OMRON

Star-delta Timer
H3DK-G

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

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

Ordering Information

■ List of Models

Operating modes	Supply voltage	Control output		H3DK-G
Star-delta Timer	24 to 240 VAC/DC	Contact outputs Delta circuit: SPDT, Star circuit: SPDT	Model	**H3DK-G**
	12 VDC		Model	**H3DK-GA**
	240 to 440 VAC		Model	**H3DK-GE**

■ 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	Safety standards	Accessories
H3DK-G	9 terminals	Time-limit operation/self-resetting	Time-limit (relay) Star circuit: SPDT Delta circuit: SPDT	DIN Track mounting	cURus*1 (UL 508 CSA C22.2 No. 14) EN 61812-1 IEC 60664-1 4 kV/2 EN 50274	User label

*1. Except for the H3DK-GE.

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

		H3DK-G, -GA	H3DK-GE
Power supply voltage *1		• 24 to 240 VAC/DC, 50/60 Hz *2 • 12 VDC *2	• 240 to 440 VAC (50/60 Hz) *5
Allowable voltage fluctuation range		• 24 to 240 VAC/DC: 85% to 110% of rated voltage • 12 VDC: 90% to 110% of rated voltage	80 % to 110% of rated voltage
Power reset		Minimum power-OFF time: 0.5 s	
Reset voltage		10% of rated voltage	
Power consumption	H3DK-G	At 240 VAC: 6.6 VA max. *3	At 440 VAC: 34 VA max.
	H3DK-GA	At 12 VDC: 0.9 W max.	

	H3DK-G, -GA	H3DK-GE
Control output	Contact output (Time-limit output: relay, Star output: SPDT, Delta output: SPDT): 5 A at 250 VAC with resistive load ($\cos\phi$ = 1), 5 A at 30 VDC with resistive load *3, *4 0.15 A max at 125 VDC with resistive load, 0.1 A at 125 VDC with L/R of 7 ms. The minimum applicable load is 10 mA at 5 VDC (P reference value). Contact materials : Ag-alloy + Gold plating	Contact output: Ith 2 A 1.5 A at 120 VAC with AC-15, 1 A at 240 VAC with AC-15, 0.3 A at 440 VAC with AC-15, Contact materials : Ag-alloy + Gold plating
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. Refer to *DC Power Consumptions (Reference Information)* on page 27 for DC power consumptions.
*4. The control output ratings are for one H3DK operating alone. If you operate two or more Timers side by side, refer to *Installation Pitch and Output Switching Capacity (Reference Values)* on the next page.
*5. For the H3DK-GE, approx. 6 A of inrush current will flow when the power supply is turned ON. When selecting the device connected to the Timer, allow leeway in the current ratings.

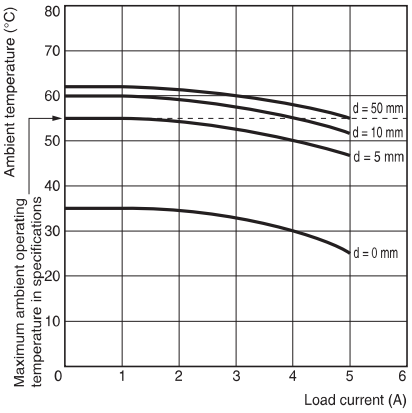
■ Characteristics

		H3DK-G, -GA	H3DK-GE
Accuracy of operating time		±1% of FS max.	
Setting error		±10% of FS ±0.05 s max.	
Transfer time		Total error ± (25% of transfer time + 5 ms) max.	
Influence of voltage		±0.5% of FS max.	
Influence of temperature		±2% of FS max.	
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.	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,500 VAC 50/60 Hz for 1 min. Between control output terminals and operating circuit: 2,500 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		H3DK-G: 24 to 240 VAC/VDC: 5 kV between power terminals, 5 kV between current-carrying metal parts and exposed non-current-carrying metal parts H3DK-GA: 12 VDC: 1 kV between power terminals, 1.5 kV between current-carrying metal parts and exposed non-current-carrying metal parts	H3DK-GE: 240 to 440 VAC: 7.5 kV between power terminals, 7.5 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	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/s² 3 times each in 6 directions	
	Malfunction	100 m/s² 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)
Degree of protection		IP30 (Terminal block: IP20)	
Weight		Approx. 120 g	

* Except for the H3DK-GE

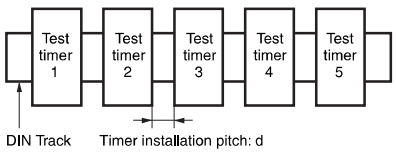
● Installation Pitch and Output Switching Capacity (Reference Values)

The relation between the installation pitch and the load current is shown in the following graph. (Except for the H3DK-GE) If Timer is used under load conditions that exceed the specified values, the temperature inside the Timer will increase, reducing the life expectancy of internal parts.



Testing Method

Tested Timer: H3DK-G
Applied voltage: 240 VAC
Installation pitch: 0, 5, 10, and 50 mm



■ Applicable standards

Safety standards	cURus: UL 508/CSA C22.2 No. 14 *1 EN 50274: Finger protection, back-of-hand proof EN 61812-1: Pollution degree 2, Overvoltage category III *2 CCC: Pollution degree 2, Overvoltage category II, section DB14048.5-2008 part 5-1 LR: Test Specification No. 1-2002 Category ENV 1.2 *1	
EMC	(EMI) Radiated Emissions: Emission AC Mains: Harmonic Current: Voltage Fluctuations and Flicker: (EMS) Immunity ESD: Immunity RF-interference: Immunity Burst: Immunity Surge: Immunity Conducted Disturbance: Immunity Voltage Dip/Interruption:	EN61812-1 EN 55011 class B EN 55011 class B EN 61000-3-2 *1 EN61000-3-3 *1 EN61812-1 IEC61000-4-2 IEC61000-4-3 IEC61000-4-4 IEC61000-4-5 IEC61000-4-6 IEC61000-4-11

*1. This standard is not applicable to the H3DK-GE.
*2. This standard is not applicable if the output is used with a rating that exceeds 250 VAC.

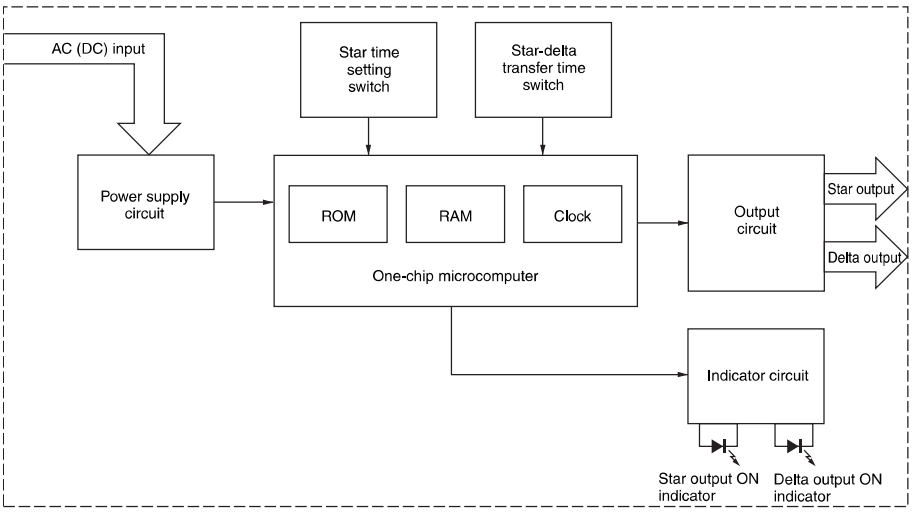
■ I/O

Input		None
Output	Control output	The star output is turned OFF when the dial set value is reached and the delta output is turned ON after the preset transfer time elapses.

Connections

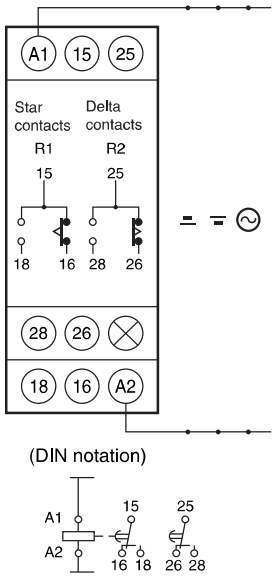
■ Block Diagrams

H3DK-G



■ Terminal Arrangement

H3DK-G

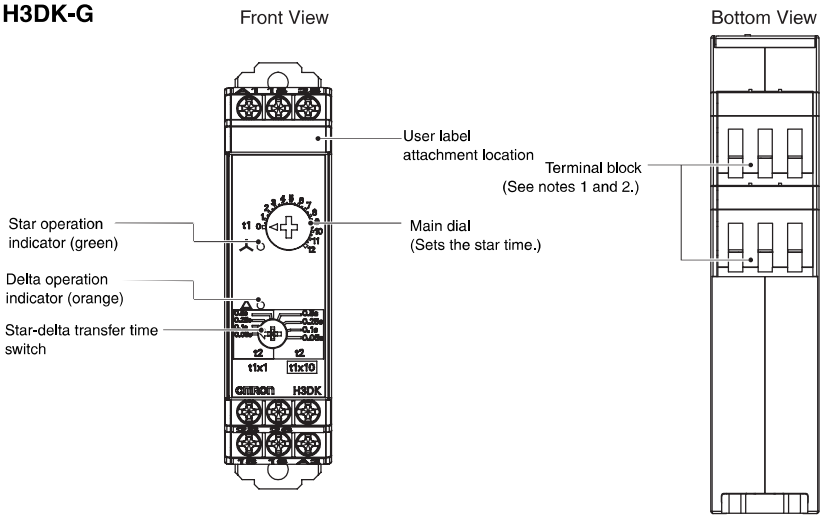


(DIN notation)

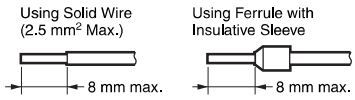
Note: The power supply terminals do not have polarity.

Nomenclature

H3DK-G



Note 1. Use solid wire (2.5 mm² 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.

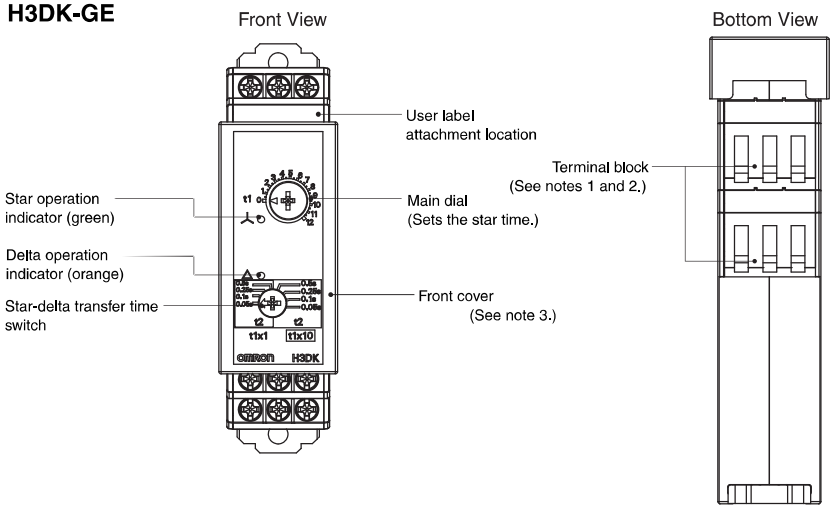


Recommended Ferrules
Phoenix Contact
- AI□□□ Series
- AI-TWIN□□□ Series

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.

H3DK-GE

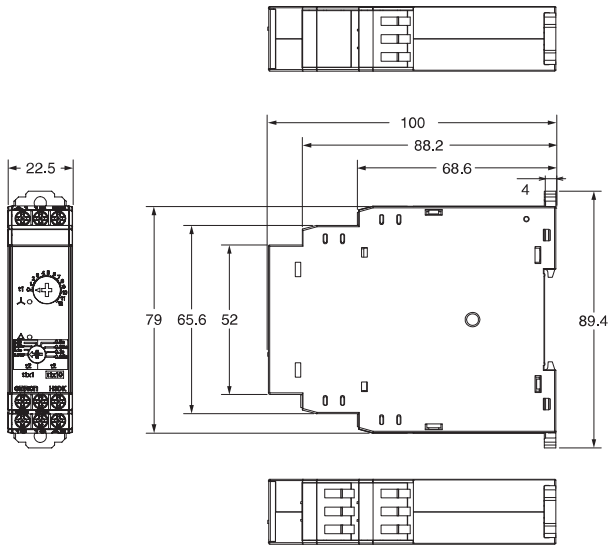


Dimensions

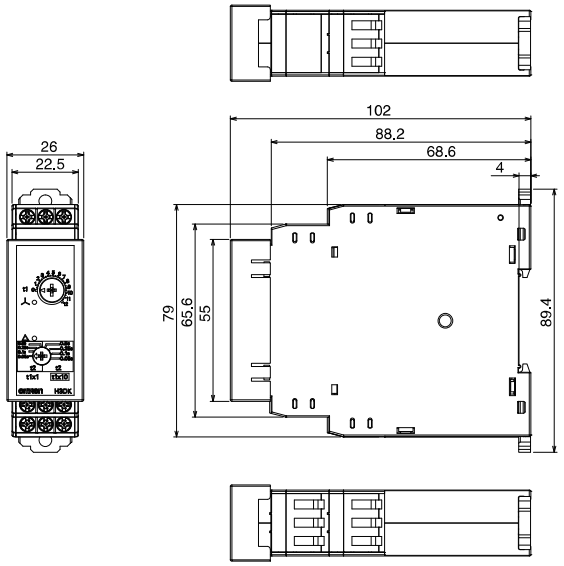
(Unit: mm)

■ Timers

H3DK-G



H3DK-GE



■ Track Mounting Products (Sold Separately)

Refer to page 28 for details.

Operating Procedures

■ Basic Operation

Setting the Time Ranges → **Setting the Time**

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

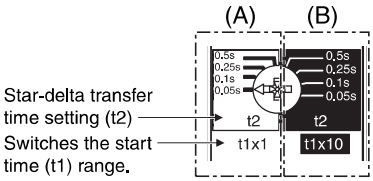
Star Time (t1) Range

Set the star-delta transfer time.

For ×1 (1 to 12 s), use side (A) (labeled "t1×1").

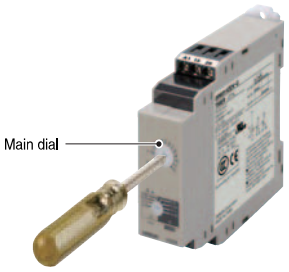
For ×10 (10 to 120 s), use side (B) (labeled "t10×1").

(See following diagram.)

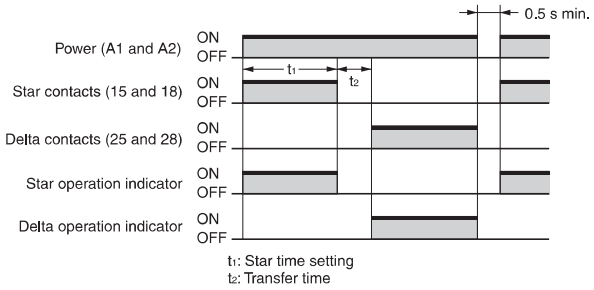


● Setting the Time

The start time is set with the main dial.



■ Timing Chart



Note: "t1" is the start set time. "t2" is the transfer time.