

# Solid-state Timer

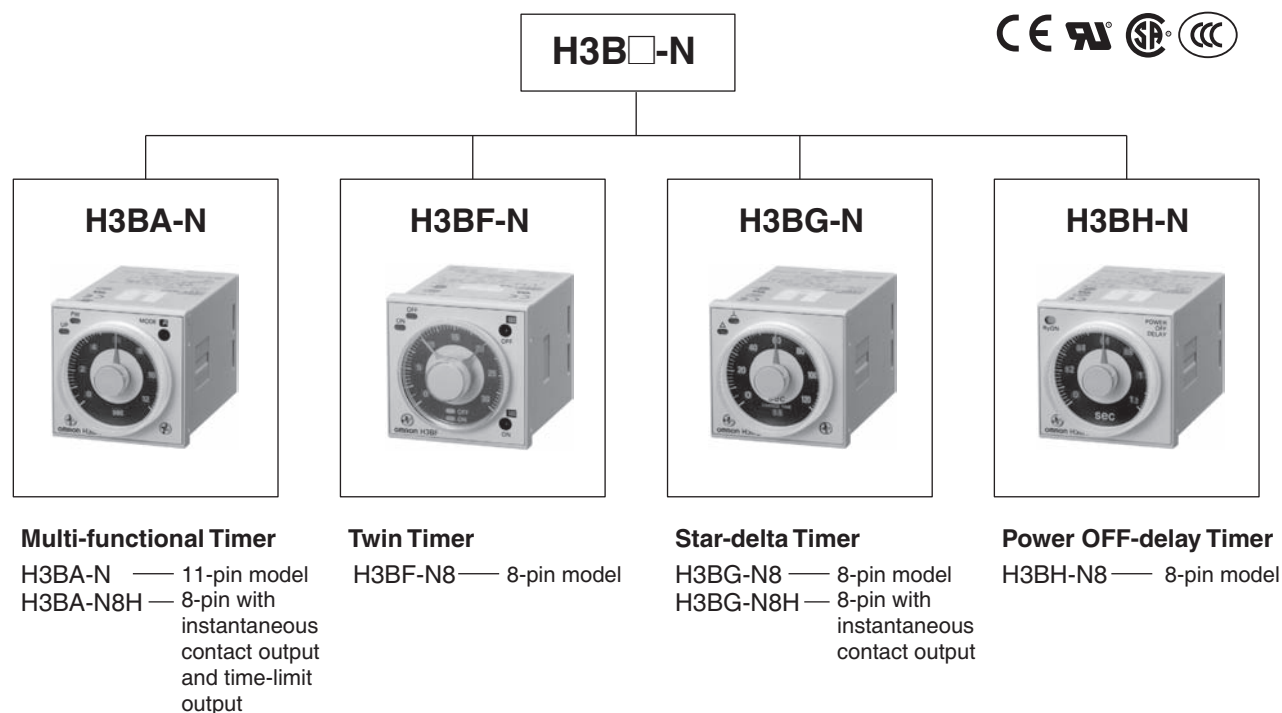
## H3BF-N/BG-N/BH-N

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments. Refer to *Warranty and Application Considerations* (page 23), and *Safety Precautions* (page 22).

### A Wide Variety of DIN 48 x 48-mm Twin Timers, Star-delta Timers, and Power OFF-delay Timers

- CE marking.  
UL, CSA and CCC certification, conforms to LR.
- High immunity against waveform distortion of power supply caused by devices like inverters.
- Three-language instruction manual provided.

### ■ Broad Line-up of H3B□-N Series



**Note:** Refer to the H3BA-N Datasheet (Cat. No. L093-E1-03) for details.

# Solid-state Twin Timer

## H3BF-N8

- Independent ON- and OFF-time settings. Furthermore, combinations of long ON- or OFF-time and short OFF- or ON-time settings are possible.
- Wide time ranges from 0.05 s to 300 h.
- Easy sequence checks through instantaneous outputs for a zero set value at any time range.
- Approved by UL, CSA, CE and CCC.



## Model Number Structure

### Model Number Legend

H3BF-N□  
1

1. Configuration  
8: 8-pin socket

## Ordering Information

### List of Models

| Operating modes   | Supply voltage     | Models  |
|-------------------|--------------------|---------|
| Flicker OFF start | 110 VAC (50/60 Hz) | H3BF-N8 |
|                   | 220 VAC (50/60 Hz) |         |

**Note:** Specify both the model number and supply voltage when ordering.  
Example: H3BF-N8 110 VAC  
Supply voltage

## ■ Accessories (Order Separately)

| Name/specifications                    |                        | Models    |
|----------------------------------------|------------------------|-----------|
| Flush Mounting Adapters                |                        | Y92F-30   |
|                                        |                        | Y92F-73   |
|                                        |                        | Y92F-74   |
| Mounting Tracks                        | 50 cm (l) × 7.3 mm (t) | PFP-50N   |
|                                        | 1 m (l) × 7.3 mm (t)   | PFP-100N  |
|                                        | 1 m (l) × 16 mm (t)    | PFP-100N2 |
| End Plate                              |                        | PFP-M     |
| Spacer                                 |                        | PFP-S     |
| Protective Cover                       |                        | Y92A-48B  |
| Track Mounting/Front Connecting Socket | 8-pin                  | P2CF-08   |
| Back Connecting Socket                 | 8-pin                  | P3G-08    |
| Hold-down Clips                        | For PL08 Socket        | Y92H-7    |
|                                        | For PF085A Socket      | Y92H-8    |

## Specifications

### ■ General

| Item                   | H3BF-N8                                                                                                                  |
|------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Operating mode         | Flicker OFF start                                                                                                        |
| Pin type               | 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                                                                 |
| Approved standards     | UL508 *1, CSA C22.2 No.14, CCC: GB/T 14048.5 *2<br>Conforms to EN61812-1 (Pollution degree 2 / Overvoltage category III) |

\*1.Surrounding air temperature: 0°C to 40°C

\*2.CCC certification requirements

|                                                                                  |                                                                                                                                                                          |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended fuse                                                                 | 0216005 (250 VAC, 5 A) manufactured by Littelfuse                                                                                                                        |
| Rated operating voltage U <sub>e</sub><br>Rated operating current I <sub>e</sub> | AC-15: U <sub>e</sub> : 250 VAC, I <sub>e</sub> : 3 A<br>AC-13: U <sub>e</sub> : 250 VAC, I <sub>e</sub> : 5 A<br>DC-13: U <sub>e</sub> : 30 VDC, I <sub>e</sub> : 1.5 A |
| Rated insulation voltage                                                         | 250 V                                                                                                                                                                    |
| Rated impulse withstand voltage<br>(altitude: 2,000 m max.)                      | 4 kV (at 240 VAC)                                                                                                                                                        |
| Conditional short-circuit current                                                | 1,000 A                                                                                                                                                                  |

### ■ Time Ranges

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

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

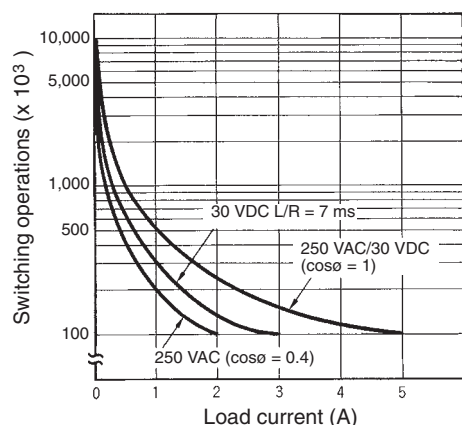
## ■ Ratings

|                         |                                                                    |
|-------------------------|--------------------------------------------------------------------|
| Rated supply voltage    | 110 VAC (50/60 Hz), 220 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 VAC: Approx. 2.9 VA (1.6 W)<br>220 VAC: Approx. 7.0 VA (1.6 W) |
| Control outputs         | Contact output: 5 A at 250 VAC, resistive load ( $\cos\phi = 1$ )  |

## ■ Characteristics

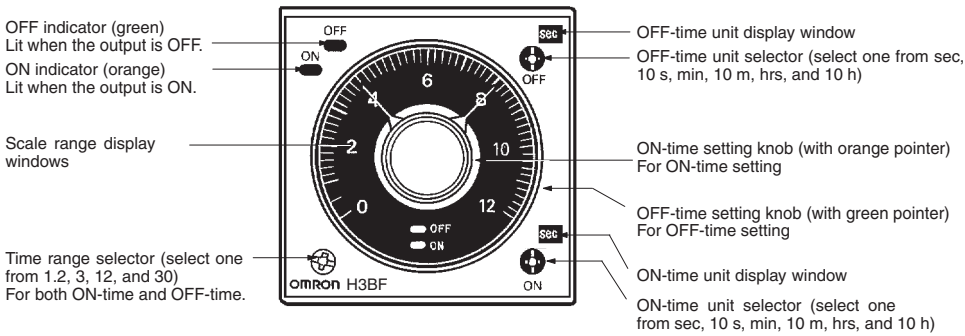
|                            |                                                                                                                                                                                                                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accuracy of operating time | $\pm 0.3\%$ FS max. ( $\pm 0.3\%$ FS $\pm 10$ ms in ranges of 1.2 and 3 s)                                                                                                                                                                                                                     |
| Setting error              | $\pm 5\%$ FS $\pm 0.05$ s max.                                                                                                                                                                                                                                                                 |
| Reset time                 | 0.1 s max.                                                                                                                                                                                                                                                                                     |
| Influence of voltage       | $\pm 0.5\%$ FS max. ( $\pm 0.5\%$ FS $\pm 10$ ms in ranges of 1.2 and 3 s)                                                                                                                                                                                                                     |
| Influence of temperature   | $\pm 2\%$ FS max. ( $\pm 2\%$ FS $\pm 10$ ms in ranges of 1.2 and 3 s)                                                                                                                                                                                                                         |
| Insulation resistance      | 100 M $\Omega$ 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)<br>2,000 VAC, 50/60 Hz for 1 min (between control output terminals and operating circuit)<br>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)<br>4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts)                                                                                                                                                                      |
| Noise immunity             | $\pm 1.5$ kV (between power terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 $\mu$ s, 1-ns rise)                                                                                                                                                                        |
| Static immunity            | Malfunction: 8 kV<br>Destruction: 15 kV                                                                                                                                                                                                                                                        |
| Vibration resistance       | Destruction: 10 to 55 Hz with 0.75-mm single amplitude each in three directions<br>Malfunction: 10 to 55 Hz with 0.5-mm single amplitude each in three directions                                                                                                                              |
| Shock resistance           | Destruction: 1,000 m/s <sup>2</sup> (approx. 100G) each in three directions<br>Malfunction: 100 m/s <sup>2</sup> (approx. 10G) each in three directions                                                                                                                                        |
| Ambient temperature        | Operating: $-10^{\circ}\text{C}$ to $55^{\circ}\text{C}$ (with no icing)<br>Storage: $-25^{\circ}\text{C}$ to $65^{\circ}\text{C}$ (with no icing)                                                                                                                                             |
| Ambient humidity           | Operating: 35% to 85%                                                                                                                                                                                                                                                                          |
| Life expectancy            | Mechanical: 20 million operations min. (under no load at 1,800 operations/h)<br>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 (panel surface)                                                                                                                                                                                                                                                                      |
| Weight                     | Approx. 100 g                                                                                                                                                                                                                                                                                  |

## Engineering Data (Reference)



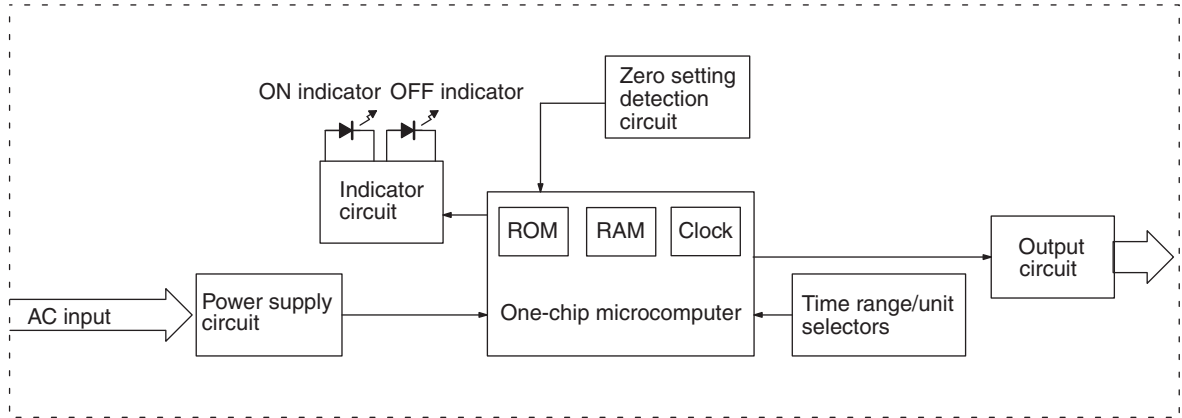
**Reference:** A maximum current of 0.15 A can be switched at 125 VDC ( $\cos\phi = 1$ ) and a maximum current of 0.1 A can be switched at 125 VDC and  $L/R = 7\text{ms}$ . In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 10 mA at 5 VDC (failure level: P).

Nomenclature



Operation

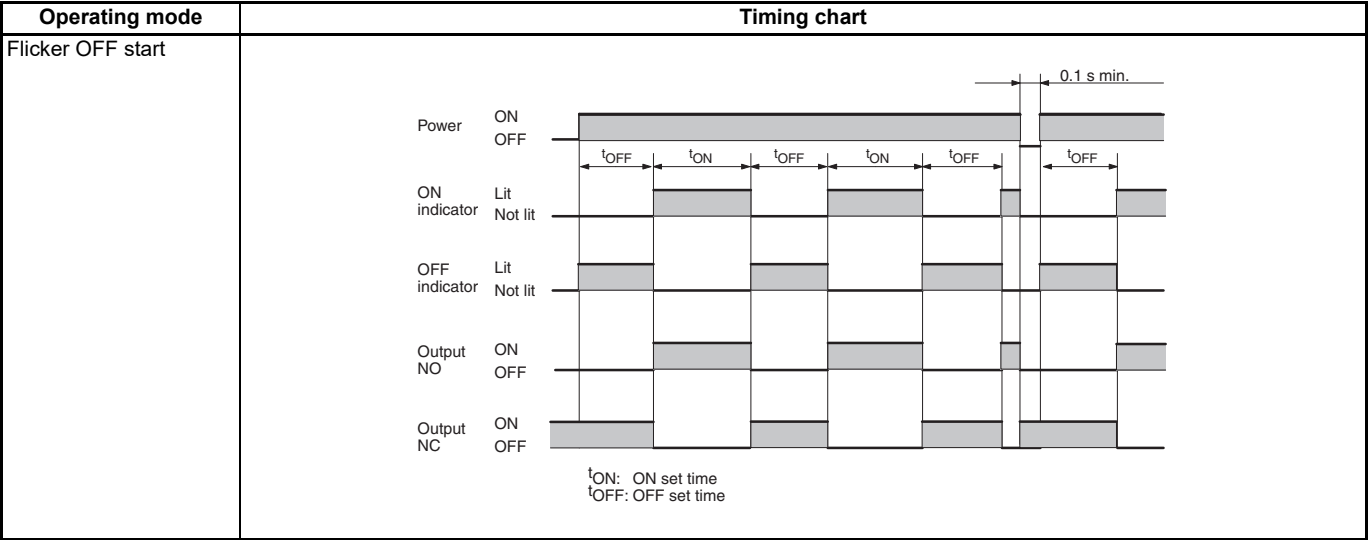
■ Block Diagrams



■ 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

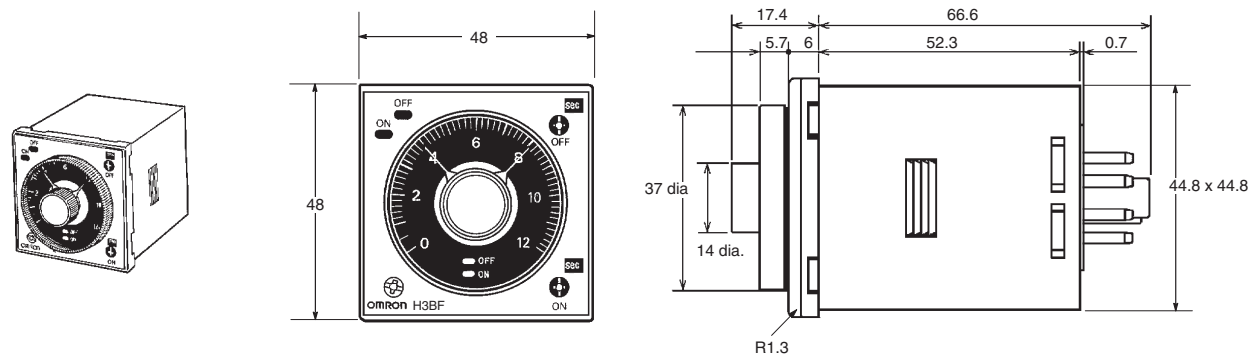


**Note:** Provide at least 0.1 s for the reset time.

Dimensions

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

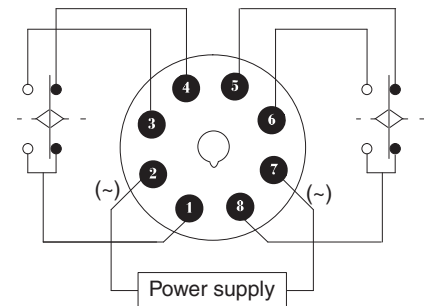
H3BF-N8



Installation

■ Terminal Arrangement

H3BF-N8



# Solid-state Star-delta Timer

## H3BG-N8

- A wide star-time range (up to 120 seconds) and star-delta transfer time range (up to 1.0 seconds).
- Setting rings (order separately) to enable consistent settings and to limit the setting range.
- Panel Covers (order separately) to enable various panel designs.
- Approved by UL, CSA, CE and CCC.



## Model Number Structure

### Model Number Legend

H3BG-N□□  
1 2

1. Configuration

8: 8-pin socket

2. Outputs

None: Star-delta operation contact

H: Star-delta operation contact and instantaneous contact

## Ordering Information

### List of Models

| Outputs                                      | Supply voltage     | Models   |
|----------------------------------------------|--------------------|----------|
| Time-limit contact                           | 110 VAC (50/60 Hz) | H3BG-N8  |
|                                              | 220 VAC (50/60 Hz) |          |
| Time-limit contact and instantaneous contact | 110 VAC (50/60 Hz) | H3BG-N8H |
|                                              | 220 VAC (50/60 Hz) |          |

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

Example: H3BG-N8 110 VAC

Supply voltage

## ■ Accessories (Order Separately)

| Name/specifications                    |                            | Models    |
|----------------------------------------|----------------------------|-----------|
| Flush Mounting Adapters                |                            | Y92F-30   |
|                                        |                            | Y92F-70   |
|                                        |                            | Y92F-71   |
| Mounting Tracks                        | 50 cm (l) × 7.3 mm (t)     | PFP-50N   |
|                                        | 1 m (l) × 7.3 mm (t)       | PFP-100N  |
|                                        | 1 m (l) × 16 mm (t)        | PFP-100N2 |
| End Plate                              |                            | PFP-M     |
| Spacer                                 |                            | PFP-S     |
| Protective Cover                       |                            | Y92A-48B  |
| Track Mounting/Front Connecting Socket | 8-pin                      | P2CF-08   |
| Back Connecting Socket                 |                            | P3G-08    |
| Time Setting Rings                     | Setting a specific time    | Y92S-27   |
|                                        | Limiting the setting range | Y92S-28   |
| Panel Covers (See note)                | Light gray (5Y7/1)         | Y92P-48GL |
|                                        | Black (N1.5)               | Y92P-48GB |
| Hold-down Clips                        | For PL08 Socket            | Y92H-1    |
|                                        | For PF085A Socket          | Y92H-2    |

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

## Specifications

### ■ General

| Item                   | H3BG-N8                                                                                                                  | H3BG-N8H                                                                                                    |
|------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| 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)<br>SPST-NO (delta operation circuit)                                        | Time-limit: SPST-NO (star operation circuit)<br>SPST-NO (delta operation circuit)<br>Instantaneous: SPST-NO |
| Mounting method        | DIN track mounting, surface mounting, and flush mounting                                                                 |                                                                                                             |
| Approved standards     | UL508 *1, CSA C22.2 No.14, CCC: GB/T 14048.5 *2<br>Conforms to EN61812-1 (Pollution degree 2 / Overvoltage category III) |                                                                                                             |

\*1.Surrounding air temperature: 0°C to 40°C

\*2.CCC certification requirements

|                                                          |                                                             |
|----------------------------------------------------------|-------------------------------------------------------------|
| Recommended fuse                                         | 0216005 (250 VAC, 5 A) manufactured by Littelfuse           |
| Rated operating voltage Ue                               | AC-15: Ue: 250 VAC, Ie: 3 A                                 |
| Rated operating current Ie                               | AC-13: Ue: 250 VAC, Ie: 5 A<br>DC-13: Ue: 30 VDC, Ie: 1.5 A |
| Rated insulation voltage                                 | 250 V                                                       |
| Rated impulse withstand voltage (altitude: 2,000 m max.) | 4 kV (at 240 VAC)                                           |
| Conditional short-circuit current                        | 1,000 A                                                     |

### ■ Time Ranges

| Star-delta transfer time |                             | 0.05 sec      | 0.1 sec | 0.25 sec | 0.5 sec | 0.75 sec | 1.0 sec |
|--------------------------|-----------------------------|---------------|---------|----------|---------|----------|---------|
| Full scale setting       |                             |               |         |          |         |          |         |
| 6                        | Star operation time setting | 0.5 to 6 sec  |         |          |         |          |         |
| 12                       |                             | 1 to 12 sec   |         |          |         |          |         |
| 60                       |                             | 5 to 60 sec   |         |          |         |          |         |
| 120                      |                             | 10 to 120 sec |         |          |         |          |         |

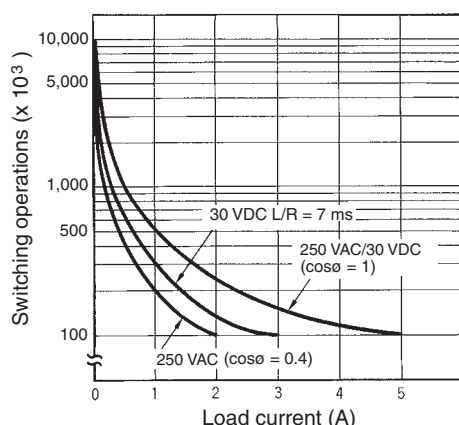
## ■ Ratings

|                         |                                                                    |
|-------------------------|--------------------------------------------------------------------|
| Rated supply voltage    | 110 VAC (50/60 Hz), 220 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       | 110 VAC: Approx. 4.6 VA (2.3 W)<br>220 VAC: Approx. 9.5 VA (2.3 W) |
| Control outputs         | Contact output: 5 A at 250 VAC, resistive load ( $\cos\phi = 1$ )  |

## ■ Characteristics

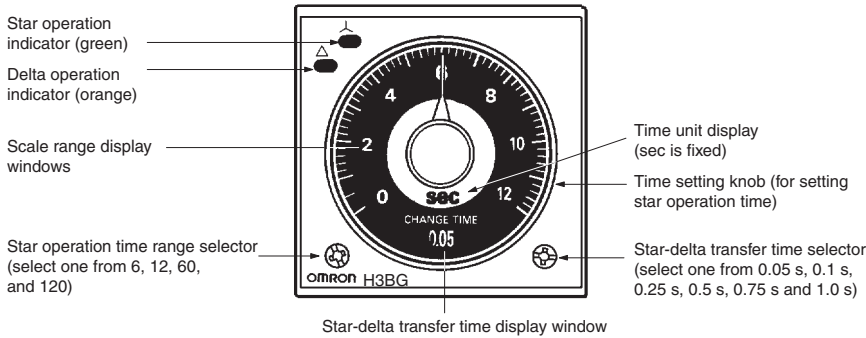
|                            |                                                                                                                                                                                                                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accuracy of operating time | $\pm 0.3\%$ FS max.                                                                                                                                                                                                                                                                            |
| Setting error              | $\pm 5\%$ FS $\pm 0.05$ s max.                                                                                                                                                                                                                                                                 |
| Star-delta transfer time   | Accuracy: $\pm 25\%$ FS + 5 ms max.                                                                                                                                                                                                                                                            |
| Influence of voltage       | $\pm 0.5\%$ FS max.                                                                                                                                                                                                                                                                            |
| Influence of temperature   | $\pm 2\%$ FS max.                                                                                                                                                                                                                                                                              |
| Insulation resistance      | 100 M $\Omega$ 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)<br>2,000 VAC, 50/60 Hz for 1 min (between control output terminals and operating circuit)<br>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)<br>4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts)                                                                                                                                                                      |
| Noise immunity             | $\pm 1.5$ kV (between power terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 $\mu$ s, 1-ns rise)                                                                                                                                                                        |
| Static immunity            | Malfunction: 8 kV<br>Destruction: 15 kV                                                                                                                                                                                                                                                        |
| Vibration resistance       | Destruction: 10 to 55 Hz with 0.75-mm single amplitude each in three directions<br>Malfunction: 10 to 55 Hz with 0.5-mm single amplitude each in three directions                                                                                                                              |
| Shock resistance           | Destruction: 1,000 m/s <sup>2</sup> (approx. 100G) each in three directions<br>Malfunction: 300 m/s <sup>2</sup> (approx. 30G) each in three directions                                                                                                                                        |
| Ambient temperature        | Operating: $-10^{\circ}\text{C}$ to $55^{\circ}\text{C}$ (with no icing)<br>Storage: $-25^{\circ}\text{C}$ to $65^{\circ}\text{C}$ (with no icing)                                                                                                                                             |
| Ambient humidity           | Operating: 35% to 85%                                                                                                                                                                                                                                                                          |
| Life expectancy            | Mechanical: 20 million operations min. (under no load at 1,800 operations/h)<br>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 (panel surface)                                                                                                                                                                                                                                                                      |
| Weight                     | H3BG-N8: Approx. 110 g; H3BG-N8H: Approx. 130 g                                                                                                                                                                                                                                                |

## Engineering Data (Reference)



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

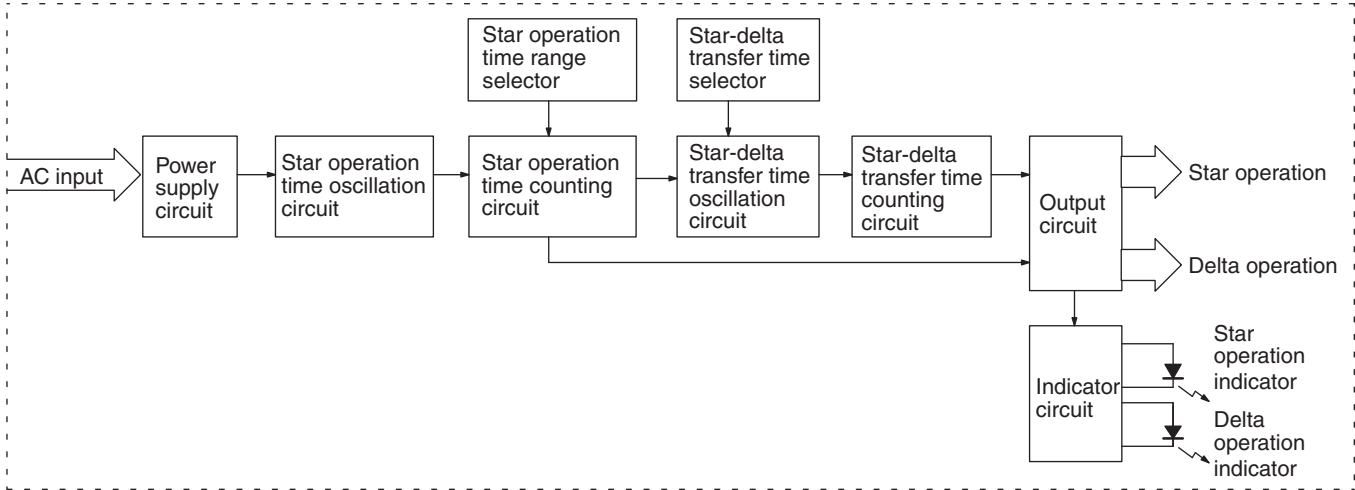
# Nomenclature



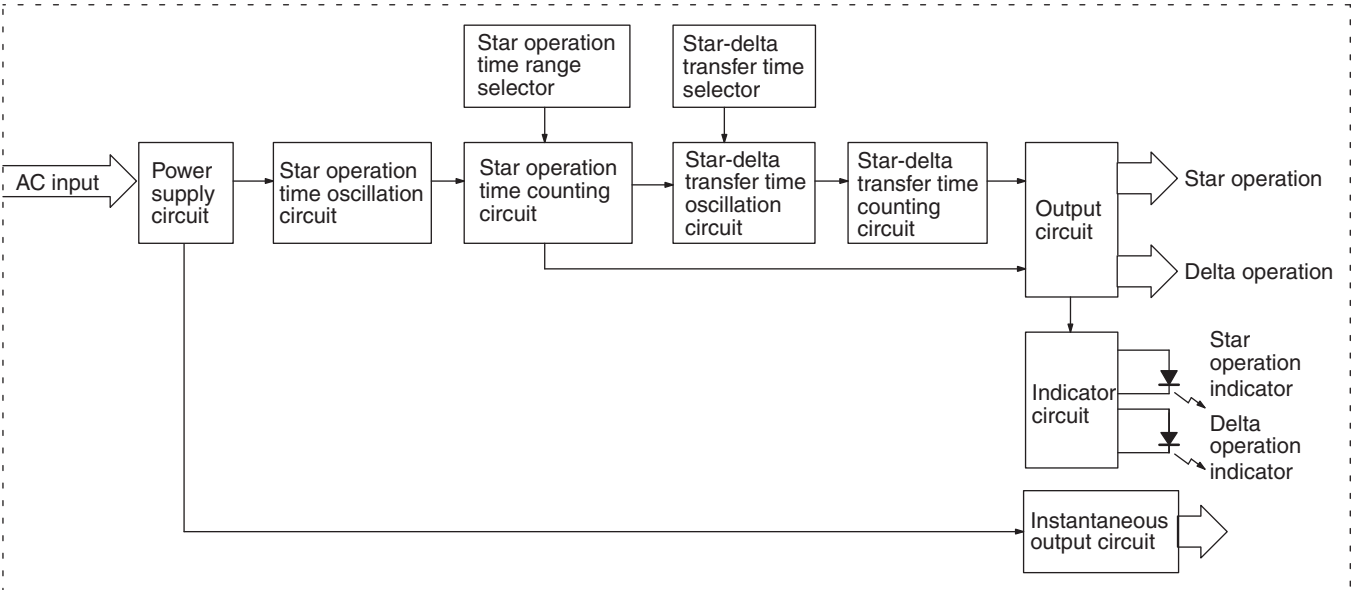
# Operation

## Block Diagrams

### H3BG-N8



### H3BG-N8H



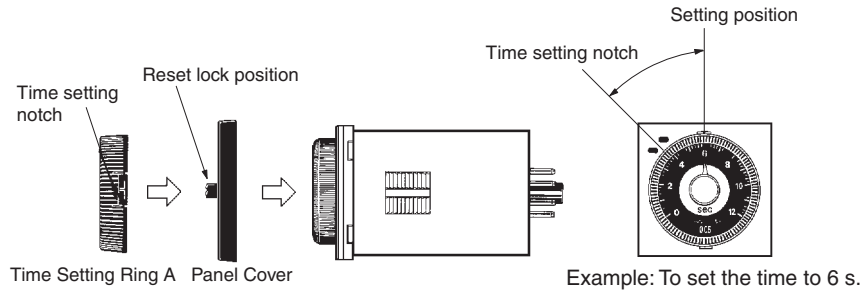
I/O Functions

|         |                |                                                                                                                                                                                                         |
|---------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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

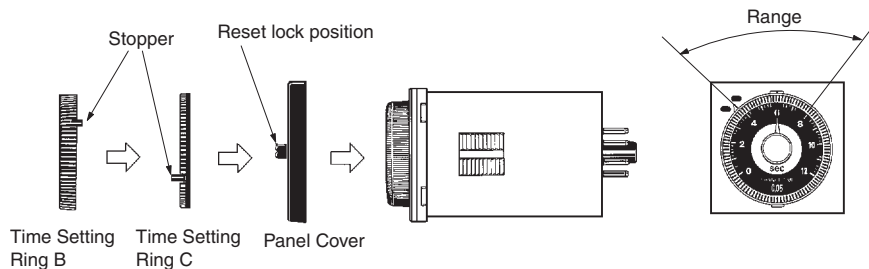
Setting a Specific Time

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.



Limiting the Setting Range

Example: To set a range of 4 and 8 s.  
Mount the Panel Cover on the Timer, set the time setting knob to 4 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 8 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

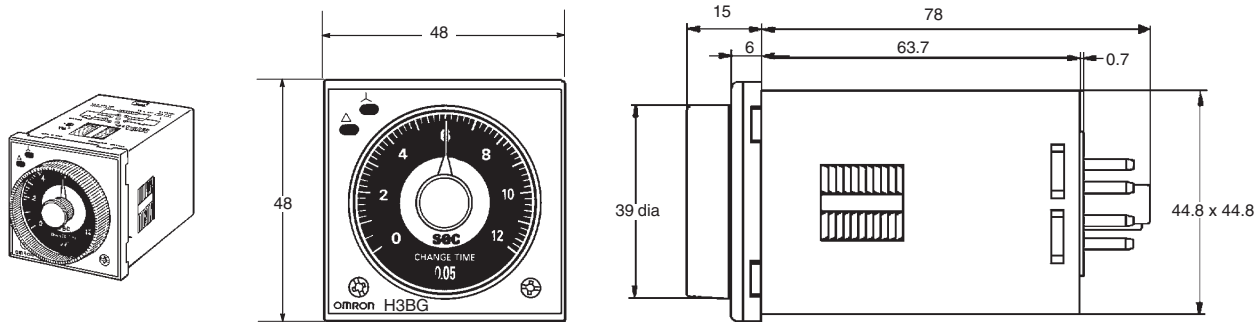
| Model       | Timing chart                   |                |
|-------------|--------------------------------|----------------|
| H3BG-N8/N8H | Power (2 – 7)                  | ON<br>OFF      |
|             | Instantaneous output (1 – 3)   | ON<br>OFF      |
|             | Star operation output (8 – 5)  | ON<br>OFF      |
|             | Delta operation output (8 – 6) | ON<br>OFF      |
|             | Star operation indicator       | Lit<br>Not lit |
|             | Delta operation indicator      | Lit<br>Not lit |

**Note:** t1: Star operation time setting  
t2: Star-delta transfer time  
**Note:** Note: Instantaneous contacts are provided only for the H3BG-N8H.

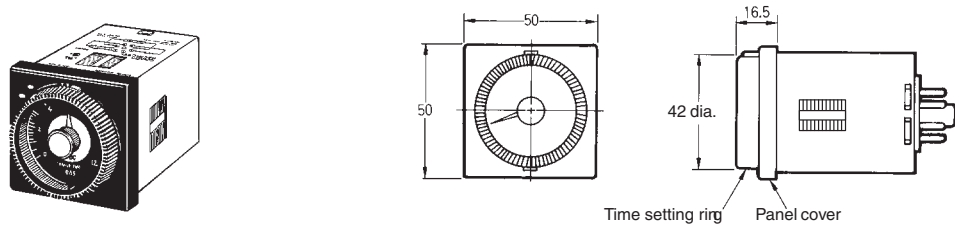
# Dimensions

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

## H3BG-N8/N8H



## Dimensions with Set Ring



# Accessories

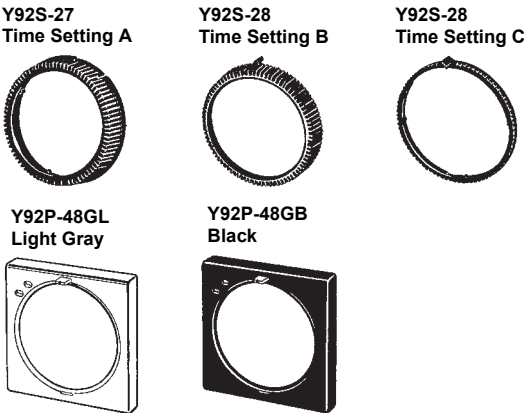
## Time Setting Ring/Panel Cover

There are two types of Panel Covers (Y92P-48GL and Y92P-48GB), all of which are available in two 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.

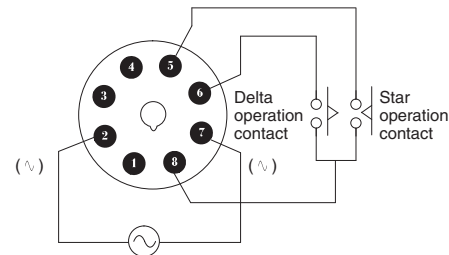
|                                   |                                                                          |
|-----------------------------------|--------------------------------------------------------------------------|
| <b>Setting a specific time</b>    | Time Setting Ring A (Y92S-27) and Panel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



# Installation

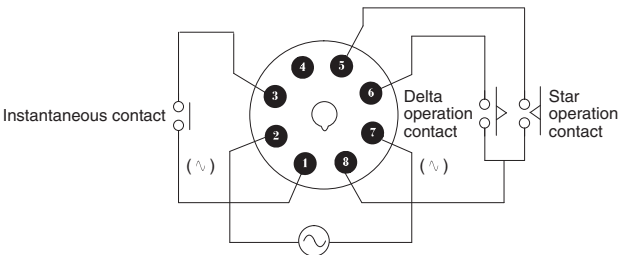
## Terminal Arrangement

### H3BG-N8



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

### H3BG-N8H



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

# Solid-state Power OFF-delay Timer

## H3BH-N8

- Long power OFF-delay times;  
S-series: up to 12 seconds,  
M-series: up to 12 minutes.
- Setting rings (order separately) to enable consistent settings and to limit the setting range.
- Panel Covers (order separately) to enable various panel designs.
- Approved by UL, CSA, CE and CCC.



## Model Number Structure

### Model Number Legend

H3BH-N<sup>1</sup>

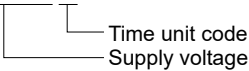
1. Configuration  
8: 8-pin socket

## Ordering Information

### List of Models

| Output | Supply voltage     | Timer    |          |
|--------|--------------------|----------|----------|
|        |                    | S-series | M-series |
| DPDT   | 110 VAC (50/60 Hz) | H3BH-N8  | H3BH-N8  |
|        | 220 VAC (50/60 Hz) |          |          |

**Note:** Specify both the supply voltage and time unit code (S or M) in addition to the model number when ordering.  
Example: H3BH-N8 110 VAC M



## ■ Accessories (Order Separately)

| Name/specifications                    |                        | Models    |
|----------------------------------------|------------------------|-----------|
| Flush Mounting Adapters                |                        | Y92F-30   |
|                                        |                        | Y92F-70   |
|                                        |                        | Y92F-71   |
| Mounting Tracks                        | 50 cm (l) × 7.3 mm (t) | PFP-50N   |
|                                        | 1 m (l) × 7.3 mm (t)   | PFP-100N  |
|                                        | 1 m (l) × 16 mm (t)    | PFP-100N2 |
| End Plate                              |                        | PFP-M     |
| Spacer                                 |                        | PFP-S     |
| Protective Cover                       |                        | Y92A-48B  |
| Track Mounting/Front Connecting Socket | 8-pin                  | P2CF-08   |
| Back Connecting Socket                 | 8-pin                  | P3G-08    |
| Hold-down Clips                        | For PL08 Socket        | Y92H-1    |
|                                        | For PF085A Socket      | Y92H-2    |

## Specifications

### ■ General

| Item                   | H3BH-N8                                                                                                                  |
|------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Operating/Reset method | Instantaneous operation/Time-limit reset                                                                                 |
| Pin type               | 8-pin                                                                                                                    |
| Input type             | ---                                                                                                                      |
| Output type            | Relay output (DPDT)                                                                                                      |
| Mounting method        | DIN track mounting, surface mounting, and flush mounting                                                                 |
| Approved standards     | UL508 *1, CSA C22.2 No.14, CCC: GB/T 14048.5 *2<br>Conforms to EN61812-1 (Pollution degree 2 / Overvoltage category III) |

\*1.Surrounding air temperature: 0°C to 40°C

\*2.CCC certification requirements

|                                                             |                                                             |
|-------------------------------------------------------------|-------------------------------------------------------------|
| Recommended fuse                                            | 0216005 (250 VAC, 5 A) manufactured by Littelfuse           |
| Rated operating voltage Ue                                  | AC-15: Ue: 250 VAC, Ie: 3 A                                 |
| Rated operating current Ie                                  | AC-13: Ue: 250 VAC, Ie: 5 A<br>DC-13: Ue: 30 VDC, Ie: 1.5 A |
| Rated insulation voltage                                    | 250 V                                                       |
| Rated impulse withstand voltage<br>(altitude: 2,000 m max.) | 4 kV (at 240 VAC)                                           |
| Conditional short-circuit current                           | 1,000 A                                                     |

### ■ Time Ranges

| Time unit               |          | S-series     | M-series   |
|-------------------------|----------|--------------|------------|
| Full scale setting      |          | s (sec)      | min        |
| 0.6                     | Set time | 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. |
| Limit-time repeat cycle |          | 3 s min.     |            |

**Note:** If the above minimum power ON time is not secured, the H3BH-N8 may not operate. Be sure to secure the above minimum power ON time.

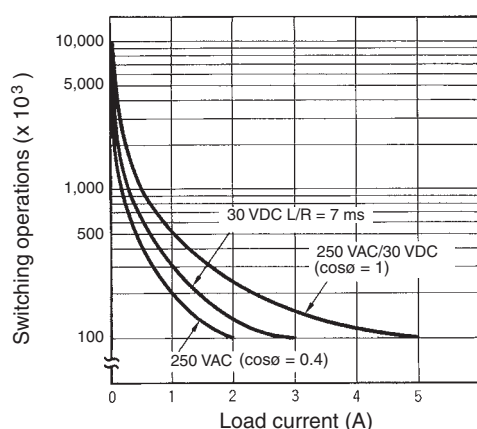
## ■ Ratings

|                         |                                                                        |
|-------------------------|------------------------------------------------------------------------|
| Rated supply voltage    | 110 VAC (50/60 Hz), 220 VAC (50/60 Hz)                                 |
| Operating voltage range | 85% to 110% of rated supply voltage                                    |
| Power consumption       | 110 VAC: Approx. 0.17 VA (0.15 W)<br>220 VAC: Approx. 0.24 VA (0.18 W) |
| Control outputs         | Contact output: 5 A at 250 VAC, resistive load ( $\cos\phi = 1$ )      |

## ■ Characteristics

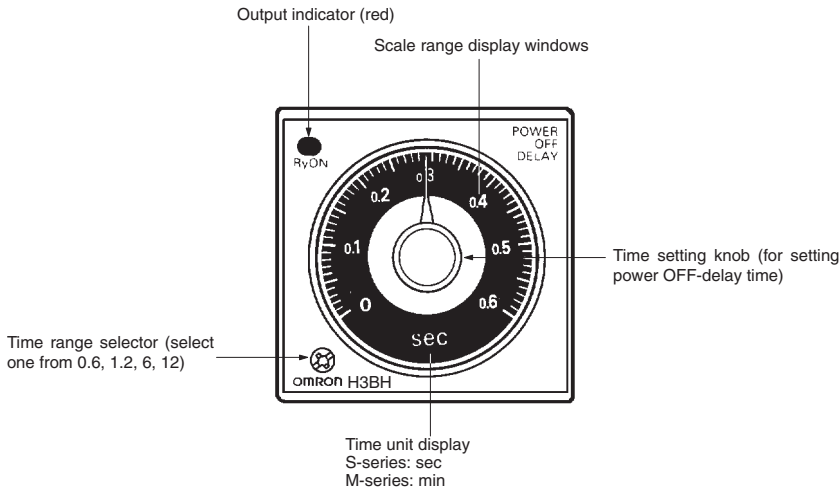
|                            |                                                                                                                                                                                                                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accuracy of operating time | $\pm 0.3\%$ FS max. ( $\pm 0.3\%$ FS $\pm 10$ ms in ranges of 0.6 and 1.2 s)                                                                                                                                                                                                                   |
| Setting error              | $\pm 5\%$ FS $\pm 0.05$ s max.                                                                                                                                                                                                                                                                 |
| Influence of voltage       | $\pm 0.5\%$ FS max. ( $\pm 0.5\%$ FS $\pm 10$ ms in ranges of 0.6 and 1.2 s)                                                                                                                                                                                                                   |
| Influence of temperature   | $\pm 2\%$ FS max. ( $\pm 2\%$ FS $\pm 10$ ms in ranges of 0.6 and 1.2 s)                                                                                                                                                                                                                       |
| Insulation resistance      | 100 M $\Omega$ 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)<br>2,000 VAC, 50/60 Hz for 1 min (between control output terminals and operating circuit)<br>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)<br>4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts)                                                                                                                                                                      |
| Noise immunity             | $\pm 1.5$ kV (between power terminals), square-wave noise by noise simulator<br>(pulse width: 100 ns/1 $\mu$ s, 1-ns rise)                                                                                                                                                                     |
| Static immunity            | Malfunction: 8 kV<br>Destruction: 15 kV                                                                                                                                                                                                                                                        |
| Vibration resistance       | Destruction: 10 to 55 Hz with 0.75-mm single amplitude each in three directions<br>Malfunction: 10 to 55 Hz with 0.5-mm single amplitude each in three directions                                                                                                                              |
| Shock resistance           | Destruction: 1,000 m/s <sup>2</sup> (approx. 100G) each in three directions<br>Malfunction: 100 m/s <sup>2</sup> (approx. 10G) each in three directions                                                                                                                                        |
| Ambient temperature        | Operating: $-10^{\circ}\text{C}$ to $55^{\circ}\text{C}$ (with no icing)<br>Storage: $-25^{\circ}\text{C}$ to $65^{\circ}\text{C}$ (with no icing)                                                                                                                                             |
| Ambient humidity           | Operating: 35% to 85%                                                                                                                                                                                                                                                                          |
| Life expectancy            | Mechanical: 10 million operations min. (under no load at 1,200 operations/h)<br>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 (panel surface)                                                                                                                                                                                                                                                                      |
| Weight                     | Approx. 120 g                                                                                                                                                                                                                                                                                  |

## Engineering Data (Reference)



**Reference:** A maximum current of 0.15 A can be switched at 125 VDC ( $\cos\phi = 1$ ) and a maximum current of 0.1 A can be switched at 125 VDC and  $L/R = 7$  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).

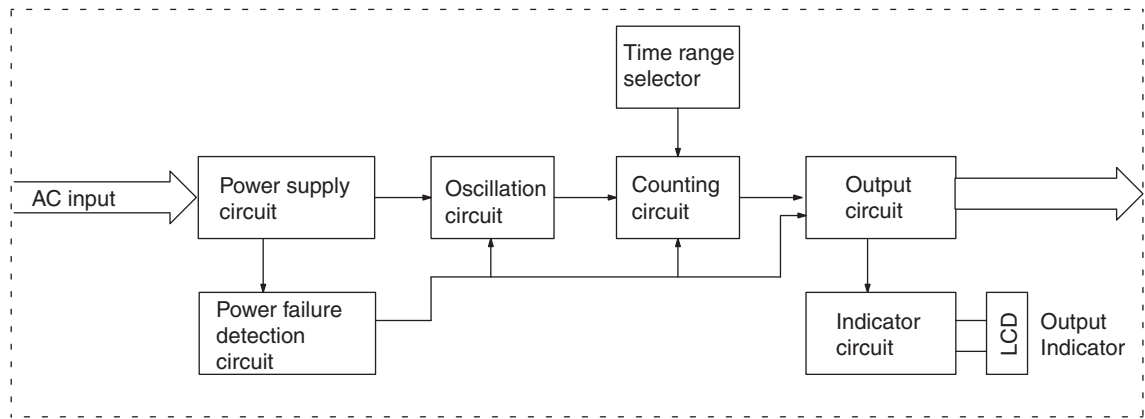
Nomenclature



Operation

■ Block Diagrams

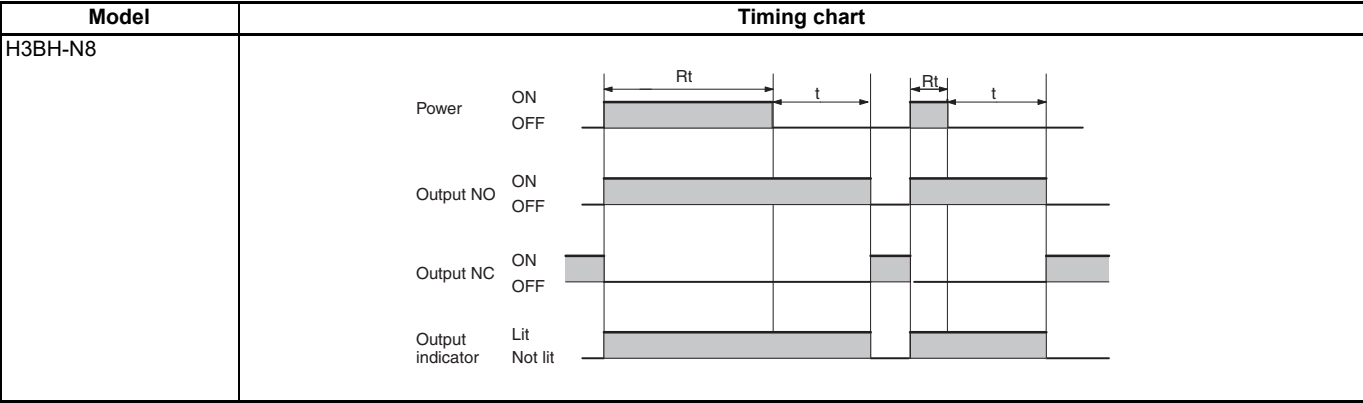
Without Reset Input (H3BH-N8)



■ I/O Functions

|         |                |                                                                                                                                   |
|---------|----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 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

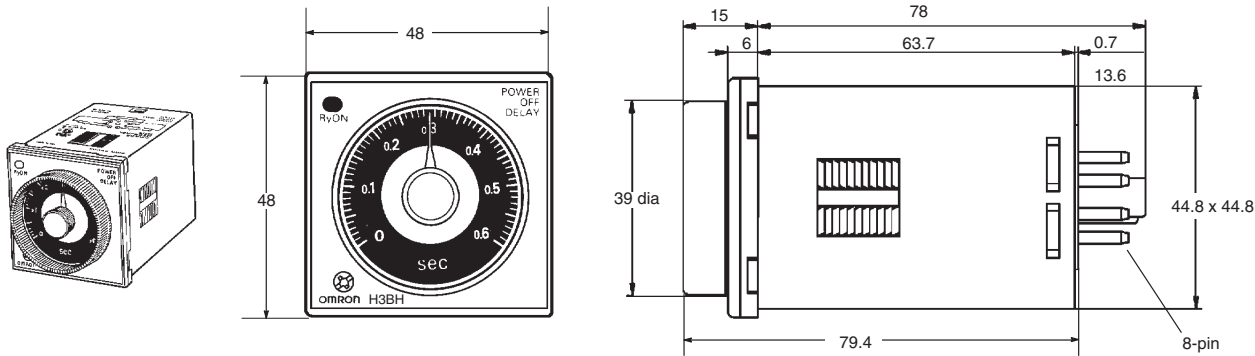


**Note:** t: Set time  
Rt: Minimum power ON time (S-series: 0.1 s min.; M-series: 2 s min.). The Timer may not operate (the output may not turn ON) below this value.

Dimensions

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

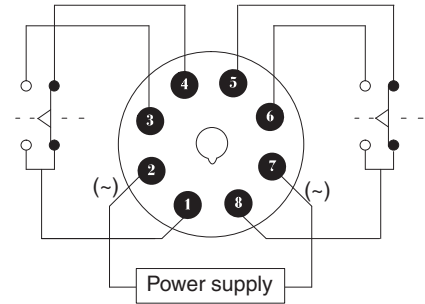
H3BH-N8



Installation

■ Terminal Arrangement

H3BH-N8



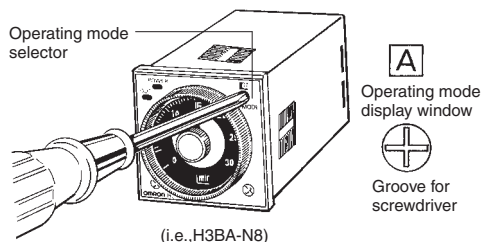
# Operation

**Note:** The undermentioned is common for all H3BF-N/BG-N/BH-N models.

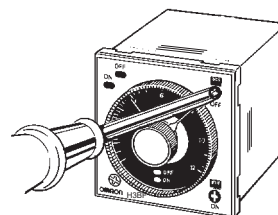
## Basic Setting

### 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.

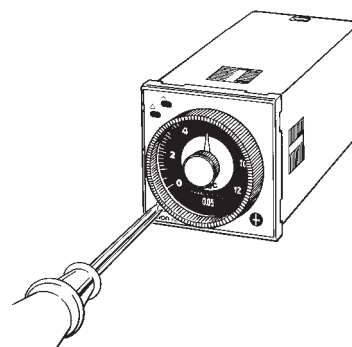


For OFF-time, the desired time unit (sec, 10 s, min, and hrs, or 10 s, 10 min, hrs, and 10 h) is indicated in the OFF-time unit display window at the upper right corner of the front panel and can be changed by turning the OFF-time unit selector located below the OFF-time unit display window.



### H3BG-N8/N8H Star-delta Timers

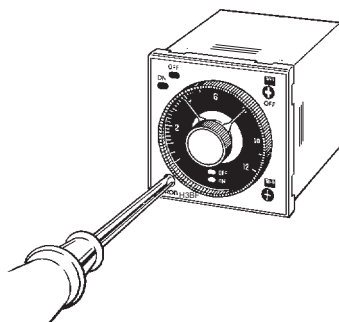
A star operation time range (0 to 6, 0 to 12, 0 to 60, or 0 to 120 seconds) is selected with the star operation time range selector at the lower left corner of the front panel.



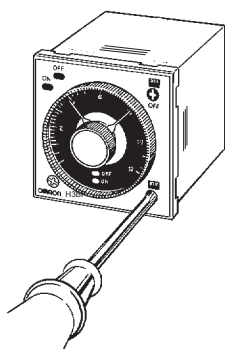
### Selection of Time Unit and Time Range

#### H3BF-N8 Twin Timers

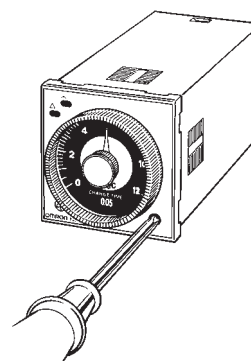
A time range (0 to 1.2, 0 to 3, 0 to 12, or 0 to 30) is selected for ON and OFF-time using the time range selector at the lower left corner of the front panel, and the selected time range appears within the plastic frame of the time setting knob (= scale range display windows).



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.

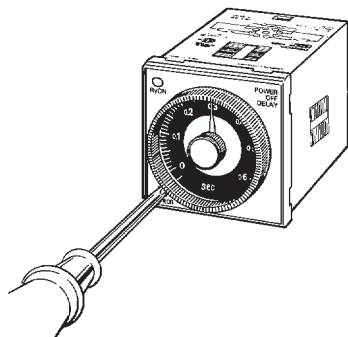


The time required for switching (0.05, 0.1, 0.25, 0.5, 0.75, or 1.0 second) from the star operation to the delta operation of the H3BG-N8/N8H can be selected with the star-delta transfer time selector at the lower right corner of the front panel.



## H3BH-N8 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 H3BH-N8, specify "S" for the second unit or "M" for the minute unit.



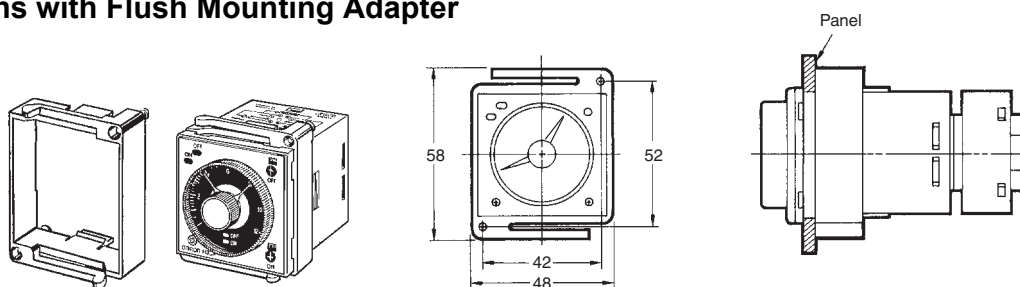
## Dimensions

**Note:** The undermentioned is common for all H3B□-N models.

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

### Dimensions with Flush Mounting Adapter Y92F-30

Y92F-30



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

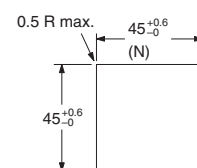
N can be obtained as follows (n: the number of H3BF-N/BG-N/BH-N models arranged side by side)

Without a Cover:  $N = (48n - 2.5) \text{ }^{+1}_{-0}$

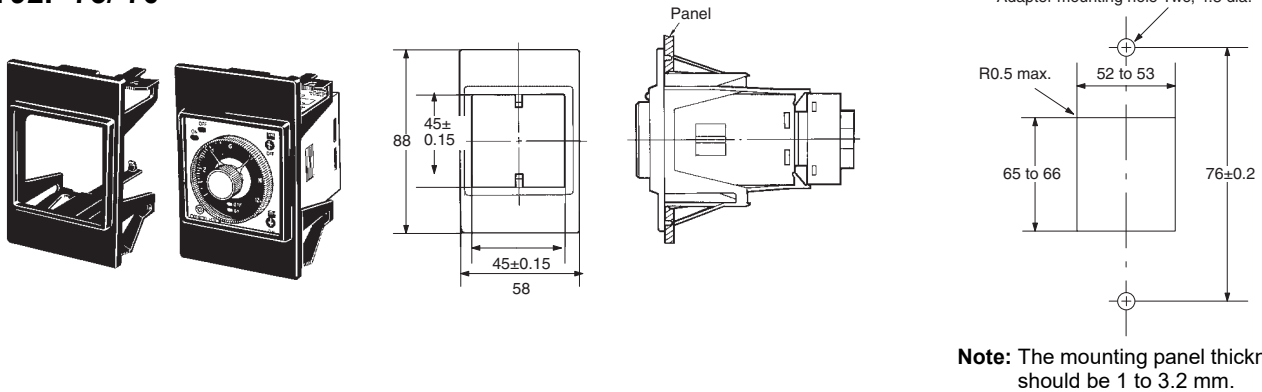
With the Protective Cover:  $N = (51n - 5.5) \text{ }^{+1}_{-0}$

With the Panel Cover:  $N = (50n - 4.5) \text{ }^{+1}_{-0}$

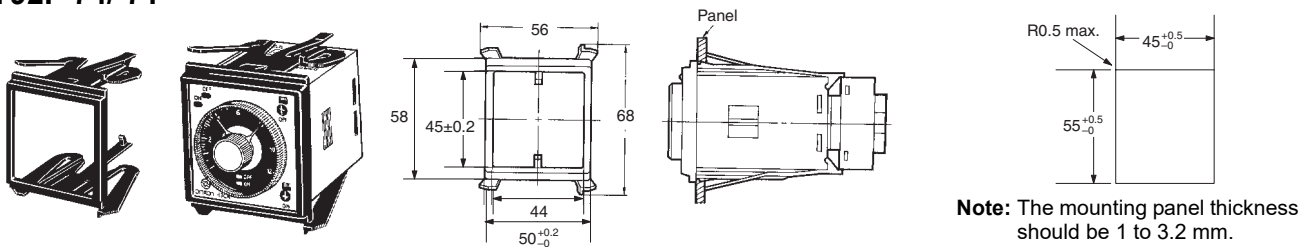
### Panel Cutout



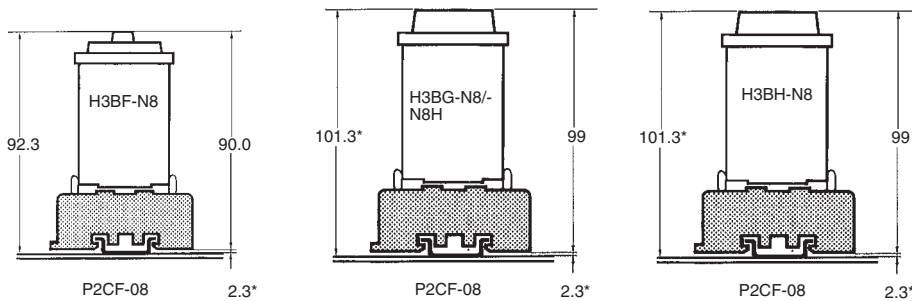
### Dimensions with Flush Mounting Adapter Y92F-73/-70



### Dimensions with Flush Mounting Adapter Y92F-74/-71

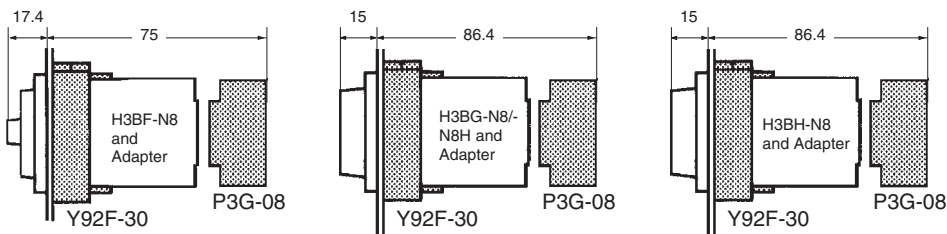


### Track Mounting



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

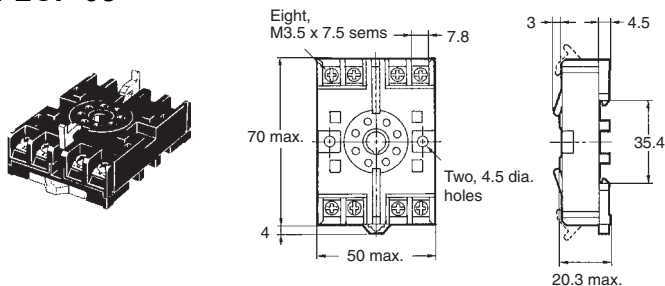
### Flush Mounting



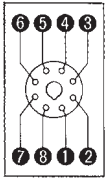
■Accessories (Order Separately)

Track Mounting/Front Connecting Socket

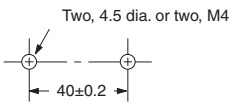
P2CF-08



Terminal Arrangement/  
Internal Connections  
(Top View)

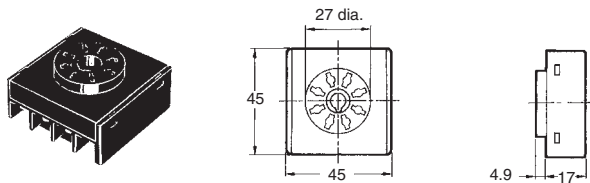


Surface Mounting Holes

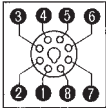


Back Connecting Socket

P3G-08

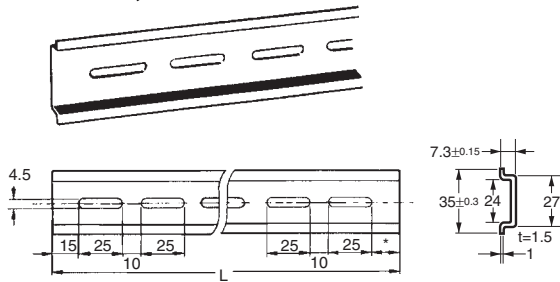


Terminal Arrangement/  
Internal Connections  
(Bottom View)



Mounting Track

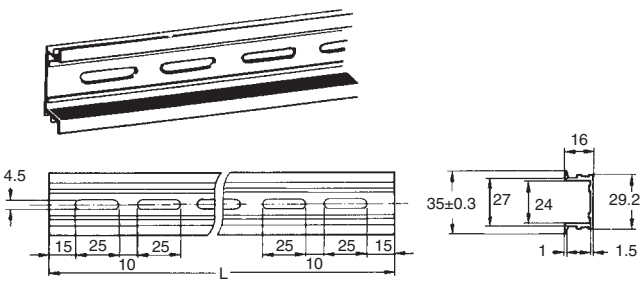
PFP-100N, PFP-50N



L: Length

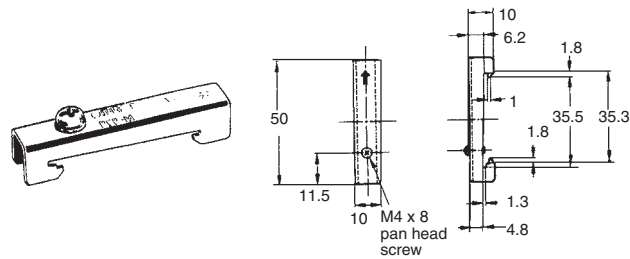
|       |           |
|-------|-----------|
| 1 m   | PFP-100N  |
| 50 cm | PFP-50N   |
| 1 m   | PFP-100N2 |

PFP-100N2



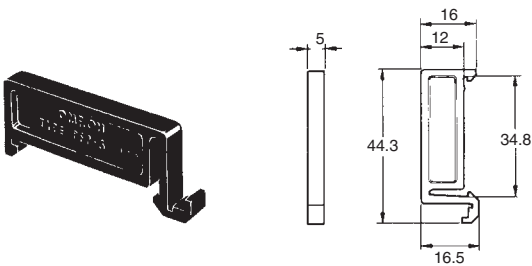
End Plate

PFP-M



Spacer

PFP-S



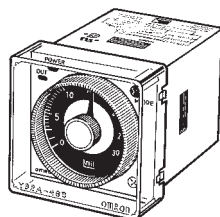
## Protective Cover

### 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.

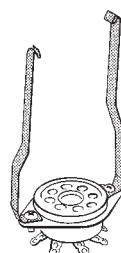
### Y92A-48B



## Hold-down Clip

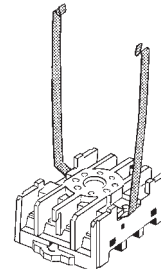
### Y92H-7/-1

For PL08 Socket



### Y92H-8/-2

For PF085A Socket



## Safety Precautions

**Note:** The undermentioned is common for all H3B□-N models.

A transformer is not used in the power supplies for the H3B□-N. Therefore, an electrical shock may be received by touching the input terminals when the power supply voltage is being applied. Take adequate precautions to protect against electrical shock.

## Changing of Settings

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

## Power Supplies (H3BH-N8)

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 H3BH-N8 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.

## Input/Output (H3BH-N8)

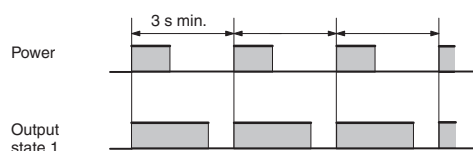
The H3B□-N-series models have a transformerless power supply.

## Wiring (H3BH-N8)

The H3BH-N8 has a high impedance circuit. Therefore, the H3BH-N8 may not be reset if the H3BH-N8 is influenced by inductive voltage. In order to eliminate any influence of inductive voltage, the wires connected to the H3BH-N8 must be kept as short as possible and should not be installed alongside power lines. If the H3BH-N8 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  $\mu$ F and a resistance of approximately 120  $\Omega$  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 (H3BH-N8)

An interval of 3 s minimum is required to turn on the H3BH-N8 after the H3BH-N8 is turned off. If the H3BH-N8 is turned on and off repeatedly with an interval of shorter than 3 s, the internal parts of the H3BH-N8 may deteriorate and the H3BH-N8 may malfunction.



If it is required that the output be turned on repeatedly with an interval of shorter than 3 s, consider using the H3BA-N in mode D (signal OFF-delay).

## Others

Since latching relays are used in the H3BH-N8, output contacts may become reversed or set to neutral state when an impact is applied to the Timer. If the Timer has been dropped, be sure to reinspect the Timer before using it again.