Measuring and Monitoring Relays

K8AB Series

Industry First!
Two SPDT Outputs Available in New Models DIN Sized at 22.5 mm

Eight slim models featuring a variety of innovative new functions.

- Single-phase power monitoring:
  - Current relay
  - Voltage relay
  - Upper-/lower-limit voltage relays
- Three-phase power monitoring:
  - Phase-sequence phase-loss relay (Detected at startup.)
  - Voltage phase-sequence phase-loss relay *
  - Asymmetry phase-sequence phase-loss relay *
  - Voltage relay
- Temperature monitoring:
  - Temperature alarm device

* Refer to the Q&A section for information on phase loss during operation.

Features

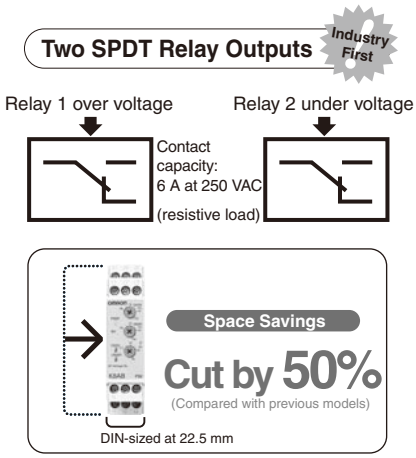
Slim 22.5-mm Design Features Two SPDT Relay Outputs (K8AB-VW, K8AB-PM, and K8AB-PW)

Provides individual over voltage and under voltage settings and outputs.

1-/3-phase Power Supply

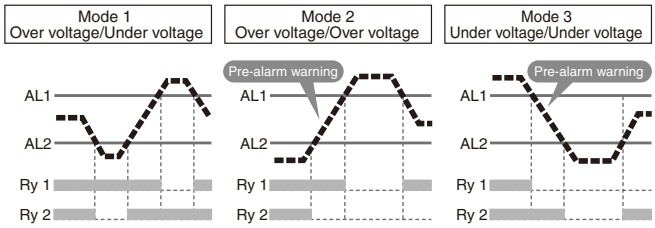
Many customers require the individual upper and lower limit outputs that are normally available only in larger 45-mm relays. For the first time from any manufacturer, OMRON has achieved this and more in a slim-body design measuring just 22.5 mm. These relays not only offer advantages such as 3-phase power supply compatibility and a resistive load contact capacity of 6 A at 250 VAC, but they also reduce panel production cost because they use 50% less space than previous models.

Note: The relay output capacity for the K8AB-TH is 3 A at 250 VAC (resistive load).



Pre-alarm Monitoring Mode Provides Advanced Warning (K8AB-VW Only)

In plants and other sites that operate 365 days a year, unexpected shutdowns must be kept to an absolute minimum. OMRON addresses this problem with the K8AB-VW featuring a pre-alarm monitoring mode that can be set to two levels for two outputs. K8AB-VW makes scheduled maintenance possible because the pre-alarm monitoring mode provides advance warning of impending trip alarms.

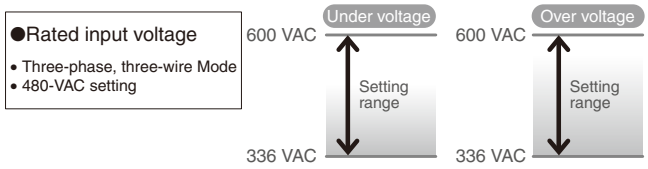


Expanded Setting Range Ensures Over Voltage and Under Voltage Monitoring Flexibility

Over voltage and under voltage can be set for the full span of the allowable input range, so over voltage and under voltage can now be monitored with flexibility.

Note: The setting range for operation time can be set within –30% to +25% of the range selected using the DIP switch on the Unit.

Example: K8AB-PW 3-phase Voltage Relay



Usable as a Simple Sensor Controller

Accepts inputs of 4 to 20 mA or 0 to 10 V.

Compatible with Commercial CTs

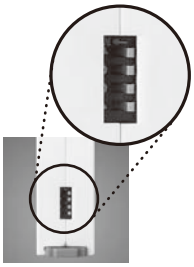
The K8AB-AS 1-Phase Current Relay can be used with commercial CTs for current measurement.

	CT current on secondary side	Applicable model
Commercial CTs	0 to 1 A AC	K8AB-AS2
	0 to 5 A AC	

Note: OMRON-compatible CT: K8AC-CT200L Only the K8AB-AS3 can be used for AC operation at both 100 and 200 A.

DIP Switch Function Selection

Various relay functions can be selected using a DIP switch. This means that the number of models required can be reduced to 1/8 what it had been simply by installing a relay like the K8AB-AS. An added advantage is that it reduces the inventory of maintenance parts.



Example: K8AB-AS 1-Phase Current Relay

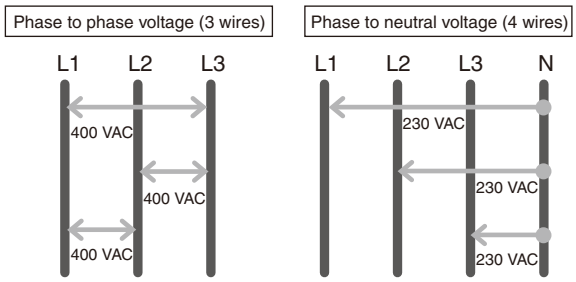
	DIP switch		Function
Resetting method	SW2	ON	Manual reset
		OFF	Automatic reset
Relay drive method	SW3	ON	Normally open
		OFF	Normally closed
Operating mode	SW4	ON	Over current
		OFF	Under current

Note: 1. The operating time can be set to 0.1 to 30 s.

2. SW1 of K8AB-AS is not used.

Single K8AB Monitors 3-phase Power Supply with 3 or 4 Wires (K8AB-PM, K8AB-PA, and K8AB-PW)

OMRON Low-voltage Monitoring Relays can be used to monitor 3-phase power supplies with 3 or 4 wires simply by changing DIP switch settings.



A Single K8AB Can Monitor a 3-phase Power Supply Anywhere in the World

Reduces Maintenance Parts Inventory

	SW3			ON	ON	OFF	OFF
	SW4			ON	OFF	ON	OFF
K8AB-P□1	SW2	ON	P-P	200 V	220 V	230 V	240 V
		OFF	P-N	115 V	127 V	133 V	138 V
K8AB-P□2	SW2	ON	P-P	380 V	400 V	415 V	480 V
		OFF	P-N	220 V	230 V	240 V	277 V

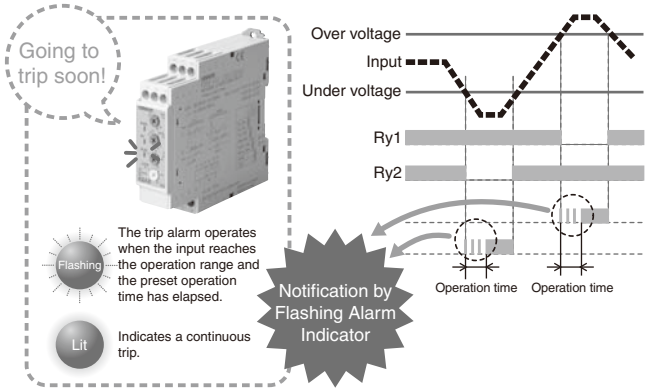
DIN Track Mounting

Gang-mounting is also possible.

Operation Level Indication by Flashing Alarm Indicator

Checking the operating status has never been convenient because of the time it takes to reach the preset operation time. The K8AB eliminates this problem by featuring a flashing alarm indicator that clearly indicates the operating status. This has greatly simplified the task of checking on-site status particularly when operation settings are changed or an error occurs.

Note: Excluding the K8AB-PH and K8AB-TH.



Ideal for Monitoring Current or Voltage

Current Monitoring Applications (Single Phase)

Application	Measured current	Applicable models	Operating value setting range
Simple Sensor Controller	4 to 20 mA DC	K8AB-AS1	2 to 20 mA AC/DC
			10 to 100 mA AC/DC
			50 to 500 mA AC/DC
Process control signal monitoring (using a commercial CT)	0 to 1 A AC 0 to 5 A AC	K8AB-AS2	0.1 to 1 A AC/DC
			0.5 to 5 A AC/DC
			0.8 to 8 A AC/DC
Current monitoring for motors and heaters (using a special CT)	0 to 200 A AC	K8AB-AS3 (See note.)	---
			10 to 100 A AC
			20 to 200 A AC

Note: Special CT model: OMRON K8AC-CT200L

Voltage Monitoring Applications (Single Phase)

Application	Measured voltage	Applicable models	Operating value setting range
Direct current monitoring (monitoring the output voltage of a shunt)	0 to 60 mV DC 0 to 100 mV DC 0 to 150 mV DC	K8AB-VS1 K8AB-VW1	6 to 60 mV AC/DC
			10 to 100 mV AC/DC
			30 to 300 mV AC/DC
Power supply line monitoring	12 VDC 24 VDC 100 VAC 115 VAC	K8AB-VS2 K8AB-VW2	1 to 10 V AC/DC
			3 to 30 V AC/DC
			15 to 150 V AC/DC
	200 VAC 230 VAC 400 VAC 480 VAC	K8AB-VS3 K8AB-VW3	20 to 200 V AC/DC
			30 to 300 V AC/DC
			60 to 600 V AC/DC

Wire Connection

2×2.5 mm^2 solid or 2×1.5 mm^2 standard ferrules.

Compliance with International Standards

A third party has certified CE mark compliance. This device is in compliance with UL certification requirements.

Selection Guide

Product name	Model	Nominal input	Supply voltage	Output relays	Housing
1-Phase Current Relay	K8AB-AS1	I1-COM: 2 to 20 mA AC/DC I2-COM: 10 to 100 mA AC/DC I3-COM: 50 to 500 mA AC/DC	24 VDC	One SPDT relay	DIN 22.5 mm
			24 VAC		
			100 to 115 VAC		
			200 to 230 VAC		
	K8AB-AS2	I1-COM: 0.1 to 1 A AC/DC I2-COM: 0.5 to 5 A AC/DC I3-COM: 0.8 to 8 A AC/DC	24 VDC		
			24 VAC		
			100 to 115 VAC		
			200 to 230 VAC		
	K8AB-AS3	I2-COM: 10 to 100 A AC I3-COM: 20 to 200 A AC *	24 VDC		
			24 VAC		
			100 to 115 VAC		
			200 to 230 VAC		
1-Phase Voltage Relay	K8AB-VS1	V1-COM: 6 to 60 mV AC/DC V2-COM: 10 to 100 mV AC/DC V3-COM: 30 to 300 mV AC/DC	24 VDC	One SPDT relay	
			24 VAC		
			100 to 115 VAC		
			200 to 230 VAC		
	K8AB-VS2	V1-COM: 1 to 10 V AC/DC V2-COM: 3 to 30 V AC/DC V3-COM: 15 to 150 V AC/DC	24 VDC		
			24 VAC		
			100 to 115 VAC		
			200 to 230 VAC		
	K8AB-VS3	V1-COM: 20 to 200 V AC/DC V1-COM: 30 to 300 V AC/DC V1-COM: 60 to 600 V AC/DC	24 VDC		
			24 VAC		
			100 to 115 VAC		
			200 to 230 VAC		
1-Phase Voltage Relay	K8AB-VW1	V1-COM: 6 to 60 mV AC/DC V2-COM: 10 to 100 mV AC/DC V3-COM: 30 to 300 mV AC/DC	24 VDC	Two SPDT relays	
			24 VAC		
			100 to 115 VAC		
			200 to 230 VAC		
	K8AB-VW2	V1-COM: 1 to 10 V AC/DC V2-COM: 3 to 30 V AC/DC V3-COM: 15 to 150 V AC/DC	24 VDC		
			24 VAC		
			100 to 115 VAC		
			200 to 230 VAC		
	K8AB-VW3	V1-COM: 20 to 200 V AC/DC V1-COM: 30 to 300 V AC/DC V1-COM: 60 to 600 V AC/DC	24 VDC		
			24 VAC		
			100 to 115 VAC		
			200 to 230 VAC		
Phase-sequence, Phase-loss Relay	K8AB-PH1	200 to 500 VAC	Same as the input voltage.	One SPDT relay	
3-Phase Voltage, Phase-sequence, Phase-loss Relay	K8AB-PM1	200, 220, 230, or 240 VAC		Two SPDT relays	
	K8AB-PM2	380, 400, 415, or 480 VAC			
3-Phase Asymmetry, Phase-sequence, Phase-loss Relay	K8AB-PA1	200, 220, 230, or 240 VAC		One SPDT relay	
	K8AB-PA2	380, 400, 415, or 480 VAC			
3-Phase Voltage Relay	K8AB-PW1	200, 220, 230, or 240 VAC		Two SPDT relays	
	K8AB-PW2	380, 400, 415, or 480 VAC			
Temperature Monitoring Relay	K8AB-TH11S	Thermocouple/Pt100 (0 to 399°C/°F)	100 to 240 VAC	One SPDT relay	
	K8AB-TH12S	Thermocouple (setting unit of 10°C/°F)	100 to 240 VAC		
NEW	K8AB-TH11S	Thermocouple/Pt100 (0 to 399°C/°F)	24 V AC/DC		
	K8AB-TH12S	Thermocouple (setting unit of 10°C/°F)	24 V AC/DC		

* The K8AC-CT200L CT is required to use the K8AB-AS3. Use the K8AB-AS to use a commercially available CT.

Model Number Structure

K8AB-□□
1 2 3

1. Basic Model

Notation	Meaning
K8AB	Measuring and Monitoring Relays

2. Functions

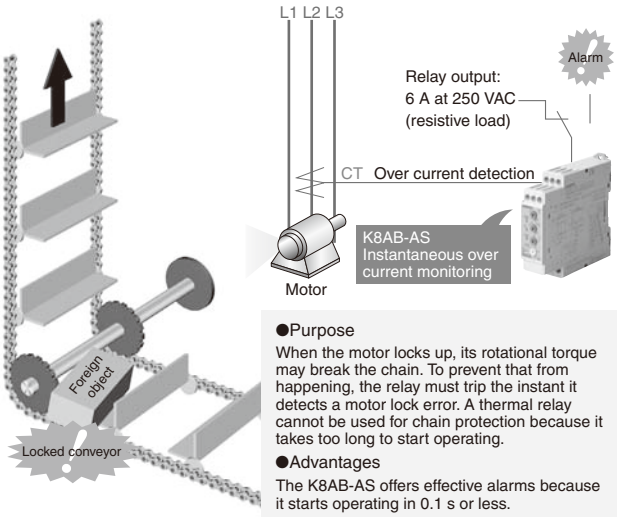
Notation	Meaning	Operation	Datasheet available
AS	Single-phase Current Relay	One-sided operation	Yes
VS	Single-phase Voltage Relay	One-sided operation	Yes
VW	Single-phase Upper-/lower-limit Voltage Relay	Simultaneous upper and lower limit monitoring	Yes
PH	Phase-sequence Phase-loss Relay	---	Yes
PM	Three-phase Voltage Phase-sequence Phase-loss Relay	Simultaneous upper and lower limit monitoring	Yes
PA	Three-phase Asymmetry Phase-sequence Phase-loss Relay	---	Yes
PW	Three-phase Voltage Relay	Simultaneous upper and lower limit monitoring	Yes
TH	Temperature Alarm Device	One-sided operation	Yes

3. Rated Operating Power

Note: For details, refer to *the relevant detasheet*.

Application Examples

Chain Breakage Protection for Conveyors K8AB-AS



●Purpose

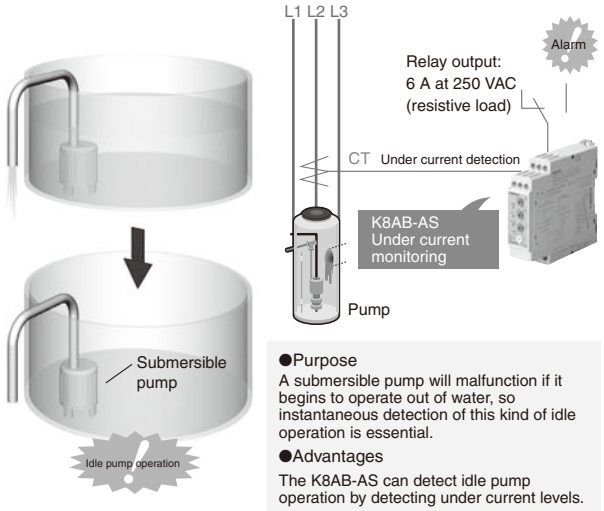
When the motor locks up, its rotational torque may break the chain. To prevent that from happening, the relay must trip the instant it detects a motor lock error. A thermal relay cannot be used for chain protection because it takes too long to start operating.

●Advantages

The K8AB-AS offers effective alarms because it starts operating in 0.1 s or less.

(If a motor is used as the load, be careful that the inrush current does not exceed the allowable input range.)

Protection against Idle Running of a Submersible Pump K8AB-AS



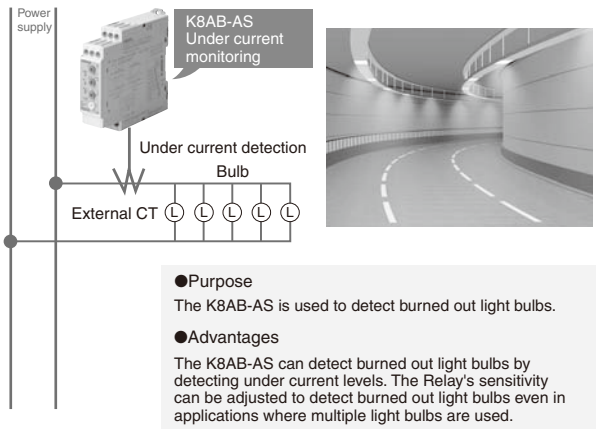
●Purpose

A submersible pump will malfunction if it begins to operate out of water, so instantaneous detection of this kind of idle operation is essential.

●Advantages

The K8AB-AS can detect idle pump operation by detecting under current levels.

Bulb Burnout Detection K8AB-AS



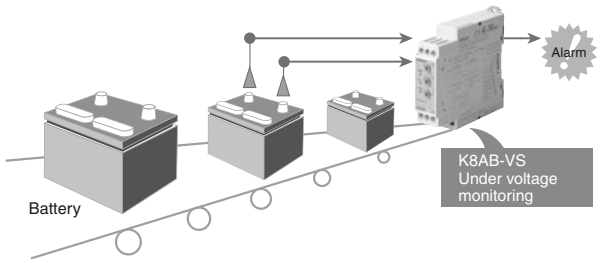
●Purpose

The K8AB-AS is used to detect burned out light bulbs.

●Advantages

The K8AB-AS can detect burned out light bulbs by detecting under current levels. The Relay's sensitivity can be adjusted to detect burned out light bulbs even in applications where multiple light bulbs are used.

Battery Voltage Checking K8AB-VS



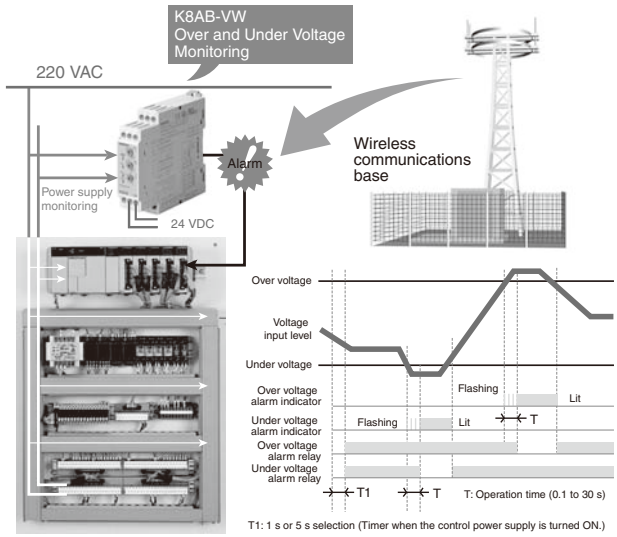
●Purpose

The K8AB-VS is used to check battery charge levels.

●Advantages

The K8AB-VS can detect when the battery charge is low.

Monitoring the Control Power Supply at Communication Bases K8AB-VW



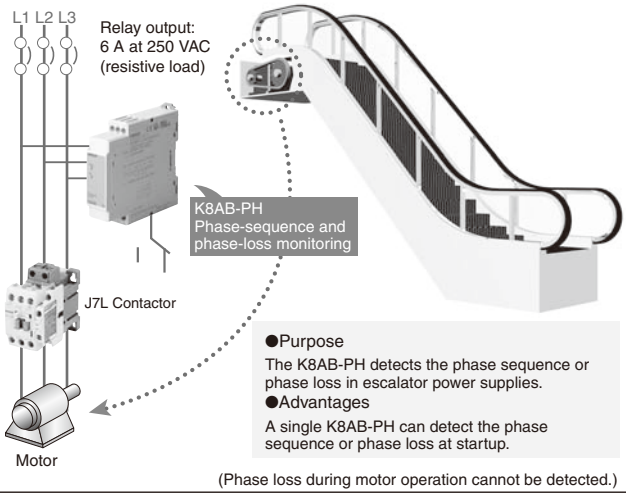
●Purpose

Communications bases must be carefully monitored because the effects of a power outage or voltage drop would be highly detrimental to communications. This is why the K8AB-VW monitors the control panel power supply for over voltage and under voltage levels.

●Advantages

It can detect over voltage and under voltage as well as output individual over voltage and under voltage alarms using SPDT relays.

Monitoring Phase Sequence/ Phase Loss for Escalators — K8AB-PH



●Purpose

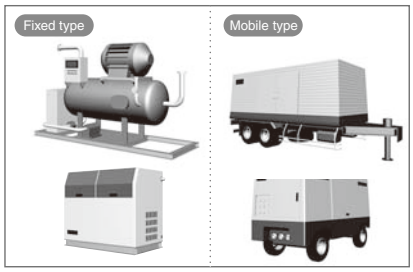
The K8AB-PH detects the phase sequence or phase loss in escalator power supplies.

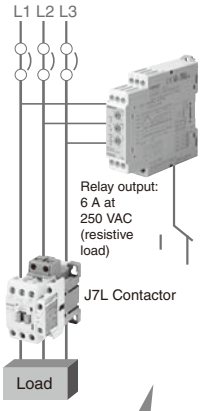
●Advantages

A single K8AB-PH can detect the phase sequence or phase loss at startup.

(Phase loss during motor operation cannot be detected.)

Monitoring Compressor Power Supplies — K8AB-PM





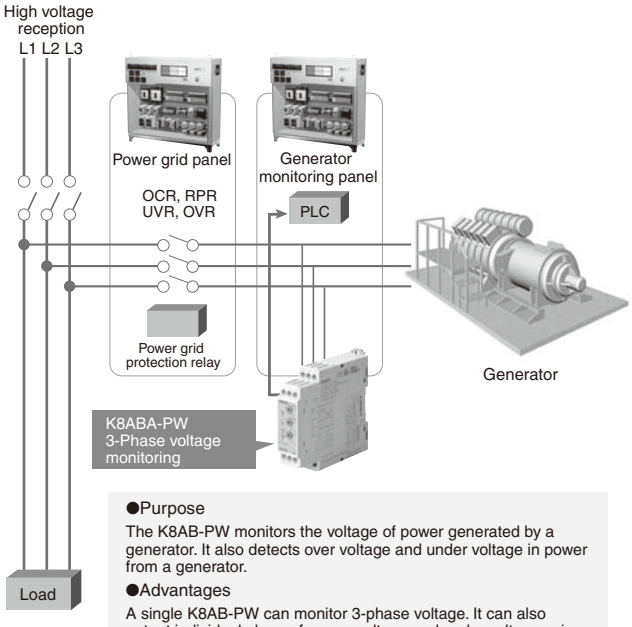
●Purpose

Compressors cannot operate correctly under conditions such as under voltage, asymmetry voltage, phase loss, or phase sequence. The K8AB-PM can be used to monitor 3-phase voltage, the phase sequence, and phase loss.

●Advantages

A single K8AB-PM can monitor over voltage, under voltage, the phase sequence and phase loss in 3-phase voltage. It can also output individual alarms for over voltage or under voltage using an SPDT relay. The K8AB-PM is able to recognize which alarm has occurred.

Monitoring Generated Voltage — K8AB-PW



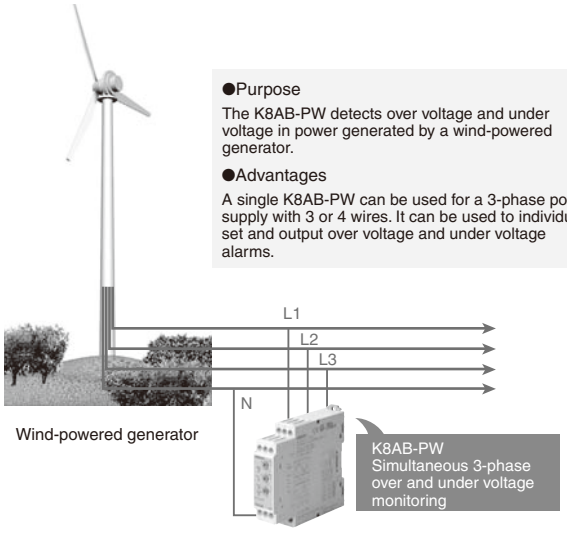
●Purpose

The K8AB-PW monitors the voltage of power generated by a generator. It also detects over voltage and under voltage in power from a generator.

●Advantages

A single K8AB-PW can monitor 3-phase voltage. It can also output individual alarms for over voltage and under voltage using SPDT relays because it features two outputs with SPDT relays. The voltage measurement range can be switched from 200 to 480 VAC and the K8AB-PW can be switched to monitor phase voltage or line voltage.

Monitoring Voltage Generated by Wind-powered Generators — K8AB-PW



●Purpose

The K8AB-PW detects over voltage and under voltage in power generated by a wind-powered generator.

●Advantages

A single K8AB-PW can be used for a 3-phase power supply with 3 or 4 wires. It can be used to individually set and output over voltage and under voltage alarms.

- The application examples provided in this catalog are for reference only. Check functions and safety of the equipment before use.
- Never use the products for any application requiring special safety requirements, such as nuclear energy control systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, or other 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 products are properly rated and installed for the intended use within the overall equipment or system.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

In the interest of product improvement, specifications are subject to change without notice.

Single-phase Current Relay
K8AB-AS

Ideal for current monitoring for industrial facilities and equipment.

- Monitor for overcurrents or undercurrents.
- Manual resetting and automatically resetting supported by one Relay.
- Startup lock and operating time can be set separately.
- One SPDT output relay, 6 A at 250 VAC (resistive load).
- Output relay can be switched between normally open and normally closed.
- Process control signal (4 to 20 mA) and commercial CT input (0 to 1 A or 0 to 5 A) supported.
- Output status can be monitored using LED indicator.
- Inputs are isolated from the power supply.

⚠ Refer to *Safety Precautions for the K8AB Series*. Refer to page 15 for the Q&A section.

Model Number Structure

■ Model Number Legend

K8AB-□□□□
1 2 3 4

1. Basic Model
K8AB: Measuring and Monitoring Relays

2. Functions
AS: Single-phase Current Relay (One-sided operation)

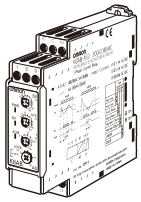
3. Measuring Current
1: 2 to 20 mA AC/DC, 10 to 100 mA AC/DC, 50 to 500 mA AC/DC
2: 0.1 to 1 A AC/DC, 0.5 to 5 A AC/DC, 0.8 to 8 A AC/DC
3: 10 to 100 A AC, 20 to 200 A AC (See note.)

Note: The K8AB-AS3 is specially designed to be used in combination with the OMRON K8AC-CT200L Current Transformer (CT). (Direct input is not possible.)

4. Supply Voltage
24 VDC: 24 VDC
24 VAC: 24 VAC
100-115 VAC: 100 to 115 VAC
200-230 VAC: 200 to 230 VAC

Ordering Information

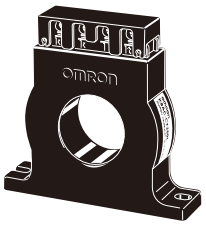
■ List of Models

Single-phase Current Relay	Measuring current	Supply voltage	Model
	2 to 20 mA AC/DC, 10 to 100 mA AC/DC, 50 to 500 mA AC/DC	24 VDC	**K8AB-AS1 24 VDC**
		24 VAC	**K8AB-AS1 24 VAC**
		100-115 VAC	**K8AB-AS1 100-115 VAC**
		200-230 VAC	**K8AB-AS1 200-230 VAC**
	0.1 to 1 A AC/DC, 0.5 to 5 A AC/DC, 0.8 to 8 A AC/DC	24 VDC	**K8AB-AS2 24 VDC**
		24 VAC	**K8AB-AS2 24 VAC**
		100-115 VAC	**K8AB-AS2 100-115 VAC**
		200-230 VAC	**K8AB-AS2 200-230 VAC**
	10 to 100 A AC, 20 to 200 A AC (See note.)	24 VDC	**K8AB-AS3 24 VDC**
		24 VAC	**K8AB-AS3 24 VAC**
		100-115 VAC	**K8AB-AS3 100-115 VAC**
		200-230 VAC	**K8AB-AS3 200-230 VAC**

Note: The K8AB-AS3 is designed to be used in combination with an OMRON K8AC-CT200L Current Transformer (CT). (Direct input is not possible.)

■ Accessory (Order Separately)

OMRON CT

Current Transformer	Input range	Applicable Relay	Model
	10 to 100 A AC, 20 to 200 A AC	K8AB-AS3	**K8AC-CT200L**

Other CTs

CT current on secondary side	Applicable Relay
0 to 1 A AC, 0 to 5 A AC	K8AB-AS2

Ratings and Specifications

■ Input Range

Model	Range*	Connection terminal	Measuring current	Input impedance	Overload capacity
K8AB-AS1	0 to 20 mA AC/DC	I1-COM	2 to 20 mA AC/DC, 10 to 100 mA AC/DC, 50 to 500 mA AC/DC	Approx. 5 Ω	Continuous input : 120% of maximum input 1 s max. : 150% of maximum input
	0 to 100 mA AC/DC	I2-COM		Approx. 1 Ω	
	0 to 500 mA AC/DC	I3-COM		Approx. 0.2 Ω	
K8AB-AS2	0 to 1 A AC/DC	I1-COM	0.1 to 1 A AC/DC, 0.5 to 5 A AC/DC, 0.8 to 8 A AC/DC	Approx. 0.12 Ω (Load : 0.5 VA)	
	0 to 5 A AC/DC	I2-COM		Approx. 0.02 Ω (Load : 1.5 VA)	
	0 to 8 A AC/DC	I3-COM		Approx. 0.02 Ω (Load : 3 VA)	
K8AB-AS3	0 to 100 A AC	I2-COM	10 to 100 A AC, 20 to 200 A AC (See note.)	Using OMRON CT	Continuous input : 120% of maximum input 30 s max. : 200% of maximum input 1 s max. : 600% of maximum input
	0 to 200 A AC	I3-COM		Using OMRON CT	

Note: The K8AB-AS3 is designed to be used in combination with an OMRON K8AC-CT200L Current Transformer (CT). (Direct input is not possible.)

* The range is selected using connected terminals.

■ Ratings

Power supply voltage	**Isolated power supply**	24 VDC, 24 VAC, 100 to 115 VAC, 200 to 230 VAC
Power consumption		24 VDC: 1 W max. 24 VAC: 4 VA max. 100 to 115 VAC: 4 VA max. 200 to 230 VAC: 5 VA max.
Operating value setting range (SV)		10% to 100% of maximum measuring current K8AB-AS1: 2 to 20 mA AC/DC 10 to 100 mA AC/DC 50 to 500 mA AC/DC K8AB-AS2: 0.1 to 1 A AC/DC 0.5 to 5 A AC/DC 0.8 to 8 A AC/DC K8AB-AS3: When used together with a K8AC-CT200L Current Transformer 10 to 100 A AC 20 to 200 A AC
Operating value		100% operation at set value
Reset value setting range (HYS.)		5% to 50% of operating value
Reset method		Manual reset/automatic reset (switchable) **Note:** Manual reset: Turn OFF power supply for 1 s or longer.
Operating time setting range (T)		0.1 to 30 s
Startup lock time setting range (LOCK) **Note:** Enabled only for overcurrent operation.		0 to 30 s (The startup lock timer starts when the input has reached approximately 30% or more of the set value.) **Note:** Enabled only for overcurrent operation.
Indicators		Power (PWR): Green, Relay output (RY): Yellow, Alarm outputs (ALM): Red
Input impedance		Refer to "Input Range" on previous page.
Output relays		One SPDT relay (NO/NC switched using DIP switch.)
Output relay ratings		Rated load Resistive load 6 A at 250 VAC (cosϕ = 1) 6 A at 30 VDC (L/R = 0 ms) Inductive load 1 A at 250 VAC (cosϕ = 0.4) 1 A at 30 VDC (L/R = 7 ms) Maximum contact voltage: 250 VAC Maximum contact current: 6 A AC Maximum switching capacity: 1,500 VA Minimum load: 10 mA at 5 VDC Mechanical life: 10,000,000 operations Electrical life: Make: 50,000 times, Break: 30,000 times
Ambient operating temperature		−20 to 60°C (with no condensation or icing)
Storage temperature		−40 to 70°C (with no condensation or icing)
Ambient operating humidity		25% to 85% (with no condensation)
Storage humidity		25% to 85% (with no condensation)
Altitude		2,000 m max.
Terminal screw tightening torque		0.49 N·m
Terminal wiring method		Recommended wire Solid wire: 2.5 mm^2 Twisted wires: AWG16, AWG18 **Note: 1.** Ferrules with insulating sleeves must be used with twisted wires. **2.** Two wires can be twisted together. Recommended ferrules AI 1,5-8BK (for AWG16) manufactured by Phoenix Contact AI 1-8RD (for AWG18) manufactured by Phoenix Contact AI 0,75-8GY (for AWG18) manufactured by Phoenix Contact
Case color		Munsell 5Y8/1
Case material		PBT/ABS resin (self-extinguishing resin) UL94-V0
Weight		Approx. 130 g
Mounting		Mounted to DIN Track or via M4 screws (tightening torque: 1.2 N·m)
Dimensions		22.5 (W) × 90 (H) × 100 (D) mm

■ Specifications

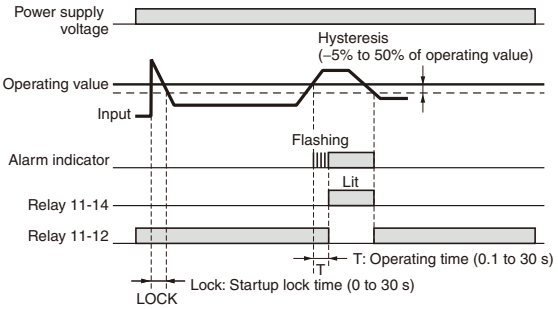
Allowable power supply voltage range		85% to 110% of power supply voltage
Allowable power supply frequency range		50/60 Hz ±5 Hz
Input frequency range		K8AB-AS1 and K8AB-AS2: DC input or AC input (45 to 65 Hz) K8AB-AS3: AC input (45 to 65 Hz)
Overload capacity		K8AB-AS1 and K8AB-AS2: Continuous input: 120% of maximum input, 1 s max.: 150% of maximum input. K8AB-AS3: Continuous input: 120% of maximum input, 30 s max.: 200% of maximum input, 1 s max.: 600% of maximum input **Note:** Overload capacity of primary side of CT.
Setting error	**Operating value**	Set value ±10% full scale
	Reset value	
	Operating time	
	Startup lock time	
Repeat error	**Operating value**	Operating value ±2% Error calculation: Error = ((Maximum operating value − Minimum operating value (over 10 operations))/2)/Average value × 100%
	Reset value	Reset value ±2% Error calculation: Error = ((Maximum reset value − Minimum reset value (over 10 resets))/2)/Average value × 100%
	Operating time	Operating time repeat error: ±50 ms Overcurrent: Measured when input suddenly changes from 0% to 120% of setting. Undercurrent: Measured when input suddenly changes from 120% to 0% of setting.
	Startup lock time	Startup lock time repeat error: ±50 ms (measured at sudden change from 0% to 120% of setting)
Temperature influence		Operating value Drift based on measured value at standard temperature: −20°C to standard temperature: ±1,000 ppm/°C max. Standard temperature to 60°C : ±1,000 ppm/°C max. (Humidity: 25% to 80%) Operating time Fluctuation based on measured value at standard temperature: −20°C to standard temperature: ±10% max. Standard temperature to 60°C : ±10% max. (Humidity: 25% to 80%)
Humidity influence		Operating value Based on ambient humidity of 65% 25% to 80%: ±5% max. Operating time Based on ambient room humidity 25% to 80%: ±10% max.
Influence of power supply voltage		Operating value: ±5% max. Operating time: ±10% max. **Note:** The error in the operating value and operating time under standard conditions.
Influence of power supply frequency		Operating value: ±5% max. (at 45 to 65 Hz) Operating time: ±10% max. (at 45 to 65 Hz) **Note:** The error in the operating value and operating time under standard conditions.
Influence of input frequency		Operating value (45 to 65 Hz) K8AB-AS1 and K8AB-AS2: ±5% max. K8AB-AS3: ±10% max. Operating time (45 to 65 Hz) ±10% max. **Note:** The error in the operating value and operating time under standard conditions.
Applicable standards	**Conforming standards**	EN60255-5 and EN60255-6 Installation environment (Pollution Degree 2, Overvoltage Category III)
	EMC	EN61326
Insulation resistance		20 MΩ min. Between external terminals and case Between power supply terminals and input terminals (excluding models with DC power supply) Between power supply terminals and output terminals Between input terminals and output terminals
Dielectric strength		2,000 VAC for one minute Between external terminals and case Between power supply terminals and input terminals (excluding models with DC power supply) Between power supply terminals and output terminals Between input terminals and output terminals
Noise immunity		1,500 V power supply terminal common/normal mode Square-wave noise of ±1 μs/100 ns pulse width with 1-ns rise time
Vibration resistance		Frequency 10 to 55 Hz, 0.35-mm single amplitude, acceleration 50 m/s^2 10 sweeps of 5 min each in X, Y, and Z directions
Shock resistance		100 m/s^2, 3 times each in 6 directions along three axes (up/down, left/right, forward/backward)
Degree of protection		Terminal section: Finger protection

Connections

■ Wiring Diagram

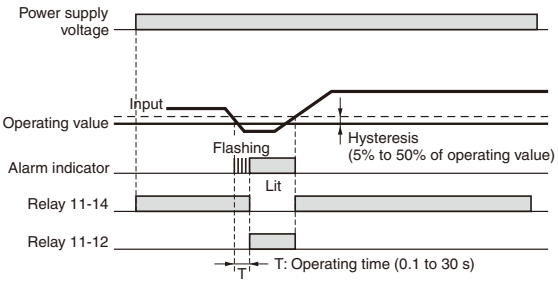
Overcurrent Operation Diagram (Output Relay Drive Method: Normally Open)

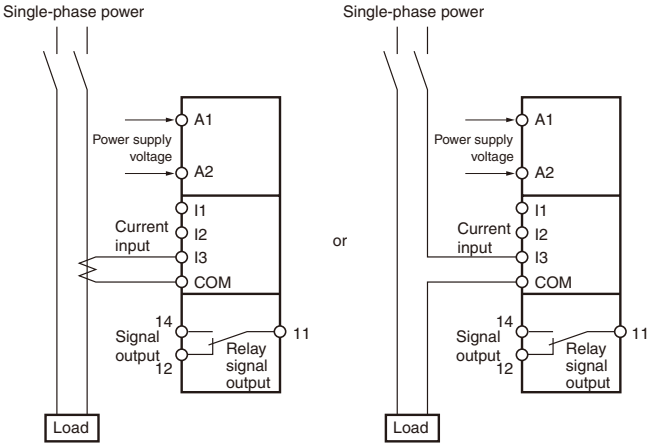
DIP switch setting: SW3 OFF.



Undercurrent Operation Diagram (Output Relay Drive Method: Normally Closed)

DIP switch setting: SW3 ON.

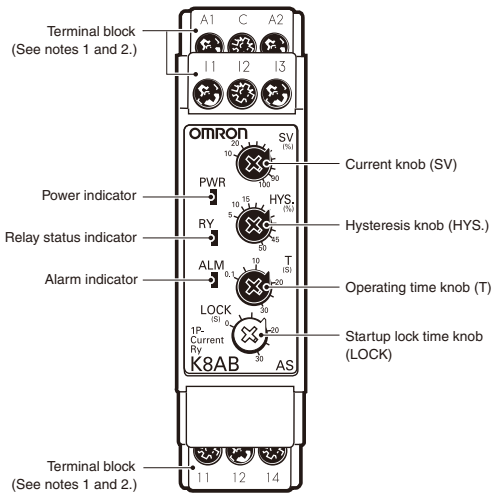




Note: The K8AB-AS3 is designed to be used in combination with the OMRON K8AC-CT200L Current Transformer (CT).

Nomenclature

■ Front



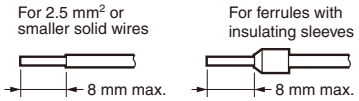
Indicators

Item	Meaning
Power indicator (PWR: Green)	Lit when power is being supplied.
Relay status indicator (RY: Yellow)	Lit when relay is operating.
Alarm indicator (ALM: Red)	Lit when there is an overcurrent or undercurrent. The indicator flashes to indicate the error status after the input has exceeded the threshold value while the operating time is being clocked.

Setting Knobs

Item	Usage
Current knob (SV)	Used to set the current to 10% to 100% of maximum measuring current.
Hysteresis knob (HYS.)	Used to set the rest value to 5% to 50% of the operating value.
Operating time knob (T)	Used to set the operating time to 0.1 to 30 s.
Startup lock time knob (LOCK)	Used to set the startup lock time to 0 to 30 s.

Note: 1. Use either a solid wire of 2.5 mm^2 maximum or a ferrule with insulating sleeve for the terminal connection.
The length of the exposed current-carrying part inserted into the terminal must be 8 mm or less to maintain dielectric strength after connection.



Recommended ferrules
Phoenix Contact
- AI 1,5-8BK (for AWG16)
- AI 1-8RD (for AWG18)
- AI 0,75-8GY (for AWG18)

2. Tightening torque
Recommended: 0.49 N·m
Maximum: 0.54 N·m

■ Operation and Setting Methods

Setting Ranges and Wiring Connections

Model	Measuring current	Wiring connection
K8AB-AS1	2 to 20 mA AC/DC	I1-COM
	10 to 100 mA AC/DC	I2-COM
	50 to 500 mA AC/DC	I3-COM
K8AB-AS2	0.1 to 1 A AC/DC	I1-COM
	0.5 to 5 A AC/DC	I2-COM
	0.8 to 8 A AC/DC	I3-COM
K8AB-AS3	10 to 100 A AC (See note 2.)	I2-COM
	20 to 200 A AC (See note 2.)	I3-COM

Note: 1. The DC input terminals have no polarity.
2. The K8AB-AS3 is designed to be used in combination with the OMRON K8AC-CT200L Current Transformer (CT). (Direct input is not possible.)

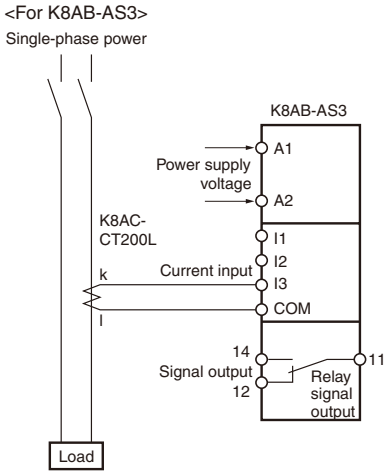
Connections

1. Input
Connect the input between the I1-COM, I2-COM, or I3-COM terminals, according to the input current. Malfunctions may occur if the input is connected to unused terminals and the Unit will not operate correctly.
Terminal I1 is not used by the K8AB-AS3.
If using the OMRON K8AC-CT200L CT, connect to terminals k and l on the K8AC-CT200L. (Terminals kt and lt are not used.)

2. Power Supply
Connect the power supply to terminals A1 and A2.

3. Outputs
SPDT relays are output to terminals 11, 12, and 14.

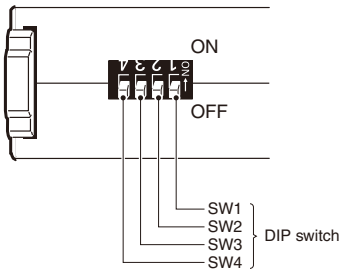
Note: Use the recommended ferrules if using twisted wires.



DIP Switch Settings

The resetting method, relay drive method, and operating mode are set using the DIP switch located on the bottom of the Unit.

K8AB-AS□ does not use SW1.



DIP Switch Functions

SWITCH	ON ● ↑ / OFF ❍ ↓	4 (ON / OFF)	3	2	1
Resetting method	Automatic reset	---	---	●	NO USE
	Manual reset	---	---	❍	
Relay drive method	Normally closed	---	●	---	
	Normally open	---	❍	---	
Operating mode	Undercurrent	●	---	---	
	Overcurrent	❍	---	---	

Note: All pins are set to OFF at the factory.

Setting Method

1. Setting Current
The current knob (SV) is used to set the current.
The current can be set to 10% to 100% of the maximum measuring current.
Turn the knob while there is an input to the input terminals until the alarm indicator flashes (when the set value and the input have reached the same level.)
Use this as a guide to set the current.
The maximum measuring current will differ depending on the model and the input terminal.
Example: K8AB-AS3 Using Input Terminals I3-COM
The maximum measuring current will be 200 A AC and the setting range will be 20 to 200 A.

2. Hysteresis

Hysteresis is set using the hysteresis knob (HYS.)
The setting range is 5 to 50% of the operating value.
Turn the knob while there is an input to the input terminals until the alarm indicator flashes (when the set value and the input have reached the same level.)
Use this as a guide to set the hysteresis.

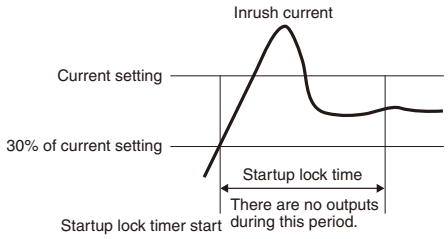
Example: Maximum of 200 A AC, Current Setting (SV) of 50%, and Overcurrent Operation
Operation will be at 100 A and resetting at 90 A when the hysteresis (HYS.) is set to 10%.

3. Operating Time

The operating time is set using the operating time knob (T).
The operating time can be set to between 0.1 and 30 s.
Turn the knob while there is an input to the input terminals until the alarm indicator flashes (when the set value and the input have reached the same level.)
Use this as a guide to set the operating time.
If the input current exceeds (drops lower than) the current setting, the alarm indicator will start flashing for the set period and then stay lit.

4. Startup Lock Time

The startup lock time is set using the startup lock time knob (LOCK).
The startup lock time can be set to between 0 and 30 s.
Turn the knob while there is an input to the input terminals until the alarm indicator flashes (when the set value and the input have reached the same level.)
Use this as a guide to set the startup lock time.
The startup lock time will start when the input current reaches 30% or more of the current setting.
Use startup lock time to prevent unwanted operation, e.g., as a result of inrush current.

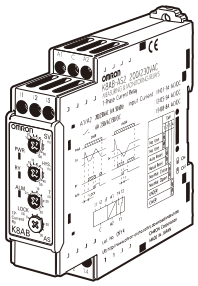


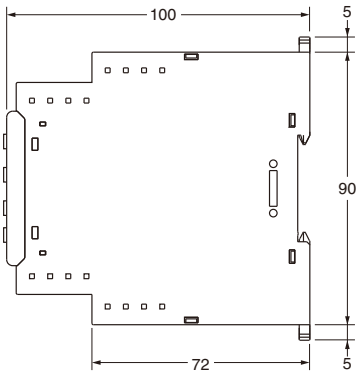
Dimensions

(Unit: mm)

Single-phase Current Relays

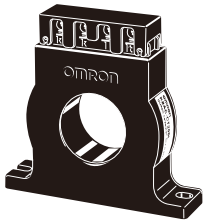
K8AB-AS1
K8AB-AS2
K8AB-AS3

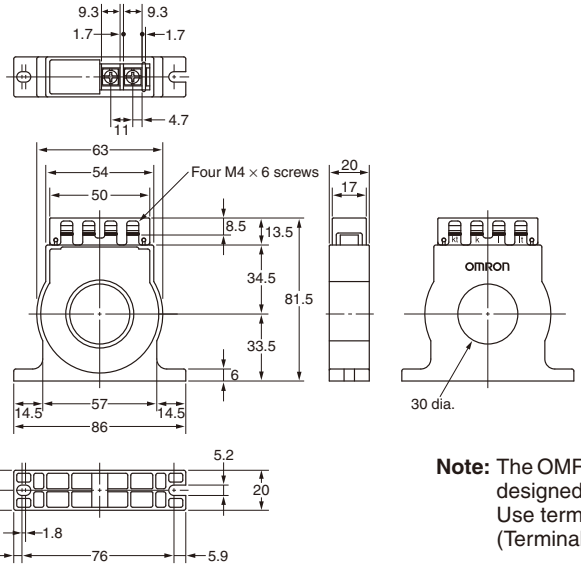




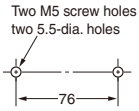
OMRON CT

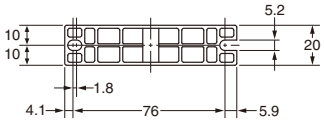
K8AC-CT200L





Mounting Hole Dimensions





Note: The OMRON Current Transformer (CT) is designed to be used with the K8AB-AS3. Use terminals k and l for connections. (Terminals kt and lt are not used.)

Questions and Answers

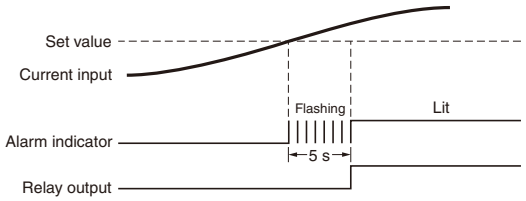
Q **Checking Operation**

A

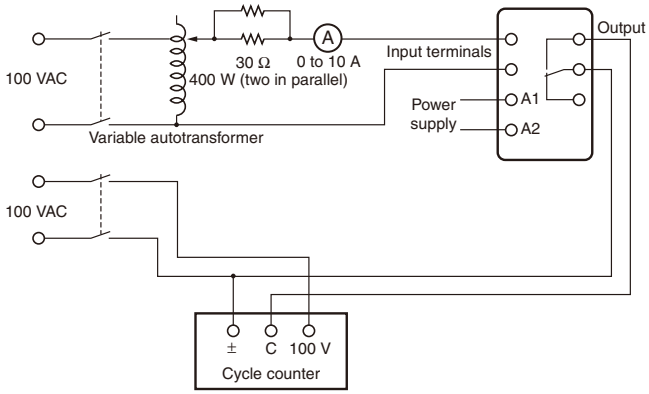
Overcurrents
Gradually increase the input from 80% of the setting. The input will equal the operating value when the input exceeds the setting and the alarm indicator starts flashing. Operation can be checked by the relay outputs that will start after the operating time has passed.

Undercurrent
Gradually decrease the input from 120% of the setting and check the operation using the same method as for overcurrent.

Example: Overcurrent Operating Mode, Normally Open Relay Drive, and an Operating Time of 5 s



Connection Diagram



Q **How to Measure the Operating Time**

A

Overcurrent
Change the input suddenly from 0% to 120% of the set value and measure the time until the Unit operates.

Undercurrent
Change the input suddenly from 120% to 0% of the set value and measure the time until the Unit operates.

Q **Monitoring Switch-mode Power Supplies**

A

Switch-mode Power Supplies cannot be monitored. In circuits with a capacitor input, including switch-mode power supplies, the input capacitor recharge current flows in pulse form as the load current. The K8AB-AS□ has a built-in filter as a countermeasure against high frequencies and cannot be used to remove pulse current.

Q **Operating Adjustment Knobs**

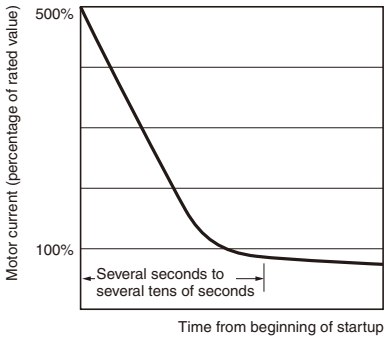
A

Use a screwdriver to turn the knobs. There is a stopper to prevent the knob from turning any further once it has been turned completely to the left or right. Do not force the knob past these limits.

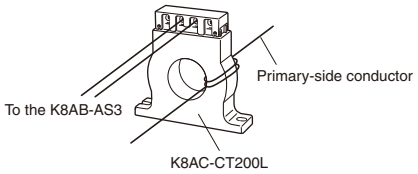
Q **Can a motor with a rated current of 5 A be monitored using the K8AB?**
Are there any application precautions?

A

The K8AB-AS1 and K8AB-AS2 cannot be used with motor loads. Use the K8AB-AS3 in combination with the K8AC-CT200L Current Transformer (CT). With motor loads, the startup current and stall current will cause a current of many times the rated current to flow. Refer to the following figure for information on the motor startup current.



For a motor with a rating of 5 A, the startup current will be approximately 30 A. The startup current will exceed the overload capacity (rating: 150% for 1 s) of the K8AB-AS1 and K8AB-AS2 and result in failure of the Relay.
To monitor the motor load, use the K8AB-AS3. (Overload capacity: 120% of rating for continuous load, 200% of rating for 30 s, and 600% of rating for 1 s).
The K8AB-AS3 has a large input range. Pass the conductors multiple times through the special CT.



Concept behind Passing Conductor through the CT When Using the K8AB-AS3

Example: Monitoring Overload of a Motor with a Rated Current of 5 A

K8AB settings:
Overcurrent detection, operating value setting: 25%, operating time: 0.1 s
Startup lock timer: 0.1 to 30 s (Set the timer according to the duration of the startup current.)

The setting range for the K8AB-AS3 is 10% to 100% of the rated current (i.e., 10 to 100 A). Pass the conductors through the CT five times so that at least 10 A of current flows. The input current to the K8AB will be 25 A (i.e., 5 A x 5 loops).
If a startup current of six times the rated current is generated, it will be 150 A (i.e., 25 A x 6). The overload capacity for the K8AB-AS3 is 200% of the rating for 30 s. The Relay will not fail even if the startup current continues for 30 s, and it is possible to perform overload detection.

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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

In the interest of product improvement, specifications are subject to change without notice.