New Product

Single-phase Voltage Relay
K8DT-VS

Detect abnormal voltages applies to equipment to protect against equipment failure.
Use in either overvoltage or undervoltage mode.

- Monitor AC or DC currents with one Relay.
- Settings for the operating value, hysteresis, and operating time.
- Width of 17.5 mm to reduce space required in panels.
- Push-In Plus Terminal that reduce wiring work.
  The use of cage clamps enables wiring with bare stranded wires.
  Double-insertion holes for crossover wiring (all terminals).
- UL listed for easy shipping to North America.
- Models added with transistor outputs for superior contact reliability.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

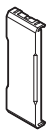
⚠ Refer to *Safety Precautions* on page 9.
Refer to page 8 for commonly asked questions.

Ordering Information

Single-phase Voltage Relay

Setting range	Power supply voltage	Output	Model
1 to 10 V AC/DC 3 to 30 V AC/DC 15 to 150 V AC/DC	24 VAC/DC	Relay: SPDT contact output	**K8DT-VS2CD**
		Transistor	**K8DT-VS2TD**
	100 to 240 VAC	Relay: SPDT contact output	**K8DT-VS2CA**
		Transistor	**K8DT-VS2TA**
20 to 200 V AC/DC 30 to 300 V AC/DC 60 to 600 V AC/DC	24 VAC/DC	Relay: SPDT contact output	**K8DT-VS3CD**
		Transistor	**K8DT-VS3TD**
	100 to 240 VAC	Relay: SPDT contact output	**K8DT-VS3CA**
		Transistor	**K8DT-VS3TA**

Optional Cover
Front Cover

Appearance	Model
	**Y92A-D1A**

Ratings and Specifications

Input Range

Model	Range ✻	Connection terminal	Setting range	Input impedance	Overload capacity
K8DT-VS2□□	0 to 10 V AC/DC	V1-COM	1 to 10 V AC/DC	Approx. 120 kΩ	Continuous input at 115% of maximum input 10 s at 125% (up to 600 VAC)
	0 to 30 V AC/DC	V2-COM	3 to 30 V AC/DC	Approx. 320 kΩ	
	0 to 150 V AC/DC	V3-COM	15 to 150 V AC/DC	Approx. 1.6 MΩ	
K8DT-VS3□□	0 to 200 V AC/DC	V1-COM	20 to 200 V AC/DC	Approx. 1.2 MΩ	
	0 to 300 V AC/DC	V2-COM	30 to 300 V AC/DC	Approx. 1.7 MΩ	
	0 to 600 V AC/DC	V3-COM	60 to 600 V AC/DC	Approx. 3.1 MΩ	

✻ The range is selected using connected terminals.

Ratings

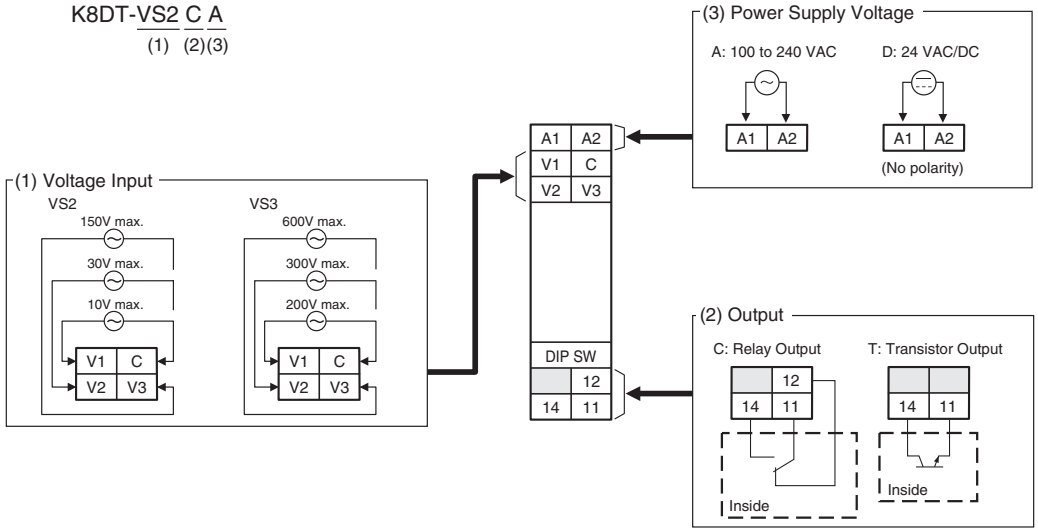
Power supply voltage	K8DT-VS□□D: 24 VAC 50/60Hz, 24 VDC K8DT-VS□□A: 100 to 240 VAC 50/60Hz
Power consumption	24 VAC/DC: 1.8 VA/1 W max. 100 to 240 VAC: 2.5 VA max.
Rated insulation voltage	600 VAC
Operating value setting range (SV)	10% to 100% of maximum setting range K8DT-VS2: 1 to 10 V AC/DC 3 to 30 V AC/DC 15 to 150 V AC/DC K8DT-VS3: 20 to 200 V AC/DC 30 to 300 V AC/DC 60 to 600 V AC/DC
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
Power ON lock time	1 s or 5 s (Switched using DIP switch.)
Indicators	Power (PWR): Green, Relay output (RY): Yellow, Alarm outputs (ALM): Red
Input impedance	Refer to *Input Range* on page 2.
Output form	Relay Output: SPDT contact Transistor Output: 1 Switchable between normally open and normally closed with a DIP switch setting.
Output relay ratings	Rated load 5 A at 250 VAC (Resistive load) 5 A at 30 VDC (Resistive load) 1 A at 250 VAC (Inductive load) 0.2 A at 48 VDC (Inductive load) Minimum load: 5 VDC, 10 mA (reference values) Mechanical life: 10 million operations min. Electrical life: 5 A at 250 VAC or 30 VDC: 50,000 operations 3 A at 250 VAC or 30 VDC: 100,000 operations
Transistor output ratings	Rated voltage: 24 VDC (maximum voltage: 26.4 VDC) Maximum current: 50 mA DC
Ambient operating temperature	−20 to 60°C (with no condensation or icing)
Storage temperature	−25 to 65°C (with no condensation or icing)
Ambient operating humidity	25% to 85% RH (with no condensation)
Storage humidity	25% to 85% RH (with no condensation)
Altitude	2,000 m max.
Applicable wires	Stranded wires, solid wires, or ferrules
Applicable wire size	0.25 to 1.5 mm^2 (AWG24 to AWG16)
Wire insertion force	8 N max. for AWG20 wire
Screwdriver insertion force	15 N max.
Wire stripping length	8 mm
Ferrule length	8 mm
Recommended flat-blade screwdriver	XW4Z-00B (Omron) SZF 0.4 × 2.5 (Phoenix Contact) 210-719 (Wago) SDI 0.4 × 2.5 × 75 (Weidmuller)
Current capacity	10 A (per pole)
Number of insertions	50 times
Case color	N1.5
Case material	PC, UL 94 V-0
Weight	Approx. 100 g
Mounting	Mounts to DIN Track, or screw mounting
Dimensions	17.5 × 90 × 90 mm (W×H×D)

Specifications

Allowable operating voltage range		85% to 110% of rated power supply voltage
Allowable operating frequency range		50/60 Hz ±5 Hz
Input frequency range		40 to 500 Hz
Overload capacity		Continuous input at 115% of maximum input, 10 s at 125% (up to 600 VAC).
Repeat accuracy	**Operating value**	±0.5% full scale (at 25°C and 65% humidity, rated power supply voltage)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Applicable standards	**Conforming standards**	EN 60947-5-1 Installation environment (pollution level 2, Overvoltage category III)
	EMC	EN 60947-5-1
	Safety standards	UL 60947-5-1 (Listing), Korean Radio Waves Act (Act 10564), CCC (GB/T 14048.5)
Insulation resistance		20 MΩ min. Between external terminals and case Between power supply terminals and input terminals 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 Between power supply terminals and output terminals Between input terminals and output terminals
Impulse withstand voltage		6 kV (between live terminals and exposed, non-charged metal parts)
Noise immunity		Square-wave noise of 1-μs/100-ns pulse width with 1-ns rise time 100 to 240 VAC: 1,500 V power supply terminal common/normal mode 24 VAC: 1,500 V power supply terminal common/normal mode 24 VDC: 480 V power supply terminal common
Vibration resistance		Frequency: 10 to 55 Hz, 0.35-mm single amplitude 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 3 axes
Degree of protection		Terminals: IP20

Connections

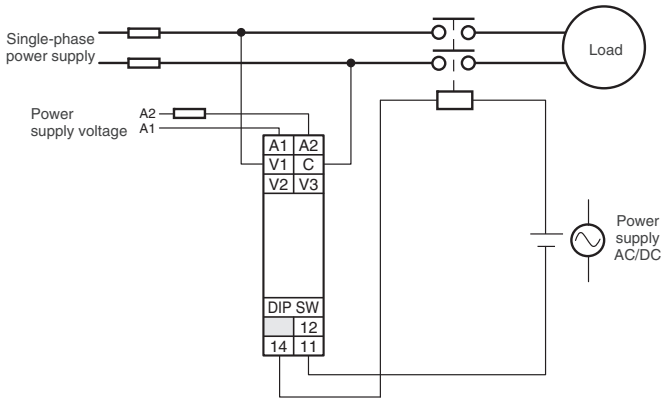
Terminal Diagram



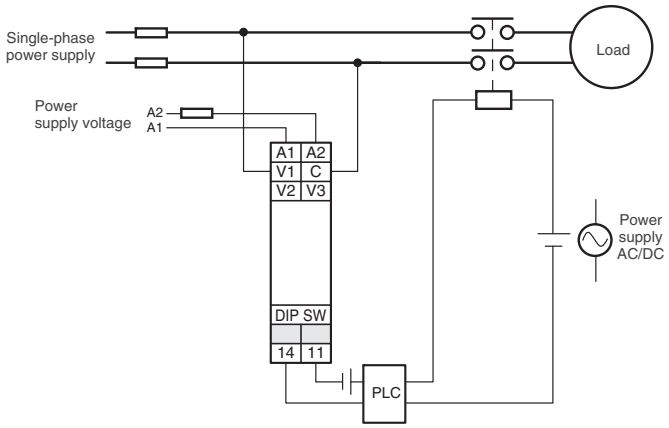
Note: 1. Do not connect anything to terminals that are shaded in gray.
2. There is no polarity for the DC power supply input.
3. For the voltage input, you can input only from the C terminal and one other terminal.
4. Refer to Setting Ranges and Wiring Connections for information on the V1, V2, and V3 voltage input terminals.

Wiring Example

Relay Output



Transistor Output

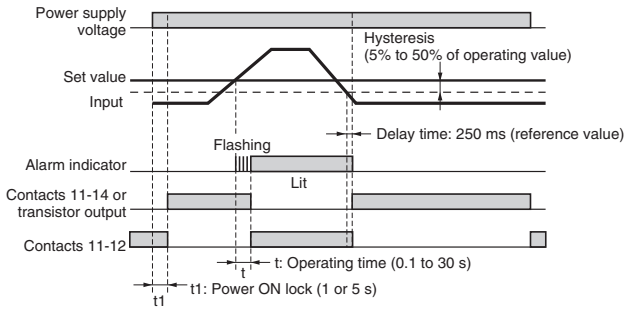


Note: Use copper wires with a rating of 75°C or an equivalent rating.

Timing Charts

Overvoltage Operation Diagram (Output Drive Method: Normally Closed)

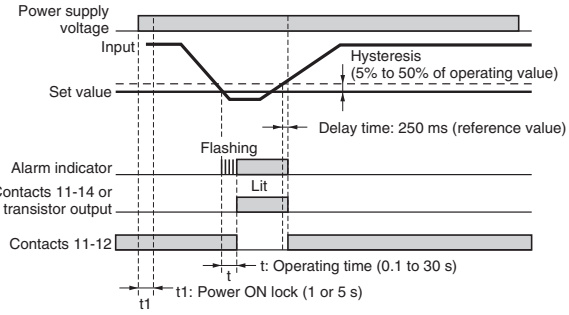
DIP switch setting: SW3 ON, SW4 OFF.



Note: The power ON lock prevents unnecessary alarms from being generated during the instable period when the power is first turned on. There is no contact output during timer operation.

Undervoltage Operation Diagram (Output Drive Method: Normally Open)

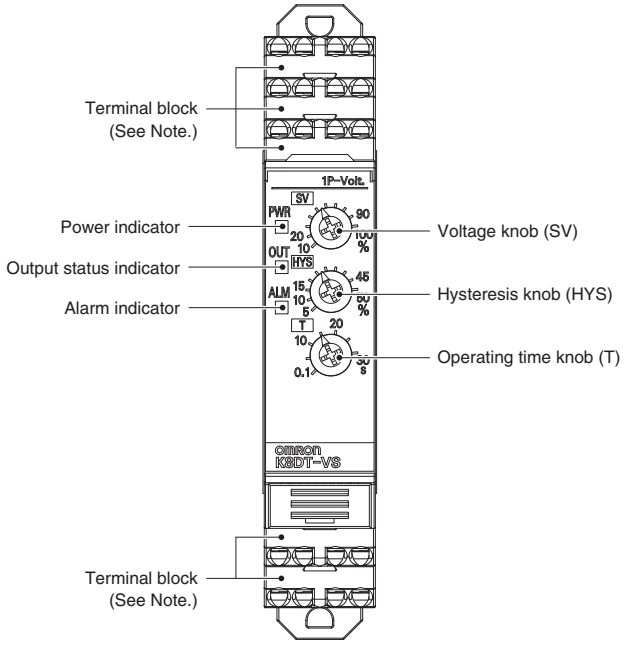
DIP switch setting: SW3 OFF, SW4 ON.



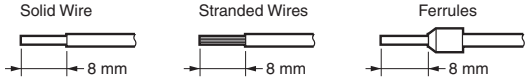
Note: The power ON lock prevents unnecessary alarms from being generated during the instable period when the power is first turned on. There is no relay output during timer operation.

Nomenclature

Front



Note: Use solid wires, stranded wires, or ferrules to connect to the terminals.
To maintain the withstand voltage after connecting the terminals, insert 8 mm of exposed conductor into the terminal.



Indicators

Item	Meaning
Power indicator (PWR: Green)	Lit when power is being supplied.
Output status indicator (OUT: Yellow)	Lights for output
Alarm indicator (ALM: Red)	Lit when there is an overvoltage or undervoltage. The indicator flashes to indicate the error status after the input has exceeded the set value while the operating time is being clocked.

Setting Knobs

Item	Usage
Voltage knob (SV)	Used to set the voltage to 10% to 100% of maximum setting range.
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.

Operation Methods

Setting Ranges and Wiring Connections

Model	Setting range	Wiring connection
K8DT-VS2	1 to 10 V AC/DC	V1-COM
	3 to 30 V AC/DC	V2-COM
	15 to 150 V AC/DC	V3-COM
K8DT-VS3	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.

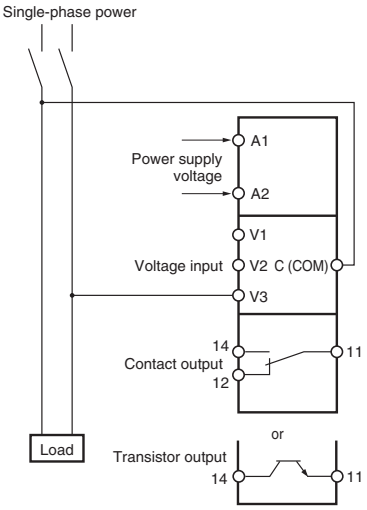
Power Supply

Connect the power supply to terminals A1 and A2.

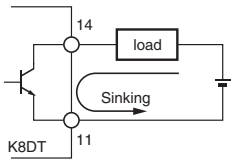
Outputs

For a relay output, the SPDT contacts are output on terminals 11, 12, and 14. For a transistor output, the output is on terminals 11 and 14.

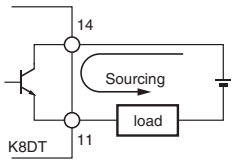
The internal circuit of the transistor output is NPN, but application is possible for either a sinking or sourcing output.



In the case of sinking output applications



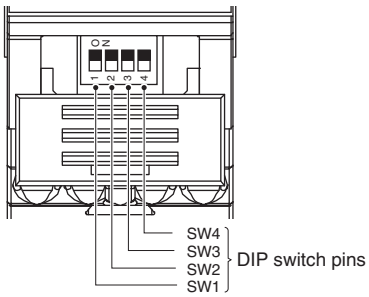
In the case of sourcing output applications



DIP Switch Settings

The power ON lock time, reset method, drive output method, and operating mode are set using the DIP switch located on the front of the Unit.

Note: Open the DIP switch cover to set the DIP switch.
Keep the DIP switch cover closed while the power supply to the Relay is ON.



DIP switch pins

Pin	ON ❍ ↑ / OFF ● ↓	1 (ON / OFF)	2	3	4
Power ON lock time	**5 s**	❍	---	---	---
	1 s	●	---	---	---
Resetting method	**Automatic reset**	---	❍	---	---
	Manual reset	---	●	---	---
Relay drive method	**Normally closed**	---	---	❍	---
	Normally open	---	---	●	---
Operating mode	**Undervoltage**	---	---	---	❍
	Overvoltage	---	---	---	●

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

Setting Method

Setting Voltage

The voltage knob (SV) is used to set the voltage.
The voltage can be set to 10% to 100% of the maximum setting range.
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 setting range will differ depending on the model and the input terminal.
Example: K8DT-VS3 Using Input Terminal V3-COM
The maximum setting range will be 600 VAC/VDC and the setting range will be 60 to 600 V.

Hysteresis

Hysteresis is set using the hysteresis knob (HYS)
The setting range is 5 to 50% of the operating value.
Example: Maximum Setting of 600 VAC/VDC, Voltage Set Value (SV) of 50%, and Overvoltage Operation
Operation will be at 300 V and resetting at 270 V when the hysteresis (HYS) is set to 10%.

Operating Time

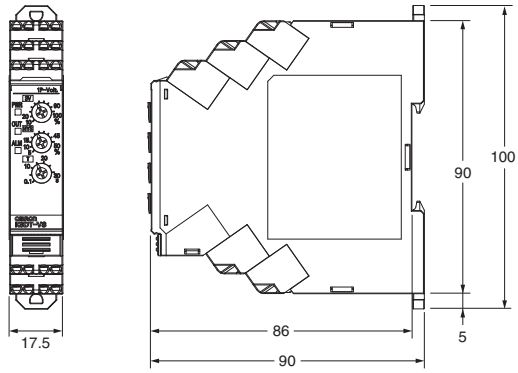
The operating time is set using the operating time knob (T).
The operating time can be set to between 0.1 and 30 s.
If the input voltage exceeds (or drops lower than) the voltage set value, the alarm indicator will start flashing for the set period and then stay lit.

Dimensions

(Unit: mm)

Single-phase Voltage Relays

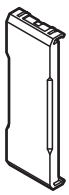
K8AK-VS2
K8AK-VS3

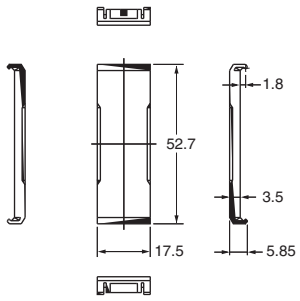


Options (Order Separately)

Front Cover

Y92A-D1A

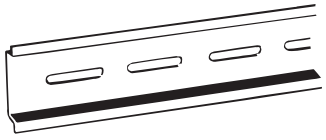


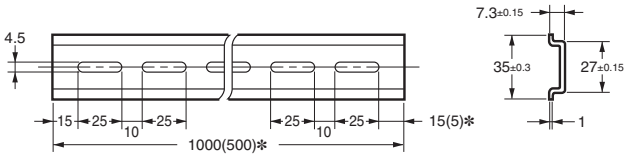


Optional Parts for DIN Track Mounting

DIN Tracks

PFP-100N
PFP-50N





* Dimensions in parentheses are for the PFP-50N.