



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.
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This is the general warning sign. It is used to alert the user to potential hazards. All safety messages that follow this sign shall be obeyed to avoid possible harm.

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 690V and rated control power up to 33kW (current up to 68A) under AC-3, 380/400V application category 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	AC contactor model assembled	Thermal relay model assembled	Current setting range (A)	AC-3						Type of SCPD	Button type of starter with button
				220/230V		380/400V		660/690V			
				Ie(A)	Pe(kW)	Ie(A)	Pe(kW)	Ie(A)	Pe(kW)		
NQ2-15□/1	NC1-12	NR2-25	0.1~0.16	0.16	0.03	0.16	0.04	0.16	0.06	gG2	NP2-EA31 (start) NP2-EA42 (stop)
			0.16~0.25	0.25	0.04	0.25	0.06	0.25	0.12	gG2	
			0.25~0.4	0.4	0.06	0.4	0.09	0.4	0.18	gG2	
			0.4~0.63	0.63	0.09	0.63	0.18	0.63	0.25	gG2	
			0.63~1	1	0.18	1	0.25	1	0.55	gG4	
			1~1.6	1.6	0.25	1.6	0.55	1.6	1.1	gG4	
			1.25~2	2	0.37	2	0.75	2	1.1	gG6	
			1.6~2.5	2.5	0.37	2.5	0.75	2.5	1.5	gG6	
			2.5~4	4	0.75	4	1.5	4	3	gG10	
			4~6	6	1.1	6	2.2	6	4	gG16	
			5.5~8	8	1.5	8	3	8	5.5	gG20	
			7~10	10	2.2	10	4	8.9	7.5	gG20	
NQ2-15□/2	NC1-18	NR2-25	9~13	12	3	12	5.5	-	-	gG25	
			7~10	10	2.2	10	4	10	7.5	gG20	
			9~13	13	3	13	5.5	12	10	gG25	
			12~18	18	4	18	7.5	-	-	gG35	
NQ2-15□/3	NC1-25	NR2-25	9~13	13	3	13	5.5	13	11	gG25	
			12~18	18	4	18	7.5	18	15	gG35	
			17~25	25	5.5	25	11	-	-	gG50	

Table 2 (continued)

Model	AC contactor model assembled	Thermal relay model assembled	Current setting range (A)	AC-3						Type of SCPD	Button type of starter with button
				220/230V		380/400V		660/690V			
				Ie(A)	Pe(kW)	Ie(A)	Pe(kW)	Ie(A)	Pe(kW)		
NQ2-15□/4	NC1-32	NR2-25	17~25	25	5.5	25	11	21	18.5	gG50	NP2-EA31 (start) NP2-EA42 (stop)
		NR2-36	23~32	32	7.5	32	15	-	-	gG63	
			28~36	32	7.5	32	15	-	-	gG80	
NQ2-33□/1	NC1-65	NR2-93	23~32	32	7.5	32	15	32	30	gG63	
			30~40	40	11	40	18.5	40	33	gG100	
			37~50	50	11	50	22	42	33	gG100	
			48~65	52	15	52	25	-	-	gG100	
NQ2-33□/2	NC1-95	NR2-93	30~40	40	11	40	18.5	40	37	gG100	
			37~50	50	11	50	22	49	37	gG100	
			48~65	65	18.5	65	30	-	-	gG100	
			55~70	68	18.5	68	33	-	-	gG125	
			63~80	68	25	68	33	-	-	gG125	

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 ($\times 10^4$ times)	AC-3	100			50	50	
	AC-4	20			10	10	
Mechanical life ($\times 10^4$ times)		1000			100	600	100
Coil power (VA)	Pick-up power	NQ2-15□/1~2: $\leq 70VA$; NQ2-15□/3~4: $\leq 110VA$; NQ2-33□/1~2: $\leq 300VA$					
	Holding power	NQ2-15□/1: $\leq 9VA$; NQ2-15□/2: $\leq 9.5VA$; NQ2-15□/3~4: $\leq 14VA$; NQ2-33□/1~2: $\leq 57VA$					
Operating range	Pull-in voltage	(85%~110%) U_s					
	Release voltage	(20%~75%) U_s					
Pole impedance (Ω)		≤ 0.05					
Rated conditional short-circuit current, I_q (kA) (corresponds to 400V testing voltage)		50					
Coordination type		Type "2" coordination					
Enclosure protection class		IP40					
Rated duties		Eight-hour duty, Uninterrupted duty, Intermittent periodic duty					
Trip class		10A					

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)	116×207×133	176×207×133	176×207×133	116×207×143	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

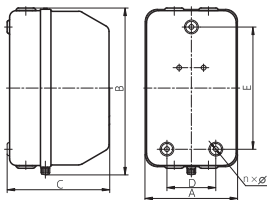


Figure 1 Outline and installation size of NQ2-15, 15N, 15NB

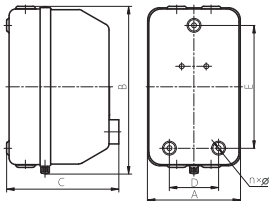


Figure 2 Outline and installation size of NQ2-15P

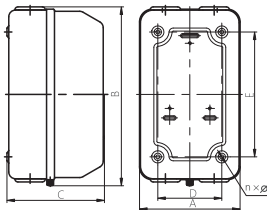


Figure 3 Outline and installation size of NQ2-33

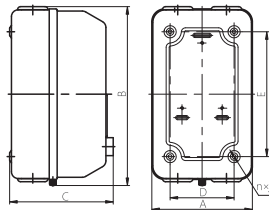


Figure 4 Outline and installation size of NQ2-33P

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.

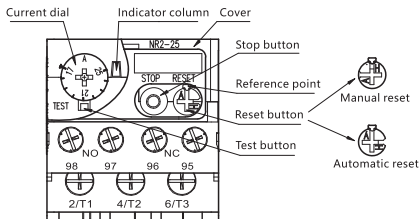


Figure 5 Panel layout of the thermal relay

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.

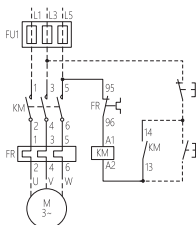


Figure 6 Control circuit voltage same as main circuit voltage (three-phase)

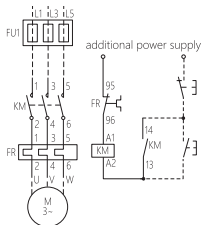


Figure 7 Control circuit voltage different from main circuit voltage (three-phase)

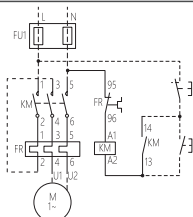


Figure 8 Control circuit voltage same as main circuit voltage (single-phase)

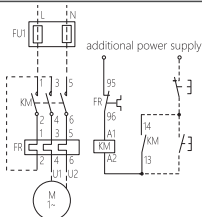
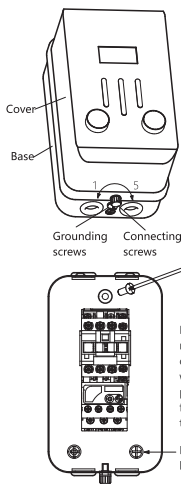


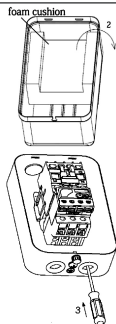
Figure 9 Control circuit voltage different from main circuit voltage (single-phase)

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. If there is a foam cushion in the cover, remove the foam cushion from the cover;
3. Use some tool to pierce the rubber seal rings on both sides for later wiring;
4. Connect the main circuit, control circuit and grounding screws, adjust the current setting value of the thermal relay; and install the product according to the requirements;
5. 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)
$0 < I \leq 8$	1
$8 < I \leq 12$	1.5
$12 < I \leq 20$	2.5
$20 < I \leq 25$	4
$25 < I \leq 32$	6
$32 < I \leq 50$	10
$50 < I \leq 65$	16
$65 < I \leq 85$	25
$85 < I \leq 100$	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 current setting 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 current setting 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 current setting 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

Check 18

Test date: Please see The packing

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NQ2 Series Electromagnetic Starter User Instruction

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