

NQ3 Series
Electromagnetic Starter

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.

1 Main Use Purpose and Application Scope

NQ3 series electromagnetic starter (hereinafter referred to as starter) is mainly used in electric circuits with AC frequency of 50Hz (or 60Hz), rated operating voltage up to 660V and rated operating current up to 22A for controlling the direct start and stop of electric motor. Starter with thermal overload relay (hereinafter referred to as thermal relay) can be used to protect the overload and phase loss of electric motor.

2 Key Technical Parameters

Table 1 Ambient Conditions

Ambient temperature (°C)	-5°C~+40°C, average temp. not exceeding +35°C within 24h
Hot and humid atmospheric conditions	+40°C, RH not exceeding 50% and may reach 90% at +20°C
Altitude	No influence below 2,000m
Pollution class/installation category	Class 3/III

Table 2 Key Technical Parameters of Starter (I)

Model	Conventional free air thermal current of shell frame, I _{th} (A)	Rated operating current of shell frame, I _e (A)	Rated power control of shell frame, P _e (kW)			AC contactor model assembled	Thermal relay model assembled	Setting current range of thermal relay (A)
			AC-3					
			660V	380V	220V			
NQ3-5.5P	12	12	7.5	5.5	3	NC1-1810	NR2-25	0.1~0.16
								0.16~0.25
								0.25~0.4
								0.4~0.63
								0.63~1
								1~1.6
								1.25~2
								1.6~2.5
								2.5~4
								4~6
NQ3-11P	22	22	15	11	5.5	NC1-3210	NR2-25	0.63~1
								1~1.6
								1.25~2
								1.6~2.5
								2.5~4

Table 2 (continued)

Model	Conventional free air thermal current of shell frame, I _{th} (A)	Rated operating current of shell frame, I _e (A)	Rated power control of shell frame, P _e (kW)			AC contactor model assembled	Thermal relay model assembled	Setting current range of thermal relay (A)
			AC-3					
			660V	380V	220V			
NQ3-11P	22	22	15	11	5.5	NC1-3210	NR2-25	4~6 5.5~8 7~10 9~13 12~18 17~25

Table 3 Key Technical Parameters of Starter (II)

Model		NQ3-5.5P	NQ3-11P
Use type		Main circuit: AC-3, AC-4; auxiliary circuit: AC-15	
Rated insulation voltage, U _i (V)		690	
Rated impulse withstand voltage, U _{imp} (kV)		6	
Operational frequency (times/h)	AC-3	1200	
	AC-4	300	
Electrical life (×10 ⁴ times)	AC-3	50	
Mechanical life (×10 ⁴ times)		100	
Operating range	Pull-in voltage	(85%~110%) U _s	
	Release voltage	(20%~75%) U _s	
Rated conditional short-circuit current, I _q (kA) (corresponds to 380V testing voltage)		50	
Enclosure protection class		IP55	
Rated duties		Eight-hour duty, Uninterrupted duty, Intermittent periodic duty	

3 Installation

1) See Fig. 1 and Table 4 for the outline and installation size of the starter.

Table 4 Outline and Installation Size

Unit: mm

Model	NQ3-5.5P	NQ3-11P
Maximum outline size (A×B×C)	96×166×125	116×196×130
Installation size (D×E)	60×130	60×150
n×Φ	3×Φ6	
Reference picture	See Fig. 1	

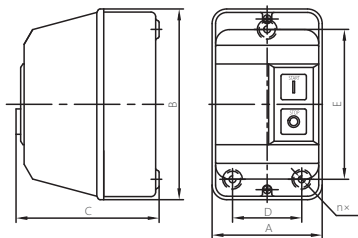


Figure 1 Outline and installation size

2) Inspection of operating flexibility of the thermal relay inside the starter

Open the cover of the thermal relay. Press the blue Reset button using a small screwdriver and rotate it 90° clockwise so that the relay is in the Automatic Reset status (Letter A on the Reset button is in vertical alignment with the reference point). Then, use the small screwdriver to press the red Test button beside TEST downward vertically. You can hear the operating sound of the contact, and the indicator column is red. Loosen your hold on the screwdriver, you can hear the sound of the reset contact and the indicator column resumes its original status (Alternatively, you can use a multimeter). If any abnormality occurs during the testing, replace it immediately. The panel layout of the thermal relay is shown in Fig. 2.

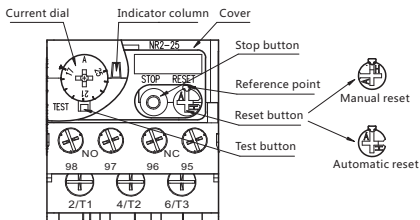


Figure 2 Panel layout of the thermal relay

3) Starter wiring diagram

When the product leaves the factory, the control circuits are wired on the premises that the voltage of the starter is the same as that of the main circuit. Once the main circuit is powered on, the starter can operate without additional wiring. The starter cannot control single-phase motor unless the main circuits of any two of its phases are connected in series. In case the control circuit voltage is different from the main circuit voltage, disconnect the two wires on the main circuit and connect them to the control power supply.

See Fig. 3 – Fig. 6 for the starter wiring diagram.

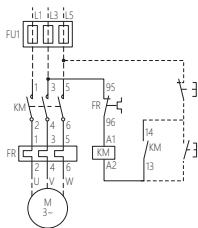


Figure 3 Control circuit voltage same as main circuit voltage (three-phase)

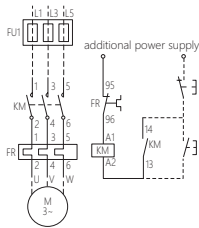


Figure 4 Control circuit voltage different from main circuit voltage (three-phase)

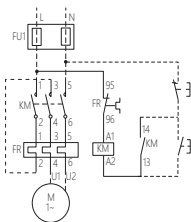


Figure 5 Control circuit voltage same as main circuit voltage (single-phase)

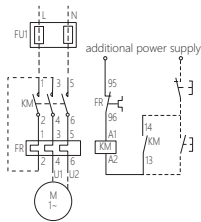


Figure 6 Control circuit voltage different from main circuit voltage (single-phase)

4) Starter installation procedure and method

See Fig. 7 for starter installation instructions.

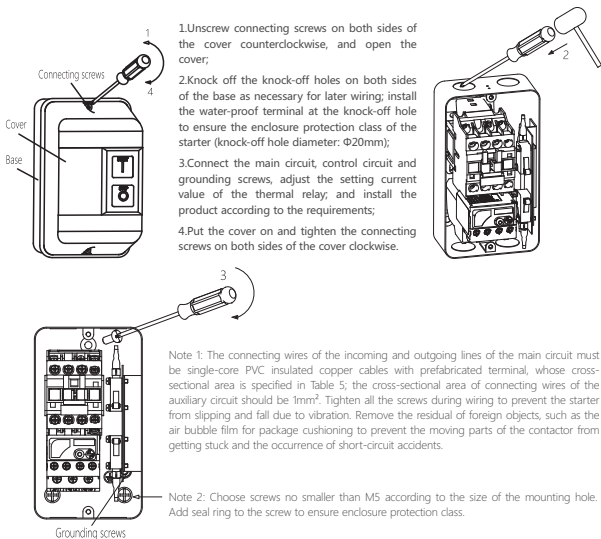


Figure 7 Starter installation diagram

Table 5 Cross-sectional area of connecting wires of the main circuit

Rated operating current of motor, I (A)	Cross-sectional area of connecting wires of main circuit (mm^2)
$0 < I \leq 8$	1
$8 < I \leq 12$	1.5
$12 < I \leq 20$	2.5
$20 < I \leq 25$	4

4 Maintenance

Check whether the thermal relay inside the starter operates reliably on a regular basis (once a month) by adjusting the current dial and reducing the setting current until the relay operates. Then, restore the current dial to the original position.

Note: Do not dismantle and repair the product at will. Once the product is found damaged, replace it immediately.

Table 6 Examples of Fault Analysis and Troubleshooting

Symptoms	Cause analysis	Troubleshooting method and precautions
The starter mis-operates before being overloaded	The setting current value of thermal relay is smaller than the actual operating current of the motor.	Fine tune the current dial so that the product' s set current matches the actual current of the motor.
	Strong shock or vibration	Inspect the installation site and troubleshoot to prevent the product from being placed in an environment where there is strong shock or vibration.
	Frequent starts of the motor	The motor start requires a certain interval, with frequency no more than 30 times per hour.
	The cross-sectional area of connecting wires of the main circuit is too small.	Choose standard wires according to Table 5.
The starter fails to operate after being overloaded	The setting current value of thermal relay is bigger than the actual operating current of the motor.	Fine tune the current dial so that the product' s set current matches the actual current of the motor.
	The cross-sectional area of connecting wires of the main circuit is too big.	Choose standard wires according to Table 5.
The starter fails to operate	The wiring of the starter becomes loose or falls	Tighten the connecting screws and check whether the screws are loosen before use.
	The coil voltage is too low or voltage fluctuation is too big.	Increase the power supply voltage or add stabilized voltage equipment.
	The setting current value of thermal relay is too small which leads to the failure of product reset.	Fine tune the current dial toward the bigger current direction.

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.

CHNT

QC PASS

NQ3 Series
Electromagnetic Starter
IEC/EN 60947-4-1

Check 19

Test date: Please see the packing

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CHINT

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NQ3 Series
Electromagnetic Starter
User Instruction

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