2. Type designation

N JBK 7 - 800 □ □ / □

- Company code
- Motor protection relay
- Design sequence No.
- Specification code
- None:4mA~20mA analog transformation is not available
  M:4mA~20mA analog transmission
- None:communication interface is not available
  T:RS485 interface
- Rated current:5,10,40,100,400,800

NJBK7 Motor Protection Relay

1. General

NJBK7-800 motor protector (hereinafter referred to as the protector) is applicable to the protection of overload, blocking, loss of phase, three-phase current unbalance, undercurrent, grounding, PTC temperature and communication failure of none-stop or intermittent duty AC motors with AC frequency 50Hz, rated insulation voltage below AC690V and rated operating current 1A~800A. Equipped with RS485 interface and 4mA ~ 20mA analog transmission interface, the protector can achieve network communication. The remote monitoring, control, fault inquiry and other functions of the motor are realized through the upper computer. The large current specification uses a flexible Rogowski coil to collect current, which has the advantages of wide range of setting current, high precision and convenient installation. The protector is generally used in conjunction with an AC contactor.

Standards:IEC 60947-4-1

3.Key Technical Parameters

Table 1 Ambient Conditions

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

Table 2 Product Specifications and Main Technical Parameters

Model	**NJBK7-800/5 NJBK7-800M/5 NJBK7-800T/5 NJBK7-800MT/5**	**NJBK7-800/10 NJBK7-800M/10 NJBK7-800T/10 NJBK7-800MT/10**	**NJBK7-800/40 NJBK7-800M/40 NJBK7-800T/40 NJBK7-800MT/40**	**NJBK7-800/100 NJBK7-800M/100 NJBK7-800T/100 NJBK7-800MT/100**	**NJBK7-800/400 NJBK7-800M/400 NJBK7-800T/400 NJBK7-800MT/400**	**NJBK7-800/800 NJBK7-800M/800 NJBK7-800T/800 NJBK7-800MT/800**
Display method	Nixie tube and indicator light.					
Protection function	Overload, blocking, loss of phase, three-phase current unbalance, undercurrent, grounding, PTC temperature and communication failure.					
Number of contacts	1 group of change-over (protective), 1 group of normally on (auxiliary).					

Table 3 Main Circuit Technical Parameters

Product Model	NJBK7-800 □□ /5	NJBK7-800 □□ /10	NJBK7-800 □□ /40	NJBK7-800 □□ /100	NJBK7-800 □□ /400	NJBK7-800 □□ /800
Rated insulation voltage	AC690V					
Rated control supply voltage Us , frequency	85%Us~110%Us ,AC220V, AC230V, AC240V, AC380V, AC400V, AC415V, 50Hz					
Rated impulse withstand voltage Uimp	4kV					
Rated conditional short-circuit current	10kA				30kA	
Enclosure protection class (if applicable)	IP20					
Pollution class	Class 3					
Rated duty	8h duty or non-stop duty					
Electromagnetic environment	B					

Table 4 Auxiliary Circuit Technical Parameters

	NJBK7 Series
Rated insulation voltage (V)	AC480
Rated impulse withstand voltage Uimp (kV)	2.5
Contact capacity	Ue/Ie:480V/0.75A,240V/1.5A;Ith:5A

5. Motion characteristic

5.1 Motion characteristic of inverse time lag: When the current value exceeds 1.05 times of the setting current value, the protector will start the inverse time lag overload protection function. The protector will simulate and calculate the thermal accumulation and motion time of the motor according to the overload multiple of the overload current. When the thermal accumulation reaches a certain value, the protector will motion and cut off the AC contactor to protect the motor. For the relationship between overload current and time, please refer to Figure 1 and table 5.

Overload curve / Motion time(s) \ Overload multiple	1.05	1.2	1.5	2	5	6	7.2	Note
Kr=1	No Motion	63	40	22	3.6	2.5	1.8	Meet the 5 level
Kr=2		125	80	45	7.2	5	3.5	Meet the 10 level
Kr=3		250	160	90	14	10	6.9	Meet the 10 level
Kr=4		500	320	180	29	20	14	Meet the 20 level
Kr=5		750	480	270	43	30	21	Meet the 30 level

5.2 Motion characteristic of blocking protection: When the maximum phase current ≥ the setting current value × the set blocking ratio, the protector motions, and the motion time is the set blocking motion time.

5.3 Motion characteristic of phase loss protection: When any one of the three-phase currents of the main circuit is lower than 25% of the setting current, the protector motions, and the motion time ≤3s.

5.4 Motion characteristic of three-phase unbalance protection: When the three-phase current of the main circuit conforms to the following formula, the protector motions, and the motion time ≤3s.

$$\frac{M^{3}ax \mid Ii\text{-}Iavg \mid i=1}{Iavg} \times 100\% \geq \text{Set current unbalancerate}$$

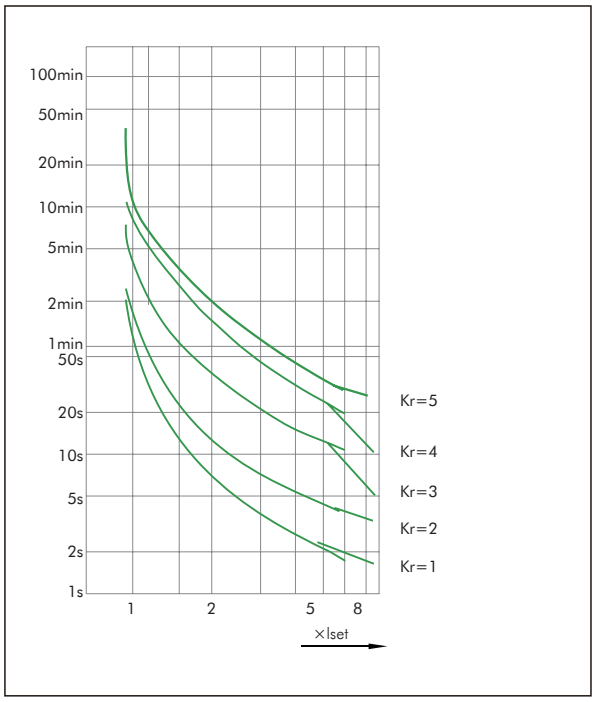
Where: I_i——Effective current value of each phase.

I_{vag}——Mean value of effective three-phase current values.

5.5 Motion characteristic of undercurrent protection: When the minimum phase current ≤ the set current value × the set undercurrent percentage, the protector motions, and the motion time is the set undercurrent motion time.

5.6 Motion characteristic of grounding protection: The ground fault protection of the protector is realized by an external zero-sequence current transformer. When the current passing through the primary side of the zero-sequence current transformer is within (0.9-1.1) times of the motion current range, the protector motions, and the motion time ≤1s.

Tripping characteristic curve



5.7 Characteristic of temperature protection: The overheat protection function of the protector is realized by detecting the resistance value of the PTC thermistor embedded in the stator winding of the motor. When the resistance value of the PTC thermistor ≤ 750 Ω, the protector will not motion; when the resistance value of the PTC thermistor is in the range of 1650 Ω ~ 4000 Ω, the protector will motion for ≤ 1s; when the resistance value of the PTC thermistor is in the range of 750 Ω ~ 1650 Ω, the protector can be reset; When the user does not select the temperature protection function, terminals T1 and T2 must be short circuited.

5.8 Characteristic of communication failure: The protector and the transformer are connected through a dedicated cable, and when the cable is broken or damaged, the protector motions, and the motion time ≤3s.

5.9 Communication the protector is provided with RS485 interface supporting Modbus protocol. If the communication network is required, please contact us, and we'll provide you with detailed communication specification for protector.

6. Typical wiring

Figure1 Wiring diagram for direct start

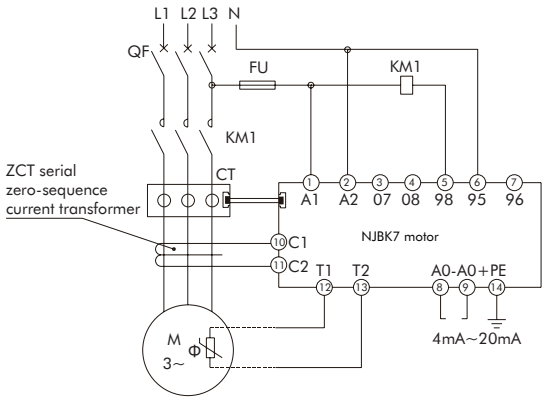


Figure2 Wiring diagram for secondary-current direct start

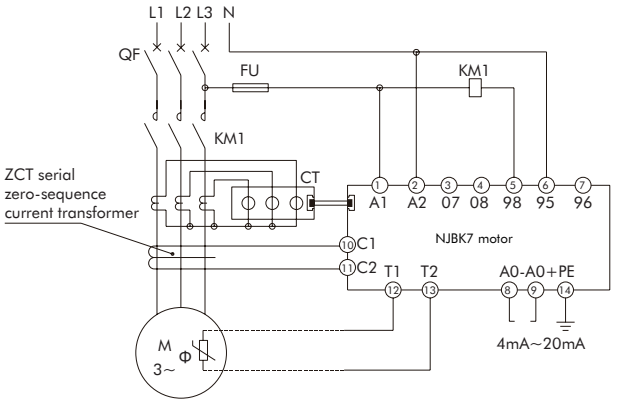


Figure3 Wiring diagram for star delta start

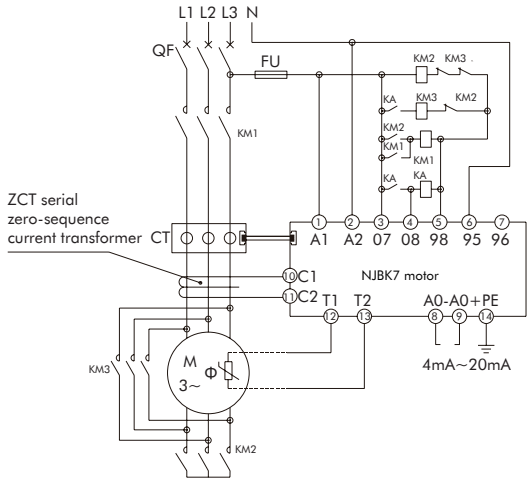
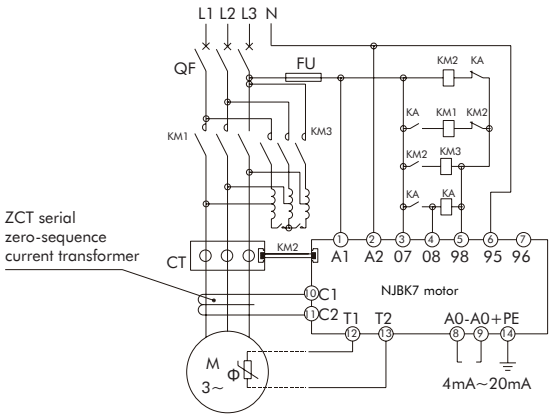


Figure4 Wiring diagram for auto voltage-reduction start



7. Outline drawing

Figure5 Outline drawing of current specification with 5A,10A,40A

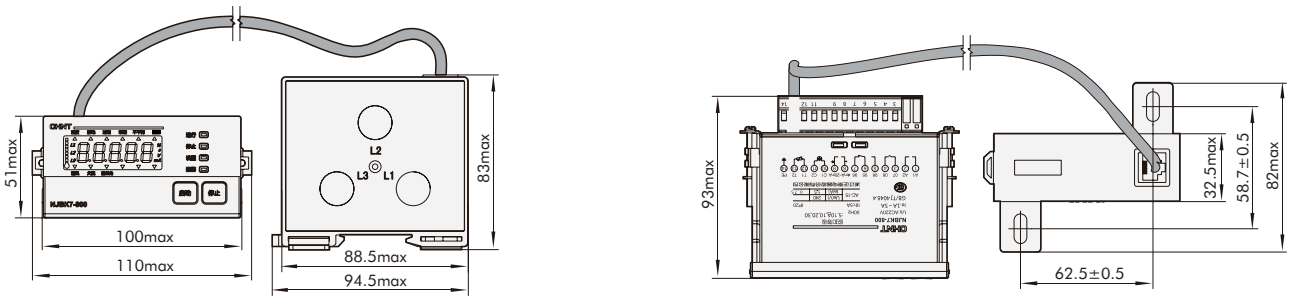
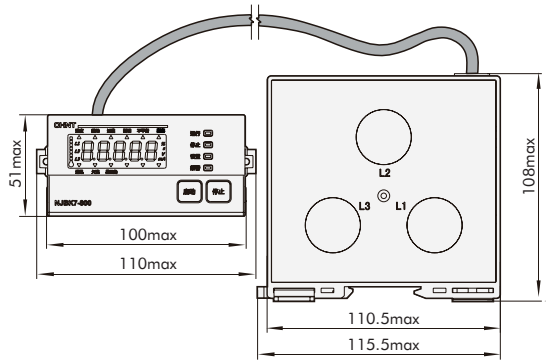


Figure6 Outline drawing of current specification with 100A



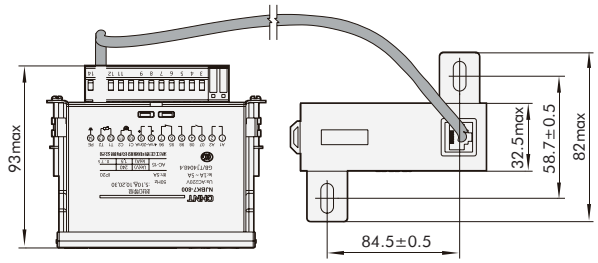


Figure7 Outline drawing of current specification with 400A,800A

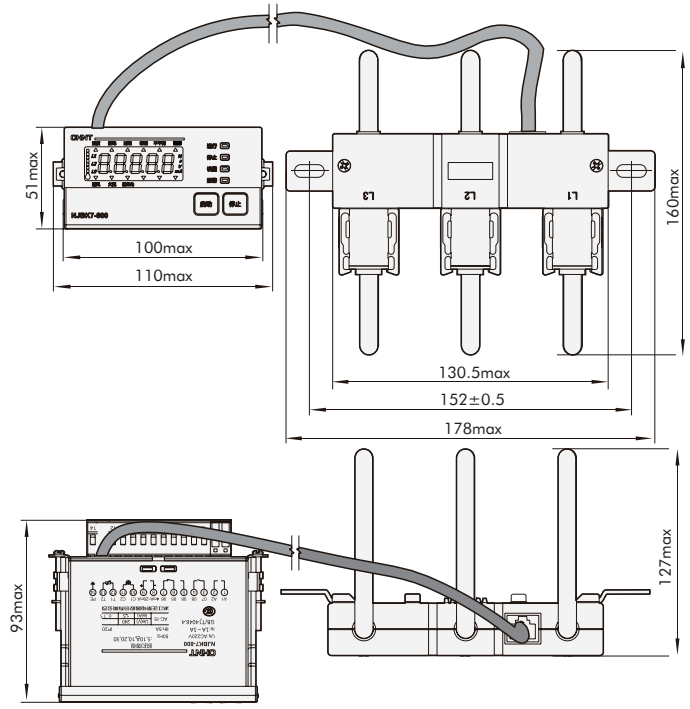


Figure8 Installation method 1 for Rogowski coil

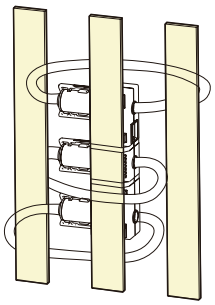


Figure9 Installation method 2 for Rogowski coil

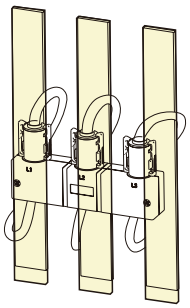


Figure10 Opening size