



NS2-80
AC Motor 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 User Purpose

The NS2-80 AC motor starter (hereinafter referred to as starter) is applicable to circuits with frequency of AC 50Hz or 60Hz, rated operating voltage of 690V and below, and current range from 20A to 80A, for infrequent start control of 3-phase AC motor and protection for short circuit, overload and phase failure. It can also be used for protection of distribution line and infrequent load transfer, or used as isolator.

2 Environmental Conditions and Key Technical Parameters

Table 1 Environmental Conditions

Environmental conditions	
Ambient temperature (°C)	-5°C~+40°C, with average temperature within 24h not exceeding +35°C.
Hot and humid atmospheric conditions	Relative humidity should not exceed 50% at +40°C, up to 90% at +20°C.
Altitude	No influence below 2000m
Pollution class/installation category	Class 3/Category III

Table 2 Main Circuit Technical Parameters 1

No.	Model	Frame size rated current I_{nm} A	Rated current of release I_n A	Setting current range of release A	Setting current value of short circuit current release I_r A	Rated limit short-circuit breaking capacity I_{cu} , Rated operating short-circuit breaking capacity I_{cs} kA				Flashover distance mm
						400/415V		690V		
						I_{cu}	I_{cs}	I_{cu}	I_{cs}	
1	NS2-80	80	25	20~25	350	50	17.5	4	2	50
2			32	23~32	448	50	17.5	4	2	
3			40	30~40	560	50	17.5	4	2	
4			50	37~50	700	50	17.5	4	2	
5			65	48~65	910	50	17.5	4	2	
6			80	63~80	1120	50	17.5	4	2	

Table 3 Main Circuit Technical Parameters 2

No.	Content	Parameters
1	Rated operating voltage $U_e(V)$	690V and below
2	Rated frequency (Hz)	50/60
3	Rated duty system, specify level of intermittent duty (if any)	Continuous duty system
4	Rated insulation voltage $U_i(V)$	690
5	Rated impulse withstand voltage $U_{imp}(kV)$	8
6	Enclosure protection class	IP20
7	Strip length of conductor (wire/busbar) before being inserted into terminals (mm)	10
8	Cross-sectional area of conductor (wire/busbar) (mm^2)	4~25
9	Maximum allowable number of conductors (wire/busbar)	1
10	Size of terminal fastening screw (or bolt)	M8
11	Tightening torque of terminal fastening screw (N.m)	6
12	Operation frequency (time/hour)	≤ 25
13	Available contactor	NC1, NC8

Table 4 Basic Parameters of Auxiliary Contacts

Name	Model	Terminal mark	Rated insulation voltage U_i V	Conventional free air thermal current I_{th} A	Application category	Rated operating voltage U_e V	Rated operating current I_e A
Instantaneous auxiliary contact assembly	NS2-AE20	13-14, 23-24	250	2.5	AC-15	230/240	0.5
					DC-13	60	0.15
Instantaneous auxiliary contact assembly	NS2-AE11	13-14, 21-22	250	2.5	AC-15	230/240	0.5
					DC-13	60	0.15

Continued table 4

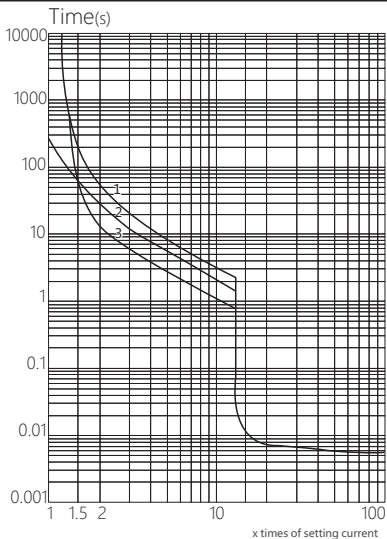
Name	Model	Terminal mark	Rated insulation voltage U_i V	Conventional free air thermal current I_{th} A	Application category	Rated operating voltage U_e V	Rated operating current I_e A
Instantaneous auxiliary contact assembly	NS2-AU20 (NS2-80)	(73)43-44 (74), (63)33-34 (64)	690	6	AC-15	230/240	3.3
						380/415	2.2
					DC-13	220	0.5
Instantaneous auxiliary contact assembly	NS2-AU11 (NS2-80)	(73)43-44 (74), (61)31-32 (62)	690	6	AC-15	230/240	3.3
						380/415	2.2
					DC-13	220	0.5

Table 5 Models and Basic Parameters of Undervoltage Release and Shunt Release

Name	Model	Terminal mark	Rated insulation voltage U_i V	Rated control circuit voltage U_c
Undervoltage release	NS2-UV110	D1/D2	690	110V ~ 115V/50Hz or 127V/60Hz
	NS2-UV220	D1/D2		220V ~ 240V/50Hz
	NS2-UV380	D1/D2		380V ~ 400V/50Hz or 440V/60Hz
Shunt release	NS2-SH110	C1/C2		110V ~ 115V/50Hz or 127V/60Hz
	NS2-SH220	C1/C2		220V ~ 240V/50Hz
	NS2-SH380	C1/C2		380V ~ 400V/50Hz or 440V/60Hz

Table 6 Instantaneous Trip Characteristics

No.	Test current	Initial status	Set time	Expected results
1	0.8I _r	Cold state	$t \geq 0.2s$	No trip
2	1.2 I _r	Cold state	$t < 0.2s$	Trip



- 1 Start from cold state, 3 poles
2 Start from cold state, 2 poles
3 Start from thermal state, 3 poles

Figure 1 Time – current characteristic curve (20°C)

3 Installation

3.1 Installation

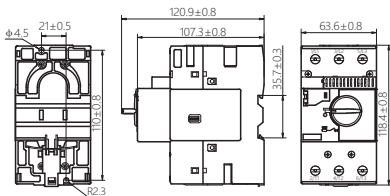


Figure 2 Outline and installation dimensions of NS2-80

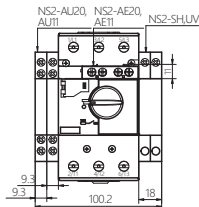


Figure 3 Positions and dimensions of accessories

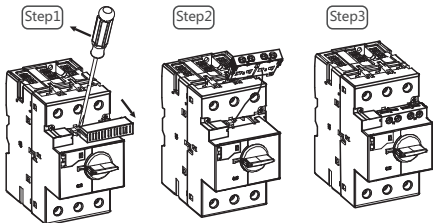


Figure 4 Assembly method of NS2-AE

See Figure 5 for assembly procedure of starter and auxiliary contacts when the starter is disconnected:

Confirm the starter is disconnected ;

Step1: Hang the front end of the auxiliary contacts on the slot at the left front of the starter and move the auxiliary contacts towards the starter;

Step2: Before the extension bar at the center of the auxiliary contacts touches the starter, use a screwdriver to push the central slot of the auxiliary contacts so it stays at the top; Push the auxiliary contacts towards the starter, press and hold the blue button at the end of the auxiliary contacts and fit it into the starter;

Step3: After fitting the auxiliary contacts, break and make the starter for 5 – 10 times, check if the slot at the center of the auxiliary contacts can move together with the starter reliably. In the meantime, check if the auxiliary contacts are powered-on normally; if there is any abnormality, repeat step1 – step3).

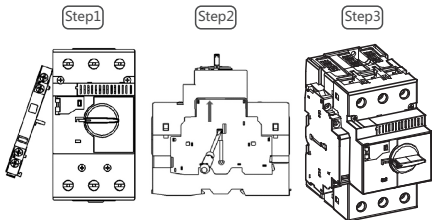


Figure 5 Assembly method of NS2-AU

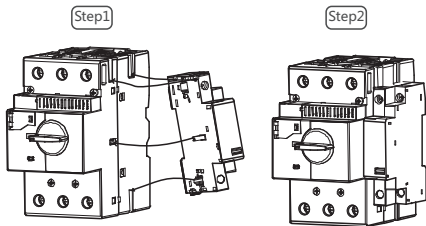


Figure 6 Assembly method of NS2-SH/UV

3.2 Wiring

Single core PVC insulated copper wire is used, see Table 7 for cross-sectional area of wires.

Table 7 Operating current and cross-sectional area of wires

Current range A	Nominal cross-sectional area of wires mm²
12 < I ≤ 20	2.5
20 < I ≤ 25	4.0
25 < I ≤ 32	6.0
32 < I ≤ 50	10
50 < I ≤ 65	16
65 < I ≤ 80	25

3.3 Adjustment and Inspection

1) Check if the rated voltage (U_e) of the starter matches with the actual control voltage of the power supply.

2) Check if the rated operating current of the motor is within the setting current range of the starter.

3) Check if the starter can operate normally: Turn the knob of the starter to 1 and press TEST button, you should hear the starter is disconnected and the knob should be turned to O. If not, please replace the starter.

4) The operating current of the starter (setting current value of thermal element) should be determined based on the rated current of the motor. If you need to use a setting current value between two scales, you can slightly turn the cam proportionally and make adjustment during actual operation.

3.4 Selection of backup fuse

Protection will be provided by the starter if the short circuit current is smaller than or equal to the rated limit short circuit breaking capacity of the starter; if the short circuit current is bigger than the rated limit short circuit breaking capacity of the starter, protection will be provided by fuse or circuit breaker. See Table 8 for the models and current of the backup fuse of the starter.

Table 8 Models and current of the backup fuse of the starter

No.	Rated current of release In A	Setting current range Ie A	Specifications of backup fuse				Standard rated power of 3-phase motor kW	
			400V/415V		690V		AC-3	
			aM A	gG A	aM A	gG A	400V/415V	690V
1	25	20~25	250	315	160	200	11	18.5
2	32	23~32	250	315	160	200	15	22
3	40	30~40	250	315	160	200	18.5	37
4	50	37~50	315	400	200	250	22	45
5	65	48~65	315	400	200	250	30	55
6	80	63~80	315	400	200	250	37	63

4 Maintenance

Clean the dust on the motor starter everyday. Conduct product test and maintenance once half a year to ensure the flexibility of the operating mechanism and the good contact of the contacts. Tighten the terminal screws according to specified torque, and coordinate the load protection capacity of the motor starter according to commissioning requirements.

The starter should be handled carefully during transportation and installation. It is forbidden to use crane to handle the starter which can damage the product and change its protection features.

Table 9 Analysis and Troubleshooting of Faults

Symptoms	Cause analysis	Troubleshooting method and precautions
The starter operates in advance.	The setting current of the starter is smaller than the actual operating current of the motor.	Use the cam to fine tune the product to match the setting current matches with the actual current of the motor.
	Strong impact or vibration	Check the installation site and eliminate the fault to match the product is free from strong impact or vibration.
	Frequent start of motor	There should be a certain interval between each start of the motor. The maximum start frequency is 25 times/hour.
	The cross-sectional area of the connecting wire is too small.	Select standard wire according to Table 7.
The starter does not operate.	The setting current of the starter is bigger than the rated current of the motor.	Use the cam to fine tune the product to match the setting current matches with the actual current of the motor.
	The cross-sectional area of the connecting wire is too big.	Select standard wire according to Table 7.

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 according to local regulations.

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QC PASS

NS2-80
AC Motor Starter
IEC/EN 60947-2
IEC/EN 60947-4-1

Check 28

Test date: Please see the packing

ZHEJIANG CHINT ELECTRICS CO.,LTD.

CHNT

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NS2-80

AC Motor Starter

User Instruction

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