

NJJ3
Counting 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

NJJ3 counting relay (hereinafter referred to as the counter) is mainly used as counting or counting control component in the control circuit with AC frequency of 50Hz/60Hz, rated control power supply voltage up to 240V and DC rated control power supply voltage up to 240V.

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	NJJ3
Output method	1 group of change-over contact, collector open output (30VDC, 100mA max)
Counting digit	6 digits (6-digit red LED is the count value, 6-digit green LED is the preset value)
Counting speed	1 time/s, 30 times/s, 1000 times/s optional
Counting mode	Add, subtract, reversible A, reversible B, reversible C
Batch processing	Can be set as 0~999999
Display form	Nixie tube display
Input signal	Contact input, sensor input (NPN type, PNP type optional)
External sensor power supply	12VDC, 30mA max
Value setting	Setting range 0.001~99.999
Output mode	N, F, C, R, K, P, Q, A

Table 2 (continued)

Model	NJJ3
Output time	The output time can be set as 0.01s~9.99s (when the output mode is C, R, K, P, Q, A)
Installation method	Panel type
Power-off memory	More than 10 years

Table 3 Main Circuit and Auxiliary Circuit Technical Parameters

No.	Product Model	NJJ3		
1	Rated control supply voltage U_s (V), frequency (Hz)	AC/DC100V~240V, 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)	5		
4	Rated operating voltage U_e (V)	AC220V	AC380V	DC220V
5	Utilization category and rated operating current I_e (A)	AC-15	AC-15	DC-13
		0.75A	0.47A	0.27A
6	Rated insulation voltage U_i (V)	380V		
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	RT36-00/6A		
11	Size of terminal tightening screw (or nut)	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)

3 Installation

3.1 Outline and installation size: see Figure 1~ Figure 2, unit: mm.

3.2 See Figure 3 for the panel diagram, see Figure 4~ Figure 6 for the wiring diagram, see Figure 7 for the logic selection diagram, and see Figure 8 for the output wiring diagram.

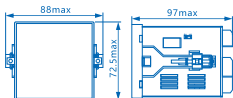


Figure 1 Outline Size



Figure 2 Hole-cutting Size

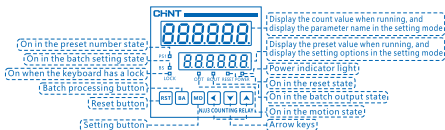


Figure 3 Panel Diagram

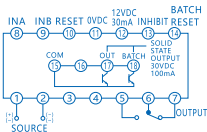


Figure 4 Wiring Diagram

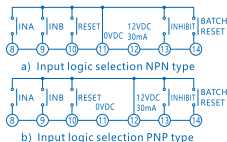


Figure 5 Contact Input Wiring Diagram

Sensor signal wiring diagram	Contact signal wiring diagram

a) Input logic selection NPN type

Sensor signal wiring diagram	Contact signal wiring diagram

b) Input logic selection PNP type

Notes: * is INA\INB\RESET\INHIBIT\BATCH RESET.

Figure 6 Wiring Diagram of Sensor Input

Logic input selection diagram	Note
	In power failure, use tweezers to toggle the switch to select the input logic.

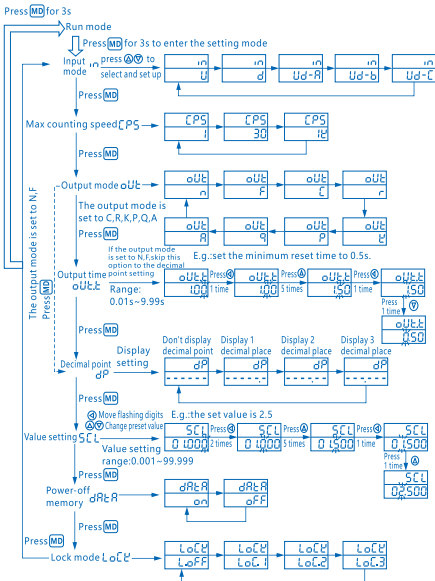
Figure 7 Logic Input Selection Diagram

Output type	Output wiring diagram	Note
Counter output		—
Solid state output		The load shall not exceed the rated capacity of 30VDC 100mA; if inductive load is applied, protection diode should be connected as shown in the figure.

Figure 8 Output Wiring Diagram

3.3 Counter setting

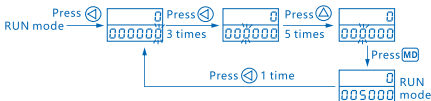
3.3.1 Parameter setting



3.3.2 Preset value setting

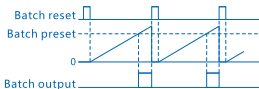


Example: set the preset value to 5000



Notes: All setting parameters are automatically stored before power failure, and the counting value is determined according to the setting. If no button action occurs in the setting mode, it will automatically return to the run mode after 60s.

3.3.3 Batching counting



- 1) The batch count value is incremental. If the count value exceeds 999999, then cycle count. It will be reset after the BATCH RESET signal comes.
- 2) The batch count value is not affected by the input of (RST) key and external reset signal.

- 3) The motion of batch counter:

If the batch output is ON, it will remain ON state until the batch reset signal comes.

The status of the batch output remains ON when the power is turned on after the power is turned off, until the batch reset signal comes.

Batch output is not affected by the input of (RST) key and external reset signal.

3.3.4 Batch preset value setting



3.3.5 Value setting function

This function is used to measure the length, flow, position, etc. The amount

represented by one pulse is the unit value (user defined), and the counter realizes the metering function according to the set unit value.

New display value = original display value + (or -) unit value × number of pulses

Example: when the set value is 0.02 and the counting mode is add counting, the current count value is 0.10 (the decimal point display is set as: two decimal places are valid). After two pulses are given to the counter, the current count value is 0.14.

3.3.6 Lock mode description

The product has a lock mode to prevent press errors.

L o F F Means no lock status, the lock light of the front panel is off

L o C . 1 Means **[RST]** is locked, the lock light of the front panel is on.

L o C . 2 Means **[◀] [▲] [▼]** are locked, the lock light of the front panel is on.

L o C . 3 Means **[RST] [◀] [▲] [▼]** are locked, the lock light of the front panel is on.

3.4 Counting mode of the counter

This counter has 5 counting modes: add, subtract, reversible A, reversible B and reversible C, as shown in Table 5.

Table 5 Counting Mode

Counting mode	Working sequence diagram	Note
U Add counting mode		INA rising edge count, INB input, stop counting.
		When INA is input, INB input falling edge count.
d Subtract counting mode	<p>*n is the preset value</p>	INA rising edge count, INB input, stop counting.
	<p>*n is the preset value</p>	When INA is input, INB input falling edge count.
Ud-A Reversible counting mode A		Add count when INA is input, Subtract count when INB is input.

Table 5 (continued)

Counting mode	Working sequence diagram	Note
Ud-b Reversible counting mode B		Add count when INA is input, Subtract count when INB is input.
Ud-C Reversible counting mode C		Automatically distinguish between positive and negative rotation, add or subtract counting.

Notes:

- 1) In the case of sensor input, the high level is 5V~30V, the low level is 0V~2V; In the case of contact input, the user does not need to consider high and low levels.
- 2) a minimum signal width or more, b 1/2 minimum signal width or more.

3.5 Output mode of the counter

This product has 8 output modes, as shown in Table 6.

Table 6 Output Mode

Output mode	\uparrow add counting mode	\downarrow subtract counting mode	Reversible counting mode A, B, C
N (N)			
F (F)			
C (C)			
R (R)			

Table 6 (continued)

Output mode	↑ add counting mode	↓ subtract counting mode	Reversible counting mode A, B, C
\mathcal{K} (K)			
\mathcal{P} (P)			
\mathcal{Q} (Q)			
\mathcal{R} (A)			

Notes: t is the set value of the output time output .

3.6 Installation method of the counter

The installation method of the sensor of reversible counting mode C is as follows:



3.7 Instructions for use

- 1) 100ms after power on is the rising period of power supply, 700ms after power off is the falling period of power supply. So input the signal after power on for 100ms, and turn on the power after power off for 700ms.
- 2) Make sure the power is off when selecting the input logic (NPN/PNP).
- 3) The matching counting speed must be selected according to the speed of signal input: when the counting speed is 1 time/s, the signal pulse width should be $\geq 500\text{ms}$; when the counting speed is 30 times/s, the signal pulse width should be $\geq 16.7\text{ms}$; When the counting speed is 1000 times/s, the signal pulse width should be $\geq 500\mu\text{s}$. If contact input is applied, please use the low speed mode, otherwise miscount will be generated.
- 4) When the counting signal is contact input, please use the contact with good contact to prevent the counter from count error due to the serious rebound of the contact. If necessary, a capacitor of $1\mu\text{F} \sim 10\mu\text{F}$ may be connected at both ends of the contact to enhance the counting reliability.

- 5) The counting signal line shall not use the same pipe with the power supply to avoid interference. The signal line should be as short as possible and shielded wire should be used if necessary.

4 Maintenance

- 4.1 The terminal of the counter 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 7 Fault Analysis and Troubleshooting

Symptoms	Cause analysis	Troubleshooting method
The Nixie tube does not display	Check if the wire is securely connected with the terminal, and the terminal of the power end is correctly wired.	Wire the product securely according to the product manual.
The product fails to count	Whether the signal wiring is wrong, whether the input voltage is too low, whether the input logic (NPN / PNP) is correct, and whether the counting speed matches the signal width.	Connect wires reliably according to the user instructions, and confirm the input logic is correct and the counting speed is proper.

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

NJJ3

Counting Relay
IEC/EN 60947-5-1

JDQ Check 10

Test date: Please see the packing

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CHINT

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NJJ3 Counting Relay User Instruction

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