

# Product Specifications

Product name: Molded Case Circuit Breaker (MCCB)

Product model: NDM3-160

Date: 20160719

Prepared by	Reviewed by	Approved by
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Revision History

Version	Revision Content	Revision Date	Revised By
0	New addition	20160719	Han Chang

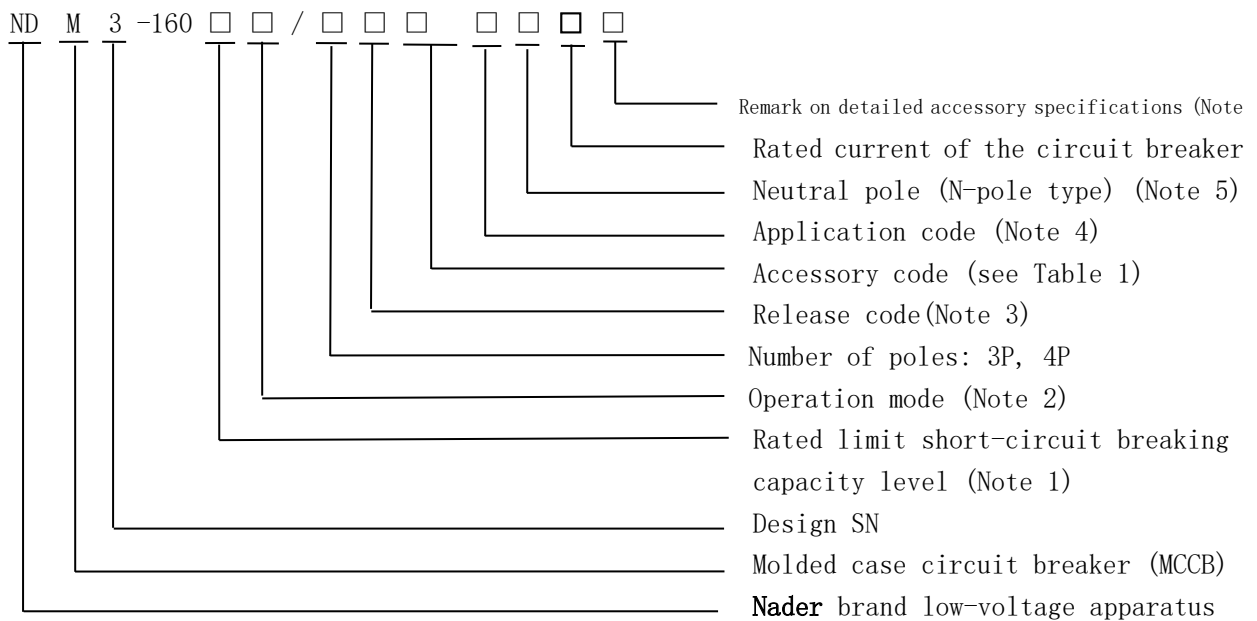
## 1. Application Scope and Purpose

NDM3 series of molded case products apply to infrequent switching of circuits with the AC 50/60Hz, the rated working voltage of 690V and rated working current of 160A 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. Picture



## 3. Specification and Model Description



Note 1: Rated limit short-circuit breaking capacity of 3P products:

L: Standard type, M: Relatively high breaking type, H: High breaking type;

Note 2: Operation mode:

No code is available for the direct handle-operated mode

P: Motor-operated

Z: Rotation handle;

Note 3: Release code:

0: Tripper (none)

2: Instantaneous tripper only

3: Complex tripper;

Note 4: Application code

No code is available for the circuit breaker for distribution

2: Protection motor type;

Note 5: Type A: The N-pole isn't installed with an overcurrent tripper, but always connected;

Type B: The N-pole isn't installed with an overcurrent tripper, but on-off with the other three poles;

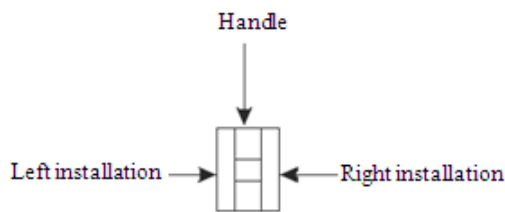
Type C: The N-pole is installed with an overcurrent tripper, and on-off with the other three poles;

Note 6: Remark on detailed accessory specifications

1. Detailed description of connection-type or rotation handle:

- ① Normal products are uncoded;
- ② P: Extended connection busbar;
- ③ JK: Only the inlet wire end adopts the connection frame while the outlet wire end adopts the front-plate connection mode as the wiring mode;
- ④ CK: Only the outlet wire end adopts the connection frame while the inlet wire end adopts the front-plate connection mode as the wiring mode;
- ⑤ K: Inlet and outlet wire ends adopt the connection frame as the wiring mode;
- ⑥ H: Rear-plate connection
- ⑦ Z1: Plug-in rear-plate connection
- ⑧ Z2: Plug-in front-plate connection

Table 1: Comparison Table of Accessory Code:

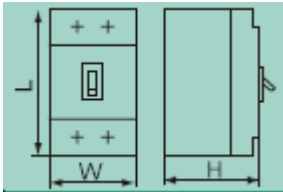


Legend

- Single auxiliary contact
- Dual-auxiliary contact
- Alarm contact
- Shunt release
- Under-voltage release

Accessory code	Accessory name	Model	
		3	4
00	None	—	
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	—	
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		
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, single auxiliary/alarm contact	—	
58	Single auxiliary/alarm contact		
68	Dual-auxiliary contact, single auxiliary/alarm contact	—	
78	Under-voltage release, single auxiliary/alarm contact	—	

#### 4. Main Technical Parameters

Model		NDM3-160			
Rated current of housing $I_{nm}$ (A)		160			
Rated current $I_n$ (A)		125, 140, 160			
Rated insulation voltage $U_i$ (AC V)		1000			
Rated impulse withstand voltage $U_{imp}$ (V)		8000			
Rated working voltage $U_e$ (AC V)		AC380/400/415V		AC660/690V	
Number of poles		3			4
Rated limit short-circuit breaking capacity level		C	L	M	/
Rated limit short-circuit breaking capacity $I_{cu}$ (KA)	400V	35	40	70	70
	690V	/	/	20	20
Rated operating short-circuit breaking capacity $I_{cs}$ (KA)	400V	25	30	50	50
	690V	/	/	10	10
Operating performance	POWER ON	8000			
	Without electricity	20,000			
		NDM3-160C: 3P (W×L×H) :92×139×75.5			
		NDM3-160L: 3P (W×L×H) :92×150×74.5			
		NDM3-160M: 3P (W×L×H) :92×150×92.5			
		NDM3-160: 4P (W×L×H) :122×150×92.5			

##### 4.1 Connection capacity:

Rated current A	125	140	160
Wire cross-section area $mm^2$	50	50	75

#### 4.2 Derating factor table of the circuit breaker

SN	Housing	Derating Factor Table of Product Temperature							
		Temperature	40°C	45°C	50°C	55°C	60°C	65°C	70°C
1	160	Derating factor	1	0.977	0.954	0.931	0.907	0.883	0.858

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.

#### 4.3 High-altitude derating factor

High-altitude Derating Factor Table of Molded Case Circuit Breaker

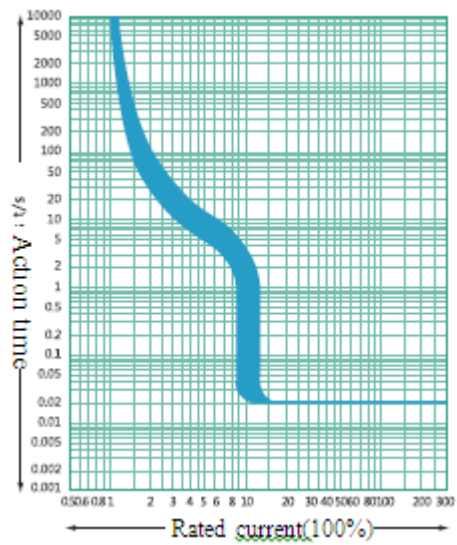
Altitude (km)	Rated operating current	Maximum operating voltage	Rated power frequency withstand voltage
2	$I_n$	$U_e$	$U$
2.5	$I_n$	$U_e$	$U$
3	$0.980I_n$	$0.87U_e$	$0.909U$
3.5	$0.972I_n$	$0.846U_e$	$0.858U$
4	$0.963I_n$	$0.813U_e$	$0.820U$
4.5	$0.951I_n$	$0.781U_e$	$0.784U$
5	$0.938I_n$	$0.743U_e$	$0.752U$

#### 4.4 Normal Working Environment

- 1) Altitude  $\leq 2000$  m;
- 2) Ambient temperature:  $-35^\circ\text{C} \sim +70^\circ\text{C}$ ; the average within 24h shall not be more than  $+35^\circ\text{C}$ . If the ambient temperature is higher than  $+40^\circ\text{C}$ , the user needs to reduce the capacity. See "Derating Factor Table of Product Temperature Change" for the derating factory;
- 3) The 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%
- 4) For frost due to temperature change, the corresponding measures should be taken
- 5) The product can withstand the effects of wet air, salt mist and oil mist.
- 6) The installation category of the circuit breaker connected/not connected to the main loop is III and II respectively
- 7) The pollution level is Level 3
- 8) The maximum gradient is  $22.5^\circ$ .
- 9) The product can be disposed in places that are free from explosive media, media corrosive to metal, insulation damaging gas, and conductive dust
- 10) The product should be installed free from snow and rain
- 11) In case of stricter user conditions than the above description, negotiate with the manufacturer

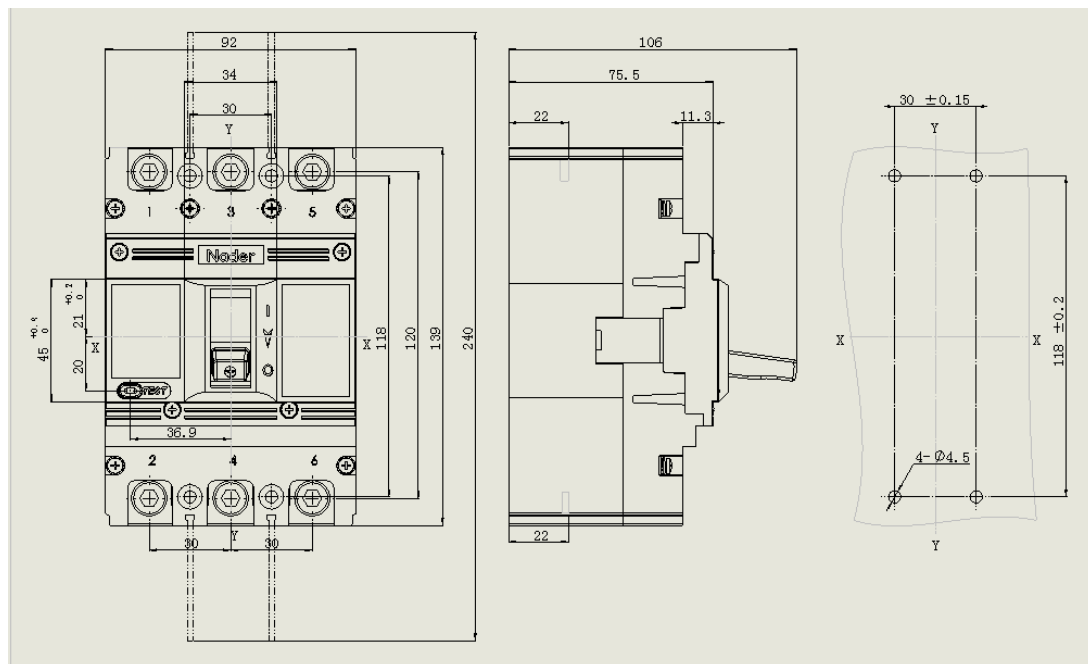
## 5. Characteristic Curve of Circuit Breaker

NDM3-160 Time/Current Characteristic Curve



## 6. Outline and Mounting Hole Dimensions

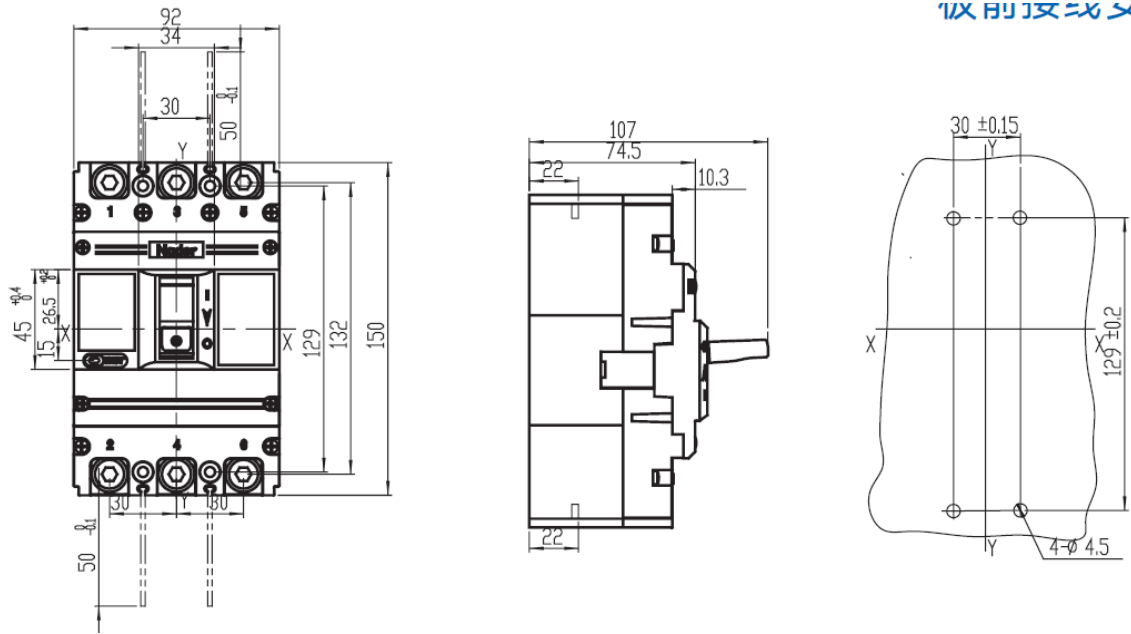
### 6.1 NDM3-160C



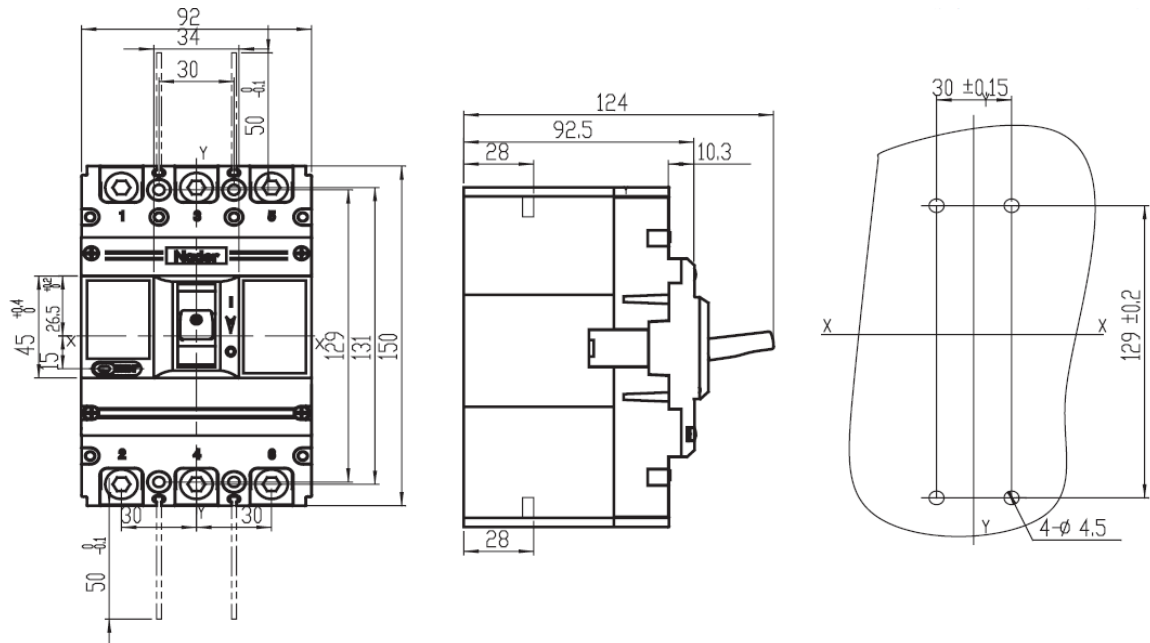


6.2 NDM3-160L

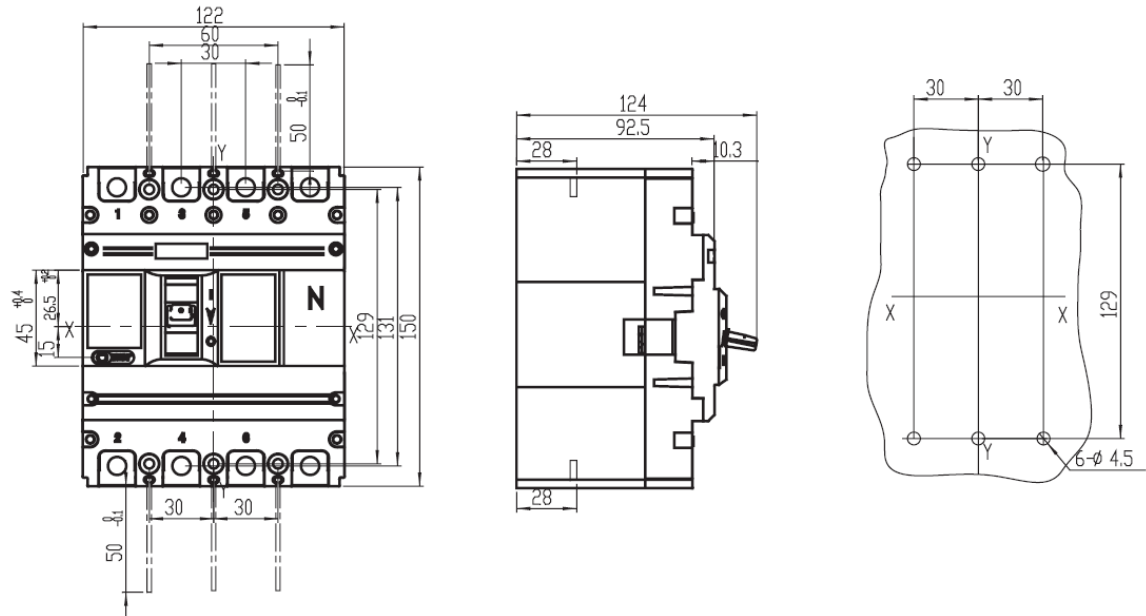
尺寸及线文



6.3 NDM3-160M



## 6.4 NDM3-160/4P

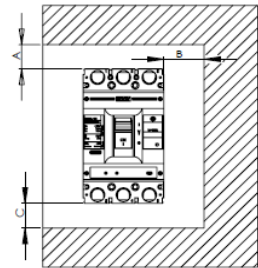


**Note:** The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-m.

## 7 Mounting distance (mm)

1) Insulation distance mounted in the metal cabinet (unit: mm), as shown below:

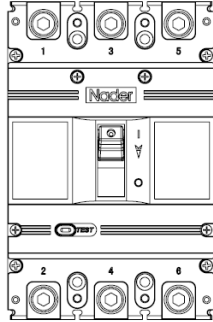
Mounting distance	A (inlet wire end to the cabinet face)		B (distance from side to cabinet)	C (outlet wire end to the cabinet face)
	With a 0 arcing cover	Without a 0 arcing cover		
Specification				
NDM3-160	25	65	30	30



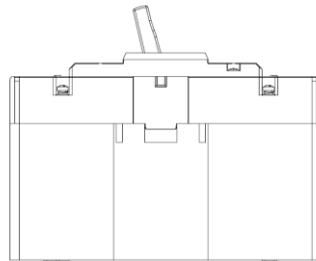
## 8. Installation Mode

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

Minimum packaging quantity: 1 piece/box. The packaged products should be stored in a warehouse with the ambient temperature of  $-40^\circ\text{C}\sim 75^\circ\text{C}$  and relative humidity below 80% without acidic, alkali or other corrosive gas in the surrounding air. Under the conditions above, the storage period shall be no more than 36 months since the manufacturing date.

## 10. Precautions

- ▲ Various characteristics and accessories of the circuit breaker are set in the factory, which shall not be adjusted randomly;
- ▲ 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.