

CCC, CQC, CB, CE, TUV

Molded Case Circuit Breaker

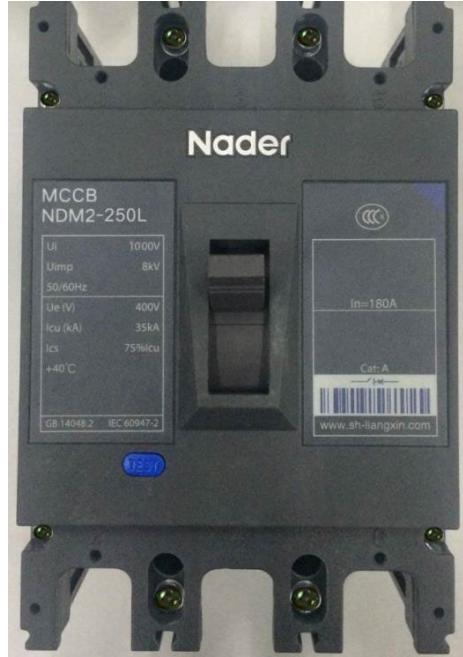
NDM2-250 series



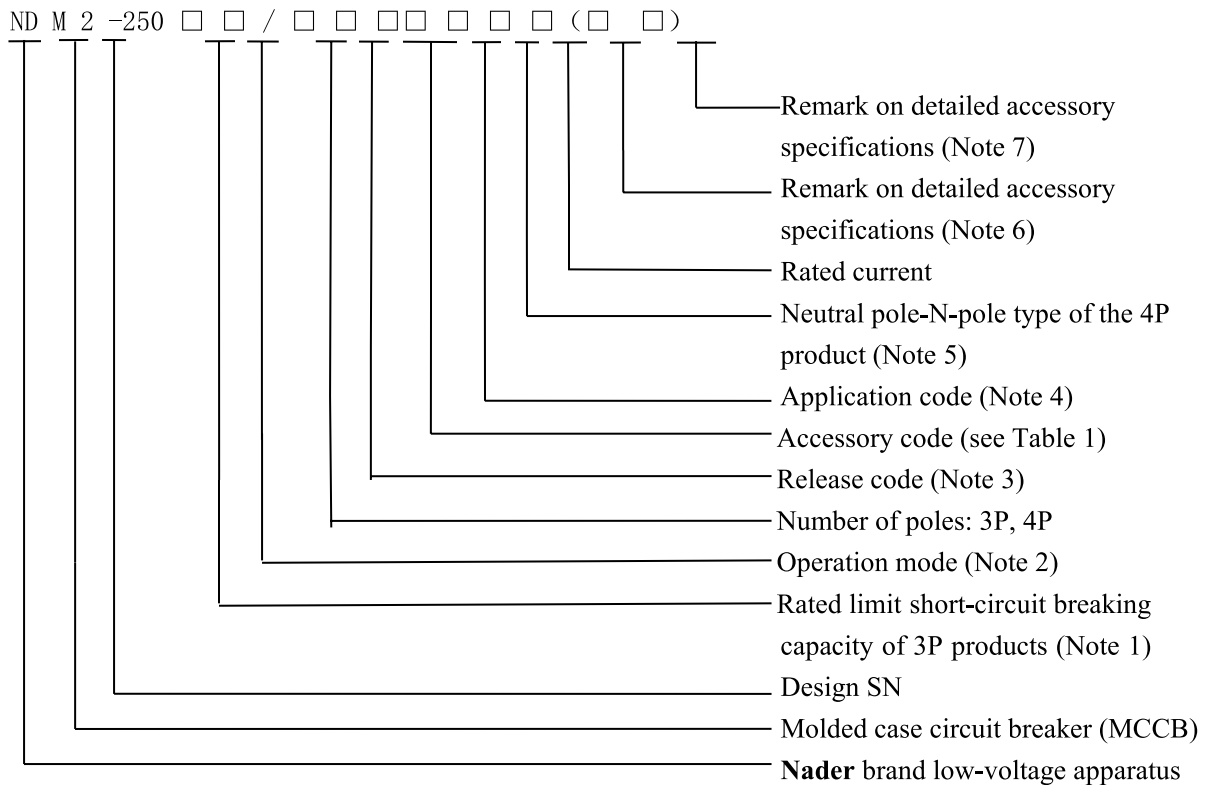
1. Applicable Scope and Purpose

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,

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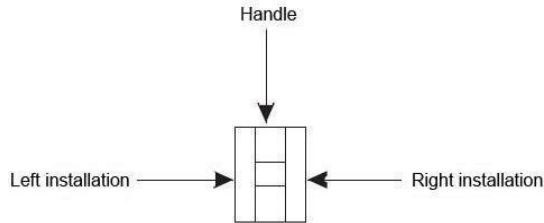
NDM2-250 series



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:



Legend :

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

Table 1

| Accessory code | Accessory name | Installation position | | Model | | NDM2-250 | | NDM2-400 | | NDM2-630 | | NDM2-800 | |
|----------------|--|-----------------------|-------|-------|---|----------|---|----------|---|----------|---|----------|---|
| | | Left | Right | 3 | 4 | 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

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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 |
| | 690V | | | 10 | |
| Rated operating short-circuit breaking capacity Ics (KA) | 400V | 19 | 26 | 38 | 64 |
| | 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 mm ² | 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 I _{th} | 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/I _e | U/U _e | cosφ | I/I _e | U/U _e | 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

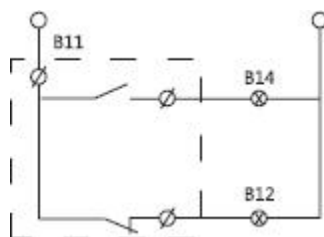
| Usage category | Connecting | | | Breaking | | | Times | Operation frequency (times/h) | Power-on time |
|----------------|------------------|------------------|------|------------------|------------------|------|-------|-------------------------------|---------------|
| | I/I _e | U/U _e | cosφ | I/I _e | U/U _e | 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



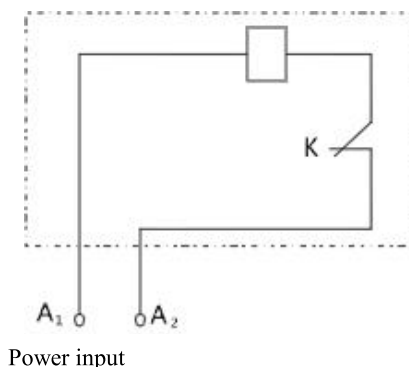
During normal on-off of the circuit breaker, the contact won't act and only change its original status after free tripping (or fault trip) with the normally-open state changed to be closed and normally-closed state changed to be open. After the circuit breaker is tripper, the contact will be restored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

③ Alarm contact parameters

U_e=220V, I_{th}=3A

5) Shunt tripper

① Wiring diagram of the shunt tripper





- 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°C | +45°C | +50°C | +55°C | +60°C | +65°C | +70°C |
| 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

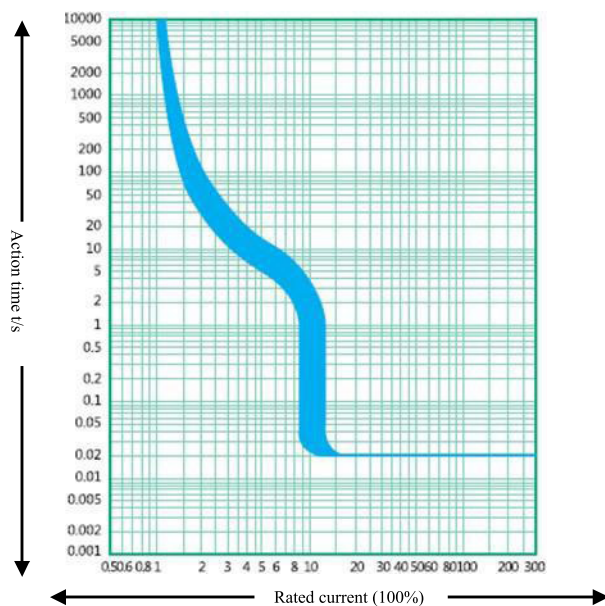
- ▲ Altitude: $\leq 2000\text{m}$.
- ▲ Ambient temperature: $-35^{\circ}\text{C} \sim +70^{\circ}\text{C}$. (Reduced capacity is not considered with the temperature below $+40^{\circ}\text{C}$)
- ▲ The relative humidity at an ambient temperature of $+40^{\circ}\text{C}$ should not exceed 50%. A higher relative humidity is allowed at a lower temperature.
- ▲ 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

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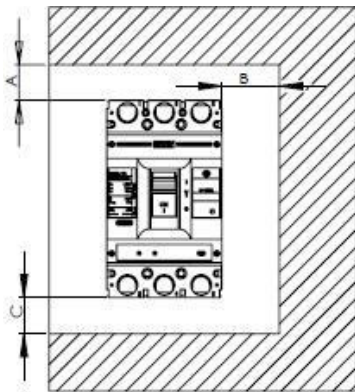
| Model | H | H1 |
|-------------|-----|-----|
| NDM2-250C、L | 86 | 110 |
| NDM2-250M、H | 103 | 127 |
| NDM2-250 4P | | |

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

10. Installation Mode

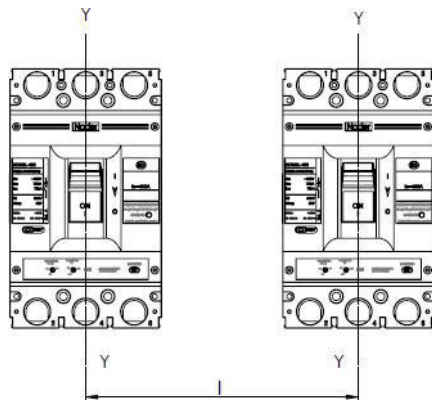
Installation mode: To be installed horizontally or vertically.

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) |
|-------------------|--|--------------------------|-----------------------------------|---|
| | With a 0 arcing cover | Without a 0 arcing cover | | |
| Specification | | | | |
| 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)

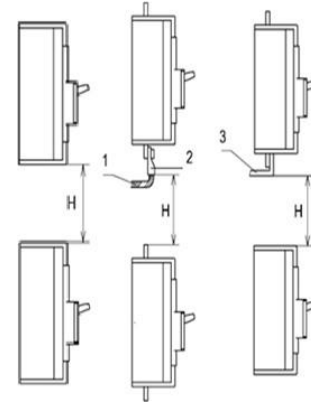
| Specification | H (distance of circuit breaker from bottom) | |
|---------------|---|--------------------------|
| | With a 0 arcing cover | Without a 0 arcing cover |
| NDM2-250 | 90 | 93 |

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 $-40^{\circ}\text{C}\sim 75^{\circ}\text{C}$ 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.