Shanghai Liangxin Electrical Co., Ltd.

NDM3AR-250 Moulded case circuit breaker

Product Specification

（IPD-ENG-DEV-T22 A1 2016-09-23）

Prepared	黄谢军	Date	2020.11.27
Reviewed	张明学	Date	2020.11.27
Countersign	王虎	Date	2020.11.27
	李成明		2020.11.27
Approved	曹健	Date	2020.11.30

Revision information					
Version	Revised contents and reasons	Date	Prepared	Reviewed	Approved
0	Newly added	7/28/2020	Huang Xiejun	Zhang Mingxue	Cao Jian
1	Update according to the latest specification template	10/26/2020	Huang Xiejun	Zhang Mingxue	Cao Jian
2	Correction of backboard wiring diagram	11/25/2020	Huang Xiejun	Zhang Mingxue	Cao Jian

1. Applicable scope and purpose

The NDM3AR-250 moulded case circuit breakers have a rated insulation voltage of 1000V and apply to circuits with the AC 50Hz/60Hz, the rated working voltage to AC415V and rated working current (125A 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  ;

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

2. Picture of the product

3. Specification and model description

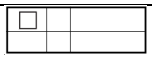
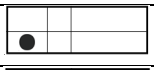
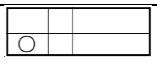
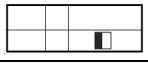
Table 1 Model Interpretation

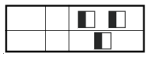
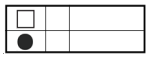
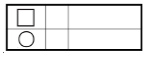
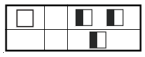
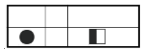
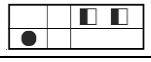
ND	M	3A	R-	□	□	□/□	□	□	□	□	□	□
1	2	3	4	5	6	7	8	9	10	11	12	13	14

S.N.	Name of S.N.	Interpretation
1	Enterprise characteristic code	ND: “Nader” low-voltage apparatus
2	Product type code	M: Moulded case circuit breaker (MCCB)
3	Design S.N.	3A
4	Serial derived code	R: Thermomagnetic is adjustable

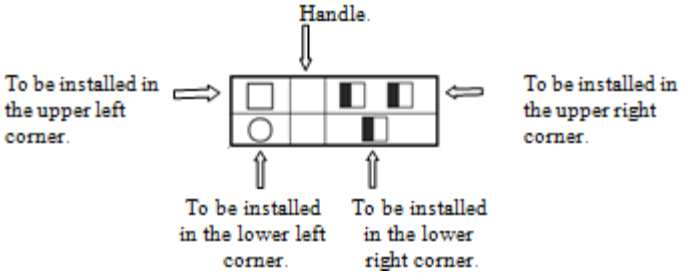
5	Current of the frame size	250
6	Interrupting level code	C: elementary
		L: standard
		M: medium-high
		H: high
7	Operation mode	No code: directly handle operation
		P: Rotation handle operated
		Z: Turn operated
8	Pole	3、4
9	Trip release code	3: Complex tripper
10	Accessory code	See Table 1
11	Application code	No code: Power distribution protection
		2: AC thermal-magnetic motor protection
12	Neutral pole (N-pole type)method	A: N-pole is without the over-current protection and always connect
		B: N-pole is without the over-current protection and acts together with other three poles(N-pole close first and open last)
		C: N-pole is with the over-current protection and acts together with other three poles(N-pole close first and open last)
		D: N-pole is without the over-current protection and always connect
13	Rated current	See Table 2
14	Wiring method	No code: Normal product
		P: Extended connection busbar
		Z1: Rear screw connection
		Z2Q: Plug-in plate front wiring
		Z2H: Plug-in plate back wiring

Table 1 Accessory code Table

Accessory code	Accessory name	Installation position
—	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.



Attachment installation diagram

4. Main technical parameters

Table 2 Accessory code Table

Model		NDM3AR-250							
Shell frame grade rated current Inm (A)		250							
Rated current In (A)		125、160、200、250							
Rated insulation voltage Ui (V)		1000							
Rated impulse withstand voltage Uimp(V)		8000							
Rated operating voltage Ue (AC V)		380/400/415							
Power frequency withstand voltage (1min) (V)		3500							
Usage category		A							
Pole		3				4			
Interrupting level code		C	L	M	H	C	L	M	H
Rated Ultimate Short-circuit breaking capacity Icu (kA)	AC 380/400/415V	36	50	70	85	36	50	70	85
Rated Service Short-circuit breaking capacity Ics (kA)	AC 380/400/415V	36	50	70	85	36	50	70	85
Life (times)	Electrical life	8000							
	Mechanical life	20000							
Boundary dimension	L（mm）	165				165			
	M（mm）	105				140			
	H（mm）	86				86			
Flashover distance (mm)		⩽50							
Trip element		Power distribution protection: Thermo-adjustable (0.8-0.9-1.0) In, Magnet-adjustable (5-6-7-8-9-10) In,The accuracy is plus or minus 20%; AC thermal-magnetic motor protection: Thermo-adjustable (0.8-0.9-1.0) In, Magnet-adjustable（9-10-11-12-13-14）In,The accuracy is plus or minus 20%;							

4.1 Selection of sectional area of circuit breaker connection cables

Table 3 Selection of sectional area of connecting bus or cable

Rated current (A)	125	160	200	250
Conductor area(mm^2)	50	70	95	120

4.2 Torque of circuit breaker connecting terminal and mounting screw tightening

Table 4 Torque of circuit breaker terminal and mounting screw tightening

Model	Thread diameter(mm)	Torque values(N·m)
NDM3AR-250	Connection screw M8	15
	Install screw M5	4

4.3 Drop capacity coefficient of circuit breaker temperature change

Table 5 Circuit breaker temperature variation drop capacity coefficient table

Model	Correction factor							
NDM3AR-250	Temperature (℃)	40	45	50	55	60	65	70
	Correction factor	1	0.97	0.94	0.91	0.88	0.85	0.83

Note: (1) When the operating ambient temperature is below + 40℃, the product can be used normally without derating capacity.

(2)The above derating factors are measured at the frame current.

4.4 High altitude drop capacity coefficient of circuit breaker

Table 6 High altitude drop capacity coefficient of circuit breaker

Altitude (m)	Working current correction factor	Power frequency withstand voltage (V)	Rated insulation voltage (V)
2000	1In	3500	1000
2500	1In	3500	1000
3000	0.98In	3150	900
3500	0.97In	3000	840
4000	0.95In	2800	780
4500	0.94In	2650	730
5000	0.93In	2500	670

5. Normal working environment

1) The altitude of the installation site is no more than 2000 m, and the high-altitude capacitance drop coefficient is shown in "Table of High-Altitude Capacitance Drop coefficient of Circuit breaker";

2) Ambient temperature -35℃ ~ +70℃; The average value of 24h does not exceed +35℃. When the ambient temperature is higher than +40℃, the user needs to use the capacity drop, and the capacity drop coefficient is shown in the table "Circuit breaker Temperature change Capacity drop coefficient";

3) When the ambient temperature is +40 ° C, the relative humidity should not exceed 50%. Relatively low temperature can have high humidity, such as: when 20 ° C, the relative humidity can reach 90%; Corresponding measures should be taken for frost caused by temperature change;

4) The product can withstand the influence of moist air, salt mist, oil mist and mold;

5) for the installation of the main loop of the circuit breaker connected to category: Ⅲ class (grade distribution and control level), the main loop of the circuit breaker is not connected to the installation of the categories are: Ⅱ class (load);

6) Pollution level: Level 3;

7) Protection level: IP20;

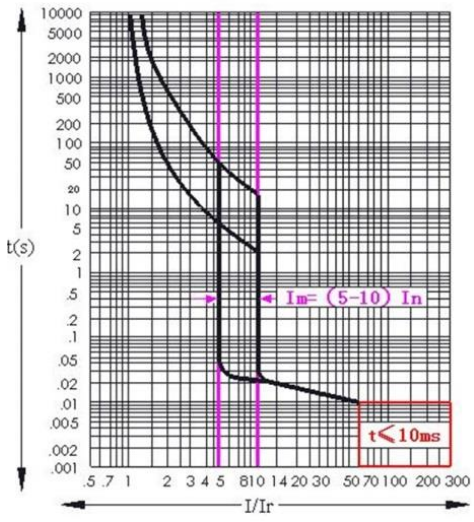
8) The product shall be installed in a medium without explosion risk, and the medium shall be free of gas and conductive dust sufficient to corrode the metal and destroy the insulation, and shall be avoided to be used in places invaded by rain and snow;

9) When the user's conditions of use are more severe than those mentioned above, he/she shall consult with the manufacturer.

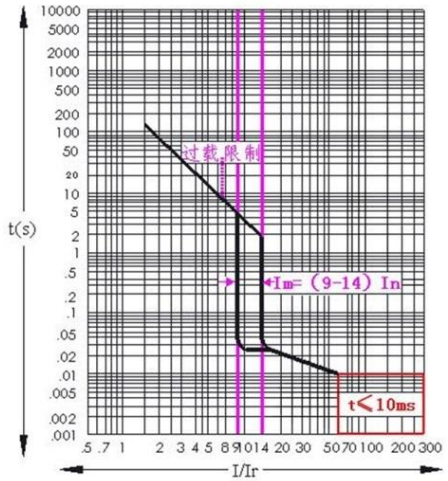
6. Trip characteristics

6.1 Trip characteristic curve

6.1.1 Distribution type short-circuit overload protection characteristic curve

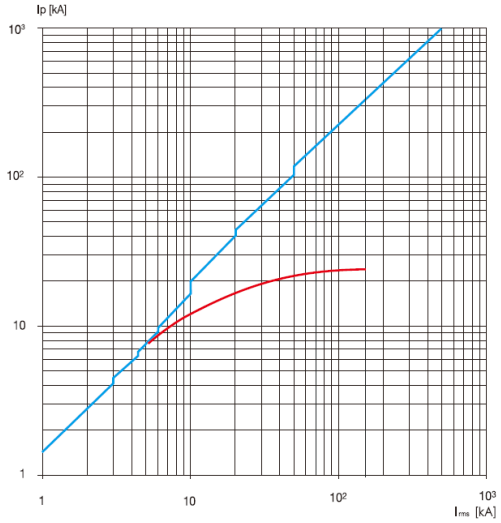


6.1.2 Characteristic curve of short-circuit overload protection for electric models

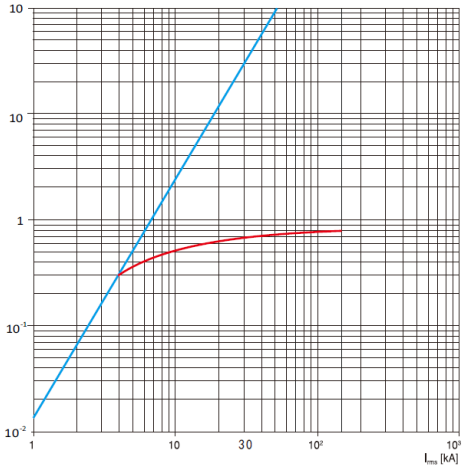


6.2 Current limiting and permissible energy curves

6.2.1 Current limiting curve

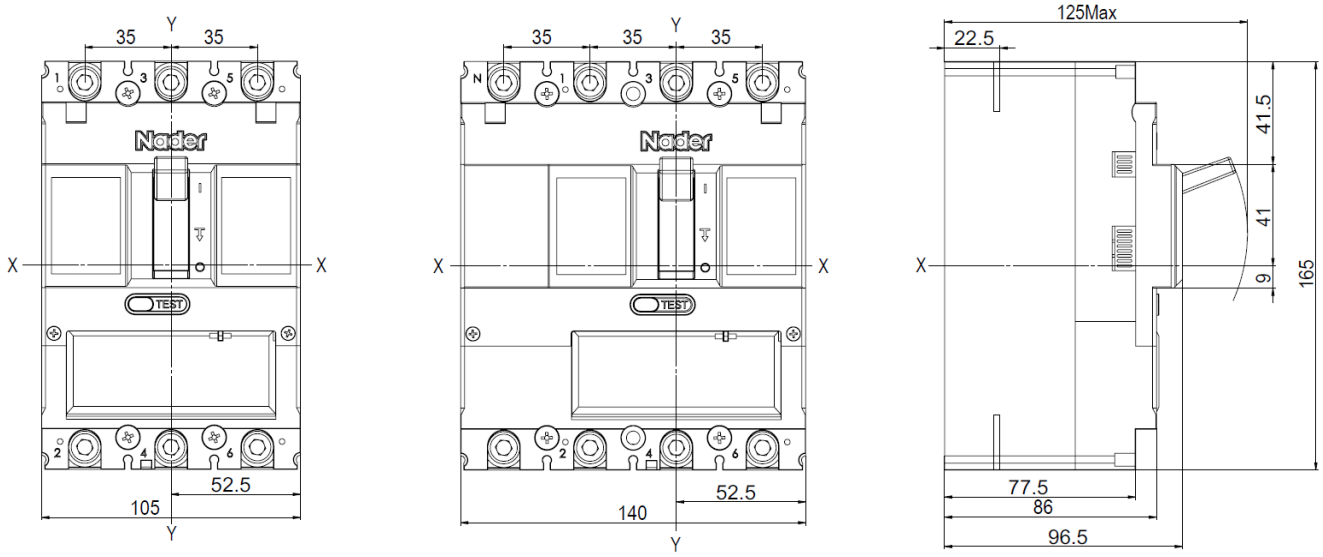


6.2.2 Permissible energy curve

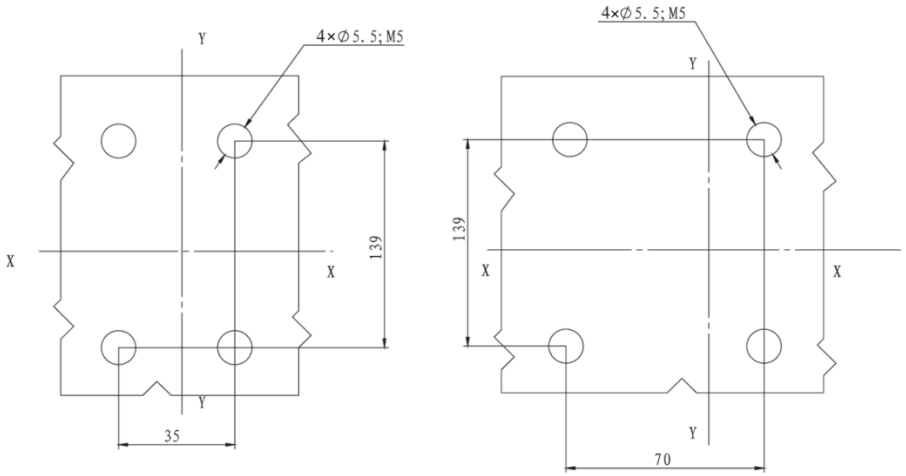


7. Shape, size of mounting hole and safe distance

7.1 Front-Panel

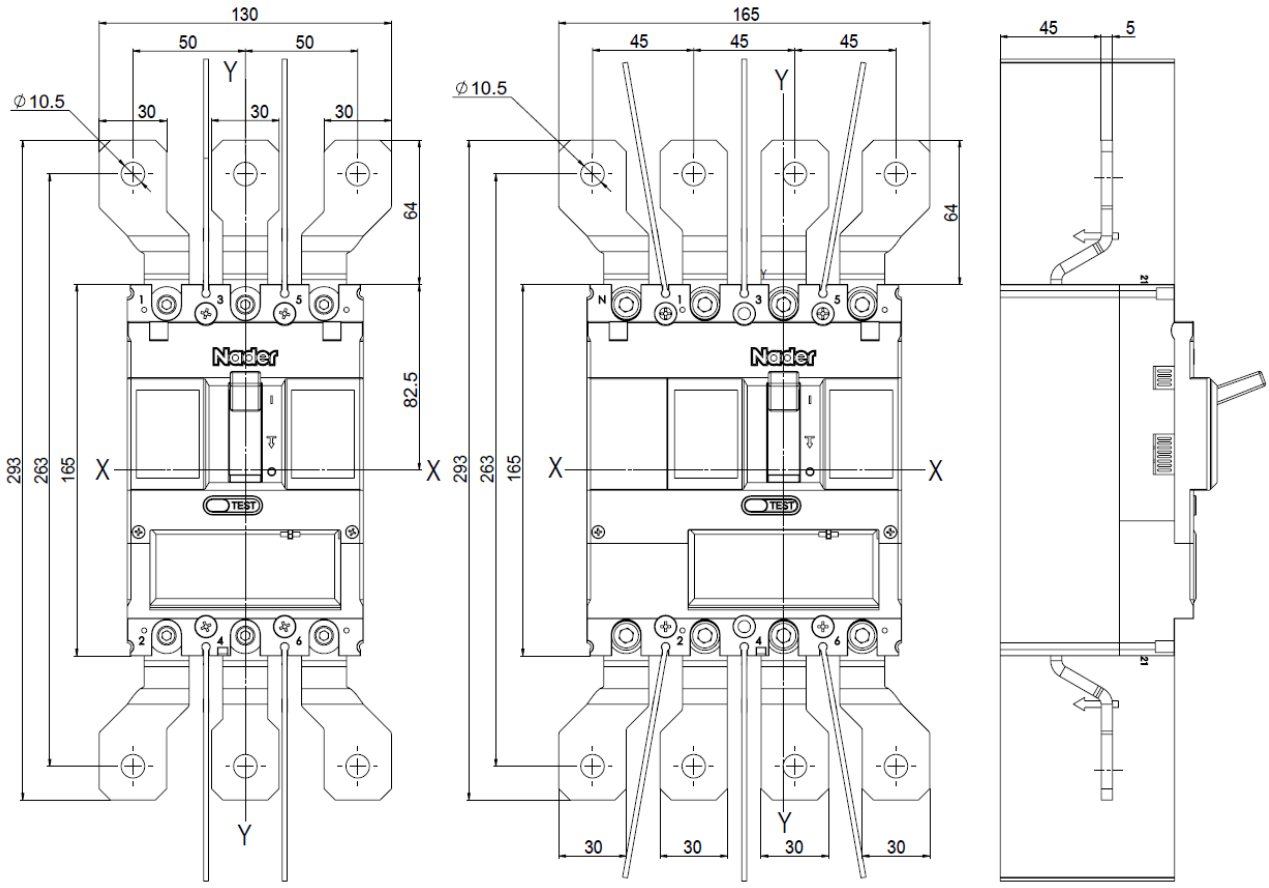


Opening size drawing of front wiring mounting plate :

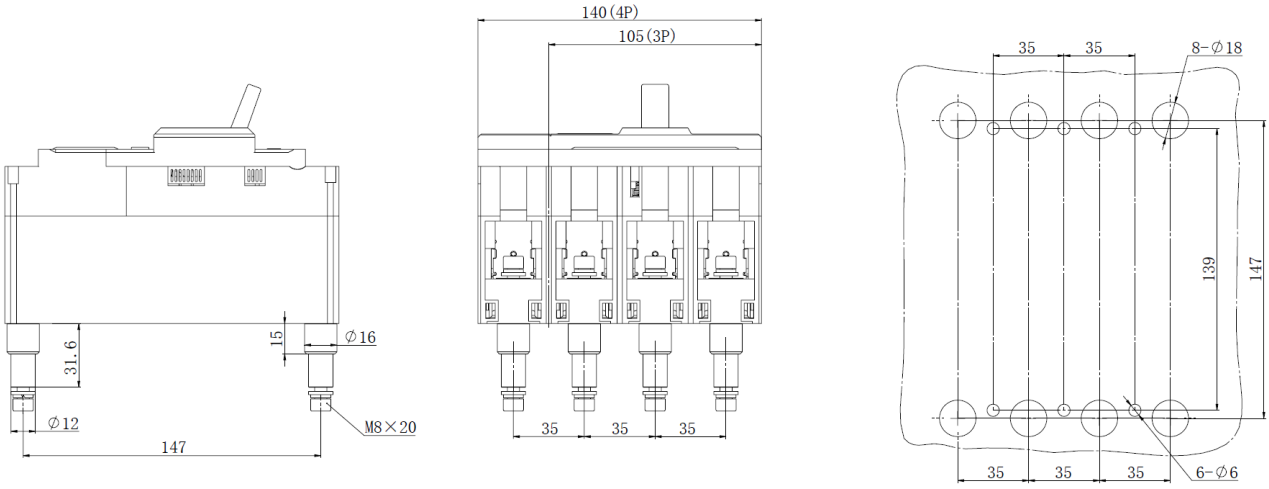


3P Mounting hole 4P Mounting hole

7.2 Connection wiring

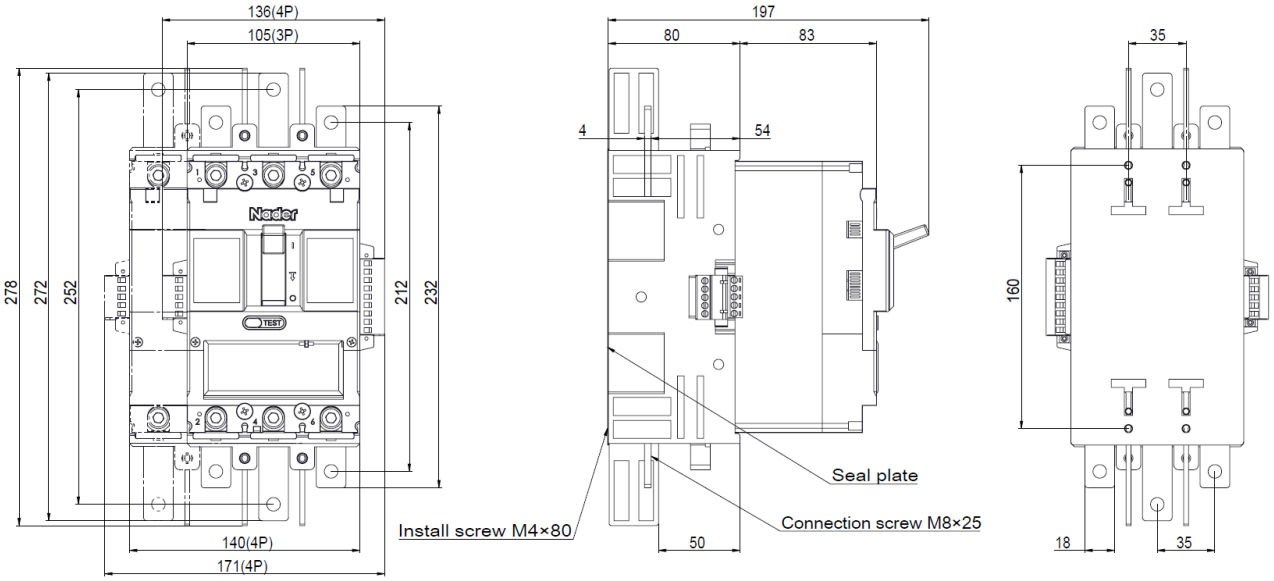


7.3 After the board wiring

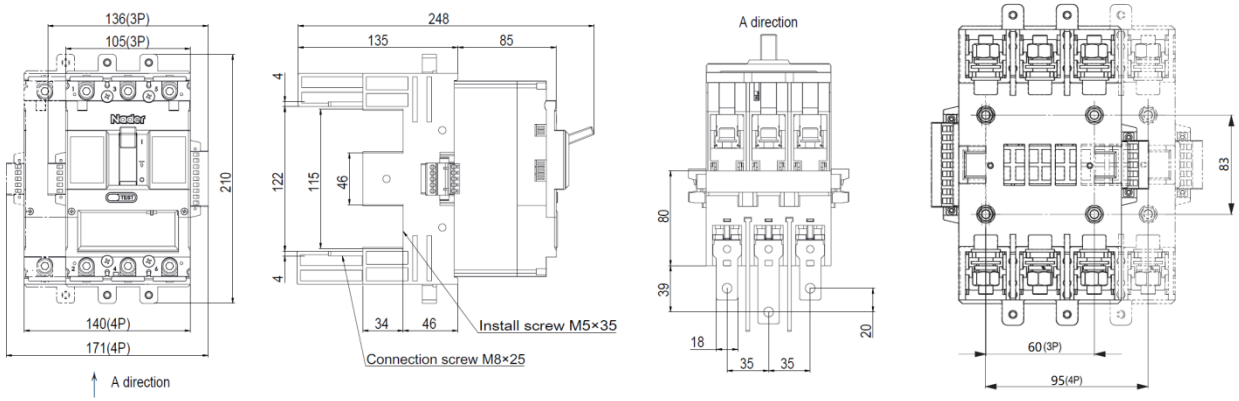


7.4 Plug in connection

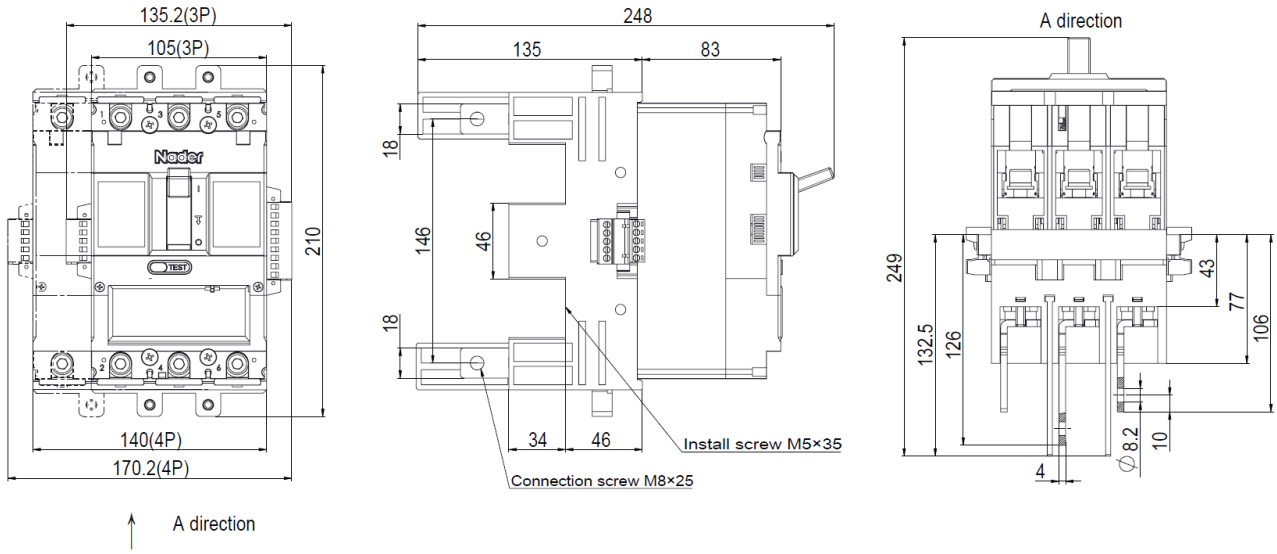
7.4.1 Plug-in plate front wiring (horizontal)



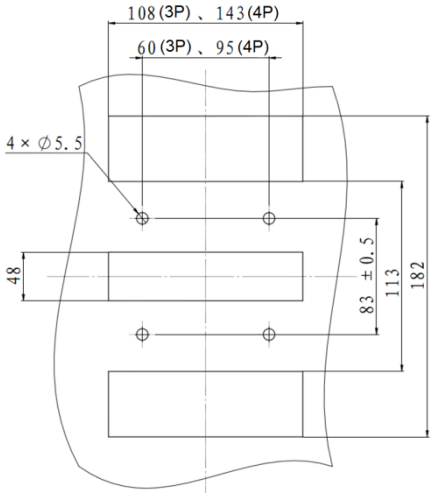
7.4.2 Plug-in plate rear wiring (horizontal)



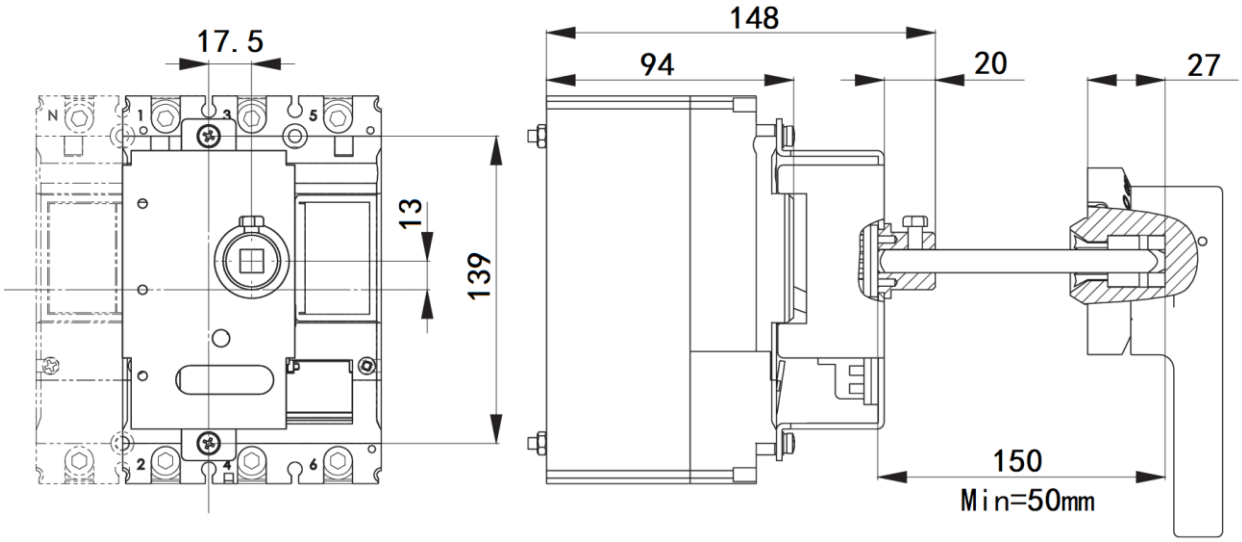
7.4.3 Plug-in plate front wiring (vertical)

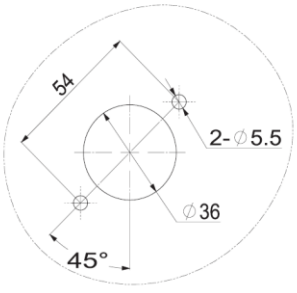


Size of rear opening of insert plate :

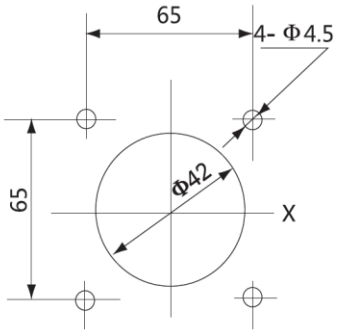


7.5 Turn Operation+ Front-Panel





Y type

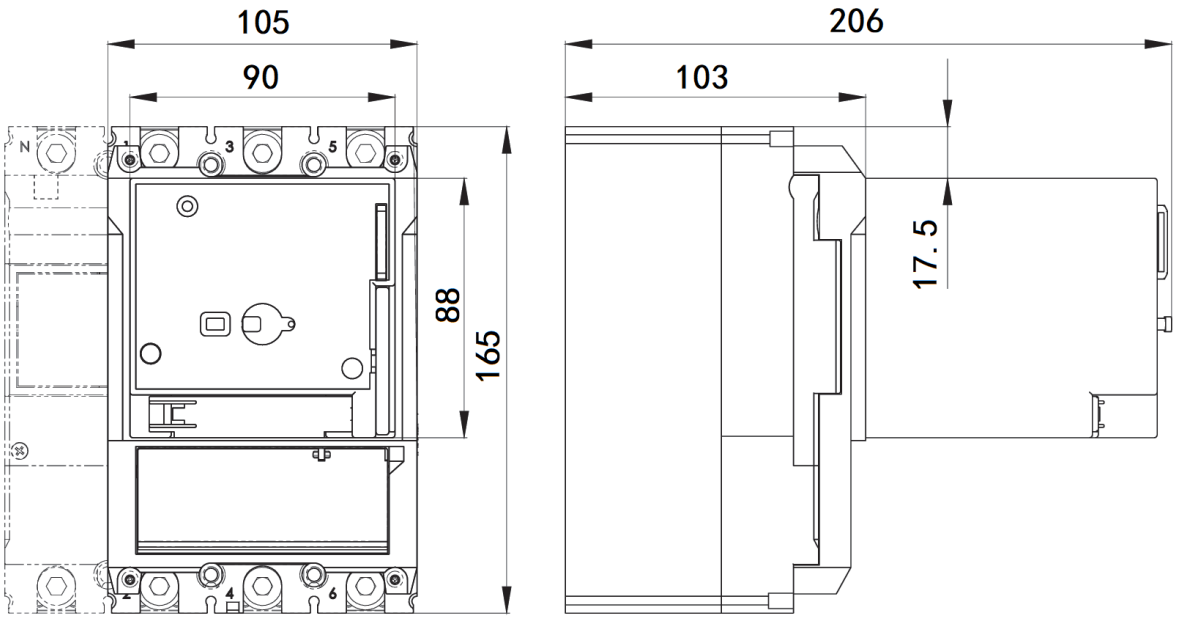


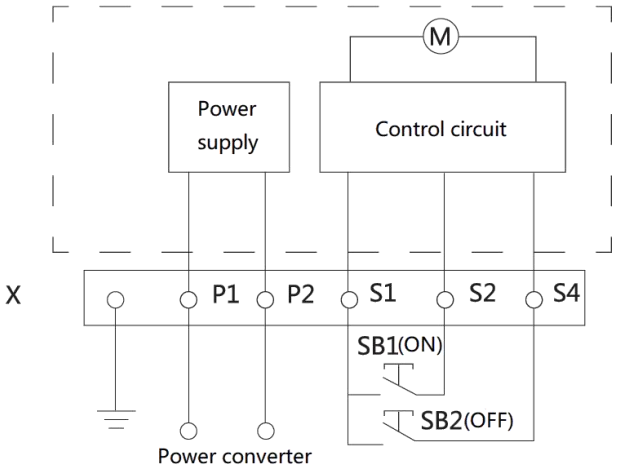
F type

For turn operation,operate it 180° in the clockwise direction while operation in the counterclockwise direction is prohibited.

The length of turn operation shaft is optional(150、200、300、350、650mm).

7.6 Electric Operation+ Front-Panel





Note it is prohibited to connect P1 and P2 with S1,S2 and S4.

Table 7 Main technical parameters of electric operating mechanism

Accessory name	Voltage specifications			
Electric operating mechanism	DC24V	AC110V/DC110V	AC230V/DC250V	AC400V
code	DC1-02	DC1-11	DC1-22	DC1-40
Current action	About 3A	About 1A	About 0.5A	About 0.5A
Motor power	80W	150W	150W	200W

7.7 Safe distance for circuit breaker installation

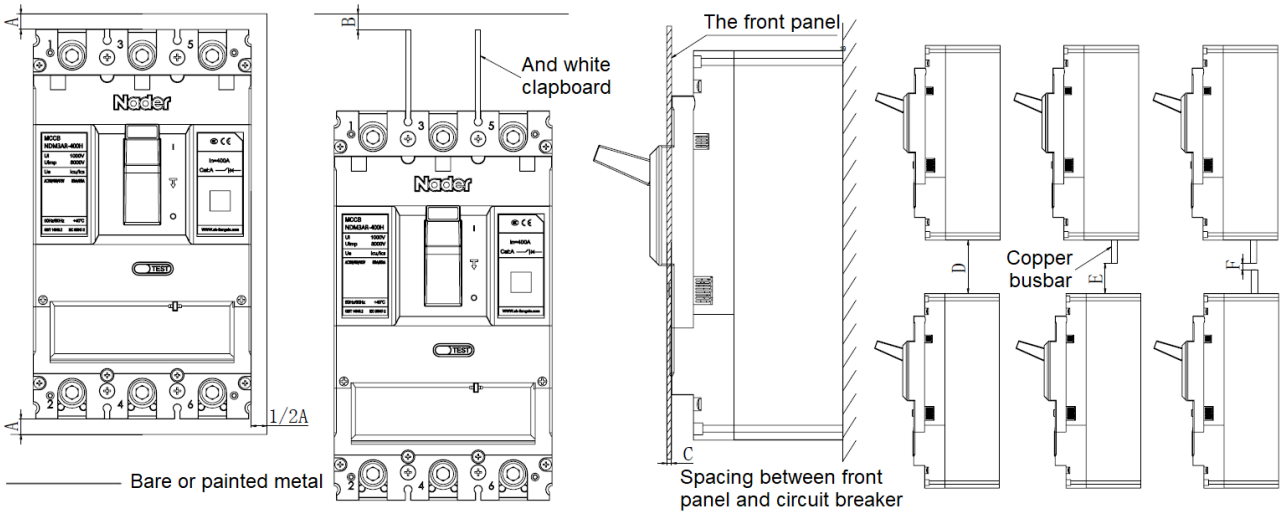


Table 8 Safety Clearance Parameter

Model	Clearance A (mm)	Clearance B (mm)	Clearance C (mm)	Clearance D (mm)	Clearance E (mm)	Clearance F (mm)
NDM3AR-250	≥50	≥0	≥0	≥120	≥80	≥40

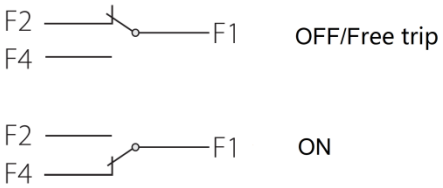
Note:Unmarked tolerance class is in accordance with GB/T 1804-C.

8. Attachment Function Description

8.1 Rated Parameters of the Auxiliary Contact

Table 9 Parameter of Auxiliary Contact Table

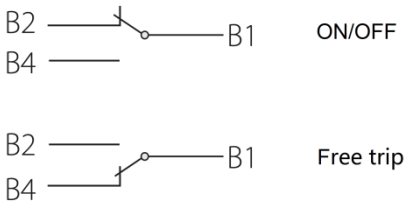
Attachment name	Attachment specification	Rated working voltage / Conventional thermal current (Ith)		
Auxiliary contact	F1/M5-160	AC250V/10A	AC400V/3A	DC220V/0.2A



8.2 Rated Parameters of the Alarm Contact

Table 10 Rated Parameters of the Alarm Contact Table

Attachment name	Attachment specification	Rated working voltage / Current(Ie)	
Alarm contact	BJ1-11/M5-160	AC250V/3A	DC220V/0.2A



8.3 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.

Table 11 Rated Parameters of the Under-voltage Release Table

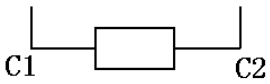
Voltage specifications (V)	AC110/DC110	AC230V/DC250V	AC400V
Code	Q11	Q22	Q40
Keeping power consumption/W	0.5	1.0	1.5

8.4 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.

Table 12 Rated Parameters of the Shunt Release Table

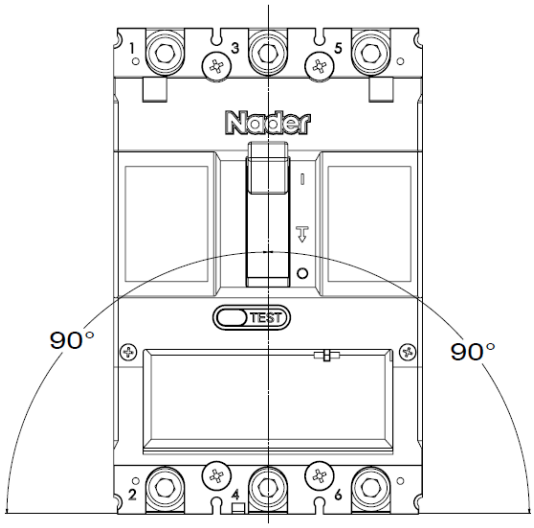
Voltage specifications (V)	DC24V	DC48V	AC/DC110V	AC230V/DC250V
Code	FT02	FT04	FT11	FT22
Keeping power consumption/W	20	13	8	19



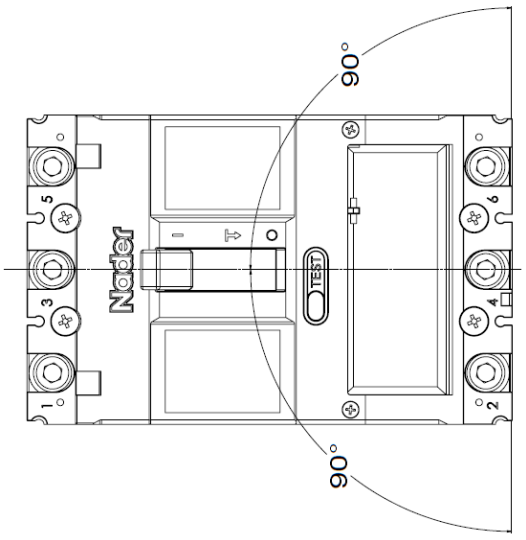
9. Installation direction

Product vertical installation (vertical installation), the slope of the installation surface and vertical plane ≤±22.5°.

Product Horizontal installation (cross installation).



Vertical installation



Horizontal installation

10. Packaging and storage

Minimum packing quantity of 1 / box, packaged products, at ambient temperature of -40℃ ~ +75 ℃, should be stored in a warehouse with air circulation and relative humidity not greater than 80%. A storehouse where ambient air is free of acid, alkaline, or other corrosive gases. Under the above conditions, the storage period shall not exceed 3 years from the production date.

11. Environmental compliance

Products comply with RoHS standards.

12. List of installation accessories

SN	Name	Specifications	3P Quantity/Set	4P Quantity/Set
1	Cross small pan-head screw	M5×85	4	4
2	Plain washer	5	4	4
3	Spring washer	5	4	4
4	Hexagon nut	M5	4	4
5	Partition	——	4	6

13. Matters needing attention

1) All characteristics and accessories of circuit breaker shall be set by the manufacturer. Only trained or certified professionals can adjust, install and maintain the circuit breaker, trip unit or other accessories according to the line design parameters;

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

3) The circuit breaker handle can be in three positions, indicating three states of closure, disconnection and free trip respectively. When the handle is in the position of free trip, the handle should be pulled in the direction of disconnection. At this time, the circuit breaker can be repressed before closing.