Nader

Product Specification of NDM2-63

Product Name:Molded Case Circuit Breaker

Product Model:NDM2-63

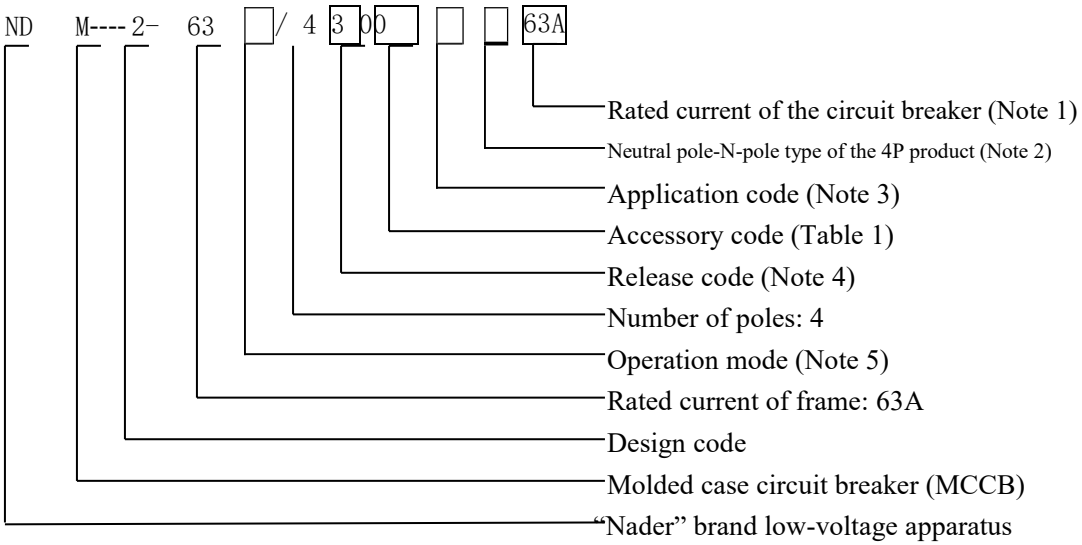
NDM2-63

1、 Application Scope and Purpose

NDM2 series of molded case circuit breakers (referred to as circuit breakers) apply to infrequent switching of circuits with the 50/60Hz, the rated working voltage of AC690V and rated working current of 800A 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. Products are widely used in the new energy, power, industrial control, real estate, electric power, telecom, rail transportation, project (public) construction and etc.

2. Picture of the Product

3. Specification and Model Description



Note 1: The rated current is: 10A, 12.5A, 16A, 20A, 25A, 32A, 40A, 50A 63A;

Note 2: The neutral pole-N-pole type of the 4P product is divided into three types:

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 3: Application code: No code is available for the circuit breaker for distribution; the protection motor type is represented as 2;

Note 4: Release code;

0: Tripper (none)

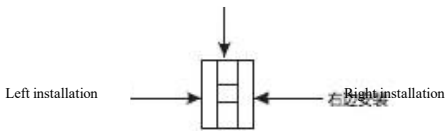
2: Instantaneous tripper only

3: Complex tripper

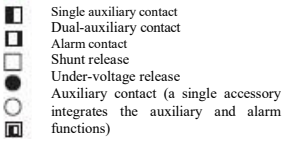
Note 5: No code is available for the direct handle-operated mode; P: Motor-operated; Z: Rotation handle-operated

Table 1: Comparison Table of Accessory Code:

Handle

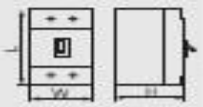


Legend



Accessory code	Accessory name	NDM2Z-63 2	NDM2Z-63 3
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, auxiliary alarm contact		
58	Auxiliary alarm contact		
68	Dual-auxiliary contact, auxiliary alarm contact	—	
78	Under-voltage release, auxiliary alarm contact	—	

4、 Main Technical Parameters

Model		NDM2-63		
Rated current of frame Inm (A)		63		
Rated current In (A)		10、12.5、16、20、25、32、40、50、63		
Rated insulation voltage Ui (V)		1000		
Rated impulse withstand voltage Uimp (V)		8000		
Power frequency withstand voltage (1min) (V)		3000		
Usage category		A		
Number of poles		3	3	4
Rated limit short-circuit breaking capacity level		L	M	
Rated limit short-circuit breaking capacity Icu (kA)	AC 400V	25	50	50
	AC 690V			
Rated limit short-circuit breaking capacity level Ics (kA)	AC 400V	19	38	38
	AC 690V			
Operating performance(Number of times)	Electrical life	8000		
	Mechanical life	20000		
Outline dimensions 	L	135	135	135
	W	78	78	103
	H	73.5	81.5	81.5
Flashover distance (mm)		≤50		
Wiring mode		General, P, Z1，Z2Q, Z2H		

5、 Connection capacity:

Rated current A	10, 12.5	16, 20	25	32	40, 50	63
Wire cross-section area mm2	1.5	2.5	4.0	6.0	10	16

SN	Rated current of frame (A)	Thread diameter	Torque value (N)
1	63	M5	4

SN	Rated current of frame (A)	Mounting thread diameter	Torque value (N)
1	63	M3	1

6. Normal Working Environment

- **Operating Ambient Temperature**

-35℃~+70℃; the average within 24 h shall not be more than +35℃. If the temperature is higher than +40℃, the user needs to reduce the capacity. See the "Derating Factor Table of Temperature Change for NDM2Z Series Molded Case Circuit Breakers" for the derating factor.

- **Storage Temperature**

-40℃~+75℃

- **Altitude**

The altitude of the installation site doesn't exceed 2,000m. See the "Derating Factor Table of Temperature Change for NDM2Z Series Molded Case Circuit Breakers" for the derating factor at the altitude;

- **Operating/Storage Relative Humidity**

The 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.

- **Pollution Level**

Level 3

- **Installation Category**

The installation category of the circuit breaker connected to the main loop is: Ⅲ (power distribution and control level);

The installation category of the circuit breaker not connected to the main loop is: Ⅱ (load level).

- **Installation Environment**

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.

- **Derating Factor Table of Temperature Change for NDM2 Series Molded Case Circuit Breaker**

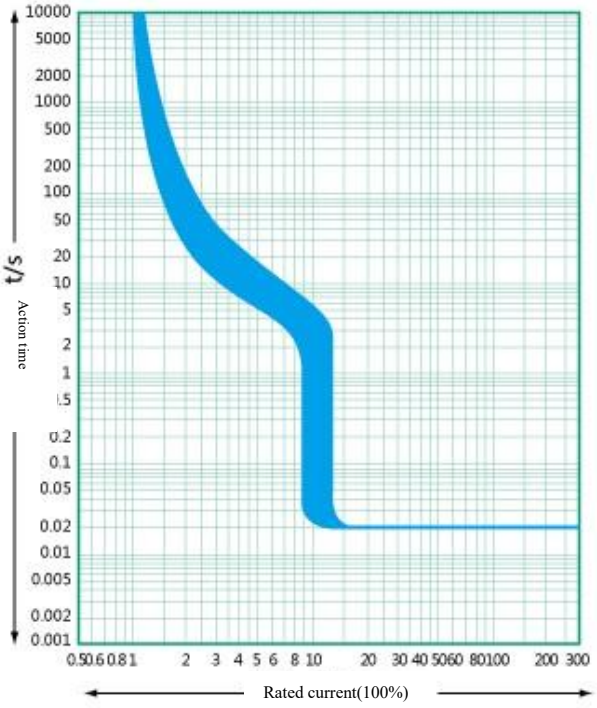
SN	Product model	Derating factor of product temperature change							
1	NDM2-63	Temperature	40℃	45℃	50℃	55℃	60℃	65℃	70℃
		Derating factor	1	0.979	0.958	0.937	0.915	0.893	0.871

High-altitude Derating Factor Table of Molded Case Circuit Breaker

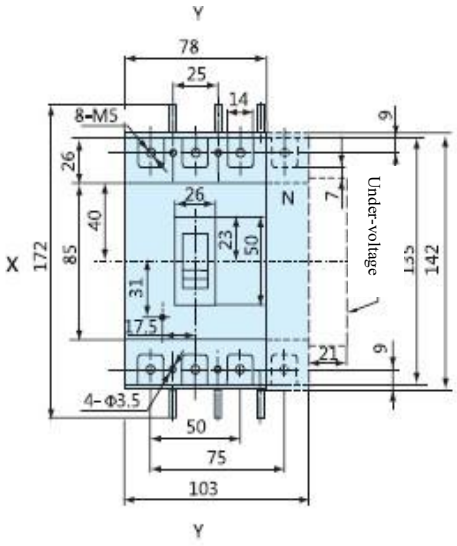
Altitude H Altitude (km)	Rated working current	Ultimate working voltage	Rated working frequency withstand voltage
2	In	Ue	U
2.5	In	Ue	U
3	0.98In	0.83Ue	0.89U
3.5	0.97 In	0.77 Ue	0.85U
4	0.96In	0.71Ue	0.80U
4.5	0.95 In	0.67 Ue	0.77U
5	0.94In	0.63Ue	0.73U

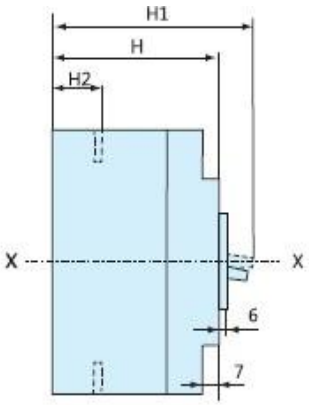
7、 Tripping Characteristics

NDM2-63 Time/Current Characteristic Curve:



8. Outline and Installation Dimensions

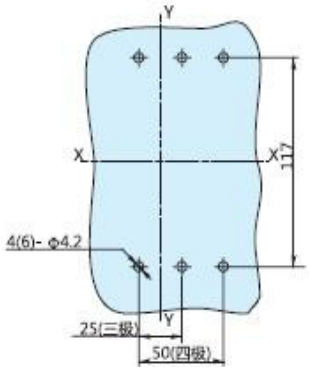




Add a 142" terminal cover (optional); no terminal cover is available for 4P products

Hole Dimensions of Front-plate Connection

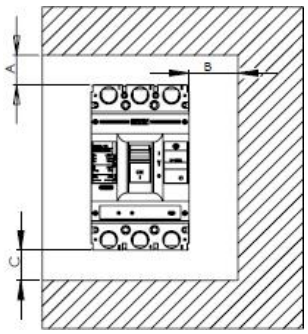
Mounting Plate



Model	H	H1	H2
NDM2-63L	73.5	90.5	20.5
NDM2-63M	81.5	98.5	28.5
NDM2-63四极			

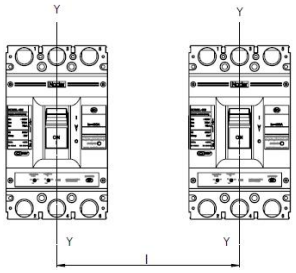
8.1 Insulation distance mounted in the metal cabinet (unit: mm), as shown below:

Mounting distance	A (inlet wire end to the cabinet face)		B (distance from side to cabinet)	C (outlet wire end to the cabinet face)
Specification	With a 0 arcing cover	Without a 0 arcing cover		
NDM2-63	25	65	30	30



8.2 Minimum center distance between rowed circuit breakers

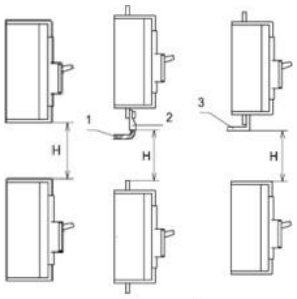
Specification	Width of circuit breaker (mm)		Center distance (mm)	
	3 poles-3P	4 poles-4P	3 poles-3P	4 poles-4P
NDM2-63	78	103	108	133



Note: Check the connected busbar or cable during rowing or stacking of the circuit br air insulation distance won't be reduced

8.3 Minimum center distance between stacked circuit breakers

Specification	H (distance of circuit breaker from bottom)	
	With a 0 arcing cover	Without a 0 arcing cover
NDM2-63	90	90

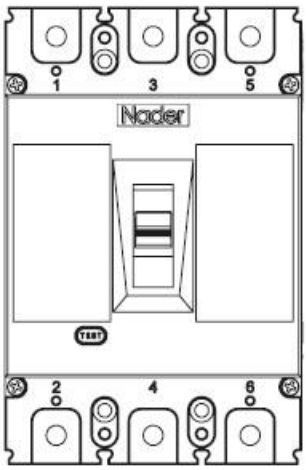


Note:

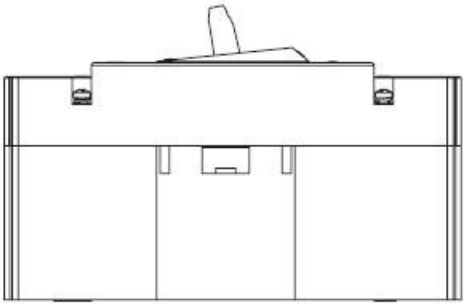
1. Cable insulating connection
2. Connection without insulation
3. Check whether the 0 arcing cover or phase partition is assembled properly before products are energized.

9. Installation Mode

- **Installation Direction**
  - 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

Minimum packaging quantity: 1 piece/box. The packaged products should be stored in a warehouse with the ambient temperature of -45℃~75 ℃ and the corresponding 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.

11. List of Accessories and Installation

SN	Name	**Specification**	Quantity/Set
1	Cross small pan-head screws	M3X35	6
2.	Plain washer	3	6
3	Spring washer	3	6
4	Hexagon nut	M3	6
5	Phase partition	——	6

12. 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.

Nader

Product Specification of NDM2-125

Product Name:Molded Case Circuit Breaker

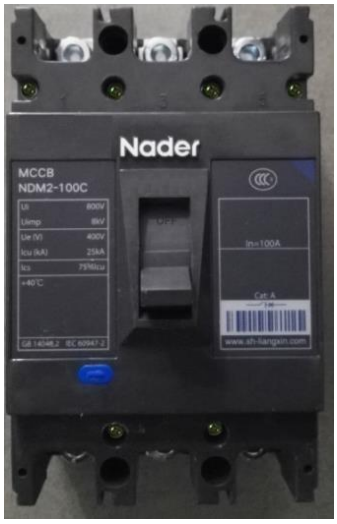
Product Model:NDM2-125

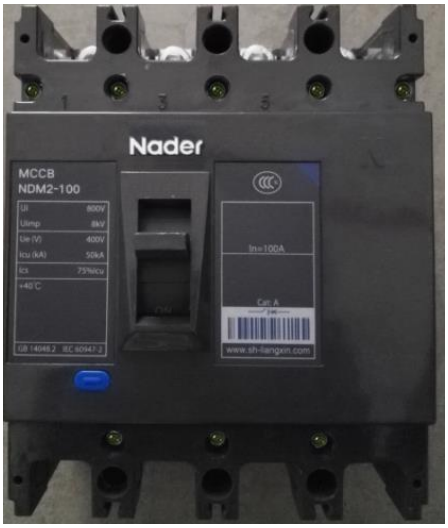
1、 Application Scope and Purpose

NDM2 series of molded case products apply to infrequent switching of circuits with the AC 50Hz (or 60Hz), the rated working voltage of 690V and rated working current of 125A 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.

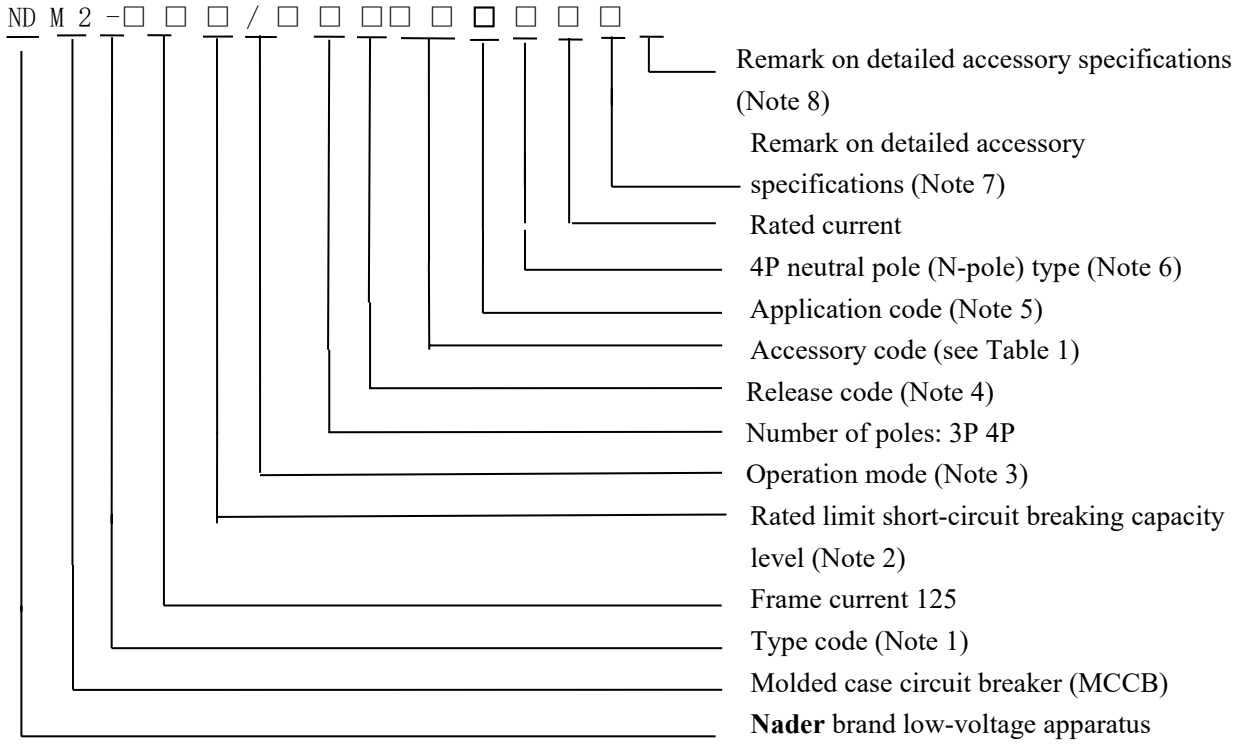
2 、 Picture of the Product (The picture is for reference only)

3P **4P**





3、 Specifications and Models Description



Note 1: Type code

2: Design SN

Note 2: Rated limit short-circuit breaking capacity of 3P products:

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

Note 3: Operation mode:

No code is available for the direct handle-operated mode

P: Motor-operated

Z: Rotation handle;

Note 4: Release code:

0: Tripper (none)

2: Instantaneous tripper only

3: Complex tripper;

Note 5: Application code

No code is available for the circuit breaker for distribution

2: Protection motor type;

Note 6: 4P neutral pole (N-pole) type:

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 7: 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

For example: NDM2-125M/3300 125A (plug-in rear-plate connection);

NDM2-125LZ/3321 125A (CS1-A);

NDM2-125M/33002 125A (connection busbar), etc.

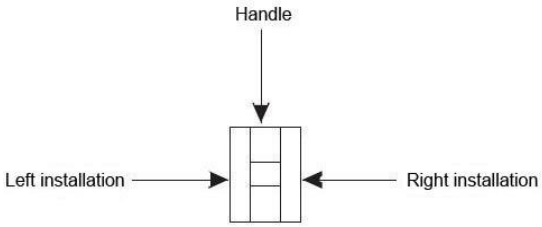
Note 8: Indicate the accessory voltage; the voltage of the electric operating mechanism, undervoltage tripper and shunt tripper shall be indicated temporarily:

① The voltage of the electric operating mechanism is represented as DC1 space+voltage: For example NDM2-125LP/3020 125A (DC1 220V),

② If only the voltage exists in the (), the voltage of the shunt tripper or undervoltage tripper from the accessories is indicated in default,

For example: NDM2-125L/3341 125A (AC220V)

Table 1: Comparison Table of Accessory Code:



Legend：

- Single auxiliary contact
- Dual-auxiliary contact
- Alarm contact
- Shunt release
- Under-voltage release
- (Single auxiliary & alarm) contact

Installation position / Model / Number of poles	Accessory code	Accessory name	NDM2-125 3	NDM2-125 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		NDM2-125				
Rated current of housing Inm (A)		125				
Rated current In (A)		16, 20, 25, 32, 40, 50, 63, 80, 100, 125				
Rated insulation voltage Ui (AC V)		1000				
Rated impulse withstand voltage Uimp (V)		8000				
Rated working voltage Ue (AC V)		AC400V, AC690V				
Number of poles		3				4
Rated limit short-circuit breaking capacity level		C	L	M	H	/
Rated limit short-circuit breaking capacity Icu (KA)	400V	25	35	50	85	50
	690V			10		
Rated operating short-circuit breaking capacity Ics (KA)	400V	19	26	38	64	38
	690V			8		
Operating performance	POWER ON	8000				
	Without electricity	20000				

4.1 Connection capacity:

Rated current A	16, 20	25	32	40, 50	63	80	100	125
Wire cross-section area mm^2	2.5	4	6	10	16	25	35	50

4.2 Tightening torque value of terminal/mounting screw

SN	Rated current of frame	Thread diameter	Torque value
1	NDM2-125	M8	12
		M4	2.4

4.3 Derating factor table of the circuit breaker

SN	Housing	Derating Factor Table of Product Temperature							
1	125	Temperature	40℃	45℃	50℃	55℃	60℃	65℃	70℃
		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℃, 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

High-altitude Derating Factor Table of Molded Case Circuit Breaker

Altitude (km)	Rated operating current	Maximum operating voltage	Rated power frequency withstand voltage
2	In	Ue	1U
2.5	In	Ue	1U
3	0.98In	0.83Ue	0.89U
3.5	0.97In	0.77Ue	0.85U
4	0.96In	0.71Ue	0.80U
4.5	0.95In	0.67Ue	0.77U
5	0.94In	0.63Ue	0.73U

7. Normal Working Environment

1) Altitude≤2000 m;

2) Ambient temperature: -35℃ ~ + 70℃; the average within 24h shall not be more than +35℃. If the ambient temperature is higher than +40℃, 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℃ should not exceed 50%. A higher relative humidity is allowed at a lower temperature. For example, the relative humidity at 20℃ 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°.

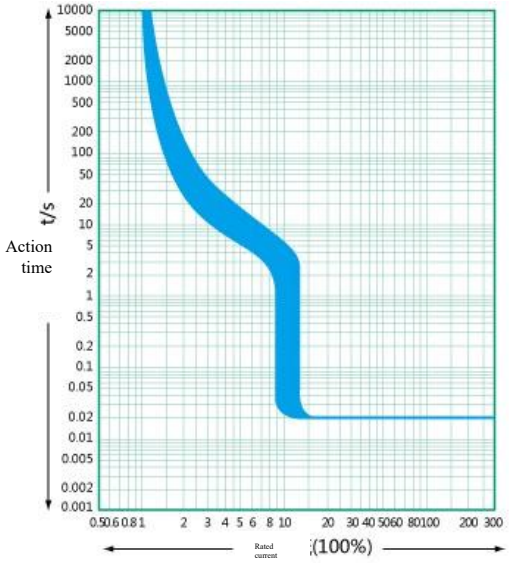
9) The product can be disposed in places that are free from explosive media, media corrosive to metal, insulation damaging gas, and conductive dust

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

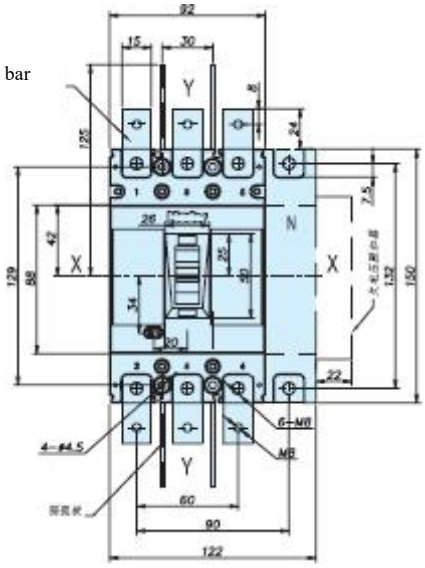
8. Characteristic Curve of Circuit Breaker

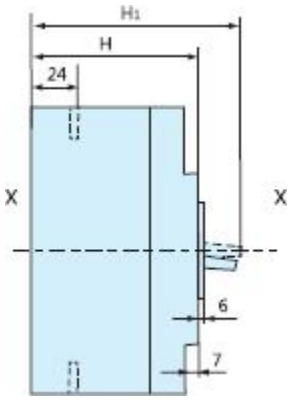
Time/current characteristic curve:

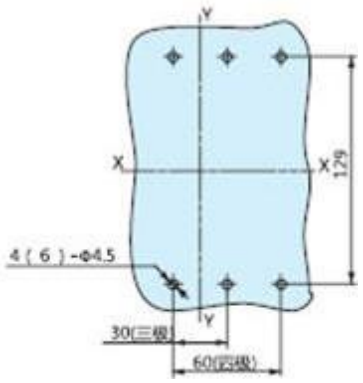


9. Outline and Installation Dimensions

Connection bar
(optional)





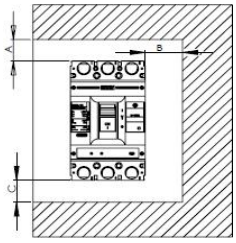


Model	H	H1
NDM2-125C、L	69	86
NDM2-125M	87	104
NDM2-125四极		

9.1 Mounting distance (mm)

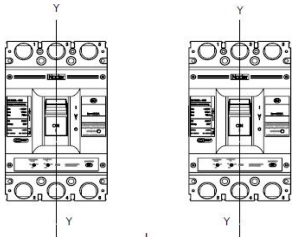
1) Insulation distance mounted in the metal cabinet (unit: mm), as shown below:

Mounting distance	A (inlet wire end to the cabinet face)		B (distance from side to cabinet)	C (outlet wire end to the cabinet face)
Specification	With a 0 arcing cover	Without a 0 arcing cover		
NDM2-125	25	65	30	30



2) Minimum center distance between rowed circuit breakers

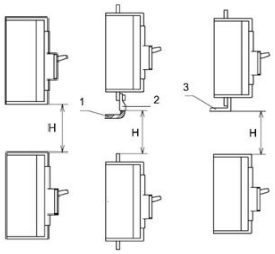
Specification	Width of circuit breaker (mm)			Center distance (mm)		
	2P	3P	4P	2P	3P	4P
NDM2-125	/	92	122	/	122	152



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

3) Minimum center distance between stacked circuit breakers

Specification	H (distance of circuit breaker from bottom)	
	With a 0 arcing cover	Without a 0 arcing cover
NDM2-125	90	91



Note: 1. Bare cable connection (only for Type L products)

2. Cable insulating connection

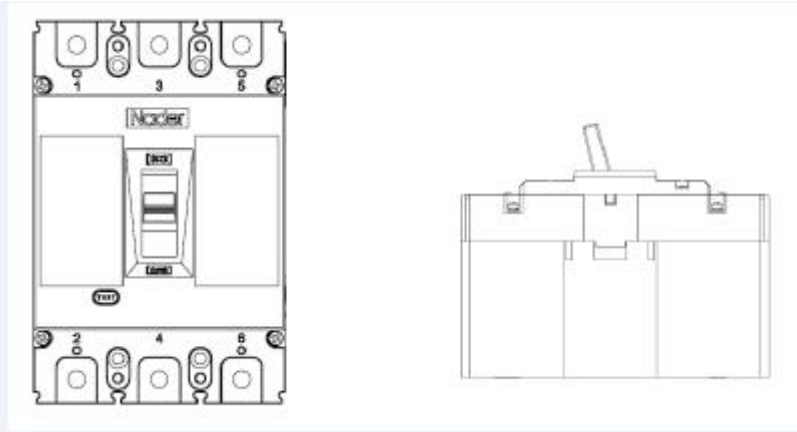
3. Connection without insulation

4. Check whether the 0 arcing cover or phase partition is assembled properly before products are energized.

10. Installation Mode

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

11. Packaging and Storage

Minimum packaging quantity: 1 piece/box. The packaged products should be stored in a warehouse with the ambient temperature of -40℃~75 ℃ and the corresponding 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.

12. List of Accessories and Installation

SN	Name	Specification	Quantity/Set/3P	Quantity/Set/4P
1	Cross small pan-head screws	M4X45	4	6
2.	Plain washer	4	4	6
3	Spring washer	4	4	6
4	Hexagon nut	M4	4	6
5	Phase partition	——	4	6

13. 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.

Nader

Product Specification of NDM2-250

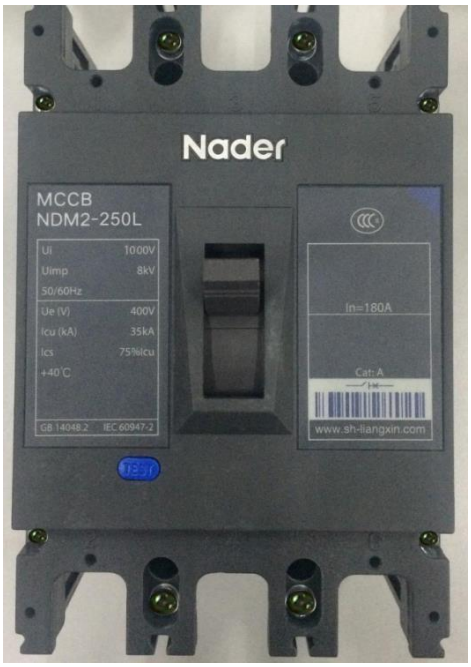
Product Name:Molded Case Circuit Breaker

Product Model:NDM2-250

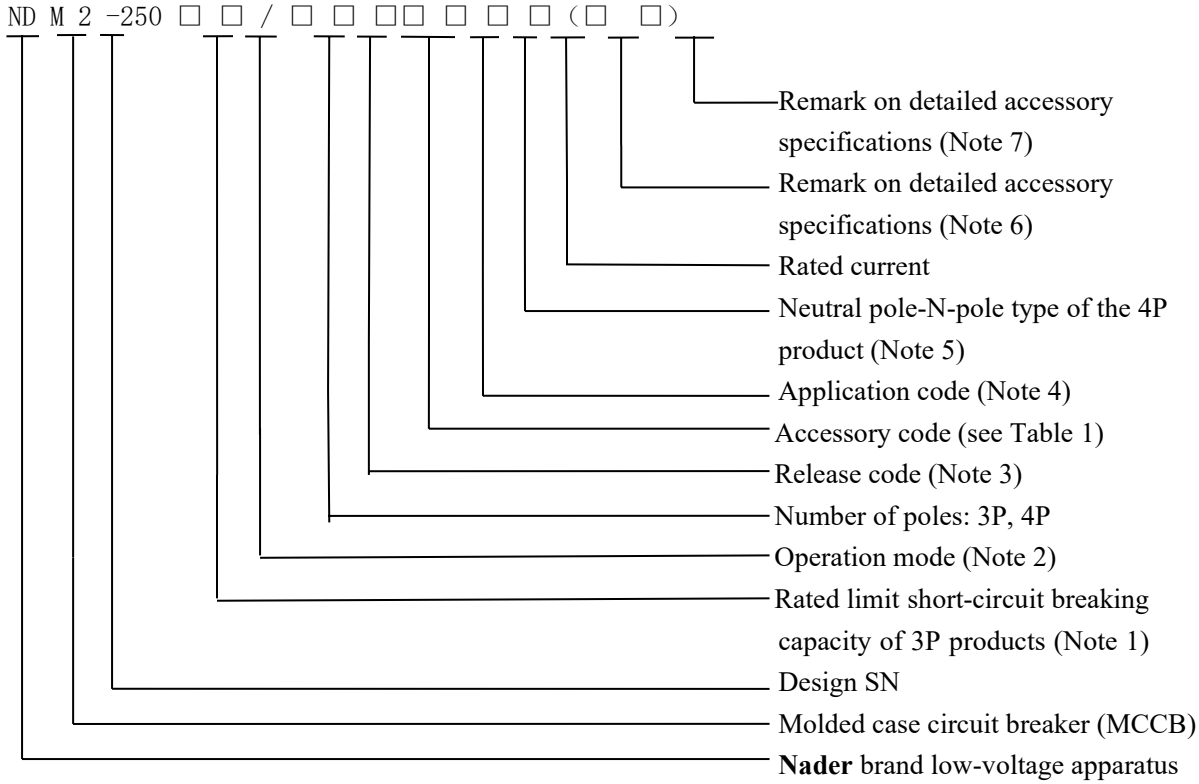
1. Applicable Scope and Purpose

NDM2 series of molded case products apply to infrequent switching of circuits with the AC 50Hz (or 60Hz), the rated working voltage of 690V and rated working current of 800A 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 of the Product (The picture is for reference only; the specific kind prevails)



3. Specification and Model Description



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

C: Basic type, 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: The neutral pole-N-pole type of the 4P product is divided into three types:

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

For example:

NDM2-250M/3300 250A (plug-in rear-plate connection),

NDM2-250LZ/3321 125A(CS1-A),

NDM2-250M/33002 200A (connection busbar), etc.

Note 7: Indicate the accessory voltage; the voltage of the electric operating mechanism, undervoltage tripper and shunt tripper shall be indicated temporarily:

① The voltage of the electric operating mechanism is represented as CD2 space+voltage: For example NDM2-250LP/3020 250A (CD2 DC24V),

② If only the voltage exists in the (), the voltage of the shunt tripper or undervoltage tripper from the accessories is indicated in default,

For example:

NDM2-250L/3341 200A (AC220V)

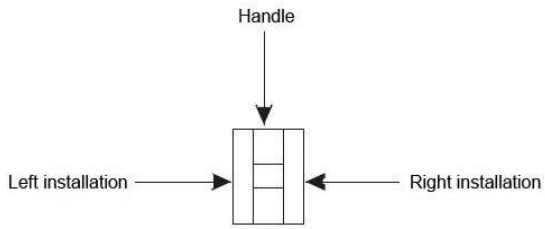
③ If the shunt tripper or undervoltage tripper exists simultaneously with the different voltage, it shall be clearly marked in front of the voltage,

For example:

NDM2-250M/3350 125A(MX AC220V+Q AC380V),

MX and Q represent the shunt tripper and undervoltage tripper respectively.

Table 1: Comparison Table of Accessory Code:



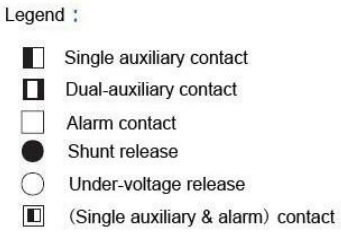


Table 1

Installation position / Model / Number of poles		NDM2-250		NDM2-400		NDM2-630		NDM2-800	
Accessory code	Accessory name	3	4	3	4	3	4	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

1) Electrical characteristics

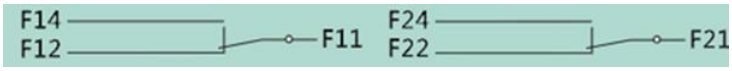
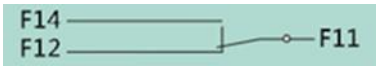
Model		NDM2-250				
Rated current of frame Inm (A)		250				
Rated current In (A)		100、125、140、160、180、200、225、250				
Rated insulation voltage Ui (AC V)		1000				
Rated impulse withstand voltage Uimp (V)		8000				
Rated working voltage Ue (AC V)		AC400V、AC690V				
Number of poles		3				4
Rated limit short-circuit breaking capacity level		C	L	M	H	/
Rated limit short-circuit breaking capacity Icu (KA)	400V	25	35	50	85	50
	690V			10		
Rated operating short-circuit breaking capacity Ics (KA)	400V	19	26	38	64	38
	690V			8		
Operating performance	POWER ON	8000				
	Without electricity	20000				

2) Connection capacity:

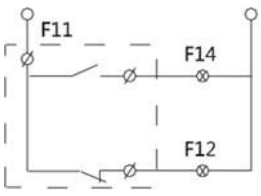
Rated current A	100	125/140	160	180/200/225	250
Wire cross-section area mm2	35	50	70	95	120

3) Auxiliary contact

① Auxiliary contact and its combination

The circuit breaker is in the “Off” or “Free tripping” position	Dual-auxiliary contact	
	Single auxiliary contact	
The circuit breaker is in the “On” position	“Closing” converted to “Disconnection”, and “Disconnection” converted to “Closing”	

② Wiring diagram of the auxiliary contact

	Power supply
	On circuit
	Off circuit

③ Current parameters of the auxiliary contact

Rated current of frame	Agreed thermal current Ith	Rated operating current at AC 400V
125-630	3A	0.30A

④ Electrical life of the auxiliary contact

Usage category	Connecting			Breaking			Times	Operation frequency (times/h)	Power-on time
	I/Ie	U/Ue	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

⑤ Making and breaking capacity of the auxiliary contact

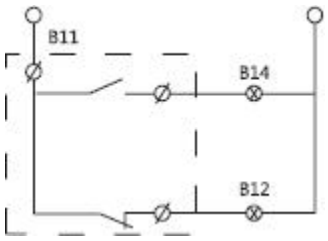
Usage category	Connecting			Breaking			Times	Operation frequency (times/h)	Power-on time
	I/Ie	U/Ue	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1.1	0.3	1	1.1	0.3	10	120	≥0.05s
DC-13	1.1	1.1	6Pe	1.1	1.1	6Pe			≥T0.95

4) Alarm contact

① Alarm contact and its combination

The circuit breaker is in the "On" and "Off" position	
The circuit breaker is in the "Free tripping" position	

② Wiring diagram of the alarm contact



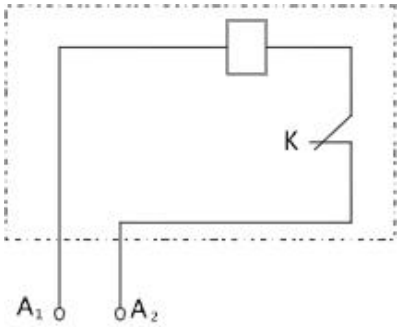
During normal on-off of the circuit breaker, the contact won't act and only change its original status after free tripping (or fault trip) with the normally-open state changed to be closed and normally-closed state changed to be open. After the circuit breaker is tripper, the contact will be restored to the original position.

③ Alarm contact parameters

Ue=220V, Ith=3A

5) Shunt tripper

① Wiring diagram of the shunt tripper



Power input

② Control voltage of the shunt tripper : AC 50Hz 230V 400V
DC 24V 220V

With the rated control voltage within 70%110%, the shunt tripper should make the reliable tripping under all the operation conditions.

5. Derating Parameter Table of Temperature for the Circuit Breaker

	Derating factor (In)						
	+40℃	+45℃	+50℃	+55℃	+60℃	+65℃	+70℃
NDM2-250	1	0.982	0.963	0.944	0.924	0.904	0.882

Note: The above derating factors are measured at the current of 250A

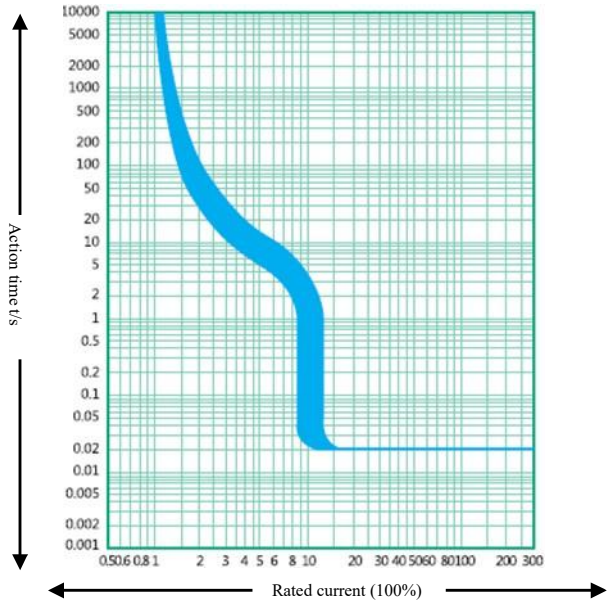
6 High-altitude derating factor

Altitude (km)	Rated operating current	Maximum operating voltage	Rated power frequency withstand voltage
2	In	Ue	U
2.5	In	Ue	U
3	0.980In	0.870Ue	0.909U
3.5	0.972In	0.846Ue	0.858U
4	0.963In	0.813Ue	0.820U
4.5	0.951In	0.781Ue	0.784U
5	0.938In	0.743Ue	0.752U

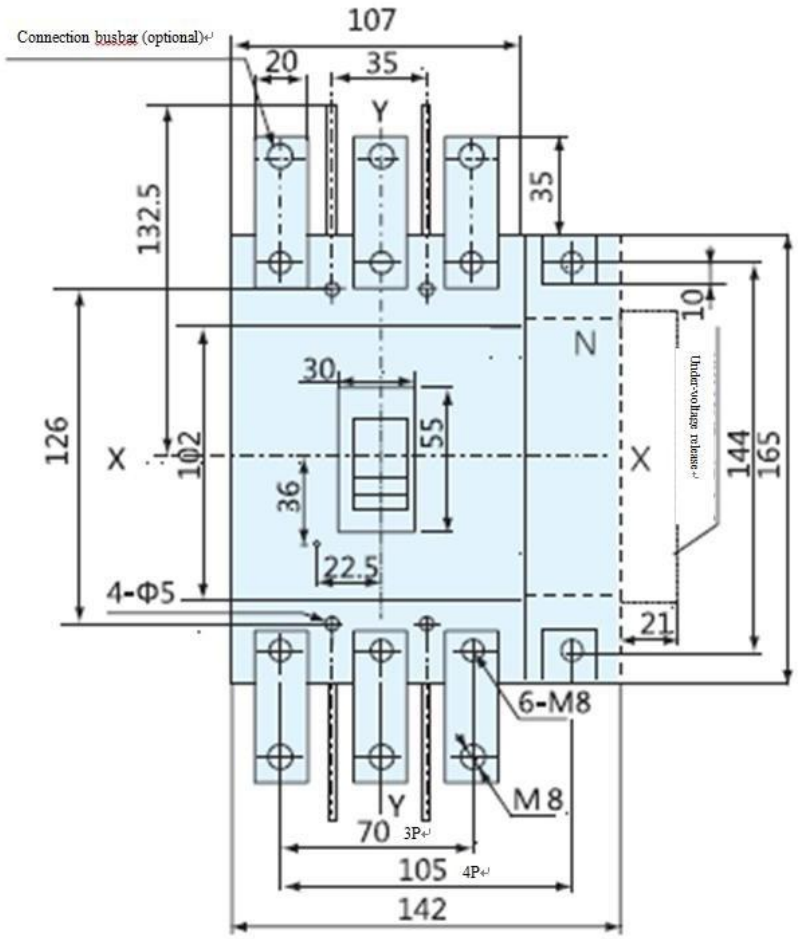
7. Normal Working Environment

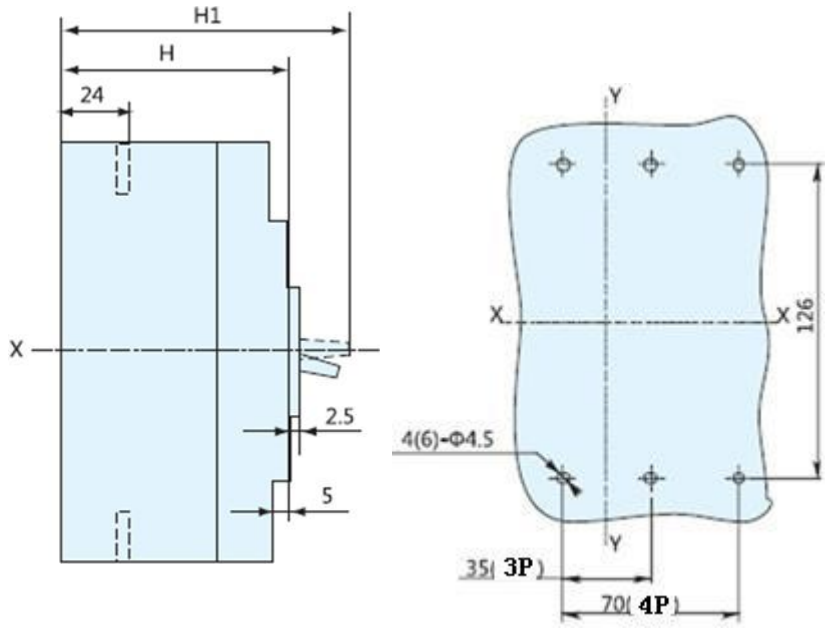
- ▲ Altitude: ≤2000m.
- ▲ Ambient temperature: -35℃~+70℃. (Reduced capacity is not considered with the temperature below +40℃)
- ▲ The relative humidity at an ambient temperature of +40℃ should not exceed 50%. A higher relative humidity is allowed at a lower temperature.
- ▲ Pollution level: 3.
- ▲ The product can withstand the effects of wet air, salt mist, oil mist and mould.
- ▲ The product should be installed free from snow and rain.
- ▲ The product can be disposed in places that are free from explosive media, media corrosive to metal, insulation damaging gas, and conductive dust.
- ▲ In case of stricter user conditions than the above description, negotiate with the manufacturer.

8. Characteristic Curve of Circuit Breaker


Action time t/s
10000
5000
2000
1000
500
200
100
50
20
10
5
2
1
0.5
0.2
0.1
0.05
0.02
0.01
0.005
0.002
0.001
0.5 0.6 0.8 1 2 3 4 5 6 8 10 20 30 40 50 60 80 100 200 300
Rated current (100%)

9. Outline and Mounting Hole Dimensions





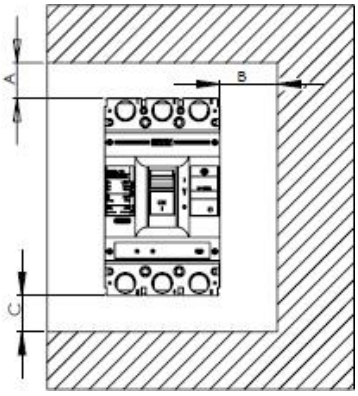
Model	H	H1
NDM2-250C、L	86	110
NDM2-250M、H	103	127
NDM2-250 4P		

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

10. Installation Mode

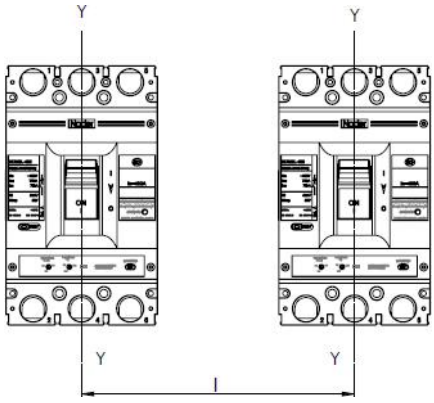
Installation mode: To be installed horizontally or vertically.

1) Insulation distance mounted in the metal cabinet (mm)



Mounting distance	A (inlet wire end to the cabinet face)		B (distance from side to cabinet)	C (outlet wire end to the cabinet face)
Specification	With a 0 arcing cover	Without a 0 arcing cover		
NDM2-250	25	65	30	30

2) Minimum center distance between rowed circuit breakers (mm)

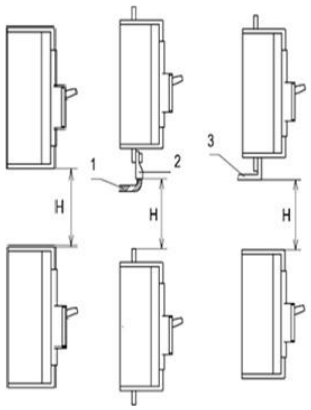


Specification	Width of circuit breaker		I Center distance	
	3P	4P	3P	4P
NDM2-250	107	142	137	172

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.

3) Minimum center distance between stacked circuit breakers (mm)

Specification	H (distance of circuit breaker from bottom)	
	With a 0 arcing cover	Without a 0 arcing cover
NDM2-250	90	93



Note :1 Bare cable connection

2 Cable insulating connection

3 Connection without insulation

Requirements: Check whether the 0 arcing cover or phase partition is assembled properly before products are energized

11. Packaging and Storage

Minimum packaging quantity: 1 piece/box. The packaged products should be stored in a warehouse with the ambient temperature of -40℃~75℃ and the corresponding 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.

12、List of Accessories and Installation

SN	Name	Specification	Quantity/Set（3P）	Quantity/Set（4P）
1	Cross small pan-head screws	M4X45	4	6
2.	Plain washer	4	4	6
3	Spring washer	4	4	6
4	Hexagon nut	M4	4	6
5	Phase partition	——	4	6

13. 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.

▲ Make sure to add a phase partition for product use.

▲ Tighten the accessory kit mounting screw M4 with a torque of 2.4Nm; when the terminal screw adopts the M8 hexagon screw, tighten it with a torque of 12m.

Nader

Product Specification of NDM2-400

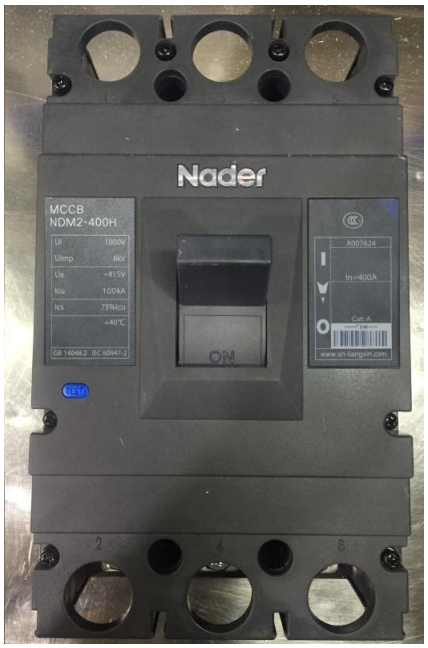
Product Name:Molded Case Circuit Breaker

Product Model:NDM2-400

1. Applicable Scope and Purpose

NDM2 series of molded case products apply to infrequent switching of circuits with the AC 50Hz (or 60Hz), the rated working voltage of 690V and rated working current of 800A 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 of the Product



3. Specification and Model Description

ND M 2- 400 M □ / 3 3 00 □ 400A

- 400A: Rated current of the circuit breaker (Note1)
- □: Application code (Note 2)
- 00: Accessory code (Table 1)
- 3: Release code (Note 3)
- / 3: Number of poles: 3
- □: Operation mode (Note 4)
- M: Rated limit short-circuit breaking capacity level (Note 5)
- 400: Rated current of frame: 400A
- 2-: Design code
- M: Molded case circuit breaker (MCCB)
- ND: "Nader" brand low-voltage apparatus

Note 1: The rated current is: 225A, 250A, 315A, 350A, 400A.

Note 2: Application code: No code is available for the circuit breaker for distribution; the protection motor type is represented as 2.

Note 3: Release code

0: Tripper (none)

2: Instantaneous tripper only

3: Complex tripper

Note 4 Operation mode:

No code is available for the direct handle-operated mode

P: Motor-operated

Z: Rotation handle

Note 5: Rated limit short-circuit breaking capacity level:

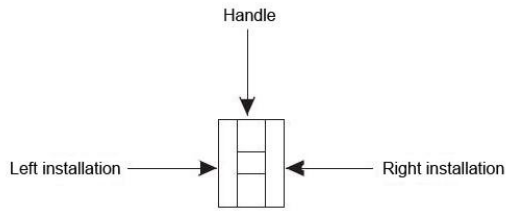
C: Basic type

L: Standard type

M: Relatively high breaking type

H: High breaking type

Table 1: Comparison Table of Accessory Code:



Legend：

- Single auxiliary contact
- Dual-auxiliary contact
- Alarm contact
- Shunt release
- Under-voltage release
- (Single auxiliary & alarm) contact

Installation position / Model / Number of poles / Accessory code / Accessory name	NDM2-250		NDM2-400		NDM2-630		NDM2-800	
	3	4	3	4	3	4	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

(1). Electrical characteristics

- ▲ Rated insulation voltage Ui: 1000V
- ▲ Rated working voltage Ue: AC 400V or AC 690V (only for Type M)
- ▲ Rated current of frame Inm: 400A
- ▲ Rated limit short-circuit breaking current Icu:

  Type C: 35KA

  Type L: 50KA

  Type M: 65KA (AC 400V)

  15KA (AC 690V)

  Type H: 100KA
- ▲ Rated operating short-circuit breaking current Ics:

  Type C: 26KA

  Type L: 38KA

  Type M: 49KA (AC 400V)

  11KA (AC 690V)

  Type H: 75KA
- ▲ Rated working current of the auxiliary contact: 0.4A
- ▲ The conventional thermal current of the auxiliary contact: 3A

(2). Operating performance

- ▲ With electricity: 7,500 times
- ▲ Without electricity: 10,000 times

(3). Connection capacity:

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

4) Tightening torque value of terminal/mounting screw

Rated current of frame	Thread diameter	Torque value (N·m)
NDM2-400	M10	20
	M6	6

5 High-altitude derating factor

Altitude (km)	Rated operating current	Maximum operating voltage	Rated 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	0.858U
4	0.963In	0.813Ue	0.820U
4.5	0.951In	0.781Ue	0.784U
5	0.938In	0.743Ue	0.752U

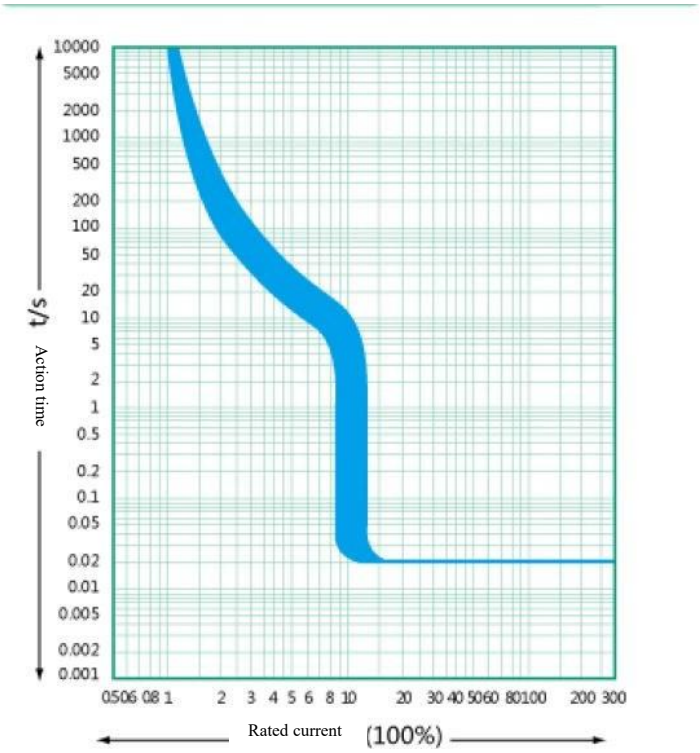
5. Normal Working Environment

Normal Working Environment

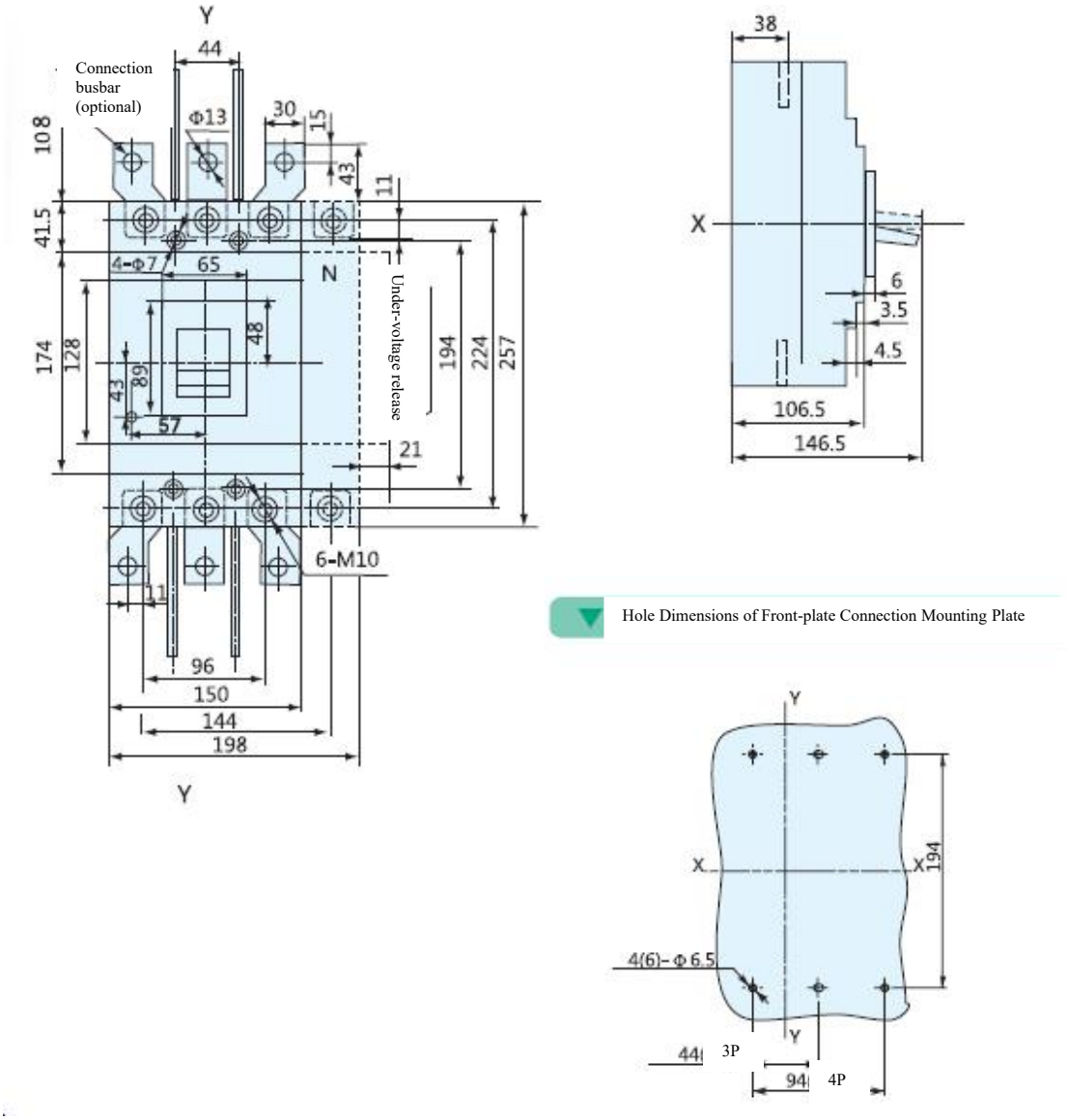
- ▲ Altitude: ≤2000m.
- ▲ Ambient temperature: -35℃~+70℃.
- ▲ Pollution level: 3.
- ▲ The product can withstand the effects of wet air, salt mist and oil mist.
- ▲ The maximum gradient is 22.5°.
- ▲ The product can be disposed in places that are free from explosive media, media corrosive to metal, insulation damaging gas, and conductive dust.

The product should be installed free from snow and rain.

6. Tripping Characteristics



7. Outline and Installation Dimensions

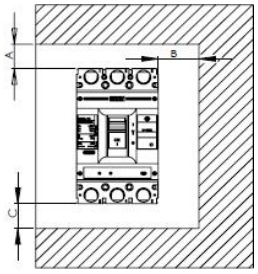


Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-m.

Mounting distance (mm)

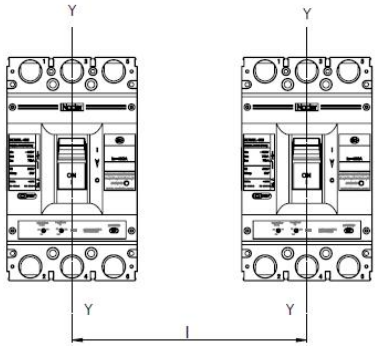
1) Insulation distance mounted in the metal cabinet (unit: mm), as shown below:

Mounting distance	A (inlet wire end to the cabinet face)		B (distance from side to cabinet)	C (outlet wire end to the cabinet face)
Specification	With a 0 arcing cover	Without a 0 arcing cover		
NDM2-400	25	120	35	35



2) Minimum center distance between rowed circuit breakers:

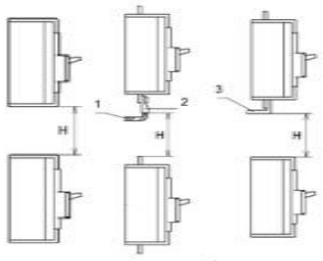
Specification	Width of circuit breaker (mm)		Center distance (mm)	
	3P	4P	3P	4P
NDM2-400	150	198	190	238



Note: Check the connected busbar or cable during rowing or stacki ı ensure that the air insulation distance won't be reduced.

3) Minimum center distance between stacked circuit breakers

Specification	H (distance of circuit breaker from bottom)	
	With a 0 arcing cover	Without a 0 arcing cover
NDM2-400	155	155



Note: 1. Bare cable connection

2. Cable insulating connection

3. Connection without insulation

4. Check whether the 0 arcing cover or phase partition is assembled properly before products are energized.

8. Installation Mode

Installation mode: To be installed horizontally or vertically.

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℃~75℃ and the corresponding 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. List of Accessories and Installation

SN	Name	Specification	Quantity/Set
1	Cross small pan-head screws	M6X70	4 (3P)/6 (4P)
2.	Plain washer	6	8(3P)/12 (4P)
3	Spring washer	6	4 (3P)/6 (4P)
4	Hexagon nut	M6	4 (3P)/6 (4P)
5	Phase partition	——	4 (3P)/6 (4P)
6	Plug	——	6 (3P)/8 (4P)

11. 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.

Nader

Product Specification of NDM2-630

Product Name:Molded Case Circuit Breaker

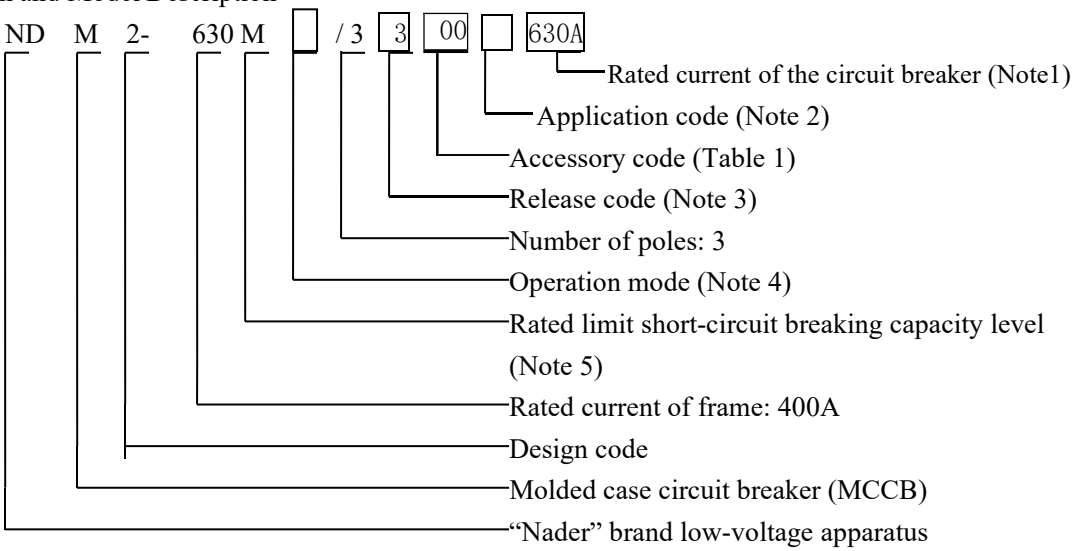
Product Model:NDM2-630

1. Applicable Scope and Purpose

NDM2 series of molded case products apply to infrequent switching of circuits with the AC 50Hz (or 60Hz), the rated working voltage of 690V and rated working current of 800A 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 of the Product

3. Specification and Model Description



Note 1: The rated current is: 400A, 500A, 630A.

Note 2: Application code: No code is available for the circuit breaker for distribution; the protection motor type is represented as 2.

Note 3: Release code

0: Tripper (none)

2: Instantaneous tripper only

3: Complex tripper

Note 4 Operation mode:

No code is available for the direct handle-operated mode

P: Motor-operated

Z: Rotation handle

Note 5: Rated limit short-circuit breaking capacity level:

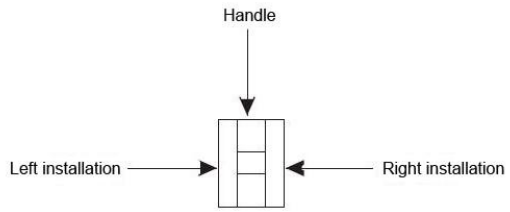
C: Basic type

L: Standard type

M: Relatively high breaking type

H: High breaking type

Table 1: Comparison Table of Accessory Code:



Legend：

- Single auxiliary contact
- Dual-auxiliary contact
- Alarm contact
- Shunt release
- Under-voltage release
- (Single auxiliary & alarm) contact

Installation position / Model / Number of poles / Accessory code / Accessory name	NDM2-250		NDM2-400		NDM2-630		NDM2-800	
	3	4	3	4	3	4	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

(1). Electrical characteristics

- ▲ Rated insulation voltage Ui: 1000V
- ▲ Rated working voltage Ue: AC 400V or AC 690V (only for Type M)
- ▲ Rated current of frame Inm: 630A
- ▲ Rated limit short-circuit breaking current Icu:

  Type C: 35KA

  Type L: 50KA

  Type M: 65KA (AC 400V)

  15KA (AC 690V)

  Type H: 100KA
- ▲ Rated operating short-circuit breaking current Ics:

  Type C: 26KA

  Type L: 38KA

  Type M: 49KA (AC 400V)

  11KA (AC 690V)

  Type H: 75KA
- ▲ Rated working current of the auxiliary contact: 0.4A
- ▲ The conventional thermal current of the auxiliary contact: 3A

(2). Operating performance

- ▲ With electricity: 7,500 times
- ▲ Without electricity: 10,000 times

(3). Connection capacity:

Rated current A	Cable section		Copper bar size	
	Qty	Section ㎜^{2}	Qty	Dimensions ㎜^{2}
400	1	240	2	30×5
500	2	150	2	30×5
630	2	185	2	40×5

4) Tightening torque value of terminal/mounting screw

Rated current of frame	Thread diameter	Torque value (N·m)
NDM2-630	M12	28
	M6	6

5 High-altitude derating factor

Altitude (km)	Rated operating current	Maximum operating voltage	Rated 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	0.858U
4	0.963In	0.813Ue	0.820U
4.5	0.951In	0.781Ue	0.784U
5	0.938In	0.743Ue	0.752U

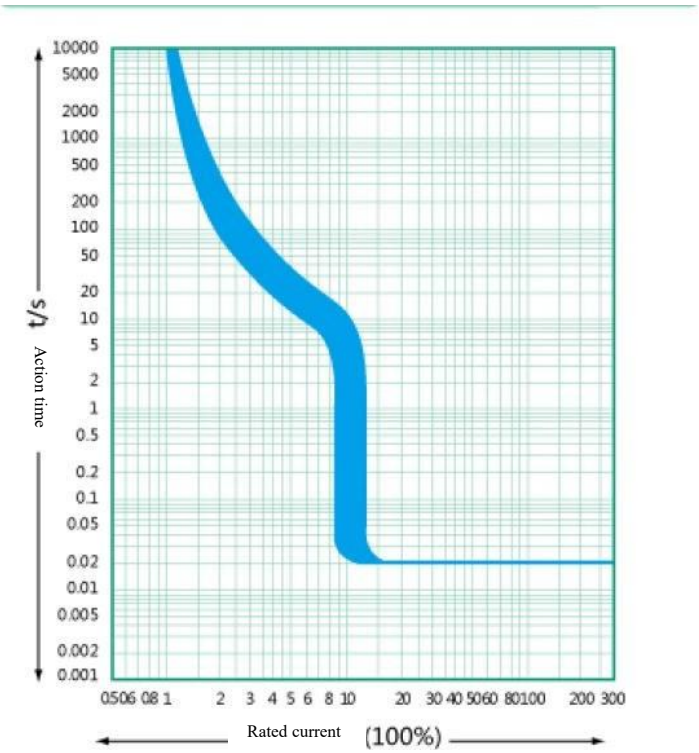
5. Normal Working Environment

Normal Working Environment

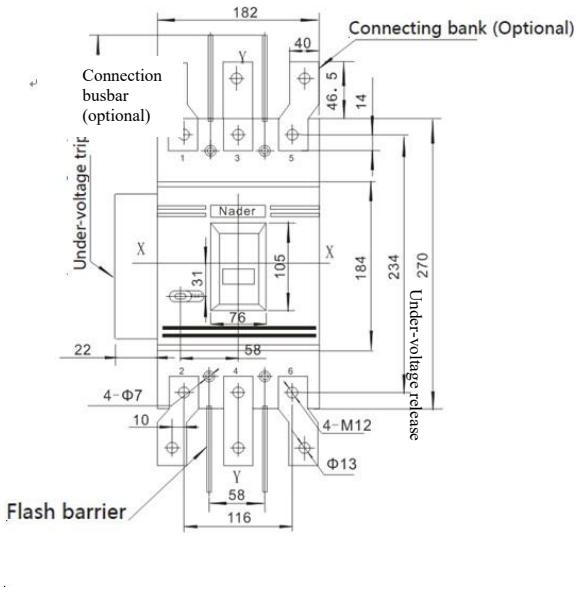
- ▲ Altitude: ≤2000m.
- ▲ Ambient temperature: -35℃~+70℃.
- ▲ Pollution level: 3.
- ▲ The product can withstand the effects of wet air, salt mist and oil mist.
- ▲ The maximum gradient is 22.5°.
- ▲ The product can be disposed in places that are free from explosive media, media corrosive to metal, insulation damaging gas, and conductive dust.

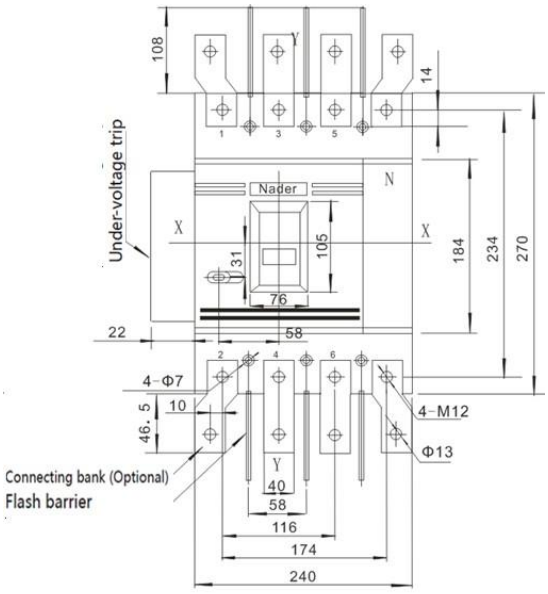
The product should be installed free from snow and rain.

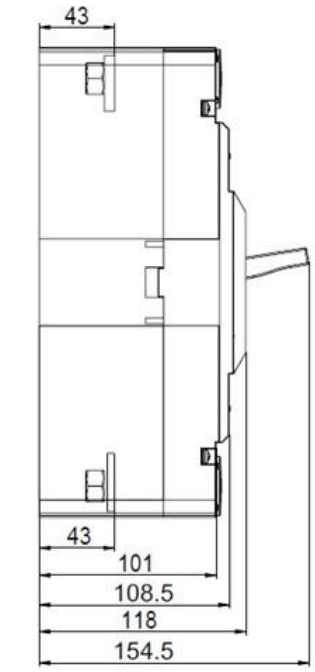
6. Tripping Characteristics



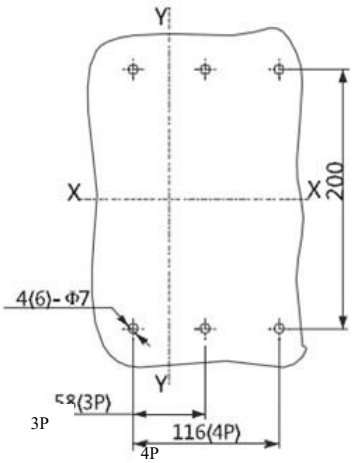
7. Outline and Installation Dimensions







Hole Dimensions of Front-plate Connection Mounting Plate

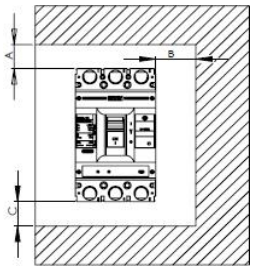


Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-m.

Mounting distance (mm)

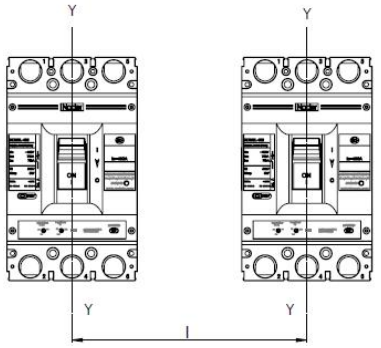
1) Insulation distance mounted in the metal cabinet (unit: mm), as shown below:

Mounting distance	A (inlet wire end to the cabinet face)		B (distance from side to cabinet)	C (outlet wire end to the cabinet face)
Specification	With a 0 arcing cover	Without a 0 arcing cover		
NDM2-630	25	120	35	35



2) Minimum center distance between rowed circuit breakers:

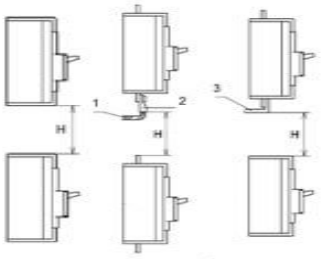
Specification	Width of circuit breaker (mm)		Center distance (mm)	
	3P	4P	3P	4P
NDM2-630	182	240	222	280



Note: Check the connected busbar or cable during rowing or stacki r ensure that the air insulation distance won't be reduced.

3) Minimum center distance between stacked circuit breakers

Specification	H (distance of circuit breaker from bottom)	
	With a 0 arcing cover	Without a 0 arcing cover
NDM2-630	155	155



Note: 1. Bare cable connection

2. Cable insulating connection

3. Connection without insulation

4. Check whether the 0 arcing cover or phase partition is assembled properly before products are energized.

8. Installation Mode

Installation mode: To be installed horizontally or vertically.

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℃~75℃ and the corresponding 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. List of Accessories and Installation

SN	Name	Specification	Quantity/Set
1	Cross small pan-head screws	M6X75	4 (3P)/6 (4P)
2.	Plain washer	6	8(3P)/12 (4P)
3	Spring washer	6	4 (3P)/6 (4P)
4	Hexagon nut	M6	4 (3P)/6 (4P)
5	Phase partition	——	4 (3P)/6 (4P)
6	Plug	——	6 (3P)/8 (4P)

11. 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.

Nader

Product Specification of NDM2L-125

Product Name:Residual Current Breaker with Overload

Product Model:NDM2L-125

1 Purpose

NDM2L-125 molded case leakage circuit breaker product specifications, in order to clarify the content and scope of product development, to provide the basis for the follow-up project plan

2 Range

This specification applies to NDM2L-125 molded case leakage circuit breaker body and related accessories

3 Terminology

术语	描述
Type AC CBR	The residual sinusoidal alternating current of the non-DC component, whether applied suddenly or slowly, is guaranteed to trip the CBR
Type A CBR	The residual sine current and the residual pulsating direct current (with / without the superposition of the DC component) that are suddenly applied or slowly raised can ensure that the CBR

4 Referance

NO	文档名称
1	P12001-NDM2L-125/250/400/630 MCCB Product package requirements table
2	P12001-NDM2L-125-630 MCCB Conceptual scheme

5 Basic Require

5.1 Application Range

NDM2L series molded case leakage circuit breaker, the rated insulation voltage of 1000V, for AC 50Hz or 60Hz, rated working voltage 380V / 400V / 415V, do not frequent conversion and the motor is not frequent use. Circuit breakers with overload, short circuit and undervoltage protection, to protect the line and power equipment from damage.
AC-type leakage circuit breakers, to ensure that they are tripped with the remaining sinusoidal alternating current of the DC component without any sudden or slow rise.
Type A leakage circuit breakers are guaranteed to be tripped with respect to the residual sinusoidal current and the residual pulsating direct current (with or without specified superposed DC component) that is suddenly applied or slowly raised.

NDM2L-125 products, with A and AC-type leakage protection, 3P breaking capacity M, H-type, 4P breaking capacity with the M-type.

NDM2L series of leakage circuit breakers, product structure requirements are integrated structure with leakage alarm does not trip function.

5.2 Specification Type

ND M 2 L- □□ □/□ □□/□□ □ □□ □

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

No.	Implication	NDM2L
1	Brand Code	ND Nader 牌低压电器
2	Product Code	M
3	Design Code	2
4	Derivation code	L: Electric leakage protection funtion
5	Frame size	125
6	Grade of rated umlimate short circuit breaking capacity	Type M
		Type H
		4P: No code
7	Operation method	No code: Direct handle operation
		P: Motor operation
		Z: Rotary handle operation
8	The Tripped type of residual current	No code: AC type residual current protective device;
		A: A type residual current protective device.
9	Type of time delay	No delay: X Delay: Y
10	The Tripped type of residual current	Type V
11	Trip unit	3: Thermal magnetic
12	Number of poles	3、4
13	Accessory Code	Details in Page 14: Accessory Require

14	Application	No code: Power distribution
15	N-pole type of four pole production	A: N-pole is always close without overload release B: N-pole is open or close together with other three poles and without overload release C: N-pole is open or close together with other three poles and with overload release
16	Rated current (In)	16/20/25/32/40/50/63/80/100/125

5.3 Working Environment

Environment	Details
Working Temperature	-35~70℃
Altitude	≤2000m
Pollution level	III
Salt fog level	Satisfied 48 hours

6 Fuction Require

6.1 Rated Residual Operating Current

NDM2L-125 Type A 和 AC Electric leakage protection funtion

Function		Residual Operating V	
Residual Type		AC	A
Current	Non-Delay X	30mA、100mA、300mA、500mA	
	Delay Y	100mA、300mA、500mA	
Rated residual non-operating current		1/2*I△n	
Rated residual current making/breaking capacity		1/4*Icu	

6.2 Rated Residual Operating Time

Residual Current		I△n	2*I△n	5*I△n	10*I△n
Non-Delay	Max.Breaking Time (s)	0.2	0.1	0.04	0.04
Delay	Max.Breaking Time (s)	0.5/1.15/2.15	0.35/1/2	0.25/0.9/1.9	0.25/0.9/1.9
	Limiting non-driving time△t (s)	——	0.1/0.5/1	——	——

7 Technical Indicators

7.1 Standard Conformed

GB / T 2423.4-2008 Environmental testing for electric and electronic products Part 2: Test methods - Test Db: alternating hot and humid

GB/T 4207-2003 Measurement of Electrical Traces and Resistance Tracing Indexes of Solid Insulating Materials in Humid Conditions

GB14048.1-2006 Low voltage switchgear and controlgear - Part 1: General (IEC 60947-1: 2001, MOD)

GB14048.2-2008 Low voltage switchgear and controlgear - Part 2: Low - voltage circuit - breakers (IEC 60947-2: 2006, IDT)

GB14048.5-2008 Low voltage switchgear and controlgear - Part 5-1: Control circuits Electrical and switching elements Electromechanical control circuits（IEC 60947-5-1:2003, MOD）

GB/T 14092.3-2009 Mechanical products Environmental conditions High altitude

GB/T 19608.3-2004 Classification of special environmental conditions Part 3: Plateau

GB/T 20645-2006 Technical requirements for low - voltage electrical appliances for high altitude in special environmental conditions

GB/T 20626.3-2006 Special environmental conditions Plateau electronic products Part 3 Protection of lightning foul condensation

JB/T 834-1999 Technical requirements for tropical low - voltage electrical appliances

7.2 Technical Parameters

7.2.1 Electrical Characteristics

NDM2L-125 Type A 和 AC Electric leakage protection MCCB

Name	Details
Poles	3P/4P
Rated Current (A)	16/20/25/32/40/50/63/80/100/125
Rated Voltage (V)	380/400/415
Rated insolution Voltage Ui(V)	1000
Frame Size	125
Rated ultimate breaking capacity Icu(kA)	NDM2L-125M&4P:52.5kA NDM2L-125H:85kA
Rated operated breaking capacity	NDM2L-125M&4P:35kA NDM2L-125H:50kA

Ics(kA)	
Operating cycles(times)	Charged:8000 uncharged:20000
Pollution level	III
Rated insulation voltage Uimp	8kV

7.2.2 Cable Contents

Note: The default dimension for "D" is 150mm. It can be also customized.Note1

▼ Sectional Area of Connecting Bus and Cable

Rated current (A)	10	16 20	25	32	40 50	63	80	100	125 140	160	180 200 225	250	315 350	400
Sectional Area of Connecting Wire(mm^2)	1.5	2.5	4.0	6.0	10	16	25	35	50	70	95	120	185	240

▼ Selection of Cable

Rated current (A)	Sectional Area of Cable		Dimension of Copper Bar	
	Quantity	Sectional Area of Cable (mm^2)	Quantity	Dimension (mm^2)
500	2	150	2	30×5
630	2	185	2	40×5
700, 800	2	240	2	50×5Note2

8 Constraint

NDM2L-125 development of type A and AC leakage circuit breaker two;
Product structure as a whole.
Leakage function to increase leakage instructions, and NDM3L series of leakage circuit breaker consistent.
The above products are subject to the latest requirements of the company.

9 Special Require

9.1 Environment

Normal working environment:
▲ can withstand the impact of humid air, salt spray, oil mist.
▲ The maximum inclination is 22.5 °.

▲ in the absence of explosive media, and the media is not enough to corrode the metal and damage the insulation of the gas and conductive dust place.
▲ should be installed in the absence of rain and snow invasion of the place.

9.2 Electonmagnetic Compatibility

Meet the EMC performance requirements of GB14048.2

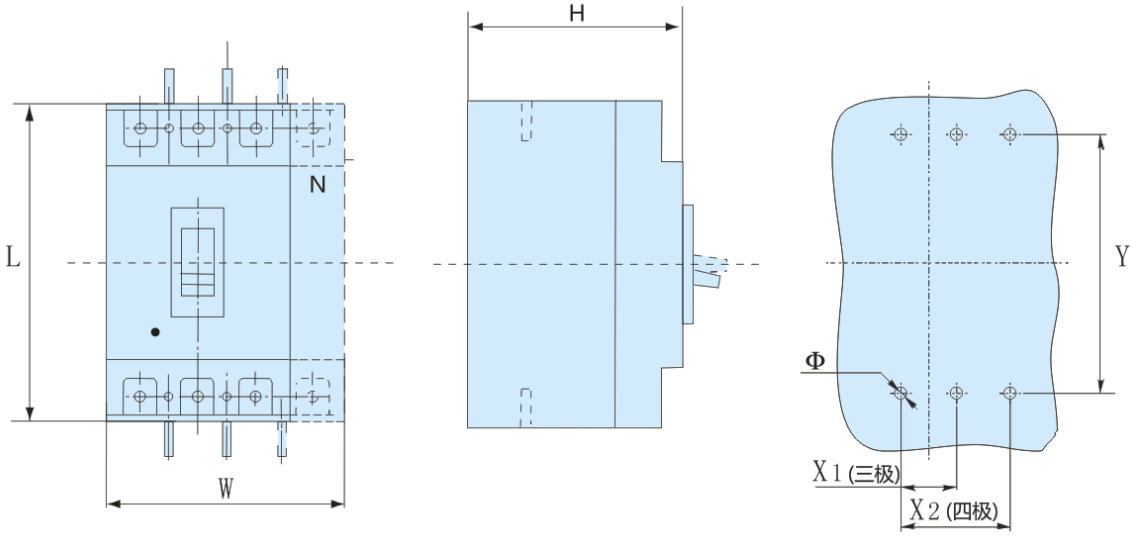
9.3 Protection

Protection class: IP20

10 External Inerface

NDM2L series molded case leakage circuit breaker can increase the leakage alarm does not trip module

11 Appearance



Product Size Table（mm）

	L	W		H	Y	X1	X2	Φ
		3P	4P					
NDM2L-125	**150**	**92**	**122**	**92**	**129**	**30**	**60**	**4.5**

12 Installation

Can be installed horizontally, can also be installed vertically

13 Quality

13.1 Maintainability

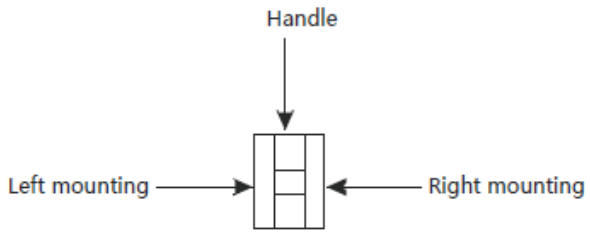
The project of the circuit breaker for the new R & D content, manufacturing the site of the majority of production equipment, you can use existing products for maintenance

13.2 Manufacturability

☒ Circuit breaker body internal zero, parts in the production site assembly, all production site assembly, equipment can borrow the product. Thermo-magnetic and leakage release for the new design, increase the relevant fixture, the use of mature technology for manufacturing

14 Attachment

Accessory Code



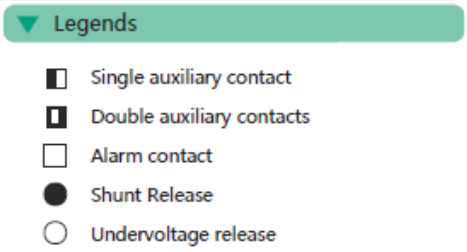


Table 1 Accessory Code

Code	Name	NDM2L-125		NDM2L-250		NDM2L-400		NDM2L-630	
Mounting Position / Type / Number of Pole		3	4	3	4	3	4	3	4
00	No accessory	——		——		——		——	
10	Shunt Release								
20	Double Auxiliary Contacts								
21	Single Auxiliary Contact								
30	Undervoltage Release								
40	Shunt Release and Double Auxiliary Contacts								
41	Shunt Release and Single Auxiliary Contact								
50	Shunt Release and Undervoltage Release								
60	Two Sets Double Auxiliary Contacts								
61	Two Sets Single Auxiliary Contact								
62	Double Auxiliary Contacts and Single Auxiliary Contact								
70	Undervoltage Release and Double Auxiliary Contacts								
71	Undervoltage Release and Single Auxiliary Contact								
08	Alarm Contact								
18	Shunt Release and Alarm Contact								
28	Double Auxiliary Contacts and Alarm Contact								
38	Undervoltage Release and Alarm Contact								
48	Shunt release, Single Auxiliary Contact and Alarm Contact								
58	Single Auxiliary Contact and Alarm Contact								
68	Double Auxiliary Contact, Single Auxiliary Contact and Alarm Contact								
78	Undervoltage Release, Single Auxiliary Contact and Alarm Contact								

Note：1.For 4-pole products，the accessory on the right side is installed by the position of N pole

2.“——” mean no accessory

3.For 3-pole products，it only can be installed one accessory on the left side

15 Environmental Proctection

Conform to the RoHs directive

16 Certification

CCC certification

17 Packaging

Packing capacity of 1 / box (box), packaged into the box of the product, should be in the ambient temperature of -40 ~ 75 ℃, corresponding to the relative humidity of 80%, the surrounding air without acid, alkaline or other corrosive gas warehouse In the storage. Under the above conditions, the storage period is not more than 18 months from the date of manufacture

Nader

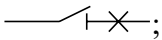
Product Specification of NDM2L-250

Product Name:Molded Case Circuit Breaker

Product Model:NDM2L-250

1. Applicable Scope and Purpose of Circuit Breaker

The NDM2L-250 molded case circuit breaker with the residual current protection (hereinafter referred to as circuit breaker) applies to infrequent switching of circuits with the AC 50/60Hz, the working voltage of AC415V and the working current up to 250A. With the overload, short circuit and under-voltage protection functions, the circuit breaker can protect lines and power equipment from damage. Meanwhile, they can deal with the personal safety, fire hazards and other potential risks caused due to long-term ground faults that can't be detected with the overcurrent protection function.

The circuit breaker has an isolating function with the corresponding symbol of  ;

Comply with standards: IEC60947-2, GB/T 14048.2.

Products comply with CCC、CE、TUV and CB certification.

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

ND M 2 L -□ □ □ / □ □ □ / □ □ □ □ □ □ □ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17		
SN	SN name	NDM2L
1	Enterprise code	ND: “Nader” low-voltage apparatus
2	Product code	M: Molded case circuit breaker (MCCB)
3	Design SN	2
4	Derived code of the series	L: Residual current protection
5	Shell frame level	250
6	Breaking capacity level	M: Relatively high breaking type
		H: High breaking type
7	Operation mode	No code: Direct handle-operated mode
		P: Motor-operated
		Z: Rotary operation
8	Derived code of the function	No code: Type AC current leakage protection type
		A: Type A current leakage protection type
9	Delay type	X: Non-time delay
		Y: Delay
		XB: Non-time delay alarm tripping
		YB: Delay alarm tripping
		XI: Non-time delay + alarm non-tripping
		YI: Delay + alarm non-tripping
10	Residual current release type	V: Type V residual current release
11	Number of poles	3, 4
12	Release code	3: Complex tripper
13	Accessory code	See Table 1
14	Application code	No code: Power distribution type
15	N-pole (neutral pole) type of the 4P product	A: The N-pole isn't installed with an overcurrent release, but always connected
		B: The N-pole isn't installed with an overcurrent release, but on-off with the other three poles
		C: The N-pole is installed with an overcurrent tripper, and on-off with the other three poles
16	Rated current	See Table 2
17	Cabling type	No code: Normal product
		P: Connection busbar

Note:

1、 When the operation mode is electric operation or manual operation, the residual action current gear, residual current action time gear, and leakage indication button can't be adjusted;

2、 Offline entry is not allowed. If offline entry is required, special products must be customized.

Table 1: Comparison Table of Accessory Code:

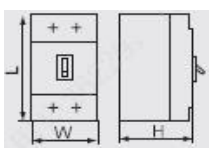
Accessory code	Accessory name	Installation Position / Model / Number of poles	NDM2L-250	
			3	4
00	N/A		—	
10	Shunt release			
20	Dual-auxiliary contact			
21	Single auxiliary contact			
30	Under-voltage release			
40	Shunt release, dual-auxiliary contact			
41	Shunt release, single auxiliary contact			
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			
28	Dual-auxiliary contact, alarm contact			
58	Auxiliary alarm contact			
68	Dual-auxiliary contact, auxiliary alarm contact			

Note: The 3P product can only be available with the left-installed single accessory with the accessory code as 10, 20, 21, 30, 08, 58;

For two accessories provided with 4P, the alarm non-tripping function can’t be selected simultaneously.

4. Main Technical Parameters of Circuit Breaker

Table 2 Main Technical Parameters of Circuit Breaker

<table>
<tr><td colspan="4">Model</td><td colspan="5">NDM2L-250</td></tr>
<tr><td colspan="4">Rated current of frame Inm (A)</td><td colspan="5">250</td></tr>
<tr><td colspan="4">Rated current In (A)</td><td colspan="5">100, 125, 140, 160, 180, 200, 225, 250</td></tr>
<tr><td colspan="4">Rated insulation voltage Ui (AC V)</td><td colspan="5">1000</td></tr>
<tr><td colspan="4">Rated impulse withstand voltage Uimp (V)</td><td colspan="5">8000</td></tr>
<tr><td colspan="4">Rated working voltage Ue (AC V)</td><td colspan="5">380/400/415</td></tr>
<tr><td colspan="4">Utilization category</td><td colspan="5">A</td></tr>
<tr><td colspan="4">Number of poles</td><td colspan="3">3</td><td colspan="2">4</td></tr>
<tr><td colspan="4">Breaking capacity level</td><td>M</td><td>H</td><td colspan="2">/</td></tr>
<tr><td colspan="4">Rated limit short-circuit breaking capacity Icu (kA)</td><td>52.5</td><td>85</td><td colspan="2">52.5</td></tr>
<tr><td colspan="4">Rated operating short-circuit breaking capacity Ics (kA)</td><td>35</td><td>50</td><td colspan="2">35</td></tr>
<tr><td colspan="4">Rated residual short-circuit making and breaking capacity I△m(kA)</td><td colspan="5">0.25 Icu</td></tr>
<tr><td colspan="2" rowspan="4">Rated residual action current I△n(mA)</td><td rowspan="2">Non-time delay</td><td>Type AC</td><td colspan="5">Type V 30/100/300/500</td></tr>
<tr><td>Type A</td><td colspan="5">Type V 30/100/300/500</td></tr>
<tr><td rowspan="2">delay</td><td>Type AC</td><td colspan="5">Type V 100/300/500</td></tr>
<tr><td>Type A</td><td colspan="5">Type V 100/300/500</td></tr>
<tr><td colspan="4">Rated residual non-action current I△no(mA)</td><td colspan="5">0.5I△n</td></tr>
<tr><td rowspan="4">Residual current action time</td><td colspan="2">Residual current</td><td colspan="2">I△n</td><td>2I△n</td><td>5I△n</td><td>10I△n</td></tr>
<tr><td>Non-time delay</td><td>Maximum breaking time (s)</td><td colspan="2">0.2</td><td>0.1</td><td>0.04</td><td>0.04</td></tr>
<tr><td rowspan="2">delay</td><td>Maximum breaking time (s)</td><td colspan="2">0.5, 1.15 2.15</td><td>0.35, 1 2</td><td>0.25, 0.9 1.9</td><td>0.25, 0.9 1.9</td></tr>
<tr><td>Limit non-driving time (s)</td><td colspan="2">/</td><td>0.1, 0.5 1</td><td>/</td><td>/</td></tr>
<tr><td rowspan="3">Operating performance (times)</td><td colspan="2">Electrical life</td><td colspan="5">8000</td></tr>
<tr><td rowspan="2">Mechanical life</td><td>Maintainable free life</td><td colspan="5">20000</td></tr>
<tr><td>Maintainable life</td><td colspan="5">40000</td></tr>
<tr><td rowspan="3">Boundary dimension</td><td colspan="2" rowspan="3">  </td><td>L(mm)</td><td colspan="2">165</td><td>165</td><td>165</td></tr>
<tr><td>W(mm)</td><td colspan="2">107</td><td>107</td><td>142</td></tr>
<tr><td>H(mm)</td><td colspan="2">90.5</td><td>90.5</td><td>90.5</td></tr>
<tr><td colspan="4">Flashover distance(mm)</td><td colspan="5">≤50</td></tr>
</table>

Note：1.The overall dimension does not include the dimension of terminal cover。

2. According to the standard, the maximum rated working voltage AC415V * 1.05 * 1.05=457.5V

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

Table 3 Selection of the NDM2L-250 Connecting Bus or Cable Cross-section Area

Rated current (A)	100	125, 140	160	180, 200, 225	250
Wire cross-section area (mm^2)	35	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 specification	Torque (N·m)
NDM2L-250	M8	12
	M4	1.5

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							
NDM2L-250	Temperature (℃)	40	45	50	55	60	65	70
	Derating factor	1	0.982	0.963	0.944	0.924	0.904	0.882

Note: 1) When the operating ambient temperature is below + 40℃, 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	Power frequency withstand voltage correction coefficient	Isolation voltage correction coefficient (V)
2000	1	3500	1000
2500	1	3500	1000
3000	0.98	3150	900
3500	0.97	3000	850
4000	0.95	2800	810
4500	0.94	2650	770
5000	0.93	2500	730

4.5 Power loss coefficient of circuit breaker

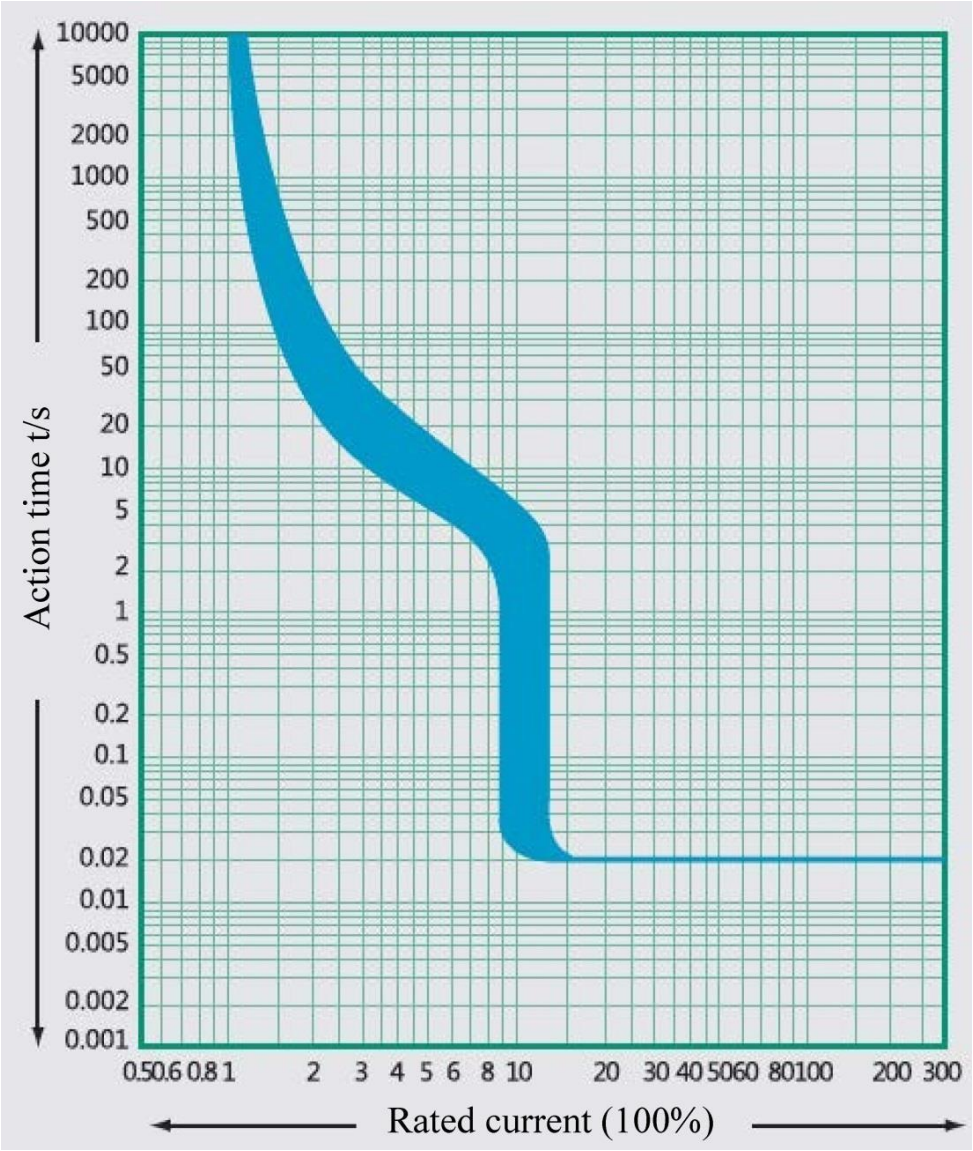
Table 7 Power loss coefficient table of circuit breaker

Model	Energizing current(A)	Total power loss(W)
		Wiring before and after board
NDM2L-250	250	67

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 +40℃, 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.

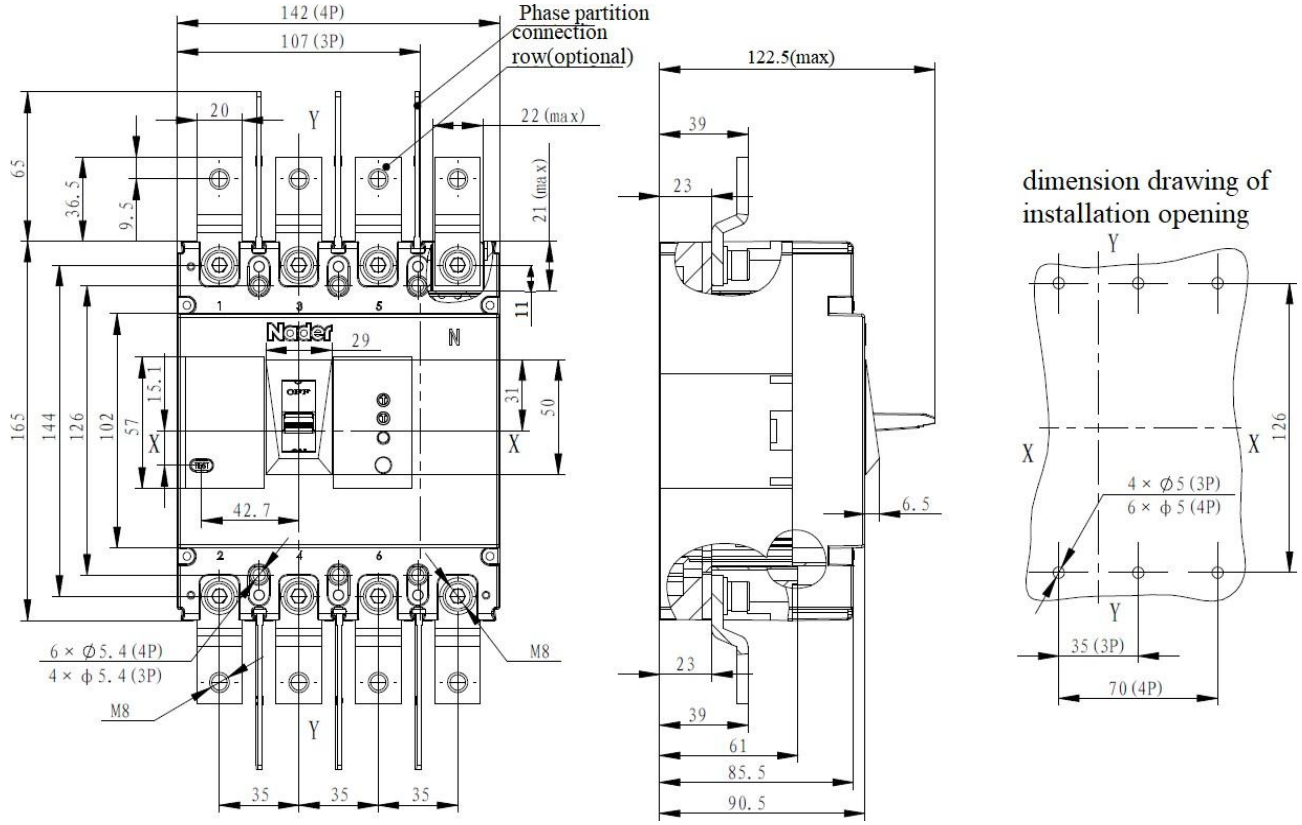
6. Short-circuit Overload Protection Characteristic Curve of Circuit Breaker



Time/Current Characteristic Curve

7. Outline and Mounting Hole Dimensions of Circuit Breaker

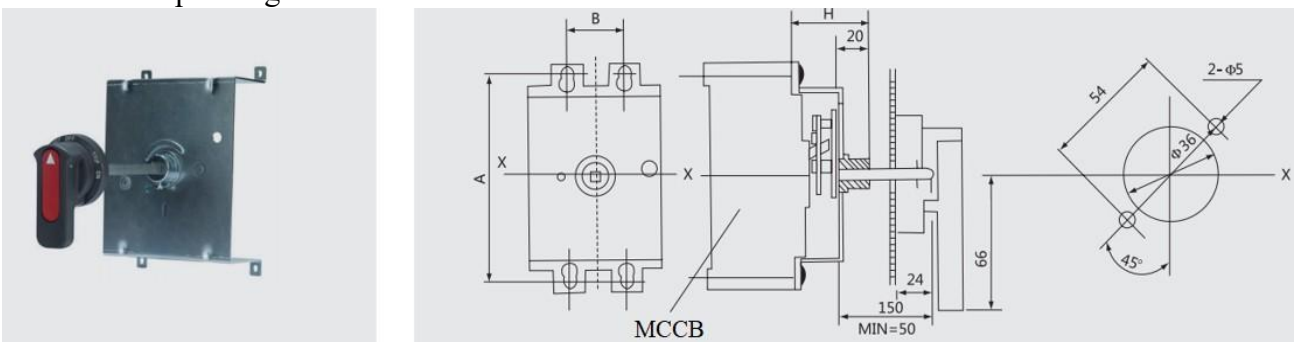
7.1 Outline and mounting hole dimensions of circuit breaker



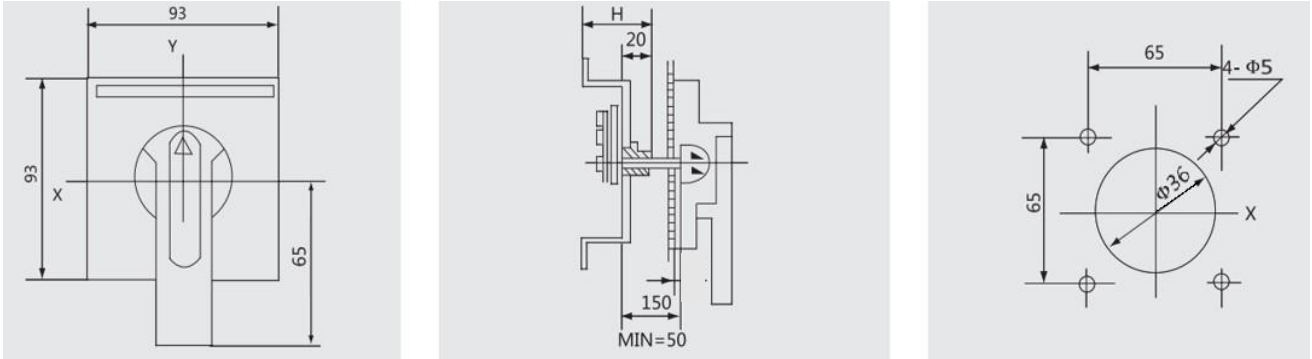
Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

7.2 Manual operating mechanism

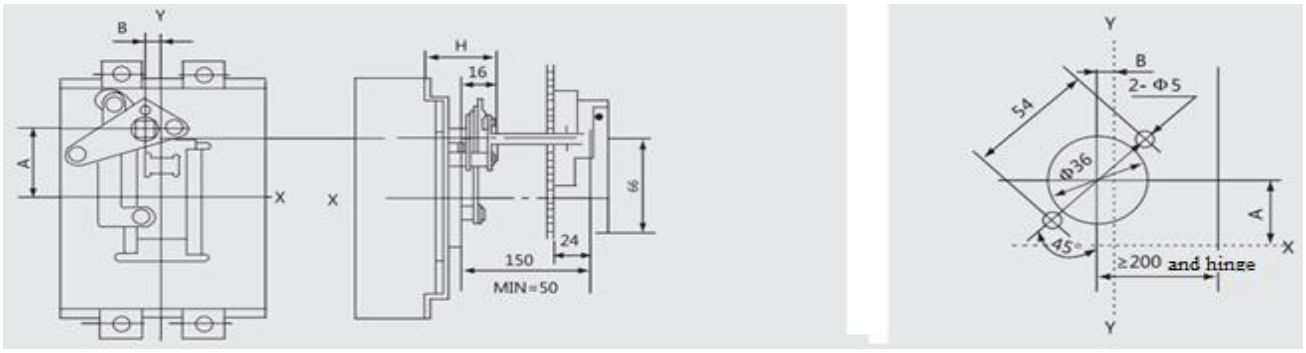
7.2.1 Manual operating mechanism and CS1-A handle



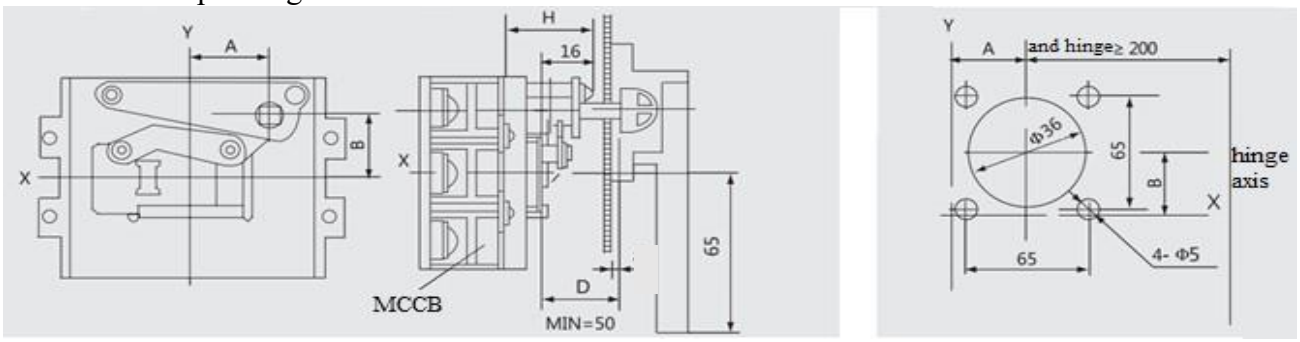
7.2.2 Manual operating mechanism and CS1-F handle



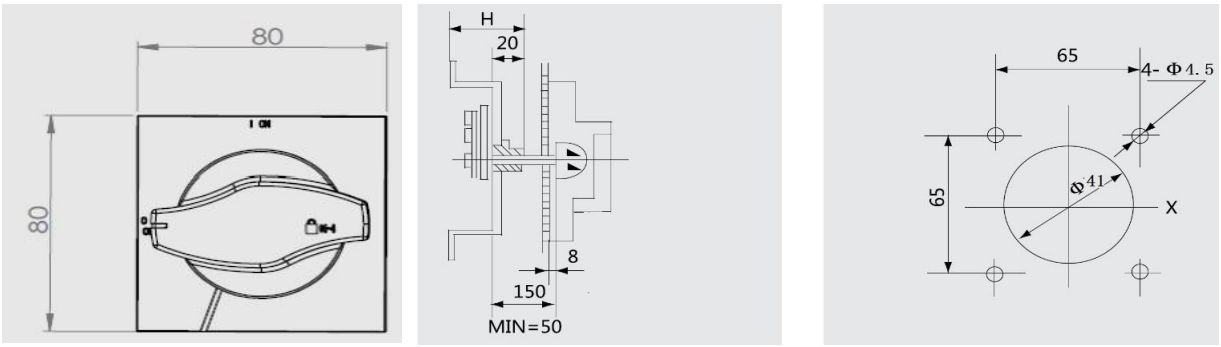
7.2.3 Manual operating mechanism and CS2-A handle



7.2.4 Manual operating mechanism and CS2-F handle



7.2.5 CS1-IP65 handle installation opening diagram



7.2.6 CS2-IP65 handle installation opening diagram

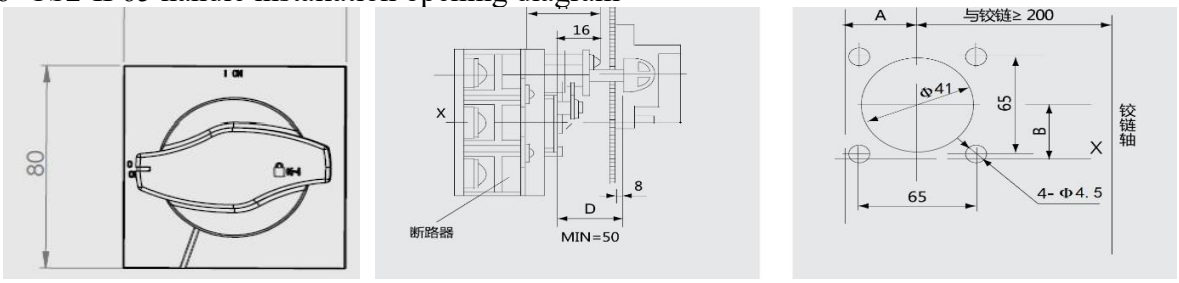


Table 8 Installation dimension of Manual operating mechanism (Unit: mm)

Manual operation type	Model	Installation dimension of manual operating mechanism			Installation mode
		H	A	B(3/4P)	
CS1	NDM2L-250	69	104	30	Vertical installation
CS2	NDM2L-250	46	35	11.5	

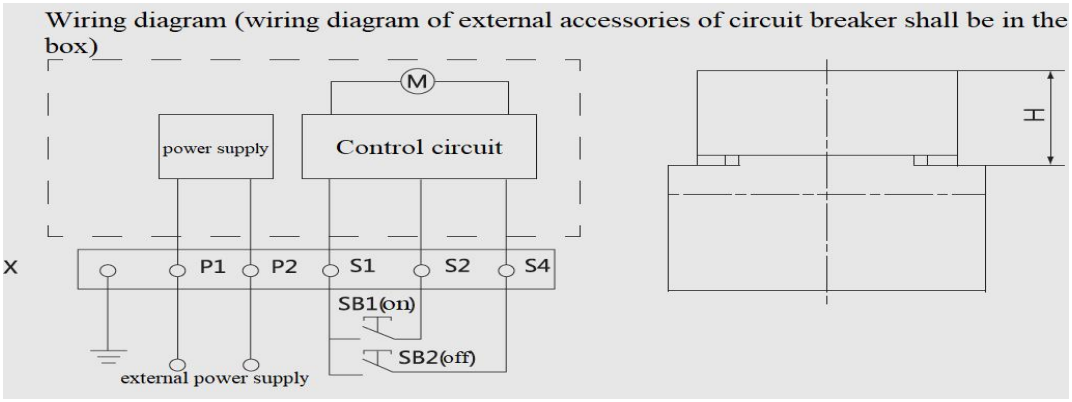
Note:1) A type is round handle, F type is square handle；

2) The length of A-type handle is 66mm and that of F-type handle is 65mm;

3) The D dimension in the drawing is 150mm by default, and the customizable length is 200 / 300 / 350 / 650mm；

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

7.3 Electric operating mechanism



Symbol description: SB1、SB2: Operation button (provided by the customer)

X: Terminal block　　P1、P2：External power supply

Voltage specification: AC110V、AC220V、AC400V、DC24V、DC110V、DC220V

Table 9 Main technical parameters of electric operating mechanism

Equipped with circuit breaker	Action current(A)	Electric power(W)				service life / time	Operating mechanism height H(mm)
		AC/DC230V	AC/DC110V	AC380V	DC24V		
NDM2L-125	≤0.5	≤180	≤180	≤350	80	20000	92

7.4 Safe mounting distance of circuit breaker

Table 10 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		
NDM2L-250	25	65	30	30

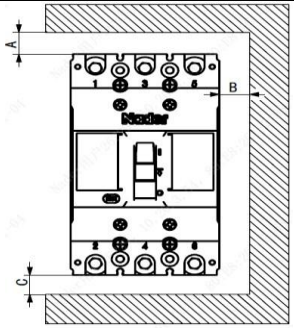


Table 11 Minimum Center Distance between Rowed Circuit Breakers (Unit: mm)

Model	Width of circuit breaker		I Center distance	
	3 poles	4 poles	3 poles	4 poles
NDM2L-250	107	142	137	172

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.

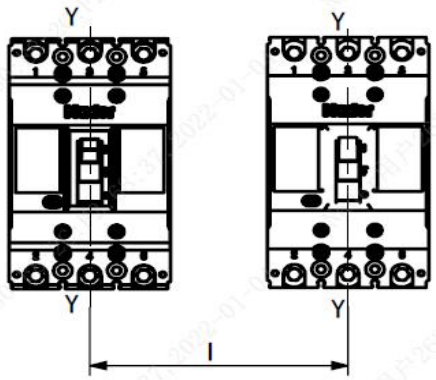


Table 12 Minimum Distance between Stacked Circuit Breakers (Unit: mm)

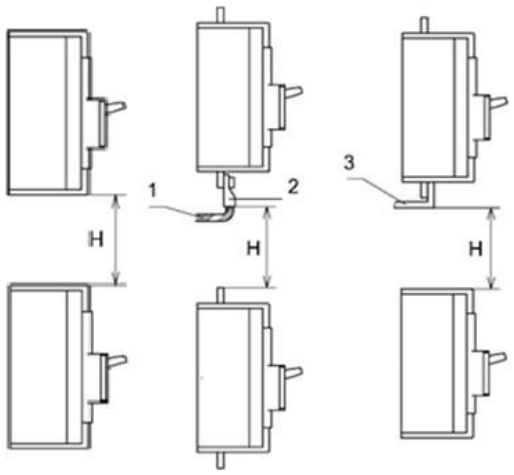
Model	H (distance of circuit breaker from bottom)	
	With a terminal cover	Without a terminal cover
NDM2L-250	90	93

Note: 1) Insulated cable

2) Cable terminal

3) Connection without insulation

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



8、Attachment function description

8.1 Under-voltage release

When the power voltage drops to the range (35%~70%) of the under-voltage release,the release can break the circuit breaker reliably; when the power voltage is 35% lower than the rated working voltage of the under-voltage release, the release can prevent closing of the circuit breaker; when the power voltage is 85% higher than the rated working voltage of the under-voltage release, the release can guarantee reliable closing of the circuit breaker.

Table 13 Voltage Specifications and Power Consumption of Under-voltage Release

Model	Instantaneous current value(A)		Power waste (W)	
	AC380V	AC230V	AC380V	AC230V
NDM2L-250	0.01	0.006	1.1	0.66

Note：The under-voltage release must be energized before the circuit breaker can be switched on and closed again, otherwise the circuit breaker will be damaged。

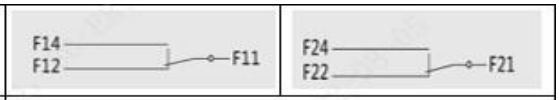
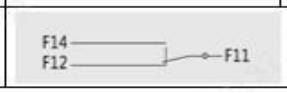
8.2 Shunt release

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 14 Voltage Specifications and Power Consumption of shunt release

Model	Shunt release	DC24V	AC230V	DC220V	AC380V
NDM2L-250	Instantaneous current value(A)	6.8	0.5	0.3	0.4
	Power waste (W)	164.5	115	76.2	155.6

8.3 Auxiliary contact

The circuit breaker is in the "open" and "free tripping" positions	Dual-auxiliary contact		
	Single auxiliary contact		
the circuit breaker is in the "close" position	"close" to "open"、" open " to " close "		

8.3.1 Current parameters of auxiliary contact

Table 15 Current parameters of auxiliary contact

Category	Frame current (A)	Conventional thermal current Ith (A)	Rated working current Ie(A)	
			AC400V	DC220V
Auxiliary contact	250	3	1.5	0.15
Note :minimum applicable load: 5V，1mA.				

8.3.2 Electrical life of auxiliary contact

Table 16 Electrical life of auxiliary contact

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

8.3.3 Making and breaking capacity of auxiliary contact

Table 17 Making and breaking capacity of auxiliary contact

Ues category	On			Off			Times	Frequency	Power on time
	I/Ie	U/Ue	cosφ	I/Ie	U/Ue	cosφ			
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

8.4 Alarm contact

The circuit breaker is in the position of "opening" and "closing"	
The circuit breaker is in the position of "free tripping"	

Table 18 Current parameters of alarm contact

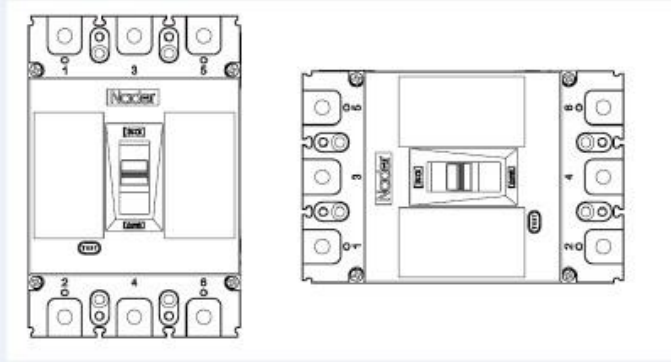
Category	Frame current (A)	Conventional thermal current Ith(A)	Rated working current Ie(A)	
			AC400V	DC220V
Alarm contact	250	3	0.3	0.15

Note：Shunt release, auxiliary contact and alarm contact wiring standard wire length is 0.7m, 1m、2m、4m can be customized according to demand。

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 Direction of Circuit Breaker

SN	Name	Specification	3P Quantity/Set	4P Quantity/Set
1	Cross small pan-head screw	M4×75	4	4
2	Hexagon nut	M4	4	4
3	Spring washer	4	4	4
4	Plain washer	4	8	8
5	Phase partition	——	4	6
6	Hexagon socket cylindrical head combination	M8X22	6	8

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.