

# Solid-state Timer 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 EN61812-1 and approved by UL and CSA.

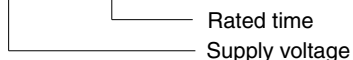


## Ordering Information

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 (See note 3.)	H3Y-4-0 (See note 3.)

**Note:** 1. Specify both the model number, supply voltage, and rated time when ordering.

Ex. H3Y-2 100 to 120 VAC 0.5 s



2. Sockets and Hold-down Clips are not included with the H3Y. They must be ordered separately.
3. Use the H3Y-4 or H3Y-4-0 Series when switching micro loads.

## Accessories (Order Separately)

Timer	Track-mounted Socket (See note.)	Back-connecting Socket		
		Solder terminal	Wire-wrap terminal	PC terminal
H3Y-2	PYF08A, PYF08A-N, PYF08A-E	PY08	PY08QN(2)	PY08-02
H3Y-4	PYF14A, PYF14A-N, PYF14A-E	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)
<b>Rated supply voltage (See note 6.)</b>	24, 100 to 120 (50/60 Hz), 200 to 230 VAC (50/60 Hz) (See note 1.), 12, 24, 48, 125, 100 to 110 VDC (See notes 2 and 3.)
<b>Operating voltage range</b>	All rated voltages except 12 VDC: 85% to 110% of rated supply voltage 12 VDC: 90% to 110% of rated supply voltage (See note 4.)
<b>Reset voltage</b>	10% min. of rated supply voltage (See note 5.)
<b>Power consumption</b>	100 to 120 VAC: Relay ON: Approx. 1.8 VA (1.6 W) at 120 VAC, 60 Hz Relay OFF: approx. 1 VA (0.6 W) at 120 VAC, 60 Hz 200 to 230 VAC: Relay ON: Approx. 2.2 VA (1.8 W) at 230 VAC, 60 Hz Relay OFF: Approx. 1.5 VA (1.1 W) at 230 VAC, 60 Hz 24 VAC: Relay ON: Approx. 1.8 VA (1.4 W) at 24 VAC, 60 Hz Relay OFF: Approx. 0.3 VA (0.2 W) at 24 VAC, 60 Hz 12 VDC: Relay ON: Approx. 1.1 W at 12 VDC Relay OFF: Approx. 0.1 W at 12 VDC 24 VDC: Relay ON: Approx. 1.1 W at 24 VDC Relay OFF: Approx. 0.1 W at 24 VDC 48 VDC: Relay ON: Approx. 1.2 W at 48 VDC Relay OFF: Approx. 0.3 W at 48 VDC 100 to 110 VDC: Relay ON: Approx. 1.6 W at 110 VDC Relay OFF: Approx. 0.4 W at 110 VDC 125 VDC: Relay ON: Approx. 1.6 W at 125 VDC Relay OFF: Approx. 0.4 W at 125 VDC
<b>Control outputs</b>	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:**
- Do not use the output from an inverter as the power supply. Refer to *Safety Precautions for All Times* for details.
  - With DC ratings, single-phase full-wave rectified power sources may be used.
  - Only the H3Y-2 and H3Y-2-0 Series include 2-VDC models.
  - 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.
  - Set the reset voltage as follows to ensure proper resetting.
    - 100 to 120 VAC: 10 VAC max.
    - 200 to 230 VAC: 20 VAC max.
    - 100 to 110 VDC: 10 VDC max.
  - Refer to *Safety Precautions for All Times* when combining the Timer with an AC 2-wire proximity sensor.

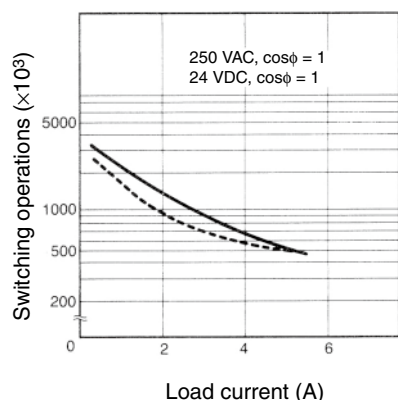
## ■ Characteristics

<b>Accuracy of operating time</b>	±1% FS max. (0.5 s range: ±1%±10 ms max.)
<b>Setting error (see note 1)</b>	±10%±50 ms FS max.
<b>Reset time</b>	Min. power-opening time: 0.1 s max. (including halfway reset)
<b>Reset voltage</b>	10% max. of rated supply voltage
<b>Influence of voltage (see note 1)</b>	±2% FS max.
<b>Influence of temperature (see note 1)</b>	±2% FS max.
<b>Insulation resistance</b>	100 MΩ min. (at 500 VDC)
<b>Dielectric strength</b>	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)
<b>Vibration resistance</b>	Destruction: 10 to 55 Hz, 0.75-mm single amplitude Malfunction: 10 to 55 Hz, 0.5-mm single amplitude
<b>Shock resistance</b>	Destruction: 1,000 m/s <sup>2</sup> (approx. 100G) Malfunction: 100 m/s <sup>2</sup> (approx. 10G)
<b>Ambient temperature</b>	Operating: -10°C to 50°C (with no icing) Storage: -25°C to 65°C (with no icing)
<b>Ambient humidity</b>	Operating: 35% to 85%
<b>Life expectancy</b>	Mechanical: 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)
<b>Impulse withstand voltage</b>	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
<b>Noise immunity</b>	±1.5 kV, square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
<b>Static immunity</b>	Destruction: 8 kV Malfunction: 4 kV
<b>Enclosure rating</b>	IP40
<b>Weight</b>	Approx. 50 g
<b>EMC</b>	(EMI) EN61812-1 Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A (EMS) EN61812-1 Immunity ESD: EN61000-4-2: 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4) Immunity Surge: EN61000-4-5: 2 kV line to ground (level 3) 1 kV line to line (level 3)
<b>Approved standards</b>	UL508, CSA C22.2 No. 14, Lloyds Conforms to EN61812-1 and IEC60664-1. (2.5 kV/2 for H3Y-2/-2-0, 2.5 kV/1 for H3Y-4/-4-0) Output category according to EN60947-5-1.

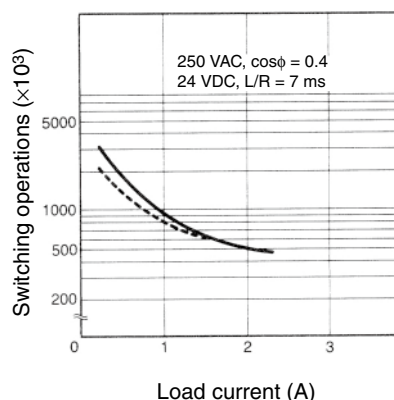
- Note:** 1. Add ±10 mS to the above value for the 0.5-S range model.  
2. Terminal screw sections are excluded.

# Engineering Data

H3Y-2, H3Y-2-0

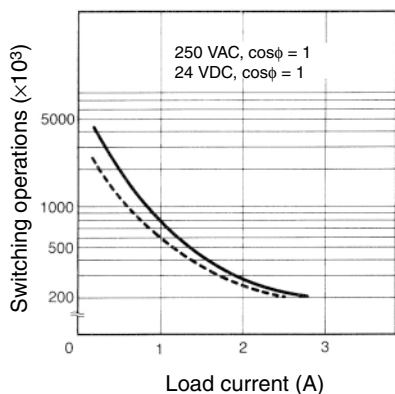


H3Y-2, H3Y-2-0

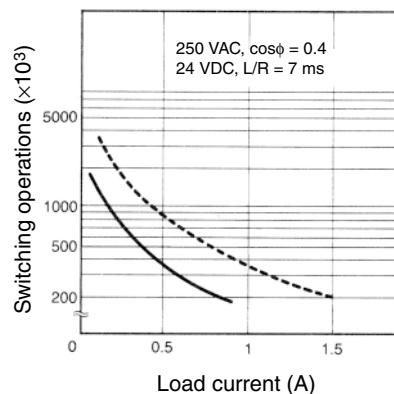


Reference: A maximum current of 0.6 A can be switched at 125 VDC ( $\cos\phi = 1$ ).  
Maximum current of 0.2 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 1 mA at 5 VDC (P reference value).

H3Y-4, H3Y-4-0



H3Y-4, H3Y-4-0

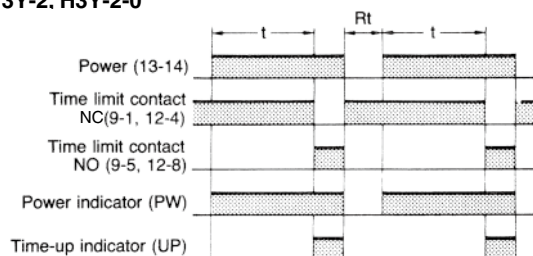


Reference: A maximum current of 0.5 A can be switched at 125 VDC ( $\cos\phi = 1$ ).  
Maximum current of 0.2 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 1 mA at 1 VDC (P reference value).

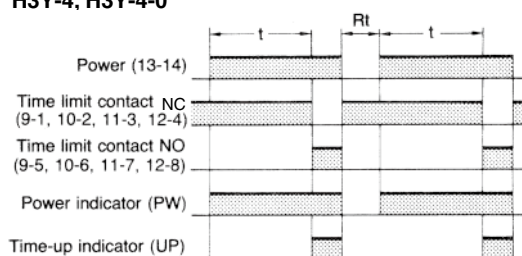
## Operation

### ■ Timing Chart

H3Y-2, H3Y-2-0



H3Y-4, H3Y-4-0

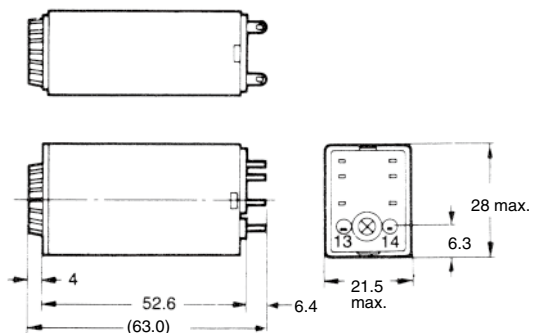


# Dimensions

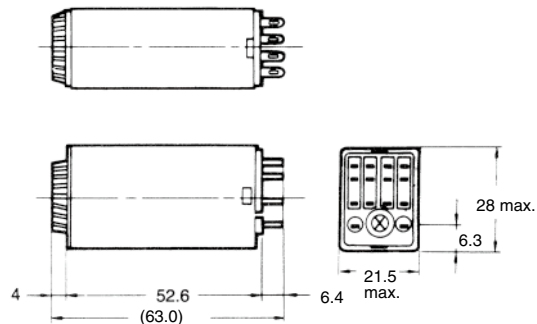
Note: All units are in millimeters unless otherwise indicated.

## Timers

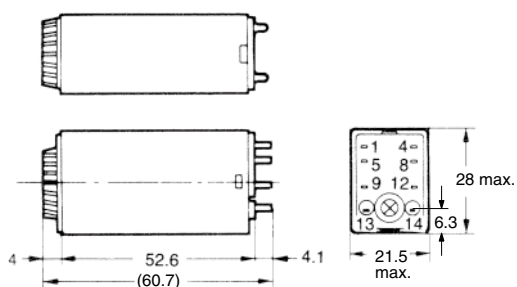
H3Y-2



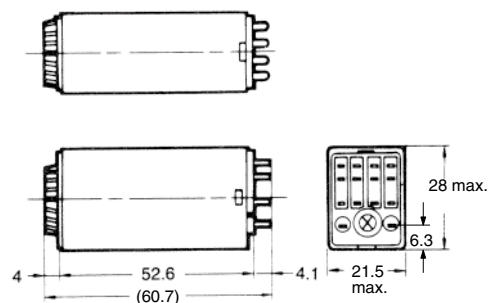
H3Y-4



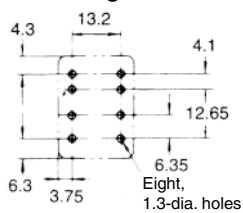
H3Y-2-0



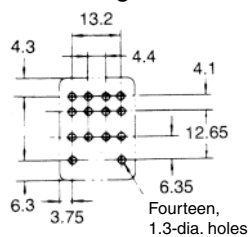
H3Y-4-0



Mounting Holes



Mounting Holes

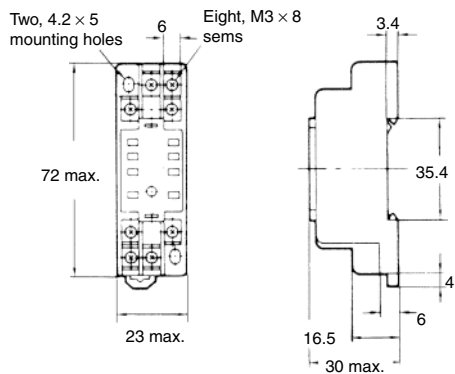


## ■ Accessories (Order Separately)

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

### Track Mounting/Front Connecting Sockets

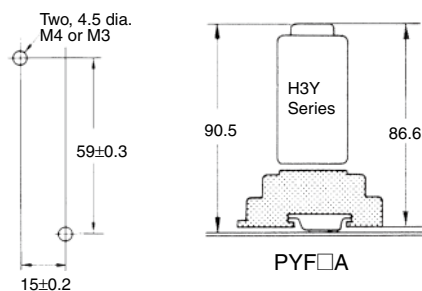
#### PYF08A



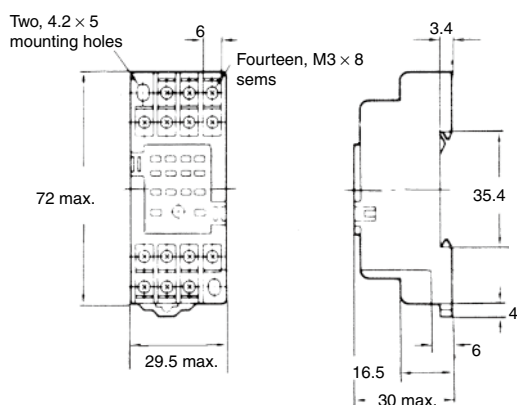
Terminal Arrangement (Top View)



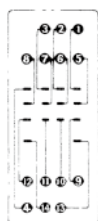
Mounting Holes



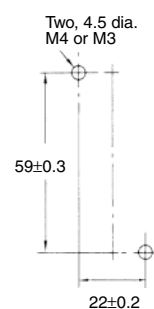
#### PYF14A



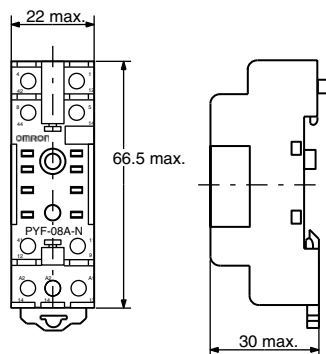
Terminal Arrangement (Top View)



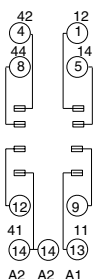
Mounting Holes



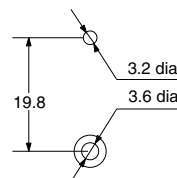
#### PYF08A-N



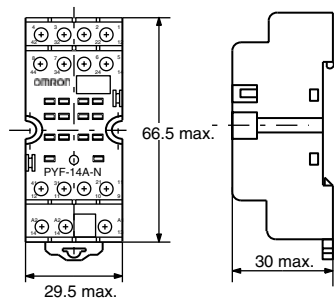
Terminal Arrangement



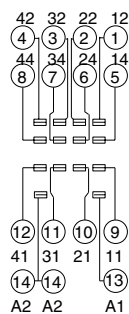
Mounting Holes (for Surface Mounting)



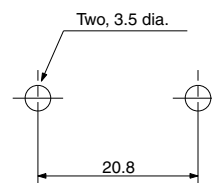
#### PYF14A-N



Terminal Arrangement

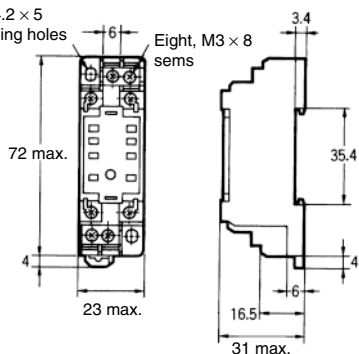


Mounting Holes (for Surface Mounting)

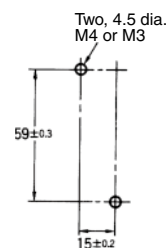
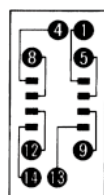


## PYF08A-E

Two, 4.2 × 5 mounting holes

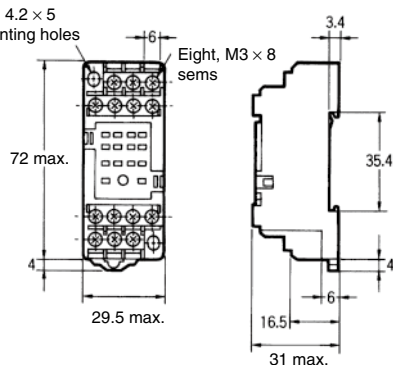


(Top View)

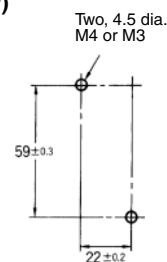
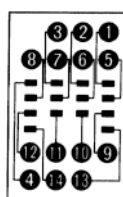


## PYF14A-E

Two, 4.2 × 5 mounting holes



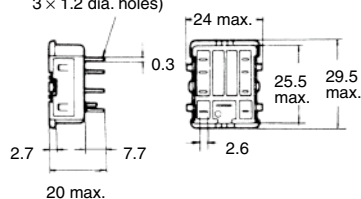
(Top View)



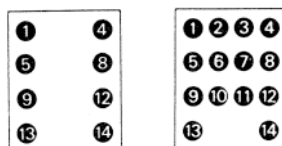
## Back Connecting Sockets

### PY08, PY14

Eight, 3 × 1.2 dia. holes only for PY08 (Fourteen, 3 × 1.2 dia. holes)



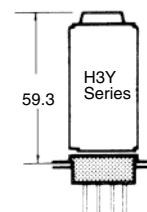
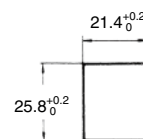
Terminal Arrangement (Bottom View)



PY08

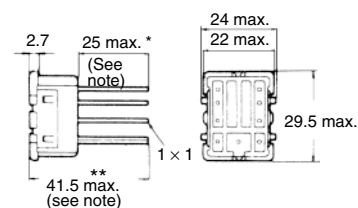
PY14

Panel Cutout

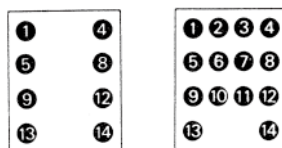


PY□, PY□-02, PY□QN(2)

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



Terminal Arrangement (Bottom View)

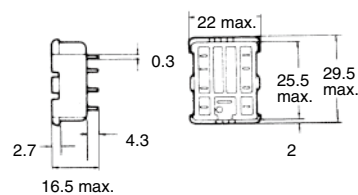


PY08QN  
PY08QN(2)

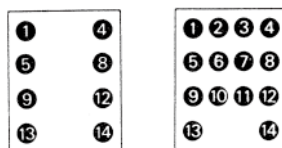
PY14QN  
PY14QN(2)

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

### PY08-02, PY14-02



Terminal Arrangement (Bottom View)



PY08-02

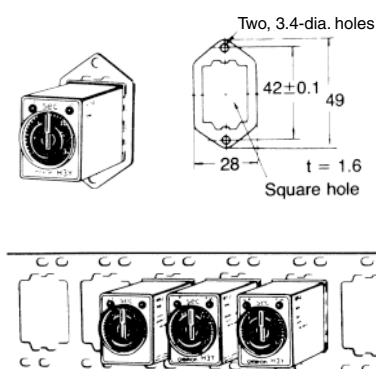
PY14-02

## Socket Mounting Plates (t = 1.6)

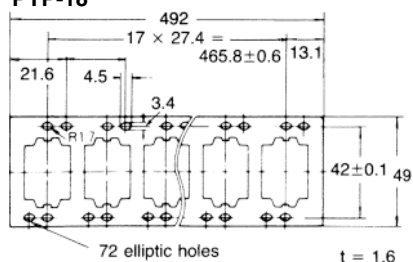
Applicable socket	For mounting 1 socket	For mounting 18 sockets
PY08, PY14, PY08QN(2), PY14QN(2)	PYP-1	PYP-18

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

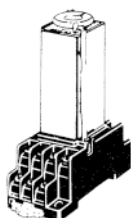
### PYP-1



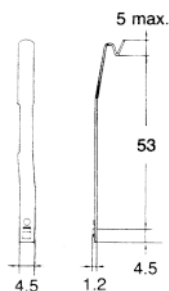
### PYP-18



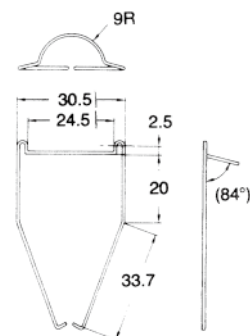
### Relay Hold-down Clips



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

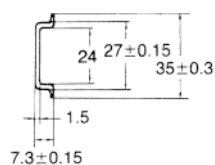
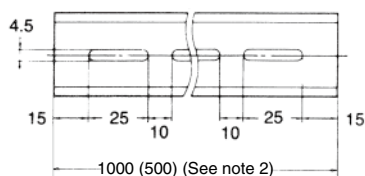


### Y92H-4 for PY□ Socket



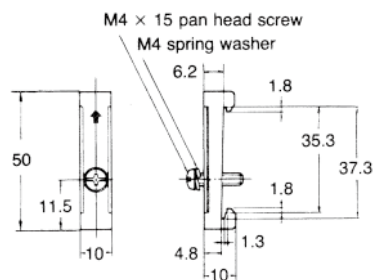
### Mounting Track

PF-P100N/PFP-50N (see note 1)



### End Plate

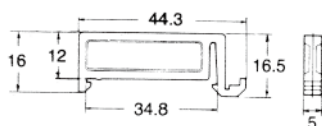
PFP-M



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

### Spacer

PFP-S

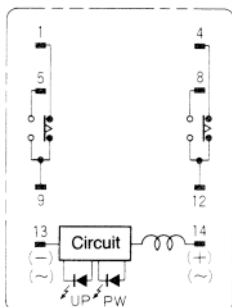




# Installation

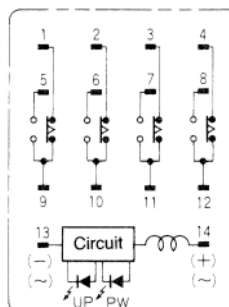
## ■ Connection

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



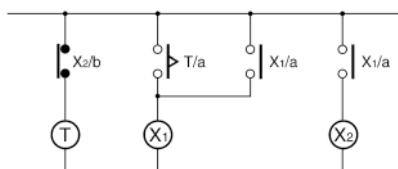
Connect the DC power supply to terminals 13 and 14 according to the polarity marks.

## Safety 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.

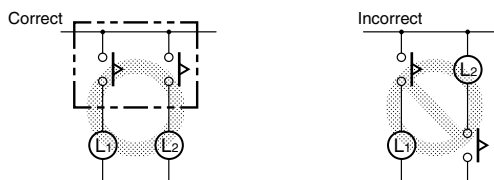
The operating voltage will increase when using the H3Y in any place where the ambient temperature is more than 50°C. Supply 90% to 110% of the rated voltages (at 12 VDC: 95% to 110%) when operating at 45°C or higher.

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.

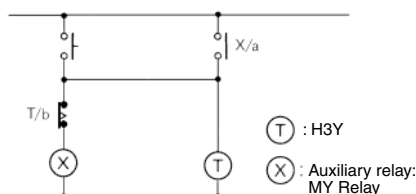


(X) : Auxiliary relay such as MY Relay

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 EN61812-1

### Conformance

The H3Y as a built-in timer conforms to EN61812-1 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.

Basic insulation is ensured between the H3Y's operating circuit and control output.

Insulation requirement: Overvoltage category II, pollution degree 1 (H3Y-4/-4-0), pollution degree 2 (H3Y-2/-2-0) (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.

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

# Safety Precautions for All Timers

Refer to the *Safety Precautions* for individual Timers for precautions specific to each Timer.

## ⚠ WARNING

The following Timers contain lithium batteries that are not explosion proof.



1. Timers with Built-in Batteries: H5L  
The Timer contains a lithium battery, which may occasionally ignite or rupture. Do not disassemble, deform under pressure, heat to 100°C or higher, or incinerate the Timer.
2. Timers with Replaceable Batteries: Y92S-20 (for H5CN-M)  
The battery may occasionally rupture, ignite, or leak fluid. Do not short the positive and negative terminals. Do not charge, disassemble, deform under pressure, or throw the battery into a fire. If a non-specified battery is used, the battery may leak fluid or rupture, occasionally resulting in equipment failure or minor injury. Use only the specified battery.

## ⚠ CAUTION

The following Timers contain lithium batteries that are explosion proof.



Timers with Built-in Batteries: H5BR, H5AN-4DM, H5S, H5F, and H4KV

The Timer contains a lithium battery, which may occasionally ignite or rupture. Do not disassemble, deform under pressure, heat to 100°C or higher, or incinerate the Timer.

## ■ Precautions for Safe Use

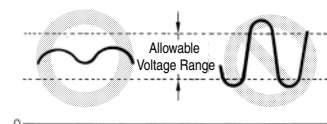
### Operating Environment

- Use the Timer within the ratings specified for ambient operating temperature and ambient operating humidity for each model.
- Store the Timer with the specified temperature range for each model. If the Timer has been stored at a temperature of less than -10°C, allow the Timer to stand at room temperature for at least 3 hours before using it.
- Use the Timer within the performance specified for water and oil exposure for each model.
- Do not use the Timer in locations subject to shock and vibration. Long-term usage in such locations may damage the Timer due to stress.  
Magnetic contactors generate a shock of 1,000 to 2,000 m/s<sup>2</sup> when switching a load. When mounting to DIN Track, separate magnetic contactors from the Timer so that the Timer is not subjected to vibration and shock. Use anti-vibration rubber.
- Do not use the Timer in locations subject to excessive dust, corrosive gases, or direct sunlight.
- Do not use organic solvents (such as paint thinner or benzene), strong alkalis, or strong acids because they will damage the external finish of the Timer.
- Separate the input devices, input wiring, and Timer as far as possible from sources of noise and power lines carrying noise.
- When using the Timer in environments subject to large amounts of static electricity (e.g., pipes carrying molding materials, powders, or fluid materials), separate the Timer as far as possible from the sources of static electricity.
- Do not remove the external case from the Timer.
- Do not use the Timer in locations where condensation may occur due to high humidity or sudden temperature changes. Condensation inside the Timer may result in malfunction or damage to Timer elements.
- The life of internal parts may be reduced if Timers are mounted in close proximity to each other.
- Resin and rubber parts (e.g., rubber packing) may deteriorate, shrink, or harden depending on the operating environment (e.g., subjected to corrosive gases, ultraviolet light, or high temperatures). We recommend periodic inspection and replacement.

- Normal operation may not be possible in locations subject to sulfidizing gas, such as in sewer systems or waste incinerators. OMRON does not market any Timers or other control devices for operation in atmospheres containing sulfidizing gas. Seal the Timer so that sulfidizing gas will not enter it. If sealing is not possible, OMRON does provide special Timers with improved resistance to sulfidizing gas. Ask your OMRON representative for details.

### Power Supply

- Be sure that the voltage applied is within the specified range, otherwise the internal elements of the Timer may be damaged.
- Install a switch or circuit breaker that allows the operator to immediately turn OFF the power, and label it to clearly indicate its function.
- Maintain voltage fluctuations in the power supply within the specified range.



- Use a commercial power supply for the power supply voltage input to models with AC inputs. Inverters with an output frequency of 50/60 Hz are available, but the rise in the internal temperature of the Timer may result in ignition or burning. Do not use an inverter output for the power supply of the Timer.
- The Timers listed below cannot be directly turned ON and OFF by using an AC 2-wire proximity sensor to turn the Timer's power supply ON and OFF. Use the following countermeasure when using an AC 2-wire proximity sensor with the Timer. (The power supply circuit in the Timer uses half-wave rectification. Only a half AC wave is supplied to the proximity sensor, which may cause operation to be unstable.)

#### Applicable Models

H3Y, H3YN, H3RN, H3CA-8, RD2P, and H3CR(-A, -A8, -AP, -F, and -G)

#### Countermeasure

- Wire through a relay and use the relay contacts to turn the power supply ON and OFF.  
Confirm the stability of operation after making the connections.
- Install protective measures (such as earth leakage breakers, wiring breakers, or fuses) on the power supply side according to any applicable laws or regulations.

## Correctly Handling Input Signals

Malfunction due to noise may occur if input wiring is placed in the same duct or conduit as power lines or high-voltage lines. Separate input wiring from power lines and wire them in a separate system. Also, use shielded cables, use metal conduits, and keep wiring distances as short as possible.

## Timers with Relays

- Do not connect a load that exceeds contact ratings, such as the switching capacity (contact voltage or contact current). Insulation faults, contact welding, contact faults, and other failures to achieve specified performance may occur and the relay may be damaged or may burn.
- Continued use with deteriorated performance may ultimately result in insulation breakdown between circuits or relay burning. The life of the built-in relay is greatly affected by switching conditions. Before using the Timer, test operation under actual application conditions and confirm that the switching frequency presents no problems in performance.
- Electrical life depends on the type of load, switching frequency, and ambient environment. Observe the following precautions when using the Timer. When switching a DC load, contact transfer may cause the contacts to stick or may cause contact failure. Confirm applicability and consider using a surge absorbing element. When switching at high frequencies, heat generated by arcing may cause contacts to melt or may cause metal corrosion. Consider connecting an arc absorbing element, reducing the switching frequency, or lowering the humidity.
- The surge current depends on the type of load, which also affects contact switching frequency and the number of operations. Check the rated current and the surge current, and design the circuits with sufficient margin.

Resistive load	Solenoid load	Motor load	Incandescent lamp load
Rated current	10 to 20 times the rated current	5 to 10 times the rated current	10 to 20 times the rated current

Sodium light loads	Capacitor loads	Transformer loads	Mercury light loads
1 to 3 times the rated load	20 to 40 times the rated load	5 to 15 times the rated load	1 to 3 times the rated load

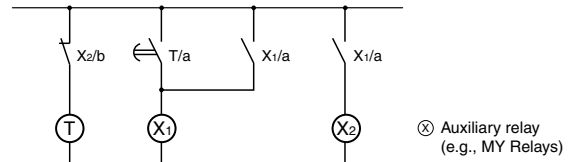
- Arcing when switching and relay heating may result in ignition or explosion. Do not use the Timer in atmospheres subject to inflammable or explosive gases.
- Contact faults may occur. Do not use the Timer in atmospheres subject to sulfidizing gas, chloride gas, or silicon gas.
- The switching capacity for DC voltage loads is lower than that for AC voltage loads.

## Timers with Non-contact Outputs

- Short faults or open faults may occur due to destruction of the output element. Do not use the Timer for a load that exceeds the rated output current.
- Short faults or open faults may occur due to destruction of the output element from reverse electromotive force. When using the Timer for a DC inductive load, always connect a diode as a countermeasure against reverse electromotive force.

## Other Precautions

- Confirm that you have the correct model before using it.
- Be sure that all terminals are wired correctly.
- Always test the output status with a tester before using a Timer with a built-in keep relay (e.g., the H3CR-H and H3DE-H). Shock resulting from dropping the Timer during transport or handling may cause the output contacts to reverse or to be in a neutral status.
- Leaving the Timer with outputs ON at a high temperature for a long time may hasten the degradation of internal parts (such as electrolytic capacitors). Use the Timer in combination with relays and avoid leaving the Timer with the output turned ON for an extended period of time (e.g., for more than a month). Reference Example (Use the Timer as shown below.)



- Be sure that only a qualified worker (e.g., an electrical engineer) performs electrical work for the Timer.

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## Read and Understand This Catalog

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