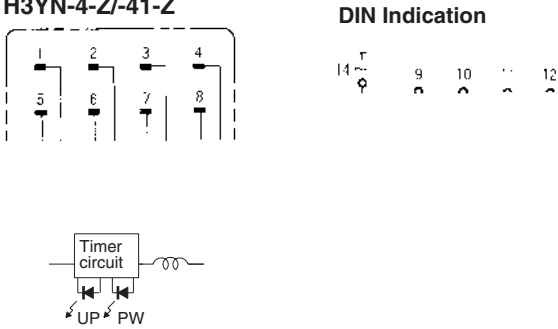
Connections

■ Connection

H3YN-2/-21



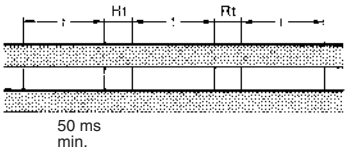
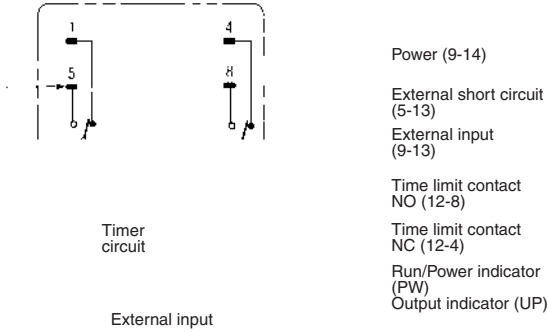
H3YN-4/-41 H3YN-4-Z/-41-Z



Pulse Operation

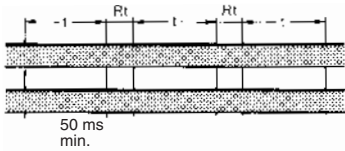
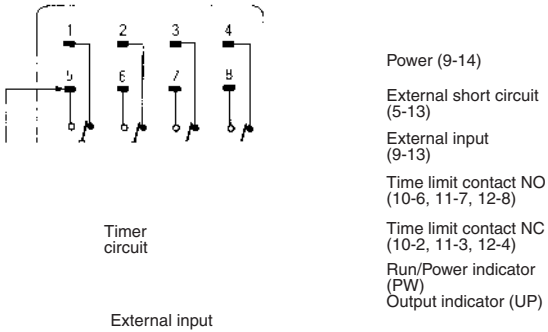
A pulse output for a certain period can be obtained with a random external input signal.
Use the H3YN in interval mode as shown in the following timing charts.

H3YN-2/-21



Note: t: Set time
Rt: Reset time

H3YN-4/-41 H3YN-4-Z/-41-Z



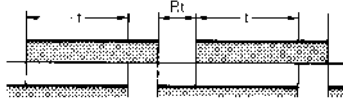
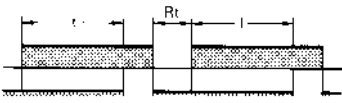
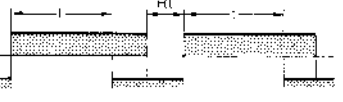
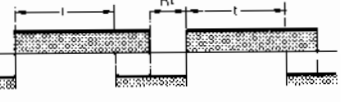
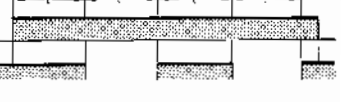
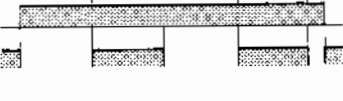
Note: t: Set time
Rt: Reset time

Caution
Be careful when connecting wires.

Mode	Terminals
Pulse operation	Power supply between 9 and 14 Short-circuit between 5 and 13 Input signal between 9 and 13
Operating mode; interval and all other modes	Power supply between 13 and 14

Operation

■ Timing Chart

Operating mode	Timing chart	
	H3YN-2/-21	H3YN-4/-41
ON-delay Power  Output 	Power (13-14)  Time limit contact NC (9-1, 12-4) Time limit contact NO (9-5, 12-8) Run/Power indicator (PW) Output indicator (UP)	Power (13-14)  Time limit contact NC (9-1, 10-2, 11-3, 12-4) Time limit contact NO (9-5, 10-6, 11-7, 12-8) Run/Power indicator (PW) Output indicator (UP)
Interval Power  Output 	Power (13-14)  Time limit contact NC (9-1, 12-4) Time limit contact NO (9-5, 12-8) Run/Power indicator (PW) Output indicator (UP)	Power (13-14)  Time limit contact NC (9-1, 10-2, 11-3, 12-4) Time limit contact NO (9-5, 10-6, 11-7, 12-8) Run/Power indicator (PW) Output indicator (UP)
Flicker OFF-start Power  Output 	Power (13-14)  Time limit contact NC (9-1, 12-4) Time limit contact NO (9-5, 12-8) Run/Power indicator (PW) Output indicator (UP)	Power (13-14)  Time limit contact NC (9-1, 10-2, 11-3, 12-4) Time limit contact NO (9-5, 10-6, 11-7, 12-8) Run/Power indicator (PW) Output indicator (UP)
Flicker ON-start Power  Output 	Power (13-14)  Time limit contact NC (9-1, 12-4) Time limit contact NO (9-5, 12-8) Run/Power indicator (PW) Output indicator (UP)	Power (13-14)  Time limit contact NC (9-1, 10-2, 11-3, 12-4) Time limit contact NO (9-5, 10-6, 11-7, 12-8) Run/Power indicator (PW) Output indicator (UP)

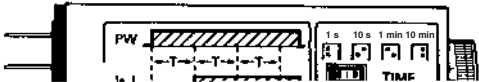
Note: t: Set time
Rt: Reset time

DIP Switch Settings

The 1-s range and ON-delay mode for H3YN-2/-4/-4-Z, the 1-min range and ON-delay mode for H3YN-21/-41/-41-Z are factory-set before shipping.

Time Ranges

Model	Time range	Time setting range	Setting	Factory-set
H3YN-2, H3YN-4 H3YN-4-Z	1 s	0.1 to 1 s		Yes
	10 s	1 to 10 s		No
	1 min	0.1 to 1 min		No
	10 min	1 to 10 min		No
H3YN-21, H3YN-41 H3YN-41-Z	1 min	0.1 to 1 min		Yes
	10 min	1 to 10 min		No
	1 h	0.1 to 1 h		No
	10 h	1 to 10 h		No



Note: The top two DIP switch pins are used to select the time ranges.

Operating Modes

Operating mode	Setting	Factory-set
ON-delay		Yes
Interval		No
Flicker OFF-start		No
Flicker ON-start		No

Note: The bottom two DIP switch pins are used to select the operating mode.

Nomenclature

Output Indicator (Orange)
(Lit: Output ON)

Run/Power Indicator (Green)
(Lit: Power ON)

Main Dial

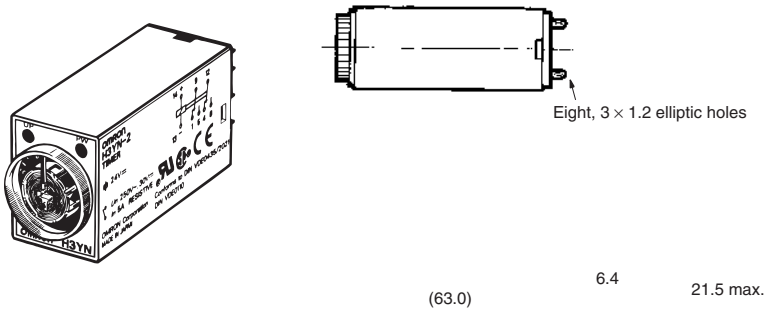
Set the desired time according to time range selectable by DIP switch.

Dimensions

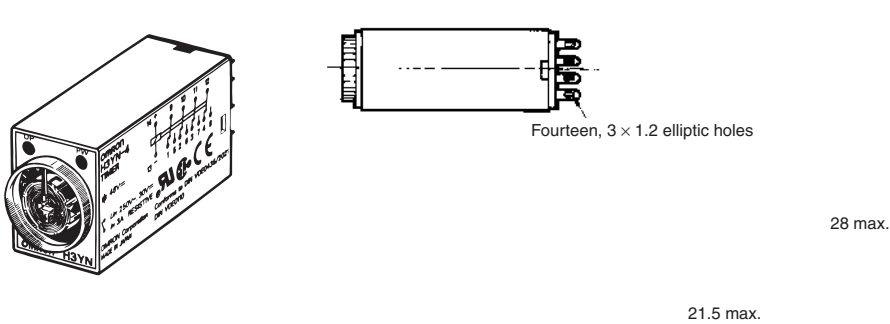
Note: All units are in millimeters unless otherwise indicated.

■ Timers

H3YN-2/-21 Front Mounting



H3YN-4/-41 Front Mounting H3YN-4-Z/-41-Z



Mounting Height

PYF08A/PYF08A-N/PYF08A-E (PYF14A/PYF14A-N/PYF14A-E (see note))



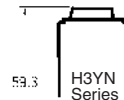
PYF08A (PYF14A)

PY08 (PY14 (see note))



PY08 (PY14)

PY08QN (PY14QN (see note))



PY08QN
(PY14QN)

Note: Models in parentheses are Connecting Sockets to the H3YN-4/-41 or H3YN-4-Z/-41-Z.

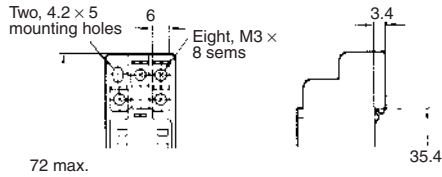
■ Accessories (Order Separately)

Connecting Sockets

Use the PYF□A, PY□, PY□-02, or PY□QN(2) to mount the H3YN. When ordering any one of these Sockets, replace "□" with "08" or "14."

Track Mounting/Front Connecting Sockets

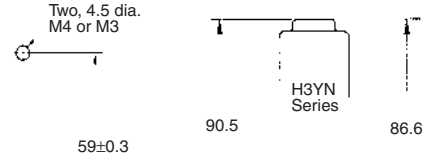
PYF08A



Terminal Arrangement (Top View)

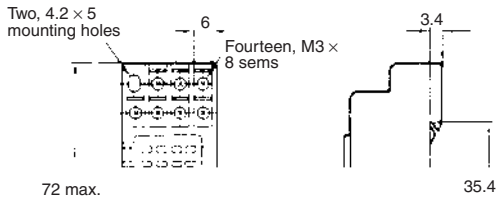


Mounting Holes



15±0.2 PYF□A

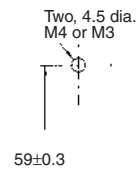
PYF-14A



Terminal Arrangement (Top View)

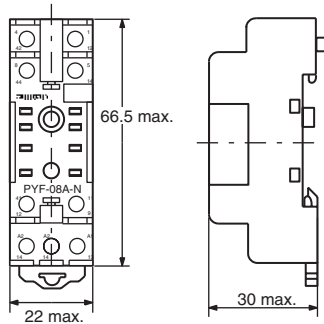


Mounting Holes

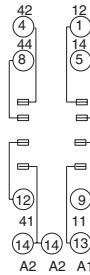


22±0.2

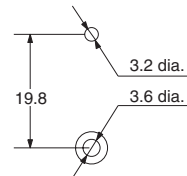
PYF-08A-N



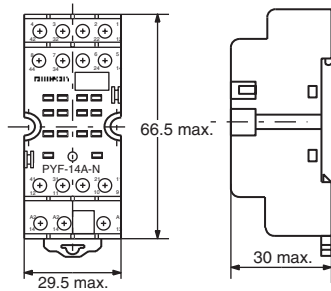
Terminal Arrangement



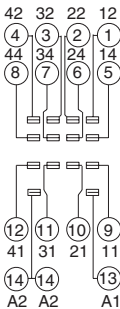
Mounting Holes (for Surface Mounting)



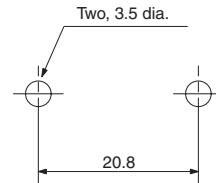
PYF-14A-N



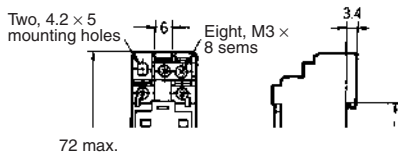
Terminal Arrangement



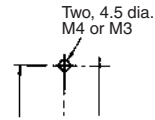
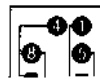
Mounting Holes (for Surface Mounting)



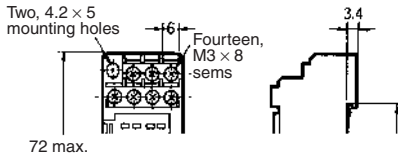
PYF08A-E



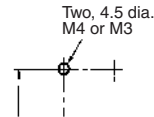
(Top View)



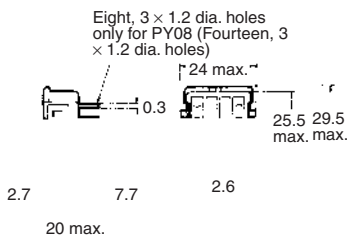
PYF14A-E



(Top View)



Back Connecting Sockets PY08, PY14



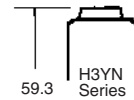
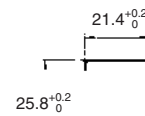
Terminal Arrangement
(Bottom View)



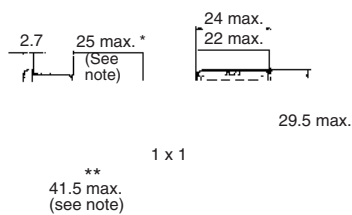
PY08

PY14

Panel Cutout



PY08QN, PY14QN PY08QN(2), PY14QN(2)



Terminal Arrangement
(Bottom View)



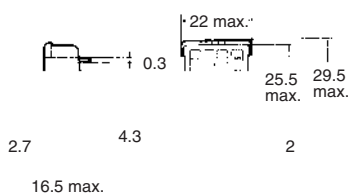
PY08QN
PY08QN(2)

PY14QN
PY14QN(2)

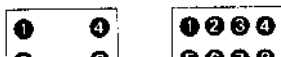
PY□, PY□-02,
PY□QN(2)

Note: With PY□QN(2)-(3), dimension * should read 20 max. and dimension ** 36.5 max.

PY08-02, PY14-02



Terminal Arrangement
(Bottom View)

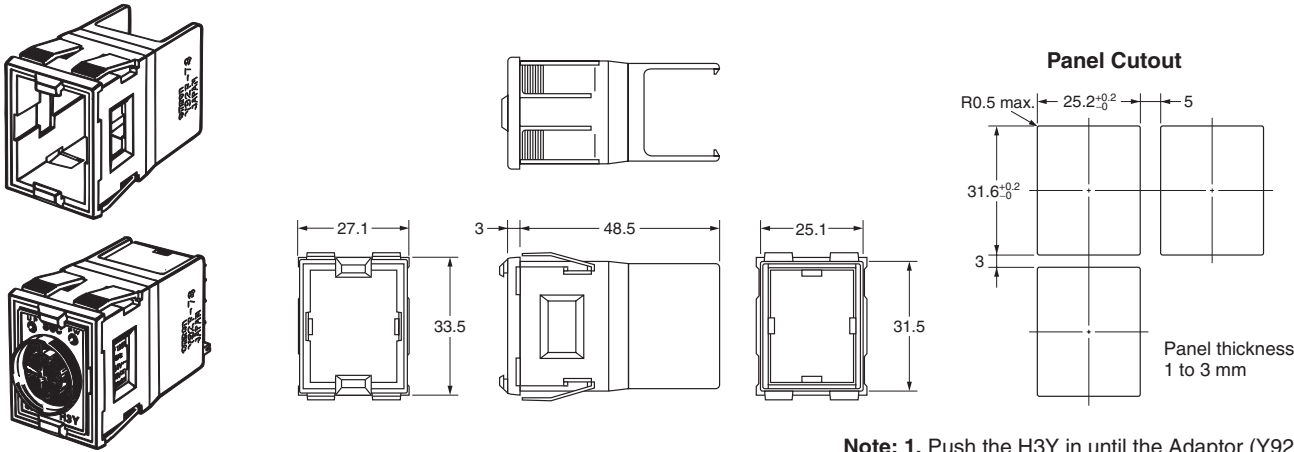


PY08□-02

PY14□-02

Flush Mounting Adapter

Y92F-78

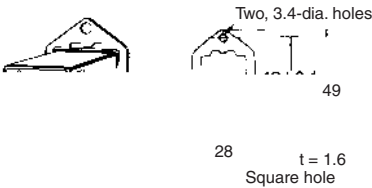


- Note:** 1. Push the H3Y in until the Adaptor (Y92F-78) hooks engage with its rear panel.
2. Do not round the corners of the cutout on the rear panel surface, otherwise the Adaptor (Y92F-78) tabs may not engage properly.

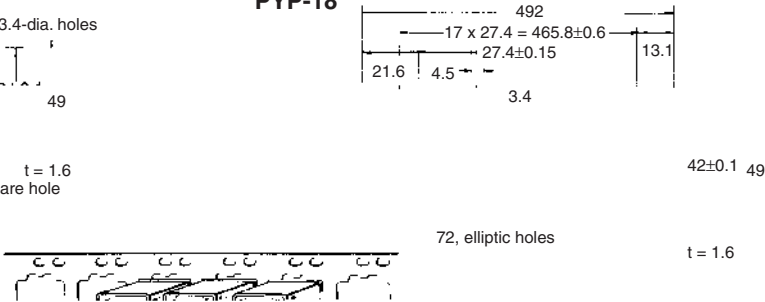
Socket Mounting Plates

The PYP-1 is a Socket Mounting Plate for a single Socket and the PYP-18 is a Socket Mounting Plate for 18 Sockets. The PYP-18 can be cut appropriately according to the number of Sockets to be used.

PYP-1



PYP-18



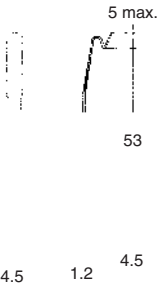
Hold-down Clips

The Hold-down Clip makes it possible to mount the H3YN securely and prevent the H3YN from falling out due to vibration or shock.

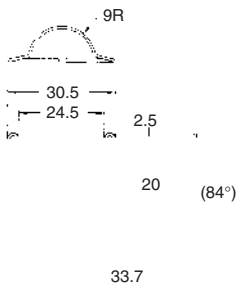
Y92H-3
Y92H-4



Y92H-3 for
PYF□A Socket
(Set of Two Clips)



Y92H-4 for
PY□ Socket

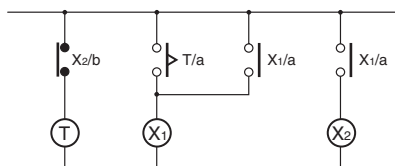


Precautions

■ Correct Use

The operating voltage will increase when using the H3YN continuously in any place where the ambient temperature is in a range of 45°C to 50°C. Supply 90% to 110% of the rated voltages (at 12 VDC: 95% to 110%).

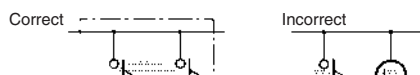
Do not leave the H3YN in time-up condition for a long period of time (for example, more than one month in any place where the ambient temperature is high), otherwise the internal parts (aluminum electrolytic capacitor) may become damaged. Therefore, the use of the H3YN with a relay as shown in the following circuit diagram is recommended to extend the service life of the H3YN.



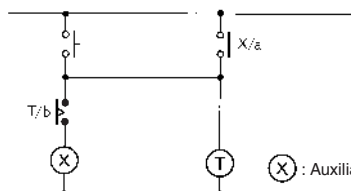
⊗ : Auxiliary relay such as MY Relay

The H3YN must be disconnected from the Socket when setting the DIP switch, otherwise the user may touch a terminal imposed with a high voltage and get an electric shock.

Do not connect the H3YN as shown in the following circuit diagram on the right hand side, otherwise the H3YN's internal contacts different from each other in polarity may become short-circuited.



Use the following safety circuit when building a self-holding or self-resetting circuit with the H3YN and an auxiliary relay, such as an MY Relay, in combination.



⊗ : Auxiliary relay such as MY Relay

In the case of the above circuit, the H3YN will be in pulse operation. Therefore, if the circuit shown on page C-73 is used, no auxiliary relay will be required.

Do not set to the minimum setting in the flicker modes, otherwise the contact may become damaged.

Be careful not to apply any voltage to the terminal screws on the back of the Timer. Mount the product so that the screws will not come in contact with the panel or metal parts.

Do not use the H3YN in places where there is excessive dust, corrosive gas, or direct sunlight.

Do not mount more than one H3YN closely together, otherwise the internal parts may become damaged. Make sure that there is a space of 5 mm or more between any H3YN models next to each other to allow heat radiation.

The internal parts may become damaged if a supply voltage other than the rated ones is imposed on the H3YN.

In order to conform to UL and CSA requirements when using the H3YN-4/-41 or H3YN-4-Z/-41-Z, connect the Unit so that output contacts (contacts of different poles) have the same electric potential.

In cases such as PLC input where the load is extremely small for the control output of a timer containing a power relay (using other than gold-plated contacts), reliability can be increased by using contacts of the same poles (e.g., the H3Y-2) in parallel.

■ Precautions for EN61812-1 Conformance

The H3YN as a built-in timer conforms to EN61812-1 provided that the following conditions are satisfied.

Handling

Do not touch the DIP switch while power is supplied to the H3YN.

Before dismounting the H3YN from the Socket, make sure that no voltage is imposed on any terminal of the H3YN.

The applicable Socket is the PYF□A.

Only basic insulation is ensured between the Y92H-3 Hold-down Clips and H3YN internal circuits.

Do not allow the Y92H-3 Hold-down Clips to contact other parts.

The insulation test voltage between different pole contacts for the 4-pole model is the impulse voltage of 2.95 kV.

Wiring

The power supply for the H3YN must be protected with equipment such as a breaker approved by VDE.

Basic insulation is ensured between the H3YN's operating circuit and control output.

Basic insulation: Overvoltage category II, pollution degree 1 (H3YN-4/-41, H3YN-4-Z/-41-Z), pollution degree 2 (H3YN-2/-21) (with a clearance of 1.5 mm and a creepage distance of 2.5 mm at 240 VAC)

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Solid-state Timer

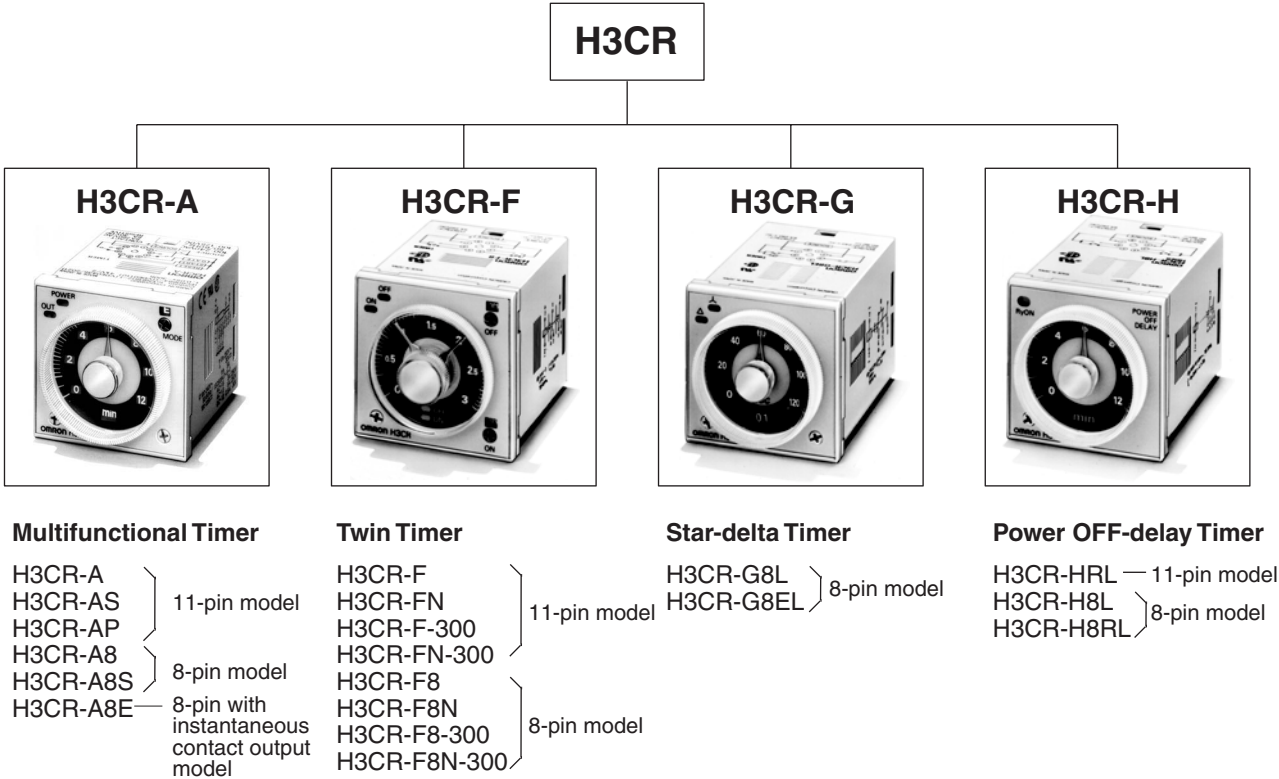
H3CR

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* (CD), and *Safety Precautions* (pages C-103, C-124, *Common to H3CR* on CD).

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



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

Contents

Solid-state Timer

H3CR-A.....	C-83
H3CR-F.....	C-105
H3CR-G.....	C-111
H3CR-H.....	C-117

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 C-84 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				
	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 DIN-rail	50 cm () x 7.3 mm (t)	PFP-50N
	1 m () x 7.3 mm (t)	PFP-100N
	1 m () x 16 mm (t)	PFP-100N2
End Plate		PFP-M
Spacer		PFP-S
Protective Cover		Y92A-48B
DIN-rail 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-rail 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 k Ω max. ON residual voltage: 1 V max. OFF impedance: 100 k Ω 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 ($\cos\phi = 1$) 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:**
- DC ripple rate: 20% max. if the power supply incorporates a single-phase, full-wave rectifier.
 - 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.
 - 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.

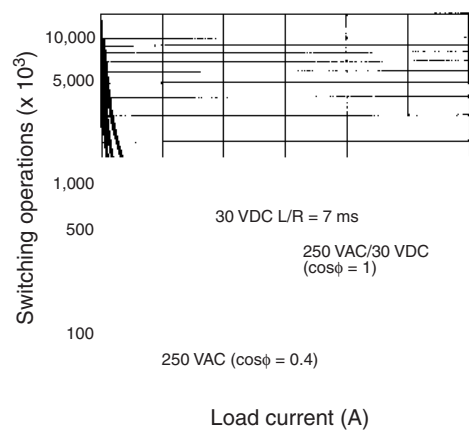
■ Characteristics

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/s ² 3 times each in 6 directions Malfunction: 100 m/s ² 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) Emission Enclosure: EN61812-1 Emission AC Mains: EN55011 Group 1 class A (EMS) 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" on page C-88.

Life-test Curve

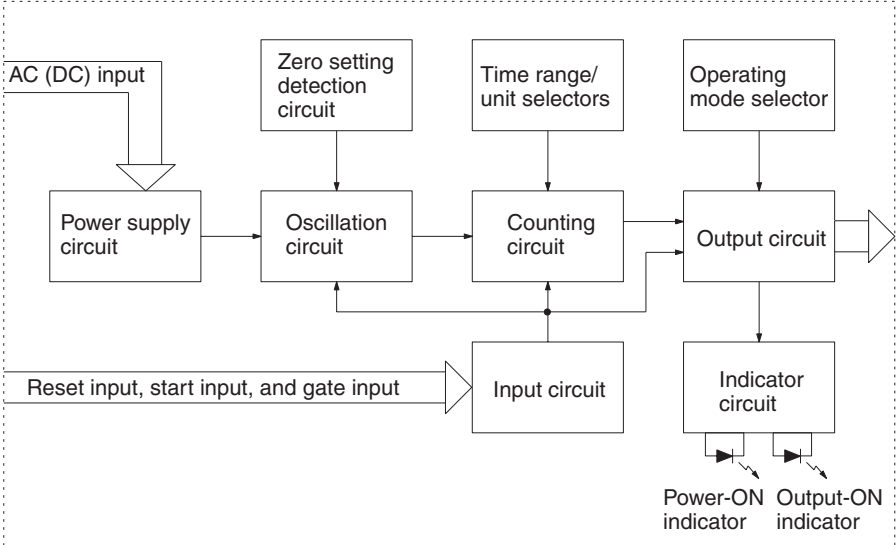


Reference: A maximum current of 0.15 A can be switched at 125 VDC ($\cos\phi = 1$) and a maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 10 mA (100 mA for H3CR-A8E) at 5 VDC (failure level: P).

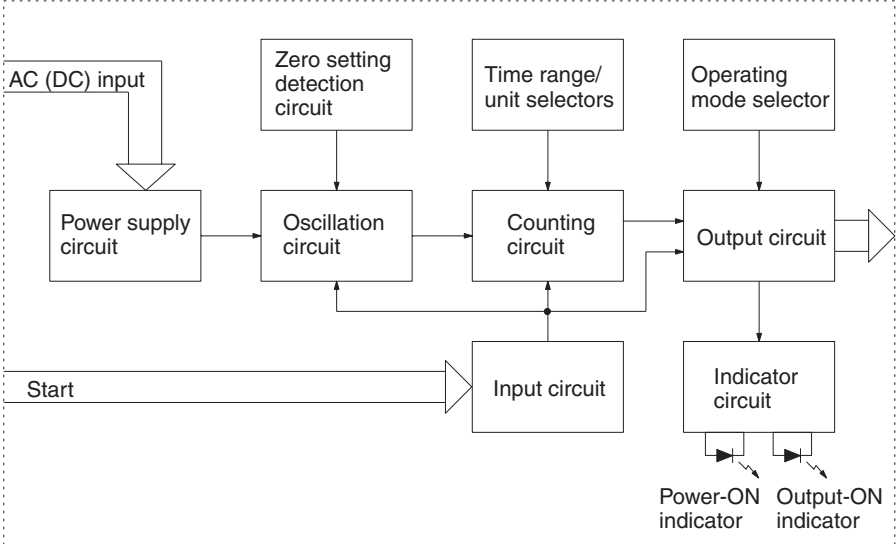
Connections

■ Block Diagrams

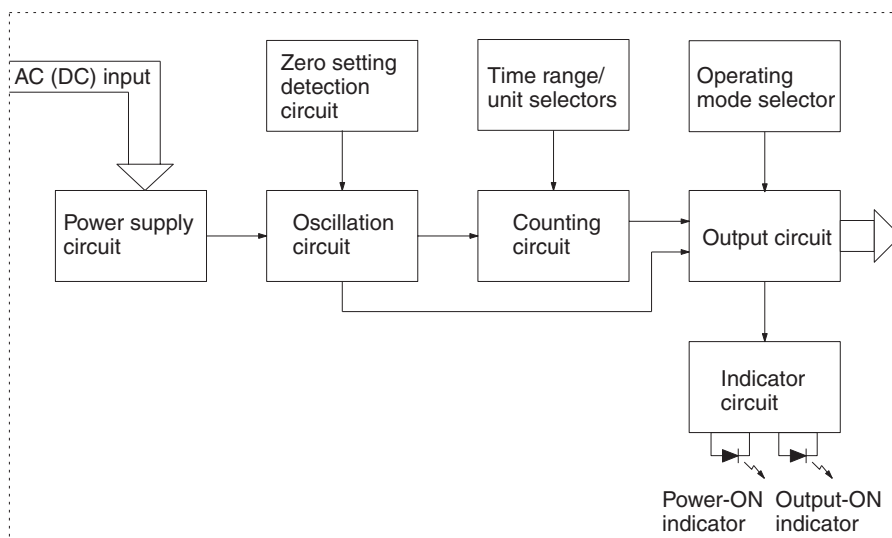
H3CR-A/AS



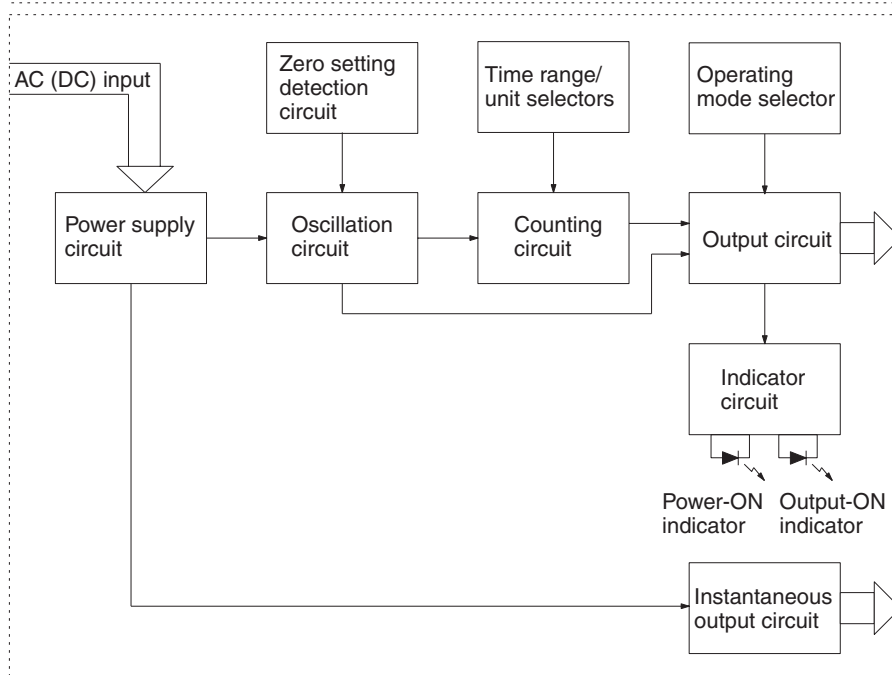
H3CR-AP



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.

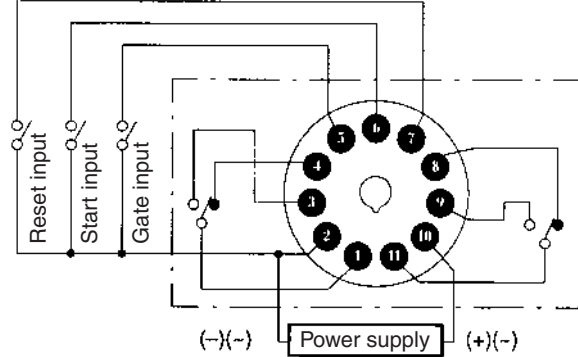
Terminal Arrangement

Note: The delayed contact of conventional Timers was indicated as 

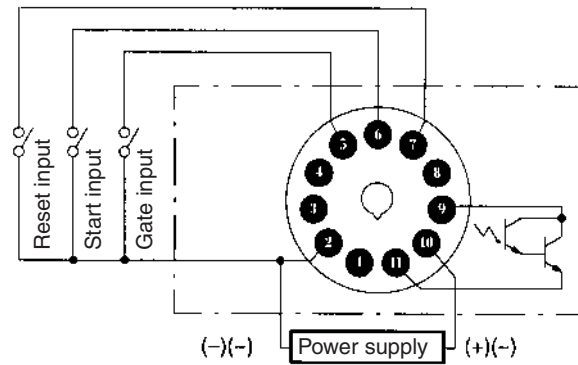
The contact symbol of the H3CR-A is indicated as  because its operating mode is six multi-modes (four multi-modes for the H3CR-A8).

11-pin Models

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

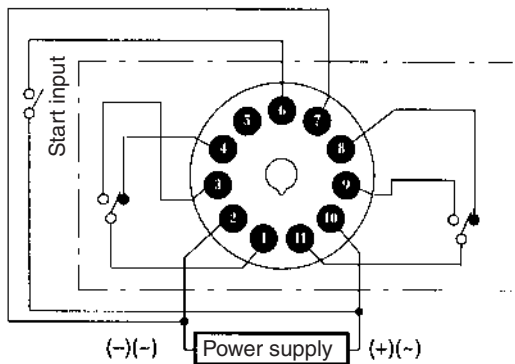


H3CR-AS (Transistor Output)



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

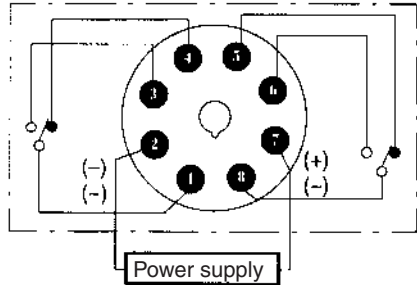
H3CR-AP (Contact Output)



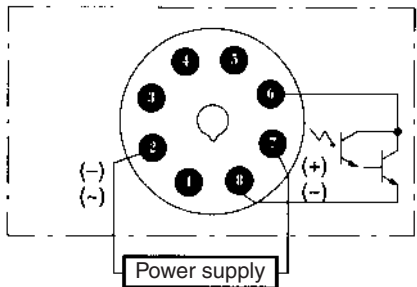
- Note:**
- Terminal 5 is empty.
 - Separate power supplies can be used for the Timer and inputs.

8-pin Models

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

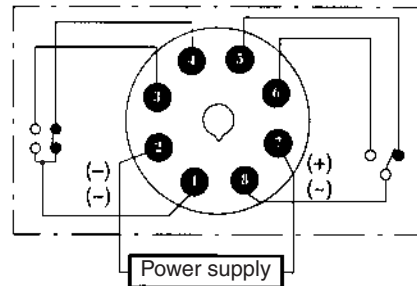


H3CR-A8S (Transistor Output)



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

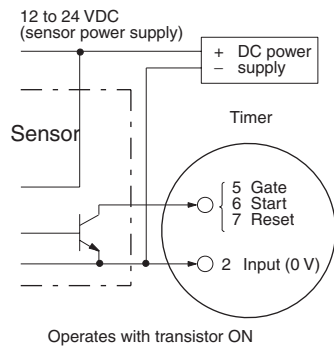
H3CR-A/-AS

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

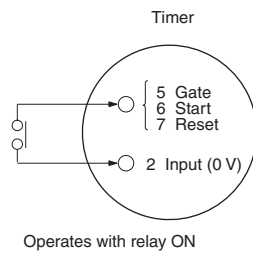
No-voltage Inputs

No-contact Input

(Connection to NPN open collector output sensor.)

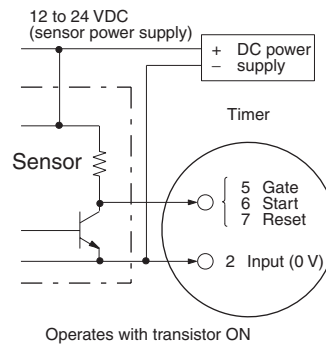


Contact Input



No-contact Input

(Connection to a voltage output sensor.)



No-voltage Input Signal Levels

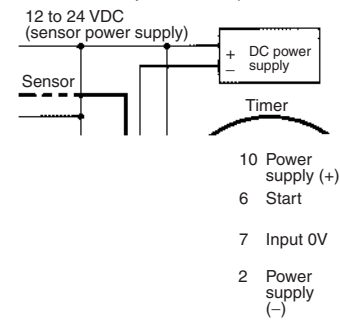
No-contact input	1. Short-circuit level Transistor ON Residual voltage: 1 V max. Impedance when ON: 1 kΩ max.
	2. Open level Transistor OFF Impedance when OFF: 100 kΩ min.
Contact input	Use contacts which can adequately switch 0.1 mA at 5 V

H3CR-AP

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

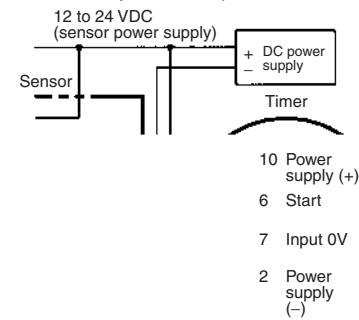
Voltage Inputs

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



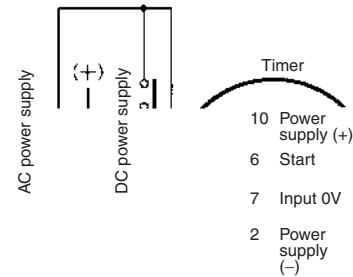
Operates with PNP transistor ON

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



Operates with NPN transistor ON

Contact Input



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

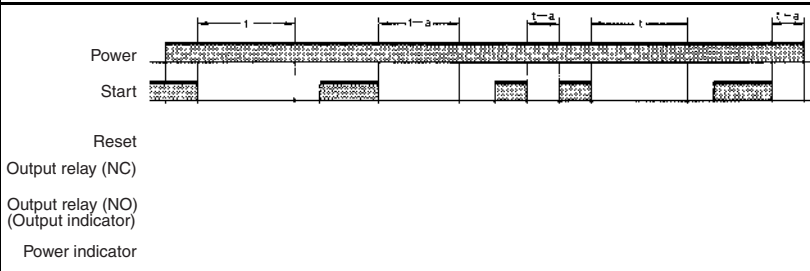
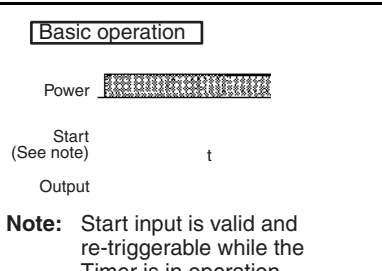
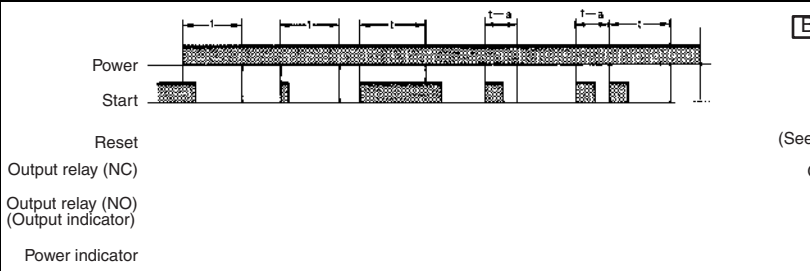
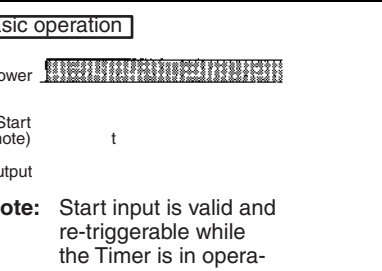
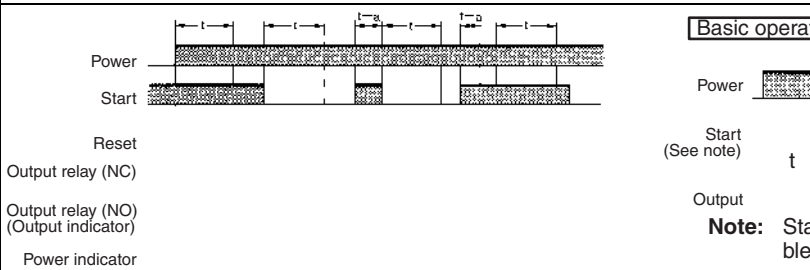
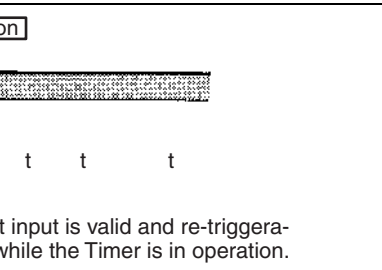
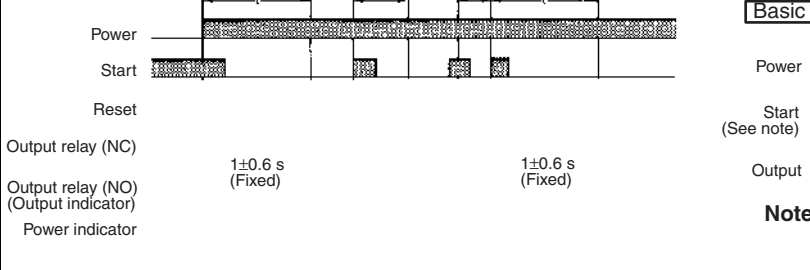
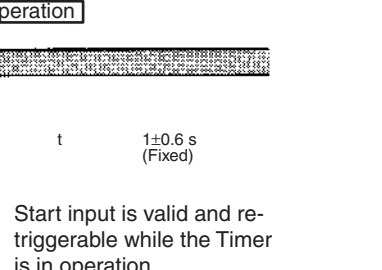
■ Timing Chart

- 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.

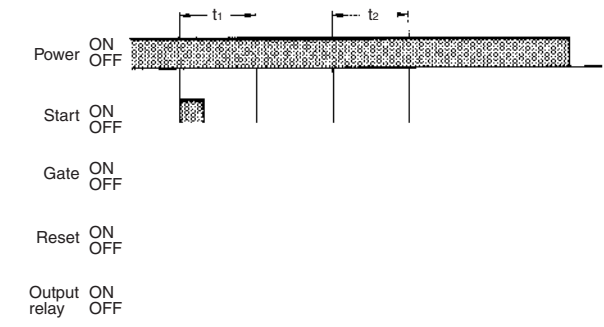
H3CR-A/-AS/-AP*

*H3CR-AP model incorporates start input only.

Operating mode	Timing chart	
A: ON-delay	Note: Start input is invalid while the Timer is in operation.	
B: Flicker OFF start	Note: Start input is invalid while the Timer is in operation.	
B2: Flicker ON start	Note: Start input is invalid while the Timer is in operation.	
C: Signal ON/OFF-delay	Note: Start input is valid and re-triggerable while the Timer is in operation.	

Operating mode	Timing chart	
D: Signal OFF-delay	 Basic operation Note: Start input is valid and re-triggerable while the Timer is in operation.	
E: Interval	 Basic operation Note: Start input is valid and re-triggerable while the Timer is in operation.	
G: Signal ON/OFF-delay	 Basic operation Note: Start input is valid and re-triggerable while the Timer is in operation.	
J: One-shot output	 Basic operation Note: Start input is valid and re-triggerable while the Timer is in operation.	

Gate Signal Input



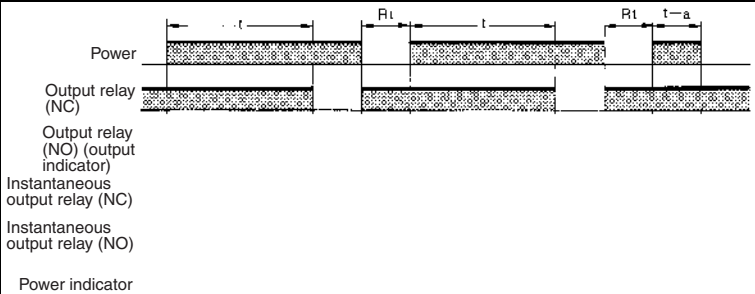
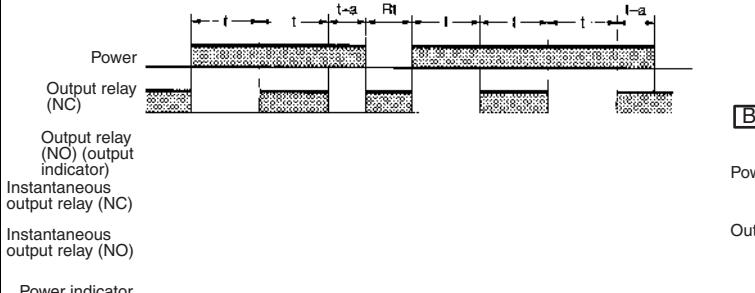
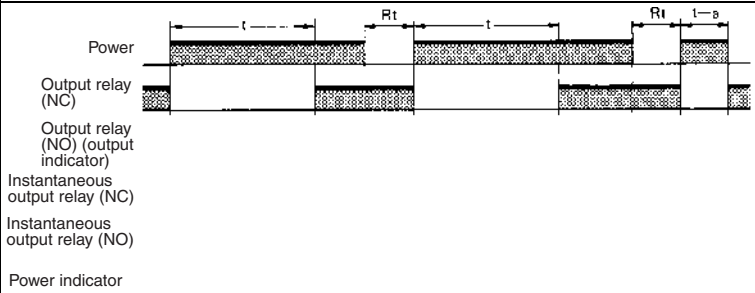
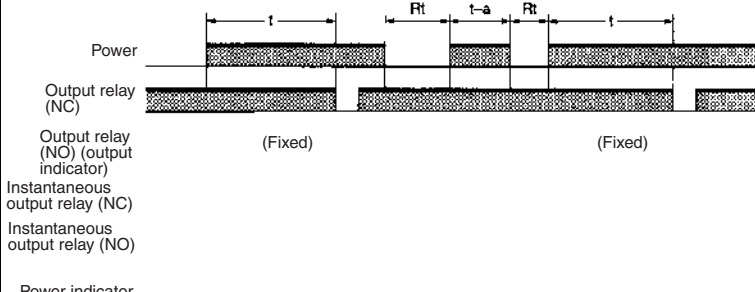
- Note:**
1. This timing chart indicates the gate input in operating mode A (ON-delay operation).
 2. The set time is the sum of t_1 and t_2 .
 3. H3CR-AP model incorporates start input only.

H3CR-A8/-A8S

Operating mode	Timing chart	
A: ON-delay		
B ₂ : Flicker ON start		
E: Interval		
J: One-shot output		

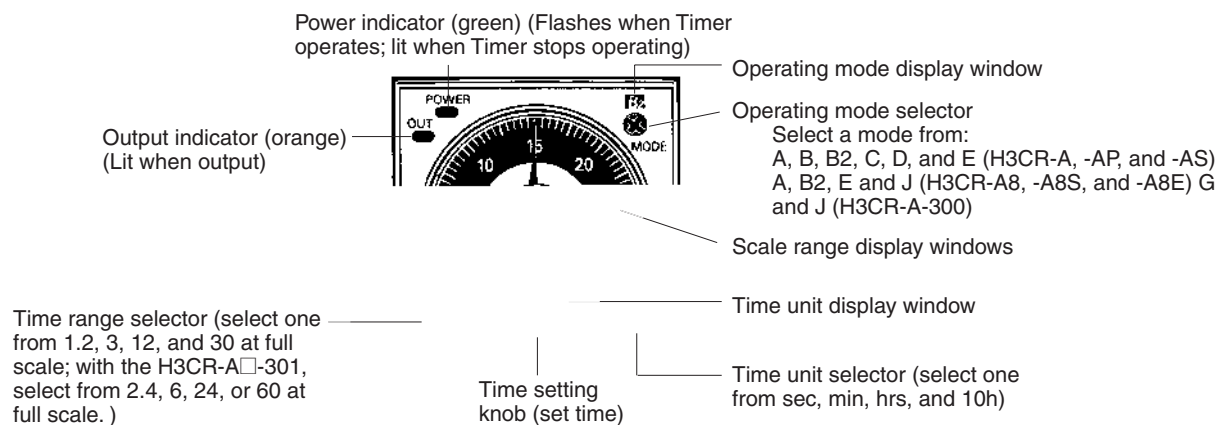
Note: 1. The minimum power-opening time ("Rt") is 0.1 s.
2. The letter "t" in the timing charts stands for the set time and "t-a" means that the period is less than the time set.

H3CR-A8E

Operating mode	Timing chart	
A: ON-delay	 Power Output relay (NC) Output relay (NO) (output indicator) Instantaneous output relay (NC) Instantaneous output relay (NO) Power indicator Basic operation Power Output t	
B ₂ : Flicker ON start	 Power Output relay (NC) Output relay (NO) (output indicator) Instantaneous output relay (NC) Instantaneous output relay (NO) Power indicator Basic operation Power Output t	
E: Interval	 Power Output relay (NC) Output relay (NO) (output indicator) Instantaneous output relay (NC) Instantaneous output relay (NO) Power indicator Basic operation Power Output t	
J: One-shot out-put	 Power Output relay (NC) Output relay (NO) (output indicator) Instantaneous output relay (NC) Instantaneous output relay (NO) Power indicator Basic operation Power Output t 1±0.6 s (Fixed)	

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.

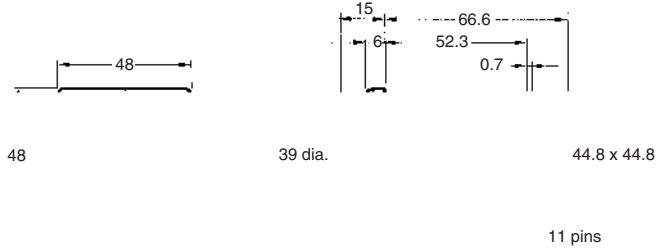
Nomenclature



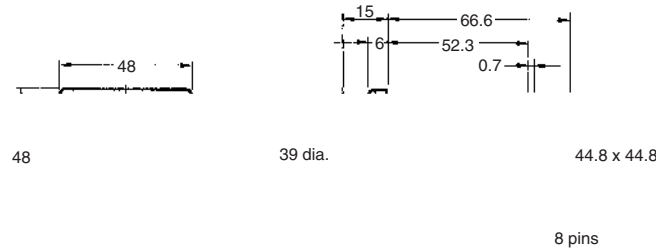
Dimensions

Note: All units are in millimeters unless otherwise indicated.

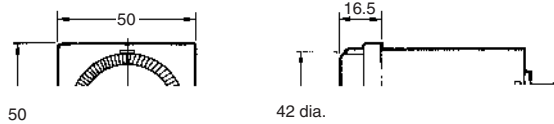
H3CR-A
H3CR-AP
H3CR-AS



H3CR-A8
H3CR-A8S
H3CR-A8E

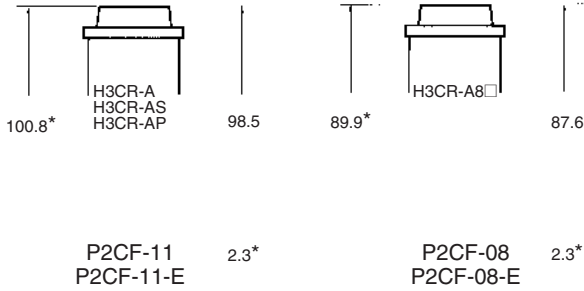


Dimensions with Set Ring



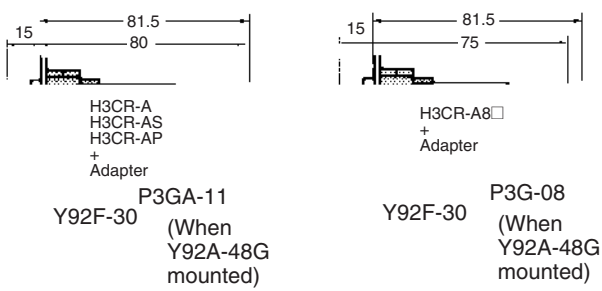
Dimensions with Front Connecting Socket

P2CF-08-□/ P2CF-11-□



Dimensions with Back Connecting Socket

P3G-08/ P3GA-11



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

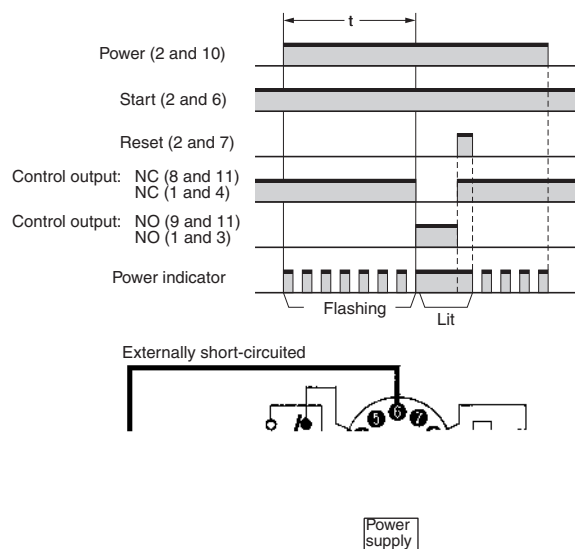
Application Examples (H3CR-A)

A Mode: ON-delay

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

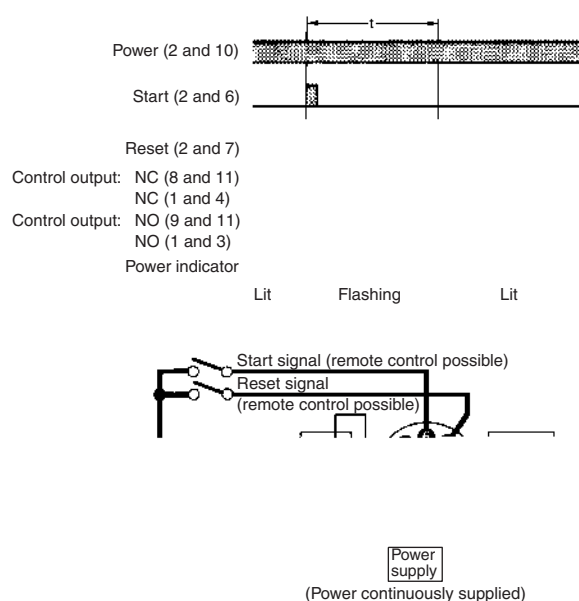
1. Power-ON Start/Power-OFF Reset

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



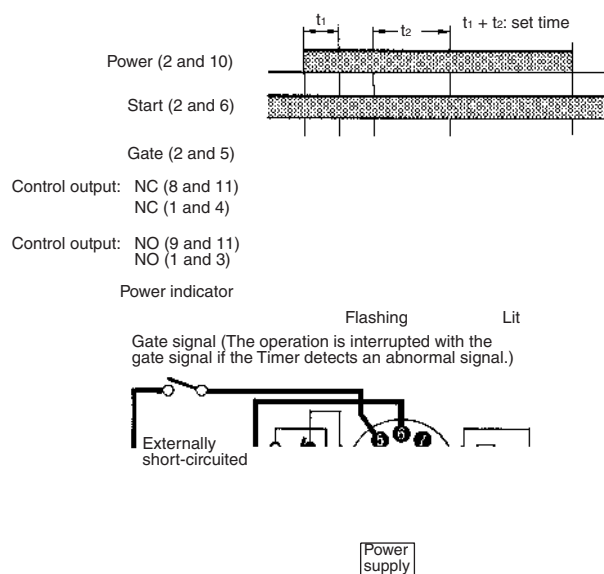
2. Signal Start/Signal Reset

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



3. Control of Integrated Time with Gate Signal

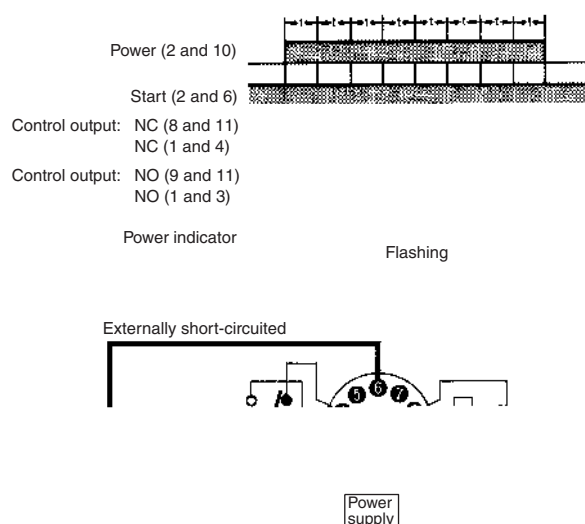
With a gate signal, the Power-ON start operation and Signal start operation can be controlled (the operation can be interrupted).



B/B2 Mode: Flicker

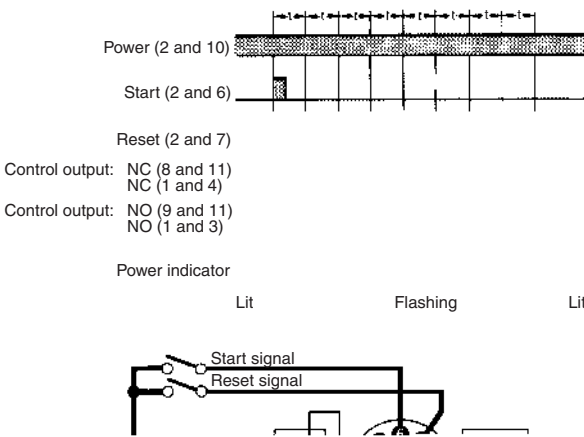
The flicker operation in the B and B2 modes can be effectively applied to lamp or buzzer (ON and OFF) alarms or the monitoring of an intermittent operation with a display.

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.



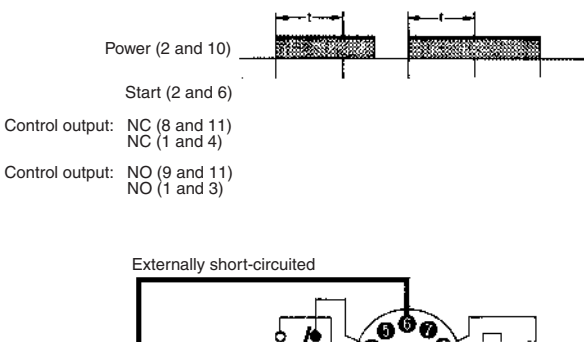
Power supply
(Power continuously supplied)

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.

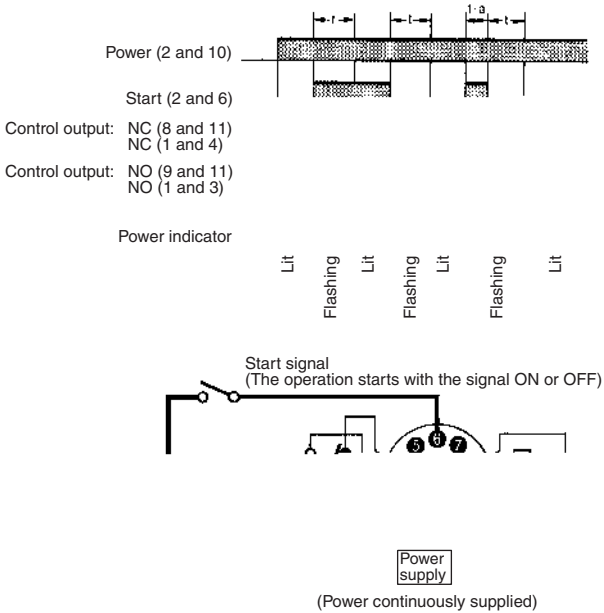
1. Power-ON Start/Instantaneous Operation/Time-limit Reset

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



Power supply

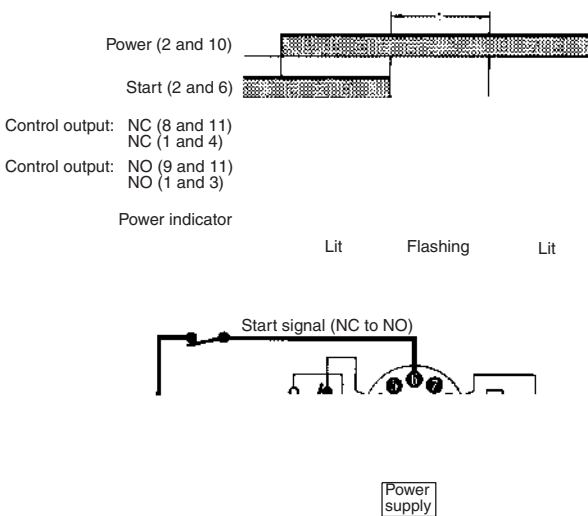
2. Signal-ON-OFF Start/Instantaneous Operation/Time-limit Reset



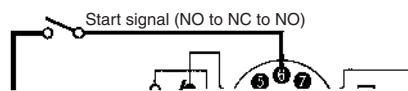
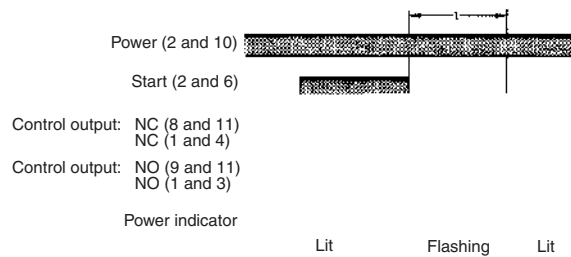
D Mode: Signal OFF-delay

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



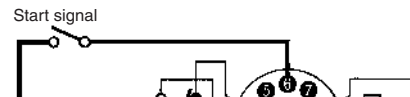
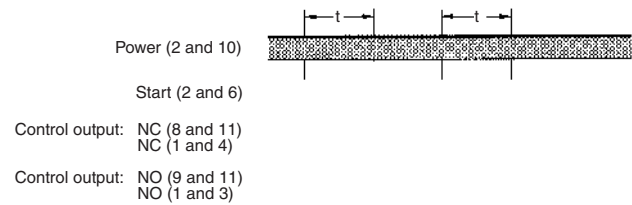
2. Signal Start/Instantaneous Operation/ Time-limit Reset



Power supply
(Power continuously supplied)

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.

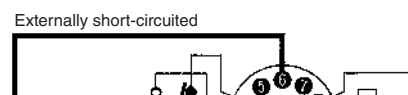
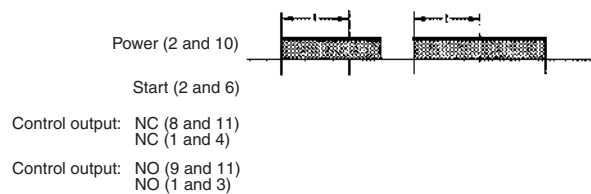


Power supply
(Power continuously supplied)

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.



Power supply

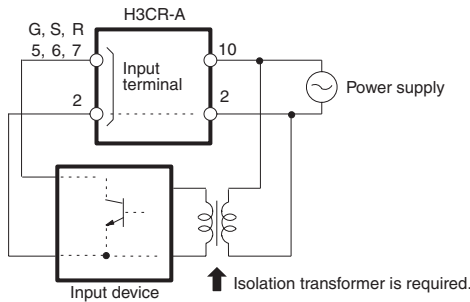
Safety Precautions (H3CR-A)

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

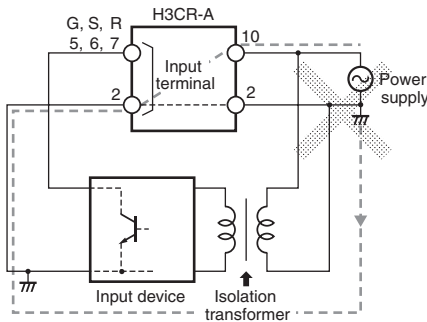
Power Supplies

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.

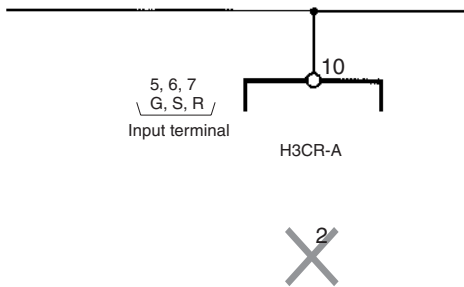
Correct



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.



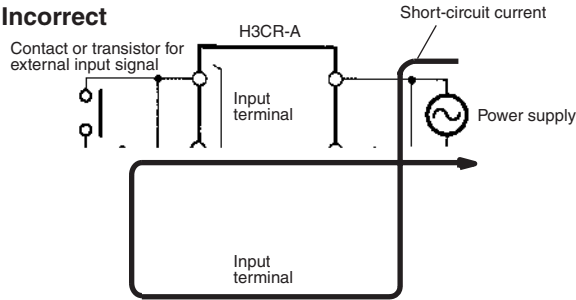
Make sure that the voltage is applied within the specified range, otherwise the internal elements of the Timer may be damaged.

Input/Output

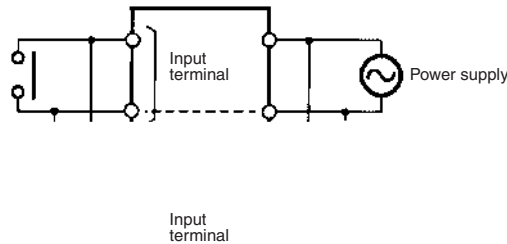
Relationship between Input and Power Supply Circuits (except for H3CR-A8E)

The H3CR-A (except for H3CR-A8E) uses transformerless power supply. When connecting a relay or transistor as an external 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.

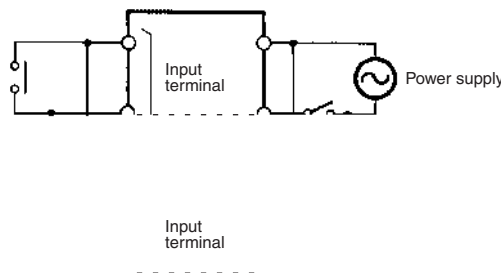
Incorrect



Correct



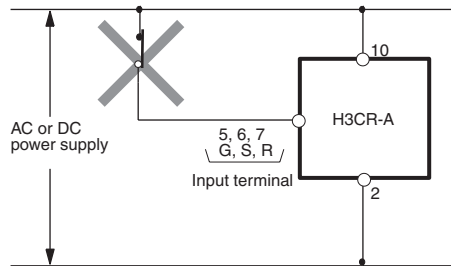
It is impossible to provide two independent power switches as shown below regardless of whether or not the Timers are different in phase.



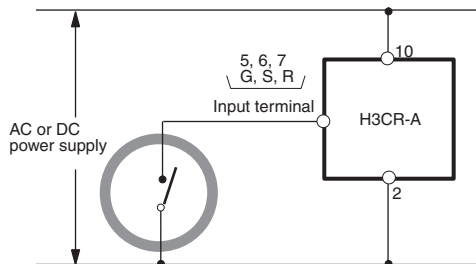
Relationship between Input and Power Supply Circuits (H3CR-A□/-A□S)

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.

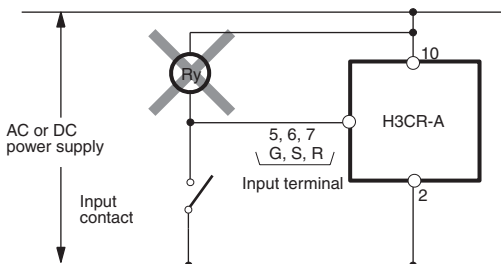
Incorrect



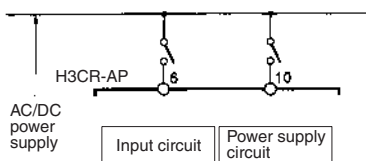
Correct



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.



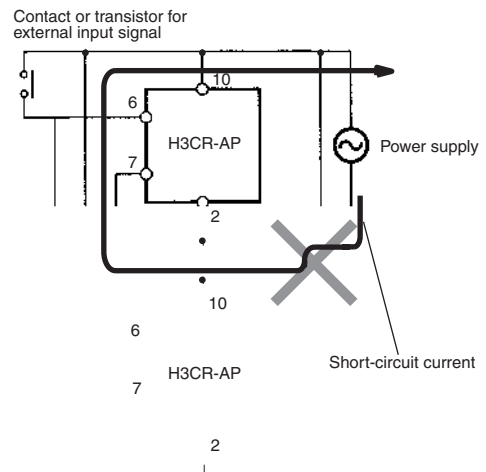
Relationship between Input and Power Supply Circuits (H3CR-AP)



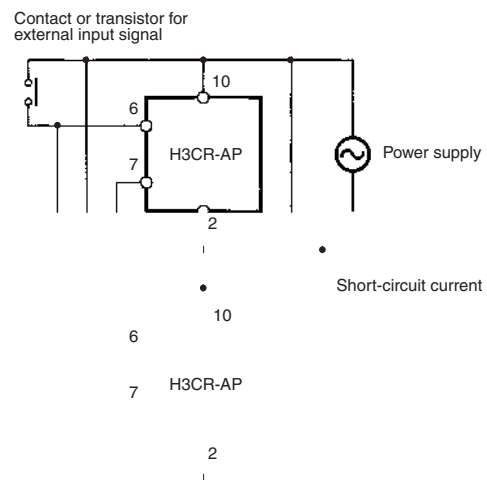
Since the input circuit and the power supply circuit are configured independently, the input circuit can be turned ON or OFF irrespective of the ON/OFF state of the power supply. It must be noted that a voltage equivalent to the power supply voltage is applied to the input circuit.

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.

Solid-state Twin Timer

H3CR-F

DIN 48 x 48-mm Twin Timers

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



Model Number Structure

Model Number Legend

H3CR - F -

1 2 3 4 5

1. Classification

F: Twin timers

2. Configuration

None: 11-pin socket

8: 8-pin socket

3. Twin Timer Mode

None: Flicker OFF start

N: Flicker ON start

4. Time Range

None: 0.05 s to 30 h models

300: 1.2 s to 300 h models

5. Supply Voltage

100-240AC: 100 to 240 VAC

24AC/DC: 24 VAC/VDC

12DC: 12 VDC

48-125DC: 48 to 125 VDC

Ordering Information

List of Models

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

■ Accessories (Order Separately)

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
		Y92F-73
		Y92F-74
Mounting DIN-rail	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
DIN-rail 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)
Hold-down Clip (See note 2)	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. Hold-down Clips are sold in sets of two.

Specifications

■ General

Item	H3CR-F	H3CR-F8	H3CR-FN	H3CR-F8N
Operating mode	Flicker OFF start		Flicker ON start	
Pin type	11-pin	8-pin	11-pin	8-pin
Operating/Reset method	Time-limit operation/Time-limit reset or self-reset			
Output type	Relay output (DPDT)			
Mounting method	DIN-rail mounting, surface mounting, and flush mounting			
Approved standards	UL508, CSA C22.2 No.14, NK, Lloyds Conforms to EN61812-1 and IEC60664-1 (VDE0110) 4kV/2. Output category according to EN60947-5-1.			

■ Time Ranges

0.05 s to 30 h Models

Time unit		s (sec)	x10 s (10 s)	min (min)	h (hrs)
Setting	1.2	0.05 to 1.2	1.2 to 12	0.12 to 1.2	
	3	0.3 to 3	3 to 30	0.3 to 3	
	12	1.2 to 12	12 to 120	1.2 to 12	
	30	3 to 30	30 to 300	3 to 30	

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

1.2 s to 300 h Models

Time unit		x10 s (10 s)	x10 min (10 min)	h (hrs)	x10 h (10 h)
Setting	1.2	1.2 to 12	1.2 to 12	0.12 to 1.2	1.2 to 12
	3	3 to 30	3 to 30	0.3 to 3	3 to 30
	12	12 to 120	12 to 120	1.2 to 12	12 to 120
	30	30 to 300	30 to 300	3 to 30	30 to 300

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

■ Ratings

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

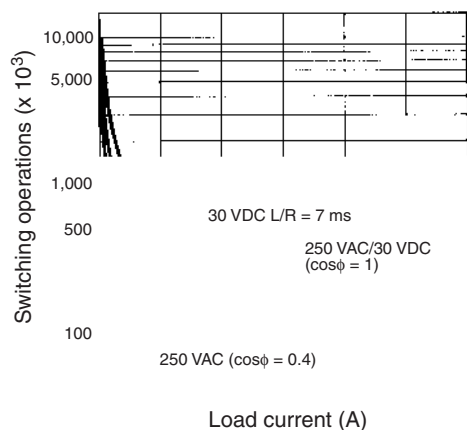
Note: A power supply with a ripple of 20% max. (single-phase power supply with full-wave rectification) can be used with each DC Model.

■ Characteristics

Accuracy of operating time	±0.2% FS max. (±0.2% FS ±10 ms max. in ranges of 1.2 and 3 s)		
Setting error	±5% FS ±50 ms max.		
Reset time	0.1 s max.		
Reset voltage	10% max. of rated voltage		
Influence of voltage	±0.2% FS max. (±0.2% FS ±10 ms max. in ranges of 1.2 and 3 s)		
Influence of temperature	±1% FS max. (±1% FS ±10 ms max. in ranges of 1.2 and 3s)		
Insulation resistance	100 MΩ min. (at 500 VDC)		
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying metal parts and exposed non-current-carrying metal parts) 2,000 VAC, 50/60 Hz for 1 min (between control output terminals and operating circuit) 2,000 VAC, 50/60 Hz for 1 min (between contacts of different polarities) 1,000 VAC, 50/60 Hz for 1 min (between contacts not located next to each other)		
Impulse withstand voltage	3 kV (between power terminals) for 100 to 240 VAC, 48 to 125 VDC 1 kV for 12 VDC, 24 VAC/DC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC, 48 to 125 VDC 1.5 kV for 12 VDC, 24 VAC/DC		
Noise immunity	±1.5 kV (between power terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±400 V for 12 VDC		
Static immunity	Malfunction: 8 kV Destruction: 15 kV		
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm single amplitude for 2 hrs each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude for 10 min each in three directions		
Shock resistance	Destruction: 980 m/s ² three times each in six directions Malfunction: 98 m/s ² three times each in six directions		
Ambient temperature	Operating: -10°C to 55°C (with no icing) Storage: -25°C to 65°C (with no icing)		
Ambient humidity	Operating: 35% to 85%		
Life expectancy	Mechanical: 20 million operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 1,800 operations/h) (See note)		
EMC	(EMI) EN61812-1 Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A (EMS) EN61812-1 Immunity ESD: IEC61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: IEC61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity RF-interference from Pulse-modulated Radio Waves: IEC61000-4-3: 10 V/m (900±5 MHz) (level 3) Immunity Conducted Disturbance: IEC61000-4-6: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC61000-4-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4) Immunity Surge: IEC61000-4-5: 1 kV line to line (level 3) 2 kV line to ground (level 3)		
Case color	Light Gray (Munsell 5Y7/1)		
Degree of protection	IP40 (panel surface)		
Weight	Approx. 100 g		

Note: Refer to the “Life-test Curve” on page C-108.

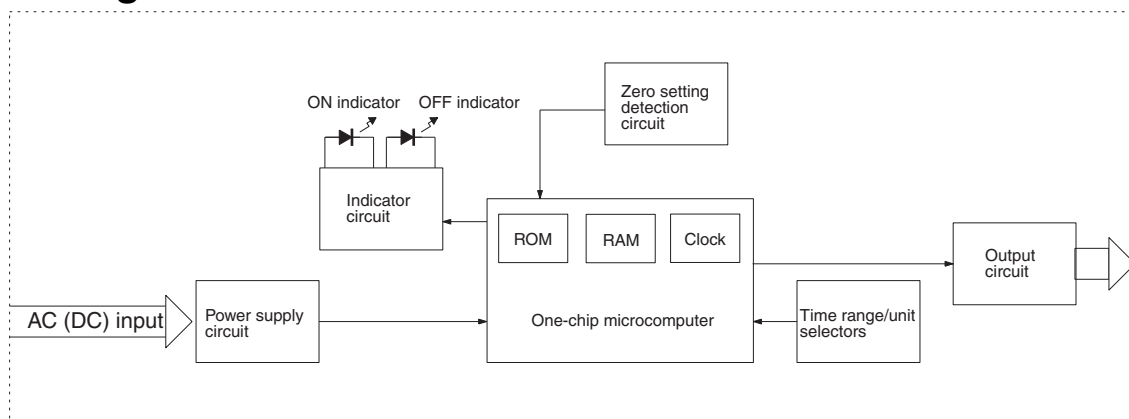
Life-test Curve



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

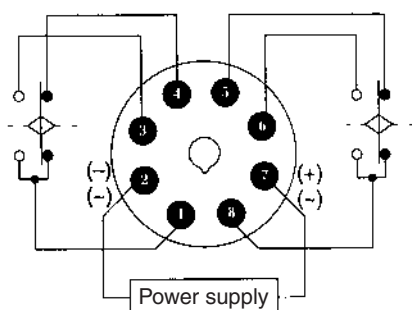


I/O Functions

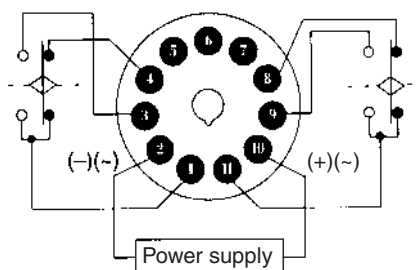
Inputs		---
Outputs	Control output	Outputs are turned ON/OFF according to the time set by the ON- and OFF-time setting knob.

Terminal Arrangement

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



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

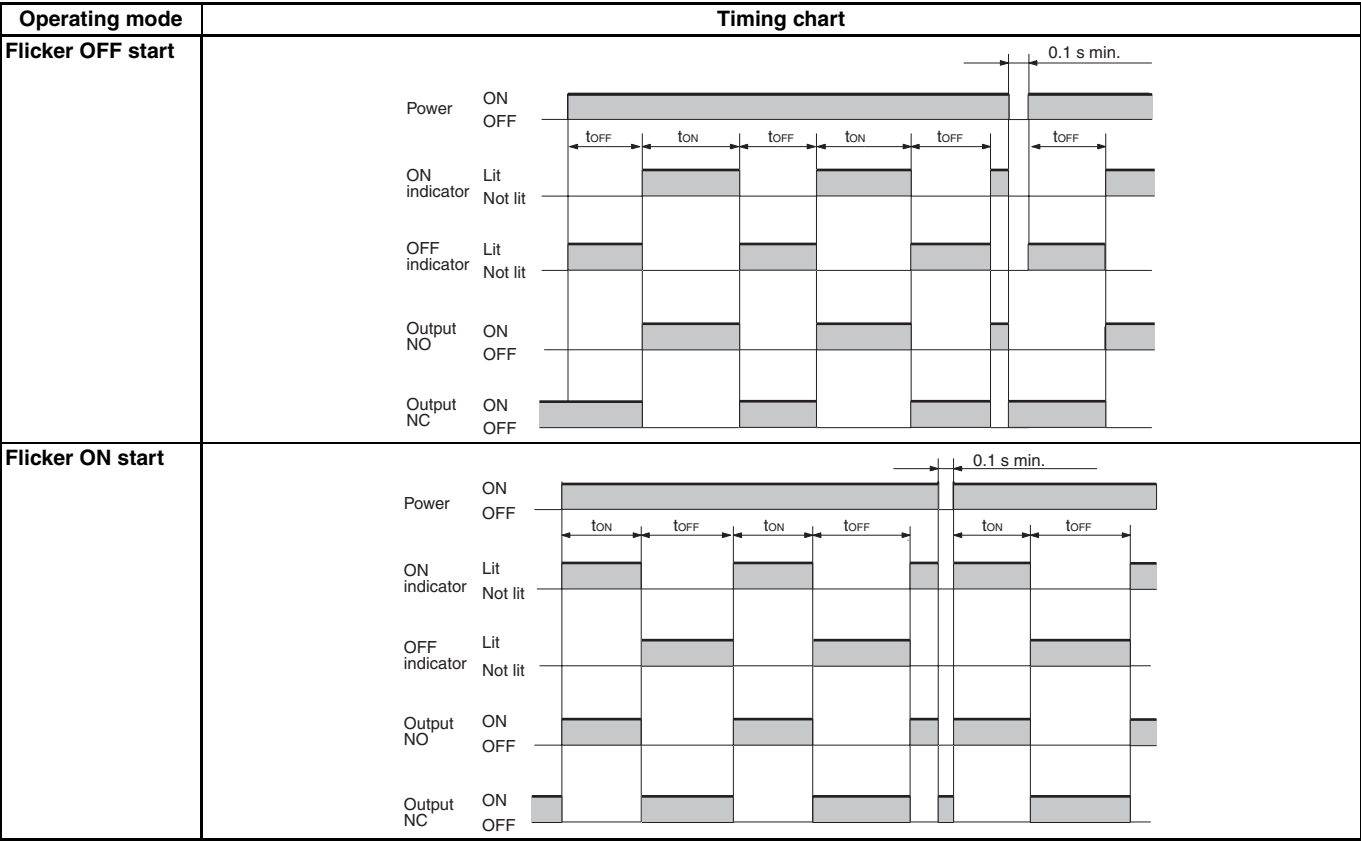


Note: Leave terminals 5, 6, and 7 open. Do not use them as relay terminals.

Operation

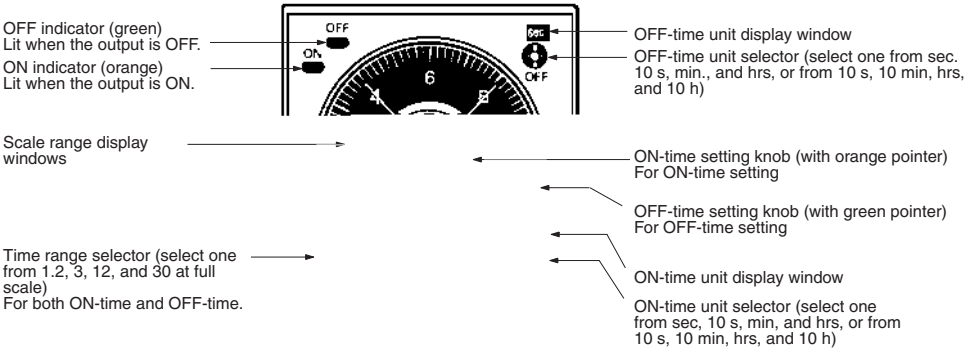
■ Timing Chart

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



Note: 1. The reset time requires a minimum of 0.1 s.
2. When power is supplied in flicker ON start mode, the OFF indicator lights momentarily. This, however, has no effect on the performance of the Timer.

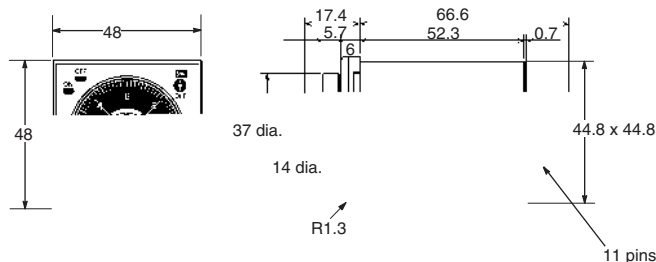
Nomenclature



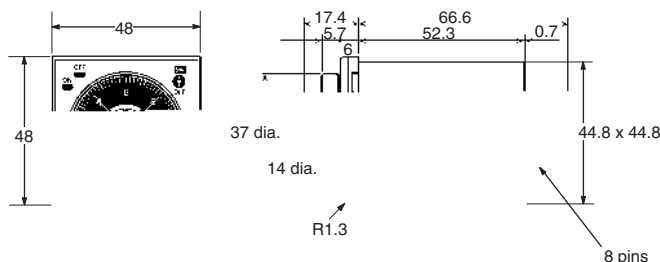
Dimensions

Note: All units are in millimeters unless otherwise indicated.

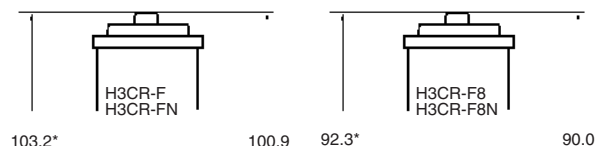
H3CR-F
H3CR-FN
H3CR-F-300
H3CR-FN-300



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



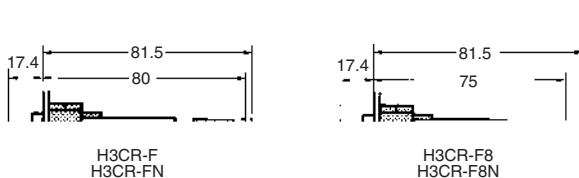
Dimensions with Front Connecting Socket P2CF-08-□/P2CF-11-□



P2CF-11
P2CF-11-E 2.3*

P2CF-08
P2CF-08-E 2.3*

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



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

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

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

Solid-state Star-delta Timer

H3CR-G

DIN 48 x 48-mm Star-delta Timer

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



Model Number Structure

Model Number Legend

H3CR - G 8 □ L □
1 2 3 4 5

1. Classification

G: Star-delta timer

2. Configuration

8: 8-pin socket

3. Outputs

None: Star-delta operation contact

E: Star-delta operation contact and instantaneous contact

4. Dimensions

L: Long-body model

5. Supply Voltage

100-120AC: 100 to 120 VAC

200-240AC: 200 to 240 VAC

Ordering Information

List of Models

Outputs	Supply voltage	8-pin models
Time-limit contact	100 to 120 VAC	H3CR-G8L 100-120AC
	200 to 240 VAC	H3CR-G8L 200-240AC
Time-limit contact and instantaneous contact	100 to 120 VAC	H3CR-G8EL 100-120AC
	200 to 240 VAC	H3CR-G8EL 200-240AC

Accessories (Order Separately)

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
		Y92F-70
		Y92F-71
Mounting DIN-rail	50 cm () x 7.3 mm (t)	PFP-50N
	1 m () x 7.3 mm (t)	PFP-100N
	1 m () x 16 mm (t)	PFP-100N2
End Plate		PFP-M
Spacer		PFP-S
Protective Cover		Y92A-48B

Name/specifications		Models
DIN-rail Mounting/ Front Connecting Socket	8-pin	P2CF-08
	8-pin, finger safe type	P2CF-08-E
Back Connecting Socket	8-pin	P3G-08
	8-pin, finger safe type	P3G-08 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-1
	For PF085A Socket	Y92H-2

Note: 1. Y92A-48G is a finger safe terminal cover which is attached to the P3G-08 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-G8L	H3CR-G8EL
Functions	Star-delta timer	Star-delta timer with instantaneous output
Pin type	8-pin	
Operating/Reset method	Time-limit operation/Self-reset	
Output type	Time-limit: SPST-NO (star operation circuit) SPST-NO (delta operation circuit)	Time-limit: SPST-NO (star operation circuit) SPST-NO (delta operation circuit) Instantaneous: SPST-NO
Mounting method	DIN-rail mounting, surface mounting, and flush mounting	
Approved standards	UL508, CSA C22.2 No.14, NK, Lloyds Conforms to EN61812-1 and IEC60664-1 (VDE0110) 4kV/2. Output category according to EN60947-5-1.	

■ Time Ranges

Time unit		Star operation time ranges
Full scale setting	6	0.5 to 6 s
	12	1 to 12 s
	60	5 to 60 s
	120	10 to 120 s

Star-delta transfer time	Programmable at 0.05 s, 0.1 s, 0.25 s or 0.5 s
--------------------------	--

■ Ratings

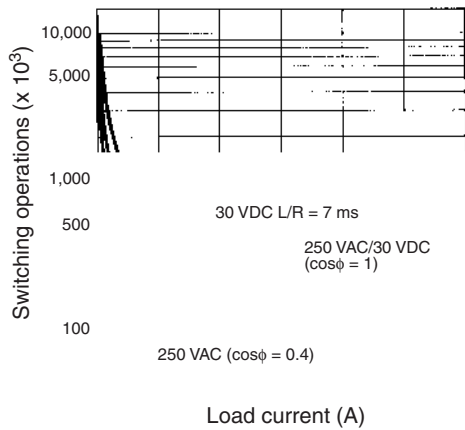
Rated supply voltage	100 to 120 VAC (50/60 Hz), 200 to 240 VAC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-opening time: 0.5 s
Power consumption	100 to 120 VAC: approx. 6 VA (2.6 W) at 120 VAC 200 to 240 VAC: approx. 12 VA (3.0 W) at 240 VAC
Control outputs	Contact output: 5 A at 250 VAC/30 VDC, resistive load ($\cos\phi = 1$)

■ Characteristics

Accuracy of operating time	±0.2% FS max.
Setting error	±5% FS ±50 ms max.
Accuracy of Star-delta transfer time	±25% FS + 5 ms max.
Reset voltage	10% max. of rated voltage
Influence of voltage	±0.2% FS max.
Influence of temperature	±1% FS max.
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying metal parts and exposed non-current-carrying metal parts) 2,000 VAC, 50/60 Hz for 1 min (between control output terminals and operating circuit) 2,000 VAC, 50/60 Hz for 1 min (between contacts of different polarities) 1,000 VAC, 50/60 Hz for 1 min (between contacts not located next to each other)
Impulse withstand voltage	3 kV (between power terminals) 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts)
Noise immunity	±1.5 kV (between power terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Malfunction: 8 kV Destruction: 15 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm single amplitude for 2 hrs each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude for 10 min each in three directions
Shock resistance	Destruction: 980 m/s ² three times each in six directions Malfunction: 294 m/s ² three times each in six directions
Ambient temperature	Operating: -10°C to 55°C (with no icing) Storage: -25°C to 65°C (with no icing)
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 20 million operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 1,800 operations/h) (See note)
EMC	(EMI) EN61812-1 Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A (EMS) EN61812-1 Immunity ESD: IEC61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: IEC61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity RF-interference from Pulse-modulated Radio Waves: IEC61000-4-3: 10 V/m (900±5 MHz) (level 3) Immunity Conducted Disturbance: IEC61000-4-6: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC61000-4-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4) Immunity Surge: IEC61000-4-5: 1 kV line to line (level 3) 2 kV line to ground (level 3)
Case color	Light Gray (Munsell 5Y7/1)
Degree of protection	IP40 (panel surface)
Weight	H3CR-G8L: approx. 110 g; H3CR-G8EL: approx. 130 g

Note: Refer to the "Life-test Curve" on page C-114.

Life-test Curve

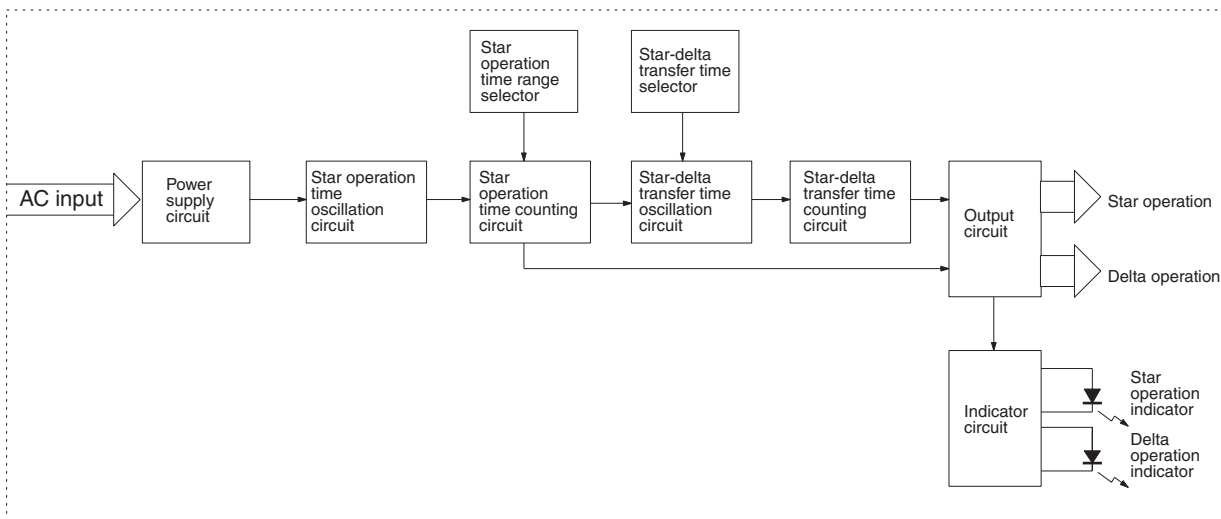


Reference: A maximum current of 0.15 A can be switched at 125 VDC ($\cos\phi = 1$) and a maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 10 mA at 5 VDC (failure level: P).

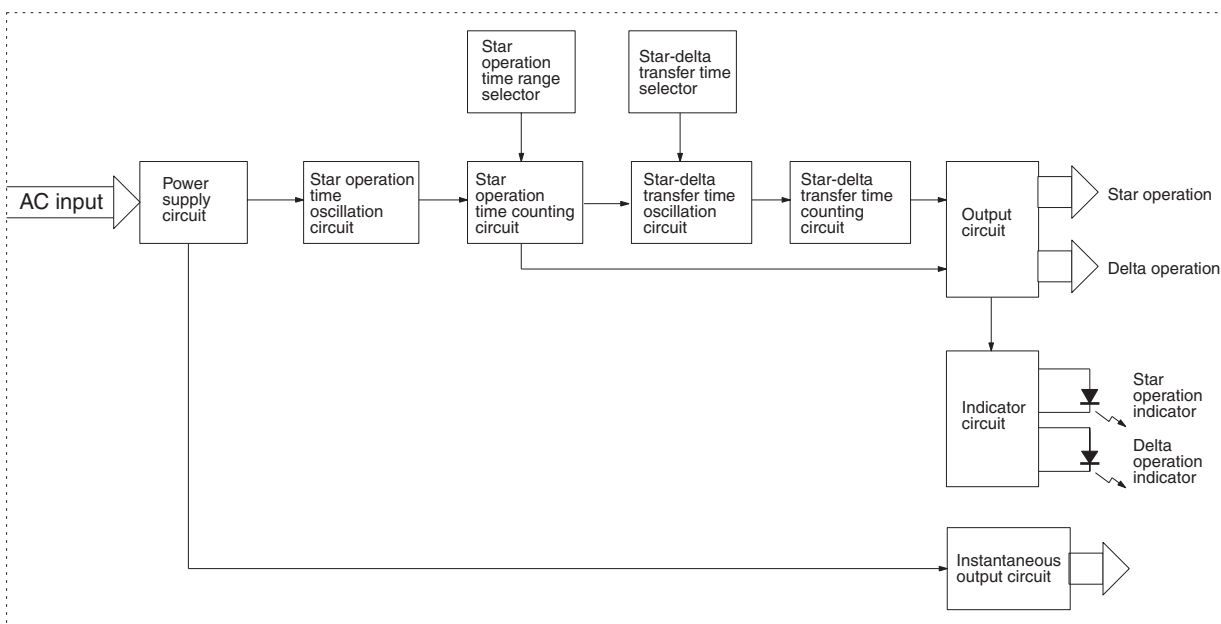
Connections

Block Diagrams

H3CR-G8L



H3CR-G8EL

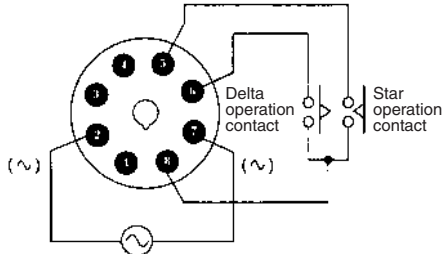


I/O Functions

Inputs	---	
Outputs	Control output	If the time reaches the value set with the time setting knob, the star operation output will be turned OFF and there will be delta operation output after the set star-delta transfer time has elapsed.

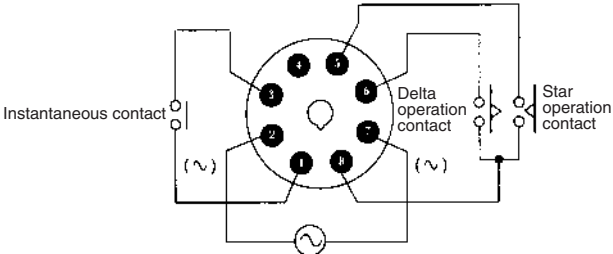
Terminal Arrangement

H3CR-G8L



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

H3CR-G8EL

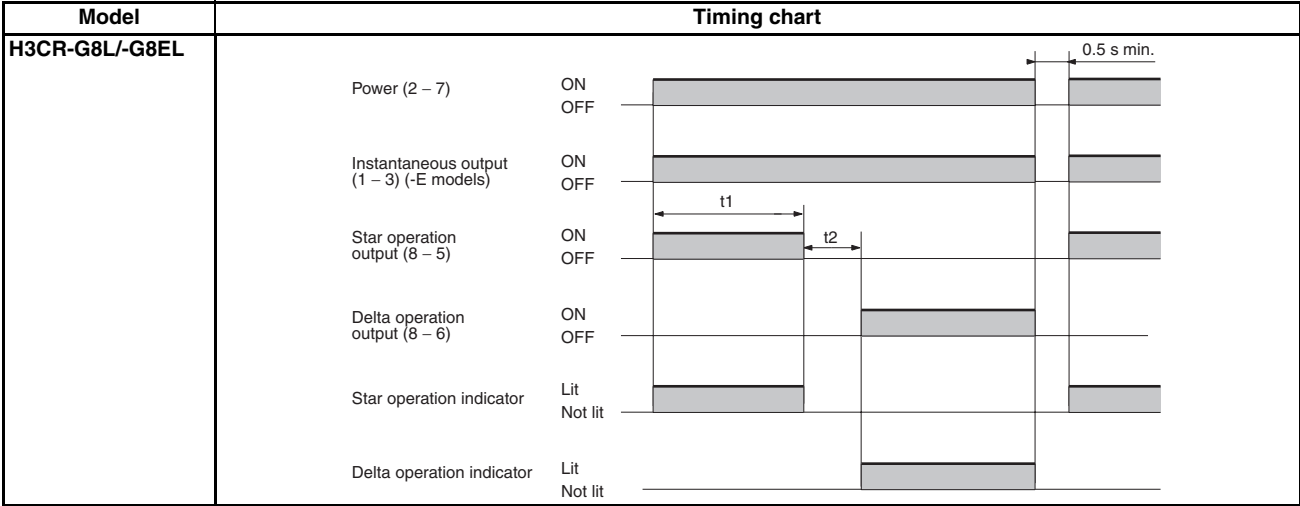


Note: Leave terminal 4 open. Do not use them as relay terminals.

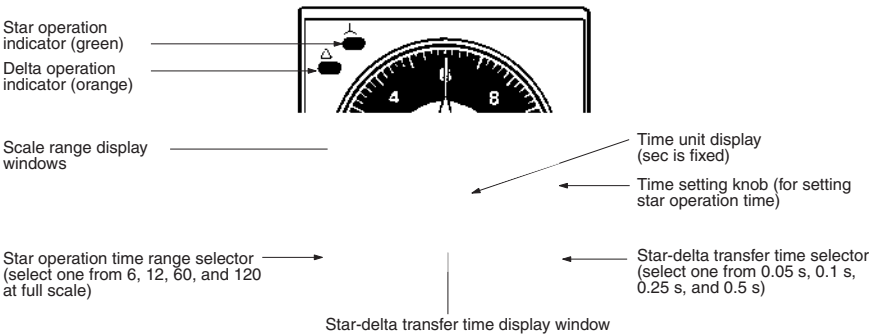
Operation

Timing Chart

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

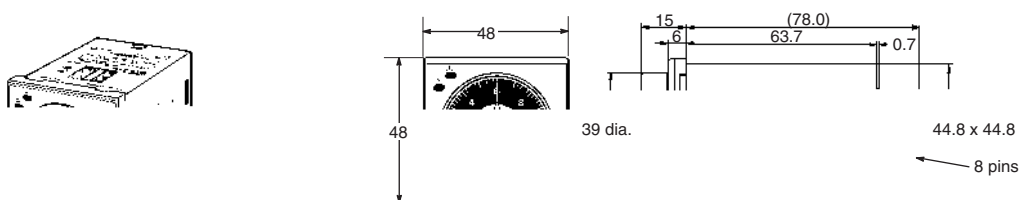


Nomenclature

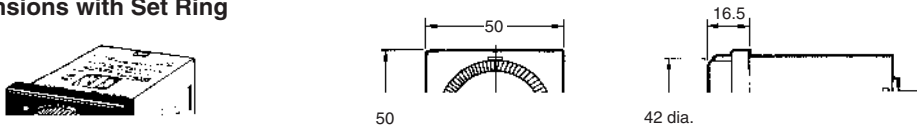


Dimensions

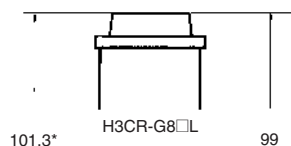
Note: All units are in millimeters unless otherwise indicated.



Dimensions with Set Ring



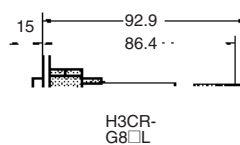
Dimensions with Front Connecting Socket P2CF-08-□



P2CF-08 2.3*
P2CF-08-E

Time setting ring Panel cover

Dimensions with Back Connecting Socket P3G-08



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

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

Solid-state Power OFF-delay Timer

H3CR-H

DIN 48 x 48-mm Power OFF-delay Timer

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



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* below for availability.

H3CR - H ☐ ☐ **L** ☐ ☐
1 2 3 4 5 6

1. Classification

H: Power OFF-delay timer

2. Configuration

None: 11-pin socket

8: 8-pin socket

3. Input

None: Without reset input

R: With reset input

4. Dimensions

L: Long-body model

5. Supply Voltage

100-120AC: 100 to 120 VAC

200-240AC: 200 to 240 VAC

48DC: 48 VDC

100-125DC: 100 to 125 VDC

6. Time Range

S: 0.05 to 12 s

M: 0.05 to 12 min

List of Models

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

■ Accessories (Order Separately)

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
		Y92F-70
		Y92F-71
Mounting DIN-rail	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
DIN-rail 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)
Hold-down Clip (See note 2)	For PL08 and PL11 Sockets	Y92H-1
	For PF085A Socket	Y92H-2

Note: 1. Y92A-48G is a finger safe terminal cover which is attached to the P3G-08 or P3GA-11 Socket.

2. Hold-down Clips are sold in sets of two.

Specifications

■ General

Item	H3CR-H8L	H3CR-H8RL	H3CR-HRL
Operating/Reset method	Instantaneous operation/Time-limit reset	Instantaneous operation/Time-limit reset/Forced reset	
Pin type	8-pin		11-pin
Input type	---	No-voltage	
Output type	Relay output (DPDT)	Relay output (SPDT)	Relay output (DPDT)
Mounting method	DIN-rail mounting, surface mounting, and flush mounting		
Approved standards	UL508, CSA C22.2 No.14, NK, Lloyds Conforms to EN61812-1 and IEC60664-1 (VDE0110) 4kV/2. Output category according to EN60947-5-1.		

■ Time Ranges

Time unit		S-series s (sec)	M-series min (min)
Setting	0.6	0.05 to 0.6	
	1.2	0.12 to 1.2	
	6	0.6 to 6	
	12	1.2 to 12	
Min. power ON time		0.1 s min.	2 s min.
Time-up operation repeat period		3 s min.	
Forced-reset repeat period		3 s min.	

Note: 1. If the above minimum power ON time is not secured, the H3CR may not operate. Be sure to secure the above minimum power ON time.

2. Do not use the Timer with a repeat period of less than 3 s. Doing so may result in abnormal heating or burning. Refer to *Safety Precautions (H3CR-H)* on page C-124 for details.

Ratings

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

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

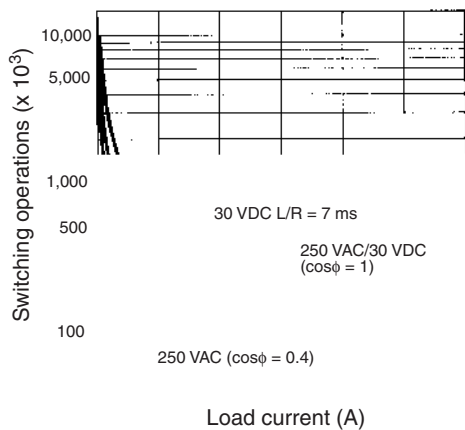
2. For contact input, use contacts which can adequately switch 1 mA at 5 V.

Characteristics

Accuracy of operating time	$\pm 0.2\%$ FS max. ($\pm 0.2\%$ FS ± 10 ms max. in ranges of 0.6 and 1.2 s)																															
Setting error	$\pm 5\%$ FS ± 50 ms max.																															
Operation start voltage	30% max. of rated voltage																															
Influence of voltage	$\pm 0.2\%$ FS max. ($\pm 0.2\%$ FS ± 10 ms max. in ranges of 0.6 and 1.2 s)																															
Influence of temperature	$\pm 1\%$ FS max. ($\pm 1\%$ FS ± 10 ms max. in ranges of 0.6 and 1.2 s)																															
Insulation resistance	100 M Ω min. (at 500 VDC)																															
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying metal parts and exposed non-current-carrying metal parts) 2,000 VAC, 50/60 Hz for 1 min (between control output terminals and operating circuit) 2,000 VAC, 50/60 Hz for 1 min (between contacts of different polarities) 1,000 VAC, 50/60 Hz for 1 min (between contacts not located next to each other)																															
Impulse withstand voltage	3 kV (between power terminals) for 100 to 120 VAC, 200 to 240 VAC, 100 to 125 VDC; 1 kV for 24 VAC/DC, 48 VDC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 120 VAC, 200 to 240 VAC, 100 to 125 VDC; 1.5 kV for 24 VAC/DC, 48 VDC																															
Noise immunity	± 1.5 kV (between power terminals) and ± 600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μ s, 1-ns rise); ± 1 kV (between power terminals) for 48 VDC																															
Static immunity	Malfunction: 8 kV Destruction: 15 kV																															
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm single amplitude for 2 hrs each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude for 10 min each in three directions																															
Shock resistance	Destruction: 980 m/s ² three times each in six directions Malfunction: 98 m/s ² three times each in six directions																															
Ambient temperature	Operating: -10°C to 55°C (with no icing) Storage: -25°C to 65°C (with no icing)																															
Ambient humidity	Operating: 35% to 85%																															
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,200 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 1,200 operations/h) (See note)																															
EMC	<table> <tr> <td>(EMI)</td><td>EN61812-1</td><td></td></tr> <tr> <td>Emission Enclosure:</td><td>EN55011 Group 1 class A</td><td></td></tr> <tr> <td>Emission AC Mains:</td><td>EN55011 Group 1 class A</td><td></td></tr> <tr> <td>(EMS)</td><td>EN61812-1</td><td></td></tr> <tr> <td>Immunity ESD:</td><td>IEC61000-4-2:</td><td>6 kV contact discharge (level 3) 8 kV air discharge (level 3)</td></tr> <tr> <td>Immunity RF-interference from AM Radio Waves:</td><td></td><td>IEC61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3)</td></tr> <tr> <td>Immunity RF-interference from Pulse-modulated Radio Waves:</td><td></td><td>IEC61000-4-3: 10 V/m (900$\pm$5 MHz) (level 3)</td></tr> <tr> <td>Immunity Conducted Disturbance:</td><td>IEC61000-4-6:</td><td>10 V (0.15 to 80 MHz) (level 3)</td></tr> <tr> <td>Immunity Burst:</td><td>IEC61000-4-4:</td><td>2 kV power-line (level 3) 2 kV I/O signal-line (level 4)</td></tr> <tr> <td>Immunity Surge:</td><td>IEC61000-4-5:</td><td>1 kV line to line (level 3) 2 kV line to ground (level 3)</td></tr> </table>		(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 $\pm$ 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)
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Immunity Surge:	IEC61000-4-5:	1 kV line to line (level 3) 2 kV line to ground (level 3)																														
Case color	Light Gray (Munsell 5Y7/1)																															
Degree of protection	IP40 (panel surface)																															
Weight	Approx. 120 g																															

Note: Refer to the *Life-test Curve* on page C-120.

Life-test Curve

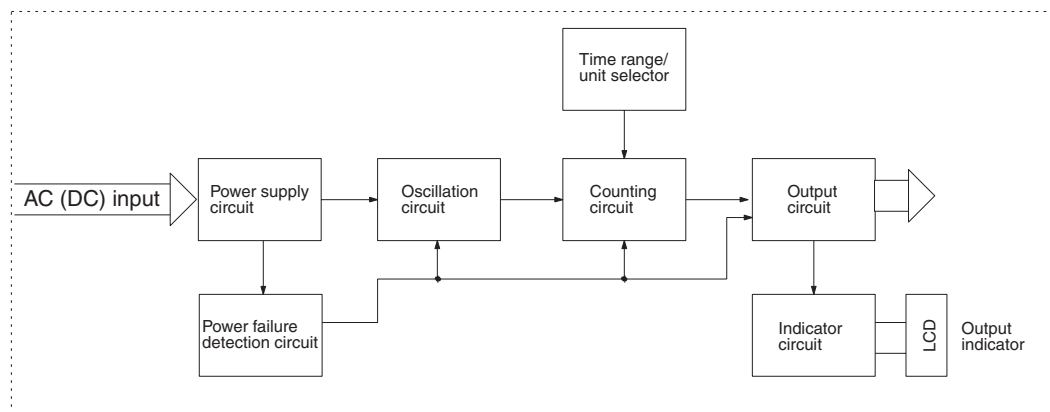


Reference: A maximum current of 0.15 A can be switched at 125 VDC ($\cos\phi = 1$) and a maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 10 mA at 5 VDC for H3CR-H8L/-HRL and 100 mA at 5 VDC for H3CR-H8RL (failure level: P).

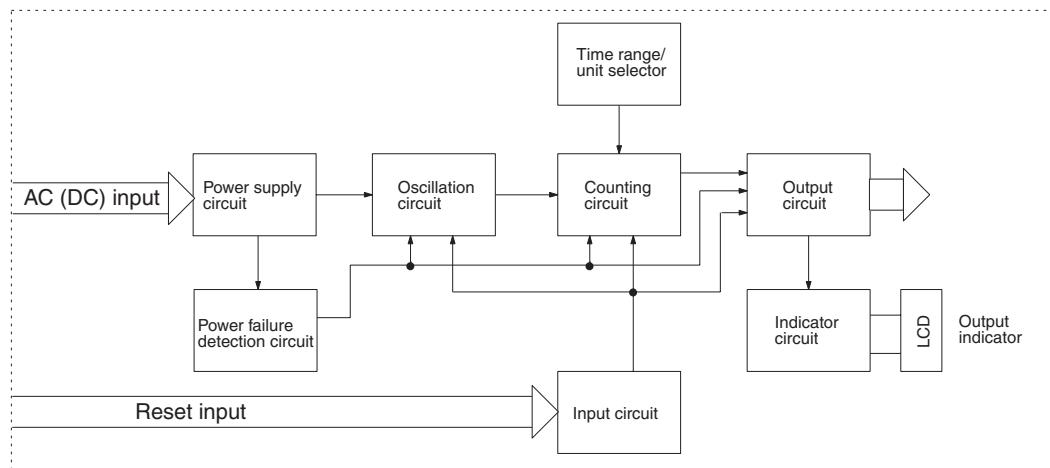
Connections

Block Diagrams

Without Reset Input (H3CR-H8L)



With Reset Input (H3CR-H8RL/-HRL)



I/O Functions

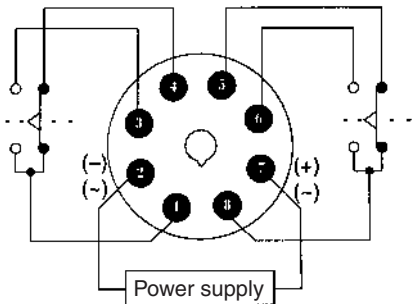
Inputs	Reset	Turns off the control output and resets the elapsed time.
Outputs	Control output	Operates instantaneously when the power is turned on and time-limit resets when the set time is up after the power is turned off.

Terminal Arrangement

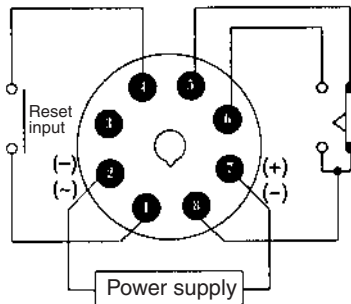
Note: DC models, including 24 VAC/DC models, have polarity.

8-pin Models

Without Reset Input (H3CR-H8L)



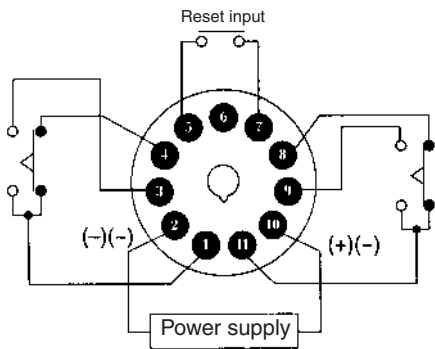
With Reset Input (H3CR-H8RL)



Note: Leave terminal 3 open. Do not use them as relay terminals.

11-pin Model

With Reset Input (H3CR-HRL)



Note: Leave terminal 6 open. Do not use them as relay terminals.

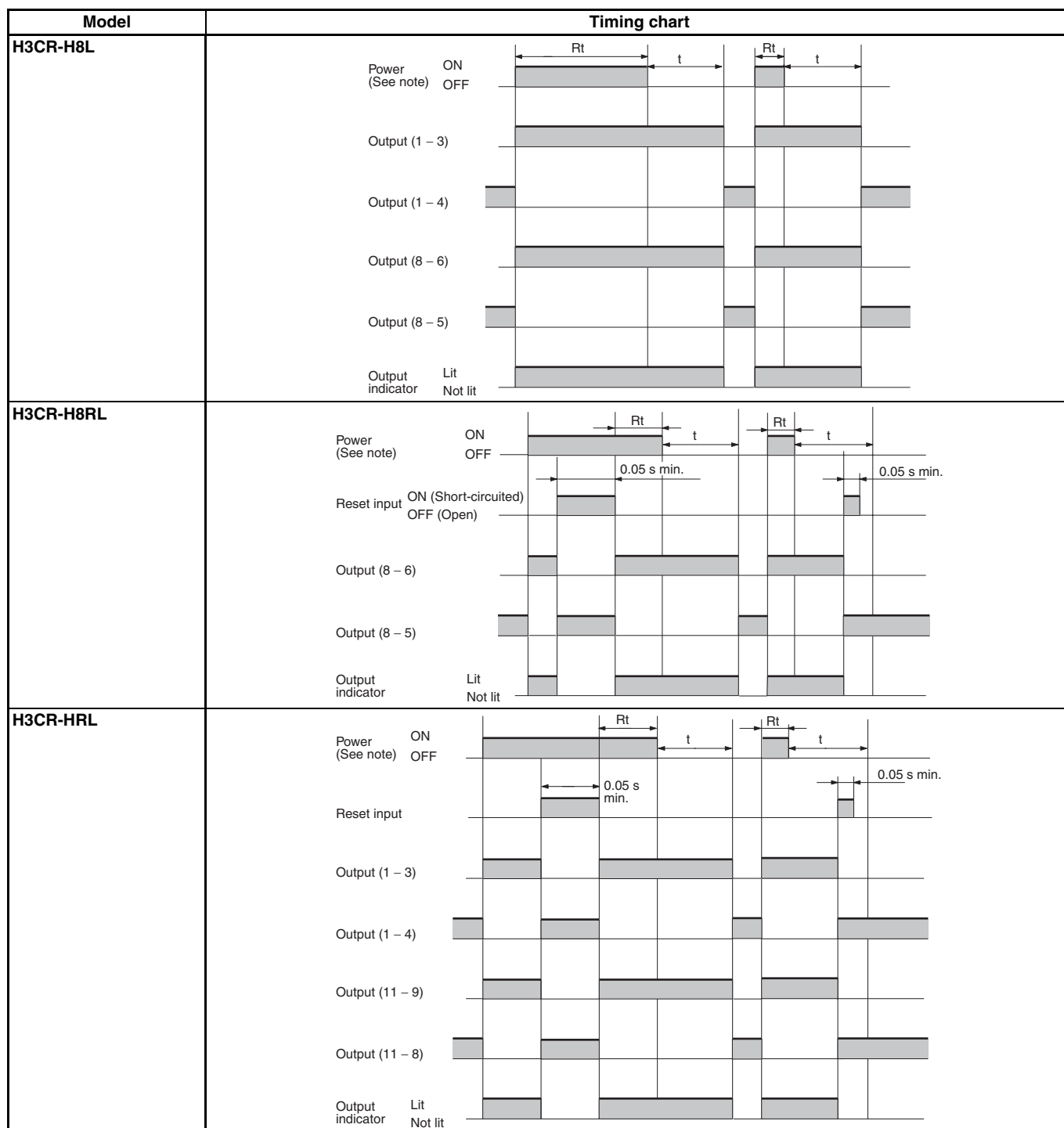
Operation

■ Timing Chart

t: Set time

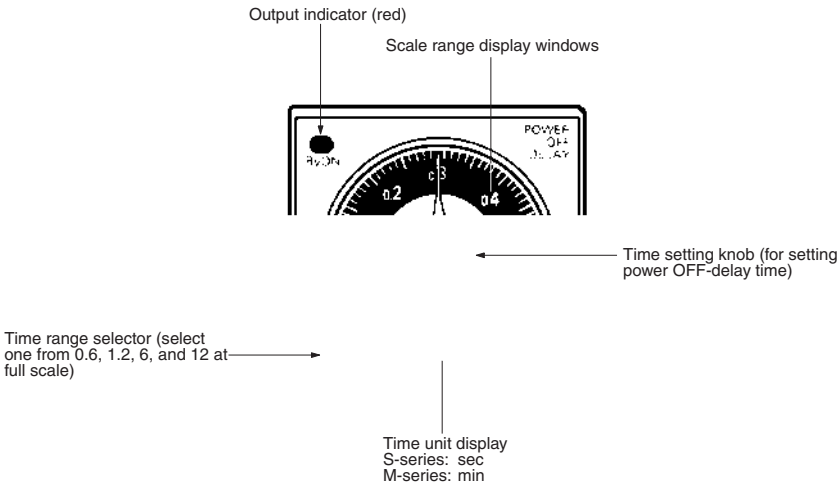
Rt: Minimum power ON time (S-series: 0.1 s min.; M-series: 2 s min.)

If the power ON time is less than this value, the Timer may not operate (i.e., output may not turn ON).



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

Nomenclature

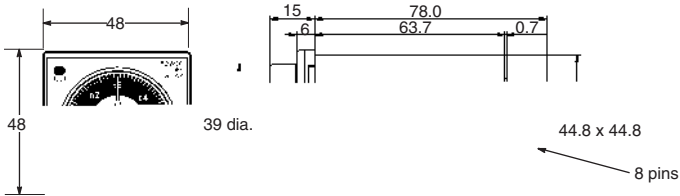


Timers

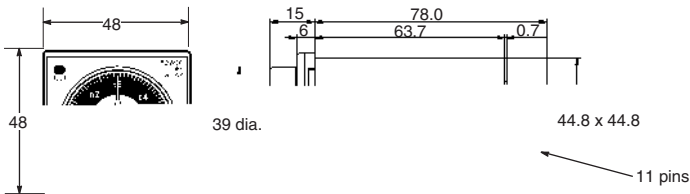
Dimensions

Note: All units are in millimeters unless otherwise indicated.

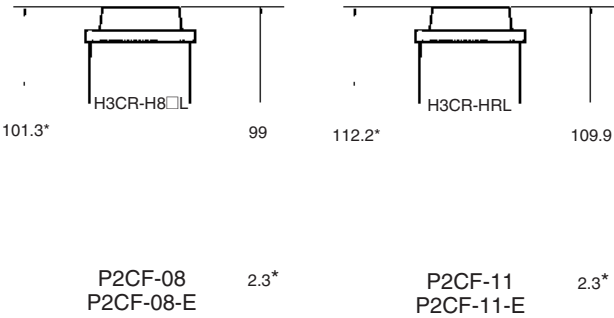
H3CR-H8L
H3CR-H8RL



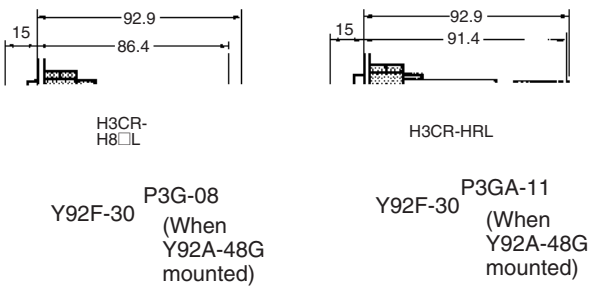
H3CR-HRL



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-rail (reference value).

Safety Precautions (H3CR-H)

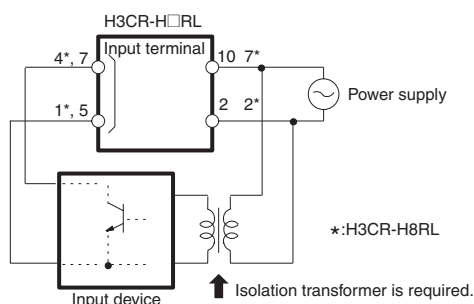
Note: The undermentioned is common for all H3CR-H models.

Power Supplies

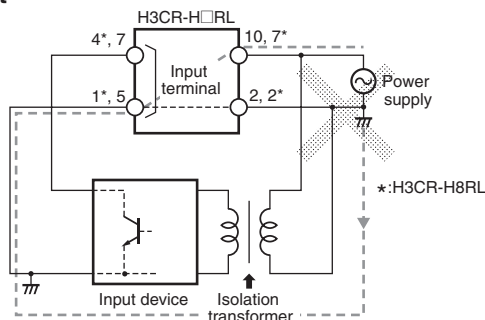
The H3CR-H has a large inrush current; provide sufficient power supply capacity. If the power supply capacity is too small, there may be delays in turning ON the output.

With the H3CR-H□RL, for the power supply of an input device, use an isolating transformer, of which the primary and secondary windings are mutually isolated and the secondary winding is not grounded.

Correct



Incorrect

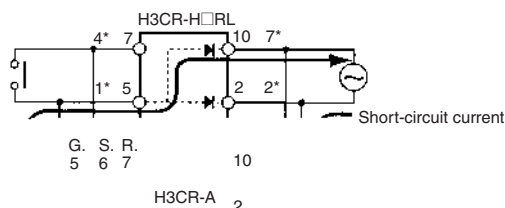


Input/Output (H3CR-H□RL)

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

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

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



*: H3CR-H8RL

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

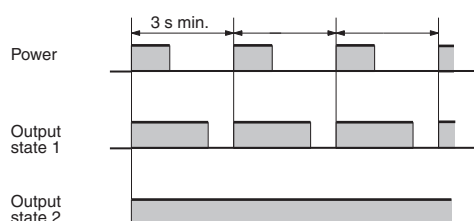
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Wiring

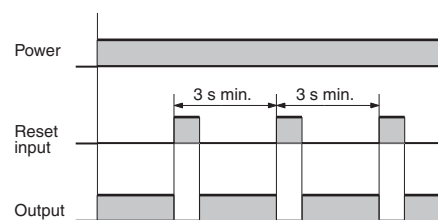
The H3CR-H has a high impedance circuit. Therefore, the H3CR-H may not be reset if the H3CR-H is influenced by inductive voltage. In order to eliminate any influence of inductive voltage, the wires connected to the H3CR-H must be as short as possible and should not be installed alongside power lines.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

Operation

An interval of 3 s minimum is required to turn on the H3CR-H after the H3CR-H is turned off. If the H3CR-H is turned on and off repeatedly with an interval of shorter than 3 s, abnormal heating or burning may occur in internal elements.



After the forced reset function of the H3CR-H is activated, an interval of 3 s minimum is required to activate the forced reset function again. If the forced reset function is activated repeatedly with an interval of shorter than 3 s, the internal parts of the H3CR-H may deteriorate and the H3CR-H may malfunction.



If it is required that the output be turned on repeatedly with an interval of shorter than 3 s, consider use of the H3CR-A in mode D (signal OFF-delay).

Others

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

Multifunction Digital Timer

H5CX

- Highly visible display with backlit negative transmissive LCD.
- Programmable PV color to visually alert when output status changes (screw terminal block models).
- Intuitive setting enabled using DIP switch (H5CX-A/-A11 models) and ergonomic up/down digit keys.
- Twin timer in one body to meet a broader range of cyclic control application requirements as well as ON/OFF duty adjustable flicker mode.
- PNP/NPN switchable DC-voltage input (H5CX-A/-A11 models).
- Finger-safe terminals (screw terminal block models).
- Meet a variety of mounting requirements:
Screw terminal block models, and pin-style terminal models.
- NEMA4/IP66 compliance.
- Six-language instruction manual.



Timers

Contents

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Ordering Information.....	C-126
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Nomenclature	C-132
Dimensions.....	C-133
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Operating Procedures	C-141
Setting Procedure Guide.....	C-141
Operating Procedures (Timer Function).....	C-142
Operating Procedures (Twin Timer Function)	C-149
Operation in Timer/Twin Timer Selection Mode	C-153
Additional Information.....	C-154

Model Number Structure

Model Number Legend:

H5CX-□□□□□
1 2 3 4 5

1. Type classifier

A: Standard type

L: Economy type

2. External connection

None: Screw terminals

8: 8-pin socket

11: 11-pin socket

3. Output type

None: Contact output

S: Transistor output

4. Supply voltage

None: 100 to 240 VAC 50/60 Hz

D: 12 to 24 VDC/24 VAC 50/60 Hz

5. Case color

None: Black

G: Light gray (Munsell 5Y7/1): Produced upon request.

Ordering Information

List of Models

Output type	Supply voltage	Models		
		Standard type		Economy type
		Screw terminals	11-pin socket	8-pin socket
Contact output	100 to 240 VAC	H5CX-A	H5CX-A11	H5CX-L8
	12 to 24 VDC/24 VAC	H5CX-AD	H5CX-A11D	H5CX-L8D
Transistor output	100 to 240 VAC	H5CX-AS	H5CX-A11S	H5CX-L8S
	12 to 24 VDC/24 VAC	H5CX-ASD	H5CX-A11SD	H5CX-L8SD

Note: The power supply and input circuits for the H5CX-A11/A11S have basic insulation. Other models are not insulated.

Accessories (Order Separately)

Name		Models
Flush Mounting Adapter (See note 1.)		Y92F-30
Waterproof Packing (See note 1.)		Y92S-29
DIN-rail 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 2.)
	11-pin	P3GA-11
	11-pin, finger-safe type	P3GA-11 with Y92A-48G (See note 2.)
Hard Cover		Y92A-48
Soft Cover		Y92A-48F1
Mounting DIN-rail	50 cm (l) × 7.3 mm (t)	PFP-50N
	1 m (l) × 7.3 mm (t)	PFP-100N
	1 m (l) × 16 mm (t)	PFP-100N2
End Plate		PFP-M
Spacer		PFP-S

Note 1. Supplied with H5CX-A□ models (except for H5CX-A11□ and H5CX-L8□ models).

2. Y92A-48G is a finger-safe terminal cover attached to the P3G-08 or P3GA-11 Socket.

Specifications

■ Ratings

Item	H5CX-A□	H5CX-A11□	H5CX-L8□
Classification	Digital timer		
Rated supply voltage	100 to 240 VAC (50/60 Hz), 24 VAC (50/60 Hz)/12 to 24 VDC (permissible ripple: 20% (p-p) max.)		
Operating voltage range	85% to 110% rated supply voltage (12 to 24 VDC: 90% to 110%)		
Power consumption	Approx. 6.2 VA at 264 VAC Approx. 5.1 VA at 26.4 VAC Approx. 2.4 W at 12 VDC		
Mounting method	Flush mounting	Flush mounting, surface mounting, DIN-rail mounting	
External connections	Screw terminals	11-pin socket	8-pin socket
Terminal screw tightening torque	0.5 N·m max.	---	
Display	7-segment, negative transmissive LCD; Present value: 11.5-mm-high characters, red or green (programmable) Set value: 6-mm-high characters, green	7-segment, negative transmissive LCD Present value: 11.5-mm-high characters, red Set value: 6-mm-high characters, green	
Digits	4 digits		
Time ranges	9.999 s (0.001-s unit), 99.99 s (0.01-s unit), 999.9 s (0.1-s unit), 9999 s (1-s unit), 99 min 59 s (1-s unit) 999.9 min (0.1-min unit), 9999 min (1-min unit), 99 h 59 min (1-min unit), 999.9 h (0.1-h unit), 9999 h (1-h unit)		
Timer mode	Elapsed time (Up), remaining time (Down) (selectable)		
Input signals	Start, gate, reset		Start, reset
Input method	No-voltage input/voltage input (switchable) <u>No-voltage Input</u> ON impedance: 1 kΩ max. (Leakage current: 5 to 20 mA when 0 Ω) ON residual voltage: 3 V max. OFF impedance: 100 kΩ min. <u>Voltage Input</u> High (logic) level: 4.5 to 30 VDC Low (logic) level: 0 to 2 VDC (Input resistance: approx. 4.7 kΩ)		<u>No-voltage Input</u> ON impedance: 1 kΩ max. (Leakage current: 5 to 20 mA when 0 Ω) ON residual voltage: 3 V max. OFF impedance: 100 kΩ min.
Start, reset, gate	Minimum input signal width: 1 or 20 ms (selectable, same for all input)		
Power reset	Minimum power-opening time: 0.5 s (except for A-3, b-1, and F mode)		
Reset system	Power resets (except for A-3, b-1, and F modes), external and manual reset		
Sensor waiting time	250 ms max. (Control output is turned OFF and no input is accepted during sensor waiting time.)		
Output modes	A, A-1, A-2, A-3, b, b-1, d, E, F, Z, ton or toff		
One-shot output time	0.01 to 99.99 s		
Control output	SPDT contact output: 5 A at 250 VAC/30 VDC, resistive load (cosφ=1) Minimum applied load: 10 mA at 5 VDC (failure level: P, reference value) Transistor output: NPN open collector, 100 mA at 30 VDC max. residual voltage: 1.5 VDC max. (Approx. 1 V) Output category according to EN60947-5-1 for Timers with Contact Outputs (AC-15; 250 V 3 A/AC-13; 250 V 5 A/DC-13; 30 V 0.5 A) Output category according to EN60947-5-2 for Timers with Transistor Outputs (DC-13; 30 V 100 mA) NEMA B300 Pilot Duty, 1/4 HP 5-A resistive load at 120 VAC, 1/3 HP 5-A resistive load at 240 VAC		
Key protection	Yes		
Memory backup	EEPROM (overwrites: 100,000 times min.) that can store data for 10 years min.		
Ambient temperature	Operating: -10 to 55°C (-10 to 50°C if timers are mounted side by side) (with no icing or condensation) Storage: -25 to 65°C (with no icing or condensation)		
Ambient humidity	25% to 85%		
Case color	Black (N1.5)		
Attachments	Waterproof packing, flush mounting adapter, label for DIP switch settings	Label for DIP switch settings	None

Characteristics

Item	H5CX-A□/-A11□/-L8□
Accuracy of operating time and setting error (including temperature and voltage influences) (See note 1.)	Power-ON start: $\pm 0.01\%$ ± 50 ms max. Rated against set value Signal start: ± 0.005 ± 30 ms max. Rated against set value Signal start for transistor output model: $\pm 0.005\%$ ± 3 ms max. (See note 2.) If the set value is within the sensor waiting time at startup the control output of the H5CX will not turn ON until the sensor waiting time passes.
Insulation resistance	100 M Ω min. (at 500 VDC) between current-carrying terminal and exposed non-current-carrying metal parts, and between non-continuous contacts
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min between current-carrying terminals and non-current-carrying metal parts 1,000 VAC (for H5CX-□SD), 50/60 Hz for 1 min between control output, power supply, and input circuit (2,000 VAC for models other than H5CX-□SD) 1,000 VAC, 50/60 Hz for 1 min between non-continuous contacts
Impulse withstand voltage	3 kV (between power terminals) for 100 to 240 VAC, 1 kV for 24 VAC/12 to 24 VDC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC 1.5 kV for 24 VAC/12 to 24 VDC
Noise immunity	± 1.5 kV (between power terminals) and ± 600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 ms, 1-ns rise)
Static immunity	Destruction: 15 kV Malfunction: 8 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm single amplitude each in three directions, four cycles each (8 min per cycle) Malfunction: 10 to 55 Hz with 0.35-mm single amplitude each in three directions, four cycles each (8 min per cycle)
Shock resistance	Destruction: 294 m/s ² each in three directions Malfunction: 98 m/s ² each in three directions
Life expectancy	Mechanical: 10,000,000 operations min. Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load) See <i>Life-test Curve</i> on page C-129.
Approved safety standards (See note 3.)	UL508/Recognition (H5CX-L8□: Listing only with OMRON's P2CF-08□ or P3G-08 socket), CSA C22.2 No. 14, conforms to EN61010-1 (Pollution degree 2/overvoltage category II) Conforms to VDE0106/P100 (finger protection).
EMC	(EMI) Emission Enclosure: EN61326 Emission AC mains: EN55011 Group 1 class A (EMS) Immunity ESD: EN61326 EN61000-4-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: EN61000-4-3: 10 V/m (Amplitude-modulated, 80 MHz to 1 GHz) (level 3); 10 V/m (Pulse-modulated, 900 MHz ± 5 MHz) (level 3) Immunity Conducted Disturbance: EN61000-4-6: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power-line (level 3); 1 kV I/O signal-line (level 4) Immunity Surge: EN61000-4-5: 1 kV line to lines (power and output lines) (level 3); 2 kV line to ground (power and output lines) (level 3) Immunity Voltage Dip/Interruption EN61000-4-11: 0.5 cycle, 100% (rated voltage)
Degree of protection	Panel surface: IP66 and NEMA Type 4 (indoors) (See note 4.)
Weight	H5CX-A□: Approx. 135 g, H5CX-A11□/-L8□: Approx. 105 g

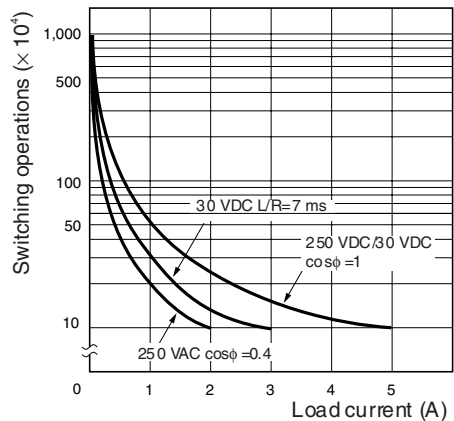
Note 1. The values are based on the set value.

2. The value is applied for a minimum pulse width of 1 ms.

3. To meet UL listing requirements with the H5CX-L8□, an OMRON P2CF-08-□ or P3G-08 Socket must be mounted on the Timer.

4. A waterproof packing is necessary to ensure IP66 waterproofing between the H5CX and installation panel.

Life-test Curve (Reference Values)



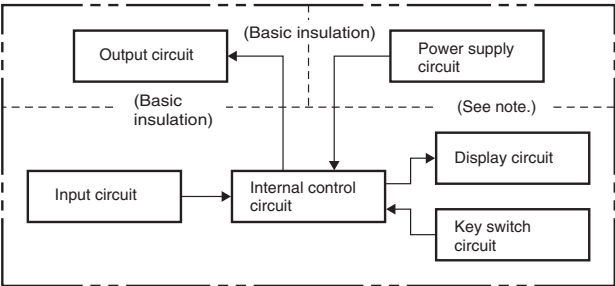
Reference: A maximum current of 0.15 A can be switched at 125 VDC (cosφ=1) and a maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 10 mA at 5 VDC (failure level: P).

Inrush Current (Reference Values)

Voltage	Applied voltage	Inrush current (peak value)	Time
100 to 240 VAC	264 VAC	5.3 A	0.4 ms
24 VAC/12 to 24 VDC	26.4 VAC	6.4 A	1.4 ms
	26.4 VDC	4.4 A	1.7 ms

Connections

Block Diagram



Note: Power circuit is not insulated from the input circuit, except for H5CX-A11/-A11S, which have basic insulation.

I/O Functions

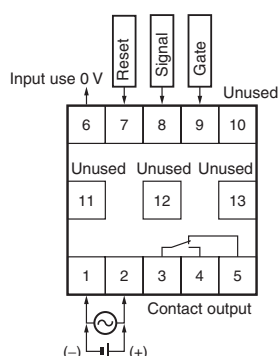
Inputs	Start signal	Stops timing in A-2 and A-3 (power ON delay) modes. Starts timing in other modes.
	Reset	Resets present value. (In elapsed time mode, the present value returns to 0; in remaining time mode, the present value returns to the set value.) Count inputs are not accepted and control output turns OFF while reset input is ON. Reset indicator is lit while reset input is ON.
	Gate	Inhibits timer operation.
Outputs	Control output (OUT)	Outputs take place according to designated operating mode when timer reaches corresponding set value.

■ Terminal Arrangement

Confirm that the power supply meets specifications before use.

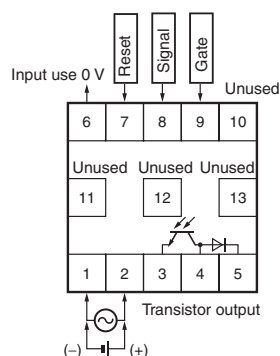
Recommended 24VDC power supply; eg. OMRON S8VS

H5CX-A/-AD



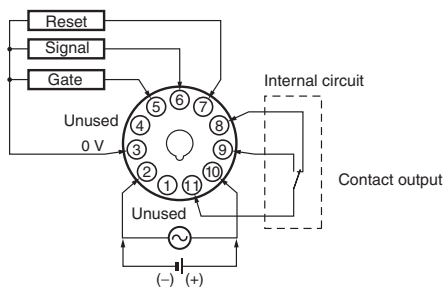
The power supply and input circuit are not insulated.
Terminals 1 and 6 of the H5CX-AD are connected internally.

H5CX-AS/-ASD



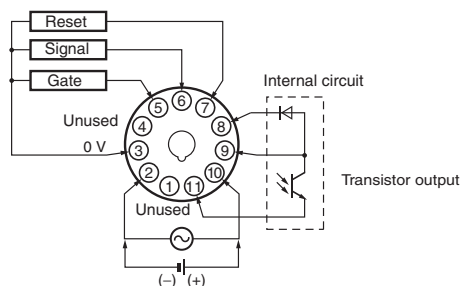
The power supply and input circuit are not insulated.
Terminals 1 and 6 of the H5CX-ASD are connected internally.

H5CX-A11/-A11D



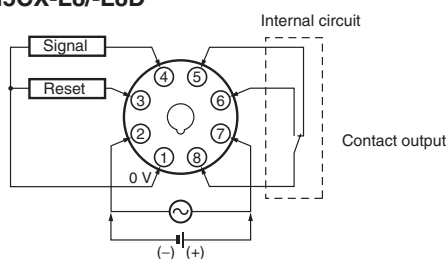
The power supply and input circuit of the H5CX-A11 have basic insulation.
The power supply and input circuit of the H5CX-A11D are not insulated.
Terminals 2 and 3 of the H5CX-A11D are connected internally.

H5CX-A11S/-A11SD



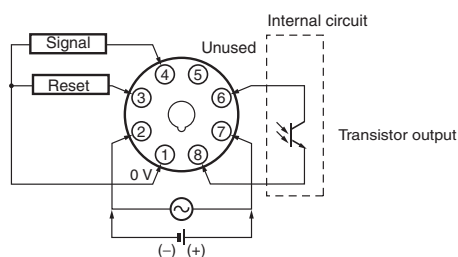
The power supply and input circuit of the H5CX-A11S have basic insulation.
The power supply and input circuit of the H5CX-A11SD are not insulated.
Terminals 2 and 3 of the H5CX-A11SD are connected internally.

H5CX-L8/-L8D



The power supply and input circuit are not insulated.
Terminals 1 and 2 of the H5CX-L8D are connected internally.

H5CX-L8S/-L8SD

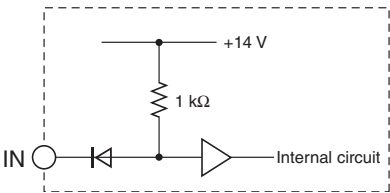


The power supply and input circuit are not insulated.
Terminals 1 and 2 of the H5CX-L8SD are connected internally.

Note: Do not connect unused terminals as relay terminals.

Input Circuits

Start, Reset, and Gate Input



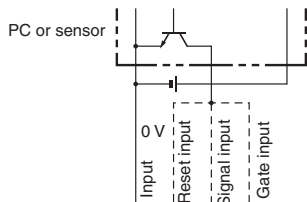
Input Connections

The inputs of the H5CX-A□/-A11□ are no-voltage (short-circuit or open) inputs or voltage inputs.
The input of the H5CX-L8□ is no-voltage input only.

No-voltage Inputs (NPN Inputs)

Open Collector

(Connection to NPN open collector output sensor)

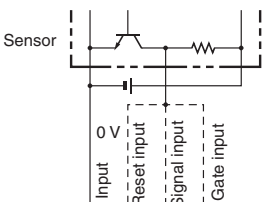


H5CX-A□	⑥	⑦	⑧	⑨
H5CX-A11□	③	⑦	⑥	⑤
H5CX-L8□	①	③	④	—

Operate with transistor ON

Voltage Output

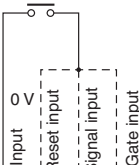
(Connection to a voltage output sensor)



H5CX-A□	⑥	⑦	⑧	⑨
H5CX-A11□	③	⑦	⑥	⑤
H5CX-L8□	①	③	④	—

Operate with transistor ON

Contact Input



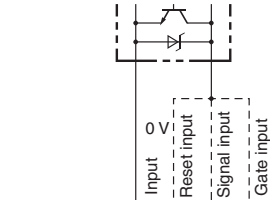
H5CX-A□	⑥	⑦	⑧	⑨
H5CX-A11□	③	⑦	⑥	⑤
H5CX-L8□	①	③	④	—

Operate with relay ON

No-voltage Input Signal Levels

No-contact input	Short-circuit level Transistor ON Residual voltage: 3 V max. Impedance when ON: 1 kΩ max. (the leakage current is 5 to 20 mA when the impedance is 0 Ω) Open level Transistor OFF Impedance when OFF: 100 kΩ min.
Contact input	Use contact which can adequately switch 5 mA at 10 V Maximum applicable voltage: 30 VDC max.

DC Two-wire Sensor



H5CX-A□	⑥	⑦	⑧	⑨
H5CX-A11□	③	⑦	⑥	⑤
H5CX-L8□	①	③	④	—

Operate with transistor ON

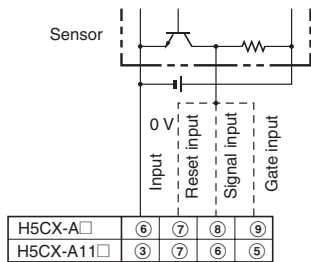
Applicable Two-wire Sensor

Leakage current: 1.5 mA max.
Switching capacity: 5 mA min.
Residual voltage: 3 VDC max.
Operating voltage: 10 VDC

Voltage Inputs (PNP Inputs)

No-contact Input (NPN Transistor)

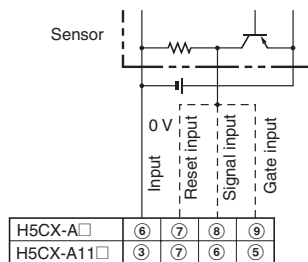
(Connection to NPN open collector output sensor)



Operate with transistor OFF

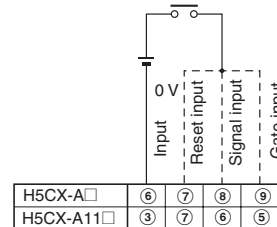
No-contact Input (PNP Transistor)

(Connection to PNP open collector output sensor)



Operate with transistor ON

Contact Input



Operate with relay ON

Voltage Input Signal Levels

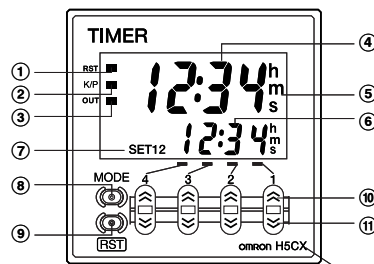
High level (Input ON): 4.5 to 30 VDC
 Low level (Input OFF): 0 to 2 VDC
 Maximum applicable voltage: 30 VDC max.
 Input resistance: Approx. 4.7 kΩ

Note: Power circuit is not insulated from the input circuit, except for H5CX-A11/-A11S, which have basic insulation. For wiring, refer to *Precautions*.

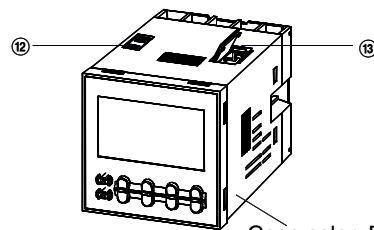
Nomenclature

Indicator

- ① Reset Indicator (orange)
- ② Key Protection Indicator (orange)
- ③ Control Output Indicator (orange)
- ④ Present Value (red or green (programmable) for H5CX-A models, red for H5CX-A11 /-L models)
Character height: 11.5 mm
- ⑤ Time Unit Display (Color is same as present value.):
(If the time range is 0 min, 0 h, 0.0 h, or 0 h 0 min, this display flashes to indicate timing operation.)
- ⑥ Set Value (green)
Character height: 6 mm
- ⑦ Set Value 1, 2 Display



Front View



Case color: Black

Operation Key

- ⑧ Mode Key (Changes modes and setting items)
- ⑨ Reset Key (Resets present value and output)
- ⑩ Up Keys 1 to 4
- ⑪ Down Keys 1 to 4

Switches

- ⑫ Key-protect Switch

(default setting) OFF ↔ ON



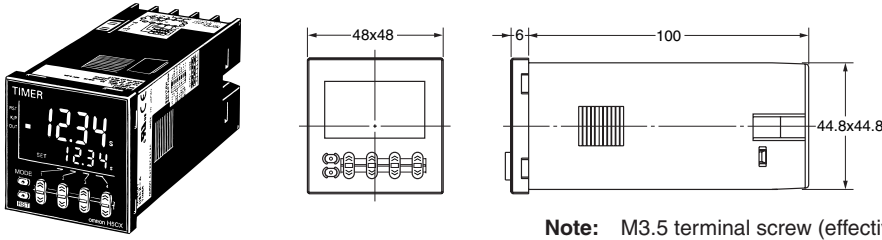
- ⑬ DIP Switch

Dimensions

Note: All units are in millimeters unless otherwise indicated.

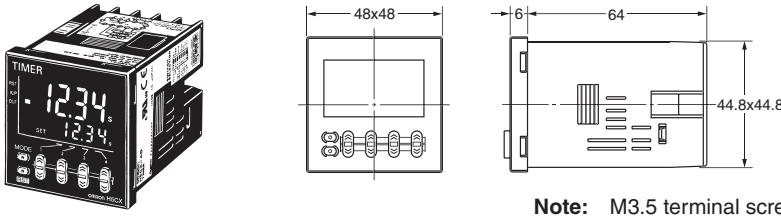
■ Timer (without Flush Mounting Adapter)

H5CX-A/-AS (Flush Mounting)



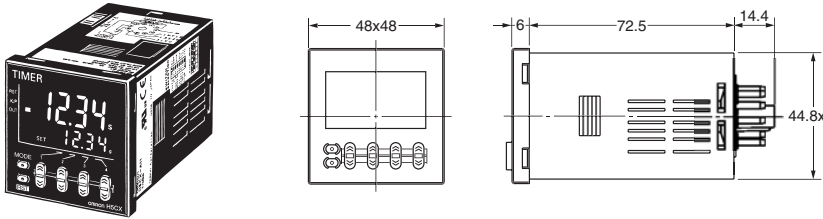
Note: M3.5 terminal screw (effective length: 6 mm)

H5CX-AD/-ASD (Flush Mounting)

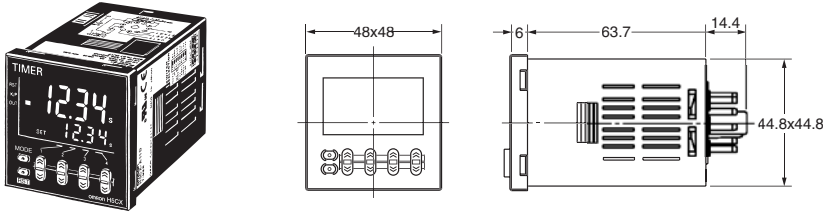


Note: M3.5 terminal screw (effective length: 6 mm)

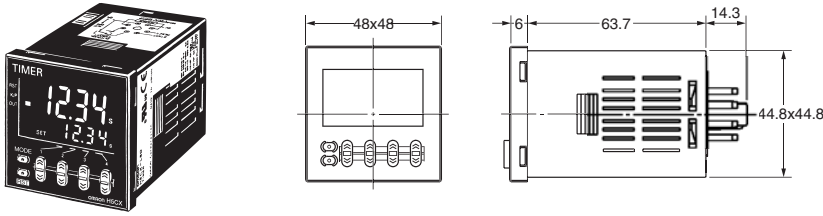
H5CX-A11/-A11S (Flush Mounting/Surface Mounting)



H5CX-A11D/-A11SD (Flush Mounting/Surface Mounting)

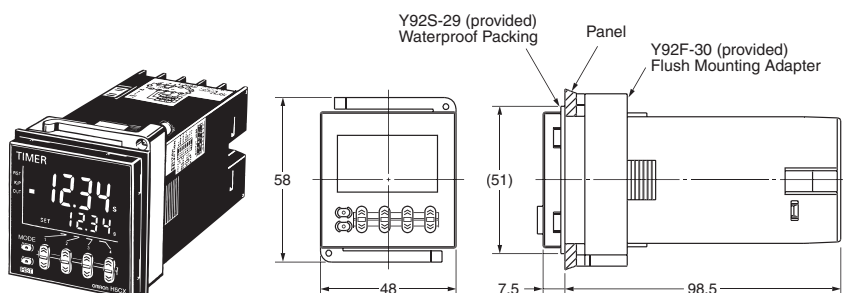


H5CX-L8□ (Flush Mounting/Surface Mounting)

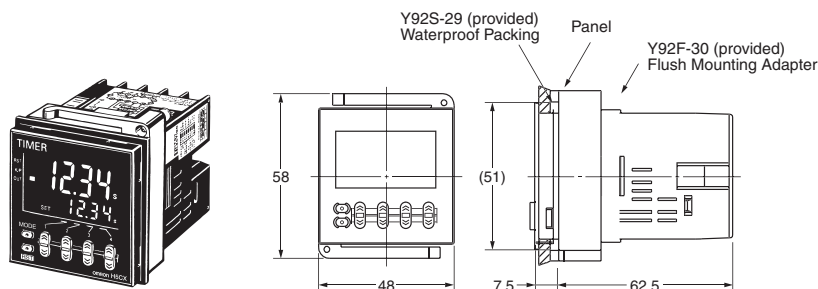


■ Dimensions with Flush Mounting Adapter

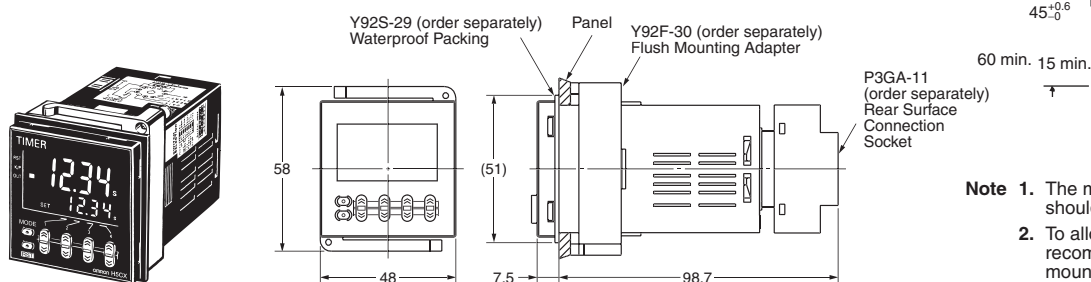
H5CX-A/-AS (Provided with Adapter and Waterproof Packing)



H5CX-AD/-ASD (Provided with Adapter and Waterproof Packing)

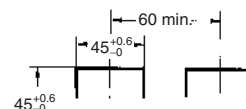


H5CX-A11/-A11S (Adapter and Waterproof Packing Ordered Separately)



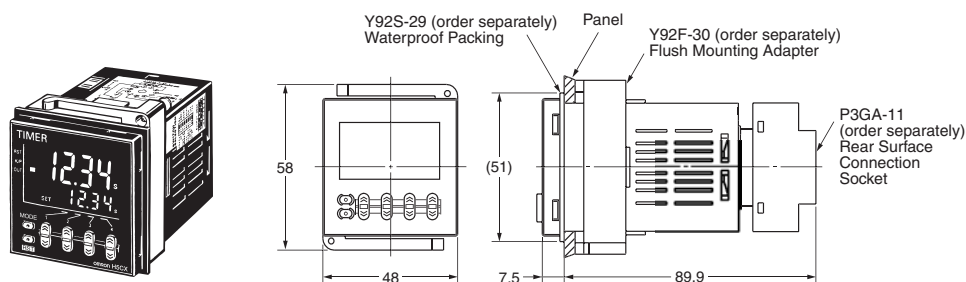
Panel Cutouts

Panel cutouts areas shown below.
(according to DIN43700).



- Note**
1. The mounting panel thickness should be 1 to 5 mm.
 2. To allow easier operability, it is recommended that Adapters are mounted so that the gap between sides with hooks is at least 15 mm.
 3. It is possible to mount timers side by side, but only in the direction without the hooks.

H5CX-A11D/-A11SD (Adapter and Waterproof Packing Ordered Separately)



n side by side mounting

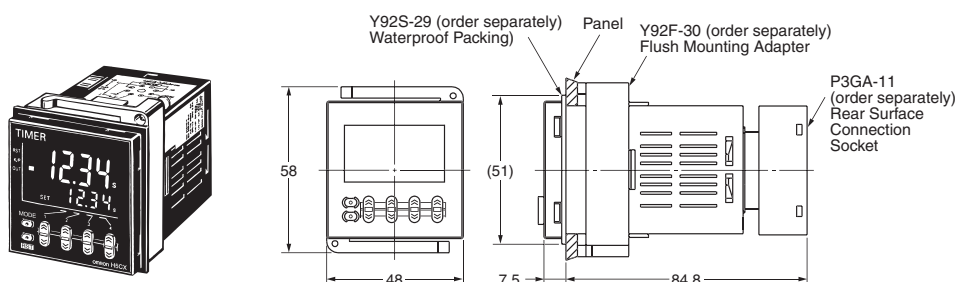
A

$$A = (48n - 2.5) \begin{matrix} +1 \\ 0 \end{matrix}$$

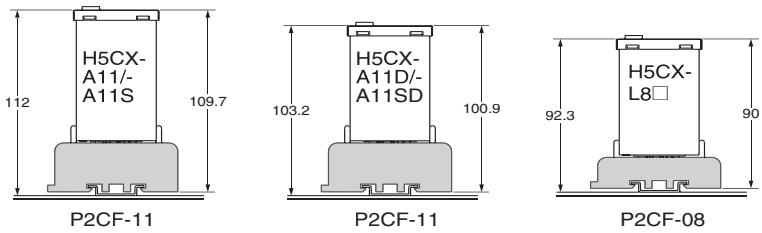
With Y92A-48F1 attached.
 $A = \{48n - 2.5 + (n-1) \times 4\} \begin{matrix} +1 \\ 0 \end{matrix}$

With Y92A-48 attached.
 $A = (51n - 5.5) \begin{matrix} +1 \\ 0 \end{matrix}$

H5CX-L8□ (Adapter and Waterproof Packing Ordered Separately)



■ Dimensions with Front Connecting Socket



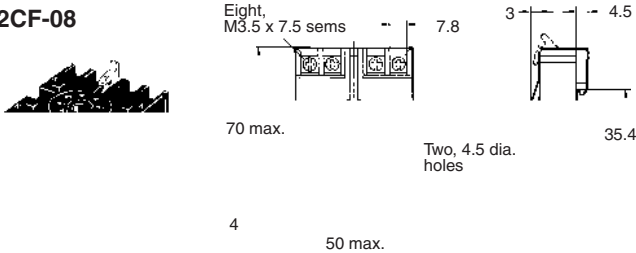
Note: These dimensions vary with the kind of DIN-rail (reference value).

■ Accessories (Order Separately)

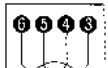
Note: All units are in millimeters unless otherwise indicated.

Track Mounting/Front Connecting Socket

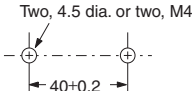
P2CF-08



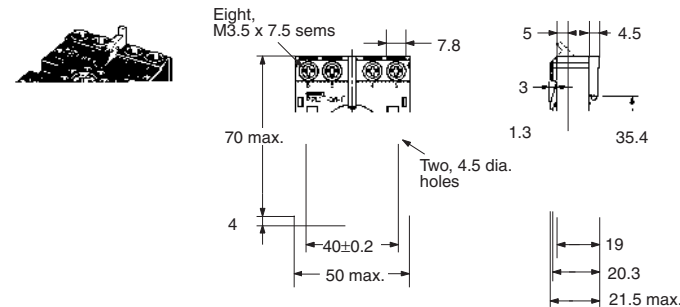
Terminal Arrangement/
Internal Connections
(Top View)



Surface Mounting Holes

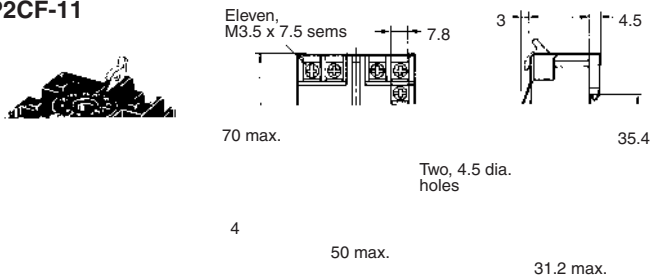


P2CF-08-E (Finger Safe Terminal Type)
Conforming to VDE0106/P100

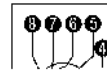


Track Mounting/Front Connecting Socket

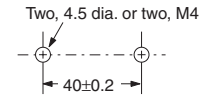
P2CF-11



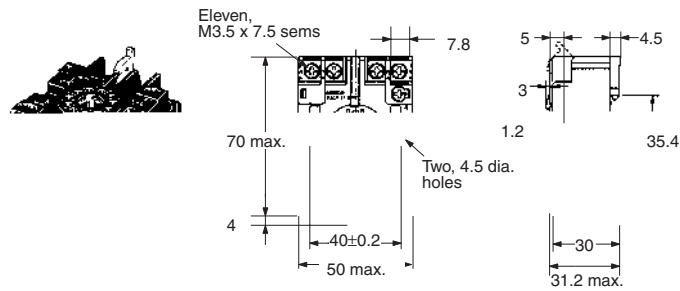
Terminal Arrangement/ Internal Connections (Top View)



Surface Mounting Holes

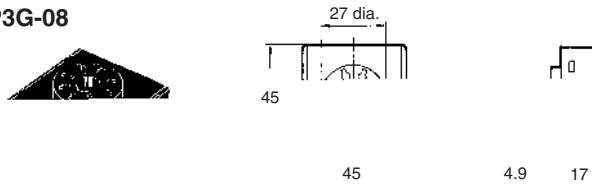


P2CF-11-E (Finger Safe Terminal Type) Conforming to VDE0106/P100



Back Connecting Socket

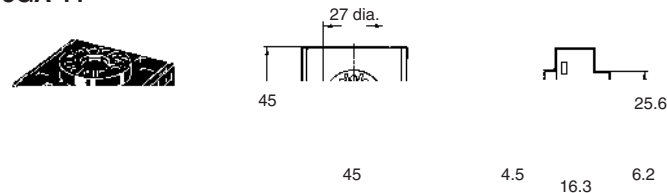
P3G-08



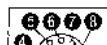
Terminal Arrangement/ Internal Connections (Bottom View)



P3GA-11



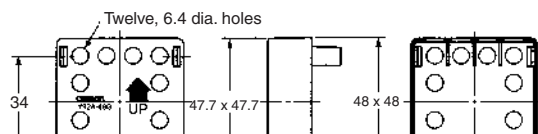
Terminal Arrangement/ Internal Connections (Bottom View)



Finger Safe Terminal Cover Conforming to VDE0106/P100

Y92A-48G

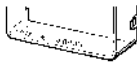
(Attachment for P3G-08/P3GA-11
Socket)



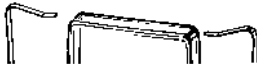
16.5 24.6 27.6

47.4

Hard Cover
Y92A-48

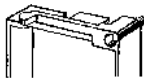


Soft Cover
Y92A-48F1



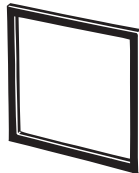
Flush Mounting Adapter
(provided with H5CX-A□ models)

Y92F-30



Waterproof Packing
(provided with H5CX-A□ models)

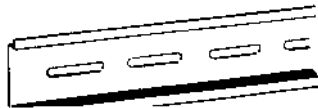
Y92S-29



Note: Order the Flush Mounting Adapter separately if it is lost or damaged.

Note: Order the Waterproof Packing separately if it is lost or damaged. Depending on the operating environment, the Waterproof Packing may deteriorate, contract, or harden and so regular replacement is recommended to ensure NEMA4 compliance.

Mounting DIN-rail
PFP-100N, PFP-50N



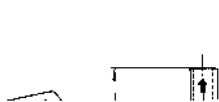
PFP-100N2



4.5	15	25	10	25	25	25	25	1,000 (500) (See note.)	10	25	*	7.3±0.15	35±0.3	27±0.15	4.5	15	25	10	25	25	25	15	1,000	10	15	35±0.3	27	24	29.2	16	1	1.5
-----	----	----	----	----	----	----	----	----------------------------	----	----	---	----------	--------	---------	-----	----	----	----	----	----	----	----	-------	----	----	--------	----	----	------	----	---	-----

Note: The values shown in parentheses are for the PFP-50N.

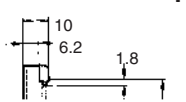
End Plate
PFP-M



50

11.5

10 M4 x 8
pan head
screw



1.8

1.3

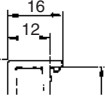
4.8

Spacer
PFP-S



44.3

16.5



34.8

Precautions

⚠ Caution

Do not use the product in locations subject to flammable or explosive gases. Doing so may result in explosion.

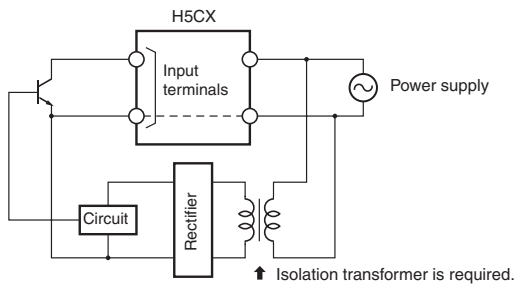
The service life of the output relays depends on the switching capacity and switching conditions. Consider the actual application conditions and use the product within the rated load and electrical service life. Using the product beyond its service life may result in contact deposition or burning.

Do not disassemble, repair, or modify the product. Doing so may result in electric shock, fire, or malfunction.

Do not allow metal objects or conductive wires to enter the product. Doing so may result in electric shock, fire, or malfunction.

■ Power Supplies

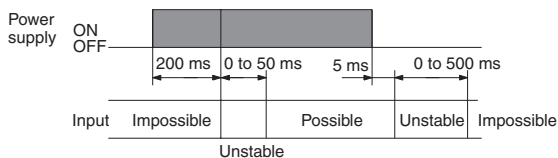
For the power supply of an input device of the H5CX (except for H5CX-A11□), use an isolating transformer with the primary and secondary windings mutually isolated and the secondary winding not grounded.



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

Do not touch the input terminals while power is supplied. The H5CX (except for H5CX-A11/-A11S) has a transformerless power supply and so touching the input terminals with power supplied may result in electric shock.

When turning the power ON and OFF, input signal reception is possible, unstable, or impossible as shown in the diagram below.



Turn the power ON and OFF using a relay with a rated capacity of 10 A minimum to prevent contact deterioration due to inrush current caused by turning the power ON and OFF.

Apply the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value immediately, otherwise they may not be reset or a timer error may result.

Be sure that the capacity of the power supply is large enough, otherwise the Timer may not start due to inrush current (approx. 10 A) that may flow for an instant when the Timer is turned on.

Make sure that the fluctuation of the supply voltage is within the permissible range.

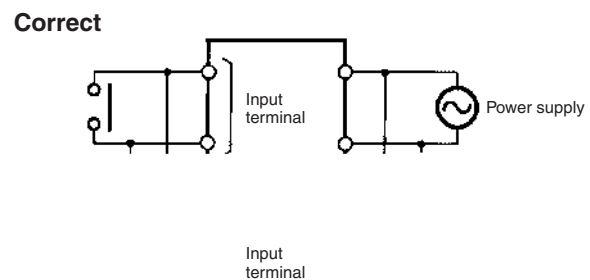
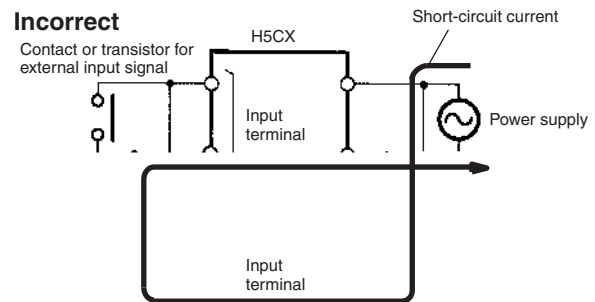
■ Timer Control with Power Start

To allow for the startup time of peripheral devices (sensors, etc.), the H5CX starts timing operation between 200 ms to 250 ms after power is turned ON. For this reason, in operations where timing starts from power ON, the time display will actually start from 250 ms. If the set value is 249 ms or less, the time until output turns ON will be a fixed value between 200 and 250. (Normal operation is possible for set value of 250 ms or more.) In applications where a set value of 249 ms or less is required, use start timing with signal input.

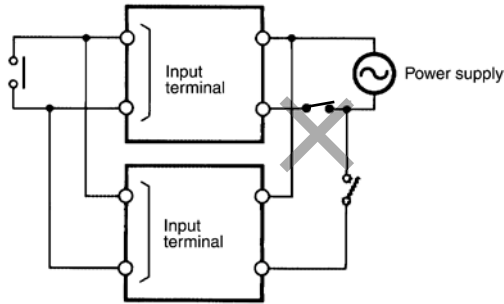
When the H5CX is used with power start in F mode (i.e., accumulative operation with output on hold), there will be a timer error (approximately 100 ms each time the H5CX is turned ON) due to the characteristics of the internal circuitry. Use the H5CX with signal start if timer accuracy is required.

■ Input/Output

The H5CX (except for H5CX-A11/-A11S) uses a transformerless power supply. When connecting a relay or transistor as an external 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.



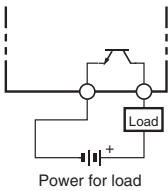
It is impossible to provide two independent power switches as shown below regardless of whether or not the Timers are different in phase.



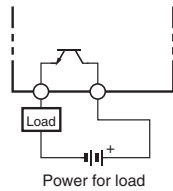
■ Transistor Output

The transistor output of the H5CX is insulated from the internal circuitry by a photocoupler, so the transistor output can be used as both NPN and PNP output.

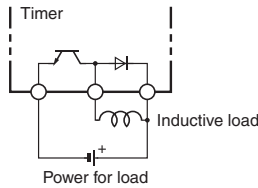
NPN Output



PNP Output



The diode connected to the collector of the output transistor is used to absorb inverted voltage that is generated when an inductive load is connected to the H5CX.



■ Changing the Set Values

When changing the set value during a timing operation, the output will turn ON if the set value is changed as follows because of the use of a constant read-in system:

Elapsed time mode: Present value $\geq$ set value

Remaining time mode: Elapsed time $\geq$ set value (The present value is set to 0.)

Note: When in the remaining time mode, the amount the set value is changed is added to or subtracted from the present value.

■ Self-diagnostic Function

The following displays will appear if an error occurs.

Main display	Sub-display	Error	Output status	Correction method	Set value after reset
E1	Not lit	CPU	OFF	Either press the reset key or reset the power supply.	No change
E2	Not lit	Memory error (RAM)	OFF	Reset the power supply.	No change
E2	5Ln	Memory error (EEP) (See note)	OFF	Reset to the factory settings using the reset key.	0

Note: This includes times when the life of the EEPROM has expired.

■ Operation with a Set Value of 0

Operation with a set value of 0 will vary with the output mode. Refer to the *Timing Charts*.

■ DIP Switch Setting

Ensure that the power is turned OFF before changing DIP switch settings. Changing DIP switch settings with the power turned ON may result in electric shock due to contact with terminals subject to high voltages.

■ Power Failure Backup

All data is stored in the EEPROM when there is a power failure. The EEPROM can be overwritten more than 100,000 times.

Operating mode	Overwriting timing
A-3, F mode	When power is turned OFF.
Other mode	When settings are changed.

■ Response Delay Time When Resetting (Transistor Output)

The following table shows the delay from when the reset signal is input until the output is turned OFF.

(Reference value)

Minimum reset signal width	Output delay time
1 ms	0.8 to 1.2 ms
20 ms	15 to 25 ms

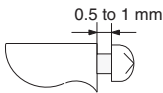
■ Wiring

Be sure to wire the Timer with the correct polarity.

■ Mounting

Tighten the two mounting screws on the Adapter. Tighten them alternately, a little at a time, so as to keep them at an equal tightness.

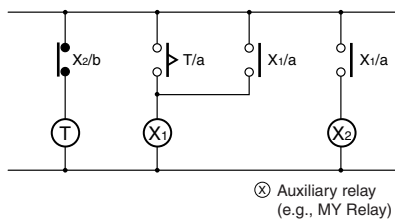
The H5CX's panel surface is water-resistant (conforming to NEMA 4 and IP66). In order to prevent the internal circuit from water penetration through the space between the timer and operating panel, attach a waterproof packing between the timer and installation panel and secure the waterproof packing with the Y92F-30 flush-mounting adapter.



It is recommended that the space between the screw head and the adapter should be 0.5 to 1 mm.

■ Operating Environment

- Use the product within the ratings specified for submerging in water, and exposure to oil.
- Do not use the product in locations subject to vibrations or shocks. Using the product in such locations over a long period may result in damage due to stress.
- Do not use the product in locations subject to dust, corrosive gases, or direct sunlight.
- Separate the input signal devices, input signal cables, and the product from the source of noise or high-tension cables producing noise.
- Separate the product from the source of static electricity when using the product in an environment where a large amount of static electricity is produced (e.g., forming compounds, powders, or fluid materials being transported by pipe).
- Organic solvents (such as paint thinner), as well as very acidic or basic solutions might damage the outer casing of the Timer.
- Use the product within the ratings specified for temperature and humidity.
- Do not use the product in locations where condensation may occur due to high humidity or where temperature changes are severe.
- Store at the specified temperature. If the H5CX has been stored at a temperature of less than -10°C , allow the H5CX to stand at room temperature for at least 3 hours before use.
- Leaving the H5CX with outputs ON at a high temperature for a long time may hasten the degradation of internal parts (such as electrolytic capacitors). Therefore, use the product in combination with relays and avoid leaving the product as long as more than 1 month with the output turned ON.



■ Insulation

There is no insulation between power supply and input terminals (except for H5CX-A11/-A11S).

Basic insulation between power supply and output terminals, and between input terminals and output terminals.

Input and output terminals are connected to devices without exposed charged parts.

Input and output terminals are connected to devices with basic insulation that is suitable for the maximum operating voltage.

Operating Procedures

■ Setting Procedure Guide

Settings for Timer Operation

Use the following settings for all models except the H5CX-L8□.
Refer to page C-143 for the H5CX-L8□.

When Using Basic Functions Only

--- Basic Functions ---

- Time range (0.001 s to 999.9 h, except 9999 h and 9999min)
- Output mode (A, A-2, E, F)
- Timer mode (UP/DOWN)
- Input signal width (20 ms/1 ms)

The settings can be performed easily with the DIP switch.

■ For details on the setting methods, refer to page C-142.

When Using Other Time Ranges (9999 h, 9999 min) and Output Modes (A-1, A-3, b, b-1, d, and Z)

All the functions can be set with the operation keys.

■ For details on the setting methods, refer to page C-143.

When Using More Detailed Setting Items (Output Time, NPN/PNP Input Mode, Display Color, Key Protect Level)

Setting for items other than the basic functions can be performed with the operation keys.

■ For details on the setting methods, refer to page C-143.

Note: At the time of delivery, the H5CX is set for timer operation.

Settings for Twin Timer Operation

Use the following settings for all models except the H5CX-L8□.
Refer to page C-150 for the H5CX-L8□.

When Using Basic Functions Only

--- Basic Functions ---

- Time range (0.01 s to 99 min 59 s)
- ON/OFF start mode (flicker OFF start/flicker ON start)
- Timer mode (UP/DOWN)
- Input signal width (20 ms/1 ms)

The settings can be performed easily with the DIP switch.

■ For details on the setting methods, refer to page C-149.

When Using Other Time Ranges (999.9 min, 9999 min, 99 h 59 min, 999.9 h, 9999 h, 9.999 s)

All the functions can be set with the operation keys.

■ For details on the setting methods, refer to page C-150.

When Using More Detailed Setting Items (NPN/PNP Input Mode, Display Color, Key Protect Level)

Setting for items other than the basic functions can be performed with the operation keys.

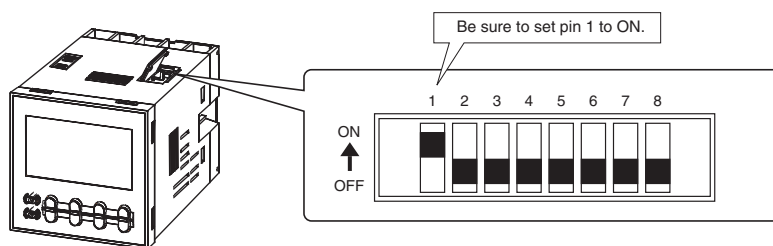
■ For details on the setting methods, refer to page C-150.

Note: At the time of delivery, the H5CX is set for timer operation.

■ Operating Procedures (Timer Function)

Settings for Basic Functions

Settings for basic functions can be performed with just the DIP switch.



	Item	OFF	ON
1	DIP switch settings enable/disable	Disabled	Enabled
2	Time range	Refer to the table on the right.	
3			
4			
5	Output mode	Refer to the table on the right.	
6			
7	Timer mode	Elapsed time (UP)	Remaining time (DOWN)
8	Input signal width	20 ms	1 ms

Note: All the pins are factory-set to OFF.

Pin 2	Pin 3	Pin 4	Time range
ON	ON	ON	0.001 s to 9.999 s
OFF	OFF	OFF	0.01 s to 99.99 s
ON	OFF	OFF	0.1 s to 999.9 s
OFF	ON	OFF	1 s to 9999 s
ON	ON	OFF	0 min 01 s to 99 min 59 s
OFF	OFF	ON	0.1 min to 999.9 min
ON	OFF	ON	0 h 01 min to 99 h 59 min
OFF	ON	ON	0.1 h to 999.9 h

Pin 5	Pin 6	Output mode
OFF	OFF	A mode (signal ON delay (I): power reset operation)
ON	OFF	A-2 mode: (power ON delay (I): power reset operation)
OFF	ON	E mode (interval: power reset operation)
ON	ON	F mode (accumulative: power hold operation)

Easy Confirmation of Switch Settings Using Indicators

The ON/OFF status of the DIP switch pins can be confirmed using the front display. For details, refer to page 153.

Note 1. Be sure to set pin 1 of the DIP switch to ON. If it is set to OFF, the DIP switch settings will not be enabled.

2. Changes to DIP switch settings are enabled when the power is turned ON. (Perform DIP switch settings while the power is OFF.)

3. There is no DIP switch on the H5CX-L8□. For details on the setting methods, refer to page C-143.

4. When using time ranges or output modes that cannot be set with the DIP switch, all of the settings have to be made using the operation keys. For details on the setting methods, refer to page C-143.

Detailed Settings

After making DIP switch settings for basic functions, detailed settings (see note) can be added using the operation keys. For details, refer to page C-143.

Note: Output time, NPN/PNP input mode, display color, key protect level.

Settings for Advanced Functions

Settings that cannot be performed with the DIP switch are performed with the operation keys.

Power ON

Run mode

0.00 s
SET 0.00 s

See note 1.
MODE
3 s min.

See note 2.
MODE
3 s min.

For details on operations in run mode, refer to page C-145.

- Note 1.** If the mode is switched to the function setting mode during operation, operation will continue.
- 2.** Changes made to settings in function setting mode are enabled for the first time when the mode is changed to run mode. Also, when settings are changed, the timer is reset (time initialized and output turned OFF).

The characters displayed in reverse video are the default settings.

When performing settings with operation keys only, set pin1 of the DIP switch to OFF (factory setting). If pin 1 of the DIP switch is set to ON, the setting items indicated in ■ will not be displayed.

Function setting mode

Time range
t L n r
s

Time range

Set the time range using the Δ ∇ keys.

---s ---s ---s ---s ---h ---s

⇒ For details, refer to *Time Range List* below.

Timer mode
t L n n
UP

Timer mode

Set the timer mode using the Δ ∇ keys.

UP $\leftrightarrow$ d o u n
(Elapsed time) (Remaining time)

Output mode
o u t n
A

Output mode

Set the output mode using the Δ ∇ keys.

A $\leftrightarrow$ A-1 $\leftrightarrow$ A-2 $\leftrightarrow$ A-3 $\leftrightarrow$ b $\leftrightarrow$ b-1 $\leftrightarrow$ d $\leftrightarrow$ E $\leftrightarrow$ F $\leftrightarrow$ Z
(A) (A-1) (A-2) (A-3) (b) (b-1) (d) (E) (F) (Z)

Output time
o t L n
H o l d

Output time

Set each digit for the output time using the corresponding Δ ∇ keys.

0 $\leftrightarrow$ 1 $\leftrightarrow$ 2 $\leftrightarrow$ 3 $\leftrightarrow$ 4 $\leftrightarrow$ 5 $\leftrightarrow$ 6 $\leftrightarrow$ 7 $\leftrightarrow$ 8 $\leftrightarrow$ 9
H o l d / 0.0 : ~ 99.99 : Output hold/0.01 to 99.99 s

(If the output time is set to 0.00, H o l d is displayed.)
Displayed for modes A, A-1, A-2, A-3, b, and b-1 only.

Set the input signal width using the Δ ∇ keys.

20 m s $\leftrightarrow$ 1 m s
(20 ms) (1 ms)

Input signal
i n p u t
20 m s

Input signal

NPN/PNP input
i n p u t
n P n

NPN/PNP input

Set the NPN/PNP input mode using the Δ ∇ keys.

n P n $\leftrightarrow$ P n P
(NPN input) (PNP input)

Only displayed for H5CX-A□ and H5CX-A11□ models.

Display color
c o l o r
r e d

Display color

Set the display color using the Δ ∇ keys.

r e d $\leftrightarrow$ g r n $\leftrightarrow$ r - g $\leftrightarrow$ g - r
(Red) (Green) Red-green Green-red

Displayed for terminal-block models (H5CX-A□) only.

Key protect level
k e y p r o t
k P - 1

Key protect level

Set the key protect level using the Δ ∇ keys.

k P - 1 $\leftrightarrow$ k P - 2 $\leftrightarrow$ k P - 3 $\leftrightarrow$ k P - 4 $\leftrightarrow$ k P - 5
(KP-1) (KP-2) (KP-3) (KP-4) (KP-5)

Time Range List

Display	Set Value
---s	0.01 s to 99.99 s (default setting)
---s	0.1 s to 999.9 s
---s	1 s to 9999 s
---m	0 min 01 s to 99 min 59 s
---m	0.1 min to 999.9 min
---m	1 min to 9999 min
---h	0 h 01 min to 99 h 59 min
---h	0.1 h to 999.9 h
---h	1 h to 9999 h
---s	0.001 s to 9.999 s

Explanation of Functions

Time Range ($\overline{t} \overline{L} \overline{n} \overline{r}$) (Setting possible using DIP switch.)

Set the range to be timed in the range 0.000 s to 9,999 h. Settings of type ---- h (9,999 h) and ---- min (9,999 min) cannot, however, be made with the DIP switch. Use the operation keys if these settings are required.

Timer Mode ($\overline{t} \overline{L} \overline{n} \overline{n}$) (Setting possible using DIP switch.)

Set either the elapsed time (UP) or remaining time (DOWN) mode.

Output Mode ($\overline{o} \overline{U} \overline{t} \overline{n}$) (Setting possible using DIP switch.)

Set the output mode. The possible settings are A, A-1, A-2, A-3, b, b-1, d, E, F, and Z. Only output modes A, A-2, E, and F can be set using the DIP switch. Use the operation keys if a different setting is required. (For details on output mode operation, refer to "Timing Charts" on page C-146.)

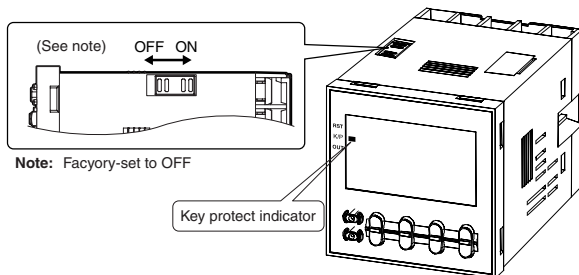
Output Time ($\overline{o} \overline{t} \overline{L} \overline{n}$)

When using one-shot output, set the output time for one-shot output (0.01 to 99.99 s). One-shot output can be used only if the selected output mode is A, A-1, A-2, b, or b-1. If the output time is set to 0.00, $\overline{H} \overline{o} \overline{L} \overline{d}$ is displayed, and the output is held.

Key Protect Level ($\overline{P} \overline{Y} \overline{P} \overline{L}$)

Set the key protect level.

When the key-protect switch is set to ON, it is possible to prevent setting errors by prohibiting the use of certain operation keys by specifying the key protect level (KP-1 to KP-5). The key protect indicator is lit while the key-protect switch is set to ON.



Input Signal Width ($\overline{L} \overline{F} \overline{L} \overline{L}$) (Setting possible using DIP switch.)

Set the minimum signal input width (20 ms or 1 ms) for signal, reset, and gate inputs. The same setting is used for all external inputs (signal, reset, and gate inputs). If contacts are used for the input signal, set the input signal width to 20 ms. Processing to eliminate chattering is performed for this setting.

NPN/PNP Input Mode ($\overline{L} \overline{n} \overline{o} \overline{d}$)

Select either NPN input (no-voltage input) or PNP input (voltage input) as the input format. The same setting is used for all external inputs. For details on input connections, refer to "Input Connections" on page C-131.

Display Color ($\overline{L} \overline{o} \overline{L} \overline{r}$)

Set the color used for the present value.

	Output OFF	Output ON
$\overline{r} \overline{E} \overline{d}$	Red (fixed)	
$\overline{G} \overline{r} \overline{n}$	Green (fixed)	
$\overline{r} \overline{-} \overline{G}$	Red	Green
$\overline{G} \overline{-} \overline{r}$	Green	Red

Level	Meaning	Details			
		Changing mode (See note.)	Switching display during operation	Reset key	Up/down key
KP-1 (default setting)		No	Yes	Yes	Yes
KP-2		No	Yes	No	Yes
KP-3		No	Yes	Yes	No
KP-4		No	Yes	No	No
KP-5		No	No	No	No

Note: Changing mode to timer/twin timer selection mode ($\overline{M} \overline{O} \overline{D} \overline{E}$ + $\overline{A} \overline{1}$ 1 s min.) or function setting mode ($\overline{M} \overline{O} \overline{D} \overline{E}$ 3 s min.).

Timing Charts

Timer Operation

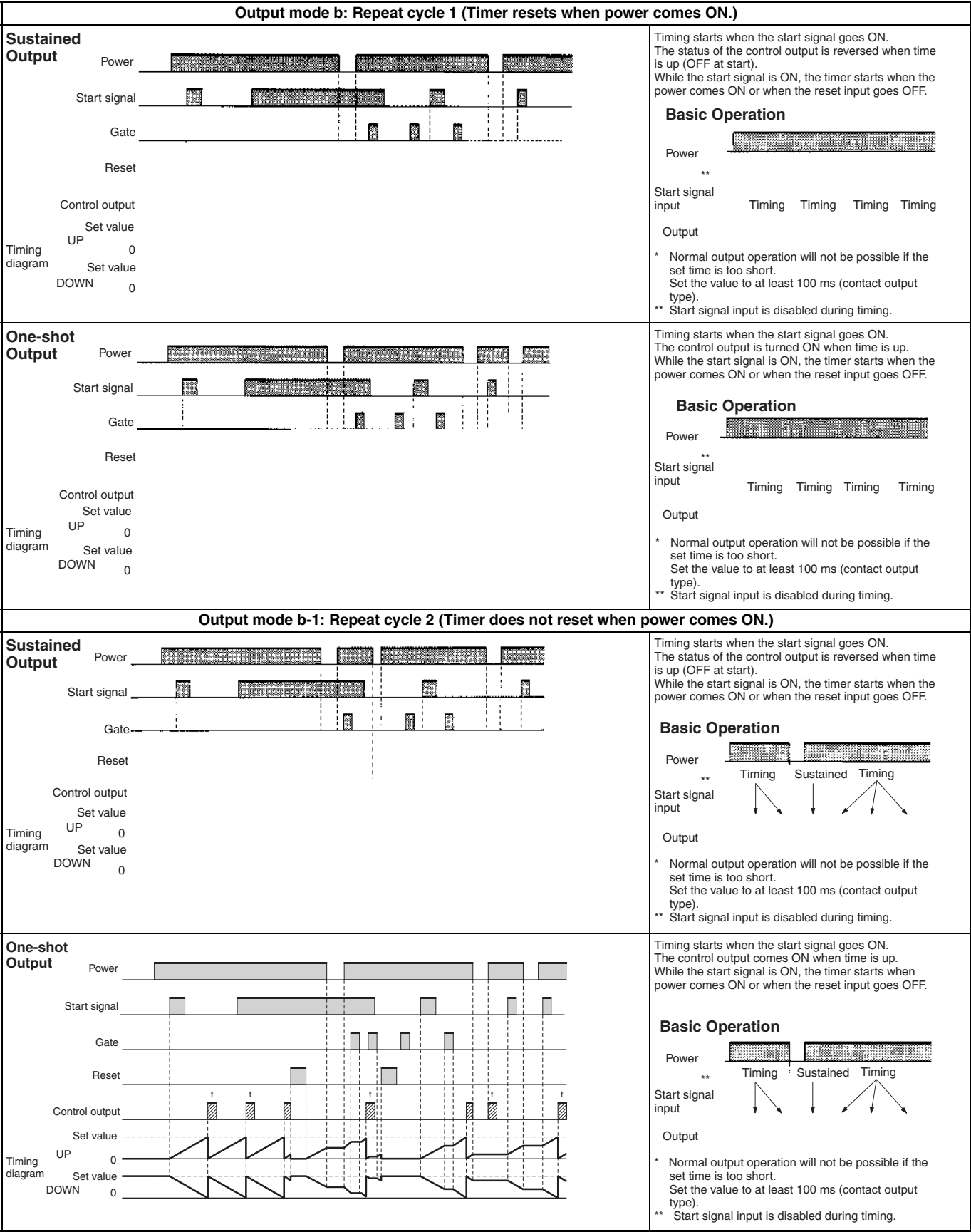
The gate input is not included in the H5CX-L8□ models.

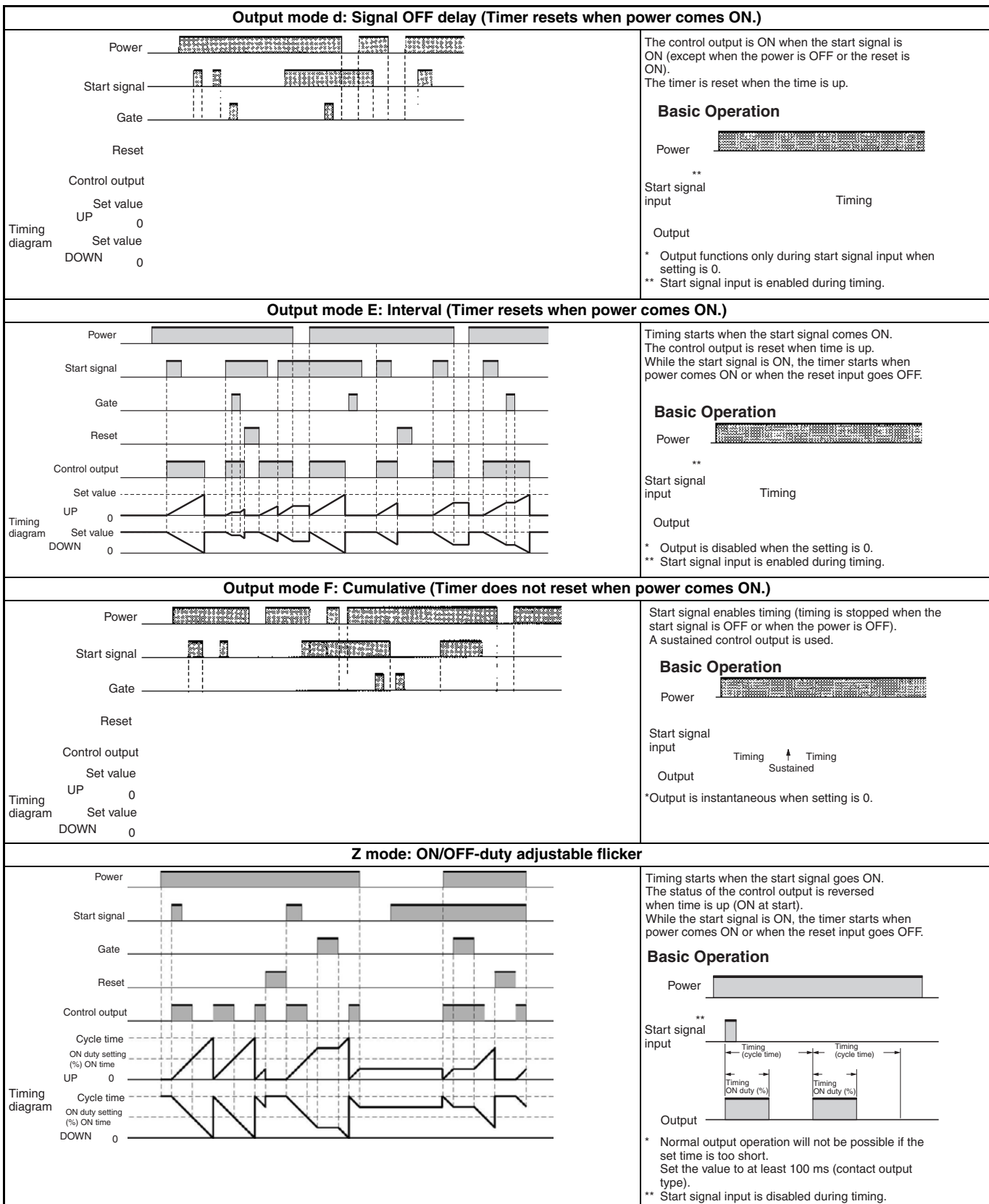
One-shot output

Sustained output

Either one-shot output or sustained output can be selected.

Output mode A: Signal ON delay 1 (Timer resets when power comes ON.)	
Timing diagram UP 0 DOWN 0	Timing starts when the start signal goes ON. While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF. The control output is controlled using a sustained or one-shot time period. Basic Operation * Output is instantaneous when setting is 0. ** Start signal input is disabled during timing.
Output mode A-1: Signal ON delay 2 (Timer resets when power comes ON.)	
Timing diagram UP 0 DOWN 0	Timing starts when the start signal goes ON, and is reset when the start signal goes OFF. While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF. The control output is controlled using a sustained or one-shot time period. Basic Operation *Output is instantaneous when setting is 0.
Output mode A-2: Power ON delay 1 (Timer resets when power comes ON.)	
Timing diagram UP 0 DOWN 0	Timing starts when the reset input goes OFF. The start signal disables the timing function (i.e., same function as the gate input). The control output is controlled using a sustained or one-shot time period. Basic Operation *Output is instantaneous when setting is 0.
Output mode A-3: Power ON delay 2 (Timer does not reset when power comes ON.)	
Timing diagram UP 0 DOWN 0	Timing starts when the reset input goes OFF. The start signal disables the timing function (i.e., same function as the gate input). The control output is controlled using a sustained or one-shot time period. Basic Operation *Output is instantaneous when setting is 0.





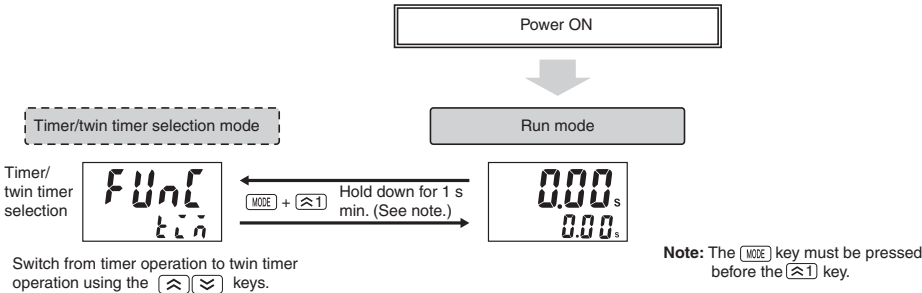
Z Mode

Output quantity can be adjusted by changing the cycle time set in the adjustment level to 1 and by changing the ON duty (%) set value. The set value shows the ON duty (%) and can be set to a value between 0 and 100 (%). When the cycle time is 0, the output will always be OFF. When the cycle time is not 0 and when ON duty has been set to 0 (%), the output will always be OFF. When ON duty has been set to 100 (%), the output will always be ON.

■ Operating Procedures (Twin Timer Function)

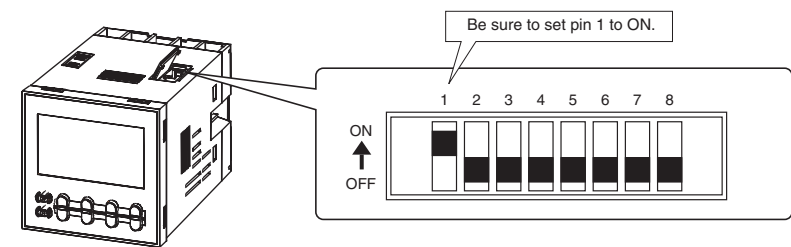
Switching from Timer to Twin Timer

The H5CX is factory-set for timer operation. To switch to twin timer operation, use the procedure given below. For details, refer to page C-154.



Settings for Basic Functions

Settings for basic functions can be performed with just the DIP switch.



	Item	OFF	ON
1	DIP switch settings enable/disable	Disabled	Enabled
2	OFF time range	Refer to the table on the right.	
3			
4	ON time range	Refer to the table on the right.	
5			
6	ON/OFF start mode	Flicker OFF start	Flicker ON start
7	Timer mode	UP	DOWN
8	Input signal width	20 ms	1 ms

Pin 2	Pin 3	OFF time range
OFF	OFF	0.01 s to 99.99 s
ON	OFF	0.1 s to 999.9 s
OFF	ON	1 s to 9999 s
ON	ON	0 min 01 s to 99 min 59 s

Pin 4	Pin 5	ON time range
OFF	OFF	0.01 s to 99.99 s
ON	OFF	0.1 s to 999.9 s
OFF	ON	1 s to 9999 s
ON	ON	0 min 01 s to 99 min 59 s

Note: All the pins are factory-set to OFF.

Easy Confirmation of Switch Settings Using Indicators
The ON/OFF status of the DIP switch pins can be confirmed using the front display. For details, refer to page C-153.

- Note 1.** Be sure to set pin 1 of the DIP switch to ON. If it is set to OFF, the DIP switch settings will not be enabled.
- 2.** Changes to DIP switch settings are enabled when the power is turned ON. (Perform DIP switch settings while the power is OFF.)
- 3.** There is no DIP switch on the H5CX-L8□. For details on the setting methods, refer to page C-150.
- 4.** When using time ranges that cannot be set with the DIP switch, all of the settings have to be made using the operation keys. For details on the setting methods, refer to page C-150.

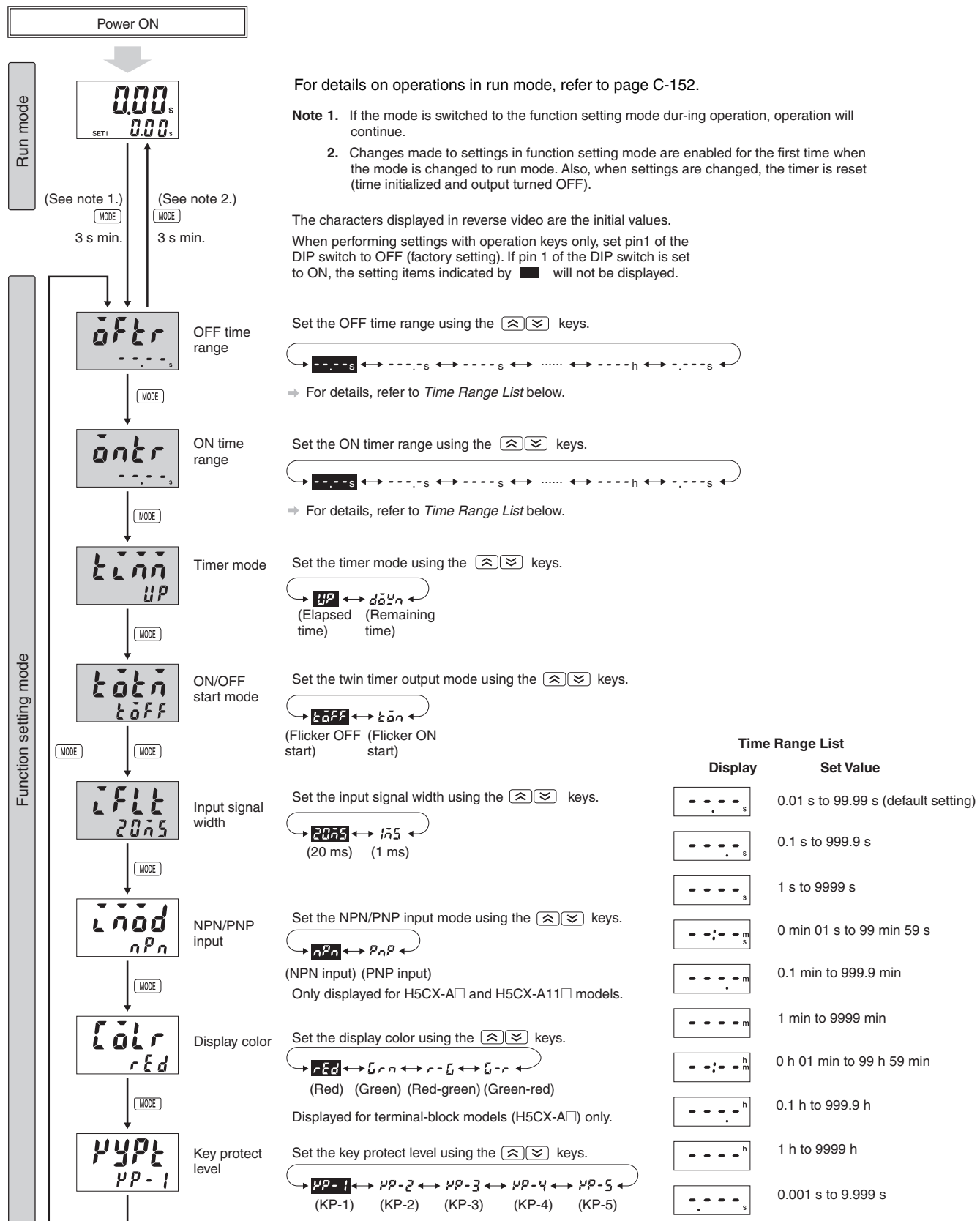
Detailed Settings

After making DIP switch settings for basic functions, detailed settings (see note) can be added using the operation keys. For details, refer to page C-150.

Note: NPN/PNP input mode, display color, key protect level.

Settings for Advanced Functions

Settings that cannot be performed with the DIP switch are performed with the operation keys.



Explanation of Functions

OFF Time Range ($\bar{o}F\bar{t}r$) (Setting possible using DIP switch.)

Set the time range for the OFF time in the range 0.000 s to 9,999 h. Only settings of type --.- s (99.99 s), ---. s (999.9 s), ---- s (9,999 s), and -- min -- s (99 min 59 s), however, can be made with the DIP switch. Use the operation keys if another type of setting is required.

ON Time Range ($\bar{o}n\bar{t}r$) (Setting possible using DIP switch.)

Set the time range for the ON time in the range 0.001 s to 9,999 h. Only settings of type --.- s (99.99 s), ---. s (999.9 s), ---- s (9,999 s), and -- min -- s (99 min 59 s), however, can be made with the DIP switch. Use the operation keys if another type of setting is required.

Timer Mode ($\bar{t}\bar{c}\bar{n}\bar{n}$) (Setting possible using DIP switch.)

Set either UP (incremental) or DOWN (decremental) timer mode. In UP mode, the elapsed time is displayed, and in DOWN mode, the remaining time is displayed.

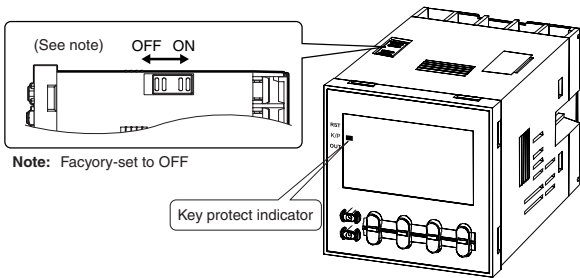
ON/OFF Start Mode ($\bar{t}\bar{o}\bar{t}\bar{n}$) (Setting possible using DIP switch.)

Set the output mode. Set either flicker OFF start or flicker ON start. (For details on output mode operation, refer to "Timing Charts" on page C-152.)

Key Protect Level ($\mu yP\bar{t}$)

Set the key protect level.

When the key-protect switch is set to ON, it is possible to prevent setting errors by prohibiting the use of certain operation keys by specifying the key protect level (KP-1 to KP-5). The key protect indicator is lit while the key-protect switch is set to ON.



Input Signal Width ($\bar{c}F\bar{t}\bar{t}$) (Setting possible using DIP switch.)

Set the minimum signal input width (20 ms or 1 ms) for signal, reset, and gate inputs. The same setting is used for all external inputs (signal, reset, and gate inputs). If contacts are used for the input signal, set the input signal width to 20 ms. Processing to eliminate chattering is performed for this setting.

NPN/PNP Input Mode ($\bar{c}\bar{n}\bar{o}\bar{d}$)

Select either NPN input (no-voltage input) or PNP input (voltage input) as the input format. The same setting is used for all external inputs. For details on input connections, refer to "Input Connections" on page C-131.

Display Color ($\bar{c}\bar{o}\bar{L}r$)

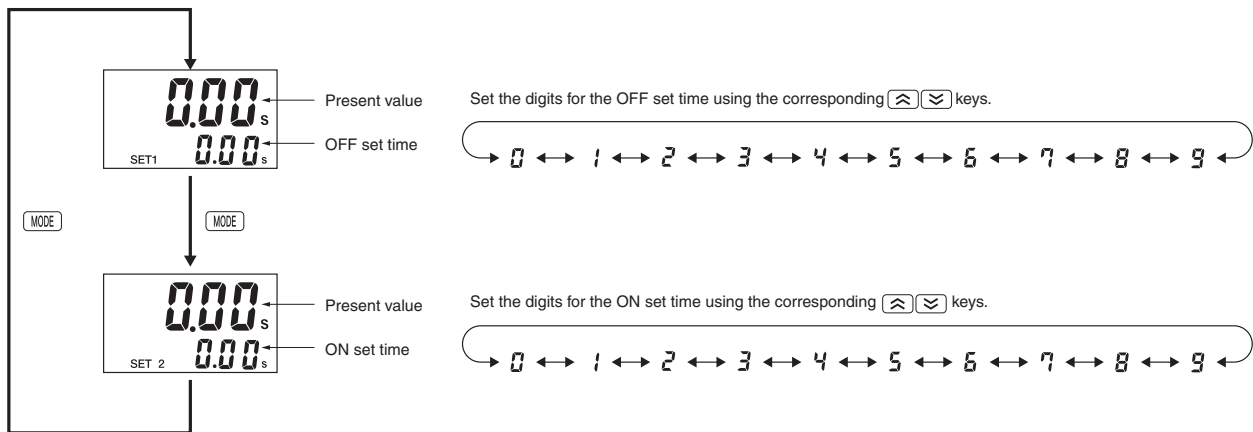
Set the color used for the present value.

	Output OFF	Output ON
rEd	Red (fixed)	
$\bar{G}rn$	Green (fixed)	
$r-\bar{G}$	Red	Green
$\bar{G}-r$	Green	Red

Level	Meaning	Details			
		Changing mode (See note.)	Switching display during operation	Reset key	Up/down key
KP-1 (default setting)		No	Yes	Yes	Yes
KP-2		No	Yes	No	Yes
KP-3		No	Yes	Yes	No
KP-4		No	Yes	No	No
KP-5		No	No	No	No

Note: Changing mode to timer/twin timer selection mode ($\text{MODE} + \text{[1]}$ 1 s min.) or function setting mode ($\text{MODE} + \text{[3]}$ 3 s min.).

Operation in Run Mode



Present Value and OFF Set Time

The present value is displayed in the main display and the OFF set time is displayed in the sub-display. "SET1" lights at the same time.

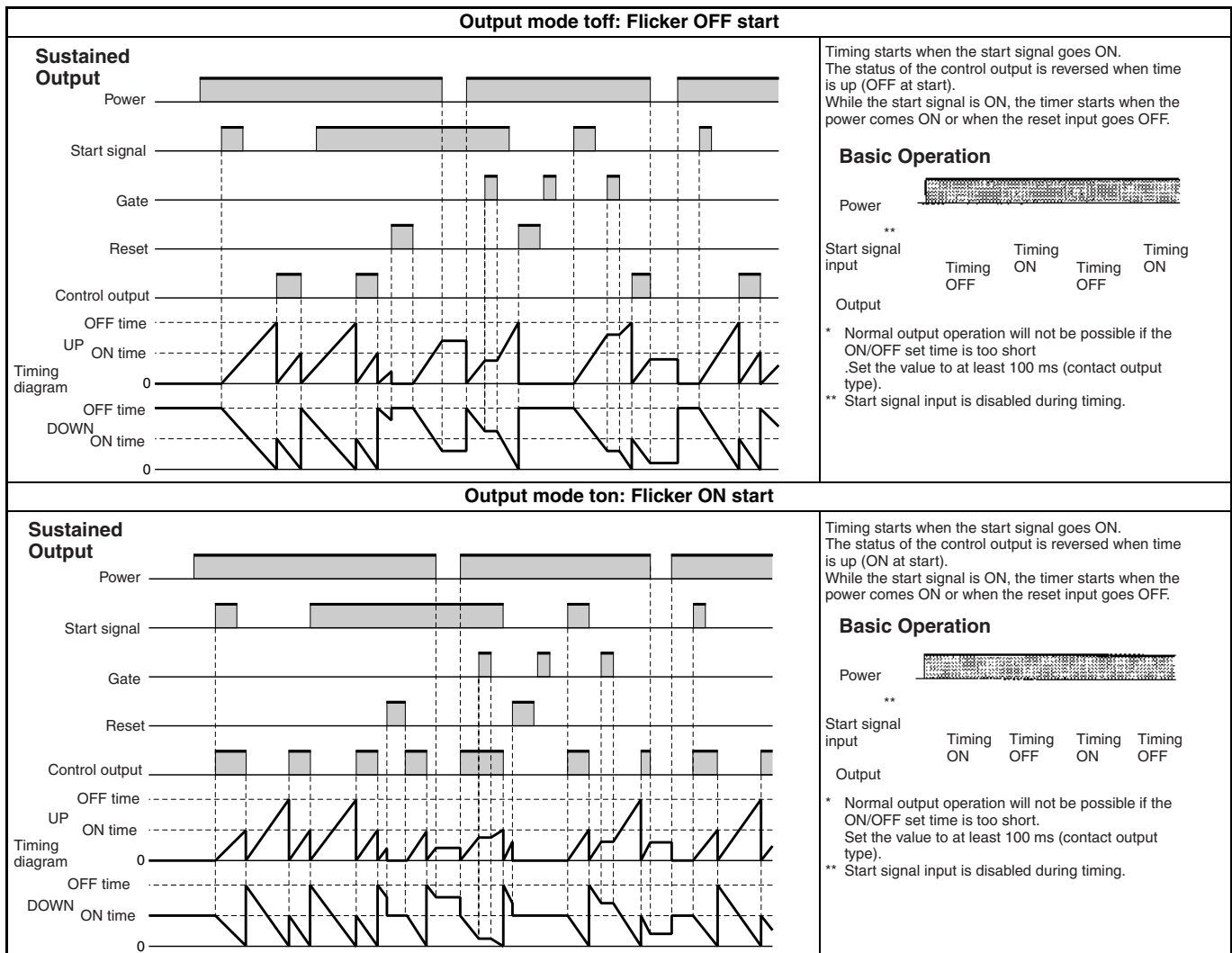
The present value is displayed in the main display and the ON set time is displayed in the sub-display. "SET2" lights at the same time.

Timing Charts

Present Value and ON Set Time

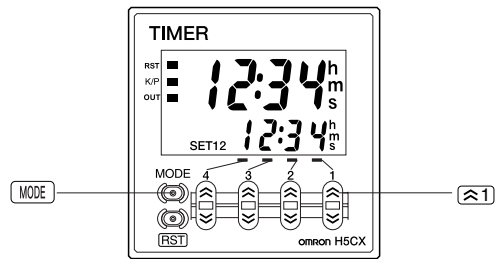
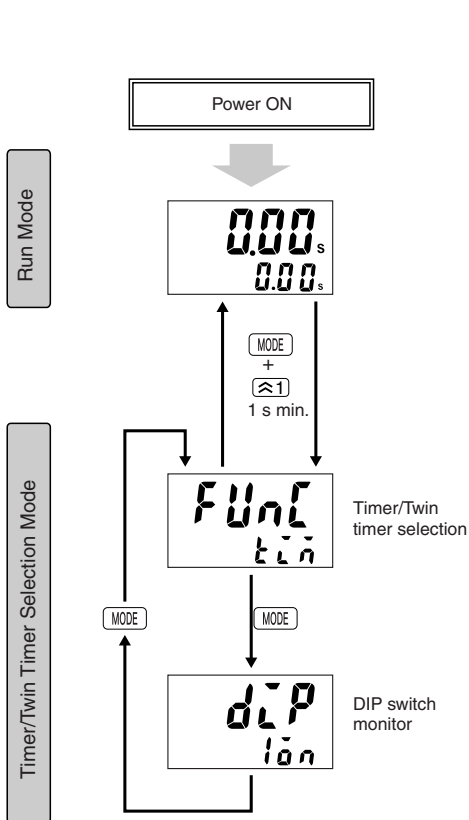
Twin Timer Operation

The gate input is not included in the H5CX-L8□ models.



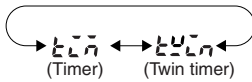
■ Operation in Timer/Twin Timer Selection Mode

Select whether the H5CX is used as a timer or a twin timer in timer/twin timer selection mode. The H5CX is also equipped with a DIP switch monitor function, a convenient function that enables the settings of the DIP switch pins to be confirmed using the front display.



To change the mode to timer/twin timer selection mode, hold down the **1** key for 1 s min. with the **MODE** key held down. The **MODE** key must be pressed before the **1** key. If the **1** key is pressed first, the mode will not change.

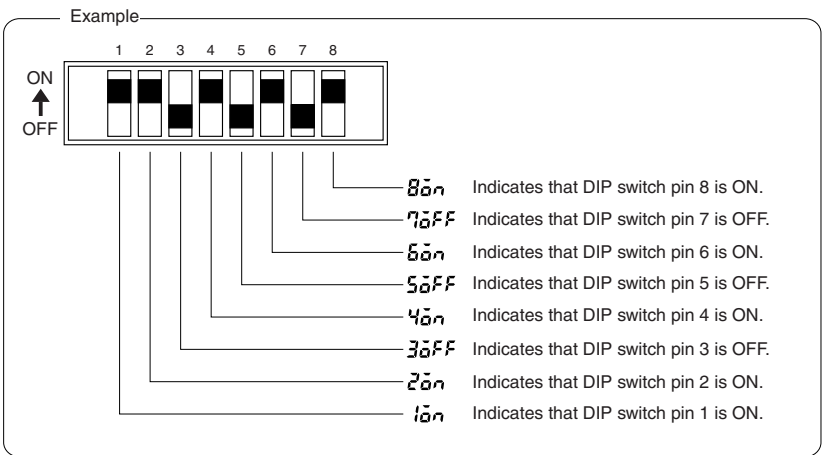
Select either timer operation or twin timer operation using the **1** **2** keys.



Note: The H5CX is factory-set for timer operation.

Confirm the status of DIP switch pins 1 to 8 using the **1** **2** keys.

- Note 1.** This display is not supported with H5CX-L8□.
- 2.** This display is only possible when DIP switch pin 1 (DIP switch settings enable/disable) is set to ON (enable).

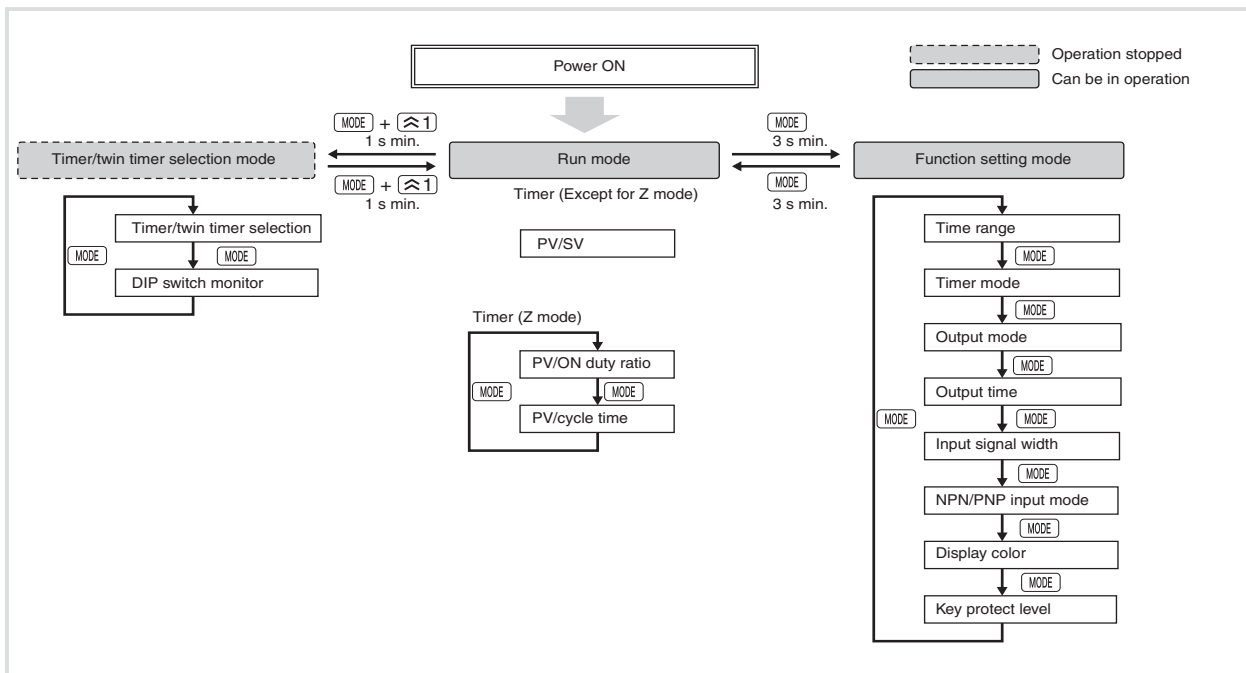


- Note 1.** When the mode is changed to timer/twin timer selection mode, the present value is reset and output turns OFF. Timing operation is not performed in timer/twin timer selection mode.
- 2.** Setting changes made in timer/twin timer selection mode are enabled when the mode is changed to run mode. If settings are changed, the H5CX is automatically reset (present value initialized, output turned OFF).

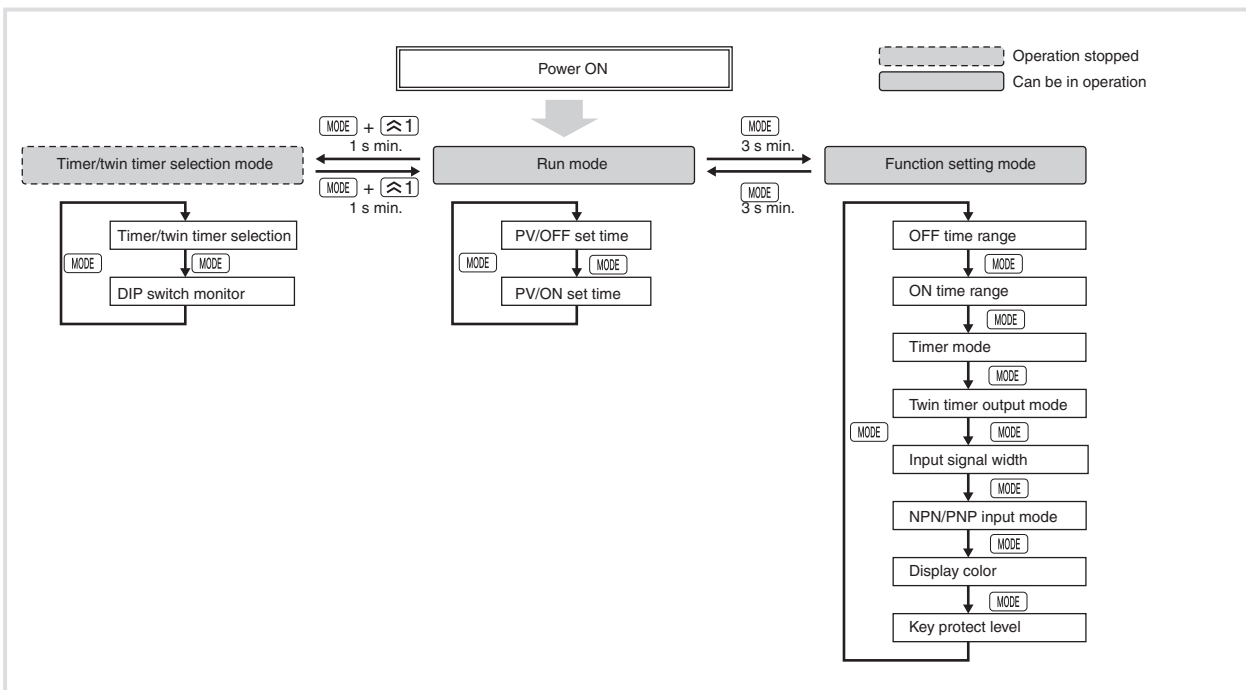
Additional Information

■ Using the Operation Keys

Timer Operation



Twin Timer Operation



Note 1. All setting changes are performed using the **⇧** and **⇩** keys.

2. The above flowcharts outline the procedure for all models. For details on specific models, refer to page C-143 (timer operation) or page C-150 (twin timer operation).

List of Settings

Fill in your set values in the set value column of the following tables and utilize the tables for quick reference.

Timer/Twin Timer Selection Mode

Parameter name	Parameter	Setting range	Default value	Unit	Set value
Timer/Twin Timer selection	FUN	$\overline{E}L\overline{N}/\overline{E}L\overline{N}$	$\overline{E}L\overline{N}$	---	
DIP switch monitor	dLP	$\overline{o}n/\overline{o}FF$	$\overline{o}FF$	---	

Settings for Timer Operation

Run Mode when Output Mode Is Not Z

Parameter name	Parameter	Setting range	Default value	Unit	Set value
Present value, set value	Set value	---	0.00 to 99.99 (Time range: --,--s)	0.00	s
		---	0.0 to 999.9 (Time range: ---,--s)	0.0	s
		---	0 to 9999 (Time range: ----s)	0	s
		---	0:00 to 99:59 (Time range: --min--s)	0:00	min; s
		---	0.0 to 999.9 (Time range: ---,--min)	0.0	min
		---	0 to 9999 (Time range: ----min)	0	min
		---	0:00 to 99:59 (Time range: --h--min)	0:00	h; min
		---	0.0 to 999.9 (Time range: ---,--h)	0.0	h
		---	0 to 9999 (Time range: ----h)	0	h
		---	0.000 to 9.999 (Time range: -,---s)	0.000	s
	Present value	---	Same as set value	Same as left	Same as left

Run Mode when Output Mode = Z

Parameter name	Parameter	Setting range	Default value	Unit	Set value
Present value, ON duty ratio	Cycle time	---	0.00 to 99.99 (Time range: --,--s)	0.00	s
		---	0.0 to 999.9 (Time range: ---,--s)	0.0	s
		---	0 to 9999 (Time range: ----s)	0	s
		---	0:00 to 99:59 (Time range: --min--s)	0:00	min; s
		---	0.0 to 999.9 (Time range: ---,--min)	0.0	min
		---	0 to 9999 (Time range: ----min)	0	min
		---	0:00 to 99:59 (Time range: --h--min)	0:00	h; min
		---	0.0 to 999.9 (Time range: ---,--h)	0.0	h
		---	0 to 9999 (Time range: ----h)	0	h
		---	0.000 to 9.999 (Time range: -,---s)	0.000	s
	ON duty ratio	---	0 to 100	0	%
Present value, cycle time	Present value	---	Same as cycle time above	Same as left	Same as left
	Present value	---	Same as cycle time above	Same as left	Same as left

Function Setting Mode

Parameter name	Parameter	Setting range	Default value	Unit	Set value
Time range	$\overline{E}L\overline{N}r$	--,--s/---,--s/----s/--min--s/---,--min/----min/--h--min/---,--h/---h/---s	---,--s	---	
Timer mode	$\overline{E}L\overline{N}\overline{n}$	$\overline{u}P/\overline{d}\overline{o}L\overline{n}$	$\overline{u}P$	---	
Output mode	$\overline{o}L\overline{t}\overline{n}$	$\overline{R}/\overline{R}-\overline{1}/\overline{R}-\overline{2}/\overline{R}-\overline{3}/\overline{b}/\overline{b}-\overline{1}/\overline{d}/\overline{E}/\overline{F}/\overline{Z}$	$\overline{R}$	---	
Output time	$\overline{o}L\overline{t}\overline{n}$	$\overline{H}\overline{o}L\overline{d}/0.0\ 1\ to\ 99.99$	$\overline{H}\overline{o}L\overline{d}$	s	
Input signal width	$\overline{I}F\overline{L}\overline{t}$	$\overline{2}0\overline{n}5/\overline{1}\overline{n}5$	$\overline{2}0\overline{n}5$	---	
NPN/PNP input mode	$\overline{I}\overline{n}\overline{o}d$	$\overline{n}P\overline{n}/P\overline{n}P$	$\overline{n}P\overline{n}$	---	
Display color	$\overline{I}\overline{o}L\overline{r}$	$\overline{r}\overline{E}d/\overline{o}r\overline{G}/\overline{r}-\overline{o}/\overline{o}-\overline{r}$	$\overline{r}\overline{E}d$	---	
Key protect level	$\overline{H}P\overline{t}$	$\overline{H}P-\overline{1}/\overline{H}P-\overline{2}/\overline{H}P-\overline{3}/\overline{H}P-\overline{4}/\overline{H}P-\overline{5}$	$\overline{H}P-\overline{1}$	---	

Settings for Twin Timer Operation

Run Mode

Parameter name		Parameter	Setting range	Default value	Unit	Set value
Present value, OFF set time	OFF set time	---	0.00 to 99.99 (Time range: --,--s)	0.00	s	
		---	0.0 to 999.9 (Time range: ---,--s)	0.0	s	
		---	0 to 9999 (Time range: ----s)	0	s	
		---	0:00 to 99:59 (Time range: --min--s)	0:00	min; s	
		---	0.0 to 999.9 (Time range: ---,-min)	0.0	min	
		---	0 to 9999 (Time range: ----min)	0	min	
		---	0:00 to 99:59 (Time range: --h--min)	0:00	h; min	
		---	0.0 to 999.9 (Time range: ---,-h)	0.0	h	
		---	0 to 9999 (Time range: ----h)	0	h	
		---	0.000 to 9.999 (Time range: -,---s)	0.000	s	
	Present value	---	Same as OFF set time above	Same as left	Same as left	
Present value, ON set time	ON set time	---	Same as OFF set time above	Same as left	Same as left	
	Present value	---	Same as OFF set time above	Same as left	Same as left	

Function Setting Mode

Parameter name	Parameter	Setting range	Default value	Unit	Set value
OFF time range	$\bar{o}F\bar{t}r$	--,--s/---,--s/----s/--min--s/---,--min/----min/ --h--min/---,--h/----h/-,---s	--,--s	---	
ON time range	$\bar{o}n\bar{t}r$	--,--s/---,--s/----s/--min--s/---,--min/----min/ --h--min/---,--h/----h/-,---s	--,--s	---	
Timer mode	$\bar{t}c\bar{n}\bar{n}$	UP/dōn	UP	---	
ON/OFF start mode	$\bar{t}\bar{o}\bar{t}\bar{n}$	$\bar{t}\bar{o}FF/\bar{t}\bar{o}n$	$\bar{t}\bar{o}FF$	---	
Input signal width	$\bar{c}FL\bar{t}$	2005/105	2005	---	
NPN/PNP input mode	$\bar{c}\bar{n}\bar{o}d$	nPn/PnP	nPn	---	
Display color	$\bar{c}\bar{o}Lr$	rEd/Grn/r-G/G-r	rEd	---	
Key protect level	$\mu\bar{y}P\bar{t}$	$\mu P-1/\mu P-2/\mu P-3/\mu P-4/\mu P-5$	$\mu P-1$	---	

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Motor Timer H2C

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 C-167), and *Safety Precautions* (page C-165).

DIN-sized (48 x 48, 45 x 75 mm) Motor Timer with Variable Time Ranges

- Five time ranges are selectable per timer unit.
- Easy-to-monitor neon lamp for timing operation indication (for 110, 120, 220, 240 VAC types only).
- Easy-to-set large transparent knob and easy-to-read single pattern scale facilitate time setting.
- Equipped with timing operation indicator and moving pointer.
- Conforms to EN61812-1 and IEC60664-1 4 kV/1 for Low Voltage, and EMC Directives (except for H2C-F□).



Model Number Structure

Model Number Legend

H2C-□ □
1 2

1. External Connection/Attachment

- None: 11-pin socket
S: 11-pin socket/time setting ring
8: 8-pin socket
F: Front screw

2. Operation/Resetting System

- None: Time-limit operation/self-resetting
R: Time-limit operation/electric resetting

Ordering Information

List of Models

Operation/resetting system	Internal connection	Terminal	Time-limit contact	Instantaneous contact	Attachment	Model
Time-limit operation/self-resetting	Parallel motor and clutch connection Separate motor and clutch connection	8-pin socket	SPDT	SPDT	---	H2C-8
		11-pin socket			---	H2C
		Front screw			Y92A-Y1 Time Setting Ring	H2C-S
		Front screw			---	H2C-F
Time-limit operation/electric resetting	Parallel motor and clutch connection Separate motor and clutch connection	8-pin socket	SPDT	---	---	H2C-8R
		11-pin socket		SPDT	---	H2C-R
		Front screw		---	Y92A-Y1 Time Setting Ring	H2C-SR
		Front screw		---	---	H2C-FR

Note: Specify both the supply voltage and time range code (A, B, or C) in addition to the model number when ordering.

Example: H2C-S 24 VAC B

Time range code
Supply voltage

■ Accessories (Order Separately)

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
Time Setting Ring (See note 1.)		Y92A-Y1
Mounting DIN-rail	50 cm (l) × 7.3 mm (t)	PFP-50N
	1 m (l) × 7.3 mm (t)	PFP-100N
	1 m (l) × 16 mm (t)	PFP-100N2
End Plate		PFP-M
Spacer		PFP-S
Protective Cover		Y92A-48B
DIN-rail 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, screw terminal	P3G-08
	8-pin, finger safe type	P3G-08 with Y92A-48G (See note 2.)
	11-pin	P3GA-11
	11-pin, finger safe type	P3GA-11 with Y92A-48G (See note 2.)
Hold-down Clip (See note 3.)	For PL08 and PL11 Sockets	Y92H-1
	For PF085A Socket	Y92H-2

Note: 1. Supplied with H2C-S/-SR models.

2. Y92A-48G is a finger safe terminal cover which is attached to the P3G-08 or P3GA-11 Socket.

3. Hold-down Clips are sold in sets of two.

Specifications

■ Time Ranges

Five time ranges are available for each timer by turning the time range selector every 60 degrees.

Note: Rated time is displayed on the window.

Time range code	Position of time range selector				
					
A	1.25 to 30 s	7.5 s to 3 min	1.25 to 30 min	7.5 min to 3 h	1.25 to 30 h
B	0.2 to 6 s	2 to 60 s	0.2 to 6 min	2 to 60 min	0.2 to 6 h
C	0.5 to 12 s	5 to 120 s	0.5 to 12 min	5 to 120 min	0.5 to 12 h

■ Ratings

Item	H2C
Rated supply voltage (motor and clutch)	24, 48, 100, 110, 115, 120, 200, 220, or 240 VAC (50/60 Hz) (see note)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	4.2 VA max. (3.96 W max.)
Reset voltage	10% max. of rated supply voltage
Reset time	Minimum power-opening time: 0.5 s Minimum pulse width: 0.5 s
Control outputs	6 A at 250 VAC, resistive load ($\cos\phi = 1$)
Mounting method	Flush mounting (except for H2C-F/-FR models), surface mounting, DIN-rail mounting

Note: The front panel of the timer is color coded to identify the following supply voltage classifications:

100 to 120 V: Blue

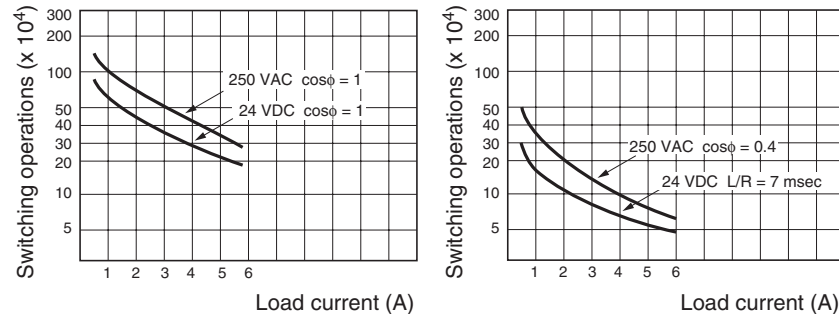
200 to 240 V: Red

Other classes: Black

Characteristics

Accuracy of operating time	±0.5% FS max. (±1% max. at 0.2 to 6 s for the time range code B or at 0.5 to 12 s for the time range code C)
Setting error	±2% FS max.
Reset time	0.5 s max.
Influence of voltage	±1% FS max.
Influence of temperature	±2% FS max.
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,500 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts) 2,000 VAC, 50/60 Hz for 1 min (between contact and control circuit and between contacts of different polarities) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 10 to 55 Hz with 0.375-mm single amplitude for 1 h each in three directions Malfunction: 10 to 55 Hz with 0.25-mm single amplitude for 10 min each in three directions
Shock resistance	Destruction: 1,000 m/s ² Malfunction: 150 m/s ²
Ambient temperature	Operating: -10°C to 50°C Storage: -25°C to 65°C
Ambient humidity	Operating: 45% to 85%
Life expectancy	Mechanical: 10,000,000 operations min. (under no load at 1,800 operations/h) Electrical: 500,000 operations min. (3 A at 250 VAC, resistive load at 1,800 operations/h) See <i>Life-test Curve</i> for other details.
Motor life expectancy	20,000 h
Approved standards	UL917, CSA C22.2 No.14. Conforms to EN61812-1 and IEC60664-1 4 kV/1 (except for H2C-F□ models). Output category according to EN60947-5-1 (except for H2C-F□ models).
EMC (except for H2C-F□ models)	(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 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	H2C series: approx. 180 g H2C-F series: approx. 270 g

Life-test Curve

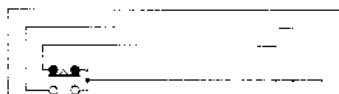


Connections

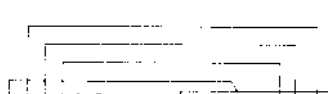
Terminal Arrangement

Note: The connections diagrams are for when the clutch is in the excited, reset state.

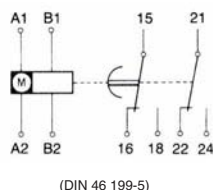
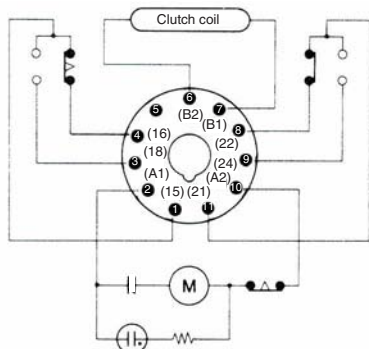
H2C-8



H2C-8R

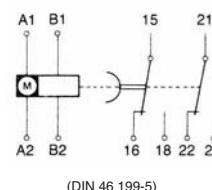
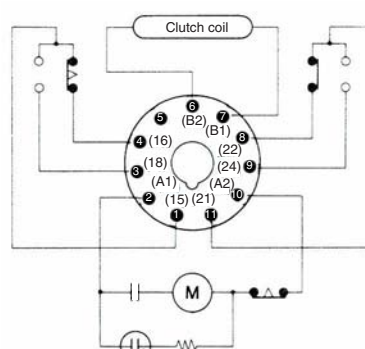


H2C(-F)/H2C-S



(DIN 46 199-5)

H2C(-F)R/H2C-SR

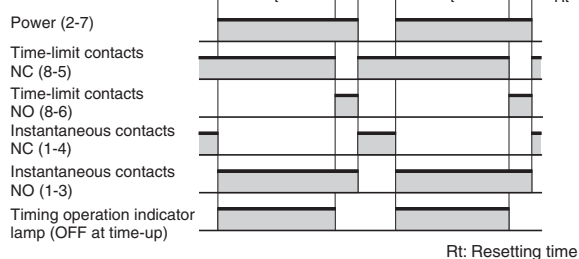


(DIN 46 199-5)

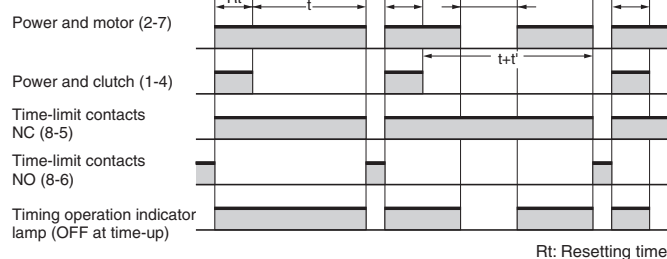
Operation

Timing Chart

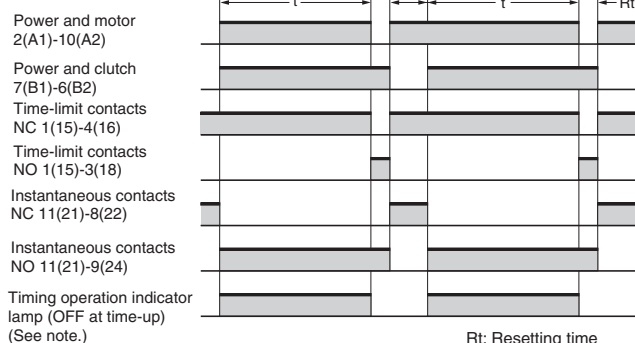
H2C-8



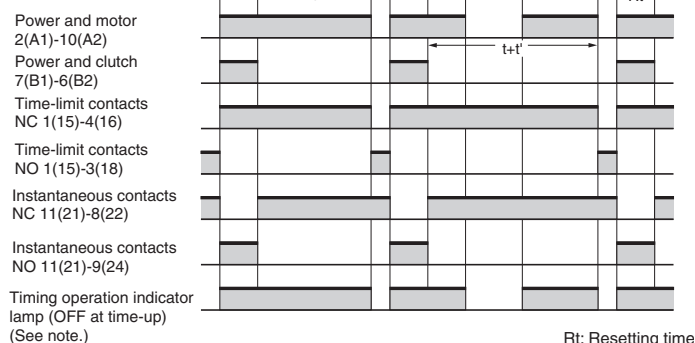
H2C-8R



H2C(-F)/H2C-S

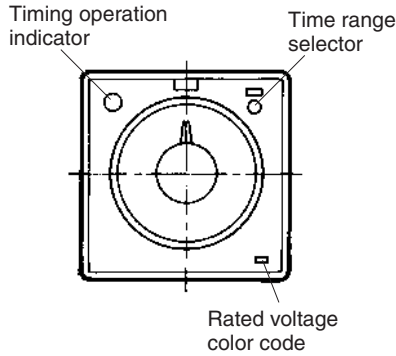


H2C(-F)R/H2C-SR



Note: For the types rated at 24 and 48 VAC, the timing operation indicator is not equipped.

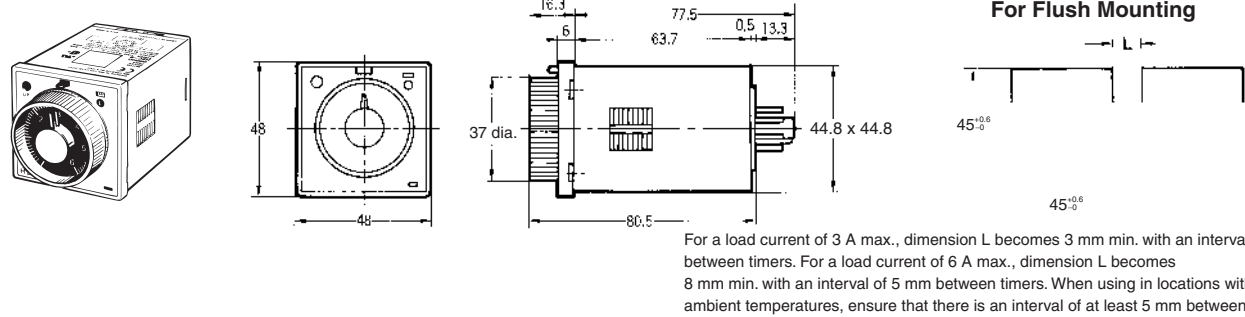
Nomenclature



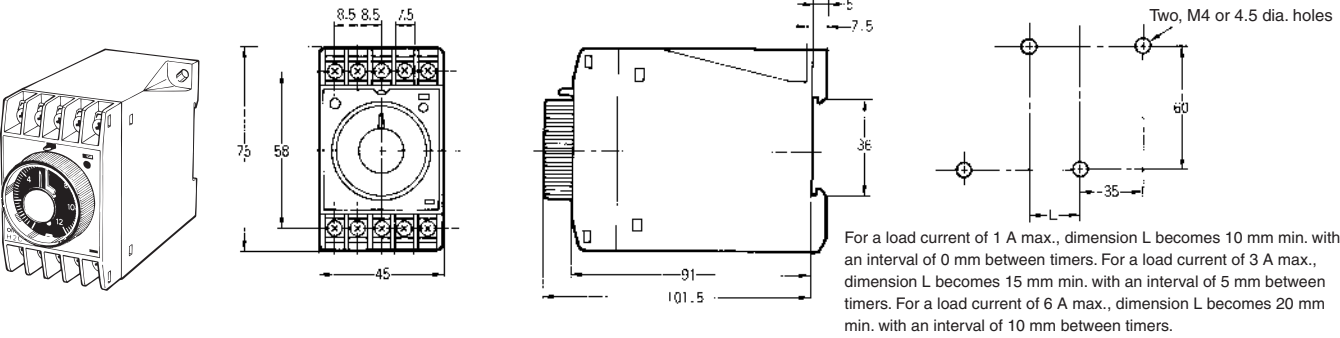
Dimensions

Note: All units are in millimeters unless otherwise indicated.

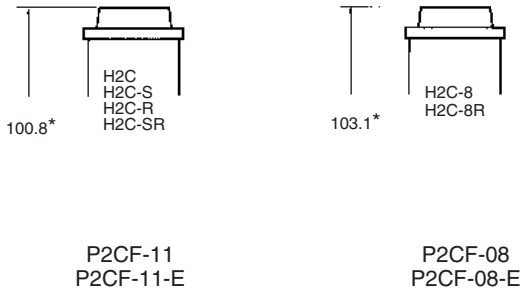
H2C/H2C-S/H2C-R/H2C-SR/H2C-8/H2C-8R



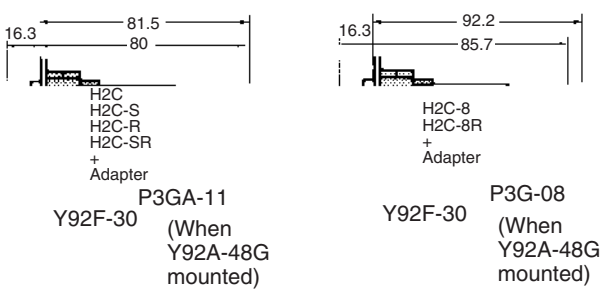
H2C-F/H2C-FR



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



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

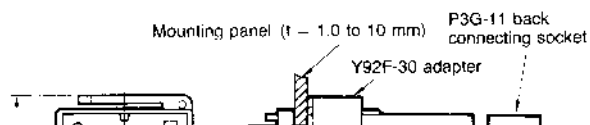


*These dimensions vary with the kind of DIN-rail (reference value).

■ Accessories (Order Separately)

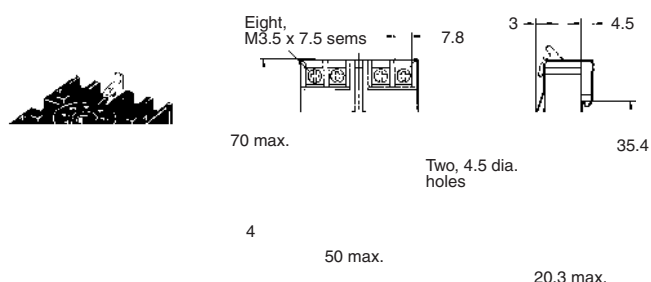
Adapter for Flush Mounting

Y92F-30

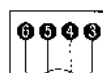


DIN-rail Mounting/Front Connecting Socket

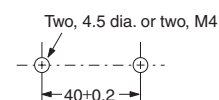
P2CF-08



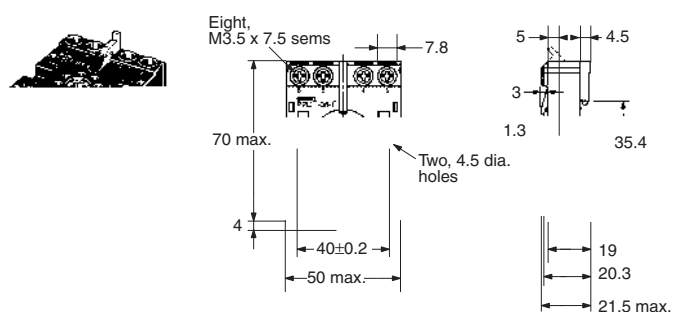
Terminal Arrangement/
Internal Connections
(Top View)



Surface Mounting Holes

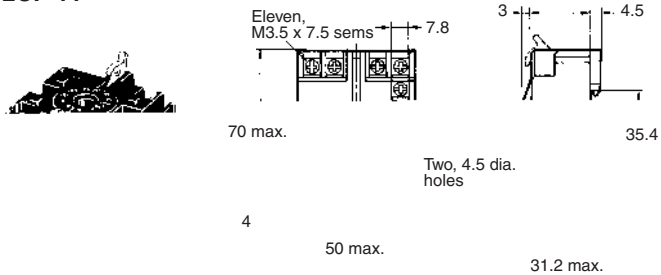


P2CF-08-E (Finger Safe Terminal Type)
Conforming to VDE0106/P100

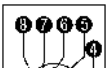


DIN-rail Mounting/Front Connecting Socket

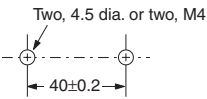
P2CF-11



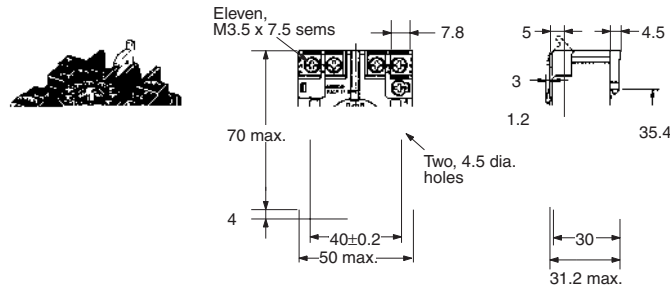
Terminal Arrangement/
Internal Connections
(Top View)



Surface Mounting Holes

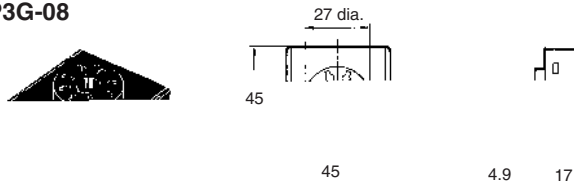


P2CF-11-E (Finger Safe Terminal Type) Conforming to VDE0106/P100



Back Connecting Socket

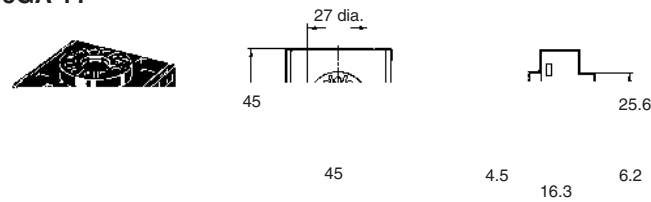
P3G-08



Terminal Arrangement/
Internal Connections
(Bottom View)



P3GA-11



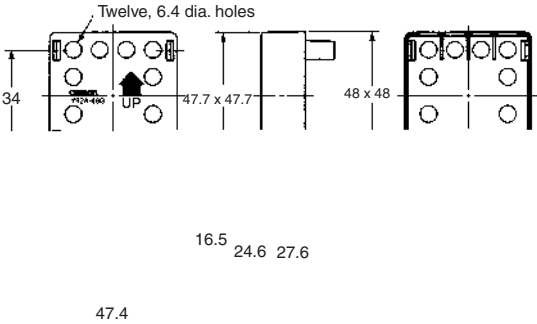
Terminal Arrangement/
Internal Connections
(Bottom View)



Finger Safe Terminal Cover

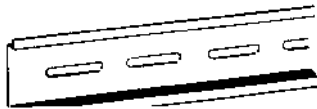
Conforming to VDE0106/P100

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

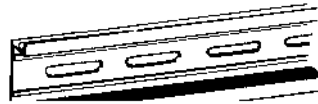


Mounting DIN-rail

PFP-100N, PFP-50N



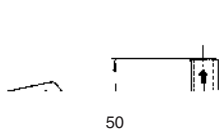
PFP-100N2



Note: The value shown in parentheses are for the PFP-50N.

End Plate

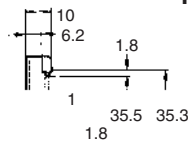
PFP-M



50

11.5

10 M4 x 8
pan head
screw

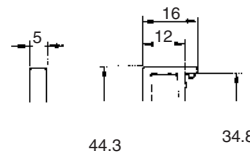


1.8 35.5 35.3

1.3
4.8

Spacer

PFP-S



44.3

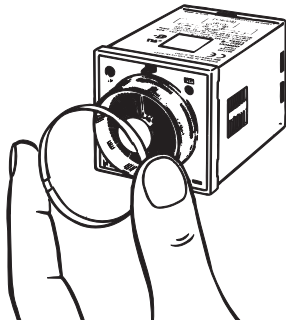
34.8

16.5

Time Setting Ring

Y92A-Y1

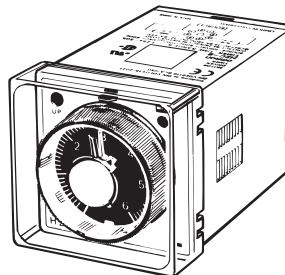
The time setting ring locks the time setting knob to store the set time to facilitate its resetting. A maximum of two time setting rings are connectable per timer.



Protective Cover

Y92A-48B

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



Timer Hold-down Clips

Y92H-2
(for PF085A/PF113A
Connecting Socket)

Y92H-1
(for PL08/PL11
Connecting Socket)



Safety Precautions

CAUTION

This may occasionally cause electric shock, fire, or malfunction. Never disassemble, repair, or modify the H2C.

This may occasionally cause electric shock, fire, or malfunction. Do not allow metal fragments or lead wire scraps to fall inside the H2C.

Precautions for Safe Use

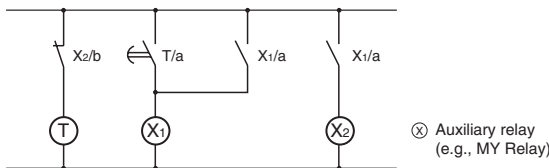
Observe the following items to ensure the safe use of this product.

Environmental Precautions

- Store the H2C within the specified ratings. If the H2C has been stored at temperatures -10°C or lower, let it stand for 3 hours or longer at room temperature before turning ON the power supply.
- Use the H2C within the specified ratings for operating temperature and humidity.
- Do not operate the H2C in locations subject to sudden or extreme changes in temperature, or locations where high humidity may result in condensation.
- Do not use the H2C in locations subject to vibrations or shock. Extended use in such locations may result in damage due to stress.
- Do not use the H2C in locations subject to excessive dust, corrosive gas, or direct sunlight.
- Install the H2C well away from any sources of static electricity, such as pipes transporting molding materials, powders, or liquids.
- The H2C is not waterproof or oil resistant. Do not use it in locations subject to water or oil.
- The life expectancy of internal components may be reduced if the H2C is mounted side-by-side.
- Do not use organic solvents (such as paint thinner or benzene), strong alkaline, or strong acids because they will damage the external finish.

Usage Precautions

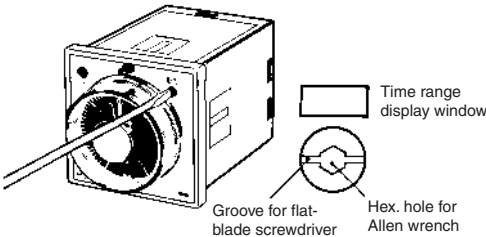
- Install a switch or circuit breaker that allows the operator to immediately turn OFF the power, and label it to clearly indicate its function.
- Be sure to wire the terminals correctly.
- Do not install input lines in the same duct or conduit as power supply or other high-voltage lines. Doing so may result in malfunction due to noise. Separate the input lines from high-voltage lines.
- Internal elements may be destroyed if a voltage outside the rated voltage is applied.
- Maintain voltage fluctuations in the power supply within the specified range.
- Use a switch, relay, or other contact so that the rated power supply voltage will be reached within 0.1 s. If the power supply voltage is not reached quickly enough, the H2C may malfunction or outputs may be unstable.
- Leaving the H2C with outputs ON at a high temperature for a long time may hasten the degradation of internal parts (such as electrolytic capacitors). Therefore, use the H2C in combination with relays and avoid leaving the H2C for more than 1 month with an output turned ON.



Precautions for Correct Use

How to Change the Time Range

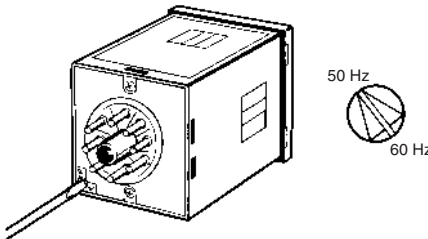
Change the time range by turning the knob clockwise using a flat-blade screwdriver or an Allen wrench. There are five possible settings. The selected time is displayed in the time range display window above the knob.



Do not change the time range while the timer is in operation.

How to Select Power Frequency

Before using the timer, set the frequency selector located at the rear panel to the proper power frequency (50 to 60 Hz).



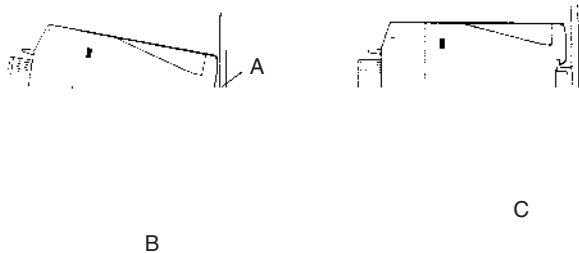
How to Mount the Timer on Mounting DIN-rail

Mounting

First hook portion A of the timer to the mounting DIN-rail, then press the timer in direction B.

Dismounting

Pull out portion C with a round-blade screwdriver and remove the timer from the mounting DIN-rail.



Electrical Set

The motor and clutch do not need to be reset simultaneously.

Use the voltage applied to the clutch for resetting with the H2C-□R. Do not allow power to be continuously applied to the motor and clutch for extended periods of time.

Others

Do not turn the operation time setting knob beyond the range of the scale. To achieve higher accuracy in setting, measure the operation time while turning the operation time setting knob.

The deviation and setting error for the operation time shows the percent of FS. The absolute value of the deviation and setting error will not change even if the set time is changed. The time specifications should therefore be selected to use the operation time as close to FS as possible.

At high temperatures, the operation voltage will be 90% or less if voltage is applied continuously after timeout. Be sure to keep the voltage within the allowable voltage fluctuation range.

Precautions for EN61812-1

The H2C (except for H2C-F□) as a built-in timer conforms to EN61812-1, provided that the following conditions are satisfied.

Handling

Before dismounting the H2C from the Socket, make sure that no voltage is imposed on any terminal of the H2C.

Applicable Sockets: P2CF-□□, P2CF-□□-E, PF085A, PL□□.

Wiring

Basic insulation is ensured between the motor circuit, clutch circuit, and control output circuit. (However, the H2C-8 motor circuit and clutch circuit use the same input.) Basic insulation is also ensured between the output circuits of models with instantaneous output.

Basic insulation: Overvoltage category III, pollution degree 1 (See note.)

Operating parts: Reinforced insulation (double insulation)
(with a clearance of 5.5 mm and a creepage distance of 5.5 mm at 240 VAC)

Output parts: Basic insulation
(with a clearance of 3.0 mm and a creepage distance of 3.0 mm at 240 VAC)

Note: Overvoltage category II, pollution degree 1 if the Timer is mounted to the PL11 Socket.

Warranty and Application Considerations

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Disclaimers

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased product.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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