

K8AK-TH OMRON Temperature Monitoring Relay

EN Instruction Manual

Thank you for purchasing the OMRON Product. To ensure the safe application of the Product, only a professional with an understanding of electricity and electric devices must handle it. Read this manual carefully before using the Product and always keep it close at hand when the Product is in use.

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Safety Precautions

Key to Warning Symbols

CAUTION Indicates a potentially hazardous situation which, if not avoided, is likely to result in minor or moderate injury or property damage. Read this manual carefully before using the product.

2262081-3C

Warning Symbols

CAUTION	Do not touch the terminals while power is being supplied. Minor injury due to electric shock may occasionally occur.
CAUTION	Do not allow pieces of metal, wire clippings, or fine metallic shavings or filings from installation to enter the product. Doing so may occasionally result in electric shock, fire, or malfunction.
CAUTION	Do not use the product where subject to flammable or explosive gas. Otherwise, minor injury from explosion may occasionally occur.
CAUTION	Never disassemble, modify, or repair the product or touch any of the internal parts. Minor electric shock, fire, or malfunction may occasionally occur.
CAUTION	Tighten the terminal screws to between 0.49 and 0.59 N · m. Loose screws may occasionally result in fire.
CAUTION	Tighten the terminal screws to between 0.49 and 0.59 N · m. Tight screws may occasionally result in damage of screws.
CAUTION	Set the parameters of the product so that they are suitable for the system being monitored. If they are not suitable, unexpected operation may occasionally result in property damage or accidents. Change the position of side SW while power is NOT being supplied.
CAUTION	A malfunction in the product may occasionally make control operations impossible or prevent alarm outputs, resulting in property damage to connected equipment and machinery. Periodically check the product's operation. To maintain safety in the event of malfunction of the product, take appropriate safety measures, such as installing a monitoring device on a separate line.
CAUTION	If the output relay is used past their life expectancy, contact fusing or burning may occasionally occur. Always consider the application conditions and use the output relay within its rated load and electrical life expectancy. The life expectancy of output relay varies considerably with the output load and switching conditions.

Precautions for Safe Use

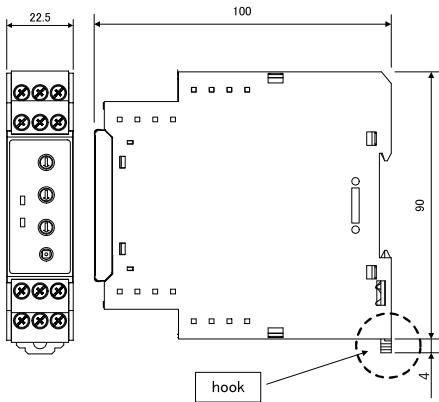
- The product is designed for indoor use only. Do not use the product outdoors or in any of the following locations.
 - Places directly subject to heat radiated from heating equipment.
 - Places subject to splashing liquid or oil atmosphere.
 - Places subject to direct sunlight.
 - Places subject to icing and condensation.
 - Places subject to dust or corrosive gas (in particular, sulfide gas and ammonia gas).
 - Places subject to intense temperature change.
 - Places subject to vibration and large shocks.
- Use/store within the rated temperature and humidity ranges. Provide forced cooling if required.
- Install K8AK in a correct direction.
- Be sure to wire properly with correct polarity of terminals. Power supply terminals have no polarity.
- Wire the input and output terminals correctly.
- Use this product within the rated load and power supply.
- Be sure that the temperature sensor type and the input type set on K8AK are the same.
- When extending the lead wires on a thermocouple, be sure to use compensating conductors suitable for the thermocouple type.
- When extending the lead wires on a platinum resistance thermometer, use lead wires with a low resistance (5Ω max. per line) and be sure that the resistance is the same for all three lead wires.
- Use the recommended solderless terminals.
- Do not wire the terminals which are not used.
- Make sure that the rated voltage is attained within 1 second.
- Design system (control panel, etc.) considering the 2 seconds of delay that K8AK's output to be determined after power ON.
- Make sure that K8AK has 30 minutes or more to warm up after power ON. During warming up K8AK does not measure correct temperature.
- Separate the high-voltage or large-current power lines from other lines, and avoid parallel or common wiring with the power lines when you are wiring to the terminals.
- Allow as much space as possible between K8AK and devices that generate powerful high frequencies or surge.
- Do not use a microwave receiver near K8AK. Microwave interference may affect K8AK.
- A switch or circuit breaker should be provided close to this unit. The switch or circuit breaker should be within easy reach of the operator, and must be marked as a disconnecting means for this unit.
- Do not use paint thinner or similar chemical to clean with. Use standard grade alcohol.
- When discarding, properly dispose of the product as industrial waste.
- Confirm that the power and alarm 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.
- Temperature of the terminal block is Max.65°C. Please take note.

Specifications

Supply voltage	100 to 240VAC type 24VAC/DC type
Operating frequency	50/60Hz
Operating voltage range	85 to 110% of the rated voltage
Operating frequency range	95 to 105% of the rated frequency
Power consumption	5VA max.(100 to 240VAC) 4VA max.(24VDC) 2W max.(24VDC)
Inrush current	19.2A max.(100 to 240VAC) 13.6A max.(24VAC/DC)
Accuracy	±1%FS
Relay output	5A,250VAC/30VDC(resistive load) Electrical life 50,000times 3A,250VAC/30VDC(resistive load) Electrical life 100,000times
Ambient temperature	1c contact -20 to 55°C (Avoid freezing or condensation)
Ambient humidity	25 to 85%
Storage temperature	-25 to 65°C
Storage humidity	25 to 85%
Weight	Approx.160g
Degree of protection	IP20
Altitude	Max.2,000m
External input	Output current: approx.10mA Contact input ON :1kΩ max. OFF :100kΩ min. No-contact input(NPN) ON :residual voltage 1.5V max. OFF:leakage current 0.1mA min.
Memory protection	Non-volatile memory (Number of write operations: 1,000,000 cycles)
Recommended fuse	T2A,250VAC,time-lag,low-breaking capacity
Installation environment	Installation category II, pollution degree 2(as per EN61010-1)
Temporary overvoltage	100 to 240VAC type Long-term:250V+(Supply voltage) Short-term:1200V+(Supply voltage)

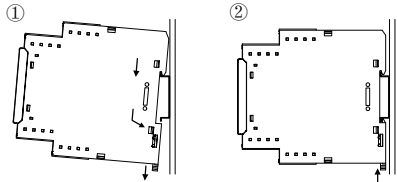
Wiring

Dimensions (mm)



Mounting

- Mounting to the DIN Rail
 - Insert the hook on the top of the K8AK into the DIN Rail.
 - Press the K8AK until the hook lock into place.

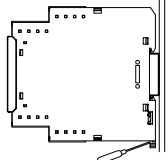


Durability

Malfunction vibration	Acceleration :50m/s ² Frequency :10~55Hz (In each direction(x,y,z),5min x 10cycles)
Malfunction shock	Acceleration :150m/s ² (100m/s ² for the internal relay) (In each direction(x,y,z),3times)

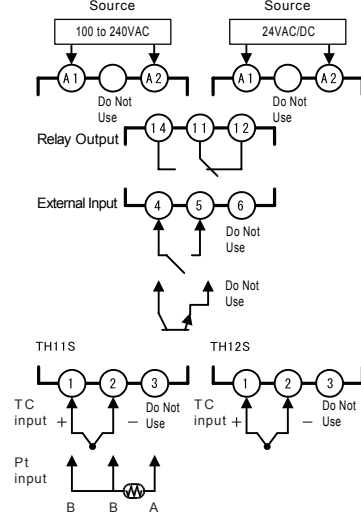
Dismounting

Pull down on the hook with a flat-blade screwdriver and lift up on the K8AK.



Applicable DIN Rail
PFP-100N (100 cm)
PFP-50N (50 cm)

Connections



Solderless terminals (Recommendation)

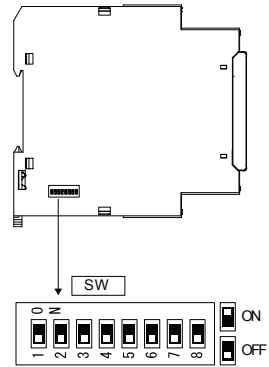
Types	Diameter of wires
A11, 5-8BK (PHOENIX CONTACT)	AWG#16
A11-8RD (PHOENIX CONTACT)	AWG#18
A10, 75-8GY (PHOENIX CONTACT)	AWG#18

Tool(Recommendation)

Cross-head screwdriver (φ5mm)

Function

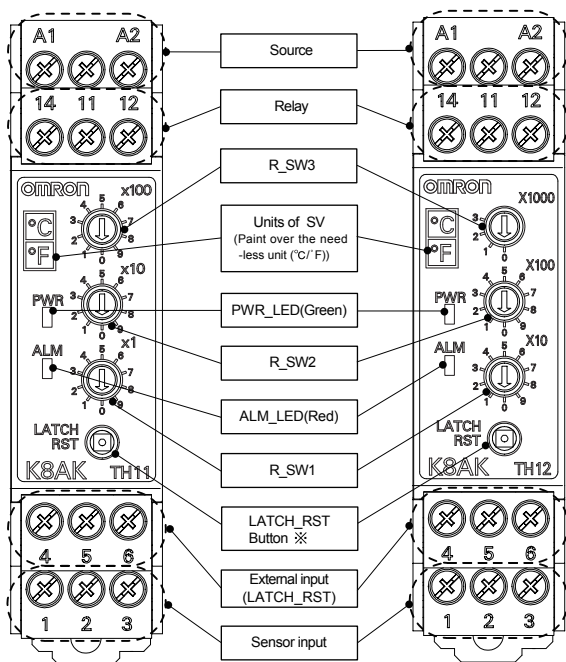
Names of parts



※Default : All OFF

Change the position of side SW while power is NOT being supplied. Side SW operation is effective after power ON. Use the small screwdriver when you operate the SWs or the Button.

※ The SV protection will function when the latch reset button is pressed for at least 5 s. The power indicator will flash when the SV is protected. To release the protection, press the latch reset button again for at least 5 s.



Switch Operation

TH11S	R_SW3	100°C(°F) (0~9)
	R_SW2	10°C(°F) (0~9)
	R_SW1	1°C(°F) (0~9)

※Default : 0°C

	SW						
	1	2	3	4	5	6	7
Upper Limit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lower Limit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Latch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-Latch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-Fail Safe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fail Safe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
°C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
°F	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

※Default : All OFF
※SW 8 : Not use

TH12S

R_SW3	1000°C(°F) (0~3) ※4~9:Setting range over.
R_SW2	100°C(°F) (0~9)
R_SW1	10°C(°F) (0~9)

※Default : 0°C

	SW						
	1	2	3	4	5	6	7
Upper Limit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lower Limit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Latch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-Latch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-Fail Safe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fail Safe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
°C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
°F	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

※Default : All OFF
※SW 8 : Not use

Applicable Standards	EN 61010-1
EMC	EMI EN 61326-1 EMS EN 61326-1

Setting range

TH11S	0~999			
	°C		°F	
Input Type	Lower	Upper	Lower	Upper
K	0	999	0	999
J	0	850	0	999
T	0	400	0	700
E	0	600	0	999
Pt100	0	850	0	999
Pt1000	0	850	0	999
-	-	-	-	-
-	-	-	-	-

TH12S	0~3200			
	°C		°F	
Input Type	Lower	Upper	Lower	Upper
K	0	1300	0	2300
J	0	850	0	1500
T	0	400	0	700
E	0	600	0	1100
B	100	1800	300	3200
R	0	1700	0	3000
S	0	1700	0	3000
PL II	0	1300	0	2300

Errors(ALM_LED:flash)

- Following (1)~(3) may occur.
- Sensor burn out or Sensor input range over.
 - Setting range over.
 - Inner error(devices, memories, etc.).

- Trouble shooting
 - Comes out of SV protect mode.
 - Reset the latch.
 - Confirm the wiring and parameter settings.
 - Reset the SOURCE.

If K8AK return to normal state, the cause may be the noise. If not, there is need to replace it.

※The state of latched output and the state of SV protect mode are backed by Non-volatile memory. The frequent operation will damage Non-volatile memory.

Sensor input range

TH11S	°C				°F			
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
K	-20	1019	-40	1039	-20	1320	-40	2340
J	-20	870	-40	1039	-20	870	-40	1540
T	-20	420	-40	740	-20	420	-40	740
E	-20	620	-40	1039	-20	620	-40	1140
Pt100	-20	870	-40	1039	-20	870	-40	1039
Pt1000	-20	870	-40	1039	-20	870	-40	1039
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-

TH12S	°C				°F			
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
K	-20	1320	-40	2340	-20	1320	-40	2340
J	-20	870	-40	1540	-20	870	-40	1540
T	-20	420	-40	740	-20	420	-40	740
E	-20	620	-40	1140	-20	620	-40	1140
B	0	1820	0	3240	0	1820	0	3240
R	-20	1720	-40	3040	-20	1720	-40	3040
S	-20	1720	-40	3040	-20	1720	-40	3040
PL II	-20	1320	-40	2340	-20	1320	-40	2340

Conformance to Safety Standards

Reinforced insulation is provided between input power supply, relay output, and between other terminals.

To install a recommended fuse for this product according to the instruction manual is necessary.

Please do not use this Temperature Monitoring Relay for measurement of the circuit applicable to the Measurement Category II, III and IV.

Do not use this product to measure energized objects which voltage values exceed 30Vrms or 60VDC.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Conformance to EN/IEC Standards

This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

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Suitability for Use

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

See also product catalog for Warranty and Limitation of Liability.

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