Shanghai Liangxin Electrical Co., Ltd.

NDM3E-400 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	2020/10/28	Sun Lanping	Chen Xinming	Ding Fei
1	Update the product appearance picture and product dimension outline drawing	2021/09/30	Sun Lanping	Chen Xinming	Ding Fei
2	Add attachment information	2022/12/15	Yang rongrong	Chen Xinming	Ding Fei

1. Applicable Scope and Purpose of Circuit Breaker

The NDM3E-400 electronic 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 can provide modules with the communication function, which can make the original circuit breaker upgrade to the communication circuit breaker conveniently, thus realizing "Four remotes" functions, namely, remote control, remote adjustment, remote measuring and remote measurement.

The Disconnecting Switch 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

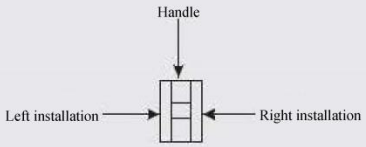
ND	M	3	E	-	400	□	□	/□	/□	□	□	□	□	□	□	□	□
1	2	3	4		5	6	7	8	9	10	11	12	13	14	15	16	17

SN	SN name	NDM3E
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 series	E: Electronic
5	Shell frame level	400
6	Breaking capacity level	M: Relatively high breaking type
		H: High breaking type
7	Operation mode	No code: Direct handle-operated mode
		P: Motor-operated
		Z: Rotation handle
8	Derived code of the function	No code: Basic type intelligent release
		G: Ground protection type intelligent release
		T: Communication type intelligent release
		GT: Ground protection communication type intelligent release
9	Number of poles	3, 4
10	Accessory code	See Table 1
11	Application code	No code: Power distribution type
		2: Motor protection type
12	N-pole (neutral pole) type of the 4P product	C: The N-pole is installed with an overcurrent tripper, and on-off with the other three poles
		D: The N-pole is installed with an overcurrent tripper, but always connected
13	Special use	Q: Voltage-check self-reset
14	Special function code	I: Non-tripping at the time of alarming
15	Rated current In	See Table 2
16	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
		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

17	Other code	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
		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 AC220V/AC230V
		AC380V: Shunt release/ Under-voltage release operation voltage AC380V/AC400V/AC415V
		DC24V: Shunt release operation voltage DC24V
		DC220V: Shunt release operation voltage DC220V
		Z: Terminal housing
		J: Mechanical interlocking
		MS2：MS2 lock

Note：The setting current is factory set to the rated current by default. If you need to set to other settings, please contact the sales person.

Table 1: Comparison Table of Accessory Code:



Legend
- Single auxiliary contact
- Dual-auxiliary contact
- Alarm contact
- Shunt release
- Under-voltage release
- Auxiliary alarm contact (a single accessory features the auxiliary and alarm functions)

Accessory code	Accessory name	NDM3E-400 (Non-communication type) 3	NDM3E-400 (Non-communication type) 4
300	N/A	——	
310	Shunt release		
320	Dual-auxiliary contact		
321	Single auxiliary contact		
330	Under-voltage release		
340	Shunt release, dual-auxiliary contact		
341	Shunt release, single auxiliary contact		
350	Shunt release, under-voltage release		
360	Two sets of single auxiliary contacts		
361	Two sets of dual-auxiliary contacts		
362	Dual-auxiliary contact, single auxiliary contact		
370	Under-voltage release, dual-auxiliary contact		
371	Under-voltage release, single auxiliary contact		
308	Alarm contact		
318	Shunt release, alarm contact		
328	Dual-auxiliary contact, alarm contact		
338	Under-voltage release, alarm contact		
348	Shunt release, auxiliary alarm contact		
358	Auxiliary alarm contact		
368	Dual-auxiliary contact, auxiliary alarm contact		
378	Under-voltage release, auxiliary alarm contact		

Accessory code	Accessory name	NDM3E-400 (Communication type) 3	NDM3E-400 (Communication type) 4
300	None/communication type	——	
320	Dual-auxiliary contact/communication type		
321	Single auxiliary contact/communication type		
330	Undervoltage release/communication type		
361	Two sets of dual-auxiliary contacts		
362	Dual-auxiliary contact, single auxiliary contact/communication type		
371	Under-voltage release, single auxiliary contact/communication type		
308	Alarm contact/communication type		
338	Under-voltage release, alarm contact/communication type		
358	Auxiliary alarm contact/communication type		

Note :

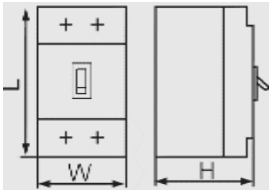
1) The first number "3" of the release accessory code represents the intelligent controller with the three-section protection while the last two numbers represent the inner accessory code;

2) Since the communication type requires to use a set of right-side auxiliary contacts, the single auxiliary or alarm contact output is only located on the right side of the above accessory mode.

3) “I” in “32**I” identifies overload alarm without tripping, with output function, and the last two digits ** identify internal accessory code.

4. Main Technical Parameters of Circuit Breaker

Table 2 Main Technical Parameters of Circuit Breaker

Model			NDM3E-400		
Rated current of frame Inm (A)			400		
Rated current In (A)			400		
Setting current Ir (A)			160,200, 225, 250, 280, 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, 660/690		
Power frequency withstand voltage U (1min) (V)			3500		
Utilization category			B		
Short-time withstand current Icw (kA/1s)			5		
Number of poles			3		4
Breaking capacity level			M	H	/
Rated limit short-circuit breaking capacity Icu (kA)		AC380/400/415V	70	100	70
		AC660/690V	20	/	20
Rated operating short-circuit breaking capacity Ics (kA)		AC380/400/415V	65	70	65
		AC660/690V	15	/	15
Operating performance (times)	Electrical life		7500		
	Mechanical life	Maintainable free life	15000		
		Maintainable life	30000		
Boundary dimension		L(mm)	257		257
		W(mm)	150		198
		H(mm)	107		107
Flashover distance(mm)			≤100		

Note 1 :The overall dimension does not include the dimension of terminal cover。

2: The setting current is factory set to the rated current by default. If you need to set to other settings, please contact the sales person.

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

Table 3 Selection of the NDM3E-400 Connecting Bus or Cable Cross-section Area

Rated current (A)	160	200, 225	250	280, 315, 350	400
Wire cross-section area (mm^2)	70	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)
NDM3E-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							
NDM3E-400	Temperature (℃)	40	45	50	55	60	65	70
	Derating factor	1	1	1	0.978	0.957	0.934	0.911

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	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

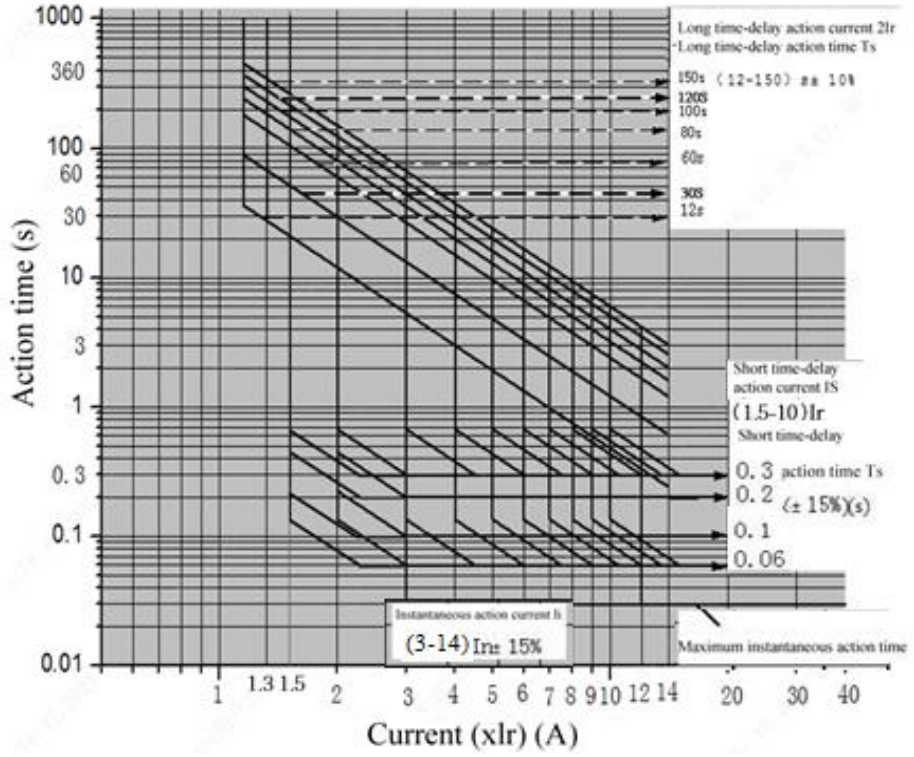
Model	Energizing current(A)	Total power loss(W)		
		Wiring before and after board	Plug in board front Wiring	Plug in bear board Wiring
NDM3E-400	400	115	115	125

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 +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.

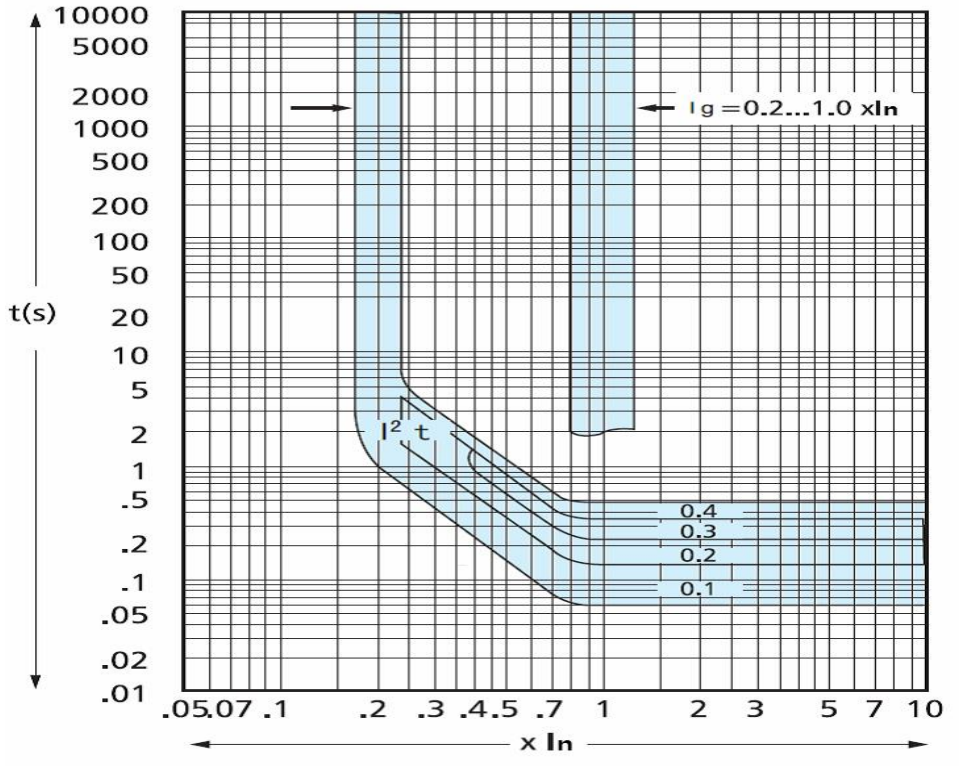
6. Short-circuit Overload Protection Characteristic Curve of Circuit Breaker

6.1 Long time-delay, short time-delay and instantaneous protection characteristic curve of power distribution type



Time/Current Characteristic Curve

6.2 Ground protection characteristic curve of power distribution type



Ground protection characteristic curve

6.3 Setting value of the intelligent controller

Table 8: Basic type

Model	Shell frame level Rated current In(A)	Current and time parameters							
		Ir (A)	Tr (s)	Isd(×Ir)	Tsd(s)	Ii(×In)	Ip(×Ir)	IrN(×Ir)	TrN(s)
NDM3E-400 3P	400	160,200, 225,250, 280,315, 350,400, OFF	12 30 60 80 100 120 150 OFF	1.5,2,3, 4 5, 6, 7 8, 10, OFF	0.06 0.1 0.2 0.3	3, 4, 5 6, 7, 8 10, 12 14, OFF	0.7, 0.8 0.9, 1.0, OFF	/	/
NDM3E-400 4P							Built-in 0.9	0.5, 1.0 OFF	Tr

Table 9(Continued): Ground Type

Model	Shell frame level Rated current In(A)	Current and time parameters							
		Ir (A)	Tr (s)	Isd(×Ir)	Tsd(s)	Ii(×In)	Ip(×Ir)	Ig(×In)	Tg(S)
NDM3E -400	400	160,200, 225,250, 280,315, 350,400, OFF	12,30 60,80 100 120 150 OFF	1.5,2,3, 4 5, 6, 7 8, 10, OFF	Built-in 0.3	3, 4, 5 6, 7, 8 10, 12 14, OFF	Built-in 0.9	0.2, 0.3 0.4, 0.5 0.6, 0.8 1.0, OFF	0.1 0.2 0.3 0.4

Note: For the ground-type 4P product, IrN can't be set with the factory default as 1.0Ir in case of no requirements for the order。

Table 9: Communication Type

Model	Rated current of frame In(A)	Current and time parameters					
		Ir (A)	Tr (s)	Isd(A)	Tsd(s)	Ii(A)	Ip(A)
NDM3E -400	400	160-400, OFF In step of 0.1A	12-150、OFF In step of 1S	240-4000, OFF In step of 1A	0.06, 0.1 0.2, 0.3	1200-5600 In step of 1A	140-400, OFF In step of 0.1A

Model	Rated current of frame In(A)	Current and time parameters	
		IrN(×Ir)	TrN(s)
NDM3E -400 4P	400	0.5, 1.0, OFF	Tr

Table 9 (Continued): Ground Communication Type

Model	Rated current of frame In(A)	Current and time parameters							
		Ir (A)	Tr (s)	Isd(A)	Tsd(s)	Ii(A)	Ip(A)	Ig(×In)	Tg(S)
NDM3E -400	400	160-400, OFF In step of 0.1A	12-150 OFF In step of 1S	240-4000, OFF In step of 1A	0.06 0.1 0.2 0.3	1200-5600 In step of 1A	112-400 In step of 0.1A	80-400 OFF In step of 0.1A	0.1, 0.2 0.3, 0.4

Model	Rated current of frame In(A)	Current and time parameters	
		IrN(×Ir)	TrN(s)
NDM3E -400 4P	400	0.5, 1.0, OFF	Tr

Notes: 1. When Ir gear is OFF, it is closed with long delay and short delay at the same time; when Isd gear is OFF, it is closed with short delay;

2. When the 4P product is basic type, Ip can't be set, if there isn't requirement in the order, the default value is 0.9 Ir.

3. When the product is grounding type, Tsd can't be set, if there isn't requirement in the order, the default value is 0.3s.

4. When the product is grounding type, Ip can't be set, if there isn't requirement in the order, the default value is 0.9Ir.

5. When the 4P product is grounding type, IrN can't be set, if there isn't requirement in the order, the default value is 1.0Ir.

6. The upper computer is required to set the gear of communication products. It is not displayed on the control panel. see《NDT-01598 Modbus RTU communication protocol for NDM2E & 3E & 5E molded case circuit breaker》 for communication parameter adjustment。

7. If it is overloaded for a long time, it is not recommended to close Tr.

8. If reliable tripping is required, the single-phase current of the main circuit shall not be less than 0.4In and the three-phase current shall not be less than 0.2In.

9. When the product is overload alarm and does not trip, Tr needs to be closed. In this case, the following conditions should be noted:

1) Avoid setting Isd too high to prevent the product from being damaged by overload for a long time.

2) Within a certain time after the alarm output, it is necessary to timely check the power consumption of the load to prevent the circuit breaker from burning under heavy load.

6.4 Protection characteristics of power distribution-type circuit breaker

Table 11: Protection Characteristics of Intelligent Release

<table>
<tr><td colspan="9">Overload long time-delay protection Ir, Tr</td></tr>
<tr><td colspan="2">Setting current Ir</td><td colspan="7">See Table 8 or 9</td></tr>
<tr><td rowspan="7">Action features (reverse time limit)</td><td rowspan="2">TR setting value (s)</td><td colspan="7">In = 400A</td></tr>
<tr><td>12</td><td>30</td><td>60</td><td>80</td><td>100</td><td>120</td><td>150</td></tr>
<tr><td>≤1.05Ir</td><td colspan="7">＞2h inaction</td></tr>
<tr><td>＞1.30Ir</td><td colspan="7">＜1h action</td></tr>
<tr><td>t(s) at 1.5Ir</td><td>21.3</td><td>53.3</td><td>106.7</td><td>142.2</td><td>177.8</td><td>213.3</td><td>266.6</td></tr>
<tr><td>t(s) at 2.0Ir</td><td>12</td><td>30</td><td>60</td><td>80</td><td>100</td><td>120</td><td>150</td></tr>
<tr><td>t(s) at 7.2Ir</td><td>0.93</td><td>2.31</td><td>4.63</td><td>6.17</td><td>7.72</td><td>9.26</td><td>11.57</td></tr>
<tr><td>Accuracy</td><td colspan="7">±10%(Inherent error±20)</td></tr>
<tr><td colspan="9">Note: The action curve conforms to $t=(2Ir/I)^2\times Tr$
t: overload long time-delay action time Tr: setting value of the overload long time-delay action time
I: Actual running current Ir: setting value of the overload long time-delay action current</td></tr>
<tr><td colspan="9">Short circuit short-time delay protection Isd, Tsd</td></tr>
<tr><td colspan="3">Setting current Isd</td><td colspan="6">See Table 8 or 9</td></tr>
<tr><td rowspan="5">Action characteristics</td><td rowspan="2">Reverse time limit Isd≤I＜1.5Isd</td><td>Tsd setting value (s)</td><td>0.06</td><td>0.1</td><td>0.2</td><td>0.3</td></tr>
<tr><td>t action time (s)</td><td colspan="4">$t=(1.5Isd/I)^2\times Tsd$</td></tr>
<tr><td rowspan="3">Fixed time limit 1.5Isd≤I＜Ii</td><td>t action time (s)</td><td>0.06</td><td>0.1</td><td>0.2</td><td>0.3</td></tr>
<tr><td>Returnable time (s)</td><td>/</td><td>/</td><td>0.14</td><td>0.21</td></tr>
<tr><td>Accuracy</td><td colspan="4">±10%(Inherent error±20)</td></tr>
<tr><td colspan="6">Note: The inverse time limit action curve conforms to $t=(1.5Isd/I)^2\times Tsd$
t: short-circuit short time-delay action time Tsd: setting value of the short-circuit short time-delay action time
I: Actual running current Isd: setting value of the short-circuit short time-delay action current</td></tr>
</table>

Table 11 (Continued) Protection Characteristics of Intelligent Release

<table>
<tr><td colspan="7">Short circuit instantaneous protection Ii</td></tr>
<tr><td colspan="2" rowspan="2">Action characteristics</td><td colspan="3">Setting current Ii</td><td colspan="2">See Table 8 or 9</td></tr>
<tr><td colspan="3">Action time</td><td colspan="2">＜50ms</td></tr>
<tr><td colspan="7">Neutral wire protection IrN TrN</td></tr>
<tr><td colspan="4">Setting current Ip</td><td colspan="3">See Table 8 or 9</td></tr>
<tr><td colspan="2" rowspan="2">Action characteristics</td><td colspan="3">TRN action time</td><td colspan="2">Tr</td></tr>
<tr><td colspan="3">Accuracy</td><td colspan="2">±10%(Inherent error ±20)</td></tr>
<tr><td colspan="7">Pre-alarm Ip</td></tr>
<tr><td colspan="3">Setting current Ip</td><td colspan="4">See Table 8 or 9</td></tr>
<tr><td colspan="2" rowspan="2">characteristics</td><td colspan="2">Alarm indicator</td><td colspan="3">The indicator changes to be constantly on from flashing</td></tr>
<tr><td colspan="2">Accuracy</td><td colspan="3">±10%(Inherent error ±20)</td></tr>
<tr><td colspan="7">Overload indicator (maximum load)</td></tr>
<tr><td colspan="2" rowspan="3">characteristics</td><td colspan="3">Current value range</td><td colspan="2">1.15×Ir</td></tr>
<tr><td colspan="3">Overload indicator</td><td colspan="2">Constantly on</td></tr>
<tr><td colspan="3">Accuracy</td><td colspan="2">±10%(Inherent error ±20)</td></tr>
<tr><td colspan="7">Ground fault protection Ig, Tg</td></tr>
<tr><td colspan="3">Setting current Ig</td><td colspan="4">(0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0)×In+OFF</td></tr>
<tr><td rowspan="4">Action characteristics</td><td rowspan="2">Reverse time limit Ig≤IΔ＜2Ig</td><td>Tg setting value (s)</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td></tr>
<tr><td>t action time (s)</td><td colspan="4">t =(2Ig/I)2×Tg</td></tr>
<tr><td rowspan="2">Fixed time limit IΔ≥2Ig</td><td>t action time (s)</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td></tr>
<tr><td>Accuracy</td><td colspan="4">±10%(Inherent error ±20)</td></tr>
<tr><td colspan="7">Note: I: 3P product is A/B/C three-phase current vector sum, 4P product is A/B/C/N four-phase current vector sum.
Note: The inverse time limit action curve conforms to t =(2Ig / I)^2×Tg
t: Action time Tg: Setting time of ground protection
I: Actual operating current Ig: Setting current of ground protection</td></tr>
</table>

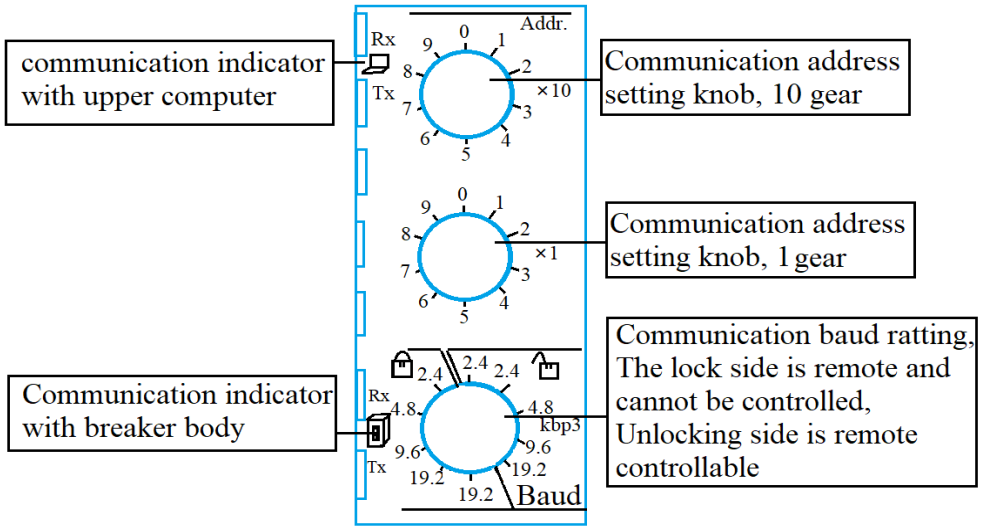
6.5、Communication Adaptor DF-MB/C3

The communication adapter is DF-MB/C3, and the model of Circuit breaker release is communication or alarm without tripping, including this module.

The main parameters are as follows:

Communication adaptor common parameter		
Electrical characteristic	Power supply	24VDC(19.2～28.8VDC)
	Power dissipation	40mA
Communication	Port	RS485，2 Modbus RTU
	Optional address	1～99
	Baud rate	2400/4800/9600/19200bps
	Check bit	CRC check odd-even check not supported
	Maximum number of single unibus	32
Physical characteristic	Demension	90×71.7×22.5mm(terminal not included)
		109.5×71.7×22.5mm(terminal included)
	Weight	0.075kg
Environmental characteristic	Working temperature	-25℃～70℃
	Restoring temperature	-40℃～75℃
	Ambient condition	surrounding temperature 40℃， relative humidity 95%
	Pollution	3
	Fire resistance	UL94-V0
	Protection level	IP20

The definition of the front knob and indicator light of the communication adapter



Gear Adjustment of Communication Adaptor

1） Before communication, the address and baud rate shall be set first.
The address setting is set by two knobs (one is ten times gear and the other is one time gear). For example, the ten times gear is set to 2, the one time gear is set to 3, and the address is 23.

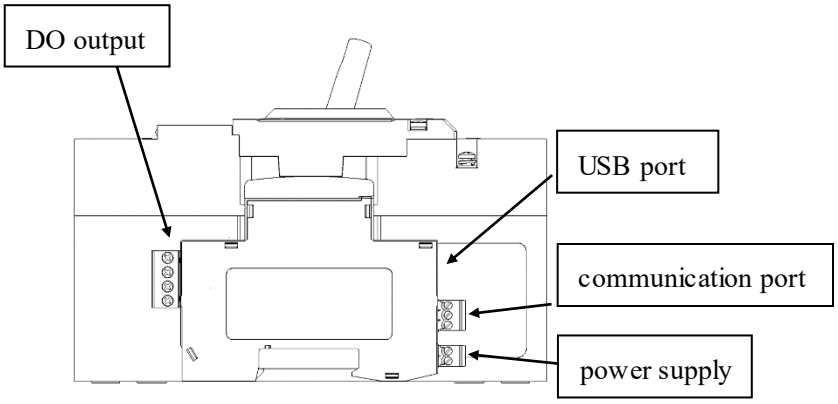
The baud rate has 8 gears in total as follows

- 19200 / lock: baud rate 19200， control command disabled
- 19200 / no lock: baud rate 19200, control command enabled
- 9600 / lock: baud rate 9600, control command disabled
- 9600 / no lock: baud rate 9600, control command enabled
- 4800 / lock: baud rate 4800, control command disabled
- 4800 / no lock: baud rate 4800, control command enabled
- 2400 / lock: baud rate 2400, control command disabled
- 2400 / no lock: baud rate 2400, control command enabled

2） Indicator definition

- Internal communication - receiving lamp: the adapter communicates with the device. If data is received, the indicator flashes;
- Internal communication - sending light: the adapter communicates with the device. If data is sent, the indicator light flashes; otherwise, the indicator light does not light up。
- External communication - receiving light: the adapter communicates with the upper computer. If data is received, the indicator light flashes; otherwise, the indicator light does not light up
- External communication - sending light: the adapter communicates with the upper computer. If data is sent, the indicator light flashes; otherwise, the indicator light does not light up.

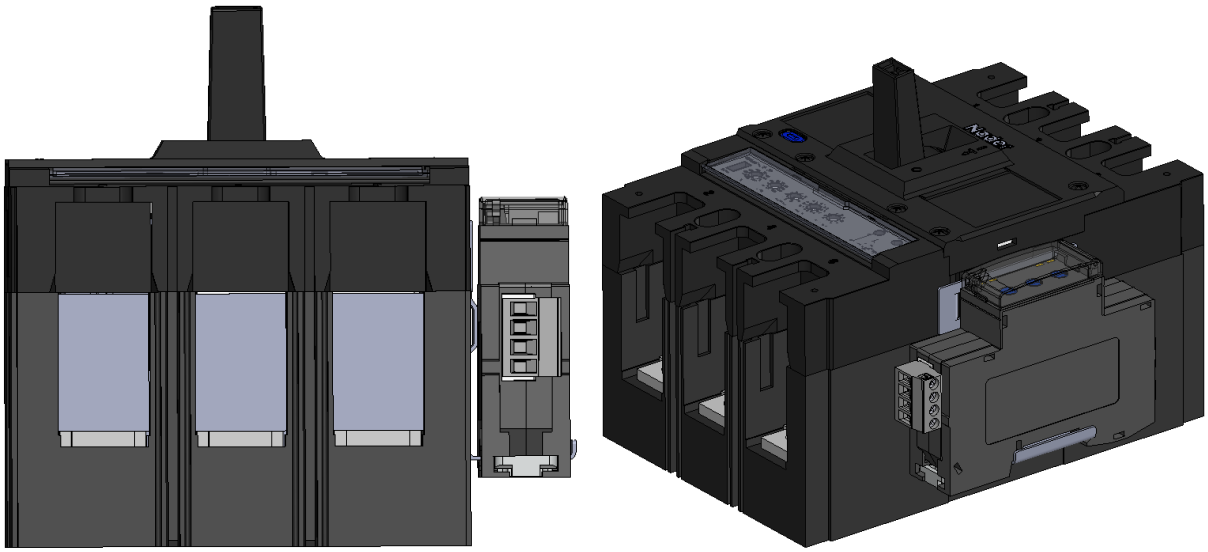
Communication adapter interface description



Note1:DO1~DO3 are three-way do output control. If there is no special requirement, all three-way d0 are alarm output (any one of them is selected to connect with com during Wiring), and the output function (RS485 communication configuration) can be customized, such as opening and closing control of electric operating mechanism.

Note 2.Multiple numbers of adapters can be cascade installed (maximum 32). Each MCCB can set address (1~99), there are 2400, 4800, 9600, 19200bps, four option for baud rate set.

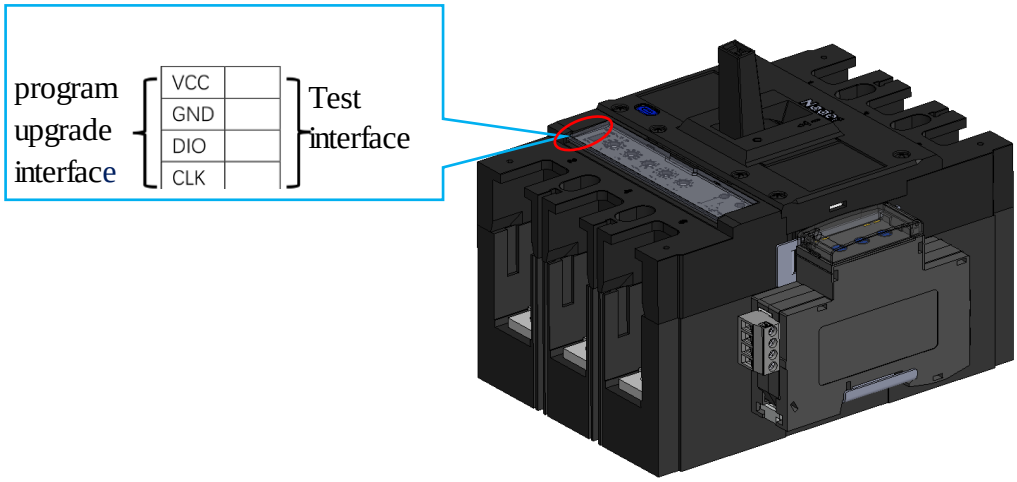
Note 3. The communication type Circuit breaker and the adapter can be connected through the communication line extending from the side of the Circuit breaker.



Communication type Circuit breaker and communication adapter（the communication adapter has external communication function and overload non tripping function）

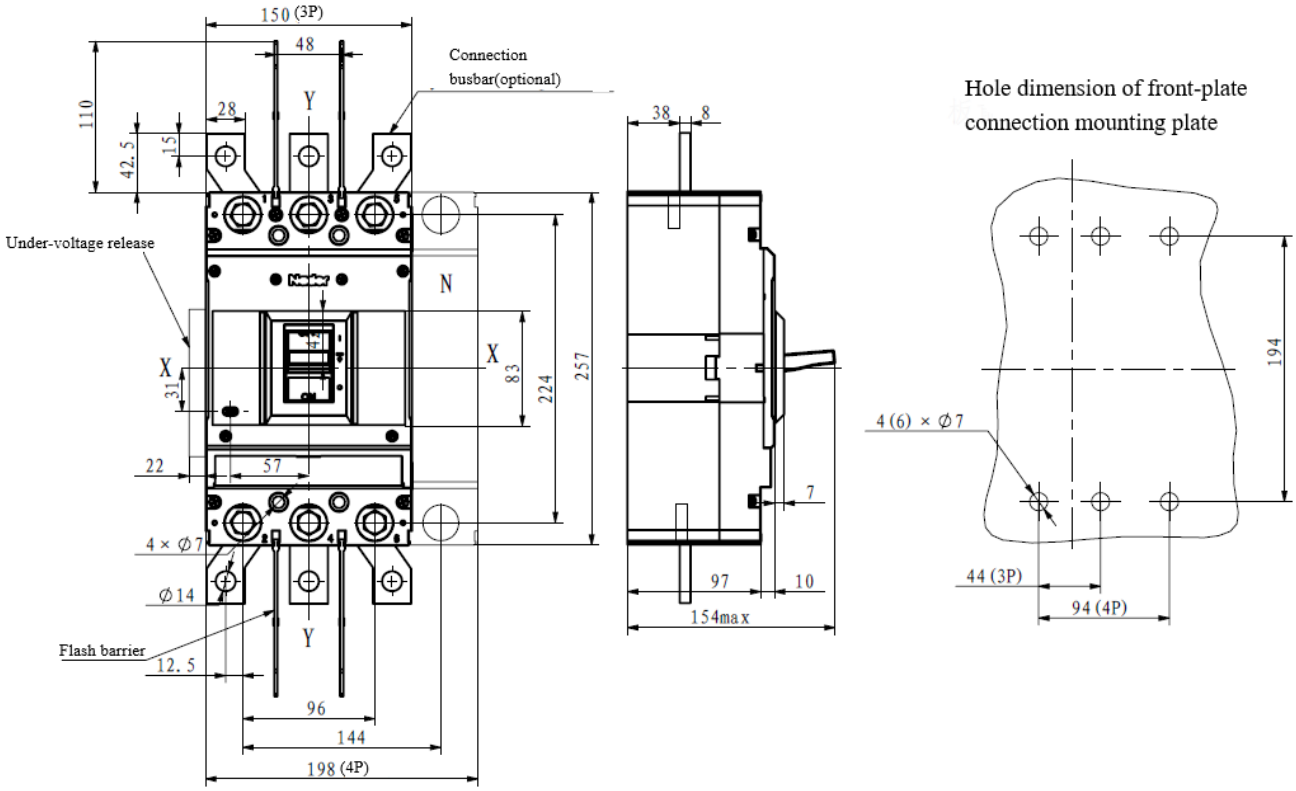
6.8 Program upgrade

The product supports maintenance or upgrade of disassembly free program. The interface is as follows:



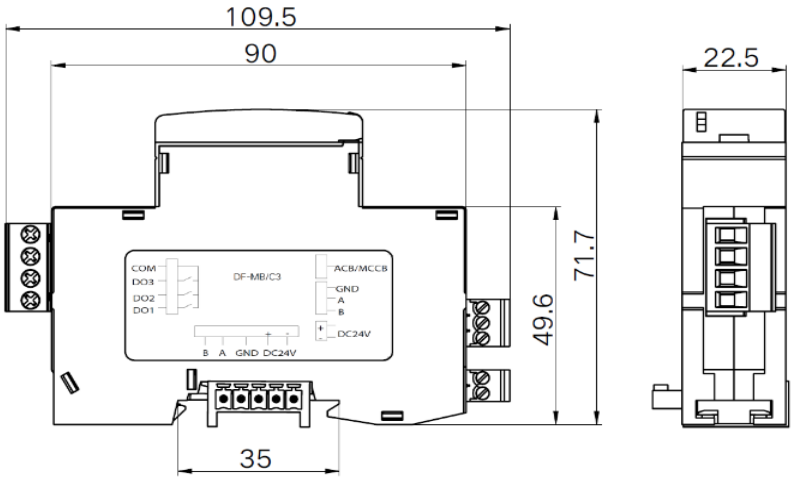
7. Outline and Mounting Hole Dimensions of Circuit Breaker

7.1 Outline and Installation Dimensions of Circuit Breaker



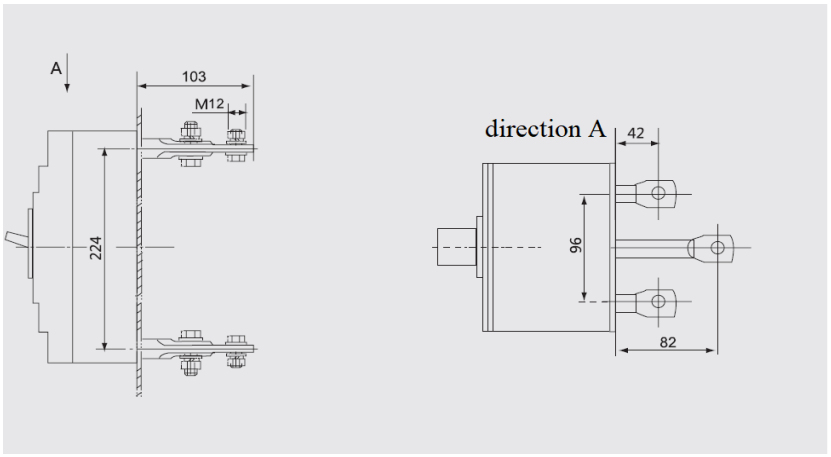
Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

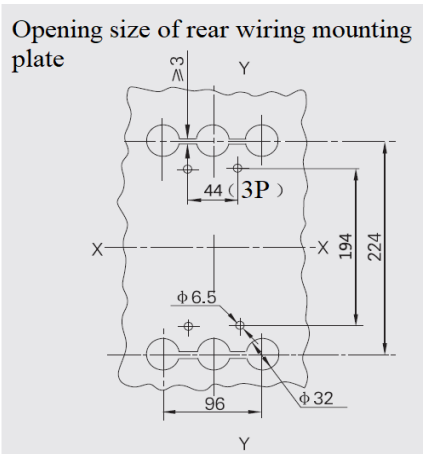
7.2 Installation dimensions of communication adapter (Unit: mm)



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

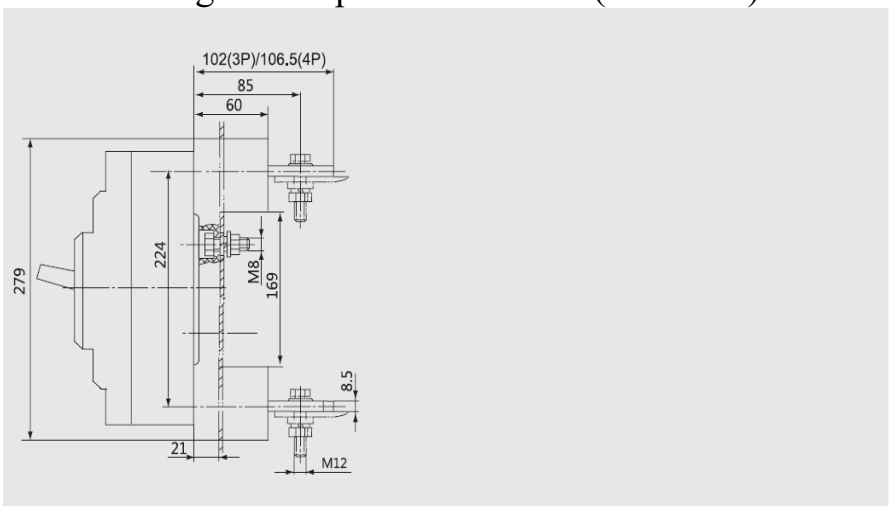
7.3 Z1: Plug in board（rear mounting）(Unit: mm)

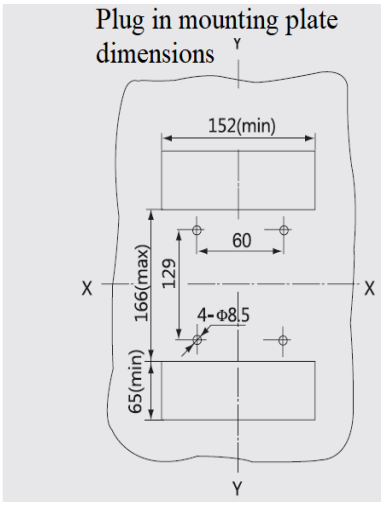




Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

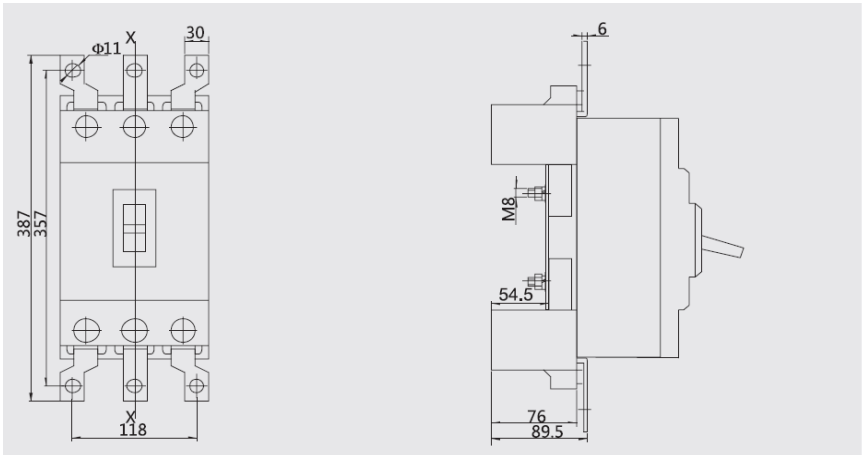
7.4 Z2H: Plug-in rear-plate connection (Unit: mm)

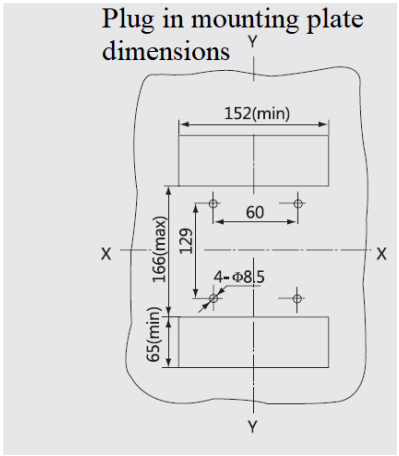




Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

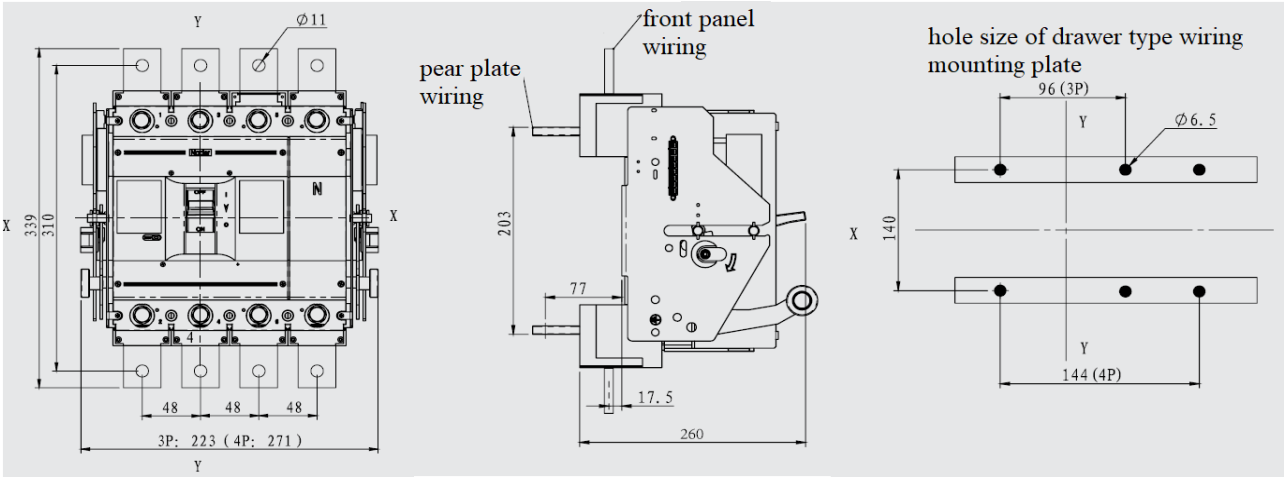
7.5 Z2Q Plug-in front-plate connection (Unit: mm) (3P)





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

7.6 Drawer type wiring



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

7.7 Manual operating mechanism

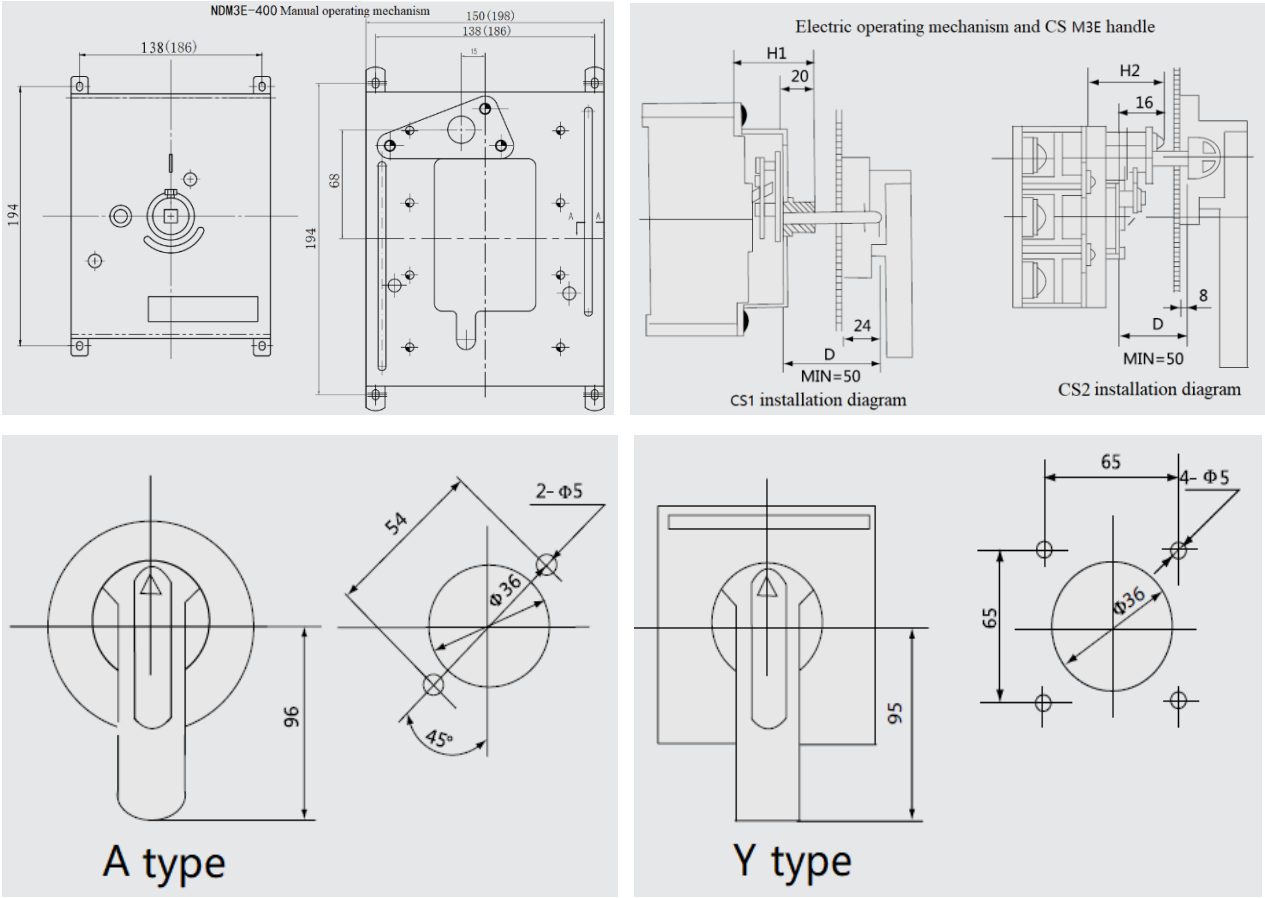


Table 13 Installation dimension of manual operating mechanism (Unit: mm)

Manual operation type	Equipped with circuit breaker	Installation dimension of manual operating mechanism		Installation mode
		H1	H2	
CS1	NDM3E-400	85	/	Vertical installation
CS2	NDM3E-400	/	61	

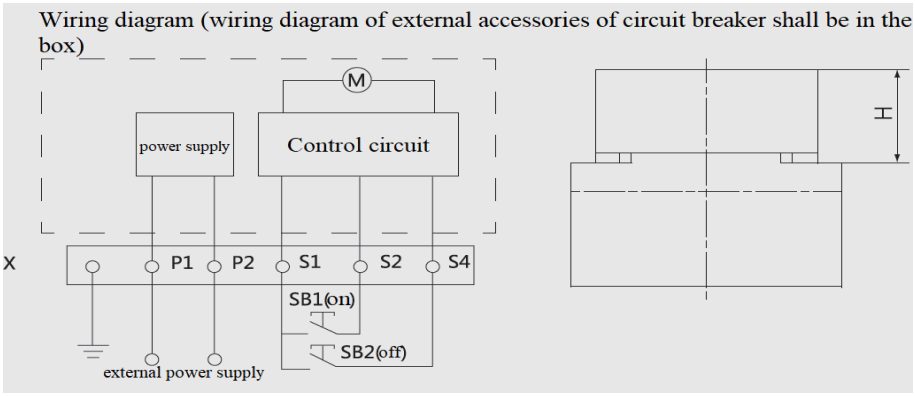
Note : 1）A type is round handle, F type is square handle;

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.

7.8 Electric operating mechanism



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

X: Terminal block P1、P2：External power supply

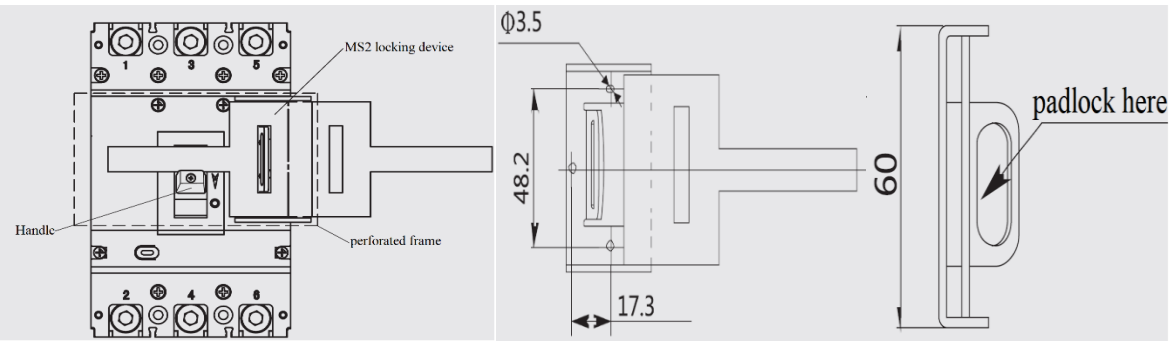
Voltage specification: AC 50Hz AC110V、AC220V、AC400V、DC24V、DC110V、DC220V

Table 14 Main technical parameters of electric operating mechanism

Equipped with Disconnecting Switch	Action current(A)	Electric power(W)				service life / time	Operating mechanism height H(mm)
		AC/DC220V	AC/DC110V	AC400V	DC24V		
NDM3E-400	⩽2	⩽350	⩽250	⩽600	160	10000	149

7.9 MS2 locking device

MS2 is a split locking device (i.e. the device is installed on the left or right side of the Disconnecting Switch cover, and the default is installed on the right side if there are no special requirements). It is used for NDM3E series products to prevent manual closing and opening (the dotted line part is the Disconnecting Switch 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；

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

7.10 Mechanical interlocking

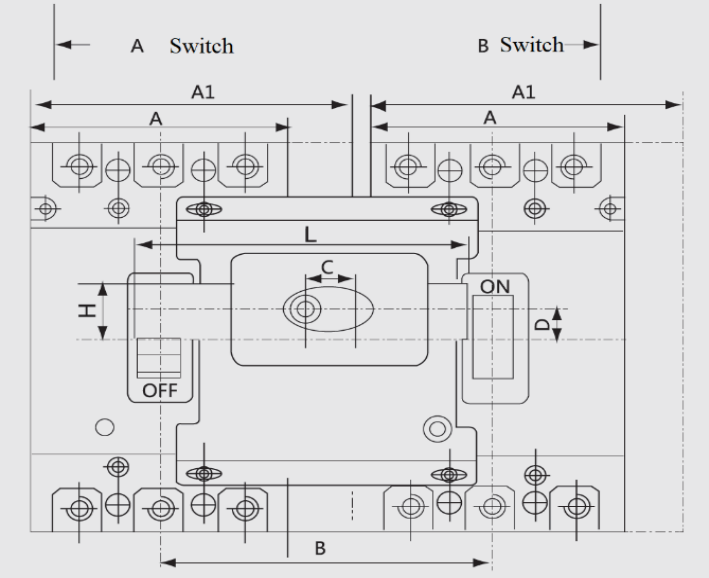


Table 15 Installation dimension of mechanical interlocking (Unit: mm)

Model	A	A1	B	C	D	L	H
NDM3E-400	150	/	180	57	10	190	30
NDM3E-400（4P)	/	198	230	57	10	240	30

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

7.11 Safe mounting distance of circuit breaker

Table 16 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		
NDM3E-400	25	120	35	35

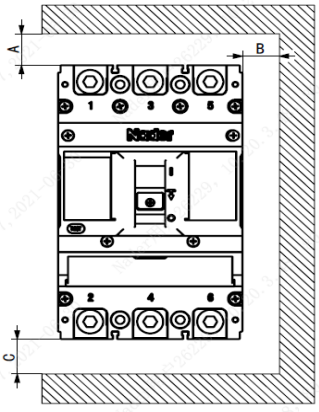


Table 17 Minimum Center Distance between Rowed Circuit Breakers (Unit: mm)

Model	Width of circuit breaker		Center distance	
	3 poles	4 poles	3 poles	4 poles
NDM3E-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.

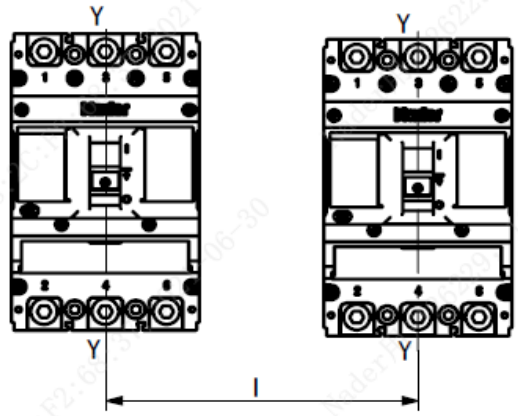


Table 18 Minimum Center Distance between Stacked Circuit Breakers (Unit: mm)

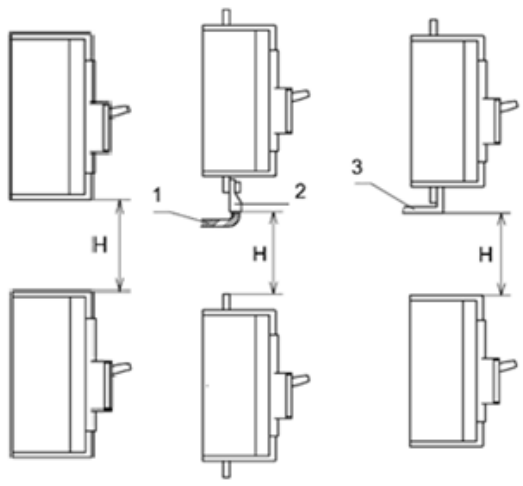
Model	H (distance of circuit breaker from bottom)	
	With a terminal cover	Without a terminal cover
NDM3E-400	155	155

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 19 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
NDM3E-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 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 20 Voltage Specifications and Power Consumption of shunt release

Model	Shunt release	DC24V	AC230V	DC220V	AC380V
NDM3E-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 21Current parameters of auxiliary contact

Category	Frame current (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 22 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 23 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

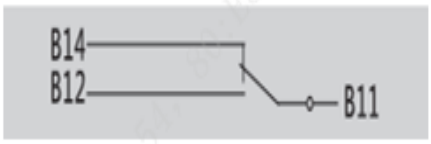
The circuit breaker is in the position of "opening" and "closing"	
The circuit breaker is in the position of "free tripping"	

Table 18 Current parameters of alarm contact

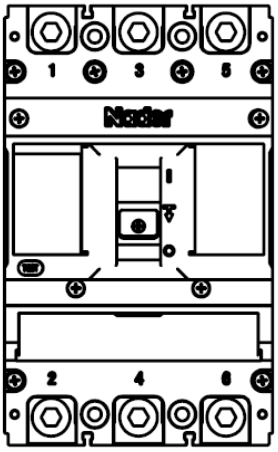
Category	Frame current (A)	Conventional thermal current Ith(A)	Rated working current Ie(A)	
			AC400V	DC220V
Alarm contact	400	3	0.3	0.15

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

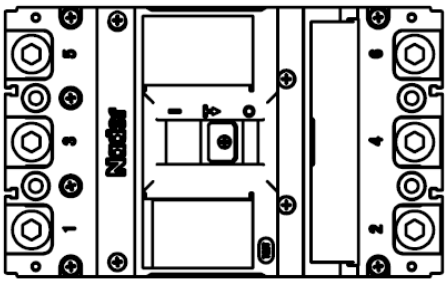
9. Installation Direction of Circuit Breaker

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	Plug	——	6	8
6	Phase partition	——	4	6
7	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.