

Shanghai Liangxin Electrical Co., Ltd.

NDM3Z-250V Product Specification

(IPD-ENG-DEV-T20 A1 2016-09-23)

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Revision History					
Version	Revision Reason/Content	Implementati on Date	Prepared by	Reviewe d by	Approve d by
0	Newly added	2020/10/28	Sun Lanping	Xun Funping	Ding Fei
1	Update the product appearance picture and product dimension outline drawing	2021/09/30	Sun Lanping	Xun Funping	Ding Fei

1. Applicable Scope and Purpose of Circuit Breaker

The NDM3Z-250V DC molded case circuit breaker (hereinafter referred to as circuit breaker) applies to the DC system application environment and the electric circuit with the working voltage of DC1500V and the working current of 250A. With the overload, short circuit and undervoltage protection functions, the circuit breaker can protect lines and power equipment from damage.

2. Product Picture of Circuit Breaker (The picture is for reference only; the specific kind prevail)



Picture of the Product

3. Specification and Model Description of Circuit Breaker

<u>ND</u> 1	<u>M</u> 2	<u>3</u> 3	<u>Z</u> - <u>250</u> 4 5	<u>□</u> 6	<u>□</u> 7	<u>□</u> / <u>□</u> 8 9	<u>□</u> 10	<u>□</u> 11	<u>□</u> 12	<u>□</u> 13
SN	SN name		NDM3Z							
1	Enterprise code		ND: “Nader” low-voltage apparatus							
2	Product code		M: Molded case circuit breaker (MCCB)							
3	Design SN		3							
4	Derived code of		Z: DC							
5	Shell frame level		250							
6	Derived code of		V: High voltage type							
7	Breaking		No code: Normal product							
8	Operation mode		No code: Direct handle-operated mode							
9	Number of poles		2, 3							
10	Release code		3: Complex release							
11	Accessory code		See Table 1							
12	Rated current		See Table 2							
13	Cabling type		2P No code: Normal product							
			3P No code: Normal product							

Table 1: Comparison Table of Accessory Code:

<div><div>Handle</div><div>Left installation →</div><div>→ Right installation</div><div></div></div>				<div>Legend</div> <div><div></div> Single auxiliary contact</div> <div><div></div> Shunt release</div>	
Accessory code	Accessory name	Installation Position	Model	NDM3Z-250V	
				2	3
00	N/A			—	—
10	Shunt release			<div></div>	<div></div>
21	Single auxiliary contact			<div></div>	<div></div>
41	Shunt release, single auxiliary contact			—	<div></div>

4. Main Technical Parameters of Circuit Breaker

Table 2 Main Technical Parameters of Circuit Breaker

Model		NDM3Z-250V	
Rated current of frame Inm (A)		250	
Rated current In (A)		63, 80, 100, 125, 140, 160, 180, 200, 225, 250	
Rated insulation voltage Ui (AC V)		1500	
Rated impulse withstand voltage Uimp (V)		12000	
Power frequency withstand voltage U (1min) (V)		3820	
Utilization category		A	
Number of poles		2	3
Rated working voltage Ue (DC V)		1000	1500
Rated limit short-circuit breaking capacity Icu (kA)		20	20
Rated operating short-circuit breaking capacity Ics (kA)		16	16
Operating performance (times)	Electrical life		2000
	Mechanical life	Maintainable free life	10000
		Maintainable life	20000

4.1 Selection of the circuit breaker connecting bus or cable cross-section area:

Table 3 Selection of the NDM3Z-250V Connecting Bus or Cable Cross-section Area

Rated current (A)	125, 140	160	180, 200, 225	250
Wire cross-section area (mm ²)	50	70	95	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	Thread diameter (mm)	Torque (N·m)
NDM3Z-250V	M8	12
	M4	2.4

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							
NDM3Z-250V	Temperature (°C)	40	45	50	55	60	65	70
	Derating factor	1	1	1	0.95	0.93	0.91	0.88

Note: 1) When the operating ambient temperature is below 50°C, the product can be used normally without derating capacity.

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

4.4 High-altitude derating factor of the circuit breaker

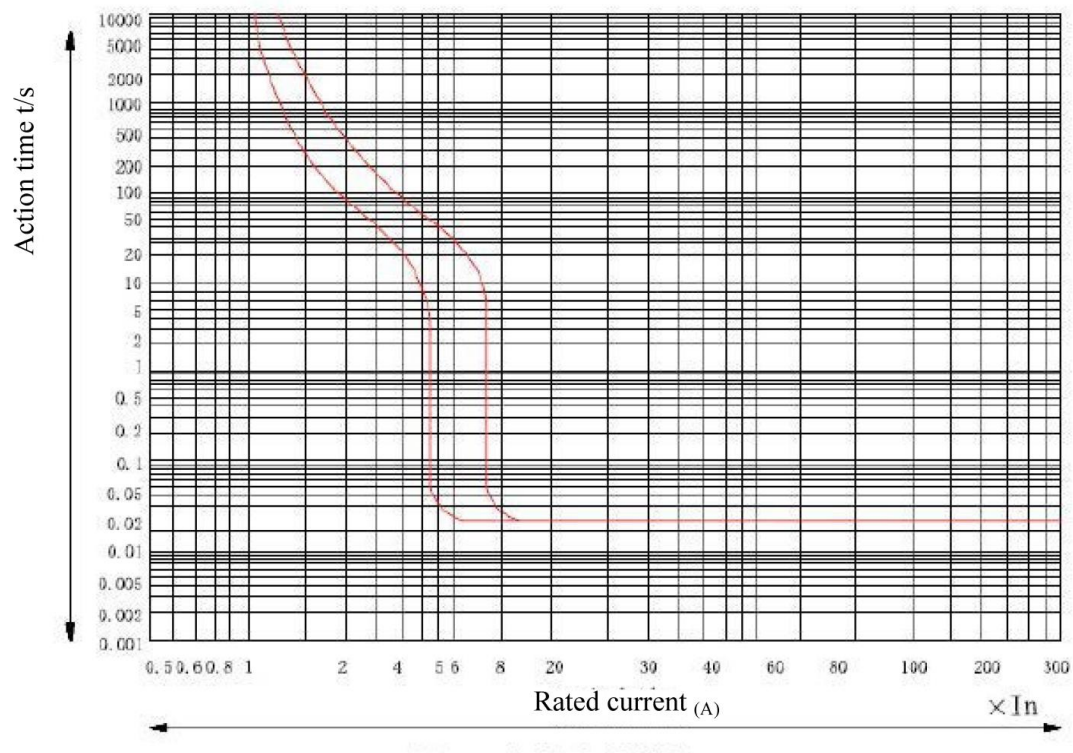
Table 6 High-altitude Derating Factor Table of Circuit Breaker

Elevation (m)	Working current correction coefficient	Maximum working current correction coefficient (V)	Power frequency withstand voltage correction coefficient (V)	Isolation voltage correction coefficient (V)
2000	1	1	1	1
2500	1	1	1	1
3000	0.98	1	1	1
3500	0.95	1	1	1
4000	0.93	1	1	1
4500	0.91	1	1	1
5000	0.89	1	1	1

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 $+50^{\circ}\text{C}$, 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) 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;
- 8) In case of stricter user conditions than the above description, negotiate with the manufacturer.

6. Short-circuit Overload Protection Characteristic Curve of Circuit Breaker



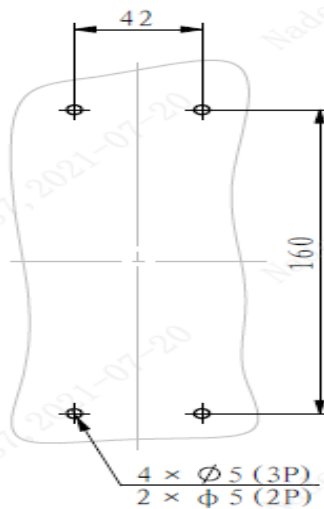
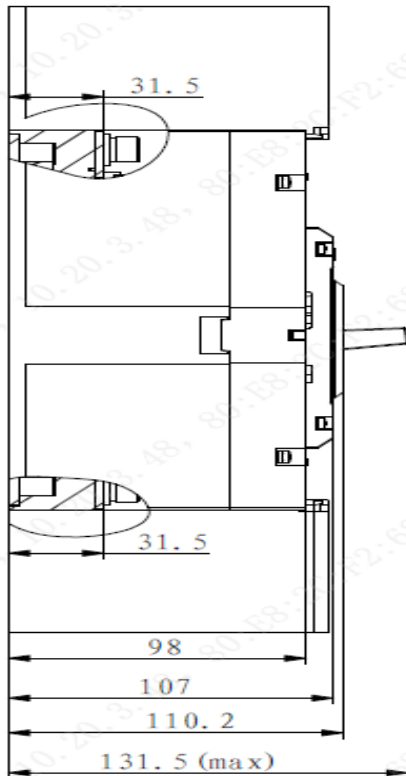
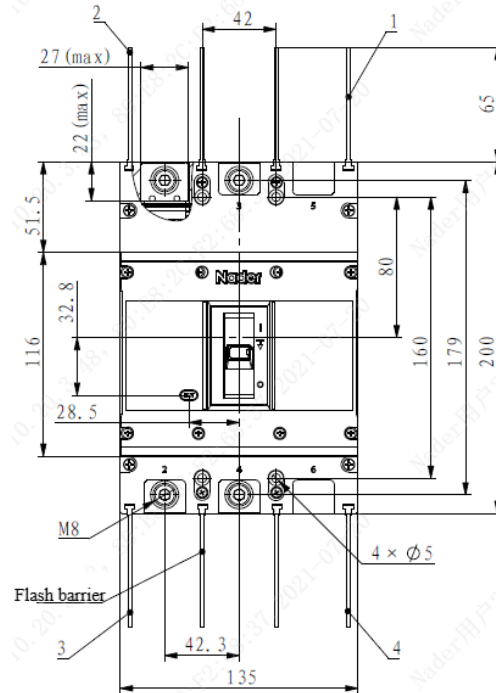
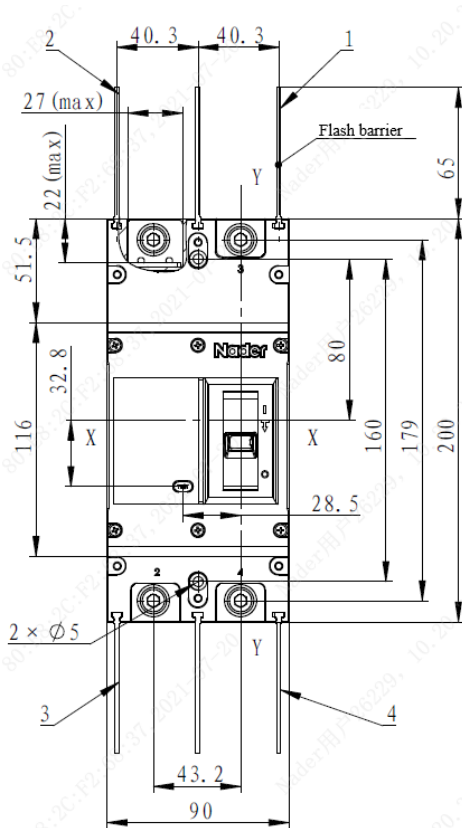
Time/Current Characteristic Curve

7. Outline, Mounting Hole Dimensions and Safety Distance of Circuit Breaker

7.1 Outline and mounting hole dimensions of circuit breaker

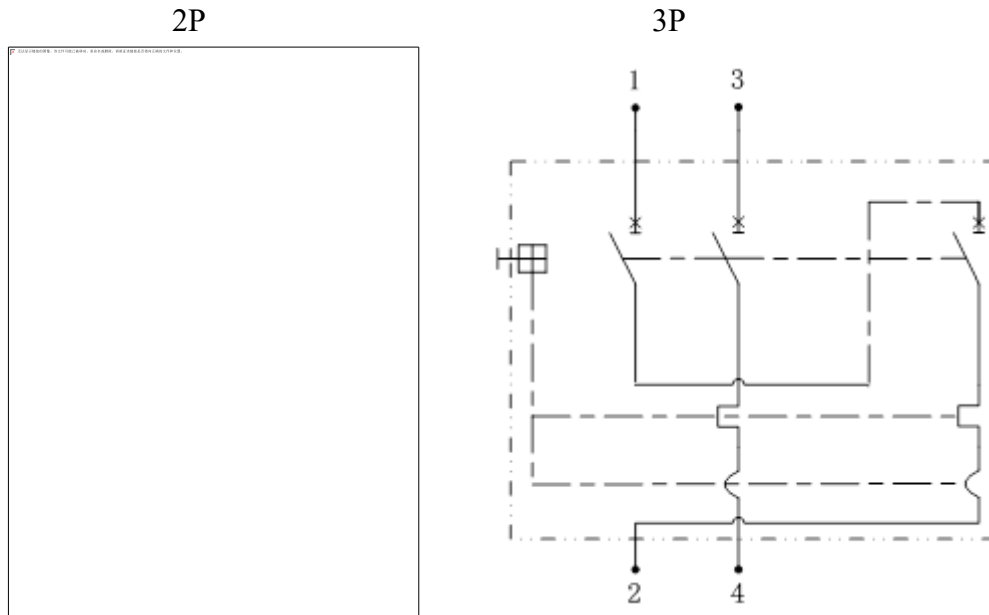
2P

3P



Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

7.2 Wiring Diagram of Circuit Breaker



7.3 Safe mounting distance of circuit breaker

Table 7 Insulation Distance Mounted in the Metal Cabinet (Unit: mm)

Model	A	B	C	D	E	F
NDM3Z-250 V	65	30	30	25	3	13

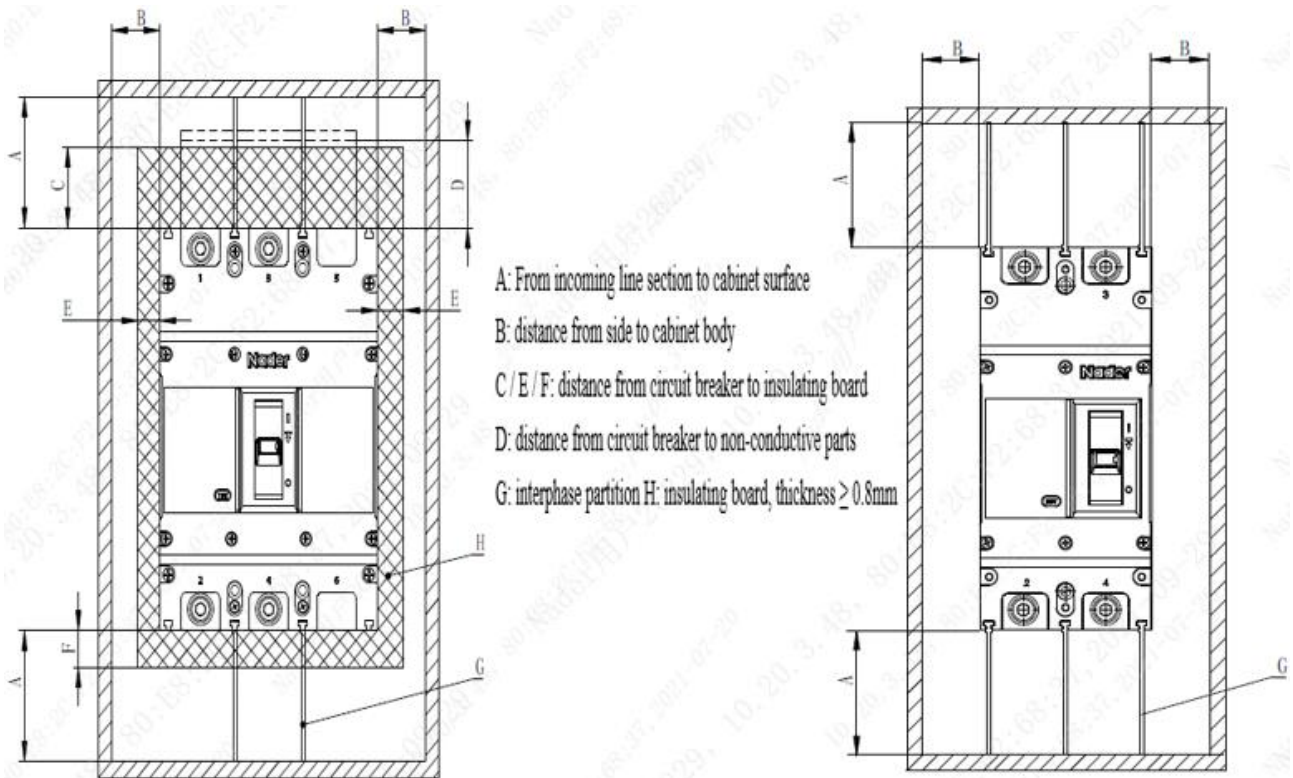


Table 8 Minimum Center Distance between Rowed Circuit Breakers (Unit: mm)

Model	I Center distance		
	2 poles	3 poles	3 poles
NDM3Z-250V	90	135	190

Note: Check the connected busbar or cable during rowing or stacking of the circuit breaker to ensure that the air insulation distance won't be reduced.

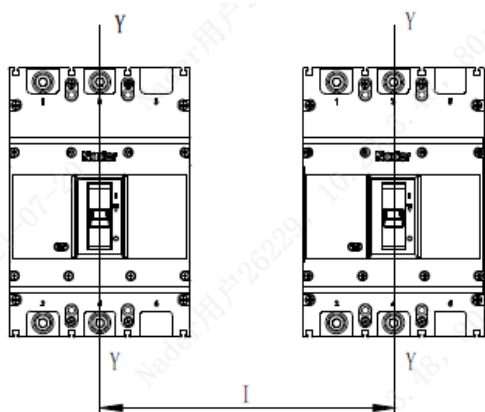


Table 9 Minimum Center Distance between Stacked Circuit Breakers (Unit: mm)

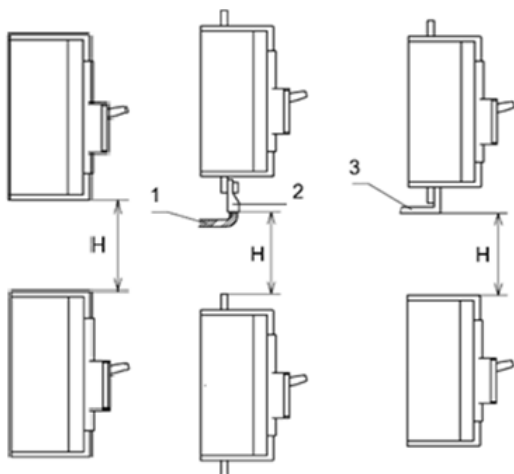
Model	H (distance of circuit breaker from bottom)	
	With a terminal cover	Without a terminal cover
NDM3Z-250V	50	93

Note: 1) Bare cable connection

2) Cable insulating connection

3) Connection without insulation

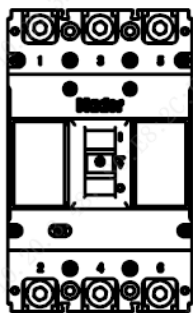
Requirements: Check whether the terminal cover or phase partition is assembled properly before products are energized.



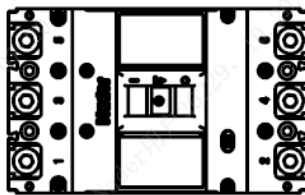
8. Installation Direction of Circuit Breaker

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

9. Packaging and Storage of Circuit Breaker

Minimum packaging quantity: 1 piece/box. The packaged products should be stored in a warehouse with the air ventilation and the relative humidity no more than 80% when the ambient temperature is $-40^\circ\text{C} \sim +75^\circ\text{C}$. No acidic alkaline or other corrosive gas exists in the ambient air in the warehouse. Under the conditions above, the storage period shall be no more than three years since the manufacturing date.

10. Installation Direction of Circuit Breaker

SN	Name	Specification	2P Quantity/Set	3P Quantity/Set
1	Cross small pan-head screw	M4×45	2	4
2	Hexagon nut	M4	2	4
3	Spring washer	4	2	4
4	Plain washer	4	2	4
5	Phase partition	—	6	8

11. 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.