

Shanghai Liangxin Electrical Co., Ltd.

NDM3-400 Product Specification

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

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	Revision Histo	ory			
Version	Revision Reason/Content	Implementati on Date	Prepared by	Reviewe d by	Approve d by



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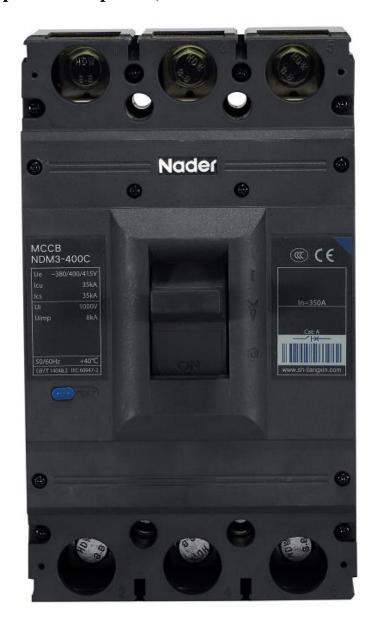
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1. Applicable Scope and Purpose of Circuit Breaker

The NDM3-400 molded case circuit breaker (hereinafter referred to as circuit breaker) applies to infrequent switching of circuits with the AC 50/60Hz, the working voltage of AC690V and working current of 400A as well as infrequent motor starting. 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)

Document No.: NDT-04522





Picture of the Product

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3. Specification and Model Description of Circuit Breaker

	<u>M</u> <u>3</u> − <u>400</u> <u>□</u>					
	2 3 4 5	6 7 8 9 10 11 12 13 14 15 16				
SN	SN name	NDM3				
1	Enterprise code	ND: "Nader" low-voltage apparatus				
2	Product code	M: Molded case circuit breaker (MCCB)				
3	Design SN	3				
4	Shell frame level	400				
		C: Basic type				
5	Breaking capacity	L: Standard type				
	level	M: Relatively high breaking type				
		H: High breaking type				
		No code: Direct handle-operated mode				
6	Operation mode	P: Motor-operated				
		Z: Rotary operation				
7	Number of poles	3, 4				
	_	0: Release (none)				
8	Release code	2: Instantaneous tripper only				
		3: Complex tripper				
9	Accessory code	See Table 1				
1.0		No code: Power distribution type				
10	Application code	2: Motor protection type				
		A: The N-pole isn't installed with an overcurrent release, but				
	N-pole (neutral	always connected				
11	pole)	B: The N-pole isn't installed with an overcurrent release, but				
11	type of the 4P	on-off with the other three poles				
	product	C: The N-pole is installed with an overcurrent tripper, and				
		on-off with the other three poles				
12	Special use	Q: Voltage-check self-reset				
13	Special function code	I: Non-tripping at the time of alarming				
14	Rated current	See Table 2				
		No code: Normal product				
		P: Connection busbar				
		Z1: Rear-plate connection				
15	Cabling type	Z2H: Plug-in rear-plate connection				
		Z2Q: Plug-in front-plate connection				
		Z3H: Integrated plug-in rear-plate connection控制				
		Z3Q: Integrated plug-in front-plate connection				
		DL: Dedicated for electric power				
		Codes of internal and external accessories:				
16	Other codes	Such as manual operation: CS1-A, electric operation: DC1				
		220V, shunt: AC230V, undervoltage: DC220V				
		220 1, Shant. 110230 1, under voltage. DC220 1				

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Table 1: Comparison Table of Accessory Code:



	Accessory name Model Accessory name	NDM3-400
Accessory code		3 4
00	N/A	
10	Shunt release	•
20	Dual-auxiliary contact	
21	Single auxiliary contact	
30	Under-voltage release	
40	Shunt release, dual-auxiliary contact	•
41	Shunt release, single auxiliary contact	
50	Shunt release, under-voltage release	0 •
60	Two sets of dual-auxiliary contacts	
61	Two sets of single auxiliary contacts	
62	Dual-auxiliary contact, single auxiliary contact	
70	Under-voltage release, dual-auxiliary contact	0 0
71	Under-voltage release, single auxiliary contact	
08	Alarm contact	
18	Shunt release, alarm contact	
28	Dual-auxiliary contact, alarm contact	
38	Under-voltage release, alarm contact	
48	Shunt release, auxiliary alarm contact	
58	Auxiliary alarm contact	
68	Dual-auxiliary contact, auxiliary alarm contact	
78	Under-voltage release, auxiliary alarm contact	



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4. Main Technical Parameters of Circuit Breaker

Table 2 Main Technical Parameters of Circuit Breaker

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Model	Model			NDM3-400				
Rated current of frame Inn	400							
Rated current In (A)			225,	250, 315, 35	50, 400			
Rated insulation voltage U	Ti (AC V)			1000				
Rated impulse withstand v	oltage Uimp (V)			8000				
Rated working voltage Ue	(AC V)		380/40	0/415, 500,	660/690			
Power frequency withstan	nd voltage U (1min)			3500				
Utilization category	Utilization category			A				
Number of poles		3				4		
Breaking capacity level		С	L	M	Н	/		
Rated limit short-circuit	AC380/400/415V	35	50	70	100	70		
breaking capacity Icu	AC500V	/	/	50	/	50		
(kA)	AC660/690V	/	/	20	/	20		
Rated operating	AC380/400/415V	35	50	70	75	70		
short-circuit breaking	AC500V	/	/	50	/	50		
capacity Ics (kA)	AC660/690V	/	/	15	/	15		
Operating performance	Electrical life			7500				
(times)	Mechanical life			10000				



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

Table 3 Selection of the NDM3-400 Connecting Bus or Cable Cross-section Area

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Rated current (A)	225	250	315, 350	400
Wire cross-section area (mm ²)	95	120	185	240

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)
NDM3-400	M10	20
NDW3-400	M6	6

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							
NDM3-400	Temperat ure (°C)	40	45	50	55	60	65	70
11/21/13-400	Derating factor	1	0.981	0.962	0.942	0.922	0.901	0.879

Note: 1) When the operating ambient temperature is below +40°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	In	Ue	U
2.5	In	Ue	U
3	0.980In	0.87Ue	0.909U
3.5	0.972In	0.846Ue	0.85 <mark>8</mark> U
4	0.963In	0.813Ue	2020. 0 页 082 0U
4.5	0.951In	0.781Ue	0.784U
5	0.938In	0.743Ue	0.752U

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5. Normal Working Environment of Circuit Breaker

- 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;
- The ambient temperature is -35° C $\sim +70^{\circ}$ C; the average within 24 h shall not be more than $+35^{\circ}$ C. If the ambient temperature is higher than $+40^{\circ}$ 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 $+40^{\circ}$ 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;
- The product can withstand the effects of wet air, salt mist, oil mist and mould;
- 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);
- The pollution level is Level 3;
- 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.

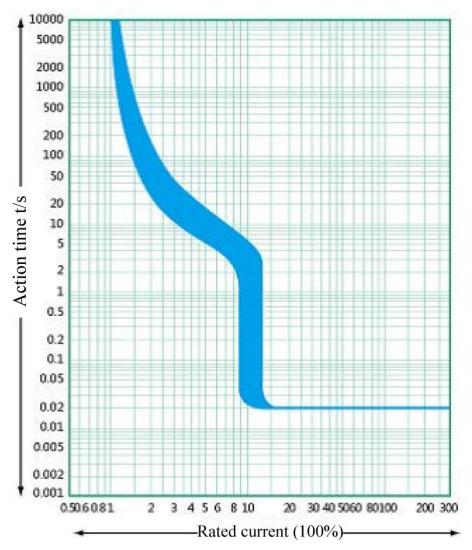


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6. Short-circuit Overload Protection Characteristic Curve of Circuit Breaker



Time/Current Characteristic Curve



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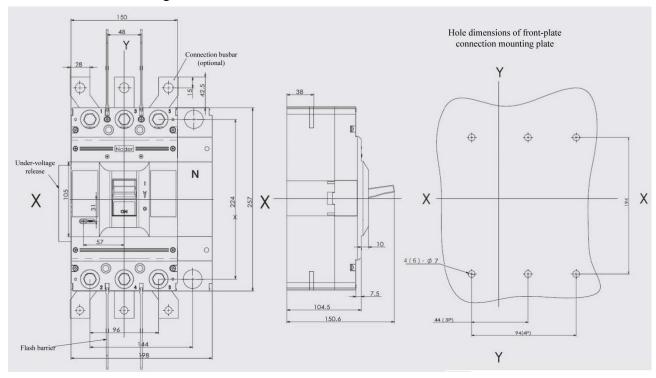
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7. Outline and Mounting Hole Dimensions of Circuit Breaker

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7.1 Outline and mounting hole dimensions of circuit breaker

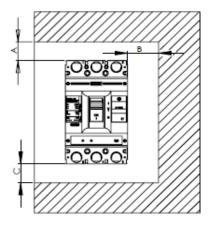


Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-m.

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	C (outlet wire end
Model	With a terminal cover	Without a terminal cover	to the cabinet face)	to the cabinet face)
NDM3-400	25	120	35	35





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

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Model	Width of cir	cuit breaker	I Center	distance
Model	3 poles	4 poles	3 poles	4 poles
NDM3-400	150	198	190	238

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.

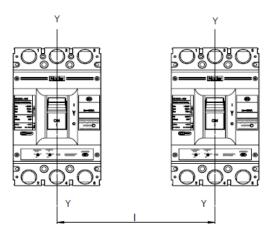


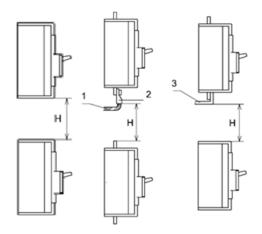
Table 9 Minimum Distance between Stacked Circuit Breakers (Unit: mm)

Model	H (distance of circu	it breaker from bottom)
Model	With a terminal cover	Without a terminal cover
NDM3-400	155	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.





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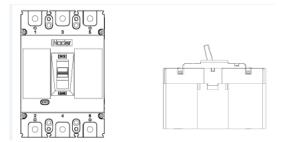


8. Installation Direction of Circuit Breaker

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

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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°C∼+75 °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	3P Quantity/Set	4P Quantity/Set
1	Cross small pan-head screw	M6×70	4	6
2	Hexagon nut	M6	4	6
3	Spring washer	6	4	6
4	Plain washer	6	8	12
5	Phase partition		4	6
6	Plug		6	8 05
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11. Circuit Breaker Notes

- 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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