CCC, CQC, CB, CE, TUV

Molded Case Circuit Breakers

NDM5-160 series

1 Applicable scope and purpose

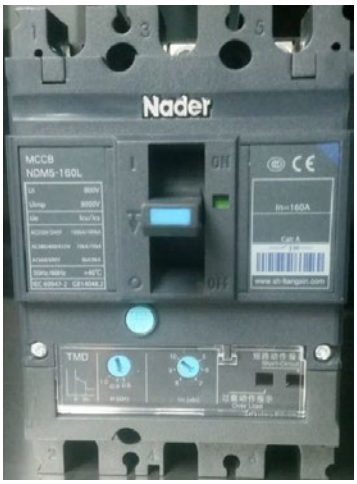
The NDM5-160 series of moulded case circuit breakers (referred to as circuit breakers) have a rated insulation voltage of 800V and apply to circuits with the AC 50Hz/60Hz, the rated working voltage to AC415V and rated working current (16A to 160A). The circuit breakers are used for distributing power while protect the overload, short circuit and under-voltage (with a under-voltage release) of lines and power units as well as the infrequent starting, braking, overload and short circuit of motors.

The circuit breaker has an isolating function with the corresponding symbol of

Comply with standards: IEC60947-2, GB/T 14048.2.

2 Picture of the product

2P Product



3P Product

4P Product

3 Specification and model description

ND M 5 - 160 □ □/ □ / □ / □ □ □ □ □

- Application code Accessories:
- See Table 1 Operation mode:
- See Note 6 Cabling mode:
- See Note 5 Installation mode:
- See Note 4 Release code: See
- Note 3 Number of poles: See
- Note 2
- Rated current In (A): See Note 1
- Breaking level code: L, M, H
- Frame current Inm (A): 160
- Design SN
- Moulded case circuit breaker (MCCB)
- Enterprise characteristic code

Note: 1) Rated current In(A): 16A, 20A, 25A, 32A, 40A, 50A, 63A,80A,100A,125A,160A.

2)Number of poles:

2: 2 poles; 3: 3 poles; 4: 4 ploes

4A: N-pole without the over-current protection, but is always on;

4B: N-pole without the over-current protection, but is on-off together with other three poles (N-pole is on and then off);

4C: N-pole with the over-current protection, but is on-off together with other three poles (N-pole is on

and then off);

4D: N-pole with the over-current protection, but is always on.

3) Release code:

TMD (distribution protection): [thermo-adjustable (0.8-0.9-1.0) In, magnet-adjustable (5-6-7-8-9-10) In(magnet-fixed 10In in 16-80A), for the distribution];

TMM (motor protection): [thermo-adjustable (0.8-0.9-1.0) In, magnet-adjustable (9-10-11-12-13-14) In(magnet-fixed 14In in 16-80A), for the motor].

4) Installation mode:

fixed without secondary connector: null

plug-in without secondary connector: P0

plug-in with secondary connector: P1

lide rail: G

5) Cabling mode: front connection:

front connection: null

rare parallel connection: RH

front extended connection: ES

front uncovered copper cable :Fcu

6) Operation mode:

directly handle operation: null

rotary handle with round center hole and square axis length 150: Z1A150

rotary handle with round center hole and square axis length 200: Z1A200

rotary handle with round center hole and square axis length 300: Z1A300

rotary handle with round center hole and square axis length 350: Z1A350

rotary handle with round center hole and square axis length 650: Z1A650

rotary handle with round square hole and square axis length 150: Z1F150

rotary handle with round square hole and square axis length 200: Z1F200

rotary handle with round square hole and square axis length 300: Z1F300

rotary handle with round square hole and square axis length 350: Z1F350

rotary handle with round square hole and square axis length 650: Z1F650

motor operation DC24V：M02

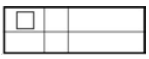
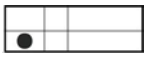
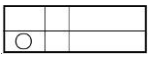
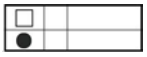
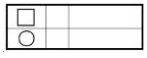
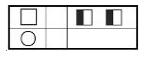
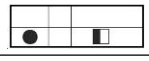
motor operation AC110V/DC110V：M11

motor operation AC230V/DC220V：M22

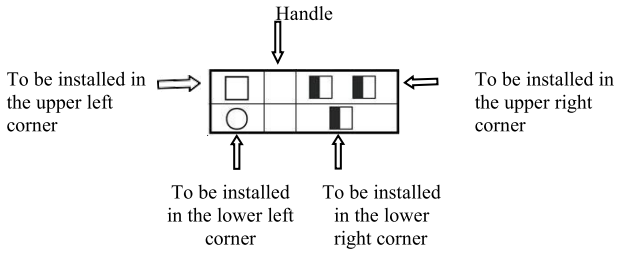
motor operation AC400V：M40

moter operation only for 3P, 4P

Table 1

Accessory code	Accessory name	Installation position
		3P, 4P
—	None	—
08	Alarm contact	
10	Shunt release	
30	Under-voltage release	
21	Single auxiliary contact	
61	Two sets of single auxiliary contacts	
23	Three sets of single auxiliary contacts	
18	Shunt release, alarm contact	
38	Under-voltage release, alarm contact	
22	Single auxiliary contact, alarm contact	
88	Two sets of single auxiliary contacts, alarm contact	
26	Three sets of single auxiliary contacts, alarm contact	
42	Shunt release, single auxiliary contact, alarm contact	
44	Shunt release, two sets of single auxiliary contacts, alarm contact	
46	Shunt release, three sets of single auxiliary contacts, alarm contact	
75	Under-voltage Release, single auxiliary contact, alarm contact	
77	Under-voltage release, two sets of single auxiliary contacts, alarm contact	
81	Under-voltage release, three sets of single auxiliary contacts, alarm contact	
41	Shunt release, single auxiliary contact	
11	Shunt release, two sets of single auxiliary contacts	
12	Shunt release, three sets of single auxiliary contacts	
71	Under-voltage release, single auxiliary contact	
72	Under-voltage release, two sets of single auxiliary contacts	
73	Under-voltage release, three sets of single auxiliary contacts	

Note: ◧ Single auxiliary contact; □ Alarm contact; ●Shunt release; ○Under-voltage release.



4 Main technical parameters

Frame current Inm			160A		
Rated current In			16A, 20A, 25A, 32A, 40A, 50A, 63A,80A,100A,125A,160A		
Rated voltage Ue (V)			AC230/AC240,AC400/AC415		
Usage category			A		
Rated impulse withstand voltage Uimp			8000V		
Rated insulation voltage Ui			800V		
Power frequency withstand voltage (1min)			3000V		
Rated Ultimate/Service Short-circuit breaking capacity Icu/Ics (kA)		Code	L	M	H
		AC230V/AC240V	100/100	120/120	150/150
		AC400V/AC415V (3P /4P)	70/70	100/100	150/150
Life	Mechanical life		15,000 times		
	Electrical life	AC230V/AC240V	6000 times		
		AC400V/AC415V	6000 times		

5 Normal working environment

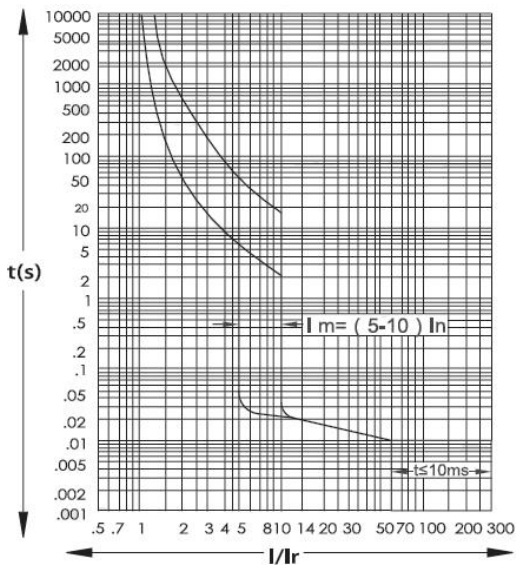
1) Elevation: ≤2000m;
2) Ambient air temperature: -35℃～+70℃; the average value within 24 hours doesn't exceed +35℃;
3) Storage environment: -40℃ to +75℃;
4) Atmospheric conditions: ambient air temperature of +40℃, with a relative humidity of 95%;
5) Class of pollution: 3;
6) Protection class: IP20;
7) Installation category: main circuit and under-voltage release: installation category Ⅲ; auxiliary circuit and control circuit: installation category Ⅱ;

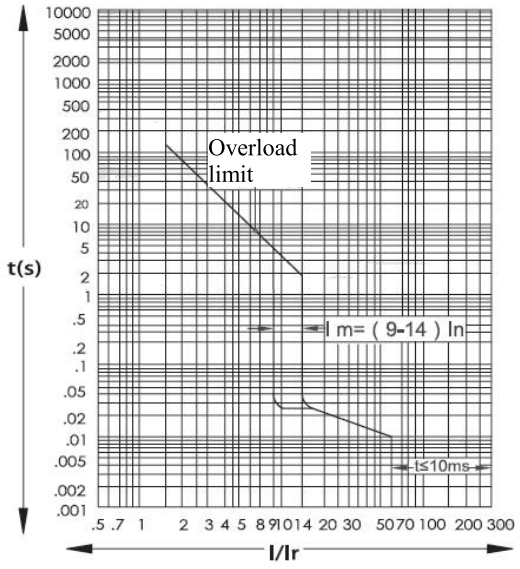
Note: Undervoltage tripper and shunt tripper are used, it is -25℃～+70℃.

6 Tripping characteristics

6.1 Tripping characteristics curve under normal environment (ambient air temperature: 40℃)

NDM5-160 Distribution NDM5-160 Timing Protection





6.2 The tripping characteristics should be corrected due to small changes when the ambient air temperature varies

Ambient air temperature	Correction factor
40℃	1.0
45℃	0.975
50℃	0.95
55℃	0.925
60℃	0.9
65℃	0.875
70℃	0.85

Note: 1. The above derating factors are measured at the frame current;

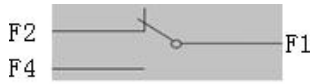
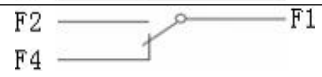
2. When the operating ambient temperature is below + 40℃ , the product can be used normally without derating capacity.

6.3 The coefficient of elevation reduction should be corrected due to small changes by considering the air insulation characteristics and cooling capacity with the ambient temperature of +40℃ and the altitude above 2,000m.

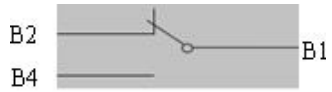
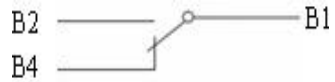
Altitude (m)	2000	3000	4000	5000
Power frequency withstand voltage (v)	3500	3000	2500	2000
Average insulation class (v)	1Ui	0.9Ui	0.8Ui	0.7Ui
Maximum working voltage (v)	1Ue	0.9Ue	0.8Ue	0.7Ue
Average working current (+40℃)	1In	0.96In	0.93In	0.9In

7 Operation instructions for accessories

7.1 Rated parameters of the auxiliary contact

Accessory name		Auxiliary contact
Voltage specifications (V)/conventional thermal current (Ith)		AC250V/10A，AC400V/3A，DC220V/0.2A
Wiring diagram	Off	
	On	

7.2 Rated parameters of the alarm contact

Accessory name		Alarm contact
Voltage specifications (V)/conventional		AC250V/3A, DC220V/0.2A
Wiring diagram	On, off	
	Free tripping	

7.3 Under-voltage release

When the power voltage drops to the range (35%~70%) of the under-voltage release, the release can break the circuit breaker reliably; when the power voltage is 35% lower than the rated working voltage of the under-voltage release, the release can prevent closing of the circuit breaker; when the power voltage is 85% higher than the rated working voltage of the under-voltage release, the release can guarantee reliable closing of the circuit breaker.

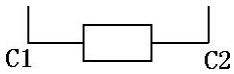
Voltage specifications of the under-voltage release: AC110V/DC110V, AC230V/DC250V.

Accessory name	Under-voltage release	
Voltage specifications (V)	Q11	Q22
	AC110/DC110	AC230/DC250

7.4 Shunt release

When the external voltage of the shunt release is between 70% and 110% of the rated control power voltage, the release can break the circuit breaker reliably.

Accessory name	Shunt release			
Voltage specifications (V)	FT02	FT04	FT11	FT22
	AC24/DC24	AC48/DC48	AC110/DC110	AC230/DC250



8 Reference section of the connecting wire

Rated current (A)	16,20	25	32	40,50	63	80	100	125	160
Wire cross-section area (mm^2)	2.5	4	6	10	16	25	35	50	70

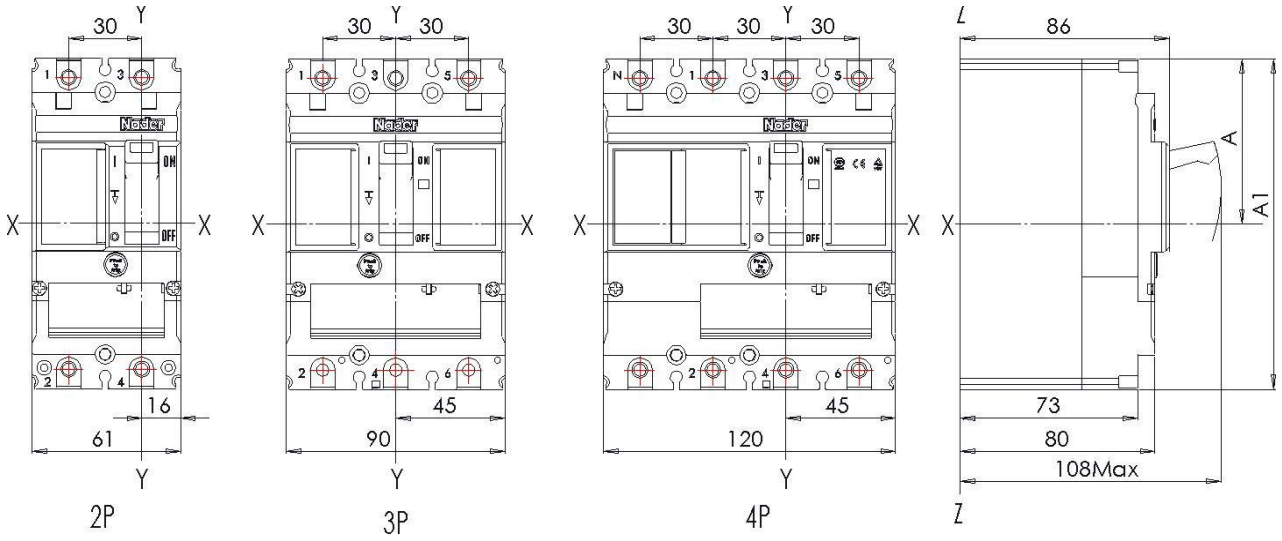
Connecting terminal/Tightening torque value of mounting screw

Frame current	Thread diameter	Torque value
160	M6	6
160	M4	1.2

9 Outline and installation dimensions

9.1 External dimensions of products

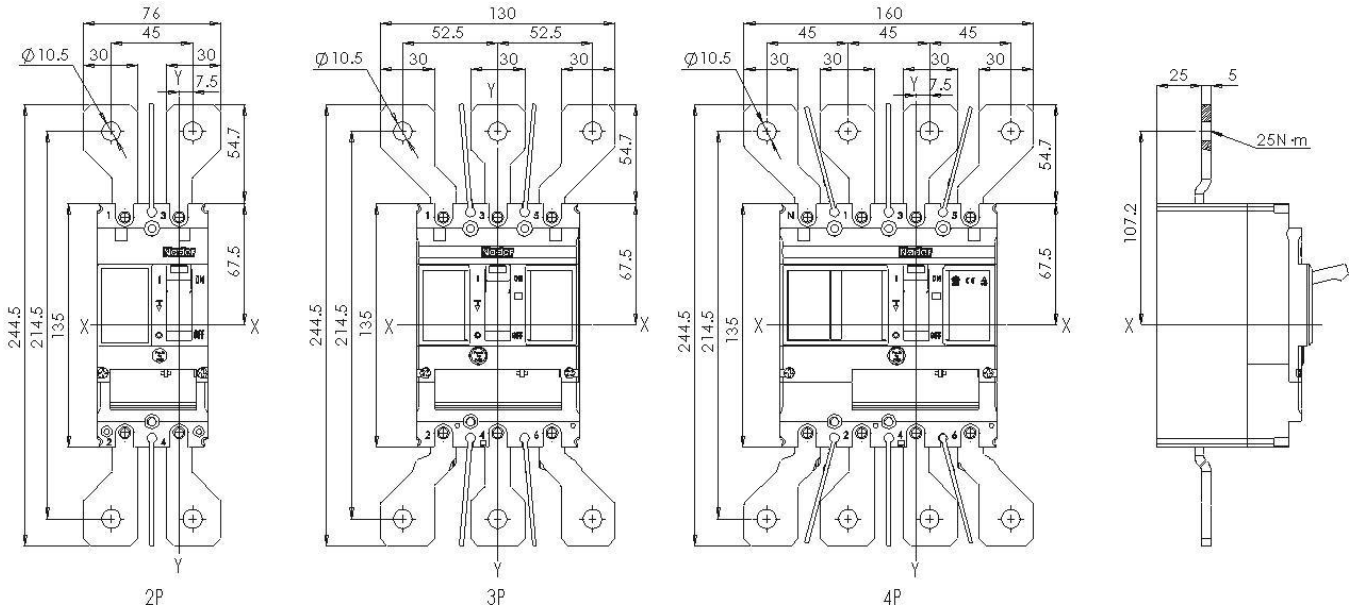
9.1.1 External dimensions of products



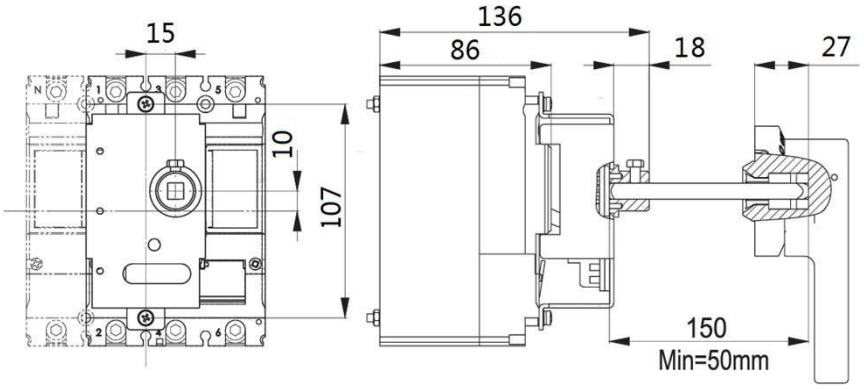
Note: Dimensions of conducive bar or terminal front-plate connection products: A=67.5, A1=135;
Dimensions of bare cable front-plate connection products (FCu): A=77.5, A1=155;

9.1.2 External dimensions of products and external accessories

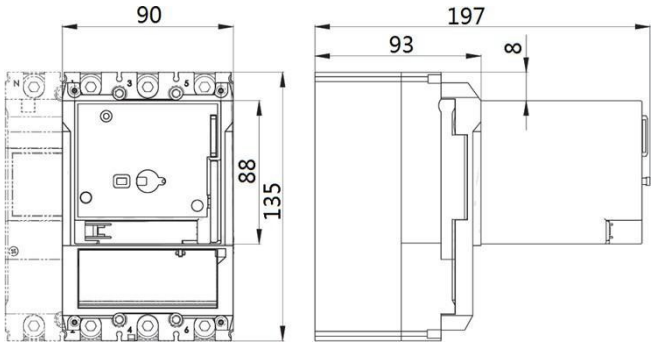
a. External dimensions of extended front-plate connection products (ES):



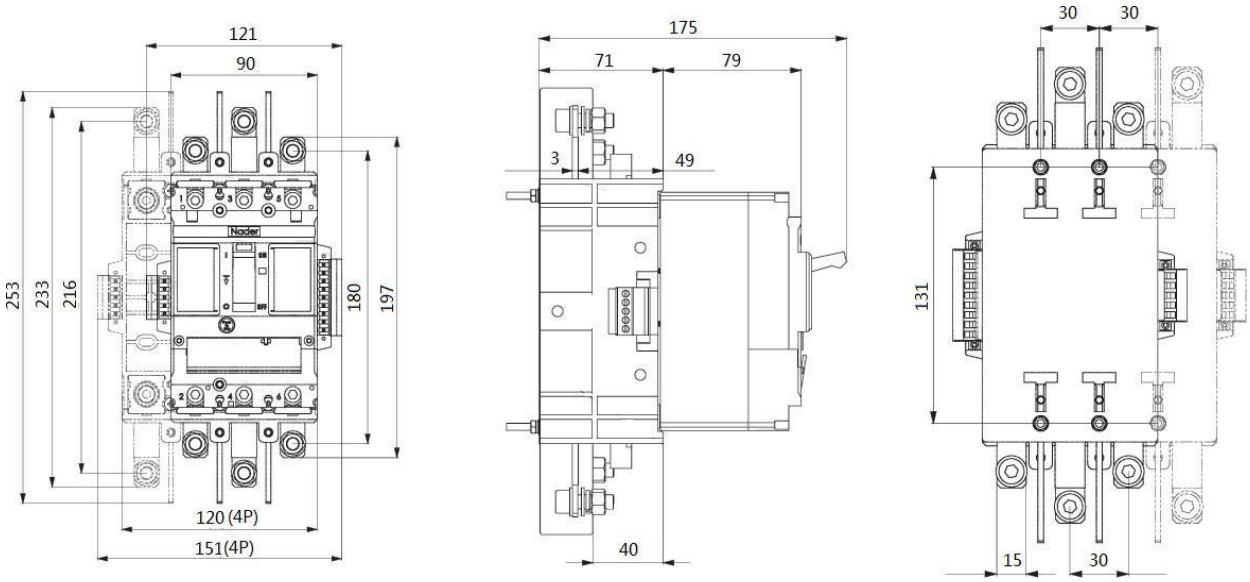
b. External dimensions of the circuit breaker and its manual operating mechanism connection:



c. External dimensions of the circuit breaker and its electric operating mechanism connection:

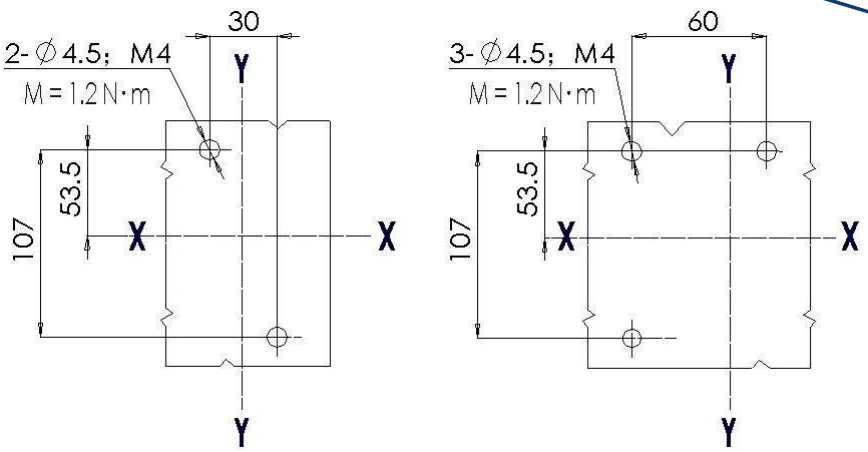


d. External dimensions of plug-in front-plate connection:



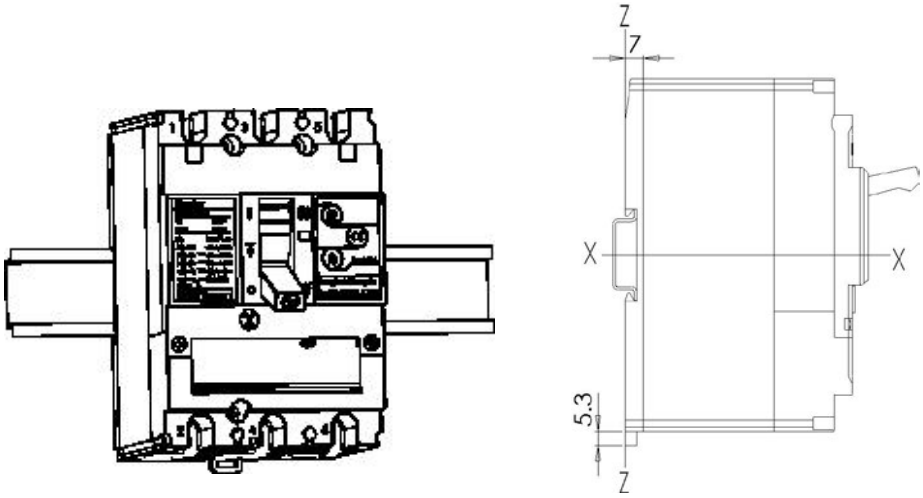
9.2 Product installation dimensions

9.2.1 Installed on the baseplate

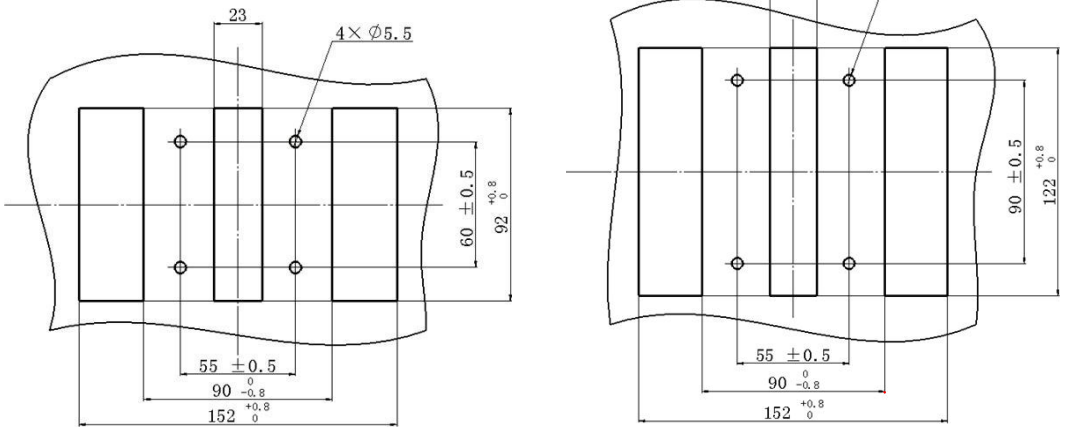


3P Mounting Hole 4P Mounting Hole

9.2.2 External dimensions of guide-rail connection (G) products installed on DIN guide rails



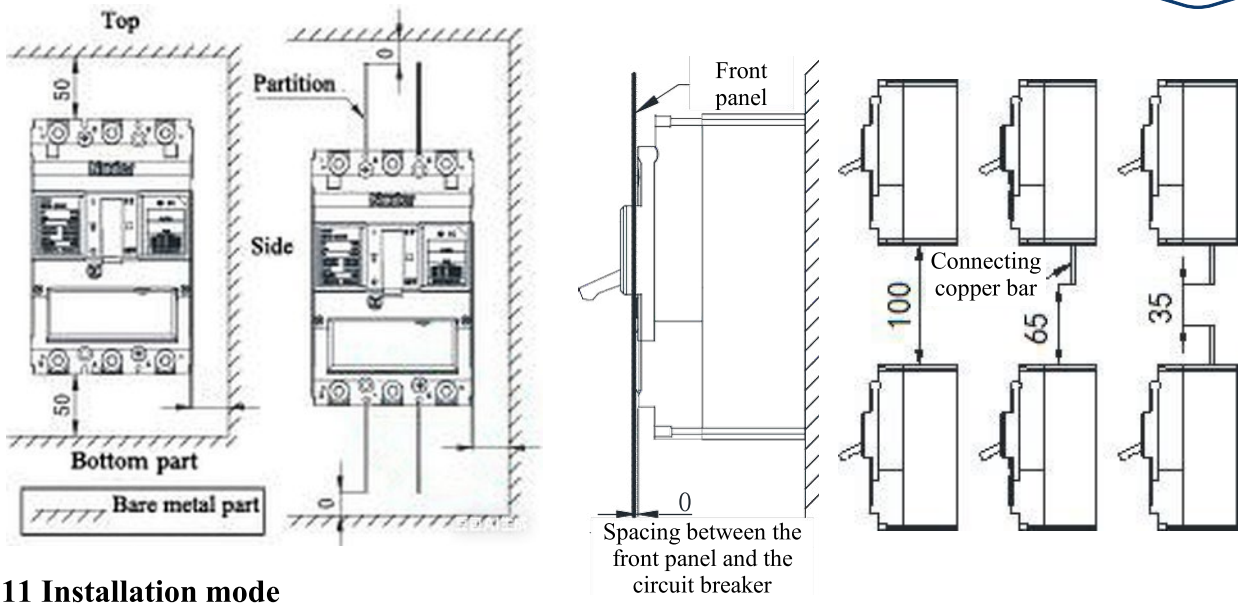
9.2.3 Installed on the plug-in



3P Mounting Hole 4P Mounting Hole

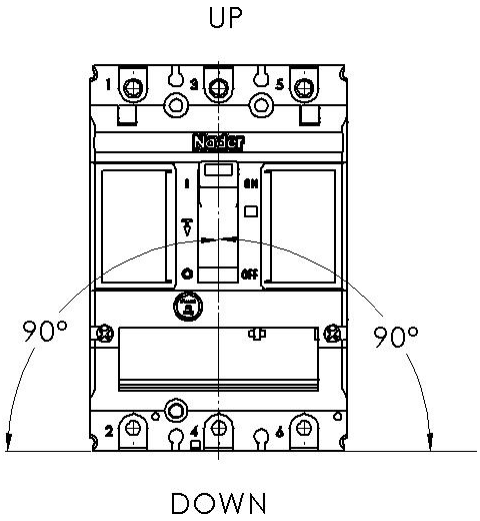
10 Safety spacing

See the figure below for the minimum safety distance of the circuit breaker from the top, bottom, side and front panel during installation.



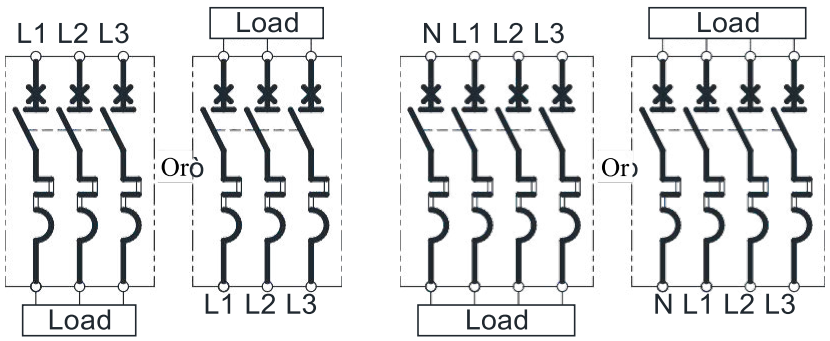
11 Installation mode

The product allowable installation mode is shown as the figure below.



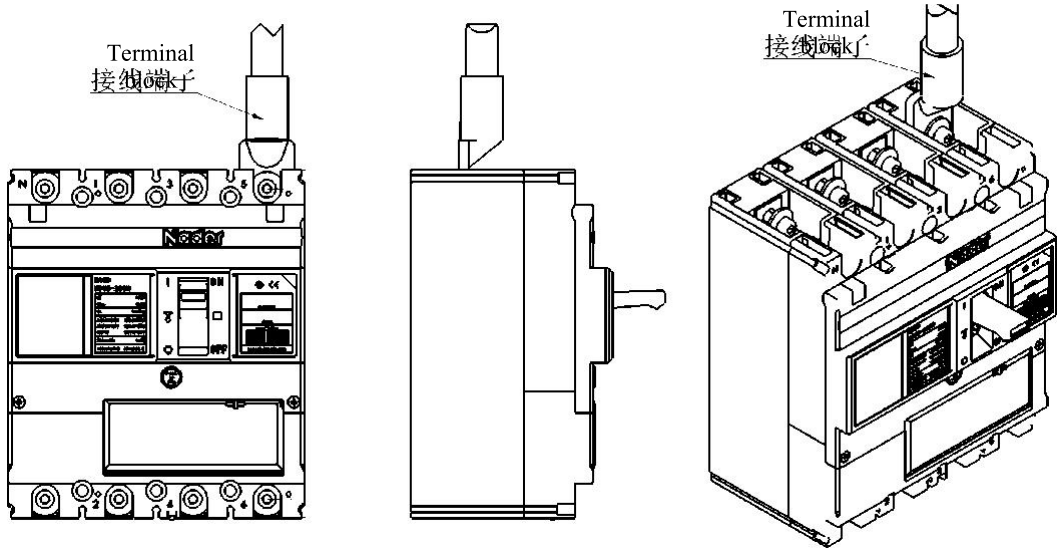
12 Connection capacity

12.1 Wiring diagrams of the product main circuit

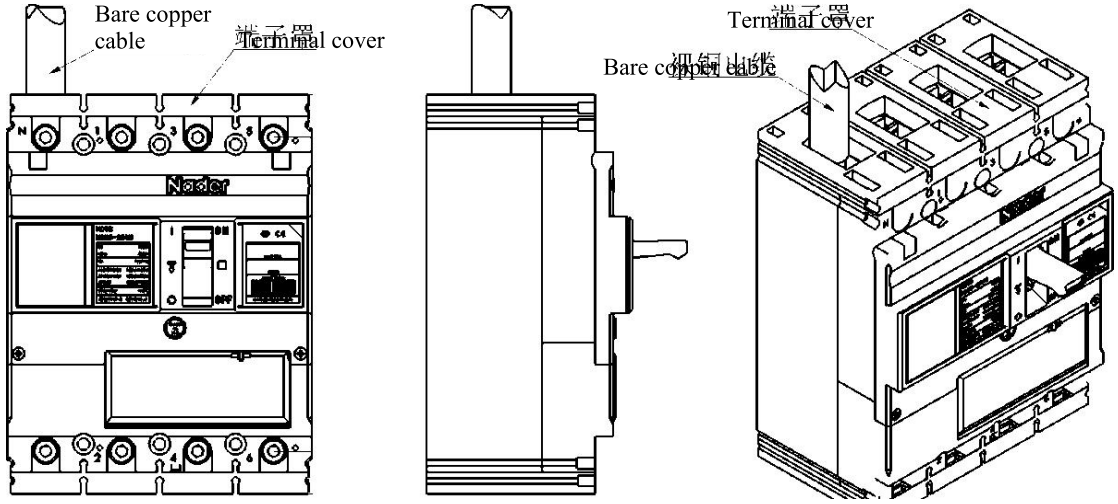


(3P Wiring Diagram) (4P Wiring Diagram)

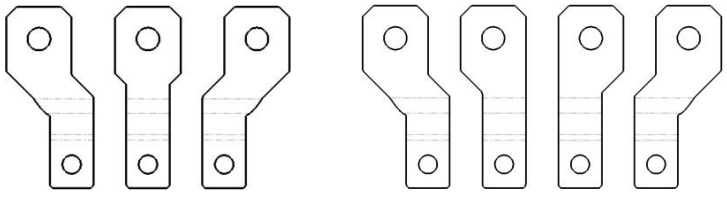
12.2Connection of the front-plate copper bar or copper cable with terminal blocks



12.3 Connection of the front-plate bare copper cable (FCu)



12.4 Connection sorting of the extended terminal (ES)



3P extended bar　　4P extended bar

13 Packaging and storage

Minimum packaging quantity: 1 piece/box. The packaged products should be stored in a warehouse without acidic, alkali or other corrosive gas in the surrounding air.

Users shall obey the storage and use conditions. In case of product damage or abnormal use due to manufacturing quality issues within 36 months from the date of factory delivery, the factory shall be responsible for free maintenance or replacement.

14 List of accessories and installation

SN	Name	Specifications	Quantity/Set	
			3P	4P
1	Cross small pan-head screw(s)	M4×75	2	3
2	Plain washer	4	2	3
3	Spring washer	4	2	3
4	Hexagon nut(s)	M4	2	3
5	Partition	——	4	6

15 Precautions

1) The performance parameters of this specification are suitable for normal conditions. For special requirements, put the equipment into use after consulting the company with formal confirmation and re-adjusting parameters by the company.
2) The circuit breaker, tripping unit or other accessories can only be installed and maintained by the trained or qualified professionals;
3) Ensure that the power supply is off before installing or removing any device.