

# Solid-state Timer

# H3YN-□-B

## Miniature Timer with Multiple Time Ranges and Multiple Operating Modes



- UL listed when used with a Push-In Plus Terminal Block Socket. \*  
Conforms to CSA, CE Marking, LR, and CCC.
- Black design with power supply terminals on top and contact output terminals on bottom.
- Standard multiple operating modes and multiple time ranges.
- Pin configuration compatible with MY Power Relay.
- Minimizes stock.

\* When used in combination with a Push-In Plus Terminal Block Socket (PYF-□-PU-L).



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Refer to *Safety Precautions* on page 38.

## Ordering Information

### List of Models

| Supply voltage                                                     | Time-limit contact   | Short-time range model<br>(0.1 s to 10 min) | Long-time range model<br>(0.1 min to 10 h) |
|--------------------------------------------------------------------|----------------------|---------------------------------------------|--------------------------------------------|
| 24, 100 to 120, 200 to 230 VAC;<br>12, 24, 48, 100 to 110, 125 VDC | DPDT                 | H3YN-2-B                                    | H3YN-21-B                                  |
|                                                                    | 4PDT                 | H3YN-4-B *1                                 | H3YN-41-B *1                               |
| 24 VDC                                                             | 4PDT (Twin contacts) | H3YN-4-Z-B *1, *2                           | H3YN-41-Z-B *1, *2                         |

**Note:** 1. Sockets and Hold-down Clips are not included with the H3YN-B. They must be ordered separately.

\*1. Use the H3YN-4-B or H3YN-41-B Series when switching micro loads, and use the H3YN-4-Z-B or H3YN-41-Z-B Series when switching even smaller loads.

\*2. Only models with 24 VDC power supply are available.

## Accessories (Order Separately)

### Hold-down Clips

| Name/specification             | Model  |
|--------------------------------|--------|
| Hold-down Clips For PYF-□-PU-L | Y92H-3 |

**Note:** For details, refer to *Precautions for H3Y-series Timers* on page 31.

### Socket

| Timer   |           | Square Sockets |                  |                    |             |                             |
|---------|-----------|----------------|------------------|--------------------|-------------|-----------------------------|
| Contact | Model     | Pin            | Connection       | Terminal           | Model       | Terminal Type               |
| DPDT    | H3YN-2□-B | 8-pin          | Front Connecting | DIN track mounting | PYF-08-PU-L | Push-In Plus Terminal Block |
| 4PDT    | H3YN-4□-B | 14-pin         | Front Connecting | DIN track mounting | PYF-14-PU-L | Push-In Plus Terminal Block |

**Note:** 1. Cannot be used with the H3YN-□-0 (PCB terminals).

2. For details, refer to *Precautions for H3Y-series Timers* on page 31.

## Specifications

## Ratings

| Item                          | H3YN-2-B/-4-B/-4-Z-B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | H3YN-21-B/-41-B/-41-Z-B                                       |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Time ranges                   | 0.1 s to 10 min (1 s, 10 s, 1 min, or 10 min max. selectable)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.1 min to 10 h (1 min, 10 min, 1 h, or 10 h max. selectable) |
| Rated supply voltage *5, *6   | 24, 100 to 120, 200 to 230 VAC (50/60 Hz) *1<br>12, 24, 48, 100 to 110, 125 VDC *2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                               |
| Pin type                      | Plug-in                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                               |
| Operating mode                | ON-delay, interval, flicker OFF start, or flicker ON start (selectable with DIP switch)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                               |
| Operating voltage range       | 85% to 110% of rated supply voltage (12 VDC: 90% to 110% of rated supply voltage) *3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                               |
| Reset voltage                 | 10% min. of rated supply voltage *4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                               |
| Power consumption             | 100 to 120 VAC: Relay ON: Approx. 1.8 VA (1.6 W) at 120 VAC, 60 Hz<br>Relay OFF: Approx. 1 VA (0.6 W) at 120 VAC, 60 Hz<br>200 to 230 VAC: Relay ON: Approx. 2.2 VA (1.8 W) at 230 VAC, 60 Hz<br>Relay OFF: Approx. 1.5 VA (1.1 W) at 230 VAC, 60 Hz<br>24 VAC: Relay ON: Approx. 1.8 VA (1.4 W) at 24 VAC, 60 Hz<br>Relay OFF: Approx. 0.3 VA (0.2 W) at 24 VAC, 60 Hz<br>12 VDC: Relay ON: Approx. 1.1 W at 12 VDC<br>Relay OFF: Approx. 0.1 W at 12 VDC<br>24 VDC: Relay ON: Approx. 1.1 W at 24 VDC<br>Relay OFF: Approx. 0.1 W at 24 VDC<br>48 VDC: Relay ON: Approx. 1.2 W at 48 VDC<br>Relay OFF: Approx. 0.3 W at 48 VDC<br>100 to 110 VDC: Relay ON: Approx. 1.6 W at 110 VDC<br>Relay OFF: Approx. 0.4 W at 110 VDC<br>125 VDC: Relay ON: Approx. 1.6 W at 125 VDC<br>Relay OFF: Approx. 0.4 W at 125 VDC |                                                               |
| Control outputs               | DPDT:<br>5 A at 250 VAC, resistive load ( $\cos\phi = 1$ )<br>The minimum applicable load is 1 mA at 5 VDC (P reference value).<br>Contact materials: Ag<br>4PDT:<br>3 A at 250 VAC, resistive load ( $\cos\phi = 1$ )<br>H3YN-4-B/-41-B series: The minimum applicable load is 1 mA at 1 VDC (P reference value).<br>H3YN-4-Z-B/-41-Z-B series: The minimum applicable load is 1 mA at 1 VDC (P reference value).<br>Contact materials: Au-clad + Ag-alloy                                                                                                                                                                                                                                                                                                                                                         |                                                               |
| Ambient operating temperature | -10°C to 55°C (with no icing)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                               |
| Storage temperature           | -25°C to 65°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                               |
| Ambient operating humidity    | 35% to 85%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                               |

\*1. Do not use the output from an inverter as the power supply. Refer to *Safety Precautions for All Timers* for details on your OMRON website.

\*2. Single-phase, full-wave-rectified power supplies can be used.

\*3. When using the H3YN-B continuously in any place where the ambient temperature is in a range of 45°C to 50°C, supply 90% to 110% of the rated supply voltages (supply 95% to 110% with 12 VDC type).

\*4. 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.

\*5. Refer to *Safety Precautions for All Timers* on your OMRON website when combining the Timer with an AC 2-wire proximity sensor.

\*6. A diode to prevent reverse voltages is provided only on models with a DC power supply.

## Characteristics

| Item                       | H3YN-2-B/-21-B/-4-B/-41-B                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Accuracy of operating time | ±1% FS max. (1 s range: ±1%±10 ms max.)                                                                                                                                                                                                                                                                                                                                                                                                          |  |
| Setting error              | ±10%±50 ms FS max.                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| Reset time                 | Min. power-opening time: 0.1 s max. (including halfway reset)                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Influence of voltage       | ±2% FS max.                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| Influence of temperature   | ±2% FS max.                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| Insulation resistance      | 100 MΩ min. (at 500 VDC)                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| Dielectric strength        | 2,000 VAC, 50/60 Hz for 1 min<br>(between current-carrying terminals and exposed non-current-carrying metal parts) *1<br>2,000 VAC, 50/60 Hz for 1 min (between operating power circuit and control output)<br>2,000 VAC, 50/60 Hz for 1 min (between different pole contacts; 2-pole model)<br>1,500 VAC, 50/60 Hz for 1 min (between different pole contacts; 4-pole model)<br>1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts) |  |
| Vibration resistance       | Destruction: 10 to 55 Hz, 0.75-mm single amplitude for 1 h each in 3 directions<br>Malfunction: 10 to 55 Hz, 0.5-mm single amplitude for 10 min each in 3 directions                                                                                                                                                                                                                                                                             |  |
| Shock resistance           | Destruction: 1,000 m/s <sup>2</sup><br>Malfunction: 100 m/s <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                         |  |
| Life expectancy            | Mechanical: 10,000,000 operations min. (under no load at 1,800 operations/h)<br>Electrical: DPDT: 500,000 operations min. (5 A at 250 VAC, resistive load at 1,800 operations/h)<br>4PDT: 200,000 operations min. (H3YN-4-Z/-41-Z: 100,000 operations min.)<br>(3 A at 250 VAC, resistive load at 1,800 operations/h) *2                                                                                                                         |  |
| Impulse withstand voltage  | Between power terminals:<br>3 kV for 100 to 120 VAC, 200 to 230 VAC, 100 to 110 VDC, 125 VDC<br>1 kV for 12 VDC, 24 VDC, 48 VDC, 24 VAC<br>Between exposed non-current-carrying metal parts:<br>4.5 kV for 100 to 120 VAC, 200 to 230 VAC, 100 to 110 VDC, 125 VDC<br>1.5 kV for 12 VDC, 24 VDC, 48 VDC, 24 VAC                                                                                                                                  |  |
| Noise immunity             | ±1.5 kV, square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)                                                                                                                                                                                                                                                                                                                                                              |  |
| Static immunity            | Destruction: 8 kV<br>Malfunction: 4 kV                                                                                                                                                                                                                                                                                                                                                                                                           |  |
| Degree of protection       | IP40                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| Weight                     | Approx. 50 g                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
| EMC                        | (EMI)<br>Emission Enclosure: EN 61812-1<br>Emission AC Mains: EN 55011 Group 1 class A<br>(EMS)<br>Immunity ESD: EN 61812-1<br>Immunity RF-interference: IEC 61000-4-2<br>Immunity Burst: IEC 61000-4-3<br>Immunity Surge: IEC 61000-4-4<br>Immunity Conducted Disturbance: IEC 61000-4-5<br>Immunity Voltage Dip/Interruption: IEC 61000-4-6                                                                                                    |  |
| Approved standards         | cULus (or cURus): UL 508/CSA C22.2 No.14 *3, CSA C22.2 No.14, Lloyds, CCC: GB/T 14048.5 *5<br>Conforms to EN 61812-1 and IEC 60664-1. (2.5 kV/2 for H3YN-2-B/-21-B *4,<br>2.5 kV/1 for H3YN-4-B/-41-B, H3YN-4-Z-B/-41-Z-B *4)                                                                                                                                                                                                                    |  |

\*1. Terminal screw sections are excluded.

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

\*3. cULus listing applies when the OMRON PYF-□-PU-L is used.

cURus recognition applies when any other socket is used.

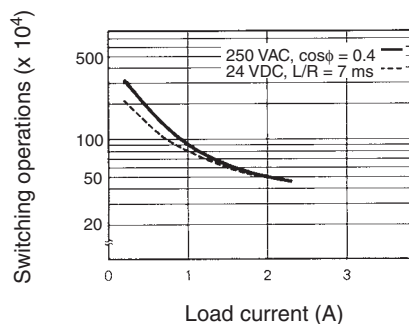
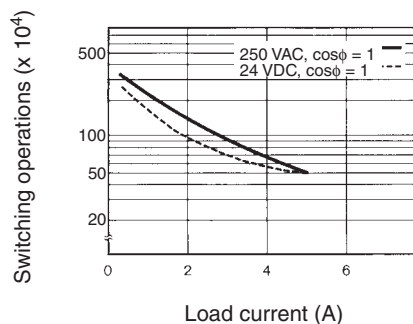
\*4. Overvoltage category II

\*5. CCC certification requirements

| Model                                                       | H3YN-2-B/21-B                                                                              | H3YN-4-B/41-B                                                                              |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Recommended fuse                                            | RT14-20/6A (380 VAC 6 A), manufactured by DELIXI                                           | RT14-20/4A (380 VAC 4 A), manufactured by DELIXI                                           |
| Rated operating voltage Ue<br>Rated operating current Ie    | AC-15: Ue: 250 VAC, Ie: 3 A<br>AC-13: Ue: 250 VAC, Ie: 5 A<br>DC-13: Ue: 30 VDC, Ie: 0.5 A | AC-15: Ue: 250 VAC, Ie: 2 A<br>AC-13: Ue: 250 VAC, Ie: 3 A<br>DC-13: Ue: 30 VDC, Ie: 0.5 A |
| Rated insulation voltage                                    | 250 V                                                                                      |                                                                                            |
| Rated impulse withstand voltage<br>(altitude: 2,000 m max.) | 2.5 kV (at 240 VAC)                                                                        |                                                                                            |
| Conditional short-circuit current                           | 1000 A                                                                                     |                                                                                            |

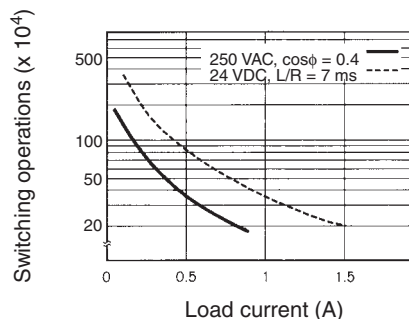
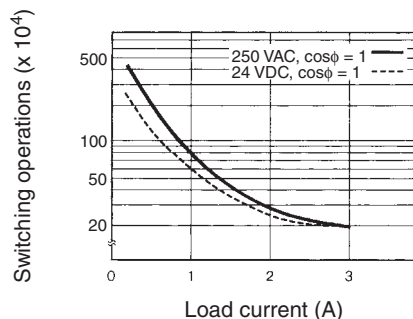
## Life-test Curve (Reference Value)

### H3YN-2-B/-21-B



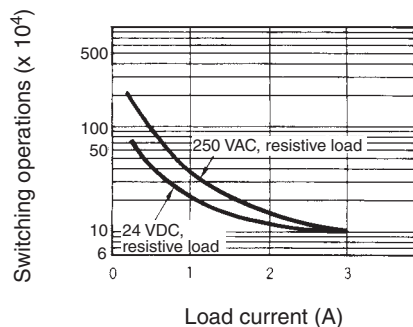
Reference: A maximum current of 0.6 A can be switched at 125 VDC ( $\cos\phi = 1$ ).  
 Maximum current of 0.2 A can be switched if  $L/R$  is 7 ms. In both cases, a life of 100,000 operations can be expected.  
 The minimum applicable load is 1 mA at 5 VDC (P reference value)

### H3YN-4-B/-41-B



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

### H3YN-4-Z-B/-41-Z-B

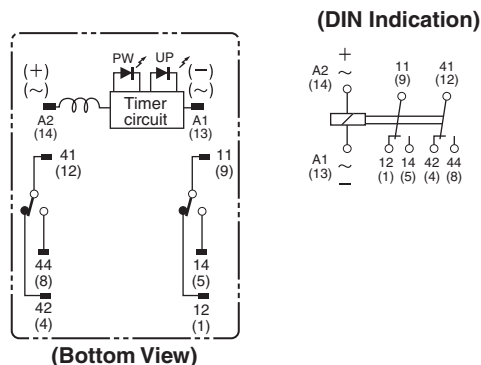


Reference: A maximum current of 0.5 A can be switched at 125 VDC ( $\cos\phi = 1$ ).  
 Maximum current of 0.2 A can be switched if  $L/R$  is 7 ms. In both cases, a life of 100,000 operations can be expected.  
 The minimum applicable load is 0.1 mA at 1 VDC (P reference value)

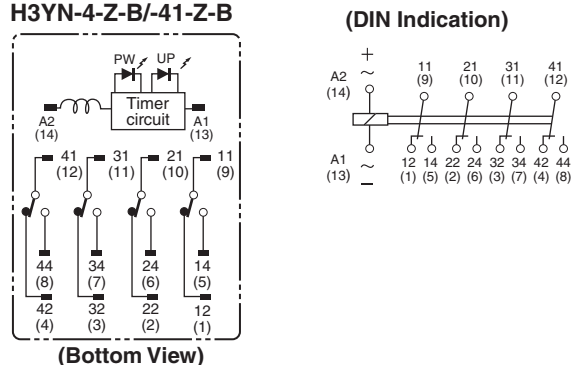
## Connections

### Connection

#### H3YN-2-B/-21-B



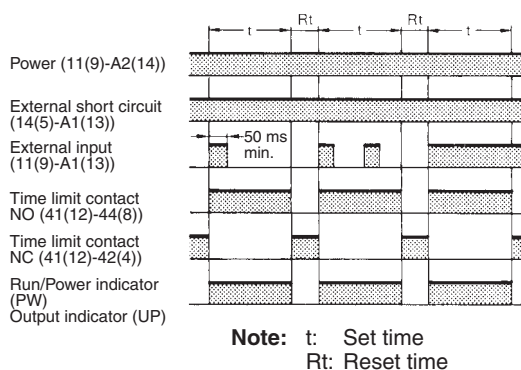
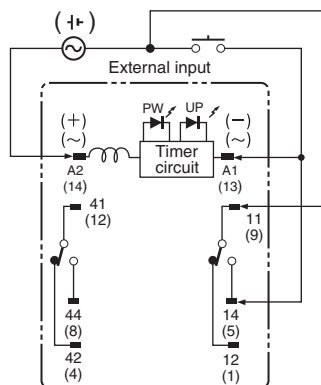
#### H3YN-4-B/-41-B H3YN-4-Z-B/-41-Z-B



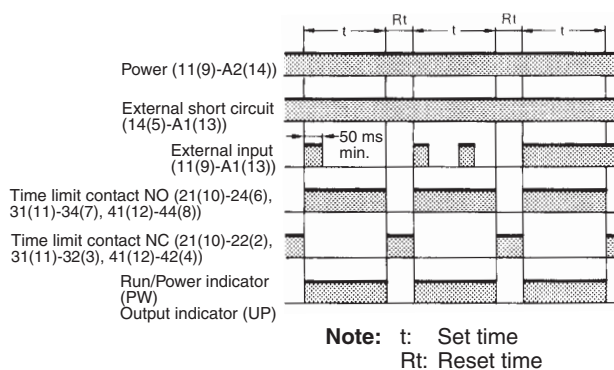
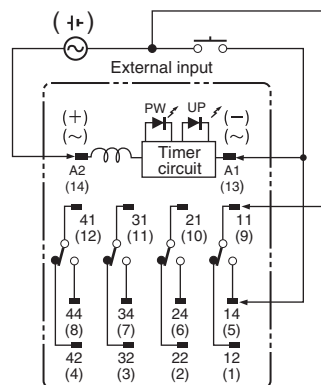
### Pulse Operation

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

#### H3YN-2-B/-21-B



#### H3YN-4-B/-41-B H3YN-4-Z-B/-41-Z-B



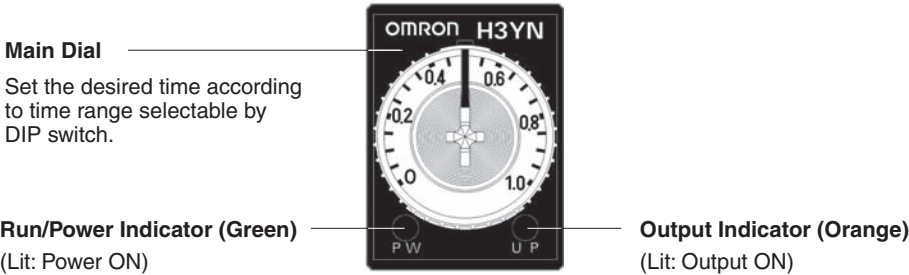
### Caution

Be careful when connecting wires.

| Mode                                         | Terminals                                                                                                                |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Pulse operation                              | Power supply between 11(9) and A2(14)<br>Short-circuit between 14(5) and A1(13)<br>Input signal between 11(9) and A1(13) |
| Operating mode; interval and all other modes | Power supply between A1(13) and A2(14)                                                                                   |

H3YN-□-B

Nomenclature

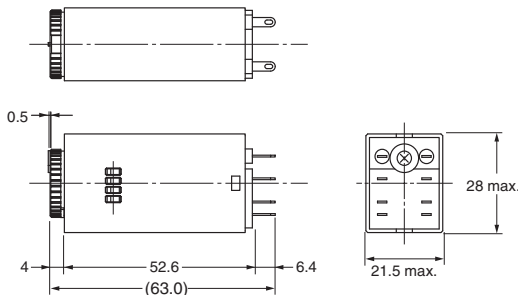


Dimensions

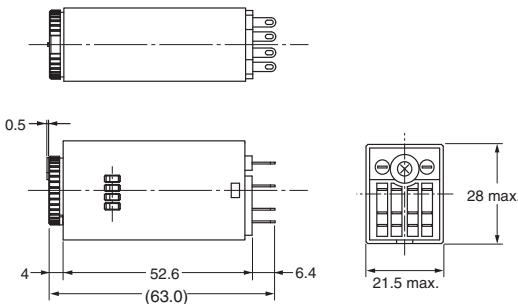
(Unit: mm)

Timers

H3YN-2-B/-21-B Front Mounting



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



## Operation

### DIP Switch Settings

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

### Time Ranges

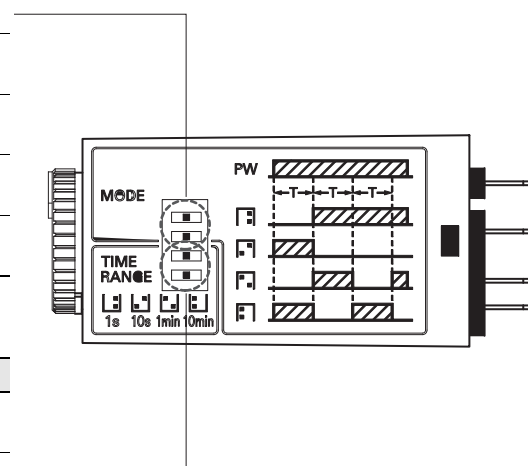
| Model                                  | Time range | Time setting range | Setting                                                                           | Factory-set |
|----------------------------------------|------------|--------------------|-----------------------------------------------------------------------------------|-------------|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

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

### Operating Modes

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

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



Timing Chart

| Operating mode    | Timing chart                                                                                                                                                                                                |                                                                                                                                                                                                                                                                     |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | H3YN-2-B/-21-B                                                                                                                                                                                              | H3YN-4-B/-41-B                                                                                                                                                                                                                                                      |
| ON-delay          | <p>Power (A1(13)-A2(14))</p> <p>Time limit contact NC (11(9)-12(1), 41(12)-42(4))</p> <p>Time limit contact NO (11(9)-14(5), 41(12)-44(8))</p> <p>Run/Power indicator (PW)</p> <p>Output indicator (UP)</p> | <p>Power (A1(13)-A2(14))</p> <p>Time limit contact NC (11(9)-12(1), 21(10)-22(2), 31(11)-32(3), 41(12)-42(4))</p> <p>Time limit contact NO (11(9)-14(5), 21(10)-24(6), 31(11)-34(7), 41(12)-44(8))</p> <p>Run/Power indicator (PW)</p> <p>Output indicator (UP)</p> |
| Interval          | <p>Power (A1(13)-A2(14))</p> <p>Time limit contact NC (11(9)-12(1), 41(12)-42(4))</p> <p>Time limit contact NO (11(9)-14(5), 41(12)-44(8))</p> <p>Run/Power indicator (PW)</p> <p>Output indicator (UP)</p> | <p>Power (A1(13)-A2(14))</p> <p>Time limit contact NC (11(9)-12(1), 21(10)-22(2), 31(11)-32(3), 41(12)-42(4))</p> <p>Time limit contact NO (11(9)-14(5), 21(10)-24(6), 31(11)-34(7), 41(12)-44(8))</p> <p>Run/Power indicator (PW)</p> <p>Output indicator (UP)</p> |
| Flicker OFF-start | <p>Power (A1(13)-A2(14))</p> <p>Time limit contact NC (11(9)-12(1), 41(12)-42(4))</p> <p>Time limit contact NO (11(9)-14(5), 41(12)-44(8))</p> <p>Run/Power indicator (PW)</p> <p>Output indicator (UP)</p> | <p>Power (A1(13)-A2(14))</p> <p>Time limit contact NC (11(9)-12(1), 21(10)-22(2), 31(11)-32(3), 41(12)-42(4))</p> <p>Time limit contact NO (11(9)-14(5), 21(10)-24(6), 31(11)-34(7), 41(12)-44(8))</p> <p>Run/Power indicator (PW)</p> <p>Output indicator (UP)</p> |
| Flicker ON-start  | <p>Power (A1(13)-A2(14))</p> <p>Time limit contact NC (11(9)-12(1), 41(12)-42(4))</p> <p>Time limit contact NO (11(9)-14(5), 41(12)-44(8))</p> <p>Run/Power indicator (PW)</p> <p>Output indicator (UP)</p> | <p>Power (A1(13)-A2(14))</p> <p>Time limit contact NC (11(9)-12(1), 21(10)-22(2), 31(11)-32(3), 41(12)-42(4))</p> <p>Time limit contact NO (11(9)-14(5), 21(10)-24(6), 31(11)-34(7), 41(12)-44(8))</p> <p>Run/Power indicator (PW)</p> <p>Output indicator (UP)</p> |

Note: t: Set time  
Rt: Reset time