

STAR-DELTA Timer

# MA4SD

## INSTRUCTION MANUAL

Thank you for purchasing HANYOUNG product.  
Please check whether the product is the exactly same as you ordered.  
Before using the product, please read this instruction manual carefully.  
Please keep this manual where you can view at any time

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HANYOUNG NUX



### Safety information

Before using the product, please read the safety information thoroughly and use it properly. Alerts declared in the manual are classified to Danger, Warning and Caution by their criticality

<b>DANGER</b>	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
<b>WARNING</b>	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
<b>CAUTION</b>	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury

**Danger**

There is a danger of occurring electric shock in the input/output terminals so please never let your body or conductive substance is touched.

**Warning**

- If there is a possibility of an accident caused by errors or malfunctions of this product, install external protection circuit to prevent the accident.
- This product does not contain an electric switch or fuse, so the user needs to install a separate electric switch or fuse externally. (Fuse rating : 250 V 0.5 A)
- To prevent deflection or malfunction of this product, supply proper power voltage in accordance with the rating.
- To prevent electric shock or malfunction of product, do not supply the power until the wiring is completed.
- Since this product is not designed with explosion-protective structure, do not use it any place with flammable or explosive gas.
- Do not decompose, modify, revise or repair this product. This may be a cause of malfunction, electric shock or fire.
- Reassemble this product while the power is OFF. Otherwise, it may be a cause of malfunction or electric shock.
- If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- Due to the danger of electric shock, use this product installed onto a panel while an electric current is applied.

**Caution**

- The contents of this manual may be changed without prior notification.
- Before using the product you purchased, make sure that it is exactly what you ordered.
- Make sure that there is no damage or abnormality of the product during delivery.
- Do not use this product at any place with corrosive (especially noxious gas or ammonia) or flammable gas.
- Do not use this product at any place with direct vibration or impact.
- Do not use this product at any place with liquid, oil, medical substances, dust, salt or iron contents.
- Do not polish this product with substances such as alcohol or benzene.
- Do not use this product at any place with a large inductive difficulty or occurring static electricity or magnetic noise.
- Do not use this product at any place with possible thermal accumulation due to direct sunlight or heat radiation.
- Install this product at place under 2,000 m in altitude.
- When the product gets wet, the inspection is essential because there is a danger of electric leakage or fire.
- If there is excessive noise from the power supply, using insulating transformer or noise filter is recommended. The noise filter must be attached to a panel which is already connected to a ground and the wire between the filter output and power supply terminal must be as short as possible.
- If putting power cables closely together then it is effective against noise.
- Do not connect anything to the unused terminals.
- After checking the polarity of terminal, connect wires at the correct position.
- When this product is connected to a panel, use a circuit breaker or switch approved with IEC60947-1 or IEC60947-3.
- Install the circuit breaker or switch at near place for convenient use.
- Write down on a label that if the circuit breaker or switch is operating then the power will be disconnected since the circuit breaker or switch is installed.
- For the continuous and safe use of this product, the periodical maintenance is recommended.
- Some parts of this product have limited life span, and others are changed by time
- The warranty period for this product including parts is one year if this product is properly used

### Features

- Star-delta timer • 8 Pins plug type • High capacity MOTOR start timer
- Instantaneous contact output, start contact output, DELTA contact output.
- Various power supply voltage (100 - 240 V a.c 50/60 Hz, 24 - 240 V d.c Dual usage)

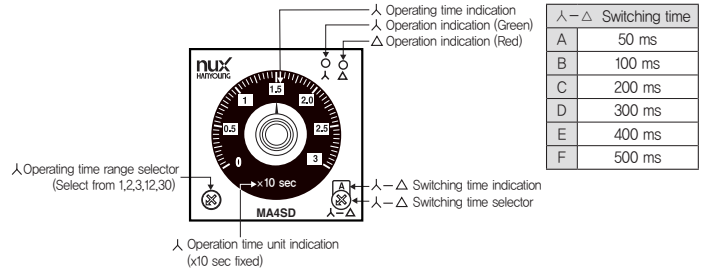
### Suffix code

Model	Code	Description
MA4	<input type="checkbox"/>	Analog multi timer (STAR-DELTA Timer), 48 (W) × 48 (H) mm
Control output	SD	Λ output, Δ output
	SDI	Instantaneous output, Λ output, Δ output

### Specification

Model	MA4SD	MA4SDI
Power supply voltage	100 - 240 V a.c 50/60 Hz, 24 - 240 V d.c	
Allowable voltage	Power supply voltage ±10 %	
Power consumption	Approx. 3.8 VA (100 - 240 V a.c 60 Hz), Approx. 1.9 W (24 - 240 V d.c)	
Resetting time	100 ms max	
Λ Operating time range	1 ~ 300 sec	
Operating time difference	Repeated error : ±0.3 % max, Settling error : ±5 % max, Voltage error : ±0.5 % max, Temperature tolerance : ±2 % max (Percentage of full scale)	
Δ Conversion time error	±25 % max	
Control output	Output mode	Power ON Start
	Contact composition	Λ Contact : 1 a, Δ Contact : 1 a
Relay Life span	Output mode	Λ Contact : 1a, Δ Contact : 1 a, Instantaneous contact : 1 a
	Contact capacity	250 V a.c 5 A resistive load
Relay Life span	Mechanical : 5 million times min, Electrical : 100 thousand times min (250 V a.c 5 A resistive load)	
Insulation resistance	100 MΩ min (at 500 V d.c Between current-carrying terminals and exposed noncurrent-carrying metal parts.)	
Dielectric strength	2000 V a.c 50/60 Hz 2 minute (Between current-carrying terminal and exposed noncurrent-carrying metal parts.)	
Noise immunity	±2 kV (Between power terminal, pulse width ±1 μs, square wave noise by noise simulator)	
Vibration resistance	10 - 55 Hz (For 1 min), Double amplitude 0.75mm, X,Y,Z each direction for 1 hour	
Shock resistance	300 % (30G) X, Y, Z each direction for 3 times	
Ambient temperature	-10 ~ 55 °C (icing or dew condensation not allowed)	
Storage temperature	-25 ~ 65 °C (icing or dew condensation not allowed)	
Ambient humidity	35 ~ 85 % R.H.	
Weight	Approx. 95g (Including fixing bracket)	

### Part name and function



Λ-Δ Switching time
A 50 ms
B 100 ms
C 200 ms
D 300 ms
E 400 ms
F 500 ms

### Time

#### Λ Operation time specification

Operation time range	Operation time
1,2	1 ~ 12 sec
3	2.5 ~ 30 sec
12	10 ~ 120 sec
30	25 ~ 300 sec

※ Λ Select operation time by operation time range selector.

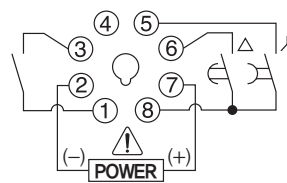
#### Λ-Δ Switching time specification

Switching time indication letter	Switching time
A	50 ms
B	100 ms
C	200 ms
D	300 ms
E	400 ms
F	500 ms

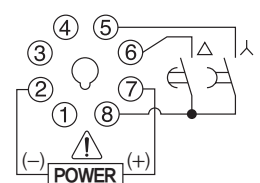
※ Λ-Δ Select switching time by switching time selector.

### Connection diagram

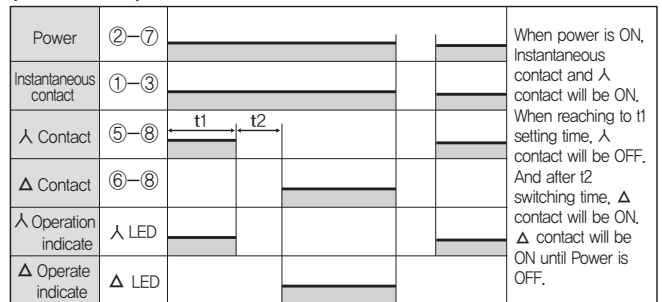
#### MA4SDI



#### MA4SD



### Operation specification



※ t1 : Λ Operating time

※ t2 : Λ-Δ Conversion time

Caution) MA4SD does not have Instantaneous contact .

### Appearance and panel cutout

[Unit : mm]

