Shanghai Liangxin Electrical Co., Ltd.

NDM3Z-630 Product Specification

(IPD-ENG-DEV-T20 A1 2016-09-23)

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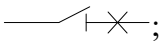
Revision History					
Version	Revision Reason/Content	Implementation Date	Prepared by	Reviewed by	Approved by
0	Newly added	6/9/2020	Jiang Wushan	Ding fei	Cao Jian
1	Update the product appearance picture and product dimension outline drawing	2021/09/30	Sun Lanping	Chen Xinming	Ding Fei
2	Add attachment information	20221212	Yang rongrong	Chen Xinming	Ding Fei

1. Applicable Scope and Purpose of Circuit Breaker

The NDM3Z-630 DC molded case circuit breaker (hereinafter referred to as circuit breaker) applies to the DC system application environment and the electric circuit with the working voltage of DC1000V and the working current of 125A. 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

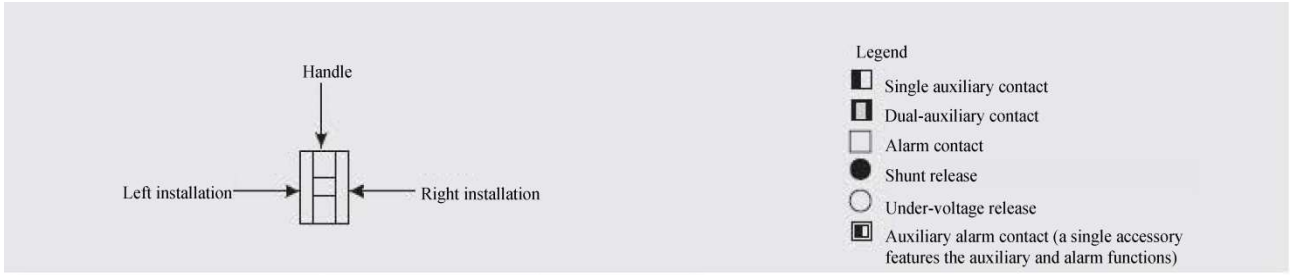
ND	M	3	Z - 630	□ / □	□	□	□	□	□	□	□	□	□
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

SN	SN name	NDM3Z
1	Enterprise code	ND: “Nader” low-voltage apparatus
2	Product code	M: Molded case circuit breaker (MCCB)
3	Design SN	3
4	Derived code of the	Z: DC
5	Shell frame level	630
6	Derived code of the	No code: Conventional type
7	Breaking capacity	No code: Normal product
8	Operation mode	No code: Direct handle-operated mode
		P: Motor-operated
		Z: Rotation handle
9	Number of poles	2, 3*, 4
10	Release code	0: Release (none)
		2: Instantaneous tripper only
		3: Complex tripper
11	Accessory code	See Table 1
12	Rated current	See Table 2
13	Cabling type	2P No code: Normal product
		3P No code: J0*
		4P: J0, bipolar parallel (only J0 for 630A)
14	Other code	CS1-A/150: Circular center hole rotary handle + shaft length 150mm
		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
		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 Square center hole rotary handle + shaft length 150mm
		CS1-IP65/200: IP65 Square center hole rotary handle + shaft length 200mm
		CS1-IP65/300: IP65 Square center hole rotary handle + shaft length 300mm
		CS1-IP65/350: IP65 Square center hole rotary handle + shaft length 350mm
		CS1-IP65/650: IP65 Square center 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
		DC24V: Shunt release/ Under-voltage operation voltage DC24V
		DC220V: Shunt release operation voltage DC220V
		AC380V: Shunt release/ Under-voltage release operation voltage AC380/400/415V
		AC230V: Shunt release/ Under-voltage release operation voltage AC220/230V
		Z: Terminal housing
		S: Heating handle
		MS2：MS2 lock

Note：Please contact the manufacturer for 2P+N.

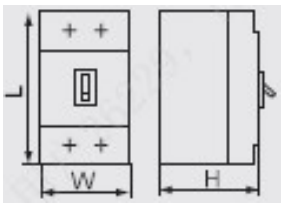
Table 1: Comparison Table of Accessory Code:



Accessory code	Accessory name	Installation Position / Model / Number of poles: NDM3Z-630 2	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			NDM3Z-630				
Rated current of frame Inm (A)			630				
Rated current In (A)			400, 500, 630, 1000 (in parallel), 1250 (in parallel)				
Rated insulation voltage Ui (AC V)			1000				
Rated impulse withstand voltage Uimp (V)			8000				
Power frequency withstand voltage U (1min) (V)			3500				
Utilization category			A				
Number of poles			2/2P+N*		3	4	4 (parallel)
Rated working voltage Ue (DC V)			500	690	750	1000	500	700
Rated limit short-circuit breaking capacity Icu (kA)			35	8	40	40	30	20
Rated operating short-circuit breaking capacity Ics (kA)			35	8	40	40	30	20
Operating performance (times)	Electrical life		1000				
	Mechanical life	Maintainable free life	5000				
		Maintainable life	10000				
Boundary dimension		L(mm)	270			270	
		W(mm)	182			240	
		H(mm)	111			111	
Flashover distance(mm)			⩽100				

Note：Please contact the manufacturer for 2P+N;

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 NDM3Z-630 Connecting Bus or Cable Cross-section Area

Rated current (A)	400	500	630	1000	1250
Wire cross-section area (mm^2)	240	150×2	185×2	150×4	185×4

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)
NDM3Z-630	M12	28
	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							
NDM3Z-630	Temperature (℃)	40	45	50	55	60	65	70
	Derating factor	1	1	1	0.92	0.90	0.89	0.83

Note: 1) When the operating ambient temperature is below 50℃, 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(V)	Power frequency withstand voltage correction coefficient(V)	Isolation voltage correction coefficient(V)
2000	1	1	1	1
2500	1	1	1	1
3000	0. 98	1	1	1
3500	0. 95	1	1	1
4000	0. 93	1	1	1
4500	0. 91	1	1	1
5000	0. 89	1	1	1

4.5 Power loss coefficient of circuit breaker

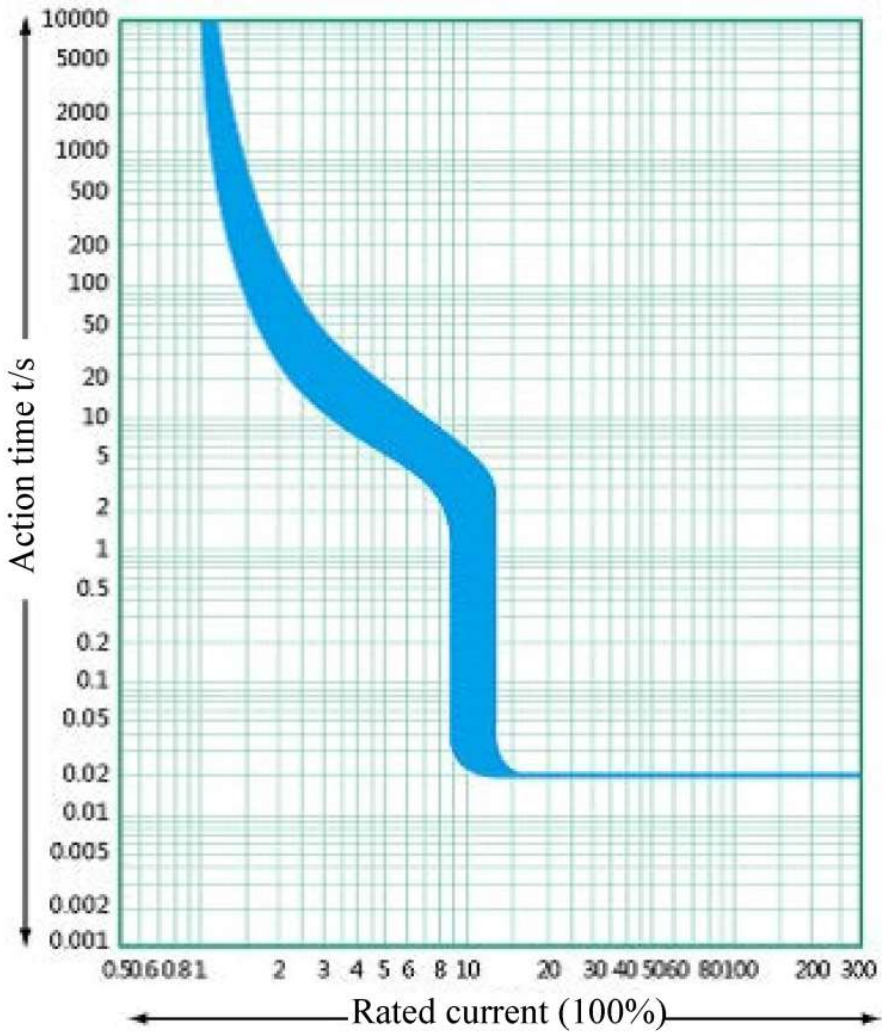
Table 7 Power loss coefficient table of circuit breaker

Model	Energizing current(A)	Total power loss(W)
		Wiring before and after board
NDM3Z-630 Mesothermal type (400-630A)	630	187

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 24h shall not be more than +35℃. If the ambient temperature is higher than +50℃, 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

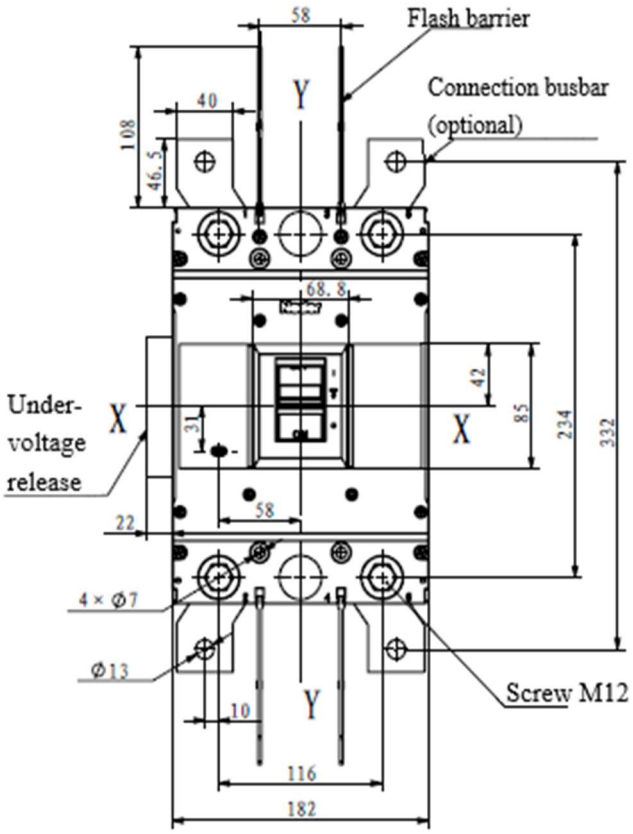


Time/Current Characteristic Curve

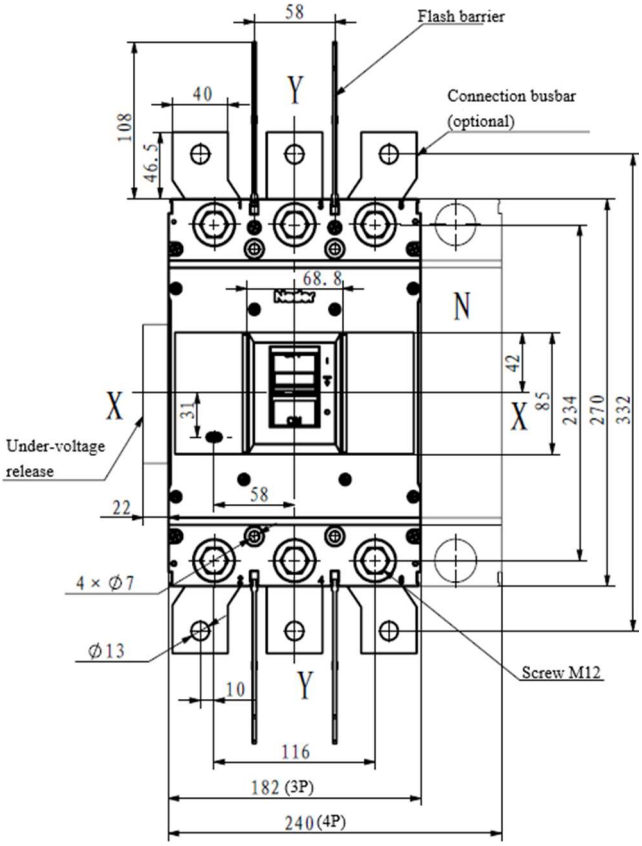
7. Outline, Mounting Hole Dimensions and Safety Distance of Circuit Breaker

7.1 Outline and mounting hole dimensions of circuit breaker

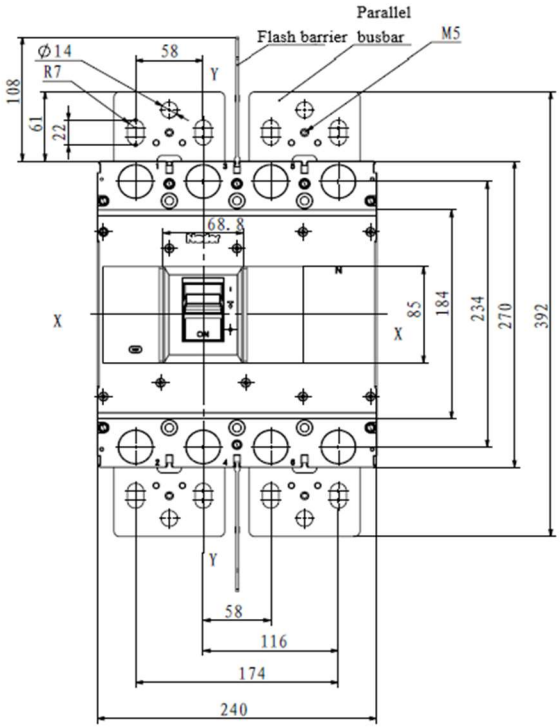
2P

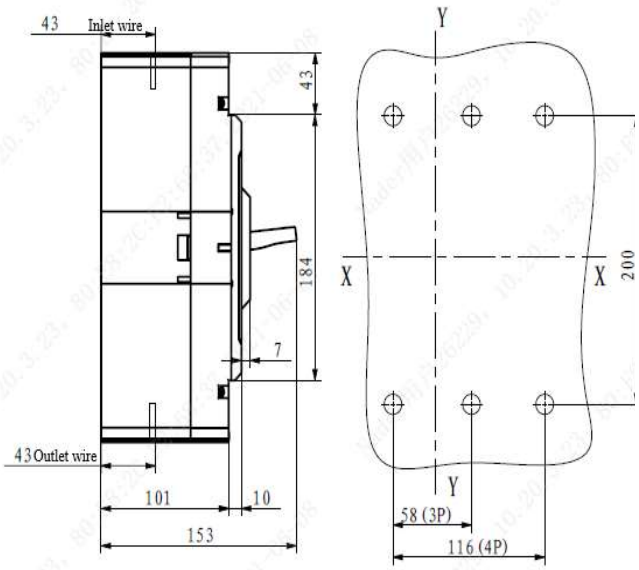


2P+N/3P(J0)/4P(J0)



bipolar parallel

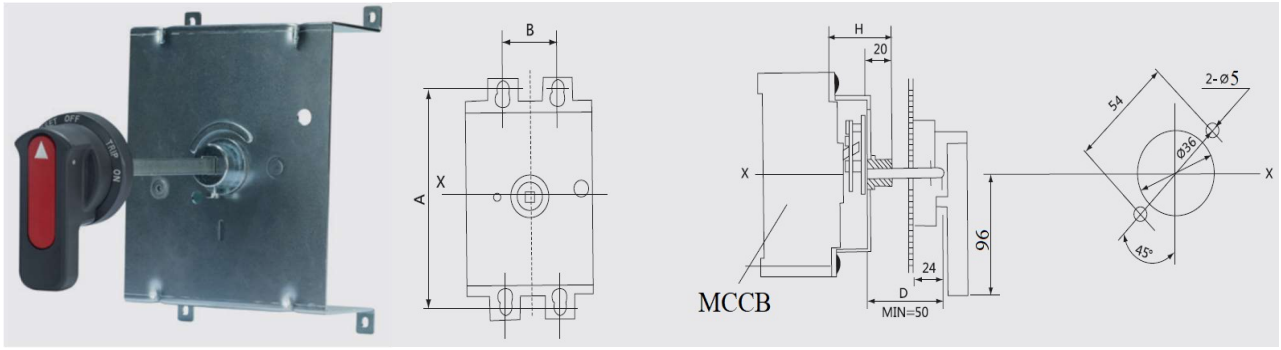




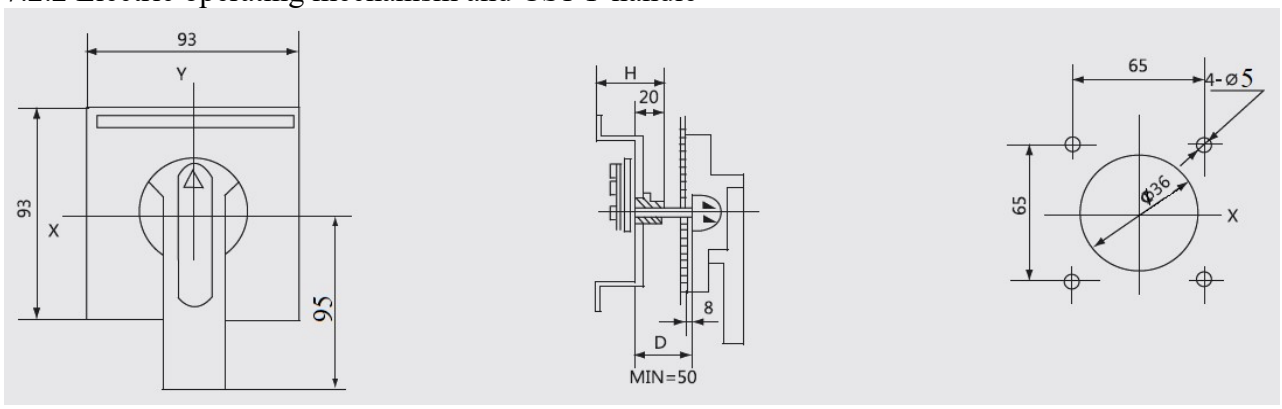
Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

7.2 Manual operating mechanism

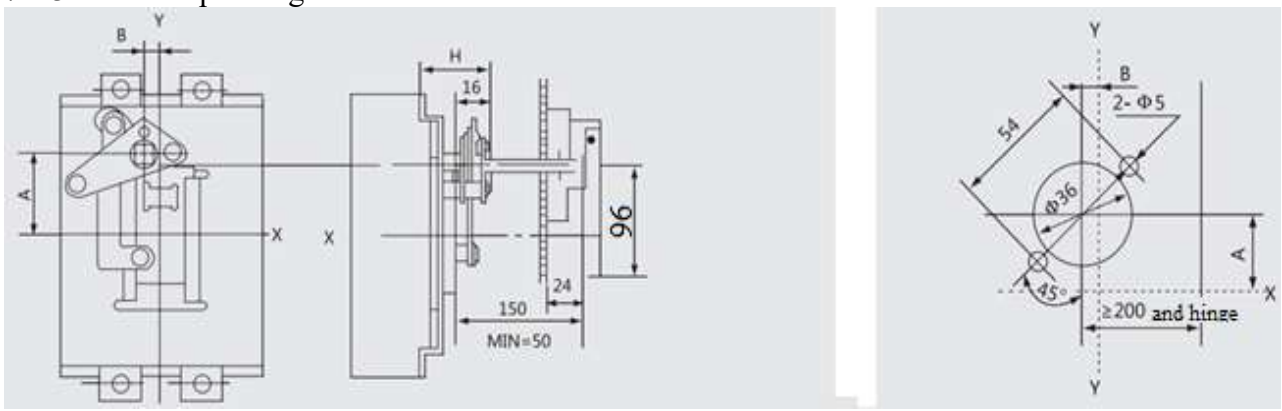
7.2.1 Electric operating mechanism and CS1-A handle



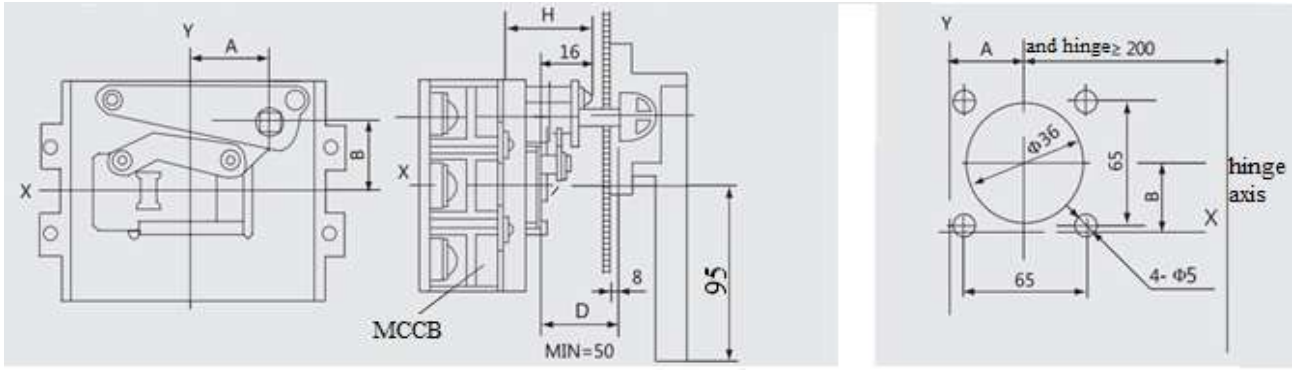
7.2.2 Electric operating mechanism and CS1-F handle



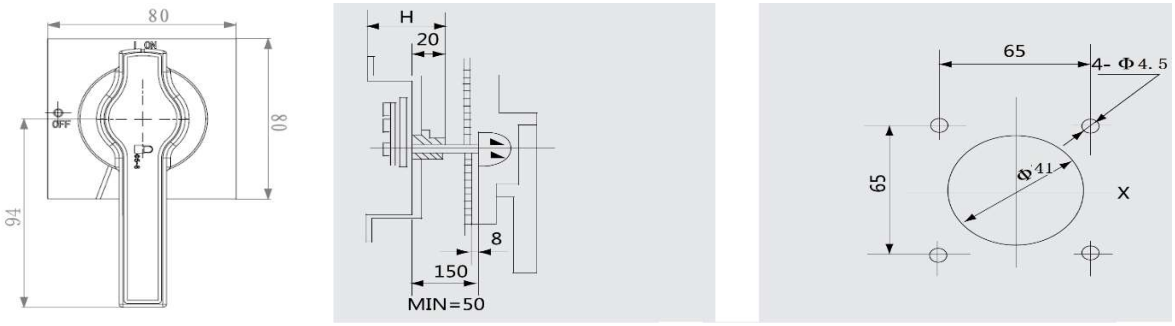
7.2.3 Electric operating mechanism and CS2-A handle



7.2.4 Electric operating mechanism and CS2-F handle



7.2.5 Electric operating mechanism and CS1-IP65 handle



7.2.6 Electric operating mechanism and CS2-IP65 handle

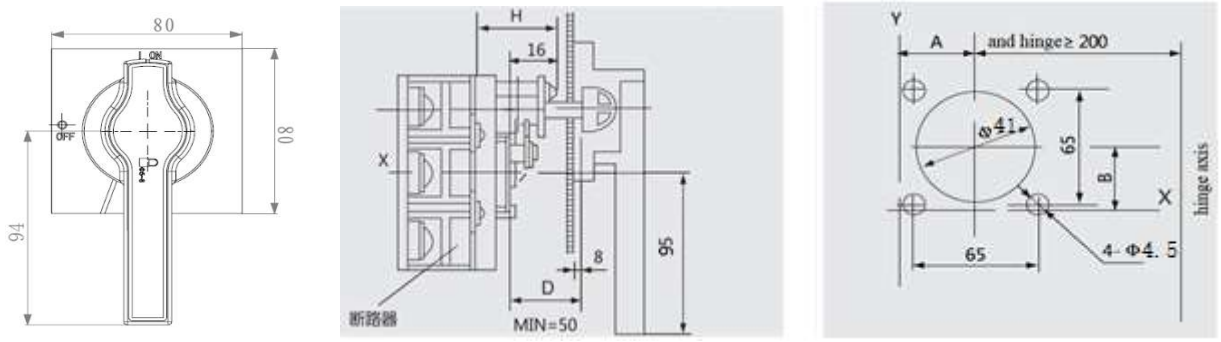


Table 8 Installation dimension of manual operating mechanism (Unit: mm)

Manual operation type	Model	Installation dimension of manual operating mechanism				Installation mode
		H	A	B		
				3P	4P	
CS1	NDM3Z-630	84	200	171	229	Vertical installation
CS2	NDM3Z-630	61	67. 5	15		

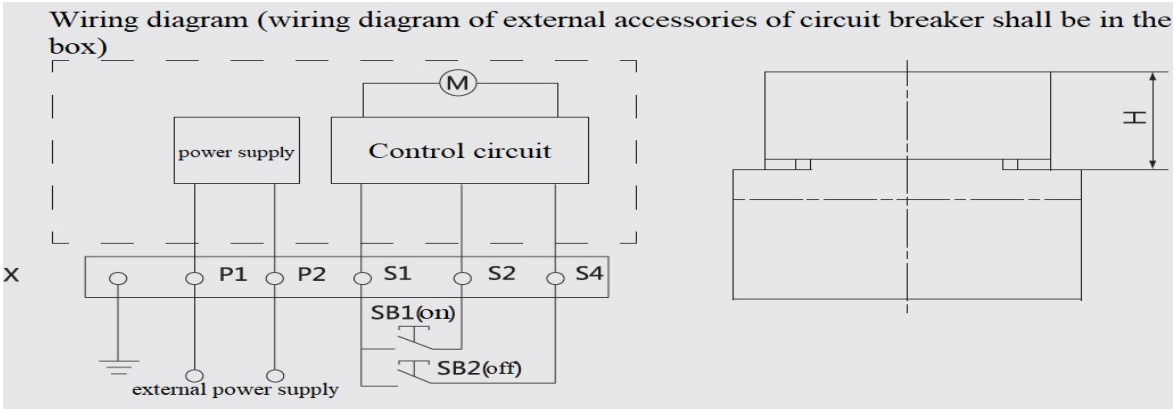
Note:1) A type is round handle, F type is square handle;

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

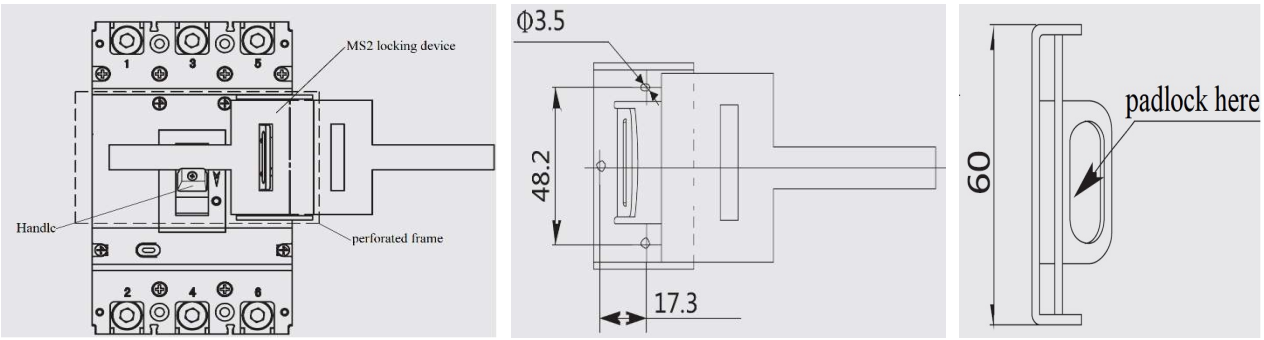
Voltage specification: AC110V、AC220V、AC400V、DC24V、DC110V、DC220V

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	AC400V	DC24V		
NDM3Z-630	≤2	≤350	≤250	≤600	160	10000	147

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 NDM3Z series products to prevent manual closing and opening (the dotted line part is the circuit breaker part).



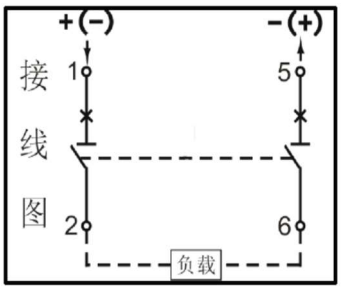
Installation diagram of MS2 lock mechanism (Unit: mm)

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

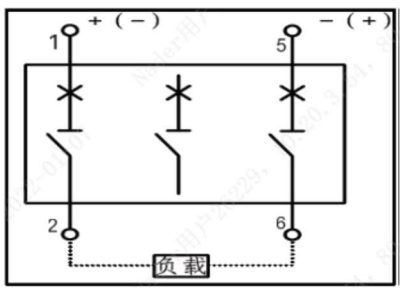
2: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

7.5 Wiring Diagram of Circuit Breaker

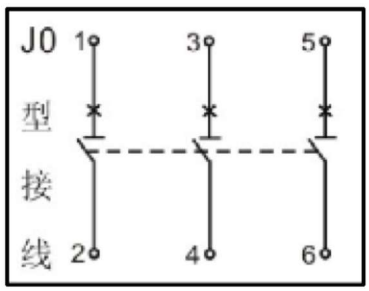
2P



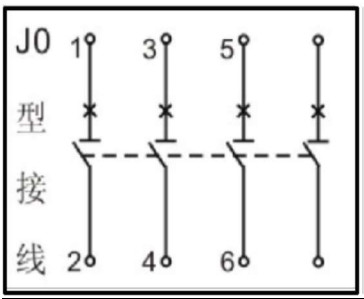
2P+N



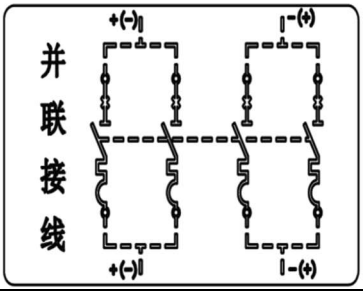
3P J0



4P J0



4P bipolar parallel



7.6 Safe mounting distance of circuit breaker

Table 10 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		
NDM3Z-630	25	120	35	35

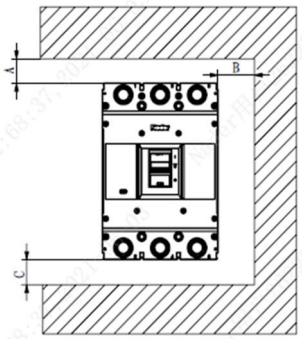


Table 11 Minimum Center Distance between Rowed Circuit Breakers (Unit: mm)

Model	Width of circuit breaker		I Center distance	
	2/2P+N/3 poles	4 poles	2/2P+N/3 poles	4 poles
NDM3Z-630	182	240	222	280

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.

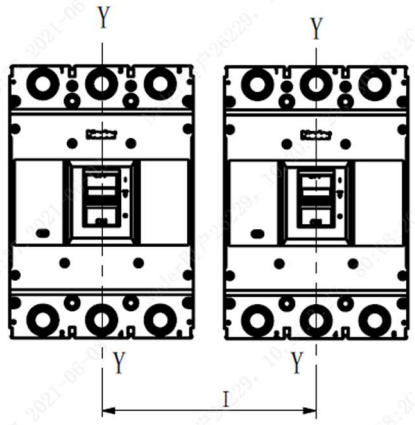


Table 12 Minimum Center Distance between Stacked Circuit Breakers (Unit: mm)

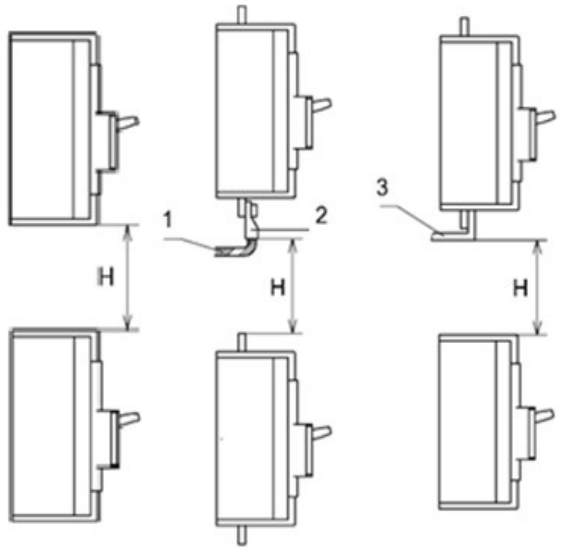
Model	H (distance of circuit breaker from bottom)	
	With a terminal cover	Without a terminal cover
NDM3Z-630	155	155

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 13 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
NDM3Z-630	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。

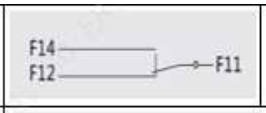
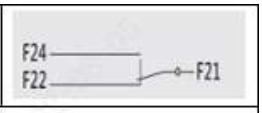
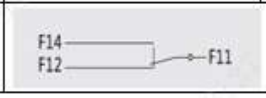
8.2 Shunt release

When the external voltage of the shunt release is between 70% and 110% of the rated control power voltage, the release can break the circuit breaker reliably.

Table 14 Voltage Specifications and Power Consumption of shunt release

Model	Shunt release	DC24V	AC230V	DC220V	AC400V
NDM3Z-630	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 15 Current parameters of auxiliary contact

Category	Frame current (A)	Conventional thermal current Ith (A)	Rated working current Ie(A)	
			DC220V(DC-13)	AC400V(AC-15)
Auxiliary contact	630	3	0.15	1.5

8.3.2 Electrical life of auxiliary contact

Table 16 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 17 Making and breaking capacity 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	1.1	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

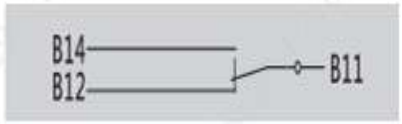
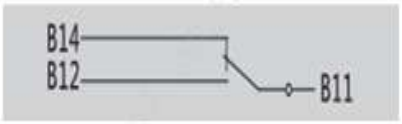
The circuit breaker is in the position of "opening" and "closing"	
The circuit breaker is in the position of "free tripping"	

Table 18 Current parameters of alarm contact

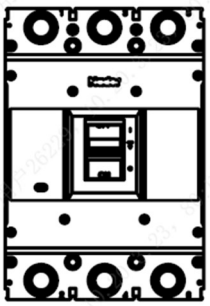
Category	Frame current (A)	Conventional thermal current Ith(A)	Rated working current Ie(A)	
			DC220V	AC400V
Alarm contact	630	3	0.15	0.4

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

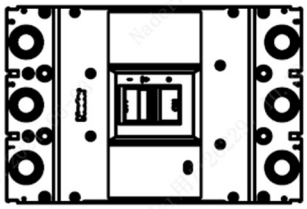
9. Installation Direction of Circuit Breaker

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 Accessory List of Circuit Breaker

SN	Name	Specification	2P Quantity/Set	2P+N/3P Quantity/Set	4P Quantity/Set（J0）
1	Cross small pan-head screw	M6×75	4	4	6
2	Hexagon nut	M6	4	4	6
3	Spring washer	6	4	4	6
4	Plain washer	6	8	8	12
5	Phase partition	——	4	4	6
6	Hexagon head combination bolt	M12×35	4	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.