

Moulded Case Circuit Breakers

MCCB



NM8, NM8S
Moulded Case
Circuit Breakers

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NM1
Moulded Case
Circuit Breakers

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5. Technical data

5.1 Parameters

NM8 circuit breaker Thermal-magnetic type		NM8-125				NM8-250				NM8-400				NM8-630				NM8-800				NM8-1250																																																		
4 Frames		Frame 1				Frame 2				Frame 3				Frame 4				Frame 4																																																						
Electric characteristics as per IEC 60947-2 and EN60947-2																																																																								
Rated current(A) In	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																																							
Rated insulation voltage (V) Ui	800																800				800				800				800																																											
Rated impulse withstand voltage (kV) Uimp	8																8				8				8				8																																											
Rated operational voltage (V) Ue	AC 50/60Hz																690				690				690				690				690																																							
	DC																-				-				-				-				-																																							
Number of poles	1 ^① 2 3 4				2 3 4				3 4				3 4				3 4				3 4																																																			
Breaking capacity code	-																H C S H R C S H				C S H R C S H				C S H R C S H				S H R S H				S H R S H																																							
Rated ultimate short-circuit breaking capacity (kA RMS) Icu	AC 380V/400V/415V																100 35 50 100 150 35 50 100				50 70 100 150 50 70 100				50 70 100 150 50 70 100				50 70 100 150 50 70 100				50 70 100 150 50 70 100																																							
	AC 660V/690V																10 6 10 10 10 6 10 10				15 15 15 15 15 15 15				15 15 15 15 15 15 15				10 20 10 20				10 20 10 20																																							
Rated service breaking capacity Ics= (%Icu)	100																100				100 ^②				100 ^②				50				50																																							
Suitability for isolation	■																■				■				■				■																																											
Utilization category	A																A				A				A				A																																											
Safety of insulation	■																■				■				■				■																																											
Life(CO recycle)	Mechanical																20,000				15,000				15,000				10,000				10,000																																							
	Electrical																10,000				6,000				6,000				6,000				6,000																																							
Protection	Thermo-magnetic																Thermo-magnetic				Thermo-magnetic				Thermo-magnetic				Thermo-magnetic				Thermo-magnetic																																							
Release units	■																■				■				■				■																																											
Over-load protection	■																■				■				■				■																																											
Short-circuit protection	■																■				■				■				■																																											
Residual current protection	Added on residual current protection module																-				-				-				-																																											
Mounting and connection																																																																								
Fixed	Front connection																■				■				■				■																																											
	Rear connection																■				■				-				-																																											
DIN rail	Front connection																■				-				-				-																																											
	Rear connection																■				■				-				-																																											
Plug-in	Front connection																■				■				-				-																																											
	Rear connection																■				■				-				-																																											
Manual	Handle																■				■				-				-																																											
	Direct or extended rotary handle																■				■				-				-																																											
Motor-driven mechanism																																																																								
Manual, remote operated automatic source changeover systems																																																																								
Shunt and under-voltage release																																																																								
Auxiliary and alarm contact																																																																								
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Mounting and connection accessories																																																																								
Connection terminal																																																																								
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Rear connection plate																																																																								
DIN rail adaptor																																																																								
Plug-in type connection accessories																																																																								
Terminal covers																																																																								
Interphase barrier																																																																								
Dimension and weight																																																																								
Dimension(mm)W×H×L	Fixed type-front connection																62×140×79				90×140×79				120×140×79				70×157×88				105×157×88				140×157×88				140×255×113				185×255×113				140×255×113				185×255×113				210×370×196				280×370×196				210×370×196				280×370×196			
	Weight(kg)																0.85				1.2				1.6				1.5				2.1				2.8				7.5				10				7.5				10				17.5				23				17.5				23			

Note:
 ① For 1 pole product, Ics=100%Icu=45kA @AC220V/ 240V
 ② When Ue is ≥660V, Ics=50% Icu.

NM8S circuit breaker Electronic type		NM8S-125				NM8S-250				NM8S-400				NM8S-630 ^①				NM8S-800				NM8S-1250				NM8S-1600																													
3 Frames		Frame 1				Frame 2				Frame 3				Frame 3				Frame 3				Frame 3																																	
Electric characteristics as per IEC 60947-2 and EN60947-2																																																							
Rated current(A) In	40, 50, 63, 80, 100, 125																100, 125, 160, 180, 200, 225, 250				250, 315, 350, 400				250, 315, 350, 400, 500, 630				630, 700, 800				630, 700, 800, 1000, 1250				1000, 1250, 1600																		
Rated insulation voltage (V) Ui	800																800				800				800				800				800																						
Rated impulse withstand voltage (kV) Uimp	8																8				8				8				8				8																						
Rated operational voltage (V) Ue	AC 50/60Hz																690				690				690				690				690				415																		
	DC																-				-				-				-				-				-																		
Number of poles	3				4				3				4				3				4				3				4																										
Breaking capacity code	S H																S H				S H R S H				S H R S H				S H R S H				S H R S H																						
Rated ultimate short-circuit breaking capacity (kA RMS) Icu	AC 380V/400V/415V																70 100				70 100				70 100 150 70 100				70 100 150 70 100				50 70 100 50 70				50 70 100 50 70																		
	AC 660V/690V																10 10				10 10				15 15 15 15 15				15 15 15 15 15				-				-																		
Rated service breaking capacity Ics= (%Icu)	100																100 ^②				100 ^②				100 ^②				50				50																						
Suitability for isolation	■																■				■				■				■				■																						
Utilization category	A																A				A				A				A				A																						
Safety of insulation	■																■				■				■				■				■																						
Life(CO recycle)	Mechanical																20,000				15,000				15,000				10,000				10,000																						
	Electrical																20,000				6,000				4,000				4,000				4,000																						
Protection	Electronic																Electronic				Electronic				Electronic				Electronic				Electronic																						
Release units	■																■				■				■				■				■																						
Over-load protection	■																■				■				■				■				■																						
Short-circuit protection	■																■				■				■				■				■																						
Residual current protection	Added on residual current protection module																-				-				-				-				-																						
Mounting and connection																																																							
Fixed	Front connection																■				■				■				■				■																						
	Rear connection																■				-				-				-				-																						
DIN rail	Front connection																■				-				-				-				-																						
	Rear connection																■				-				-				-				-																						
Plug-in	Front connection																■				■				-				-				-																						
	Rear connection																■				-				-				-				-																						
Manual	Handle																■				■				-				-				-																						
	Direct or extended rotary handle																■				■				-				-				-																						
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Dimension and weight																																																							
Dimension(mm)W×L×H	Fixed type-front connection																105×157×88				140×157×88				140×255×113				185×255×113				140×255×113				185×255×113				210×370×196				280×370×196										
	Weight(kg)																2.1				2.8				8				11				8				11				17.5				23				17.5				23		

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

5.2 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	-

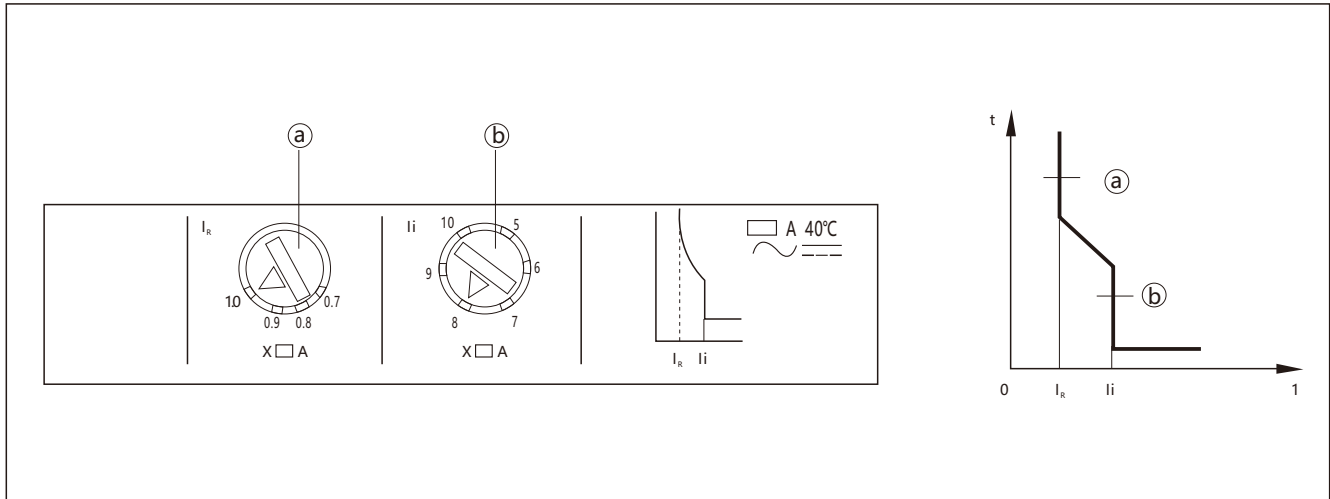
Note:

- 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 NM8-250, 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 (0.8~1)XIn	Adjustable range (0.8~1)XIn ¹⁾	Adjustable range (0.8~1)XIn ¹⁾	Adjustable range (0.8~1)XIn ¹⁾	Adjustable range (0.8~1)XIn	Adjustable range (0.8~1)XIn
N-pole protection (A) 4A, 4B 4C, 4D	Without protection 1.0XIr	Without protection 1.0XIr	Without protection 1.0XIr	Without protection 1.0XIr	Without protection 1.0XIr	Without protection 1.0XIr
Short-circuit protection	Magnetic protection					
Tripping current li (A)	10In (for power distribution protection) 12In (for motor protection)	Adjustable range (5~10) XIn (8~12)In(for motor protection)	Adjustable range (5~10) XIn (8~12)In(for motor protection)	Adjustable range (5~10) XIn (8~12)In(for motor protection)	Adjustable range (5~10) XIn	Adjustable range (5~10)XIn

¹⁾

Note:

(0.7~1) XIn is optional, please note that ordering code is different with (0.8~1) XIn

NM8-250, (100~180)A: adjustable magnetic protection value=(6~10)In, (200~250)A: adjustable magnetic protection value=(5~10)In

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

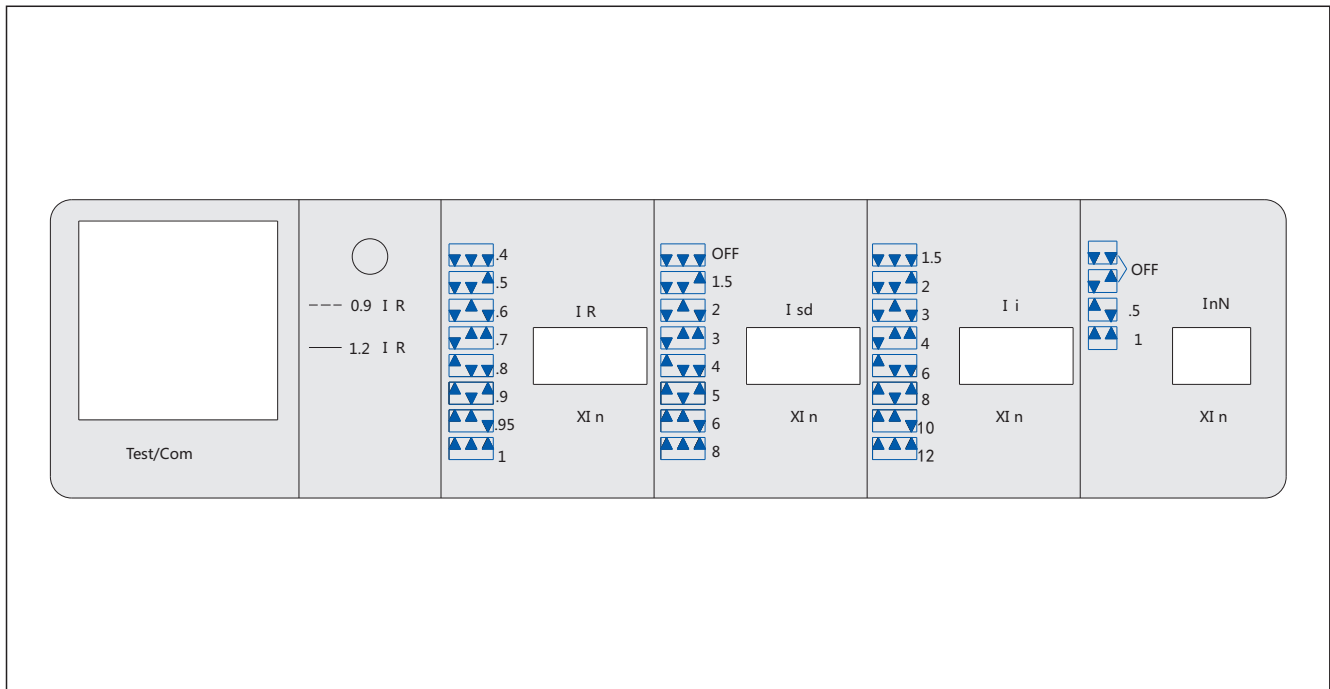
6.1.3 Characteristic of thermo protection operation of thermo-magnetic release for motor protection

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

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.



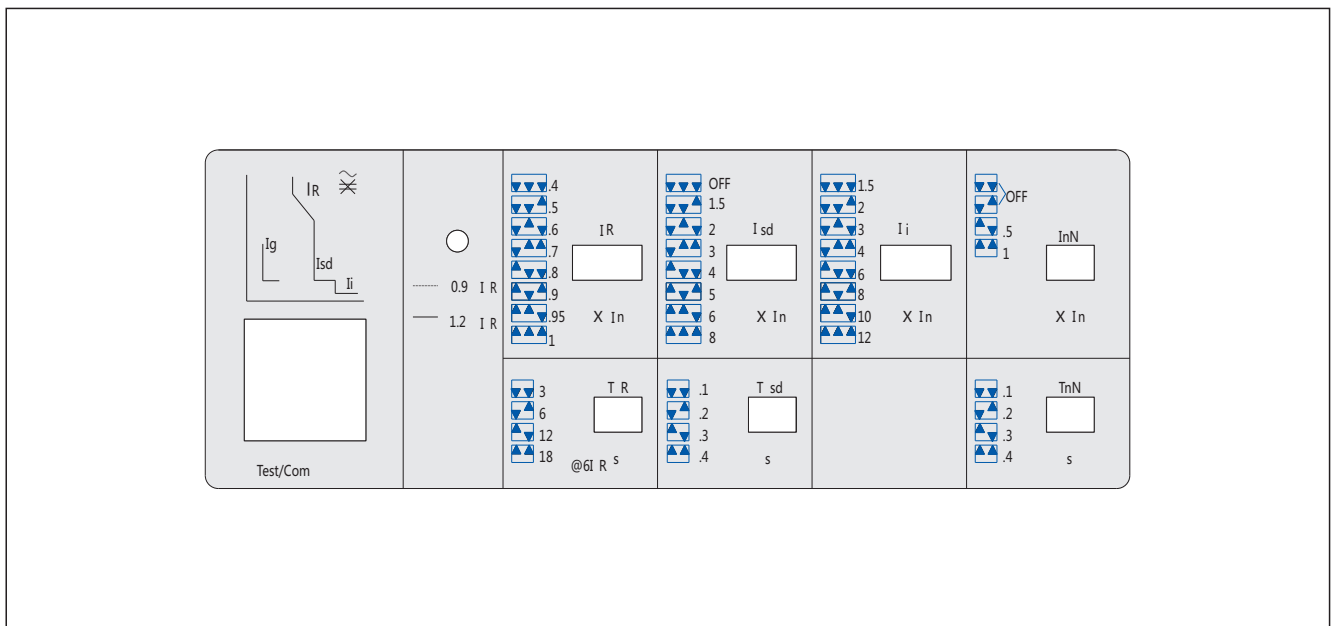


The indicator light flashes, when single-phase operational current is $\leq 90\%$ IR.
 The indicator light is always lit, when single-phase operational current is $\geq 115\%$ IR.

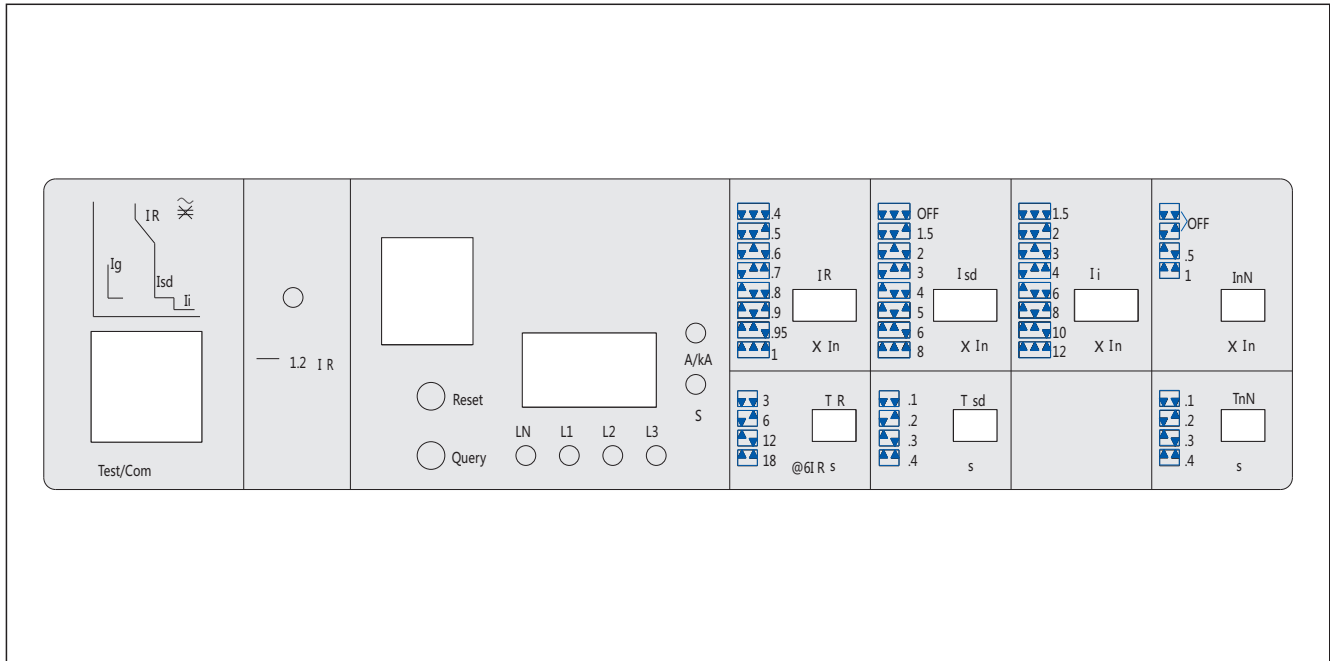
Electronic release	NM8S-125	NM8S-250
Rated value I_n (A) 20~70°C	40, 50, 63, 80, 100, 125	100, 125, 160, 180, 200, 225, 250
Over-load protection	Thermal protection	
Tripping current I_R	Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn	Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn
Tripping time $1.05 I_R$ $1.3 I_R$ $1.5 I_R$ $6 I_R$	>2h non tripping $\leq 1h$ 96s 6s	> 2h non tripping $\leq 1h$ 96s 6s
N-line protection tripping current I_{nN}	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.



6.2.3 NM8S-800, 1250, 1600 electronic release is an universal module. It is of 6 current specifications: 630A, 700A, 800A, 1000A, 1250A and 1600A 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_{Rr} , 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-800,1250,1600	> 2h non-tripping	< 1h tripping	48, 96, 192, 288	27, 54, 108, 162	3, 6, 12, 18



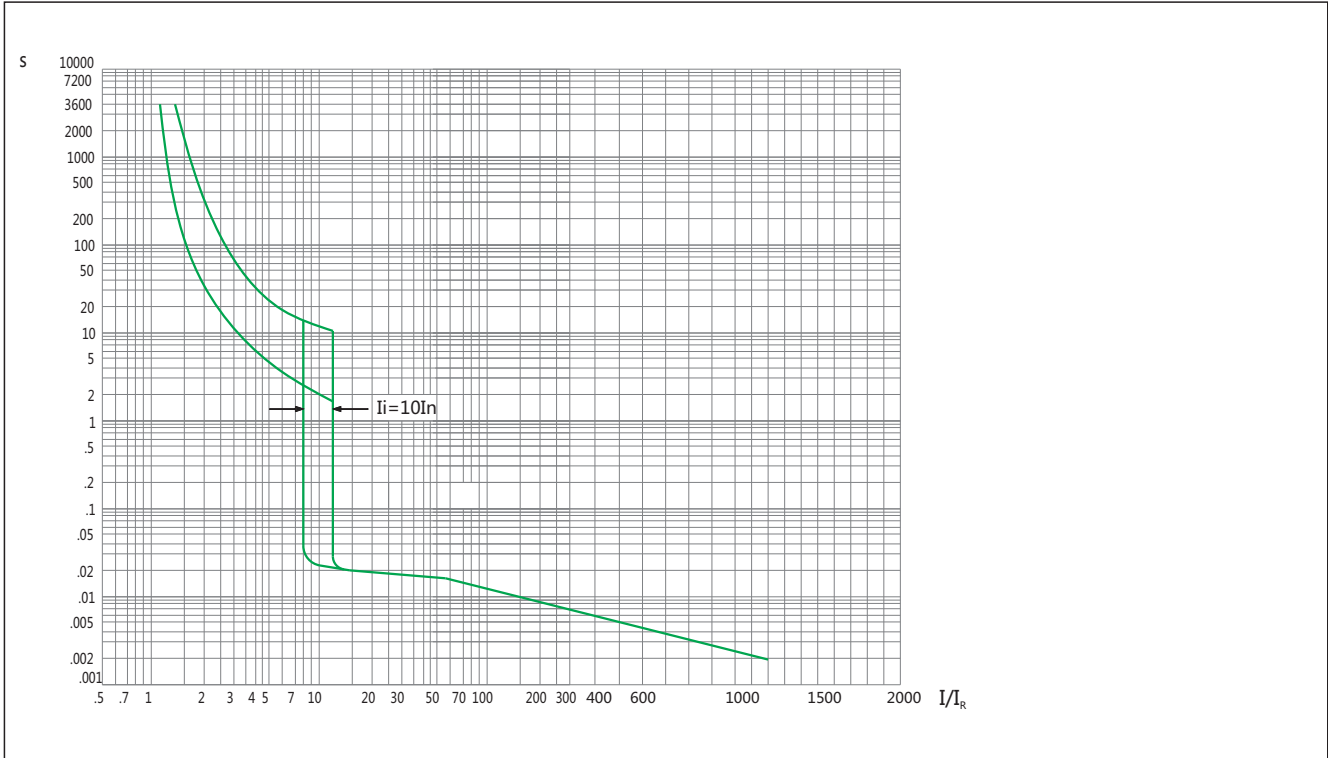
- I_t indicator light for over-load status indication
The indicator light flashes, when single-phase operational current is $< 90\% I_R$
The indicator light is always lit, when single-phase operational current is $\geq 115\% I_R$
- I_{sd} setting of short-circuit protection and tripping time
Setting 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_{nn} 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_{nn} the operating time of N-pole could be adjusted as per customers' requirements.

Electronic release	NM8S-400	NM8S-630	NM8S-800	NM8S-1250	NM8S-1600
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	1000, 1250, 1600
long time-delay over-load protection (thermal protection)					
Tripping current I_k (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	Adjustable range 0.4, 0.6, 0.7, 0.8, 0.9, 0.95, 1In
Tripping time $6I_k$ (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	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	Adjustable range OFF, 1.5, 2, 3, 4, 5, 6, 8In
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	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)	Adjustable range 1.5, 2, 3, 4, 6, 8, 10, 12XIn 12In(for motor protection)
(N-line) protection					
Tripping current I_{nn} (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	Adjustable range OFF, 0.5, 1XIn
Tripping time T_{nn} (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	Adjustable range 0.1, 0.2, 0.3, 0.4

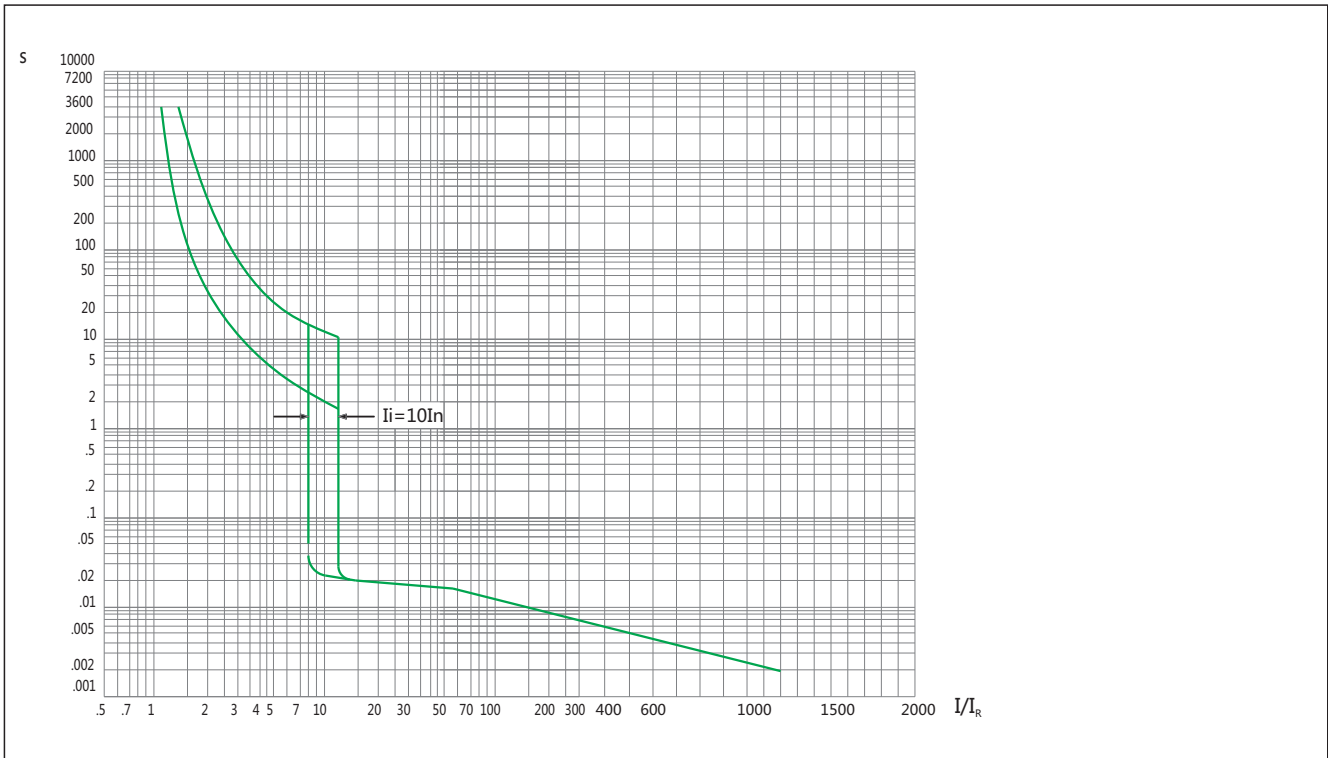
7. Curves

7.1 Tripping curve (ambient temperature +40°C)

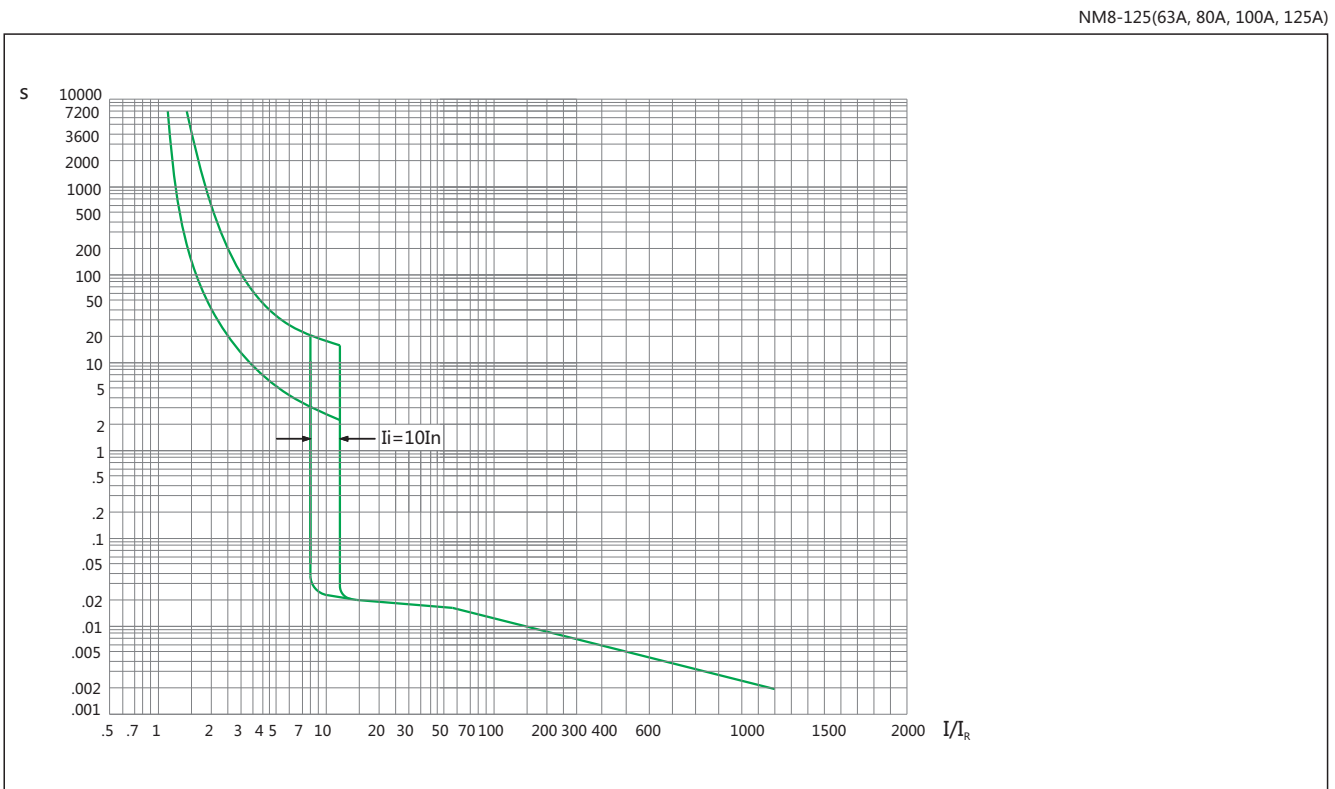
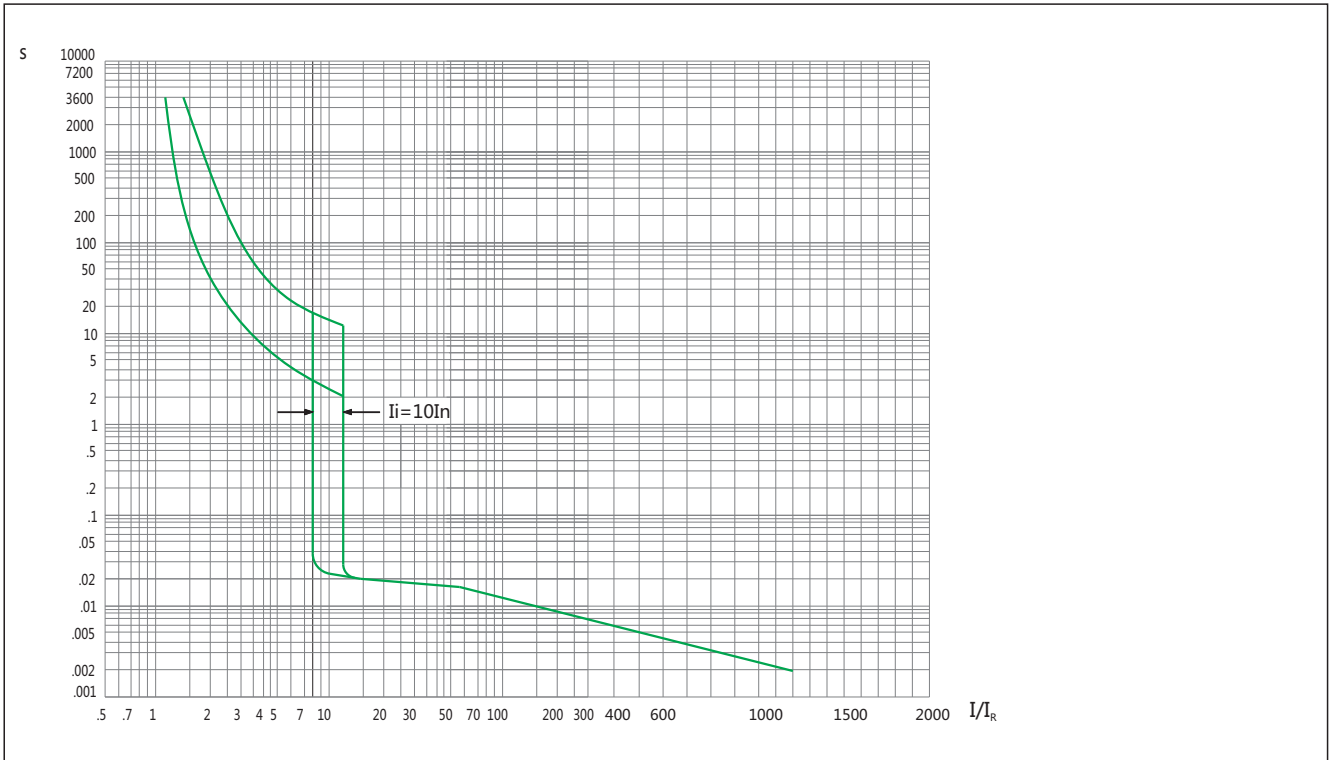
NM8-125(16A, 20A)



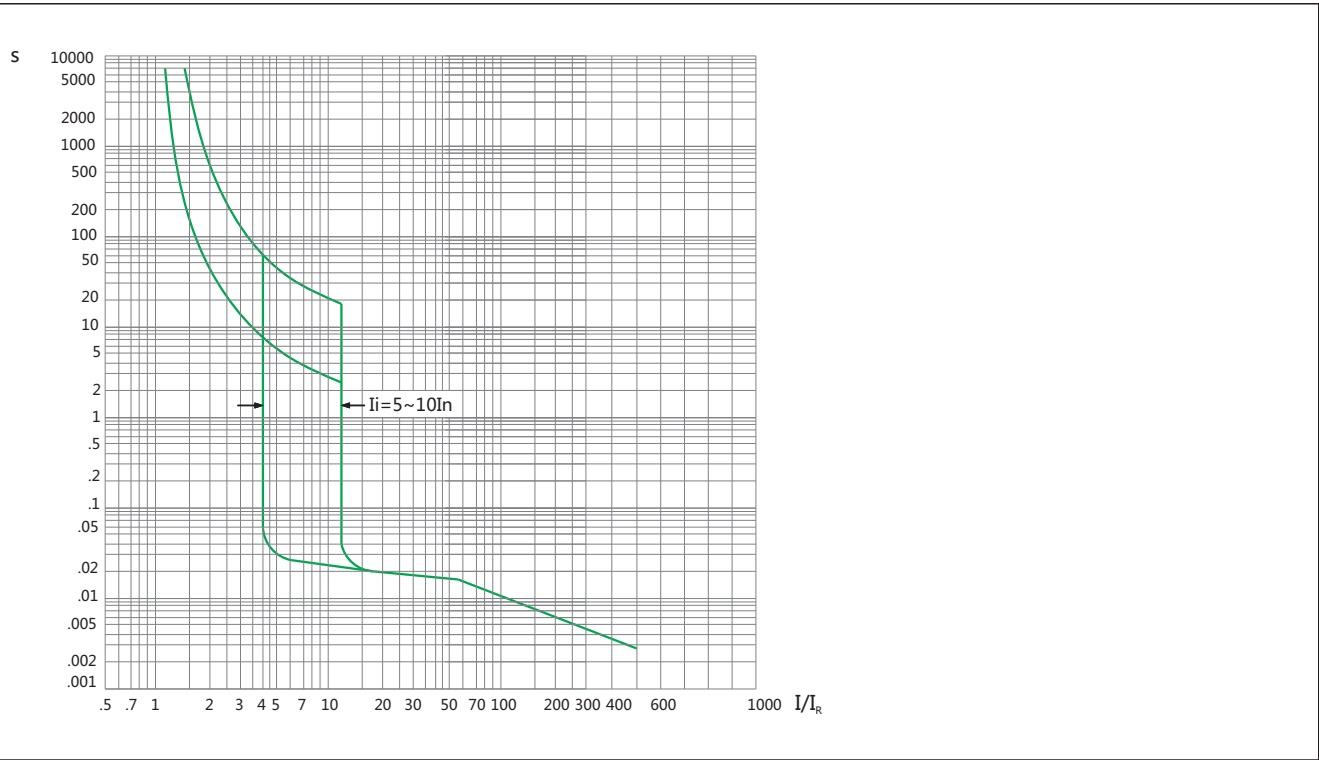
NM8-125(25A, 32A)



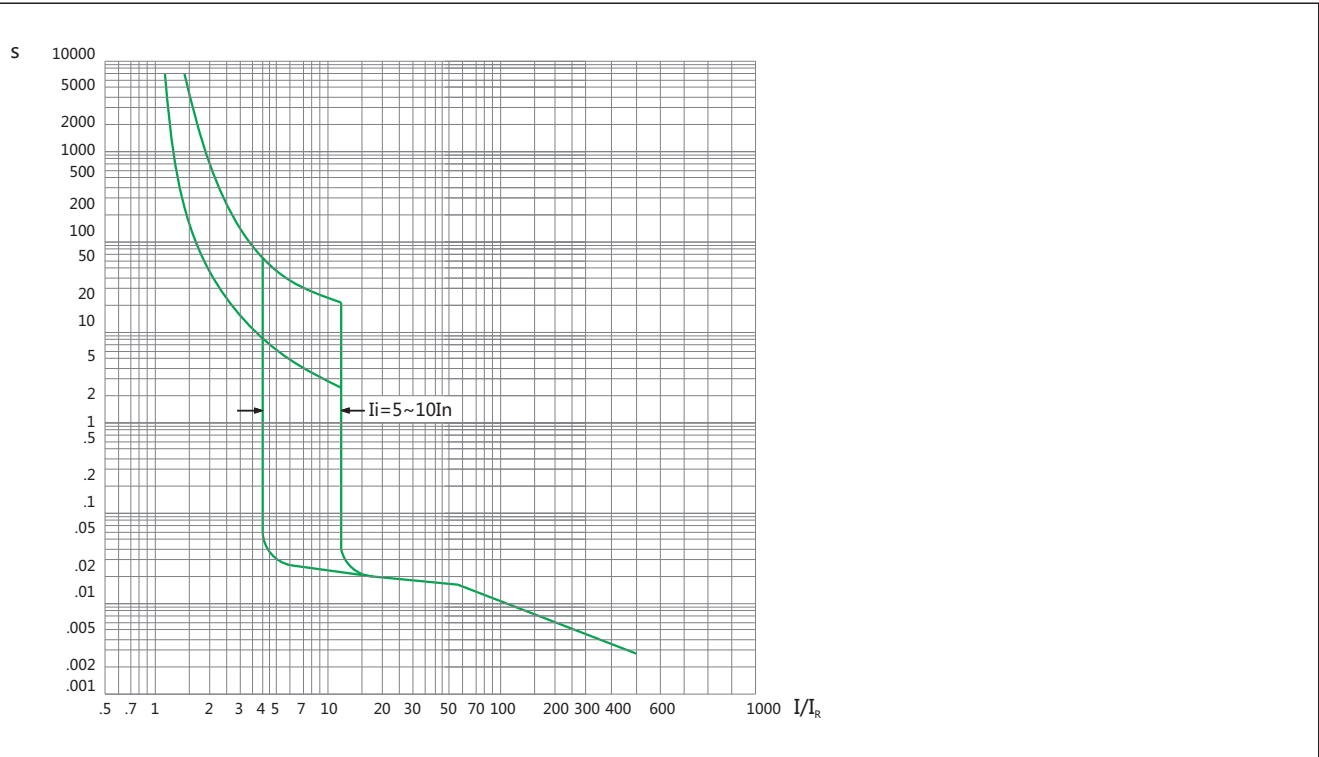
NM8-125(40A, 50A)



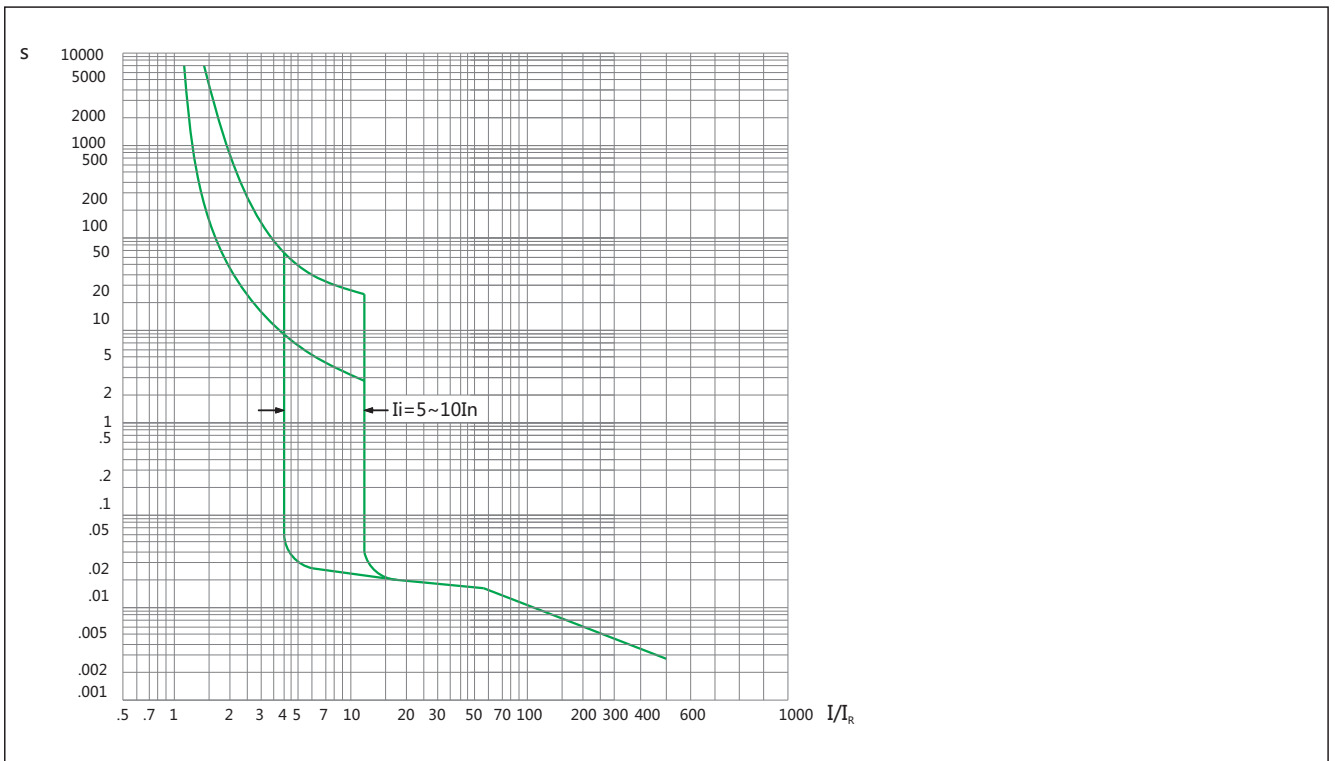
NM8-250(100A, 125A)



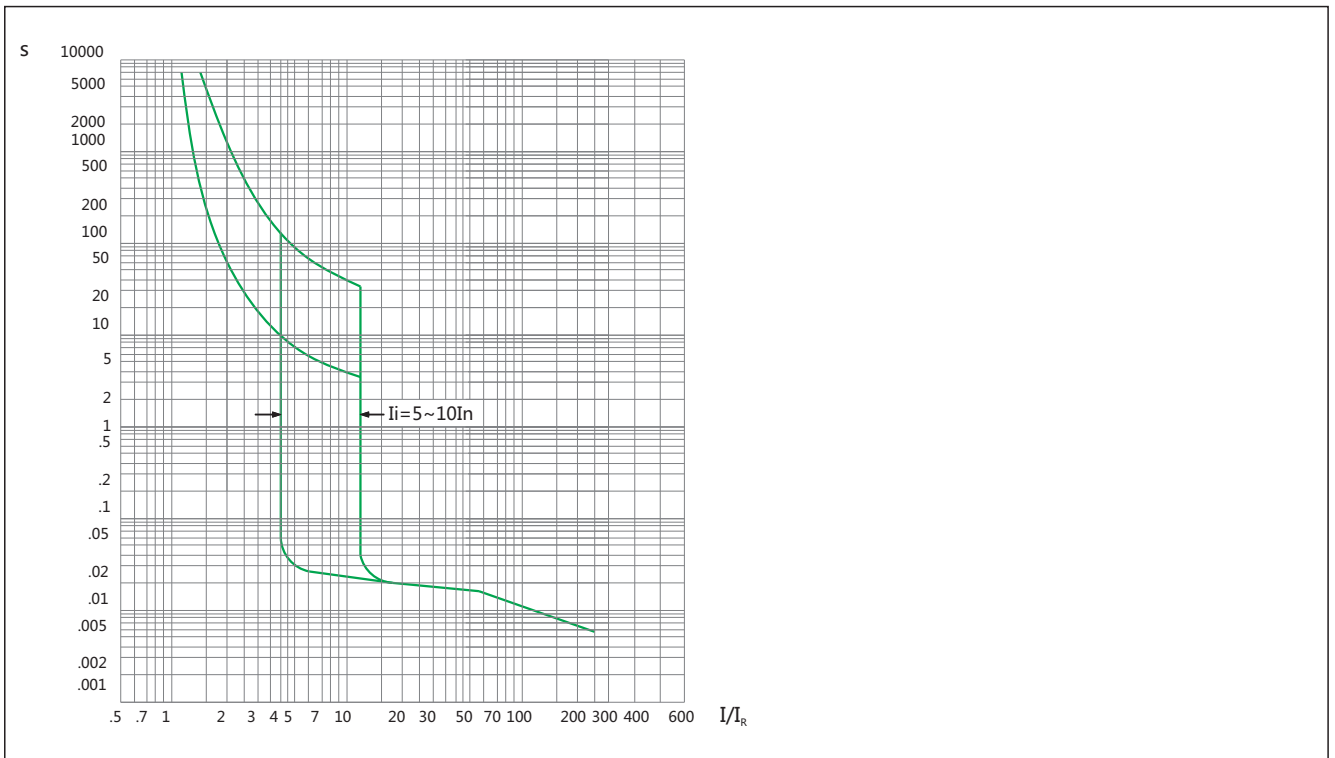
NM8-250(160A, 180A)



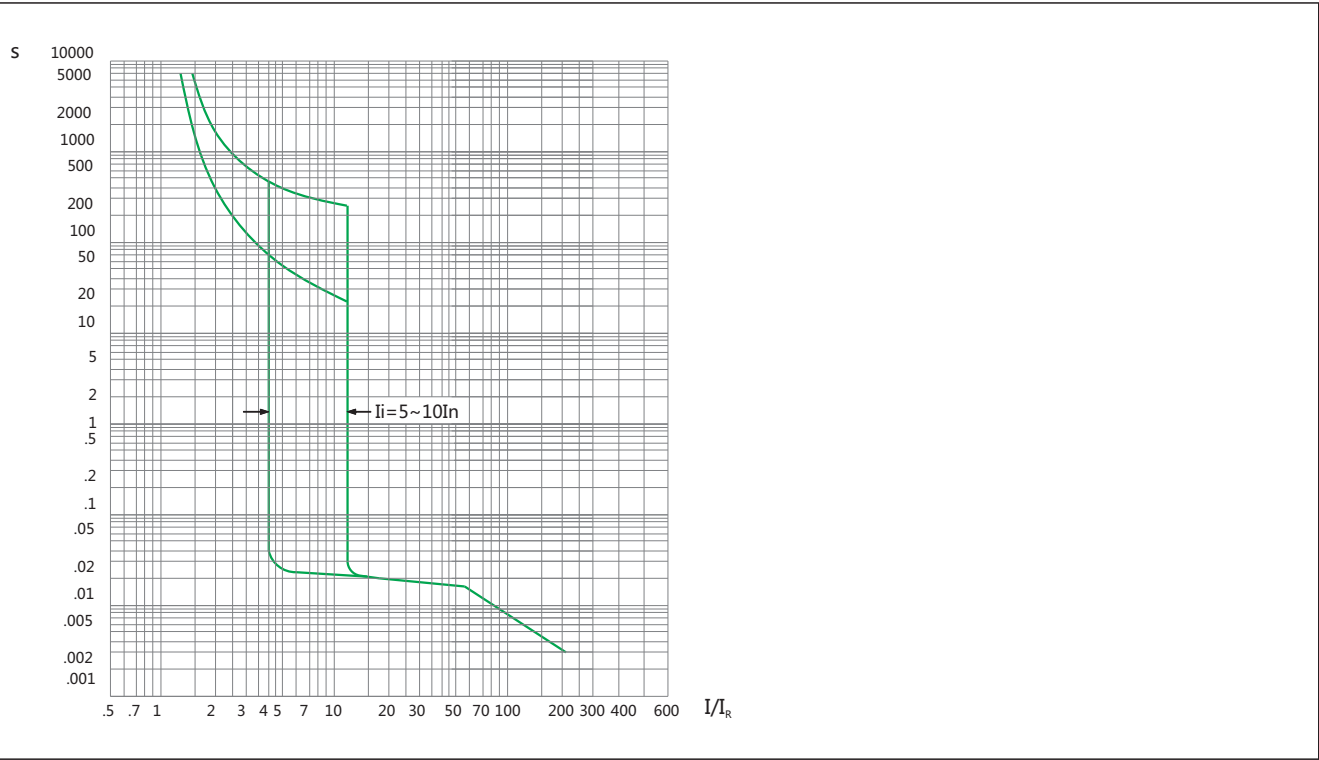
NM8-250(200A, 225A, 250A)



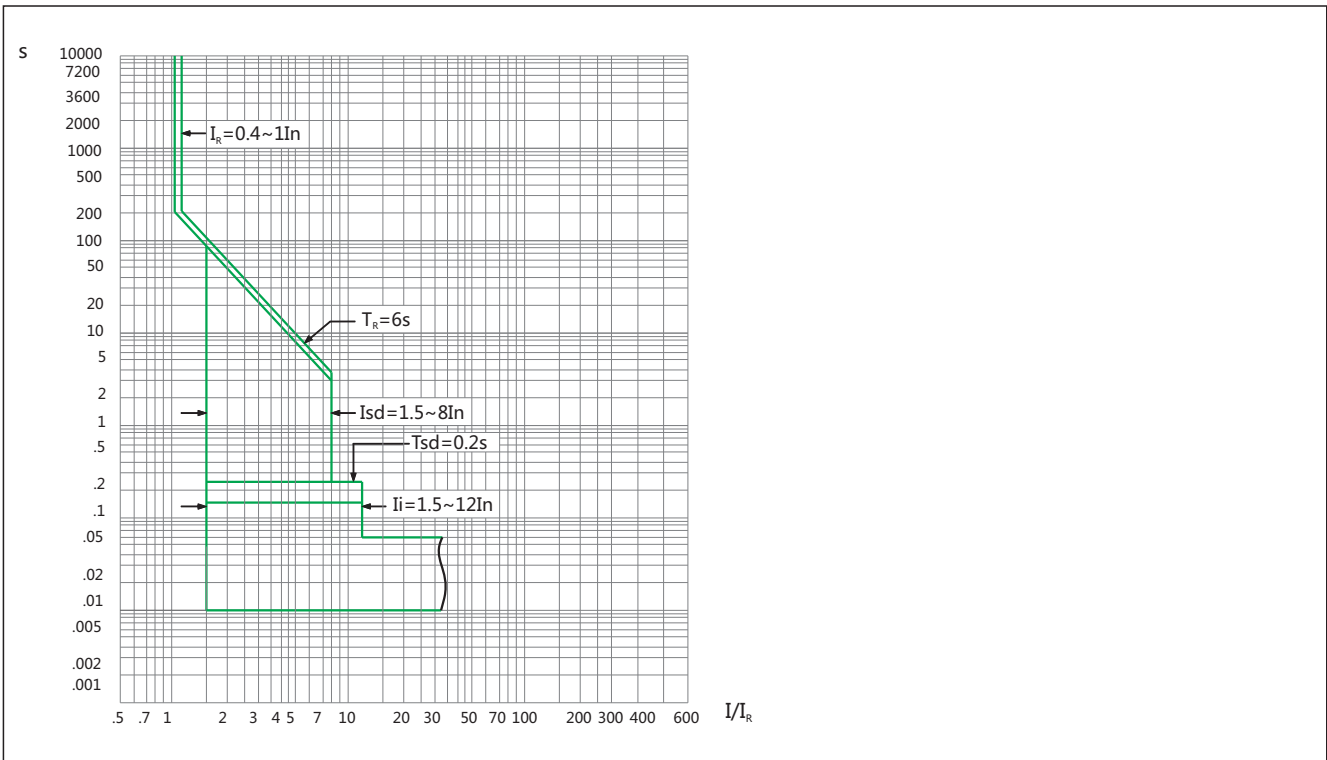
NM8-400, 630(250A~500A)



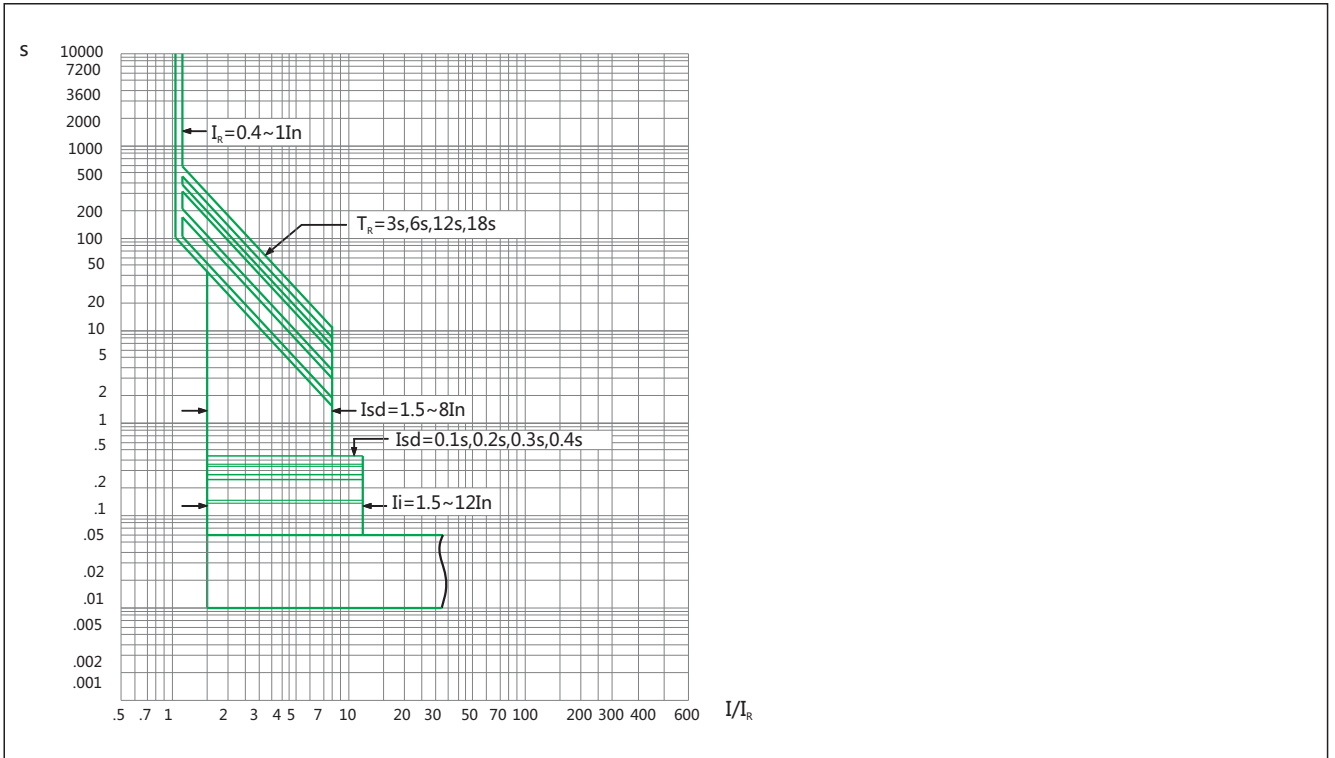
NM8-800(630~800A)
 NM8-1250(630A~1250A)



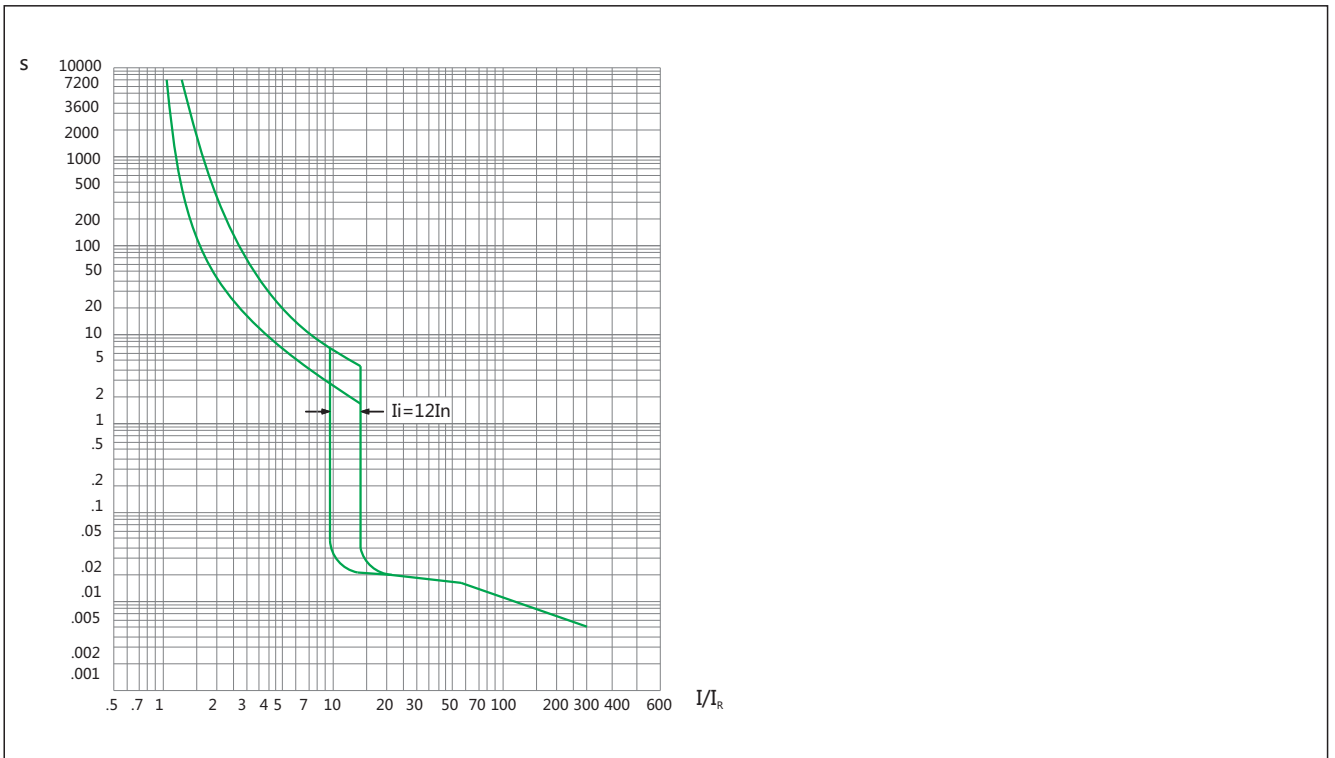
NM8S-125, 250(40A~250A)



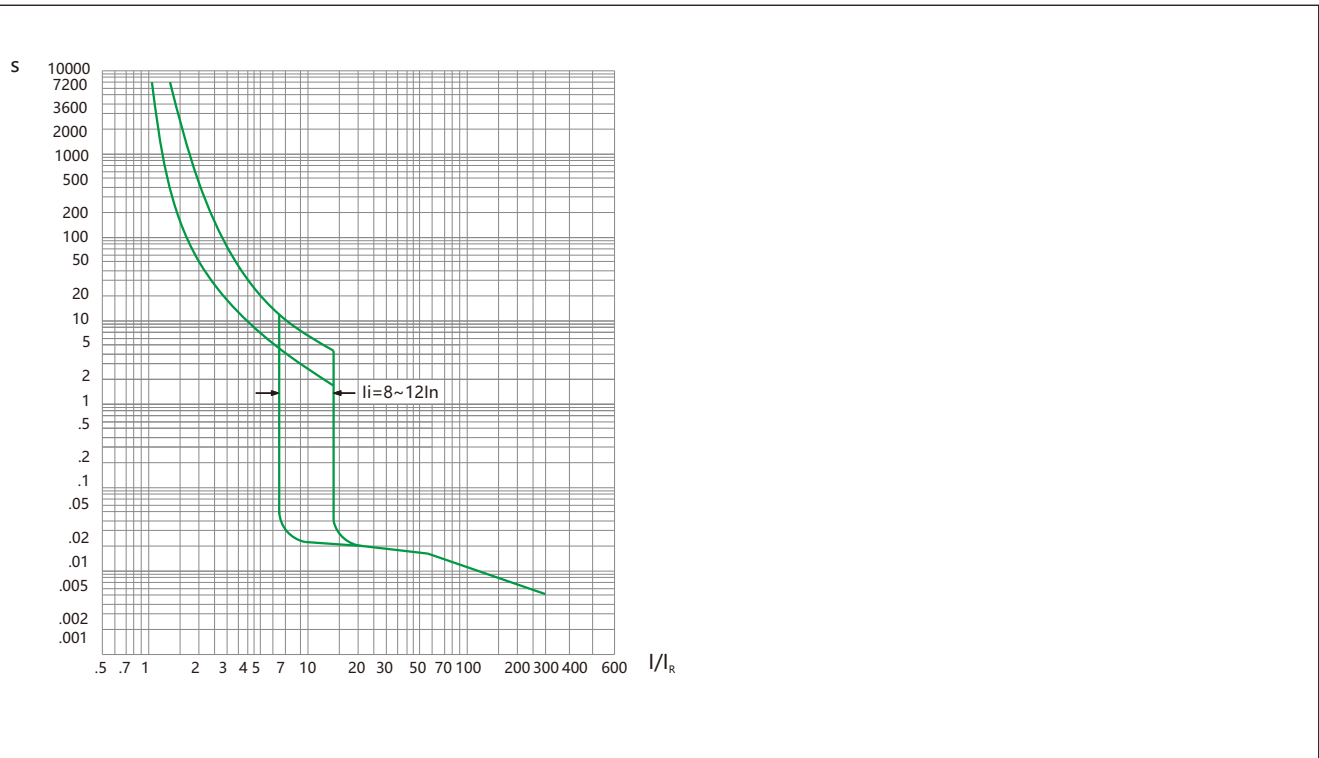
NM8S-400,630(250A~630A)
 NM8S-800,1250(630A~1250A)
 NM8S-1600(1000A~1600A)



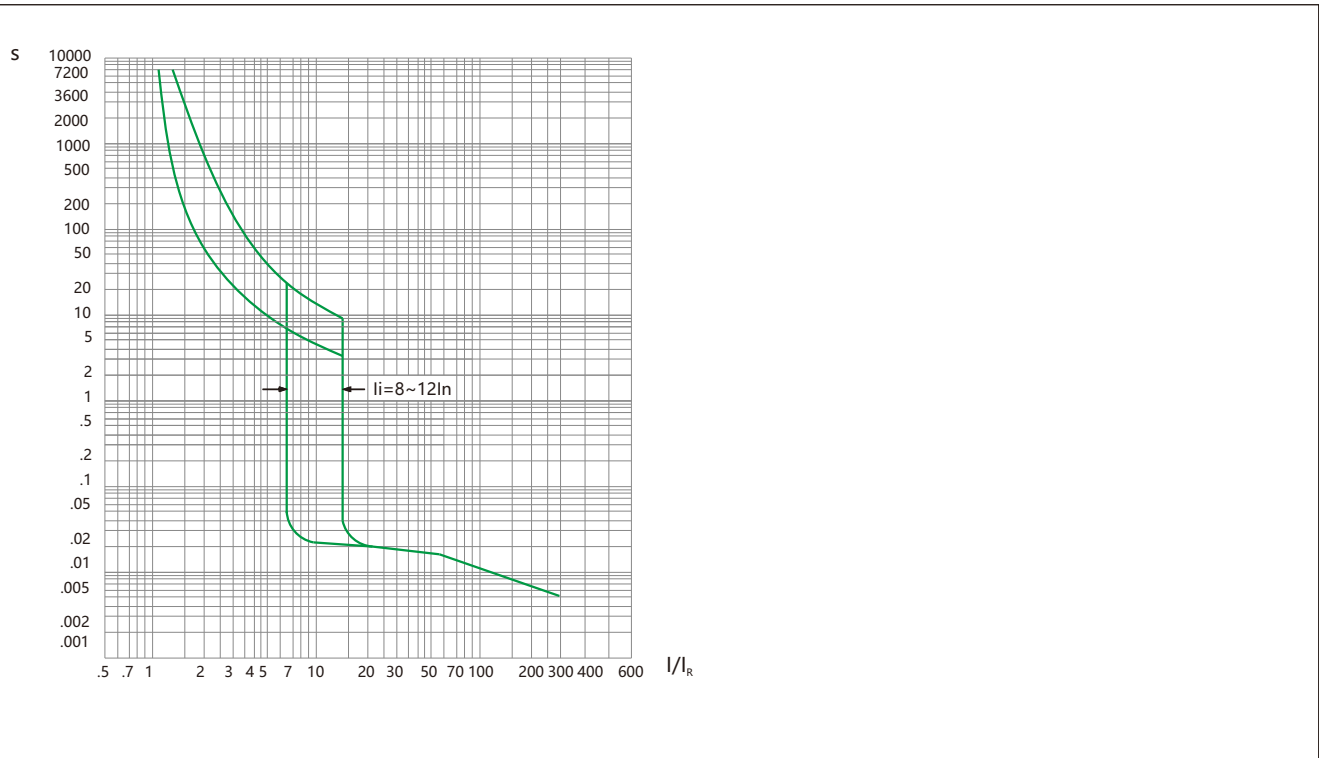
Motor protection release
 NM8-125(16A~125A)



NM8-250(100A ~ 250A)



NM8-400,630(250A ~ 500A)





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°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
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°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
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	1	1	0.98	0.95	0.93	0.90
NM8S-800S/H/R(630~800)	1	1	1	1	1	1	1	1	1	1	1	0.975	0.975	0.95	0.95
NM8S-1250S/H/R(1000~1250)	1	1	1	1	1	1	1	1	1	1	1	0.95	0.9	0.875	0.80
NM8S-1600S/H/R(1000~1600)	1	1	1	1	1	1	1	1	1	1	1	0.95	0.9	0.875	0.80

8. Mounting of circuit breaker

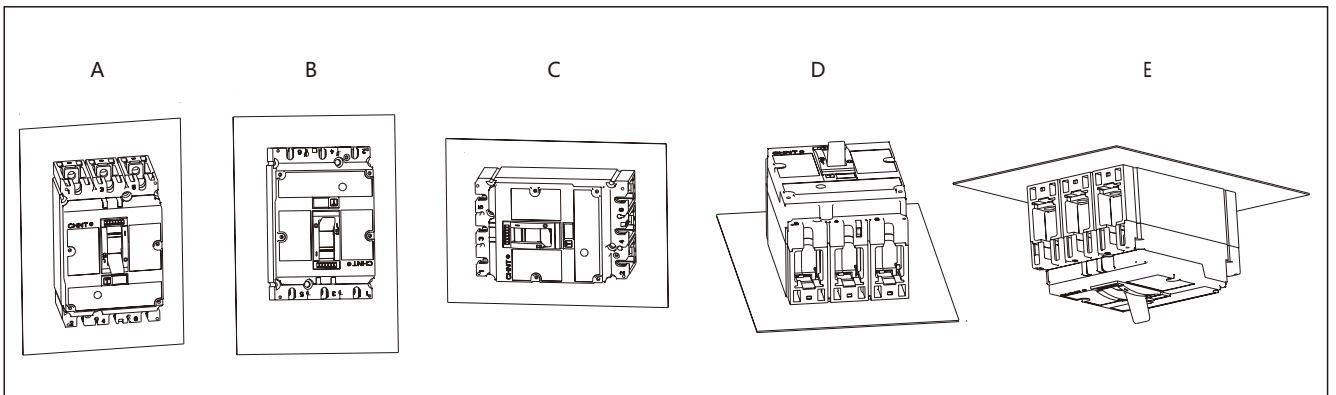
8.1 Modes of down-lead

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.



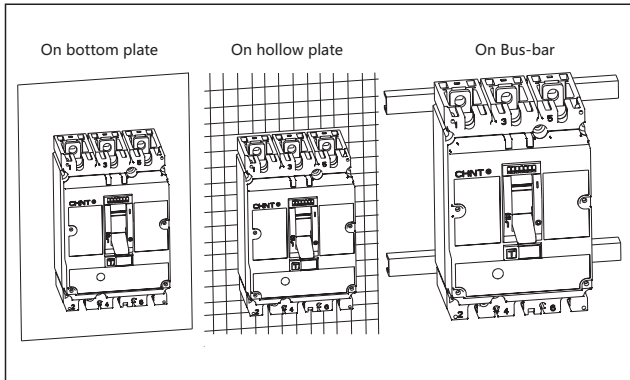
8.2 Modes of mounting

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

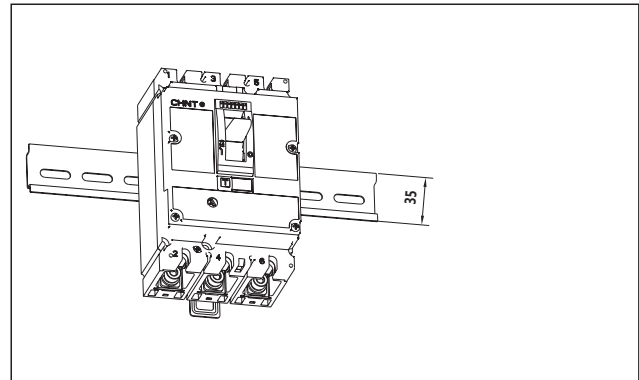


8.3 Modes of fixing

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

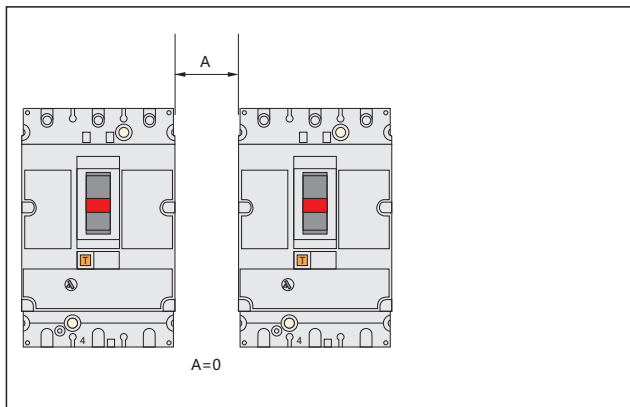


8.3.2 Fixing mode following is available for NM8(S)-125, 250 for fixed type breakers, which adopts DIN rail adaptor of front connection.

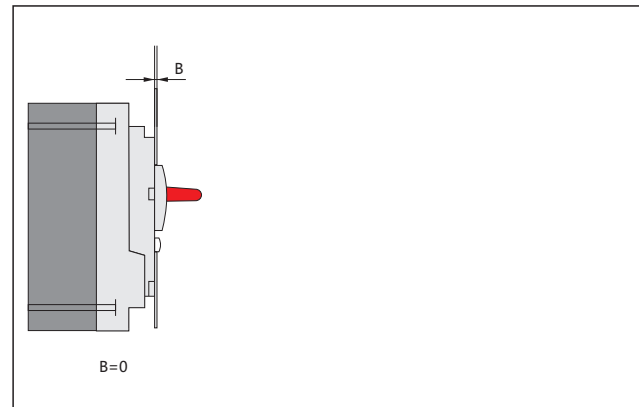


8.4 Secured distance

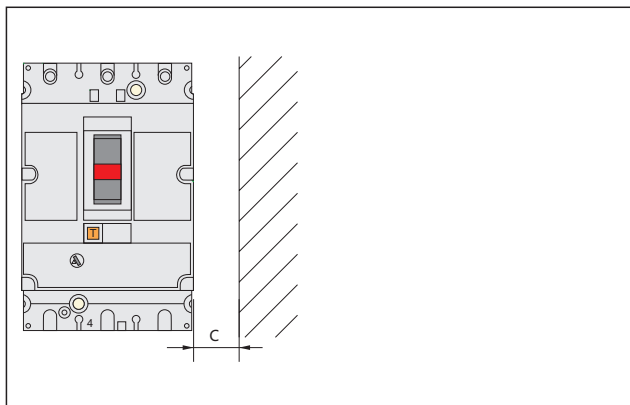
8.4.1 Min. Distance between breakers



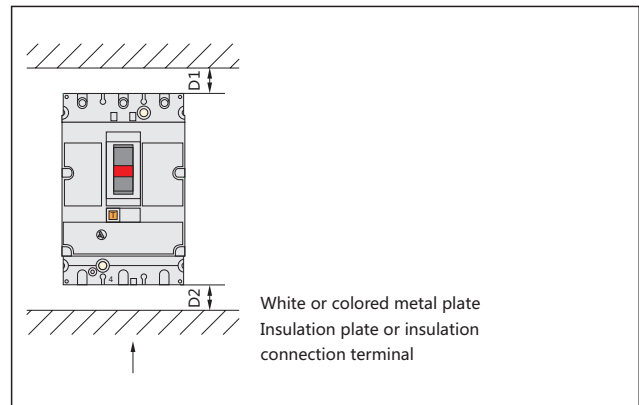
8.4.2 Min. distance between breaker and surface of switchgear where the operation handle is exposed.



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	Ue≤440V	10	30	30	35	35
	Ue<600V	20	30	30	35	35
	Ue≥600V	30	30	30	35	35
NM8-250 NM8S-250	Ue≤440V	10	30	30	35	35
	Ue<600V	20	30	30	35	35
	Ue≥600V	30	30	30	35	35
NM8-400, 630, NM8S-400, 630	Ue≤440V	10	30	30	60	60
	Ue<600V	20	30	30	60	60
	Ue≥600V	30	30	30	100	100
NM8-800, 1250, NM8S-800, 1250, 1600	Ue≤690V	50	130	100	70	70

Note: when voltage is ≥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

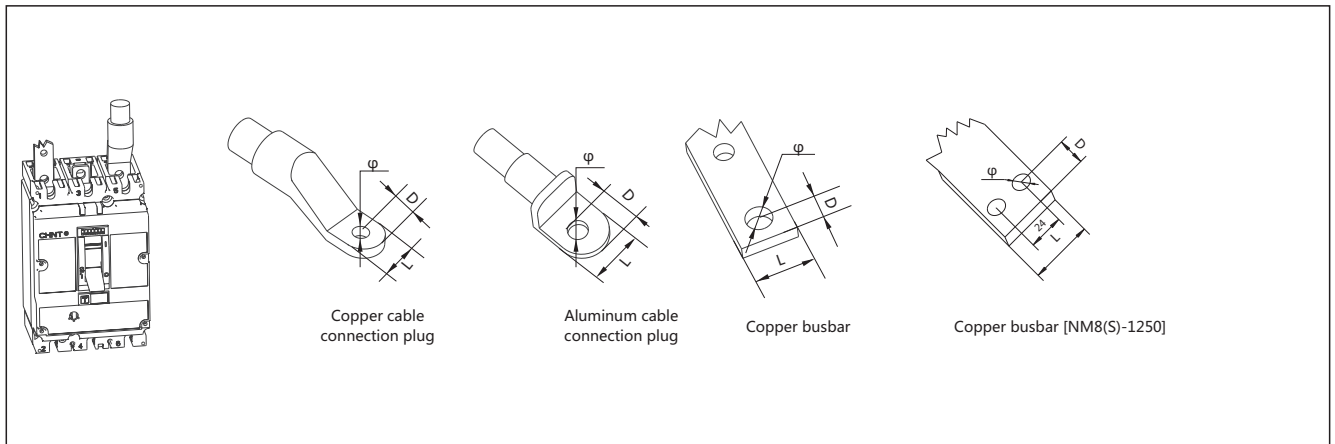
Size of connection screw

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, 1600
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

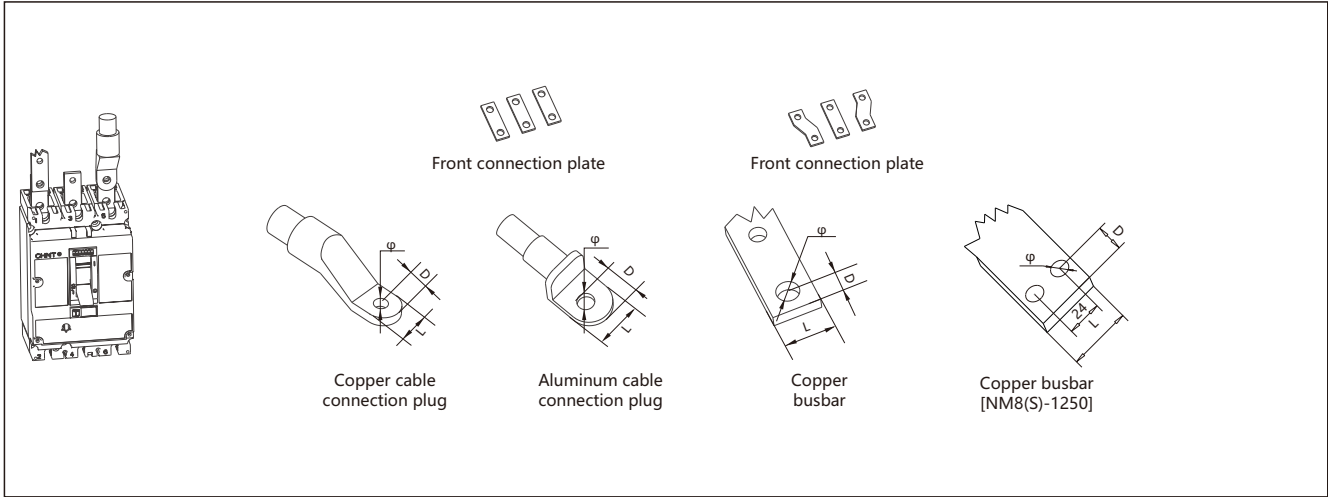
b. With front connection and use screw to connect
with copper (aluminum) cable connection plate or copper busbar
Size of connection screw

NM8-125: M6

NM8S-125, NM8-250, NM8S-250: M8

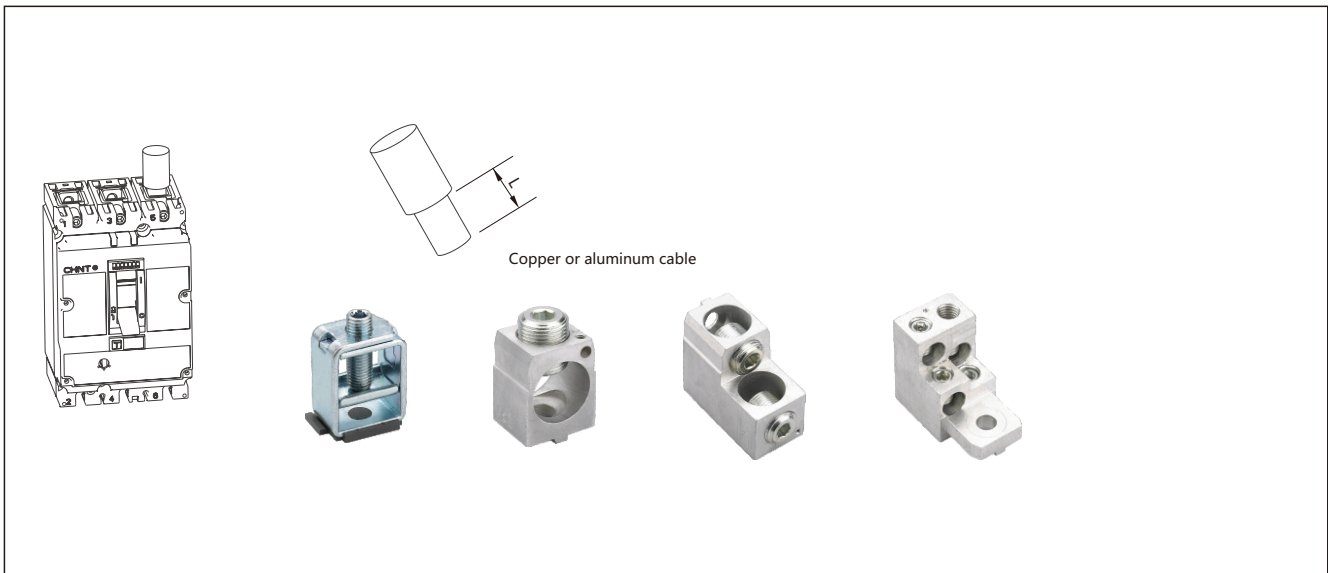
NM8-400, 630, NM8S-400, 630: M12

NM8-800, 1250, NM8S-800, 1250, 1600: M10



Dimension	NM8-125	NM8S-125 NM8-250 NM8S-250	NM8-400, 630 NM8S-400, 630	NM8-800, 1250 NM8S-800, 1250, 1600
Distance between different poles(mm)	30	35	52.5	70
L(mm)	≤15	≤25	≤40	≤60
D(mm)	≤7	≤10	≤16	≤16
Φ(mm)	> 6	> 8	> 12	> 12

8.5.2 Connection of bare cable



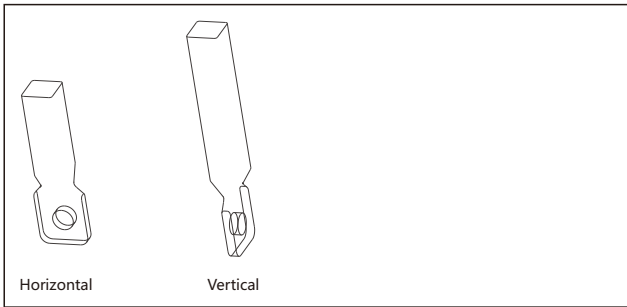
Dimension	NM8-125	NM8S-125 NM8-250 NM8S-250
L(mm)	16	20
CSA(mm ²)	2.5~50	2.5~185

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.

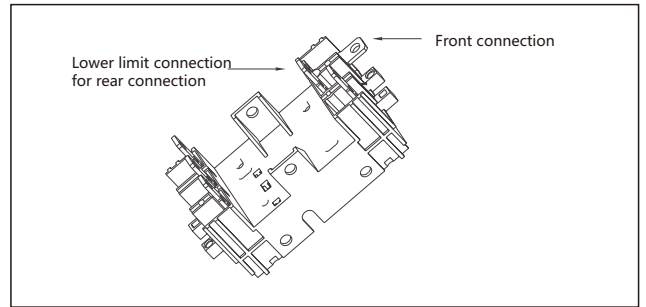
Rear connection



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

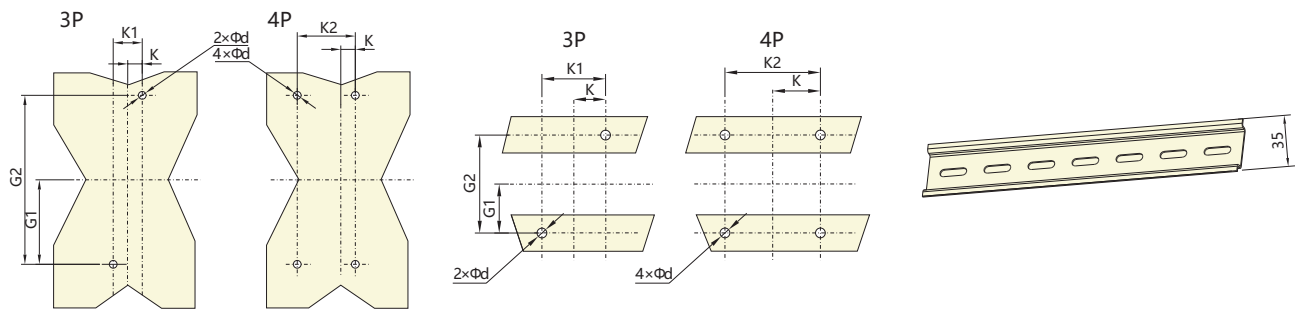
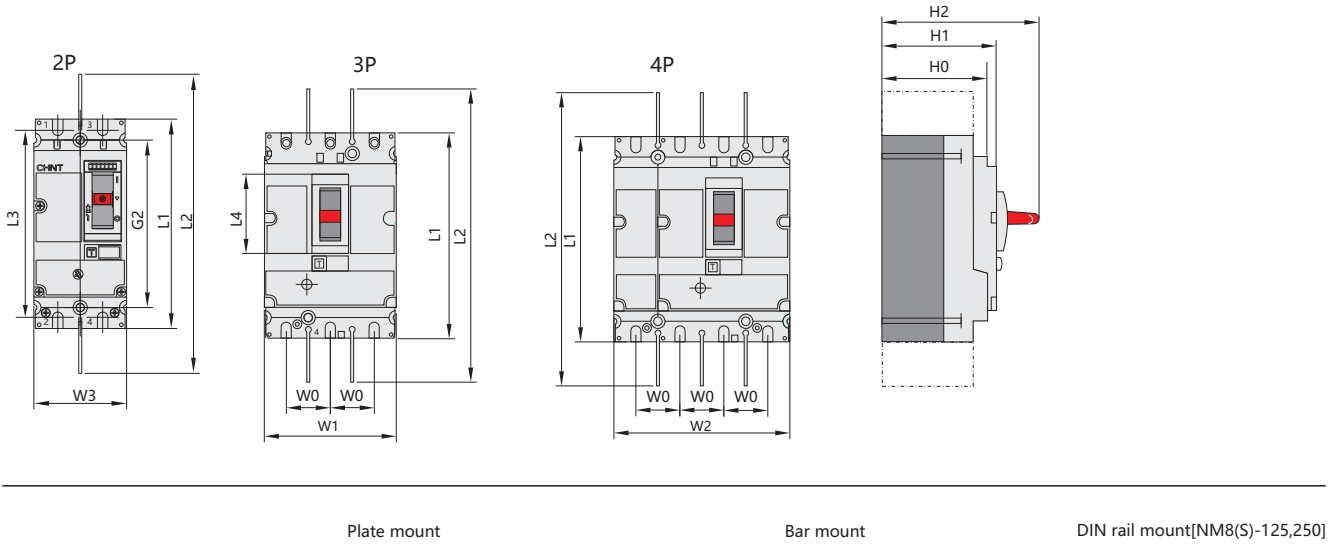
Rated current(A)	16	20	25	32	40	50	63	80	100	125	160	200	250	315	350	400	500	630	700	800	1000	1250	1600	
Cross section area (mm ²)	Copper cable	2.5	2.5	4.0	6.0	10	10	16	25	35	50	70	95	120	185	185	240	2×150	2×185	2×240	2×240	-	-	-
	Copper busbar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2×30×5	2×40×5	2×50×5	2×50×5	2×60×5	2×80×5	2×80×5

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
1600	—	2×80×5

8.6 Overall and Mounting Dimensions

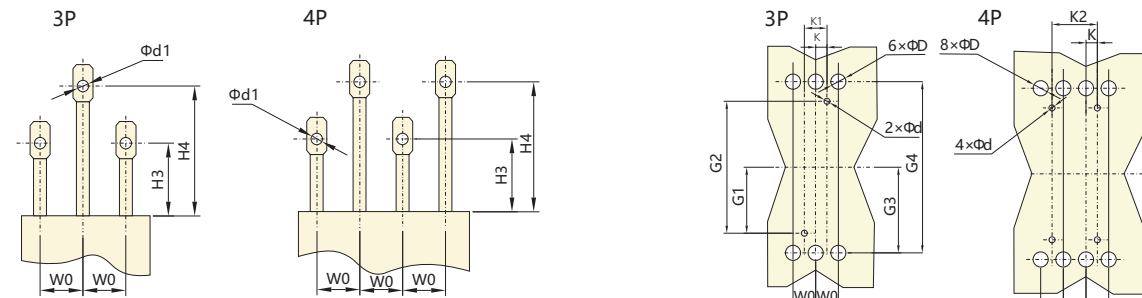
8.6.1 Overall and mounting dimensions of fixed type for front connection



Model	L1	L2	L3	L4	H0	H1	H2	K	K1	K2	G1	G2	W0	W1	W2	W3	d
NM8-125	140	243	126	54	72	79	108	15	30	60	56	112	30	90	120	62	5.5
NM8S-125/NM8-250/NM8S-250	157	273	140	60	82	88	126	17.5	35	70	62.5	125	35	105	140	70	5.5
NM8-400, 630/NM8S-400, 630	255	482	227	114	109	113	168	22.5	45	90	100	201.5	45	140	185	-	5.5
NM8-800, 1250/NM8S-800, 1250	370	565	265	134.5	141	145	206	35	70	140	120	240	70	210	280	-	7
NM8S-1600	370	565	341.5	124	137	151	211	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	63	126	5.5	6.5	15
NM8S-125/NM8-250/NM8S-250	47	87	35	17.5	35	70	62.5	125	70	140	5.5	8	20
NM8-400,630/NM8S-400,630	50	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

B

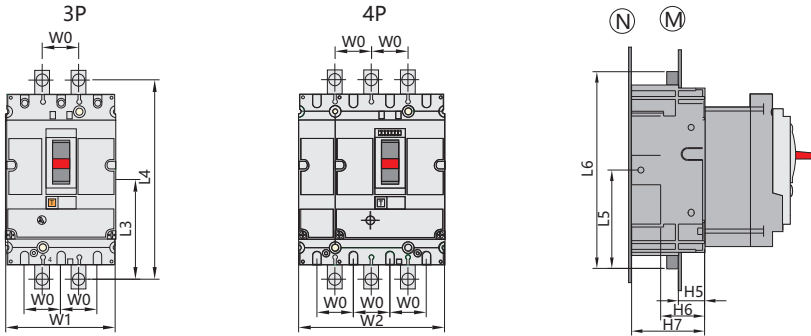


Plate mount

Bar mount

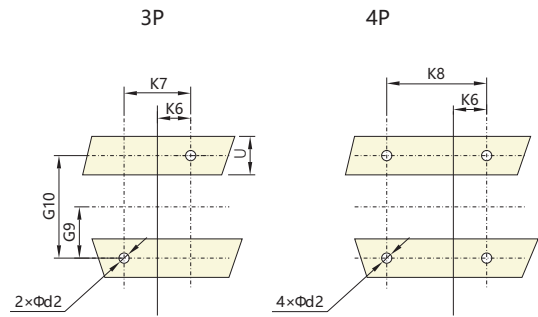
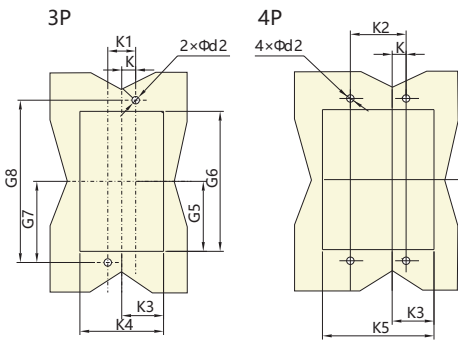
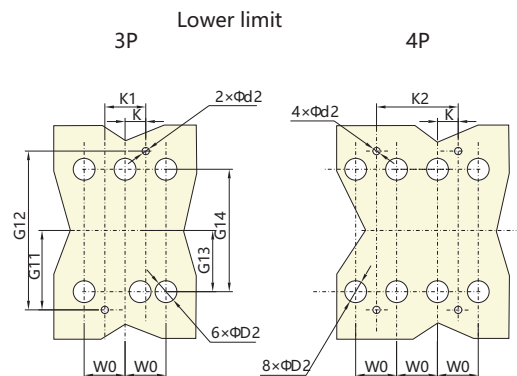
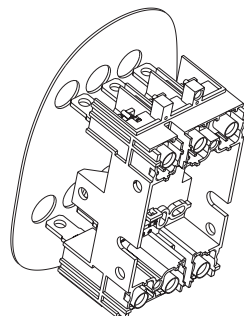
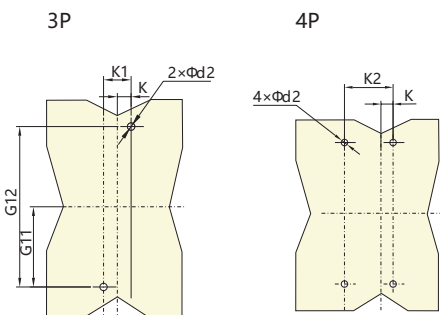


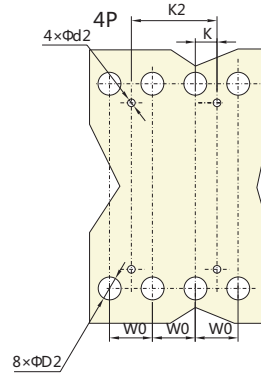
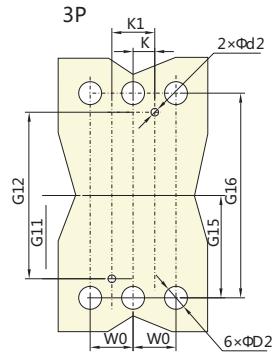
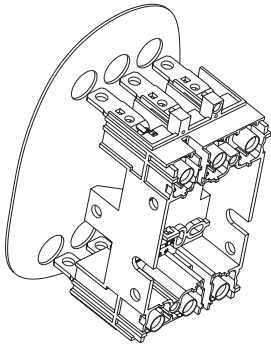
Plate mount (N) front connection
Insulation barrier must be mounted
between mounting plate and breaker base

(standard configuration)
Plate mount (N) rear connection
Mounting plate and breaker base must be used with insulation material



Note: Plug-in type rear connection, use insulated mounting base plate

Upper limit

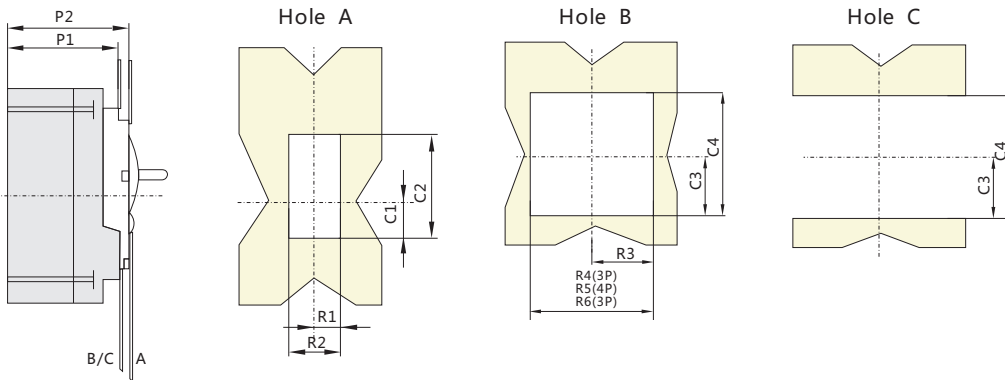


(mm)

Model	W0	W1	W2	L4	L5	L6	H5	H6	H7	K	K1	K2	K3	K4	K5	K6	K7
NM8-125	30	90	120	170.5	90	180	24	40	67	15	30	60	47	94	124	30	60
NM8S-125/NM8-250/NM8S-250	35	105	140	190	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	300	157.5	315	27	45	100	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	20	≤32
NM8S-125/NM8-250/NM8S-250	105	87	174	95	190	37.5	75	77.5	155	61	122	79	158	6	25	≤32
NM8-400, 630/NM8S-400, 630	140	137	274	150	300	75	150	125	250	101	202	126	252	6	35	≤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
NM8-1250/NM8S-1250	103	145	41	82	107	214	284	-	90	131	125	250



9. Accessories

9.1 Inner accessories

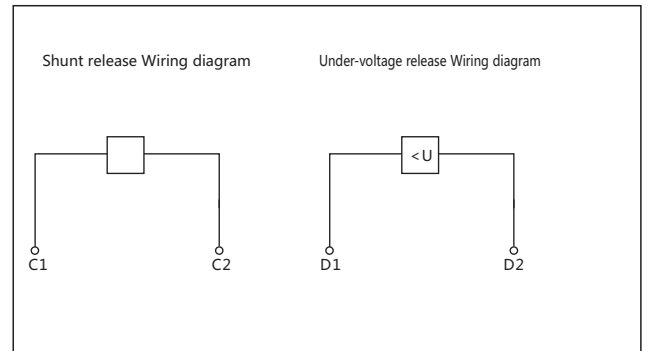
9.1.1 Shunt release

$U_s = 70 \sim 110\% U_s$, 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

$U_s = 35 \sim 70\% U_e$, circuit breaker reliably breaks
 $U_s \geq 85\% U_e$, circuit breaker reliably closes
 $U_s < 35\% U_e$, prevent circuit breaker from making

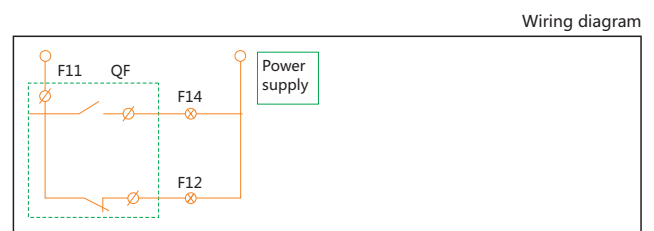
Note: With under-voltage release, $U_s \geq 85\% U_e$, circuit breaker normally makes and breaks



9.1.3 Auxiliary contact

Function: Indication of contacting status

Circuit breaker is at making status	
Circuit breaker is at breaking status	



9.1.4 Alarm contact

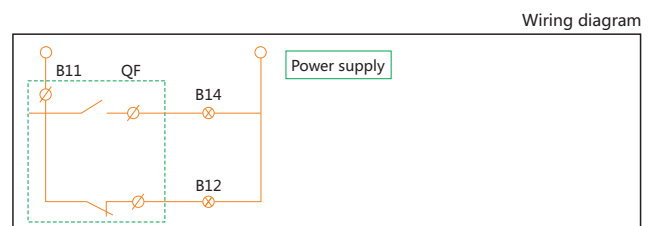
Function: indication of reason for circuit breaker releasing;

- * 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.

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



Accessory	Code	Mounting and wiring mode		
		NM8-125, 250 NM8S-125, 250	NM8-400, 630 NM8S-400, 630	NM8-800, 1250 NM8S-800, 1250,1600
		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 Auxiliary contact	SM: AC220V, SQ: AC380V, SB: DC24V AX			
Two groups of auxiliary contact	AX, AX			
Auxiliary contact Under-voltage release	AX UM: AC220V, UQ: AC380V			
Shunt release Alarm contact	SM: AC220V, SQ: AC380V, SB: DC24V AL			
Auxiliary contact Alarm contact	AX AL			
Under-voltage release Alarm contact	AL			
Shunt release Auxiliary contact, alarm	SM: AC220V, SQ: AC380V, SB: DC24V AX, AL			
Two groups of auxiliary contact	AX, AX AL			
Alarm contact Auxiliary contact, alarm contact Under-voltage release	AX, AL (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, 1600, 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

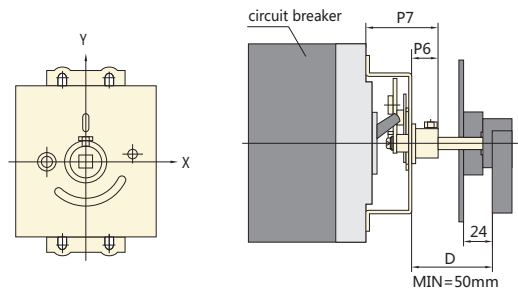
Protection degree: IP30

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 unwantedly.



(mm)

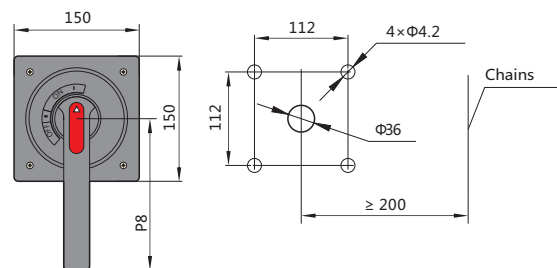
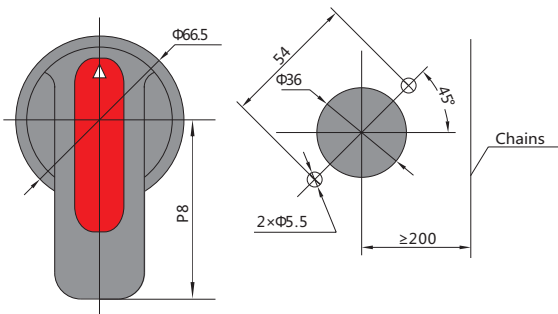
Dimension	NM8-125	NM8S-125, NM8-250, NM8S-250	NM8-400, NM8S-400	NM8-630, NM8S-630	NM8(S)-800	NM8(S)-1250,1600
P6	18	18	18	18	18	18
P7	55	55	72	72	95.5	95.5
P8	65	65	126	126	170	170



Handle mounting (mm)

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

NM8(S)-800,1250,1600



9.2.2 Direct rotary handle

Protection degree : IP40

Functions:

Reliable insulation;

Isolation function indication;

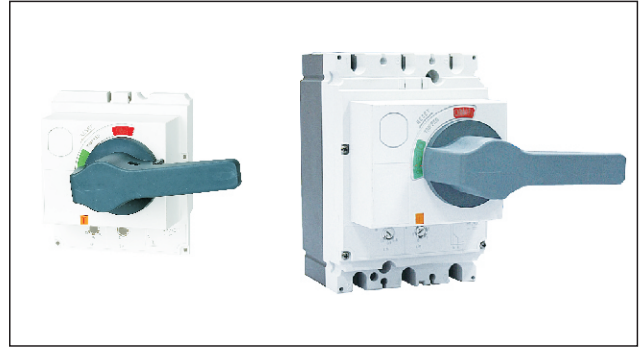
0(breaking), 1(making) and free tripping indication;

Realize free tripping of circuit breaker;

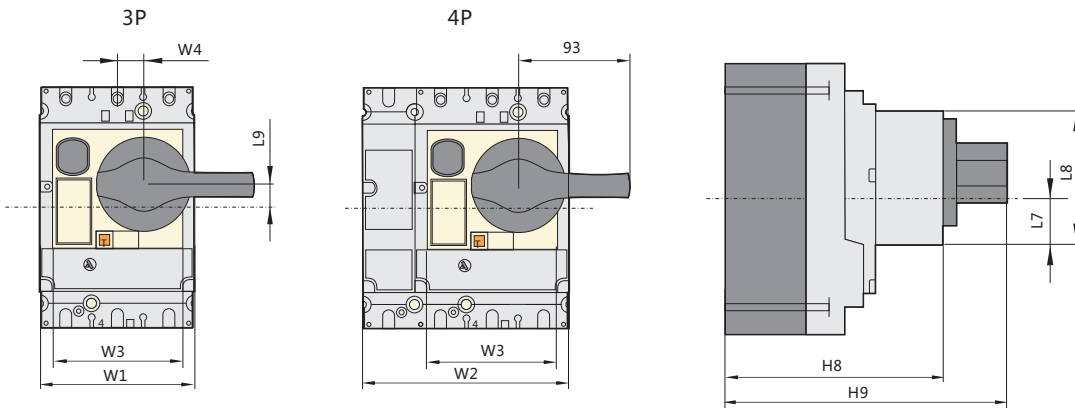
At "OFF" status, the breaker can be fitted with 1-3

padlocks with a diameter of

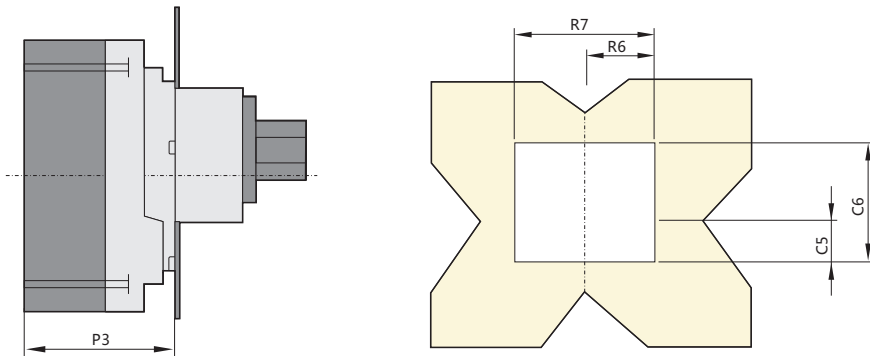
5~8mm (by customer).



Direct rotary handle



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





9.2.3 Extended rotary handle

Protection degree: IP55

Functions:

Reliable insulation;

Isolation function indication;

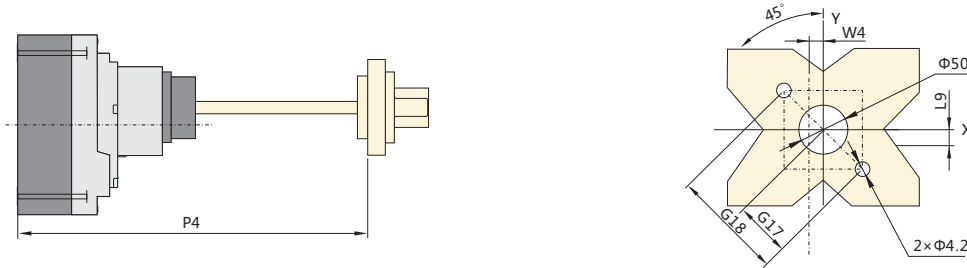
0(breaking), 1(making) and free tripping indication;

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)



	W1	W2	W3	W4	L7	L8	L9	H8	H9	P3	P4	R6	R7	C5	C6	G17	G18
NM8-125	90	120	76	15.25	37	70	13.3	115	163	80	≥175 ≤600	38	76	38	70	37	74
NM8S-125 NM8-250 NM8S-250	105	140	93.5	15.5	39	77.5	9	126	174	90	≥175 ≤600	46.5	93	40.5	76.5	37	74
NM8-400,630/ NM8S-400,630	140	185	122	18	69	121.5	24.5	152	200	115	≥175 ≤600	61	122	70.5	121	37	74

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:

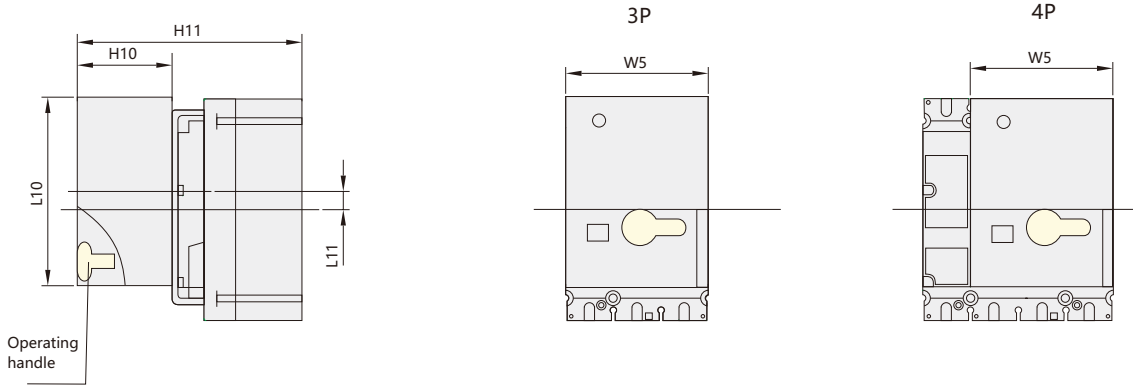
Turn "manual/auto" switch to "manual" position and then push the button to make and break the breaker remotely.

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

Operational range: 85%Un~110%Un.

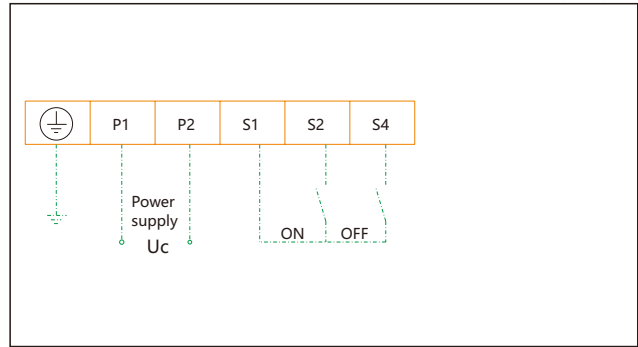
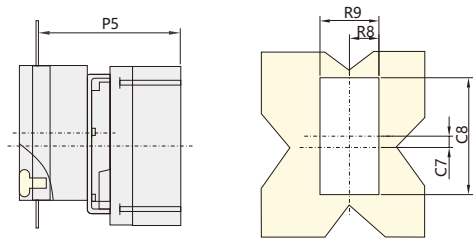


NM8 circuit breaker	Rated control voltage	Electrical life	Operational current	Power consumption
NM8-125	AC/DC 110V DC 220V AC 380V	10,000 operations	≥0.5 A	200W 300W
NM8S-125 NM8-250 NM8S-250	AC230/DC 220V AC 380V AC/DC 110V	10,000 operations	≥0.5 A	200W 300W
NM8-400 NM8S-400 NM8-630 NM8S-630	AC/DC 110V AC230/DC 220V AC 380V	5,000 operations	≥2 A	350W
NM8-800 NM8S-800 NM8-1250 NM8S-1250	AC/DC 110V AC230/DC 220V AC 380V	3,000 operations	≥7.5 A	400W



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(S)-400, 630	130	115	250	175	19	65	130	225	19	180
NM8(S)-800, 1250	130	115	295	175	47.5	65	130	270	47.5	180



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



10. COMA-2 communication module 10.1 General



COMA-2 communication module is the interface module for our intelligent MCCB and bus communication system, suitable for NM8S series of intelligent MCCB, operating communication level conversion and relay control output. Combined with the Modbus-RTU communication protocol, the communication module can easily connect with Fieldbus master device to realize telemeter, and the remote control function.

10.2 Technical parameter

Rated voltage: AC230V, AC400V or DC24V (range of error 15%)

Communication type: RS485 (Modbus protocol)

Contact capacity: AC250V /15A

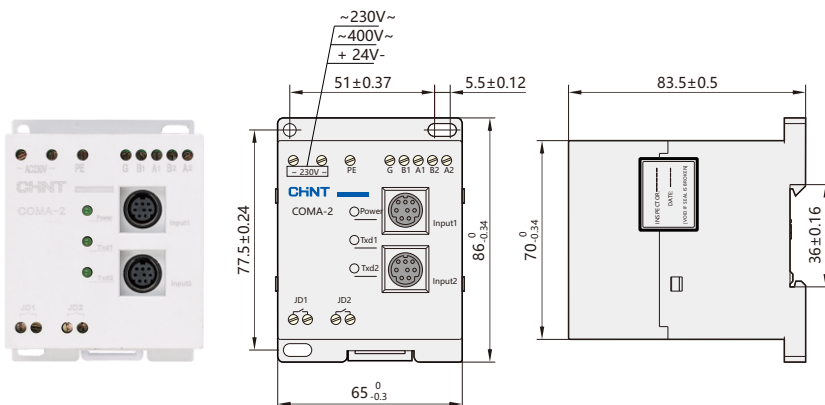
Transmission medium: shielded twisted pair line

Transmission distance: 12km (using A level of shielded twisted pair line)

Working state instructions: LED instructions

Station number: 2 stations

10.3 Dimensions of product and installation



10.4 Solutions for communication

Solution	Function	Product and accessories	Remark
Solution 1	Telemetry	NM8S MCCB COMA-2	Read phase current
Solution 2	Telemetry + Telesignalisation	NM8S MCCB COMA-2 Auxiliary contact	Read phase current Indicate the status of MCCB
Solution 3	Telemetry + Telesignalisation + Telecommand	NM8S MCCB COMA-2 Auxiliary contact Motor-driven mechanism	Read phase current Indicate the status of MCCB Remote control Mccb switch on and off

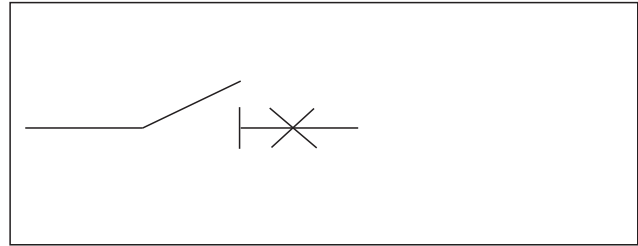
11. Complementary technical information

11.1 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.



11.2 Current-limiting

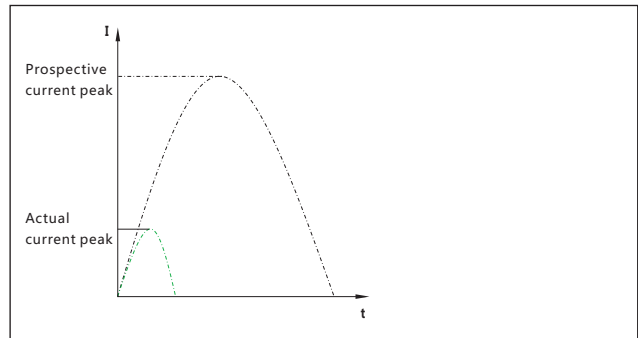
11.2.1 Current-limiting capacity

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.

11.2.2 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 .

- 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.



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 ⁵	1.98×10 ⁵	3.33×10 ⁵
Butyl	Cu K=131	4.29×10 ⁴	8.41×10 ⁴	1.55×10 ⁵	2.47×10 ⁵	3.86×10 ⁵	5.87×10 ⁵	9.88×10 ⁵
	Al K=87	1.89×10 ⁴	3.71×10 ⁴	6.83×10 ⁴	1.09×10 ⁵	1.70×10 ⁵	2.59×10 ⁵	4.36×10 ⁵
EPR	Cu K=143	5.11×10 ⁴	1.00×10 ⁵	1.85×10 ⁵	2.94×10 ⁵	4.60×10 ⁵	7.00×10 ⁵	1.18×10 ⁶
	Al K=94	2.21×10 ⁴	4.33×10 ⁴	7.97×10 ⁴	1.27×10 ⁵	1.99×10 ⁵	3.02×10 ⁵	5.09×10 ⁵



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)

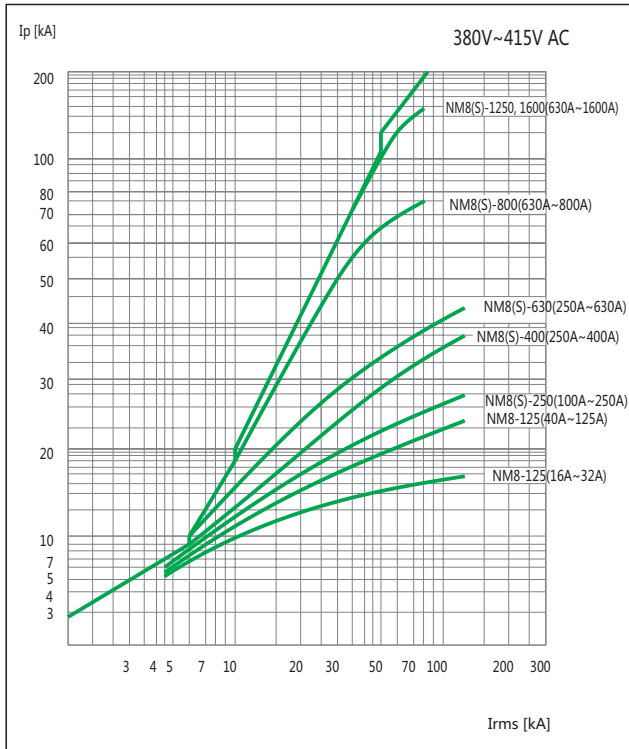
b. Is a Cu/PVC cable with a CSA of 10mm² adequately protected by a NM8-125S circuit breaker

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

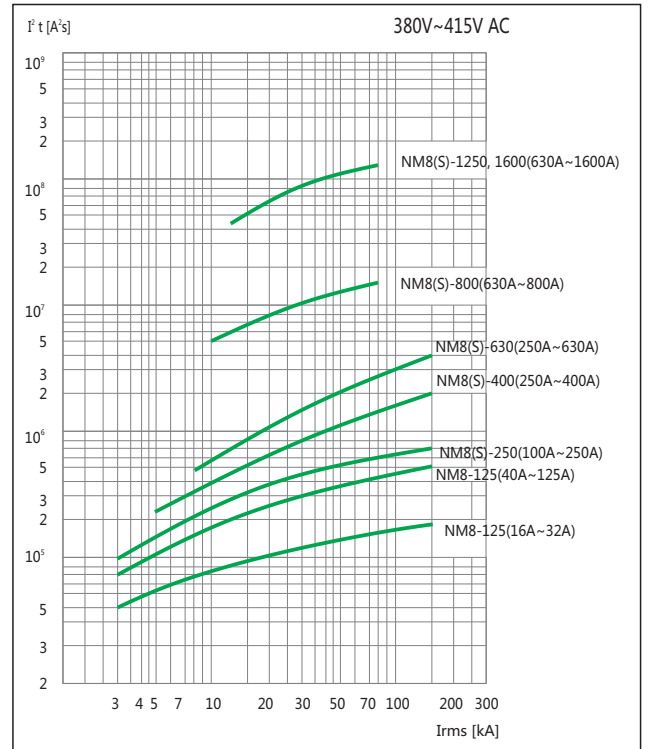
at the point where a NM8-125S ($I_{cu}=50\text{kA}$) is installed,

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

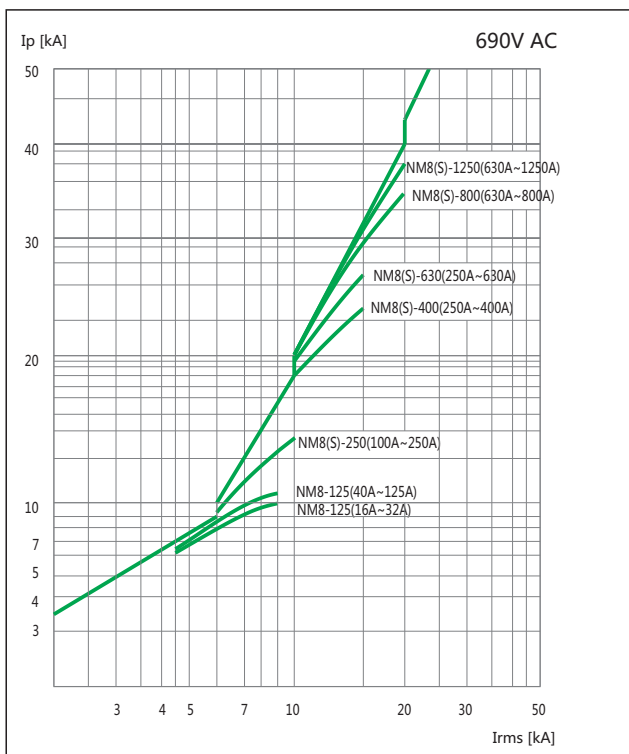
I² t Curve



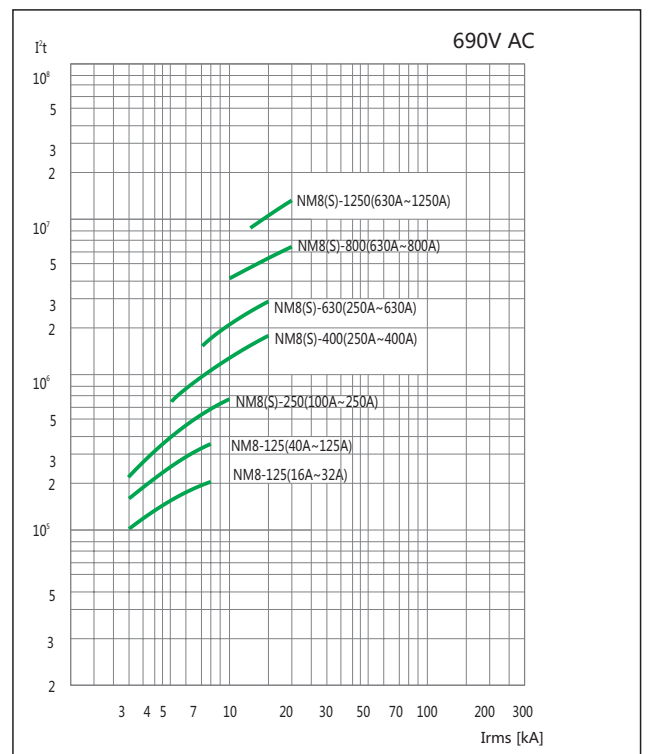
A²s curve



I² t Curve



A²s curve



11.3 Power loss per pole

Resistance/ power loss mΩ/W	NM8-125	NM8S-125	NM8-250	NM8S-250	NM8-400	NM8S-400
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
315					0.28/27.8	0.15/14.9
350					0.28/34.3	0.15/18.4
400					0.24/38.4	0.15/24
500						
630						
700						
800						
1000						
1250, 1600						

11.4 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

NM8-630	NM8S-630	NM8-800	NM8S-800	NM8-1250	NM8S-1250,1600
0.3/18.8	0.13/8.1				
0.28/27.8	0.13/12.9				
0.28/34.3	0.13/15.9				
0.24/38.4	0.13/20.8				
0.2/50	0.13/32.5				
	0.13/51.6				
		0.04/15.9	0.04/15.9	0.04/15.9	0.04/15.9
		0.04/19.6	0.04/19.6	0.04/19.6	0.04/19.6
		0.04/25.6	0.04/25.6	0.04/25.6	0.04/25.6
				0.04/40	0.04/40
				0.04/62.5	0.04/62.5

11.5 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-125~1600

Downstream: DZ267, DZ47, eB, UB, NBH8, NB1, DZ158, NM8(S)-125~1600

Upstream Breaking capacity (kA rms) →	NM8S-125S 85	NM8S-125H 100	NM8S-250S 85	NM8S-250H 100	NM8S-400S 85	NM8S-400H 100	NM8S-400R 150
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	65
NM8-125S		100		100		100	150
NM8-125H							150
NM8-250S				100		100	150
NM8-250H							150
NM8-400S						100	150
NM8-400H							150
NM8-630S							
NM8-630H							
NM8-800S							
NM8-800H							
NM8-1250S							
NM8-1250H							
NM8S-125S		100		100		100	150
NM8S-125H							150
NM8S-250S				100		100	150
NM8S-250H							150
NM8S-400S						100	150
NM8S-400H							150
NM8S-630S							
NM8S-630H							
NM8S-800S							
NM8S-800H							
NM8S-1250S							
NM8S-1250H							
NM8S-1600H							

B

NM8S-630S 85	NM8S-630H 100	NM8S-630R 150	NM8S-800S 65	NM8S-800H 100	NM8S-1250S 65	NM8S-1250H 100	NM8S-1600H 100
	100	150		100		100	100
		150					
	100	150		100		100	100
		150					
	100	150		100		100	100
		150					
	100	150		100		100	100
		150					
				100		100	100
				100		100	100
	100	150		100		100	100
		150					
	100	150		100		100	100
		150					
	100	150		100		100	100
		150					
	100	150		100		100	100
		150					
				100		100	100
				100		100	100
				100		100	100
						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	NM8S-400R 150
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	40
NM8-125S		100		100		100	150
NM8-125H				100		100	150
NM8-250S				100		100	150
NM8-250H						100	150
NM8-400S						100	150
NM8-400H							150
NM8-630S							
NM8-630H							
NM8-800S							
NM8-800H							
NM8-1250S							
NM8-1250H							
NM8S-125S		100		100		100	150
NM8S-125H				100		100	150
NM8S-250S				100		100	150
NM8S-250H						100	150
NM8S-400S						100	150
NM8S-400H							150
NM8S-630S							
NM8S-630H							
NM8S-800S							
NM8S-800H							
NM8S-1250S							
NM8S-1250H							
NM8S-1600H							



NM8S-630S 70	NM8S-630H 100	NM8S-630R 150	NM8S-800S 50	NM8S-800H 70	NM8S-1250S 50	NM8S-1250H 70	NM8S-1600H 70
	100	150		70		70	70
	100	150		70		70	70
	100	150		70		70	70
	100	150		70		70	70
	100	150		70		70	70
	100	150		70		70	70
	100	150		70		70	70
		150		70		70	70
				70		70	70
				70		70	70
				70		70	70
				70		70	70
	100	150		70		70	70
	100	150		70		70	70
	100	150		70		70	70
	100	150		70		70	70
	100	150		70		70	70
	100	150		70		70	70
		150		70		70	70
				70		70	70
				70		70	70
				70		70	70
				70		70	70
				70		70	70
				70		70	70
				70		70	70

11.6 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.

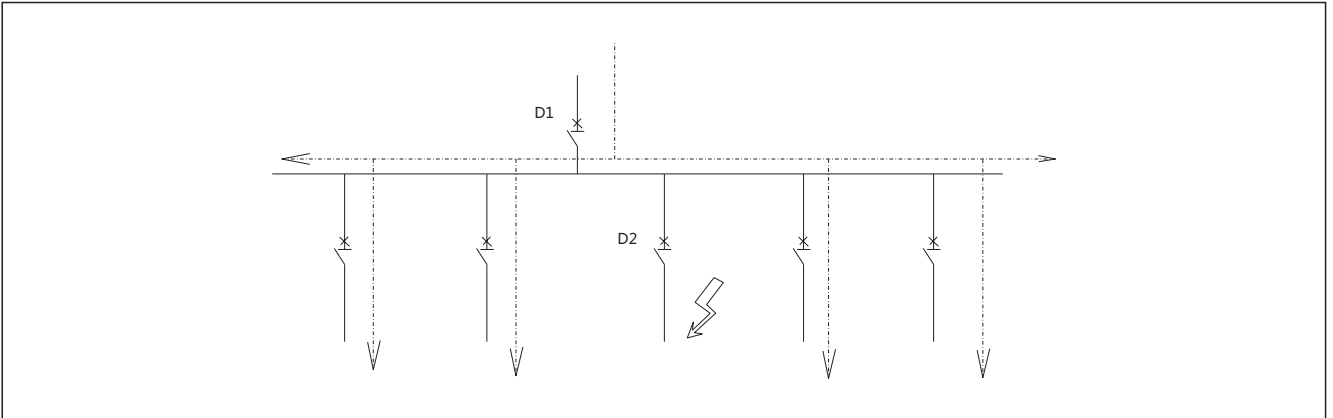
Partial protection discrimination: For a much lower current compared with where the fault occurred (the limit value of protection discrimination), breaker D2 breaks and breaker D1 keeps making status (total protection discrimination).

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
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
DZ158	63									0.8	1.0	T	T	T	T
	80										1.0	T	T	T	T
	100												T	T	T



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	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

Upstream: NM8S-125~1250

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

		NM8S-125 S/H			NM8S-250 S/H				NM8S-400 S/H/R			
		40	100	125	100	160	200	250	250	315	350	400
DZ267 C Curves	≤10	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	16	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	20	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	25		0.8	1.0	T	T	T	T	T	T	T	T
	32		0.8	1.0	T	T	T	T	T	T	T	T
DZ47, eB, UB C Curves	≤10	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	16	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	20	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	25		0.8	1.0	T	T	T	T	T	T	T	T
	32		0.8	1.0	T	T	T	T	T	T	T	T
	40		0.8	1.0	T	T	T	T	T	T	T	T
	50		0.8	1.0	T	T	T	T	T	T	T	T
NBH8 B C Curves	≤10	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	16	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	20	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	25		0.8	1.0	T	T	T	T	T	T	T	T
	32		0.8	1.0	T	T	T	T	T	T	T	T
	40		0.8	1.0	T	T	T	T	T	T	T	T
NB1 B C D Curves	≤10	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	16	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	20	0.5	0.8	1.0	T	T	T	T	T	T	T	T
	25		0.8	1.0	T	T	T	T	T	T	T	T
	32		0.8	1.0	T	T	T	T	T	T	T	T
	40		0.8	1.0	T	T	T	T	T	T	T	T
	50		0.8	1.0	T	T	T	T	T	T	T	T
	63		0.8	1.0	T	T	T	T	T	T	T	T
	63		0.8	1.0	T	T	T	T	T	T	T	T
	80			1.0	T	T	T	T	T	T	T	T
	100					T	T	T	T	T	T	T
DZ158	63		0.8	1.0	T	T	T	T	T	T	T	T
	80			1.0	T	T	T	T	T	T	T	T
	100					T	T	T	T	T	T	T
	125					T	T	T	T	T	T	



NM8S-630 S/H/R						NM8S-800 S/H			NM8S-1250 S/H					NM8S-1600 S/H		
250	315	350	400	500	630	630	700	800	630	700	800	1000	1250	1000	1250	1600
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

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														
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														
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	50	T	T
T	T	T	T	T	T	T	T	T	50	50	50	50	50	50	50	T	T
T	T	T	T	T	T	T	T	T	50	50	50	50	50	50	50	T	T
T	T	T	T	T	T	T	T	T	50	50	50	50	50	50	50	T	T
T	T	T	T	T	T	T	T	T	50	50	50	50	50	50	50	T	T
T	T	T	T	T	T	T	T	T	50	50	50	50	50	50	50	T	T
T	T	T	T	T	T	T	T	T	50	50	50	50	50	50	50	T	T
T	T	T	T	T	T	T	T	T	50	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	T	T	T
5	T	T	T	3	T	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	T
		5	T			5	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	3	T	T	T	T	40	40	40	40	40	40	40	T	T
		T	T		5	T	T	T	40	40	40	40	40	40	40	T	T
		5	T			5	T	T	40	40	40	40	40	40	40	T	T
			5				5	T	40	40	40	40	40	40	40	T	T
5		5	5	T	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	T
		5	5					T	T	T	T	T	T	T	T	T	T
			5					T	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	30	T	T
										30	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														
NM8S-1600 S/H	1000														
	1250														
	1600														

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



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
							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
										12	12	12	12	12	15	15
											12	12	12	12	15	15
														12	15	15
															15	15

NM8S-630 S/H/R						NM8S-800 S/H			NM8S-1250,1600 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	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T

	Upstream Downstream In (A) Ii (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											
	1250											
NM8S-1250 S/H	630											
	700											
	800											
	1000											
	1250											
NM8S-1600 S/H	1000											
	1250											
	1600											

Note:

- The area with T indication clarifies total protection discrimination between upstream and downstream circuit breakers;
- The area with numbers clarifies partial protection discrimination between upstream and downstream circuit breakers;
- 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					NM8S-1600 S/H		
250	315	350	400	500	630	630	700	800	630	700	800	1000	1250	1000	1250	1600
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
			T	T	T	T	T	T	T	T	T	T	T	T	T	T
				T	T	T	T	T	T	T	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
			T	T	T	40	40	40	40	40	40	T	T	T	T	T
				T	T	40	40	40	40	40	40	T	T	T	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	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	T	T	T
				8	8	30	30	30	30	30	30	T	T	T	T	T
					8	30	30	30	30	30	30	T	T	T	T	T
					8	30	30	30	30	30	30	T	T	T	T	T
			8	8	8	12	12	12	12	12	12	15	15	15	15	15
				8	8	12	12	12	12	12	12	15	15	15	15	15
					8	12	12	12	12	12	12	15	15	15	15	15
					8	12	12	12	12	12	12	15	15	15	15	15
				8	8	30	30	30	30	30	30	T	T	T	T	T
				8	8	30	30	30	30	30	30	T	T	T	T	T
					8	30	30	30	30	30	30	T	T	T	T	T
							30	30		30	30	T	T	T	T	T
				8	8	12	12	12	12	12	12	15	15	15	15	15
				8	8	12	12	12	12	12	12	15	15	15	15	15
					8	12	12	12	12	12	12	15	15	15	15	15
							12	12	12	12	12	15	15	15	15	15
								12			12	15	15	15	15	15
												20	20	20	20	20
												15	15	15	15	15
												20	20	20	20	20
												15	15	15	15	15

11.7 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:

- NM8 and NM8S breakers can replace each other with the same capacity in the table above.
- NRE8 electronic relays and NR2 thermal relays can replace each other with the same capacity in the table above.
- Breaker is at the power supply side
- In the delta connection circuit of thermal relay, the setting value is 0.58Ie;
- The max. start-up time is 20s;
- 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;
- The interval of star type connection changing into delta connection is 0.1s.










12. NM8 series accessories description form

Name of accessory	Code	Frame	Pole	Remark
Auxiliary contact 	AX-8/M8	NM8(S)-125,250,400,630 NM8(S)-800,1250	2P/3P/4P	
Alarm contact 	AL-8/M8	NM8(S)-125,250,400,630	2P/3P/4P	
Alarm contact 	AL-8/M8-1250	NM8(S)-800,1250	3P/4P	
Shunt release 	SM6:AC220V	NM8-125	2P/3P/4P	
	SQ6:AC380V			
	SH6:AC110V			
	SB1:DC24V			
	SB4:DC110V			
	SM5:AC220V	NM8S-125 NM8(S)-250,400,630	2P/3P/4P	
	SQ5:AC380V			
	SH5:AC110V			
	SB0:DC24V			
	SB5:DC110V			
	SM7:AC220V	NM8(S)-800,1250	3P/4P	
	SQ7:AC380V			
	SH7:AC110V			
	SB3:DC24V			
	SB7:DC110V			
SB2:DC220V				
Under voltage release 	UM6:AC220V	NM8-125	2P/3P/4P	
	UQ6:AC380V			
	UM5:AC220V	NM8S-125 NM8(S)-250,400,630	2P/3P/4P	
	UQ5:AC380V			
	UB0:DC24V			
	UM7:AC220V	NM8(S)-800,1250	3P/4P	
	UQ7:AC380V			
UB3:DC24V				
Motor driven operating mechanism 	MO10:AC/DC110V	NM8-125	3P/4P	
	MO12:AC230/DC220			
	MO13:AC380			
	MO22:AC230/DC220	NM8S-125 NM8(S)-250		
	MO23:AC380			
	MO30:AC/DC110V	NM8(S)-400,630		
	MO32:AC230/DC220			
	MO33:AC380			
	MO40:AC/DC110V	NM8(S)-800,1250		
	MO41:AC230/DC220			
MO42:AC380				
Plug-in base 	PL13	NM8-125	3P	
	PL14		4P	
	PL23	NM8S-125 NM8(S)-250	3P	
	PL24		4P	
	PL33	NM8(S)-400,630	3P	
	PL34		4P	
Economical extended rotary manual operating handle 	RH11	NM8-125	3P	
	RH14		4P	
	RH21	NM8S-125 NM8(S)-250	3P	
	RH24		4P	
	RH31	NM8(S)-400,630	3P/4P	
	RH41		3P/4P	
Normal direct rotary manual operating handle 	RH12	NM8-125	3P/4P	
	RH22	NM8-250	3P/4P	
	RH25	NM8S-125/250	3P/4P	
	RH32	NM8-400,630	3P/4P	
	RH35	NM8S-400,630	3P/4P	

Continued form 1

Name of accessory	Code	Frame	Pole	Remark
Normal extended rotary manual operating handle 	RH13	NM8-125	3P/4P	
	RH23	NM8-250	3P/4P	
	RH26	NM8S-125/250	3P/4P	
	RH33	NM8-400,630	3P/4P	
	RH36	NM8S-400,630	3P/4P	
Locking system 	PD1	NM8-125	3P/4P	
	PD2	NM8S-125,NM8(S)-250	3P/4P	
	PD3	NM8(S)-400,630	3P/4P	
	PD4	NM8(S)-800,1250	3P/4P	
Mechanical Interlock 	COMA-2/AC230V	NM8(S)-125		
	COMA-2/AC400V	NM8(S)-250		
	COMA-2/DC24V	NM8(S)-400,630		
		NM8(S)-800,1250		
DIN rail adaptor 	MI13	NM8-125	3P	
	MI14		4P	
	MI23	NM8S-125 NM8(S)-250	3P	
	MI24		4P	
	MI33	NM8(S)-400,630	3P	
	MI34		4P	
Rear connection plate 	DIN13	NM8-125	3P	
	DIN14		4P	
	DIN23	NM8S-125 NM8(S)-250	3P	
	DIN24		4P	
Short terminal cover 	BM12	NM8-125	2P	
	BM13		3P	
	BM14		4P	
	BM22		2P	
	BM23	NM8S-125 NM8(S)-250	3P	
	BM24		4P	
	BM33	NM8(S)-400,630	3P	
	BM34		4P	
Extended terminal cover 	ST13	NM8-125	3P	
	ST14		4P	
	ST23	NM8S-125 NM8(S)-250	3P	
	ST24		4P	
	ST33	NM8(S)-400,630	3P	
	ST34		4P	
	ST43	NM8(S)-800,1250	3P	
	ST44		4P	
Front connection plate 	LT13	NM8-125	3P	
	LT14		4P	
	LT23	NM8S-125 NM8(S)-250	3P	
	LT24		4P	
	LT33	NM8(S)-400,630	3P	
	LT34		4P	
	LT43	NM8(S)-800,1250	3P	
	LT44		4P	
Front connection plate 	FM12	NM8-125	2P	
	FM13		3P	
	FM14		4P	
	FM22		2P	
	FM23	NM8S-125 NM8(S)-250	3P	
	FM24		4P	
	FM33	NM8(S)-400,630	3P	
	FM34		4P	
	FM43	NM8(S)-800,1250	3P	
	FM44		4P	



Name of accessory	Code	Frame	Pole	Remark		
Cage clamp terminal	CT12	NM8-125	2P			
	CT13		3P			
	CT14		4P			
		CT22	NM8S-125 NM8(S)-250	2P		
		CT23		3P		
		CT24		4P		
				CT33	NM8(S)-400,630	3P
	CT34		4P			
Exterior clamp terminal	ET12 C1	NM8-125	2P	1×95		
	ET13 C1		3P	1×95		
	ET14 C1		4P	1×95		
		ET22 C1	NM8S-125 NM8(S)-250	2P	1×240	
		ET23 C1		3P	1×240	
		ET24 C1		4P	1×240	
		ET22 C2		2P	2×120	
		ET23 C2		3P	2×120	
		ET24 C2		4P	2×120	
		ET22 C6		2P	6×35	
		ET23 C6		3P	6×35	
		ET24 C6		4P	6×35	
		ET33 C2	NM8(S)-400,630	3P	2×240	
		ET34 C2		4P	2×240	
				ET33 C4	3P	4×95
	ET34 C4			4P	4×95	
		ET43 C3		NM8(S)-800,1250	3P	3×240
		ET44 C3			4P	3×240
		ET43 C4	3P		4×240	
	ET44 C4	4P	4×240			

13. Model definition and description for NM8 series product

NM8S	-	250	H	/	160	/	4C	/	M
↑		↑	↑		↑		↑		↑
Product code	Frame current	Breaking capacity code	Rated current	Poles			Usage code		
NM8: Thermal magnetic MCCB NM8S: Electronic MCCB	125 250 400 630 800 1250 1600	C S H R	16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160, 180, 200, 225, 250, 315, 350, 400, 500, 630, 700, 800, 1000, 1250 1600	2:2 poles 3:3 poles 4:4 poles 4A: there is no over current release installed at pole N and N pole will always connect, which will not operate with the other three poles. 4B: there is no over current release installed at pole N and N pole will operate with the other three poles. 4C: there is over current release installed at pole N and N pole will operate with the other three poles. 4D: there is over current release installed at pole N and N pole will always connect.			M: motor protection No code: distribution protection		

14. Model definition and description for NM8 accessories

BM23	/	RH12	/	UM5	/	AX-8/M8	
Connection Accessories		Control mechanism Accessories			Internal Accessories		
FM12,FM13,FM14: Front connection plate (NM8-125) FM22,FM23,FM24: Front connection plate (NM8S-125 NM8(S)-250) FM33,FM34: Front connection plate (NM8(S)-400,630) FM43,FM44: Front connection plate (NM8(S)-800,1250) BM12,BM13,BM14: Rear connection plate (NM8-125) BM22,BM23,BM24: Rear connection plate (NM8S-125 NM8(S)-250) BM33,BM34: Rear connection plate (NM8(S)-400,630) PL13,PL14: Plug-in base (NM8-125) PL23,PL24: Plug-in base (NM8S-125 NM8(S)-250) PL33,PL34: Plug-in base (NM8(S)-400,630) DIN13,DIN14: DIN rail adaptor (NM8-125) DIN23,DIN24: DIN rail adaptor (NM8S-125 NM8(S)-250) CT12, CT13, CT14: Cage clamp terminal (NM8-125) CT22, CT23, CT24: Cage clamp terminal (NM8S-125 NM8(S)-250) CT33, CT34: Cage clamp terminal (NM8(S)-400,630) LT13,LT14: Extended terminal cover (NM8-125) LT23,LT24: Extended terminal cover (NM8S-125 NM8(S)-250) LT33,LT34: Extended terminal cover (NM8(S)-400,630) LT43,LT44: Extended terminal cover (NM8(S)-800,1250) ST13,ST14: Short terminal cover (NM8-125) ST23,ST24: Short terminal cover (NM8S-125 NM8(S)-250) ST33,ST34: Short terminal cover (NM8(S)-400,630) ST43,ST44: Short terminal cover (NM8(S)-800,1250)		RH11,RH14: Economical extended rotary manual operating handle (NM8-125) RH21,RH24: Economical extended rotary manual operating handle (NM8S-125 NM8(S)-250) RH31: Economical extended rotary manual operating handle (NM8(S)-400,630) RH41: Economical extended rotary manual operating handle (NM8(S)-800,1250) RH13: Normal extended rotary manual operating handle(NM8-125) RH23, RH26: Normal extended rotary manual operating handle (NM8-250,NM8S-125,250) RH33, RH36: Normal extended rotary manual operating handle (NM8-400,630,NM8S-400,630) RH12: Normal direct rotary manual operating handle(NM8-125) RH22,RH25: Normal direct rotary manual operating handle (NM8-250,NM8S-125,250) RH32, RH35: Normal direct rotary manual operating handle (NM8-400,630,NM8S-400,630) MO10, MO12, MO13: Motor driven operating mechanism(NM8-125) MO20, MO22, MO23: Motor driven operating mechanism(NM8S-125 NM8(S)-250) MO30, MO32, MO33: Motor driven operating mechanism(NM8(S)-400,630) MO40, MO41, MO42: Motor driven operating mechanism(NM8(S)-800,1250) PD1: Locking system(NM8-125) PD2: Locking system (NM8S-125 NM8(S)-250) PD3: Locking system (NM8(S)-400,630) PD4: Locking system (NM8(S)-800,1250) Communication model (NM8S-125,250,400,630,800,1250)		Shunt release SM6:AC220V SH6:AC110V SQ6:AC380V SB1:DC24V SB4:DC110V (NM8-125) SM5:AC220V SH5:AC110V SQ5:AC380V SB0:DC24V SB5:DC110V (NM8S-125, NM8(S)-250, 400,630) SM7:AC220V SH7:AC110V SQ7:AC380V SB3:DC24V SB7:DC110V SB2:DC220V (NM8(S)-800, 1250)		Under voltage release UM6:AC220V UQ6:AC380V (NM8-100) UM5:AC220V UQ5:AC380V UB0:DC24V UB5:DC110V (NM8S-125, NM8(S)-250,400,630) UM7:AC220V UQ7:AC380V UB3:DC24V (NM8(S)-800,1250)	Auxiliary contact (NM8(S)-125, NM8(S)-250,400,630, NM8(S)-800,1250) Alarm contact AL-8/M8 (NM8(S)-125, NM8(S)-250,400,630) AL-8/M8-1250 (NM8(S)-800,1250)

