# Measuring and Monitoring Relays
# K8AB Series

CSM_K8AB_series_Outline_DS_E_3_2

## 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

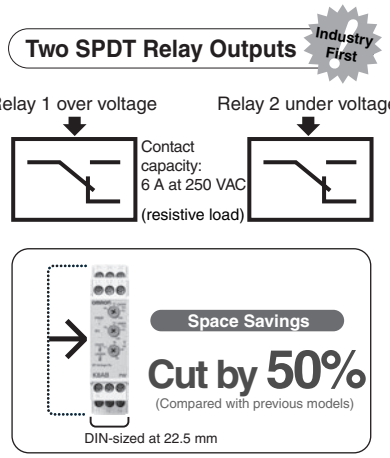
## Slim 22.5-mm Design Features Two SPDT Relay Outputs (K8AB-VW, K8AB-PM, and K8AB-PW)

### Provides individual over voltage and under voltage settings and outputs.

**1-/3-phase Power Supply**

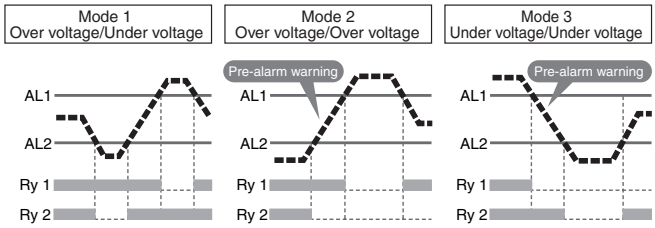
Many customers require the individual upper and lower limit outputs that are normally available only in larger 45-mm relays. For the first time from any manufacturer, OMRON has achieved this and more in a slim-body design measuring just 22.5 mm. These relays not only offer advantages such as 3-phase 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.

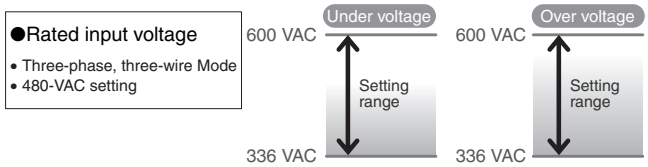



## Expanded Setting Range Ensures Over Voltage and Under Voltage Monitoring Flexibility

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

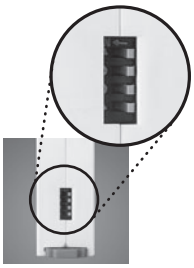
The K8AB-AS 1-Phase Current Relay can be used with commercial CTs for current measurement.

| | 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.



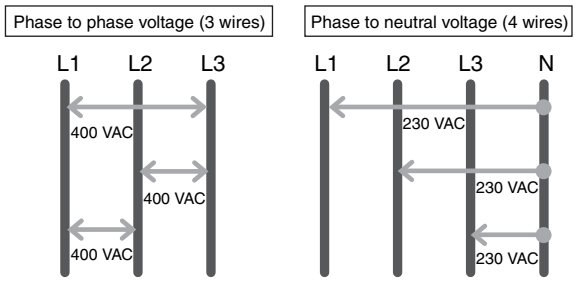
**Example: K8AB-AS 1-Phase Current Relay**

| | 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 |

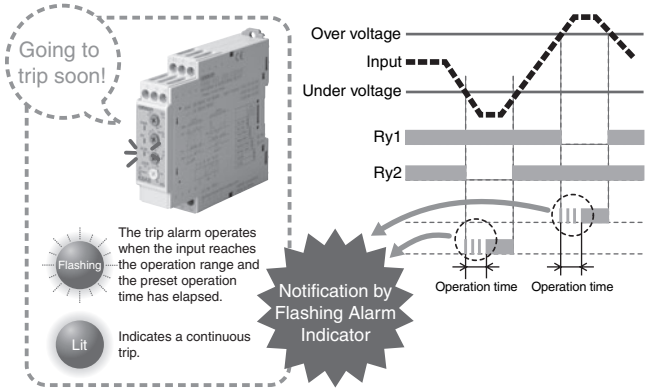
### DIN Track Mounting

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)**

K8AB-AS2 can use standardized CT!!

| 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 standardized CT) | 0 to 1 A AC<br>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<br>0 to 100 mV DC<br>0 to 150 mV DC | K8AB-VS1<br>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<br>24 VDC<br>100 VAC<br>115 VAC | K8AB-VS2<br>K8AB-VW2 | 1 to 10 V AC/DC |
| | | | 3 to 30 V AC/DC |
| | | | 15 to 150 V AC/DC |
| | 200 VAC<br>230 VAC<br>400 VAC<br>480 VAC | K8AB-VS3<br>K8AB-VW3 | 20 to 200 V AC/DC |
| | | | 30 to 300 V AC/DC |
| | | | 60 to 600 V AC/DC |

## Wire Connection

$2 \times 2.5$ mm$^2$ solid or $2 \times 1.5$ 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 | 24 V AC/DC | One SPDT relay | DIN 22.5 mm |
| | | I2-COM: 10 to 100 mA AC/DC | 100 to 115 VAC | | |
| | | I3-COM: 50 to 500 mA AC/DC | 200 to 230 VAC | | |
| | K8AB-AS2 *1 | I1-COM: 0.1 to 1 A AC/DC | 24 V AC/DC | | |
| | | I2-COM: 0.5 to 5 A AC/DC | 100 to 115 VAC | | |
| | | I3-COM: 0.8 to 8 A AC/DC | 200 to 230 VAC | | |
| | K8AB-AS3 *2 | I2-COM: 10 to 100 A AC | 24 V AC/DC | | |
| | | I3-COM: 20 to 200 A AC | 100 to 115 VAC | | |
| | | | 200 to 230 VAC | | |
| 1-Phase Voltage Relay | K8AB-VS1 | V1-COM: 6 to 60 mV AC/DC | 24 V AC/DC | One SPDT relay | |
| | | V2-COM: 10 to 100 mV AC/DC | 100 to 115 VAC | | |
| | | V3-COM: 30 to 300 mV AC/DC | 200 to 230 VAC | | |
| | K8AB-VS2 | V1-COM: 1 to 10 V AC/DC | 24 V AC/DC | | |
| | | V2-COM: 3 to 30 V AC/DC | 100 to 115 VAC | | |
| | | V3-COM: 15 to 150 V AC/DC | 200 to 230 VAC | | |
| | K8AB-VS3 | V1-COM: 20 to 200 V AC/DC | 24 V AC/DC | | |
| | | V1-COM: 30 to 300 V AC/DC | 100 to 115 VAC | | |
| | | V1-COM: 60 to 600 V AC/DC | 200 to 230 VAC | | |
| 1-Phase Voltage Relay | K8AB-VW1 | V1-COM: 6 to 60 mV AC/DC | 24 V AC/DC | Two SPDT relays | |
| | | V2-COM: 10 to 100 mV AC/DC | 100 to 115 VAC | | |
| | | V3-COM: 30 to 300 mV AC/DC | 200 to 230 VAC | | |
| | K8AB-VW2 | V1-COM: 1 to 10 V AC/DC | 24 V AC/DC | | |
| | | V2-COM: 3 to 30 V AC/DC | 100 to 115 VAC | | |
| | | V3-COM: 15 to 150 V AC/DC | 200 to 230 VAC | | |
| | K8AB-VW3 | V1-COM: 20 to 200 V AC/DC | 24 V AC/DC | | |
| | | V1-COM: 30 to 300 V AC/DC | 100 to 115 VAC | | |
| | | V1-COM: 60 to 600 V AC/DC | 200 to 230 VAC | | |
| Phase-sequence, Phase-loss Relay *3 | 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 | | |
| | 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 | | |

*1 K8AB-AS2 can use standardized CT.
*2 The K8AC-CT200L CT is required to use with K8AB-AS3.
*3 K8AB-PH can detect the phase-loss during motor operation.

# 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 |

**3. Rated Operating Power**

**Note:** For details, refer to the relevant Ordering Information.

**K8AB-TH1□□**
2 3 4

**2. Functions**

| Notation | Meaning | Operation |
|---|---|---|
| TH1 | Temperature Alarm Device | One-sided operation |

**3. Setting range**

| Notation | Meaning |
|---|---|
| 1 | Low temperature range (0 to 399°C set in increments of 1°C) |
| 2 | High temperature range (0 to 1700°C set in increments of 10°C) |

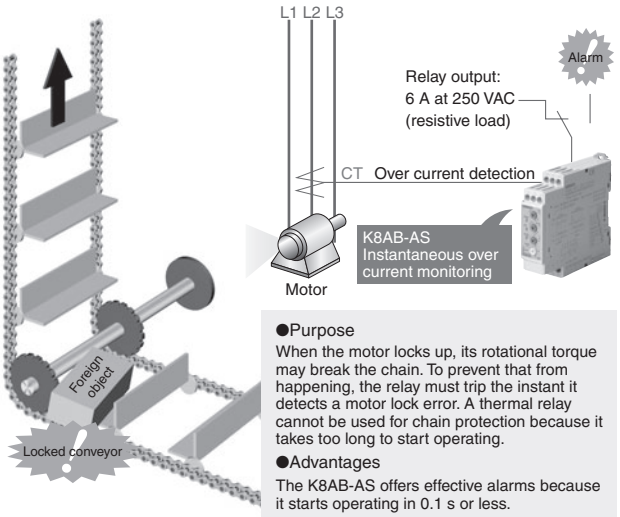
**4. Output form**

| Notation | Meaning |
|---|---|
| S | One SPDT relay output |

# Application Examples

## Chain Breakage Protection for Conveyors K8AB-AS

K8AB-AS2 can use standardized CT!!




●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.

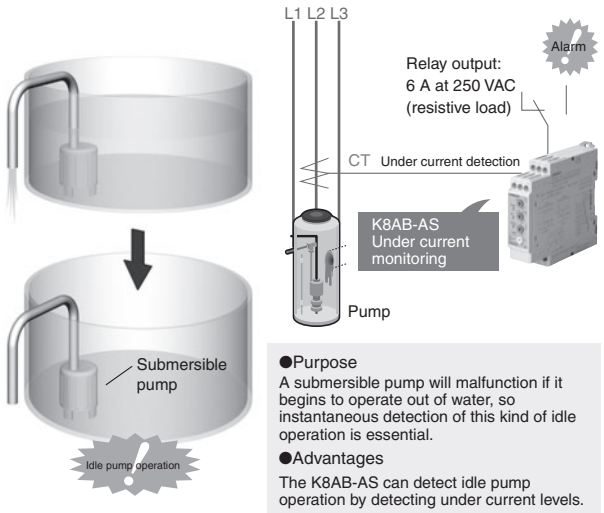
●Advantages

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

K8AB-AS2 can use standardized CT!!




●Purpose

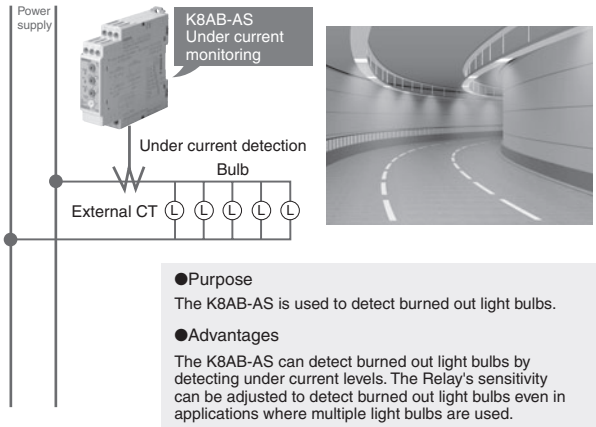
A submersible pump will malfunction if it begins to operate out of water, so instantaneous detection of this kind of idle operation is essential.

●Advantages

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

## Bulb Burnout Detection K8AB-AS

K8AB-AS2 can use standardized CT!!



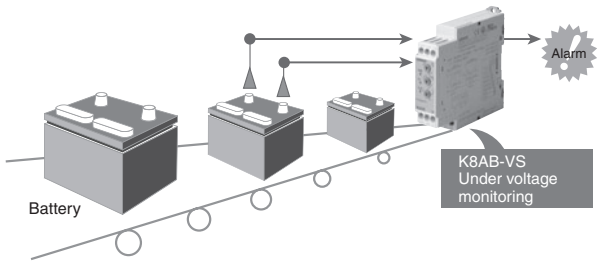

●Purpose

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



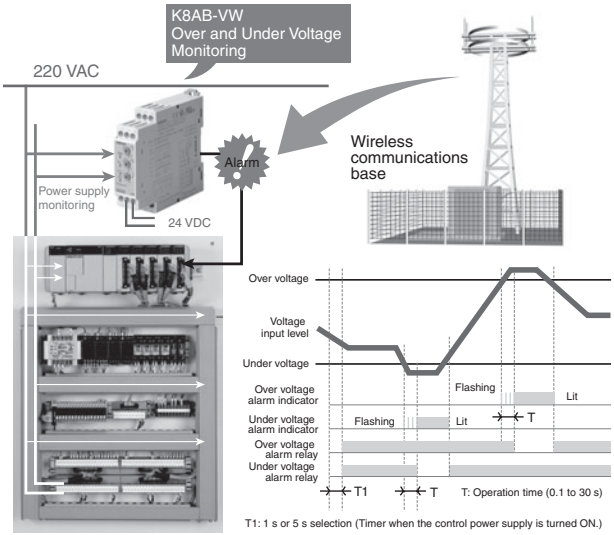

●Purpose

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

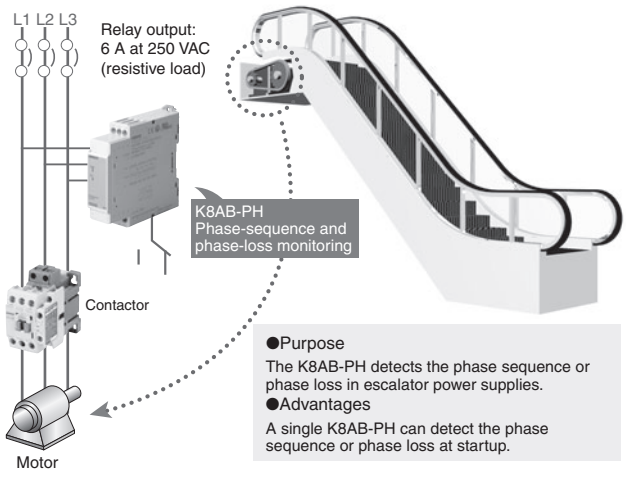
Communications bases must be carefully monitored because the effects of a power outage or voltage drop would be highly detrimental to communications. This is why the K8AB-VW monitors the control panel power supply for over voltage and under voltage levels.

●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

Can detect the phase-loss during motor operation!!



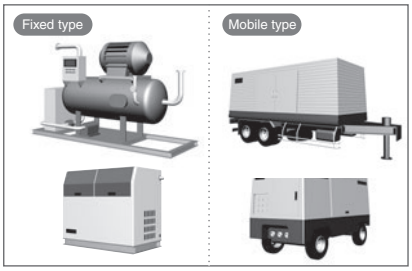

●Purpose

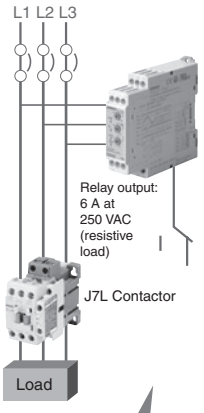
The K8AB-PH detects the phase sequence or phase loss in escalator power supplies.

●Advantages

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

## Monitoring Compressor Power Supplies — K8AB-PM



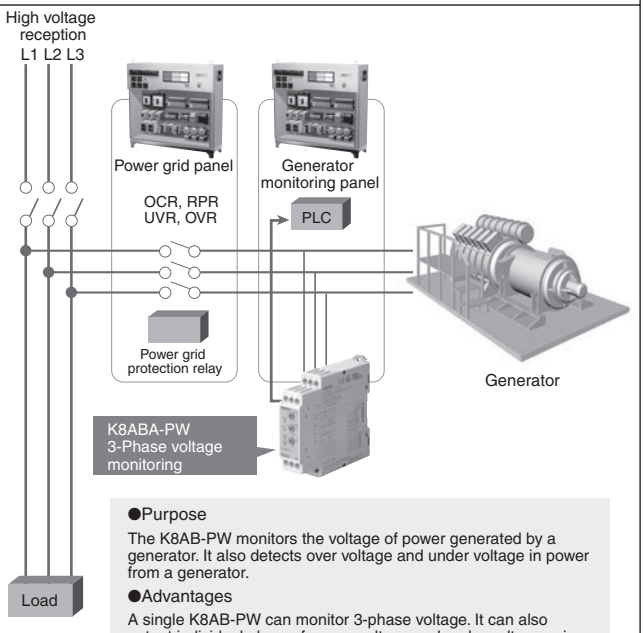

●Purpose

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



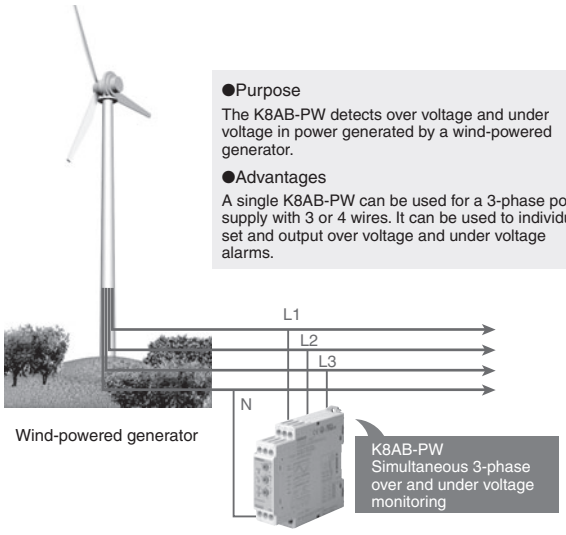

●Purpose

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.



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.

## Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

## Warranty and Limitations of Liability

### WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

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In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS 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 OR REPAIR.

## Application Considerations

### SUITABILITY FOR USE

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

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear 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 the products.

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 PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

### PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

## Disclaimers

### 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 model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

### DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

### PERFORMANCE DATA

Performance data given in this catalog 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 users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

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