

Single-phase Voltage Relay K8AB-VW

Ideal for voltage monitoring for industrial facilities and equipment.

- Monitor for overvoltages and undervoltages simultaneously. Separate settings and outputs supported for overvoltages and undervoltages.
- Manual resetting and automatically resetting supported by one Relay.
- Pre-alarm Monitoring Mode.
- Two SPDT output relays, 6 A at 250 VAC (resistive load).
- Process control signal (0 to 10 V) and current splitter input supported.
- Output status can be monitored using LED indicator.
- Input frequency of 40 to 500 Hz supported.



Model Number Structure

■ Model Number Legend

K8AB-

1 2 3 4

1. Basic Model

K8AB: Measuring and Monitoring Relays

2. Functions

VW: Single-phase Voltage Relay (Simultaneous upper and lower limit monitoring)

3. Measuring Current

1: 6 to 60 mV AC/DC, 10 to 100 mV AC/DC, 30 to 300 mV AC/DC

2: 1 to 10 V AC/DC, 3 to 30 V AC/DC, 15 to 150 V AC/DC

3: 20 to 200 V AC/DC, 30 to 300 V AC/DC, 60 to 600 V AC/DC

4. Supply Voltage

24 VDC: 24 VDC

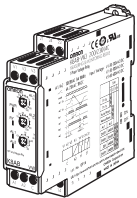
24 VAC: 24 VAC

100-115 VAC: 100 to 115 VAC

200-230 VAC: 200 to 230 VAC

Ordering Information

■ List of Models

| Single-phase Voltage Relay | Measuring voltage | Supply voltage | Model |
|---|--|----------------|------------------------------------|
|  | 6 to 60 mV AC/DC, 10 to 100 mV AC/DC, 30 to 300 mV AC/DC | 24 VDC | K8AB-VW1 24 VDC (See note.) |
| | | 24 VAC | K8AB-VW1 24 VAC |
| | | 100-115 VAC | K8AB-VW1 100-115 VAC |
| | | 200-230 VAC | K8AB-VW1 200-230 VAC |
| | 1 to 10 V AC/DC, 3 to 30 V AC/DC, 15 to 150 V AC/DC | 24 VDC | K8AB-VW2 24 VDC (See note.) |
| | | 24 VAC | K8AB-VW2 24 VAC |
| | | 100-115 VAC | K8AB-VW2 100-115 VAC |
| | | 200-230 VAC | K8AB-VW2 200-230 VAC |
| | 20 to 200 V AC/DC, 30 to 300 V AC/DC, 60 to 600 V AC/DC | 24 VDC | K8AB-VW3 24 VDC (See note.) |
| | | 24 VAC | K8AB-VW3 24 VAC |
| | | 100-115 VAC | K8AB-VW3 100-115 VAC |
| | | 200-230 VAC | K8AB-VW3 200-230 VAC |

Note: Models with a 24-VDC power supply have a non-isolated power supply. The inputs and power supply are connected internally so the K8AB-VW will not operate normally if an unwanted current path exists. If an unwanted current path exists, use a K8AB AC Power Supply or isolate with an external power supply.

Ratings and Specifications

■ Ratings

| | | |
|---|---------------------------|---|
| Power supply voltage | Non-isolated power supply | 24 VDC (See note.) |
| | Isolated power supply | 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 (AL1 and AL2) | | 10% to 100% of maximum measuring voltage K8AB-VW1: 6 to 60 mV AC/DC 10 to 100 mV AC/DC 30 to 300 mV AC/DC K8AB-VW2: 1 to 10 V AC/DC 3 to 30 V AC/DC 15 to 150 V AC/DC K8AB-VW3: 20 to 200 V AC 30 to 300 V AC 60 to 600 V AC |
| Operating value | | 100% operation at set value |
| Reset value | | 5% of operating value (fixed) |
| 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 |
| Power ON lock time (LOCK) | | 1 s or 5 s (Switched using DIP switch.) |
| Indicators | | Power (PWR): Green, Relay output (RY): Yellow, Alarm outputs (ALM): Red |
| Input impedance | | K8AB-VW1: 9 kΩ min. K8AB-VW2: 100 kΩ min. K8AB-VW3: 1 MΩ min. |
| Output relays | | Two SPDT relays (NC operation) |
| 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 Al 1,5-8BK (for AWG16) manufactured by Phoenix Contact Al 1-8RD (for AWG18) manufactured by Phoenix Contact Al 0,75-8GY (for AWG18) manufactured by Phoenix Contact |
| Case color | | Munsell 5Y8/1 |
| Case material | | ABS resin (self-extinguishing resin) UL94-V0 |
| Weight | | DC models: Approx. 120 g AC models: Approx. 160 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 |

Note: Models with a 24-VDC power supply have a non-isolated power supply; the inputs and power supply are connected internally. If both the input and power supply are grounded, an unwanted current path will be created and the Unit will not operate normally. If an unwanted current path exists, use a K8AB model with an AC power supply or use an isolated DC power supply.

■ 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 | | 40 to 500 Hz |
| Overload capacity | | Continuous input: 115% of maximum input, 10 s max.: 125% of maximum input |
| Setting error | Operating value | Set value ±10% full scale |
| | Operating time | |
| | Power ON lock time | Set value ±0.5 s |
| 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 (See note.) | Overvoltage Operating value × 95% ±2% Undervoltage Operating value × 105% ±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 Overvoltage: Measured when input suddenly changes from 0% to 120% of setting. Undervoltage: Measured when input suddenly changes from 120% to 0% of setting. |
| | Power ON lock time | Power ON lock time repeat error: ±0.5 s (The operating time when the operating time is set to the minimum value and the power supply suddenly changes from 0% to 100%.) |
| 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 | | At 40 to 500 Hz Operating value ±5% max. Operating time ±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 |
| | Safety standards | UL508 |
| 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 1 terminals Between power supply terminals and output 2 terminals Between input terminals and output 1 terminals Between input terminals and output 2 terminals Between output 1 terminals and output 2 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 1 terminals Between power supply terminals and output 2 terminals Between input terminals and output 1 terminals Between input terminals and output 2 terminals Between output 1 terminals and output 2 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 |

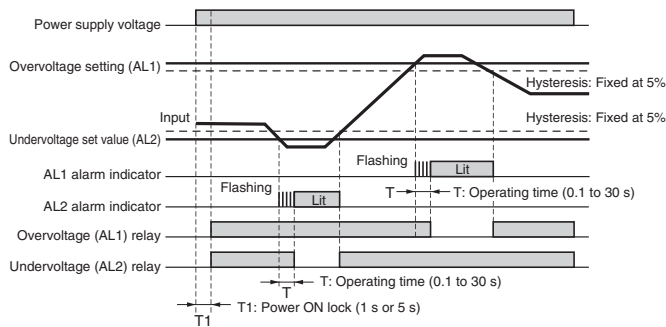
Note: The reset value is valid only for automatic resets.

Connections

■ Wiring Diagram

Overvoltage and Undervoltage Operation Diagram

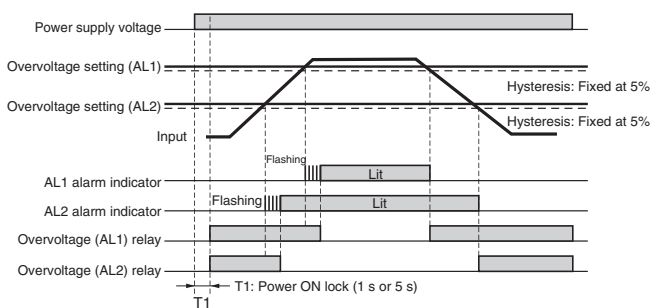
DIP switch settings: SW3 and SW4 both ON or both OFF.



- Note:**
1. The K8AB-VW output relay is normally operative.
 2. The power ON lock prevents unnecessary alarms from being generated during the instable period when the power is first turned on. There is no relay output during timer operation.

Overvoltage and Overvoltage Operation Diagram (Overvoltage Pre-alarm Mode)

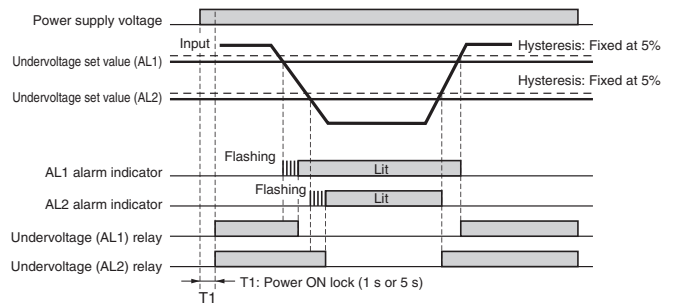
DIP switch settings: SW3 ON and SW4 OFF.



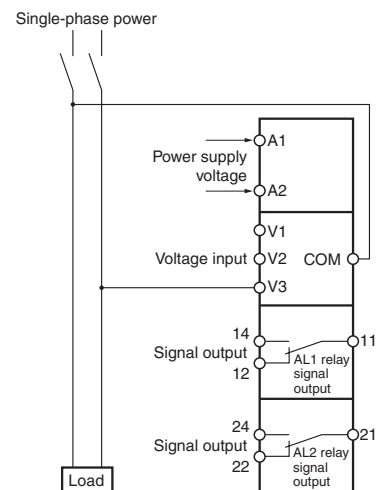
- Note:**
1. The K8AB-VW output relay is normally operative.
 2. The power ON lock prevents unnecessary alarms from being generated during the instable period when the power is first turned on. There is no relay output during timer operation.

Undervoltage and Undervoltage Operation Diagram (Undervoltage Pre-alarm Mode)

DIP switch settings: SW3 OFF and SW4 ON.

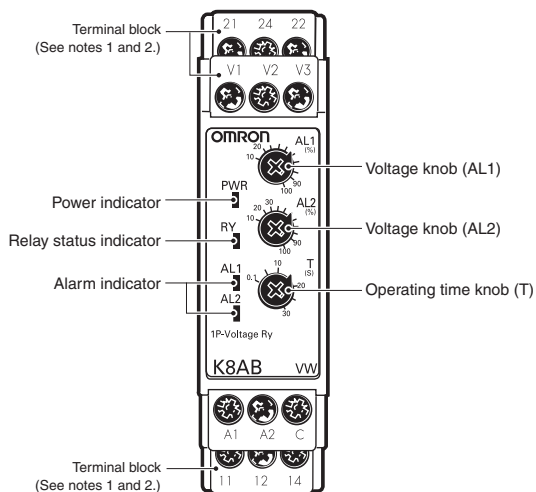


- Note:**
1. The K8AB-VW output relay is normally operative.
 2. The power ON lock prevents unnecessary alarms from being generated during the instable period when the power is first turned on. There is no relay output during timer operation.



Nomenclature

Front



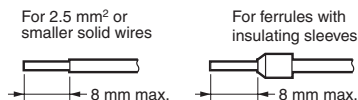
Indicators

| Item | Meaning |
|-------------------------------------|---|
| Power indicator (PWR: Green) | Lit when power is being supplied. |
| Relay status indicator (RY: Yellow) | Lit when relay operates (Not light when both AL1 and AL2 are in error status) (Normally lit) |
| Alarm indicators (AL1 and AL2: Red) | Lit when there is an overvoltage or undervoltage. 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 |
|-------------------------|--|
| Voltage knob (AL1) | Used to set the voltage to 10% to 100% of maximum measuring voltage. |
| Voltage knob (AL2) | Used to set the voltage to 10% to 100% of maximum measuring voltage. |
| Operating time knob (T) | Used to set the operating time to 0.1 to 30 s. |

Note 1. Use either a solid wire of 2.5 mm² 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

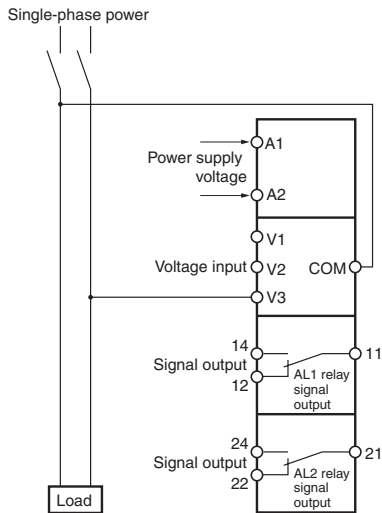
■ Operation and Setting Methods

Setting Ranges and Wiring Connections

| Model | Measuring current | Wiring connection |
|----------|--------------------|-------------------|
| K8AB-VW1 | 6 to 60 mV AC/DC | V1-COM |
| | 10 to 100 mV AC/DC | V2-COM |
| | 30 to 300 mV AC/DC | V3-COM |
| K8AB-VW2 | 1 to 10 V AC/DC | V1-COM |
| | 3 to 30 V AC/DC | V2-COM |
| | 15 to 150 V AC/DC | V3-COM |
| K8AB-VW3 | 20 to 200 V AC/DC | V1-COM |
| | 30 to 300 V AC/DC | V2-COM |
| | 60 to 600 V AC/DC | V3-COM |

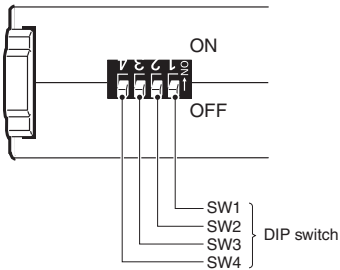
Connections

- Input**
Connect the input between terminals V1-COM, V2-COM, or V3-COM, depending on the input voltage.
Malfunctions may occur if the input is connected to unused terminals and the Unit will not operate correctly.
- Power Supply**
Connect the power supply to terminals A1 and A2.
Note: Models with DC power supply have a non-isolated power supply. The input and power supply terminals are connected internally so the K8AB-VW will not operate normally if an unwanted current path is created.
If an unwanted current path exists, use a model with an AC power supply or isolate with an external power supply.
- Outputs**
AL1 (SPDT relay) is output to terminals 11, 12, and 14.
AL2 (SPDT relay) is output to terminals 21, 22, and 24.
Note: Use the recommended ferrules if using twisted wires.



DIP Switch Settings

The power ON lock time, resetting method and operating mode are set using the DIP switch located on the bottom of the Unit.



DIP Switch Functions

| SWITCH | ON ● ↑ | | | | OFF ○ ↓ | | | |
|--------------------|-----------------|--------------|-----|-----|---------|-----|-----|-----|
| | 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 |
| Power ON lock time | 5 s | --- | --- | --- | --- | --- | --- | ● |
| | 1 s | --- | --- | --- | --- | --- | --- | ○ |
| Resetting method | Automatic reset | --- | --- | ● | --- | --- | --- | --- |
| | Manual reset | --- | --- | ○ | --- | --- | --- | --- |
| Operating mode | AL1 | | AL2 | | | | | |
| | Overvoltage | Undervoltage | ● | ● | --- | --- | --- | --- |
| | Undervoltage | Undervoltage | ● | ○ | --- | --- | --- | --- |
| | Overvoltage | Overvoltage | ○ | ● | --- | --- | --- | --- |
| | Overvoltage | Undervoltage | ○ | ○ | --- | --- | --- | --- |

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

Setting Method

1. Setting Voltage

The voltage knob (AL1 and AL2) is used to set the voltage.

The voltage can be set to 10% to 100% of the maximum measuring voltage.

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 voltage.

The maximum measuring voltage will differ depending on the model and the input terminal.

Example: K8AB-VW3 Using Input Terminal V3-COM

The maximum measuring voltage will be 600 VAC/VDC and the setting range will be 60 to 600 V.

2. 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 exceeds (or drops lower than) the voltage setting, the alarm indicator will start flashing for the set period and then stay lit.

Dimensions

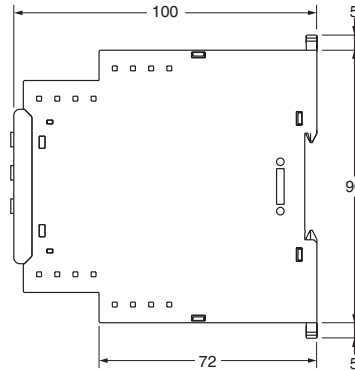
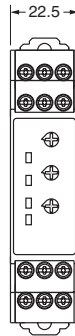
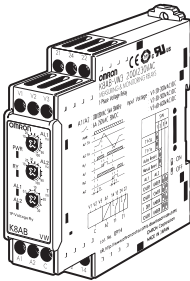
(Unit: mm)

Single-phase Voltage Relays

K8AB-VW1

K8AB-VW2

K8AB-VW3



Safety Precautions

■ Precautions for Safe Use

Make sure to follow the instructions below to ensure safety.

1. Do not use or keep this product in the following environments.
 - Outdoors, or places subject to direct sunlight or wearing weather.
 - Places where dust, iron powder, or corrosive gases (in particular, sulfuric or ammonia gas) exist.
 - Places subject to static electricity or inductive noise.
 - Places where water or oil come in contact with the product.
2. Make sure to install this product in the correct direction.
3. There is a remote risk of electric shock. Do not touch terminals while electricity is being supplied.
4. Make sure to thoroughly understand all instructions in the Instructions Manual before handling this product.
5. Make sure to confirm terminal makings and polarity for correct wiring.
6. Tighten terminal screws firmly using the following torque.
Recommended tightening torque: 0.49 N·m
Maximum tightening torque: 0.54 N·m max.
7. Operating ambient temperature and humidity for this product must be within the indicated rating when using this product.
8. There is a remote risk of explosion. Do not use this product where flammable or explosive gas exists.
9. Make sure that no weight rests on the product after installation.
10. To enable an operator to turn off this product easily, install switches or circuit breakers that conform to relevant requirements of IEC60947-1 and IEC60947-3, and label them appropriately.
11. For DC input, use a SELV power-supply capable of overcurrent protection. Specifically, a SELV power-supply has a double or reinforced insulation for input and output, and output voltage of 30 V_{r.m.s} with 42.4 V at peak or DC60V maximum.
Recommended power-supply: Model S8VS-06024□. (Omron product)

■ Precautions for Correct Use

For Proper Use

1. Do not use the product in the following locations.
 - Places subject to radiant heat from heat generating devices.
 - Places subject to vibrations or physical shocks.
2. Make sure to use setting values appropriate for the controlled object. Failure to do so can cause unintended operation, and may result in accident or corruption of the product.
3. Do not use thinner or similar solvent for cleaning. Use commercial alcohol.
4. When discarding, properly dispose of the product as industrial waste.
5. Only use this product within a board whose structure allows no possibility for fire to escape.

About Installation

1. When wiring, use only recommended crimp terminals.
2. Do not block areas around the product for proper dissipation of heat. (If you do not secure space for heat dissipation, life cycle of the product will be compromised.)
3. To avoid electrical shocks, make sure that power is not supplied to the product while wiring.
4. To avoid electrical shocks, make sure that power is not supplied to the product when performing DIP switch settings.

Noise Countermeasures

1. Do not install the product near devices generating strong high frequency waves or surges.
2. When using a noise filter, check the voltage and current and install it as close to the product as possible.
3. In order to prevent inductive noise, wire the lines connected to the product separately from power lines carrying high voltages or currents. Do not wire in parallel with or on the same cable as power lines.
Other measures for reducing noise include running lines along separate ducts and using shield lines.

To avoid faulty operations, malfunctions, or failure, observe the following operating instructions.

1. When turning on the power, make sure to realize rated voltage within 1 second from the time of first supply of electricity.
2. Make sure to use power supply for operations, inputs, and transformer with the appropriate capacity and rated burden.
3. Maintenance and handling of this product may only be performed by qualified personnel.
4. Distortion ratio of input wave forms must be 30% or less. Use of this product with circuits that have large distortion in wave forms may result in unwanted operations.
5. Using this product for thyristor controls or inverters will result in errors.
6. When setting the volume, adjust the control from the minimum side to the maximum side.

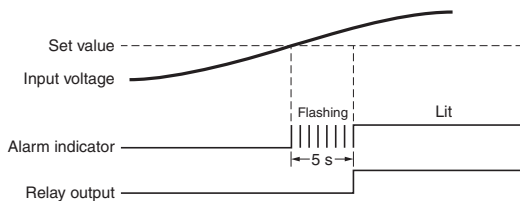
Questions and Answers

Q Checking Operation

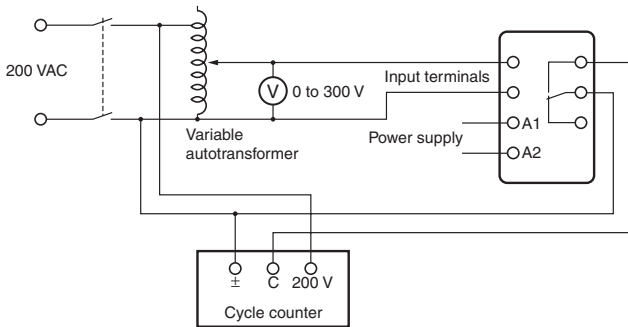
- A** **Overvoltages**
Gradually increase the input from 80% of the setting. The input will equal the operating value when the input exceeds the setting and the alarm indicator starts flashing. Operation can be checked by the relay outputs that will start after the operating time has passed.
- Undervoltage**
Gradually decrease the input from 120% of the setting and check the operation using the same method as for overvoltage.

Example: Overvoltage Operating Mode, Undervoltage Operating Mode and an Operating Time of 5 s

Note: K8AB-VW□ output relays are normally operative.



Connection Diagram



Q How to Measure the Operating Time

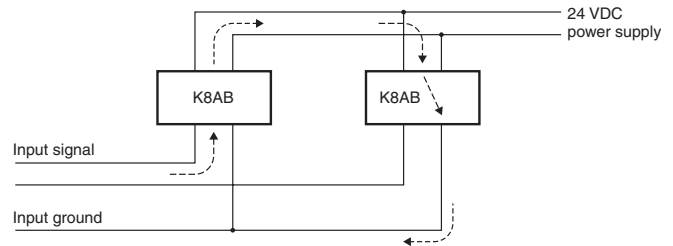
- A** **Overvoltage**
Change the input suddenly from 0% to 120% of the set value and measure the time until the Unit operates.
- Undervoltage**
Change the input suddenly from 120% to 0% of the set value and measure the time until the Unit operates.

Q Grounding the Power Supply for K8AB Models with a DC Power Supply

- A** The input and power supply must be isolated. Models with a DC power supply have a non-isolated power supply. The input and power supply are connected internally so the K8AB-VW□ will not operate normally if an unwanted current path exists. If an unwanted current path exists, use a K8AB model with an AC power supply or use an isolated DC power supply.

Q Using Multiple K8AB Relays with a DC Power Supply

- A** The input and power supply must be isolated. The input and power supply are connected internally so an unwanted current path will be created if more than one K8AB is used with one DC power supply, as shown in the diagram, and the K8AB will not operate correctly. If an unwanted current path exists, use a K8AB model with an AC power supply or use a different isolated DC power supply for each K8AB.



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 Setting the Pre-alarm Monitoring Mode

- A** Use the DIP switch to set the operating mode pins both to overvoltage (SW3 ON and SW4 OFF) or both to undervoltage (SW3 OFF and SW4 ON).
- Example: Both Pins Set to Overvoltage
AL1 can be used as the pre-alarm for AL2 by setting a smaller voltage set value for AL1 than for AL2.

Warranty and Application Considerations

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.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

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.

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

Disclaimers

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*.

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased product.

DIMENSIONS AND WEIGHTS

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

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. N144-E1-02 **In the interest of product improvement, specifications are subject to change without notice.**

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