NDM2
Moulded Case Circuit Breakers

Edition 2016

Nader 良信电器

1. Product Overview

														
Model	**NDM2-63**			**NDM2-100/125**					**NDM2X-125**	**NDM2-225/250**				
Rated operating current In (A)	10、12.5、16、20、25、32、40、50、63			16、20、25、32、40、50、63、80、100、125					16、20、25、32、40、50、63、80、100、125	100、125、140、160、180、200、225、250				
Number of poles	3	3	4	3	3	3	3	4	2	3	3	3	3	4
Rated limit short-circuit breaking capacity level	L	M		C	L	M	H		/	C	L	M	H	
Rated ultimate short-circuit breaking capacity Icu (kA) 400V	25	50	50	25	35	50	85	50	35	25	35	50	85	50
Rated running short-circuit breaking capacity Ics (kA) 400V	19	38	38	19	26	38	64	38	26	19	26	38	64	38
N-pole type of four-pole product	4A、4B、4C			4A、4B、4C					/	4A、4B、4C				
Certification	CCC、TUV、CE													

													
Model	**NDM2-400**					**NDM2-630**					**NDM2-800**		
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) 400V	35	50	65	100	65	35	50	65	100	65	75	100	75
Rated running short-circuit breaking capacity Ics (kA) 400V	26	38	49	75	49	26	38	49	75	49	56	75	56
N-pole type of four-pole product	4A、4B、4C					4A、4B、4C					4A、4B、4C		
Certification	CCC、TUV、CE												

2. Product Features

Scope of application and purpose

NDM2 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 the use of infrequent conversion and infrequent start of motor. The circuit-breakers provide overload, short circuit and undervoltage protection, and can protect the circuit and power supply device from damage. The products have been widely used in new energy, electric power, industrial control, real estate, electric and power supply, telecommunication, rail transportation, industrial (public) construction and other industries.

Structural features

The circuit breakers are divided into four types: 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.

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 “NDM2 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 NDM2 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

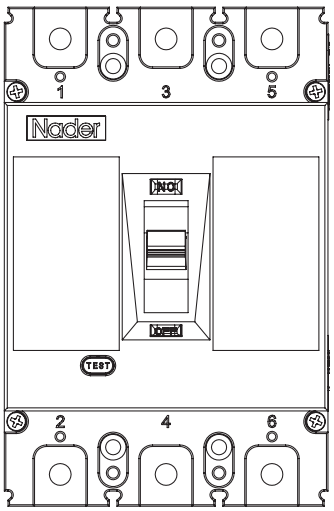
- ◆ Mounting categories of circuit breaker connecting to the main circuit: Category III (power distribution and control level).
- ◆ Mounting categories of circuit breaker not connecting to the main circuit: Class Ⅱ (load level) .

● Installation environment

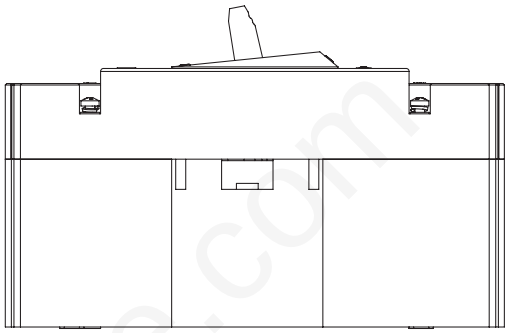
The product shall be installed in a medium without explosive danger, and the medium is not enough to corrode metal and damage the place where the insulating gas and conducting gas are located, so as to avoid any use in a rainy or snowy place.

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 NDM2 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
NDM2-63 direct heating type (10-25A)	25	28	-	32
NDM2-100 direct heating type (16-25A)	25	40	42	45
NDM2-125 direct heating type (125A)	25	40	42	45
NDM2-63 intermittent heating type (32-63A)	63	20	-	24
NDM2-100 intermittent heating type (32-100A)	100	35	37	40
NDM2-125 intermittent heating type (32-125A)	125	39	42	43
NDM2-225 intermittent heating type (125-225A)	225	62	66	70
NDM2-250 intermittent heating type (250A)	250	67	73	73
NDM2-400 intermittent heating type (225-400)	400	115	120	125
NDM2-630 intermittent heating type (400-630A)	630	187	-	200
NDM2-800 intermittent heating type (630-800A)	800	262	-	-

4. Technical Characteristics of the Product

4.1 Description of Specifications and Models

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

Serial No.	Serial No. name	NDM2
1	Enterprise code	ND: Nader and low-voltage apparatus
2	Product code	M： Moulded case circuit breakers
3	Design serial No.	2
4	Type code	X： Small housings of two-pole (only for 125)
5	Frame grade Rated current	See Table 1
6	Rated ultimate short-circuit breaking capacity	Type C： Basic type
		Type L： Standard type
		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	Number of poles	2， 3， 4
9	Overload 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 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
13	Wiring pattern code (See Table 1)	No code： Normal
		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
		Type K： Wiring at the incoming/outgoing line end： Wiring frame type
		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	See Table 1

4.2 Technical Parameters

Table 1 Table of main performance parameters of circuit breaker

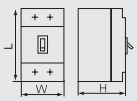
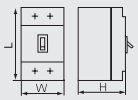
Model		NDM2-63			NDM2-100					NDM2-125				
Frame grade Current Inm (A)		63			100					125				
Rated current In (A)		10、12.5、16、20、25、32、40、50、63			16、20、25、32、40、50、63、80、100					16、20、25、32、40、50、63、80、100、125				
Rated insulation voltage Ui (V)		1000			1000					1000				
Rated impulse withstand voltage 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	4	3	3	3	3	4	3	3	3	3	4
Rated limit short-circuit breaking capacity level		L	M		C	L	M	H		C	L	M	H	
Rated ultimate short-circuit breaking capacity Icu (kA)	AC 400V	25	50	50	25	35	50	85	50	25	35	50	85	50
	AC 690V						10					10		
Rated running short-circuit breaking capacity Ics (kA)	AC 400V	19	38	38	19	26	38	64	38	19	26	38	64	38
	AC 690V						8					8		
Operating performance (time)	Electrical life	8000			8000					8000				
	Mechanical life	20000			20000					20000				
Outline dimension 	L	135	135	135	150	150	150	150	150	150	150	150	150	150
	W	78	78	103	92	92	92	92	122	92	92	92	92	122
	H	73.5	81.5	81.5	69	69	87	87	87	69	69	87	87	87
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,JK,CK,K,Z1,Z2Q,Z2H,Z3Q,Z3H				

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

Model		NDM2X-125	NDM2-225					NDM2-250					
Frame grade Current Inm (A)		125	225					250					
Rated current In (A)		16、20、25、32、40、50、63、80、100、125	100、125、140、160、180、200、225					125、140、160、180、200、225、250					
Rated insulation voltage Ui (V)		1000	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		2	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	25	35	50	85	50	25	35	50	85	50	
	AC 690V				10								
Rated running short-circuit breaking capacity Ics (kA)	AC 400V	26	19	26	38	64	38	19	26	38	64	38	
	AC 690V				8								
Operating performance (time)	Electrical life	8000	8000					8000					
	Mechanical life	20000	20000					20000					
Outline dimension	L	150	165	165	165	165	165	165	165	165	165	165	165
	W	64	107	107	107	107	142	107	107	107	107	107	142
	H	69	86	86	103	103	103	86	86	103	103	103	103
Flashover distance (mm)		≤50	≤50					≤50					
Wiring mode		Conventional, P,JK,CK,K	Conventional, P,JK,CK,K,Z1,Z2Q,Z2H,Z3Q,Z3H					Conventional, P,JK,CK,K,Z1,Z2Q,Z2H,Z3Q,Z3H					

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

Model		NDM2-400					NDM2-630					NDM2-800		
Frame grade Current Inm (A)		400					630					800		
Rated current In (A)		225、250、315、350、400					400、500、630					630、700、800		
Rated insulation voltage Ui (V)		1000					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	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)	AC 415V	35	50	65	100	65	35	50	65	100	65	75	100	75
	AC 690V			15					15			20		
Rated running short-circuit breaking capacity Ics (kA)	AC 415V	26	38	49	75	49	26	38	49	75	49	56	56	75
	AC 690V			11					11			15		
Operating performance (time)	Electrical life	7500					7500					7500		
	Mechanical life	10000					10000					10000		
Outline dimension 	L	257	257	257	257	257	270	270	270	270	270	280	280	280
	W	150	150	150	150	198	182	182	182	182	240	210	210	280
	H	106.5	106.5	106.5	106.5	106.5	110	110	110	110	110	115.5	115.5	115.5
Flashover distance (mm)		≤100					≤100					≤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 of derating factors of NDM2 series moulded case circuit breaker under varied temperatures

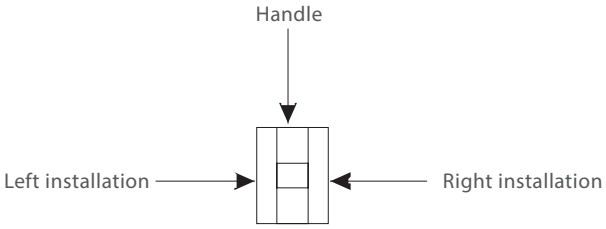
Serial No.	Frame grade Rated current (A)	Derating factors corresponding to temperatures						
		40℃	45℃	50℃	55℃	60℃	65℃	70℃
1	63	1	0.979	0.958	0.937	0.915	0.893	0.871
2	100/125	1	0.977	0.954	0.931	0.907	0.883	0.858
3	225/250	1	0.982	0.963	0.944	0.924	0.904	0.882
4	400	1	0.981	0.962	0.942	0.922	0.901	0.879
5	630	1	0.979	0.958	0.937	0.915	0.893	0.871
6	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 NDM2 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 Comparison Table of Accessory Codes

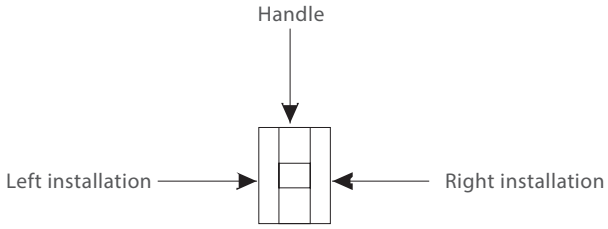


Legend:

- 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	NDM2-63		NDM2-100		NDM2-125		NDM2X-125	NDM2-225	
	Installation location / Model / Number of poles	3	4	3	4	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 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 alarm contact	◧	●	◧	●	◧	●	—	◧	●
58	Auxiliary alarm contact	◧		◧		◧		◧	◧	
68	Double auxiliary contacts, auxiliary alarm contact	—		◧	◧	◧	◧	—	◧	◧
78	Under-voltage tripper, auxiliary alarm contact	—		◧	○	◧	○	—	◧	○



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 (continued)

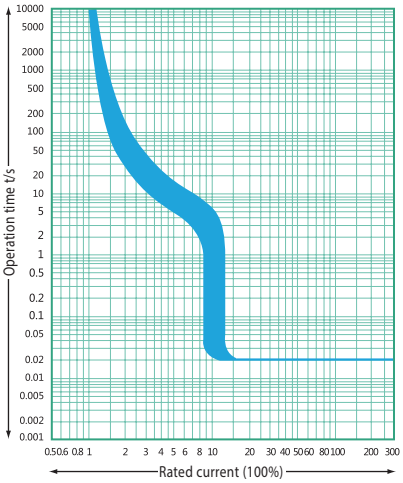
Accessory code	Accessories Name	NDM2-250		NDM2-400		NDM2-630		NDM2-800	
	Installation location / Model / Number of poles	3	4	3	4	3	4	3	4
00	No	——		——		——		——	
10	Shunt tripper	●		●		●			●
20	Double auxiliary contacts	◧◨		◧◨		◧◨		◧◨	
21	Single auxiliary contact	◧		◧		◧		◧	
30	Under-voltage tripper		○		○		○	○	
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 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

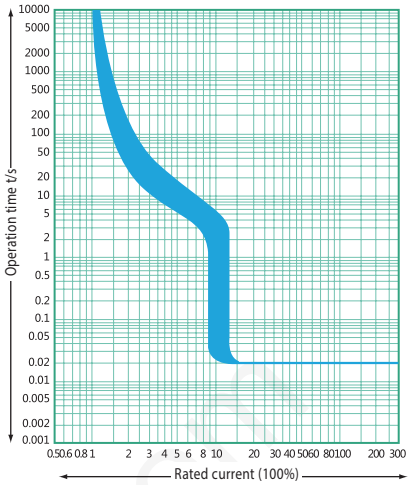
● Protection requirements for the products:

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		

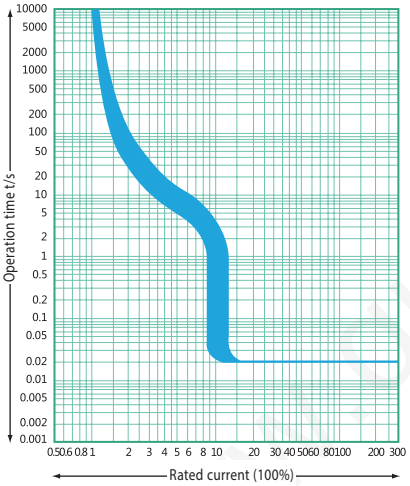
Product short circuit overload protection characteristic curve



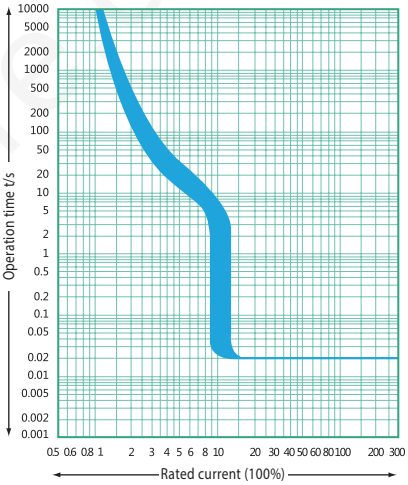
NDM2-63 L.M Time/current characteristic curve



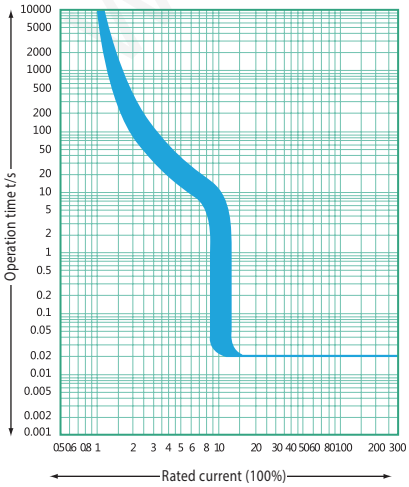
NDM2-100, 125 C.L.M.H NDM2X-125 Time/ current characteristic curve



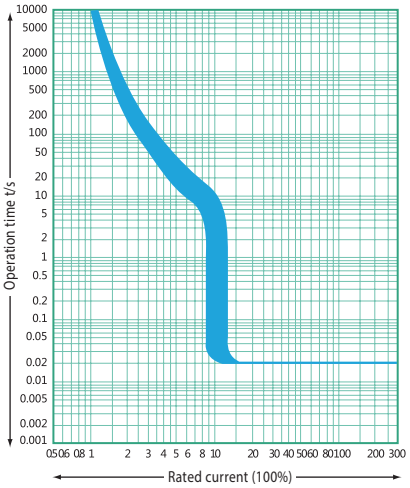
NDM2-225, 250 C.L.M.H Time/current characteristic curve



NDM2-400 C.L.M.H Time/current characteristic curve



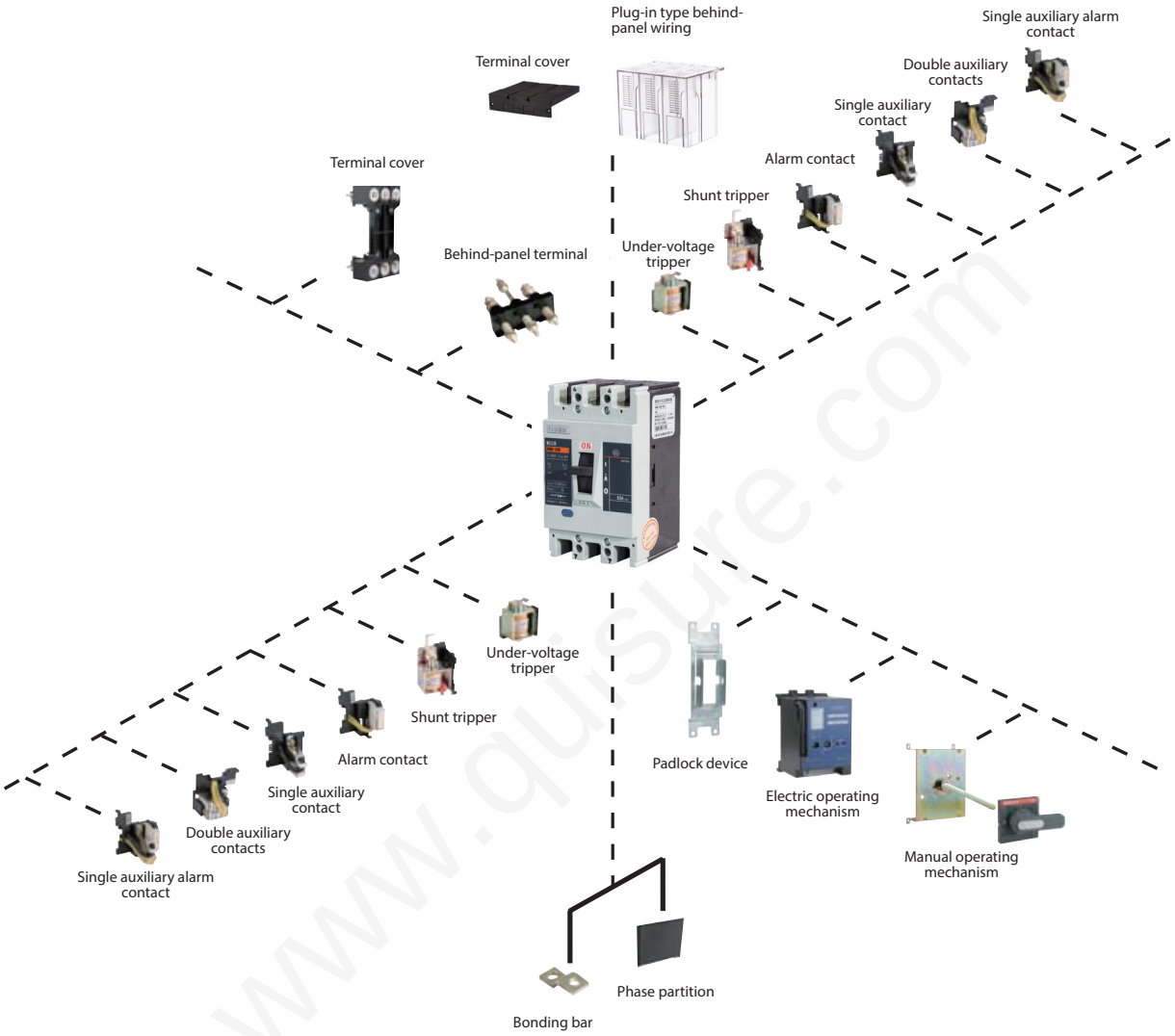
NDM2-630 C.L.M.H Time/current characteristic curve



NDM2-800 M.H Time/current characteristic curve

5. Accessories

5.1 List of Accessories



5.2 Accessories Function Description

5.2.1 Auxiliary contact Technical parameters

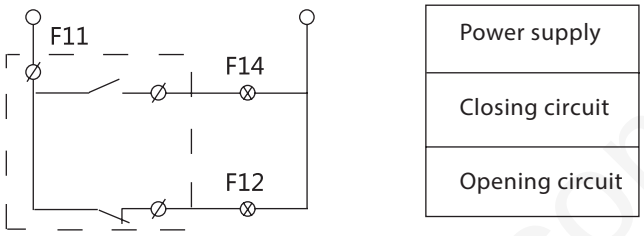
● Auxiliary contacts and combinations

The breaker is at the "opening" or "free tripping" position	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 1th	Rated operational current at AC 400V
Inm≤225	3A	0.30A
Inm>225	3A	0.40A

Auxiliary contact wiring diagram



★ Electrical life of auxiliary contact

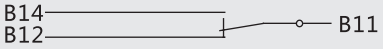
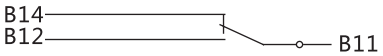
Use class	Switch on			Breaking			Frequency	Operation frequency (time(s)/ hour)	Conduction time
	I/Ie	I/Ie	cos φ	I/Ie	U/Ue	cos φ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

★ 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

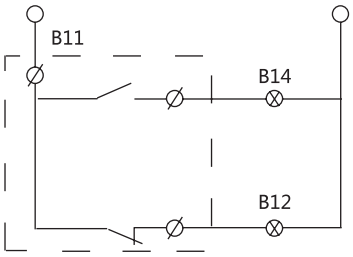
5.2.2 Alarm contact

★ 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	

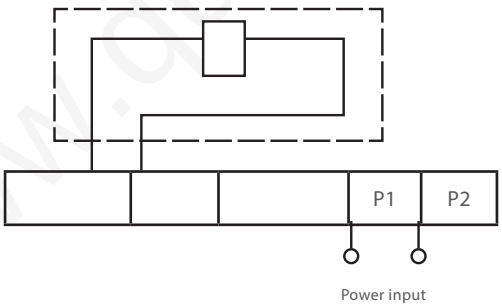
★ Alarm contact wiring diagram

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, closing of circuit breaker should be reliably prevented. 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
  DC 110V 220V
- 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

Instantaneous current and power consumption of under-voltage tripper

Product models	Instantaneous current value (mA)		Power consumption (W)	
	AC 400V	AC 230V	AC 400V	AC 230V
NDM2-63	10	13.5	4	3.105
NDM2-100/125	9.75	14.25	3.95	3.2275
NDM2-225/250	10.88	14.75	4.352	3.392
NDM2-400	9	11	3.6	2.53
NDM2-630	8.5	11	3.4	2.53
NDM2-800	5	7.25	2	1.6675

5.2.4 Shunt tripper

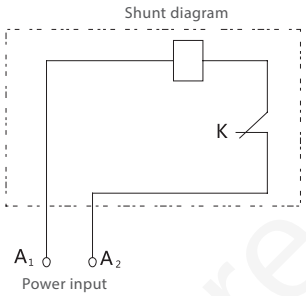
★ Generally installed at Phase A of circuit breaker; the shunt tripper should enable the circuit breaker to trip reliably at 70%~110% of rated control voltage under all operation conditions.

★ Control voltage : AC 50 Hz 230 V 400 V

DC [1]24V Low power consumption, 24, 220V

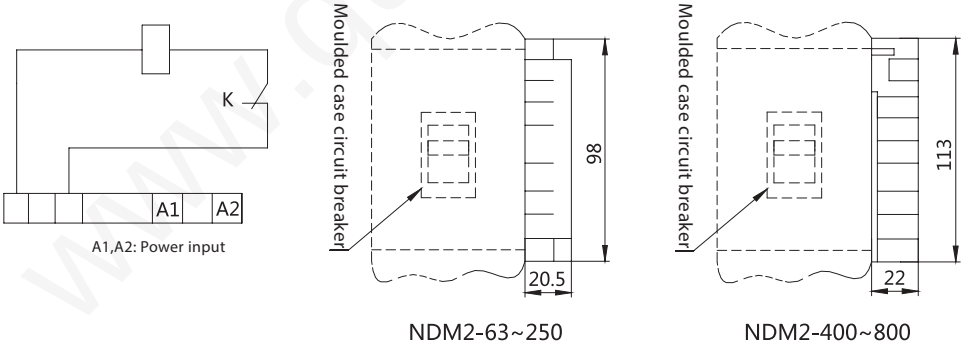
★ Shunt tripper wiring diagram

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.

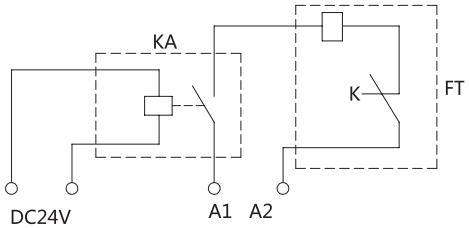


★ DC24V low power shunt tripper wiring diagram and outline dimension of external ceiling rose

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.



★ DC24V control power wiring diagram



KA : DC24V relay with electric shock capacity of 1A

FT : AC220V/380V Shunt tripper

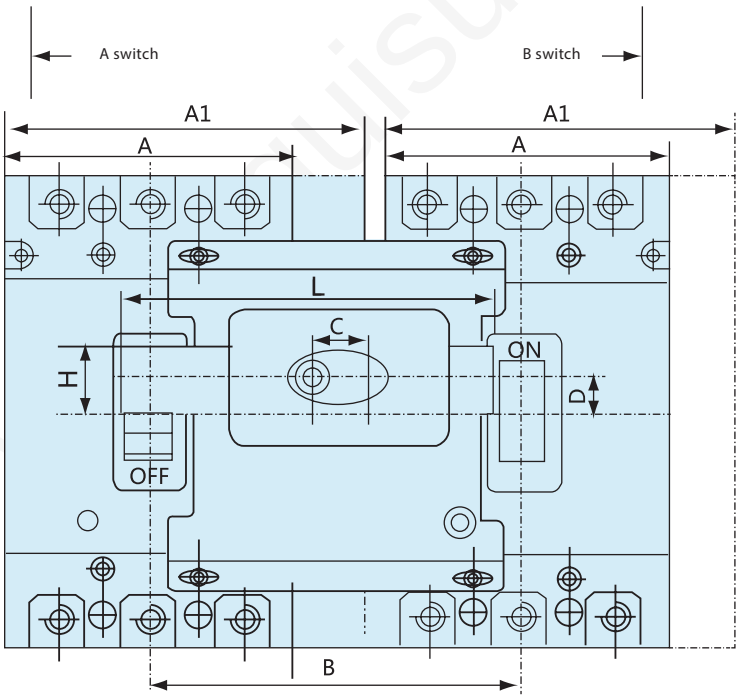
The rated voltage of FT is the power input voltage of A1 and A2

★ 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)
NDM2-63	0.28	0.434	0.341	4	91.6	76.1	90.7	96.2	15
NDM2-100/125	0.288	0.425	0.341	4	96.8	73	90.7	91.2	15
NDM2-225/250	0.313	0.412	0.341	3.87	112	68.8	90.7	85.3	15
NDM2-400	0.197	0.325	0.4	3.87	67	62.3	94.4	1000	15
NDM2-630	0.199	0.314	0.4	3.87	68	58.2	94.4	100	15
NDM2-800	0.538	0.898	1.134	5.22	163	153		120	15

5.3 Functions and Sizes of External Accessories

5.3.1 Mechanical interlock



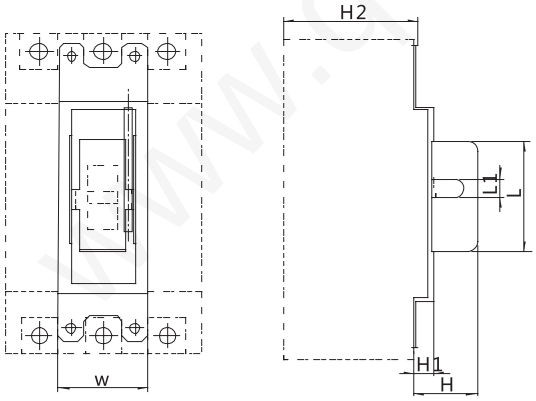
Mechanical interlocking and related dimensions

Product models	A	A1	B	C	D	L	H	Remarks
NDM2-63	78		102	38	13	118	22	For NDM2-63L,M
NDM2-100	92		120	50	11.5	118	22	For NDM2-100C,L,M,H

Product models	A	A1	B	C	D	L	H	Remarks
NDM2-125	92		120	50	11.5	118	22	For NDM2-125C,L,M
NDM2-225	107		135	50	14	135	22	For NDM2-225C,L,M,H
NDM2-250	107		135	50	14	135	22	For NDM2-250C,L,M
NDM2-400	150		180	60	18	175	30	For NDM2-400C,L,M,H
NDM2-630	182		235	60	16	198	28	For NDM2-630C,L,M,H
NDM2-800	210		243	60	18	230	30	For NDM2-800M, H
NDM2-63/4P		103	132	38	13	125	22	For NDM2-63, four-pole
NDM2-100/4P		122	152	50	11.5	150	22	For NDM2-100, four-pole
NDM2-125/4P		122	152	50	11.5	150	22	For NDM2-125, four-pole
NDM2-225/4P		142	173	50	9	168	22	For NDM2-225, four-pole
NDM2-250/4P		142	173	50	9	168	22	For NDM2-250, four-pole
NDM2-400/4P		198	230	60	16	188	28	For NDM2-400, four-pole
NDM2-630/4P		240	295	60	12	240	30	For NDM2-630, four-pole
NDM2-800/4P		280	310	60	29.5	300	30	For NDM2-800M, four-pole

5.3.2 Locking Device

- MS1 locking mechanism installation diagram

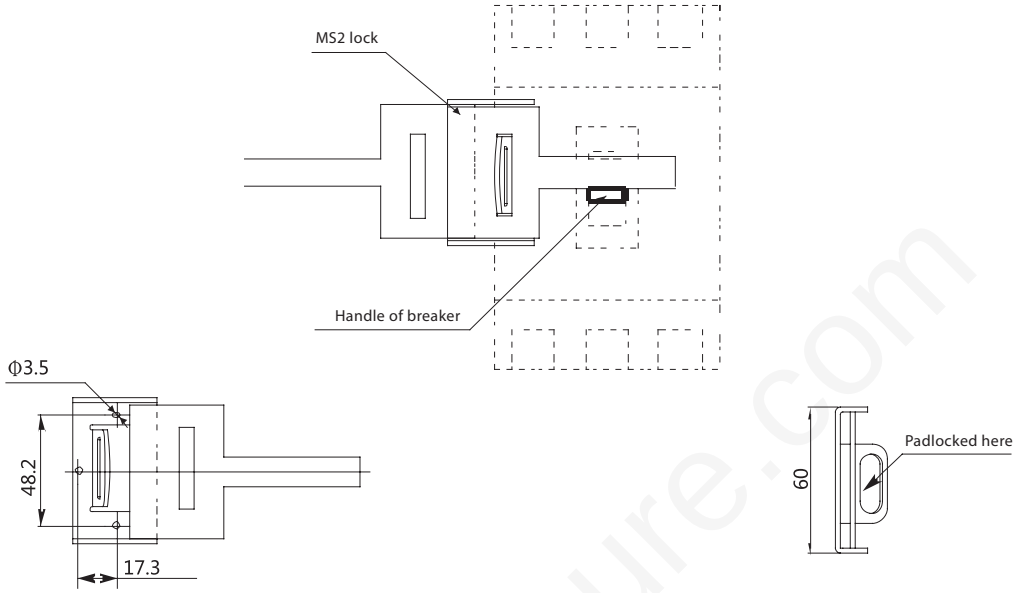


MS1 is an integral lock device (which means that the locking device and the circuit breaker share the mounting screws during the co-installation), which is aimed at preventing closing and opening operations due to human error; at present, there are only NDM2-100, 125, 225 and 250 available; the installation dimensions are shown in the following figures and tables (The dotted part in the figure is the circuit breaker part)

Product models	W	L	L1	H	H1	H2
NDM2-63(L)	42	55	9	24	4	68
NDM2-63 (M) and four-pole	42	55	9	24	4	76
NDM2-100/125(C,L)	42	55	9	24	4	63.5
NDM2-100/125 (M, H) and four-pole	42	55	9	24	4	81.5
NDM2-225/250(C,L)	52	66	9	26	4	82
NDM2-100/125 (M, H) and four-pole	52	66	9	26	4	99

MS2 Locking device

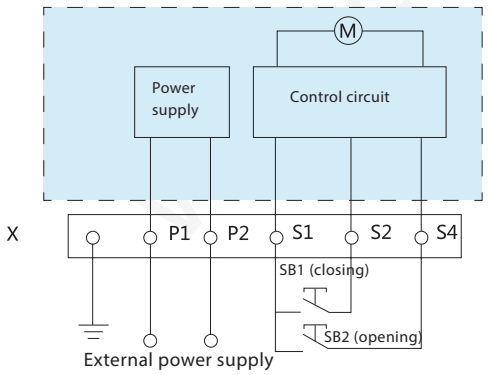
MS2 is a split lock device (which means that the device is installed on the left or right of the front cover of circuit breaker) and is used for products of NDM2 series, which is aimed at preventing closing and opening operation due to human error (the dotted part is the circuit breaker part).



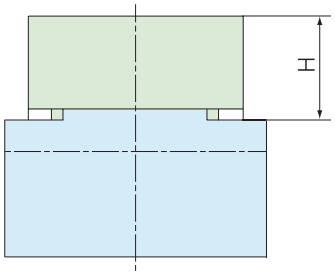
MS2 locking mechanism installation diagram

Electric operating mechanism

★ CD2 motor operating mechanism (equipped with NDM2-63-800 series)



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



CD2 Electric operating mechanism

Explanation of notation:

SB1, SB2: Operating button (prepared by users)

X: Terminal block

P1, P2: External power supply

Voltage Specification:

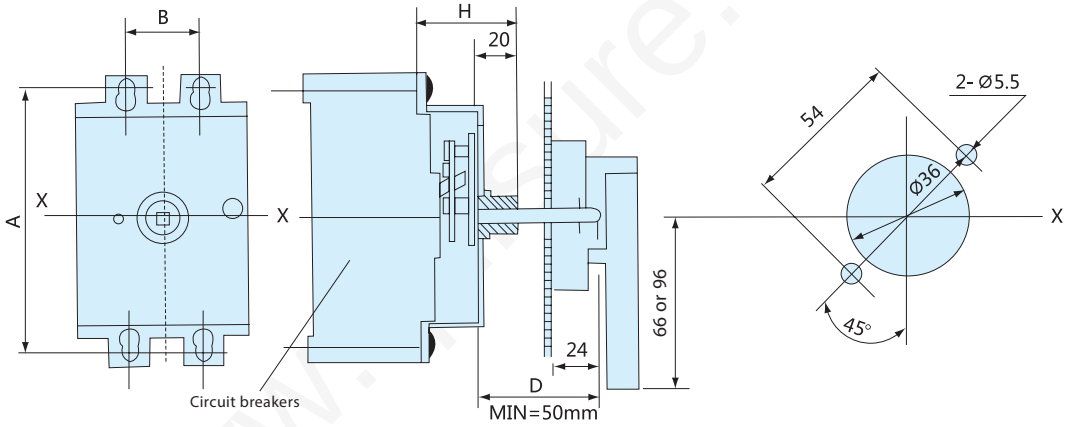
AC50Hz 110V,230V,400V,DC24V,110V,220V

★ Technical parameters of CD2 motor operating mechanism

Power distribution breaker	Operating current (A)	Electric power (W)	Life/times	Operating mechanism height H (mm)
NDM2-63（L、M、4P）	≤ 0.5	14	14000	90.5
NDM2-100、125（C、L、M、H、4P）	≤ 0.5	14	14000	92
NDM2-225、250（C、L、M、H、4P）	≤ 0.5	14	10000	92
NDM2-400（C、L、M、H、4P）	≤ 2	35	5000	142
NDM2-630（C、L、M、H、4P）	≤ 2	35	5000	153
NDM2-800（M、H、4P）	≤ 2	35	5000	146

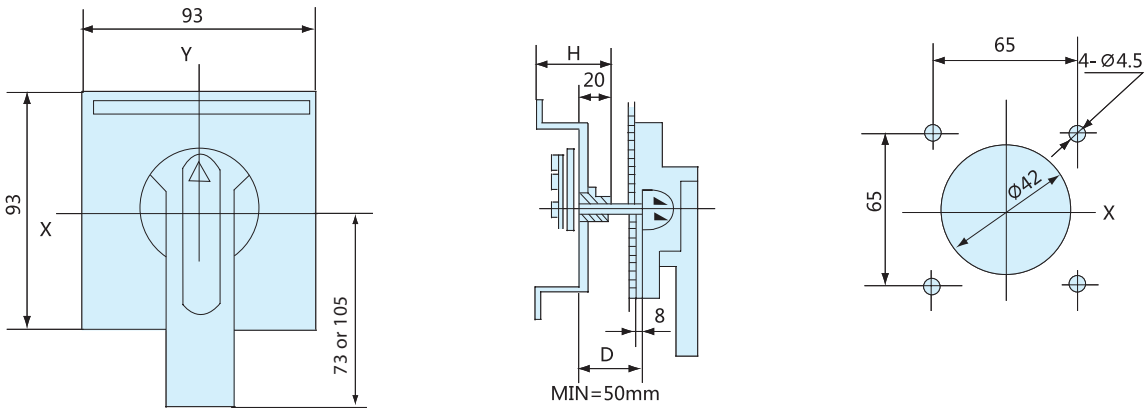
● Manual operating mechanism

★ CS1-A type handle mounting opening diagram

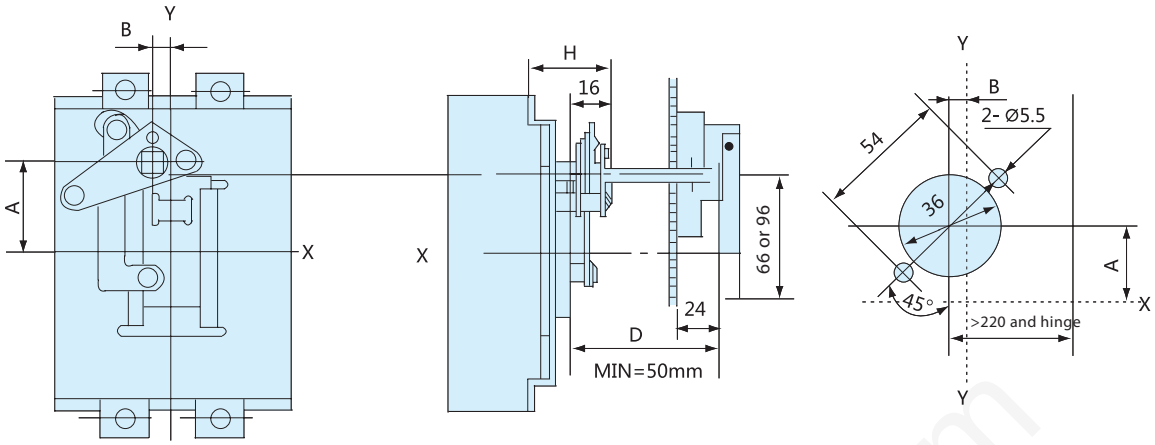


Note: A type is a round handle F type is a square handle

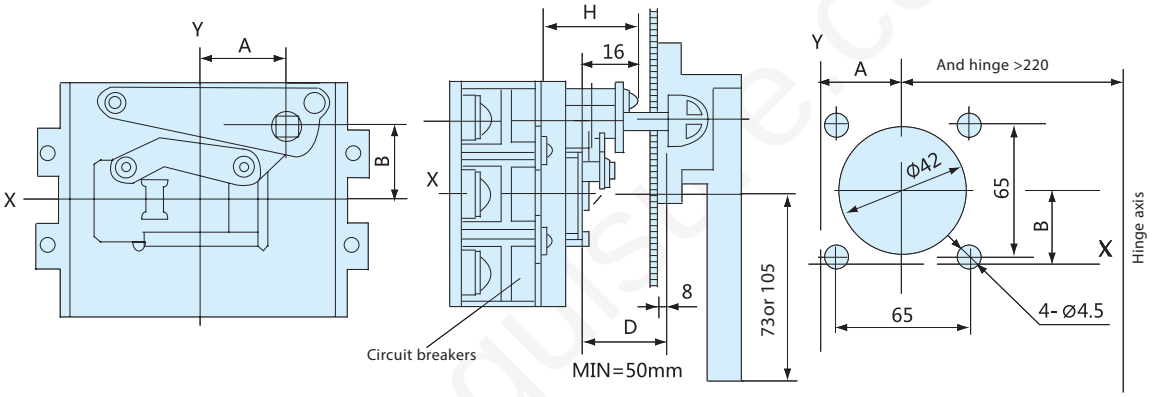
★ CS1-F type handle mounting opening diagram



★ CS2-F type handle mounting opening diagram



★ CS2-A type handle mounting opening diagram

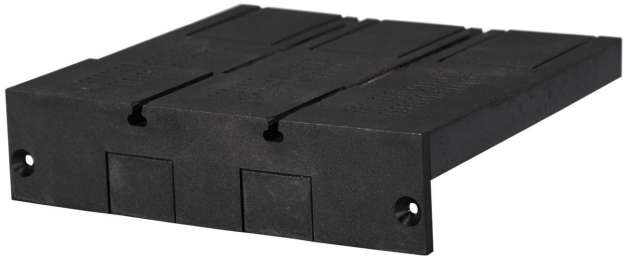


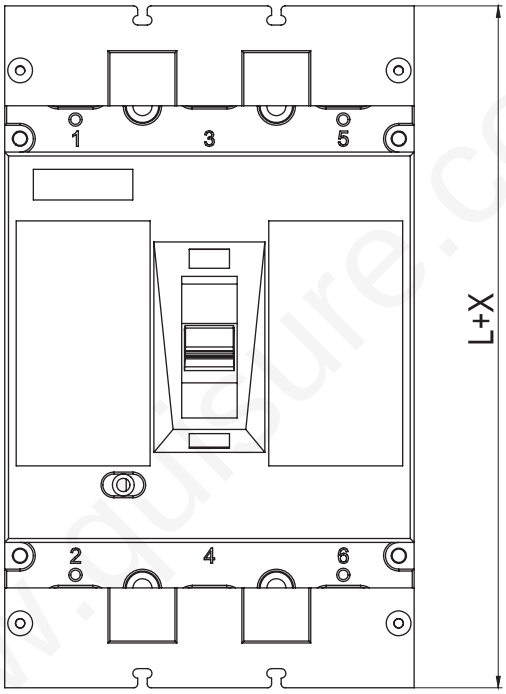
★ Mounting method and outline dimension of manual operating mechanism

External accessories	External accessory model	Equipped with circuit breaker	Manual installation dimensions: mm			Installation mode
			H	A	B	
Manual operating mechanism	CS1-63	NDM2-63L/M	49	100	25	Vertical mounting
	CS1-100	NDM2-100、125 C/L/M/H	49	104	30	
	CS1-225	NDM2-225、250 C/L/M/H	55	143	35	
	CS1-400	NDM2-400 C/L/M/H	76	194	138	
	CS1-630	NDM2-630 C/L/M/H	83	81	171	Horizontal mounting
	CS1-800	NDM2-800 M/H	63	87.5	198	Horizontal mounting
	CS2-100	NDM2-100、125C/L/M/H	46	35	11.5	Vertical mounting
	CS2-100	NDM2-100、125C/L/M/H	46	37	11.5	Horizontal mounting
	CS2-225	NDM2-225、250C/L/M/H	48	35	31	Vertical mounting
	CS2-225	NDM2-225、250C/L/M/H	48	45	32	Horizontal mounting
	CS2-400	NDM2-400 C/L/M/H	61	65	15	Vertical mounting
	CS2-630	NDM2-630 C/L/M/H	61	67.5	15	Horizontal mounting
	CS2-800	NDM2-800 M/H	66	63	15	

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

5.3.3 Zero flashover cover

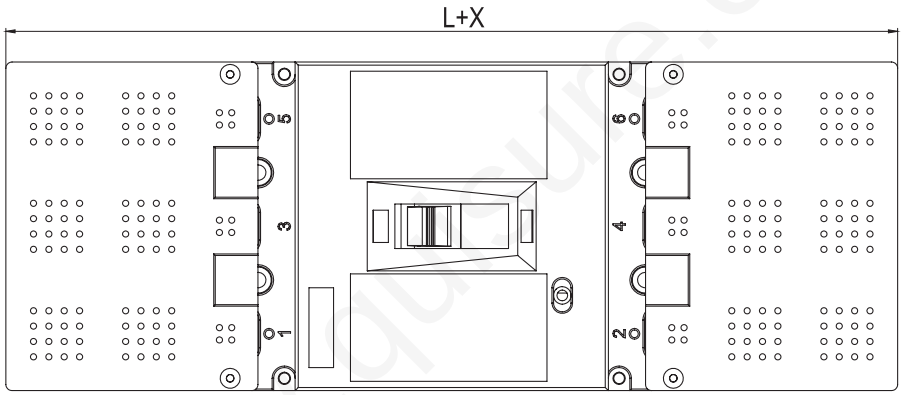




Product series	Model	Body length L	Increased length of terminal cover X	Length after addition of terminal cover Lx
NDM2	NDM2-100/125	150	12	162
	NDM2-225/250	165	19	184
	NDM2-400	257	19	276
	NDM2-630	270	19	289
	NDM2-800	280	19	299

5.3.4 Extended terminal cover

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

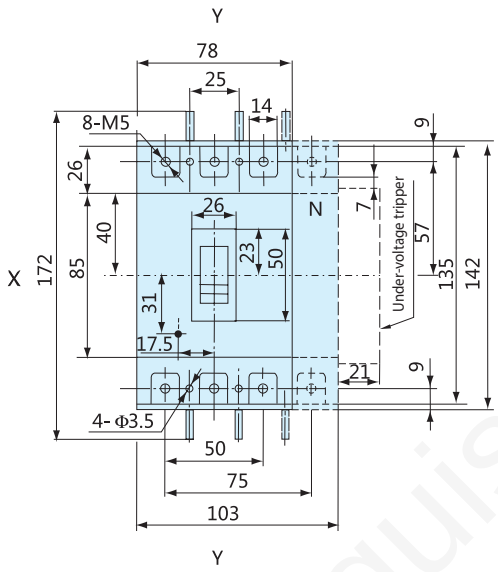


Product series	Model	Body length L (mm)	Increased length of extended terminal cover X(mm)	Total length Lx (mm)
NDM2	NDM2-100L/125L	150	130	280
	NDM2-225L/250L	165	126	291
	NDM2-400L	257	144	401
	NDM2-630L	270	130	400
	NDM2-800L	280	150	430

6. Product Outline Dimension

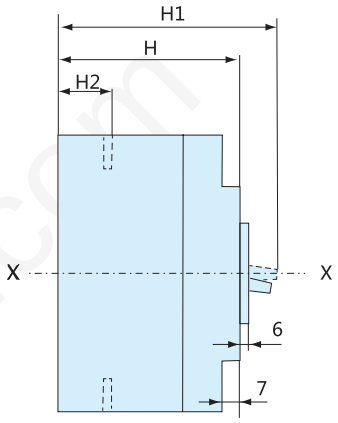
6.1 NDM2-63 (L, M) Outline Dimension, Mounting Dimension and Wiring Method

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

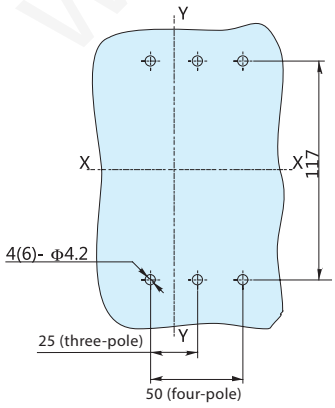


* The size of additional terminal cover (optional piece) is 142, and a four-pole product is not provided with terminal cover.

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



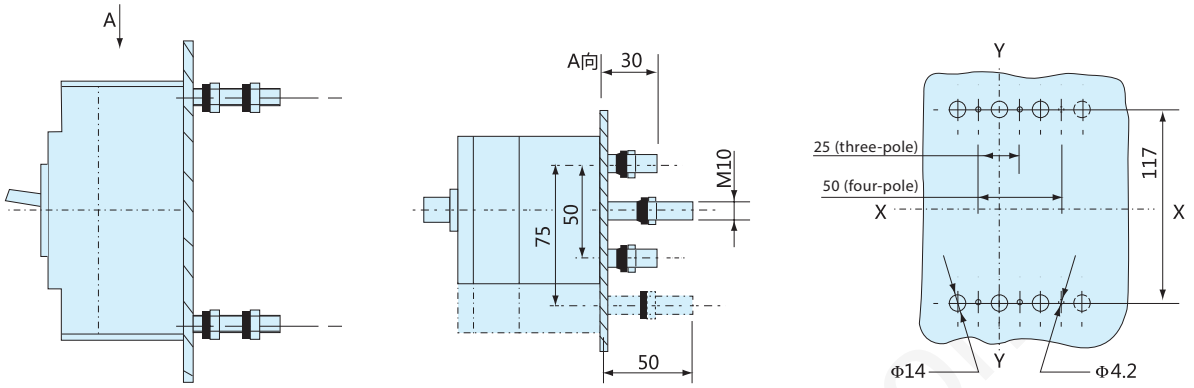
the size of opening of before-panel wiring mounting panel



Model	H	H1	H2
NDM2-63L	73.5	90.5	20.5
NDM2-63M	81.5	98.5	28.5
NDM2-63 four-pole			

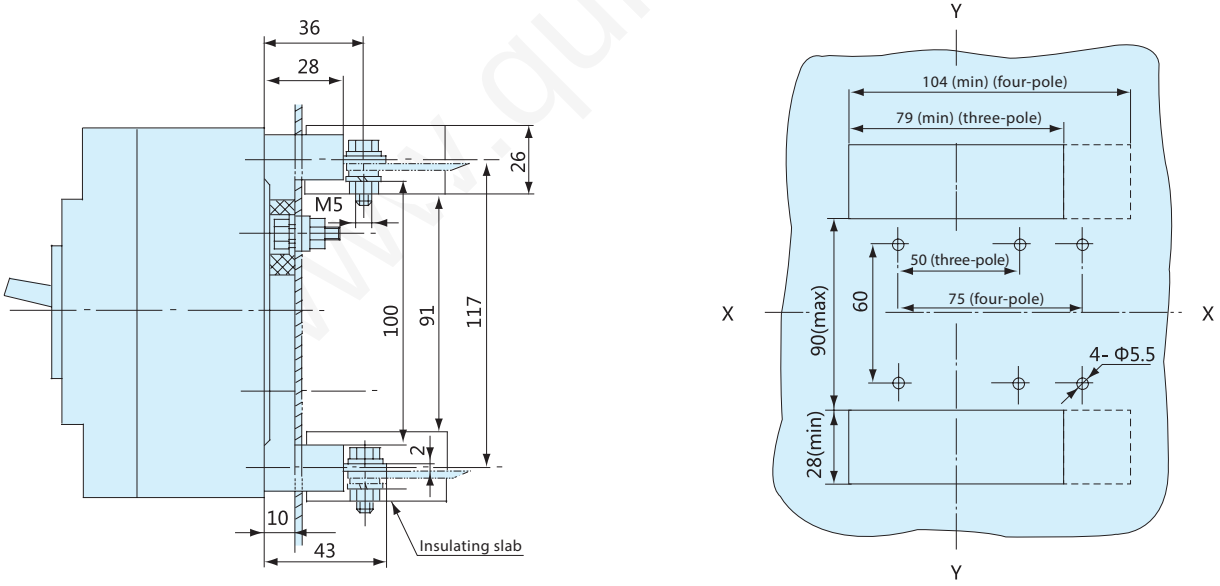
Z1: Behind-panel wiring (three-pole, four-pole)

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



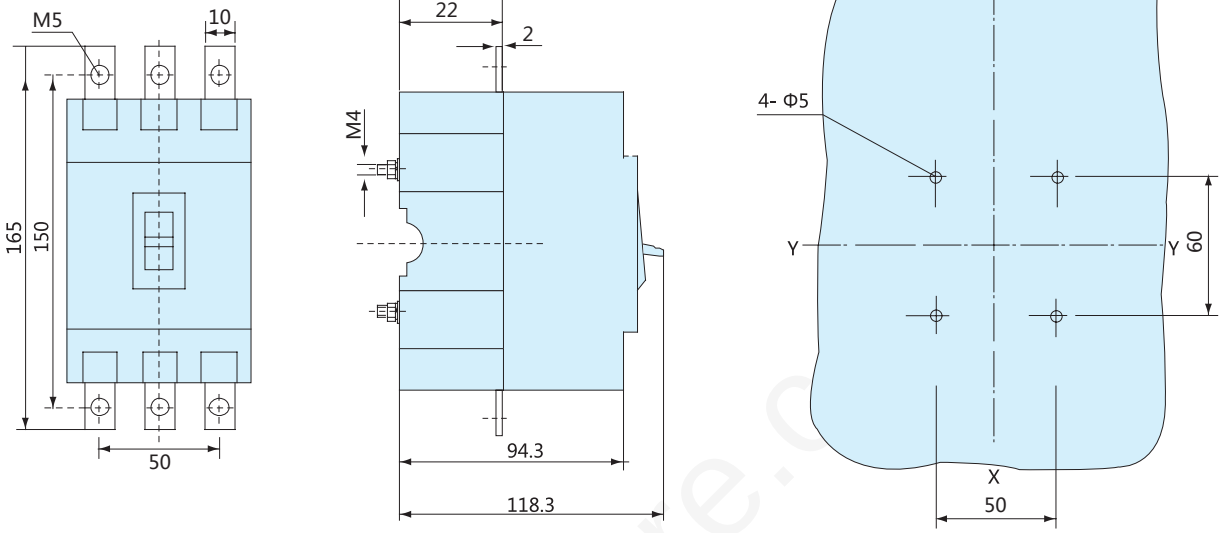
Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

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)

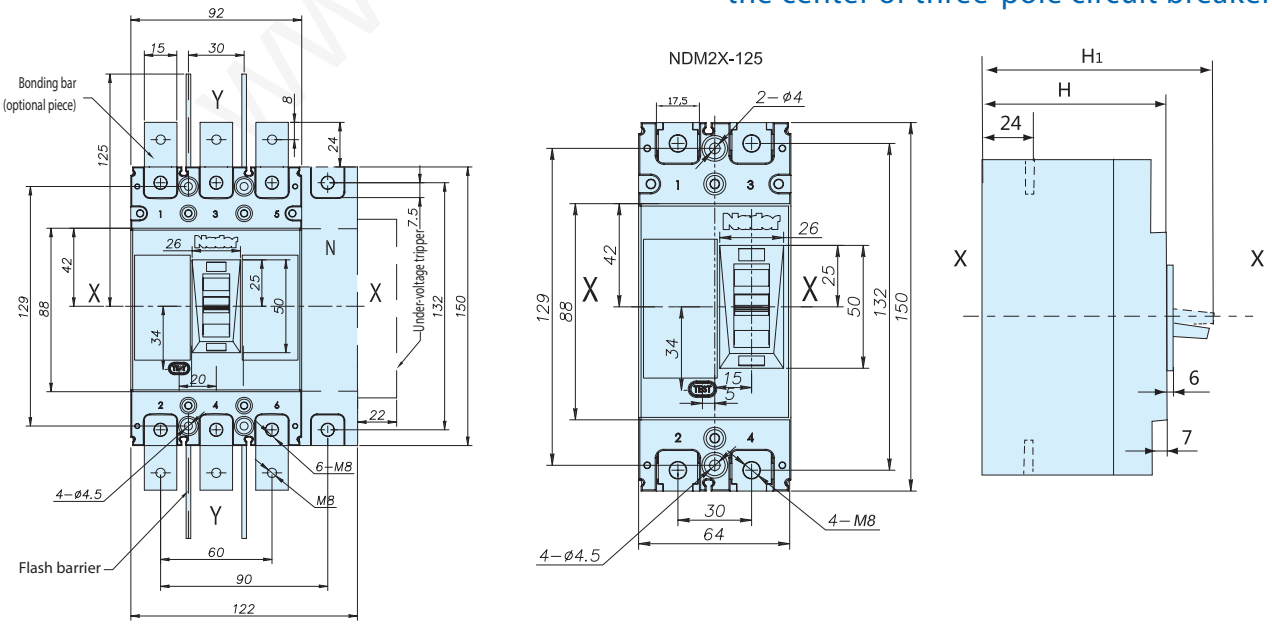
X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker



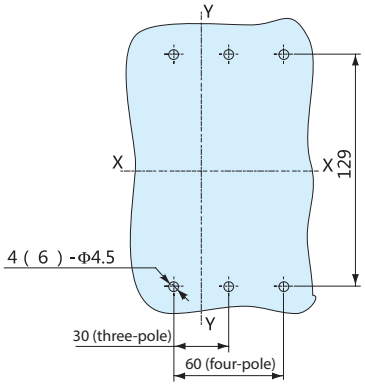
6.2 NDM2-100 (C, L, M, H) 125 (C, L, M, H) NDM2X-125 Outline Dimension, Mounting Dimension and Wiring Method

Before-panel wiring (two-pole,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

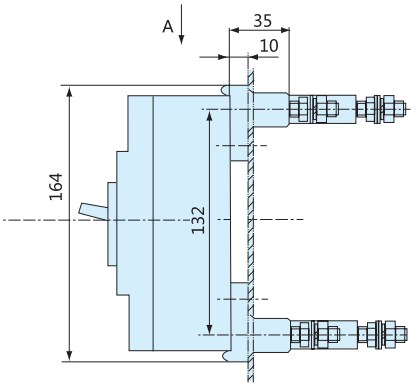


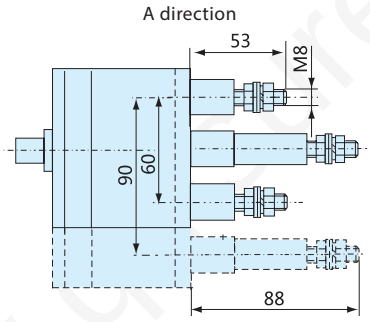
the size of opening of before-panel wiring mounting panel



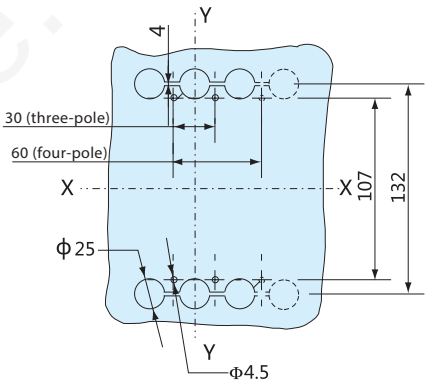
Model	H	H1
NDM2-100C、L	69	86
NDM2-125C、L		
NDM2X-125		
NDM2-100M、H	87	104
NDM2-125M		
NDM2-100 four-pole		
NDM2-125 four-pole		

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

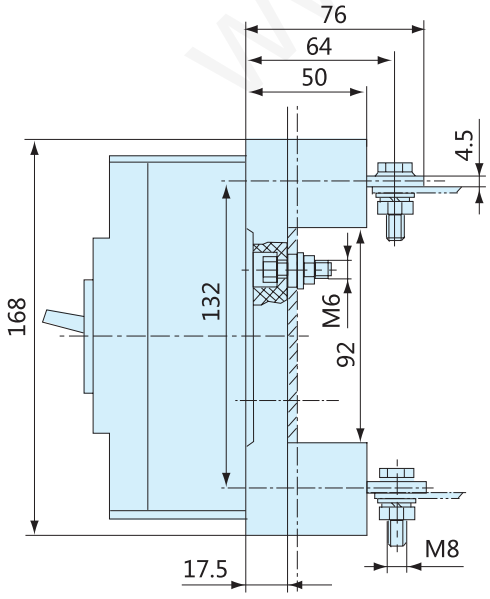




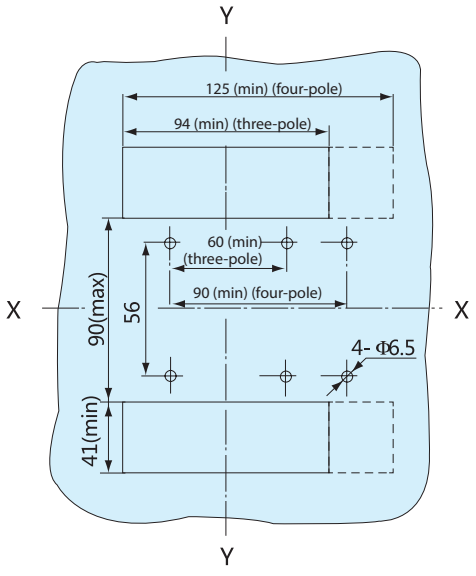
X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of three-pole circuit breaker



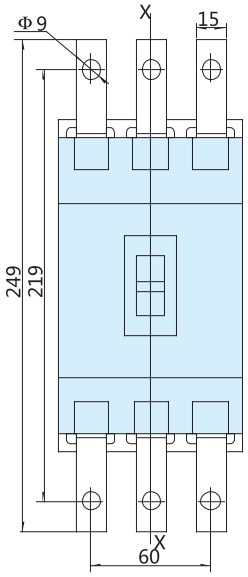
Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

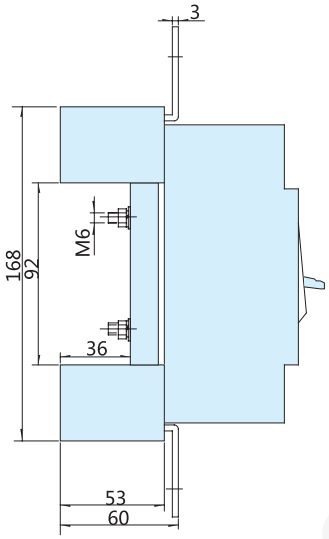


X-X, Y-Y represents the size of plug-in type mounting panel at the center of three-pole circuit breaker

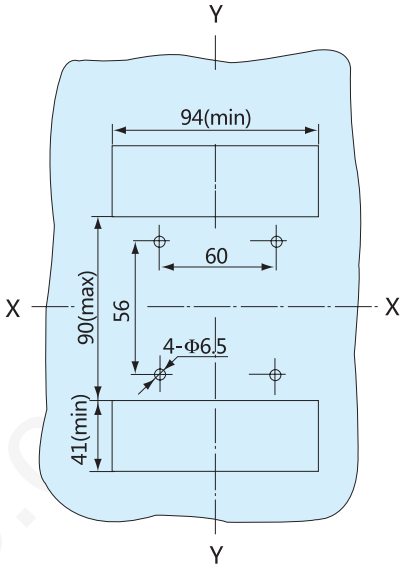


Z2Q:Plug-in type before-panel wiring (three-pole)



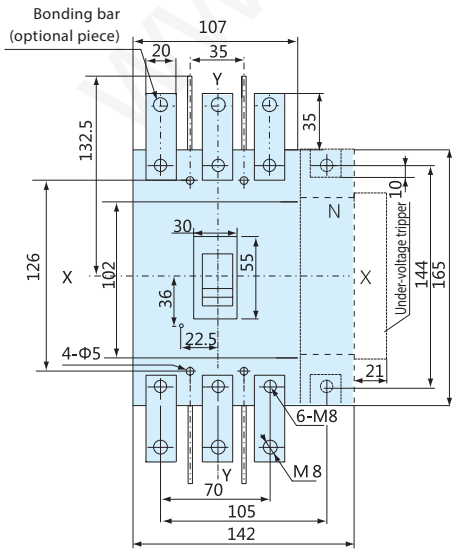


X-X, Y-Y represents the size of plug-in type mounting panel at the center of three-pole circuit breaker

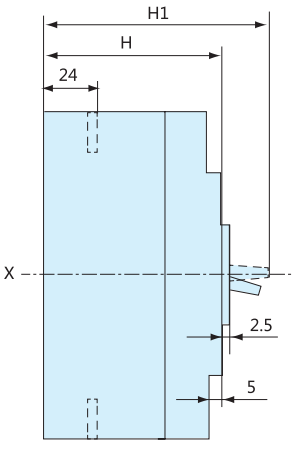


6.3 NDM2-225 (C, L, M, H) 250 (C, L, M, H) Outline Dimension, Mounting Dimension and Wiring Method

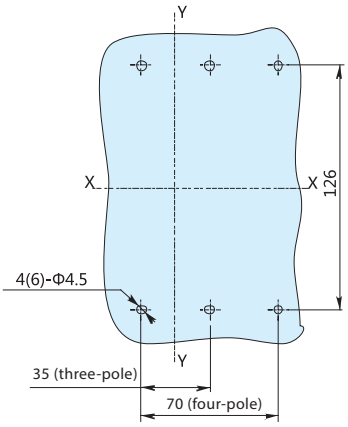
Before-panel wiring (three-pole,four-pole)



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



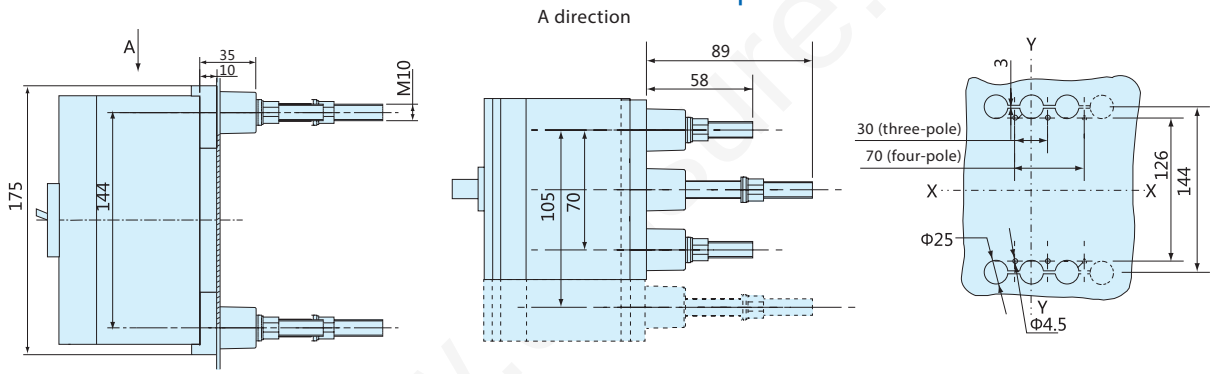
the size of opening of before-panel wiring mounting panel



Model	H	H1
NDM2-225C、L	86	110
NDM2-250C、L		
NDM2-250M、H	103	127
NDM2-250M		
NDM2-225 four-pole		
NDM2-250 four-pole		

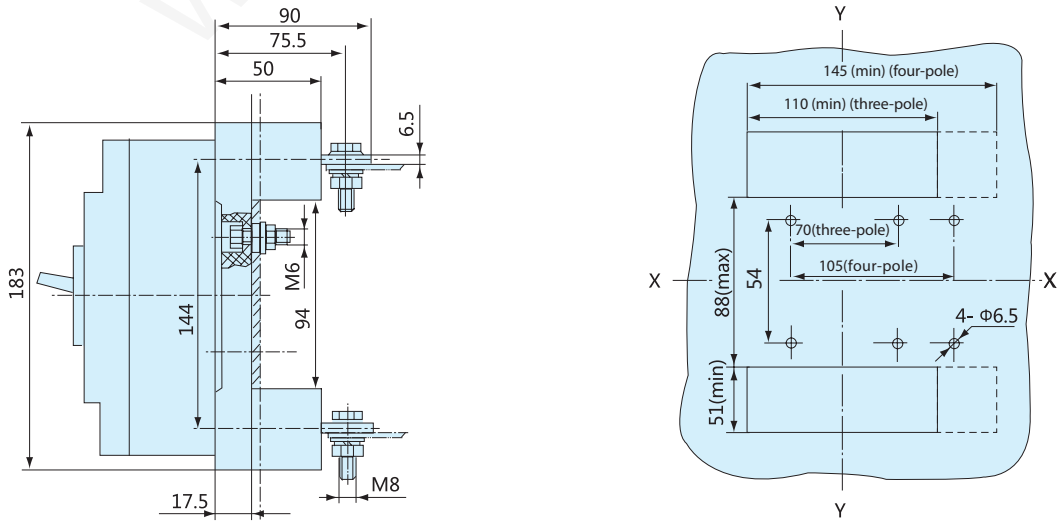
Z1: Behind-panel wiring (three-pole, four-pole)

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

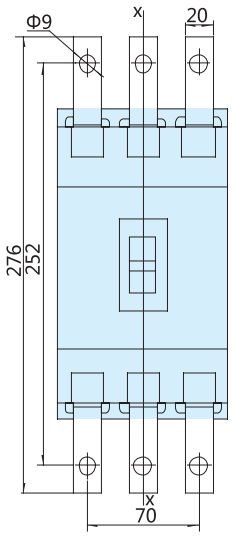


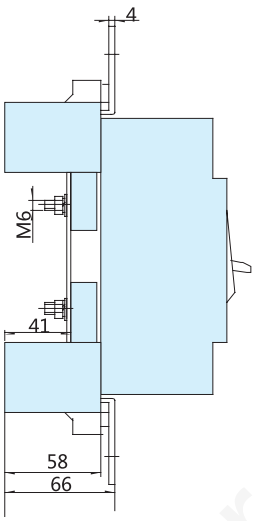
Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

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

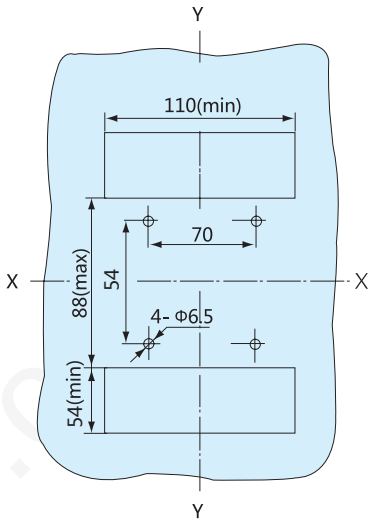


Z2Q:Plug-in type before-panel wiring (three-pole)





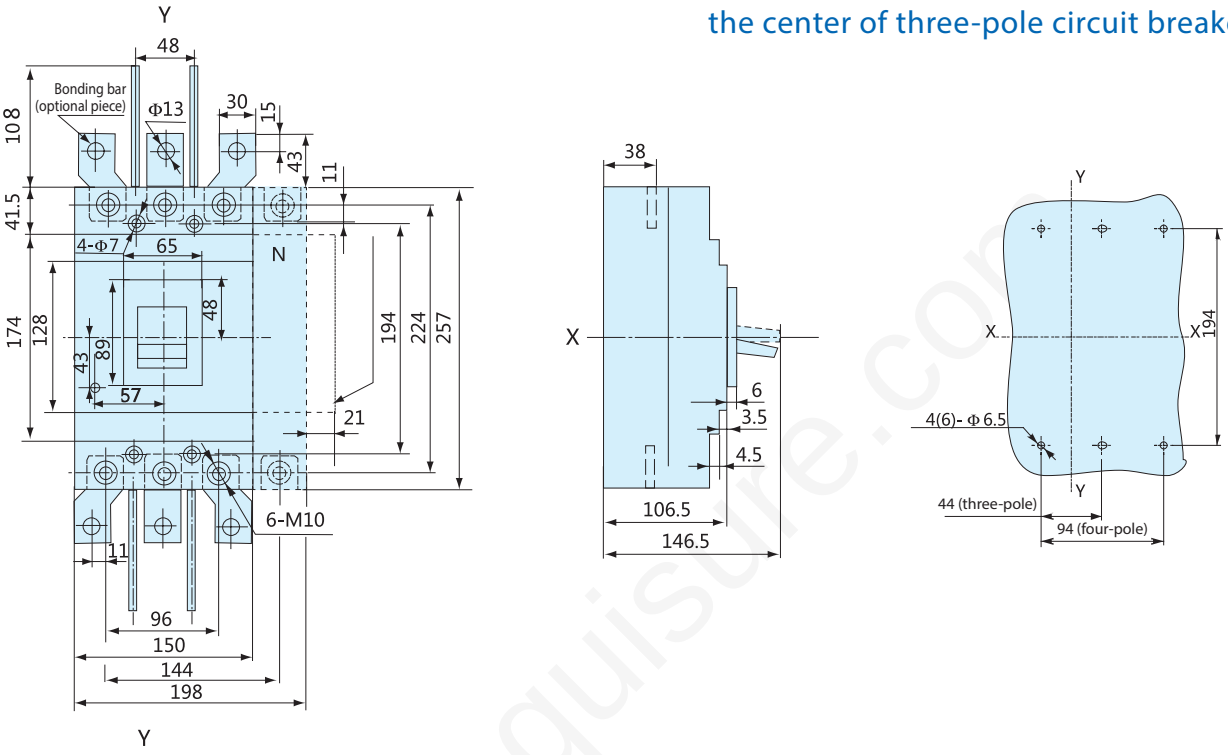
X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker



6.4 NDM2-400(C, L, M, H) Outline Dimension, Mounting Dimension and Wiring Method

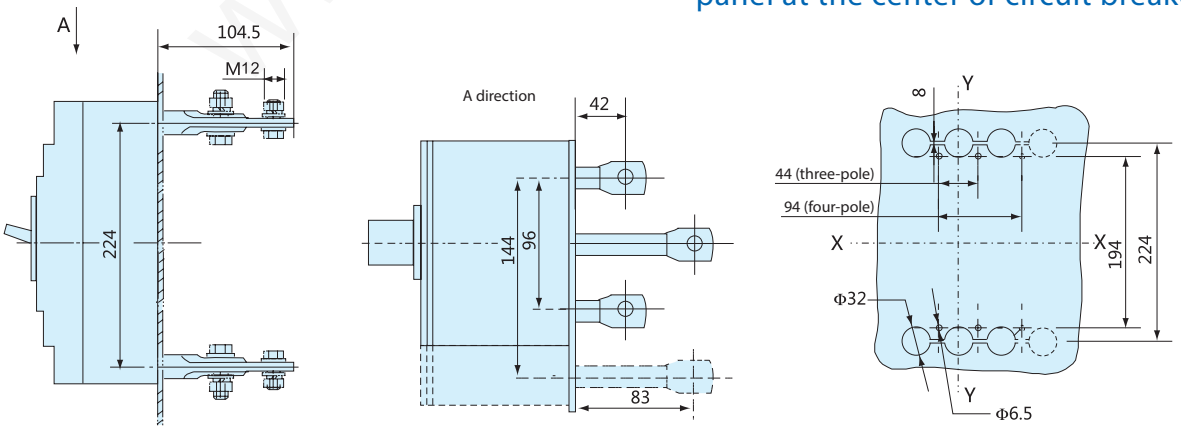
Before-panel wiring (three-pole,four-pole)

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



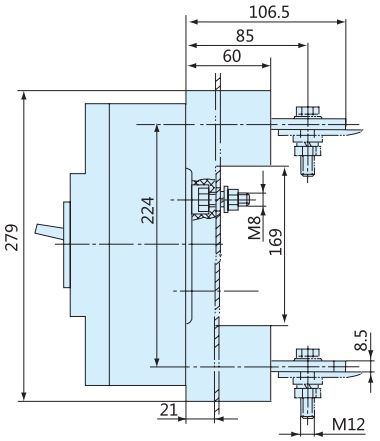
Z1: Behind-panel wiring (three-pole, four-pole)

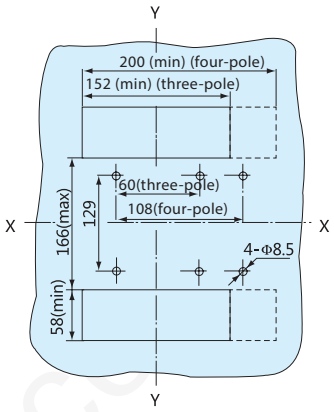
X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of circuit breaker



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

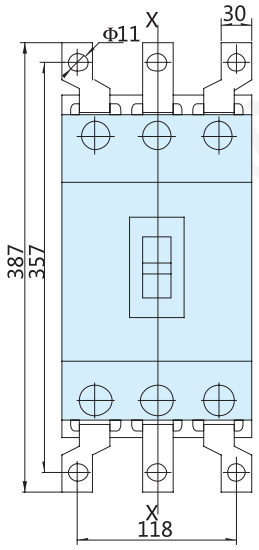
X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker

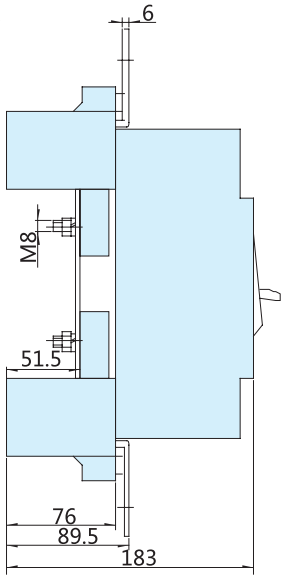


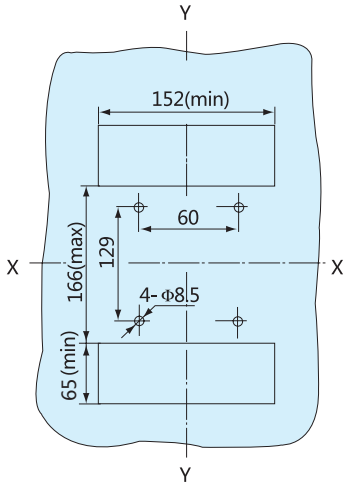


Z2Q:Plug-in type before-panel wiring (three-pole)

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

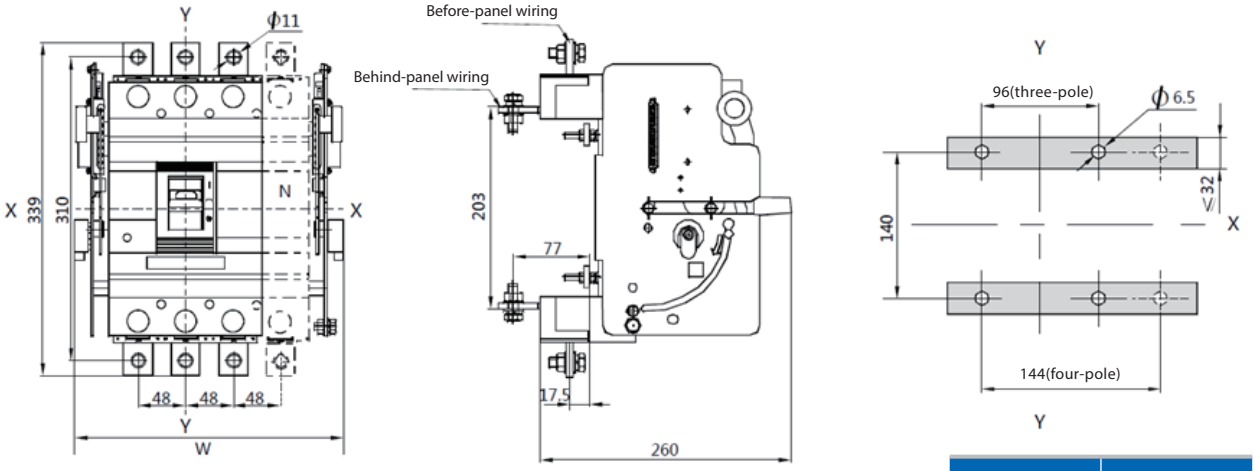






Drawer wiring (three-pole, four-pole)

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

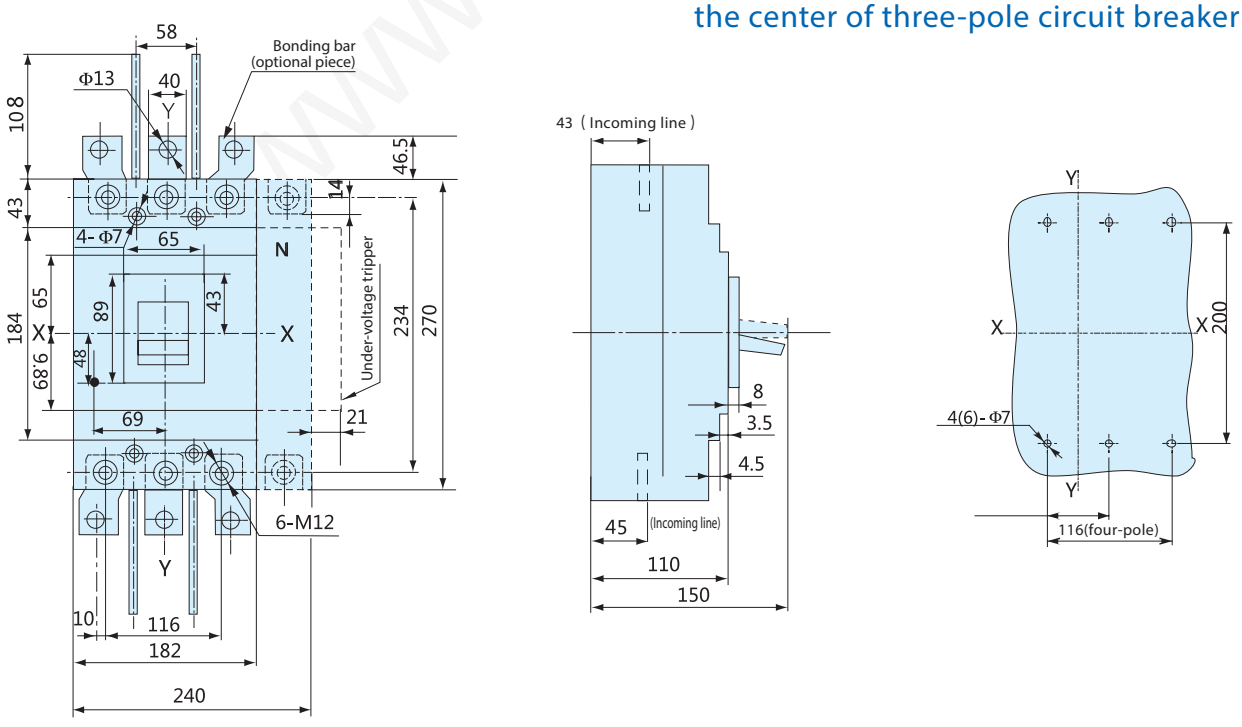


级数	W
Three-pole	223
Four-pole	271

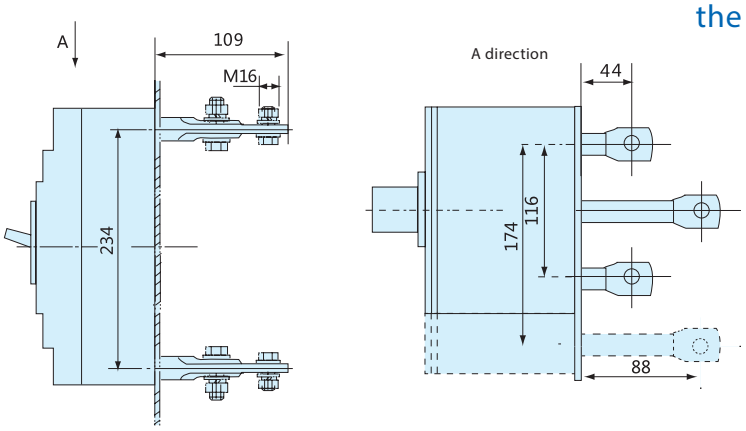
6.5 NDM2-630(C, L, M, H) Outline Dimension, Mounting Dimension and Wiring Method

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

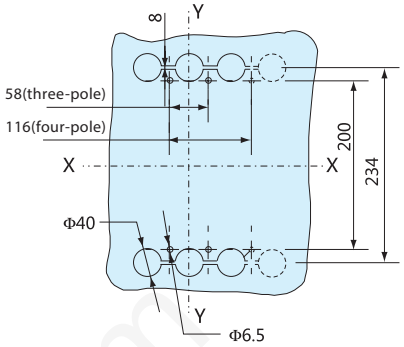
X-X, Y-Y represents the size of opening of before-panel wiring mounting panel at the center of three-pole circuit breaker



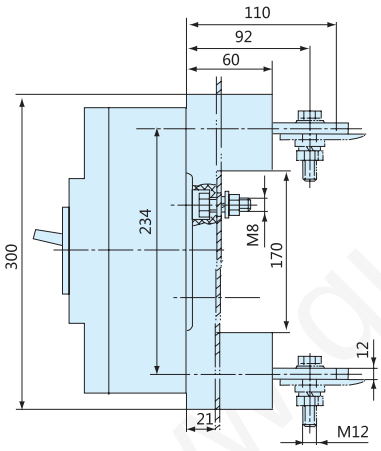
Z1: Behind-panel wiring (three-pole, four-pole)



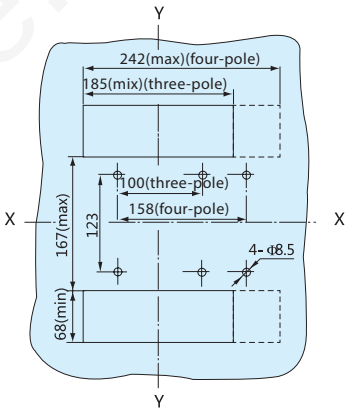
X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of three-pole circuit breaker



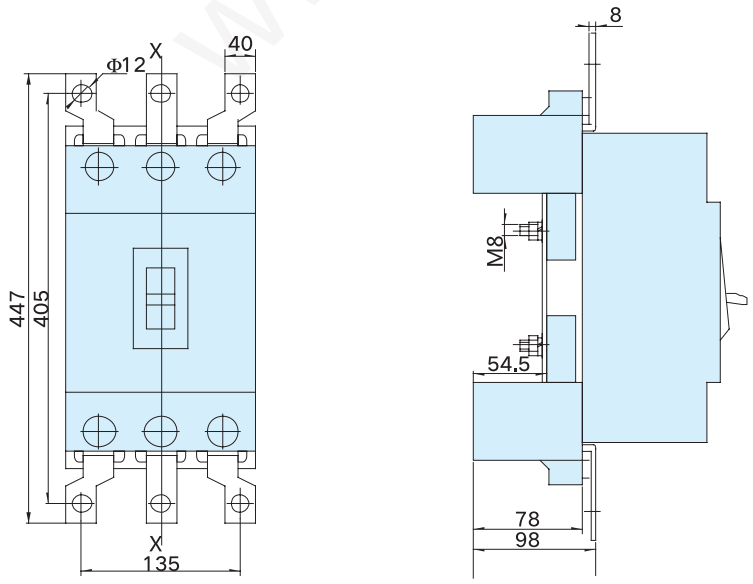
Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

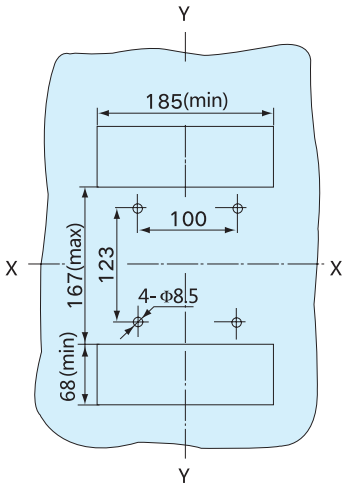


X-X, Y-Y represents the size of plug-in type mounting panel at the center of three-pole circuit breaker



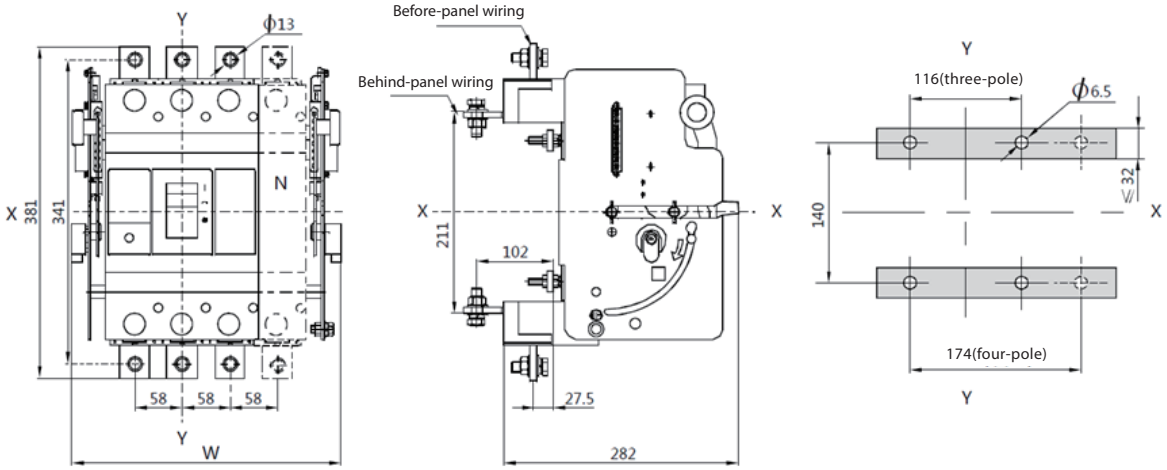
Z2Q:Plug-in type before-panel wiring (three-pole)





Drawer wiring (three-pole, four-pole)

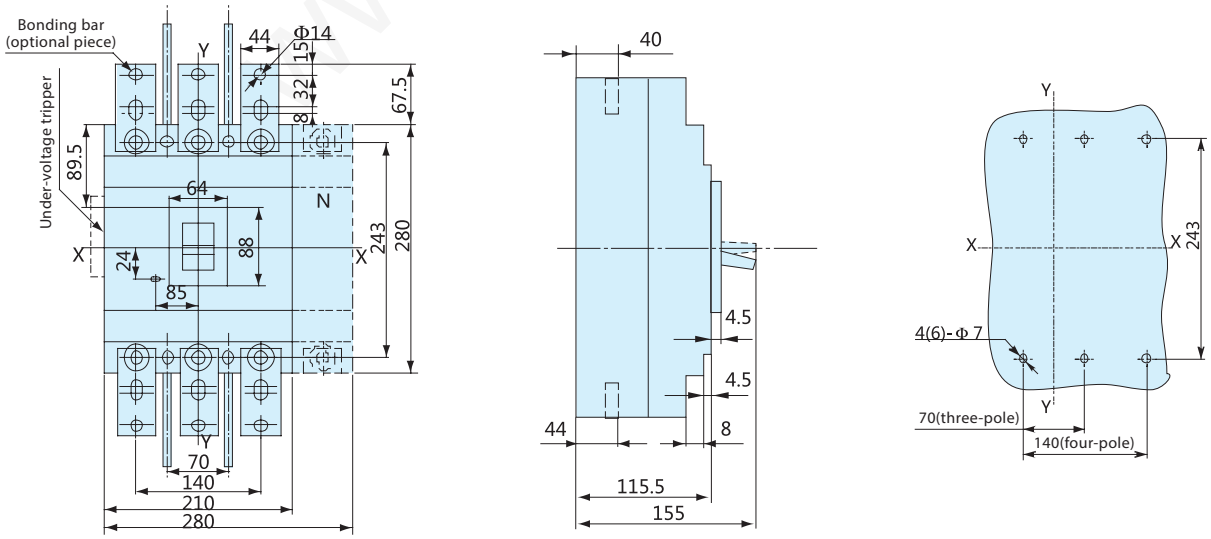
X-X, Y-Y represents the size of opening of drawer type wiring mounting panel at the center of three-pole circuit breaker



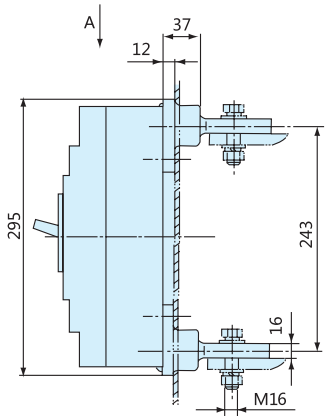
6.6 NDM2-800(M, H) Outline Dimension, Mounting Dimension and Wiring Method

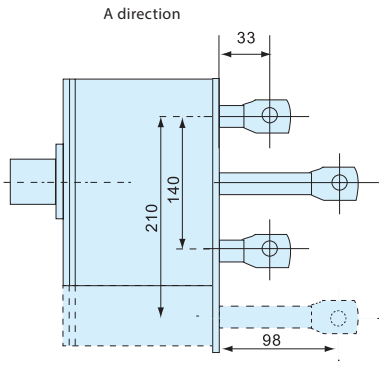
Before-panel wiring (three-pole,four-pole)

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

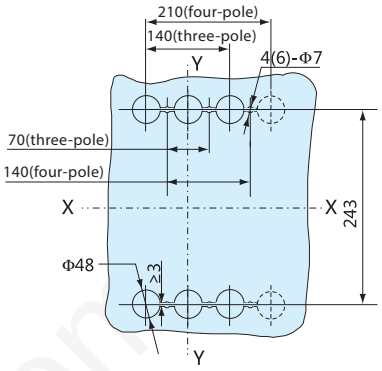


Z1: Behind-panel wiring (three-pole, four-pole)

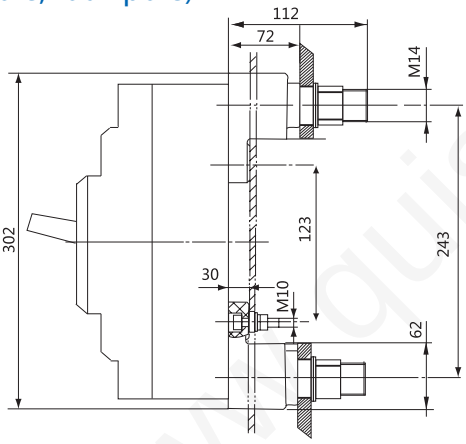




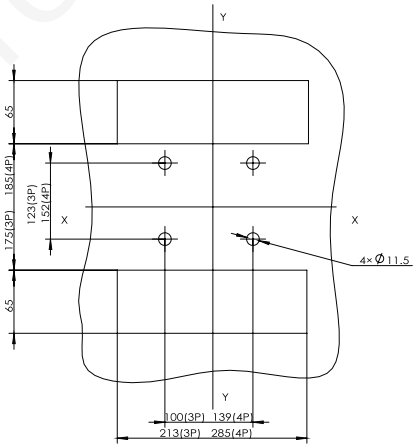
X-X, Y-Y represents the size of opening of behind-panel wiring mounting panel at the center of circuit breaker



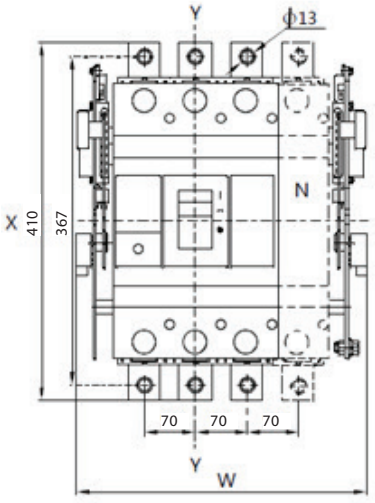
Z2H:Plug-in type behind-panel wiring (three-pole, four-pole)

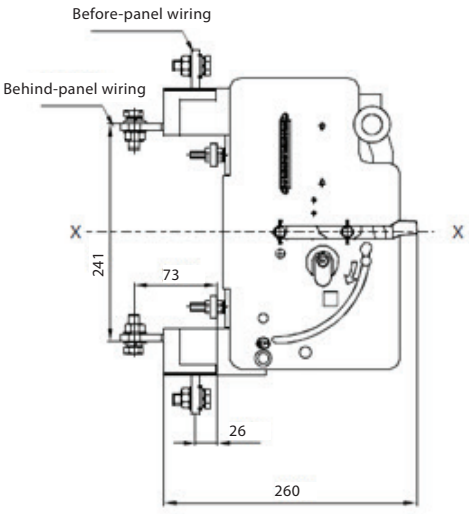


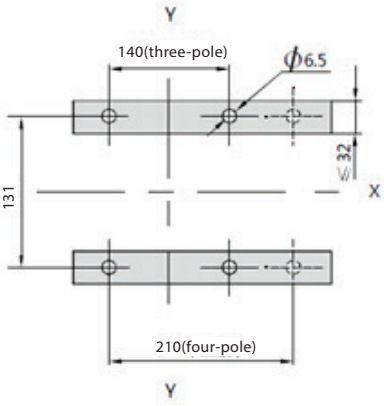
X-X, Y-Y represents the size of plug-in type mounting panel at the center of circuit breaker



Drawer wiring (three-pole, four-pole)



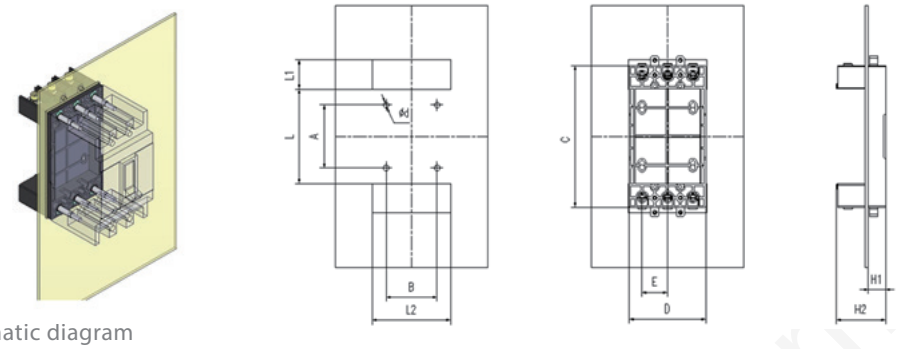




Number of poles	W
Three-pole	289
Four-pole	359

6.7 NDM2-(100-800)Z3 Plug-in Type Mounting Dimension and Wiring Method

● Z3H (Scheme 1): Behind-panel mounting



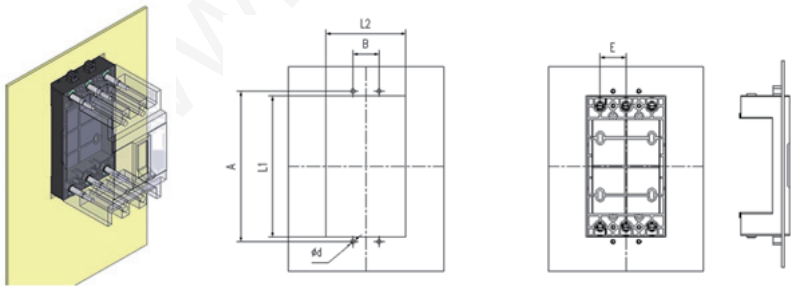
Installation schematic diagram

Typical product model	Breaker model	A	B	L	L1	L2	d	C	D	E	H1	H2	Remarks
MZ3-100	NDM2-100/125	65	60	90	51	94	6.5	160	90	30	18	56.2	
MZ3-225	NDM2-225/250	74	70	100	55	110	6.5	179	105	35	20	73.2	
MZ3-400	NDM2-400	140	96	178	70	150	7	274	148	48	45	85	
MZ3-630	NDM2-630	140	116	178	83	177	7	300	232	58	44	120	
MZ3-800	NDM2-800	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

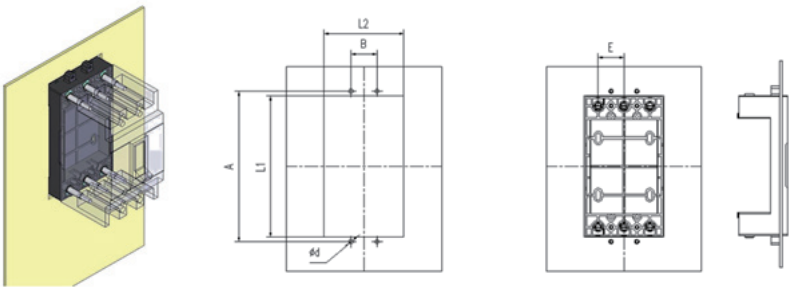


Installation schematic diagram

Typical product model	Breaker model	A	B	L1	L2	d	E	Remarks
MZ3-100	NDM2-100/125	170	30	161	92	5	30	
MZ3-225	NDM2-225/250	191	35	180	107	5	35	
MZ3-400	NDM2-400	290	48	276	150	6	48	
MZ3-630	NDM2-630	316	58	302	176	6	58	
MZ3-800	NDM2-800	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

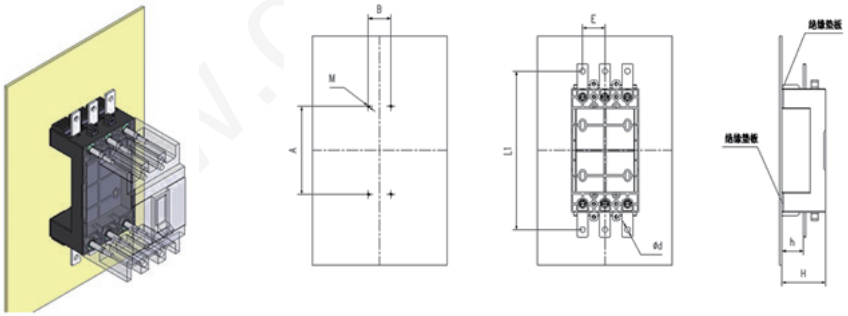


Installation schematic diagram

Typical product model	Breaker model	A	B	E	Remarks
MZ3-100	NDM2-100/125	65	60	30	
MZ3-225	NDM2-225/250	74	70	35	
MZ3-400	NDM2-400	140	96	48	
MZ3-630	NDM2-630	140	116	58	
MZ3-800	NDM2-800	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	Remarks
MZ3-100	NDM2-100/125	110	30	198	30	6.5	M4	57	28	
MZ3-225	NDM2-225/250	150	35	223	35	8.5	M4	74	32	
MZ3-400	NDM2-400	244	48	326	48	10.5	M5	85	36	
MZ3-630	NDM2-630	264	58	352	58	12.5	M6	120	64	
MZ3-800	NDM2-800	283	70	363	70	12.5	M6	125	67	

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

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

● Selection of busbars

Rated current A	10 12.5	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

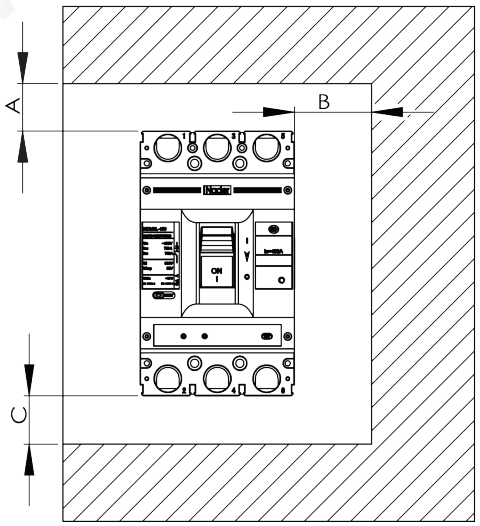
● Selection of Cable

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
700, 800	2	240	2	50 × 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.

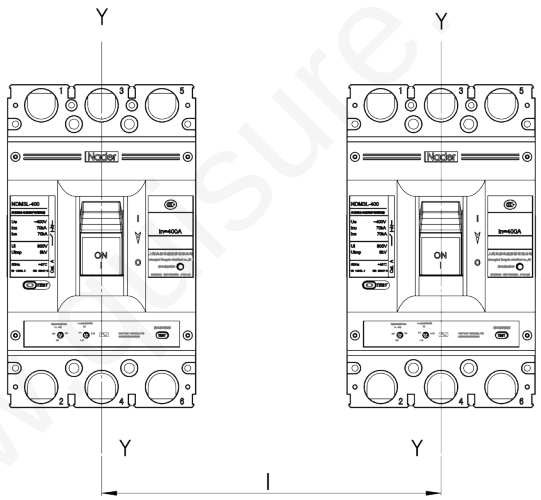
6.9 Safe Distance for Circuit Breaker Mounting

● 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)	C (From incoming line end to cabinet surface)
Specifications	With zero flashover cover	Without zero flashover cover		
NDM2-63	25	65	30	30
NDM2-100	25	65	30	30
NDM2-125	25	65	30	30
NDM2X-125	/	65	30	30
NDM2-225	25	65	30	30
NDM2-250	25	65	30	30
NDM2-400	25	120	35	35
NDM2-630	25	120	35	35
NDM2-800	25	120	35	35

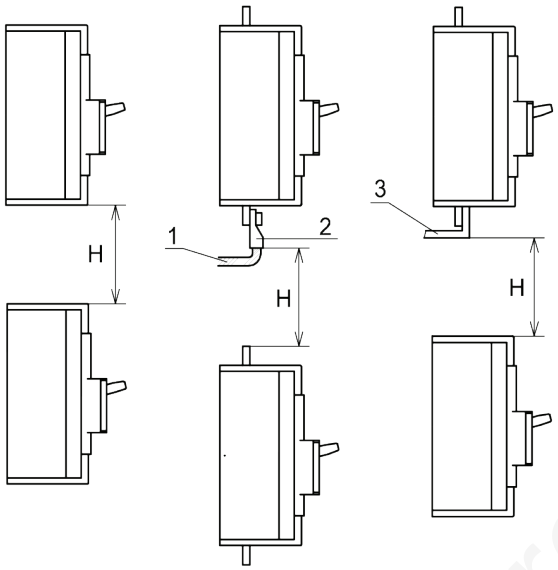
Minimum center distance of row installation room of the circuit breakers



Specifications	Circuit breaker width (mm)			Center distance I (mm)		
	Two-pole	Three-pole	Four-pole	Two-pole	Three-pole	Four-pole
NDM2-63	25	65	25	65	30	30
NDM2-100	25	65	25	65	30	30
NDM2-125	25	65	25	65	30	30
NDM2X-125	/	65	/	65	30	30
NDM2-225	25	65	25	65	30	30
NDM2-250	25	65	25	65	30	30
NDM2-400	25	120	25	120	35	35
NDM2-630	25	120	25	120	35	35
NDM2-800	25	120	25	120	35	35

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
NDM2-63	90	90
NDM2-100	90	91
NDM2-125	90	91
NDM2X-125	/	91
NDM2-225	90	93
NDM2-250	90	93
NDM2-400	155	155
NDM2-630	155	155
NDM2-800	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: NDM2-100L with under-voltage protection and behind-panel wiring of the single auxiliary contact plate, with rated current of 80A and control power voltage of AC220, 10 sets.