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NDM3 Serie

Edition 2016

Nader 良信电器

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NDM3
Moulded Case Circuit Breakers

Edition 2016

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1. Product Overview

															
Model	NDM3-100		NDM3-125				NDM3-160				NDM3-250				
Rated operating current In (A)	10、16、20、25、32、40、50、63、80、100		16、20、25、32、40、50、63、80、100、125				125、140、160				100、125、140、160、180、200、225、250				
Number of poles	3	3	3	3	4	3	3	3	4	3	3	3	3	4	
Rated limit short-circuit breaking capacity level	C	L	M	H		C	L	M		C	L	M	H		
Rated ultimate short-circuit breaking capacity Icu (kA) 415V	35	40	70	100	70	35	40	70	70	35	40	70	100	70	
Rated running short-circuit breaking capacity Ics (kA) 415V	22	30	50	70	50	25	30	50	50	25	30	50	70	50	
N-pole type of four-pole product	/	4A、4B、4C													
Certification	CCC、TUV、CE														

													
Model	NDM3-400					NDM3-630					NDM3-800		
Rated operating current In (A)	225、250、315、350、400					400、500、630					630、700、800		
Number of poles	3	3	3	3	4	3	3	3	3	4	3	3	4
Rated limit short-circuit breaking capacity level	C	L	M	H		C	L	M	H		M	H	
Rated ultimate short-circuit breaking capacity Icu (kA) 415V	35	50	70	100	70	35	50	70	100	70	70	100	70
Rated running short-circuit breaking capacity Ics (kA) 415V	35	50	70	75	70	35	50	70	75	70	70	75	70
N-pole type of four-pole product	4A、4B、4C												
Certification	CCC、TUV、CE												

2. Product Features

Scope of application and purpose

NDM3 series moulded case circuit breakers (hereinafter referred to as breakers) are applicable to work in the AC circuits with AC frequency of 50/60Hz, rated operating voltage of up to AC690V, and rated current of up to 800A for infrequent conversion and infrequent start of motor.

At the same time, the circuit breaker provides the function of overload alarm without tripping; when the line is overloaded, circuit breaker with this function will not trip but only output overload signal to ensure the continuity of supply. The product can be used for 8 hours at 1.3 times of the rated current, and its performance remains unchanged after cooling. The circuit breaker can replace the thermal relay alarm program, provide overload, short circuit and under-voltage protection functions, and protect the circuit and power equipment from damage.

Structural features

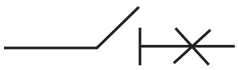
- The circuit breakers are divided into C type (basic), L type (standard), M type (higher breaking) and H type (high breaking type) by the rated limit short-circuit breaking capability. The circuit breakers feature small size, high breaking capability, short arcing, vibration resistance, etc.
- Boxed accessories may be used for rapid installation of circuit breaker, and timely respond to the user requirements without any adjustments.

Meeting the following standards

- GB14048.1-2012 Low-voltage switchgear and controlgear - Part 1:General rules
- GB14048.2-2008 Low-voltage switchgear and controlgear - Part 1:Low-voltage circuit breaker
- IEC 60947-1 Low-voltage switchgear and controlgear-Part 1:General rules
- IEC 60947-2 Low-voltage switchgear and controlgear-Part 2: Circuit-breakers

3. Application Scope

3.1 Electrical Symbols

The circuit breaker provides isolation function, whose corresponding symbol is: 

3.2 Applicable Environment

● Temperature of the working environment

-35℃ ~ +70℃, the average value in 24h is not more than +35℃. At +40℃ and above, the user needs to derate, with the derating factor shown in "Table of derating factors of NDM3 moulded case circuit breaker under varied temperatures".

● Storage temperature

-40℃ ~ +75℃。

● Altitude

The altitude of installation site is ≤2000m, and the derating factors under varied altitudes are shown in “Table of derating factors of NDM3 moulded case circuit breaker under varied altitudes”.

● Relative humidity for operation/Relative humidity for storage

At the ambient temperature of +40℃, the relative humidity shall not be more than 50%; for a lower temperature, the humidity may be higher, for example: The relative humidity could be up to 90% at 20℃. Appropriate measures should be taken against frost due to temperature variation.

● Pollution grade

Grade 3.

● Installation category

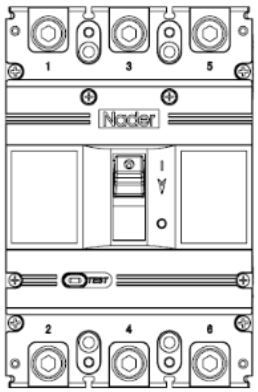
- Mounting categories of circuit breaker connecting to the main circuit: Category III (power distribution and control level).
- Mounting categories of circuit breaker not connecting to the main circuit: Class II (load level) .

● Installation environment

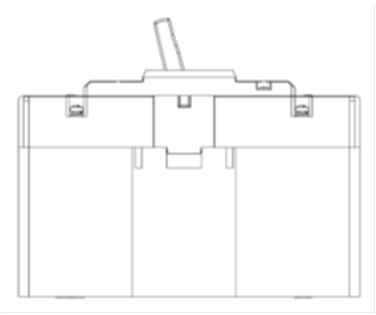
The product shall be installed in a medium without explosive danger, and the medium is not enough to corrode metal and damage the place where the insulating gas and conducting gas are located, so as to avoid any use in a rainy or snowy place.

Installation direction

- Vertical mounting, the gradient between the mounting plane and the vertical plane should be ≤ ± 22.5 ° ;
- Horizontal mounting.



Vertical installation



Horizontal installation

3.3 Breaker Power Loss Table

Model	Current (A)	Total power loss (W)		
		Before-panel/ behind-panel wiring	Plug-in type before-panel wiring	Plug-in type behind-panel wiring
NDM3-100C	100	15.5	15.6	15.7
NDM3-125（L,M,H）Direct heating type (16-25A)	25	40	42	45
NDM3-125（L,M,H）Intermittent heating type (32-100A)	100	35	37	40
NDM3-125（L,M,H）Intermittent heating type (125A)	125	39	42	43
NDM3-160（C,L,M,H）	125	22.5	24.6	24.9
NDM3-160（C,L,M,H）	140	28.2	30.84	30.9
NDM3-160（C,L,M,H）	160	36.87	40.32	40.5
NDM3-250C	250	39.3	39.4	39.5
NDM3-250（L,M,H）Intermittent heating type (125-225A)	225	62	66	70
NDM3-250（L,M,H）Intermittent heating type (250A)	250	67	73	73
NDM3-400（C,L,M,H）Intermittent heating type (250-400)	400	115	120	125
NDM3-630（C,L,M,H）Intermittent heating type (400-630A)	630	187	-	200
NDM3-800（M,H）Intermittent heating type (630-800A)	800	262	-	-

4. Technical Characteristics of the Product

4.1 Description of Specifications and Models

ND	M	3 - □	□	□ / □	□	□	□	□	□ - □	□
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Serial No.	Serial No. name	NDM3
1	Enterprise code	ND : Nader brand low-voltage apparatus
2	Product code	M : Moulded case circuit breakers
3	Design serial No.	3
4	Frame grade	See Table 1
5	Breaking capability level	Type C:Basic type
		Type L:Standard type
		Type M:Relevant high breaking type
		Type H:High breaking type
6	Operation mode	No code: Direct operation by handle
		P:Electrically operated
		Z:Turning handle
7	Number of poles	3 , 4
8	Tripper code	0 : Without tripper
		2 : Instantaneous tripper only
		3 : Complex tripper
9	Accessory code	See Table 2

Serial No.	Serial No. name	NDM3
10	Usage code	No code: Power distribution type
		2: Motor protection type
11	N-pole (neutral pole) type of four-pole product	Type A:N pole is not be equipped with over-current tripper, and is always connected
		Type B:N pole is not be equipped with over-current tripper, and is switched on or off together with other three poles
		Type C:N pole is equipped with over-current tripper, and is switched on or off together with other three poles
12	Overload alarm without tripping	I : Overload alarm without tripping
13	Wiring form	No code: Conventional product
		P : Extended busbar
		Type JK: Incoming line terminal Wiring:Wiring box type, wiring at the outgoing line end: Before-panel wiring type
		Type CK: Incoming line terminal Wiring: Before-panel wiring type, wiring at the outgoing line end: Wiring frame
		Type K: Wiring at the incoming/outgoing line end:Wiring frame
		Z1: Behind-panel wiring
		Z2Q : Plug-in type before-panel wiring
		Z2H : Plug-in type behind-panel wiring
		Z3Q : Plug-in before-panel wiring integrated type
		Z3H : Plug-in behind-panel wiring integrated type (Please specify the wiring scheme)
14	Rated current In	See Table 1

Note: Overload alarm without tripping; Tripper code 2 is required: Instantaneous tripping, which is only provided for NDM3-125, NDM3-250 L/M/H and A and B type neutral poles among the four poles.

4.2 Technical Parameters

Table 1 Table of main performance parameters of circuit breaker

Model		NDM3-100	NDM3-125				NDM3-160			
Frame grade Current Inm (A)		100	125				160			
额定电流In（A）		10、16、20、25、32、40、50、63、80、100	16、20、25、32、40、50、63、80、100、125				125、140、160			
Rated insulation voltage Ui (V)		800	1000				1000			
Rated impulse withstand voltage Uimp (V)		8000	8000				8000			
Power frequency withstand voltage U: (1 minute) (V)		3000	3000				3000			
Use class		A	A				A			
Number of poles		3	3	3	3	4	3	3	3	4
Rated limit short-circuit breaking capacity level		C	L	M	H		C	L	M	
Rated ultimate short-circuit breaking capacity Icu (kA)	AC 400V	35								
	AC380/400 /415V		40	70	100	70	35	40	70	70
	AC 500V	10		40		40				
	AC 690V	10								
	AC 660/690V			20		20			20	20
Rated running short-circuit breaking capacity Ics (kA)	AC 400V	22								
	AC380/400 /415V		30	50	70	50	25	30	50	50
	AC 500V	10		40		40				
	AC 690V	6								
	AC 660/690V			10		10			10	10
Operating performance	Electrical life	8000	8000				8000			
	Mechanical life	20000	20000				20000			
Outline dimension	L	130	150	150	150	150	139	150	150	150
	W	75	92	92	92	122	92	92	92	122
	H	65	68	86	86	86	75.5	74.5	92.5	92.5
Flashover distance (mm)		≤50	≤50				≤50			
Wiring mode		Conventional、P、Z1、Z2Q、Z2H	Conventional、P、JK、CK、K、Z1、Z2Q、Z2H、Z3Q、Z3H				Conventional、P、Z1、Z2Q、Z2H			

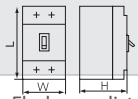


Table 1 Main performance and technology parameters of circuit breaker (continued)

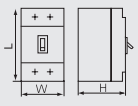
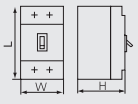
Model		NDM3-250					NDM3-400				
Frame grade Current Inm (A)		250					400				
Rated current In (A)		100、125、140、160、180、200、225、250					225、250、315、350、400				
Rated insulation voltage Ui (V)		800	1000	1000	1000	1000	1000				
Rated impulse withstand voltage Uimp (V)		8000	8000	8000	8000	8000	8000				
Power frequency withstand voltage U: (1 minute) (V)		3000					3000				
Use class		A					A				
Number of poles		3	3	3	3	4	3	3	3	3	4
Rated limit short-circuit breaking capacity level		C	L	M	H		C	L	M	H	
Rated ultimate short-circuit breaking capacity Icu (kA)	AC 400V	35									
	AC380/400 /415V		40	70	100	70	35	50	70	100	70
	AC 500V			40		40			50		50
	AC 690V										
	AC 660/690V			20					20		20
Rated running short-circuit breaking capacity Ics (kA)	AC 400V	25									
	AC380/400 /415V		30	50	70	50	35	50	70	75	70
	AC 500V			40		40			50		50
	AC 690V										
	AC 660/690V			10					15		15
Operating performance	Electrical life	8000					7500				
	Mechanical life	20000					10000				
Outline dimension	L	165	165	165	165	165	257	257	257	257	257
	W	105	107	107	107	142	150	150	150	150	198
	H	63.4	88.5	105.5	105.5	105.5	104.5	104.5	104.5	104.5	104.5
Flashover distance (mm)		≤50					≤100				
Wiring mode		Conventional、P、Z1、Z2Q、Z2H、Z3Q、Z3H	Conventional、P、JK、CK、K、Z1、Z2Q、Z2H、Z3Q、Z3H				Conventional、P、Z1、Z2Q、Z2H、Z3Q、Z3H				

Table 1 Main performance and technology parameters of circuit breaker (continued)

Model		NDM3-630					NDM3-800		
Frame grade Current Inm (A)		630					800		
Rated current In (A)		400、500、630					630、700、800		
Rated insulation voltage Ui (V)		1000					1000		
Rated impulse withstand voltage Uimp (V)		8000					8000		
Power frequency withstand voltage U: (1 minute) (V)		3000					3000		
Use class		A					A		
Number of poles		3	3	3	3	4	3	3	4
Rated limit short-circuit breaking capacity level		C	L	M	H		M	H	
Rated ultimate short-circuit breaking capacity Icu (kA)	AC 400V								
	AC380/400 /415V	35	50	70	100	70	70	100	70
	AC 500V								
	AC 690V								
	AC 660/690V			20		20	20		20
Rated running short-circuit breaking capacity Ics (kA)	AC 400V								
	AC380/400 /415V	35	50	70	75	70	70	75	70
	AC 500V								
	AC 690V								
	AC 660/690V			15		15	15		15
Operating performance	Electrical life	7500					7500		
	Mechanical life	10000					10000		
Outline dimension	L	270	270	270	270	270	280	280	280
	W	182	182	182	182	240	210	210	280
	H	108.5	108.5	108.5	108.5	108.5	112	112	112
Flashover distance (mm)		≤100					≤100		
Wiring mode		Conventional、P、Z1、Z2Q、Z2H、Z3Q、Z3H					Conventional、P、Z1、Z2Q、Z2H、Z3Q、Z3H		

● Table of derating factors of NDM3 moulded case circuit breaker under varied temperatures

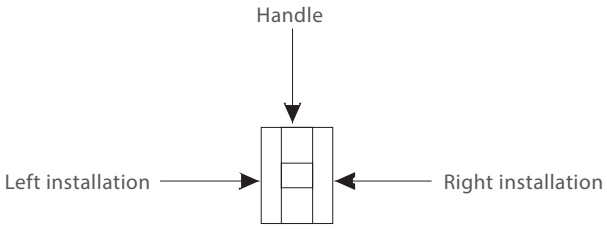
Serial No.	Frame grade Rated current (A)	Derating factors corresponding to temperatures						
		40℃	45℃	50℃	55℃	60℃	65℃	70℃
1	100/125/160	1	0.977	0.954	0.931	0.907	0.883	0.858
2	250	1	0.982	0.963	0.944	0.924	0.904	0.882
3	400	1	0.981	0.962	0.942	0.922	0.901	0.879
4	630	1	0.979	0.958	0.937	0.915	0.893	0.871
5	800	1	0.980	0.960	0.939	0.918	0.897	0.877

Note: When the ambient temperature is below 40℃, the product can be used normally, with no derating capacity.

● Table of derating factors of NDM3 moulded case circuit breaker under varied altitudes

Altitude (m)	2000	2500	3000	3500	4000	4500	5000
Operating current correction factor	In	In	0.98In	0.97In	0.96In	0.95In	0.94In
Operating current correction factor	Ue	Ue	0.83Ue	0.77Ue	0.71Ue	0.67Ue	0.63Ue
Power frequency withstand voltage correction factor	U	U	0.89U	0.85U	0.80U	0.77U	0.73U

4.3 Accessory Code Comparison Table



Legend:

- Single auxiliary contact
- Double auxiliary contacts
- Alarm contact
- Shunt tripper
- Under-voltage tripper
- Auxiliary contact (Single accessory integrates auxiliary and alarm functions)

Table 2 Comparison table of tripping method accessory codes

Accessory code	Accessories Name	NDM3-100	NDM3-125		NDM3-160		NDM3-250 C	NDM3-250 L/M/H	NDM3-250	NDM3-400		NDM3-630		NDM3-800	
	Installation location / Model / Number of poles	3	3	4	3	4	3	3	4	3	4	3	4	3	4
00	No	—	—		—		—	—	—	—		—		—	
10	Shunt tripper	◻●	◻●		●◻		◻●	◻●	◻●	◻●		◻●		◻●	
20	Double auxiliary contacts	◧◻	◧◻		◧◻		◧◻	◧◻	◧◻	◧◻		◧◻		◧◻	
21	Single auxiliary contact	◧◻	◧◻		◧◻		◧◻	◧◻	◧◻	◧◻		◧◻		◧◻	
30	Under-voltage tripper	○◻	○◻		○◻		◻○	○◻	○◻	○◻		○◻		○◻	
40	Shunt tripper, double auxiliary contacts	◧●	◧●		—		◧●	◧●	◧●	◧●		◧●		◧●	
41	Shunt tripper, single auxiliary contact	◧●	◧●		●◧		◧●	◧●	◧●	◧●		◧●		◧●	
50	Shunt tripper, under-voltage tripper	○●	○●		—		●○	○●	○●	○●		○●		○●	
60	Two groups of double auxiliary contacts	◧◧	◧◧		—		◧◧	◧◧	◧◧	◧◧		◧◧		◧◧	
61	Two groups of single auxiliary contacts	◧◧	◧◧		◧◧		◧◧	◧◧	◧◧	◧◧		◧◧		◧◧	
62	Double auxiliary contacts, single auxiliary contact	◧◧	◧◧		—		◧◧	◧◧	◧◧	◧◧		◧◧		◧◧	
70	Under-voltage tripper, double auxiliary contacts	○◧	○◧		○◧		◧○	○◧	○◧	○◧		○◧		○◧	
71	Under-voltage tripper, single auxiliary contact	○◧	○◧		○◧		◧○	○◧	○◧	○◧		○◧		○◧	
08	Alarm contact	◻◻	◻◻		◻◻		◻◻	◻◻	◻◻	◻◻		◻◻		◻◻	
18	Shunt tripper, Alarm contact	◻●	◻●		—		◻●	◻●	◻●	◻●		◻●		◻●	
28	Double auxiliary contacts, alarm contact	◻◧	◻◧		◻◧		◻◧	◻◧	◻◧	◻◧		◻◧		◻◧	
38	Under-voltage tripper, alarm contact	○◻	○◻		—		◻○	○◻	○◻	○◻		○◻		—	
48	Shunt tripper, auxiliary contact	◧●	◧●		—		◧●	◧●	◧●	◧●		◧●		◧●	
58	Auxiliary alarm contact	◧◻	◧◻		◧◻		◧◻	◧◻	◧◻	◧◻		◧◻		◧◻	
68	Double auxiliary contacts, auxiliary alarm contact	◧◧	◧◧		—		◧◧	◧◧	◧◧	◧◧		◧◧		◧◧	
78	Under-voltage tripper, auxiliary alarm contact	○◧	○◧		—			○◧	○◧	○◧		○◧		—	

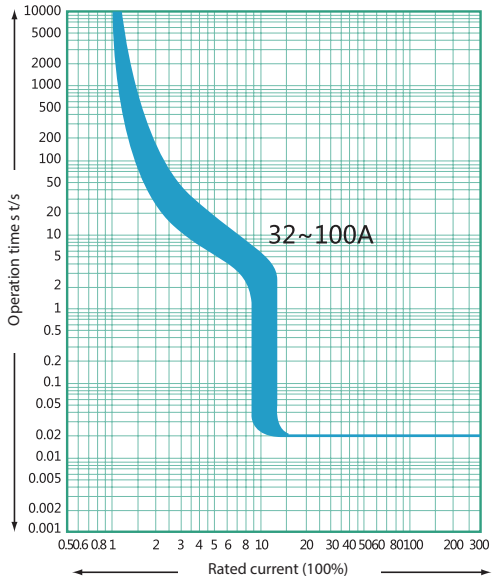
4.4 Product Tripping Curve

● Protection requirements for the products

Tripper rated current (A)	Thermal tripper (ambient temperature is +40℃)		Operating current for the electromagnetic tripper (A)	Remarks
	1.05In (cold state) non-operating time (h)	1.3In (thermal state) operating time (h)		
10≤In≤63	1	1	10In × （1 ± 20%）	Power distribution type
63 < In≤800	2	2	10In × （1 ± 20%）	
10≤In≤800	1.0In (cold state) non-operating time (h)	1.2In (thermal state) operating time (h)	12In × （1 ± 20%）	Motor protection type
	2	2		

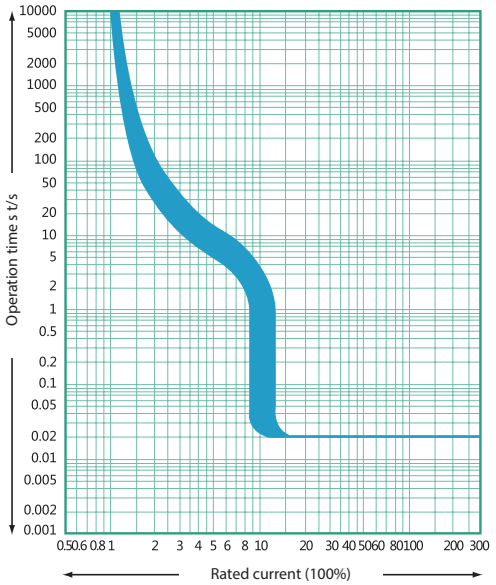
Note: In NDM3-100C, 10~25A electromagnetic tripper operating current value is 300 ± 20%

● Product short circuit overload protection characteristic curve

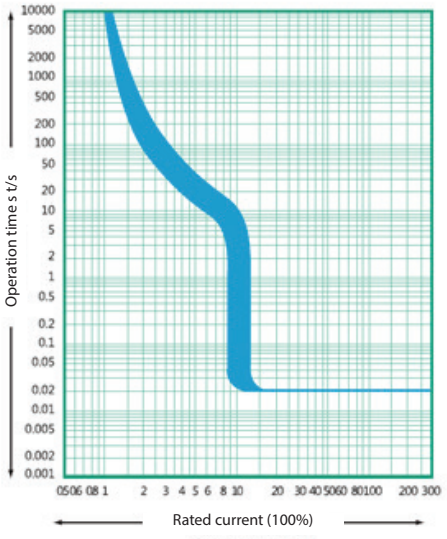


Note: In NDM3-100C, 0~25A instantaneous operating current value is 300 ± 20%

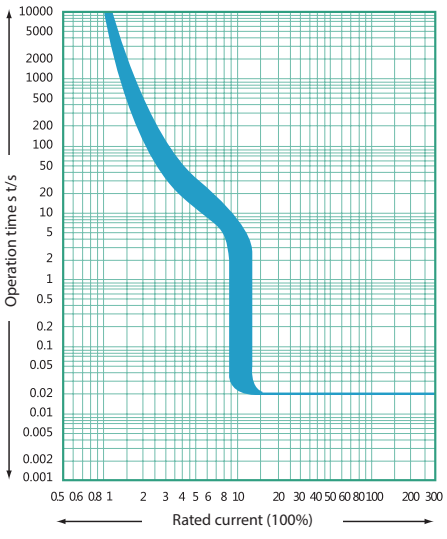
NDM3-100C time/current characteristic curve



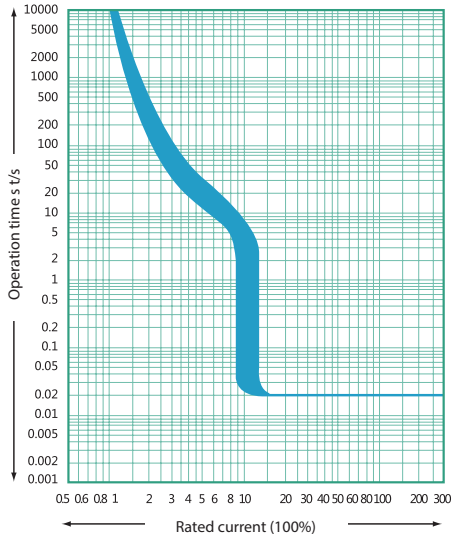
NDM3-125 time/current characteristic curve



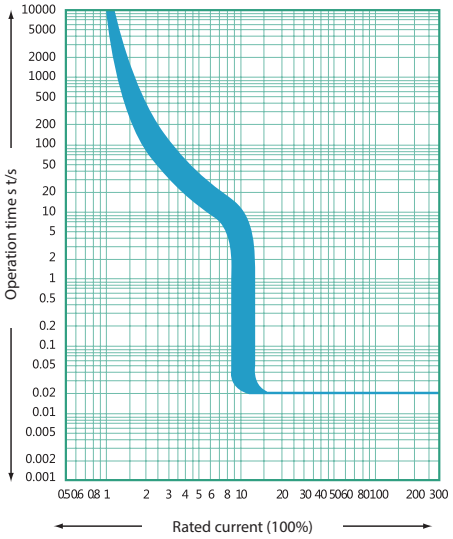
NDM3-160 time/current characteristic curve



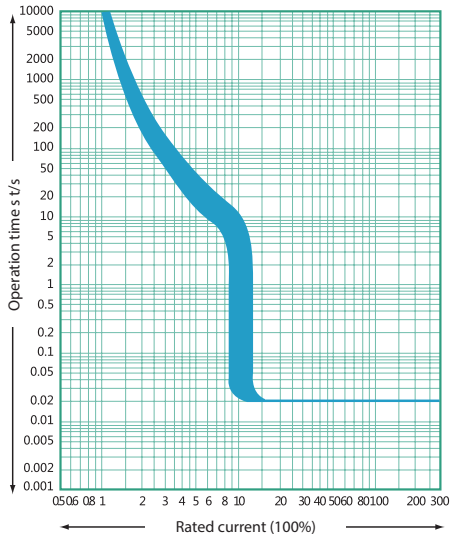
NDM3-250 time/current characteristic curve



NDM3-400 time/current characteristic curve

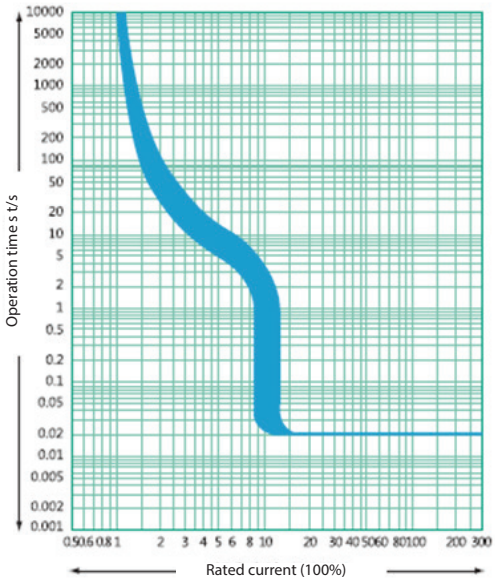


NDM3-630 time/current characteristic curve

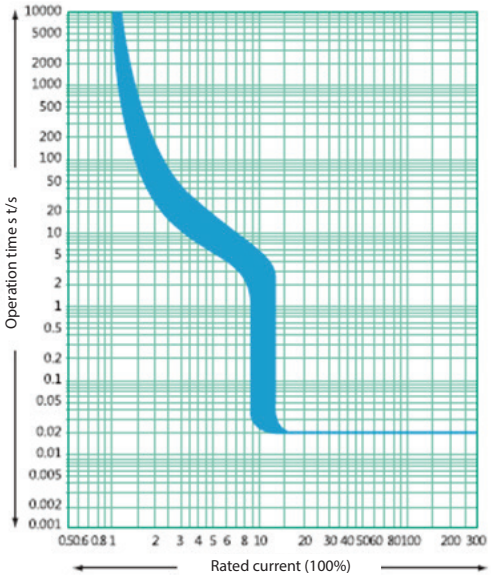


NDM3-800 time/current characteristic curve

● Overload alarm without tripping characteristic curve

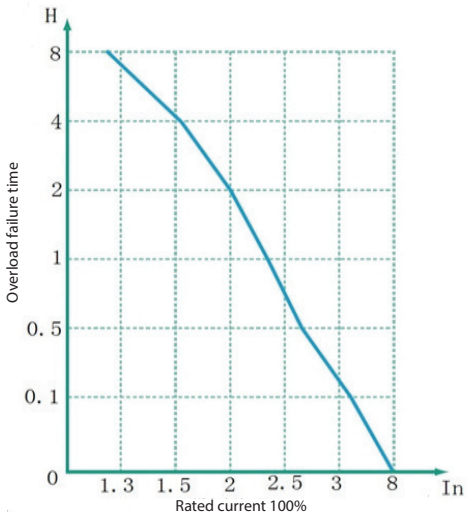


NDM3-125 overload alarm without tripping characteristic curve



NDM3-250 overload alarm without tripping characteristic curve

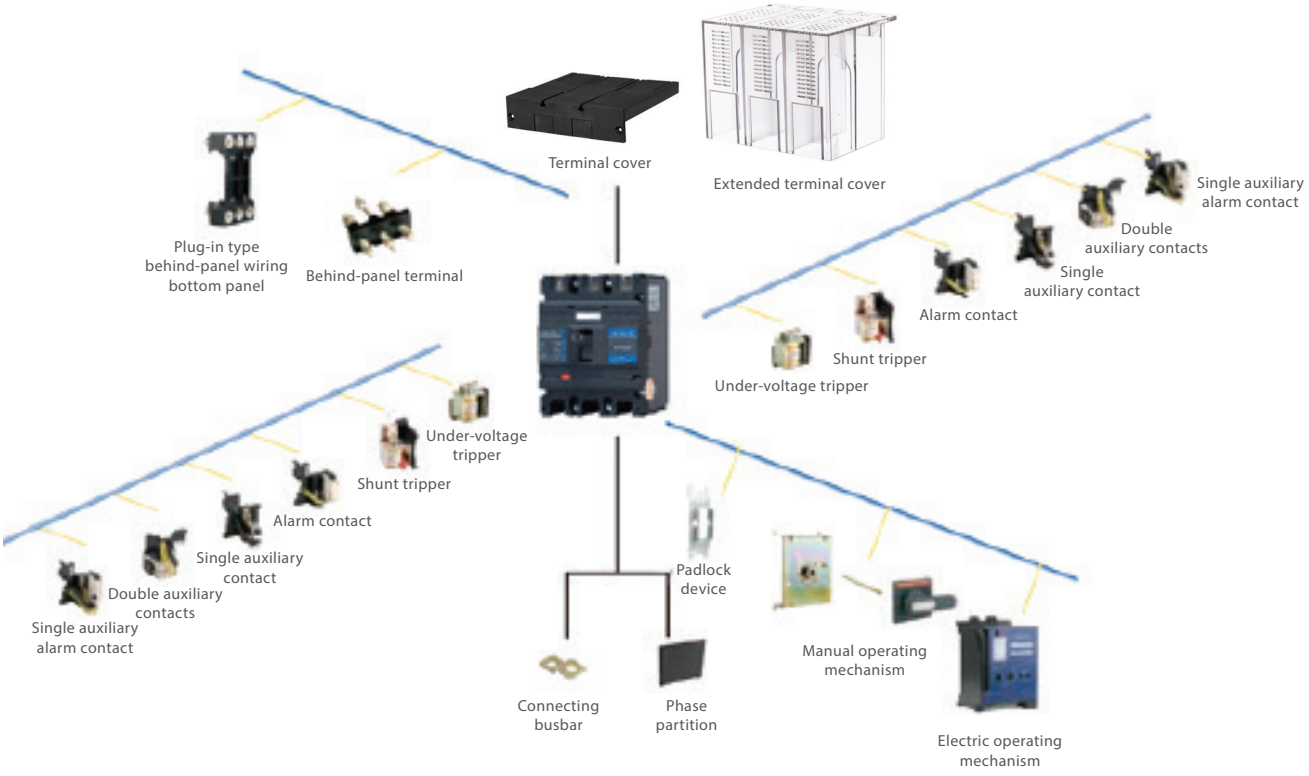
● Operating current and failure time characteristic curve (when the circuit breaker is at the overload alarm status)



Overload current and failure time characteristic curve

5. Accessories

5.1 List of Accessories



Note: NDM3-160 is temporarily not provided with extended terminal cover.

5.2 Accessories Function Description

5.2.1 Auxiliary contact

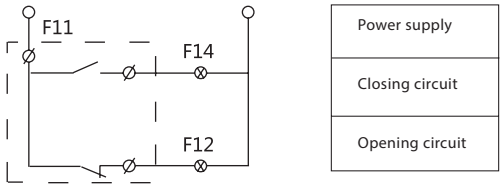
- Auxiliary contacts and combinations

The breaker is at the "opening" or "free tripping" position	Double auxiliary contacts	F14 F12 — F11; F24 F22 — F21
	Single auxiliary contact	F14 F12 — F11
The breaker is at the "closing" position	"Closing" switches to "opening", "opening" switches to "closing"	

Auxiliary contact current parameters

Frame grade Rated current	Conventional heating current	Rated operational current at AC 400V
100 - 800	3A	0.30A

Auxiliary contact wiring diagram



Electrical life of auxiliary contac

Use class	Switch on			Breaking			Frequency	Operation frequency (time(s)/hour)	Conduction time
	I/Ie	I/Ie	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

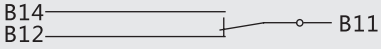
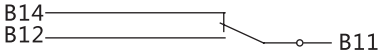
Connection and breaking capacity of auxiliary contact

Use class	Switch on			Breaking			Frequency	Operation frequency (time(s)/hour)	Conduction time
	I/Ie	I/Ie	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1	0.3	1	1	0.3	10	120	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

5.2.2 Alarm contact

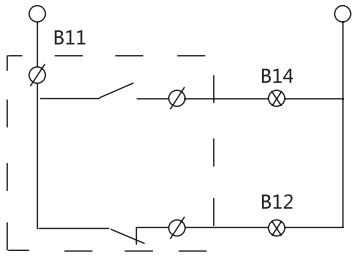
Auxiliary contacts and combinations

Alarm contact Ue = 220V, Ith = 3A

When the circuit breaker is at the position of “opening” or “closing”	
The circuit breaker is at the “free tripping” position	

● Alarm contact wiring diagram

In the case of proper closing or opening of circuit breaker, the contact does not operate; only after free tripping (or fault tripping) will the original state of contact be changed, which means normally open switches to closed and normally closed switches to open; after re-buckle of the circuit breaker, the contact is restored to the original position.



5.2.3 Under-voltage tripper

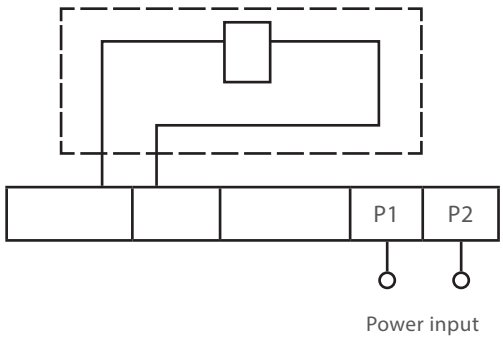
★ At 35%~70% of rated control power voltage, the under-voltage tripper should operate reliably to disconnect the circuit breaker.When it is less than 35% of the rated voltage, the circuit breaker should be reliably prevented from closing; when the power supply voltage is equal to or greater than 85% of rated voltage, it should be ensured that the circuit breaker is closed.

★ Control voltage: AC 50Hz 230V 400V

★ Note: The under-voltage tripper must be energized first in order to re-buckle and close the circuit breaker, otherwise it will damage the circuit breaker.

★ Instantaneous current and power consumption of under-voltage tripper

Product models	Instantaneous current value (A)		Power consumption (W)	
	AC 400V	AC 230V	AC 400V	AC 230V
NDM3-100 NDM3-125	9.75	14.25	3.95	3.2275
NDM3-250	10.88	14.75	4.352	3.392
NDM3-400	9	11	3.6	2.53
NDM3-630	8.5	11	3.4	2.53
NDM3-800	5	7.25	2	1.6675



Under-voltage tripper wiring diagram

5.2.4 Shunt trippe

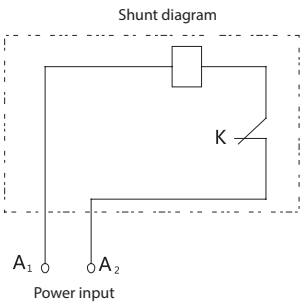
★ Generally installed at Phase A of circuit breaker; the shunt tripper should enable the circuit breaker to trip reliably at 70%~110% of rated control voltage under all operation conditions.

★ Control voltage: AC 50Hz230V 400V

DC 24V Low power consumption, 24V, 220V

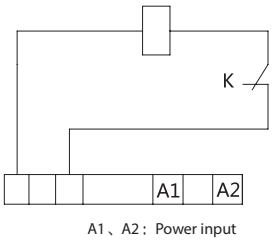
● Shunt tripper wiring diagram

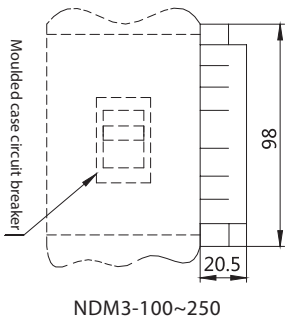
When the control circuit power supply is DC24V and the power is lower than 80W, it is possible to use low power shunt tripper or add intermediate relay.

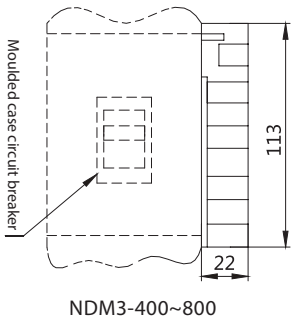


● DC24V low power shunt tripper wiring diagram and outline dimension of external ceiling rose

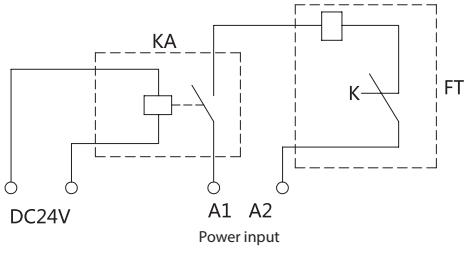
The normal operating power of DV24V low power shunt tripper is as low as 15W, which substantially meet the requirements of all DC24V control circuits. The low power shunt belt has plug-in junction boxes, whose outline dimension is shown below.







★ DC24V control power supply wiring diagram



KA： DC24V relay with electric shock capacity of 1A

FT： AC220V/380V Shunt tripper

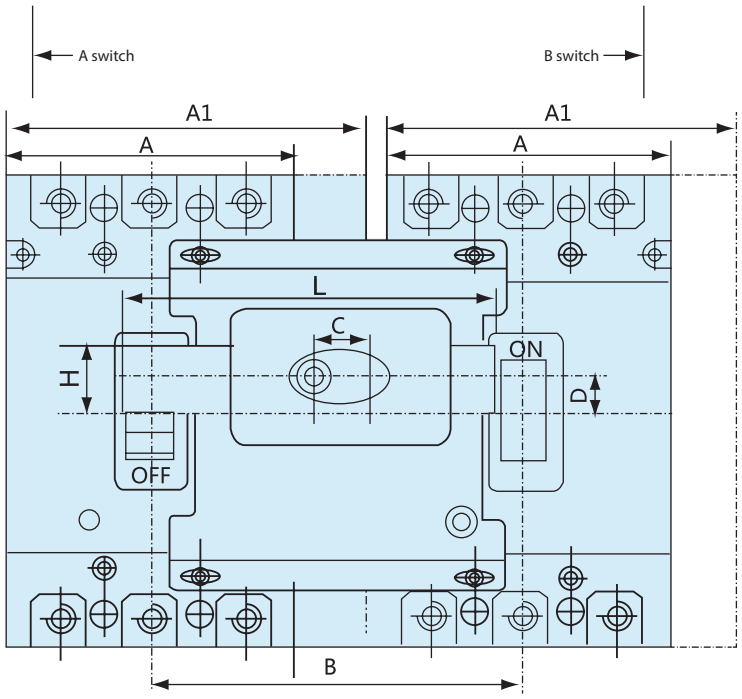
The rated voltage of FT is the power input voltage of A1 and A2

- Instantaneous current and power consumption of shunt tripper

Product models	Instantaneous current value (A)				Power consumption (W)				
	AC 400V	AC 230V	DC220V	DC 24V	AC 400V	AC 230V	DC 220V	DC 24V	DC 24V (Low power consumption)
NDM3-100/125	0.288	0.425	0.341	4	96.8	73	90.7	91.2	15
NDM3-250	0.313	0.412	0.341	3.87	112	68.8	90.7	85.3	15
NDM3-400	0.197	0.325	0.4	3.87	67	62.3	94.4	100	15
NDM3-630	0.199	0.314	0.4	3.87	68	58.2	94.4	100	15
NDM3-800	0.538	0.898	1.134	5.22	163	153		120	15

5.3 Functions and Sizes of NDM3 External Accessories

5.3.1 Mechanical interlock



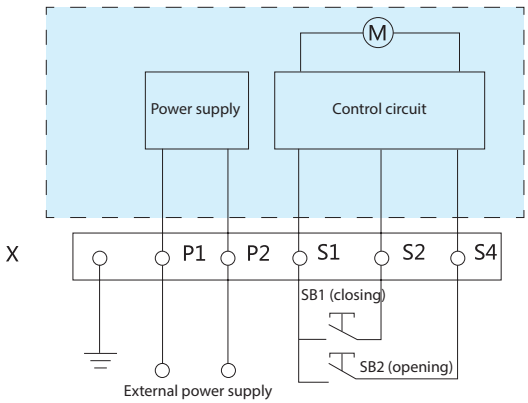
Mechanical interlocking and related dimensions

Product models	A	A1	B	C	D	L	H	Remarks
NDM3-125	92		120	50	11.5	118	22	
NDM3-250	107		135	50	14	135	22	
NDM3-400	150		180	60	18	175	30	
NDM3-630	182		235	60	16	198	28	
NDM3-800	210		243	60	18	230	30	
NDM3-125/4P		122	152	50	11.5	150	22	
NDM3-250/4P		142	173	50	9	168	22	
NDM3-400/4P		198	230	60	16	188	28	
NDM3-630/4P		240	295	60	12	240	30	
NDM3-800/4P		280	310	60	29.5	300	30	

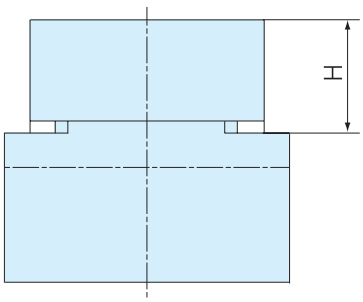
5.3.2 Electric operating mechanism

- CD2 electric operating mechanism (equipped with NDM3-100~800 series)

◆ Wiring diagram (The circuit breaker external accessory wiring diagram is in the dotted box)



◆ CD2 Electric operating mechanism



Symbol instruction:
SB1, SB2: Operating button (prepared by users)
X: Terminal block
P1, P2: External power supply

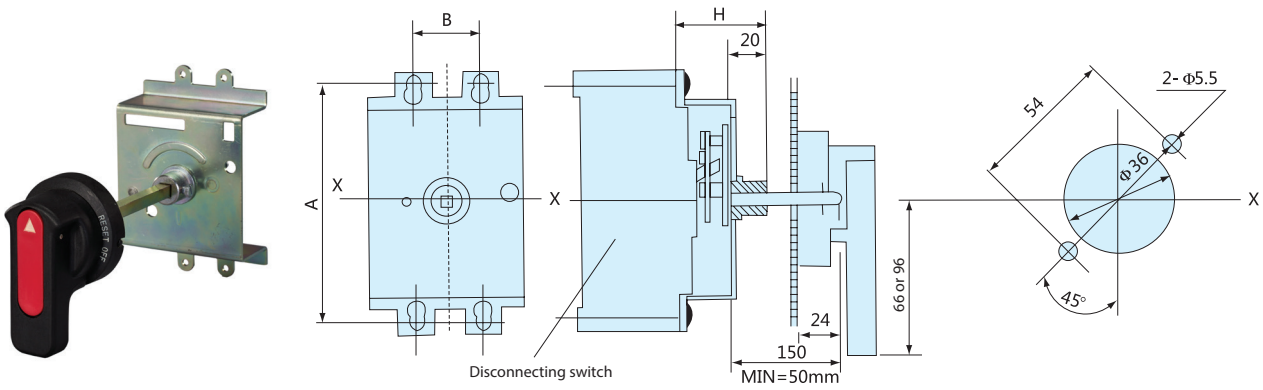
◆ Voltage specification:
AC 50Hz 110V、230V、400V
DC 24V、110V、220V

- Technical parameters of CD2 motor operating mechanism

Equipped with circuit breaker	Operating current (A)	Electric power (W)	Life/times	Operating mechanism height H (mm)
NDM3-100/125	≤0.5	14	20000	89.5
NDM3-160	≤0.5	14	10000	94
NDM3-250	≤0.5	14	20000	92
NDM3-400	≤2	35	10000	149
NDM3-630	≤2	35	10000	147
NDM3-800	≤2	35	5000	151

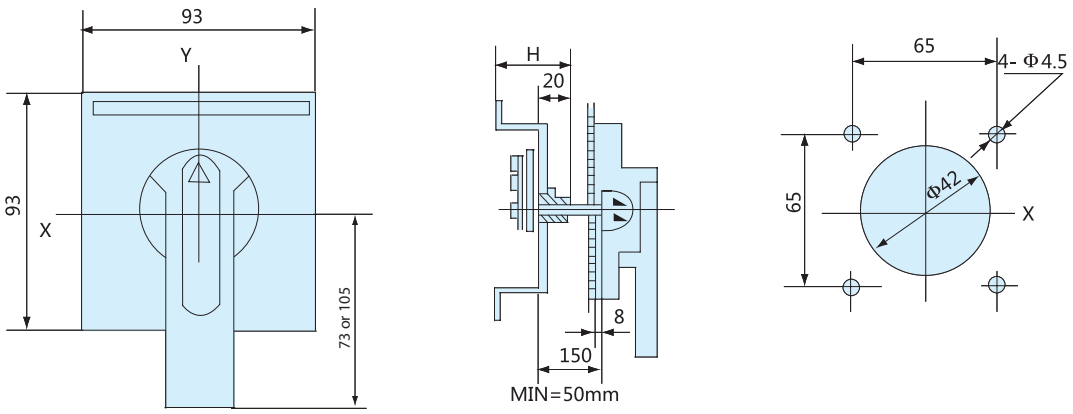
5.3.3 Manual operating mechanism

- CS1-A type handle mounting opening diagram

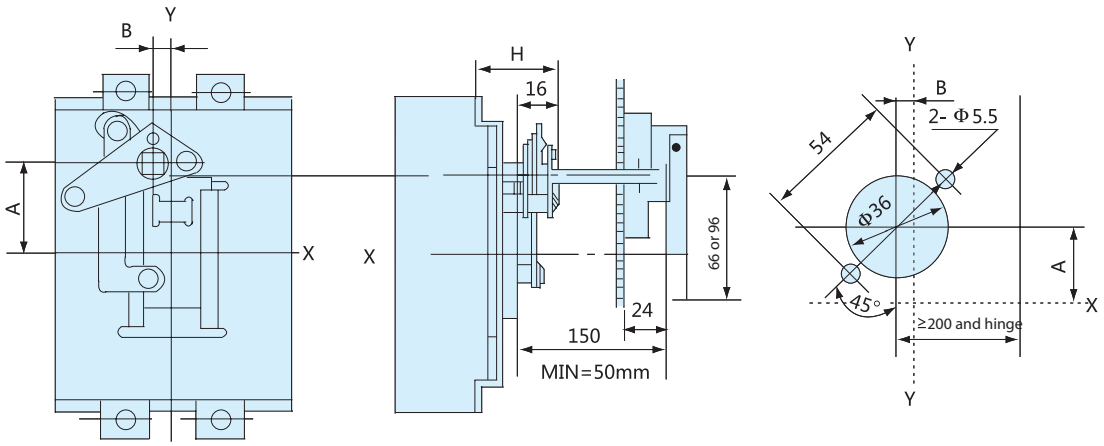


Note: A type is a round handle F type is a square handle

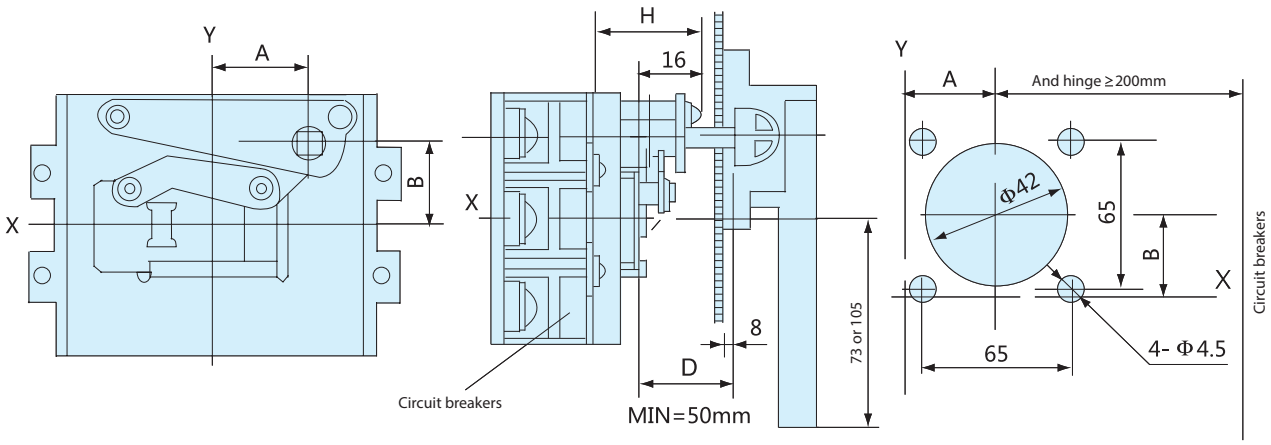
- CS1-F type handle mounting opening diagram



- CS2-A type handle mounting opening diagram



- CS2-F type handle mounting opening diagram



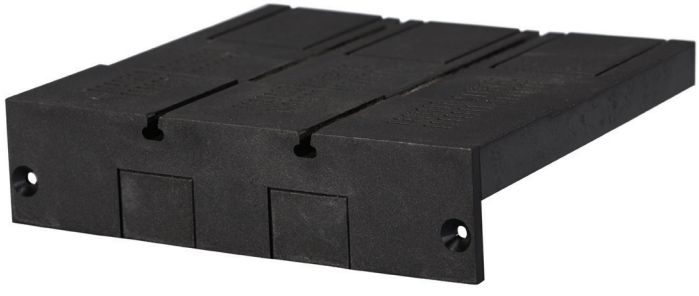
● Mounting method and outline dimension of manual operating mechanism

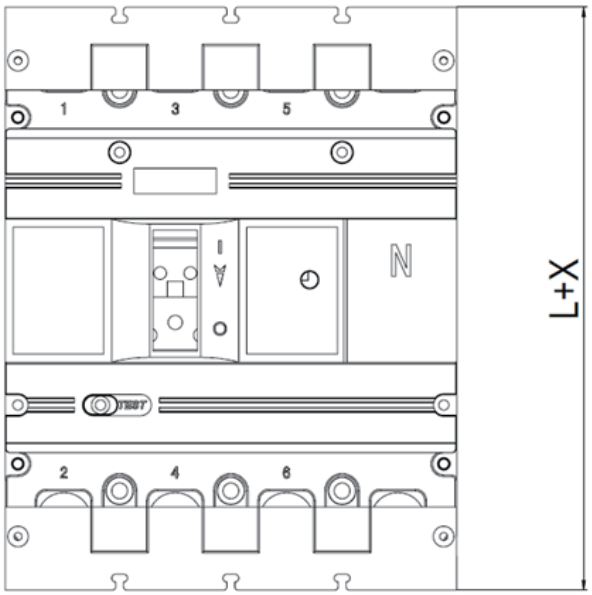
External accessories	External accessory model	Equipped with circuit breaker	Manual installation dimensions: (mm)				Installation mode
			H	A	B		
					3P	4P	
Manual operating mechanism	CS1-100	NDM3-125	54	104	30		Vertical mounting
	CS1/M3-160C	NDM3-160C	49	118	30		
	CS1/M3-160(L,M)	NDM3-160(L,M)	49	129	30		
	CS1-225	NDM3-250	55	143	35		
	CS1-400(NDM3)	NDM3-400	82	194	137	185	
	CS1-630(NDM3)	NDM3-630	82	200	171	229	
	CS1-800(NDM3)	NDM3-800	84	243	198	268	
	CS2-100	NDM3-125	46	35	11.5		
	CS2/M3-160C	NDM3-160C	46	35	11.5		
	CS2/M3-160(L,M)	NDM3-160(L,M)	46	35	11.5		
	CS2-225	NDM3-250	48	35	31		
	CS2-400(NDM3)	NDM3-400	61	65	15		
	CS2-630(NDM3)	NDM3-630	61	60	15		
	CS2-800(NDM3)	NDM3-800	66	48	15		

Note: In the figure, size D is 150mm by default, and can be customized according to the customer requirements.

5.4 Terminal Cover

5.4.1 Zero flashover cover



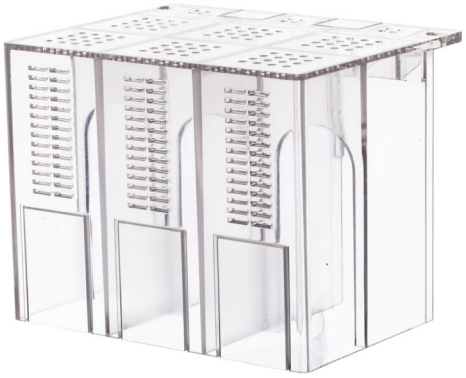


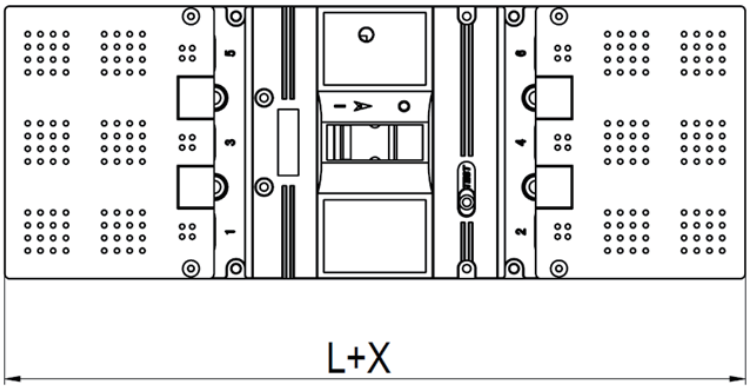
The terminal covers are mounted on both sides of the product to provide zero flashover function for the product, whose heights and widths are consistent with the product and lengths are shown in the following table.

Product series	Model	Body length L	Increased length of terminal cover X	Length after addition of terminal cover Lx
NDM3	NDM3-100C	130	12	142
	NDM3-125	150	12	162
	NDM3-160C	139	12	151
	NDM3-160	150	12	162
	NDM3-250C	165	14	179
	NDM3-250	165	19	184
	NDM3-400	257	19	276
	NDM3-630	270	19	289
	NDM3-800	280	19	299

5.4.2 Extended terminal cover

The extended terminal cover is mainly used for bare cable installation to protect the cable.



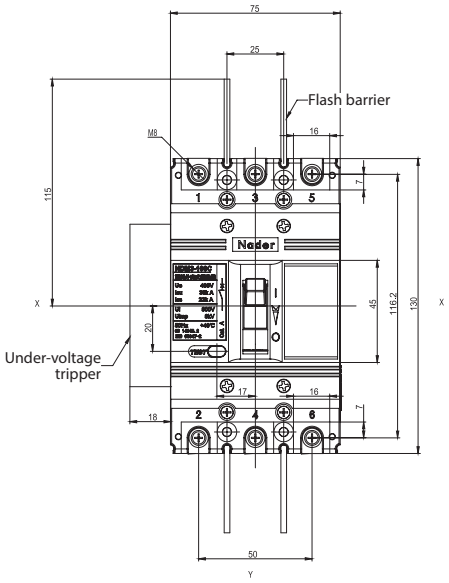


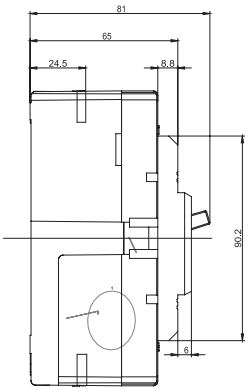
Product series	Model	Body length L (mm)	Increased length of extended terminal cover X(mm)	Total length Lx (mm)
NDM3	NDM3-125L	150	130	280
	NDM3-250L	165	126	291
	NDM3-400L	257	144	401
	NDM3-630L	270	130	400
	NDM3-800L	280	150	430

6. Product Outline Dimension

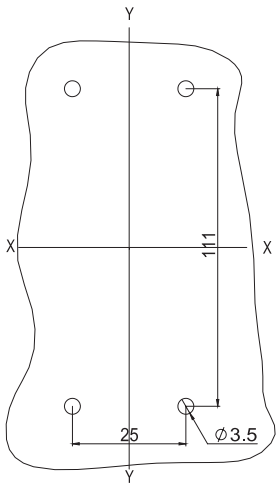
6.1 NDM3-100C Outline Dimension, Mounting Dimension and Wiring Method

Before-panel wiring (three-pole)

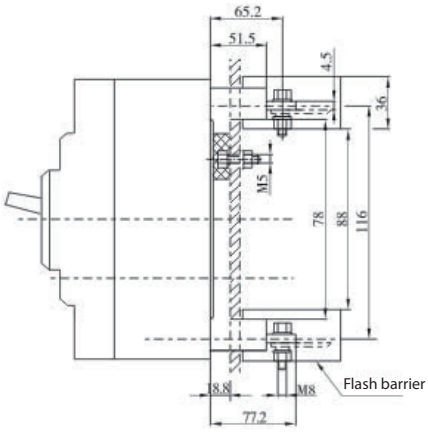




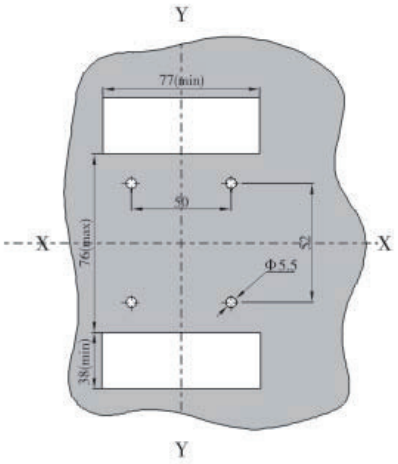
X-X, Y-Y represents the size of opening of before-panel wiring mounting plate at the center of three-pole circuit breaker



Z2H: Plug-in type behind-panel wiring (three-pole)

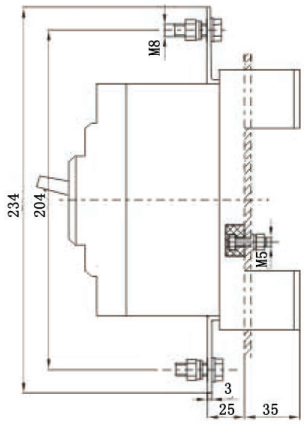


X-X, Y-Y represents the center of circuit breaker

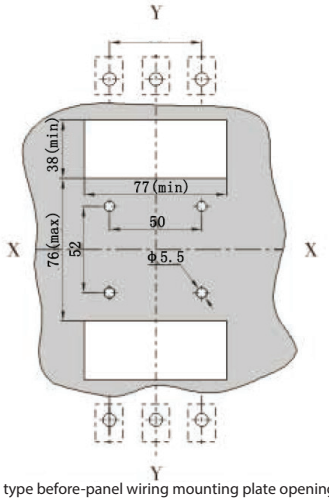


Plug-in type behind-panel wiring mounting plate opening size

Z2Q:Plug-in type before-panel wiring (three-pole)



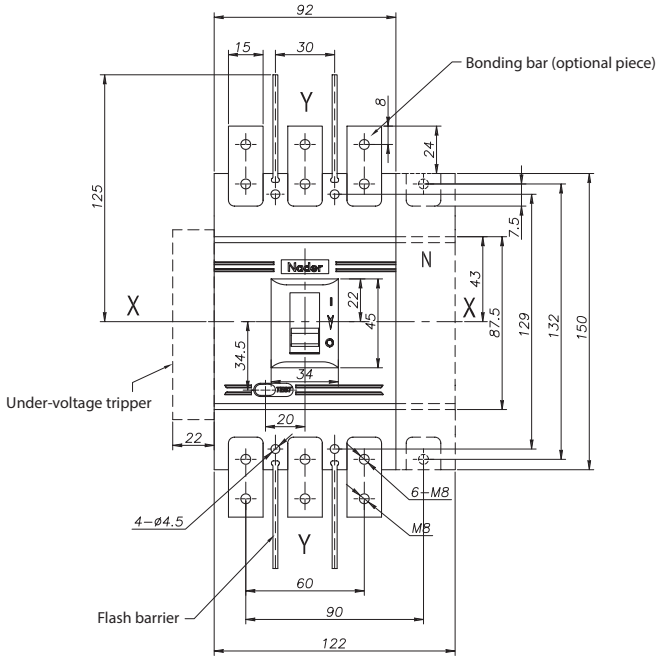
X-X, Y-Y represents the center of circuit breaker



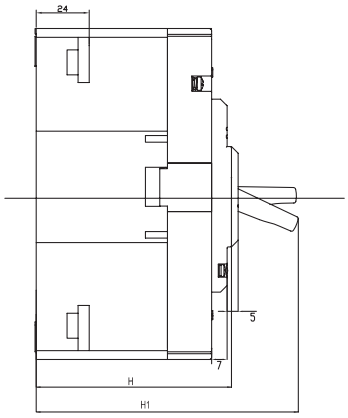
Plug-in type before-panel wiring mounting plate opening size

6.2 NDM3-125(L, M, H) Outline Dimension, Mounting Dimension and Wiring Method

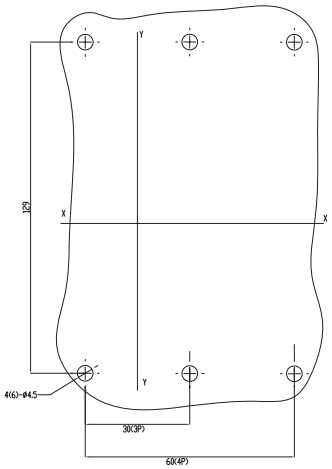
Before-panel wiring (three-pole,four-pole)



X-X, Y-Y represents the size of opening of before-panel wiring mounting panel of the center of three-pole circuit breaker

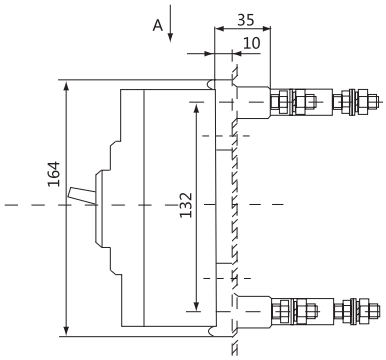


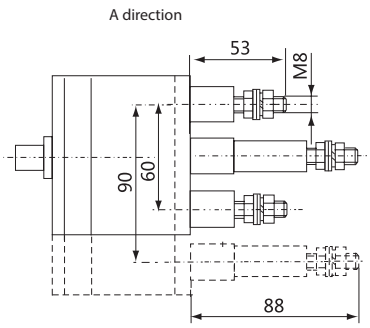
the size of opening of before-panel wiring mounting panel



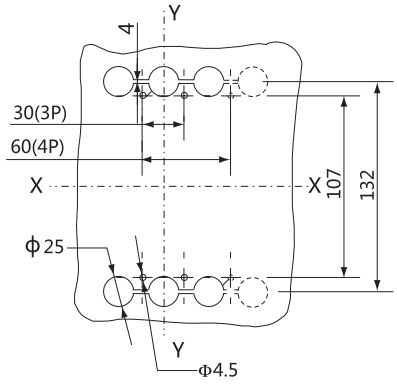
Model	H	H1
NDM3-125L	68	100
NDM3-125M/H	86	118
NDM3-125 four-pole		

Z1: Behind-panel wiring (three-pole, four-pole)

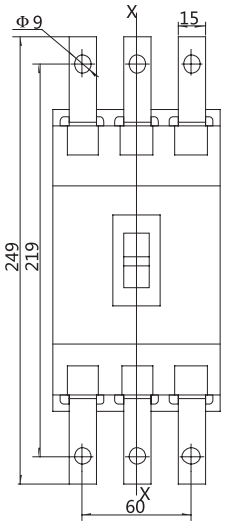


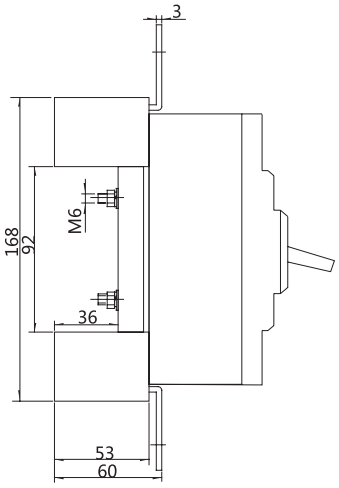


X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of circuit breaker

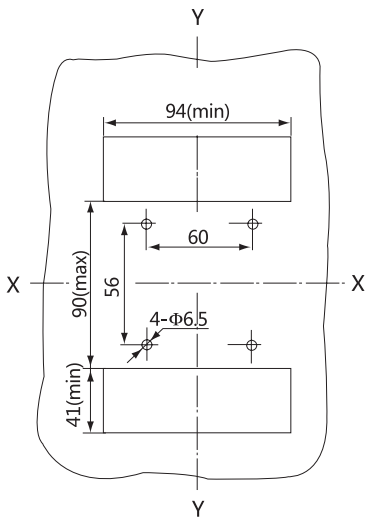


Z2Q:Plug-in type before-panel wiring (three-pole)



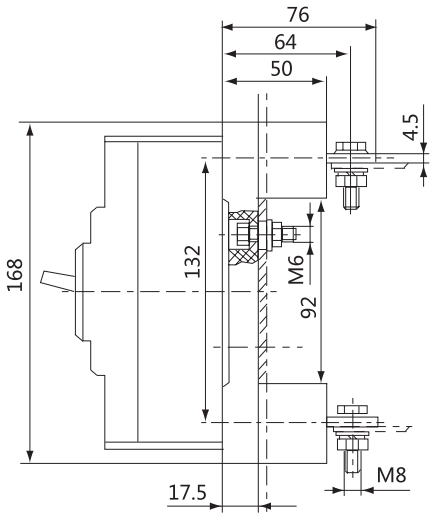


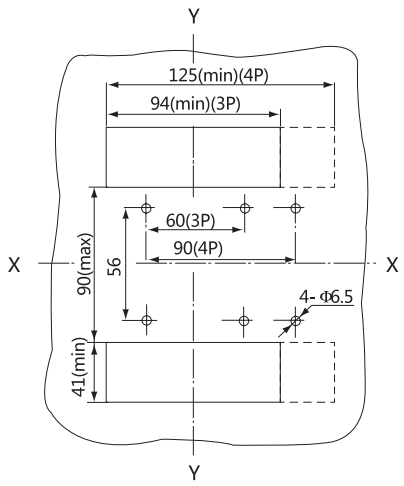
X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker



Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker



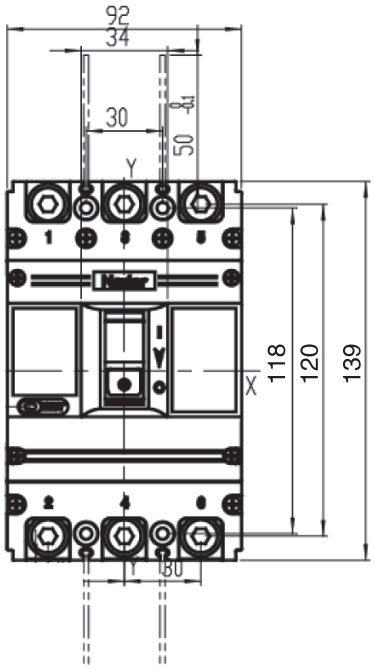


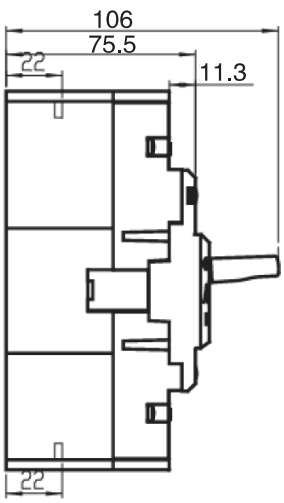
6.3 NDM3-160 Outline Dimension, Mounting Dimension and Wiring Method

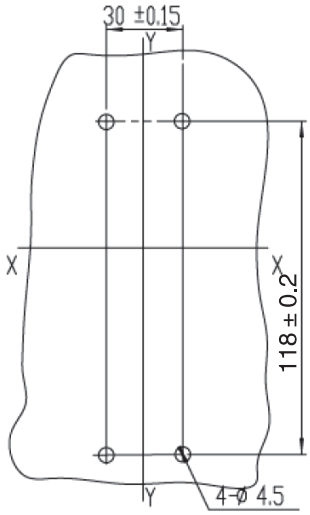
6.3.1 NDM3-160C/L/M before-panel wiring

NDM3-160C (three-pole)

X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker

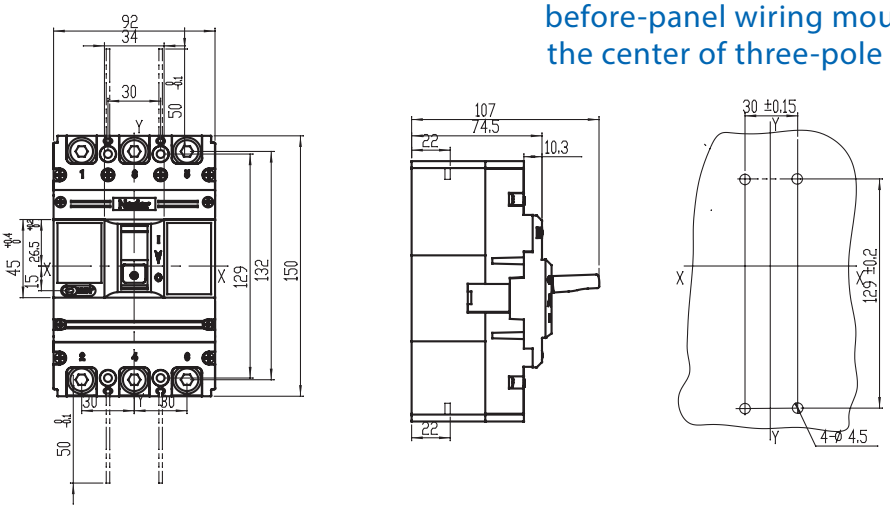






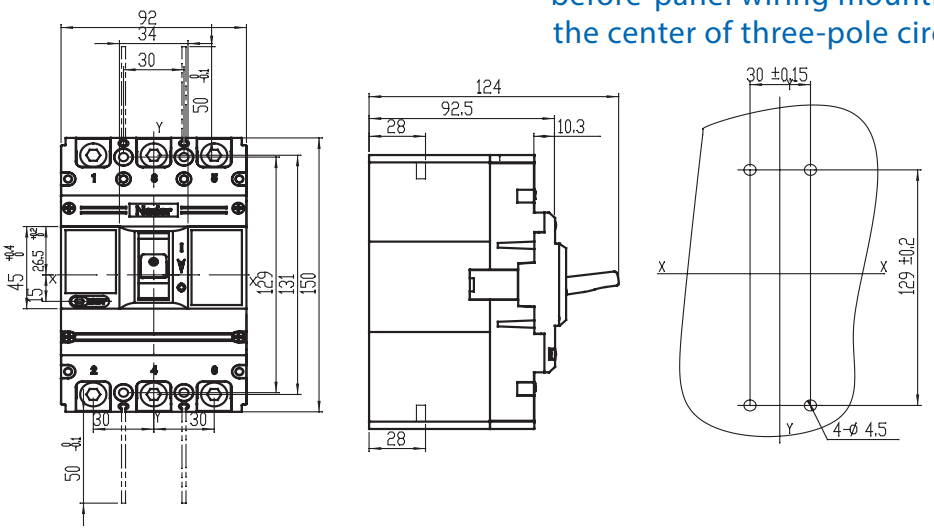
NDM3-160L (three-pole)

X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker



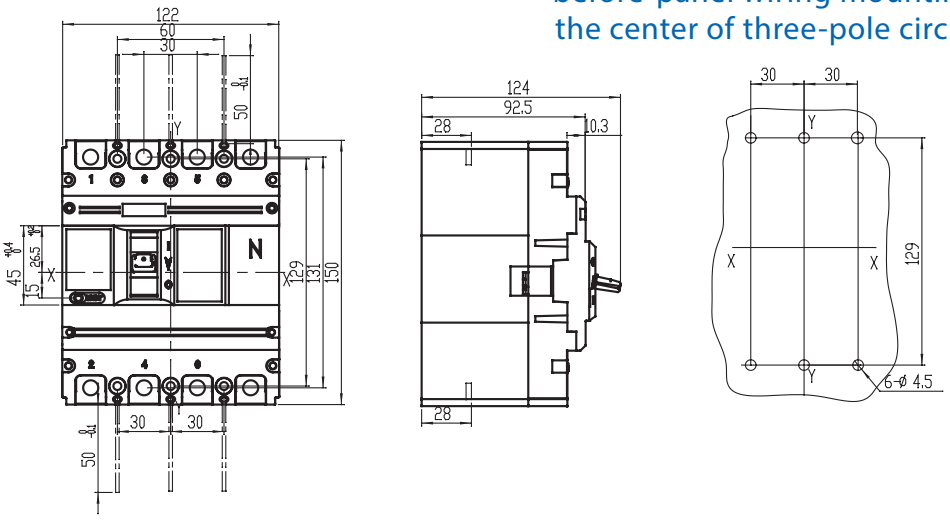
NDM3-160M (three-pole)

X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker



NDM3-160 (four-pole)

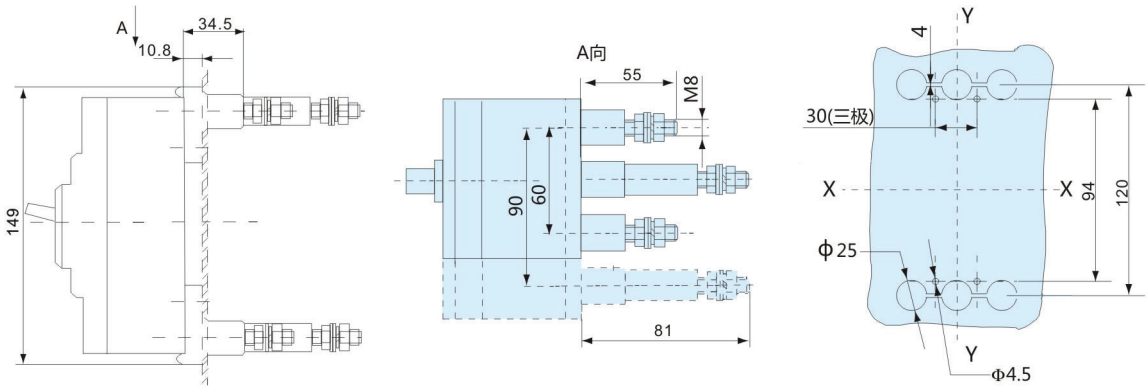
X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker



6.3.2 NDM3-160C/L/M behind-panel wiring

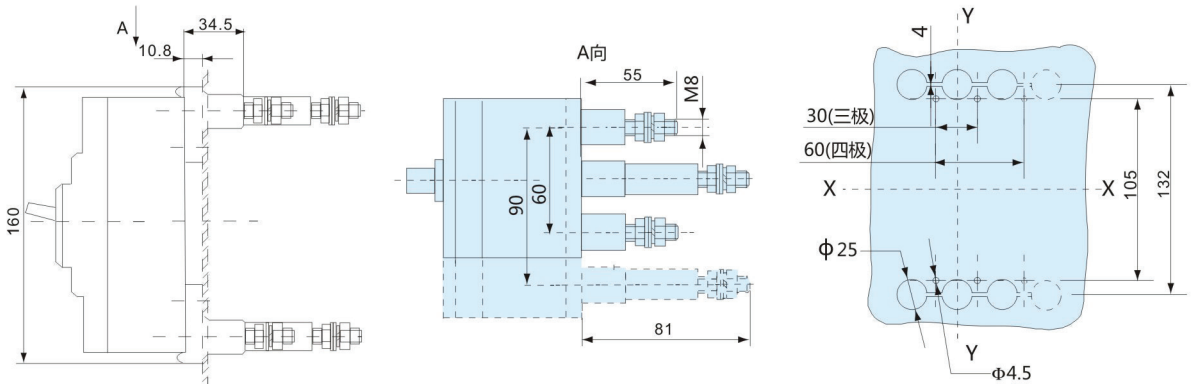
NDM3-160C (three-pole)

X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of three-pole circuit breaker



NDM3-160 L/M (three-pole, four-pole)

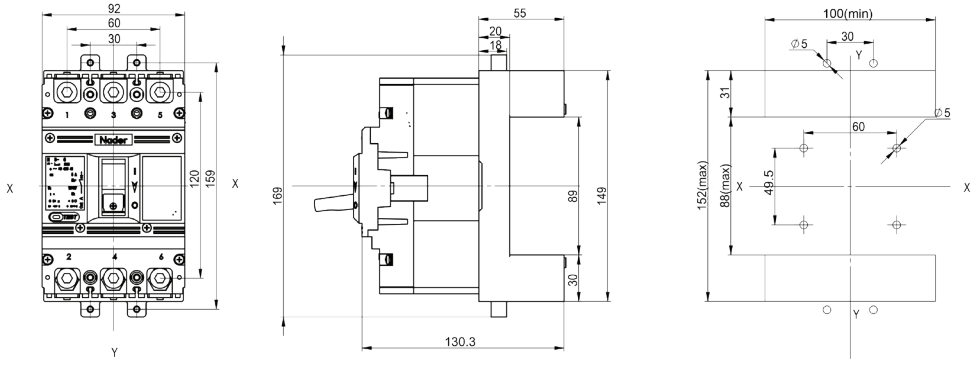
X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of three-pole circuit breaker



6.3.3 NDM3-160C/L/M plug-in type behind-panel wiring Z2H

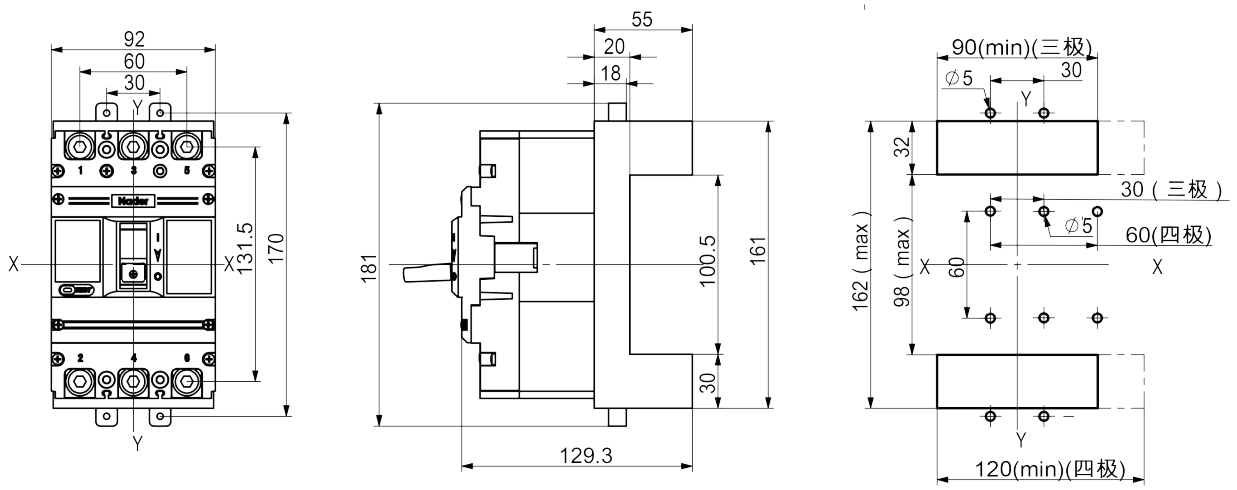
NDM3-160C (three-pole)

X-X, Y-Y represents the size of opening of plug-in type behind-panel wiring mounting plate at the center of three-pole circuit breaker



NDM3-160 L/M
(three-pole, four-pole)

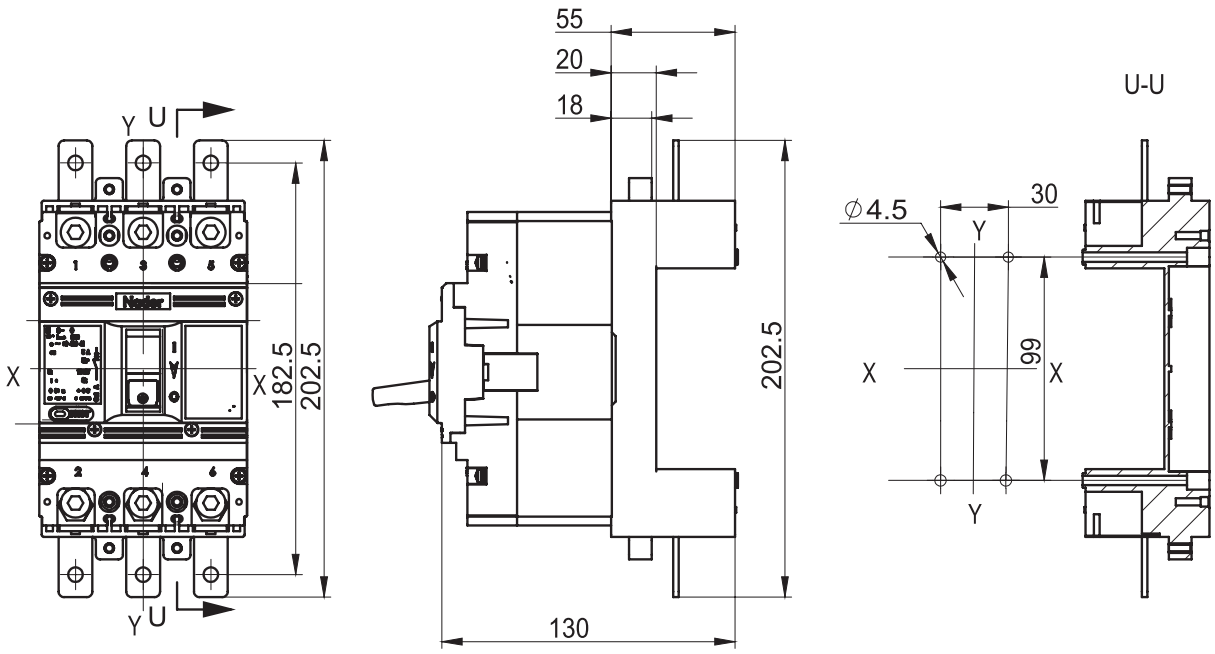
X-X, Y-Y represents the size of opening of plug-in type behind-panel wiring mounting plate at the center of three-pole circuit breaker



6.3.4 NDM3-160C/L/M plug-in type before-panel wiring Z2Q

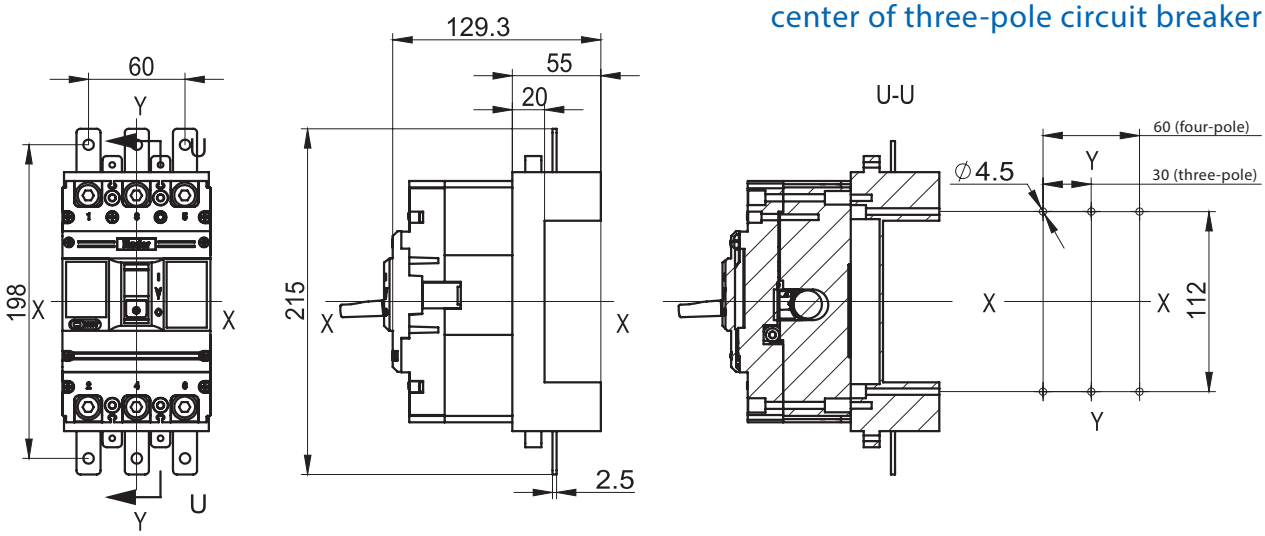
NDM3-160C (three-pole)

X-X, Y-Y represents the size of opening of plug-in type before-panel wiring mounting plate at the center of three-pole circuit breaker



NDM3-160 L/M (three-pole, four-pole)

X-X, Y-Y represents the size of opening of plug-in type behind-panel wiring mounting plate at the center of three-pole circuit breaker

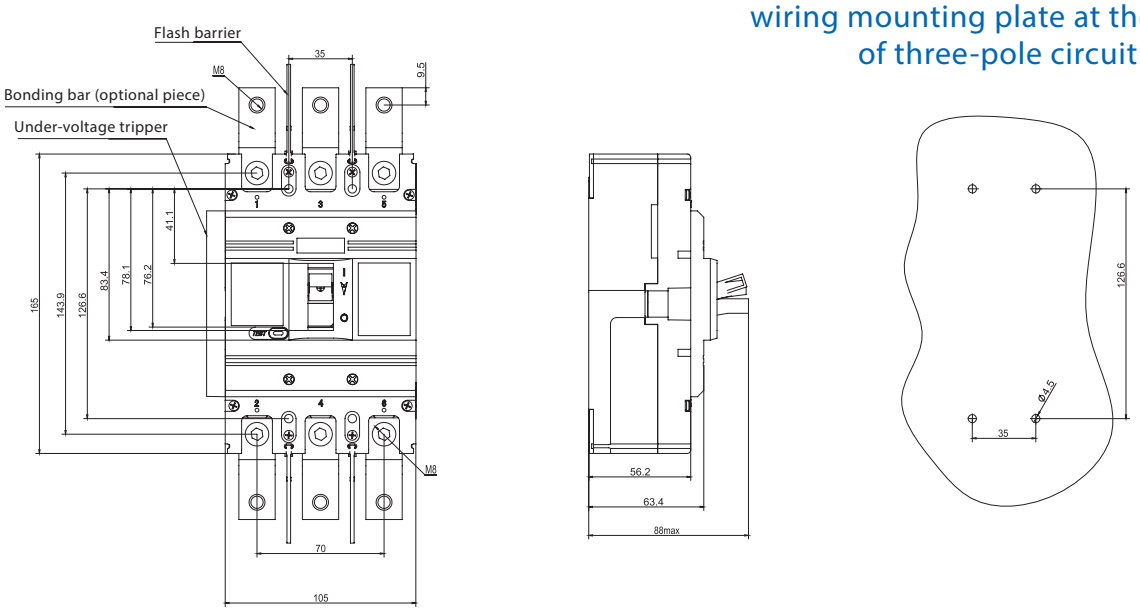


6.4 NDM3-250 Outline Dimension, Mounting Dimension and Wiring Method

● 6.4.1 NDM3-160C/L/M plug-in type before-panel wiring Z2Q

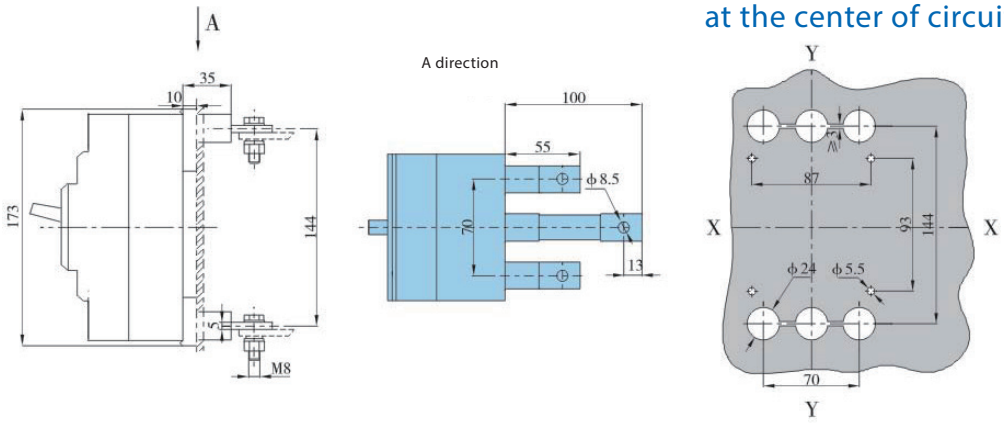
NDM3-160C (three-pole)

X-X, Y-Y represents the size of opening of plug-in type before-panel wiring mounting plate at the center of three-pole circuit breaker



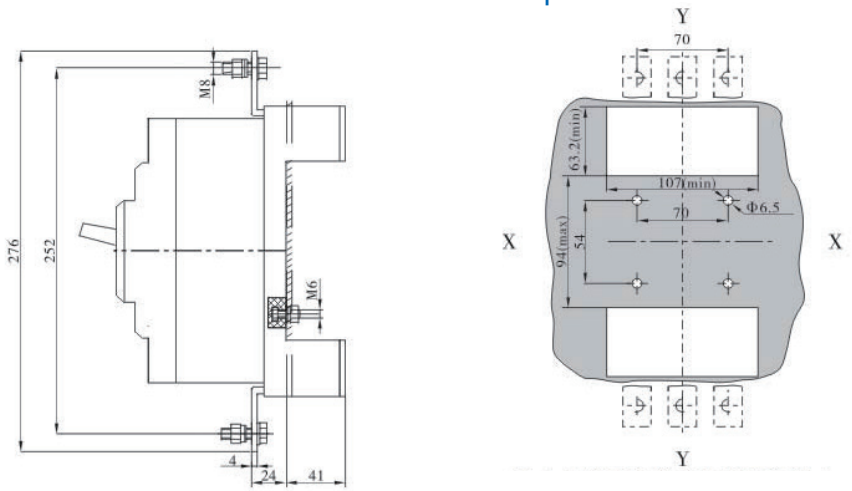
Z1: Behind-panel wiring (three-pole)

X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of circuit breaker



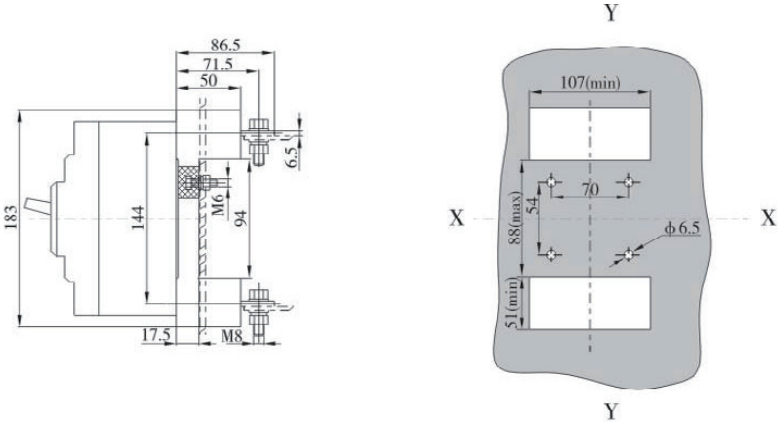
Z2Q:Plug-in type before-panel wiring (three-pole)

X-X, Y-Y represents the size of opening of plug-in type before-panel wiring mounting plate at the center of circuit breaker



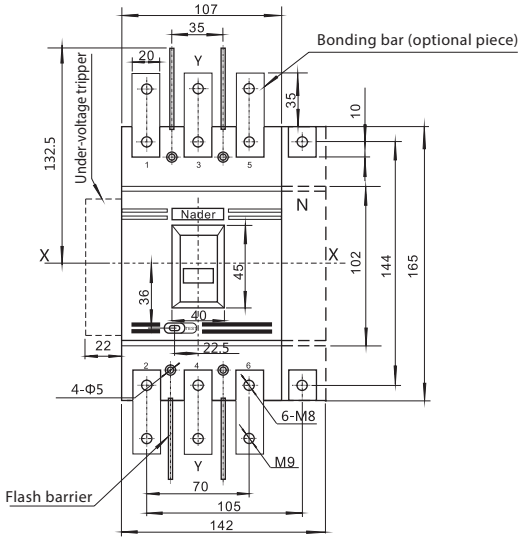
Z2H:Plug-in type behind-panel wiring (three-pole)

X-X, Y-Y represents the size of opening of plug-in type behind-panel wiring mounting plate at the center of circuit breaker

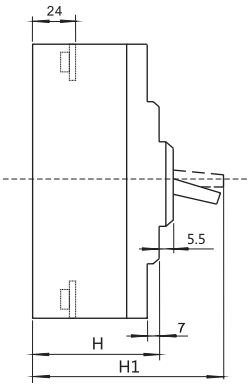


6.4.2 NDM3-250(L, M, H) outline dimension, mounting dimension and wiring method

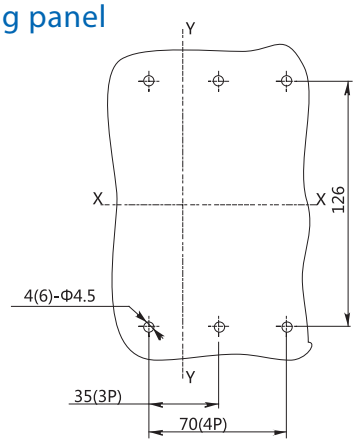
Before-panel wiring (three-pole,four-pole)



X-X, Y-Y represents the size of opening of before-panel wiring mounting panel of the center of three-pole circuit breaker

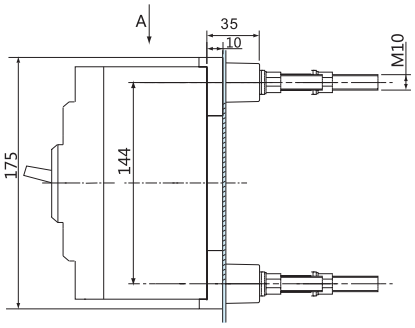


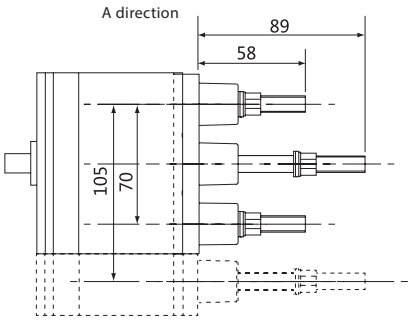
the size of opening of before-panel wiring mounting panel



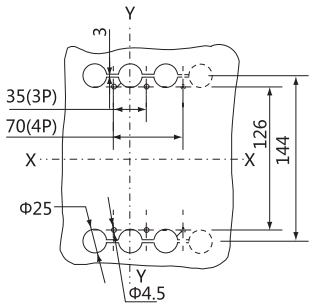
Model	H	H1
NDM3-250L	88.5	122.5
NDM3-250M/H	105.5	139.5
NDM3-250四极		

Z1: Behind-panel wiring (three-pole, four-pole)



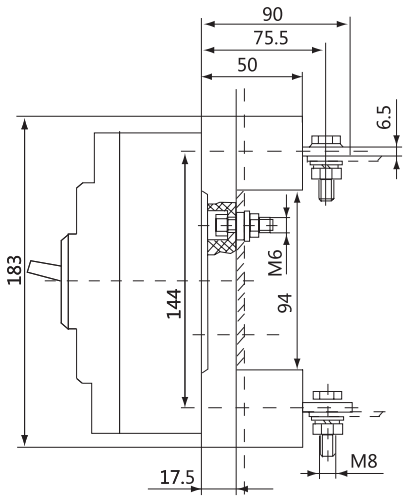


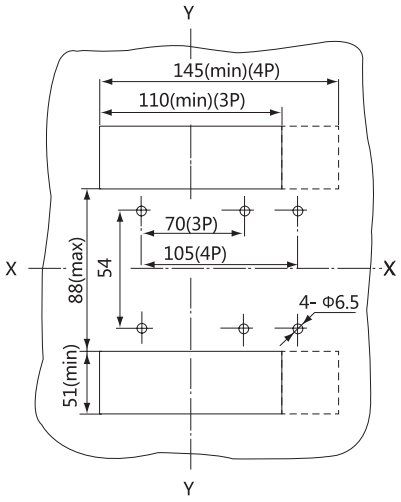
X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of circuit breaker



Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

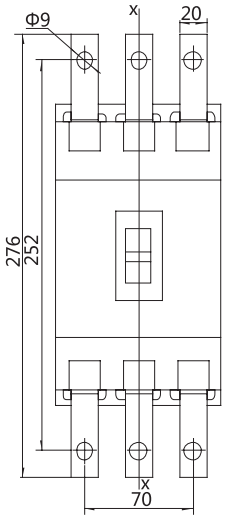
X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker

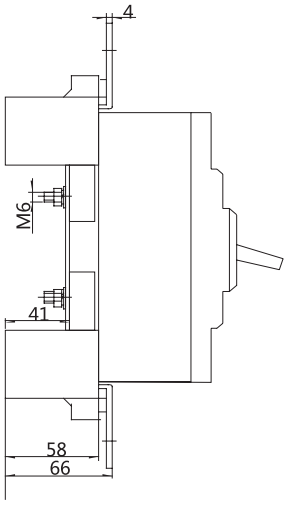


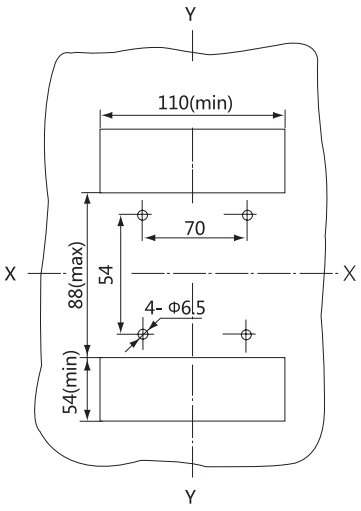


Z2Q:Plug-in type before-panel wiring (three-pole)

X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker

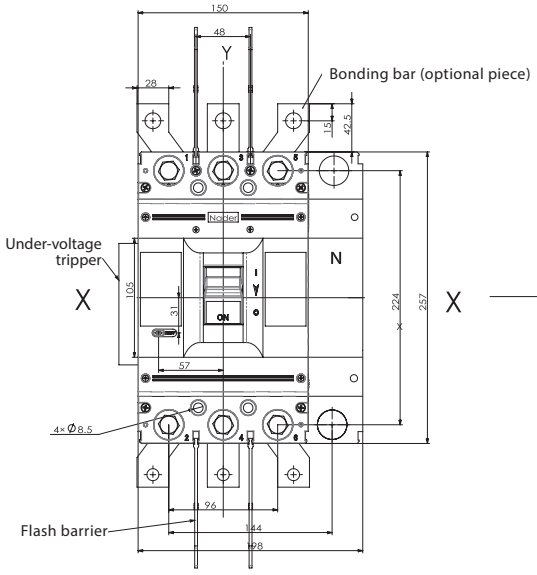




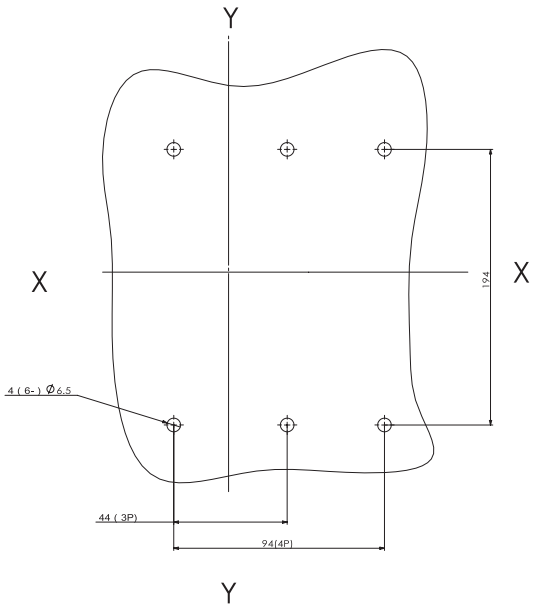


6.5 NDM3-400 Outline Dimension, Mounting Dimension and Wiring Method

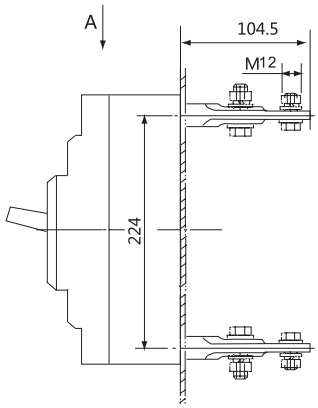
Before-panel wiring (three-pole,four-pole)

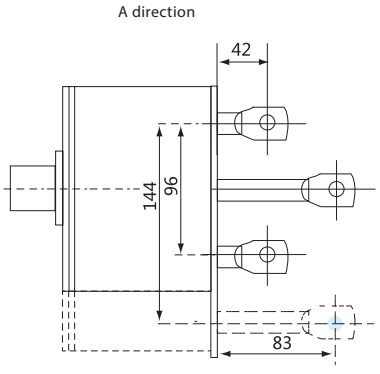


X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker

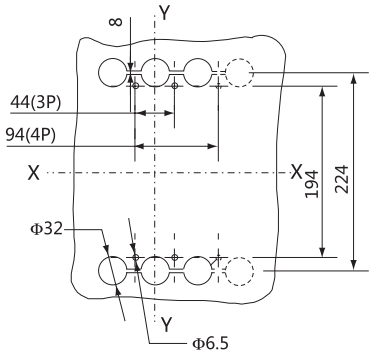


Z1: Behind-panel wiring (three-pole, four-pole)



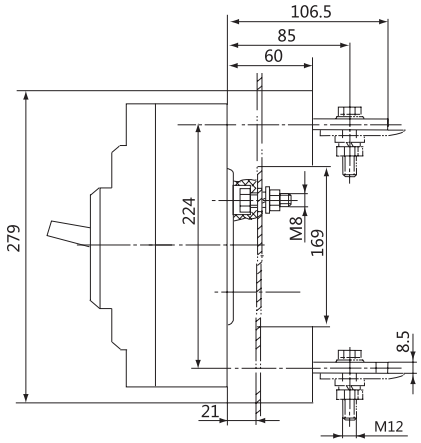


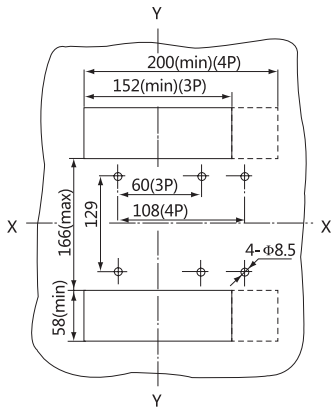
X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of circuit breaker



Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

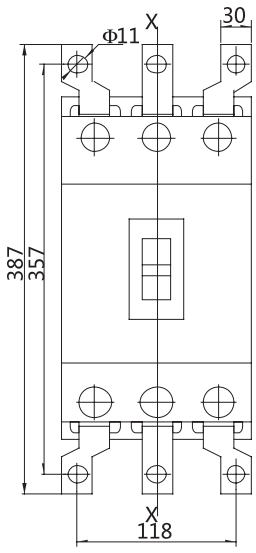
X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker

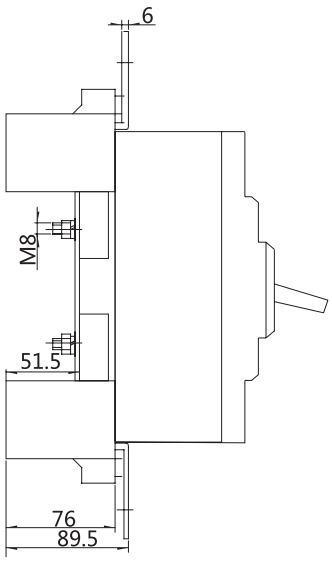


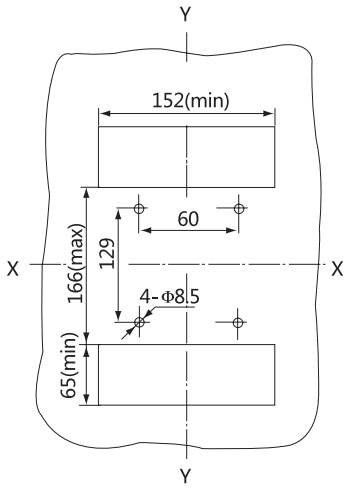


Z2Q:Plug-in type before-panel wiring (three-pole)

X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker

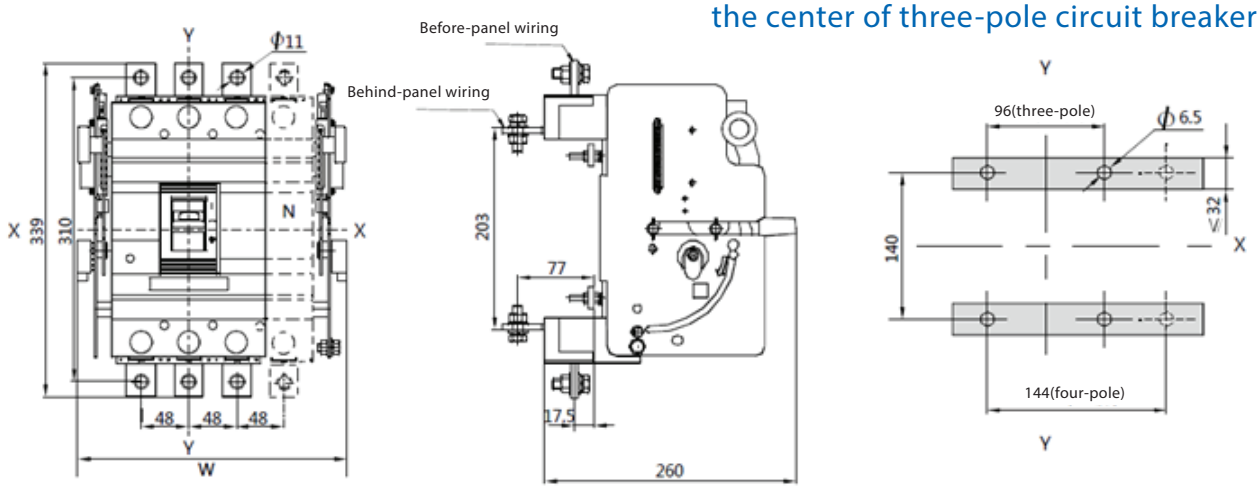






Drawer wiring (three-pole, four-pole)

X-X, Y-Y represents the size of opening of drawer type wiring mounting panel at the center of three-pole circuit breaker

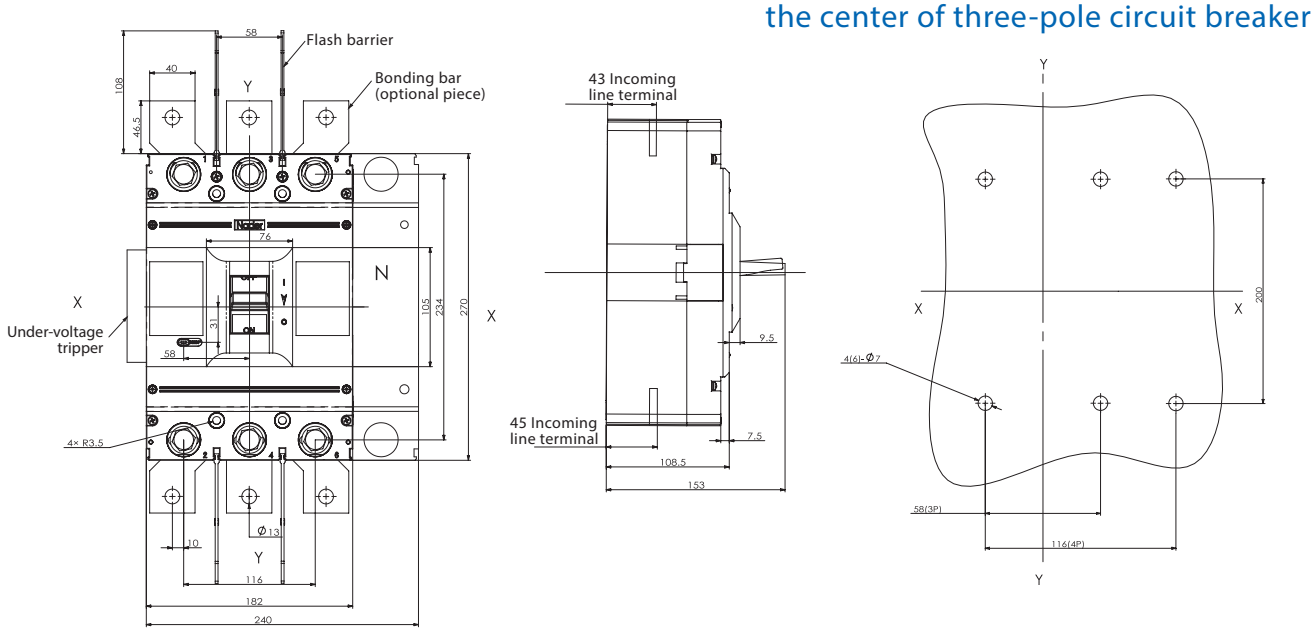


Grade number	W
Three-pole	223
Four-pole	271

6.6 NDM3-630 Outline Dimension, Mounting Dimension and Wiring Method

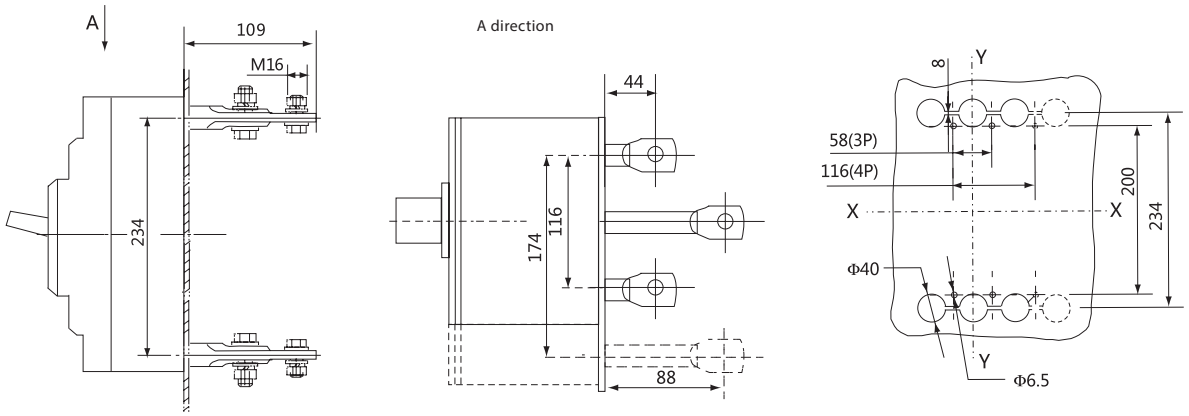
Before-panel wiring (three-pole,four-pole)

X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker



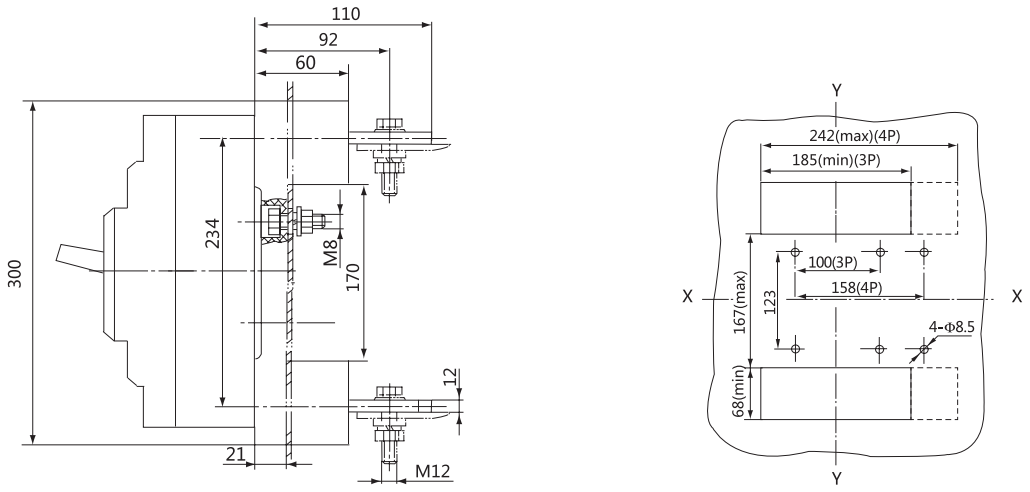
Z1: Behind-panel wiring (three-pole, four-pole)

X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of circuit breaker



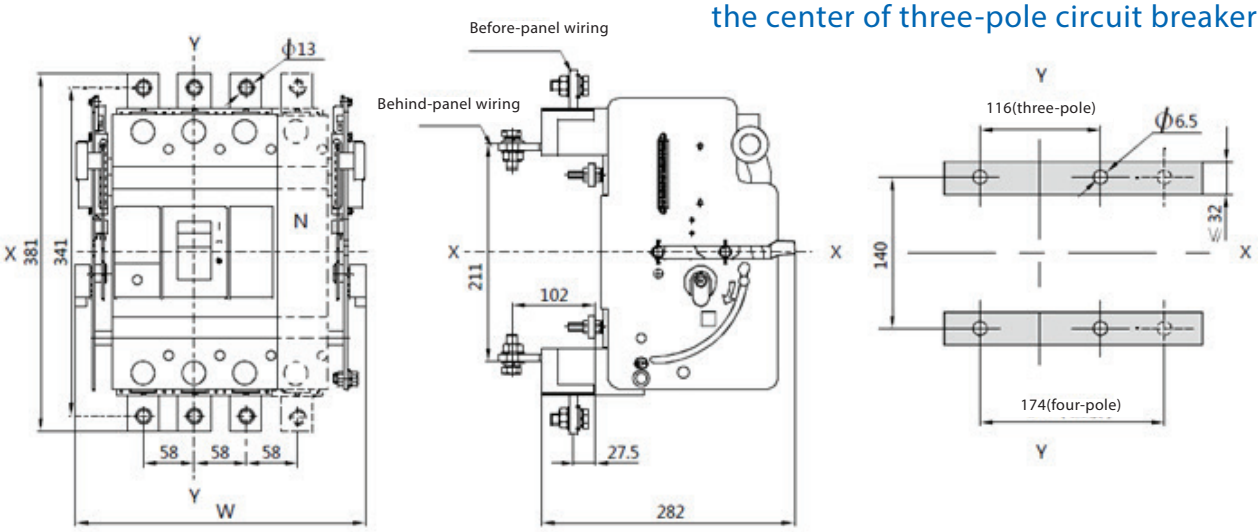
Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker



Drawer wiring (three-pole, four-pole)

X-X, Y-Y represents the size of opening of drawer type wiring mounting panel at the center of three-pole circuit breaker

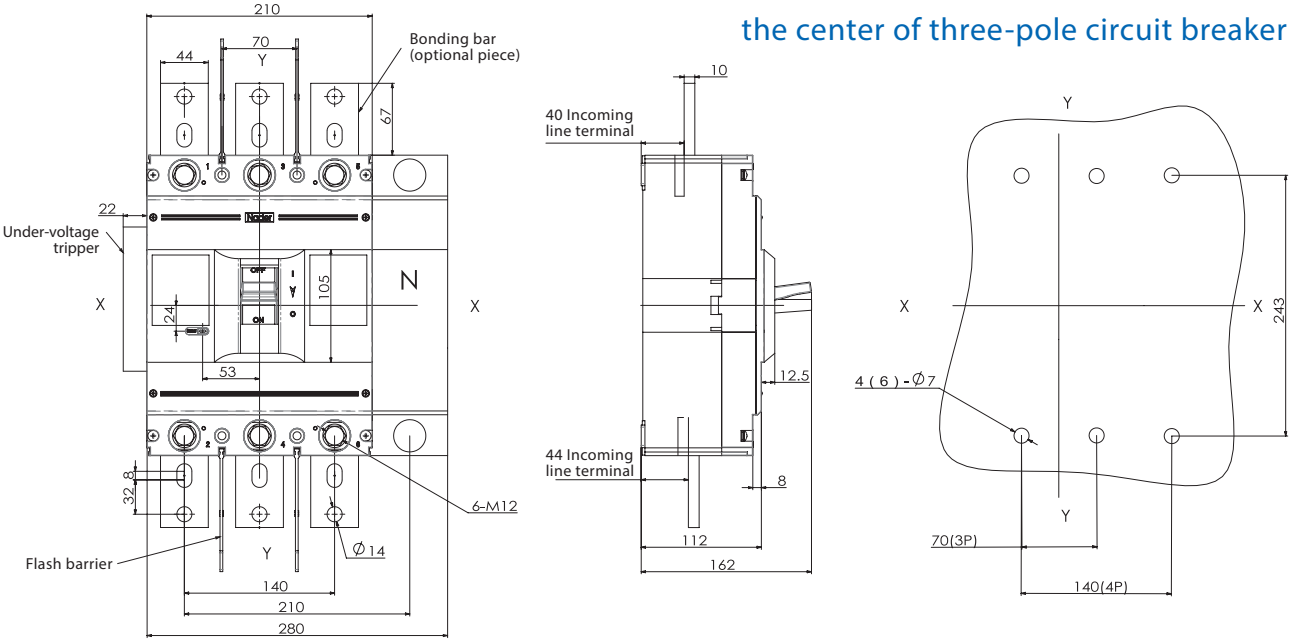


Grade number	W
Three-pole	253
Four-pole	311

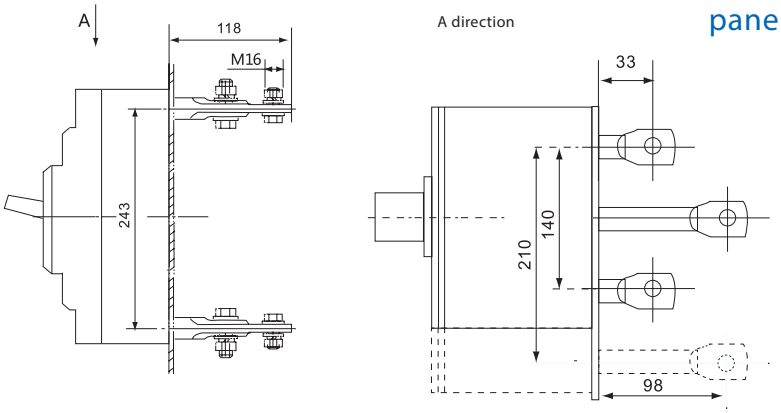
6.7 NDM3-800 Outline and Installation Dimension

Before-panel wiring (three-pole,four-pole)

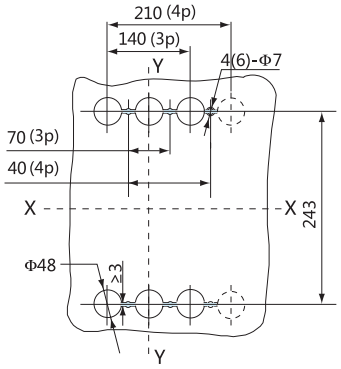
X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker



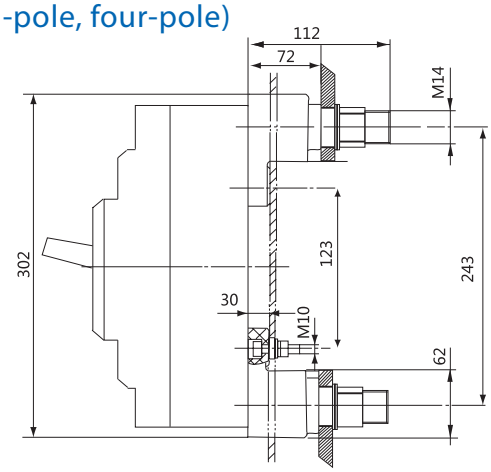
Z1: Behind-panel wiring (three-pole, four-pole)



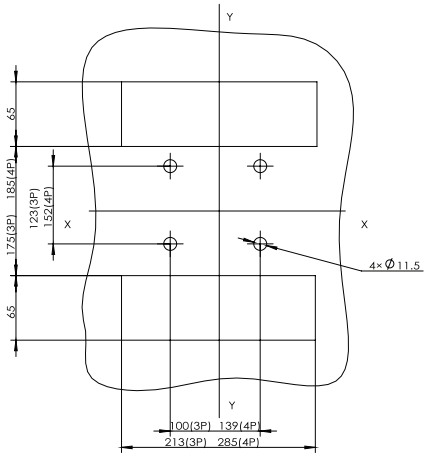
X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of circuit breaker



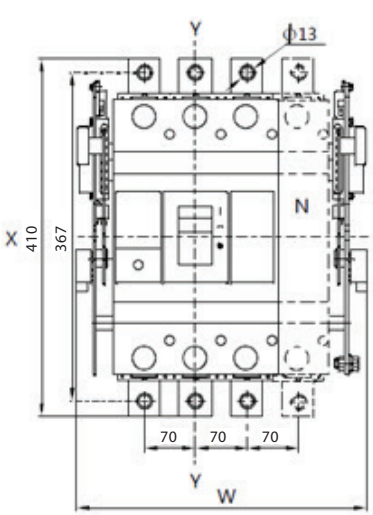
Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

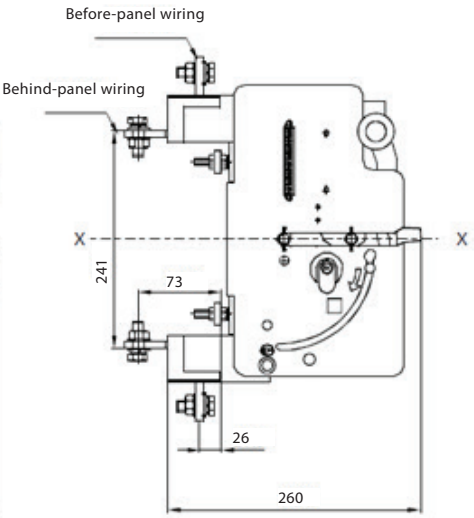


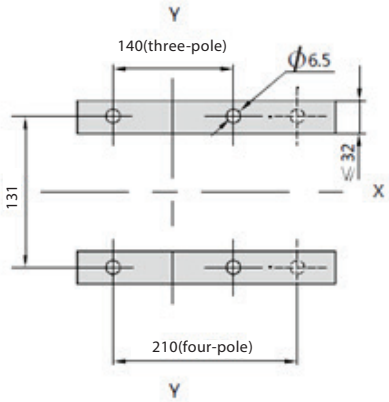
X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker



Drawer wiring (three-pole, four-pole)



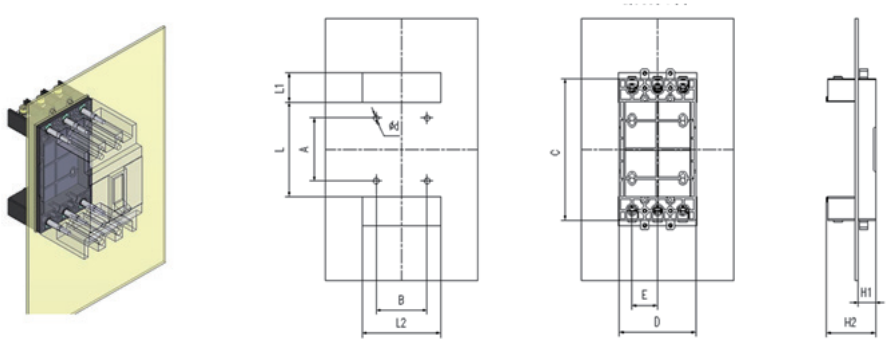




Grade number	W
Three-pole	289
Four-pole	359

6.8 NDM3-(125-800)Z3 Series Plug-in Type Mounting Dimension and Wiring Method

● Z3H (Scheme 1): Behind-panel mounting

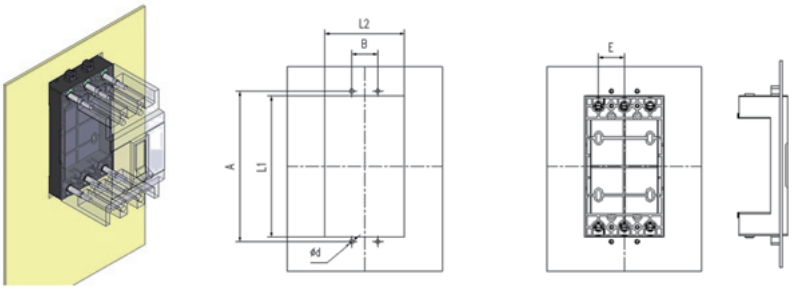


Installation schematic diagram

Typical product model	Breaker model	A	B	L	L1	L2	d	C	D	E	H1	H2
MZ3-100	NDM3-125	65	60	90	51	94	6.5	160	90	30	18	56.2
MZ3-225	NDM3-250	74	70	100	55	110	6.5	179	105	35	20	73.2
MZ3-400	NDM3-400	140	96	178	70	150	7	274	148	48	45	85
MZ3-630	NDM3-630	140	116	178	83	177	7	300	232	58	44	120
MZ3-800	NDM3-800	143	140	181	87	213	7	311	210	70	44	125

Note 1: When the product is 4-pole, phase distance E is increased for sizes B, L2 and D.
Note 2: When the product is 4-pole and the frame degree is ≤250A, phase distance E should be increased for sizes B and L2; when the product is 4-pole and the frame degree is ≥400A, size B remains unchanged and phase distance E is increased for N pole distance of L2.

● Z3H (Scheme 2):Large opening behind-panel mounting

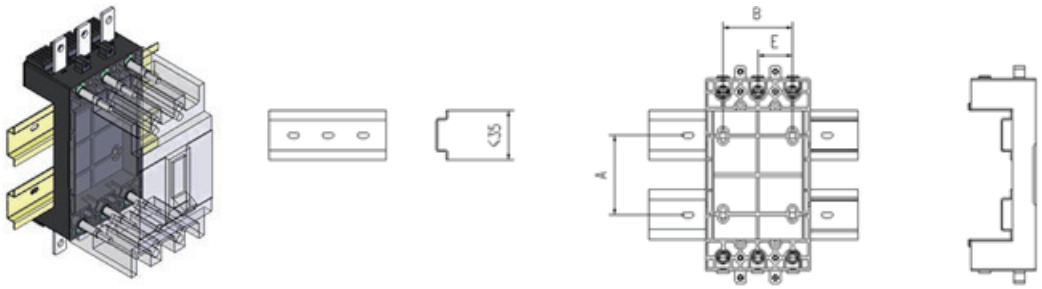


Installation schematic diagram

Typical product model	Breaker model	A	B	L1	L2	d	E
MZ3-100	NDM3-125	170	30	161	92	5	30
MZ3-225	NDM3-250	191	35	180	107	5	35
MZ3-400	NDM3-400	290	48	276	150	6	48
MZ3-630	NDM3-630	316	58	302	176	6	58
MZ3-800	NDM3-800	327	70	313	212	6	70

Note: When the product is 4-pole and the frame degree is ≤250A, phase distance E shall be increased for sizes B and L2; when the product is 4-pole and the frame degree is ≥400A, size B remains unchanged and phase distance E is increased for N pole distance of L2.

Z3H (Scheme 3): Frame behind-panel mounting

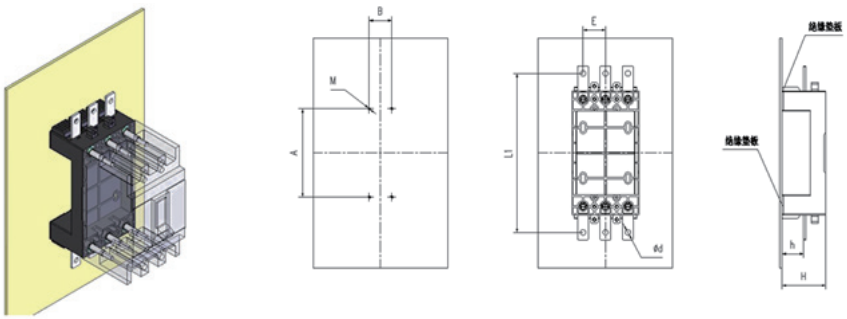


Installation schematic diagram

Typical product model	Breaker model	A	B	E
MZ3-100	NDM3-125	65	60	30
MZ3-225	NDM3-250	74	70	35
MZ3-400	NDM3-400	140	96	48
MZ3-630	NDM3-630	140	116	58
MZ3-800	NDM3-800	143	140	70

Note: When the product is 4-pole, phase distance E is increased for size B.

Z3Q: Before-panel mounting

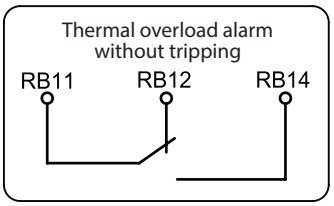


Installation schematic diagram

Typical product model	Breaker model	A	B	L1	E	d	M	H	h
MZ3-100	NDM3-125	110	30	198	30	6.5	M4	57	28
MZ3-225	NDM3-250	150	35	223	35	8.5	M4	74	32
MZ3-400	NDM3-400	244	48	326	48	10.5	M5	85	36
MZ3-630	NDM3-630	264	58	352	58	12.5	M6	120	64
MZ3-800	NDM3-800	283	70	363	70	12.5	M6	125	67

Warning: Insulation pad must be placed for before-panel mounting

6.9 Wiring Method for Overload Alarm Without Tripping



RB11: COM terminal
RB12: NC terminal
RB14: NO terminal

Please conduct the connection of the output terminal signals in strict accordance with the icon of thermal overload alarm without tripping on the side of circuit breaker; any losses caused by false alarm or no alarm due to incorrect wiring method are not the responsibility of the manufacturer.

6.10 Selection of Cross-sectional Areas of Connecting Busbars and Cables

● Selection of busbars

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

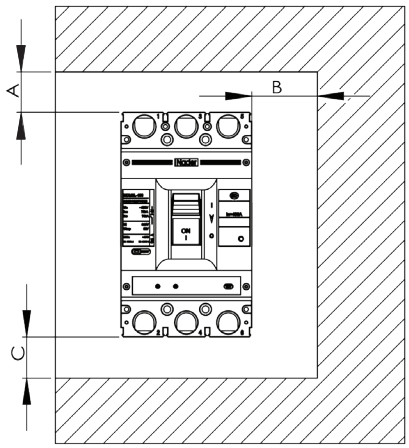
● Selection of cable

Rated current (A)	Cross-sectional areas of cables		Copper busbar size	
	Quantity	Sectional area (mm^2)	Quantity	Dimension (mm^2)
500	2	150	2	30 × 5
630	2	185	2	40 × 5
700, 800	2	240	2	50 × 5

Note①： Connect to the circuit breaker, and select the appropriate wiring method according to Outline Dimension, Mounting Dimension and Wiring Method;
Note②: If copper bar is selected for connection, the copper bar cannot be directly connected to the circuit breaker body and extended busbar accessories are required.

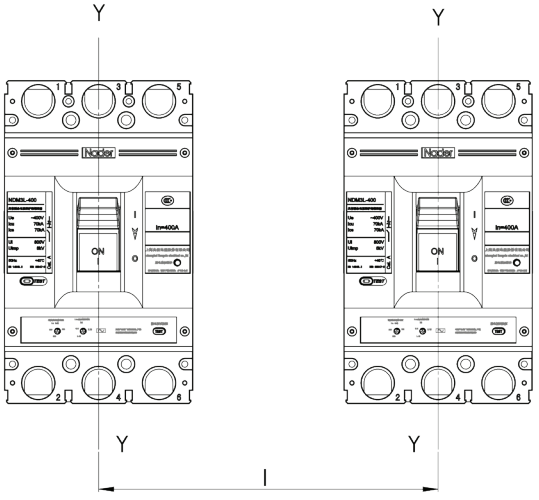
6.11 Safe Mounting Distance for Circuit Breaker

● Insulation distances for installation in a small metal cabinet (unit: mm)



Mounting distance	A (From incoming line end to cabinet surface)		B (Distance from the side to the cabinet)	C (From incoming line end to cabinet surface)
Specifications	With zero flashover cover	Without zero flashover cover		
NDM3-100	25	65	30	30
NDM3-125	25	65	30	30
NDM3-160	25	65	30	30
NDM3-250C	25	65	30	30
NDM3-250	25	65	30	30
NDM3-400	25	120	35	35
NDM3-630	25	120	35	35
NDM3-800	25	120	35	35

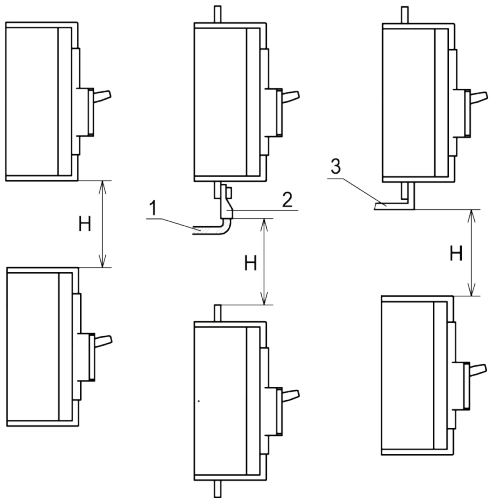
● Minimum center distance of row installation room of the circuit breakers



Specifications	Circuit breaker width (mm)		Center distance I (mm)	
	3 oles	4 poles	3 poles	4 poles
NDM3-100	75	/	105	/
NDM3-125	92	122	122	152
NDM3-160	92	122	122	152
NDM3-250C	105	/	140	/
NDM3-250	107	142	137	172
NDM3-400	150	198	190	238
NDM3-630	182	240	222	280
NDM3-800	210	280	250	320

Note: For installation of circuit breakers in a row or stack, check the connection busbars or cables to ensure the air insulation distance will not be reduced.

Minimum distance between circuit breakers installed in stack



1: Bare cable connection
2: Cable insulation connection
3: Connection and no insulation

Specifications	H (distance between the bottom and top of circuit breaker)	
	With zero flashover cover	Without zero flashover cover
NDM3-100	90	90
NDM3-125	90	91
NDM3-160	90	91
NDM3-250C	90	93
NDM3-250	90	93
NDM3-400	155	155
NDM3-630	155	155
NDM3-800	155	155

Note: Check whether the zero flashover cover or the interphase barrier is installed in place before energizing.

7. Usage and Maintenance

- The characteristics of circuit breaker and accessories are set by the manufacturer; only the trained or certified professional personnel can adjust, install and maintain the circuit breaker, tripping unit and other accessories referring to the circuit design parameters;
- Ensure the power is in the inactive state before installation and removal of any device.
- The handle of circuit breaker can be located at three positions respectively representing the three conditions of closing, disconnection and free tripping. When the handle is at the free tripping position, the handle should be pulled in the disconnection direction. At this time, the circuit breaker could re-buckle and then the switch could be closed.
- Please observe the conditions for storage and use; if the product is damaged or cannot be normally used due to quality problem within 36 months from the date of delivery by the manufacturer, the manufacturer is responsible for free repair or replacement.

8. Ordering Instructions

- Please specify the models, specifications and ordering quantity of circuit breakers; when under-voltage tripper, shunt tripper or electrically operated mechanism are used, please indicate the voltage values of operating voltage and control power.
- For example: NDM3-125L with under-voltage protection, single auxiliary contact, and behind-panel wiring Rated current of 80A and control power voltage of AC220 10 sets.

NDM3L
Moulded Case Residual Current Action Protector

Edition 2016

Nader 良信电器

1. Product Overview

				
Model	NDM3L-125	NDM3L-250	NDM3L-400	NDM3L-630
Rated operating current In (A)	16、20、25、32、40、50、63、80、100、125	100、125、140、160、180、200、225、250	225、250、315、350、400	400、500、630
Number of poles	3、4	3、4	3、4	3、4
Ue	400			
Rated ultimate short-circuit breaking capacity Icu (kA)	70	70	70	70
Rated running short-circuit breaking capacity Ics (Ics)	50	50	70	70
Rated residual operating current I△n (mA)	100/300/500（mA）		300/500/1000（mA）	300/500/1000（mA）
	100/300/500（mA）		300/500/1000（mA）	300/500/1000（mA）
N-pole type of four-pole product	4A、4B、4C			
Certification	CCC			

2. Product Features

Scope of application and purpose

NDM3L series moulded case residual current action protectors (hereinafter referred to as protectors) are applicable to work in the AC circuits with AC frequency of 50Hz, rated operating voltage of up to AC415V, and rated current of up to 630A for infrequent conversion and infrequent start of motor. The protectors provide overload, short circuit and under-voltage protection functions, which can protect the circuit and power supply device from damage. And it can also deal with personal safety, fire and other hazards due to long-term ground fault that cannot be detected by the overcurrent protection function.

Structural features

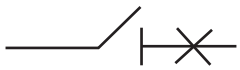
- Boxed accessories may be used for rapid installation of protectors, and timely respond to the user requirements without any adjustments.
- Three phases are sampled from the operating power of residual current protection module of protector; if any phase is missing, the residual current protection module can still work properly.
- Adjustable at the site: Three-level residual current, three-level delay time, and the user may make adjustments according to the site requirements.
- Leakage tripper indication: After the product leakage tripping, the leakage tripping indication button will pop up.
- Superior operating performance in case of operating voltage fault:
- When the phase voltage drops to 50V, it can still reliably provide residual current protection function.

Meeting the following standards

- GB 14048.1 Low-voltage switchgear and controlgear - Part 1:General rules
- GB 14048.2 Low-voltage switchgear and controlgear - Part 2:Circuit breakers
- IEC 60947-1 Low-voltage switchgear and controlgear-Part 1: General rules
- IEC 60947-2 Low-voltage switchgear and controlgear-Part 2: Circuit-breakers

3. Application Scope

3.1 Electrical Symbols

The circuit breaker provides isolation function, whose corresponding symbol is: 

3.2 Applicable Environment

● Temperature of the working environment

-35℃ ~ +70℃, the average value in 24h is not more than +35℃. At +40℃ and above, the user needs to run with less load. For derating factors, see “NDM3L MCCB derating factor table”.

● Storage temperature:

-40℃ ~ +75℃

● Altitude

The altitude of installation site is ≤2000m, and the derating factors under varied altitudes are shown in “Table of derating factors of NDM3L moulded case circuit breaker under varied altitudes”;

● Relative humidity for operation/Relative humidity for storage

At the ambient temperature of +40℃, the relative humidity shall not be more than 50%; for a lower temperature, the humidity may be higher, for example: The relative humidity could be up to 90% at 20℃. Appropriate measures should be taken against frost due to temperature variation.

● Pollution grad

Grade 3.

● Installation category

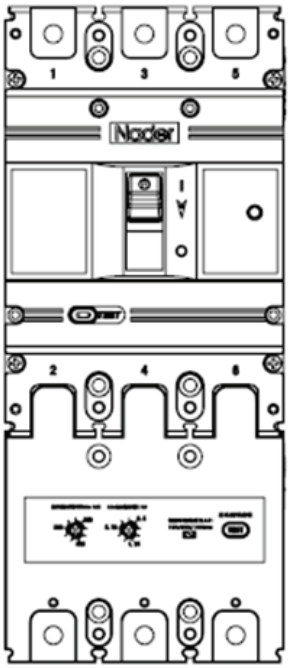
- ◆ Mounting categories of circuit breaker connecting to the main circuit:Category III (power distribution and control level).
- ◆ Mounting categories of circuit breaker not connecting to the main circuit:Class Ⅱ (load level) .

● Installation environment

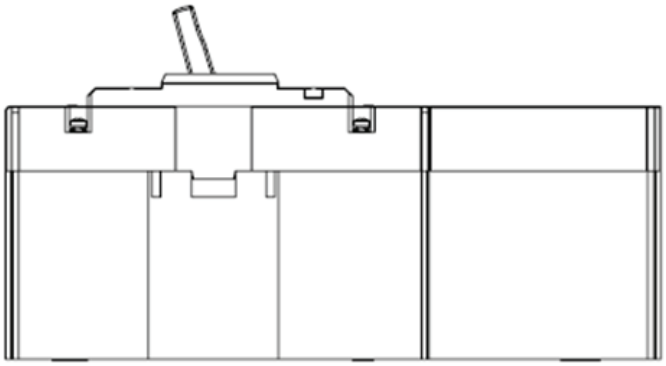
The product shall be installed in a medium without explosive danger, and the medium is not enough to corrode metal and damage the place where the insulating gas and conducting gas are located, so as to avoid any use in a rainy or snowy place.

Installation directio

- Vertical mounting, the gradient between the mounting plane and the vertical plane should be ≤ ± 22.5 ° .
- Horizontal mounting.



Vertical installation



Horizontal installation

3.3 NDM3L Breaker Power Loss

Model	Current (A)	Total power loss (W)
		Before-panel/behind-panel wiring
NDM3L-125 direct heating type (16-25A)	25	40
NDM3L-125 intermittent heating type (32-125A)	125	39
NDM3L-250	250	67
NDM3L-400	400	115
NDM3L-630	630	187

4. Technical Characteristics of the Product

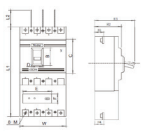
4.1 Description of Specifications and Models

ND	M	3	L	-	□	□	/	□	/	□	□	□	□	□	-	□	□
1	2	3	4		5	6		7		8	9	10	11	12		13	14

Serial No.	Serial No. name	NDM3L
1	Enterprise code	ND: Nader brand low-voltage apparatus
2	Product code	M: Plastic shell
3	Design serial No.	3
4	Derived code	L: Leakage protection
5	Frame grade	See Table 1
6	Operation mode	No code: Direct operation by handle
		P: Electrically operated
		Z: Turning handle
7	Categories of operating characteristics when residual current contains a DC component	No code: AC type residual current protector
		A: A type residual current protector
8	Number of poles	3, 4
9	Tripper code	0: Without tripper
		2: Instantaneous tripper only
		3: Complex tripper
10	Accessory code	See Table 2
11	Usage code	No code: Power distribution type
		2: Motor protection type
12	N-pole (neutral pole) type of four-pole product	Type A: N pole is not be equipped with over-current tripper, and shall be always connected
		Type B: N pole is equipped with over-current tripper, and is switched on or off together with other three poles
		Type C: N pole is equipped with over-current tripper, and is switched on or off together with other three poles
13	Wiring mode	No code: Conventional product
		P: Extended busbar
14	Rated current In	Refer to Table 1 for details.

4.2 Technical Parameters

Table 1 Table of main performance parameters of circuit breaker

Model			NDM3L-125		NDM3L-250		NDM3L-400		NDM3L-630	
Frame grade Current Inm (A)			125		250		400		630	
Rated current In (A)			16、20、25、32、40、50、63、80、100、125		100、125、140、160、180、200、225、250		225、250、315、350、400		400、500、630	
Rated insulation voltage Ui (V)			1000		1000		1000		1000	
Rated impulse withstand voltage Uimp (V)			8000		8000		8000		8000	
Use class			A		A		A		A	
Number of poles			3	4	3	4	3	4	3	4
Rated ultimate short-circuit breaking capacity Icu (kA)	AC380/400V/415V		70	70	70	70	70	70	70	70
Rated running short-circuit breaking capacity Ics (kA)	AC380/400V/415V		50	50	50	50	70	70	70	70
Rated residual operating current I△n (mA)	Non-delay	AC type	30	30	30	30	300/500/1000		300/500/1000	
			100/300/500	100/300/500	100/300/500	100/300/500				
		A type		30/100/300/500/1000		30/100/300/500/1000				
	Delay	AC type	100/300/500	100/300/500	100/300/500	100/300/500	300/500/1000		300/500/1000	
		A type		100/300/500/1000		100/300/500/1000				
Rated residual non-operating current I△no (mA)			1/2 $I_{\triangle n}$		1/2 $I_{\triangle n}$		1/2 $I_{\triangle n}$		1/2 $I_{\triangle n}$	
Rated residual short-circuit connecting capacity I△m (kA)			1/4 Icu		1/4 Icu		1/4 Icu		1/4 Icu	
Operating performance	Electrical life		8000		8000		7500		7500	
	Mechanical life		20000		20000		10000		10000	
Outline dimension 	L1		225	225	225	225	257	257	280	280
	L2		50	50	65	65	108	108	108	108
	W		92	122	107	142	150	198	210	280
	H2		87	87	105.5	105.5	104.5	104.5	112	112
Flashover distance (mm)			≤50		≤50		≤50		≤100	
Wiring mode			Conventional、P		Conventional、P		Conventional、P		Conventional、P	
Operating characteristics when the residual current contains a DC component (AC type, A type)			AC	AC、A	AC	AC、A	AC		AC	

● Table of derating factors of NDM3L series residual current protection moulded case circuit breaker under varied temperatures

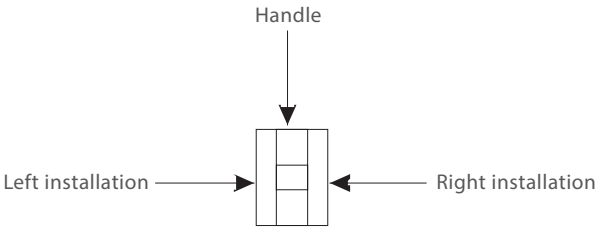
Serial No.	Frame grade Rated current (A)	Derating factors corresponding to temperatures						
		40℃	45℃	50℃	55℃	60℃	65℃	70℃
1	125	1	0.977	0.954	0.931	0.907	0.883	0.858
2	250	1	0.982	0.963	0.944	0.924	0.904	0.882
3	400	1	0.981	0.962	0.942	0.922	0.901	0.879
4	630	1	0.979	0.958	0.937	0.915	0.893	0.871

Note: When the ambient temperature is below 40℃, the product can be used normally, with no derating capacity.

● Table of derating factors of NDM3L series residual current protection moulded case circuit breaker under varied altitudes

Altitude (m)	2000	2500	3000	3500	4000	4500	5000
Operating current correction factor	In	In	0.98In	0.97In	0.96In	0.95In	0.94In
Operating current correction factor	Ue	Ue	0.83Ue	0.77Ue	0.71Ue	0.67Ue	0.63Ue
Power frequency withstand voltage correction factor	U	U	0.89U	0.85U	0.80U	0.77U	0.73U

4.3 Accessory Code Comparison Table



Legend:

- Single auxiliary contact
- Double auxiliary contacts
- Alarm contact
- Shunt tripper
- Under-voltage tripper
- Auxiliary contact (Single accessory integrates auxiliary and alarm functions)

Table 2 Comparison table of tripping method accessory codes

Accessory code / Accessories Name / Installation location / Number of poles / Model	NDM3L-125		NDM3L-250		NDM3L-400		NDM3L-630	
	3	4	3	4	3	4	3	4
00 No	——		——		——		——	
10 Shunt tripper	●		●		●		●	
20 Double auxiliary contacts	◧		◧		◧		◧	
21 Single auxiliary contact	◧		◧		◧		◧	
30 Under-voltage tripper	○		○		○		○	
40 Shunt tripper, double auxiliary contacts	●	◧	●	◧	●	◧	●	◧
41 Shunt tripper, single auxiliary contact	●	◧	●	◧	●	◧	●	◧
60 Two groups of double auxiliary contacts	◧	◧	◧	◧	◧	◧	◧	◧
61 Two groups of single auxiliary contacts	◧	◧	◧	◧	◧	◧	◧	◧
62 Double auxiliary contacts, single auxiliary contact	◧	◧	◧	◧	◧	◧	◧	◧
70 Under-voltage tripper, double auxiliary contacts	○	◧	○	◧	○	◧	○	◧
71 Under-voltage tripper, single auxiliary contact	○	◧	○	◧	○	◧	○	◧
08 Alarm contact	□		□		□		□	
28 Double auxiliary contacts, alarm contact	□	◧	□	◧	□	◧	□	◧
58 Auxiliary alarm contact	◧		◧		◧		◧	
68 Double auxiliary contacts, auxiliary alarm contact	◧	◧	◧	◧	◧	◧	◧	◧

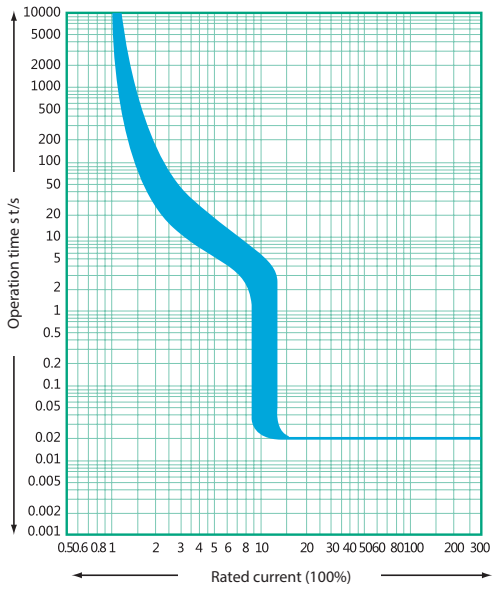
Note: NDM3L series 3P products can only be provided with left installed accessories with codes of: 10,20,21,30,08,58;

4.4 Product Tripping Curve

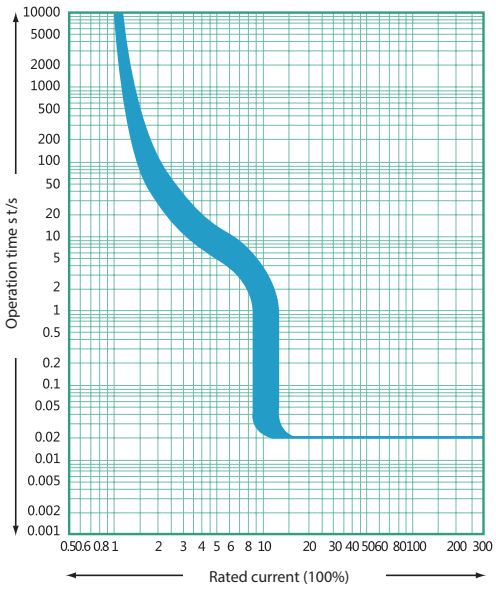
● Protection requirements for the products:

Tripper rated current (A)	Thermal tripper (ambient temperature is +40℃)		Operating current for the electromagnetic tripper (A)	Remarks
	1.05In (cold state) non-operating time (h)	1.3In (thermal state) operating time (h)		
16≤In≤63	1	1	10In × （1 ± 20%）	Power distribution type
63 < In≤630	2	2	10In × （1 ± 20%）	
16≤In≤630	1.0In (cold state) non-operating time (h)	1.2In (thermal state) operating time (h)	12In × （1 ± 20%）	Motor protection type
	2	2		

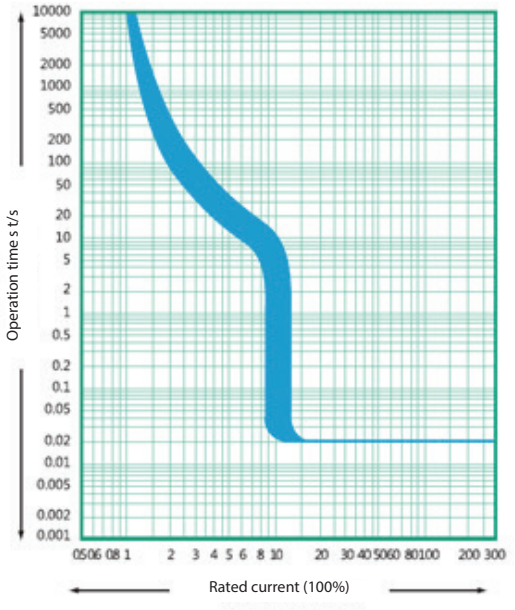
● NDM3L product short circuit overload protection characteristic curve



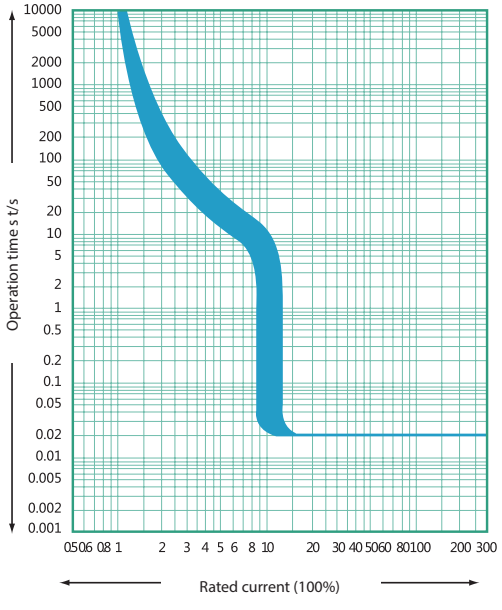
NDM3L-125 time/current characteristic curve



NDM3L-250 time/current characteristic curve

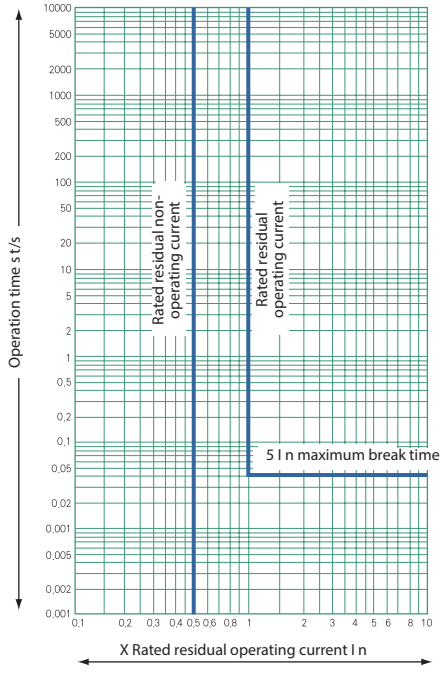


NDM3L-400 time/current characteristic curve

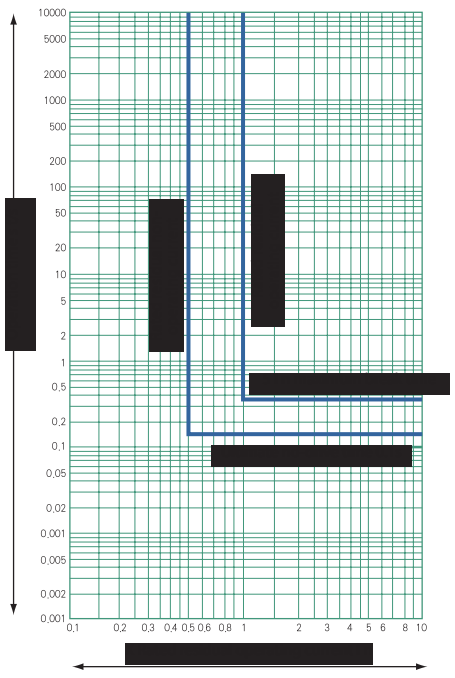


NDM3L-630 time/current characteristic curve

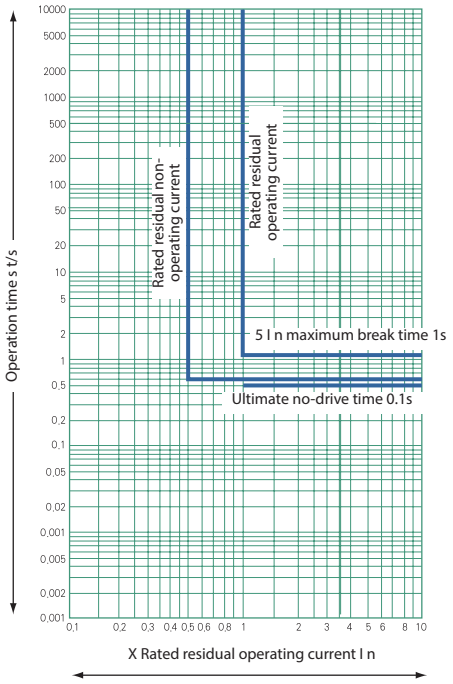
● NDM3L product short circuit overload protection characteristic curve



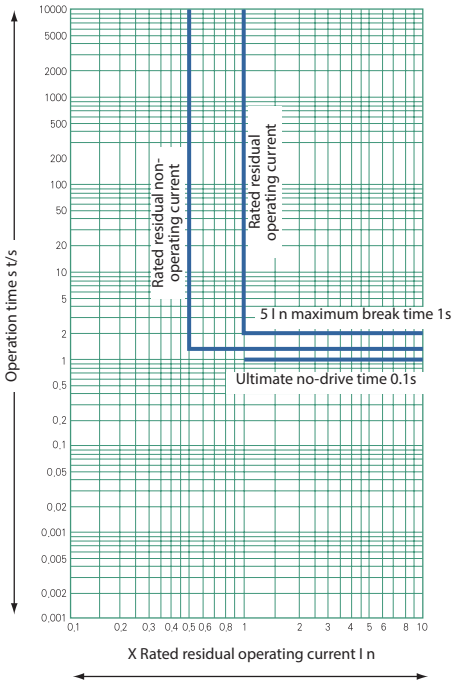
I Δ n = 0.1A, 0.3A, 0.5A, 1A, 3A, 10A, 30A non-delay residual current protection time/current characteristic curve



I Δ n = 0.1A, 0.3A, 0.5A, 1A, 3A, 10A, 30A delay residual current protection time/current characteristic curve



I Δ n = 0.1A, 0.3A, 0.5A, 1A, 3A, 10A, 30A delay residual current protection time/current characteristic curve



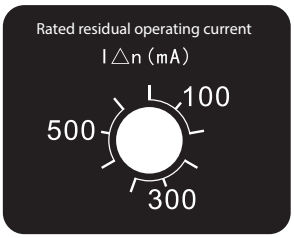
I Δ n = 0.1A, 0.3A, 0.5A, 1A, 3A, 10A, 30A delay residual current protection time/current characteristic curve

● Residual current operating time

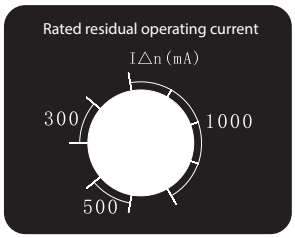
Residual current		I△n	2I△n	5I△n	10I△n
Non-delay	Maximum breaking time (s)	0.2	0.1	0.04	0.04
Delay	Maximum breaking time (s)	0.5/1.15/2.15	0.35/1/2	0.25/0.9/1.9	0.25/0.9/1.9
	Ultimate no-drive time △t(s)	-	0.1/0.5/1	-	-

● Residual current setting value setting rotary switches diagram

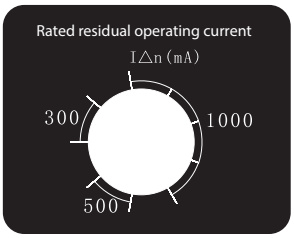
AC型

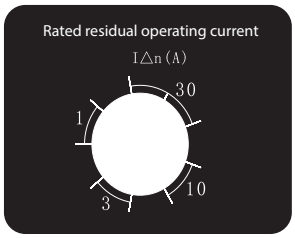


NDM3L-125/250



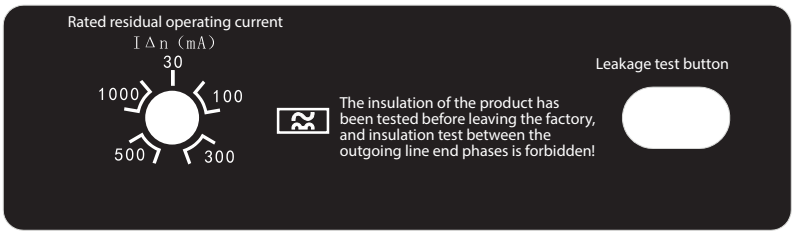
NDM3L-400





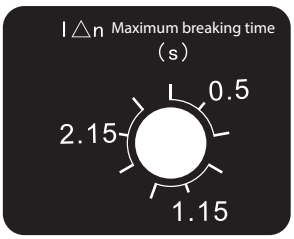
NDM3L-630

A型

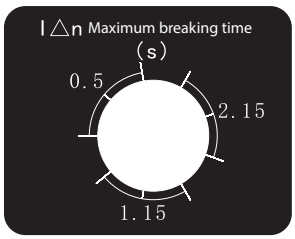


● Time delay type I△n maximum breaking time setting rotary switches diagram

AC型

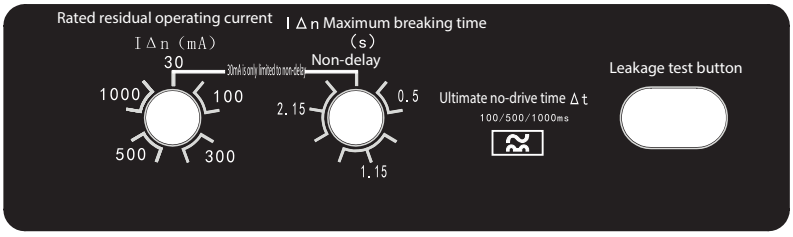


NDM3L-125/250



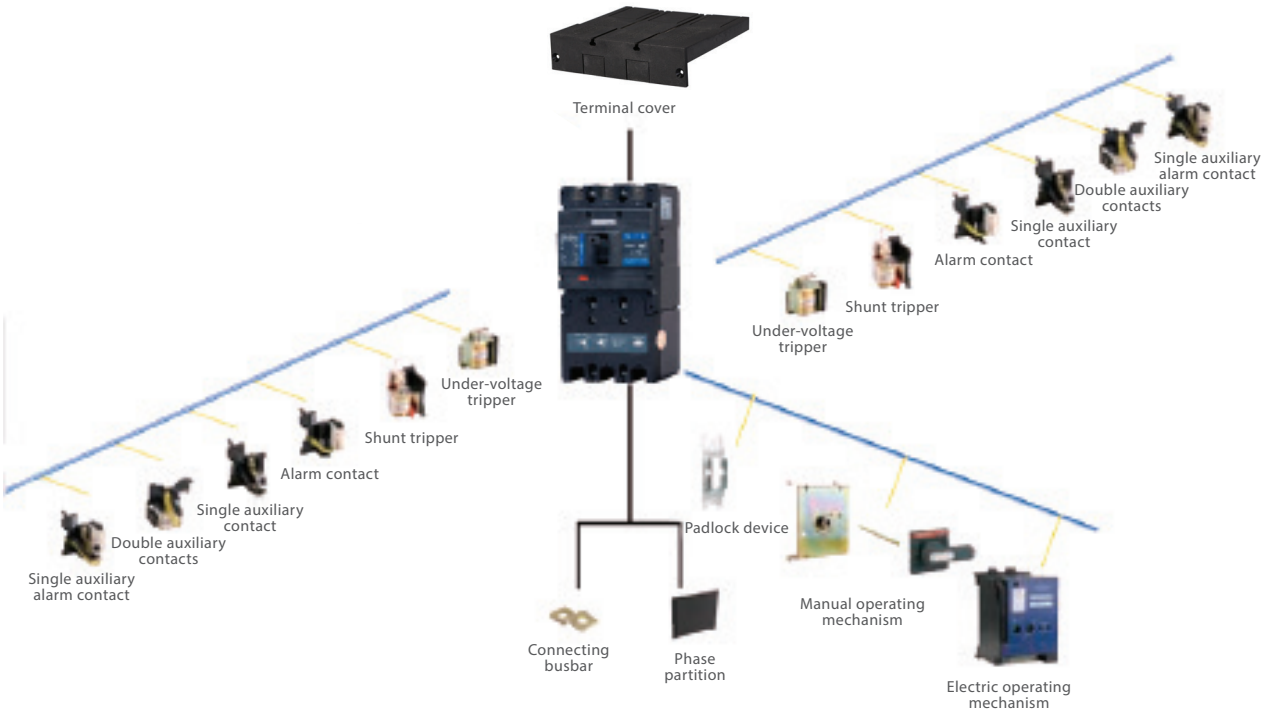
NDM3L-400/630

A型



5. Accessories

5.1 List of Accessories



5.2 Accessories Function Description

5.2.1 Auxiliary contact

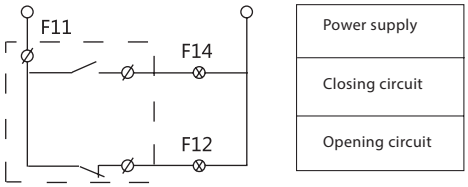
- Auxiliary contacts and combinations

The breaker is at the “opening” or “free tripping” position	Double auxiliary contacts	F14, F12 — F11; F24, F22 — F21
	Single auxiliary contact	F14, F12 — F11
The breaker is at the “closing” position	“Closing” switches to “opening”, “opening” switches to “closing”	

- Auxiliary contact Technical parameters

Frame grade Rated current	Conventional heating current	Rated operational current at AC 400V
125-630	3A	0.30A

Auxiliary contact wiring diagram



Electrical life of auxiliary contact

Use class	Switch on			Breaking			Frequency	Operation frequency (time(s)/hour)	Conduction time
	I/Ie	I/Ie	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

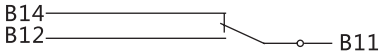
Connection and breaking capacity of auxiliary contact

Use class	Switch on			Breaking			Frequency	Operation frequency (time(s)/hour)	Conduction time
	I/Ie	I/Ie	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1	0.3	1	1	0.3	10	120	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

5.2.2 Alarm contact

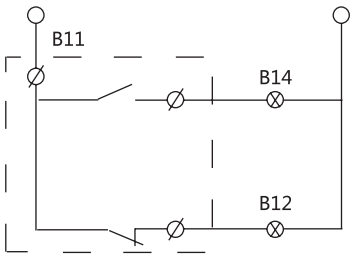
Alarm contacts and their combinations

Alarm contact Ue = 220V, Ith = 3A

When the circuit breaker is at the position of “opening” or “closing”	
The circuit breaker is at the “free tripping” position	

Alarm contact wiring diagram

In the case of proper closing or opening of circuit breaker, the contact does not operate; only after free tripping (or fault tripping) will the original state of contact be changed, which means normally open switches to closed and normally closed switches to open; after re-buckle of the circuit breaker, the contact is restored to the original position.

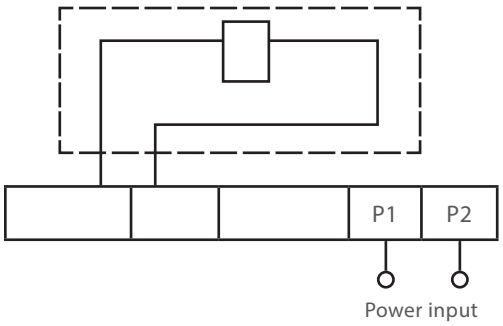


5.2.3 Under-voltage tripper

★ At 35%~70% of rated control power voltage, the under-voltage tripper should operate reliably to disconnect the circuit breaker.When it is less than 35% of the rated voltage, the circuit breaker should be reliably prevented from closing; when the power supply voltage is equal to or greater than 85% of rated voltage, it should be ensured that the circuit breaker is closed.

★ Control voltage: AC 50Hz 230V 400V

★ Note: The under-voltage tripper must be energized first in order to re-buckle and close the circuit breaker, otherwise it will damage the circuit breaker.



Under-voltage tripper wiring diagram

5.2.4 Shunt tripper

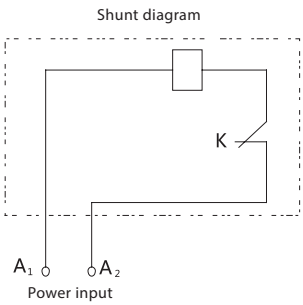
★ Generally installed at Phase A of circuit breaker; the shunt tripper should enable the circuit breaker to trip reliably at 70%~110% of rated control voltage under all operation conditions.

★ Control voltage : AC 50 Hz 230 V 400 V

DC 24V low power consumption, 24V, 220V

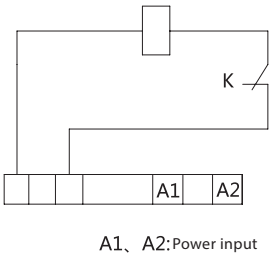
● Shunt tripper wiring diagram

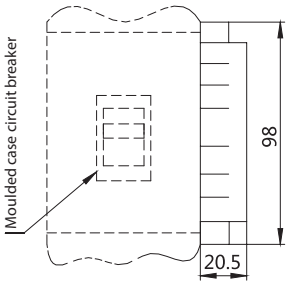
When the control circuit power supply is DC24V and the power is lower than 80W, it is possible to use low power shunt tripper or add intermediate relay.



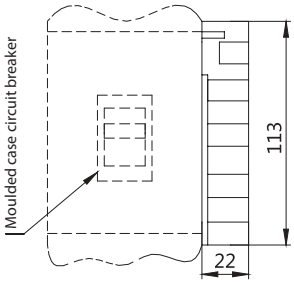
DC24V low power shunt tripper wiring diagram and outline dimension of external ceiling rose

he normal operating power of DV24V low power shunt tripper is as low as 15W, which substantially meet the requirements of all DC24V control circuits. The low power shunt has a plug-in junction box, whose outline dimension is shown below.



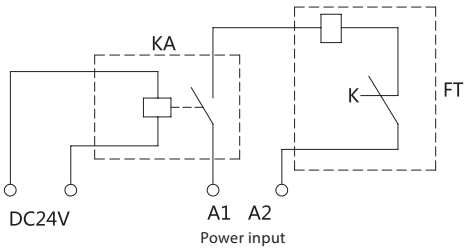


NDM3L-125~250



NDM3L-400~630

★DC24V control power wiring diagram



KA： DC24V relay with electric shock capacity of 1A

FT： AC220V/380V Shunt tripper

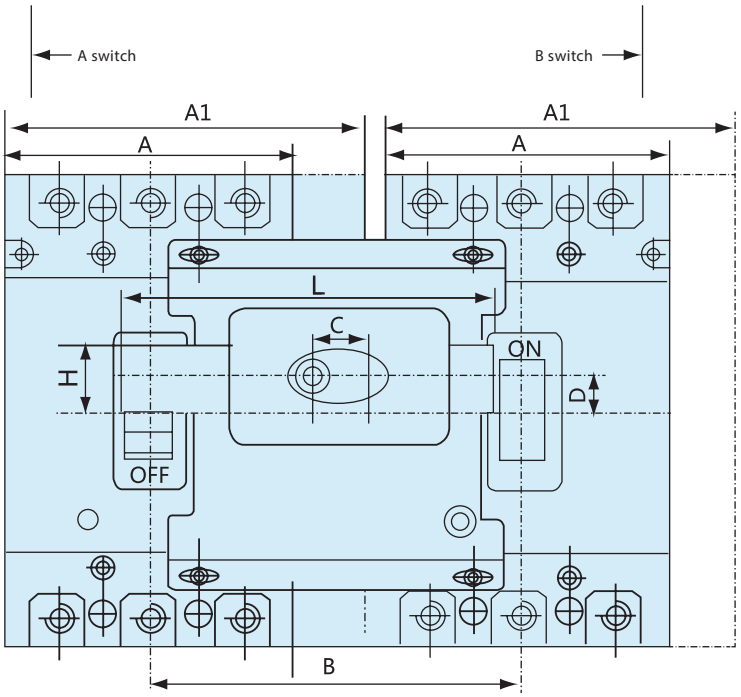
The rated voltage of FT is the power input voltage of A1 and A2

Instantaneous current and power consumption of shunt tripper

Product models	Instantaneous current value (A)				Power consumption (W)				
	AC 400V	AC 230V	DC220V	DC 24V	AC 400V	AC 230V	DC 220V	DC 24V	DC 24V (Low power consumption)
NDM3L-125	0.288	0.425	0.341	4	96.8	73	90.7	91.2	15
NDM3L-250	0.313	0.412	0.341	3.87	112	68.8	90.7	85.3	15
NDM3L-400	0.197	0.325	0.4	3.87	67	62.3	94.4	100	15
NDM3L-630	0.199	0.314	0.4	3.87	68	58.2	94.4	100	15

5.3 Functions and Sizes of NDM3L External Accessories

5.3.1 Mechanical interlock



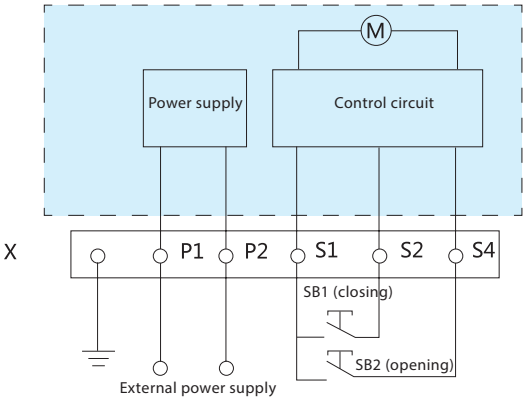
Mechanical interlocking and related dimensions

Product models	A	A1	B	C	D	L	H	Remarks
NDM3L-125	92		120	50	11.5	118	22	
NDM3L-250	107		135	50	14	135	22	
NDM3L-400	150		180	60	18	175	30	
NDM3L-630	182		235	60	16	198	28	
NDM3L-125/4P		122	152	50	11.5	150	22	
NDM3L-250/4P		142	173	50	9	168	22	
NDM3L-400/4P		198	230	60	16	188	28	
NDM3L-630/4P		240	295	60	12	240	30	

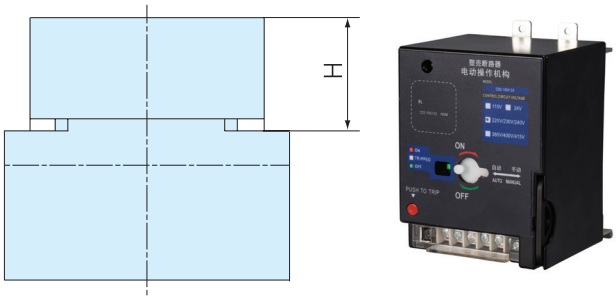
5.3.2 Electric operating mechanism

● CD2 electric operating mechanism (equipped with NDM3L-125~630 series)

◆ Wiring diagram (The circuit breaker external accessory wiring diagram is in the dotted box)



◆ CD2 Electric operating mechanism



Symbol instruction
SB1, SB2: Operating button (prepared by users)
X： Terminal block
P1、P2： External power supply

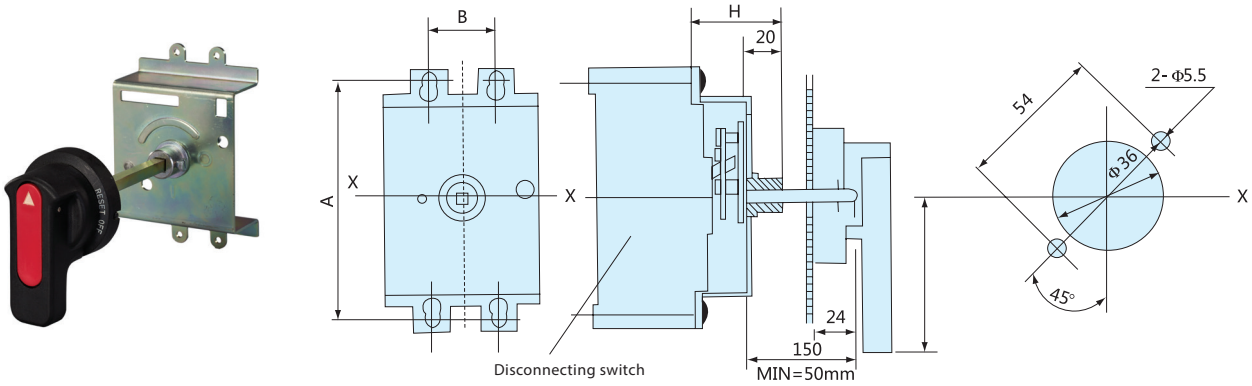
◆ Voltage specification:
AC 50Hz 110V、230V、400V
DC 24V、110V、220V

● Technical parameters of CD2 motor operating mechanism

Equipped with circuit breaker	Operating current (A)	Electric power (W)	Life/times	Operating mechanism height H (mm)
NDM3L-125	≤0.5	14	20000	89.5
NDM3L-250	≤0.5	14	20000	92
NDM3L-400	≤2	35	10000	149
NDM3L-630	≤2	35	10000	147

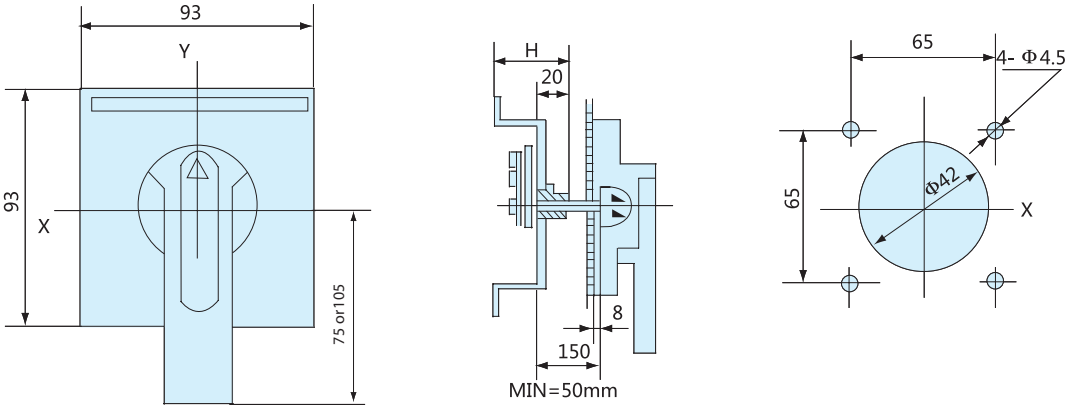
5.3.3 Manual operating mechanism

- CS1-A type handle mounting opening diagram

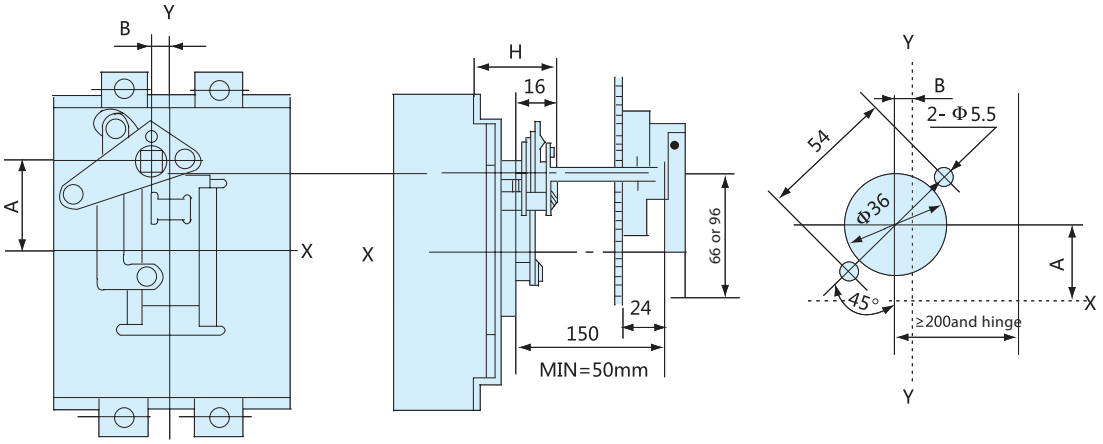


Note: A type is a round handle F type is a square handle

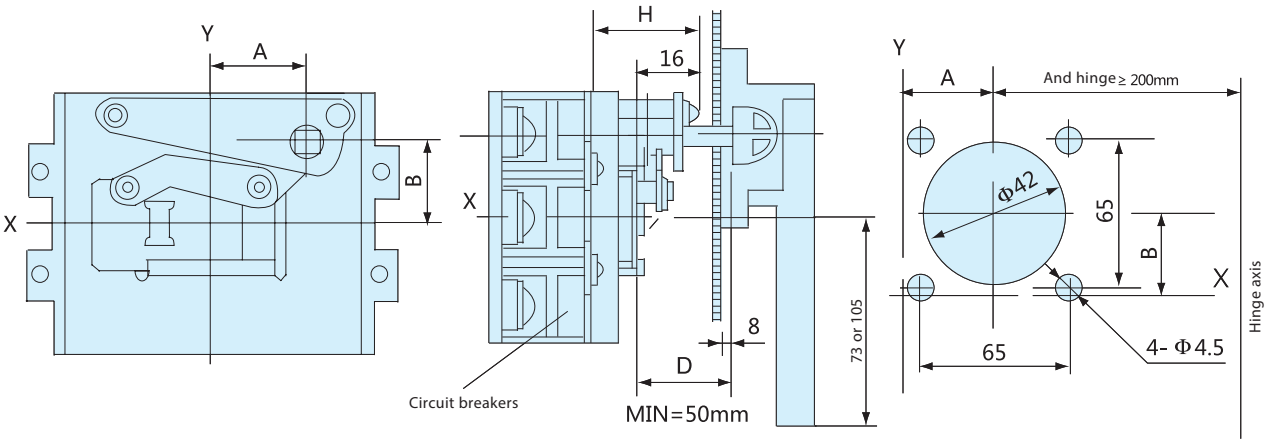
- CS1-F type handle mounting opening diagram



- CS2-A type handle mounting opening diagram



CS2-F type handle mounting opening diagram

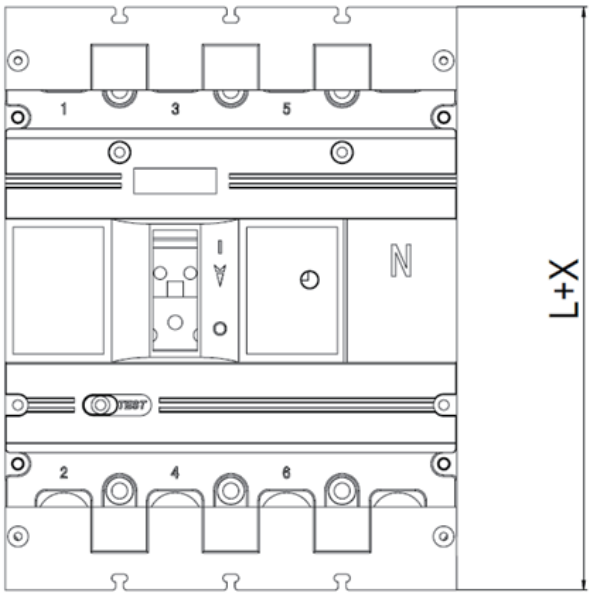


Mounting method and outline dimension of manual operating mechanism

External accessories	External accessory model	Equipped with circuit breaker	Manual installation dimensions: (mm)				Installation mode
			H	A	B		
					3P	4P	
Manual operating mechanism	CS1-100	NDM3L-125	54	104	30		Vertical mounting
	CS1-225	NDM3L-250	55	143	35		
	CS1-400(NDM3)	NDM3L-400	82	194	137	185	
	CS1-630(NDM3)	NDM3L-630	82	200	198	268	
	CS2-100	NDM3L-125	46	35	11.5		
	CS2-225	NDM3L-250	48	35	31		
	CS2-400(NDM3)	NDM3L-400	61	65	15		
	CS2-630(NDM3)	NDM3L-630	66	48	15		

Note: In the figure, size D is 150mm by default, and can be customized according to the customer requirements.

5.4 Terminal Cover



The terminal covers are mounted on both sides of the product to provide zero flashover function for the product, whose heights and widths are consistent with the product and lengths are shown in the following table.

Product series	Model	Body length L	Increased length of terminal cover X	Length after addition of terminal cover Lx
NDM3L	NDM3L-125	150	12	162
	NDM3L-250	165	19	184
	NDM3L-400	257	19	276
	NDM3L-630	270	19	289

6. Product Outline Dimension

6.1 Product Dimension Figure

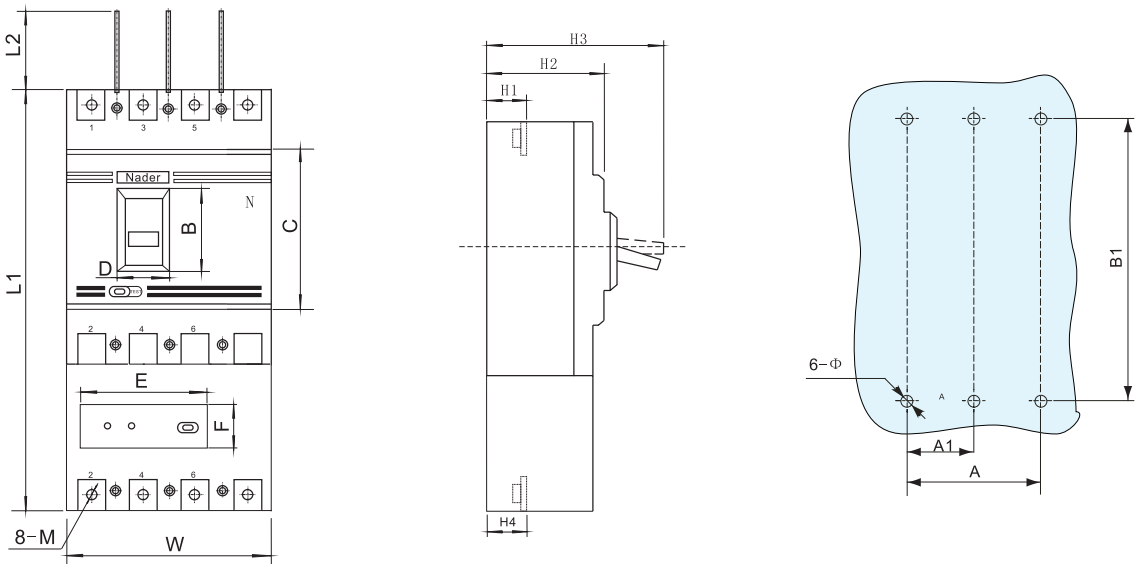


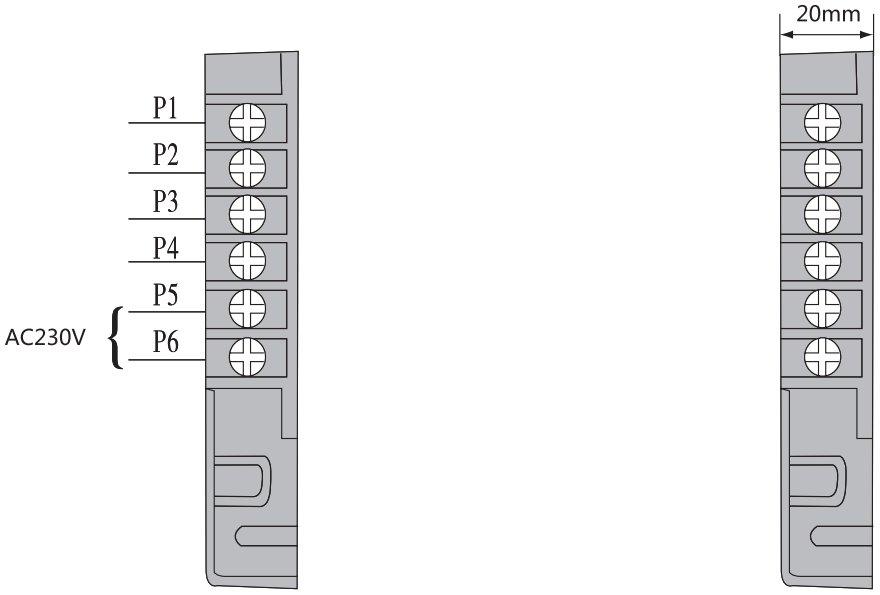
Table 4 Outline dimension and installation dimension

Model	Outline dimension												
	L1	W		L2	M	H1	H2	H3	H4	A	B1	Φ	A1
		3P	4P										
NDM3L-125	225	92	122	50	8	24	87	118	-	60	204	4.5	30
NDM3L-250	252	107	142	65	8	24	105.5	139.5	-	70	213	4.5	35
NDM3L-400	257	150	198	108	10	38	104.5	149.5	-	94	194	6.5	47
NDM3L-630	280	210	280	108	12	40	112	159	44	140	243	7	70

Table 5 Cover outline dimension

Model	B	C	D	E	F
NDM3L-125	45	87.5	34	78	23
NDM3L-250	45	102	40	92.5	25
NDM3L-400	105	174	70	124	21
NDM3L-630	105	204	84	182	22

6.2 Alarm Non-tripping Module Wiring Diagram



Note:
P1 and P2 are normally closed contact terminals
P3 and P4 are normally opened contact terminals
P5 and P6 are AC230V power supply terminals

6.3 Selection of Cross-sectional Areas of Connecting Busbars and Cables

● Selection of busbars

Rated current (A)	16 20	25	32	40 50	63	80	100	125 140	160	180 200 225	250	315 350	400
Cross-sectional area of conductor (mm^2)	2.5	4.0	6.0	10	16	25	35	50	70	95	120	185	240

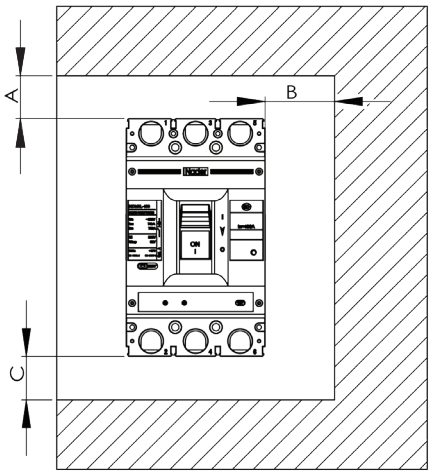
● Selection of cable

Rated current (A)	Cross-sectional areas of cables		Copper busbar size	
	Quantity	Sectional area (mm^2)	Quantity	Dimension (mm^2)
500	2	150	2	30 × 5
630	2	185	2	40 × 5

Note 1: Connect to the circuit breaker, and select the appropriate wiring method according to Outline Dimension, Mounting Dimension and Wiring Method;
Note 2: If copper bar is selected for connection, the copper bar cannot be directly connected to the circuit breaker body and extended busbar accessories are required.

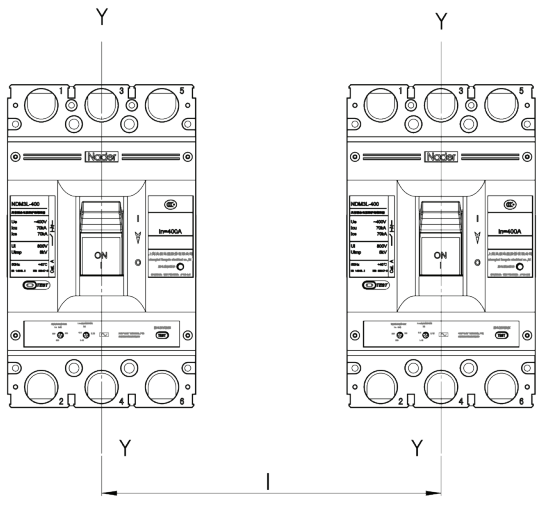
6.4 Safe Mounting Distance of Circuit Breaker

Insulation distances for installation in a small metal cabinet (unit: mm)



Mounting distance	A (From incoming line end to cabinet surface)		B (Distance from the side to the cabinet)	C (From incoming line end to cabinet surface)
Specifications	With zero flashover cover	Without zero flashover cover		
NDM3L-125	25	65	30	30
NDM3L-250	25	65	30	30
NDM3L-400	25	120	35	35
NDM3L-630	25	120	35	35

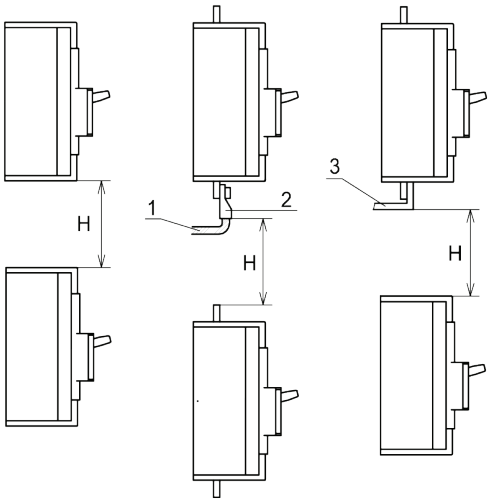
Minimum center distance of row installation room of the circuit breakers



Specifications	Circuit breaker width (mm)		Center distance I (mm)	
	3 poles	4 poles	3 poles	4 poles
NDM3L-125	92	122	122	152
NDM3L-250	107	142	137	172
NDM3L-400	150	198	190	238
NDM3L-630	210	280	250	320

Note: For installation of circuit breakers in a row or stack, check the connection busbars or cables to ensure the air insulation distance will not be reduced.

Minimum distance between circuit breakers installed in stack



1: Bare cable connection
2: Cable insulation connection
3: Connection and no insulation

Specifications	H (distance between the bottom and top of circuit breaker)	
	With zero flashover cover	Without zero flashover cover
NDM3L-125	90	91
NDM3L-250	90	93
NDM3L-400	155	155
NDM3L-630	155	155

Note: Check whether the zero flashover cover or the interphase barrier is installed in place before energizing.

7. Usage and Maintenance

- The characteristics of circuit breaker and accessories are set by the manufacturer; only the trained or certified professional personnel can adjust, install and maintain the circuit breaker, tripping unit and other accessories referring to the circuit design parameters;
- Ensure the power is in the inactive state before installation and removal of any device.
- The handle of circuit breaker can be located at three positions respectively representing the three conditions of closing, disconnection and free tripping. When the handle is at the free tripping position, the handle should be pulled in the disconnection direction. At this time, the circuit breaker could re-buckle and then the switch could be closed.
- Please observe the conditions for storage and use; if the product is damaged or cannot be normally used due to quality problem within 36 months from the date of delivery by the manufacturer, the manufacturer is responsible for free repair or replacement.

8. Ordering Instructions

- Please specify the models, specifications and ordering quantity of circuit breakers; when under-voltage tripper, shunt tripper or electrically operated mechanism are used, please indicate the voltage values of operating voltage and control power.
- For example: NDM3L-125/4300B time delay type, rated current of 80A plus 10 sets of coupling bars.

Model and specification	Rated current	Operating current selection			Actuation time selection			Alarm selection			Categories of operating characteristics when residual current contains a DC component	Quantity of order
NDM3L -125		Non-adjustable		☐	Non-delay	≤ 0.2	☐	No alarm		☐	☐ AC type ☐ A type	
		Adjustable	100/300/500	☐	Delay	0.5/1.15/2.15	☐	Alarm	No tripping	☐		
									Tripping	☐		
NDM3L -250		Non-adjustable		☐	Non-delay	≤ 0.2	☐	No alarm		☐	☐AC type ☐A type	
		Adjustable	100/300/500	☐	Delay	0.5/1.15/2.15	☐	Alarm	No tripping	☐		
									Tripping	☐		
NDM3L -400		Non-adjustable		☐	Non-delay	≤ 0.2	☐	No alarm		☐	/	
		Adjustable	300/500/1000	☐	Delay	0.5/1.15/2.15	☐	Alarm	No tripping	☐		
									Tripping	☐		
NDM3L -630		Non-adjustable		☐	Non-delay	≤ 0.2	☐	No alarm		☐	/	
		Adjustable	300/500/1000	☐	Delay	0.5/1.15/2.15	☐	Alarm	No tripping	☐		
			1/3/10/30(A)	☐			☐		Tripping	☐		

Note: Please fill in the rated current and number of orders, and tick "√" in ☐ for confirmation (if the operating current is not adjustable, please fill in the operating current and confirm it).

NDM3E
Electronic Moulded Case Circuit Breaker

Edition 2016

Nader 良信电器

1. Product Overview

									
Model	NDM3E-125			NDM3E-250			NDM3E-400		
Frame current Inm (A)	125			250			400		
Setting current Ir (A)	10、20、25、32、40、50、63、80、90、100、125			100、125、160、180、200、225、250			200、225、250、280、315、350、400		
Number of poles	3	3	4	3	3	4	3	3	4
Rated limit short-circuit breaking capacity level	M	H		M	H		M	H	
Rated ultimate short-circuit breaking capacity Icu (kA) 400V	50	85	50	50	85	50	65	100	65
Rated running short-circuit breaking capacity Ics (kA) 400V	35	50	35	35	50	35	42	65	42
N-pole type of four-pole product	4C、4D								
Certification	CCC、TUV、CE								

											
Model	NDM3E-630			NDM3E-800			NDM3E-1250		NDM3E-1600		
Frame current Inm (A)	630			800			1250		1600		
Setting current Ir (A)	280、315、350、400、450、500、550、600、630			400、450、500、550、600、630、700、750、800			800、850、900、950、1000、1050、1100、1150、1250		800、1000、1250、1600		
Number of poles	3	3	4	3	3	4	3		3	3	4
Rated limit short-circuit breaking capacity level	M	H		M	H		M	H	M	H	
Rated ultimate short-circuit breaking capacity Icu (kA) 400V	65	100	65	65	100	65	50	80	50	70	70
Rated running short-circuit breaking capacity Ics (kA) 400V	42	65	42	42	65	42	37.5	50	37.5	50	50
N-pole type of four-pole product	4C、4D						-		4C、4D		
Certification	CCC、TUV、CE										

2. Product Features

Scope of application and purpose

NDM3E series electronic moulded case circuit breakers (hereinafter referred to as breakers) are applicable to work in the AC circuits with AC frequency of 50/60Hz, rated operating voltage of up to AC690V, and rated current of up to 800A for infrequent conversion and infrequent start of motor . NDM3E circuit breaker may be optionally added with a module capable of communication. In this way, the original circuit breaker is easy to upgrade to a communication circuit breaker. It provides "four-remote" function, namely remote control, remote adjustment, telemetry, and telecommand. The circuit-breakers provide overload, short circuit and undervoltage protection, and can protect the circuit and power supply device from damage. The product is equipped with communication modules, grounding protection devices, etc. The product has been widely used in new energy, electric power, industrial control, real estate, electric power supply, telecommunications, rail transportation, industrial (public) construction and other industries.

Structural features

- The circuit breakers are divided into C type (basic), L type (standard), M type (higher breaking) and H type (high breaking type) by the rated limit short-circuit breaking capability. The circuit breakers feature small size, high breaking capability, short arcing, vibration resistance, etc.
- Boxed accessories may be used for rapid installation of circuit breaker, and timely respond to the user requirements without any adjustments.

Meeting the following standards

- GB14048.1-2012 Low-voltage switchgear and controlgear - Part 1:General rules
- GB14048.2-2008 Low-voltage switchgear and controlgear - Part 1:Low-voltage circuit breaker
- IEC 60947-1 Low-voltage switchgear and controlgear-Part 1： General rules
- IEC 60947-2 Low-voltage switchgear and controlgear-Part 2： Circuit-breakers

3. Application Scope

3.1 Electrical Symbols

The circuit breaker provides isolation function, whose corresponding symbol is: 

3.2 Applicable Environment

● Temperature of the working environment

-35℃ ~ +70℃, the average value in 24h is not more than +35℃. At +40℃ and above, the user needs to run with less load. For derating factors, see “NDM3E MCCB derating factor table”.

● Storage temperature

-40℃ ~ +75℃。

● Altitude

The altitude of installation site is ≤2000m, and the derating factors under varied altitudes are shown in "Table of derating factors of NDM3E electronic moulded case circuit breaker under varied altitudes”.

● Relative humidity for operation/Relative humidity for storage

At the ambient temperature of +40℃, the relative humidity shall not be more than 50%; for a lower temperature, the humidity may be higher, for example: The relative humidity could be up to 90% at 20℃. Appropriate measures should be taken against frost due to temperature variation.

● Pollution grade

Grade 3.

● Installation category

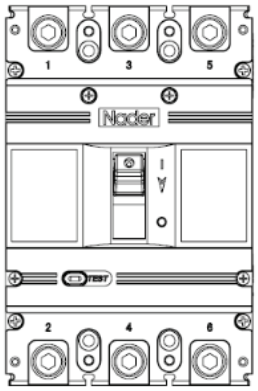
- ◆ Mounting categories of circuit breaker connecting to the main circuit:Category III (power distribution and control level).
- ◆ Mounting categories of circuit breaker not connecting to the main circuit:Class Ⅱ (load level) .

● Installation environment

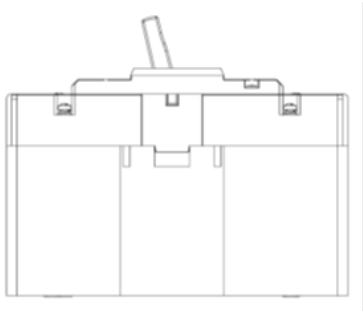
The product shall be installed in a medium without explosive danger, and the medium is not enough to corrode metal and damage the place where the insulating gas and conducting gas are located, so as to avoid any use in a rainy or snowy place.

Installation direction

- Vertical mounting, the gradient between the mounting plane and the vertical plane should be ≤ ± 22.5 °
- Horizontal mounting.



Vertical installation



Horizontal installation

3.3 Breaker Power Loss Table

Model	Current (A)	Total power loss (W)		
		Before-panel wiring	Behind-panel wiring	Plug-in type Wiring
NDM3E-125	125	35	35	40
NDM3E-250	250	62	62	70
NDM3E-400	400	115	115	125
NDM3E-630	630	190	190	210
NDM3E-800	800	262	262	294
NDM3E-1250	1250	270	No	No
NDM3E-1600	1600	280	No	No

4. Technical Characteristics of the Product

4.1 Description of Specifications and Models

ND	M	3	E-	□	□	□/□/□	□	□	□-	□	□
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Serial No.	Serial No. name	NDM3E
1	Enterprise code	ND: Nader brand low-voltage apparatus
2	Product code	M: Moulded case circuit breakers
3	Design serial No.	3
4	Derived code	E: Electronic type
5	Frame grade	See Table 1
6	Breaking capability level	Type M: Relevant high breaking type
		Type H: High breaking type
7	Operation mode	No code: Direct operation by handle
		P: Electrically operated
		Z: Turning handle
8	Derivatives of intelligent tripper Code	No code: Basic type
		G: Grounding protection type
		T: Communication type
		GT: Grounding protection communication type
9	Number of poles	3, 4
10	Accessory code	See Table 2
11	Usage code	No code: Power distribution type
		2: Motor protection type
12	N-pole of four-pole product (Neutral pole) type	Type C: N pole is equipped with over-current tripper, and is switched on or off together with other three poles
		Type D: Pole N is equipped with current tripper, and is always connected
13	Wiring form	No code: Conventional product
		P: Extended busbar
		Z1: Behind-panel wiring
		Z2Q: Plug-in type before-panel wiring
		Z2H: Plug-in type behind-panel wiring
		Z3Q: Plug-in before-panel wiring integrated type
		Z3H: Plug-in behind-panel wiring integrated type (Please specify the wiring scheme)
14	Setting current Ir	See Table 1

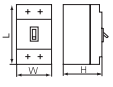
Note: NDM3E-1250 includes just basic type, and NDM3E-1600 include just basic type and grounding protection type

4.2 Technical Parameters

Table 1 Table of main performance parameters of circuit breaker

Model		NDM3E-125						NDM3E-250			NDM3E-400		
Frame grade Current Inm (A)		125						250			400		
Tripper rated current Ir(A)		10、20、25、32			40、50、63、80、90、100、125			100、125、140、160、180、200、225、250			200、225、250、280、315、350、400		
Rated insulation voltage Ui (V)		1000			1000			1000			1000		
Rated impulse withstand voltage Uimp (V)		8000			8000			8000			8000		
Power frequency withstand voltage U (1 minute) (V)		3000			3000			3000			3000		
Use class		A			A			A			B		
Short time withstand current Icw (kA/1s)		1			1			2.5			5		
Number of poles		3	3	4	3	3	4	3	3	4	3	3	4
Rated limit short-circuit breaking capacity level		M	H		M	H		M	H		M	H	
Rated ultimate short-circuit breaking capacity Icu (kA)	AC 380/400/415V	50	85	50	50	85	50	50	85	50	65	100	65
	AC 500V												
	AC 660/690V	20		20	20		20	20		20	20		20
Rated running short-circuit breaking capacity Ics (kA)	AC 380/400/415V	35	50	35	35	50	35	35	50	35	42	65	42
	AC 500V												
	AC 660/690V	15		15	15		15	15		15	15		15
Operating performance	Electrical life	8000			8000			8000			7500		
	Mechanical life	20000			20000			20000			10000		
Outline dimension	L	150	150	150	150	150	150	165	165	165	257	257	257
	W	92	92	122	92	92	122	107	107	142	150	150	198
	H	93	93	93	93	93	93	90	90	90	104.5	104.5	104.5
Flashover distance (mm)		≤50			≤50			≤50			≤100		
Wiring mode		Conventional、P、Z1、Z2Q、Z2H、Z3Q、Z3H						Conventional、P、Z1、Z2Q、Z2H、Z3Q、Z3H			Conventional、P、Z1、Z2Q、Z2H、Z3Q、Z3H		

Table 1 Main performance and technology parameters of circuit breaker (continued)

Model		NDM3E-630			NDM3E-800			NDM3E-1250		NDM3E-1600		
Frame grade Current Inm (A)		630			800			1250		1600		
Tripper rated current Ir(A)		280、315、350、400、450、500、550、600、630			400、450、500、550、600、630、700、750、800			800、850、900、950、1000、1050、1100、1150、1250、		800、1000、1250、1600		
Rated insulation voltage Ui (V)		1000			1000			1000		1000		
Rated impulse withstand voltage Uimp (V)		8000			8000			8000		8000		
Power frequency withstand voltage U (1 minute) (V)		3000			3000			3000		3000		
Use class		B			B			B		A		
Short time withstand current Icw (kA/1s)		8			10			15		/		
Number of poles		3	3	4	3	3	4	3	3	3	3	4
Rated limit short-circuit breaking capacity level		M	H		M	H		M	H	M	H	
Rated ultimate short-circuit breaking capacity Icu (kA)	AC 380/400/415V	65	100	65	65	100	65	50	80	50	70	70
	AC 500V										50	50
	AC 660/690V	20		20	20		20		20		20	20
Rated running short-circuit breaking capacity Ics (kA)	AC 380/400/415V	42	65	42	42	65	42	37.5	50	37.5	50	50
	AC 500V										50	50
	AC 660/690V	15		15	15		15		20		20	20
Operating performance	Electrical life	7500			7500			2000		2000		
	Mechanical life	10000			10000			10000		10000		
Outline dimension 	L	280	280	280	280	280	280	340	340	406	406	406
	W	210	210	280	210	210	280	210	210	210	210	280
	H	112	112	112	112	112	112	140.5	140.5	140	140	140
Flashover distance (mm)		≤100			≤100			≤100		≤100		
Wiring mode		Conventional、P、Z1、Z2Q、Z2H、Z3Q、Z3H			Conventional、P、Z1、Z2Q、Z2H、Z3Q、Z3H			Conventional、P		Conventional、P		

● Table of derating factors of NDM3E electronic moulded case circuit breaker

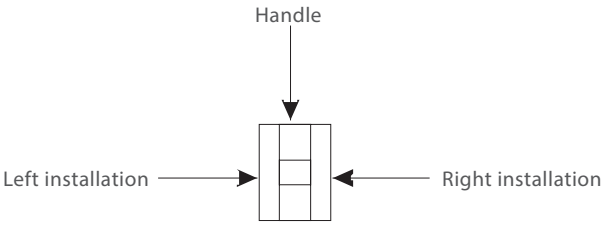
Serial No.	Frame grade Rated current (A)	Derating factors corresponding to temperatures						
		40℃	45℃	50℃	55℃	60℃	65℃	70℃
1	125	1	1	1	0.973	0.945	0.918	0.891
2	250	1	1	1	0.976	0.952	0.927	0.902
3	400	1	1	1	0.978	0.957	0.934	0.911
4	630	1	1	1	1	1	0.979	0.957
5	800	1	1	1	0.980	0.958	0.936	0.913
6	1250	1	1	1	0.976	0.952	0.928	0.903
7	1600	1	1	1	0.976	0.952	0.928	0.903

Note: When the ambient temperature is below 40℃, the product can be used normally, with no derating capacity.

● Table of derating factors of NDM3E electronic moulded case circuit breaker under varied altitudes

Altitude (m)	2000	2500	3000	3500	4000	4500	5000
Operating current correction factor	In	In	0.98In	0.97In	0.96In	0.95In	0.94In
Operating current correction factor	Ue	Ue	0.83Ue	0.77Ue	0.71Ue	0.67Ue	0.63Ue
Power frequency withstand voltage correction factor	U	U	0.89U	0.85U	0.80U	0.77U	0.73U

4.3 Accessory Code Comparison Table



Legend:

- Single auxiliary contact
- Double auxiliary contacts
- Alarm contact
- Shunt tripper
- Under-voltage tripper
- Auxiliary contact (Single accessory integrates auxiliary and alarm functions)

Table 2 Comparison table of tripping method accessory codes

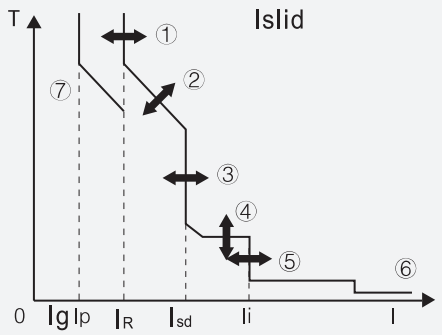
Accessory code	Accessories Name	NDM3E -125		NDM3E -250		NDM3E -400		NDM3E -630		NDM3E -800		NDM3E -1250	NDM3E -1600	
	Installation location / Model / Number of poles	3	4	3	4	3	4	3	4	3	4	3	3	4
300	No	—		—		—		—		—		—	—	
310	Shunt tripper	●		●			●		●		●	●	●	
320	Double auxiliary contacts	◧		◧		◧		◧		◧				◧
321	Single auxiliary contact	◧		◧		◧		◧		◧				◧
330	Under-voltage tripper	○		○		○		○		○		○	○	
340	Shunt tripper, double auxiliary contacts	—		●	◧	◧	●	◧	●	◧	●	●	●	◧
341	Shunt tripper, single auxiliary contact	●	◧	●	◧	◧	●	◧	●	◧	●	●	●	◧
350	Shunt tripper, under-voltage tripper	—		—		○	●	○	●	○	●	—	—	
360	Two groups of double auxiliary contacts	—		◧	◧	◧	◧	◧	◧	◧	◧	—	—	
361	Two groups of single auxiliary contacts	◧	◧	◧	◧	◧	◧	◧	◧	◧	◧	—	—	
362	Double auxiliary contacts, single auxiliary contact	—		◧	◧	◧	◧	◧	◧	◧	◧	—	—	
370	Under-voltage tripper, dual auxiliary contacts	—		○	◧	○	◧	○	◧	○	◧	○	○	◧
371	Under-voltage tripper, single auxiliary contact	○	◧	○	◧	○	◧	○	◧	○	◧	○	○	◧
308	Alarm contact	□		□		□		□		□		□	□	
318	Shunt tripper Alarm contact	—		—		□	●	□	●	□	●	●	●	
328	Double auxiliary contacts, alarm contact	□	◧	□	◧	□	◧	□	◧	□	◧	□	□	
338	Under-voltage tripper, alarm contact	—		—		○	□	—		—		○	○	□
348	Shunt tripper, auxiliary contact	—		—		◧	●	◧	●	◧	●	●	●	◧
358	Auxiliary alarm contact	◧		◧		◧		◧		◧				◧
368	Double auxiliary contacts, auxiliary alarm contact	—		◧	◧	◧	◧	◧	◧	◧	◧	—	—	
378	Under-voltage tripper, auxiliary alarm contact	—		—		○	◧	—		—		○	○	◧

Remarks: The first digit "3" in the code of tripper method indicates the intelligent controller with three-stage protection and the latter two digits indicate the code of internal accessory.

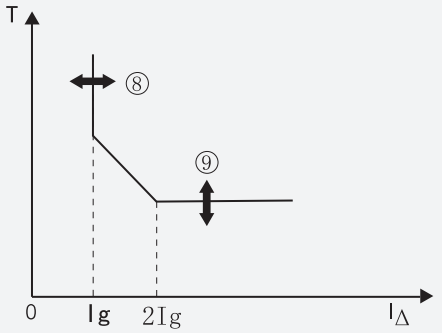
4.4 Intelligent Controller

4.4.1 Intelligent controller function and protection

● Intelligent controller



> ① Overload long-time delay operating current
> ② Long-time delay operating time
> ③ Short circuit short time delay operating current
> ④ Short time delay operating time
> ⑤ Instantaneous short-circuit operating current
> ⑥ Instantaneous override tripping current
> ⑦ Pre-alarm setting current



> ⑧ Grounding fault operating time
> ⑨ Grounding fault operating time

Protection

1- Overload long-time delay setting current IR may be adjusted at 10 levels according to the user needs.

2- Overload long-time delay setting time TR may be adjusted at 4 levels.

3 - Short circuit short time delay setting current Isd may be adjusted at 10 levels.

4 - Short circuit short time delay setting time Tsd may be adjusted at 4 levels.

5 - Instantaneous short-circuit setting current Ii may be adjusted at 10 levels.

6 - Pre-alarm setting current Ip may be adjusted at 4 levels.

7- Grounding fault protection setting current Ig may be adjusted at 8 levels.

8- Grounding fault protection setting time Tg may be adjusted at 4 levels.

9- Neutral pole setting current of four-pole circuit breaker IRN may be adjusted at 2 levels.

10- I△ is the sum of three-phase or four-phase current vectors.

Other functions

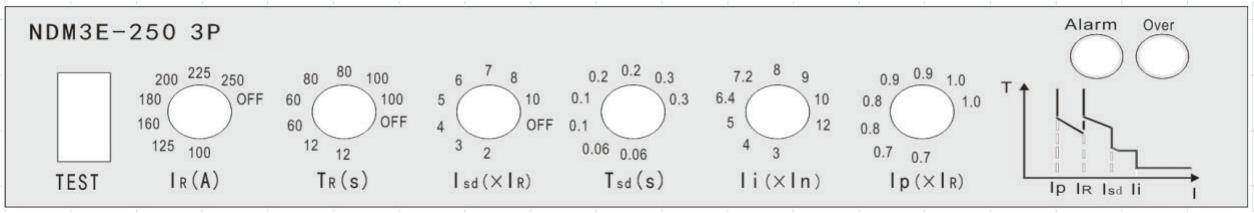
- The test port can be connected to NDM3E special tester to test and debug, and can also be connected to a PC to provide real-time test of current changes.
- During the pre-alarm indication, when the yellow light flashes, it indicates that the actual current exceeds the setting value Ip, and after a certain time, the flashing yellow light becomes constantly on.
- Overload indicator, when the red light is constantly on, it indicates that the actual current exceeds 1.15 times of the IR, it is at the overload state, and after a certain period of time, the circuit breaker will trip to open.
- Overload alarm without tripping function; when TR is adjusted to OFF position and the product is overloaded, overload signal is output, but the product is not tripped.

NDM3E controller classification

			Basic type		Grounding type		Communication type		Grounded communication type	
			3P	4P	3P	4P	3P	4P	3P	4P
1	Overload long-time delay setting current	I_R	(0.4-1.0)*In +OFF	(0.4-1.0)*In +OFF	(0.4-1.0)*In +OFF	(0.4-1.0)*In +OFF	(0.4-1.0)*In +OFF	(0.4-1.0)*In +OFF	(0.4-1.0)*In +OFF	(0.4-1.0)*In +OFF
	Overload long-time delay setting time	T_R	(12-150)*s +OFF	(12-150)*s +OFF	(12-150)*s +OFF	(12-150)*s +OFF	(12-150)*s +OFF	(12-150)*s +OFF	(12-150)*s +OFF	(12-150)*s +OFF
2	Short circuit short-time delay setting current	I_{sd}	(2-10)*I_R +OFF	(2-10)*I_R +OFF	(2-10)*I_R +OFF	(2-10)*I_R +OFF	(2-10)*I_R +OFF	(2-10)*I_R +OFF	(2-10)*I_R +OFF	(2-10)*I_R +OFF
	Short circuit short-time delay setting time	T_{sd}	(0.06-0.3)s	(0.06-0.3)s	Built-in fixed 0.3s	Built-in fixed 0.3s	(0.06-0.3)s	(0.06-0.3)s	(0.06-0.3)s	(0.06-0.3)s
3	Instantaneous short circuit setting current	I_i	(3-12)*In	(3-12)*In	(3-12)*In	(3-12)*In	(3-12)*In	(3-12)*In	(3-12)*In	(3-12)*In
	Instantaneous short circuit setting time	T_i	Built-in fixed (< 0.05s)	Built-in fixed (< 0.05s)	Built-in fixed (< 0.05s)	Built-in fixed (< 0.05s)	Built-in fixed (< 0.05s)	Built-in fixed (< 0.05s)	Built-in fixed (< 0.05s)	Built-in fixed (< 0.05s)
4	Pre-alarm setting current	I_P	(0.7-1.0)*I_R	Built-in adjustable, default 0.9*I_R	Built-in adjustable, default 0.9*I_R	Built-in adjustable, default 0.9*I_R	(0.7-1.0)*I_R	Built-in adjustable, default 0.9*I_R	(0.7-1.0)*I_R	(0.7-1.0)*I_R
5	Neutral line protection setting current	I_{RN}	—	(0.5-1.0)*I_R +OFF	—	Built-in fixed (1.0*I_R)	—	(0.5-1.0)*I_R +OFF	—	(0.5-1.0)*I_R +OFF
6	Grounding protection setting current	I_g	—	—	(0.2-1.0)* In +OFF	(0.2-1.0)* In +OFF	—	—	(0.2-1.0)* In +OFF	(0.2-1.0)* In +OFF
	Grounding protection setting time	T_g	—	—	(0.1-0.4)s	(0.1-0.4)s	—	—	(0.1-0.4)s	(0.1-0.4)s
Remarks			1. Built-in fixed :Not displayed on the controller panel, a handheld programmer cannot be used for modification; 2. Built-in adjustable : Not displayed on the controller panel, a handheld programmer can be used for modification; 3. Communication type : Not displayed on the control panel, only set through the communication module.							

4.4.2 Controller specifications

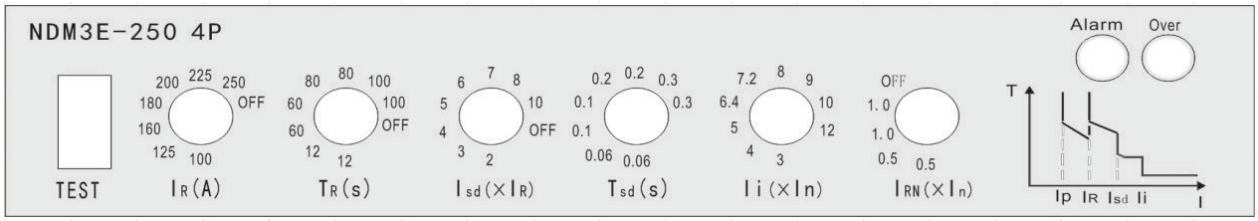
- NDM3E/3p basic typ



Controller parameter setting table (three-pole basic type)

Product specifications	Setting current and time parameters							
	I_n (A)	I_R (A)	T_R (s)	I_{sd} (*I_R)	T_{sd} (s)	I_i (*I_n)	T_i (s)	I_p (*I_R)
NDM3E-125/3P	32	16、20、25、32、OFF	12、60、80、100、OFF	2、3、4、5、6、7、8、10、OFF	0.06、0.1、0.2、0.3	3、4、5、6.3、7、8、9、10、12	< 0.05	0.7、0.8、0.9、1.0
	125	40、50、63、70、80、90、100、125、OFF						
NDM3E-250/3P	250	100、125、160、180、200、225、250、OFF				3、4、5、6.4、7.2、8、9、10、12		
NDM3E-400/3P	400	200、225、250、280、315、350、400、OFF	12、60、100、150、OFF			3、4、5、6、7、8、9、10、12、14		
NDM3E-630/3P	630	280、315、350、400、450、500、550、600、630、OFF						
NDM3E-800/3P	800	400、450、500、550、600、630、700、750、800、OFF						
NDM3E-1250/3P	1250	800、850、900、950、1000、1050、1100、1150、1250、OFF	12、60、150、OFF	2、3、4、5、6、7、8、10、OFF	0.06、0.1、0.2、0.3	3、4、5、6、7、8、9、10、12、OFF	< 0.05	0.7、0.75、0.8、0.85、0.9、0.95、1.0、OFF
NDM3E-1600/3P	1600	640、800、960、1000、1120、1280、1440、1600、OFF	12、60、100、150、OFF	2、3、4、5、6、7、8、10、OFF	0.06、0.1、0.2、0.3	3、4、5、6、7、8、9、10、12、14	< 0.05	0.7、0.8、0.9、1.0

● NDM3E/4P basic type

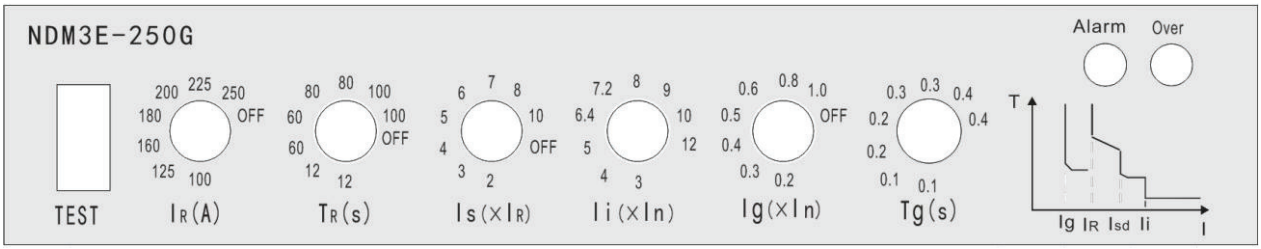


Controller parameter setting table (four-pole basic type)

Product specifications	Setting current and time parameters								
	I_n (A)	I_R (A)	T_R (s)	I_{sd} (*I_R)	T_{sd} (s)	I_i (*I_n)	T_i (s)	I_p (*I_R)	I_p (*I_R)
NDM3E-125	32	16、20、25、32、OFF	12、60、80、100、OFF	2、3、4、5、6、7、8、10、OFF	0.06、0.1、0.2、0.3	3、4、5、6.3、7、8、9、10、12	< 0.05	0.7、0.8、0.9、1.0	0.5、1.0、OFF
	125	40、50、63、70、80、90、100、125、OFF							
NDM3E-250	250	100、125、160、180、200、225、250、OFF				3、4、5、6.4、7.2、8、9、10、12			
NDM3E-400	400	200、225、250、280、315、350、400、OFF	12、60、100、150、OFF			3、4、5、6、7、8、9、10、12、14			
NDM3E-630	630	280、315、350、400、450、500、550、600、630、OFF							
NDM3E-800	800	400、450、500、550、600、630、700、750、800、OFF							
NDM3E-1600	1600	640、800、960、1000、1120、1280、1440、1600、OFF	12、60、100、150、OFF	2、3、4、5、6、7、8、10、OFF	0.06、0.1、0.2、0.3	3、4、5、6、7、8、9、10、12、14	< 0.05	内置 0.9	0.5、1.0、OFF

Note: Four-pole product pre-alarm default setting is built-in 0.9I_R

- NDM3E/3P, 4P grounding type (N pole Trn automatic tracking phase pole setting value)

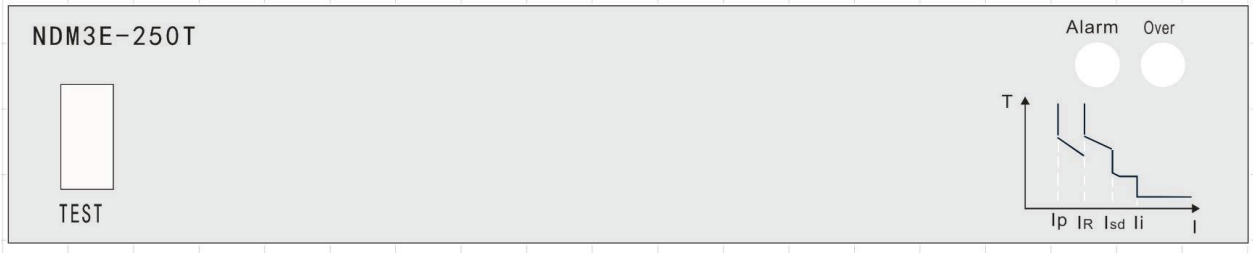


Controller parameter setting table (grounding type)

Product specifications	In (A)	Setting current and time parameters								
		IR (A)	TR (s)	Isd (*IR)	Tsd (s)	Ii (*In)	Ti (s)	Ip (*IR)	Ig (*IR)	Tg (s)
NDM3E-125	32	16、20、25、32、OFF	12、60、80、100、OFF	2、3、4、5、6、7、8、10、OFF	Built-in 0.3	3、4、5、6.3、7、8、9、10、12	< 0.05	Built-in 0.9	0.2、0.3、0.4、0.5、0.6、0.8、1.0、OFF	0.1、0.2、0.3、0.4
	125	40、50、63、70、80、90、100、125、OFF								
NDM3E-250	250	100、125、160、180、200、225、250、OFF				3、4、5、6.4、7.2、8、9、10、12				
NDM3E-400	400	200、225、250、280、315、350、400、OFF	12、60、100、150、OFF							
NDM3E-630	630	280、315、350、400、450、500、550、600、630、OFF				3、4、5、6、7、8、9、10、12、14				
NDM3E-800	800	400、450、500、550、600、630、700、750、800、OFF								

Note:
Grounding type product pre-alarm setting is fixed built-in $0.9I_R$;
Neutral line protection I_{RN} setting current for four-pole product is $1.0I_R$;
TRN automatic tracking phase pole setting value of N pole T_R of four-pole product.

● NDM3E/3P,4P communication type

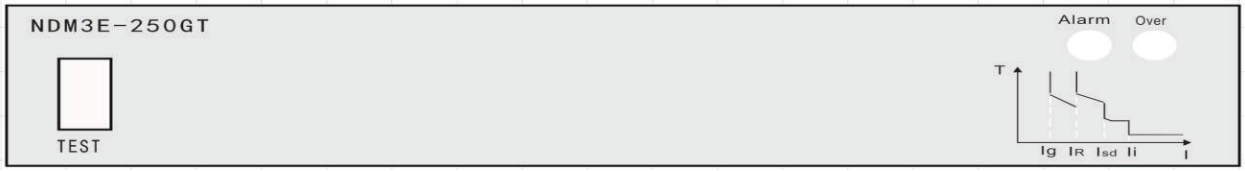


Controller parameter setting table (communication type)

Product specifications	I_n (A)	Setting current and time parameters						
		I_R (A)	T_R (s)	I_{sd} ($*I_R$)	T_{sd} (s)	I_i ($*I_n$)	T_i (s)	I_p ($*I_R$)
NDM3E-125	32	16~32+OFF	12、60、80、100、OFF	2、3、4、5、6、7、8、10、OFF	Built-in 0.3	3、4、5、6、7、8、9、10、12	< 0.05	Built-in 0.9
	125	40~125+OFF				3、4、5、6.3、7、8、9、10、12		
NDM3E-250	250	100~250+OFF				3、4、5、6.4、7.2、8、9、10、12		
NDM3E-400	400	250~400+OFF	12、60、100、150、OFF			3、4、5、6、7、8、9、10、12、14		
NDM3E-630	630	280~630+OFF						
NDM3E-800	800	400~800+OFF						

Note:
I_R is adjustable from the minimum to the maximum with the adjustment step length of 1A;
Neutral line protection I_{RN} setting current of four-pole product is 1.0I_R;
TRN automatic tracking phase pole setting value of N pole T_{RN} of four-pole product.

● NDM3E/3P,4P communication grounding type



Controller parameter setting table (communication grounding type)

Product specifications	Rated current I_n (A)	Setting current and time parameters					
		I_R (A)	T_R (s)	I_{sd} (*I_R)	T_{sd} (s)	I_i (*I_n)	I_P(*I_R)
NDM3E-125	32	16 ~ 32、OFF	12、60、80、100、OFF	32 ~ 320、OFF	0.06、0.1、0.2、0.3	96 ~ 384	11 ~ 32
	125	40 ~ 125、OFF		80 ~ 1250、OFF		375 ~ 1500	28 ~ 125
NDM3E-250	250	100 ~ 250、OFF		200 ~ 2500、OFF		750 ~ 3000	70 ~ 250
NDM3E-400	400	200 ~ 400、OFF	12、60、100、150、OFF	400 ~ 4000、OFF		1200 ~ 5600	140 ~ 400
NDM3E-630	630	280 ~ 630、OFF		560 ~ 6300、OFF		1890 ~ 8820	196 ~ 630
NDM3E-800	800	400 ~ 800、OFF		800 ~ 8000、OFF		2400 ~ 11200	280 ~ 800

Continued controller parameter setting table (communication grounding type)

Product specifications	Rated current I_n (A)	Current, time parameters			
		I_{RN} (*I_r)	T_{RN} (s)	I_g (*I_n)	T_g (s)
NDM3E-125	32	0.5、1.0、OFF	default T_R	6 ~ 32、OFF	0.1、0.2、0.3、0.4
	125			25 ~ 125、OFF	
NDM3E-250	250			50 ~ 250、OFF	
NDM3E-400	400			80 ~ 400、OFF	
NDM3E-630	630			126 ~ 630、OFF	
NDM3E-800	800			160 ~ 800、OFF	

4.4.3 Controller protection characteristic

● Overload long-time delay protection

◆ Overload long-time delay setting current I_r.

When it is set to OFF position, the controller provides only instantaneous short-circuit protection function.

◆ Overload long-time delay setting time Tr ;

When it is set to OFF position, the controller provides the function of overload alarm without tripping. The operating time accuracy is ± 10%.

◆ When the time current I is more than 1.15 times of the current overload long-time delay setting current value Ir, it is regarded as overload.

Overload protection is carried out by inverse time characteristics, and delay operating time $t_r=(2*I_r/I)^2*T_r$

◆ Wherein: t_r represents long-time delay operating time; I_r represents long-time delay setting current; I represents actual operating current; T_r is long-time delay setting time.

Protection characteristic is shown below.

Current	Protection characteristic				
1.05I_r	> 2h No operation				
1.3I_r (motor protection1.2I_r)	< 1h Operation				
	T_r				
	12	60	80	100	150
1.5*I_r	21.3	106.7	142.2	177.8	266.7
2*I_r	12	60	80	100	150
6*I_r	1.33	6.67	8.89	11.11	16.66
7.2*I_r	0.93	4.63	6.17	7.72	11.57
Operating time accuracy	± 10%				

● Short circuit short-time delay protection

◆ Short circuit short-time delay setting current I_{sd}; when it is set to OFF position, the controller doesn ' t provide short-circuit short-time delay protection.

◆ Short circuit short-time delay protection operating time T_{sd}; the operating time accuracy is ± 10%.

◆ Short circuit short-time delay protection is divided into definite time protection and inverse time lag protection.

When the fault current is$1.5*I_{sd} > I \geq I_{sd}$, it has inverse time lag protection characteristic, namely $t_{sd}=(1.5*I_{sd}/I)^2*T_{sd}$;

When the fault current is $I_i > I \geq 1.5*I_{sd}$, the inverse time lag protection is switched to definite time protection, namely $t_{sd}=T_{sd}$.

Short circuit short-time delay I_{sd} 、 T_{sd}						
Setting curren I_{sd}			(2 、 3 、 4 、 5 、 6 、 7 、 8 、 10) × In+OFF			
Actuation characteristics	Inverse time limit $I_{sd} \leq I < 1.5I_{sd}$	T_{sd} setting value (s)	0.06	0.1	0.2	0.3
		T_{sd} actuation time (s)	$t_{sd}=(1.5I_{sd})^2 \times T_{sd}/I^2$			
	Definite time $1.5I_{sd} \leq I < I_i$	T_{sd} actuation time (s)	0.06	0.1	0.2	0.3
		Recoverable time (s)	/	/	0.14	0.21
		Accuracy (%)	± 10%			

Instantaneous short circuit protection

- Instantaneous short circuit protection setting current I_i 。
- Instantaneous short circuit protection operating time T_i < 50ms ; as the fault current increases, the operating time is shortened.

Instantaneous short-circuit I_i		
Actuation characteristics	Setting current I_i	(3、4、5、6、7、8、9、10、12、14) × In
	Operation time	< 50ms

Note: Each frame setting current value I_i is shown in the table.

Pre-alarm indication

- Pre-alarm setting current I_P ;
- Pre-alarm lamp ： When $I \geq I_P$, the pre-alarm LED (yellow) flashes; after the time of $T=(2*I_r/I)^2*T_r/2$, the indicator is constantly on.

Pre-alarm I_P		
Setting current Ip		(0.7、0.8、0.9、1.0) × Ir
Characteristics	Pre-alarm lamp	The indicator flashes and then becomes constantly on
	Accuracy（%）	± 10

Overload indicator

Characteristics	Current value range	1.15 × I_R
	Overload Indicator light	Constantly on
	Accuracy (%)	± 10

Neutral line protection

- Neutral line setting current I_{RN} is at (0.5, 1.0) * + OFF;
- The neutral line protection characteristic ’ s protection time TRN automatically tracks three-phase operating time.

● Grounding protection function

◆ Grounding protection setting current I_g

I_g = (0.2、0.3、0.4、0.5、0.6、0.8、1.0) * I_n +OFF level, 8 levels in total;

◆ Grounding protection setting time T_g

T_g = (0.1、0.2、0.3、0.4) s， 4 levels in total;

◆ Grounding protection curve is "inverse time lag + definite time", namely:

★ When I△≤0.9Ig, the circuit breaker is not allowed to operate;

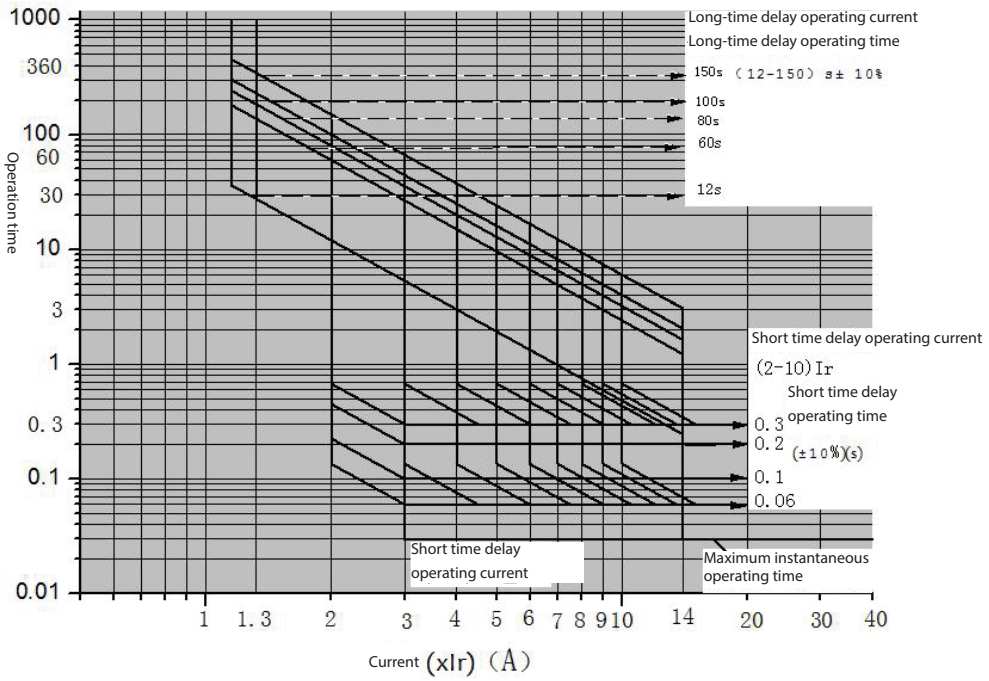
★ When 1.1*Ig≤I△≤2*Ig, the circuit breaker operates, the operating characteristic is inverse time lag, and the operating characteristic follows the equation T=(2*Ig/I)*Tg;

★ When I△≥2*Ig, the circuit breaker operates, and the operating characteristic is definite time, namely t=Tg. The operating time accuracy is ±10%.

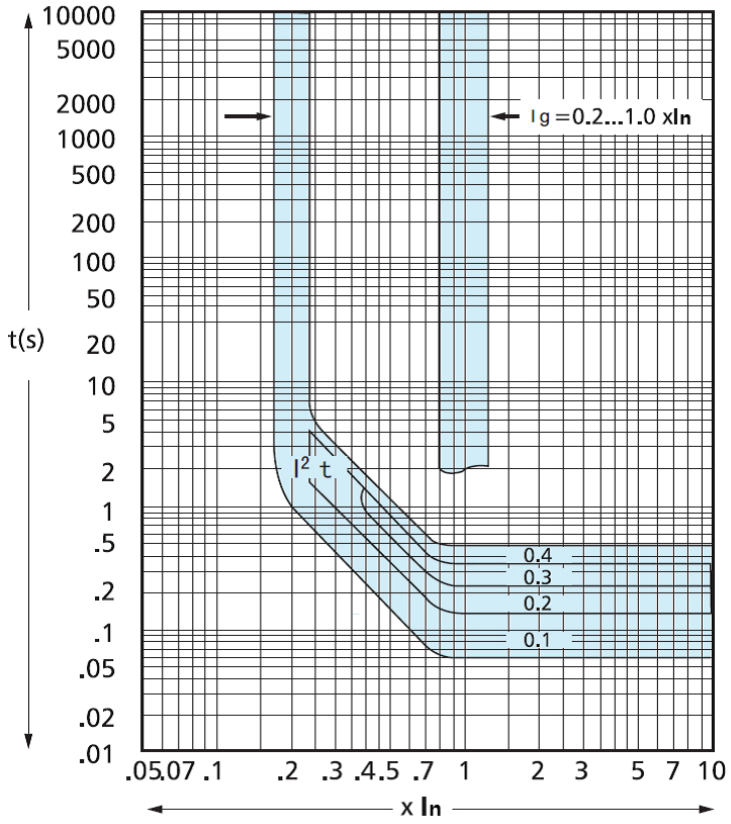
Note: I△ is the three-phase vector of main circuit of circuit breaker or the sum of three-phase current vector and N phase current vector.

4.5 Product Tripping Curve

● Over-current controller characteristic curve



Grounding protection characteristic curve



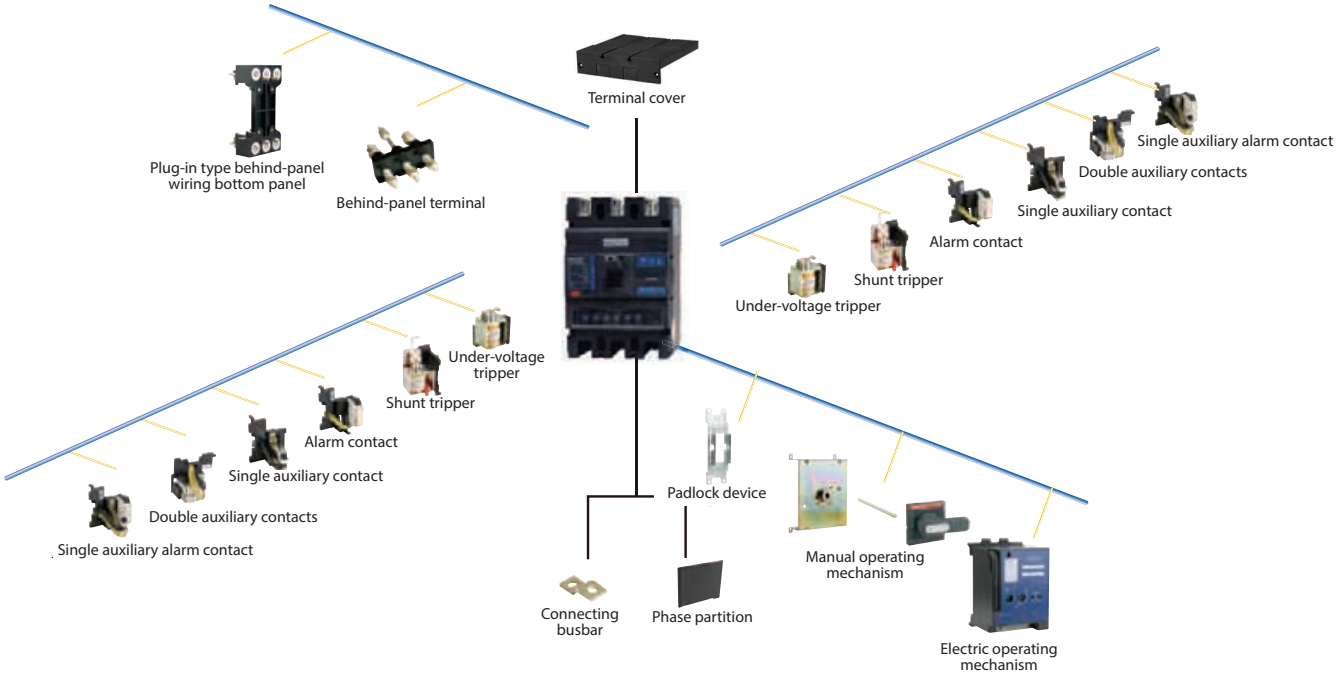
Grounding fault protection IgTg

Setting current Ig			(0.2、0.3、0.4、0.5、0.6、0.8、1.0) × In + OFF			
Actuation characteristics	Inverse time limit Ig≤I△ < 2Ig	Tg setting value (s)	0.1	0.2	0.3	0.4
		t Actuation time (s)	t = (2Ig) 2 × Tg / I 2			
	Definite time I△_2Ig	t Actuation time (s)	0.1	0.2	0.3	0.4
		Accuracy (%)	± 10			

Note: I△ is the three-phase current vector of circuit breaker and/or the vector sum of three-phase current vector and N phase current vector.

5. Accessories

5.1 List of Accessories



5.2 Accessories Function Description

5.2.1 Auxiliary contact Technical parameters

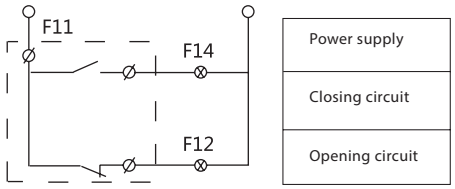
- Auxiliary contacts and combinations

The breaker is at the "opening" or "free tripping" position	NDM3E-125、250、400、630、800、1600	F14 F12 F11 F24 F22 F21
The breaker is at the "closing" position	"Closing" switched to "opening" "Opening" switched to "closing"	

- Auxiliary contact current parameters

Classification	Frame current (A)	Conventional heating current Ith (A)	Rated operating current (A)	
			AC400V	DC220V
Auxiliary contact	125, 250	3	0.3	0.15
	400, 630, 800, 1600	3	0.4	0.15

- Auxiliary contact wiring diagram



- Electrical life of auxiliary contact

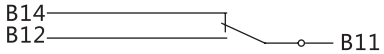
Use class	Switch on			Breaking			Frequency	Operation frequency (time(s)/hour)	Conduction time
	I/Ie	I/Ie	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

- Connection and breaking capacity of auxiliary contact

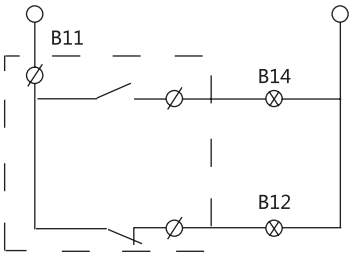
Use class	Switch on			Breaking			Frequency	Operation frequency (time(s)/hour)	Conduction time
	I/Ie	I/Ie	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1	0.3	1	1	0.3	10	120	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

5.2.2 Alarm contact

- Alarm contacts and their combinations (alarm contacts Ue = 220V, Ith = 3A)

The circuit breaker is at the position of "opening" or "closing"	NDM3E-125、250、400、630、800、1600	
The circuit breaker is at the "free tripping" position		

- Alarm contact wiring diagram



In the case of proper closing or opening of circuit breaker, the contact does not operate; only after free tripping (or fault tripping) will the original state of contact be changed, which means normally open switches to closed and normally closed switches to open; after re-buckle of the circuit breaker, the contact is restored to the original position.

● Connection and breaking capacity of alarm contact

Classification	Frame current (A)	Conventional heating current Ith (A)	Rated operating current (A)	
			AC400V	DC220V
Alarm contact	125, 250	3	0.3	0.15
	400, 630, 800, 1600	3	0.3	0.15

5.2.3 Under-voltage tripper

★ Connect to power based on the terminal numbers on the plug-in under-voltage module (It is not necessary to distinguish the positive and negative of DC power supply).

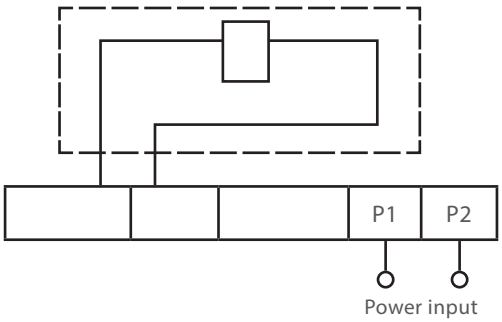
Voltage specification: AC50Hz 230V or 400V

★ When the power supply voltage is 70%~35% of rated operating voltage, the circuit breaker is caused to trip.

★ When the power supply voltage is less than 35% of rated operating voltage, the circuit breaker can be prevented from closing.

★ When the power supply voltage is greater than 85%~110% of rated operating voltage, it should be ensured that the circuit breaker is closed.

Note: The under-voltage tripper must be energized first in order to re-buckle and close the circuit breaker, otherwise it will damage the circuit breaker.



Under-voltage tripper wiring diagram

Electric characteristics of under-voltage trippers

Equipped with circuit breaker	Under-voltage tripper power consumption (W)	
	AC230V	AC 400V
NDM3E-125	2.6	3.3
NDM3E-250	3.8	3.3
NDM3E-400	3.7	2.7
NDM3E-630	2.5	2.8
NDM3E-800	2.5	2.8
NDM3E-1600	2.5	2.8

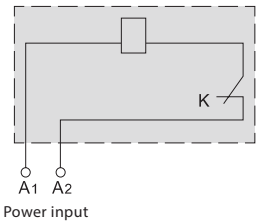
5.2.4 Shunt tripper

★ Connect to power based on the outgoing lead number (It is not necessary to distinguish the positive and negative of DC power supply)

★ Voltage specification: AC230V,400V ; DC220V,24V

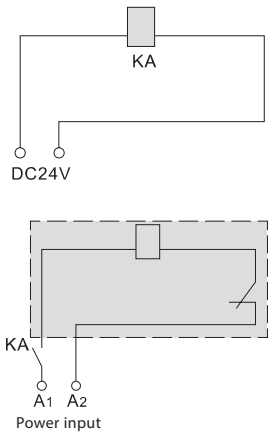
★ When the applied voltage of shunt tripper is 70%~110% of the rated control supply voltage, the circuit breaker should be reliably tripped.

● Shunt tripper wiring diagram (the circuit breaker accessory wiring diagram is within the dotted box)



K : The microswitch in the shunt tripper which is in series with the coil is normally closed contact; after opening of circuit breaker, the contact is automatically opened; at the closing, it is closed.

Note: When DC24V is used as control circuit power supply, the shunt control circuit design is recommended according to the figure above.



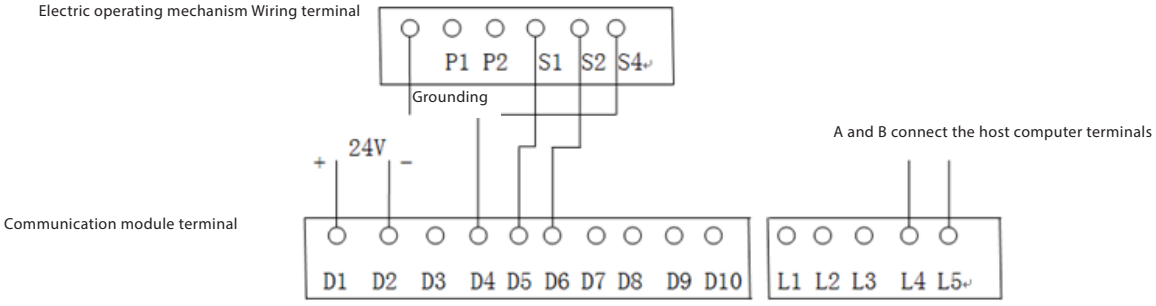
KA : It is DC24V intermediate relay, and the contact current capacity is 1A.

Product models	Instantaneous current value (A)				Power consumption (W)			
	AC400V	AC230V	DC220V	DC24V	AC400V	AC230V	DC220V	DC24V
NDM3E-125	0.288	0.425	0.341	4	96.8	73	90.7	91.2
NDM3E-250	0.313	0.412	0.341	3.87	112	68.8	90.7	85.3
NDM3E-400	0.197	0.325	0.4	3.87	67	62.3	94.4	100
NDM3E-630	0.199	0.314	0.4	3.87	68	58.2	94.4	100
NDM3E-800	0.538	0.898	1.134	5.22	163	153		120

5.2.5 Communications function

NDM3E circuit breaker cooperates with the electrically operated mechanism and connects with the upper computer to provide "four-remote" functions (with communication module).

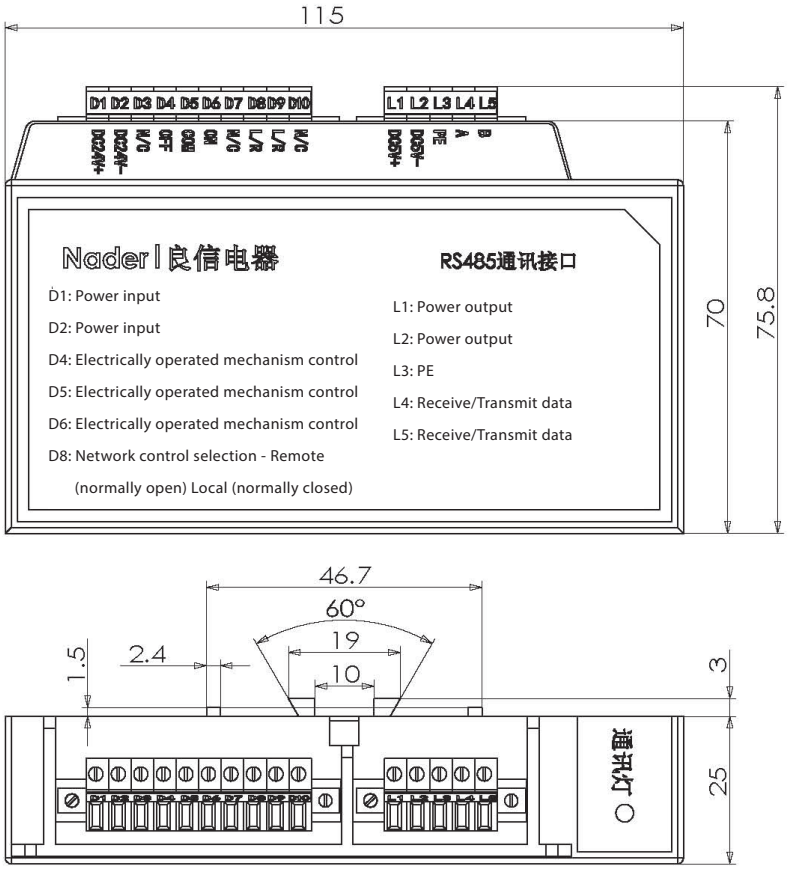
Circuit breaker identification	Breaker model	●
	Mailing address	●
	Baud rate	●
Status indication	Switching on / Switching off	●
	Network control	●
Breaker control	Switching on / Switching off	● (Electrically operated mechanism to be installed)
Reading and modification of setting protection value	Overload long-time delay setting protection current Ir, setting protection time Tr	●
	Short circuit short-time dalay setting protection current Is, setting protection time Ts	●
	Short circuit instantaneous setting protection current Ii	●
	Neutral pole setting current IRN	● (Four-pole circuit breaker)
	Grounding fault operating setting protection current Ig, setting protection time Tg	●
Reading of operating parameters	Three-phase current Ia, Ib, Ic	●
	Value of grounding fault current Ig	●
	N phase current IRN	● (Four-pole circuit breaker)
	Fault phase	●
	Fault type	●
	Fault time	●
	Fault current	●
	Alarm type	●
	The last fault record	●



Connection diagram of communication module and electrically operated mechanism

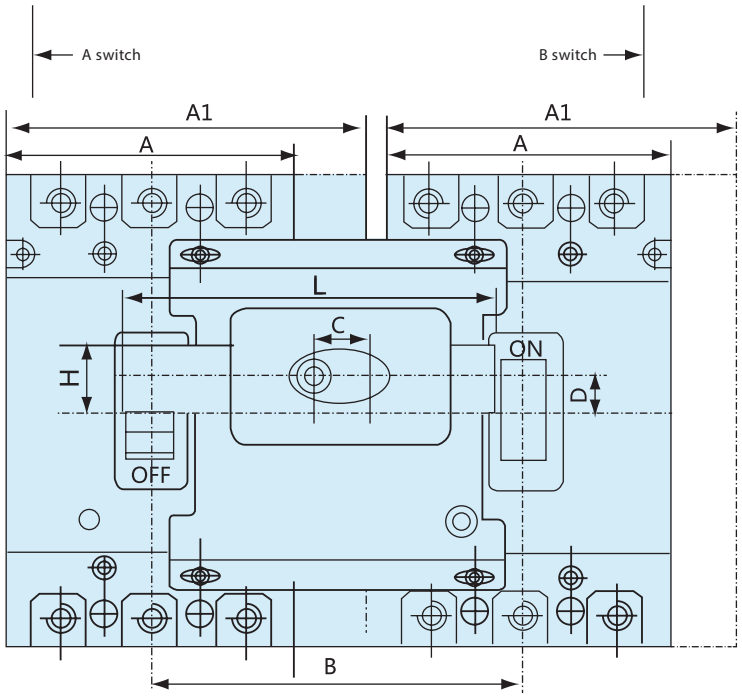
Terminal designation	Connection position	Input output (IO)
D1	Power input DC24V(+)	Input
D2	Power input DC24V(-)	
D3	Empty	
D4	Electrically operated mechanism controls the “OFF” end	Output (DO)
D5	Electrically operated mechanism controls the “COM” end	
D6	Electrically operated mechanism controls the “ON” end	
D7	Empty	
D8、D9	Network control selection	Input (DI)
D10	Empty	
L1	Power supply DC5V(+)	Output
L2	Power supply DC5V(-)	
L3	PE	
L4	Receive/Transmit data（A）	Input output
L5	Receive/Transmit data（B）	

★ Rated operational voltage Specifications :DC 24V, allowable range: ± 15%, power:≤2W； if the communication is normal, the communication light will flash.
★ With this module, "telemetry", " remote adjustment ", "remote control", and " telecommand" can be provided; furthermore, to provide remote control, the electrically operated mechanism shall be added
★ External communication: Standard RS485 interface, ModBus-RTU protocol, shielded twisted pair cable; each communication line connects up to 32 devices, the maximum distance is 1,200m, and the communication distance can be extended through the repeater.
★ Baud rate: 1.2K, 2.4K, 4.8K, 7.2K, 9.6K, 19.2K (Unit: bps).
★ DI, switching value input: Including circuit breaker closing and opening state, and remote/local status, all dry contact signals, input impedance: ≤100Ω.
★ Network control selection, i.e. selecting local or remote mode; remote is for normally open and local is for normally closed. If D8 and D9 are short connection, then it is local operating mode, and operation of circuit breaker by the host computer cannot be carried out; otherwise, it is remote operating mode, and operation of circuit breaker by the hose computer can be carried out.
★ DO, switching value output: Opening and closing control signals convert the level signals from the circuit breaker controller to dry contact signals; contact rating: Resistive load DC 30V/5A, AC 270V/3A.
★ PE: Can be directly through terminals and peripherals can be direct grounding.



5.3 Functions and Sizes of NDM3E External Accessories

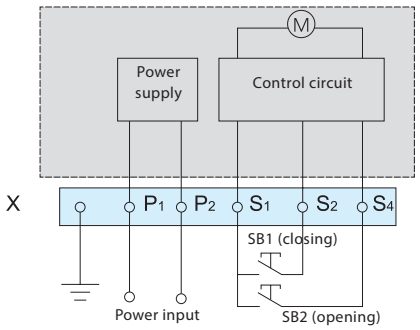
5.3.1 Mechanical interlock



Specifications / Code	NDM3E-125	NDM3E-250	NDM3E-400	NDM3E-630 NDM3E-800
A	92	107	150	210
B	120	135	180	243
C	48.5	50	60	60
D	11.5	14	18	18
L	118	135	175	230
H	22	22	30	20
A1 (4-pole)	122	142	198	280
B (4-pole)	152	173	230	310
C (4-pole)	48.5	50	60	60
D (4-pole)	11.5	14	18	18
L (4-pole)	150	168	188	300
H (4-pole)	22	22	30	30

5.3.2 $CD2_{M2E}$ Electric operating mechanism

$CD2_{M2E}$ Electric operating mechanism



$CD2_{M2E}$ motor operating mechanism wiring diagram
(The dotted box shows the internal wiring diagram of motor operating mechanism)

★ Power input Voltage specification : AC50Hz 110V、220V、380V、DC24V、110V、220V、380V

★ The electrically operated mechanism module has a very long mechanical life, and is easy to operate.

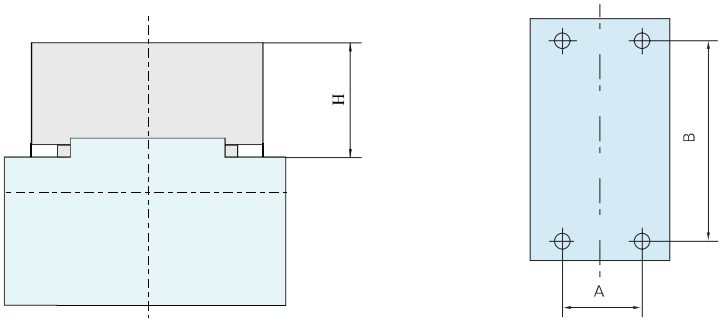
★ Can operate automatically and manually.

Operating current, motor power and life of motor operating mechanism

Equipped with circuit breaker	Operating current (A)	Motor power (W)	Service life (times)
NDM3E-125	≤0.5	14	10000
NDM3E-250	≤0.5	14	8000
NDM3E-400	≤2	35	5000
NDM3E-630	≤2	35	5000
NDM3E-800	≤2	35	3000
NDM3E-1250	≤2	35	5000
NDM3E-1600	≤2	35	5000

Note: After tripping of the circuit breaker, the electrically operated mechanism must cause the circuit breaker to re-buckle before closing.

Motor operating mechanism height and mounting dimension



Motor operating mechanism height and mounting dimension

Electric operating mechanism	Equipped with circuit breaker	H（mm）	A（mm）	B（mm）
CD2M3E-125	NDM3E-125	94	30	129
CD2M3E -250	NDM3E-250	93	35	133.5
CD2M3E -400	NDM3E-400	149	44	194
CD2M3E -800	NDM3E-630, 800 three-pole	151	70	243
CD2M3E -1250	NDM3E-1250	146	70	316
CD2M3E -1600	NDM3E-1600	146	70	316

5.3.3 CS M3E series rotary handle operating mechanism

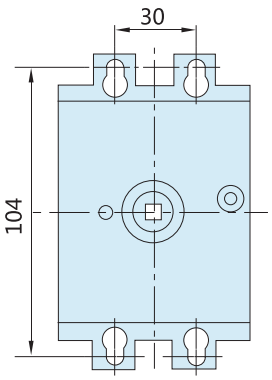
CS □ M3E - □ □

Serial No.	Serial No. name	
1	Hand-operated mechanism	CSM3E
2	Installation mode	1: Centric 2: Eccentric
3	Products equipped	NDM3E
4	Frame grade Rated current	125、250、400、630、800、1250、1600
5	Rotary handle model	F: Represents square handle; A: Represent rounded handle

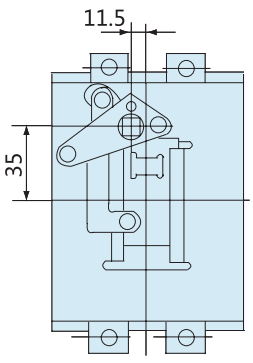
- A circuit breaker installed in the switch cabinet can be operated by the front rotary handle.
- CS M3E manually operated mechanism can be equipped with "F" type square handle or "A" type round handle and the corresponding extension handle.
- When the circuit breaker is at the closing state,, the cabinet door cannot be opened.
- If there is any fault when the operating handle or manual operating mechanism is at the closing state, the cabinet door can be opened by operating the emergency unlocking device on the handle.
- As for operating handles corresponding to different specifications of manual operating mechanisms, the door panel tapping should be consistent.

Attention: If a customer purchases the electrically and manually operating mechanisms by himself/herself, he/she must confirm the model with the company to ensure it matches the circuit breaker. Otherwise, all adverse consequences due to matching problems are not the responsibilities of the company.

NDM3E-125 manually operated mechanism

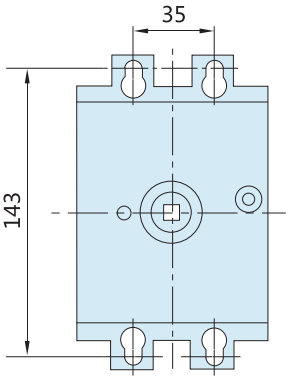


CS1M3E -100

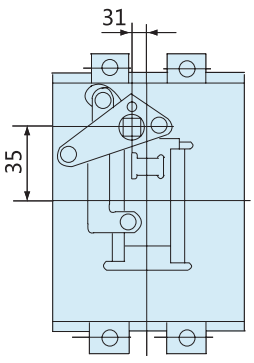


CS2 M3E -100

NDM3E-250 manually operated mechanism

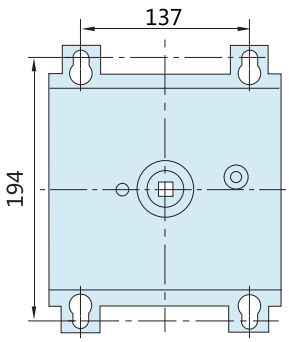


CS1M3E -250

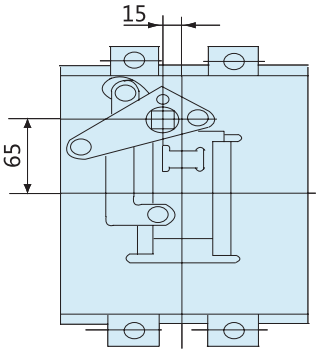


CS2 M3E -250

NDM3E-400 manually operated mechanism

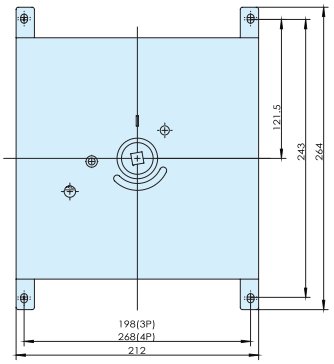


CS1$_{M3E}$-400

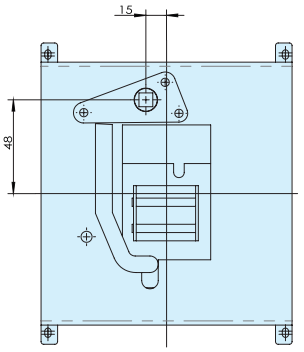


CS2$_{M3E}$-400

NDM3E-630 and 800 manually operated mechanism

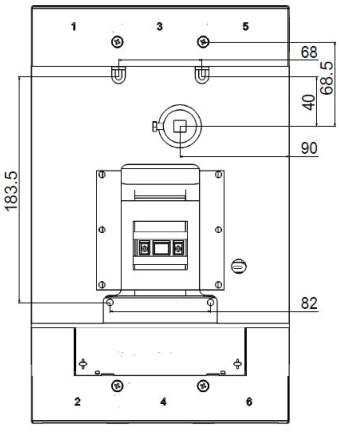


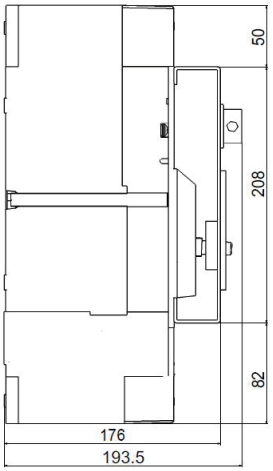
CS1$_{M3E}$-800



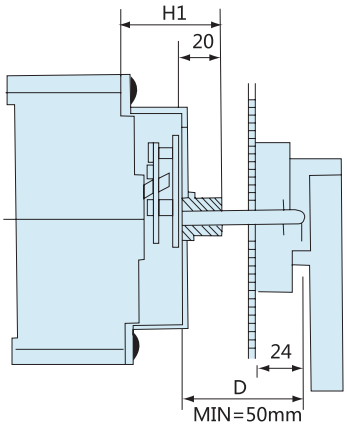
CS2$_{M3E}$-800

NDM3E-1250/1600 manually operated mechanism

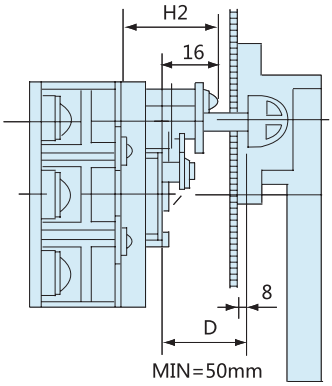




CS M3E manually operated mechanism installation diagram



CS1 installation diagram

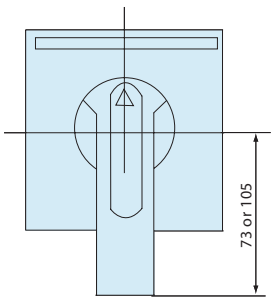


CS2 installation diagram

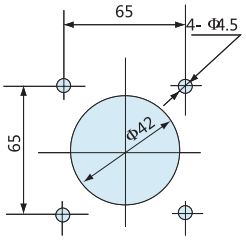
Installation method and outline dimension of external accessories

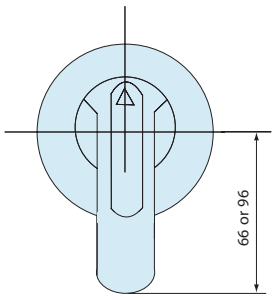
Specifications / Code	NDM3E-125	NDM3E-250	NDM3E-400	NDM3E-630 NDM3E-800	NDM3E-1250 NDM3E-1600
H1	49	55	76	63	/
H2	46	48	61	66	55
D	150mm by default, which can be customized according to the requirements				

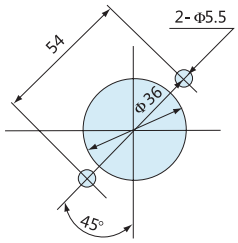
CS manually operated mechanism handle mounting hole size



Type F



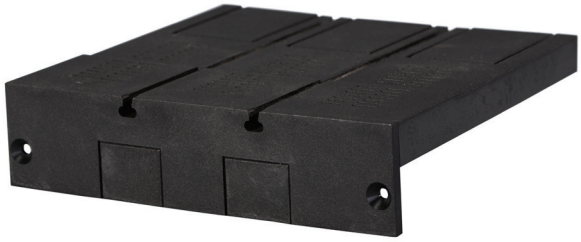


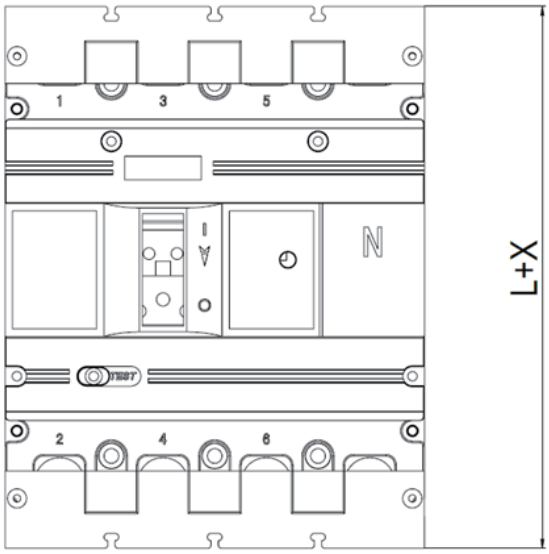


Type A

5.3.4 Zero flashover cover

The terminal covers are mounted on both sides of the product to provide zero flashover function for the product, whose heights and widths are consistent with the product and lengths are shown in the following table.



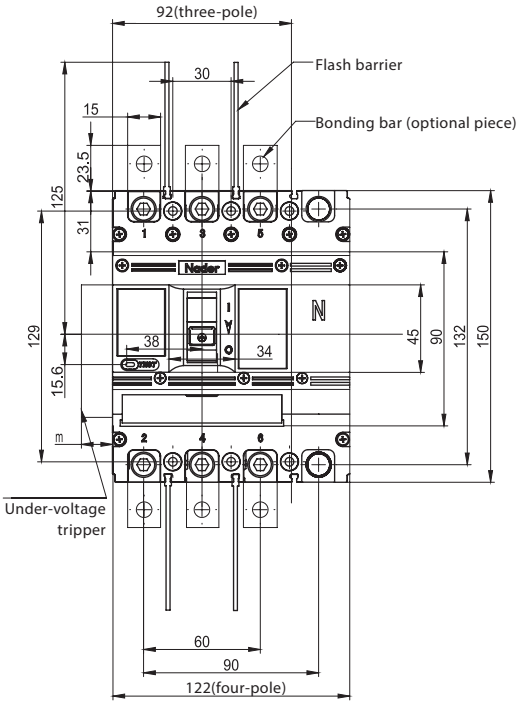


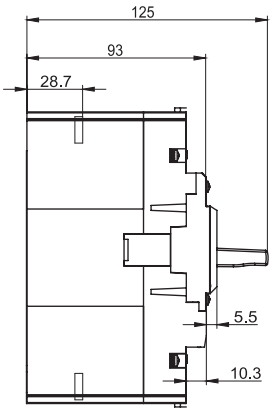
Product series	Model	Body length L	Increased length of terminal cover X	Length after addition of terminal cover Lx
NDM3E	NDM3E-125	150	12	162
	NDM3E-250	165	13	178
	NDM3E-400	257	19	276
	NDM3E-630	280	19	299
	NDM3E-800	280	19	299

6. Product Outline Dimension

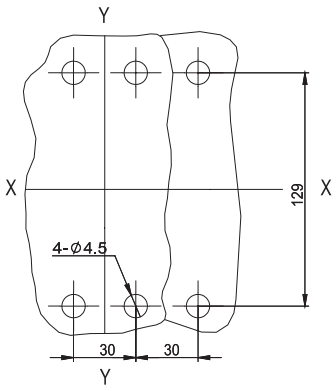
6.1 NDM3E-125 Outline Dimension, Mounting Dimension and Wiring Method

Before-panel wiring `(three-pole,four-pole)



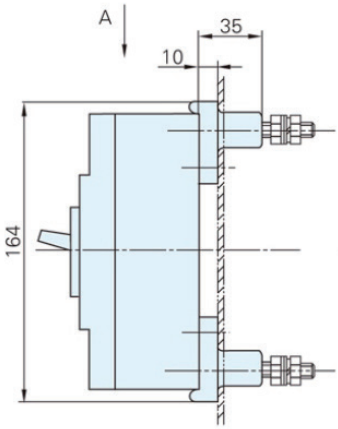


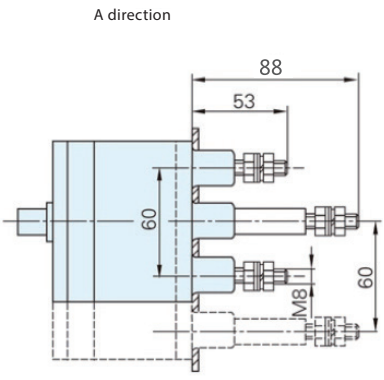
X-X, Y-Y represents the size of opening of before-panel wiring mounting panel of the center of three-pole circuit breaker

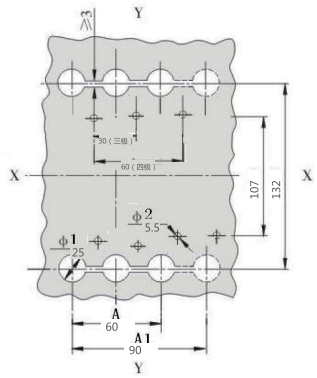


Under-voltage tripper thickness： m=21

Z1H behind-panel wiring (three-pole, four-pole)

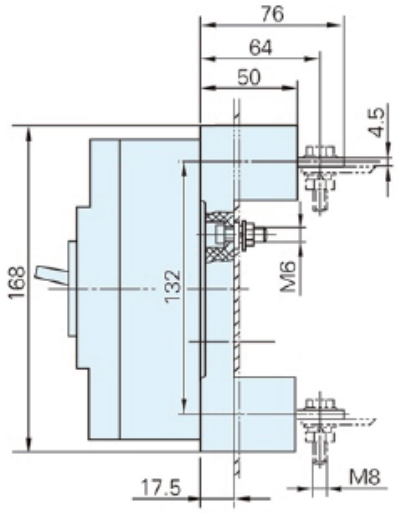




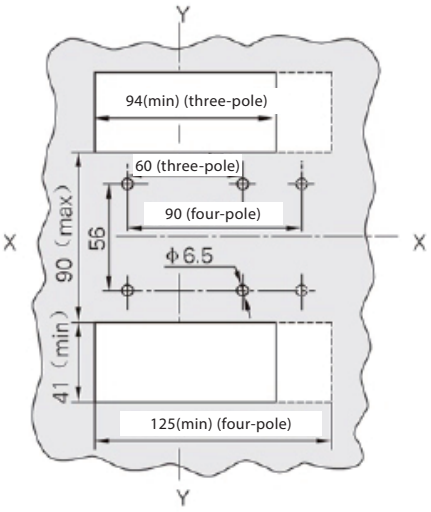


X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of three-pole circuit breaker

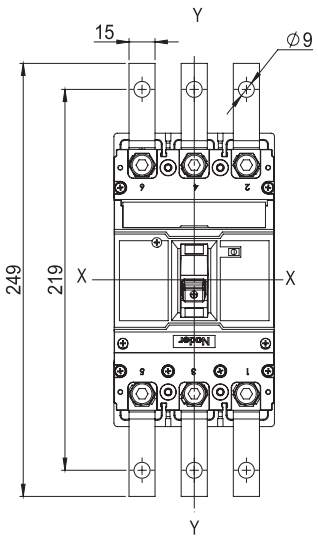
Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

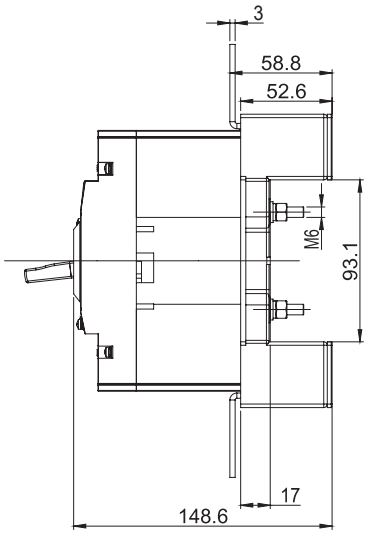


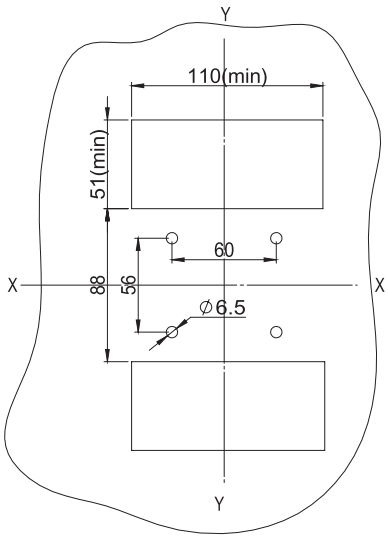
X-X, Y-Y represents the size of opening of plug-in type wiring mounting plate at the center of three-pole circuit breaker



Z2Q: Plug-in type before-panel wiring (three-pole)



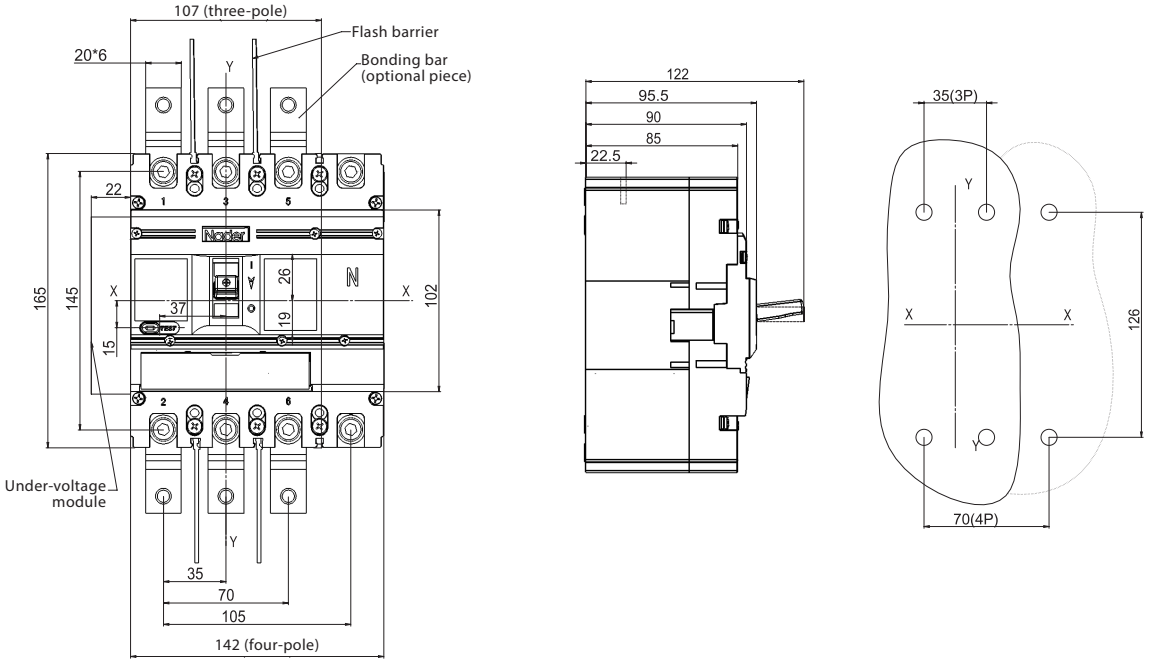




6.2 NDM3E-250 Outline Dimension, Mounting Dimension and Wiring Method

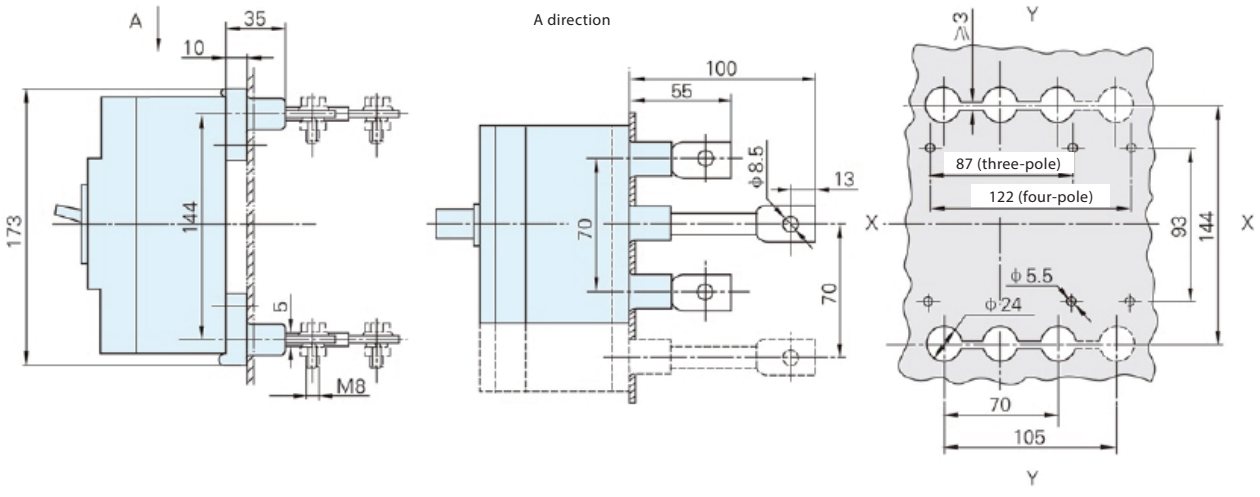
Before-panel wiring (three-pole,four-pole)

X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker



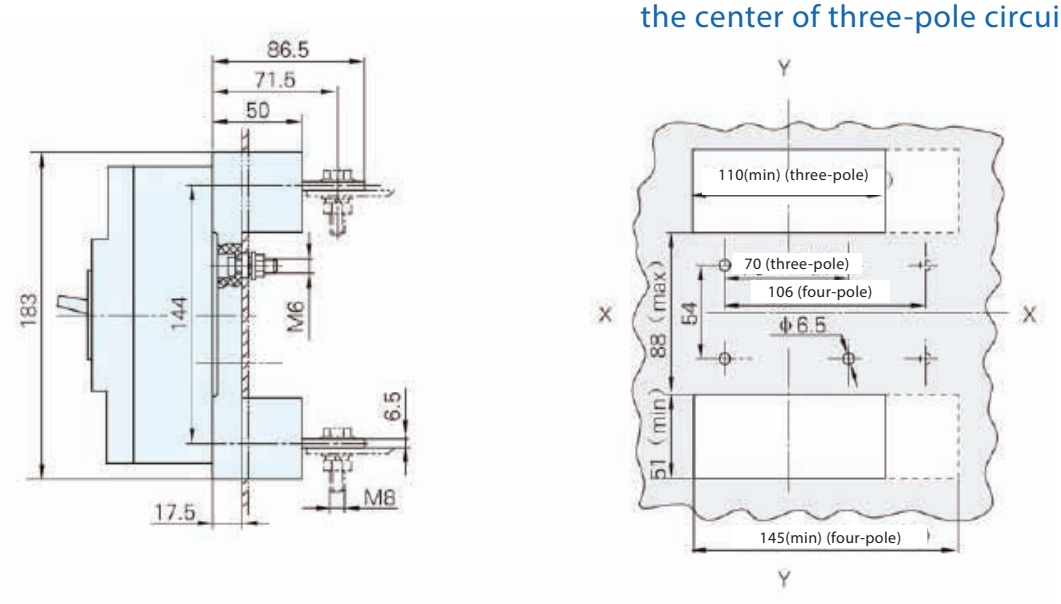
Z1H behind-panel wiring (three-pole, four-pole)

X-X, Y-Y represents the size of opening of before-panel wiring mounting panel of the center of three-pole circuit breaker



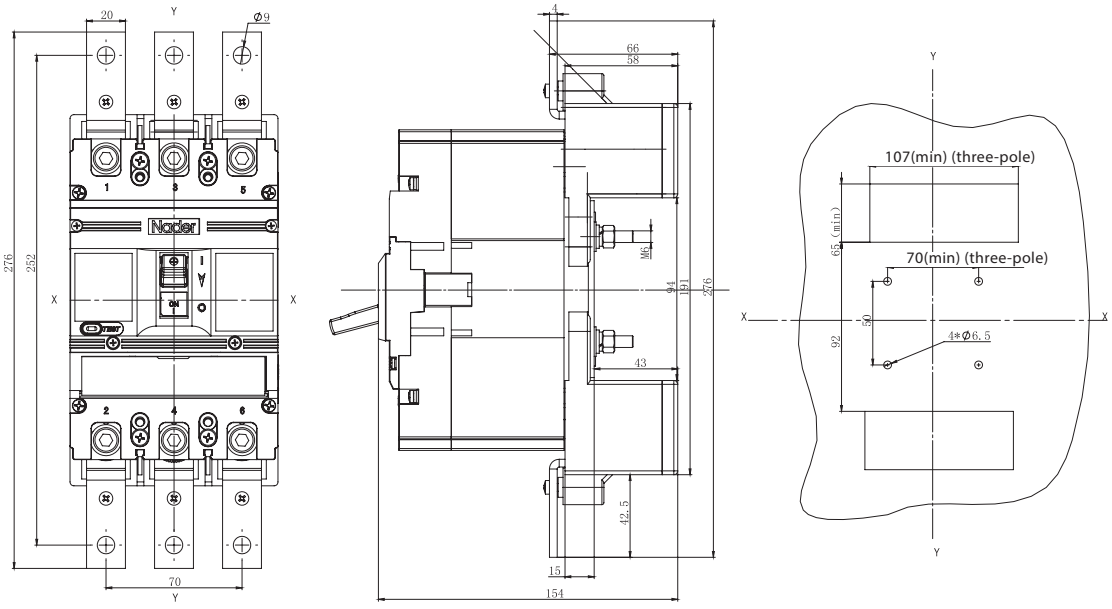
Behind-panel wiring mounting plate opening size

Z2H: Plug-in type behind-panel wiring (three-pole, four-pole)



X-X, Y-Y represents the size of opening of plug-in type wiring mounting plate at the center of three-pole circuit breaker

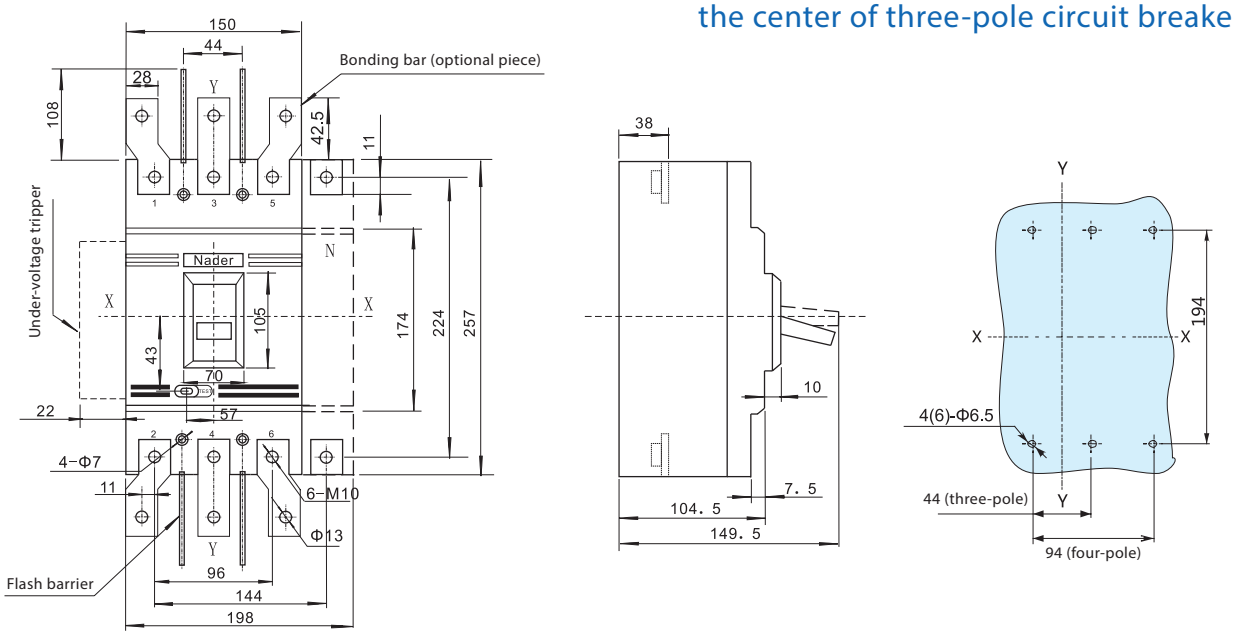
Z2Q: Plug-in type before-panel wiring (three-pole)



6.3 NDM3E-400 Outline Dimension, Mounting Dimension and Wiring Method

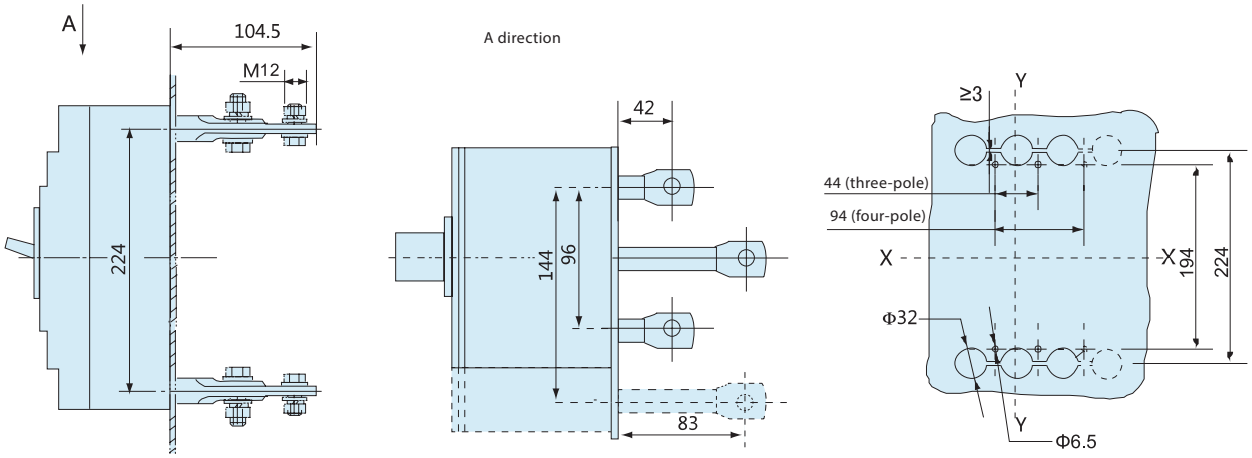
Before-panel wiring (three-pole,four-pole)

X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker



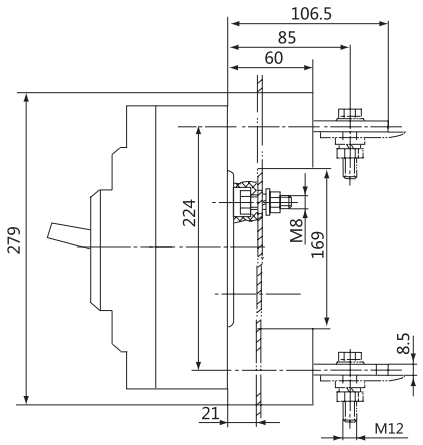
Z1H behind-panel wiring (three-pole, four-pole)

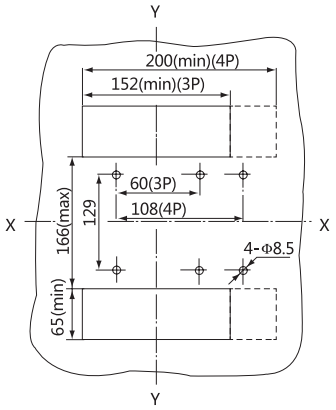
X-X, Y-Y represents the size of opening of before-panel wiring mounting panel of the center of three-pole circuit breaker



Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

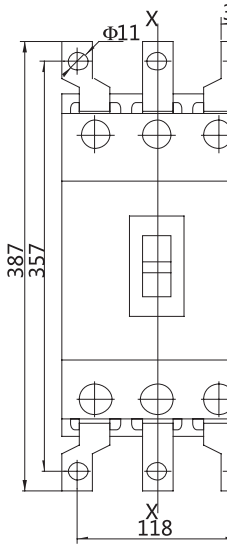
X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker

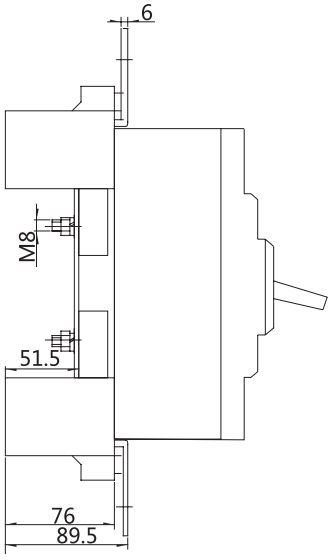


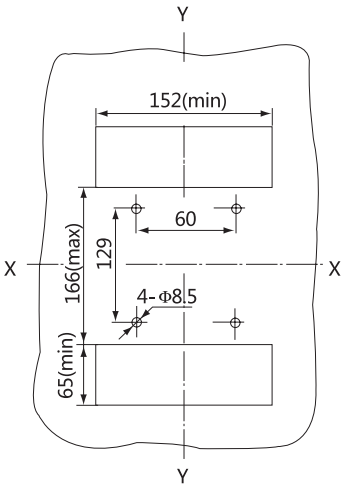


Z2Q: Plug-in type before-panel wiring (three-pole)

X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker



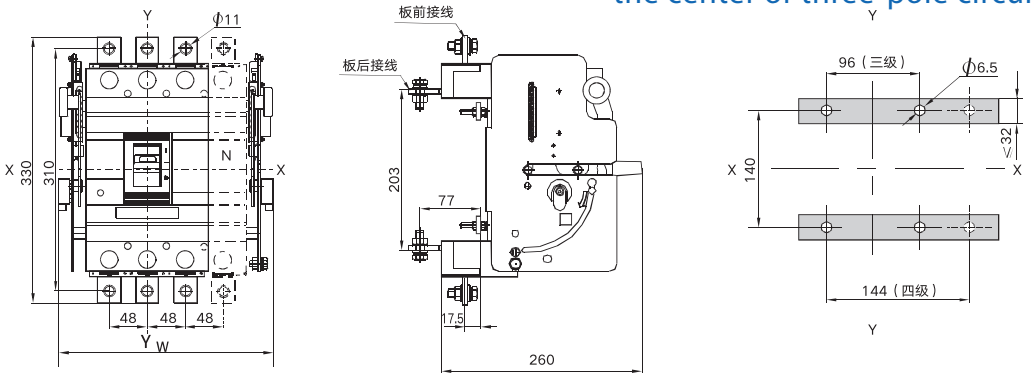




NDM3E-400 drawer accessory outline dimension and mounting dimension

Drawer wiring (three-pole, four-pole)

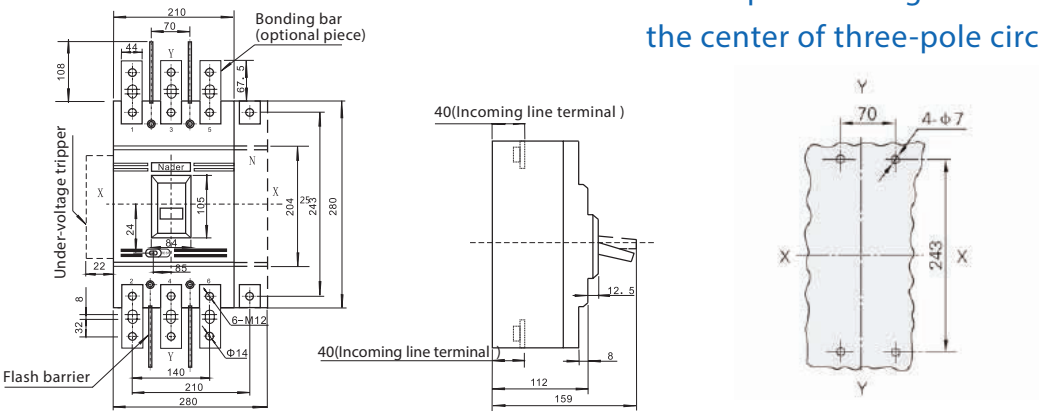
X-X, Y-Y represents the size of opening of drawer type wiring mounting panel at the center of three-pole circuit breaker



6.4 NDM3E-630 and NDM3E-800 Outline Dimension, Mounting Dimension and Wiring Method

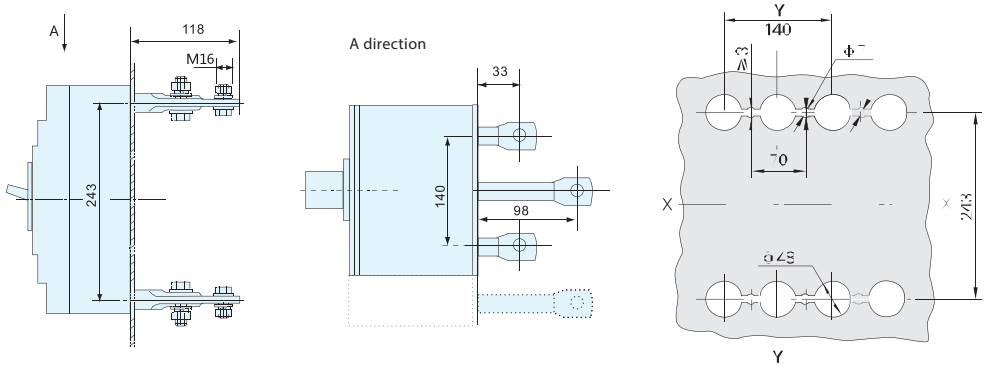
Before-panel wiring (three-pole,four-pole)

X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker



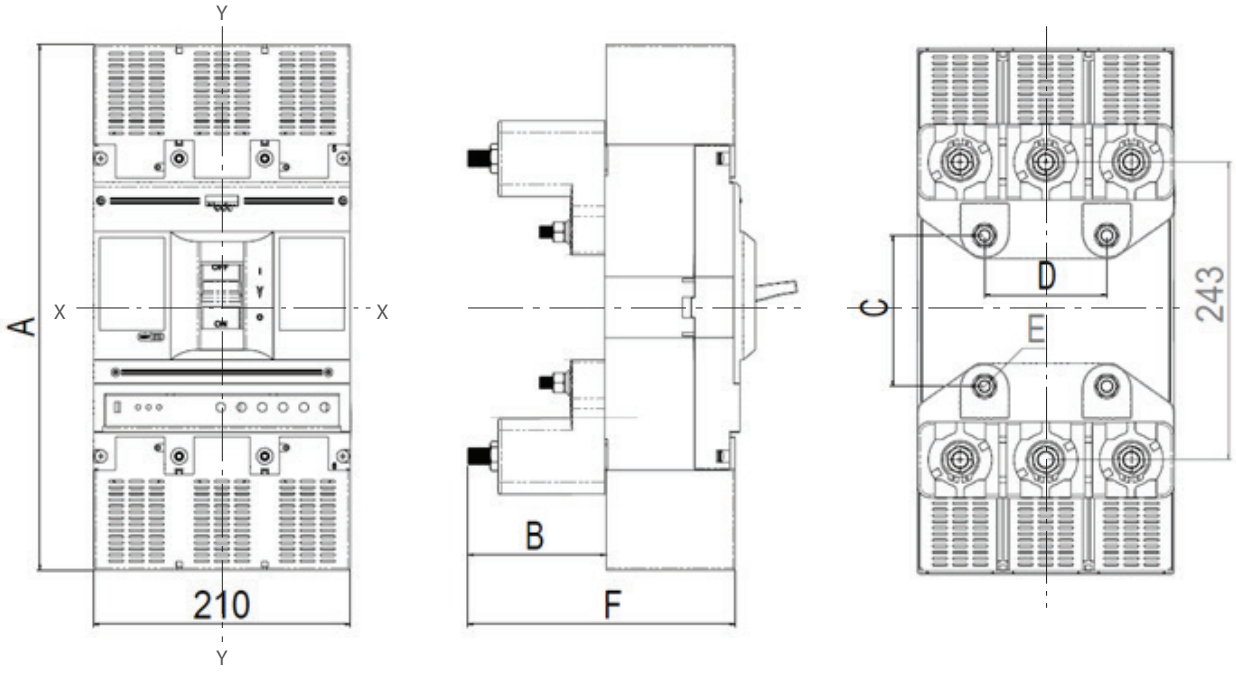
Z1H behind-panel wiring (three-pole, four-pole)

X-X, Y-Y represents the size of opening of before-panel wiring mounting panel of the center of three-pole circuit breaker

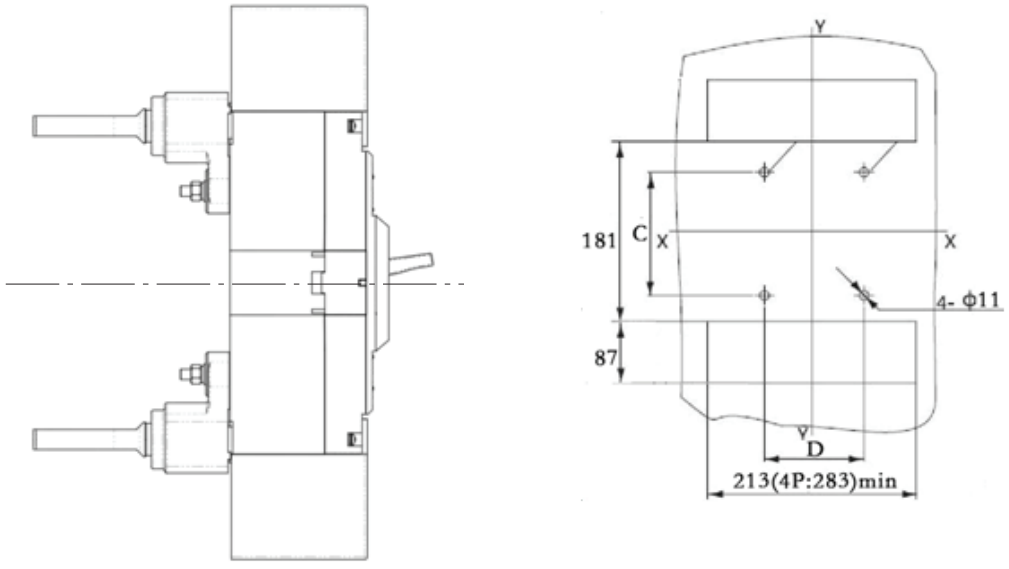


Z2Q/H plug-in type wiring (three-pole, four-pole) Type I

X-X, Y-Y represents the size of opening of plug-in type wiring mounting plate at the center of three-pole circuit breaker



Type II

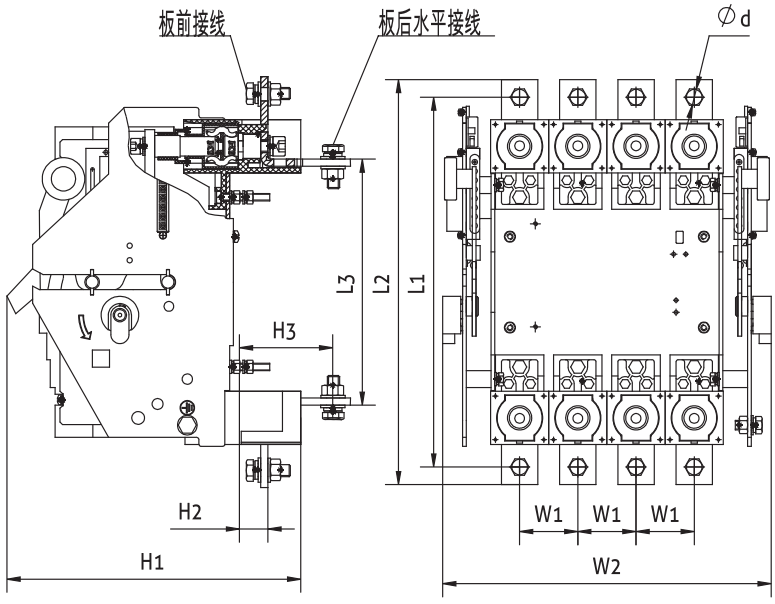


Model	Number of poles corresponding to current specifications		Product dimension (mm)					
			A	B	C	D	E	F
Type Ⅰ	630A	3P	302	113	123	100	M10	218.5
		4P	302	113	152	139	M10	218.5
	700A/800A	3P	429	113	123	100	M10	218.5
		4P	429	113	152	139	M10	218.5
Type Ⅱ	630A	3P	302	151	142	140	M8	259
		4P	302	151	142	210	M8	259
	700A/800A	3P	429	151	142	140	M8	259
		4P	429	151	142	210	M8	259

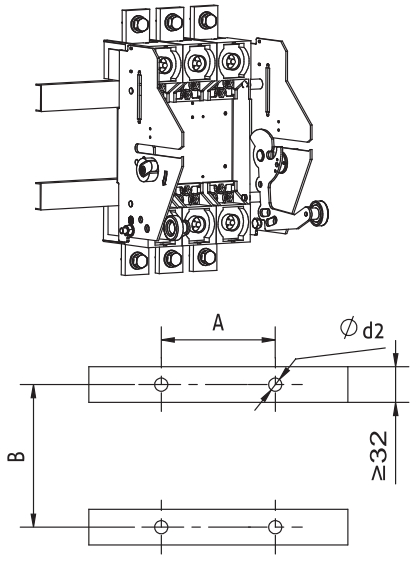
Note: Plug-in type specific selection is subject to the specifications!

Drawer wiring (three-pole, four-pole)

X-X, Y-Y represents the size of opening of drawer type wiring mounting panel at the center of three-pole circuit breaker



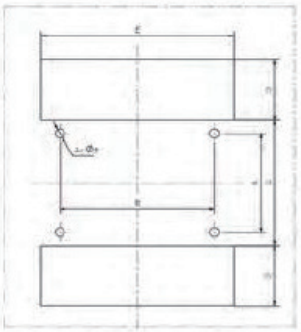
Outline and installation dimension



Beam and installation sizes

Drawer type behind-panel wiring opening diagram and related dimensions

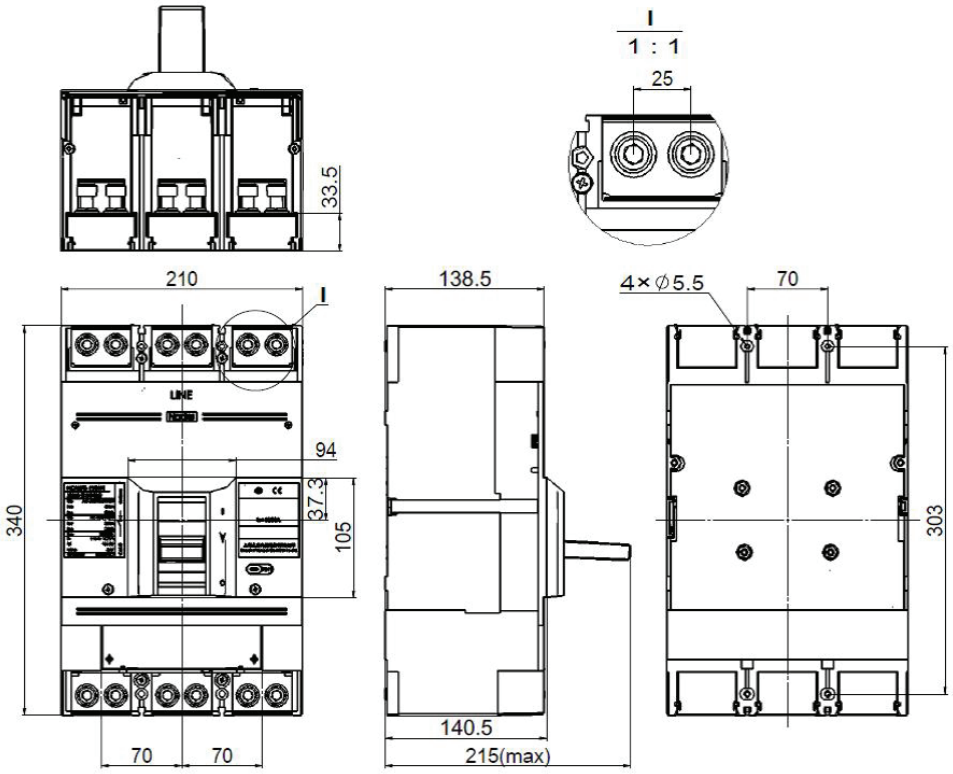
Model	Distributor breaker model	Number of poles	Installation dimension								Installation dimension		
			L1	L2	L3	H1	H2	H3	W1	W2	Φd1	A	B	Φd1
CH2-800/M	NDM2-800 NDM2E-630/800 NDM3-800 NDM3E-630/800	3P	367	410	241	260	26	73	70	289	Φ13	140	131	Φ6.5
		4P	367	410	241	260	26	73	70	359	Φ13	210	131	Φ6.5



Model	Chamber behind-panel opening size (applicable to behind-panel outgoing line only)							
	A	B		C	D	E		d
		At three-pole	At four-pole			At three-pole	At four-pole	
CH2-800/M	131	140	210	170	77	213	283	7

6.5 NDM3E-1250 Outline Dimension, Mounting Dimension and Wiring Method

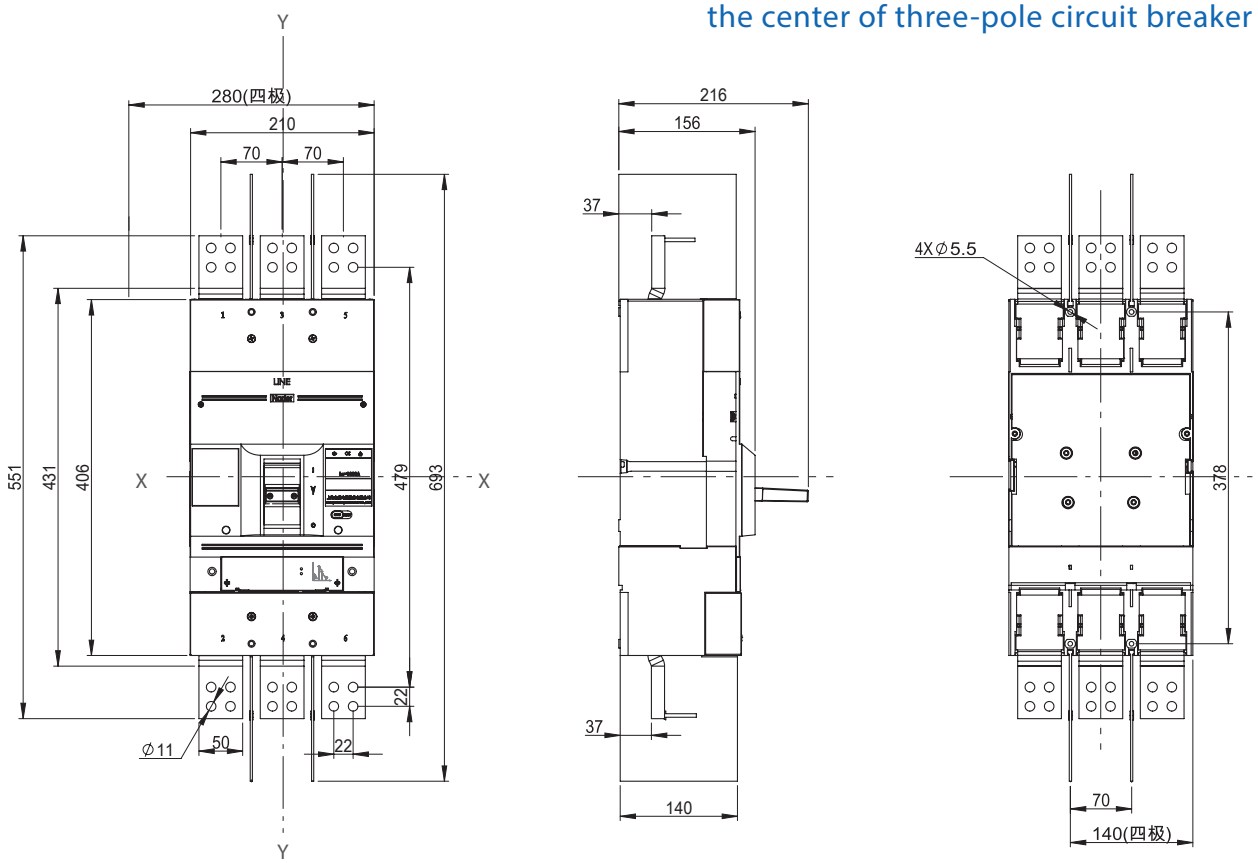
Before-panel wiring (three-pole)



6.6 NDM3E-1600 Outline Dimension, Mounting Dimension and Wiring Method

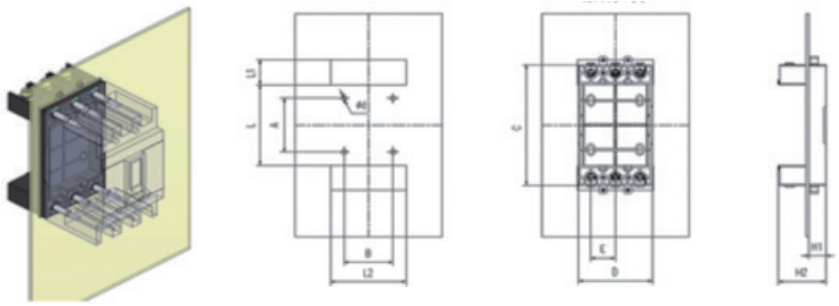
Before-panel wiring
(three-pole,four-pole)

X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker



6.7 NDM3E-(125-800)Z3 Plug-in Type Mounting Dimension and Wiring Method

● Z3H (Scheme 1): Behind-panel mounting

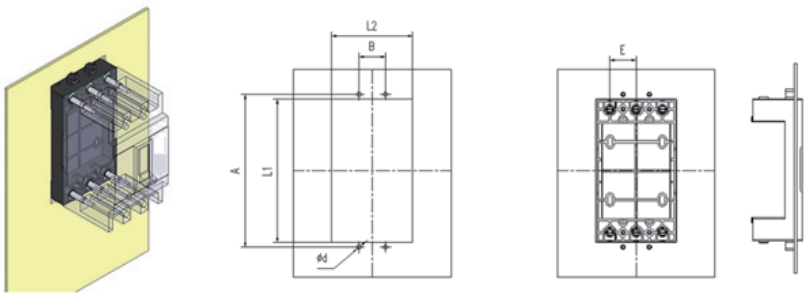


NDM3E series plug-in integrated type before- and behind-panel wiring (Z3Q/H):

Typical product model	Breaker model	A	B	L1	L2	d	E	Remarks
MZ3-125	NDM3E-125	170	30	161	92	5	30	
MZ3-250	NDM3E-250	191	35	180	107	5	35	
MZ3-400	NDM3-400	290	48	276	150	6	48	
MZ3-800	NDM3-630/800	327	70	313	212	6	70	

Note: When the product is 4-pole and the frame degree is ≤250A, phase distance E shall be increased for sizes B and L2; when the product is 4-pole and the frame degree is ≥400A, size B remains unchanged and phase distance E is increased for N pole distance of L2.

● Z3H (Scheme 2): Large opening behind-panel mounting

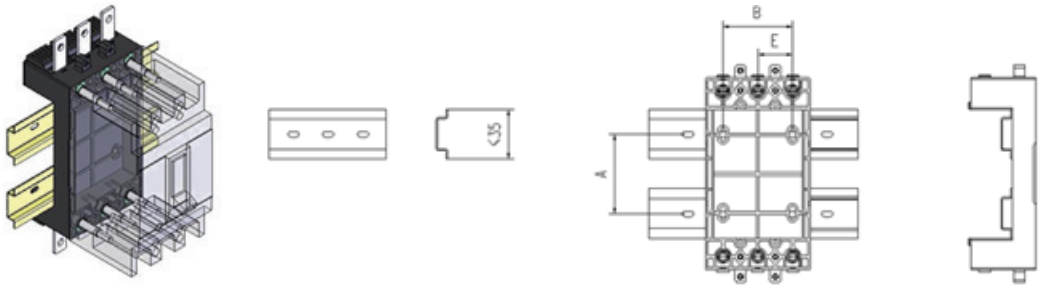


NDM3E series plug-in integrated type before- and behind-panel wiring (Z3Q/H):

Typical product model	Breaker model	A	B	L1	L2	d	E	Remarks
MZ3-125	NDM3E-125	170	30	161	92	5	30	
MZ3-250	NDM3E-250	191	35	180	107	5	35	
MZ3-400	NDM3-400	290	48	276	150	6	48	
MZ3-800	NDM3-630/800	327	70	313	212	6	70	

Note: When the product is 4-pole and the frame degree is ≤250A, phase distance E shall be increased for sizes B and L2; when the product is 4-pole and the frame degree is ≥400A, size B remains unchanged and phase distance E is increased for N pole distance of L2.

● Z3H (Scheme 3): Frame behind-panel mounting

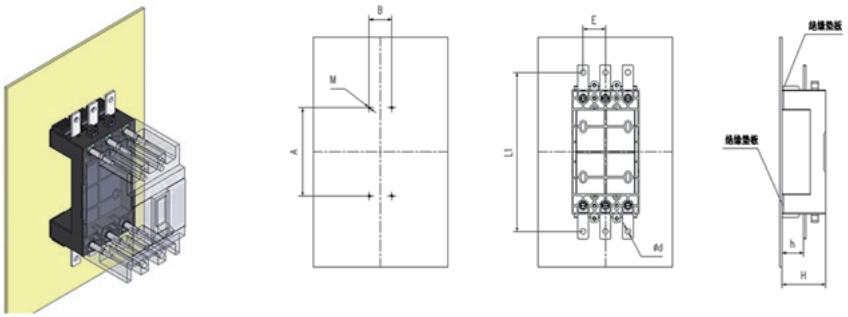


NDM3E series plug-in integrated type before- and behind-panel wiring (Z3Q/H):

Typical product model	Breaker model	A	B	E	Remarks
MZ3-125	NDM3E-125	65	50	25	
MZ3-250	NDM3E-250	74	70	35	
MZ3-400	NDM3-400	140	96	48	
MZ3-800	NDM3-630/800	143	140	70	

Note: When the product is 4-pole, phase distance E is increased for size B.

● Z3Q: Before-panel mounting



NDM3E series plug-in integrated type before- and behind-panel wiring (Z3Q/H):

Typical product model	Breaker model	A	B	L1	E	d	M	H	h	Remarks
MZ3-125	NDM3E-125	110	30	198	30	6.5	M4	55	28	
MZ3-250	NDM3E-250	150	35	223	35	8.5	M4	74	32	
MZ3-400	NDM3-400	244	48	326	48	10.5	M5	85	36	
MZ3-800	NDM3-630/800	283	70	363	70	12.5	M6	125	67	

6.8 Selection of Cross-sectional Areas of Connecting Busbars and Cables

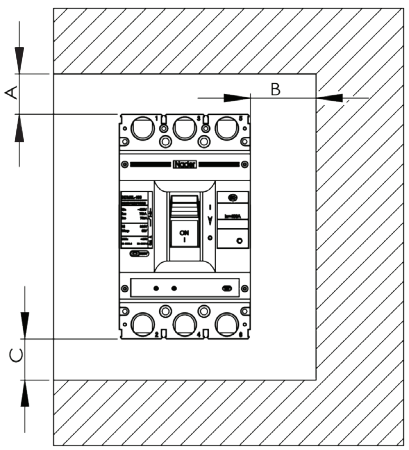
● Connecting wire as reference for cross-sectional area [1)]

Frame current (A)	Rated current (A)	Cross-section of wire/copper bar that can be at least connected (mm^2)			
125	125	50			
250	250	120			
400	400	240			
		Cable		Copper bar	
		Sectional area (mm^2)	Quantity	Sectional area (mm x mm)	Quantity
630	630	185	2	40 x 5	2
800	800	240	2	50 x 5	2
1250	1250	无	无	80 x 5	2
1600	1600	无	无	100 x 5	2

Note 1: Connect to the circuit breaker, and select the appropriate wiring method according to Outline Dimension, Mounting Dimension and Wiring Method;
Note 2: If copper bar is selected for connection, the copper bar cannot be directly connected to the circuit breaker body and extended busbar accessories are required.

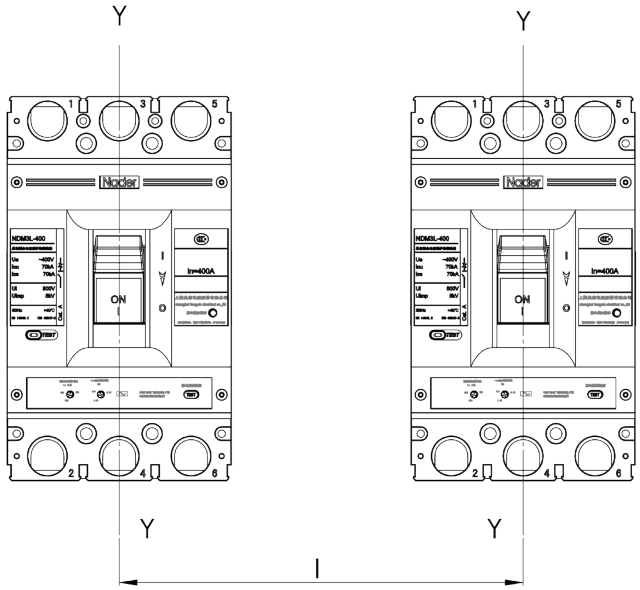
6.9 Safe Distance of Circuit Breaker Mounting

● Insulation distances for installation in a small metal cabinet (unit: mm)



Mounting distance	A (From incoming line end to cabinet surface)		B (Distance from the side to the cabinet)	B (Distance from the side to the cabinet)
Specifications	With zero flashover cover	Without zero flashover cover		
NDM3E-125	25	65	30	30
NDM3E-250	25	65	30	30
NDM3E-400	25	120	35	35
NDM3E-630	25	120	35	35
NDM3E-800	25	120	35	35
NDM3E-1250	/	120	35	35
NDM3E-1600	/	120	35	35

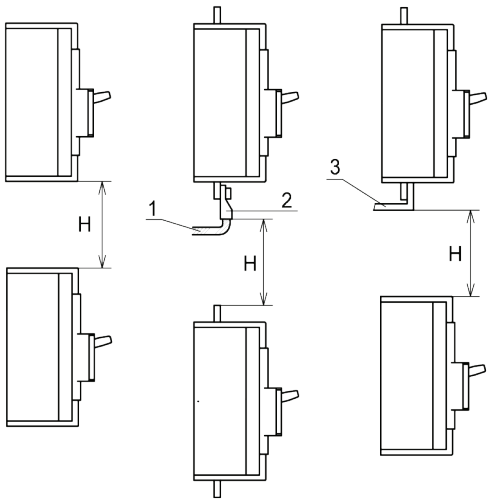
Minimum center distance of row installation room of the circuit breakers



Specifications	Circuit breaker width (mm)		Center distance I (mm)	
	Three-pole	Four-pole	Three-pole	Four-pole
NDM3E-125	92	122	122	152
NDM3E-250	107	142	137	172
NDM3E-400	150	198	190	238
NDM3E-630	182	240	222	280
NDM3E-800	210	280	250	320
NDM3E-1250	210	280	250	320
NDM3E-1600	210	280	250	320

Note: For installation of circuit breakers in a row or stack, check the connection busbars or cables to ensure the air insulation distance will not be reduced.

Minimum distance between circuit breakers installed in stack



1: Bare cable connection
2: Cable insulation connection
3: Connection and no insulation

Specifications	H (distance between the bottom and top of circuit breaker)	
	With zero flashover cover	Without zero flashover cover
NDM3E-125	90	91
NDM3E-250	90	93
NDM3E-400	155	155
NDM3E-630	155	155
NDM3E-800	155	155
NDM3E-1250	155	155
NDM3E-1600	155	155

Note: Check whether the zero flashover cover or the interphase barrier is installed in place before energizing.

7. Usage and Maintenance

- The characteristics of circuit breaker and accessories are set by the manufacturer; only the trained or certified professional personnel can adjust, install and maintain the circuit breaker, tripping unit and other accessories referring to the circuit design parameters;
- Ensure the power is in the inactive state before installation and removal of any device.
- The handle of circuit breaker can be located at three positions respectively representing the three conditions of closing, disconnection and free tripping. When the handle is at the free tripping position, the handle should be pulled in the disconnection direction. At this time, the circuit breaker could re-buckle and then the switch could be closed.
- Please observe the conditions for storage and use; if the product is damaged or cannot be normally used due to quality problem within 36 months from the date of delivery by the manufacturer, the manufacturer is responsible for free repair or replacement.

8. Specifications for Ordering or Selection

- Please specify the models, specifications and ordering quantity of circuit breakers; when under-voltage tripper, shunt tripper or electrically operated mechanism are used, please indicate the voltage values of operating voltage and control power.

User unit:	Number of units ordered:	Date of order:
Model NDM3E-- ☐☐☐/☐☐☐☐		Wiring mode: Before-panel wiring ☐
Rated current In = ☐ A		Behind-panel wiring ☐
		Plug-in type behind-panel wiring ☐
		Plug-in type before-panel wiring ☐

	Overload long-time delay operating current I_R ☐ A		Long-time delay operating time T_R ☐ S	
	Short circuit short-time delay operating current I_{sd} ☐ × I_R		Short time delay operating time T_{sd} ☐ S	
	Instantaneous short-circuit operating current I_i ☐ × I_n		☐	
	Pre-alarm operating current I_p ☐ × I_R		☐	
Grounding type controller setting	Overload long-time delay operating current I_R ☐ A		Long-time delay operating time T_R ☐ S	
	Short circuit short-time delay operating current I_{sd} ☐ × I_R		Short time delay operating time T_{sd} ☐ S	
	Instantaneous short-circuit operating current I_i ☐ × I_n		Pre-alarm operating curren I_p ☐ × I_R	
	Pre-alarm operating current I_p ☐ × I_R		Grounding fault operating time T_g ☐ S	
Accessories	Under-voltage tripper	AC380V ☐	AC220V ☐	
	Shunt tripper	AC380V ☐	AC220V ☐	DC220V ☐ DC24V ☐
		Left ☐	Right ☐	
	Electric operating mechanism	AC380V ☐	AC220V ☐	AC110V ☐
		DC220V ☐	DC110V ☐	DC24V ☐
	Turning handle operating mechanism	M3E ☐		
	Other accessories	Bonding bar ☐	Interlocking mechanism ☐	
Remarks				

● Intelligent controller factory setting value

Setting item		Distribution circuit breaker		Moto type circuit breakers	
Overload long-time delay	Setting current I_R	In		In	
	Setting time T_R	100s	10s*	100s	10s*
Short circuit short-time delay	Setting current I_{sd}	$6I_R$		$8I_R$	
	Setting time T_{sd}	0.3s		0.3s	
Instantaneous short-circuit	Setting current I_i	$10I_N$		10In	
Pre-alarm	Setting current I_p	0.9Ir		$0.9I_R$	
Grounding fault protection function		Closed			

NDM3Z
DC Moulded Case Circuit Breaker

Edition 2016

Nader 良信电器

1. Product Overview

																	
Frame grade	**NDM3Z-125**			NDM3Z-250				NDM3Z-250V	NDM3Z-400			NDM3Z-630			**NDM3Z-800**		
Frame current level range	16、20、25、32、40、50、63、80、100、125			125、140、160、180、200、225、250				63、80、100、125、140、160、180、200、225、250	225、250、315、350、400			400、500、630			630、700、800		
Ue（DC V）	500	750	1000	500	750	1000	1200	1500	500	750	1000	500	750	1000	500	750	1000
Number of poles	2	3	4	2	3	4	4	3	2	3	4	2	3	4	2	3	4
Rated ultimate short-circuit breaking capacity Icu (kA)	20	20	20	35	40	40	10	20	35	40	40	35	40	40	35	40	40
Rated running short-circuit breaking capacity Ics (kA)	20	20	20	35	25	25	10	15	35	40	40	35	40	40	35	40	40
Four-pole products	It is divided into J0, J1, J2 and J3 by wiring method																
Certification	CCC、TUV、CE																

2. Product Features

Scope of application and purpose

NDM3Z series DC moulded case circuit breakers (hereinafter referred to as breakers) are applicable to work in DC system application environment with rated operating voltage of DC1000V, and rated operating current of up to 800A.

To satisfy the customers ' application of higher voltage of DC system, we have launched NDM3Z-250V high-voltage high-breaking product whose rated operating voltage is up to DC1500V and rated operating current is up to 250A. The circuit breaker provides overload and short circuit protection, and can protect the circuit and power equipment from damage. The product has been widely used in new energy, electric power, industrial control, real estate, electric power supply, telecommunications, rail transportation, industrial (public) construction and other industries.

Structural features

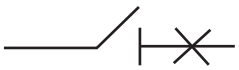
- The circuit breaker is characterized by small size, high breaking capability, short arcing, vibration resistance, etc.
- Boxed accessories may be used for rapid installation of circuit breaker, and timely respond to the user requirements without any adjustments.

Meeting the following standards

- GB 14048.1 Low-voltage switchgear and controlgear - Part 1: General rules
- GB 14048.2 Low-voltage switchgear and controlgear - Part 2: Circuit breakers
- IEC 60947-1 Low-voltage switchgear and controlgear-Part 1 : General rules
- IEC 60947-2 Low-voltage switchgear and controlgear-Part 2 : Circuit-breakers

3. Application Scope

3.1 Electrical Symbols

The circuit breaker provides isolation function, whose corresponding symbol is: 

3.2 Applicable Environment

● Temperature of the working environment

--35℃ ~ +70℃, the average value in 24h is not more than +35℃. At +50℃ and above, the user needs to run with less load. For derating factors, see “NDM3Z MCCB derating factor table”.

● Storage temperature:

-40℃ ~ +75℃。

● Altitude

The altitude of installation site is ≤4000m, and the derating factors under varied altitudes are shown in "Table of derating factors of NDM3Z moulded case circuit breaker under varied altitudes";

● Relative humidity for operation/Relative humidity for storage

At the ambient temperature of +40℃, the relative humidity shall not be more than 50%; for a lower temperature, the humidity may be higher, for example: The relative humidity could be up to 90% at 20℃. Appropriate measures should be taken against frost due to temperature variation.

● Pollution grade

Grade 3.

● Installation category

◆ Mounting categories of circuit breaker connecting to the main circuit:Category III (power distribution and control level).

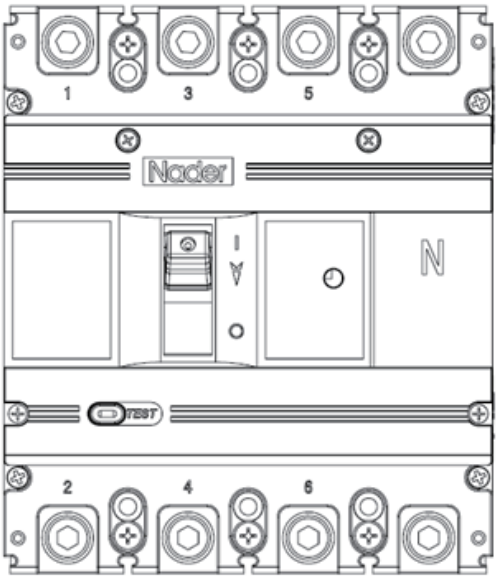
◆ Mounting categories of circuit breaker not connecting to the main circuit:Class Ⅱ (load level) .

● Installation environment

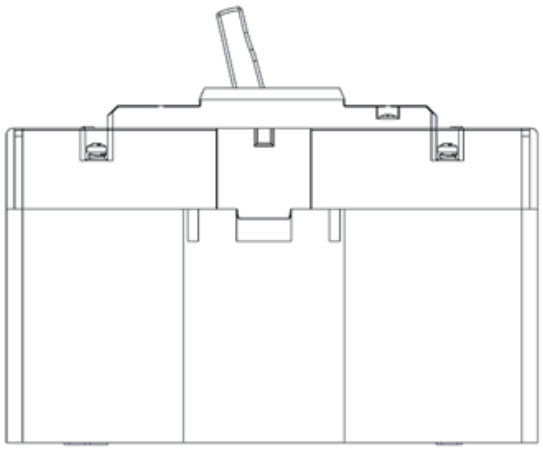
The product shall be installed in a medium without explosive danger, and the medium is not enough to corrode metal and damage the place where the insulating gas and conducting gas are located, so as to avoid any use in a rainy or snowy place.

Installation direction

- Vertical mounting, the gradient between the mounting plane and the vertical plane should be ≤ ±22.5 °.
- Horizontal mounting.



Vertical installation



Horizontal installation

3.3 NDM3Z Breaker Power Loss Table

Model	Current	Total power loss (W)
NDM3Z-125 direct heating type (16~25A)	25	40
NDM3Z-125 intermittent heating type (32~100A)	100	35
NDM3Z-125 intermittent heating type (125A)	125	39
NDM3Z-250 intermittent heating type (125~225A)	225	62
NDM3Z-250 intermittent heating type (250A)	250	67
NDM3Z-400 intermittent heating type (225~400A)	400	115
NDM3Z-630 intermittent heating type (400~630A)	630	187
NDM3Z-800 intermittent heating type (630~800A)	800	262

4. Technical Characteristics of the Product

4.1 Description of Specifications and Models

ND	M	3	Z	- □	□	□ / □	□	□ - □	□
1	2	3	4	5	6	7 8	9	10 11	12

Serial No.	Serial No. name	NDM3Z
1	Enterprise code	ND: Nader brand low-voltage apparatus
2	Product code	M: Moulded case circuit breakers
3	Design serial No.	3
4	Derived code	Z: DC moulded case circuit breaker
5	Frame level rated current	See Table 1
6	Breaking level	None:Conventional product
		V: High voltage breaking
7	Operation mode	No code: Direct operation by handle
		P: Electrically operated
		Z: Turning handle
8	Number of poles	2、3、4
9	Overload tripper code	0: Without tripper (Replace the disconnecting switch as the busbar connecting appliance)
		2: Instantaneous tripper only
		3: Complex tripper
10	Accessory code	See Table 2
11	Wiring method code (See Table 1)	2P without code: Conventional product
		3P without code: Conventional product, J0 (free wiring)
		4P: J0, J1, J2, J3, in parallel
12	Rated current	See Table 1

4.2 Technical Parameters

Table 1 Table of main performance parameters of circuit breaker

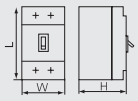
Model		NDM3Z-125			NDM3Z-250				NDM3Z-250V
Frame grade Current Inm (A)		125			250				250
Rated current In (A)		16、20、25、32、40、50、63、80、100、125			125、140、160、180、200、225、250				63、80、100、125、140、160、180、200、225、250
Rated insulation voltage Ui (V)		1000			1200				1500
Rated impulse withstand voltage Uimp (V)		8000			8000				8000
Power frequency withstand voltage U: (1 minute) (V)		3500			3500				3820
Use class		A			A				A
Number of poles		2	3	4	2	3	4	4	3
Rated limit short-circuit breaking capacity level		500	750	1000	500	750	1000	1200	1500
Rated ultimate short-circuit breaking capacity Icu (kA)		20	20	20	35	40	40	10	20
Rated running short-circuit breaking capacity Ics (kA)		20	20	20	35	25	25	10	15
Operating performance	Electrical life	5000			5000				2000
	Mechanical life	20000			10000				10000
Outline dimension 	L	150	150	150	165	165	165	165	200
	W	92	92	122	107	107	142	142	135
	H	87	87	87	104.5	104.5	104.5	104.5	104.5
Flashover distance (mm)		≤50			≤50				≤50
Wiring mode		Normal	Normal、J0	J0、J1、J2、J3	Normal	Normal、J0	J0、J1、J2、J3	J0、J1、J2、J3	Normal

Table 1 Main performance and technology parameters of circuit breaker (continued)

Model		NDM3Z-400			NDM3Z-630				NDM3Z-800			
Frame grade Current Inm (A)		400			630				800			
Rated current In (A)		225、250、315、350、400			400、500、630			1000、1250 (parallell)	630、700、800			1250、1440 (parallel)
Rated insulation voltage Ui (V)		1000			1000			1000	1000			1000
Rated impulse withstand voltage Uimp (V)		8000			8000			8000	8000			8000
Power frequency withstand voltage U: (1 minute) (V)		3500			3500			3500	3500			3500
Use class		A			A			A	A			A
Number of poles		2	3	4	2	3	4	4	2	3	4	4
Rated limit short-circuit breaking capacity level		500	750	1000	500	750	1000	500	500	750	1000	500
Rated ultimate short-circuit breaking capacity Icu (kA)		35	40	40	35	40	40	30	35	40	40	30
Rated running short-circuit breaking capacity Ics (kA)		35	40	40	35	40	40	30	35	40	40	30
Operating performance	Electrical life	1000			1000			1000	1000			500
	Mechanical life	5000			5000			5000	5000			5000
Outline dimension	L	257	257	257	270	270	270	270	280	280	280	280
	W	150	150	198	182	182	240	240	210	210	280	280
	H	104.5	104.5	104.5	108.5	108.5	108.5	108.5	112	112	112	112
Flashover distance (mm)		≤100			≤100				≤100			
Wiring mode		Normal	Normal	J2 J3	Normal	Normal	J2、J3	parallel	Normal	Normal	J2、J3	parallel

● Table of derating factors of NDM3Z DC moulded case circuit breaker under varied temperatures

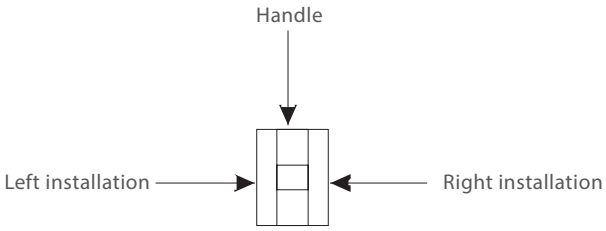
Serial No.	Frame grade Rated current（A）	Derating factors corresponding to temperatures						
		40℃	45℃	50℃	55℃	60℃	65℃	70℃
1	125	1	1	1	0.96	0.91	0.85	0.78
2	250	1	1	1	0.95	0.93	0.91	0.88
3	400	1	1	1	0.93	0.91	0.89	0.85
4	630	1	1	1	0.92	0.90	0.89	0.83
5	800	1	1	1	0.92	0.89	0.85	0.80

Note: When the ambient temperature is below 50℃, the product can be used normally, with no derating capacity.

● Table of derating factors of NDM3Z DC moulded case circuit breaker under varied altitudes

Altitude (m)	2000	3000	4000	5000
Operating current correction factor	In	0.97In	0.93In	0.89In
Operating voltage correction factor	Ue	Ue	Ue	Ue
Power frequency withstand voltage correction factor	U	U	U	U

4.3 Accessory Code Comparison Table



Legend:

- Single auxiliary contact
- Double auxiliary contacts
- Alarm contact
- Shunt tripper
- Under-voltage tripper
- Auxiliary contact (Single accessory integrates auxiliary and alarm functions)

Table 2 Comparison table of tripping method accessory codes

Accessory code	Accessories Name	Installation location / Model / Number of poles	NDM3Z -125			NDM3Z -250			NDM3Z -250V	NDM3Z -400			NDM3Z -630			NDM3Z -800		
			2	3	4	2	3	4	3	2	3	4	2	3	4	2	3	4
00	No		—			—			—	—			—			—		
10	Shunt tripper																	
20	Double auxiliary contacts								—									
21	Single auxiliary contact																	
30	Under-voltage tripper								—									
40	Shunt tripper, double auxiliary contacts								—									
41	Shunt tripper, single auxiliary contact																	
50	Shunt tripper, under-voltage tripper								—									
60	Two-pole double auxiliary contacts								—									
61	Two-pole single auxiliary contacts								—									
62	Double auxiliary contacts, single auxiliary contact								—									
70	Under-voltage tripper, double auxiliary contacts								—									
71	Under-voltage tripper, single auxiliary contact								—									
08	Alarm contact								—									
18	Shunt tripper Alarm contact								—									
28	Double auxiliary contacts, alarm contact								—									
38	Under-voltage tripper, alarm contact								—							—		
48	Shunt tripper Alarm contact								—									
58	Auxiliary alarm contact								—									
68	Double auxiliary contacts, auxiliary alarm contact								—									
78	Under-voltage tripper, auxiliary alarm contact								—							—		

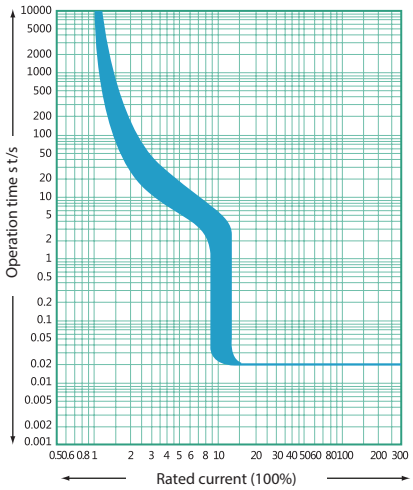
4.4 Product Tripping Curve

● Circuit breaker tripper operating performance table

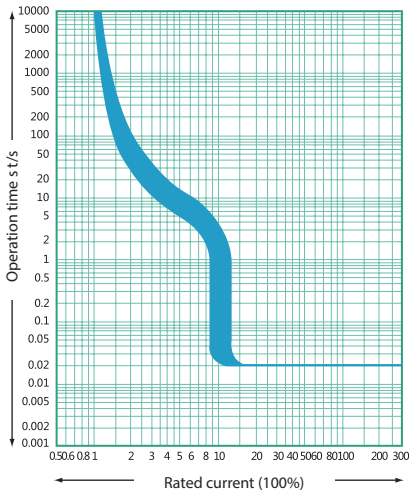
Tripper rated current (A)	Thermal tripper (ambient temperature is +50℃)		Operating current for the electromagnetic tripper (A)	Remarks
	1.05In (cold state) non-operating time (h)	1.3In (thermal state) operating time (h)		
16≤In≤63	1	1	10 In × （1 ± 20%）	Power distribution type
63 < In≤800	2	2	10 In × （1 ± 20%）	

● Product short circuit overload protection characteristic curve

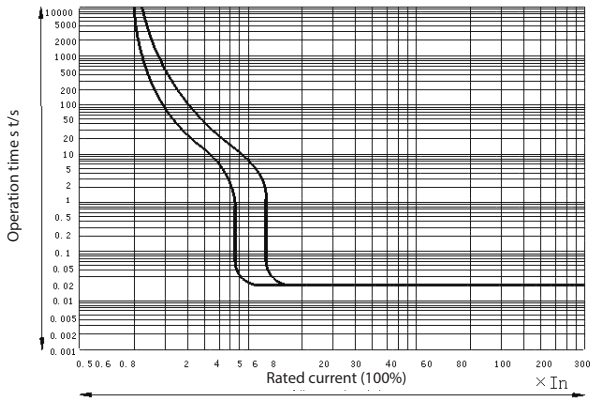
NDM3Z-125 time/current characteristic curve



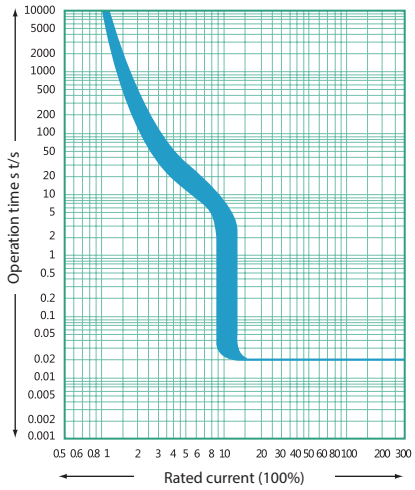
NDM3Z-250 time/current characteristic curve



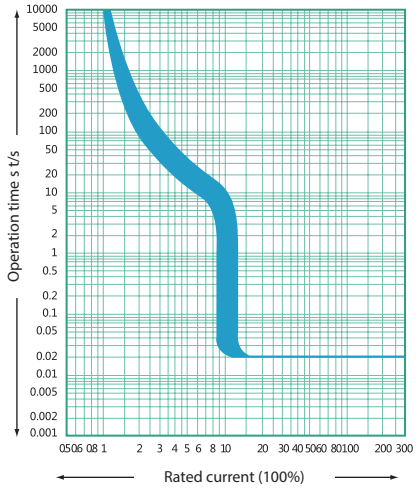
NDM3Z-250V time/current characteristic curve



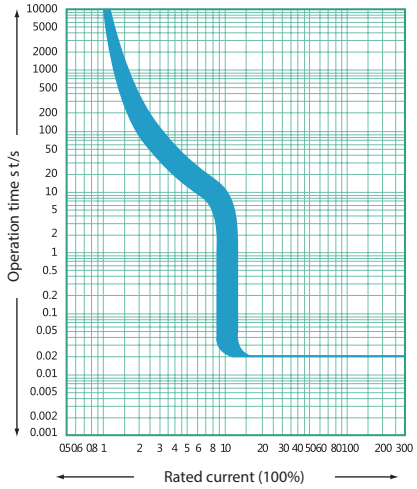
NDM3Z-400 time/current characteristic curve



NDM3Z-630 time/current characteristic curve

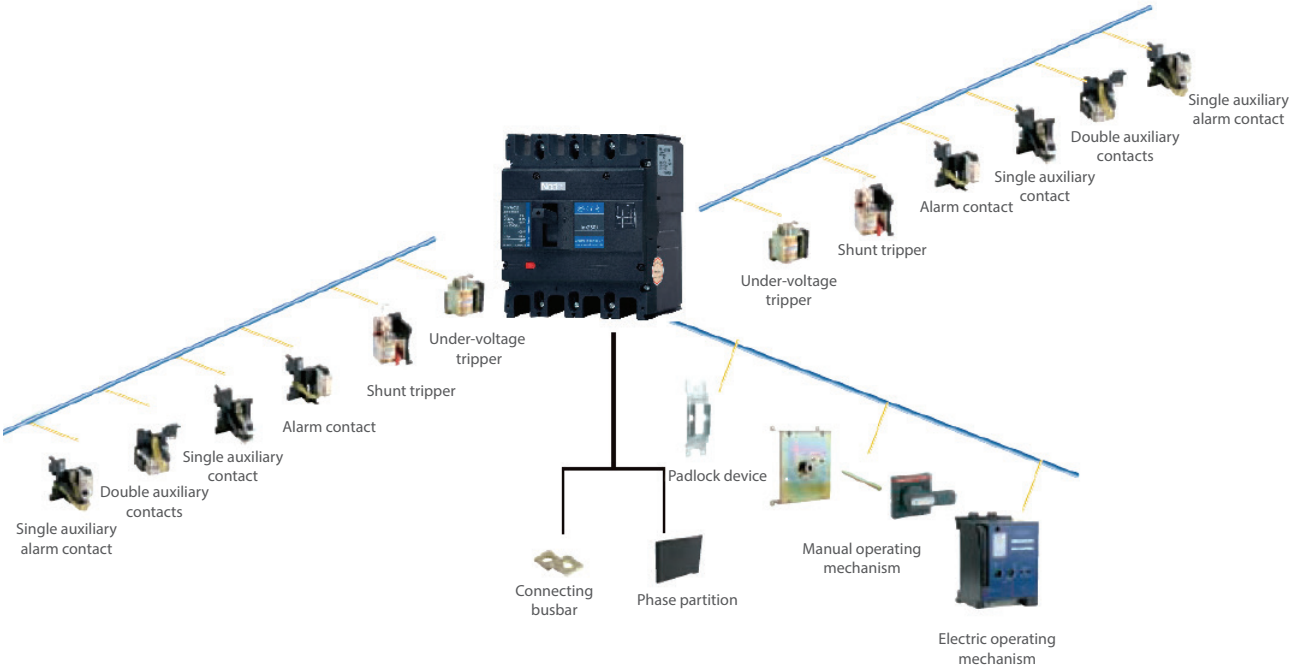


NDM3Z-800 time/current characteristic curve



5. Accessories

5.1 List of Accessories



5.2 Accessories Function Description

5.2.1 Auxiliary contact

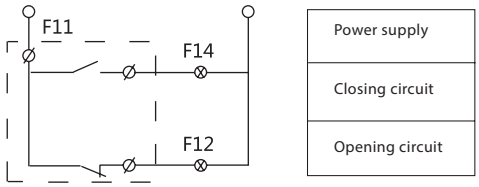
- Auxiliary contacts and combinations

The breaker is at the "opening" or "free tripping" position	Double auxiliary contacts	F14 F12 — F11; F24 F22 — F21
	Single auxiliary contact	F14 F12 — F11
The breaker is at the "closing" position	"Closing" switches to "opening", "opening" switches to "closing"	

- Auxiliary contact current parameters

Frame grade Rated current	Conventional heating current	Rated operational current at AC 400V
125~800	3A	0.30A

Auxiliary contact wiring diagram



Electrical life of auxiliary contact

Use class	Switch on			Breaking			Frequency	Operation frequency (time(s)/hour)	Conduction time
	I/Ie	I/Ie	cos φ	I/Ie	U/Ue	cos φ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

Connection and breaking capacity of auxiliary contact

Use class	Switch on			Breaking			Frequency	Operation frequency (time(s)/hour)	Conduction time
	I/Ie	I/Ie	cos φ	I/Ie	U/Ue	cos φ			
AC-15	10	1	0.3	1	1	0.3	10	120	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

5.2.2 Alarm contact

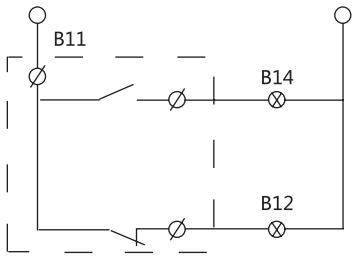
Auxiliary contacts and combinations

Alarm contact Ue = 220V, Ith = 3A

When the circuit breaker is at the position of “opening” or “closing”	
The circuit breaker is at the “free tripping” position	

Alarm contact wiring diagra

In the case of proper closing or opening of circuit breaker, the contact does not operate; only after free tripping (or fault tripping) will the original state of contact be changed, which means normally open switches to closed and normally closed switches to open; after re-buckle of the circuit breaker, the contact is restored to the original position.

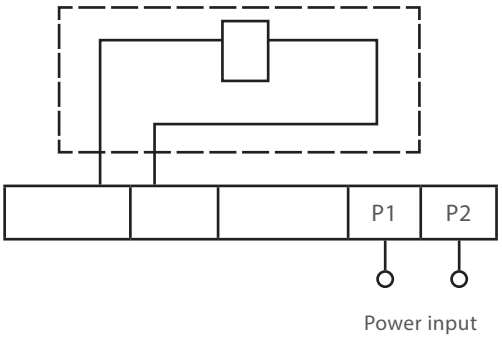


5.2.3 Under-voltage tripper

★ At 35%~70% of rated control power voltage, the under-voltage tripper should operate reliably to disconnect the circuit breaker.When it is less than 35% of the rated voltage, the circuit breaker should be reliably prevented from closing; when the power supply voltage is equal to or greater than 85% of rated voltage, it should be ensured that the circuit breaker is closed.

★ Control voltage: AC 50 Hz 230 V 400 V

★ Note: The under-voltage tripper must be energized first in order to re-buckle and close the circuit breaker, otherwise it will damage the circuit breaker.



Under-voltage tripper wiring diagram

5.2.4 Shunt tripper

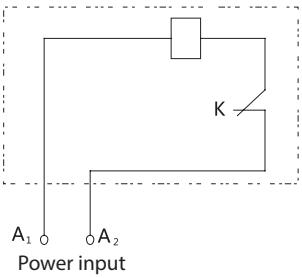
★ Generally installed at Phase A of circuit breaker; the shunt tripper should enable the circuit breaker to trip reliably at 70%~110% of rated control voltage under all operation conditions.

★ Control voltage: AC 50Hz 230V 400V

DC 24V low power consumption, 24V, 220V

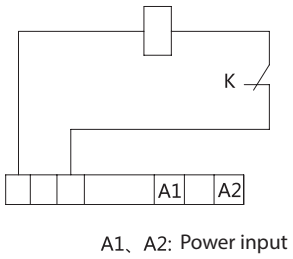
● Shunt tripper wiring diagram

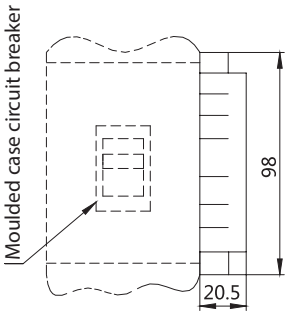
When the control circuit power supply is DC24V and the power is lower than 80W, it is possible to use low power shunt tripper or add intermediate relay.



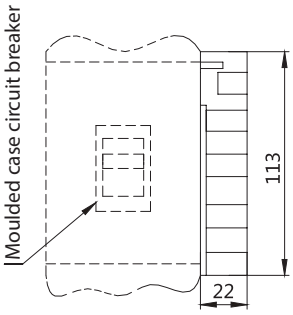
● DC24V low power shunt tripper wiring diagram and outline dimension of external ceiling rose

The normal operating power of DV24V low power shunt tripper is as low as 15W, which substantially meet the requirements of all DC24V control circuits. The low power shunt has a plug-in junction box, whose outline dimension is shown below.



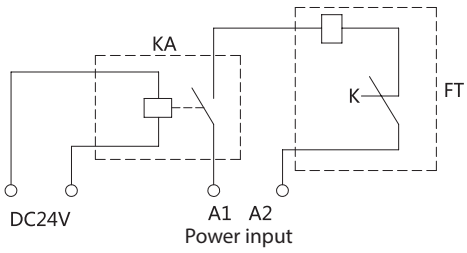


NDM3Z-125~250



NDM3Z-400~800

★ DC24V control power wiring diagram



KA： DC24V relay with electric shock capacity of 1A

FT： AC220V/380V Shunt tripper

The rated voltage of FT is the power input voltage of A1 and A2

● Instantaneous current and power consumption of shunt tripper

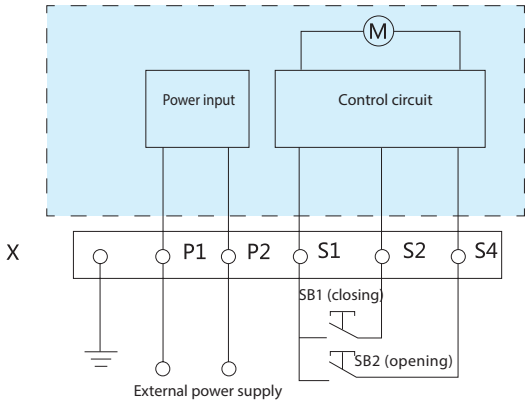
Product models	Instantaneous current value (A)				Power consumption (W)				
	AC 400V	AC 230V	DC220V	DC 24V	AC 400V	AC 230V	DC 220V	DC 24V	DC 24V (Low power consumption)
NDM3Z-125	0.288	0.425	0.341	4	96.8	73	90.7	91.2	15
NDM3Z-250	0.313	0.412	0.341	3.87	112	68.8	90.7	85.3	15
NDM3Z-400	0.197	0.325	0.4	3.87	67	62.3	94.4	100	15
NDM3Z-630	0.199	0.314	0.4	3.87	68	58.2	94.4	100	15
NDM3Z-800	0.538	0.898	1.134	5.22	163	153		120	15

5.3 Functions and Sizes of NDM3Z External Accessories

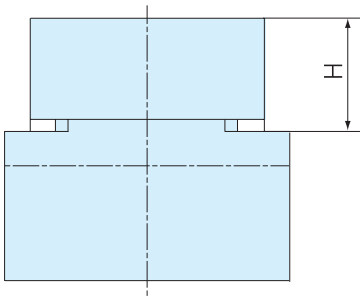
5.3.1 Electric operating mechanism

● CD2 electric operating mechanism (equipped with NDM3-125-800 series)

◆ Wiring diagram (The circuit breaker external accessory wiring diagram is in the dotted box)



◆ CD2 Electric operating mechanism



Symbol instruction :

SB1, SB2: Operating button (prepared by users)

X : Terminal block

P1 、P2 : External power supply

◆ Voltage specification:

AC 50Hz 110V、230V、400V

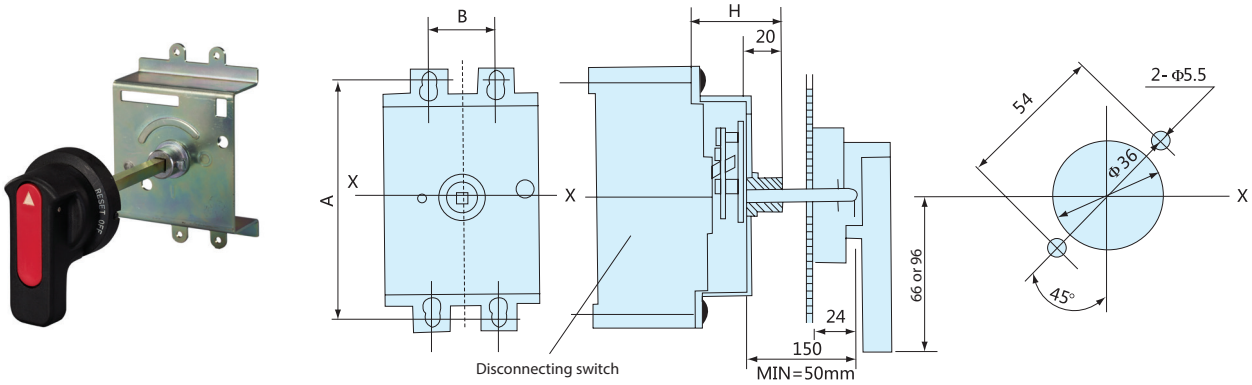
DC 24V、110V、220V

● Technical parameters of CD2 motor operating mechanism

Equipped with circuit breaker	Operating current (A)	Electric power (W)	Life/times	Operating mechanism height H (mm)
NDM3Z-125	≤0.5	14	20000	89.5
NDM3Z -250	≤0.5	14	20000	92
NDM3Z -400	≤2	35	10000	149
NDM3Z -630	≤2	35	10000	147
NDM3Z -800	≤2	35	5000	151

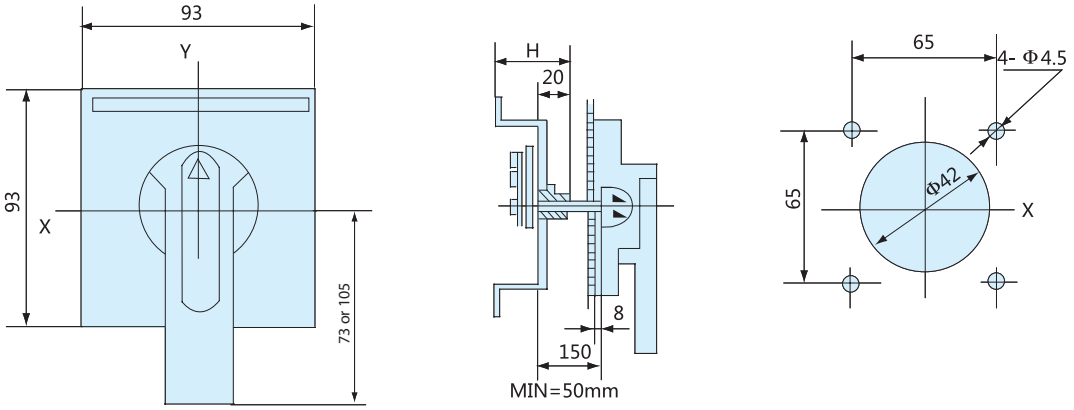
5.3.2 Manual operating mechanism

- CS1-A type handle mounting opening diagram

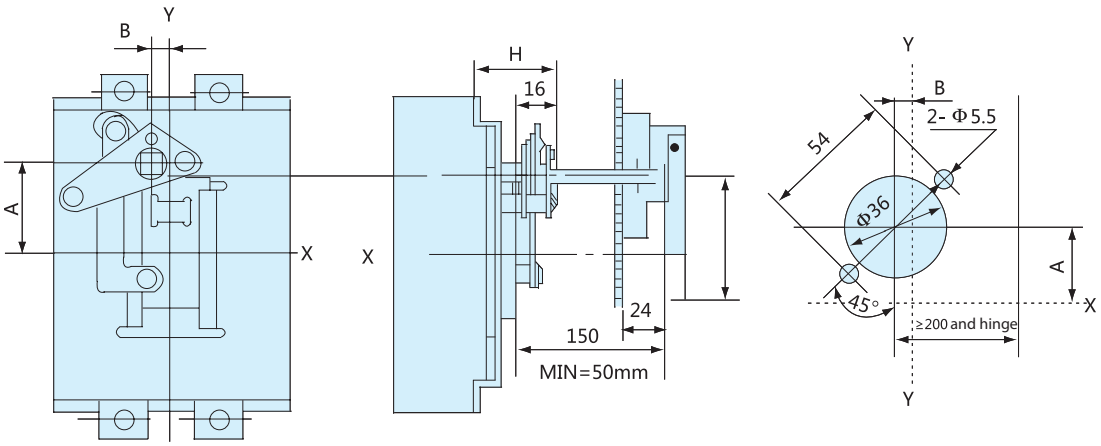


Note: A type is a round handle F type is a square handle

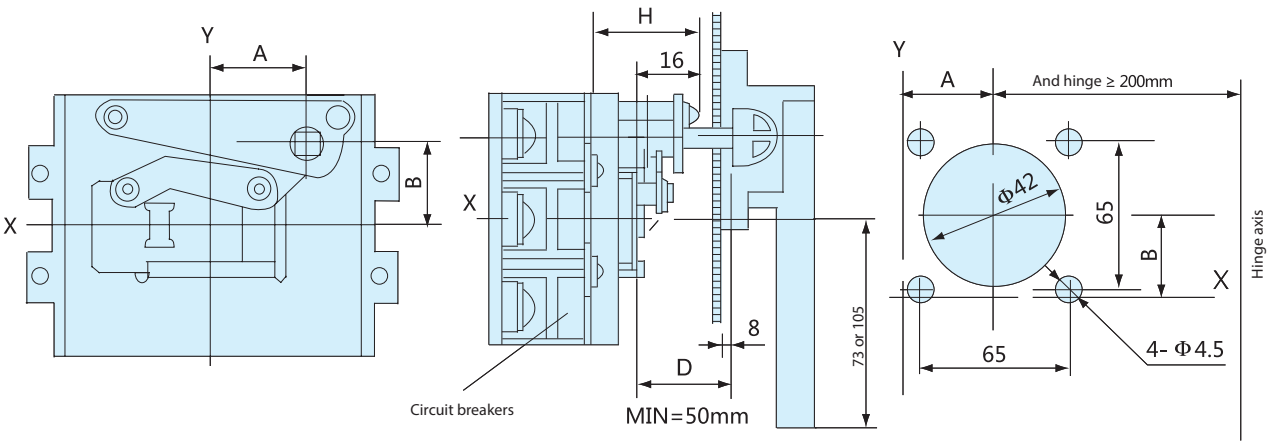
- CS1-F type handle mounting opening diagram



- CS2-A type handle mounting opening diagram



● CS2-F type handle mounting opening diagram



● Mounting method and outline dimension of manual operating mechanism

External accessories	External accessory model	Equipped with circuit breaker	Manual installation dimensions: (mm)				Installation mode
			H	A	B		
					3P	4P	
Manual operating mechanism	CS1-100	NDM3Z-125	54	104	30		Vertical mounting
	CS1-225	NDM3Z-250	55	143	35		
	CS1-400(NDM3)	NDM3Z-400	82	194	137	185	
	CS1-630(NDM3)	NDM3Z-630	82	200	171	229	
	CS1-800(NDM3)	NDM3Z-800	84	243	198	268	
	CS2-100	NDM3Z-125	46	35	11.5		
	CS2-225	NDM3Z-250	48	35	31		
	CS2-400(NDM3)	NDM3Z-400	61	65	15		
	CS2-630(NDM3)	NDM3Z-630	61	60	15		
	CS2-800(NDM3)	NDM3Z-800	66	48	15		

Note: In the figure, size D is 150mm by default, and can be customized according to the customer requirements.

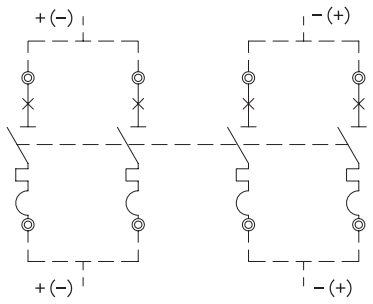
5.4 Special Applications

● Parallel inside the circuit breaker

The product can enhance the maximum current application by interphase paralleling to meet the customer demand of DC system. And the customer can provide free incoming lines from the bottom or top.

NDM3Z-630 Parallel In: 1000A, 1250A

NDM3Z-800 Parallel In: 1250A, 1440A

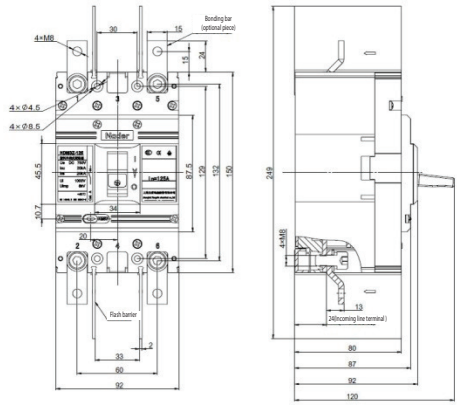


6. Product Outline Dimension

6.1 NDM3Z-125 Outline Dimension, Mounting Dimension and Wiring Method

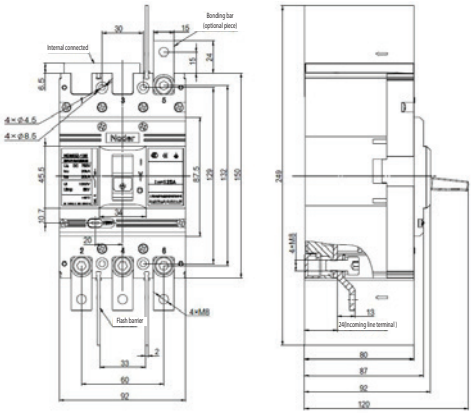
Before-panel wiring

Two-pole

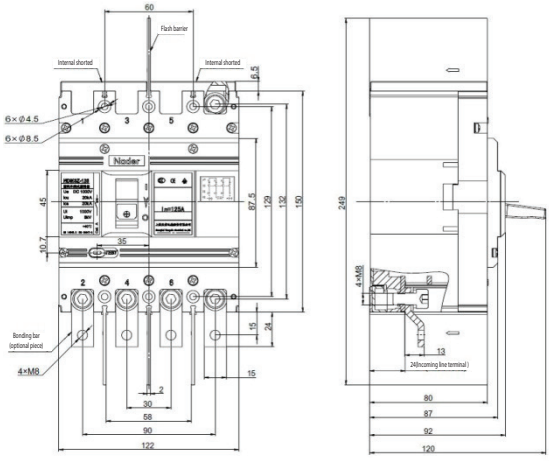


X-X, Y-Y represents the center of circuit breaker handle

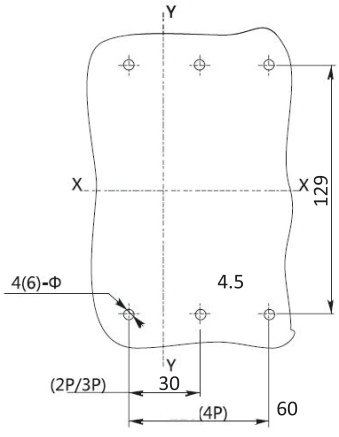
Three-pole



Four-pole



the size of opening of before-panel wiring mounting panel

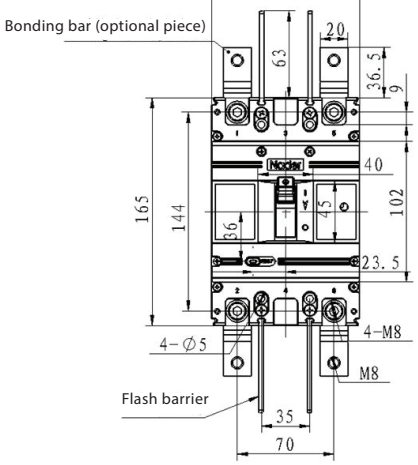


6.2 NDM3Z-250 Outline Dimension, Mounting Dimension and Wiring Method

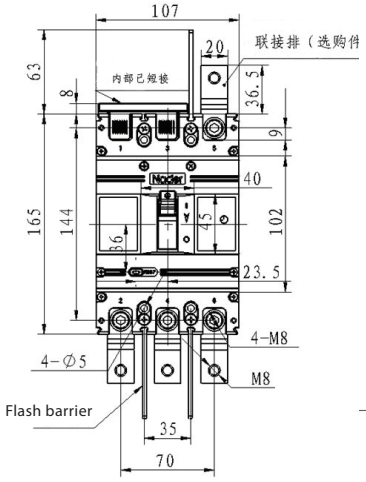
Before-panel wiring

X-X, Y-Y represents the center of circuit breaker handle

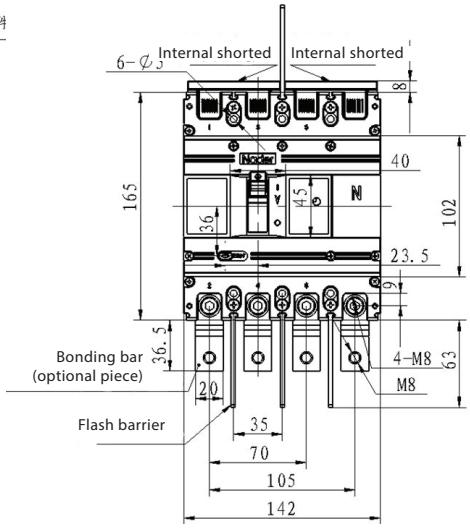
Two-pole



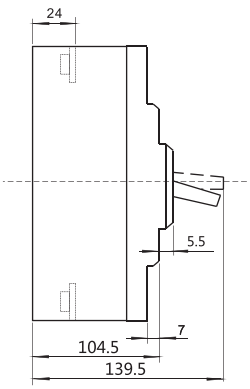
Three-pole

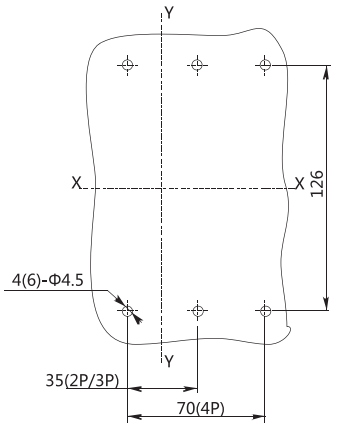


Four-pole



the size of opening of before-panel wiring mounting panel

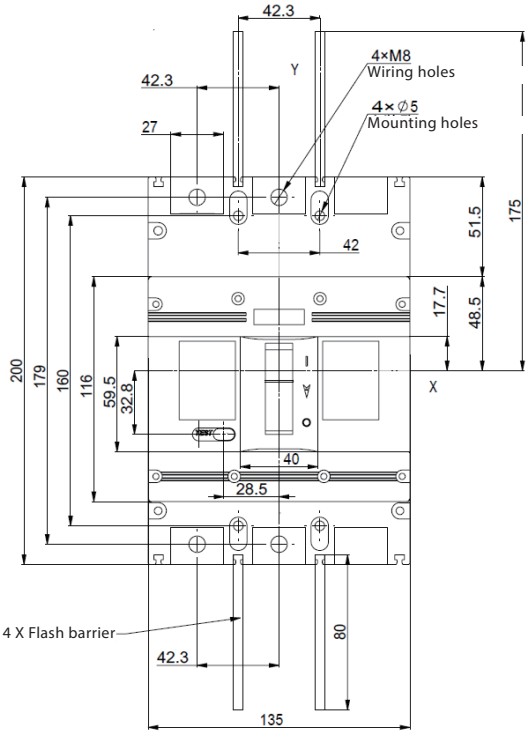




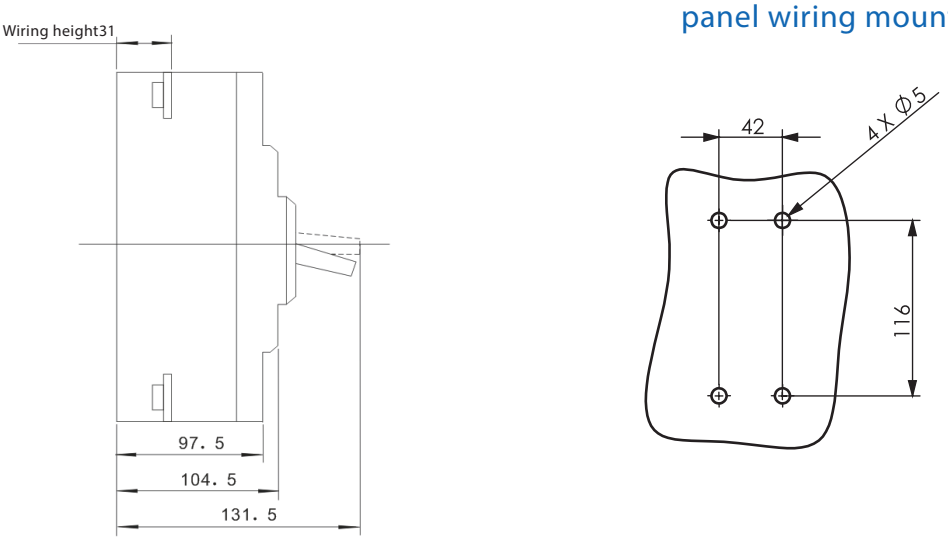
6.3 NDM3Z-250V Outline Dimension, Mounting Dimension and Wiring Method

Before-panel wiring

X-X, Y-Y represents the center of three-pole circuit breaker



the size of opening of before-panel wiring mounting panel

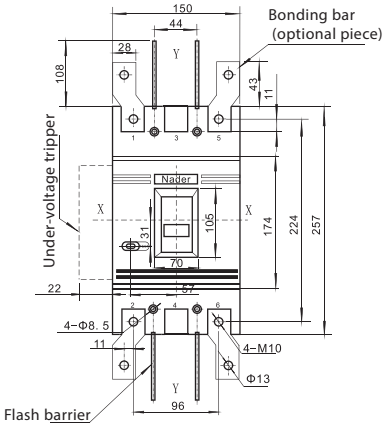


6.4 NDM3Z-400 Outline Dimension, Mounting Dimension and Wiring Method

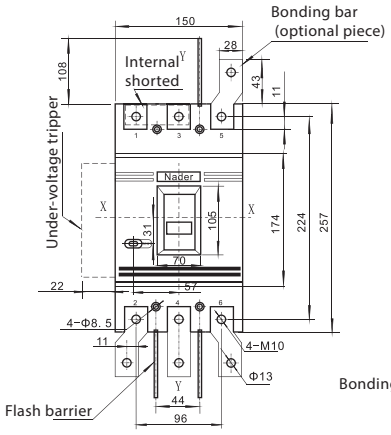
Before-panel wiring

X-X, Y-Y represents the center of three-pole circuit breaker

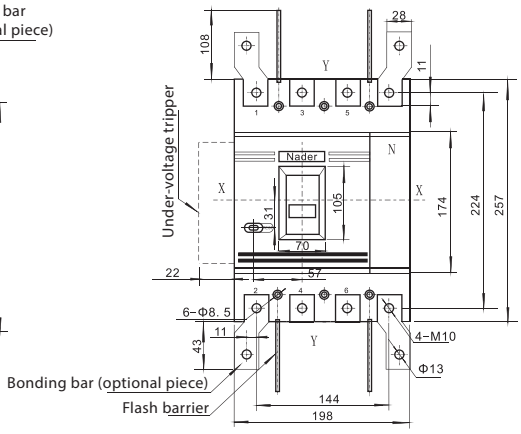
Two-pole



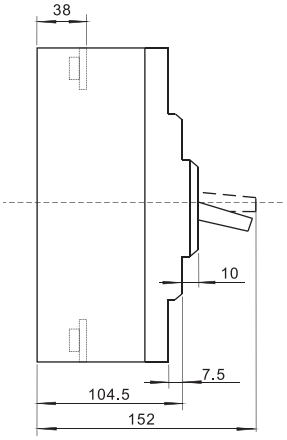
Three-pole

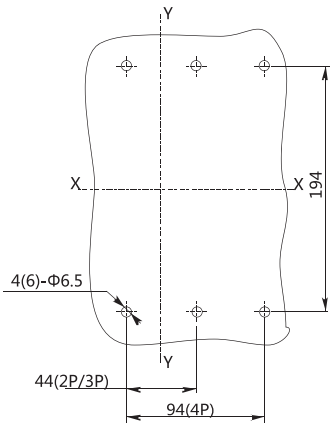


Four-pole



the size of opening of before-panel wiring mounting panel



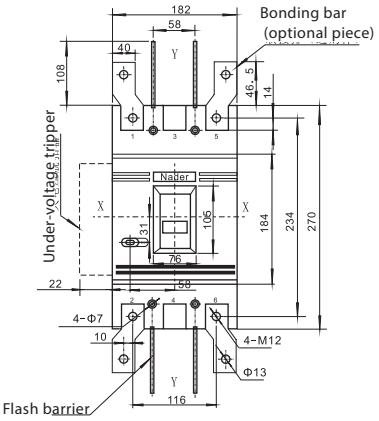


6.5 NDM3Z-630 Outline Dimension, Mounting Dimension and Wiring Method

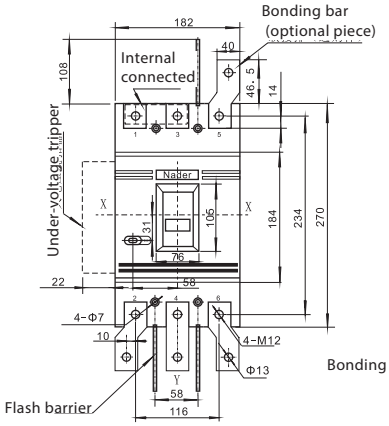
Before-panel wiring

X-X, Y-Y represents the center of circuit breaker handle

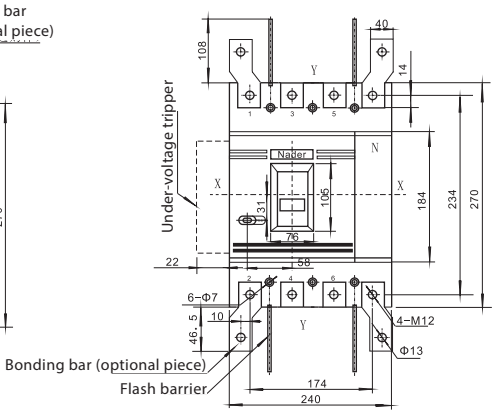
Two-pole



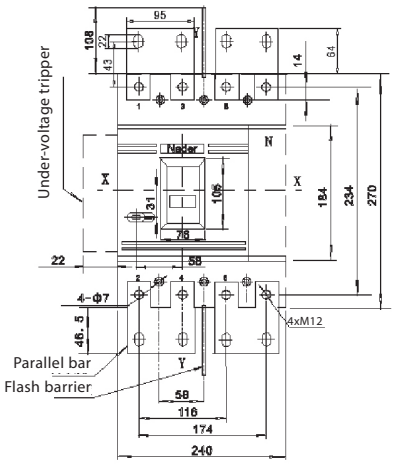
Three-pole



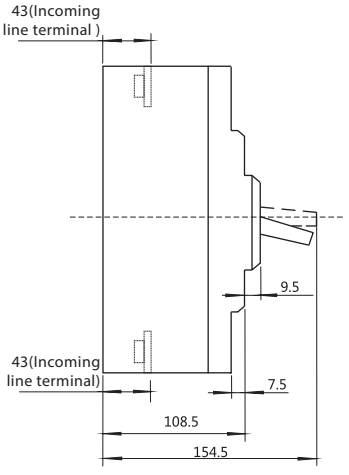
Four-pole

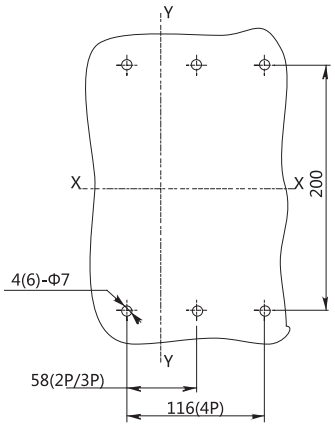


Four-pole parallel wiring



the size of opening of before-panel wiring mounting panel



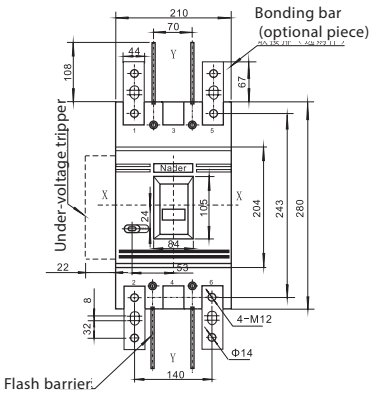


6.6 NDM3Z-800 Outline Dimension, Mounting Dimension and Wiring Method

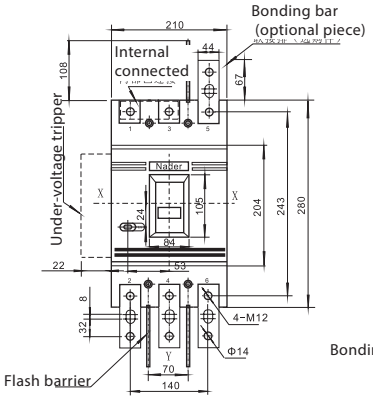
Before-panel wiring

X-X, Y-Y represents the center of circuit breaker handle

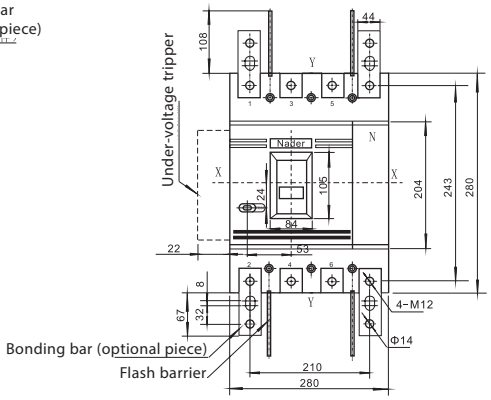
Two-pole



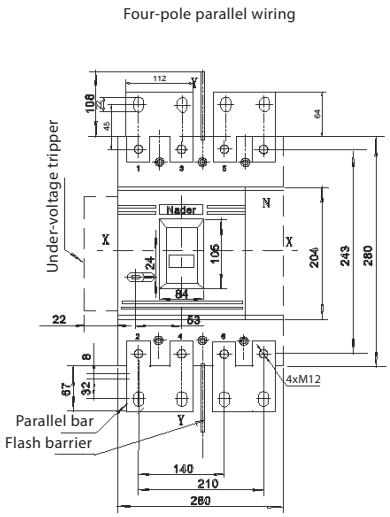
Three-pole



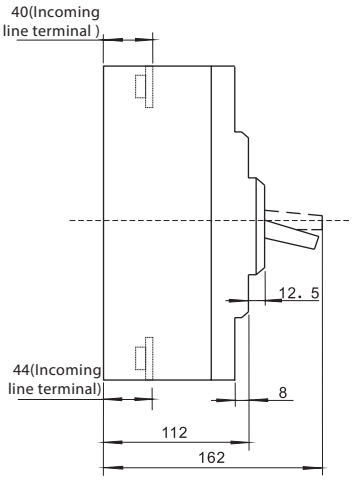
Four-pole

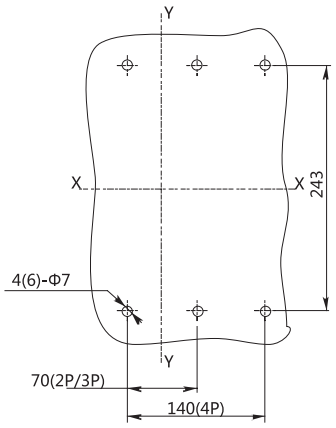


Four-pole parallel wiring

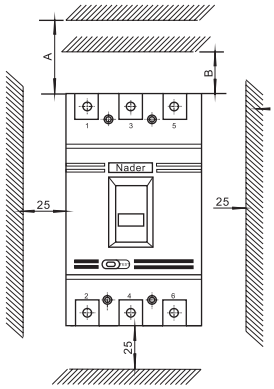


the size of opening of before-panel wiring mounting panel





Breaker safe distance (unit: mm)



Model	A	B
NDM3Z-125	50	25
NDM3Z-250	50	25
NDM3Z-400	100	25
NDM3Z-630	100	25
NDM3Z-800	100	25

Selection of cross-sectional areas of connecting busbars and cables

Note:
A means the safe distance when the top is made of metal plate
B means the safe distance when the top is made of insulation plate

6.7 Selection of Cross-sectional Areas of Connecting Busbars and Cables

● Selection of busbars

Rated current A	10	16 20	25	32	40 50	63	80	100	125 140	160	180 200 225	250	315 350	400
Cross-sectional area of conductor mm²	1.5	2.5	4.0	6.0	10	16	25	35	50	70	95	120	185	240

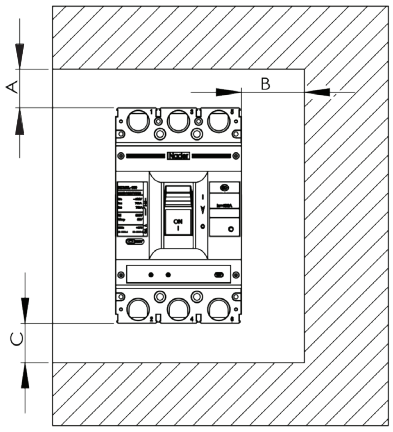
● Selection of conductors

Rated current A	Cross-sectional areas of cables		Copper busbar size	
	Quantity	Sectional area mm²	Quantity	Dimensions mm × mm
500	2	150	2	30 × 5
630	2	185	2	40 × 5
800	2	240	2	50 × 5

Note 1: Select the appropriate wiring method according to Outline Dimension, Mounting Dimension and Wiring Method;
Note 2: If copper bar is selected for connection, the copper bar cannot be directly connected to the circuit breaker body and extended busbar accessories are required.

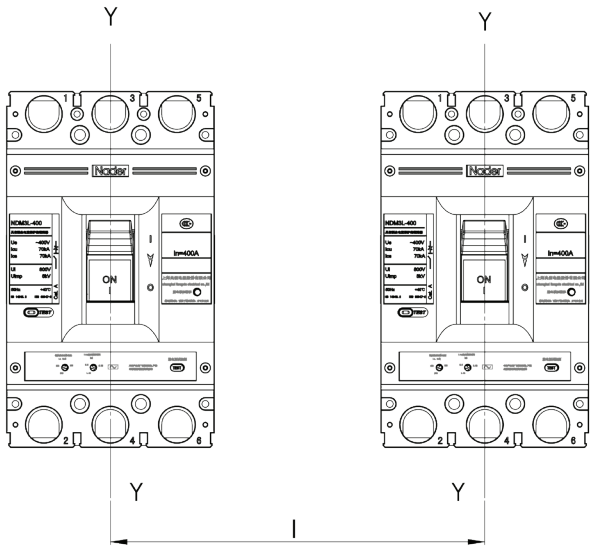
6.8 Safe Distance of Circuit Breaker Mounting

● Insulation distance for installation in a small metal cabinet (unit: mm)



Mounting distance	A (From incoming line end to cabinet surface)		BB (Distance from the side to the cabinet)	C (From incoming line end to cabinet surface)
Specifications	With zero flashover cover	Without zero flashover cover		
NDM3Z-125	/	65	30	30
NDM3Z-250	/	65	30	30
NDM3Z-250V	/	65	30	30
NDM3Z-400	/	120	35	35
NDM3Z-630	/	120	35	35
NDM3Z-800	/	120	35	35

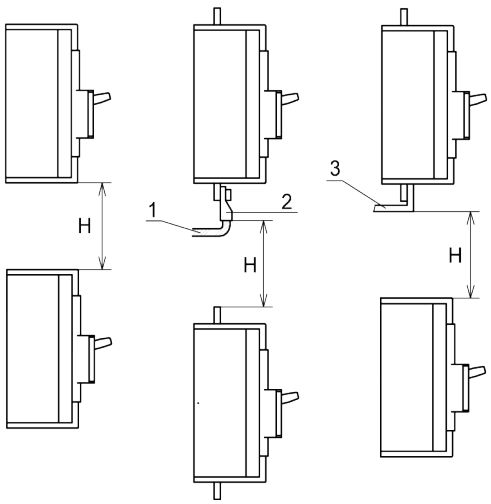
● Minimum center distance of row installation room of the circuit breakers



Specifications	Circuit breaker width (mm)		Center distance I (mm)	
	3 poles	4 poles	3 poles	4 poles
NDM3Z-125	92	122	122	152
NDM3Z-250	107	142	137	172
NDM3Z-250V	135	/	190	/
NDM3Z-400	150	198	190	238
NDM3Z-630	182	240	222	280
NDM3Z-800	210	280	250	320

Note: For installation of circuit breakers in a row or stack, check the connection busbars or cables to ensure the air insulation distance will not be reduced.

Minimum distance between circuit breakers installed in stack



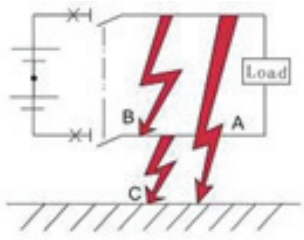
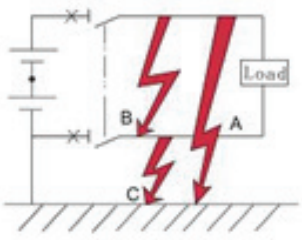
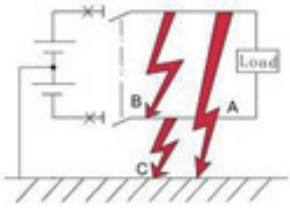
1: Bare cable connection
2: Cable insulation connection
3: Connection and no insulation

Specifications	H (distance between the bottom and top of circuit breaker)	
	With zero flashover cover	Without zero flashover cover
NDM3Z-125	/	91
NDM3Z-250	/	93
NDM3Z-250V	/	93
NDM3Z-400	/	155
NDM3Z-630	/	155
NDM3Z-800	/	155

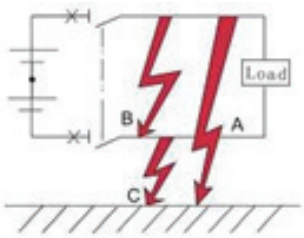
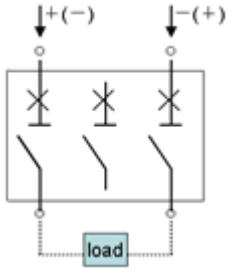
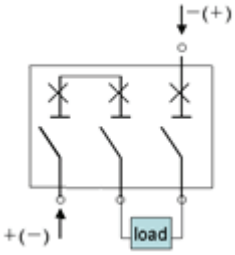
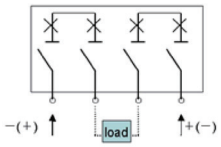
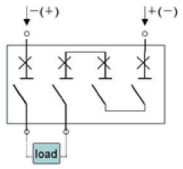
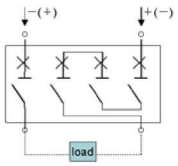
Note: Check whether the zero flashover cover or the interphase barrier is installed in place before energizing.

7. DC System Application

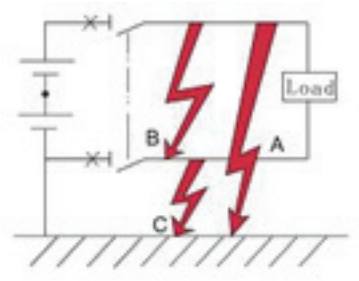
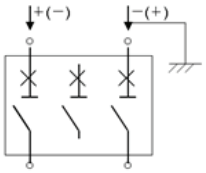
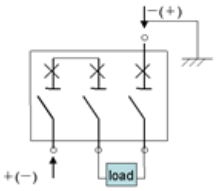
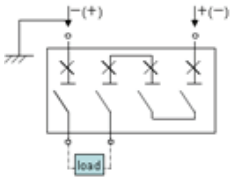
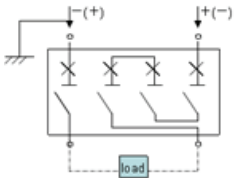
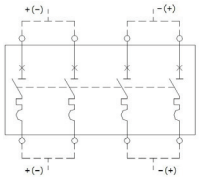
7.1 DC Grounding System Analysis

System type		Ungrounded	One-pole grounded	Neutral point grounding
Fault type diagram				
Fault analysis	Fault A	Without impacts	Under the voltage Ue, the short circuit current is the highest, and only the contact connecting the non-grounded pole is involved in breaking.	Under the voltage 1/2 Ue, the short circuit current is the highest, and only the contact connecting the non-grounded pole is involved in breaking.
	Fault B	Under the voltage Ue, the short circuit current is the highest, and the contacts in series are involved in the breaking.	Under the voltage Ue, the short circuit current is the highest, and the contacts in series are involved in the breaking.	Under the voltage Ue, the short circuit current is the highest, and the contacts in series are involved in the breaking.
	Fault C	Without impacts	Without impacts	Under the voltage 1/2 Ue, the short circuit current is the highest, and only the contact connecting the grounded pole is involved in breaking.
The worst failure		Fault B	Fault A	Serious

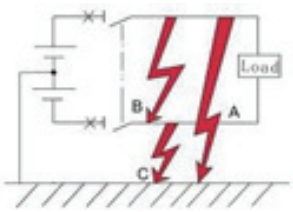
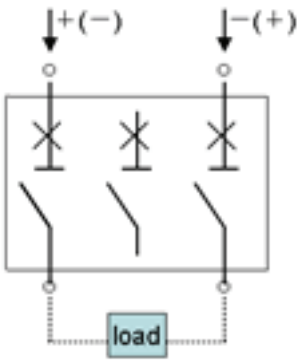
7.2 Recommended Wiring method Without Grounding System for NDM3Z

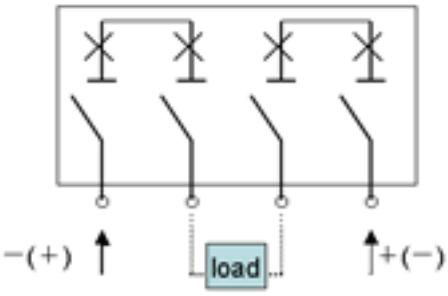
System type		Ungrounded		
Fault type diagram				
System voltage		DC500V and below (2P)	DC500-750V（3P）	DC750-1200V（4P）
Product models	NDM3Z-125~800	 Normal	 Normal J0: Free wiring Note: NDM3Z-400/630/800 Only conventional wiring	J0: Free wiring  J1 type wiring  J2 type wiring  J3 type wiring

7.3 Recommended Wiring Method for One-pole Grounding System for NDM3Z

System type		One-pole grounded			
Fault type diagram					
System voltage		DC500V and below (2P)	DC250-500V（3P）	DC500-750V（4P）	DC500V and below (2P)
Product models	NDM3Z-125~800	 Normal	 Normal Note: The grounding pole cannot be changed. In other words, it is also needed to ensure non-grounded poles are in series with 2 groups of contacts.	 J2 type wiring  J3 type wiring Note: The grounding pole cannot be changed. In other words, it is also needed to ensure non-grounded poles are in series with 3 groups of contacts.	 Parallel wiring

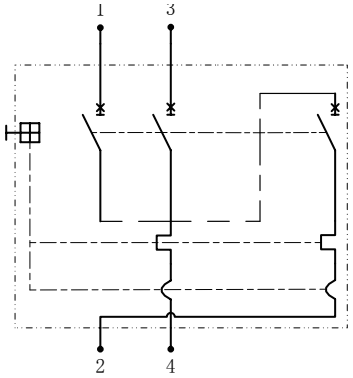
7.4 Recommended Wiring Method for One-pole Grounding System for NDM3Z

<table>
<tr><th colspan="2">System type</th><th colspan="2">Neutral point grounding</th></tr>
<tr><td colspan="2">Fault type diagram</td><td colspan="2"> 
</td></tr>
<tr><td colspan="2">System voltage</td><td>DC500V and below (2P)</td><td>DC500-1200V（4P）</td></tr>
<tr><td rowspan="2">Product models</td><td>NDM3Z-125/250</td><td> 

Normal</td><td> 

J1 type wiring</td></tr>
<tr><td>NDM3Z-400/630/800</td><td></td><td>Please contact the manufacturer for wiring method</td></tr>
</table>

7.5 NDM3Z-250V Wiring Method



8. Usage and Maintenance

- The characteristics of circuit breaker and accessories are set by the manufacturer; only the trained or certified professional personnel can adjust, install and maintain the circuit breaker, tripping unit and other accessories referring to the circuit design parameters;
- Ensure the power is in the inactive state before installation and removal of any device.
- The handle of circuit breaker can be located at three positions respectively representing the three conditions of closing, disconnection and free tripping. When the handle is at the free tripping position, the handle should be pulled in the disconnection direction. At this time, the circuit breaker could re-buckle and then the switch could be closed.
- Please observe the conditions for storage and use; if the product is damaged or cannot be normally used due to quality problem within 36 months from the date of delivery by the manufacturer, the manufacturer is responsible for free repair or replacement.

9. Ordering Instructions

- Please specify the models, specifications and ordering quantity of circuit breakers; when under-voltage tripper, shunt tripper or electrically operated mechanism are used, please indicate the voltage values of operating voltage and control power.
- For example: NDM3Z-250/4371 200A J2 (DC220V), with under-voltage and single auxiliary contact, operating voltage of DC1000V, rated current of 200A, control supply voltage of DC220V, J2-type wiring, 10 sets.

NDM3G
Moulded Disconnecting Switch

Edition 2016

Nader 良信电器

1. Product Overview

													
Specification and model		NDM3G-250			NDM3G-400			NDM3G-630			NDM3G-800		
Frame grade Inm (A)		250			400			630			800		
Number of poles		2	3	4	2	3	4	2	3	4	2	3	4
Rated operational voltage Ue (V)	DC	DC500	DC750V	DC1000V	DC500	DC750V	DC1000V	DC500	DC750V	DC1000V	DC500	DC750V	DC1000V
	AC	AC380/400/415V/ 500V/660/690V			AC380/400/415V/ 500V/660/690V			AC380/400/415V/ 500V/660/690V			AC380/400/415V/ 500V/660/690V		
Rated short-circuit making capacity: Icm (kA)		3			5			8			10		
Certification		CCC			CCC			CCC			CCC		

2. Product Features

Scope of application and purpose

NDM3G series moulded case disconnecting switches (hereinafter referred to as disconnecting switches) are applicable to work in the circuits with AC frequency of 50/60HZ, rated operating voltage of up to AC 690V and DC 1000V, and rated operating current of up to 800A. They have load capacity and provide infrequent conversion. They can effectively isolate the electrical equipment and the power supply to ensure safe and reliable maintenance.

Structural features

Boxed accessories may be used for rapid installation of circuit breaker, and timely respond to the user requirements without any adjustments.

Meeting the following standards

- GB14048.1 Low-voltage switchgear and controlgear - Part 1: General rules
- GB14048.3 Low-voltage switchgear and controlgear - Part 3:Disconnecting switch
- IEC 60947-1 Low-voltage switchgear and controlgear-Part 1: General rules
- IEC 60947-3 Low-voltage switchgear and controlgear-Part 3: switch-disconnectors

3. Application Scope

3.1 Electrical Symbols

The circuit breaker provides isolation function, whose corresponding symbol is: 

3.2 Applicable Environment

● Temperature of the working environment

-35℃ ~ +70℃, the average value in 24h is not more than (+35℃).

● Storage temperature

-40℃ ~ +75℃。

● Altitude

Installation site altitude ≤ 2,000m.

● Relative humidity for operation/Relative humidity for storage

At the ambient temperature of +40℃, the relative humidity shall not be more than 50%; for a lower temperature, the humidity may be higher, for example: The relative humidity could be up to 90% at 20℃. Appropriate measures should be taken against frost due to temperature variation.

● Pollution grade

Grade 3.

● Installation category

Mounting category of circuit breaker connected to the main circuit is:Category III (power distribution and control level).

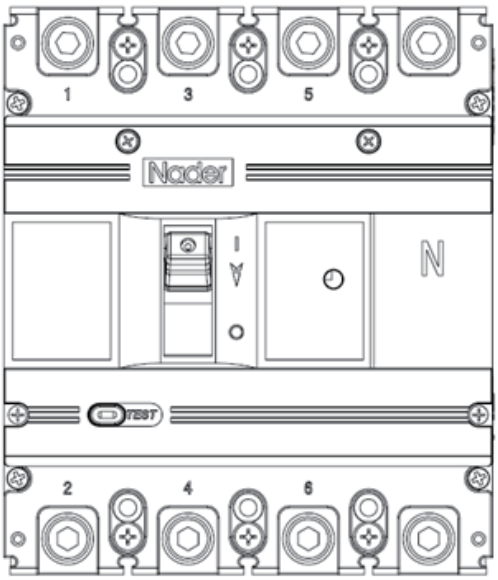
Mounting category of circuit breaker not connected to the main circuit is: Class Ⅱ (load level) .

● Installation environment

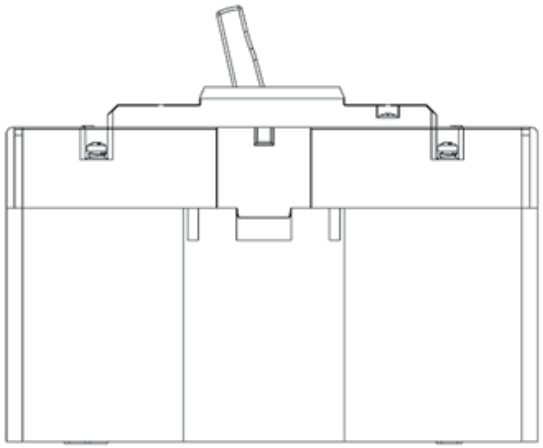
The product shall be installed in a medium without explosive danger, and the medium is not enough to corrode metal and damage the place where the insulating gas and conducting gas are located, so as to avoid any use in a rainy or snowy place.

Installation direction

- Vertical mounting, the gradient between the mounting plane and the vertical plane should be ≤ ±22.5 °.
- Horizontal mounting



Vertical installation



Horizontal installation

4. Technical Characteristics of the Product

4.1 Description of Specifications and Models

ND	M	3	G	- □	□ / □	□ - □	□	□
1	2	3	4	5	6 7	8 9	10	11

Serial No.	Serial No. name	NDM3G
1	Enterprise code	ND: Nader brand low-voltage apparatus
2	Product code	M: Plastic shell
3	Design serial No.	3
4	Derived code	G: Disconnecting switch
5	Frame grade	See Table 1
6	Operation mode	No code: Direct operation by handle
		P: Electrically operated
		Z: Turning handle
7	Number of poles	20: 2 poles 30: 3 poles 40: 4 poles
8	Accessory code	See Table 2
9	Wiring form	No code: Conventional product
		P: Extended busbar
10	Rated current In	See Table 1
11	Use class	AC/DC-21A and 21B breaking resistive load, including appropriate overload
		AC/DC-22A and 22B breaking resistance and inductance mixing load, including appropriate overload
		AC/DC-23A breaking motor load or other highly inductive loads

4.2 Technical Parameters

Table 1 Table of main performance parameters of circuit breaker

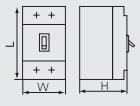
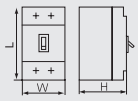
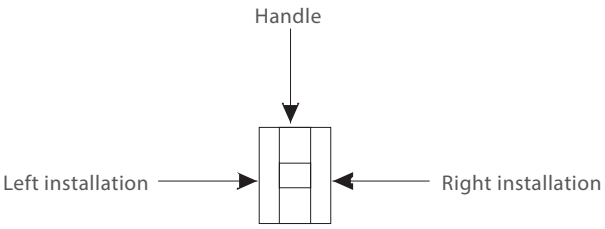
Model		NDM3G-250			NDM3G-400		
Frame grade Current Inm (A)		250			400		
Rated current In (A)		250			400		
Rated insulation voltage Ui (V)		1000			1000		
Rated impulse withstand voltage Uimp (V)		8000			8000		
Power frequency withstand voltage U (1 minute) (V)		3000			3000		
Use class		AC-21A/22A/23A DC-21B/22B	AC-21A/22A/23A DC-21B/22B	AC-21A/22A/23A DC-21B/22B	AC-21A/22A/23A DC-21A/22A/23A	AC-21A/22A/23A DC-21A/22A/23A	AC-21A/22A/23A DC-21A/22A/23A
Number of poles		2	3	4	2	3	4
Rated operational voltage Ue (V)		AC380/400/415 AC500 AC660/690 DC500	AC380/400/415 AC500 AC660/690 DC750	AC380/400/415 AC500 AC660/690 DC1000	AC380/400/415 AC500 AC660/690 DC500	AC380/400/415 AC500 AC660/690 DC750	AC380/400/415 AC500 AC660/690 DC1000
Rated short-circuit making capacity: Icm (kA)		3	3	3	5	5	5
Rated short-time withstand current: Icw (kA/1s)		3	3	3	5	5	5
Operating performance	Electrical life	5000			7500		
	Mechanical life	10000			10000		
Outline dimension 	L	165	165	165	257	257	257
	W	107	107	142	150	150	198
	H	105.5	105.5	105.5	104.5	104.5	104.5
Flashover distance (mm)		≤50			≤50		
Wiring mode		Conventional、P			Conventional、P		

Table 1 Table of main performance parameters of circuit breaker

Model		NDM3G-630			NDM3G-800		
Frame grade Current Inm (A)		630			800		
Rated current In (A)		630			800		
Rated insulation voltage Ui (V)		1000			1000		
Rated impulse withstand voltage Uimp (V)		8000			8000		
Power frequency withstand voltage U (1 minute) (V)		3000			3000		
Use class		AC-21A/22A/23A DC-21A/22A/23A	AC-21A/22A/23A DC-21A/22A/23A	AC-21A/22A/23A DC-21A/22A/23A	AC-21A/22A/23A DC-21A/22A/23A	AC-21A/22A/23A DC-21A/22A/23A	AC-21A/22A/23A DC-21A/22A/23A
Number of poles		2	3	4	2	3	4
Rated operational voltage Ue (V)		AC380/400/415 AC500 AC660/690 DC500	AC380/400/415 AC500 AC660/690 DC750	AC380/400/415 AC500 AC660/690 DC1000	AC380/400/415 AC500 AC660/690 DC500	AC380/400/415 AC500 AC660/690 DC750	AC380/400/415 AC500 AC660/690 DC1000
Rated short-circuit making capacity: Icm (kA)		8	8	8	10	10	10
Rated short-time withstand current: Icw (kA/1s)		8	8	8	10	10	10
Operating performance	Electrical life	7500			7500		
	Mechanical life	10000			10000		
Outline dimension 	L	270	270	270	280	280	280
	W	182	182	240	210	210	280
	H	108.5	108.5	108.5	112	112	112
Flashover distance (mm)		≤50			≤50		
Wiring mode		Conventional、P			Conventional、P		

4.3 Accessory Code Comparison Table



Legend:

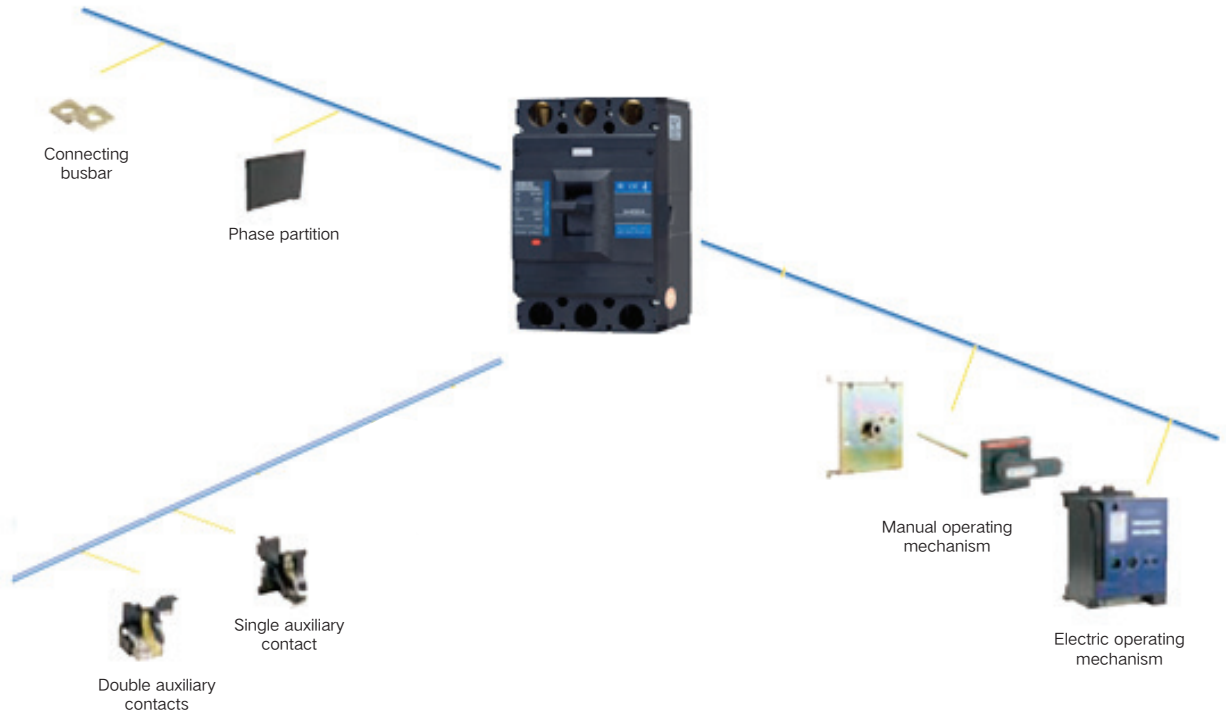
- Single auxiliary contact
- Double auxiliary contacts

Table 2 Comparison table of tripping method accessory codes

Accessory code	Accessories Name	NDM3G-250			NDM3G-400			NDM3G-630			NDM3G-800		
	Installation location / Model / Number of poles	2	3	4	2	3	4	2	3	4	2	3	4
00	No	——			——			——			——		
20	Double auxiliary contacts												
21	Single auxiliary contact												

5. Accessories

5.1 List of Accessories



5.2 Accessories Function Description

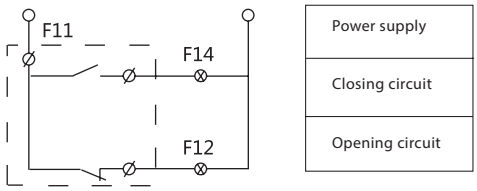
● Auxiliary contacts and combinations

The breaker is at the "opening" or "free tripping" position	Double auxiliary contacts	F14 F12 — F11 F24 F22 — F21
	Single auxiliary contact	F14 F12 — F11
The breaker is at the "closing" position	"Closing" switches to "opening", "opening" switches to "closing"	

● Auxiliary contact current parameters

Frame grade Rated current	Conventional heating current	Rated operational current at AC 400V
250-800	3A	0.30A

● Auxiliary contact wiring diagram



● Electrical life of auxiliary contact

Use class	Switch on			Breaking			Frequency	Operation frequency (time(s)/hour)	Conduction time
	I/Ie	I/Ie	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

● Connection and breaking capacity of auxiliary contact

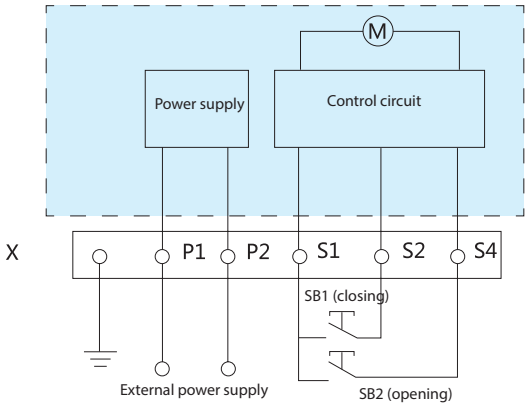
Use class	Switch on			Breaking			Frequency	Operation frequency (time(s)/hour)	Conduction time
	I/Ie	I/Ie	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1	0.3	1	1	0.3	10	120	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

5.3 Functions and Sizes of External Accessories

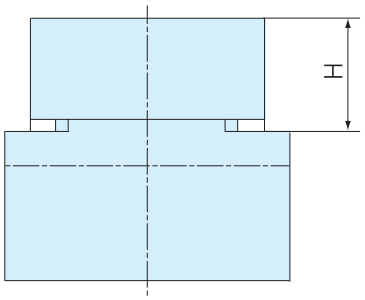
5.3.1 Electric operating mechanism

● CD2 motor operating mechanism (equipped with NDM3G-250~800 series)

◆ Wiring diagram (The circuit breaker external accessory wiring diagram is within the dotted box)



◆ CD2 Electric operating mechanism



Symbol instruction:
SB1, SB2: Operating button (prepared by users)
X： Terminal block
P1、P2： External power suppl

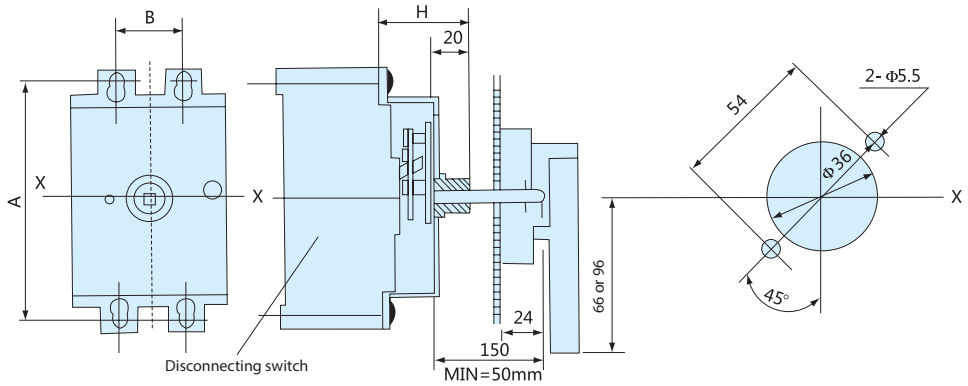
◆ Voltage specification :
AC 50Hz 110V、230V、400V
DC 24V、110V、220V

● Technical parameters of CD2 motor operating mechanism

Disconnecting switch provided	Operating current (A)	Electric power (W)	Life/times	Operating mechanism height H (mm)
NDM3G-250	≤ 0.5	14	20000	92
NDM3G-400	≤ 2	35	10000	149
NDM3G-630	≤ 2	35	10000	147
NDM3G-800	≤ 2	35	5000	151

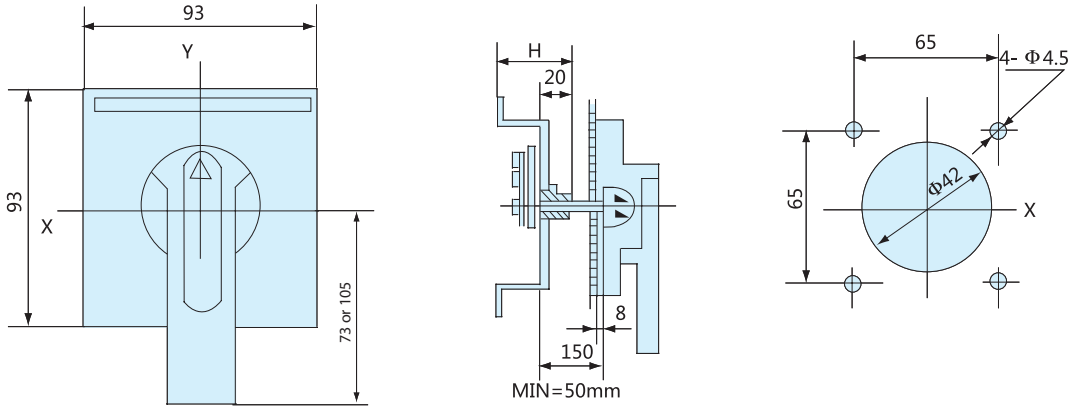
5.3.2 Manual operating mechanism

- CS1-A type handle mounting opening diagram

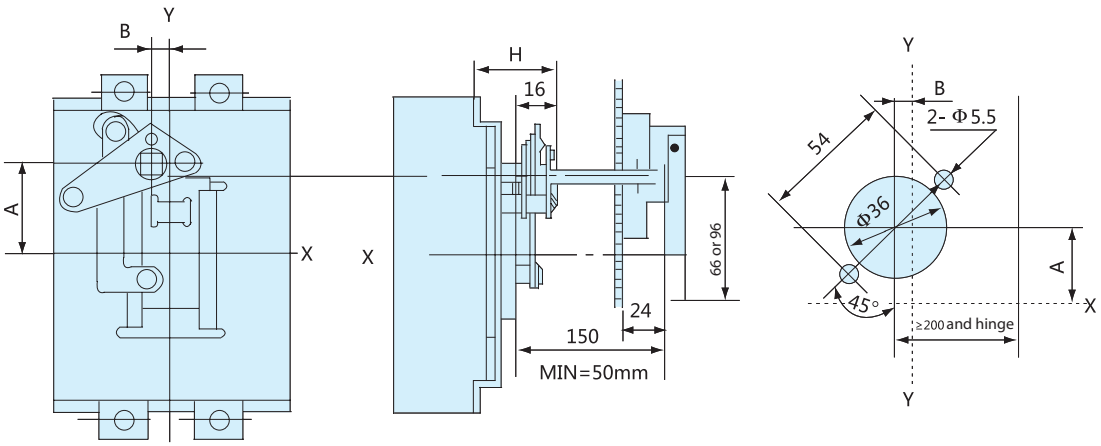


Note: A type is a round handle F type is a square handle

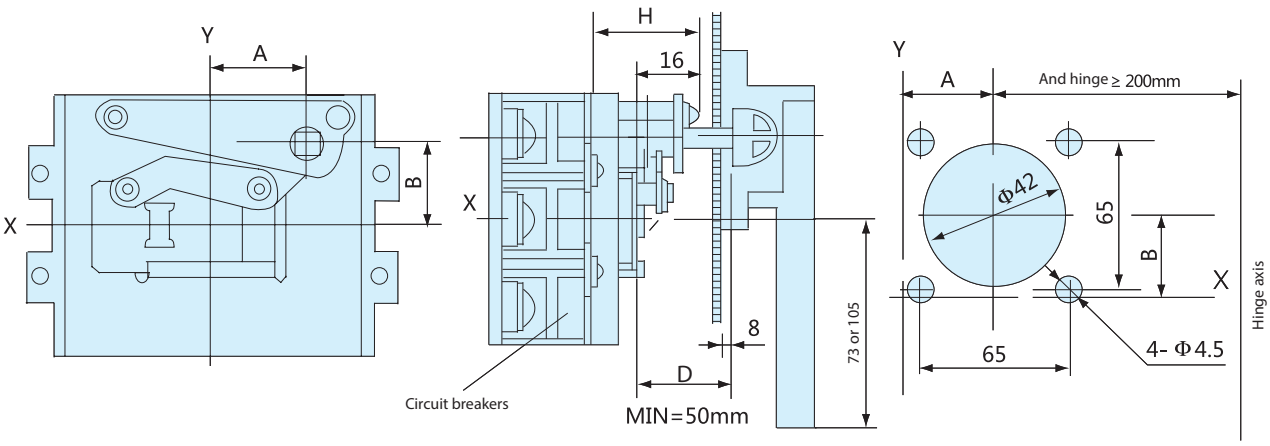
- CS1-F type handle mounting opening diagram



- CS2-A type handle mounting opening diagram



CS2-F type handle mounting opening diagram



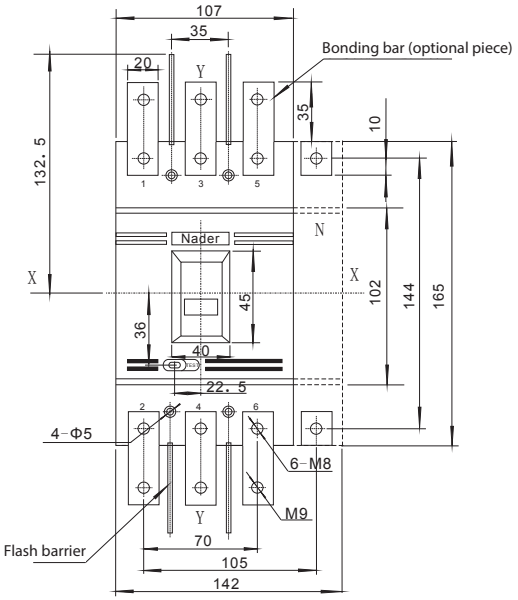
Mounting method and outline dimension of manual operating mechanism

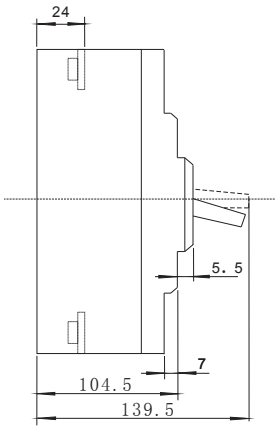
External accessories	External accessory model	Equipped with circuit breaker	Manual installation dimensions: (mm)				Installation mode
			H	A	B		
					3P	4P	
Manual operating mechanism	CS1-225	NDM3G-250	49	100	25		Vertical mounting
	CS1-400 (NDM3)	NDM3G-400	76	194	137	185	
	CS1-630 (NDM3)	NDM3G-630	83	200	171	229	
	CS1-800 (NDM3)	NDM3G-800	83	200	171	229	
	CS2-225	NDM3G-250	46	35	11.5		
	CS2-400 (NDM3)	NDM3G-400	46	37	11.5		
	CS2-630 (NDM3)	NDM3G-630	48	35	31		
	CS2-800 (NDM3)	NDM3G-800	61	60	15		

Note: In the figure, size D is 150mm by default, and can be customized according to the customer requirements.

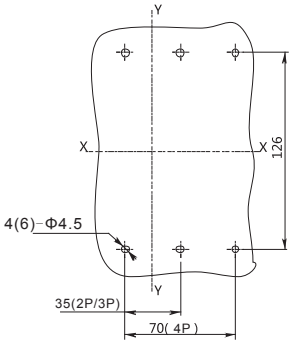
6. Product Outline Dimension

6.1 NDM3G-250 Outline Dimension, Mounting Dimension and Wiring Method

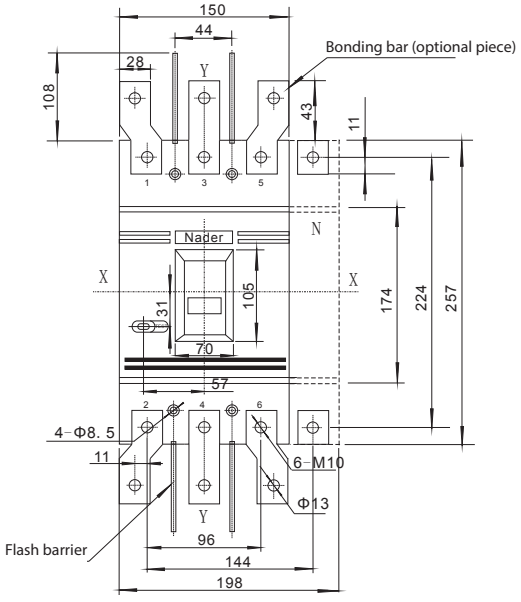


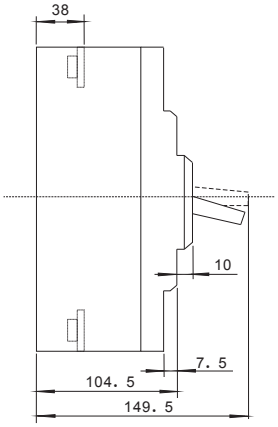


the size of opening of before-panel wiring mounting panel

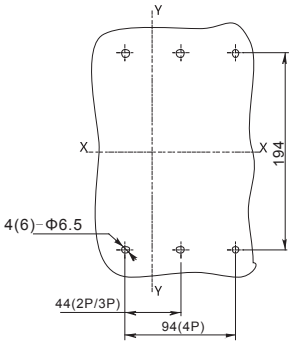


6.2 NDM3G-400 Outline Dimension, Mounting Dimension and Wiring Method



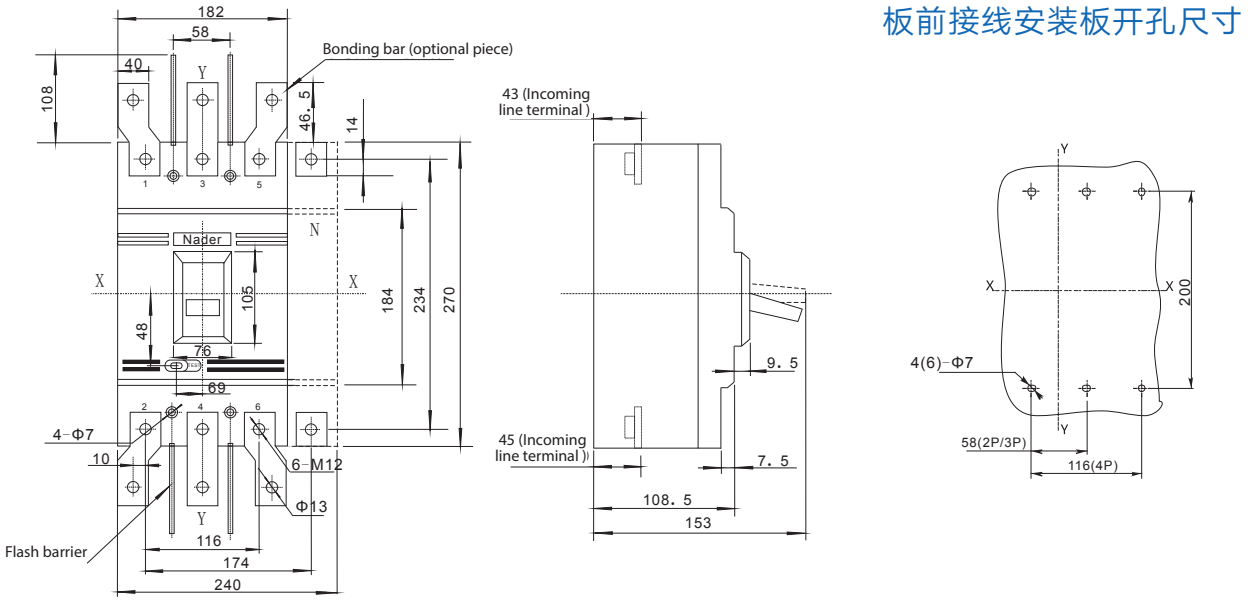


the size of opening of before-panel wiring mounting panel



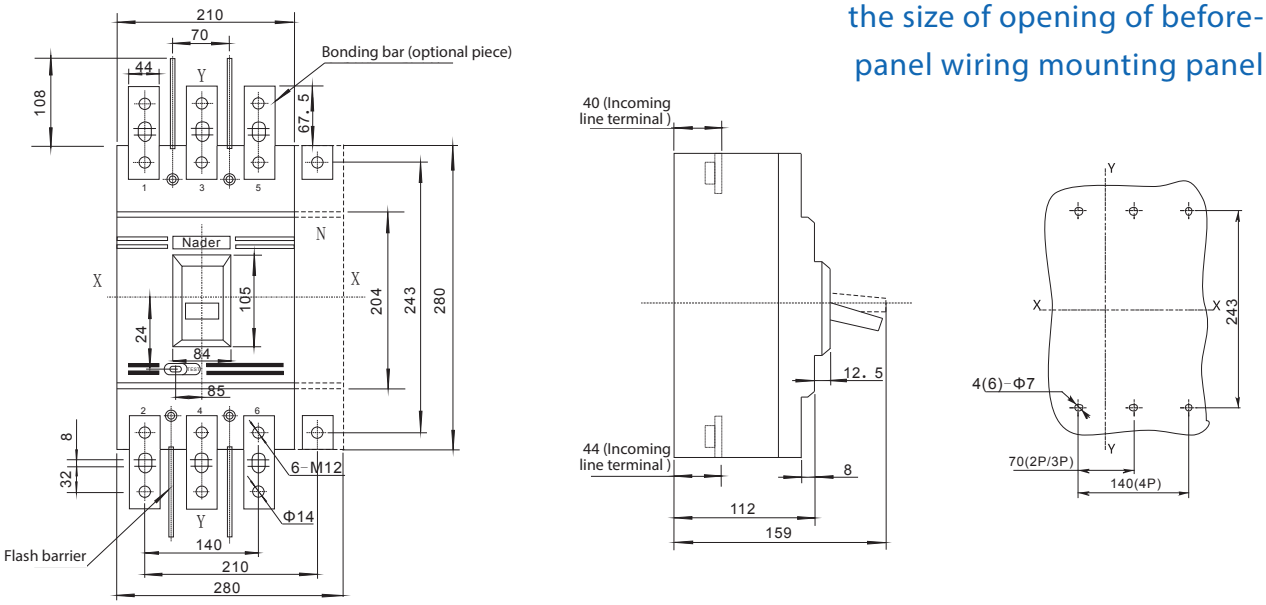
6.3 NDM3G-630 Outline Dimension, Mounting Dimension and Wiring Method

板前接线安装板开孔尺寸



6.4 NDM3G-800 Outline Dimension, Mounting Dimension and Wiring Method

the size of opening of before-panel wiring mounting panel



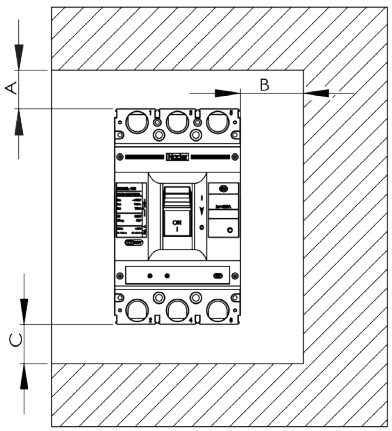
6.5 Selection of Cross-sectional Areas of Connecting Busbars and Cablesas of Connecting Busbars and Cables

- For cross-sections of connecting wires and rated currents, see the table

Rated current A	250	400	630	800
Cross-sectional area of conductor mm^2	120	120	185 × 2	240 × 2

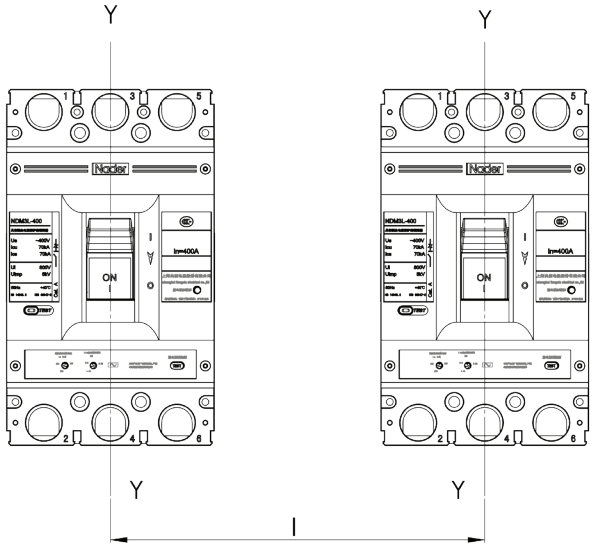
6.6 Safe Mounting Distance of Circuit Breaker

- Insulation distances for installation in a small metal cabinet (unit: mm)



Mounting distance	A (From incoming line end to cabinet surface)		B (Distance from the side to the cabinet)	C (From incoming line end to cabinet surface)
Specifications	With zero flashover cover	Without zero flashover cover		
NDM3G-250	/	65	30	30
NDM3G-400	/	120	35	35
NDM3G-630	/	120	35	35
NDM3G-800	/	120	35	35

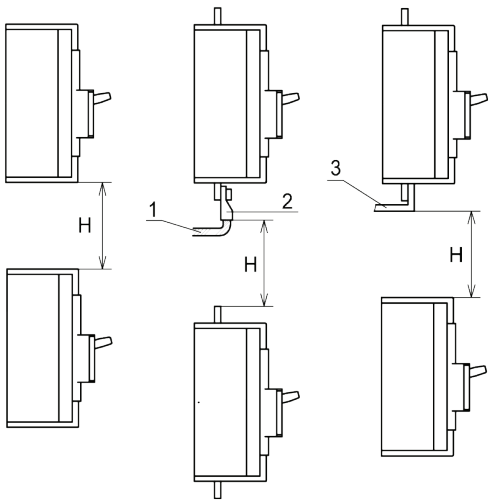
Minimum center distance of row installation room of the circuit breakers



Specifications	Circuit breaker width (mm)			Center distance I (mm)		
	2-pole	3-pole	4-pole	2-pole	3-pole	4-pole
NDM3G-250	107	107	142	137	137	172
NDM3G-400	150	150	198	190	190	238
NDM3G-630	182	182	240	222	222	280
NDM3G-800	210	210	280	250	250	320

Note:For installation of circuit breakers in a row or stack, check the connection busbars or cables to ensure the air insulation distance will not be reduced.

Minimum distance between circuit breakers installed in stack



1: Bare cable connection
2: Cable insulation connection
3: Connection and no insulation

Specifications	H (distance between the bottom and top of circuit breaker)	
	With zero flashover cover	Without zero flashover cover
NDM3G-250	/	93
NDM3G-400	/	155
NDM3G-630	/	155
NDM3G-800	/	155

Note: Check whether the zero flashover cover or the interphase barrier is installed in place before energizing.

7. Usage and Mmaintenance

- The characteristics of circuit breaker and accessories are set by the manufacturer; only the trained or certified professional personnel can adjust, install and maintain the circuit breaker, tripping unit and other accessories referring to the circuit design parameters;
- Ensure the power is in the inactive state before installation and removal of any device.
- The handle of circuit breaker can be located at three positions respectively representing the three conditions of closing, disconnection and free tripping. When the handle is at the free tripping position, the handle should be pulled in the disconnection direction. At this time, the circuit breaker could re-buckle and then the switch could be closed.
- Please observe the conditions for storage and use; if the product is damaged or cannot be normally used due to quality problem within 36 months from the date of delivery by the manufacturer, the manufacturer is responsible for free repair or replacement.

8. Ordering Instructions

- Please specify the models, specifications and ordering quantity of circuit breakers; when under-voltage tripper, shunt tripper or electrically operated mechanism is used, please indicate the voltage value of operating voltage or the control power supply voltage.