

# 22.5-mm-width Timers

## H3DKZ



### Range of DIN Track-mounted, Standard 22.5-mm-width Timers

- A wide AC/DC power supply range (24 to 240 VAC/DC).<sup>\*1</sup>
- ON-delay Timers and Twin Timers include models with 12-VDC power supply.<sup>\*1</sup>
- G-type Models (H3DKZ-G) now include model with 240 to 440-VAC power supply.
- EN 61812-1 compliance, CE Marking, and CCC certification<sup>\*2</sup>.
- Finger-safe terminal block.

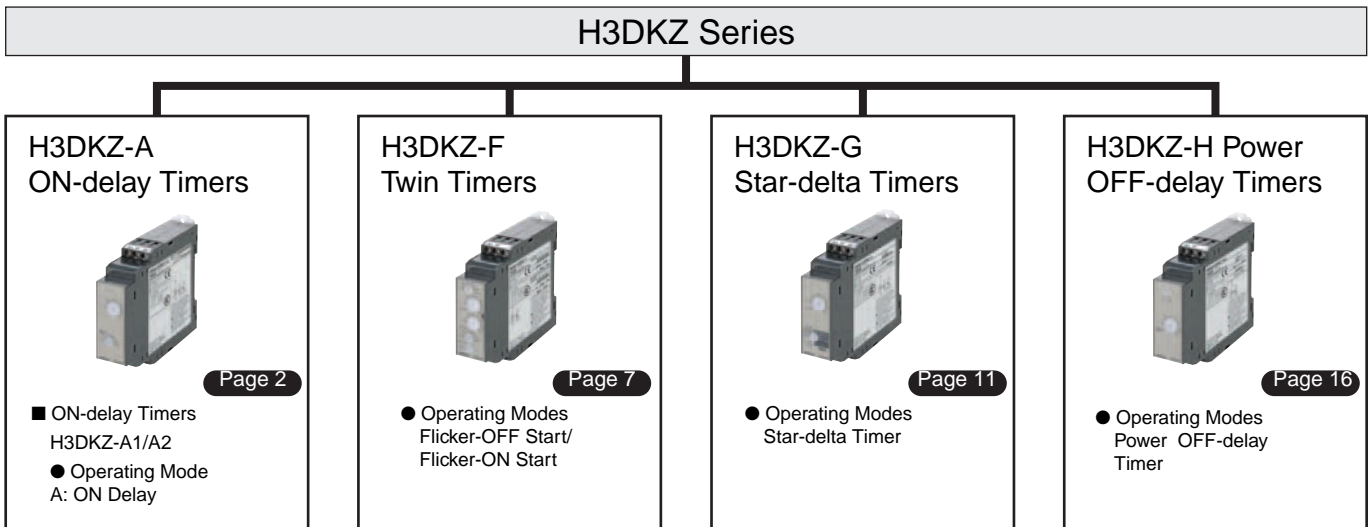
\*1. Except for the H3DKZ-H.

\*2. Certification for the H3DKZ-GE is scheduled to be obtained in the near future.



### Model Number Structure

#### ■ The Entire H3DKZ Series



#### ■ Model Number Legend (Not all models that can be represented with the model number legend can necessarily be produced.)

H3DKZ-□□□□  
1 2 3 4

##### 1. Type

Symbol	Meaning
A	ON-delay Timer
F	Twin Timer
G	Star-delta Timer
H	Power OFF-delay Timer

##### 2. Control Output

Symbol	Meaning
1	SPDT
2	DPDT

\* A-type models only.

##### 3. Supply Voltage

Symbol	Meaning
Blank	24 to 240 VAC/DC
A	12 VDC
B	24 to 48 VAC/DC
C	100 to 120 VAC
D	200 to 240 VAC
E	240 to 440 VAC *

\* G-type models only.

##### 4. Time Ranges (H-type Models Only)

Symbol	Meaning
L	1 to 12 s or 10 to 120 s

# ON-delay Timer H3DKZ-A

- A wide time setting range of 0.10 s to 1200 h.
- Single mode (On-delay) Timer.
- A wide AC/DC power supply range (24 to 240 VAC/DC).
- Models with 12-VDC power supply available.



## Ordering Information

### List of Models

Supply voltage	Control output	Model
24 to 240 VAC/DC	SPDT (time-limit output)	H3DKZ-A1
	DPDT (time-limit output)	H3DKZ-A2
12 VDC	SPDT (time-limit output)	H3DKZ-A1A
	DPDT (time-limit output)	H3DKZ-A2A

### Accessories (Order Separately)

Item	Specification	Model
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

### Model Structure

Model	Operating modes	Terminal block	Output type	Mounting method	Accessories
H3DKZ-A2	A: ON Delay	9 terminals	Relay, DPDT	DIN Track mounting	User label
H3DKZ-A1		6 terminals	Relay, SPDT		

## Specifications

### ■ Time Ranges

Time range setting	0.1 s	1 s	10 s	1 min	10 min	1 h	10 h	100 h
Set time range	0.1 to 1.2 s	1 to 12 s	10 to 120 s	1 to 12 min	10 to 120 min	1 to 12 h	10 to 120 h	100 to 1,200 h
Scale numbers	12							

### ■ Ratings

Power supply voltage <sup>*1</sup>	• 24 to 240 VAC/DC, 50/60 Hz <sup>*2</sup> • 12 VDC <sup>*2</sup>	
Allowable voltage fluctuation range	• 24 to 240 VAC/DC: 85% to 110% of rated voltage • 12 VDC: 90% to 110% of rated voltage	
Power reset	Minimum power-OFF time: 0.1 s	
Reset voltage	10% of rated voltage <sup>*3</sup>	
Power consumption <sup>*4</sup>	H3DKZ-A1	At 240 VAC: 6.6 VA max.
	H3DKZ-A2	At 240 VAC: 4.5 VA max.
Control output	Contact output, 5 A at 250 VAC with resistive load ( $\cos\phi = 1$ ), 5 A at 30 VDC with resistive load	
Ambient operating temperature	-20 to 55°C (with no icing)	
Storage temperature	-40 to 70°C (with no icing)	
Ambient operating humidity	25% to 85%	

\*1. When using a 24-VDC power supply voltage, there will be an inrush current of approximately 0.25 A. Allow for this inrush current when turning ON and OFF the power supply to the Timer with device with a solid-state output, such as a sensor.

\*2. DC ripple: 20% max.

\*3. Actual value

\*4. The power consumption is for mode A after the Timer times out.

\*5. Refer to *DC Power Consumptions (Reference Information)* on page 21 for DC power consumptions.

### ■ Characteristics

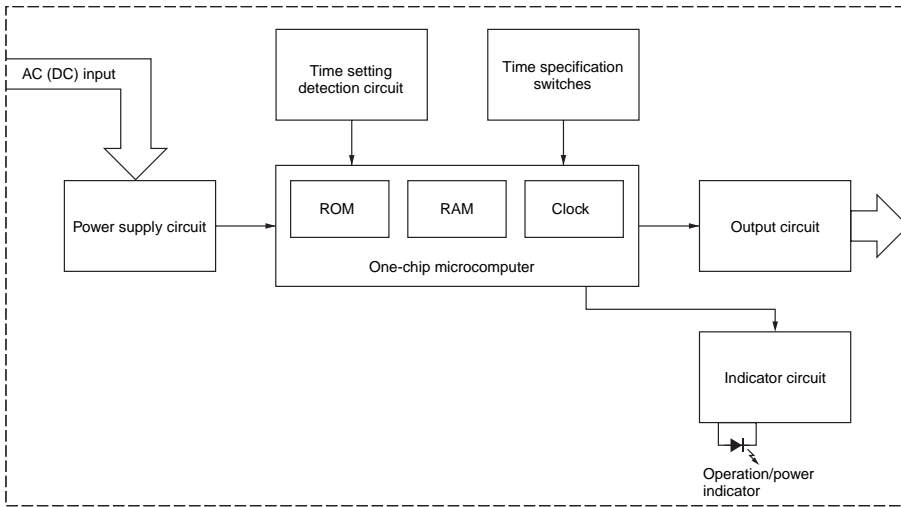
Accuracy of operating time	±1% of FS max.	
Setting error	±5% of FS *	
Influence of voltage	±2% of FS max. *	
Influence of temperature	±5% of FS max. *	
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC 50/60 Hz for 1 min. Between control output terminals and operating circuit: 2,000 VAC 50/60 Hz for 1 min. Between contacts of different polarity: 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.	
Static immunity	Malfunction: 4 kV, Destruction: 8 kV	
Vibration resistance	Destruction	0.75-mm single amplitude at 10 to 55 Hz for 2 h each in 3 directions
	Malfunction	0.5-mm single amplitude at 10 to 55 Hz for 10 min each in 3 directions
Shock resistance	Destruction	1,000 m/s <sup>2</sup> 3 times each in 6 directions
	Malfunction	100 m/s <sup>2</sup> 3 times each in 6 directions
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) Radiated Emissions: EN 55011 class B Emission AC Mains: EN 55011 class B Harmonic Current: EN 61000-3-2 Voltage Fluctuations and Flicker: EN 61000-3-3 (EMS) ESD Immunity: EN 61000-4-2: 6 kV contact discharge, 8 kV air discharge Radiated Radio-Frequency Electromagnetic Field Immunity (AM Radio Waves): EN 61000-4-3: 10 V/m (80 MHz to 1 GHz) Burst Immunity: EN 61000-4-4: 2 kV power line, 1 kV I/O signal line Surge Immunity: EN 61000-4-5: 2 kV common mode, 1 kV differential mode	
Degree of protection	IP30 (Terminal block: IP20)	
Weight	Approx. 120 g	

\* Actual value.

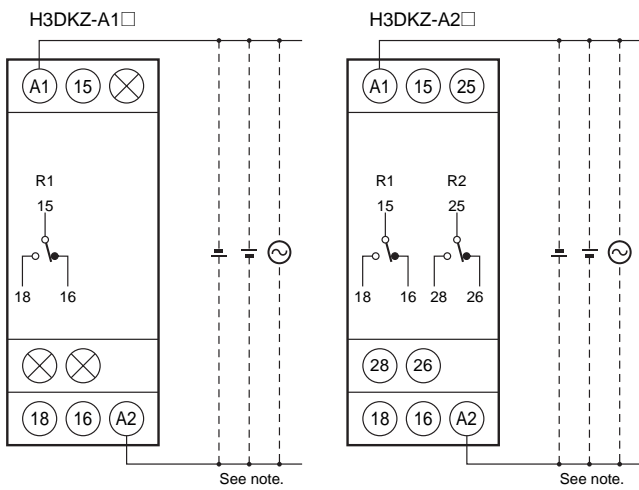
# Connections

## ■ Block Diagrams

### H3DKZ-A1□/□/□ A2□

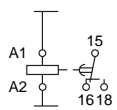


## ■ Terminal Arrangement

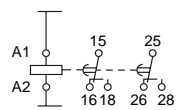


Note: The power supply terminals do not have polarity.

(DIN notation)

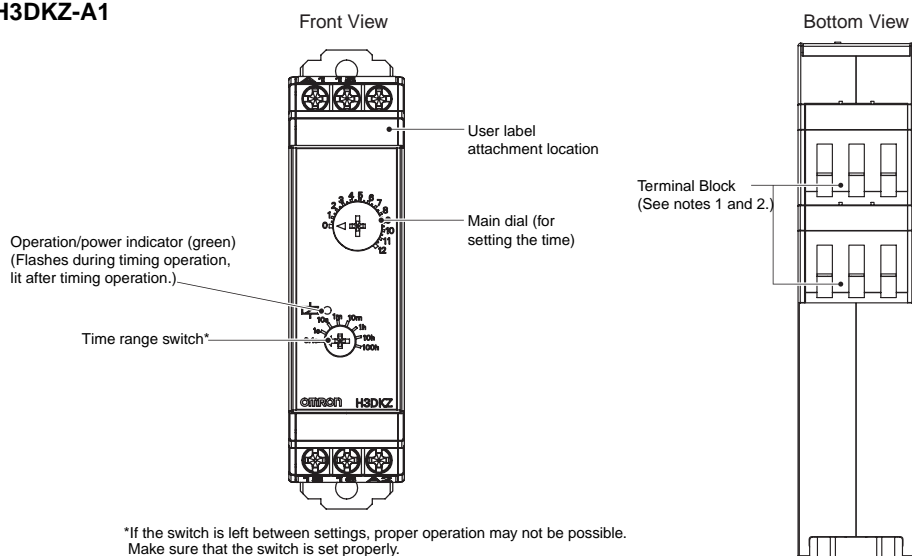


(DIN notation)



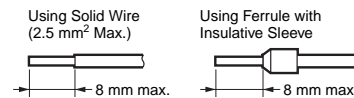
## Nomenclature

### H3DKZ-A1



\*If the switch is left between settings, proper operation may not be possible. Make sure that the switch is set properly.

Note 1. Use solid wire (2.5 mm<sup>2</sup> max.) or ferrules with insulative sleeves to connect to the terminals. To maintain the withstand voltage after connecting the terminals, insert no more than 8 mm of exposed conductor into the terminal.

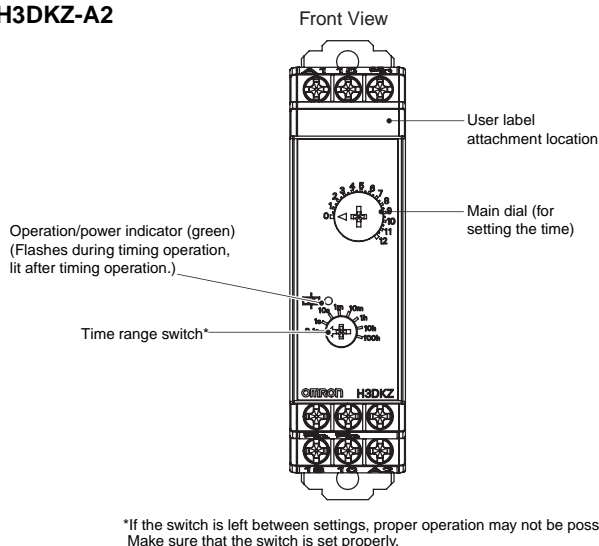


Recommended Ferrules

- Phoenix Contact
- AI□□□ Series
- AI-TWIN□□□ Series

Note 2. Screw Tightening Torque  
Recommended torque: 0.49 N·m  
Maximum torque: 0.98 N·m

### H3DKZ-A2



\*If the switch is left between settings, proper operation may not be possible. Make sure that the switch is set properly.

## Dimensions

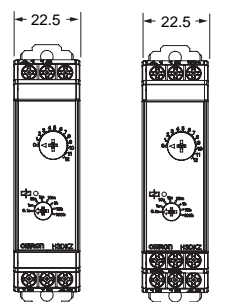
(Unit: mm)

### Timers

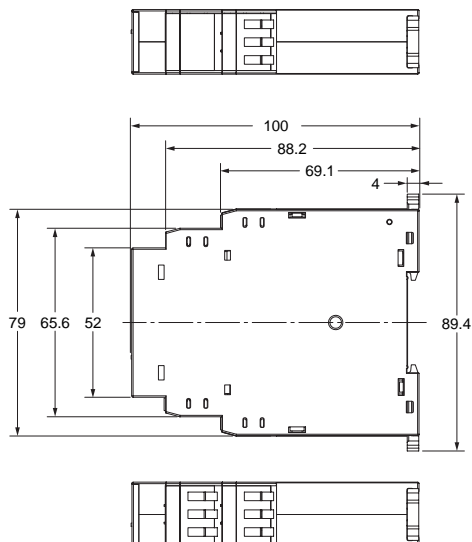
#### H3DKZ-A



H3DKZ-A1  
H3DKZ-A2



H3DKZ-A1 H3DKZ-A2



# Operating Procedures

## Basic Operation

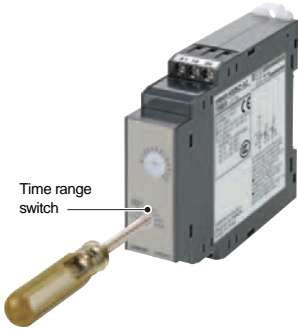
### Setting Switches

- Each switch has a snap mechanism that secures the switch at given positions. Set the switch to one of these positions. Do not set it midway between two positions. Malfunction could result from an improper setting.

### Setting the Time Range

#### Setting the Time Range

The time range switch can be used to set the time range. Turn the switch with a flat-blade or Phillips screwdriver.



## Timing Charts

Note 1. The minimum power reset time is 0.1 s.

Note 2. The letter "t" in the timing charts stands for the set time and "t-a" means that the period is less than the time set.

Operating mode	Timing chart
ON-delay	<p>The timing chart for ON-delay mode shows four horizontal tracks over time. The top track is 'Power (A<sub>1</sub> and A<sub>2</sub>)', showing three pulses of duration 't'. The second track is 'Time-limit contacts: NC 15 and 16 (25 and 26)', which is high during the first pulse and low during the second and third. The third track is 'Time-limit contacts: NO (output indicator) 15 and 18 (25 and 28)', which is low during the first pulse and high during the second and third. The bottom track is 'Operation/power indicator', showing a series of vertical bars that are present during the first pulse and absent during the second and third. Above the pulses, horizontal arrows indicate the duration 't' for each pulse. A longer arrow labeled 't-a' spans the duration of the second and third pulses.</p>

# Twin Timer

## H3DKZ-F

- Switch between flicker-OFF or flicker-ON start mode.
- Independent ON time and OFF time settings.
- Eight time ranges from 0.1 s to 1,200 h.



## Ordering Information

### List of Models

Supply voltage	Control output	Model
24 to 240 VAC/DC	SPDT (time-limit output)	H3DKZ-F
12 VDC	SPDT (time-limit output)	H3DKZ-FA

### Accessories (Order Separately)

Item	Specification	Model
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

### Model Structure

Model	Operating modes	Terminal block	Output type	Mounting method	Accessories
H3DKZ-F	Flicker OFF start/flicker ON start	6 terminals	Relay, SPDT	DIN Track mounting	User label

## Specifications

### Time Ranges

Time range setting	0.1 s	1 s	10 s	1 min	10 min	1 h	10 h	100 h
Set time range	0.1 to 1.2 s	1 to 12 s	10 to 120 s	1 to 12 min	10 to 120 min	1 to 12 h	10 to 120 h	100 to 1,200 h
Scale numbers	12							

### Ratings

Power supply voltage <sup>*1</sup>	• 24 to 240 VAC/DC, 50/60 Hz <sup>*2</sup> • 12 VDC <sup>*2</sup>
Allowable voltage fluctuation range	• 24 to 240 VAC/DC: 85% to 110% of rated voltage • 12 VDC: 90% to 110% of rated voltage
Power reset	Minimum power-OFF time: 0.1 s
Reset voltage	10% of rated voltage <sup>*3</sup>
Power consumption	H3DKZ-F
	H3DKZ-FA
Control output	At 240 VAC: 4.5VA max. <sup>*4</sup> At 12 VDC: 0.6 W max.
Ambient operating temperature	Contact output (SPDT): 5 A at 250 VAC with resistive load (cosφ = 1) 5 A at 24 VDC with resistive load <sup>*3, *4</sup>
Ambient operating temperature	-20 to 55°C (with no icing)
Storage temperature	-40 to 70°C (with no icing)
Ambient operating humidity	25% to 85%

\*1. When using a 24-VDC power supply voltage, there will be an inrush current of approximately 0.25 A. Allow for this inrush current when turning ON and OFF the power supply to the Timer with device with a solid-state output, such as a sensor.

\*2. DC ripple: 20% max.

\*3. Actual value.

\*4. Refer to DC Power Consumptions (Reference Information) on page 21 for DC power consumptions.

## ■ Characteristics

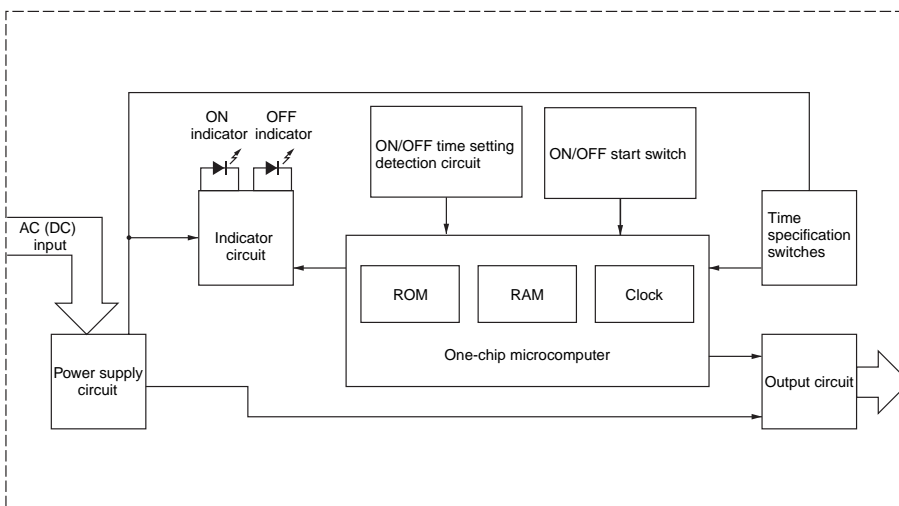
Accuracy of operating time	±1% of FS max.	
Setting error	±5% of FS ±0.05 s max. *	
Influence of voltage	±2% of FS max. *	
Influence of temperature	±5% of FS max. *	
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC 50/60 Hz for 1 min. Between 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.	
Vibration resistance	Destruction	0.75-mm single amplitude at 10 to 55 Hz for 2 h each in 3 directions
	Malfunction	0.5-mm single amplitude at 10 to 55 Hz for 10 min each in 3 directions
Shock resistance	Destruction	1,000 m/s <sup>2</sup> 3 times each in 6 directions
	Malfunction	100 m/s <sup>2</sup> 3 times each in 6 directions
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) Radiated Emissions: EN61812-1 EN 55011 class B Emission AC Mains: EN 55011 class B Harmonic Current: EN 61000-3-2 Voltage Fluctuations and Flicker: EN61000-3-3 (EMS) ESD Immunity: EN 61000-4-2: 6 kV contact discharge, 8 kV air discharge Radiated Radio-Frequency Electromagnetic Field Immunity (AM Radio Waves): EN 61000-4-3: 10 V/m (80 MHz to 1 GHz) Burst Immunity: EN 61000-4-4: 2 kV power line, 1 kV I/O signal line Surge Immunity: EN 61000-4-5: 2 kV common mode, 1 kV differential mode	
Degree of protection	IP30 (Terminal block: IP20)	
Weight	Approx. 110 g	

\*Actual value.

## Connections

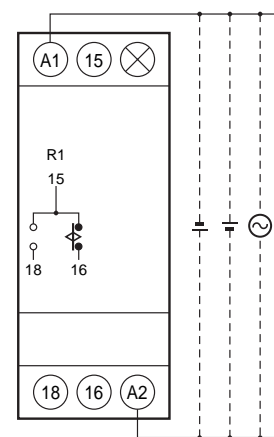
### ■ Block Diagrams

H3DKZ-F

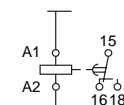


### ■ Terminal Arrangement

H3DKZ-F



(DIN notation)

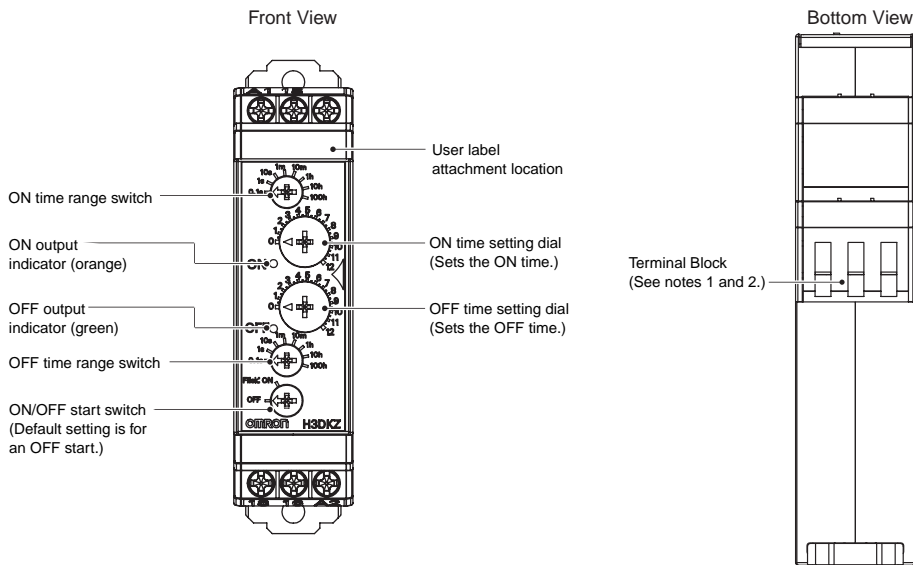


Note: The power supply terminals do not have polarity.

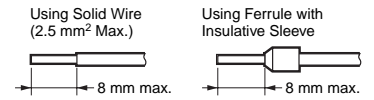


Nomenclature

H3DKZ-F



Note 1. Use solid wire (2.5 mm<sup>2</sup> max.) or ferrules with insulative sleeves to connect to the terminals.  
To maintain the withstand voltage after connecting the terminals, insert no more than 8 mm of exposed conductor into the terminal.



Recommended Ferrules  
Phoenix Contact  
• AI□□□ Series  
• AI-TWIN□□□ Series

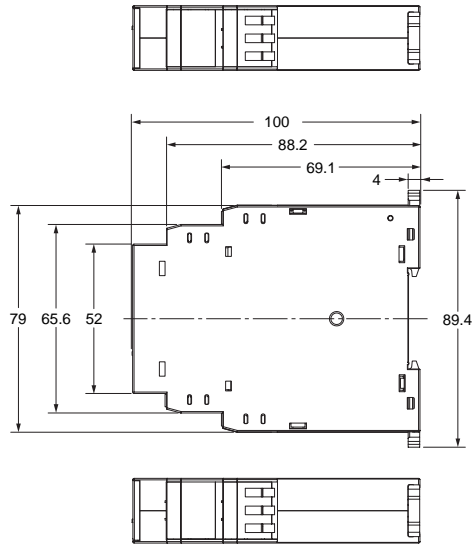
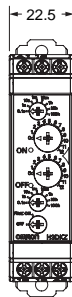
Note 2. Screw Tightening Torque  
Recommended torque: 0.49 N·m  
Maximum torque: 0.98 N·m

Dimensions

(Unit: mm)

■ Timers

H3DKZ-F



# H3DKZ-F

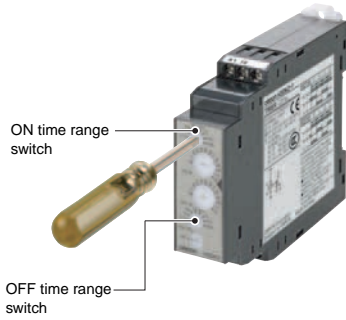
## Operating Procedures

### Basic Operation

#### Setting the Time Ranges

##### ● Setting the Time Ranges

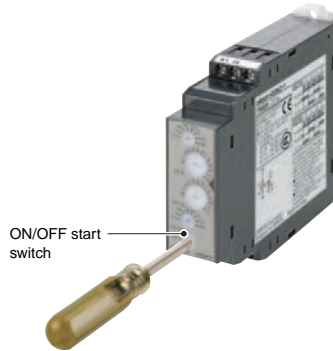
Use the ON time range switch to set the ON time range and the OFF time range switch to set the OFF time range. Turn the switches with a flat-blade or Phillips screwdriver.



#### Setting the ON/OFF Start Switch

##### ● Setting an ON Start or OFF Start

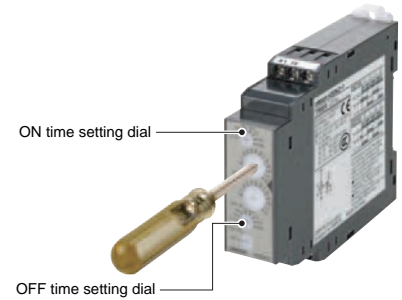
The ON/OFF start switch can be used to switch between ON-start and OFF-start operation.



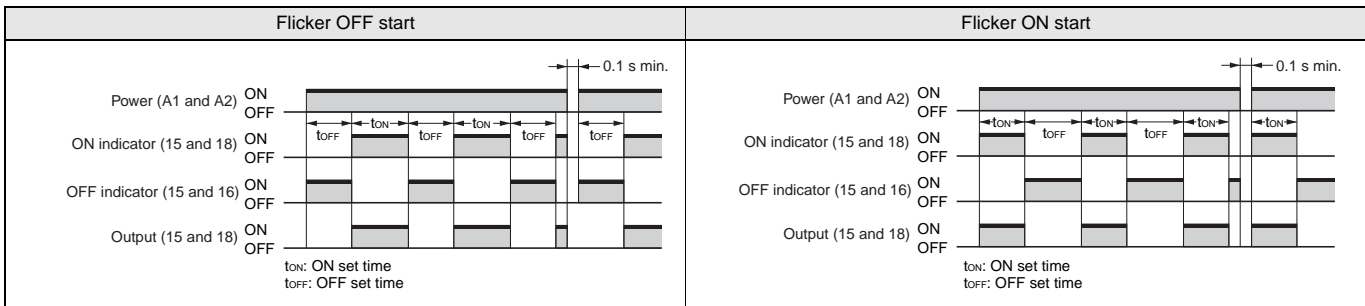
#### Setting the Times

##### ● Setting the Times

Use the ON time setting dial and the OFF time setting dial to set the ON time and OFF time.



### Timing Charts



Note 1. The reset time is 0.1 s min.

Note 2. When power is supplied in flicker ON start mode, the OFF indicator lights momentarily. This, however, has no effect on the performance of the Timer.

# Star-delta Timer

## H3DKZ-G

- Set two time ranges between 1 and 120 s with one Timer.
- Models with 240 to 440-VAC power supply added to series.



### Ordering Information

#### List of Models

Supply voltage	Control output	Model
24 to 240 VAC/DC	Star circuit: SPDT, delta circuit: SPDT	<b>H3DKZ-G</b>
240 to 440 VAC/DC	Star circuit: SPDT, delta circuit: SPDT	<b>H3DKZ-GE</b>

#### Accessories (Order Separately)

Item	Specification	Model
Mounting Track	50 cm (l) x 7.3 mm (t)	<b>PFP-50N</b>
	1 m (l) x 7.3 mm (t)	<b>PFP-100N</b>
	1 m (l) x 16 mm (t)	<b>PFP-100N2</b>
End Plate	---	<b>PFP-M</b>
Spacer	---	<b>PFP-S</b>

#### Model Structure

Model	Terminal block	Operating/resetting method	Output type	Mounting method	Accessories
H3DKZ-G	9 terminals	Time-limit operation/self-resetting	Time-limit (relay) Star circuit: SPDT Delta circuit: SPDT	DIN Track mounting	User label

### Specifications

#### Time Ranges

Time range setting	t1x1	t1x10
Star set time (t1) range	1 to 12 s	10 to 120 s
Star-Delta transfer time (t2)	Select from 0.05, 0.1, 0.25, or 0.5 s.	

#### Ratings

	H3DKZ-G	H3DKZ-GE
Power supply voltage <sup>*1</sup>	• 24 to 240 VAC/DC, 50/60 Hz <sup>*2</sup>	• 240 to 440 VAC (50/60 Hz)
Allowable voltage fluctuation range	• 24 to 240 VAC/DC: 85% to 110% of rated voltage • 240 to 440 VAC: 80% to 110% of rated voltage	
Power reset	Minimum power-OFF time: 0.5 s	
Reset voltage	10% of rated voltage <sup>*3</sup>	
Power consumption	At 240 VAC: 6.6 VA max. <sup>*4</sup>	At 440 VAC: 34 VA max.
Control output	Contact output (Time-limit output: relay, Star output: SPDT, Delta output: SPDT): 5 A at 250 VAC with resistive load (cosφ = 1) 5 A at 24 VDC with resistive load <sup>*4,*5</sup>	1 th 2 A AC-15 120 VAC: 1.5 A AC-15 240 VAC: 1 A AC-15 440 VAC: 0.3 A
Ambient operating temperature	-20 to 55°C (with no icing)	
Storage temperature	-40 to 70°C (with no icing)	
Ambient operating humidity	25% to 85%	

\*1. When using a 24-VDC power supply voltage, there will be an inrush current of approximately 0.25 A. Allow for this inrush current when turning ON and OFF the power supply to the Timer with device with a solid-state output, such as a sensor.

\*2. DC ripple: 20% max.

\*3. Actual value.

\*4. Refer to *DC Power Consumptions (Reference Information)* on page 21 for DC power consumptions.

\*5. 125 VDC: 0.15 A max. with resistive load, 125 VDC: 0.1 A with L/R of 7 ms.  
Minimum load: 10 mA at 5 VDC (P level, reference value)

## ■ Characteristics

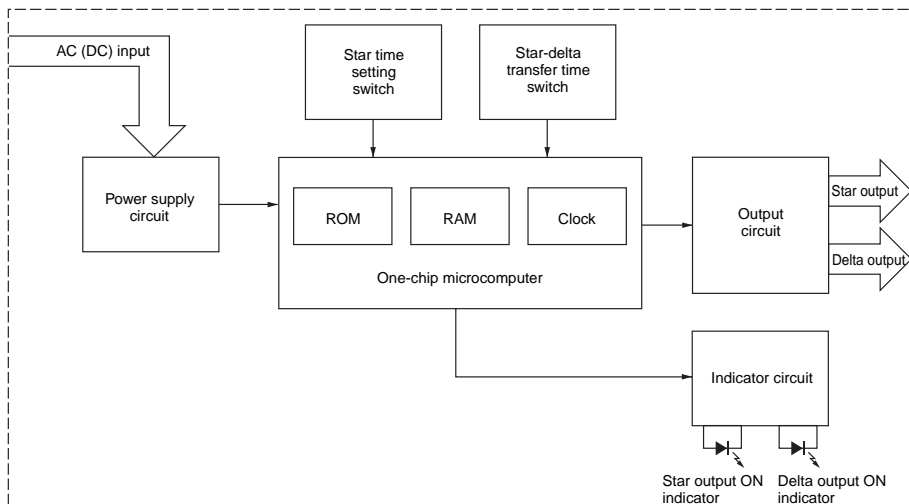
		H3DKZ-G	H3DKZ-GE
Accuracy of operating time		±1% of FS max.	
Setting error		±5% of FS ±0.05 s max. *1	
Transfer time		Total error ± (25% of transfer time + 5 ms) max. *1	
Influence of voltage		±2% of FS max. *1	
Influence of temperature		±5% of FS max. *1	
Dielectric strength		Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC 50/60 Hz for 1 min. *2 Between control output terminals and operating circuit: 2,000 VAC 50/60 Hz for 1 min. *2 Between contacts of different polarity: 2,000 VAC 50/60 Hz for 1 min. *2 Between contacts not located next to each other: 1,000 VAC 50/60 Hz for 1 min.	
Vibration resistance	Destruction	0.75-mm single amplitude at 10 to 55 Hz for 2 h each in 3 directions	
	Malfunction	0.5-mm single amplitude at 10 to 55 Hz for 10 min each in 3 directions	
Shock resistance	Destruction	1,000 m/s <sup>2</sup> 3 times each in 6 directions	
	Malfunction	100 m/s <sup>2</sup> 3 times each in 6 directions	
Life expectancy	Mechanical	10 million operations min. (under no load at 1,800 operations/h)	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)	100,000 operations min. (0.3 A at 440 VAC, resistive load at 1,800 operations/h)
EMC		(EMI)EN61812-1 Radiated Emissions:EN 55011 class B Emission AC Mains:EN 55011 class B Harmonic Current:EN 61000-3-2 Voltage Fluctuations and Flicker:EN61000-3-3 (EMS)EN61812-1 ESD Immunity:EN 61000-4-2: 6 kV contact discharge, 8 kV air discharge Radiated Radio-Frequency Electromagnetic Field Immunity (AM Radio Waves): EN 61000-4-3: 10 V/m (80 MHz to 1 GHz) Burst Immunity:EN 61000-4-4: 2 kV power line, 1 kV I/O signal line Surge Immunity:EN 61000-4-5: 2 kV common mode, 1 kV differential mode	
Degree of protection		IP30 (Terminal block: IP20)	
Weight		Approx. 120 g	

\*1. Actual value.

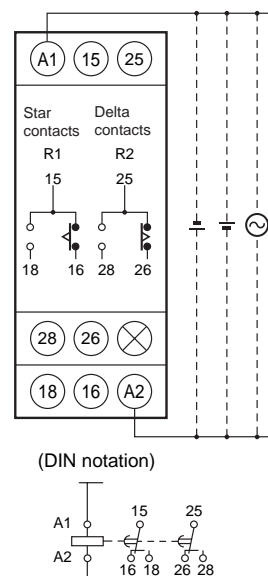
\*2. The dielectric strength of the H3DKZ-GE (240 to 440 VAC) is 2,500 VAC 50/60 Hz.

## Connections

### ■ Block Diagrams H3DKZ-G



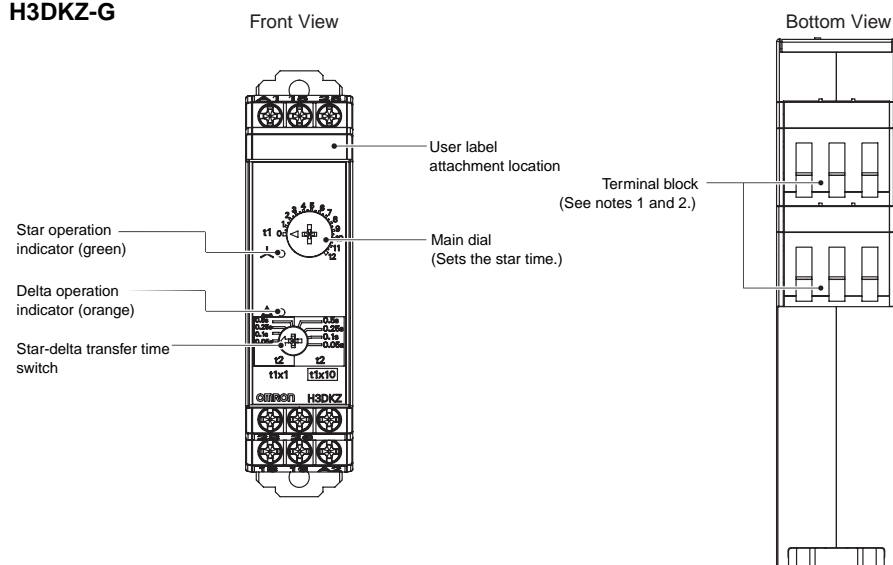
### ■ Terminal Arrangement H3DKZ-G



Note: The power supply terminals do not have polarity.

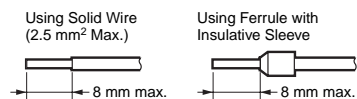
## Nomenclature

### H3DKZ-G



Note 1. Use solid wire (2.5 mm<sup>2</sup> max.) or ferrules with insulative sleeves to connect to the terminals.

To maintain the withstand voltage after connecting the terminals, insert no more than 8 mm of exposed conductor into the terminal.



Recommended Ferrules

Phoenix Contact

- AI□□□ Series

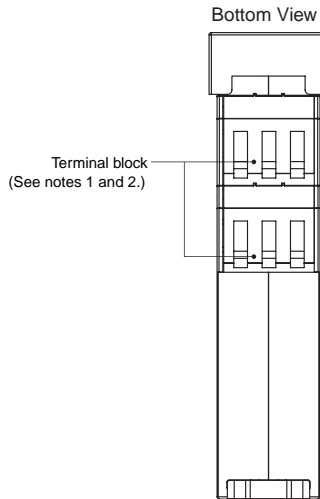
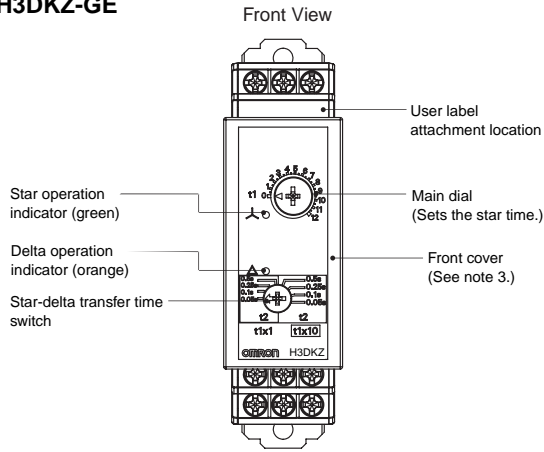
- AI-TWIN□□□ Series

Note 2. Screw Tightening Torque

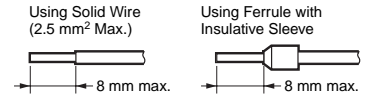
Recommended torque: 0.49 N·m

Maximum torque: 0.98 N·m

## H3DKZ-GE



Note 1. Use solid wire (2.5 mm<sup>2</sup> max.) or ferrules with insulative sleeves to connect to the terminals.  
To maintain the withstand voltage after connecting the terminals, insert no more than 8 mm of exposed conductor into the terminal.



Recommended Ferrules

Phoenix Contact

- AI□□□ Series
- AI-TWIN□□□ Series

Note 2. Screw Tightening Torque  
Recommended torque: 0.49 N·m  
Maximum torque: 0.98 N·m

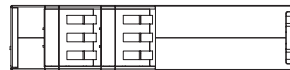
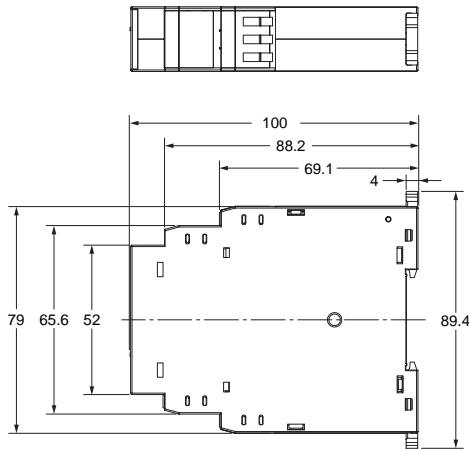
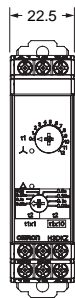
Note 3. Always keep the front cover mounted when using the Timer.

## Dimensions

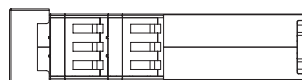
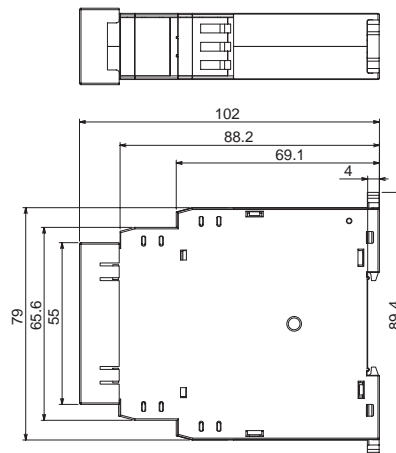
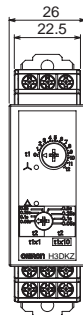
(Unit: mm)

### ■ Timers

#### H3DKZ-G



#### H3DKZ-GE



## Operating Procedures

### Basic Operation



#### Setting the Delta Time Range and the Star-delta Transfer Time (t2)

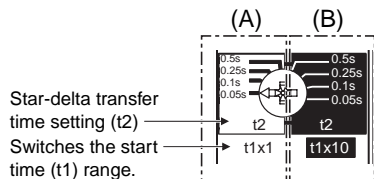
##### Star Time (t1) Range

Set the star-delta transfer time.

For  $\times 1$  (1 to 12 s), use side (A) (labeled "t1 $\times 1$ ").

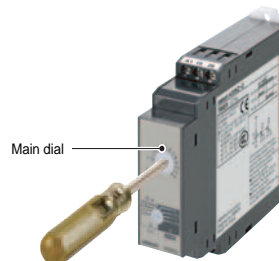
For  $\times 10$  (10 to 120 s), use side (B) (labeled "t1 $\times 10$ ").

(See following diagram.)

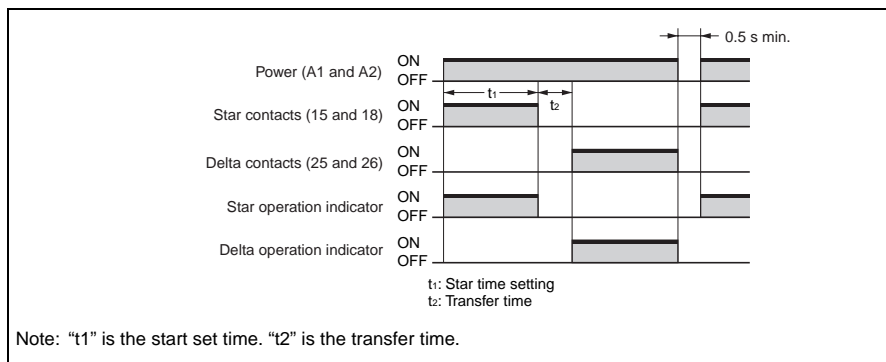


#### Setting the Time

The start time is set with the main dial.



### Timing Chart



# Power OFF-delay Timer H3DKZ-H

- Set two time ranges, from 1 to 120 seconds.



## Ordering Information

### ■ List of Models

Supply voltage	Control output	Model
100 to 120 VAC	SPDT	H3DKZ-HCL
200 to 240 VAC	SPDT	H3DKZ-HDL

### ■ Accessories (Order Separately)

Item	Specification	Model
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

### ■ Model Structure

Model	Terminal block	Operating/resetting method	Output type	Mounting method	Accessories
H3DKZ-H	6 terminals	Instantaneous operation/ time-limit reset	Relay, SPDT	DIN Track mounting	User label

## Specifications

### ■ Time Ranges

	L Series	
Time range setting	x1	x10
Set time range	1 to 12 s	10 to 120 s
Power ON time	0.3 s min.	
Scale numbers	12	

### ■ Ratings

Supply voltage	<ul style="list-style-type: none"> <li>• 100 to 120 VAC, 50/60 Hz</li> <li>• 200 to 240 VAC, 50/60 Hz</li> </ul>	
Allowable voltage fluctuation range	85% to 110% of rated voltage	
Power consumption	H3DKZ-HCL	At 120 VAC: 11.7 VA max.
	H3DKZ-HDL	At 240 VAC: 29.5 VA max.
Control output	Contact output, 5 A at 250 VAC with resistive load ( $\cos\phi = 1$ ), 5 A at 30 VDC with resistive load	
Ambient operating temperature	-20 to 55°C (with no icing)	
Storage temperature	-40 to 70°C (with no icing)	
Ambient operating humidity	25% to 85%	

\*The control output ratings are for one H3DKZ operating alone.



## ■ Characteristics

Accuracy of operating time		±1% of FS max.
Setting error		±5% of FS *
Influence of voltage		±2% of FS max. *
Influence of temperature		±5% of FS max. (±2% ±10 ms max. at 1.2-s range) *
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.
Vibration resistance	Destruction	0.75-mm single amplitude at 10 to 55 Hz for 2 h each in 3 directions
	Malfunction	0.5-mm single amplitude at 10 to 55 Hz for 10 min each in 3 directions
Shock resistance	Destruction	1,000 m/s <sup>2</sup> 3 times each in 6 directions
	Malfunction	100 m/s <sup>2</sup> 3 times each in 6 directions
Life expectancy	Mechanical	10 million operations min. (under no load at 1,200 operations/h)
	Electrical	100,000 operations min. (5 A at 250 VAC, resistive load at 1,200 operations/h)
EMC		(EMI) Radiated Emissions: EN 55011 class B Emission AC Mains: EN 55011 class B Harmonic Current: EN 61000-3-2 Voltage Fluctuations and Flicker: EN 61000-3-3 (EMS) ESD Immunity: EN 61000-4-2: 6 kV contact discharge, 8 kV air discharge Radiated Radio-Frequency Electromagnetic Field Immunity (AM Radio Waves): EN 61000-4-3: 10 V/m (80 MHz to 1 GHz) Burst Immunity: EN 61000-4-4: 2 kV power line, 1 kV I/O signal line Surge Immunity: EN 61000-4-5: 2 kV common mode, 1 kV differential mode
Degree of protection		IP30 (Terminal block: IP20)
Weight		Approx. 120 g

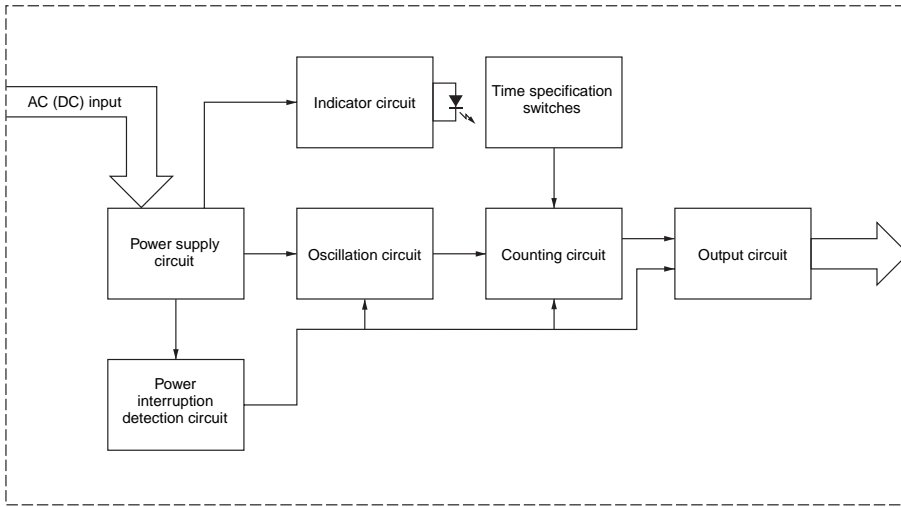
\*Actual value.

# H3DKZ-H

## Connections

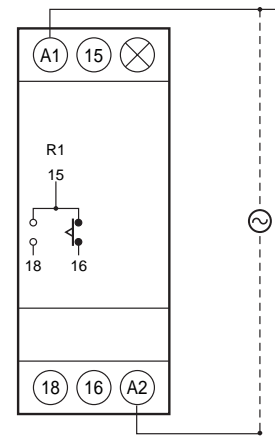
### ■ Block Diagrams

#### H3DKZ-H

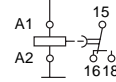


### ■ Terminal Arrangement

#### H3DKZ-H



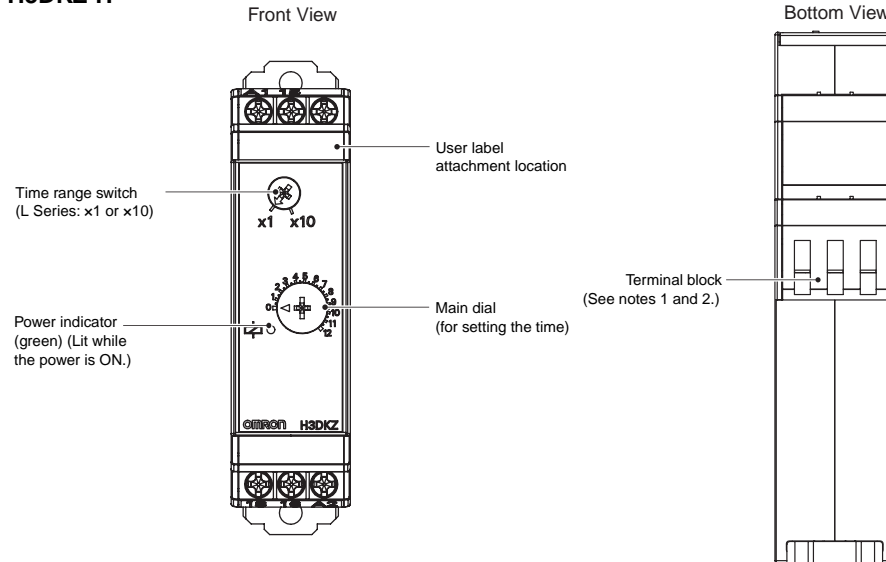
(DIN notation)



Note: The power supply terminals do not have polarity.

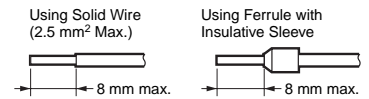
## Nomenclature

### H3DKZ-H



Note 1. Use solid wire (2.5 mm<sup>2</sup> max.) or ferrules with insulative sleeves to connect to the terminals.

To maintain the withstand voltage after connecting the terminals, insert no more than 8 mm of exposed conductor into the terminal.



Recommended Ferrules

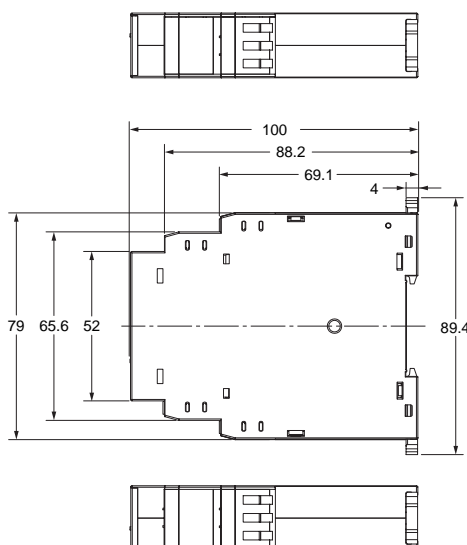
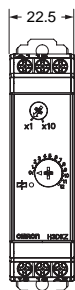
- AI□□□ Series
- AI-TWIN□□□ Series

Note 2. Screw Tightening Torque  
Recommended torque: 0.49 N·m  
Maximum torque: 0.98 N·m

## Dimensions

### Timers

#### H3DKZ-H



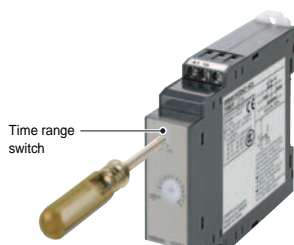
## Operating Procedures

### Basic Operation

#### Setting the Time Ranges

##### Setting the Time Ranges

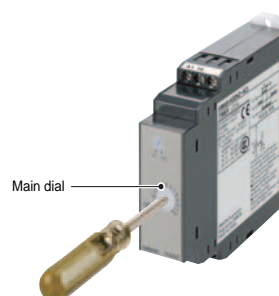
The scale multiplier can be changed with the timer range switch. It can be changed between  $\times 1$  s and  $\times 10$  s for an L-series Timer.



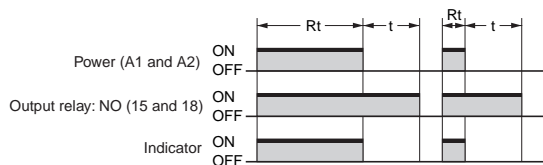
#### Setting the Time

##### Setting the Time

The operation time is set with the main dial.



### Timing Charts



t: Set time

Rt: Minimum power-ON time L Series: 0.3 s min.

(The output may never turn ON if the power is not ON for at least this time.)


# H3DKZ


## Safety Precautions


### ● Refer to Safety Precautions for All Timers.


Note: The following is common for all H3DKZ models.


#### Caution


Switching arcs or relay heating may cause fire or explosion. Do not use the Timer in the presence of inflammable or explosive gases. 

The H3DKZ Series uses a transformerless power supply system. An electrical shock may occur if an input terminal is touched while power is being supplied. 

The inrush current will depend on the type of load and may influence the contact switching frequency and number of operations. Check both the rated current and the inrush current, and allow leeway in the circuit design. 

The life of the output relay largely depends on the switching current and other switch conditions. Consider the actual application conditions and do not exceed the rated load or electrical life. If the output relay is used beyond its service life, the contacts may fuse or burning may occur. Also, never exceed the rated load current. When using a heater, also place a thermal switch in the load circuit. 

Do not remove the external case. 

Minor electric shock, fire, or equipment failure may sometimes occur. Do not disassemble, modify, or repair the Timer or touch any internal parts. 

#### Precautions for Safe Use

- Use ferrules to wire the H3DKZ. If stranded wires are used, wire scraps may enter the Timer, possibly shorting the circuits.
- Rapid changes in temperature or high humidity may cause condensation in Timer circuits, possibly resulting in malfunction or damage to components. Check the application environment.
- Store the Timer within the rated ranges given for the Timer model you are using. If the Timer is stored below  $-20^{\circ}\text{C}$ , allow it to warm up for three hours at room temperature before turning ON the power supply.
- Use the Timer within the ambient operating temperature and ambient operating humidity ranges given for the Timer model you are using.
- Use the Timer within the characteristics for water and oil exposure given for the Timer model you are using.
- Do not use the Timer in locations subject to excessive dust, corrosive gas, or direct sunlight.
- Do not use the Timer in locations subject to vibration and shock. Long-term exposure may damage the Timer due to stress.
- Separate the Timer from any sources of excessive static electricity, such as forming materials and pipes carrying power or liquid materials.
- Maintain the variations in the power supply voltage to within the specified allowable range.
- If a voltage that exceeds the rating is applied, internal components may be destroyed.
- Wire all terminals correctly.
- Use only the specified wires for wiring.  
Applicable wire gauge: AWG18 to AWG22
- Install and clearly label a switch or circuit breaker so that the operator can quickly turn OFF the power supply.
- If the Timer is left in the timed out condition for a long period of time at high temperatures, internal components (such as electrolytic capacitors) may deteriorate quickly.
- The exterior of the Timer may be damaged by organic solvents (such as thinners or benzene), strong alkali, or strong acids.
- For Timers with AC power input, use a commercial power supply for the power supply voltage. Although some inverters give 50/60 Hz as the output frequency, do not use an inverter output as the power supply for a Timer. Doing so may result in smoking or burning due to internal temperature increases in the Timer.
- Use the same type of wiring for all Timer wiring.
- When disposing of the Timer, observe all local ordinances as they apply.
- The Timer may not operate properly in locations that are subject to sulfide gas, such as in sewers or incinerators. Products that are suitable for operation in sulfide gas are not available for OMRON Timers or general control devices. Seal the Timer to isolate it from sulfide gas. If the Timer cannot be sealed, OMRON can make special products with resistance to sulfide gas for some Timers. Ask your OMRON representative for details.
- Confirm that the power and output indicators are operating normally. Depending on the operating environment, the indicators and plastic parts may deteriorate faster than expected, causing the indicators to fail. Periodically perform inspections and replacements.

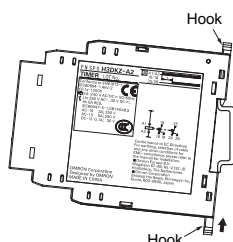
## Precautions for Correct Use

### ● Changing Switch Settings

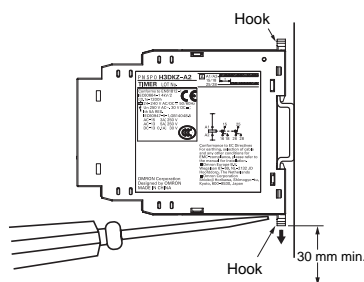
Do not change the time unit, time scale, operating mode, or INIT/TIME switch while the Timer is in operation. Doing so may result in malfunction. Turn OFF the power supply before changing the setting of any switch.

### ● Mounting and Dismounting

- Although there are no particular mounting restrictions, the Timer should be mounted as horizontally as possible.
- When mounting the Timer on a mounting Track, loosen the two hooks, press the Timer onto the Track, and then insert the hooks.



- When removing the Timer, pull out the two hooks, and then remove the Timer from the Track



- It will be easier to mount and dismount the Timer if a distance of 30 mm or more is provided between the bottom of the Timer and other equipment.

### ● Power Supply

- The power supply can be connected to the power input terminals without considering polarity.
- A DC power supply can be connected if its ripple factor is 20% or less and the average voltage is within the allowable voltage fluctuation range of the Timer.
- The H3DKZ-H has a large inrush current. Provide sufficient power supply capacity. If the power supply capacity is too small, there may be delays in turning ON the output.

### ● Environment

- When using the Timer in an area with excessive electronic noise, separate the Timer and input device as far as possible from the noise sources. It is also recommended to shield the input signal wiring to prevent electronic interference.
- The external impulse voltage entering across the power supply terminals has been checked against a  $\pm 1.2 \times 50 \mu\text{s}$  standard waveform according to JEC-210, Impulse Voltage/Current Test, of The Institute of Electrical Engineers of Japan. Surge or noise superimposed on the power supply may damage internal components or cause them to malfunction. We recommend that you check the circuit waveform and use surge absorbers. The effects on components depend on the type of surge and noise that are generated. Always perform testing with the actual equipment.

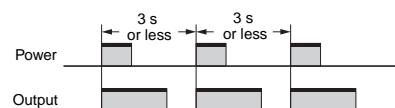
### ● Wiring

The H3DKZ-H acts like a high-impedance circuit. Therefore, the Timer may not reset if it is influenced by inductive voltage. To eliminate inductive voltage, the wires connected to the Timer must be as short as possible and should not be installed parallel to power lines. If the Timer is influenced by inductive voltage that is 30% or more of the rated voltage, connect a CR filter with a capacitance of approximately  $0.1 \mu\text{F}$  and a resistance of approximately  $120 \Omega$  or a bleeder resistor between the power supply terminals.

If there is any residual voltage due to current leakage, connect a bleeder resistor between the power supply terminals.

### ● Operating Frequency

- The H3DKZ-H may malfunction if it is used as shown below. Do not use the H3DKZ-H in these ways.  
Timer Repeatedly Times Out in Cycles of 3 s or Less



### ● DC Power Consumptions (Reference Information)

H3DKZ-A1/-A2	At 24 VDC: 1.1 W max.
H3DKZ-F	At 24 VDC: 1.1 W max.
H3DKZ-G	At 24 VDC: 1.2 W max.
H3DKZ-HCL/-HDL	At 24 VDC: 1.2 W max.

### ● Other Precautions

- If the Timer is mounted on a control panel, dismount the Timer from the control panel before carrying out a voltage withstand test between the electric circuits and non-current-carrying metal parts of the Timer. (Otherwise, the internal circuits of the Timer may be damaged.)
- The H3DKZ-H uses a latching relay for the output. Shock, such as dropping the H3DKZ-H during shipment or handling, can cause the output contacts to reverse to the neutral position. Check the output status with a tester before using the H3DKZ-H.
- The life expectancy of the control output contacts is greatly affected by switching conditions. Always confirm operation using the actual conditions and equipment before using the Timer and make sure that the number of switching operations presents no problems in performance. If Timer application is continued after performance has deteriorated, insulation failure between circuits, burning of the control output relay, or other problem will eventually occur.
- If the power supply voltage is gradually increased, a power reset may occur or the Timer may time out. Use a switch, relay, or other device with contacts to apply the power supply voltage all at once.
- Make sure that residual voltage or inductive voltage is not applied after the power turns OFF.
- Error in the operation time of the Timer is given as a percentage of the full-scale time. The absolute value of the error will not change even if the set time is changed. Therefore, always use the Timer with the set time set as close as possible to the full-scale value of the set time range.
- When switching a microload, check the specified minimum load given for the Timer model you are using.
- When setting the operating time, do not turn the dial beyond the scale range.

- 
- If better accuracy is required in the set time, adjust the dial while measuring the operation time.
  - If the Timer is reset immediately after timing out, make sure that the circuit configuration allows sufficient resetting time.

- Errors will occur in the sequence if there is not sufficient resetting time.
- When directly switching a DC load, the switching capacity will be lower than when switching an AC load.
- 

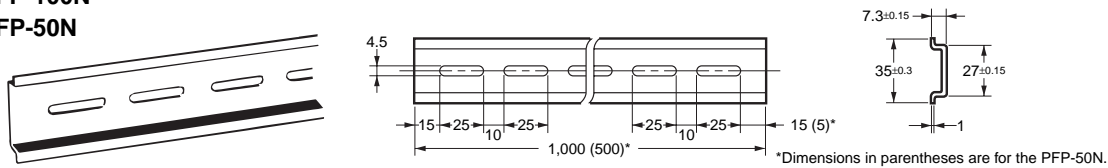


## **EN/IEC Standard Compliance**

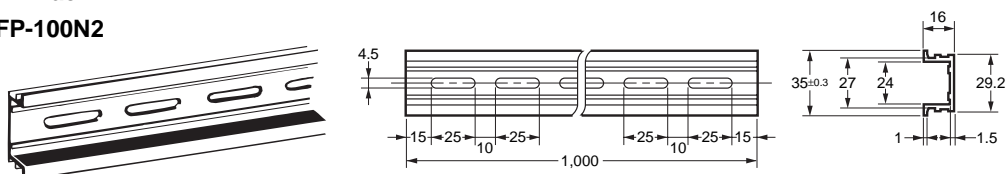
- Refer to the user manual for the H3DKZ for cable selection and other conditions for compliance with EMC standards.
- The power supply terminals and input terminals are not isolated. There is basic insulation between the power supply terminals and output terminals.
- If double or reinforced insulation is required, use the double or reinforced insulation defined in IEC 60664 that is suitable for the maximum applied voltage for the clearance, solid insulation, and other factors.

Track Mounting Products (Sold Separately)

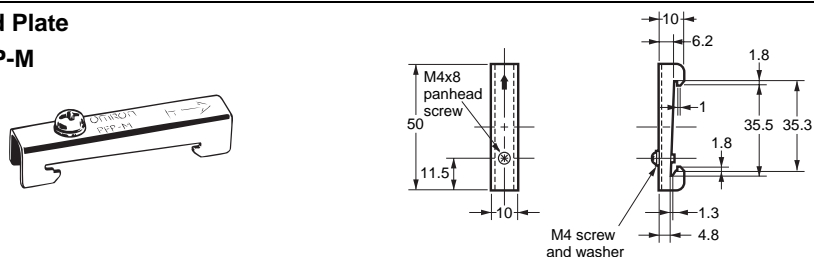
DIN Track  
PFP-100N  
PFP-50N



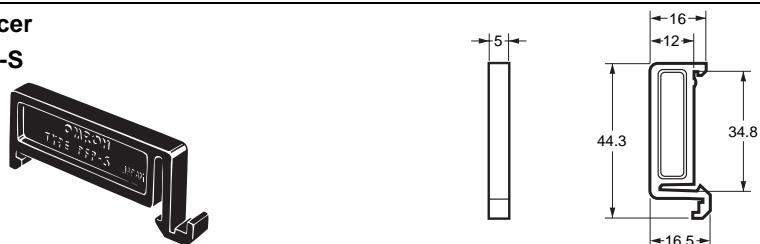
DIN Track  
PFP-100N2



End Plate  
PFP-M



Spacer  
PFP-S



Note 1: Order the above products in multiples of 10.  
Note 2: The Tracks conform to DIN standards.

# Terms and Conditions of Sale

- Offer; Acceptance.** These terms and conditions (these "Terms") are deemed part of all quotes, agreements, purchase orders, acknowledgments, price lists, catalogs, manuals, brochures and other documents, whether electronic or in writing, relating to the sale of products or services (collectively, the "Products") by Omron Electronics LLC and its subsidiary companies ("Omron"). Omron objects to any terms or conditions proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
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- Discounts.** Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (i) the invoice is paid according to Omron's payment terms and (ii) Buyer has no past due amounts.
- Interest.** Omron, at its option, may charge Buyer 1-1/2% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
- Orders.** Omron will accept no order less than \$200 net billing.
- Governmental Approvals.** Buyer shall be responsible for, and shall bear all costs involved in, obtaining any government approvals required for the importation or sale of the Products.
- Taxes.** All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Omron or required to be collected directly or indirectly by Omron for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Omron.
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  - All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Omron), at which point title and risk of loss shall pass from Omron to Buyer; provided that Omron shall retain a security interest in the Products until the full purchase price is paid;
  - Delivery and shipping dates are estimates only; and
  - Omron will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
- Claims.** Any claim by Buyer against Omron for shortage or damage to the Products occurring before delivery to the carrier must be presented in writing to Omron within 30 days of receipt of shipment and include the original transportation bill signed by the carrier noting that the carrier received the Products from Omron in the condition claimed.
- Warranties.** (a) **Exclusive Warranty.** Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied. (b) **Limitations.** OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) **Buyer Remedy.** Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty. See <http://www.omron247.com> or contact your Omron representative for published information.
- Limitation on Liability; Etc.** OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.
- Indemnities.** Buyer shall indemnify and hold harmless Omron Companies and their employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Omron is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products. Without limiting the foregoing, Buyer (at its own expense) shall indemnify and hold harmless Omron and defend or settle any action brought against such Companies to the extent based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
- Property; Confidentiality.** Any intellectual property in the Products is the exclusive property of Omron Companies and Buyer shall not attempt to duplicate it in any way without the written permission of Omron. Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Omron. All information and materials supplied by Omron to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
- Export Controls.** Buyer shall comply with all applicable laws, regulations and licenses regarding (i) export of products or information; (ii) sale of products to "forbidden" or other proscribed persons; and (iii) disclosure to non-citizens of regulated technology or information.
- Miscellaneous.** (a) **Waiver.** No failure or delay by Omron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) **Assignment.** Buyer may not assign its rights hereunder without Omron's written consent. (c) **Law.** These Terms are governed by the law of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Products (without regard to conflict of law principles). (d) **Amendment.** These Terms constitute the entire agreement between Buyer and Omron relating to the Products, and no provision may be changed or waived unless in writing signed by the parties. (e) **Severability.** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (f) **Setoff.** Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice. (g) **Definitions.** As used herein, "including" means "including without limitation"; and "Omron Companies" (or similar words) mean Omron Corporation and any direct or indirect subsidiary or affiliate thereof.

## Certain Precautions on Specifications and Use

- Suitability of Use.** Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given:
  - Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
  - Use in consumer products or any use in significant quantities.
  - Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
  - Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this Product.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON'S PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
- Programmable Products.** Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.
- Performance Data.** Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.
- Change in Specifications.** Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.
- Errors and Omissions.** Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.





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