



Conform to: IEC 60947-4-1

### NJBK10 series

## Motor protection relay

### Operation instruction



Please read the operation instructions before installing and using the product.



#### 1 Application

NJBK10 series motor protection relay (hereinafter referred to as the protector) suitable for AC 50Hz, rated insulation voltage up to 690V and under, rated working current 1A-200A long-term or intermittent AC motor work overload, open-phase, three-phase imbalance protection. Product meets IEC60947-4-1 standard requirements.

#### 2 Normal working condition and working environment

2.1 Altitude: Not more than 2000m.

2.2 Ambient air temperature: -15°C ~ +55°C, and the average value in 24 hours is not more than +35°C.

2.3 Atmospheric condition: Relative air humidity is not more than 50% when the highest temperature is +40°C; High relative humidity is allowed under low temperature. For example, air humidity could reach 90% when the ambient temperature is +20°C. And special measures should be taken for occasionally appearing condensation caused by temperature changes.

2.4 Pollution class: 3.

2.5 The gradient between installation surface and vertical surface is not more than ±5°.

2.6 In medium without explosion hazards, and without air which could corrode metal and destroy insulation, and places without conducting dust seriously existing.

2.7 Places with rain and snow protection equipment, and are not full of steam.

2.8 In places without distinct shake, shock and vibration.

2.9 Installation type: II.

2.10 Electromagnetic Environment: A;

2.11 Protective class of the outer casing: IP20.

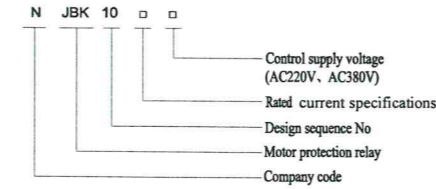
#### 3 Model, specification and technical parameter

3.1 Model and its meaning.

3.2 Main specification: See form 1.

#### 3.3 Basic parameters of the main circuit

Rated insulation voltage: 690V, rated current of the casing: 200A, rated frequency: 50Hz.



Form 1 Main specification

Model	Rated working current A	Range of current setting A	Applicable motor power kW
NJBK10-10	10	2~10	1~5
NJBK10-50	50	10~50	5~25
NJBK10-200	200	40~200	20~100

#### 3.4 Basic parameters of auxiliary circuit see

Basic parameters of auxiliary circuit see Form 2; Rated insulation voltage: 380V; rated frequency: 50Hz.

#### Form 2 Basic parameters of auxiliary circuit

Useable type	AC-15
Rated working voltage Ue (V)	240 380
Rated working current Ie(A)	1.5 0.95
Agreed heating current Ith(A)	5

3.5 phase failure and unbalanced action time 3s, with a relative error of ±10%, uneven. The balance rate can be set, unbalance ratio is calculated as follows:

$$\text{Unbalanced ratio} = \frac{\text{Max}(|I_1 - I_{\text{avg}}|)}{I_{\text{avg}}} \times 100\%$$

where:

I<sub>i</sub>: Each phase current RMS;

I<sub>avg</sub>: Three-phase current average;

#### 4 Panel and dimensions

##### 4.1 Schematic Diagram of Panel see Figure 1.

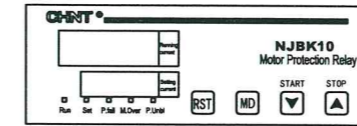


Figure 1 Schematic diagram of panel

##### 4.2 Outline drawing of NJBK10 see Figure 2.

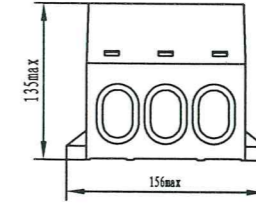


Figure 2 Outline drawing of NJBK10

##### 5 Connecting terminals and wiring diagram

###### 5.1 Connecting terminals see Figure 3.

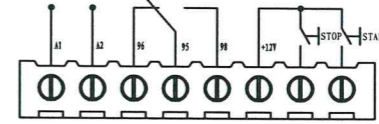


Figure 3 Connecting terminals

###### 5.2 Wiring diagram see Figure 4, Figure 5.

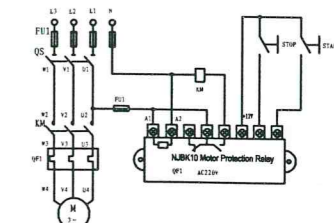


Figure 4 Wiring diagram for control power voltage of AC220V

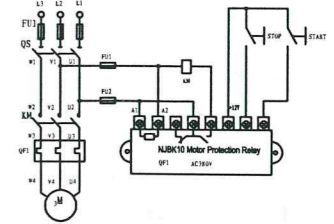


Figure 5 Wiring diagram for control power voltage of AC380V

Note: If the protector does not connect to the start and stop button. Please open the auto start function. When the protector is restored to power supply, after the power is cut off, the protector automatically starts according to the set automatic starting time delay.

- 1 -

- 2 -

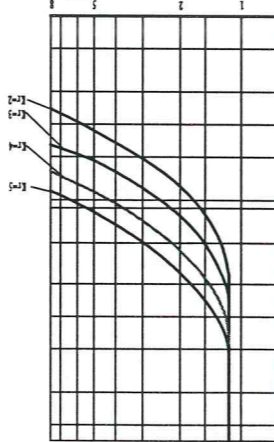
- 3 -

- 4 -

- 5 -

- 10 -

Figure 6 Time-current characteristic curve



Overload Action level	1.05	1.2	1.5	2	3	5	6	1.2	Minute
[1~]	No action	63	40	22	3.6	2.5	1.8		Meet the 5 level
[2~]	No action	125	80	45	7.2	5	3.5		Meet the 10A level
[3~]	No action	250	160	90	14	10	6.9		Meet the 20 level
[4~]	No action	500	320	180	29	20	14		Meet the 30 level
[5~]	No action	750	480	270	43	30	21		Meet the 30 level

Form 4 Inverse time operation characteristic table

9.1 Installation and debugging must be performed by professionals. Non-professional and debugging are not allowed to detach the protector in order not to cause danger or influence the normal operation of protector.

9.2 The external start-stop line shall be as short as possible and shall not be laid in the same conduit with wires for strong current in order to avoid interferences. Please use shielded wire if long cable is required.

9.3 The operating environment shall meet the requirements of protector for operating environment. This protector shall not be used in the environment with vibration, impact, corrosion, fine dust, static electricity, intense magnetic field interference, high temperature, high humidity and direct sunlight.

9.4 Please keep this manual for future reference.

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Note: When a fault occurs, the first row of digital LED displays the fault of the three-phase current maximum value, while the flashing prompt light, the second row of digital LED displays error code.

8.1 Inverse time operation characteristic

8.2 Protection characteristics

8.3 Features

8.4 Start and stop buttons with simplified wiring.

8.5 Auto-start function can open the auto-start function and set the start-up delay in case of power resumption or reset after power failure, the protector start automatically as per the set auto start delay, free of any human intervention.

8.6 Fault memory and its indicators: In case of motor failure, the indicator displays movement time according to the protector, so as to protect the motor. The relationship between the overload current and the time are shown in Form 4, Figure 6.

8.7 Define time operation characteristics

8.8 When define time function is open, set definite time overload magnification and definite time t<sub>off</sub> the running current set overload set definite time, the protector shall act as shown in Figure 7.

Fault type	Fault display
Overload	50
Inverse time overload	50
Time limit overload	50
Open-phase	50
Imbalance	50

Form 3 Fault code

- 7 -

7.1 Double-row LED display: the upper row of LED displays running current status and fault status.

7.2 Features: overload given time protection (on/off), inverse time overload protection, open-phase, three-phase current imbalance protection function.

7.3 Built-in 4 overload curves are available to meet different occasions.

7.4 Panel with start and stop buttons, terminal block can be external connected with start and stop buttons with simplified wiring.

7.5 Auto-start function can open the auto-start function and set the start-up delay in case of power resumption or reset after power failure, the protector start automatically as per the set auto start delay, free of any human intervention.

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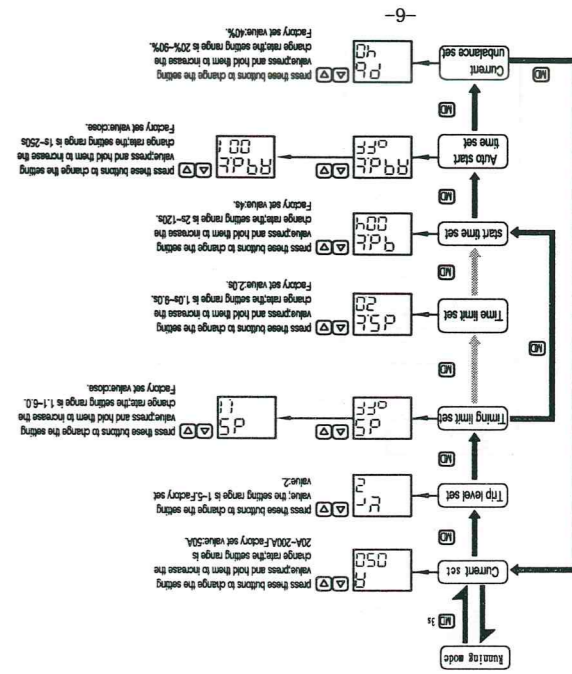
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6.1 Parameter setting

#### 6.2 Protector startup process



6.2 Protector startup process

Customer service hotline: 800-857777 400-817777  
Headline for complaint on fake products: 8577-4279987  
http://www.chnt.com E-mail: chnt@chnt.com  
Tel: 0577-63817777 Fax: 0577-63815888  
Post Code: 325603  
Province  
Address: No.1 Zhongyi Road, Zhentai Industrial Park, Bei Baixing Town, Yueqing City, Zhejiang



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