

Moulded Case Circuit Breakers







CHINA+TOMORROW= CHINT

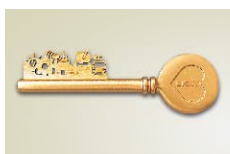
"CHIN" indicates "CHINA", and "T" represents "TOMORROW", proclaiming its signification-"Tomorrow of China".



Zhejiang CHINT Electrics Co.,Ltd. (public company, SHA:601877) is the largest-selling low-voltage electrics manufacturers in China. The company mainly engages in the research & development, manufacturing and sales of over 100 series low-voltage products with over 10,000 specification, such as modular Din-rail products, Moulded Case Circuit Breaker, Control products, Relays, Inverters, Soft Starters, Transformers, Automatic Voltage Regulators, Capacitors, Switch Disconnections, etc. and provides integrated electrical system solution for the industries of electric power, machinery, building, communication, HVAC, metallurgy, petrochemical, railway and etc.



With its worldwide presence of distribution network, CHINT is capable of delivering high quality and professional services for its customers at home and abroad.



CHINT is consistently committed to developing itself into a world-class electric supplier of integrated system solutions in this era of economic globalization. By adhering to the development strategy of "internationalization, High-Technology and Industrialization", the company has persistently devoted itself to the innovation measures in corporate system, technology, and management with a vision of offering global customers with high-performance, intelligent and energy-saving electric products, technologies and services.





Marketing Network

Chint not only has advanced production equipment, strict quality management and innovative research and development team, but also a worldwide marketing network consisting of 5 international marketing areas, 13 domestic marketing offices, 12 logistics centers, more than 280 specialty stores and more than 1000 sales companies, which are always ready to provide the users with high-quality professional services.





Europe



America



CIS Region



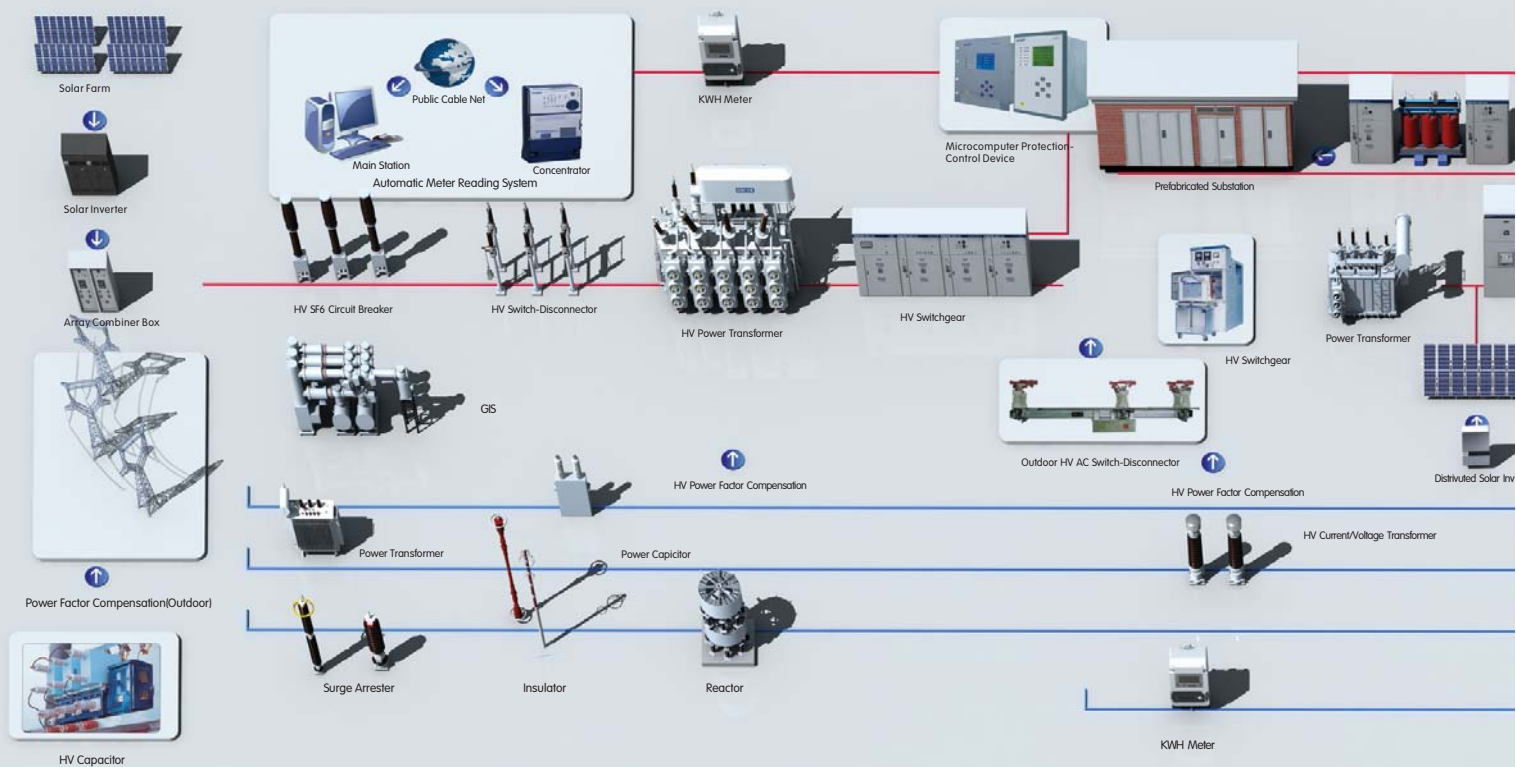
West Asia & Africa



Asia-Pacific

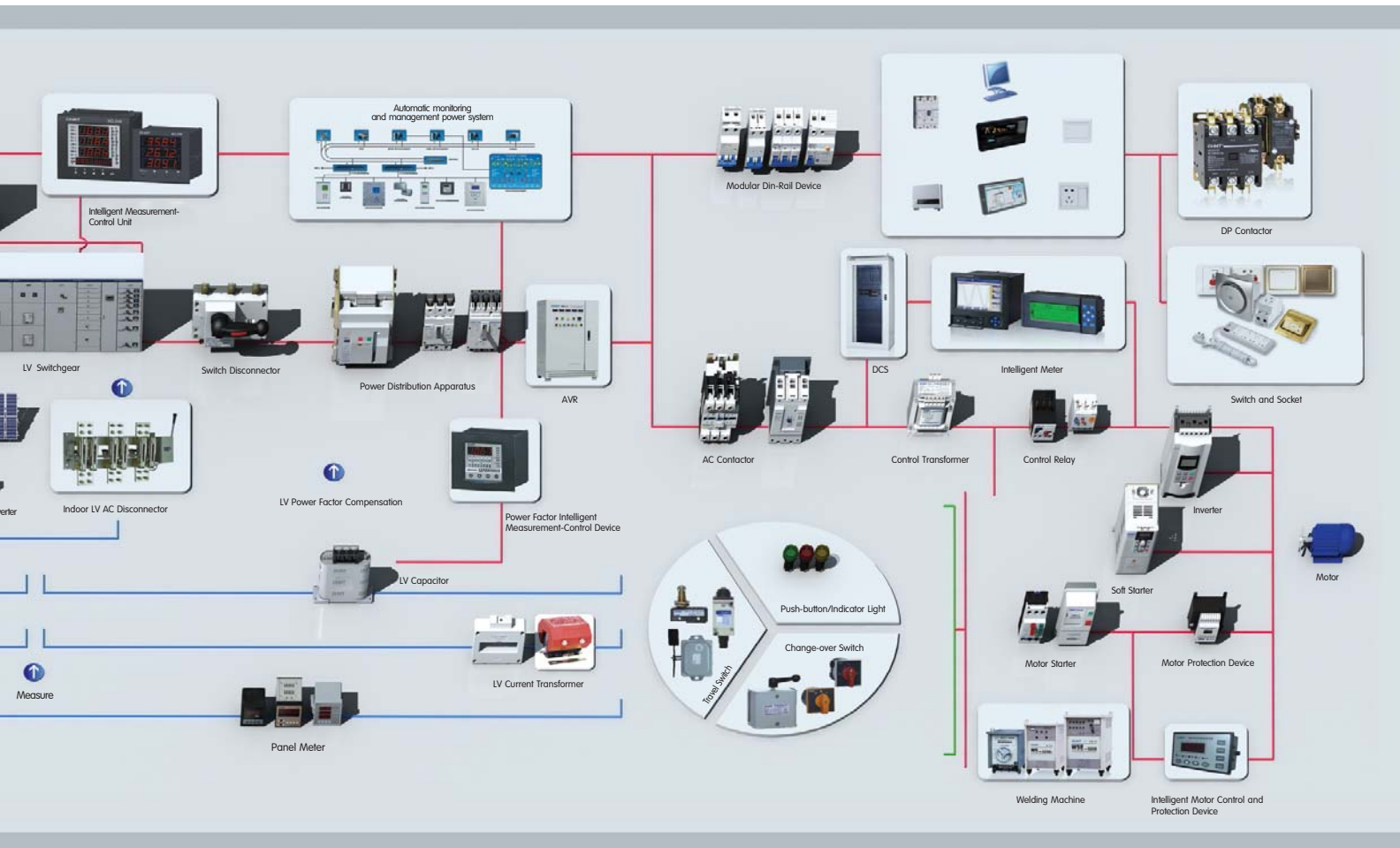


CHINT Electric Systems



Power of Dedication has transformed CHINT from a simple electric component manufacturer into a leading electric system solution provider, enabling all users from power transmission, distribution and usage sectors to access more reliable, secure, energy-saving, precise, eco-friendly, and intelligent electric products and services.

CHINT highly values all personalized demands of electric power, machinery, construction, communications, HVAC, metallurgy, petrochemical, railway, and other industries all the time, and devote itself to facilitating technical innovations and building a green future by providing users with world-class tailor-made electric system solutions.



Moulded Case Circuit Breakers

MCCB



NM8, NM8S

Page 01



NM7

Page 59








NM1

Page 68

[illegible]

Note: ① The rated current of NM8S-630 plug-in type up to 570A.

09 > >>

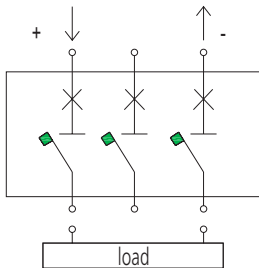
| NM8M-250 | | NM8M-400, 630 | | | | | NM8M-800, 1250 | | | | | |
|---|-----|---------------------|-----|-----|---------------------|-----|-----------------------|----|---|-----------------------|----|--|
| Frame 2 | | Frame 3 | | | | | Frame 4 | | | | | |
| 125,160,180,200,250 | | 250,315,350,400,500 | | | 250,315,350,400,500 | | 630,700,800,1000,1250 | | | 630,700,800,1000,1250 | | |
| 750 | | 750 | | | 750 | | 750 | | | 750 | | |
| 8 | | 8 | | | 8 | | 8 | | | 8 | | |
| 690 | | 690 | | | 690 | | 690 | | | 690 | | |
| 500 | | 500 | | | 500 | | 500 | | | 500 | | |
| 4 | | 3 | | | 4 | | 3 | | | 4 | | |
| <div></div> | | | | | | | | | | | | |
| S | H | S | H | R | S | H | S | H | R | S | H | |
| 50 | 100 | 70 | 100 | 150 | 70 | 100 | 50 | 70 | - | 50 | 70 | |
| 8 | 10 | 10 | 20 | 35 | 10 | 20 | - | - | - | - | - | |
| 100 | | 100 | | | 100 | | 50 | | | 50 | | |
| ■ | | ■ | | | ■ | | ■ | | | ■ | | |
| A | | A | | | A | | A | | | A | | |
| ■ | | ■ | | | ■ | | ■ | | | ■ | | |
| 20,000 | | 15,000 | | | 15,000 | | 15,000 | | | 15,000 | | |
| 20,000 | | 6,000 | | | 6,000 | | 6,000 | | | 6,000 | | |
| magnetic | | magnetic | | | magnetic | | magnetic | | | magnetic | | |
| ■ | | ■ | | | ■ | | ■ | | | ■ | | |
| ■ | | ■ | | | ■ | | ■ | | | ■ | | |
| — | | — | | | — | | — | | | — | | |
| ■ | | ■ | | | ■ | | ■ | | | ■ | | |
| ■ | | ■ | | | ■ | | ■ | | | ■ | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | — | | | — | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■ | | | ■ | | — | | | — | | |
| ■ | | ■</ | | | | | | | | | | |

5.2 Special applications

Use of DC apparatus

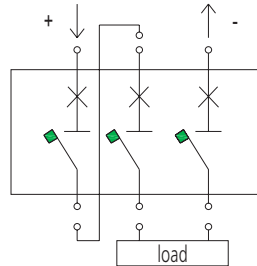
To obtain the number of poles in series needed to guarantee the required breaking capacity at the various operating voltages, suitable connection diagrams must be used. For the breaking capacity (I_{cu}), according to the voltage and the number of poles connected in series with reference to the connection diagrams. Protection and isolation of the circuit with three-pole circuit-breakers $I_{cs}=I_{cu}=10kA$ with any one connection in the following diagrams.

Diagram A: Interruption with one pole for polarity



Note: Without negative polarity connected to earth, the installation method must be such as to make the probability of a second earth fault negligible.

Diagram B: Interruption with two poles in series for one polarity and one pole for the other polarity.



Note: Without negative polarity connected to earth, the installation method must be such as to make the probability of a second earth fault negligible.

Diagram C: Interruption with three poles in series for polarity.

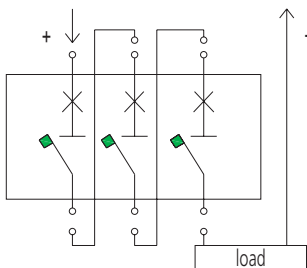


Diagram D: Interruption with four poles in series for one polarity (4C, 4D)

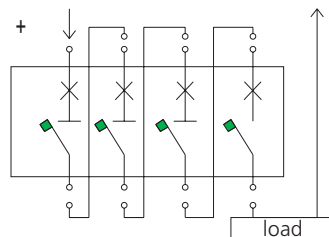
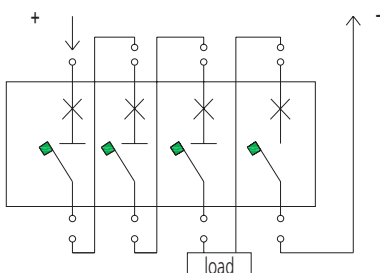
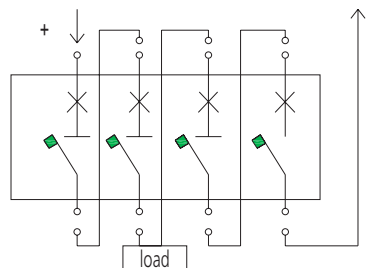


Diagram E: Interruption with three poles in series on one polarity and one pole on the other polarity (4C, 4D)



Note: Without negative polarity connected to earth, the installation method must be such as to make the probability of a second earth fault negligible.

Diagram F: Interruption with two poles in series for polarity (4C, 4D)



Note: Without negative polarity connected to earth, the installation method must be such as to make the probability of a second earth fault negligible.

The following table shows which connection diagram to use according to the number of poles to be connected in series to obtain the required breaking capacity, in relation to the type of distribution network:

| Rated voltage V | protection function | Isolation | Earth-insulated network | Network with one polarity ⁽¹⁾ earthed | Network with a middle point earthed |
|-----------------|---------------------|-----------|-------------------------|--|-------------------------------------|
| ≤250 | ■ | ■ | A | A | A |
| | ■ | - | - | - | - |
| ≤500 | ■ | ■ | A | B | A |
| | ■ | - | - | C | - |

Note:

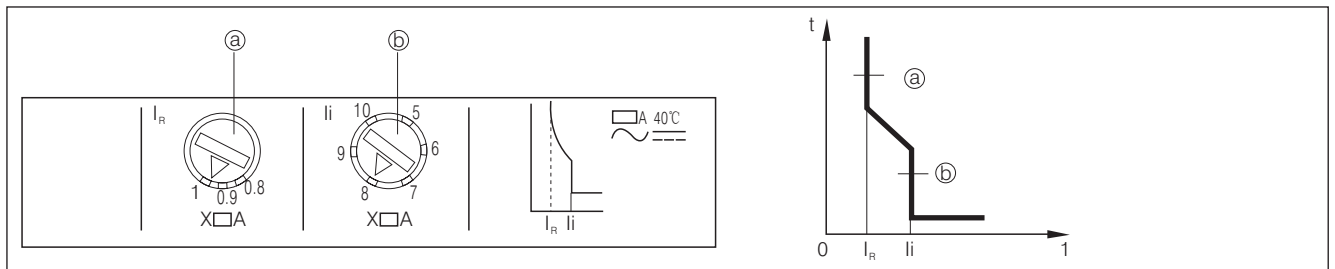
a The risk of double earth fault is nil, therefore the fault current only involves a part of the interruption poles.

b For connection with four poles in series, circuit-breakers with neutral at 100% of the phase settings must be used.

6. Release

6.1 Thermo-magnetic release

6.1.1 Thermo-magnetic release of NM8-125, 250, 400, 630, 800 and 1250 breakers can be set to meet protection requirements



Adjustable setting of over-load protection (a)

Adjustable setting of short-circuit protection or fixed (b)

| Thermo-magnetic release | NM8-125 | NM8-250 | NM8-400 | NM8-630 | NM8-800 | NM8-1250 |
|----------------------------|---|---|---|---|---|---|
| Rated value (A) In 40°C | 16, 20, 25, 32, 40, 50, 63, 80, 100, 125 | 100, 125, 160, 180, 200, 225, 250 | 250, 315, 350, 400 | 250, 315, 350, 400, 500 | 630, 700, 800 | 630, 700, 800, 1000, 1250 |
| Over-load protection | Thermo protection | | | | | |
| Tripping current IR (A) | Adjustable range 0.8~1XIn | Adjustable range 0.8~1XIn | Adjustable range 0.8~1XIn | Adjustable range 0.8~1XIn | Adjustable range 0.8~1XIn | Adjustable range 0.8~1XIn |
| N-pole protection (A) | Without protection | Without protection | Without protection | Without protection | Without protection | Without protection |
| 4A, 4B | 1.0XIn | 1.0XIn | 1.0XIn | 1.0XIn | 1.0XIn | 1.0XIn |
| 4C, 4D | 0.5 XIn | 0.5 XIn | 0.5 XIn | 0.5 XIn | 0.5 XIn | 0.5 XIn |
| Short-circuit protection | Magnetic protection | | | | | |
| Tripping current li (A) | 10In (for power distribution protection) 12In (for motor protection) | Adjustable range 5~10 XIn 8~12In(for motor protection) | Adjustable range 5~10 XIn 8~12In(for motor protection) | Adjustable range 5~10 XIn 8~12In(for motor protection) | Adjustable range 5~10 XIn 8~12In(for motor protection) | Adjustable range 5~10 XIn 8~12In(for motor protection) |

6.1.2 Characteristic of thermo protection operation of thermo-magnetic release for power distribution

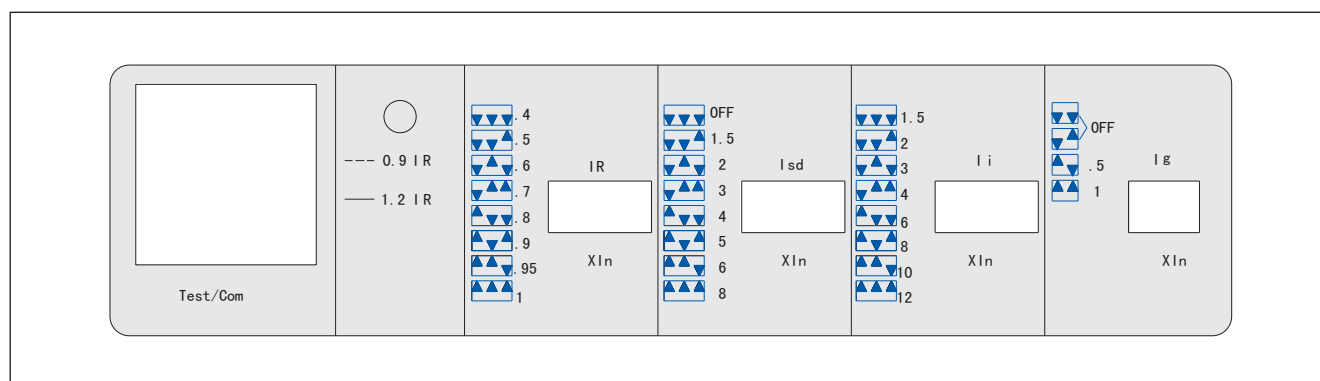
| Serial No. | Test current | I/In | Conventional time | Initial status |
|------------|-----------------------------------|------|------------------------------|--------------------|
| 1 | Conventional non-tripping current | 1.05 | >1h (In≤63A) >2h (In>63A) | Cold status |
| 2 | Conventional tripping current | 1.3 | ≤1h (In≤63A) ≤2h (In>63A) | Right after test 1 |

6.1.3 Characteristic of thermo protection operation of thermo-magnetic release for motor protection

| Serial No. | Test current | I/I _n | Conventional time | Initial status |
|------------|-----------------------------------|------------------|-------------------|--------------------|
| 1 | Conventional non-tripping current | 1.0 | >2h | Cold status |
| 2 | Conventional tripping current | 1.2 | ≤2h | Right after test 1 |
| | | 1.5 | ≤4min | |
| | | 7.2 | 4s≤T≤10s | |

6.2 Electronic Release

6.2.1 NM8S-125, 250 electronic release is an universal module. It is of 11 current specifications: 40A, 50A, 63A, 80A, 100A, 125A, 160A, 180A, 200A, 225A and 250A to adjust setting values and to meet protection requirements.

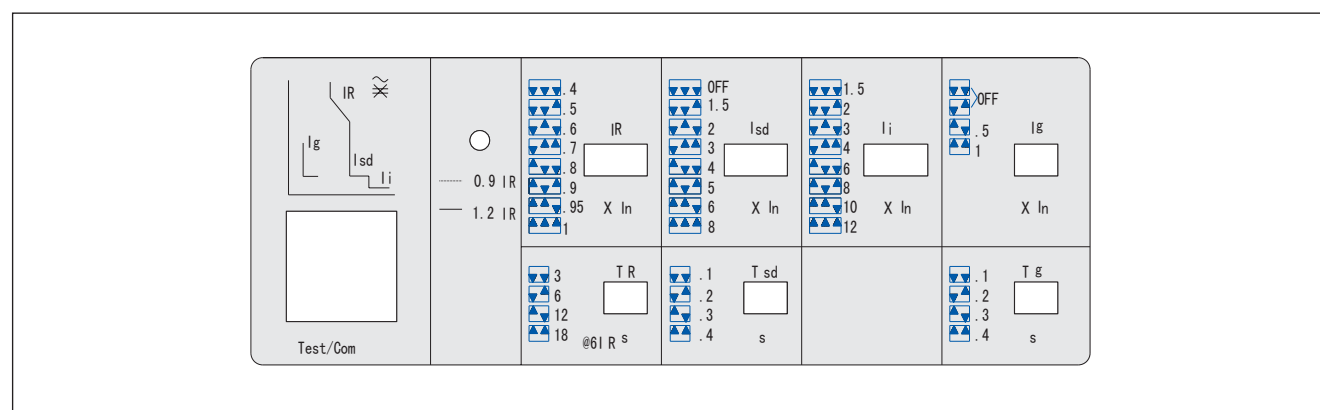


The indicator light flashes, when single-phase operational current is ≤90% I_R.

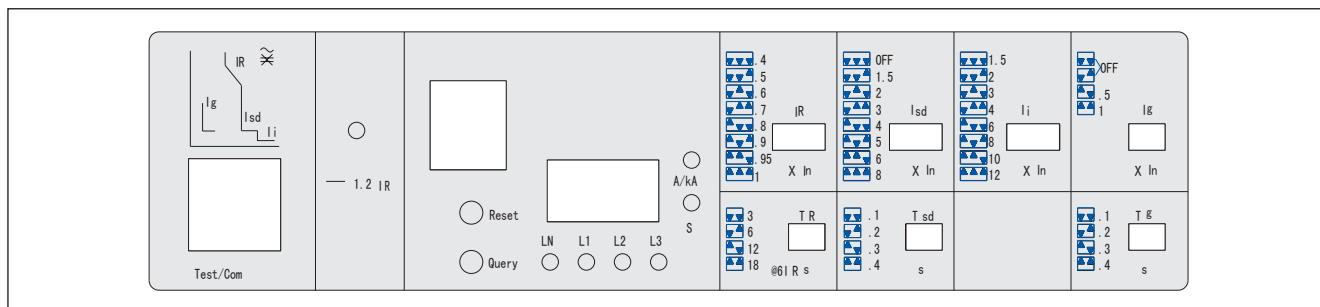
The indicator light is always lit, when single-phase operational current is ≥115% I_R.

| Electronic release | NM8S-125 | NM8S-250 |
|--|---|---|
| Rated value I _n (A) 20~70°C | 40, 50, 63, 80, 100, 125 | 100, 125, 160, 180, 200, 225, 250 |
| Over-load protection | Thermal protection | |
| Tripping current I _R | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn |
| Tripping time | >2h non tripping ≤1h 96s 6s | >2h non tripping ≤1h 96s 6s |
| N-line protection tripping current I _g | Adjustable range OFF, 0.5, 1XIn | Adjustable range OFF, 0.5, 1XIn |
| Tripping current I _i | Adjustable range 1.5, 2, 3, 4, 6, 8, 10, 12XIn | Adjustable range 1.5, 2, 3, 4, 6, 8, 10, 12XIn |
| Short time-delay short current protection tripping current I _{sd} | Adjustable range OFF, 1.5, 2, 3, 4, 6, 8XIn | Adjustable range OFF, 1.5, 2, 3, 4, 6, 8XIn |

6.2.2 NM8S-400, 630 electronic release is an universal module. It is of 6 current specifications: 250A, 315A, 350A, 400A, 500A, and 630A to adjust setting values and to meet protection requirements. The release is of wide setting range and multi-functional modules can be selected. NM8S-400, 630 electronic release.



6.2.3 NM8S-800, 1250 electronic release is an universal module. It is of 5 current specifications: 630A, 700A, 800A, 1000A, and 1250A to adjust setting values and to meet protection requirements.
The release is of wide setting range and multi-functional modules can be selected.



Tripping current I_R , I_{sd} , I_i should be set with three-digit switch or rotary knob as per current.

● I_R setting of over-load protection

I_R could be adjusted as per customers' requirements,
and TR, tripping time at the status of 6IR can be set as per customers' requirements.

| Model | 1.05 I_R | 1.3 I_R | 1.5 I_R (s) | 2.0 I_R (s) | 6 I_R (s) |
|----------------|------------------|--------------|---------------------|---------------------|-----------------|
| NM8S-400, 630 | >2h non-tripping | <1h tripping | 48,96, 192, 288 | 27, 54, 108, 162 | 3, 6, 12, 18 |
| NM8S-800, 1250 | >2h non-tripping | <1h tripping | 48, 96, 192, 288 | 27, 54, 108, 162 | 3, 6, 12, 18 |

● I_i indicator light for over-load status indication

The indicator light flashes, when single-phase operational current is $<90\% I_R$

The indicator light is always lit, when single-phase operational current is $\geq 115\% I_R$

● I_{sd} setting of short-circuit protection and tripping time

Setting value of current I_{sd} could be adjusted as per customers' requirements and OFF stands for status without ST protection;
 T_{sd} , the tripping time could be adjusted as per customers' requirements.

● I_i setting of short-circuit protection

Value of setting current could be adjusted as per customers' requirements

● I_g setting of protection operations

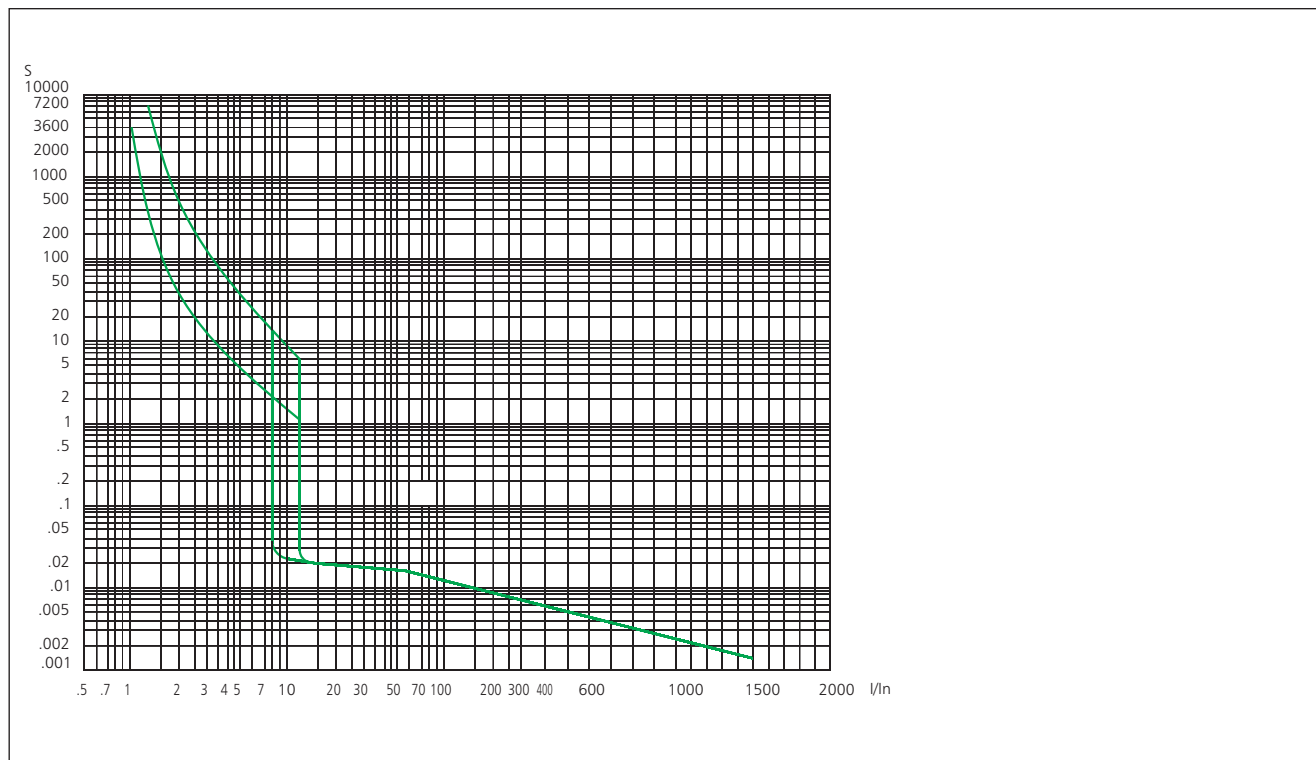
As a 4P circuit breaker with N-line protection, setting value of current I_g could be adjusted as per customers' requirements and OFF stands for status without protection of N-pole; T_g , the operating time of N-pole could be adjusted as per customers' requirements.

| Electronic release | NM8S-400 | NM8S-630 | NM8S-800 | NM8S-1250 |
|---|---|---|---|---|
| Rated value A In 20~70°C | 250, 315, 350, 400 | 250, 315, 350, 400, 500, 630 | 630, 700, 800 | 630, 700, 800, 1000, 1250 |
| long time-delay over-load protection (thermal protection) | | | | |
| Tripping current I_R (A) | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn |
| Tripping time 6I _R (s) | Adjustable range 3, 6, 12, 18 | Adjustable range 3, 6, 12, 18 | Adjustable range 3, 6, 12, 18 | Adjustable range 3, 6, 12, 18 |
| short time-delay short-circuit protection | | | | |
| Tripping current I_{sd} (A) | Adjustable range OFF, 1.5, 2, 3, 4, 5, 6, 8XIn | Adjustable range OFF, 1.5, 2, 3, 4, 5, 6, 8XIn | Adjustable range OFF, 1.5, 2, 3, 4, 5, 6, 8XIn | Adjustable range OFF, 1.5, 2, 3, 4, 5, 6, 8XIn |
| Tripping time T_{sd} (s) | Adjustable range 0.1, 0.2, 0.3, 0.4 | Adjustable range 0.1, 0.2, 0.3, 0.4 | Adjustable range 0.1, 0.2, 0.3, 0.4 | Adjustable range 0.1, 0.2, 0.3, 0.4 |
| (Instantaneous) short-circuit protection | | | | |
| Tripping current I_i (A) | Adjustable range 1.5, 2, 3, 4, 6, 8, 10, 12XIn 12In(for motor protection) | Adjustable range 1.5, 2, 3, 4, 6, 8, 10, 12XIn 12In(for motor protection) | Adjustable range 1.5, 2, 3, 4, 6, 8, 10, 12XIn 12In(for motor protection) | Adjustable range 1.5, 2, 3, 4, 6, 8, 10, 12XIn 12In(for motor protection) |
| (N-line) protection | | | | |
| Tripping current I_g (A) | Adjustable range OFF, 0.5, 1XIn | Adjustable range OFF, 0.5, 1XIn | Adjustable range OFF, 0.5, 1XIn | Adjustable range OFF, 0.5, 1XIn |
| Tripping time T_g (s) | Adjustable range 0.1, 0.2, 0.3, 0.4 | Adjustable range 0.1, 0.2, 0.3, 0.4 | Adjustable range 0.1, 0.2, 0.3, 0.4 | Adjustable range 0.1, 0.2, 0.3, 0.4 |

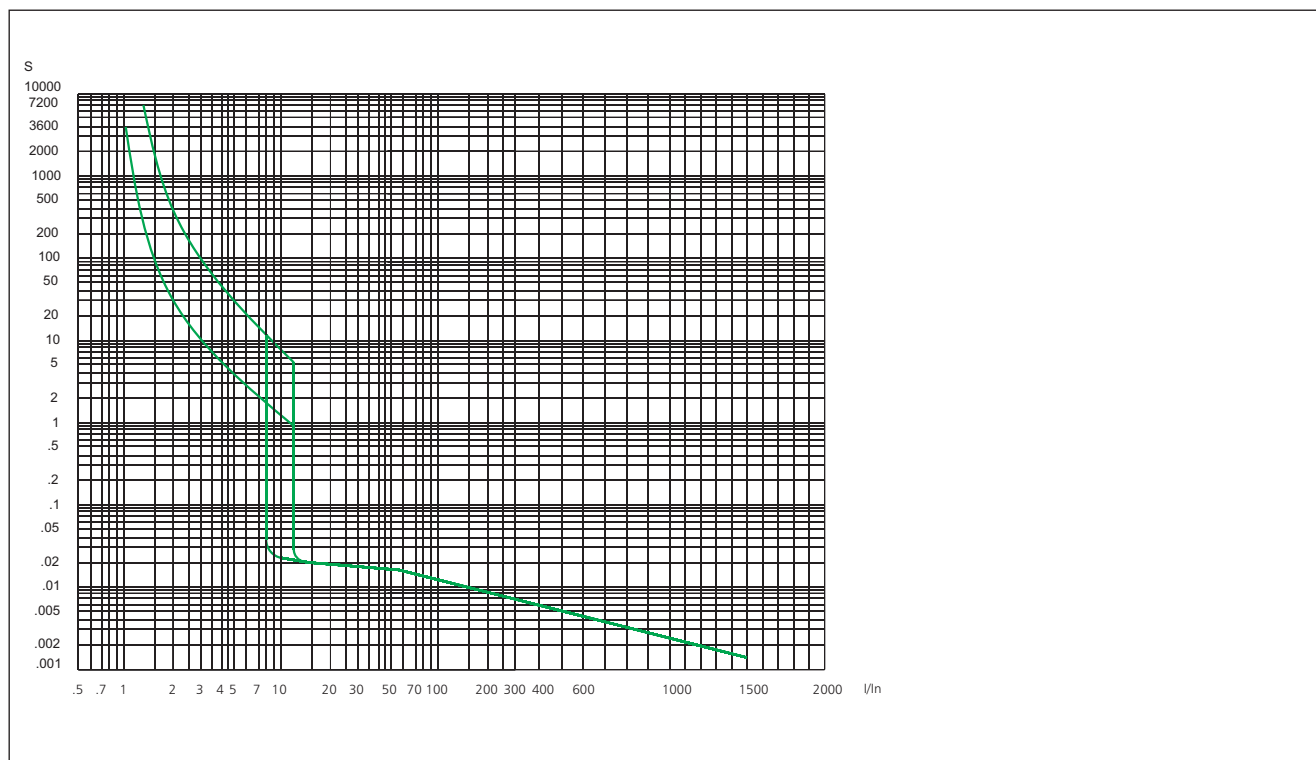
7. Curves

7.1 Tripping curve (ambient temperature +40°C)

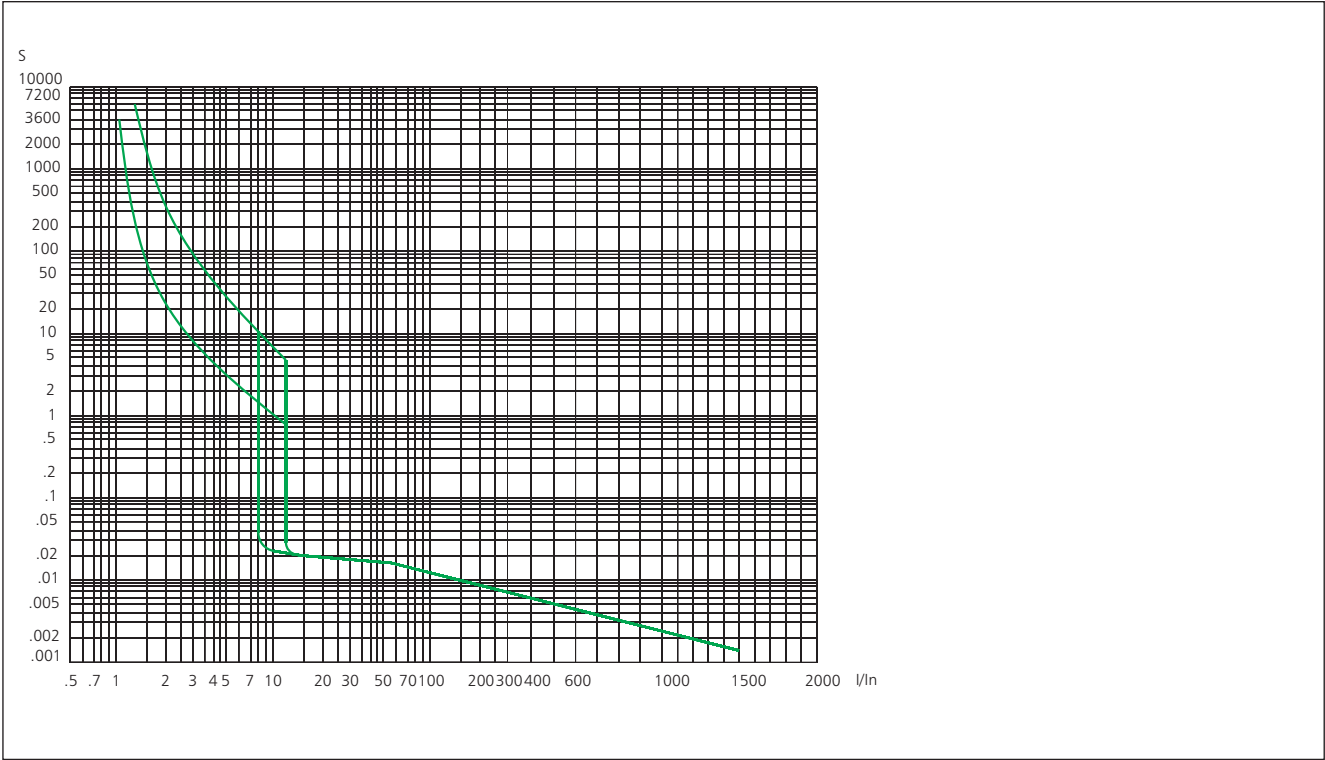
NM8-125 (16A, 20A)



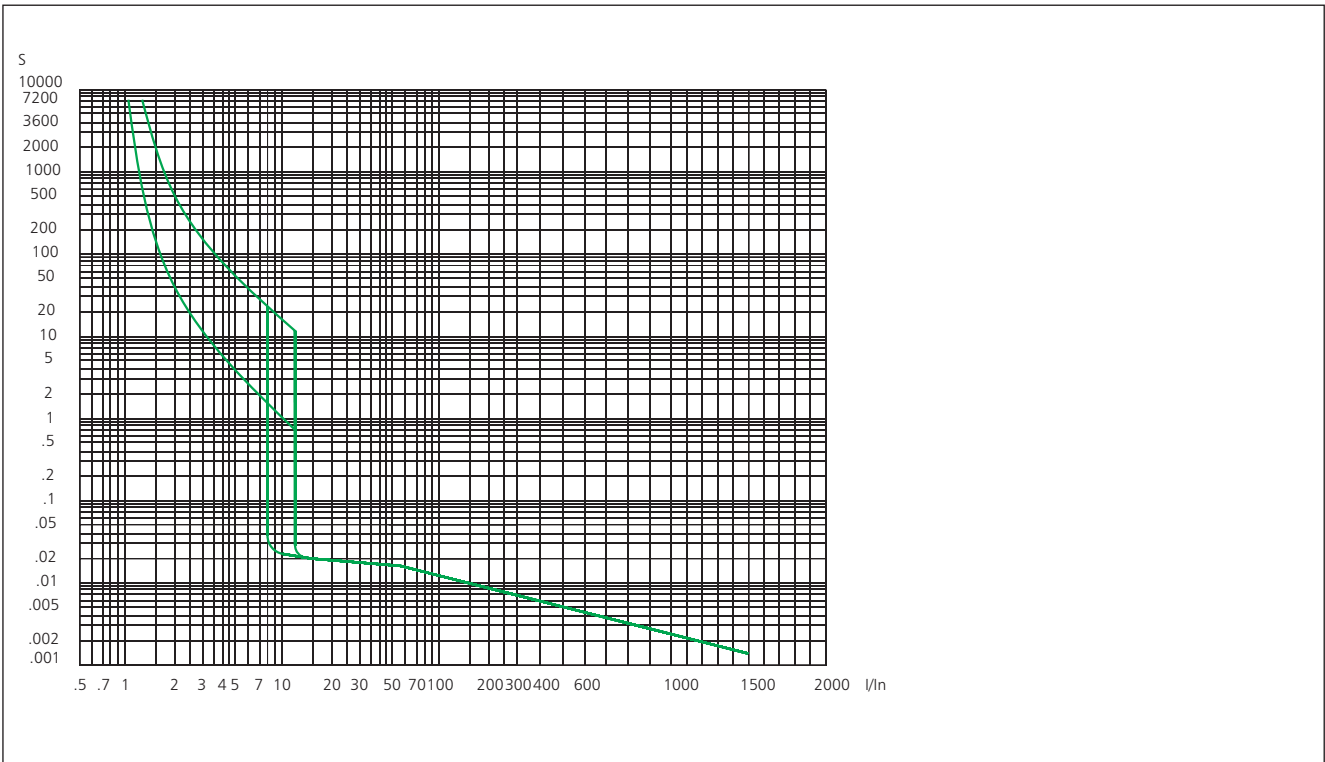
NM8-125(25A, 32A)



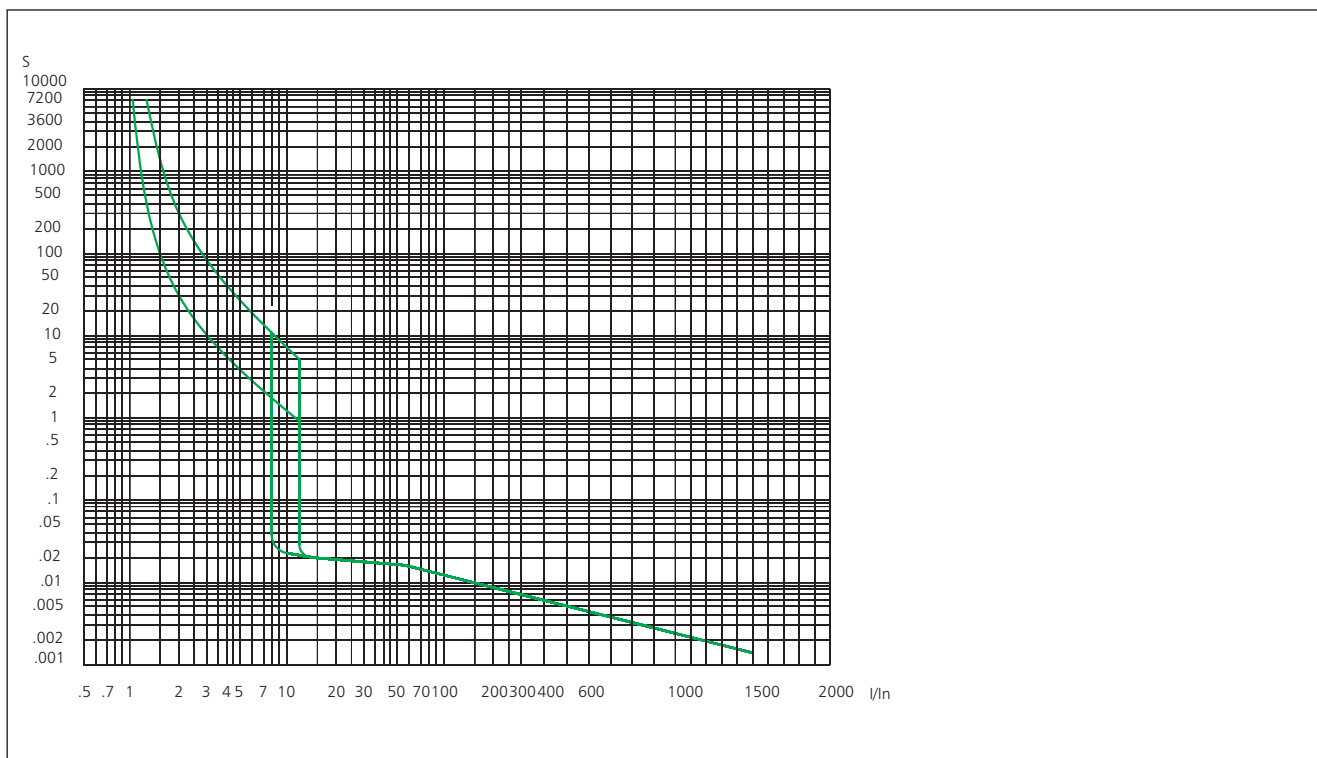
NM8-125 (40A, 50A)



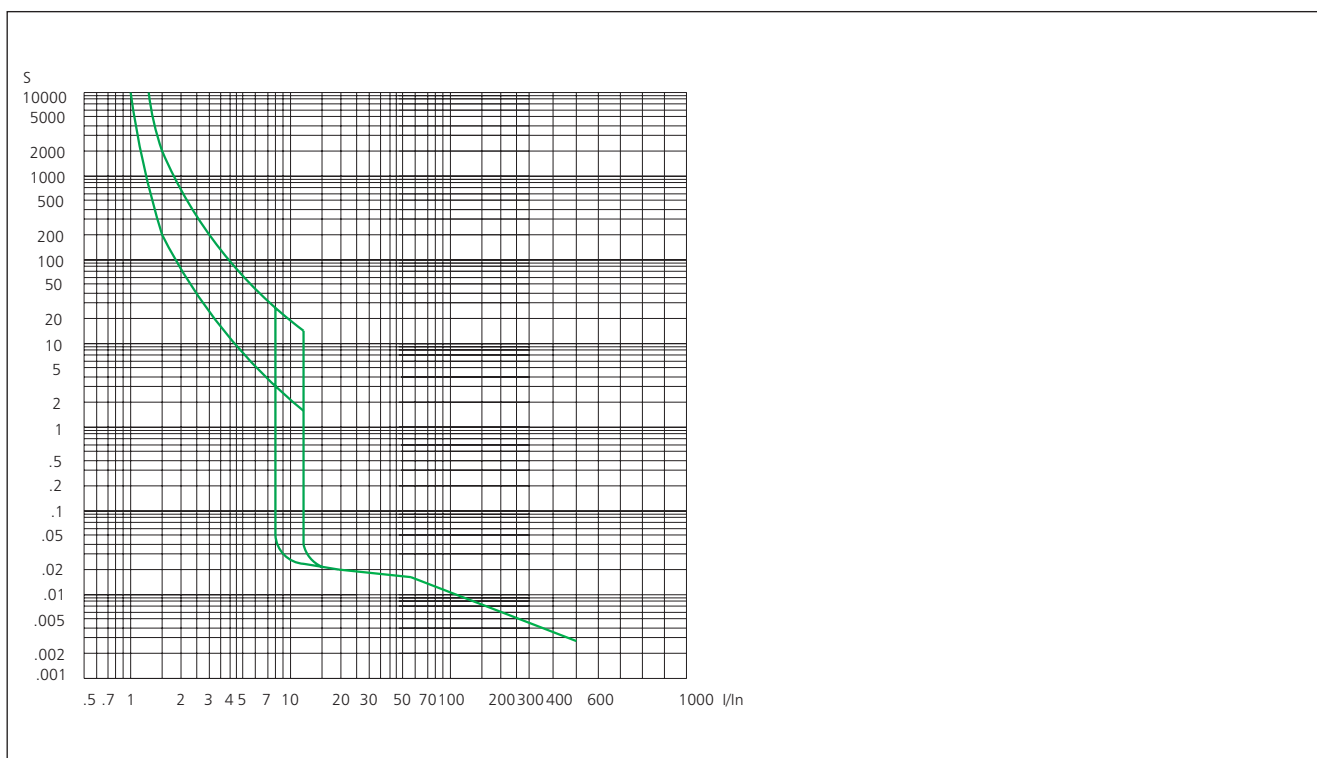
NM8-125 (63A, 80A, 100A)



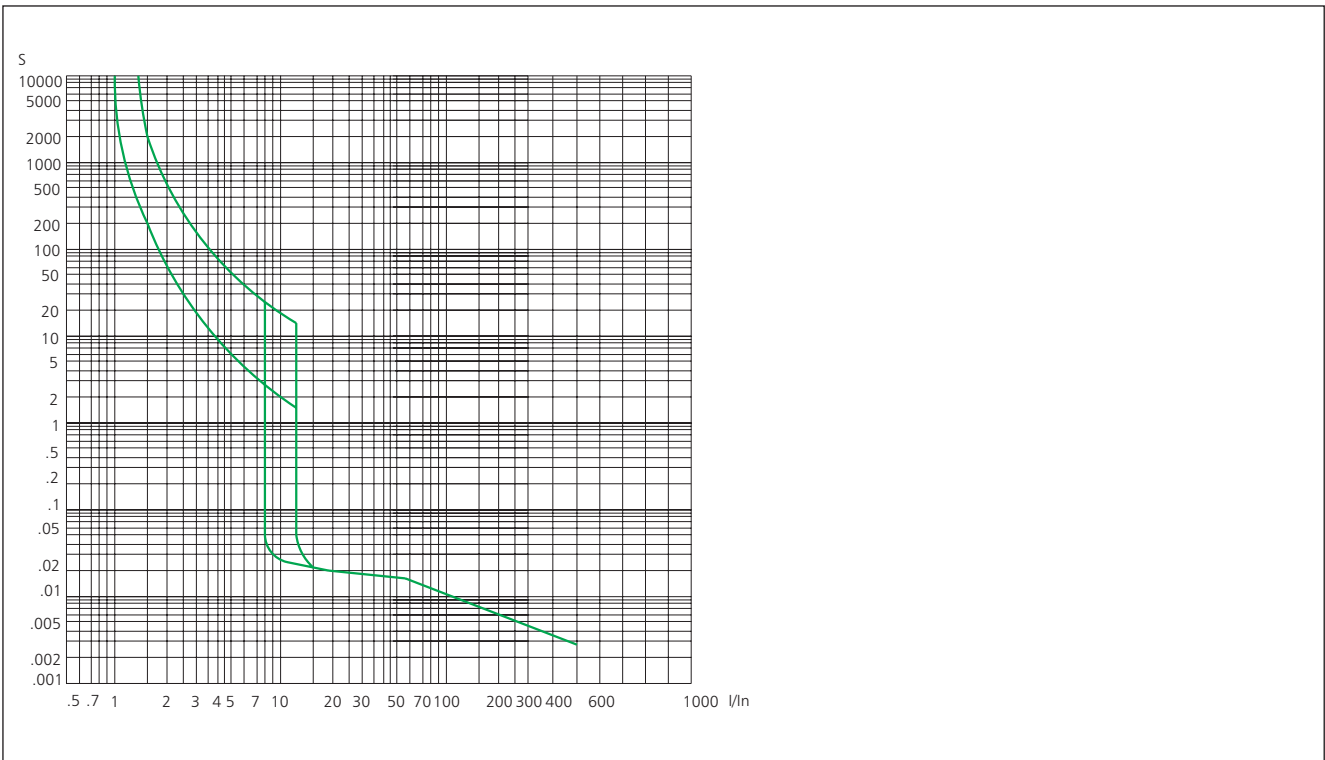
NM8-125 (125A)



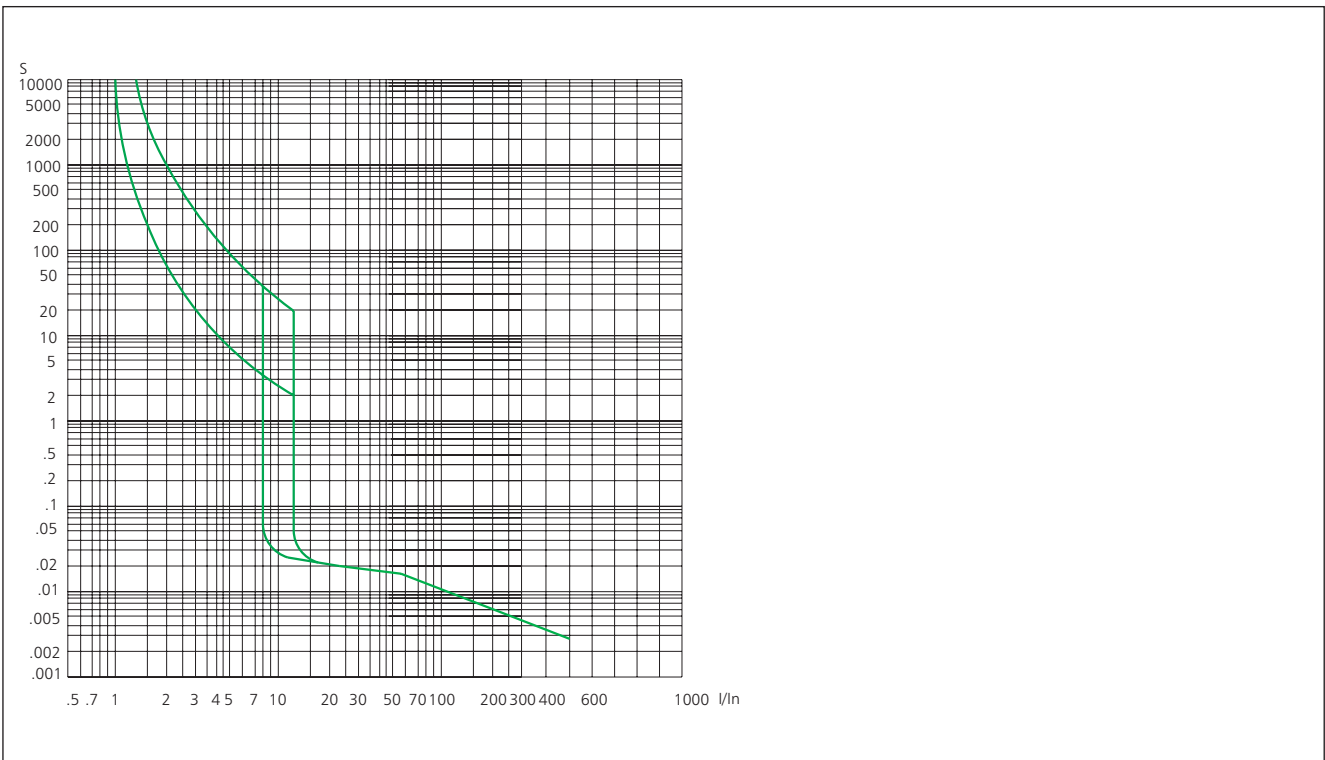
NM8-250 (100A)



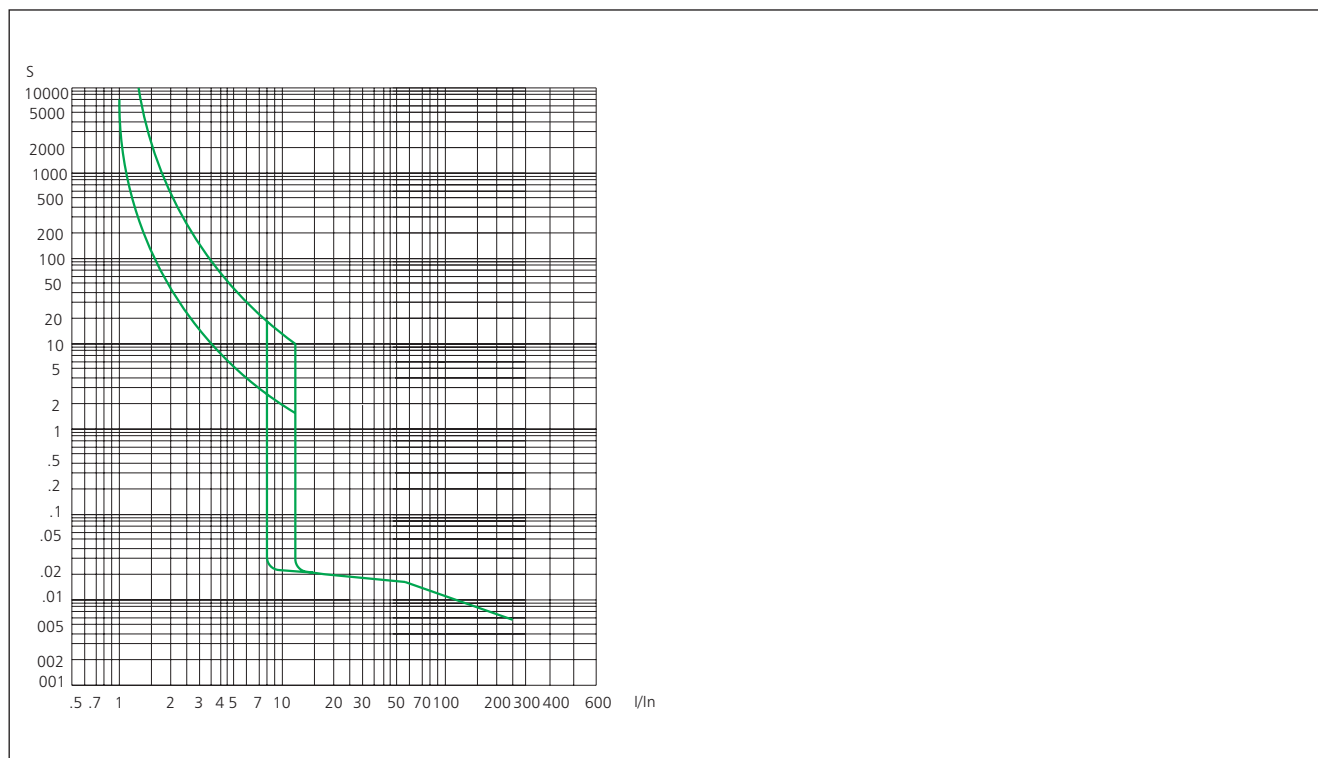
NM8-250 (160A)



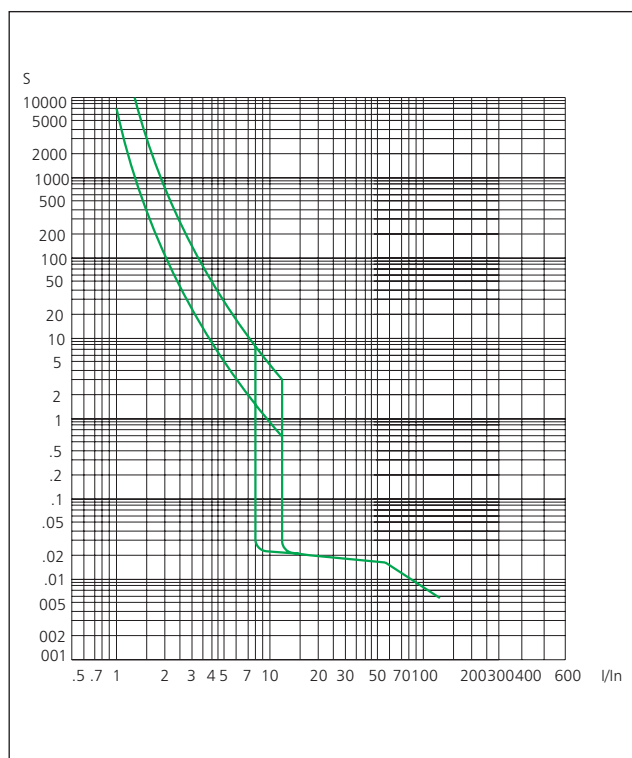
NM8-250 (200A, 250A)



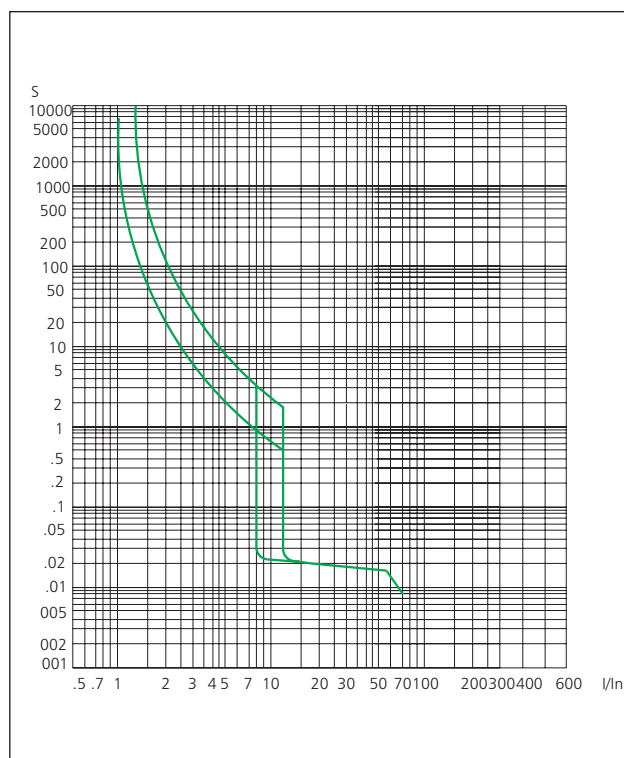
NM8-630 (250A~500A)



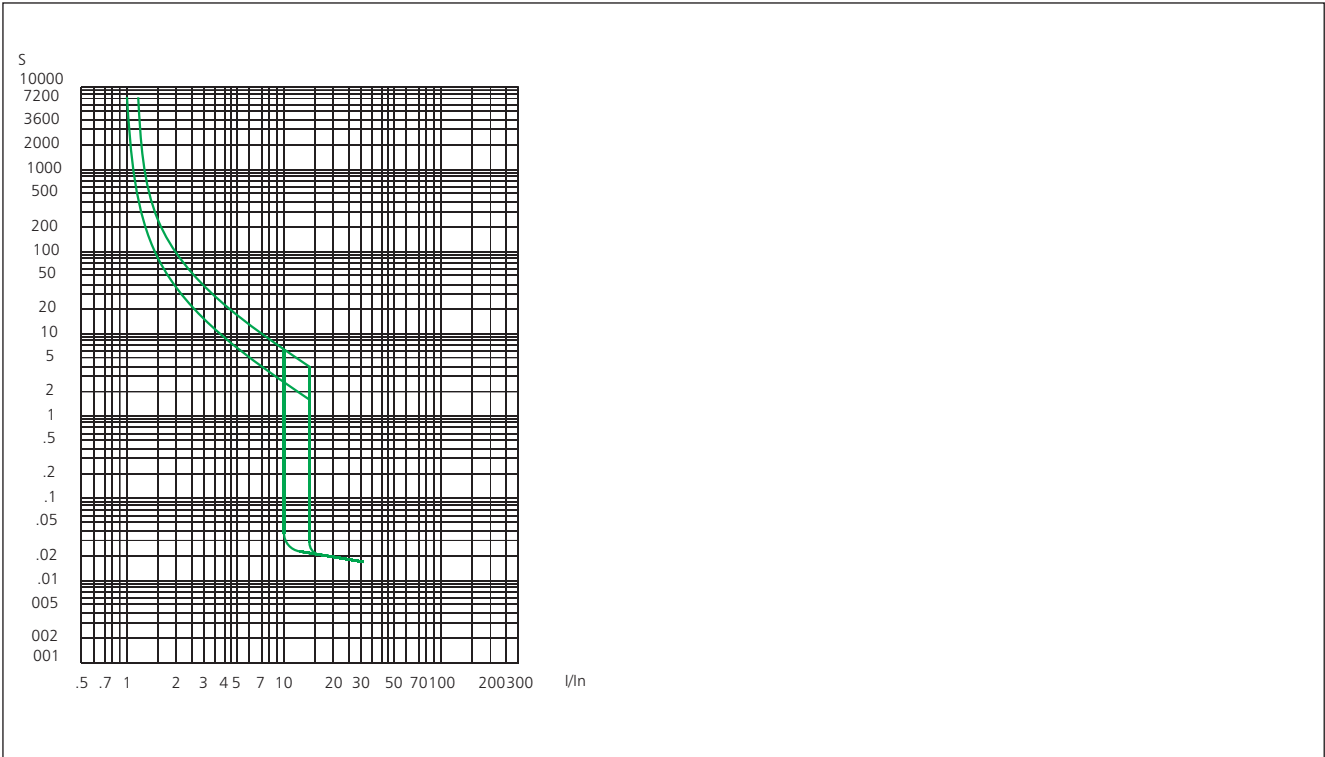
NM8-1250(630A ~ 800A)



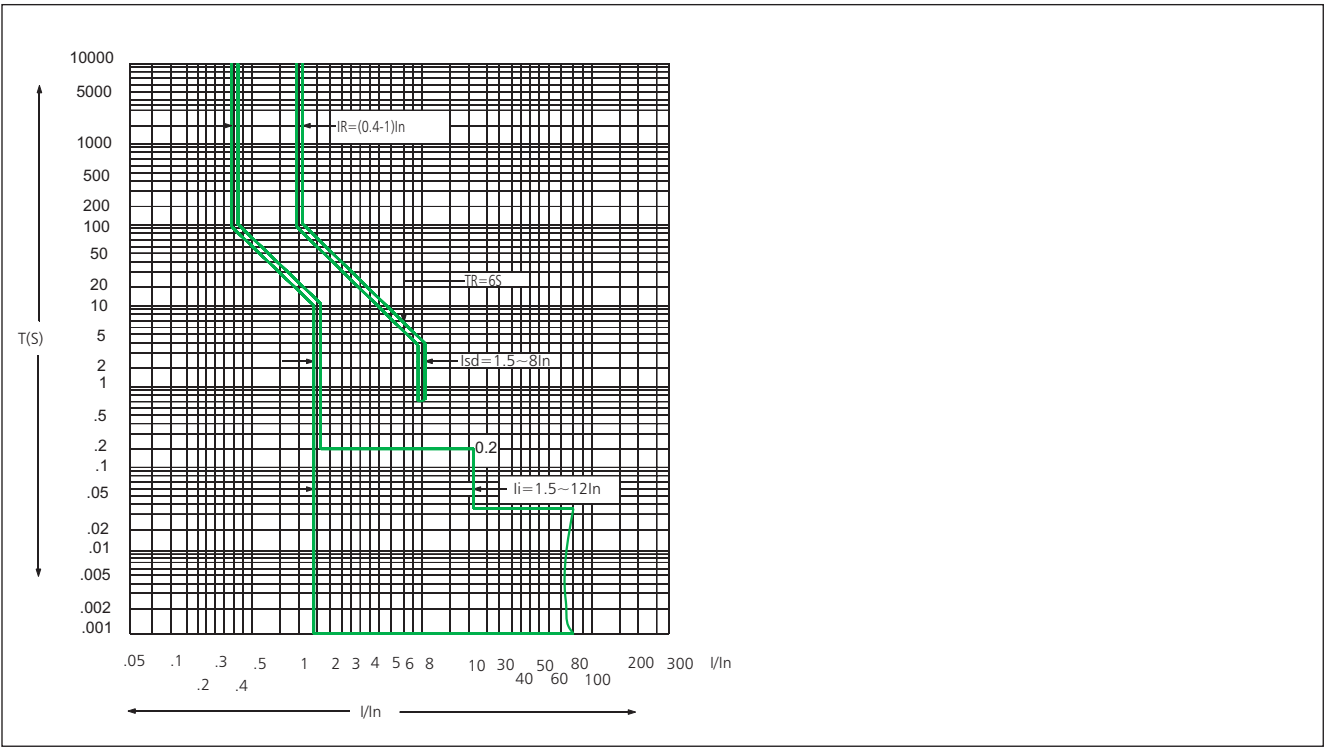
NM8-1250(1000A ~ 1250A)



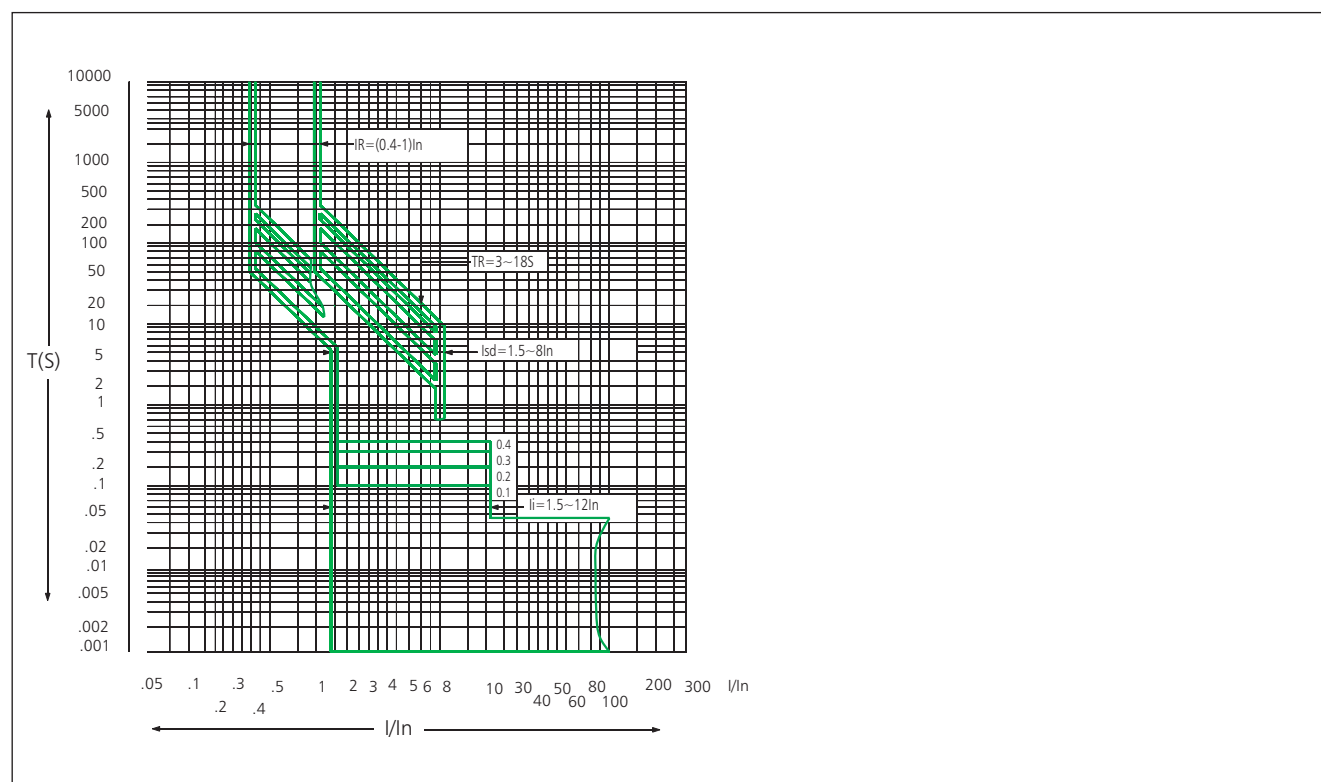
Motor protection release NM8-125, 250, 400, 630 (16A~500A)



Electronic type NM8S-125, 250(16A~250A)



Intelligent release NM8S-400, 630(250A~630A)
NM8S-800, 1250(630A~1250A)



7.2 Temperature compensation

When the ambient temperature slightly changes, tripping characteristics will change as well, please refer to the table below for temperature compensation correction.

7.2.1 Temperature compensation coefficient of breaker with thermo-magnetic release as follows.

| Ambient temperature | 0℃ | 5℃ | 10℃ | 15℃ | 20℃ | 25℃ | 30℃ | 35℃ | 40℃ | 45℃ | 50℃ | 55℃ | 60℃ | 65℃ | 70℃ |
|--------------------------------------|-----|-------|------|-------|-----|-------|------|-------|-----|-------|------|-------|------|-------|------|
| Temperature compensation coefficient | 1.2 | 1.175 | 1.15 | 1.125 | 1.1 | 1.075 | 1.05 | 1.025 | 1.0 | 0.975 | 0.95 | 0.925 | 0.90 | 0.875 | 0.85 |

Note: For reference only

7.2.2 Temperature compensation coefficient of breaker with electronic release as follows

| Frame Level rated current | 0℃ | 5℃ | 10℃ | 15℃ | 20℃ | 25℃ | 30℃ | 35℃ | 40℃ | 45℃ | 50℃ | 55℃ | 60℃ | 65℃ | 70℃ |
|---------------------------|----|----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|------|-------|-------|
| NM8S-125S/H(40~125) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NM8S-250S/H(125~160) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NM8S-250S/H(200~250) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.95 | 0.95 | 0.90 | 0.90 |
| NM8S-630S/H/R(250~400) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.98 | 0.95 | 0.93 | 0.90 |
| NM8S-630S/H/R(500~630) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.98 | 0.95 | 0.93 | 0.90 | 0.88 | 0.85 |
| NM8S-1250S/H/R(630~800) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.975 | 0.975 | 0.95 | 0.95 | 0.925 | 0.925 |
| NM8S-1250S/H/R(1000~1250) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.95 | 0.9 | 0.875 | 0.80 | 0.80 | 0.80 |

8. Mounting of circuit breaker

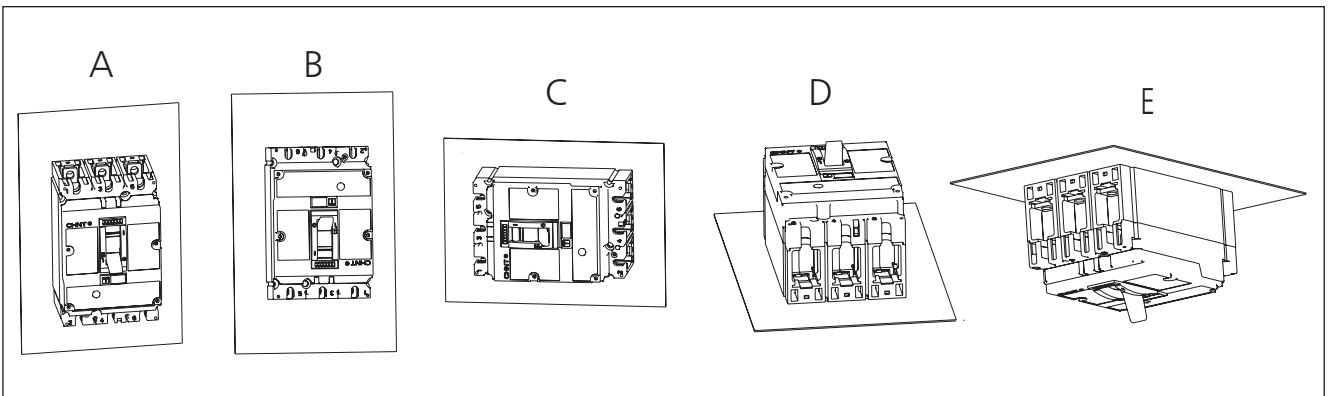
8.1 Modes of down-lead

Two modes of upper and lower down-lead are available; adoption of different down-lead modes will not affect normal operation of breaker, in addition, it is no need for derating.



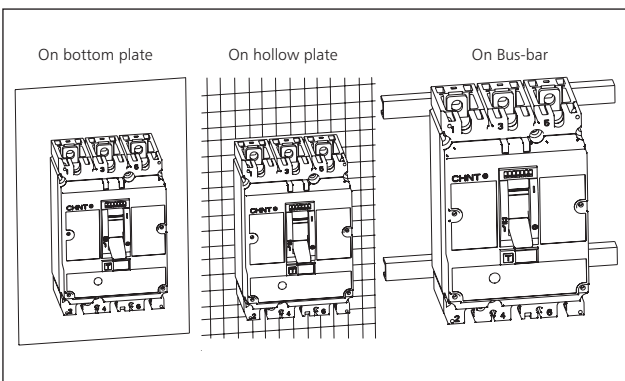
8.2 Modes of mounting

Mounting modes following are available for fixed and plug-in type breakers.

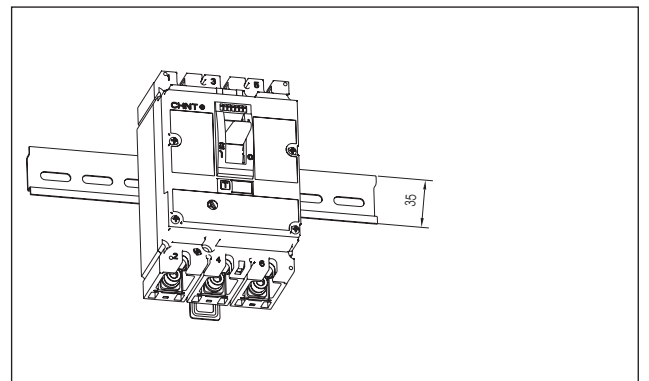


8.3 Modes of fixing

8.3.1 Fixing modes following are available for fixed and plug-in type breakers.

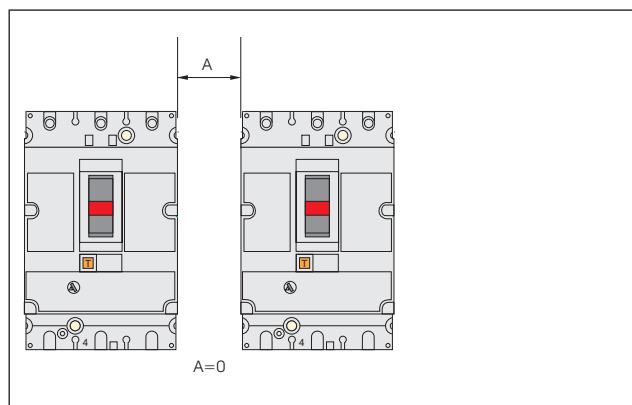


8.3.2 Fixing mode following is available for NM8(S)-125, 250 for fixed type breakers, which adopts DIN rail adaptor of front connection.

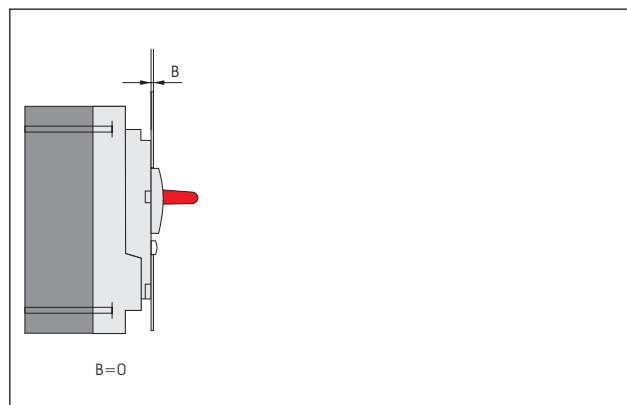


8.4 Secured distance

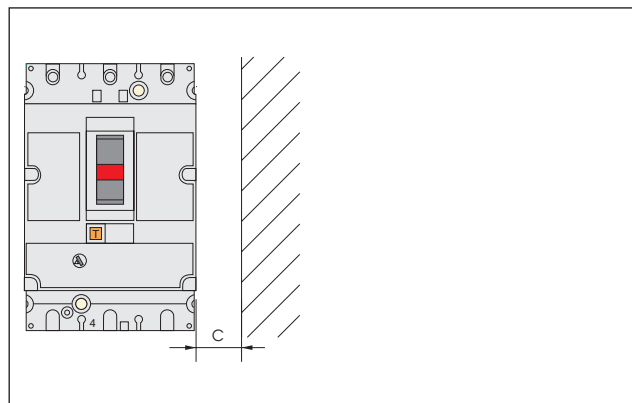
8.4.1 Min. Distance between breakers



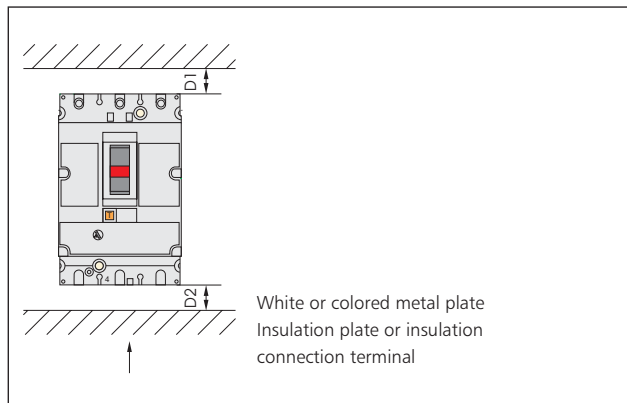
8.4.2 Min. distance between breaker and surface of switchgear where the operation handle is exposed.



8.4.3 Min. distance between breaker and side of switchgear



8.4.4 Min. distance between top and bottom of breaker



| NM8 Breaker | Ue | C | Insulation plate or insulation connection terminal(mm) | | White or colored metal plate(mm) | |
|----------------------------------|-----------------|----|--|-----|----------------------------------|-----|
| | | | D1 | D2 | D1 | D2 |
| NM8-125 NM8S-125 | $U_e \leq 440V$ | 10 | 30 | 30 | 35 | 35 |
| | $U_e < 600V$ | 20 | 30 | 30 | 35 | 35 |
| | $U_e \geq 600V$ | 30 | 30 | 30 | 35 | 35 |
| NM8-250 NM8S-250 | $U_e \leq 440V$ | 10 | 30 | 30 | 35 | 35 |
| | $U_e < 600V$ | 20 | 30 | 30 | 35 | 35 |
| | $U_e \geq 600V$ | 30 | 30 | 30 | 35 | 35 |
| NM8-400, 630, NM8S-400, 630 | $U_e \leq 440V$ | 10 | 30 | 30 | 60 | 60 |
| | $U_e < 600V$ | 20 | 30 | 30 | 60 | 60 |
| | $U_e \geq 600V$ | 30 | 30 | 30 | 100 | 100 |
| NM8-800, 1250, NM8S-800, 1250 | $U_e \leq 690V$ | 50 | 130 | 100 | 70 | 70 |

Note: when voltage is $\geq 500V$, extended terminal cover should be mounted

8.5 Modes of connection

8.5.1 Cable connection plug and Copper busbar

a. Screw is used to connect with copper (aluminum) cable connection plug or copper busbar

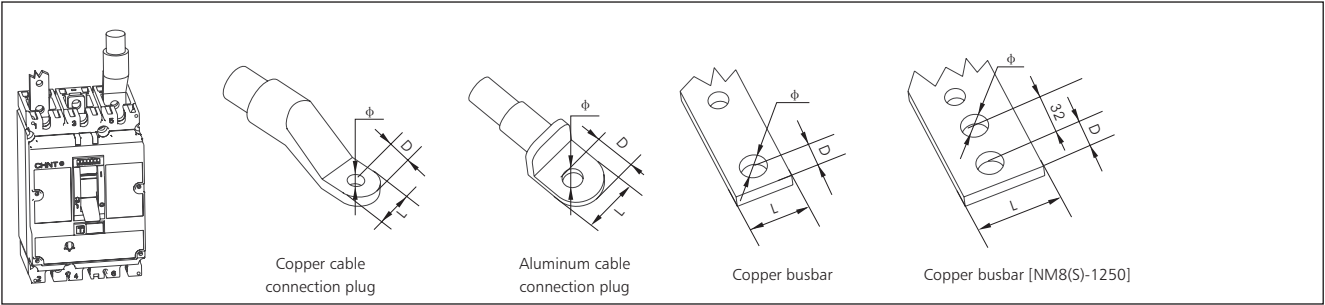
Size of connection screw

NM8-125: M6

NM8S-125、NM8-250、NM8S-250: M8

NM8-400, 630、NM8S-400, 630: M10

NM8-800, 1250、NM8S-800, 1250: M10



| Dimension | NM8-125 | NM8S-125 NM8-250 NM8S-250 | NM8-400, 630 NM8S-400, 630 | NM8-800, 1250 NM8S-800, 1250 |
|--------------------------------------|---------|---------------------------------|-------------------------------|---------------------------------|
| Distance between different poles(mm) | 30 | 35 | 45 | 70 |
| L(mm) | ≤ 15 | ≤ 25 | ≤ 32 | ≤ 50 |
| D(mm) | ≤ 7 | ≤ 10 | ≤ 16 | ≤ 16 |
| Φ (mm) | >6 | >8 | >10 | >11 |

b. With front connection and use screw to connect with copper (aluminum) cable connection plate or copper busbar

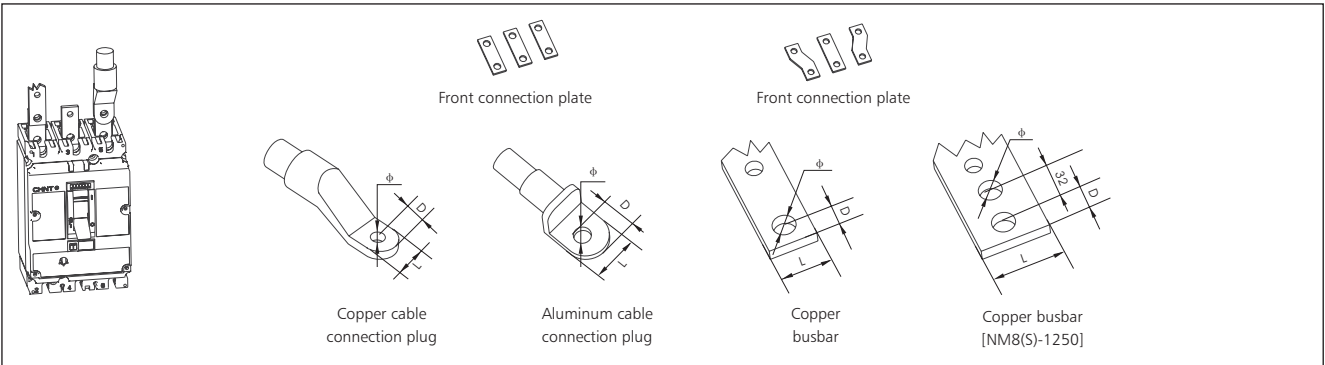
Size of connection screw

NM8-125: M6

NM8S-125, NM8-250、NM8S-250: M8

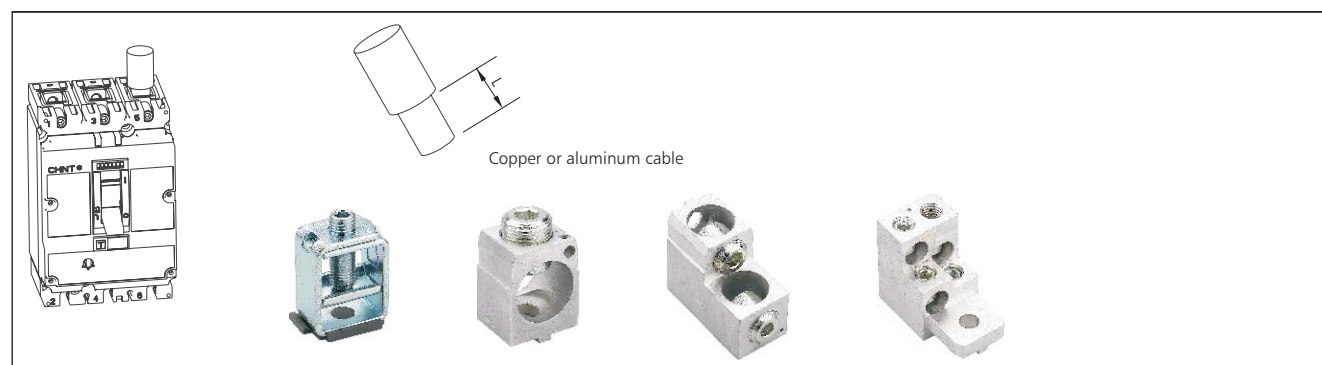
NM8-400, 630, NM8S-400, 630: M12

NM8-800, 1250, NM8S-800, 1250: M10



| Dimension | NM8-125 | NM8S-125 NM8-250 NM8S-250 | NM8-400, 630 NM8S-400, 630 | | NM8-800, 1250 NM8S-800, 1250 |
|--------------------------------------|---------|---------------------------------|-------------------------------|------|---------------------------------|
| Distance between different poles(mm) | 30 | 35 | 52.5 | 70 | 70 |
| L(mm) | ≤ 15 | ≤ 25 | ≤ 40 | ≤ 60 | ≤ 50 |
| D(mm) | ≤ 7 | ≤ 10 | ≤ 20 | ≤ 20 | ≤ 16 |
| Φ (mm) | >6 | >8 | >12 | >12 | >11 |

8.5.2 Connection of bare cable



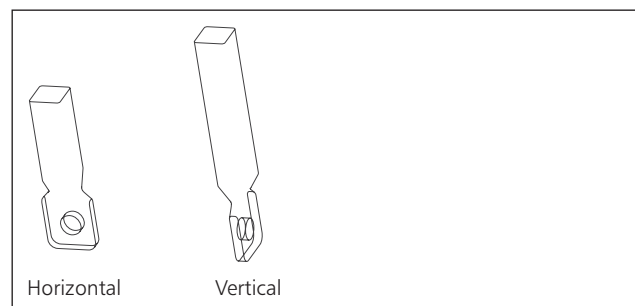
| Dimension | NM8-125 | NM8S-125 NM8-250 NM8S-250 |
|-----------------------|---------|---------------------------------|
| L(mm) | 16 | 20 |
| CSA(mm ²) | 2.5~70 | 2.5~185 |

| Dimension | NM8-400, 630 NM8S-400, 630 | | |
|-----------------------|-------------------------------|--------|--------|
| Number of cable | 1 | 2 | 4 |
| L(mm) | 26 | 30, 60 | 30 |
| CSA(mm ²) | 35~370 | 35~185 | 35~125 |

8.5.3 Rear connection

For rear connection, cable connection plug should be used for connection with copper busbar.

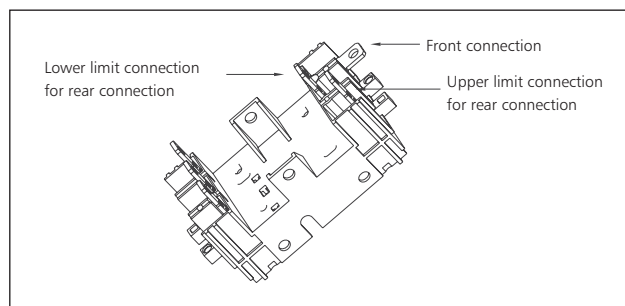
Rear connection



8.5.4 Plug-in type connection

Two modes of front and rear connection are available; for rear connection, upper limit or lower limit connection is used.

Plug-in type



8.5.5 Standard CSA of copper cable or busbar used for connection

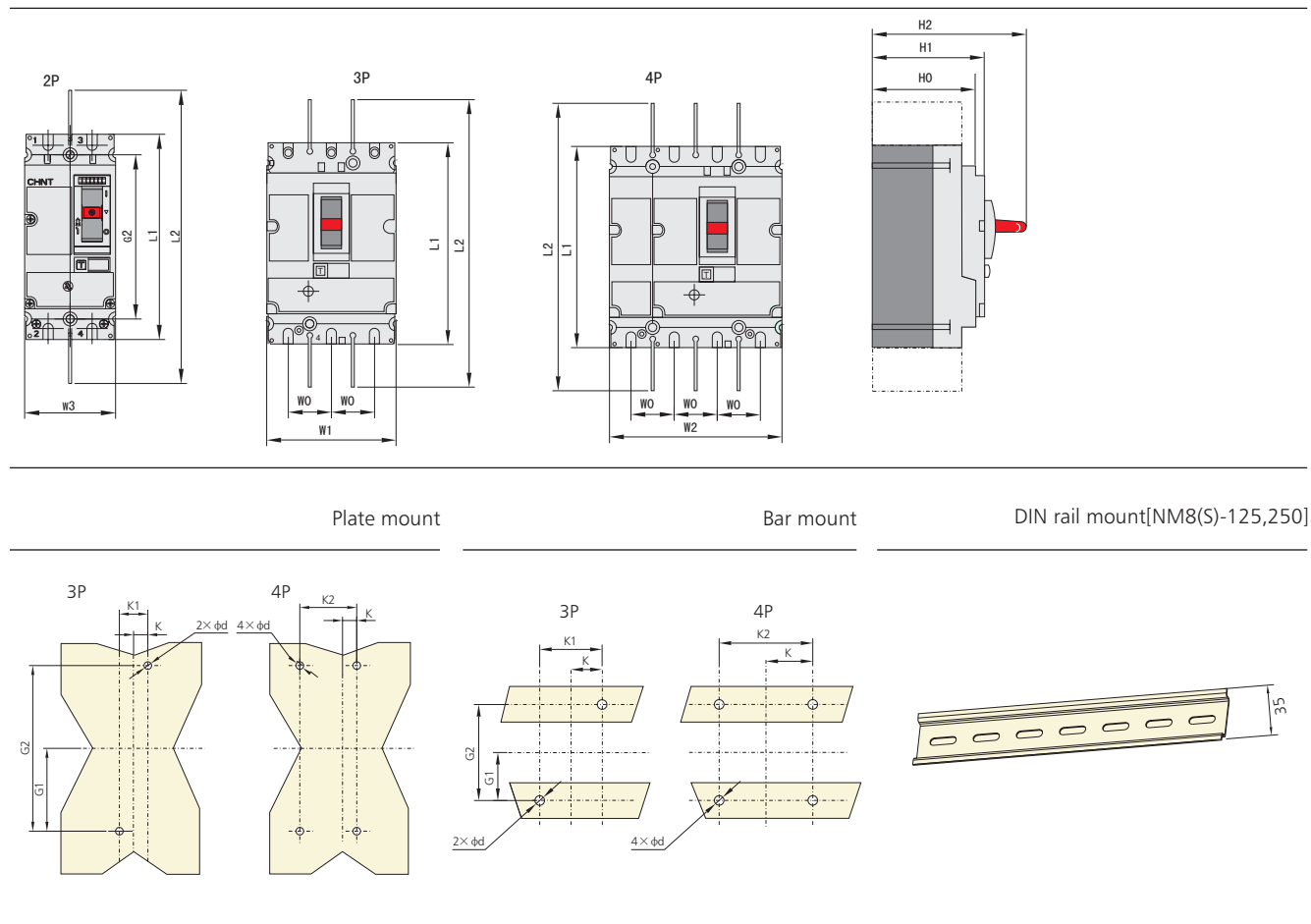
| Rated current(A) | | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 350 | 400 | 500 | 630 | 700 | 800 | 1000 | 1250 |
|---------------------------------------|---------------|-----|-----|-----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|--------|--------|--------|--------|--------|--------|
| Cross section area (mm ²) | Copper cable | 2.5 | 2.5 | 4.0 | 6.0 | 10 | 10 | 16 | 25 | 35 | 50 | 70 | 95 | 120 | 185 | 185 | 240 | 2×150 | 2×185 | 2×240 | 2×240 | - | - |
| | Copper busbar | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2×30×5 | 2×40×5 | 2×50×5 | 2×50×5 | 2×60×5 | 2×70×5 |

8.5.6 Usual cross sections for conductors according intensity

| In(A) | Copper conductors | Copper bar |
|-------|---------------------------------------|------------------------------------|
| | Cross Section Area (mm ²) | Dimensions Area (mm ²) |
| 10 | 1.5 | — |
| 16 | 2.5 | — |
| 20 | 2.5 | — |
| 25 | 4 | — |
| 32 | 6 | — |
| 40 | 10 | — |
| 63 | 16 | — |
| 80 | 25 | — |
| 100 | 35 | — |
| 125 | 50 | — |
| 160 | 70 | — |
| 200 | 95 | — |
| 250 | 120 | — |
| 315 | 185 | — |
| 400 | 240 | — |
| 500 | 2×150 | 2×30×5 |
| 630 | 2×185 | 2×40×5 |
| 800 | 2×240 | 2×50×5 |
| 1000 | — | 2×60×5 |
| 1250 | — | 2×80×5 |

8.6 Overall and Mounting Dimensions

8.6.1 Overall and mounting dimensions of fixed type for front connection

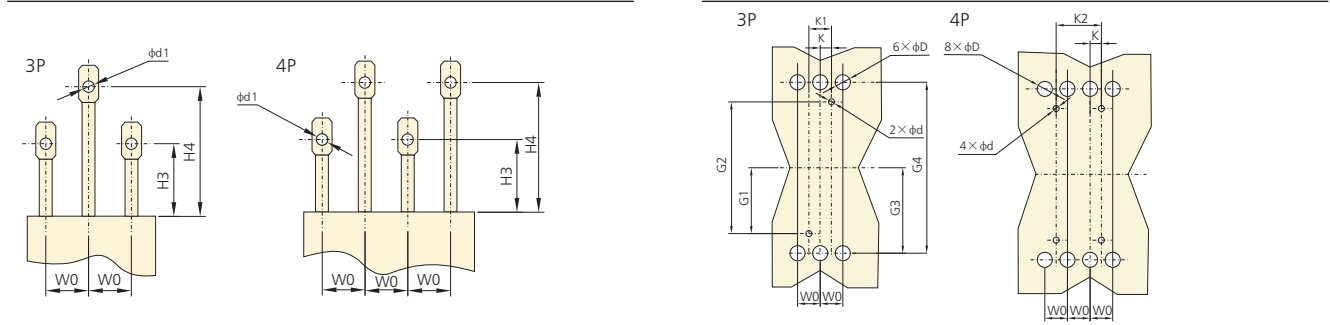


(mm)

| Model | L1 | L2 | H0 | H1 | H2 | K | K1 | K2 | G1 | G2 | W0 | W1 | W2 | W3 | d |
|------------------------------|-----|-----|-----|-----|-----|------|----|-----|------|-----|----|-----|-----|----|---|
| NM8-125 | 140 | 240 | 72 | 79 | 103 | 15 | 30 | 60 | 56 | 112 | 30 | 90 | 120 | 62 | 6 |
| NM8S-125/NM8-250/NM8S-250 | 157 | 357 | 82 | 88 | 126 | 17.5 | 35 | 70 | 62.5 | 125 | 35 | 105 | 140 | 70 | 6 |
| NM8-400, 630/NM8S-400, 630 | 255 | 474 | 95 | 113 | 168 | 22.5 | 45 | 90 | 100 | 200 | 45 | 140 | 185 | - | 6 |
| NM8-800, 1250/NM8S-800, 1250 | 370 | 570 | 132 | 144 | 206 | 35 | 70 | 140 | 120 | 240 | 70 | 210 | 280 | - | 7 |

8.6.2 Overall and mounting dimensions of fixed type for rear connection

Plate mount



(mm)

| Model | H3 | H4 | W0 | K | K1 | K2 | G1 | G2 | G3 | G4 | d | d1 | D |
|---------------------------|----|-----|----|------|----|----|------|-----|-------|-----|---|----|----|
| NM8-125 | 47 | 87 | 30 | 15 | 30 | 60 | 56 | 112 | 62.5 | 125 | 6 | 6 | 15 |
| NM8S-125/NM8-250/NM8S-250 | 57 | 97 | 35 | 17.5 | 35 | 70 | 62.5 | 125 | 72 | 144 | 6 | 8 | 20 |
| NM8-400/NM8S-400 | 56 | 100 | 45 | 22.5 | 45 | 90 | 100 | 200 | 113.5 | 227 | 6 | 13 | 32 |
| NM8-630/NM8S-630 | 56 | 100 | 45 | 22.5 | 45 | 90 | 100 | 200 | 113.5 | 227 | 6 | 13 | 32 |

8.6.3 Overall and mounting dimension of plug-in type

Plate mount

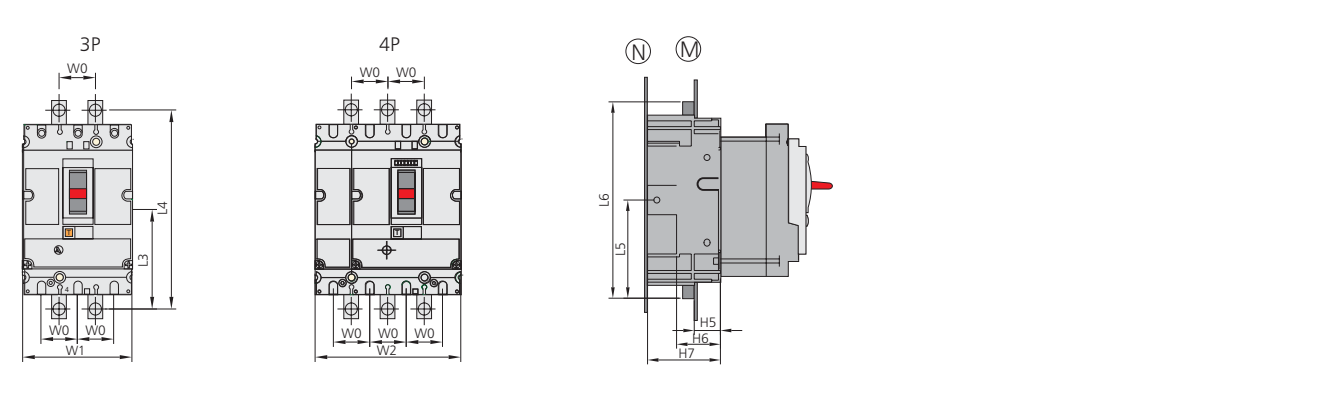


Plate mount

Bar mount

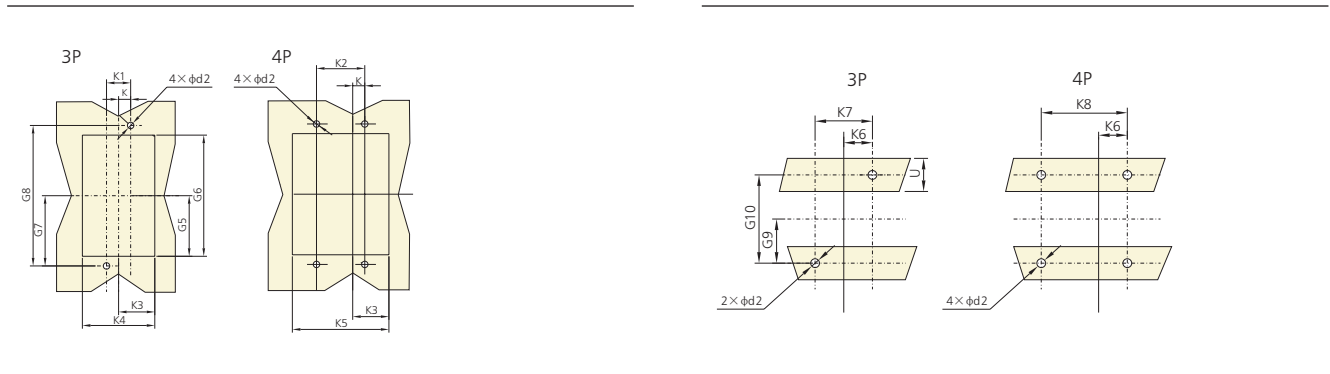
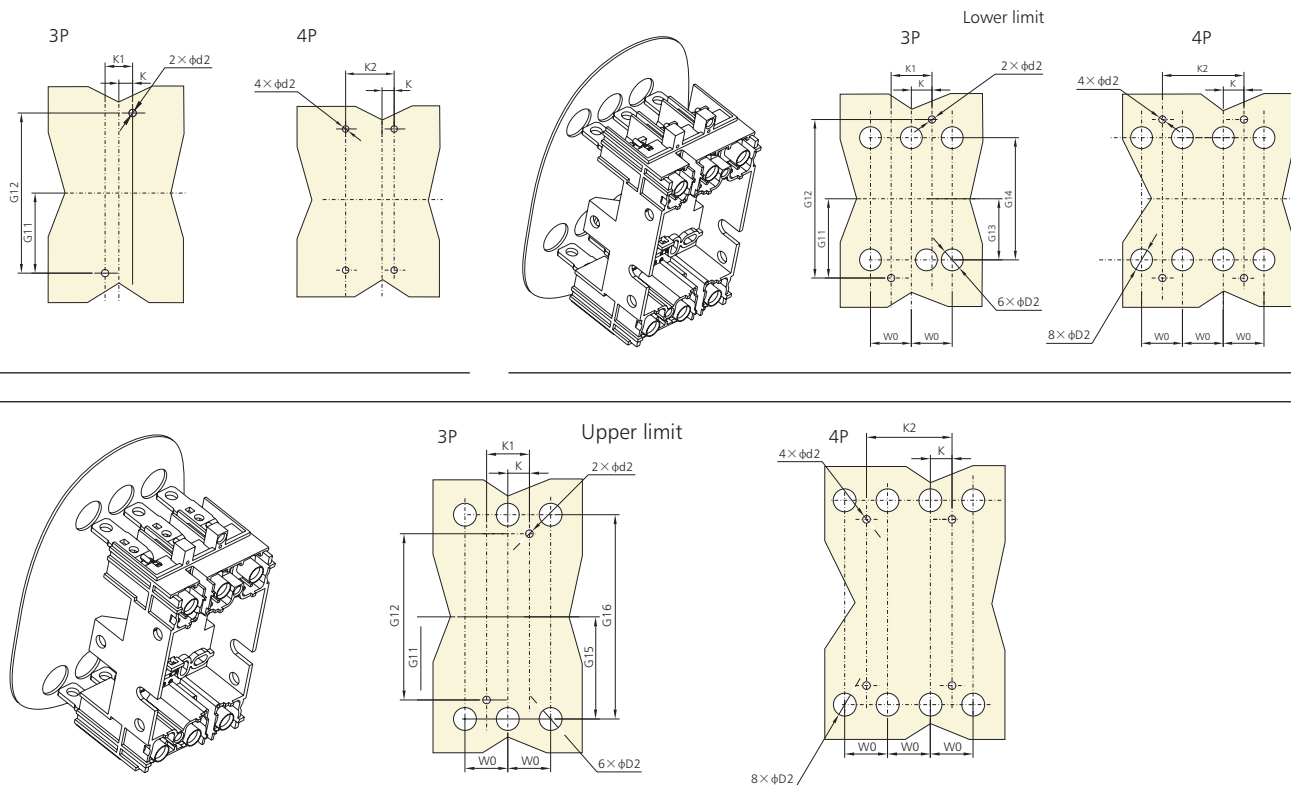


Plate mount **(N)** front connection
Insulation barrier must be mounted
between mounting plate and breaker base

Plate mount **(N)** rear connection
Insulation barrier must be mounted
between mounting plate and breaker base

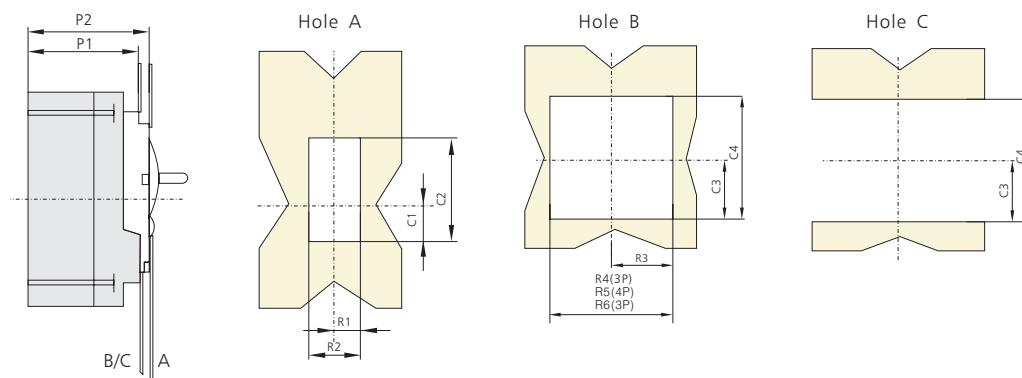


(mm)

| Model | W0 | W1 | W2 | L5 | L6 | H5 | H6 | H7 | K | K1 | K2 | K3 | K4 | K5 | K6 | K7 |
|----------------------------|----|-----|-----|-------|-----|----|----|----|------|----|----|------|-----|-----|----|----|
| NM8-125 | 30 | 90 | 120 | 90 | 180 | 24 | 40 | 67 | 15 | 30 | 60 | 47 | 94 | 124 | 30 | 60 |
| NM8S-125/NM8-250/NM8S-250 | 35 | 105 | 140 | 102.5 | 205 | 27 | 45 | 75 | 17.5 | 35 | 70 | 54.5 | 109 | 144 | 35 | 70 |
| NM8-400, 630/NM8S-400, 630 | 45 | 140 | 185 | 157.5 | 315 | 27 | 45 | 45 | 22.5 | 45 | 90 | 71.5 | 143 | 188 | 45 | 90 |

| Model | K8 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | d2 | D2 | U |
|----------------------------|-----|-----|-----|------|-------|------|-----|------|-----|------|-----|------|-----|----|----|------|
| NM8-125 | 90 | 77 | 154 | 85.2 | 170.4 | 32.5 | 65 | 68 | 136 | 54.5 | 109 | 70.5 | 141 | 6 | 26 | ≤ 32 |
| NM8S-125/NM8-250/NM8S-250 | 105 | 87 | 174 | 95 | 190 | 37.5 | 75 | 77.5 | 155 | 61 | 122 | 79 | 158 | 6 | 30 | ≤ 32 |
| NM8-400, 630/NM8S-400, 630 | 140 | 137 | 274 | 150 | 300 | 75 | 150 | 125 | 250 | 100 | 200 | 126 | 252 | 6 | 33 | ≤ 32 |

8.6.4 Flush type (for fixed or plug-in type)



(mm)

| Model | P1 | P2 | R1 | R2 | R3 | R4 | R5 | R6 | C1 | C2 | C3 | C4 |
|----------------------------|-----|-----|------|----|------|-----|-----|----|------|-----|------|-----|
| NM8-125 | 73 | 80 | 13 | 26 | 46.5 | 93 | 123 | 65 | 26 | 68 | 50.5 | 101 |
| NM8S-125/NM8-250/NM8S-250 | 83 | 90 | 14.5 | 29 | 54 | 108 | 143 | 73 | 33 | 78 | 56.5 | 113 |
| NM8-400, 630/NM8S-400, 630 | 109 | 114 | 26.5 | 53 | 71.5 | 143 | 188 | - | 41.5 | 116 | 108 | 205 |

9. Accessories

9.1 Inner accessories

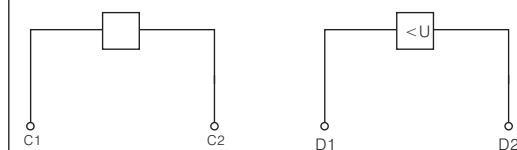
9.1.1 Shunt release

$U_s = 70 \sim 110\% I_n$, circuit breaker reliably operates
Long-time electrification is prohibited
Time of response: pulsive type $\geq 20\text{ms}$, $\leq 60\text{ms}$

9.1.2 Under-voltage release

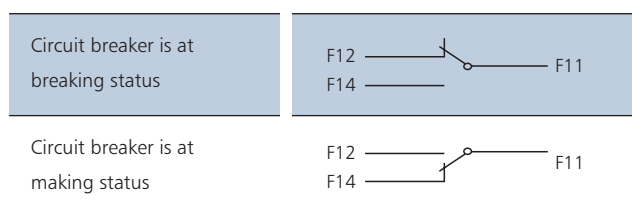
$U_s = 35 \sim 70\% U_n$, circuit breaker reliably breaks
 $U_s \geq 85\% U_n$, circuit breaker reliably closes
 $U_s < 35\% U_n$, prevent circuit breaker from making
Note: With under-voltage release, $U_s \geq 85\% U_n$, circuit breaker normally makes and breaks

Shunt release Wiring diagram Under-voltage release Wiring diagram

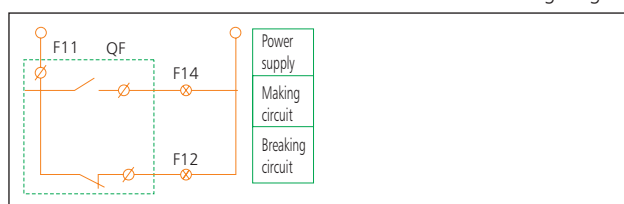


9.1.3 Auxiliary contact

Function: Indication of contacting status



Wiring diagram



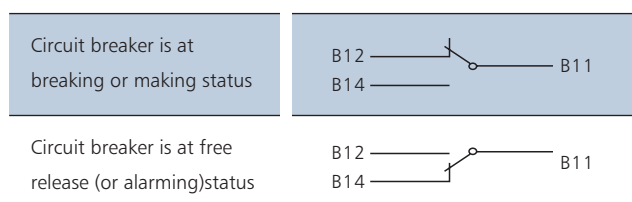
9.1.4 Alarm contact

Function: indication of reason for circuit breaker releasing;

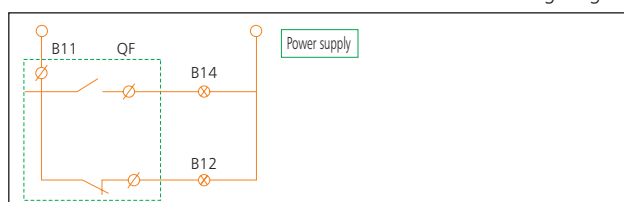
- * Over-load
- * Short-circuit
- * Grounding fault
- * Operation of under-voltage releasing or free tripping

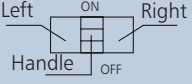


































































When circuit breaker normally makes and breaks, alarm contact not operates.

After free tripping (or tripping due to failure), alarm contact operates and after the circuit breaker again normally operates, alarm contact recovers original status.



Wiring diagram



| Accessory | Code | Mounting and wiring mode | | |
|----------------------------------|-------------------------------------|---|---|---|
| | |  | | |
| | | NM8-125, 250 NM8S-125, 250 | NM8-400, 630 NM8S-400, 630 | NM8-800, 1250 NM8S-800, 1250 |
| | | 3P, 4P | 3P, 4P | 3P, 4P |
| No accessory | |  |  |  |
| Alarm contact | AL |  |  |  |
| Shunt release | SM: AC220V, SQ: AC380V SB: DC24V |  |  |  |
| Auxiliary contact | AX |  |  |  |
| Under-voltage release | UM: AC220V UQ: AC380V |  |  |  |
| Shunt release | SM: AC220V, SQ: AC380V, SB: DC24V |  |  |  |
| Auxiliary contact | AX |  |  |  |
| Two groups of auxiliary contact | AX, AX |  |  |  |
| Auxiliary contact | AX |  |  |  |
| Under-voltage release | UM: AC220V, UQ: AC380V |  |  |  |
| Shunt release | SM: AC220V, SQ: AC380V, SB: DC24V |  |  |  |
| Alarm contact | AL |  |  |  |
| Auxiliary contact | AX |  |  |  |
| Alarm contact | AL |  |  |  |
| Under-voltage release | AL |  |  |  |
| Alarm contact | AL |  |  |  |
| Shunt release | SM: AC220V, SQ: AC380V, SB: DC24V |  |  |  |
| Auxiliary contact, alarm | AX, AL |  |  |  |
| Two groups of auxiliary contact | AX, AX |  |  |  |
| Alarm contact | AX, AL |  |  |  |
| Auxiliary contact, alarm contact | |  |  |  |
| Under-voltage release | (UM: AC220V, UQ: AC380V) |  |  |  |

■-Shunt release ▲-Under-voltage release ○-Auxiliary contact ●-Alarm contact

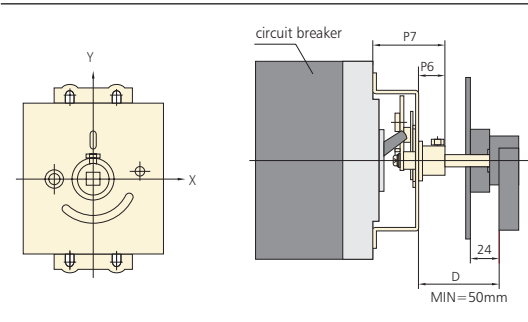
Note: 1: For NM8-125, 250, 400, 630, NM8S-125, 250, 400, 630, under-voltage and shunt release couldn't be simultaneously equipped on one breaker.

2: For NM8-800, 1250, NM8S-800, 1250, at most three auxiliary contacts could be equipped, under-voltage and shunt release could be simultaneously equipped on one breaker, in addition, their positions could be exchanged.

9.2 External accessories

9.2.1 Economic extended rotary handle

Protection degree: IP30
Functions: Isolation function indication;
0(breaking), 1(making)and free tripping indication;
At "OFF" status, the breaker can be fitted with 1-3
padlocks with a diameter of 5-8mm(by customer),
This prevents the door of switchgear being opened
unwantly.



(mm)

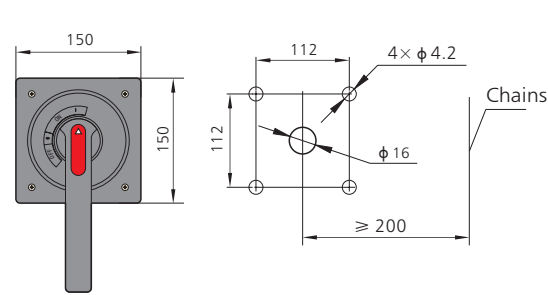
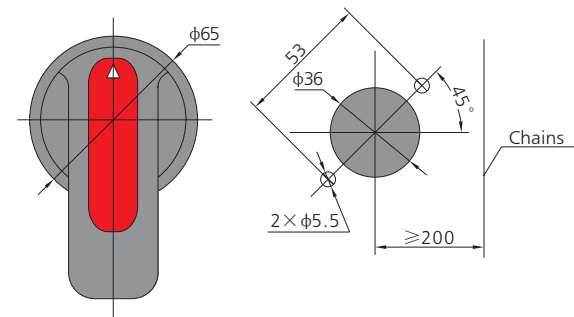
| Dimension | NM8-125 | NM8S-125, NM8-250, NM8S-250 | NM8-400, NM8S-400 | NM8-630, NM8S-630 | NM8(S)-800 | NM8(S)-1250 |
|-----------|---------|-----------------------------|-------------------|-------------------|------------|-------------|
| P6 | 14 | 14 | 20 | 20 | 21 | 21 |
| P7 | 56 | 56 | 60 | 60 | 103 | 103 |



Handle mounting (mm)

NM8(S)-125,250,400,630

NM8(S)-800,1250



9.2.2 Direct rotary handle

Protection degree: IP40

Functions:

Reliable insulation;

Isolation function indication;

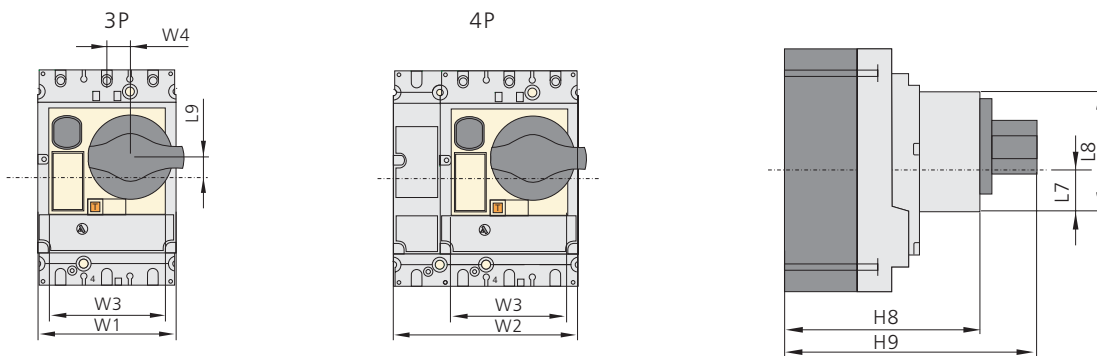
0(breaking), 1(making) and free tripping indication;

Realize free tripping of circuit breaker;

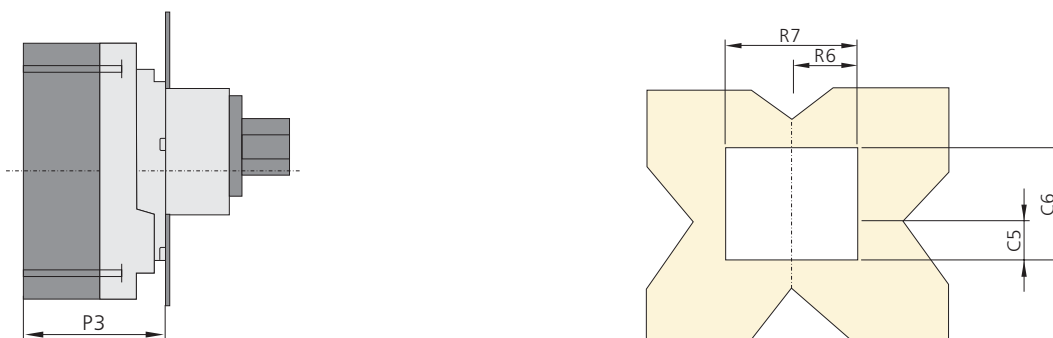
At "OFF" status, the breaker can be fitted with 1-3 padlocks with a diameter of 5~8mm (by customer).



Direct rotary handle



Front boring(fixed or plug-in circuit breaker)



9.2.3 Extended rotary handle
Protection degree: IP55
Functions:
Reliable insulation;
Isolation function indication;
0(breaking), 1(making) and free tripping indication;
When the door is open, the release can be set
and the breaker will not make;
At "OFF" status, the breaker can be fitted with 1~3
padlocks with a diameter of 5~8mm (by customer).
Then door of the switchgear can be opened.



Front boring(fixed or plug-in circuit breaker)(mm)



(mm)

| Model | W1 | W2 | W3 | W4 | L7 | L8 | L9 | H8 | H9 | P3 | P4 | R6 | R7 | C5 | C6 | G17 | G18 |
|----------|----|-----|-----|-------|----|-----|------|-----|-----|-----|----------------|----|-----|------|-----|-----|-----|
| NM8-125 | 30 | 90 | 76 | 15.25 | 37 | 70 | 13.3 | 114 | 148 | 80 | ≥ 175 ≤ 600 | 39 | 78 | 38 | 72 | 36 | 72 |
| NM8S-125 | 35 | 105 | 93 | 9.25 | 39 | 73 | 9 | 125 | 159 | 90 | ≥ 175 ≤ 600 | 48 | 96 | 40.5 | 76 | 36 | 72 |
| NM8-250 | | | | | | | | | | | | | | | | | |
| NM8S-250 | | | | | | | | | | | | | | | | | |
| NM8-400 | 45 | 140 | 122 | 5 | 69 | 121 | 24.5 | 148 | 198 | 115 | ≥ 175 ≤ 600 | 62 | 124 | 70.5 | 124 | 36 | 72 |
| NM8S-400 | | | | | | | | | | | | | | | | | |
| NM8-630 | 45 | 140 | 122 | 5 | 69 | 121 | 24.5 | 148 | 198 | 115 | ≥ 175 ≤ 600 | 62 | 124 | 70.5 | 124 | 36 | 72 |
| NM8S-630 | | | | | | | | | | | | | | | | | |

9.2.4 Motor-driven mechanism

Protection degree: IP40

Functions:

Reliable insulation;

Isolation function indication;

0(breaking), 1(making) and free tripping indication;

Free releasing of circuit breaker;

Making and breaking the breaker manually or automatically

Manual operation

Turn "manual/auto" switch to "auto" position and then turn the handle to make and break the breaker.

Automatic operation:

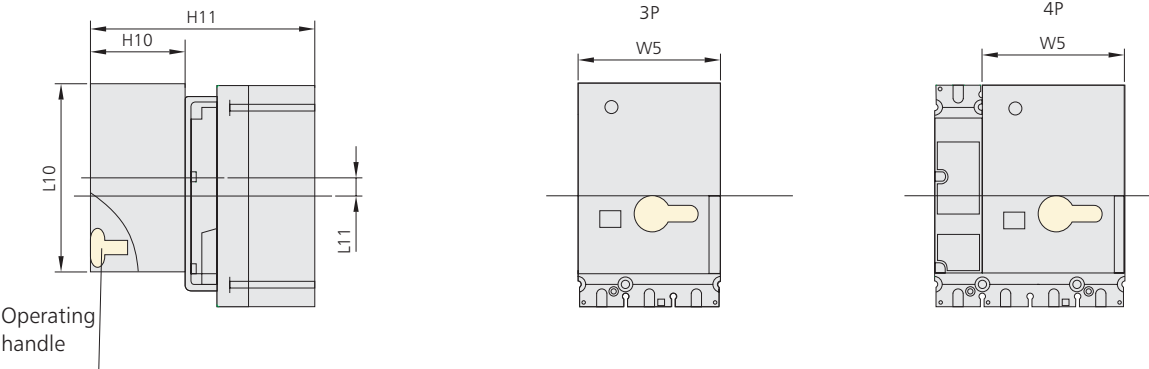
Turn "manual/auto" switch to "manual" position and then push the button to make and break the breaker remotely.

The make/break operation is carried out via pulse or self-retaining type signal control.

Operational range: 85%Un~110%Un.

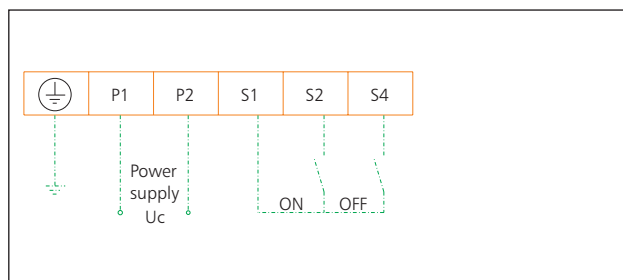
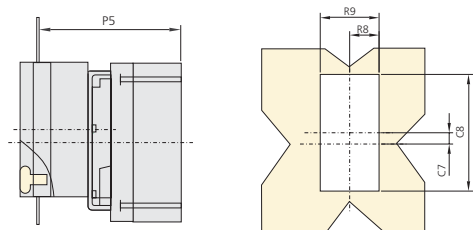


| NM8 circuit breaker | Rated control voltage | Electrical life | Operational current | Power consumption |
|--|-----------------------|-------------------|---------------------|-------------------|
| NM8-125 | 100-240V AC | 10,000 operations | ≤ 0.5 A | 14VA |
| | 100-220V DC | | | 14W |
| | 24V DC | | | 14W |
| NM8S-125 | 100-240V AC | 10,000 operations | ≤ 0.5 A | 14VA |
| NM8-250 | 100-220V DC | | | 14W |
| NM8S-250 | 24V DC | | | 14W |
| NM8-400 NM8S-400 NM8-630 NM8S-630 | 230V AC | 5,000 operations | ≤ 2 A | 35VA |
| | 110V AC | | | 35VA |
| | 220V DC | | | 35W |
| | 110V DC | | | 35W |
| | 24V DC | | | 35W |
| NM8-800 NM8S-800 NM8-1250 NM8S-1250 | 230V/400V AC | 3,000 operations | ≤ 7.5 A | 200W |



Front boring(fixed or plug-in circuit breaker)

Wiring diagram



(mm)

| Model | W5 | H10 | H11 | L10 | L11 | R8 | R9 | P5 | C7 | C8 |
|-----------------------------|-----|-----|-----|-----|------|------|-----|-----|------|-----|
| NM8-125 | 90 | 77 | 164 | 117 | 17.3 | 46.5 | 93 | 144 | 17.3 | 120 |
| NM8S-125, NM8-250, NM8S-250 | 90 | 77 | 175 | 117 | 14.5 | 46.5 | 93 | 155 | 14.5 | 120 |
| NM8-400, NM8S-400 | 107 | 115 | 250 | 174 | 19 | 64 | 128 | 225 | 19 | 177 |
| NM8-630, NM8S-630 | 107 | 115 | 250 | 174 | 19 | 64 | 128 | 225 | 19 | 177 |
| NM8-800, NM8S-800 | - | - | - | - | - | - | - | - | - | - |
| NM8-1250, NM8S-1250 | - | - | - | - | - | - | - | - | - | - |

9.3 Locking system

Locking the breaker at status of making or breaking.
The system can be fitted with 1~3 padlocks
with a diameter of 5~8mm (by customer).

9.4 Terminal cover

Protection degree: IP40

Protect from being contacted with main circuit.

Selection of terminal cover:

Fixed breaker (front connection): Long terminal cover;

Fixed breaker (rear connection): Short terminal cover;

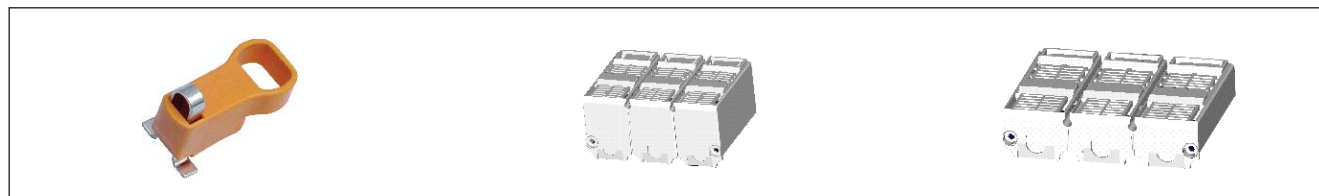
Plug-in breaker: short terminal cover;

When voltage is $\geq 500V$, terminal cover selected for definite connection mode

Locking system

Long terminal cover

Short terminal cover



10. Complementary technical information

10.1 Isolation function

Isolation functions of all the circuit breakers as per IEC60947/EN60947-2; Isolating position of contactors is at 0 (OFF) status. The operating handle will correctly indicate the status of 0(OFF), only if the contactor breaks.

Padlocks could be mounted after the contacts breaks;

Operation of isolation functions will realize following points:

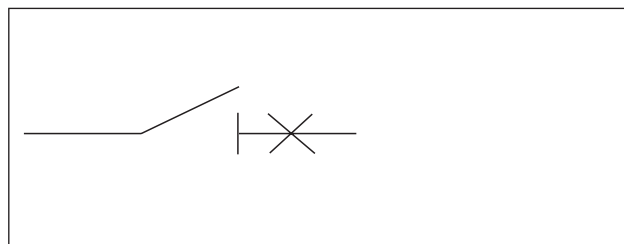
- Contacts operation correctly indicates:
 - operating reliability of interior mechanism;
- No residual current;
- Higher impulse withstands voltage for terminals at the power supply side and on-load side.

10.2 Current-limiting

10.2.1 Current-limiting capacity

The current-limiting capacity of a circuit breaker is its aptitude to limit short-circuits current. By occurring of short-circuit, the breaker is able to limit I^2t in time so as to protect circuits and switchgear at downstream.

The exceptional limiting capacity of NM8 series is due to the rotating double-break technique, which is characterized by very rapid natural repulsion of contacts and the appearance of two arc voltages in series with a very steep wave front.



- a. Exceptional current-limiting capacity is able to greatly reduce power caused by fault current so as to enhance breaking capacity of breaker to $I_{cs}=100\%I_{cu}$;
- b. The capacity has greatly released damages, which short-circuit current lay to apparatus;
- c. The capacity has greatly lowered temperature-rise so as to lengthen service life of the cable;
- d. The capacity has greatly reduced power so as to lessen distortion of contacts and bus bar;
- e. The capacity has greatly decreased interruptions to apparatus nearby.

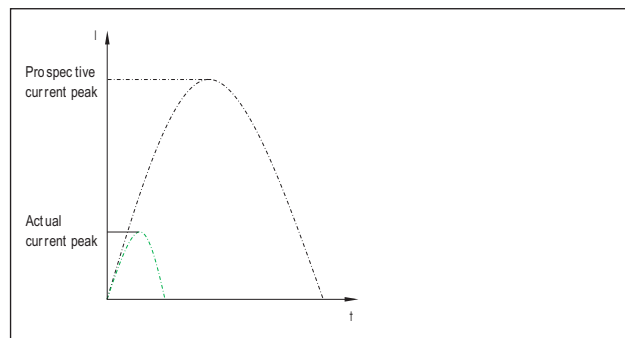
10.2.2 Current-limiting curves

The current-limiting capacity of a circuit breaker is expressed by two curves which are the prospective current and the actual short-circuit current.

Thermal stress (A^2S), i.e. the energy dissipated by the short-circuit current in a conductor with a resistance of 1Ω .

The table below indicates the maximum permissible thermal stresses for cables depending on their insulation, conductor (Cu or Al) and cross section area (CSA).

CSA values are given in mm^2 and thermal stresses in A^2S .



| CSA(mm^2) | | 1.5 | 2.5 | 4 | 6 | 10 | 16 | 25 | 35 |
|---------------|----------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| PVC | Cu K=115 | 2.97×10^4 | 8.26×10^4 | 2.12×10^5 | 4.76×10^5 | 1.32×10^6 | 3.40×10^6 | 8.26×10^6 | 1.62×10^7 |
| | Al K=76 | 1.30×10^4 | 3.61×10^4 | 9.26×10^4 | 2.08×10^5 | 5.78×10^5 | 1.48×10^6 | 3.16×10^6 | 7.08×10^6 |
| Butyl | Cu K=131 | 3.86×10^4 | 1.07×10^5 | 2.75×10^5 | 6.18×10^5 | 1.72×10^6 | 4.39×10^6 | 1.07×10^7 | 2.10×10^7 |
| | Al K=87 | 1.70×10^4 | 4.73×10^4 | 1.21×10^5 | 2.72×10^5 | 7.57×10^5 | 1.94×10^6 | 4.73×10^6 | 9.27×10^6 |
| EPR | Cu K=143 | 4.60×10^4 | 1.28×10^5 | 3.27×10^5 | 7.36×10^5 | 2.04×10^6 | 5.23×10^6 | 1.28×10^7 | 2.51×10^7 |
| | Al K=94 | 1.99×10^4 | 5.52×10^4 | 1.41×10^5 | 3.18×10^5 | 8.84×10^5 | 2.26×10^6 | 5.52×10^6 | 1.08×10^7 |

| CSA(mm^2) | | 50 | 70 | 95 | 120 | 150 | 185 | 240 |
|---------------|----------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| PVC | Cu K=115 | 3.31×10^4 | 6.48×10^4 | 1.19×10^5 | 1.90×10^5 | 2.98×10^6 | 4.53×10^6 | 7.62×10^6 |
| | Al K=76 | 1.44×10^4 | 2.83×10^4 | 5.21×10^4 | 8.32×10^4 | 1.30×10^6 | 1.98×10^6 | 3.33×10^6 |
| Butyl | Cu K=131 | 4.29×10^4 | 8.41×10^4 | 1.55×10^5 | 2.47×10^5 | 3.86×10^6 | 5.87×10^6 | 9.88×10^6 |
| | Al K=87 | 1.89×10^4 | 3.71×10^4 | 6.83×10^4 | 1.09×10^5 | 1.70×10^6 | 2.59×10^6 | 4.36×10^6 |
| EPR | Cu K=143 | 5.11×10^4 | 1.00×10^5 | 1.85×10^5 | 2.94×10^5 | 4.60×10^6 | 7.00×10^6 | 1.18×10^7 |
| | Al K=94 | 2.21×10^4 | 4.33×10^4 | 7.97×10^4 | 1.27×10^5 | 1.99×10^6 | 3.02×10^6 | 5.09×10^6 |

K is quoted from GB-50054 code for design of low voltage electrical installations.

Example:

- a. What is the actual current when a prospective short-circuit current of 125kA rms (peak value=275kA) comes through the current-limiting operation circuit breaker at upstream of NM8-125R

Answer: the peak value=23kA; (for details, refer to current-limiting curves)

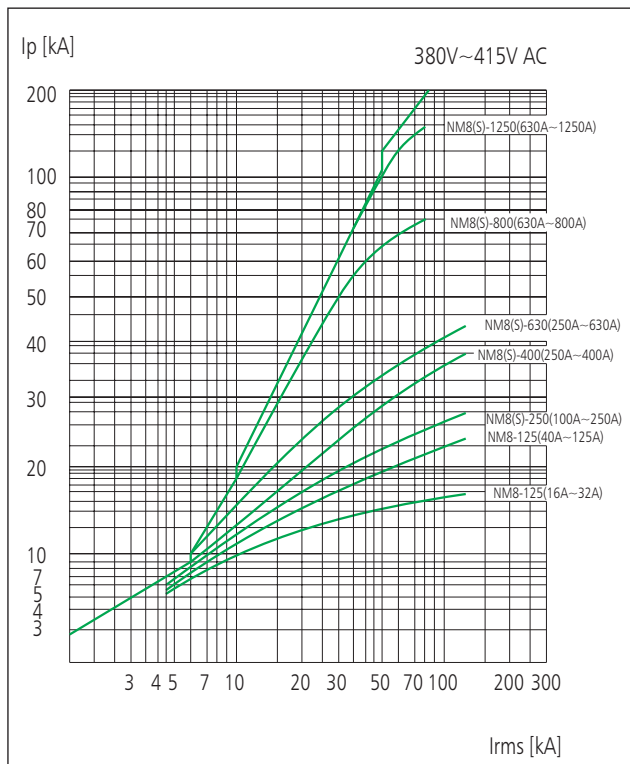
- b. Is a Cu/PVC cable with a CSA of $10mm^2$ adequately protected by a NM8-125S circuit breaker

Answer: the table above indicates that the permissible thermal stress is $1.32 \times 10^6 A^2S$

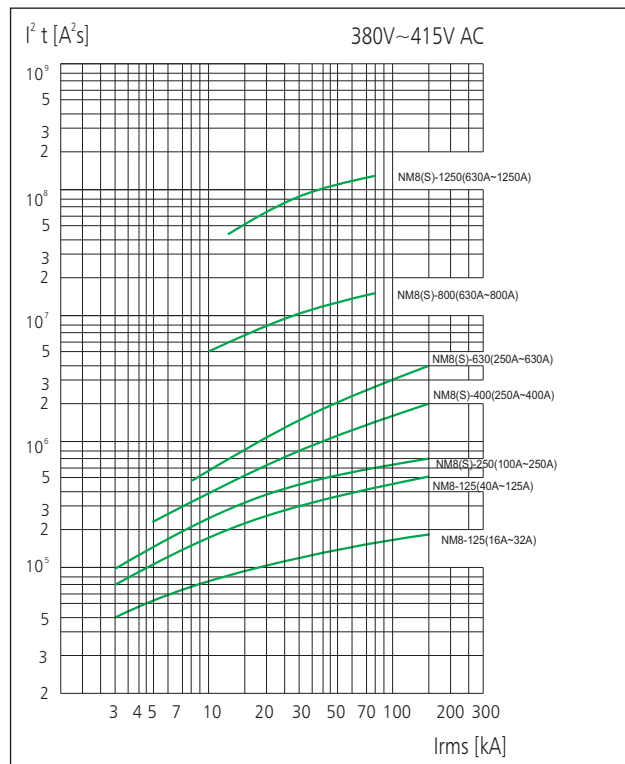
at the point where a NM8-125S ($I_{cu}=50kA$) is installed,

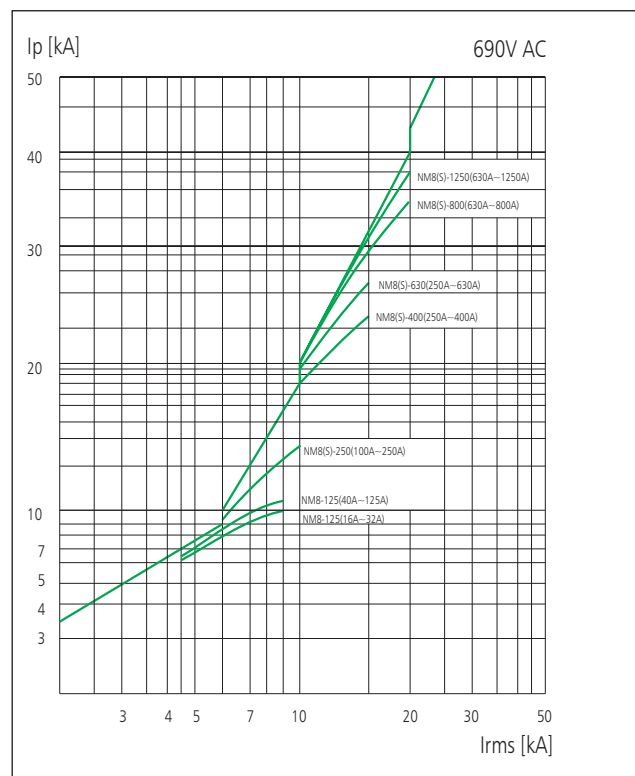
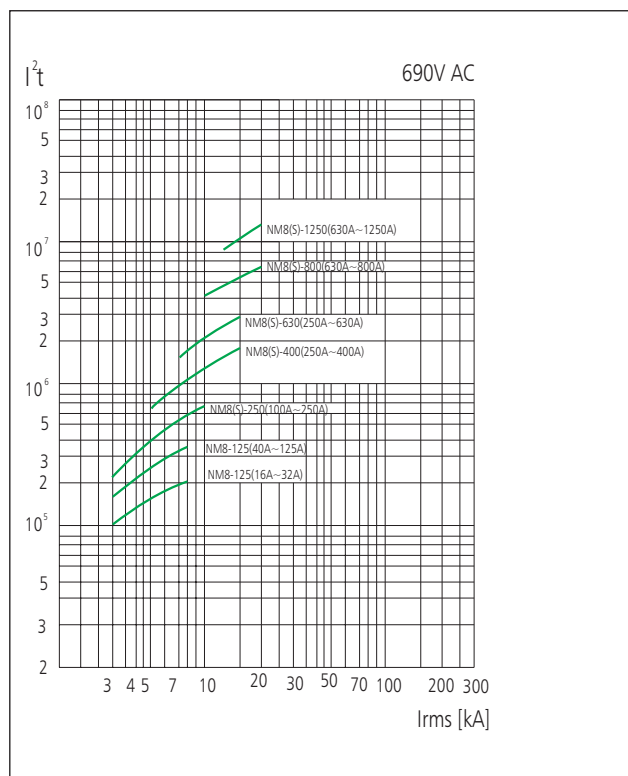
and the short-circuit current is limited within the range of $1.32 \times 10^6 A^2S$, therefore the cable could be protected.

$I^2 t$ Curve



A^2s curve



$I^2 t$ Curve $A^2 s$ curve

10.3 Power loss per pole

| Resistance/ power loss mΩ/W | NM8-125 | NM8S-125 | NM8-250 | NM8S-250 | NM8-400 | NM8S-400 | NM8-630 | NM8S-630 | NM8-800 | NM8S-800 | NM8-1250 | NM8S-1250 |
|-----------------------------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 16 | 7.1/1.8 | | | | | | | | | | | |
| 20 | 6.2/2.5 | | | | | | | | | | | |
| 25 | 4.8/3 | | | | | | | | | | | |
| 32 | 3.7/3.8 | | | | | | | | | | | |
| 40 | 2.6/4.2 | 0.85/1.4 | | | | | | | | | | |
| 50 | 2.7/6.8 | 0.7/1.8 | | | | | | | | | | |
| 63 | 1.7/6.7 | 0.7/2.8 | | | | | | | | | | |
| 80 | 1.3/8.3 | 0.7/4.5 | | | | | | | | | | |
| 100 | 0.85/8.5 | 0.5/5 | 1.0/10 | 0.5/5 | | | | | | | | |
| 125 | 0.71/11.1 | 0.5/7.8 | 1.0/15.6 | 0.5/7.8 | | | | | | | | |
| 160 | | | 0.55/14 | 0.36/9.2 | | | | | | | | |
| 180 | | | 0.55/17.8 | 0.36/11.7 | | | | | | | | |
| 200 | | | 0.55/22 | 0.36/14.4 | | | | | | | | |
| 225 | | | 0.55/27.8 | 0.28/14.2 | | | | | | | | |
| 250 | | | 0.55/34.4 | 0.28/17.5 | 0.3/18.8 | 0.15/9.4 | 0.3/18.8 | 0.13/8.1 | | | | |
| 315 | | | | | 0.28/27.8 | 0.15/14.9 | 0.28/27.8 | 0.13/12.9 | | | | |
| 350 | | | | | 0.28/34.3 | 0.15/18.4 | 0.28/34.3 | 0.13/15.9 | | | | |
| 400 | | | | | 0.24/38.4 | 0.15/24 | 0.24/38.4 | 0.13/20.8 | | | | |
| 500 | | | | | | | 0.2/50 | 0.13/32.5 | | | | |
| 630 | | | | | | | | 0.13/51.6 | 0.04/15.9 | 0.04/15.9 | 0.04/15.9 | 0.04/15.9 |
| 700 | | | | | | | | | 0.04/19.6 | 0.04/19.6 | 0.04/19.6 | 0.04/19.6 |
| 800 | | | | | | | | | 0.04/25.6 | 0.04/25.6 | 0.04/25.6 | 0.04/25.6 |
| 1000 | | | | | | | | | | | 0.04/40 | 0.04/40 |
| 1250 | | | | | | | | | | | 0.04/62.5 | 0.04/62.5 |

10.4 Influences which altitude lay to tripping characteristics

To tripping characteristics of circuit breaker, it is no obvious influence, when the altitude does not exceed 2000m. Once the altitude exceeds the level of 2000m, factors of dielectric stress lowering and cooled air should be taken into consideration.

| Altitude (m) | 2000 | 3000 | 4000 | 5000 |
|------------------------------|------|--------|--------|-------|
| Dielectric stress (V) | 3000 | 2500 | 2100 | 1800 |
| Max. operational voltage (V) | 690 | 550 | 480 | 420 |
| Ratings at 40°C (A) | 1In | 0.96In | 0.93In | 0.9In |

10.5 Cascading

Definition of Cascading

Current-limiting technique has been adopted for cascading to install downstream circuit breaker with lower breaking capacity (cheaper circuit breakers) at the given point of circuit, and upstream NM8(S) circuit breaker operates to limit short-circuit current. Under the operation of cascading network, circuit breaker with lower breaking capacity compared with prospective short-circuit current at the given point could operate under normal short-circuit status. As the short-circuit current will be limited by upstream circuit breaker with current-limiting operation, cascading network is applicable to all the power distribution apparatus protection at downstream.

In addition, cascading operation is not restricted to operation of two switches in serial, but is applicable in various electric networks, as well.

Application of cascading

Through the application of cascading, connected apparatuses could be installed in different switchgears to realize normal operation. Therefore, cascading, in common, refers to various combination of circuit breakers installed at the given point of which the breaking capacity is lower than prospective short-circuit current. And breaking capacity of upstream circuit breakers should be equal to or higher than prospective short-circuit current at the installed point to protect apparatus at downstream. Cascading application is in conformity with IEC60947-2 standards.

Cascading (220/230/240V)

Upstream: NM8-125~1250

Downstream: DZ47, eB, UB, DZ158, DZ267, NB1, NBH8, NM8 (S)-125~1250

| Upstream Breaking capacity (kA rms) → | NM8-125S 85 | NM8-125H 100 | NM8-125R 150 | NM8-250S 85 | NM8-250H 100 | NM8-250R 150 | NM8-400S 85 | |
|---|----------------------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|--|
| Downstream ↓ | Breaking capacity (kA rms) | | | | | | | |
| DZ267 | 30 | 80 | 80 | 30 | 40 | 40 | | |
| DZ47, eB, UB | 30 | 80 | 80 | 30 | 40 | 40 | | |
| NBH8 | 30 | 80 | 80 | 30 | 40 | 40 | | |
| NB1(Icn=6000A) | 40 | 100 | 100 | 40 | 50 | 50 | | |
| NB1-63(Icn=10000A) | 50 | 100 | 100 | 50 | 65 | 65 | | |
| DZ158-100 | 50 | 100 | 100 | 50 | 65 | 65 | 50 | |
| NM8-125S | | 100 | 150 | | 100 | 150 | | |
| NM8-125H | | | 150 | | | 150 | | |
| NM8-250S | | | | | 100 | 150 | | |
| NM8-250H | | | | | | 150 | | |
| NM8-400S | | | | | | | | |
| NM8-400H | | | | | | | | |
| NM8-630S | | | | | | | | |
| NM8-630H | | | | | | | | |
| NM8-800S | | | | | | | | |
| NM8-800H | | | | | | | | |
| NM8-1250S | | | | | | | | |
| NM8-1250H | | | | | | | | |
| NM8S-125S | | 100 | 150 | | 100 | 150 | | |
| NM8S-125H | | | 150 | | | 150 | | |
| NM8S-250S | | | | | 100 | 150 | | |
| NM8S-250H | | | | | | 150 | | |
| NM8S-400S | | | | | | | | |
| NM8S-400H | | | | | | | | |
| NM8S-630S | | | | | | | | |
| NM8S-630H | | | | | | | | |
| NM8S-800S | | | | | | | | |
| NM8S-800H | | | | | | | | |
| NM8S-1250S | | | | | | | | |
| NM8S-1250H | | | | | | | | |

| NM8-400H 100 | NM8-400R 150 | NM8-630S 85 | NM8-630H 100 | NM8-630R 150 | NM8-800S 65 | NM8-800H 100 | NM8-1250S 65 | NM8-1250H 100 |
|-----------------|-----------------|----------------|-----------------|-----------------|----------------|-----------------|-----------------|------------------|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 65 | 65 | | | | | | | |
| 100 | 150 | | 100 | 150 | | 100 | | 100 |
| | 150 | | | 150 | | | | |
| 100 | 150 | | 100 | 150 | | 100 | | 100 |
| | 150 | | | 150 | | | | |
| 100 | 150 | | 100 | 150 | | 100 | | 100 |
| | 150 | | | 150 | | | | |
| | | | 100 | 150 | | 100 | | 100 |
| | | | | 150 | | | | |
| | | | | | | 100 | | 100 |
| | | | | | | | | |
| | | | | | | 100 | | 100 |
| 100 | 150 | | 100 | 150 | | 100 | | 100 |
| | 150 | | | 150 | | | | |
| 100 | 150 | | 100 | 150 | | 100 | | 100 |
| | 150 | | | 150 | | | | |
| 100 | 150 | | 100 | 150 | | 100 | | 100 |
| | 150 | | | 150 | | | | |
| | | | 100 | 150 | | 100 | | 100 |
| | | | | 150 | | | | |
| | | | | | | 100 | | 100 |
| | | | | | | 100 | | 100 |

Upstream: NM8S-125~1250

Downstream: DZ267, DZ47, eB, UB, NBH8, NB1, DZ158, NM8(S)-125~1250

| Upstream Breaking capacity (kA rms) → | NM8S-125S 85 | NM8S-125H 100 | NM8S-250S 85 | NM8S-250H 100 | NM8S-400S 85 | NM8S-400H 100 | |
|---|----------------------------|------------------|-----------------|------------------|-----------------|------------------|--|
| Downstream ↓ | Breaking capacity (kA rms) | | | | | | |
| DZ267 | 30 | 80 | 30 | 40 | | | |
| DZ47, eB, UB | 30 | 80 | 30 | 40 | | | |
| NBH8 | 30 | 80 | 30 | 40 | | | |
| NB1(I _{cn} = 6000A) | 40 | 100 | 40 | 50 | | | |
| NB1(I _{cn} = 10000A) | 50 | 100 | 50 | 65 | | | |
| DZ158-100 | 50 | 100 | 50 | 65 | 50 | 65 | |
| NM8-125S | | 100 | | 100 | | 100 | |
| NM8-125H | | | | | | | |
| NM8-250S | | | | 100 | | 100 | |
| NM8-250H | | | | | | | |
| NM8-400S | | | | | | 100 | |
| NM8-400H | | | | | | | |
| NM8-630S | | | | | | | |
| NM8-630H | | | | | | | |
| NM8-800S | | | | | | | |
| NM8-800H | | | | | | | |
| NM8-1250S | | | | | | | |
| NM8-1250H | | | | | | | |
| NM8S-125S | | 100 | | 100 | | 100 | |
| NM8S-125H | | | | | | | |
| NM8S-250S | | | | 100 | | 100 | |
| NM8S-250H | | | | | | | |
| NM8S-400S | | | | | | 100 | |
| NM8S-400H | | | | | | | |
| NM8S-630S | | | | | | | |
| NM8S-630H | | | | | | | |
| NM8S-800S | | | | | | | |
| NM8S-800H | | | | | | | |
| NM8S-1250S | | | | | | | |
| NM8S-1250H | | | | | | | |

| NM8S-400R 150 | NM8S-630S 85 | NM8S-630H 100 | NM8S-630R 150 | NM8S-800S 65 | NM8S-800H 100 | NM8S-1250S 65 | NM8S-1250H 100 |
|------------------|-----------------|------------------|------------------|-----------------|------------------|------------------|-------------------|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 65 | | | | | | | |
| 150 | | | | | | | |
| 150 | | 100 | 150 | | 100 | | 100 |
| 150 | | | 150 | | | | |
| 150 | | 100 | 150 | | 100 | | 100 |
| 150 | | | 150 | | | | |
| 150 | | 100 | 150 | | 100 | | 100 |
| | | | 150 | | | | |
| | | 100 | 150 | | 100 | | 100 |
| | | | 150 | | | | |
| | | | | | 100 | | 100 |
| | | | | | | | |
| | | | | | 100 | | 100 |
| 150 | | | | | | | |
| 150 | | 100 | 150 | | 100 | | 100 |
| 150 | | | 150 | | | | |
| 150 | | 100 | 150 | | 100 | | 100 |
| 150 | | | 150 | | | | |
| 150 | | 100 | 150 | | 100 | | 100 |
| | | | 150 | | | | |
| | | 100 | 150 | | 100 | | 100 |
| | | | 150 | | | | |
| | | | | | 100 | | 100 |
| | | | | | | | |
| | | | | | 100 | | 100 |

Cascading (380/400/415V)

Upstream: NM8-125~1250;

Downstream: DZ47,eB, UB, DZ158, DZ267, NB1, NBH8, NM8(S)-125~1250

| Upstream Breaking capacity (kA rms) → | NM8-125S 50 | NM8-125H 100 | NM8-125R 150 | NM8-250S 50 | NM8-250H 100 | NM8-250R 150 | NM8-400S 70 |
|---|----------------------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|
| Downstream ↓ | Breaking capacity (kA rms) | | | | | | |
| DZ47, eB, UB | 15 | 20 | 20 | 15 | 20 | 20 | |
| NB1(Icn=6000A) | 25 | 30 | 30 | 25 | 30 | 30 | |
| NB1-63(Icn=10000A) | 25 | 40 | 40 | 25 | 40 | 40 | |
| DZ158-100 | 25 | 40 | 40 | 25 | 40 | 40 | 25 |
| NM8-125S | | 100 | 150 | | 100 | 150 | 70 |
| NM8-125H | | | 150 | | | 150 | |
| NM8-250S | | | | | 100 | 150 | 70 |
| NM8-250H | | | | | | 150 | |
| NM8-400S | | | | | | | |
| NM8-400H | | | | | | | |
| NM8-630S | | | | | | | |
| NM8-630H | | | | | | | |
| NM8-800S | | | | | | | |
| NM8-800H | | | | | | | |
| NM8-1250S | | | | | | | |
| NM8-1250H | | | | | | | |
| NM8S-125S | | 100 | 150 | | 100 | 150 | 70 |
| NM8S-125H | | | 150 | | | 150 | |
| NM8S-250S | | | | | 100 | 150 | 70 |
| NM8S-250H | | | | | | 150 | |
| NM8S-400S | | | | | | | |
| NM8S-400H | | | | | | | |
| NM8S-630S | | | | | | | |
| NM8S-630H | | | | | | | |
| NM8S-800S | | | | | | | |
| NM8S-800H | | | | | | | |
| NM8S-1250S | | | | | | | |
| NM8S-1250H | | | | | | | |

| NM8-400H 100 | NM8-400R 150 | NM8-630S 70 | NM8-630H 100 | NM8-630R 150 | NM8-800S 50 | NM8-800H 70 | NM8-1250S 50 | NM8-1250H 70 |
|-----------------|-----------------|----------------|-----------------|-----------------|----------------|----------------|-----------------|-----------------|
| | | | | | | | | |
| | | | | | | | | |
| 40 | 40 | | | | | | | |
| 100 | 150 | | | | | | | |
| | 150 | 70 | 100 | 150 | | 70 | | 70 |
| 100 | 150 | | | 150 | | | | |
| | 150 | 70 | 100 | 150 | | 70 | | 70 |
| 100 | 150 | | | 150 | | | | |
| | 150 | | 100 | 150 | | 70 | | 70 |
| | | | | 150 | | | | |
| | | | 100 | 150 | | 70 | | 70 |
| | | | | 150 | | | | |
| | | | | | | 70 | | 70 |
| | | | | | | | | |
| | | | | | | 70 | | 70 |
| 100 | 150 | | | | | | | |
| | 150 | 70 | 100 | 150 | | 70 | | 70 |
| 100 | 150 | | | 150 | | | | |
| | 150 | 70 | 100 | 150 | | 70 | | 70 |
| 100 | 150 | | | 150 | | | | |
| | 150 | | 100 | 150 | | 70 | | 70 |
| | | | | 150 | | | | |
| | | | 100 | 150 | | 70 | | 70 |
| | | | | 150 | | | | |
| | | | | | | 70 | | 70 |
| | | | | | | | | |
| | | | | | | 70 | | 70 |

Upstream: NM8S-125~1250

Downstream: DZ267, DZ47, eB, UB, NBH8, NB1, DZ158, NM8 (S) -125~1250

| Upstream Breaking capacity (kA rms) → | NM8S-125S 50 | NM8S-125H 100 | NM8S-250S 50 | NM8S-250H 100 | NM8S-400S 70 | NM8S-400H 100 |
|---|----------------------------|------------------|-----------------|------------------|-----------------|------------------|
| Downstream ↓ | Breaking capacity (kA rms) | | | | | |
| DZ47, eB, UB | 15 | 20 | 15 | 20 | | |
| NB1(Icn=6000A) | 25 | 30 | 25 | 30 | | |
| NB1-63(Icn=10000A) | 25 | 40 | 25 | 40 | | |
| DZ158 | 25 | 40 | 25 | 40 | 25 | 40 |
| NM8-125S | | 100 | | 100 | | 100 |
| NM8-125H | | | | 100 | | 100 |
| NM8-250S | | | | 100 | | 100 |
| NM8-250H | | | | | | 100 |
| NM8-400S | | | | | | 100 |
| NM8-400H | | | | | | |
| NM8-630S | | | | | | |
| NM8-630H | | | | | | |
| NM8-800S | | | | | | |
| NM8-800H | | | | | | |
| NM8-1250S | | | | | | |
| NM8-1250H | | | | | | |
| NM8S-125S | | 100 | | 100 | | 100 |
| NM8S-125H | | | | 100 | | 100 |
| NM8S-250S | | | | 100 | | 100 |
| NM8S-250H | | | | | | 100 |
| NM8S-400S | | | | | | 100 |
| NM8S-400H | | | | | | |
| NM8S-630S | | | | | | |
| NM8S-630H | | | | | | |
| NM8S-800S | | | | | | |
| NM8S-800H | | | | | | |
| NM8S-1250S | | | | | | |
| NM8S-1250H | | | | | | |

| NM8S-400R 150 | NM8S-630S 70 | NM8S-630H 100 | NM8S-630R 150 | NM8S-800S 50 | NM8S-800H 70 | NM8S-1250S 50 | NM8S-1250H 70 |
|------------------|-----------------|------------------|------------------|-----------------|-----------------|------------------|------------------|
| | | | | | | | |
| | | | | | | | |
| 40 | | | | | | | |
| 150 | | 100 | 150 | | 70 | | 70 |
| 150 | | 100 | 150 | | 70 | | 70 |
| 150 | | 100 | 150 | | 70 | | 70 |
| 150 | | 100 | 150 | | 70 | | 70 |
| 150 | | 100 | 150 | | 70 | | 70 |
| 150 | | 100 | 150 | | 70 | | 70 |
| | | 100 | 150 | | 70 | | 70 |
| | | | 150 | | 70 | | 70 |
| | | | | | 70 | | 70 |
| | | | | | 70 | | 70 |
| | | | | | 70 | | 70 |
| 150 | | 100 | 150 | | 70 | | 70 |
| 150 | | 100 | 150 | | 70 | | 70 |
| 150 | | 100 | 150 | | 70 | | 70 |
| 150 | | 100 | 150 | | 70 | | 70 |
| 150 | | 100 | 150 | | 70 | | 70 |
| 150 | | 100 | 150 | | 70 | | 70 |
| | | 100 | 150 | | 70 | | 70 |
| | | | 150 | | 70 | | 70 |
| | | | | | 70 | | 70 |
| | | | | | 70 | | 70 |
| | | | | | 70 | | 70 |
| | | | | | 70 | | 70 |

10.6 Protection discrimination(selectivity)

Protection discrimination is a must factor in low-voltage power distribution design so as to ensure reliability and continuity for users' electricity utilization.

Whenever there is fault occurring in the electric network, the upstream breaker where the fault is occurring breaks.

Protection discrimination could be clarified into 3 kinds: Total protection discrimination, partial protection discrimination and no protection discrimination(refer to fig aside):


Total protection discrimination: For all kinds of current where the faults occurred, including the overload current and nonresistance current, breaker D2 breaks and breaker D1 keeps making status.

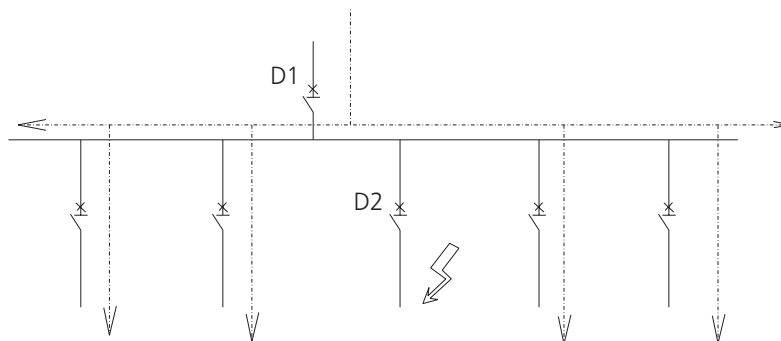
Partial protection discrimination: For a much lower current compared with where the fault occurred (the limit value of protection discrimination), breaker D2 breaks and breaker D1 keeps making status (total protection discrimination).

When the fault current is lower than limit value of protection discrimination, the upstream and downstream breakers are applicable to protection discrimination; when the fault current exceeds limit value of protection discrimination, the upstream and downstream breakers are not applicable to protection discrimination (no protection discrimination). And both of the breakers of D1 and D2 break.

Upstream: NM8-125~1250

Downstream: DZ267, DZ47, eB, UB, NBH8, NB1, DZ158

|  Upstream Downstream In (A) Ii (kA) | | NM8-125 S/H/R | | | | | | | | | | NM8-250 S/H/R | | | |
|---|-----|---------------|------|-----|-----|-----|-----|-----|------|-----|-----|---------------|-----|-----|-----|
| | | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 100 | 160 | 200 | 250 |
| DZ267 C Curves | ≤10 | 0.19 | 0.25 | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 16 | | | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 20 | | | | | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 25 | | | | | | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 32 | | | | | | | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| DZ47, eB, UB C Curves | ≤10 | 0.19 | 0.25 | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 16 | | | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 20 | | | | | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 25 | | | | | | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 32 | | | | | | | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 40 | | | | | | | | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 50 | | | | | | | | | 0.8 | 1.0 | T | T | T | T |
| NBH8 B C Curves | ≤10 | 0.19 | 0.25 | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 16 | | | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 20 | | | | | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 25 | | | | | | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 32 | | | | | | | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 40 | | | | | | | | 0.63 | 0.8 | 1.0 | T | T | T | T |
| NB1 B C D Curves | ≤10 | 0.19 | 0.25 | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 16 | | | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 20 | | | | | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 25 | | | | | | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 32 | | | | | | | 0.5 | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 40 | | | | | | | | 0.63 | 0.8 | 1.0 | T | T | T | T |
| | 50 | | | | | | | | | 0.8 | 1.0 | T | T | T | T |
| | 63 | | | | | | | | | 0.8 | 1.0 | T | T | T | T |
| DZ158 | 63 | | | | | | | | | 0.8 | 1.0 | T | T | T | T |
| | 80 | | | | | | | | | | 1.0 | T | T | T | T |
| | 100 | | | | | | | | | | | | T | T | T |

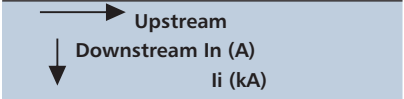
[illegible]

Downstream: DZ267, DZ47, eB, UB, NBH8, NB1, DZ158

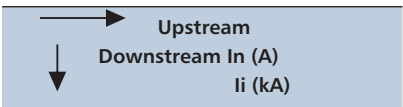
49 > >>

[illegible]

Upstream: NM8-125~1250
Downstream: NM8(S)-125~1250

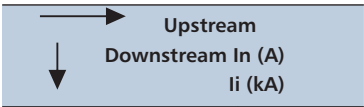
|  | | NM8-125 S/H/R | | | | | | | | | | NM8-250 S/H/R | | | | |
|---|-----|---------------|----|----|-----|-----|-----|-----|------|-----|-----|---------------|------|-----|-----|--|
| | | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 100 | 160 | 200 | 250 | |
| NM8-125 S | 16 | | | | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0 | T | T | T | |
| | 20 | | | | | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0 | T | T | T | |
| | 25 | | | | | | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0 | T | T | T | |
| | 32 | | | | | | | 0.5 | 0.63 | 0.8 | 1.0 | 2.0 | T | T | T | |
| | 40 | | | | | | | | 0.63 | 0.8 | 1.0 | 2.0 | T | T | T | |
| | 50 | | | | | | | | | 0.8 | 1.0 | 2.0 | T | T | T | |
| | 63 | | | | | | | | | | 1.0 | 2.0 | T | T | T | |
| | 80 | | | | | | | | | | | | 1.25 | T | T | |
| | 100 | | | | | | | | | | | | 1.25 | T | T | |
| | 125 | | | | | | | | | | | | | | T | |
| NM8-125 H/R | 16 | | | | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0 | T | T | T | |
| | 20 | | | | | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0 | T | T | T | |
| | 25 | | | | | | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0 | T | T | T | |
| | 32 | | | | | | | 0.5 | 0.63 | 0.8 | 1.0 | 2.0 | T | T | T | |
| | 40 | | | | | | | | 0.63 | 0.8 | 1.0 | 2.0 | 3.6 | 3.6 | 3.6 | |
| | 50 | | | | | | | | | 0.8 | 1.0 | 2.0 | 3.6 | 3.6 | 3.6 | |
| | 63 | | | | | | | | | | 1.0 | 2.0 | 3.6 | 3.6 | 3.6 | |
| | 80 | | | | | | | | | | | | 3.6 | 3.6 | 3.6 | |
| | 100 | | | | | | | | | | | | 3.6 | 3.6 | 3.6 | |
| | 125 | | | | | | | | | | | | | | 3.6 | |
| NM8S-125 S/H | 40 | | | | | | | | 0.63 | 0.8 | 1.0 | 1.25 | T | T | T | |
| | 100 | | | | | | | | | | | | 1.25 | T | T | |
| | 125 | | | | | | | | | | | | | | 2.5 | |
| NM8-250 S | 100 | | | | | | | | | | | | | | 3 | |
| | 160 | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | | |
| NM8-250 H/R | 100 | | | | | | | | | | | | | | 3 | |
| | 160 | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | | |
| NM8S-250 S/H | 100 | | | | | | | | | | | | 1.6 | 2 | 2.5 | |
| | 160 | | | | | | | | | | | | | | 2.5 | |
| | 200 | | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | | |
| NM8-400 S/H/R | 250 | | | | | | | | | | | | | | | |
| | 315 | | | | | | | | | | | | | | | |
| | 350 | | | | | | | | | | | | | | | |
| | 400 | | | | | | | | | | | | | | | |
| NM8S-400 S/H/R | 250 | | | | | | | | | | | | | | | |
| | 315 | | | | | | | | | | | | | | | |
| | 350 | | | | | | | | | | | | | | | |
| | 400 | | | | | | | | | | | | | | | |
| NM8-630 S/H/R | 250 | | | | | | | | | | | | | | | |
| | 315 | | | | | | | | | | | | | | | |
| | 350 | | | | | | | | | | | | | | | |
| | 400 | | | | | | | | | | | | | | | |
| | 500 | | | | | | | | | | | | | | | |

| NM8-400 S/H/R | | | | NM8-630 S/H/R | | | | | NM8-800 S/H | | | NM8-1250 S/H | | | | |
|---------------|-----|-----|-----|---------------|-----|-----|-----|-----|-------------|-----|-----|--------------|-----|-----|------|------|
| 250 | 315 | 350 | 400 | 250 | 315 | 350 | 400 | 500 | 630 | 700 | 800 | 630 | 700 | 800 | 1000 | 1250 |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | 50 | 50 | 50 | 50 | 50 | 50 | T | T |
| T | T | T | T | T | T | T | T | T | 50 | 50 | 50 | 50 | 50 | 50 | T | T |
| T | T | T | T | T | T | T | T | T | 50 | 50 | 50 | 50 | 50 | 50 | T | T |
| T | T | T | T | T | T | T | T | T | 50 | 50 | 50 | 50 | 50 | 50 | T | T |
| T | T | T | T | T | T | T | T | T | 50 | 50 | 50 | 50 | 50 | 50 | T | T |
| T | T | T | T | T | T | T | T | T | 50 | 50 | 50 | 50 | 50 | 50 | T | T |
| T | T | T | T | T | T | T | T | T | 50 | 50 | 50 | 50 | 50 | 50 | T | T |
| T | T | T | T | T | T | T | T | T | 50 | 50 | 50 | 50 | 50 | 50 | T | T |
| T | T | T | T | T | T | T | T | T | 50 | 50 | 50 | 50 | 50 | 50 | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| 5 | T | T | T | 3 | T | T | T | T | T | T | T | T | T | T | T | T |
| | 5 | T | T | | 5 | T | T | T | T | T | T | T | T | T | T | T |
| | | 5 | T | | | 5 | T | T | T | T | T | T | T | T | T | T |
| | | | 5 | | | | 5 | T | T | T | T | T | T | T | T | T |
| 5 | | T | T | 3 | T | T | T | T | 40 | 40 | 40 | 40 | 40 | 40 | T | T |
| | | T | T | | 5 | T | T | T | 40 | 40 | 40 | 40 | 40 | 40 | T | T |
| | | 5 | T | | | 5 | T | T | 40 | 40 | 40 | 40 | 40 | 40 | T | T |
| | | | 5 | | | | 5 | T | 40 | 40 | 40 | 40 | 40 | 40 | T | T |
| 5 | | 5 | 5 | T | T | T | T | T | T | T | T | T | T | T | T | T |
| 5 | | 5 | 5 | T | T | T | T | T | T | T | T | T | T | T | T | T |
| | | 5 | 5 | | | | T | T | T | T | T | T | T | T | T | T |
| | | | 5 | | | | | T | T | T | T | T | T | T | T | T |
| | | | | | | | 8 | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | | | | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | | | | | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | | | | | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | | | 8 | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | | | | | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | | | | | | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | | | | | | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | | | | 8 | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | | | | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | | | | | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | | | | | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | | | | | | 30 | 30 | 30 | 30 | 30 | T | T |


|  | | NM8-125 S/H/R | | | | | | | | | | NM8-250 S/H/R | | | | |
|---|------|---------------|----|----|----|----|----|----|----|-----|-----|---------------|-----|-----|-----|--|
| | | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 100 | 160 | 200 | 250 | |
| NM8S-630 S/H/R | 250 | | | | | | | | | | | | | | | |
| | 315 | | | | | | | | | | | | | | | |
| | 350 | | | | | | | | | | | | | | | |
| | 400 | | | | | | | | | | | | | | | |
| | 500 | | | | | | | | | | | | | | | |
| | 630 | | | | | | | | | | | | | | | |
| NM8-800 S/H | 630 | | | | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | | | | |
| | 800 | | | | | | | | | | | | | | | |
| NM8S-800 S/H | 630 | | | | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | | | | |
| | 800 | | | | | | | | | | | | | | | |
| NM8-1250 S/H | 630 | | | | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | | | | |
| | 800 | | | | | | | | | | | | | | | |
| | 1000 | | | | | | | | | | | | | | | |
| | 1250 | | | | | | | | | | | | | | | |
| NM8S-1250 S/H | 630 | | | | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | | | | |
| | 800 | | | | | | | | | | | | | | | |
| | 1000 | | | | | | | | | | | | | | | |
| | 1250 | | | | | | | | | | | | | | | |

Upstream: NM8S-125~1250

Downstream: NM8(S)-125~1250

|  | | NM8S-125 S/H | | | NM8S-250 S/H | | | | NM8S-400 S/H/R | | | | |
|---|-----|--------------|-----|-----|--------------|-----|-----|-----|----------------|-----|-----|-----|--|
| | | 40 | 100 | 125 | 100 | 160 | 200 | 250 | 250 | 315 | 350 | 400 | |
| NM8-125 S | 16 | | 1.2 | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 20 | | 1.2 | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 25 | | 1.2 | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 32 | | 1.2 | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 40 | | 1.2 | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 50 | | 1.2 | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 63 | | | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 80 | | | | | T | T | T | T | T | T | T | |
| | 100 | | | | | | T | T | T | T | T | T | |
| | 125 | | | | | | | T | T | T | T | T | |
| NM8-125 H/R | 16 | | 1.2 | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 20 | | 1.2 | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 25 | | 1.2 | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 32 | | 1.2 | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 40 | | 1.2 | 1.2 | 1.2 | T | T | T | T | T | T | T | |
| | 50 | | 1.2 | 1.2 | 1.2 | 2 | 36 | 36 | T | T | T | T | |
| | 63 | | | 1.2 | 1.2 | 2 | 36 | 36 | T | T | T | T | |
| | 80 | | | | | 2 | 36 | 36 | T | T | T | T | |
| | 100 | | | | | | | 36 | T | T | T | T | |
| | 125 | | | | | | | 36 | T | T | T | T | |
| NM8S-125 S/H | 40 | | 1.2 | 1.2 | 2 | 2 | T | T | T | T | T | T | |
| | 100 | | | | | 2 | T | T | T | T | T | T | |
| | 125 | | | | | | | T | T | T | T | T | |

[illegible][illegible]

|  Upstream Downstream In (A) I _i (kA) | | NM8S-125 S/H | | | NM8S-250 S/H | | | | NM8S-400 S/H/R | | | | |
|--|------|--------------|-----|-----|--------------|-----|-----|-----|----------------|-----|-----|-----|--|
| | | 40 | 100 | 125 | 100 | 160 | 200 | 250 | 250 | 315 | 350 | 400 | |
| | 40 | | 1.2 | 1.2 | 2 | 2 | T | T | T | T | T | T | |
| | 100 | | | | | 2 | T | T | T | T | T | T | |
| | 125 | | | | | | | T | T | T | T | T | |
| NM8-250 S | 100 | | | | | | | 3 | 5 | 5 | 5 | 5 | |
| | 160 | | | | | | | | | | 5 | 5 | |
| | 200 | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | |
| NM8-250 H/R | 100 | | | | | | | 3 | 5 | 5 | 5 | 5 | |
| | 160 | | | | | | | | | | 5 | 5 | |
| | 200 | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | |
| NM8S-250 S/H | 100 | | | | | | | 5 | 5 | 5 | 5 | 5 | |
| | 160 | | | | | | | 5 | 5 | 5 | 5 | 5 | |
| | 200 | | | | | | | | | | 5 | 5 | |
| | 250 | | | | | | | | | | | 5 | |
| NM8-400 S/H/R | 250 | | | | | | | | | | | | |
| | 315 | | | | | | | | | | | | |
| | 350 | | | | | | | | | | | | |
| | 400 | | | | | | | | | | | | |
| NM8S-400 S/H/R | 250 | | | | | | | | | | | | |
| | 315 | | | | | | | | | | | | |
| | 350 | | | | | | | | | | | | |
| | 400 | | | | | | | | | | | | |
| NM8-630 S/H/R | 250 | | | | | | | | | | | | |
| | 315 | | | | | | | | | | | | |
| | 350 | | | | | | | | | | | | |
| | 400 | | | | | | | | | | | | |
| | 500 | | | | | | | | | | | | |
| NM8S-630 S/H/R | 250 | | | | | | | | | | | | |
| | 315 | | | | | | | | | | | | |
| | 350 | | | | | | | | | | | | |
| | 400 | | | | | | | | | | | | |
| | 500 | | | | | | | | | | | | |
| NM8-800 S/H | 630 | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | |
| | 800 | | | | | | | | | | | | |
| NM8S-800 S/H | 630 | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | |
| | 800 | | | | | | | | | | | | |
| NM8-1250 S/H | 630 | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | |
| | 800 | | | | | | | | | | | | |
| | 1000 | | | | | | | | | | | | |
| NM8S-1250 S/H | 1250 | | | | | | | | | | | | |
| | 630 | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | |
| | 800 | | | | | | | | | | | | |
| NM8S-1250 S/H | 1000 | | | | | | | | | | | | |
| | 1250 | | | | | | | | | | | | |

Note:

- a. The area with T indication clarifies total protection discrimination between upstream and downstream circuit breakers;
 b. The area with numbers clarifies partial protection discrimination between upstream and downstream circuit breakers;
 c. For partial protection discrimination, the Max. fault current values to ensure time discrimination performance are given in the table; when fault current exceeds this value, upstream and downstream circuit breakers may operate at the same time.

| NM8S-630 S/H/R | | | | | | NM8S-800 S/H | | | NM8S-1250 S/H | | | | |
|----------------|-----|-----|-----|-----|-----|--------------|-----|-----|---------------|-----|-----|------|------|
| 250 | 315 | 350 | 400 | 500 | 630 | 630 | 700 | 800 | 630 | 700 | 800 | 1000 | 1250 |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| | | | T | T | T | T | T | T | T | T | T | T | T |
| | | | | T | T | T | T | T | T | T | T | T | T |
| | | | | | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | 40 | 40 | 40 | 40 | 40 | 40 | T | T |
| | | | T | T | T | 40 | 40 | 40 | 40 | 40 | 40 | T | T |
| | | | | T | T | 40 | 40 | 40 | 40 | 40 | 40 | T | T |
| | | | | | T | 40 | 40 | 40 | 40 | 40 | 40 | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| T | T | T | T | T | T | T | T | T | T | T | T | T | T |
| | | | T | T | T | T | T | T | T | T | T | T | T |
| | | | | T | T | T | T | T | T | T | T | T | T |
| | | | 8 | 8 | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | 8 | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | 8 | 8 | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | 8 | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | 8 | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | 8 | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | 8 | 30 | 30 | 30 | 30 | 30 | 30 | T | T |
| | | | | | | | 30 | 30 | | 30 | 30 | T | T |
| | | | | 8 | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | 8 | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | | | | 12 | 12 | 12 | 12 | 12 | 15 | 15 |
| | | | | | | | | 12 | | | 12 | 15 | 15 |
| | | | | | | | | | | | | 20 | 20 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | 15 | 15 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | 20 | 20 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | 15 | 15 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

10.7 Selection table of components for motor control or protection

400V, 50kA, type2, MCCB normal load start-up

| Motor parameters | | Circuit breaker parameters | | Contactor parameters | | Thermal relay parameters | |
|------------------|-------------------|----------------------------|------------------------------------|----------------------|---------------------------|--------------------------|-------------------|
| Rated power (kW) | Rated current (A) | Model | Setting of magnetic protection (A) | Model | Rated heating current (A) | Model | Rated current (A) |
| 5.5 | 10.9 | NM8-125S/16M | 192 | NC1-12 | 20 | NR2-25 | 9~13 |
| 7.5 | 14.4 | NM8-125S/20M | 240 | NC1-18 | 32 | NR2-25 | 12~18 |
| 11 | 20.9 | NM8-125S/25M | 300 | NC1-25 | 40 | NR2-25 | 17~25 |
| 15 | 28 | NM8-125S/32M | 384 | NC1-32 | 50 | NR2-36 | 23~32 |
| 18.5 | 34.1 | NM8-125S/40M | 480 | NC1-40 | 60 | NR2-36 | 28~36 |
| 22 | 39.4 | NM8-125S/50M | 600 | NC1-50 | 80 | NR2-93 | 30~40 |
| 30 | 53.4 | NM8-125S/63M | 756 | NC1-65 | 80 | NR2-93 | 48~65 |
| 37 | 67.9 | NM8-125S/80M | 960 | NC1-80 | 110 | NR2-93 | 55~70 |
| 45 | 80.5 | NM8-125S/100M | 1200 | NC1-95 | 110 | NR2-93 | 80~93 |
| 55 | 98.5 | NM8-125S/125M | 1500 | NC2-115 | 200 | NR2-200 | 80~125 |
| 75 | 133 | NM8-250S/160M | 1920 | NC2-150 | 200 | NR2-200 | 100~160 |
| 90 | 158.7 | NM8-250S/200M | 2400 | NC2-185 | 275 | NR2-200 | 100~160 |
| 110 | 192 | NM8-250S/250M | 3000 | NC2-225 | 275 | NR2-200 | 125~200 |
| 132 | 229 | NM8-400S/315M | 3780 | NC2-265 | 315 | NR2-630 | 160~250 |
| 160 | 275 | NM8-400S/350M | 4200 | NC2-330 | 380 | NR2-630 | 200~315 |
| 200 | 343 | NM8-400S/400M | 4800 | NC2-400 | 450 | NR2-630 | 250~400 |
| 250 | 445 | NM8-630S/500M | 6000 | NC2-500 | 630 | NR2-630 | 315~500 |
| 290 | 520 | NM8S-630S/630M | 7560 | NC2-630 | 800 | NR2-630 | 400~630 |
| 315 | 560 | NM8S-630S/630M | 7560 | NC2-630 | 800 | NR2-630 | 400~630 |

Note:

1. NM8 and NM8S breakers can replace each other with the same capacity in the table above .
2. NRE8 electronic relays and NR2 thermal relays can replace each other with the same capacity in the table above.

400V, 50kA, type2, MCCB heavy-load start-up

| Motor parameters | | Circuit breaker parameters | | Contactor parameters | | Thermal relay parameters | |
|------------------|-------------------|----------------------------|------------------------------------|----------------------|---------------------------|--------------------------|-------------------|
| Rated power (kW) | Rated current (A) | Model | Setting of magnetic protection (A) | Model | Rated heating current (A) | Model | Rated current (A) |
| 5.5 | 10.9 | NM8-125S/16M | 192 | NC1-18 | 32 | NR2-25 | 9~13 |
| 7.5 | 14.4 | NM8-125S/20M | 240 | NC1-25 | 40 | NR2-25 | 12~18 |
| 11 | 20.9 | NM8-125S/25M | 300 | NC1-32 | 50 | NR2-25 | 17~25 |
| 15 | 28 | NM8-125S/32M | 384 | NC1-40 | 60 | NR2-36 | 23~32 |
| 18.5 | 34.1 | NM8-125S/40M | 480 | NC1-50 | 80 | NR2-36 | 28~36 |
| 22 | 39.4 | NM8-125S/50M | 600 | NC1-65 | 80 | NR2-93 | 30~40 |
| 30 | 53.4 | NM8-125S/63M | 756 | NC1-80 | 110 | NR2-93 | 48~65 |
| 37 | 67.9 | NM8-125S/80M | 960 | NC1-95 | 110 | NR2-93 | 55~70 |
| 45 | 80.5 | NM8-125S/100M | 1200 | NC2-115 | 200 | NR2-93 | 80~93 |
| 55 | 98.5 | NM8-125S/125M | 1500 | NC2-150 | 200 | NR2-200 | 80~125 |
| 75 | 133 | NM8-250S/160M | 1920 | NC2-185 | 275 | NR2-200 | 100~160 |
| 90 | 158.7 | NM8-250S/200M | 2400 | NC2-225 | 275 | NR2-200 | 100~160 |
| 110 | 192 | NM8-250S/250M | 3000 | NC2-265 | 315 | NR2-200 | 125~200 |
| 132 | 229 | NM8-400S/315M | 3780 | NC2-330 | 380 | NR2-630 | 160~250 |
| 160 | 275 | NM8-400S/350M | 4200 | NC2-400 | 450 | NR2-630 | 200~315 |
| 200 | 343 | NM8-400S/400M | 4800 | NC2-500 | 630 | NR2-630 | 250~400 |
| 250 | 445 | NM8-630S/500M | 6000 | NC2-630 | 800 | NR2-630 | 315~500 |
| 290 | 520 | NM8S-630S/630M | 7560 | NC2-630 | 800 | NR2-630 | 400~630 |

Note:

1. NM8 and NM8S breakers can replace each other with the same capacity in the table above .
2. NRE8 electronic relays and NR2 thermal relays can replace each other with the same capacity in the table above.

400V, 50kA, type2, MCCB star-delta start-up

| Motor parameters | | Circuit breaker parameters | | Contactor parameters | | | Thermal relay parameters | |
|------------------|-------------------|----------------------------|------------------------------------|----------------------|-----------------|----------------|--------------------------|-------------------|
| Rated power (kW) | Rated current (A) | Model | Setting of magnetic protection (A) | Feedback contactor | Delta contactor | Star contactor | Model | Rated current (A) |
| 5.5 | 10.9 | NM8-125S/16M | 192 | NC1-09 | NC1-09 | NC1-09 | NR2-11.5 | 5.5~8 |
| 7.5 | 14.4 | NM8-125S/20M | 240 | NC1-12 | NC1-12 | NC1-09 | NR2-11.5 | 7~10 |
| 11 | 20.9 | NM8-125S/25M | 300 | NC1-18 | NC1-18 | NC1-09 | NR2-25 | 9~13 |
| 15 | 28 | NM8-125S/32M | 384 | NC1-25 | NC1-25 | NC1-12 | NR2-25 | 12~18 |
| 18.5 | 34.1 | NM8-125S/40M | 480 | NC1-25 | NC1-25 | NC1-18 | NR2-25 | 17~25 |
| 22 | 39.4 | NM8-125S/50M | 600 | NC1-32 | NC1-32 | NC1-18 | NR2-36 | 23~32 |
| 30 | 53.4 | NM8-125S/63M | 756 | NC1-40 | NC1-40 | NC1-25 | NR2-36 | 28~36 |
| 37 | 67.9 | NM8-125S/80M | 960 | NC1-50 | NC1-50 | NC1-32 | NR2-93 | 30~40 |
| 45 | 80.5 | NM8-125S/100M | 1200 | NC1-65 | NC1-65 | NC1-32 | NR2-93 | 37~50 |
| 55 | 98.5 | NM8-125S/125M | 1500 | NC1-80 | NC1-80 | NC1-40 | NR2-93 | 48~65 |
| 75 | 133 | NM8-250S/160M | 1920 | NC1-95 | NC1-95 | NC1-50 | NR2-93 | 63~80 |
| 90 | 158.7 | NM8-250S/200M | 2400 | NC2-115 | NC2-115 | NC2-65 | NR2-93 | 80~93 |
| 110 | 192 | NM8-250S/250M | 3000 | NC2-150 | NC2-150 | NC2-80 | NR2-200 | 80~125 |
| 132 | 229 | NM8-400S/315M | 3780 | NC2-150 | NC2-150 | NC2-95 | NR2-200 | 80~125 |
| 160 | 275 | NM8-400S/350M | 4200 | NC2-185 | NC2-185 | NC2-115 | NR2-200 | 100~160 |
| 200 | 343 | NM8-400S/400M | 4800 | NC2-225 | NC2-225 | NC2-150 | NR2-200 | 125~200 |
| 250 | 445 | NM8-630S/500M | 6000 | NC2-330 | NC2-330 | NC2-185 | NR2-630 | 200~315 |
| 290 | 520 | NM8S-630S/630M | 7560 | NC2-400 | NC2-400 | NC2-185 | NR2-630 | 200~315 |
| 315 | 560 | NM8S-630S/630M | 7560 | NC2-400 | NC2-400 | NC2-225 | NR2-630 | 250~400 |

Note:

1. NM8 and NM8S breakers can replace each other with the same capacity in the table above .
2. NRE8 electronic relays and NR2 thermal relays can replace each other with the same capacity in the table above.
3. Breaker is at the power supply side
4. In the delta connection circuit of thermal relay, the setting value is 0.58Ie;
5. The max. start-up time is 20s;
6. When Star type connection is changed into delta connection, the following connection modes of motor are recommended: L1, U1 to V2; L2, V1 to W2; L3, W1 to U2 to lower the impulse current;
7. The interval of star type connection changing into delta connection is 0.1s.



NM7 Moulded Case Circuit Breaker

1. General

After successively developing NM8 and NM6, our company launched another new product, the NM7 series moulded case circuit breaker upgraded from the NM1 series, by further taking the structural features and design style of the NM1 series products, modifying the accessories, wiring mode, appearance and the like in an individualization way, allowing the product not only to be set by the manufacturer before delivery but also replaced by users themselves, which is really an improvement, and integrating the up-to-date design concept to make the product more people-oriented.

Certificate: KEMA, CE.

Rated operation range 10A~800A.

Several modes available: 3P, 4P, fixed type, plug-in type, front connection, rear connection.

The product can be installed vertically or horizontally. Isolating function is available.

This product meets the requirements in IEC 60947-2.

2. Type designation

N M 7 — □ □ / □ / □ □ □ □

Operation mode codes:
D for motor operation;
Z for operation by turning the handle;
nothing for operation directly by the handle.

Types of quadrapole circuit breakers:
4A-N pole with no over-current release component,
N pole always on;
4B-N pole with no over-current release component,
N pole to be closed and opened together with the other three poles (N pole closed first and then opened);
4C-N pole with over-current release component,
N pole to be closed and opened together with the other three poles (N pole closed first and then opened);
4D-N pole with over-current release component,
N pole always on.

Codes for applications: nothing for distribution; 2 for motor protection

Release (of a mechanical switching device) mode and accessory code (see table 1)

Number of poles

Rated current

Breaking capacity codes:

C – economic type, S – standard type

H – relatively high type, R – current limiting type

Frame size rated current

Design serial number

Moulded case circuit breaker

Company code

3. Operation conditions

3.1 Ambient air temperature

3.2 The upper limit for the ambient air temperature is +40°C, lower limit -5°C, and the average temperature is not higher than +35°C within 24 hours.

3.3 Altitude: not higher than 2000m for the installation site.

3.4 Atmospheric conditions:

When the ambient air temperature is +40°C, the relative humidity of the air shall not be higher than 50%; a higher relative humidity is allowed at a lower temperature; for the wettest month, the maximum relative humidity averaged shall be 90% while the lowest temperature averaged in that month +25°C, and the condensation produced due to temperature change shall be taken into consideration.

3.5 Class of pollution: 3

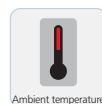


Table 1

| Accessory code | | Accessory installation and mode of wirings | | | |
|---|------------------|--|---------|--------------|---------|
| Accessory name | Compound release | NM7-125 | NM7-250 | NM7-400, 630 | NM7-800 |
| | | 3P 4P | 3P 4P | 3P 4P | 3P 4P |
| No accessories | 300 | | | | |
| Alarm contact | 308 | | | | |
| Shunt release | 310 | | | | |
| Auxiliary contact | 320 | | | | |
| Under voltage release | 330 | | | | |
| Shunt release, auxiliary contact | 340 | | | | |
| Shunt release, under voltage release | 350 | | | | |
| Two groups of auxiliary contacts | 360 | | | | |
| Auxiliary contact, under voltage release | 370 | | | | |
| Shunt release, alarm contact | 318 | | | | |
| Auxiliary contact, alarm contact | 328 | | | | |
| Under voltage release, alarm contact | 338 | | | | |
| Shunt release, auxiliary contact, alarm contact | 348 | | | | |
| Two groups of auxiliary contacts, alarm contact | 368 | | | | |
| Auxiliary contact, under voltage release, alarm contact | 378 | | | | |

Note: a. 200 for the breaker body only with the magnetic release;

300 for thermal release + magnetic release body;

000 for the breaker body with no release and inner accessory.

b. ● alarm contact; ○ auxiliary contact; ■ shunt release; ▲ under voltage release.

4. Technical data

| NM7 | NM7-125 |
|--|---------------------------------|
| Rated current I_n (A) | 16,20,25,32,40,50,63,80,100,125 |
| Rated insulation voltage U_i (V) | 800 |
| Rated impulse withstand voltage U_{imp} (kV) | 8 |
| Rated operational voltage U_e (V) | 380/400/415/690 |

Appearance




| Breaking capacity feature code | | S | |
|--|----------------|------------|------|
| Number of poles | | 3 | 4 |
| Rated ultimate short circuit breaking capacity I_{cu} (kA) | AC380/400/415V | 35 | 35 |
| | AC690V | - | - |
| Rated service short circuit breaking capacity I_{cs} (kA) | AC380/400/415V | 17.5 | 17.5 |
| | AC690V | - | - |
| Service life (C-O cycle) | Mechanical | 25000 | |
| | Electric | 8000 | |
| Overall dimensions (mm) | 3P(L×W×H) | 155×90×74 | |
| | 4P(L×W×H) | 155×120×74 | |
| Isolating function | | ● | |
| Front connection panel | | ■ | |
| Rear connection panel | | ■ * | |
| Cage type connection terminal | | ■ * | |
| Plug-in type | | ■ * | |
| Draw-out type | | ■ * | |
| Rotary manual operating handle | | ■ | |
| Motor driven operating handle | | ■ | |
| Shunt, under voltage release | | ■ | |
| Auxiliary, alarm contact | | ■ | |
| Terminal cover | | ■ * | |

Note: ● Standard configuration ■ Selected configuration; the one with * is unconfiguration.



| | |
|-----------------------------|--|
| NM7-250 | |
| 100,125,160,180,200,225,250 | |
| 800 | |
| 8 | |
| 380/400/415/690 | |



| | |
|------------|------|
| S | |
| 3 | 4 |
| 35 | 35 |
| - | - |
| 17.5 | 17.5 |
| - | - |
| 20000 | |
| 2500 | |
| A | |
| 165×105×74 | |
| 165×140×74 | |
| ● | |
| ■ | |
| ■ * | |
| ■ * | |
| ■ * | |
| ■ * | |
| ■ | |
| ■ | |
| ■ | |
| ■ * | |

| NM7 | | NM7-400 | | | | |
|---|----------------|--|----|------|------|--|
| Rated current I _n (A) | | 250,315,350,400 | | | | |
| Rated insulation voltage U _i (V) | | 800 | | | | |
| Rated impulse withstand voltage U _{imp} (kV) | | 8 | | | | |
| Rated operational voltage U _e (V) | | 380/400/415/690 | | | | |
| Appearance | |  | | | | |
| Breaking capacity feature code | | S | | H | | |
| Number of poles | | 3 | 4 | 3 | 4 | |
| Rated ultimate short circuit breaking capacity I _{cu} (kA) | AC380/400/415V | 50 | 50 | 65 | 65 | |
| | AC690V | - | - | 12 | 12 | |
| Rated service short circuit breaking capacity I _{cs} (kA) | AC380/400/415V | 25 | 25 | 32.5 | 32.5 | |
| | AC690V | - | - | 6 | 6 | |
| Service life (C-O cycle) Usage category | Mechanical | 4000 | | | | |
| | Electric | 1000 | | | | |
| | | A | | | | |
| Overall dimensions (mm) | 3P(L×W×H) | 257×150×107 | | | | |
| | 4P(L×W×H) | 257×198×107 | | | | |
| Isolating function | | ● | | | | |
| Front connection panel | | ● | | | | |
| Rear connection panel | | ■ * | | | | |
| Cage type connection terminal | | ■ * | | | | |
| Plug-in type | | ■ * | | | | |
| Draw-out type | | | | | | |
| Rotary manual operating handle | | ■ | | | | |
| Motor driven operating handle | | ■ | | | | |
| Shunt, under voltage release | | ■ | | | | |
| Auxiliary, alarm contact | | ■ | | | | |
| Terminal cover | | ■ * | | | | |

Note: ● Standard configuration ■ Selected configuration; the one with * is unconfiguration

| NM7-630 | | | | NM7-800 | | | |
|---|----|------|------|--|----|------|------|
| 400,500,630 | | | | 500,630,700,800 | | | |
| 800 | | | | 800 | | | |
| 8 | | | | 8 | | | |
| 380/400/415/690 | | | | 380/400/415/690 | | | |
|  | | | |  | | | |
| S | | H | | S | | H | |
| 3 | 4 | 3 | 4 | 3 | 4 | 3 | 4 |
| 50 | 50 | 65 | 65 | 50 | 50 | 75 | 75 |
| - | - | 15 | 15 | - | - | 15 | 15 |
| 25 | 25 | 32.5 | 32.5 | 25 | 25 | 37.5 | 37.5 |
| - | - | 7.5 | 7.5 | - | - | 10 | 10 |
| 4000 | | | | 2500 | | | |
| 1000 | | | | 500 | | | |
| A | | | | A | | | |
| 280×182×112 | | | | 275×210×112 | | | |
| 280×240×112 | | | | 275×280×112 | | | |
| ● | | | | ● | | | |
| ● | | | | ● | | | |
| ■ * | | | | ■ * | | | |
| ■ * | | | | ■ * | | | |
| ■ * | | | | | | | |
| | | | | ■ * | | | |
| ■ | | | | ■ | | | |
| ■ | | | | ■ | | | |
| ■ | | | | ■ | | | |
| ■ | | | | ■ | | | |
| ■ * | | | | ■ * | | | |

5. Inverse-time overcurrent protection curve for the breaker for distribution (see Fig. 1 – 10)

Fig.1 NM7-125(16A~32A) operation characteristic curve

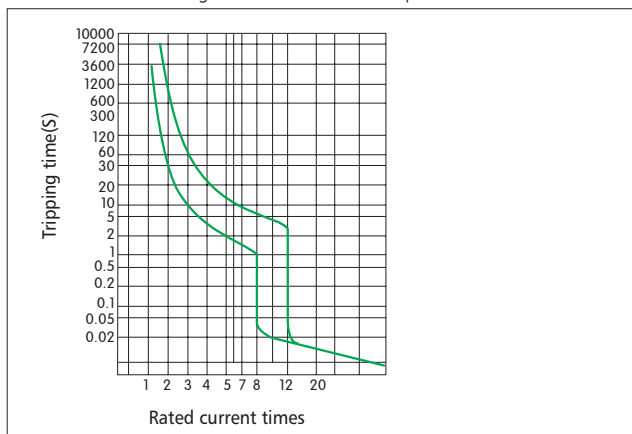


Fig.2 NM7-125(16A~32A) temperature compensation curve

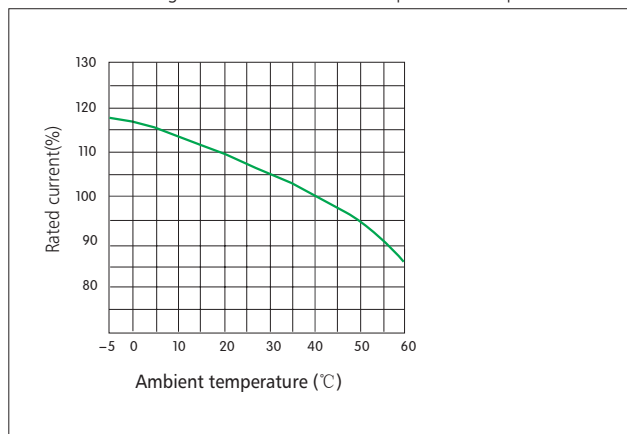


Fig.2 NM7-125(40A~125A) operation characteristic curve

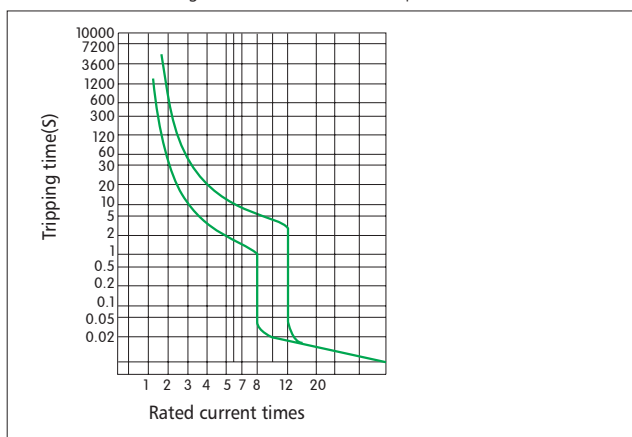


Fig.4 NM7-125(40A~125A) temperature compensation curve

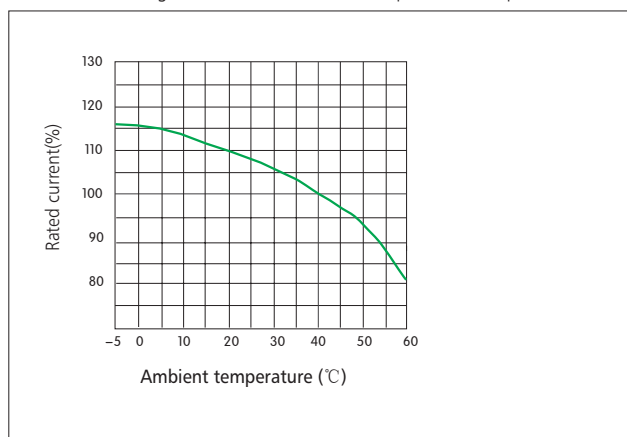


Fig.3 NM7-250 operation characteristic curve

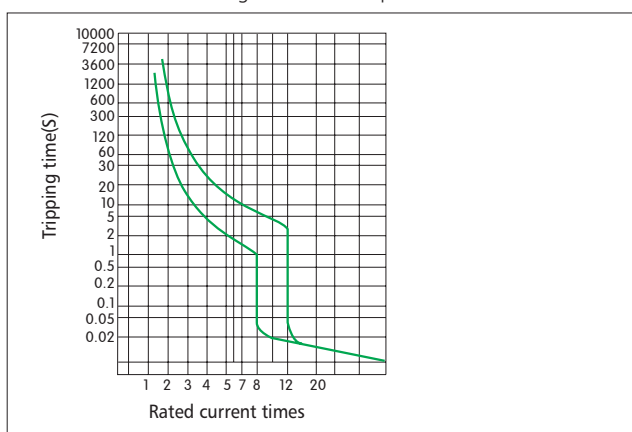


Fig.6 NM7-250 temperature compensation curve

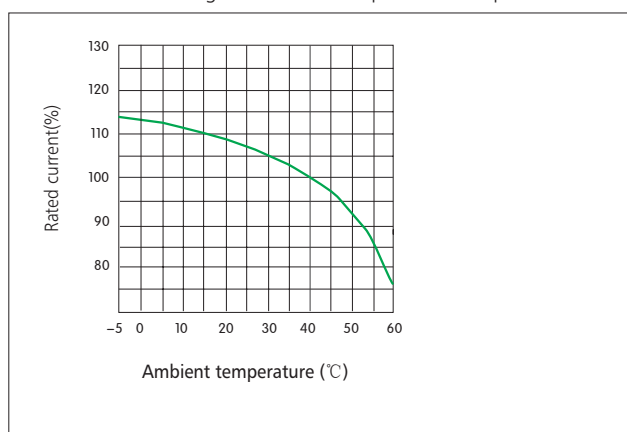


Fig.7 NM7-400 operation characteristic curve

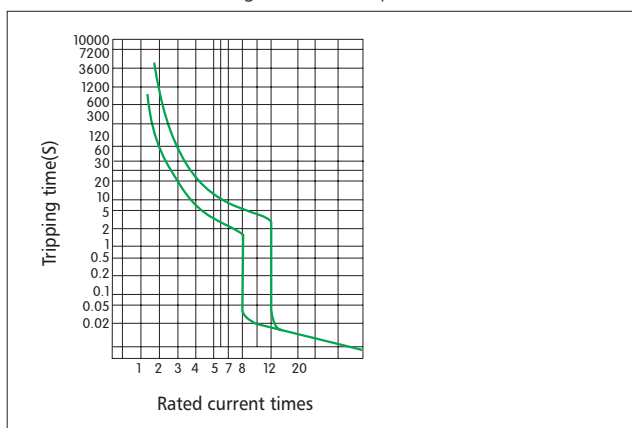


Fig.8 NM7-400 temperature compensation curve

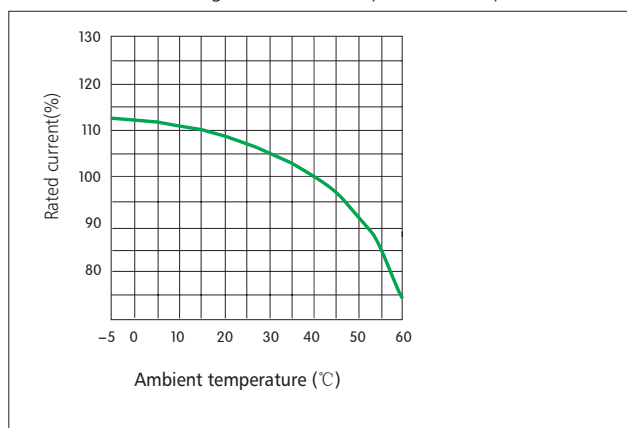


Fig.9 NM7-630 operation characteristic curve

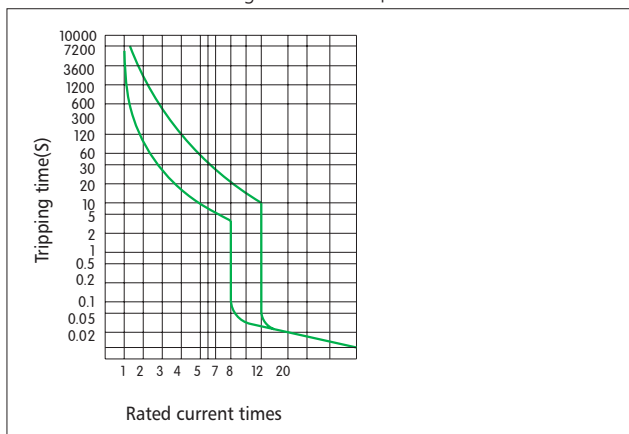


Fig.10 NM7-630 temperature compensation curve

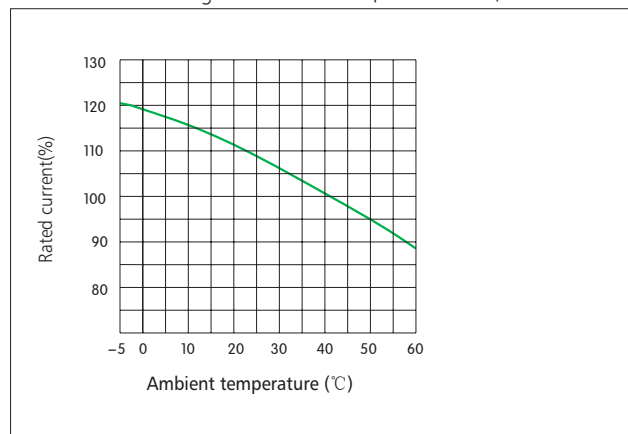


Fig.11 NM7-800 operation characteristic curve

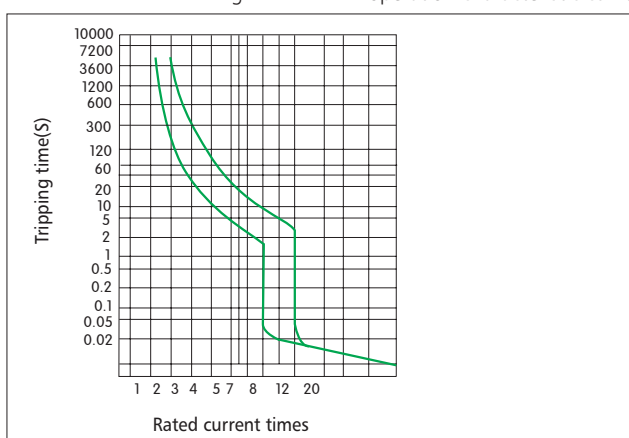
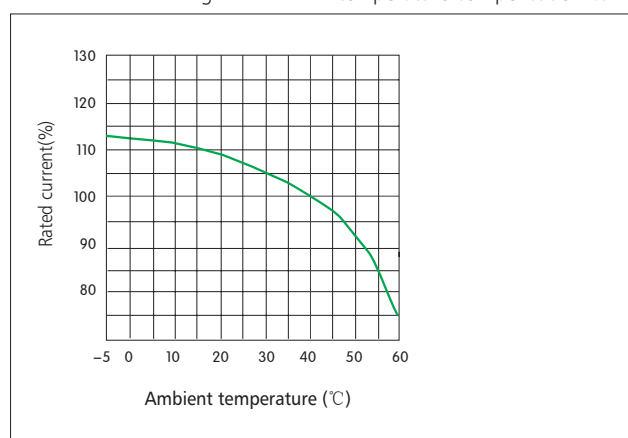
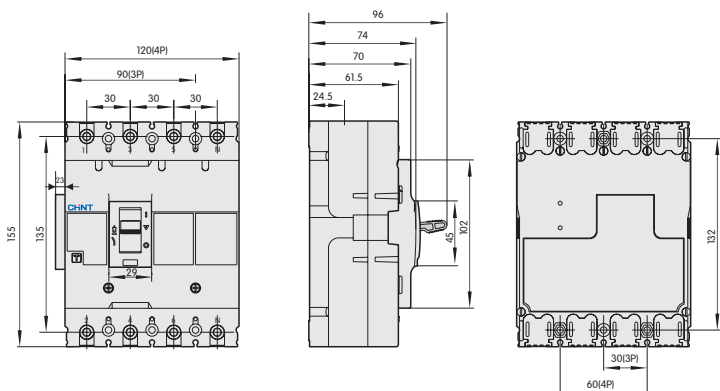


Fig.12 NM7-800 temperature compensation curve

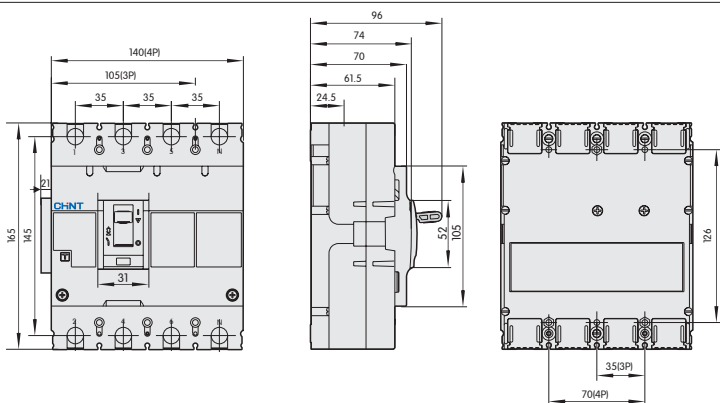


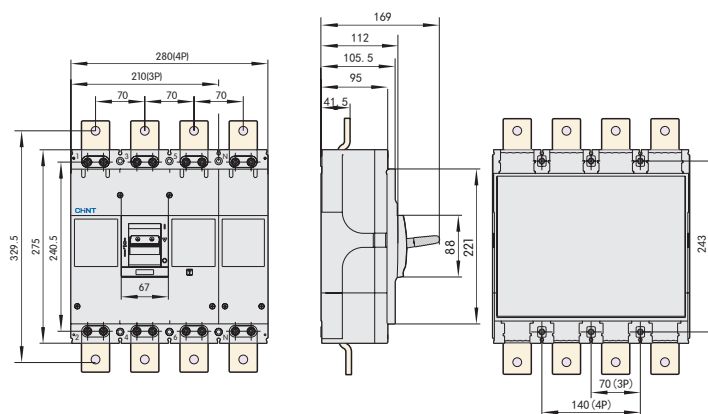
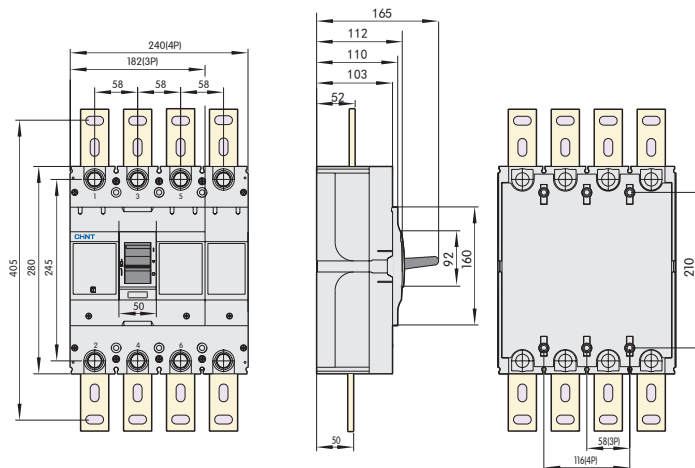
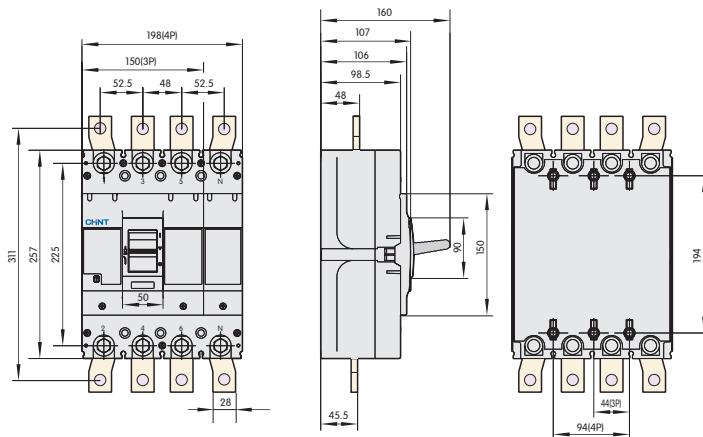
6. Overall and mounting dimensions

NM7-125



NM7-250





7. Ordering information

Users shall order goods in the following way:

Product type + rated current + code of the inner accessory (00 for no inner accessories) + application code + operation mode + (word description, accessory voltage, type and the like to be described in detail).

Order Sample: 10 pcs of NM7—250S, 250A, three poles, shunt release (AC230V), for motor protection, power operating mechanism (DC220V), plug-in type.

10 pcs of NM7—250S/250/3310 2 D (shunt AC230V, power operating mechanism DC220V, plug-in type).



NM1 Moulded Case Circuit Breaker

1. General

- 1.1 Certificates: KEMA, ESC, UKrSEPRO, GOST, RCC, KC;
1.2 Electric ratings: AC 690V, 50/60HZ, 10~1250A;
1.3 Mounting mode: Vertical and horizontal;
1.4 Standard: IEC/EN60947-2.



2. Type designation

NM 1-□□□/□□□□

Type of N-pole for 4-P breaker*

Application: Blank: for power distribution;

2: for motor protection

Release type and accessory code
(please refer to table on page 94)

Number of poles

Operation mode: Blank: direct operation with handle;

P: motor-driven operation;

Z: Operation with rotary handle

Code of Breaking capacity : S-standard type;

H-higher type;

R-current limiting type

Frame size rated current

Design sequence number

MCCB code

Company code

Note *: There are 4 types of N-pole for 4P breaker

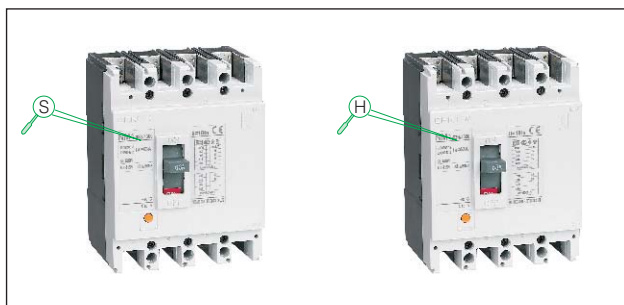
A: without current release components, N-Pole is always at making status, not makes and breaks with other three poles;
B: Without current release components, N-Pole makes with the other three poles(N-pole first makes then breaks);
C: With current release components, N-Pole makes and breaks with other three poles(N-pole first makes then breaks);
D: With current release components, N-Pole is always at making status, not makes and breaks with other three poles;

3. Classification

According to breaking capacity of breaker:

Standard type (S)

Higher type (H)



Current-limiting type (R)



According to wiring mode:

Front connection



Rear connection



plug-in



According to operation mode:

Direct operation with handle



Operation with rotary handle



Motor-driven operation



According to number of poles:

2P



3P



4P



4. Operation conditions

- 4.1 Temperature: $-5^{\circ}\text{C} \sim +40^{\circ}\text{C}$; the average value within 24h shall not exceed $+35^{\circ}\text{C}$. (please refer to coefficients on P107 for temperature compensation correction); for the circuit breaker with thermo-magnetic release, $+40^{\circ}\text{C}$ is set to be the standard temperature for ratings. For temperature not between $-5^{\circ}\text{C} \sim +40^{\circ}\text{C}$, please contact us for temperature compensation correction.
- 4.2 Altitude: not exceed 2000m (Please contact with us for reduction coefficient if altitude at the mounted site beyond 2000m).

4.3 Pollution grade: Grade 3

4.4 Air conditions

At mounting site, relative humidity not exceed 50% at the max temperature of $+40^{\circ}\text{C}$, higher relative humidity is allowable under lower temperature. For example, RH could be 90% at $+20^{\circ}\text{C}$, special measures should be taken to occurrence of dews.

8. Curves (for power distribution, calibrated at 40°C)

8.1 The characteristic curve of anti-time limit and the correcting curve of temperature see fig.

Fig.1 NM1-63(10~32), NM1-125(25~32)
Characteristic Curve

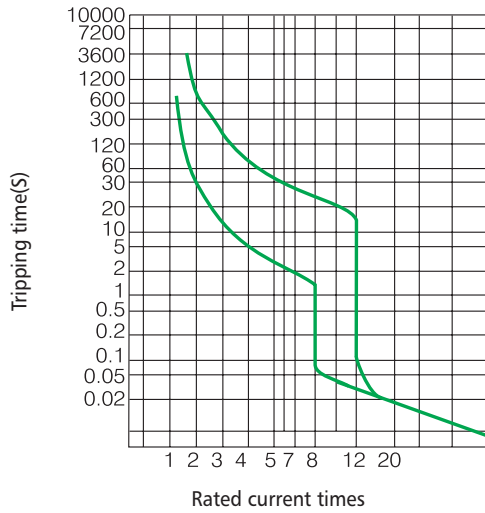


Fig.2 NM1-63(10~32), NM1-125(25~32)
Adjustment curve of temperature

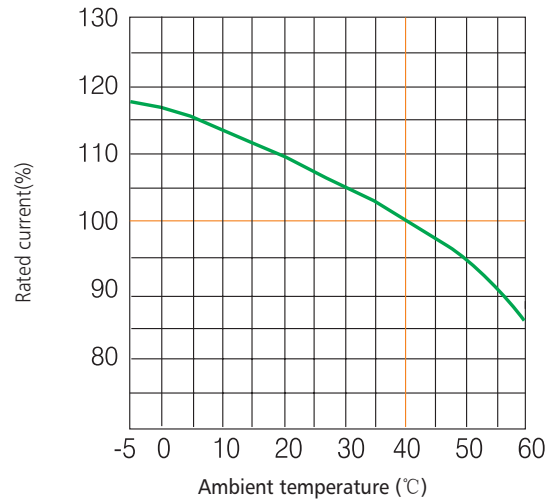


Fig.3 NM1-63(40~63), NM1-125(40~125)
Characteristic Curve

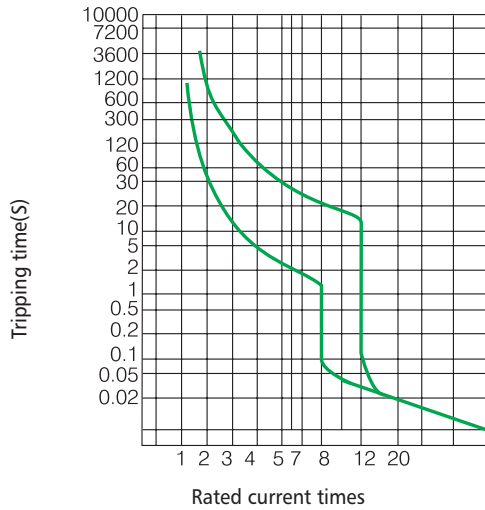
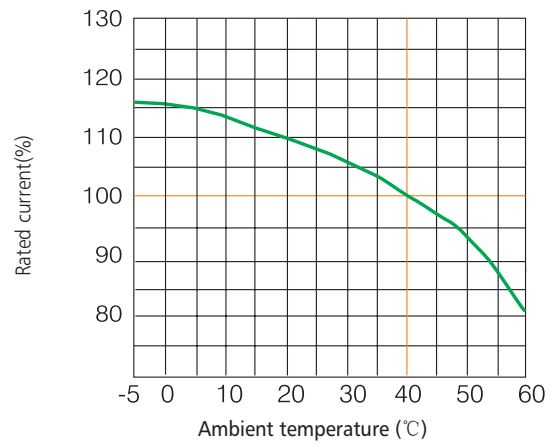


Fig.4 NM1-63(40~63), NM1-125(40~125)
Adjustment curve of temperature



Moulded Case Circuit Breakers

NM1

5. Technical data

| Frame size current | | 63 | | | 125 | | | 250 | | | 400 | | | 630 | | | 800 | | | 1250 | | |
|---|--|--|--|--|--|--|--|--|--|--|------------------------------|--|--|--------------------|--|--|---------------|--|--|---------------------------|--|--|
| Electric characteristics as per IEC 60947-2, EN 60947-2 | | | | | | | | | | | | | | | | | | | | | | |
| Rated current (A) in 40°C | | 10, 16, 20, 25, 30, 32, 40, 50, 60, 63 | | | 25, 30, 32, 40, 50, 60, 63, 75, 80, 100, 125 | | | 100, 125, 140, 150, 160, 175, 180, 200, 225, 250 | | | 225, 250, 300, 315, 350, 400 | | | 400, 450, 500, 630 | | | 630, 700, 800 | | | 700, 800, 900, 1000, 1250 | | |
| Rated insulation voltage (V) Ui | | 500 | | | 800 | | | 800 | | | 800 | | | 800 | | | 800 | | | 800 | | |
| Rated impulse withstand voltage(kV) Uimp | | 6 | | | 8 | | | 8 | | | 8 | | | 8 | | | 8 | | | 8 | | |
| Rated operational voltage (V) Ue AC 50/60Hz | | 415 | | | 690 | | | 690 | | | 690 | | | 690 | | | 690 | | | 690 | | |
| Arcing distance (mm) | | ≤50 | | | ≤50 | | | ≤50 | | | ≤100 | | | ≤100 | | | ≤100 | | | ≤100 | | |
| Breaking capacity code | | S | | | C S | | | S | | | S H | | | S H R | | | H R | | | R | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |

6. Release

Inverse time breaking action property of the over current tripping of the breaker (for power distribution) at the status that all poles are electrified simultaneously

| No. | Test current | Itin | Conventional time | Initial status |
|-----|-------------------------------|------|-------------------------|------------------------|
| 1 | Conventional non-trip current | 1.05 | 2In(>63A) 1In(<=63A) | Cold status |
| 2 | Conventional trip current | 1.30 | 2In(>63A) 1In(<=63A) | Right after test no. 1 |

Inverse time-delay breaking operation property of the over current tripping of the breaker (for motor protection) at the status that all poles are electrified simultaneously (conforms to IEC60947-3)

| Serial No. | Setting current | Conventional time | Start-up status | Remark |
|------------|-----------------|-------------------|------------------------|------------|
| 1 | 1.0In | >2h | Cold status | |
| 2 | 1.2In | <2h | Right after test no. 1 | 10≤In≤250 |
| 3 | 1.5In | ≤4min | Cold status | 250≤In≤630 |
| 4 | 7.2In | ≤8min | Cold status | 10≤In≤630 |
| | | ≤4s | Cold status | 10≤In≤250 |
| | | 6s≤t≤20s | Cold status | 250≤In≤630 |

N-pole of 4P circuit breaker is at the right side, see table below for rated current of N-pole release.

| Frame size | Rated current (A) | Rated current at N-pole (A) |
|------------|-------------------|-----------------------------|
| 10 | 10 | 10 |
| 16 | 16 | 16 |
| 20 | 20 | 20 |
| 25 | 25 | 25 |
| 30 | 30 | 30 |
| 32 | 32 | 32 |
| 40 | 40 | 40 |
| 50 | 50 | 50 |
| 60 | 60 | 60 |
| 63 | 63 | 63 |
| 25 | 25 | 25 |
| 30 | 30 | 30 |
| 32 | 32 | 32 |
| 40 | 40 | 40 |
| 50 | 50 | 50 |
| 60 | 60 | 60 |
| 63 | 63 | 63 |
| 75 | 75 | 63 |
| 80 | 80 | 63 |
| 100 | 100 | 63 |
| 125 | 125 | 63 |

| Frame size | Rated current (A) | Rated current at N-pole (A) |
|------------|-------------------|-----------------------------|
| 100 | 100 | 100 |
| 125 | 125 | 100 |
| 140 | 140 | 100 |
| 150 | 150 | 100 |
| 160 | 160 | 100 |
| 175 | 175 | 100 |
| 180 | 180 | 100 |
| 200 | 200 | 100 |
| 225 | 225 | 125 |
| 250 | 250 | 125 |
| 225 | 225 | 225 |
| 250 | 250 | 225 |
| 300 | 300 | 225 |
| 315 | 315 | 225 |
| 350 | 350 | 225 |
| 400 | 400 | 225 |
| 400 | 400 | 400 |
| 450 | 450 | 400 |
| 500 | 500 | 400 |
| 630 | 630 | 400 |
| 630 | 630 | 400 |
| 800 | 800 | 500 |
| 700 | 700 | 500 |
| 800 | 800 | 500 |

Note: The rated current of N-pole can be made equal to the other phases.

7. Product overview

NM1 Moulded Case Circuit Breaker

- 1 MCB (fixed type)
- 2 Plug-in type
- 3 Rear connection
- 4 Undervoltage release
- 5 Shunt release
- 6 Alarm contact
- 7 Auxiliary contact
- 8 Motor-driven operation mechanism
- 9 Extended manual operation handle
- 10 Mechanical interlock
- 11 Cage clamp terminal (Refer to P102)
- 12 Terminal cover
- 13 Front connection plate

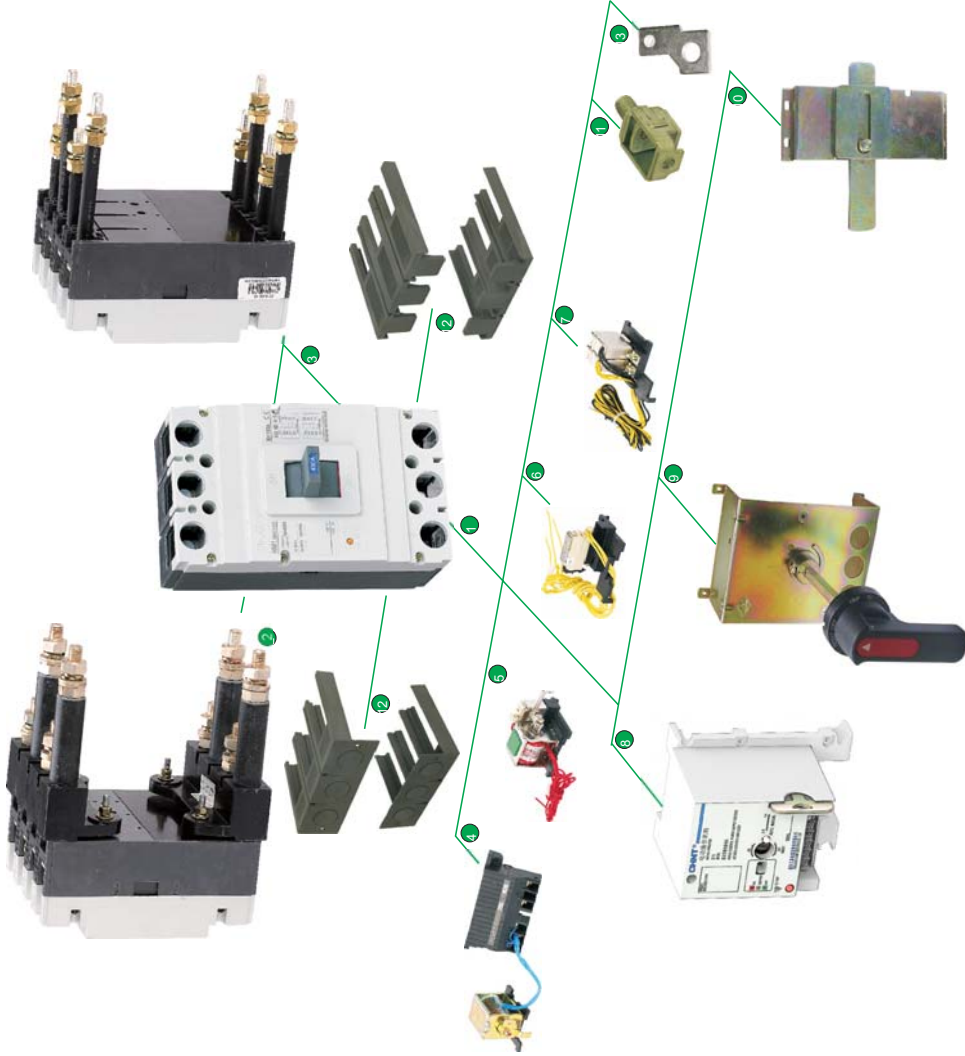


Fig.5 NM1-250 Characteristic Curve

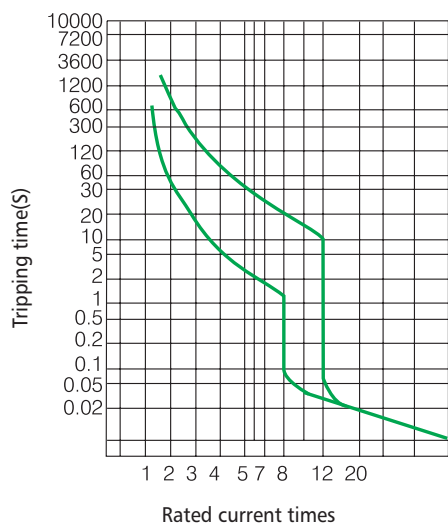


Fig.6 NM1-250 Adjustment curve of temperature

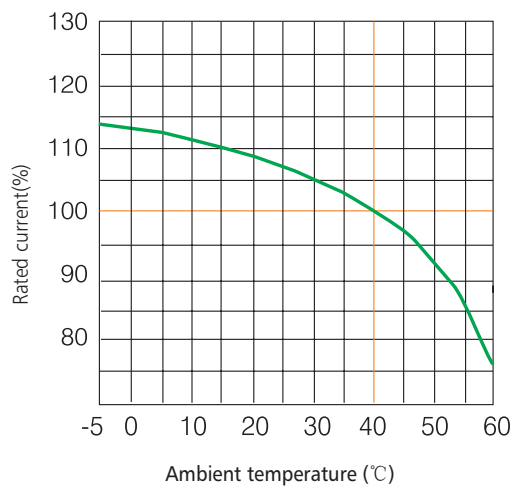


Fig.7 NM1-400 Characteristic Curve

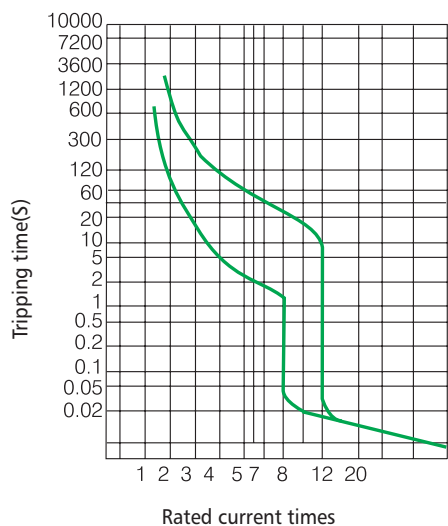


Fig.8 NM1-400 Adjustment curve of temperature

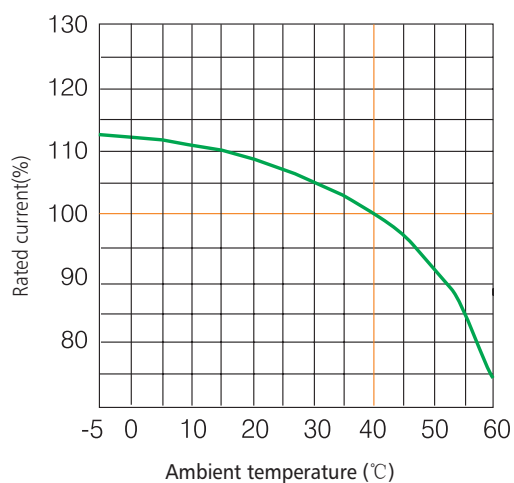


Fig.9 NM1-630, NM1-800 Characteristic Curve

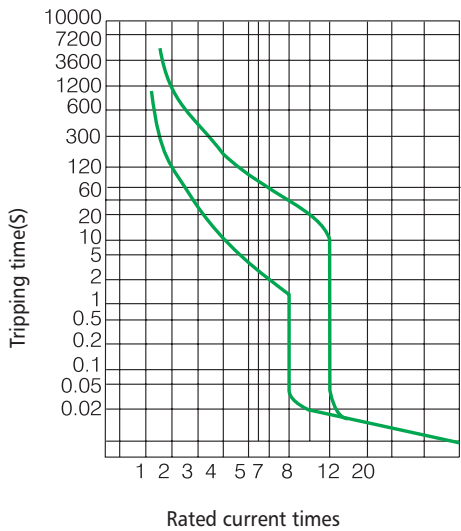


Fig.10 NM1-630, NM1-800 Adjustment curve of temperature

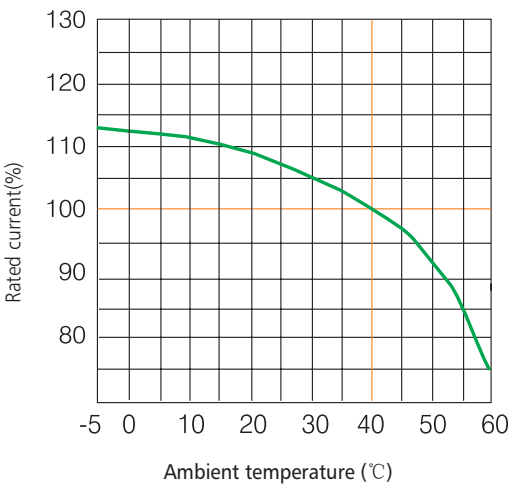


Fig.11 NM1-1250 Characteristic Curve

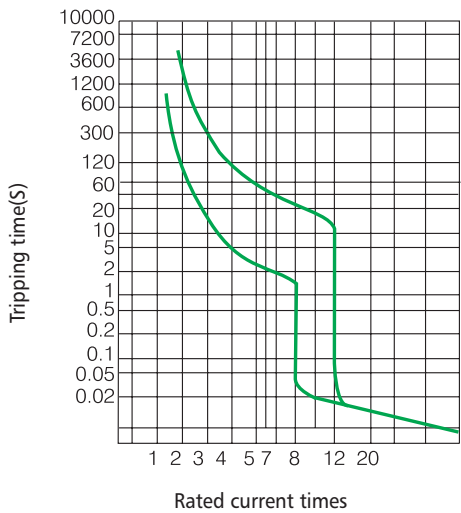
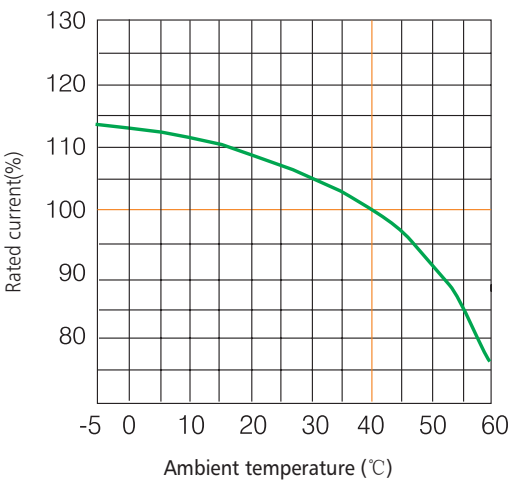


Fig.12 NM1-1250 Adjustment curve of temperature



8.2 Temperature compensation correction

NM1 series temperature compensation coefficient table (calibration at 40℃, for the calibration at other temperature standards please contact with us)

| Type | Current range | Compensation coefficient | | | | | | | | | | | | | |
|-------------------|---------------|--------------------------|------|------|------|------|------|------|------|------|-----|------|------|------|------|
| | | -5℃ | 0℃ | 5℃ | 10℃ | 15℃ | 20℃ | 25℃ | 30℃ | 35℃ | 40℃ | 45℃ | 50℃ | 55℃ | 60℃ |
| NM1-63S, H | 10~32A | 1.18 | 1.17 | 1.16 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.03 | 1 | 0.97 | 0.95 | 0.92 | 0.87 |
| NM1-63S, H | 40~63A | 1.16 | 1.16 | 1.15 | 1.14 | 1.12 | 1.10 | 1.08 | 1.06 | 1.03 | 1 | 0.97 | 0.94 | 0.87 | 0.82 |
| NM1-125C, S, H, R | 25~32A | 1.18 | 1.17 | 1.16 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.03 | 1 | 0.97 | 0.95 | 0.92 | 0.87 |
| NM1-125C, S, H, R | 40~125A | 1.16 | 1.16 | 1.15 | 1.14 | 1.12 | 1.10 | 1.08 | 1.06 | 1.03 | 1 | 0.97 | 0.94 | 0.87 | 0.82 |
| NM1-250C, S, H, R | 100~250A | 1.14 | 1.13 | 1.13 | 1.12 | 1.10 | 1.08 | 1.07 | 1.05 | 1.03 | 1 | 0.97 | 0.93 | 0.86 | 0.76 |
| NM1-400S, H, R | 225~400A | 1.13 | 1.12 | 1.12 | 1.11 | 1.10 | 1.08 | 1.06 | 1.05 | 1.03 | 1 | 0.97 | 0.93 | 0.85 | 0.75 |
| NM1-630S, H, R | 400~630A | 1.13 | 1.12 | 1.12 | 1.11 | 1.10 | 1.08 | 1.07 | 1.05 | 1.03 | 1 | 0.97 | 0.93 | 0.85 | 0.75 |
| NM1-800S,H, R | 630~800A | 1.13 | 1.12 | 1.12 | 1.11 | 1.10 | 1.08 | 1.07 | 1.05 | 1.03 | 1 | 0.97 | 0.93 | 0.85 | 0.75 |
| NM1-1250H | 700~1250A | 1.14 | 1.13 | 1.12 | 1.11 | 1.10 | 1.09 | 1.07 | 1.05 | 1.03 | 1 | 0.97 | 0.92 | 0.85 | 0.76 |

9. Wiring

Front connection(Fixed connection)

Extended connection terminals (for products 10~1250A, extended terminals are available)

Connection screws

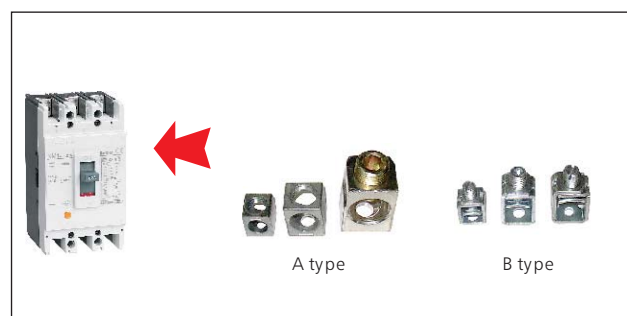


| Frame level | Current (A) | Breaking capacity code | Front connection screw | | |
|-------------|-------------|------------------------|--------------------------|----------------------------|-----------------|
| | | | Hexagonal head screw (A) | Hexagonal socket screw (B) | Cross screw (C) |
| 63 | 10 | S | ■ | | |
| | | H | ■ | | |
| | 16 | S | ■ | | |
| | | H | ■ | | |
| | 20 | S | ■ | | |
| | | H | ■ | | |
| | 25 | S | ■ | | |
| | | H | ■ | | |
| | 30 | S | ■ | | |
| | | H | ■ | | |
| | 32 | S | ■ | | |
| | | H | ■ | | |
| 125 | 40 | S | ■ | | |
| | | H | ■ | | |
| | 50 | S | ■ | | |
| | | H | ■ | | |
| | 60 | S | ■ | | |
| | | H | ■ | | |
| | 63 | S | ■ | | |
| | | H | ■ | | |
| | 25 | C | ■ | | |
| | | S | ■ | | |
| | | H | ■ | | |
| | 30 | R | ■ | | |
| | | C | ■ | | |
| | | S | ■ | | |
| | 32 | H | ■ | | |
| | | R | ■ | | |
| | | C | ■ | | |
| | 40 | S | ■ | | |
| | | H | ■ | | |
| | | R | ■ | | |
| | 50 | C | ■ | | |
| | | S | ■ | | |
| | | H | ■ | | |
| | 60 | R | ■ | | |
| | | C | ■ | | |
| | | S | ■ | | |
| | 63 | H | ■ | | |
| | | R | ■ | | |
| | | C | ■ | | |
| | 75 | S | ■ | | |
| | | H | ■ | | |
| | | R | ■ | | |

| Frame level | Current (A) | Breaking capacity code | Front connection screw | | |
|-------------|-------------|------------------------|--------------------------|----------------------------|-----------------|
| | | | Hexagonal head screw (A) | Hexagonal socket screw (B) | Cross screw (C) |
| 125 | 80 | C | ■ | | |
| | | S | ■ | | |
| | | H | ■ | | |
| | 100 | R | ■ | | |
| | | C | ■ | | |
| | | S | ■ | | |
| | 125 | H | ■ | | |
| | | R | ■ | | |
| | | C | ■ | | |
| | 100 | S | ■ | | |
| | | H | ■ | | |
| | | R | ■ | | |
| 250 | 125 | S | ■ | | |
| | | H | ■ | | |
| | | R | ■ | | |
| | 140 | C | ■ | | |
| | | S | ■ | | |
| | | H | ■ | | |
| | 150 | R | ■ | | |
| | | S | ■ | | |
| | | H | ■ | | |
| | 160 | R | ■ | | |
| | | S | ■ | | |
| | | H | ■ | | |
| | 175 | R | ■ | | |
| | | S | ■ | | |
| | | H | ■ | | |
| | 180 | R | ■ | | |
| | | S | ■ | | |
| | | H | ■ | | |
| | 200 | R | ■ | | |
| | | S | ■ | | |
| | | H | ■ | | |
| | 225 | R | ■ | | |
| | | S | ■ | | |
| | | H | ■ | | |
| | 250 | R | ■ | | |
| | | S | ■ | | |
| | | H | ■ | | |
| 400 | 225 | R | ■ | | ■ |
| | | S | ■ | | ■ |
| | | H | ■ | | ■ |
| | 250 | R | ■ | | ■ |
| | | S | ■ | | ■ |
| | | H | ■ | | ■ |
| | 300 | R | ■ | | ■ |
| | | S | ■ | | ■ |
| | | H | ■ | | ■ |
| | | R | ■ | | ■ |
| | | S | ■ | | ■ |
| | | H | ■ | | ■ |

| Frame level | Current (A) | Breaking capacity code | Front connection screw | | |
|-------------|-------------|------------------------|--------------------------|----------------------------|-----------------|
| | | | Hexagonal head screw (A) | Hexagonal socket screw (B) | Cross screw (C) |
| 400 | 315 | S | ■ | | ■ |
| | | H | ■ | | ■ |
| | | R | ■ | | ■ |
| | 350 | S | ■ | | ■ |
| | | H | ■ | | ■ |
| | | R | ■ | | ■ |
| | 400 | S | ■ | | ■ |
| | | H | ■ | | ■ |
| | | R | ■ | | ■ |
| 630 | 400 | S | | | ■ |
| | | H | | | ■ |
| | | R | | | ■ |
| | 450 | S | | | ■ |
| | | H | | | ■ |
| | | R | | | ■ |
| | 500 | S | | | ■ |
| | | H | | | ■ |
| | | R | | | ■ |
| 800 | 630 | S | | | ■ |
| | | H | | | ■ |
| | | R | | | ■ |
| | 700 | S | | | ■ |
| | | H | | | ■ |
| | | R | | | ■ |
| | 800 | S | | | ■ |
| | | H | | | ■ |
| | | R | | | ■ |

Cage clamp terminals (for products 16~630A, cage clamp terminals are available)



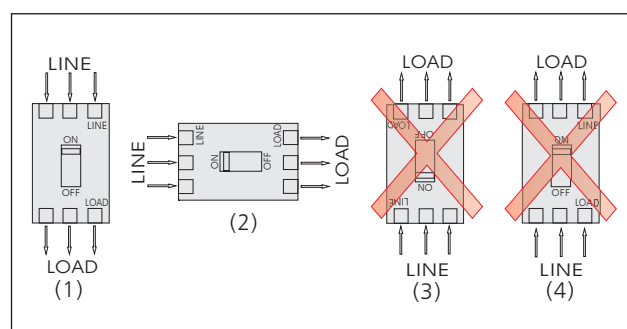
Rear connection

Rear connection is applicable to 3P and 4P products of NM1-63~NM1-800



Plug-in connection

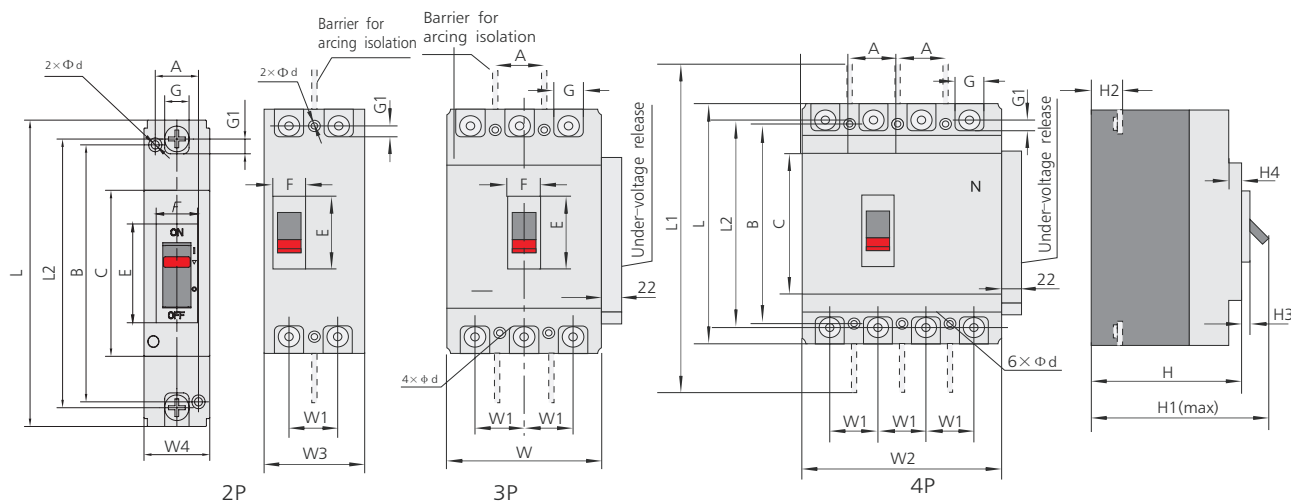
Plug-in connection is applicable to 3P and 4P products of NM1-63~NM1-800



Modes of down-lead (1) and (2) illustrated in the figure are available for your wiring operation. For its breaking capacity may be affected, mode of down-lead (3) is not recommended, before reception of any authorized announcement from the manufacturer; the mode of down-lead (4) is prohibited for your wiring.

10. Overall and mounting dimensions

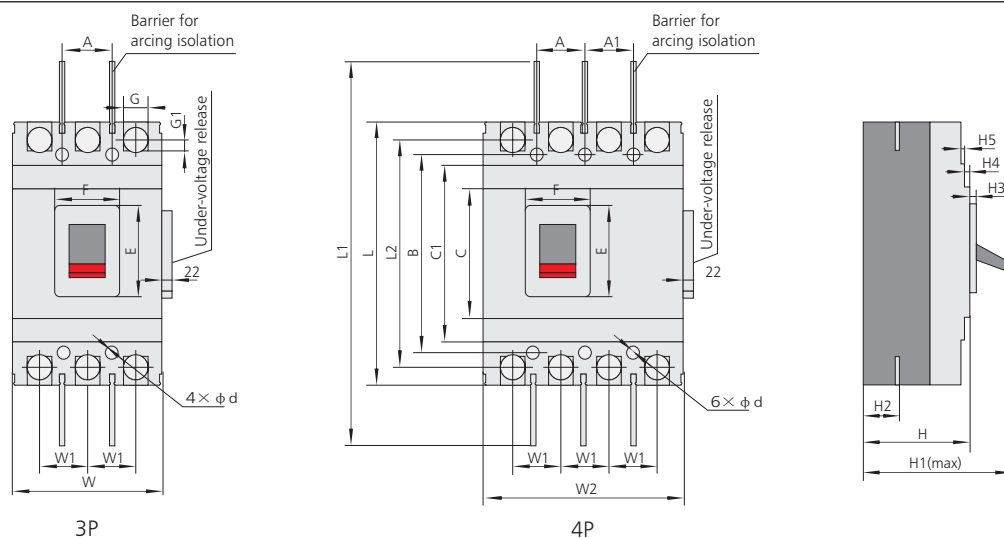
Fig.15a NM1-63, 125, 250 fixed connection



(mm)

| Dimension | | NM1-63S | NM1-63H | NM1-125C NM1-125S | NM1-125H NM1-125R | NM1-250S/1P | NM1-250C NM1-250S | NM1-250H NM1-250R |
|------------------------|----|---------|---------|----------------------|----------------------|-------------|----------------------|----------------------|
| Overall dimensions | C | 85 | 85 | 84 | 84 | 102 | 102 | 102 |
| | E | 48 | 48 | 50.5 | 50.5 | 51 | 50 | 50 |
| | F | 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| | G | 14 | 14 | 17.5 | 17.5 | 17.5 | 23 | 23 |
| | G1 | 6.5 | 6.5 | 7.5 | 7.5 | 9 | 11.5 | 11.5 |
| | H | 72 | 82 | 68 | 86 | 85 | 86 | 103 |
| | H1 | 90 | 100 | 86 | 104 | 109 | 110 | 127 |
| | H2 | 18 | 28 | 24 | 24 | 23 | 24 | 24 |
| | H3 | 4 | 4 | 4 | 4 | 4.5 | 4 | 4 |
| | H4 | 6 | 6 | 7 | 7 | 6 | 5 | 5 |
| | L | 135 | 135 | 155 | 155 | 165 | 165 | 165 |
| | L1 | 235 | 235 | 255 | 255 | - | 360 | 360 |
| | L2 | 117 | 117 | 136 | 136 | 144 | 144 | 144 |
| | W | 76 | 76 | 90 | 90 | - | 105 | 105 |
| | W1 | 25 | 25 | 30 | 30 | - | 35 | 35 |
| | W2 | - | 102.5 | - | 120 | - | - | 140 |
| | W3 | - | - | - | 65 | - | - | 75 |
| | W4 | - | - | - | - | 35 | - | - |
| Mounting dimensions | A | 25 | 25 | 30 | 30 | 28 | 35 | 35 |
| | B | 117 | 117 | 130.5 | 130.5 | 109 | 126 | 126 |
| | Φd | 4.5 | 4.5 | 4.5×6 | 4.5×6 | 5 | 5 | 5 |

Overall and mounting dimensions of NM1-400, 630, 800, 1250(Fixed type)

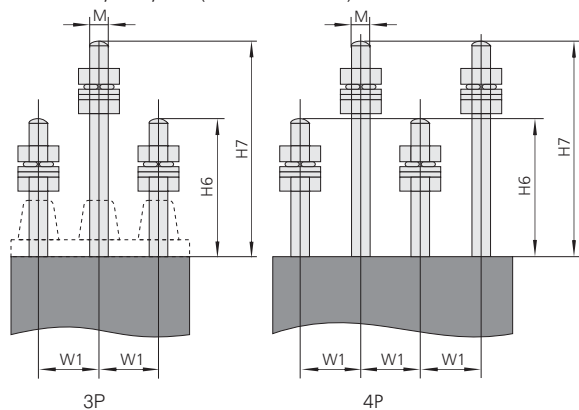


(mm)

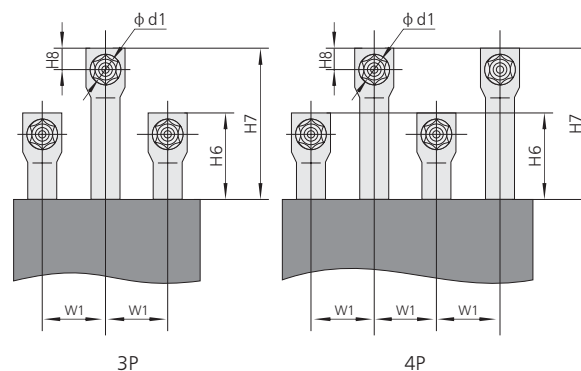
| Dimension | | NM1-400S NM1-400H NM1-400R | NM1-630S NM1-630H NM1-630R | NM1-800H/R | NM1-1250H |
|---------------------|-----|----------------------------------|----------------------------------|------------|-----------|
| Overall dimensions | C | 127.5 | 134.5 | 136 | 265.5 |
| | C1 | 173.5 | 184.5 | 204 | 345.5 |
| | E | 88.5 | 89 | 81 | 97 |
| | F | 65 | 65.5 | 66 | 78 |
| | G | 30.5 | 44 | 45 | - |
| | G1 | 11 | 13.5 | 12.5 | - |
| | H | 107 | 112 | 116 | 141 |
| | H1 | 162 | 164.5 | 168 | 202 |
| | H2 | 40 | 42 | 41.5 | 58 |
| | H3 | 6.5 | 7 | 4.5 | 16.5 |
| | H4 | 5 | 3.5 | 5 | 2 |
| | H5 | 5 | 4.5 | 8 | 4.5 |
| | L | 257 | 270.5 | 280 | 406* |
| | L1 | 457 | 470 | 485 | 715 |
| | L2 | 224 | 234 | 243 | - |
| | W | 150 | 182 | 210 | 210 |
| Mounting dimensions | W1 | 48 | 58 | 70 | 70 |
| | W2 | 197.5 | 240 | 280 | - |
| | A | 44 | 58 | 70 | 70 |
| | A1 | 50 | - | - | - |
| | B | 194 | 200 | 243 | 375 |
| | φ d | 7 | 7 | 7 | 10 |

*Note: Length of NM1-1250H with the connection board, is 545mm

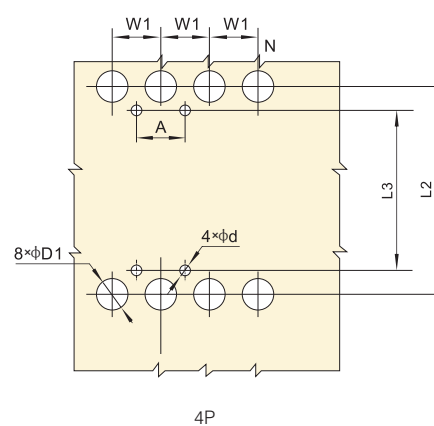
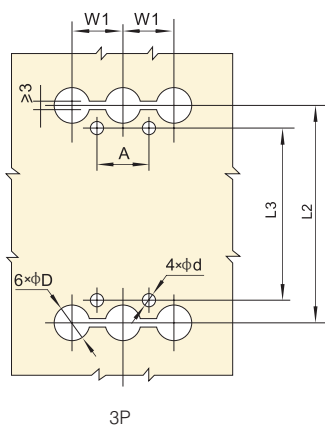
Overall and mounting dimensions of
NM1-63, 125, 250(rear connection)



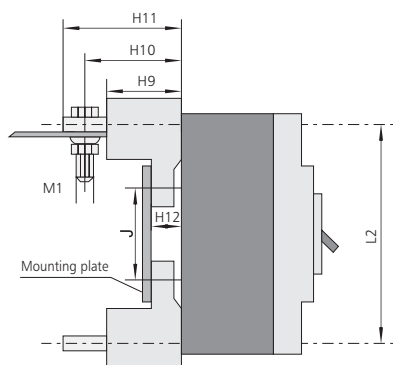
Overall and mounting dimensions of
NM1-400, 630, 800(rear connection)



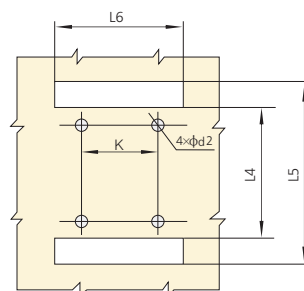
Boring diagram of rear connection



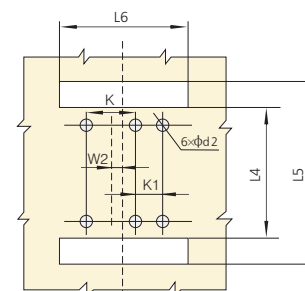
Plug-in type



3P mounting diagram



3P boring diagram of mounting plate



4P boring diagram of mounting plate

(mm)

| Dimension | | NM1-63S NM1-63H | NM1-125S NM1-125H NM1-125R | NM1-250S NM1-250H NM1-250R | NM1-400S NM1-400H NM1-400R | NM1-630S NM1-630H NM1-630R | NM1-800H NM1-800R |
|--|------|--------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------|
| Dimensions of rear connection and plug-in type | A | 25 | 30 | 35 | 44 | 58 | 70 |
| | φ d | 4.5 | 4.5×6 | 5.5 | 7 | 7 | 7 |
| | φ d1 | - | - | - | φ 12 | φ 16 | φ 16 |
| | φ d2 | 6 | 8 | 8 | 9 | 9 | 12 |
| | φ D | 8 | 10 | 12 | 33 | 37 | 37 |
| | φ D1 | 8 | 10 | 12 | 33 | 37 | 37 |
| | H6 | S:32 / H:23 | 63.5 | 67.5 | 39 | 45 | 64 |
| | H7 | S:47 / H:38 | 96.5 | 118.5 | 74 | 79 | 64 |
| | H8 | - | - | - | 18 | 20 | 20 |
| | H9 | 28 | 50 | 50 | 60 | 60 | 87 |
| | H10 | 38 | 67.5 | 71.5 | 88 | 92 | 143.7 |
| | H11 | 44.5 | 81 | 84.5 | 111 | 110 | 158.7 |
| | H12 | 10 | 18 | 18 | 21.5 | 21 | 27 |
| | L2 | 117 | 136 | 144 | 224 | 234 | 243 |
| | L3 | 117 | 130.5 | 126 | 194 | 200 | 243 |
| | L4 | 97 | 93 | 93 | 163 | 165 | 173 |
| | L5 | 138 | 180 | 190 | 285 | 302 | 305 |
| | L6 | 80/105* | 95/125* | 110/140* | 150/198* | 180/238* | 215/285* |
| | M | M6 | M8 | M10 | - | - | - |
| | K | 50 | 60 | 70 | 60 | 100 | 90 |
| | K1 | 25 | 30 | 35 | 66 | 66 | 95 |
| | J | 60 | 58 | 54 | 130.4 | 124 | 146 |
| | M1 | M5 | M8 | M8 | M10 | M12 | M12 |
| | W1 | 25 | 30 | 35 | 48 | 58 | 70 |
| | W2 | 12.5 | 15 | 17.5 | 24 | 29 | 35 |

Note: With "*" stands for dimension of 4P circuit breaker

11. Accessories

Inner accessories



| Accessory | Accessory code | | Mounting and wiring mode | | | | |
|---|-----------------------|------------------|---|---|--------------|-------------|-----------|
| | Magnetic only release | Compound release | NM1-63S NM1-125C,S,H,R NM1-250C,S,H,R | NM1-63S,H NM1-125C,S,H,R NM1-250S,H,R NM1-400S,H,R | NM1-630S,H,R | NM1-800H, R | NM1-1250H |
| | | | 2P | 3P 4P | 3P 4P | 3P 4P | 3P |
| No accessory | 200 | 300 | | | | | |
| Alarm contact | 208 | 308 | | | | | |
| Shunt release | 210 | 310 | | | | | |
| Auxiliary contact | 220 | 320 | | | | | |
| Under-voltage release | 230 | 330 | | | | | |
| Shunt release, auxiliary contact | 240 | 340 | | | | | |
| Shunt release, under-voltage release | 250 | 350 | | | | | |
| Two groups of auxiliary contacts | 260 | 360 | | | | | |
| Auxiliary contact, under-voltage release | 270 | 370 | | | | | |
| Shunt release, alarm contact | 218 | 318 | | | | | |
| Auxiliary alarm contact | 228 | 328 | | | | | |
| Under-voltage release, alarm contact | 238 | 338 | | | | | |
| Shunt release, auxiliary alarm contact | 248 | 348 | | | | | |
| Two groups auxiliary contact of auxiliary alarm contact | 268 | 368 | | | | | |
| Under-voltage release auxiliary alarm contact | 278 | 378 | | | | | |

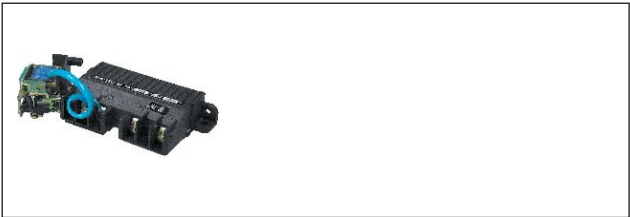
11.1 Under-voltage release

- a. $U_n=70\sim35\% U_s$, reliable operation
- b. $U_n=<35\% U_s$, prevent breaker from making
- c. $U_n=>85\% U_s$, guarantee the breaker making

The rated voltage of the under-voltage release is 50Hz, 230V and 400V.

Code of under-voltage release

| code | A2 | A4 | D1 | D2 |
|-----------------|---------|---------|---------|---------|
| voltage | AC 230V | AC 400V | DC 110V | DC 220V |
| rated frequency | 50Hz | 50Hz | - | - |



11.2 Shunt release

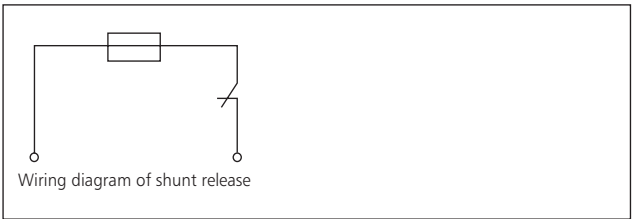
The rated control voltage of shunt release is 50Hz, 230V and 400V.

$U_n=70\%\sim110\% U_s$, reliable operation

Code of shunt release

| code | A1 | A2 | A4 | D1 | D2 | D3 |
|-----------------|-----------------|---------------|---------------|---------|---------|--------|
| voltage | AC 110/ 127V | AC 230V | AC 400V | DC 110V | DC 220V | DC 24V |
| rated frequency | 50Hz | 50Hz/ 60Hz | 50Hz/ 60Hz | - | - | - |

Note: when voltage is DC 24V, rated current should be up to $5A\pm10\%$



11.3 Auxiliary contact and alarm contact

Rated parameter of auxiliary contact


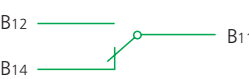
| Frame size | Conventional heating current I_{th} (A) | Rated current I_e (A) at AC 400 V | Rated current I_e (A) at DC 220 V |
|------------------|---|-------------------------------------|-------------------------------------|
| $I_{nm}\leq225A$ | 3 | 0.26 | 0.14 |
| $I_{nm}\geq400A$ | 6 | 3 | 0.2 |

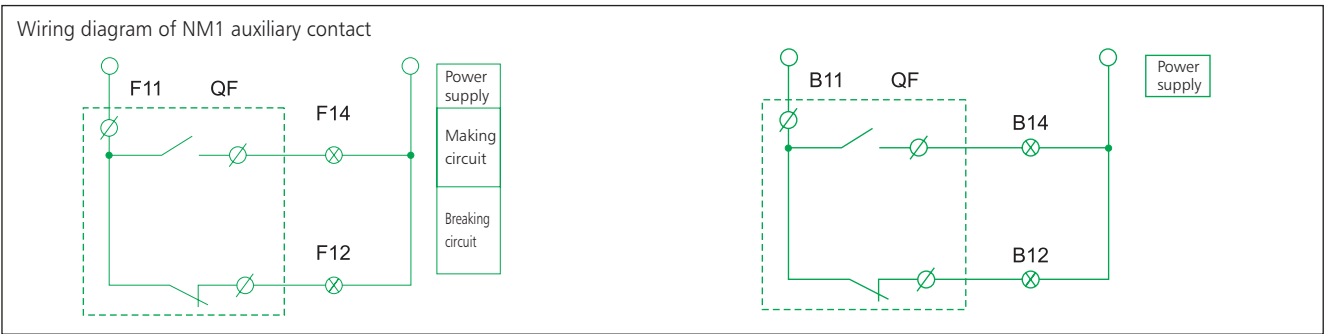
a. Auxiliary contact

| | |
|---|---|
| Circuit breaker is at "breaking" status |  |
| Circuit breaker is at "making" status |  |

b. Alarm contact

When circuit breaker normally makes and breaks, alarm contact doesn't operate. After free release (or release due to failure) alarm contact operate; and after the circuit breaker operates again, alarm contact returns to the original status.

| | |
|---|---|
| Circuit breaker is at "breaking" or "making" status |  |
| Circuit breaker is at free release (or alarming) status |  |



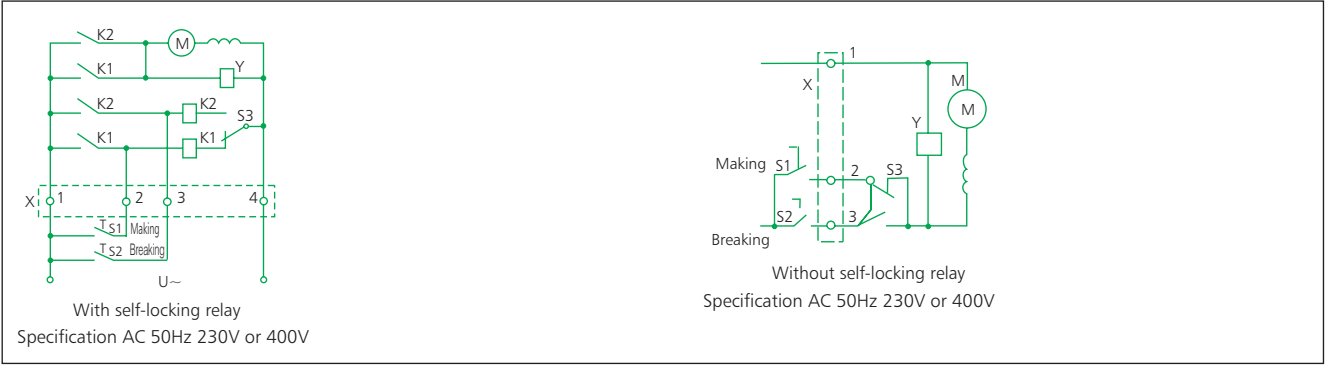
External accessories

11.4 Motor-driven operation mechanism

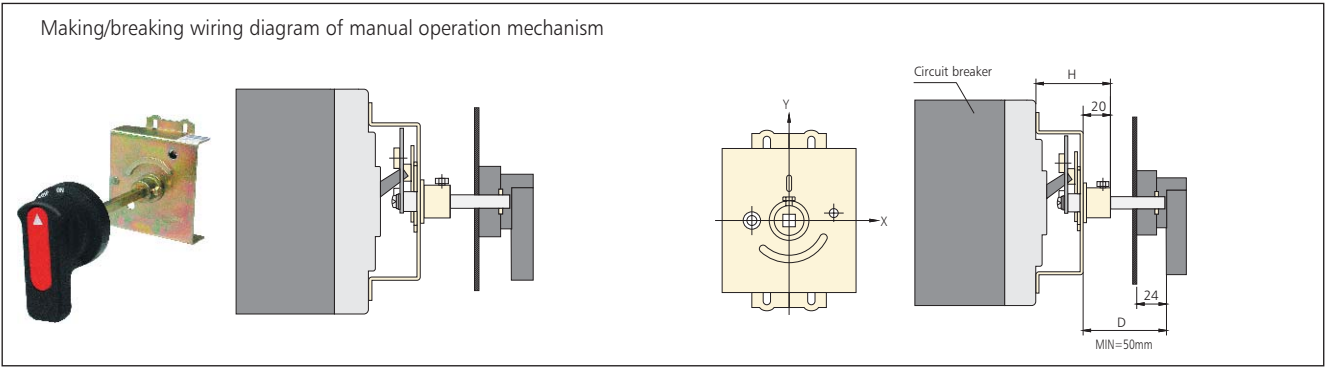
| Items | Model | NM1-63 NM1-125, NM1-250, NM1-400, NM1-630, NM1-800, NM1-1250 |
|-----------------------|-------|--|
| Structure form | | Electromagnet Motor |
| Code of AC/DC voltage | | A1/D1, A2/D2, A4, D3 |

Note: A1 AC 110V, A2 AC 230V, A4 AC 400V, D1 DC 110V, D2 DC 220V, D3 DC 24V,

Making and breaking diagram of
motor-driven operation mechanism(AC/DC)



Rotary manual operation mechanism

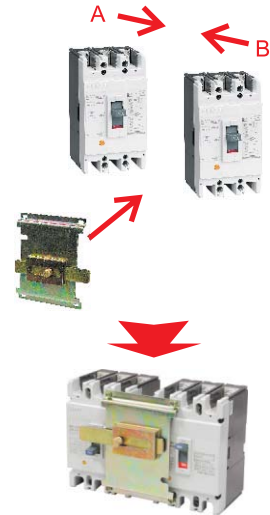
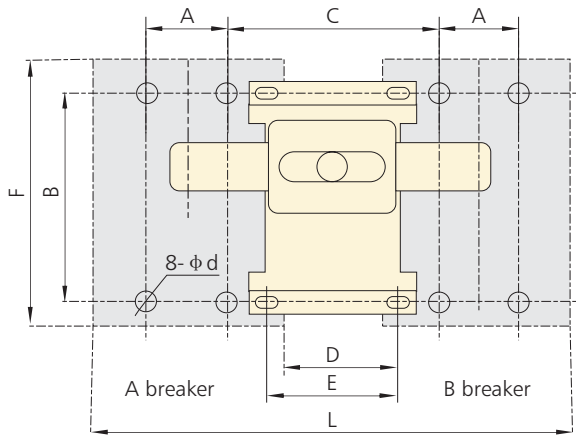


Mounting dimensions of manual operation mechanism



| (mm) | | | | | | |
|--|--------|---------|---------|---------|---------|----------------------|
| Model | NM1-63 | NM1-125 | NM1-250 | NM1-400 | NM1-630 | NM1-800H NM1-800R |
| Mounting size H | 49 | 51 | 54 | 88 | 89 | 96 |
| Y value of the handle related to the center of the breaker | 0 | 0 | 0 | 0 | 0 | 0 |

Mounting and boring dimensions



| (mm) | | | | | | | | |
|---------|----|-------|-----|----|-----|-----|-----|----------|
| Model | A | B | C | D | E | F | L | Φd |
| NM1-63 | 25 | 117 | 80 | 30 | 80 | 135 | 182 | 4.5 |
| NM1-125 | 30 | 130.5 | 90 | 30 | 90 | 155 | 210 | 4.5×6* |
| NM1-250 | 35 | 126 | 100 | 30 | 100 | 165 | 240 | 5.5 |
| NM1-400 | 44 | 194 | 136 | 30 | 40 | 257 | 330 | 7 |
| NM1-630 | 58 | 200 | 172 | 48 | 62 | 270 | 412 | 7 |
| NM1-800 | 70 | 243 | 167 | 28 | 40 | 280 | 448 | 7 |

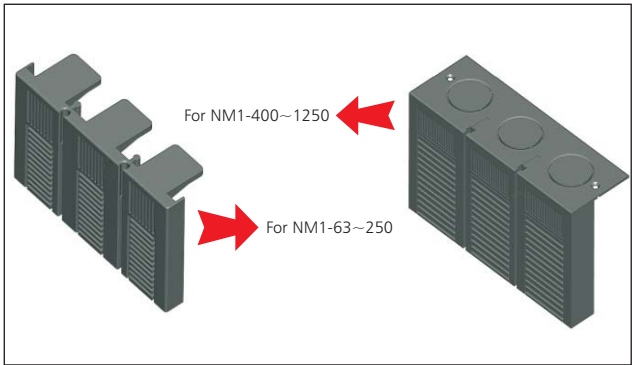
Note:

1. * stands for length of boring.
2. Install the breaker on the frame first, then install the mechanical interlock on the breaker.

12. Complementary Technical Information

- 12.1 The customized products of NM1-225, of which the capacity can be enriched to 250A is available.
- 12.2 NM1-1250 products are equipped with connection plate when they are sold; if you need connection plate for products of other model, the connection plate should be ordered separately.
- 12.3 Only H type breaker is applicable to manufacture NM1 series switch disconnector.
- 12.4 Terminal covers of the whole series NM1 products are available, and the protection degree can be up to IP40 after the breaker is equipped with terminal cover.

- 12.5 Safe distance between other electric apparatuses for mounting.



| (mm) | | | | | | | |
|----------------------|--------|---------|---------|---------|---------|---------|----------|
| Distance(min) \ Type | NM1-63 | NM1-125 | NM1-250 | NM1-400 | NM1-630 | NM1-800 | NM1-1250 |
| Line side | 50 | 50 | 50 | 100 | 100 | 100 | 100 |
| Load side | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Right side | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Left side | 25 | 25 | 25 | 25 | 25 | 25 | 25 |

12.6 Tightening torque table

| Wire size(copper) | | Rated current (A) | Tightening torque(N · m) | |
|-------------------|-----------------|-----------------------|--------------------------|-----------------|
| AWG/MCM | mm ² | | Front connection plate | Boxing terminal |
| 16-6 | 1.5-16 | $10 \leq I_n \leq 63$ | 5 | 3 |
| 4-3 | 25-35 | $63 < I_n \leq 100$ | 10 | 8 |
| 2-4/0 | 50-95 | $100 < I_n \leq 225$ | 14 | 10 |
| 300-500 | 120-240 | $225 < I_n \leq 400$ | 18 | 16 |
| 250×2 | 150×2 | $400 < I_n \leq 500$ | 22 | 18 |
| 350×2 | 185×2 | $500 < I_n \leq 630$ | 26 | 20 |
| 500×2 | 240×2 | $630 < I_n \leq 800$ | 28 | - |
| 350×4 | 185×4 | $800 < I_n \leq 1250$ | 30 | - |

12.7 Technical Data of NM1 series

| Frame current (A) | Model | Number of poles | Ui (V) | Icu/Ics(kA) | | | | | | |
|----------------------|-----------|--------------------|--------|-------------|------|------|---------|------|--------|------|
| | | | | 220V | 230V | 240V | 380V | 400V | 415V | 660V |
| 63 | NM1-63S | 3 | 500 | 20/10 | | | 15/7.5 | | - | |
| | NM1-63H | 3/4 | 500 | 42/21 | | | 35/17.5 | | - | |
| 125 | NM1-125C | 3 | 800 | 25/12.5 | | | 20/10 | | 3/1.5 | |
| | NM1-125S | 3 | 800 | 42/21 | | | 25/12.5 | | 3/1.5 | |
| | NM1-125H | 2 | 800 | 65/32.5 | | | 50/25 | | - | |
| | | 3/4 | 800 | 65/32.5 | | | 50/25 | | 8/4 | |
| | NM1-125R | 3 | 800 | 85/42.5 | | | 65/32.5 | | 10/5 | |
| | | | | | | | | | | |
| 250 | NM1-250S | 1 | 800 | 20/10 | | | - | | - | |
| | | 3 | 800 | 42/21 | | | 25/12.5 | | 5/2.5 | |
| | NM1-250H | 2 | 800 | 65/32.5 | | | 50/25 | | - | |
| | | 3/4 | 800 | 65/32.5 | | | 50/25 | | 8/4 | |
| | NM1-250R | 3 | 800 | 85/42.5 | | | 65/32.5 | | 10/5 | |
| | | | | | | | | | | |
| 400 | NM1-400S | 3/4 | 800 | 50/25 | | | 35/17.5 | | 10/5 | |
| | NM1-400H | 3 | 800 | 85/42.5 | | | 50/25 | | 12/6 | |
| | NM1-400R | 3 | 800 | 100/50 | | | 70/35 | | 15/7.5 | |
| 630 | NM1-630S | 3/4 | 800 | 50/25 | | | 35/17.5 | | 12/6 | |
| | NM1-630H | 3 | 800 | 85/42.5 | | | 50/25 | | 15/7.5 | |
| | NM1-630R | 3 | 800 | 100/50 | | | 70/35 | | 20/10 | |
| 800 | NM1-800H | 3/4 | 800 | 85/42.5 | | | 60/30 | | 20/10 | |
| | NM1-800R | 3 | 800 | 100/50 | | | 70/35 | | 20/10 | |
| 1250 | NM1-1250H | 3 | 800 | 85/42.5 | | | 65/32.5 | | 20/10 | |

| Frame current (A) | Model | Number of poles | Ui (V) | Icu/Icm(kA) | | | | | | |
|----------------------|-----------|--------------------|--------|-------------|------|------|---------|------|------|------|
| | | | | 220V | 230V | 240V | 380V | 400V | 415V | 660V |
| 63 | NM1-63S | 3 | 500 | 20/40 | | | 15/30 | | | - |
| | NM1-63H | 3/4 | 500 | 42/88.2 | | | 35/73.5 | | | - |
| 125 | NM1-125C | 3 | 800 | 25/52.5 | | | 20/40 | | | - |
| | NM1-125S | 3 | 800 | 42/88.2 | | | 25/52.5 | | | - |
| | NM1-125H | 2 | 800 | 65/43 | | | 50/105 | | | - |
| | | 3/4 | 800 | 65/43 | | | 50/105 | | | - |
| | NM1-125R | 3 | 800 | 85/187 | | | 65/143 | | | - |
| | | | | | | | | | | |
| 250 | NM1-250S | 1 | 800 | 20/40 | | | - | | | - |
| | | 3 | 800 | 42/88.2 | | | 25/52.5 | | | - |
| | NM1-250H | 2 | 800 | 65/43 | | | 50/105 | | | - |
| | | 3/4 | 800 | 65/43 | | | 50/105 | | | - |
| | NM1-250R | 3 | 800 | 85/187 | | | 65/143 | | | - |
| | | | | | | | | | | |
| 400 | NM1-400S | 3/4 | 800 | 50/105 | | | 35/73.5 | | | - |
| | NM1-400H | 3 | 800 | 85/187 | | | 50/105 | | | - |
| | NM1-400R | 3 | 800 | 100/220 | | | 70/154 | | | - |
| 630 | NM1-630S | 3/4 | 800 | 50/105 | | | 35/73.5 | | | - |
| | NM1-630H | 3 | 800 | 85/187 | | | 50/105 | | | - |
| | NM1-630R | 3 | 800 | 100/220 | | | 70/154 | | | - |
| 800 | NM1-800H | 3/4 | 800 | 85/187 | | | 60/132 | | | - |
| | NM1-800R | 3 | 800 | 100/220 | | | 70/154 | | | - |
| 1250 | NM1-1250H | 3 | 800 | 85/187 | | | 65/143 | | | |

Note: Parameters in black are only for your reference.

12.8 Cascading

12.8.1 Cascading (220/230/240V)

Upstream: NM1-63~1250

Downstream: DZ47, eB, UB, DZ158, DZ267, NB1, NBH8, NM1-63~1250

| Upstream Breaking capacity (kA RMS) | NM1-63S 20 | NM1-63H 42 | NM1-125S 25 | NM1-125H 50 | NM1-125R 65 | NM1-250S 25 | NM1-250H 50 | |
|---|----------------------------|---------------|----------------|----------------|----------------|----------------|----------------|--|
| Downstream | Breaking capacity (kA RMS) | | | | | | | |
| DZ267 | 20 | 40 | 20 | 35 | 50 | 20 | 25 | |
| DZ47, eB, UB | 20 | 40 | 20 | 35 | 50 | 20 | 25 | |
| NBH8 | 20 | 40 | 20 | 35 | 50 | 20 | 25 | |
| NB1(I _{cn} =6000A) | 20 | 42 | 25 | 35 | 50 | 25 | 35 | |
| NB1(I _{cn} =10000A) | 20 | 42 | 25 | 40 | 50 | 25 | 35 | |
| DZ158 | | | 25 | 40 | 50 | 25 | 40 | |
| NM1-63S | | 42 | 25 | 50 | 65 | 25 | 50 | |
| NM1-63H | | | | | 65 | | | |
| NM1-125S | | | | 50 | 65 | | 50 | |
| NM1-125H | | | | | 65 | | | |
| NM1-250S | | | | | | | 50 | |
| NM1-250H | | | | | | | | |
| NM1-400S | | | | | | | | |
| NM1-400H | | | | | | | | |
| NM1-630S | | | | | | | | |
| NM1-630H | | | | | | | | |
| NM1-800H | | | | | | | | |
| NM1-1250H | | | | | | | | |

12.8.2 Cascading (380/400/415V)

Upstream: NM1-63~1250

Downstream: DZ47, eB, UB, DZ158, DZ267, NB1, NBH8, NM1-63~1250

| Upstream Breaking capacity (kA RMS) | NM1-63S 15 | NM1-63H 35 | NM1-125S 25 | NM1-125H 50 | NM1-125R 65 | NM1-250S 25 | NM1-250H 50 | |
|---|----------------------------|---------------|----------------|----------------|----------------|----------------|----------------|--|
| Downstream | Breaking capacity (kA RMS) | | | | | | | |
| DZ47, eB, UB | 10 | 15 | 10 | 15 | 15 | 10 | 15 | |
| NB1(I _{cn} =6000A) | 15 | 20 | 15 | 20 | 20 | 15 | 20 | |
| NB1(I _{cn} =10000A) | 15 | 20 | 20 | 25 | 25 | 20 | 25 | |
| DZ158 | | | 20 | 25 | 35 | 20 | 25 | |
| NM1-63S | | 35 | 25 | 50 | 65 | 25 | 50 | |
| NM1-63H | | | | | 65 | | | |
| NM1-125S | | | | 50 | 65 | | 50 | |
| NM1-125H | | | | | 65 | | | |
| NM1-250S | | | | | | | 50 | |
| NM1-250H | | | | | | | | |
| NM1-400S | | | | | | | | |
| NM1-400H | | | | | | | | |
| NM1-630S | | | | | | | | |
| NM1-630H | | | | | | | | |
| NM1-800H | | | | | | | | |
| NM1-1250H | | | | | | | | |

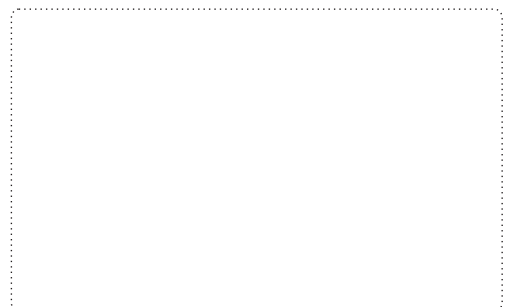
| NM1-250R 65 | NM1-400S 35 | NM1-400H 50 | NM1-400R 70 | NM1-630S 35 | NM1-630H 50 | NM1-630R 70 | NM1-800H 60 | NM1-800R 70 | NM1-1250H 65 |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| 30 | | | | | | | | | |
| 30 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |
| 40 | | | | | | | | | |
| 50 | 30 | 40 | 50 | | | | | | |
| 65 | | | | | | | | | |
| 65 | | | | | | | | | |
| 65 | | 50 | 70 | | 50 | 70 | 60 | 70 | 65 |
| 65 | | | 70 | | | 70 | | 70 | |
| 65 | | 50 | 70 | | 50 | 70 | 60 | 70 | 65 |
| 65 | | | 70 | | | 70 | | 70 | |
| | | 50 | 70 | | 50 | 70 | 60 | 70 | 65 |
| | | | 70 | | | 70 | | 70 | |
| | | | | | 50 | 70 | | | |
| | | | | | | 70 | | | |
| | | | | | | | | 70 | |

| NM1-250R 65 | NM1-400S 35 | NM1-400H 50 | NM1-400R 70 | NM1-630S 35 | NM1-630H 50 | NM1-630R 70 | NM1-800H 60 | NM1-800R 70 | NM1-1250H 65 |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 35 | 20 | 25 | 35 | | | | | | |
| 65 | | | | | | | | | |
| 65 | | | | | | | | | |
| 65 | | 50 | 70 | | 50 | 70 | 60 | 70 | 65 |
| 65 | | | 70 | | | 70 | | 70 | |
| 65 | | 50 | 70 | | 50 | 70 | 60 | 70 | 65 |
| 65 | | | 70 | | | 70 | | 70 | |
| | | 50 | 70 | | 50 | 70 | 60 | 70 | 65 |
| | | | 70 | | | 70 | | 70 | |
| | | | | | 50 | 70 | | | |
| | | | | | | 70 | | | |
| | | | | | | | | 70 | |



ZHEJIANG CHINT ELECTRICS CO.,LTD.

Add: No. 1, CHINT Road, CHINT Industrial Zone, North Baixiang,
Yueqing, Zhejiang, 325603, P.R.China
Tel: +86-577-61986198
Fax: +86-577-62775769 62871811
E-mail: global-sales@chint.com
Website: www.chint.net



Sep 2012

