

NJB1-YW Series
Liquid Level Relay

User Instruction

Safety Warning

- ① Only professional technicians are allowed for installation and maintenance.
- ② Installation in any damp, condensed-phase environment with inflammable and explosive gas is forbidden.
- ③ When the product is being installed or maintained, the power must be switched off.
- ④ You are prohibited from touching the conductive part when the product is operating.
- ⑤ The product shall be stored, installed and used in accordance with the rated control power supply voltage and specified conditions indicated in the user instructions.
- ⑥ The products shall be properly wired in strict accordance with the wiring diagram.

1 Use Purpose

NJB1-YW series liquid level relay (hereinafter referred to as the relay) is used for liquid level automatic control in civil water towers, elevated water tanks, underground reservoirs, etc. with control circuits of AC frequency of 50Hz/60Hz and rated control voltage up to 380V. The relay can be wired to realize automatic water supply or discharge control upon users' request. This product is not applicable for liquid level control of poorly conductive liquids such as oil, purified water, explosive or inflammable chemical liquids as well as sewage with high density.

2 Key Technical Parameters

Table 1 Ambient Conditions

Normal use conditions	Ambient temp.: -5°C~+40°C; average value within 24h not exceeding +35°C; altitude not exceeding 2,000m.
Atmospheric conditions	RH shall not exceed 50% when maximum temperature is +40°C; in case of lower temperature, higher RH is allowed. Measures should be taken against occasional condensation due to temperature change.
Installation category	II
Transport and storage conditions	-25°C~+55°C

Table 2 Product Specifications and Main Technical Parameters

Model	NJB1-YW	NJB1-YW1
Operate resistance (kΩ)	5kΩ to 100kΩ(adjustable)	< 40kΩ
Release resistance (kΩ)	250kΩ	> 150kΩ
Motion delay time	0.1s~10s (adjustable)	—
Motion delay error	The maximum nominal value delay error is not greater than ±20%; the minimum delay value is not greater than 10% of the maximum nominal value	—
Electrode lead length	≤100m	
Level detection electrode output voltage (V)	12V	
Installation method	Rail mounting, Equipment type	

Table 3 Main Circuit and Auxiliary Circuit Technical Parameters

No.	Product Model	NJB1-YW, NJB1-YW1	
1	Rated control supply voltage U_s (V), frequency (Hz)	AC36V, AC110V, AC220V, AC380V, 50Hz/60Hz	
2	Allowable fluctuation range of rated control power supply voltage	85% U_s ~110% U_s	
3	Agreed free air heating current I_{th} (A)	3	
4	Rated operating voltage U_e (V)	AC240V	AC415V
5	Use type under rated operating voltage and rated operating current I_e (A)	AC-15	AC-15
		0.75A	0.47A
6	Rated insulation voltage U_i (V)	415V	
7	Rated impulse withstand voltage U_{imp} (kV)	4	
8	Enclosure protection class (if applicable)	IP20	
9	Pollution class	Class 3	
10	Type and maximum value of short circuit protection	RT36-00/4A	
11	Terminal tightening screw (or nut) size	M3	
12	Torque of terminal tightening screw (N·m)	0.5	
13	Electrical life / mechanical life (10,000 times)	10/100	

Table 4 Immunity to Interference

No.	Test type	Test level
1	Electrostatic discharge immunity test	8kV (air discharge)
2	RF electromagnetic field immunity test	10V/m
3	Electrical fast transient/burst immunity test	2kV/5kHz on the power supply side
4	Surge immunity test	1kV (wire to wire)

2.1 The relay consists of a liquid level detecting electrode (wire), a signal processing circuit and an output execution relay. When it is powered on, the signal processing circuit judges the position of the current liquid level according to the level signal provided by the three electrodes, and drives the output execution relay to turn on or off the water supply or drainage circuit to achieve the purpose of automatic control of water level.

2.2 The motion sensitivity (5 k Ω ~100 k Ω) and response time (0.1s~10s) of the relay are set by the knobs. Before use, the user can determine them by turning the upper and lower knobs on the panel.

2.3 The function switch set on the relay is used to control the pull in or release of the small relay inside the product under the same liquid level state, so as to realize the water supply or drainage control without changing the wiring mode. The specific control mode is: when the function switch is in the "OFF" position, the normally open contact of the relay is closed when water is full; when the function switch is in the "ON" position, the normally open contact of the relay is open when water is full.

3 Installation

3.1 Outline and installation size: see Figure 1, unit: mm.

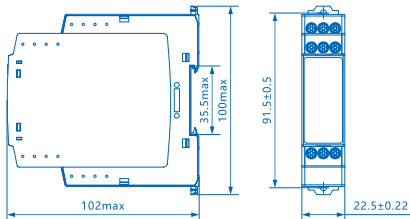


Figure 1 Outline and Installation Size

3.2 Wiring diagram: see Figure 2; working sequence diagram: see Figure 3~ Figure 4; panel diagram: see Figure 5.

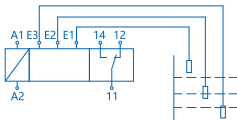


Figure 2 Wiring Diagram



Figure 3 Working Sequence Diagram of NJB1-YW floatless Relay

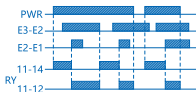


Figure 4 Working Sequence Diagram of NJB1-YW1 floatless Relay

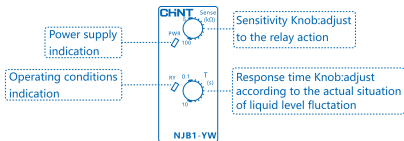


Figure 5 Panel Diagram

Notes:

- 1) Three copper wires with good conductivity should be used for the relay, and the exposed metal part with a length of not less than 5cm should be stripped at the end of the wire as the detection electrode. The distance between the three electrodes shall not be greater than 5cm. If the controlled level tank is a metal container, the enclosure must be grounded.
- 2) For different liquid and electrode lead distances, the relay can achieve reliable control through the adjustment of the sensitivity knob on the panel. First, turn the sensitivity knob to the 5k Ω position. Connect wires correctly according to the wiring diagram. Power on and put the three electrodes into the water. If the relay has no motion, turn the sensitivity knob clockwise until the relay motions.
- 3) The delay response function of the relay is mainly used to prevent the pump from starting and stopping frequently when the liquid level fluctuates greatly. Generally, the delay knob is turned to the minimum position. If the liquid level fluctuates greatly, turn the knob between 0.1s ~ 10s according to the practical situation, and turn it to 2s~3s under normal circumstances.

4 Maintenance

4.1 The terminal of the relay should be tightened on a regular basis.

4.2 Avoid squeezing the product; the product should be stored in a well-ventilated place.

4.3 For equipment that may cause material economic losses or personal safety, safety measures such as secondary circuit protection should be taken.

Table 5 Fault Analysis and Troubleshooting

Symptoms	Cause analysis	Troubleshooting method
The power indicator is not on after power-on.	The power supply pin is not wired and the wiring is incorrect or disconnected. The product is not electrified or the control power supply voltage does not match the rated control power supply voltage of the product.	Select the power supply voltage that matches the rated control power supply voltage of the product and connect wires reliably according to the user instructions.

Table 5 (continued)

Symptoms	Cause analysis	Troubleshooting method
Abnormal operation after power -on	The control wiring of the relay is incorrect or disconnected, whether the input voltage is too low, whether the three liquid level detection copper leads are normal.	Select the power supply voltage that matches the rated control power supply voltage of the product and connect wires reliably according to the user instructions. Check the three liquid level detection copper leads, remove rust from bare metal part at the end of the wire or re-strip the wire.

5 Environmental Protection

In order to protect the environment, the product or product parts should be disposed of according to the industrial waste treatment process, or be sent to the recycling station for assortment, dismantling and recycling according to local regulations.

CHINT

QC PASS

NJB1-YW Series
Liquid Level Relay
IEC/EN 60947-5-1

JDQ Check 10

Test date: Please see the packing

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CHINT

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