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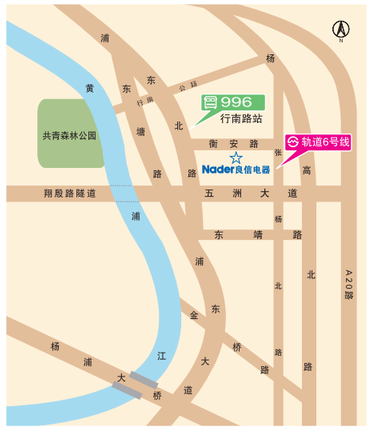

As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

2013.05

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Nader

NDM5-160 Series

Molded Case Circuit Breaker

Nader

Specialist of Low-voltage Electrical Components

About us

SHANGHAI LIANGXIN ELECTRICAL CO.,LTD.

Nader is a private joint-stock enterprise that is set up by experts in this industry, with the headquarter locates in Pudong new area, Shanghai, China. We supply products with the best cost performance based on the business ideas of "Concentration and innovation", the core value of "Sincerity and care" and the business mission of "To be the top-ranking supplier of LV devices by using resources efficiently".

We have passed the three-in-one system certification including ISO 9001-2008, ISO 14001-2004 and IECQ QC 080000, and our series of LV components have passed CCC, CB, CE (Conformity of Europe, TÜV, Din, UL and C-UL certification in succession. We comply with the European RoHS directive actively, so out products have passed inspection of SGS-CSTC as the first company in China LV device industry. Our main products have been winning Shanghai Electrical Brand Name Products for continuous three years. In addition, our products have passed the selective examination performed by the nation and Shanghai for continuous three years.

Now we have established our regional sales & service centers in 37 large cities (Shanghai, Beijing, Guangzhou, Shenzhen, Nanjing, Hangzhou, Wuhan, Chongqing, Tianjin, Xi' an, Jinan, Dalian, Harbin, Changsha, Kunming, Zhengzhou, Chengdu, Nanchang, Shijiazhuang, Changchun and Guiyang, etc.) for providing in time and good service for our customers across the country.

Nader

Specialist of Low-voltage Electrical Components

NDM5-160 Series

Molded Case Circuit Breaker

Catalog

Nader

NDM5-160 Molded case circuit breaker

Scope of application

> The NDM5-160 series of molded case circuit breakers (MCCBs) with the rated insulation voltage of 800V are applicable to the AC 50Hz or 60Hz circuits with the rated operating voltage of AC230V, AC400V and AC690V, and the rated operating current of 16A~160A for electrical energy distribution, as well as protection of circuits and power supply devices in case of overload, short circuit, undervoltage (With the UVT);, the products are also used to protect motors during infrequent starting, braking, overload, short circuit, etc..

> The isolating function with the relative symbol: .

> Standards: IEC60947-2 and GB14048.2.



Model and implication

ND	M	5	-	160	□	□	/	□	/	□	□	□	□	□
1	2	3		4	5	6		7		8	9	10	11	12

No.	Implication	Model
1	Enterprise code "NADER"	ND
2	Molded case circuit breaker	N
3	Design code	5
4	Frame current Inm (A):	160
5	Breaking level code:	S, H, L
6	Rated current In (A):	16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160
7	Number of poles	(Refer to "Note a")
8	Release code	(Refer to "Note b")
9	Installation modes	(Refer to "Note c")
10	Connection modes	(Refer to "Note d")
11	Operating modes	(Refer to "Note e")
12	Accessories	(Refer to "Table 1")

Note:

a) Number of poles

> 2: 2 poles; 3: 3 poles; 4: 4 poles;

> 4A: There is no overcurrent protection on Pole N, and Pole N is always on;

> 4B: There is no overcurrent protection on Pole N, and Pole N opens and closes with the other three poles (Pole N closes at first, and opens at last);

> 4C: There is overcurrent protection on Pole N, and Pole N opens with the other three poles (Pole N closes at first, and opens at last);

> 4D: There is overcurrent protection on Pole N, and Pole N is always on.

b) Release code

TMD (Distribution protection): [Thermal adjustable (0.8-0.9-1.0) In, magnetic adjustable (5-6-7-8-9-10) In, for power distribution];

TMM (Motor protection): [Thermal adjustable (0.8-0.9-1.0) In, magnetic adjustable (8-9-10-11-12-13-14) In, for motors];

Note: The magnetic adjustment scope of TMM (Motor protection) is (10-11-12-13-14) In.

c) Installation modes: Fixed: "No code"; plug-in: "P"; guide rail: "G".

d) Connection modes: Front wiring: "No code"; front extension wiring: "ES"; front bare copper cable wiring: "FCu"; rear screw wiring: "R".

e) Operating modes: Direct handle operation: "No code"; rotary handle operation: "R"; motor operation: "M" (Note: Not applicable to 2P).

Table 1

Accessory code	Name of accessory	Mounting position		
		2P	3P	4P
00	No	—	—	—
10	Alarm contact			
20	Shunt release			
30	Undervoltage release			
40	Single auxiliary contact	—		
50	Double auxiliary contacts	—		
60	Three auxiliary contacts	—		
12	Alarm contact + shunt release			
13	Alarm contact + undervoltage release			
14	Alarm contact + single auxiliary contact	—		
15	Alarm contact + double auxiliary contacts	—		
16	Alarm contact + three auxiliary contacts	—		
70	Alarm contact + shunt release + single auxiliary contact	—		
71	Alarm contact + shunt release + double auxiliary contacts	—		
72	Alarm contact + shunt release + three auxiliary contacts	—		
80	Alarm contact + undervoltage release + single auxiliary contact	—		
81	Alarm contact + undervoltage release + double auxiliary contacts	—		
82	Alarm contact + undervoltage release + three auxiliary contacts	—		
24	Shunt release + single auxiliary contact	—		
25	Shunt release + double auxiliary contacts	—		
26	Shunt release + three auxiliary contacts	—		
34	Undervoltage release + single auxiliary contact	—		
35	Undervoltage release + double auxiliary contacts	—		
36	Undervoltage release + three auxiliary contacts	—		

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Main technical parameters

Table 2

Frame current Inm (A)		160								
Rated current In (A)		16、20、32、40、50、63、80、100、125、160 ;								
Rated voltage Ue (V)		AC230、AC400 (Not applicable to 2P) 、AC690 (Not applicable to 2P)								
Rated impulse withstand voltage Uimp (1s)		8kV								
Rated insulation voltage Ui (V)		800								
Power frequency withstand voltage (1min)		3000V								
Rated ultimate breaking capacity Icu(kA)	Code	S		H		L				
	AC230V (2P、3P、4P)	100		120		150				
	AC400V (3P、4P)	70		100		150				
	AC690V (3P、4P)	8		12		15				
Rated operating breaking capacity Ics(kA)		Ics=100%Icu								
Life	Mechanical life	25000times								
	Electrical life AC230V、AC400V	18000times								
	Electrical life AC690V	8000times								
Wiring capacity	Current(A)	16、20	25	32	40、50	63	80	100	125	160
	Sectional area (mm^2)	2.5	4	6	10	16	25	35	50	70

Normal operating environment

> a) Elevation: ≤2000m.

> b)Ambient temperature: -25°C~+70°C.

> c)Class of pollution: 3.

> d)Endure moist air, salt fog and oil fog.

> e)Max. gradient: 22.5°.

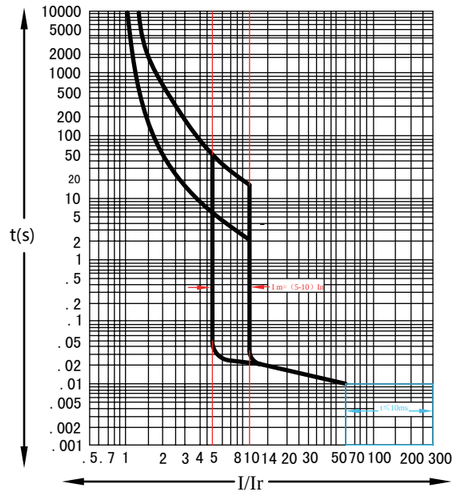
> f)In the medium without explosion hazard, and the medium contains no gas and conductive dust that may corrode metal and damage insulation.

> g)In a place without snow and rain influence.

Tripping characteristics (Refer to Fig. 1 and 2)

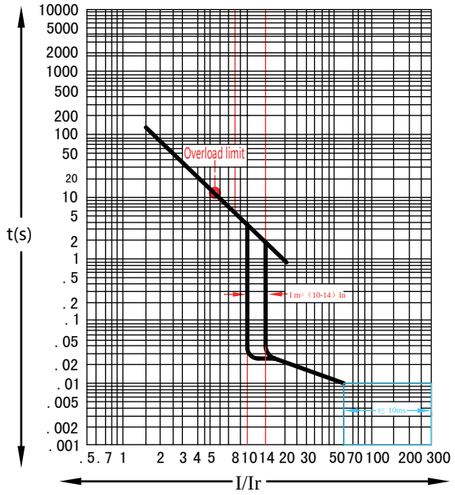
> Tripping characteristic curve in normal environment (The ambient temperature is 40°C), refer to Fig. 1 and 2.

NDM5-160 Distribution protection



(Fig. 1)

NDM5-160 Motor protection



(Fig. 2)

Table 3

> If ambient temperature fluctuates, there will be small change in tripping characteristics, which shall be corrected (Refer to Table 3)

Ambient air temperature	Coefficient for temperature correction
-25℃	1.33
-20℃	1.305
-15℃	1.278
-10℃	1.251
-5℃	1.225
0℃	1.2
5℃	1.175
10℃	1.15
15℃	1.125
20℃	1.1
25℃	1.075
30℃	1.05
35℃	1.025
40℃	1.0
45℃	0.975
50℃	0.95
55℃	0.925
60℃	0.9
65℃	0.875
70℃	0.85

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Table 4

> When the elevation is more than 2000m at the ambient temperature +40°C, in consideration of insulation characteristic and cooling capacity of air, there will be change in tripping characteristics, which shall be corrected (Refer to Table 4)

Elevation (m)	2000	3000	4000	5000
Power frequency withstand voltage (V)	3000	2700	2400	2100
Average insulation class (V)	1Ui	0.9Ui	0.8Ui	0.7Ui
Max. operating voltage (V)	1Ue	0.9Ue	0.8Ue	0.7Ue
Average operating current (+40°C)	1In	0.96In	0.93In	0.9In

Power consumption and internal resistance (Refer to Table 5) Table 5

Rated current(A)	Fixed type			
	Internal resistance of each phase (mΩ)			Total power consumption on three poles (W)
	A	B	C	
16	8.86	9.03	8.59	6.77
20	7.21	7.55	7.33	8.83
25	4.26	4.26	4.31	8.01
32	3.14	2.95	2.89	9.19
40	2.54	2.48	2.78	12.48
50	2.23	2.23	2.32	16.95
63	2.05	2.14	2.12	25.04
80	0.97	1.1	0.86	18.75
100	0.57	0.57	0.77	19.1
125	0.57	0.57	0.77	29.84
160	0.37	0.47	0.44	32.76

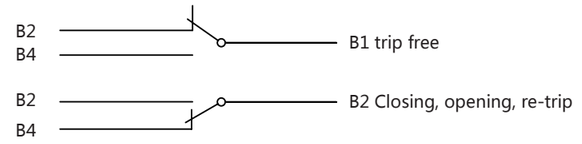
Internal accessories Table 6

> Parameters and description of auxiliary contacts (Refer to Table 6)

Accessory	Voltage (V)/Conventional thermal current (Ith)		
Auxiliary contact	AC250V/10A	AC400V/3A	DC220V/0.2A

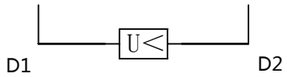
Parameters and description of alarm contact (Refer to Table 7) Table 7

Accessory	Voltage (V)/Conventional thermal current (Ith)	
Alarm contact	AC250V/10A	DC220V/0.2A



Undervoltage release (Refer to Table 8) Table 8

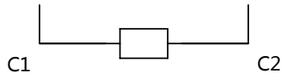
> When the supply voltage drops to 35%~70% of rated operating voltage of the undervoltage release, the release can break the circuit breaker reliably; when the supply voltage is less than 35% of the rated operating voltage of the undervoltage release, the rated operating voltage of the undervoltage release, the release can prevent the circuit breaker from closing; and when the supply voltage is more than 85% of the rated operating voltage of the undervoltage release, the rated operating voltage of the undervoltage release, the release can guarantee reliable closing of the circuit breaker.



Accessory	Rated operating voltage		
Undervoltage release	AC110V/DC110V	AC230V/DC250V	AC400V

Shunt release (Refer to Table 9) Table 9

> The shunt release can break the circuit breaker reliably when the applied voltage is between 70%~110% of the rated control supply voltage.



Accessory	Rated control voltage			
Shunt release	AC24V/DC24	AC48V/DC48	AC110V/DC110V	AC230V/DC250V

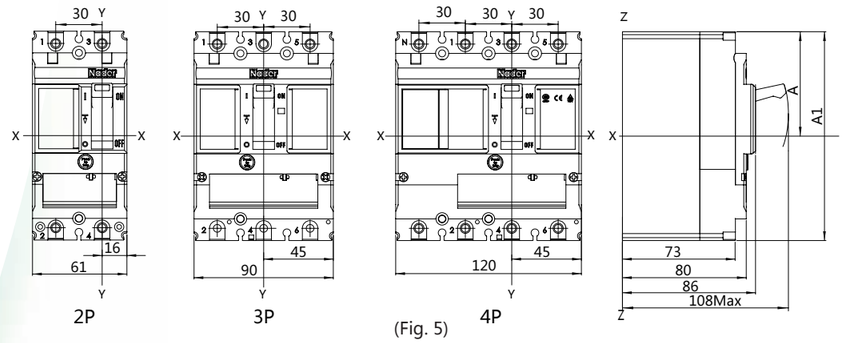
Connection capacity (Refer to Table 10) Table 10

Rated current (A)	16、20	25	32	40、50	63	80	100	125	160
Sectional area of Conductor (mm2)	2.5	4	6	10	16	25	35	50	70

Overall and mounting dimension

Overall dimension

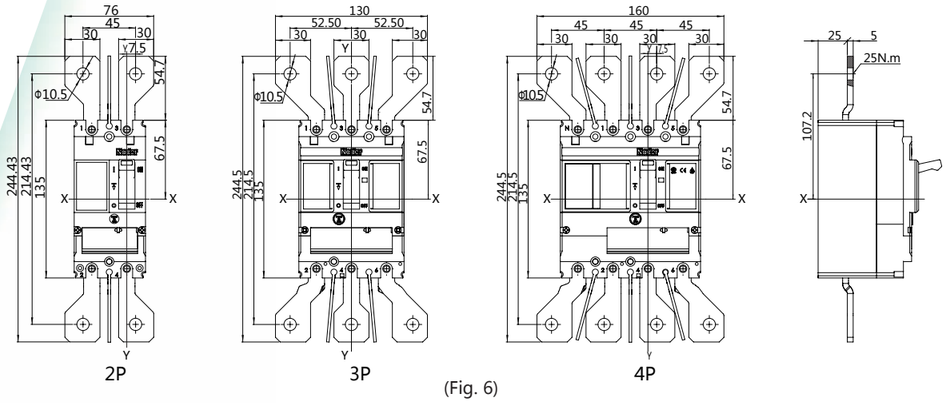
Front connection (Refer to Fig. 5)



(Fig. 5)

Note: The dimension of front connection without accessories: A=67.5, A1=135;
The dimension of front bare capper cable connection with accessories: A=77.5, A1=155.

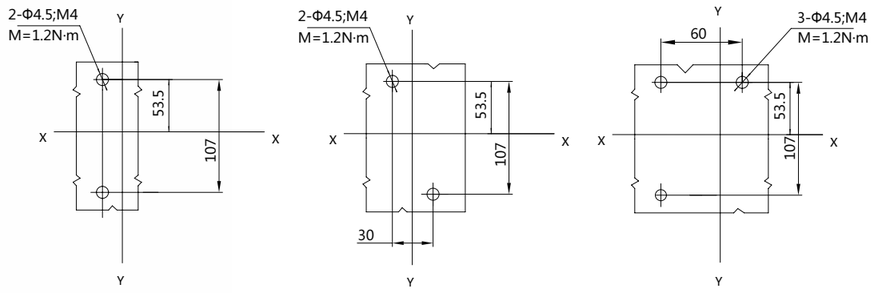
Overall dimension of front extension connection (Refer to Fig. 6)



(Fig. 6)

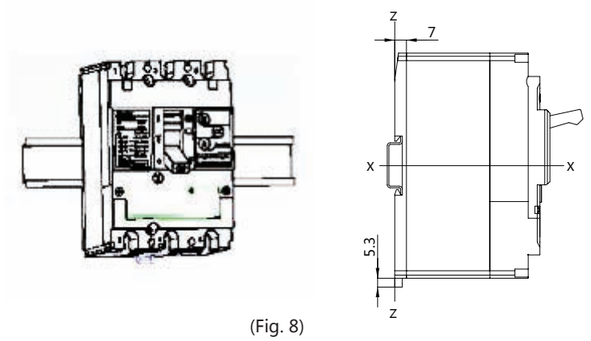
Mounting dimension

Mounting on the baseplate (Refer to Fig. 7)



(Fig. 7)

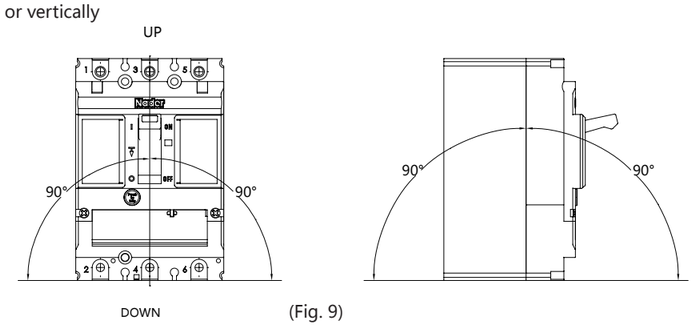
Mounting on the DIN guide rail with the adapter (Refer to Fig. 8)



(Fig. 8)

Mounting modes (Refer to Fig. 9)

Both horizontally or vertically



(Fig. 9)

Package and storage

> The Min. packing quantity is 1 pc/box, the products packed in box shall be stored in the warehouse where the ambient temperature is 5°C~35°C, the RH is under 80%, and ambient air does not contain any acid, alkaline or other corrosive gas. The storage period under the above mentioned conditions shall be no more than 18 months since the date of production.

> Storage temperature: -40°C~+70°C.

Accessories and installation Table 11

No.	Name	Specification	Qty./pc		
			2P	3P	4P
1	Cress recessed small pan head screw	M4×75	2	2	3
2	Flat washer	4	2	2	3
3	Spring washer	4	2	2	3
4	Hexagon nut	M4	2	2	3
5	Interphase insulating barrier	——	2	4	6

Notice

> a) The performance parameters here are for normal conditions. Any special requirements shall be confirmed officially before readjustment and putting into operation;

> b) Only the trained or qualified professionals can mount and maintain this circuit breaker, the tripping unit or other accessories;

> c) Before mounting or dismounting any device, make sure that the power supply has been cut off.

NDM5Z-160 Molded Case Circuit Breaker

Scope of application

> The NDM5Z-160 series of molded Case Circuit Breakers with the rated insulation voltage of 1200V are applicable to the circuits with the rated operating voltage of DC500V (2P in series), DC750V (3P in series), DC1000V (4P in series), DC1200V (4P in series), and the rated operating current of 16A~160A for electrical energy distribution, at the same time, protection of circuits and power supply devices in case of overload, short circuit, undervoltage (With the UVT) .

> The isolating function with the relative symbol: .

> Standards: IEC60947-2 and GB14048.2.

Model and implication

ND	M	5	Z	-	160	□	□	/	□	/	□	/	□	□	□	□
1	2	3	4		5	6	7		8		9		10	11	12	13

No.	Implication	Model
1	Enterprise code "NADER"	ND
2	Molded case circuit breaker	M
3	Design code	5
4	Special code for DC circuit breakers	Z
5	Frame current Inm (A):	160
6	Breaking level code:	S, H, L
7	Rated current In (A):	16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160
8	Number of poles	(Refer to "Note a")
9	Release code	(Refer to "Note b")
10	Installation modes	(Refer to "Note c")
11	Connection modes	(Refer to "Note d")
12	Operating modes	(Refer to "Note e")
13	Accessories	(Refer to "Table 1")

Note:

a) Number of poles

> 2: 2 poles; 3: 3 poles; 4: 4 poles;

b) Release code: TMDC: [Thermal adjustable (0.8-0.9-1.0) In, magnetic fixed 10In, for power distribution];

c) Installation modes: Fixed: "No code"; plug-in: "P"; guide rail: "G".

d) Connection modes: Front wiring: "No code"; front extension wiring: "ES"; front bare copper cable wiring: "FCu"; rear screw wiring: "R".

e) Operating modes: Direct handle operation: "No code"; rotary handle operation: "R"; motor operation: "M" (Note: Not applicable to 2P).

Table 1

Accessory code	Name of accessory	Mounting position		
		2P	3P	4P
00	No	—	—	—
10	Alarm contact			
20	Shunt release			
30	Undervoltage release			
40	Single auxiliary contact	—		
50	Double auxiliary contacts	—		
60	Three auxiliary contacts	—		
12	Alarm contact + shunt release			
13	Alarm contact + undervoltage release			
14	Alarm contact + single auxiliary contact	—		
15	Alarm contact + double auxiliary contacts	—		
16	Alarm contact + three auxiliary contacts	—		
70	Alarm contact + shunt release + single auxiliary contact	—		
71	Alarm contact + shunt release + double auxiliary contacts	—		
72	Alarm contact + shunt release + three auxiliary contact	—		
80	Alarm contact + undervoltage release + single auxiliary contact	—		
81	Alarm contact + undervoltage release + double auxiliary contacts	—		
82	Alarm contact + undervoltage release + three auxiliary contacts	—		
24	Shunt release + single auxiliary contact	—		
25	Shunt release + double auxiliary contacts	—		
26	Shunt release + three auxiliary contacts	—		
34	Undervoltage release + single auxiliary contact	—		
35	Undervoltage release + double auxiliary contacts	—		
36	Undervoltage release + three auxiliary contacts	—		

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Main technical parameters

Table 2

Frame current Inm (A)		160			
Rated current In (A)		16、20、32、40、50、63、80、100、125、160 ;			
Rated voltage Ue (V)		DC：500(2P)、750(3P)、1000(4P)、1200(4P)			
Rated impulse withstand voltage Uimp (1s)		8kV			
Rated insulation voltage Ui (V)		1200			
Power frequency withstand voltage (1min)		3000V			
Rated ultimate breaking capacity Icu (kA)	Code	S	H	L	
	DC500V (2P in series)	50	85	100	
	DC750V (3P in series)	50	85	100	
	DC1000V (4P in series)	25	35	50	
	DC1200V (4P in series)	无		25	
Rated operating breaking capacity Ics (kA)		Ics=100%Icu			
Life	Mechanical life	25000 times			
	Electrical life	DC500V (2P in series)	5000 times		
		DC750V (3P in series)	5000 times		
		DC1000V (4P in series)	4000 times		
		DC1200V (4P in series)	3000 times		

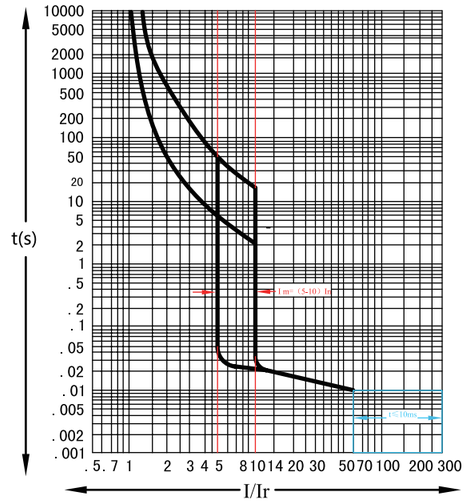
Wiring capacity	Current (A)	16、20	25	32	40、50	63	80	100	125	160
	Sectional area (mm2)	2.5	4	6	10	16	25	35	50	70

Normal operating environment

> Elevation: ≤2000m.
> Ambient temperature: -25°C~+70°C.
> Class of pollution: 3.
> Endure moist air, salt fog and oil fog.
> Max. gradient: 22.5°.
> In the medium without explosion hazard, and the medium contains no gas and conductive dust that may corrode metal and damage insulation.
> In a place without snow and rain influence.

Tripping characteristics (Refer to Fig. 2)

> Tripping characteristic curve in normal environment (The ambient temperature is 40°C), refer to Fig. 2



(Fig. 2)

Table 3

> If ambient temperature fluctuates, there will be small change in tripping characteristics, which shall be corrected (Refer to Table 3)

Ambient air temperature	Coefficient for temperature correction
-25℃	1.33
-20℃	1.305
-15℃	1.278
-10℃	1.251
-5℃	1.225
0℃	1.2
5℃	1.175
10℃	1.15
15℃	1.125
20℃	1.1
25℃	1.075
30℃	1.05
35℃	1.025
40℃	1.0
45℃	0.975
50℃	0.95
55℃	0.925
60℃	0.9
65℃	0.875
70℃	0.85

Table 4

> When the elevation is more than 2000m at the ambient temperature +40°C, in consideration of insulation characteristic and cooling capacity of air, there will be change in tripping characteristics, which shall be corrected (Refer to Table 4)

Elevation (m)	2000	3000	4000	5000
Power frequency withstand voltage (V)	3000	2700	2400	2100
Average insulation class (V)	1Ui	0.9Ui	0.8Ui	0.7Ui
Max. operating voltage (V)	1Ue	0.9Ue	0.8Ue	0.7Ue
Average operating current (+40°C)	1In	0.96In	0.93In	0.9In

Power consumption and internal resistance (Refer to Table 5) Table 5

Rated current(A)	Fixed type			
	Internal resistance of each phase (mΩ)			Total power consumption on three poles (W)
	A	B	C	
16	8.86	9.03	8.59	6.77
20	7.21	7.55	7.33	8.83
25	4.26	4.26	4.31	8.01
32	3.14	2.95	2.89	9.19
40	2.54	2.48	2.78	12.48
50	2.23	2.23	2.32	16.95
63	2.05	2.14	2.12	25.04
80	0.97	1.1	0.86	18.75
100	0.57	0.57	0.77	19.1
125	0.57	0.57	0.77	29.84
160	0.37	0.47	0.44	32.76

Internal accessories Table 6

> Parameters and description of auxiliary contacts (Refer to Table 6)

Accessory	Voltage (V)/Conventional thermal current (Ith)		
Auxiliary contact	AC250V/10A	AC400V/3A	DC220V/0.2A

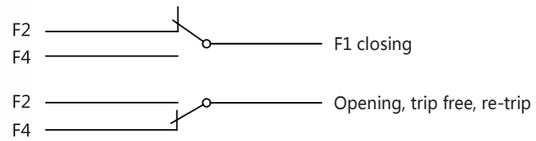
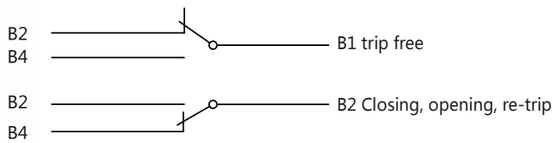


Table 7

> Parameters and description of alarm contacts (Refer to Table 7)

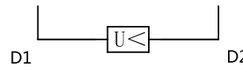
Accessory	Voltage (V)/Convention althermal current (Ith)	
Alarm contact	AC250V/3A	DC220V/0.2A



Undervoltage release (Refer to Table 8) Table 8

> When the supply voltage drops to 35%~70% of rated operating voltage of the undervoltage release, the release can break the circuit breaker reliably; when the supply voltage is less than 35% of the rated operating voltage of the undervoltage release, the undervoltage release can prevent the circuit breaker from closing; and when the supply voltage is more than 85% of the rated operating voltage of the undervoltage release, the undervoltage release can guarantee reliable closing of the circuit breaker.

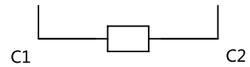
Accessory	Rated operating voltage		
Undervoltage release	AC110V/DC110V	AC230V/DC250V	AC400V



Shunt release (Refer to Table 9) Table 9

> The shunt release can break the circuit breaker reliably when the applied voltage is between 70%~110% of the rated control supply voltage.

Accessory	Rated control voltage			
Shunt release	AC24V/DC24	AC48V/DC48	AC110V/DC110V	AC230V/DC250V



Connection

Connection modes

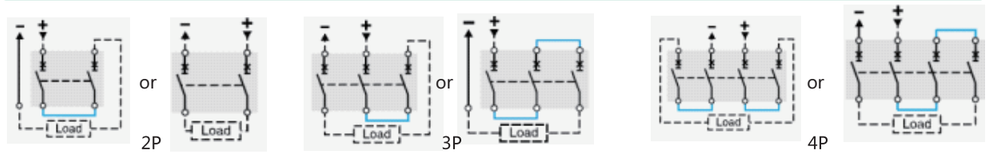


Table 10

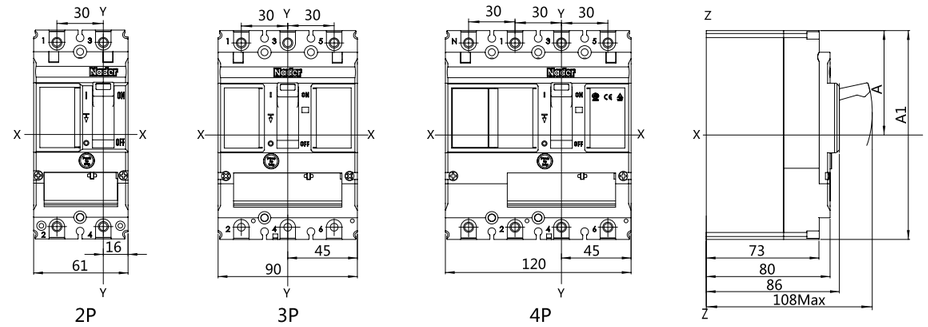
> Connection capacity

Rated current (A)	16、20	25	32	40、50	63	80	100	125	160
Sectional area of Conductor (mm^2)	2.5	4	6	10	16	25	35	50	70

Overall and mounting dimension

Overall dimension

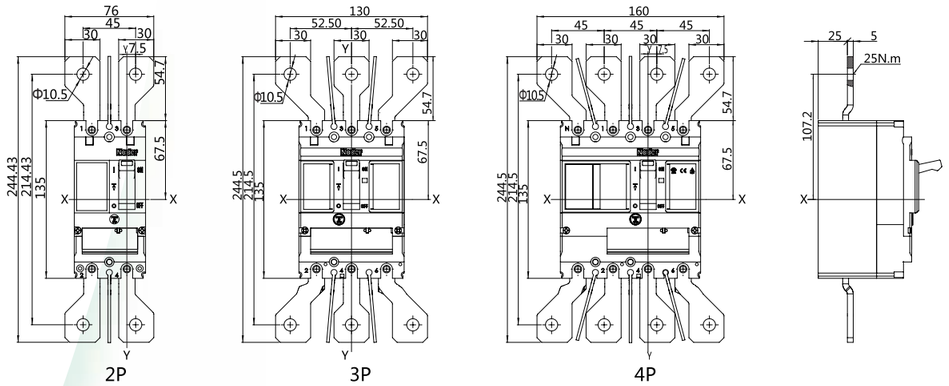
Front connection (Refer to Fig. 3)



Note: The dimension of front connection without accessories: A=67.5, A1=135;

The dimension of front bare capper cable connection with accessories: A=77.5, A1=155.

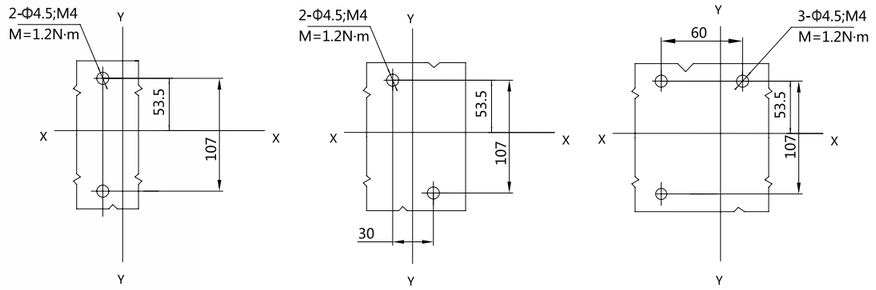
Overall dimension of front extension connection (Refer to Fig. 4)



(Fig. 4)

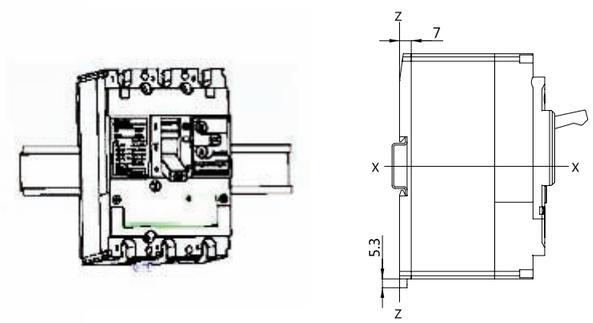
Mounting dimension

Mounting on the baseplate (Refer to Fig. 5)



(Fig. 5)

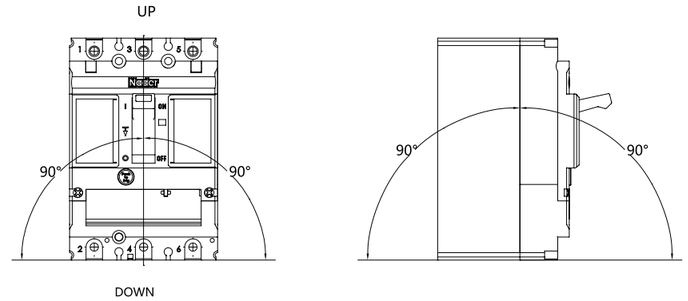
Mounting on the DIN guide rail with the adapter (Refer to Fig. 6)



(Fig. 6)

Mounting modes (Refer to Fig. 7)

Both horizontally or vertically



(Fig. 7)

Package and storage

> The Min. packing quantity is 1 pc/box, the products packed in box shall be stored in the warehouse where the ambient temperature is 5°C~35°C, the RH is under 80%, and ambient air does not contain any acid, alkaline or other corrosive gas. The storage period under the above mentioned conditions shall be no more than 18 months since the date of production.

> Storage temperature: -40°C~+70°C.

Accessories and installation (Refer to Table 11) Table 11

No.	Name	Specification	Qty./pc		
			2P	3P	4P
1	Cress recessed small pan head screw	M4×75	2	2	3
2	Flat washer	4	2	2	3
3	Spring washer	4	2	2	3
4	Hexagon nut	M4	2	2	3
5	Interphase insulating barrier	——	2	3	4
6	Short circuit bar		1	2	2

Notice

> The performance parameters here are for normal conditions. Any special requirements shall be confirmed officially before readjustment and putting into operation;

> Only the trained or qualified professionals can mount and maintain this circuit breaker, the tripping unit or other accessories;

> Before mounting or dismounting any device, make sure that the power supply has been cut off.

Nader

NDM5E-160 molded case circuit breakers

Scope of application

> The NDM5E-160 series of molded case circuit breakers with the rated insulation voltage of 800V is applicable to the AC 50Hz or 60Hz circuits with the rated operating voltage of AC400V and AC690V, and rated operating current of 160A for electrical energy distribution, which have the functions for overload long time delay inverse time lag protection, short circuit short-time delay inverse time lag protection, short circuit instantaneous protection, overload and alarm, alarm without tripping, communication and so on to protect the line and the power supply equipment.

> The isolating function with the relative symbol: 

> Standards: IEC60947-2 and GB14048.2.

Model and implication

ND	M	5	E	-	160	□	□	/	□	/	□	/	□	□	□	□
1	2	3	4		5	6	7		8		9		10	11	12	13

No.	Implication	Model
1	Enterprise code "NADER"	ND
2	Molded case circuit breaker	M
3	Design code	5
4	Special code for electronic circuit breakers	E
5	Frame current Inm (A):	160
6	Breaking level code:	S, H, L
7	Rated current In (A):	160
8	Number of poles	(Refer to "Note a")
9	Release code	(Refer to "Note b")
10	Installation modes	(Refer to "Note c")
11	Connection modes	(Refer to "Note d")
12	Operating modes	(Refer to "Note e")
13	Accessories	(Refer to "Table 1")

Note:

a) Number of poles

> 3: 3 poles;

> 4: 4 poles;

> 4A: There is no overcurrent protection on Pole N, and Pole N is always on;

> 4B: There is no overcurrent protection on Pole N, and Pole N opens and closes with the other three poles (Pole N closes at first, and opens at last);

> 4C: There is overcurrent protection on Pole N, and Pole N is opening with the other three poles (Pole N closes at first, and opens at last);

> 4D: There is overcurrent protection on Pole N, and Pole N is always on.

b) Release code

An ETB (Electronic release) has the following functions:

Overload long time delay:

> 1) Setting current Ir= (0.4-0.5-0.6-0.7-0.8-0.9-1-OFF) In;

> 2) Setting time Tr = (10-15-30-45-60-80-100-120-OFF) s;

Short circuit short time delay:

> 1) Setting current Is= (2-3-4-5-6-7-8-9-10-OFF) Ir;

> 2) Setting time: When the current is (1-1.5) Is, the short time delay Ts is inverse time lag;

> When the current > 1.5Is, the short time delay Ts = (0.1-0.2-0.3-0.4) s.

Short circuit instantaneous:

> 1) Setting current Ii=Is= (3-4-5-6-7-8-9-10-12-14-OFF) Ir;

> 2) Setting time < 50ms.

Phase N protection:

> (ON-OFF); the setting current of Phase N under protection is Irn = 0.5Ir or Irn = 1Ir, optional.

Pre-alarm:

> NDM5E-160/3P: External (0.9-1) Ir, adjustable;

> NDM5E-160/4P: Internal 0.9Ir, not adjustable;

Alarm without tripping:

> Set long time delay to OFF;

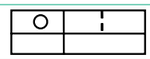
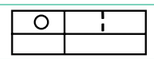
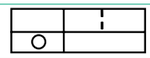
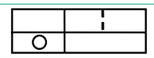
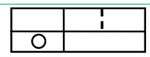
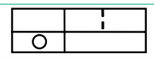
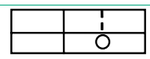
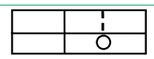
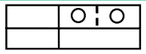
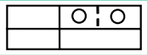
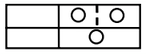
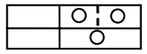
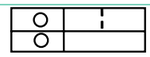
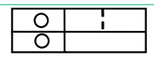
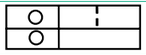
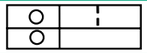
> ETC (Intelligent release): The functions of the electronic release + communication.

c) Installation modes: Fixed: "No code"; plug-in: "P"; guide rail: "G".

d) Connection modes: Front wiring: "No code"; front extension wiring: "ES"; front bare copper cable wiring: "FCu"; rear screw wiring: "R".

e) Operating modes: Direct handle operation: "No code"; rotary handle operation: "R"; motor operation: "M".

Table 1

Accessory code	Name of accessory	Mounting position	
		3P	4P
00	No	——	——
10	Alarm contact		
20	Shunt release		
30	Undervoltage release		
40	Single auxiliary contact		
50	Double auxiliary contacts		
60	Three auxiliary contacts		
12	Alarm contact + shunt release		
13	Alarm contact + undervoltage release		
14	Alarm contact + single auxiliary contact		

15	Alarm contact + double auxiliary contacts		
16	Alarm contact + three auxiliary contacts		
70	Alarm contact + shunt release + single auxiliary contact		
71	Alarm contact + shunt release + double auxiliary contacts		
72	Alarm contact + shunt release + three auxiliary contacts		
80	Alarm contact + undervoltage release + single auxiliary contact		
81	Alarm contact + undervoltage release + double auxiliary contacts		
82	Alarm contact + undervoltage release + three auxiliary contacts		
24	Shunt release + single auxiliary contact		
25	Shunt release + double auxiliary contacts		
26	Shunt release + three auxiliary contacts		
34	Undervoltage release + single auxiliary contact		
35	Undervoltage release + double auxiliary contacts		
36	Undervoltage release + three auxiliary contacts		

Main technical parameters Table 2

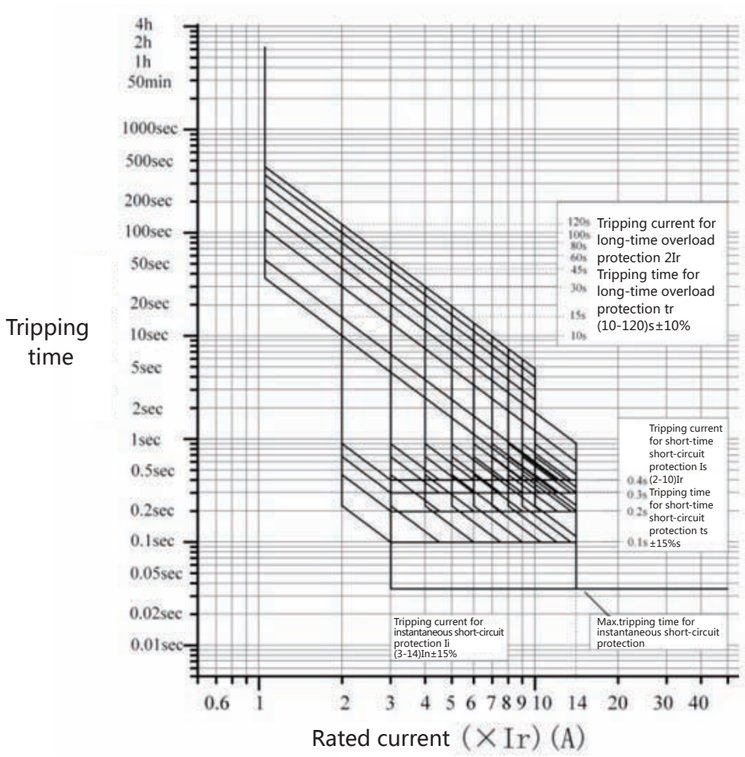
Frame current Inm (A)			160							
Rated current In (A)			160							
Rated voltage Ue (V)			AC400、AC690							
Rated impulse withstand voltage Uimp (1s)			8kV							
Rated insulation voltage Ui (V)			800							
Power frequency withstand voltage (1min)			3000V							
Rated ultimate breaking capacity Icu (kA)		Code	S		H		L			
		AC400V	70		100		150			
		AC690V	8		12		15			
Rated operating breaking capacity Ics (kA)			Ics=100%Icu							
Life	Mechanical life		25000times							
	Electrical life	AC400V	18000times							
		AC690V	8000times							
Wiring capacity	Current(A)	16、20	25	32	40、50	63	80	100	125	160
	Sectional area (mm^2)	2.5	4	6	10	16	25	35	50	70

Normal operating environment

- a) Elevation: ≤2000m.
- b) Ambient temperature: -25°C~+70°C.
- c) Class of pollution: 3.
- d) Endure moist air, salt fog and oil fog.
- e) Max. gradient: 22.5°.
- f) In the medium without explosion hazard, and the medium that contains no gas and conductive dust that may corrode metal and damage insulation.
- In a place without snow and rain influence.

Tripping characteristics

- Tripping characteristic curve in normal environment (The ambient temperature is -25°C~+40°C) (refer to Fig. 2)



(Fig. 2)

Table 3

> If ambient temperature fluctuates, there will be small change in tripping characteristics, which shall be corrected

Ambient air temperature	Coefficient for temperature correction
40℃	1.0
45℃	0.975
50℃	0.95
55℃	0.925
60℃	0.9
65℃	0.875
70℃	0.85

Table 4

> When the elevation is more than 2000m at the ambient temperature +40°C, in consideration of air insulation characteristic and cooling capacity, there will be change in tripping characteristics, which shall be corrected (Refer to Table 4)

Elevation (m)	2000	3000	4000	5000
Power frequency withstand voltage (V)	3000	2700	2400	2100
Average insulation class (V)	1Ui	0.9Ui	0.8Ui	0.7Ui
Max. operating voltage (V)	1Ue	0.9Ue	0.8Ue	0.7Ue
Average operating current (+40°C)	1In	0.96In	0.93In	0.9In

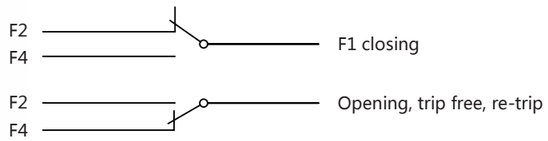
Power consumption and internal resistance Table 5

Rated current(A)	Fixed type			
	Internal resistance of each phase (mΩ)			Total power consumption on three poles (W)
	A	B	C	
160	0.34	0.43	0.4	30

Internal accessories Table 6

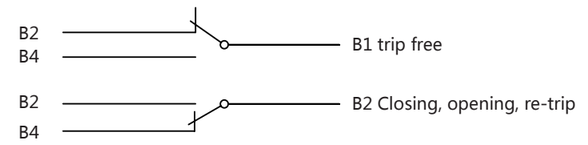
> Parameters and description of auxiliary contacts

Accessory	Voltage (V)/Conventional thermal current (Ith)		
Auxiliary contact	AC250V/10A	AC400V/3A	DC220V/0.2A



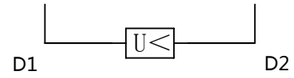
Parameters and description of alarm contacts Table 7

Accessory	Voltage (V)/Conventional thermal current (Ith)	
Alarm contact	AC250V/3A	DC220V/0.2A



Undervoltage release Table 8

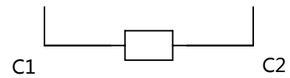
> When the supply voltage drops to 35%~70% of rated operating voltage of the undervoltage release, the release can break the circuit breaker reliably; when the supply voltage is less than 35% of the rated operating voltage of the undervoltage release, the undervoltage release can prevent the circuit breaker from closing; and when the supply voltage is more than 85% of the rated operating voltage of the undervoltage release, the undervoltage release can guarantee reliable closing of the circuit breaker.



Accessory	Rated operating voltage		
Undervoltage release	AC110V/DC110V	AC230V/DC250V	AC400V

Shunt release Table 9

> The shunt release can break the circuit breaker reliably when the applied voltage is between 70%~110% of the rated control supply voltage.



Accessory	Rated control voltage			
Shunt release	AC24V/DC24	AC48V/DC48	AC110V/DC110V	AC230V/DC250V

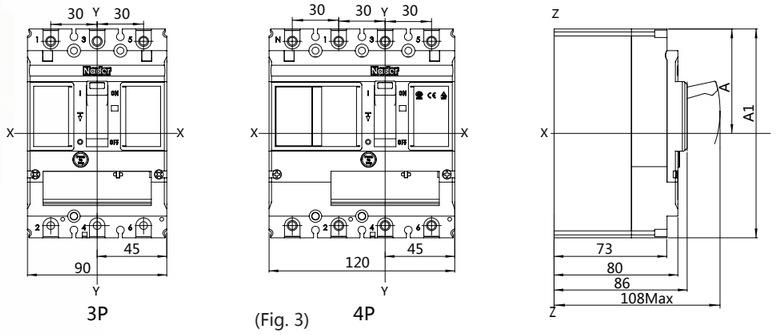
Connection capacity Table 10

Rated current (A)	16、20	25	32	40、50	63	80	100	125	160
Sectional area of Conductor (mm^2)	2.5	4	6	10	16	25	35	50	70

Overall and mounting dimension

Overall dimension

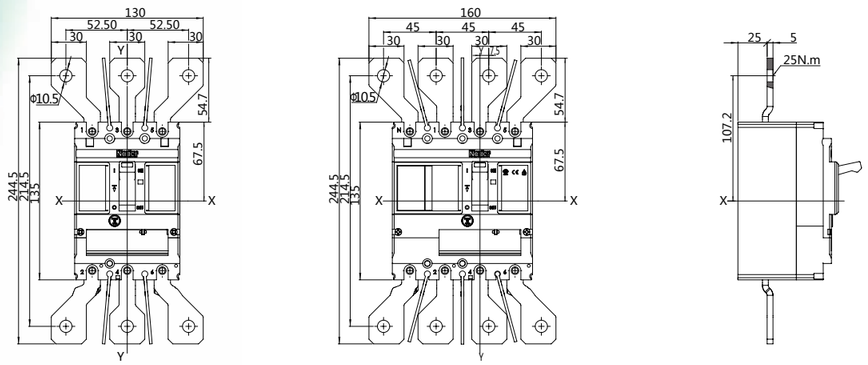
Overall dimension of Front connection



(Fig. 3)

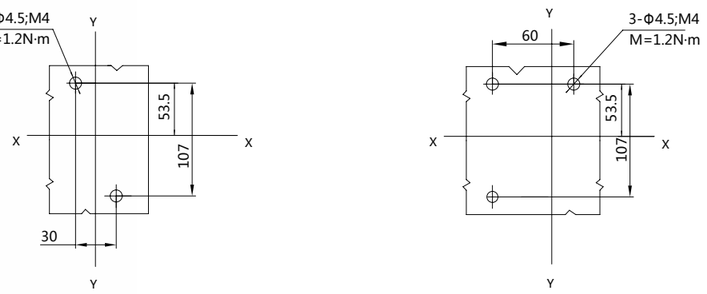
Note: The dimension of front connection without accessories: A=67.5, A1=135;
The dimension of front bare capper cable connection with accessories: A=77.5, A1=155.

Overall dimension of front extension connection (Refer to Fig. 4)



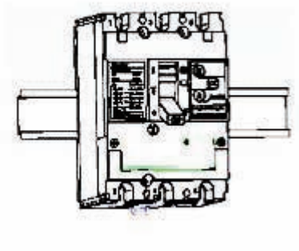
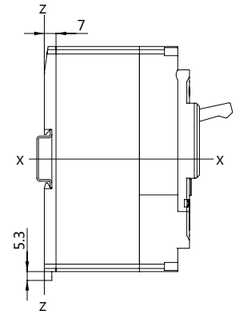
Mounting dimension

Mounting on the baseplate (Refer to Fig. 5)



(Fig. 5)

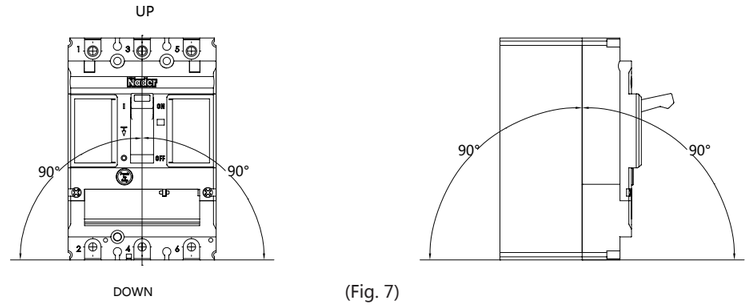
Mounting on the DIN guide rail with the adapter (Refer to Fig. 6)

(Fig. 6)

Mounting modes (Refer to Fig. 7)

Both horizontally or vertically



(Fig. 7)

Package and storage

- The Min. packing quantity is 1 pc/box, the products packed in box shall be stored in the warehouse where the ambient temperature is 5°C~35°C, the RH is under 80%, and ambient air does not contain any acid, alkaline or other corrosive gas. The storage period under the above mentioned conditions shall be no more than 18 months since the date of production.
- Storage temperature: -40°C~+70°C.

Accessories and installation (Refer to Table 11)

Table 11

No.	Name	Specification	Qty./pc	
			2P	4P
1	Cress recessed small pan head screw	M4×75	2	3
2	Flat washer	4	2	3
3	Spring washer	4	2	3
4	Hexagon nut	M4	2	3
5	Interphase insulating barrier	——	4	6

Notice

- a) The performance parameters here are for normal conditions. Any special requirements shall be confirmed officially before readjustment and putting into operation;
- b) Only the trained or qualified professionals can mount and maintain this circuit breaker, the tripping unit or other accessories;
- c) Before mounting or dismounting any device, make sure that the power supply has been cut off.