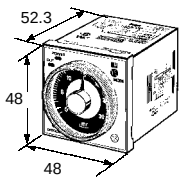
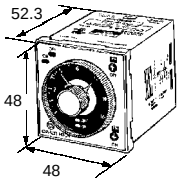
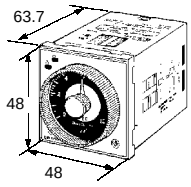
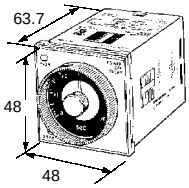
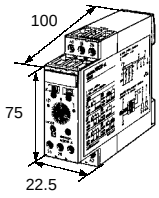
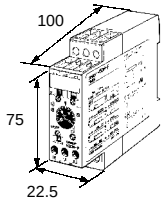
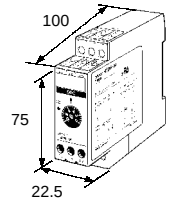
CONTENTS

Note: These products may not be available in certain areas.

Classification		Solid-state Timer							
Model		H3CR-A			H3CR-F	H3CR-G		H3CR-H	
Features		DIN 48 x 48-mm Multifunctional Timer with many times ranges, operating modes and wide power supply ranges			DIN 48 x 48-mm Solid-state Twin Timers	DIN 48 x 48-mm Solid-state Star-delta Timers		DIN 48 x 48-mm Solid-state Power OFF-delay Timers	
Appearance and dimensions									
Time range (60 Hz)		0.05 s to 300 h			0.05 s to 300 h	0.5 to 120 s		0.05 s to 12 min	
Supply voltage		100 to 240 VAC (50/60 Hz), 12 VDC, 24 VDC/VAC (50/60 Hz), 48 to 125 VDC			100 to 240 VAC (50/60 Hz), 12 VDC, 24 VDC/VAC (50/60 Hz), 48 to 125 VDC	100 to 120 VAC (50/60 Hz), 200 to 240 VAC (50/60 Hz)		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	
Power consumption		10 VA, 1.5 W, 2 VA/1 W			10 VA, 1 W, 2 VA/1 W, 1.5 W	6 VA/2.4 W, 12 VA/2.6 W		0.18 VA, 0.25 VA, 0.24 VA, 130 mW, 330 mW	
Accuracy of operating time		±0.3% max.			±0.3% max.	±0.3% max.		±0.3% max.	
Control output		5 A at 250 VAC			5 A at 250 VAC	5 A at 250 VAC		5 A at 250 VAC	
Contact configuration	**Time-limit**	DPDT	SPDT	Solid-state	DPDT	SPST-NO	SPST-NO	DPDT	SPDT
	Instantaneous	---	SPDT	---	---	SPST-NO	---	---	---
Life expectancy		20 x 10^6 operations			20 x 10^6 operations	20 x 10^6 operations		10 x 10^6 operations	
EMC		Conforms to EN50081-2, prEN50082-2			Conforms to EN50081-2, prEN50082-2	Conforms to EN50081-2, prEN50082-2		Conforms to EN50081-2, prEN50082-2	
Approved standards		UL, CSA, conforms to VDE			UL, CSA, conforms to VDE	UL, CSA, conforms to VDE		UL, CSA, conforms to VDE	
Page		16			37	43		51	

Classification		Solid-state Timer		
Model		H3DR-A	H3DR-P	H3DR-M
Features		DIN-track mounted, standard 22.5-mm width timer range		
Appearance and dimensions				
Time range (60 Hz)		0.1 s to 120 h	0.1 s to 120 h	0.1 s to 10 min
Supply voltage		100 to 240 VAC (50/60 Hz), 12 VDC, 24 VDC/VAC (50/60 Hz)	100 to 120 VAC (50/60 Hz), 200 to 240 VAC (50/60 Hz), 24 VDC/VAC (50/60 Hz)	110 to 120 VAC (50/60 Hz), 220 to 240 VAC (50/60 Hz), 24 VDC/VAC (50/60 Hz)
Power consumption		10 VA, 1 W, 2 VA/1W	6 VA, 10 VA, 2 VA/1 W	6 VA, 10 VA, 2 VA/1 W
Accuracy of operating time		±1% max.	±1% max.	±2% max.
Control output		5 A at 250 VAC	5 A at 250 VAC	5 A at 250 VAC
Contact configuration	**Time-limit**	DPDT	SPDT	SPDT
	Instantaneous	---	---	---
Life expectancy		20 x 10^6 operations	20 x 10^6 operations	20 x 10^6 operations
EMC		Conforms to EN50081-2, prEN50082-2	Conforms to EN50081-2, prEN50082-2	Conforms to EN50081-2, prEN50082-2
Approved standards		UL, CSA, conforms to VDE	UL, CSA, conforms to VDE	UL, CSA, conforms to VDE
Page		65	65	65

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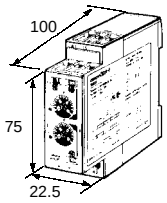
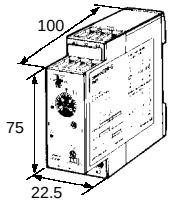
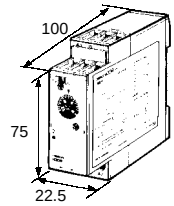
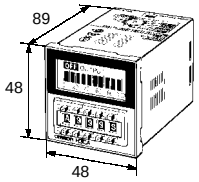
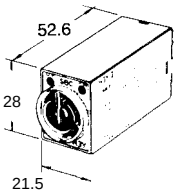
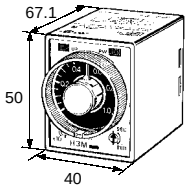
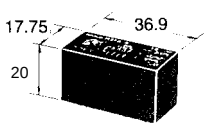
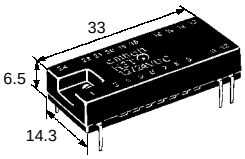
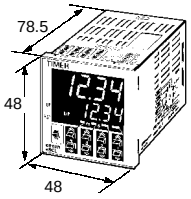
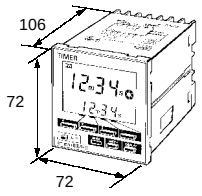
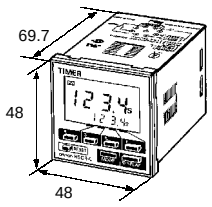
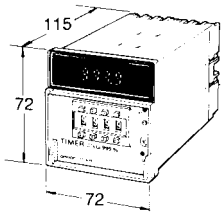
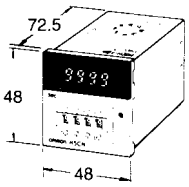
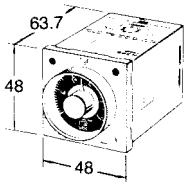
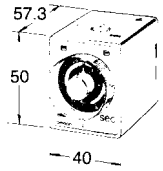
Classification		Solid-state Timer		
Model		H3DR-F	H3DR-G	H3DR-H
Features		DIN 22.5-mm Solid-state Twin Timers	DIN 22.5-mm Solid-state Star-delta Timers	DIN 22.5-mm Solid-state Power OFF-delay Timers
Appearance and dimensions				
Time range (60 Hz)		0.1 s to 12 h	1 to 120 s	0.1 to 120 s
Supply voltage		100 to 240 VAC (50/60 Hz), 48 VAC (50/60 Hz), 24 VAC/VDC (50/60 Hz), 12 VDC	100 to 240 VAC (50/60 Hz), 48 VAC (50/60 Hz), 24 VAC/VDC (50/60 Hz)	100/110/120 VAC (50/60 Hz), 200/220/240 VAC (50/60 Hz), 24 VAC/VDC (50/60 Hz), 48 VAC/VDC (50/60 Hz)
Power consumption		8.2 VA, 1.7 VA, 1.3 VA/0.6 W, 0.4 W	11 VA, 1.2 VA, 0.9 VA/0.45 W	0.5 VA, 0.8 VA, 0.17 VA/0.13 W, 0.36 VA/0.34 W
Accuracy of operating time		±1% max.	±1% max.	±1% max.
Control output		5 A at 250 VAC	5 A at 250 VAC	5 A at 250 VAC
Contact configuration	**Time-limit**	SPDT	SPST-NO	SPDT
	Instantaneous	---	---	---
Life expectancy		20 x 10^6 operations	20 x 10^6 operations	10 x 10^6 operations
EMC		Conforms to EN50081-2, prEN50082-2	Conforms to EN50081-2, prEN50082-2	Conforms to EN50081-2, prEN50082-2
Approved standards		UL, CSA, conforms to VDE	UL, CSA, conforms to VDE	UL, CSA, conforms to VDE
Page		90	95	100

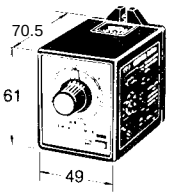
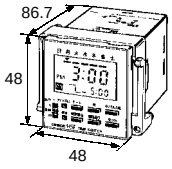
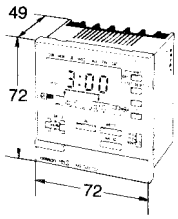
Classification		Solid-state Timer					
Model		H3CA		H3Y		H3M	
Features		DIN-sized (48 x 48 mm, 45 x 75 mm) Timer with digital setting and LCD display - multifunctions		Subminiature Timer incorporating exclusive IC ideal for sequence control		Solid-state Timer with variable time ranges	
Appearance and dimensions							
Time range (60 Hz)		0.1 s to 9.990 h		0.5 s to 3 h		0.05 to 30 h	
Supply voltage		24 to 240 VAC (50/60 Hz), 12 to 240 VDC		100, 110, 120, 200, 220, or 240 VAC (50/60 Hz), 12, 24, 48, 100, or 110 VDC		100/110/120, 200/220/ 240 VAC (50/60 Hz), 12, 24, 48, 100, or 110 VDC	
Power consumption		2 to 10 VA, 1 to 2 W		2 VA, 2 W		5 VA/2 W, 2 W	
Accuracy of operating time		±0.3%±0.05 s		±2%		±1%	
Control output		3 A at 250 VAC		5 A at 250 VAC		5 A at 250 VAC	
Contact configuration	**Time-limit**	SPDT	SPDT, DPDT	DPDT, 3PDT, 4PDT	Solid-state	DPDT	SPDT
	Instantaneous	---	SPDT	---		---	SPDT
Life expectancy		10 x 10^6 operations		10 x 10^6 operations		20 x 10^6 operations	
EMC		---		Conforms to EN50081-2, prEN50082-2 (except IEC801-4)		---	
Approved standards		UL, CSA, SEV		UL, CSA		UL, CSA	
Page		109		123		132	

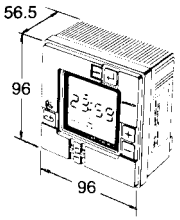
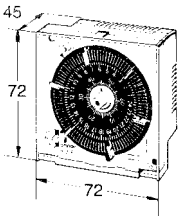
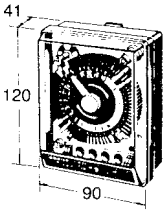
Classification		Solid-state Timer		Digital Timer	
Model		H3FA	H3T	H5CL	
Features		DIP type Timer for PC board-use provides contact and solid-state output	PCB-mounting time unit for high-frequency applications	Easy-to-see and easy-to-operate DIN 48 x 48-mm Digital Timer with IP66/NEMA 4 protection	
Appearance and dimensions					
Time range (60 Hz)		0.1 s to 60 min	0.1 to 60 min	0.001 s to 999.9 h	
Supply voltage		5, 6, 12, or 24 VDC; 5/6, 12/24 VDC	12 to 24 VDC	100 to 240 VAC (50/60 Hz), 12 to 24 VDC	
Power consumption		80 to 330 mW	60 mW, 120 mW	Approx. 10 VA, 3 W	
Accuracy of operating time		±0.5%	±2%	±0.01%±0.07 s (power start) ±0.005%±0.03 s (control signal start)	
Control output		Contact output: 3 A at 250 VAC Solid-state output: 150 mA at 30 VDC	Solid-state: 100 mA	3 A at 250 VAC	
Contact configuration	**Time-limit**	SPST-NO + SPST-NC, solid-state	SPST-NO	SPDT	Solid-state
	Instantaneous	---	---	---	---
Life expectancy		10 x 10^6 operations	---	10 x 10^6 operations	
EMC		---	---	Conforms to EN50081-2, prEN50082-2	
Approved standards		UL, CSA	---	UL, CSA	
Page		137	145	151	

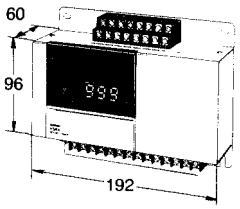
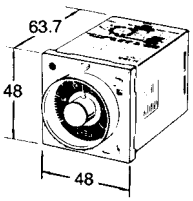
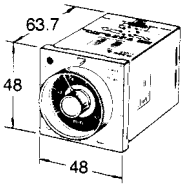
Classification		Digital Timer			
Model		H5BR	H5CR		H5AN
Features		72 x 72-mm Timer with easy-to-use functions	1/16 DIN Timer with easy-to-use function		DIN-sized (72 x 72 mm) Quartz Timer with multiple functions
Appearance and dimensions					
Time range (60 Hz)		0.01 s to 9999 h	0.001 s to 9999 h		0.01 s to 9999 h
Supply voltage		100 to 240 VAC (50/60 Hz), 24 VAC/12 to 24 VDC	100 to 240 VAC (50/60 Hz), 24 VAC (50/60 Hz), 12 to 24 VDC		100 to 240 VAC (50/60 Hz), 12 to 24, 48, or 100 VDC
Power consumption		8 VA, 5 W	3 VA/1 W, 5 VA, 2 W		10 VA, 5 W
Accuracy of operating time		±0.01%±0.05 s (power start) ±0.005%±0.03 s (control signal start)	±0.01%±0.05 s (power start) ±0.005%±0.03 s (control signal start)		±0.01%±0.05 s (power start) ±0.005%±0.03 s (control signal start)
Control output		Contact output: 5 A at 250 VAC	Contact output: 5 A at 250 VAC		Contact output: 3 A at 250 VAC Solid-state output: 100 mA at 30 VDC
Contact configuration	**Time-limit**	SPDT, solid-state	SPDT	Solid-state	SPDT, solid-state
	Instantaneous	---	---	---	---
Life expectancy		10 x 10^6 operations	10 x 10^6 operations		10 x 10^6 operations
EMC		Conforms to EN50081-2, prEN50082-2	Conforms to EN50081-2, prEN50082-2		---
Approved standards		UL, CSA	UL, CSA		UL, CSA
Page		NO TAG	174		189

Selection Guide

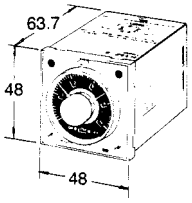
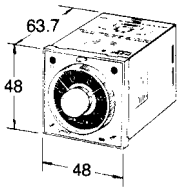
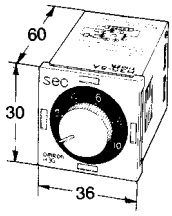
Classification		Digital Timer	Motor Timer	
Model		H5CN	H2C	H2A
Features		Miniature DIN-sized (48 x 48 mm) Quartz Timer with abundant series versions	DIN-sized (48 x 48 mm, 45 x 75 mm) Motor Timer with variable time range	Miniature, high-performance Motor Timer
Appearance and dimensions				
Time range (60 Hz)		0.001 s to 99 h 59 min	0.2 to 30 h	0.2 s to 28 h
Supply voltage		100 to 240 VAC (50/60 Hz), 12 to 48 VDC	110, 115, 120, 220, 240 VAC (50/60 Hz), 100 VAC (50 Hz), 100/110 VAC (60 Hz), 200 VAC (50 Hz), 200/220 VAC (50 Hz)	100, 110, 200, or 220 VAC (50/60 Hz)
Power consumption		12 VA/2.5 W, 2.5 W	3.5 VA	Approx. 3 VA
Accuracy of operating time		±0.01%±0.05 s (power start) ±0.005%±0.03 s (control signal start)	±0.5%	±2%
Control output		Contact output: 3 A at 250 VAC Solid-state output: 100 mA at 30 VDC	6 A at 250 VAC	2 A at 250 VAC
Contact configuration	**Time-limit**	SPDT, solid-state	SPDT	SPDT
	Instantaneous	---	SPDT	SPDT / SPST-NO
Life expectancy		10 x 10^6 operations	30 x 10^6 operations	1 x 10^6 operations
Approved standards		UL, CSA	UL, CSA	UL, CSA
Page		201	211	219

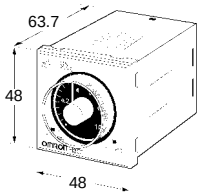
Classification		Motor Timer	Digital Daily Time Switch	Weekly Time Switch
Model		STP	H5F	H5S
Features		Best-selling Motor Timer with high repeat accuracy	Easy-to-operate Daily Time Switch for various time control	Weekly Time Switch for various time controls
Appearance and dimensions				
Time range (60 Hz)		0.4 s to 28 h	24 h x 1 week	1 week
Supply voltage		100/110, 200/220 VAC (50/60 Hz)	100 to 240 VAC (50/60 Hz)	100 to 240 VAC (50/60 Hz), 24 VDC
Power consumption		Approx. 5 VA	Approx. 2 VA	Approx. 3 A
Accuracy of operating time		±0.5%	±0.01%±0.05 s max.	±0.01%±0.05 s
Control output		Time-limit contact: 3 A at 250 VAC Instanteneous contact: 1.5 A at 250 VAC	Contact output: 15 A at 250 VAC	15 A at 250 VAC
Contact configuration	**Time-limit**	SPDT	SPST-NO	SPST-NO x 2 circuits
	Instantaneous	SPDT, SPST-NO	---	---
Life expectancy		1 x 10^6 operations	50 x 10^3 operations	50 x 10^3 operations
Approved standards		UL, CSA	UL, CSA	UL, CSA
Page		224	231	241

Classification		Daily Time Switch	24-hour/Weekly Time Switch	24-hour Time Switch
Model		H5L	H2F	H2E
Features		Easy programming with large LCD display and interactive function	Up to 96 ON/OFF cycles from DIN-sized (72 x 72 mm) Timer	ON/OFF operation in units of 15 minutes
Appearance and dimensions				
Time range (60 Hz)		24 h x 7 days	24 h/1 week	24 h
Supply voltage		100 to 240 VAC (50/60 Hz)	100 to 240 VAC (50/60 Hz)	100/110 or 200/220 VAC (50/60 Hz)
Power consumption		7 VA	3 VA, 1 or 4 VA	2 VA
Accuracy of operating time		±0.01%±0.05 s	±3 min or ±30 min	±5 min
Control output		15 A at 250 VAC, 12 A at 250 VAC	15 A at 250 VAC	15 A at 250 VAC
Contact configuration	**Time-limit**	DPST-NO	SPST-NO, SPDT	SPST-NO, DPST-NO
	Instantaneous	---	---	---
Life expectancy		100 x 10^3 operations	2 years min.	2 years min.
Approved standards		UL, CSA, SEV	UL, CSA	---
Page		252	265	270

Classification		Others					
Model		H5RA	H3BA			H3BH	
Features		Replaces rotary cams for repeat pattern control	DIN-sized (48 x 48 mm, 45 x 75-mm) Timer with selectors to cover 64 specifications			DIN-sized (48 x 48 mm) Power OFF-delay Timer	
Appearance and dimensions							
Time range (60 Hz)		0.01 s to 99.9 h	0.05 s to 100 h			0.05 s to 10 min.	
Supply voltage		100 to 240 VAC (50/60 Hz)	24, 50, 100/110/120, or 200/220/240 VAC (50/60 Hz), 12, 24, 48, or 110 VDC			100/110/120, or 200/220/240 VAC (50/60 Hz), 24, 48, 100, or 110 VDC	
Power consumption		10 W max.	10 VA, 1 W			0.5 VA, 0.7 W	
Accuracy of operating time		±0.1%±30 ms	±0.3%			±0.3%	
Control output		Solid-state output: 100 mA at 30 VDC	5 A at 250 VAC			5 A at 250 VAC	
Contact configuration	**Time-limit**	Solid-state	SPDT	SPDT	DPDT	DPDT	SPDT
	Instantaneous	---	---	SPDT	---	---	---
Life expectancy		---	20 x 10^6 operations			10 x 10^6 operations	
Approved standards		UL, CSA	UL, CSA, SEV			UL, CSA	
Page		273	280			295	

Selection Guide

Classification		Others				
Model		H3BG		H3BF	H3G	
Features		DIN-sized (48 x 48 mm, 45 x 75 mm) Star-delta Timer		DIN-sized (48 x 48 mm) Twin Timer	Low-cost, plug-in Solid-state Timer	
Appearance and dimensions						
Time range (60 Hz)		0.5 to 100 s		0.05 s to 100 h	0.1 s to 3 h	
Supply voltage		100/110/120, or 200/220/240 VAC (50/60 Hz)		100/110/120, or 200/220/240 VAC (50/60 Hz), 24, 48, 100, or 110 VDC	24, 100/110/120, or 200/220/240 VAC (50/60 Hz) 12 to 24 VDC	
Power consumption		10 VA, 2 W		10 VA/2 W	3.4 VA	
Accuracy of operating time		±0.3%		±0.3%	±2%	
Control output		5 A at 250 VAC		5 A at 250 VAC	5 or 7 A at 250 VAC	
Contact configuration	**Time-limit**	SPST-NO	SPST-NO	DPDT	SPDT	DPDT
	Instantaneous	SPST-NO	---	---	---	
Life expectancy		20 x 10^6 operations		20 x 10^6 operations	10 x 10^6 operations	
Approved standards		UL, CSA		UL, CSA	UL, CSA, SEV	
Page		301		308	316	

Classification		Others
Model		H3CT
Features		DIN 48 x 48 mm standard size Analogue Timer
Appearance and dimensions		
Time range (60 Hz)		0.1 s to 30 h
Supply voltage		100/110/120 or 200/220/240 VAC (50/60 Hz), 12, 24 VDC
Power consumption		9.3 VA, 4.4 VA, 1.3 W, 1 W
Accuracy of operating time		±1%
Control output		5 A at 250 VAC
Contact configuration	**Time-limit**	SPDT
	Instantaneous	SPDT
Life expectancy		10 x 10^6 operations
Approved standards		---
Page		321

Glossary

Ambient Operating Temperature

The ambient temperature at which a device can be used in the continuously operated state.

Ambient Storage Temperature

The ambient temperature at which a device, without power applied, may be stores safely.

Automatic Reset

To automatically return the timer to the "0" state after the lapse of given time.

Dielectric Strength

The maximum voltage a dielectric can withstand without rupturing.

DOWN Display Digital Timer

The timer whose display progresses in descending sequence (from the set value to 0).

Electrical Reset/External Reset

To reset timer by applying a required voltage to the reset circuit.

Electrical Life Expectancy

A life expectancy of a timer when the control output of the timer is operated to switch the specified voltage/current load connected to the control output.

Holding Time

The period of time from the completion of the time-limit operation to the start of the reset operation.

Humidity

The ambient humidity at which a device can be used in the continuously operated state.

Instantaneous Contact

The contact that performs instantaneous operation.

Instantaneous Operation

The operation to place the output in the ON or OFF state upon application of the required voltage to the operating circuit.

Insulation Resistance

The resistance offered by an insulating material to the flow of current resulting from an impressed DC voltage.

Integrating Operation

The operation to obtain an output when the sum of the operating times stopped or released by gate signals coincides with the set time.

Malfunction Durability Shock

The threshold of shock beyond which a device can no longer operate properly by satisfying the prescribed ratings.

Malfunction Durability Vibration

The threshold of vibration beyond which a device can no longer operate properly by satisfying the prescribed ratings.

Manual Reset

To mechanically reset the timer by manual operation.

Mechanical Durability Shock

The threshold of shock beyond which an abnormality is expected to occur in the appearance or function of a device.

Mechanical Durability Vibration

The threshold of vibration beyond which an abnormality is expected to occur in the appearance or function of a device.

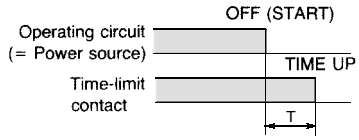
Mechanical Life Expectancy

A life expectancy of a timer when the control output of the timer is operated under no load condition.

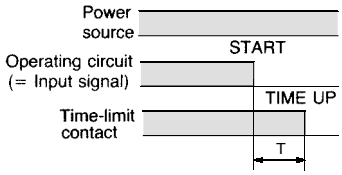
OFF-delay Timer

An output signal is generated upon application of a voltage to the operating circuit. The output signal is removed after the lapse of a given preset time from the interruption of the voltage being supplied to the operating circuit. The timer remains in the OFF state until the re-application of the voltage to the operating circuit.
This timer is also available in two types; one with a power supply also serving as an operating circuit, and the other with separate power supply and operating circuit. With the former type, restrictions are placed on the available types, operate time, etc.

(a) When the operating circuit is a power source



(b) When the operating circuit is an input signal source



OFF Time

The period of time from the start of the timer's reset operation until the application of a required voltage to the operating circuit.

OFF Time Characteristic

A change in operating time when the operate time in a given OFF time and the OFF time are changed.
Formula for calculation:
OFF time characteristic

$$= \pm \frac{TM \times 3 - TM_3}{TMs} \times 100\ (\%)$$

where,

TM_3: Average value of operating times measured during the OFF time of 1 second.

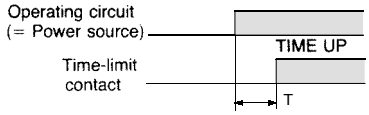
TM x 3: Average value of operating times measured during the OFF time which causes the maximum deviation from TM_3 which the OFF time range of 1 hour from the specified resetting time.

TMs: Maximum scale time

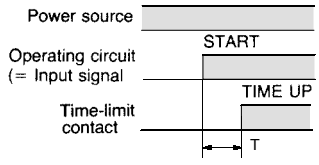
ON-delay Timer

An output signal is generated after the lapse of a given preset time from the application of voltage to the operating circuit.
The output signal is held until the operating circuit is turned off, and is removed upon turning off the operating circuit, causing the timer to return to its operable state.
This timer is available in two types; one with a power supply also serving as an operating circuit, and the other, with separate power supply and operating circuit.
In the case of motor timers, the latter type provides an higher repeat accuracy.

(a) When the operating circuit is a power source



(b) When the operating circuit is an input signal source



ON Time

The period of time during which a required voltage is being applied to the operating circuit.

Operating Time

The period of time from the application of a required voltage to the operating circuit until the completion of the time-limit contact operation.

Operating Voltage Range

The allowable fluctuation range of such a voltage as control voltage or signal voltage required to operate a device.

Power Consumption

The maximum wattage used by a device within its operating range at the specified temperature and humidity.

Depending on the internal power circuit system of the model, both apparent power and active power are indicated for the AC power supply. Refer to the apparent power when designing a transformer.

Example: H3CA-8A AC: 10 VA/1 W

Apparent power — Active power

Repeat Accuracy

Differences of operating times measured when the timer repeats operation under the same condition with a given setting time.
Formula for calculation (with operating time measured more than 5 times):
Repeat accuracy

$$= \pm \frac{1}{2} \times \frac{\text{T max.} - \text{T min.}}{\text{TMs}} \times 100\ (\%)$$

where,

T max.: Maximum value of operating times measured at the same set time

T min.: Minimum value of operating times measured at the same set time

TMs: Maximum scale time

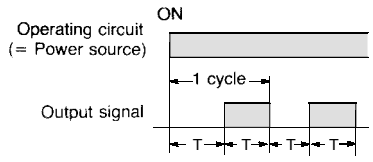
Since the repeat accuracy is expressed in terms of a percentage against the maximum setting time, the absolute value of the repeat accuracy does not change even if the setting time is changed. Accordingly, the time specification should be taken into account as much as possible, so that the timer may be used in the vicinity of full scale.

Repeat Cycle (Cyclic) Operation

The operation to repeat ON/OFF at each given operating time.

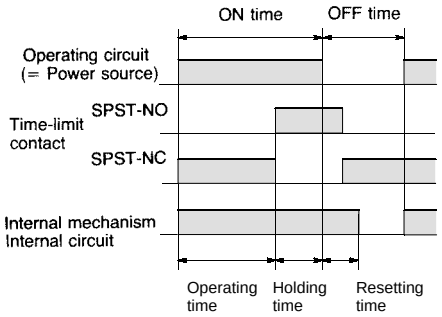
Repeat Cycle (Cyclic) Timer

An output signal is generated and removed repetitively according to the times of the set ON and OFF while a voltage is being applied to the operating circuit.



Resetting Time

The period of time from the interruption of the voltage supplied to the operating circuit during or after the time-limit operation until the return of the timer to its initial state.



Self-reset/Power-OFF Reset

To automatically reset the timer by interrupting the voltage being supplied to the operating circuit.

Setting Error

A difference between the actual operating time and scale time.
Formula for calculation (with operating time measured more than 5 times):
Setting error

$$= \frac{\text{TM} - \text{Ts}}{\text{TMs}} \times 100\ (\%)$$

where,

TM: Average value of measured operating times

Ts: Set time

TMs: Maximum scale time

Time-limit Contact

The contact that performs time-limit operation.

Time-limit Operation

The operation to obtain an output after the set time by applying the required voltage to the operating circuit.

Time-limit Reset

To return the timer to the original condition after the set time by changing the output state from ON to OFF upon application of the required voltage to the operating circuit.

UP Display Digital Timer

The timer whose display progresses in ascending sequence (from 0 to the set value).

Variation Due to Temperature Change

A change in operating time when the ambient temperature changes within a permissible range.
Formula for calculation (with operating time measured more than 5 time):
Variation due to temperature change

$$= \pm \frac{\text{TMx}_2 - \text{TMs}_2}{\text{TMs}} \times 100\ (\%)$$

where,

TM_2: Average value of operating times measured at 20°C

TMx_2: Average value of operating times measured at a temperature which causes the maximum deviation from TM_2 within the specified ambient temperature range.

TMs: Maximum scale time

Variation Due to Voltage Change

A change in operating time when the voltage of the control power source changes within the permissible fluctuation range.
Formula for calculation (with operating time measured more than 5 time):
Variation due to temperature change

$$= \pm \frac{TMx_1 - TM_1}{TMs} \times 100\ (\%)$$

where,

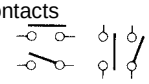
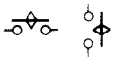
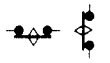
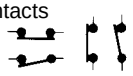
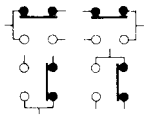
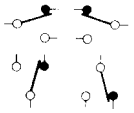
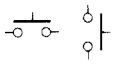
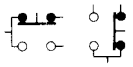
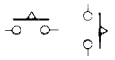
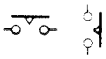
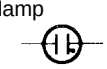
TM_1: Average value of operating times measured at rated voltage

TMx_2: Average value of operating times measured at a voltage which causes the maximum deviation from TM_1 within the permissible fluctuation range.

TMs: Maximum scale time

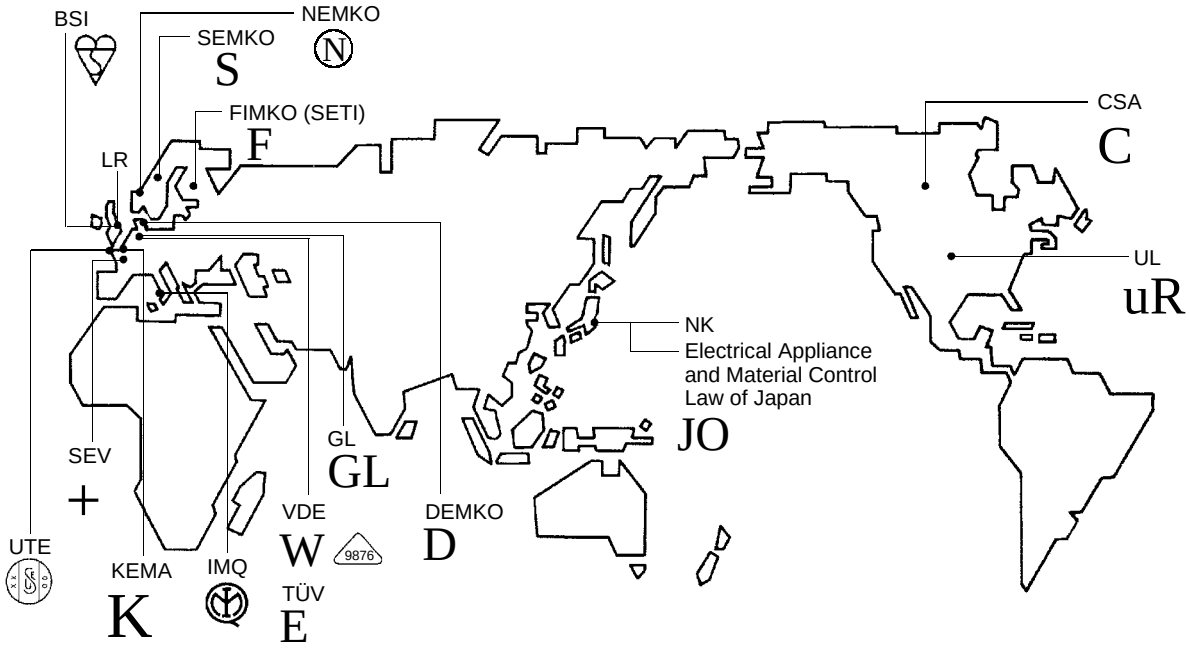
Technical Information

Symbols Used in Internal Connection Diagram of Timers

Name and symbol	Description	Name and symbol	Description
NO contacts 	Normally open contacts (A pair of contacts which are normally open when no relay input is applied.)	Time-limit operation, time-limit resetting contacts A  B 	A NO contacts B NC contacts
NC contacts 	Normally closed contacts (A pair of contacts which are normally closed when no relay input is applied.)		
Transfer contacts A  B 	Transfer contacts (NO and NC contacts which have a common contact terminal are collectively called “transfer contacts”.) A variety of contacts shown in A and B are all transfer contacts with NC contact arranged either on the right side or on the upper side.	Manually operated, automatic resetting contact A  B C 	Contacts which reset upon release of the hand, and used as the contacts to operate pushbutton switches. A NO contacts B NC contacts C Transfer contacts
Time-limit operating contacts A  B	A NO contacts	Synchronous motor 	A miniature timer which operates in synchronization with power frequency.
	B NC contacts	Relay 	An electromagnetic relay
Time-limit resetting contacts A  B 	A NO contacts	LED 	Used to indicate the operating state of the timer.
	B NC contacts	Neon lamp 	Used to indicate the operating state of the timer.

Standards

■ National Standards



IEC (International Electrotechnical Commission)

The IEC is a standardization commission founded in 1908 to promote unification and coordination of international standards relating to electricity. It is headquartered in Geneva, Switzerland.

At present there are 43 member nations in the IEC including Japan, and these member nations are quickly conforming to the IEC standards.

UL Standards (Underwriters Laboratories INC.)

A nonprofit organization established in 1894 by the American association of fire insurance companies.

Underwriters Laboratories (abbreviated to UL hereafter) conducts approval testing on all kinds of electrical products. In many U.S. cities and states, UL approval is legally required on all electrical items sold.

In order to obtain UL approval on an electrical product, all major internal components also require UL approval.

UL offers two classifications of approvals, the listing mark and the recognition mark.

A Listing Mark constitutes a entirely approval of a product. Products display the Listing Mark shown below.

u

LISTING MARK

The Recognition Mark applies to the components used in a product, and therefore constitutes a more conditional approval of a product. Products display the Recognition Mark shown below.

R

RECOGNITION MARK

CSA Standards (Canadian Standards Association)

This association descended from a nonprofit, non-government standardization organization established in 1919. In addition to industrial standardization, the association now carries out safety testing on electrical products.

CSA has closer ties to government agencies than UL, so that electrical products not approved by CSA cannot be sold in Canada. Non-approved goods being sold illegally may have to be withdrawn.

CSA approval is known as “certification,” and consequently, CSA-approved equipment is referred to as “certified equipment.” Products display the mark shown below. For a conditional certification, products display component acceptance mark.

C

CERTIFICATION MARK

CENELEC (Comite Europeen de Normalisation Electrotechnique)

CENELEC is the "European Committee for Electrotechnical Standardization" jointly founded in 1973 by the EEC (European Economic Community) and EFTA (European Free Trade Association). It is headquartered in Brussels, Belgium and currently has 18 member nations.

Faced with European market unification in 1992, CENELEC took on the very important task of creating unified European standards and is energetically proceeding with the creation of standards.

The CENELEC standards can be broadly divided into two groups: EN (European Norm) and HD (Harmonized Document).
EC member nations must use the EN standards for national standards without any changes, but they can use national standards that are have the same general content as the HD standards, so some differences in content are allowed with the HD standards.

VDE Standards (Verband Deutscher Electrotechnischer e.V.)

The VDE (German electrical technician's association), established in 1893, is mainly responsible for carrying out safety testing and approval administration of electrical products.
Compliance with VDE standards is not proscribed under German law, however, the extremely heavy penalties imposed on the manufacturer of an unapproved product which causes an electric-shock or fire mean that compliance is effectively compulsory in practice.

The VDE offers two major classifications of approval: the VDE Mark (below left) for products that can be used independently on the market, and the Monitoring Mark (below right) for components that are built into other products. The number inside the Monitoring Mark is the VDE registration number.

VDE MARK

MONITORING MARK

LR (Lloyd's Register of Shipping)

These are the standards of the Lloyd's Register of Shipping, headquartered in London. All of the OMRON control components approved in LR are UMS ships, the unmanned engine-room ship classification in the Lloyd's Register.

Unlike the safety standards such as UL, the devices are checked to ensure that they can function sufficiently under the environmental conditions when they are used in ships.
When a device is approved, Lloyd's Register doesn't apply the passing mark on the product, but includes it on the list of approved products that it publishes every year.

NK (Nippon Kaiji Kyokai)

Automation equipment and devices receive tests and inspections based on the provisions of the steel-ship regulations and can be formally approved if the tests are passed.

Testing at the production factory can be partially or entirely omitted when automation equipment and devices that have been formally approved are installed on ships.

As a general rule, manufacturers of approved products indicate that the products being shipped have been approved. (It is also acceptable to affix a label to products which require it.)

Electrical Appliance and Material Control Law of Japan

The products governed by the Electrical Appliance and Material Control Law (EAMCL) are electrical appliances generally used in the home or office. It does not apply to other industrial electrical equipment.

Electrical equipment falling under the auspices of the EAMCL are known as electrical appliances and divided into first-grade and second-grade appliances according to their dangerousness and how widespread their use.
First-grade appliances can display the symbol shown on the upper-left with an authorization number and be manufactured and sold if they pass the formal authorization tests prior to manufacture. Second-grade appliances can display the symbol shown on the lower-left with an authorization number and be manufactured and sold if the manufacturer reports the main principles of manufacturing.

First-grade
appliance symbol

Second-grade
appliance symbol

Reference

1. CE Marking

This mark is applied to products shown to conform to all relevant EC directives.

The EC directives that apply directly to this company's products are the Low-voltage directives and EMC directives. The Mechanical directives apply indirectly.

As a general rule, the CE marking is required for final products that appear on the market, but isn't required for the internal components in the product.

2. TÜV (Technischer Überwachungs - Verein)

The TÜV organizations are private, non-profit organizations whose parent organization, the German Boilermaker's Federation, was founded in 1875 to prevent boiler accidents. There are 14 independent TÜV organizations within Germany (such as TÜV Rheinland, TÜV Bayern, etc.).

The TÜV organizations inspect a broad range of industrial machinery and equipment, but is also entrusted by the government to inspect and approve electrical products based on the VDE standards.

TÜV approval is equally valid as VDE approval, and TÜV approval by any of the 14 independent organizations is valid with the others.

There are two types of approval marks, the mark on the upper-left is applied to equipment and the mark on the lower-left is applied to parts within the equipment.

3. BEAB (British Electrotechnical Approvals Board)

This non-profit organization was established in 1960 and tests mainly household electrical appliances based on BS standards.

There are two types of BEAB approval marks, the mark on the left is applied to equipment and the mark on the right is applied to parts within the equipment. Application of the parts approval mark is optional.

4. Switches and Relays Rated for Televisions (UL, CSA)

Both UL and CSA require normal TV rating approval for switches and relays used for power supply switching in appliances such as televisions and radios. UL accepts tungsten ratings (25,000 switch operations) for relays.

The TV ratings test is performed using a normal tungsten load on 6 samples. The tungsten lamp load has a inrush current about 10 times the normal current and the switching test is performed 25,000 times on each sample.

The TV ratings display indicates the tested amperage. For example, a switch passing the test for a normal current of 2 A (at 120 VAC) would be indicated by "TV–2".

5. Types of Loads

The conditions for loads other than resistive loads are different for the North American standards (UL and CSA) and the standards for each European country (VDE, SEMKO, etc.).

In North America, the tests for loads other than resistive loads are normally performed with a "general purpose load" with a 0.75 to 0.80 power factor, but in European countries the tests are performed with an inductive load with a 0.4 power factor.

■ EMC

Directive 89/336/EEC Concerning Electromagnetic Compatibility

The EMC Directive is a new-approach directive laying down equipment protection requirements and leaving it to standards, primarily harmonized standards or, failing that, national standards, to define product characteristics.

The EMC Directive is a total harmonization directive, i.e., its provisions replace the national provisions concerned.

The EMC Directive must be transposed into national law by 1st July 1991. Its provisions have applied since 1st January 1992.

The wide scope of the EMC Directive has demonstrated the overriding need to provide for a transitional period, so as to ensure a harmonious changeover from the application of systems of a purely national character to an exclusive Community system.

That is why, on 28 April 1992, the Council adopted Directive 92/31/EEC with a view to allowing a transitional period until 31 December 1995.

During this transitional period, a manufacturer will have the choice of placing on the market/putting into service:

- Products manufactured in accordance with the EMC Directive, whereby the free movement of the product is guaranteed pursuant to the Directive, or
- Products manufactured in accordance with national regulations or possibly with technical specifications of a non-mandatory nature, whereby free movement of the product will be guaranteed pursuant to Article 30 of the EEC Treaty, albeit subject to the possible derogations provided for in Article 36 and the jurisprudence of the European Community Court of Justice.

Normative References

EN50081-1
1992

Electromagnetic compatibility –
Emission standard
Part 1: Residential, commercial and light industry

EN50081-2
1993

Electromagnetic compatibility –
Emission standard
Part 2: Industrial environment

EN50082-1
1992

Electromagnetic compatibility –
Immunity standard
Part 1: Residential, commercial and light industry

prEN50082-2
1994

Electromagnetic compatibility –
Immunity standard
Part 2: Industrial environment

EN55011
1990

Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medial (ISM) radio-frequency equipment

EN55022
1985

Limits and methods of measurement of radio disturbance characteristics of information technology equipment

EN60204-1
1992

Safety of machinery –
Electrical equipment of machines
Part 1: General requirements

EN61000-4-8
1993

Electromagnetic compatibility
Part 4: Testing and measurement techniques
Section 8: Power frequency magnetic field immunity test

ENV50140
1993

Electromagnetic compatibility –
Basic immunity standard
Radiated, radio-frequency electromagnetic field –
Immunity test

ENV50141
1993

Electromagnetic compatibility –
Basic immunity standard
Conducted disturbances inducted by radio-frequency fields –
Immunity test

IEC801-2
1991

Electromagnetic compatibility for industrial-process measurement and control equipment
Part 2: Electrostatic discharge requirements

IEC801-3
1984

Electromagnetic compatibility for industrial-process measurement and control equipment
Part 3: Radiated electromagnetic field requirements

IEC801-4
1988

Electromagnetic compatibility for industrial-process measurement and control equipment
Part 4: Electrical fast transient/burst requirements

IEC801-5 (Draft)
1993

Electromagnetic compatibility for industrial-process measurement and control equipment
Part 5: Surge voltage immunity requirements

IEC801-6 (Draft)
1993

Electromagnetic compatibility for industrial-process measurement and control equipment
Part 6: Immunity to conducted disturbances induced by radio frequency fields.

IEC68-2-2
1974

Environmental testing
Tests B: Dry heat

IEC68-2-30
1980

Environmental testing
Test Db and guidance: Damp heat, cyclic (12 + 12 hour cycle)

IEC68-2-36
1973

Environmental testing
Test Fdb: Random vibration wide band
Reproducibility Medium

IEC529
1983

Degrees of protection provided by enclosures

MIL-STD-810E
1989

Method 514.4: Vibration

ASTM D 4728
1987

Standard test method for random vibration testing of shipping containers

Note: Abbreviations

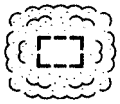
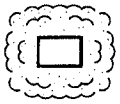
EMC:	Electromagnetic compatibility
EMS:	Electromagnetic susceptibility
EMI:	Electromagnetic interference
RF:	Radio frequency
ISM:	Industrial, scientific and medical equipment

Enclosure Ratings

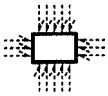
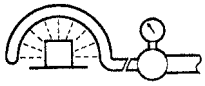
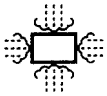
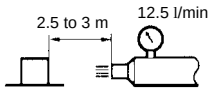
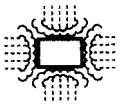
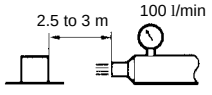
IP - 6 6 G

- Protection Specification Code (International Protection) (IEC529)
- Protection against solid foreign objects
- Protection against harmful ingress of water
- Japan Electrical Manufacturers Association's standards (JEM1030) Protection against oil

Protection Against Solid Foreign Objects

Grade	Protection	Criteria
5	Dust protected 	Limited ingress of dust permitted (no harmful deposit).
6	Dust-tight 	Totally protected against ingress of dust.

Protection Against Harmful Ingress of Water

Grade	Protection	Criteria	Examination method
4	Water splash from all directions 	Protected against water splashed from all directions; limited ingress permitted.	Spray water from all directions for 10 minutes using the test device shown below.  Flow per water spray hole: 0.07 l/min
5	Housing jets from all directions 	Protected against low-pressure jets of water from all directions; limited ingress permitted.	Spray water from all directions for one minute per m^2 of external surface area and for a total time of no less than 3 minutes using the test device shown below.  Discharging nozzle dia.: 6.3
6	Strong hosing jets from all directions 	Protected against strong jets of water, e.g. for use on shipdecks; limited ingress permitted.	Spray water from all directions for one minute per m^2 of external surface area and for a total time of no less than 3 minutes using the test device shown below.  Discharging nozzle dia.: 12.5

JEM Standards
Protection Against Oil

Grade	Protection	Criteria	Criteria
F	Oilproof	Protected against improper operation due to oil drops or spray from any direction.	No penetration of oil to the extent of interfering with proper operation after dropping the specified cutting oil on a test device for 48 hours at a rate of 0.5 l per hour.
G	Oil resistant	Protected against penetration of oil drops or spray from any direction.	No penetration of oil after dropping the specified cutting oil on a test device for 48 hours at a rate of 0.5 l per hour.

OMRON

Solid-state Timer

H3CR-A

DIN 48 x 48-mm Multifunctional Timer with Many Time Ranges, Operating Modes and Wide Power Supply Ranges

- A wide AC power supply range (100 to 240 VAC) and a wide DC power supply range (48 to 125 VDC) reduces the number of timer models kept in stock.
- Handles a wide range of applications through six operating modes.
- Enables easy sequence checks through instantaneous outputs for a zero set value at any time range.
- Only 80 mm long when panel-mounted with a Socket (excluding H3CR-A8EL).
- Setting rings (order separately) to enable consistent settings and to limit the setting range.
- Panel Covers (order separately) to enable various panel designs.
- All Units offer a wide time range (0.05 s to 300 h).
- Enables self-holding circuit or run-monitoring with instantaneous contact.
- Conforms to VDE0435/0110 and approved by UL and CSA.
- Conforms to EMC standards.
- Six-language instruction manual provided.

RC

Ordering Information

Outputs	Supply voltage	11-pin models	8-pin models
Contact	100 to 240 VAC (50/60 Hz)	H3CR-A	H3CR-A8
	12 VDC		
	24 VDC/VAC (50/60 Hz)		
	48 to 125 VDC		
Transistor (Photocoupler)	12 VDC	H3CR-AS	H3CR-A8S
	24 VDC/VAC (50/60 Hz)		
Time-limit contact and instantaneous contact	100 to 240 VAC (50/60 Hz)	---	H3CR-A8EL
	24 VDC/VAC (50/60 Hz)		H3CR-A8E
	48 to 125 VDC		

Note: Specify both the model number and supply voltage when ordering.
Example: H3CR-A 12 VDC
└── Supply voltage

■ Accessories (Order Separately)

Flush Mounting Adaptor	Y92F-30
	Y92F-73 (not for H3CR-A8EL)
	Y92F-74 (not for H3CR-A8EL)
	Y92F-70 (for only H3CR-A8EL)
	Y92F-71 (for only H3CR-A8EL)

Socket	8-pin	11-pin
Track Mounting/ Front Connecting Socket	P2CF-08	P2CF-11
Back Connecting Socket	P3G-08	P3GA-11

Mounting Track	50 cm (l) x 7.3 mm (t)	PFP-50N
	1 m (l) x 7.3 mm (t)	PFP-100N
	1 m (l) x 16 mm (t)	PFP-100N2
End Plate	PFP-M	
Spacer	PFP-S	

Protective Cover	Y92A-48B

Time Setting Ring

Setting a specific time	Y92S-27
Limiting the Setting Range	Y92S-28

Panel Cover

Color (Munsell No.)	Model
Light Gray (5Y7/1)	Y92P-48GL
Black (N1.5)	Y92P-48GB
Medium Gray (5Y5/1)	Y92P-48GM

Note: The Time Setting Ring and Panel Cover are sold together.

Hold-down Clip

Specification	Model
For PL08 and PL11 Sockets	Y92H-7 (not for H3CR-A8EL)
	Y92H-1 (for only H3CR-A8EL)
For PF085A Socket	Y92H-8 (not for H3CR-A8EL)
	Y92H-2 (for only H3CR-A8EL)

Specifications

■ General

Item	H3CR-A/-AS	H3CR-A8/-A8S	H3CR-A8EL/-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	A: ON-delay E: Interval	
Pin type	11-pin	8-pin	
Input type	No-voltage input	---	
Time-limit output type	H3CR-A/-A8: Relay output (DPDT) H3CR-AS/-A8S: Transistor output (NPN/PNP)*		Relay output (SPDT)
Instantaneous output type	---		Relay output (SPDT)
Mounting method	DIN track mounting, surface mounting, and flush mounting		
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: IEC801-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC801-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4)		
Approved standards	UL508, CSA C22.2 No.14, LR/NK Conforms to VDE0435/2021, VDE0110 Conforms to EN50081-2, prEN50082-2		

*The internal circuits are optically isolated from the output. This enables application of either NPN or PNP transistors.

■ Time Ranges

Time unit		s (sec)	min	h (hrs)	x10 h (10 h)
Setting	0	Instantaneous output (To obtain instantaneous output, set to below 0.) (see note)			
	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

Note: Instantaneous output is available with all H3CR-A models.

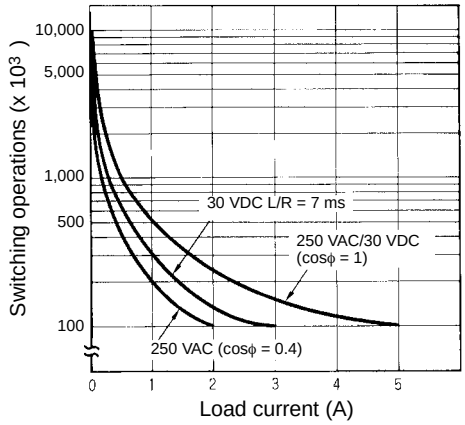
■ Ratings

Rated supply voltage	100 to 240 VAC (50/60 Hz), 12 VDC, 24 VDC/VAC (50/60 Hz), 48 to 125 VDC
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
No-voltage input	ON impedance: 1 kΩ max. ON residual voltage: 1 V max. OFF impedance: 100 kΩ min.
Power consumption	100 to 240 VAC: approx. 10 VA; 12 VDC, 48 to 125 VDC: approx. 1.5 W; 24 VDC/VAC: approx. 2 VA (AC), approx. 1 W (DC)
Control outputs	Time limit contacts: 5 A at 250 VAC, resistance 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, resistance load ($\cos\phi = 1$)

■ Characteristics

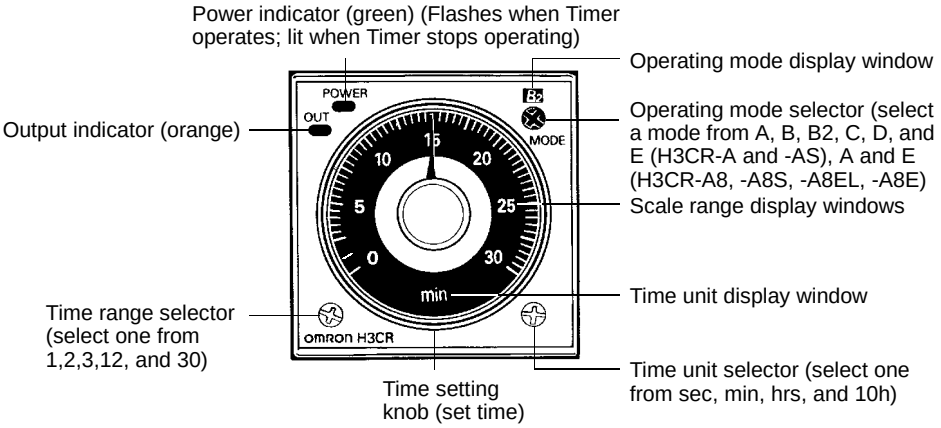
Accuracy of operating time	±0.3% FS max. (±0.3%±10 ms in a range of 1.2 s)
Setting error	±5% FS ±0.05 s max.
Reset time	Min. power-opening time: 0.1 s max. Min. pulse width: 0.05 s (H3CR-A/-AS)
Influence of voltage	±0.5% FS max. (±0.5%±10 ms in a range of 1.2 s)
Influence of temperature	±2% FS max. (±2%±10 ms in a range of 1.2 s)
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) 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 VDC/VAC 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 VDC/VAC
Noise immunity	±1.5 kV (between power terminals) and ±600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Malfunction: 8 kV Destruction: 15 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude each in three directions Malfunction: 10 to 55 Hz with 0.5-mm double amplitude each in three directions
Shock resistance	Destruction: 980 m/s^2 (100G) each in three directions Malfunction: 98 m/s^2 (10G) each in three 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)
Case color	Light Gray (Munsell 5Y7/1)
Enclosure ratings	IEC: IP40
Weight	Approx. 90 g; approx. 110 g (H3CR-A8EL/-A8E)

Engineering Data



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).

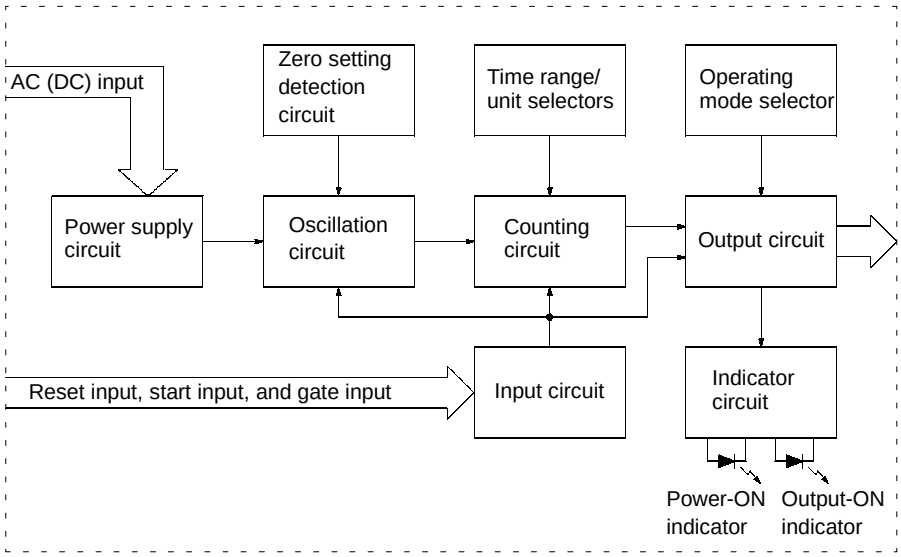
Nomenclature



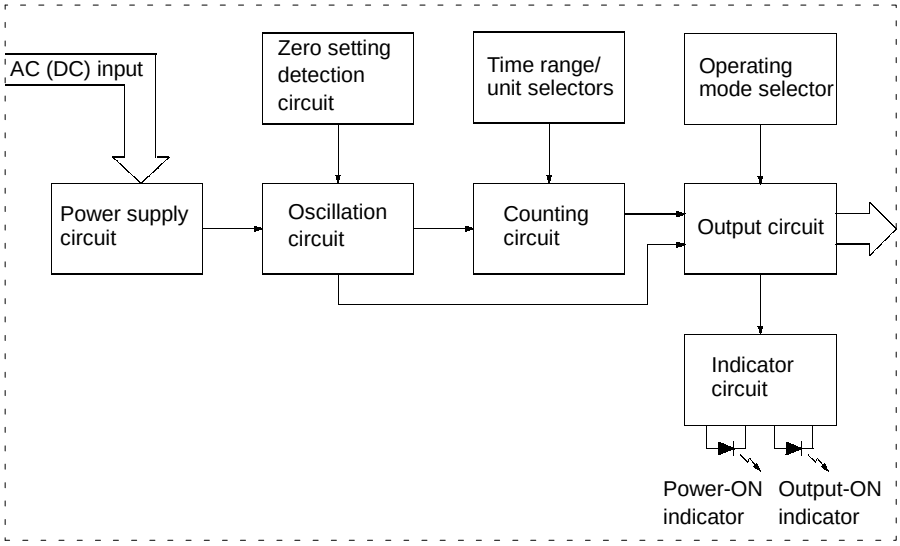
Operation

■ Block Diagrams

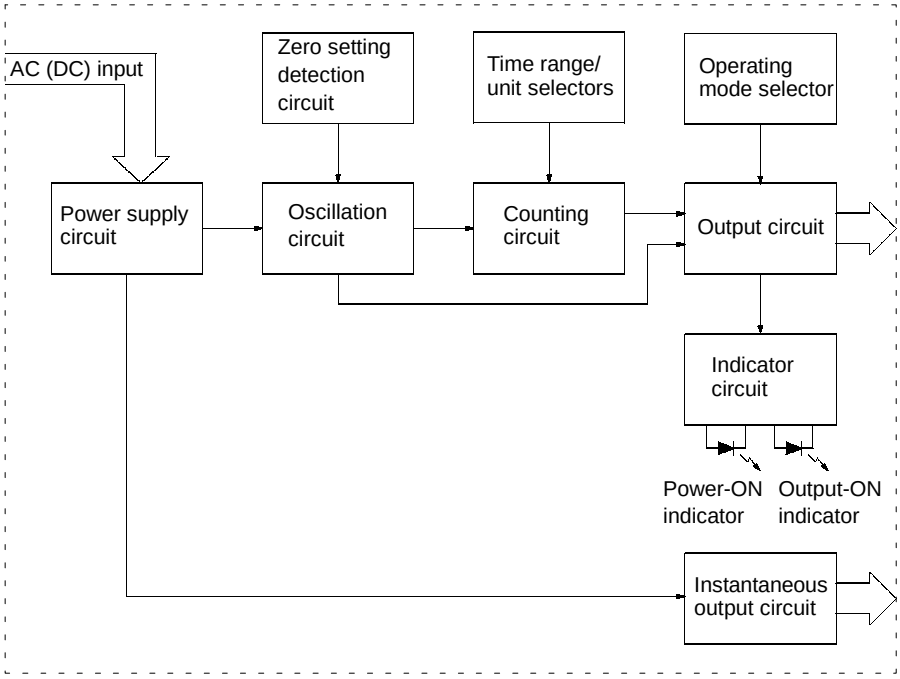
H3CR-A/AS



H3CR-A8/A8S



H3CR-A8EL/-A8E



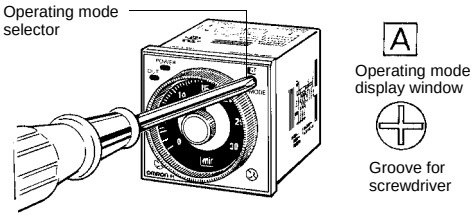
■ I/O Functions

Inputs (for -A/-AS)	**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.

■ Basic Setting

Setting of Selector

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

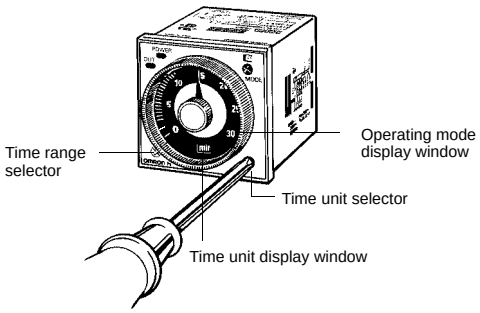


Selection of Operating Mode

Turn the operating mode selector with a screwdriver until the desired operating mode (A, B, B2, C, D, or E) appears in the display window located above the selector.

Selection of Time Unit and Time Range

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



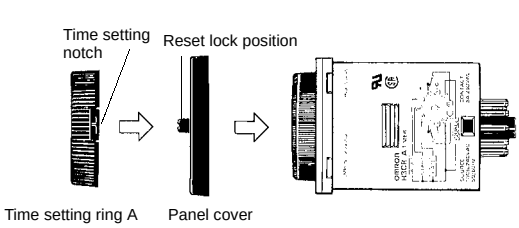
Setting of Time

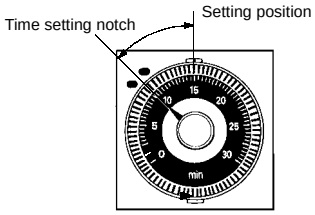
Use the time setting knob to set the desired time.

■ Using the Setting Ring

Setting a Specific Time

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

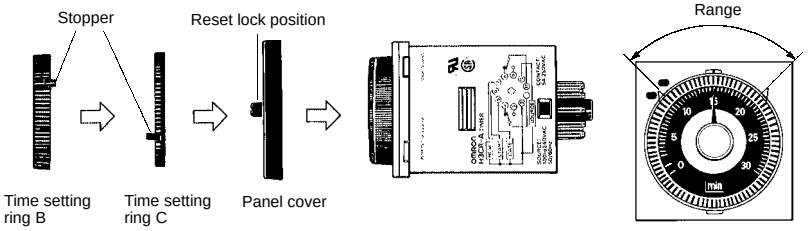




Example: To set the time to 10 s.

Limiting the Setting Range

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

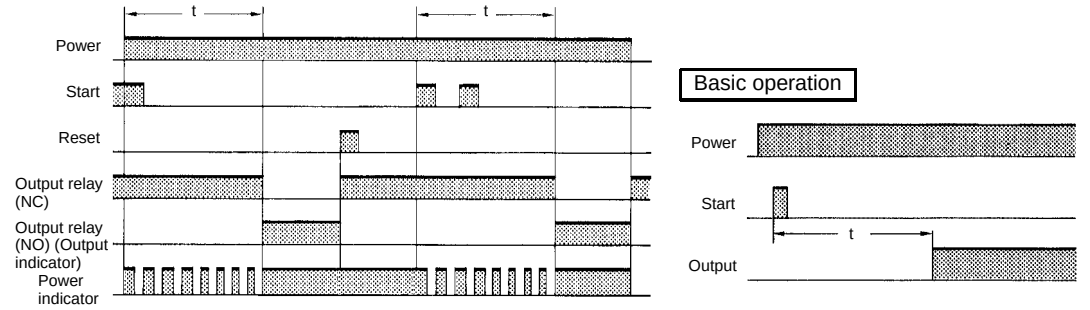
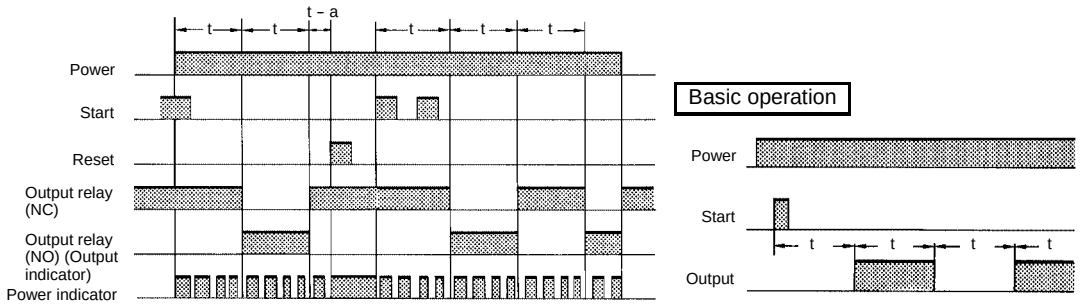
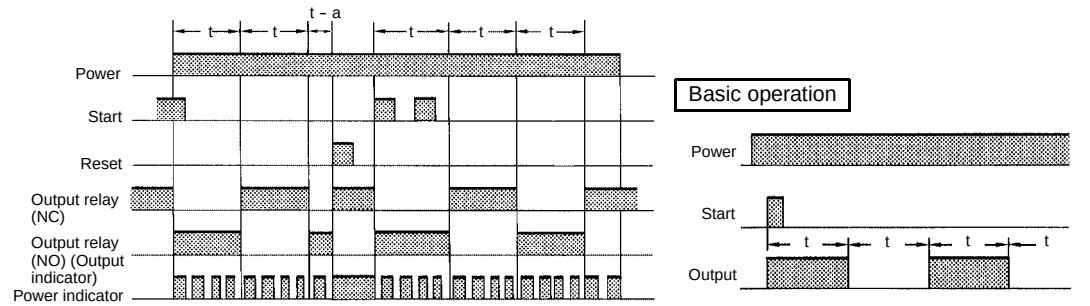
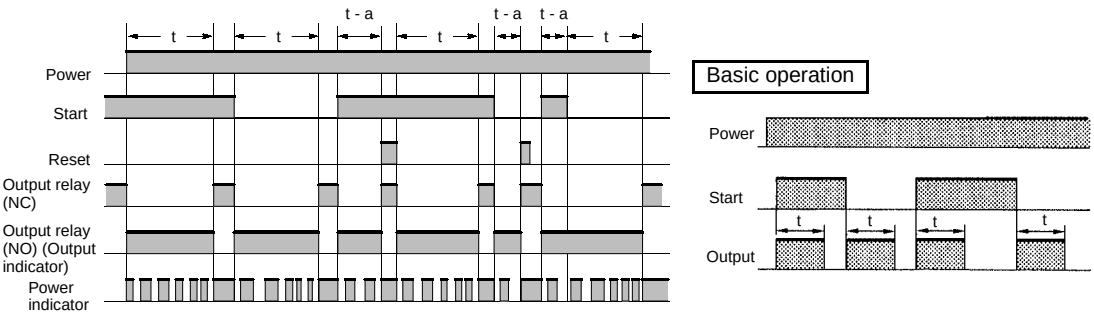


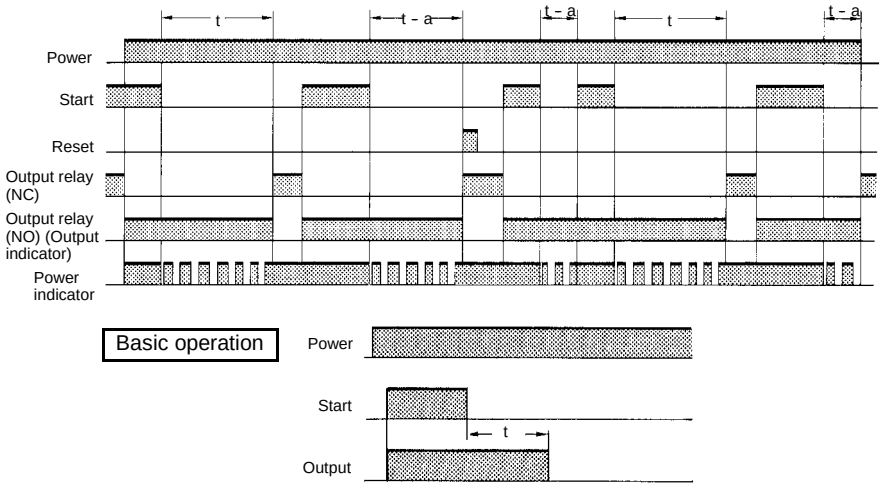
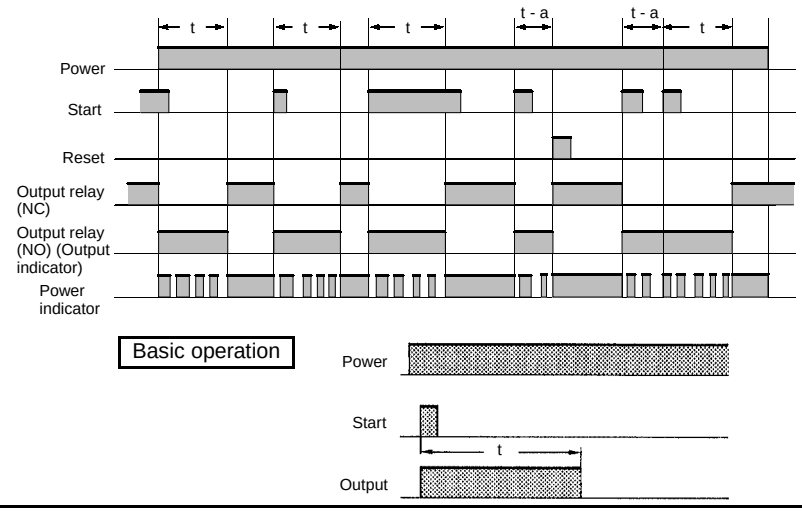
■ Timing Chart

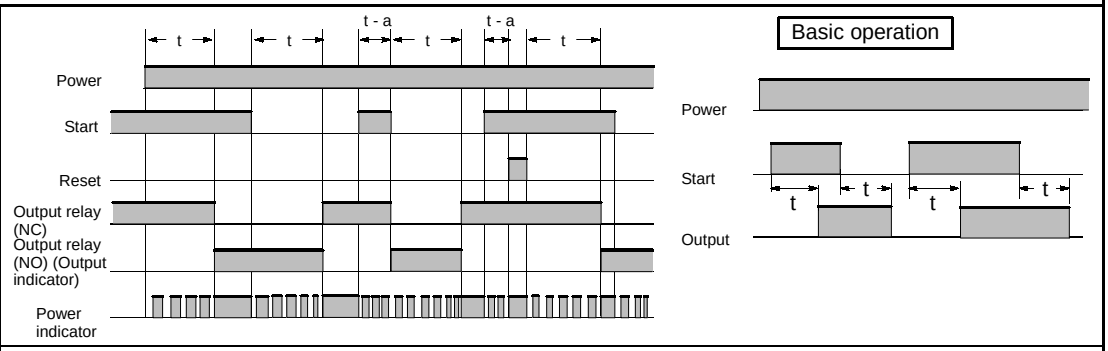
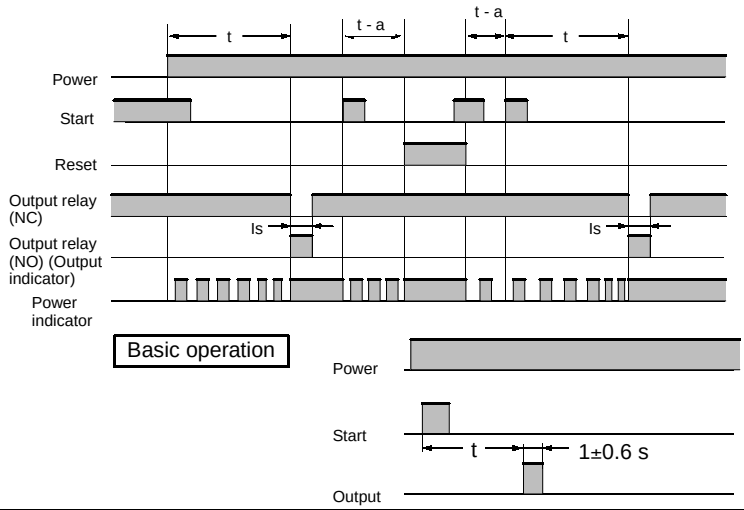
Note: 1. The minimum power-opening time (“Rt”) is 0.1 s and the minimum pulse width is 0.05 s.

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.

H3CR-A/-AS

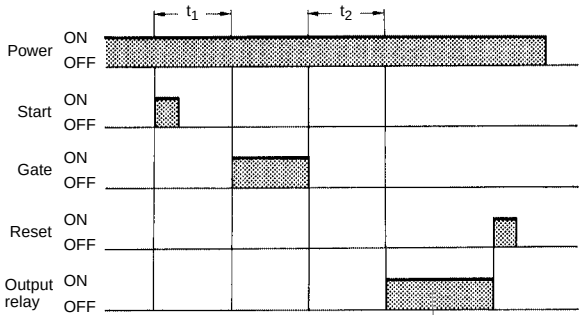
Operating mode	Timing chart
A: ON-delay	
B: Flicker OFF start	
B2: Flicker ON start	
C: Signal ON/OFF-delay	

Operating mode	Timing chart
D: Signal OFF-delay	
E: Interval	

Operating mode	Timing chart
G: Signal ON/OFF-delay	
J: One-shot output	

Note: The G and J modes are special modes. Order the H3CR-A-300 special model for these modes.

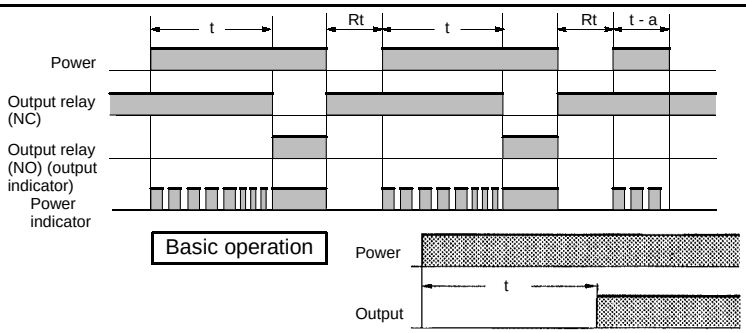
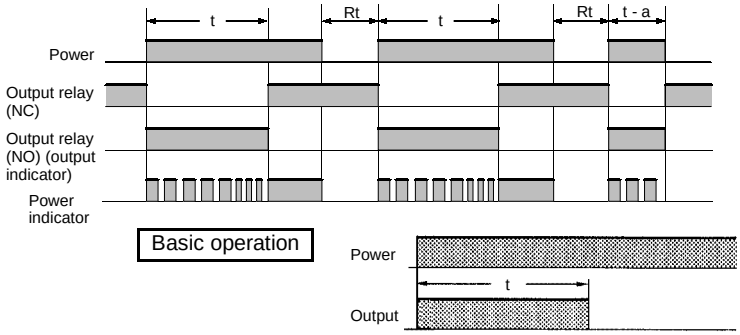
Gate Signal Input



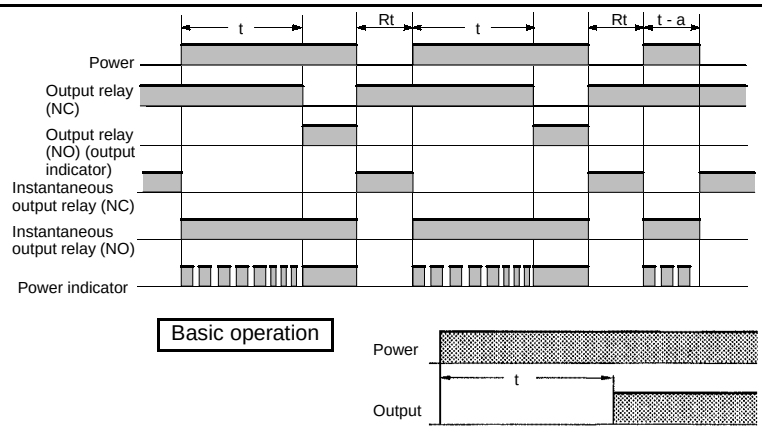
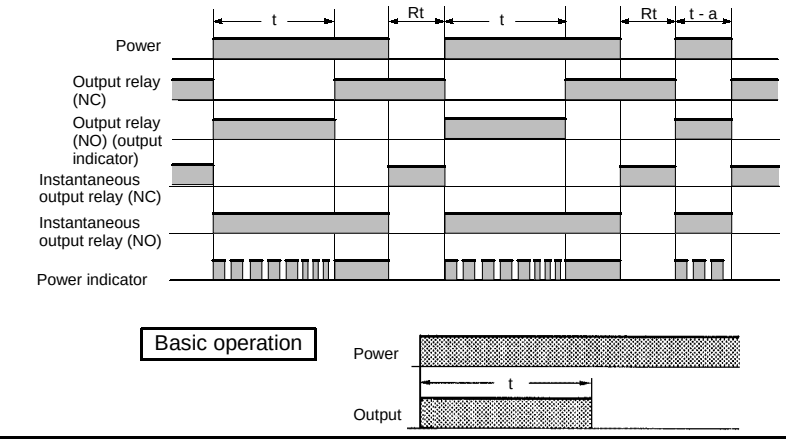
Note: 1. This timing chart indicates the gate input in operating mode A (ON-delay operation).

2. The set time is the sum of t_1 and t_2.

H3CR-A8/-A8S

Operating mode	Timing chart
A: ON-delay	
E: Interval	

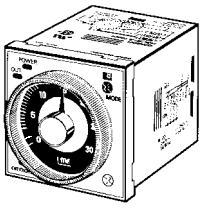
H3CR-A8EL/-A8E

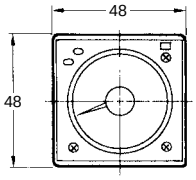
Operating mode	Timing chart
A: ON-delay	
E: Interval	

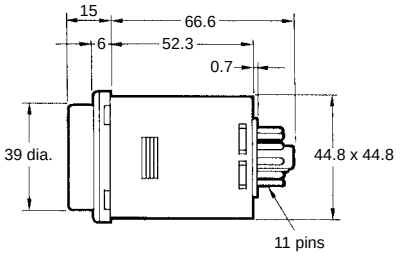
Dimensions

Note: All units are in millimeters unless otherwise indicated.

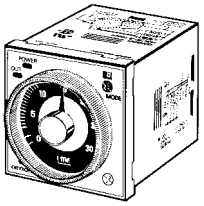
H3CR-A
H3CR-AS

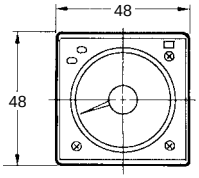


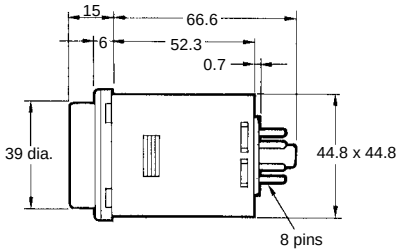




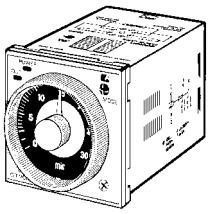
H3CR-A8
H3CR-A8S
H3CR-A8E

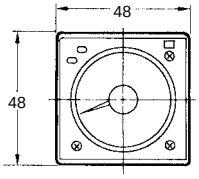


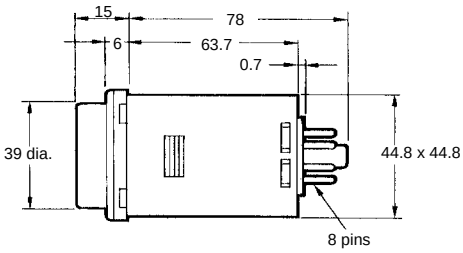




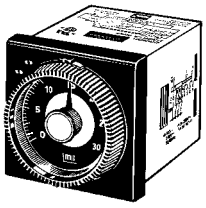
H3CR-A8EL

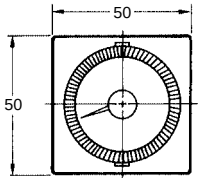


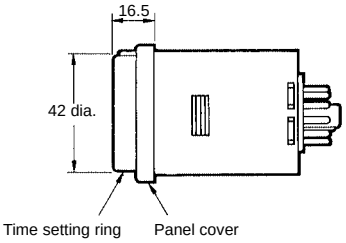




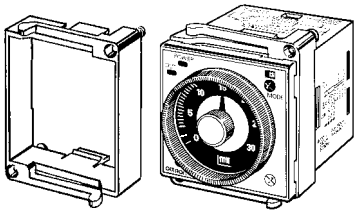
Dimensions with Set Ring

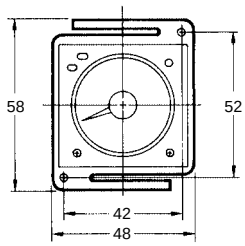


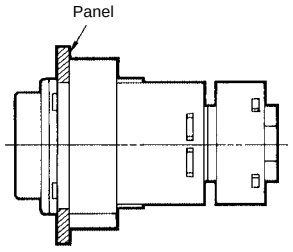




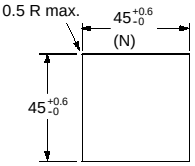
Dimensions with Flush Mounting Adaptor
Y92F-30







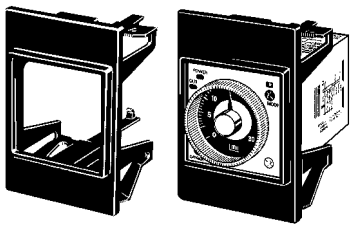
Panel Cutout

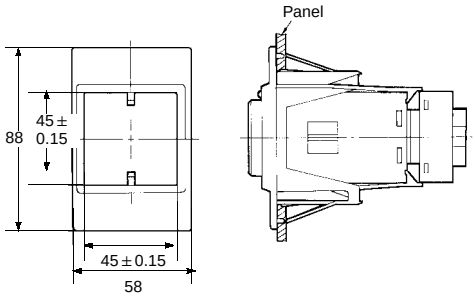


Note: The adapters for two or more timers mounted in a vertical line are different in orientation from those mounted in a horizontal line.

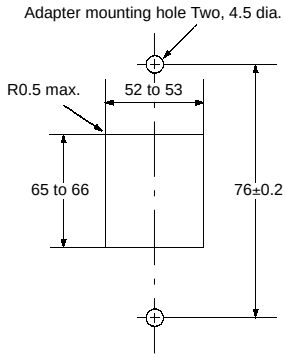
N can be obtained as follows (n: the number of H3CR models arranged side by side)
Without a Cover: N = (48n - 2.5) $^{+1}/_{-0}$
With the Protective Cover: N = (51n - 5.5) $^{+1}/_{-0}$
With the Panel Cover: N = (50n - 4.5) $^{+1}/_{-0}$

Dimensions with Flush Mounting Adaptor Y92F-73/70



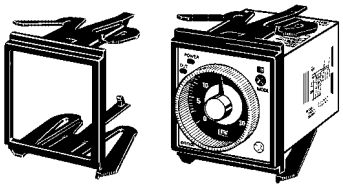


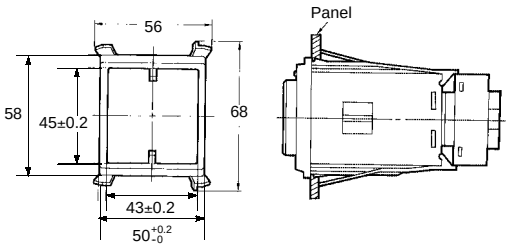
Panel Cutout

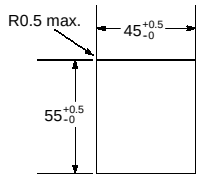


Note: The mounting panel thickness should be 1 to 3.2 mm.

Dimensions with Flush Mounting Adaptor Y92F-74/71

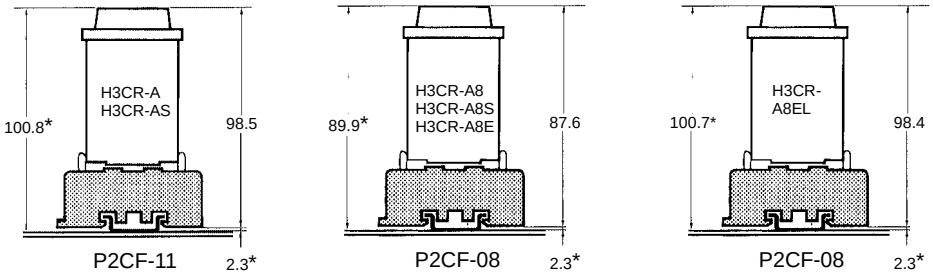






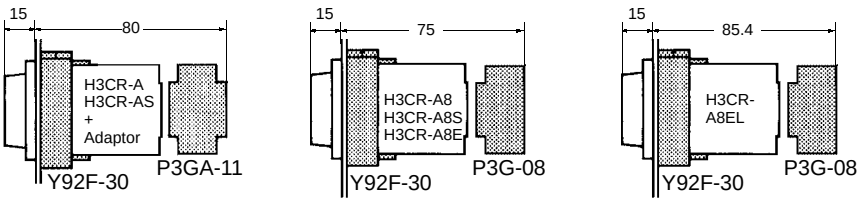
Note: The mounting panel thickness should be 1 to 3.2 mm.

Track Mounting



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

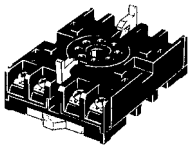
Flush Mounting

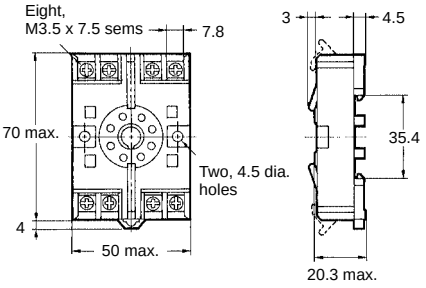


■ Accessories (Order Separately)

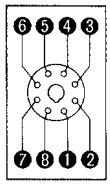
Track Mounting/ Front Connecting Socket

P2CF-08

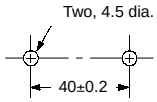




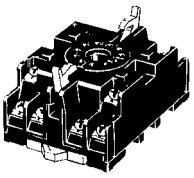
Terminal Arrangement/ Internal Connections (Top View)

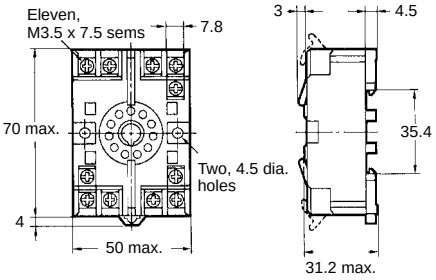


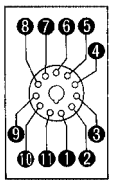
Surface Mounting Holes

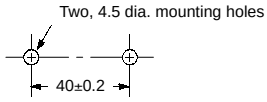


P2CF-11



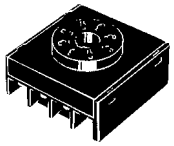


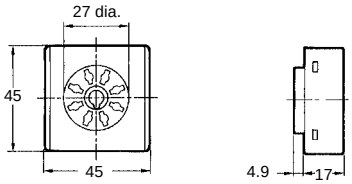




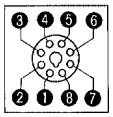
Back Connecting Socket

P3G-08

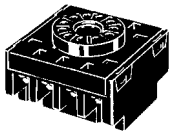


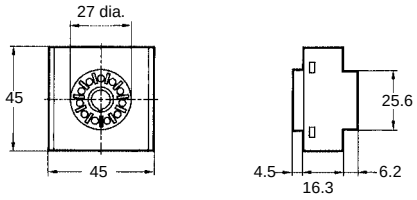


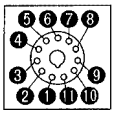
Terminal Arrangement/ Internal Connections (Bottom View)



P3GA-11

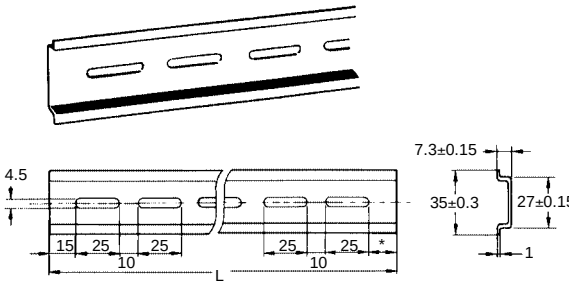




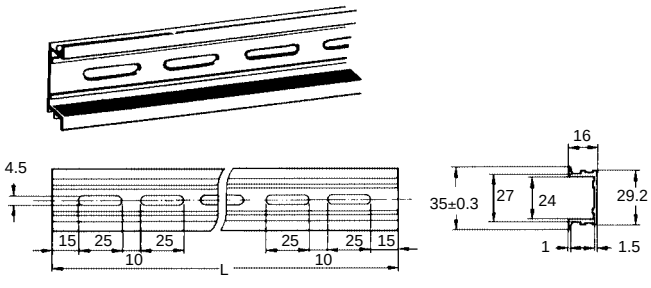


Mounting Track

PFP-100N, PFP-50N



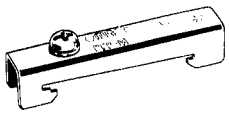
PFP-100N2

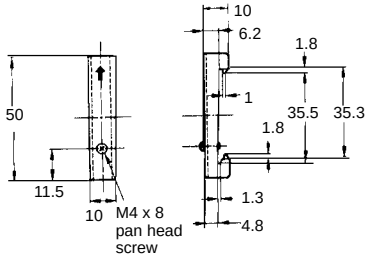


L: Length

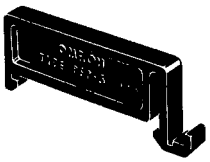
1 m	PFP-100N
50 cm	PFP-50N
1 m	PFP-100N2

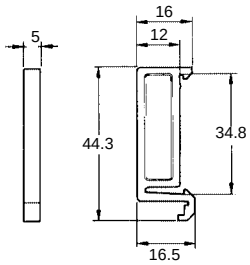
End Plate
PFP-M





Spacer
PFP-S





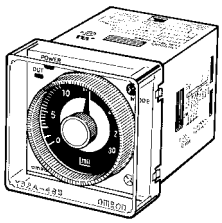
Protective Cover
Y92A-48B

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

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

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

Y92A-48B



Time Setting Ring/Panel Cover

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

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

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

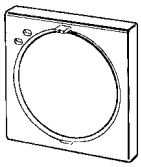
Setting a specific time	Time Setting Ring A (Y92S-27) and Panel Cover (Y92P-48GL, -48GB, or -48GM)
Limiting the setting range	Time Setting Ring B or C (Y92S-28), and Panel Cover (Y92P-48GL, -48GB, or -48GA)

Y92S-27
Time Setting A

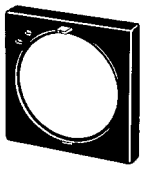
Y92S-28
Time Setting B

Y92S-28
Time Setting C

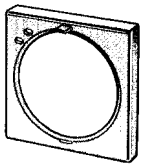
Y92P-48GL
Light Gray



Y92P-48GB
Black

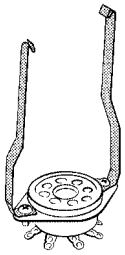


Y92P-48GM
Medium Gray

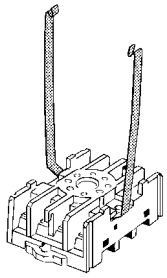


Hold-down Clip

Y92H-7/-1
For PL08 and PL11 Sockets



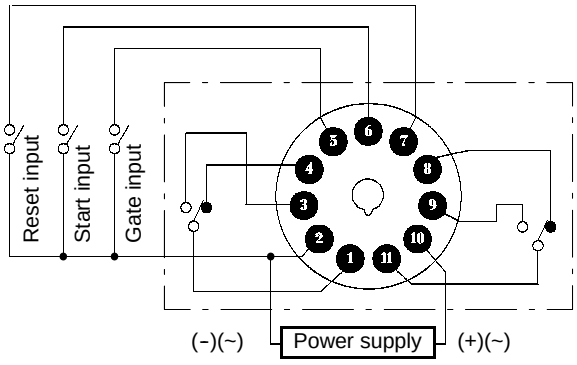
Y92H-8/-2
For PF085A Socket



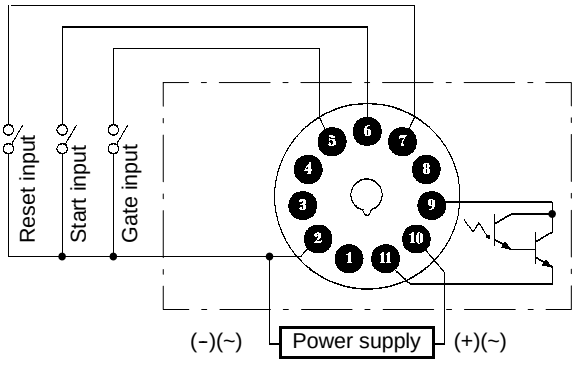
Installation

■ Terminal Arrangement

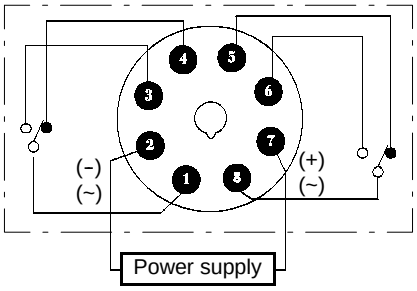
H3CR-A (Contact Output)



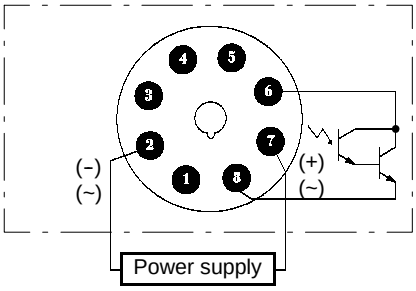
H3CR-AS (Transistor Output)



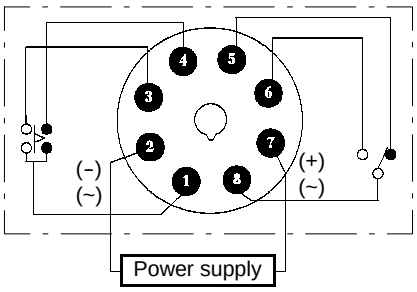
H3CR-A8 (Contact Output)



H3CR-A8S (Transistor Output)



H3CR-A8EL/-A8E (Contact Output)

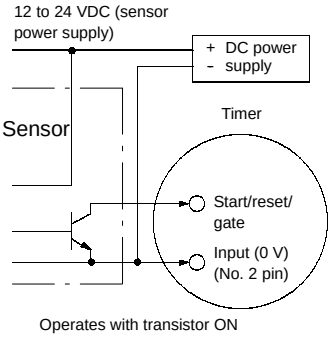


■ Input Connections

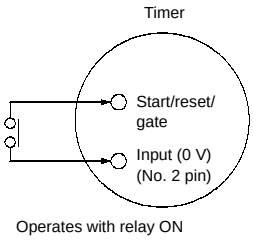
The inputs of the H3CR are no-voltage (short circuit or open) inputs.

No-voltage inputs

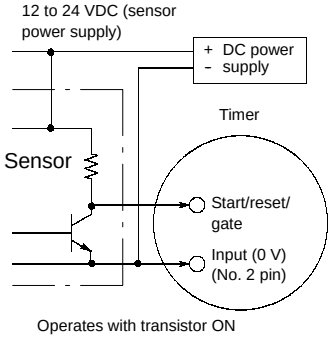
No-contact Input
(Connection to NPN open collector output sensor.)



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 80 μA at 5 V

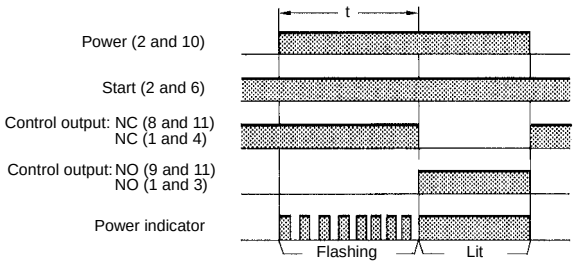
■ Application Examples

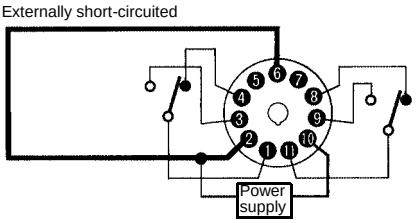
A Mode: ON-delay

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

1. Power-ON Start/Power-OFF Reset

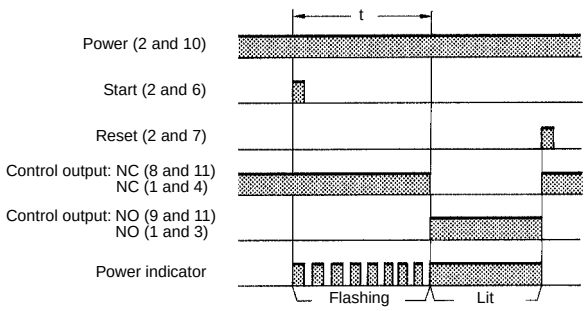
The Power-ON start/Power-OFF reset operation is a standard operating method.

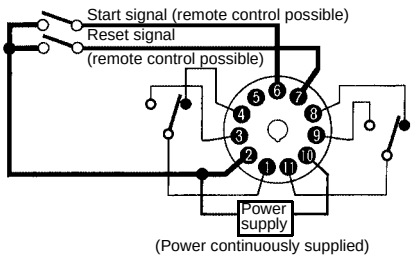




2. Signal Start/Signal Reset

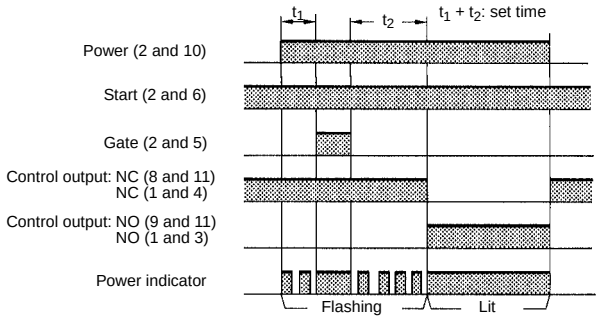
The Signal start/Signal reset operation is useful for remote control of the Timer.



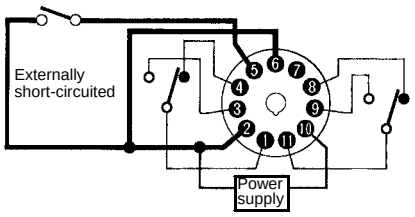


3. Control of Integrated Time with Gate Signal

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



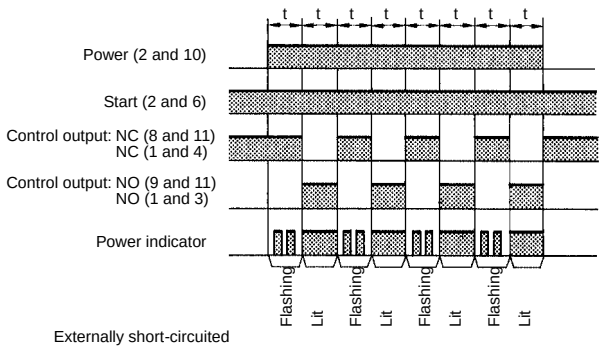
Gate signal (The operation is interrupted with the gate signal if the Timer detects an abnormal signal.)



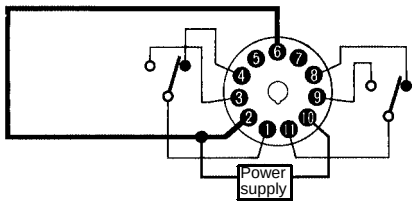
B/B2 Mode: Flicker

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)

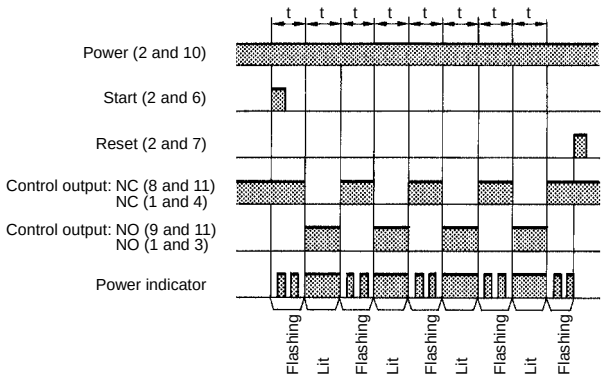


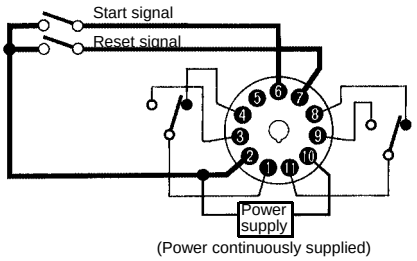
Externally short-circuited



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

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





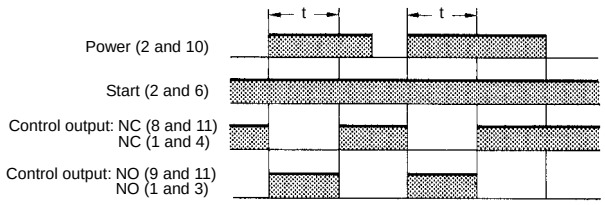
(Power continuously supplied)

C Mode: Signal ON/OFF-delay

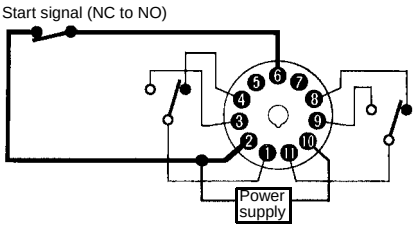
The Signal ON-/OFF-delay operation (C mode) is useful for the control of distribution of products on a production line into boxes by the specified number or time.

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

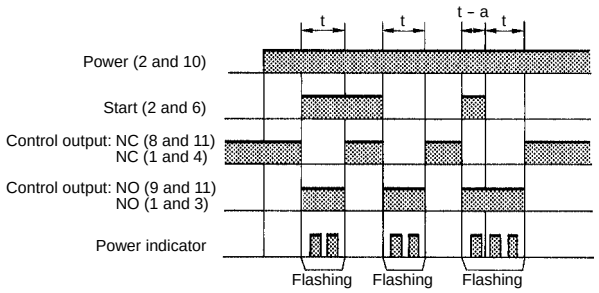
A set of these functions is useful for the operation of a machine for a specified period when power is ON.



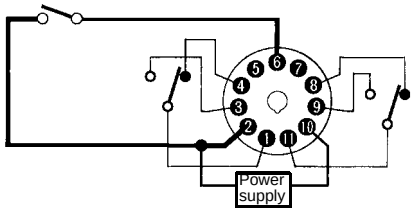
Start signal (NC to NO)



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



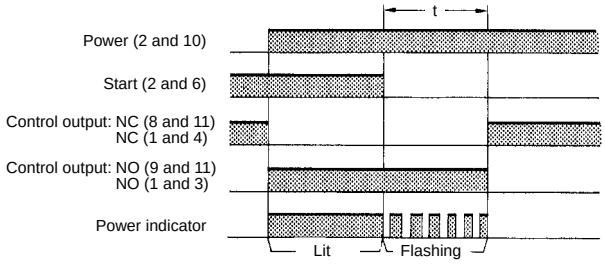
Start signal (The operation starts with the signal ON or OFF)



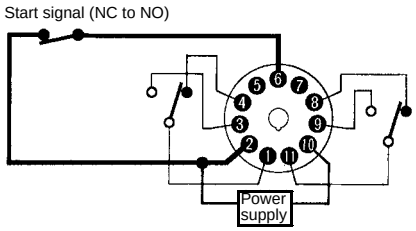
D Mode: Signal OFF-delay

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.

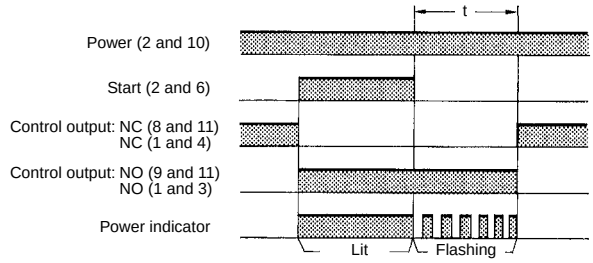
1. Power-ON Start/Instantaneous Operation/Time-limit Reset



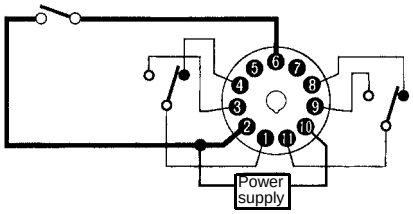
Start signal (NC to NO)



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



Start signal (NO to NC to NO)

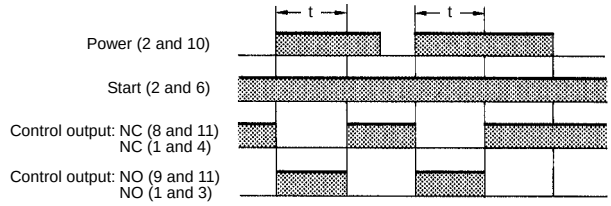


(Power continuously supplied)

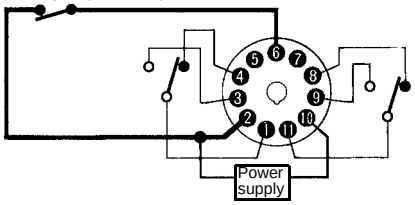
E Mode: Interval

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.

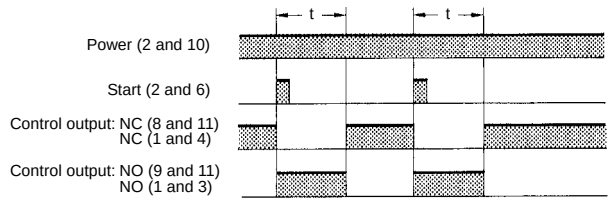


Start signal (NC to NO)

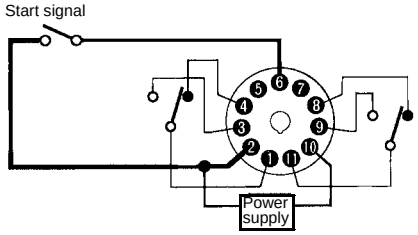


2. Signal Start/Instantaneous Operation/Time-limit Reset

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



Start signal



(Power continuously supplied)

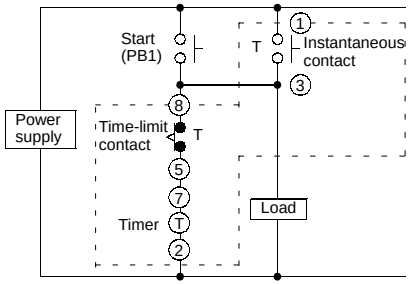
Precautions

■ Circuit with Instantaneous Contacts

Refer to the circuit diagrams below. Circuit A is a self-holding circuit with a timer (such as the H3CR-A8EL) that incorporates both instantaneous and time-limit contacts.

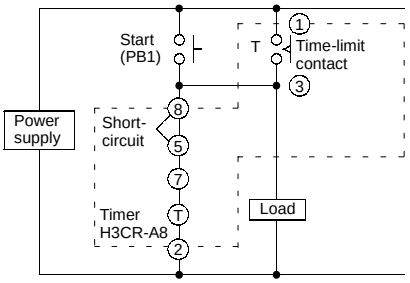
The H3CR-A (excluding H3CR-A8EL/-A8E) does not incorporate instantaneous contacts but time-limit contacts only. However, you can still design a self-holding circuit with the H3CR-A. For example, circuit B is a self-holding circuit equivalent to circuit A, which includes the H3CR-A8 in interval mode (i.e. the timer starts the moment power is turned ON and operates for a specified period).

Circuit A (with H3CR-A8EL/-A8E)



Note: No. 1 to 8 are the terminal numbers of the H3CR-A8EL/-A8E.

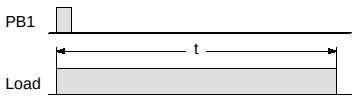
Circuit B (Interval Mode with H3CR-A8)



Note: No. 1 to 8 are the terminal numbers of the H3CR-A8.

In the case of using H3CR-A8EL/-A8E, refer to note 1 below.
In the case of using H3CR-A8, refer to note 2 below.

Note:
1. In circuit A, the contact between terminals 1 and 3 (instantaneous contact) is ON when PB1 (start switch) is turned on. Terminals 1 and 3 are OFF after a specified period during which the load operates. The moment terminals 5 and 8 are turned OFF, the timer is reset and the load power is switched off.
2. Short-circuit terminals 5 and 8 of the timer socket to change circuit A into circuit B. You need not replace the socket itself. In circuit B, the timer starts the moment power is ON and operates for a specified period.
3. The following is a timing chart for circuits A and B.



■ Changing of Setting

NOTICE: Do not change the time unit, time range, or operation mode while the timer is in operation or malfunction could result.

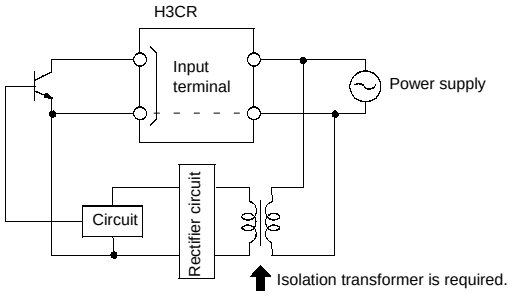
■ Power Supplies

An AC power supply can be connected to the power input terminals without regarding polarity. A DC power supply must be connected to the power input terminals as designated according to the polarity of the terminals.

A DC power supply can be connected if its ripple factor is 20% or less and the mean voltage is within the rated operating voltage range of the Timer.

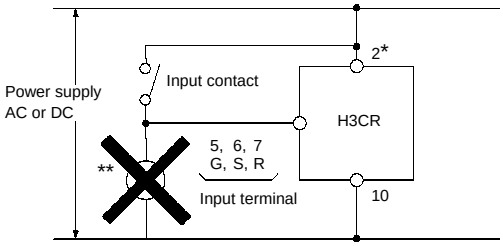
Connect the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value at once or the Timer may not be reset or a timer error could result.

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.



■ Input/Output

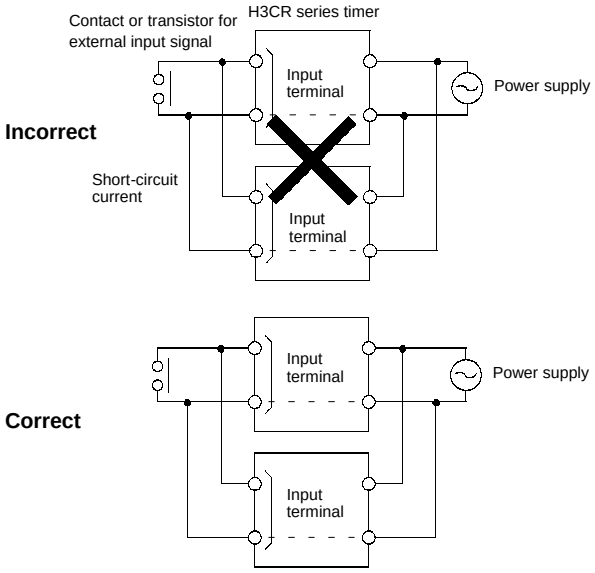
An appropriate input is applied to the input signal terminals of the Timer when one of the input terminals (terminals 5, 6, and 7) and the common terminal (terminal 2) for the input signals are short-circuited. Do not attempt to connect any input terminal to any terminal other than the common terminal or to apply voltage across other than the specified input and common terminals or the internal circuits of the Timer may be damaged.



*Power supply terminal 2 is a common terminal for the input signals (G, S, R) to the Timer. Never use terminal 10 as the common terminal for this purpose, otherwise the internal circuit of the Timer may be damaged.

**Do not connect a relay or any other load between these two points, otherwise the internal circuit of the Timer may be damaged due to the high-tension voltage applied to the input terminals.

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



The H3CR transistor output is insulated from the internal circuitry by a photocoupler, so either NPN or PNP output is possible.

■ Environment

When using the Timer in an area with excess electronic noise, separate the Timer, wiring, and the equipment which generates the input signals as far as possible from the noise sources. It is also recommended to shield the input signal wiring to prevent electronic interference.
Organic solvents (such as paint thinner), as well as very acidic or basic solutions can damage the outer casing of the Timer.

■ Others

If the Timer is mounted on a control board, dismount the timer from the control board or short-circuit the circuitry of the power board before carrying out a voltage withstand test between the electric circuitry and non current-carrying metal part of the Timer, in order to prevent the internal circuitry of the Timer from damage.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L84-E1-1C

OMRON

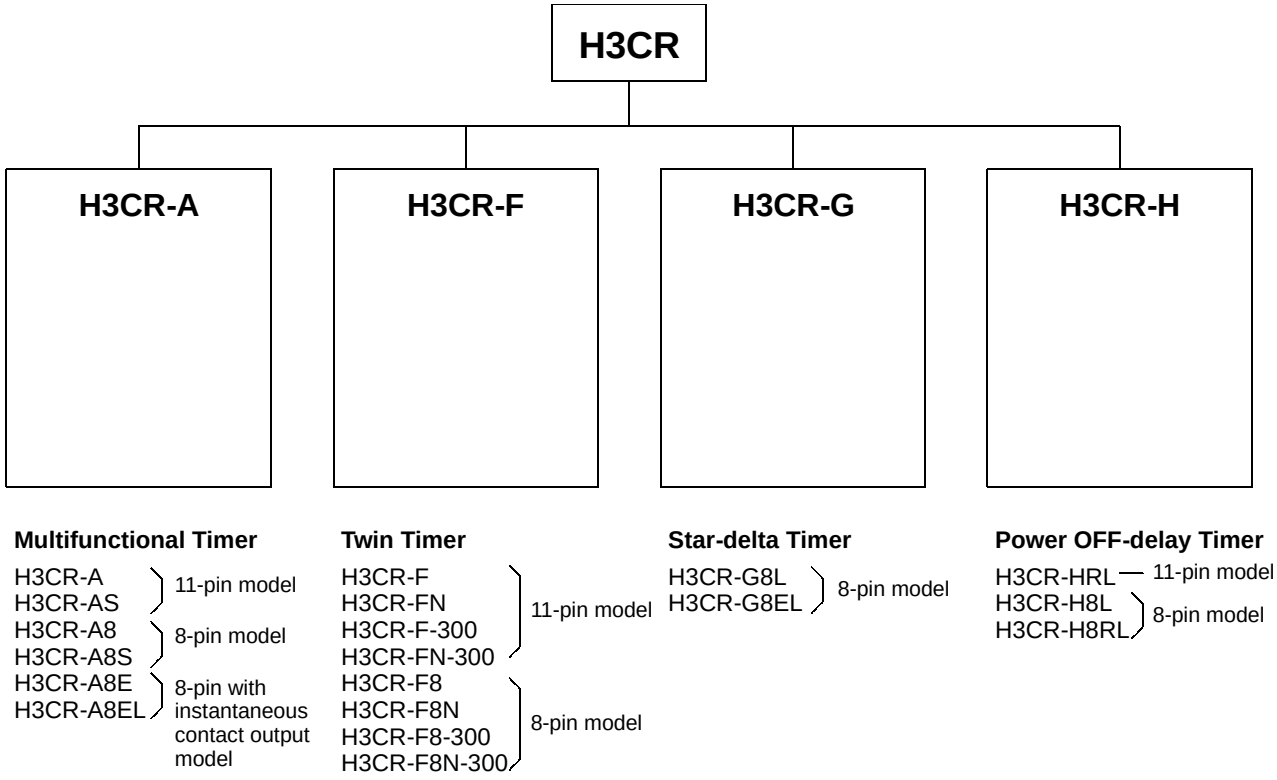
Solid-state Timer

H3CR-F/G/H

A Wide Variety of DIN 48 x 48-mm H3CR-F Twin Timers, H3CR-G Star-delta Timers, and H3CR-H Power OFF-delay Timers

- Conforms to VDE0435/0110 and approved by UL and CSA.
- Conforms to EMC standards.
- Six-language instruction manual provided.

■ Broad Line-up of H3CR Series



Note: 1. H3CR-AS, H3CR-A8S: Transistor output models
2. Refer to the *H3CR-A Datasheet (L84)* for details.

Solid-state Twin Timers

H3CR-F

DIN 48 x 48-mm Solid-state Twin Timers

- Wide power supply ranges of 100 to 240 VAC and 48 to 125 VDC respectively.
- Independent ON- and OFF-time settings. Furthermore, 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.
- Only 80 mm long when panel-mounted with a socket.
- 11-pin and 8-pin models are available.

RC

Ordering Information

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	H3CR-F8	H3CR-F-300	H3CR-F8-300
	24 VAC/DC				
	12 VDC				
	48 to 125 VDC				
Flicker ON start	100 to 240 VAC	H3CR-FN	H3CR-F8N	H3CR-FN-300	H3CR-F8N-300
	24 VAC/DC				
	12 VDC				
	48 to 125 VDC				

Note: Specify both the model number and supply voltage when ordering.
Example: H3CR-F 24 VAC/DC
Supply voltage

Model Number Legend:

H3CR - □ □ □ - □
1 2 3 4

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. Specified Type
300: Long time range (1.2 s to 300 h) type

■ Accessories (Order Separately)

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
		Y92F-73
		Y92F-74
Mounting Track	**50 cm (l) x 7.3 mm (t)**	PFP-50N
	1 m (l) x 7.3 mm (t)	PFP-100N
	1 m (l) x 16 mm (t)	PFP-100N2
End Plate		PFP-M
Spacer		PFP-S
Protective Cover		Y92A-48B
Track Mounting/ Front Connecting Socket	**8-pin**	P2CF-08
	11-pin	P2CF-11
Back Connecting Socket	**8-pin**	P3G-08
	11-pin	P3GA-11
Hold-down Clip	**For PL08 and PL11 Sockets**	Y92H-7
	For PF085A Socket	Y92H-8

Specifications

■ General

Item	H3CR-F	H3CR-F8	H3CR-FN	H3CR-F8N
Operating mode	Flicker OFF start		Flicker ON start	
Pin type	11-pin	8-pin	11-pin	8-pin
Operating/Reset method	Time-limit operation/Time-limit reset or self-reset			
Output type	Relay output (DPDT)			
Mounting method	DIN track mounting, surface mounting, and flush mounting			
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: IEC801-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC801-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4)			
Approved standards	UL508, CSA C22.2 No.14, LR/NK Conforms to VDE0435/2021, VDE0110 Conforms to EN50081-2, prEN50082-2			

■ Time Ranges

0.05 s to 30 h Models

Time unit		s (sec)	x10 s (10 s)	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

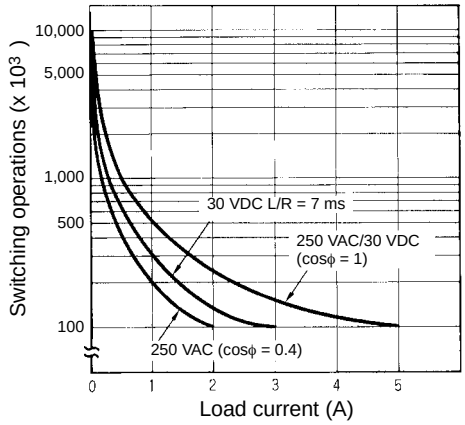
Rated supply voltage (see note)	100 to 240 VAC (50/60 Hz),12 VDC, 24 VAC/DC (50/60 Hz), 48 to 125 VDC
Operating voltage range	85% to 110% of rated supply voltage; 90% to 110% with 12-VDC models
Power reset	Minimum power-opening time: 0.1 s
Power consumption	100 to 240 VAC: approx. 10 VA; 12 VDC: approx.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

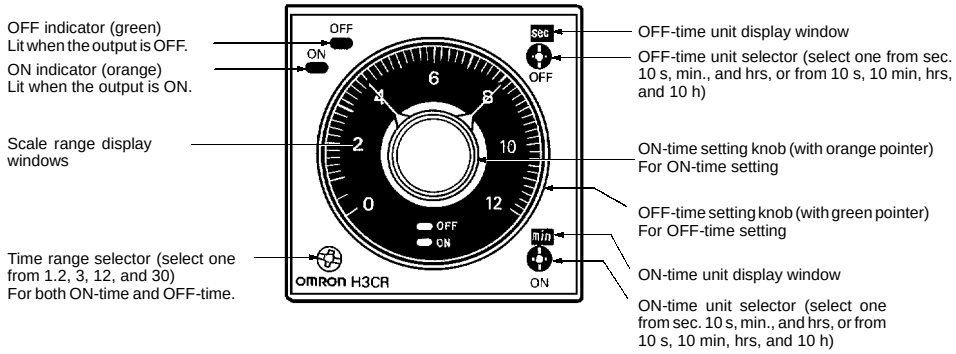
Accuracy of operating time	±0.3% FS max. (±0.3% FS ±10 ms in ranges of 1.2 and 3 s)
Setting error	±5% FS ±0.05 s max.
Reset time	0.1 s max.
Influence of voltage	±0.5% FS max. (±0.5% FS ±10 ms in ranges of 1.2 and 3 s)
Influence of temperature	±2% FS max. (±2% FS ±10 ms in ranges of 1.2 and 3s)
Insulation 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) 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 each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude each in three directions
Shock resistance	Destruction: 980 m/s^2 (100G) each in three directions Malfunction: 98 m/s^2 (10G) each in three 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)
Case color	Light Gray (Munsell 5Y7/1)
Enclosure ratings	IEC: IP40
Weight	Approx. 100 g

Engineering Data



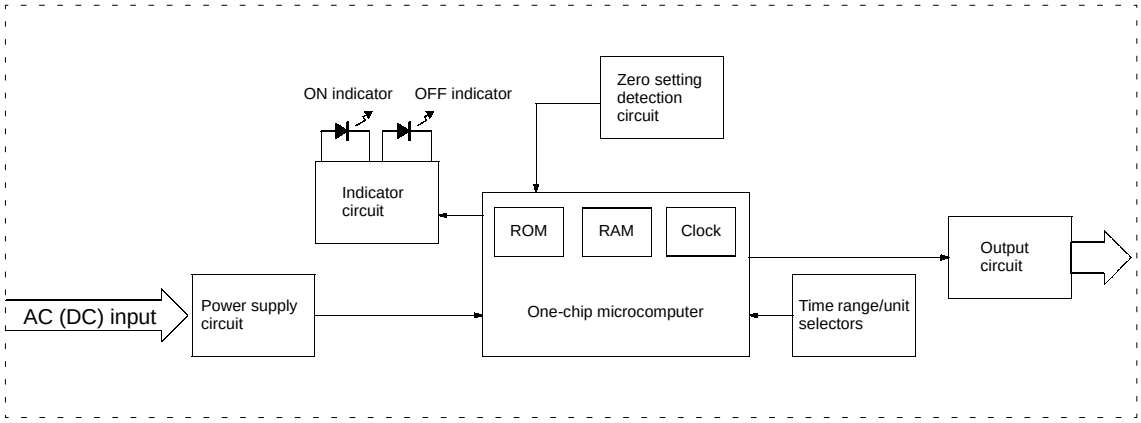
Reference: A maximum current of 0.15 A can be switched at 125 VDC ($\cos\phi$ = 1) and a maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.
The minimum applicable load is 10 mA at 5 VDC (failure level: P).

Nomenclature



Operation

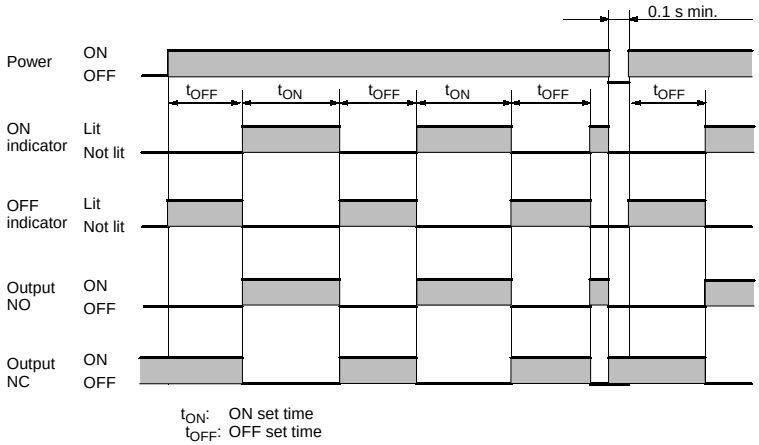
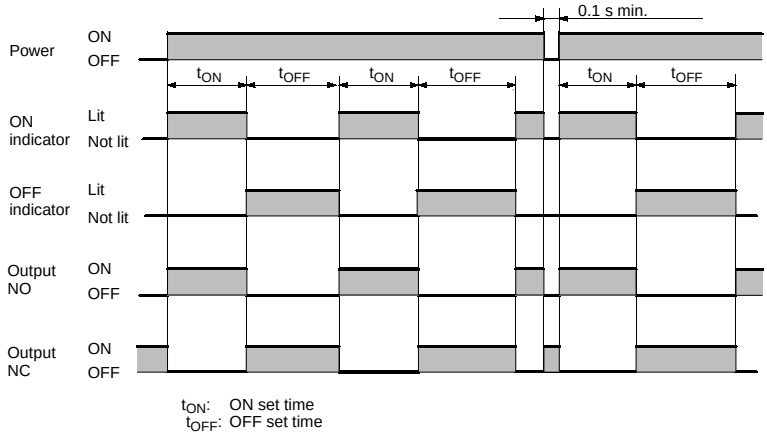
■ Block Diagrams



■ 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.

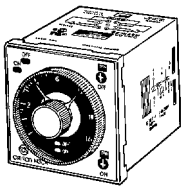
■ Timing Chart

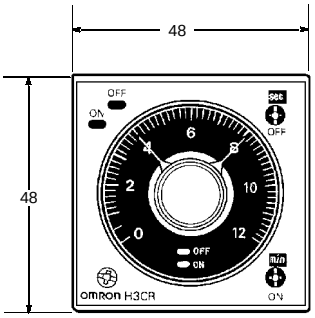
Operating mode	Timing chart
Flicker OFF start	
Flicker ON start	

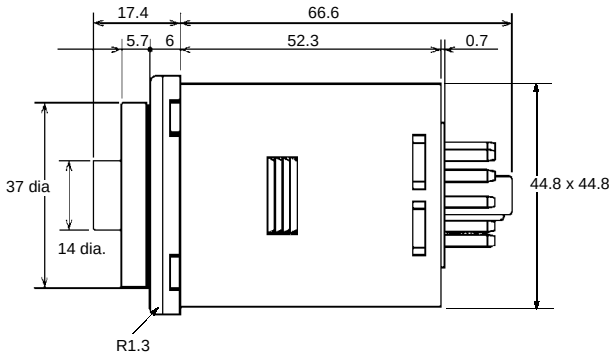
Dimensions

Note: All units are in millimeters unless otherwise indicated.

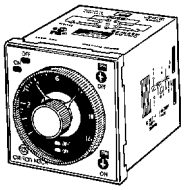
H3CR-F
H3CR-FN
H3CR-F-300
H3CR-FN-300

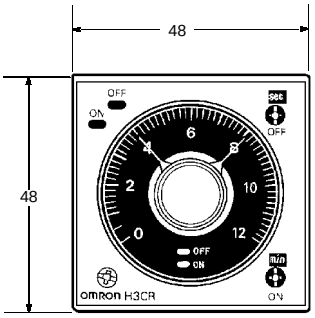


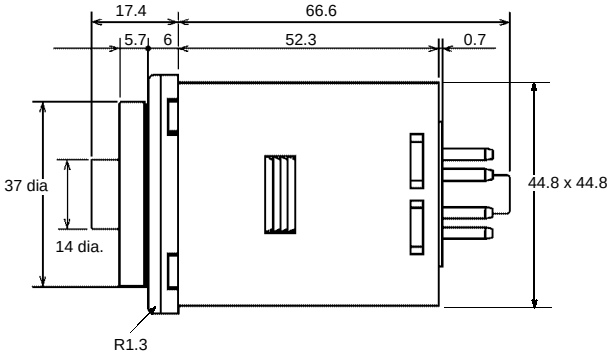




H3CR-F8
H3CR-F8N
H3CR-F8-300
H3CR-F8N-300



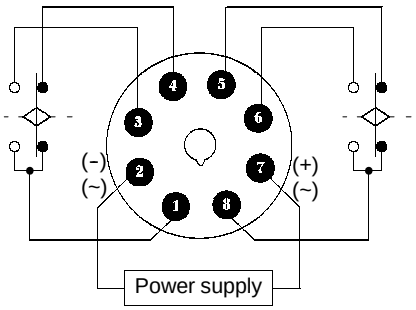




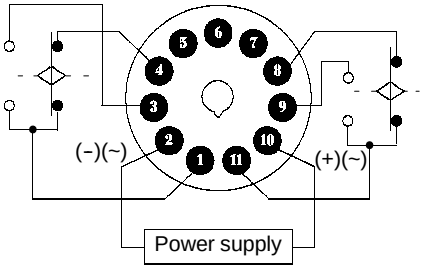
Installation

■ Terminal Arrangement

H3CR-F8
H3CR-F8N
H3CR-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.

Solid-state Star-delta Timer

H3CR-G

DIN 48 x 48-mm Solid-state Star-delta Timer

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

RC

Ordering Information

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

Note: Specify both the model number and supply voltage when ordering.
Example: H3CR-G8L 100 to 120 VAC
└ Supply voltage

Model Number Legend:

H3CR - □ □ □ □
1 2 3 4

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

■ Accessories (Order Separately)

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
		Y92F-70
		Y92F-71
Mounting Track	**50 cm (*l*) x 7.3 mm (t)**	PFP-50N
	1 m (*l*) x 7.3 mm (t)	PFP-100N
	1 m (*l*) x 16 mm (t)	PFP-100N2
End Plate		PFP-M
Spacer		PFP-S
Protective Cover		Y92A-48B
Track Mounting/ Front Connecting Socket	**8-pin**	P2CF-08
Back Connecting Socket		P3G-08
Time Setting Ring	**Setting a specific time**	Y92S-27
	Limiting the Setting Range	Y92S-28
Panel Cover (see note)	**Light Gray (5Y7/1)**	Y92P-48GL
	Black (N1.5)	Y92P-48GB
	Medium Gray (5Y5/1)	Y92P-48GM
Hold-down Clip	**For PL08 and PL11 Sockets**	Y92H-1
	For PF085A Socket	Y92H-2

Note: The Time Setting Ring and Panel Cover are sold together.

Specifications

■ General

Item	H3CR-G8L	H3CR-G8EL
Functions	Star-delta timer	Star-delta timer with instantaneous output
Pin type	8-pin	
Operating/Reset method	Time-limit operation/Self-reset	
Output type	Time-limit: SPST-NO (star operation circuit) SPST-NO (delta operation circuit)	Time-limit: SPST-NO (star operation circuit) SPST-NO (delta operation circuit) Instantaneous: SPST-NO
Mounting method	DIN track mounting, surface mounting, and flush mounting	
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: IEC801-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC801-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4)	
Approved standards	UL508, CSA C22.2 No.14, LR/NK Conforms to VDE0435/2021, VDE0110 Conforms to EN50081-2, prEN50082-2	

■ Time Ranges

Star-delta transfer time		0.05 sec	0.1 sec	0.25 sec	0.5 sec
Star operation time setting	6	0.5 to 6 sec			
	12	1 to 12 sec			
	60	5 to 60 sec			
	120	10 to 120 sec			

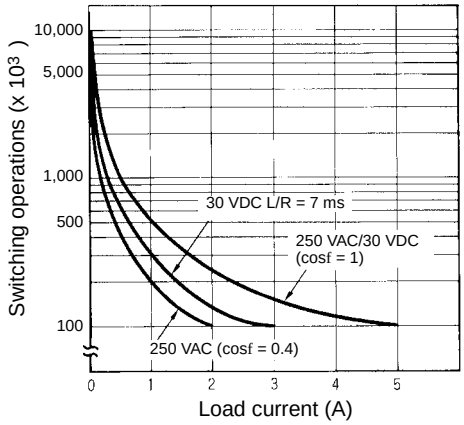
■ Ratings

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/2.4 W 200 to 240 VAC: approx. 12 VA/2.6 W
Control outputs	Contact output: 5 A at 250 VAC, resistive load ($\cos\phi = 1$)

■ Characteristics

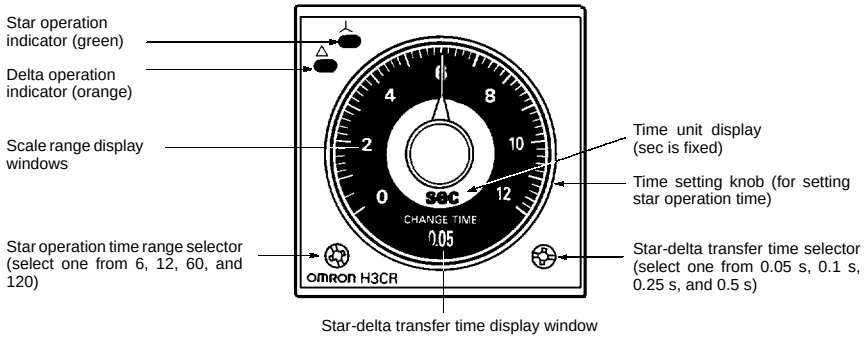
Accuracy of operating time	+0.3% FS max.
Setting error	+5% FS +0.05 s max.
Star-delta transfer time	Accuracy: ±25% FS + 5 ms max.
Influence of voltage	+0.5% FS max.
Influence of temperature	+2% FS max.
Insulation resistance	100 MW min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between 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) 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 ms, 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 three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude each in three directions
Shock resistance	Destruction: 980 m/s^2 (100G) each in three directions Malfunction: 294 m/s^2 (30G) each in three 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)
Case color	Light Gray (Munsell 5Y7/1)
Enclosure ratings	IEC: IP40
Weight	H3CR-G8L: approx. 110 g; H3CR-G8EL: approx. 130 g

Engineering Data



Reference: A maximum current of 0.15 A can be switched at 125 VDC (cosf = 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).

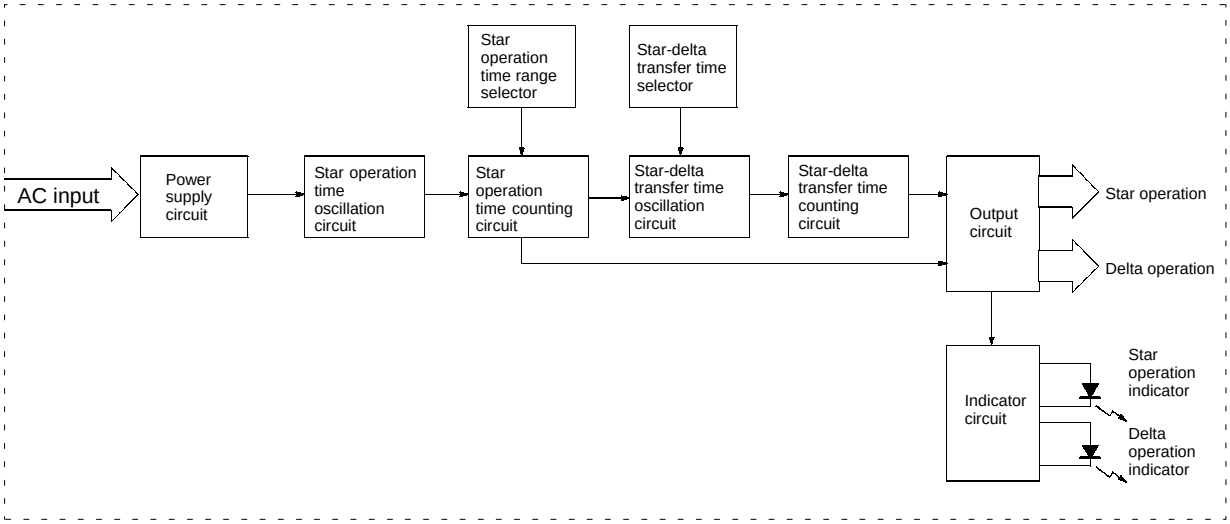
Nomenclature



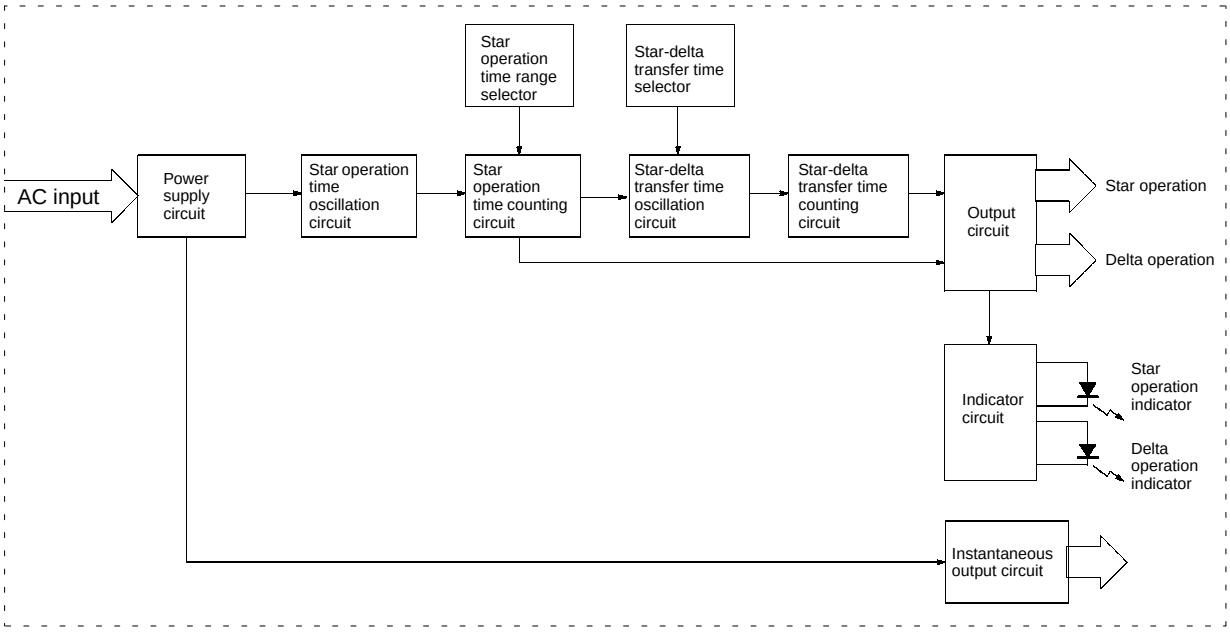
Operation

■ Block Diagrams

H3CR-G8L



H3CR-G8EL



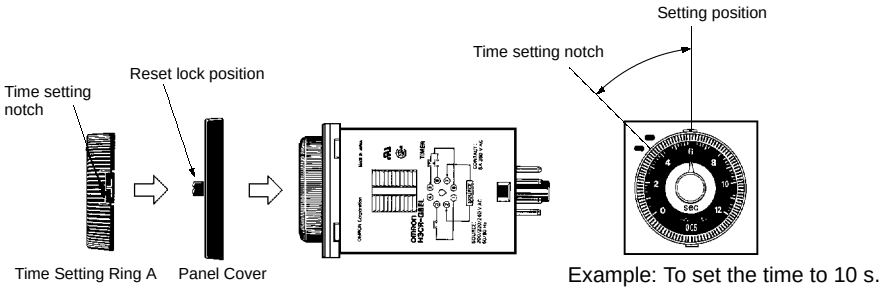
■ I/O Functions

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.

■ Using the Setting Ring

Setting a Specific Time

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

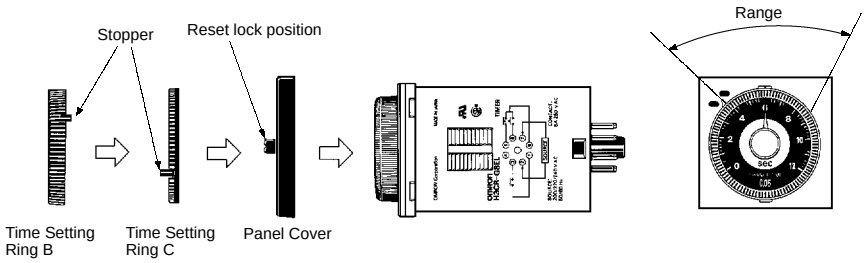


Example: To set the time to 10 s.

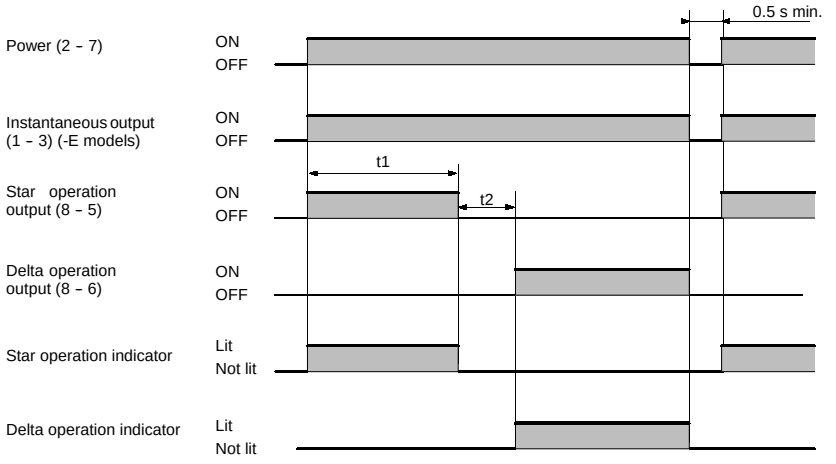
Limiting the Setting Range

Example: To set a range of 10 and 20 s.

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



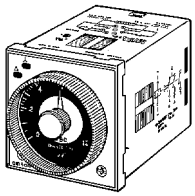
■ Timing Chart

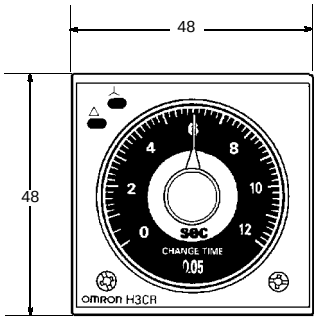
Model	Timing chart
H3CR-G8L/-G8EL	

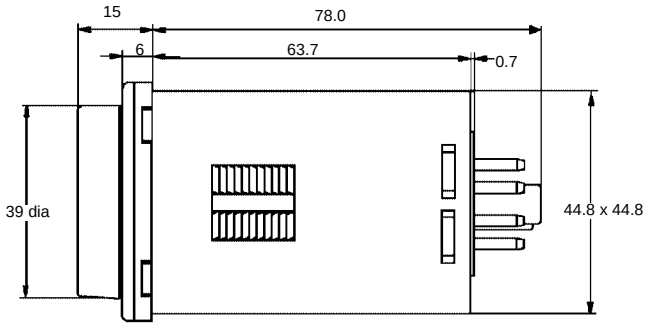
Note: t1: Star operation time setting
t2: Star-delta transfer time

Dimensions

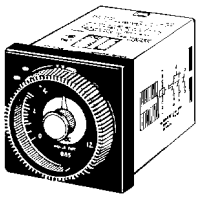
Note: All units are in millimeters unless otherwise indicated.

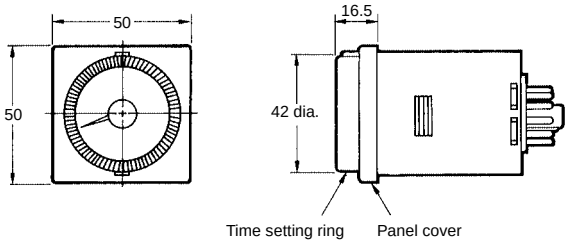






Dimensions with Set Ring





Time Setting Ring/Panel Cover

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

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

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

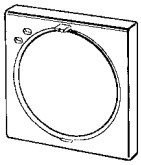
Setting a specific time	Time Setting Ring A (Y92S-27) and Panel Cover (Y92P-48GL, -48GB, or -48GM)
Limiting the setting range	Time Setting Ring B or C (Y92S-28), and Panel Cover (Y92P-48GL, -48GB, or -48GA)

Y92S-27
Time Setting A

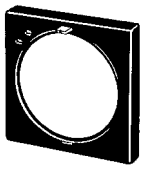
Y92S-28
Time Setting B

Y92S-28
Time Setting C

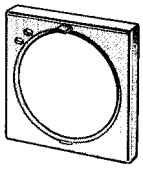
Y92P-48GL
Light Gray



Y92P-48GB
Black



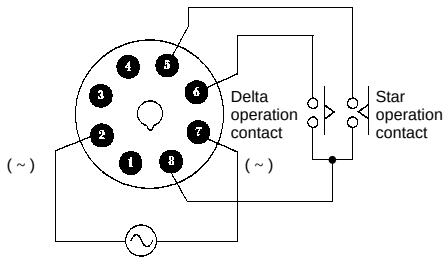
Y92P-48GM
Medium Gray



Installation

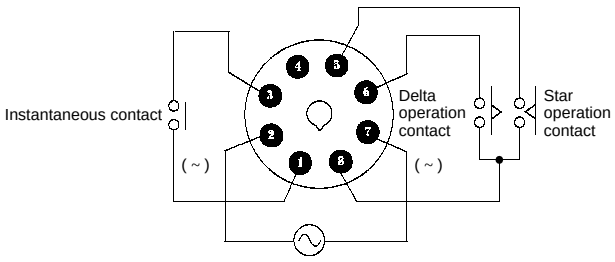
■ Terminal Arrangement

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.

Solid-state Power OFF-delay Timer

H3CR-H

DIN 48 x 48-mm Solid-state 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.

RC

Ordering Information

Input	Output	Supply voltage	S-series		M-series	
			11-pin models	8-pin models	11-pin models	8-pin models
---	DPDT	100 to 120 VAC	---	H3CR-H8L	---	H3CR-H8L
		200 to 240 VAC				
		24 VAC/DC				
		48 VDC				
		100 to 125 VDC				
With reset input		100 to 120 VAC	H3CR-HRL	---	H3CR-HRL	---
		200 to 240 VAC				
		24 VAC/DC				
		48 VDC				
		100 to 125 VDC				
	SPDT	100 to 120 VAC	---	H3CR-H8RL	---	H3CR-H8RL
		200 to 240 VAC				
		24 VAC/DC				
		48 VDC				
		100 to 125 VDC				

Note: Specify both the supply voltage and time unit code (S or M) in addition to the model number when ordering.
Example: H3CR-H8L 24 VAC/DC M
Time unit code
Supply voltage

Model Number Legend:

H3CR - □ □ □ □
1 2 3 4

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

■ Accessories (Order Separately)

Name/specifications		Models
Flush Mounting Adapter		Y92F-30
		Y92F-70
		Y92F-71
Mounting Track	**50 cm (l) x 7.3 mm (t)**	PFP-50N
	1 m (l) x 7.3 mm (t)	PFP-100N
	1 m (l) x 16 mm (t)	PFP-100N2
End Plate		PFP-M
Spacer		PFP-S
Protective Cover		Y92A-48B
Track Mounting/ Front Connecting Socket	**8-pin**	P2CF-08
	11-pin	P2CF-11
Back Connecting Socket	**8-pin**	P3G-08
	11-pin	P3GA-11
Hold-down Clip	**For PL08 and PL11 Sockets**	Y92H-1
	For PF085A Socket	Y92H-2

Specifications

■ General

Item	H3CR-H8L	H3CR-H8RL	H3CR-HRL
Operating/Reset method	Instantaneous operation/Time-limit reset	Instantaneous operation/Time-limit reset/Forced reset	
Pin type	8-pin		11-pin
Input type	---	No-voltage	
Output type	Relay output (DPDT)	Relay output (SPDT)	Relay output (DPDT)
Mounting method	DIN track mounting, surface mounting, and flush mounting		
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: IEC801-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC801-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4)		
Approved standards	UL508, CSA C22.2 No.14, LR/NK Conforms to VDE0435/2021, VDE0110 Conforms to EN50081-2, prEN50082-2		

■ Time Ranges

Time unit		S-series	M-series
		s (sec)	**min**
Setting	0.6	0.05 to 0.6	
	1.2	0.1 to 1.2	
	6	0.5 to 6	
	12	1 to 12	
Min. power ON time		0.1 sec min.	2 sec min.

Note: 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.

■ Ratings

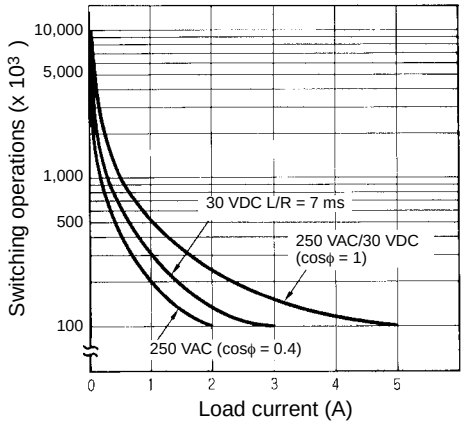
Rated supply voltage (see note)	100 to 120 VAC (50/60 Hz), 200 to 240 VAC (50/60 Hz), 24 VAC/VDC (50/60 Hz), 48 VDC, 100 to 125 VDC
Operating voltage range	85% to 110% of rated supply voltage
No-voltage input	ON-impedance: 1 kΩ max. ON residual voltage: 1 V max. OFF impedance: 500 kΩ min.
Power consumption	100 to 120 VAC: 0.18 VA (100 VAC applied) 200 to 240 VAC: 0.25 VA (200 VAC applied) 24 VAC/DC: 0.24 VA (24 VAC applied)/140 mW (24 VDC applied) 48 VDC: 130 mW (48 VDC applied) 100 to 125 VDC: 330 mW (125 VDC applied)
Control outputs	Contact output: 5 A at 250 VAC, 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

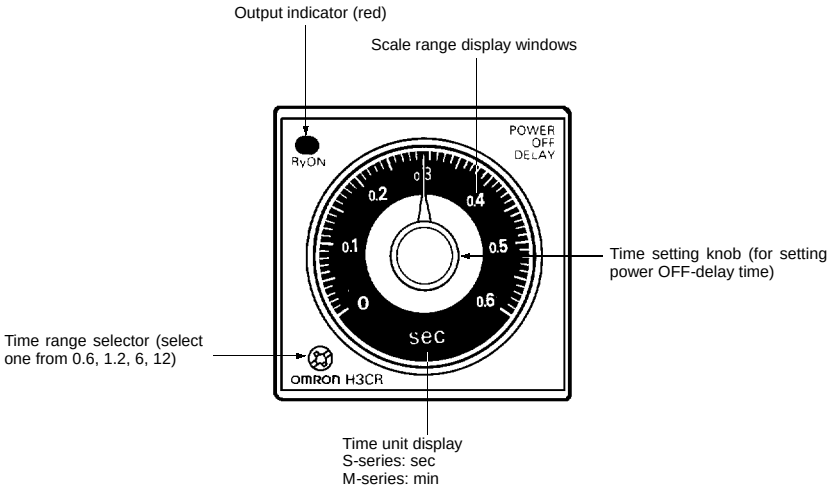
Accuracy of operating time	±0.3% FS max. (±0.3% FS ±10 ms in ranges of 0.6 and 1.2 s)
Setting error	±5% FS ±0.05 s max.
Influence of voltage	±0.5% FS max. (±0.5% FS ±10 ms in ranges of 0.6 and 1.2 s)
Influence of temperature	±2% FS max. (±2% FS ±10 ms in ranges of 0.6 and 1.2 s)
Insulation resistance	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) 1,000 VAC, 50/60 Hz for 1 min (between contacts not located next to each other)
Impulse withstand voltage	3 kV (between power terminals) for 100 to 120 VAC, 200 to 240 VAC, 100 to 125 VDC; 1 kV for 24 VAC/DC, 48 VDC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 120 VAC, 200 to 240 VAC, 100 to 125 VDC; 1.5 kV for 24 VAC/DC, 48 VDC
Noise immunity	±1.5 kV (between power terminals) and ±600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise); ±1 kV (between power terminals) for 48 VDC
Static immunity	Malfunction: 8 kV Destruction: 15 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm single amplitude each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude each in three directions
Shock resistance	Destruction: 980 m/s^2 (100G) each in three directions Malfunction: 98 m/s^2 (10G) each in three 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)
Case color	Light Gray (Munsell 5Y7/1)
Enclosure ratings	IEC: IP40
Weight	Approx. 120 g

Engineering Data



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).

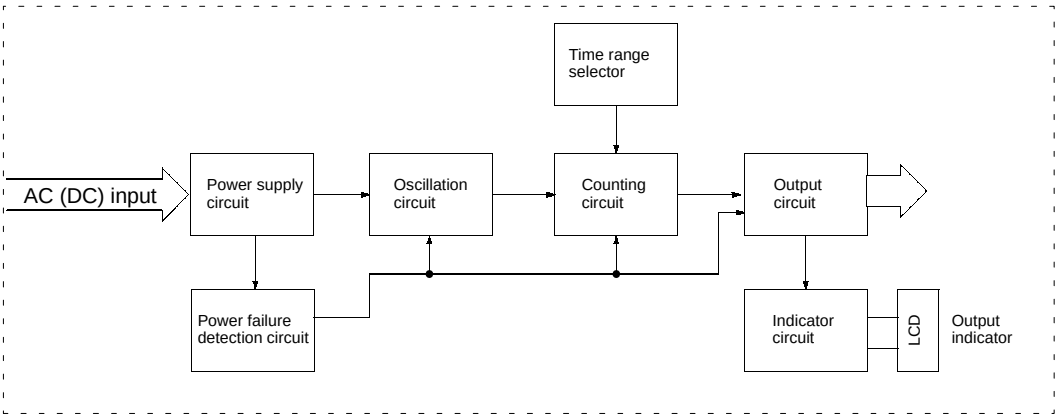
Nomenclature



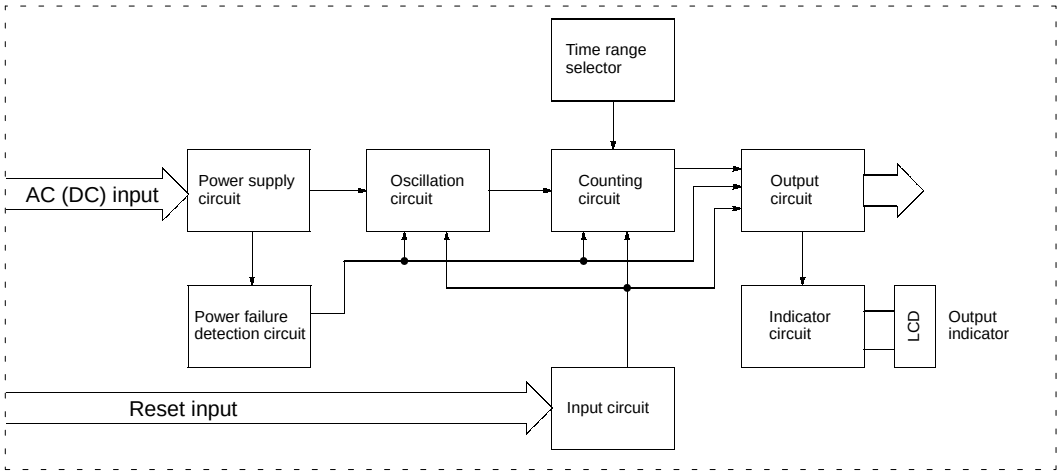
Operation

■ Block Diagrams

Without Reset Input (H3CR-H8L)



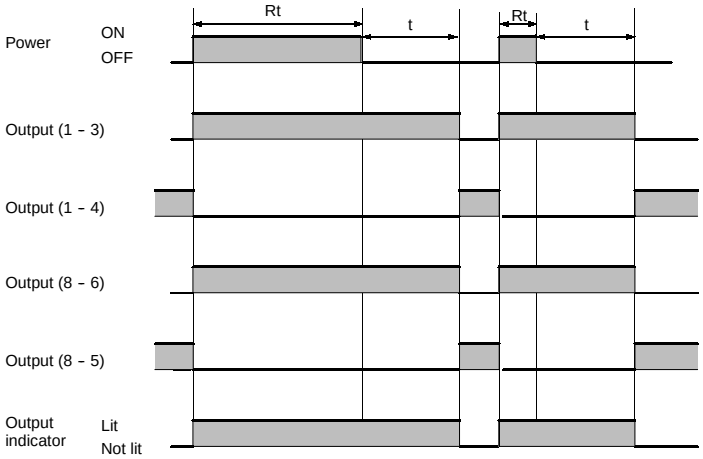
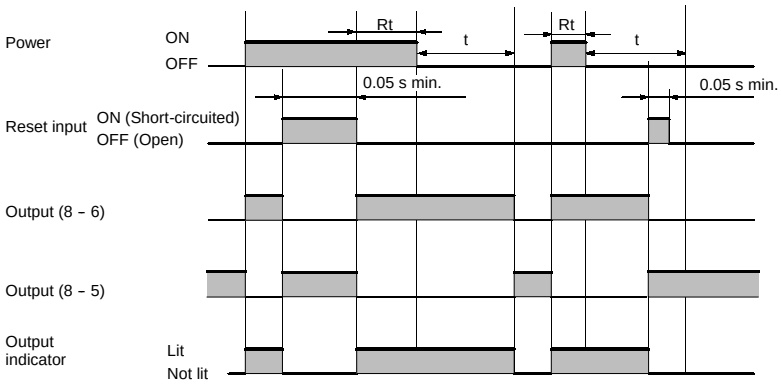
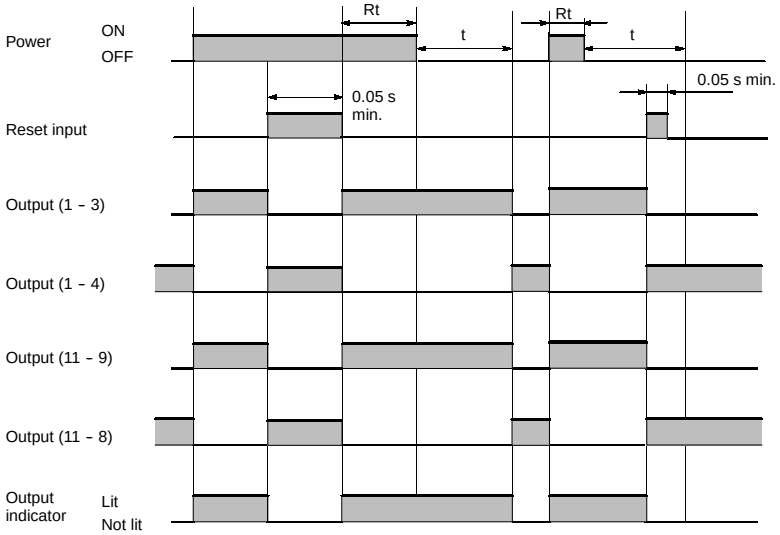
With Reset Input (H3CR-H8RL/-HRL)



■ 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.

■ Timing Chart

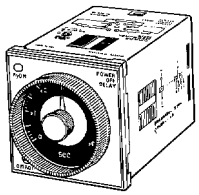
Model	Timing chart
H3CR-H8L	
H3CR-H8RL	
H3CR-HRL	

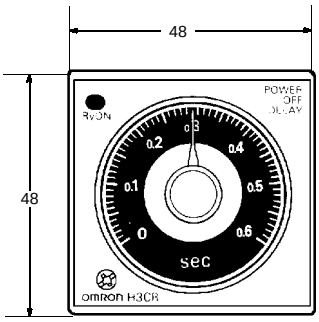
Note: t: Set time
Rt: Minimum power ON time (S-series: 0.1 s min.; M-series: 2 s min.)

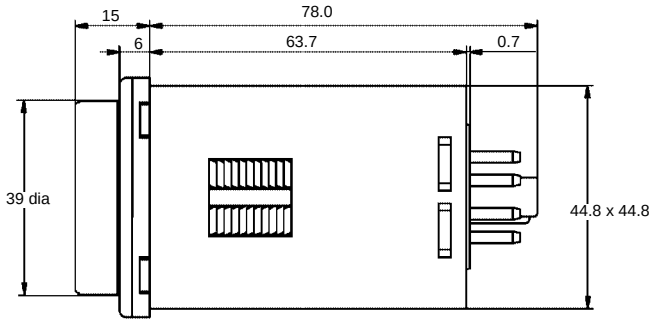
Dimensions

Note: All units are in millimeters unless otherwise indicated.

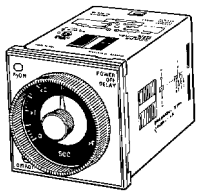
H3CR-H8L
H3CR-H8RL

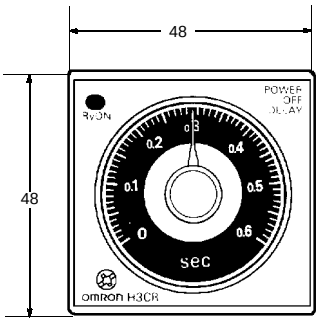


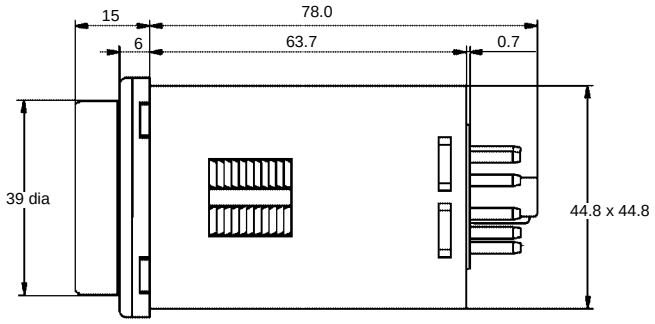




H3CR-HRL





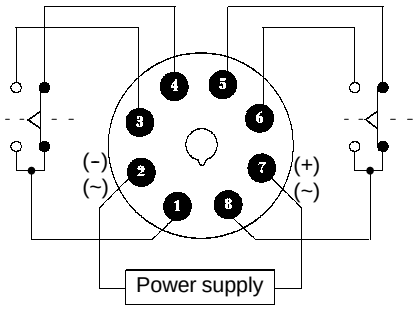


Installation

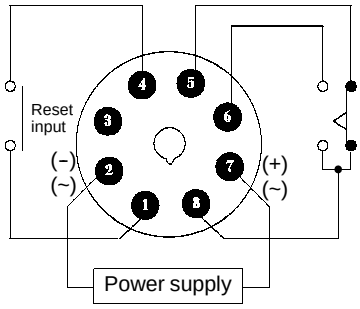
■ Terminal Arrangement

8-pin Models

Without Reset Input (H3CR-H8L)



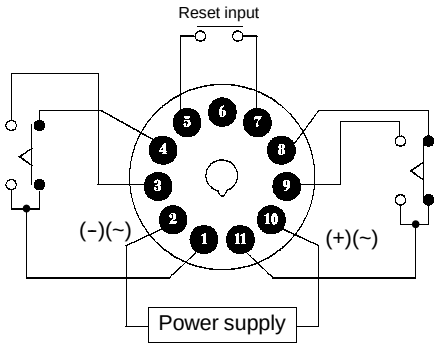
With Reset Input (H3CR-H8RL)



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.

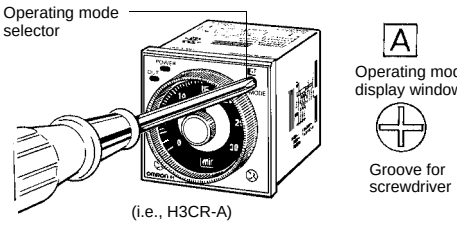
Operation

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

■ Basic Setting

Setting of Selectors

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

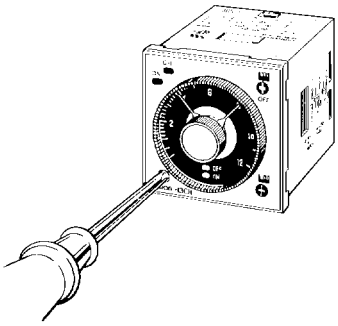


(i.e., H3CR-A)

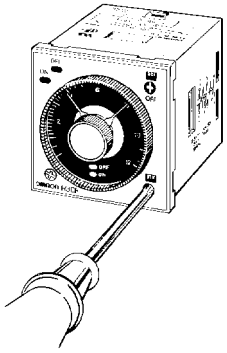
Selection of Time Unit and Time Range

- **H3CR-F Twin Timers**

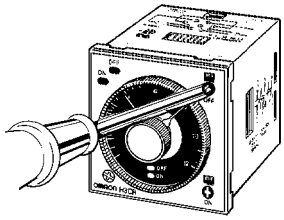
A time range (0 to 1.2, 0 to 3, 0 to 12, or 0 to 30) is selected for ON- and OFF-time using the time range selector at the lower left corner of the front panel, and the selected time range appears within the plastic frame of the time setting knob (= scale range display windows).



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

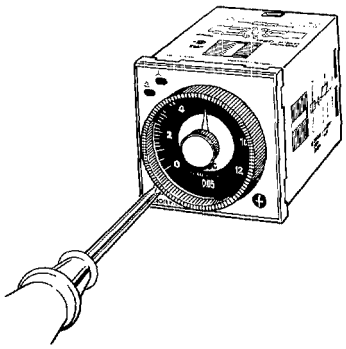


For OFF-time, the desired time unit (sec, 10 s, min, and hrs, or 10 s, 10 min, hrs, and 10 h) is indicated in the OFF-time unit display window at the upper right corner of the front panel and can be changed by turning the OFF-time unit selector located below the OFF-time unit display window.

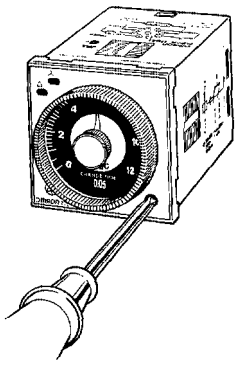


- **H3CR-G Star-delta Timers**

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

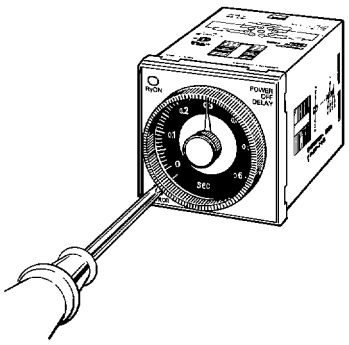


The time required for switching (0.05, 0.1, 0.25, or 0.5 second) from the star operation to the delta operation of the H3CR-G can be selected with the star-delta transfer time selector at the lower right corner of the front panel.



- **H3CR-H Power OFF-delay Timers**

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

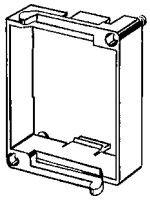


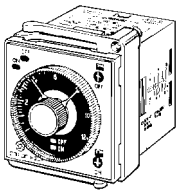
Dimensions

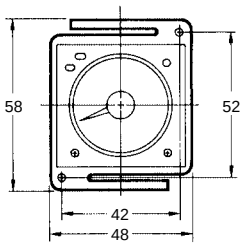
Note: The undermentioned is common for all H3CR-F/G/H models.

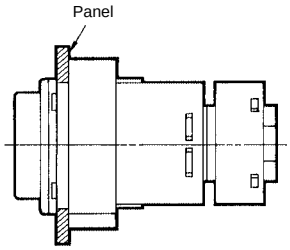
Note: All units are in millimeters unless otherwise indicated.

Dimensions with Flush Mounting Adaptor Y92F-30

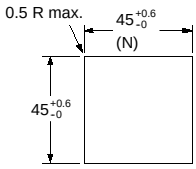








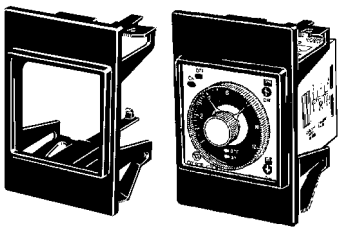
Panel Cutout

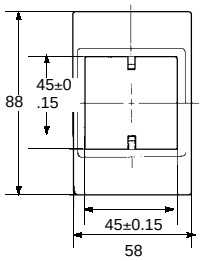


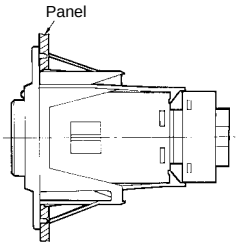
Note: The adapters for two or more timers mounted in a vertical line are different in orientation from those mounted in a horizontal line.

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

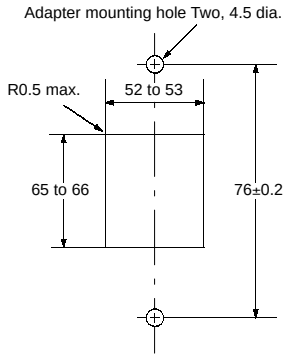
Dimensions with Flush Mounting Adaptor Y92F-73/-70





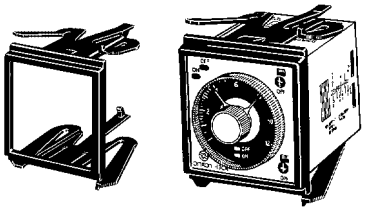


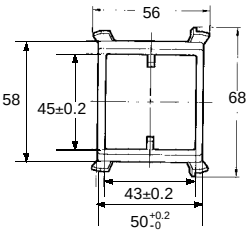
Panel Cutout

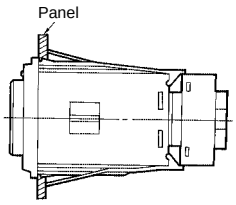


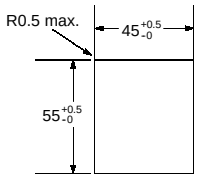
Note: The mounting panel thickness should be 1 to 3.2 mm.

Dimensions with Flush Mounting Adaptor Y92F-74/-71



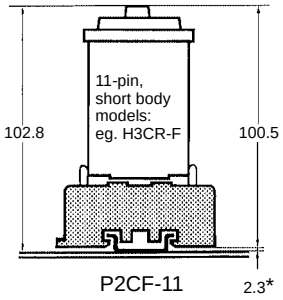


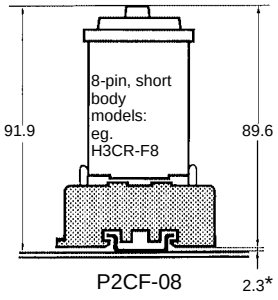


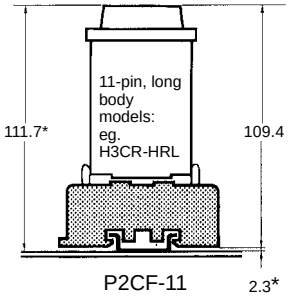


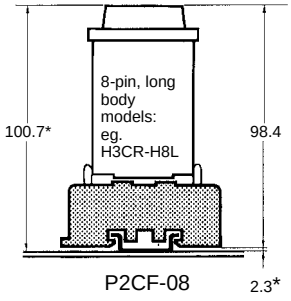
Note: The mounting panel thickness should be 1 to 3.2 mm.

Track Mounting



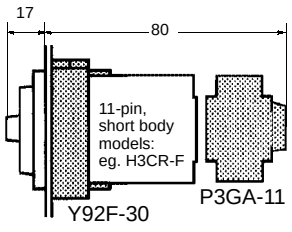


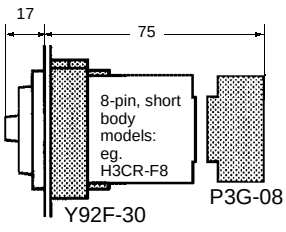


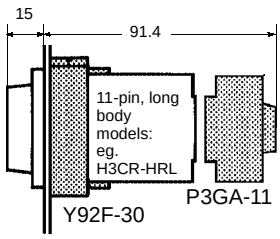


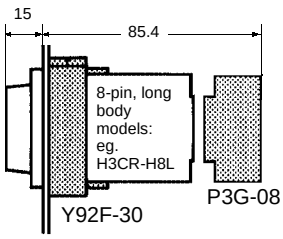
*These dimensions vary with the kind of DIN track (reference value).

Flush Mounting





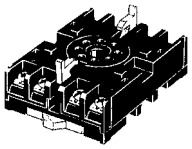


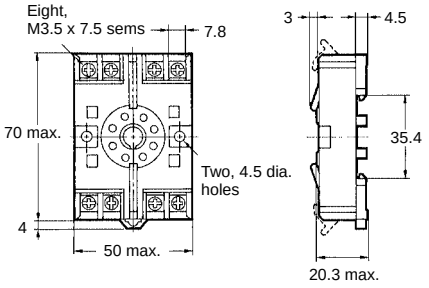


■ Accessories (Order Separately)

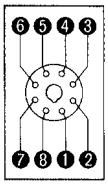
Track Mounting/ Front Connecting Socket

P2CF-08

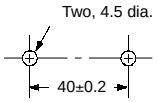




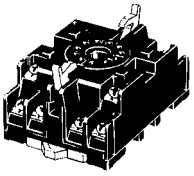
Terminal Arrangement/ Internal Connections (Top View)

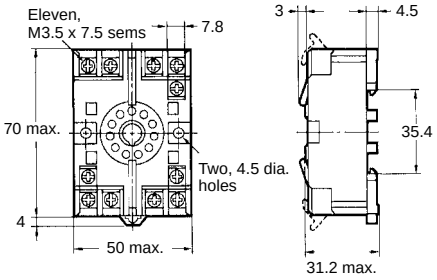


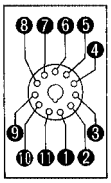
Surface Mounting Holes

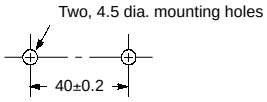


P2CF-11



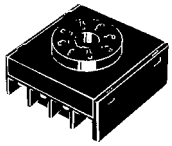


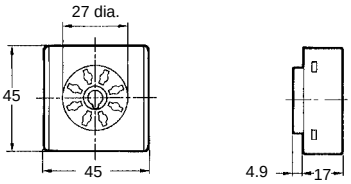




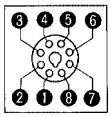
Back Connecting Socket

P3G-08

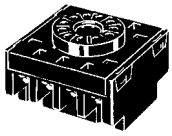


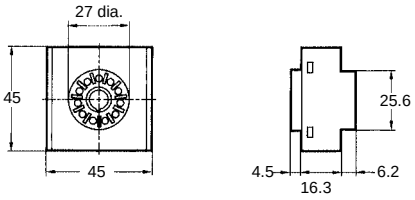


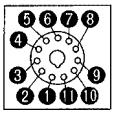
Terminal Arrangement/ Internal Connections (Bottom View)



P3GA-11

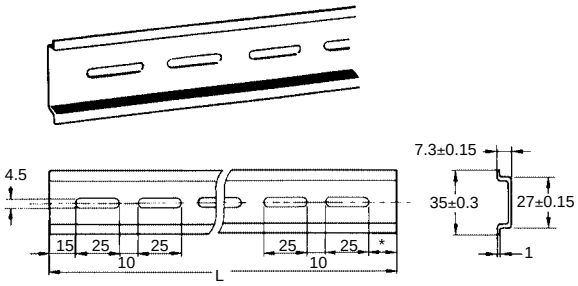




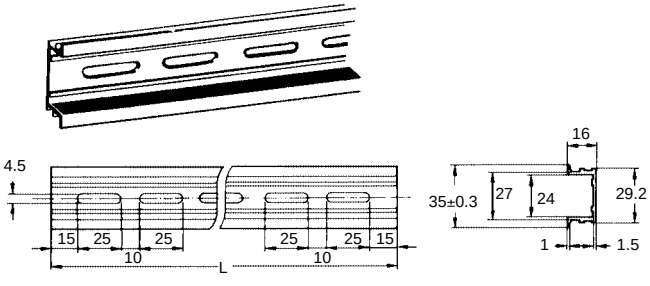


Mounting Track

PFP-100N, PFP-50N



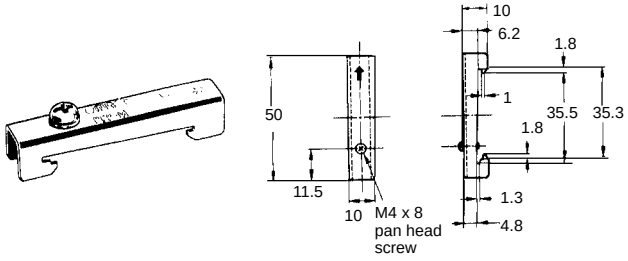
PFP-100N2



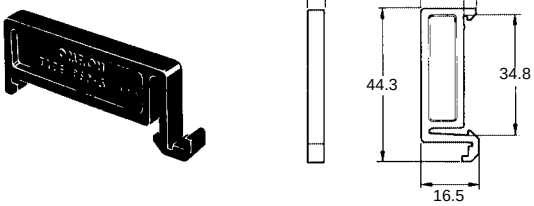
L: Length

1 m	PFP-100N
50 cm	PFP-50N
1 m	PFP-100N2

End Plate
PFP-M



Spacer
PFP-S



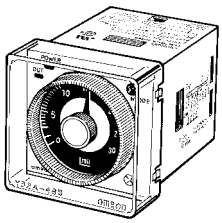
Protective Cover
Y92A-48B

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

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

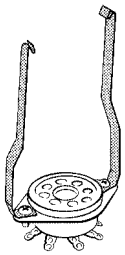
2. The Protective Cover cannot be mounted if the Panel Cover (sold separately) is used on the Timer.

Y92A-48B

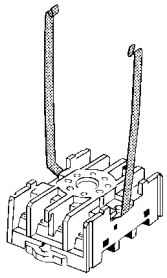


Hold-down Clip

Y92H-7/-1
For PL08 and PL11 Sockets



Y92H-8/-2
For PF085A Socket



Precautions

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

■ Changing of Setting

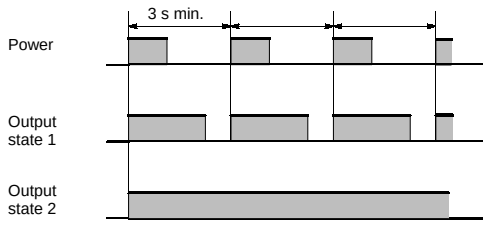
NOTICE: Do not change the time unit, time range, or operation mode while the timer is in operation or malfunction could result.

■ Wiring (H3CR-H)

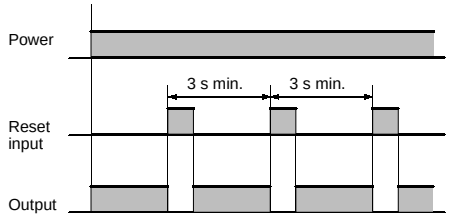
The H3CR has a high impedance circuit. Therefore, the H3CR may not be reset if the H3CR is influenced by inductive voltage. In order to eliminate any influence of inductive voltage, the wires connected to the H3CR must be as short as possible and should not be installed alongside power lines. If the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

■ Operation (H3CR-H)

An interval of 3 s minimum is required to turn on the H3CR after the H3CR is turned off. If the H3CR is turned on and off repeatedly with an interval of shorter than 3 s, the internal parts of the H3CR may deteriorate and the H3CR may malfunction.



After the forced reset function of the H3CR 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 may deteriorate and the H3CR 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).

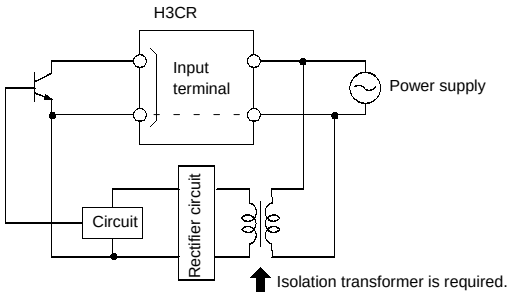
■ Power Supplies (H3CR-H)

An AC power supply can be connected to the power input terminals without regarding polarity. A DC power supply must be connected to the power input terminals as designated according to the polarity of the terminals.

A DC power supply can be connected if its ripple factor is 20% or less and the mean voltage is within the rated operating voltage range of the Timer.

Connect the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value at once or the Timer may not be reset or a timer error could result.

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.



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.

■ Inrush Current

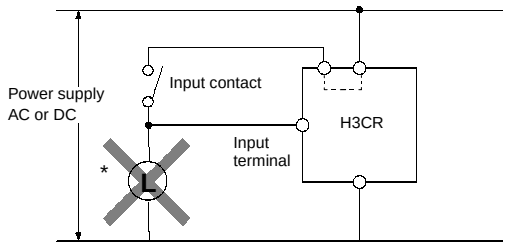
Model		Voltage	Applied voltage	Inrush current (peak value)	Time
H3CR-F		24 VAC/DC	26.4 VAC	0.7 A	10 ms
			26.4 VDC	1.1 A	9.4 ms
		12 VDC	13.2 VDC	52 mA	3.3 ms
		48 to 125 VDC	137.5 VDC	0.40 A	9.1 ms
H3CR-H	S-series	100/110/120 VAC	132 VAC	1.05 A	111 ms
		200/220/240 VAC	264 VAC	1.07 A	119 ms
		24 VAC/DC	26.4 VAC	1.26 A	133 ms
			26.4 VDC	0.85 A	137 ms
		48 VDC	52.8 VDC	0.73 A	112 ms
		100 to 125 VDC	137.5 VDC	0.62 A	109 ms
	M-series	100/110/120 VAC	132 VAC	1.02 A	364 ms
		200/220/240 VAC	264 VAC	1.03 A	323 ms
		24 VAC/DC	26.4 VAC	1.21 A	478 ms
			26.4 VDC	0.87 A	560 ms
		48 VDC	52.8 VDC	0.71 A	384 ms
		100 to 125 VDC	137.5 VDC	0.62 A	380 ms

Note: 1. The above figures are all approximations and should be used for reference only.

2. The inrush current is given mainly for DC models for the required power supply design specifications. For the H3CR-H, the inrush current is also given for 100/110/120-VAC and 200/220/240-VAC models because these models have higher inrush currents than other series.

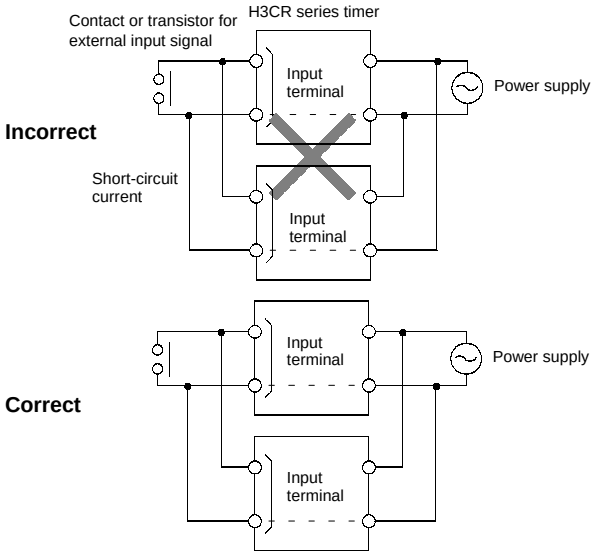
■ Input/Output (H3CR-H)

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.



*Do not connect a relay or any other load between these two points, otherwise the internal circuit of the Timer may be damaged due to the high-tension voltage applied to the input terminals.

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



■ Environment

When using the Timer in an area with excess electronic noise, separate the Timer, wiring, and the equipment which generates the input signals as far as possible from the noise sources. It is also recommended to shield the input signal wiring to prevent electronic interference.
Organic solvents (such as paint thinner), as well as very acidic or basic solutions can damage the outer casing of the Timer.

■ Others

If the Timer is mounted on a control board, dismount the timer from the control board or short-circuit the circuitry of the power board before carrying out a voltage withstand test between the electric circuitry and non current-carrying metal part of the Timer, in order to prevent the internal circuitry of the Timer from damage.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L86-E1-2

OMRON

Solid-state Timer

H3DR-A/P/M

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

- Conforms to VDE0435/0110 and approved by UL and CSA.
- Conforms to EMC standards.
- NPN and PNP Input Models are available.
- Name plates provided for easy timer identification and management.
- Finger-protection terminal block. Delivered with an open terminal for quick installation.
- Six-language insturction manual provided.

H3DR-A Full Multifunction Timer

- A wide AC power supply range (100 to 240 VAC) reduces the number of timer models kept in stock.
- Six operating modes cover a wide range of applications.
- Enables easy sequence checks through instantaneous outputs for a zero set value at any time range.
- Start, reset, and gate control inputs provided.
- A wide time setting range of 0.10 s to 120 h.
- Fine adjustment dial for accurate time settings.
- Relay (DPDT) and Transistor Output Models are available.

H3DR-P Multifunction Timer

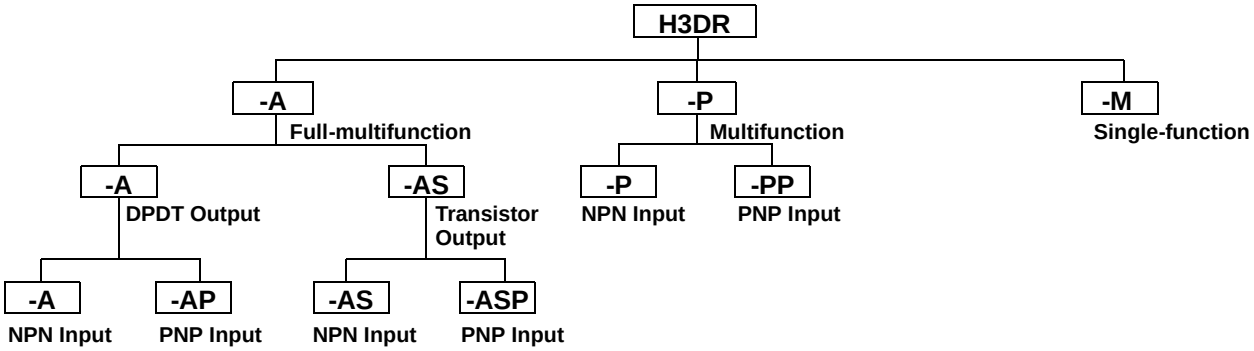
RC

- Six operating modes cover a wide range of applications.
- Enables easy sequence checks through instantaneous outputs for a zero set value at any time range.
- A wide timing range of 0.10 s to 120 h.
- Fine adjustment dial for accurate time settings.

H3DR-M Single-function Timer

- Economical solution for ON-delay applications.
- Six single-time range types: 1 s, 5 s, 10 s, 30 s, 60 s, and 10 min.

Model Legend of H3DR Series



Ordering Information

NPN (No-voltage) Input Models

Supply voltage	Outputs	Time range	Operating mode	Model
100 to 240 VAC (50/60 Hz)	Contact (DPDT)	0.10 s to 120 h (7 multi-range)	ON-delay, Flicker OFF start Flicker ON start, Signal ON/OFF-delay Signal OFF delay, Interval (6 multi-mode)	H3DR-A
12 VDC				
24 VDC/VAC (50/60 Hz)				
12 VDC	Transistor (Photocoupler)			H3DR-AS
24 VDC/VAC (50/60 Hz)				
100 to 120 VAC (50/60 Hz)	Contact (SPDT)			H3DR-P
200 to 240 VAC (50/60 Hz)				
24 VDC/VAC (50/60 Hz)				

PNP (Voltage) Input Models

Supply voltage	Outputs	Time range	Operating mode	Model
100 to 240 VAC (50/60 Hz)	Contact (DPDT)	0.10 s to 120 h (7 multi-range)	ON-delay, Flicker OFF start Flicker ON start, Signal ON/OFF-delay Signal OFF delay, Interval (6 multi-mode)	H3DR-AP
12 VDC				
24 VDC/VAC (50/60 Hz)				
12 VDC	Transistor (Photocoupler)			H3DR-ASP
24 VDC/VAC (50/60 Hz)				
100 to 120 VAC (50/60 Hz)	Contact (SPDT)			H3DR-PP
200 to 240 VAC (50/60 Hz)				
24 VDC/VAC (50/60 Hz)				

No-input Models

Supply voltage	Outputs	Time range	Operating mode	Model
110 to 120 VAC (50/60 Hz)	Contact (SPDT)	1 s, 5 s, 10 s, 30 s, 60 s, 10 min (single-time range)	ON-delay	H3DR-M
220 to 240 VAC (50/60 Hz)				
24 VDC/VAC (50/60 Hz)				

Note: 1. Specify both the model number and supply voltage when ordering.
Example: H3DR-A/-P 24 VDC/VAC (50/60 Hz)
└ Supply voltage

2. Specify both the model number, supply voltage, and time range when ordering.
Example: H3DR-M 220 to 240 VAC (50/60 Hz) 30 s
└ Supply voltage └ Time range

3. Order H3DR-M Timers in lots of 10 pcs (sold as a single package).

■ Accessories (Order Separately)

Mounting Track	50 cm (l) x 7.3 mm (t)	PFP-50N
	1 m (l) x 7.3 mm (t)	PFP-100N
	1 m (l) x 16 mm (t)	PFP-100N2
End Plate	PFP-M	
Spacer	PFP-S	

Specifications

■ General

Item	H3DR-A/-AS	H3DR-AP/-ASP	H3DR-P	H3DR-PP	H3DR-M
Operating mode	A: ON-delay B: Flicker OFF start B2: Flicker ON start C: Signal ON/OFF-delay D: Signal OFF-delay E: Interval				ON-delay
Terminal block	11/12 terminal		6/12 terminal		5/12 terminal
Input type	No-voltage input (NPN Model)	Voltage input (PNP Model)	No-voltage input (NPN Model)	Voltage input (PNP Model)	---
Output type	H3DR-A: Relay output (DPDT); H3DR-AS: Transistor output (NPN/PNP) (see note)		Relay output (SPDT)		
Mounting method	DIN track mounting				
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: IEC801-2: 4 kV contact discharge (level 2), 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC801-4: 2 kV power-line (level 3), 2 kV I/O signal-line (level 4)				
Approved standards	UL508, CSA C22.2 No.14 Conforms to VDE 0435/2021 C/250, C/30 (-AS model), VDE 0110, VDE0106/P100, IEC947 AC-15 (-P j and -M models), AC-13 (-A j model), DC-13 (-AS j model) Conforms to EN50081-2, prEN50082-2				

Note: The internal circuits are optically isolated from the output. This enables application of either NPN or PNP transistors.

■ Time Ranges

H3DR-A j **/-AS** j **/-P** j

Time unit		s (sec)	min	h (hrs)	x10 h (10 h)
Setting	0	Instantaneous output (see note)			
	Time scale: x 0.1	0.1 to 1.2			1 to 12
	Time scale: x 1	1 to 12			10 to 120

Note: To obtain instantaneous output, set the value below zero.

H3DR-M Single-time Range

Rated time	Time range
1 s	0.1 to 1 s
5 s	0.2 to 5 s
10 s	0.5 to 10 s
30 s	1 to 30 s
60 s	2 to 60 s
10 min	0.5 to 10 min

■ Ratings

NPN (No-voltage) Input Models

Item	H3DR-A	H3DR-AS	H3DR-P
Rated supply voltage	100 to 240 VAC (50/60 Hz), 12 VDC, 24 VDC/VAC (50/60 Hz)	12 VDC, 24 VDC/VAC (50/60 Hz)	100 to 120 VAC (50/60 Hz), 200 to 240 VAC (50/60 Hz), 24 VDC/VAC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage (90% to 110% with 12-VDC type)		85% to 110% of rated supply voltage
Power reset	Minimum power-opening time: 0.1 s		
No-voltage input	ON impedance: 1 kΩ max. ON residual voltage: 1 V max. OFF impedance: 100 kΩ min.		
Power consumption	100 to 240 VAC: approx. 8 VA 12 VDC: approx. 0.4 W 24 VDC/VAC: approx. 1.3 VA (AC) approx. 0.6 W (DC)		100 to 120 VAC: approx. 6 VA 200 to 240 VAC: approx. 10 VA 24 VDC/VAC: approx. 2 VA (AC) approx. 1 W (DC)
Control outputs	Contacts: 5 A at 250 VAC, resistance load (cosϕ = 1)	Transistor output: Open collector (NPN/PNP), 100 mA max. at 30 VDC max., residual voltage: 2 V max.	Contacts: 5 A at 250 VAC, resistance load (cosϕ = 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%		
Humidity class	DIN 40 040: G		

PNP (Voltage) Input Models

Item	H3DR-AP	H3DR-ASP	H3DR-PP
Rated supply voltage	100 to 240 VAC (50/60 Hz), 12 VDC, 24 VDC/VAC (50/60 Hz)	12 VDC, 24 VDC/VAC (50/60 Hz)	100 to 120 VAC (50/60 Hz), 200 to 240 VAC (50/60 Hz), 24 VDC/VAC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage (90% to 110% with 12-VDC type)		
Power reset	Minimum power-opening time: 0.1 s		
Power consumption	100 to 240 VAC: approx. 8 VA 12 VDC: approx. 0.4 W 24 VDC/VAC: approx. 1.3 VA (AC) approx. 0.6 W (DC)		100 to 120 VAC: approx. 6 VA 200 to 240 VAC: approx. 10 VA 24 VDC/VAC: approx. 2 VA (AC) approx. 1 W (DC)
Control outputs	Contacts: 5 A at 250 VAC, resistance load (cosϕ = 1)	Transistor output: Open collector (NPN/PNP), 100 mA max. at 30 VDC max., residual voltage: 2 V max.	Contacts: 5 A at 250 VAC, resistance load (cosϕ = 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%		
Humidity class	DIN 40 040: G		

No-input Models

Item	H3DR-M
Rated supply voltage	110 to 120 VAC (50/60 Hz), 220 to 240 VAC (50/60 Hz), 24 VDC/VAC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-opening time: 0.1 s
Power consumption	110 to 120 VAC: approx. 6 VA 220 to 240 VAC: approx. 10 VA 24 VDC/VAC: approx. 2 VA (AC) approx. 1 W (DC)
Control outputs	Contacts: 5 A at 250 VAC, resistance 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%
Humidity class	DIN 40 040: G

■ Characteristics

NPN (No-voltage) Input Models

Item	H3DR-A/-AS/-P
Accuracy of operating time	±1% FS max. (±1%±10 ms in a range of 1.2 s)
Setting error	±10% FS ±0.05 s max.
Reset time	Min. power-opening time: 0.1 s; Min. pulse width: 0.05 s
Reset voltage	10% max. of rated supply voltage (10 V max. for 100 to 240 VAC, 100 to 120 VAC; 20 V max. for 200 to 240 VAC)
Influence of voltage	±0.5% FS max. (±0.5% FS ±10 ms max. in a range of 1.2 s)
Influence of temperature	±2% FS max. (±2% FS ±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 -AS model), 50/60 Hz for 1 min (between current-carrying terminal and non-current-carrying metal parts) 2,000 VAC (1,000 VAC for -AS model), 50/60 Hz for 1 min (between control output terminals and operating circuit) 1,000 VAC, 50/60 Hz for 1 min (between contacts not located next to each other) (except -AS model)
Impulse withstand voltage	3 kV (between power terminals) for 100 to 120 VAC, 110 to 120 VAC, 200 to 240 VAC, 220 to 240 VAC, 100 to 240 VAC, 1 kV for 12 VDC, 24 VDC/VAC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 120 VAC, 110 to 120 VAC, 200 to 240 VAC, 220 to 240 VAC, 100 to 240 VAC, 1.5 kV for 12 VDC, 24 VDC/VAC
Noise immunity	±1.5 kV (between power terminals) (±400 V for 12 VDC) and ±600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Malfunction: 4 kV Destruction: 8 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude each in three directions Malfunction: 10 to 55 Hz with 0.5-mm double amplitude each in three directions
Shock resistance	Destruction: 980 m/s^2 (100G) each in three directions Malfunction: 98 m/s^2 (10G) each in three directions
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)
Enclosure rating	IEC: IP40
Weight	Approx. 120 g

PNP (Voltage) Input Models

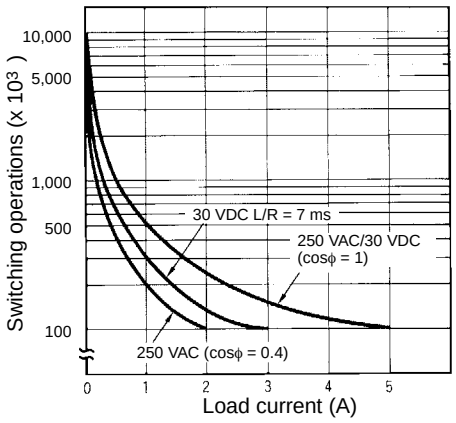
Item	H3DR-AP/-ASP/-PP
Accuracy of operating time	±1% FS max. (±1%±10 ms in a range of 1.2 s)
Setting error	±10% FS ±0.05 s max.
Reset time	Min. power-opening time: 0.1 s; Min. pulse width: 0.05 s
Reset voltage	10% max. of rated supply voltage (10 V max. for 100 to 240 VAC, 100 to 120 VAC; 20 V max. for 200 to 240 VAC)
Influence of voltage	±0.5% FS max. (±0.5% FS ±10 ms max. in a range of 1.2 s)
Influence of temperature	±2% FS max. (±2% FS ±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 -ASP model), 50/60 Hz for 1 min (between current-carrying terminal and non-current-carrying metal parts) 2,000 VAC (1,000 VAC for -ASP model), 50/60 Hz for 1 min (between control output terminals and operating circuit, and contacts of different polarity) 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 240 VAC, 1 kV for 12 VDC, 24 VDC/VAC 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 240 VAC, 1.5 kV for 12 VDC, 24 VDC/VAC
Noise immunity	±1.5 kV (between power terminals) (±400 V for 12 VDC) and ±600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Malfunction: 4 kV Destruction: 8 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude each in three directions Malfunction: 10 to 55 Hz with 0.5-mm double amplitude each in three directions
Shock resistance	Destruction: 980 m/s^2 (100G) each in three directions Malfunction: 98 m/s^2 (10G) each in three directions
Life expectancy	Mechanical: 20 million operations min. Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 1,800 operations/h)
Enclosure rating	IEC: IP40
Weight	H3DR-AP: approx. 130 g; H3DR-ASP: approx. 110 g; H3DR-PP: approx. 120 g

No-input Models

Item	H3DR-M
Accuracy of operating time	±2% FS max.
Setting error	±10% FS ±0.05 s max.
Reset time	Min. power-opening time: 0.1 s
Reset voltage	10% max. of rated supply voltage (10 V max. for 100 to 240 VAC, 100 to 120 VAC; 20 V max. for 200 to 240 VAC)
Influence of voltage	±2% FS max.
Influence of temperature	±5% FS max.
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying terminal and non-current-carrying metal parts) 2,000 VAC, 50/60 Hz for 1 min (between control output terminals and operating circuit) 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, 110 to 120 VAC, 200 to 240 VAC, 220 to 240 VAC, 100 to 240 VAC, 1 kV for 12 VDC, 24 VDC/VAC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 120 VAC, 110 to 120 VAC, 200 to 240 VAC, 220 to 240 VAC, 100 to 240 VAC, 1.5 kV for 12 VDC, 24 VDC/VAC
Noise immunity	±1.5 kV (between power terminals) and ±600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Malfunction: 4 kV Destruction: 8 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude each in three directions Malfunction: 10 to 55 Hz with 0.5-mm double amplitude each in three directions
Shock resistance	Destruction: 980 m/s^2 (100G) each in three directions Malfunction: 98 m/s^2 (10G) each in three directions
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)
Enclosure rating	IEC: IP40
Weight	Approx. 120 g

Note: The reset voltage is the residual voltage allowed from the power supply when returning the Timer to the status that existed prior to operation.

Engineering Data

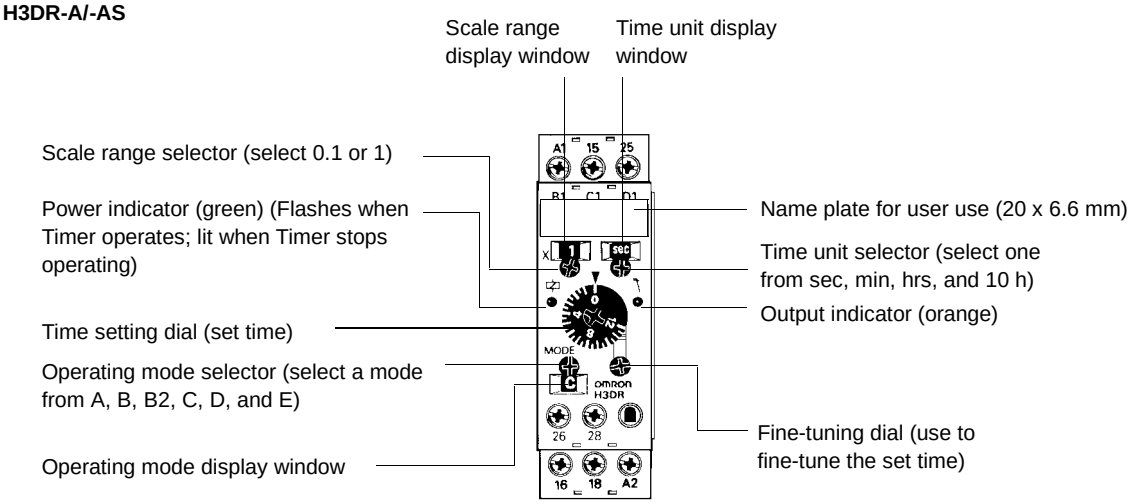


Reference: A maximum current of 0.15 A can be switched at 125 VDC (cosϕ = 1). Maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.
The minimum applicable load is 10 mA at 5 VDC (failure level: P).

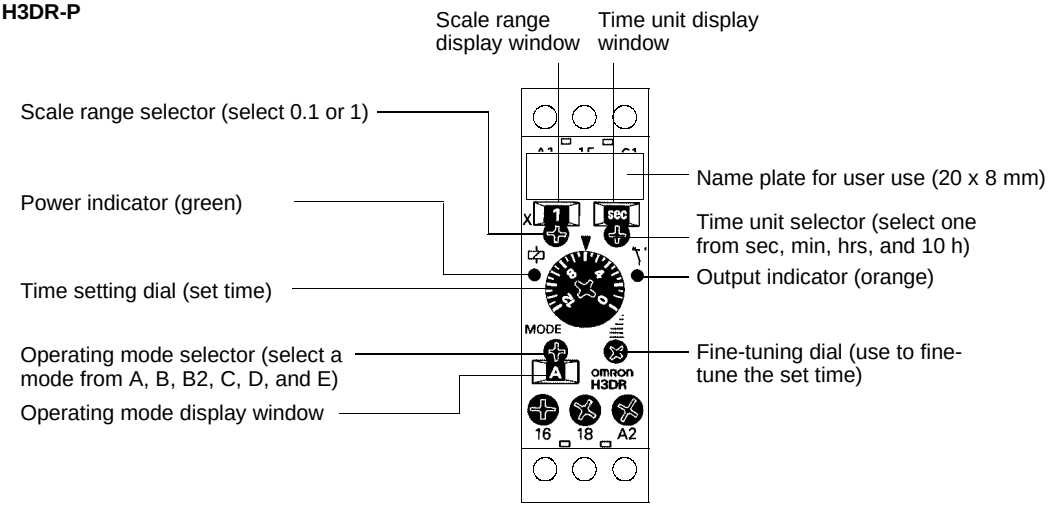
Nomenclature

NPN Input Models

H3DR-A/-AS

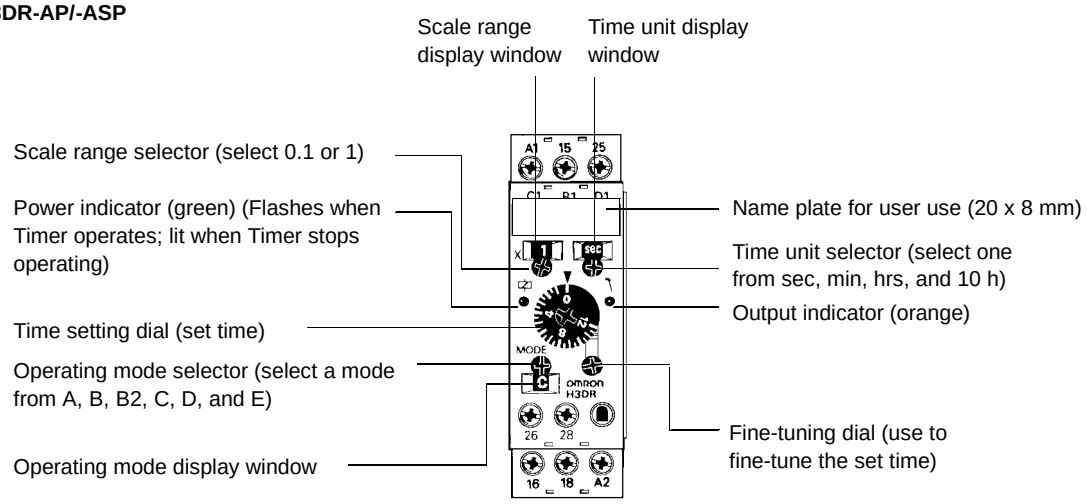


H3DR-P

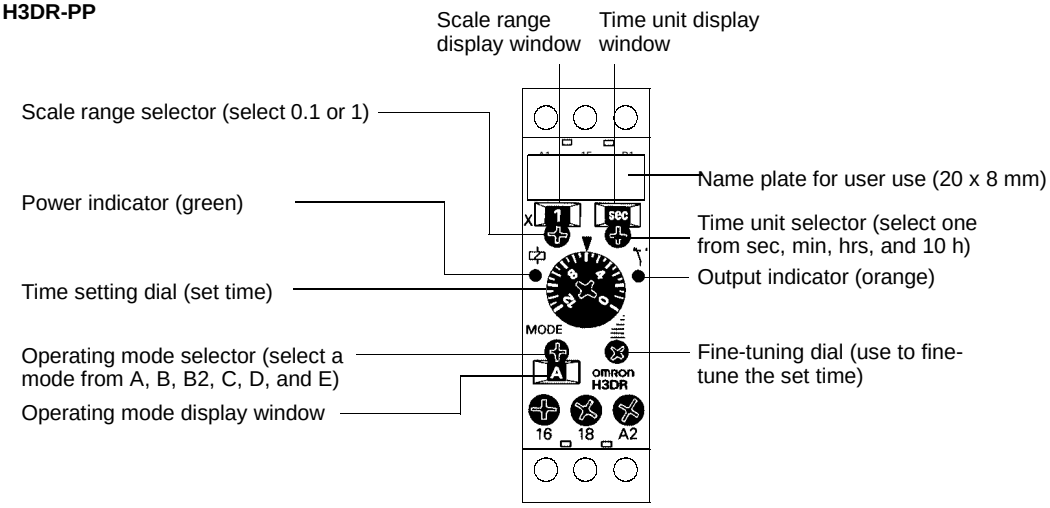


PNP Input Models

H3DR-AP/-ASP

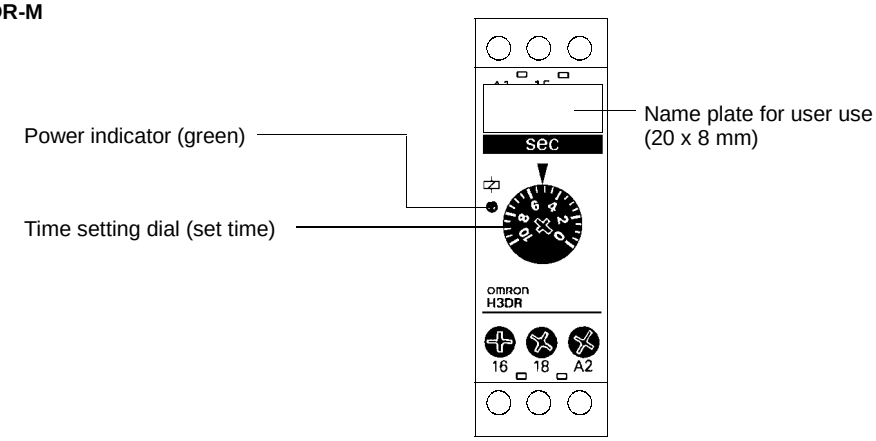


H3DR-PP



No-input Models

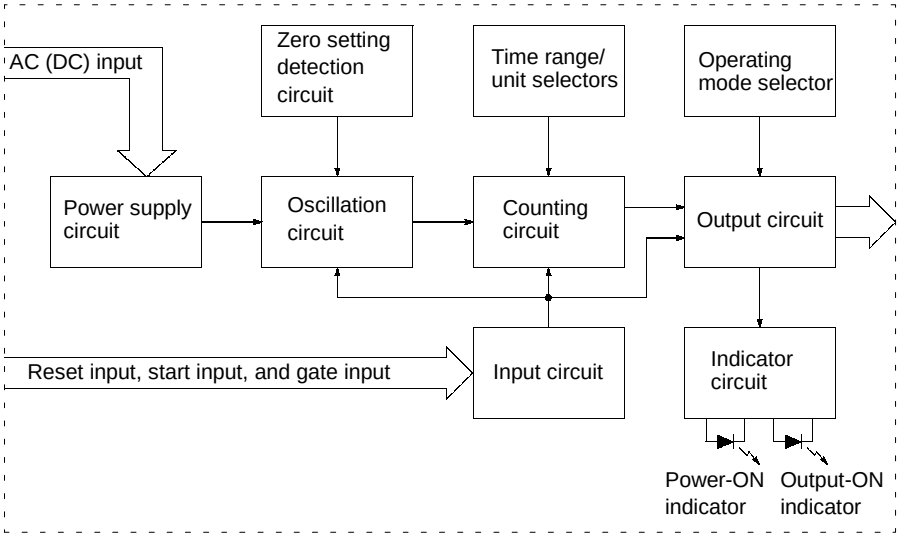
H3DR-M



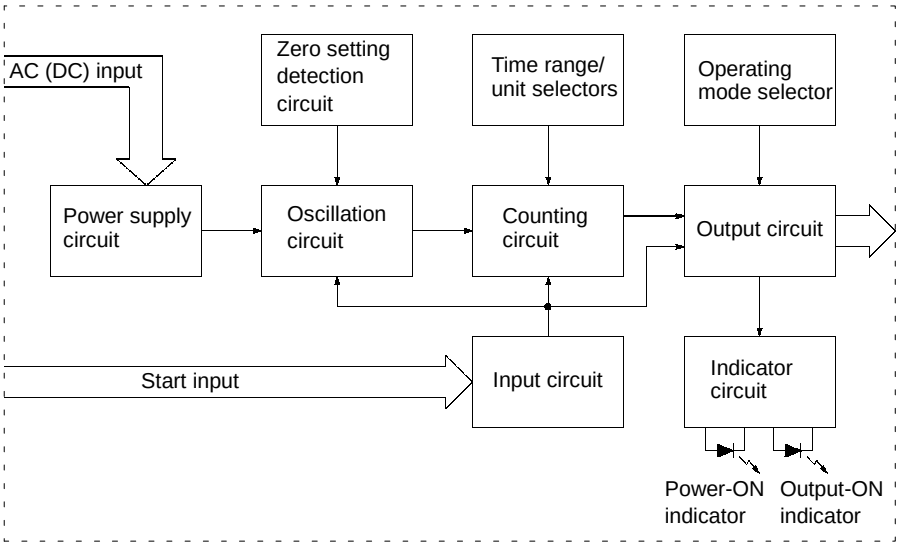
Operation

■ Block Diagram

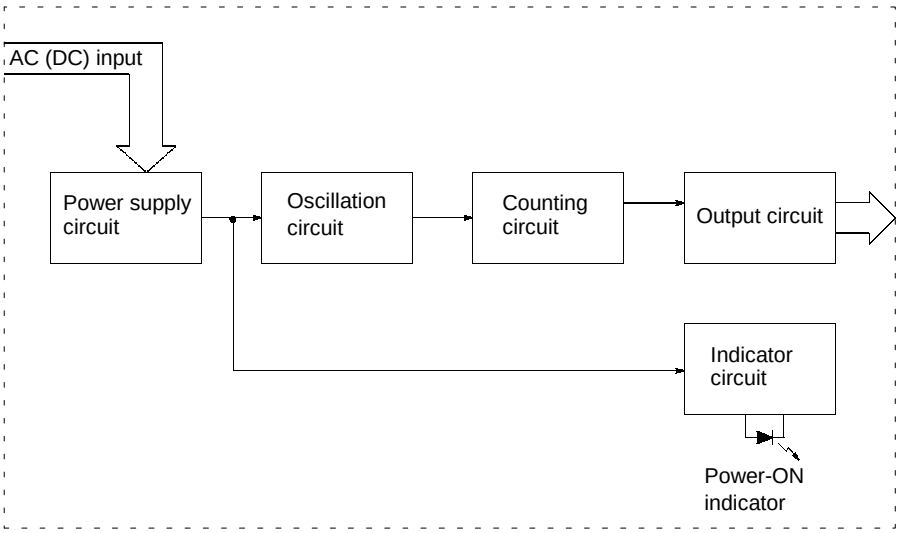
H3DR-A/-AS/-AP/-ASP



H3DR-P/-PP



H3DR-M



■ I/O Functions

H3DR-A/-AS/-AP/-ASP

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

H3DR-P/-PP

Input	**Start**	Starts time-measurement.
Output	**Control output**	Output is turned ON according to designated output mode when preset value is reached.

H3DR-M

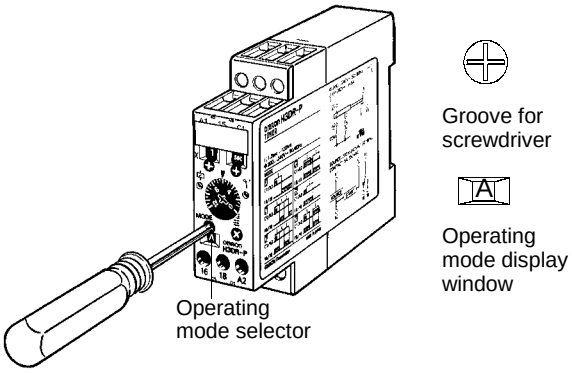
Input		No input is available.
Output	**Control output**	Output is turned ON when preset value is reached.

■ Basic Operation

H3DR-A j /-AS j /-P j

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.

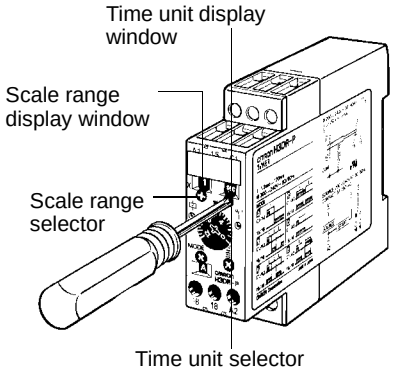


Selection of Operating Mode

Turn the operating mode selector with a screwdriver until the desired operating mode (A, B, B2, C, D, or E) appears in the display window located below the selector.

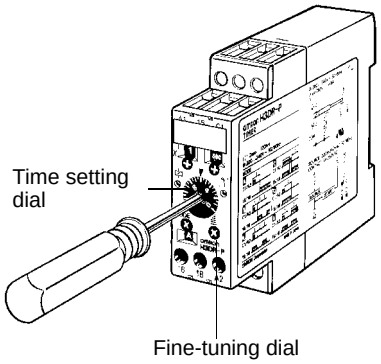
Selection of Time Unit and Time Scale

The desired time unit (s, m, h, or 10h) can be displayed in the 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 window above the selector.



Setting of Time

The desired time is set with the time setting dial. This time can be fine-tuned by adjusting the fine-tuning dial (the reduction ratio of the fine-tuning dial is 1:6). The fine-tuning dial is useful when delicate and more accurate adjustment is required.



H3DR-M

The H3DR-M does not incorporate a scale range selector, operating mode selector, or fine-tuning.

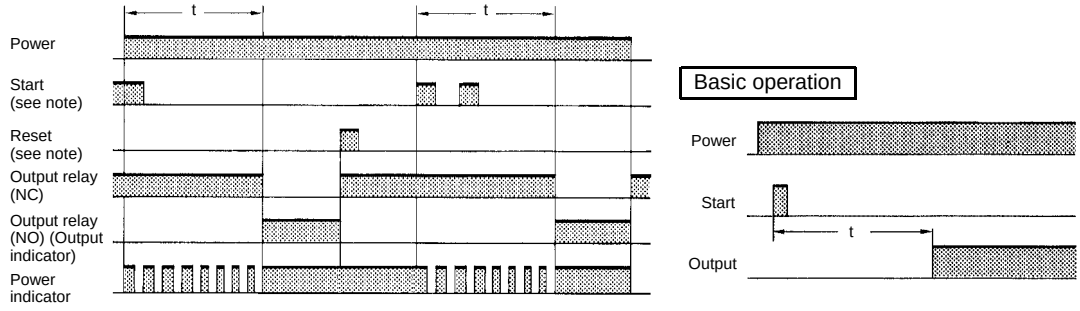
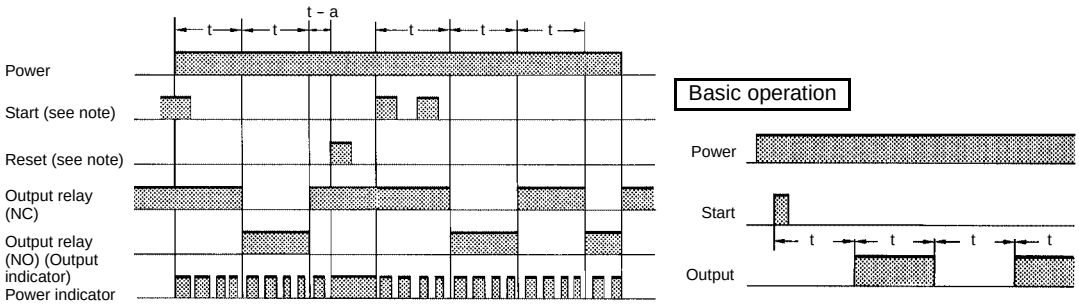
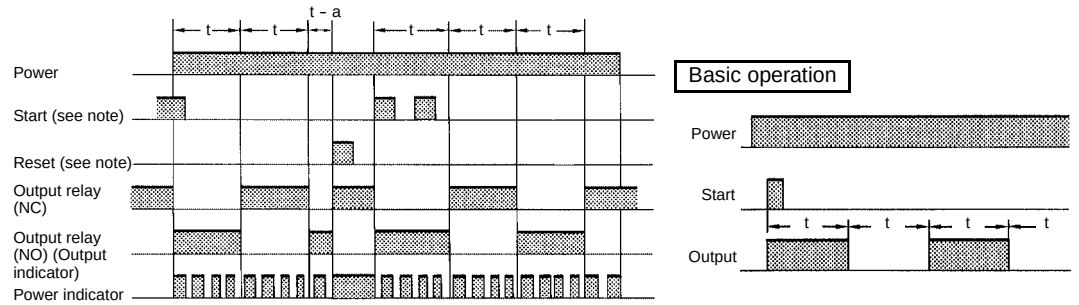
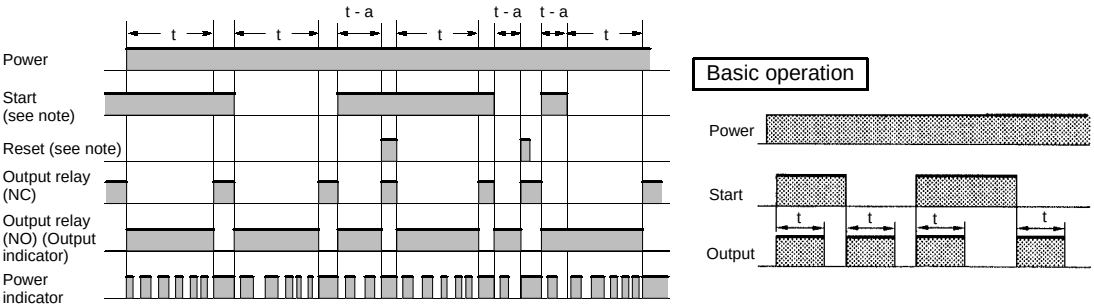
■ Timing Chart

Note: 1. The minimum power-opening time is 0.1 s and the minimum pulse width is 0.05 s.

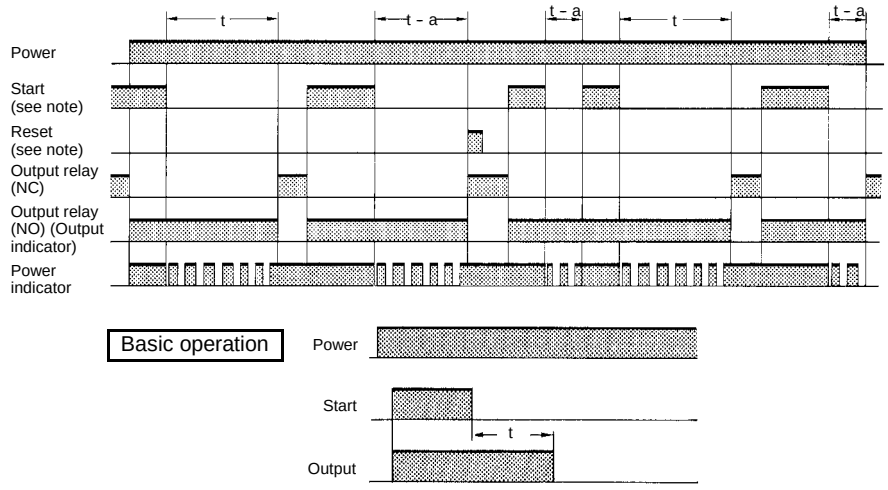
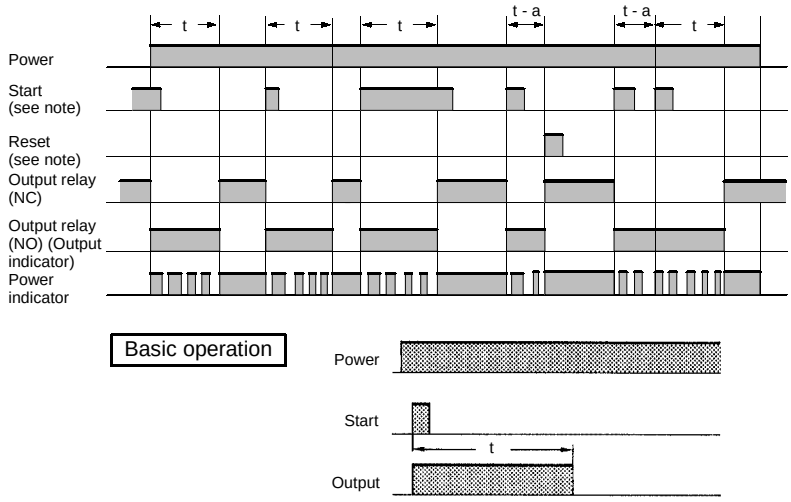
2. The letter t in the timing charts stands for the set time and t-a means that the period is less than the time set.

NPN/PNP Input Models

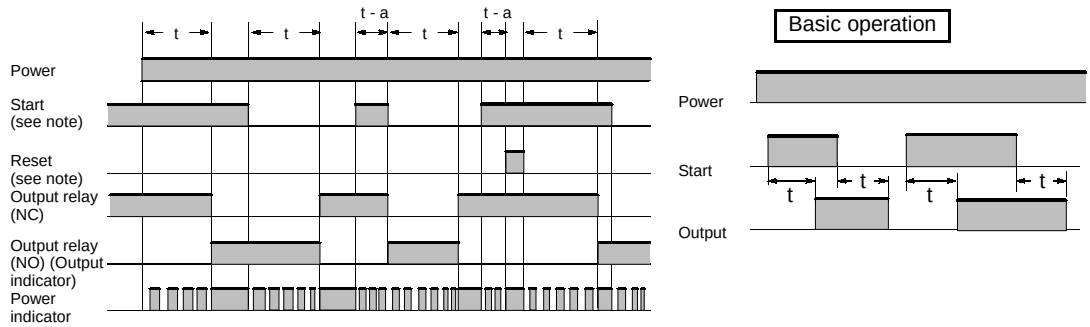
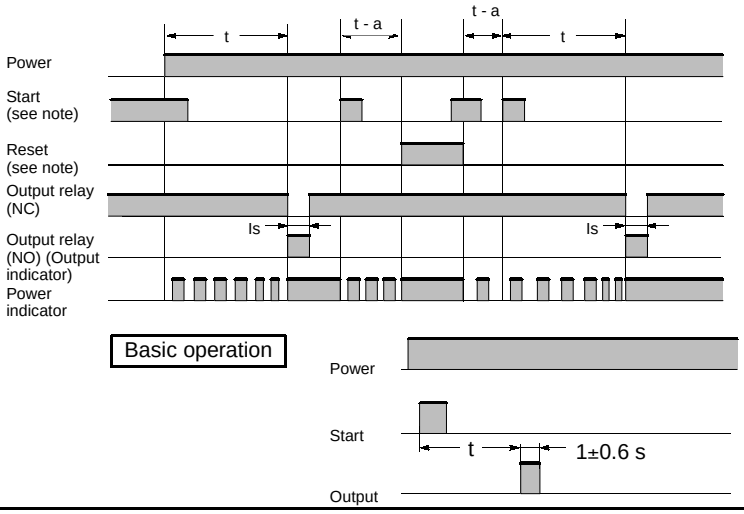
H3DR-A/-AS/-AP/-ASP

Operating mode	Timing chart
A: ON-delay	For power-on operation, short-circuit the start input and input common terminal. The timer starts operating at the moment the power is turned on. 
B: Flicker OFF start	For power-on operation, short-circuit the start input and input common terminal. The timer starts operating at the moment the power is turned on. 
B2: Flicker ON start	For power-on operation, short-circuit the start input and input common terminal. The timer starts operating at the moment the power is turned on. 
C: Signal ON/OFF-delay	

Note: For NPN Input Models, "Start" stands for short-circuited C_1 and A_2, and "Reset" stands for short-circuited D_1 and A_2.
For PNP Input Models, "Start" stands for voltage application between B_1 and A_2, and "Reset" stands for voltage application between C_1 and A_2.

Operating mode	Timing chart
D: Signal OFF-delay	
E: Interval	For power-on operation, short-circuit the start input and input common terminal. The timer starts operating at the moment the power is turned on. 

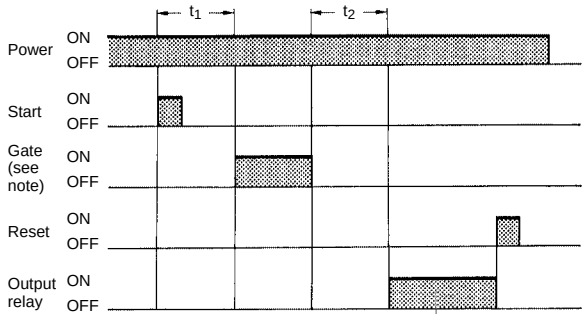
Note: For NPN Input Models, "Start" stands for short-circuited C_1 and A_2, and "Reset" stands for short-circuited D_1 and A_2.
For PNP Input Models, "Start" stands for voltage application between B_1 and A_2, and "Reset" stands for voltage application between C_1 and A_2.

Operating mode	Timing chart
G: Signal ON/OFF-delay	
J: One-shot output	For power-on operation, short-circuit the start input and input common terminal. The timer starts operating at the moment the power is turned on. 

Note: 1. For NPN Input Models, “Start” stands for short-circuited C_1 and A_2, and “Reset” stands for short-circuited D_1 and A_2.
For PNP Input Models, “Start” stands for voltage application between B_1 and A_2, and “Reset” stands for voltage application between C_1 and A_2.

2. The G and J modes are special modes. Order the H3DR-A j -300 special model for these modes.

Gate Signal Input

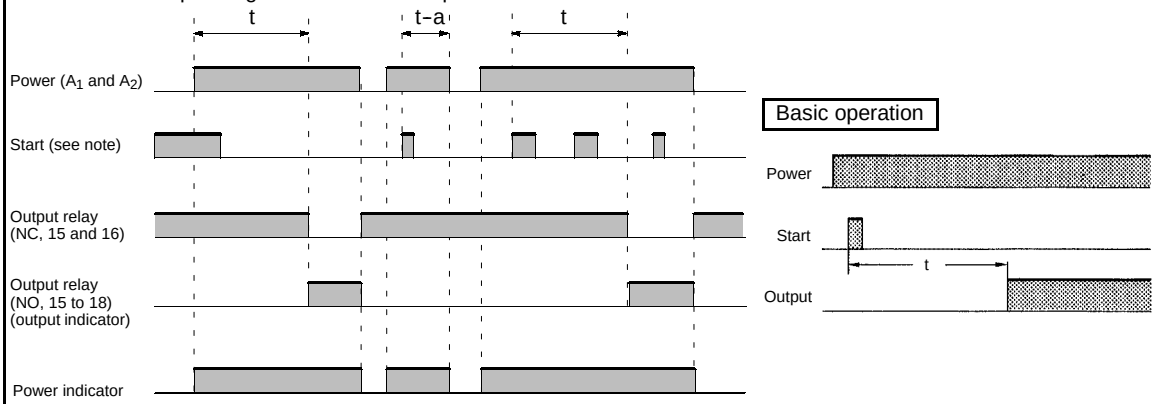
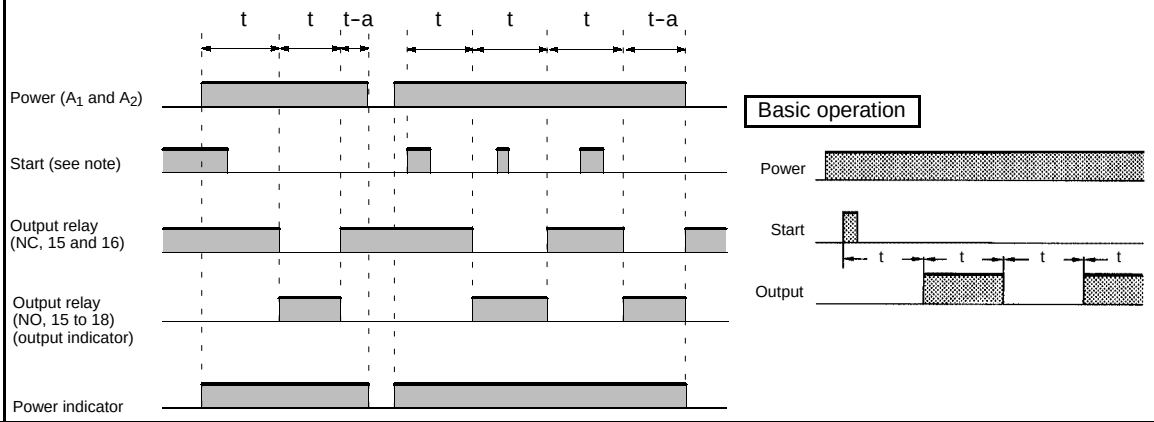
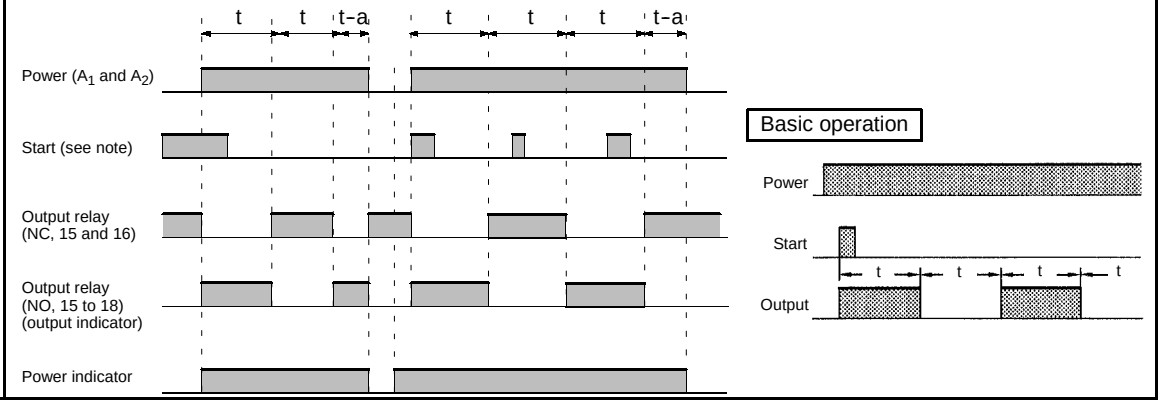


Note: 1. This timing chart indicates the gate input in operating mode A (ON-delay operation).

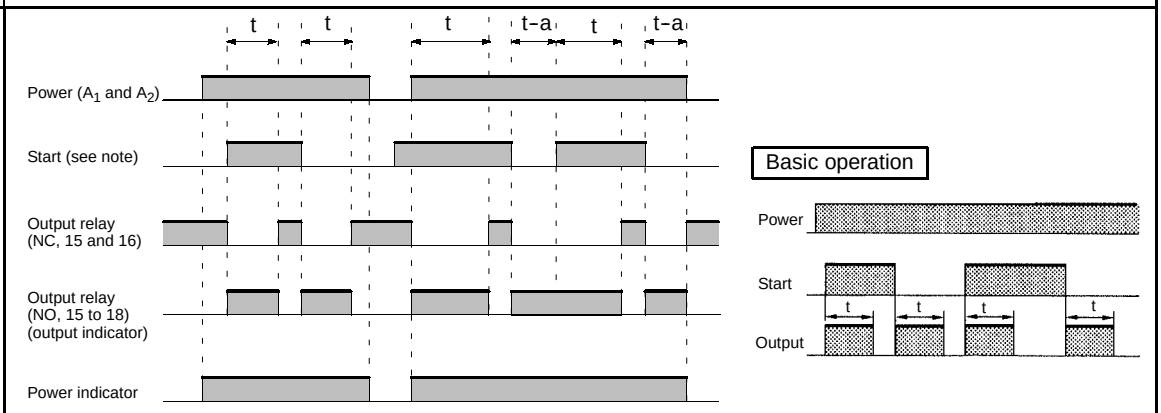
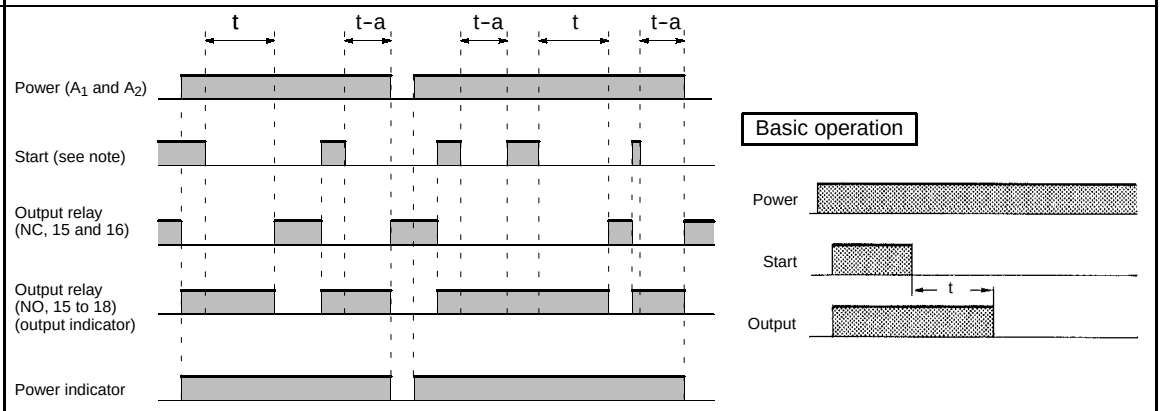
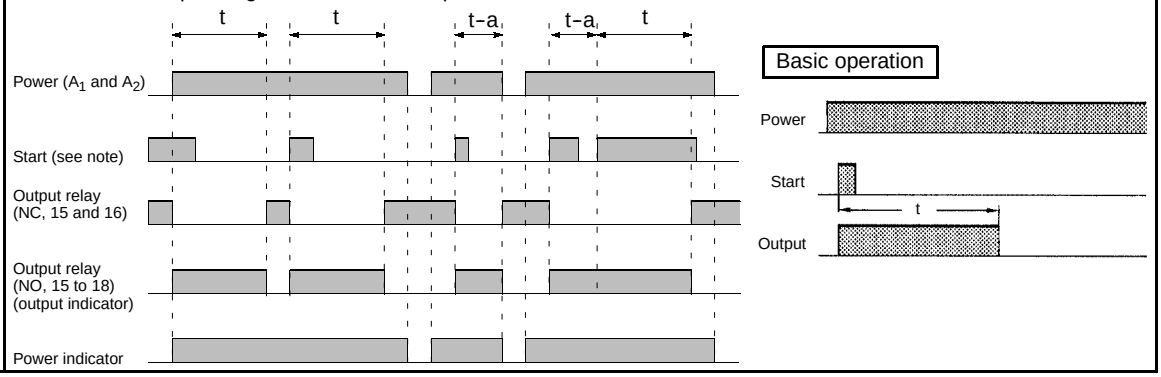
2. The set time is the sum of t_1 and t_2.

3. For NPN Input Models, “Gate” stands for short-circuited D_1 and A_2.
For PNP Input Models, “Gate” stands for voltage application between D_1 and A_2.

H3DR-P/-PP

Operating mode	Timing chart
A: ON-delay	For power-on operation, short-circuit the start input and input common terminal. The timer starts operating at the moment the power is turned on. 
B: Flicker OFF start	For power-on operation, short-circuit the start input and input common terminal. The timer starts operating at the moment the power is turned on. 
B2: Flicker ON start	For power-on operation, short-circuit the start input and input common terminal. The timer starts operating at the moment the power is turned on. 

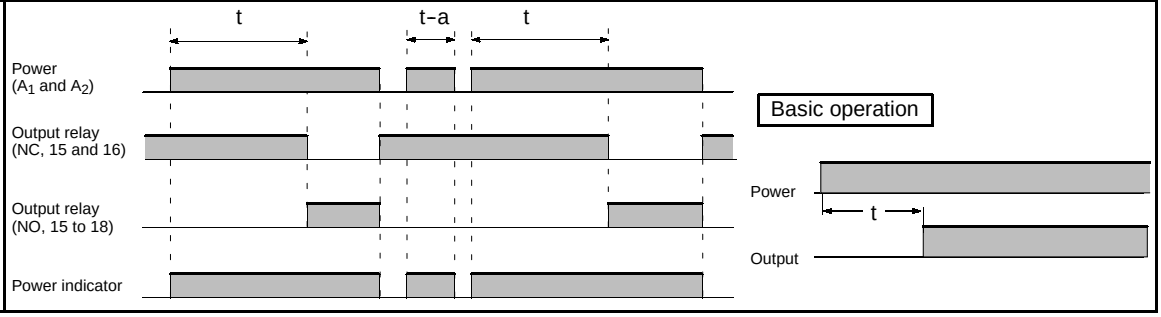
Note: For NPN Input Models, “Start” stands for short-circuited C_1 and A_2.
For PNP Input Models, “Start” stands for voltage application between B_1 and A_2.

Operating mode	Timing chart
C: Signal ON/OFF-delay	
D: Signal OFF-delay	
E: Interval	For power-on operation, short-circuit the start input and input common terminal. The timer starts operating at the moment the power is turned on. 

Note: For NPN Input Models, “Start” stands for short-circuited C_1 and A_2.
For PNP Input Models, “Start” stands for voltage application between B_1 and A_2.

No-input Model

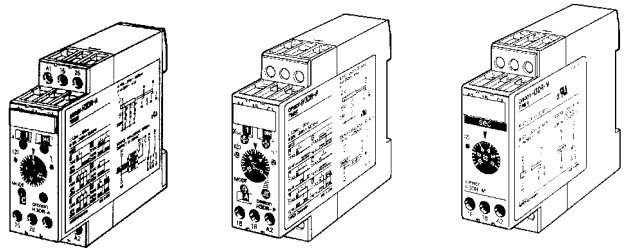
H3DR-M

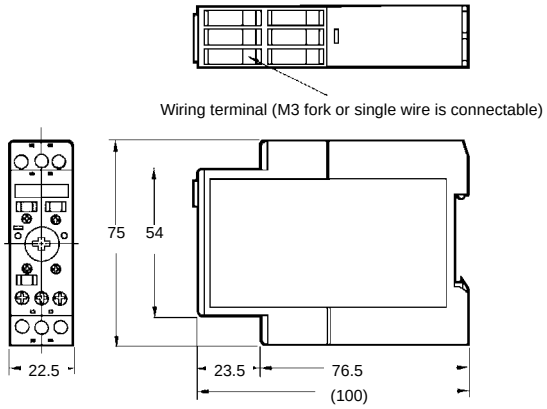
Operating mode	Timing chart
ON-delay	

Dimensions

Note: All units are in millimeters unless otherwise indicated.

H3DR-A/-AS/-AP/-ASP **H3DR-P/-PP** **H3DR-M**

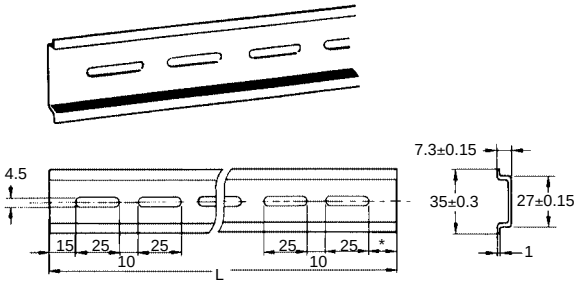




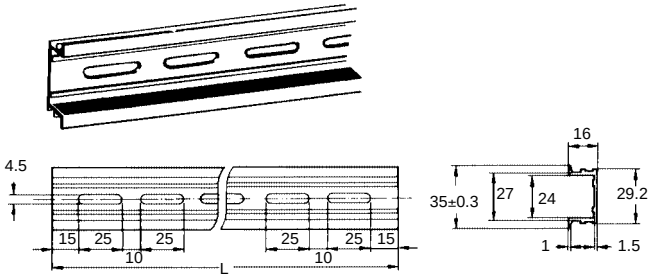
Accessories (Order Separately)

Mounting Track

PFP-100N, PFP-50N



PFP-100N2

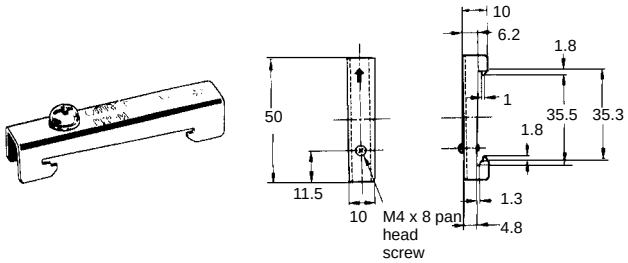


L: Length

1 m	PFP-100N
50 cm	PFP-50N
1 m	PFP-100N2

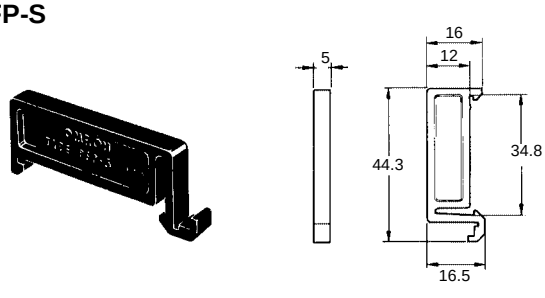
End Plate

PFP-M



Spacer

PFP-S



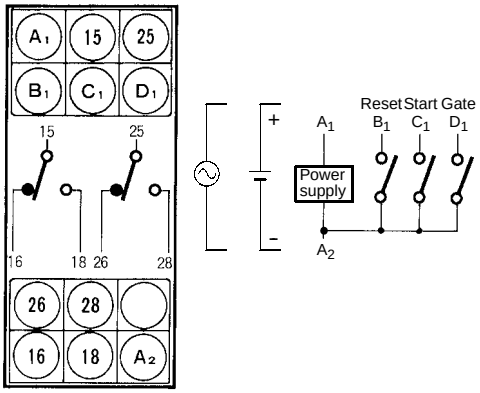
Installation

■ Terminal Arrangement

NPN Input Models

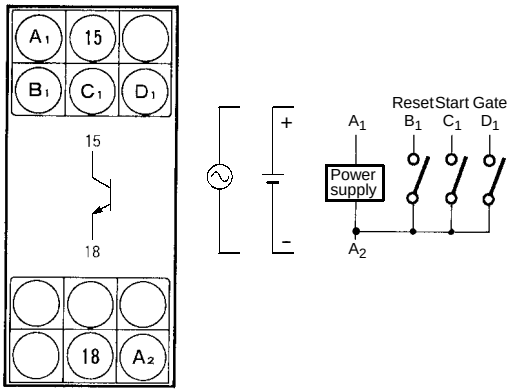
H3DR-A

DPDT Relay Output

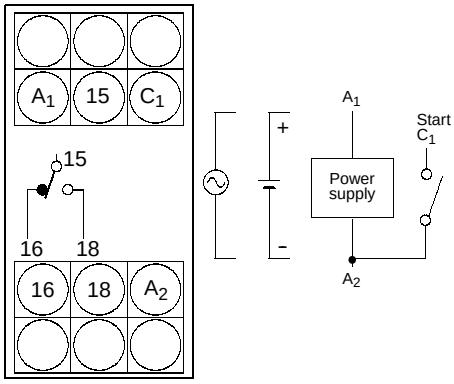


H3DR-AS

Transistor Output



H3DR-P

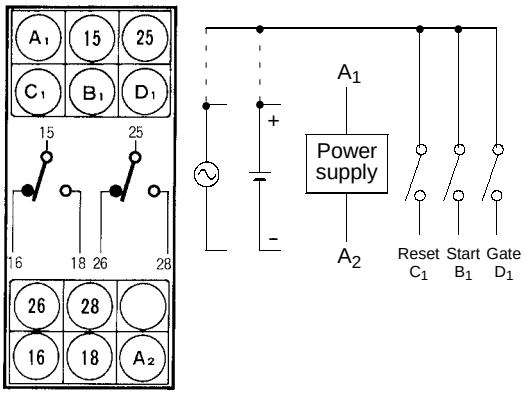


Note: The H3DR-A/-P incorporates multiple operating modes (6 modes), thus uses a new timer contact symbols which are different from conventional ones used for other digital timers.

PNP Input Models

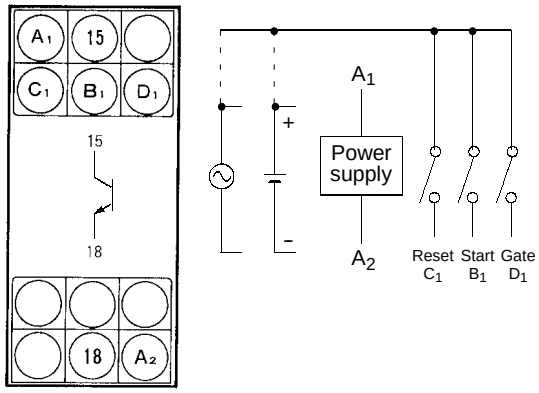
H3DR-AP

DPDT Relay Output

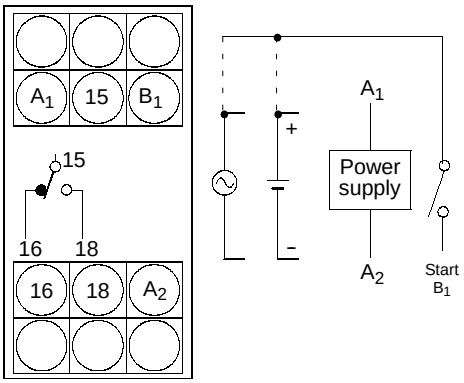


H3DR-ASP

Transistor Output



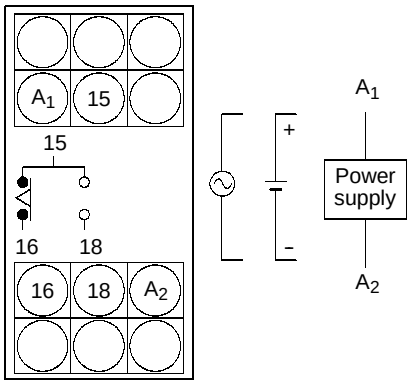
H3DR-PP



Note: The H3DR-AP/-PP incorporates multiple operating modes (6 modes), thus uses a new timer contact symbols which are different from conventional ones used for other digital timers.

No-input Models

H3DR-M



■ Input Connections (H3DR-A/-P/-AP/-PP)

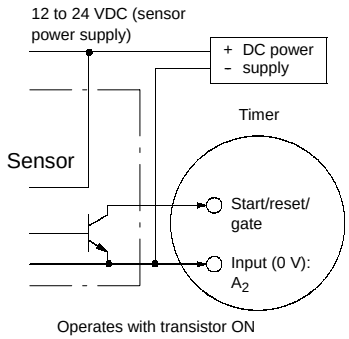
NPN Input Models

The inputs of the H3DR-A/-AS/-P are no-voltage (short circuit or open) inputs.

H3DR-A/-AS

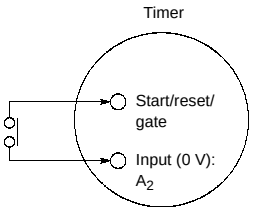
No-voltage inputs

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



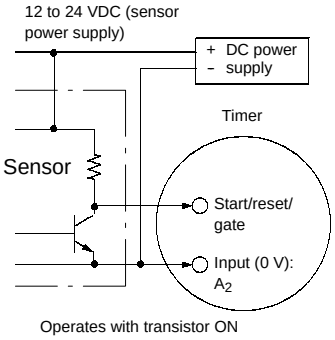
Operates with transistor ON

Contact Input



Operates with relay ON

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

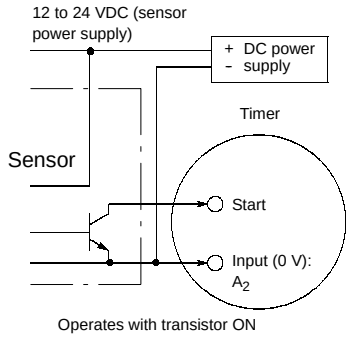


Operates with transistor ON

H3DR-P

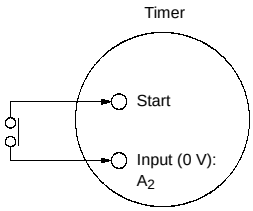
No-voltage inputs

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



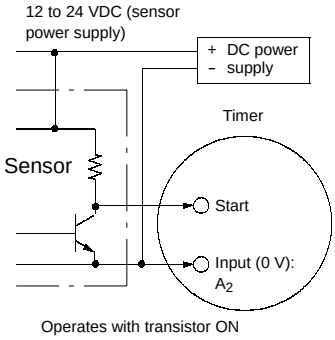
Operates with transistor ON

Contact Input



Operates with relay ON

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



Operates with transistor ON

No-voltage Input Signal Levels

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

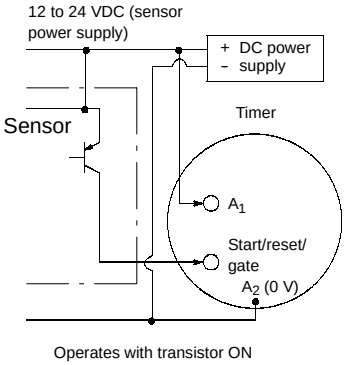
PNP Input Models

The inputs of the H3DR-AP/−ASP/-PP are voltage (voltage imposition or open) inputs.

H3DR-AP/-ASP

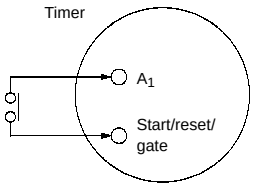
Voltage Inputs

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



Operates with transistor ON

Contact Input



Operates with relay ON

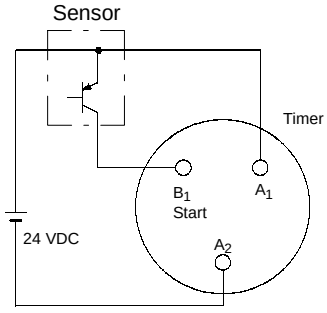
Voltage Input Signal Levels

No-contact input	1. Voltage imposition 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

H3DR-PP

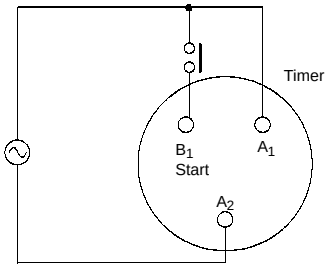
Voltage inputs

No-contact Input (for 24 VDC/VAC Model)
(Connection to PNP output sensor.)



Operates with 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 B_1 and A_2 must be more than the operating voltage range.)
	2. Transistor OFF Leakage current: 0.01 mA max. (Voltage between terminals B_1 and A_2 must be less than the operating voltage range.)
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 more than the operating voltage range or less than the operating voltage range respectively.)

Precautions

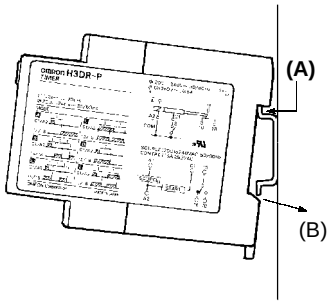
■ Changing of Setting

NOTICE: Do not change the time unit, rated time, or operating mode while the timer is in operation or malfunction could result.

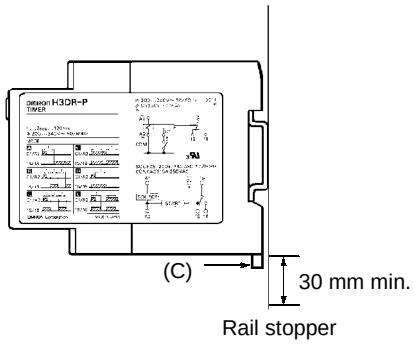
■ Mounting and Dismounting

The H3DR should be mounted as horizontally as possible.

When mounting the H3DR on a socket mounting track, hook portion (A) of the Timer to an edge of the track first, and then depress the Timer in the direction of (B).



When dismounting the H3DR, pull out portion (C) with a flat-blade screwdriver and remove the Timer from the mounting track.



The H3DR can be mounted and dismounted with ease if a distance of 30 mm or more is kept between the H3DR and other equipment.

■ Power Supplies

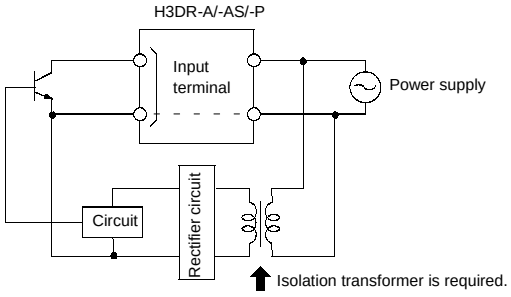
An AC power supply can be connected to the power input terminals without regarding polarity. A DC power supply must be connected to the power input terminals as designated according to the polarity of the terminals.

A DC power supply can be connected if its ripple factor is 20% or less and the mean voltage is within the rated operating voltage range of the Timer.

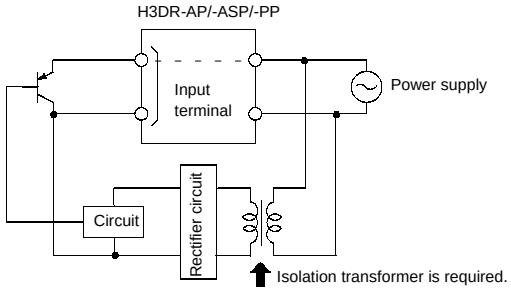
Connect the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value at once or the Timer may not be reset or a timer error could result.

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.

NPN Input Models



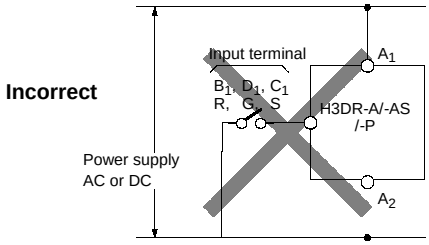
PNP Input Models



For the H3DR-P/M, use a commercial power supply with a sine-wave frequency of 50 or 60 Hz to supply 100 or 200 VAC.
If a different power supply is to be used, use the H3DR-A j j .

■ Wiring

NPN Input Models

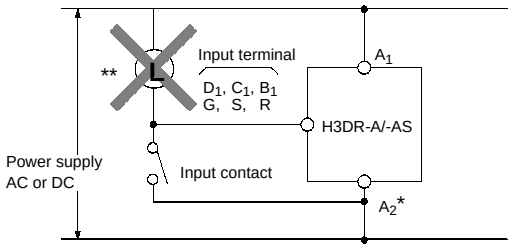


Securely connect the power supply to terminals A_1 and A_2.
Do not apply input signals unless A_2 is connected to the power supply, otherwise the internal circuit of the Timer may be damaged due to the high-tension voltage applied to the input terminals.

■ Input/Output

NPN Input Models

H3DR-A/-AS

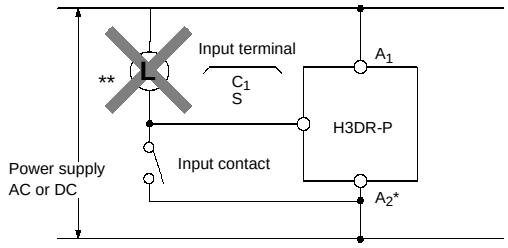


An appropriate input is applied to the input signal terminals of the Timer when one of the input terminals (terminals B_1, C_1, or D_1) and the common terminal (terminal A_2) for the input signals are short-circuited. Do not attempt to connect any input terminal to any terminal other than the common terminal or to apply voltage across other than the specified input and common terminals or the internal circuits of the Timer may be damaged.

* Power supply terminal A_2 is a common terminal for the input signals (G, S, R) to the Timer. Never use terminal A_1 as the common terminal for this purpose, otherwise the internal circuit of the Timer may be damaged.

** Do not connect a relay or any other load between these two points, otherwise the internal circuit of the Timer may be damaged due to the high-tension voltage applied to the input terminals.

H3DR-P



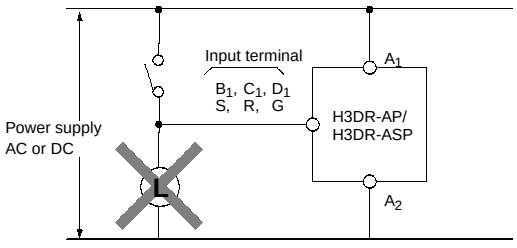
An appropriate input is applied to the input signal terminals of the Timer when the input terminal (terminal C_1) and the common terminal (terminal A_2) for the input signal are short-circuited. Do not attempt to connect any input terminal to any terminal other than the common terminal or to apply voltage across other than the specified input and common terminals or the internal circuits of the Timer may be damaged.

* Power supply terminal A_2 is a common terminal for the input signals (S) to the Timer. Never use terminal A_1 as the common terminal for this purpose, otherwise the internal circuit of the Timer may be damaged.

** Do not connect a relay or any other load between these two points, otherwise the internal circuit of the Timer may be damaged due to the high-tension voltage applied to the input terminals.

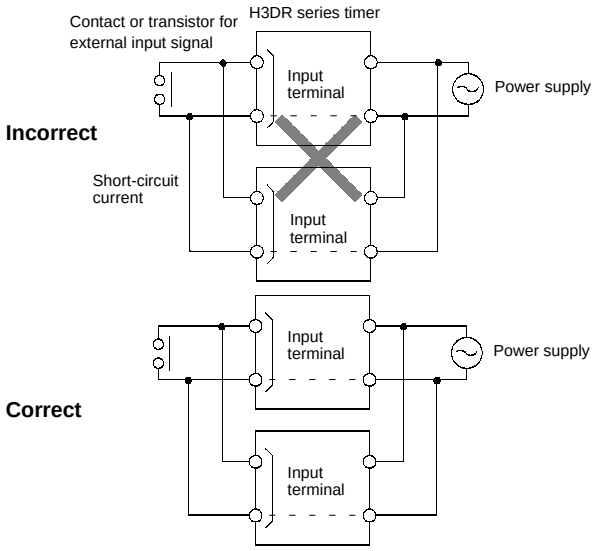
PNP Input Models

H3DR-AP/-ASP



Do not connect a relay or any other load between these two points, otherwise the internal circuit of the Timer may be damaged due to the high-tension voltage applied to the input terminals.

All Models

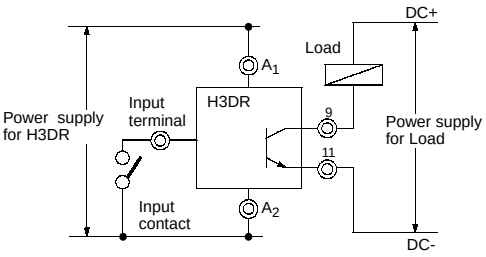


When connecting a relay or a transistor as an external signal input device, pay attention to the following points to prevent short-circuiting due to a sneak current to the transformerless power supply.
If a relay or transistor is connected to two or more Timers, the input terminals of those Timers must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

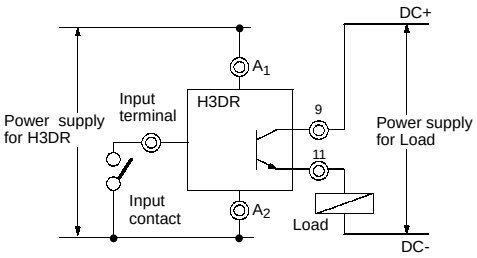
■ Output Connection of H3DR-AS with Transistor Output

The H3DR-AS transistor output is insulated from the internal circuitry by a photocoupler, so either NPN or PNP output is possible.

Application as NPN Output



Application as PNP Output



■ Environment

When using the Timer in an area with excess electronic noise, separate the Timer, wiring, and the equipment which generates the input signals as far as possible from the noise sources. It is also recommended to shield the input signal wiring to prevent electronic interference.

Organic solvents (such as paint thinner), as well as very acidic or basic solutions can damage the outer casing of the Timer.

■ Others

If the Timer is mounted on a control board, dismount the timer from the control board or short-circuit the circuitry of the power board before carrying out a voltage withstand test between the electric circuitry and non current-carrying metal part of the Timer, in order to prevent the internal circuitry of the Timer from damage.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L83-E1-3

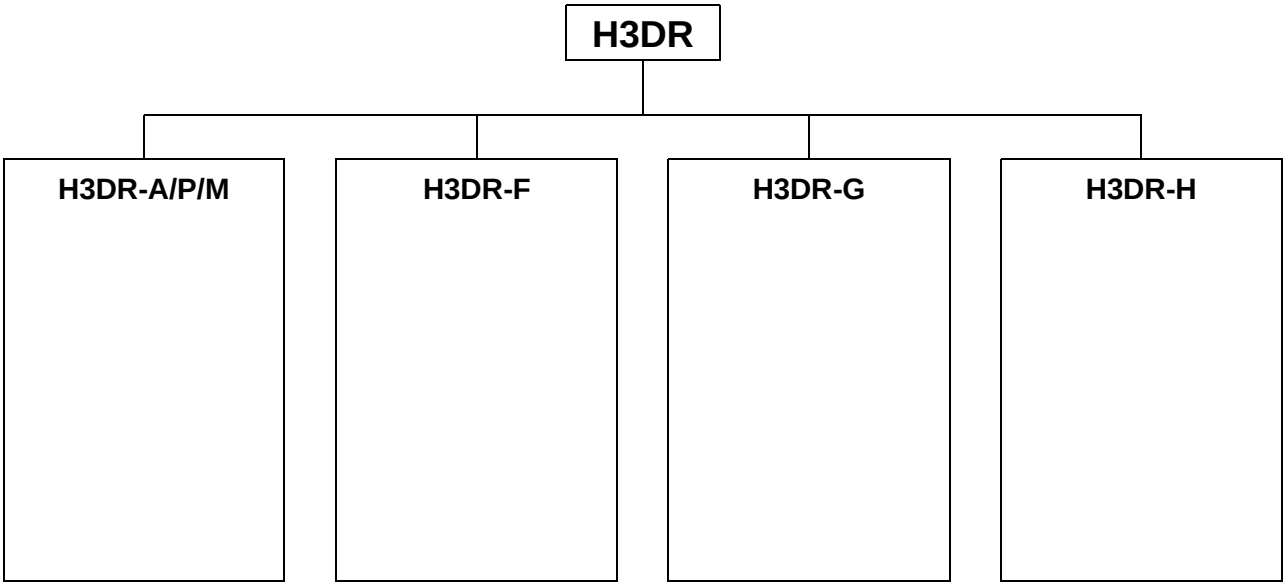
Solid-state Timer

H3DR-F/G/H

A Wide Variety of DIN 22.5-mm Width Timer Ranges: H3DR-F Twin Timer, H3DR-G Star-delta Timer, and H3DR-H Power OFF-delay Timer

- Conforms to VDE0435, 0110 and approved by UL and CSA.
- Conforms to EMC standards.
- Name plates provided for easy timer identification and management.
- Finger-protection terminal block (conforms to VDE0106) compatible with bar-sleeve or fork connectors. Delivered with an open terminal for quick installation.
- Six-language instruction manual provided.

■ Broad Line-up of H3DR Series



Standard Timer	Twin Timer	Star-delta Timer	Power OFF-delay Timer
H3DR-A/AP H3DR-AS/ASP H3DR-P/PP H3DR-M	H3DR-F	H3DR-G	H3DR-H

Note: Refer to the *H3DR-A/P/M Datasheet (L83)* for details.

Solid-state Twin Timer

H3DR-F

DIN 22.5-mm Solid-state Twin Timers

- High immunity to invertor noise.
- Independent ON- and OFF-time settings. Combinations of long ON- or OFF-time and short OFF- or ON-time settings are possible.
- Seven time ranges from 0.1 s to 12 h.
- Wide AC power supply range: 100 to 240 VAC.

RC

Ordering Information

Operating modes	Supply voltage	Model
Flicker OFF start	100 to 240 VAC	H3DR-F
	48 VAC	
	24 VAC/DC	
	12 VDC	

Note: Specify both the model number and supply voltage when ordering.
Example: H3DR-F 24 VAC/DC
Supply voltage

Model Number Legend:

H3DR- j
1

1. Classification
F: Twin timers

Specifications

■ General

Item	H3DR-F
Operating mode	Flicker OFF start
Terminal block	5 terminals used
Operating/Reset method	Time-limit operation/Time-limit reset or self-reset
Output type	Relay output (SPDT)
Mounting method	DIN track mounting
Approved standards	UL508, CSA C22.2 No. 14 Conforms to VDE0435/2021 C/250, VDE0110, VDE0106/P100 Conforms to EN50081-2, prEN50082-2
Attachment	Name plate

■ Time Ranges

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

Note: To obtain instantaneous output, set to below 0.

■ Ratings

Rated supply voltage (see note)	100 to 240 VAC (50/60 Hz), 48 VAC (50/60 Hz), 24 VAC/DC (50/60 Hz), 12 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. 8.2 VA; 48 VAC: approx. 1.7 VA; 24 VAC/DC: approx. 1.3 VA (AC), approx. 0.6 W (DC); 12 VDC: approx. 0.4 W
Control outputs	Contact output: 5 A at 250 VAC, resistive load ($\cos\phi = 1$)

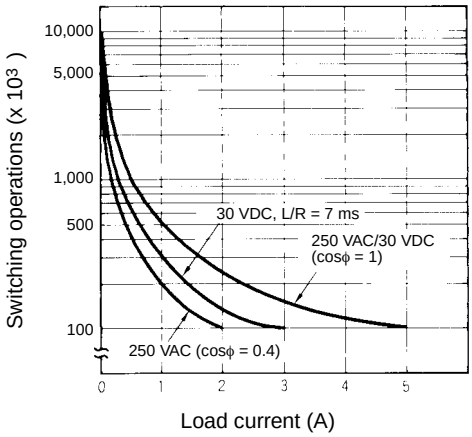
Note: A power supply with a ripple of 20% max. (single-phase power supply with full-wave rectification) can be used with each DC Model.

■ Characteristics

Accuracy of operating time	±1% FS max. (±1% FS ±10 ms max. in ranges of 1.2 s)
Setting error	±10% FS ±0.05 s max.
Reset time	0.1 s max.
Reset voltage	10% max. of rated supply voltage (10 V max. for 100 to 240 VAC)
Influence of voltage	±0.5% FS max. (±0.5% FS ±10 ms in ranges of 1.2 s)
Influence of temperature	±2% FS max. (±2% FS ±10 ms in ranges of 1.2 s)
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) 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 1 kV for 12 VDC, 24 VAC/DC, 48 VAC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC 1.5 kV for 12 VDC, 24 VAC/DC, 48 VAC
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: 4 kV Destruction: 8 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm single amplitude each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude each in three directions
Shock resistance	Destruction: 980 m/s^2 (100G) each in three directions Malfunction: 98 m/s^2 (10G) each in three 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%
Humidity class	DIN 40 040: G
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)
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: IEC801-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC801-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4)
Enclosure ratings	IEC: IP40
Weight	Approx. 110 g

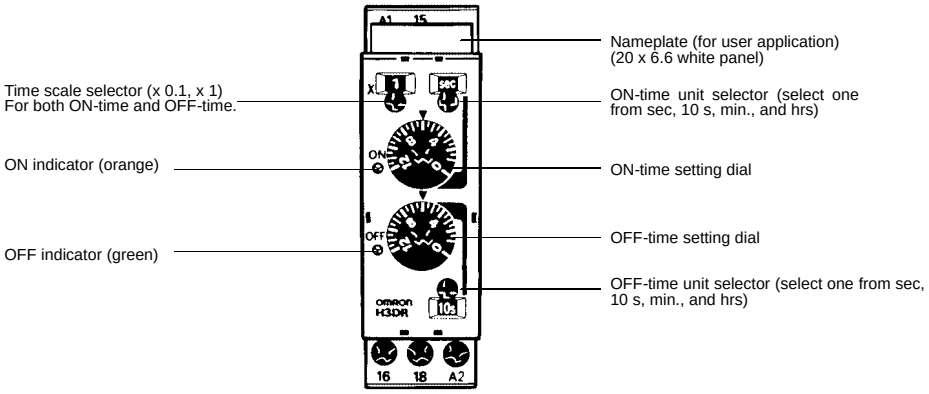
Note: The reset voltage is the residual voltage allowed from the power supply when returning the Timer to the status that existed prior to operation.

Engineering Data



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).

Nomenclature



Note: The output will change instantly if the setting dial is turned toward 0.

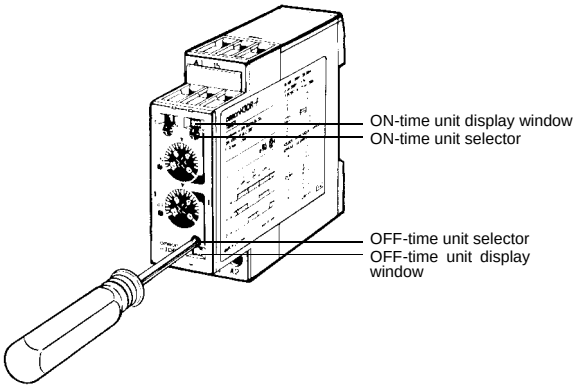
Operation

■ Basic Operation

Time Unit Selection

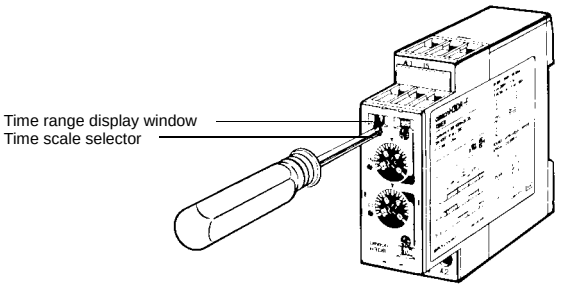
For ON-time, the desired time unit (s, 10 s, min, and h) is indicated on the ON-time unit display window at the upper-right corner of the front panel and can be changed by turning the ON-time unit selector located below the window.

For OFF-time, the desired time unit (s, 10 s, min, and h) is indicated on the OFF-time unit display window at the lower-right corner of the front panel and can be changed by turning the OFF-time unit selector located above the window.



Time Scale Selection

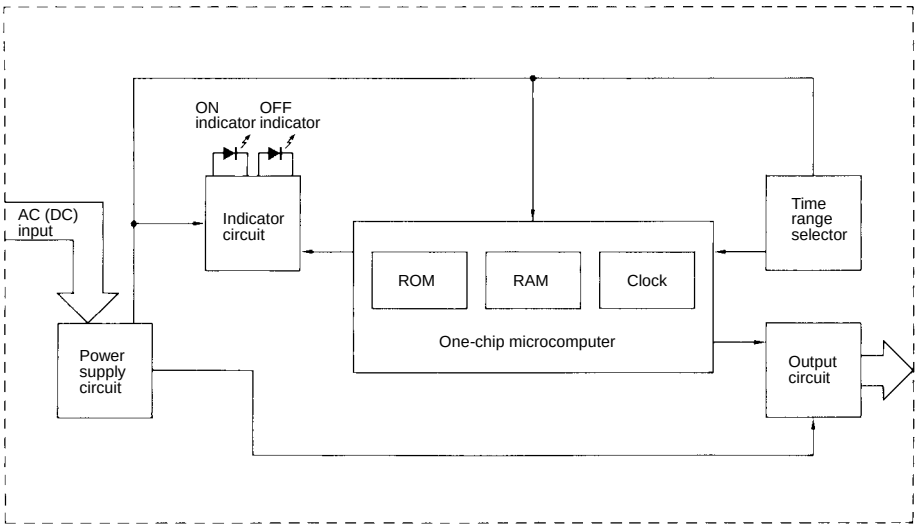
The scale (0.1 or 1) is selected with the time scale selector at the upper-left corner of the front panel and appears in the window above the selector.



Time Setting

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

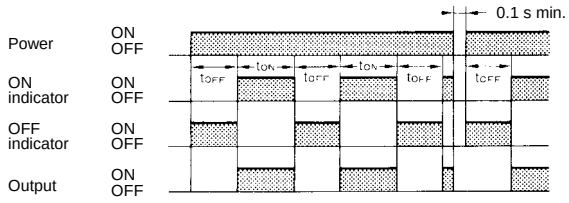
■ Block Diagram



■ I/O Functions

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

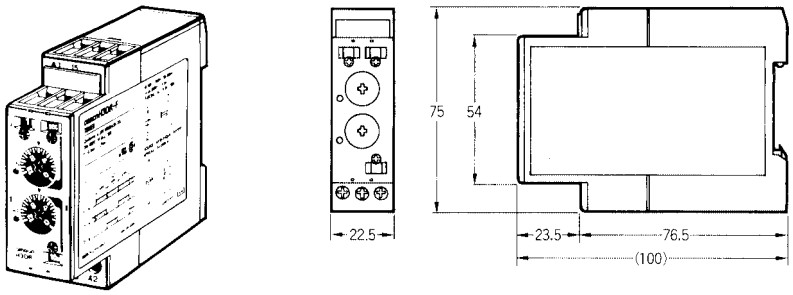
■ Timing Chart



Note: t_{ON}: ON set time
t_{OFF}: OFF set time
Allow at least 0.1 s for recovery.

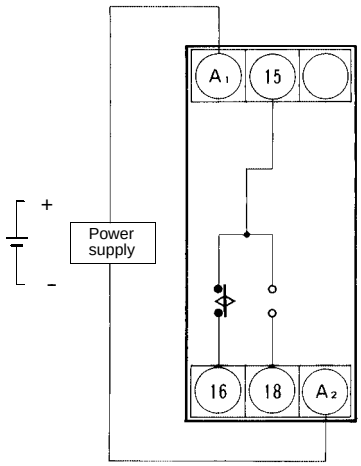
Dimensions

Note: All units are in millimeters unless otherwise indicated.



Installation

■ Terminal Arrangement



Solid-state Star-delta Timer H3DR-G

DIN 22.5-mm Solid-state Star-delta Timer

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

RC

Ordering Information

Supply voltage	Model
100 to 240 VAC	H3DR-G
48 VAC	
24 VAC/DC	

Note: Specify both the model number and supply voltage when ordering.
Example: H3DR-G 24 VAC/DC
Supply voltage

Model Number Legend:

H3DR- j
1

1. Classification
G: Star-delta timer

Specifications

■ General

Item	H3DR-G
Terminal block	6 terminals used
Operating/Reset method	Time-limit operation/Self-reset
Output type	Time-limit: SPST-NO (star operation circuit) SPST-NO (delta operation circuit)
Mounting method	DIN track mounting
Approved standards	UL508, CSA C22.2 No.14 Conforms to VDE0435/2021 C/250, VDE0110, VDE0106/P100 Conforms to EN50081-1, prEN50082-2
Attachment	Name plate

■ Time Ranges

Star-delta transfer time		0.05 sec	0.1 sec	0.25 sec	0.5 sec
Star operation time setting	Time scale: x 1 s	1 to 12 s			
	Time scale: x 10 s	10 to 120 s			

■ Ratings

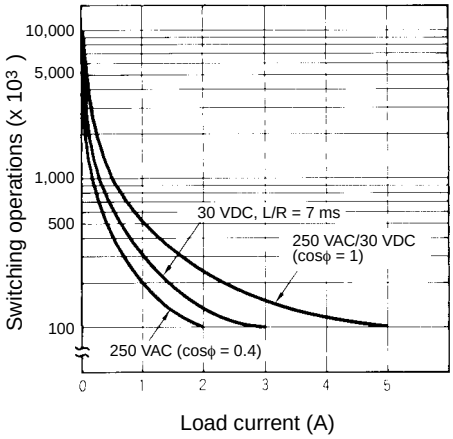
Rated supply voltage (see note)	100 to 240 VAC (50/60 Hz), 48 VAC (50/60 Hz), 24 VAC/DC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-opening time: 0.5 s
Power consumption	100 to 240 VAC: approx. 11 VA; 48 VAC: approx. 1.2 VA; 24 VAC/DC: approx. 0.9 VA (AC), approx. 0.45 W (DC)
Control outputs	Contact output: 5 A at 250 VAC, resistive load ($\cos\phi = 1$)

■ Characteristics

Accuracy of operating time	±1% FS max.
Setting error	±10% FS ±0.05 s max.
Star-delta transfer time	Accuracy: ±25% FS + 5 ms max.
Reset voltage	10% max. of rated supply voltage (10 V max. for 100 to 240 VAC)
Influence of voltage	±0.5% 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 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) 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, 1 kV for 24 VAC/DC, 48 VAC 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/DC, 48 VAC
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: 4 kV Destruction: 8 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm single amplitude each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude each in three directions
Shock resistance	Destruction: 980 m/s^2 (100G) each in three directions Malfunction: 98 m/s^2 (10G) each in three 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%
Humidity class	DIN 40 040: G
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)
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: IEC801-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC801-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4)
Enclosure ratings	IEC: IP40
Weight	Approx. 110 g

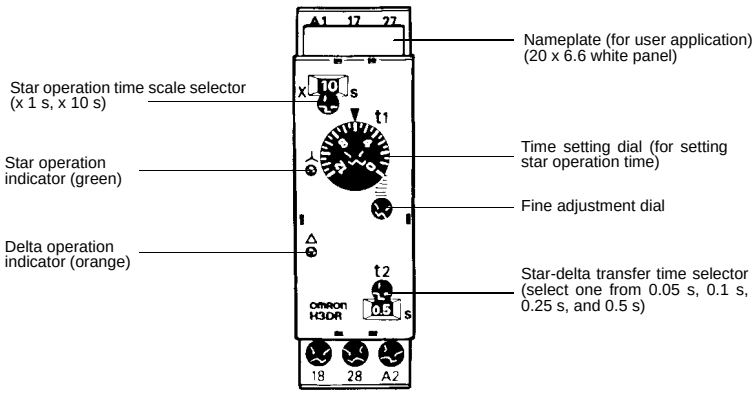
Note: The reset voltage is the residual voltage allowed from the power supply when returning the Timer to the status that existed prior to operation.

Engineering Data



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).

Nomenclature



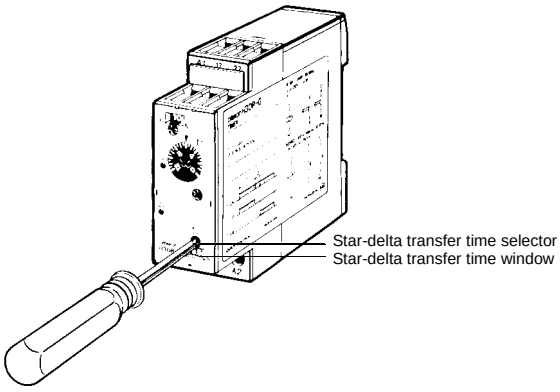
Note: The fine adjustment dial affects the setting on the main dial.

Operation

■ Basic Operation

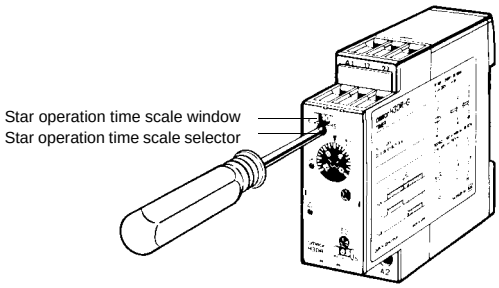
Time Unit Selection

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



Time Scale Selection

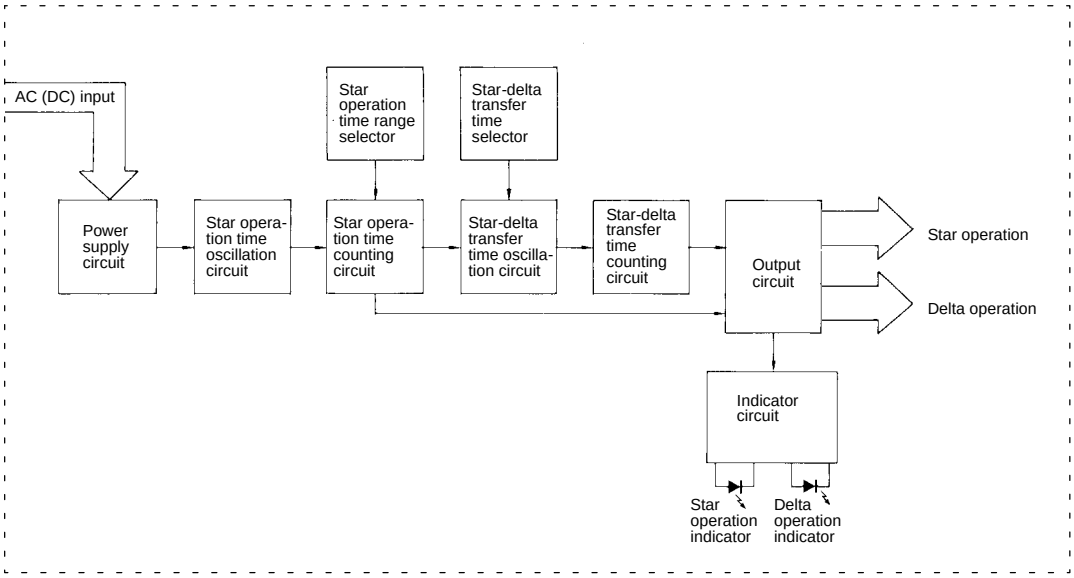
The scale (1 or 10) is selected with the time scale selector at the upper-left corner of the front panel and appears in the window above the selector.



Time Setting

Use the main dial to set the operation time.
The fine-tuning dial is useful when delicate or more accurate adjustment is required.

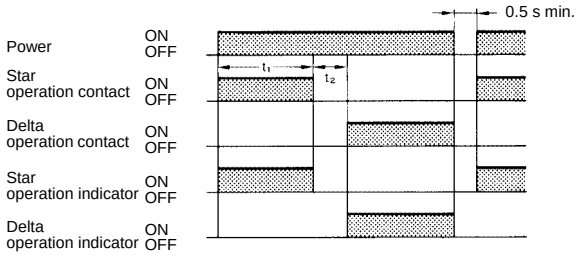
■ Block Diagram



■ I/O Functions

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

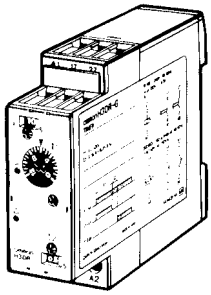
■ Timing Chart

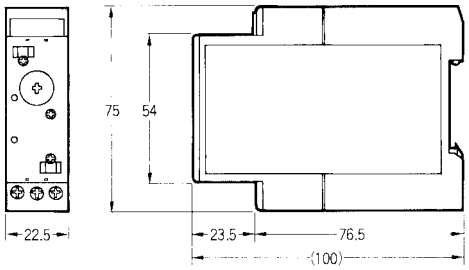


Note: t_1: Star operation time setting
t_2: Star-delta transfer time

Dimensions

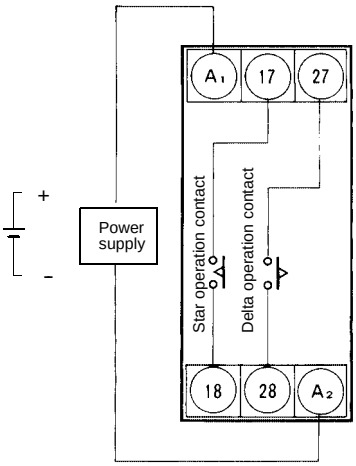
Note: All units are in millimeters unless otherwise indicated.





Installation

■ Terminal Arrangement



Solid-state Power OFF-delay Timer

H3DR-H

DIN 22.5-mm Solid-state Power OFF-delay Timer

- High immunity to invertor noise.
- Long power OFF-delay times;
  S-series: up to 12 seconds,
  L-series: up to 120 seconds.

RC

Ordering Information

Supply voltage	S-series	L-series
100 to 120 VAC	H3DR-H	H3DR-H
200 to 240 VAC		
24 VAC/DC		
48 VAC/DC		

Note: Specify both the model number and supply voltage when ordering.
Example: H3DR-H 24 VAC/DC S
Time span code
Supply voltage

Model Number Legend:

H3DR- j
1

1. Classification
H: Power OFF-delay timer

Specifications

■ General

Item	H3DR-H
Operating mode	Power OFF-delay
Terminal block	5 terminals used
Operating/Reset method	Instantaneous operation/Time-limit reset
Output type	Relay output (SPDT)
Mounting method	DIN track mounting
Approved standards	UL508, CSA C22.2 No.14 Conforms to VDE0435/2021 C/250, VDE0110, VDE0106/P100 Conforms to EN50081-2, prEN50082-2
Attachment	Name plate

■ Time Ranges

Time ranges	Setting	Setting range	Min. power ON time
S-series	**Time scale: x 0.1**	0.1 to 1.2 s	0.1 s min.
	Time scale: x 1	1 to 12 s	
L-series	**Time scale: x 1**	1 to 12 s	0.3 s min.
	Time scale: x 10	10 to 120 s	

Note: If the above minimum power ON time is not secured, the H3DR may not operate. Be sure to secure the above minimum power ON time. Allow at least 3 s for repeat synchronization of **time-out** operations (see *Precautions* on page 107).

■ Ratings

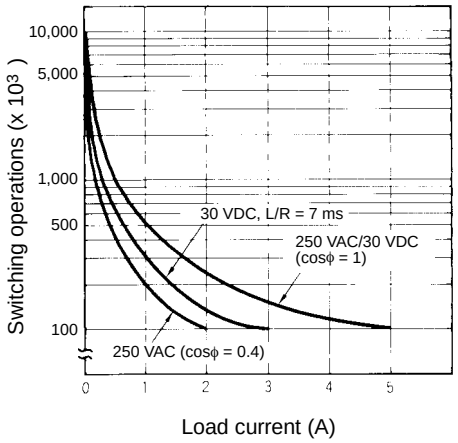
Rated supply voltage (see note)	100/110/120 VAC (50/60 Hz), 200/220/240 VAC (50/60 Hz), 24 VAC/DC (50/60 Hz), 48 VAC/DC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	100/110/120 VAC: approx. 0.5 VA 200/220/240 VAC: approx. 0.8 VA 24 VAC/DC: approx. 0.17 VA (AC), 0.13 W (DC) 48 VAC/DC: approx. 0.36 VA (AC), 0.34 W (DC)
Control outputs	Contact output: 5 A at 250 VAC, 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

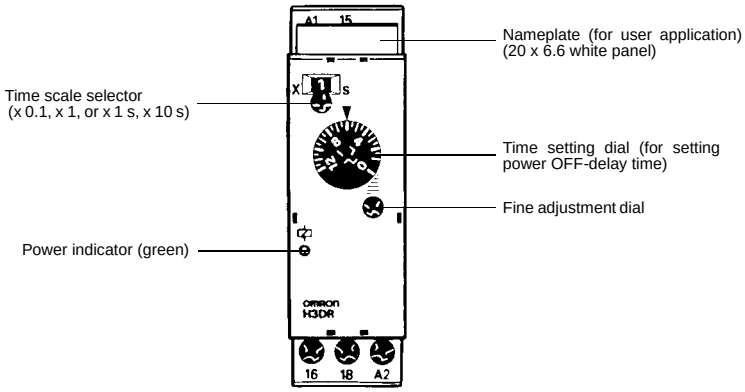
Accuracy of operating time	±1% FS max. (1% FS ±10 ms max. in ranges of 1.2 s)
Setting error	±10% FS ±0.05 s max.
Influence of voltage	±0.5% FS max. (±0.5% FS ±10 ms in ranges of 1.2 s)
Influence of temperature	±2% FS max. (±2% FS ±10 ms in ranges of 1.2 s)
Insulation resistance	100 MΩ min. (at 500 VDC)
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) 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 1 kV for 24 VAC/DC, 48 VAC/DC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 120 VAC, 200 to 240 VAC 1.5 kV for 24 VAC/DC, 48 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)
Static immunity	Malfunction: 4 kV Destruction: 8 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm single amplitude each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude each in three directions
Shock resistance	Destruction: 980 m/s^2 (100G) each in three directions Malfunction: 98 m/s^2 (10G) each in three 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)
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: IEC801-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC801-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4)
Enclosure ratings	IEC: IP40
Weight	Approx. 135 g

Engineering Data



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

Nomenclature



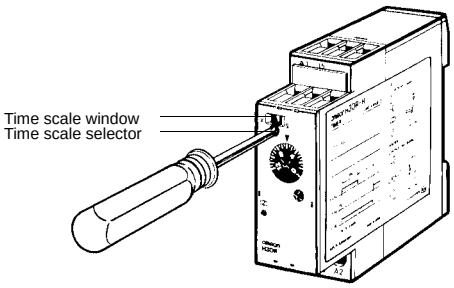
Note: The fine adjustment dial affects the setting on the main dial.

Operation

■ Basic Operation

Time Scale Selection

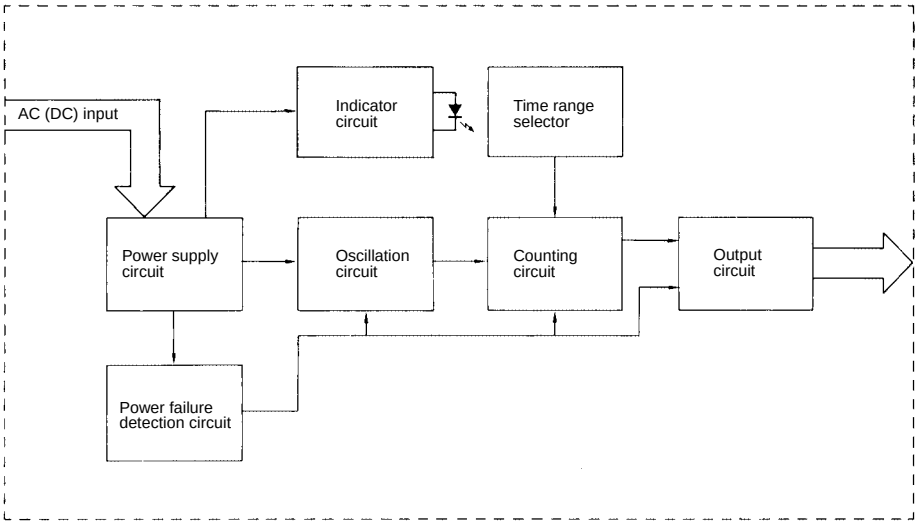
The scale is selected with the time scale selector at the upper-left corner of the front panel and appears in the window above the selector: 0.1 or 1 for S-series, 1 x 10 for L-series



Time Setting

Use the main dial to set the operation time.
The fine-tuning dial is useful when delicate or more accurate adjustment is required.

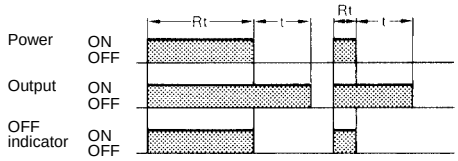
■ Block Diagram



■ 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.

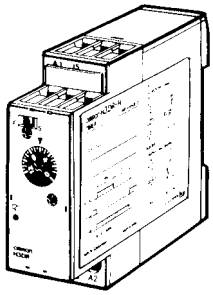
■ Timing Chart

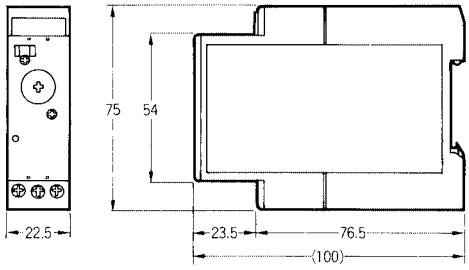


Note: t: Set time
Rt: Minimum power On time (S-series: 0.1 s min.; L-series: 0.3 s min.)
(The output may never turn ON if a value equal to or less than this value is used.)

Dimensions

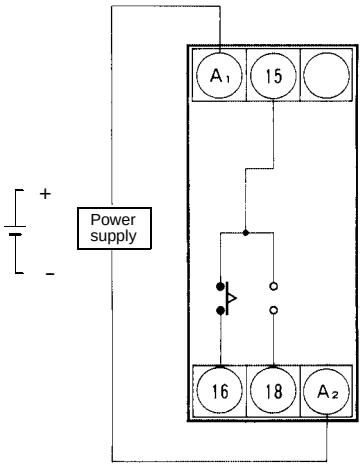
Note: All units are in millimeters unless otherwise indicated.





Installation

■ Terminal Arrangement



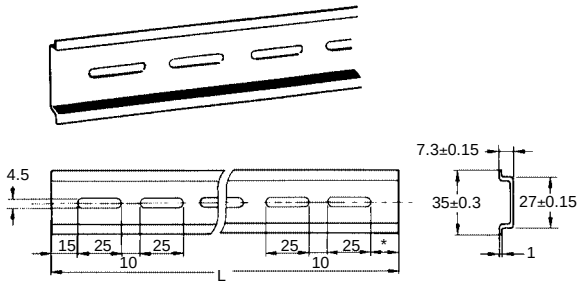
Dimensions

Note: The undermentioned is common for all H3DR-F/G/H models.

Note: All units are in millimeters unless otherwise indicated.

■ Accessories (Order Separately)

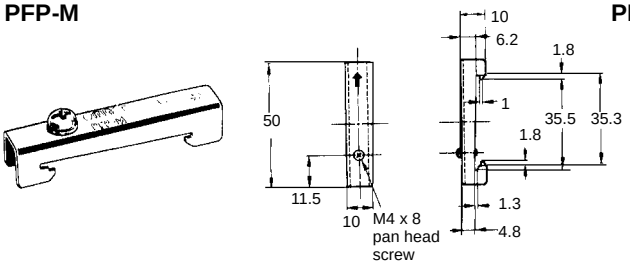
Mounting Track
PFP-100N, PFP-50N



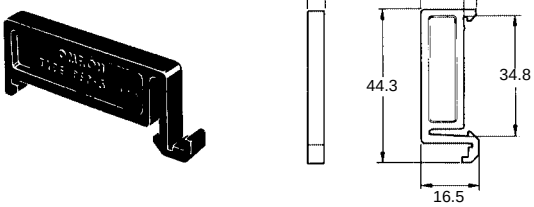
L: Length

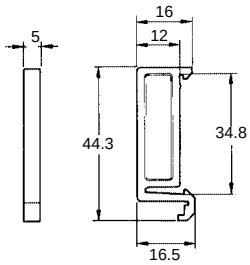
1 m	PFP-100N
50 cm	PFP-50N

End Plate
PFP-M



Spacer
PFP-S





Precautions

Note: The undermentioned is common for all H3DR-F/G/H models.

■ Changing of Setting

⚠ Caution

Do not change the time unit, time range, or operation mode while the timer is in operation or malfunction could result.

■ Power Supplies

An AC power supply can be connected to the power input terminals without regarding polarity. A DC power supply must be connected to the power input terminals as designated according to the polarity of the terminals.

A DC power supply can be connected if its ripple factor is 20% or less and the mean voltage is within the rated operating voltage range of the Timer.

Connect the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value at once or the Timer may not be reset or a timer error could result.

The H3DR-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.

Inrush Current

Model		Voltage	Applied voltage	Inrush current (peak value)	Time
H3DR-F		12 VDC	13.2 VDC	50 mA	10 ms max.
		24 VAC/DC	26.4 VAC	---	10 ms max.
			26.4 VDC	0.51 A	10 ms max.
		48 VDC	52.8 VAC	0.79 A	10 ms max.
		100 to 240 VAC	264 VAC	0.54 A	10 ms max.
H3DR-G		24 VAC/DC	26.4 VAC	0.79 A	5 ms max.
			26.4 VDC	0.54 A	10 ms max.
		48 VDC	52.8 VAC	0.54 A	5 ms max.
		100 to 240 VAC	264 VAC	0.67 A	5 ms max.
H3DR-H	S-series	24 VAC/DC	26.4 VAC	1.28 A	0.15 s max.
			26.4 VDC	0.87 A	
		48 VAC/DC	52.8 VAC	1.05 A	
			52.8 VDC	0.73 A	
		100/110/120 VAC	132 VAC	1.05 A	
		200/220/240 VAC	264 VAC	1.00 A	
	L-series	24 VAC/DC	26.4 VAC	1.33 A	0.3 s max.
			26.4 VDC	0.91 A	
		48 VAC/DC	52.8 VAC	1.05 A	
			52.8 VDC	0.73 A	
		100/110/120 VAC	132 VAC	1.05 A	
		200/220/240 VAC	264 VAC	1.01 A	

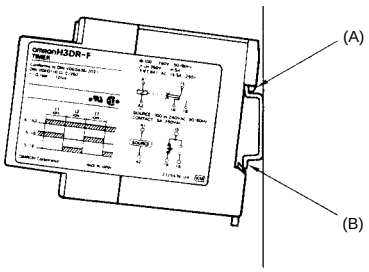
Note: 1. The above figures are all approximations and should be used for reference only.

2. The inrush current is given mainly for DC models for the required power supply design specifications. For the H3DR-H, the inrush current is also given for 100/110/120-VAC and 200/220/240-VAC models because these models have higher inrush currents than other series.

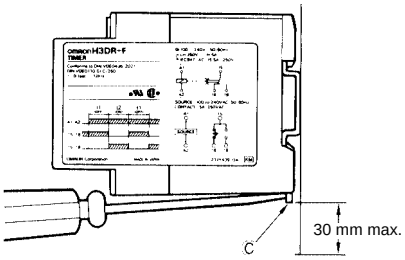
■ Mounting and Dismounting

The H3DR should be mounted as horizontally as possible.

When mounting the H3DR on a socket mounting track, hook portion (A) of the Timer to an edge of the track first, and then depress the Timer in the direction of (B).



When dismounting the H3DR, pull out portion (C) with a flat-blade screwdriver and remove the Timer from the mounting track.



The H3DR can be mounted and dismounted with ease if a distance of 30 mm or more is kept between the H3DR and other equipment.

■ Environment

When using the Timer in an area with excess electronic noise, separate the Timer and wiring as far as possible from the noise sources. Organic solvents (such as paint thinner), as well as very acidic or basic solutions can damage the outer casing of the Timer.

■ Others

If the Timer is mounted on a control board, dismount the timer from the control board or short-circuit the circuitry of the power board before carrying out a voltage withstand test between the electric circuitry and non current-carrying metal part of the Timer, in order to prevent the internal circuitry of the Timer from damage.

■ Changing Switches

The time unit and time range can be set by turning them either clockwise or counterclockwise.

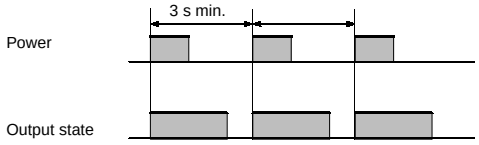
The switches are designed to click into place. Be sure that the switches are in the proper place and do not leave them between settings. Leaving switches between settings can cause faulty operation.

■ Wiring (H3DR-H)

The H3DR has a high impedance circuit. Therefore, the H3DR may not be reset if the H3DR is influenced by inductive voltage. In order to eliminate any influence of inductive voltage, the wires connected to the H3DR must be as short as possible and should not be installed alongside power lines. If the H3DR is influenced by inductive voltage that is 30% or more of the rated voltage, connect a CR filter with a capacitance of approximately 0.1 μF and a resistance of approximately 120 Ω or a bleeder resistor between the power supply terminals. If there is any residual voltage due to current leakage, connect a bleeder resistor between the power supply terminals.

■ Operation (H3DR-H)

An interval of 3 s minimum is required to turn on the H3DR after the H3DR is turned off. If the H3DR is turned on and off repeatedly with an interval of shorter than 3 s, the internal parts of the H3DR may deteriorate and the H3DR may malfunction.



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L87-E1-1A

OMRON

Solid-state Timer

H3CA

DIN-sized (48 x 48, 45 x 75 mm) Timer with Digital Setting and LCD Display

- Dual power supplies for free AC/DC.
- Eight operation modes selectable with one unit.
- Any desired time can be set digitally within a range from 0.1 seconds to 9,990 hrs.
- Four external signal inputs.
- ON/OFF indicator for control output and bar indicator for remaining time.

RC+

Ordering Information

Operation/resetting system	Operation mode	Terminal	Time-limit contact	Instantaneous contact	Mounting	
					Surface mounting/ track mounting	Flush mounting
Time-limit operation/ self-resetting/external resetting (see note 2)	8 operation modes (selectable) (see note 3)	11-pin round socket	SPDT	---	H3CA-A	H3CA-A
		Front screw			H3CA-FA	---
Time-limit operation/ self-resetting	ON-delay operation	8-pin round socket	DPDT	---	H3CA-8	H3CA-8
			SPDT	SPDT	H3CA-8H	H3CA-8H

Note: 1. Specify both the model number and supply voltage when ordering for the H3CA-8H and H3CA-8.

2. The operation/resetting system depends on the selected operation mode. For details, see *"Timing Chart".*

3. The 8 operation modes are as follows:

A: ON-delay operation
B: Repeat cycle operation
C: Signal ON/OFF-delay operation (1)
D: Signal OFF-delay operation (1)
E: Interval operation
F: One-shot and flicker operation
G: Signal ON/OFF-delay operation (2)
H: Signal OFF-delay operation (2)

■ Accessories (Order Separately)

Timer	Track mounted socket (see note 1)	Back connecting socket	
		Solder terminal	Screw terminal
H3CA-A	P2CF-11	PL11	P3GA-11
H3CA-8H/H3CA-8	P2CF-08	PL08	P3G-08

Note: Track mounted socket can be used as a front connecting socket.

Specifications

■ Time Ranges

A desired time can be set within a range of 0.1 s to 9,990 hrs by combining the three thumbwheel switch modules for time setting and one module for time unit selection.

Time unit		0.1 s	1 s	0.1 min	1 min	0.1 hrs	1 hr	10 hrs
Time range	1 to 999 (3 digits)	0 0 1 0.1 S to 9 9 9 10 h						

■ Ratings

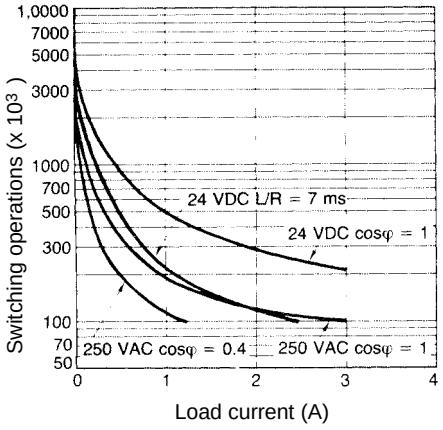
Item	H3CA-A/H3CA-FA	H3CA-8	H3CA-8H
Rated supply voltage	24 to 240 VAC (50/60 Hz), 12 to 240 VDC (permissible ripple: 20% max.)	100/110/120, 200/220/240 VAC, (50/60 Hz), 24 VDC (permissible ripple: 20% max.) (see note)	
Operating voltage range	90% to 110% of rated supply voltage	85% to 110% of rated supply voltage	
Power consumption	AC: approx. 2 VA DC: approx. 2 W	AC: approx. 10 VA/1 W DC: approx. 1 W	AC: approx. 10 VA/1.5 W DC: approx. 2 W
Control outputs	3 A at 250 VAC, resistive load ($\cos\phi = 1$)		

Note: Single-phase, full-wave rectified power sources may be used for 24 to 240 VDC.

■ Characteristics

Accuracy of operating time	±0.3% ±0.05 s
Influence of voltage	
Influence of temperature	
Setting error	±0.5% ±0.05 s
Reset time	H3CA-A/-FA: 0.5 s max. H3CA-8H/-8: 0.1 s max.
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts and between contact and control circuit) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: −10°C to 55°C
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 10,000,000 operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (3 A at 250 VAC, $\cos\phi = 1$ at 1,800 operations/h)
Approved standards	UL (File No. E41515), CSA (File No. LR22310), SEV
Weight	H3CA-A: approx. 110 g H3CA-FA: approx. 190 g

Engineering Data



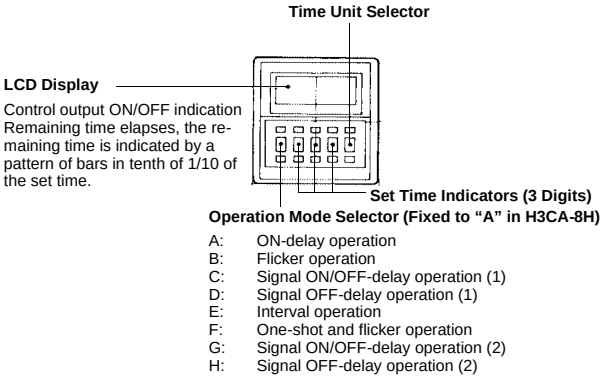
Reference: A maximum current of 0.15 A can be switched at 125 VDC ($\cos\phi = 1$). Maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.

Note: 1. The H3CA Series has been tested for the following: impulse voltages, noise (via noise simulator, for L loads, and for relay oscillation), and resistance to static electricity.

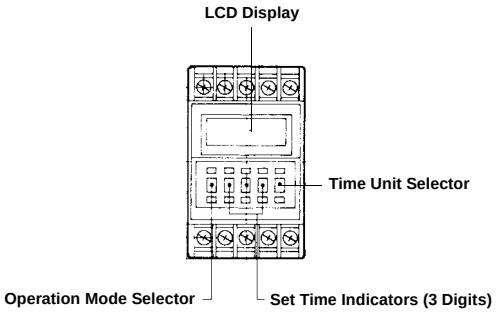
2. Minimum applicable load (P reference values):
H3CA-A(FA), H3CA-8H: 100 mA at 5 VDC
H3CA-8: 10 mA at 5 VDC

Nomenclature

H3CA-A/H3CA-8H



H3CA-FA



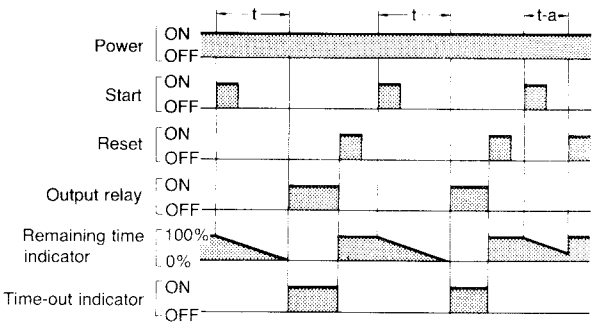
Operation

■ Timing Chart

H3CA-A (FA)

ON-delay Operation (A Mode)

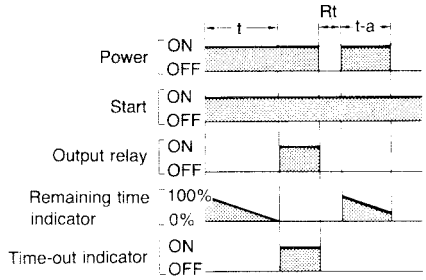
Signal Start



t: Set time; t-a: Time within the set time

Note: The minimum signal input time is 0.05 s.

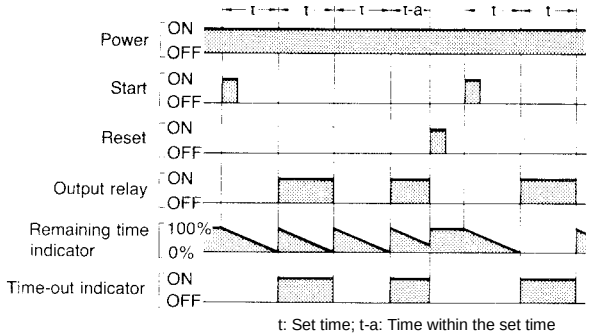
Power-ON Start/Power-OFF Reset



t: Set time; R: Resetting time; t-a: Time within the set time

Flicker Operation (B Mode)

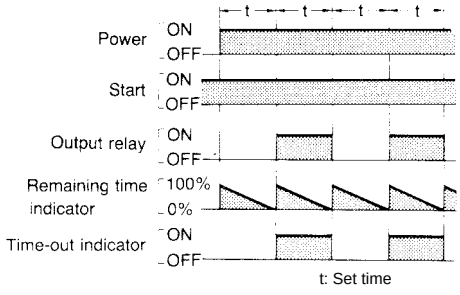
Signal Start



t: Set time; t-a: Time within the set time

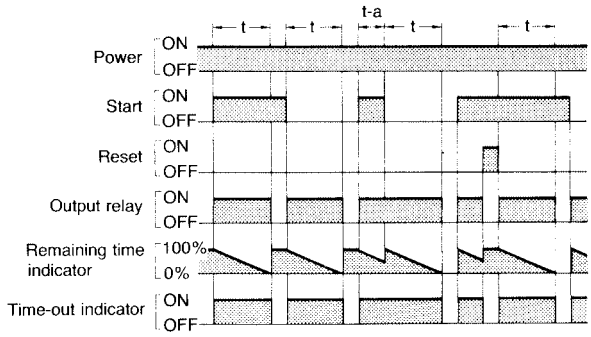
Note: The minimum signal input time is 0.05 s.

Power-ON Start/Power-OFF Reset



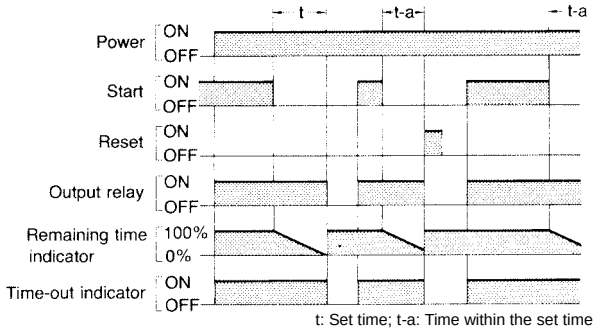
t: Set time

Signal ON/OFF-delay Operation 1 (C Mode)



t: Set time; t-a: Time within the set time

Signal OFF-delay Operation 1 (D Mode)

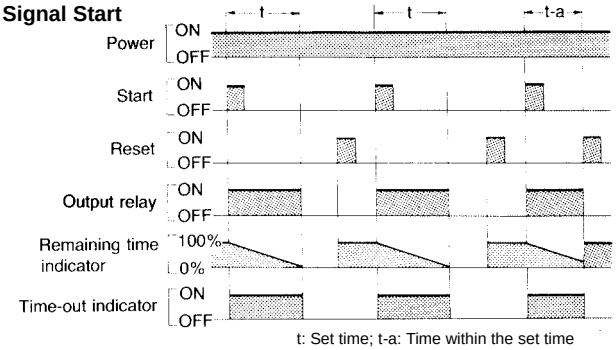


t: Set time; t-a: Time within the set time

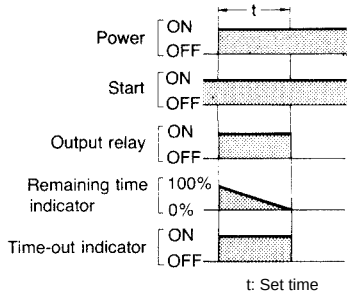
Note: 1. The minimum signal input time is 0.05 s.
2. Operation 1 refers to the version in which the output relay operates when the Start signal is ON.

Interval Operation (E Mode)

Signal Start



t: Set time; t-a: Time within the set time

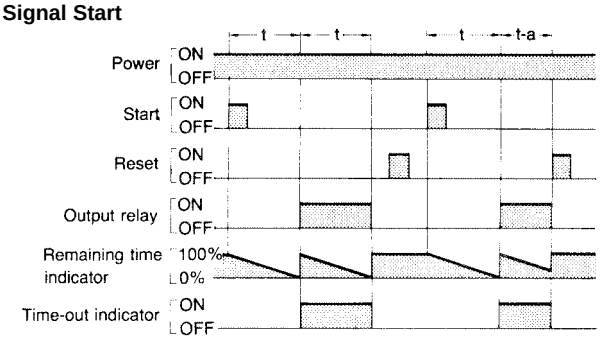


t: Set time

Note: The minimum signal input time is 0.05 s.

One-shot and Flicker Operation (F Mode)

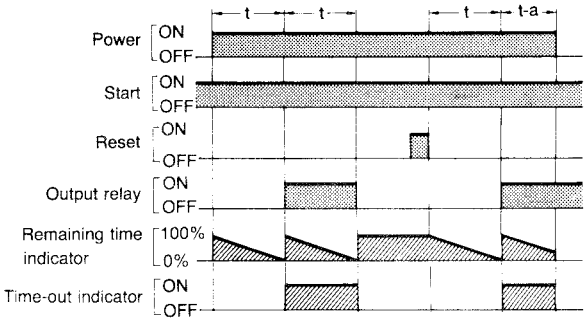
Signal Start



t: Set time; t-a: Time within the set time

Note: The minimum signal input time is 0.05 s.

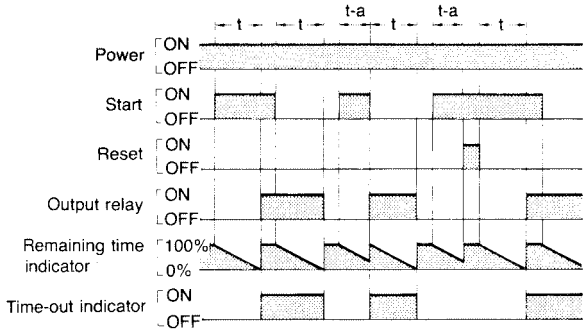
Power-ON Start/Power-OFF Reset



t: Set time; t-a: Time within the set time

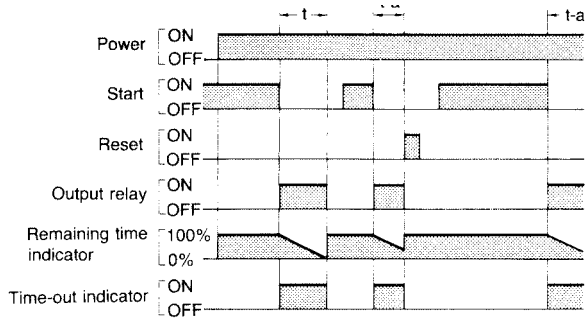
Note: The minimum signal input time is 0.05 s.

Signal ON/OFF-delay Operation 2 (G Mode)



t: Set time; t-a: Time within the set time

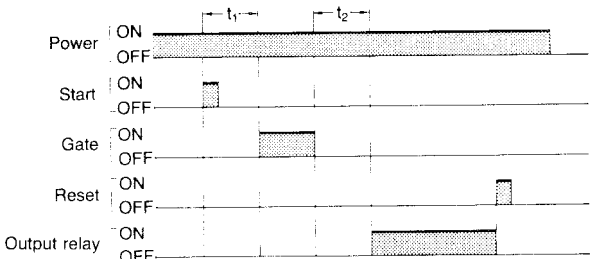
Signal ON/OFF-delay Operation 2 (H Mode)



t: Set time; t-a: Time within the set time

Note: 1. The minimum signal input time is 0.05 s.
2. Operation 2 refers to the version in which the output relay does not operate when the Start signal is ON.

How to Use Gate Signal Input

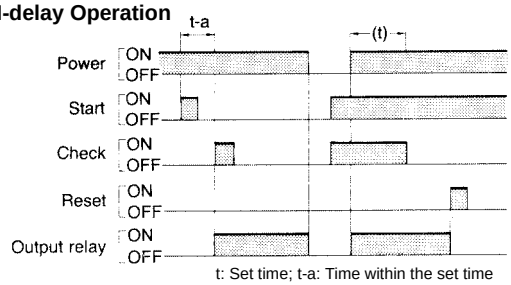


Note: 1. This timing chart indicates the gate input in operation mode A (ON-delay operation).
2. The set time is the sum of t_1 and t_2.

How to Use Check Signal Input

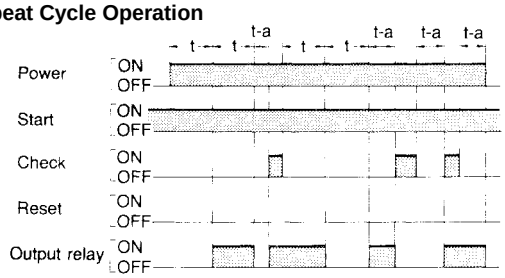
If a check signal is input to the timer during the lapse of a set time, the remaining set time will become 0 and the timer will enter the next control state. Also, while a check signal is being input, the elapsed time measurement of the set time is not performed.

ON-delay Operation



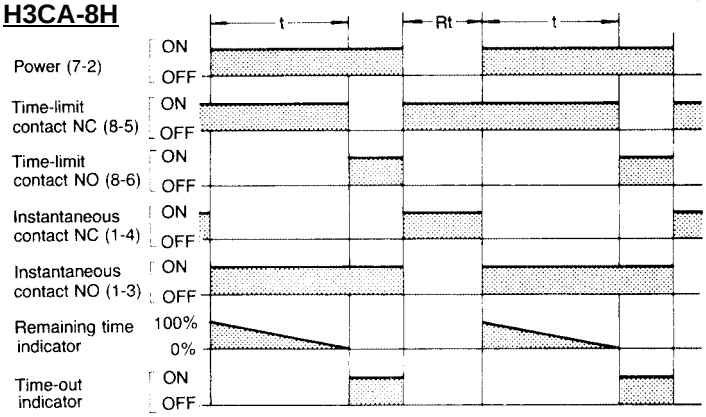
t: Set time; t-a: Time within the set time

Repeat Cycle Operation



t: Set time; t-a: Time within the set time

H3CA-8H

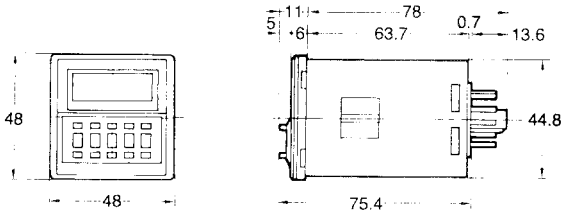


Dimensions

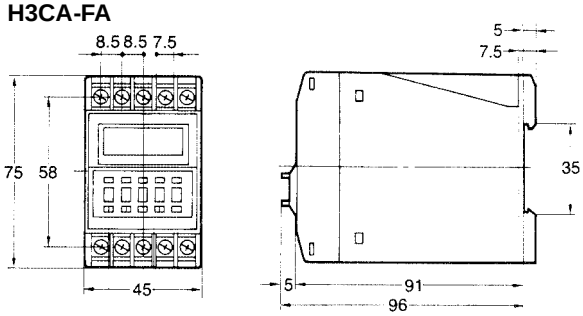
Note: All units are in millimeters unless otherwise indicated.

■ Timers

H3CA-A/-8H



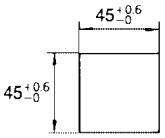
H3CA-FA



Panel Cutouts

When mounting a single unit

t = 1 to 3.2 mm



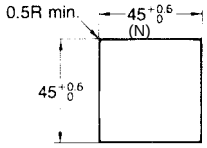
Horizontally connecting n units

No front cover:

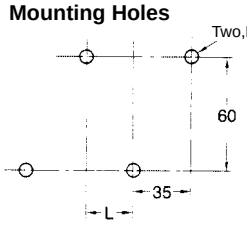
$N = (48n - 2.5)^{+1}/_{-0}$

With front cover:

$N = \{48n - 2.5 + (n - 1) \times 3\}^{+1}/_{-0}$



Mounting Holes

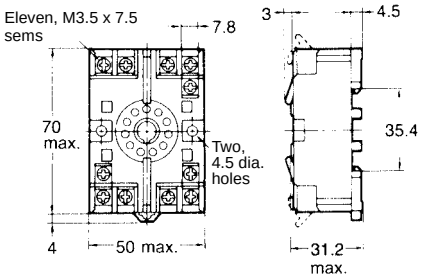


Note: When mounting two or more timers in line, dimension L between two adjacent timers should be 10 mm min.

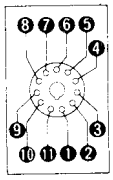
■ Accessories (Order Separately)

Track Mounted Front Connecting Socket

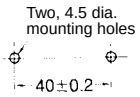
P2CF-11



Terminal Arrangement (Top View)

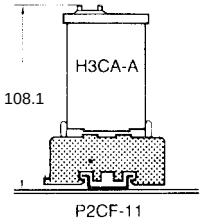


Mounting Holes

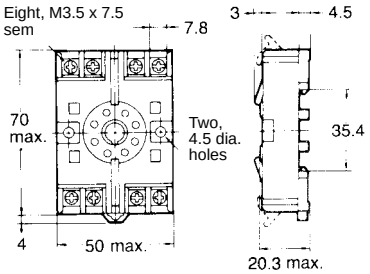


Note: P2CF-11 can be used as a front connecting socket.

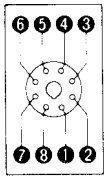
Mounting Height of Timer with Socket



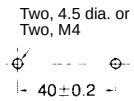
P2CF-08



Terminal Arrangement (Top View)

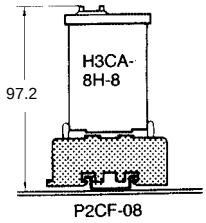


Mounting Holes



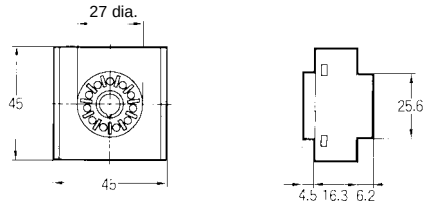
Note: P2CF-08 can be used as a front connecting socket.

Mounting Height of Timer with Socket

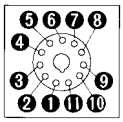


Back Connecting Socket

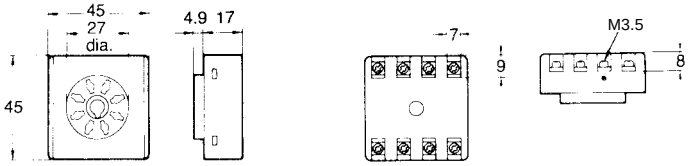
P3GA-11



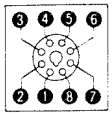
Terminal Arrangement (Bottom View)



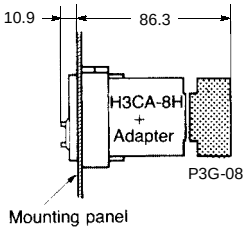
P3G-08



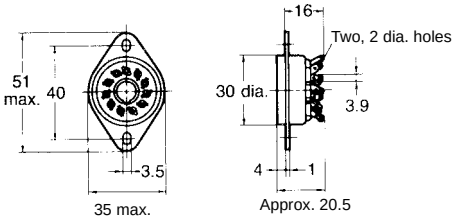
Terminal Arrangement (Bottom View)



Mounting Height of Timer with Socket

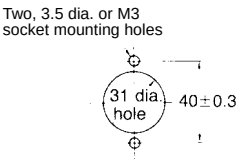


PL11

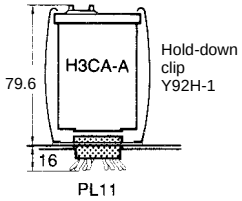


Terminal Arrangement (Bottom View)

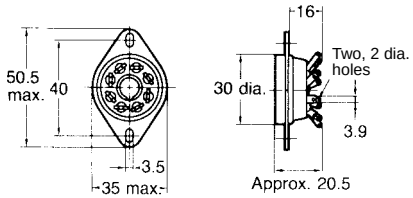
Mounting Holes



Mounting Height of Timer with Socket

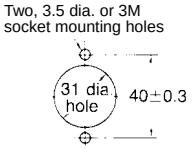


PL08

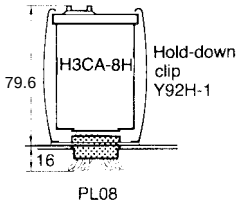


Terminal Arrangement (Bottom View)

Mounting Holes

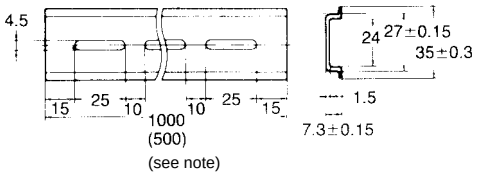


Mounting Height of Timer with Socket



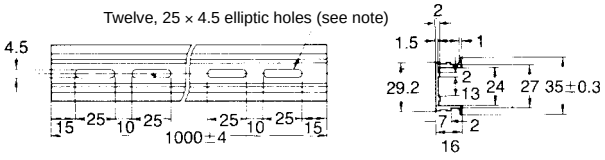
Mounting Track (Meets DIN EN50022)

PFP-100N/PFP-50N



Note: This dimension applied to PFP-50N.

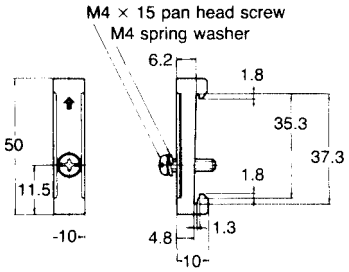
PFP-100N2



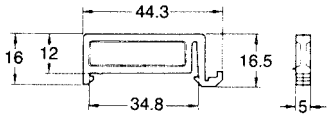
Note: A total of 12-25 x 4.5 elliptic holes are provided with 6 holes cut from each rail end at a pitch of 10 mm between holes.

End Plate

PFP-M

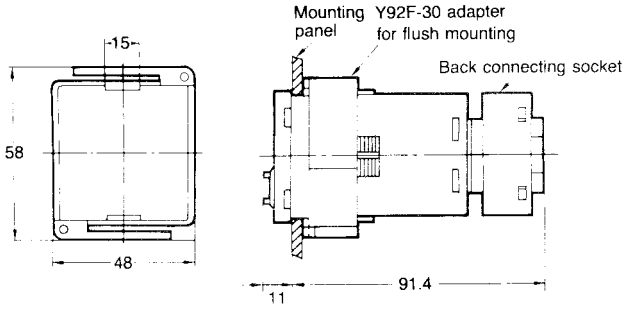


PFP-S



Adapter for Flush Mounting

Y92F-30



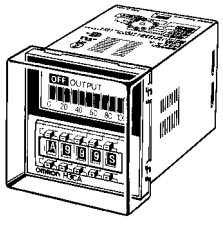
Note: Pay attention to the orientation of the adapter when mounting two or more timers in a vertical or horizontal line.

Protective Cover

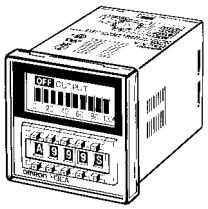
Y92A-48B/Y92A-48D

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

Y92A-48D
Hard Plastic Cover



Y92A-48D
Soft PVC Cover

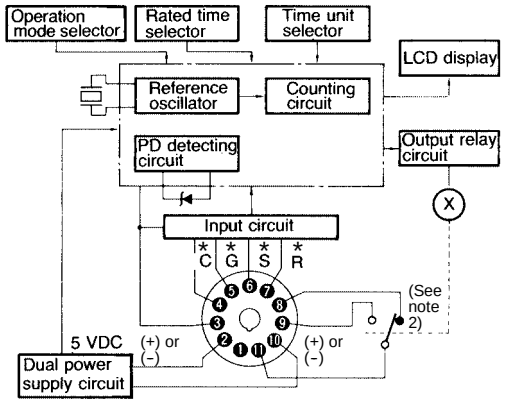


Note: The Y92A-48B Protective Cover is made of a hard plastic and therefore, must be removed to change the timer set value. However, since the Y92A-48D Protective Cover is made of PVC, the set value can be altered by pressing on the surface of the cover.

Installation

■ Terminal Arrangement

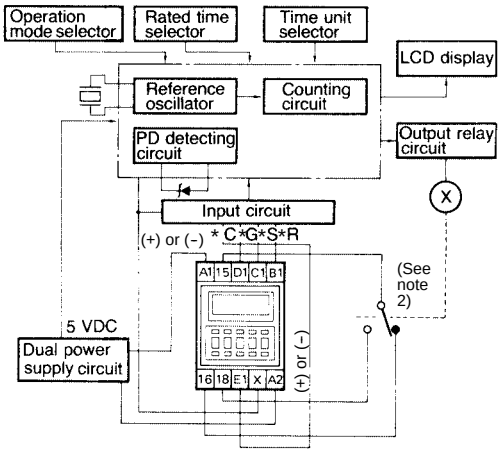
H3CA-A



Note: 1. *C: Check: C–D
*G: Gate: C–E
*S: Start: C–F
*R: Reset: C–G

2. Conventional time-limit contacts are symbolized as . However, the contacts of H3CA-A are symbolized as because timer has 8 operation modes.

H3CA-FA



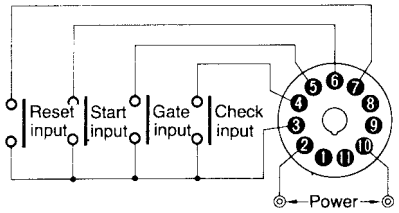
Note: 1. *C: Check: X-E1
*G: Gate: X-D1
*S: Start: X-C1
*R: Reset: X-B1

2. Conventional time-limit contacts are symbolized as . However, the contacts of H3CA-FA are symbolized as because timer has 8 operation modes.

■ Input Connections

Signal Inputs

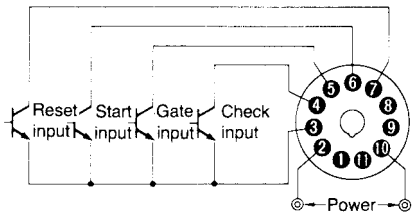
Connect the start input contact between terminals C and F, the reset input contact between terminals C and G, the gate input contact between terminals C and E, and the check input contact between terminals C and D.



For each signal input contact, use a gold-plated contacts with high reliability. Be sure that these input signals satisfy the following requirements: a resistance of 1 kΩ (max.) and a residual voltage of 1 V (max.) when the contact is made.

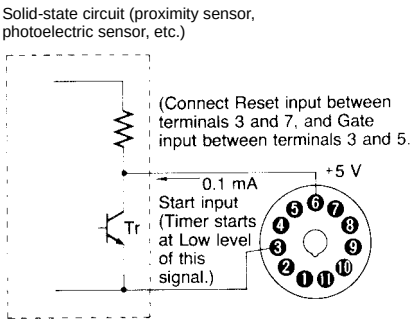
Solid-state Signal Inputs

Connect the start input transistor between terminals C and F, the reset input transistor between terminals C and G, the gate input transistor between terminals C and E, and the check input transistor between terminals C and D.



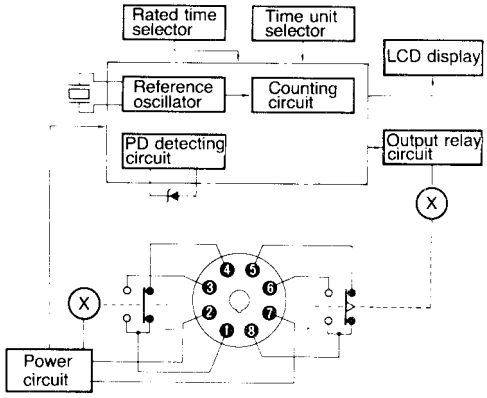
For signal input, use an open collector type transistor with characteristics: V_{CEO} = 20 V min., $V_{CE(S)}$ = 1 V max., IC = 50 mA min. and I_{CBO} = 0.5 μA max. In addition, be sure that the input signals satisfy the following requirements: a resistance of 1 kΩ (max.) and a residual voltage of 1 V (max.) when the transistor is ON, and a resistance of 200 kΩ (min.) when the transistor is OFF.

From a solid-state circuit (proximity sensor, photoelectric sensor, or the like) with rated power supply voltage ranging from 6 to 30 VDC, input signals can also be applied by other than an open collector type transistor as shown in the following diagram. The input signal from a solid-state circuit is applied when output transistor Tr turns ON. In terms of signal voltage, the signal is input when it goes from a high to low level. Again, the residual voltage should be 1 V (max.) when the transistor is ON. As the current output from the timer to Tr is approximately 0.1 mA, this connection is possible provided the residual voltage is kept to a maximum of 1 V.

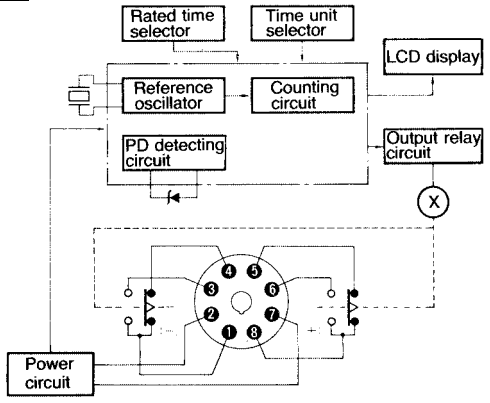


Note: Except for the power supply circuitry, avoid the laying of input signal wires in parallel or in the same conduit with high-tension or power lines. It is recommended to use shielded wires or wiring with independent metal conduits for the shortest possible distance.

H3CA-8H



H3CA-8

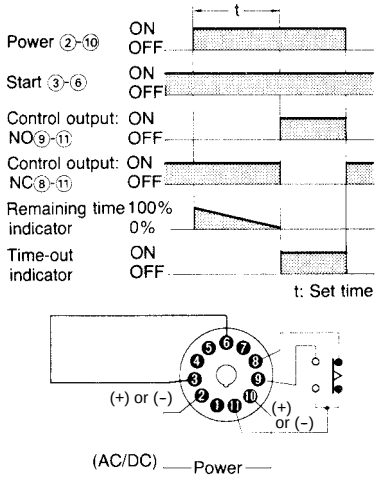


■ Application Examples

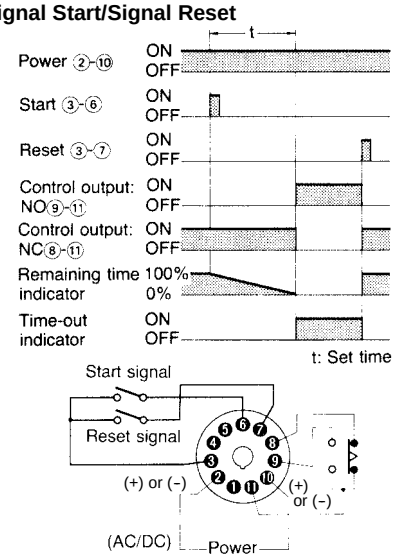
Standard type H3CA is used for the following application examples. In the schematic diagrams, each thick the indicates the wiring necessary for selecting the desired operation mode.

ON-delay Operation (A Mode)

Power-ON Start/Power-OFF Reset

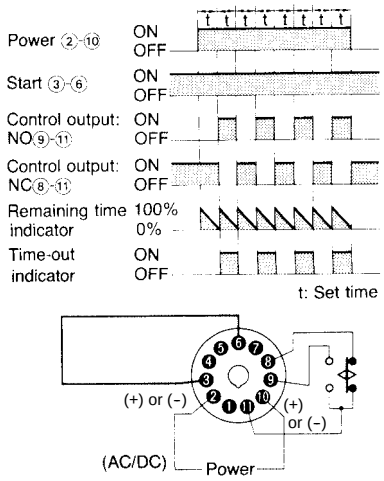


Signal Start/Signal Reset

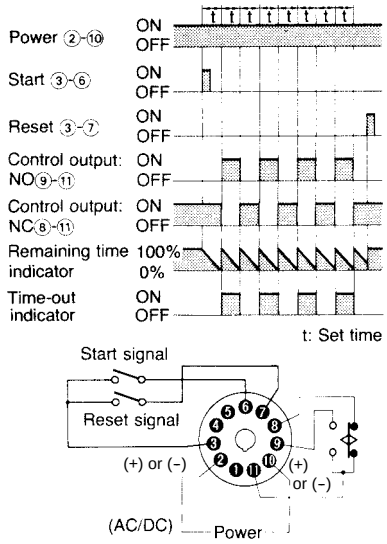


Flicker Operation (B Mode)

Power-ON Start/Power-OFF Reset

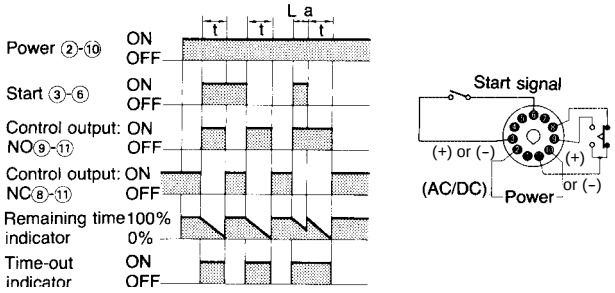


Signal Start/Signal Reset



Signal ON/OFF-delay Operation 1 (C Mode)

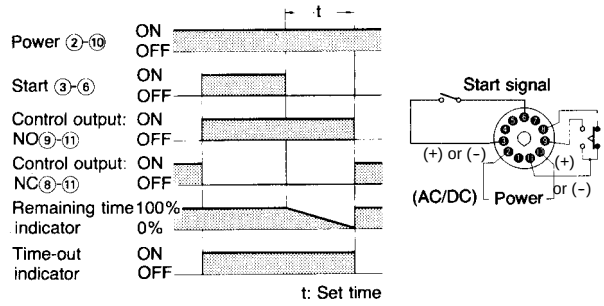
Signal ON/OFF-start/Instantaneous Operation/ Time-limit Reset



t: Set time, t-a: Time within the set time

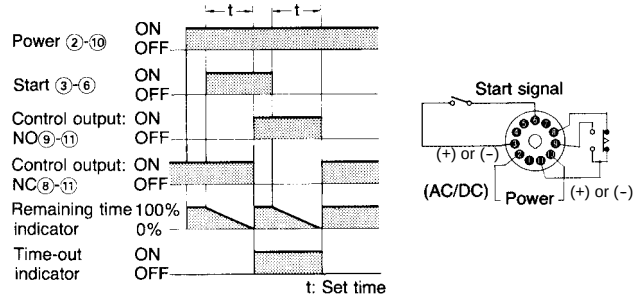
Signal OFF-delay Operation 1 (D Mode)

Signal Start/Instantaneous Operation/Time-limit Reset

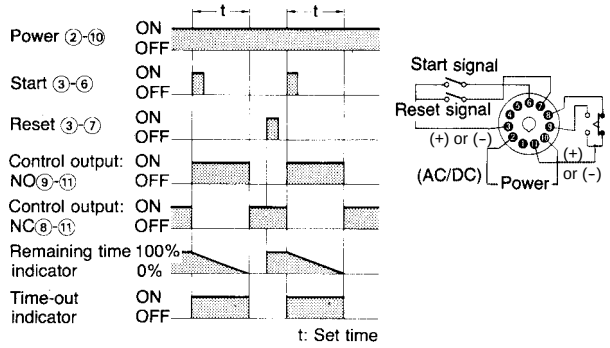


Signal ON/OFF-delay Operation 2 (G Mode)

Signal ON/OFF-start/Instantaneous Operation/ Time-limit Reset

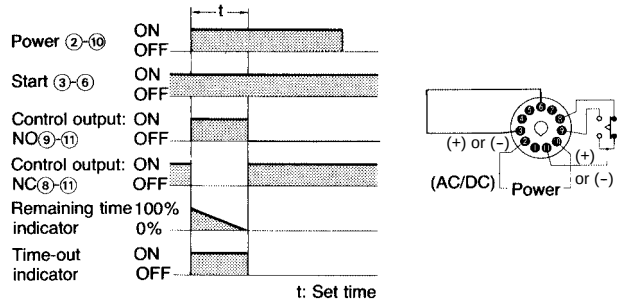


Signal Start/Signal Reset

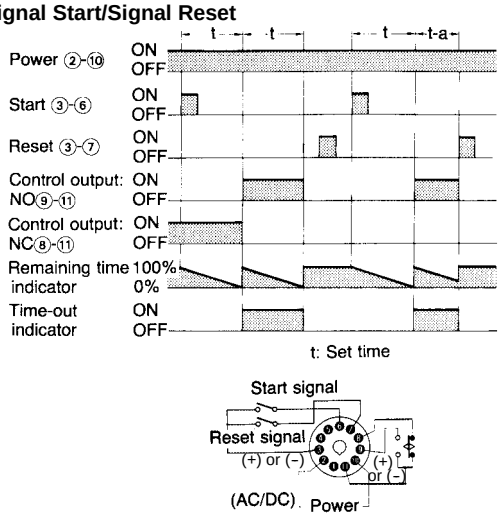


Interval Operation (E Mode)

Power-ON Start/Power-OFF Reset

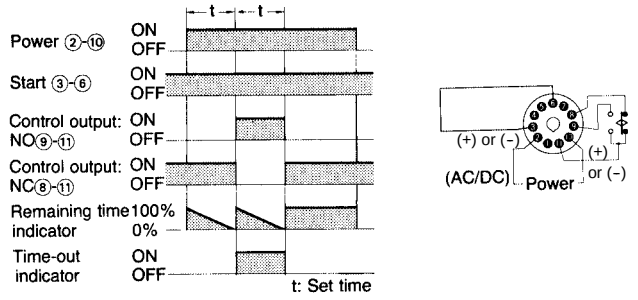


Signal Start/Signal Reset



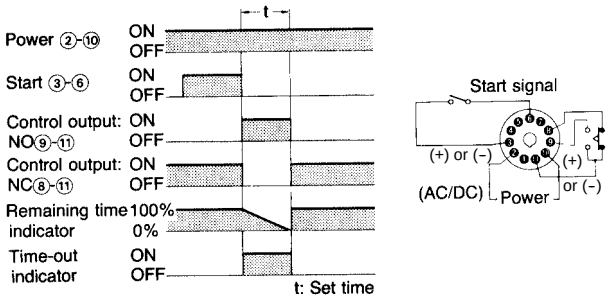
One-shot and Flicker Operation (F Mode)

Power-ON Start/Power-OFF Reset



Signal OFF-delay Operation 2 (H Mode)

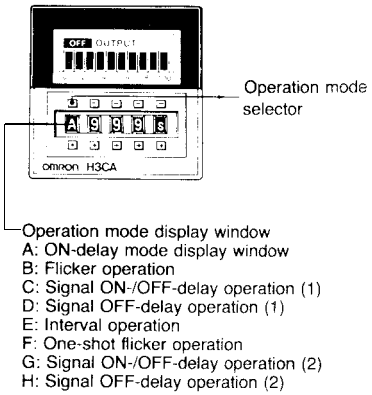
Signal/Instantaneous Operation/Time-limit Reset



Precautions

How to Change Operation Mode

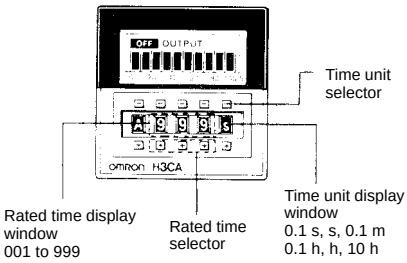
Operate the pushbuttons of the thumbwheel switch, located at the leftmost position on the front panel to set the operation mode. Eight operation modes (A, B, C, D, E, F, G, and H) are selectable and the selected operation mode is displayed in the operation mode display window.



Note: The operation mode is fixed to "A" for H3CA-8H.

How to Change Time Unit and Rated Time

Operate the pushbuttons of the rightmost thumbwheel switch to select the desired time unit. Seven time units (0.1 s, s, 0.1 m, m, 0.1 h, h, or 10 h) are selectable and the selected time unit is displayed in the time unit display window. The desired rated time is specified by operating the three thumbwheel switches in the middle of the front panel. The range of rated time is 001 to 999 for each unit.



Time Unit and Rated Time

Time unit	Rated time
0.1 s	0.1 to 99.9 s
s	1 to 999 s
0.1 min	0.1 to 99.9 min
min	1 to 999 min
0.1 hrs	0.1 to 99.9 hrs
hr	1 to 999 hrs
10 hrs	10 to 9,990 hrs

⚠ Caution

1. Do not change the time unit, rated time, or operation mode while the timer is in operation. Otherwise, the timer may malfunction or be damaged. Be sure to turn off the power supply to the timer before changing the timer unit, rated time or operation mode.
2. Note that output will be generated in C, D, E, G, or H mode even if the rated time is set to 000. No output will be generated in A, B, or F mode.

Connecting the Operating Power Supply

The H3CA-8 j contains a capacitor-drop power circuit. Use a sinusoidal power supply with a commercial frequency. Do not use power supplies with a high frequency component (such as inverter power supplies) for Timers with 100 to 240-VAC specifications. Using these power supplies can damage internal circuits.

The power supply connections to the H3CA-A and H3CA-FA can be made without regard to polarity for both AC and DC power supplies; just connect to the specified terminals (2 and 10, or A1 and A2). When connecting a DC power supply to the H3CA-8 or H3CA-8H, however, the polarity must be connected as indicated.

Although there is a wide range of power connectable to the H3CA-A and H3CA-FA, be sure that there is no inductive voltage or residual voltage applied to the timer power supply terminals (2 and 10, or A1 and A2) when the power switch is turned OFF. (Inductive voltage can be generated in the power supply line if it is placed in parallel with high-voltage or power lines.)

A DC power supply can be connected if its ripple factor is 20% or less and the mean voltage is within the rated operating voltage range of the Timer.

Connect the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value at once or the Timer may not be reset or a timer error could result.

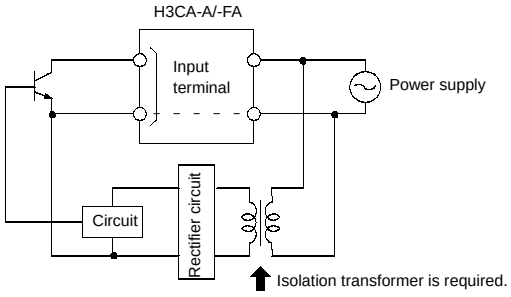
H3CA-8 and H3CA-8H Timers with AC specifications are equivalent to capacitor loads. When switching the Timer power supply with an SSR, use an SSR with a withstand voltage of twice the power supply voltage.

Input/Output

The operation of the output contacts varies with the operation specifications. Before making connections, check the operation specifications and operating conditions using the application examples provided.

The H3CA-A and H3CA-FA do not use transformers. Simultaneous inputting power from two or more power supplies to separate timers or counters from a single input contact or transistor is not possible.

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.



A transformer is not used in the power supplies for the H3CA-A and H3CA-FA. You can therefore receive an electrical shock by touching the input terminals when the power supply voltage is being applied. Take adequate precautions to protect against electrical shock.

Inputs to input signal terminals are made by shorting the individual input terminals to the common terminal (terminal 3 for the H3CA-A or terminal (X) for the H3CA-FA). Internal circuits may be damaged if connections are made to any other terminals or if voltages are applied.
If contacts are used to short the terminals, they will be switching a low voltage (approximately 5 VDC) and current (approximately 100 μA). You must therefore use high-reliability contacts with a contact resistance of 1 kΩ or less when shorted and residual voltage of 1 V maximum when shorted.

The reset input will take priority if both the set and reset inputs are turned ON simultaneously.

Others

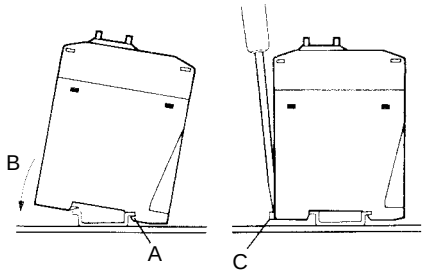
Holding relays are used for outputs on the H3CA-A Series. Dropping the Unit or otherwise subjecting it to shock can cause the relay to reverse or to move to the center position.

How to Mount the Timer on Mounting Track

When mounting a H3CA-FA Timer on a socket mounting track, observe the following procedures:

Mounting

First hook portion A of the timer to an edge of the track and then depress the timer in direction B.



Dismounting

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

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L32-E1-6

OMRON

Solid-state Timer

New H3Y

Miniature Timer Compatible with the MY Relay

- Semi-multi power supply voltage.
- Large transparent time setting knob facilitates time setting. A flat-blade and Phillips screwdriver can also be used for time setting.
- Pin configuration compatible with MY Power Relay.
- LED indication for power and output statuses.
- Conforms to EMC standards.
- Conforms to VDE0435/P2021 and approved by UL and CSA.

CE RC

Ordering Information

Operation/resetting system	Time-limit contact	Time ranges	Supply voltage	Mounting	
				Surface /DIN-track mounting (with socket)	Surface mounting (with PCB terminals)
Time-limit operation/ self-resetting	DPDT (for power switching)	0.04 s to 3 h	24, 100 to 120, 200 to 230 VAC (50/60 Hz); 12, 24, 48, 125, 100 to 110 VDC	H3Y-2	H3Y-2-0
	4PDT			H3Y-4	H3Y-4-0

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

Ex. H3Y-2 100 to 120 VAC 0.5 s

Rated time

Supply voltage

■ Accessories (Order Separately)

Timer	Track mounted socket (see note 1)	Back connecting socket		
		Solder terminal	Wire-wrap terminal	PC terminal
H3Y-2	PYF08A, PYF08A-N	PY08	PY08QN(2)	PY08-02
H3Y-4	PYF14A, PYF14A-N	PY14	PY14QN(2)	PY14-02

Note: Track mounted socket can be used as a front connecting socket.

Specifications

■ Time Ranges

Rated time	Time setting range	Rated time	Time setting range
0.5 s	0.04 to 0.5 s	3 min	0.1 to 3 min
1 s	0.1 to 1 s	5 min	0.2 to 5 min
5 s	0.2 to 5 s	10 min	0.5 to 10 min
10 s	0.5 to 10 s	30 min	1 to 30 min
30 s	1.0 to 30 s	60 min	2 to 60 min
60 s	2.0 to 60 s	3 h	0.1 to 3 h
120 s	5.0 to 120 s	---	---

■ Ratings

Item	H3Y-2(-0)/H3Y-4(-0)
Rated supply voltage	24, 100 to 120, 200 to 230 VAC (50/60 Hz), 12, 24, 48, 125, 100 to 110 VDC (see note 1)
Operating voltage range	All rated voltages except 12 VDC: 85% to 110% of rated supply voltage 12 VDC: 90% to 110% of rated supply voltage (see note 2)
Power consumption	24 VAC: Relay ON: 1.5 VA (1.1 W) (at 24 VAC, 60 Hz) Relay OFF: 0.2 VA (0.1 W) (at 24 VAC, 60 Hz) 100 to 120 VAC: Relay ON: 1.5 VA (1.3 W) (at 120 VAC, 60 Hz) Relay OFF: 0.8 VA (0.5 W) (at 120 VAC, 60 Hz) 200 to 230 VAC: Relay ON: 1.8 VA (1.5 W) (at 230 VAC, 60 Hz) Relay OFF: 1.2 VA (0.9 W) (at 230 VAC, 60 Hz) 12 VDC: Relay ON: 0.9 W (at 12 VDC) Relay OFF: 0.07 W (at 12 VDC) 24 VDC: Relay ON: 0.9 W (at 24 VDC) Relay OFF: 0.07 W (at 24 VDC) 48 VDC: Relay ON: 1.0 W (at 48 VDC) Relay OFF: 0.2 W (at 48 VDC) 100 to 110 VDC: Relay ON: 1.3 W (at 110 VDC) Relay OFF: 0.3 W (at 110 VDC) 125 VDC: Relay ON: 1.3 W (at 125 VDC) Relay OFF: 0.3 W (at 125 VDC)
Control outputs	H3Y-2(-0): 5 A at 250 VAC, resistive load ($\cos\phi = 1$) H3Y-4(-0): 3 A at 250 VAC, resistive load ($\cos\phi = 1$)

Note: 1. With DC ratings, single-phase full-wave rectified power sources may be used.

2. Use the Timer within 90% to 110% of the rated supply voltage (95% to 110% for 12 VDC) when using it continuously under an ambient operating temperature of 50 °C.

3. The model designed for a power consumption of 200 to 230 VAC at 50/60 Hz can be used within the permissible voltage fluctuation range of 170 to 230 VAC. Please contact your OMRON representative if models with specifications of 240 VAC, 50/60 Hz (85% to 110%) are required.

■ Characteristics

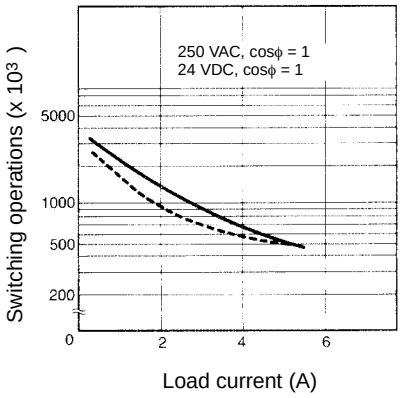
Accuracy of operating time	±1% FS max. (0.5 s range: ±1%±10 ms max.)
Setting error (see note 1)	±10%±50 ms FS max.
Reset time	Min. power-opening time: 0.1 s max. (including halfway reset)
Reset voltage	10% max. of rated supply voltage
Influence of voltage (see note 1)	±2% FS max.
Influence of temperature (see note 1)	±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 2) 2,000 VAC, 50/60 Hz for 1 min (between operating power circuit and control output) (see note 2) 2,000 VAC, 50/60 Hz for 1 min (between different pole contacts; 2-pole model) (see note 2) 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 Malfunction: 10 to 55 Hz, 0.5-mm single amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 100 m/s^2 (approx. 10G)
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: H3Y-2: 500,000 operations min. (5 A at 250 VAC, resistive load at 1800 operations/h) H3Y-4: 200,000 operations min. (3 A at 250 VAC, resistive load at 1800 operations/h)
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 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
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
Enclosure rating	IP40
Weight	Approx. 50 g
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: EN61000-4-2: 4 kV contact discharge (level 2), 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (amplitude modulated, 80 MHz to 1 GHz) (level 3), 10 V/m (pulse modulated, 900 MHz) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power-line (level 3), 2 kV I/O signal-line (level 4)
Approved standards	UL508, CSA C22.2 No. 14 Conforms to VDE0435/P2021, VDE0110 (for in-panel use) Conforms to EN50081-2, EN50082-2

Note: 1. Add ±10 mS to the above value for the 0.5-S range model.

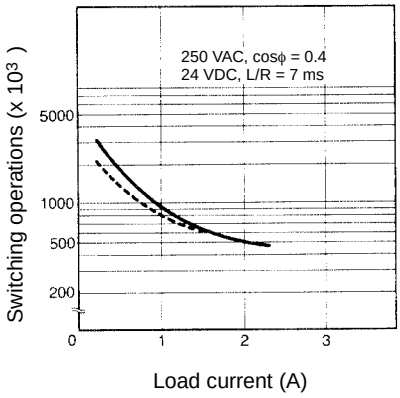
2. Terminal screw sections are excluded.

Engineering Data

H3Y-2, H3Y-2-0

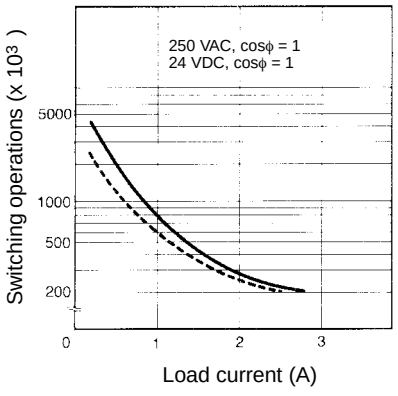


H3Y-2, H3Y-2-0

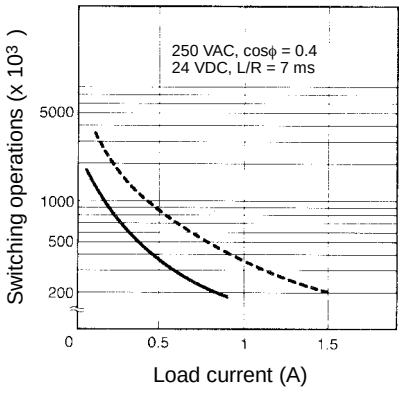


Reference: A maximum current of 0.6 A can be switched at 125 VDC (cosϕ = 1).
Maximum current of 0.2 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.
The minimum applicable load is 1 mA at 5 VDC (P reference value).

H3Y-4, H3Y-4-0



H3Y-4, H3Y-4-0

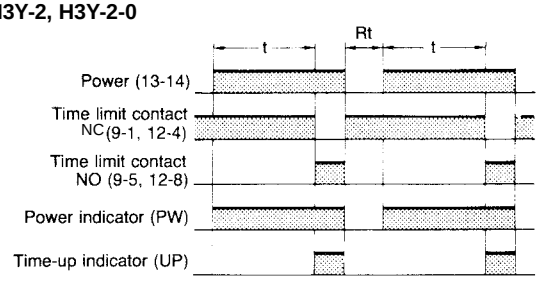


Reference: A maximum current of 0.5 A can be switched at 125 VDC (cosϕ = 1).
Maximum current of 0.2 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.
The minimum applicable load is 1 mA at 1 VDC (P reference value).

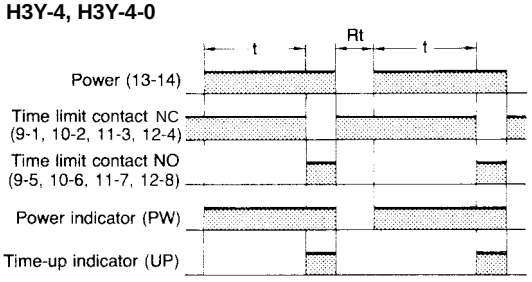
Operation

■ Timing Chart

H3Y-2, H3Y-2-0



H3Y-4, H3Y-4-0

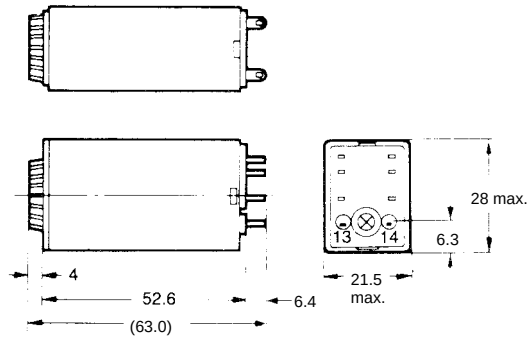


Dimensions

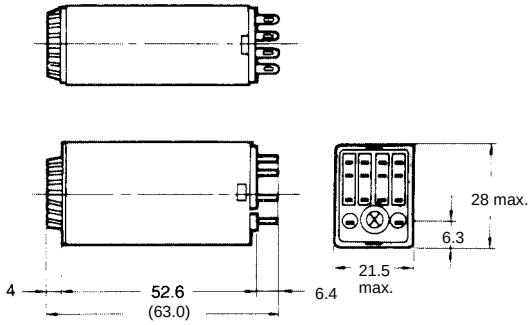
Note: All units are in millimeters unless otherwise indicated.

■ Timers

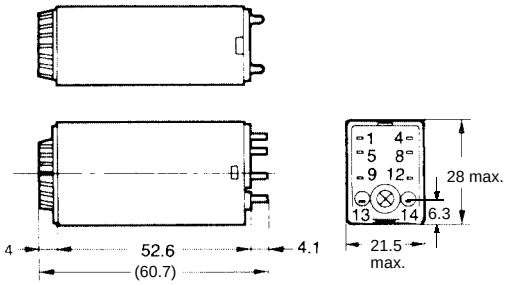
H3Y-2



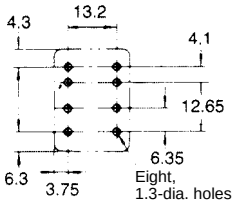
H3Y-4



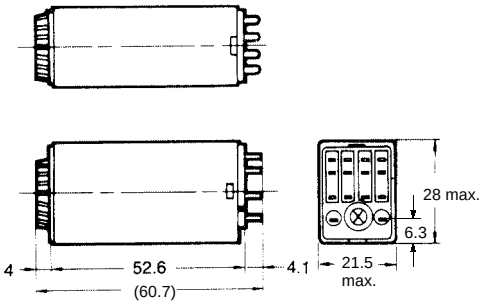
H3Y-2-0



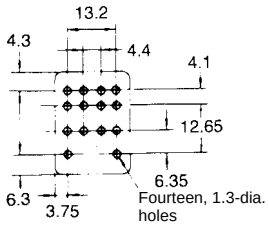
Mounting Holes



H3Y-4-0, H3Y-4-CB-0



Mounting Holes

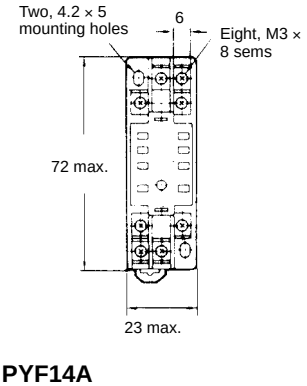


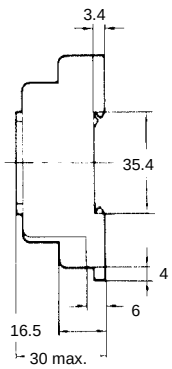
■ Accessories (Order Separately)

Use the PYF j A, PY j , PY j -02, or PY j QN(2) to mount the H3Y. When ordering any one of these sockets, replace " j " with "08" or "14."

Track Mounting/Front Connecting Sockets

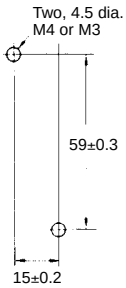
PYF08A

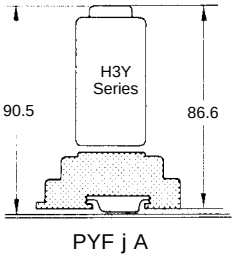




Terminal Arrangement (Top View)

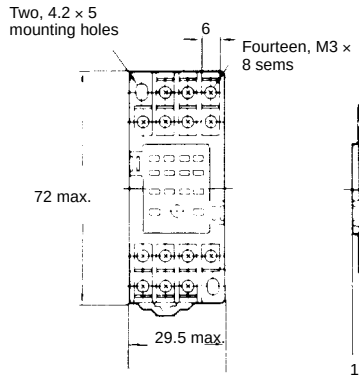
Mounting Holes

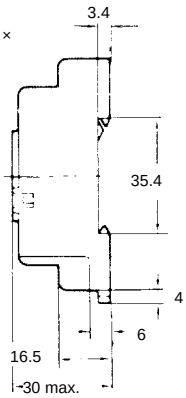




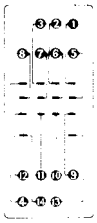
PYF j A

PYF14A

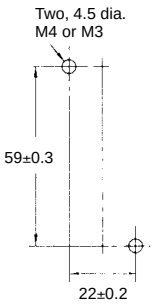




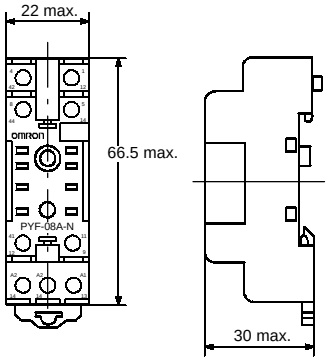
Terminal Arrangement (Top View)



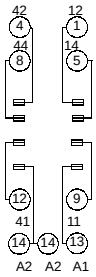
Mounting Holes



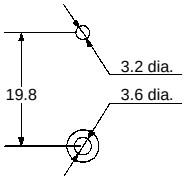
PYF08A-N



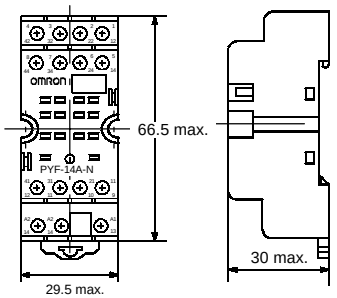
Terminal Arrangement



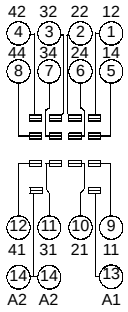
Mounting Holes (for Surface Mounting)



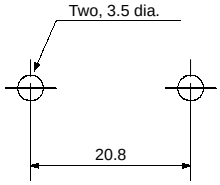
PYF14A-N



Terminal Arrangement

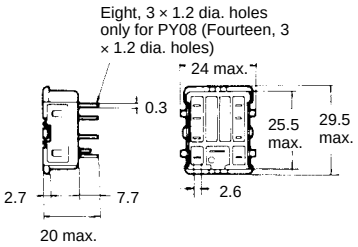


Mounting Holes (for Surface Mounting)

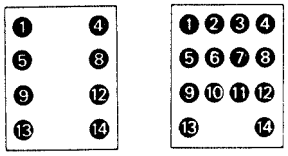


Back Connecting Sockets

PY08, PY14

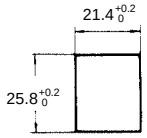


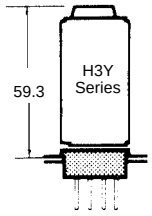
Terminal Arrangement (Bottom View)



PY08 PY14

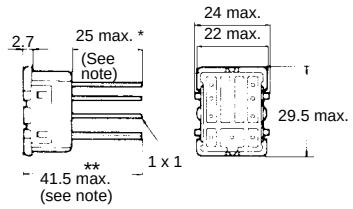
Panel Cutout



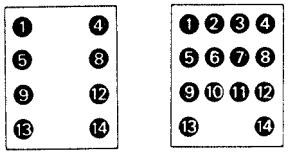


PY j , PY j -02,
PY j QN(2)

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



Terminal Arrangement (Bottom View)

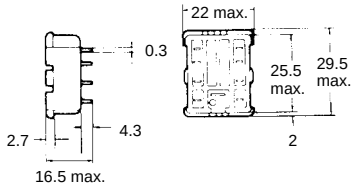


PY08QN
PY08QN(2)

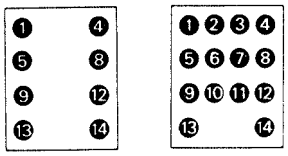
PY14QN
PY14QN(2)

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

PY08-02, PY14-02



Terminal Arrangement (Bottom View)



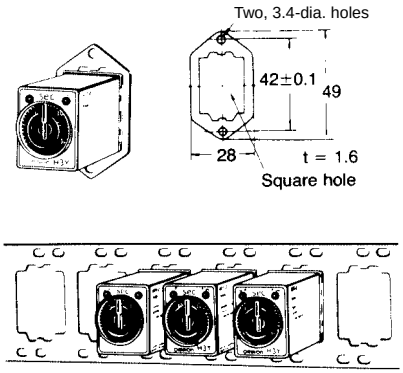
PY08-02 PY14-02

Socket Mounting Plates (t = 1.6)

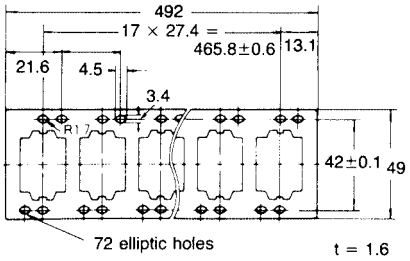
Applicable socket	For mounting 1 socket	For mounting 18 sockets
PY08, PY14, PY08QN(2), PY14QN(2)	PYP-1	PYP-18

Note: PYP-18 may be cut to any desired length.

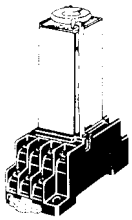
PYP-1



PYP-18

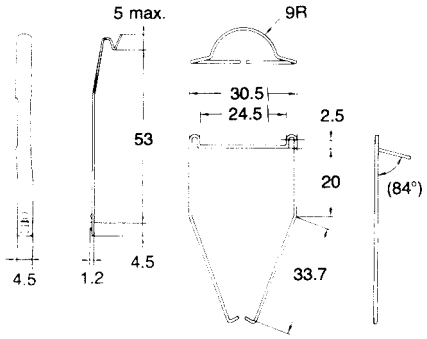


Relay Hold-down Clips



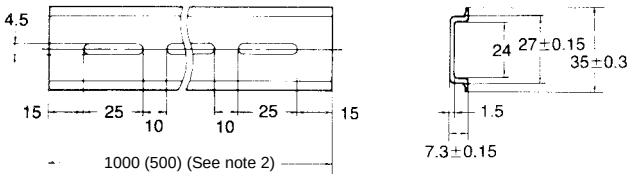
Y92H-3 for PYF j A Socket

Y92H-4 for PY j Socket



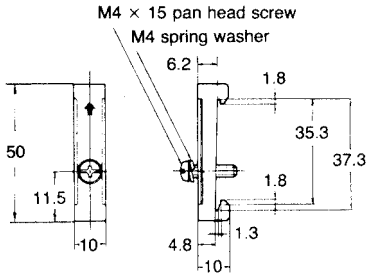
Mounting Track

PFP-100N/PFP-50N (see note 1)



End Plate

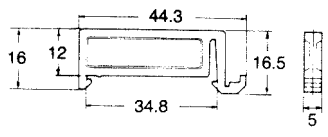
PFP-M



Note: 1. Meets DIN EN50022
2. This dimension applies to PFP-50N.

Spacer

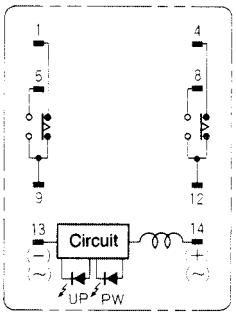
PFP-S



Installation

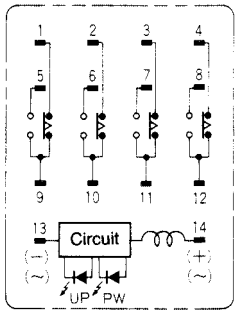
■ Connection

H3Y-2, H3Y-2-0



Connect the DC power supply to terminals 13 and 14 according to the polarity marks.

H3Y-4, H3Y-4-0



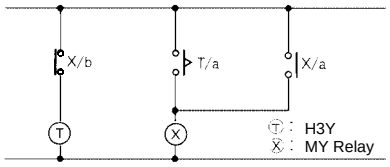
Connect the DC power supply to terminals 13 and 14 according to the polarity marks.

Precautions

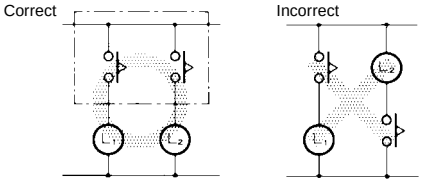
When selecting a control output, use the H3Y-2 for switching ON and OFF the power and the H3Y-4 for switching ON and OFF the minute load.

The operating voltage will increase when using the H3Y in any place where the ambient temperature is more than 50°C. Supply 90% to 110% of the rated voltages (at 12 VDC: 95% to 110%) when operating at 50°C or higher.

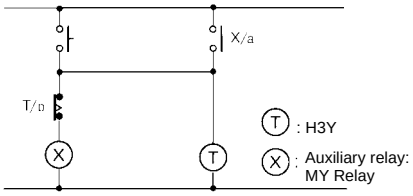
Do not leave the H3Y in time-up condition for a long period of time (for example, more than one month in any place where the ambient temperature is high), otherwise the internal parts (aluminum electrolytic capacitor) may become damaged. Therefore, the use of the H3Y with a relay as shown in the following circuit diagram is recommended to extend the service life of the H3Y.



Do not connect the H3Y as shown in the following circuit diagram on the right hand side, otherwise the H3Y'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 H3Y and an auxiliary relay, such as an MY Relay, in combination.



Do not use the H3Y in places where there is excessive dust, corrosive gas, or direct sunlight.

Do not mount more than one H3Y closely together, otherwise the internal parts may become damaged. Make sure that there is a space of 5 mm or more between any H3Y 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 H3Y. When more than 100 V is applied to 12- or 24-VDC models, the internal element (varistor) may break.

Precautions for VDE Conformance

The H3Y as a built-in timer conforms to VDE 0435/P2021 provided that the following conditions are satisfied.

Handling

Before dismounting the H3Y from the socket, make sure that no voltage is imposed on any terminal of the H3Y.

Wiring

The power supply for the H3Y must be protected with equipment such as a breaker approved by VDE.

Only a load with basic isolation can be connected to the output contact. The H3Y is a model with basic isolation. Therefore, the H3Y and the load will ensure reinforced isolation, thus meeting VDE standards.

Insulation requirement: Overvoltage category II, pollution degree 2 (with a clearance of 1.5 mm and a creepage distance of 2.5 mm at 240 VAC)

Output terminals next to each other on the H3Y-4 or H3Y-4-0 must have the same polarity.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L24-E1-9

OMRON

Solid-state Timer | H3M

Solid-state Timer with Variable Time Ranges

- Four time ranges are selectable per timer unit.
- Wide timing range of 0.05 second to 30 hours can be covered by a combination of five timer units.
- Standard surface mounting type is easily convertible to flush mounting type with the use of a special adapter (Y92F-40).
- Requires only 40 x 50 mm for mounting space.
- Equipped with power-ON & time-out indicators.

RC

Ordering Information

Operation/resetting system	Time-limit contact	Instantaneous contact	Mounting	
			Surface mounting	Flush mounting
Time-limit operation/ self-resetting	DPDT	---	H3M	H3M with Y92F-40 adapter
	SPDT	SPDT	H3M-H	H3M-H with Y92F-40 adapter

Note: 1. Specify both the model number and supply voltage when ordering.

2. Sockets and adapters for surface/track mounting are available optionally and therefore, place the order for them as necessary. Timer hold-down clips (F-hook and L-hook) are supplied with the timer.

■ Accessories (Order Separately)

Adapter
Y92F-40

Specifications

■ Time Ranges

Four time ranges are available for each timer by changing the time range selector switch positions to different combinations.

Time range code	Time range selector switch			
	× 1 / × 10 s / min	× 1 / × 10 s / min	× 1 / × 10 s / min	× 1 / × 10 s / min
A	0.05 to 0.5 s	0.5 to 5 s	0.05 to 0.5 min	0.5 to 5 min
B	0.1 to 1 s	1 to 10 s	0.1 to 1 min	1 to 10 min
C	0.3 to 3 s	3 to 30 s	0.3 to 3 min	3 to 30 min

Time range code	Time multiplying key			
	× 1 / × 10 min / h	× 1 / × 10 min / h	× 1 / × 10 min / h	× 1 / × 10 min / h
D	0.1 to 1 min	1 to 10 min	0.1 to 1 hrs	1 to 10 hrs
E	0.3 to 3 min	3 to 30 min	0.3 to 3 hrs	3 to 30 hrs

■ Ratings

Rated supply voltage	100/110/120 VAC (50/60 Hz), 200/220/240 VAC (50/60 Hz), 12, 24, 48, 100, 110 VDC (see note 2)
Operating voltage range	AC: 85% to 110% of rated supply voltage DC: 80% to 110% of rated supply voltage (see note 3)
Power consumption	AC: Approx. 5 VA/2 W DC: Approx. 2 W
Control outputs	5 A at 250 VAC, resistive load ($\cos\phi$ = 1)

Note: 1. Color indicators for the rated voltage are provided on the front of the Timer.
Blue: 100/110/120 VAC
Red: 200/220/240 VAC
None: Other voltages

2. With DC ratings, single-phase full-wave rectified power sources may be used.

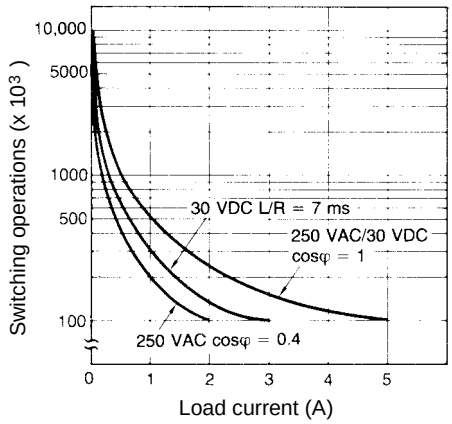
3. 90% to 110% for 12-VDC models.

■ Characteristics

Accuracy of operating time	±1% max. (see note)
Setting error	±10% max.
Reset time	0.1 s max.
Influence of voltage	±1% max. (see note)
Influence of temperature	±2% max. (see note)
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts) 1,500 VAC, 50/60 Hz for 1 min (between contact and control circuit) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: −10°C to 50°C Storage: −25°C to 65°C
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)
Approved standards	UL (File No. E41515), CSA (File No. LR22310)
Weight	Approx. 100 g

Note: For the timer with time range code A, add ±10 ms to the respective characteristics when the time range selector switches are in the x 1 s (0.05 to 0.5 s) position.

Engineering Data

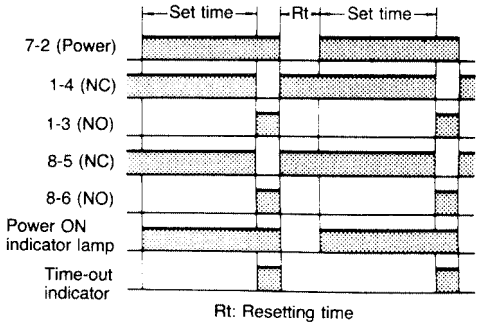


Reference: A maximum current of 0.15 A can be switched at 125 VDC ($\cos\phi$ = 1). Maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.
The minimum applicable load is 10 mA at 5 VDC (failure level: P).

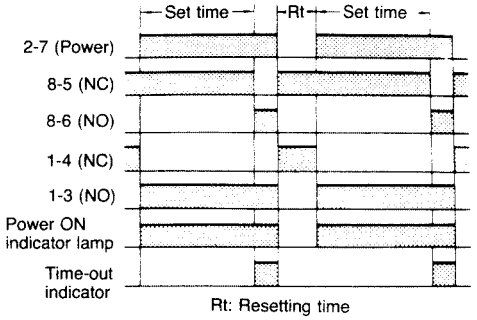
Operation

■ Timing Chart

H3M



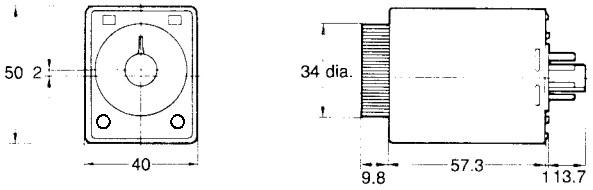
H3M-H



Dimensions

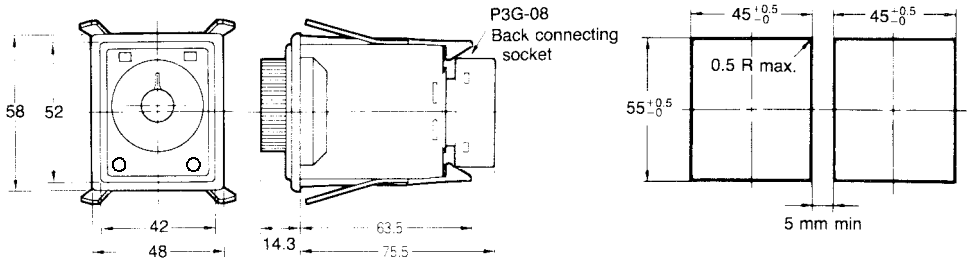
Note: All units are in millimeters unless otherwise indicated.

H3M(-H)



■ Accessories (Order Separately)

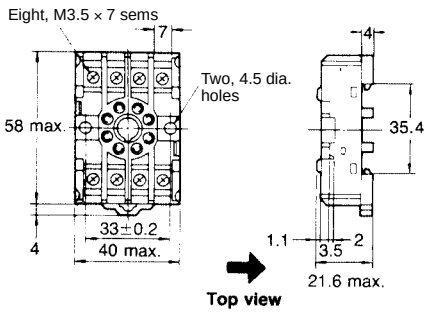
Y92F-40 Adapter with Flush Mounting



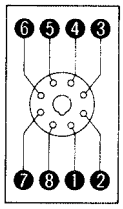
Note: When two or more timers mounted in line are to be continuously energized at the same time after the lapse of the set time, be sure to limit the carry current to less than 1 A. When using the timers at an ambient temperature of more than 40°C, be sure to reset the timers immediately after the set time has elapsed.

Track Mounted/Front Connecting Socket

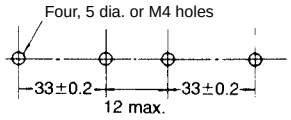
PF085A



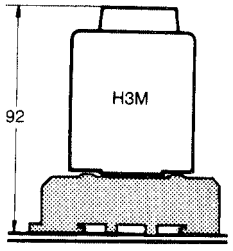
Terminal Arrangement (Top View)



Mounting Holes

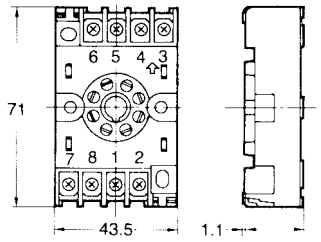


Mounting Height of Timer with Socket

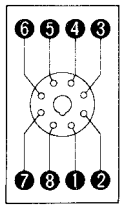


Note: PF085A can be used as a front connecting socket.

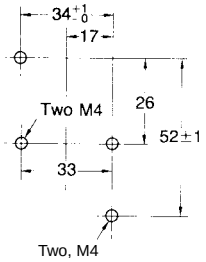
P2B



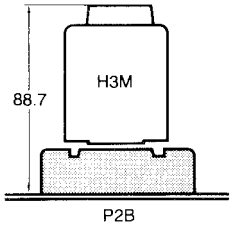
Terminal Arrangement (Top View)



Mounting Holes

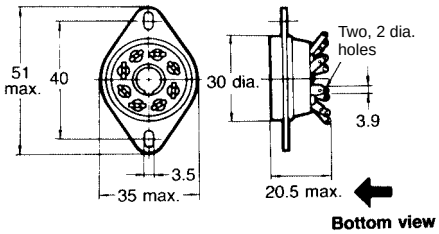


Mounting Height of Timer with Socket

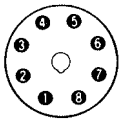


Back Connecting Socket

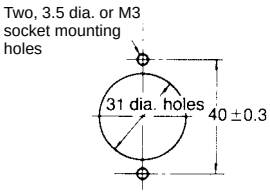
PL08



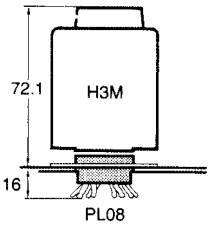
Terminal Arrangement (Bottom View)



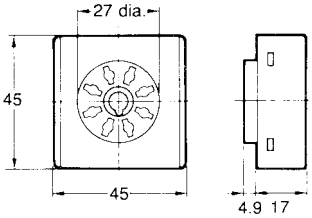
Mounting Holes



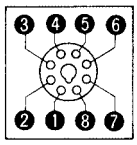
Mounting Height of Timer with Socket



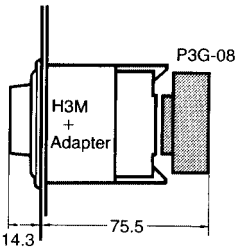
P3G-08



Terminal Arrangement (Bottom View)

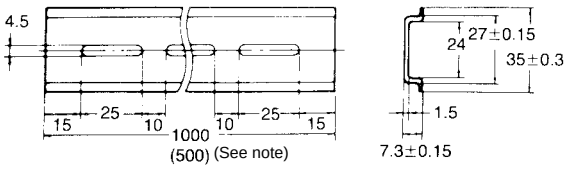


Mounting Height of Timer with Socket



Mounting Track

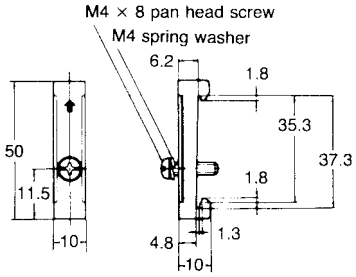
PFP-100N/PFP-50N



Note: This dimension applies to PFP-50N.

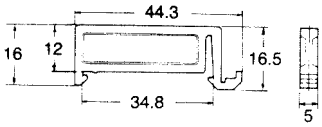
End Plate

PFP-M



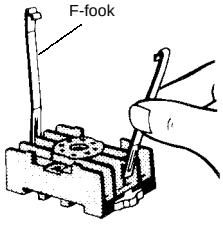
Spacer

PFP-S



Hold-down Clips (Attached)

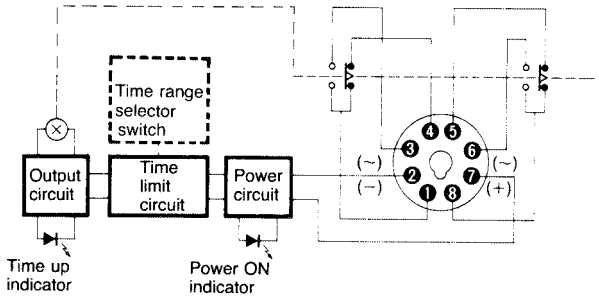
PHC-1 For PF085A



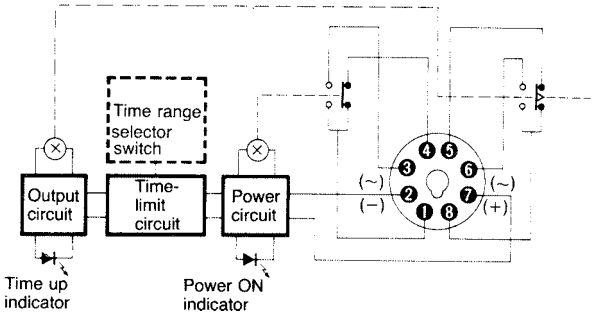
Installation

■ Connection

H3M



H3M-H



Precautions

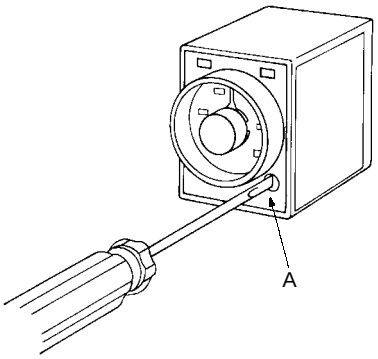
Power Source Connection

Because the AC-operated version is a capacitive load, the solid-state relay to be used must be rated at a dielectric strength two times as that of the timer to switch the power source of the timer.

The H3M contains a capacitor-drop power circuit. Use a sinusoidal power supply with a commercial frequency. Do not use power supplies with a high frequency component (such as inverter power supplies) for Timers with 100 to 240-VAC specifications. Using these power supplies can damage internal circuits.

How to Change the Time Range

The H3M is provided with two time range selector switches. One is on the lower right side A of the front panel and the other on the lower left side. Change the positional combination of the time range selector switches with a flat-blade screwdriver as desired.



⚠ Caution

Be sure to turn the power off before changing the time specification. Changing the time range while the timer is in operation may result in a malfunction.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L25-E1-10

OMRON

Solid-state Timer

H3FA

DIP Model Timer for PC Board Use Provides Contact and Solid-state Output

- Four rated times available:
  models suffixed -A and -SA: 1 s, 10 s, 1 min, 10 min;
  models suffixed -B and -SB: 6 s, 60 s, 6 min, 60 min.
- Timer operation may also be controlled through an external variable resistor.
- Timer can be cleaned while mounted on a PC Board.
- Twenty-four-pin IC socket can be used for mounting the time unit.
- Mountable on a 1-inch pitch rack.
- Pulse output types also available.

RC

Ordering Information

Operation/resetting system	Time-limit contact	Time range	Surface mounting (with IC socket or direct mounting on PC Board)
Time-limit operation/power-OFF resetting and external resetting/ Integrating operation/power-OFF resetting and external resetting OFF-delay operation by external signal/ power-OFF resetting	Contact output (SPST-NO + SPST-NC)	1 s to 10 min	H3FA-A
		6 s to 60 min	H3FA-B
	Solid-state output	1 s to 10 min	H3FA-SA
		6 s to 60 min	H3FA-SB
Instantaneous operation/time-limit resetting and external resetting (pulse output)	Contact output (SPST-NO + SPST-NC)	1 s to 10 min	H3FA-AU
		6 s to 60 min	H3FA-BU
	Solid-state output	1 s to 10 min	H3FA-SAU
		6 s to 60 min	H3FA-SBU

Note: 1. Specify both the model number and supply voltage when ordering.

2. The desired operation/resetting system is selected by short-circuiting and opening the specified terminals.

Specifications

■ Time Ranges

Model	Rated time	Time setting range
H3FA-A	1 s	0.1 to 1 s
H3FA-AU	10 s	1 to 10 s
H3FA-SA	1 min	0.1 to 1 min
H3FA-SAU	10 min	1 to 10 min
H3FA-B	6 s	0.6 to 6 s
H3FA-BU	60 s	6 to 60 s
H3FA-SB	6 min	0.6 to 6 min
H3FA-SBU	60 min	6 to 60 min

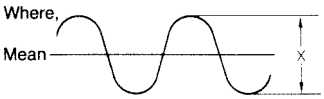
Note: 1. The above timing range applies to when the internal variable resistor of H3FA is used.

2. The external variable resistor may also be used by opening the terminals connected to the internal variable resistor.

■ Ratings

Item	H3FA-A(U)/H3FA-B(U)	H3FA-SA(U)/H3FA-SB(U)
Rated supply voltage	5, 6, 12, or 24 VDC (see note 1)	5/6 VDC, 12/24 VDC (see notes 1 and 2)
Operating voltage range	5 VDC: 90% to 110% of rated supply voltage 6, 12, 24 VDC: 85% to 110% of rated supply voltage	5/6 VDC: 90% to 110% of rated supply voltage 12/24 VDC: 85% to 110% of rated supply voltage
Power consumption	5, 6 VDC: approx. 230 mW 12 VDC: approx. 270 mW 24 VDC: approx. 330 mW	5/6 VDC: approx. 80 mW 12 VDC: approx. 100 mW 24 VDC: approx. 240 mW
Control outputs	Contact output: SPST-NO + SPST-NC, 3 A at 250 VAC, resistive load	Solid-state output: 150 mA at 24 VDC (voltage drop: 1.0 V max.)

Note: 1. Permissible ripple: 20% max. (3% max. at 5, 6 VDC-operated models)



X/Mean value x 100 ≦ 20 (%) max.

2. Supply voltage can be selected by short-circuiting (12 VDC) or opening (24 VDC) the specified terminals.

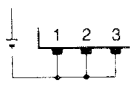
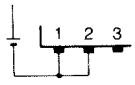
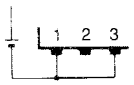
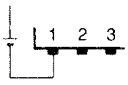
■ Characteristics

Accuracy of operating time	±0.5% max. (see note 1)
Setting error	0 to 30% FS (at 20°C, at rated voltage)
Reset time	10 ms max.
Influence of voltage	±1% max. (see note 1) ±2% max.: (5, 6, 5/6 VDC-operated models)
Influence of temperature	±5% max. (see note 1)
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	1,500 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying metal parts and between contact and control circuit) (see note 2) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts) (see note 2)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: −10°C to 55°C
Ambient humidity	Operating: 35% to 85%
Life expectancy (see note 1)	Mechanical: 10,000,000 operations min. (under no load at 18,000 operations/h) Electrical: 100,000 operations min. (3 A at 250 VAC, resistive load at 1,800 operations/h)
Approved standards	UL (File No. E41515), CSA (File No. LR22310)
Weight	Contact output: approx. 15 g Solid-state output: approx. 10 g

Note: 1. Add or subtract 10 ms to the ratings when using a timer with a rated time of 1 s.

2. Applicable to H3FA-A(U) and -B(U)

■ Rated Time and Terminal Connection

Model	Terminal connection			
				
H3FA-A(U)/-SA(U)	1 s	10 s	1 min	10 min
H3FA-B(U)/-SB(U)	6 s	60 s	6 min	60 min

Note: 1. Short-circuit terminals 21 and 22 when using the internal variable resistor of H3FA.

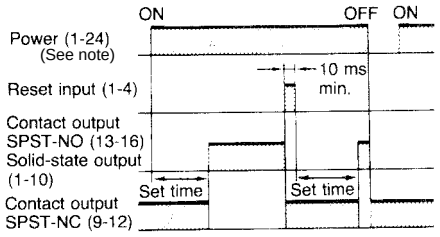
2. An external resistor can also be used by opening terminals 21 and 22. When using an external resistor (1 MΩ for H3FA-A(U) and -SA(U), 3 MΩ for H3FA-B(U) and -SB(U)), connect it between terminals 21 and 23.

Operation

■ Timing Chart

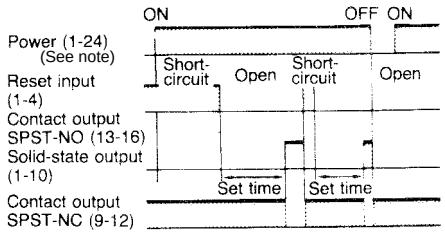
H3FA-A/H3FA-B/H3FA-SA/H3FA-SB

Standard Operation (ON-delay Operation)



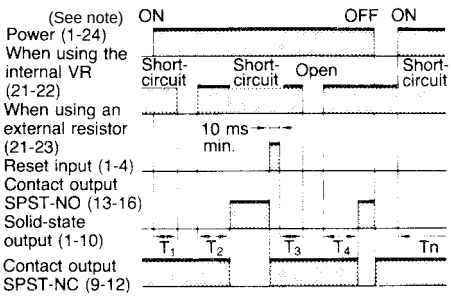
Note: When using the 12/24 VDC operated timer with a 12 VDC power supply, short-circuit terminals 13 and 15.

OFF-delay Operation by External Signal



Note: When using the 12/24 VDC operated timer with a 12 VDC power supply, short-circuit terminals 13 and 15.

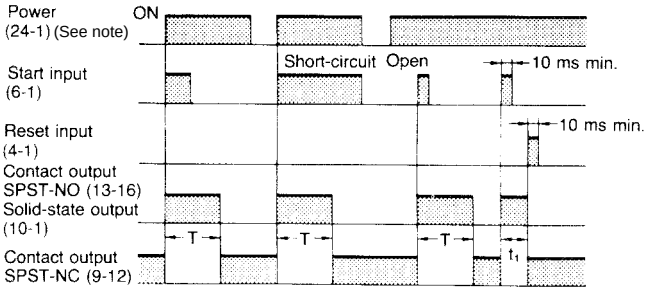
Integration Operation



Note: 1. Control output is provided when the set time ($T_1 + T_2$ or $T_3 + T_4$) is up.
2. When using the 12/24 VDC operated timer with a 12 VDC power supply, short-circuit terminals 13 and 15.

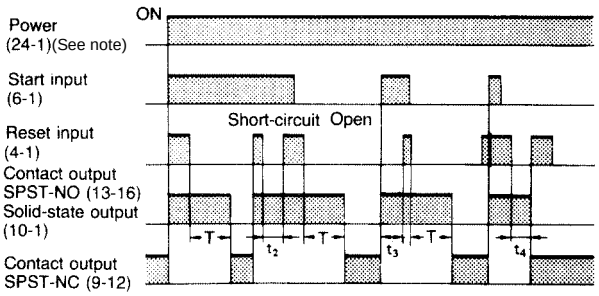
H3FA-AU/H3FA-BU/H3FA-SAU/H3FA-SBU

One-shot Output Operation



Note: 1. When using the 12 VDC operated timer suffixed -S j U, short-circuit terminals 13 and 15.
2. T denotes set time.
t_1, t_2, t_3, t_4, < T

OFF-delay Operation by External Signal

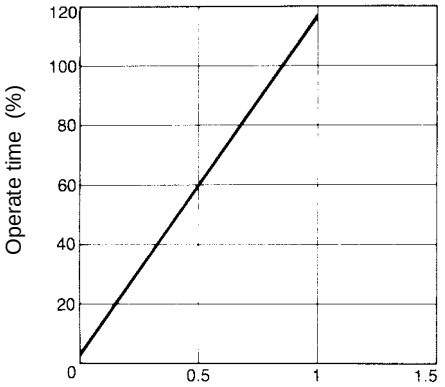


Note: 1. When using the 12 VDC operated timer suffixed -S j U, short-circuit terminals 13 and 15.
2. T denotes set time.
t_1, t_2, t_3, t_4, < T

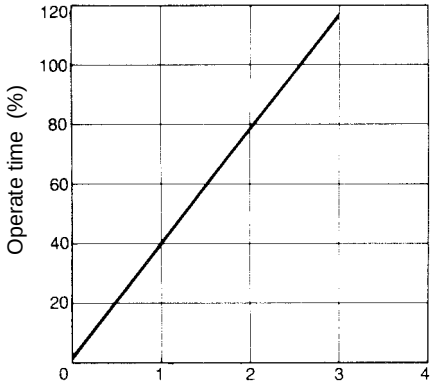
■ External Resistor and Operate Time

When using an external resistor, refer to the characteristic diagrams shown below.
Use an external resistor rated at about 0.1 W/1 MΩ for H3FA(U) and -SA(U), and 0.1W/3 MΩ for H3FA-B(U) and -SB(U).
Pay attention to external noise and keep the lead length to less than 2 m. Since the characteristic diagrams represent standard data, the operate time factory-setting may not always be uniform from one product to another.
Should higher timer precision be required, use of a variable resistor is recommended for time adjustment.
Note that the operate time becomes slightly longer than the set time as the length of the leads increase.

H3FA-A(U)/-SA(U)



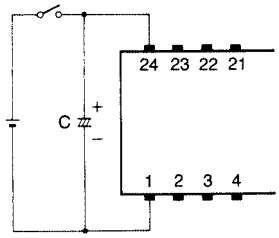
H3FA-B(U)/-SB(U)



When Prolonging Reset Time

The time unit has a shorter reset time than conventional timers so that it can be used in combination with solid-state circuit. To prolong the reset time of the time unit while it is in operation to about 100 ms, connect a capacitor having the listed constant to the time unit as shown below. Since the reset time after the set time is up varies depending on the load relay connected, select an appropriate capacitor having the desired constant taking into consideration the load relay connected. For the pulse output types (H3FA- j U), since the reset time before the set time is up varies depending on the load relay connected, select an appropriate capacitor having the desired constant taking into consideration the load relay connected.

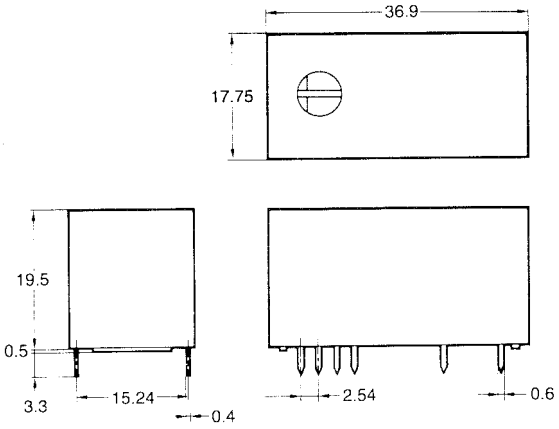
Rated voltage	Capacity of capacitor
12 VDC	10 μF, 25 V
24 VDC	4.7 μF, 50 V
5, 6 VDC	22 μF, 16 V



Dimensions

Note: All units are in millimeters unless otherwise indicated.

H3FA-A, H3FA-B, H3FA-SA, H3FA-SB

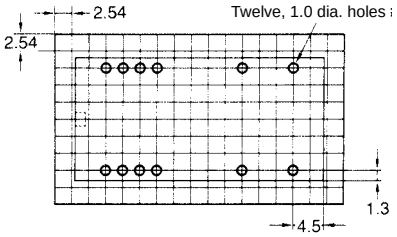


Applicable Connecting Socket

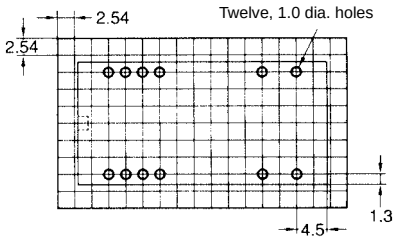
Standard 24-pin IC socket can be used for mounting the time unit.

Mounting Holes (Top View)

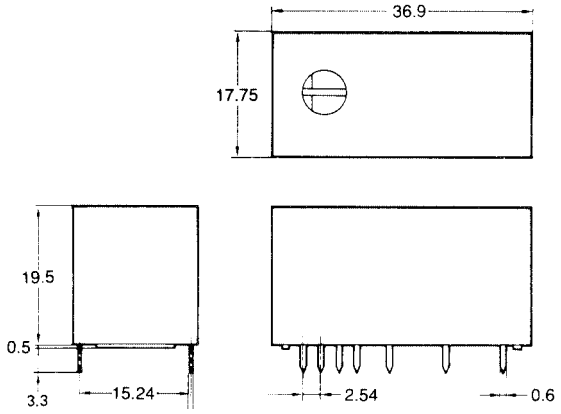
H3FA-A/-B



H3FA-SA/-SB



H3FA-AU, H3FA-BU, H3FA-SAU, H3FA-SBU

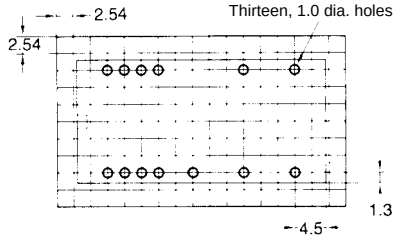


Applicable Connecting Socket

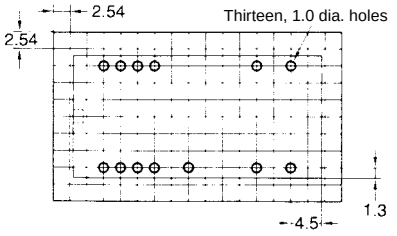
Standard 24-pin IC socket can be used for mounting the time unit.

Mounting Holes (Top View)

H3FA-AU/-BU



H3FA-SAU/-SBU



Installation

■ Connection

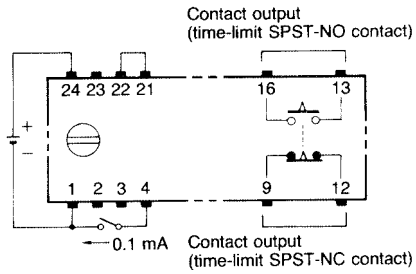
Note: Do not apply voltage to any terminal other than the power supply terminals. Otherwise, the internal circuitry may be damaged.

H3FA-A, H3FA-B, H3FA-SA, H3FA-SB

Standard Operation (ON-delay Operation)

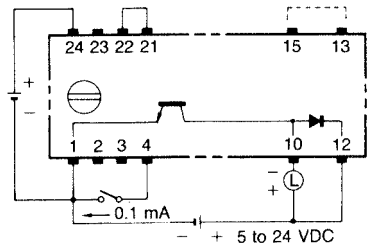
When the set time has elapsed subsequent to the power application (connect power to terminals A and X, and short-circuit terminals M and O when a 12/24 VDC-operated model is used with a 12 VDC power supply), output is produced.
When connecting an external resistor to the time unit, connect it between terminals U and W, and open terminals U and V. Refer to *"External Resistor and Operate Time"* on page 140.
When operating an external reset input contact short-circuit terminals A and D. In this case, the current that flows from terminal D to terminal A is approx. 0.1 mA. Therefore, use of a high-reliability contact is recommended for the reset input.

Contact Output (Top View)



Solid-state Output (Top View)

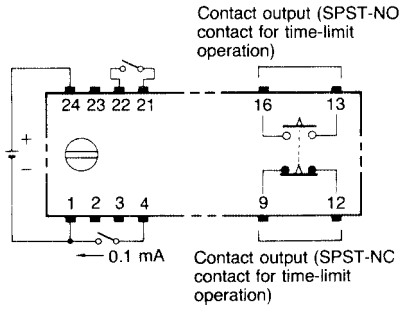
When using the 12/24 VDC operated timer with a 24 VDC power supply, open terminals 13 and 15.



Integration Operation

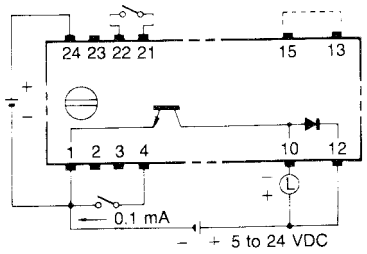
By opening the terminals connected to the internal variable resistor (U and V), or external resistor (U and W), timer operation can be interrupted to permit the time unit to perform time integration operations. Reconnecting the terminals enables timer operation to be continued.

Contact Output (Top View)



Solid-state Output (Top View)

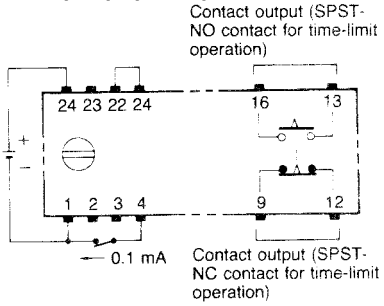
When using the 12/24 VDC operated timer with a 24 VDC power supply, open terminals 13 and 15.



OFF-delay Operation by External Signal

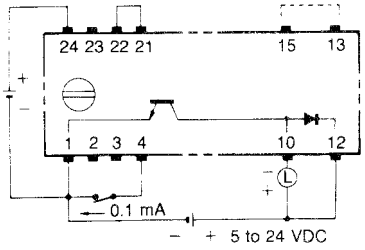
The time unit can be reset through the application of an external reset signal. This permits the time unit to perform OFF-delay operation. With terminals A and D short-circuited, the time unit initiates the time-limit operation upon opening these terminals and when the set time has elapsed, output is produced. Since the current that flows from terminal D to terminal A is about 0.1 mA, use of a high-reliability contact is recommended for the reset input.

Contact Output (Top View)



Solid-state Output (Top View)

When using the 12/24 VDC operated timer with a 24 VDC power supply, open terminals 13 and 15.



H3FA-AU, H3FA-BU, H3FA-SAU, H3FA-SBU

One-shot Output Operation

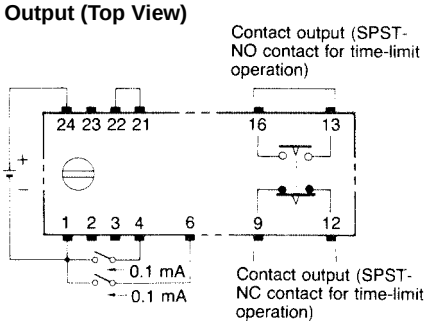
Upon power application (connect power to terminals A and X short-circuit terminals M and O when using the 12/24 VDC operated timer with 12 VDC power supply) and start input application (short-circuit terminals F and A), output is produced immediately and is reset when the set time has elapsed.

While operating the timer unit, if a reset input is applied a start input (terminals F and A are open), the time unit stops operating and the output is reset.

When operating an external start or reset input contact, the current that flows from terminal F to terminal A (start input) or from terminal D to terminal A (reset input) is approx. 0.1 mA. Therefore, use of a high-reliability contact is recommended for start and reset inputs.

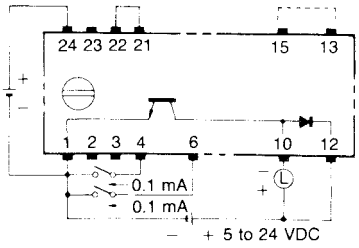
When connecting an external resistor to the time unit, connect it between terminals U and W open terminals U and V. Refer to *"External Resistor and Operate Time"*.

Contact Output (Top View)



Solid-state Output (Top View)

When using the 12/24 VDC operated timer with a 24 VDC power supply, open terminals 13 and 15.



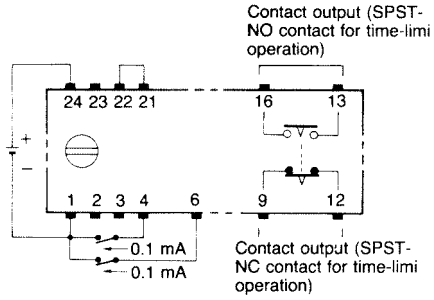
OFF-delay Operation by External Signal

Upon power application (connect power to terminals A and X short-circuit terminals M and O when using the 12/24 VDC operated timer with 12 VDC power supply) and start input application (short-circuit terminals F and A), output is produced immediately, and if the start input is continuously applied, the time-limit operation can be suspended by applying a reset input before the set time has elapsed. (Although the reset input has been continuously applied before applying a start input, output will be produced upon applying a start input.)

With terminals A and D short-circuited, the time unit initiates the time-limit operation upon opening these terminals and when the set time has elapsed, output is reset.

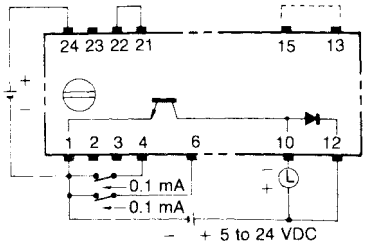
When operating an external start or reset input contact, the current that flows from terminal F to terminal A (start input) or from terminal D to terminal A (reset input) is approx. 0.1 mA. Therefore, use of a high-reliability contact is recommended for start and reset inputs.

Contact Output (Top View)



Solid-state Output (Top View)

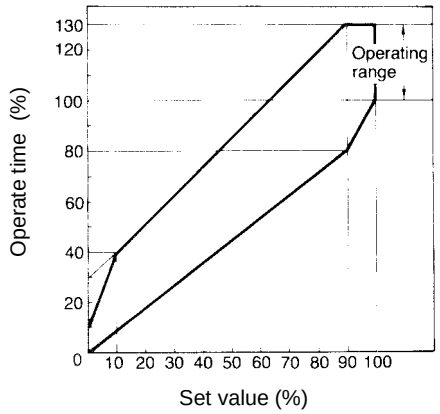
When using the 12/24 VDC operated timer with a 24 VDC power supply, open terminals 13 and 15.



Precautions

Operating

Refer to the diagram below for variations in the operate time with respect to the set value.



Others

When cleaning the timer, confirm that the sealing tape is securely in place. Do not clean without this sealing tape affixed.

Use alcohol type (IPA, ethanol) solvent which are less chemically reactive. Note that use of other solvents may damage the materials used for the timer. Clean the Timer in less than 2 minutes. The cleaning solution must be 50_C or less.

The tails of the connecting leads are solder-plated with consideration given to temperature at the time of soldering. When soldering the leads, keep the temperature at 260°C±5°C and complete soldering within 10 s.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L38-E1-6

OMRON

Solid-state Timer

H3T

PCB-mounting Time Unit for High-frequency Applications

- Ideal for high-frequency applications with 1-ms reset time (including during operation) either for power resets or external resets.
- High repeat accuracy – ±2% including the initial value.
- Solid-state control output capability of up to 100 mA permits selection from a wide variety of output relays.
- Timer operation may also be controlled through an externally connected variable resistor.

Ordering Information

Operation/resetting system	Time-limit contact	Time ranges	Model
Time-limit operation/power-OFF resetting and external resetting Integrating operation/power-OFF resetting and external resetting OFF-delay operation by external signal/ Power-OFF resetting	Solid-state output	1 s to 10 min (multi)	H3T-A
		6 s to 60 min (multi)	H3T-B

Note: 1. Time specifications differ for H3T-A and H3T-B.
2. The desired operation/resetting system is selected by short-circuiting and opening the specified terminals.
3. A 24-pin IC socket can be used for mounting the time unit.
4. The number of terminals differs from previous single time range units.

Specifications

■ Time Ranges

Model	Max. scale time	Time setting range
H3T-A (4 multispec)	1 s 10 s 1 min 10 min	0.1 to 1 s 1 to 10 s 0.1 to 1 min 1 to 10 min
H3T-B (4 multispec)	6 s 60 s 6 min 60 min	0.6 to 6 s 6 to 60 s 0.6 to 6 min 6 to 60 min

Note: 1. The above timing range applies to when the internal variable resistor of H3T is used.
2. The external variable resistor may also be used by opening the terminals connected to the internal variable resistor.

■ Ratings

Rated supply voltage	12 or 24 VDC, permissible ripple: 5% max. Switched by shorting and opening terminals.
Operating voltage range	12 V: 90% to 110% of rated voltage 24 V: 80% to 110% of rated voltage
Power consumption	12 V: Approx. 60 mW 24 V: Approx. 120 mW
Control output	Solid-state output: 100 mA Voltage drop: 1.2 V max. (see note 2)

Note: 1. Residual voltage on reset input when shorted: 1.0 V.

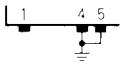
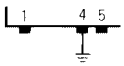
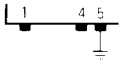
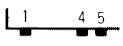
2. Contact output switching capacity: 100 mA, but rated coil current of relay loads must be 75 mA or less.

■ Characteristics

Accuracy of operating time	±2% max. (Percentage of FS value, including initial value)
Setting error	0% to 100% FS (Percentage of FS value)
Reset time	1 ms max. (including resets during operation)
Influence of voltage	±2% max. (Percentage of FS value)
Influence of temperature	±5% max. at −10°C to 70°C (Percentage of FS value)
Insulation resistance	100 MΩ min. (at 250 VDC)
Dielectric strength	500 VAC, 50/60 Hz for 1 min (between all terminals, knob and case)
Vibration resistance	Destruction: 10 to 55 Hz with 1.5-mm double amplitude Malfunction: 10 to 55 Hz with 1.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 1,000 m/s^2 (approx. 100G)
Ambient temperature	Operating: −10°C to 70°C (with no icing) Storage: −25°C to 80°C (with no icing)
Ambient humidity	Operating: 35% to 85%
Weight	Approx. 10 g

Operation

■ Time Specifications and Terminals

Model	Terminals			
				
H3T-A	1 s	10 s	1 min	10 min
H3T-B	6 s	60 s	6 min	60 min

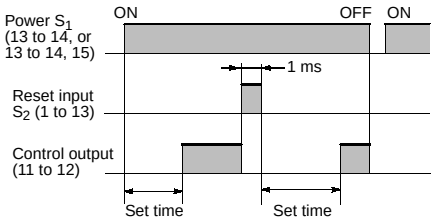
Note: 1. Short terminals 21 and 22 when using the internal adjustment (variable resistor) in the H3T.

2. An external resistor can be used by opening terminals 21 and 24. Connect the external resistor (2 MΩ for H3T-A and H3T-B) between terminals 21 and 24.

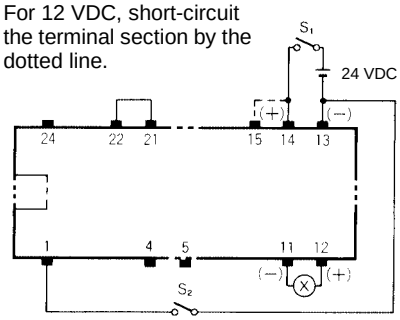
■ Timing Chart

Standard Operation

Outputs are produced when the set time is reached after power (S_4) is applied (to terminals 13 and 14 or terminals 13, 14, and 15). An external resistor can be connected between terminals 21 and 24; leave terminals 21 and 22 open (refer to following information on externally connected resistor and operation time). When performing an external reset, short-circuit terminals 1 and 13. The current will be approximately 1 mA, so any contacts that are controlled by the output must be highly reliable. When controlling a transistor, the I_{CEO} must be 0.1 mA and the V_{CE}(sat) must be 1.0 V or less.

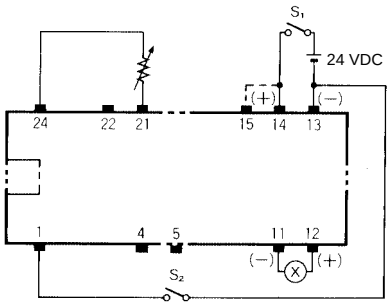


For 12 VDC, short-circuit the terminal section by the dotted line.



Note: Terminal 24 cannot be used.

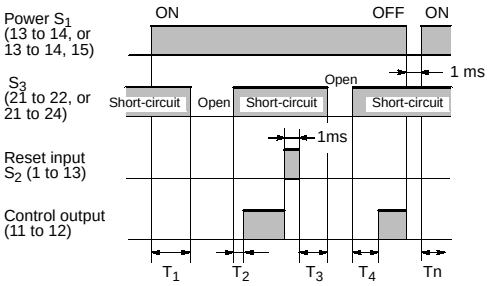
When Connecting External Resistor



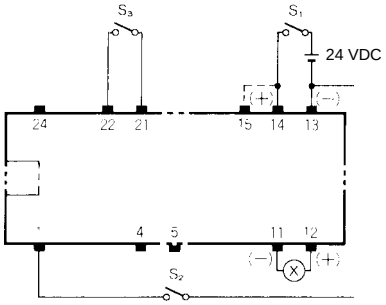
Note: Terminal 22 cannot be used.

Integration Operation

The variable resistor connection can be opened to interrupt the timer operation, thus enabling integration operation. Interrupt the timer operation by opening the connection between terminals 21 and 22 when using the interval variable resistor, or by opening the connection between terminals 21 and 24 when using an external resistor. Timer operation will continue when the connection is closed again.

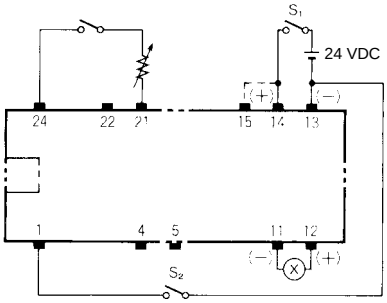


Set time ($T_1 + T_2$, or $T_3 + T_4$)



Note: Terminal 24 cannot be used.

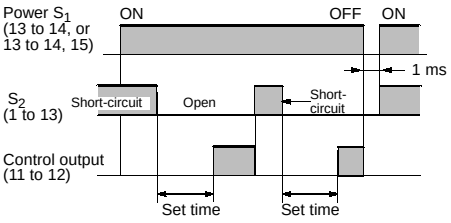
When Connecting External Resistor

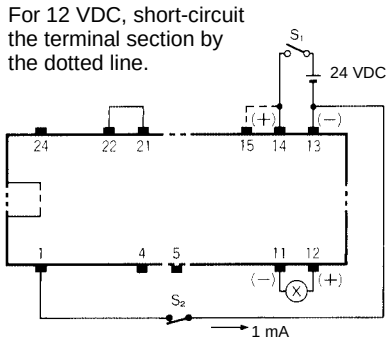


Note: Terminal 22 cannot be used.

OFF-delay Operation by External Signal

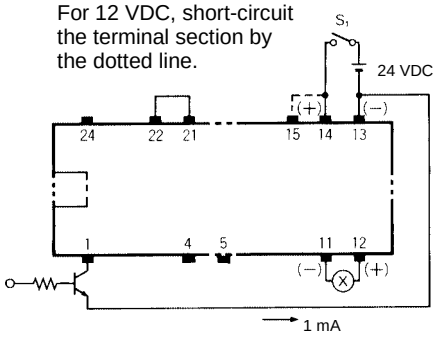
The Time Unit can be reset by applying a reset signal, enabling OFF-delay operation via an external signal. Short-circuit 1 and 13 and then open the connection to start the time-limit operation. An output will be made when the set time is reached. The current from terminal 1 to terminal 13 will be approximately 1 mA, so any contacts that are controlled by the output must be highly reliable. When controlling a transistor, the I_{CEO} must be 0.1 mA and the V_{CE}(sat) must be 1.0 V or less.





Note: Terminal 24 cannot be used.

When Controlling a Transistor



Note: Terminal 24 cannot be used.

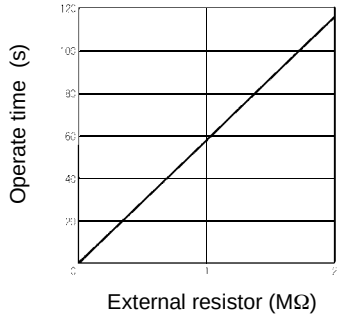
■ External Resistor and Operate Time

When using an external resistor, refer to the characteristic diagrams shown below.

Use an external resistor rated at about 0.1 W/2 MΩ.

Pay attention to external noise and keep the lead length to less than 2 m.

Since the characteristic diagrams represent standard data, the operate time factory-setting may not always be uniform from one product to another.
Should higher timer precision be required, use of a variable resistor is recommended for time adjustment.

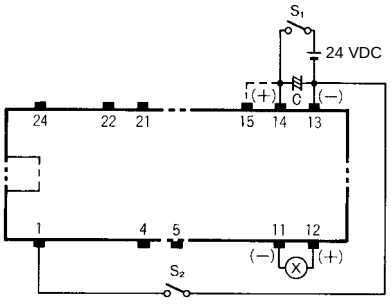


When Prolonging Reset Time

The time unit has a shorter reset time than conventional timers so that it can be used in combination with solid-state circuit. To prolong the reset time of the time unit while it is in operation to about 100 ms, connect a capacitor having the listed constant to the time unit as shown below.

Rated voltage	Capacity of capacitor
12 VDC	10 μF, 25 V
24 VDC	4.7 μF, 50 V

(Top View)

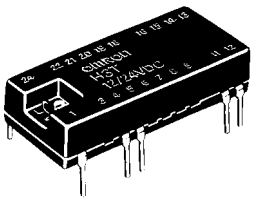


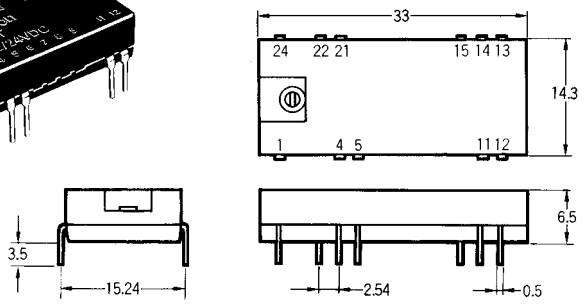
Note: For 12 VDC short-circuit the terminal section shown by the dotted line.

Dimensions

Note: All units are in millimeters unless otherwise indicated.

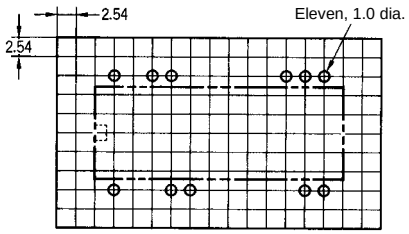
H3T





PCB Dimensions (Top View)

Applicable socket: XR2A-2401-N



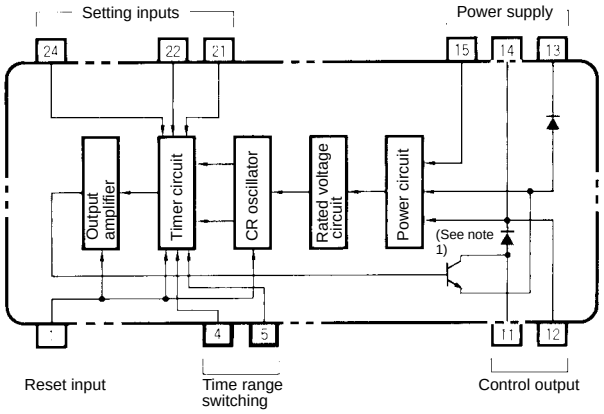
Note: 1. Terminal pitch: 2.54 mm
2. Conventional models with only a single time range do not have terminals 4 and 5.

Installation

■ Internal Connections

When the input voltage is applied, the CR oscillator circuit in the timer receives current through the power circuits and begins oscillation. When the value set in the timing circuit is counted, an output signal is generated. This signal is amplified by a transistor to operate the load. The voltage created across the load is the input voltage minus the forward voltage drop of the transistor and diode.

(Top View)



Note: 1. A diode is connected internally to adsorb surge voltage generated by the output relay.
2. Terminals 12 and 14 are internally connected.
3. There are no time range switching terminals as there were on previous models.

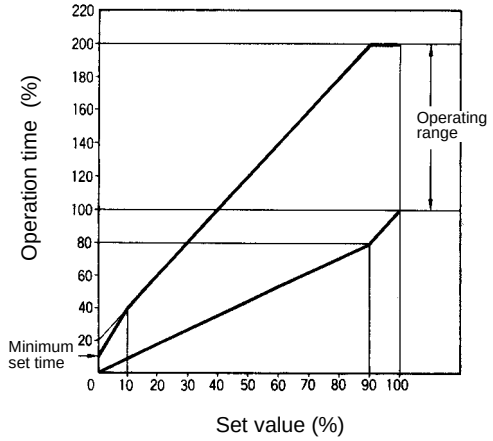
Precautions

Turn the time set knob gently. Forcing the knob can damage it. The life of the internal variable resistor is approximately 50 turns. Use an external variable resistor if frequent adjustment is necessary.

If greater accuracy is required in setting the operation time, measure the time in advance and adjust it with the knob.

Handle the lead terminals with care.

The operation time will vary with the set value as shown below.



The short time range can be used to more easily set long set values.

Example 1: To set the H3T-A to 10 min, set the time range to 10 s, adjust the knob to 10 s, and then change the time range to 10 min.

Example 2: To set the H3T-B to 5 min, set the time range to 6 s, adjust the knob to 5 s, and then change the time range to 6 min.

The case is made of PBT, which has good resistance to chemicals and will not be affected if cleaned at room temperature for short durations of time. The structure of the Unit, however, does not allow for submersed cleaning.

Models with exposed internal variable resistors can malfunction if the moving parts come into direct contact with liquid.

Although leads are plated to allow for soldering temperatures, soldering must be performed within 10 s at 260 ¦ 5_C. Solder by hand.

The Unit can be damaged if the terminal pins come into contact with static electricity on hands or objects during mounting or transport. Be sure to ground-out static electricity before handling the Unit.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L37-E1-5

OMRON

Digital Timer

H5CL

Easy-to-see and Easy-to-operate DIN 48 x 48 mm Digital Timer with IP66/NEMA 4 Protection

- Water- and dust-protected for severe environments.
- Large, high-visibility LED displays with a height of 12 mm.
- Simple setting with Increment and Decrement Keys.
- Conforms to EMC standards.
- Six-language instruction manual provided.

RC

Ordering Information

Outputs	Supply voltage	Model	
		Without Shock Prevention Cover	With Shock Prevention Cover
Contact output	100 to 240 VAC	H5CL-A	---
	12 to 24 VDC	H5CL-AD	H5CL-AD-500
Transistor output (Photocoupler)	100 to 240 VAC	H5CL-AS	---
	12 to 24 VDC	H5CL-ADS	---

Model Number Legend:

H5CL-A □ □
1 2 3

1. **Fixed**
2. **D: DC Supply Voltage**
3. **S: Transistor output**

■ Accessories (Order Separately)

Name	Model
Soft Cover	Y92A-48F1
Hard Cover	Y92A-48
Shock Prevention Cover (for DC models only)	Y92A-48T
Back Connecting Socket for flush mounting (for AC models only)	P3GA-11
DIN Track/Surface Mounting/Front Connecting Socket (for AC models only)	P2CF-11
Rubber Packing (see note)	Y92S-29
Flush Mounting Adaptor (see note)	Y92F-30

Note: Supplied with each Unit.

Specifications

Item	H5CL-A j (AC models)	H5CL-AD j (DC models)
Classification	Digital timer	
Mounting	DIN track, surface, and flush mounting	Flush mounting
External connections	Socket	Screw terminals
Enclosure ratings	Panel surface: IEC IP66 and NEMA Type 4 (indoors) when Y92S-29 rubber packing is used.	
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: IEC801-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC801-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4)	
Approved standards	UL 508, CSA C22.2 No.14 Conforms to EN50081-2, prEN50082-2	
Digits	4 digits (zero suppress method)	
Max. time settings	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), 99 h 59 min (1-min unit), 999.9 h (0.1-h unit)	
Display modes	Up (increment) and Down (decrement) (selectable)	
Input signals	Start, gate, reset, and key protection	
Input method	No-voltage input: via NPN transistor or switching of contact	
Operating modes	A (signal ON-delay), F (accumulative operation) (selectable)	
Reset system	Power reset (A (signal ON-delay) mode only), external, manual resets	
Sensor waiting time	216 ms typ., 250 ms max. (Control output is turned OFF and no input is accepted during sensor waiting time.)	
External power supply	50 mA at 12 VDC (±10%)	---
Display	7-segment LEDs (12 mm high, red LEDs for the present value, and 8 mm high, green LEDs for the set value)	
Memory backup	EEP-ROM (overwritten 200,000 times min.), which can store data for 20 years min.	
Case	Light gray (Munsell 5Y7/1)	

■ Ratings

Item	H5CL-A j (AC models)	H5CL-AD j (DC models)
Rated supply voltage	100 to 240 VAC, 50/60 Hz	12 to 24 VDC (permissible ripple: 20% (p-p) max.)
Operating voltage range	85 to 264 VAC, 50/60 Hz	10.8 to 26.4 VDC
Current consumption	Approx. 10 VA	Approx. 3 W
Start, reset, gate inputs	Min. pulse width: 1 ms/20 ms (selectable, same for all three inputs)	
Key protection input	Response time: 1 s max.	
Power reset	Min. power opening time: 0.5 s (excluding F (accumulative operation) mode)	
Control output	Contact output: SPDT, 3 A at 250 VAC, resistive load (cosϕ =1) (G6B-2114P-US-U used) Min. applicable load: 10 mA at 5/24 VDC (P level, for reference value) Transistor output: NPN open collector, 100 mA max. at 30 VDC max., residual voltage 1.5 VDC max.	

■ Characteristics

Item	H5CL-A j (AC models)	H5CL-AD j (DC models)
Deviation of operating time and setting error (including temperature and voltage influences)	Power start: ±0.01% ±0.05 s max. (see note 1) Signal start: ±0.005% ±0.03 s max. (see note 1) Signal start, at transistor output model: ±0.005% ±3 ms max. (see note 1 and 2) If the set value is within the sensor waiting time (250 ms max.) in the case of power start, the control output of the H5CL will not be turned ON until the sensor waiting time passes.	
Insulation resistance	100 MΩ 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 terminal and exposed non-current-carrying metal parts) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)	1,000 VAC, 50/60 Hz for 1 min (between current-carrying terminal and exposed non-current-carrying metal parts, and between non-continuous contacts)
Surge voltage	3.0 kV (between power terminals) 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts)	1.0 kV (between power terminals) 1.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts)
Noise immunity	±1.5 kV (between power terminals) ±600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)	±480 kV (between power terminals) ±600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Destruction: 15 kV Malfunction: 8 kV	
Vibration resistance	Destruction: 10 to 55 Hz, 0.75-mm single amplitude each in three directions Malfunction: 10 to 55 Hz, 0.5-mm single amplitude each in three directions	
Shock resistance	Destruction: 294 m/s^2 (30G) each in three directions Malfunction: 98 m/s^2 (10G) each in three directions	
Ambient temperature	Operating: −10 to 55 °C (−10 to 50 °C if timers are mounted side by side) (with no icing) Storage: −25 to 65 °C (with no icing)	
Ambient humidity	Operating: 35% to 85%	
Life expectancy	Mechanical: 10,000,000 operations min. Electrical: 100,000 operations min. (3 A at 250 VAC, resistive load)	
Weight	Approx. 130 g	Approx. 110 g

Note: 1. The values are based on the set value.
2. The value is applied for a minimum pulse width of 1 ms.

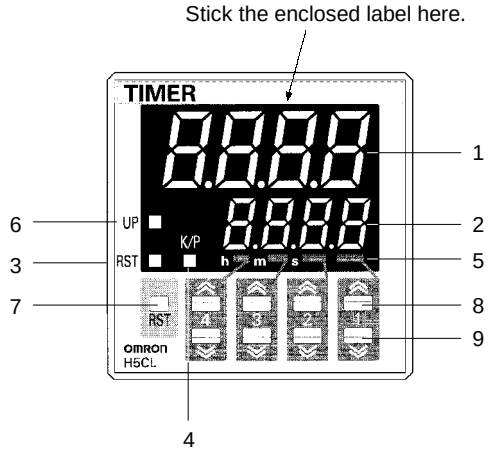
Nomenclature

Indicator

1. **Present Value**
   Red LEDs with a character height of 12 mm
   Note: The decimal point will flash on the present value during the timing operation in the following ranges: 0.1 to 999.9 min, 0 h 01 min to 99 h 59 min, and 0.1 to 999.9 h.
2. **Preset Value**
   Green LEDs with a character height of 8 mm
3. **Reset Indicator** (orange)
4. **Key Protection Indicator** (orange)
5. **Time Unit Display** (orange)
6. **Control Output Indicator** (orange)

Operation Key

7. **Reset (RST) Key**
   The RST Key initializes the present value and control output.
8. **Increment Keys (1 to 4)**
   Up Keys 1 to 4 increment the preset value.
9. **Decrement Keys (1 to 4)**
   Down Keys 1 to 4 decrement the preset value.



Operation

■ DIP Switch Setting

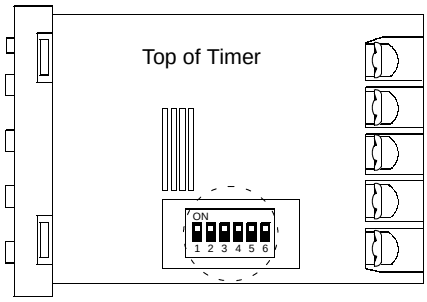
Pin no.	Item	OFF	ON
1, 2, 3	**Time ranges**	See table below.	
4	**Display modes**	Up (Increment)	Down (Decrement)
5	**Min. pulse width of inputs**	20 ms	1 ms
6	**Operating modes**	A (signal ON-delay)	F (accumulative operation)

Note: Set the DIP switch before installation and operation of the Unit. DIP switch setting changes are not effective while the power is on.

Time Ranges

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

Note: Switches 1 to 6 are all set to OFF before shipping.

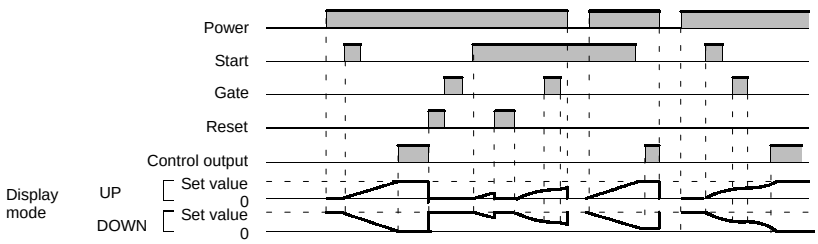


(The same switch settings apply to AC and DC models)

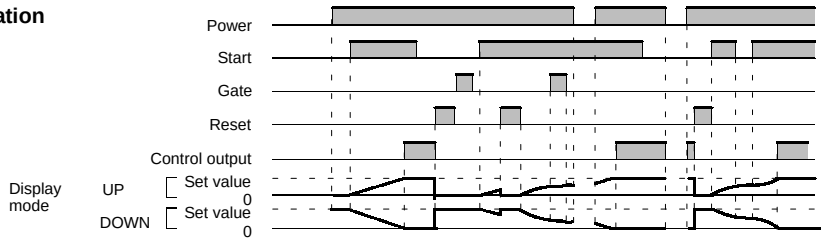
Timer Control with Power Start
When using the H5CL with power start, short-circuit the start input and input 0-V terminals.

■ Operating Modes

A Mode
Signal ON-delay



F Mode
Accumulative Operation

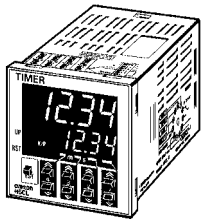


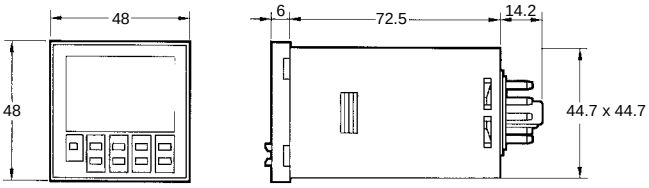
Dimensions

Note: All units are in millimeters unless otherwise indicated.

H5CL-A j

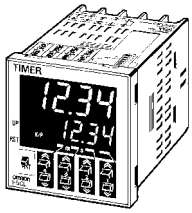
DIN Track/Surface/Flush Mounting

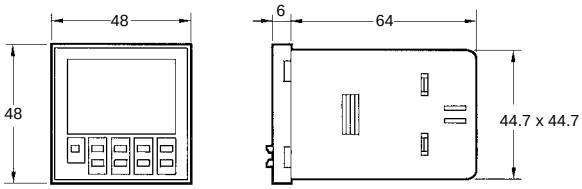




H5CL-AD j

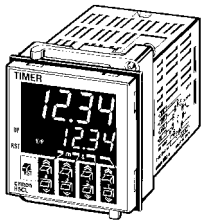
Flush Mounting

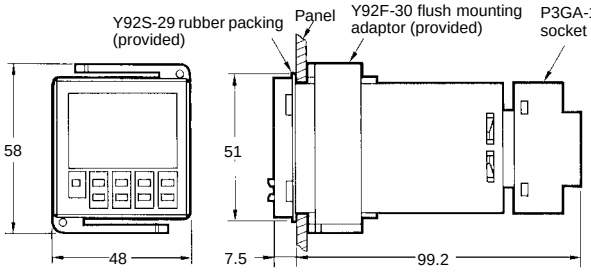




H5CL-A j

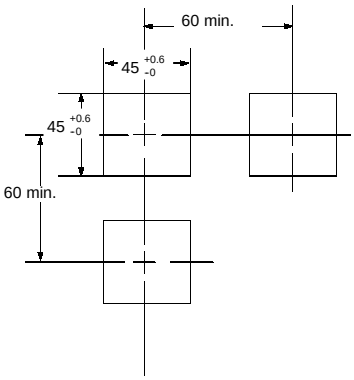
With Flush Mounting Adaptor





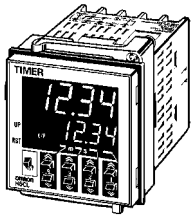
Panel Cutouts

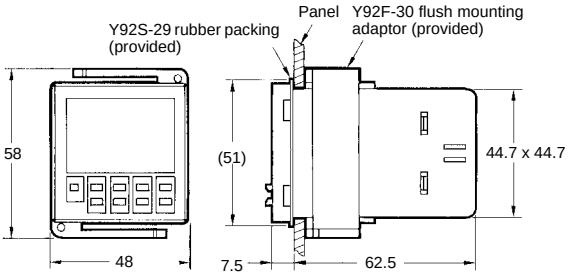
Panel cutouts are as shown below. (according to DIN43700).

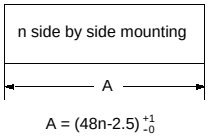


H5CL-AD j

With Flush Mounting Adaptor



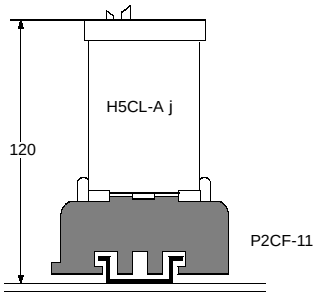




A = (48n-2.5) +1 -0

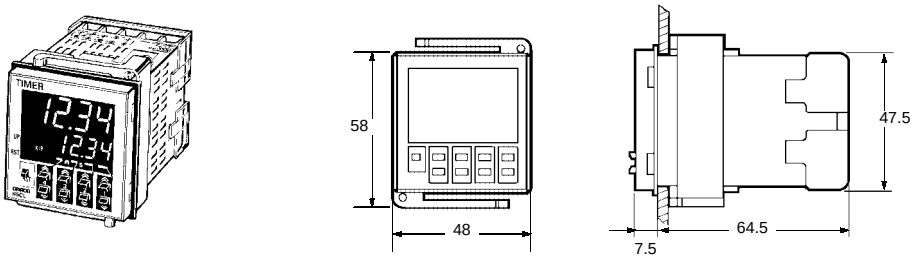
Note:
1. The mounting panel thickness should be 1 to 4 mm.
2. It is possible to mount timers side by side, but only in one direction.
3. When the Timers are mounted closely side by side, the Timers will not be water-resistive.

DIN Track Mounting



H5CL-AD j -500

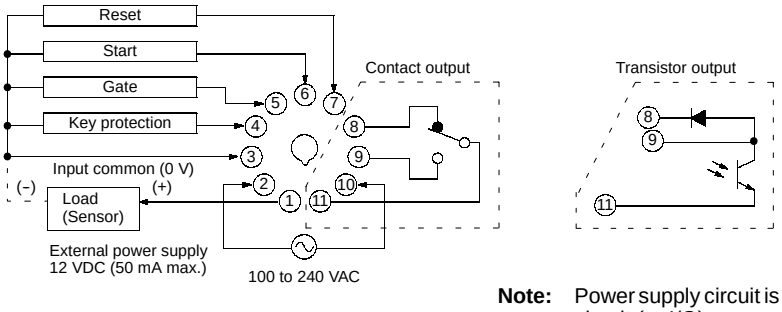
The cover conforms to finger protection standard against electric shock. (VDE 0106/P100)



Installation

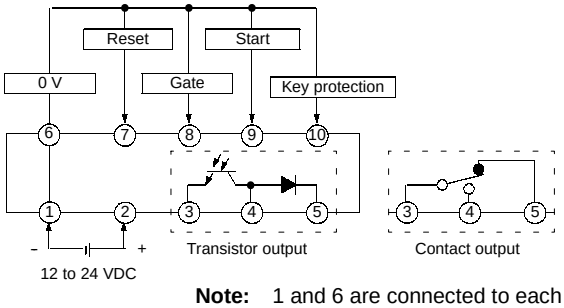
■ Terminal Arrangement

AC Models



Note: Power supply circuit is insulated from the internal circuit (or I/O).

DC Models

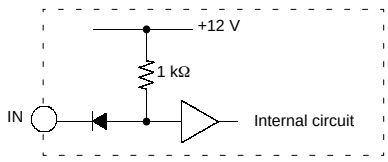


Note: 1 and 6 are connected to each other internally.

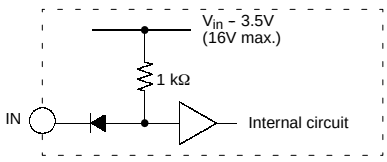
■ Input Circuits

Start, Reset, and Gate Input

H5CL-A j (AC Models)

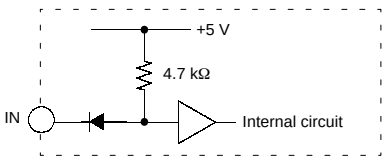


H5CL-AD j (DC Models)



V_{in}: Supply voltage

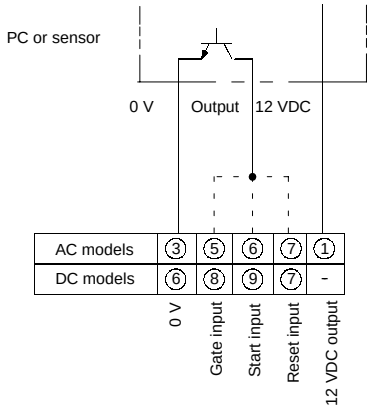
Key Protection Input



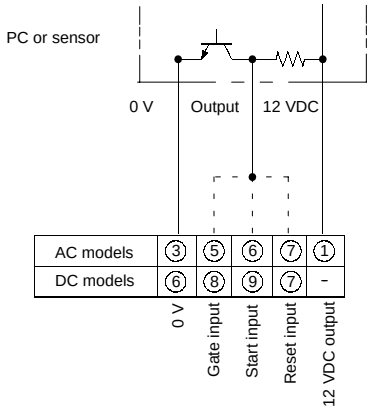
Note: No key input is effective while key protection input is ON.

■ Input Connections

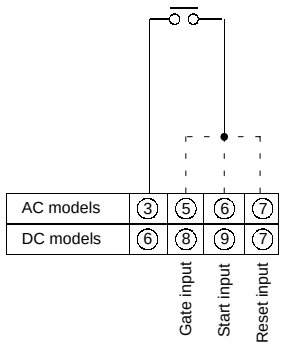
Open Collector Output



Voltage Output



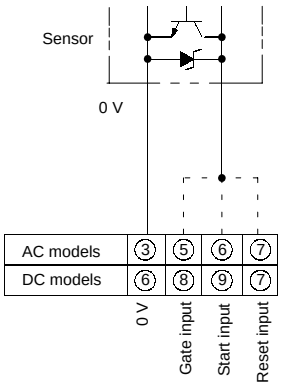
Contact input



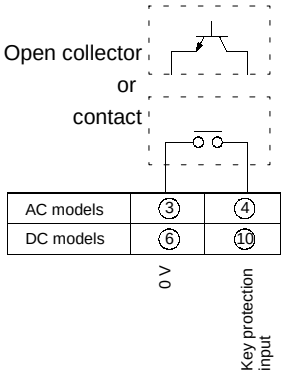
Start, Reset, and Gate Input Specification

ON impedance: 500 Ω max. (the leakage current is 5 to 20 mA when the impedance is 0 Ω.)
ON residual voltage: 2 V max.
OFF impedance: 100 kΩ min.
Maximum applicable voltage: 30 VDC max.

Two-wire Sensor



Key Protection Input



Applicable Two-wire Sensor

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

Note: When connecting a two-wire sensor to a DC models, supply 24 VDC (21.6 to 26.4 VDC) to the timer.

Key Protection Input

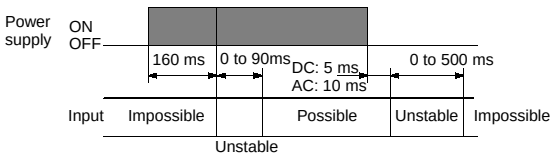
ON impedance: 1 kΩ max.
(the leakage current is approx. 1 mA when the impedance is 0 Ω.)
ON residual voltage: 0.5 V max.
OFF impedance: 100 kΩ min.
Maximum applicable voltage: 30 VDC max.

Note: The used contact should switch 1 mA at 5 V.

Precautions

Power Supplies

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



Apply the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value immediately.

Turn the power ON and OFF with 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.

Timer Control with Power Start

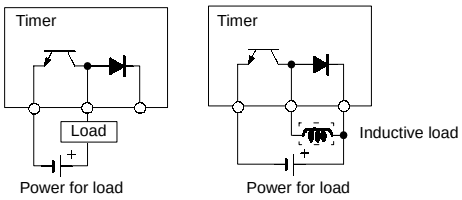
The timer will start 160 to 250 ms after the H5CL is turned on due to the startup time required for the sensor and any other peripheral devices connected to the H5CL (refer to the timing chart on the previous page). As a result, the control output of the H5CL will turn ON at a specific point in time within a range of 160 to 250 ms after the H5CL is turned on for any set value that is 216 ms or less. The present value will be displayed 216 ms after the H5CL is turned on. The H5CL operates normally if the set value is 217 ms or more.
If a set value of 216 ms or less is needed, operate the H5CL using a signal start.

When the H5CL 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 H5CL is turned on) due to the characteristics of the internal circuitry.
Use the H5CL with signal start if timer accuracy is required.

Transistor Output

The transistor output of the H5CL is insulated from the internal circuitry by a photocoupler, so the transistor output can be used as both NPN and 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 H5CL.



Self-diagnostic Function

The following displays will appear if an error occurs.

Display	Error	Output status	Correction	Set value after correction
e1	CPU	OFF	Press RST Key or turn power off and then ON	No change
e2	Memory (see note)			0

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

Operating Environment

When using the Timer in an area with excess electronic noise, separate the Timer, wiring, and the equipment which generates the input signals as far as possible from the noise sources. It is also recommended to shield the input signal wiring to prevent electronic interference.

Organic solvents (such as paint thinner), as well as very acidic or basic solutions can damage the outer casing of the Timer.

Preset Value Change

When changing preset value during timing operation, output will turn ON if preset value is changed as follows:

Display mode UP: Present value ≥ preset value
Display mode DOWN: Elapse time ≥ preset value
(Present value = 0)

Note: When in down mode, the changed amount of preset value is added to or subtracted from the present value.

Reset with a Preset Value of 0

The output will go ON when the start signal is input. The output will be OFF while the reset key is pressed or the reset input is ON.

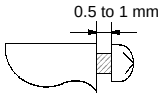
Power Failure Backup

All data is stored in the EEPROM when there is power failure. The EEPROM can be overwritten more than 200,000 times.

Operating mode	Overwriting timing
A mode	When the H5CL is turned off after changing the set value.
F mode	When the H5CL is turned off after changing the set value, turning the start input, or the reset input ON.

Flush Mounting

The H5CL's panel surface is water-resistive (conforming to NEMA 4 (indoors) and IP66). In order to prevent the internal circuit from water penetration through the space between the timer and operating panel, attach a rubber packing (provided with the H5CL) between the timer and operating panel and secure the rubber packing with the Y92F-30 flush-mounting adaptor.



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

Other

In case of performing a dielectric strength test, etc., on the H5CL mounted to a control panel, disconnect the H5CL from the connecting circuit, or short-circuit all the terminals of the H5CL.
Otherwise the H5CL may be damaged.

Terminal 1 (power supply terminal) and terminal 6 (input common: 0 V for input) of DC model H5CL are internally connected to each other.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L85-E1-2

OMRON

Multifunction Digital Timer | H5BR

72 x72 mm Timer with Easy-to-use Functions

- Nine output modes accommodate a wide variety of applications.
- All parameters set by scroll-through menus accessed from the front panel.
- Field-selectable time ranges from 0.001 second to 9999 hours.
- High visibility LCD display with built-in backlight.
- Batch counting Function records the number of completed cycles.
- Contact and solid-state outputs available simultaneously.
- Precision control possible to 0.001 second.
- Four levels of key protection provided.
- Selectable elapsed time (UP) and remaining time (DOWN) display.
- Conforms to EMC standards.
- Six-language instruction manual provided.

RC

Ordering Information

Functions		9 field selectable
Contact type		One SPDT relay and two NPN open collector transfor output
Terminal form		18 terminal screws on rear of case
Part number		H5BR-B
Supply voltage	**AC**	24/100 to 240 V, 50/60 Hz
	DC	12 to 24 V

Note: Specify both the model and control power supply when ordering.

■ Model Legend

H5BR - □

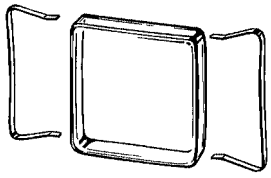
Type classifier
B: Standard

■ Accessories (Order Separately)

Soft cover	Y92A-72F1
Shock prevention cover*	Y92A-72T

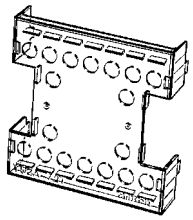
Note: Models with a shock prevention cover can be ordered by adding "-500" to the end of the model number.
e.g., H5BR-B-500 (100 to 240 VAC, 50/60 Hz)
The cover provides finger protection conforming to VDE0106/P100.

Soft cover



Y92A-72F1

Shock Prevention Cover
(conforming to VDE0106/P100)



Y92A-72T

Specifications

Model	H5BR-B (Standard type)
Classification	Digital timer
Mounting	Panel mounting
External connections	Screw terminals
Enclosure ratings	IP54 (panel surface)
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: IEC801-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC801-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4)
Approved standards	UL: File no. E41515 CSA: File no. LR22310 Conforms to EN50081-2, prEN50082-2
Display modes	Elapsed time (UP), remaining time (DOWN)
Output modes	A, A-1, A-2, A-3, b, b-1, d, E, F
Reset system	Power reset (except A-3, b-1, and F modes), External, manual, automatic resets (internal according to A-1, b, b-1, d, and E mode operation)
Batch counting function	Yes
Sensor power supply	12 VDC
Input signals	Start, reset, gate, batch count reset, key protect inputs
Input method	No-voltage input: Via opening and closing of contact
Control outputs	SPDT contact output and transistor output (NPN open collector)
Batch outputs	Transistor output (NPN open collector)
Display	LCD backlit
Digits	4 digits
Max. time settings	9.999 s (0.001 s units), 99.99 s (0.01 s units), 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 hr 59 min (1 min unit), 999.9 hr (0.1 hr unit), 9999 hr (1 hr unit)
Memory backup	Backup time for power interruption: Approx. 10 years at 20°C

■ Ratings

Rated supply voltage	100 to 240 VAC, 50/60 Hz 24 VAC/12 to 24 VDC (permissible ripple: 20% max.)
Operating voltage range	85% to 110% of rated voltage
Power consumption	Approx. 8 VA at 50 Hz, 240 VAC; approx. 5 W at 24 VDC
Reset and control signals	Min. pulse width 1 ms/20ms selectable
Batch count reset and gate	Min. pulse width: Approx. 20 ms
Key protect	Response time: 1 s
One-shot time	0.1 to 99.9 s or hold
Power reset (except A-3, b-1, and F mode)	Min. power opening time: 0.5 s
Signal, reset, gate, batch count reset inputs	No-voltage input ON impedance: 1 kΩ max. (Approx. 2 mA when 0 Ω) ON residual voltage: 2 V max. OFF impedance: 100 kΩ min.
Key protect input	No-voltage input ON impedance: 1 kΩ max. (Approx. 2 mA when 0 Ω) ON residual voltage: 1 V max. OFF impedance: 100 kΩ min.
Control outputs	Contacts: 5 A at 250 VAC, resistance load (cos ϕ = 1) Transistor output: Open collector 100mA at 30 VDC max. residual voltage 2 V max. (Approx. 1 V)
External power supply	80 mA, 12 VDC ±10% (5% ripple max.)
Ambient temperature	-10°C to 55°C (with no icing)
Storage temperature	-25°C to 65°C (with no icing)
Ambient humidity	35% to 85%
Case	Light gray

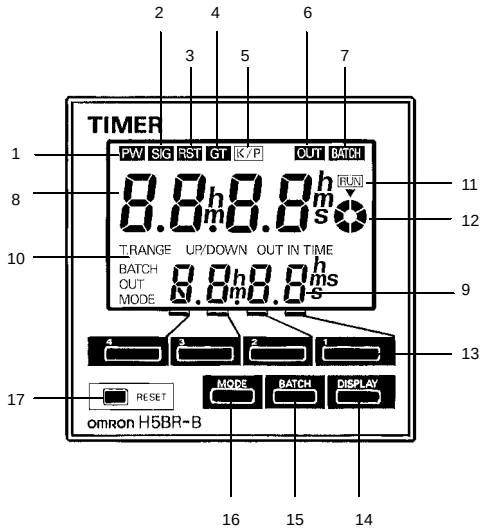
■ Characteristics

Repeat accuracy, setting error (including temperature and voltage effects)		Power start: ±0.01% ±0.05 s max. Control signal start: ±0.005% ±0.03 s max. *(rate for set value)
Insulation resistance		100 MΩ 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 terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC type 1,000 VAC for 24VAC/12 to 24 VDC type
Surge voltage		3 kV (between power terminals) for 100 to 240 VAC type, 1 kV for 24 VAC/12 to 24 VDC type 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC type, 1.5 kV for 24 VAC/12 to 24 VDC type
Noise immunity		±2 kV (between power terminals) and ±600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity		Malfunction: 8 kV; destruction: 15 kV
Vibration	**Destruction**	10 to 55 Hz with 0.75-mm single amplitude each in three directions
	Malfunction	10 to 55 Hz with 0.5-mm single amplitude each in three directions
Shock	**Destruction**	294 m/s^2 (30G) each in three directions
	Malfunction	98 m/s^2 (10G) each in three directions
Life expectancy	**Mechanical**	10 million operations min.
	Electrical	100,000 operations min. (5 A at 250 VAC in load resistance)
Weight		Approx. 270 g (9.6 oz)

Nomenclature

Display

1. Power indicator
2. Signal input indicator
3. Reset indicator
4. Gate indicator
5. Key protection indicator
6. Control output indicator
7. Batch output indicator
8. Present value
   (character height: 12mm) (Non significant zeroes suppressed)
9. Set value
   (character height: 8 mm)
   (Indicates value in set function mode)
10. Mode indicator
11. Timing indicator
12. Elapsed time indicator
    (Indicates the fraction of a unit which has elapsed. Displayed for timing ranges of 999.9 min. or greater.)



Operation key

13. Increment keys (1 to 4)
    (Used to change the corresponding digit of the set value. Used to change data in the setting mode.)
14. Display key
    (Switches to the present value display.)
15. Batch key
    (Switches to the batch display.)
16. Mode key
    (Switches from run mode to setting mode. Changes items in the setting mode.
17. Reset key
    (Resets timing and outputs.)

■ Factory Settings

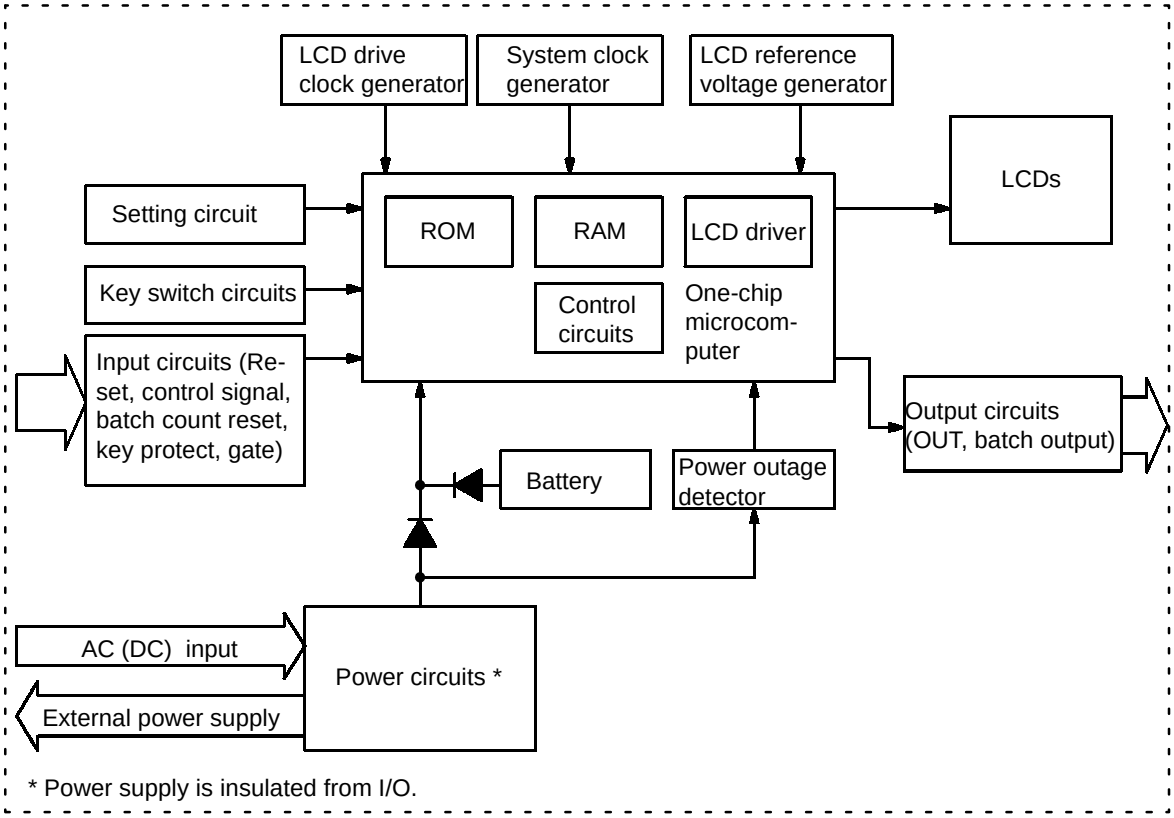
The following table shows the timer settings when it is shipped. Please change the settings as necessary to suit the system before operation. Settings and the display receive power from the internal battery and are therefore unaffected by external power interruptions.

Model	H5BR-B (Standard)
Time range	- -. - -s
Present value	0.00 s
Presets	0.00 s
Batch present count	0
Batch setting count	0
UP/DOWN mode	UP
Output mode	A: Signal on delay (I)
Output time	Hold
Input signal time	20 ms
Key protect level	KP-1

Note: With the initial settings, there will be no output even if the power supply is connected. External inputs and outputs cannot be used without a power supply.

Operation

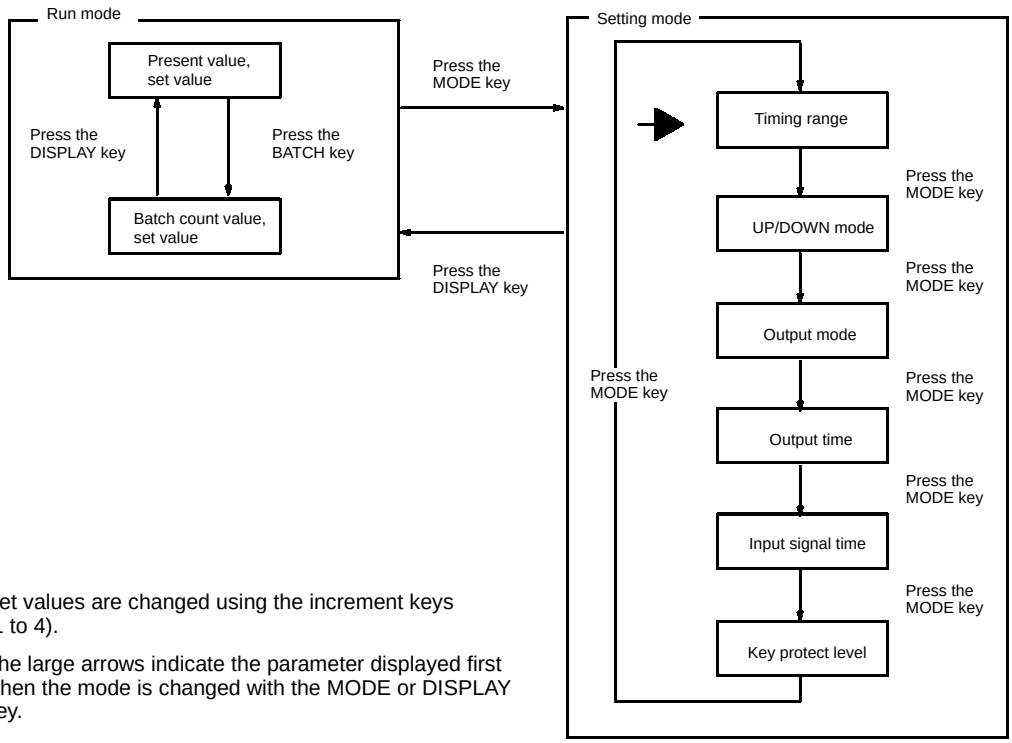
■ Block Diagram



■ 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. (to zero in UP modes, to preset in DOWN mode. Count inputs are not accepted while reset input is ON. Reset indicator lit while reset input is ON.
	Gate	Inhibits timer operation.
	Batch count reset	Resets batch count to zero and batch output turns OFF on leading edge. Batch count signals are not accepted while batch count reset is ON.
	Key protect	Makes keys inoperative according to key protect level. Key protected indicator lit while key protect input is ON. Effective when power supply is turned off. Effective when protect terminals are shorted.
Outputs	**Control output (OUT)**	Outputs made according to designated output mode when corresponding preset is reached.
	Batch output	Outputs made when batch count equals the preset number of batches. Batch output remains ON until batch count reset goes ON. When the number of batches is set to zero, batch counting is performed but batch outputs are not made.

■ Operational Overview



Note: 1. Set values are changed using the increment keys (1 to 4).

2. The large arrows indicate the parameter displayed first when the mode is changed with the MODE or DISPLAY key.

■ Setting Item Table

Mode	Setting item	Discription	Setting procedure
Run mode	Set value	Compared to the present value. Determines the timing of the control output according to the output mode.	Sequence when changing a digit using the increment keys (1 to 4). 0 → 1 → 2 → .... → 8 → 9
	Batch count set value	Turns ON the batch output when the preset number of cycles have been completed.	Sequence when changing a digit using the increment keys (1 to 4). 0 → 1 → 2 → .... → 8 → 9
Setting mode	Time range*	Determines the timing range.	Change the timing range with the increment keys (1 to 4).
	UP/DOWN mode	Selects	Select UP/DOWN with the increment keys (1 to 4). (UP) u ⟷ d (DOWN)
	Output mode	Determines the form of the control output. (Refer to the present value vs. output diagrams on page 10 to 12.)	Sequence when changing the mode using the increment keys (1 to 4). a → a-1 → a-2 → a-3 → b → b-1 → d → e → f
	Output time	Determines the duration of the control output. Will be displayed when the output mode is A, A-1, A-2, A-3, b, or b-1. Will not be displayed when the output mode is d, E, or F.	Use keys 1 to 3 to change the value. Key1 adjusts the first digit (0.1's digit). Key2 adjusts the second digit (1's digit). Key3 adjusts the third digit (10's digit). 0 → 1 → 2 → .... → 8 → 9 Key4 selects either hold output or one-shot output. hold ⟷ 0.0 s
	Input signal time	Changes the duration of the control and reset input signals.	Change the duration with the increment keys (1 to 4). (1 ms) 1 ⟷ 20 (20 ms)
	Key protect level	Locks certain keys to prevent accidental operation. The key protection level, kP-1 to kP-4, determines which keys are locked when the key protection input is ON. The locked keys are crossed out in the diagram on the right.	Sequence when changing the key protect level using the increment keys (1 to 4). kp-1 → kp-2 → kp-3 → kp-4 <KP-1> <KP-2> <KP-3> <KP-3>

Note: 1. Changes made in setting mode become effective when run mode is entered.

2. The time range setting appears first when setting mode is entered.

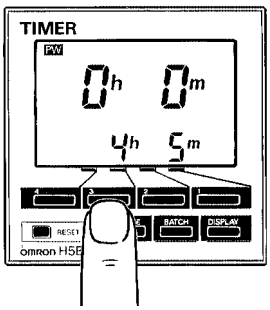
■ Examples

Run Mode

Changing the Set Value

To change the set value from 3 hr 5 min to 4 hr 5 min, press the 3 key so that the number 4 appears in the hour's place.

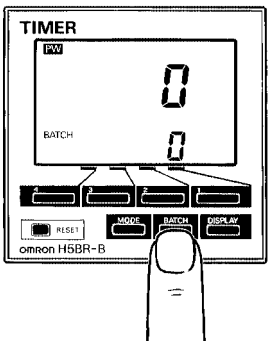
- Pressing keys 1 through 4 increments the corresponding column by 1.
- The columns can be changed in any order, but the output will be turned ON if the set value is less than the present value.
- Nonsignificant zeros are normally not shown on the set value display.



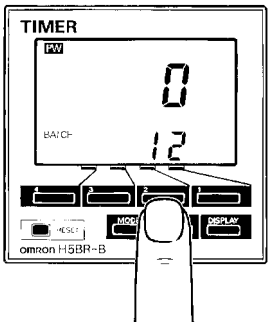
Note: Read *Changing Set Values* in the *Precautions* section, pg. 15, before changing the Timer set value during operation.

Changing the Batch Count Set Value

1. Press the BATCH key to switch from the present value display to the batch count display.



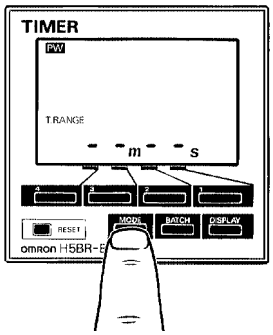
2. Change the set value when the Timer is set to the batch count display.
   - Nonsignificant zeros are normally suppressed on the batch count set value display.
   - Press the DISPLAY key to switch back from the batch count display to the present value display.



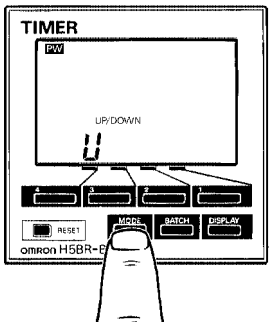
Setting Mode

Changing Settings in the Setting Mode

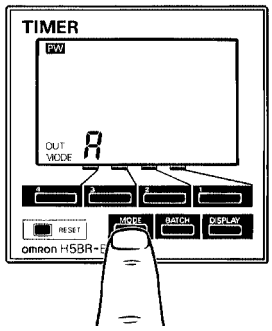
1. Press the MODE key to switch from run mode to setting mode.
   - The Timer will continue operation if switched from run mode to setting mode during operation.
   - The MODE key will be locked if the key protection function is enabled.
   - Settings changed in the setting mode are not effective until run mode is entered. As the operating conditions will change in this case, always reset operation with the RESET key or a reset input.



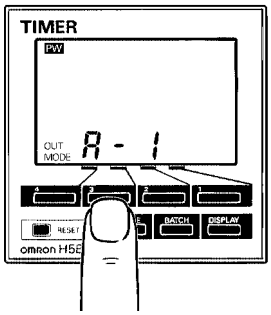
2. Press the MODE key to scroll successively through the items that can be set.



3. Changing the selected item
   - Press the MODE key until the desired item appears.

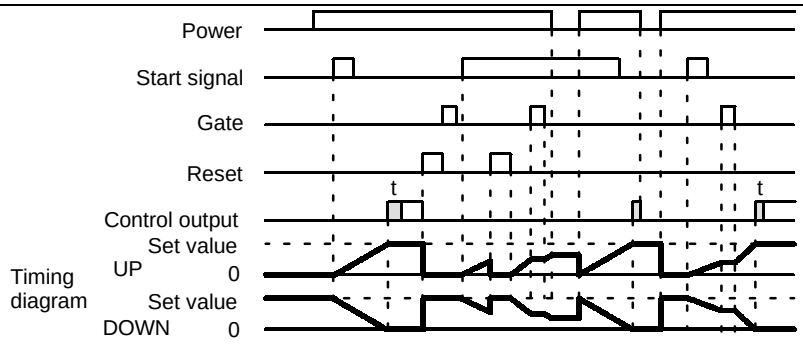


   - Change the item setting by pressing keys 1 through 4. (Press the DISPLAY key to switch back from setting mode to run mode.)



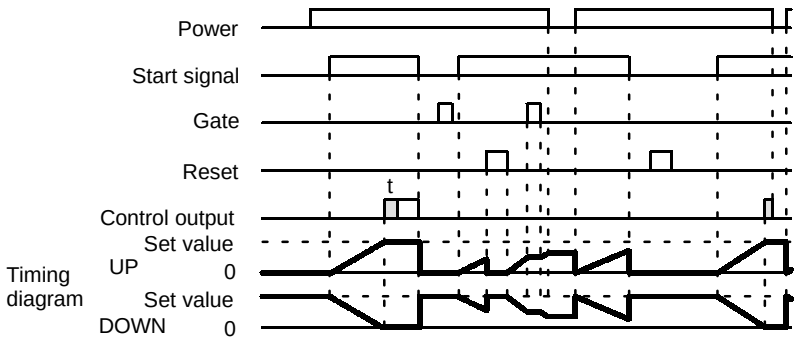
■ Timing Charts

Output mode A: Signal ON delay 1 (Timer resets when power comes on.)



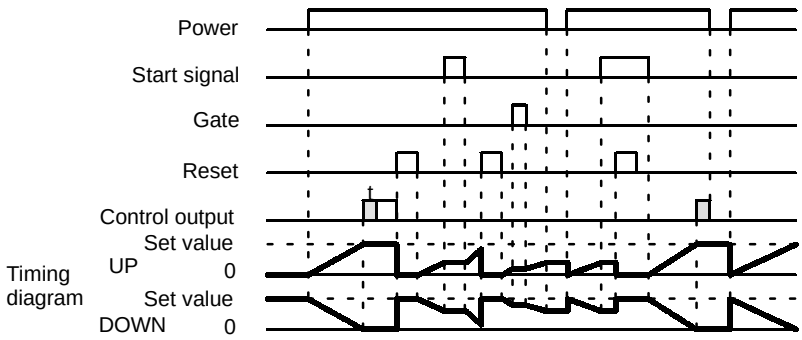
Timing begins at the leading edge of the start signal. The control output will be energized when the present value equals the preset time. The output can be sustained until a reset signal is applied or power interrupted or for a programmable one-shot time period.

Output mode A-1: Signal ON delay 2 (Timer resets when power comes on.)



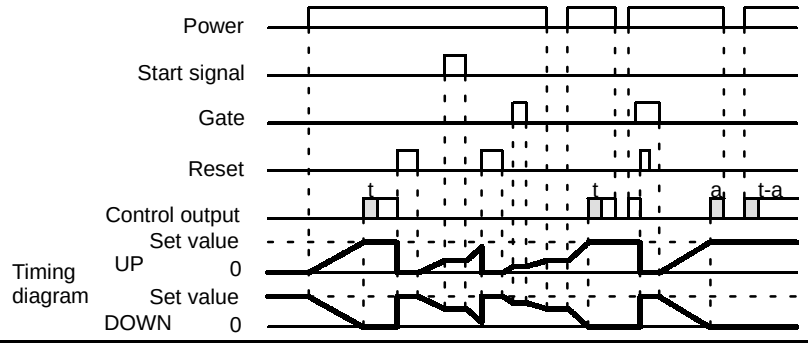
Timing begins at the leading edge of the start signal. The control output will be energized if the start signal is sustained for a amount of time equal to the preset time. The output can be sustained until a reset signal is applied or power interrupted or for a programmable one-shot time period.

Output mode A-2: Power ON delay 1 (Timer resets when power comes on.)

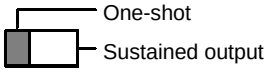


Timing begins when power is applied. Start signals act as a gate input causing the present value to ???. The control output will be energized when the present value equals the preset time. The output can be sustained until a reset signal is applied or power interrupted or for a programmable one-shot time period.

Output mode A-3: Power ON delay 2 (Timer does not reset when power comes on.)

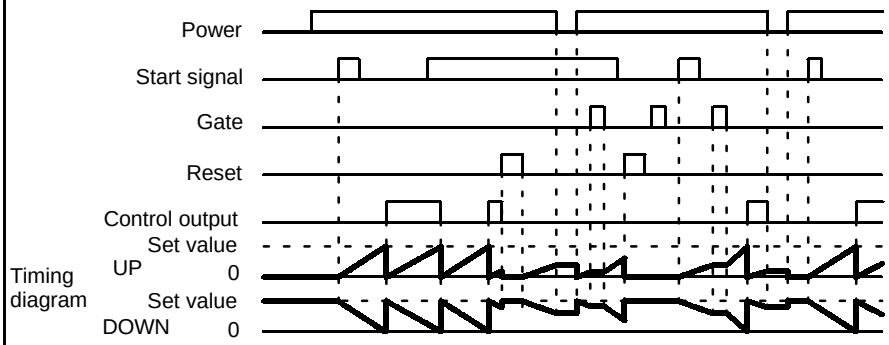


Timing begins when power is applied. Start signals act as a gate input causing the present value to ???. The control output will be energized when the present value equals the preset time. The output can be sustained until a reset signal is applied or power interrupted or for a programmable one-shot time period.

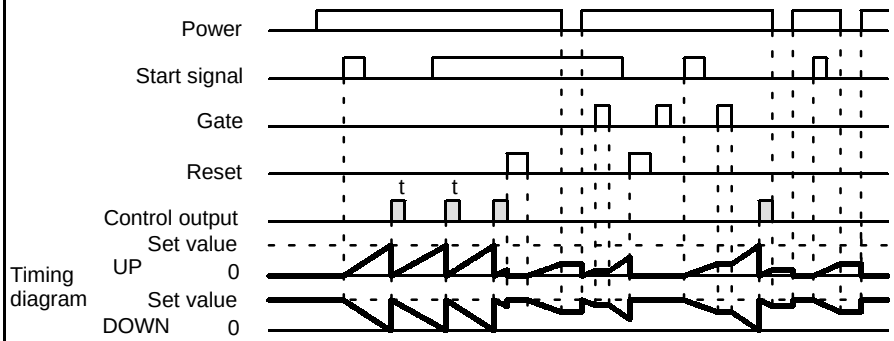


One-shot outputs can be set from 0.1 s to 99.9 s.

Output mode b: Repeat cycle 1 (Timer resets when power comes on.)

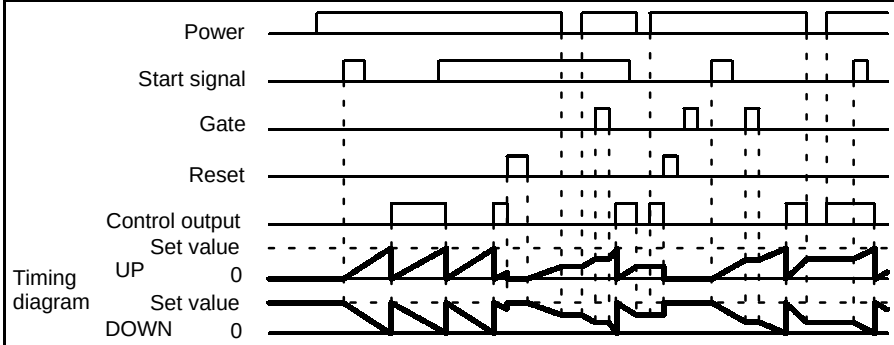


The OFF/ON cycle is initiated at the leading edge of the start signal. The output relay will be OFF for the preset time, then ON for the preset time. The cycle will be repeated until a reset input is applied or power is interrupted.

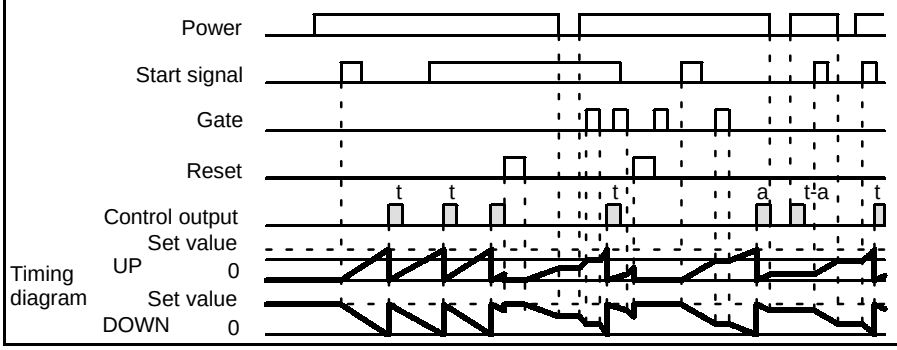


The OFF/ON cycle is initiated at the leading edge of the start signal. The control output will be OFF for the first cycle. In subsequent cycles the output will be ON for the programmable one-shot time period, then OFF for the remained of the preset time. The cycle will be repeated until a reset input is applied or power is interrupted.

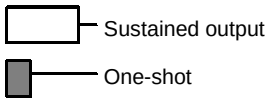
Output mode b-1: Repeat cycle 2 (Timer does not reset when power comes on.)



The OFF/ON cycle is initiated at the leading edge of the start signal. The output relay will be OFF for the preset time, then ON for the preset time. The cycle will be repeated until a reset input is applied or power is interrupted.

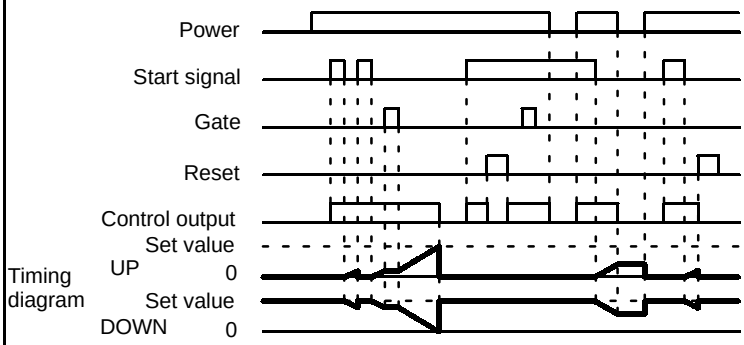


The OFF/ON cycle is initiated at the leading edge of the start signal. The control output will be OFF for the first cycle. In subsequent cycles the output will be ON for the programmable one-shot time period, then OFF for the remained of the preset time. The cycle will be repeated until a reset input is applied or power is interrupted.



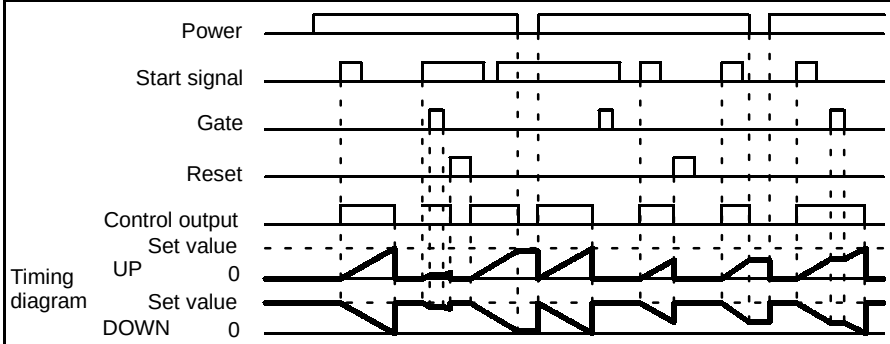
One-shot outputs can be set from 0.1 s to 99.9 s.

Output mode d: Signal OFF delay (Timer resets when power comes on.)



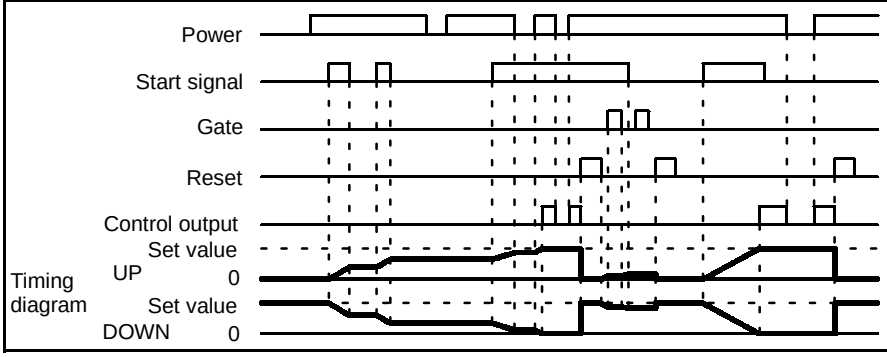
The control output is energized at the leading edge of the start signal. Timing begins at the trailing edge of the start signal. The control output is de-energized when the present value equals the preset time.

Output mode E: Interval (Timer resets when power comes on.)



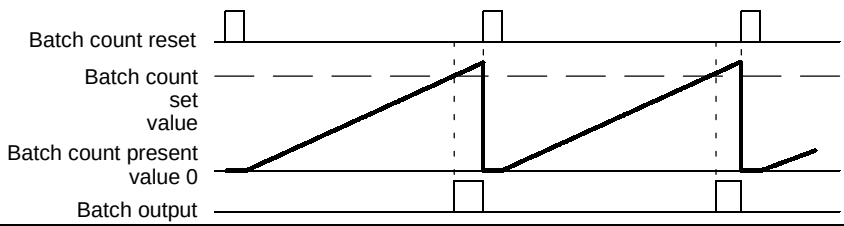
Timing begins on the leading edge of the start signal. The control output is only energized during timing. The timer is reset when power is interrupted or a reset signal is applied.

Output mode F: Cumulative (Timer does not reset when power comes on.)



Timing begins on the leading edge of the start signal. The control output is energized when the cumulative elapsed time of the start signal is equal to the preset time. The output is sustained until power is interrupted or a reset signal applied.

■ Batch Counter Operation



The batch count output holds until reset by the batch count reset.
The present value of the batch count advances continuously.

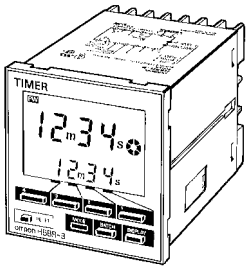
1. The batch count present value remains at 0 while the batch count reset is ON.
2. When the batch count set value is 0, the batch count will proceed, but there will be no output.
3. When the batch count present value exceeds 9999, it returns to 0.
4. The batch count present value and output are not affected by RESET key or reset input.
5. When power is interrupted and the batch count output is ON, the output will be ON when power returns.
6. When a batch count set value which is greater than the present value is changed to a set value which is less than the present value, the output will go ON.
7. If, after the output has gone ON, the set value is changed to a set value which is greater than the present value, the output will remain ON.
8. In the Flicker 1, 2 output hold modes, the number of completed timing is double the number of outputs. To control the number of outputs, set the batch count set value at double the desired number of outputs.

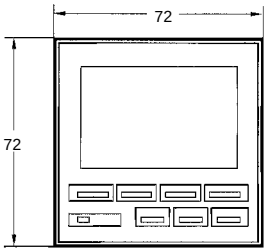
Dimensions

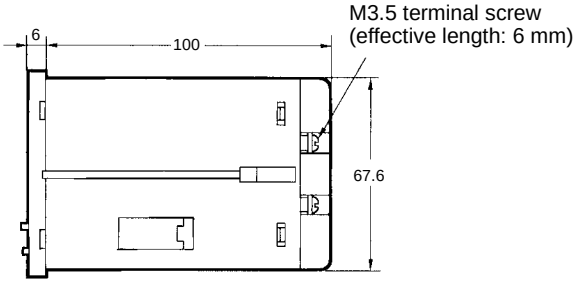
Note: All units are in millimeters unless otherwise indicated.

H5BR

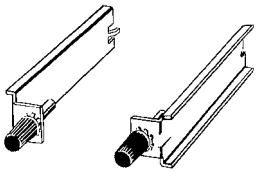
Panel Mounting

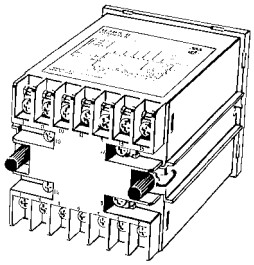


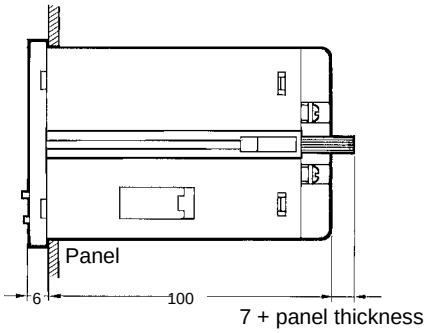




Panel Mounting Adaptor

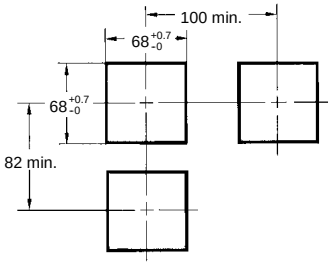






Panel Cutouts

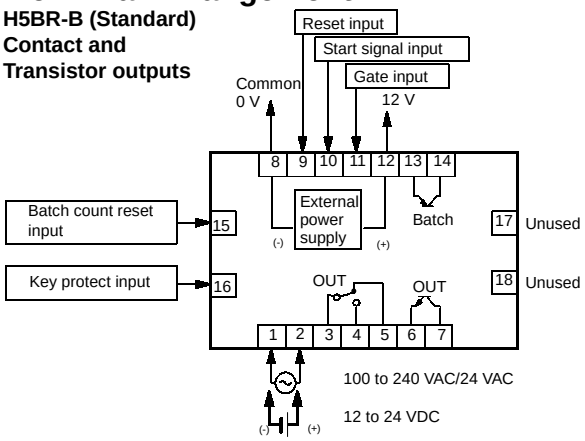
Panel cutouts are as shown at right. (according to DIN43700).



Installation

■ Terminal Arrangement

H5BR-B (Standard) Contact and Transistor outputs

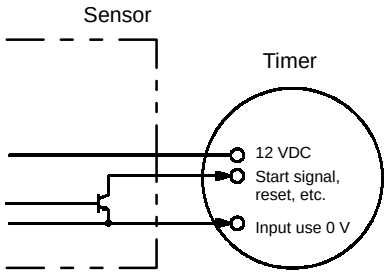


Note: Do not connect unused terminals.

■ Connections

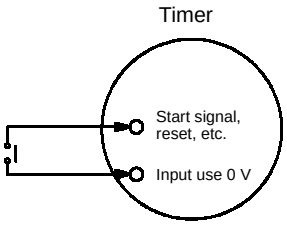
The inputs of the H5BR are no-voltage (short circuit or open) inputs.

No-contact Input (NPN Transistor)



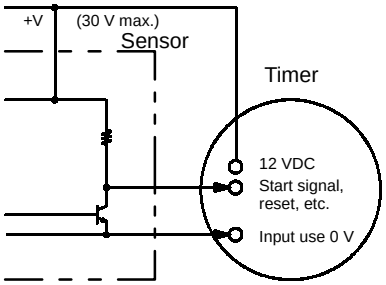
High: transistor ON

Contact Input



High: contact ON

No-contact Input



High: transistor ON

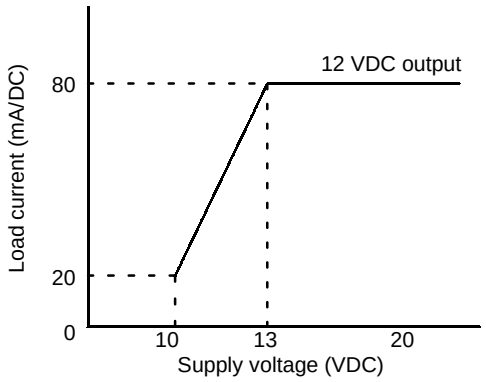
No-voltage Input Signal Levels

No-contact input	1. High level Transistor ON Residual voltage: 2 V max. Impedence when ON: 1 kΩ max.
	2. Low level Transistor OFF Impedence when OFF: 100 kΩ min.
Contact input	Use contacts which can adequately switch 2 mA at 5 V

Precautions

■ External Power Supply

- The capacity of the external power supply is 80 mA at 12 VDC. When using a 24 VAC/12 to 24 VDC power supply, reduce the load with the power supply voltage, as shown in the following diagram (DC power supplies only).



■ Power Supplies

- If power is interrupted for less than 10 ms, operation will continue normally. If power is interrupted for between 10 and 500 ms, operation will be inconsistent, and timing may stop or reset, depending on the mode.
- Connect the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value immediately.
- Depending on switching frequency, current surges may degrade relay contacts; relays with a capacity greater than 10 A are recommended.
- Be sure that the capacity of the external power supply is adequate, because the power supply may not provide a surge current sufficient to start the Timer due to the switching regulator contained in the Timer's internal circuitry.

■ Input and Output

- Do not use external sources to increase the voltage of input signals (control signal, reset, gate, and key protection).
- Be sure that the load of the control output (contact, transistor) is less than the maximum values indicated in the specifications. If the output load exceeds the recommended value, the lifespan of the contact output type will be shortened dramatically, and the transistor of the transistor output type will be damaged.
- The transistor output is insulated from the internal circuitry by a photocoupler, so either NPN or PNP transistors can be used.

■ Self-diagnostic Function

- The following displays will appear if an error occurs. The present value and output enter the same status as after pressing the RESET key.

Display	Error	Output status	Correction	Setting
e1	CPU	OFF	Press RESET key	No change
e2	Memory		(batch count to 0)	Set at the factory

■ Changing Set Values

- The Timer set value can be changed while the timer is operating, so a high value can be set temporarily to inactivate the timer, or a low value can be set to activate the timer more quickly. (If the set value is changed accidentally during operation, the timer might be activated. Therefore, turn the key protection input ON unless the set value is being changed.)
- To avoid changing the output when changing the set value, it is recommended to begin changing the set value by entering a large number in the higher digit.

■ Operating Environment

- When using the Timer in an area with much electronic noise, separate the Timer, wiring, and the equipment which generates the input signals as far as possible from the noise sources. It is also recommended to shield the input signal wiring to prevent electronic interference.
- Organic solvents (such as paint thinner), as well as very acidic or basic solutions might damage the outer casing of the Timer.

■ Other

- When the timer is installed in a control box and tests are conducted which may damage the Timer's internal circuitry (for example, a test measuring the maximum voltage difference between the control circuit and metal components), remove the Timer from the control box or short circuit the terminals.

Caution

This product contains a lithium battery. Lithium batteries explode if incinerated. Dispose of the Digital Timer as a non-combustible item.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L34-E1-2A

OMRON

Multifunction Digital Timer | H5CR

1/16 DIN Timer with Easy-to-use Functions

- Nine output modes accommodate a wide variety of applications.
- All parameters set by scroll-through menus accessed from the front panel.
- Field-selectable time ranges from 0.001 second to 9999 hours.
- High visibility LCD display with built-in backlight.
- Precision control possible to 0.001 second.
- Four levels of key protection provided.
- Selectable elapsed time (UP) and remaining time (DOWN) display.
- Model H5CR-S only 64 mm deep.
- Conforms to EMC standards.
- Six-language instruction manual provided.

RC+

Ordering Information

Functions		9 field selectable					
Contact type		SPDT relay			Solid-state open collector		
Unit Depth		Basic (78 mm)	Standard (100 mm)	Short body (64 mm)	Basic (78 mm)	Standard (100 mm)	Short body (64 mm)
Display	Backlit	---	H5CR-B	H5CR-S	---	H5CR-BS	H5CR-SS
	Non backlit	H5CR-L	---	---	H5CR-LS	---	---
Supply voltages	AC	24/100 to 240 V, 50/60 Hz	24/100 to 240 V, 50/60 Hz	---	24/100 to 240 V, 50/60 Hz	24/100 to 240 V, 50/60 Hz	---
	DC	12 to 24 V	---	12 to 24 V	12 to 24 V	---	12 to 24 V

Note: Add the supply voltage to the part number when ordering.

■ Model Legend

H5CR - □ □

2. Output type classifier
Blank: Relay output
S: Solid-state output

1. Type classifier
L: Basic
B: Standard
S: Short body

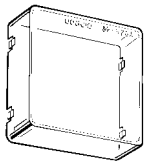
Note: Models with a shock prevention cover can be ordered by adding "-500" to the end of the model number.
e.g., H7CR-B-500 (100 to 240 VDC, 50/60 Hz)
The shock prevention cover provides finger protection conforming to VDE0106/P100.

■ Accessories (Order Separately)

Hard cover	Y92A-48
Soft cover	Y92A-48F1
Track mounted socket	P2CF-08
Rear surface connection socket	P3G-08
Shock prevention cover	Y92A-48T
Mounting Adapter	Y92F-30*

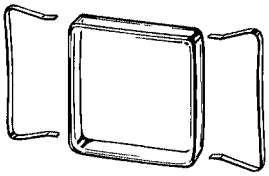
*Standard with unit

Hard Cover



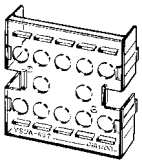
Y92A-48

Soft Cover



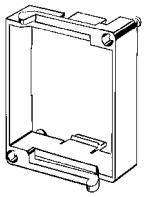
Y92A-48F1

Shock Prevention Cover
(conforming to VDE0106/P100)



Y92A-48T

Adapter



Y92F-30

Specifications

Model	H5CR-L (Basic type)	H5CR-B (Standard type)	H5CR-S (Short body type)
Classification	Digital timer		
Mounting	Panel or Surface mounting	Panel mounting	
External connections	8P socket	Screw terminals	
Enclosure ratings	IP40	IP54 (panel surface)	
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: IEC801-2: 4 kV contact discharge (level 2), 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC801-4: 2 kV power-line (level 3), 2 kV I/O signal-line (level 4)		
Approvals	UL: File no. E41515 CSA: File no. LR22310 Conforms to EN50081-2, prEN50082-2		
Display modes	Elapsed time (UP), remaining time (DOWN)		
Output modes	A, A-1, A-2, A-3, b, b-1, d, E, F		
Reset system	Power reset (except A-3, b-1, and F modes), External, manual, automatic resets (internal according to A-1, b, b-1, d, and E mode operation)		
Input signals	Start, reset inputs	Start, reset, gate, key protect inputs	
Input method	No-voltage input: Via opening and closing of contact		
Control outputs	SPDT contact output and transistor output (NPN open collector)		
Display	LCD without backlight	LCD with backlight	
Digits	4 digits		
Max. time settings	9.999 s (0.001 s units), 99.99 s (0.01 s units), 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 hr 59 min (1 min unit), 999.9 hr (0.1 hr unit), 9999 hr (1 hr unit)		
Memory backup	Backup time for power interruption: Approx. 10 years at 20°C		

■ Ratings

Model	H5CR-L (Basic type)	H5CR-B (Standard type)	H5CR-S (Short body type)
Rated supply voltage	100 to 240 VAC (50/60 Hz) 24 VAC (50/60 Hz) 12 to 24 VDC (permissible ripple: 20% max.)	100 to 240 VAC (50/60 Hz) 24 VAC (50/60 Hz)	12 to 24 VDC (permissible ripple: 20% max.)
Operating voltage range	85% to 110% of rated voltage		
Power consumption	Approx. 3 VA at 50 Hz, 240 VAC; approx. 1 W at 24 VDC	Approx. 5 VA at 50 Hz, 240 VAC	Approx. 2 W at 24 VDC
Reset and control signals	Min. pulse width 1 ms/20ms selectable		
Gate	---	Min. pulse width: Approx. 20 ms	
Key protect	---	Response time: 1 s	
One-shot time	0.1 to 20 s (select from 7 kinds) or hold		
Power reset (except A-3, b-1, and F mode)	Min. power opening time: 0.5 s		
Signal, reset, gate inputs	No-voltage input ON impedance: 1 kΩ max. (Approx. 2 mA when 0 Ω) ON residual voltage: 2 V max. OFF impedance: 100 kΩ min.a		
Key protect input	---	No-voltage input ON impedance: 1 kΩ max. (Approx. 2 mA when 0 Ω) ON residual voltage: 1 V max. OFF impedance: 100 kΩ min.	
Control outputs	Contacts: 5 A at 250 VAC, resistance load (cos ϕ = 1) Transistor output: Open collector 100mA at 30 VDC max. residual voltage 2 V max. (Approx. 1 V)		
Ambient temperature	-10°C to 55°C (with no icing)		
Storage temperature	-25°C to 65°C (with no icing)		
Ambient humidity	35% to 85%		
Case	Light gray		

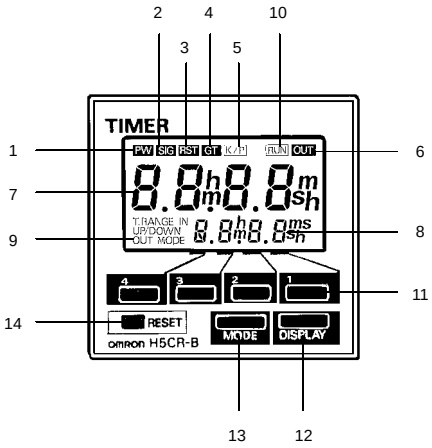
■ Characteristics

Repeat accuracy (including temperature and voltage effects)		Power start: ±0.01% ±0.05 s max. Control signal start: ±0.005% ±0.03 s max. *(rate for set value)
Insulation resistance		100 MΩ 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 terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC type 1,000 VAC for 24VAC/12 to 24 VDC type
Surge voltage		3 kV (between power terminals) for 100 to 240 VAC type, 1 kV for 24 VAC/12 to 24 VDC type 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC type, 1.5 kV for 24 VAC/12 to 24 VDC type
Noise immunity		±2 kV (between power terminals)(±480 V for 12 to 24 VDC) and ±600 V (between 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	**Destruction**	10 to 55 Hz with 0.75-mm single amplitude each in three directions
	Malfunction	10 to 55 Hz with 0.5-mm single amplitude each in three directions
Shock	**Destruction**	294 m/s^2 (30G) each in three directions
	Malfunction	98 m/s^2 (10G) each in three directions
Life expectancy	**Mechanical**	10 million operations min.
	Electrical	100,000 operations min. (5 A at 250 VAC in load resistance)
Weight		H5CR-L: Approx. 105 g, H5CR-B: Approx. 160 g, H5CR-S: Approx: 120 g

Nomenclature

Display

1. Power indicator
2. Signal input indicator
3. Reset indicator
4. Gate indicator
   (not included in the H5CR-L)
5. Key protection indicator
   (not included in the H5CR-L)
6. Control output indicator
7. Present value
   (character height: 8mm)(Non significant zeroes suppressed)
8. Set value
   (character height: 4 mm)
   (Indicates value in set function mode)
9. Mode indicator
10. Timing indicator



Operation key

11. Increment keys (1 to 4)
    (Used to change the corresponding digit of the set value. Used to change data in the set mode.)
12. Display key
    (Switches to the present value display.)
13. Mode key
    (Switches from run mode to set mode. Changes items in the set mode.
14. Reset key
    (Resets timing and outputs.)

■ Factory Settings

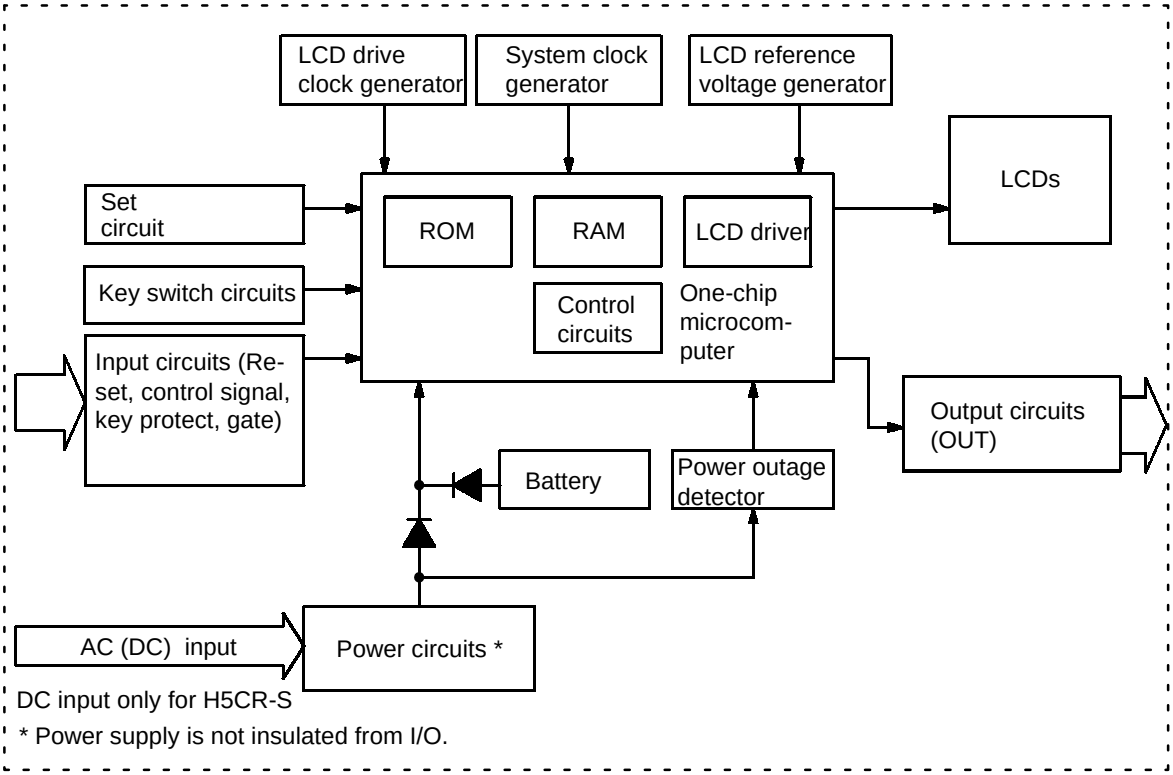
The following table shows the timer settings when it is shipped. Please change the settings as necessary to suit the system before operation. Settings and the display receive power from the internal battery and are therefore unaffected by external power interruptions.

Model	H5CR-B (Standard)/H5CR-S (Short body)	H5CR-L (Basic)
Time range	- -. - -s	
Present value	0.00 s	
Presets	0.00 s	
UP/DOWN mode	UP	
Output mode	A: Signal on delay (I)	
Output time	Hold	
Input signal time	20 ms	
Key protect level	KP-1	---

Note: With the initial settings, there will be no output even if the power supply is connected. External inputs and outputs cannot be used without a power supply.

Operation

■ Block Diagram

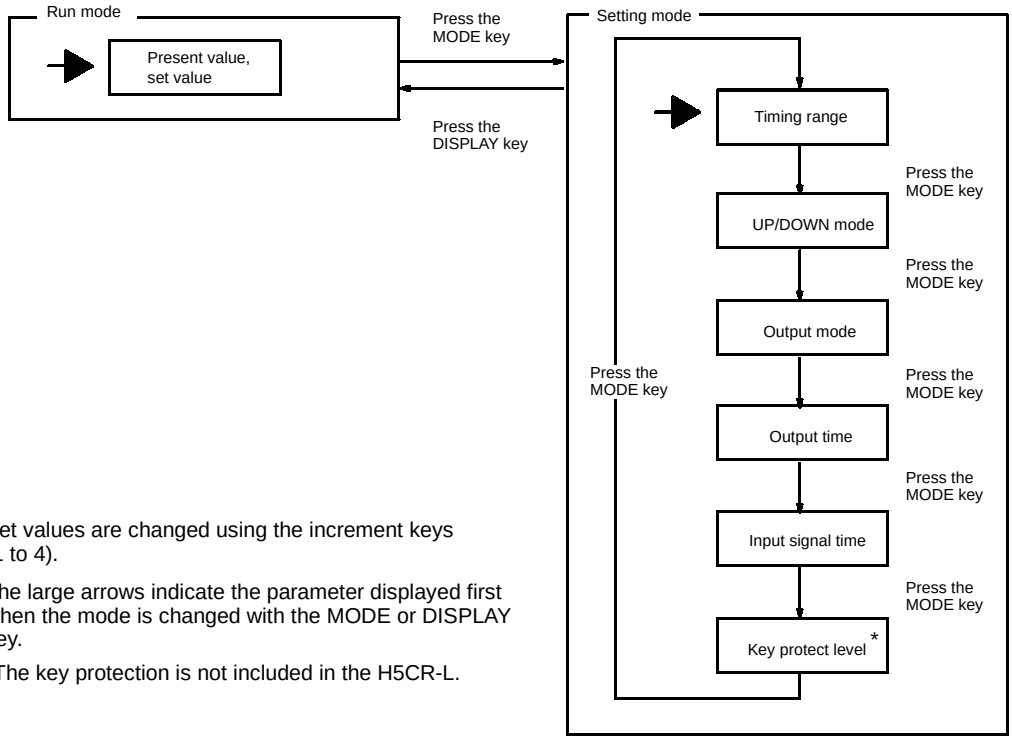


■ I/O Functions

Inputs	**Start signal**	Stops timing in A-2 and A-3 (power on delay) modes. Starts timing in other modes.
	Reset	Resets present value. (to zero in UP modes, to preset in DOWN mode. Count inputs are not accepted while reset input is ON. Reset indicator lit while reset input is ON.
	Gate	Inhibits timer operation.
	Key protect	Makes keys inoperative according to key protect level. Key protected indicator lit while key protect input is ON. Effective when power supply is turned off. Effective when protect terminals are shorted.
Outputs	**Control output (OUT)**	Outputs made according to designated output mode when corresponding preset is reached.

■ Operational Overview

This flowchart shows operation common to all H5CR models. Refer to the following Setting Item Table for details on the operation of specific models.



Note: 1. Set values are changed using the increment keys (1 to 4).

2. The large arrows indicate the parameter displayed first when the mode is changed with the MODE or DISPLAY key.

3. *The key protection is not included in the H5CR-L.

■ Setting Item Table

Mode	Setting item	Discription	Setting procedure
Run mode	Set value	Compared to the present value. Determines the timing of the control output according to the output mode.	Sequence when changing a digit using the increment keys (1 to 4). 0 → 1 → 2 → .... → 8 → 9
Setting mode	Time range*	Determines the timing range.	Change the timing range with the increment keys (1 to 4).
	UP/DOWN mode	Selects	Select UP/DOWN with the increment keys (1 to 4). (UP) u ⟷ d (DOWN)
	Output mode	Determines the form of the control output. (Refer to the present value vs. output diagrams on page 9 to 11.)	Sequence when changing the mode using the increment keys (1 to 4). a → a-1 → a-2 → a-3 → b → b-1 → d → e → f
	Output time	Determines the duration of the control output. Will be displayed when the output mode is A, A-1, A-2, A-3, b, or b-1. Will not be displayed when the output mode is d, E, or F.	Change the output time with the increment keys (1 to 4) hold ← 0.1 s → 0.5 s → 1s → 5s → 10 s → 15 s → 20 s
	Input signal time	Changes the duration of the control and reset input signals.	Change the duration with the increment keys (1 to 4). (1 ms) 1 ⟷ 20 (20 ms)
	Key protect level	Locks certain keys to prevent accidental operation. The key protection level, kP-1 to kP-4, determines which keys are locked when the key protection input is ON. The locked keys are crossed out in the diagram on the right.	Sequence when changing the key protect level using the increment keys (1 to 4). kp-1 → kp-2 → kp-3 → kp-4 <KP-1> <KP-2> <KP-3> <KP-3>

Note: 1. Changes made in setting mode become effective when run mode is entered.
2. The time range setting appears first when setting mode is entered.
3. *The key protection function is not included in the H5CR-L.

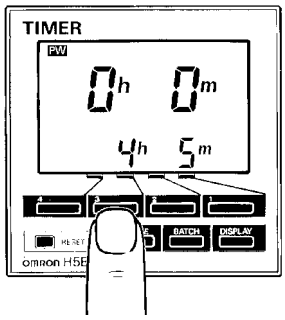
■ Examples

Run Mode

Changing the Set Value

To change the set value from 3 hr 5 min to 4 hr 5 min, press the 3 key so that the number 4 appears in the hour's place.

- Pressing keys 1 through 4 increments the corresponding column by 1.
- The columns can be changed in any order, but the output will be turned ON if the set value is less than the present value.
- Nonsignificant zeros are suppressed on the set value display.

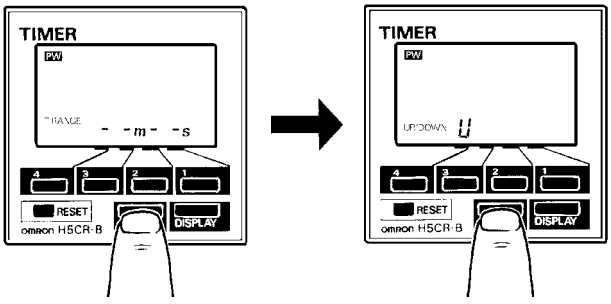


Note: Read *Changing Set Values* in the *Precautions* section, pg. 15, before changing the Timer set value during operation.

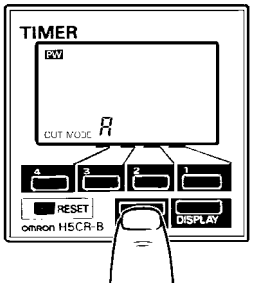
Setting Mode

Changing Settings in the Set Mode

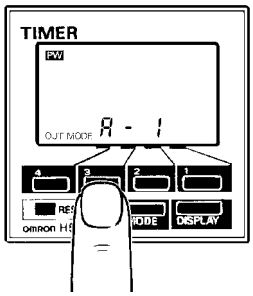
1. Press the MODE key to switch from run mode to set mode.
   - The Timer will continue operation if switched from run mode to set mode during operation.
   - The MODE key will be locked if the key protection function is enabled.
   - Settings changed in the set mode are not effective until run mode is entered. As the operating conditions will change in this case, always reset operation with the RESET key or a reset input.
2. Press the MODE key to scroll successively through the items that can be set.



3. Changing the selected item
   - Press the MODE key until the desired item appears



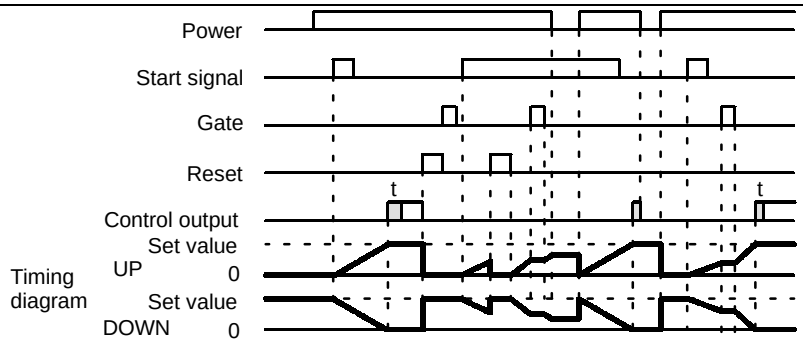
   - Change the item setting by pressing keys 1 through 4. (Press the DISPLAY key to switch back from set mode to run mode.)



■ Timing Charts

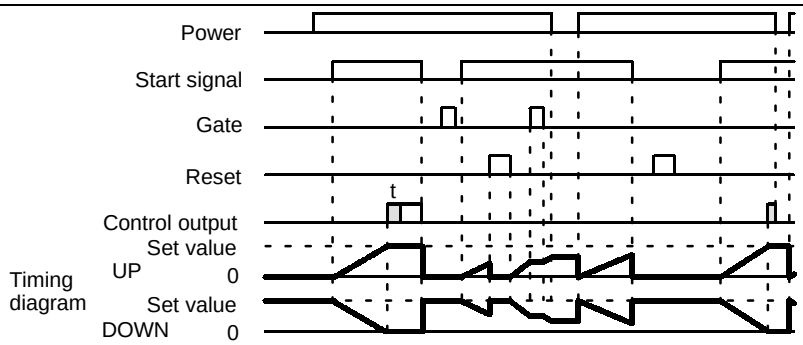
The gate input is not included in the H5CR-L.

Output mode A: Signal ON delay 1 (Timer resets when power comes on.)



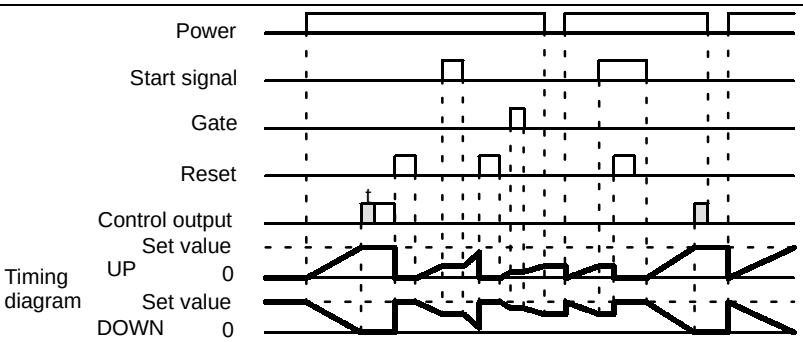
Timing begins at the leading edge of the start signal. The control output will be energized when the present value equals the preset time. The output can be sustained until a reset signal is applied or power interrupted or for a programmable one-shot time period.

Output mode A-1: Signal ON delay 2 (Timer resets when power comes on.)



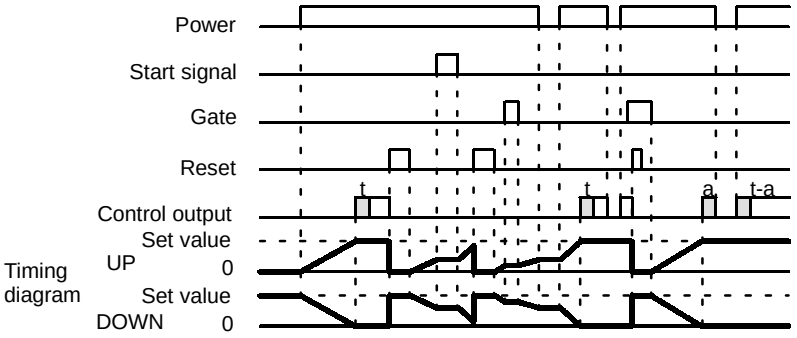
Timing begins at the leading edge of the start signal. The control output will be energized if the start signal is sustained for a amount of time equal to the preset time. The output can be sustained until a reset signal is applied or power interrupted or for a programmable one-shot time period.

Output mode A-2: Power ON delay 1 (Timer resets when power comes on.)

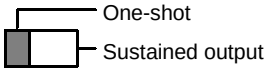


Timing begins when power is applied. Start signals act as a gate input causing the present value to ???. The control output will be energized when the present value equals the preset time. The output can be sustained until a reset signal is applied or power interrupted or for a programmable one-shot time period.

Output mode A-3: Power ON delay 2 (Timer does not reset when power comes on.)

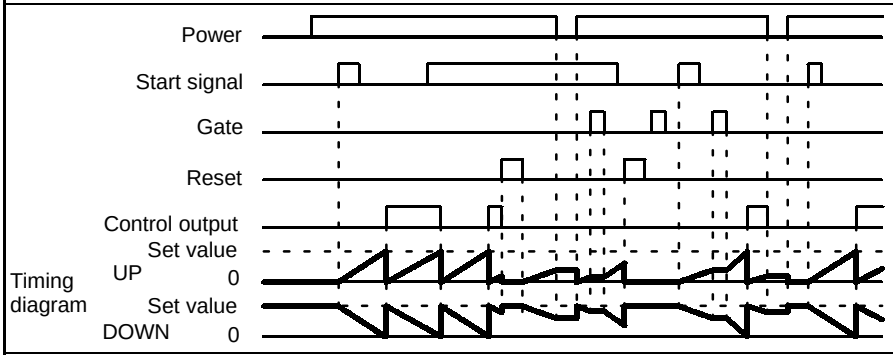


Timing begins when power is applied. Start signals act as a gate input causing the present value to ???. The control output will be energized when the present value equals the preset time. The output can be sustained until a reset signal is applied or power interrupted or for a programmable one-shot time period.

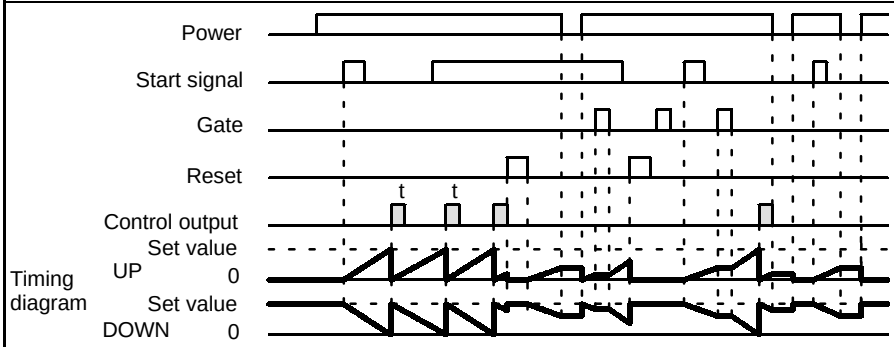


One-shot outputs can be set to 0.1 s, 0.5 s, 1 s, 5 s, 10 s, 20 s.

Output mode b: Repeat cycle 1 (Timer resets when power comes on.)

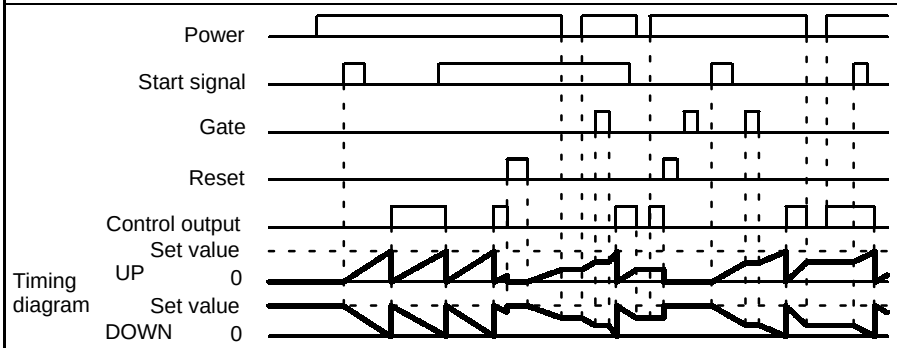


The OFF/ON cycle is initiated at the leading edge of the start signal. The output relay will be OFF for the preset time, then ON for the preset time. The cycle will be repeated until a reset input is applied or power is interrupted.

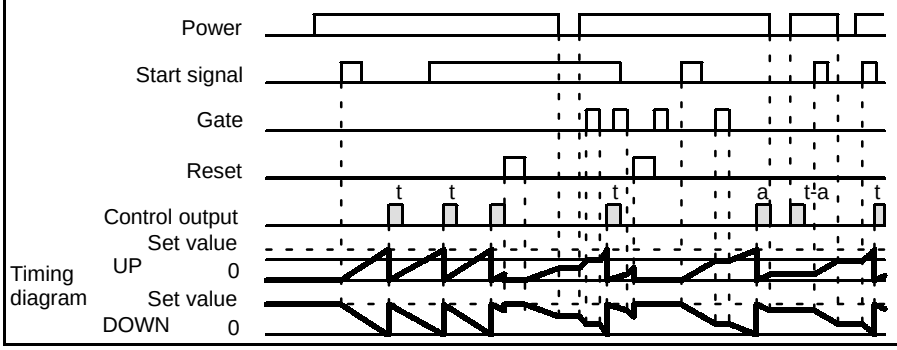


The OFF/ON cycle is initiated at the leading edge of the start signal. The control output will be OFF for the first cycle. In subsequent cycles the output will be ON for the programmable one-shot time period, then OFF for the remained of the preset time. The cycle will be repeated until a reset input is applied or power is interrupted.

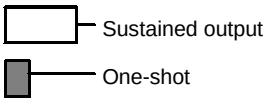
Output mode b-1: Repeat cycle 2 (Timer does not reset when power comes on.)



The OFF/ON cycle is initiated at the leading edge of the start signal. The output relay will be OFF for the preset time, then ON for the preset time. The cycle will be repeated until a reset input is applied or power is interrupted.

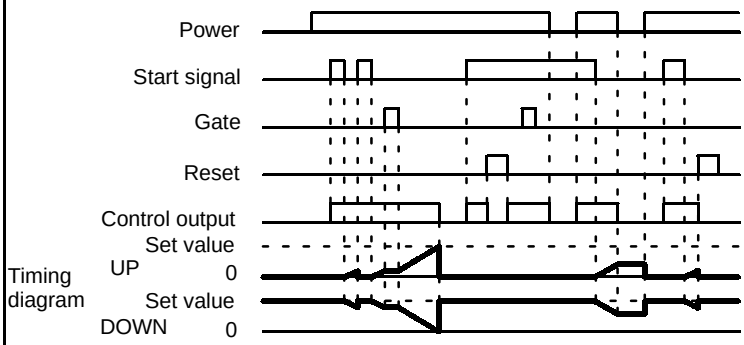


The OFF/ON cycle is initiated at the leading edge of the start signal. The control output will be OFF for the first cycle. In subsequent cycles the output will be ON for the programmable one-shot time period, then OFF for the remained of the preset time. The cycle will be repeated until a reset input is applied or power is interrupted.



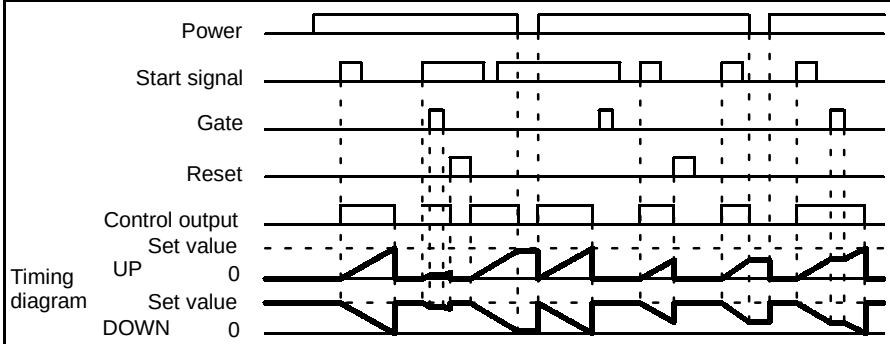
One-shot outputs can be set to 0.1 s, 0.5 s, 1 s, 5 s, 10 s, 15 s or 20 s.

Output mode d: Signal OFF delay (Timer resets when power comes on.)



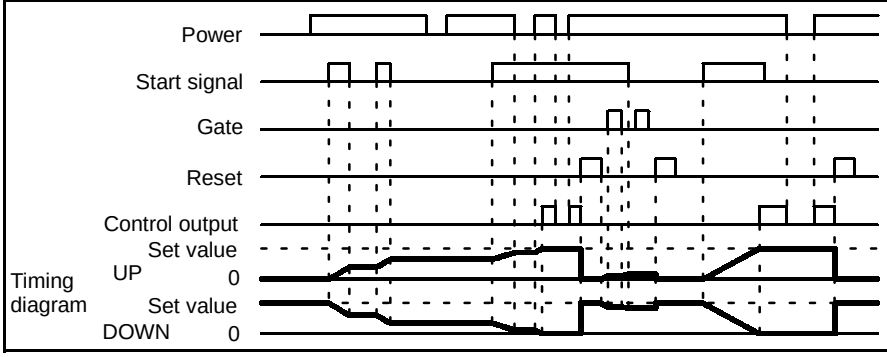
The control output is energized at the leading edge of the start signal. Timing begins at the trailing edge of the start signal. The control output is de-energized when the present value equals the preset time.

Output mode E: Interval (Timer resets when power comes on.)



Timing begins on the leading edge of the start signal. The control output is only energized during timing. The timer is reset when power is interrupted or a reset signal is applied.

Output mode F: Cumulative (Timer does not reset when power comes on.)



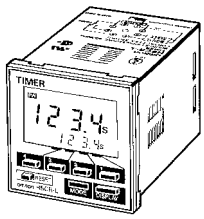
Timing begins on the leading edge of the start signal. The control output is energized when the cumulative elapsed time of the start signal is equal to the preset time. The output is sustained until power is interrupted or a reset signal applied.

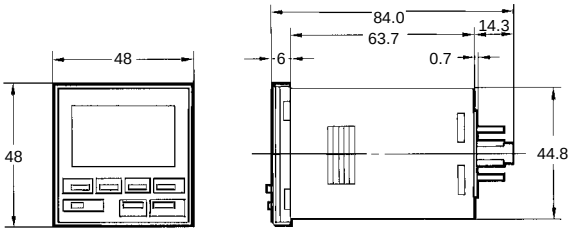
Dimensions

Note: All units are in millimeters unless otherwise indicated.

H5CR-L

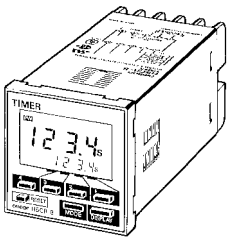
Panel Mounting/Surface Mounting

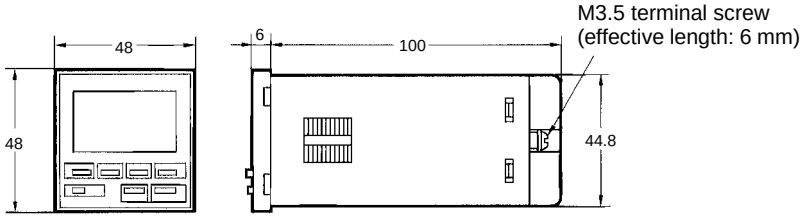




H5CR-B

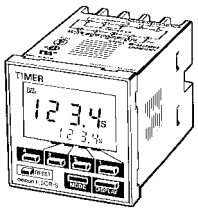
Panel Mounting

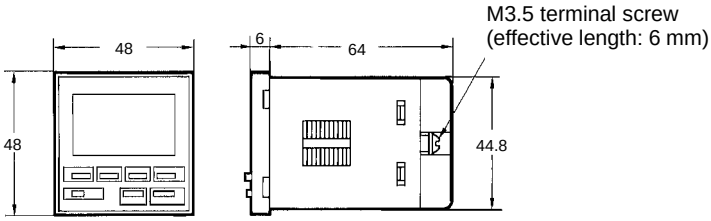




H5CR-S

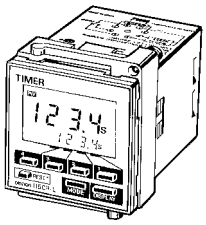
Panel Mounting

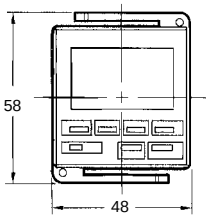


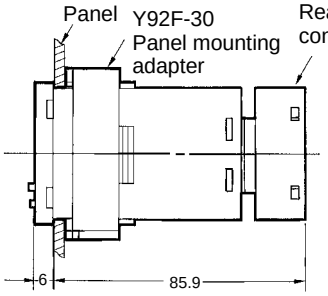


H5CR-L

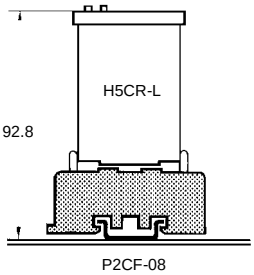
Panel Mounting Adapter



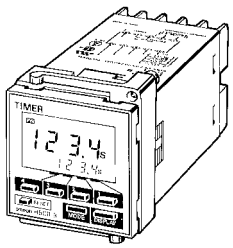


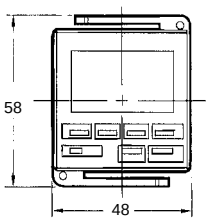


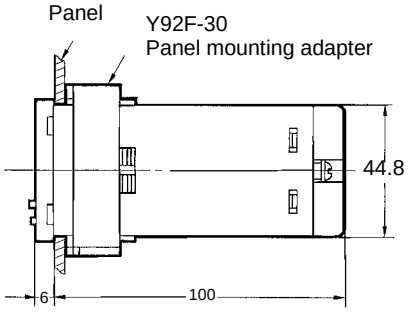
Surface Mounting



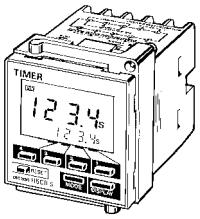
H5CR-B

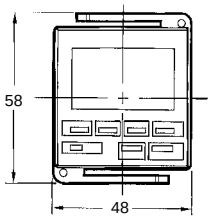


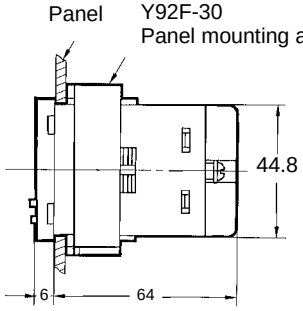




H5CR-S

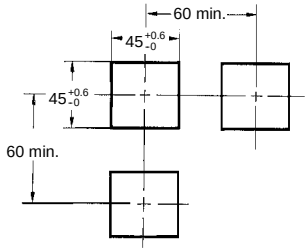




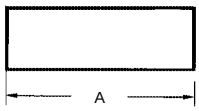


Panel Cutouts

Panel cutouts are
as shown below.
(according to DIN43700).



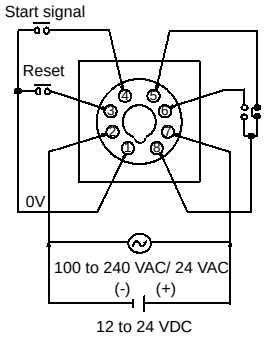
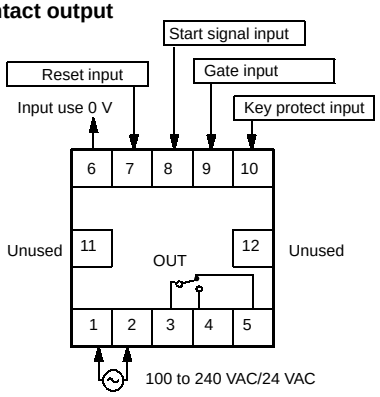
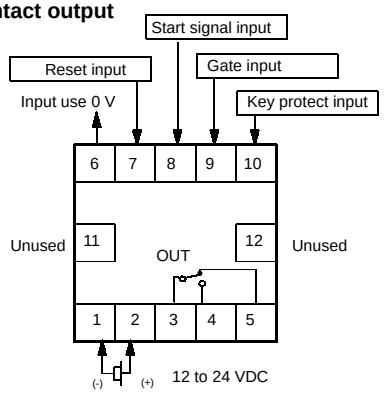
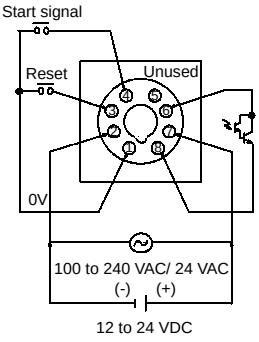
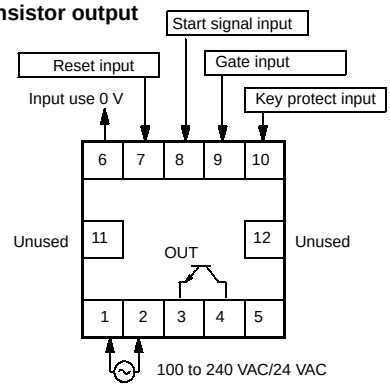
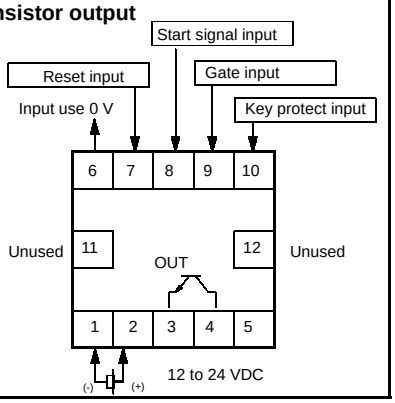
Note 1. The mounting panel thickness should be 1 to 4 mm.
2. It is possible to mount timers side by side, but only horizontally.



$A = \{n \times 45 + (n-1) \times 3.5\}\ ^{+0.6}_{-0}$

Installation

■ Terminal Arrangement

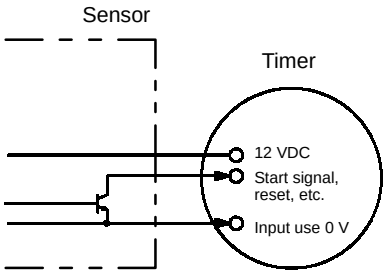
H5CR-L (Basic)	H5CR-B (Standard)	H5CR-S (Short body)
Contact output 	**Contact output** 	**Contact output** 
Transistor output 	**Transistor output** 	**Transistor output** 

Note: Do not connect unused terminals.

■ Connections

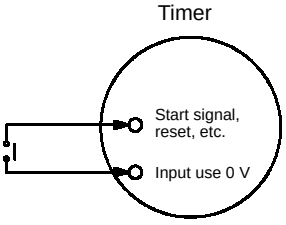
The inputs of the H5CR are no-voltage (short circuit or open) inputs.

No-contact Input (NPN Transistor)



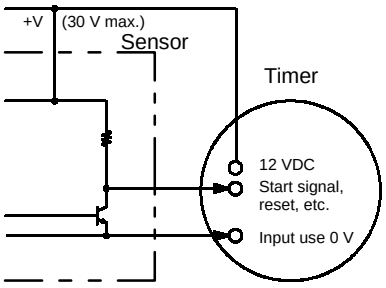
High: transistor ON

Contact Input



High: contact ON

No-contact Input



High: transistor ON

No-voltage Input Signal Levels

No-contact input	1. High level Transistor ON Residual voltage: 2 V max. Impedence when ON: 1 kΩ max.
	2. Low level Transistor OFF Impedence when OFF: 100 kΩ min.
Contact input	Use contacts which can adequately switch 2 mA at 5 V

Precautions

■ Power Supplies

- The input circuit is not insulated from the power supply circuit. The internal circuit might be damaged by a surrounding AC circuit, so use an insulated AC power supply with equipment connected to the input circuit.
- If power is interrupted for less than 10 ms, operation will continue normally. If power is interrupted for between 10 and 500 ms, operation will be inconsistent, and timing may stop or reset, depending on the mode.
- Connect the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value immediately.
- Depending on switching frequency, current surges may degrade relay contacts; relays with a capacity greater than 10 A are recommended.

■ Input and Output

- Do not use external sources to increase the voltage of input signals (control signal, reset, gate, and key protection).
- Be sure that the load of the control output (contact, transistor) is less than the maximum values indicated in the specifications. If the output load exceeds the recommended value, the lifespan of the contact output type will be shortened dramatically, and the transistor of the transistor output type will be damaged.
- The transistor output is insulated from the internal circuitry by a photocoupler, so either NPN or PNP transistors can be used.

■ Self-diagnostic Function

- The following displays will appear if an error occurs. The present value and output enter the same status as after pressing the RESET key.

Display	Error	Output status	Correction	Set
e1	CPU	OFF	Press RESET key	No change
e2	Memory			Set at the factory

■ Changing Set Values

- The Timer set value can be changed while the timer is operating, so a high value can be set temporarily to inactivate the timer, or a low value can be set to activate the timer more quickly. (If the set value is changed accidentally during operation, the timer might be activated. Therefore, turn the key protection input ON unless the set value is being changed.)
- To avoid changing the output when changing the set value, it is recommended to begin changing the set value by entering a large number in the higher digit.

■ Operating Environment

- When using the Timer in an area with much electronic noise, separate the Timer, wiring, and the equipment which generates the input signals as far as possible from the noise sources. It is also recommended to shield the input signal wiring to prevent electronic interference.
- Organic solvents (such as paint thinner), as well as very acidic or basic solutions might damage the outer casing of the Timer.

■ Other

- When the timer is installed in a control box and tests are conducted which may damage the Timer's internal circuitry (for example, a test measuring the maximum voltage difference between the control circuit and metal components), remove the Timer from the control box or short circuit the terminals.

Caution

This product contains a lithium battery. Lithium batteries explode if incinerated. Dispose of the Digital Timer as a non-combustible item.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L35-E1-3A

OMRON

Digital Timer

H5AN

DIN-sized (72 x 72 mm) Quartz Timer with Multiple Functions

- Wide time range from 1/100 seconds to 9999 hrs.
- Built-in power supply incorporated in timer enables direct connection of sensors and other components.
- Draw-out construction allows maintenance without disconnecting the wiring.
- Power supply freely selectable within a range of 100 to 240 VAC; a DC-operated version is also available.
- Control outputs of both contact type and solid-state type simultaneously available.
- Seven operating modes (N, F, C, R, K, P, and Q) are available.

RC

Ordering Information

Operation system	Resetting system	No. of digits	Backup power supply function for memory protection	Model
Time-limit operation, integrating operation	Power-OFF resetting (excluding -M), external resetting, manual resetting, automatic resetting	4 digits (switch-selectable): 0.01 to 99.99 s, 0.1 to 999.9 s, 1 to 9999 s, 0.1 to 999.9 min, 0.1 to 999.9 hrs, 1 to 9999 hrs, 1 s to 99 min 59 s, 1 min to 99 hrs 59 min	Not provided	H5AN-4D
			Provided (approx. 10 years at 20°C)	H5AN-4DM

Note: 1. Specify both the model number and supply voltage when ordering.

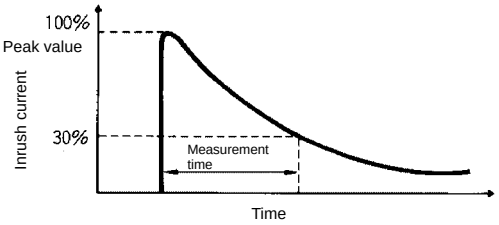
2. The Timer is supplied with two mounting fixtures.

Specifications

■ Ratings

Item	H5AN-4D/H5AN-4DM
Rated supply voltage	H5AN-4D: 100 to 240 VAC (50/60 Hz), 12 to 24, 48, or 100 VDC (permissible ripple: 20% max.) H5AN-4DM: 100 to 240 VAC (50/60 Hz) 12 to 24 VDC (permissible ripple: 20% max.)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	Approx. 10 VA (at 240 VAC, 50 Hz), approx. 5 W (at 24 VDC)
Resetting system and gate input	Reset by power-OFF: min. power OFF time: 0.5 s External reset or gate (common to contact and solid-state inputs): min. reset input signal width: 0.02 s
Control outputs	Contact output: SPDT, 3 A at 250 VAC, resistive load ($\cos\phi = 1$) Solid-state output: Open collector, 100 mA max. at 30 VDC max.
Power supply for externally connected components	12 VDC±10%, 80 mA (permissible ripple: 5% max.)

Note: Inrush current was measured within the range shown below.

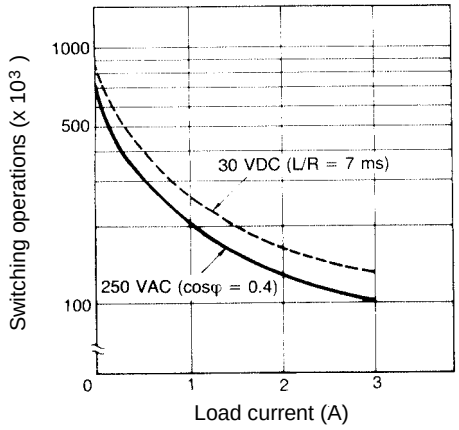


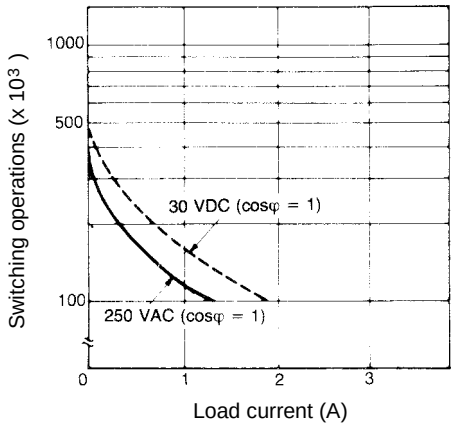
■ Characteristics

Accuracy of operating time	±0.01% ±0.05 s max. (power OFF start), ±0.005% ±0.03 s max. (reset start) (see note)
Setting error	
Influence of voltage	
Influence of temperature	
Insulation resistance	100 MΩ min. (at 500 VDC) (between current-carrying terminal and exposed non-current carrying metal parts, between non-continuous contacts)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying metal parts) 750 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 300 m/s^2 (approx. 30G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: −10°C to 55°C Storage: −25°C to 65°C
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 10,000,000 operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (3 A at 250 VAC, resistive load)
Approved standards	UL (File No. E41515), CSA (File No. LR22310)
Weight	Approx. 360 g

Note: This value denotes the average of the repeat accuracy, setting error, and variations due to voltage and temperature changes. It includes the rise time of the power supply, and the operating time of the internal and output circuits.

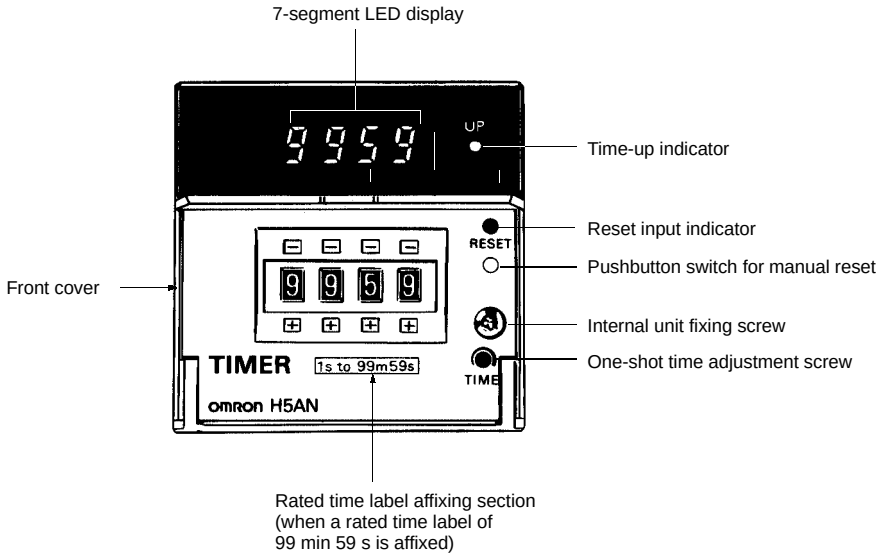
Engineering Data





Reference: A maximum current of 0.15 A can be switched at 125 VDC (cosϕ = 1).
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 (P reference value).

Nomenclature

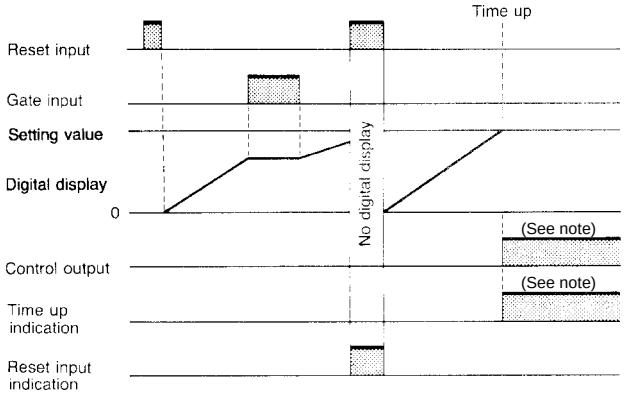


Operation

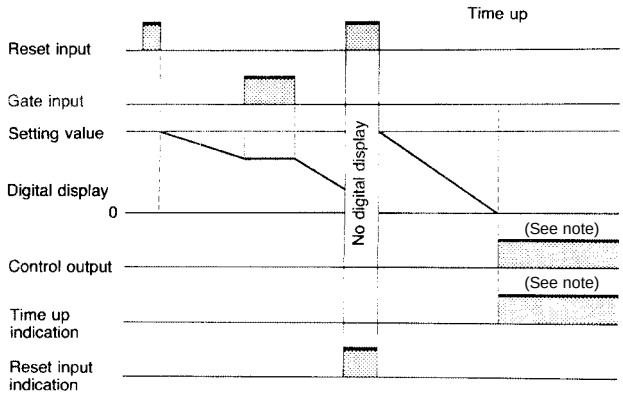
■ Timing Chart

Digital Display

UP Display



DOWN Display



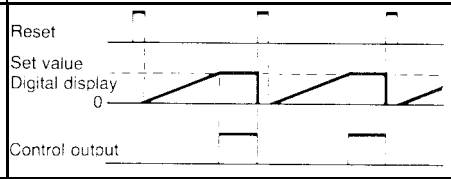
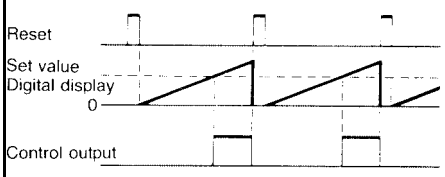
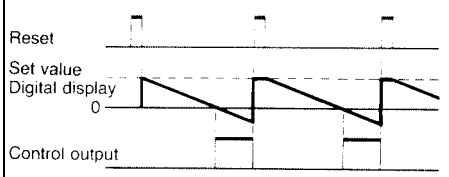
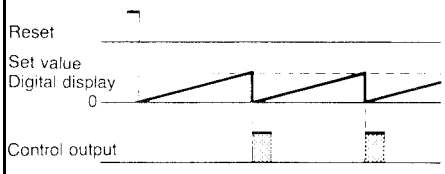
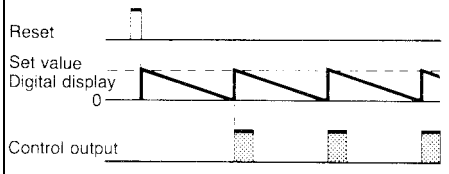
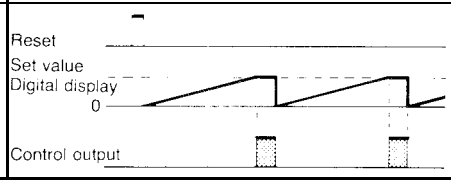
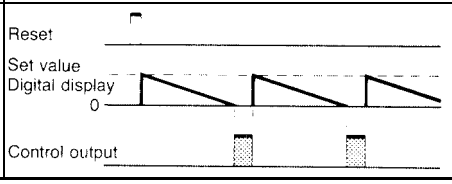
Note: After the set time has elapsed, operation continues according to the mode (N, F, C, R, K, P, or Q).

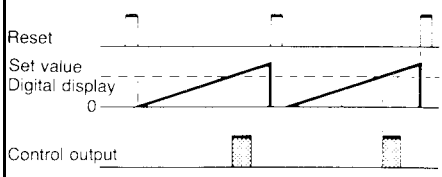
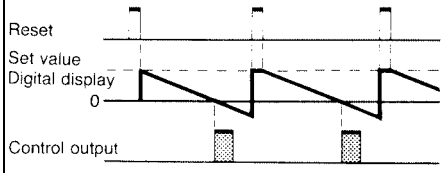
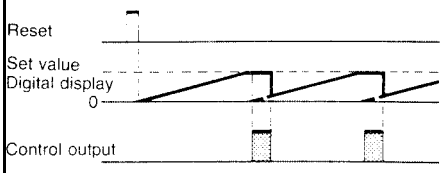
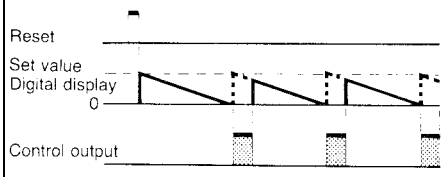
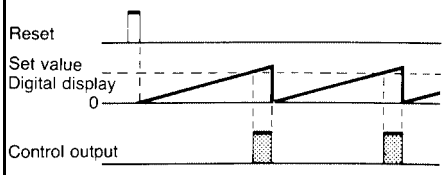
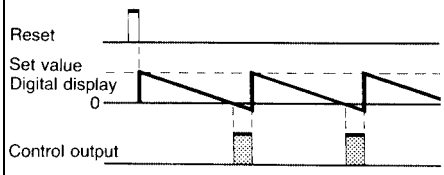
Operation Mode

(The control output and digital display when the set time is up differ in each of the operation modes available.)


Self-holding output


One-shot output (0.1 to 1s variable)

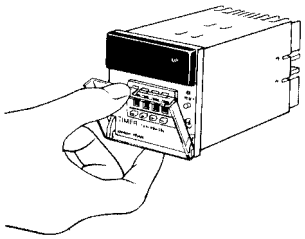
Mode	UP display	DOWN display	Operation after the set time is up
N			The control output and digital display are held until a reset input is applied.
F			In UP mode, the digital display continues to increment up to “9999” even after reaching the set value and then returns to all zeroes. In DOWN mode, the digital display continues to up 9999, and then decrements “9998, 9997, ...,” after reaching all zeroes. The control output is held until a reset input is applied.
C			The digital display returns to the initial setting once the set time has elapsed and the timer restarts the timing operation. When the set time has elapsed, the output signal is generated during the one-shot time. The timer repeats this cycle.
R			The digital display returns to the initial setting after the one-shot time and the timer restarts the timing operation. When the set time has elapsed, the output signal is generated during the one-shot time. The timer repeats this cycle.

Mode	UP display	DOWN display	Operation after the set time is up
K			In UP mode, the digital display continues to increment up to “9999”, even after reaching the set value and then returns to all zeroes. In DOWN mode, the digital display continues up to 9999, and the decrements “9998, 9997, ...,” after reaching all zeroes. The timer restarts the timing operation when the incrementing or decrementing value reaches the set value. The output is generated during the one-shot time. The timer repeats this cycle.
P			For the digital display, the value at the up is held during the one-shot time; however, the timing operation of the timer returns to the initial setting when the set time has elapsed and the timer restarts the timing operation. When the set time has elapsed, the output signal is generated during the one-shot time. The timer repeats this cycle.
Q			In UP mode, the digital display continues to increment after reaching the set value during the one-shot time. In DOWN mode, the digital display continues to 9999 and then decrements “9998, 9997, ...,” after reaching all zeros during the one-shot time. However, in both UP and DOWN modes, the digital display returns to the initial setting after the one-shot time and the timer restarts the timing operation. When the set time has elapsed, the output signal is generated during the one-shot time. The timer repeats this cycle.

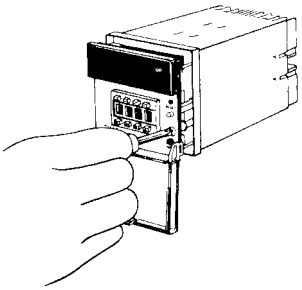
Note:
1. When a rated time of 99 min 59 s or 99 h 59 min is selected, the overflow values of the digital display when using the DOWN (count-down) function will be indicated as 9959, 9958, 9957, ... in modes F, K, and Q.
2. In this timing chart, the number of step advances during the one-shot time varies in accordance with the selected rated time and duration of the one-shot time.
3. In C and P modes, set time value n should be sufficiently longer than the one-shot time t.

■ Programming of Specifications

The built-in specifications selector switches are used for programming UP or DOWN display, rated time, operation mode, and output level of the solid-state output when the set time has elapsed, etc. Set these switches for programming the desired functional specifications by referring to *"Positions and Functions of Specification Selector Switches".*

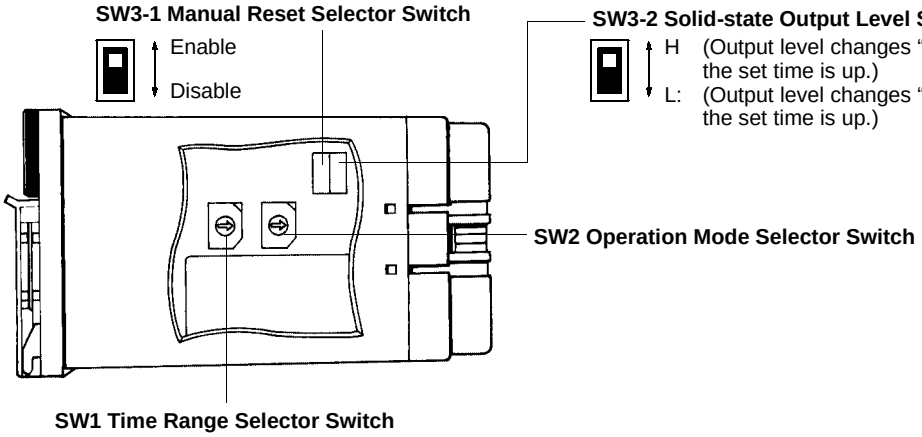


Open the front cover.



The internal unit comes out by loosening the internal unit fixing screw.

Positions and Functions of Specification Selector Switches



SW1

Switch position	Rated time	Setting range
0	99.99 s	0.01 to 99.99 s
1	999.9 s	0.1 to 999.9 s
2	9999 s	1 to 9999 s
3	99 min 59 s	1 s to 99 min 59 s
4	999.9 min	0.1 to 999.9 min
5	99 hrs 59 min	1 min to 99 hrs 59 min
6	999.9 hrs	0.1 to 999.9 hrs
7	9999 hrs	1 to 9999 hrs
8	99.99 s	Same as switch position “0”
9	999.9 s	Same as switch position “1”

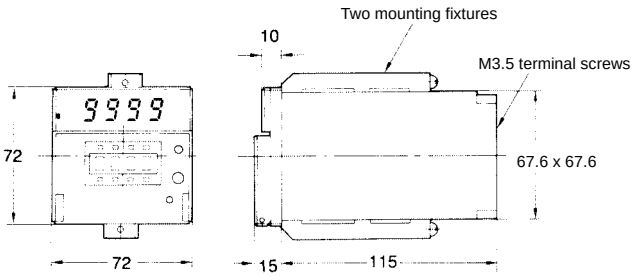
Note: Select the appropriate label, from the rated time labels supplied as accessories, and affix it on the proper position on the front panel.

SW2

Switch position	Operating mode	Display mode
0	N	DOWN display
1	F	
2	C	
3	R	
4	K	
5	P	**Note:** 1. Same as switch position “0”
6	Q	
7	N (see note 1)	
8	N	UP display
9	F	
A	C	
B	R	
C	K	
D	P	**Note:** 2. Same as switch position “8”
E	Q	
F	N (see note 2)	

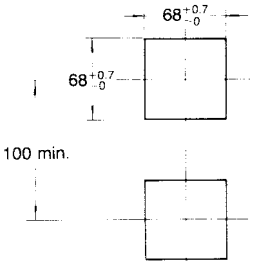
Dimensions

Note: All units are in millimeters unless otherwise indicated.



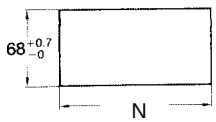
Panel Cutouts

(Panel cutout conforms to DIN 43700)



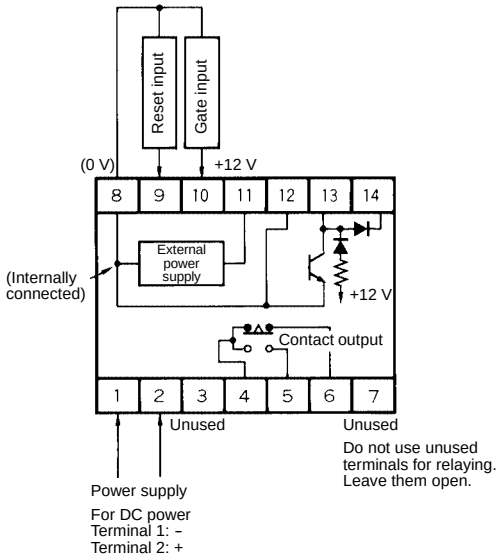
(Horizontally connecting N units)

{(n − 1) x 72 + 70 } min. (including 2-mm clearance between units)



Installation

■ Terminal Arrangement



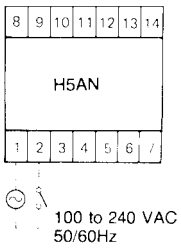
Note: Specifications for 12- to 24-VDC, 48-VDC, and 100-VDC models are listed separately in this datasheet.

■ Connections

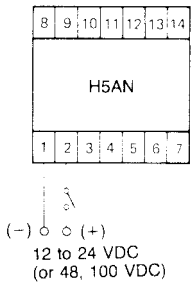
Power Supply Connection

Connect the required supply voltage to terminals 1 and 2.

AC Power Supply



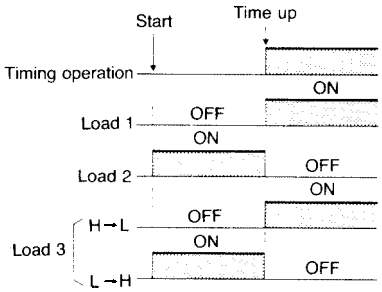
DC Power Supply



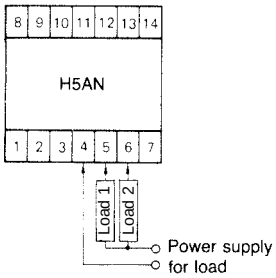
Load Connection

Terminals 4, 5, and 6 are for contact output while terminals 12 and 13 are for solid-state output. (Terminal 14 is connected to absorb the surge if an inductive load is connected.)
The control outputs of both contact type and solid-state type are simultaneously available.

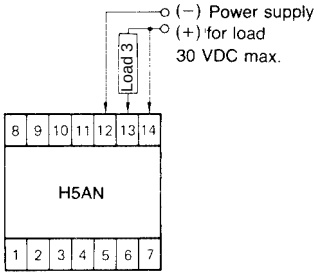
Load Operation



When a Load Operates with Contact Output



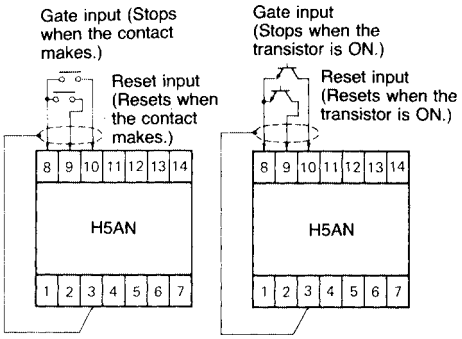
When a Load Operates with Solid-state Output



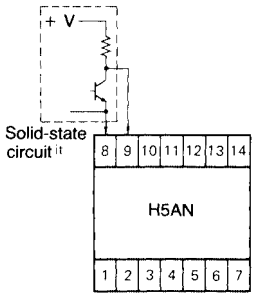
Connection of Reset and Gate Inputs

For reset input, connect a contact or an open collector type transistor between terminals 8 and 9. The timer resets when contact is made or when the transistor is ON. For gate inptus, connect a contact or an open collector type transistor between terminals 8 and 10. The timer stops when contact is marked or when the transistor is ON.

Use a contact of high contact reliability, or an open collector type transistor with characteristics: V_{CEO} = 20 V min., $V_{CE(S)}$ = 3 V max., I_C = 50 mA min. and I_{CBO} = 0.5 μA max.. Use of a gate input contact with minimum contact bounce (chatter) is a must, since the contact bounce time will cause an error in timer operating time.



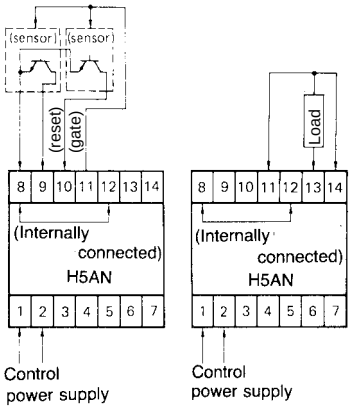
When connecting a solid-state circuit not of the open collector type to the gate or reset inputs as shown below, the voltage of the solid-state circuit (+V) should be 13 to 30 V, and the $V_{CE(S)}$ of the transistor should be less than 3 V (the current that flows from either terminal 9 or 10 is approximately 10 mA). Moreover, it is essential that the circuit be ON for gate or reset input, and OFF when there is no input.



Connection of a Power Supply for Externally Connected Components

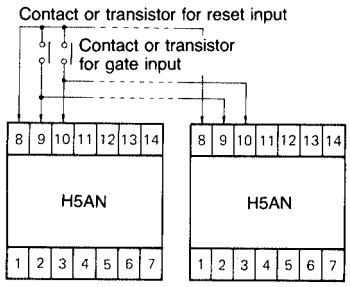
The H5AN has a built-in power supply for externally connected components such as sensors for gate or reset input, or loads connected to the solid-state control output (12 VDC, 80 mA).

Power can be applied to the sensors and loads simultaneously.



Simultaneous Input to a Number of H5AN Timers with the Same Contact or the Same Open Collector Transistor

A reset or gate input may be applied to two or more units of H5AN with only one contact or transistor as shown below. In this case, caution is required as a large current flows into the transistor. (The current that flows from H5AN is approximately 10 mA pre unit.)



Precautions

Setting of Operating Time

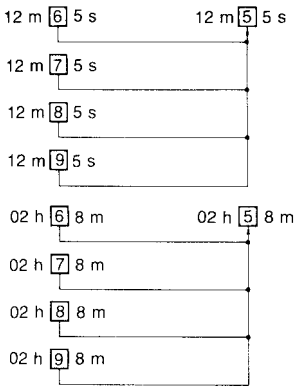
Time Setting Range

Rated time	Setting range
99.99 s	0.01 to 99.99 s (see note)
999.9 s	0.1 to 999.9 s (see note)
9999 s	1 to 9999 s
99 min 59 s	1 s to 99 min 59 s
999.9 min	0.1 to 999.9 min (see note)
99 hrs 59 min	1 min to 99 hrs 59 min
999.9 hrs	0.1 to 999.9 hrs (see note)
9999 hrs	1 to 9999 hrs

Note: The decimal point is not shown in the digital display.

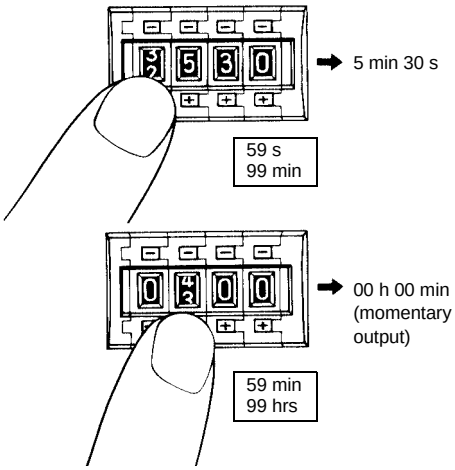
1. Since the H5AN Timer is capable of reading the input data at any time during normal operation, the set time can be changed during power application. This feature sets back the output from the timer by temporarily setting the longer time or quickens the output by setting the shorter time. During normal operation, the set time may be accidentally changed by touching a thumbwheel switch, causing the timer to operate with a different set time. To prevent this possibility, keep the front cover closed except when changing the set time.
2. When the set time is all zeroes (e.g., 000.0 s or 00 hrs 00 min), there will be a momentary control output upon power application which can be used to check normal output. When changing the set time during normal operation, pay special attention not to alter the set value to this state.
3. Since the sexagesimal system is adopted, when a rated time of 99 min 59 s or 99 hrs 59 min is selected, any value set to 6 or more (i.e. 6-9) in the order of x 10 s or x 10 min respectively will be rated as 5. Some erroneous setting examples are shown below.

Examples of Setting/Actual Operating Time



4. When changing the set time while power is being supplied, an inadequate push of the thumbwheel switches will display two numbers in one digital display window, causing the operating time to drift widely. Therefore, press the thumb-wheel switches surely. Take particular care in the case when the other three digits are all zero, since the improper setting of the fourth switch to create four zeroes will cause a momentary output.

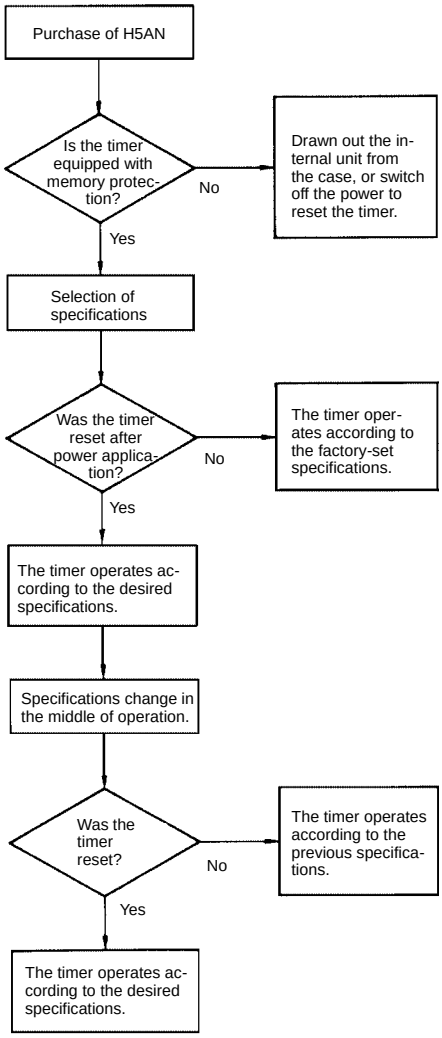
(Undesirable Setting) ➡ (Possible Operating Time)



5. When operating the built-in selector switches of the H5AN-4DM Timer with a backup power supply function for memory protection, it is necessary to reset (either externally or manually) the timer at the time the power is applied.
   Also when this type of timer is connected to a device (or manually) this must also be done when power is applied for the first time.

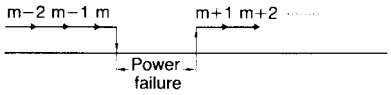
Note: If the timer is not reset, it operates in accordance with the previous specifications or with the factory set specifications.

Resetting of Type with a Backup Power Supply Function for Memory Protection



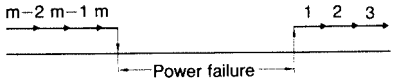
6. The type without a backup power supply function for memory protection operates as shown below depending on the duration of the power failure.

(A) Power failure of 0.01 s max.



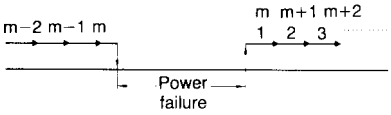
Note: The timer starts in the initial setting upon power recovery.

(B) Power failure of 0.5 s min.



Note: The timer starts in the initial setting upon power recovery.

(C) Power failure of 0.01 to 0.5 s.



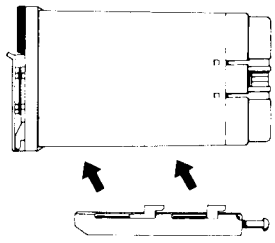
Note: Either (A) or (B)

The type with a backup power supply function for memory protection restarts in the status preceding the power failure as shown in (A), regardless of the duration of the power failure.

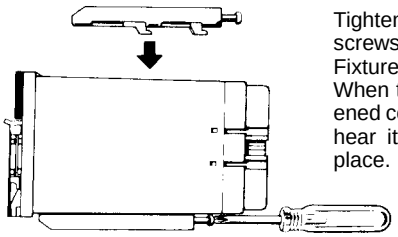
7. The type with backup power supply for memory protection incorporates a battery for backup power supply which lasts for about ten years of normal use, meaning data is retained even during a power failure lasting ten years. (The battery cannot be replaced.)
8. When using the timer in operation modes other than N and F modes (i.e., C, R, K, P, and Q), the control output is available for the one-shot time only. For this reason, adjust the one-shot time by rotating the one-shot time adjustment screw on the front panel (variable within a range to 0.1 to 1 s).

Mounting

A Mounting Fixture is included with the H5AN. Mount the Unit using the Mounting Fixture so that the Unit is secure and does not move

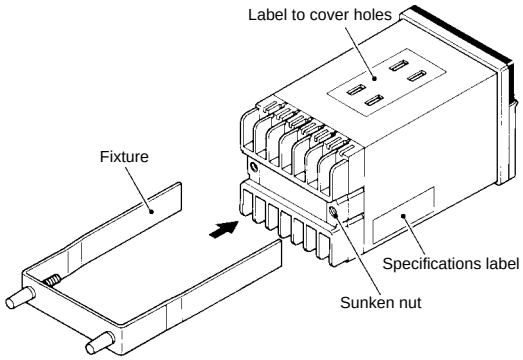


Loosen (to the left) the screws on the Mounting Fixture sufficiently and attach it from the bottom.



Tighten (to the right) the screws on the Mounting Fixture completely. When the screw is tightened completely, you will hear it turning freely in place.

A model is also available for vertical gang-mounting (Model H5AN-4D(M)-300).



⚠ WARNING

Fire, Explosion, and Severe Burn Hazard

The H5AN has a built-in lithium battery. Be sure to dispose of the old H5AN properly, as lithium batteries are likely to explode if incinerated.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L50-E1-7

OMRON

Digital Timer

H5CN

Miniature DIN-sized (48 x 48 mm) Quartz Timer with Abundant Series Versions

- Series version cover a wide range of rated times; 9.999 s, 99.99 s, 999.9 s, 99 min 59 s, and 99 hrs 59 min.
- Selection of elapsed time indication, remaining time indication, contact output, and solid-state output types to suit requirements.
- Power supply freely selectable within a range of 100 to 240 VAC, as well as 12 to 48 VDC
- Models with a memory backup function against power failure available.

RC

Ordering Information

Operating system		Time-limit operation, integrating operation					
Resetting system		Power-OFF resetting, external resetting					
Control output		Contact output (SPDT)				Solid-state output (open collector)	
Digital display (7-segment LEDs)		Not provided (with IN and UP indicators)	Provided (with UP indicator)			Not provided (with IN and UP indicators)	Provided (without UP indicator)
			UP display timer (increments from 0 to the set time)		DOWN display timer (decrements from the set time to 0)		Provided UP display timer
Backup power supply function for memory protection		Not provided	Not provided	Provided	Not provided	Not provided	Not provided
Rated time	**0.001 to 9.999 s**	---	---	---	---	H5CN-ZNS	H5CN-XZNS
	0.001 to 99.99 s	H5CN-AN	H5CN-XAN	H5CN-XANM	H5CN-YAN	H5CN-ANS	H5CN-XANS
	0.1 to 999.9 s	H5CN-BN	H5CN-XBN	H5CN-XBNM	H5CN-YBN	---	---
	1 s to 99 min 59 s	H5CN-CN	H5CN-XCN	H5CN-XCNM	H5CN-YCN	---	---
	1 min to 99 hrs 59 min	H5CN-DN	H5CN-XDN	H5CN-XDNM	H5CN-YDN	---	---

Note: H5CN Timer is not supplied with a connecting socket.

■ Accessories (Order Separately)

Applicable timer	Track mounting socket (see note)	Back connecting socket
		Screw terminal
H5CN- j j	P2CF-08	P3G-08
H5CN- j j M	P2CF-11	P3GA-11

Note: 1. Track mounted socket can be used as a front connecting socket.

2. Specify the desired connecting socket when ordering.

Specifications

■ Ratings

Item	Contact output	Solid-state output
Supply voltage	100 to 240 VAC (50/60 Hz), 12 to 48 VDC (permissible ripple: 20% max.) (see note)	12 to 48 VDC (permissible ripple: 20% max.)
Operating voltage range	85% to 110% of rated supply voltage	
Power consumption	Approx. 12 VA (at 240 VAC, 50 Hz), approx. 2.5 W (at 48 VDC)	Approx. 2.5 W (at 48 VDC)
Resetting system and gate input	Reset by power-OFF (not provided for models with backup power for memory protection): min. power OFF time: 0.5 s External reset or gate (common to contact and solid-state inputs): min. reset input signal width: 0.02 s; residual voltage: 2 V max.	
Control outputs	SPDT: 3 A at 250 VAC, resistive load ($\cos\phi = 1$)	Open collector: 100 mA max. at 30 VDC max.

Note: Models with memory backup function are not available for this range of DC supply voltages.

■ Characteristics

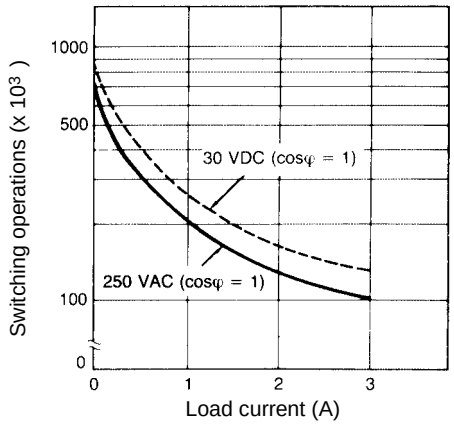
Accuracy of operating time	±0.01% ±0.05 s max. (see note 1), ±0.005% ±0.03 s max. (see note 2) (see note 3)
Setting error	
Influence of voltage	
Influence of temperature	
Insulation resistance	100 MΩ min. (at 500 VDC) (between current-carrying terminal and exposed non-current carrying metal parts, between power supply circuit and control output circuit)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying terminal and exposed non-current-carrying metal parts, between power supply circuit and control output circuit)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 300 m/s^2 (approx. 30G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: −10°C to 55°C Storage: −25°C to 65°C
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 10,000,000 operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (3 A at 250 VAC, resistive load)
Approved standards	UL (File No. E41515), CSA (File No. LR22310)
Weight	Approx. 150 g

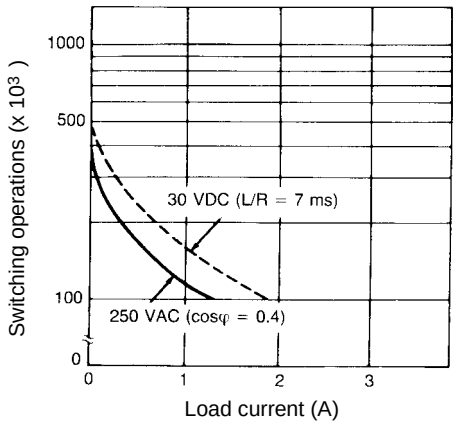
Note: 1. When timer operation is started by power application.

2. When timer operation is started after a reset input has been applied.

3. These values represent the total accuracy of the timer including the repeat accuracy, setting error, and variation due to voltage and temperature changes. Note that they also comprise errors due to the rise time of the power source and the operating times of the internal and output circuits.

Engineering Data





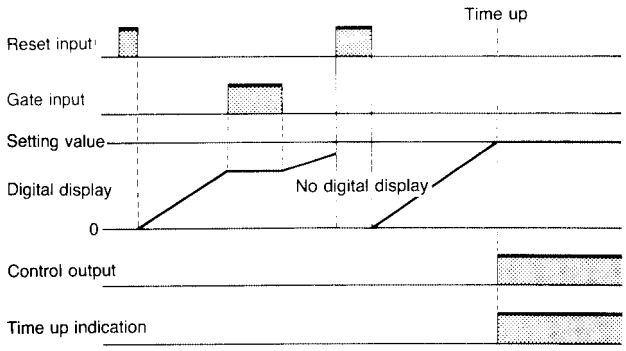
Reference: A maximum current of 0.15 A can be switched at 125 VDC (cosϕ = 1). Maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.
The minimum applicable load is 10 mA at 5 VDC (P reference value).

Operation

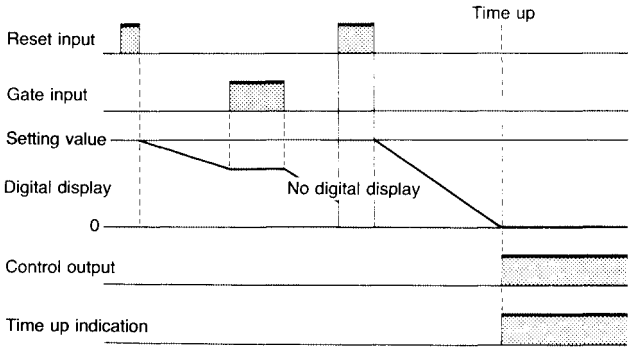
■ Timing Chart

Digital Display

UP Display



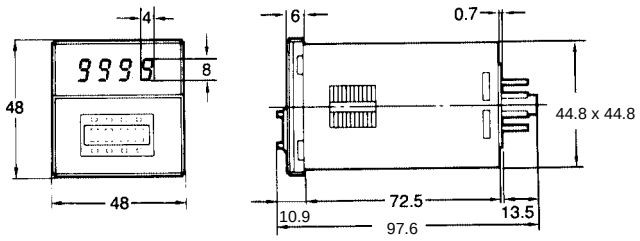
DOWN Display



Note: For the models without digital display, an IN indicator (LED) is provided to indicate power application. (This LED, however, goes off when the reset input is applied.)

Dimensions

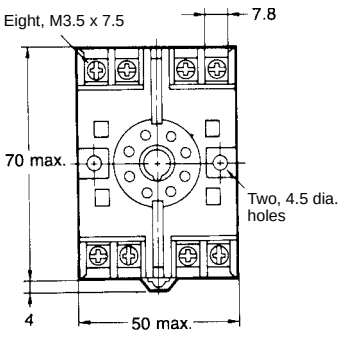
Note: All units are in millimeters unless otherwise indicated.



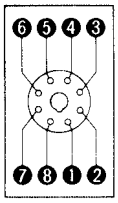
■ Accessories (Order Separately)

Track Mounted Socket

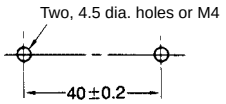
P2CF-08



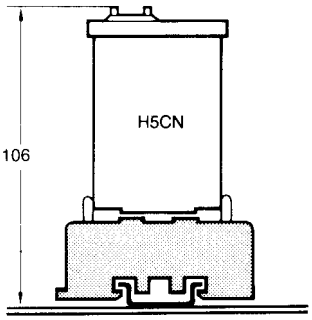
Terminal Arrangement (Top View)



Mounting Holes

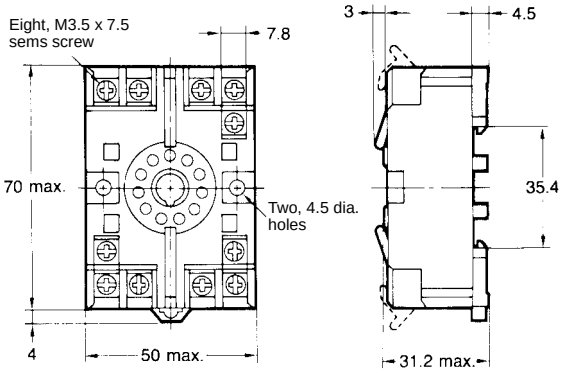


Mounting Height of Timer with Socket

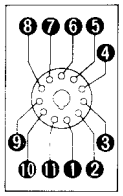


P2CF-08

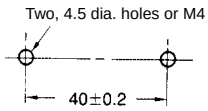
P2CF-11



Terminal Arrangement (Top View)

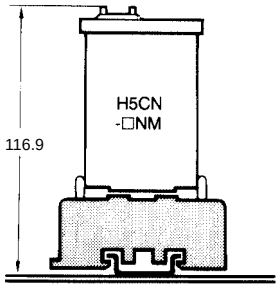


Mounting Holes



Note: Track mounting is also possible.

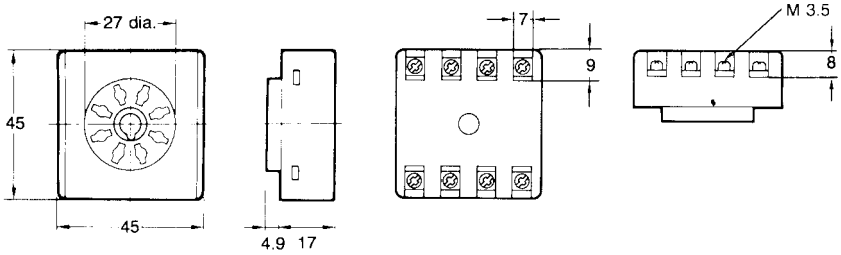
Mounting Height of Timer with Socket



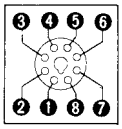
P2CF-11

Back Connecting Socket

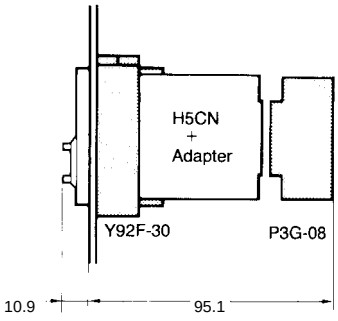
P3G-08



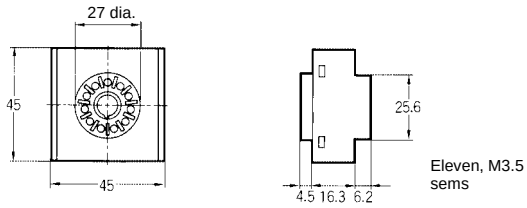
Terminal Arrangement (Bottom View)



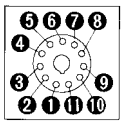
Mounting Depth of Timer with Socket



P3GA-11

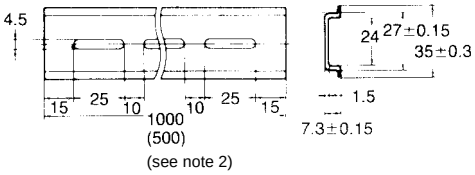


Terminal Arrangement (Bottom View)



Mounting Track

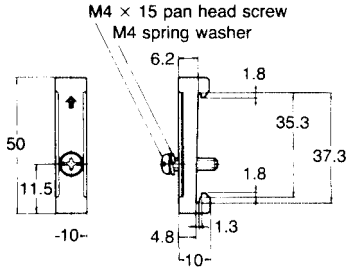
PFP-100N/PFP-50N (see note) (for PF085A)



Note: 1. Meets DIN EN50 022
2. This dimension applied to PFP-50F.

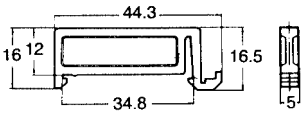
End Plate

PFP-M



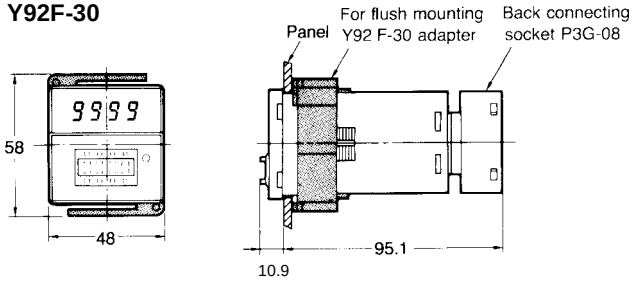
Spacer

PFP-S



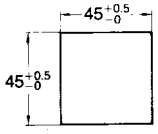
Adapter for Flush Mounting

Y92F-30

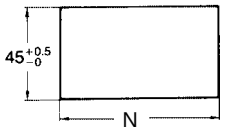


Panel Cutout

The standard panel cutout is as below. (Panel cutout conforms to DIN 43700.)



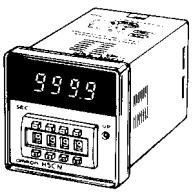
Gang-mounting of more than 2 units (horizontally)



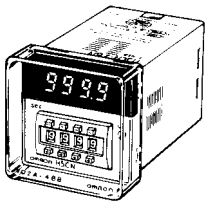
Note: 1. Panel thickness: 1 to 5 mm
2. When gang-mounting the Unit, the orientation of the Adapter must be changed depending on whether Units are mounted horizontally or vertically.
3. No cover: $N = (48n - 2.5)\ ^{+1}/_{-0}$
With hard cover: $N = \{48n - 2.5 + (n - 1) \times 3\}\ ^{+1}/_{-0}$

Protective Cover

The protective cover shields the front panel, particularly the count value setting section from dust, dirt, and water drip, as well as prevents malfunctioning of the timer due to static electricity.



Y92A-48D
(see note 1)
(Soft cover)

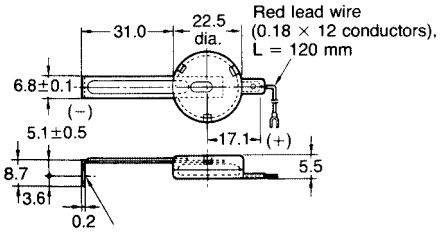


Y92A-48B
(see note 2)
(Hard cover)

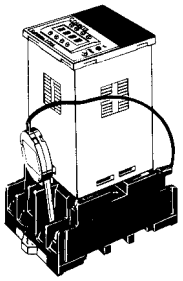
Note: 1. The soft protective cover allows the set value to be set by depressing the thumbwheel switches through it.
2. The hard protective cover prevents the set value from being altered due to accidental contact with the push type thumbwheel switch.

Backup Battery

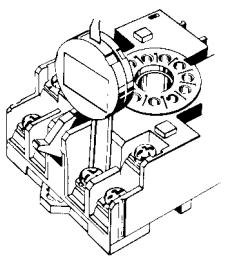
Y92S-20



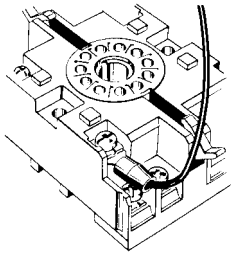
Connection of Battery Leads



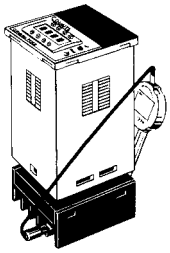
With socket P2CF-11



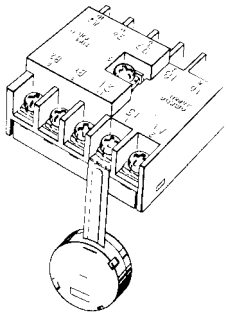
Terminal No. 1



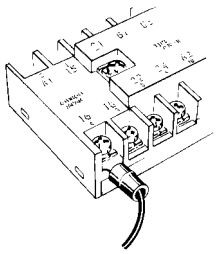
Terminal No. 4



With socket P3G-11



Terminal No. 1



Terminal No. 4

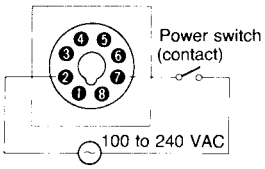
Installation

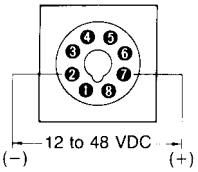
■ Connections

Power Supply Connection

Model Without Backup Power for Memory Protection

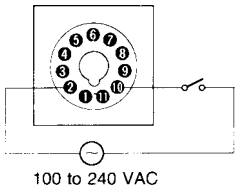
Connect the timer so that the required supply voltage can be applied across terminals B and G.





Model With Backup Power for Memory Protection

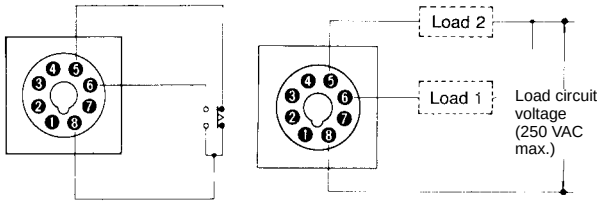
Connect the timer so that the required supply voltage can be applied across terminals B and J.



Connection of Load Circuit (Control Output)

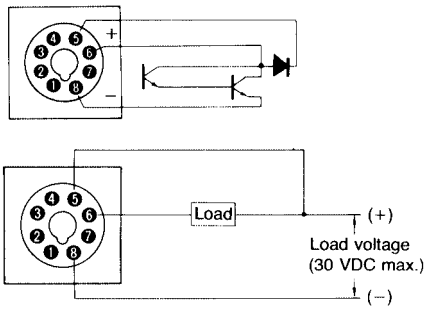
Model With Backup Power for Memory Protection
Contact Output Type (H5CN- j N)

Terminals E, F, and H are for contact output contacts. Load 1 connected in series with NO contact (between terminals F and H) is normally open, and the load circuit voltage will be applied after the lapse of the set time. The load circuit voltage is normally applied to load B conneted in series with NC contact (between terminals E and H), which will be open after the lapse of the set time.



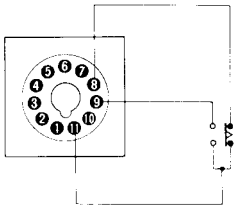
Solid-state Output Type (H5CN- j NS)

With H5CN- j NS, a solid-state output is generated by using an open collector transistor. Connect terminal F (collector) of the timer to the positive terminal of a load and terminal H (emitter) to the negative terminal.
When connecting an inductive load to the timer, connect terminal E of the timer to the positive terminal of the loads, since a diode is internally connected between terminals F and E.

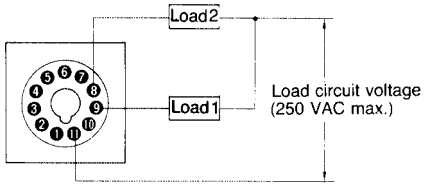


Model With Backup Power for Memory Protection Contact Output Type

(Internal circuit of control output contact)
Terminal H, I, and K are for control output contacts.



(Connection of load circuit)
Load 1 connected in series with NO contact (between terminals I and K) is normally open, and the load circuit voltage will be applied to it after the lapse of the set time. The load circuit voltage is normally applied to load B connected in series with NC contact (between terminals H and K), which will be open after the lapse of the set time.

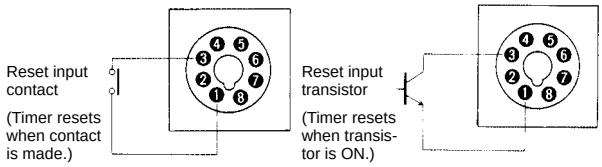


Note: The maximum load current is 3 A (resistive load).

Connection of Reset Input

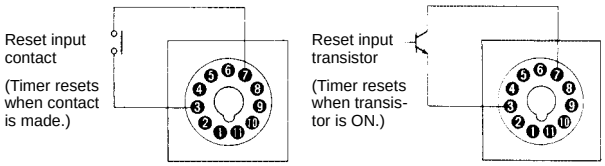
Model Without Backup Power for Memory Protection

Connection of the reset input contact or an open collector transistor between terminals A and C permits the timer to reset when contact is made or the transistor turns ON. Use of a high-reliability gold-plated contact is recommended for the reset input. For the reset input transistor, select the one satisfying the following electrical ratings:
V_{CEO} = 20 V min.
IC = 50 mA min.
I_{CBO} = 0.5 μA max.



Model With Backup Power for Memory Protection

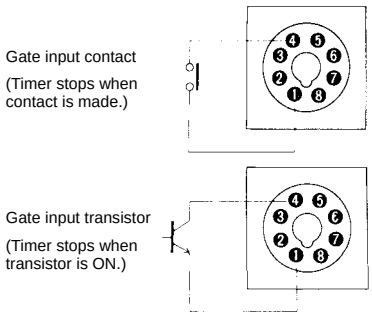
Connection of the reset input contact or an open collector transistor between terminals C and G permits the timer to reset when contact is made or the transistor turns ON. Use of a high-reliability gold-plated contact is recommended for the reset input. For the reset input transistor, select the one satisfying the following electrical ratings:
V_{CEO} = 20 V min.
IC = 50 mA min.
I_{CBO} = 0.5 μA max.



Connection of Gate Input

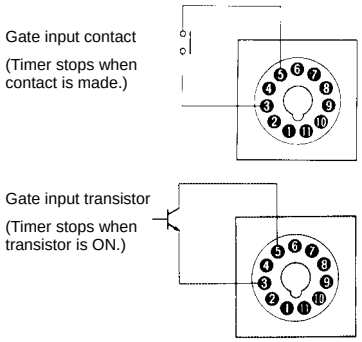
Model Without Backup Power for Memory Protection

Connection of the gate input contact or an open collector transistor between terminals A and C permits the timer to reset when contact is made or the transistor turns ON. Use of a high-reliability gold-plated contact is recommended for the gate input. For the reset input transistor, select the one satisfying the following electrical ratings:



Model With Backup Power for Memory Protection

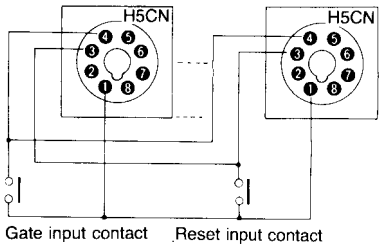
Connection of the gate input contact or an open collector transistor between terminals C and E permits the timer operation to be interrupted while the contact or transistor is in the ON state. The same recommendations as mentioned above apply on the use of the gate input contact or transistor. Use a gate input contact with a short bounce time because the contact bounce time causes an error in the operate time of the timer for a period equalling the bounce time.



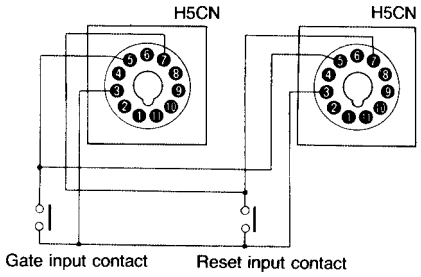
Simultaneous Input to a Number of H5CN Timers with the Same Contact

With one contact, a reset or gate input may be applied to two or more H5CN Timers as shown below.

Model Without Backup Power for Memory Protection

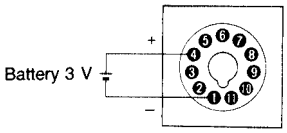


Model With Backup Power for Memory Protection



Battery Connection

Connect the Y92S-20 backup battery between terminals A and D, paying attention to the polarities.



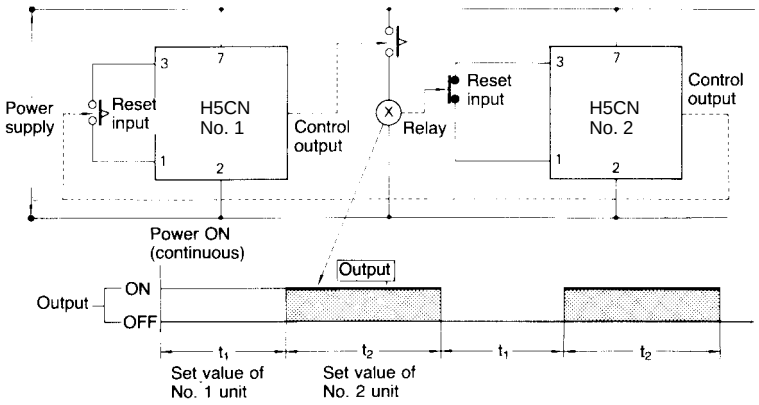
Battery Connections When Recording Interruptions

Always connect a battery when using Units with a power interruption recording function. Any 3-V battery may be used, but the time the interruption is recorded for will depend on the capacity of the battery. When using the Unit for the first time after purchase, apply power and reset the Unit once before using it. When power is applied for the first time, outputs may be produced, so do not connect the output terminals.

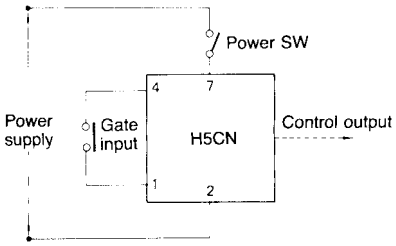
If a power interruption continues for 10 minutes or more when a battery is not connected, the display may flash, the count value and displays may be meaningless, and outputs may be produced unpredictably even if the power supply recovers. If this happens, apply power to the reset input before using the Unit further.

When connecting the battery using a Socket (P2CF-11 or P3GA-11), check the terminal numbers on the Socket and connect the positive side of the battery to terminal 4 and the negative side to terminal 1.

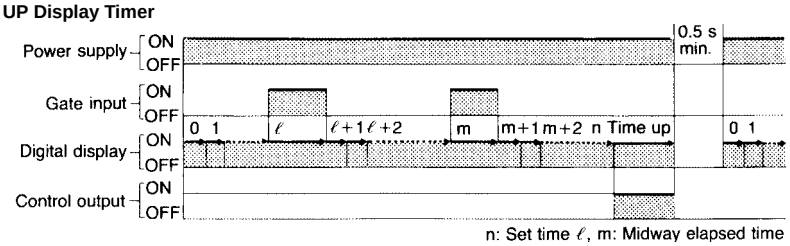
Note: 1. **High-speed Repeat Operation Circuit**
When resetting the timer using the reset input terminal, high-speed resetting is possible at a speed of 0.02 s. Accordingly, by using two H5CN Timers, a high-speed repeat operation circuit can be created.



2. **Integrating Operation**
Use of the gate input terminal permits the timer to sum up timers T_1, T_2, and T_3 (i.e., integrating operation) as shown below.

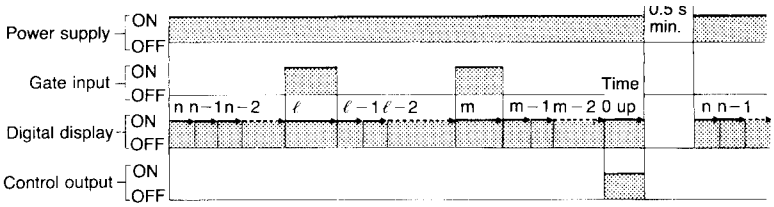


UP Display Timer



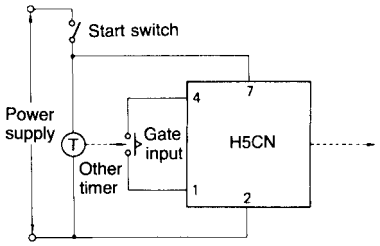
n: Set time ℓ, m: Midway elapsed time

DOWN Display Timer



Operating Time Measurement

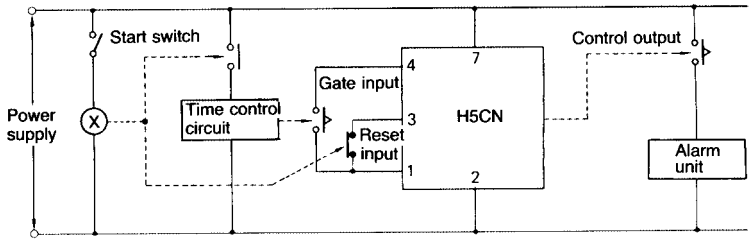
The UP display timers with digital display can be used to measure the operating time of other timers or equipment. (For this measurement, set the set time to the maximum.)



Note: The digital display of H5CN stops incrementing when the predetermined operating time of timer "T" has elapsed.

Alarm Output Circuit

The illustration shows an example of alarm output circuit. In this circuit, H5CN outputs an alarm when the time control by the other timer is not completed within the set time of the former.



Precautions

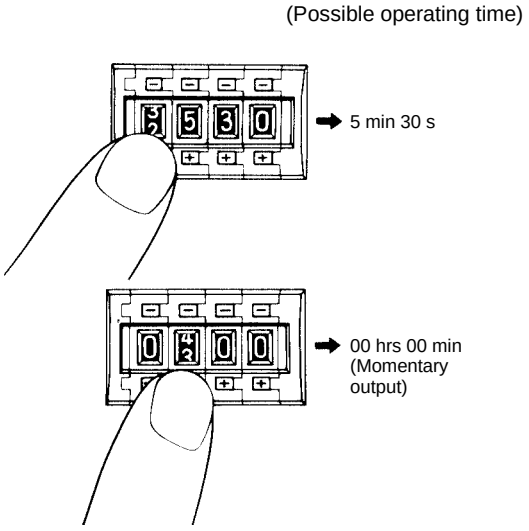
Setting of Operating Time

Time Setting Range

Setting range	Rated time
0.001 to 9.999 s	H5CN- j Z j
0.001 to 99.99 s	H5CN- j A j
0.1 to 999.9 s	H5CN- j B j
1 s to 99 min 59 s	H5CN- j C j
1 min to 99 hrs 59 min	H5CN- j D j

1. Since the H5CN Timer is capable of reading the input data at any time during normal operation, the set time can be changed during power application. This feature sets back the output from the timer by temporarily setting the longer time or quickens the output by setting the shorter time. During normal operation, the set time may be accidentally changed by touching a thumbwheel switch. To prevent this possibility, use the optional protective cover Y92A-48B.
2. When the set time is all zeroes (e.g., 000.0 s or 00 hrs 00 min), there will be a momentary control output upon power application which can be used to check normal output. When changing the set time during normal operation, pay special attention not to alter the set value to this state.
3. When changing the set time while power is being supplied, an inadequate push of the thumbwheel switches will display two numbers in one digital display window, causing the operating time to drift widely. Therefore, press the thumb-wheel switches surely. Take particular care in the case when the other three digits are all zero, since the improper setting of the fourth switch to create four zeroes will cause a momentary output.

Undesirable Setting



4. Take particular care with the H5CN- j Z j j , which is capable of setting in 1/1000th of a second, since its digital display may display an error of plus or minus 1/1000 s from the set value.

Battery Connection

Even if the unit is not provided with a backup battery, the count value will be retained for a minimum of 10 min. If a backup battery is connected, the count value will be retained for approx. 5 years. Replace the backup battery as quickly as possible within 10 min.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L52-E1-9

OMRON

Motor Timer

H2C

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).
- Conforms to VDE0110 Group C for creepage distance.
- Easy-to-set large transparent knob and easy-to-read single pattern scale facilitate time setting.
- Equipped with timing operation indicator and moving pointer.

RC

Ordering Information

Operation/resetting system	Internal connection	Terminal	Time-limit contact	Instantaneous contact	Model	
					Surface mounting/ track mounting	Flush mounting
Time-limit operation/ self-resetting	Separate motor and clutch connection	8-pin round socket	SPDT	SPDT	H2C-8	H2C-8 (with Y92F-30 adapter)
		11-pin round socket			H2C	H2C (with Y92F-30 adapter)
		Front screw			H2C-F	---
Time-limit operation/ electric resetting		8-pin round socket	SPDT	---	H2C-8R	H2C-8R (with Y92F-30 adapter)
		11-pin round socket		SPDT	H2C-R	H2C-R (with Y92F-30 adapter)
		Front screw			H2C-FR	---

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

■ Accessories (Order Separately)

Timer	Track mounted socket (see note 1)	Back connecting socket	
		Solder terminal	Screw terminal
H2C-8, H2C-8R	P2CF-08, PF085A	PL08	P3G-08
H2C, H2C-R	PF113A	PL11	P3GA-11

Note: Track mounted socket can be used as a front connecting socket.

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 hrs	1.25 to 30 hrs
B	0.2 to 6 s	2 to 60 s	0.2 to 6 min	2 to 60 min	0.2 to 6 hrs
C	0.5 to 12 s	5 to 120 s	0.5 to 12 min	5 to 120 min	0.5 to 12 hrs

■ Ratings

Item	H2C
Rated supply voltage	100, 110, 115, 120, 200, 220, or 240 VAC (50/60 Hz) (see note 1)
Operating voltage range	85% to 110% of rated supply voltage (see note 2)
Power consumption	Approx. 3.5 VA
Control outputs	6 A at 250 VAC, resistive load ($\cos\phi$ = 1) (see note 3)

Note: 1. 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

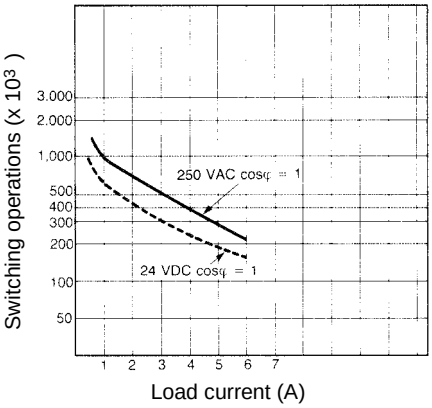
2. If the voltage continues to be applied after the set time has elapsed, the operating voltage range will change to between 90% and 110% of the rated voltage.

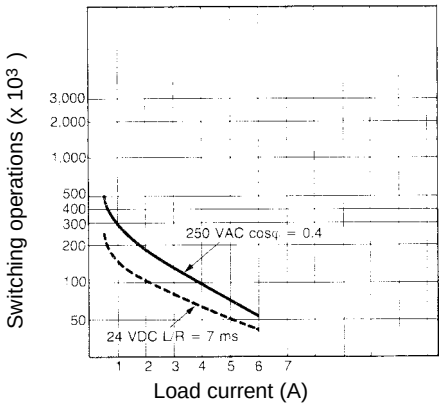
3. The switching capacity of the control output is 6 A at 250 VAC ($\cos\Phi$ = 1). Refer to *"Engineering Data"* since the electrical service life of the built-in switch will change in such a case.

■ Characteristics

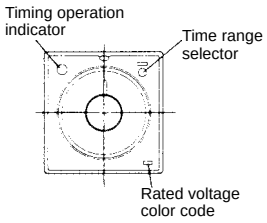
Accuracy of operating time	±0.5% max. ⟨±1% max. at 0.2 to 6 s for the time range code B or at 0.5 to 12 s for the time range code C)
Setting error	±2% max.
Reset time	0.5 s max.
Influence of voltage	±1% max.
Influence of temperature	±2% max.
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	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 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 150 m/s^2 (approx. 15G)
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. 500,000 operations min. (3 A at 250 VAC, resistive load at 1,800 operations/h) Electrical: See *"Engineering Data"*
Motor life expectancy	20,000 hrs
Approved standards	UL (File No. E52800)
Weight	H2C series: approx. 180 g H2C-F series: approx. 270 g

Engineering Data





Nomenclature

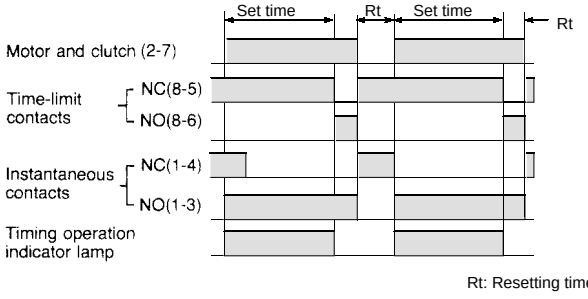


Operation

■ Timing Chart

H2C-8

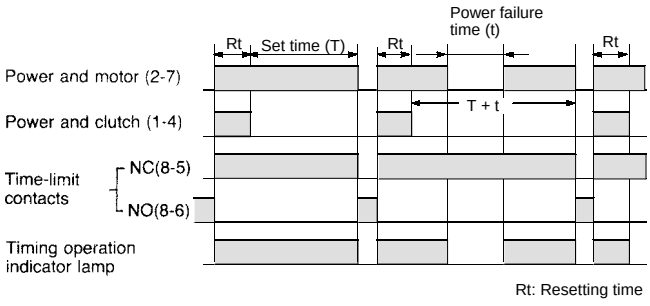
ON-delay 8-pin Round Socket



Rt: Resetting time

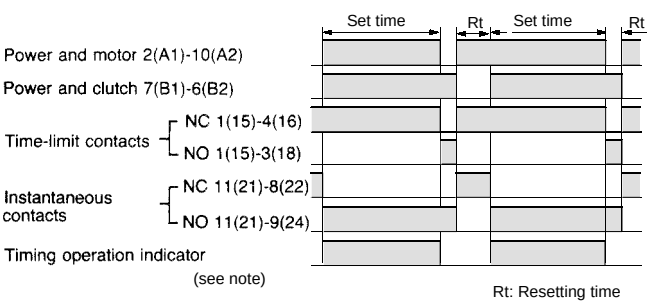
H2C-8R

OFF-delay 8-pin Round Socket



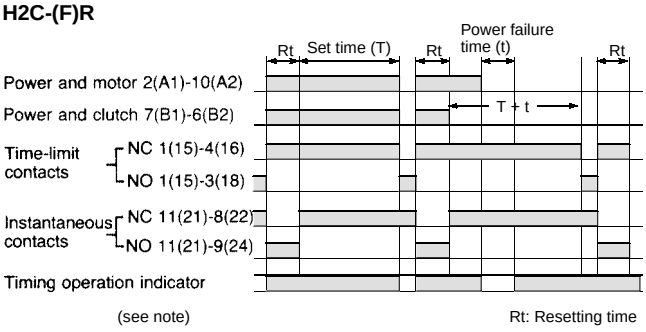
Rt: Resetting time

H2C(-F)



Rt: Resetting time

H2C-(F)R



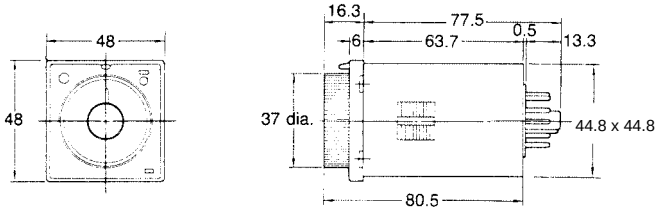
Rt: Resetting time

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

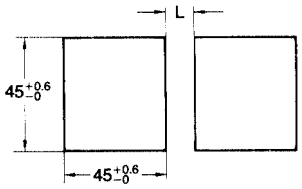
Dimensions

Note: All units are in millimeters unless otherwise indicated.

H2C/H2C-R/ H2C-8/H2C-8R

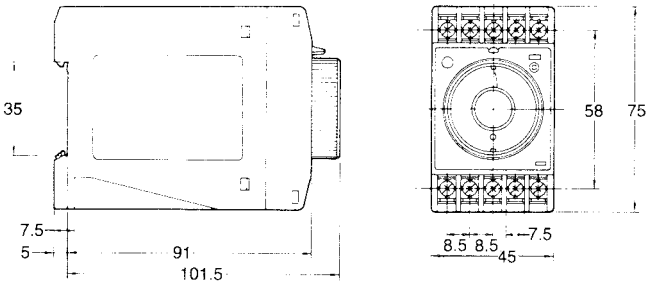


For Flush Mounting

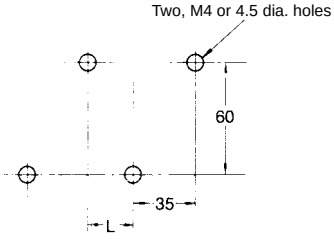


For a load current of 3 A max., dimension L becomes 3 mm min. with an interval of 0 mm between timers.
For a load current of 6 A max., dimension L becomes 8 mm min. with an interval of 5 mm between timers.

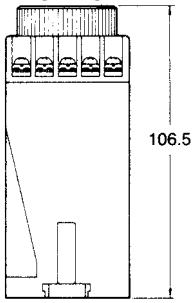
H2C-F/H2C-FR



Mounting Holes



Mounting Height of Timer

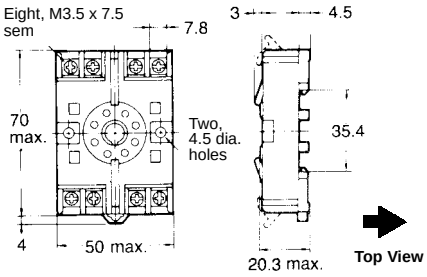


For a load current of 1 A max., dimension L becomes 10 mm min. with an interval of 0 mm between timers.
For a load current of 3 A max., dimension L becomes 15 mm min. with an interval of 5 mm between timers.
For a load current of 6 A max., dimension L becomes 20 mm min. with an interval of 10 mm between timers.

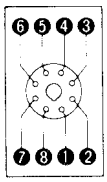
■ Accessories (Order Separately)

Track Mounted/Front Connecting Socket

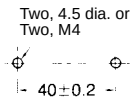
P2CF-08



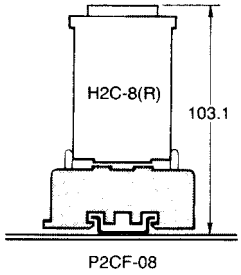
Terminal Arrangement (Top View)



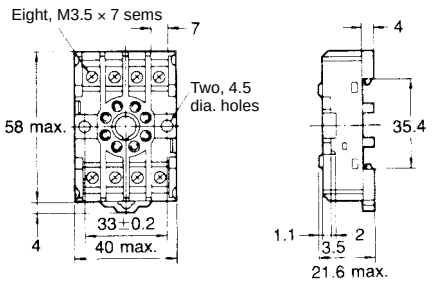
Mounting Holes



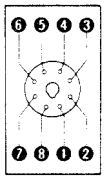
Mounting Height of Timer with Socket



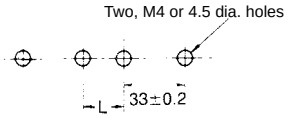
PF085A



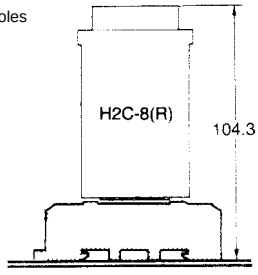
Terminal Arrangement (Top View)



Mounting Holes

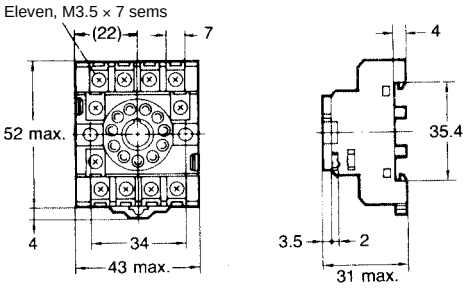


Mounting Height of Timer with Socket

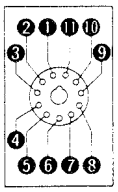


For a load current of 3 A max., dimension L becomes 14 mm min. with an interval of 0 mm between timers.
For a load current of 6 A max., dimension L becomes 19 mm min. with an interval of 5 mm between timers.

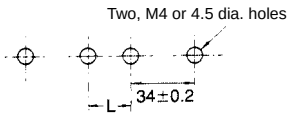
PF113A



Terminal Arrangement (Top View)

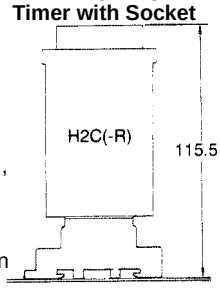


Mounting Holes



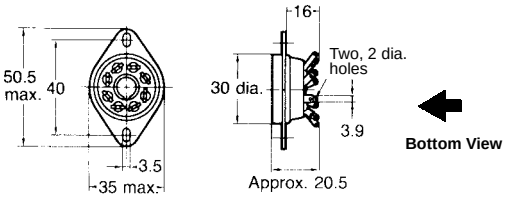
For a load current of 3 A max., dimension L becomes 14 mm min. with an interval of 0 mm between timers. For a load current of 6 A max., dimension L becomes 19 mm min. with an interval of 5 mm between timers.

Mounting Height of Timer with Socket



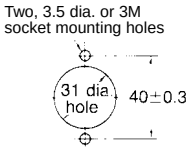
Back Connecting Socket

PL08 (Solder Terminals)

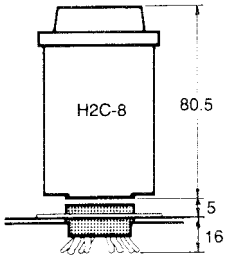


Terminal Arrangement (Bottom View)

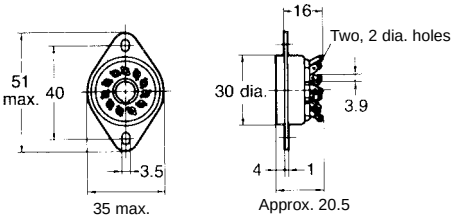
Mounting Holes



Mounting Height of Timer with Socket

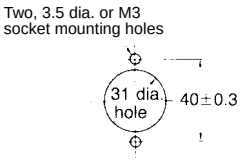


PL11 (Solder Terminals)

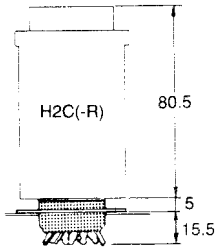


Terminal Arrangement (Bottom View)

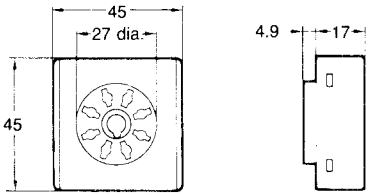
Mounting Holes



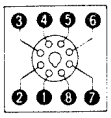
Mounting Height of Timer with Socket



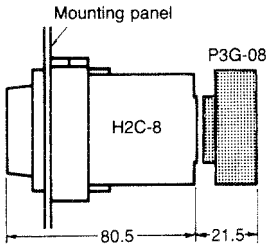
P3G-08



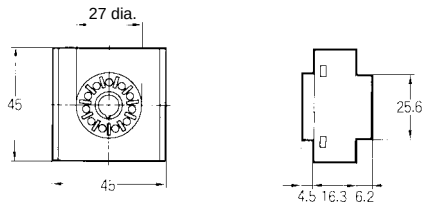
Terminal Arrangement (Bottom View)



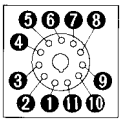
Mounting Height of Timer with Socket



P3GA-11

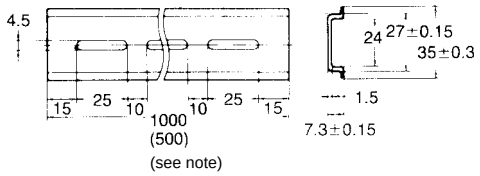


Terminal Arrangement (Bottom View)



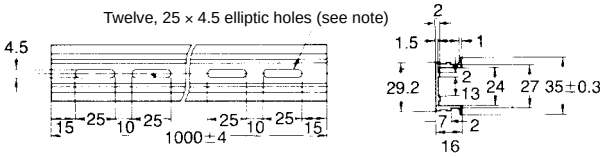
Mounting Track (Meets DIN EN50022)

PFP-100N/PFP-50N



Note: This dimension applied to PFP-50N.

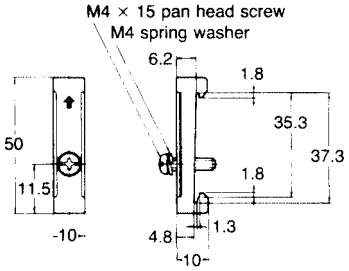
PFP-100N2



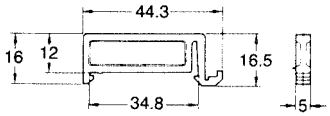
Note: A total of twelve, 25 x 4.5 elliptic holes are provided with 6 holes cut from each rail end at a pitch of 10 mm between holes.

End Plate

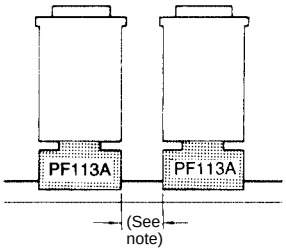
PFP-M



PFP-S

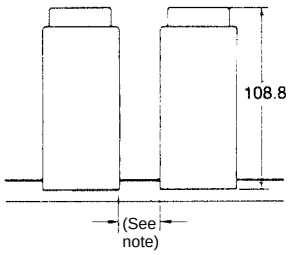


H2C (with PF113A)



Note: For a load current of 3 A max., a spacer and an end plate are not required. For a load current of 6 A, one spacer or an end plate is required.

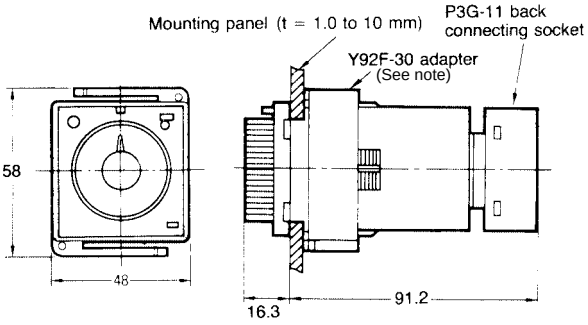
H2C-F



Note: For a load current of 1 A max., a spacer and an end plate are not required. For a load current of 3 A max., one spacer or an end plate is required. For a load current of 6 A max. two spacers or two end plates are required.

Adapter for Flush Mounting

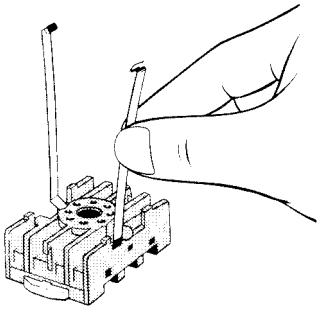
Y92F-30



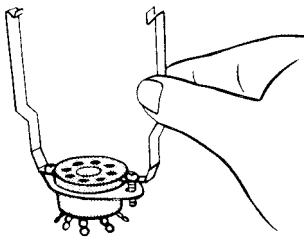
Note: The adapter can be mounted to the timer form any side of the timer housing since the adapter security notches are provided on all four sides of the housing.

Timer Hold-down Clips

Y92H-2 (for PF085A/PF113A Connecting Socket)



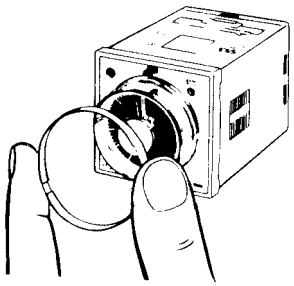
Y92H-1 (for PL08/PL11 Connecting Socket)



Time Setting Ring

Y92A-Y1

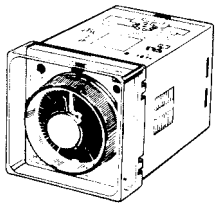
The time setting ring locks the time setting knob to store the set time to facilitate its resetting. A maximum of two time setting rings are connectable per timer.



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.

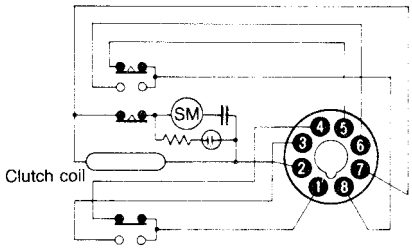


Installation

■ Terminal Arrangement

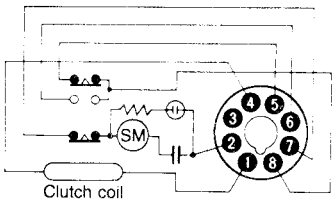
H2C-8

ON-delay 8-pin Round Socket

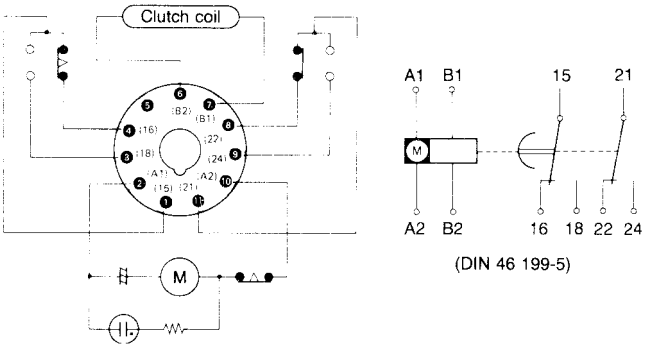


H2C-8R

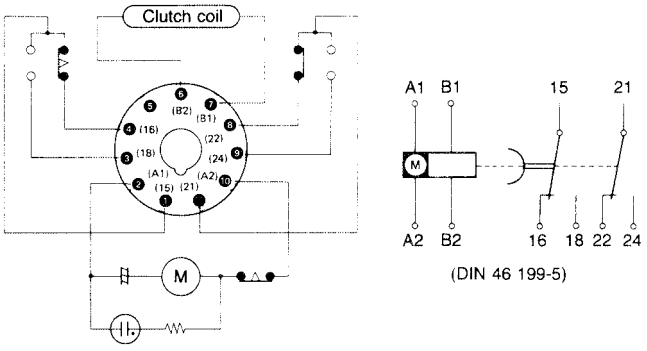
OFF-delay 8-pin Round Socket



H2C(-F)



H2C-(F)R



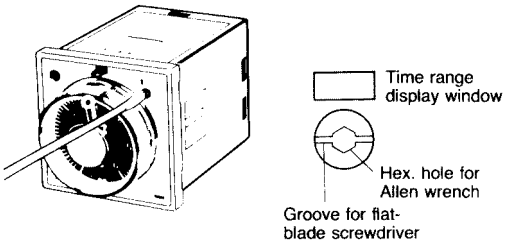
Precautions

How to Change the Time Range

Change the positions of the time range selector with a flat-blade screwdriver or an Allen wrench.

⚠ Caution

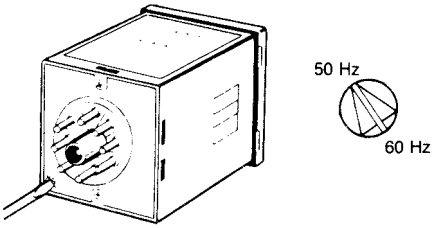
Be sure to turn the power off before changing the time specification. Changing the time range while the timer is in operation may cause a malfunction.



How to Select Power Frequency

⚠ Notice

Power frequency
Before using the timer, set the frequency selector located at the rear panel to the proper power frequency (50 or 60 Hz). Note that if the frequency selector is set incorrectly, time measurement may not be performed accurately against the set time.



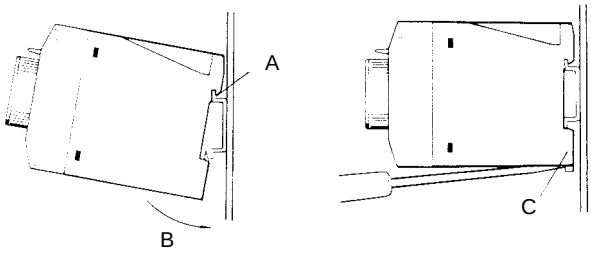
How to Mount the Timer on Mounting Track

Mounting

First hook portion A of the timer to the mounting track, then depress the timer in direction B.

Dismounting

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



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.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L07-E1-8

OMRON

Motor Timer

H2A

Miniature, High-performance Motor Timer

- Employs high-reliability bifurcated contacts for output.
- Moving pointer provided in all types for confirmation of elapsed time.
- Employs time-out and power ON indicators for all types.
- Wide variety of timing ranges from 5 s to 24 hrs.

RC

Ordering Information

Operation/resetting system	Internal connection	Time-limit contact	Instantaneous contact	Mounting
				Surface mounting (see note 2)
Time-limit operation/ self-resetting	Parallel motor and clutch connection	SPDT	---	H2A
			SPST-NO	H2A-H

Note: 1. Specify both the model number and supply voltage when ordering.

2. Surface mounting models can be used as a flush mounting type by attaching an exclusive adapter (Y92F-40) to the timer.

Specifications

■ Time Ranges

Rated time	Time setting range		Time division
	50 Hz	60 Hz	
5 s	0.2 to 6 s	0.2 to 5 s	0.2 s
10 s	0.5 to 12 s	0.5 to 10 s	0.5 s
30 s	1 to 36 s	1 to 30 s	1.0 s
60 s	2 to 72 s	2 to 60 s	2.0 s
3 min	1/6 to 3 1/2 min	1/6 to 3 min	10.0 s
6 min	1/4 to 7 1/6 min	1/4 to 6 min	15.0 s
12 min	1/2 to 14 min	1/2 to 12 min	30.0 s
30 min	1 to 36 min	1 to 30 min	1.0 min
60 min	2 to 72 min	2 to 60 min	2.0 min
3 hrs	1/6 to 3 1/2 hrs	1/6 to 3 hrs	10.0 min
6 hrs	1/4 to 7 hrs	1/4 to 6 hrs	15.0 min
12 hrs	1/2 to 14 hrs	1/2 to 12 hrs	30.0 min
24 hrs	1 to 28 hrs	1 to 24 hrs	1.0 hrs

■ Ratings

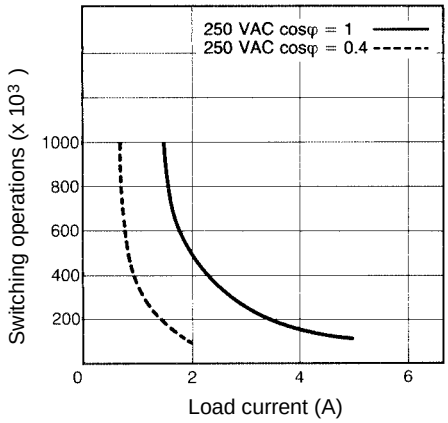
Rated supply voltage	100, 110, 200, or 220 VAC (50 Hz), 100/110, 200/220 VAC (60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	Approx. 3 VA
Control outputs	Standard type: 2 A at 250 VAC, resistive load (cosϕ = 1)

Note: The front panel of the timer is color-coded to identify the following supply voltage classifications:
100, 110 V: Blue
200, 220 V: Red
Other classes: Black

■ Characteristics

Accuracy of operating time	±2% max. (±3% max. for the 5-s model)
Setting error	±5% max.
Reset time	0.3 s max.
Influence of voltage	±1% max.
Influence of temperature	±2% max.
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts, 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: 16.7 Hz with 4-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 100 m/s^2 (approx. 10G) (5G for lateral shocks)
Ambient temperature	Operating: −10°C to 50°C
Ambient humidity	Operating: 45% to 85%
Life expectancy	Mechanical: 1,000,000 operations min. (under no load at operating of 1,800 operations/hr) Electrical: See *"Engineering Data"*
Motor life expectancy	20,000 hrs
Approved standards	UL (File No. E52800-US), CSA (File No. LR22310-US)
Weight	Approx. 170 g

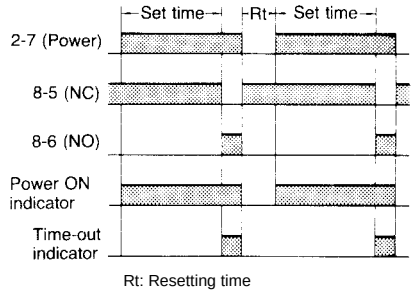
Engineering Data



Operation

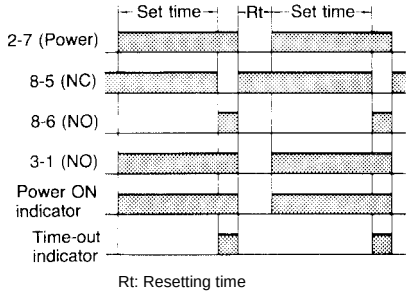
■ Timing Chart

H2A



Rt: Resetting time

H2A-H

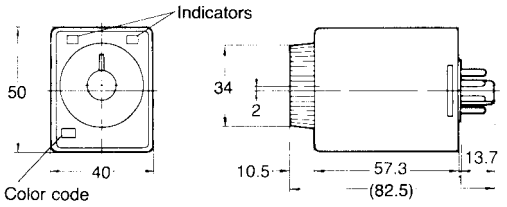


Rt: Resetting time

Dimensions

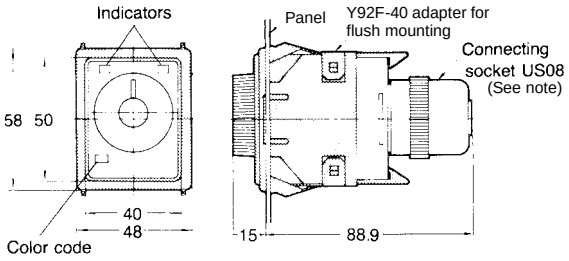
Note: All units are in millimeters unless otherwise indicated.

H2A/H2A-H

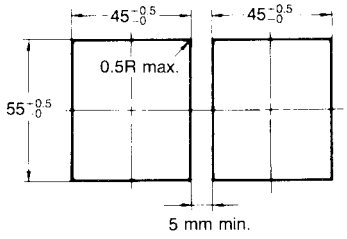


Note: F-shaped hook (PHC-1) for PF085A and L-shaped hook (PHc-4) for PL08 are supplied with the timer.

H2A(-H) with Adapter



Panel Cutouts

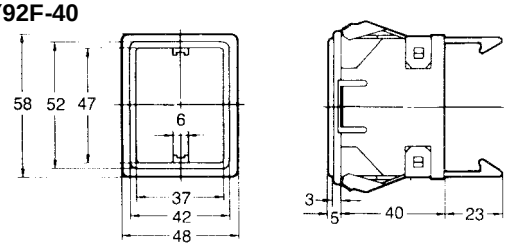


Note: Back connecting socket US08 and Y-shaped hook PHC-3 are supplied with the timers.

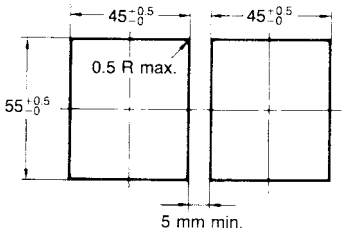
■ Accessories (Order Separately)

Adapter for Flush Mounting

Y92F-40

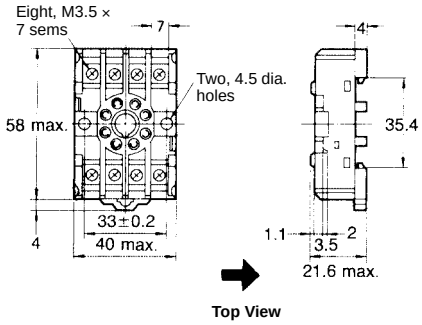


Panel Cutouts

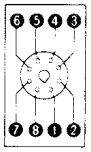


Track Mounted/Front Connecting Socket

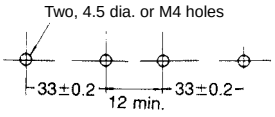
PF085A



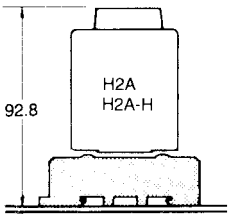
Terminal Arrangement (Top View)



Mounting Holes



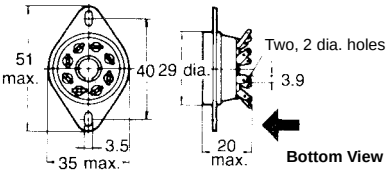
Mounting Height of Timer with Socket



Note: PF085A can be used as a front connecting socket.

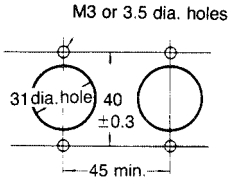
Back Connecting Socket

PL08 (Solder Terminals)

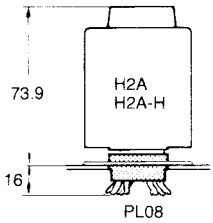


Terminal Arrangement (Bottom View)

Mounting Holes

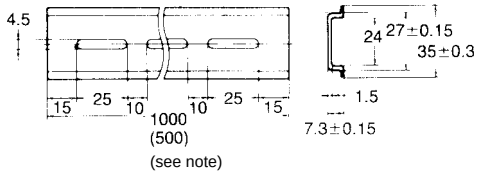


Mounting Height of Timer with Socket



Mounting Track (Meets DIN EN50022)

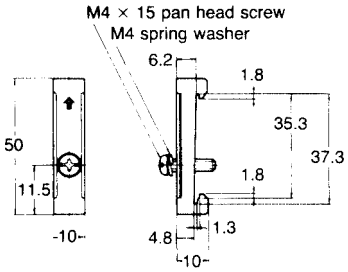
PFP-100N/PFP-50N



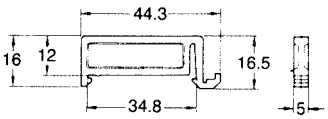
Note: This dimension applied to PFP-50N.

End Plate

PFP-M

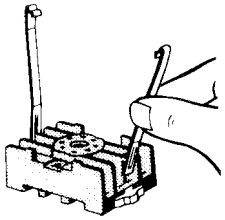


PFP-S



Hold-down Clips (Attached)

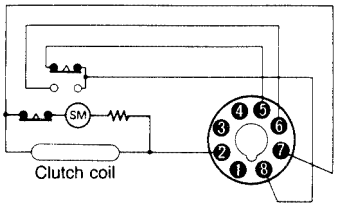
PHC-1 For PF085A



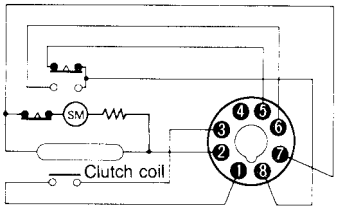
Installation

■ Terminal Arrangement

H2A



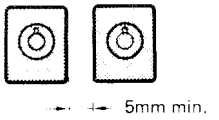
H2A-H



Precautions

Mounting

When two or more timers are to be mounted in line, provide a distance of more than 5 mm between the two adjacent timers.



When two or more timers mounted in line are to be continuously energized at the same time after the set time has elapsed, be sure to limit the carry current to less than 1 A.
When using the timers at an ambient temperature of more than 40°C, be sure to reset the timers immediately after the set time has elapsed.

Wiring

When wiring, employ a multi-core cable having a finished outer diameter of less than 10.5 mm, or insulated (twisted) wires with less than a 3 mm outer diameter.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L04-E1-8

OMRON

Motor Timer

STP

Best-selling Motor Timer with High Repeat Accuracy

- Accurate and stable operation.
- Long life (1,000,000 mechanical operations).
- Operating time is changeable at any time during operation.
- No restriction on mounting direction.
- Wide variety of timing ranges form 5 s to 24 hrs.
- Equipped with operation indicator for self-resetting type.

RC

Ordering Information

Operation/resetting system	Internal connection	Time-limit contact	Instantaneous contact	Moving pointer			
				Not provided		Provided	
				Surface mounting (see note 4)	Flush mounting	Surface mounting (see note 4)	Flush mounting
Time-limit operation/ self-resetting	Parallel motor and clutch connection	SPDT	SPST-NO (see note 3)	STP-N	STP-Y	STP-NM	STP-YM
			SPST-NO	STP-NH	---	---	STP-YMH
			SPDT	STP-ND	---	---	---
	Separate motor and clutch connection		SPST-NO (see note 3)	STP-N2	---	---	---
Time-limit operation/ electric resetting				STP-NR	---	STP-NMR	STP-YMR

Note: 1. Specify both the model number and supply voltage when ordering.

2. If a UL or CSA recognized type is required, please specify the model number by adding suffix "-US".

3. Circuit is also used for the operating power circuit.

4. The surface mounting type can be used as a flush mounting type by attaching an exclusive adapter (Y92F-50) to the timer.

Specifications

■ Time Ranges

Rated time	Time setting range		Time division
	50 Hz	60 Hz	
5 s	0.4 to 6 s	0.4 to 5 s	0.2 s
10 s	1 to 12 s	1 to 10 s	0.5 s
30 s	1 to 36 s	1 to 30 s	1.0 s
60 s	2 to 72 s	2 to 60 s	2.0 s
180 s	5 to 215 s	5 to 180 s	5.0 s
6 min	1/6 to 7 1/6 min	1/6 to 6 min	10.0 s
10 min	1/3 to 12 min	1/3 to 10 min	20.0 s
30 min	1 to 36 min	1 to 30 min	1.0 min
60 min	2 to 72 min	2 to 60 min	2.0 min
180 min (see note)	5 to 215 min	5 to 180 hrs	5.0 min
6 hrs (see note)	1/3 to 7 hrs	1/3 to 6 hrs	20.0 min
12 hrs (see note)	1/2 to 14 hrs	1/2 to 12 hrs	30.0 min
24 hrs (see note)	1 to 28 hrs	1 to 24 hrs	1.0 hrs

Note: For long-time specifications with a maximum setting time of over 180 min, only the models with a moving pointer are available.

■ Ratings

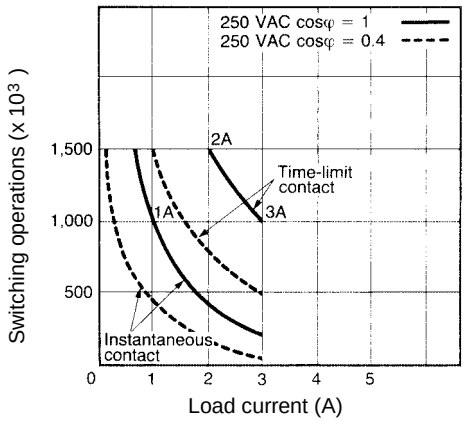
Rated supply voltage	100, 110, 200, or 220 VAC (50 Hz), 100/110, or 200/220 VAC (60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	Approx. 5 VA
Control outputs	Time-limit contact: 3 A at 250 VAC, resistive load Instantaneous contact: 1.5 A at 250 VAC, resistive load

Note: The front panel of the timer is color-coded to identify the following supply voltage classifications:
100 to 120 V: Blue
220 to 240 V: Red
Other classes: Black

■ Characteristics

Accuracy of operating time	±0.5% max. ⟨±1% max. for the 5-s and 10-s model)
Setting error	±5% max.
Reset time	0.5 s max.
Influence of voltage	±1% max.
Influence of temperature	±2% max.
Insulation resistance	50 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying metal parts and non-current-carrying metal parts, between control output terminal and operating circuit, and between contacts of different polarities) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 16.7 Hz with 4-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 150 m/s^2 (approx. 15G)
Ambient temperature	Operating: −10°C to 50°C
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 1,000,000 operations min. Electrical: See *"Engineering Data"*
Approved standards	UL (File No. E52800), CSA (File No. LR22310)
Weight	Approx. 300 g

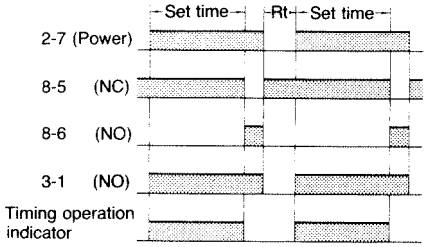
Engineering Data



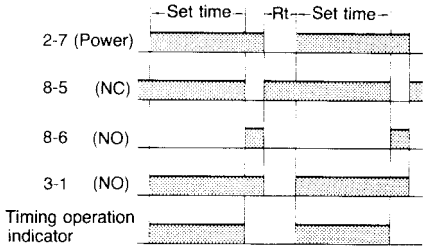
Operation

■ Timing Chart

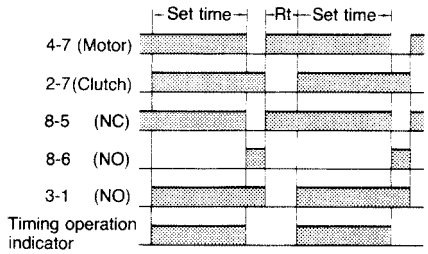
STP-N/STP-NM
STP-Y/STP-YM



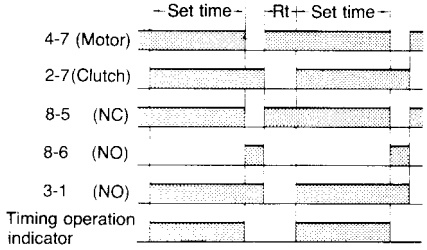
STP-NH



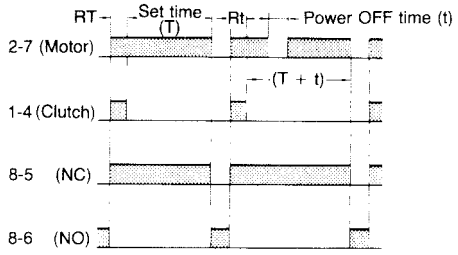
STP-ND



STP-N2



STP-NR/STP-NMR
STP-YMR

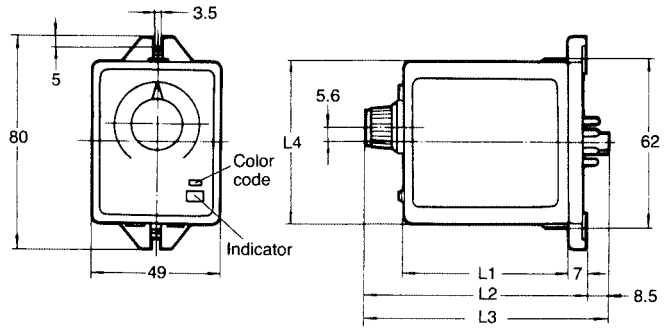


When setting the time, apply voltage across terminals 1 and 4.

Dimensions

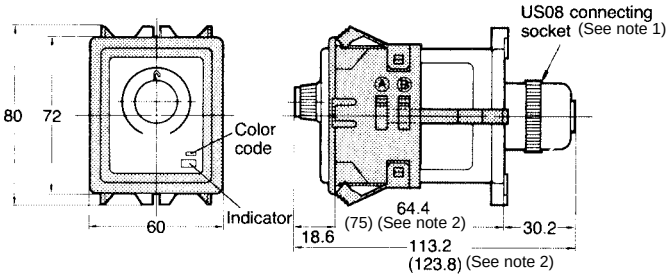
Note: All units are in millimeters unless otherwise indicated.

STP-N j /STP-NM j



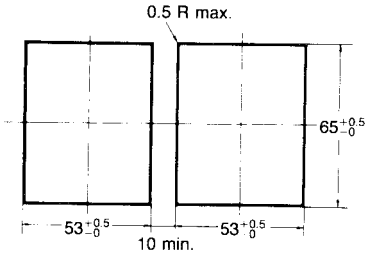
Dimension	L1	L2	L3	L4
STP-N/STP-N2 STP-ND/STP-NH STP-NR	63.5	84	92.5	61
STP-NM/STP-NMR	74.1	94.6	103.1	60.2

STP-N j /STP-NM j with Adapter



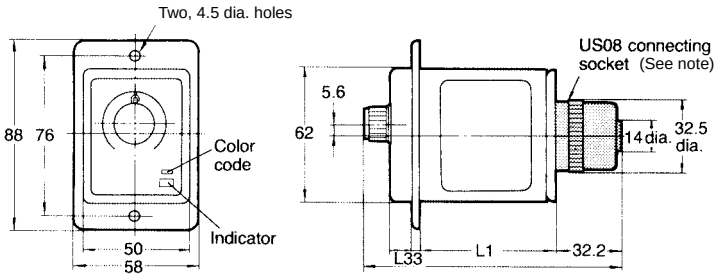
Note: 1. US08 connecting socket is supplied with the timer as an accessory.
2. The dimension in parentheses applies to the STP-NM series timers.

Panel Cutouts



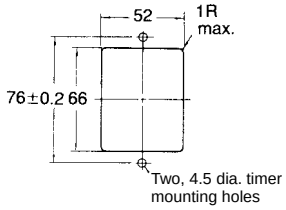
Note: The mounting panel thickness should be 1 to 3.2 mm.

STP-Y j /STP-YM j



Note: US08 connecting socket is supplied with the timer.

Panel Cutouts

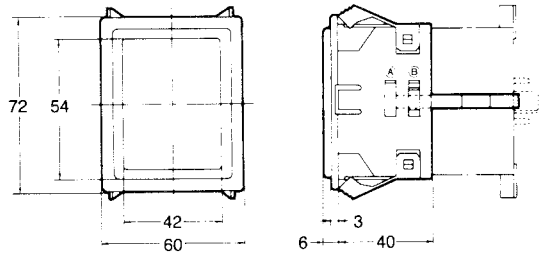


Dimension	L1	L2	L3
STP-Y	61.5	113.2	3
STP-YM/STP-YMH STP-YMR	65.4	123.1	10

■ Accessories (Order Separately)

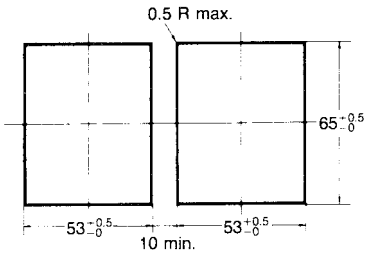
Adapter for Flush Mounting

Y92F-50



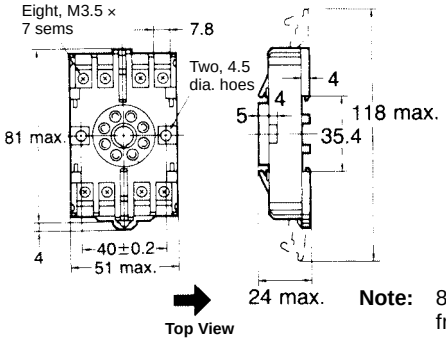
Panel Cutouts

Recommended panel thickness: 1 to 3.2 mm

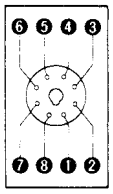


Track Mounted Socket

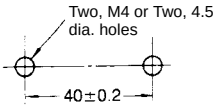
8PFA



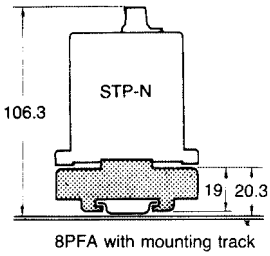
Terminal Arrangement (Top View)



Mounting Holes



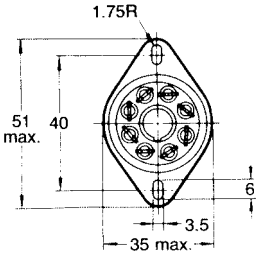
Mounting Height of Timer with Socket

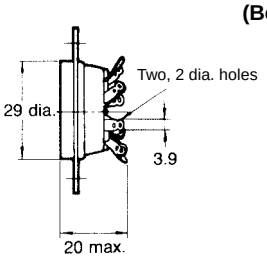


Note: 8PFA can be used as a front connecting socket.

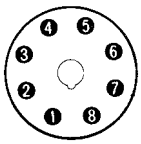
Back Connecting Socket

PL08

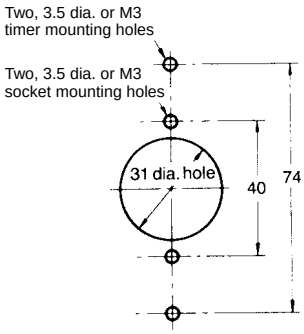




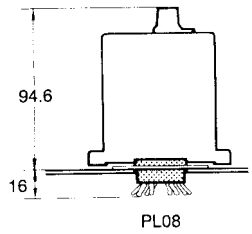
Terminal Arrangement (Bottom View)



Mounting Holes

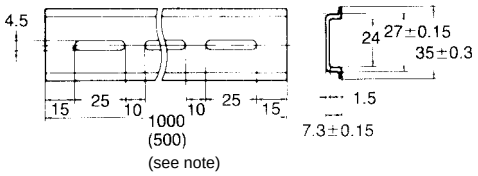


Mounting Height of Timer with Socket



Mounting Track (Meets DIN EN50022)

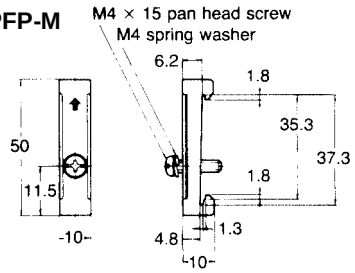
PFP-100N/PFP-50N



Note: This dimension applied to PFP-50N.

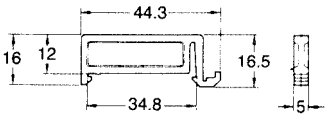
End Plate

PFP-M



Spacer

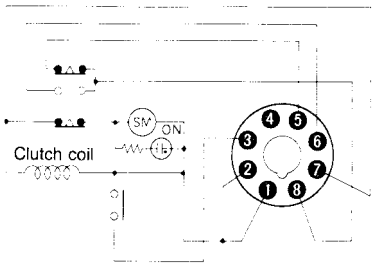
PFP-S



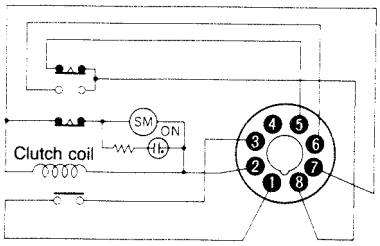
Installation

■ Terminal Arrangement

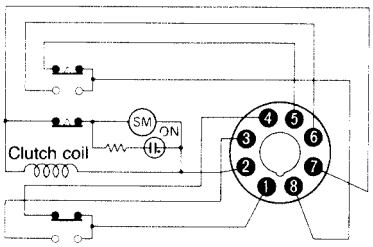
STP-N/STP-NM
STP-Y/STP-YM



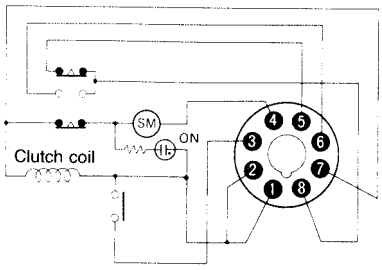
STP-NH



STP-ND

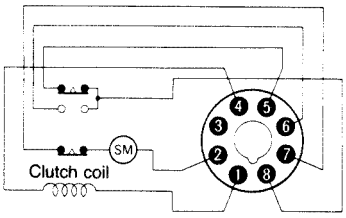


STP-N2



Note: Connect the motor drive power source between terminals D and G and the clutch operating power source between terminals B and G. In this case, be sure that both power sources are one and the same and the power source to be connected to terminal G is of the same phase.

STP-NR



Note: The Electrical Presetting type is not provided with an operation indicator.

Precautions

Connection

Connecting the Power Supply

Power supply is connected separately for the motor and the clutch. Connect the motor drive power supply across terminals 4 and 7 and connect the clutch operation power supply across terminals 2 and 7. Power supplied for both of these must be from the same power source and the same phase must be connected to terminal 7. For STP-R models, used the voltage applied for the clutch power supply for resetting. Do not apply power continuously for both the motor and clutch power supplies for extended periods of time.

Connecting Instantaneous Contact Circuit

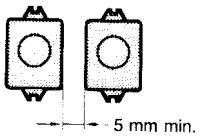
Socket terminals 1 and 3 are for an instantaneous contact circuit and are normally open. Terminal 1 is internally connected to terminal 2 to connect power. The same phase must be used for both terminal 2 and for terminals 1 and 3. The controlled load must therefore be connected to the same phase of power as the power supply connected across terminals 3 and 7. The instantaneous contact circuit for terminals 1 and 3 can be used as a self-holding circuit for the timer. This circuit, however, is electrically independent of the operation power circuits for STP-NH and STP-ND.

Setting the Operating Time

Do not turn the adjustment for the operating time past the range on the scale. If the clutch does not release then current is applied to the clutch coil when using a power reset, the moving needle will not move with the setting needle when the set time is increased (i.e., when the setting needle is turned clockwise).

Mounting

When two or more timers are to be mounted in line, provide a distance of more than 5 mm between the two adjacent timers.



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L03-E1-9

OMRON

Digital Daily Time Switch

H5F

- Precise control of both regular and special (e.g., half-day operation) ON/OFF times.
- Can be set for timed or pulsed operation, and for multiple-day operation.
- Three mounting types available: flush, surface, or track mounting.
- Timing chart displayed for at-a-glance confirmation.
- DIN-sized 48 x 48 mm.

RC

Ordering Information

Wiring	Mounting method	Model
Screw terminals	Flush mounting	H5F-B
	Surface mounting	H5F-FB
	Surface mounting/track mounting	H5F-KB

Specifications

■ Ratings

Rated supply voltage	100 to 240 VAC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	Approx. 2 VA
Control outputs	Contact output: SPST-NO, 15 A at 250 VAC, resistive load

■ Characteristics

Accuracy of operating time	±0.01% ±0.05 s max. (see note 1)
Setting error	
Influence of voltage	
Influence of temperature	
Cyclic error	Monthly difference ±15 s (at 25°C)
Memory protection	5 years min. (at 25°C) (see note 2)
Insulation resistance	100 MΩ min. (between terminals and non-current-carrying metal parts, between operating circuit and contact output circuit and between non-continuous contacts)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between terminals and non-current-carrying metal parts and between operating circuit and contact output circuit) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Noise immunity	1.5 kV (square wave noise having 100 ns width, 1 ns rise time, ± polarity and 0° to 360° phase is applied by noise simulator
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 300 m/s^2 (approx. 300G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: −10°C to 55°C (with no icing)
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 50,000 operations min. (15 A, 250 VAC, resistive load) 50,000 operations min. (1 HP, 250 VAC, motor load) 50,000 operations min. (10 A, 250 VAC, inductive load (cosϕ = 0.7)) 50,000 operations min. (100 W, 100 VAC, lamp load) 10,000 operations min. (300 W, 100 VAC, lamp load)
Approved standards	UL (File No. E41515), CSA (File No. LR22310)
Weight	H5F-B: approx. 115 g; H5F-KB: approx. 160 g; H5F-FB: approx. 130 g

Note: 1. The total error including the repeat accuracy, setting error, variation due to voltage change, and variation due to temperature change is ±0.01%±0.05 s max. ±0.01% also indicates an error in the time interval of a set time.

2. The total time when power is not being supplied.

■ Operation

Operation method	Digital quartz
Operation	1. Daily operation (Multiple-day operation possible) 2. Pulse-output operation (pulse width can be set in units of 1 s from 1 to 59 s and in units of 1 min from 1 to 60 min) 3. Partial operation on specified day (one or some of operations for certain days can also be executed on other days.) 4. Forced ON/OFF operation
Display	1. Day, hours (a.m., p.m.), minutes (0:00 to 11:59 a.m., 0:00 to 11:59 p.m.) 2. Digital display by LCD. Character height: 8 mm 3. Digital display of present time and time schedules for operation 4. Timing chart display of present time and time schedules for operation
Number of circuits	1 independent circuit
Setting method	Key switch
Minimum setting unit	1 min
Minimum set interval	1 min
Number of operations that can be set	16 (see note)

Note: Up to 8 ON/OFF operations are possible per day. (For pulse operation, the number is 16.)

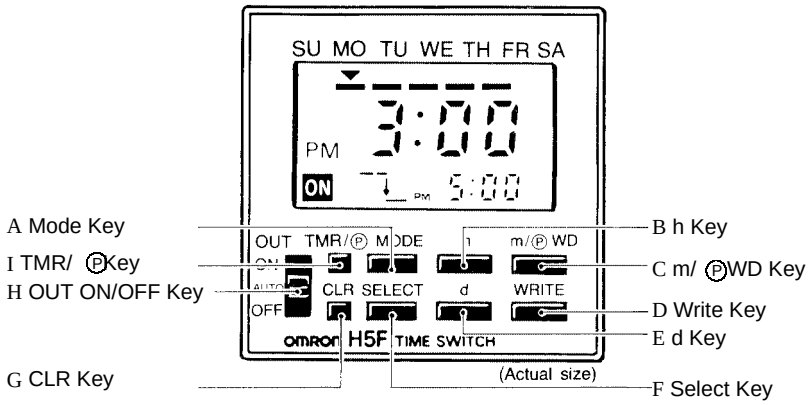
Operation Function

Timer operation	Controls the output according to preset of ON and OFF times (the time can be set in units of 1 min)
Pulse-output	Produces output for a fixed duration at the preset ON time (pulse width: 1 to 59 s, or 1 to 59 min). The pulse width can be set in units of 1 s or 1 min.
Forced ON/OFF operation	Forcibly turns ON/OFF the output by a slide switch
Partial operation on specified day	Part of one day's operation programmed for any weekday from Sunday to Saturday can be executed. (Convenient, for example, for executing a half-day operation on Saturday.)

Note: Both the timer operation and the pulse operation cannot be programmed together with.

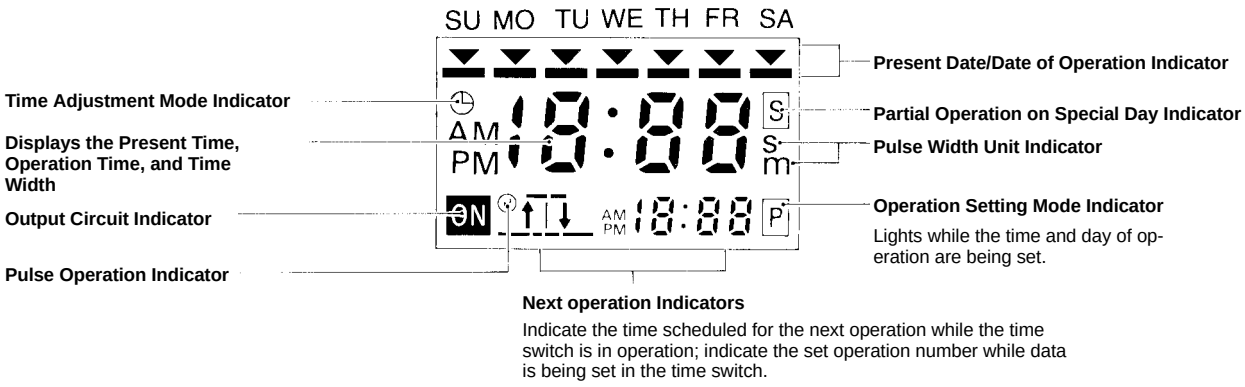
Nomenclature

Front Panel



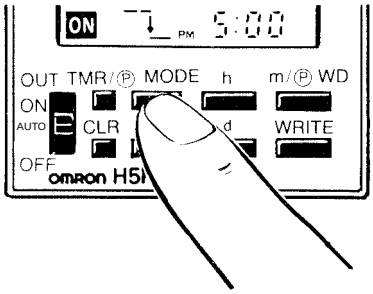
No.	Name	Function
A	Mode Key	Selects an operation mode.
B	h (Hour) Key	Sets hours.
C	m/Ⓟ WD (Minute/Pulsetime width) Key	Sets minutes or a pulse time width.
D	Write Key	Writes the set data to memory.
E	d (Day shift) Key	Moves the cursor to specify a date.
F	Select Key	Specifies or cancels a specified day.
G	CLR (Clear) Key	Erases the set data and initializes the date of operation.
H	OUT ON/OFF Key	ON: Turns on the output regardless of the setting. OUT: Turns on the output according to the setting. OFF: Turns off the output regardless of the setting.
I	TMR/Ⓟ (Timer/pulse output) Key	Selects timer operation or pulse operation.

Display



Operation

■ Programming



Change the mode by pressing the Mode Key for setting each of operations.

Time adjustment mode
(Press the Mode Key for 1 s or more.)

- Set the time with the h Key, m/Ⓟ WD Key, d Key and Write Key.

Operation time setting mode
(Press the Mode Key.)

- Select the timer operation or pulse operation with the TMR/Ⓟ Key.
- Set the operation time with the Select Key, h Key, m/Ⓟ WD Key, and Write Key.

Operation data setting mode
(Press the Mode Key.)

- Set the non-operation day and specific day with the d Key and Write Key.

Run mode
(Press the Mode Key.)

- Execute the timer operation according to the set time.

The time and date setting procedures in various operation modes are illustrated with display and key operation examples. (The shaded portion in the display indicates that indicator is blinking.)

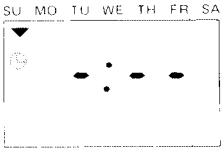
Time Adjustment

Example: Set Wednesday 10:30 a.m.

Initial time adjustment after purchase

1 Specify the day of the week with the d Key.

(Initial screen)



2 Set the present time with the h and m/Ⓟ WD Keys.

3 Press the Write Key to complete.

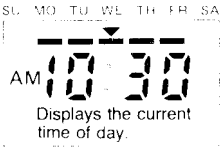
4 (The colon blinks and time measurement starts.)

Example: Set the time to Wednesday 11:00 a.m.

Time adjustment during operation.

1 Hold down the Mode Key for 1 s or more.

(Initial screen)



2 Set the present time with the h and m/Ⓟ WD Keys.

3 Press the Write Key.

4 Press the Mode Key three times to set the Run mode.

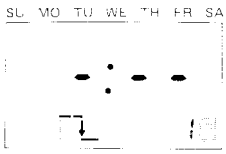
Ordinary Timer Operation

Example: ON at 8:30 a.m. and OFF at 5:15 p.m. each day from Monday to Friday.
First set the Operation time setting mode with the Mode Key.

Display and key operation (shaded portion indicates blinking of the indicator.)

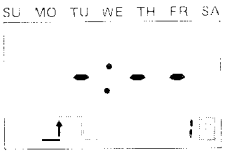
1 Set the time to 8:30 a.m. with the h and m/Ⓟ WD Keys.

(Initial screen)

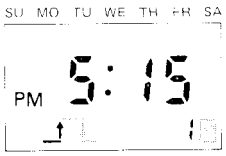


2 Press the Write Key.

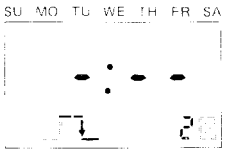
3 Set the time to 5:15 p.m. with the h and m/Ⓟ WD Keys.



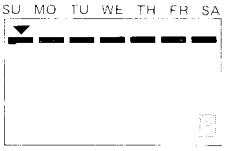
4 Press the Write Key.



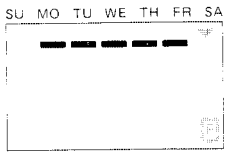
5 Press the Mode Key to set the Operation day setting mode.



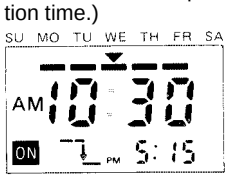
6 Set Sunday and Saturday as non-operation days with the d and Write Keys.



7 Press the Mode Key. (The Run mode will be set.)



8 (Displays the current time and the next operation time.)



Note: If the initial display is different from that shown above, press the Write Key several times until "- : - -" appears.

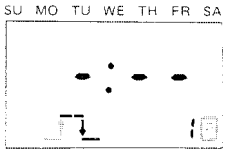
Multiple-day Operation

Example: ON at 10:00 p.m. each day from Monday to Friday and OFF at 7:00 a.m. on the following day.

Display and key operation (shaded portion indicates blinking of the indicator.)

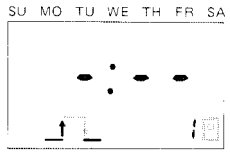
1 Set the time to 10:00 p.m. with the h and m/Ⓟ WD Keys.

(Initial screen)



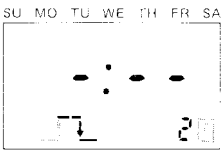
2 Press the Write Key.

3 Set the time to 7:00 a.m. with the h and m/Ⓟ WD Keys.

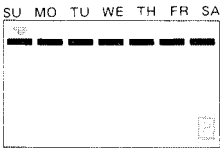


4 Press the Write Key.

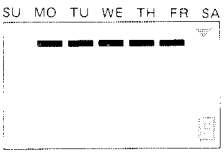
5 Press the Mode Key to set the Operation day setting mode.



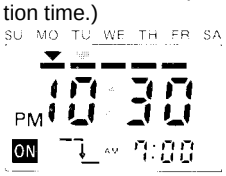
6 Set Sunday and Saturday as non-operation days with the d and Write Keys.



7 Press the Mode Key. (The Run mode will be set.)



8 (Displays the current time and the next operation time.)



Note: If the initial display is different from that shown above, press the Write Key several times until "- : - -" appears.

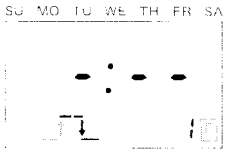
Pulse Output Operation

Example: To turn on the output for 30s at 8:25 a.m., from Monday to Friday. First set the Operation time setting mode with the Mode Key.

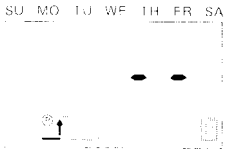
Display and key operation (shaded portion indicates blinking of the indicator.)

1 Press the TMR/Ⓟ key to specify the pulse operation.

(Initial screen)

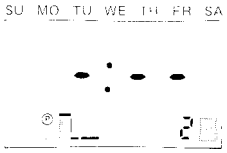


2 Press the m/Ⓟ Key to set a pulse width of 30 s. Press the Write Key.

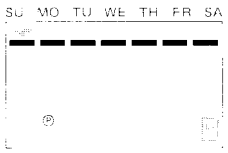


3 Set the On time to 8:25 a.m., by using the h and m/Ⓟ WD Keys. Press the Write Key.

4 Press the Mode Key to set the operation date setting mode.



5 Use the d Key and Write Key to specify Sunday and Saturday as non-operation days.



6 Press the Mode Key. (The Run mode will be set.)

7 (Displays the current time and the next operation time.)

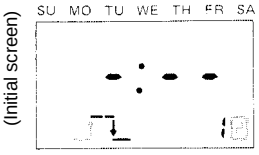
Note: The initial display may be different from that shown above, but disregard this and continue the key operation.

Partial Operation on Specified Day

ON at 8:30 a.m. and OFF at 0:30 p.m..
ON at 1:15 p.m. and OFF at 5:15 p.m. from Monday to Friday.
ON at 8:30 a.m. and OFF at 0:30 p.m. on Saturday.
(To specify Saturday as a special day)
First set the Operation time setting mode with the Mode Key.

Display and key operation (shaded portion indicates blinking of the indicator.)

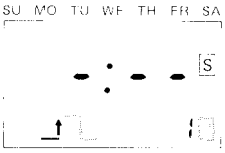
1 Press the Select day Key to light the special day operation (S) indicator (see note 2). Set the ON time to 8:30 a.m. with the h and m/Ⓟ WD keys.



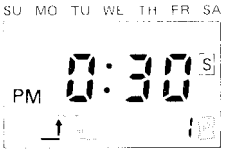
(See note 1)

2 Press the Write Key.

3 Press the h and m/Ⓟ WD Keys to set the OFF time to 0:30 p.m..

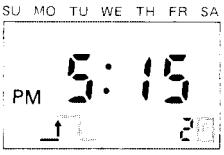


4 Press the Write Key. Press the h and m/Ⓟ WD Keys to set the ON time to 1:15 p.m..



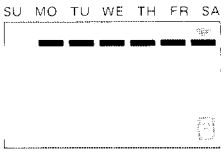
5 Press the Write Key. Press the h and m/Ⓟ WD Keys to the specify 5:15 p.m..

6 Press the Write Key. Press the Mode Key to set the Operation date setting mode.



7 Use the d and Write Keys to specify Sunday as non-operation day and Saturday as a special day (see note 3).

8 Press the Write Key. (The run mode will be set.)



9 (The blinking Saturday indicator indicates that Saturday is a special day.)

Canceling the Setting

To cancel the setting of the circuit.

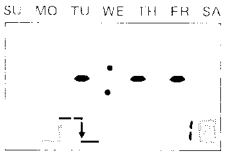
Display and key operation (shaded portion indicates blinking of the indicator.)

1 Press the Mode Key to specify the Operation date setting or Operation time setting mode.

2 Press the CLR key.

3 (Displayed for 1 s)

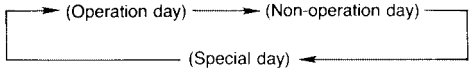
4 All the set operation times, pulse widths, and operation days are erased.



Note: 1. If the display is for the pulse operation, change the operation mode to the timer operation with the TMR/Ⓟ Key.

2. Even in the pulse operation, a specified day may be specified by displaying the special day indicator with the Select key.

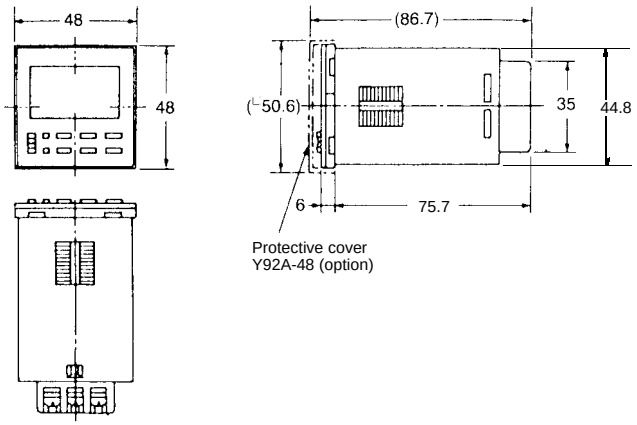
3. At each depression of the Write Key, " ▬ " mark shifts as follows;



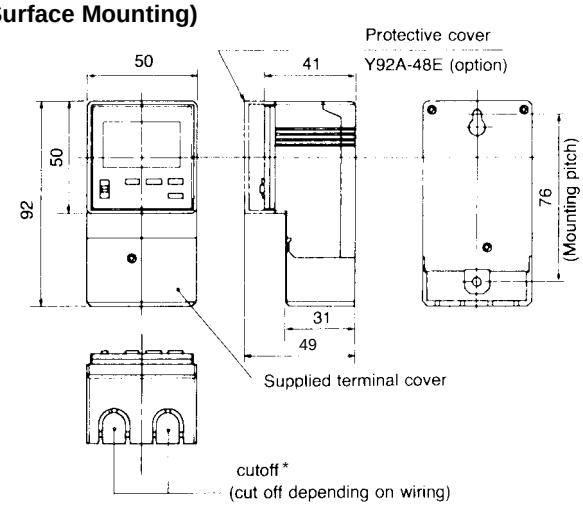
Dimensions

Note: All units are in millimeters unless otherwise indicated.

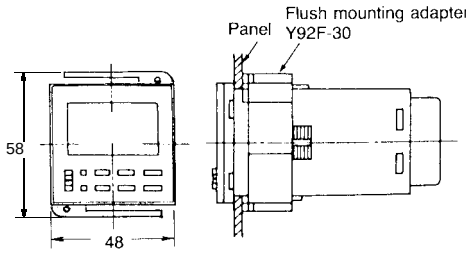
H5F-B
(Flush Mounting)



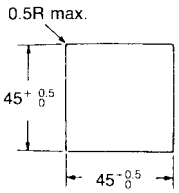
H5F-FB
(Surface Mounting)



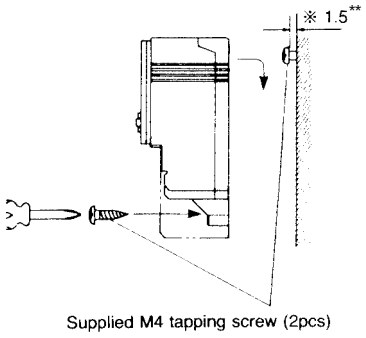
Mounting Dimensions
Flush Mounting (H5F-B)



Panel Cutout

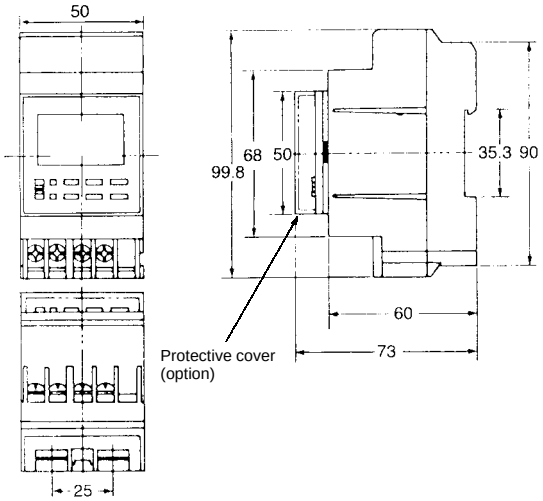


Mounting

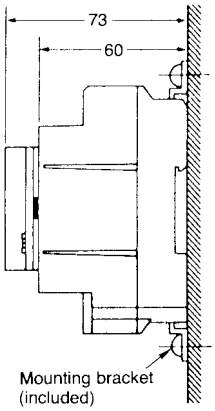


Note: To provided the dimension marked ** tighten the screw using the cut off (marked *).

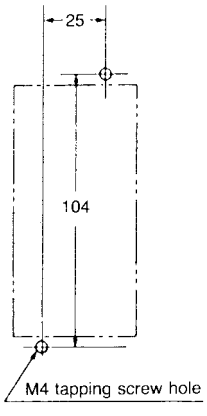
H5F-KB
(Surface/Track Mounting)



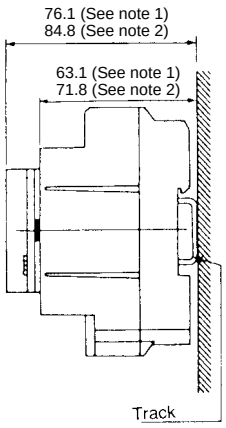
Surface Mounting



Mounting Hole



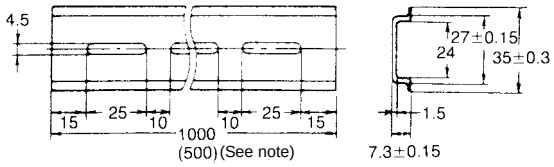
Track Mounting



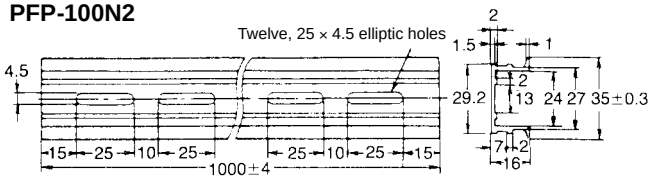
Note: 1. With mounting tracks PFP-100N or PFP-50N.
2. With mounting track PFP-100N2.

Mounting Track (Meets DIN EN50022)

PFP-100N/PFP-50N



PFP-100N2



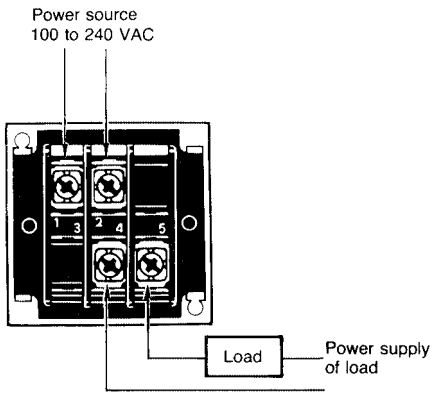
Note: This dimension applied to PFP-50N.

Installation

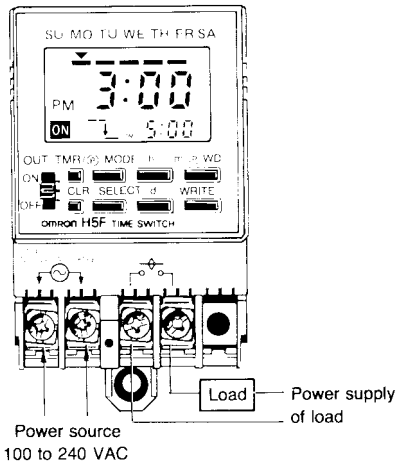
■ Connections

Flush Mounting

H5F-B

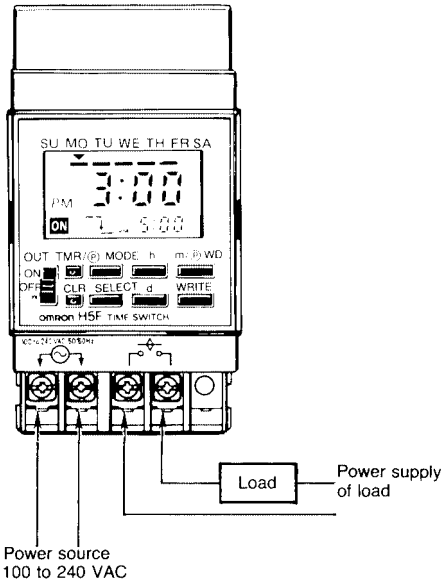


H5F-FB



Surface/Track Mounting

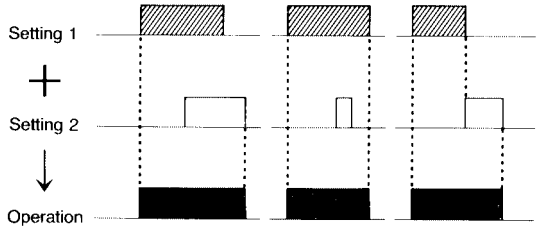
H5F-KB



Precautions

Operation

If two or more ON or OFF times have been specified at the same time, the first input ON time or the last input OFF time take precedence over the other ON or OFF times.



Note: With the above setting, the output is continuously produced without interruption, because the ON time of program 1 and OFF time of program 2 are valid.

The ON and OFF times can be set to the same value, but the timer will not operate.
(Example: if both the ON and OFF times are set to 10:30 a.m., Monday, the timer does not produce any output.)

After data has been set, note that pressing the TMR/Ⓟ key to change the operation between the timer and pulse operation will cause the set data to be lost.

If a power failure occurs, the output is turned off and the indicators go off during the power failure.

⚠ WARNING

The H5F has a built-in lithium battery. When disposing of an entire timer containing a lithium battery, be sure to do so properly. Lithium batteries may explode if incinerated, causing fire or severe burns.
Also, do not touch the input terminals of any H5F timer while power is being to the timer.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L15-E1-3

OMRON

Weekly Time Switch

H5S

Weekly Time Switch for Various Time Controls

- A different program possible each day.
- Easy-to-program using the interactive menu system.
- Multiple-day operation, cyclic and pulse-output operation possible.
- ON/OFF operations can be set in 24 steps.
- Timing chart display for operation monitoring.
- Two circuits can be controlled independently.
- Supply voltage from 100 to 240 VAC.
- Surface, flush, or track mounting possible.

RC

Ordering Information

Wiring	Mounting style	Model
Screw terminals	Flush mounting	H5S-B
	Surface mounting/track mounting	H5S-FB

Specifications

■ Time Ranges

Rated time	Time setting range	Time division
1 week	00:00 a.m. to 11:59 p.m.	1 min

■ Ratings

Rated supply voltage	100 to 240 VAC (50/60 Hz), 24 VDC
Operating voltage range	85% to 110% of rated supply voltage (85 to 264 VAC (50/60 Hz))
Power consumption	Approx. 3 VA
Control outputs	SPST-NO x 2 circuits: 15 A at 250 VAC, resistive load

■ Characteristics

Accuracy of operating time	±0.01% ±0.05 s max. (see note)
Setting error	
Influence of voltage	
Influence of temperature	
Cyclic error	Monthly difference ±15 s (at 25°C) (±4 s/week, ±1 min/4 months)
Memory protection	5 years min. (at 25°C)
Insulation resistance	100 MΩ min. (between current-carrying terminals and non-current-carrying metal parts, between operation circuit and contact control output circuit, 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 and between operation circuit and contact control circuit) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Noise immunity	1,500 V (100 ns wide, for 1 μs, 1 ns rise time, ± polarity, and 0° to 360° phase. Square noise generated by noise simulator)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 294 m/s^2 (30G) Malfunction: 98 m/s^2 (10G)
Ambient temperature	Operating: −10°C to 55°C
Ambient humidity	Operating: 35% to 85%
Life expectancy	50,000 operations min. (15 A at 250 VAC, resistive load) 50,000 operations min. (1 HP at 250 VAC, motor load) 50,000 operations min. (10 A at 250 VAC, inductive load (cosϕ = 0.7)) 50,000 operations min. (100 W at 100 VAC, lamp load) 10,000 operations min. (300 W at 100 VAC, lamp load)
Approved standards	UL (File No. E52800), CSA (File No. LR22310, 10 A at 250 VAC (general use), 15 A at 125 VAC (resistive load))
Weight	Approx. 200 g

Note: The total error including the repeat accuracy, setting error, variation due to voltage change, and variation due to temperature change is ±0.01%±0.05 s max., ±0.01% indicates an error in the time interval of a set time.

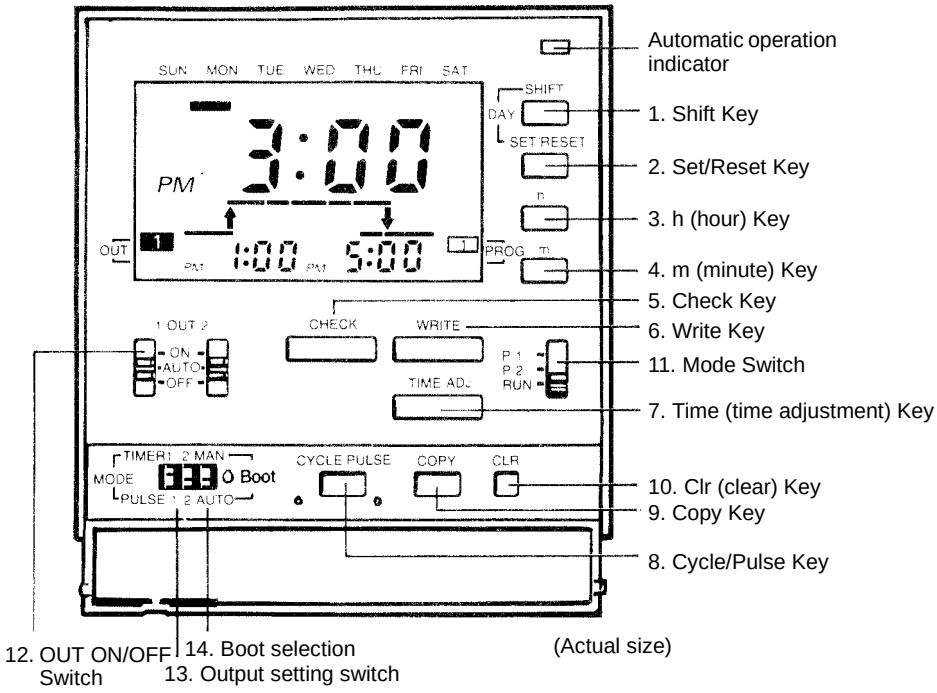
Operation

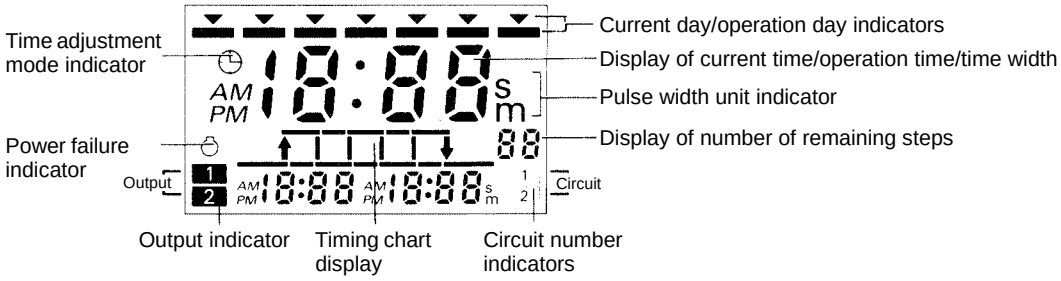
Operation method	Digital quartz
Operation	1. Weekly operation (multiple-day operation possible) 2. Cyclic operation 3. Pulse-output operation (Pulse width can be set in units of 1 s from 1 to 59 s and in units of 1 min from 1 to 60 min.) 4. Day override operation (Operation for one day can be also executed on any other day.) 5. Forced ON/OFF Operation 6. Manual or automatic operation selectable on recovery from power failure.
Display	Digital indication by LCD (character height: 10 mm) 1. Day, hrs (a.m., p.m.), minutes (0:00 to 11:59 a.m., 0:00 to 11:59 p.m.) 2. Digital display of operation schedule during operation 3. Timing chart display of operation schedule during operation
Number of circuits	2 independent circuits
Setting method	Key switch
Min. setting unit	1 min
Min. set interval	1 min
Number of steps that can be set	24 (total of 2 circuits) (see note)

Note: Normally, an ON/OFF operation is counted as two steps (i.e., ON + OFF operations), a cyclic operation as four steps, and a pulse operation as 1 step.

Nomenclature

Front Panel (With Cover Open)



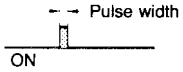
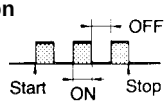
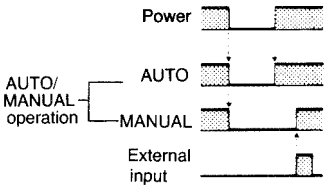


Key Operations

No.	Function
1	Shifts the cursor (B) specifying a day to the right.
2	Sets or cancels a specified day.
3, 4	Sets a time or ON/OFF time width.
5	Monitors the parameters set for an operation during an operation.
6	Sets parameters.
7	Sets a time adjustment mode.
8	Specifies a cyclic operation, or sets a pulse width.
9	Specifies a day substitution operation.
10	Cancels the parameters set for each circuit, or a day override operation.
11	P1: Circuit 1 setting mode P2: Circuit 2 setting mode RUN: RUN mode
12	ON: Turns on the output regardless of the setting. AUTO: Execute an operation as specified. OFF: Turns off the output regardless of the setting.
13	TIMER: Executes an ordinary timer or cyclic operation. PULSE: Executes a pulse output operation.
14	Specifies an operation to be performed after power recovery (AUTO/MANUAL).

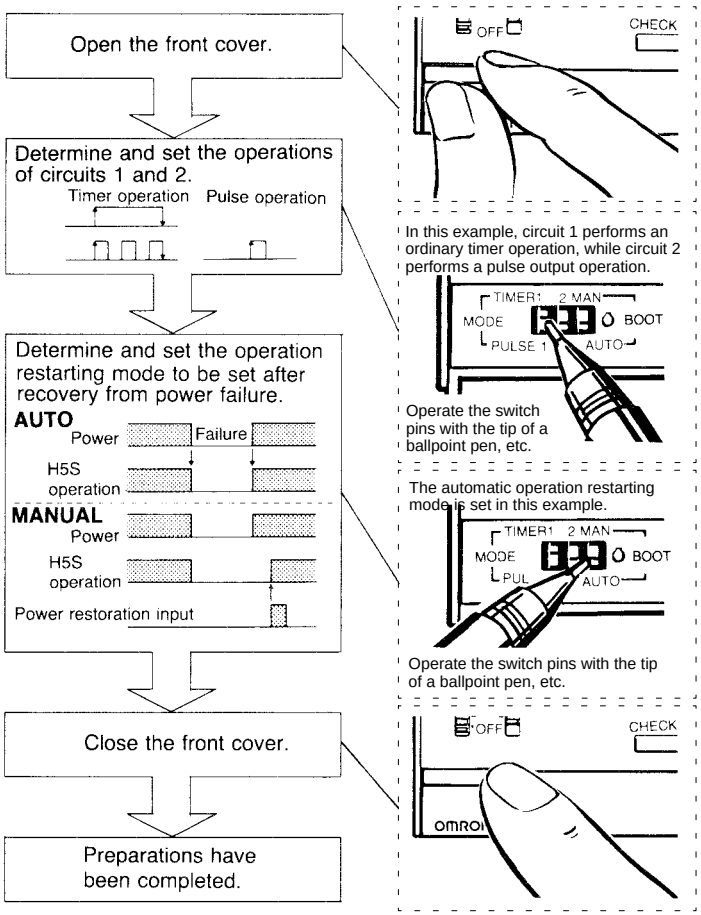
Operation

■ Operation Function

Timer operation 	Controls the output according to the set time of ON and OFF (the time can be set in units of 1 min)
Pulse-output operation 	Produces the output for a fixed duration at the set ON (pulse width: 1 to 59 s, or 1 to 59 min). The pulse width can be set in units of 1 s or 1 min. The pulse width can be set for each step.
Cyclic operation 	Repeatedly performs an ON/OFF operation during a specific period, which can be set in units of 1 min.
Forced ON/OFF operation	Forcibly turns ON/OFF the output by a side switch
Operation on power restoration 	AUTO: Operation is automatically started on power recovery MANUAL: Operation is started by applying an external signal after power recovery
Day override operation	Executes a day's operation on another day. (The specified new operation is performed only for one week.)

■ Programming

Before setting the parameters necessary for each operation, the operation of circuits (outputs) 1 and 2 must be determined. Also, whether the operation is restarted automatically or manually after power failure recovery should be specified.



Time Adjustment

Set the Mode Switch to RUN.

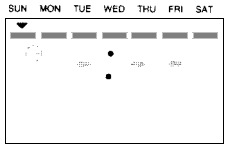
Example: Set Wed. 10:30 a.m.

Initial time adjustment after purchase

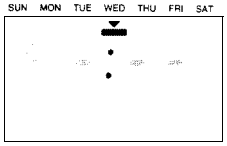
Display and key operation (Shaded portion indicates blinking of the indicator.)

1 Specify a day with the Shift and Set Keys.

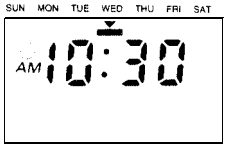
(Initial screen)



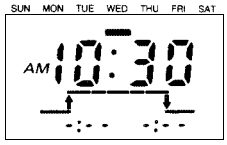
2 Set a time with the h and m Keys.



3 Press the Write Key to complete.



4

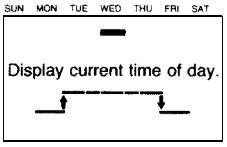


Time adjustment during operation

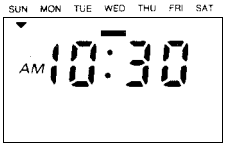
Display and key operation (Shaded portion indicates blinking of the indicator.)

1

(Initial screen)



2



Ordinary Timer Operation

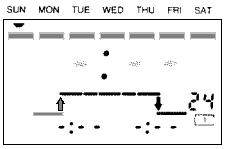
Set the Mode Switch to P1 (or P2).

Example: ON at 9:00 a.m. and OFF at 5:45 p.m. on Monday through Friday.

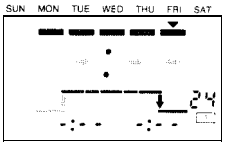
Display and key operation (Shaded portion indicates blinking of the indicator.)

1 Move the cursor (B) with the Shift Key. Press the Set Key so that of a desired day turns on. Select Monday through Friday.

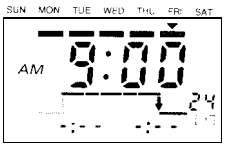
(Initial screen)



2 Set the time to 9:00 a.m. with the h and m Keys.

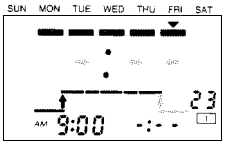


3 Press the Write Key.

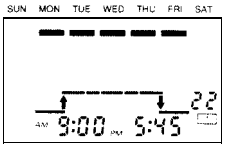


Display and key operation (Shaded portion indicates blinking of the indicator.)

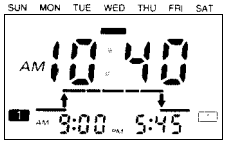
4 Set the time to 5:45 p.m. with the h and m Keys. Press the Write Key.



5 (The set times are displayed for 1 s and the display returns to the initial screen.)
Set the Mode Switch to RUN.



6 The current time is displayed along with the remaining portion of the currently scheduled operation or the time chart for the current operation. Flashing time displays on time charts indicate times for the following day.



Cyclic Operation

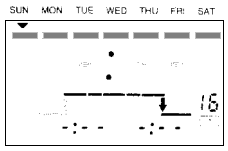
Set the Mode Switch to P1 (or P2).

Example: Start: 7:00 p.m. Friday, ON time: 15 min
Stop: 10:10 p.m. Friday, OFF time: 1 hour 10 min

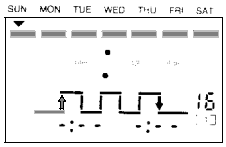
Display and key operation (Shaded portion indicates blinking of the indicator.)

1 Open the cover and press the Cycle Key.

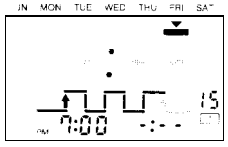
(Initial screen)



2 Specify Friday with the Shift and Set Keys. Set the time to 7:00 p.m. with the h and m Keys. Press the Write Key.

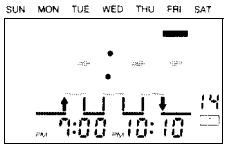


3 Set the time to 10:10 p.m. with the h and m Keys.
Press the Write Key.

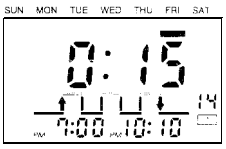


Display and key operation (Shaded portion indicates blinking of the indicator.)

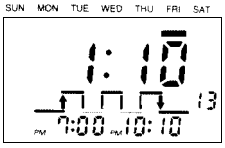
4 Depress the h key for a while Set the minute to 15 with m Key.



5 Press the Write Key. Set an OFF time of 1 hour 10 min with the h and m Keys.



6 Press the Write Key. (The display returns to the initial screen 1 s later.) The Mode Switch to RUN.



Multiple-day Operation

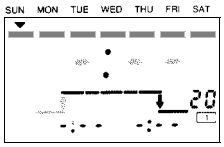
Set the Mode Switch to P1 (or P2).

Example: ON at 9:00 p.m. Monday and OFF at 3:15 a.m. Tuesday.

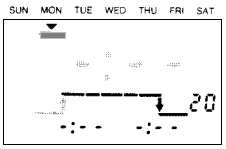
Display and key operation (Shaded portion indicates blinking of the indicator.)

1 Specify Monday with the Shift and Set Keys.

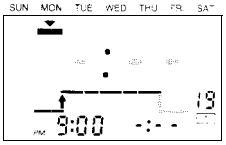
(Initial screen)



2 Set the time to 9:00 p.m. with the h and m Keys. Press the Write Key.

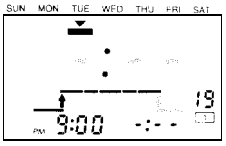


3 Press the Reset Key. Specify Tuesday with the Shift and Set Keys.

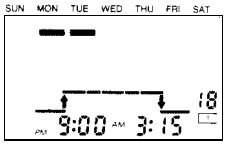


Display and key operation (Shaded portion indicates blinking of the indicator.)

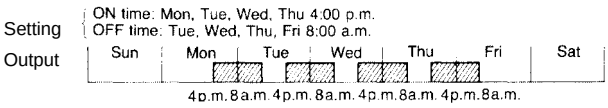
4 Set the time to 3:15 a.m. with the h and m Keys. Press the Write Key.



5 (Displayed for 1 s and then the initial display returns.) Set the Mode Switch to RUN (Lines for days other than the current day and the program time will flash.)



Note: To set the time switch to operate over several days, the operations can be programmed all at once by specifying the ON and OFF times.



Pulse Output Operation

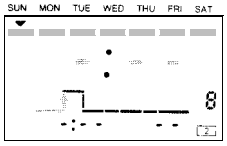
Set the Mode Switch to P1 (or P2).

Example: To produce output for 10 s at 9:00 a.m. and 0:15 p.m. Monday through Friday.

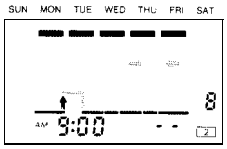
Display and key operation (Shaded portion indicates blinking of the indicator.)

1 Specify Monday, Tuesday, Wednesday, Thursday, and Friday with the Shift and Set Keys. Set the time to 9:00 a.m. with the h and m keys. Press the Write Key.

(Initial screen)

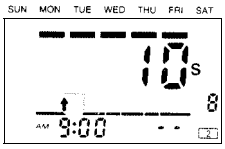


2 Set the pulse width to 10 s using the Pulse Key. (When this key is depressed, the display value is incremented rapidly.)

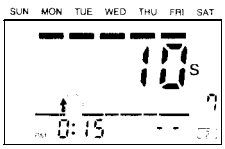


Display and key operation (Shaded portion indicates blinking of the indicator.)

3 Press the Write Key. (The display returns to the initial screen after a 1-second pause.) (In the same manner, set the time of 0:15 p.m. for Monday through Friday.)



4 Press the Write Key. (If the previously set pulse width can be used, press the Write Key only. The display returns to the initial screen after a 1-second pause.) Set the Mode Switch to RUN.



Checking the Setting in Operation Sequence

Set the Mode Switch to RUN.

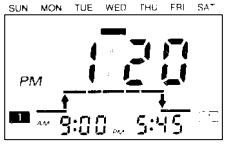
To check the operation of today.

Example: Wednesday

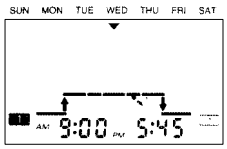
Display and key operation (Shaded portion indicates blinking of the indicator.)

1 Press the Check Key.

(Initial screen)



2 The first item of today's operation set for circuit 1 is displayed.



3 Afterward, each time the Check Key is pressed, all the operations set for circuit 1 are displayed followed by those for circuit 2. (If nothing is set for circuit 1, display starts with the operations set for circuit 2.)

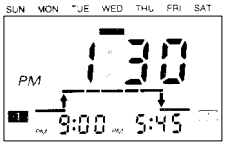
The output is not changed even when Check is pressed. The present value is displayed again when Check has been left untouched for 20 s or longer.

To check the operation of a day other than today.

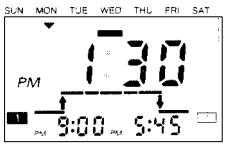
Example: To check Monday's operation on Wednesday

Display and key operation (Shaded portion indicates blinking of the indicator.)

1 Move the cursor to the Monday position using the Shift and Set Keys.



2 Press the Check Key. (The first item of the operations set for circuit 1 to be executed on Monday is displayed.)



3 Afterward, each time the Check Key is pressed, all Monday operations set for circuit 1 are displayed followed by those for circuit 2. (If nothing is set for circuit 1, display starts with the operations set for circuit 2.)

When the specified operation has been displayed for monitoring, the display returns to the initial screen.

Day Override

Set the Mode Switch to RUN.

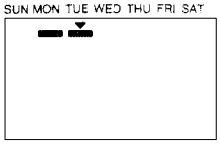
To override Saturday's operation for Monday and Tuesday on Friday.

Display and key operation (Shaded portion indicates blinking of the indicator.)

1 Depress the Copy Key for at least 1 s.

2 Specify Monday and Tuesday with the Shift and Set Keys.

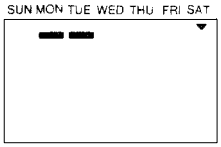
3 Press the Write Key.



Display and key operation (Shaded portion indicates blinking of the indicator.)

4 Specify Saturday with the Shift and Set Keys.

5 Press the Write Key. (The display returns to the initial screen.)



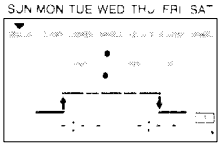
Canceling the Setting

To cancel the setting of each circuit.

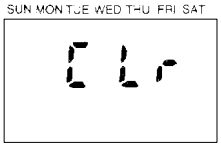
Display and key operation (Shaded portion indicates blinking of the indicator.)

1 Set the Mode Switch to the position of the circuit whose setting is to be canceled.

2 Press the CLR Key.



3 The message Clr is displayed for 1 s, then the display returns to the initial screen. (The setting for circuit 2 can be canceled in the same manner.)

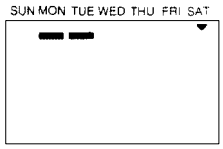


To cancel the day override program.

Display and key operation (Shaded portion indicates blinking of the indicator.)

1 Set the Mode Key to RUN. Depress the Copy Key for at least 1 s.

2 Press the Clr Key. (The display returns to the initial screen.)

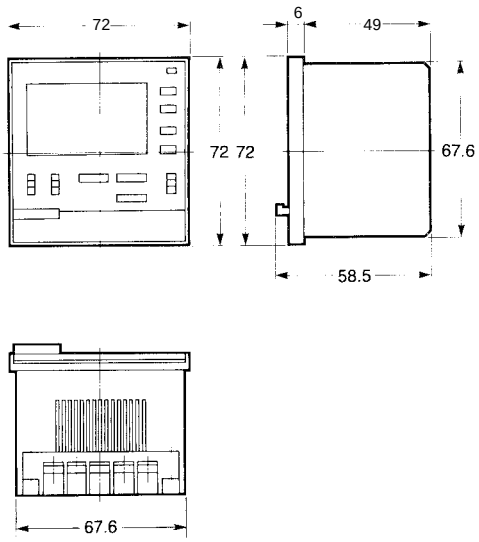


3 Press Copy for 1 s again. Set a new override.

Dimensions

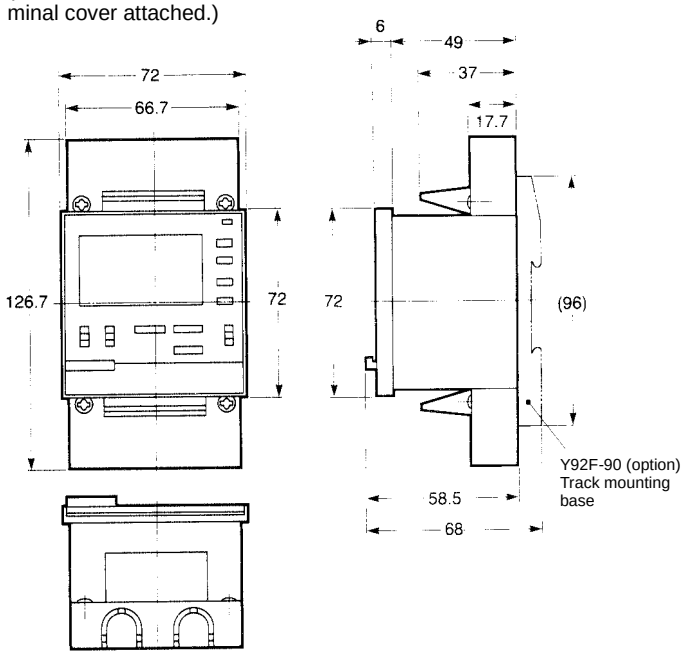
Note: All units are in millimeters unless otherwise indicated.

H5S-B (Flush Mounting Model)



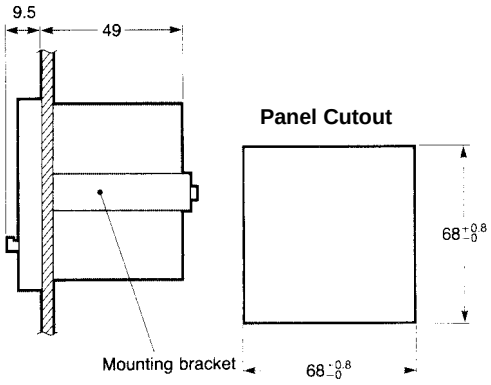
H5S-FB (Surface Mounting Model)

(The Unit is shown with the enclosed terminal cover attached.)



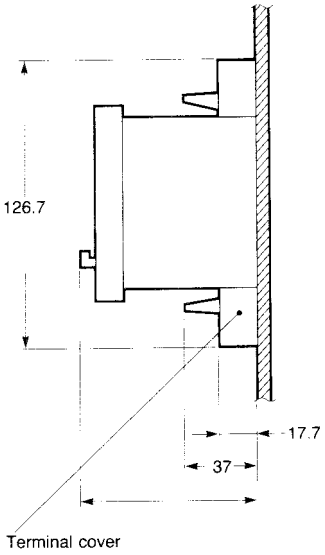
Mounting Dimensions

Flush Mounting (H5S-B)

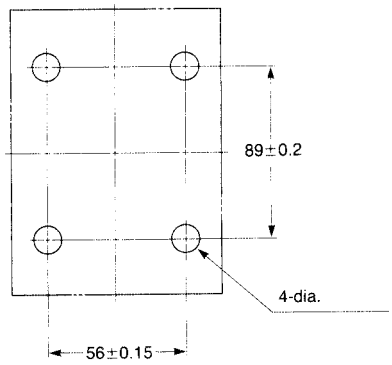


Note: Panel thickness: 1 to 5 mm

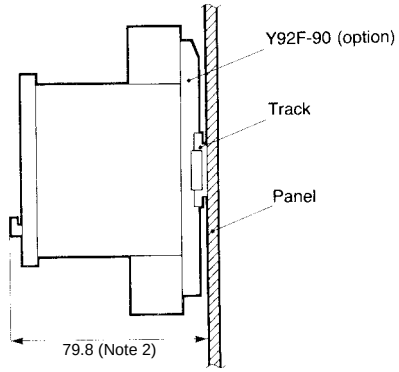
Surface Mounting (H5S-FB)



Mounting Holes



Track Mounting (H5S-FB with Y92F-90)



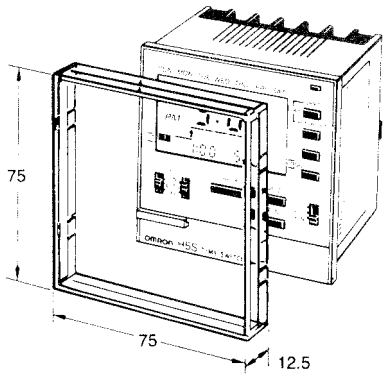
Note: 1. With mounting track PFP-100N or PFP-50N
2. With mounting track PFP-100N2

When mounting the time switch on a soft iron panel using the M4 tapping screws, the diameter of the mounting holes drilled into the panel vary according to the panel thickness, as follows. If the panel is die-cast, aluminum, the hole diameter should be slightly larger.

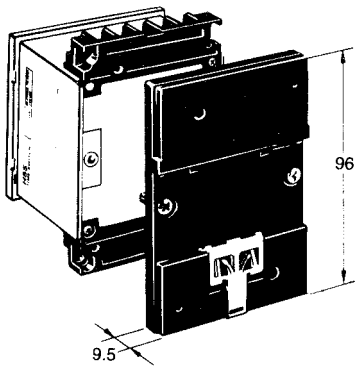
Panel thickness	0.8	1.0	1.2	1.6	2.0	2.6	3.2	4.0
Hole diameter	3.6			3.7				

■ Accessories (Order Separately)

Y92A-72C Protective Cover

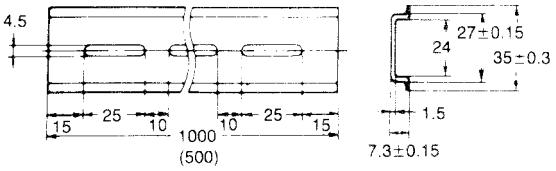


Y92F-90 Track Mounting Base



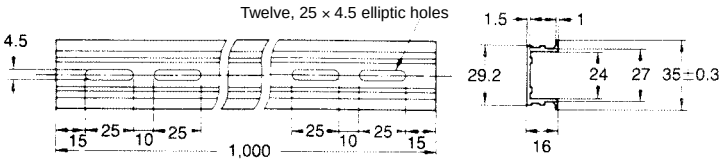
Mounting Track

PFP-100N/PFP-50N (Meets DIN EN 50022)



This dimension applies to the PFP-50N Mounting Track.

PFP-100N2 (Meets DIN EN 50022)

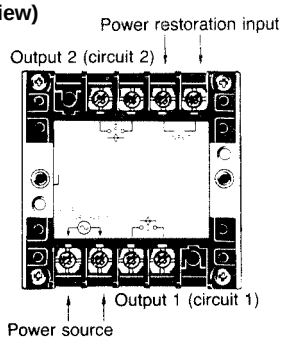


Installation

■ Terminal Arrangement

H5S-B Flush Mounting Models

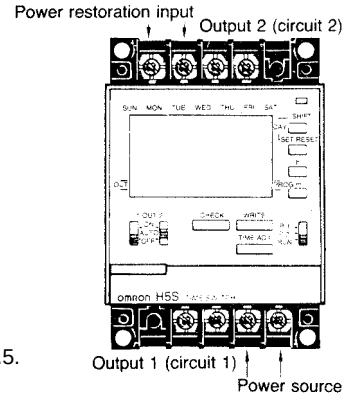
(Rear View)



Note: The terminal screws are M3.5.

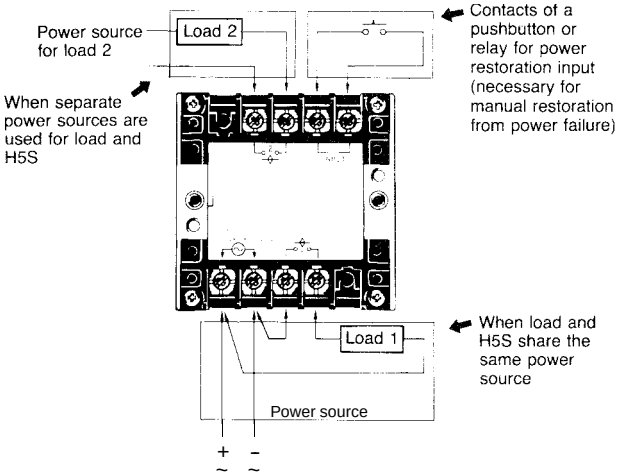
H5S-FB Surface Mounting Models

(Front View)

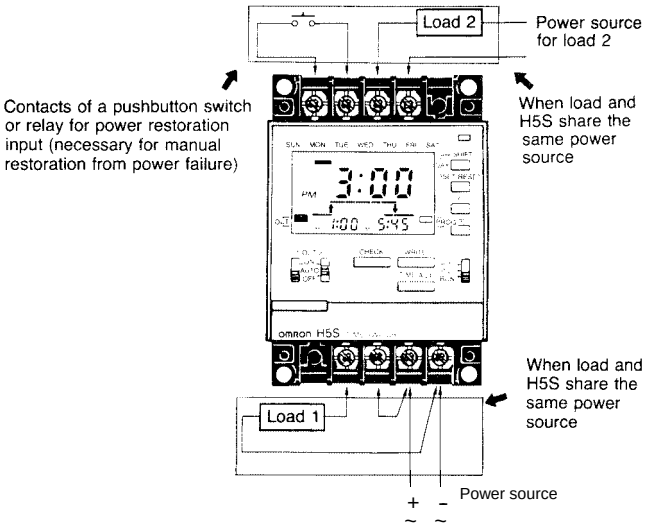


■ Connections

H5S-B Flush Mounting Models



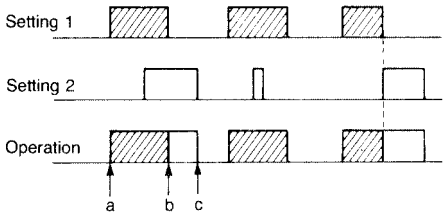
H5S-FB Surface Mounting Models



Precautions

Operation

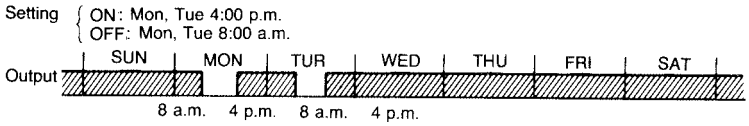
The earlier ON time setting takes precedence.



If both settings 1 and 2 are for an ON/OFF or pulse operation, the output is continuously produced without being interrupted. For example, if setting 1 is for cyclic operation, and 2 is set for an ON/OFF operation, the cyclic operation is performed during period of a to b, and the ON/OFF operation is performed from b to c.

Multiple-day Operation

If more than one day is specified and when the output is turned on, it is turned off on the day when the first OFF time is set.



If an ON and OFF have been set at the same time of the same day (such setting is possible), no operation is performed.

If the Mode Switch is set to the P1 (or P2) position, no output is produced. Therefore, after setting has been done, set the Mode Switch to the RUN position and confirm that the automatic operation indicator lights.

The set data may be erased if the OUT switch is moved between the TIMER and PULSE positions after the data has been set.

⚠ WARNING

The H5S has a built-in lithium battery. When disposing of old batteries, or of an entire timer containing lithium battery, be sure to do so properly. Lithium batteries may explode if incinerated, causing fire or severe burns. Also, do not touch the input terminals of any H5S Timer while power is being supplied to the timer.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L14-E1-4A

OMRON

Weekly Time Switch

H5L

Easy Programming with Large LCD Display and Interactive Functions

- Programming for 24 hrs x 7 days using just five switches.
- Sixteen program steps available.
- Power supply freely selectable from 100 to 240 VAC.
- 15 A control outputs from first and second circuits.
- Manual ON/OFF switching for control output without changing the program.
- Memory protection during power failure for up to 10 years.
- Cycle operation possible.
- Surface, flush, or track mounting.

RC+

Ordering Information

Wiring	Backup power supply function for memory protection	No. of program steps	Model
Screw terminals	Provided (approx. 10 years at 25°C)	16 in total of first and second circuits (Each ON or OFF is considered to be one step.)	H5L-A

Specifications

■ Time Ranges

Rated time	Time setting range	Time division
24 hrs x 7 days	00:00 to 23:59	1 min

■ Ratings

Rated supply voltage	100 to 240 VAC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	7 VA
Control outputs	15 A at 250 VAC, resistive load at 50°C 12 A at 250 VAC, resistive load at 55°C

■ Characteristics

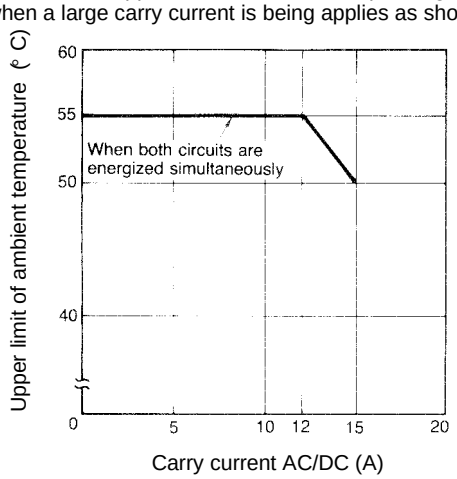
Accuracy of operating time	±0.01% ±0.05 s max. (see note 1)
Setting error	
Influence of voltage	
Influence of temperature	
Cyclic error	±15 s (at 25°C)
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying terminals and exposed non-current-carrying metal parts) 1,000 VAC, 50/60 Hz for 1 min (between control power supply circuit and contact control output circuits, between non-continuous contacts)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 300 m/s^2 (approx. 30G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: −10°C to 55°C
Ambient humidity	Operating: 35% to 85%
Life expectancy	100,000 operations min. (15 A at 250 VAC, resistive load)
Approved standards	UL (File No. E52800), CSA (File No. LR22310), SEV
Weight	Approx. 350 g

Note: The overall error, which includes repeat accuracy, setting error, and variations due to changes in voltage and temperature, is ±0.01% or ±0.05 s max..

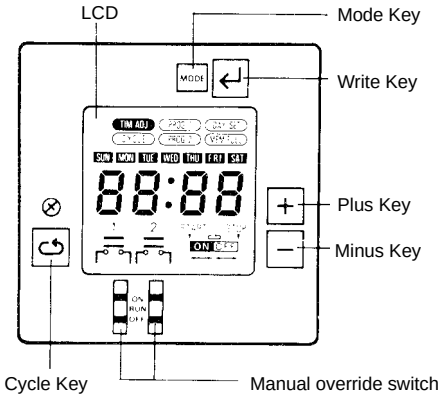
Engineering Data

Ambient Operating Temperature and Carry Current

Note that the upper limit of the ambient operating temperature lowers when a large carry current is being applies as shown below.



Nomenclature



Note: This figure shows the LCD section with all display items being displayed on the screen.

Key Operation

Key	Name	Function
MODE	Mode Key	Changes program mode RUN mode → Current time setting mode → First circuit operation setting mode → First weekday setting mode → Second circuit operation setting mode → Second circuit weekday setting mode → RUN mode
↵	Write Key	To write the set data using the Plus and/or Minus Key. Reads out the set program.
+	Plus Key	Changes “day of week” while setting day of week. Changes “hours” or “minutes” while setting current time. When the Plus Key is held down, the displayed digit increments continuously; when the Minus Key is held down, it decrements continuously. When specifying output. The Plus Key specifies output ON while the Minus Key specifies output OFF. Note that if the same key is pressed twice, the output specification becomes invalid; neither ON nor OFF is set.
−	Minus Key	
↺	Cycle Key	Specifies the cycle program. Pressing this key twice causes the set cycle program to be cleared.
ON RUN OFF	Manual override switch	ON: Turns ON output regardless of program RUN: Executes program OFF: Turns OFF output regardless of program First and second circuit can be operated independently.

Operation

■ Programming

The H5L Weekly Timer has the following six program modes. Use the Mode Key to change the modes. Use the Write Key, Plus Key, Minus Key, and Cycle Key for programming in each mode.

Mode Change Sequence **Programming Details**

Current time setting

To set the current time in the order of "day of week", "hour" and "minute".

1. Press the Mode Key for longer than 1 s to put the H5L in "TIM ADJ" mode.
2. Set "DAY OF WEEK" using the Plus and/or Minus Keys. Then press the Write Key to write the set weekday.
3. Set "hour" using the Plus and/or Minus Keys. Then press the Write Key to write the set hour.
4. Set "minute" using Plus and/or Minus Keys. Then press the Write Key to write the set minute.

First circuit operation setting

To specify first circuit operation in the order of "hour", "minute", and "output ON or OFF"

1. Press the Mode Key to put the H5L in "PROG 1" mode.
2. Set "hour" using the Plus and/or Minus Keys. Then press the Write Key to write the set hour.
   Set "minute" using the Plus and/or Minus Keys. Then press the Write Key to write the set minute.
3. Specify "ON" or "OFF" of output using the Plus or Minus Key and press the Write Key to write the set output specification.

In this manner, set ON time and OFF time as many times as necessary.

First circuit weekday setting

To set for each weekday whether the program for the first circuit set in the previous step is to be executed or not.

1. Press the Mode Key to put the H5L in "PROG 1" "DAY SET" mode.
2. Press the Plus Key to run the first circuit and press the Minus Key for it not to run.
3. Press the Write Key to change day of week.

Repeat steps 2 and 3 for Sunday to Saturday.

Second circuit operation setting

To specify second circuit operation in the order of "hour", "minute", and "output ON or OFF"

1. Press the Mode Key to put the H5L in "PROG 2" mode.
2. Proceed with the settings in the same manner as in the first circuit operation setting above.

Second circuit weekday setting

To set for each weekday whether the program for the second circuit set in the previous steps is to be executed or not.

1. Press the Mode Key to put the H5L in "PROG 2" "DAY SET" mode.
2. Proceed with the settings in the same manner as in the first circuit operation setting above.

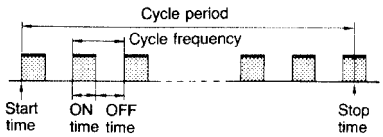
RUN

Run the H5L using the set program. In RUN mode, the current time and output status are displayed but the operation mode is not displayed. After starting the H5L, the colon between the "hour" and "minute" blinks to indicate that time count is in execution.

Note: The H5L operates in accordance with the program already set even while another program is being set. The output status display ($\overset{1}{\sqcap}$ $\overset{2}{\sqcap}$ etc.) during programming displays the setting being programmed. Therefore, note that the output status displayed on the LCD may not agree with the actual output status.

Cycle Program

In the H5L, the cycle program can be used to repeat ON and OFF of output for a certain period in a predeterminded cycle. A cycle program consists of the following four steps:
Start time, ON time, OFF time, Stop time



Setting A Cycle Program

Set the four steps of the cycle program in the following procedure.

Setting start time — Set the "hour" and "minute" of start time using the Plus and/or Minus Key.

Setting ON time — Set the ON time of the cycle frequency in the order of "hour" and "minute".

Setting OFF time — Set the OFF time of the cycle frequency in the order of "hour" and "minute".

Setting stop time — Set the stop time of the cycle program.

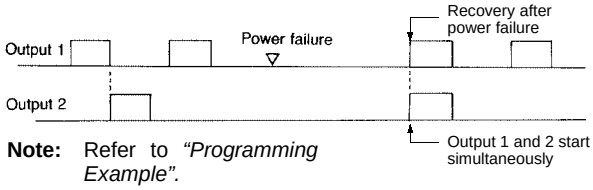
Normal program mode — On completing settings for the four steps, the H5L returns automatically to normal program mode.

Cautions on Using Cycle Programs

1. When the current time is included within the set cycle period, the cycle operation starts (output turns ON) on completing the cycle program setting (when stop time is written).
2. When any of the following occurs during a cycle period, the cycle operation restarts from output ON.

   Recovery after power failure
   Current time adjustment

   Change of start or stop time of the cycle program during operation. For this reason, if the cycle programs for the first and second circuits are set in such a manner that outputs 1 and 2 have a phase difference, note that the phase difference is changed when any of the abovementioned conditions occur as shown in the example below. (Therefore, it is recommended that cycle programs are used sequentially.)



Note: Refer to *"Programming Example".*

3. The cycle period (from start time to stop time) must not be a multiple of the cycle frequency (ON time plus OFF time). The cycle period can be set within a range of 1 min to 24 hrs.
4. ON time as well as OFF time can be set within a range of 1 min to 23 hrs 59 min.

Deleting Programming

1. **Deleting from Normal Operation Programs (ON Time/ OFF Time)**

   Call up the output display for the program to be deleted by pressing the Write Key. The minus sign (–) for the output point will flash.
   Next, change the display to disable the output using the Plus and Minus Keys. For NC contacts, press the Plus Key and for NO contacts, press the Minus Key. The connecting bar above the contacts will disappear and the display will flash to indicate that the output has been displayed. If the Write Key is pressed at this time, the step will be deleted.

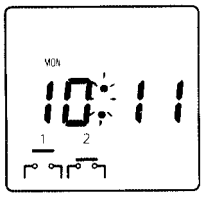
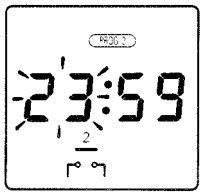
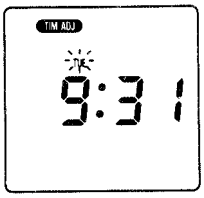
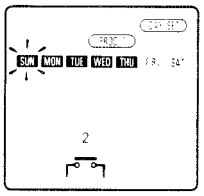
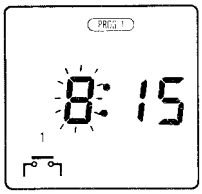
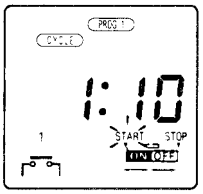
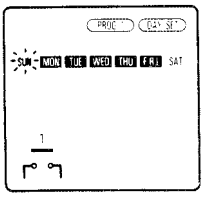
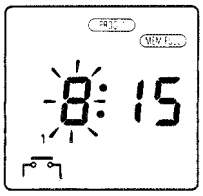
2. **Deleting from Cyclic Programs**

   Four steps will be simultaneously deleted from the cyclic program if the program is called up and then the Cycle and Write Keys are pressed in order. The start time display will remain, but the program will be deleted.

■ LCD Display

LCD Display (Display Example in Each Mode)

Since the H5L employs interactive programming, the program mode and setting data are displayed on the LCD.

Display	Mode	Display data	Display	Mode	Display data
	RUN	Current day of week: Monday Current time: 10:11 First circuit: OFF Second circuit: ON		Second operation time setting	The second circuit turns ON Sunday to Thursday (operation by the set program is executed). It turns OFF on Friday and Saturday (operation by the set program stops).
	Current time setting	Current day of week: Tuesday Current time: 9:31		Second Weekday setting	The second circuit turns ON Sunday to Thursday (operation by the set program is executed). It turns OFF on Friday and Saturday (operation by the set program stops).
	First operation time setting	The first circuit turns on at 8:15		Cycle Program setting	The first circuit starts cycle operation at 1:10 (for details, refer to Cycle Program).
	First weekday setting	The first circuit turns OFF on Sunday and Saturday (operation by the set program stops). It turns ON Monday to Friday (operation by the set program is executed).		Memory over	Indicates that all 16 program steps have been written (on writing the 16th step, the data set for the first step is displayed on the LCD).

Note: Meaning of output status indications

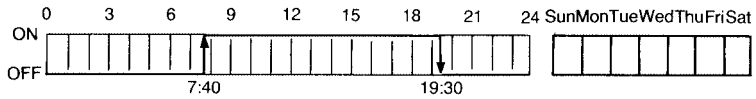
:Output ON, ⌐¬; Output OFF, ⌐ ¬: Invalid (if an invalid instruction is written to a step, that step will be cleared.)

■ Programming Example

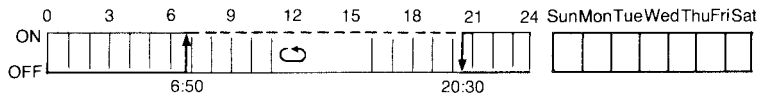
Be sure to create a timing chart before programming.

Operating Timing Chart

First Circuit



Second Circuit



Example

ON and OFF Programs
Cyclic Programs

In this example, the first circuit is programmed to turn ON at 7:40 and OFF at 19:30. This circuit is operated from Monday through Friday and stopped on Saturday and Sunday.
The second circuit is cyclically operated with each parameter set as follows:
Start time: 6:50
ON time: 5 min
OFF time: 20 min
Stop time: 20:30
The second circuit is stopped from operating on Sunday and operated from Monday through Saturday. The current time is assumed to be 11:15 a.m. on Tuesday.

Writing Program

Even while being programmed, the timer generates output according to the previous program. If you don't want an unexpected operation of output relay, turn on (or off) the manual switch.
In the figure, the indicators and digits shown in are blinking.

1. Setting Current Time

To set the current time, "day of the week", "hour", and "minute" must be specified.
First, turn on the power to the H5L.
The contents of the memory are cleared on power-up and the TIM ADJ indicator is displayed as shown on the left.
As an example, set the time to 11:15 on Tuesday.

Start by setting the day of the week. The blinking indicator indicates the parameter that can be set.
Set the current day of the week to Tuesday by pressing the Plus or Minus Key.

When "TUE" is displayed, press the Write Key to store the current day of the week in memory. The "hour" indicator will begin to flash and the "day of the week" indicator will stop flashing.

Set the current hour to 11 by pressing the Plus or Minus Key, followed by the Write Key.

At this time, the "minute" indicator will blink. Set the current minute to 15 by pressing the Plus or Minus Key, followed by the Write Key.

This completes the current time setting.

2. First Circuit Operation Setting

To program the operation of the first circuit, “hour”, “minute”, and “output” must be specified.

Press the Mode Key to place the H5L into PROG 1 mode. The display will be as shown on the left.

Since the first circuit is to be turned ON at 7:40, set the “hour” to 7 by pressing the Plus or Minus Key and then store it in memory by using the Write Key.

The “minute” will start blinking. Set it to 40 by using the Plus or Minus Key and store it in memory by pressing the Write Key.

Now, the output status indicator will blink. Set the output to the ON state with the Plus Key followed by the Write Key.
(If the Plus Key is pressed twice at this time, the display will give an invalid indication, and if the Write Key is pressed, this program will be deleted.)

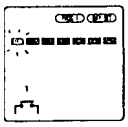
The display returns to the initial state as shown on the left and waits for the next program command to be input.

Since the first circuit should be turned OFF at 19:30, set the hour to 19 and the minute to 30 by using the Plus or Minus Key and then the Write Key.

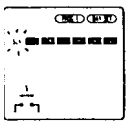
The output status indicator starts blinking. Set the output to the OFF state using the Minus Key and store it in memory by pressing the Write Key.

The display returns to the initial state and waits for the next program command to be input. Now let us turn to the setting of the “day of the week”.

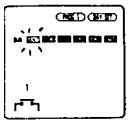
3. Fist Circuit Day-of-the-week Setting



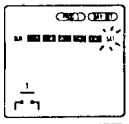
By pressing the Mode Key, place the H5L into DAY SET mode.
The display will be as shown on the left.
Press the Plus Key to operate the first circuit on a particular day of the week and press the Minus Key to stop it. The reverse video (i.e., white characters on a black background) of the day-of-the-week indicators means that the first circuit is operated on that day. The day on which circuit operation is stopped is indicated by bold indicators. Initially, the circuit is set to operates on all the days of the week and the SUN indicator blinks.



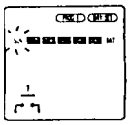
In this example, since circuit operation is to be stopped on Sunday, select SUN and press the Minus Key, then store the setting in memory by pressing the Write Key.



The MON indicator will start blinking. Press the Write Key, until the SAT indicator blinks.



Since the first circuit is not to be operated on Saturday, press the Minus Key followed by the Write Key.



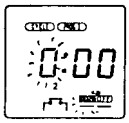
The SUN indicator will start blinking again. This completes the setting of all the days of the week for the first circuit.

4. Second Circuit Operation Setting

Press the Mode Key to place the H5L into PROG 2 mode. The display appears as shown on the left.

In this example, as the second circuit is to be cyclically operated, specify the cycle program by pressing the Cycle Key.

Select the start time by setting the hour to 6 and the minute to 50 using pressing the Plus or Minus Key. Write each set value by pressing the Write Key.

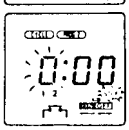


The timer will now wait for you to set the ON time (5 min in this example).

Press the Write Key to select 0 hrs, then use the Plus or Minus Keys followed by the Write Key to select 5 min.

The timer will now wait for the OFF time to be set (20 min in this example).

Press the Write Key to select 0 hrs, then use the Plus or Minus Keys followed by the Write Key to select 20 min.

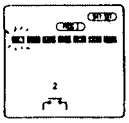


The timer will now wait for the cyclic circuit operation stop time to be set (20:30 in this example).

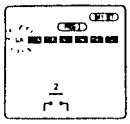
Set the hour to 20 using the Plus or Minus Keys, then press the Write Key. Set the minutes to 30 and press the Write Key again.

The programming of the cyclic operation is now complete. The timer will wait for input of a new program as shown. We will now have to set the day of the week for the second circuit.

5. Second Circuit Day-of-the Week Setting



Press the Mode Key to place the H5L into PROG 2, DAY WET mode. Initially, all days of the week are selected (shown by reverse video) and the SUN indicator will be flashing.



In our example, the second circuit is to be operated on all days except Sunday. To inhibit Sunday operation, press the Minus Key while the SUN indicator is flashing. The circuit will now be operated only from Monday to Saturday.

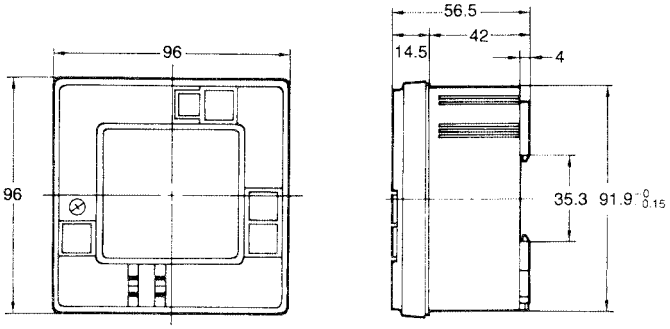
All of the parameters have now been programmed for this example. Press the Mode Key to place the timer into RUN mode. The display will be as shown (assuming five minutes have elapsed while programming). The output status indicators indicate the status of each of the circuit.

Note: Set manual override switches 1 and 2 to RUN.

Dimensions

Note: All units are in millimeters unless otherwise indicated.

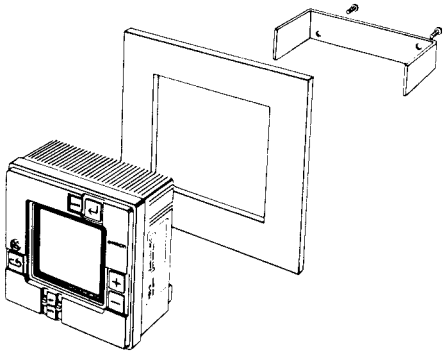
H5L-A



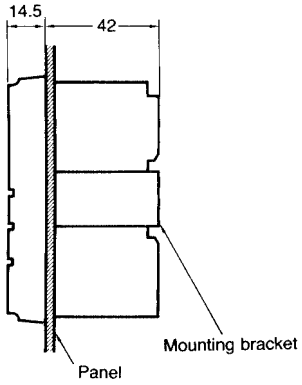
Mounting Dimensions

Flush Mounting

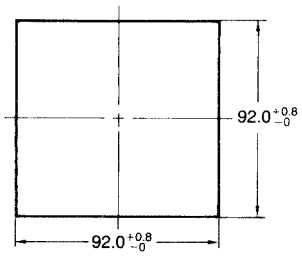
Use a U-shaped mounting bracket to flush mount the unit.



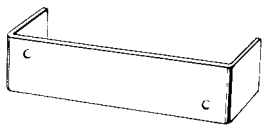
Dimensions



Panel Cutout

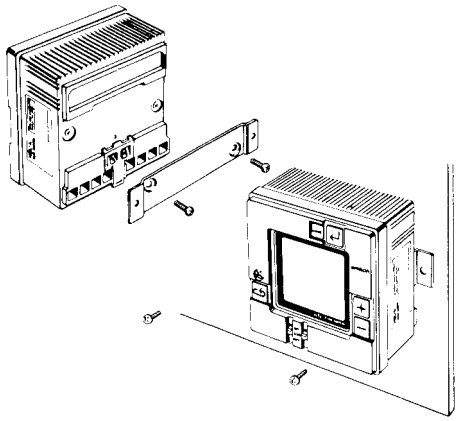


Mounting Bracket (Included)

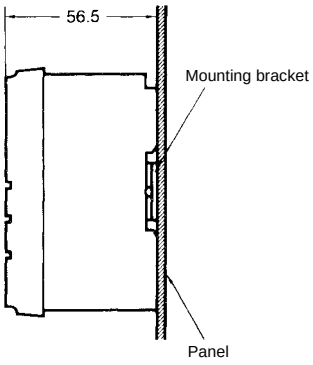


Surface Mounting

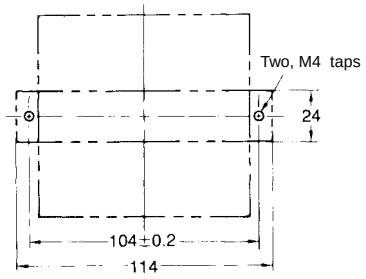
Use a straight mounting bracket to surface mount the unit.



Dimensions



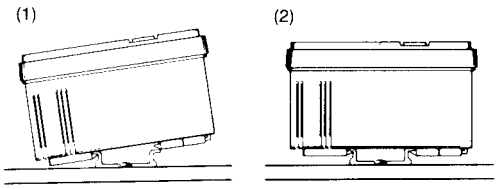
Panel Cutout



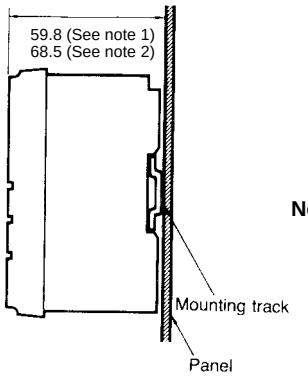
Mounting Bracket (Included)

Track Mounting

Hook the upper part on the rear surface to the upper edge of the mounting track and press the unit down.



Dimensions

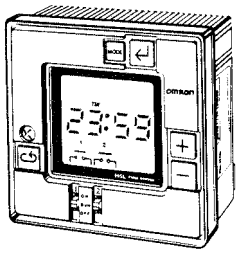


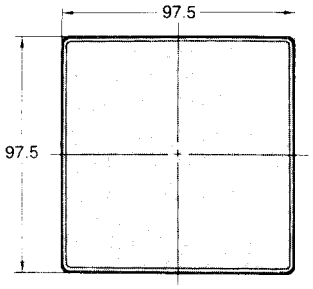
Note:
1. When using mounting track PFP-100N or PFP-50N.
2. When using mounting track PFP-100N2.

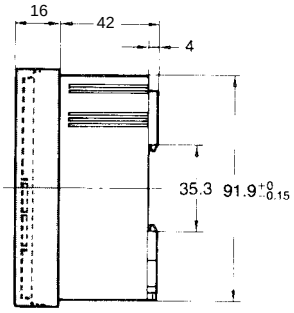
■ Accessories (Order Separately)

Front Cover

Y92A-96A

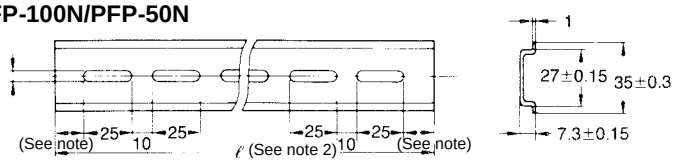




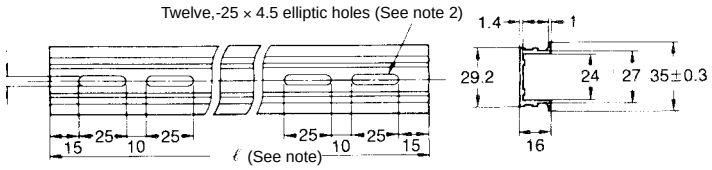


Mounting Track (Meets DIN EN 50022)

PFP-100N/PFP-50N



PFP-100N2



Note:
1. This dimension is 15 mm on both ends in the case of the PFP-100N but on one end in the case of the PFP-50N.
2. The length l of each mounting track is shown in this table.
3. A total of twelve 25 x 4.5 elliptic holes are provided, with six holes cut from each end of the track at a pitch of 10 mm between holes.

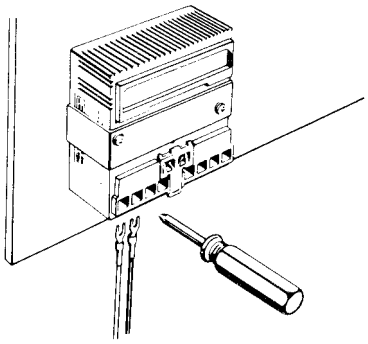
PFP-100N	1 m
PFP-50N	50 cm
PFP-100N2	1 m

Installation

■ Wiring

Wiring From the Rear

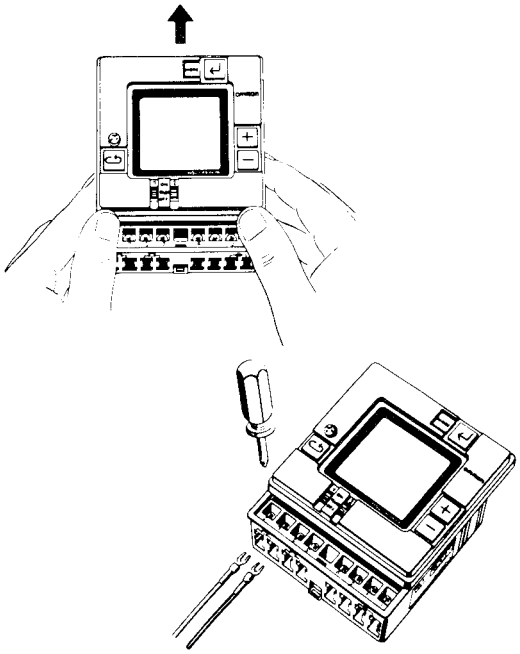
Perform wiring from the rear of the unit when the unit is flush mounted.



Wiring From the Front

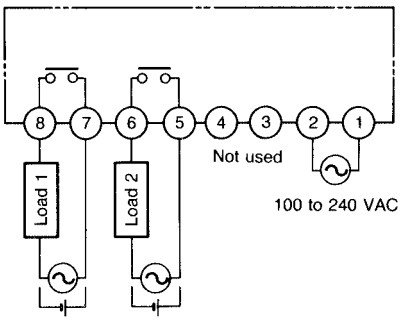
Perform wiring from the front of the unit when the unit is track or surface mounted.

1. Loosen the screw on the left side of the front.
2. Slide the upper part of the unit approx. 15 mm upward.
3. After the terminals appear, perform wiring.
4. Return the upper part of the unit to the original position and tighten the screw.



■ Connections

Connect the power supply between terminals A and B, the load for the first circuit between terminals G and H, and the load for the second circuit between terminals E and F. Terminals C and D are no connects.



Note: To each load, connect the power supply for load.

Precautions

Backup Power Supply for Memory Protection during Power Failure

The Model H5L Time Switch has a built-in battery. This backup power supply allows continuous operation of the internal timer circuit during a power failure. If the duration of a power failure or service interruption is within the life-time of the backup battery, no time adjustment is required for the timer. Note that during a power failure, the output contacts are in the OFF state and the display is dark. The backup battery has a life-time of 10 years assuming normal usage.

Please do not burn or puncture the lithium battery included with this product, since it poses a health hazard.

Others

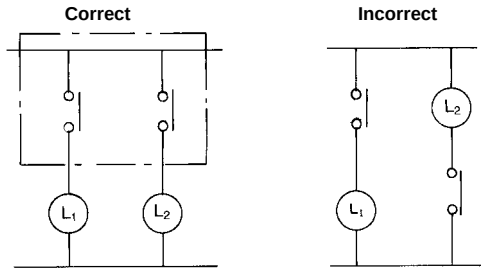
The load current of the control output should be within the ratings specified in the connection diagram. If these ratings are exceeded, the contact service life will be reduced significantly.
When doing impulse voltage or insulation resistance tests with the time switch mounted on a board, remove the time switch body to isolate the time switch circuit. This will prevent degradation or damage to the internal circuitry of the time switch.

When using the timer switch under noisy condition, isolate the time switch from any noise sources or high power lines.

Avoid the following conditions:
Corrosive gases.
Constant vibrations or large shocks.
Water or oil spray.
Dust.
Direct sunlight.
Organic solvents (thinner or benzine), strong acids or bases.

If operating conditions exceed the above values, be sure to connect a surge absorber. When switching inductive loads, counterelectromotive force is generated. When using the H5L as a switch contactor or for similar functions, connect a surge absorber to prevent malfunctions or damage to the timer.

Perform wiring so that the potential across the output contacts is the same. This prevents short circuiting of the contacts as shown below.



The optional cover (Y92A-96A) is recommended for dusty conditions.

Do not take the case off the body.
When using the time switch in conditions subject to static electricity, (caused by transportation of molding materials and liquid materials with pipes), isolate the time switch from the source of the static electricity.

The storage temperature range for the time switch is −25°C to 65°C. If the time switch is stored at temperatures below −10°C leave if more than 3 hours at the room temperature and then apply the power.

⚠ WARNING

Fire, Explosion, and Severe Burn Hazard

The H5L has a built-in lithium battery. Be sure to dispose of the old H5L properly, as lithium batteries are likely to explode if incinerated.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L31-E1-6

OMRON

24-hour/Weekly Time Switch | H2F

Up to 96 ON/OFF Cycles from DIN-sized (72 x 72 mm) Timer

- Easy setting with color-coded programming tabs.
- Choose 24-hour or 1-week models with either SPST-NO or SPDT control outputs.
- Minute dial assures accurate settings.
- Models with memory protection available.
- Control outputs can be manually turned ON/OFF.
- Designed for surface, flush, or track mounting.

RC

Ordering Information

Mounting method	Control output	24-hour operation		1-week operation
		Synchronous motor	Quartz motor (with memory protection)	Quartz motor (with memory protection)
Flush	SPST-NO	H2F-D	H2F-DM	H2F-WM
	SPDT	H2F-DC	H2F-DMC	H2F-WMC
Surface/track	SPST-NO	H2F-DF	H2F-DMF	H2F-WMF
	SPDT	H2F-DFC	H2F-DMFC	H2F-WMFC

■ Accessories (Order Separately)

Extra programming tabs	**1 pair for each ON/OFF**	Y92S-21

Note: 24-hour type is supplied with three pairs of programming tabs.
1-week type is supplied with seven pairs of programming tabs.

Specifications

■ Time Ranges

Operation period	Minimum division	Minimum set time	Maximum set time
24-hour	15 min	15 min	23 hrs 45 min
1-week	1 hr	2 hrs	166 hrs

■ On/OFF Cycle

Operation period	24-hour	1-week
Maximum cycles	96	84

■ Ratings

Rated supply voltage	Synchronous motor: 100/110/120 VAC, 200/220/240 VAC (50/60 Hz) (see note) Quartz motor: 100 to 240 VAC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	Synchronous motor: 3 VA max. Quartz motor: 1 VA max. at 100 to 120 VAC, 4 VA max. at 200 to 240 VAC
Control outputs	15 A at 250 VAC, resistive load, SPST-NO, SPDT

Note: Refer to *"Precautions"*.

■ Characteristics

Item	24-hour operation		1-week operation
	Synchronous motor	Quartz motor	
Accuracy of operating time (see note 1)	±3 min max.		±30 min max.
Influence of voltage			±30 min max.
Influence of temperature			±30 min max.
Setting error (see note 2)	±3 min max.		±30 min max.
Cyclic error	±3 min max.		±30 min max.
Memory protection against power failure	---	180 hrs min. (see note 3)	
Insulation resistance	100 MΩ min. (at 500 VDC)		
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying terminals and non-current-carrying metal parts) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)		
Vibration resistance	Destruction: 16.7 Hz, 4-mm double amplitude Malfunction: 10 to 55 Hz, 0.5-mm double amplitude		
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 200 m/s^2 (approx. 20G)		
Ambient temperature	Operating: −10°C to 55°C		
Ambient humidity	Operating: 35% to 85%		
Life expectancy	2 years min. (approx. 10,000 operations min.)		
Approved standards	UL (File No. E52800), CSA (File No. LR22310)		
Weight	Flush mounting: approx. 150 g Surface mounting: approx. 200 g		

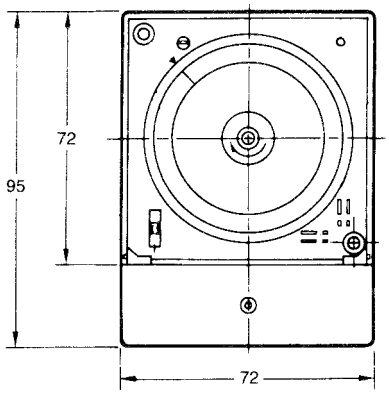
Note: 1. Accuracy of operating time of when the timer is ON or when the timer is OFF.
2. Difference between the set and actual operation time with the pointer set to the present time.
3. When the timer is used for the first time after energization of 72 hrs.

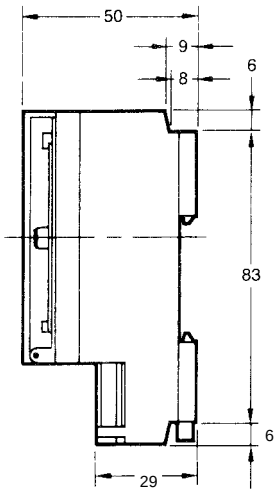
Dimensions

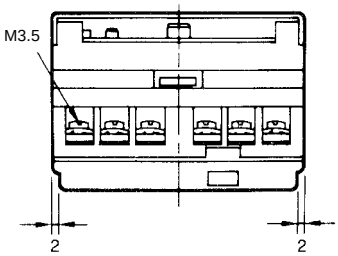
Note: All units are in millimeters unless otherwise indicated.

Mounting Dimensions

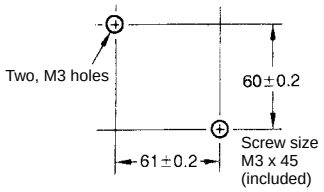
Surface Mounting: H2F-DF/-DMF/-WMF
Track Mounting: H2F-DFC/-DMFC/-WMFC



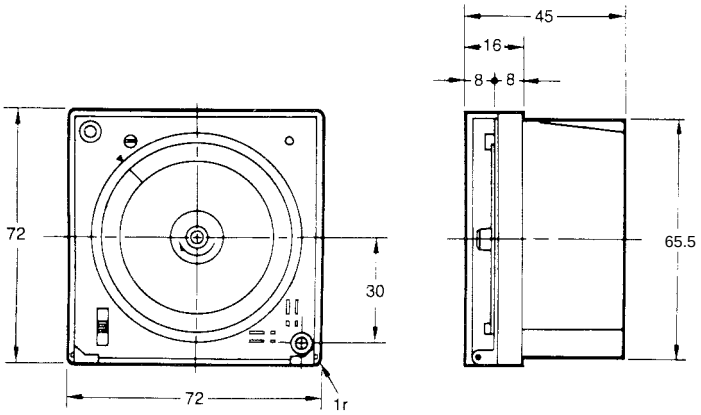




Mounting Holes

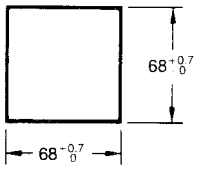


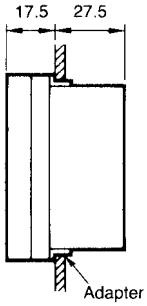
Flush Mounting: H2F-D/-DM/-WM/-DC/-DMC/-WMC

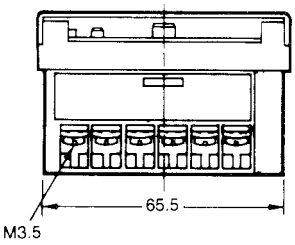


Panel Cutout

Recommended panel thickness: 3.2 mm







Note: The mounting adapter and screws are included.

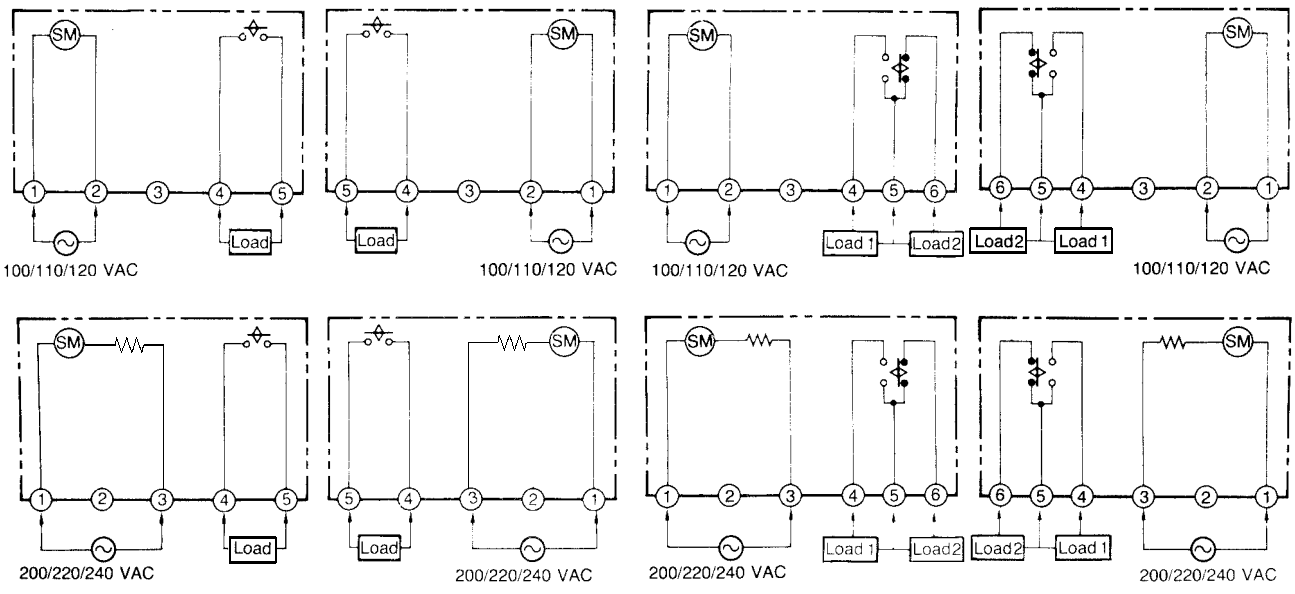
Installation

■ Connections

Synchronous Motor Model

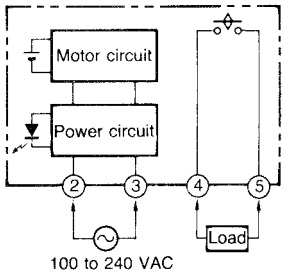
(SPST-NO Output) **(SPDT Output)**

H2F-D **H2F-DF** **H2F-DC** **H2F-DFC**

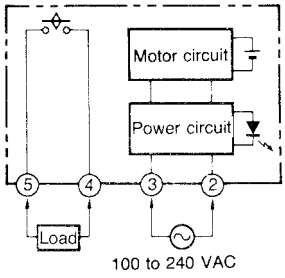


Quartz Motor Model
(SPST-NO Output)

H2F-DM/H2F-WM

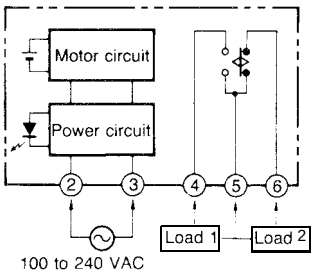


H2F-DMF/H2F-WMF

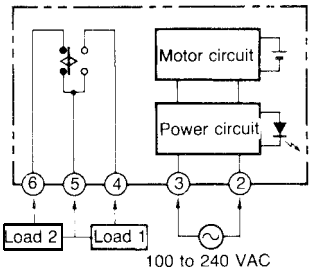


(SPDT Output)

H2F-DMC/WMC



H2F-DMFC/WMFC

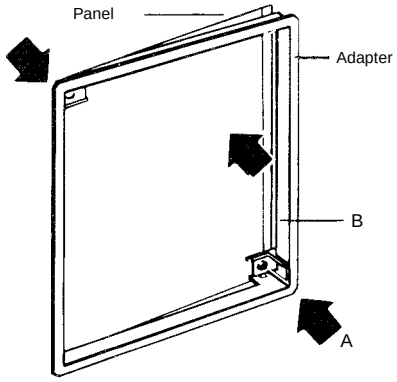


Note: Connect an independent power source to the load.

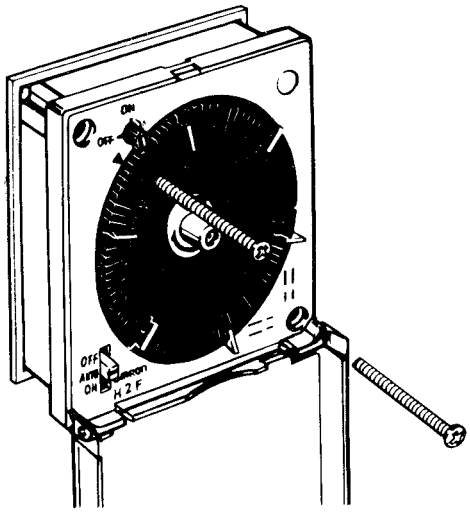
Precautions

Flush Mounting

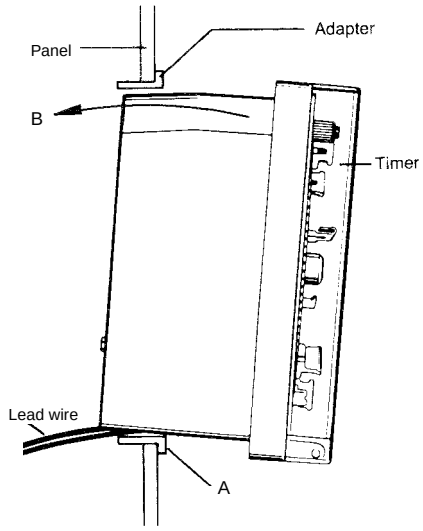
1. To mount the adapter to the panel cutout, first deform the adapter by pushing it on the two opposing corners (as indicated by arrows A. Then push part B into the cutout (i.e., toward the back of the panel).



2. After the adapter is mounted, insert the timer as shown in the figure below. Secure the timer by tightening the two mounting screws (M3 x 16) included as accessories.



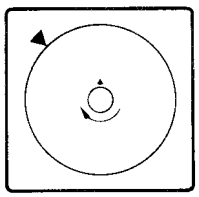
3. If the lead wires have been connected to the timer from the front of the panel before the timer is mounted in the panel, engage the timer to part A of the adapter and push it in the direction of B. Then tighten the two screws as described in 2.



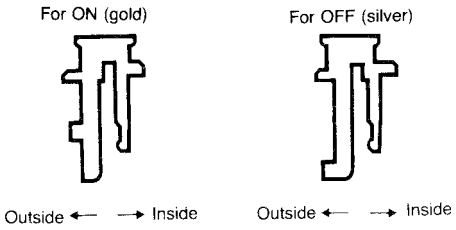
Time Setting

To set the time, turn the center knob clockwise to the correct time. Turning it counterclockwise or turning it with your fingers hooked on the setting bracket may cause a malfunction.

Set the hour to the arrow on the upper left corner of the front panel and the minute, to the arrow on the center knob.



Use the gold setting tabs to set the ON time and the silver ones to set the OFF time. Position the thick leg of the tab toward the outside of the dial and insert the tab securely into the groove on the dial.



Three pairs pairs of setting tabs are attached.
Store the spare tabs in the compartment at the lower right corner of the front panel.

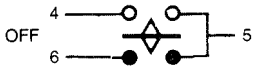
Manual Switch

SPST-NO Output

A 3-position selector switch, located at the lower left corner of the front panel, determines output operation. In the OFF position, the control output is forcibly turned OFF regardless of the setting of the programming tabs. Set to the AUTO position, the output is turned ON and OFF according to the settings of the programing tabs. In the ON position, the output is forcibly turned ON regardless of the setting of the programming tabs.

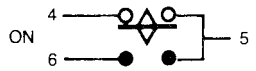
SPDT Output

When the manual switch at the lower left corner of the front is set to the OFF position, both load 1 (connected across terminals 4 and 5) and load 2 (across 5 and 6) are turned OFF.



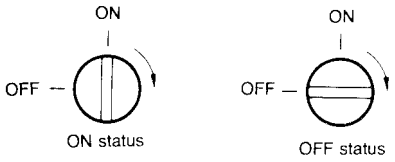
When it is set to the AUTO position, the output is turned ON and OFF according to the setting of the programming tabs.

When the manual switch is set to the ON position, load 1 (connected across terminals 4 and 5) is turned ON and load 2 (across 5 and 6) is turned OFF.



Output Indicator

The output indicator at the upper left corner of the front panel shows the status of the output when the manual switch is set to the AUTO position.



In addition, the output can be manually turned ON or OFF by rotating the knob clockwise (in the arrow direction). The knob will not turn counterclockwise.

Note on H2F-D, -DF series (synchronous motor versions)

Before using the timer, select the appropriate frequency of your area by the frequency selector switch provided on the upper part of the rear panel.

Upper part of rear panel
(cycles per second)

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L13-E1-3

OMRON

24-hour Time Switch

H2E

ON/OFF Operation in Units of 15 Minutes

- The only requirement for time setting is the plugging of a setting pin into the desired hole on the dial.
- Permits manual ON/OFF operation independent of the set time.
- A power indicator lamp is provided, which permits monitoring even during the night.

Ordering Information

Classification	Control output	One cycle time	Min. setting time	Mounting method	Model
Standard type	SPST-NO	24 hrs	15 min	Surface mounting	H2E
				Flush mounting	H2E-Y
Dual-circuit type	DPST-NO		30 min	Surface mounting	H2E-2
				Flush mounting	H2E-Y2

Note: 1. Specify both the model number and supply voltage when ordering. All H2E-series Timers are supplied with two pairs of setting pins (one pair for each ON operation and OFF operation) as the standard accessories. If more setting pins are required, also specify the required number of setting pins.

2. For the flush mounting types, a mounting bracket is supplied.

3. Repetitive operations can be performed in a cycle of 24 hrs.

Specifications

■ Time Ranges

Item	H2E, H2E-Y	H2E-2, H2E-Y2
Type	Daily	
Operation period	24-hour	
Minimum division	15 min	
Minimum set time	15 min	30 min
Maximum set time	23 hrs 45 min	24 hrs

■ Ratings

Rated supply voltage	100/110 or 200/220 VAC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	Approx. 2 VA
Control outputs	15 A at 250 VAC, resistive load ($\cos\phi = 1$) (max. operating voltage: 250 VAC)

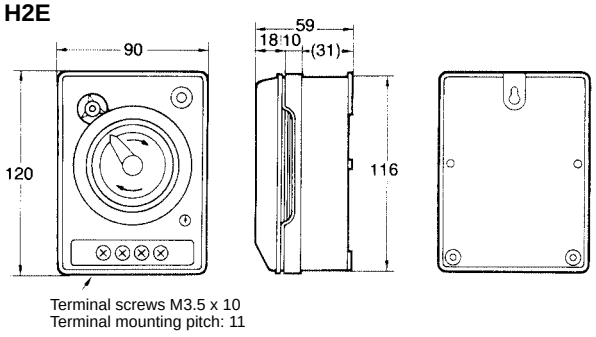
■ Characteristics

Accuracy of operating time	±5 min max.
Influence of voltage	
Influence of temperature	
Setting error	±5 min max.
Cycle time	±5 min max.
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts and between contact and control circuit) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 16.7 Hz, 4-mm double amplitude Malfunction: 10 to 55 Hz, 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 200 m/s^2 (approx. 20G)
Ambient temperature	Operating: −10°C to 55°C
Ambient humidity	Operating: 45% to 85%
Life expectancy	2 years min. (10,000 contact operations min.)
Weight	H2E(-Y): approx. 315 g H2E-(Y)2: approx. 360 g

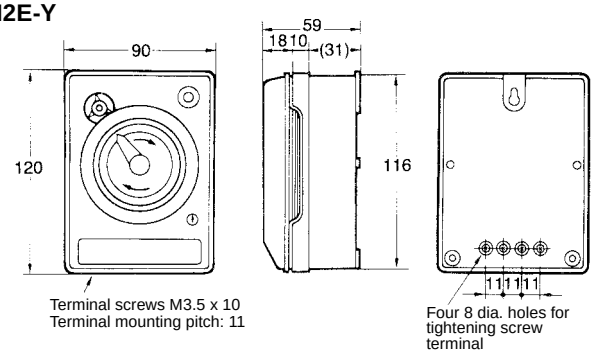
Dimensions

Note: All units are in millimeters unless otherwise indicated.

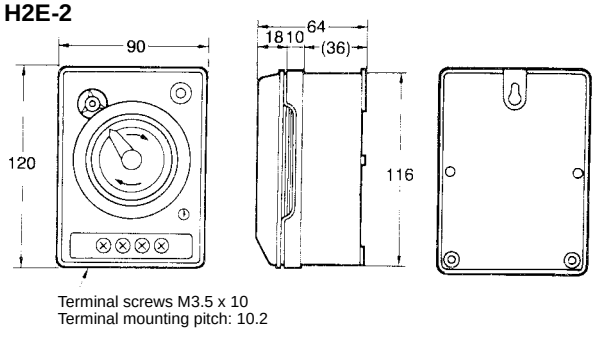
H2E



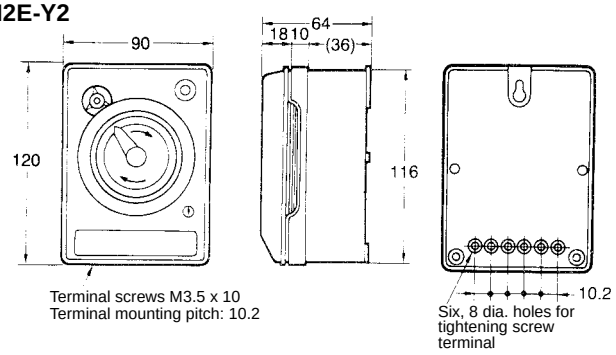
H2E-Y



H2E-2

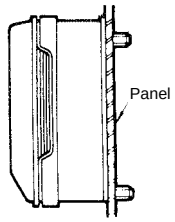


H2E-Y2

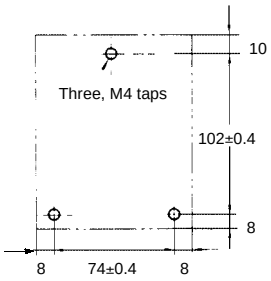


Mounting Dimensions

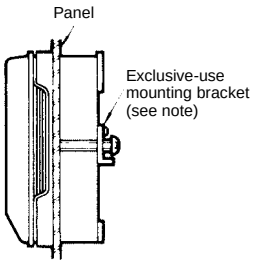
Surface Mounting
H2E, H2E-2



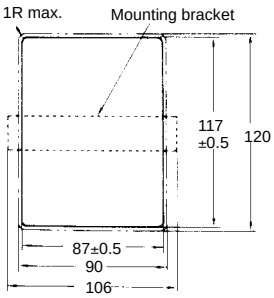
Mounting Holes



Flush Mounting
H2E-Y, H2E-Y2



Mounting Holes

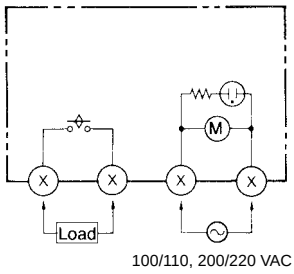


Note: The mounting panel thickness should be 1 to 3.2 mm.

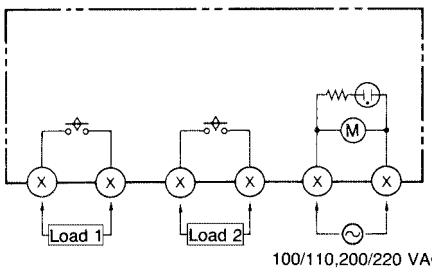
Installation

■ Connections

H2E, H2E-Y



H2E-2, H2E-Y2



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L10-E1-8

OMRON

Rotary Timer

H5RA

Replaces Old-fashioned Rotary Cams for Repeat Pattern Control on Conveyors, Wrapping and Food Packaging Machines, etc.

- Choose between 8 or 16 control outputs.
- Store three separate control programs.
- Fine-adjust cycle time without changing the program.
- Wide supply voltage range: 100 to 240 VAC.
- Wide time setting range: 9.99 s to 99.9 hrs.
- Built-in battery protects program memory.
- Quick, accurate response.
- Easy-to-read LED status and setting displays.

Ordering Information

Operation method	No. of control outputs	Mounting method	Model
Continuous repetition	8	Surface mounting	H5RA-8
	16		H5RA-16

Specifications

■ Time Ranges

Rated time	Setting range	
	Cycle	Output
9.99 s	0.02 to 9.99 s	0.00 to 9.98 s (see note)
99.9 s	0.2 to 99.9 s	0.0 to 99.8 s (see note)
999 s	2 to 999 s	0 to 998 s (see note)
99.9 min	0.2 to 99.9 min	0.0 to 99.8 min (see note)
999 min	2 to 999 min	0 to 998 min (see note)
99.9 hrs	0.2 to 99.9 hrs	0.0 to 99.8 hrs (see note)

Note: Must be within the set cycle.

■ Ratings

Rated supply voltage	100 to 240 VAC (50/60 Hz)
Operating voltage range	90% to 110% of rated supply voltage (90 to 264 VAC, (50/60 Hz))
Power consumption	10 W max.
Control outputs	100 mA at 30 VDC, solid-state (open collector)

■ Input Response Time

Control input	Start 1 Start 2 Gate Reset Bank 2 Bank 3 Output inhibit Operation check 1 Operation check 2 Batch count reset	20 ms + chattering time

■ Output Response Time

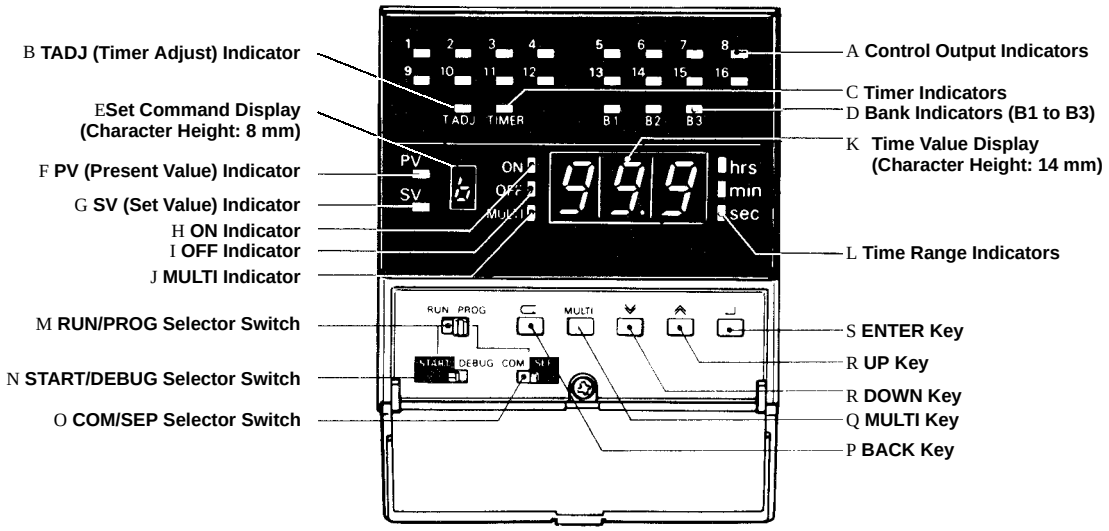
Control output	Start 1 Start 2 Gate Reset Bank 2 Bank 3 Output inhibit	20 ms

■ Characteristics

Accuracy of operating time	±0.1%±30 ms (percent of set value)
Influence of voltage	
Influence of temperature	
Cycle time	±0.1%±10 ms (excluding initial cycle)
Reset time	1 s
Memory protection against momentary power failure	10 ms
Memory protection	With built-in battery, 10 years at 25°C
Power-ON time	0.5 s max.
Insulation resistance	100 MΩ min. (at 500 VDC) (between current-carrying and non-current-carrying parts and between power circuit and control circuit)
Dielectric strength	1,500 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts and between power circuit and control circuit)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude for 2 hrs Malfunction: 10 to 55 Hz with 0.5-mm double amplitude for 10 min
Shock resistance	Destruction: 300 m/s^2 (approx. 30G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: −10°C to 55°C
Ambient humidity	Operating: 35% to 85%
Weight	Approx. 1.3 kg

Nomenclature

Front Panel



Functional Description

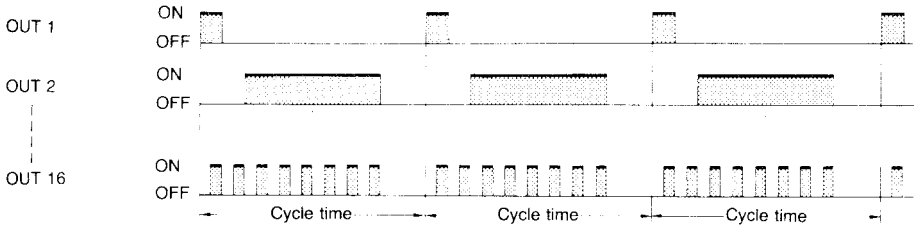
No.	Name	Function
A	**Control Output Indicators (1 to 16)**	In the PROG mode, these indicators illuminate to indicate that the control outputs of the corresponding control output numbers are being programmed and in the RUN mode, illuminate to indicate that the control outputs of the corresponding output control numbers are being turned ON.
B	**TADJ (Timer Adjust)**	Illuminates when a value other than % is set in common command parameter “E” in the input display of a timer adjust value.
C	**TIMER Indicator**	Illuminates while the timer is in operation. (i.e., output monitor during timer operation)
D	**Bank Indicators (B1, B2, B3)**	One of the B1, B2, and B3 indicators illuminates to indicate that the bank is under execution.
E	**Set Command Display**	Displays a common command parameter (A through E) or the set number of stages (0 through 7) of a separate command parameter.
F	**PV (Present Value) Indicator**	Illuminates while a present time value is being displayed on the time value display.
G	**SV (Set Value) Indicator**	Illuminates while a set time value is being displayed on the time value display.
H	**ON Indicator**	Illuminates to indicate that the ON time is being set.
I	**OFF Indicator**	Illuminates to indicate that the OFF time is being set.
J	**MULTI Indicator**	Illuminates while the multistage setting function is effective.
K	**Time Value Display**	Displays a time value (present value or set value) or an error message.
L	**Time Range Indicators**	One of the “hrs, min, and sec” indicators illuminates to indicate the time unit of the set time range.
M	**RUN/PROG Selector**	A slide switch used to select the RUN switch (Program RUN) or PROG (Programming) mode.
N	**START/DEBUG Selector**	A slide switch used to select the START switch (Execution) or DEBUG (Debugging) mode for the program written with the switches effective only in the RUN mode.
O	**COM/SEP Selector**	A slide switch used to select the COM switch (common command parameter setting) or SEP (separate command parameter setting) mode. This switch is effective only in the PROG mode.
P	**BACK Key**	A key used to verify the contents of the separate or common command parameters programmed for each control output.
Q	**MULTI Key**	A key used to operate a control output more than once per cycle.
R	**UP and DOWN Keys**	Keys used to change a time value, control output number, or time range.
S	**ENTER Key**	A key used to enter a value to be set or to advance data while monitoring programmed data.

Operation

■ Basic Operation

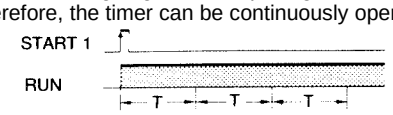
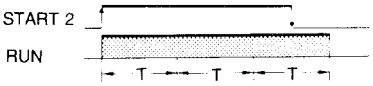
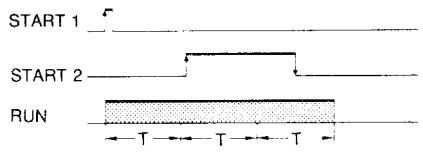
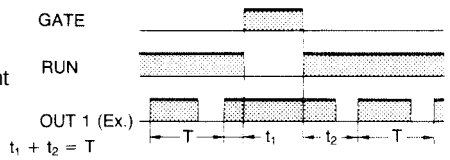
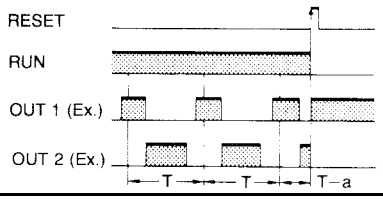
The H5RA is an electronic rotary timer whose control outputs repeatedly turn ON and OFF in a fixed cycle. The H5RA is ideal for controlling machines that repeatedly perform a fixed cycle, replacing old-fashioned electrified cam timers. The operation pattern and cycle time of each output can be easily set or changed by programming, providing flexibility and sophistication. Full details on programming are contained in the H5RA Rotary Timer Operation Manual, available from OMRON.

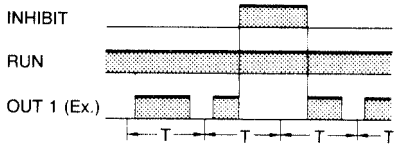
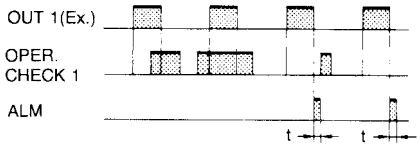
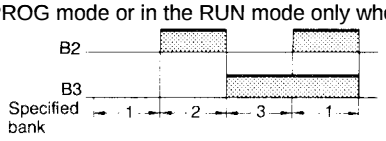
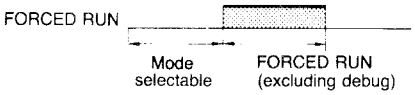
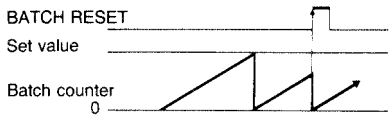
Timing Chart (Control Output Only)



Control Inputs

The control inputs are signals from such things as pushbuttons or external devices which control the operation of the Rotary Timer.

	Name	Function	Description
Read in at power up	**RESET at PW.ON**	Specifies the operating mode on power application or recovery.	When this input signal is turned ON, the present time value is reset on power application. When it is OFF, the present time value before power failure is retained.
	START at PW.ON		When this input signal is turned ON, the timer starts operating on power application. When it is ON, the timer waits until the START 1 or START 2 signal is input.
	OUTPUT MODE		When this input signal is turned ON, the control outputs remain OFF until either the START signals or the RESET signal is input. When it is OFF, the control output returns to the status before power failure. This input signal has no effect while the START at PW.ON signal is turned ON.
Normally read in	**START 1**	Starts the timer.	The timer starts operating at the leading edge of this input signal. It does not detect the trailing edge. Therefore, the timer can be continuously operated by a one-shot input signal. 
	START 2	Starts and, when one cycle is completed, stops the timer operation.	The timer starts operating at the leading edge of this input signal. After it has detected the trailing edge, the timer stops when the cycle has been completed. 
	Note: The priorities of the START 1 and 2 signals are the same and thus the timer operates according to the most recent signal. For example, if the timer is started by START 1 and then detects the trailing edge of START 2, it stops at the end of the present cycle.		
	Gate	Pauses the timer operation.	The timer pauses at the leading edge of this input signal. The control output signals retain their present conditions. 
	RESET	Returns the present time value to 0 and stops the timer operation.	The timer returns its present value to 0 and stops operating at the leading edge of this input signal. 

	Name	Function	Description
Normally read in	**INHIBIT**	Turns OFF all the control outputs.	The timer turns OFF all the control output signals at the leading edge of this input signal. The output signals remain OFF as long as this signal is ON. The timer can continue the timing even while the outputs are turned OFF. 
	OPER. CHECK 1	Checks whether the actuator is operating normally.	If this input signal does not turn ON while control output 1 is turned ON, the timer produces an alarm output signal when control output 1 is turned OFF. For one-shot time t, refer to the description of the alarm output. 
	OPER. CHECK 2		If this input signal does not turn OFF while control output 2 is turned ON, the timer produces an alarm output signal when control output 2 is turned OFF.
	Note: Both input signals OPER. CHECK 1 and 2 share the same alarm output. Therefore, whether the alarm output has been activated.		
	B2 (Bank 2)	Specifies one of three memory blocks (banks).	A program can be stored in each bank and the program to be executed specified by either or both of these input signals. The program at the specified bank can be changed or executed. Banks 2 and 3 are selected by the corresponding input signal. When the B2 and B3 signals are both OFF or when they are both ON at the same time, bank 1 is selected. Bank selection can be done in the PROG mode or in the RUN mode only when the timer is not timing. 
	B3 (Bank 3)		
	FORCED RUN	Forcibly sets the RUN mode to protect the program from damage or loss.	When this input signal is turned ON, the RUN mode is set irrespective of the position of the RUN/PROG selector switch on the front panel. Only when it is turned OFF can the PROG mode and DEBUG mode be specified. 
	BATCH RESET	Resets the present count value of a batch counter.	The batch counter of the specified bank is reset at the leading edge of this input signal. 

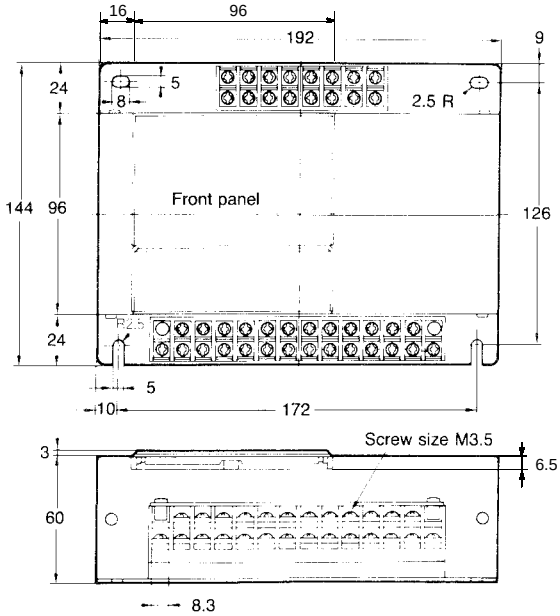
Note: 1. These signals are only acknowledged on power application.

2. In the timing charts in the above tables, T denotes the cycle time.

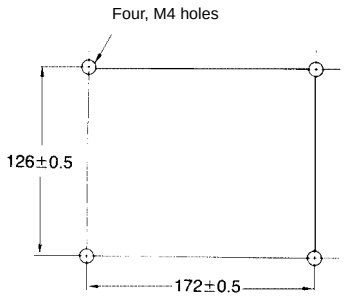
3. Of the input signal pulses in the figures in the above tables, the shaded pulses indicate that the input signal is level-sensitive. The pluses not shaded but with up and down arrows indicate that the input signal is edge-sensitive.

Dimensions

Note: All units are in millimeters unless otherwise indicated.



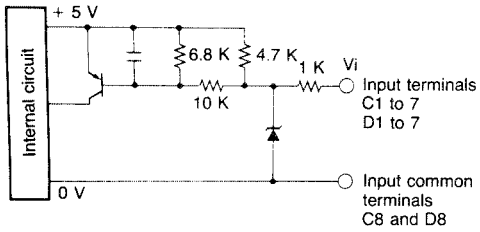
Mounting Holes



Installation

■ Input Specifications

Circuit Configuration



Input current		−2 mA max.
Signal	**ON**	Vi = 2 V max.
	OFF	Vi = 4 V min.

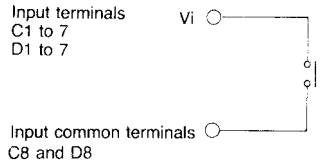
Terminal Arrangement (Upper Terminals)

Terminal number	D1	D2	D3	D4	D5	D6	D7	D8
Function	OUTPUT MODE	B2	B3	INHIBIT	BATCH RESET	RESET at PW.ON	START at PW.ON	INPUT COM
Terminal number	C1	C2	C3	C4	C5	C6	C7	C8
Function	FORCED RUN	START 1	START 2	GATE	RESET	OPER. CHECK 1	OPER. CHECK 2	INPUT COM

Note: Use the input common terminals even though they are internally connected to the output common terminals.

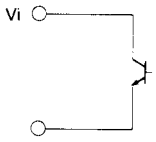
Connections

Contact Input



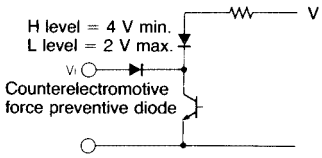
Resistance when contacts are closed: 1 kΩ max.
Resistance when contacts are open: 100 kΩ min.

Solid-state, No-voltage Input



Residual voltage Vi between input terminals when transistor is ON: 2 V max.
Impedance when transistor is OFF: 100 kΩ min.

Solid-state, Voltage Input

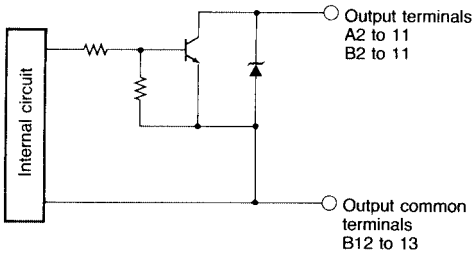


Residual voltage Vi between input terminals when transistor is ON: 2 V max.
Impedance when transistor is OFF: 100 kΩ min.

Note: Be sure to connect a diode to protect the output transistor from counterelectromotive force.

■ Output Specifications

Circuit Configuration



Output type	Solid-state open collector
Dielectric strength	30 V
Permissible current	100 mA
Residual voltage	1.0 V max.
Leakage current	0.1 mA max.

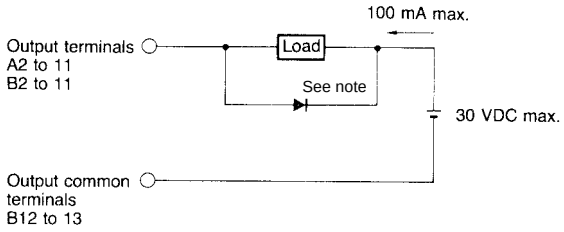
Terminal Arrangement (Bottom Terminals)

Terminal number	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14
Function	---	ALM	RUN	OUT 1	OUT 2	OUT 3	OUT 4	OUT 5	OUT 6	OUT 7	OUT 8	S1 (power)	S2 (power)	---
Terminal number	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14
Function	---	BATCH	READY	OUT 9	OUT 10	OUT 11	OUT 12	OUT 13	OUT 14	OUT 15	OUT 16	OUTPUT COM	OUTPUT COM	FG

Note: 1. Terminals B4 through B11 of H5RA-8 are not to be used.

2. Use the input common terminals even though they are internally connected to the output common terminals.

Connections



Note: When using an inductive load, be sure to connect a diode to protect the output transistor from counterelectromotive force.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L80-E1-3

OMRON

Solid-state Timer

H3BA

DIN-sized (48 x 48, 45 x 75 mm) Timer with 3 Selectors to Cover 64 Specifications

- Sixteen selectable time ranges (0.05 s to 100 hrs).
- Four operation modes switch-selectable.
- External signal inputs for easy control of the timer from a remote site.
- A single LED indicator for both timing (RUN) and time-up (UP).

RC+

Ordering Information

Operation/ resetting system	Operation mode	Terminal	Time-limit contact	Instantaneous contact	Model	
					Surface/ track mounting	Flush mounting
Time-limit operation/ self-resetting/external resetting (see note 2)	ON-delay, Repeat cycle, Signal ON-/OFF-delay, or Signal OFF-delay operation (selectable)	11-pin round socket	DPDT	---	H3BA (with P2CF-11 socket)	H3BA (with Y92F-30 adapter)
		Front screw	SPDT	---	H3BA-FA	---
Time-limit operation/ self-resetting	ON-delay operation	8-pin round socket	SPDT	SPDT	H3BA-8H (with P2CF-08 socket)	H3BA-8H (with Y92F-30 adapter)
			DPDT	---	H3BA-8 (with P2CF-08 socket)	H3BA-8 (with Y92F-30 adapter)

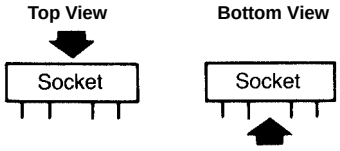
Note: 1. Specify both the model number and supply voltage when ordering.

2. The operation/resetting system is dependent on the selected operation mode. For details, see *"Timing charts (Operation Modes)"*.

■ Accessories (Order Separately)

Timer	Track mounted socket (see note 1)	Back connecting socket	
		Solder terminal	Screw terminal
H3BA	P2CF-11	PL11	P3GA-11
H3BA-8H/H3BA-8	P2CF-08	PL08	P3G-08

Note: Track mounted socket can be used as a front connecting socket.



■ Replacements

H3BA	Replacement model	Reference page
H3BA	H3CR-A	16
H3BA-8	H3CR-A8	
H3BA-8H	H3CR-A8E(L)	
H3BA-FA	H3DR-A	66

Specifications

■ Time Ranges

Time unit		s	min	hrs	10 h
Setting	0.5	0.05 to 0.5			0.05 to 0.5 h
	1	0.1 to 1			1 to 10 h
	5	0.5 to 5			5 to 50 h
	10	1 to 10			10 to 100 h

■ Ratings

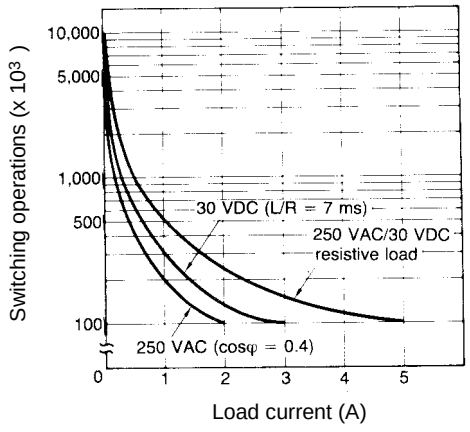
Rated supply voltage	24, 50, 100/110/120 or 200/220/240 VAC (50/60 Hz); 12, 24, 48, 100, or 110 VDC (permissible ripple: 20% max.)
Operating voltage range	All rated voltage except 12 VDC: 85% to 110% of rated supply voltage 12 VDC model: 90% to 110% of rated supply voltage
Power consumption	AC: approx. 10 VA/1 W; DC: approx. 1 W
Control outputs	5 A at 250 VAC, resistive load ($\cos\phi = 1$) Minimum permissible load (ref. value): 10 mA at 5 VDC, 100 mA at 5 VDC (-FA, -8H)

■ Characteristics

Accuracy of operating time	±0.3% (see note 1)
Setting error	±5%
Reset time	0.1 s max.
Influence of voltage	±0.5% (see note 1)
Influence of temperature	±2% max. (see note 1)
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts and between contact and control circuit) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: –10°C to 55°C
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 20,000,000 operations min. (under no load at 1,800 operations/h) Electrical: See *"Engineering Data."*
Approved standards	UL (File No. E41515), CSA (File No. LR22310), SEV (License No. D5.11/435)
Weight	H3BA, H3BA-8H, H3BA-8: approx. 100 g; H3BA-FA: approx. 170 g

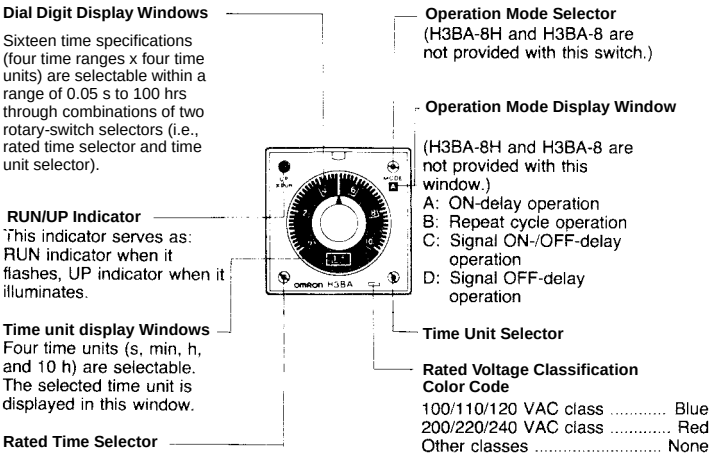
Note: When the timer is set at a rated time of 0.5 s or 1 s, add ±10 ms to the respective characteristics.

Engineering Data

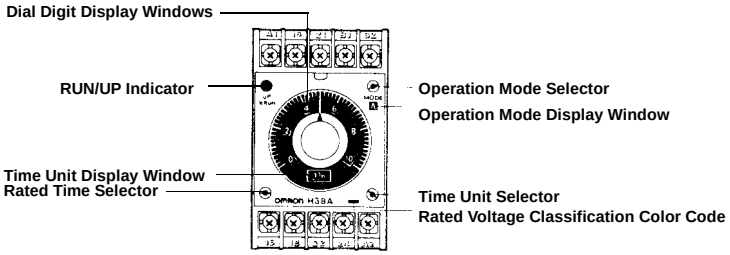


Nomenclature

H3BA/H3BA-8(H)



H3BA-FA



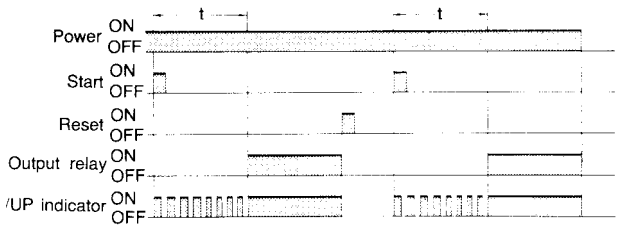
Operation

■ Timing Chart (Operation Modes)

H3BA (FA)

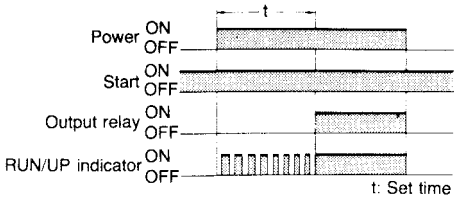
ON-delay Operation (A Mode)

Signal Start



Note: The minimum signal input time is 0.05 s. The start signal generated while the timer is in operation becomes invalid.

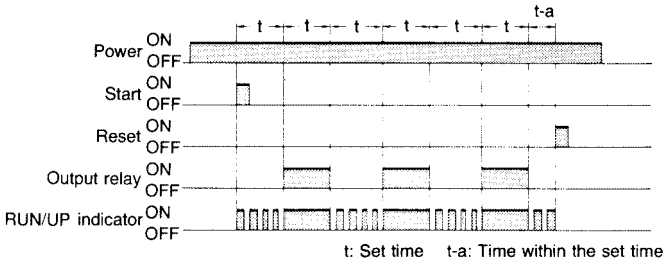
Power-ON Start/Power-OFF Reset



Note: The minimum resetting time is 0.15 s min.

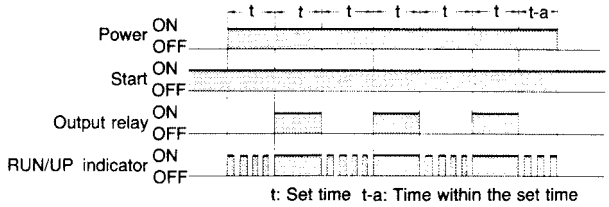
Repeat Cycle Operation (B Mode)

Signal Start



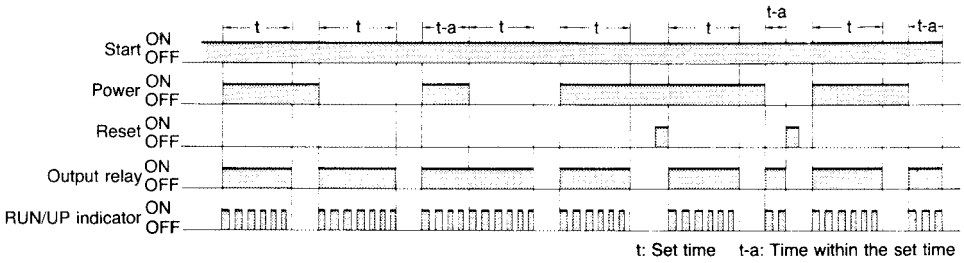
Note: The minimum signal input time is 0.05 s.

Power-ON Start/Power-OFF Reset



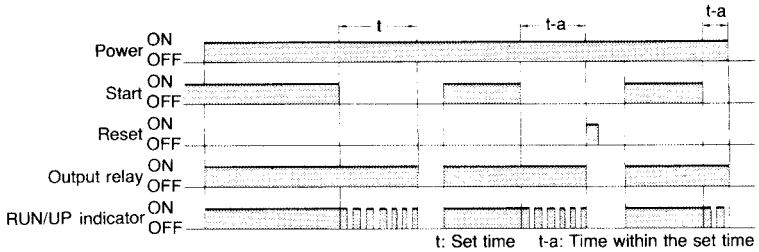
Note: The minimum resetting time is 0.1 s min.

Signal ON/OFF-delay Operation (C Mode)



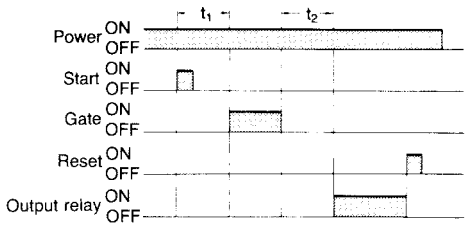
Note: The minimum signal input time is 0.05 s.

Signal OFF-delay Operation (D Mode)



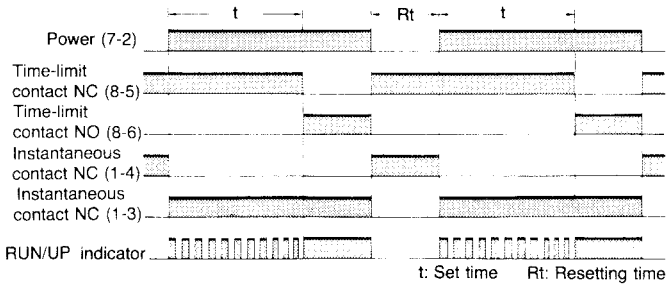
Note: The minimum signal input time is 0.05 s.

How to Use Gate Signal Input



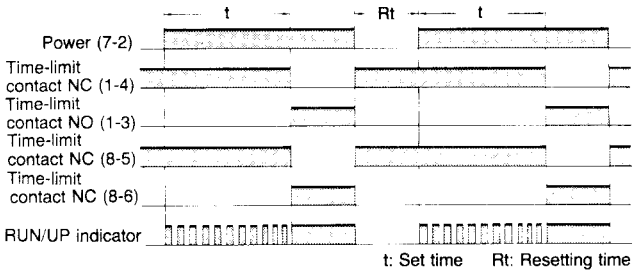
Note: 1. This timing chart indicates the gate input in operation mode A (ON-delay operation).
2. The set time is the sum of t_1 and t_2.

H3BA-8H



Note: The minimum signal input time is 0.05 s.

H3BA-8

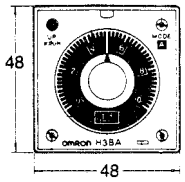


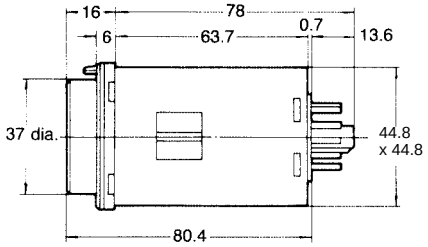
Dimensions

Note: All units are in millimeters unless otherwise indicated.

■ Timers

H3BA-A/-8(H)

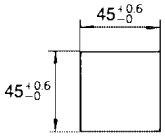




Panel Cutouts

When mounting a single unit

t = 1 to 3.2 mm



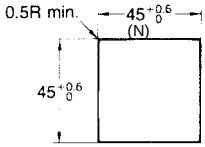
Horizontally connecting n units

No front cover:

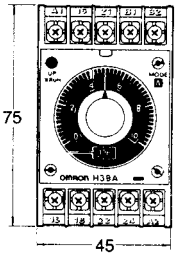
$N = (48n - 2.5)^{+1}/_{-0}$

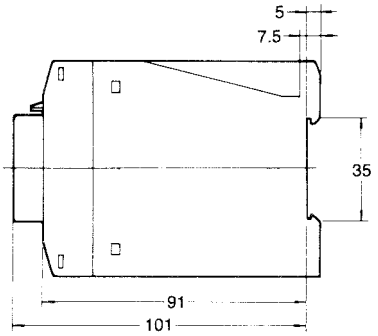
With front cover:

$N = \{48n - 2.5 + (n - 1) \times 3\}^{+1}/_{-0}$

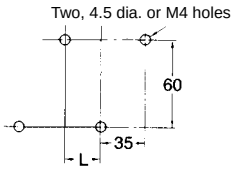


H3BA-FA





Mounting Holes

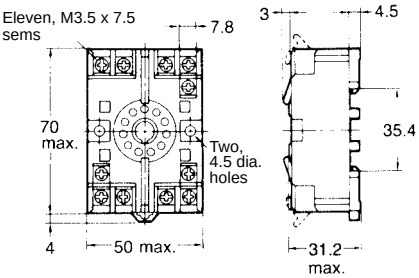


Note: When mounting two or more timers in line, dimension L between two adjacent timers should be 10 mm min.

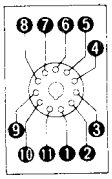
■ Accessories (Order Separately)

Track/Front Mounting Socket

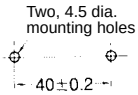
P2CF-11



Terminal Arrangement (Top View)

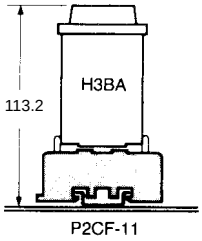


Mounting Holes

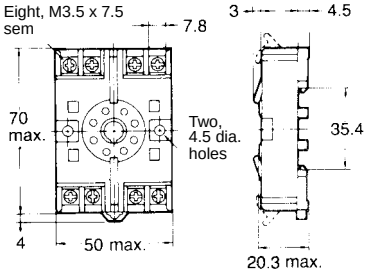


Note: P2CF-11 can be used as a front connecting socket.

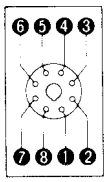
Mounting Height of Timer with Socket



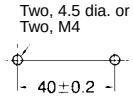
P2CF-08



Terminal Arrangement (Top View)

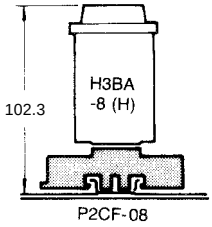


Mounting Holes



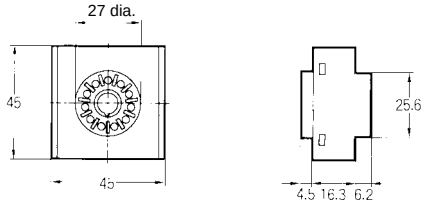
Note: P2CF-11 can be used as a front connecting socket.

Mounting Height of Timer with Socket

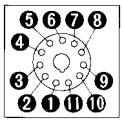


Back Connecting Socket

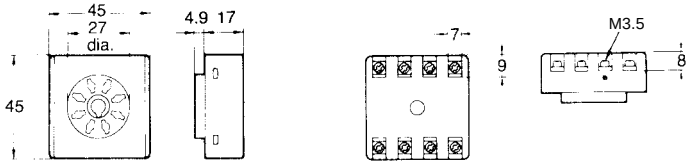
P3GA-11



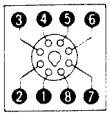
Terminal Arrangement (Bottom View)



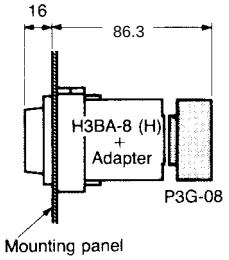
P3G-08



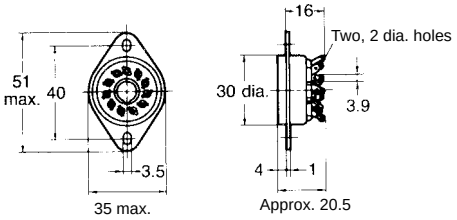
Terminal Arrangement (Bottom View)



Mounting Height of Timer with Socket

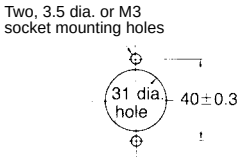


PL11

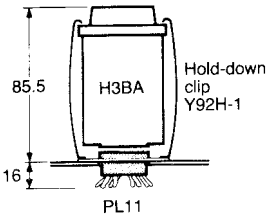


Terminal Arrangement (Bottom View)

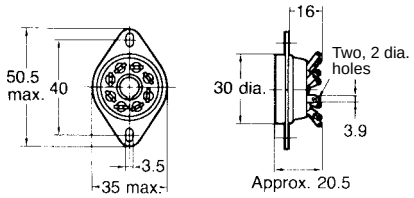
Mounting Holes



Mounting Height of Timer with Socket

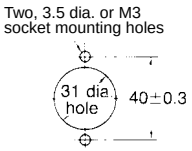


PL08

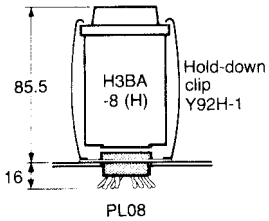


Terminal Arrangement (Bottom View)

Mounting Holes

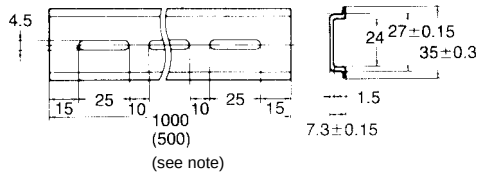


Mounting Height of Timer with Socket



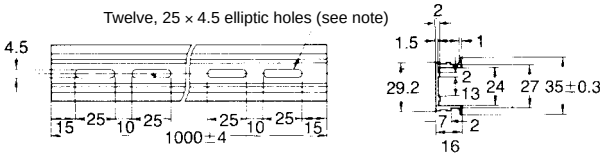
Mounting Track (Meets DIN EN50022)

PFP-100N/PFP-50N



Note: This dimension applied to PFP-50N.

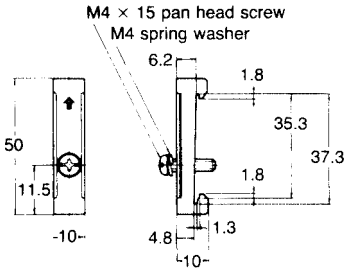
PFP-100N2



Note: A total of twelve 25 x 4.5 elliptic holes are provided with 6 holes cut from each rail end at a pitch of 10 mm between holes.

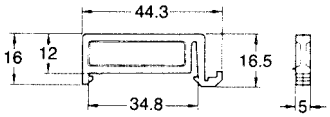
End Plate

PFP-M



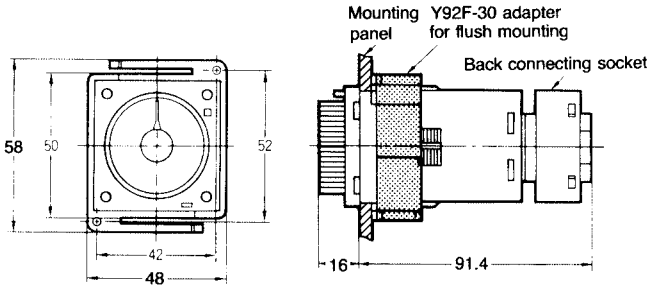
Spacers

PFP-S



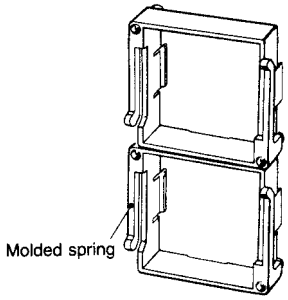
Adapter for Flush Mounting

Y92F-30

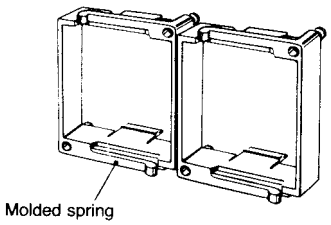


Note: Pay attention to the orientation of the adapter when mounting two or more timers in a vertical or horizontal line.

When mounting two or more timers in a vertical line, arrange all the adapters so that their molded springs are positioned on the right and left sides.

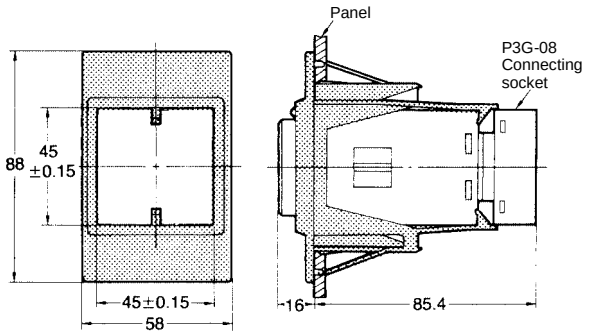


When mounting two or more timers in a horizontal line, arrange all the adapters so that their molded springs are positioned on the top and bottom sides.

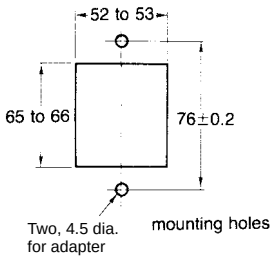


Y92F-70

Recommended panel thickness: 1 to 3.2 mm.



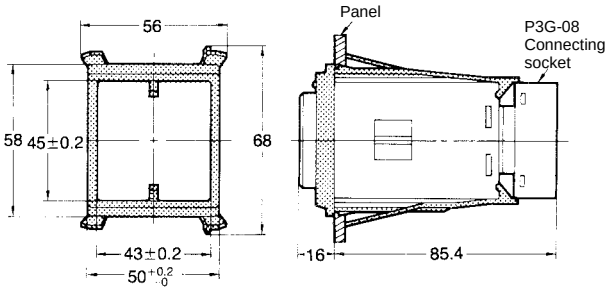
Panel Cutout



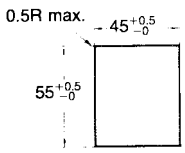
Note: With H3BF-8, dimension should read as 16.7 mm.

Y92F-71

Recommended panel thickness: 1 to 3.2 mm.



Panel Cutout

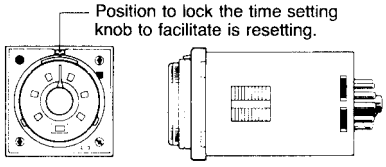


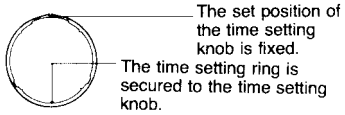
Note: With H3BF-8, dimension should read as 16.7 mm.

Timing Setting Ring

Y92A-Y1

When setting a given time for a single timer unit, use of the time setting ring facilitates the time setting operation and minimizes possible setting errors by operators.



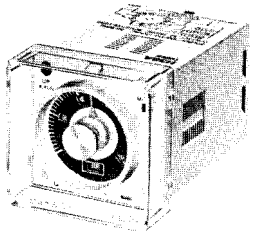


Protective Cover

Y92A-48B

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

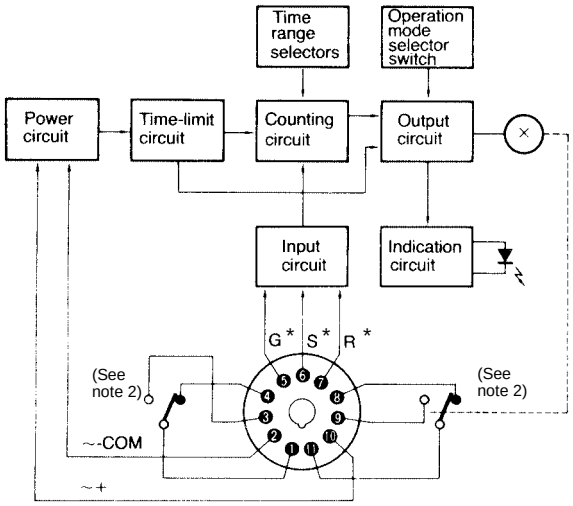
Note:
1. The Y92A-48B Protective Cover is made of a hard plastic and therefore it must be removed to change the timer set value.
2. The Protective Cover cannot be mounted if the Panel Cover (sold separately) is used on the Timer.



Installation

■ Terminal Arrangement

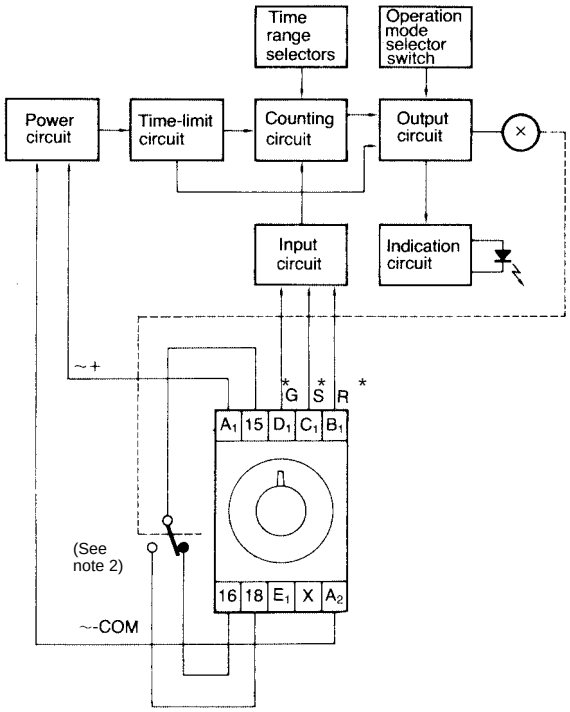
H3BA



Note: 1. *G: Gate: B–E
*S: Start: B–F
*R: Reset: B–G

2. Conventional time-limit contacts are symbolized as . However, the contacts of H3BA are symbolized as because timer has four operation modes. Refer to *"Application Examples"*.

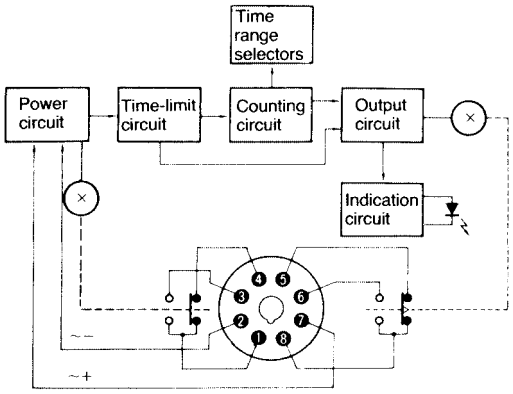
H3BA-FA



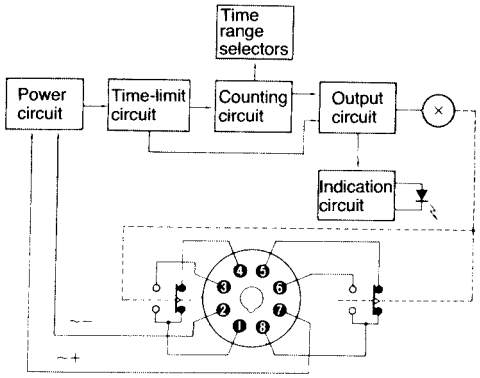
Note: 1. *G: Gate: A2–D1
*S: Start: A2–C1
*R: Reset: A2–B1

2. Conventional time-limit contacts are symbolized as . However, the contacts of H3BA-FA are symbolized as because timer has four operation modes. Refer to *"Application Examples"*.

H3BA-8H



H3BA-8

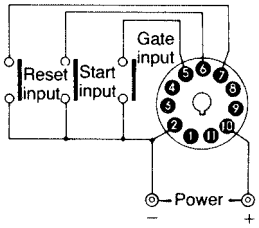


■ Connection

Contact Signal Inputs

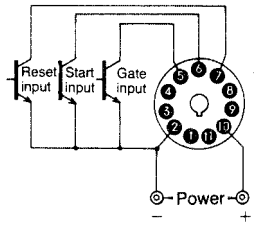
Connect the start input contact between terminals B and F, the reset input contact between terminals B and G, the gate input contact between terminals B and E, respectively. For each signal input contact, use a gold-plated contact of high contact reliability. Be sure that these input signals satisfy the following requirements:

1. A resistance of 1 kΩ (max.) when the contact makes.
2. A residual voltage of 1 V (max.) when the contact makes.



Solid-state Signal Inputs

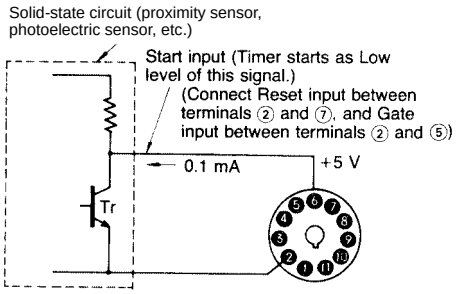
Connect the start input transistor between terminals B and F, the reset input transistor between terminals B and G, the gate input transistor between terminals B and E, respectively.



For signal input, use an open collector transistor with characteristics: V_{CEO} = 20 V min., $V_{CE(S)}$ = 1 V max., I_C = 50 mA min. and I_{CBO} = 0.5 μA max. In addition, be sure that the input signals satisfy the following requirements:

1. A resistance of 1 kΩ (max.) when the resister is ON.
2. A residual voltage of 1 V (max.) when the transistor is ON
3. A resistance of 200 kΩ (min.) when the transistor is OFF

From a solid-state circuit (proximity sensor, photoelectric sensor, or the like) with rated power supply voltage ranging from 6 to 30 VDC, input signals can also be applied by other than an open collector type transistor as shown in the following diagram.



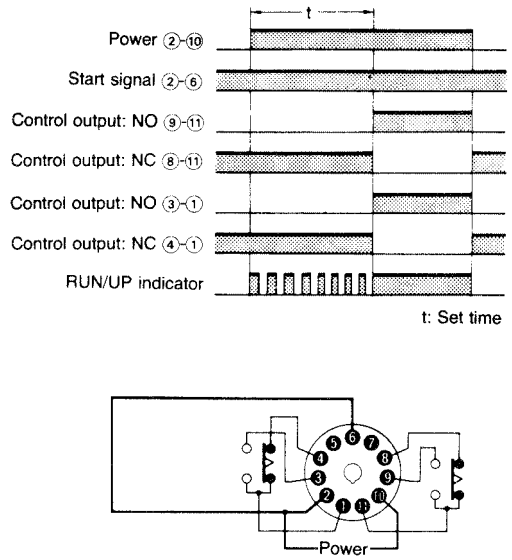
Note: Except for the wiring for the power supply circuitry, avoid the laying of input signal wires in parallel or in the same conduit with high-tension or power lines. It is recommended to use shielded wires or wiring with independent metal conduits for the shortest possible distance.

■ Application Examples

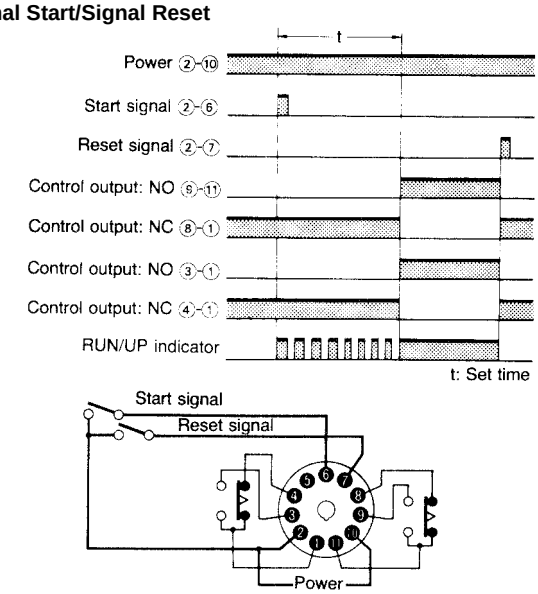
Standard type H3BA is used for the following application examples. In the schematic diagrams, each thick the indicates the wiring necessary for selecting the desired operation mode.

ON-delay Operation (A Mode)

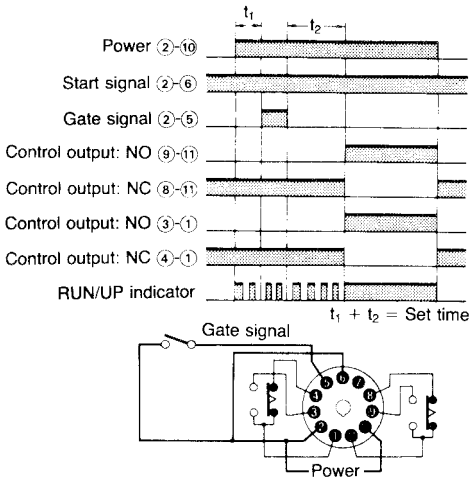
Power-ON Start/Power-OFF Reset



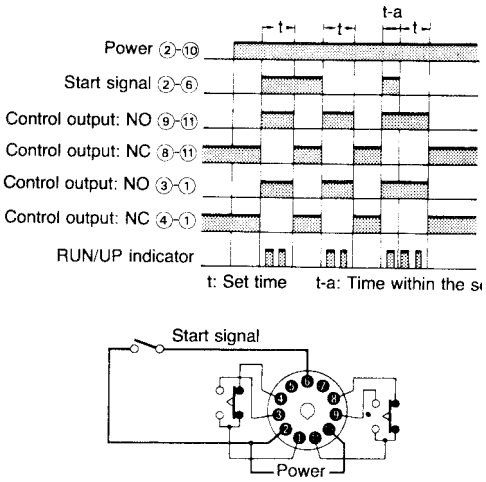
Signal Start/Signal Reset



Integrating Operation by Gate Signal

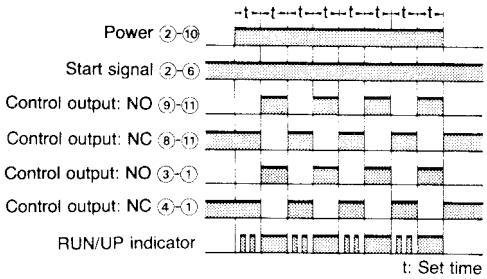


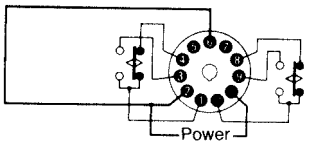
Signal ON-/OFF-delay Operation (C Mode)



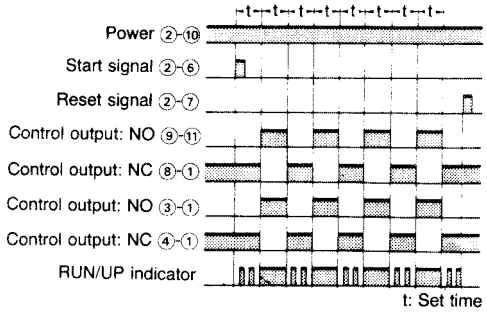
Repeat Cycle Operation (B Mode)

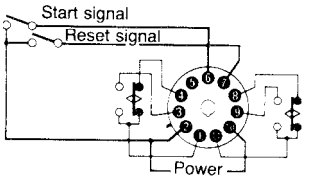
Power-ON Start/Power-OFF Reset





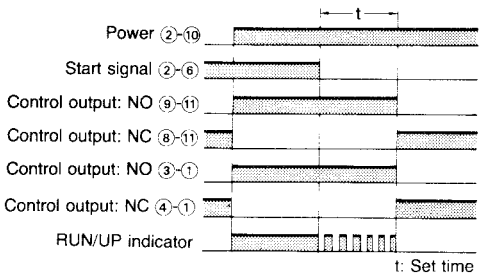
Signal Start/Signal Reset

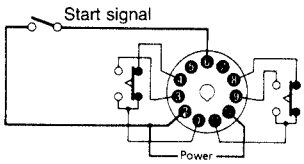




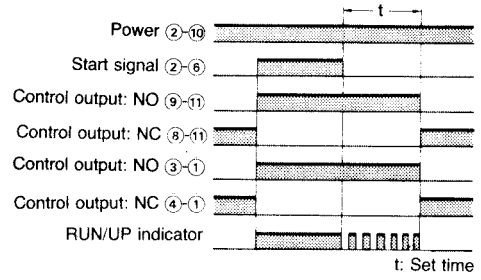
Signal OFF-delay Operation (D Mode)

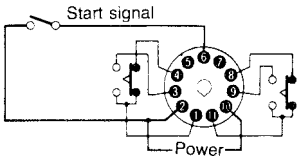
Power-ON Start/Instantaneous Operation/Time-limit Reset





Signal Start/Instantaneous Operation/Time-limit Reset

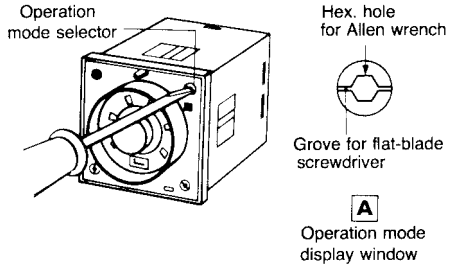




Precautions

How to Change Rated Time

Turn the operation mode selector (i.e., rotary switch) with a flat-blade screwdriver or an Allen wrench until the desired operation mode (A, B, C, or D) appears in the display window located below the selector.

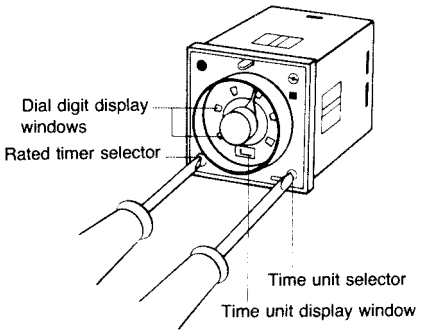


How to Change Time Unit and Rated Time

The desired time unit (sec, min, hrs, or 10 h) can be displayed in the window below the time setting knob by turning the time unit selector (i.e., rotary switch) located at the lower right corner of the front panel. Dial digits appear in the six windows around the time setting knob according to the rated time selected by turning the rated time selector (i.e., rotary switch) located at the lower left corner of the front panel.

The following digits will appear in the respective dial digit display windows:

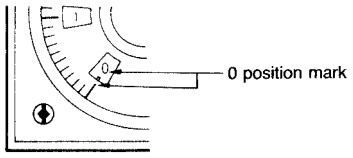
Rated time	Dial digits
0.5	0, 0.1, 0.2. 0.3, 0.4, 0.5
1	0, 0.2, 0.4, 0.6, 0.8, 1.0
5	0, 1, 2, 3, 4, 5
10	0. 2. 4. 6. 8. 10



Switch Setting

The selector switches for time unit, rated time, and operation mode selection can be turned in both directions, clockwise and counter-clockwise. Each selector switch has a snap mechanism that secures the switch at a given position. Set the switch at a position at which it is secured. Do not set it midway between two securing positions because such practice may causes the Timer to malfunction or, in the worst case, break down.

Accurately move and set the scale selector switch, matching the 0 position mark to a division on the scale.



⚠ Caution

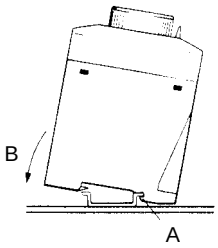
Do not change the time unit, or operation mode while the Timer is in operation. Otherwise, the Timer may malfunction or suffer from damage. Be sure to turn off the power supply of the Timer before changing the time unit, rated time or operation mode.

How to Mount Timer on Mounting Track

When mounting a H3B Timer on a socket mounting track, observe the following procedures:

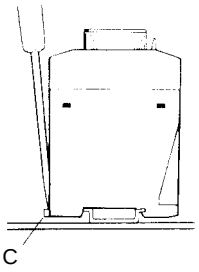
Mounting

First hook portion A of the Timer to an edge of the track and then depress the Timer in the direction of B.



Dismounting

Pull out portion C with a round-blade screwdriver and remove the Timer from the mounting track.



⚠ WARNING

Electrical Shock Hazard

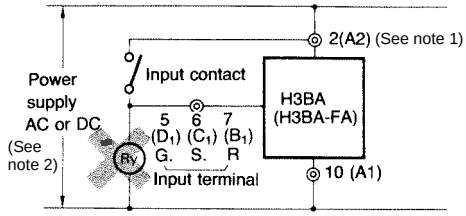
Never touch the input terminals of any H3BA Timer while power is being applied to the Timer.

⚠ Caution

Inputs to H3BA, H3BA-FA and H3BH-8R

A transformer is not used in the power supplies for the H3B Series. You can therefore receive an electrical shock by touching the input terminals when the power supply voltage is being applied. Take adequate precautions to protect against electrical shock.

To the input signal terminals of the Timer, an appropriate input is applied when one of the input terminals No. 5, 6, 7 (D_1, C_1, B_1) and the common terminal for the input signals (No. 2 for H3BA, No. A2 for H3BA-FA) are short-circuited. Do not attempt to connect any input terminal to any terminals other than the common terminal or to apply voltage across other than the specified input and common terminals. Otherwise, the internal circuit of the Timer may be damaged.



Note:
1. Power supply terminal No.2 (A2) is a common terminal for the input signals (G, S, R) to the Timer. Never use terminal No.10 (A1) as the common terminal for this purpose, or the internal circuit of the Timer may be damaged.
2. Do not connect a relay or any other load between these two points, or the internal circuit of the Timer may be damaged due to the high-tension voltage applied to the input terminals.

Power Supply Connection

If the Timer is connected to an AC power supply, its two-pole terminals can be connected to the power supply in either direction, regardless of the polarity. But if it is connected to a DC power supply, be sure to connect the Timer's power terminals to the correct polarities.

Use sine wave for the waveform of an AC power supply. Use a DC power supply having a ripple factor of 20% or less and supplying a mean voltage that is within the rated operating voltage range of the Timer.

Make sure that the supply voltage is applied to the Timer all at once, using contacts such as of a switch or relay. If the supply voltage is applied gradually, the Timer may not be able to perform power reset or its set time may be up when it should not.

Power Source Connection

Because the AC-operated version is a capacitive load, the solid-state relay to be used must be rated at a dielectric strength two times that of the Timer to switch the power source of the Timer.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L31-E1-7

OMRON

Solid-state Timer | H3BH

DIN-sized (48 x 48 mm) Power OFF-delay Timer

- Long-duration power OFF-delay Timer (S series: 0.5 to 10 s, M series: 0.5 to 10 min)
- Forced resetting type available, which helps expand the application range of the power OFF-delay Timer.
- Equipped with relay ON indicator.

RC

Ordering Information

Operation/resetting system	Terminal	Time-limit contact	Mounting method	
			Surface mounting/ track mounting	Flush mounting
Instantaneous operation/ time-limit resetting	8-pin round socket	DPDT	H3BH-8 (with P2CF-08 socket)	H3BH-8 (with Y92F-30 adapter)
Instantaneous operation/ time-limit resetting/ forced resetting		SPDT	H3BH-8R (with P2CF-08 socket)	H3BH-8R (with Y92F-30 adapter)

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

■ Accessories (Order Separately)

Same as H3BA except for the following.

Timer	Track mounted socket (see note 1)	Back connecting socket	
		Solder terminal	Screw terminal
H3BH-8/-8R	P2CF-08	PL08	P3G-08

Note: Track mounted socket can be used as a front connecting socket.

■ Replacements

H3BH	Replacement model	Reference page
H3BH-8	H3CR-H8L	51
H3BH-8R	H3CR-H8RL	

Specifications

■ Time Ranges

Time unit		S series	M series
		s	min
Setting	0.5	0.05 to 0.5	
	1	0.1 to 1	
	5	0.5 to 5	
	10	1 to 10	
Min. power ON time		0.1 s min.	2 s min.
Min. interval for forced reset operation		10 s min.	
Min. interval for power ON operation		10 s min.	

■ Ratings

Rated supply voltage	100/110/120 or 200/220/240 VAC (50/60 Hz); 24, 48, 100, or 110 VDC (permissible ripple: 20% max.)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	AC: approx. 0.5 VA; DC: approx. 0.7 W
Control outputs	5 A at 250 VAC, resistive load ($\cos\phi = 1$) Minimum permissible load (ref. value): 10 mA at 5 VDC, 100 mA at 5 VDC (-8R)

Note: When power is applied to any of the H3B series Timers, an initial current of approx. 0.3 A flows for approx. 1 s (M series), 0.1 s (S series), irrespective of the rated supply voltage of the Timer.

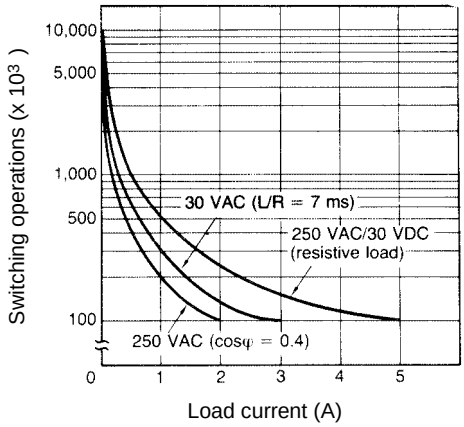
■ Characteristics

Accuracy of operating time	±0.3% (see note 1)
Setting error	±5%
Power ON time	S series: 0.1 s min. M series: 2 s min.
Influence of voltage	±0.5% (see note 1)
Influence of temperature	±2% max. (see note 1)
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts and between contact and control circuit) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: −10°C to 55°C
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 10,000,000 operations min. (under no load at 1,200 operations/h) Electrical: See *"Engineering Data."*
Approved standards	UL (File No. E41515), CSA (File No. LR22310)
Weight	Approx. 100 g

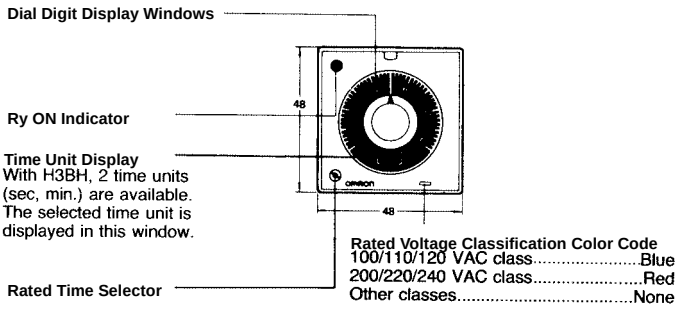
Note: 1. When the Timer is set at a rated time of 0.5 s or 1 s, add ±10 ms to the respective characteristics.

2. Resetting time means the minimum power application time for power OFF-delay Timer. If less, the output relay may not release.

Engineering Data



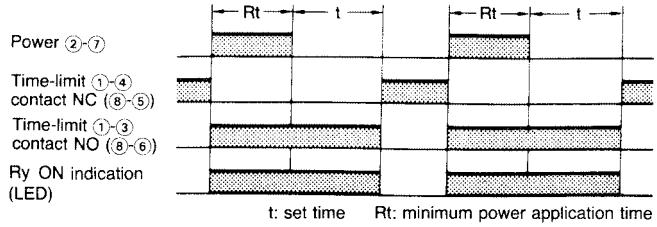
Nomenclature



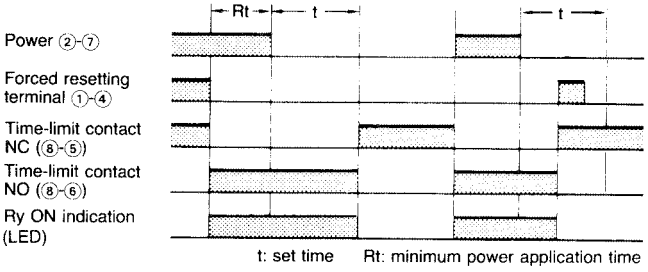
Operation

■ Timing Chart

H3BH-8

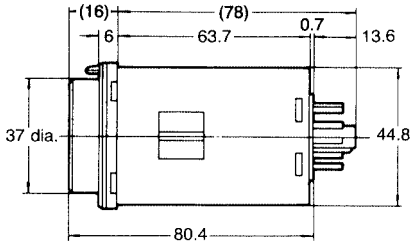


H3BH-8R



Dimensions

Note: All units are in millimeters unless otherwise indicated.

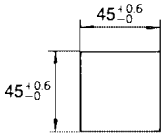


Note: Numbers in parentheses are reference value.

Panel Cutouts

When mounting a single unit

t = 1 to 3.2 mm



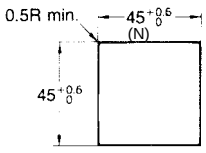
Horizontally connecting n units

No front cover:

$N = (48n - 2.5)^{+1}/_{-0}$

With front cover:

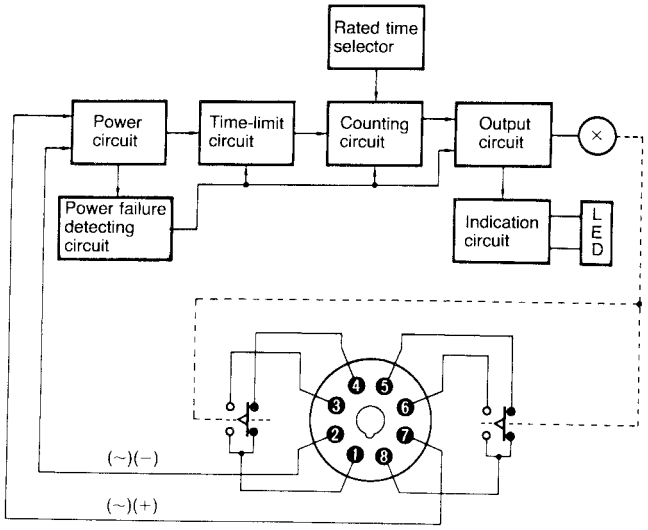
$N = \{48n - 2.5 + (n - 1) \times 3\}^{+1}/_{-0}$



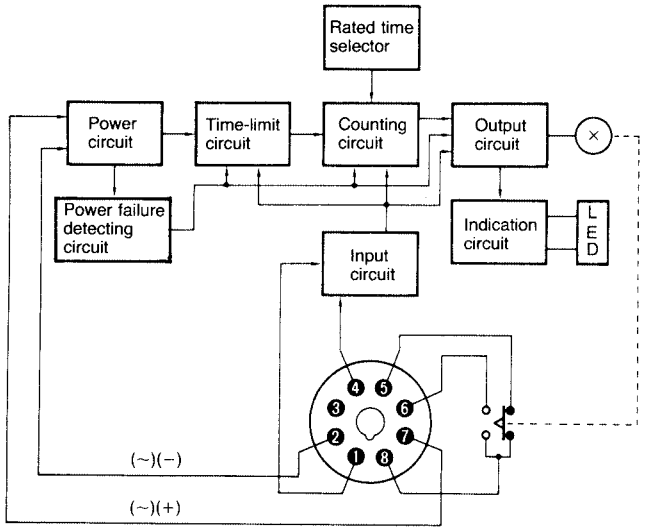
Installation

■ Terminal Arrangement

H3BH-8



H3BH-8R



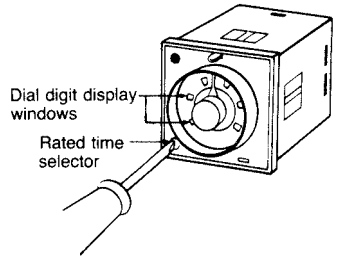
Precautions

⚠ Caution

Do not change the time unit, or operation mode while the Timer is in operation. Otherwise, the Timer may malfunction or suffer from damage. Be sure to turn off the power supply of the Timer before changing the time unit, rated time or operation mode.

How to Change Rated Time

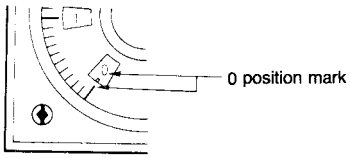
Dial digits (0 to 0.5, 0 to 1.0, 0 to 5, or 0 to 10) appear in the six windows around the time setting knob according to the rated time selected by turning the rated time selector (i.e., rotary switch) located at the lower-left corner of the front panel.



Switch Setting

The selector switches for time unit, scale, and function can be turned in both directions, clockwise and counterclockwise. Each selector switch has a snap mechanism that secures the switch at a given position. Set the switch at a position at which it is secured. Do not set it midway between two securing positions because such practice may causes the Timer to malfunction or, in the worst case, break down.

Accurately move and set the scale selector switch, matching the 0 position mark to a division on the scale.



Wiring

Since the H3BH uses a high-impedance circuit, the induced voltage may disable it from releasing. To prevent this, keep the wiring as short as possible. Also, do not run the wiring in parallel to power lines. In case the induced voltage is more than 30% of the rated voltage, connect an RC filter (C = 0.1 μF, R = 120 Ω) or bleeder resistor across the power terminals. Connect the bleeder resistor also when the residual voltage is caused by a leakage current.

⚠ WARNING

Electrical Shock Hazard

Never touch the input terminals of any H3BH Timer while power is being applied to the Timer.

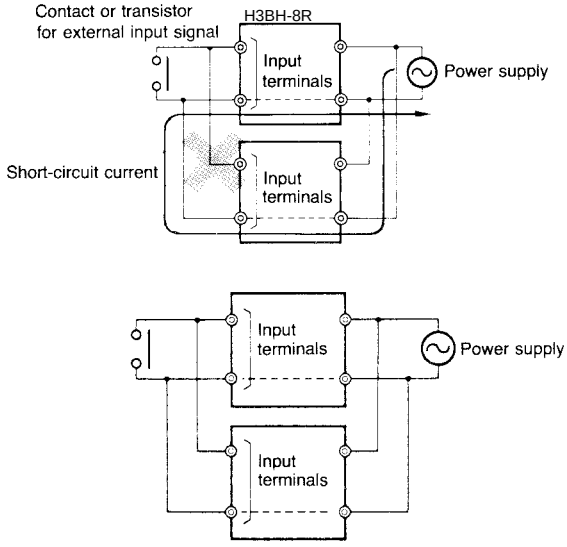
⚠ Caution

Inputs to H3BA, H3BA-FA and H3BH-8R

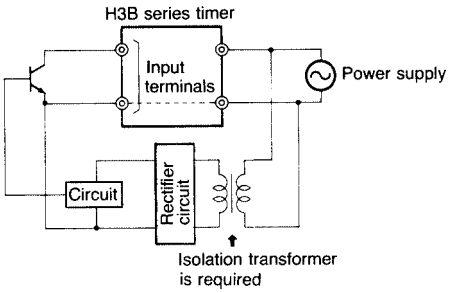
A transformer is not used in the power supplies for the H3B Series. You can therefore receive an electrical shock by touching the input terminals when the power supply voltage is being applied. Take adequate precautions to protect against electrical shock.

When connecting the contact of transistor for external input signal to the input terminals of the Timer, pay attention to the following points to prevent short-circuiting due to sneak current to the transformerless power supply.

Do not connect two or more Timers to an external input signal contact simultaneously.



For the power supply of an input device, use an isolation transformer, of which the primary and secondary windings are mutually isolated and the secondary winding is not grounded.



Power Supply Connection

If the Timer is connected to an AC power supply, its two-pole terminals can be connected to the power supply in either direction, regardless of the polarity. But if it is connected to a DC power supply, be sure to connect the Timer's power terminals to the correct polarities.

Use sine wave for the waveform of an AC power supply. Use a DC power supply having a ripple factor of 20% or less and supplying a mean voltage that is within the rated operating voltage range of the Timer.

Make sure that the supply voltage is applied to the Timer all at once, using contacts such as of a switch or relay. If the supply voltage is applied gradually, the Timer may not be able to perform power reset or its set time may be up when it should not.

Power Source Connection

Because the AC-operated version is a capacitive load, the solid-state relay to be used must be rated at a dielectric strength two times that of the Timer to switch the power source of the Timer.

Wiring

H3BH Timer has a high impedance circuit and thus may be influenced by inductive voltage. Consequently, the Timer may not release. To prevent this, keep the wiring of the Timer cables as short as possible. Also, do not route the cables in parallel with power lines. If the inductive voltage runs to 30% of the rated supply voltage or higher, connect an RC filter (with C = 0.1 μF and R = 120 Ω) or a bleeder resistor across the power terminals of the Timer. Connecting a bleeder resistor also suppress residual voltage cause by leakage current.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L31-E1-6

OMRON

Solid-state Timer | H3BG

DIN-sized (48 x 48, 45 x 75 mm)
Star-delta Timer

- Wide ranges of star circuit operation time (5 to 100 s) and star–delta circuit transfer time (0.05, 0.1, 0.25 and 0.5 s)
- Easy-to-wire terminal layout on the front of the timer (H3BG-F/-FH only).
- Equipped with star-delta indicators.

RC

Ordering Information

Operation/ resetting system	Terminal	Time-limit contact	Instantaneous contact	Model	
				Surface/ track mounting	Flush mounting
Time-limit operation/ self-resetting	8-pin round socket	SPST-NO (star circuit), SPST-NO (delta circuit)	---	H3BG-8 (with P2CF-08 socket)	H3BG-8 (with Y92F-30 adapter)
			SPST-NO	H3BG-8H (with P2CF-08 socket)	H3BG-8H (with Y92F-30 adapter)
	Front screw		---	H3BG-F	---
			SPST-NO	H3BG-FH	---

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

■ Accessories (Order Separately)

Same as H3BA except for the following exception.

Timer	Track mounted socket (see note 1)	Back connecting socket	
		Solder terminal	Screw terminal
H3BG-8(H)	P2CF-08	PL08	P3G-08

Note: Track mounted socket can be used as a front connecting socket.

■ Replacements

H3BG	Replacement model	Reference page
H3BG-8	H3CR-G8L	43
H3BG-8H	H3CR-G8EL	
H3BG-8-30	H3CR-G8L-30	
H3BG-8H-31	H3CR-G8EL-31	

Specifications

■ Time Ranges

Time unit		0.05 s	0.1 s	0.25 s	0.5 s
Setting	5	0.5 to 5 s			
	10	1 to 10 s			
	50	5 to 50 s			
	100	10 to 100 s			

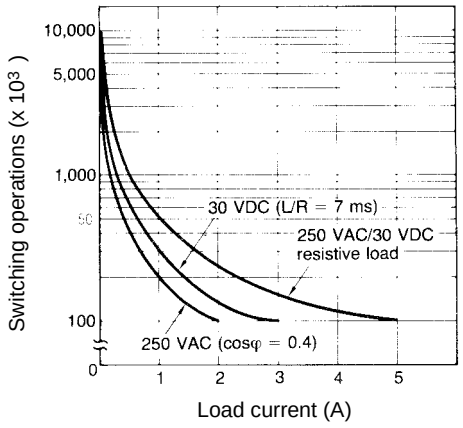
■ Ratings

Rated supply voltage	100/110/120 or 200/220/240 VAC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	AC: approx. 10 VA/2 W
Control outputs	5 A at 250 VAC, resistive load ($\cos\phi$ = 1) Minimum permissible load (ref. value): 100 mA at 5 VDC

■ Characteristics

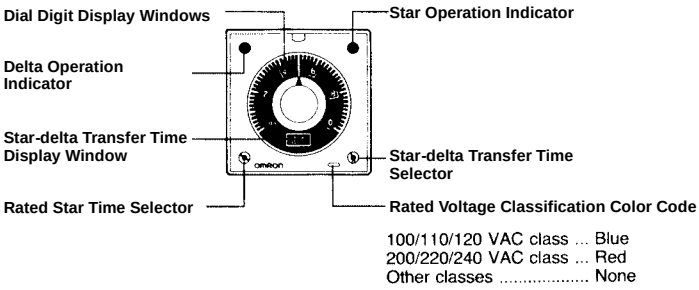
Accuracy of operating time	±0.3%
Setting error	±5%
Star-delta transfer time	±25% + 5 ms
Reset time	0.5 s max.
Influence of voltage	±0.5%
Influence of temperature	±2% max.
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts and between contact and control circuit) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 300 m/s^2 (approx. 30G)
Ambient temperature	Operating: −10°C to 55°C
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 20,000,000 operations min. (under no load at 1,800 operations/h) Electrical: See *"Engineering Data."*
Approved standards	UL (File No. E41515), CSA (File No. LR22310)
Weight	H3BG-8, H3BG-8H: approx. 100 g; H3BG-F, H3BG-FH: approx. 170 g

Engineering Data

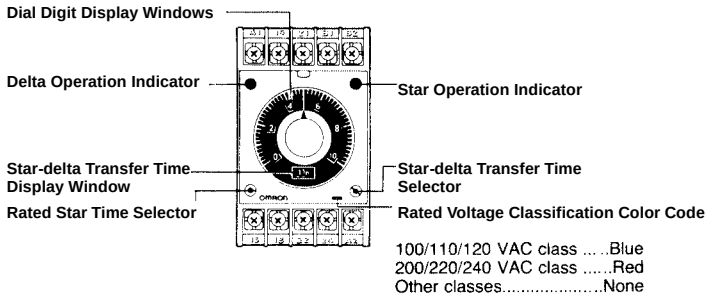


Nomenclature

H3BG-8/H3BA-8(H)

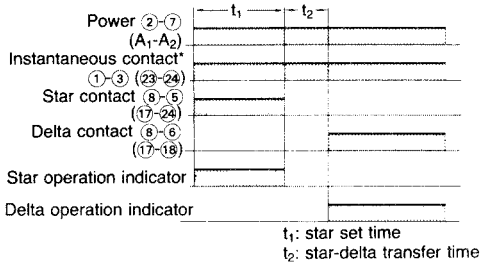


H3BG-F/H3BG(-FH)



Operation

■ Timing Chart

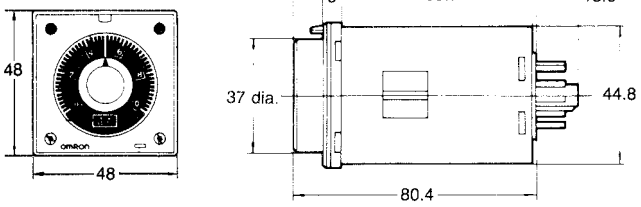


Note: 1. The terminal numbers in parentheses apply to H3BG-F(H).
2. Instantaneous contact is only available for H3BG-8H and H3BG-FH.

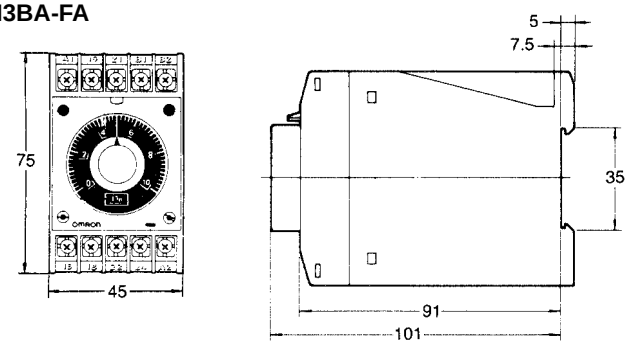
Dimensions

Note: All units are in millimeters unless otherwise indicated.

H3BA-A/-8(H)

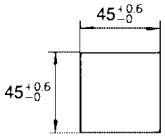


H3BA-FA

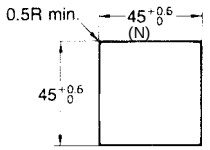


Panel Cutouts

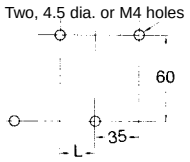
When mounting a single unit
t = 1 to 3.2 mm



Horizontally connecting n units
No front cover:
$N = (48n - 2.5)^{+1}/_{-0}$
With front cover:
$N = \{48n - 2.5 + (n - 1) \times 3\}^{+1}/_{-0}$



Mounting Holes

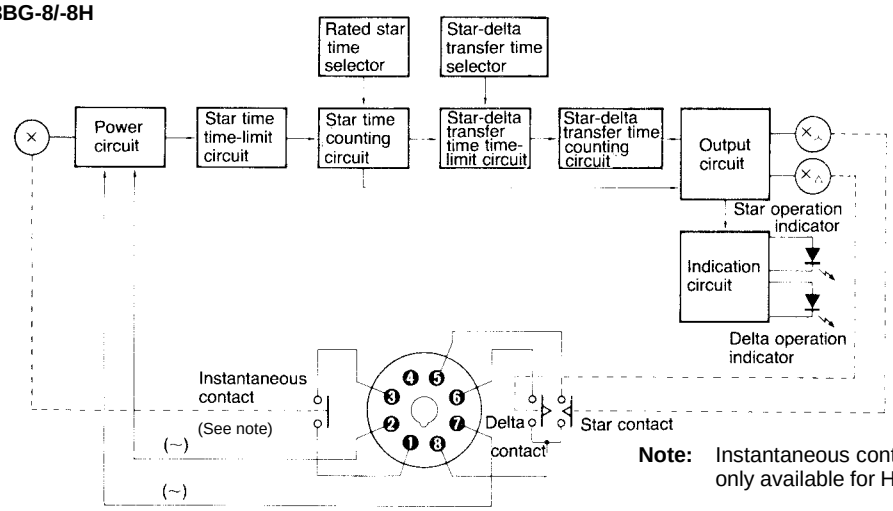


Note: When mounting two or more timers in line, dimension L between two adjacent timers should be 10 mm min.

Installation

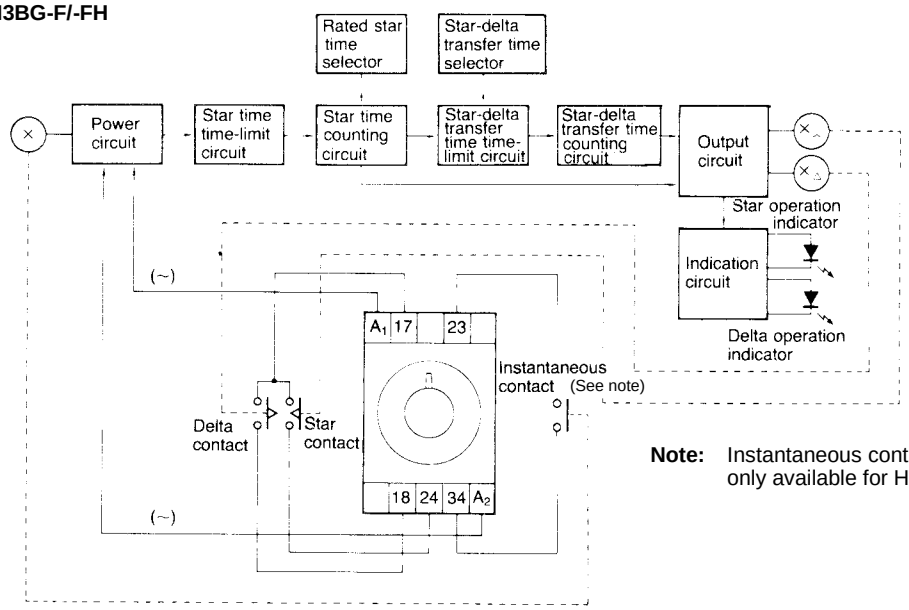
■ Internal Connection

H3BG-8/-8H



Note: Instantaneous contact is only available for H3BG-8H.

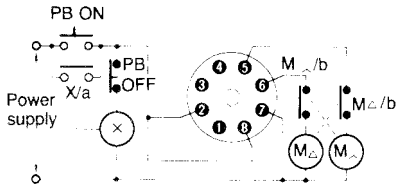
H3BG-F/-FH



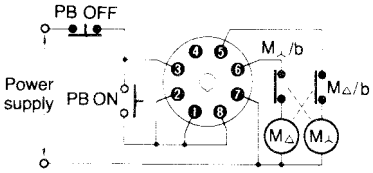
Note: Instantaneous contact is only available for H3BG-FH.

■ External Connection

H3BG-8



H3BG-8H



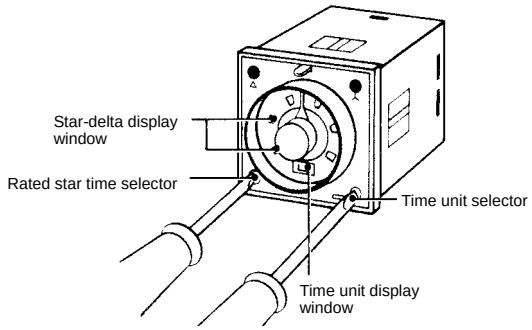
Precautions

How to Change Time Unit and Rated Time

The desired time unit (sec, min, hrs, or 10 h) can be displayed in the window below the time setting knob by turning the time unit selector (i.e., rotary switch) located at the lower right corner of the front panel. Dial digits appear in the six windows around the time setting knob according to the rated time selected by turning the rated time selector (i.e., rotary switch) located at the lower left corner of the front panel.

The following digits will appear in the respective dial digit display windows:

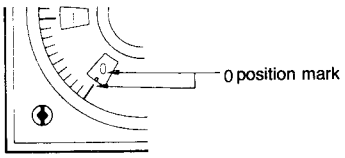
Rated time	Dial digits
5	0, 1, 2, 3, 4, 5
10	0. 2. 4. 6. 8. 10
50	0, 10, 20, 30, 40, 50
100	0, 20, 40, 60, 80, 100



Switch Setting

The selector switches for time unit, scale, and function can be turned in both directions, clockwise and counterclockwise. Each selector switch has a snap mechanism that secures the switch at a given position. Set the switch at a position at which it is secured. Do not set it midway between two securing positions because such practice may causes the Timer to malfunction or, in the worst case, break down.

Accurately move and set the scale selector switch, matching the 0 position mark to a division on the scale.



⚠ Caution

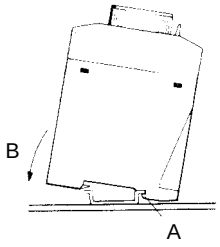
Do not change the time unit, or operation mode while the Timer is in operation. Otherwise, the Timer may malfunction or suffer from damage. Be sure to turn off the power supply of the Timer before changing the time unit, rated time or operation mode.

How to Mount Timer on Mounting Track

When mounting a H3B Timer on a socket mounting track, observe the following procedures:

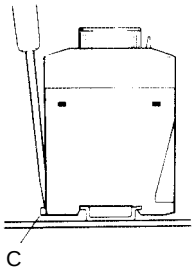
Mounting

First hook portion A of the Timer to an edge of the track and then depress the Timer in the direction of B.



Dismounting

Pull out portion C with a round-blade screwdriver and remove the Timer from the mounting track.



⚠ WARNING

Electrical Shock Hazard

Never touch the input terminals of any H3BG Timer while power is being applied to the Timer.

⚠ Caution

Power Supply Connection

If the Timer is connected to an AC power supply, its two-pole terminals can be connected to the power supply in either direction, regardless of the polarity. But if it is connected to a DC power supply, be sure to connect the Timer's power terminals to the correct polarities.

Use sine wave for the waveform of an AC power supply. Use a DC power supply having a ripple factor of 20% or less and supplying a mean voltage that is within the rated operating voltage range of the Timer.

Make sure that the supply voltage is applied to the Timer all at once, using contacts such as of a switch or relay. If the supply voltage is applied gradually, the Timer may not be able to perform power reset or its set time may be up when it should not.

Power Source Connection

Because the AC-operated version is a capacitive load, the solid-state relay to be used must be rated at a dielectric strength two times that of the Timer to switch the power source of the Timer.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L31-E1-7

OMRON

Solid-state Timer | H3BF

DIN-sized (48 x 48 mm) Twin Timer

- Sixteen selectable time rages (0.05 s to 100 hrs).
- Easy-to-read large scale and easy-to-set coaxial dual knob facilitate time setting.
- Equipped with ON and OFF operation indicators for control output.

RC

Ordering Information

Operation/ resetting system	Terminal	Time-limit contact	Model	
			Surface/ Track mounting	Flush mounting
Time-limit operation/ time-limit resetting/ self resetting	8-pin round socket	DPDT	H3BF-8 (with P2CF-08 socket)	H3BF-8 (with Y92F-30 adapter)

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

■ Accessories (Order Separately)

Same as H3BA except for the following exception.

Timer	Track mounted socket (see note 1)	Back connecting socket	
		Solder terminal	Screw terminal
H3BF-8	P2CF-08	PL08	P3G-08

Note: Track mounted socket can be used as a front connecting socket.

■ Replacements

H3BF	Replacement model	Reference page
H3BF-8	H3CR-F8	37
	H3CR-F8-300	

Specifications

■ Time Ranges

Time unit		s	min	hrs	10 h
Setting	0.5	0.05 to 0.5			0.5 to 5 h
	1	0.1 to 1			1 to 10 h
	5	0.5 to 5			5 to 50 h
	10	1 to 10			10 to 100 h

■ Ratings

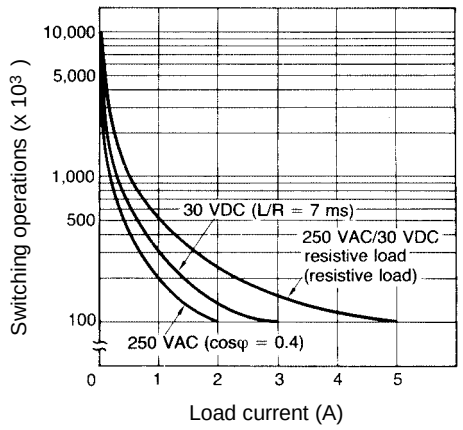
Rated supply voltage	100/110/120 or 200/220/240 VAC (50/60 Hz) 24, 48, 100 or 110 VDC (permissible ripple: 20% max.)
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	AC: approx. 10 VA/2 W; DC: approx. 1 W
Control outputs	5 A at 250 VAC, resistive load ($\cos\phi = 1$) Minimum permissible load (ref. value): 10 mA at 5 VDC

■ Characteristics

Accuracy of operating time	±0.3% (see note)
Setting error	±5%
Reset time	0.1 s max.
Influence of voltage	±0.5% (see note)
Influence of temperature	±2% max. (see note)
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts and between contact and control circuit) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: −10°C to 55°C
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 20,000,000 operations min. (under no load at 1,800 operations/h) Electrical: See *"Engineering Data."*
Approved standards	UL (File No. E41515), CSA (File No. LR22310)
Weight	Approx. 100 g

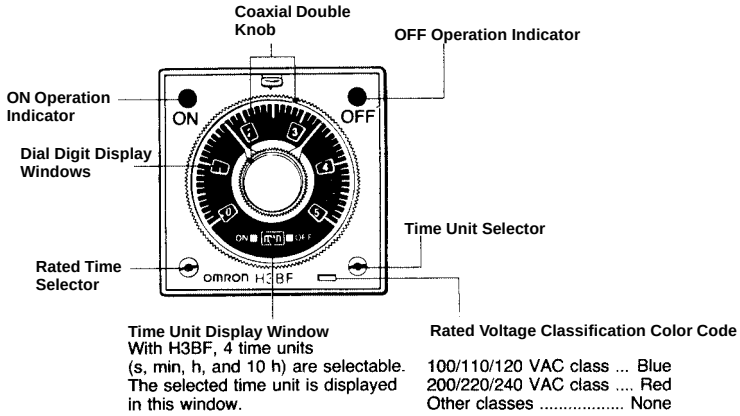
Note: When the timer is set at a rated time of 0.5 s or 1 s, add ±10 ms to the respective characteristics.

Engineering Data



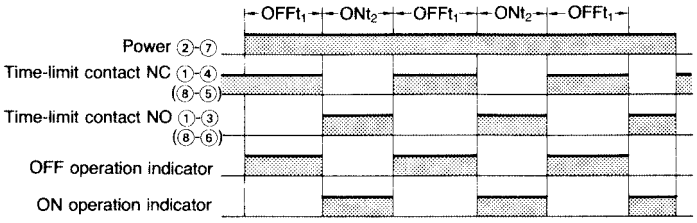
Nomenclature

H3BF-8



Operation

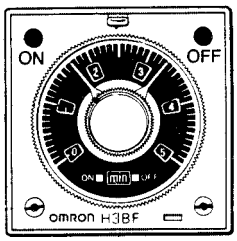
■ Timing Chart

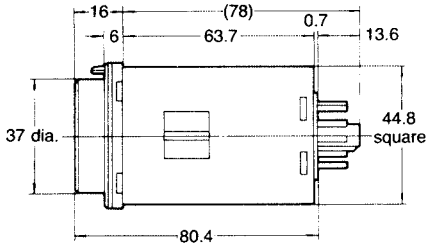


Dimensions

Note: All units are in millimeters unless otherwise indicated.

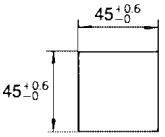
H3BF-8



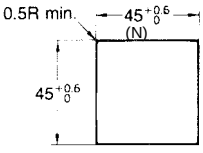


Panel Cutouts

When mounting a single unit
t = 1 to 3.2 mm

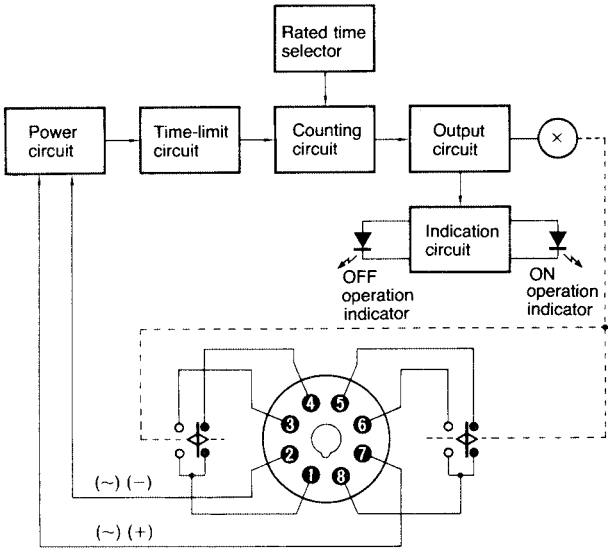


Horizontally connecting n units
No front cover:
$N = (48n - 2.5)^{+1}/_{-0}$
With front cover:
$N = \{48n - 2.5 + (n - 1) \times 3\}^{+1}/_{-0}$



Installation

■ Connection



Precautions

How to Change Time Unit and Rated Time

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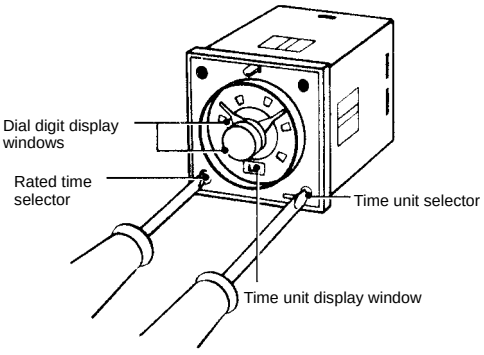
The following digits will appear in the respective dial digit display windows:

Rated time	Dial digits
0.5	0, 0.1, 0.2. 0.3, 0.4, 0.5
1	0, 0.2, 0.4, 0.6, 0.8, 1.0
5	0, 1, 2, 3, 4, 5
10	0. 2. 4. 6. 8. 10



Switch Setting

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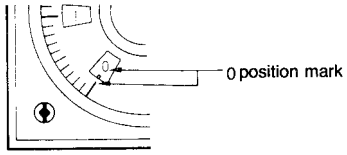
Accurately move and set the scale selector switch, matching the 0 position mark to a division on the scale.



⚠ Caution

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⚠ Caution

Power Supply Connection

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Power Source Connection

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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L31-E1-7

OMRON

Watertight Cover

Y92A- j j N

Ideal for Food Processing Machines or Other Applications that Require Watertightness

- Four sizes (96 x 96, 72 x 72, 48 x 96, 48 x 48) are available.
- Conforms to IP66 or NEMA4 (indoors).

Ordering Information

Model	Y92A-96N	Y92A-72N	Y92A-49N	Y92A-48N
Size	96 x 96 mm	72 x 72 mm	48 x 96 mm	48 x 48 mm

■ Materials

Front cover	94V-2 polycarbonate
Packing	Chloroprene rubber
Panel	SUS304

■ Applicable OMRON Products

Temperature Controller

ES100, E5AF, E5EF, Thermac X, W, S, E5T, E5P, E5KN, E5C2, E5C4

Timer

H3CR, H3B Series, H3CA, H5CR, H2C, H5CN, H5BR, H5AN

Counter

H8CA-S, H7CR, H8PS, H7BR, H8BM, H7CL, H7AN, H7CN

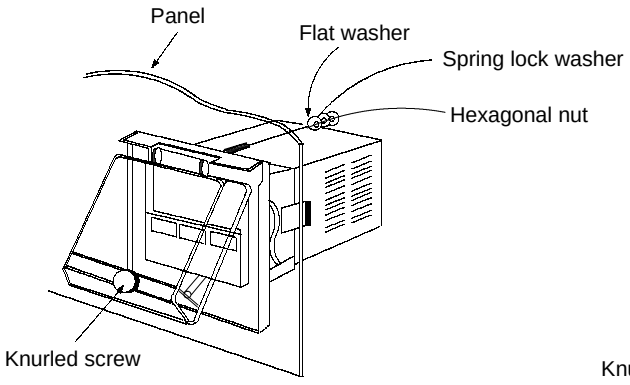
Intelligent Signal Processor/Digital Panel Meter

K3TX, K3TH, K3TR, K3TS, K3TE (see note), K3TF, K3TL

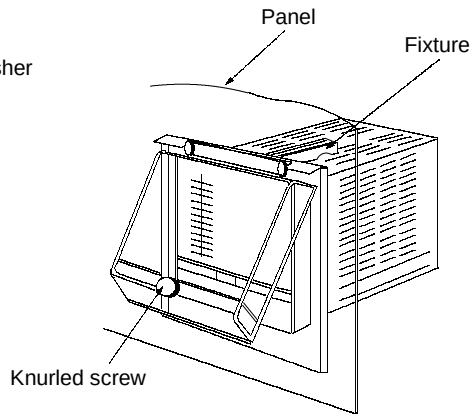
Note: Use the K32-L49MB (sold separately) for mounting.

Nomenclature

48 x 48 mm



96 x 96/72 x 72/48 x 96 mm

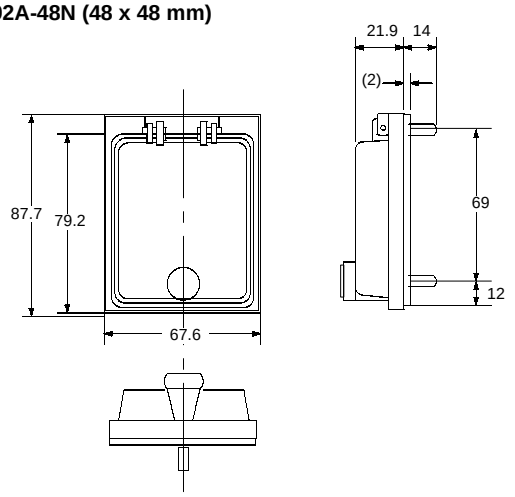


Note: Tighten the knurled screw to a torque of 0.03 N S m (3 kgf S cm) and the hexagonal nut to a torque of 0.05 N S m (5 kgf S cm).

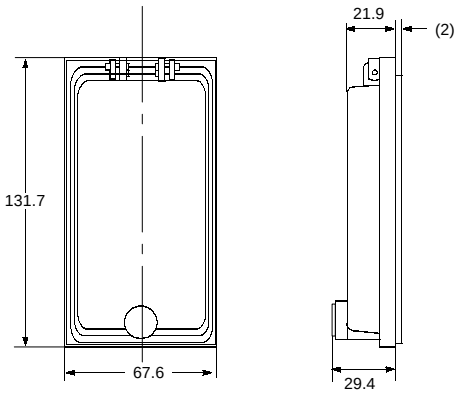
Dimensions

Note: All units are in millimeters unless otherwise indicated.

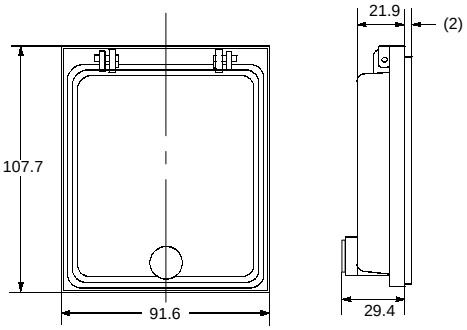
Y92A-48N (48 x 48 mm)



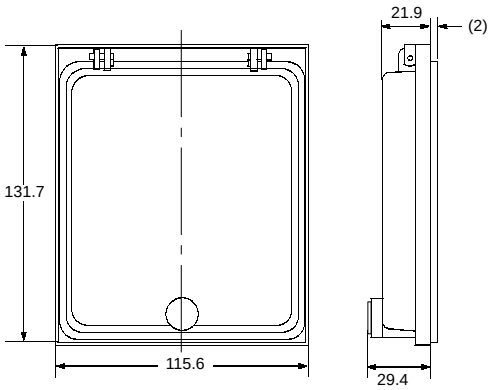
Y92A-49N (48 x 96 mm)



Y92A-72N (72 x 72 mm)

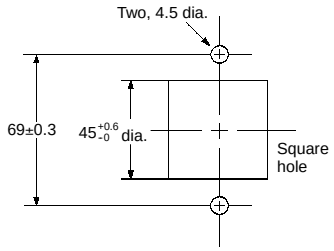


Y92A-96N (96 x 96 mm)



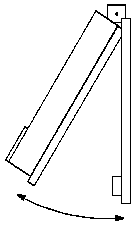
Panel Cutout

Y92A-48N (48 x 48 mm)



Precautions

It is possible to open or close the front cover by untightening or tightening the knurled screw.



Be sure to take the space required for the opening and closing of the front cover into consideration when installing the Watertight Cover.

The front cover is made of polycarbonbate, which can be cleaned using water, methanol, or ethanol.

Regularly check the packing, the quality of which will deteriorate over the process of time.

The front cover can be mounted in any direction.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. Q88-E1-1

OMRON

Solid-state Timer | H3G

Low-cost, Plug-in Solid-state Timer

- Time limit operation with automatic resetting.
- Subminiature DIN size (36 x 36 mm).
- Wide choice of supply voltages: 24, 100/110/120, or 200/220/240 VAC.
- Fits standard 8-pin sockets.
- Surface-mount timer converts to flush mounting style with optional adapter (see *Accessories*).
- LED power-ON indicator.

RC+

Ordering Information

Operation/resetting system	Time-limit contact	Mounting method	Rated time	Model
Time-limit operation/ self-resetting	SPDT	Surface mounting	1 s, 3 s, 5 s, 10 s, 30 s, 30 s, 60 s, 3 min, 5 min, 10 min, 30 min, 60 min, 3 hrs	H3G-8A
	DPDT		1 s, 3 s, 5 s, 10 s, 30 s, 30 s, 60 s, 3 min, 5 min, 10 min, 30 min, 60 min, 3 hrs	H3G-8C

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

Ex. H3G-8A 100/110/120 VAC 1 s

Rated time

Supply voltage

Specifications

■ Time Ranges

Rated time	Time range	Rated time	Time range
1 s	0.1 to 1 s	3 min	0.3 to 3 min
3 s	0.3 to 3 s	5 min	0.5 to 5 min
5 s	0.5 to 5 s	10 min	1 to 10 min
10 s	1 to 10 s	30 min	3 to 30 min
30 s	3 to 30 s	60 min	6 to 30 min
60 s	6 to 60 s	3 hrs	0.3 to 3 hrs

■ Ratings

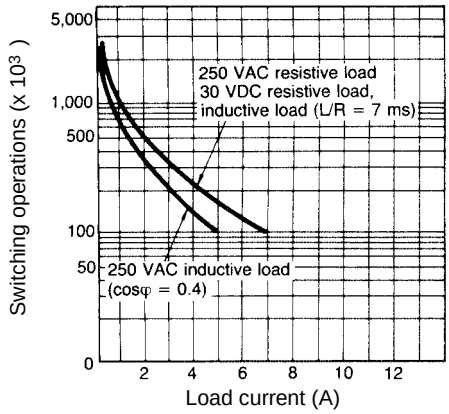
Rated supply voltage	24, 100/110/120 or 200/220/240 VAC (50/60 Hz); 12, 24 VDC
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	Approx. 3.4 VA (at 200 VAC)
Control outputs	H3G-8A: 7 A at 125/250 VAC, resistive load H3G-8C: 5 A at 125/250 VAC, resistive load

■ Characteristics

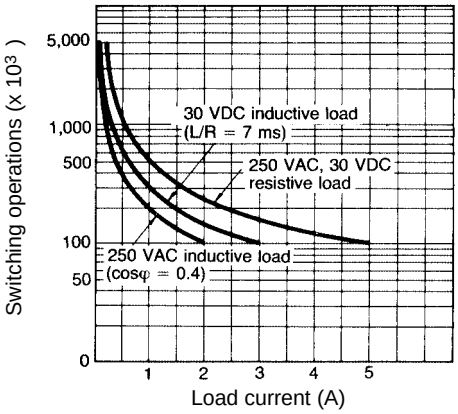
Accuracy of operating time	±2% max.
Setting error	±10% max.
Influence of voltage	±2% max.
Influence of temperature	±5% max.
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts, and between contact-carrying and control circuit, and between contacts of different poles) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude Malfunction: 10 to 55 Hz with 0.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 100 m/s^2 (approx. 10G)
Ambient temperature	Operating: −10°C to 55°C
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 10,000,000 operations min. Electrical: See *"Engineering Data."*
Approved standards	UL (File No. E41515) CSA (File No. LR22310) Input: 100/110/120, 200/220/240 VAC (50/60 Hz) Output: H3G-8A: 7 A at 125, 250 VAC (resistive load) H3G-8C: 5 A at 125, 250 VAC (resistive load) SEV
Weight	Approx. 55 g

Engineering Data

H3G-8A



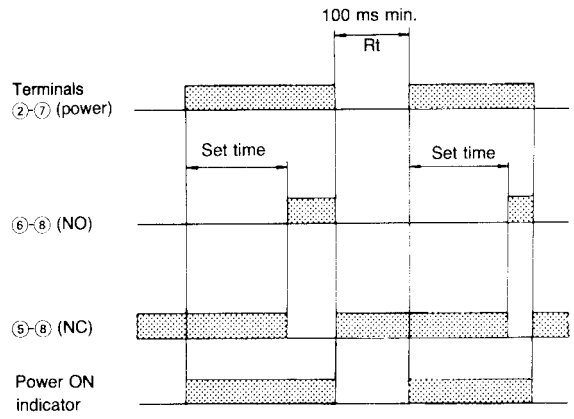
H3G-8C



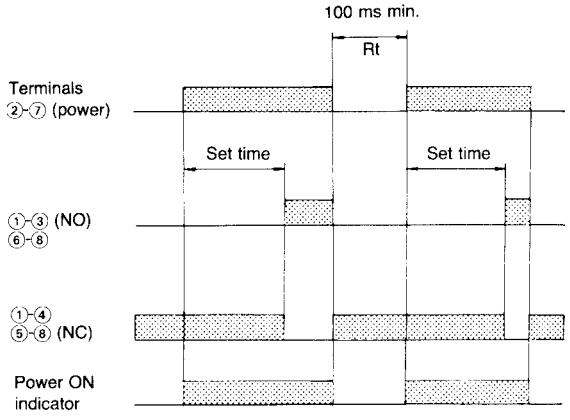
Operation

■ Timing Chart

H3G-8A

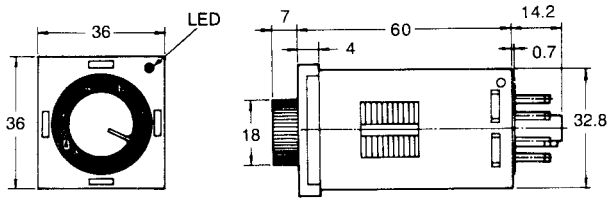


H3G-8C



Dimensions

Note: All units are in millimeters unless otherwise indicated.

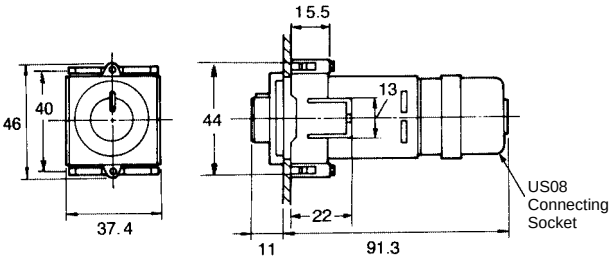


■ Accessories (Order Separately)

Adapter for Flush Mounting

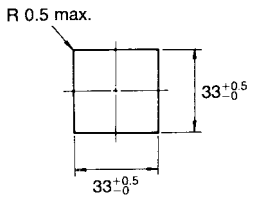
Y92F-31

Adapter Y92F-31 shown with H3G-8 j and connecting socket.



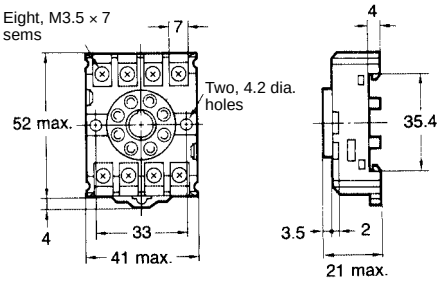
Panel Cutout

Recommended panel thickness: 1 to 5 mm

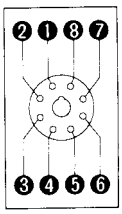


Track Mounting Socket

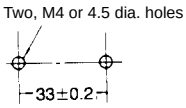
PF083A



Terminal Arrangement (Top View)

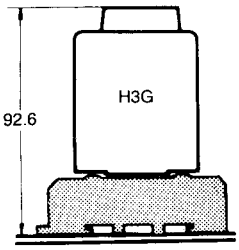


Mounting Holes

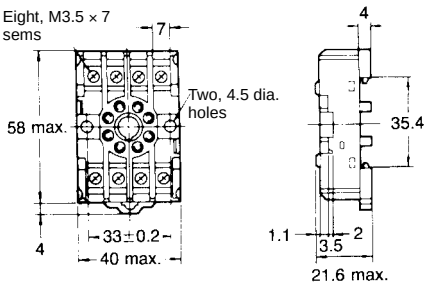


Note: PF085A can be used as a front connecting socket.

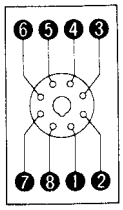
Mounting Height of Timer with Socket



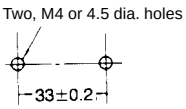
PF085A



Terminal Arrangement (Top View)

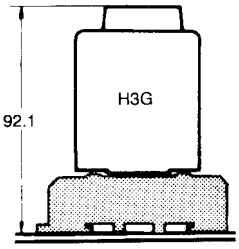


Mounting Holes



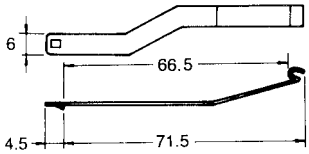
Note: PF085A can be used as a front connecting socket.

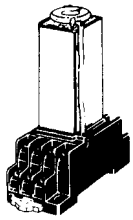
Mounting Height of Timer with Socket



Mounting Clips

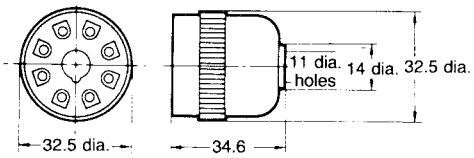
Y92H-6

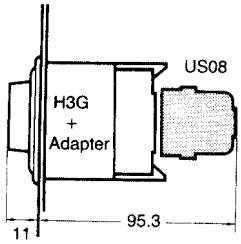




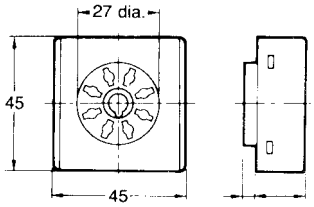
Connecting Socket

US08

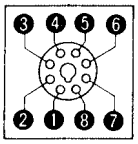


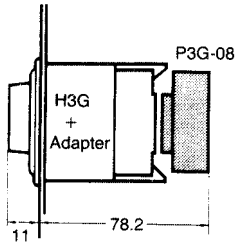


P3G-08



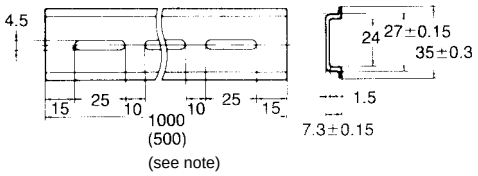
Terminal Arrangement (Bottom View)





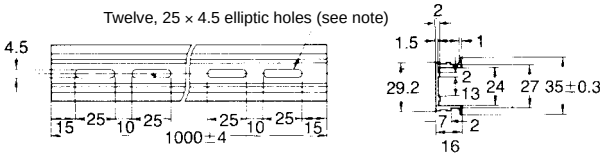
Mounting Track (Meets DIN EN50022)

PFP-100N/PFP-50N



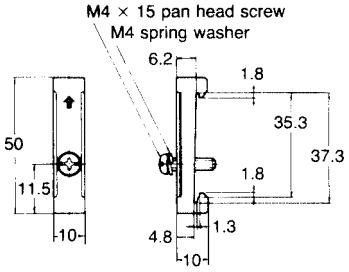
Note: This dimension applied to PFP-50N.

PFP-100N2



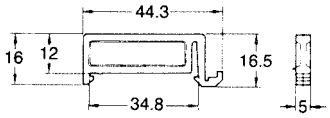
End Plate

PFP-M (for Track Mounting Socket)



Spacer

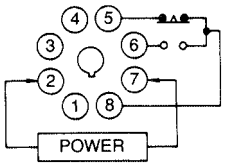
PFP-S (for Track Mounting Socket)



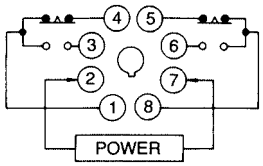
Installation

■ Terminal Arrangement

H3G-8A



H3G-8C



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L33-E1-4

OMRON

Solid-state Timer | H3CT

DIN 48 x 48-mm Standard Size Analog Timer

- Wide time range (for 4 series of models); 0.1 s to 30 hrs.
- Model with instantaneous contact available.
- High setting accuracy.

Ordering Information

Rated supply voltage	Instantaneous contact	Time ranges			
		B Series 0.1 s to 10 min	C Series 0.3 s to 30 min	D Series 0.1 min to 10 hrs	E Series 0.3 min to 30 hrs
100 to 120 VAC, 200 to 240 VAC, 12 VDC, 24 VDC	Yes	H3CT-8H			
	No	H3CT-8A			

Note: Specify both the model number and supply voltage when ordering.
Example: H3CT-8H 100 to 120 VAC B
B: Time range code
100 to 120 VAC: Supply voltage

Model Number Legend:

H3CT-8 j
1

1. Output Type
A: Time-limit SPDT
H: Time-limit SPDT, instantaneous SPDT

■ Accessories (Order Separately)

Track Mounting Socket	P2CF-08
Back Connecting Socket	P3G-08, PL-08
Flush Mounting Adapter	Y92F-30

Specifications

■ General

Item	H3CT-8A	H3CT-8H
Operating mode	ON-delay	
Pin type	8 pin	
Operating/Reset method	Time-limit operation/Self-reset	
Output type	Time-limit (SPDT)	Time-limit (SPDT), instantaneous (SPDT)
Mounting method	DIN track and surface mounting; Flush mounting with Y92F-30 Adapter (not provided)	

■ Time Ranges

Series	DIP switch setting		Time setting range	Maximum setting time
	Multiple rated time	Time unit		
B	x 1	sec	0.1 to 1 s	1 s
	x 10	sec	1 to 10 s	10 s
	x 1	min	0.1 to 1 min	1 min
	x 10	min	1 to 10 min	10 min
C	x 3	sec	0.3 to 3 s	3 s
	x 30	sec	3 to 30 s	30 s
	x 3	min	0.3 to 3 min	3 min
	x 30	min	3 to 30 min	30 min
D	x 1	min	0.1 to 1 min	1 min
	x 10	min	1 to 10 min	10 min
	x 1	hrs	0.1 to 1 hrs	1 hr
	x 10	hrs	1 to 10 hrs	10 hrs
E	x 3	min	0.3 to 3 min	3 min
	x 30	min	3 to 30 min	30 min
	x 3	hrs	0.3 to 3 hrs	3 hrs
	x 30	hrs	3 to 30 hrs	30 hrs

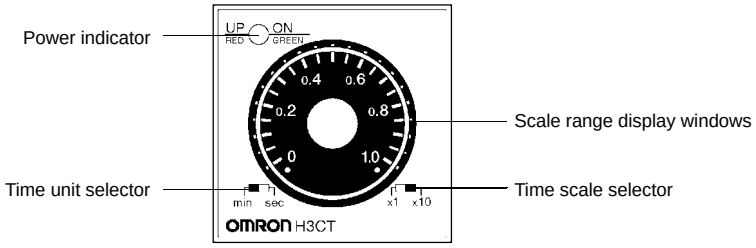
■ Ratings

Rated supply voltage	200 to 240 VAC (50/60 Hz)	100 to 120 VAC (50/60 Hz)	24 VDC	12 VDC
Operating voltage range	85% to 110% of rated supply voltage			90% to 110% of rated supply voltage
Power consumption	9.3 VA	4.4 VA	1.3 W	1 W
Control outputs	5 A at 250 VAC, resistive load (cosϕ = 1)			

■ Characteristics

Accuracy of operating time	±1% FS max. (±10 ms FS in ranges of 0.5 and 1 s)
Setting error	±5%
Influence of voltage	±1% (±10 ms FS in range of 0.5 and 1 s)
Influence of temperature	±2% (±10 ms FS in range of 0.5 and 1 s)
Insulation resistance	100 MΩ
Dielectric strength	2,000 VAC (between current-carrying metal parts and exposed non-current-carrying metal parts) 2,000 VAC (between control output terminals and operating circuit) 1,000 VAC (between contacts not located next to each other)
Vibration resistance	Destruction: 0.75-mm single amplitude each in three directions Malfunction: 0.5-mm single amplitude each in three directions
Ambient temperature	Operating: −10°C to 55°C (with no icing)
Ambient humidity	Operating: 35% to 85%
Life expectancy	Mechanical: 10,000,000 operations min. (at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, cosϕ = 1, at 1,800 operations/h)

Nomenclature



Operation

■ Basic Operation

Time Unit Selection

The desired time unit can be selected with the time unit selector located at lower-left corner of the front panel.

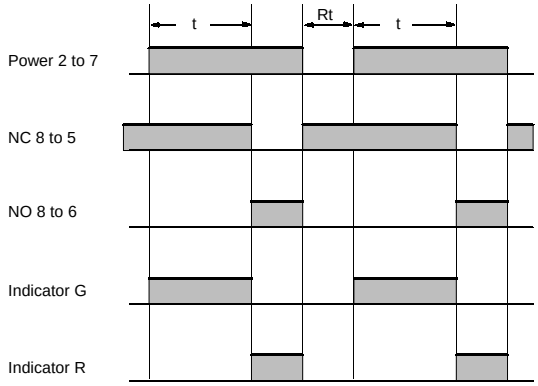
Time Scale Selection

The scale is selected with the time scale selector at the lower-right corner of the front panel.

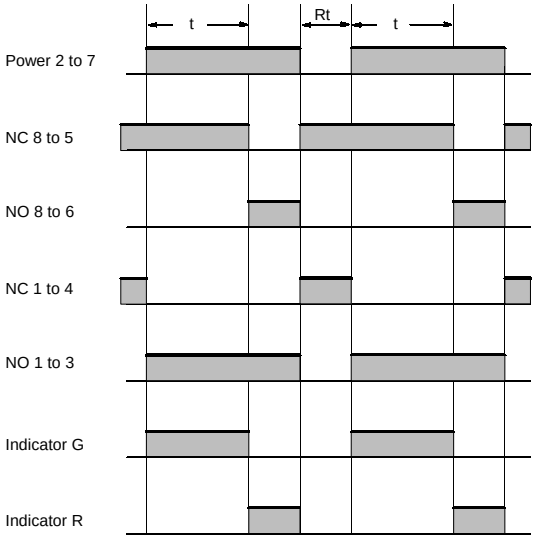
■ Timing Charts

Note: 1. The minimum power-operating time, “Rt,” is 0.1 s.
2. The “t” in the timing charts stands for the set time.

H3CT-8A



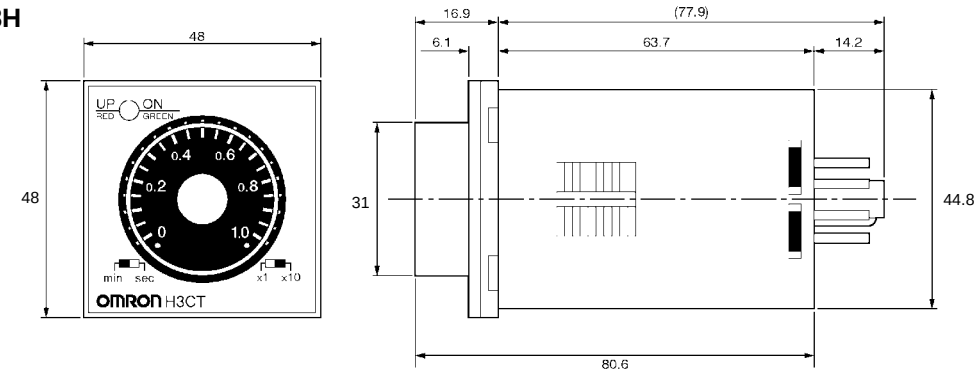
H3CT-8H



Dimensions

Note: All units are in millimeters unless otherwise indicated.

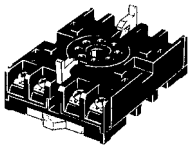
H3CT-8A/-8H

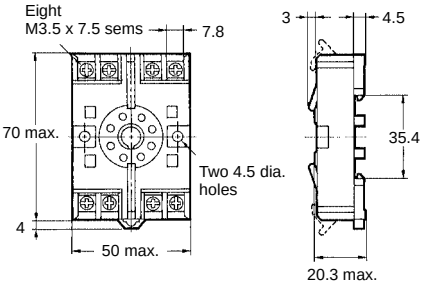


■ Accessories (Order Separately)

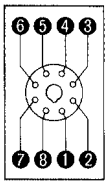
Track Mounting Socket

P2CF-08

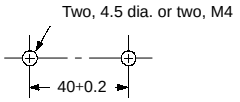




Terminal Arrangement/ Internal Connections (Top View)

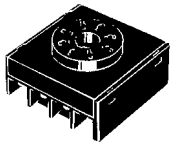


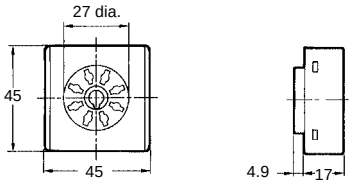
Surface Mounting Holes



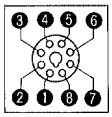
Back Connecting Socket

P3G-08

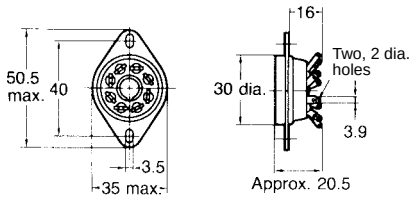




Terminal Arrangement/ Internal Connections (Bottom View)

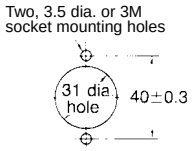


PL08



Terminal Arrangement (Bottom View)

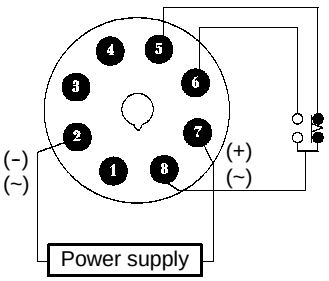
Mounting Holes



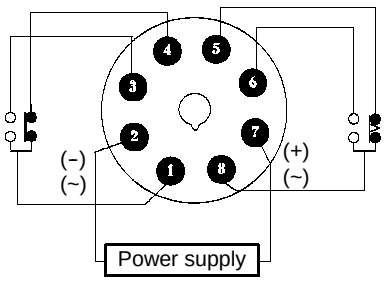
Installation

■ Terminal Arrangement

H3CT-8A



H3CT-8H



Precautions

Power Supplies

The power supply circuit of the H3CT uses the capacitor drop method. This circuit should be used with a commercial sine-wave frequency. The internal circuit may be damaged if a power supply with higher frequency (i.e., inverter power supply) is used.

Environment

When using the Timer in an area with excess electronic noise, separate the Timer, wiring, and the equipment which generates the input signals as far as possible from the noise sources. It is also recommended to shield the input signal wiring to prevent electronic interference.

Organic solvents (such as paint thinner), as well as very acidic or basic solutions can damage the outer casing of the Timer.

Others

If the Timer is mounted on a control board, dismount the timer from the control board or short-circuit the circuitry of the power board before carrying out a voltage withstand test between the electric circuitry and non current-carrying metal part of the Timer, in order to prevent the internal circuitry of the Timer from damage.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. L88-E1-1

OMRON Corporation
Systems Components Division
28th Fl., Crystal Tower Bldg.
1-2-27, Shiromi, Chuo-ku,
Osaka 540 Japan
Phone: 06-949-6012
Fax: 06-949-6021

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