NS2 Manual Motor Starter

NS2-25、NS2-32

NS2-25X、NS2-32X

NS2-32H

NS2-80

1. General

1.1 Certificates: SEMKO, CE, UkrSEPRO, EAC, RCC, UL;

1.2 Electric ratings: AC690V, 25A, 32A, 80A;

1.3 Standard: IEC/EN 60947-2, IEC60947-4-1

2. Type designation

N S 2 - □ □ / □

- Rated current of release
- Code of structural modification
- Frame size rated current (A)
- Design sequence No.
- AC motor starter
- Company code

3. Operating conditions

3.1 Temperature: -5℃ ~ +40℃,
average temperature in 24 hours not exceed +35℃

3.2 Altitude: not exceed 2000m

3.3 Air conditions:
At mounting site, relative humidity not exceed 50% at the max temperature of +40℃, higher relative humidity is allowable under lower temperature,
for example, RH could be 90% at +20℃

3.4 Pollution grade: Grade Ⅲ

3.5 Trip class:
10A(NS2-25, NS2-25X, NS2-32, NS2-32X,NS2-32H)
10 (NS2-80, NS2-80B)

3.6 Rated operational system:
Continuous operational system

3.7 Mounting conditions:
The inclination between the mounting plane and the vertical plane shall not exceed 5°
The product shall be installed and operated at a place without obvious shake, impact and vibration.

D

4. Technical data

4.1 Protection properties
Over-load Protection Properties

Series No.	Multiple of setting current	Initial status	Time		Expected results	Ambient temperature
1	1.05	Cold status	t≥2h		Non-tripping	+20℃±2℃
2	1.20	Heat status (right after test.1)	t < 2h		Tripping	+20℃±2℃
3	1.50	Heat status (right after test.1)	Tripping class	10A t < 2min	Tripping	+20℃±2℃
				10 t < 4min		
4	7.20	Cold status	Tripping class	10A 2s < t≤10s	Tripping	+20℃±2℃
				10 4s < t≤10s		

Phase failure protection properties

Series No.	Multiple of setting current		Initial status	Time	Expected results	Ambient temperature
	Any 2 phases	The other phase				
1	1.0	0.9	Cold status	t≥2h	Non-tripping	+20℃±2℃
2	1.15	0	Heat status (right after test.1)	t < 2h	Tripping	+20℃±2℃

Temperature compensation properties

Series No.	Multiple of setting current	Initial status	Time	Expected results	Ambient temperature
1	1.0	Cold status	t≥2h	Non-tripping	+40℃±2℃
2	1.2	Heat status (right after test.1)	t < 2h	Tripping	+40℃±2℃
3	1.5	Heat status (through 1.0 times rated current ,after thermal equilibrium is reached)	t < 2min	Tripping	+40℃±2℃
4	1.05	Cold status	t≥2h	Non-tripping	-5℃±2℃
5	1.3	Heat status (right after test.3)	t < 2h	Tripping	-5℃±2℃
6	1.5	Heat status (through 1.0 times rated current ,after thermal equilibrium is reached)	t < 4min	Tripping	-5℃±2℃

4.2 Technical parameters

Type	Rated current of release In(A)	Setting current regulation range (A)	Rated ultimate short-circuit breaking Icu , Rated service short-circuit breaking capacity Ics				Arcing distance (mm)
			400/415V		690V		
			Icu	Ics	Icu	Ics	
NS2-25(X)	0.16	0.1 ~ 0.16	100	100	100	100	40
NS2-25(X)	0.25	0.16 ~ 0.25	100	100	100	100	40
NS2-25(X)	0.4	0.25 ~ 0.4	100	100	100	100	40
NS2-25(X)	0.63	0.4 ~ 0.63	100	100	100	100	40
NS2-25(X)	1	0.63 ~ 1	100	100	100	100	40
NS2-25(X)	1.6	1 ~ 1.6	100	100	100	100	40
NS2-25(X)	2.5	1.6 ~ 2.5	100	100	3	2.25	40
NS2-25(X)	4	2.5 ~ 4	100	100	3	2.25	40
NS2-25(X)	6.3	4 ~ 6.3	100	100	3	2.25	40
NS2-25(X)	10	6 ~ 10	100	100	3	2.25	40
NS2-25(X)	14	9 ~ 14	15	7.5	3	2.25	40
NS2-25(X)	18	13 ~ 18	15	7.5	3	2.25	40
NS2-25(X)	23	17 ~ 23	15	6	3	2.25	40
NS2-25(X)	25	20 ~ 25	15	6	3	2.25	40
NS2-32(X)	32	24 ~ 32	10	5	3	2.25	40
NS2-32H	0.16	0.1 ~ 0.16	100	100	100	100	40
NS2-32H	0.25	0.16 ~ 0.25	100	100	100	100	40
NS2-32H	0.4	0.25 ~ 0.4	100	100	100	100	40
NS2-32H	0.63	0.4 ~ 0.63	100	100	100	100	40
NS2-32H	1	0.63 ~ 1	100	100	100	100	40
NS2-32H	1.6	1 ~ 1.6	100	100	100	100	40
NS2-32H	2.5	1.6 ~ 2.5	100	100	4	4	40
NS2-32H	4	2.5 ~ 4	100	100	4	4	40
NS2-32H	6.3	4 ~ 6.3	100	100	4	4	40
NS2-32H	10	6 ~ 10	100	100	4	4	40
NS2-32H	14	9 ~ 14	50	25	4	4	40
NS2-32H	18	13 ~ 18	50	25	4	4	40
NS2-32H	23	17 ~ 23	50	25	4	4	40
NS2-32H	25	20 ~ 25	50	25	4	4	40
NS2-32H	32	24 ~ 32	50	25	4	4	40
NS2-80	25	20~25	50	17.5	4	2	50
NS2-80	32	23~32	50	17.5	4	2	50
NS2-80	40	30~40	50	17.5	4	2	50
NS2-80	50	37~50	50	17.5	4	2	50
NS2-80	65	48~65	50	17.5	4	2	50
NS2-80	80	63~80	50	17.5	4	2	50

4.2.1 Rated power of three phase motor controlled by starter

Type	Rated current of release In(A)	Setting current regulation range (A)	Standard rated power of three phase motor (kW)					
			AC-3，50Hz/60Hz					
			230/240V	400V	415V	440V	500V	690V
NS2-25(X)、NS2-32H	0.16	0.1-0.16	-	-	-	-	-	-
NS2-25(X)、NS2-32H	0.25	0.16-0.25	-	-	-	-	-	-
NS2-25(X)、NS2-32H	0.4	0.25-0.4	-	-	-	-	-	-
NS2-25(X)、NS2-32H	0.63	0.4-0.63	-	-	-	-	-	0.37
NS2-25(X)、NS2-32H	1	0.63-1	-	-	-	0.37	0.37	0.55
NS2-25(X)、NS2-32H	1.6	1-1.6	-	0.37	-	0.55	0.75	1.1
NS2-25(X)、NS2-32H	2.5	1.6-2.5	0.37	0.75	0.75	1.1	1.1	1.5
NS2-25(X)、NS2-32H	4	2.5-4	0.75	1.5	1.5	1.5	2.2	3
NS2-25(X)、NS2-32H	6.3	4-6.3	1.1	2.2	2.2	3	3.7	4
NS2-25(X)、NS2-32H	10	6-10	2.2	4	4	4	5.5	7.5
NS2-25(X)、NS2-32H	14	9-14	3	5.5	5.5	7.5	7.5	9
NS2-25(X)、NS2-32H	18	13-18	4	7.5	9	9	9	11
NS2-25(X)、NS2-32H	23	17-23	5.5	11	11	11	11	15
NS2-25(X)、NS2-32H	25	20-25	5.5	11	11	11	15	18.5
NS2-32(X)、NS2-32H	32	24-32	7.5	15	15	15	18.5	25

4.3 Setting value of instantaneous electromagnetic tripping current of starter

Type	Rated current of release In(A)	Regulating range of setting current of thermal element(A)	Current setting value of instantaneous electromagnetic release Ir(A)
NS2-25(X) NS2-32H	0.16	0.1-0.16	1.5
	0.25	0.16-0.25	2.4
	0.4	0.25-0.4	5
	0.63	0.4-0.63	8
	1	0.63-1	13
	1.6	1-1.6	22.5
	2.5	1.6-2.5	33.5
	4	2.5-4	51
	6.3	4-6.3	78
	10	6-10	138
	14	9-14	170
	18	13-18	223
	23	17-23	327
	25	20-25	327
NS2-32(X)、NS2-32H	32	24-32	416
NS2-80	25	20-25	350
	32	23-32	448
	40	30-40	560
	50	37-50	700
	65	48-65	910
	80	63-80	1120

4.3.1 Action characteristics of instantaneous electromagnetic trip of starter

Test current	Initial state	Set time	Expected results	Ambient air temperature
0.8Ir	Cold state	t≥0.2s	No trip	+20℃±5℃
1.2Ir	Cold state	t < 0.2s	Trip	+20℃±5℃

4.4 Selection of backup fuse

When the expected short-circuit current of the installation site is greater than the rated limit short-circuit breaking capacity of the starter, the type and melt current specification of the backup short-circuit protection fuse shall be provided. For example, gG type fuse can be selected.

Type	Rated current of release In(A)	Setting current regulation range (A)	Current rating of fuse-link of back-up fuse,which Icc > Icu									
			230/240V		400/415V		440V		500V		690V	
			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
NS2-25(X)	0.16	0.1-0.16	★	★	★	★	★	★	★	★	★	★
NS2-25(X)	0.25	0.16-0.25	★	★	★	★	★	★	★	★	★	★
NS2-25(X)	0.4	0.25-0.4	★	★	★	★	★	★	★	★	★	★
NS2-25(X)	0.63	0.4-0.63	★	★	★	★	★	★	★	★	★	★
NS2-25(X)	1	0.63-1	★	★	★	★	★	★	★	★	★	★
NS2-25(X)	1.6	1-1.6	★	★	★	★	★	★	★	★	★	★
NS2-25(X)	2.5	1.6-2.5	★	★	★	★	★	★	★	★	16	20
NS2-25(X)	4	2.5-4	★	★	★	★	★	★	★	★	25	32
NS2-25(X)	6.3	4-6.3	★	★	★	★	50	63	50	63	32	40
NS2-25(X)	10	6-10	★	★	★	★	50	63	50	63	32	40
NS2-25(X)	14	9-14	★	★	63	80	50	63	50	63	40	50
NS2-25(X)	18	13-18	★	★	63	80	50	63	50	63	40	50
NS2-25(X)	23	17-23	80	100	80	100	63	80	50	63	40	50
NS2-25(X)	25	20-25	80	100	80	100	63	80	50	63	40	50
NS2-32(X)	32	24-32	80	100	80	100	63	80	50	63	40	50
NS2-32H	0.16	0.1-0.16	★	★	★	★	★	★	★	★	★	★
NS2-32H	0.25	0.16-0.25	★	★	★	★	★	★	★	★	★	★
NS2-32H	0.4	0.25-0.4	★	★	★	★	★	★	★	★	★	★
NS2-32H	0.63	0.4-0.63	★	★	★	★	★	★	★	★	★	★
NS2-32H	1	0.63-1	★	★	★	★	★	★	★	★	★	★
NS2-32H	1.6	1-1.6	★	★	★	★	★	★	★	★	★	★
NS2-32H	2.5	1.6-2.5	★	★	★	★	★	★	★	★	20	25
NS2-32H	4	2.5-4	★	★	★	★	★	★	★	★	25	32
NS2-32H	6.3	4-6.3	★	★	★	★	★	★	★	★	40	50
NS2-32H	10	6-10	★	★	★	★	★	★	50	63	40	50
NS2-32H	14	9-14	★	★	★	★	50	63	50	63	50	63
NS2-32H	18	13-18	★	★	100	125	63	80	50	63	50	63
NS2-32H	23	17-23	★	★	100	125	80	100	50	63	50	63
NS2-32H	25	20-25	★	★	100	125	80	100	50	63	50	63
NS2-32H	32	24-32	★	★	100	125	80	100	50	63	50	63
NS2-80	25	20-25	-	-	250	315	-	-	-	-	160	200
NS2-80	32	23-32	-	-	250	315	-	-	-	-	160	200
NS2-80	40	30-40	-	-	250	315	-	-	-	-	160	200
NS2-80	50	37-50	-	-	315	400	-	-	-	-	200	250
NS2-80	65	48-65	-	-	315	400	-	-	-	-	200	250
NS2-80	80	63-80	-	-	315	400	-	-	-	-	200	250

5. Other

5.1 Starters accessories

5.1.1 Type, model and specifications of accessories (see Table 10).

Description of accessories	Accessories Model				Accessories Specifications
	NS2-25, NS2-32 applies	NS2-25X, NS2-32X applies	NS2-32H applies	NS2-80 applies	
Undervoltage release	NS2-UV110	NS2-UV110	NS2-UV110	NS2-UV110	110~115V, 50Hz; 127V,60Hz
	NS2-UV220	NS2-UV220	NS2-UV220	NS2-UV220	220~240V, 50Hz
	NS2-UV380	NS2-UV380	NS2-UV380	NS2-UV380	380~400V, 50Hz; 440V,60Hz
Shunt release	NS2-SH110	NS2-SH110	NS2-SH110	NS2-SH110	110~115V, 50Hz; 127V,60Hz
	NS2-SH220	NS2-SH220	NS2-SH220	NS2-SH220	220~240V, 50Hz
	NS2-SH380	NS2-SH380	NS2-SH380	NS2-SH380	380~400V, 50Hz; 440V,60Hz
Instantaneous auxiliary contact (front hanging)	NS2-AE20	NS2-AE20	NS2-AE20	NS2-AE20	2NO
	NS2-AE11	NS2-AE11	NS2-AE11	NS2-AE11	1NO+1NC
Instantaneous auxiliary contact (side hanging)	NS2-AU20	NS2-AU20	NS2-AU20	NS2-AU20(NS2-80)	2NO
	NS2-AU11	NS2-AU11	NS2-AU11	NS2-AU11(NS2-80)	1NO+1NC
Fault signal contact and instantaneous auxiliary contact	NS2-FA0110	NS2-FA0110	NS2-FA0110	-	1NC+1NO
	NS2-FA0101	NS2-FA0101	NS2-FA0101	-	1NC+1NC
	NS2-FA1010	NS2-FA1010	NS2-FA1010	-	1NO+1NO
	NS2-FA1001	NS2-FA1001	NS2-FA1001	-	1NO+1NC
Waterproof mounting box	NS2-MC	WPB-1	-	-	-
Mounting box with emergency stop button	NS2-MC01	-	-	-	-

5.1.2 Undervoltage trip device

NS2-UV110, UV220, UV380'S, performance:

a. Rated insulation voltage Ui (V): 690.

b. Operating characteristics: When the voltage drops to 70% and 35% of the rated voltage range, undervoltage trip device shall act;

Undervoltage trip device in the power supply voltage is less than 35% of the rated voltage of the trip device, the undervoltage trip device should be able to prevent the starter from closing;

when the power supply voltage is equal to or greater than 85% of the rated voltage of the trip device, the undervoltage trip device should guarantee closure of the starter.

NS2-UV

5.1.3 The characteristics of the shunt trip

NS2-SH110, SH220, SH380:

a. Rated insulation voltage Ui (V): 690.

b. Operating characteristics: the operating voltage range of the shunt trip device is rated working voltage of 70% ~ 110%.

NS2-SH

5.1.4 Characteristics of the instantaneous auxiliary contact NS2-Ae20, AE11 (front hanging)

a. rated insulation voltage Ui (V): 250;

b. agreed thermal current Ith (A): 2.5;

c. type , rated voltage and rated operating current (see Table 11) of instantaneous auxiliary contacts.

NS2-AE

Table 11

Utilization category	AC-15				DC-13		
Rated operating voltage Ue (V)	24	48	110/127	230/240	24	48	60
Rated operating current Ie (A)	2	1.25	1	0.5	1	0.3	0.15
Normal operating power P (W)	48	60	127	120	24	15	9

5.1.5 Instantaneous auxiliary contact NS2-AU20, AU11 performance (side hanging):
a. rated insulation voltage Ui (V): 690;
b. agreed thermal current Ith (A): 6;
c. type, rated voltage and rated operating current of the instantaneous auxiliary contacts(see Table 12).

NS2-AU

Utilization category	AC-15							DC-13				
Rated operating voltage Ue (V)	48	110/127	230/240	380/415	440	500	690	24	48	60	110	220
Rated operating current Ie (A)	6	4.5	3.3	2.2	1.5	1	0.6	6	5	3	1.3	0.5
Normal operating power P (W)	300	500	720	850	650	500	400	140	240	180	140	120

5.1.6 Characteristics of the fault signal contact and instantaneous auxiliary contact NS2-FA:
Fault signal contact and instantaneous auxiliary contact NS2-FA, consist of the fault signal contact and instantaneous auxiliary contact. They have different use types and characteristics.
a. rated insulation voltage Ui (V): 690;
b. agreed thermal currents of instantaneous auxiliary contacts: 6, agreed thermal current of fault signal contacts Ith (A): 2.5;
c. the use type, rated voltage and rated work current (see Table 12) of the instantaneous auxiliary contact same as the NS2-AU instantaneous auxiliary contact; the use type, rated voltage and rated operating current (see Table 13) of the fault signal contacts.

NS2-FA

Utilization category	AC-14				DC-13		
Rated operating voltage Ue (V)	24	48	110/127	230/240	24	48	60
Rated operating current Ie (A)	1.5	1	0.5	0.3	1	0.3	0.15
Normal operating power P (W)	36	48	72	72	24	15	9
Operating performance (time)	1000	1000	1000	1000	1000	1000	1000

5.1.7 Non-normal making and breaking capacity (see Table 14) of fault signal contact and instantaneous auxiliary contact.

Use type	Connection		Disconnection				On-off operation cycles and operating frequency		
	I/Ie	U/Ue	CosΦ or T0.95	I/Ie	U/Ue	CosΦ or T0.95	Operating cycles	Operating cycles per minutes	Energize Time
AC-14	6	1.1	0.7	6	1.1	0.7	10	2	0.05
AC-15	10	1.1	0.3	10	1.1	0.3	10	2	0.05
DC-13	1.1	1.1	6Pe	1.1	1.1	6Pe	10	2	0.05

Note: Pe≥50W, T0.95 upper limit≈6Pe≤300ms.

5.1.8 Mounting box （NS2-MC、NS2-MC01）

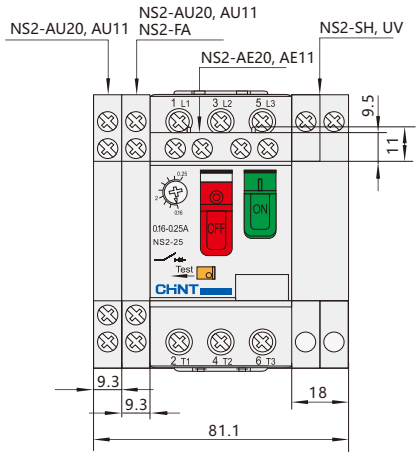
NS2-MC Waterproof installation box IP55

NS2-MC01 Installation box with emergency stop button IP55

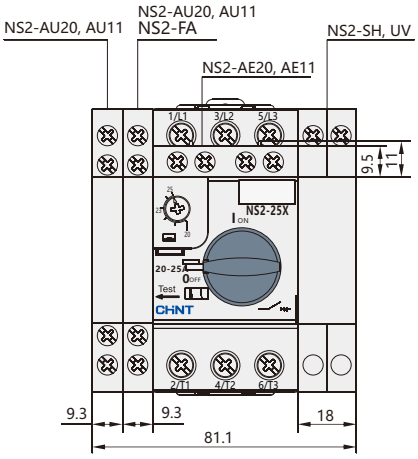
WPB-1 Waterproof installation box IP55

6. Overall and mounting dimension (mm)

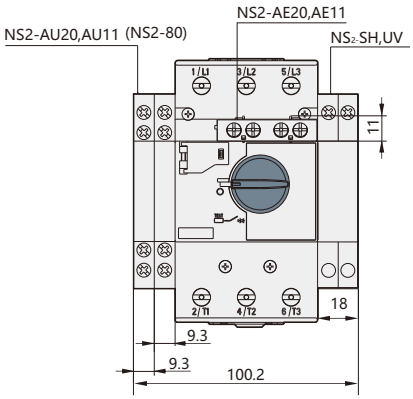
NS2-25, NS2-32



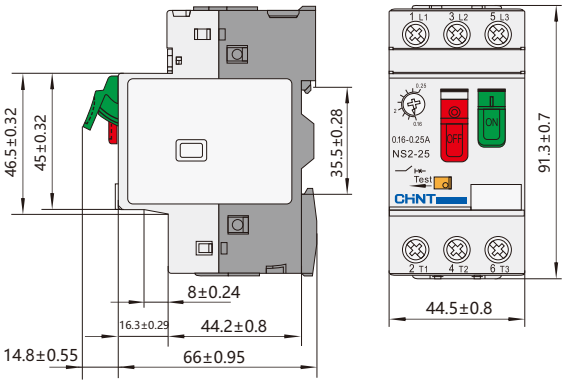
NS2-25X, NS2-32X, NS2-32H



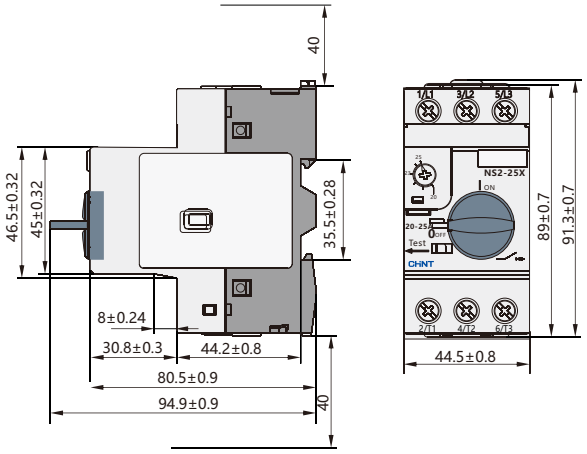
NS2-80



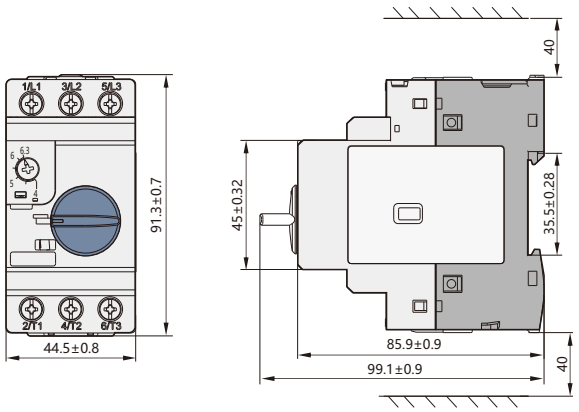
NS2-25, NS2-32



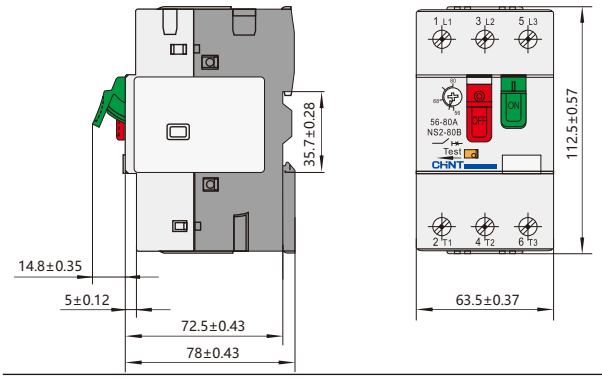
NS2-25X, NS2-32X



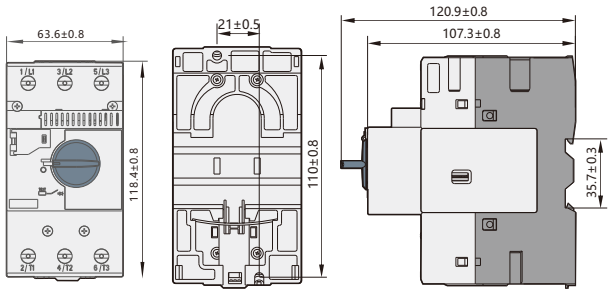
NS2-32H



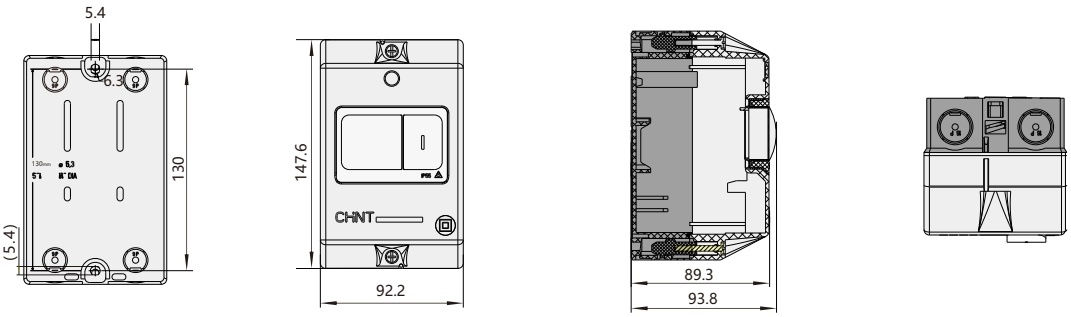
NS2-80B



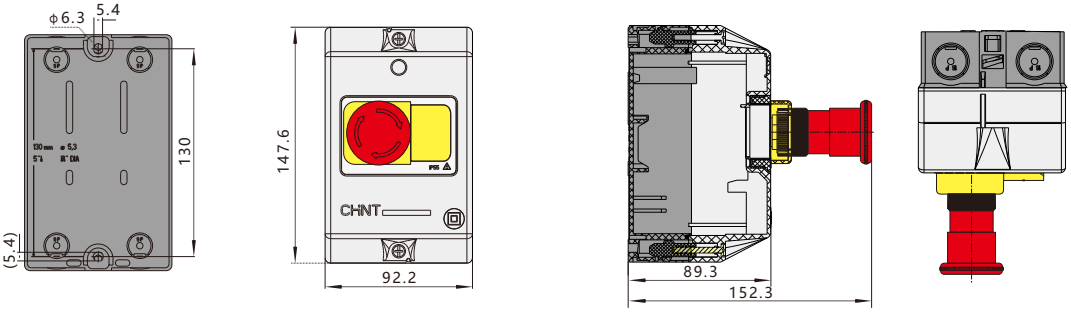
NS2-80



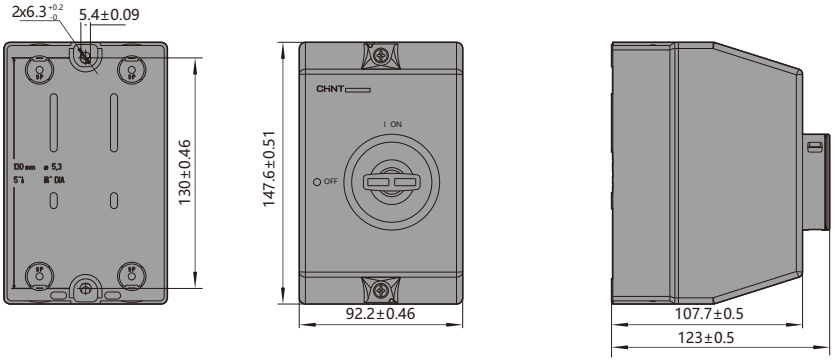
NS2-MC



NS2-MC01



WPB-1



D