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).

⚠ Refer to *Safety Precautions* on page 38.

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

## Ordering Information

### List of Models

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

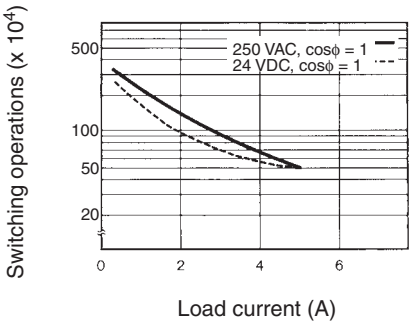
| Item | H3YN-2-B/-21-B/-4-B/-41-B |
|---|---|
| **Accuracy of operating time** | ±1% FS max. (1 s range: ±1%±10 ms max.) |
| **Setting error** | ±10%±50 ms FS max. |
| **Reset time** | Min. power-opening time: 0.1 s max. (including halfway reset) |
| **Influence of voltage** | ±2% FS max. |
| **Influence 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 $m/s^2$<br>Malfunction: 100 $m/s^2$ |
| **Life expectancy** | Mechanical: 10,000,000 operations min. (under no load at 1,800 operations/h)<br>Electrical: DPDT:<br>500,000 operations min. (5 A at 250 VAC, resistive load at 1,800 operations/h)<br>4PDT:<br>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) EN 61812-1<br>Emission Enclosure: EN 55011 Group 1 class A<br>Emission AC Mains: EN 55011 Group 1 class A<br>(EMS) EN 61812-1<br>Immunity ESD: IEC 61000-4-2<br>Immunity RF-interference: IEC 61000-4-3<br>Immunity Burst: IEC 61000-4-4<br>Immunity Surge: IEC 61000-4-5<br>Immunity Conducted Disturbance: IEC 61000-4-6<br>Immunity Voltage Dip/Interruption: IEC 61000-4-11 |
| **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) |

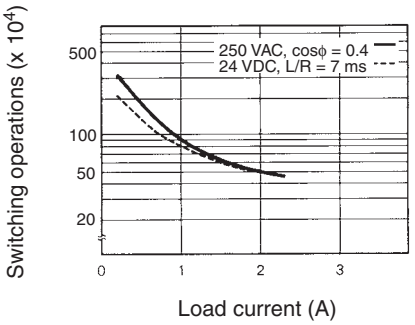
**✱1.** Terminal screw sections are excluded.
**✱2.** Refer to the *Life-test Curve*.
**✱3.** cULus listing applies when the OMRON PYF-□-PU-L is used.
cURus recognition applies when any other socket is used.
**✱4.** Overvoltage category II
**✱5.** CCC certification requirements

| 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 (altitude: 2,000 m max.)** | 2.5 kV (at 240 VAC) | |
| **Conditional short-circuit current** | 1000 A | |

## Life-test Curve (Reference Value)

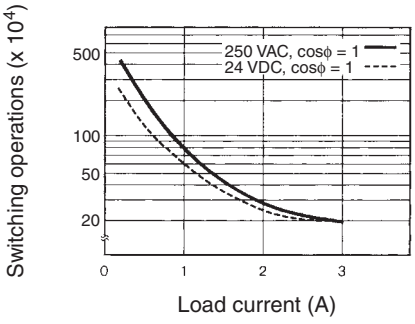
**H3YN-2-B/-21-B**

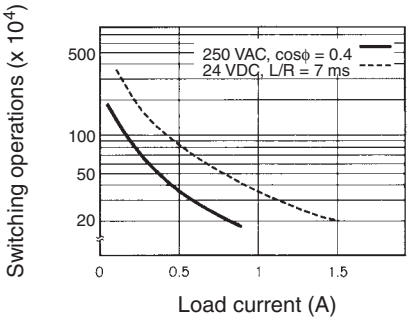



Reference: A maximum current of 0.6 A can be switched at 125 VDC (cosϕ = 1).
Maximum current of 0.2 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.
The minimum applicable load is 1 mA at 5 VDC (P reference value)

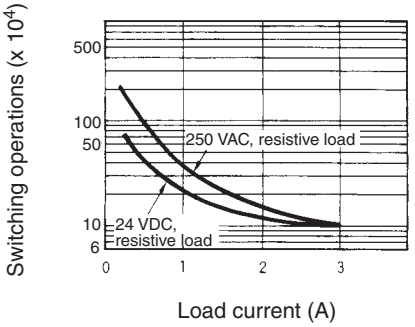
**H3YN-4-B/-41-B**




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

**H3YN-4-Z-B/-41-Z-B**

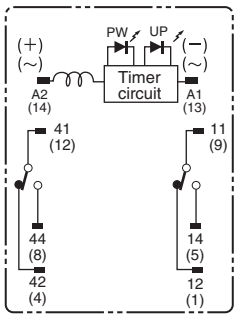



Reference: A maximum current of 0.5 A can be switched at 125 VDC (cosϕ = 1).
Maximum current of 0.2 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.
The minimum applicable load is 0.1 mA at 1 VDC (P reference valu

# Connections

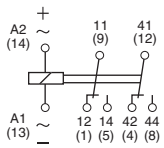
## Connection

**H3YN-2-B/-21-B**

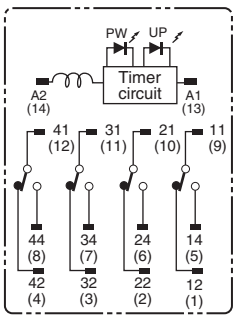



(Bottom View)

(DIN Indication)

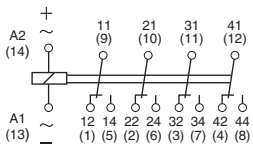



**H3YN-4-B/-41-B**
**H3YN-4-Z-B/-41-Z-B**




(Bottom View)

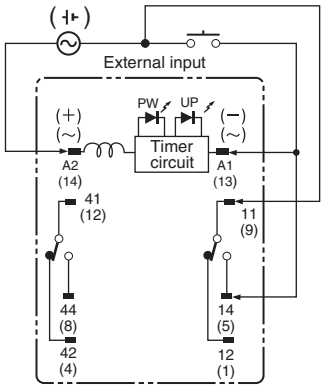
(DIN Indication)

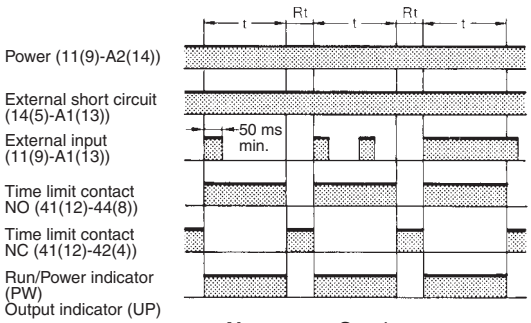



### Pulse Operation

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.

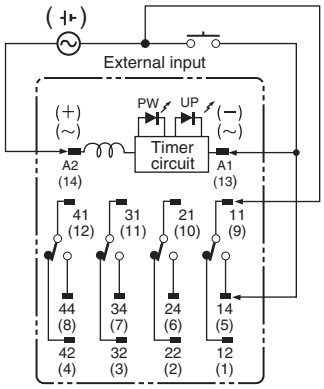
**H3YN-2-B/-21-B**

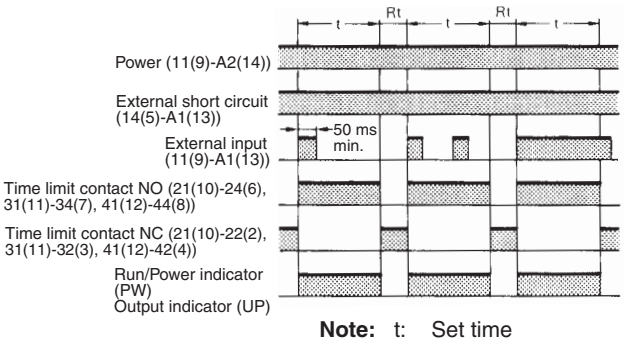



**Note:** t: Set time
Rt: Reset time

**H3YN-4-B/-41-B**
**H3YN-4-Z-B/-41-Z-B**




**Note:** t: Set time
Rt: Reset time

**⚠ 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) |

## Nomenclature

**Main Dial**

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

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

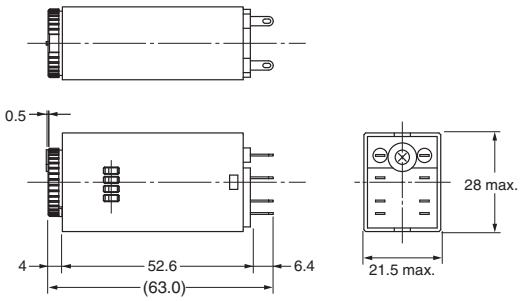
**Output Indicator (Orange)**
(Lit: Output ON)

## Dimensions

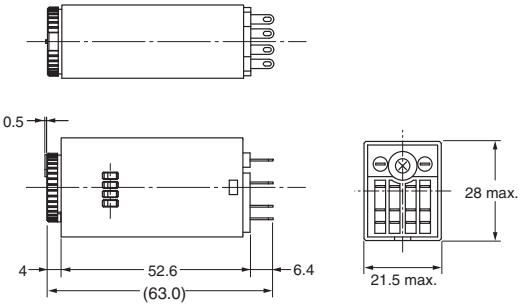
**(Unit: mm)**

### Timers

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




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



# Operation

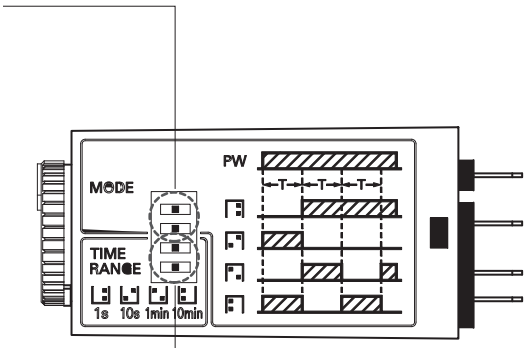
## DIP Switch Settings

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, H3YN-4-B 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, H3YN-41-B 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.

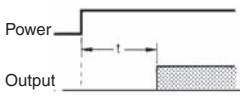
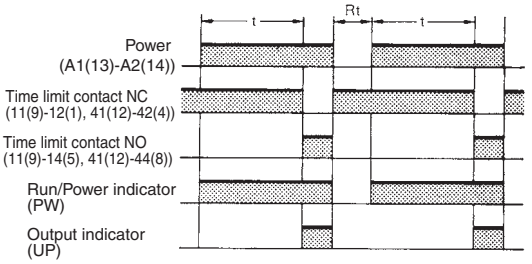
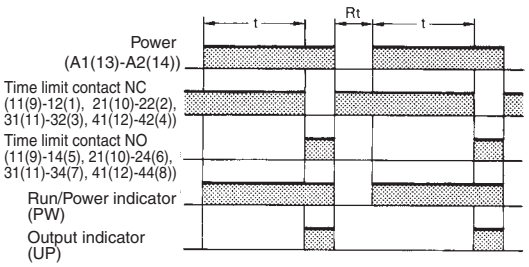
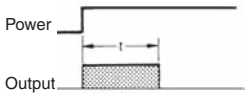
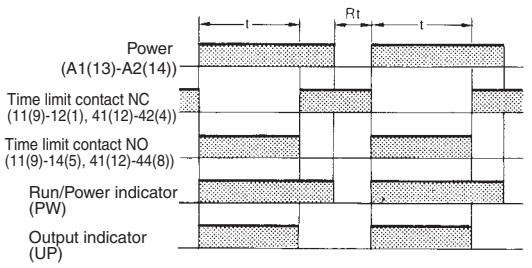
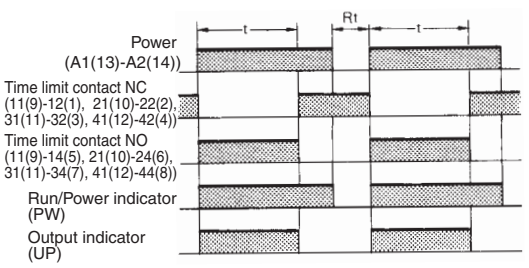
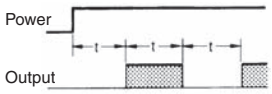
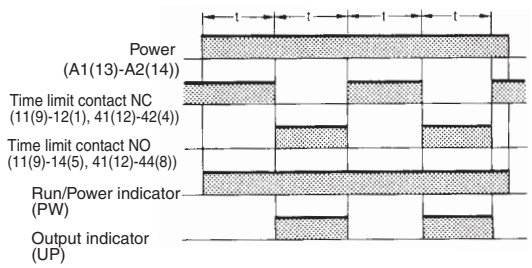
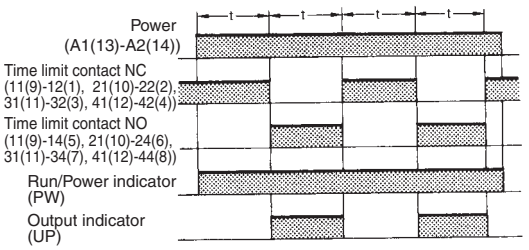
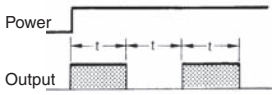
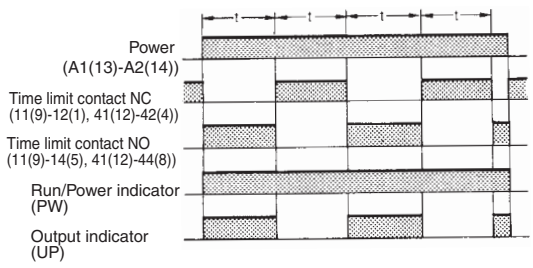
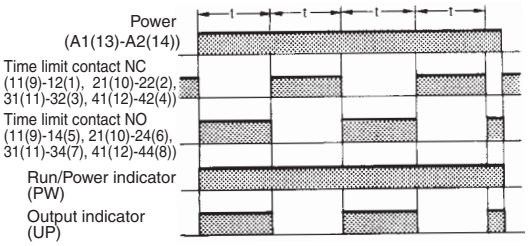



### Operating Modes

| 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**<br>  |  |  |
| **Interval**<br>  |  |  |
| **Flicker OFF-start**<br>  |  |  |
| **Flicker ON-start**<br>  |  |  |

**Note:** t: Set time
Rt: Reset time