VOLTAGE RELAY

PTS TYPE

High-performance under-voltage relay that activates output when all 3-phase voltages fall below a reference voltage by monitoring voltage on each phase of 4 wires

FEATURES

Monitoring voltages of 3-phase 4 wires with a single unit

The PTS type for monitoring 3-phase 4 wires is newly available in addition to the conventional FVS type that monitors only one phase. The PTS type under-voltage relay monitors all 3-phase voltages to verify that voltages on all phases are lower than a reference voltage. The PTS type incorporates 1a1b output contacts.

Operation status LED

With the operation monitor LED, you can easily check control power ON/OFF status and monitor voltage. (POWER, UV)

Digital switch

The digital switch simplifies the reference voltage setting procedure.

Voltage indication label (standard accessory)

Labels that indicate reference voltage settings are included in the product.
If you attach a label after setting a voltage, you can easily confirm the reference voltage.

Control voltage is input from monitor power supply. No additional control power supply is required.

Since control voltage is input from the monitor power supply, the relay unit does not need an additional control power supply.
* The internal relay turns OFF when input voltage falls below 38V regardless of the reference voltage setting.

High-performance engineering plastic is used for the storing case.

To enhance flame-retardance, high-performance engineering plastic is used for the storing case. (UL94, V-1)

SPECIFICATIONS (RATINGS, PERFORMANCE)

Item	Specification	
Rated insulation voltage (Ui)	250V	
Monitor/control input voltage	Each phase: 40 to 110V AC	
Max. input value	130V (continuous), 250V (instantaneous)	
Input impedance	4kΩ or more (when output relay is exited)	
Reference voltage	40, 50, 60, 70, 80V AC (5 settings)	
Insulated resistance	L-A	10MΩ or more (500V DC Megger tester) *1
	L-L	10MΩ or more (500V DC Megger tester) *2
Power-frequency withstand voltage	L-A	2,000V AC for 1 min. *1
	L-L	2,000V AC for 1 min. *2
Impulse withstand voltage (Uimp)	L-A	±7kV / 3 times for each pole *1
	L-L①	±4.5kV / 3 times for each pole *2
	L-L②	±3kV / 3 times for each pole (between monitor / control input terminals)
Noise resistance	Electric wave noise	150MHz band (5W), 400MHz band (5W) 900MHz band (cellular phone)
	Static noise	Contact discharge: 8kV Air discharge: 15kV
Vibration resistance	Frequency: 16.7Hz Double amplitude: 0.4mm Direction: Forward / backward, right / left, up / down Vibration time: 10min	
Shock resistance	Shock value: 294m/s² Number of shocks: 3 times each (forward, backward, right, left, up, down)	
Ambient temperature	Performance warranty	0 to 40˚C
	Operation warranty	–10 to 55˚C (Allowable for several hours per day)
	Recovery warranty	–20 to 60˚C
Relative humidity	30 to 90% (daily average)	
Altitude	2,000 m max.	
Power consumption	Approx. 3.5 W (Control power supply: Maximum rating, When output relay is excited)	
Weight	Approx. 220g	

*1 Between monitor/control input and output contact terminals and mounting rail
*2 Between monitor/control input terminals and output contact terminals, and between individual output contact terminals

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PTS TYPE

HOW TO ORDER

PTS - SP - AC40/120
① ② ③ ④

No.	Item	Indication	Description	Remarks
①	Basic type	PTS	—	
②	Shape code	S	8-pin socket type	Applicable to the socket, 8PFA1 (OMRON)
③	Circuit code	P	3-phase 4-wire AC under-voltage monitoring	
④	Power supply voltage	AC 40 / 120	40 to 120V AC	Since control voltage is input from monitor power supply, no additional control power supply is required.

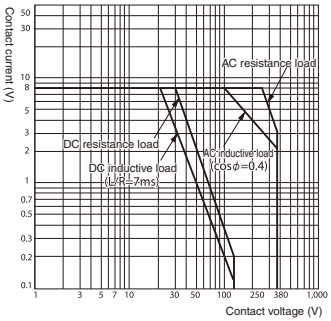
CONFORMABLE STANDARDS

Standard	Name	Year
JEC-174D	Auxiliary relay for power supply	1987
JEC-2500	Protection relay for power supply	1979
B-402	Digital protection relay and protection relay equipment	1997.10

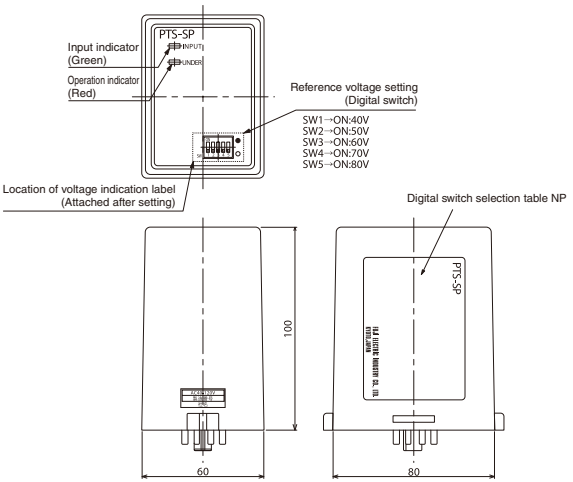
OTHER SPECIFICATIONS

Item	Description	
Set / Reset time	0.5 sec. max.	
Error range	Within ±2V	
Reset dead band	Within +4V	
Temperature effect	Within ±1V / 10°C	
Output contact rating	Max. operational voltage	380V AC max. 125V DC max.
	Rated current-carrying capacity (Ith)	5A
Number of output contacts	UNDER	1a1b
Operational indication color	Power supply indicator	Green (during operation)
	Output contact indicator	Red (during operation)

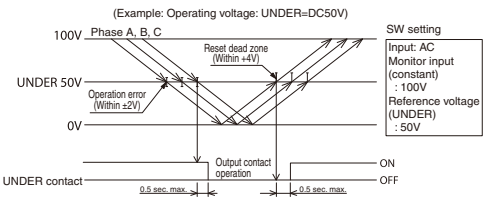
MAXIMUM SWITCHING CAPACITY OF OUTPUT CONTACT



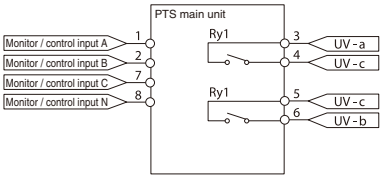
STANDARD PRODUCTS



■Operation chart



■Connection diagram



●Operation

By monitoring input voltage on each phase of AC 3-phase 4 wires, the output contact is switched when all 3-phase voltages fall below a reference voltage. The internal relay has no voltage when input voltage is 38V or lower regardless of the reference voltage setting.

The above operation chart is based on “a-contact” output.

In constant monitoring mode, the internal relay is ON.

⇒ (Terminals 3 - 4: Open, Terminals 5 - 6: Closed)

When all 3-phase voltages fall below a reference voltage or when the monitor input is lost, the internal relay turns OFF.

⇒ (Terminals 3 - 4: Closed, Terminals 5 - 6: Open)

●Indicators

	Power supply indicator lamp (Green) INPUT	Operation indicator lamp (Red) UNDER	Internal relay	Terminals 3 – 4	Terminals 5 – 6
All 3-phase voltages are 38 V or lower	Unlit	Unlit	No voltage	ON	OFF
All 3-phase voltages are reference voltage or lower	Lit	Lit	No voltage	ON	OFF
At least one-phase voltage is higher than reference voltage	Lit	Unlit	Excited	OFF	ON

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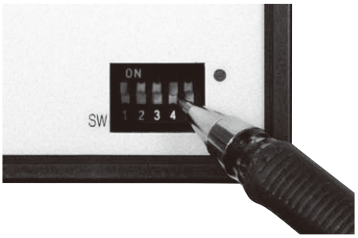
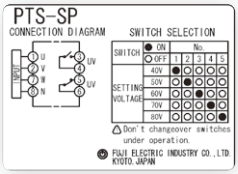
TECHNICAL DATA

REFERENCE VOLTAGE SETTING PROCEDURE

①Reference voltage (operating voltage) setting

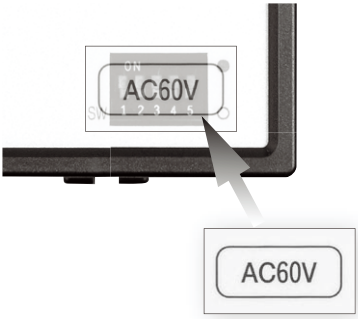


By referring to the “Digital switch selection table” on the side of the relay unit, specify a reference voltage with the digital switch.
(Example: To set “70 V AC”, turn ON the No. 4 bit.)



Digital switch selection table
* Attached on side of the product body

②Attaching voltage indication label



To indicate the reference voltage specified in step ①, attach the voltage indication label (included in the product).
Be sure to attach this label so that the voltage is not accidentally changed after setting.
Before attaching the label, verify that the digital switch setting conforms to the selection table on the side of the product body.

Voltage indication label
* Standard accessory included in the product

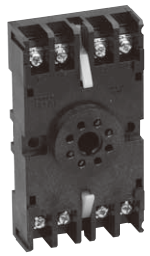
③Connecting the relay unit to a socket

Connect the relay unit to a specified applicable socket to apply a monitor voltage.

ACCESSORIES

Applicable socket (Order unit: 10)

●8PFA1 [OMRON]



Voltage indication label (*Included as standard accessory) (Order unit: 10)

●PTS-SP-NP

Typical parts list

No.	Part name	Material	Remarks
1	Case	Modified PPE	UL94−V1
2	Plug pin	Brass / Tin-plated	—

■Instructions for handling the product and other information

- This product is applicable to a 3-phase 4-wire voltage circuit and is not applicable to a 3-phase 3-wire voltage circuit. In applications to other circuits, this product enables monitoring of typical phase voltage of 3-phase 4-wire circuit, and monitoring of single-phase 2-wire voltage.
- For connection with a PT (transformer), check the capacity of the transformer (including other load).
- When setting a voltage, be sure to disconnect the relay unit from the socket, or do not apply a monitor voltage or power supply voltage to the relay unit (to prevent output error).
- After setting a voltage, be sure to attach the voltage indication label suitable for each state (to prevent erroneous operation and entry of a foreign substance).
- When you set a reference voltage with the digital switch, do not turn ON multiple bits simultaneously (to prevent output error).