Please read the operation instruction manual before installing and using the product.

Conform to: IEC60947-5-1

NJB1-Y

Single Phase Voltage Relay

Operation Instruction Manual

1.Purpose&Application Scope

NJB1-Y single phase voltage relays (hereinafter called the relay for short) are applied in AC220V, 110V, 24V, frequency 50Hz (or 60Hz) and DC 24V control circuits as single phase over-voltage protection or under-voltage protection and indication elements, making or breaking circuits as intended operating values and time.

The products are in compliance with requirements of Standards IEC60947-5-1.

2.Model & Meaning

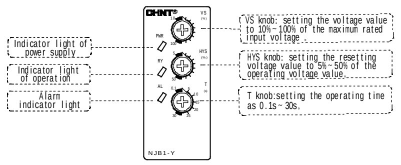
N JB 1 - Y / □ □

- □ (second): Rated voltage of control power supply
- □ (first): Voltage specification(see Table 1)
- Y: Feature code — Y:single phase voltage relay
- 1: Design S.N.
- JB: Monitoring protection relay
- N: Enterprise code

Table 1 Specifications

Voltage specifications	Rated input voltage	
1	V1-COM	6mV～60mV
	V2-COM	10mV～100mV
	V3-COM	30mV～300mV
2	V1-COM	1V～10V
	V2-COM	3V～30V
	V3-COM	15V～150V
3	V1-COM	20V～200V
	V2-COM	30V～300V
	V3-COM	60V～600V

3.Schematic Diagram of Panel



Note:

Operating voltage = maximum rated input voltage × voltage ratio;

Over-voltage protection:

resetting voltage = operating voltage-operating voltage × lag ratio

Under-voltage protection:

resetting voltage = operating voltage + operating voltage× lag ratio

4.Normal operating conditions and installation conditions

4.1 Normal operating conditions

4.1.1 Ambient air temperature

a）Upper limit no more than +40℃;

b）Lower limit to less than -5℃;

c）Average within 24 hours no more than +35℃.

4.1.2 Altitude

The relay shall be installed at levels not over 2000m above the mean sea level.

4.1.3 Atmosphere condition

4.1.3.1 Humidity

When the maximum temperature is at +40℃, the relative humidity of air is not higher than 50%. In case of a lower temperature, a higher relative humidity is allowed. Special measures shall be taken against occasional condensation resulted from temperature changes.

4.1.3.2 Pollution grade:Grade 3.

4.2 Installation Conditions

4.2.1 In the media without explosive risk, and no gases that may be corrosive to metal and damage insulation and no electric dusts remain in the media.

4.2.4 Installation type: Ⅱ.

4.3 Transport and storage condition: -10℃～+55℃.

5.Major Technical Data

5.1 Protection range and major technical data:

5.1.1 Operating mode: over-voltage protection or under-voltage protection.

5.1.2 Rated operating voltage: AC220V, AC110V, AC24V, 50Hz/60Hz, DC24V.

5.1.3 Setting range of operating values: 10%～100% of the ultimate rated input value.

5.1.4 Operating value: 100% of the setting value.

5.1.5 Repeatability: ±10% of the operating value.

5.1.6 Resetting voltage value: 5%～50% of the operating value.

5.1.7 Resetting methods: manual resetting or automatic resetting; in case of manual resetting, break the operating power supply for a dwell time of 1s or longer.

5.1.8 Operating time and error:0.1s～30s; ±10% of the setting value.

5.1.9 Power supply locking: 1s or 5s, ±0.3s.

5.1.10 Mounting style: rail-mounting, built-in mounting.

5.1.11 Mechanical durability: 1×10^{6} times.

5.1.12 Electrical durability: 1×10^{5} times.

5.1.13 Number of contacts: 1 set changeover.

5.1.14 Contact capacity: AC220V 3A COSϕ=1 DC28V 5A.

5.1.15 Power consumption: ≤3VA.

5.2 Auxiliary circuit utilization category: AC-15, DC-13.

5.3 Parameters of auxiliary circuits: see Table 2.

5.4 Resistance to Interference: see Table 3.

Table 2 Parameters of Auxiliary Circuits

Contact arrangement	Agreed thermal current Ith A	Utilization category	Rated operating voltage Ue V	Rated operating current Ie A
2 sets of change-over contacts	5	AC-15	220	0.75
			380	0.47
		DC-13	220	0.27

Table 3 Resistance to Interference

Items	Level of severity
Electostatic discharge	±8kV×(1±10%)kV(air discharge)
Radiated radio-frequency electromagnetic field	Test electrical field intensity 10×（1±10%）V/m
Electical fast transients/bursts	Dwell time 1min to power wire 2kV
Surge (impulse)	Open circuit test voltage 2×（1±10%）kV

6. Overall Dimensions and Connection Methods

6.1 Overall dimensions of NJB1-Y single phase voltage relay: see Figure 1.

6.2 Connection methods of NJB1-Y single phase voltage relays: see Figure 2.

7. Operating instructions for selector switch keys

7.1 Schematic diagram of selector switch position: see Figure 3.

7.2 Setting of operating modes: see Table 4.

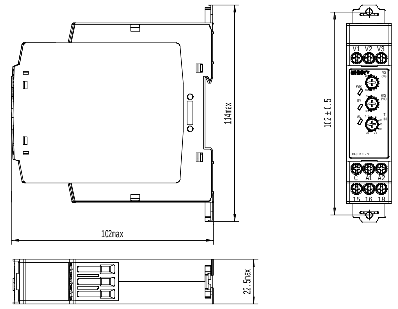


Figure 1 Overall Dimension of NJB1-Y Relays

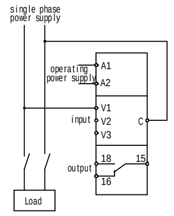


Figure 2 Connection Diagram of NJB1-Y Relay

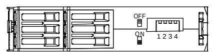


Figure 3 Schematic Diagram of Selector Switch Position

Table 4 Setting of Operating Modes

Function		SW 1	SW 2	SW 3	SW 4
Power supply locking time	T1=5s	ON			
	T1=1s	OFF			
Resetting methods	Auto Reset		ON		
	Manual Reset		OFF		
Relay driving mode	Normal Close			ON	
	Normal Open			OFF	
Operating mode	UNDER				ON
	OVER				OFF

Note: [ON symbol] Indicates the switch is in “ON” state.

[OFF symbol] Indicates the switch is in “OFF” state.

8.Descriptions of Operating Modes

Please see Figure 4 for details of time sequences of each operating mode.

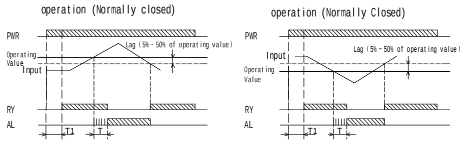


Figure 4 Operation Time Sequence Diagram

Note:

T1 is the locking time of startup (1s or 5s);

T is the operating time (0.1s～30s);

When the replay is operated in the normal-open mode, its time sequence is contrary to that of the normal-close mode.

9.Exemplification of settings

Example 1: Setting of over-voltage protection

When the input voltage is above 10V, a protection operation is required after a time lag of 10s; when power-on delay is 5s, the relay provides a normal open operation; and when the voltage is below 7V, the relay provides automatic resetting.

1)Choose NJB1-Y2 single phase voltage relay, with the input voltage connected to V1 (1V～10V) and C terminals.

2)Tune the voltage ratio knob to 100, the input control voltage is 10V.

3)Tune the lag ratio knob to 30％, the resetting voltage = 10-10×30%.

4)Tune the time knob to 10s, the delay time is 10s.

5)Set the dial code of power supply locking time at"[ON]"position, T1=5s, and the power-on time delay is 5s.

6)Set the dial code of reset mode at"[ON]"position, it is the automatic reset mode.

7)Set the dial code of protection mode at"[OFF]"position, it is the over voltage protection mode.

Example 2: Setting of under-voltage protection

When the input voltage is below 160V, a protection operation is required after a time lag of 0.1s; when the power-on time delay is 1s, the relay provides a normal close operation; and when the voltage is above 200V, therelay provides automatic resetting.

1)Choose NJB1-Y3 single phase voltage relay, with the input voltage connected to V1 (20V～200V) and C terminals.

2)Tune the voltage ratio knob to 80, the input control voltage is 160V.

3)Tune the lag ratio knob to 25％, the reset voltage =160+160×25.

4)Tune the time knob to 0.1s, the delay time is 0.1s.

5)Set the dial code of power supply locking time at"[OFF]"position, T1=1s, and the power-on time delay is 1s.

6)Set the dial-code of reset mode at"[ON]"position, it is the automatic resetting mode.

7)Set the dial-code of protection mode at"[ON]"position, it is the under voltage protection mode.

Note:

In the case of a manual resetting, the power-off time shall be not less than 1s.

10.Installation, Operation and Maintenance

10.1 The relay shall be applied within the range of 85%～110% of the rated voltage of the control power supply.

10.2 The connection shall be performed correctly in accordance with the connection diagram. In the case of DC products, be careful about the polarity of the power supply.

10.3 The data plate of the relay is only provided with schematic scales, and the protection values shall be checked during operation.

10.4 In case the knobs are turned during the process of over/under voltage protection, the time delay for such operation will be incorrect; modification of switch settings during an operation of over/under voltage protection is invalid. The setting shall be finished before making contact or in a normal case.

10.5 When the relay is of rail-mounting style, type TH35-7.5 steel rail shall be applied.

11.Notes

11.1 NJB1-Y series single phase voltage relays only provide over voltage protection or under voltage protection, and they cannot provide both over voltage protection and under voltage protection simultaneously.

11.2 During operation, the time interval from breaking the power supply to reapplying a voltage shall be bigger than 1 sec., otherwise it may result in unreliable resetting.

11.3 Do not allow the power supply inlet wire in the same tube or in stranding with other HV wires, and if necessary, use screened wires and the wiring shall be short, so that it may not cause any interference to the normal operation of the relay.

11.4 Do not use the relay in a dusty area with corrosive gases and without protection from sunlight and rain.

11.5 Please store and operate the relay at the rated voltage and in the conditions of required temperature, altitude and humidity.

Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist.Check with you local anthority of retailer for recycling advice。

Preserve this manual for backup use.

ZHEJIANG CHINT ELECTRICS CO.,LTD