CCC, CQC, CB, CE, TUV

Moulded Case Circuit Breaker

NDM3-400 series

QUISURE
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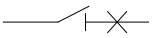
ISO9001:2015
QUALITY GUARANTEED

1.Applicable Scope and Purpose of Circuit Breaker

The NDM3 -400 molded case circuit breaker (hereinafter referred to as circuit breaker) applies to infrequent switching of circuits with the AC 50/60Hz, the working voltage of AC690V and working current of 400A as well as infrequent motor starting. With the overload, short circuit and under -voltage protection functions, the circuit breaker can protect lines and power equipment from damage.

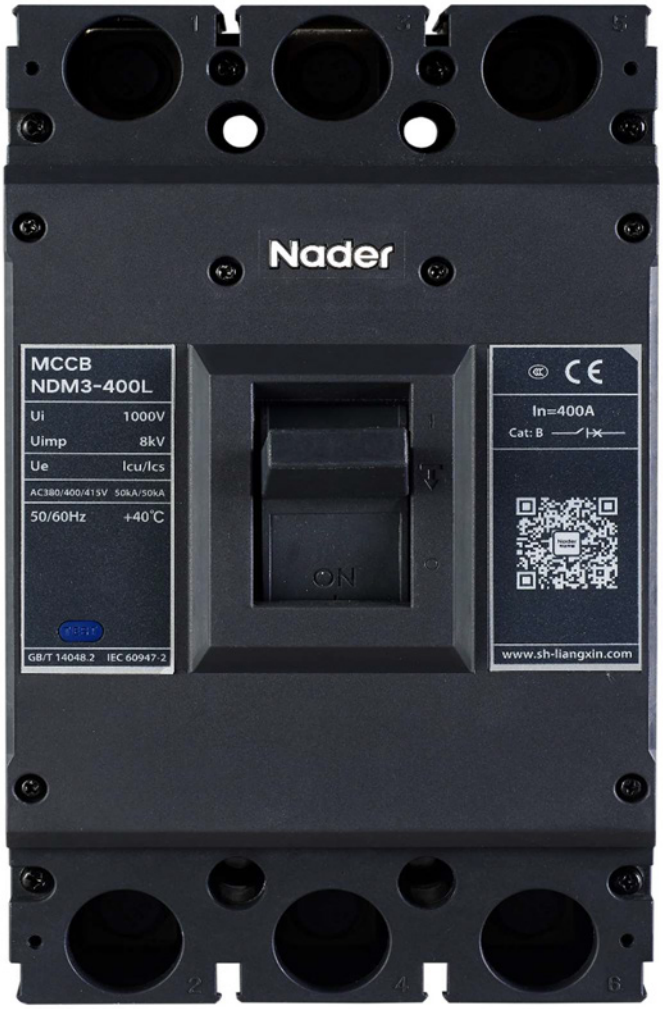
The circuit breaker has an isolating function with the corresponding symbol of  ;

Comply with standards: IEC60947 -2, GB/T 14048.2.

Products comply with CCC 、CE 、TUV and CB certification.

2.Product Picture of Circuit Breaker

(The picture is for reference only; the specific kind prevail)



Picture of the Product

3.Specification and Model Description of Circuit Breaker

ND	M	3	-	400	□	□	/	□	□	□	□	□	□	□	□	□	□
1	2	3		4	5	6		7	8	9	10	11	12	13	14	15	16

SN	SN name	NDM3
1	Enterprise code	ND: Manufacturer code
2	Product code	M: Molded case circuit breaker (MCCB)
3	Design SN	3
4	Shell frame level	400
5	Breaking capacity level	C: Basic type
		L: Standard type
		M: Relatively high breaking type
		H: High breaking type
6	Operation mode	No code: Direct handle-operated mode
		P: Motor-operated
		Z: Rotary operation
7	Number of poles	3, 4
8	Release code	0: Release (none)
		2: Instantaneous tripper only
		3: Complex tripper
9	Accessory code See	Table 1
10	Application code	No code: Power distribution type
		2: Motor protection type
11	N-pole (neutral pole) type of the 4P product	A: The N-pole isn't installed with an overcurrent release, but always connected
		B: The N-pole isn't installed with an overcurrent release, but on-off with the other three poles
		C: The N-pole is installed with an overcurrent tripper, and on-off with the other three poles

12	Special use	Q: Voltage-check self-reset
13	Special function code	I: Non-tripping at the time of alarming
14	Rated current See	Table 2
15	Cabling type	No code: Normal product
		P: Connection busbar
		Z1: Rear-plate connection
		Z2H: Plug-in rear-plate connection
		Z2Q: Plug-in front-plate connection
		Z3H: Integrated plug-in rear-plate connection
		Z3Q: Integrated plug-in front-plate connection
	Other code	CS1-A/150: Circular center hole rotary handle + shaft length 150mm
16		CS1-A/200: Circular center hole rotary handle + shaft length 200mm
		CS1-A/300: Circular center hole rotary handle + shaft length 300mm
		CS1-A/350: Circular center hole rotary handle + shaft length 350mm
		CS1-A/650: Circular center hole rotary handle + shaft length 650mm
		CS1-F/150: Square center hole rotary handle + shaft length 150mm
		CS1-F/200: Square center hole rotary handle + shaft length 200mm
		CS1-F/300: Square center hole rotary handle + shaft length 300mm

16		CS1-F/350: Square center hole rotary handle + shaft length 350mm
		CS1-F/650: Square center hole rotary handle + shaft length 650mm
		CS2-A/150: Circular eccentric hole rotary handle + shaft length 150mm
		CS2-A/200: Circular eccentric hole rotary handle + shaft length 200mm
		CS2-A/300: Circular eccentric hole rotary handle + shaft length 300mm
		CS2-A/350: Circular eccentric hole rotary handle + shaft length 350mm
		CS2-A/650: Circular eccentric hole rotary handle + shaft length 650mm
		CS2-F/150: Square eccentric hole rotary handle + shaft length 150mm
		CS2-F/200: Square eccentric hole rotary handle + shaft length 200mm
		CS2-F/300: Square eccentric hole rotary handle + shaft length 300mm
		CS2-F/350: Square eccentric hole rotary handle + shaft length 350mm
		CS2-F/650: Square eccentric hole rotary handle + shaft length 650mm
		CS1-IP65/150: IP65 Circular eccentric hole rotary handle + shaft length 150mm
		CS1-IP65/200: IP65 Circular eccentric hole rotary handle + shaft length 200mm
		CS1-IP65/300: IP65 Circular eccentric hole rotary handle + shaft

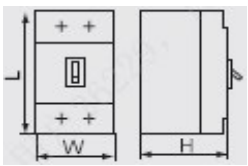
		length 300mm
		CS1-IP65/350: IP65 Circular eccentric hole rotary handle + shaft length 350mm
		CS1-IP65/650: IP65 Circular eccentric hole rotary handle + shaft length 650mm
		CS2-IP65/150: IP65 Square eccentric hole rotary handle + shaft length 150mm
		CS2-IP65/200: IP65 Square eccentric hole rotary handle + shaft length 200mm
		CS2-IP65/300: IP65 Square eccentric hole rotary handle + shaft length 300mm
		CS2-IP65/350: IP65 Square eccentric hole rotary handle + shaft length 350mm
		CS2-IP65/650: IP65 Square eccentric hole rotary handle + shaft length 650mm
		DC1 24V:Electric operation voltage DC24V
		DC1 110V: Electric operation voltage AC/DC110V
		DC1 220V: Electric operation voltage AC230V/DC220V
		DC1 380V: Electric operation voltage AC380/400/415V
		AC230V: Shunt release/ Under-voltage release operation voltage AC220/230V
		AC380V: Shunt release/ Under-voltage release operation voltage AC380/400V/415V
		DC24V: Shunt release operation voltage DC24V
		DC220V: Shunt release operation voltage DC220V
		MS2 ： MS2 lock
		J: Mechanical interlocking
		Z: Terminal housing
		S: Heating handle

Table 1: Comparison Table of Accessory Code:

Accessory code	Accessory name	NDM3-400 (Model / Installation Position / Number of poles) 3	4
00	N/A	—	
10	Shunt release		
20	Dual-auxiliary contact		
21	Single auxiliary contact		
30	Under-voltage release		
40	Shunt release, dual-auxiliary contact		
41	Shunt release, single auxiliary contact		
50	Shunt release, under-voltage release		
60	Two sets of dual-auxiliary contacts		
61	Two sets of single auxiliary contacts		
62	Dual-auxiliary contact, single auxiliary contact		
70	Under-voltage release, dual-auxiliary contact		
71	Under-voltage release, single auxiliary contact		
08	Alarm contact		
18	Shunt release, alarm contact		
28	Dual-auxiliary contact, alarm contact		
38	Under-voltage release, alarm contact		
48	Shunt release, auxiliary alarm contact		
58	Auxiliary alarm contact		
68	Dual-auxiliary contact, auxiliary alarm contact		
78	Under-voltage release, auxiliary alarm contact		

4.Main Technical Parameters of Circuit Breaker

Table 2 Main Technical Parameters of Circuit Breaker

Model			NDM3-400				
Rated current of frame Inm (A)			400				
Rated current In (A)			225, 250, 315, 350, 400				
Rated insulation voltage Ui (AC V)			1000				
Rated impulse withstand voltage Uimp (V)			8000				
Rated working voltage Ue (AC V)			380/400/415, 500, 660/690				
Power frequency withstand voltage U (1min) (V)			3500				
Utilization category			A				
Number of poles			3				4
Breaking capacity level			C	L	M	H	/
Rated limit short-circuit breaking capacity Icu (kA)	AC380/400/415V		36	50	70	100	70
	AC500V		/	/	50	/	50
	AC660/690V		/	/	20	/	20
Rated operating short-circuit breaking capacity Ics (kA)	AC380/400/415V		36	50	70	75	70
	AC500V		/	/	50	/	50
	AC660/690V		/	/	15	/	15
Operating performance (times)	Electrical life		7500				
	Mechanical life	Maintainable free life	10000				
		Maintainable life	20000				
Boundary dimension		L(mm)	257				257
		W(mm)	150				198
		L(mm)	107				107
Flashover distance(mm)			⩽100				

Note :The overall dimension does not include the dimension of terminal cover

4.1 Selection of the circuit breaker connecting bus or cable cross-section area:

Table 3 Selection of the NDM3-400 Connecting Bus or Cable Cross-section Area

Rated current (A)	225	250	315, 350	400
Wire cross-section area (mm^2)	95	120	185	240

4.2 Tightening Torque of the Circuit Breaker Terminal and Mounting Screw

Table 4 Tightening Torque of the Circuit Breaker Terminal and Mounting Screw

Model	Thread specification	Torque (N·m)
NDM3-400	M10	20
	M6	6

4.3 Derating factor of temperature change for the circuit breaker

Table 5 Derating Factor Table of Temperature Change for the Circuit Breaker

Model	Derating factor of product temperature change							
NDM3-400	Temperature (℃)	40	45	50	55	60	65	70
	Derating factor	1	0.981	0.962	0.942	0.922	0.901	0.879

Note: 1) When the operating ambient temperature is below +40℃, the product can be used normally without derating capacity.

2)The above derating factors are measured at the frame current.

4.4 High-altitude derating factor of the circuit breaker

Table 6 High-altitude Derating Factor Table of Circuit Breaker

Elevation (m)	Working current correction coefficient	Maximum working current correction coefficient	Power frequency withstand voltage correction coefficient	Isolation voltage correction coefficient
2000	1	690	3500	1000
2500	1	690	3500	1000
3000	0.98	620	3150	900
3500	0.97	580	3000	850
4000	0.95	550	2800	810
4500	0.94	520	2650	770
5000	0.93	500	2500	730

4.5 Power loss coefficient of circuit breaker

Table 7 Power loss coefficient table of circuit breaker

Model	Energizing current(A)	Total power loss(W)		
		Wiring before and after board	Plug in board front Wiring	Plug in bear board Wiring
NDM3-400(C/L/M/H) Mesothermal type (225-400A)	400	115	120	125

5.Normal Working Environment of Circuit Breaker

1) The altitude of the installation site doesn’t exceed 2,500m. See the “High-altitude Derating Factor Table of Circuit Breaker” for the derating factor at the altitude;

2) The ambient temperature is -35℃ ~ + 70℃; the average within 24 h shall not be more than +35℃. If the ambient temperature is higher than +40℃, the user needs to reduce the capacity. See the “Derating Factor Table of Temperature Change for the Circuit Breaker” for the derating factor;

3) Its relative humidity at an ambient temperature of +40℃ should not exceed 50%. A higher relative humidity is allowed at a lower temperature. For example, the relative humidity at 20℃ can reach 90%; for frost due to temperature change, the corresponding measures should be taken;

4) The product can withstand the effects of wet air, salt mist, oil mist and mould;

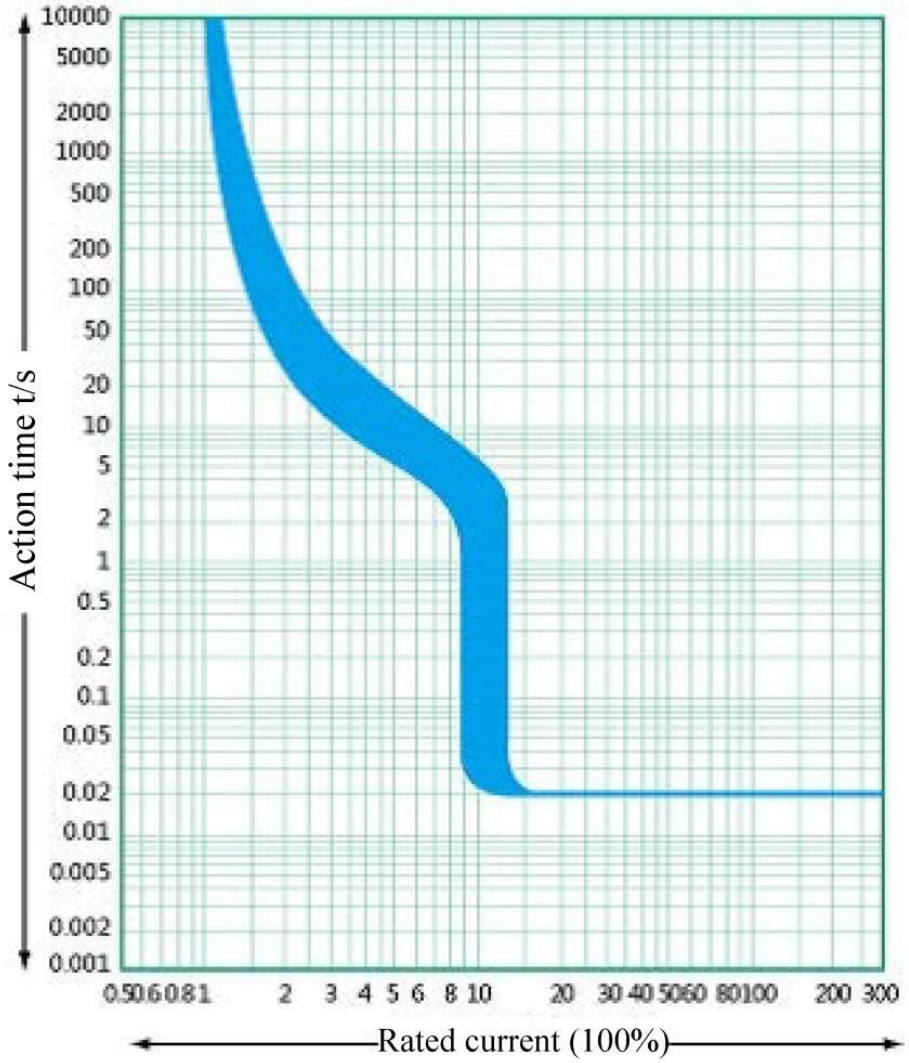
5) The installation category of the circuit breaker connected to the main loop is: Category Ⅲ (power distribution and control level), The installation category of the circuit breaker not connected to the main loop is: Category Ⅱ (load level);

6) The pollution level is Level 3;

7) The product should be installed in places that are free from explosive media, media corrosive to metal, insulation damaging gas, and conductive dust, which should be also avoided from snow and rain;

8) In case of stricter user conditions than the above description, negotiate with the manufacturer.

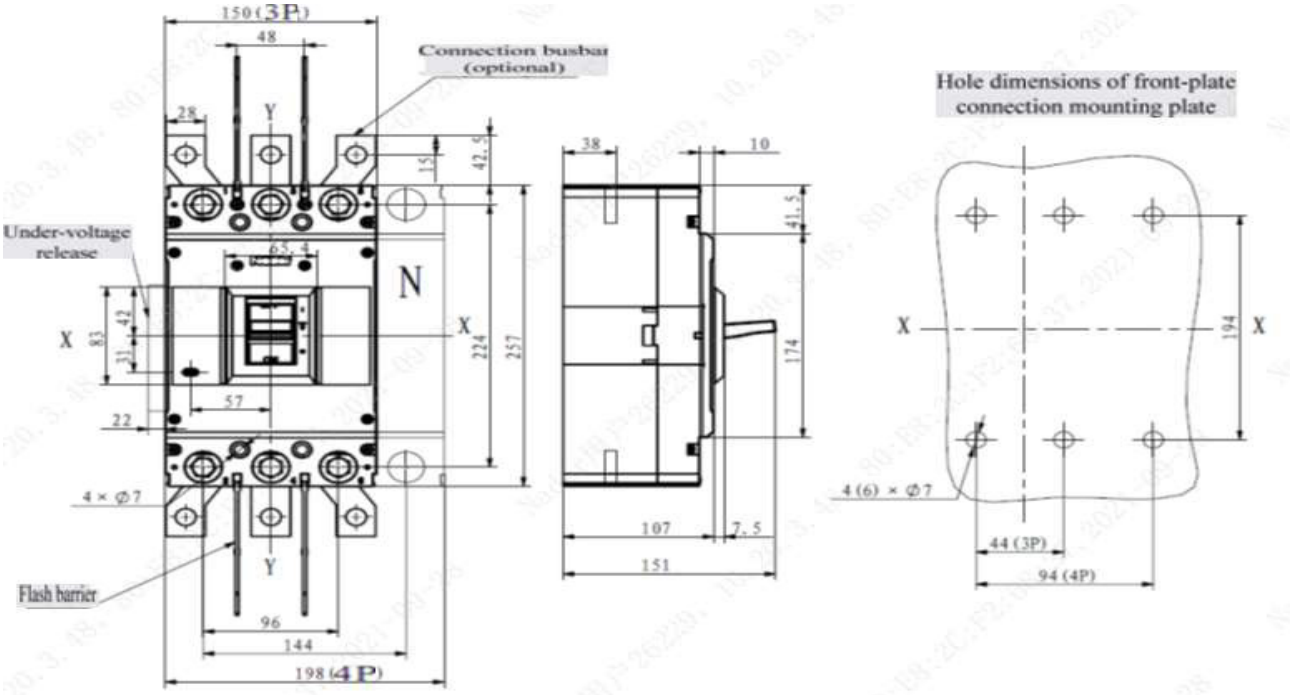
6.Short-circuit Overload Protection Characteristic Curve of Circuit Breaker



Time/Current Characteristic Curve

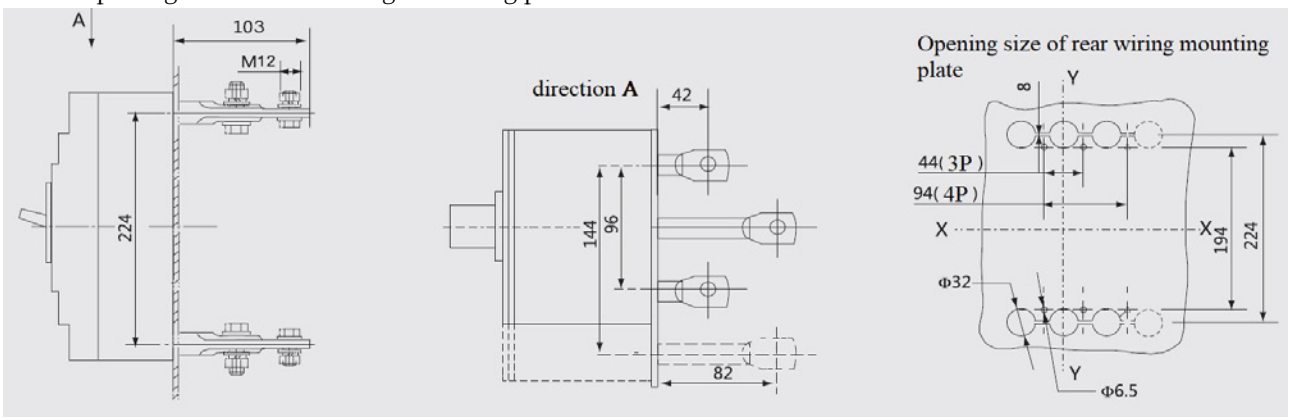
7.Outline and Mounting Hole Dimensions of Circuit Breaker

7.1 Outline and mounting hole dimensions of circuit breaker



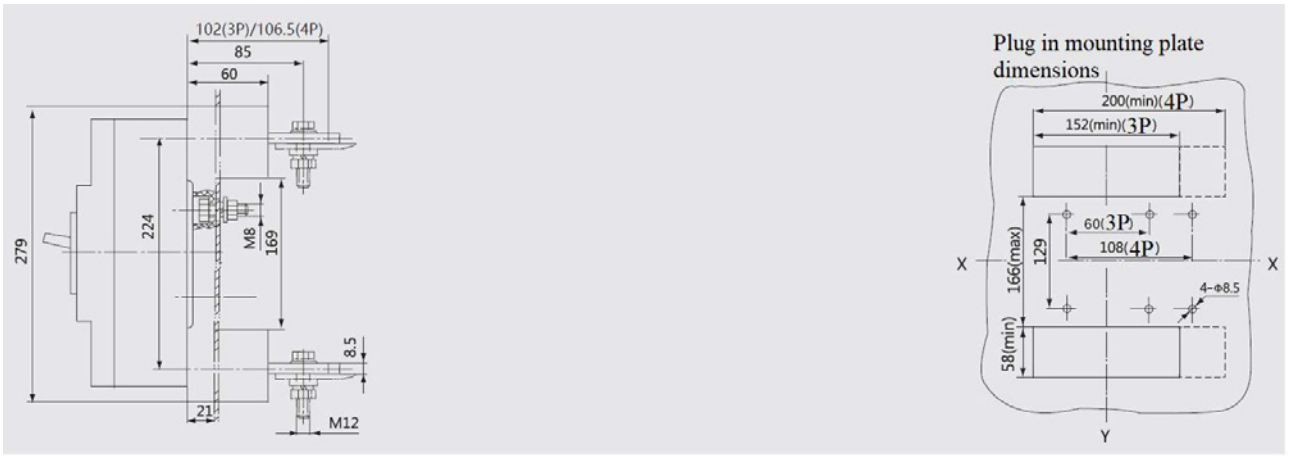
Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

7.2 Z1: opening size of rear wiring mounting plate



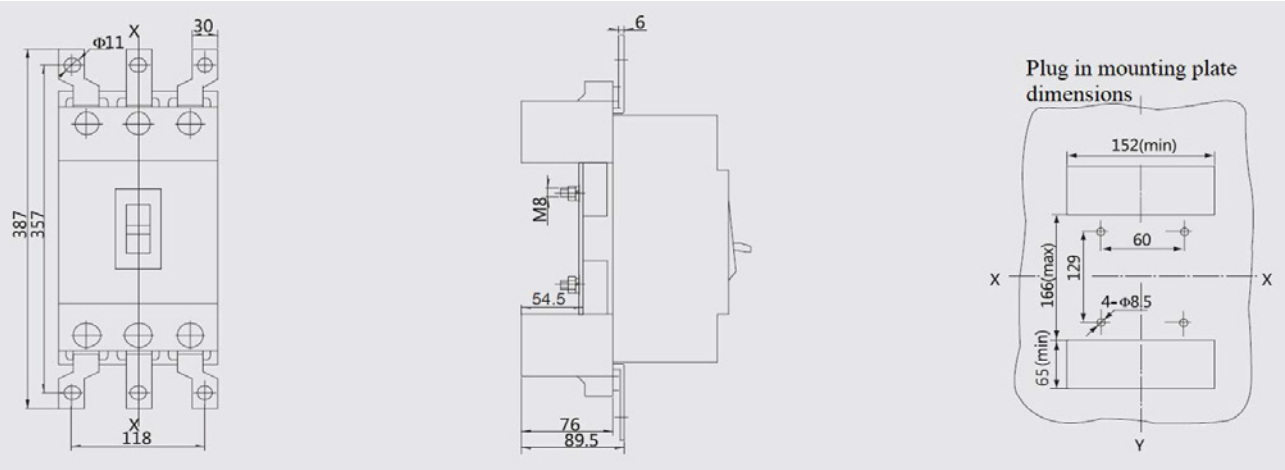
Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

7.3 Z2H: plug in rear plate wiring



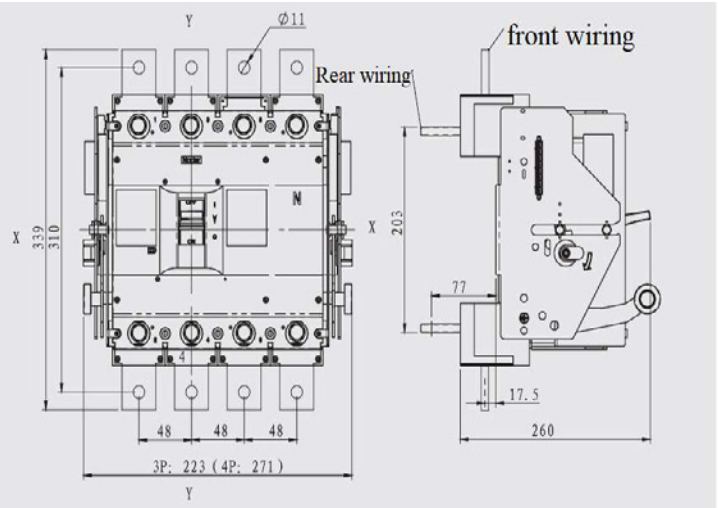
Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

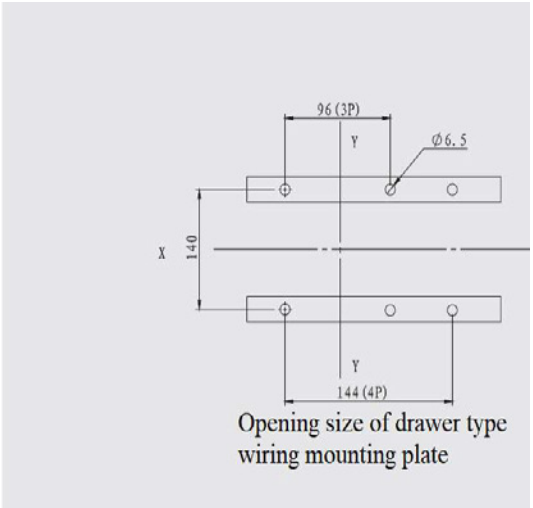
7.4 Z2Q Plug in front plate wiring (3P)



Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

7.5 Drawer type wiring (Unit: mm)

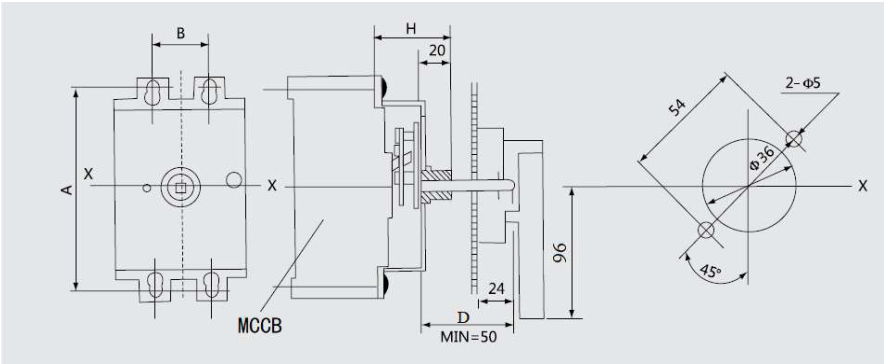




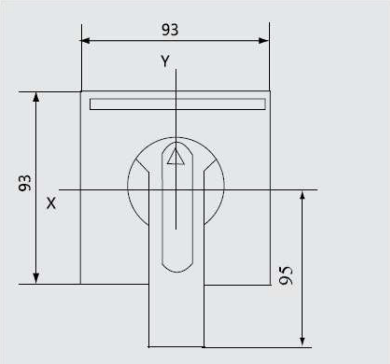
Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

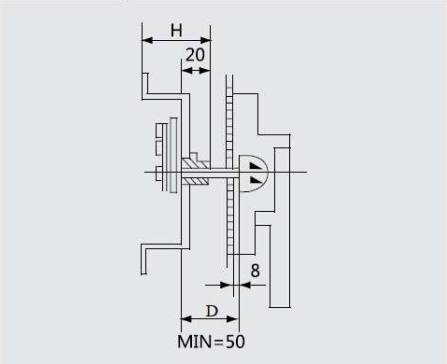
7.6 Manual operating mechanism

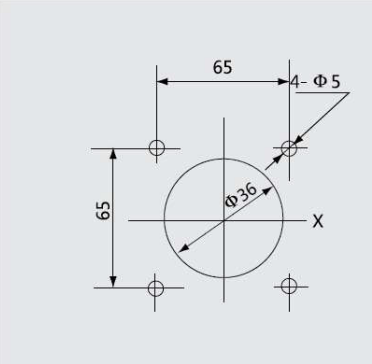
7.6.1 Electric operating mechanism and CS1-A handle



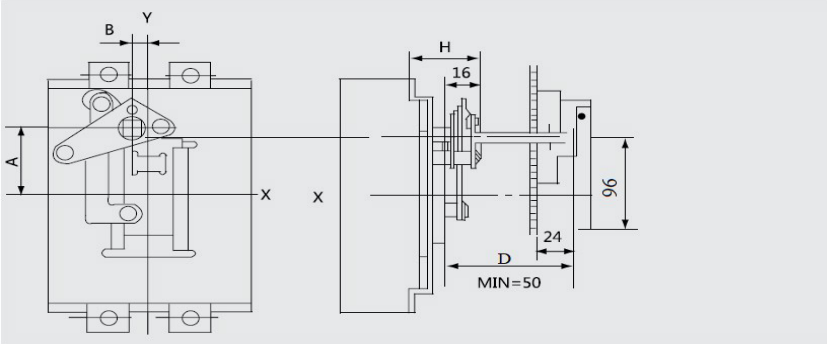
7.6.2 Electric operating mechanism and CS1-F handle

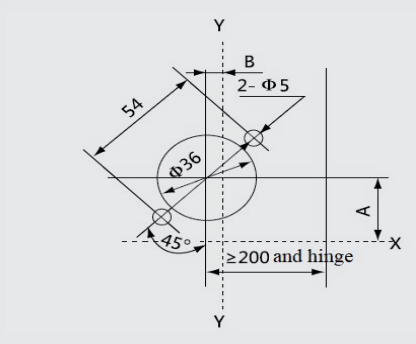




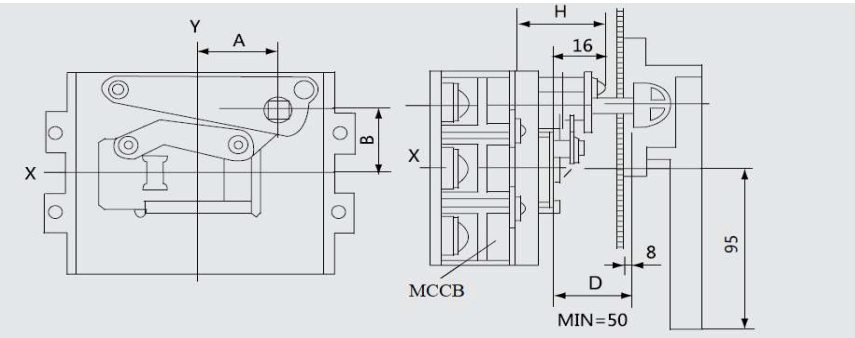


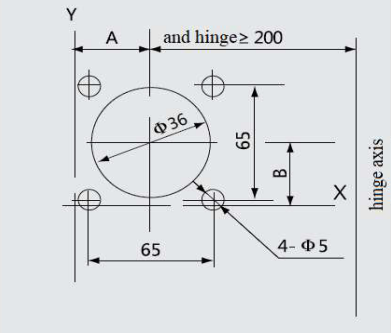
7.6.3 Electric operating mechanism and CS2-A handle



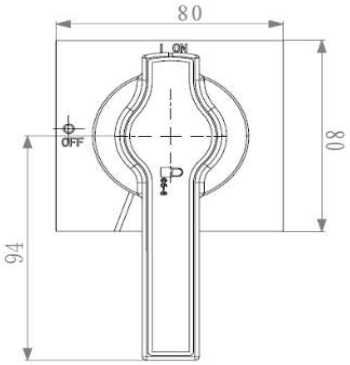


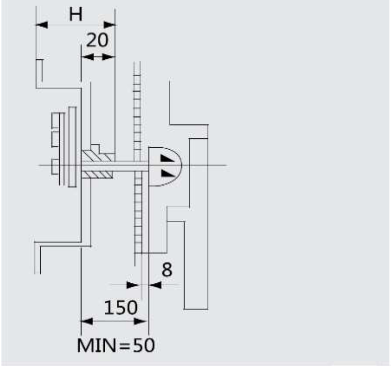
7.6.4 Electric operating mechanism and CS2-F handle

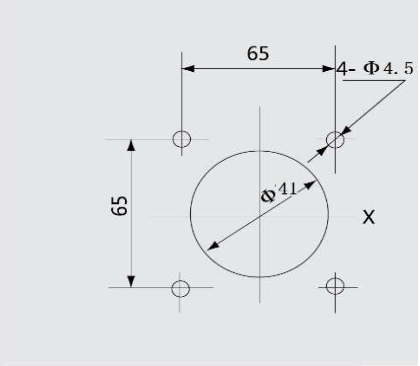




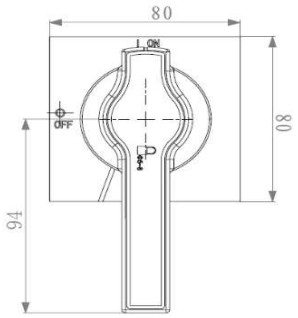
7.6.5 Electric operating mechanism and CS1-IP65 handle

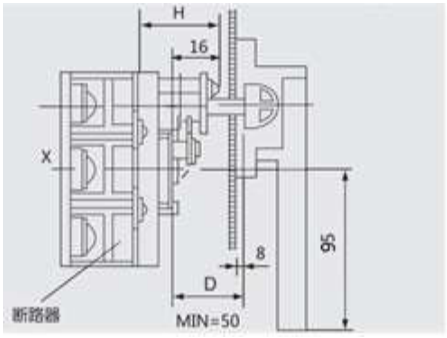






7.6.6 Electric operating mechanism and CS2-IP65 handle





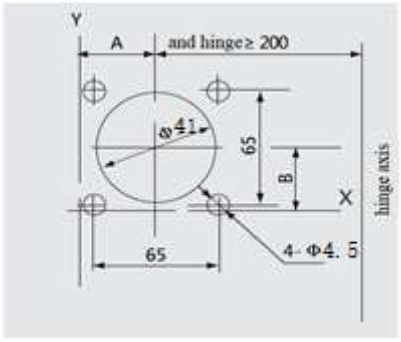


Table 8 Installation mode of electric operating mechanism

Manual operation type	Model	Installation dimension of manual operating mechanism				Installation mode
		H	A	B		
				3P	4P	
CS1	NDM3-400	85	194	137	185	Vertical installation
CS2	NDM3-400	61	68	15	15	

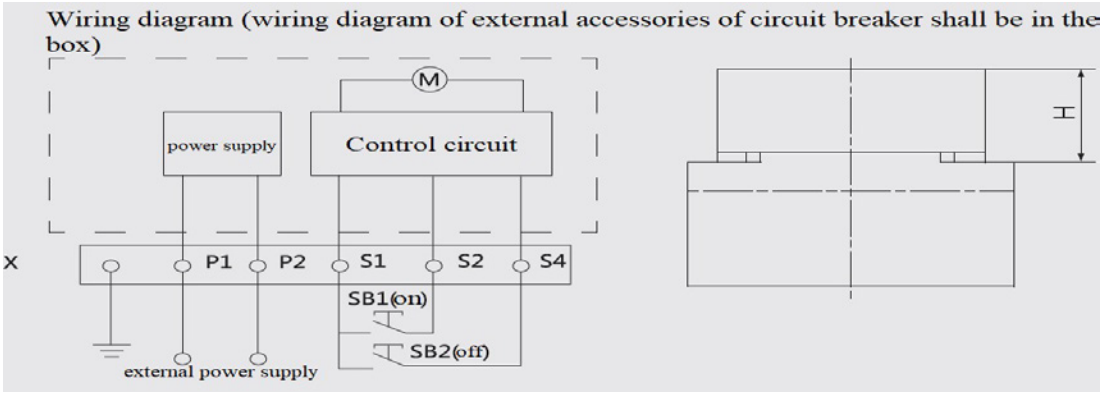
Note :1)Type A is round handle, type F is square handle ;

2)The length of A-type handle is 96mm and that of F- type handle is 95mm;

3)The D dimension in the drawing is 150mm by default, and the customizable length is 200 / 300 / 350 / 650mm ;

4)The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c. .

7.3 Electric operating mechanism



Symbol description: SB1、SB2: Operation button (provided by the customer)

X: Terminal block P1 、P2： External power supply

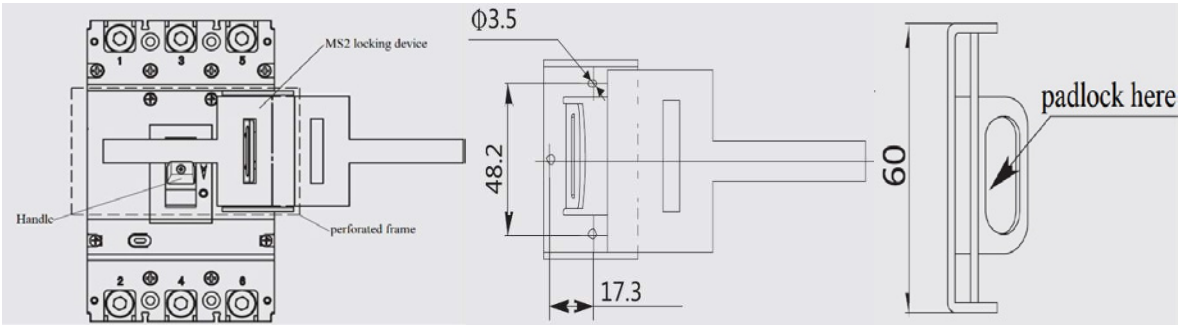
Voltage specification: AC110V、AC220V、AC400V、DC24V、DC110V、DC220V

Table 9 Main technical parameters of electric operating mechanism

Equipped with circuit breaker	Action current(A)	Electric power (W)				Service life / time	Operating mechanism height H(mm)
		AC/DC220V	AC/DC110V	AC380V	DC24V		
NDM3-400	⩽ 2	⩽350	⩽250	⩽600	160	10000	149

7.4 MS2 locking device

MS2 is a split locking device (i.e. the device is installed on the left or right side of the Circuit breaker cover, and the default is installed on the right side if there are no special requirements). It is used for NDM3 series products to prevent manual closing and opening (the dotted line part is the Circuit breaker part).



Installation diagram of MS2 lock mechanism (Unit: mm)

Note 1:After MS2 accessories are selected, other internal and external accessories cannot be installed on the same side ;

Note 2: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c .

7.5 Mechanical interlocking

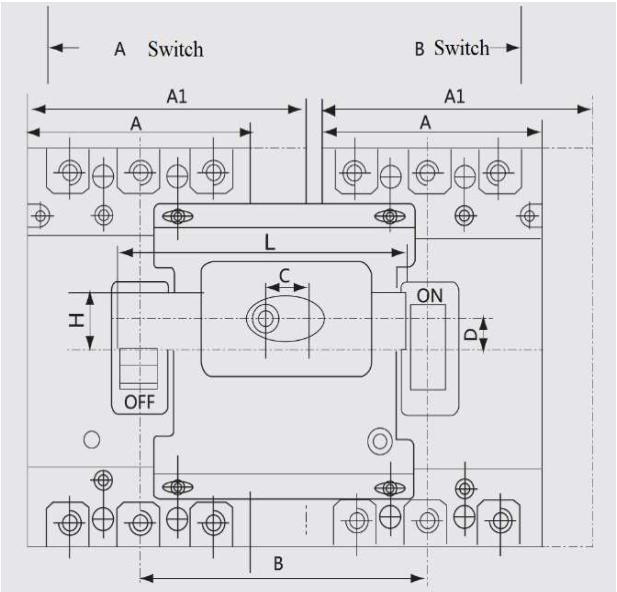


Table 10 Installation dimension of mechanical interlocking (Unit: mm)

Model	A	A1	B	C	D	L	H
NDM3-400	150	/	180	57	10	190	30
NDM3-400 （4P)	/	198	230	57	10	235	30

Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c

7.10 Safe mounting distance of circuit breaker

Table 11 Insulation Distance Mounted in the Metal Cabinet (Unit: mm)

Mounting distance	A (inlet wire end to the cabinet face)		B (distance from side to the cabinet face)	C (outlet wire end to the cabinet face)
Model	With a terminal cover	Without a terminal cover		
NDM3 -400	25	120	35	35

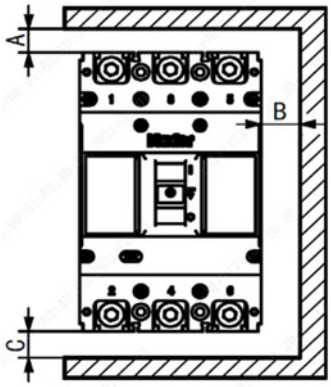


Table 8 Minimum Center Distance between Rowed Circuit Breakers (Unit: mm)

Model	Width of circuit breaker		I Center distance	
	3 poles	4 poles	3 poles	4 poles
NDM3 -400	150	198	190	238

Note: Check the connected busbar or cable during rowing or stacking of the circuit breaker to ensure that the air insulation distance won't be reduced.

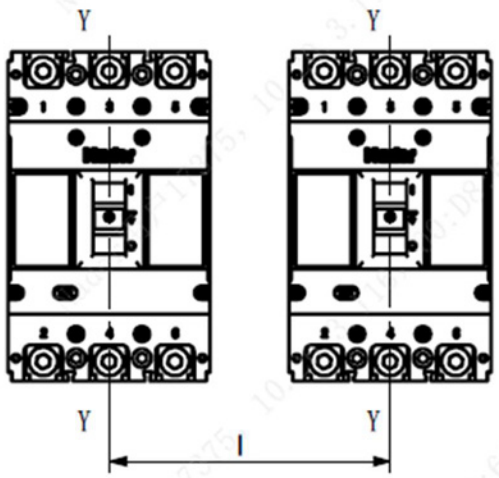


Table 9 Minimum Distance between Stacked Circuit Breakers (Unit: mm)

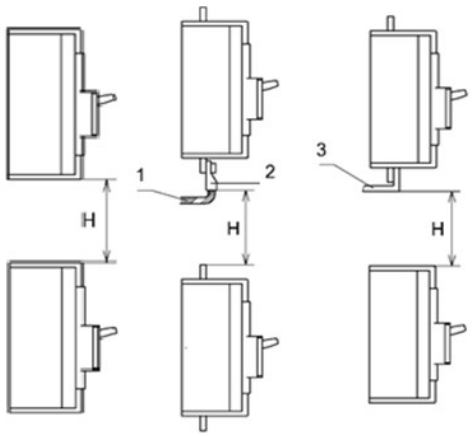
Model	H (distance of circuit breaker from bottom)	
	With a terminal cover	Without a terminal cover
NDM3-400	155	155

Note: 1) Insulated cable

2)Cable terminal

3)Connection without insulation

Requirements: Check whether the terminal cover or phase partition is assembled properly before products are energized.



8、 Attachment function description

8.1 Under-voltage release

When the power voltage drops to the range (35%~70%) of the under-voltage release, the release can break the circuit breaker reliably; when the power voltage is 35% lower than the rated working voltage of the under-voltage release, the release can prevent closing of the circuit breaker; when the power voltage is 85% higher than the rated working voltage of the under-voltage release, the release can guarantee reliable closing of the circuit breaker.

Table 14 Voltage Specifications and Power Consumption of Under-voltage Release

Model	Instantaneous current value(A)		Power waste (W)			
			Pull in power consumption		maintain power consumption	
	AC230V	AC380V	AC230V	AC380V	AC230V	AC380V
NDM3-400	0.8	0.5	190	223	0.8	0.9

Note: The under-voltage release must be energized before the circuit breaker can be switched on and closed again, otherwise the circuit breaker will be damaged.

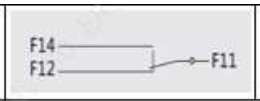
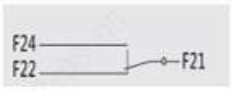
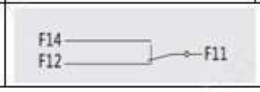
8.2 Shunt release

When impressed voltage of shunt tripper is between 70% and 110% of rated control power voltage, the breaker can be reliably broken.

Table 15 Voltage Specifications and Power Consumption of shunt release

Model	Shunt release	DC24V	AC230V	DC220V	AC380V
NDM3-400	Instantaneous current value(A)	6.8	0.76	0.48	0.28
	Power waste (W)	164.5	176.3	105	112

8.3 Auxiliary contact

The circuit breaker is in the "open" and "free tripping" positions	Dual-auxiliary contact		
	Single auxiliary contact		
the circuit breaker is in the "close" position	"close" to "open"、" open " to " close "		

8.3.1 Current parameters of auxiliary contact

Table 16 Current parameters of auxiliary contact

Category	Frame current (A)	Ith(A) Conventional thermal current Ith (A)	Rated working current Ie(A)	
			AC400V(AC-15)	DC220V(DC-13)
Auxiliary contact	400	3	1.5	0.15

8.3.2 Electrical life of auxiliary contact

Table 17 Electrical life of auxiliary contact

Ues category	On			Off			Times	Frequency	Power on time
	I/Ie	U/Ue	cosϕ	I/Ie	U/Ue	cosϕ			
AC-15	10	1	0.3	1	1	0.3	6050	360	⩾ 0.05s
DC-13	1	1	6Pe	1	1	6Pe			⩾ T0.95ms

8.3.3 Making and breaking capacity of auxiliary contact

Table 18 Making and breaking capacity of auxiliary contact

Ues	On			Off			Times	Frequency	Power on
category	I/Ie	U/Ue	cosϕ	I/Ie	U/Ue	cosϕ			time
AC -15	10	1.1	0.3	10	1.1	0.3	10	360	⩾ 0.05s
DC -13	1.1	1.1	6Pe	1.1	1.1	6Pe			⩾ T0.95ms

8.4 Alarm contact

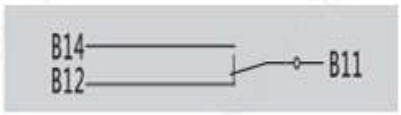
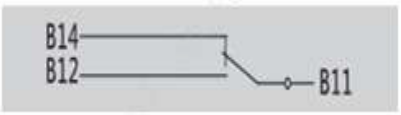
The circuit breaker is in the position of "opening" and "closing"	
The circuit breaker is in the position of "free tripping"	

Table 19 Current parameters of alarm contact

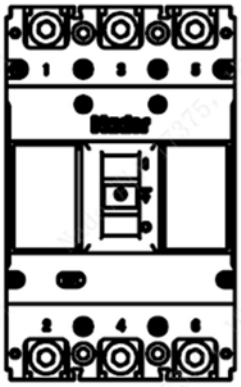
Category	Frame current (A)	Conventional thermal current Ith(A)	Rated working current Ie(A)	
			AC400V	DC220V
Alarm contact	400	3	0.4	0.15

Note: Shunt release, auxiliary contact and alarm contact wiring standard wire length is 0.7m, 1m、2m、4m can be customized according to demand.

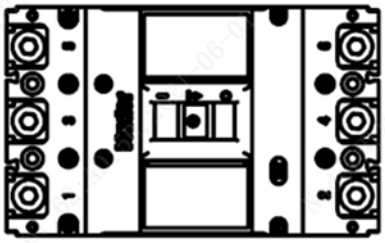
9.Installation Direction of Circuit Breaker

For vertical installation of the product, the gradient between the installation surface and the vertical plane is no more than ±22.5°.

Horizontal installation of the product.



Vertical Installation



Horizontal Installation

10.Packaging and Storage of Circuit Breaker

Minimum packaging quantity: 1 piece/box. The packaged products should be stored in a warehouse with the air ventilation and the relative humidity no more than 80% when the ambient temperature is -40℃~+75 ℃. No acidic alkaline or other corrosive gas exists in the ambient air in the warehouse. Under the conditions above, the storage period shall be no more than three years since the manufacturing date.

11.Installation Direction of Circuit Breaker

SN	Name	Specification	3P Quantity/Set	4P Quantity/Set
1	Cross small pan-head screw	M6×70	4	6
2	Hexagon nut	M6	4	6
3	Spring washer	6	4	6
4	Plain washer	6	8	12
5	Phase partition	——	4	6
6	Hexagon head combination bolt	M10×35	6	8

12.Circuit Breaker Notes

1)Various characteristics and accessories of the circuit breaker are set in the factory. The circuit breaker, tripping unit or other accessories can only be adjusted, installed and maintained by the trained or qualified professionals according to the parameter requirements of the line design;

2)Ensure that the power supply is off before installing or removing any device;

3)The circuit breaker handle can be located in three positions, indicating three states: on, off and free tripping. When the handle is in the free tripping position, pull the handle in the off direction when the circuit breaker is connected and on.