



NQ2 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

NQ2 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 68A 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, Ith (A) | Rated operating current of shell frame, Ie (A) | Rated power control of shell frame, Pe (kW) | | | AC contactor model assembled | Thermal relay model assembled | Setting current range of thermal relay (A) | Button type of starter with button |
|-----------|--|---|--|------|------|---------------------------------------|--|--|--|
| | | | AC-3 | | | | | | |
| | | | 660V | 380V | 220V | | | | |
| NQ2-15□/1 | 13 | 12 | 7.5 | 5.5 | 3 | NC1-12 | NR2-25 | 0.1~0.16 | NP2-EA31 (start) NP2-EA42 (stop) |
| | | | | | | | | 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 | |
| | | | | | | | | 5.5~8 | |
| | | | | | | | | 7~10 | |
| | | | | | | | | 9~13 | |
| NQ2-15□/2 | 18 | 18 | 10 | 7.5 | 4 | NC1-18 | 12~18 | | |
| NQ2-15□/3 | 25 | 25 | 15 | 11 | 5.5 | NC1-25 | 17~25 | | |
| NQ2-15□/4 | 36 | 32 | 18.5 | 15 | 7.5 | NC1-32 | NR2-36 | 23~32 | |
| | | | | | | | | 28~36 | |

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) | Button type of starter with button |
|-----------|--|---|--|------|------|---------------------------------------|--|--|--|
| | | | AC-3 | | | | | | |
| | | | 660V | 380V | 220V | | | | |
| NQ2-33□/1 | 65 | 52 | 33 | 25 | 15 | NC1-65 | NR2-93 | 23~32 | NP2-EA31 (start) NP2-EA42 (stop) |
| | | | | | | | | 30~40 | |
| | | | | | | | | 37~50 | |
| | | | | | | | | 48~65 | |
| NQ2-33□/2 | 95 | 68 | 37 | 33 | 25 | NC1-95 | | 55~70 | |
| | | | | | | | | 63~80 | |
| | | | | | | | | 80~93 | |
| | | | | | | | | | |

Table 3 Key Technical Parameters of Starter (II)

| Model | | NQ2-15/1~4 | NQ2-15N/1~4 | NQ2-15NB/1~4 | NQ2-15P/1~4 | NQ2-33/1~2 | NQ2-33P/1~2 |
|---|-----------------|---|-------------|--------------|-------------|------------|-------------|
| 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 | | | | 600 | |
| | AC-4 | 300 | | | | 300 | |
| Electrical life (×10 ⁴ times) | AC-3 | 100 | | | 50 | 50 | |
| | AC-4 | 20 | | | 10 | 10 | |
| Mechanical life (×10 ⁴ times) | | 1000 | | | 100 | 600 | 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 | | IP40 | | | | | |
| Rated duties | | Eight-hour duty, Uninterrupted duty, Intermittent periodic duty | | | | | |

3 Installation

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

Table 4 Outline and Installation Size

Unit: mm

| Model | NQ2-15 | NQ2-15N | NQ2-15NB | NQ2-15P | NQ2-33 | NQ2-33P |
|------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Maximum outline size (A×B×C) | 116×207×127 | 176×207×127 | 176×207×127 | 116×207×138 | 167×296×162 | 167×296×172 |
| Installation size (D×E) | 60×150 | 130×150 | 130×150 | 60×150 | 105×205 | 105×205 |
| n×Φ | 3×Φ6 | | | 3×Φ6 | 4×Φ6.2 | 4×Φ6.2 |
| Reference picture | See Fig. 1 | | | See Fig. 2 | See Fig. 3 | See Fig. 4 |

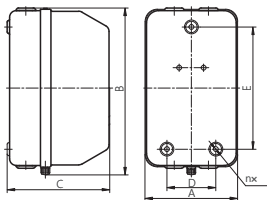


Figure 1 Outline and installation size of NQ2-15, 15N, 15NB

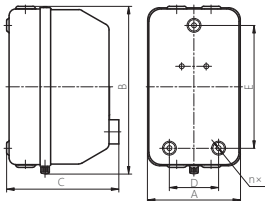


Figure 2 Outline and installation size of NQ2-15P

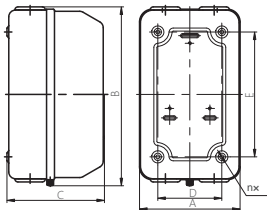


Figure 3 Outline and installation size of NQ2-33

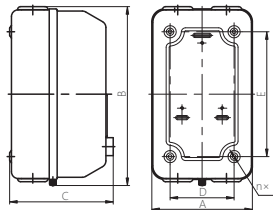


Figure 4 Outline and installation size of NQ2-33P

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. 5.

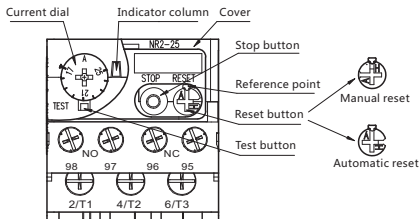


Figure 5 Panel layout of the thermal relay

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. 6 – Fig. 9 for the starter wiring diagram.

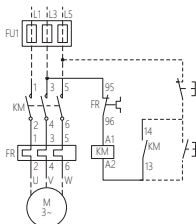


Figure 6 Control circuit voltage same as main circuit voltage (three-phase)

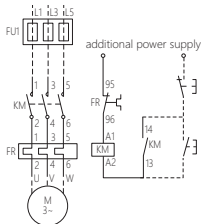


Figure 7 Control circuit voltage different from main circuit voltage (three-phase)

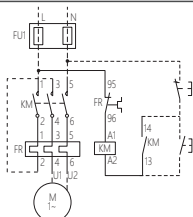


Figure 8 Control circuit voltage same as main circuit voltage (single-phase)

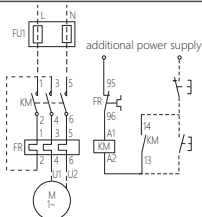
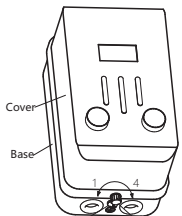


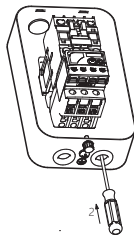
Figure 9 Control circuit voltage different from main circuit voltage (single-phase)

4) Starter installation procedure and method

See Fig. 10 for starter installation instructions.



1. Unscrew connecting screws on the base and cover counterclockwise, and open the cover;
2. Use some tool to pierce the rubber seal rings on both sides for later wiring;
3. Connect the main circuit, control circuit and grounding screws, adjust the setting current value of the thermal relay; and install the product according to the requirements;
4. Put the cover on and tighten the connecting screws clockwise.



Note 1: The connecting wires of the incoming and outgoing lines of the main circuit must be single-core PVC insulated copper cables with prefabricated terminal, whose cross-sectional area is specified in Table 5; the cross-sectional area of connecting wires of the auxiliary circuit should be 1mm². Tighten all the screws during wiring to prevent the starter from slipping and fall due to vibration. Remove the residual of foreign objects to prevent the moving parts of the contactor from getting stuck and the occurrence of short-circuit accidents.

Note 2: Choose screws no smaller than M5 according to the size of the mounting hole. Add seal ring to the screw to ensure enclosure protection class.

Figure 10 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 ≤ 8 | 1 |
| 8 < I ≤ 12 | 1.5 |
| 12 < I ≤ 20 | 2.5 |
| 20 < I ≤ 25 | 4 |
| 25 < I ≤ 32 | 6 |
| 32 < I ≤ 50 | 10 |
| 50 < I ≤ 65 | 16 |
| 65 < I ≤ 85 | 25 |
| 85 < I ≤ 100 | 35 |

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.

CHINT

QC PASS

NQ2 Series
Electromagnetic Starter
IEC/EN 60947-4-1

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Test date: Please see the packing

ZHEJIANG CHINT ELECTRICS CO., LTD.

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NQ2 Series Electromagnetic Starter User Instruction

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