


Shanghai Liangxin Electrical Co., Ltd.

# NDM3Z-250VM Product Specification

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

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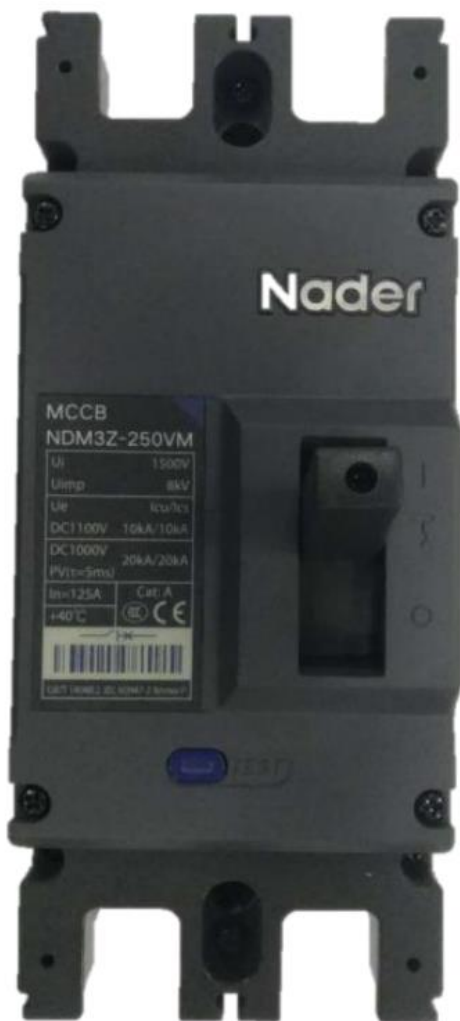




## 1. Applicable Scope and Purpose of Circuit Breaker

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

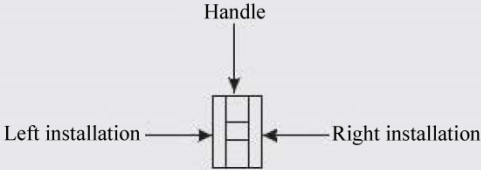


### 3. Specification and Model Description of Circuit Breaker

<u>ND</u>	<u>M</u>	<u>3</u>	<u>Z</u> - <u>250</u>	<u>□</u>	<u>□</u>	<u>□</u> / <u>□</u>	<u>□</u>	<u>□</u>	<u>□</u>	<u>□</u>	<u>□</u>	<u>□</u>	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
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										
14	Other codes		Code of internal accessories: Such as shunt: AC230V										



Table 1: Comparison Table of Accessory Code:



Legend

- Single auxiliary contact
- Dual-auxiliary contact
- Shunt release

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



#### 4. Main Technical Parameters of Circuit Breaker

Table 2 Main Technical Parameters of Circuit Breaker

Model	NDM3Z-250VM	
Rated current of frame $I_{nm}$ (A)	250	
Rated current $I_n$ (A)	125, 140, 160, 180, 200, 225, 250	
Rated insulation voltage $U_i$ (AC V)	1500	
Rated impulse withstand voltage $U_{imp}$ (V)	8000	
Power frequency withstand voltage $U$ (1min) (V)	3820	
Utilization category	A	
Number of poles	2	
Rated working voltage $U_e$ (DC V)	1000	1100
Rated limit short-circuit breaking capacity $I_{cu}$ (kA)	20	10
Rated operating short-circuit breaking capacity $I_{cs}$ (kA)	20	10
Operating performance (times)	Electrical life	2000
	Mechanical life	12000



## 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 <sup>2</sup> )	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-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							
	Temperature (°C)	40	45	50	55	60	65	70
NDM3Z-250 VM	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

Altitude (km)	Correction factor of the working current	Correction factor of the working voltage	Correction factor of the power frequency withstand voltage
2	$I_n$	$U_e$	U
3	$0.97I_n$	$U_e$	U
4	$0.93I_n$	$U_e$	U
5	$0.89I_n$	$U_e$	U

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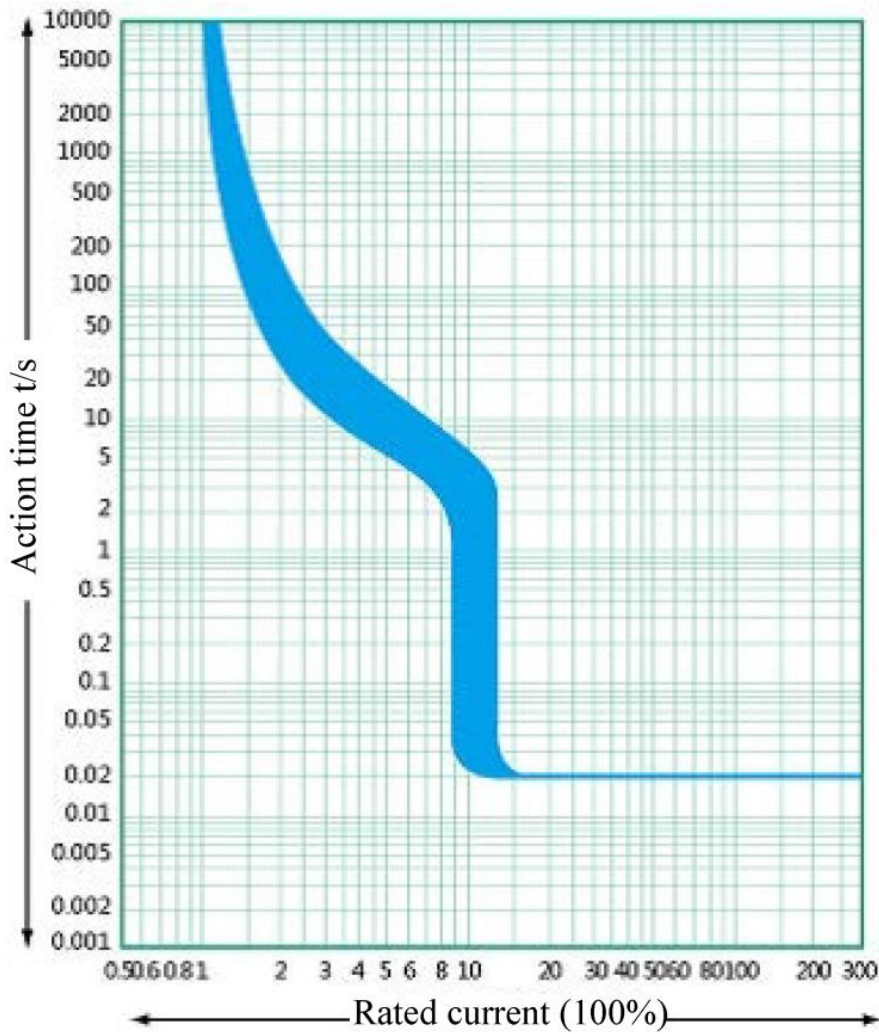
## 5. Normal Working Environment of Circuit Breaker

- 1) The altitude of the installation site doesn't exceed 2,000m. 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  $20^{\circ}\text{C}$  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



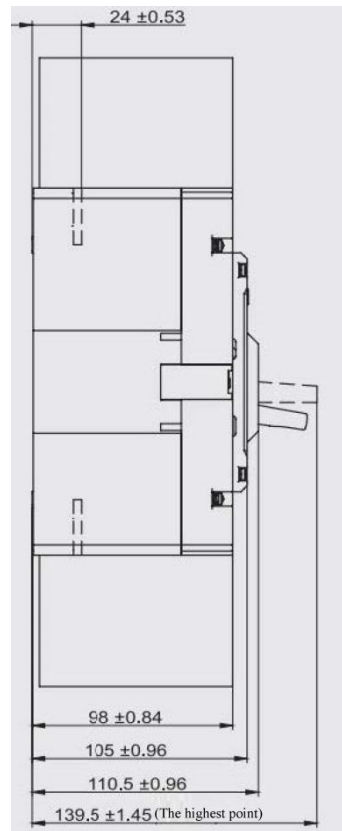
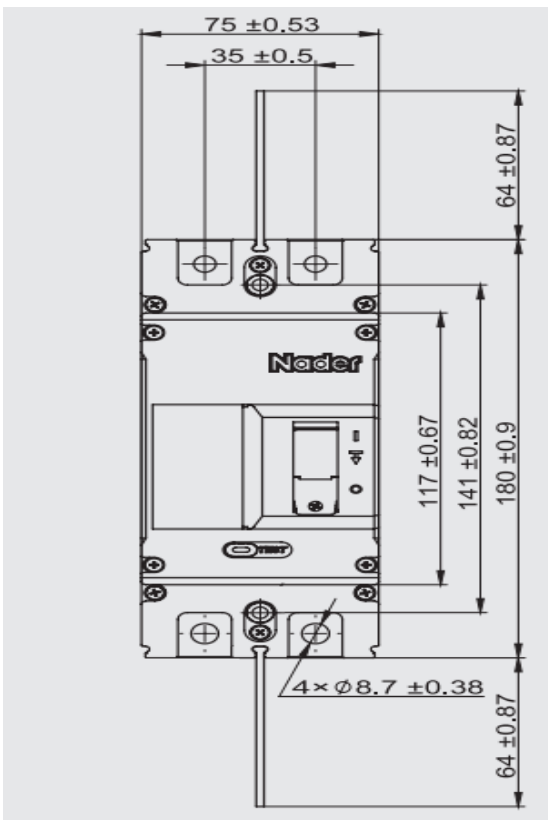
Time/Current Characteristic Curve



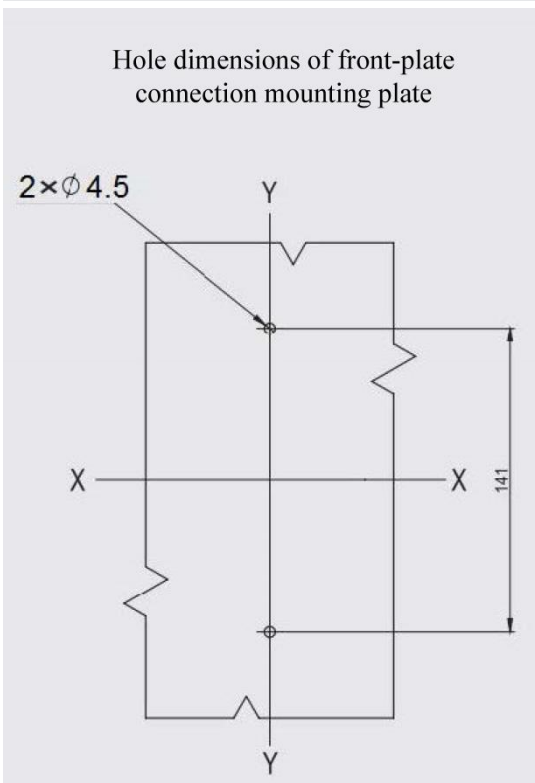
## 7. Outline, Mounting Hole Dimensions and Safety Distance of Circuit Breaker

### 7.1 Outline and mounting hole dimensions of circuit breaker

2P



Hole dimensions of front-plate connection mounting plate



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

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			
NDM3Z-250VM	≥20	≥30	≥65

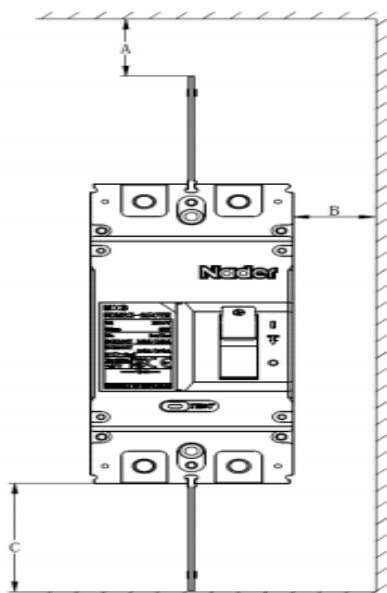


Table 8 Minimum Center Distance between Rowed Circuit Breakers (Unit: mm)

Model	I Center distance
	2 poles
NDM3Z-250VM	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.

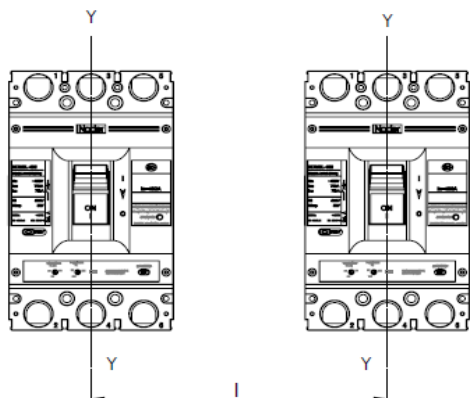


Table 9 Minimum Center Distance between Stacked Circuit Breakers ( Unit: mm)

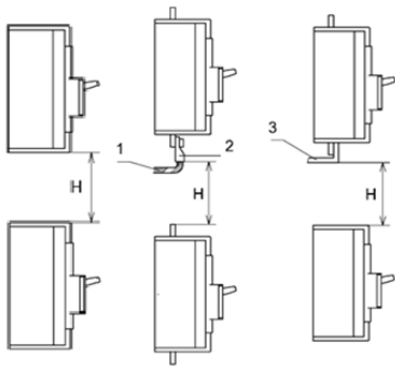
Model	H (distance of circuit breaker from bottom)
NDM3Z-250VM	155

Note: 1) Bare cable connection

2) Cable insulating connection

3) Connection without insulation

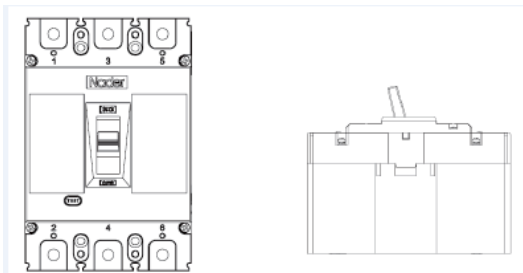
Requirements: Check whether the terminal cover or phase partition is assembled properly before products are energized.



### 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 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

## 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.



“The storage life is three years”

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