NS2 Manual Motor Starter

NS2-25、NS2-32

NS2-25X、NS2-32X

NS2-32H

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 - □ □ / □ □ □

- Current specifications
- Accessories specifications (none, canbe omitted)
- 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,NS2-80)
3.6 Rated operational system:
eight-hour day (working 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.

4.Technicaldata

4.1 RatedinsulationvoltageUi(V):690
4.2 RatedoperatingvoltageUe(V):AC230/240,AC400/415,AC440,AC500,AC690.
4.3 Ratedfrequency(Hz):50/60.
4.4 RatingcurrentoframeclassInm(A):25(NS2-25,25X),32(NS2-32,32XNS2-32H), 80(NS2-80)
4.5 RatedcurrentofreleaseIn(A):(seetable4).
4.6 Settingcurrentrange:(seetable4).
4.7 RatedlimitshortcircuitbreakingcapacityIcu(kA):(seetable4).
4.8 ShortcircuitbreakingcapabilityIcs(kA)forratedoperation:(seetable4).
4.9 RatedshocktolerancevoltageUimp(kV):8.
4.10 Selectivecategory(ClassAorB)andapplicationcategory:ClassAandAC-3
4.11 Insulationlength(mm):10;15(NS2-80)Beforeinsertingconductor(conductor/conductorbar)intoterminal
4.12 Cross-sectionalareaofconductor(conductor/conductorbar)mm²:1-6;2.5~25 (NS2-80)

NS2-80

4.13 Maximumnumberofrootsallowedtoclipintotheconductor(conductor/conductor bar):2;1(NS2-80)

4.14Screw(orbolt)Sizeofwiringend:M4;M8(NS2-80)

4.15TerminalScrewtighteningtorque(N.m):1.7;6(NS2-80)

4.16Operationfrequency(times/hour):≤30;≤25(NS2-80)

4.17Adaptablecontactor:NC1;NC8

4.18 Action characteristics of each phase of the starter when load balancing (see Table 1).

Table 1

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		

4.19 The action characteristics of phase failure protection properties (see Table 2)

Table 2

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℃

4.20 The action characteristics owf temperature compensation properties (see Table 3)

Table 3

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℃

4.13 Technical parameters

Table 4

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		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	15	75	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

4.13.1 Rated power of three phase motor controlled by starter

Type	Rated current of release In(A)	Setting current regulation range (A)	Standard Rated Power Three Phase Motor(kW) AC-3,50Hz/60Hz					
			230/240V	400V	415V	440V	500V	690V
NS2-25X)、NS2-32H	0.16	0.1-0.16	-	-	-	-	-	-
NS2-25X)、NS2-32H	0.25	0.16-0.25	-	-	-	-	-	-
NS2-25X)、NS2-32H	0.4	0.25-0.4	-	-	-	-	-	-
NS2-25(X)、NS2-32H	0.63	0.4-0.63	-	-	-	-	-	0.37
NS2-25×)、NS2-32H	1	0.63-1	-	-	-	0.37	0.37	0.55
NS2-25×)、NS2-32H	1.6	1-1.6	-	0.37	-	0.55	0.75	1.1
NS2-25×)、NS2-32H	2.5	1.6-2.5	0.37	0.75	0.75	1.1	1.1	1.5
NS2-25X)、NS2-32H	4	2.5-4	0.75	1.5	1.5	1.5	2.2	3
NS2-25X)、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
NS2-25X)、NS2-32H	18	13-18	4	7.5	9	9	9	11
NS2-25×)、NS2-32H	23	17-23	5.5	11	11	11	11	15
NS2-25X)、NS2-32H	25	20-25	5.5	11	11	11	15	18.5
NS2-32(X)、NS2-32H3	22	4-32	7.5	15	15	15	18.5	25

Type	Read current of release In(A)	Regulating range of setting current of thermal element(A)	Currentsetting value of instantaneous electromagnetic release Ii(A)
NS2-25(X) N2S3-2H	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	33.2
	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)、N2S3-2H	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

4.14.1 Action characteristics of instantaneous electromagnetic trip of starter

Test current	Initial state	Set time	Expected results	Ambientair temperature
0.8Ii	Cold st ate	t≥0.2s	No trip	+20℃ ±5℃
1.2Ii	Cold st ate	t<0.2s	Trip	+20℃ ±5℃

4.15 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 currentregulation 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	★	★	63	80	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

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	110~115V, 50Hz; 127V,60Hz
	NS2-UV220		NS2-UV220	NS2-UV220	220~240V, 50Hz
	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		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.RatedimpulsewithstandvoltageUimp(kV):6i

c. 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-SH

NS2-AE

5.1.3 The characteristics of the shunt trip

NS2-SH110, SH220, SH380:

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

b.RatedimpulsewithstandvoltageUimp(kV):6i

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

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.RatedimpulsewithstandvoltageUimp(kV):2.5i

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

Table 11

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

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.Ratedimpulsewithstandvoltage Uimp(kV):4i

d. 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: Ith (A) : 6, agreed thermal current of fault signal contacts Ith (A): 2.5;

c.Ratedimpulsewithstandvoltageoffaultsignalcontact Uimp(kV):2.5i

RatedimpulsewithstandvoltageofInstantaneousauxiliarycontact Uimp(kV):4i

d. 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 Other parameters

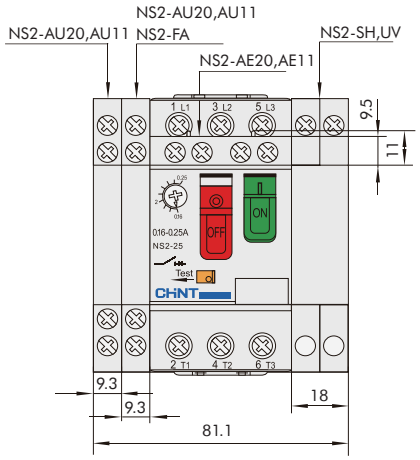
Model	Model of matched fuse	Rated current of supporting fuse A	Rated limiting short circuit current Iq kA	Enclosure protection class
NS2-AE20,AE11	gG、RT36-00	6	1	IP20
NS2-AU20,AU11		10		
NS2-FA				

5.1.9 Mounting box （NS2-MC、NS2-MC01）

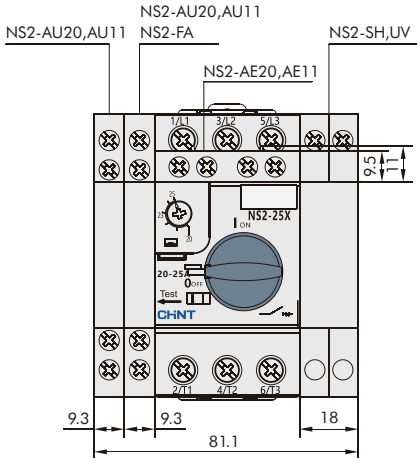
	NS2-MC Waterproof installation box	IP55
	NS2-MC01 Installation box with emergency stop button	IP55
	WPB-1 Waterproof installation box	IP55

6. Overall and mounting dimension (mm)

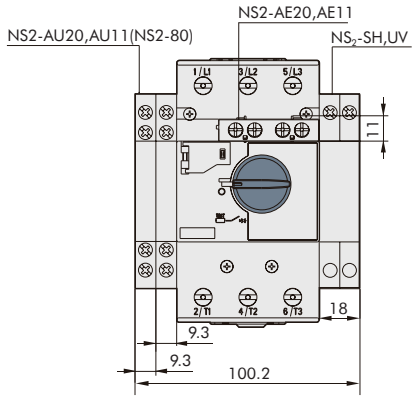
NS2-25,NS2-32



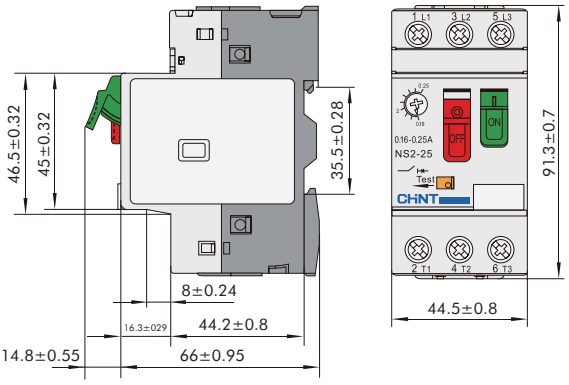
NS2-25X,NS2-32X,NS2-32H



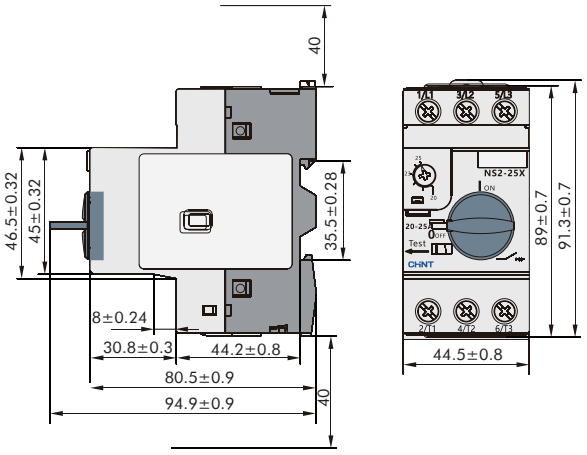
NS2-80



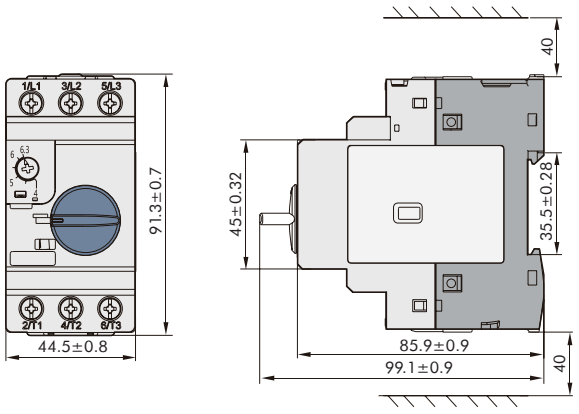
NS2-25,NS2-32



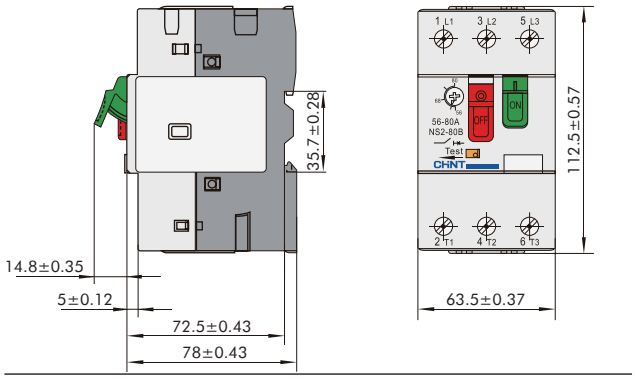
NS2-25X,NS2-32X



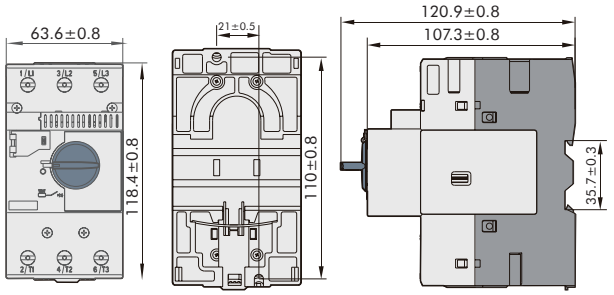
NS2-32H



NS2-80B



NS2-80



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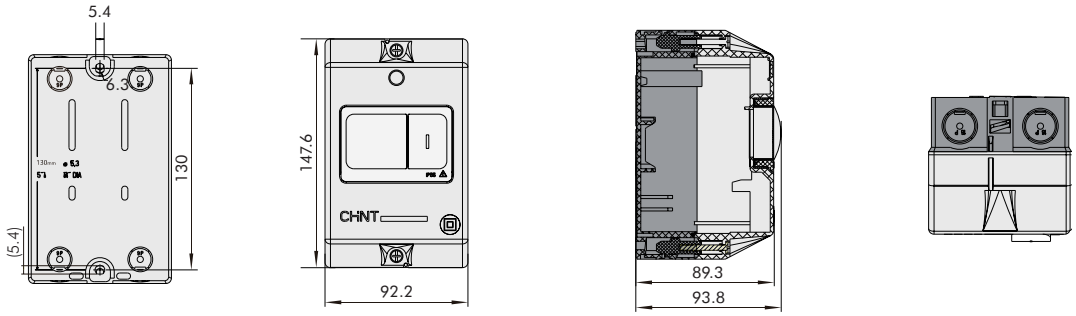

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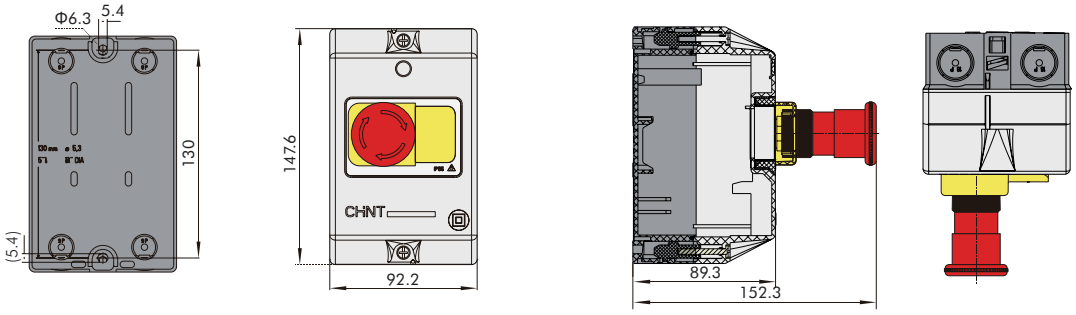

WPB-1