NO:2020.04

CHINT ELECTRICS

NS2-25(X)、NS2-32(X)、NS2-32H
AC Motor Starter

User Instruction

Standard: IEC/EN 60947-2
IEC/EN 60947-4-1

⚠ 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 Use Purpose

NS2-25(X), NS2-32(X), NS2-32H AC motor starters (hereinafter referred to as starters) are applicable to circuits with frequency of AC 50Hz or 60Hz, rated operating voltage up to 690V and current from 0.1 to 32A. They are used for infrequent start control of 3-phase AC motor and they can protect motor from short circuit, overload and loss of phase. They can also be used for distribution line protection and infrequent load transfer or used as isolators.

2 Main Technical Parameters

Table 1 Main technical parameters

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

Technical parameters										
No.	Model	Frame size rated current I_{nm} A	Release rated current I_n A	Adjustment range of release setting current A	Release setting current value for short circuit current I_r A	Rated ultimate short circuit breaking capacity I_{cu},Rated operating short circuit breaking capacity I_{cs} kA				Arc distance mm
						400/415V		690V		
						I_{cu}	I_{cs}	I_{cu}	I_{cs}	
1	NS2-25 NS2-25X	25	0.16	0.1~0.16	1.5	100	100	100	100	40
2			0.25	0.16~0.25	2.4	100	100	100	100	
3			0.4	0.25~0.4	5	100	100	100	100	
4			0.63	0.4~0.63	8	100	100	100	100	
5			1	0.63~1	13	100	100	100	100	

Table 1 (continued)

6	NS2-25 NS2-25X	25	1.6	1~1.6	22.5	100	100	100	100	40
7			2.5	1.6~2.5	33.5	100	100	3	2.25	
8			4	2.5~4	51	100	100	3	2.25	
9			6.3	4~6.3	78	100	100	3	2.25	
10			10	6~10	138	15	7.5	3	2.25	
11			14	9~14	170	15	7.5	3	2.25	
12			18	13~18	223	15	7.5	3	2.25	
13			23	17~23	327	15	6	3	2.25	
14			25	20~25	327	15	6	3	2.25	
15	NS2-32 NS2-32X	32	32	24~32	416	10	5	3	2.25	40
16	NS2-32H	32	0.16	0.1~0.16	1.5	100	100	100	100	40
17			0.25	0.16~0.25	2.4	100	100	100	100	
18			0.4	0.25~0.4	5	100	100	100	100	
19			0.63	0.4~0.63	8	100	100	100	100	
20			1	0.63~1	13	100	100	100	100	
21			1.6	1~1.6	22.5	100	100	100	100	
22			2.5	1.6~2.5	33.5	100	100	4	4	
23			4	2.5~4	51	100	100	4	4	
24			6.3	4~6.3	78	100	100	4	4	
25			10	6~10	138	100	100	4	4	
26			14	9~14	170	50	25	4	4	
27			18	13~18	223	50	25	4	4	
28			23	17~23	327	50	25	4	4	
29			25	20~25	327	50	25	4	4	
30			32	24~32	416	50	25	4	4	

Table 2 Technical parameters and performance

No.	Content	Parameters
1	Rated operating voltage Ue(V)	690V and below
2	Rated frequency (Hz)	50/60Hz
3	Rated duty system, specify intermittent duty level (if any)	Long term duty system
4	Rated insulation voltage Ui(V)	690V
5	Rated impulse withstand voltage Uimp(kV)	8kV
6	Enclosure protection class	IP20, IP55 (Waterproof box)
7	Conductor (wire/conducting bar) strip length before being inserted into terminal (mm)	10
8	Conductor (wire/conducting bar) sectional area mm^2	1~6
9	Allowable maximum number of conductor (wire/conducting bar) to be inserted	2
10	Size of fixing screws (or bolts) at wiring end	M4
11	Tightening torque for fixing screws at wiring end (N.m)	1.7
12	Operating frequency (times/hour)	≤30

Table 3 Basic parameters of auxiliary contacts and fault signal contact

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

Table 3 (continued)

Instantaneous auxiliary contact block	NS2-AU20	(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 block	NS2-AU11	(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
Fault signal contact and instantaneous auxiliary contact block	NS2-FA0110	95-96	250	2.5	AC-14	230/240	0.3
					DC-13	60	0.15
		53-54	690	6	AC-15	230/240	3.3
						380/415	2.2
					DC-13	220	0.5
Fault signal contact and instantaneous auxiliary contact block	NS2-FA0101	95-96	250	2.5	AC-14	230/240	0.3
					DC-13	60	0.15
		51-52	690	6	AC-15	230/240	3.3
						380/415	2.2
					DC-13	220	0.5
Fault signal contact and instantaneous auxiliary contact block	NS2-FA1010	97-98	250	2.5	AC-14	230/240	0.3
					DC-13	60	0.15
		53-54	690	6	AC-15	230/240	3.3
						380/415	2.2
					DC-13	220	0.5
Fault signal contact and instantaneous auxiliary contact block	NS2-FA1001	97-98	250	2.5	AC-14	230/240	0.3
					DC-13	60	0.15
		51-52	690	6	AC-15	230/240	3.3
						380/415	2.2
					DC-13	220	0.5

Table 4 Model and basic parameters of undervoltage release and shunt release

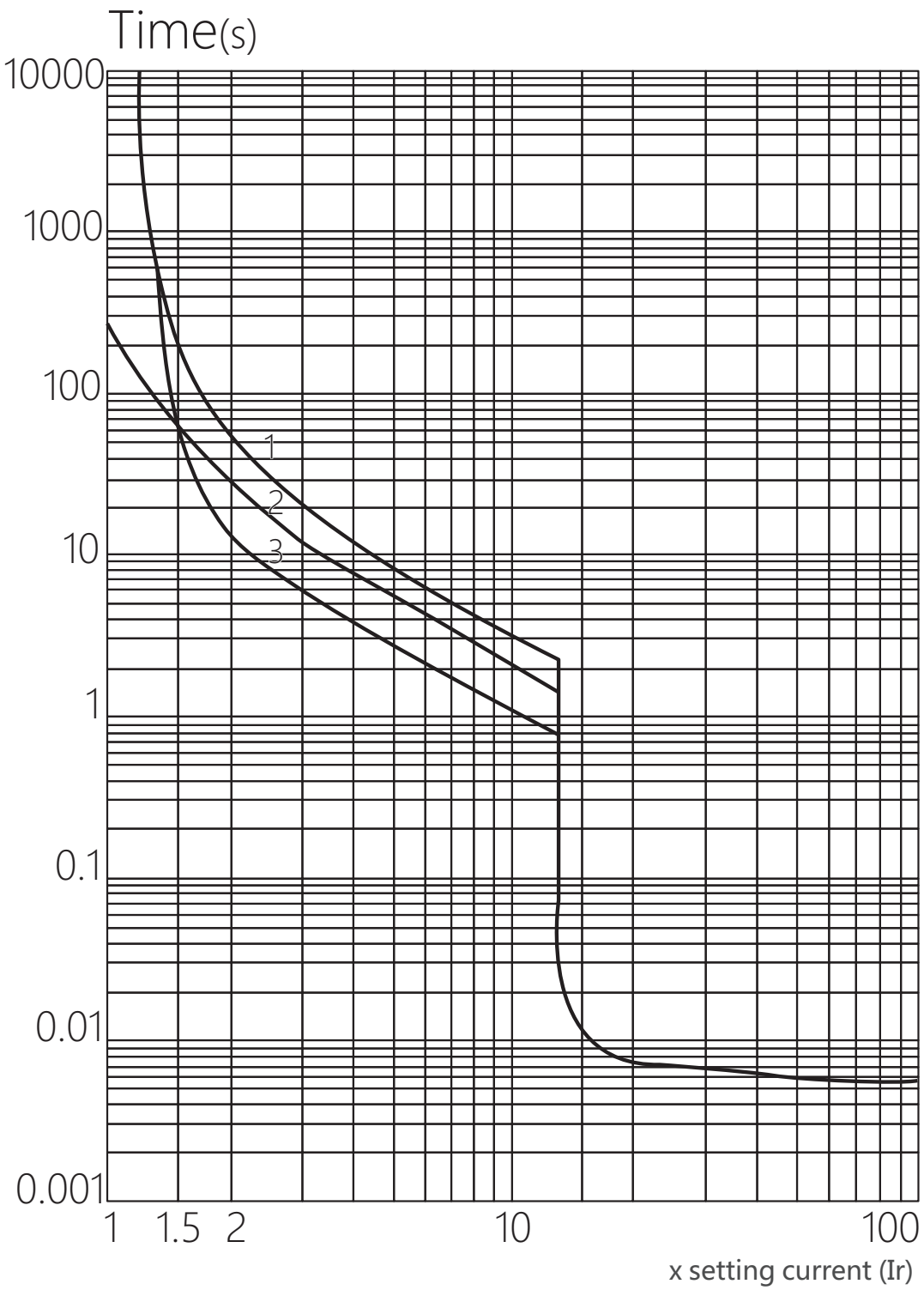
Name	Model	Terminal mark	Rated insulation voltage U_i V	Rated control circuit voltage U_c
Undervoltage release	NS2-UV110	D1/D2	690	110V - 115V/50Hz or 127V/60Hz
	NS2-UV220	D1/D2		220V - 240V/50Hz
	NS2-UV380	D1/D2		380V - 400V/50Hz or 440V/60Hz
Shunt release	NS2-SH110	C1/C2		110V - 115V/50Hz or 127V/60Hz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

Table 5 Characteristics of waterproof box

Name	Model	Protection class	Applicable products
Waterproof mounting box	NS2-MC	IP55	NS2-25, NS2-32
Waterproof mounting box with emergency stop button	NS2-MC01		NS2-25, NS2-32
Waterproof mounting box	WPB-1		NS2-25X, NS2-32X

Table 6 Characteristics of instantaneous trip

No.	Test current	Initial state	Specified time	Expected results
1	0.8Ir	Cold state	$t \geq 0.2s$	Do not trip
2	1.2 Ir	Cold state	$t < 0.2s$	Trip



(1) 3 poles from cold state
(2) 2 poles from cold state
(3) 3 poles from hot state

Figure 1 Time – current characteristic curve (20℃)

3 Installation

3.1 Installation

Unit: mm

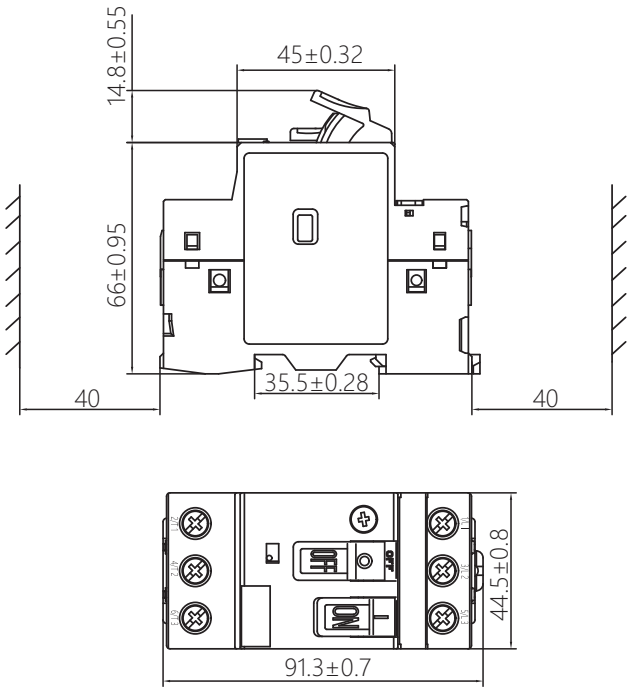


Figure 2 Overall and installation dimensions of NS2-25\NS2-32

Unit: mm

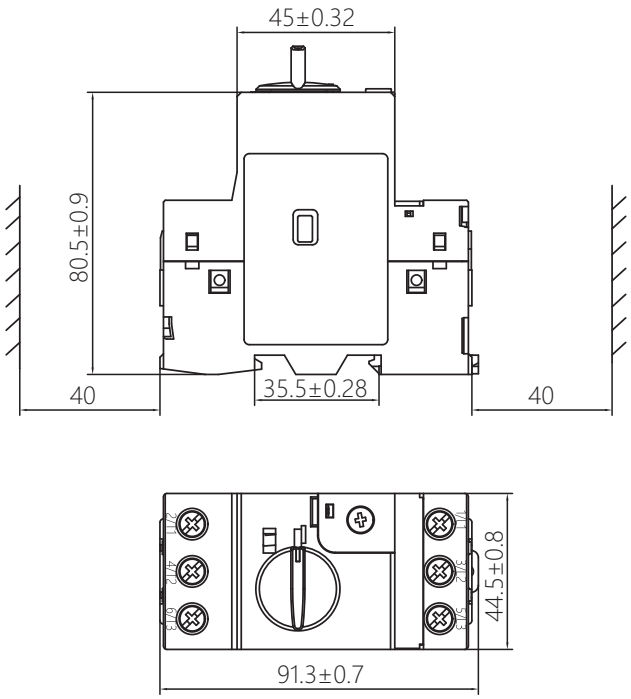


Figure 3 Overall and installation dimensions of NS2-25X\NS2-32X

Unit: mm

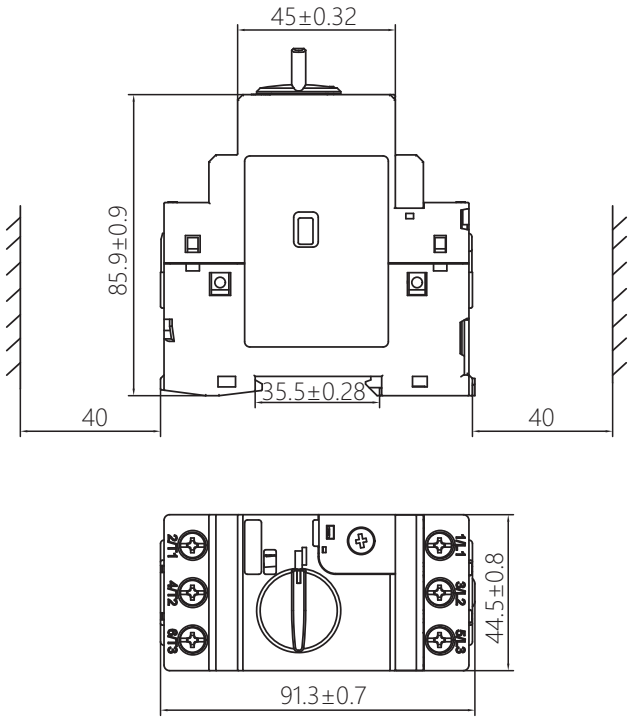


Figure 4 Overall and installation dimensions of NS2-32H

Unit: mm

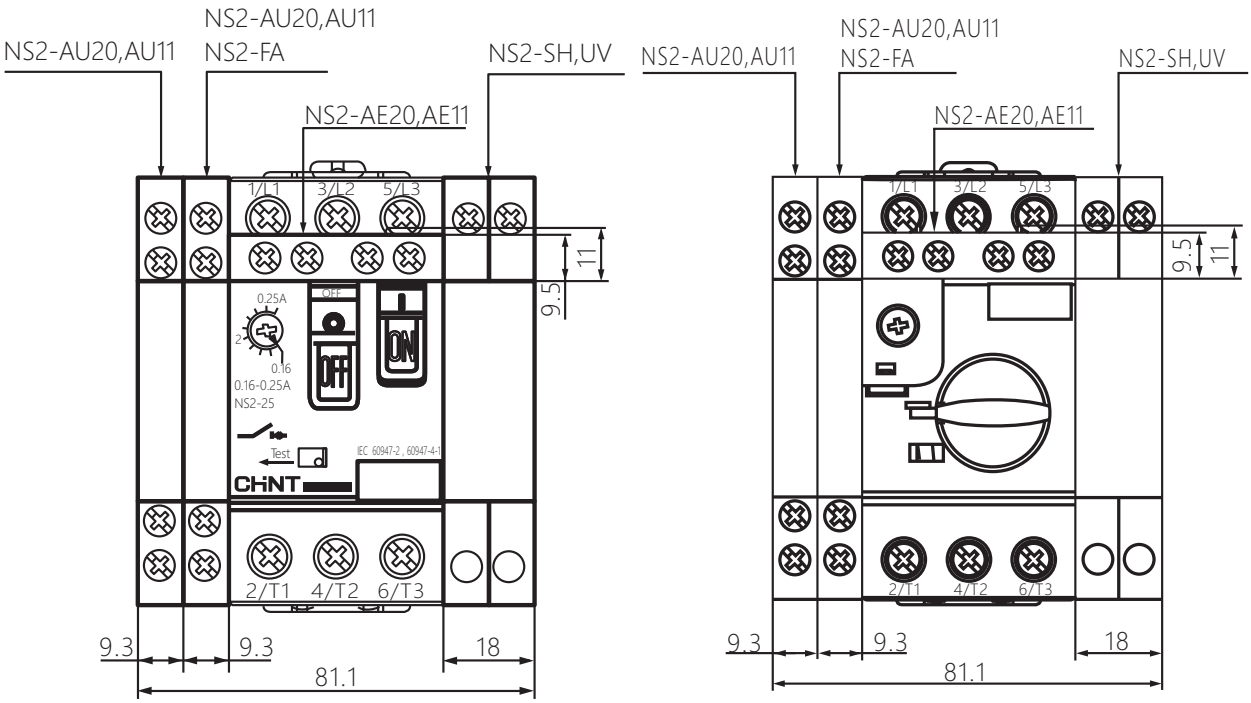


Figure 5 Assembly positions and dimensions of accesories

Unit: mm

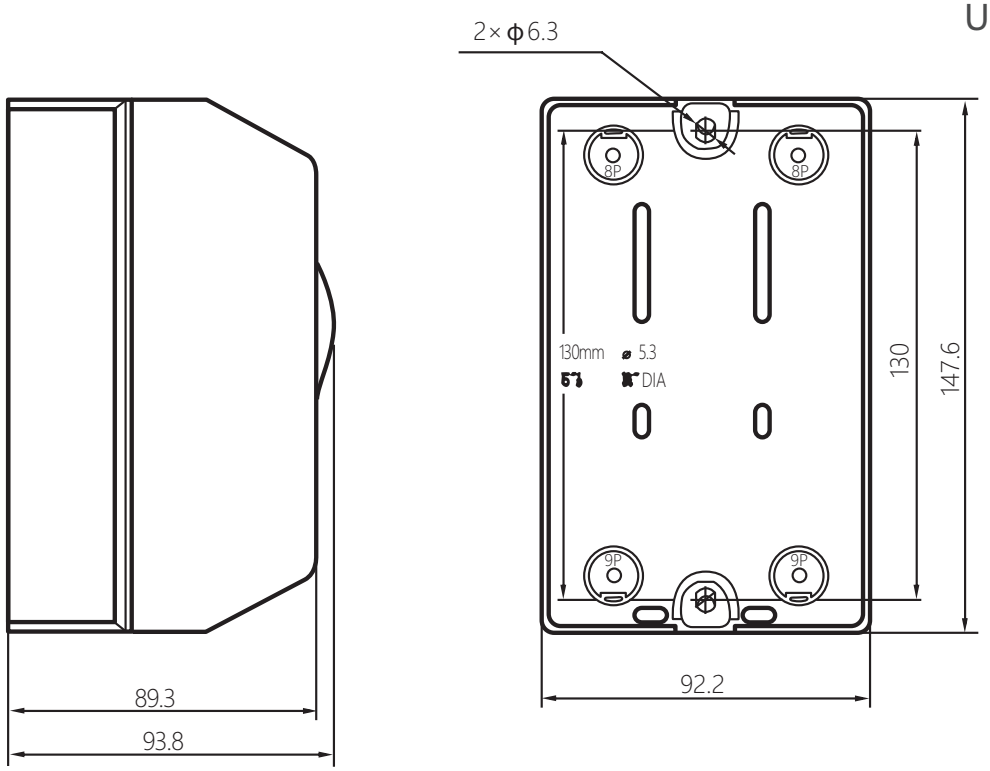


Figure 6 Overall and installation dimensions of NS2-MC

Unit: mm

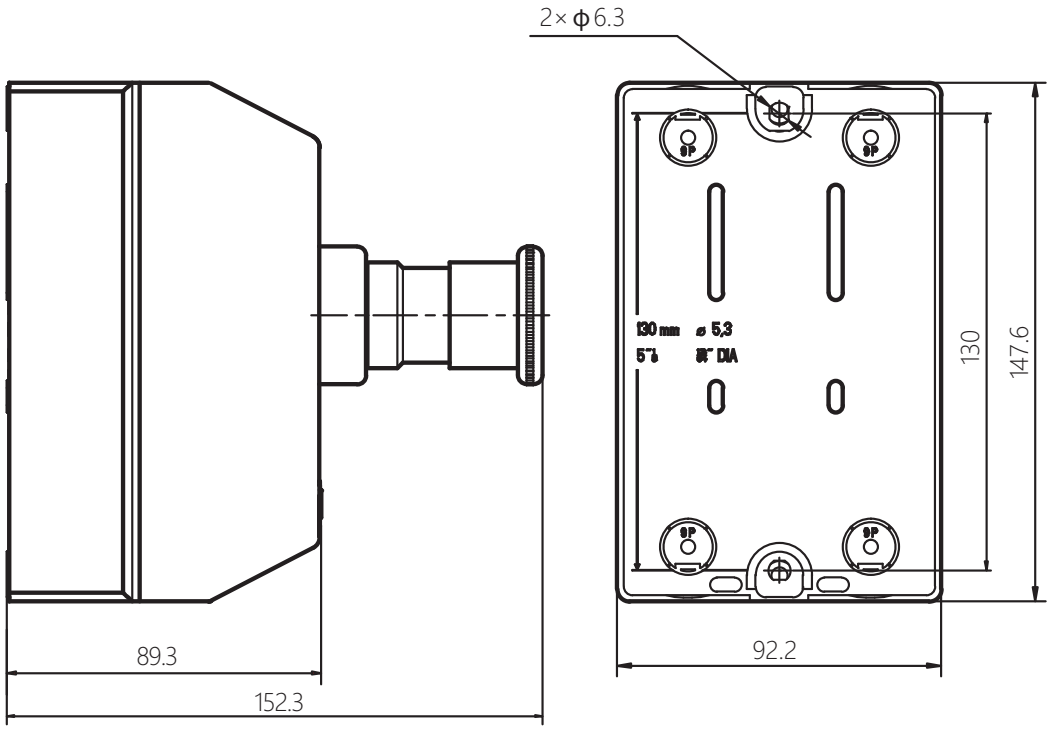


Figure 7 Overall and installation dimensions of NS2-MC01

Unit: mm

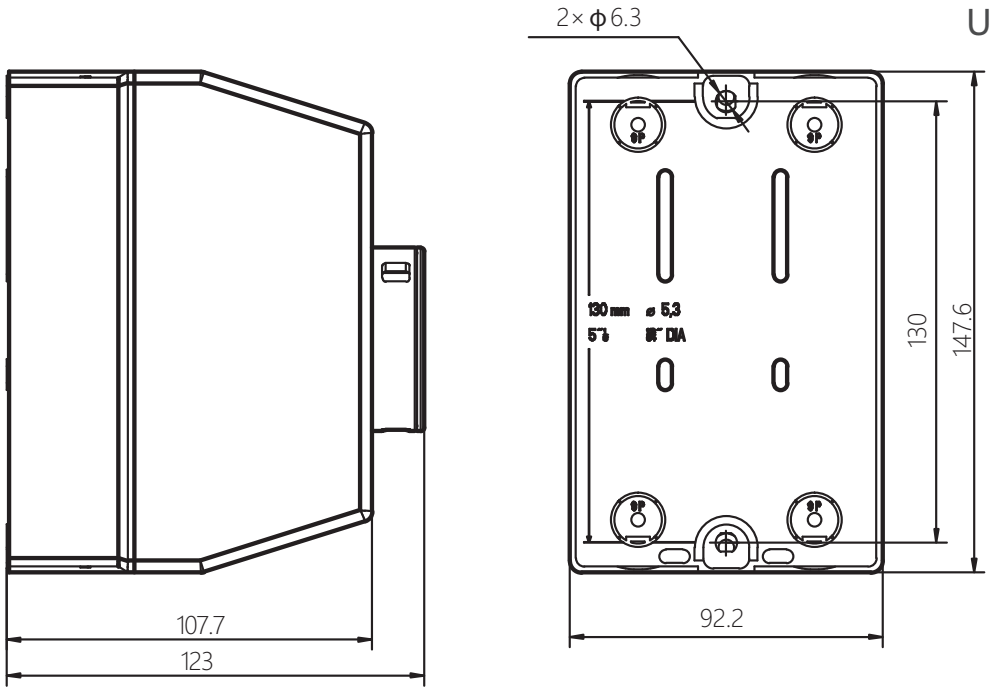


Figure 8 Overall and installation dimensions of WPB-1

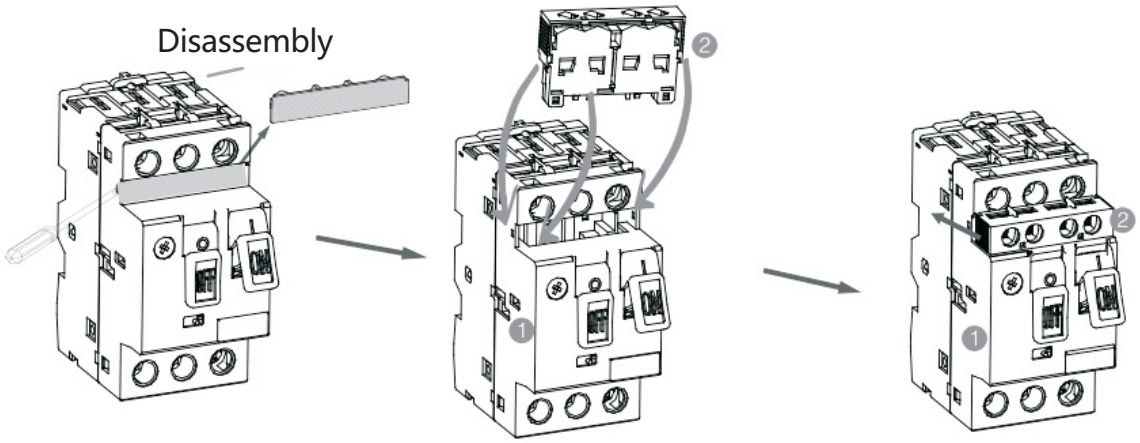


Figure 9 Assembly method for NS2-AE

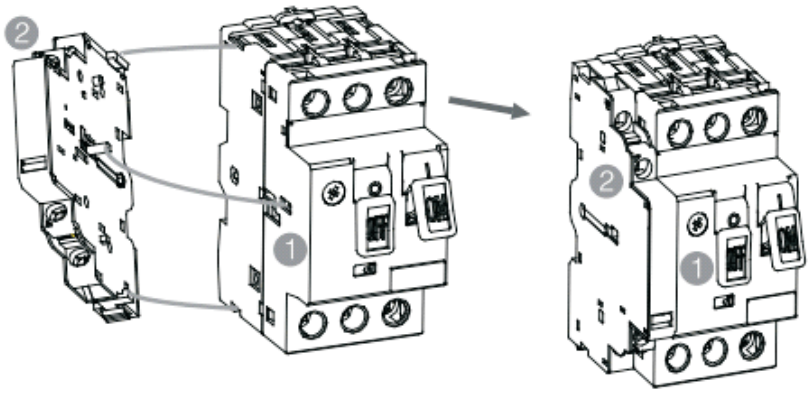


Figure 10 Assembly method for NS2-AU

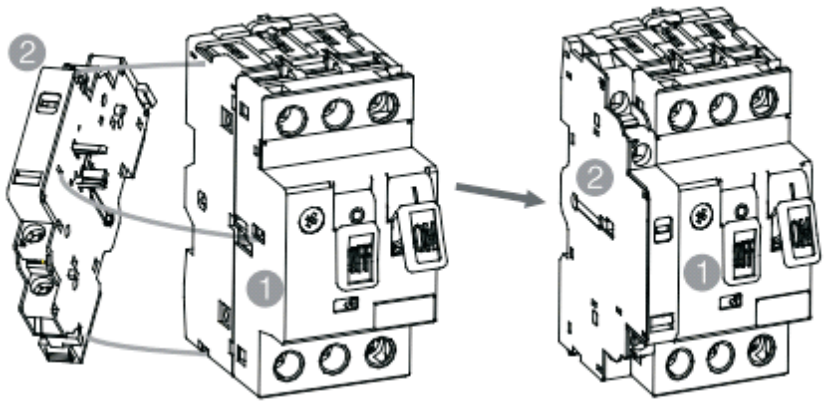


Figure 11 Assembly method for NS2-FA

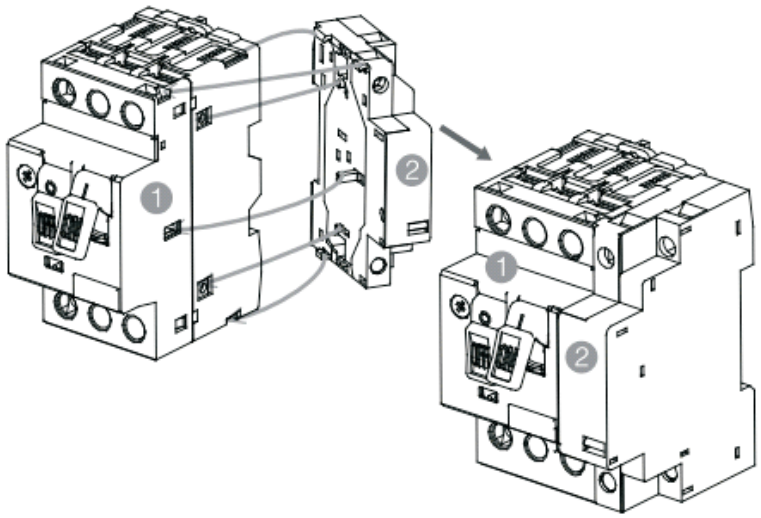


Figure 12 Assembly method for NS2-UV

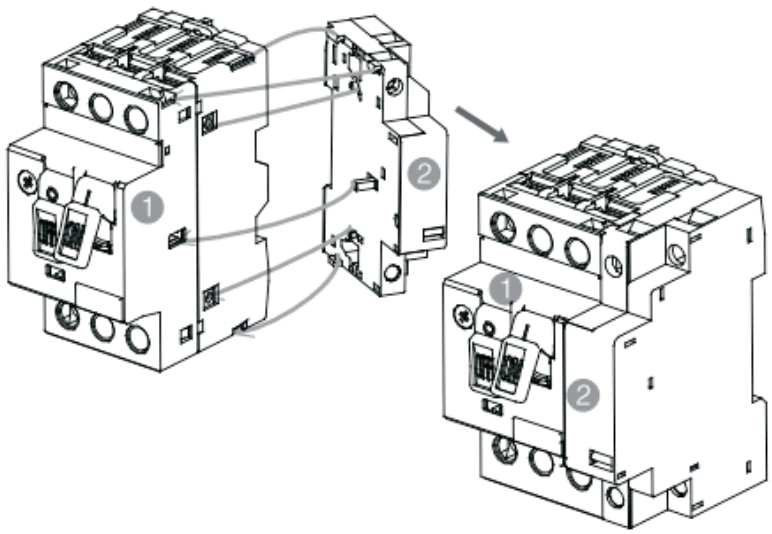


Figure 13 Assembly method for NS2-SH

3.2 Wiring

Use single core PVC insulated copper conductor for wiring, see Table 7 for sectional area of the wire.

Table 7 Connecting wire for operating current

Current range A	Nominal sectional area of connecting wire mm^2
0 < I≤8	1.0
8 < I≤12	1.5
12 < I≤20	2.5
20 < I≤25	4.0
25 < I≤32	6.0

3.3 Adjustment and inspection

1) Check if the rated voltage of the starter Ue is consistent with the actual control voltage of power.

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

3) Check if the starter can operate smoothly: press down the green button of the starter or turn the knob to ON position. Flip the guide plate beside the TEST mark on the cover according to the direction shown by the arrow. You can hear the operation sound of the contact, and the green button will bounce back or the knob will be turned to OFF position. Replace the starter if there is any abnormality.

4) The operating current of the starter (setting current value of thermal element) should be determined by the rated current of the motor. If the setting current value between two scales is required, turn the cam slightly accordingly. User can make adjustment during operation.

3.4 Coordination of protection

If the short-circuit current is not bigger than the rated ultimate short circuit breaking capacity of the starter, the protection should be provided by the starter; if the short circuit current is bigger than the rated ultimate short

circuit breaking capacity of the starter, the protection should be provided by the fuse or circuit breaker. See Table 8 for model and melt current of the backup fuse of starter.

Table 8 Model and melt current of the backup fuse of starter

No.	Model	Adjustment range of thermal element setting current A	Backup fuse is only needed when the expected short circuit current Icc > Icu rated ultimate short circuit breaking capacity									
			230/240V		400/415V		440V		500V		600V	
			aM A	gl/gG A	aM A	gl/gG A	aM A	gl/gG A	aM A	gl/gG A	aM A	gl/gG A
1	NS2-25(X)	0.1-0.16	★	★	★	★	★	★	★	★	★	★
2		0.16-0.25	★	★	★	★	★	★	★	★	★	★
3		0.25-0.4	★	★	★	★	★	★	★	★	★	★
4		0.4-0.63	★	★	★	★	★	★	★	★	★	★
5		0.63-1	★	★	★	★	★	★	★	★	★	★
6		1-1.6	★	★	★	★	★	★	★	★	★	★
7		1.6-2.5	★	★	★	★	★	★	★	★	16	20
8		2.5-4	★	★	★	★	★	★	★	★	25	32
9		4-6.3	★	★	★	★	50	63	50	63	32	40
10		6-10	★	★	63	80	50	63	50	63	32	40
11		9-14	★	★	63	80	50	63	50	63	40	50
12		13-18	★	★	63	80	50	63	50	63	40	50
13		17-23	80	100	80	100	63	80	50	63	40	50
14		20-25	80	100	80	100	63	80	50	63	40	50
15	NS2-32(X)	24-32	80	100	80	100	63	80	50	63	40	50
16	NS2-32H	0.1-0.16	★	★	★	★	★	★	★	★	★	★
17		0.16-0.25	★	★	★	★	★	★	★	★	★	★
18		0.25-0.4	★	★	★	★	★	★	★	★	★	★

Table 8 (continued)

No.	Model	Adjustment range of thermal element setting current A	Backup fuse is only needed when the expected short circuit current Icc > Icu rated ultimate short circuit breaking capacity									
			230/240V		400/415V		440V		500V		600V	
			aM A	gl/gG A	aM A	gl/gG A	aM A	gl/gG A	aM A	gl/gG A	aM A	gl/gG A
19	NS2-32H	0.4-0.63	★	★	★	★	★	★	★	★	★	★
20		0.63-1	★	★	★	★	★	★	★	★	★	★
21		1-1.6	★	★	★	★	★	★	★	★	★	★
22		1.6-2.5	★	★	★	★	★	★	★	★	20	25
23		2.5-4	★	★	★	★	★	★	★	★	25	32
24		4-6.3	★	★	★	★	★	★	★	★	40	50
25		6-10	★	★	★	★	★	★	50	63	40	50
26		9-14	★	★	★	★	50	63	50	63	50	63
27		13-18	★	★	100	125	63	80	50	63	50	63
28		17-23	★	★	100	125	80	100	50	63	50	63
29		20-25	★	★	100	125	80	100	50	63	50	63
30		24-32	★	★	100	125	80	100	50	63	50	63

Note: ★ means fuse is not needed.

4 Maintenance

Clean the dust on the motor starter timely. Conduct product test and maintenance every half a year to ensure the smooth operation of the product and the good contact of NO and NC contacts. Tighten the terminal screws with specified torque and align the load protection capability of the motor starter according to commissioning requirements.

Be careful when handling and installing the starter. It is prohibited to move the product by crane with strong impact so that the product will not be damaged and its protection characteristics will not change.

Table 9 Analysis and Troubleshooting of Faults

Symptoms	Cause analysis	Troubleshooting method and precautions
Misoperation of starter	The setting current value of the starter is smaller than the actual operating current of the motor.	Fine tune the cam to match the set current matches the actual motor current.
	Strong shock or vibration	Check installation status and conduct troubleshooting. Do not place the product in environment with strong shock or vibration.
	Frequent start of motor	The start frequency of the motor should not exceed 30 times/hour
	The sectional area of the connecting wire is too small.	Use standard wire according to Table 7.
Starter does not operate.	The setting current value of the starter is bigger than the rated current value of the motor.	Fine tune the cam to match the set current matches the actual motor current.
	The sectional area of the connecting wire is too big.	Use 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.

CHINT

QC PASS

NS2-25(X)、NS2-32(X)、NS2-32H
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.

CHINT ELECTRICS

NS2-25(X)、NS2-32(X)、NS2-32H
AC Motor Starter
User Instruction

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