OMRON

Twin Timer

H3DE-F

22.5 mm Twin Timer
Designed for Track Mounting

- Wide AC/DC power supply range, AC/DC 24 to 230
- Independent long or short ON-/OFF-time settings are possible
- Repeat-cycle can be set for ON-start or OFF-start by switch-selection
- Time range of 0.1 second to 12 hours
- Finger protection terminal block

Ordering Information

■ TIMER

Description	Supply voltage	**Part number**
Independent ON-time/OFF-time operation	24 to 230 VAC/VDC	**H3DE-F AC/DC24-230**

■ MODEL NUMBER LEGEND

H3DE-□-□ 1. F: Twin timers 2. Supply voltage
1 2

■ ACCESSORIES (ORDER SEPARATELY)

Item	Description	**Part number**
Mounting track	50 cm (l) x 7.3 mm (t)	**PFP-50N**
	1 m (l) x 7.3 mm (t)	**PFP-100N**
	1 m (l) x 16 mm (t)	**PFP-100N2**
End plate		**PFP-M**
Spacer		**PFP-S**

Specifications

■ GENERAL

Item	H3DE-F
Operating mode	Repeat-cycle with independent ON-time/OFF-time operation
Operating/Reset method	Time-limit operation/Time-limit reset or self-reset
Terminal block	Clamps two 2.5 mm^2 max. bar terminals without sleeves
Terminal screw tightening torque	0.98 N • m max. {approx. 10 kgf • cm max.}
Output type	Relay: SPDT
Mounting method	DIN track mounting (See Note.)
Attachment	Nameplate
Approved standards	UL508, CSA 22.2 No.14 Conforms to EN61812-1, IEC60664-1 (VDE0110) 4 kV/2, VDE0106/P 100 Output category according to IEC60947-5-1 (AC-13; 250 V 5A/AC-15; 250 V 3 A/DC-13; 30 V 0.1 A)

Note: Can be mounted to 35-mm DIN track with a plate thickness of 1 to 2.5 mm.

■ TIME RANGES

Time scale display (See Note 1.)	Time unit display			
	sec	10 s	min	hrs
x 0.1	0.1 to 1.2 s	1 to 12 s	0.1 to 1.2 min	0.1 to 1.2 h
x 1	1 to 12 s	10 to 120 s	1 to 12 min	1 to 12 h

Note: 1. Time scale display is applied commonly for ON and OFF time.
2. When the main dial is set to “0” for all settings, the output will operate instantaneously.

■ RATINGS

Rated supply voltage (See Note.)	24 to 230 VAC/VDC (50/60 Hz)
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-off time: 0.1 s
Reset voltage	2.4 VAC/DC max.
Power consumption	AC: Approx. 3.1 VA (1.8 W) at 230 VAC DC: Approx. 0.8 W at 24 VDC
Control output	Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$); 5 A at 30 VDC with resistive load ($\cos\phi = 1$)
Ambient temperature	Operating: −10°C to 55°C (14°F to 131°F) with no icing Storage: −25°C to 65°C (−13°F to 149°F) with no icing
Ambient humidity	Operating: 35% to 85%

Note: DC ripple rate: 20% max.

■ CHARACTERISTICS

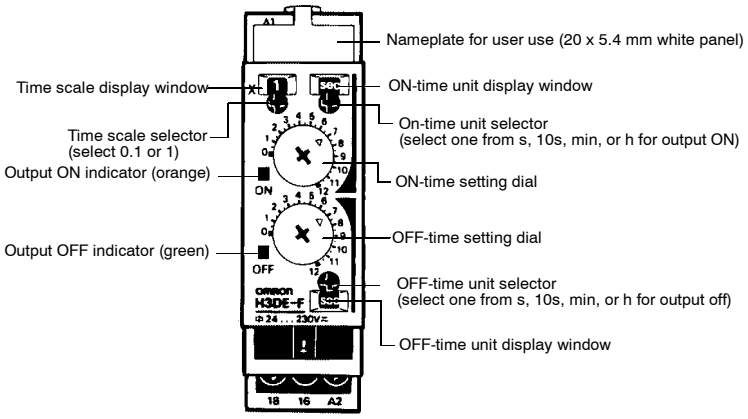
Accuracy of operating time	±1% max. of FS (±1% ±10 ms max. at 1.2-s range)
Setting error	±10% ±0.05 s max. of FS
Influence of voltage	±0.5% max. of FS (±0.5% ±10 ms max. at 1.2-s range)
Influence of temperature	±2% max. of FS (±2% ±10 ms max. at 1.2-s range)
Insulation resistance	100 MΩ min. at 500 VDC
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC (50/60 Hz) for 1 min. Between control output terminals and operating circuit: 2,000 VAC (50/60 Hz) for 1 min. Between contacts not located next to each other: 1,000 VAC (50/60 Hz) for 1 min.
Impulse withstand voltage	3 kV (between power supply terminals) 4.5 kV (between current-carrying metal parts and exposed non-current-carrying metal parts)
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±1.5 kV
Static immunity	Malfunction: 4 kV Destruction: 8 kV
Vibration resistance	Malfunction: 0.5-mm single amplitude at 10 to 55 Hz Destruction: 0.75-mm single amplitude at 10 to 55 Hz
Shock resistance	Malfunction: 100 m/s^2 (approximately 10G) Destruction: 1,000 m/s^2 (approximately 100G)
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h)
EMC	EMI Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Harmonic Current: EN61000-3-2 Voltage Fluctuation and Flickering: EN61000-3-3 EMS Immunity ESD: EN61000-4-2: 6 kV contact discharge (level 3); 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power port and output port (level 3); 1 kV control port with capacitive clamp (level 3) Immunity Surge: EN61000-4-5: 2 kV common mode (level 3); 1 kV differential mode (level 3)
Enclosure rating	IP30 (IP20 for terminal block)
Weight	Approx. 110 g

Note: For reference:
A maximum current of 0.15 A can be switched at 125 VDC ($\cos\phi$=1).
A maximum current of 0.1 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 10 mA at 5 VDC (failure level: P).

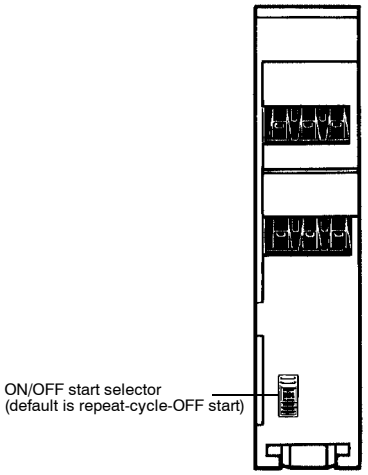
Nomenclature

■ H3DE-F

Front View



Bottom View

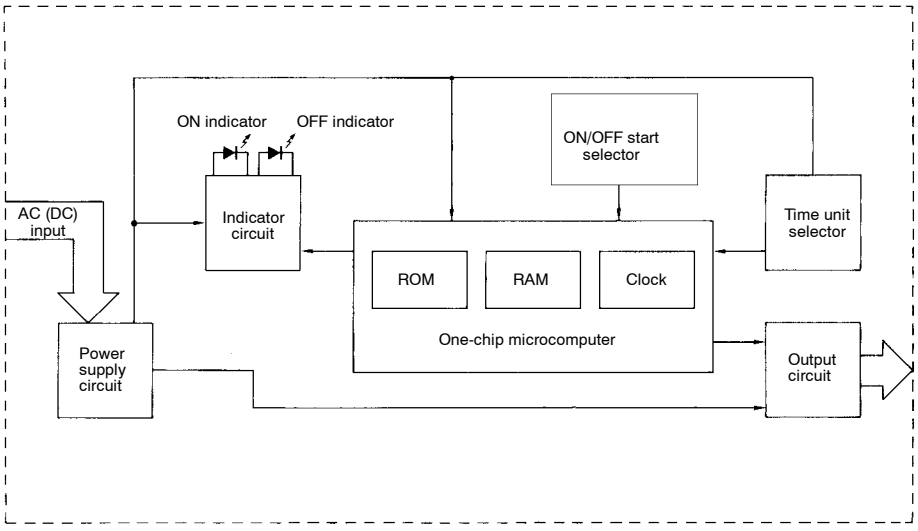


ON/OFF Start Selector Switch Settings

Setting	Operating mode
	ON-start
	OFF-start

Operation

■ BLOCK DIAGRAM



■ I/O FUNCTION

Inputs		—
Outputs	Control output	Outputs are turned ON/OFF according to the time set by the ON-time/OFF-time setting dial.

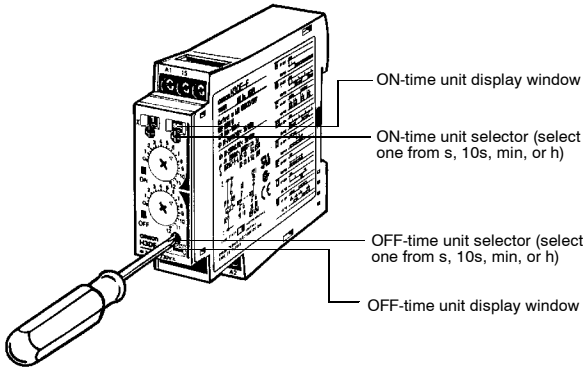
■ BASIC OPERATION

Time Unit Selection

The time unit display window for output ON is located on the upper-right side of the front panel, above the corresponding time unit selector.

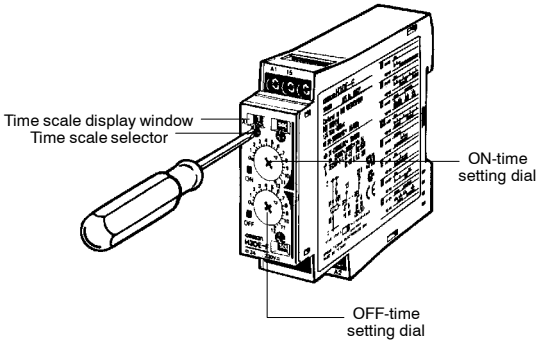
The time unit display window for output OFF is located on the lower-right side of the front panel below the corresponding time unit selector.

According to the setting of each time unit selector, “sec” for seconds, “10s” for 10 seconds, “min” for minutes, or “hrs” for hours will appear in the corresponding time unit display window.



Time Scale Selection

The time scale selector on the upper-left side of the front panel can be set to 0.1 or 1 as a magnification coefficient.



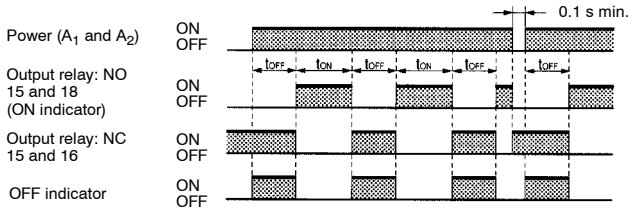
Time Setting

Use the ON/OFF-time setting dials to set the ON/OFF time.

■ TIMING CHARTS

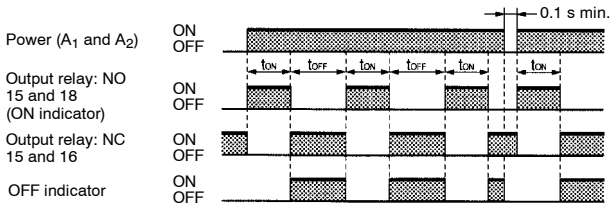
Operating Mode

OFF-Start



t_{ON}: ON set time
t_{OFF}: OFF set time

ON-Start



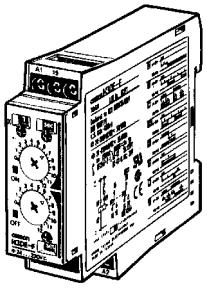
t_{ON}: ON set time
t_{OFF}: OFF set time

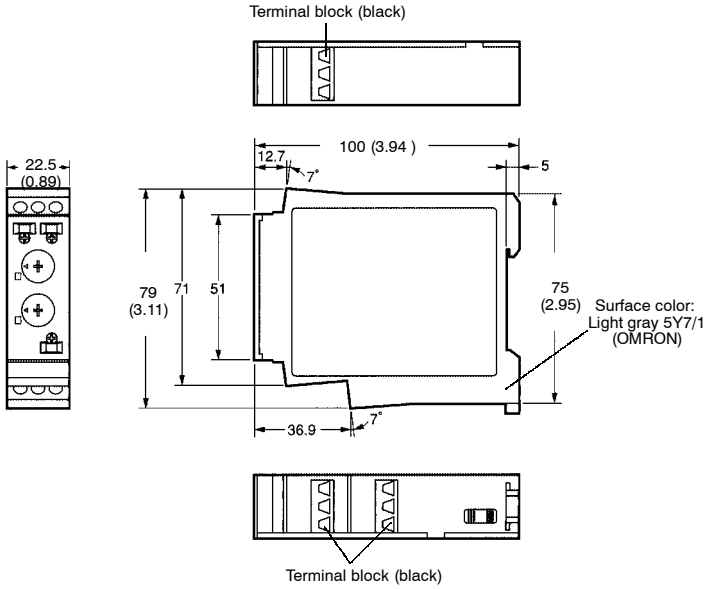
Note: 1. The reset time requires a minimum of 0.1 s.
2. When power is supplied in flicker-ON start mode, the OFF indicator lights momentarily, but this has no effect on the performance of the Timer.

Dimensions

Unit: mm (inch)

■ H3DE-F

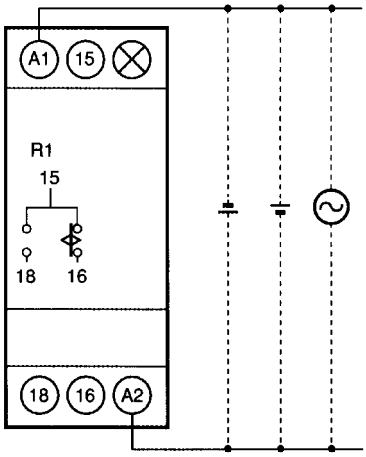




Installation

■ TERMINAL ARRANGEMENT

Note: DC supply voltage does not require the designation of polarity.

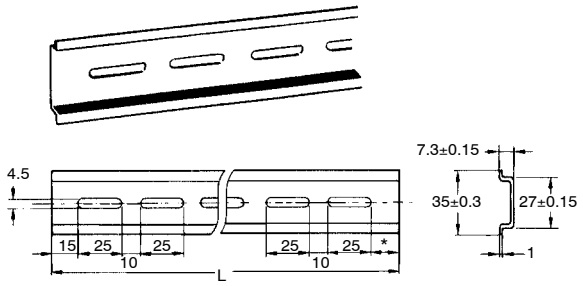


Accessories (Order Separately)

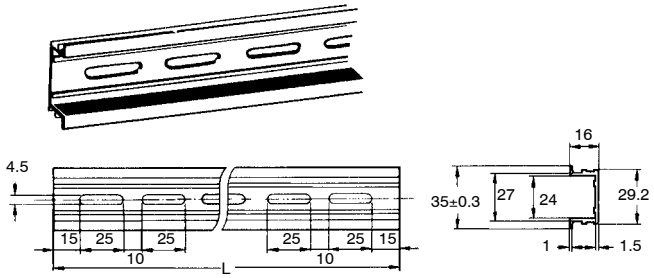
Unit: mm (inch)

■ DIMENSIONS

Mounting Track PFP-100N, PFP-50N



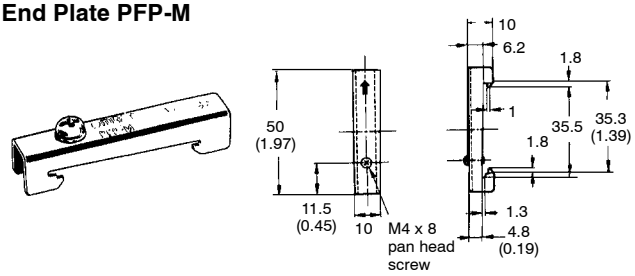
PFP-100N2



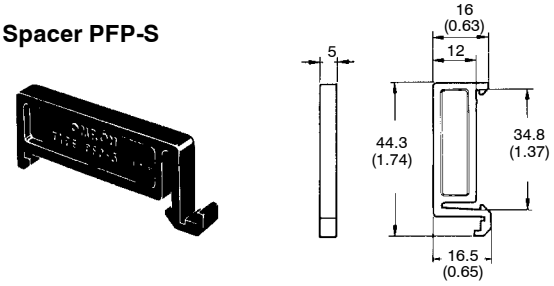
L: Length

1 m	39.37 in	PFP-100N
50 cm	19.69 in	PFP-50N
1 m	39.37 in	PFP-100N2

End Plate PFP-M



Spacer PFP-S



Precautions

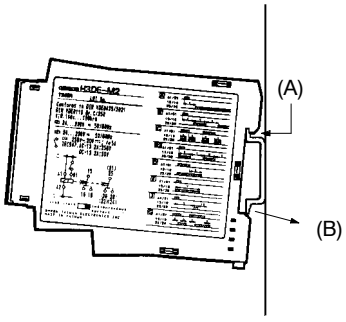
■ SETTING CHANGES

Note: Important: Do not change the time unit, time scale, operating mode, or output type selector switch while the Timer is in operation or malfunction could result.

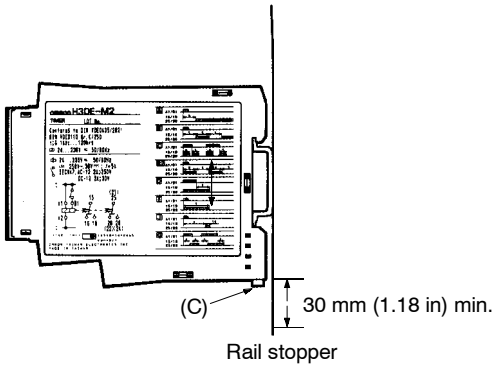
■ MOUNTING AND REMOVAL

The H3DE should be mounted as horizontally as possible.

When mounting the H3DE on a socket mounting track, hook portion (A) of the Timer to an edge of the track first, and then depress the Timer in the direction of (B).



When removing the H3DE, pull out portion (C) with a flat-blade screwdriver and remove the Timer from the mounting track.



The H3DE can be mounted or removed easily if a distance of 30 mm (1.18 in) or more is kept between the H3DE and the top surface of other equipment located below the H3DE.

■ POWER SUPPLIES

The H3DE Series is provided with a transformerless power supply system. An electric shock may be received if the input terminal or the output type selector switch is touched while power is being supplied.

Use the bar terminal for wiring the H3DE. Using a stranded-wire terminal may cause a short-circuit due to a stray wire entering into the Timer.

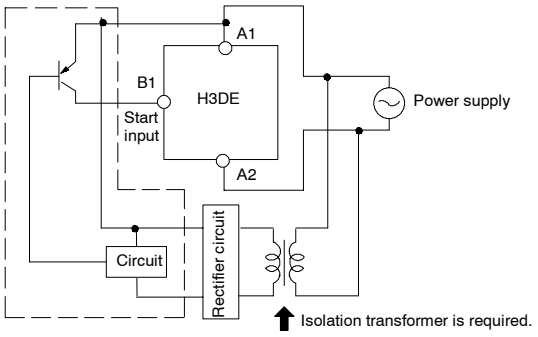
Both AC and DC power supplies can be connected to the power input terminals without regarding polarity.

With the H3DE only, a DC power supply must be connected to the power input terminals as designated according to the polarity of the terminals.

A DC power supply can be connected if its ripple factor is 20% or less and the mean voltage is within the rated operating voltage range of the Timer.

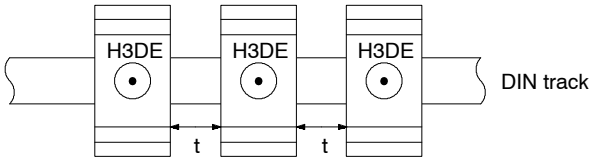
Connect the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value at once or the Timer may not be reset or a timer error could result.

For the power supply of an input device, use an isolating transformer, of which the primary and secondary windings are mutually isolated and the secondary winding is not grounded.



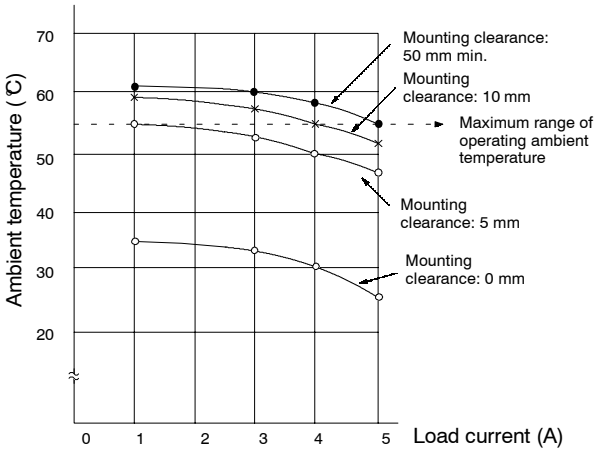
■ MOUNTING CLEARANCE

If the load current is continuously being supplied to the Timer for a long period of time, be sure to provide the mounting clearance as shown in the figure below. If used under the conditions other than those specified below, the life of internal components may be shortened due to an excessive rise in the internal temperature.



t: Mounting clearance (mm)

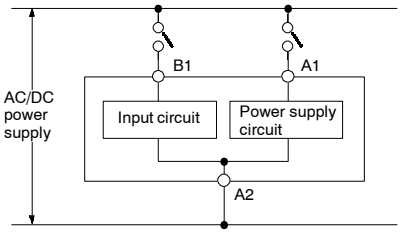
■ SWITCHING CURRENT VS. AMBIENT TEMPERATURE (WHEN MOUNTING TWO OR MORE H3DE UNITS SIDE-BY-SIDE)



(Measurement Condition: Input voltage of 230 VAC)

■ INPUT/OUTPUT

Relationship between Input and Power Supply Circuits

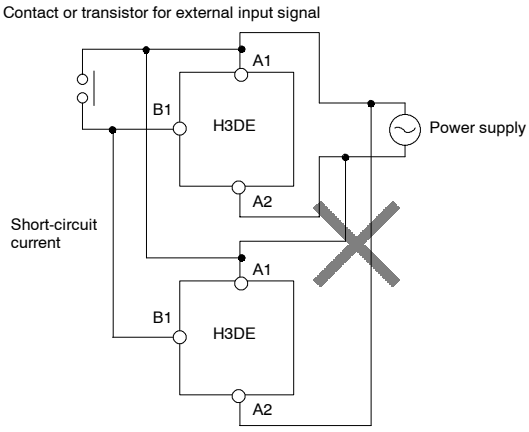


Since the input circuit and the power supply circuit are configured independently, the input circuit can be turned on or off irrespective of the on/off state of the power supply.
It must be noted that a voltage equivalent to the power supply voltage is applied to the input circuit.

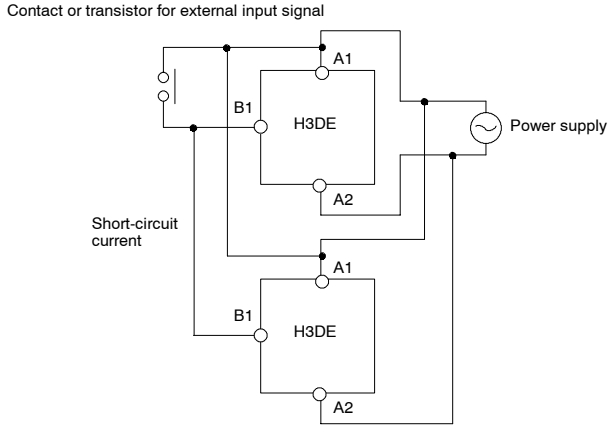
When connecting a relay or a transistor as an external signal input device, pay attention to the following points to prevent short-circuiting due to a sneak current to the transformerless power supply.

If a relay or transistor is connected to two or more Timers, the input terminals of those Timers must be wired properly so that they will not be different in phase or the terminals will be short-circuited to one another (refer to the figures below).

Incorrect



Correct



Note: The H3DE Series is provided with a transformerless power supply system.

■ INPUT WIRES

The input wires must be as short as possible. If the floating capacity of wires exceeds 2,000 pF (approx. 17 m for cables with 120 pF/m), the operation will be affected. Pay particular attention when using shielded cables.

■ VDE CONFORMANCE

The H3DE as a built-in timer conforms to VDE 0435/P2021 provided that the following conditions are satisfied:

The output section of the H3DE is provided only with basic isolation. To ensure reinforced isolation required by the VDE standards, provide supplementary basic isolation on the load side connected to the output.

The H3DE itself is designed according to the following:

- Overvoltage category III
- Pollution degree 2

The following facts are based on the above standards:

- Operation parts on the front and bottom: Reinforced isolationwith clearance of 5.5 mm and creepage distance of 5.5 mm at 230 VAC
- Output: Basic isolation with clearance of 3 mm and creepage distance of 3 mm at 230 VAC

■ ENVIRONMENT

When using the Timer in an area with excess electronic noise, separate the Timer, wiring, and the equipment which generates the input signals as far as possible from the noise sources. To further prevent electronic interference, shield the input signal wiring.

Organic solvents (such as paint thinner), as well as very acidic or basic solutions can damage the outer casing of the Timer.

Do not use the Timer in places where it is exposed to dust, corrosive gas, or direct sunlight.

When storing the Timer, make sure that the ambient temperature and humidity are within the rated values. Leave the Timer at room temperature for at least three hours before using the Timer if it has been stored at an ambient temperature of -10°C or below.

■ RELAY LIFE EXPECTANCY

Built-in relay for the H3DE: G6RN; 50,000 operations min.
(8 A at 250 VAC, resistive load at 360 operations/h.)

NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

OMRON®

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