

Shanghai Liangxin Electrical Co., Ltd.

PRODUCT SPECIFICATION

NDMNZ-320V

Miniature Circuit Breaker

(IPD-ENG-DEV-T22 A2 2023-03-14)

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Approved by	Ding fei	Date	2026-05-21

Revision information					
Version	Revised contents and reasons	Date	Prepared	Reviewed	Approved
0	Newly added	2024-11-28	Ju Chunwei	Jiang Wushan	Sun Lanping
1	Updated parameter	2025-02-26	Ju Chunwei	Jiang Wushan	Sun Lanping
2	1、 7.1 Drawing size update 2、 Table 9 update 3、 9.4 Drawing size update	2025-04-01	Ju Chunwei	Jiang Wushan	Sun Lanping
3	1、 Add KR 2、 Update handle information: CS1-A changed to CS1-B 3、 Added 4.5 product power consumption information	2026-06-26	Yangrongrong	Xufuping	Dingfei

1 Application

NDMNZ-320V molded case circuit breaker (hereinafter referred to as circuit breaker) is suitable for working voltage below DC1500V and rated working current in DC systems up to 320A. The circuit breaker has the function of overload and short circuit protection, which can protect the line and power supply equipment from damage caused by overcurrent. It can be used in power generation, power transmission and transformation, photovoltaic new energy, communication and other fields.

The circuit breaker has an isolating function with the corresponding symbol of $\text{---} \diagup \text{---} \times \text{---}$;

Comply with standards: IEC 60947-2, GB/T 14048.2.

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

2 Product pictures

(The pictures are for reference only, which are subject to the real thing)

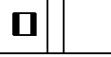
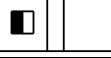


3 Product model

ND M N □ - 320 □ □ / □ □ □ □ □ □ □
 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Item	Parameter type	NDMNZ-320V
1	Enterprise code	ND
2	Product code	M: Molded case circuit breaker (MCCB)
3	Design SN	N:New energy
4	Derived codename	Z:DC
5	Shell frame grade	320
6	High voltage level	V
7	Operation mode	No code: directly handle operation Z: Rotary operation
8	Pole	2
9	Operation mode	No code: Direct handle-operated mode
10	Accessory code	See Table 1
11	Rated current	63、125、160、200、250、320
12	Cabling type	No code: Normal product
13	Other code	CZ: Terminal cover CS1-B/150/200/300/350/650: Circular center hole rotary handle + shaft length 150/200/300/350/650mm CS1-IP65/150/200/300/350/650: IP65 Square center hole rotary handle + shaft length 150/200/300/350/650mm
14	Special code	KR: Internal accessory wire with Kang Rui terminal

Table 1: Comparison Table of Accessory Code:

Accessory code	Accessory name	Installation Location
00	无	——
08	Alarm contact	
10	Shunt release	
20	Dual-auxiliary contact	
21	Single auxiliary contact	
41	Shunt release , Single auxiliary contact	
58	Auxiliary alarm contact	

Note:

- ☐ Single auxiliary contact; ☒ Dual-auxiliary contact ☐ Alarm contact;
 • Shunt release ☒ Single auxiliary contact ☒ Shunt release, Single auxiliary contact

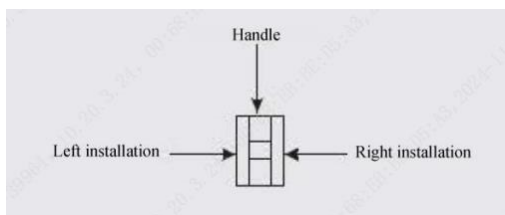
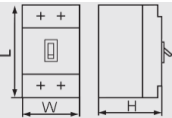
**4 Main technical parameters**

Table 2 Main Technical Parameters of Circuit Breaker

Model		NDMNZ-320V	
Rated current of frame Inm (A)		320	
Rated current In (A)		63、125、160、200、250、320	
Rated insulation voltage Ui (DC V)		1600	
Rated impulse withstand voltage Uimp (kV)		12	
Rated working voltage Ue (DC V)		1000/1500	
Power frequency withstand voltage U (1min) (V)		3820	
Utilization category		A	
Number of poles		2	
Rated limit short-circuit breaking capacity Icu (kA)	DC1500V	20kA(τ =2ms)	
	DC1000V	40kA(τ =2ms)	
Rated operating short-circuit breaking capacity Ics (kA)	DC1500V	20kA(τ =2ms)	
	DC1000V	40kA(τ =2ms)	
Life(times)		Electrical life (DC1500V)	1000
		Mechanical life (maintenance-free)	10000
Boundary dimension		L(mm)	200
		W(mm)	84
		H(mm)	108
Flashover distance(mm)		0 (With terminal cover) 100 (Without terminal cover)	
Cabling type		front-plate connection	

Maintenance-free definition: The ability of a product or component to function properly without manual maintenance or intervention during its expected life under normal conditions of use.

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

Table 3 Selection of the NDMNZ-320V Connecting Bus or Cable Cross-section Area

Rated current (A)	63	125	160	200	250	320
Cross-section area of cable (mm ²)	16	50	70	95	120	185

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)
NDMNZ-320V	Wiring screw M8	12
	Product mounting screw M4	1.5

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										
NDMNZ-320V	Temperature (°C)	40	45	50	55	60	65	70	75	80	85
	Derating factor	1	1	1	1	0.96	0.92	0.89	0.85	0.81	0.78

Note: 1) When the operating ambient temperature is below + 55°C, 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)	2000	2500	3000	3500	4000	4500	5000
Working current correction coefficient	1	1	0.98	0.95	0.93	0.91	0.89
Maximum operating voltage	1	1	1	1	1	1	1
Power frequency withstand voltage correction coefficient	1	1	1	1	1	1	1
Isolation voltage correction coefficient (V)	1	1	1	1	1	1	1

4.5 Power loss coefficient of circuit breaker

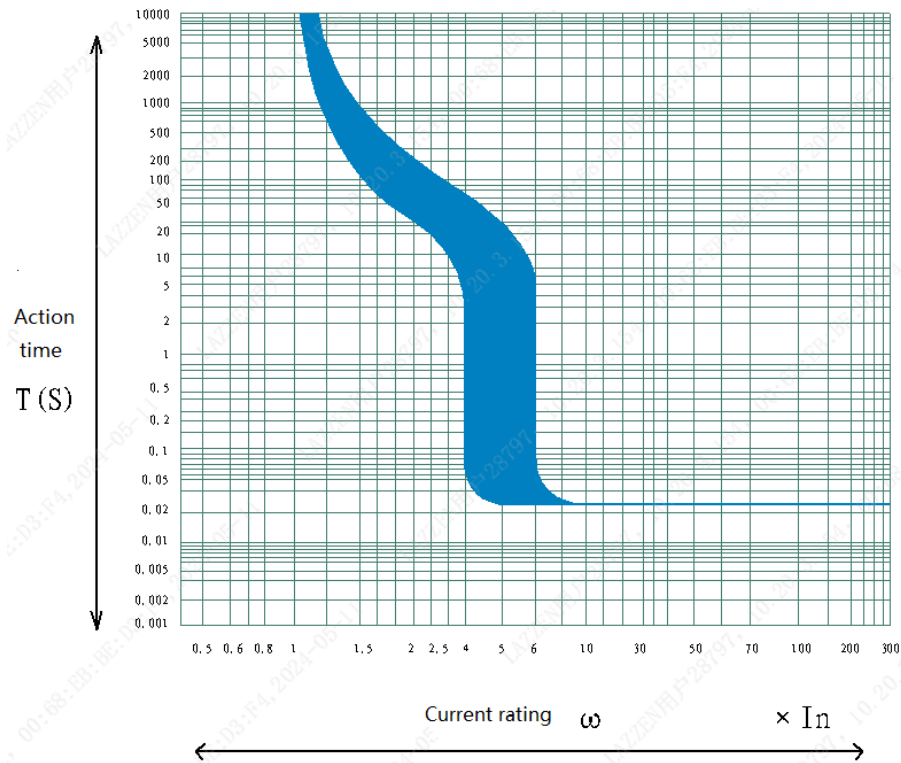
Model	Energizing current(A)	Total power loss(W) Wiring before and after board
NDMNZ-320V(250A)	250	62.5
NDMNZ-320V(320A)	320	102

5 Working conditions

- 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 -40°C~ +85°C; If the ambient temperature is higher than +85°C, 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°C should not exceed 50%. A higher relative humidity is allowed at a lower temperature. For example, the relative humidity at 20°C 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) Degree of protection: IP20;
- 8) The product is installed in a medium without explosion hazard, and the medium is free of gases and conductive dust that can corrode the metal and destroy the insulation, and avoid use in places where rain and snow invade;
- 9) In case of stricter user conditions than the above description, negotiate with the manufacturer.

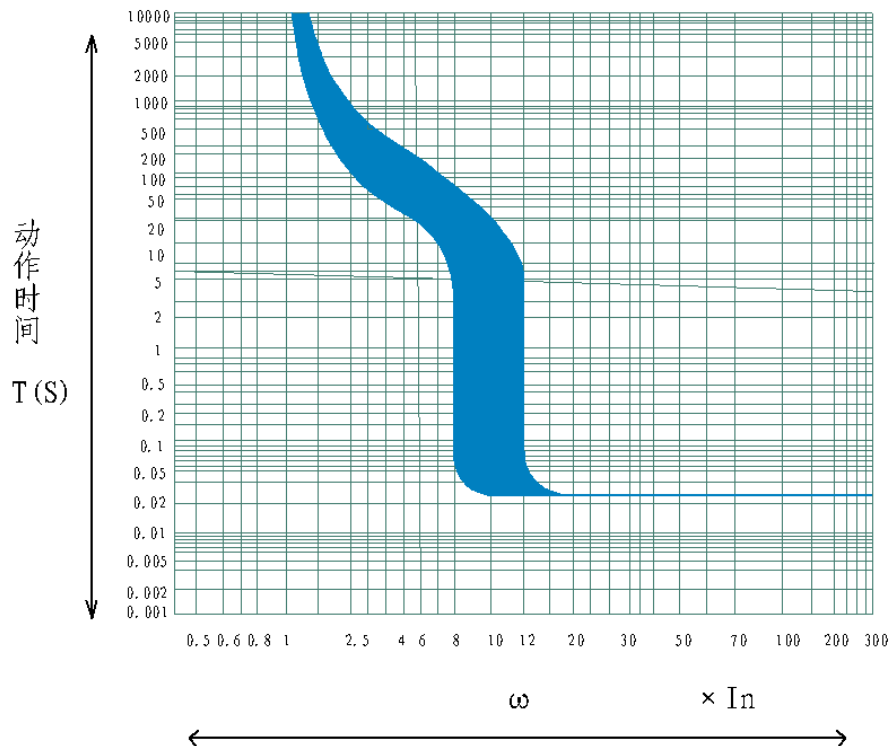
6 Time-current curves

6.1 Characteristic curve of short-circuit overload protection ($5I_n$), action value accuracy of $\pm 20\%$.



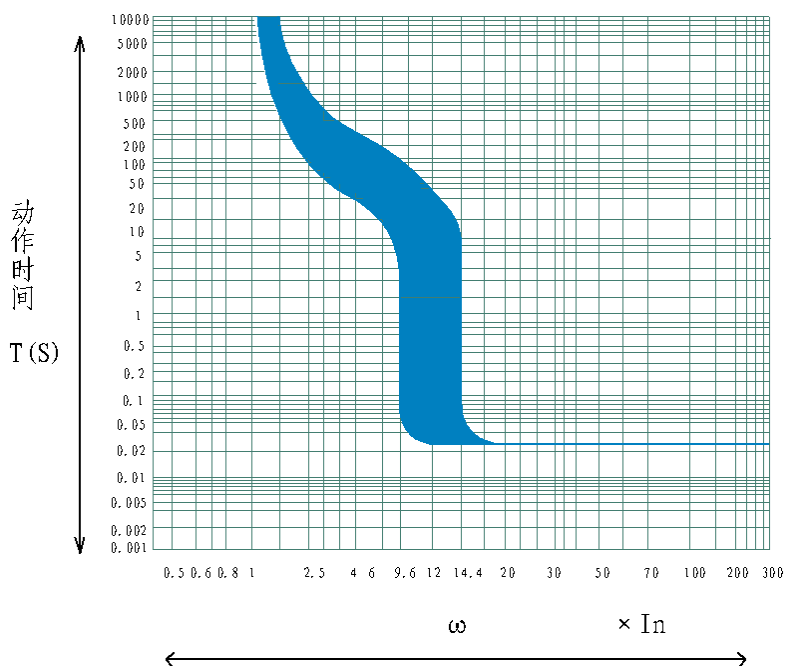
Time/current characteristic curves ($I_n \geq 200A$)

6.2 Characteristic curve of short-circuit overload protection ($10I_n$), action value accuracy of $\pm 20\%$.



Time/current characteristic curves ($100A \leq I_n < 200A$)

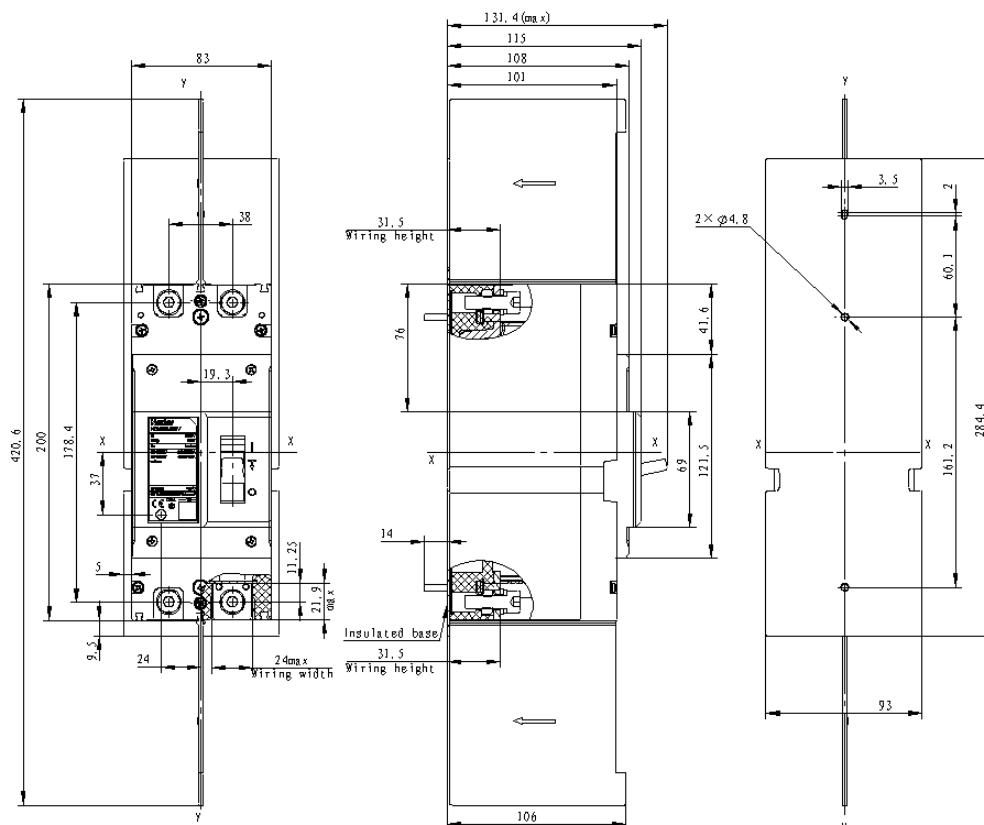
6.3 Characteristic curve of short-circuit overload protection ($12I_n$) , action value accuracy of $\pm 20\%$.



Time/current characteristic curves ($I_n < 100A$)

7 Shape, installation opening size and safety distance

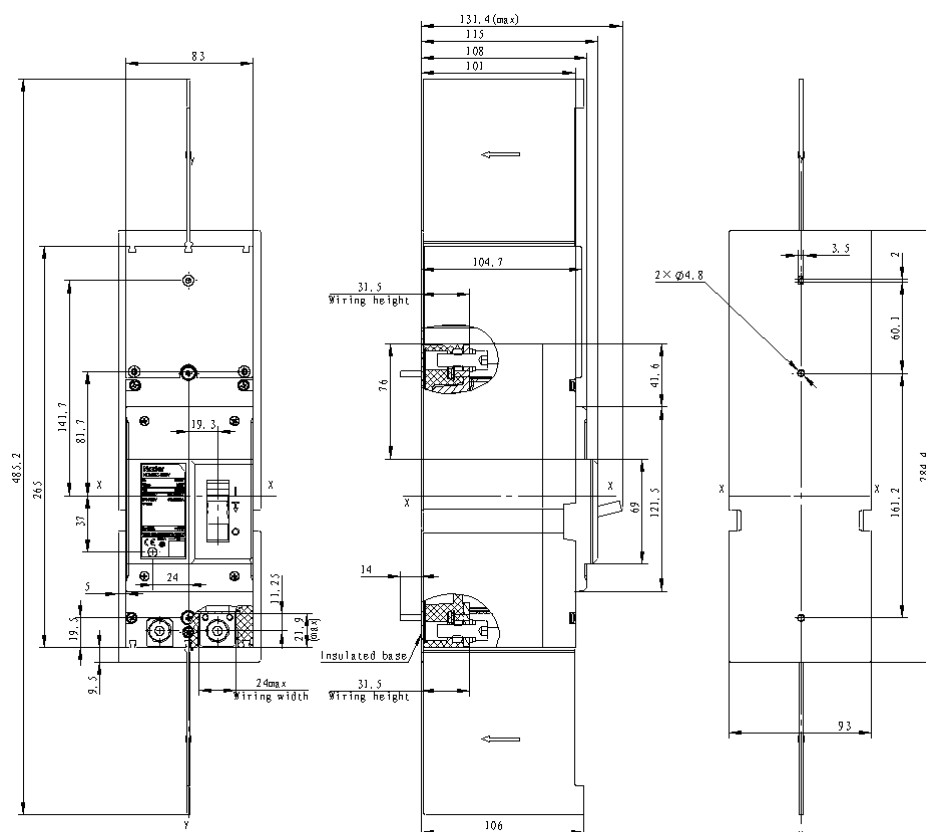
7.1 Dimensions



The overall dimensions of the product body

Note: The limit deviation of unnoted tolerance dimensions is according to GB/T 1804-c.

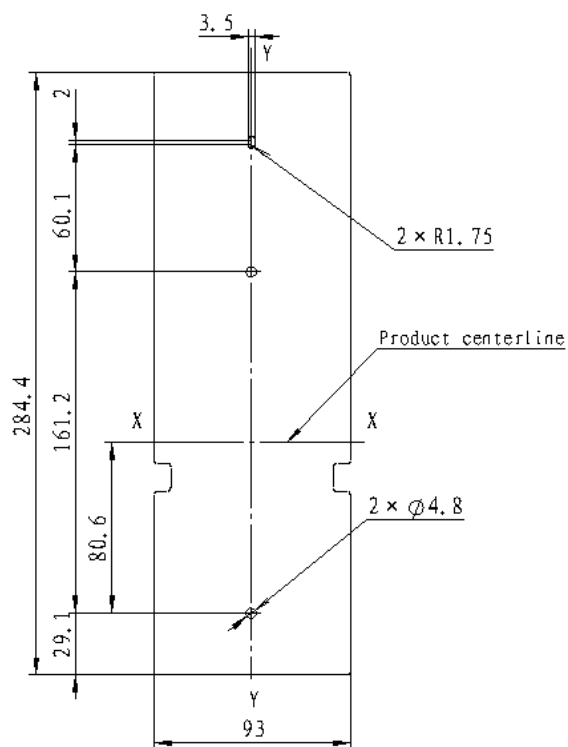
Add.: No.2000, South Shen Jiang Rd., Pudong District, Shanghai, 201315, PRC. Tel:(021)68586699 Fax:(021)23025796



Product dimensions for with terminal cover

Note: The limit deviation of unnoted tolerance dimensions is according to GB/T 1804-c.

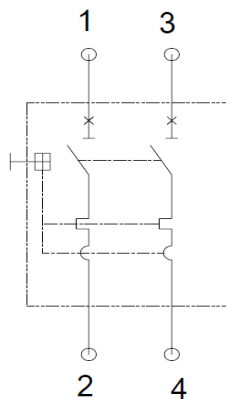
7.2 Insulating base dimensions



Outline dimensions of the Insulating base

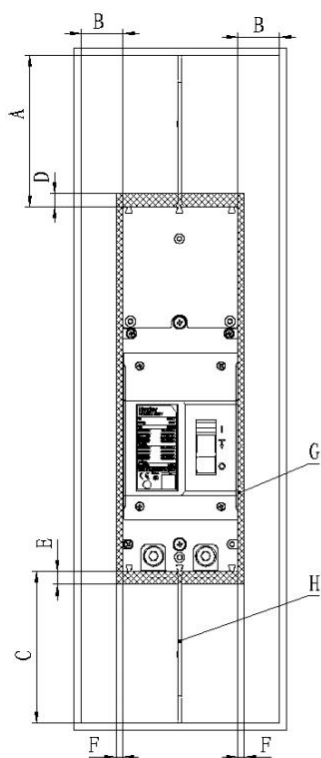
Note: If not specified, the tolerance grade is according to GB/T 1804-c (linear dimension 0.5~3, tolerance: ± 0.2 ; 3~6, tolerance: ± 0.3 ; 6~30, tolerance: ± 0.5 ; 30~120, tolerance: ± 0.8 ; 120~400, tolerance: ± 1.2).

7.3 circuit breaker wiring diagram



Wiring Diagram for NDMNZ-320V 2P

7.4 Circuit breaker installation safety distance



- A: Terminal cover end to cabinet surface
- B: Distance from side to cabinet
- C: Distance from the outgoing end to the cabinet surface
- D: To non-conductive parts
- E/F: circuit breaker to edge of insulating base plate
- G: Insulation board thickness $\geq 0.8\text{mm}$
- H: Alternating partitions

Table 7 Safety distance parameter table for installation in metal cabinet (unit: mm)

Model	A (With terminal cover)	A (Without terminal cover)	B	C	D	E	F
NDMNZ-320V	30	110	30	110	10	10	5

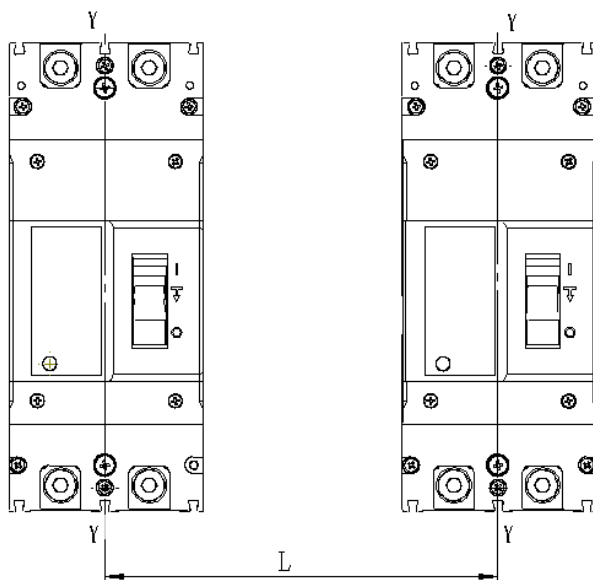


Table 8: Parameter table of minimum center distance between circuit breaker rows(unit: mm).

Model	L (Side-by-side circuit breaker center distance)
	2P
NDMNZ-320V	114

Note:

When the circuit breakers are arranged or stacked, check the connection busbar or cable to ensure that the air insulation distance will not be reduced.

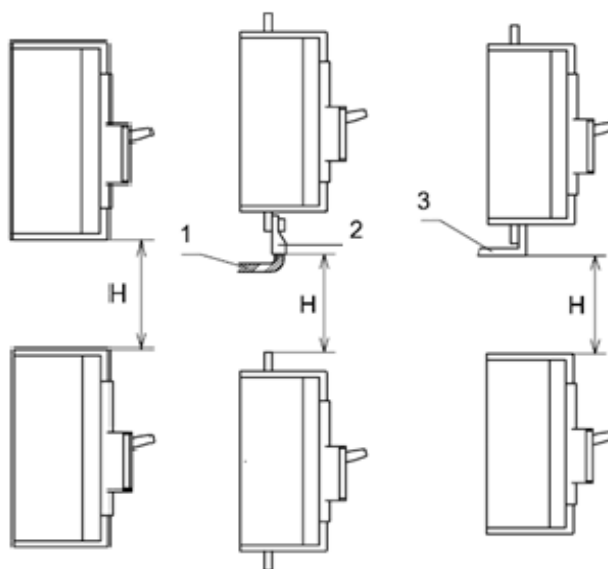


Table 9:Parameters of the minimum center distance between circuit breaker stacks(unit: mm)

Model	H (up and down distance of stacked circuit breakers).	
NDMNZ-320V	With terminal cover	Without terminal cover
	220	140

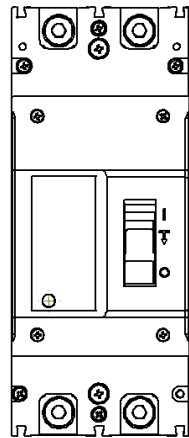
Note:

- 1 in the above figure is an insulated cable; 2 is a cable terminal; 3 is connected - no insulation;
- Before the product is powered on, please check that the terminal cover and phase spacer are assembled in place.

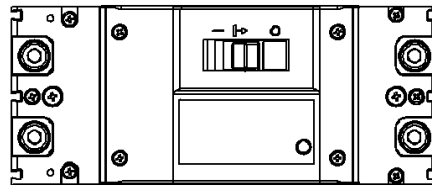
8 Installation Direction of Circuit Breaker

For vertical installation of the product, the gradient between the installation surface and the vertical plane is no more than $\pm 22.5^\circ$.

Horizontal installation of the product.



Vertical installation



Horizontal installation

9 Attachment function description

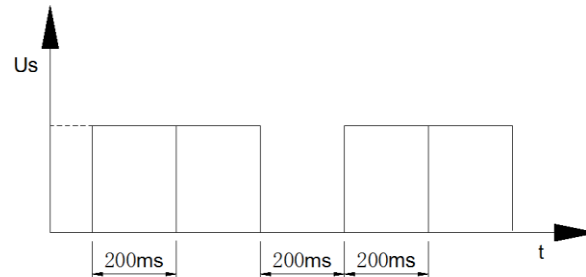
9.1 Shunt release

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 10: Parameter table of shunt release

Model	Shunt release		
Voltage specification (V)	DC24V	AC230V	AC400V
Instantaneous current value (A)	3.7	0.46	0.52
Instantaneous Power waste (W)	89	106	206

Note: The working principle of the shunt release: there is a coil inside the shunt release, which can only work for a short time, and the sub-excitation is a single pulse action (it is recommended that the power-on time is greater than 200ms), The time from the power on (receiving the signal) of the shunt trip device to the tripping of the product is $\leq 200\text{ms}$, and it is recommended to use a 500ms-1s pulse power supply, The number of pulses shall not exceed three times.



9.2 Auxiliary contacts

The circuit breaker is in the "open" and "free tripping" positions	Dual-auxiliary contact	F14 F12	F11	F24 F22	F21
	Single auxiliary contact	F14 F12	F11		
the circuit breaker is in the "close" position	"close" to "open"、" open " to " close "				

9.2.1 Auxiliary contact current parameters

Table 11 Auxiliary contact current parameters

Model	Conventional thermal current I_{th} (A)	Rated working current I_e (A)	
		AC380V(AC-15)	DC220V(DC-13)
NDMNZ-320V	3	0.4	0.15
Minimum load usage: 5V/160mA			

9.2.2 Electrical life of auxiliary contact

Table 12 Electrical life of auxiliary contact

Usage category	On			Off			Times	Power on time
	I/I_e	U/U_e	$\cos\phi$	I/I_e	U/U_e	$\cos\phi$		
AC-15	10	1	0.3	1	1	0.3	6050	$\geq 0.05\text{s}$
DC-13	1	1	6Pe	1	1	6Pe		$\geq 0.95\text{ms}$

9.2.3 Making and breaking capacity of auxiliary contact

Table 13 Making and breaking capacity of auxiliary contact

Usage category	On			Off			Times	Power on time
	I/Ie	U/Ue	$\cos\phi$	I/Ie	U/Ue	$\cos\phi$		
AC-15	10	1.1	0.3	10	1.1	0.3	10	$\geq 0.05s$
DC-13	1.1	1.1	6Pe	1.1	1.1	6Pe		$\geq T0.95ms$

9.3 Alarm contacts

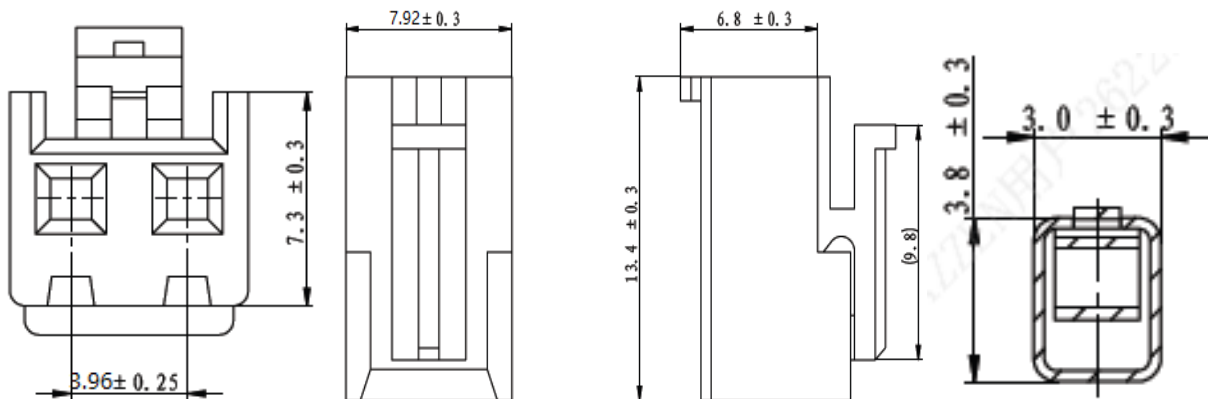
Table 14 Alarm contact current parameters

Attachment name		Alarm contact (conventional)
Voltage specification/Agreed heating current (Ith).		AC380V/0.4A、DC220V/0.15A
Schematic diagram of wiring	Open and close	
	Free tripping	

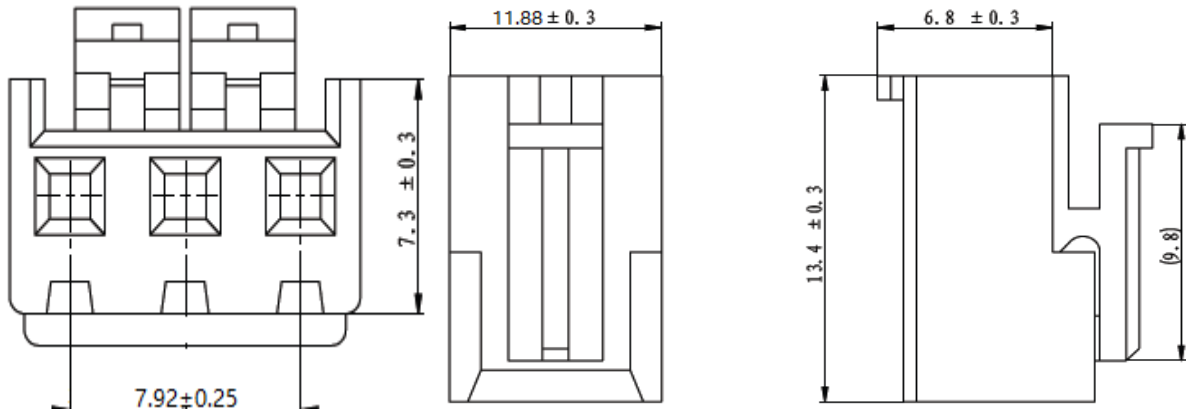
Note:

The standard wire length of the shunt release, auxiliary contact and alarm contact is 0.7 meters, and 1 meter, 2 meters and 4 meters can be customized according to requirements.

9.4 Attachment connector (KR3961) dimensions (optional)



Auxiliary connector terminal dimensions (optional)



Auxiliary connector terminal dimensions (optional)

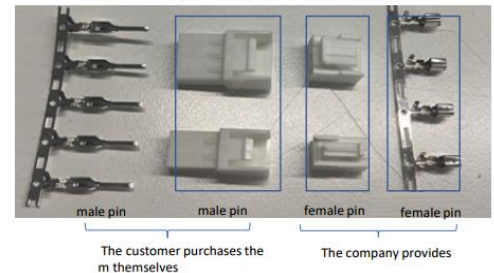
Note: For NDMNZ-320V/2341 with Kang Rui terminals, the default terminals are 2PIN + 3PIN. If you need 5pin terminals, you need to make special notes.

KR3961 connector - corresponding foreman material code

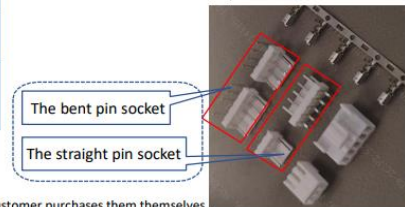
name	poles	material code (The company provides)	Corresponding male material code (line-to-line, customer purchase)	corresponding male material code (line-to-board, customer purchase)	
				straight needle	curved needle
socket	2	A3961O00249P60	JXAP1693-02-2P	C3961VD00229P630	C3961RD00229P630
	3	A3961O00349P60	JXAP1693-02-3P	C3961VD00329P630	C3961RD00329P630
	5	A3961O00549P60	JXAP1693-02-5P	C3961VD00529P630	C3961RD00529P630
	6	A3961O00649P60	JXAP1693-02-6P	C3961VD00629P630	C3961RD00629P630
	8	A3961O00849P60	JXAP1693-02-8P	C3961VD00829P630	C3961RD00829P630
pin	/	B3961OT2AA200	JXAP1693-02-T	/	/

Note: When choosing the line-to-line connection method, the customer needs to simultaneously purchase the plug and the pin.

The various components of the line-to-line connector



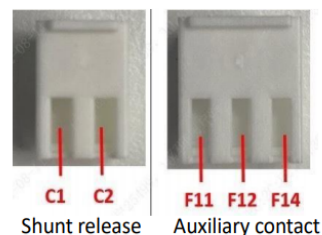
The various components of the line-to-board connector



Our company's connector female head supplier is Kang Rui. It is recommended that customers also choose Kang Rui when purchasing male heads to avoid other suppliers. When the male head produced by the supplier was assembled with the female head of our company, there were problems.

Machine line number layout

NO.	poles	Accessory type	1st place	2nd place	3rd place	4th place	5th place	6th place	7th place	8th place
1	2P	Shunt release	C1	C2	/					
		Under-voltage release	D1	D2	/					
2	3P	Auxiliary contact	F11	F12	F14	/				
		Alarm contact	B11	B12	B14	/				
3	5P	Shunt release +Auxiliary contact	C1	C2	F11	F12	F14	/		
		Shunt release +Alarm contact	C1	C2	B11	B12	B14	/		
		Under-voltage release +Auxiliary contact	D1	D2	F11	F12	F14	/		
		Under-voltage release +Alarm contact	D1	D2	B11	B12	B14	/		
4	6P	Dual-Auxiliary contact	F11	F12	F14	F21	F22	F24	/	
		Auxiliary alarm contact	F11	F12	F14	B11	B12	B14	/	
5	8P	Shunt release +Dual-Auxiliary contact	C1	C2	F11	F12	F14	F21	F22	F24
		Shunt release +Auxiliary alarm contact	C1	C2	F11	F12	F14	B11	B12	B14
		Under-voltage release +Dual-Auxiliary contact	D1	D2	F11	F12	F14	F21	F22	F24
		Under-voltage release +Auxiliary alarm contact	D1	D2	F11	F12	F14	B11	B12	B14



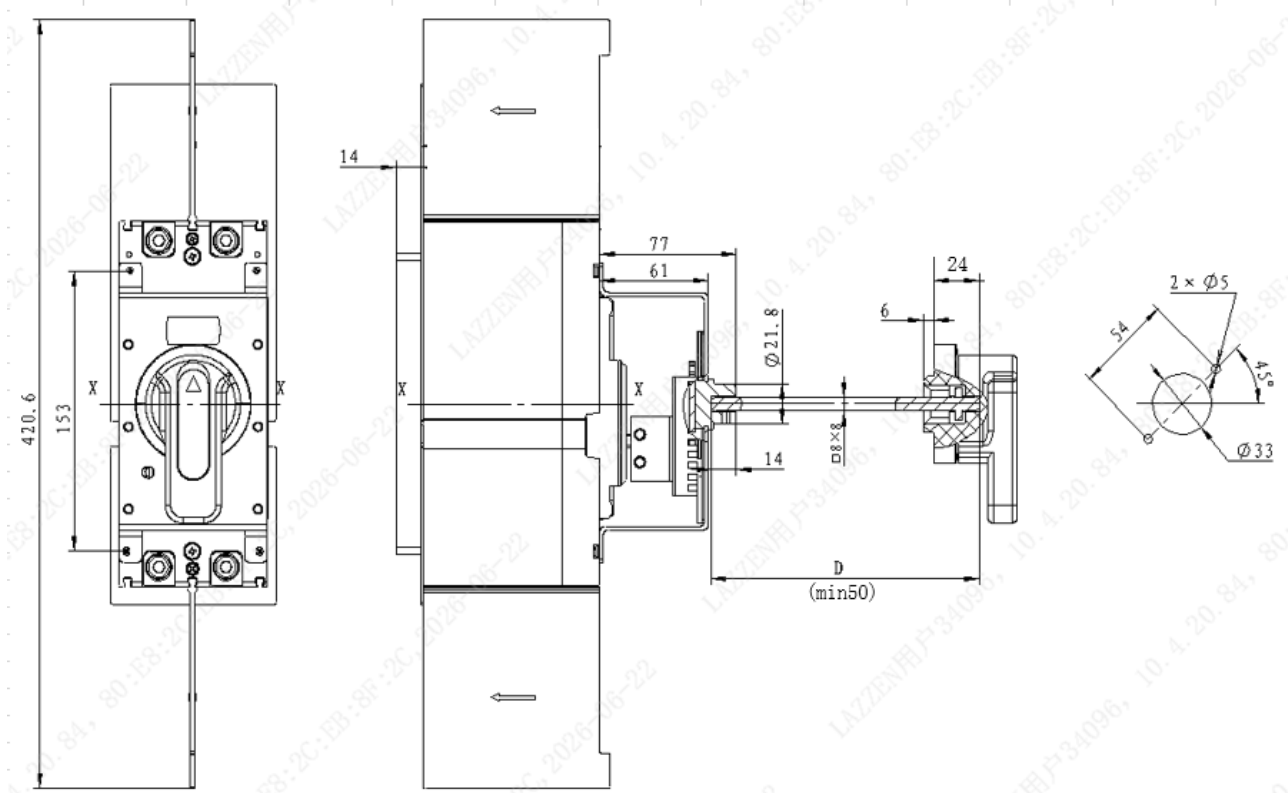
Example

Accessory connector line number layout table

Note: The auxiliary and alarm terminals are defaulted to 3P, the demounting and under-voltage terminals are defaulted to 2P. If you need other forms, please specify.

9.5 Manual operating mechanism

9.5.1 Electric operating mechanism and CS1-A handle



Note: The limit deviation of unnoted tolerance dimensions is according to GB/T 1804-c.

[illegible]

- 1) The limit deviation of unnoted tolerance dimensions is according to GB/T 1804-c
- 2) B type is round handle, The length of B-type handle is 65mm;
- 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.

The minimum packaging quantity is 1 / box, and the products packed into boxes should be stored in a warehouse with air circulation and relative humidity of no more than 80% at an ambient temperature of -40 °C ~ +85 °C. It is stored in a warehouse where there are no acidic, alkaline or other corrosive gases in the surrounding air. Under the above conditions, the storage period shall not exceed 3 years from the date of production.

SN	Name	Specification	2P Quantity/Set
1	Cross small pan-head screw	M4×100	2
2	Hex nuts	M4	2
3	Phase spacer	Length 114	2
4	Rubber sleeve for nut at the inlet end	--	2

5	Allen socket wiring combination screws	M8×25	4
6	Insulated base plate	284.4×93×1.5	1
7	Cross small pan-head screw	M3×65	1 (optional)
8	Hex nuts	M3	1 (optional)
9	Terminal cover	87.5×83×103	1 (optional)
10	Terminal cover mounting screw	ST3.5×12	2 (optional)

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.