

Catalogue

WENZHOU XUCKY ELECTRIC CO.,LTD

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NDMI SERIES MOULDED CASE CIRCUIT BREAKER

Scope of Application

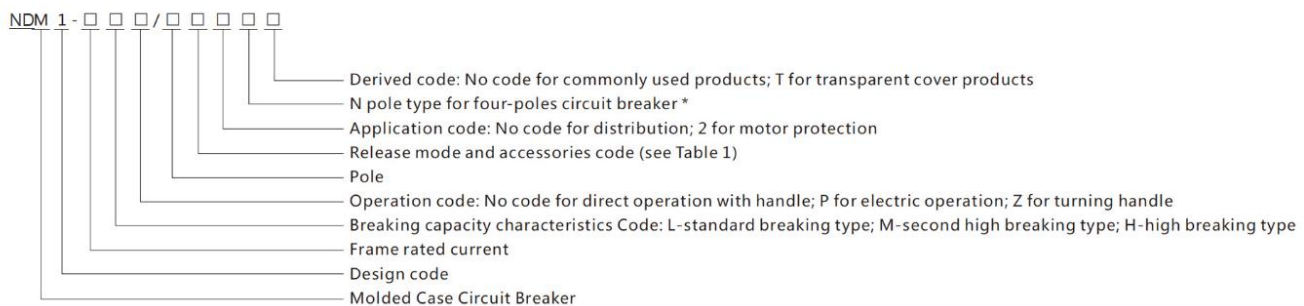
XUCKY NDM1 Molded Case Circuit Breaker (**NDM1**, hereinafter referred to as **MCCB**), is new circuit breakers which have been designed and developed by the company using international advanced technology. The **circuit breakers** are of the following characteristics: compact size, high breaking capacity, short arc-over distance and shakeproof, is ideal products applied on land or ships. The rated insulation voltage of the circuit breaker is 800V (500V for NDM1-63), it is suitable for the distribution network of AC 50Hz / 60Hz, rated working voltage of 690V and rated current of 1250A, to distribute power and protect circuit and power equipment from being damaged caused by overload, short-circuit, under-voltage and other fault. Also for protection infrequent conversion of the circuits and infrequent start of motor and overload, short circuit, under voltage.

NDM1 circuit breaker can be mounted vertically (upright) or horizontally (transverse).

NDM1 **MCCB** is suitable for isolation and the symbol is " ".

NDM1 MCCB meets the standard: GB14048.2 "low-voltage switchgear and control equipment, Part 2: circuit breakers."

Model and meaning



Note:
 According to the pole, it classifies four types:
 Type A: N-pole without over-current release components, and N-pole has been connected all along, and does not act with other three poles to turn on or off;
 B-type: N-pole without over-current release components, and N-pole could act with other three poles (N-pole turn-on prior to turn-off);
 Type C: N-pole fixed with over-current release components, and N-pole could act with other three poles (N-pole turn-on prior to turn-off);
 D-type: N-pole fixed with over-current release components, and N-pole has been connected all along, and does not act with other three poles to turn on or off.
 Circuit breaker for distribution without code, circuit breaker for motor protection with 2
 No code for direct operation with handle; P for electric operation; Z for turning handle.
 Classification according to rated current of over-current release:
 NDM1-63 **MCCB** has nine: 6,10,16,20,25,32,40,50,63 A;
 NDM1-125 **MCCB** has eleven: 16,20,25,32,40,50,63,80,100,125 A;

NDM1-160 MCCB has nine: 32,40,50,63,80,100,125,160 A;
 NDM1-250 MCCB has seven: 125,140,160,180,200,225,250 A;
 NDM1-400 MCCB has five: 225,250,315,350,400 A;
 NDM1-630 MCCB has three: 400,500,630 A;
 NDM1-800 MCCB has three: 630,700,800A;
 NDM1-1000 MCCB has two: 800,1000A.

Note: 6A only has electromagnetic (instantaneous) type, is not recommended specifications.

According to the wiring method: wiring in front of board, wiring on back of board, insertion type of the board.
 According to over-current release pattern: thermodynamic-electromagnetic (double) type, electromagnetic (instantaneous) type.

According to the outfit, it has two types: with or without outfit.

The outfit include inner accessories and outside accessories: The inner accessories have shunt release, under-voltage release, auxiliary contact and alarm contact. The outside accessories are turning handle operation mechanism, power-driven operation mechanism and so on.

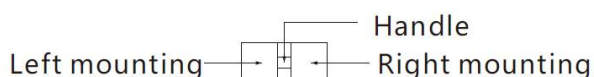
According to the breaking capacity: L-standard breaking type; M-second high breaking type; H-high breaking type

Normal operating conditions

- Ambient air temperature: $-5^{\circ}\text{C} \sim +40^{\circ}\text{C}$, and average temperature in 24h is below $+35^{\circ}\text{C}$.
- Altitude: The altitude of the installation site is not more than 2000m.
- Atmospheric conditions: The air relative humidity in the highest temperature $+40^{\circ}\text{C}$ is not more than 50%; In the low temperature can have higher relative humidity. The maximum average relative humidity is 90%, while the average monthly minimum temperature is $+25^{\circ}\text{C}$, and consider the temperature changes in product on the surface of the gel.
- Pollution Degree: 3.

Main technical parameters

- Alarm contact ●
- Shunt release ○
- Auxiliary contact ■
- Undervoltage release ▲



Main technical index

- 1, Instantaneous action characteristic setting value of the circuit breaker for distribution is $10I_n \pm 20\%$, NDM1-1000 is $7I_n \pm 20\%$; Instantaneous action characteristic set value of the circuit breaker for motor protection is $12I_n \pm 20\%$.
- 2, The rated value of the circuit breaker in Table 2.
- 3, In the ambient temperature of $+40^{\circ}\text{C}$, the circuit breaker for distribution over-current release action characteristics shown in Table 3, the circuit breaker for motor protection over-current release action characteristics shown in Table 4.

Characteristics of inverse time breaking action of circuit breakers over-current release for power distribution when every pole is power-on at the same time

| No. | Test current | I/In | Set time | Initial state |
|-----|-----------------------------------|------|------------------------|--------------------------|
| 1 | Conventional non-tripping current | 1.05 | 2h(In>63A), 1h(In≤63A) | Cold |
| 2 | Conventional non-tripping current | 1.30 | 2h(In>63A), 1h(In≤63A) | Immediately after Test 1 |

Instantaneous action characteristic setting value of the circuit breaker for distribution is $10I_n \pm 20\%$, and instantaneous action characteristic setting value of the circuit breaker for motor protection is $12I_n \pm 20\%$.

Characteristics of inverse time breaking action of circuit breakers over-current release for motor protection when every pole is power-on at the same time

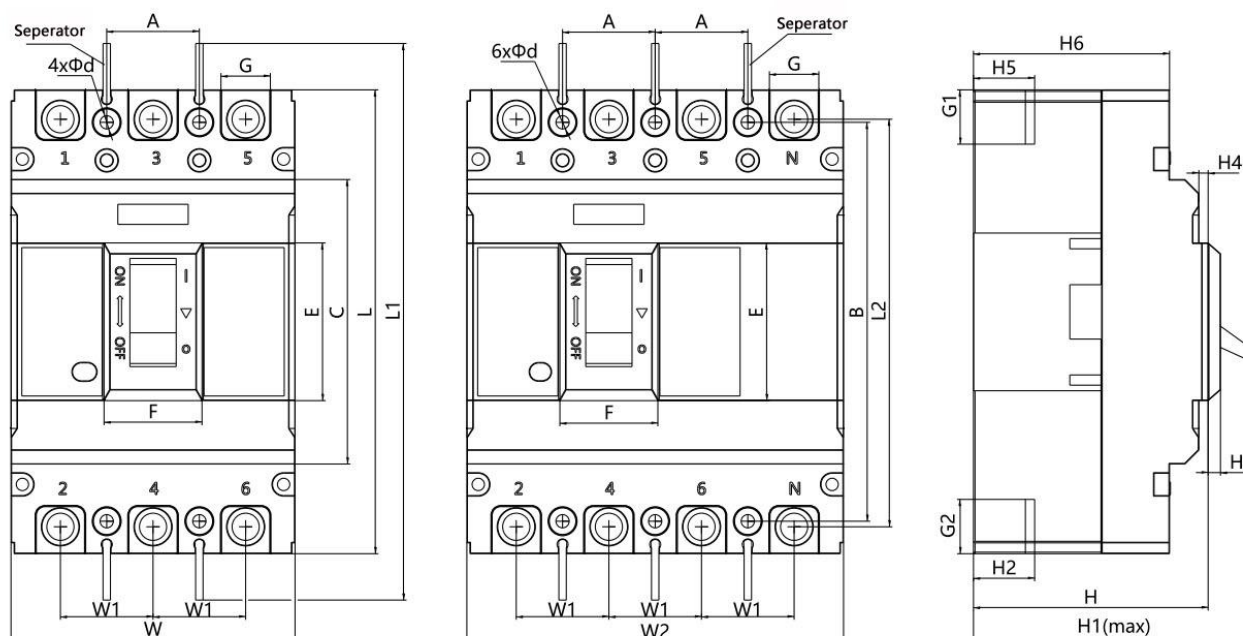
| No. | I/In | Set time | Initial state | Remark |
|-----|------|----------------------|--------------------------|------------------------|
| 1 | 1.0 | >2h | Cold | |
| 2 | 1.2 | ≤2h | Immediately after Test 1 | |
| 3 | 1.5 | ≤4min | Cold | $10 \leq n \leq 225$ |
| | | ≤8min | | $225 < n \leq 630$ |
| 4 | 7.2 | $4s \leq T \leq 10s$ | Cold | $10 \leq I_n \leq 225$ |
| | | $6s \leq T \leq 20s$ | | $225 < I_n \leq 630$ |

Derating factors table of temperature changes

| Model/Coefficient/Temperature | +40℃ | +45℃ | +50℃ | +55℃ | +60℃ |
|-------------------------------|------|------|------|------|------|
| NDM1-63 | 1 | 0.94 | 0.88 | 0.80 | 0.72 |
| NDM1-100 | 1 | 0.95 | 0.89 | 0.84 | 0.76 |
| NDM1-225 | 1 | 0.96 | 0.91 | 0.87 | 0.82 |
| NDM1-400 | 1 | 0.94 | 0.84 | 0.80 | 0.73 |
| NDM1-630 | 1 | 0.93 | 0.88 | 0.83 | 0.76 |
| NDM1-800 | 1 | 0.93 | 0.88 | 0.83 | 0.76 |
| NDM1-1250 | 1 | 0.88 | 0.83 | 0.79 | 0.76 |

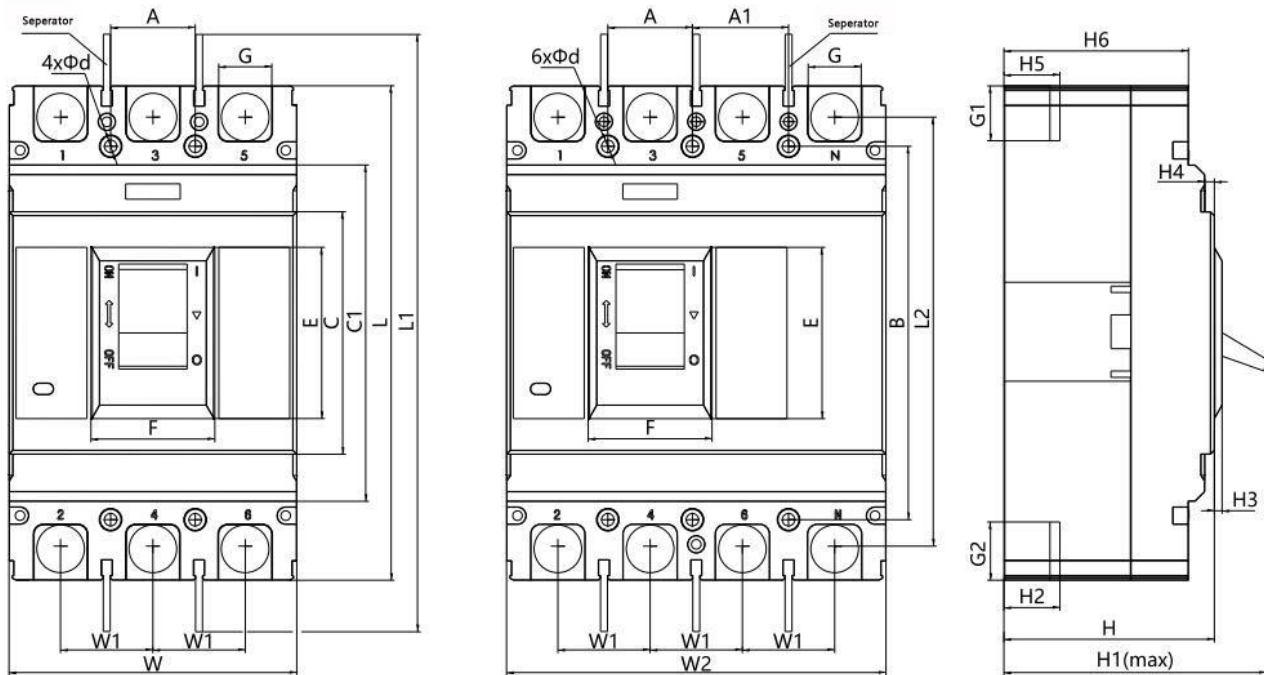
Outline and installation dimensions

NDM1-63、125、160、250 Outline and Installation dimension of wiring in front of the board



| Model | 63(10-40)A | 63to125(50-125)A | 125to160 | 250 | |
|----------------------------|------------|------------------|----------|-------|------|
| Outline Dimension | C | 92 | 92 | 92 | 100 |
| | E | 50.5 | 50.5 | 51 | 66 |
| | F | 26 | 26 | 32 | 33.5 |
| | G | 14 | 17.5 | 17 | 23 |
| | G1 | 15 | 15.5 | 16.5 | 21.5 |
| | G2 | 15 | 15 | 16.5 | 22 |
| | H | 71 | 71 | 77 | 91 |
| | H1 | 91 | 91 | 99 | 110 |
| | H2 | 21 | 21 | 25 | 23.5 |
| | H3 | 3 | 3 | 4 | 3 |
| | H4 | 3 | 3 | 3 | 3 |
| | H5 | 21 | 21 | 26 | 23.5 |
| | H6 | 61.5 | 61.5 | 64.5 | 80 |
| | L | 135 | 135 | 150 | 165 |
| | L1 | 233 | 233 | 255 | 360 |
| L2 | 121 | 121 | 131.5 | 144 | |
| W | 78 | 78 | 92 | 106 | |
| W1 | 25 | 25 | 30 | 35 | |
| W2 | 103 | 103 | 122 | 141 | |
| Installation dimension | A | 25 | 25 | 30 | 35 |
| | B | 116 | 116 | 129 | 126 |
| | Φd | 4x5 | 4x5 | 4.3 | 5 |
| Wiring screw specification | M6x12 | M6x12 | M8x20 | M8x20 | |

NDM1-400、 630、 800、 1000 Outline and Installation dimension of wiring in front of the board



| Model | 400 | 400 630 | 630 | 800 | 800 1000 | |
|----------------------------|--------|---------|--------|--------|----------|--------|
| Outline Dimension | C | 126 | 126 | 132 | 136 | 136 |
| | C1 | 175 | 175 | 184 | 204 | 204 |
| | E | 89 | 89 | 89 | 93 | 93 |
| | F | 64 | 64 | 69 | 66 | 66 |
| | G | 31 | 31 | 44 | 45 | 45 |
| | G1 | 30 | 30 | 28 | 33 | 33 |
| | G2 | 30 | 30 | 28 | 33.5 | 33.5 |
| | H | 110 | 110 | 115.5 | 116 | 116 |
| | H1 | 152 | 152 | 158 | 160 | 160 |
| | H2 | 36.5 | 39 | 40 | 40 | 43(41) |
| | H3 | 4 | 4 | 4.5 | 5 | 5 |
| | H4 | 5 | 5 | 5 | 4.5 | 4.5 |
| | H5 | 36 | 38 | 42.5 | 40 | 42 |
| | H6 | 96.5 | 96.5 | 100.5 | 103 | 103 |
| | L | 257 | 257 | 271 | 280 | 280 |
| | L1 | 457 | 457 | 471 | 485 | 485 |
| | L2 | 222 | 222 | 234 | 243 | 243 |
| | W | 150 | 150 | 183 | 210 | 210 |
| | W1 | 48 | 48 | 58 | 70 | 70 |
| | W2 | 198 | 198 | 240 | - | - |
| Installation Dimension | A | 44 | 44 | 58 | 70 | 70 |
| | A1 | 50 | 50 | 58 | 70 | 70 |
| | B | 194 | 194 | 200 | 243 | 243 |
| | Φd | 6.5 | 6.5 | 7 | 7 | 7 |
| Wiring screw specification | M10x25 | M12x30 | M12x30 | M12x35 | M12x35 | |

Accessories of circuit breakers

1、 Internal accessory of circuit breakers

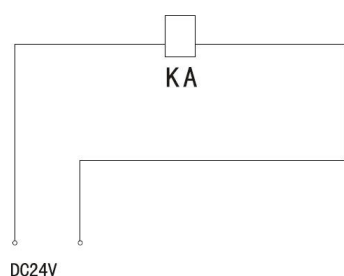
1.1 Shunt release

Rated control supply voltage of the shunt release: AC50Hz, 230V, 400; DC110V, 220V, 24V; When between 70%~110%, can break the circuit breaker reliably.<

When rated control supply voltage of the shunt release is DC24V, the maximum length of copper wire should meet the following requirements

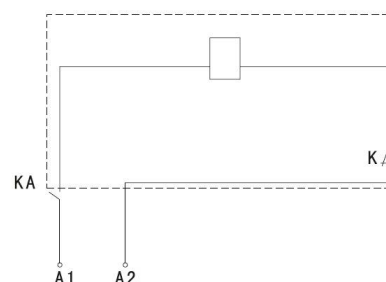
| Rated control supply voltage U_c (DC24V)/Conductor area | 1.5mm ² | 2.5mm ² |
|-----------------------------------------------------------|--------------------|--------------------|
| 100% U_c | 150m | 250m |
| 85% U_c | 100m | 160m |

If the requirements of the above table are not met, it is recommended to design the shunt release control circuit using the following figure



KA: for DC24V intermediate relay
The contact current capacity is 1A

The schematic diagram of the shunt circuit is the shunt trip



Power input

Power input voltage specifications:
AC50Hz, 230V, 400V

1.2 Under-voltage release

When the power supply voltage drops to under-voltage release rated voltage of 70% to 35% of the range, the under-voltage

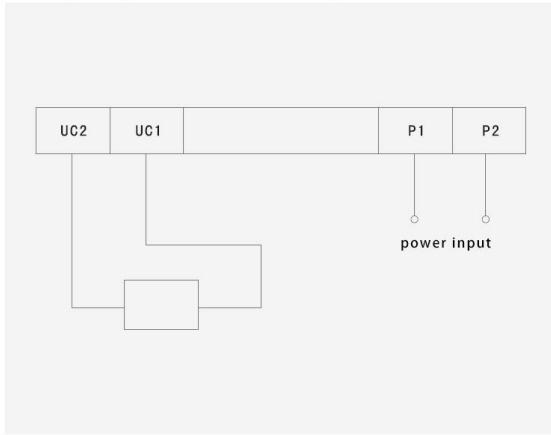
release circuit breaker reliable break; when the supply voltage is below the rated voltage undervoltage release 35% , Under-voltage

release to prevent the circuit breaker is closed; when the supply voltage is higher than 85% of the rated voltage of the under-voltage

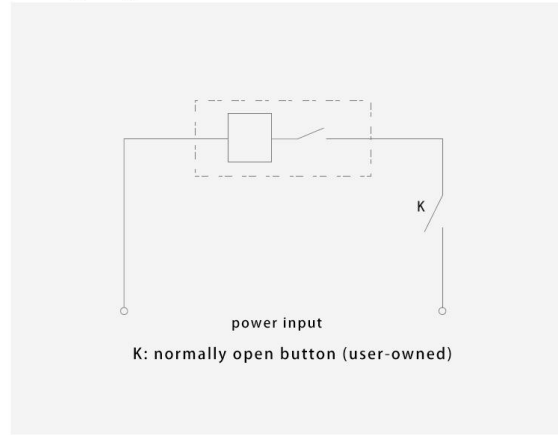
release, the under-voltage release ensures that the circuit breaker is closed. The undervoltage releases are rated at AC50Hz, 230V, 400V.

Special Note: The circuit breaker with undervoltage release, only in the under-voltage with rated voltage, which can open and close normally.

Wiring diagram of undervoltage release



Wiring diagram of shunt release



1.3 Pre-paid meter dedicated release

The rated operating voltage U_e of the pre-paid meter dedicated release is AC230/50Hz, it can work normally in the range of (65% ~ 110%) U_e . When the Ctrl is cut off, the circuit breaker will delay 0.5s ~ 2s to be opening.

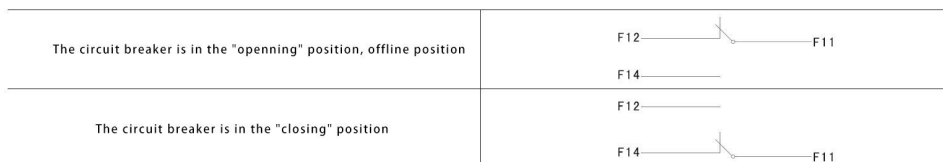
Wiring diagram of pre-paid meter dedicated release



1.4 The rated value of auxiliary contacts and alarm contacts in Table 5

| Classification | Conventional thermal current (I _{th}) | Rated current when AC 400V I _e (AC-15) | Rated current when DC 220V I _e (DC-13) |
|-------------------|-------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| Auxiliary contact | 3 | 0.4 | 0.15 |
| Alarm contact | 3 | 0.3 | 0.15 |

a. Auxiliary contact



b. Alarm contact

Alarm contacts don't act when the circuit breaker opens and closes normally, alarm contacts switch between

normal opening and normal closing only after free tripping or fault tripping.



2、 External Accessory for Circuit Breakers

2.1 Motor operating mechanism. The rated value and code are shown in Table 6.

| Category/Model | NDM1-63. 125.160. 250 | NDM1-400. 630. 800. 1000 |
|-----------------|-----------------------|--------------------------|
| Structure type | Electromagnet | Motor |
| AC voltage code | AC50Hz、 230V、 400 | AC50Hz、 230V、 400 |
| DC voltage code | DC110V、 220V | DC110V、 220V |

NOTE: After the tripping of circuit-breaker with electric operating mechanism, the electric operating mechanism must make the circuit-breaker buckle again, then it can close.

| Corresponding letters | Function name | Function corresponding to the model |
|-----------------------|---------------------------------------|----------------------------------------------------------------------------------------------|
| a | Model features | NDM1 Molded Case Circuit Breaker |
| b | Frame rated current code | 63A、 125A、 160A、 250A、 400A、 630A、 800A、 1000A |
| c | Breaking capacity characteristic code | standard breaking type; |
| d | Operation mode code | No code for handle operation; P for electric operation; Z for turning handle operation |
| e | Pole | 3-three poles; 4-four poles |
| f | Release name | 2 Electromagnetic release; |

| | | |
|---|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | 3 Double release |
| g | Accessory | 00 Without accessory 08 Alarm contact 10 Shunt release 20 Auxiliary contact 30 Undervoltage release 40 Shunt release, Auxiliary contact 50 Shunt release, Undervoltage release 60 Two sets of auxiliary contacts 70 Auxiliary contact, Undervoltage release 18 Shunt release, Alarm contact 28 Auxiliary contact, Alarm contact 38 Undervoltage release, Alarm contact 48 Shunt release, Auxiliary contact, Alarm contact 58 Shunt release, Undervoltage release, Alarm contact 68 Two sets of auxiliary contacts, Alarm contact 78 Auxiliary contact, Undervoltage release, Alarm contact 10Y Pre-paid meter dedicated release 40Y Pre-paid meter dedicated release, Auxiliary contact 50Y Pre-paid meter dedicated release, Auxiliary contact, Undervoltage release 18Y Pre-paid meter dedicated release, Alarm contact 48Y Pre-paid meter dedicated release, Auxiliary contact, Alarm contact 58Y Pre-paid meter dedicated release, Undervoltage release, Alarm contact |
| h | Application | No code for distribution; 2 for motor protection |
| i | Conventional products | No code; T for transparent cover products |
| j | Amperage | 10、16、20、25、32、63、80、100、125、160、180、200 、225、250、315、350、400、500、630、700、800、1000 |

Example: NDM1-63/ 33102 63A means NDM1-type molded case circuit breaker, frame rated current is 63A, breaking capacity is the standard type, handle operation, 3 poles, double release, with shuntrelease, for motor protection, rated current is 63A.

Selection, installation, use should be consistent with the product manual or the relevant national standards.

Note: N-pole type of 4P circuit breaker is divided into A-type, B-type, which is not specified defaults to Btype.