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1. Applicable Scope and Purpose of Circuit Breaker

The NDM3Z-250VM 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 DC1100V 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

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3. Specification and Model Description of Circuit Breaker

ND	M	3	Z	- 250	□	□	□ / □	□	□	□	□
1	2	3	4	5	6	7	8	9	10	11	12	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	M: Relatively high breaking type
8	Operation mode	No code: Direct handle-operated mode
9	Number of poles	2
10	Release code	3: Complex release
11	Accessory code	See Table 1
12	Rated current	See Table 2
13	Cabling type	No code: Normal product

Table 1: Comparison Table of Accessory Code:

Accessory code	Accessory name	NDM3Z-250VM
	Installation Position / Model / Number of poles	2
00	N/A	—
10	Shunt release	
21	Single auxiliary contact	
41	Shunt release, single auxiliary contact	

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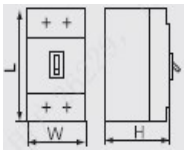
4. Main Technical Parameters of Circuit Breaker

Table 2 Main Technical Parameters of Circuit Breaker

Model				NDM3Z-250VM	
Rated current of frame Inm (A)				250	
Rated current In (A)				125, 140, 160, 180, 200, 225, 250	
Rated insulation voltage Ui (AC V)				1500	
Rated impulse withstand voltage Uimp (V)				8000	
Power frequency withstand voltage U (1min) (V)				3820	
Utilization category				A	
Number of poles				2	
Rated working voltage Ue (DC V)				1000	1100
Rated limit short-circuit breaking capacity Icu (kA)				20	10
Rated operating short-circuit breaking capacity Ics (kA)				20	10
Operating performance (times)	Electrical life			2000	
	Mechanical life	Maintainable free life		12000	
		Maintainable life		24000	
Overall dimension			L(mm)	180	180
			W(mm)	75	75
			H(mm)	105	105
Arcing distance				≤50	

Note: the overall dimension does not include the dimension of terminal cover.

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

Table 3 Selection of the NDM3Z-250VM 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

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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-250VM	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-250 VM	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

4.5 Power loss coefficient of circuit breaker

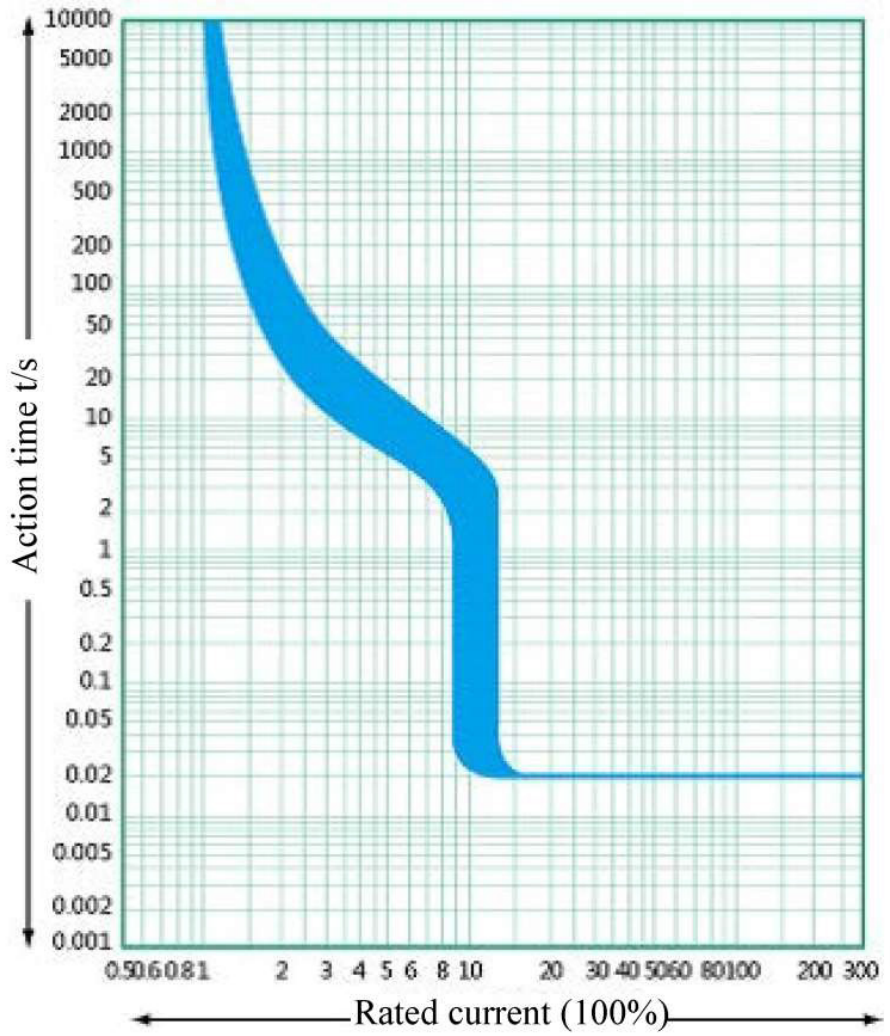
Table 7 Power loss meter of circuit breaker

Model	Energizing current(A)	Total power loss(W)
NDM3Z-250VM	250	40

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℃ ~ + 70℃; the average within 24 h shall not be more than +35℃. If the ambient temperature is higher than +50℃, 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℃ should not exceed 50%. A higher relative humidity is allowed at a lower temperature. For example, the relative humidity at 20℃ 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

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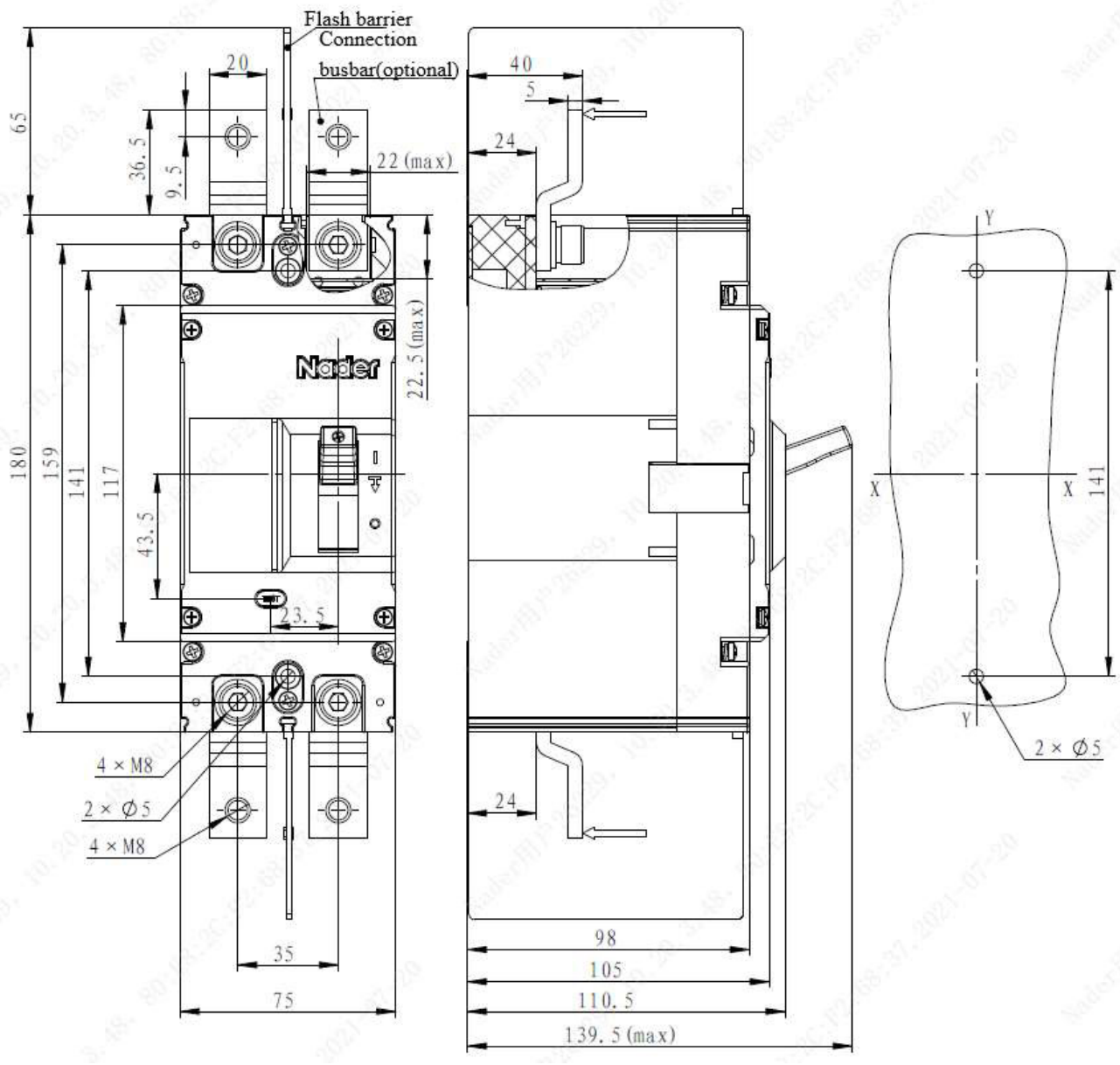
7. Outline, Mounting Hole Dimensions and Safety Distance of Circuit Breaker

7.1 Outline and mounting hole dimensions of circuit breaker

2P



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

7.2 Safe mounting distance of circuit breaker

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

Mounting distance	A (inlet wire end to the cabinet face)		B (distance from side to the cabinet face)	C (outlet wire end to the cabinet face)
Model	With a terminal cover	Without a terminal cover		
NDM3Z-250VM	/	115	30	30

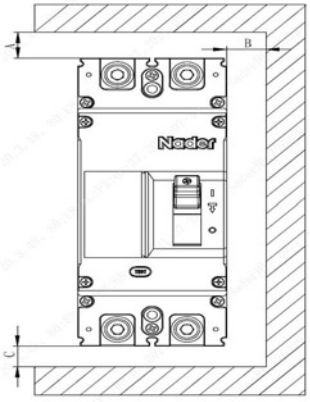


Table 8 Minimum Center Distance between Rowed Circuit Breakers (Unit: mm)

Model	Width of circuit breaker	I Center distance
	2 poles	2 poles
NDM3Z-250VM	75	105

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.

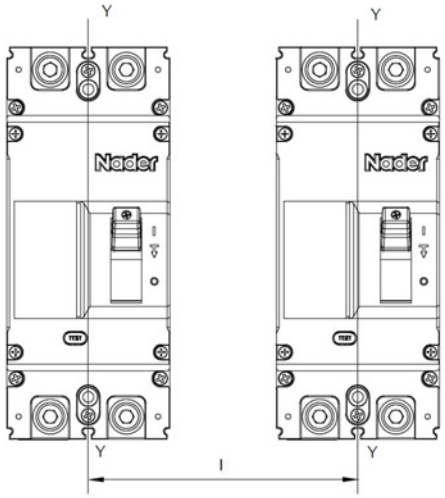


Table 9 Minimum Center Distance between Stacked Circuit Breakers (Unit: mm)

Model	H (distance of circuit breaker from bottom)	
	With a terminal cover	Without a terminal cover
NDM3Z-250VM	/	155

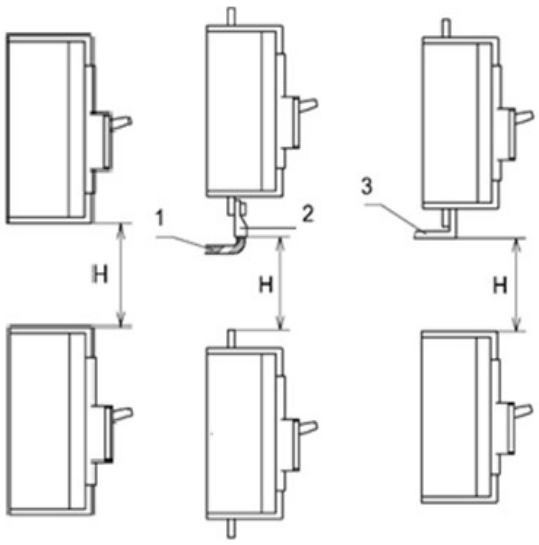
Note: 1) Insulated cable

2) cable terminal

3) connection – uninsulated

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

Model	H (distance of circuit breaker from bottom)	
	With a terminal cover	Without a terminal cover
NDM3Z-250VM	/	155



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8、Attachment function description

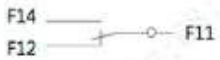
8.1 Shunt release

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 11 Rated Parameters of the Shunt Release

Model	Voltage specifications	DC24V	AC230V	DC220V	AC400V
NDM3Z-250VM	Retention power consumption (A)	4	0.25	0.24	0.43
	Instantaneous power consumption (W)	97.6	57.5	52.6	173.9

8.2 Auxiliary contact

The circuit breaker is in the "open" or "free tripping" position	Single auxiliary contact	
The circuit breaker is in the "close" position	The "close" tums to open, and the "open" tums to "close"	

8.2.1 Rated parameters of the alarm contact

Table 12 Rated parameters of the alarm contact

Category	Frame current(A)	Conventional thermal current lth (A)	Working current(A)	
			AC400V	DC220V
Auxiliary contact	250	3	0.3	0.15

8.2.2 Electrical life of auxiliary contact

Table 13 electrical life of auxiliary contact

Usage category	On			Off			Times	Frequency	Power on time
	I/Ie	U/Ue	cos φ	I/Ie	U/Ue	cos φ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥ T0. 95 ms

8.2.3 Making and breaking capacity of auxiliary contact

Table 14 Making and breaking capacity of auxiliary contact

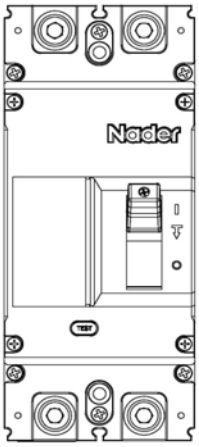
Usage category	On			Off			Times	Frequency	Power on time
	I/Ie	U/Ue	cos φ	I/Ie	U/Ue	cos φ			
AC-15	10	1.1	0.3	10	1.1	0.3	10	360	≥0.05s
DC-13	1.1	1.1	6Pe	1.1	1.1	6Pe			≥T0.95ms

Note :Shunt Release、Auxiliary contact ， the standard wiring line is 0.7m long and can be customized according to requirements

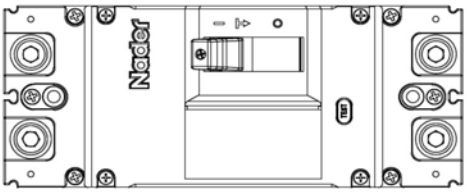
9. Installation Direction of Circuit Breaker

For vertical installation of the product, the gradient between the installation surface and the vertical plane is no more than ±22.5°.

Horizontal installation of the product.



Vertical Installation



Horizontal Installation

10. 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℃~+75 ℃. 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.

11. Installation Accessory List of Circuit Breaker

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

12. 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.