

Shanghai Liangxin Electrical Co., Ltd.

Product Specification

(IPD-ENG-DEV-T22 A1 2016-09-23)

Product Name: Moulded Case Circuit Breaker (MCCB)

Product type: NDM5-250

Date: 2024-10-10

Prepared	杨荣荣	Date	2024-10-11
Reviewed	黄金华	Date	2024-10-12
Countersign	李焰峰	Date	2024-10-12
Approved	丁飞	Date	2024-10-12

Revision information					
Version	Revised contents and reasons	Date	Prepared	Reviewed	Approved
0	Newly added	10/10/2024	Yang rong rong	Huang jin hua	Ding Fei

1 Applicable scope and purpose

The NDM5-250 series of moulded case circuit breakers (referred to as circuit breakers) have a rated insulation voltage of 1000V and apply to circuits with the AC 50Hz/60Hz, the rated working voltage (AC230V/240V, AC400V/415V, AC690V) and rated working current (6A to 250A). 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 $\text{---}\diagup\diagdown\text{---}$;

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

Each voltage level and short-circuit section capacity of the circuit breaker can be connected with the lower incoming line.

2 Picture of the product



Fig.1 3P Product

3 Specification and model description

ND	M	5	--	□	□	□	/	□	/	□	/	□	□	□
1	2	3	4	5	6	7	8	9	10	11	12			
S.N.	Serial number name					NDM5								
1	Company code					ND: "Nader" low voltage electrical apparatus								
2	Product code					M: Molded case circuit breaker (MCCB)								
3	Design serial number					5								
4	Shell frame grade Inm(A)					250								
5	Breaking ability level					L: Standard								
						M: Relatively high score broken type								
						H: High score broken type								
						U: Very high score broken type								
						R: Ultra high broken type								
6	Rated current: In(A)					Refer to Table 2								
7	Number of poles					2: 2 poles;								
						3: 3 poles;								
						4A: N-pole is always closed without overload release;								
						4B: N-pole opens or closes together with other three poles and without overload release(N-pole closes first, opens last);								
						4C: N-pole opens or closes together with other three poles and with overload release (N-pole closes first, opens last);								
						4D: N-pole is always closed with overload release.								
8	Release code					TMF: Power distribution protection-thermal magnet-fixed								
						TMD: power distribution protection-thermo-magnetic adjustable								
						TMM: AC thermal-magnetic motor protection release (3 poles)								
						Thermo-adjustable (0.8-0.9-1.0)In								
						Magnet-adjustable (9-10-11-12-13-14)In								
						MF: Magnetic fixed (only for U/R)								
9	Installation code+ Wiring method					Null: Stationary connector + front panel wiring								
						ES: Stationary connector+ front extension wiring board								
						R0: Stationary connector + screw connector +on after terminal								
						Fcu: Stationary connector +front bare copper cable wiring								
						G: Guide rail type+ front panel wiring(2Pexcept)								
						GES: Guide rail type+ front extension wiring board(2Pexcept)								

		GFcu: Guide rail type+ front bare copper cable wiring(2Pexcept)
		P0FH: plug-in without secondary connector +horizontal wiring in front of board
		P0RH: plug-in without secondary connector + horizontal wiring behind the board
		P0RV: plug-in without secondary connector +rear vertical wiring
		P1FH: plug-in with secondary connector + horizontal wiring in front of board
		P1RH: plug-in with secondary connector + horizontal wiring behind the board
		P1RV: plug-in with secondary connector + rear vertical wiring
10	Operation mode	Null: directly handle operation
		Z1A150: rotary handle with round center hole and square axis length 150
		Z1A200: rotary handle with round center hole and square axis length 200
		Z1A300: rotary handle with round center hole and square axis length 300
		Z1A350: rotary handle with round center hole and square axis length 350
		Z1A650: rotary handle with round center hole and square axis length 650
		Z1F150: rotary handle with round square hole and square axis length 150
		Z1F200: rotary handle with round square hole and square axis length 200
		Z1F300: rotary handle with round square hole and square axis length 300
		Z1F350: rotary handle with round square hole and square axis length 350
		Z1F650: rotary handle with round square hole and square axis length 650
		M02: motor operation DC24V
		M11: motor operation AC110V/DC110V
		M22: motor operation AC230V/DC220V
		M40: motor operation AC400V
11	Accessory code	See Table 1
12	Other codes	J: Mechanical interlocking(2P except)
		MS2: MS2 lock(2P except)

Note: 1) Breaking grade U/R type only 3-pole fixed type, front wiring products;

2) Breaking grade U/R type U/R without electric operation mode;

3) TMD release:

32A-40A (only for U/R): [Thermo-adjustable (0.8-0.9-1.0) In, Magnet-fixed 14In]

50A-125A (50A only for U/R): [Thermo-adjustable (0.8-0.9-1.0) In, Magnet-fixed 10In]

160A-250A: [Thermo-adjustable (0.8-0.9-1.0) In, Magnet-adjustable (5-6-7-8-9-10) In]

TMM release:

32A-125A (32A-50A only for U/R): [Thermo-adjustable (0.8-0.9-1.0) In, Magnet-fixed 14In]

160A-250A: [Thermo-adjustable (0.8-0.9-1.0) In, Magnet-adjustable (9-10-11-12-13-14) In]

TMF release:

32A-40A (only for U/R): [Thermo-fixed 1.0 In, Magnet-fixed 14In]

50A-125A (50A only for U/R): [Thermo-fixed 1.0 In, Magnet-fixed 10In]

160A-250A: [Thermo-fixed 1.0 In, Magnet-fixed 10In]

MF release (only for U/R): 6A-125A Magnet-fixed 14In;

MA release (only for U/R): 160A-250A Magnet-adjustable (9-10-11-12-13-14) In;

The detail specification is in the chapter7.2.

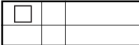
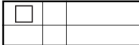
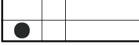
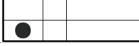
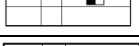
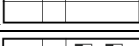
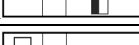
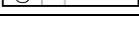
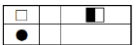
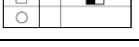
4) In(6、10、12.5、16、20、25、32、40、50、63、80、100、125) is only 3P.

5) U/R Add standard terminal cover and insulated base plate (1 terminal cover);

6) Add insulation bottom plate after inserting the board;

7) U / R Plug-in plate without terminal cover

Table 1

Accessory code	Accessory name	Installation position	
		2P	3P, 4P
00	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.

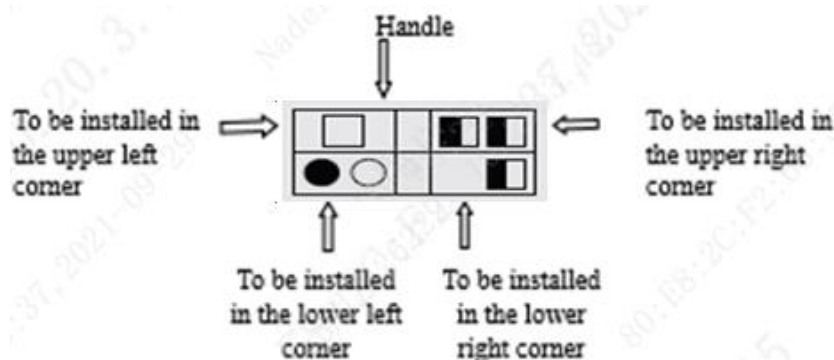
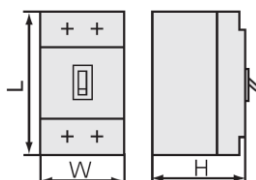


Fig.2 Attachment installation diagram

4 Main technical parameters

Table 2 Technical Parameter

Model		NDM5-250										
Frame current Inm		250A										
Rated current In		6、10、12.5、16、20、25、32、40、50、63、80、100、125、160、200、250										
Rated voltage Ue (AC V)		230/240, 400/415, 690										
Usage category		A										
Rated impulse withstand voltage Uimp		8000V										
Rated insulation voltage Ui		1000V										
Power frequency withstand voltage (1min)		3500V										
Number of poles		2			3					4		
Rated Ultimate/Service Short-circuit breaking Capacity Icu/Ics(kA)	Interrupting level code	L	M	H	L	M	H	U	R	L	M	H
	AC230/240V	70	100	150	70	100	150	/	/	70	100	150
	AC400/415V	/	/	/	70	100	150	/	/	70	100	150
	AC690V	/	/	/	10	15	25	55	80	10	15	25

Operational performance (times)	Mechanical life (times)	Maintainable free life	25000		15000	25000	
		Maintainable life	50000		30000	50000	
	Electrical life	AC230/240V	10000 times				
		AC400/415V	10000 times				
		AC690V	4000 times				
Boundary dimension			L(mm)	165	165	200	165
			W(mm)	70	105	105	140
			H(mm)	86	86	106.5	86
			Flashover distance(mm)			≤50	

Note1: The overall dimension does not include the dimension of terminal cover.

Note2: U/R Add standard terminal cover and insulated base plate (1 terminal cover)

4.1 sectional area and applicable rated current adopted in wiring

Table 3 Wire parameters

Rated current (A)	Cable section (mm ²)
6	1
10	1.5
12.5、16、20	2.5
25	4
32	6
40、50	10
63	16
80	25
100	35
125	50
160	70
200	95
250	120

4.2 Tightening Torque of the Circuit Breaker Terminal and Mounting Screw

Table 4 Tightening Torque of the Circuit Breaker Terminal and Mounting Screw

Model	Screw application	Thread specification	Torsional moment (N·m)
NDM5-250	Wiring screw	M8	15
	Set screw	M5	4

4.3 Derating factor of temperature change for the circuit breaker

Table 5 Derating Factor Table of Temperature Change for the Circuit Breaker

Model	Derating factor of product temperature change							
	Temperature(°C)	40	45	50	55	60	65	70
NDM5-250L/M/H	Derating factor	1.0	0.97	0.94	0.91	0.88	0.85	0.83
NDM5-250U/R	Derating factor	1.0	1.0	1.0	0.93	0.88	0.86	0.83

Note: 1) When the operating ambient temperature is below + 40°C (NDM5-250U/R is 50°C), the product can be used normally without derating capacity. and do not need to reduce capacity.
2) The above derating factors are measured under the rated current of the shell frame.

4.4 High altitude derating factor of circuit breaker

Table 6 Altitude drop correction factor

Altitude (m)	2000	2500	3000	3500	4000	4500	5000
Working current correction coefficient	1	1	0.98	0.97	0.95	0.94	0.93
Maximum operating voltage (V)	690	690	620	580	550	520	500
Power frequency withstand voltage (V)	3500	3500	3150	3000	2800	2650	2500
Average insulation class (V)	1000	1000	900	850	810	770	730

4.5 Power consumption of circuit breaker

Table 7 Product current specification single phase power consumption able

Model	Current specification	Single phase power consumption (W)		
		Front panel wiring rear panel wiring	Plug in front of plate、rear board wiring	Extended row wiring
NDM5-250L/M/H	250A	18.8	25	19.5
NDM5-250U/R	250A	21.8	/	22.5

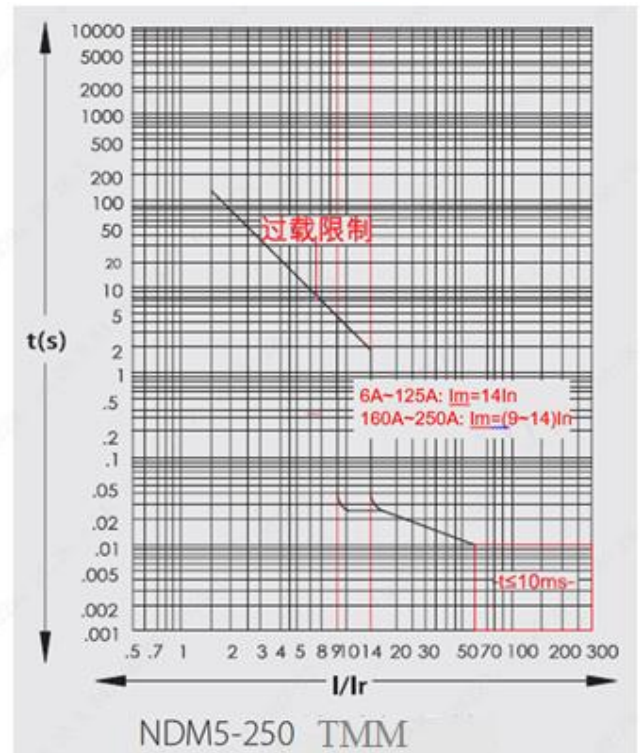
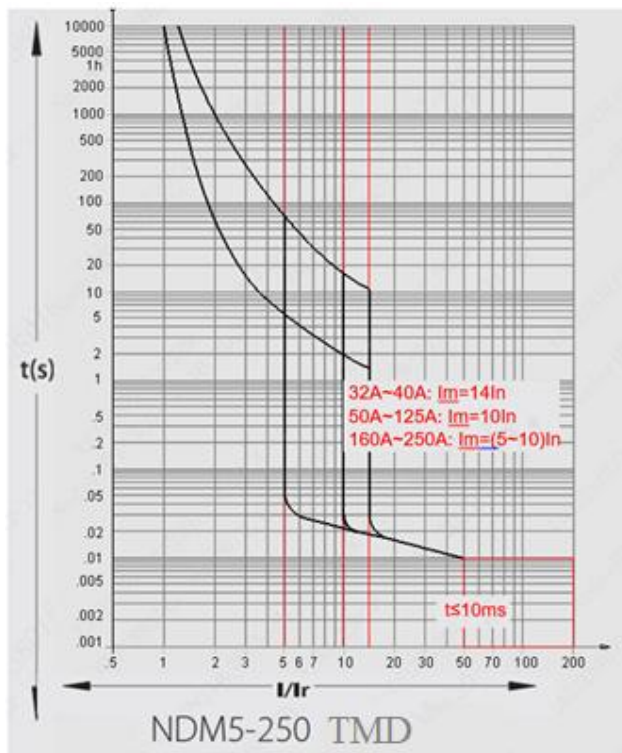
Note: The above data are the single-phase loss measured under the rated current of the circuit breaker when the ring temperature is 40°C。

5. Normal Working Environment of Circuit Breaker

- 1) The altitude of the installation site doesn't exceed 2,500m. See the "High-altitude Derating Factor Table of Circuit Breaker" for the derating factor at the altitude;
- 2) The ambient temperature is $-35^{\circ}\text{C} \sim +70^{\circ}\text{C}$; the average within 24 h shall not be more than $+35^{\circ}\text{C}$. If the ambient temperature is higher than $+40^{\circ}\text{C}$ (NDM5-250U/R is 50°C), the user needs to reduce the capacity. See the "Derating Factor Table of Temperature Change for the Circuit Breaker" for the derating factor;
- 3) Its relative humidity at an ambient temperature of $+40^{\circ}\text{C}$ should not exceed 50%. A higher relative humidity is allowed at a lower temperature. For example, the relative humidity at 20°C can reach 90%; for frost due to temperature change, the corresponding measures should be taken;
- 4) The product can withstand the effects of wet air, salt mist, oil mist and mould;
- 5) The installation category of the circuit breaker connected to the main loop is: Category III (power distribution and control level), The installation category of the circuit breaker not connected to the main loop is: Category II (load level);
- 6) The pollution level is Level 3;
- 7) Degree of protection : IP 20;
- 8) The product should be installed in places that are free from explosive media, media corrosive to metal, insulation damaging gas, and conductive dust, which should be also avoided from snow and rain;
- 9) In case of stricter user conditions than the above description, negotiate with the manufacturer.

6 Tripping characteristics

6.1 Tripping characteristics curve under normal environment (ambient air temperature: $+40^{\circ}\text{C}$)



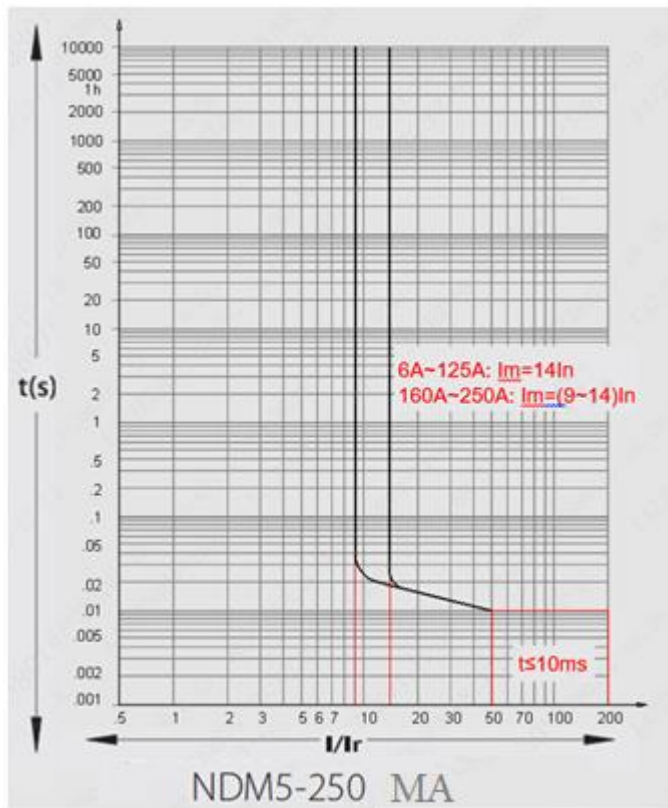


Fig.3 Trip curve

6.2 Current limiting and permissive characteristic curve

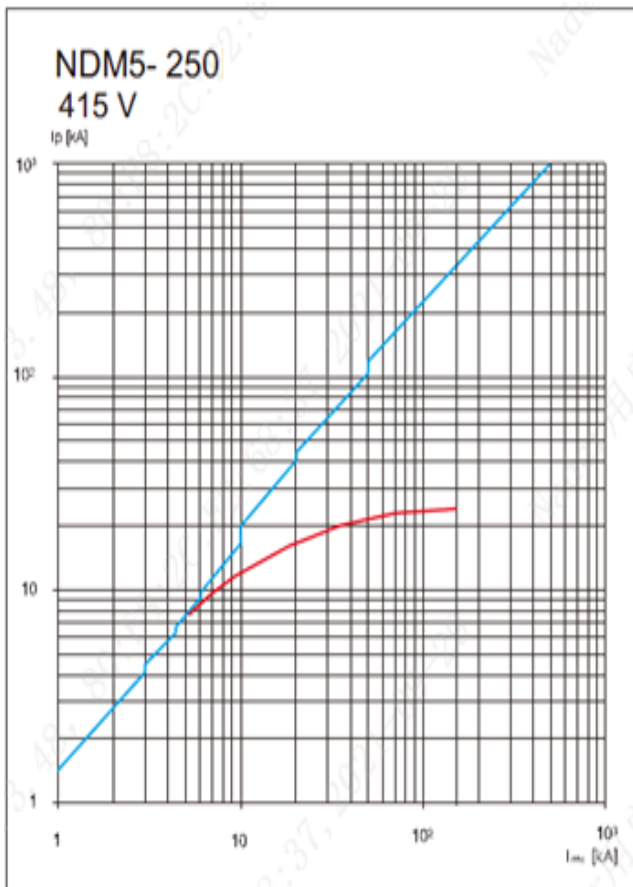


Fig.4 Current limiting characteristic curve chart

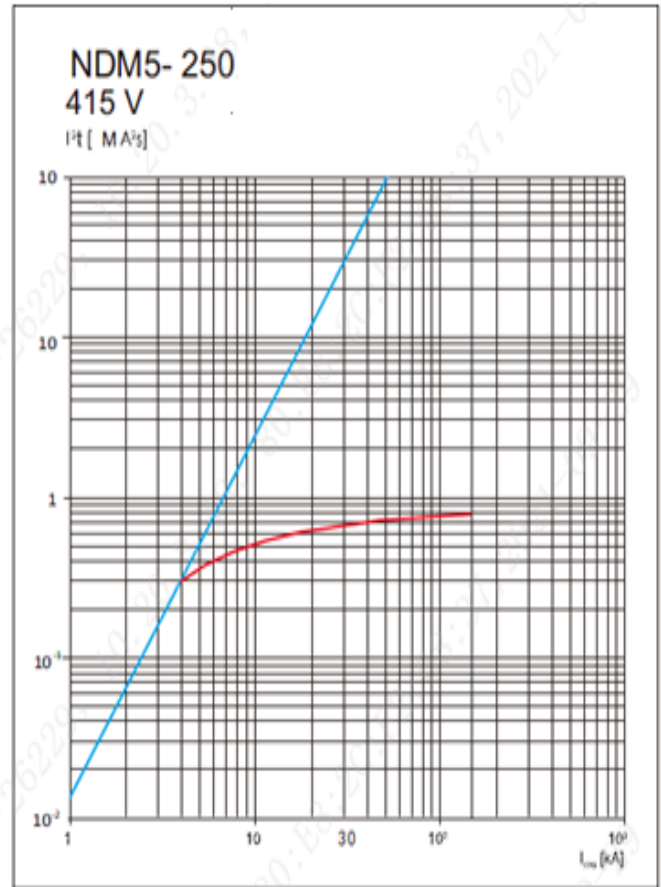


Fig.5 Permissive characteristic curve chart

6.3 Current limiting and permissive characteristic curve

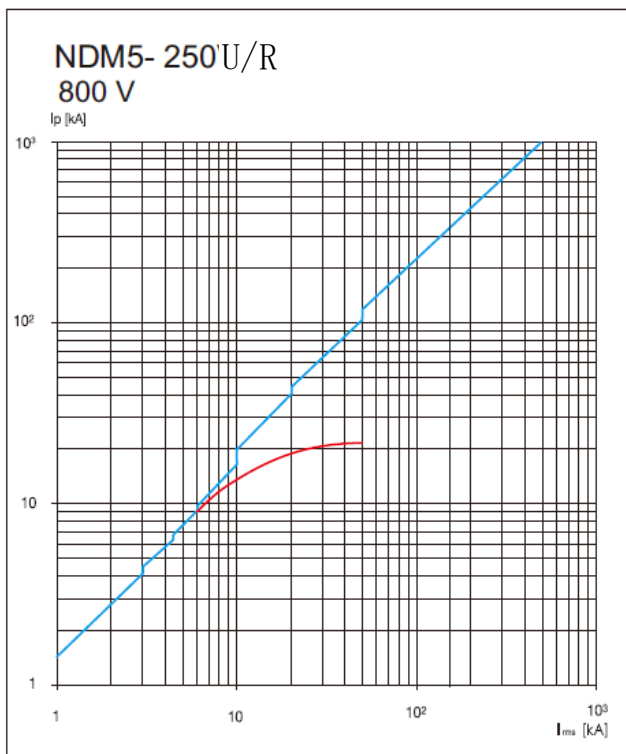


Fig.6 Current limiting characteristic curve chart

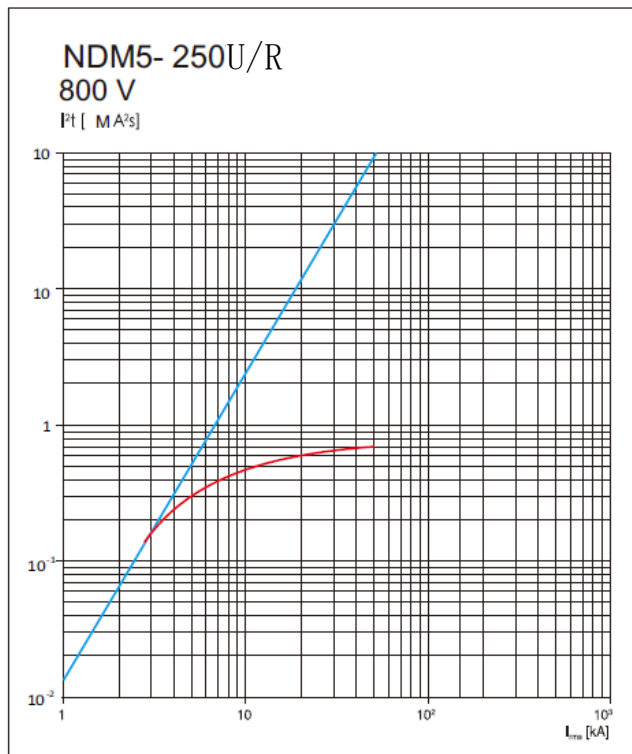
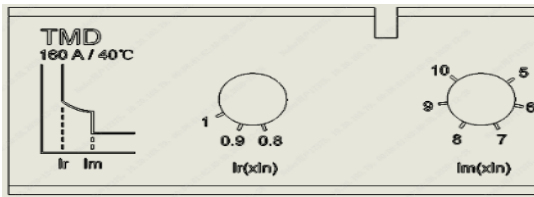


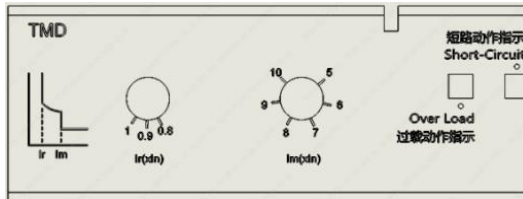
Fig.7 Permissive characteristic curve

7. Controller operation description and function introduction

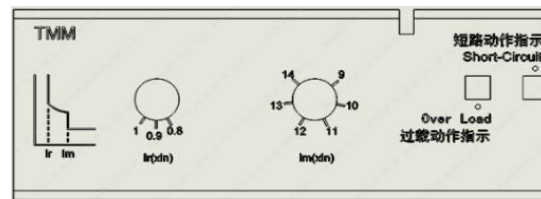
7.1 Nameplate of release



2P TMD (Distribution protection)



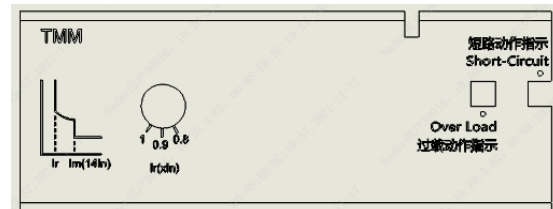
3P/4P TMD (Distribution protection)



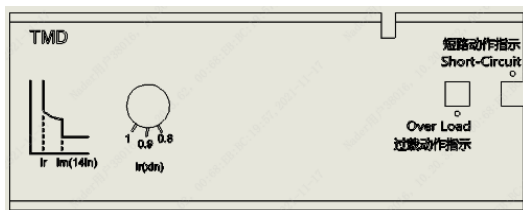
3P/4P TMM (Motor protection)



3P TMD (magnet-fixed 10In)



3P TMM (Motor protection)



3P TMD (magnet-fixed 14In)



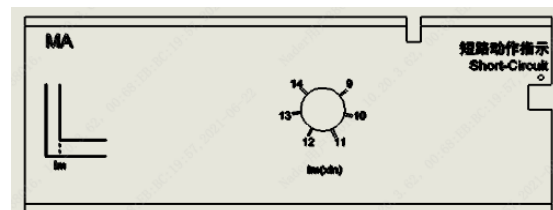
3P TMD (magnet-fixed 10In)



3P MF (magnet-fixed 14In)



3P TMD (magnet-fixed 14In)



3P MA (magnet-adjustable)

7.2 The detail specification:

Frame	Release protection	Distribution protection		Motor protection					
	Amperage (A)	TMD	TMF	TMM	MA(only for U/R)	MF(only for U/R)			
250	6（only for U/R）	/	/	/	/	Magnet-fixed 14In			
	10（only for U/R）								
	12.5（only for U/R）								
	16（only for U/R）								
	20（only for U/R）								
	25（only for U/R）								
	32（only for U/R）	Thermo-adjustable (0.8-0.9-1.0)In Magnet-fixed 14In	Thermo-fixed 1.0In Magnet-fixed 14In	Thermo-adjustable (0.8-0.9-1.0)In Magnet-fixed 14In					
	40（only for U/R）								
	50（only for U/R）	Thermo-adjustable (0.8-0.9-1.0)In Magnet-fixed 10In	Thermo-fixed 1.0In Magnet-fixed 10In						
	63								
	80								
	100								
	125								
	160	Thermo-adjustable (0.8-0.9-1.0)In Magnet-adjustable (5-6-7-8-9-10)In	Thermo-fixed 1.0In Magnet-adjustable 10In	Thermo-adjustable (0.8-0.9-1.0)In Magnet-adjustable (9-10-11-12-13-14)In	Magnet-adjustable (9-10-11-12-13-14)In	/			
	200								
	250								

8. Outline and installation dimensions

8.1 External dimensions of products

8.1.1 External dimensions of front-plate connection products

NDM5-250L/M/H:

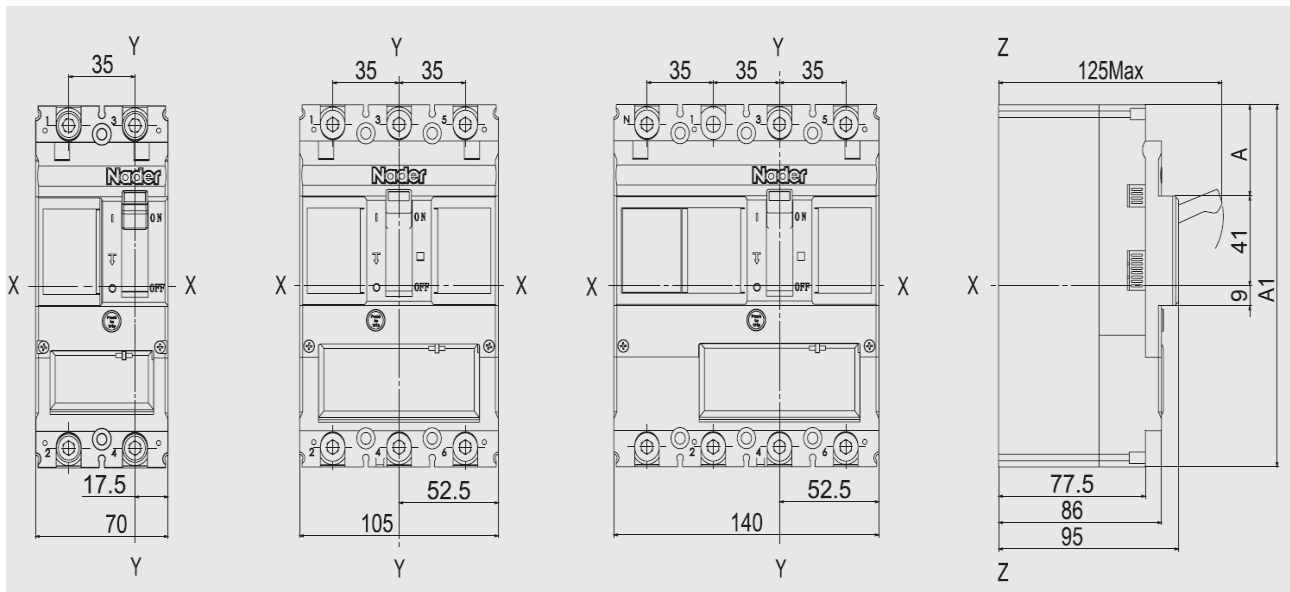


Fig.8 NDM5-250L/M/H 2P 3P 4P Outline dimension drawing of front board wiring products

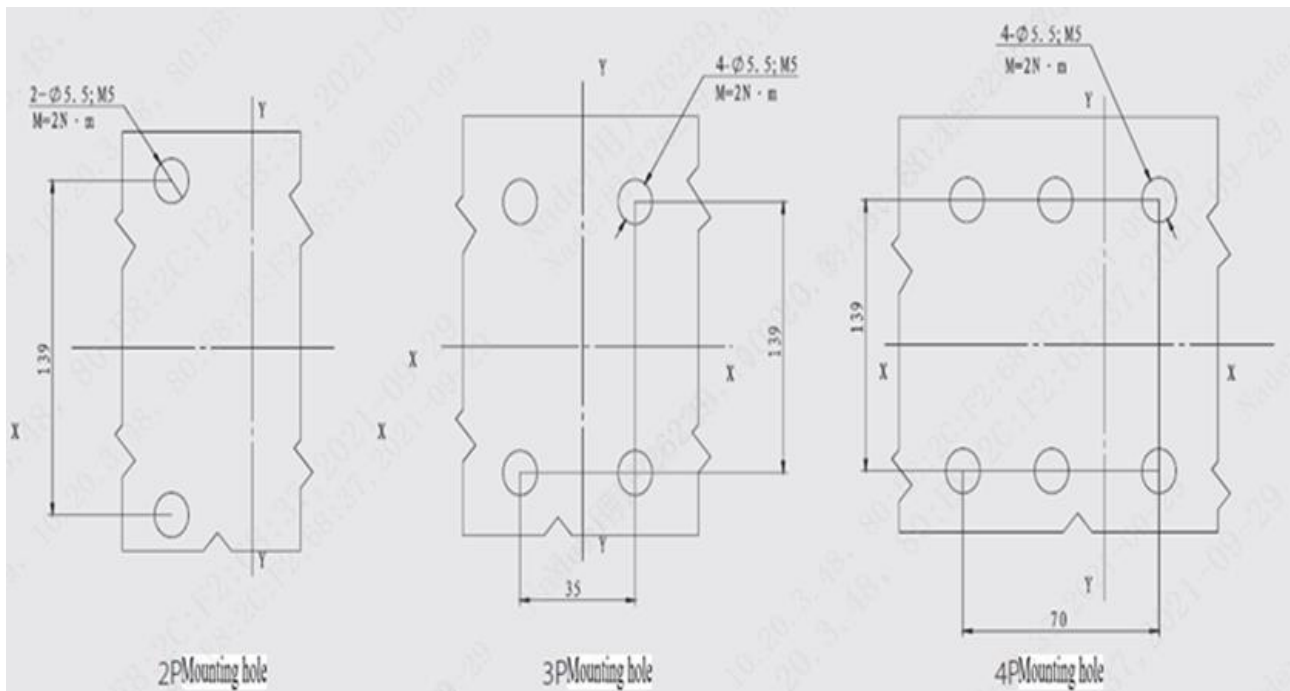


Fig.9 NDM5-250L/M/H 2P 3P 4P Installation dimension drawing of front board wiring products

Note: 1) Dimensions of conductive bar or terminal front-plate connection products: A=82.5, A1=165;

Dimensions of bare cable front-plate connection products (FCu): A=92.5, A1=185;

Dimensions of partition: B=56 ($U_e \leq 690V$), B=100 ($U_e > 690V$)

2) Unmarked tolerance level should follow GB/T 1804-c.

3) Four mounting holes for grade 4 products can be selected from the size

NDM5-250U/R:

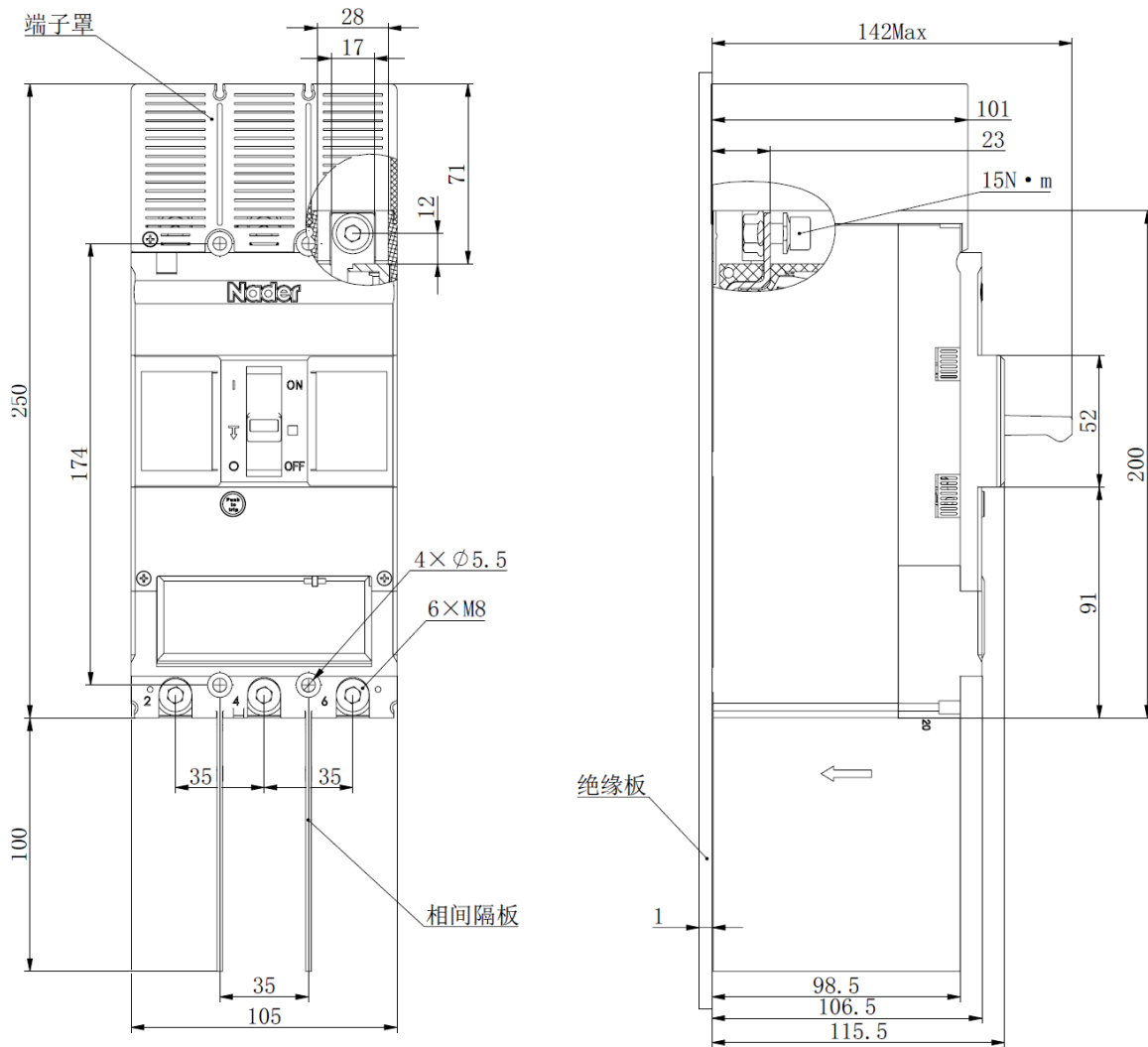


Fig.9 Size of terminal cover

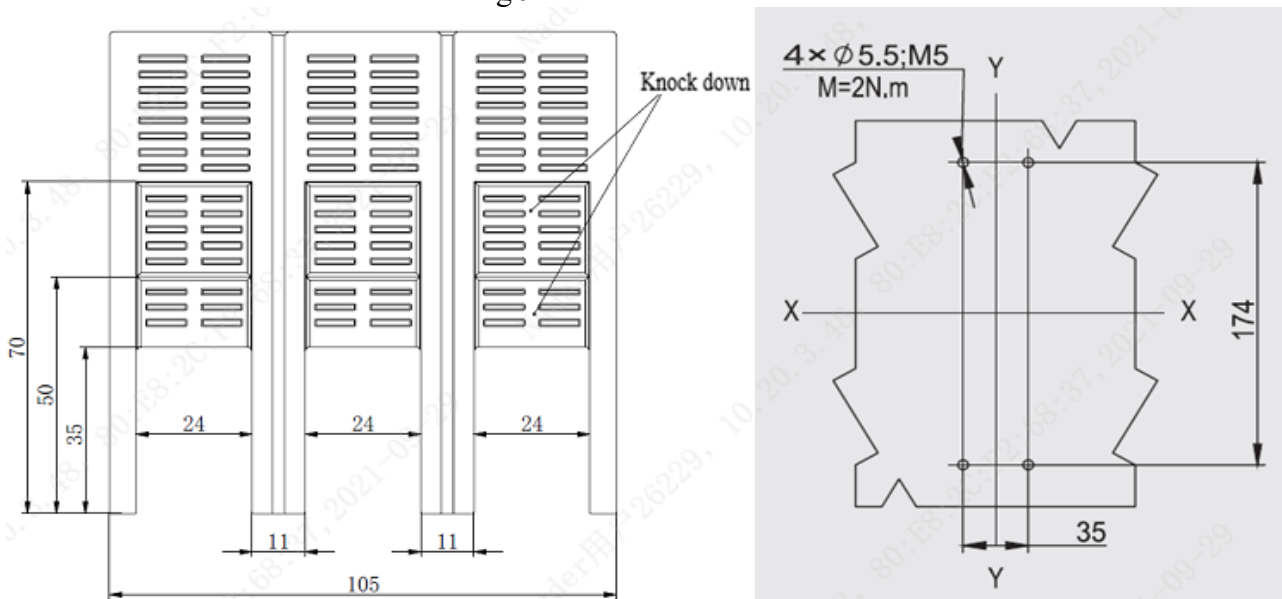


Fig.10 NDM5-250U/R 3P Outline dimension drawing of front board wiring products

Note1: The tolerance grade without note is in accordance with GB/T 1804-c.

Note2: U/R Add standard terminal cover and insulated base plate (1 terminal cover)

8.1.2 Size of terminal cover :

NDM5-250 L/M/H:

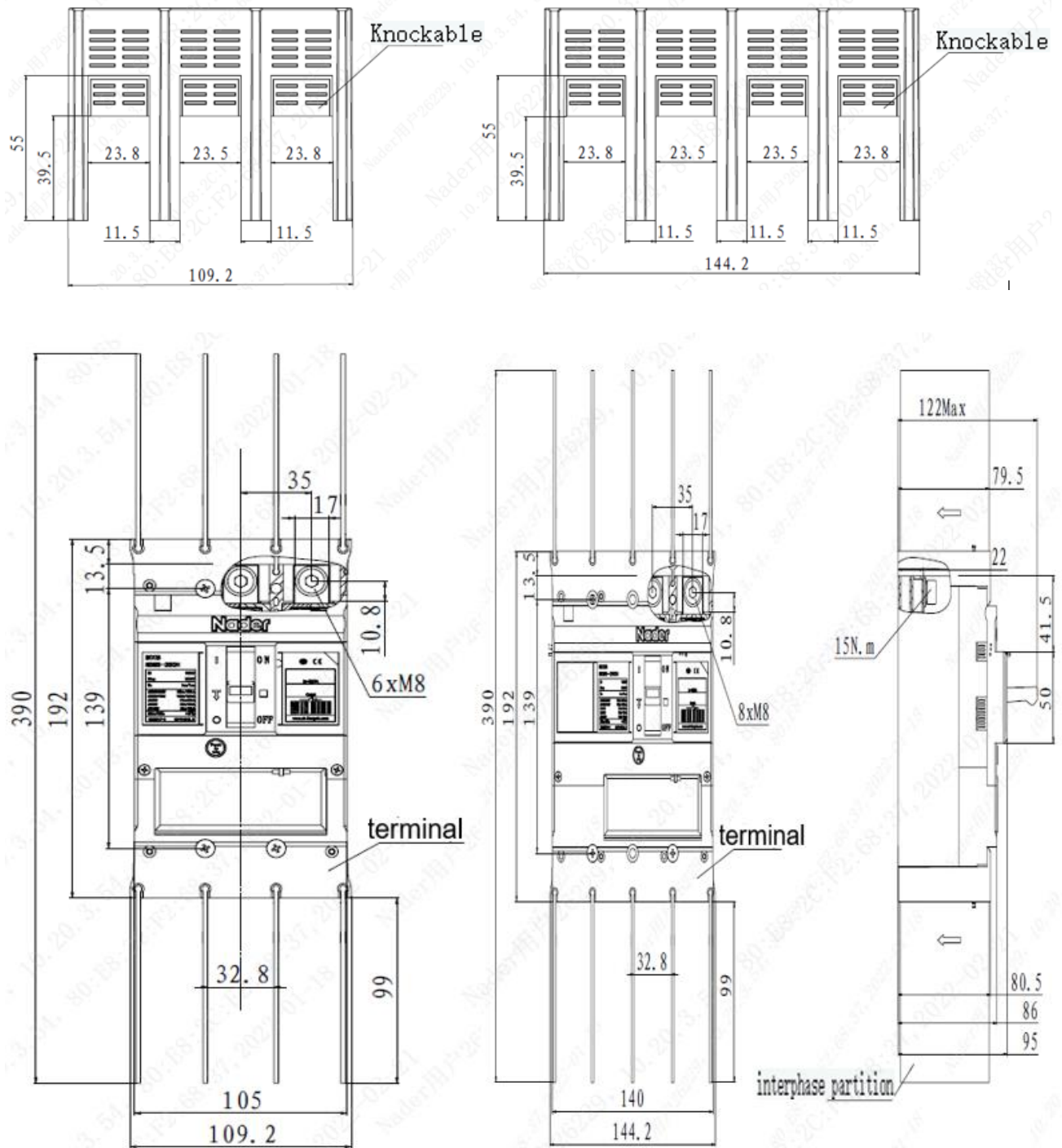


Fig.11 NDM5-250L/M/H 2/3/4P Outline dimension drawing of front board wiring products

Note: The tolerance grade without note is in accordance with GB/T 1804-c.

8.2 NDM5-250L/M/H External dimensions of extended front-plate connection products

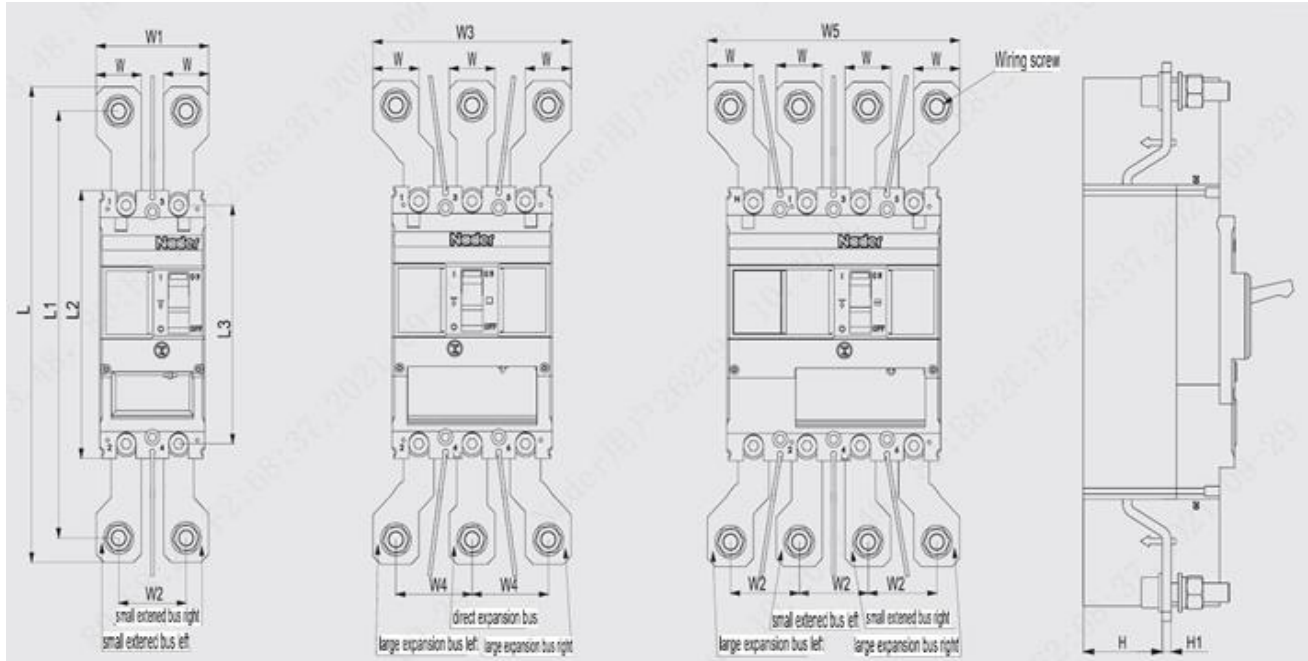


Fig.12 2P/3P/4P Outline and installation dimensions of expansion wiring in front of the board

Table 8 The overall dimensions of the front wiring expansion bar and the circuit breaker after combined installation are shown in the figure below

Extended bus	L	L1	L2	L3	W	W1	W2	W3	W4	W5	H	H1	Wiring screw (provided by the user)
KM1/ M5-250	293	263	165	147	30	75	45	130	50	165	45	5	M10×40

Note: 1) 2p Extended bus combination mode: small expansion bus (2 pieces on the left\right) ;

2) 3p Extended bus combination mode: large expansion bus (2 pieces on the left\right) +2 –piece direct expansion busbar;

3) 4p Extended bus combination mode: small expansion bus (2 pieces on the left\ right) large expansion bus (2 pieces on the left\right);

4) Unmarked tolerance level should follow GB/T 1804-c.

8.3 NDM5-250L/M/H 2P/3P/4P Outline and installation dimension of rear wiring board

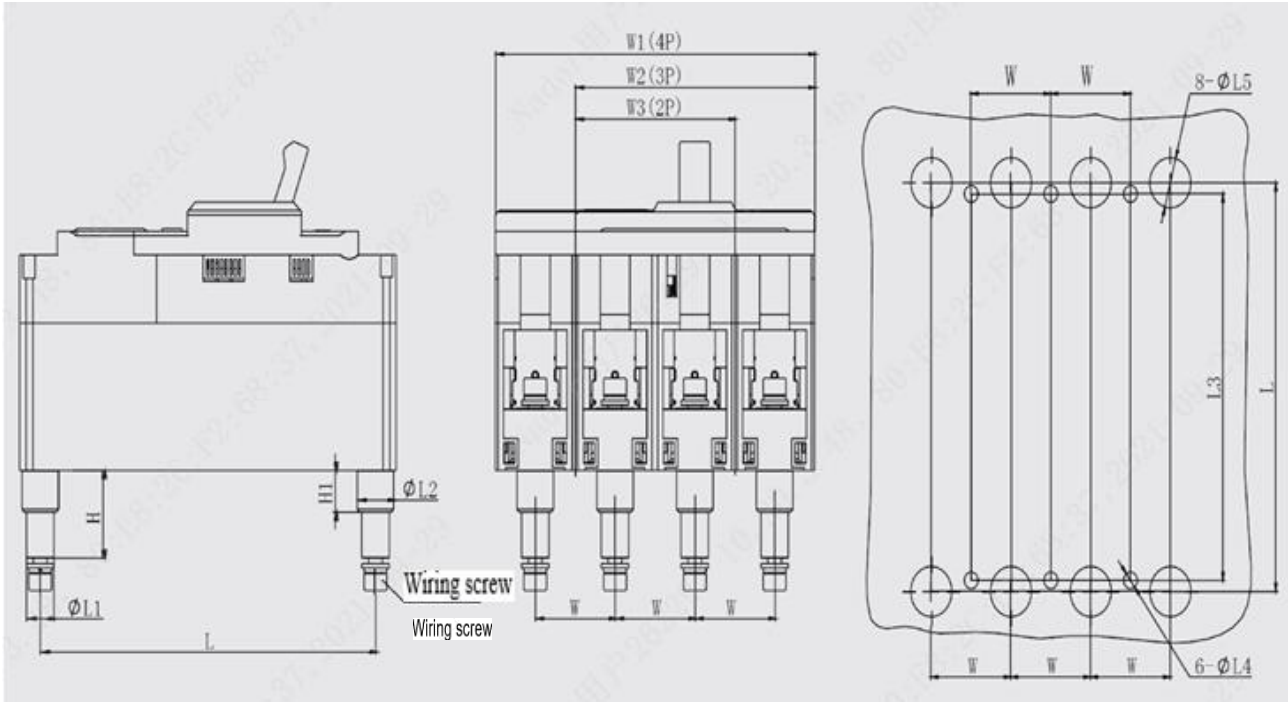


Fig.13 2P、3P、4P outline dimension drawing of rear wiring board

Table 9 2P、3P、4P the installation dimensions of wiring products behind the board are shown in the table below

Pear panel wiring	L	L1	L2	L3	L4	L5	H	H1	H2	W	W1	W2	W3	Wiring screw (provided by the user)
BH1/M5-250	147	12	16	139	6	18	31.6	15	30	35	140	105	70	M8×20

Note: Unmarked tolerance level should follow GB/T 1804-c.

8.4 NDM5-250L/M/H Outline and installation dimensions of plug-in board front wiring

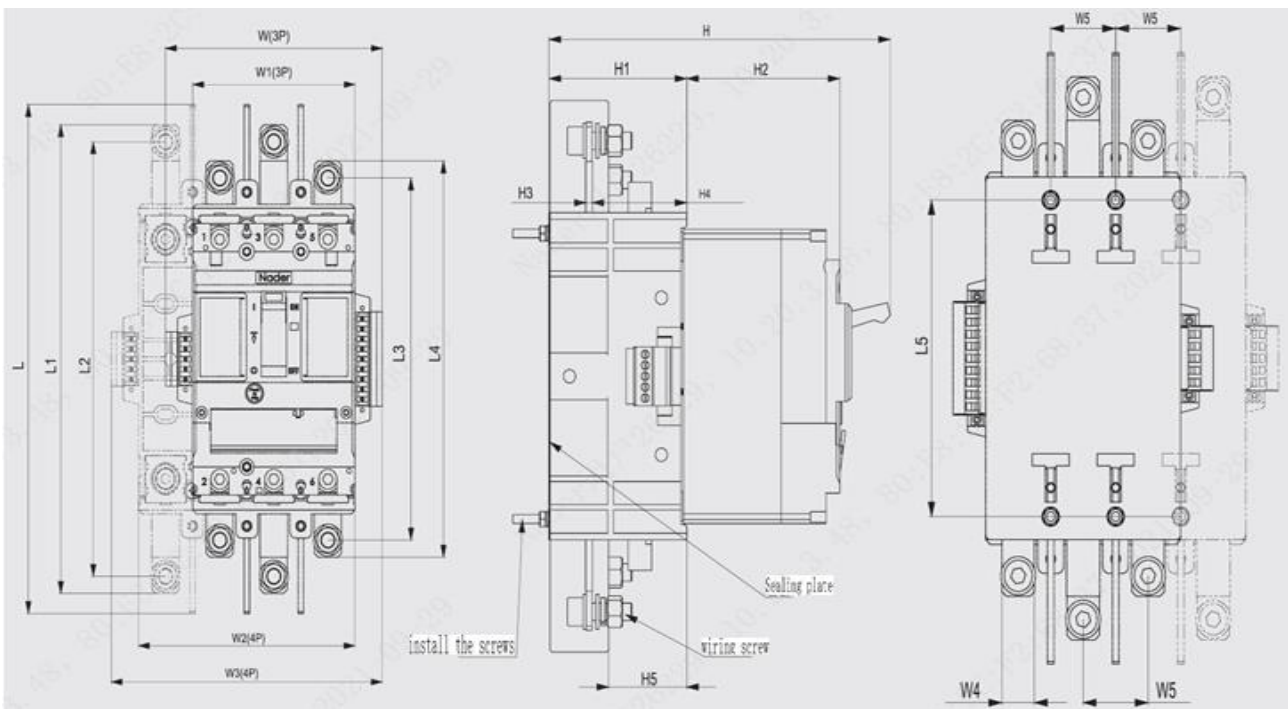


Fig.14 External dimensions of plug-in front-panel connection

Table 10 The overall dimensions of plug-in board front wiring (horizontal) and circuit breaker after installation are shown in the figure below

Plug in specification CR1-Q/M5-250 L/M/H	W	W1	W2	W3	W4	W5	L	L1	L2	Wiring screw
	136	105	140	171	18	35	278	272	252	M8×25
	L3	L4	L5	H	H1	H2	H3	H4	H5	Install the screws
	212	232	160	197	81	83	4	54	50	M4×80
Plug in specification CR1-Q/M5-250 U/R	W	W1	W2	W3	W4	W5	L	L1	L2	Wiring screw
	135	105	/	/	18	35	314	308	288	M8×25
	L3	L4	L5	H	H1	H2	H3	H4	H5	Install the screws
	248	268	195	219.5	80.5	103.5	4	54	49.5	M4×80

Note 1: Unmarked tolerance level should follow GB/T 1804-c.

2: U/R type with inserted plate, the body is not equipped with insulating base plate

8.5 NDM5-250L/M/H 3P\4P Mounting hole dimensions of plug-in connections

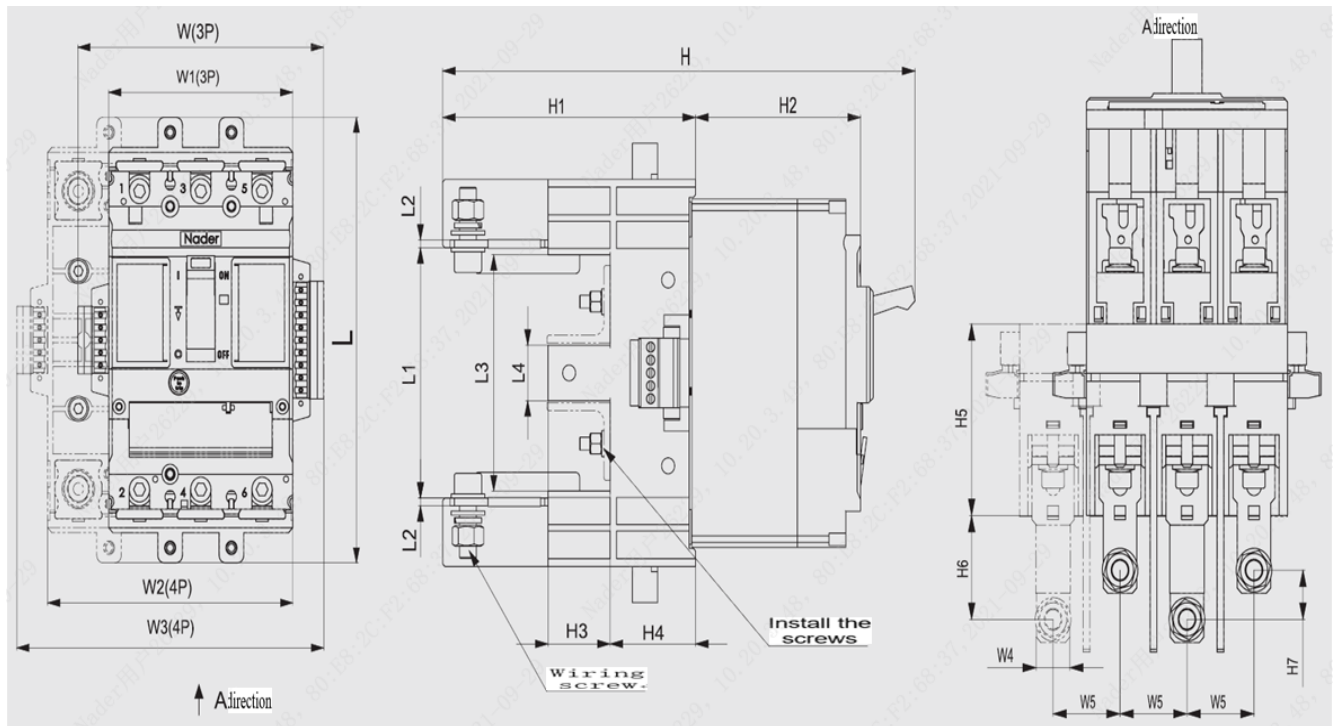


Fig.15 3P/4P Mounting hole dimensions of plug-in connections

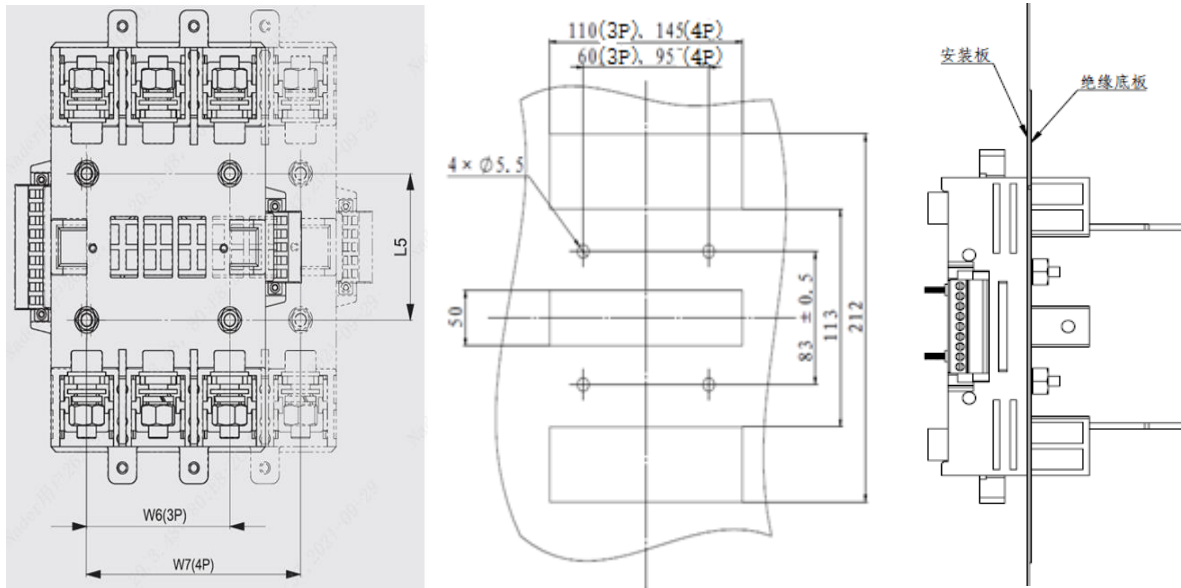


Fig.15 3P/4P Mounting hole dimensions of plug-in connections

Table 11 The overall dimensions of plug-in device (horizontal wiring behind the board)and circuit breaker after installation are shown in the table below

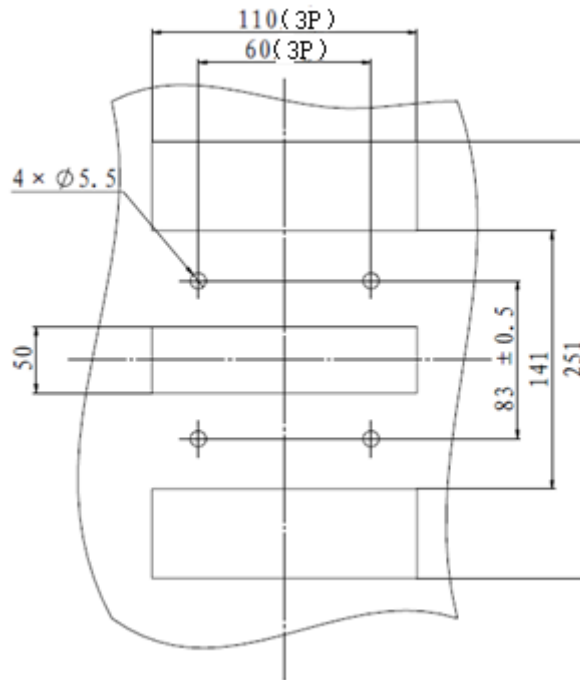
Plug in board rear wiring CR1- H/M5- 250L/M/H	W	W1	W2	W3	W4	W5	W6	W7	L	L1	L2	Wiring screw
	136	105	140	171	18	35	60	95	210	122	4	M8×25
	L3	L4	L5	H	H1	H2	H3	H4	H5	H6	H7	Install the screws
	115	46	83	248	135	83	34	46	80	19	20	M5×35
Plug in board rear wiring CR1- H/M5- 250U/R	W	W1	W2	W3	W4	W5	W6	W7	L	L1	L2	Wiring screw
	135	105	/	/	18	35	60	/	246	158	4	M8×25
	L3	L4	L5	H	H1	H2	H3	H4	H5	H6	H7	Install the screws
	151.5	45	83	273.5	134.5	103.5	34	46	80	39	20	M5×35

Note 1: Unmarked tolerance level should follow GB/T 1804-c.

2: U/R type plus insert plate front body without insulating base plate

This bottom plate is a free gift from Liangxin and is used to enhance the insulation of the plug-in bottom in high voltage environments. It can be determined whether it can be installed according to the actual site (without affecting the performance of the product itself). When installing the plug-in base, the insulation bottom plate can be fixed with nuts along with the base, without the need for tools such as double-sided tape.8.6 3P/4P Outline and installation dimensions of guide rail type safety rotation products.

Hole size for NDM5-250U/R plug-in board wiring products



Note: Unmarked tolerance level should follow GB/T 1804-c.

8.6 NDM5-250L/M/H External dimensions of three pole and four pole guide rail installation products

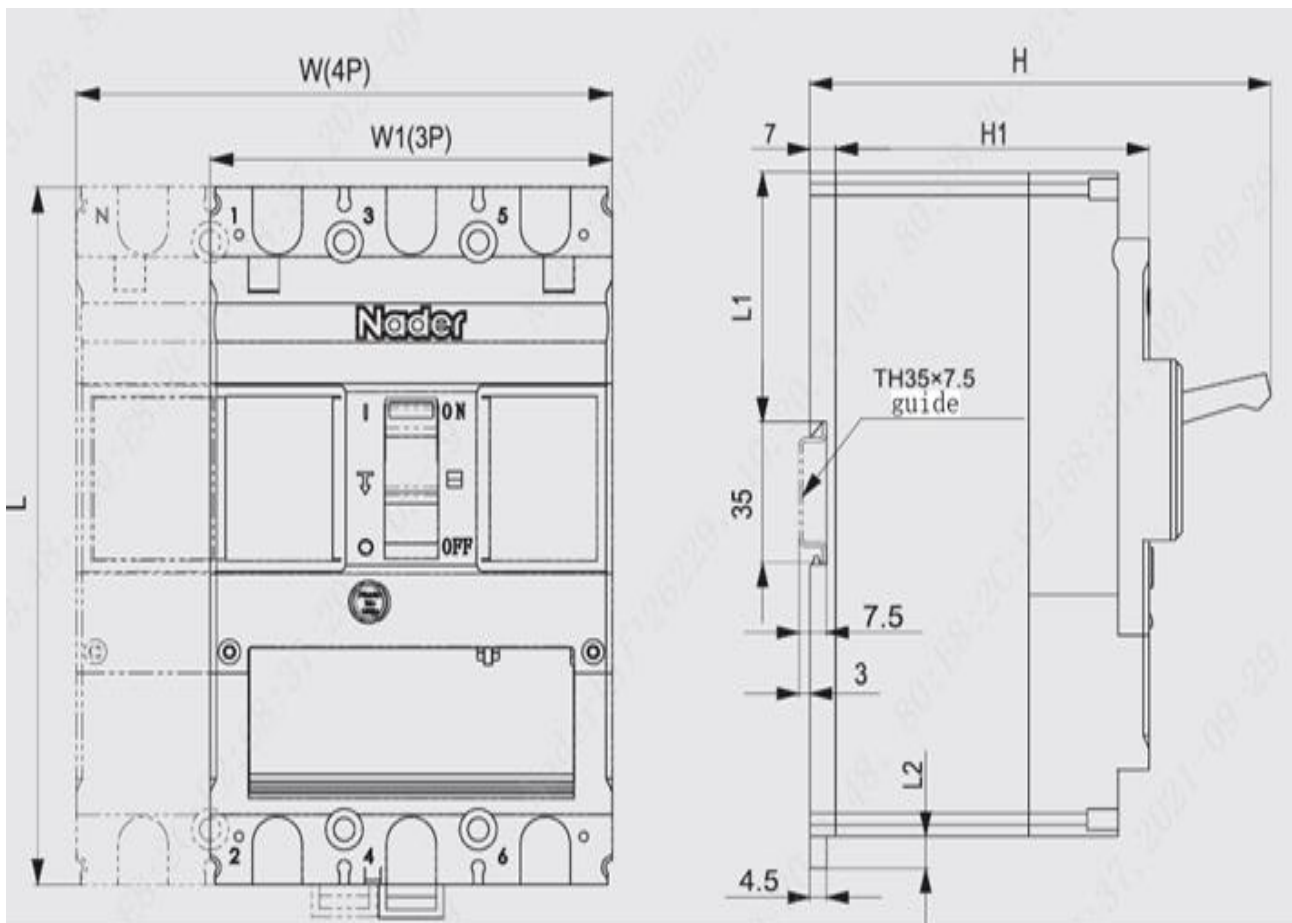


Fig.16 3P\4P Outline and installation dimensions drawing of guide rail type safety rotation products

Table 12 The installation dimensions of guide rail type safety rotation products are shown in the figure

IN-Rail Mounting	W	W1	L	L1	L2	H	H1
DK1/M5-250	140	105	165	62	8	126.4	86

Note: Unmarked tolerance level should follow GB/T 1804-c.

8.7 Rotary handle operating mechanism

Manual operation-the schematic diagram of handle installation and opening and the outline dimension diagram of manual operation are shown below respectively:

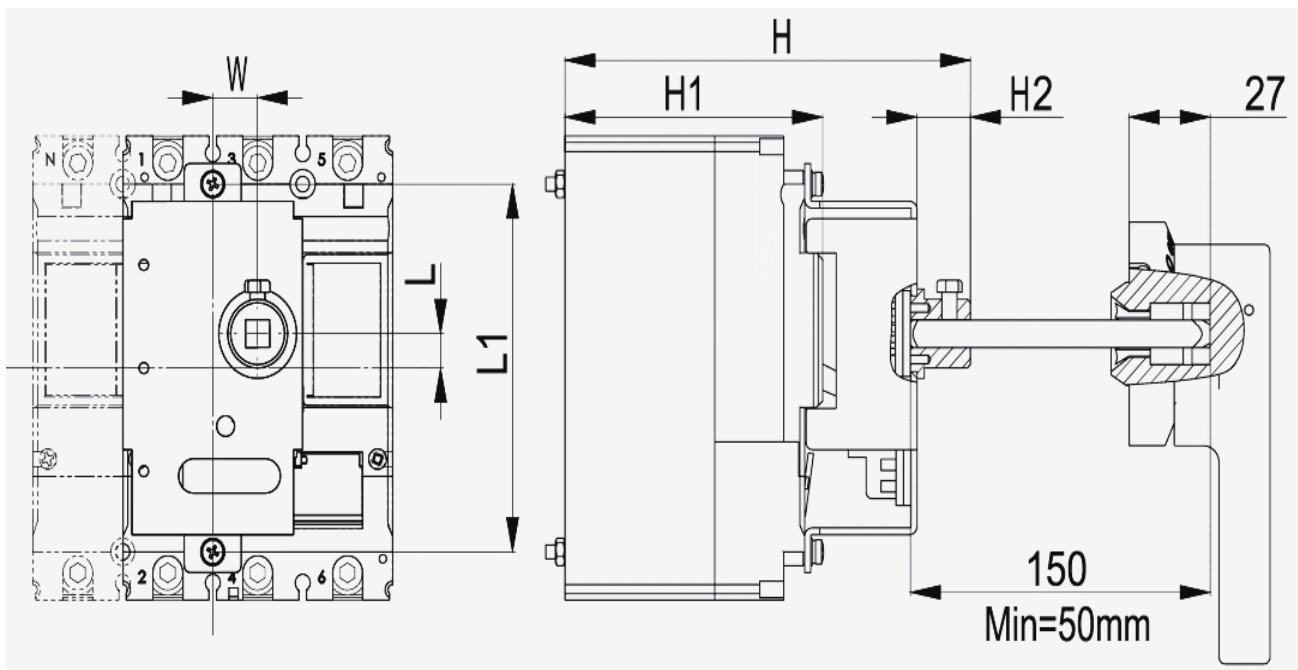


Fig.17 Installation drawing of rotary handle operating mechanism

Table 13 Installation drawing of rotary handle operating mechanism

Model	W	L	L1	H	H1	H2	Square shaft specification
NDM5-250L/W/H	17.5	13	139	151	95	20	8×8
NDM5-250U/R	17.5	13	174	171.5	115.5	20	8×8

Note: Unmarked tolerance level should follow GB/T 1804-c.

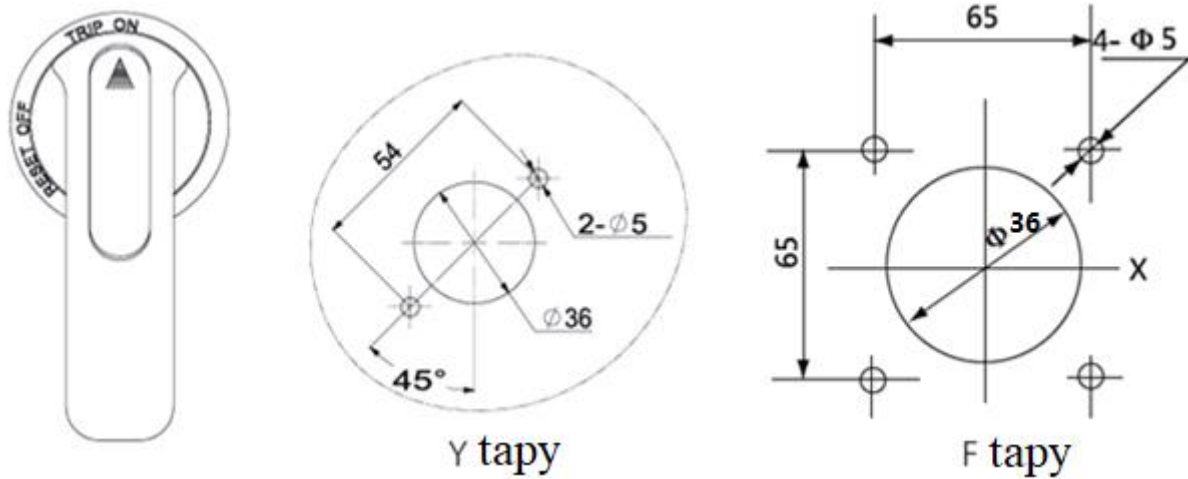


Fig.18 Installation opening diagram of rotary handle

Note: 1) During manual operation, it shall rotate 180°clockwise, and counterclockwise operation is prohibited.
2) Unmarked tolerance level should follow GB/T 1804-c.

8.8 Electric operation

Electric operation-overall dimension of circuit breaker and its electric operating mechanism after installation:

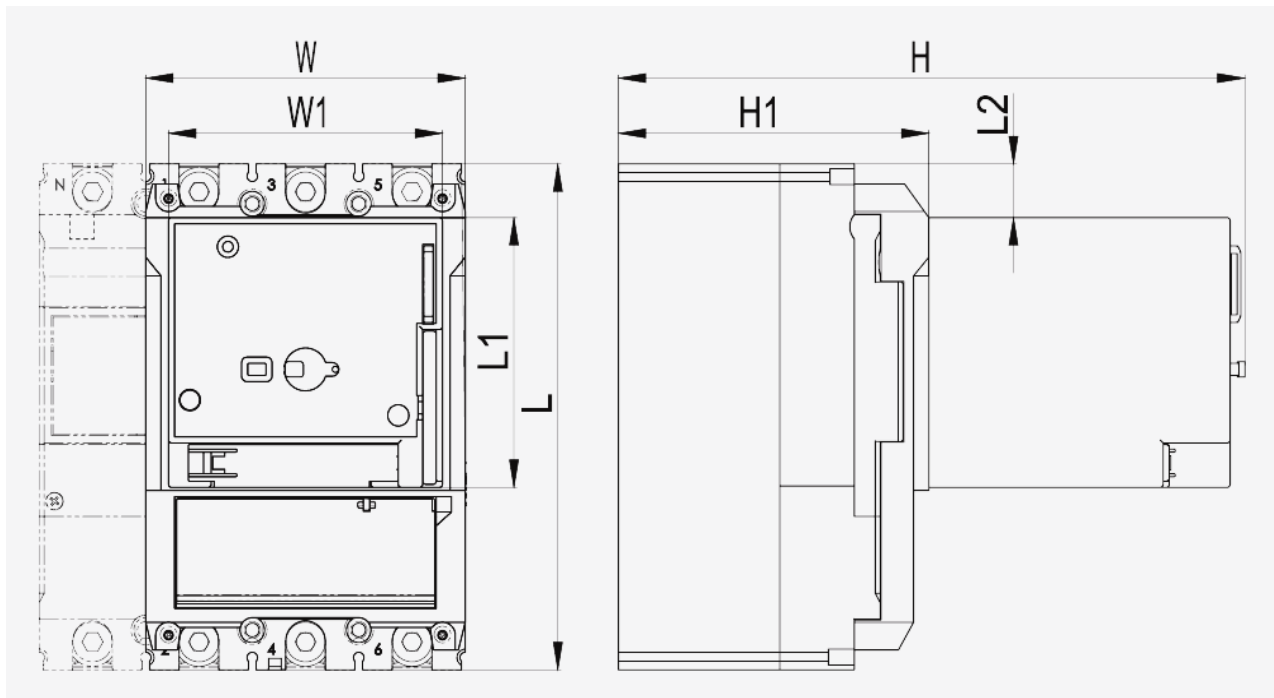


Fig.19 External dimension diagram of electric operation

Table 14 External dimension diagram of electric operation

Electric operation model	W	W1	L	L1	L2	H	H1
DC1-□/M5-250	105	90	165	88	17.5	206	103

Note: Unmarked tolerance level should follow GB/T 1804-c.

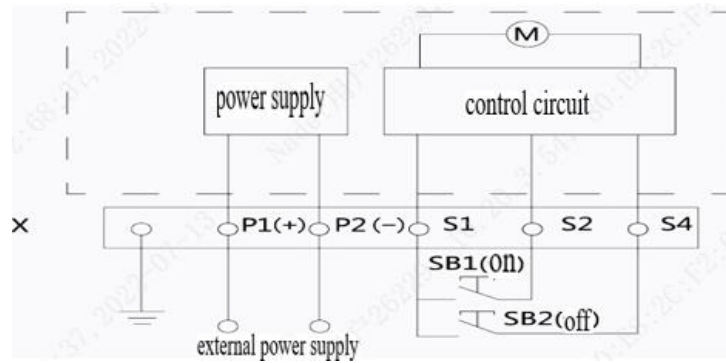


Fig.20 Electric operation wiring diagram

- Note: 1) During manual operation, 180° shall be operated clockwise, and counterclockwise operation is prohibited
- 2) P1 and P2 shall not be connected with S1 and S2 and S4 during electric operation wiring
- 3) Unmarked tolerance level should follow GB/T 1804-c.

Table 15 Voltage specification and power of electric operation

Attachment Name	Electric operation			
Voltage specification	DC24V	AC110V/DC110V	AC230V/DC220V	AC400V
power (W)	80	150	150	200

8.9 Mechanical interlock

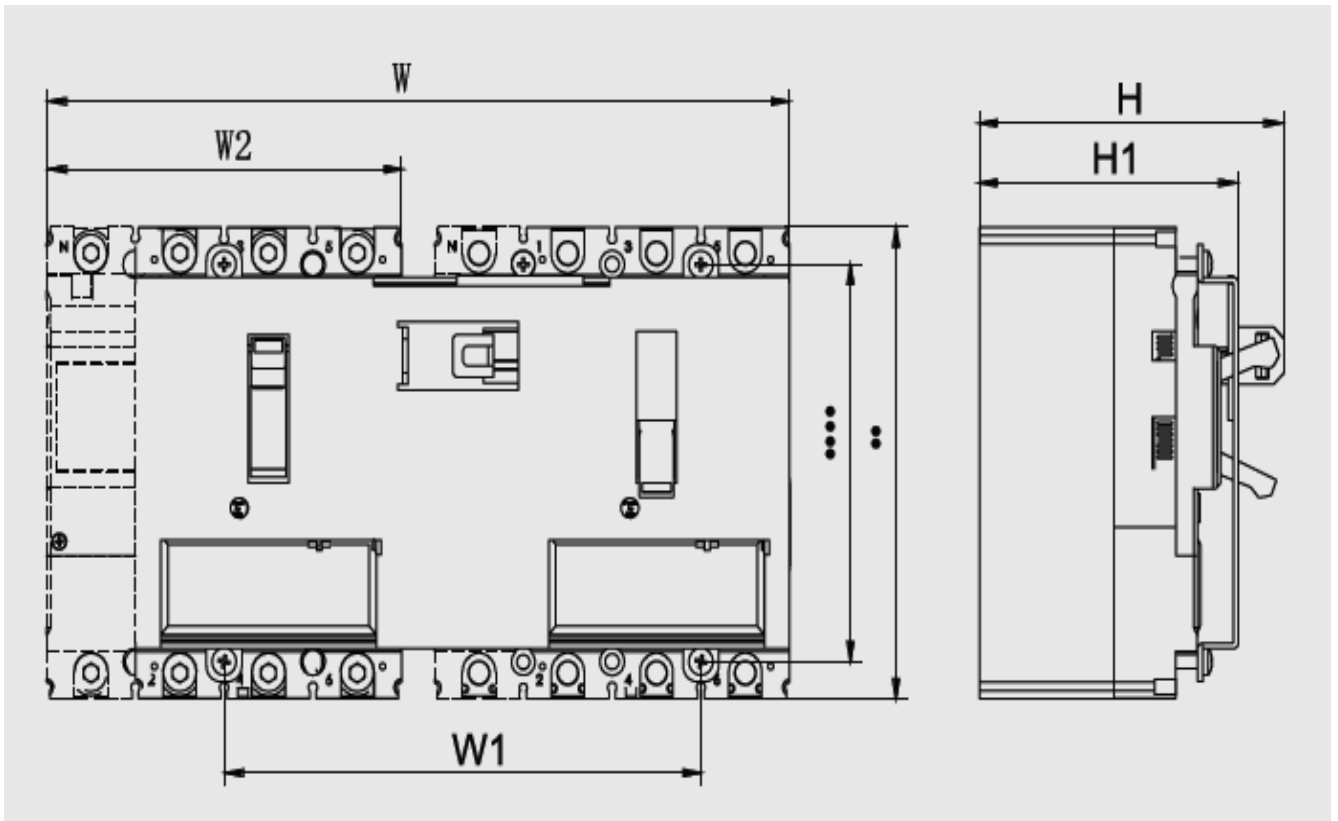


Fig.21 Outline dimension drawing of mechanical interlocking mechanism and circuit breaker after installation

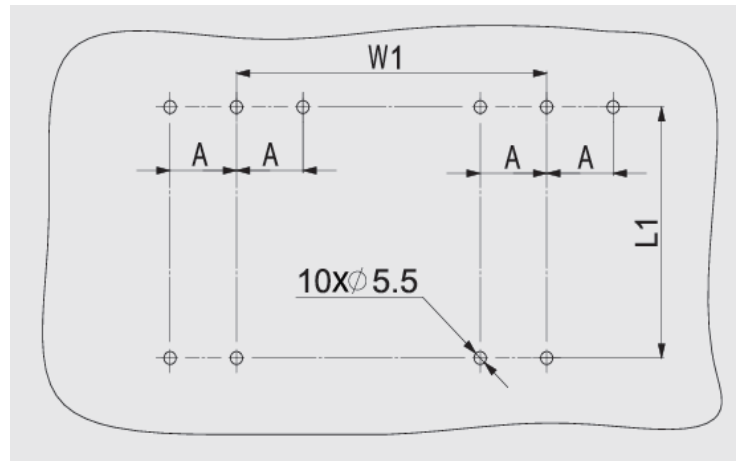


Fig.22 Installation opening dimension drawing

Table 16 Overall dimensions of mechanical interlocking mechanism and circuit breaker after installation

mechanical interlocking mechanism	Applicable circuit breaker	W	W1	W2	L	L1	H	H1	A
JS111Y/M5-250	NDM5-250/3P	258	188	105	165	139	120	102	35
	NDM5-250/4P	293	188	140	165	139	120	102	35

Note: 1) U/R Model no mechanical interlocking mechanism

2) Unmarked tolerance level should follow GB/T 1804-c.

8.10 Copper bar in front of board or copper cable with wiring terminal

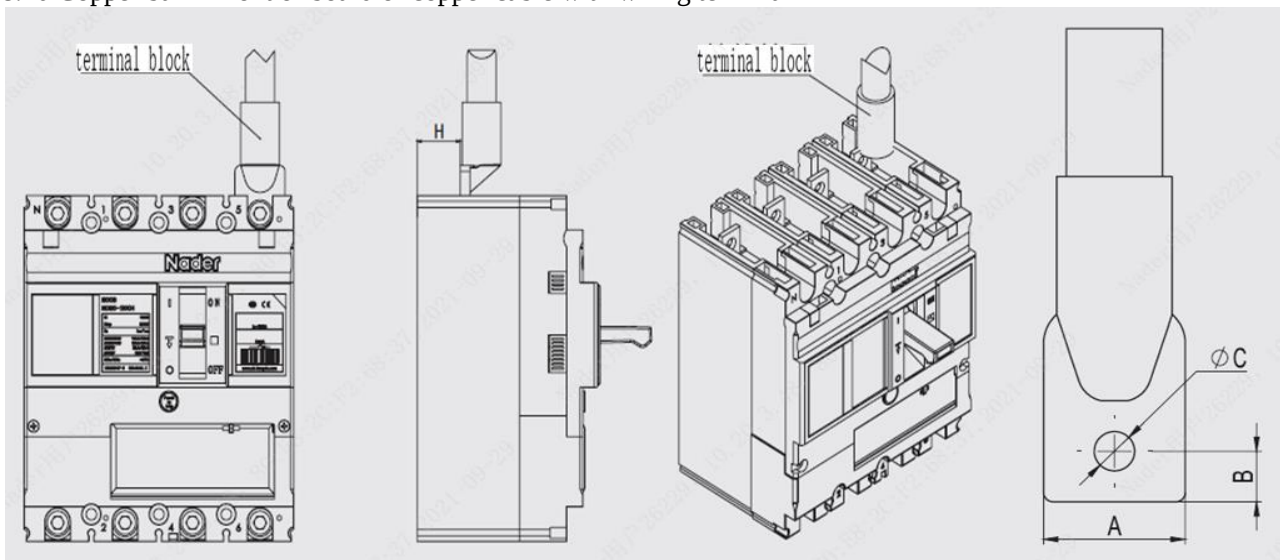


Fig.23 Connection diagram of copper bar in front of board or copper cable with wiring terminal

Table 17 Connection size of copper bar in front of board or copper cable with wiring terminal

Model	A(mm)	B(mm)	ΦC(mm)	H(mm)
NDM5-250	≤26	≤12	8.4	22(L/M/H), 23(U/R)

Note: Unmarked tolerance level should follow GB/T 1804-c.

8.11 Safety distance

The minimum safety distance between the top, bottom, side and front panel when installing the circuit breaker, see the figure below:

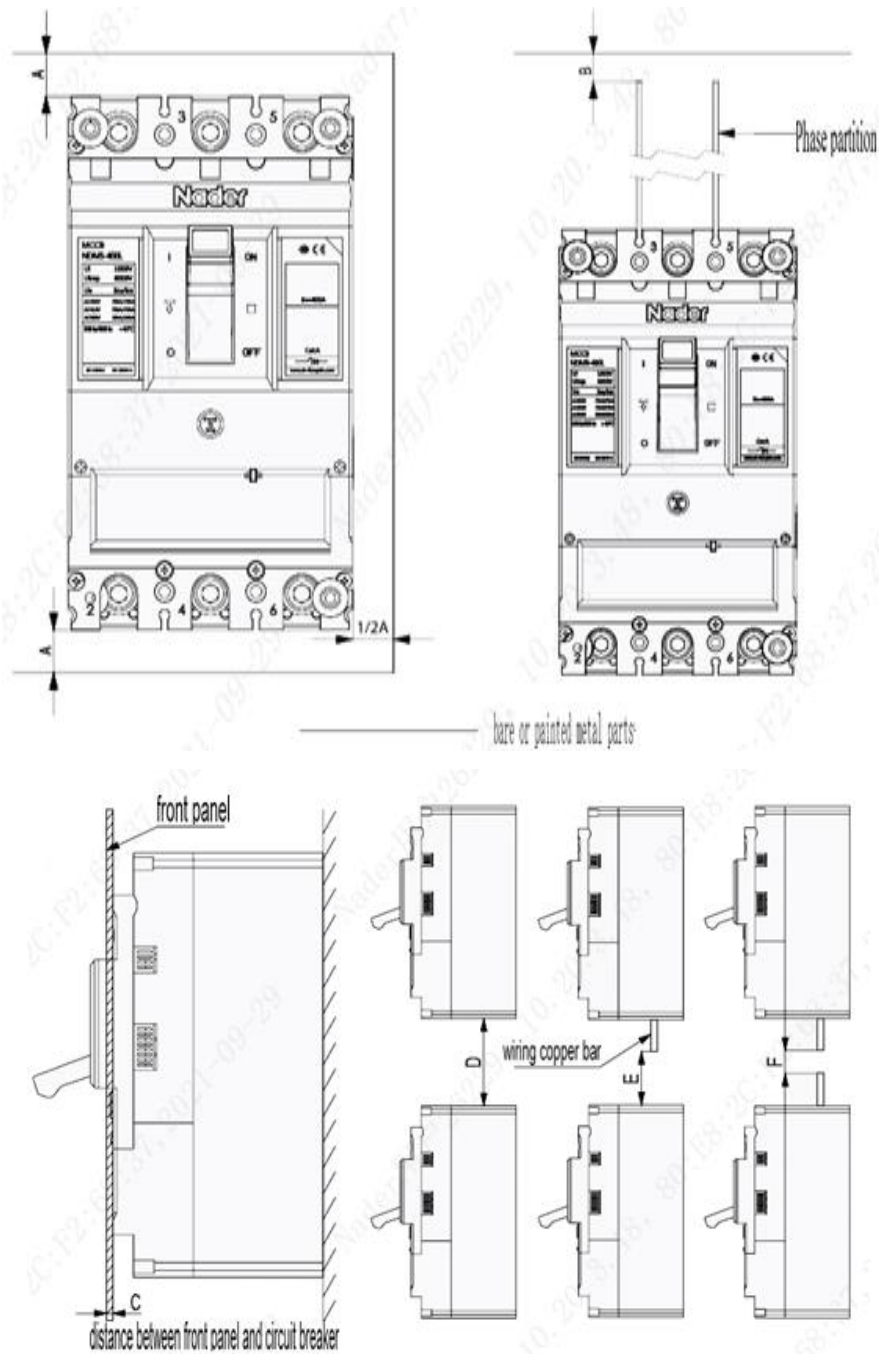


Fig.24 Insulation distance mounted in the metal cabinet

Table 18 Insulation distance mounted in the metal cabinet (unit: mm)

Model	Spacing A	Spacing B	Spacing C	Spacing D	Spacing E	Spacing F
NDM5-250	≥ 50	≥ 0	≥ 0	≥ 120	≥ 80	≥ 40

Note: (1) Board front wiring (standard phase spacer board) unit mm

(2) Unnoted tolerance grade in accordance with GB/T 1804-c.

(3) Under the premise of ensuring insulation and heat dissipation, the installation spacing of circuit breakers can be reduced.

8.12 Safety spacing

8.12.1 Insulation requirement between phases

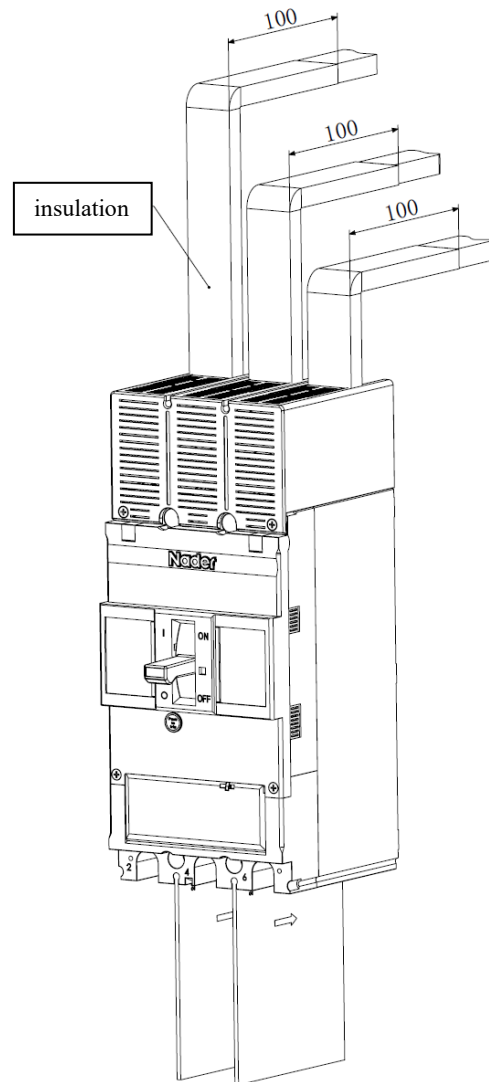
a. Cable

Naked metal at cable lug must be insulated with interphase partition

b. Busbar (see picture below for size of insulated cover)

Straight bar:insulation covers all around

curved bar: Insulation covers to 100mm long to the curve.



Size of insulated cover

Note:1. Copper bar can be directly connected to the products. if aluminum bars are applied, extended copper bars must be used to reach out of the terminal shell and then connect to the aluminum bar. plus, connection parts of the aluminum are suggested to plate with tin. Use partitions to insulate the bars after connection.(if aluminum bars are intended to be applied, please contact us. we will provide two more partitions for insulation.)

2. Partitions are not allowed to be pressed between bars.

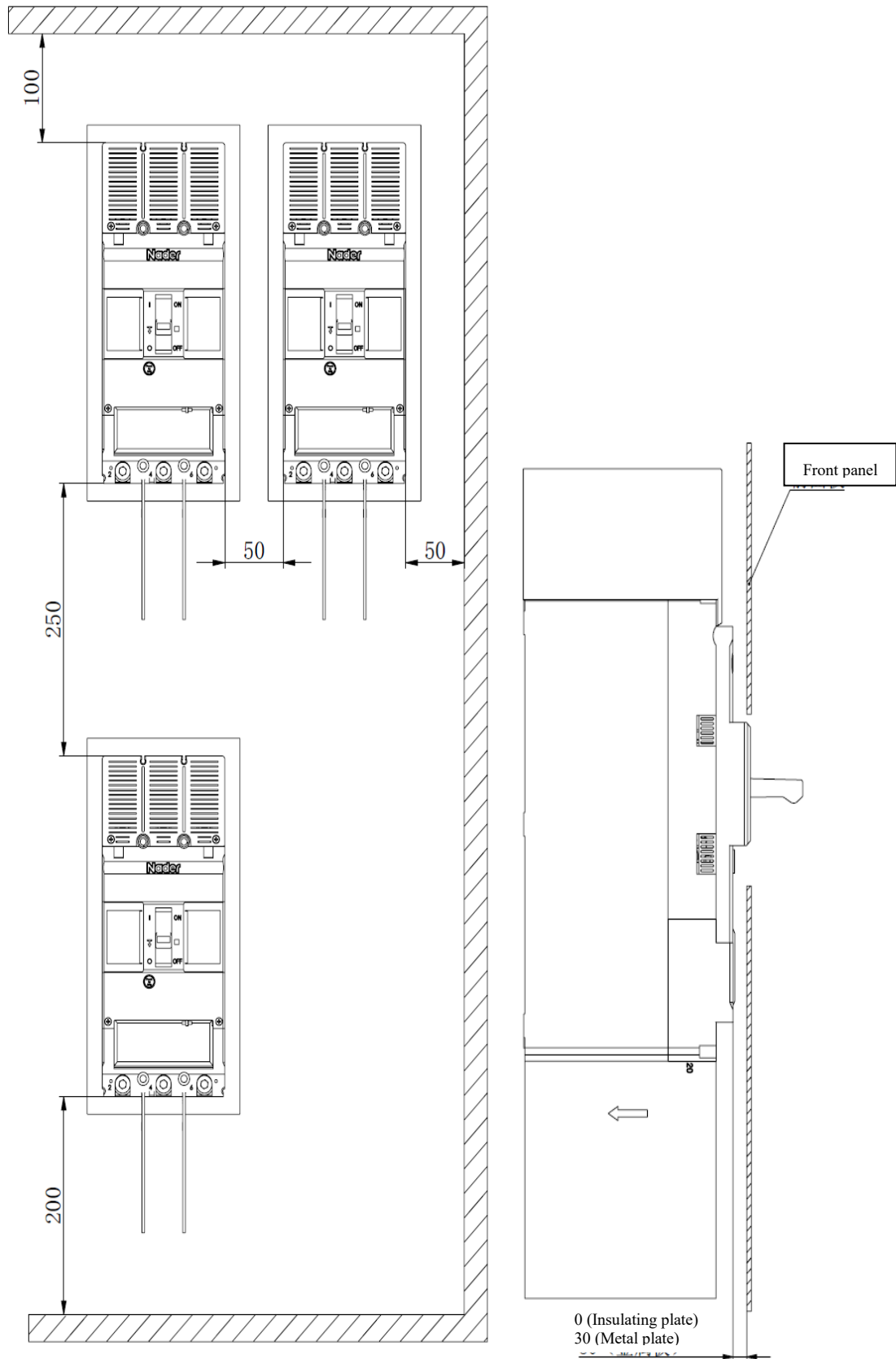
3. The picture above is only for identifying the sizes of insulation cover. there is no requirement of bar connection method here.

8.12.2 distance requirement of installation in cabinet

See the figure below for the minimum safety distance of the circuit breaker from the top, bottom, side and

Add: No.2000, South Shen Jiang Rd. Pudong District, Shanghai, 201315, PRC Tel:(021)68586699 Fax:(021)23025796

adjacent products during installation.

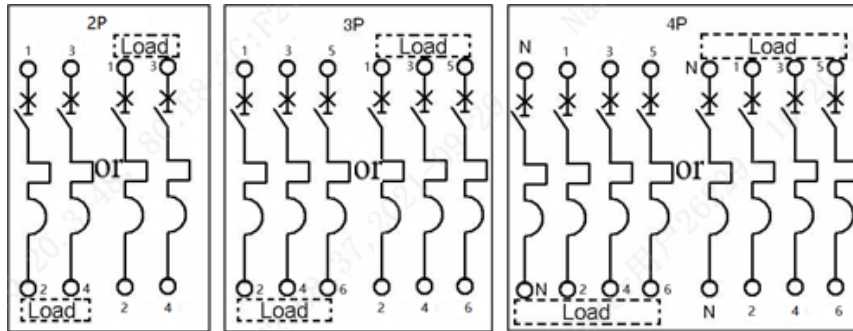


Distance requirement of installation in cabinet

Safety distance of front panel

Unmarked tolerance level should follow GB/T 1804-c.

8.13 Wiring diagrams of the product main circuit



Note: shunt tripper is working principle: it is a single pulse action. If it needs to act again, the shunt release must be power on before it can act again.

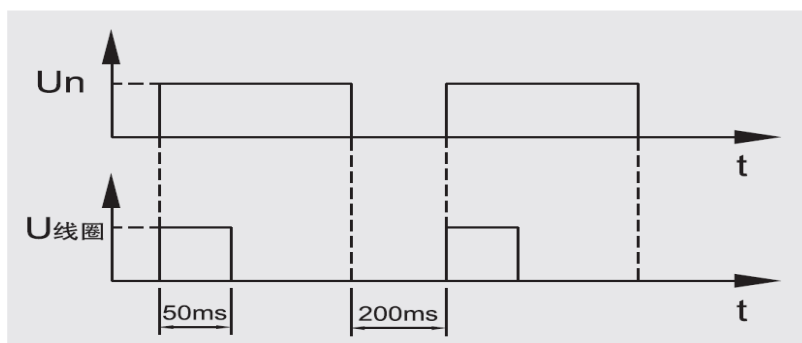
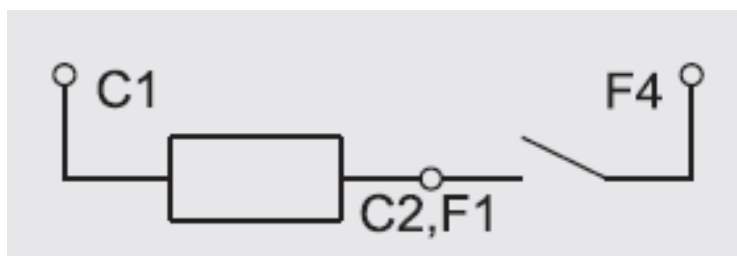


Fig.27 Working principle diagram of shunt tripper

If long-term power supply is required so that the circuit breaker cannot be closed normally, one auxiliary contact can be connected in series as shown in the figure below.



9.3 Rated parameters of the auxiliary contact

Table 21 Rated parameters of the auxiliary contact

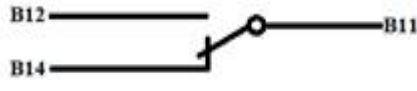
Accessory name		Auxiliary contact (normally)	Auxiliary contact (low-power dissipation)
Voltage specifications (V)/conventional (Ith)		AC250V/10A 、 AC400V/3A 、 DC220V/0.2A	DC30V/0.1A
Wiring diagram	Off		
	On		
Internal resistance		<30mΩ	<50mΩ

Note1: If need DC30V/0.1A Auxiliary contact, please explain when ordering.

2: The first auxiliary harness is identified as F11 (red), F12 (white), F14 (yellow), and the second auxiliary harness is identified as F21 (red), F22 (white), F24 (yellow), and so on. At most three groups of auxiliary harness are installed.

9.4 Rated parameters of the alarm contact

Table 22 Rated parameters of the alarm contact

Accessory name		Auxiliary contact (normally)	Auxiliary contact (low-power dissipation)
Voltage specifications (V)/conventional (Ith)		AC250V/10A、AC400V/3A、DC220V/0.2A	DC30V/0.1A
Wiring diagram	On, off		
	Free tripping		
Internal resistance		<30mΩ	<50mΩ

Note1: If need DC30V/0.1A Auxiliary contact, please explain when ordering.

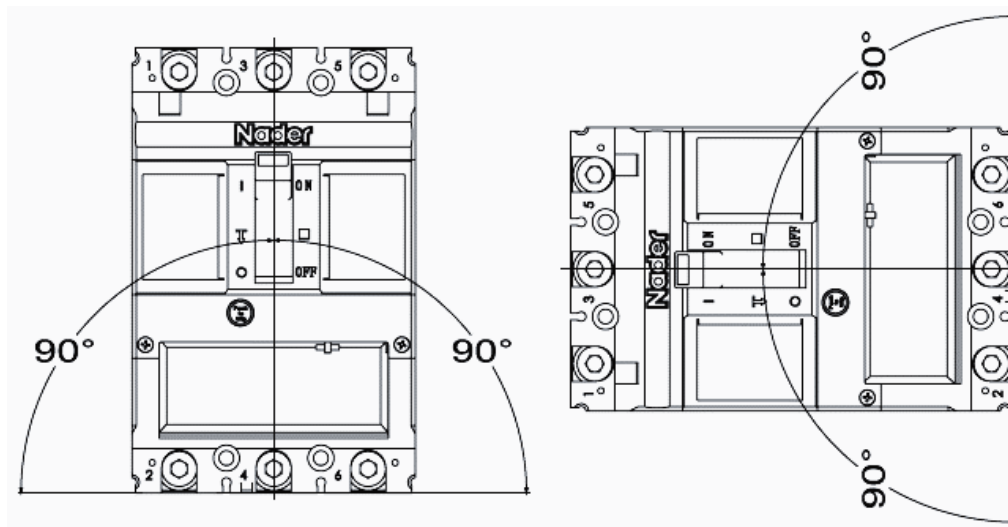
2: Alarm harness is identified as B11 (red), B12 (white), B14 (yellow).

Under-voltage release、Shunt Release、Auxiliary contact、Alarm contact , the standard wiring line is 0.7m long , 1m、2m、4m can be customized according to requirements.

10. Installation direction of circuit breaker

For vertical installation of the product, the gradient between the installation surface and the vertical plane is no more than $\pm 22.5^\circ$.

Horizontal installation of the product.



Vertical Installation

Horizontal Installation

Fig.28 Installation direction diagram

11. Packaging and Storage

Minimum packaging quantity: 1 piece/box. The packaged products should be stored in a warehouse with the ambient temperature of $-40^\circ\text{C} \sim 75^\circ\text{C}$ and relative humidity below 80% without acidic, alkali or other corrosive gas in the surrounding air. Under the conditions above, the storage period shall be no more than 36 months since the

manufacturing date.

12. Environment

The environment that comply with RoHS instruction.

13. List of accessories and installation

Table 23 Accessories list form (NDM5-250L/M/H)

SN	Name	Specification	2P Quantity/Set	3P Quantity/Set	4P Quantity/Set
1	Cross small pan-head screw	M5×85	2	4	4
2	Hexagon nut	M5	2	4	4
3	Spring washer	5	2	4	4
4	Plain washer	5	2	4	4
5	Interphase partition	——	2	4	6
6	Hexagon socket cylindrical head combination	M8×22	4	6	8
7	moulded case circuit breaker	NDM5-250L/M/H	1	1	1

Table 24 Accessories list form(NDM5-250U/R)

SN	Name	Specification	Quantity/Set
1	Cross small pan-head screw	M5×110	4
2	Hexagon nut	M5	4
3	Spring washer	5	4
4	Plain washer	5	4
5	Interphase partition	——	4
6	Hexagon socket cylindrical head combination	M8×22	6
7	Terminal guard	——	1
8	Terminal cap screw	M2. 9×7	2
9	insulating base	——	1

10	Moulded case circuit breaker	NDM5-250U/R	1
----	------------------------------	-------------	---

14. Circuit breaker notes

1) Various characteristics and accessories of the circuit breaker are set in the factory. The circuit breaker, tripping unit or other accessories can only be adjusted, installed and maintained by the trained or qualified professionals according to the parameter requirements of the line design;

2) Ensure that the power supply is off before installing or removing any device;

3) The circuit breaker handle can be located in three positions, indicating three states: on, off and free tripping. When the handle is in the free tripping position, pull the handle in the off direction when the circuit breaker is connected and on.