

# Solid-state Timer

# H3YN

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

- Minimizes stock.
- Pin configuration compatible with MY Power Relay.
- Standard multiple operating modes and multiple time ranges.
- Conforms to EN 61812-1 and IEC 60664-1 for Low Voltage, and EMC Directives



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<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                                      | H3YN-21                                    |
|                                                                    | 4PDT                 | H3YN-4 *1                                   | H3YN-41 *1                                 |
| 24 VDC                                                             | 4PDT (Twin contacts) | H3YN-4-Z *1, *2                             | H3YN-41-Z *1, *2                           |

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

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

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

## Accessories (Order Separately)

### Adapter, Mounting Plate, Hold-down Clips, Terminal covers

| Name/specification        | Model                            |
|---------------------------|----------------------------------|
| Flush mounting adapter    | Y92F-78                          |
| Mounting Plate for Socket | For 1 Socket PYP-1               |
|                           | For 18 Sockets PYP-18            |
| Hold-down Clips           | For PYFZ-□ and PYF□A Y92H-3      |
|                           | For PY□ and PYF□M Y92H-4         |
| Terminal covers           | For PYFZ-08 PYCZ-C08 (2 pcs/set) |
|                           | For PYFZ-14 PYCZ-C14 (1 pcs/set) |

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

## Socket

| Timer   |         | Square Sockets |                  |                                                  |           |
|---------|---------|----------------|------------------|--------------------------------------------------|-----------|
| Contact | Model   | Pin            | Connection       | Terminal                                         | Model     |
| DPDT    | H3YN-2□ | 8-pin          | Front Connecting | DIN track mounting                               | PYFZ-08   |
|         |         |                |                  | DIN track mounting (Finger Protection Structure) | PYFZ-08-E |
|         |         |                | Back Connecting  | Screw mounting                                   | PYF08M    |
|         |         |                |                  | Solder terminal                                  | PY08      |
| 4PDT    | H3YN-4□ | 14-pin         | Front Connecting | PCB terminal                                     | PY08-02   |
|         |         |                |                  | DIN track mounting                               | PYFZ-14   |
|         |         |                | Back Connecting  | DIN track mounting (Finger Protection Structure) | PYFZ-14-E |
|         |         |                |                  | Solder terminal                                  | PY14      |
|         |         |                |                  | PCB terminal                                     | PY14-02   |

**Note:** 1. Cannot be used with the H3Y-□-0 (PCB terminals).

2. The PYFZ-□-E and PYF□A-E have a finger-protection structure. Round crimp terminals cannot be used. Use forked crimp terminals.

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

# H3YN

## Specifications

### Ratings

| Item                          | H3YN-2/-4/-4-Z                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | H3YN-21/-41/-41-Z                                             |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| 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/-41 series: The minimum applicable load is 1 mA at 1 VDC (P reference value).<br>H3YN-4-Z/-41-Z 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 50°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 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/-21/-4/-41                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 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> *2<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) *3                                                                                                                         |  |
| 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>EN 55011 Group 1 class A<br>Emission AC Mains: EN 55011 Group 1 class A<br>(EMS)<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         | UL 508, 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/-21, 2.5 kV/1 for H3YN-4/-41, H3YN-4-Z/-41-Z) *4                                                                                                                                                                                                                                                                          |  |

\*1. Terminal screw sections are excluded.

\*2. The destructive shock resistance test was performed on the Timer.

\*3. Refer to the *Life-test Curve*.

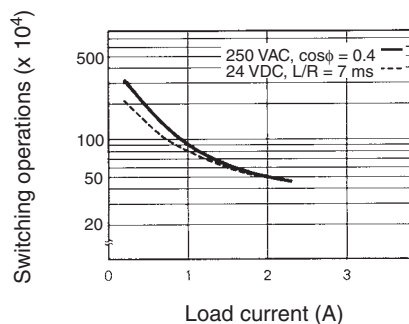
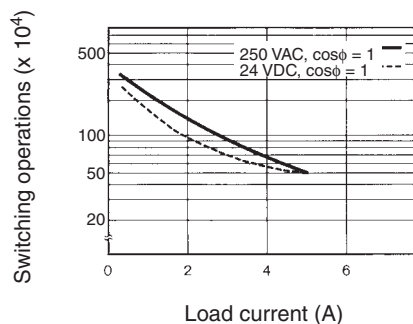
\*4. Overvoltage category II.

\*5. CCC certification requirements

| Model                                                       | H3YN-2/-21                                                                                 | H3YN-4/-41                                                                                 |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Recommended fuse                                            | RT14-20/6A (380 VAC 6 A),<br>manufactured by DELIXI                                        | RT14-20/4A (380 VAC 4 A),<br>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                                                                                     |                                                                                            |

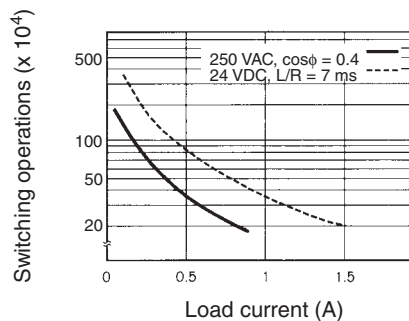
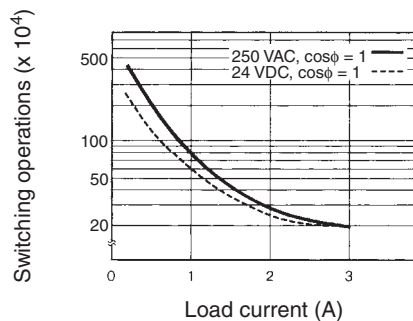
## Life-test Curve (Reference Value)

### H3YN-2/-21



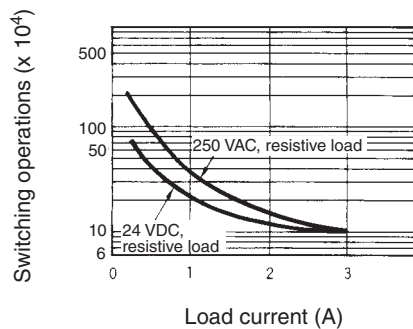
Reference: A maximum current of 0.6 A can be switched at 125 VDC ( $\cos\phi = 1$ ).  
 Maximum current of 0.2 A can be switched if  $L/R$  is 7 ms. In both cases, a life of 100,000 operations can be expected.  
 The minimum applicable load is 1 mA at 5 VDC (P reference value)

### H3YN-4/-41



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/-41-Z

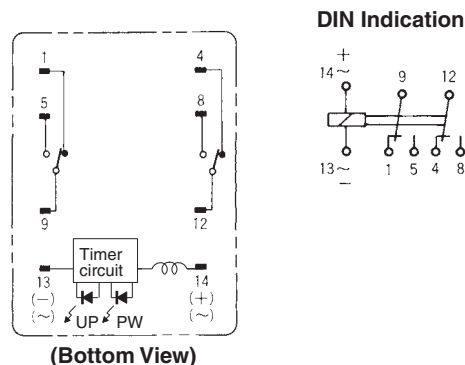


Reference: A maximum current of 0.5 A can be switched at 125 VDC ( $\cos\phi = 1$ ).  
 Maximum current of 0.2 A can be switched if  $L/R$  is 7 ms. In both cases, a life of 100,000 operations can be expected.  
 The minimum applicable load is 0.1 mA at 1 VDC (P reference value)

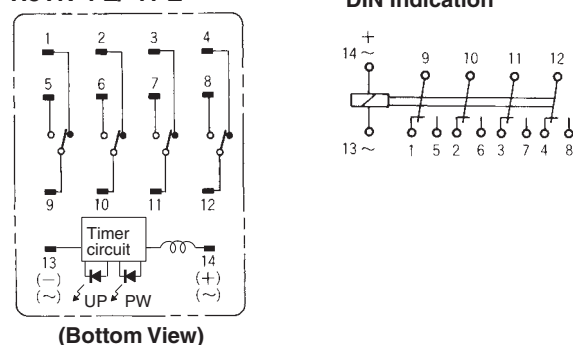
## Connections

### Connection

#### H3YN-2/-21



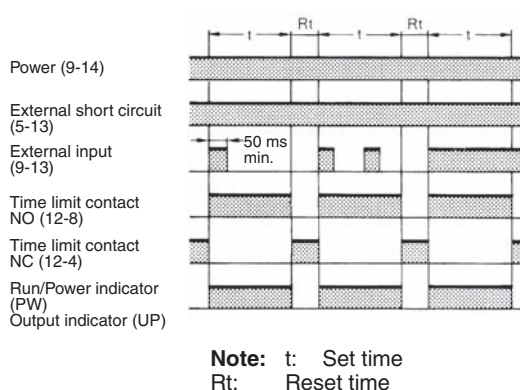
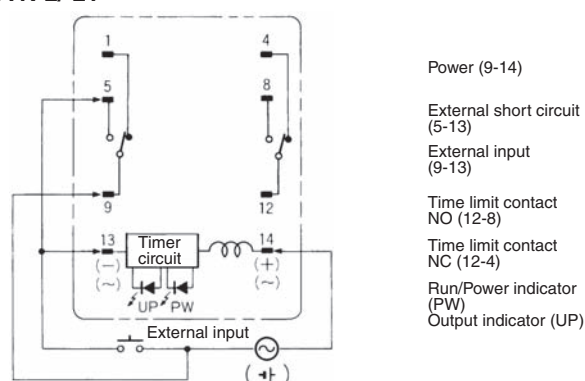
#### H3YN-4/-41 H3YN-4-Z/-41-Z



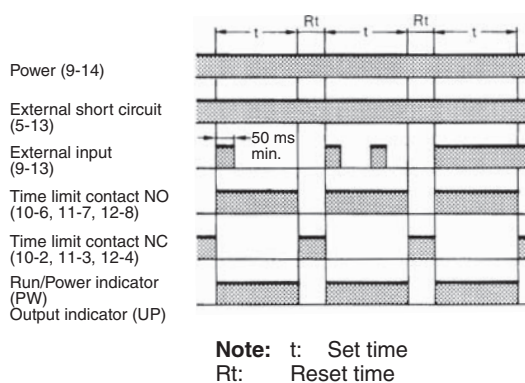
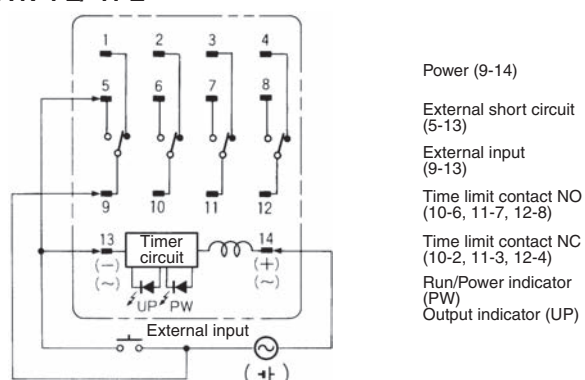
### Pulse Operation

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

#### H3YN-2/-21



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



**Caution**  
Be careful when connecting wires.

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

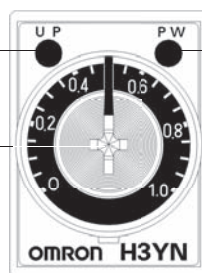
# H3YN

## Nomenclature

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

**Main Dial**

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



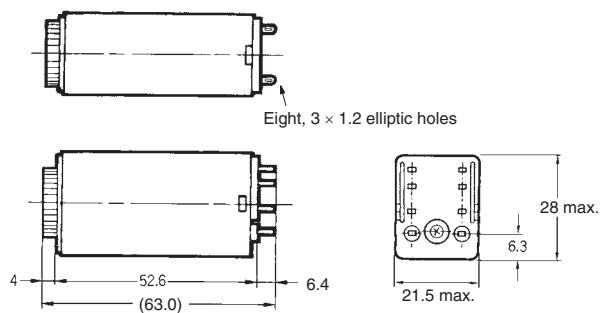
**Run/Power Indicator (Green)**  
(Lit: Power ON)

## Dimensions

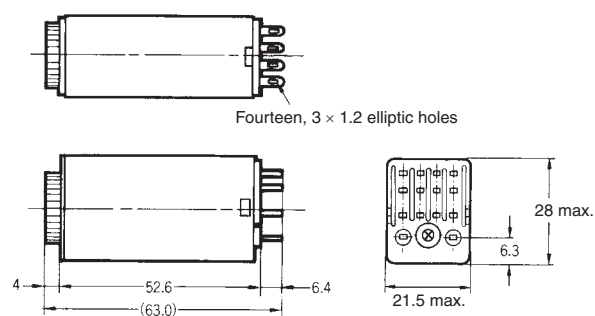
(Unit: mm)

### Timers

#### H3YN-2/-21 Front Mounting



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



## Operation

### DIP Switch Settings

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

#### Time Ranges

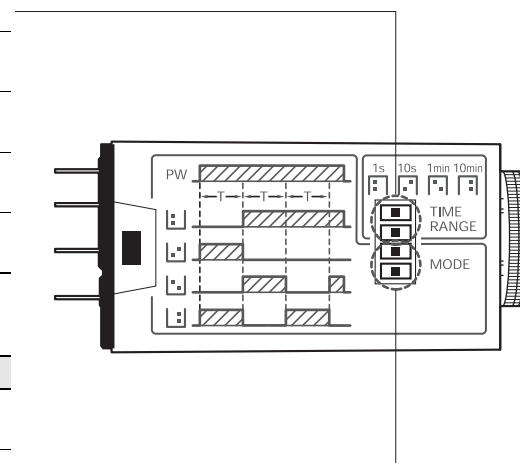
| Model                            | Time range | Time setting range | Setting | Factory-set |
|----------------------------------|------------|--------------------|---------|-------------|
| H3YN-2,<br>H3YN-4<br>H3YN-4-Z    | 1 s        | 0.1 to 1 s         |         | Yes         |
|                                  | 10 s       | 1 to 10 s          |         | No          |
|                                  | 1 min      | 0.1 to 1 min       |         | No          |
|                                  | 10 min     | 1 to 10 min        |         | No          |
| H3YN-21,<br>H3YN-41<br>H3YN-41-Z | 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 top two DIP switch pins are used to select the time ranges.

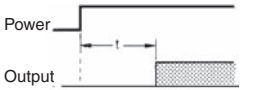
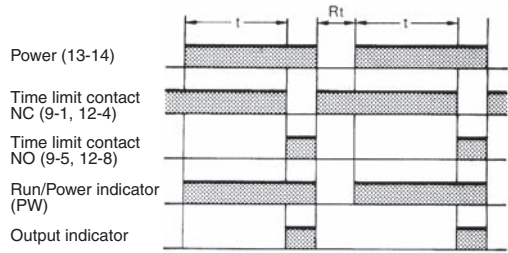
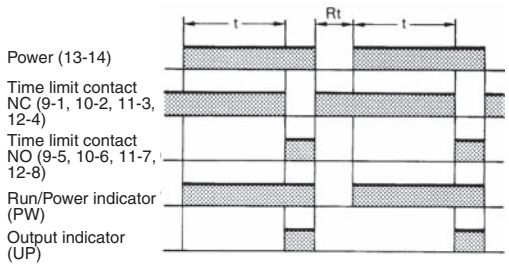
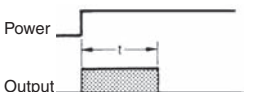
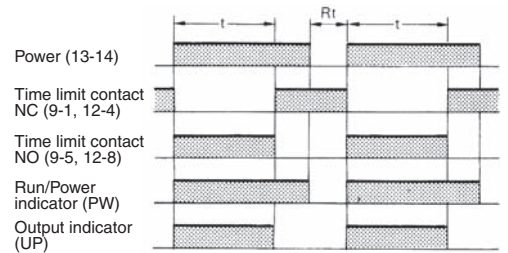
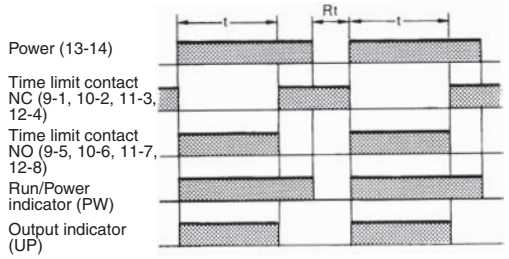
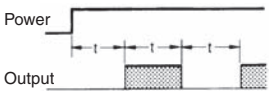
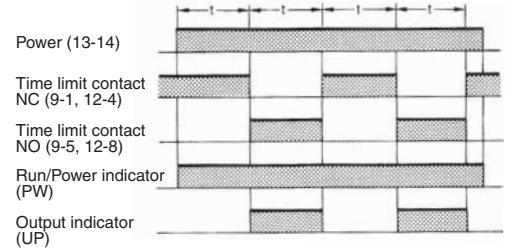
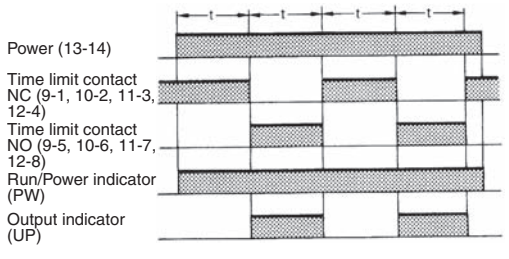
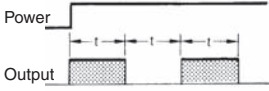
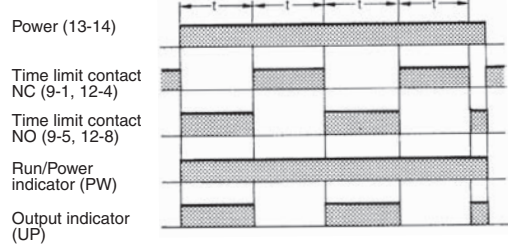
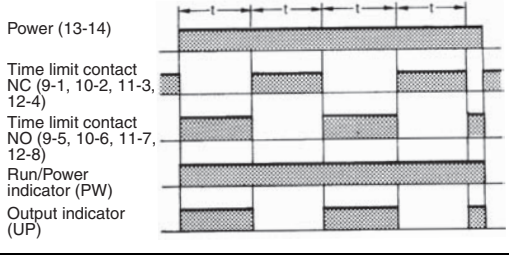
#### Operating Modes

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

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



Timing Chart

| Operating mode                                                                                                            | Timing chart                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                           | H3YN-2/-21                                                                                                                                                                                                                                                                             | H3YN-4/-41                                                                                                                                                                                                                                                                                                      |
| <div>ON-delay</div> <div></div>           | <div>Power (13-14)</div> <div>Time limit contact NC (9-1, 12-4)</div> <div>Time limit contact NO (9-5, 12-8)</div> <div>Run/Power indicator (PW)</div> <div>Output indicator</div> <div></div>        | <div>Power (13-14)</div> <div>Time limit contact NC (9-1, 10-2, 11-3, 12-4)</div> <div>Time limit contact NO (9-5, 10-6, 11-7, 12-8)</div> <div>Run/Power indicator (PW)</div> <div>Output indicator (UP)</div> <div></div>   |
| <div>Interval</div> <div></div>           | <div>Power (13-14)</div> <div>Time limit contact NC (9-1, 12-4)</div> <div>Time limit contact NO (9-5, 12-8)</div> <div>Run/Power indicator (PW)</div> <div>Output indicator (UP)</div> <div></div>   | <div>Power (13-14)</div> <div>Time limit contact NC (9-1, 10-2, 11-3, 12-4)</div> <div>Time limit contact NO (9-5, 10-6, 11-7, 12-8)</div> <div>Run/Power indicator (PW)</div> <div>Output indicator (UP)</div> <div></div>   |
| <div>Flicker OFF-start</div> <div></div> | <div>Power (13-14)</div> <div>Time limit contact NC (9-1, 12-4)</div> <div>Time limit contact NO (9-5, 12-8)</div> <div>Run/Power indicator (PW)</div> <div>Output indicator (UP)</div> <div></div>  | <div>Power (13-14)</div> <div>Time limit contact NC (9-1, 10-2, 11-3, 12-4)</div> <div>Time limit contact NO (9-5, 10-6, 11-7, 12-8)</div> <div>Run/Power indicator (PW)</div> <div>Output indicator (UP)</div> <div></div>  |
| <div>Flicker ON-start</div> <div></div> | <div>Power (13-14)</div> <div>Time limit contact NC (9-1, 12-4)</div> <div>Time limit contact NO (9-5, 12-8)</div> <div>Run/Power indicator (PW)</div> <div>Output indicator (UP)</div> <div></div> | <div>Power (13-14)</div> <div>Time limit contact NC (9-1, 10-2, 11-3, 12-4)</div> <div>Time limit contact NO (9-5, 10-6, 11-7, 12-8)</div> <div>Run/Power indicator (PW)</div> <div>Output indicator (UP)</div> <div></div> |

Note: t: Set time  
Rt: Reset time