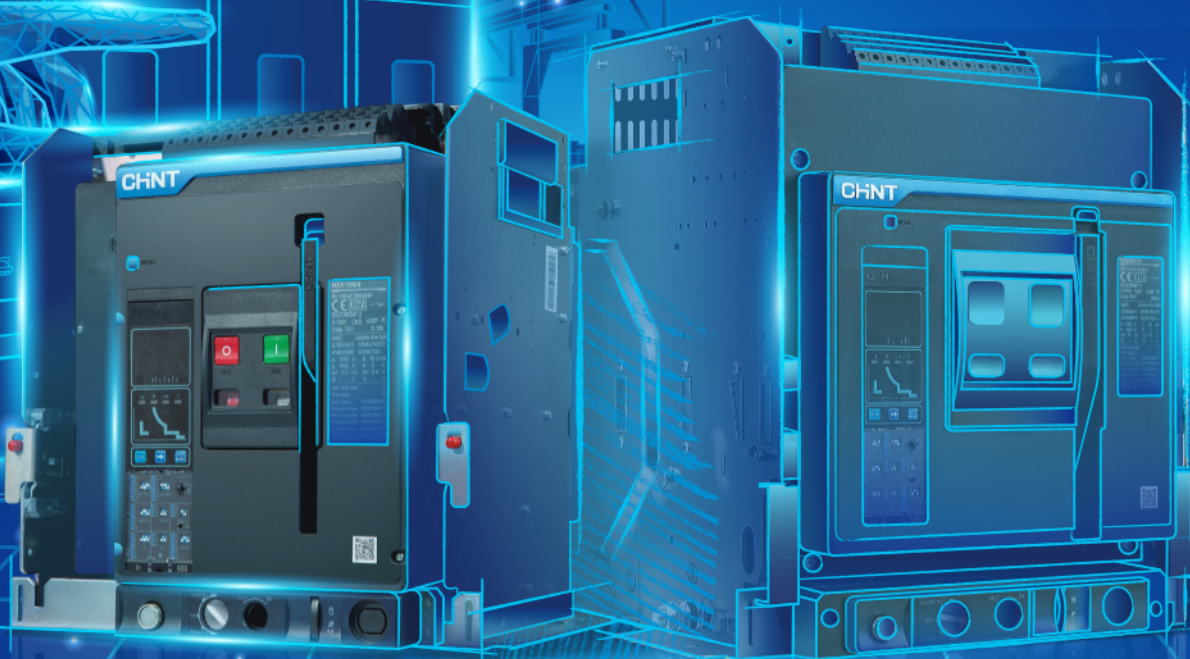


# CHNT

Empower the World



## Air Circuit Breaker



# Air Circuit Breaker

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**NXA series air circuit breaker** P-001

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## Functions and features

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## Installation and wiring

Dimensions and installation	P-029
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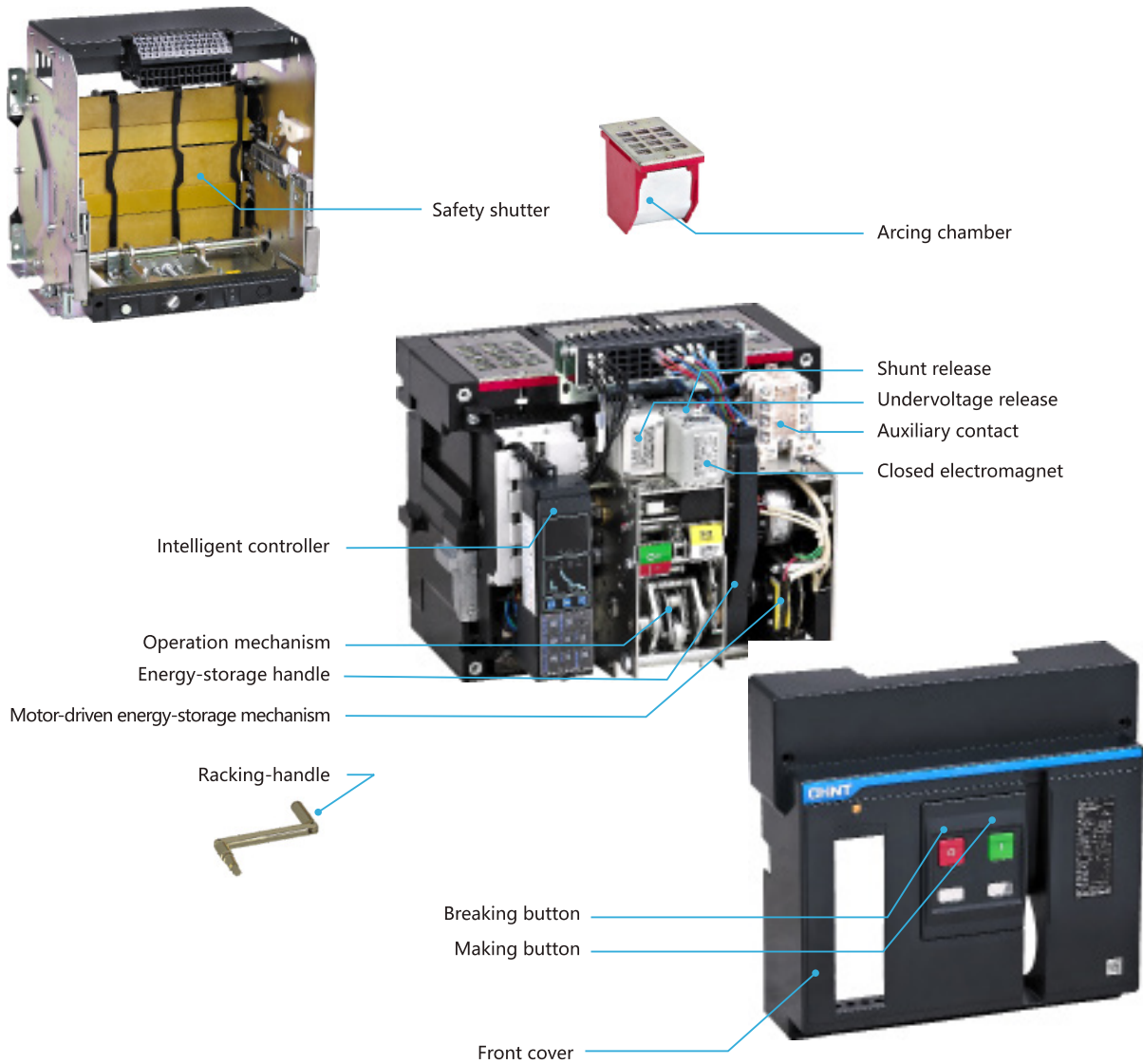
## Annex

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## Structural features of the circuit breaker

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## Circuit breaker description



- |                                    |   |
|------------------------------------|---|
| 1 Trademark                        | 9 QR code   |
| 2 Secondary wiring terminal        | 10 Extraction draw plate (only applicable to draw-out type)           |
| 3 Breaking button                  | 11 "Disconnected" position locking (only applicable to draw-out type) |
| 4 Energy-storage handle            | 12 Racking-handle entry (only applicable to draw-out type)            |
| 5 Making button                    | 13 Position indication (only applicable to draw-out type)             |
| 6 Nameplate                        | 14 Racking-handle storage (only applicable to draw-out type)          |
| 7 Energy-storage/release indicator | 15 Intelligent controller   |
| 8 Breaking/making indicator        | 16 Fault-breaking indicator reset button                              |



### Circuit breaker

- Frame size (A): 1600, 2000, 3200, 4000, 6300
- Breaking capacity: N,S,H
- Rated operational voltage Ue (VAC): 380/400/415, 440/525/690
- Number of poles: 3P, 4P
- Installation method: draw-out type, fixed type



### Operation conditions and environment adaptability

- Operation temperature:
  - The electrical and mechanical characteristics are applicable to the ambient temperature of -5°C ~+40°C . NXA can also operate in the ambient temperature of -45°C ~+70°C (M type, A type), -20°C ~+70°C (P type, H type, CD-1), the derating factor is seen in P23-24.
- Storage conditions: apply to -45°C ~+70°C
- NXA can resist the following electromagnetic interference
  - Overvoltage generated by electromagnetic interference
  - Overvoltage caused by environment interference or a power distributing system
  - Electrostatic discharge of radio waves (radio, intercom, radar and the like)
- NXA has successfully passed the test for electromagnetic compatibility specified according to the following standards (EMC) IEC/EN 60947-2 Annex F
  - The test can guarantee no false tripping and no interference on tripping time
- Protection grade:
  - Front IP 20, other side IP 00



### Connection

- Rear connection
  - Horizontal connection, vertical connection
- Optional accessories
  - Interphase barrier

### Lock

- Padlocks of "Making" and "Breaking" push button
- Position padlock (for locking the circuit breaker at disconnected position)
- Chassis padlock
- Door interlock: the circuit breaker is arranged at the connected or test part so as to prohibit to open the door



### Indication contact

- Standard contact
  - Making and breaking indication contacts
  - Fault tripping indication contact
- Optional accessories
  - Position indication contact
  - Spring charged indication contact



Drawout type breaker



Fixed type breaker



Note: NXA63 fixed type is seen in P45

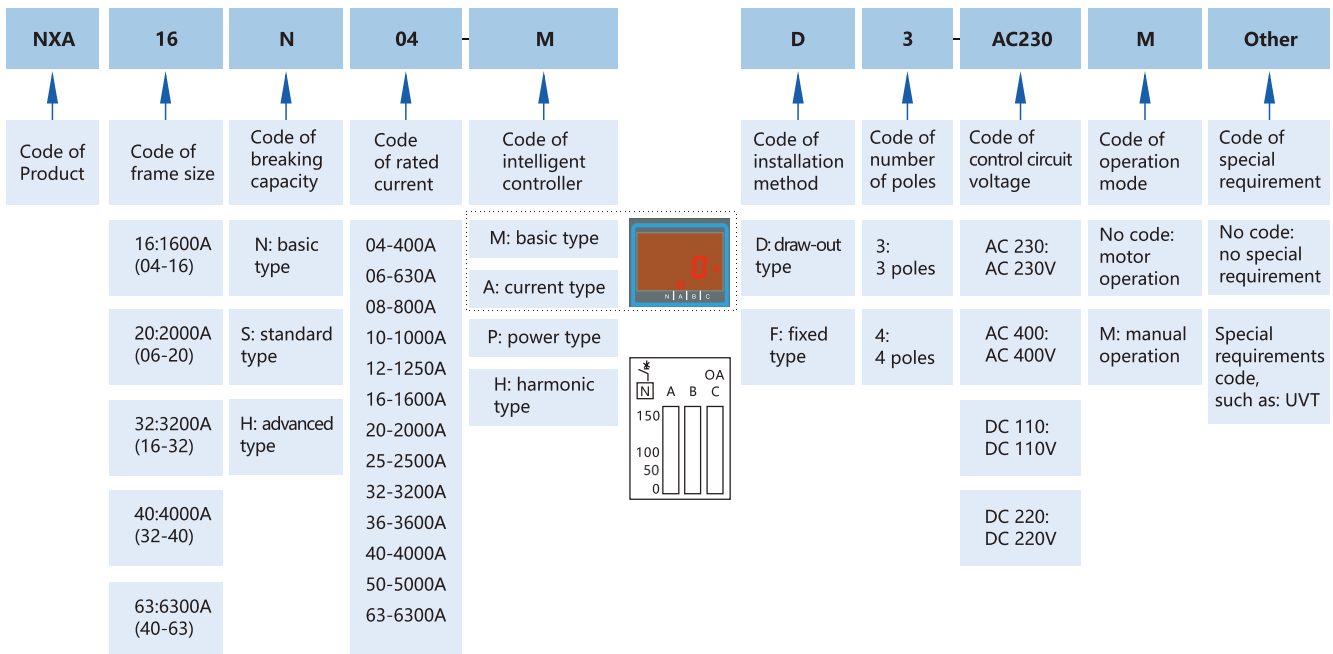
Accessories



### Model definition and description-intelligent controller

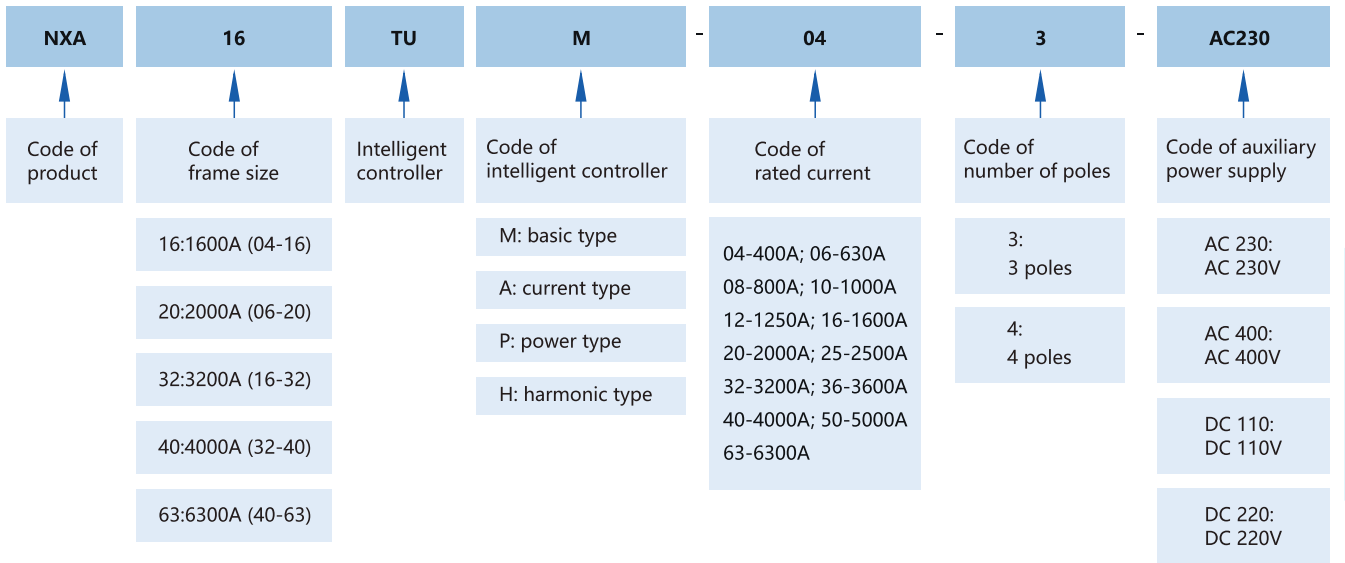
Frame size	Rated current													
	Breaking capacity	400	630	800	1000	1250	1600	2000	2500	3200	3600	4000	5000	6300
1600A	N	■	■	■	■	■	■							
	S	■	■	■	■	■	■							
	H	■	■	■	■	■	■							
2000A	N		■	■	■	■	■	■						
	S		■	■	■	■	■	■						
	H		■	■	■	■	■	■						
3200A	N						■	■	■	■				
	S						■	■	■	■				
	H						■	■	■	■				
4000A	N									■	■	■		
	S									■	■	■		
	H									■	■	■		
6300A	H										■	■	■	

### Model definition and description

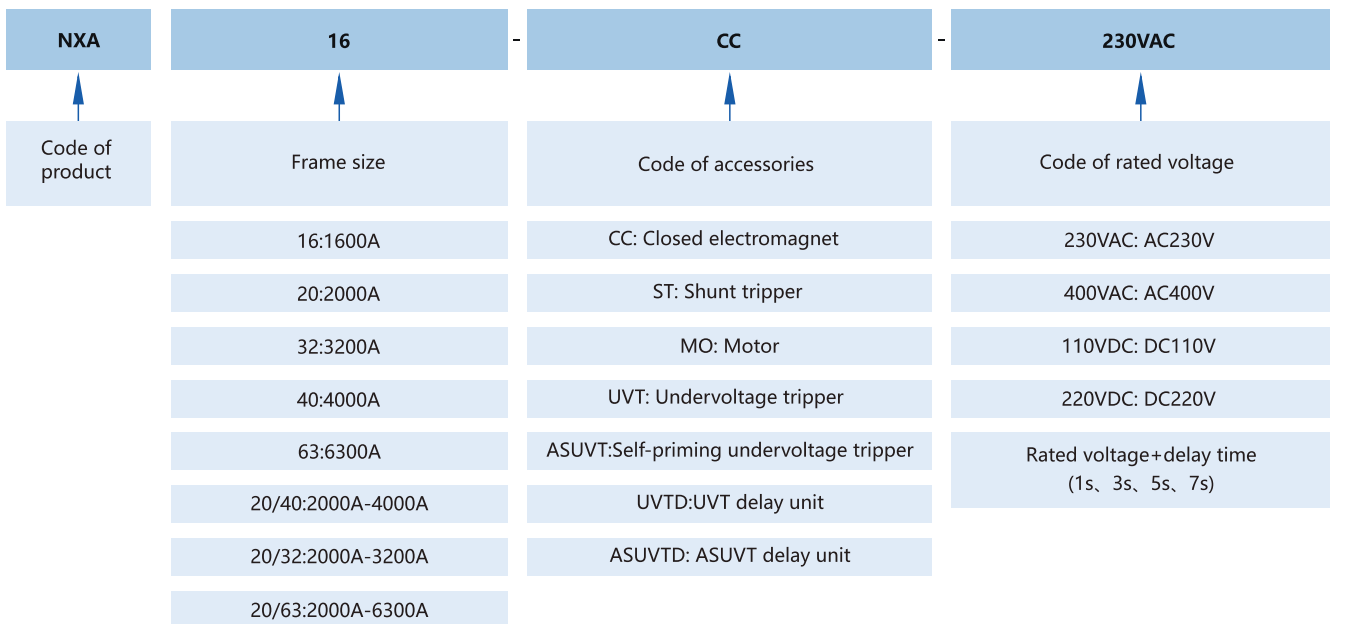


- Note: 1) Intelligent controller PT/HT type. The basic functions are the same with P/H type. T refers to the internal temperature measurement function.
- 2) Manual operation does not contain motor-driven mechanism, closing electromagnet and shunt release. Motor operation contains all standard accessories of remote operation.
- 3) Auxiliary working voltage of the intelligent controller: corresponding power modules is required if DC220V or DC110V is selected.
- 4) NXA16N10-AD3-AC230: frame size is 1600A, N type breaking capacity, rated current is 1000A, A type intelligent controller, draw-out type and 3 poles, control voltage is AC 230V motor operation.

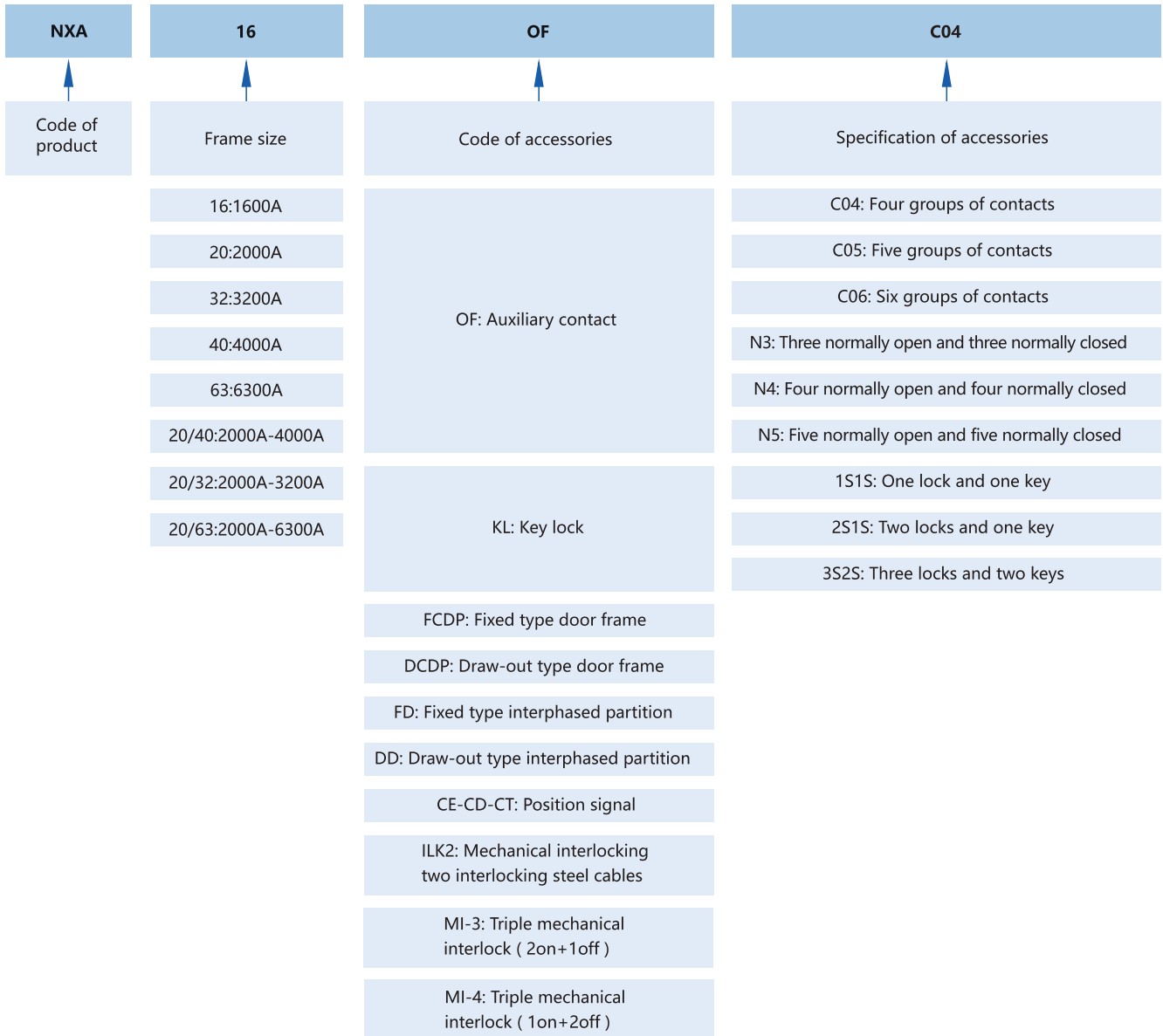
**NXA series air circuit breaker**



**Model definition and description-accessories**



Model definition and description-accessories







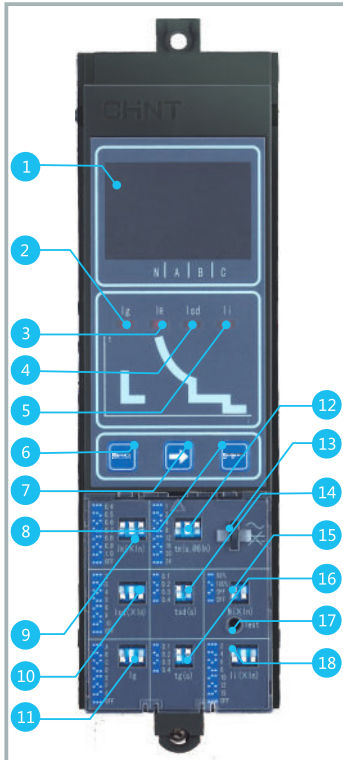
# Technical parameters

## Features

Number of poles	3/4 6300A only 3P	
Rated operational voltage Ue (V)	AC 380/400/415 , AC 440/525/690	
Rated insulation voltage Ui (V)	1000	
Rated impulse withstand voltage Uimp (kV)	12	
Rated frequency (Hz)	50/60	
Flashover distance (mm)	0	
Applicable to isolation	IEC/EN 60947-2	Applicable
Pollution grade	IEC 60664-1	N:3

Frame size			1600A					
Rated current (A)			400	630	800	1000	1250	1600
Rated current of the fourth pole (A)			400	630	800	1000	1250	1600
Type of the circuit breaker			N	S	H			
Rated ultimate short circuit breaking capacity (kA rms) VAC 50/60Hz	Icu	380/400/415V	50	42	50			
		440/525/690V	30	36	36			
Rated service short circuit breaking capacity (kA rms) VAC 50/60Hz	Ics	380/400/415V	42	42	50			
		440/525/690V	30	36	36			
Utilization category			B					
Rated short-time withstand current (kA rms) VAC 50/60Hz	Icw 1s	380/400/415V	42	42	42			
		440/525/690V	30	36	36			
	Icw 3s	380/400/415V	20	25	25			
		440/525/690V	-	-	-			
Closed capacity (kA peak) VAC 50/60Hz	Icm	380/400/415V	105	88.2	105			
		440/525/690V	63	75.6	75.6			
Making current tripping protection function (MCR kA rms)			10	16	16			
Breaking time (ms)			32					
Closing time (ms)			70					
Installation, connection and service life								
Service life C/O cycle	Mechanical	Without maintenance	15000					
	Electrical	Without maintenance	8000					
Connection	Horizontal		▪					
	Fixed type	3P	254×243.5×318.5					
		4P	324×243.5×318.5					
Size (width × depth × height)	Draw-out type	3P	308×331.5×351					
		4P	378×331.5×351					

2000A							3200A				4000A			6300A			
630	800	1000	1250	1600	2000		1600	2000	2500	3200	3200	3600	4000	4000	5000	6300	
630	800	1000	1250	1600	2000		1600	2000	2500	3200	3200	3600	4000	2000	2500	-	
N	S	H					N	S	H				N	S	H	H	
80	65	80					80	80	100				80	85	100	120	
50	55	55					65	70	70				65	75	75	85	
50	65	65					80	80	85				80	85	85	120	
50	55	55					65	70	70				65	75	75	85	
B							B						B				
50	65	65					65	80	85				65	85	85	100	
50	55	55					65	70	70				65	75	75	75	
37	42	42					37	50	50				37	50	50	-	
-	-	-					-	-	-				-	-	-	-	
176	143	176					176	176	220				176	187	220	264	
105	121	121					143	154	154				143	165	165	187	
16	16	16					26	26	26				26	26	26	26	
32							32						32			32	
70							70						70			70	
15000							10000				10000			2000			
8000							7000				3000			500			
▪							▪				▪			▪			
374×344×400							439×373.5×400				550×337.5×400			897×435.5×399			
469×344×400							554×373.5×400				700×337.5×400			897×435.5×399			
403×430×435.5							463×499.5×435.5				569×416×435.5			923×500×435.5			
498×430×435.5							578×499.5×435.5				719×416×435.5			923×500×435.5			



**M/A-type intelligent controller**

1. Display window : display current value, setting parameter , fault current , trip time , etc.
2. lg indicator : This light is on after ground fault trip
3. lr indicator : This light is on after overload long-delay trip
4. lsd indicator : This light is on after short-circuit short-delay trip
5. li indicator : This light is on after short-circuit instantaneous trip
6. Menu button : Query the DIP position and fault record
7. Right button : Switch to the next state when querying the DIP position
8. Return button: Return to the previous level , or reset
9. Overload long-delay current multiple setting switch
10. Short-circuit short-delay current multiple setting switch
11. Ground fault current multiple setting switch
12. Overload long-delay time setting switch
13. Mask keyhole
14. Short-circuit short-delay time setting switch
15. N-pole protection setting switch
16. Ground fault delay time setting switch
17. Test
18. Short-circuit instantaneous current multiple setting switch

## Intelligent controller

### M/A-type intelligent controller(basic protection)

#### Protection

The setting of all protected thresholds and DIP switches for delay. The setting value can be displayed in the display window.

- Overload protection
  - True RMS long delay protection
  - Thermal memory: Accumulation of heat before and after tripping
- Short-circuit protection
  - Short delay (RMS) and instantaneous protection
  - 4-speed definite time is optional in terms of delay.
- Ground fault protection
  - 4-speed definite time is optional in terms of delay.
- Neutral line overcurrent protection
  - The neutral line protection threshold can be adjusted to 50%,100% and off for 3P + N or 4P products( 6300 shell frame only 50% )
- Test function
  - Simulate 6I<sub>r</sub> test current for test tripping

- Trip record function
  - One-time failure memory function

- Ammeter
  - The M-type intelligent controller measures the true current rms between 40% and 150% with an accuracy of 2%

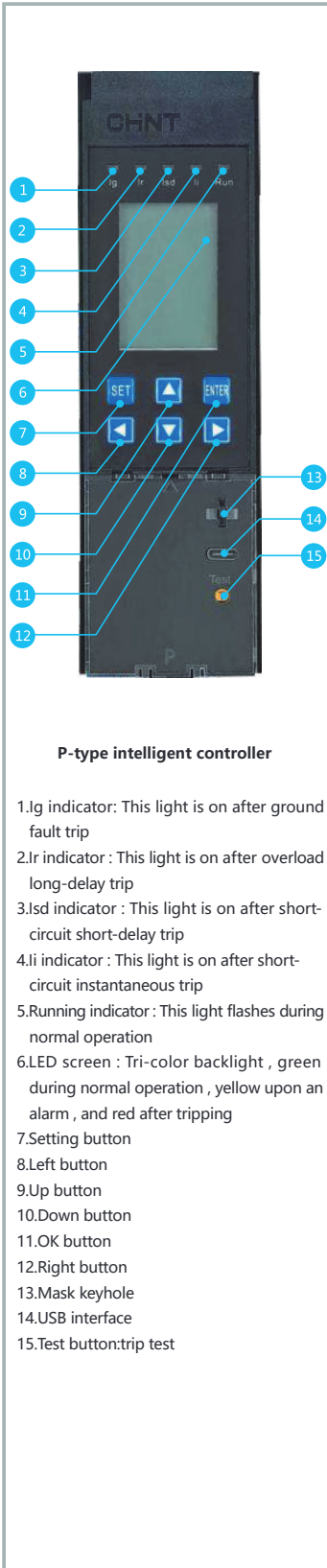
- Operation times record function

#### **A-type intelligent controller (current type)**

##### Protection

The setting of all protected thresholds and DIP switches for delay . The setting value can be displayed in the display window.

- In addition to the protection and extended functions of all M-type control units , the A-type control unit also includes
- Voltage imbalance protection
  - The main circuits current phase failure or three phase current imbalance can be protected.



**P-type intelligent controller**

- 1.Ig indicator: This light is on after ground fault trip
- 2.Ir indicator : This light is on after overload long-delay trip
- 3.Isd indicator : This light is on after short-circuit short-delay trip
- 4.Ii indicator : This light is on after short-circuit instantaneous trip
- 5.Running indicator : This light flashes during normal operation
- 6.LED screen : Tri-color backlight , green during normal operation , yellow upon an alarm , and red after tripping
- 7.Setting button
- 8.Left button
- 9.Up button
- 10.Down button
- 11.OK button
- 12.Right button
- 13.Mask keyhole
- 14.USB interface
- 15.Test button:trip test

### P type intelligent controller (power type)

#### Protection

The setting of all protected thresholds and buttons for delay.

- Include the protection functions of all A-type control units
- Ground current protection function (optional) Equipped with a dedicated external transformer and disconnection protector for power grounding protection

#### Advanced protection function

- Voltage imbalance protection
- Overvoltage and undervoltage protection
- Over-frequency and under-frequency protection
- Phase sequence protection
- Reverse power protection function
- Required value protection function

The required value of the true RMS of each phase current is calculated in a measurement window , and the protection works when the required value exceeds the limit.

When the execution mode is an alarm , the action is in principle the same as the grounding alarm . The settings for the sliding time window are in the "measurement table settings"menu . The required value protection is set for each item:

- Maximum required current value of phase A ;
- Maximum required current value of phase B;
- Maximum required current value of phase C;
- Maximum required current value of phase N;
- (not affected by neutral line protection setting)

#### Extended functions

- Intelligent controller self-diagnosis
- Recording function of the number of operations/fault trip/alarm/ displacement: providing the last 8 records
- Main contact wear display function : The contact wear degree is evaluated according to the mechanical life,electrical life and breaking capacity of different frames.
- Internal clock function
- Button Trip-test function

#### Electric energy meter

- Current measurement
- Voltage measurement
- Frequency measurement
- Required value measurement
- Power (active,reactive,apparent) measurement
- Electric energy (active,reactive,apparent) measurement
- Power factor measurement

#### LCD tri-color backlight

Green during normal operation , yellow upon an alarm , and red after tripping.



**H-type intelligent controller**

1. Ig indicator: This light is on after ground fault trip
2. Ir indicator: This light is on after overload long-delay trip
3. Isd indicator: This light is on after short-circuit short-delay trip
4. Ii indicator: This light is on after short circuit instantaneous trip
5. Running indicator: This light flashes during normal operation
6. LCD screen: Three-color backlight, green during normal operation, yellow during an alarm, and red after tripping
7. Setting button
8. Left button
9. Up button
10. Down button
11. OK button
12. Right button
13. Mask keyhole
14. USB interface
15. Test button: trip test

**H type intelligent controller (harmonic type)**

Protection

The setting of all protected thresholds and buttons for delay

- In addition to the protection and extended functions of all P-type control units, the H-type control unit also includes
  - Load monitoring function
  - Zone selective interlock
  - Communication function  
Modbus-RTU communication protocol
  - Input / output function  
2DI2DO or 4DO  
DI signal : AC ( 220-250 ) V  
DO requires a power unit ( 24VDC output ) and a relay unit
  - Harmonic analysis function  
Measure the fundamental current, fundamental phase voltage, fundamental power and 3-31 odd-order harmonic current content ( HR<sub>Ih</sub> ), harmonic voltage content ( HR<sub>Uh</sub> ), total harmonic current distortion rate [THD<sub>i</sub>,thd<sub>i</sub>], total harmonic voltage distortion rate [THD<sub>u</sub>,thd<sub>u</sub>]. Harmonic content (HR): The ratio of the square root mean of the hth harmonic component contained in the periodic AC amount to the square root mean of the fundamental component (expressed as a percentage).

## Protection features

The protection features of the intelligent controller comprise inverse time characteristic and constant time characteristic. When the fault current exceeds the set value of the inverse time limit, the controller performs constant time protection.

The inverse time limit corresponds to the feature curve I<sup>2</sup>t.

### Overload long-time-delay protection feature

Overload long-time-delay protection action threshold value

< 1.05I<sub>r</sub> : > 2h, no action

≥ 1.3I<sub>r</sub> : < 1h, action

I<sub>r</sub> current setting value range: 0.4I<sub>n</sub>, 0.5 I<sub>n</sub>, 0.6 I<sub>n</sub>, 0.7 I<sub>n</sub>, 0.8 I<sub>n</sub>, 0.9 I<sub>n</sub>, 1.0 I<sub>n</sub>+OFF (M/A); 0.4I<sub>n</sub>~1.0I<sub>n</sub>+OFF(P/H)

Inverse time limit action feature: I<sup>2</sup>t, wherein t=(6/N)<sup>2</sup>\*tr

Setting Multiple of Current	Action Time							
1.5I <sub>r</sub>	16	32	64	128	192	256	320	384
2I <sub>r</sub>	9	18	36	72	108	144	180	216
6I <sub>r</sub>	1	2	4	8	12	16	20	24

Note: N --- the multiple I/I<sub>r</sub> obtained by dividing failure current by set current

t --- time delay action of the failure action

tr --- long-time-delay set value

Allowed error of the action time ±15%

Conventional factory tuning: I<sub>r</sub>=1.0I<sub>n</sub>

tr=2s@6I<sub>r</sub>

### Short circuit short-time-delay protection feature

Short circuit short-time-delay protection action threshold value

< 0.85I<sub>sd</sub>: no action

> 1.15I<sub>sd</sub>: action

I<sub>sd</sub> current set value range: 2I<sub>r</sub>, 3I<sub>r</sub>, 4I<sub>r</sub>, 5I<sub>r</sub>, 6I<sub>r</sub>, 8I<sub>r</sub>, 10I<sub>r</sub> +OFF (max 50kA, M/A); 2I<sub>r</sub>~10I<sub>r</sub>+OFF(max 50kA, P/H)

Current	Action time		Remark
I <sub>sd</sub> < I ≤ 10I <sub>r</sub>	Inverse time limit	Action feature I <sup>2</sup> t= (10I <sub>r</sub> ) <sup>2</sup> t <sub>sd</sub>	P, H
		Setting time s 0.1, 0.2, 0.3, 0.4	
I ≥ 1.1I <sub>sd</sub>	Constant time limit	Setting time s 0.1, 0.2, 0.3, 0.4	M, A, P, H
		Minimum s 0.06, 0.16, 0.255, 0.34	
	Maximum s 0.14, 0.24, 0.345, 0.46		
	Return time	0.05, 0.14, 0.25, 0.33	

Note: I<sub>sd</sub>---short-time-delay current set value

I--- failure current value

I<sub>r</sub>--- long-time-delay set value

t--- failure action time-delay time

t<sub>sd</sub>---short-time-delay inverse time limit set value

Permissible error of action time ±15%

Conventional factory tuning: I<sub>sd</sub>=8I<sub>r</sub>(I<sub>r</sub> < 6250A)

I<sub>sd</sub>=50kA(I<sub>r</sub> ≥ 6250A)

t<sub>sd</sub>=0.4s



### Short circuit instantaneous protection features

Short circuit instantaneous protection action threshold value

- < 0.85I<sub>i</sub>: no action
- > 1.15I<sub>i</sub>: action

The current setting value of instantaneous action: 2I<sub>n</sub>, 4I<sub>n</sub>, 6I<sub>n</sub>, 8I<sub>n</sub>, 10I<sub>n</sub>, 12I<sub>n</sub>, 15I<sub>n</sub>+OFF(NXA40 max50kA, NXA63 max63kA, M/A);  
 2I<sub>n</sub>~15I<sub>n</sub>+OFF(NXA40 max 50kA, NXA63 max63kA P/H)

Note: action time ≤ 50ms

Conventional factory tuning: I<sub>i</sub>=12I<sub>n</sub>(I<sub>n</sub>=400A~5000A)  
 I<sub>i</sub>=63kA(I<sub>n</sub>=6300A)

### Earth fault protection action features

Earth fault protection action threshold value

- < 0.9I<sub>g</sub>: no action
- > 1.1I<sub>g</sub>: action

M/A

Current setting value	A	B	C	D	E	F	G	OFF
NXA16, 20	0.2I <sub>n</sub>	0.3I <sub>n</sub>	0.4I <sub>n</sub>	0.5I <sub>n</sub>	0.6I <sub>n</sub>	0.8I <sub>n</sub>	I <sub>n</sub>	
NXA32, 40, 63	500A	640A	800A	960A	1040A	1120A	1200A	
tg(s)	Inverse time limit	Action features						

P/H

NXA16, 20: 0.2I<sub>n</sub>~1.0I<sub>n</sub>+OFF

NXA32, 40, 63: 500A~1200A+OFF

$$t = \frac{(I_g)^2}{I^2} \times t_g$$

Constant time limit	Setting time (s)	0.1	0.2	0.3	0.4
	Minimum (s)	0.06	0.16	0.255	0.34
	Maximal (s)	0.14	0.24	0.345	0.46
	Return time	0.05	0.14	0.25	0.33

Note: I<sub>g</sub> --- earth fault protection setting value. Default setting: NXA16/20: I<sub>g</sub>=0.5I<sub>n</sub>

When I<sub>n</sub> ≥ 1250A, I<sub>g</sub> max=1200A

NXA32/40/63: I<sub>g</sub>=800A

I --- failure current value

t --- failure action time-delay time

t<sub>g</sub> --- earthing inverse time limit set value

The permissible error of the inverse time limit action time: ±15%

Conventional factory tuning: OFF

### Controller minimum display current

Frame	I <sub>n</sub>	Minimum display value (A)
1600	400 ~ 1600	60
2000	630 ~ 2000	60
≥3200	≥1600	120

Note: Controller can work normally when single phase not less than 0.4I<sub>n</sub>, three phase not less than 0.2I<sub>n</sub>.



## Intelligent Controller measurement accuracy

Current measurement	
Measuring range	Ia,Ib,Ic and In , not less than 15In (breaker rated current)
Measurement accuracy	Not accurate below 0.1In
	Accuracy varying linearly from 5% to 2% between 0.1In and 0.4In
	Accuracy is 2% between 0.4In and 1.5In
	Accuracy varying linearly from 2% to 15% above 1.5In
	Accuracy is 10% for ground current

Voltage measurement	
Measuring range	Linear voltage : 0-600V
	Phase voltage: 0V~300V
Measurement accuracy	Tolerance : ±1%

Frequency	
Measuring range	45HZ-65HZ
Tolerance	Tolerance:±0.1HZ

Power	
Measurement method	RMS mode
Measurement content	3p-type:total active power , total reactive power , total apparent power
	4p-type : split-phase active power , split-phase reactive power , split-phase apparent power , total activepower , total reactive power , total apparent power
Measuring range	Active power : -32768kw~ +32767kw
	Reactive power : -32768 kvar~ +32767 kvar
	Apparent power : 0KVA-65535kVA
	Tolerance:±2.5%

Power factor	
Measurement content	Total power factor , split-phase power factor
Measurement range	-1.00~ +1.00

Electric energy	
Measurement content	Input reactive energy (EQin),output reactive energy (EQout)
	Input active energy ( EPin ) , output active energy ( EPOut )
	Total active energy (EPtotal),total reactive energy (EQtotal),total apparent energy (EStotal)
Measuring range	Active energy:(0~4294967295) kWh
	Reactive energy:(0~4294967295) kvarh
	Apparent energy:(0~4294967295) kVAh
Measurement accuracy	±2.5%

Harmonic measurement	
Fundamental measurement	Current:Ia,Ib,Ic
	Fundamental measurement voltage:Uab,Ubc,Uca
Total harmonic distortion	THD : total distortion rate of harmonic relative to fundamental wave
	Thd . total distortion rate of harmonic relative to RMS
Amplitude spectrum of harmonics	The Controller can display the FFT amplitude of 3-31 odd-order harmonics and display as a percentage
Control unit measurement accuracy	±2%

LSI curves

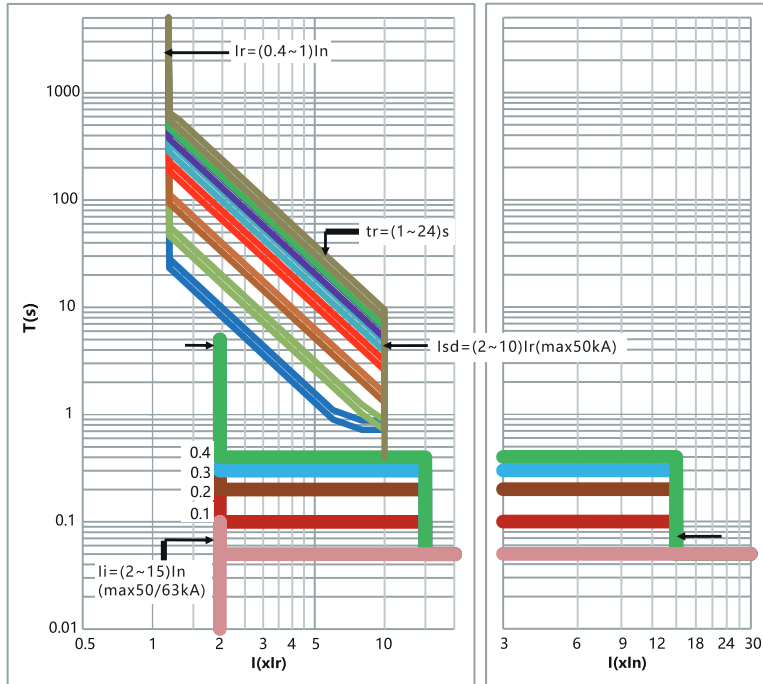


Fig.1 Overcurrent protection curves

Earth fault protection curves

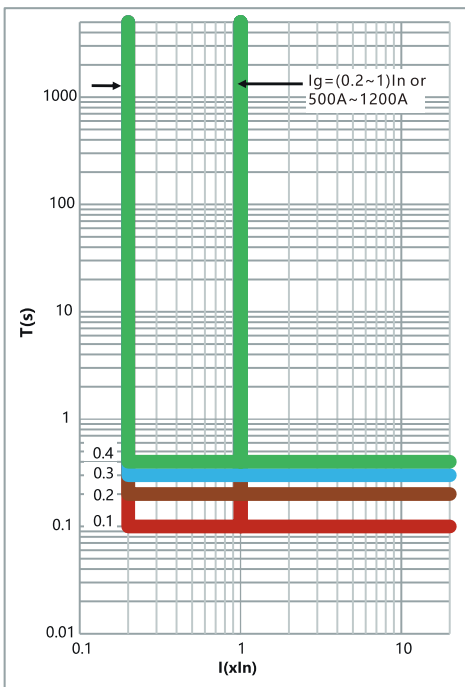


Fig.2 Asymmetrical earth fault protection curves



## Accessories: locks

### Pushbutton lock

The pushbutton lock is to lock the circuit breaker by a transparent cover blocks so as to prevent the breaking button and the making button of the circuit breaker from misoperation and guarantee the reliable running of the circuit breaker.

### Body lock

• A key lock includes four types. The latter two are applied to 2 input and 1 connect power distribution system:

- Random lock
- One lock and one key
- Two locks and one key
- Three locks and two keys

Note: When the user separately purchases the key lock for installation, the panel needs to be opened with a hole opener, and the hole opener is provided by the user.

Hole diameter: NXA16:Φ21mm NXA20~63:Φ24mm

### Safety shutters padlock

- The padlock is prepared by users. Diameter of the lock is no more than Φ5mm. when a circuit breaker body is at the disconnected or test part, the safety shutters automatically block access to the disconnecting contact cluster.

### "Disconnected" position padlock

After the chassis and body are locked at "Disconnected" position by a padlock, the racking-handle cannot be inserted into racking-handle entry, and then the position of the body cannot be changed.

### Door interlock

Circuit breaker state door interlock

A cabinet door is prohibited to be opened when the circuit breaker is closed.

The cabinet door is allowed to be opened when the circuit breaker is disconnected.

Circuit breaker position door interlock

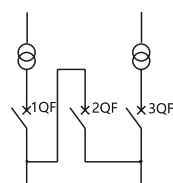
The cabinet door is prohibited to be opened when the circuit breaker is at the connected and test part. The cabinet door is allowed to be opened when the circuit breaker is at the disconnected position.

### Cable mechanical interlock

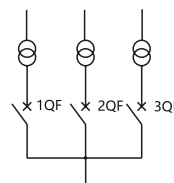
It can realize the interlock of two horizontal or vertical-installed, three poles or four poles, drawout type or fixed type circuit breaker.

Circuit diagram

Available running manner



1QF	2QF	3QF
0	0	0
0	0	1
0	1	1
1	0	0
1	1	0
1	0	1

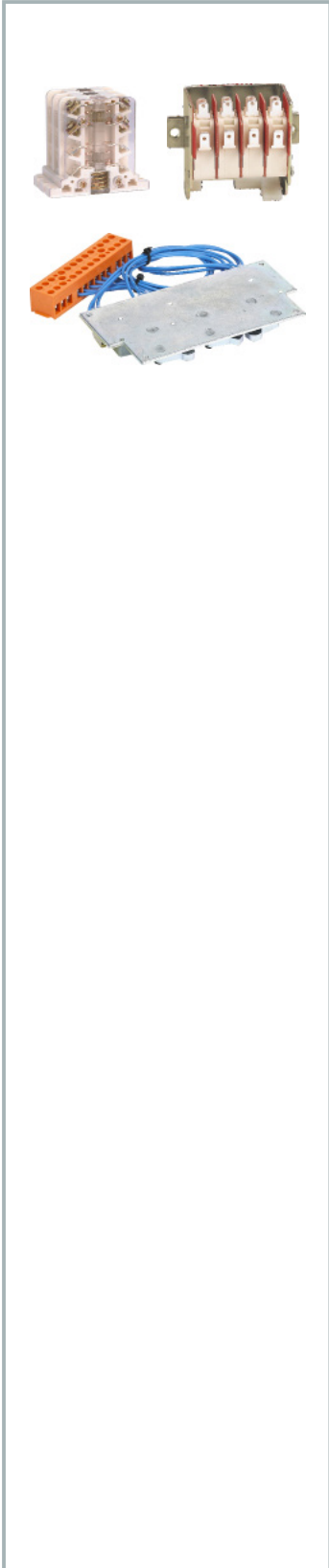


1QF	2QF	3QF
0	0	0
0	0	1
0	1	0
1	0	0

Note:a. If need bend the cable,make sure radian is more than 120° .

b. Check and make sure enough lubricating oil of the cable.

c. The maximum distance between two interlock circuit breakers is1.5m.



## Accessories: indication contacts

### ON/OFF indication contacts

Standard configuration		4CO	6CO(for AC of NXA16 only)
Breaking capacity		Current (A) / Voltage (V)	Current (A) / Voltage (V)
Utilization category	VAC(AC-15)	1.3/240, 0.75/415	1.3/240, 0.75/415
	VDC(DC-13)	0.55/110, 0.27/220	0.55/110, 0.27/220

### "Connected", "disconnected" and "test" position indication contact

Standard configuration		1CO/3	
Breaking capacity		Current (A) / Voltage (V)	
Utilization category	VAC(AC-15)	1.3/240, 0.75/415	
	VDC(DC-13)	0.55/110, 0.27/220	

### Alarming contact

Standard configuration		1CO	
Breaking capacity		Current (A) / Voltage (V)	
Utilization category	VAC(AC-15)	1.3/240, 0.75/415	
	VDC(DC-13)	0.55/110, 0.27/220	

### Spring charging indication contact

Standard configuration		1NO	
Breaking capacity		Current (A)/ Voltage (V)	
Utilization category	VAC(AC-15)	1.3/240, 0.75/415	
	VDC(DC-13)	0.55/110, 0.27/220	

Note: 1) CO refers to a switch contact, and a one-normally-open and one-normally-closed contact is matched with a common terminal.

2) NO refers to a normally open contact. NC refers to a normally closed contact.



• Motor-driven mechanism (MO) (Standard configuration)

When a circuit breaker is switched on, an motor operation mechanism stores energy automatically, so that when the circuit breaker is tripped, the device can switch on instantly. An energy-storage handle as spare when no auxiliary power supply is provided.

Characteristics		
Power supply	VAC 50/60HZ	220/230/240, 380/400/415
	VDC	110, 220
Operation threshold	0.85-1.1Us	
Frame size: power loss (VA or W)	16: 75W; 20: 85W; 32: 110W; 40: 110W; 63: 150W	
Motor overcurrent	≤1min	
Charging time	≤7s	
Operation frequency	≤2times/min	

1600A frame MO      2000A~6300A frame MO



Shunt Release

• Shunt Release(SHT)

The Shunt Release ( SHT ) is used to remotely disconnect the Circuit Breaker . When the Circuit Breaker is in the closed state , it can be opened at any time.

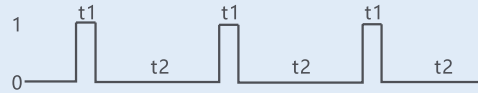
The SHT device has both AC and DC control modes . When the power supply voltage is equal to any voltage value between 70% and 110% of the rated control power supply voltage , the SHT can reliably disconnect the Circuit Breaker .

Characteristics of shunt release

Rated control power supply voltage Us (v)	AC220/230/240	AC380/400/415	DC220	DC110	AC110
Operating voltage (V)	(0.7-1.1)Us				
Break time (ms)	≤ 28				
Power consumption (VA/W)	500	620	500	400	400

**TIP:**

The Shunt Release and Closing Electromagnet belong to the pulse energization working mode , and it is necessary to ensure that the pulse time t1 is not less than 200ms and the energization interval t2 is greater than 15s.



• Closed electromagnet

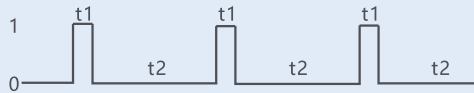
After the energy storage of the motor is completed , the closed electromagnet can be operated and controlled within a range of 10 meters to instantaneously release the energy storage spring force of the operating mechanism to close the circuit breaker .

Characteristics of closed electromagnet

Rated control power supply voltage Us (v)	AC220/230/240	AC380/400/415	DC220	DC110	AC110
Operating voltage (V)	(0.85-1.1)Us				
Close time (ms)	≤ 50				
Power consumption (VA/W)	500	620	500	400	400

**TIP:**

The Shunt Release and Closing Electromagnet belong to the pulse energization working mode , and it is necessary to ensure that the pulse time t1 is not less than 200ms and the energization interval t2 is greater than 15s





1600A frame UVT    2000~4000A frame UVT

6300A frame ASUVT

2000~4000A frame UVTD

- Undervoltage release (UVT)  
Under-voltage release (UVT) (Optional, The power must be turned on before the circuit breaker is closed)  
The under-voltage release has instantaneous operation and delayed operation:

Operation types of each frame under-voltage release	Self-priming	Helped priming
Under-voltage instantaneous release	Inm=1600A, 6300A	Inm=2000A, 3200A, 4000A
Under-voltage delay release	Inm=1600A, 6300A	Inm=2000A, 3200A, 4000A

Notes:

1. Inm=1600A under-voltage delay does not require an external delay controller. The power-off operation is an instantaneous operation. There is no zero voltage delay function;
2. Inm=6300A under-voltage delay does not require an external under-voltage delay controller. There is a delay function for low voltage and power off;
3. Inm=2000A~4000A under-voltage delay requires an external delay controller. There is a delay operation when the power is off. There is a zero voltage delay function.

Delay time of under-voltage release	Delay time (optional)	Accuracy
Inm=1600A	1 s, 3 s, 5 s, 7 s (not adjustable)	±15%
Inm=2000A~4000A	1 s, 3 s, 5 s (not adjustable)	0~1s
Inm=6300A	0.3 s~7.5 s (adjustable)	±15%

The under-voltage will not operate when the voltage returns to 85% Ue and higher,, within 1/2 delay time.

Note:

A self-priming under-voltage delay release may be provided for special orders of NXA20~63. There is no external under-voltage delay controller, and the delay time is 0.3s~7.5s, selectable and adjustable with an accuracy of ±15%.  
When the under-voltage release is not powered, the circuit breaker cannot be closed either electrically or manually.

Characteristics of under-voltage release	
Rated control power supply voltage Ue(V)	Ac110. AC220/230/240. AC380/400/415
Operating voltage (V)	(0.35~0.7)Ue
Reliable closing voltage (V)	(0.85~1.1)Ue
Reliable not-closing voltage (V)	≤0.35Ue
Power consumption (Inm=1600A/Inm=2000A~6300A)	20VA/48VA (W)

# Capacity derating and power loss

## Temperature capacity derating table of the fixed type circuit breaker

1600 frame temperature derating

Ambient temperature	400A	630A	800A	1000A	1250A	1600A
Connection method	Level	Level	Level	Level	Level	Level
40°	-	-	-	-	-	-
45°	-	-	-	-	-	-
50°	-	-	-	-	-	1550
55°	-	-	-	-	1150	1500
60°	-	550	-	-	1050	1450

Note: "-" means no derating is required, the same below.

2000 frame temperature derating

Ambient temperature	630A	800A	1000A	1250A	1600A	2000A
Connection method	Level	Level	Level	Level	Level	Level
40°	-	-	-	-	-	-
45°	-	-	-	-	1550	1900
50°	-	-	-	-	1500	1850
55°	-	-	-	-	1400	1800
60°	-	-	-	-	1300	1700

3200 frame temperature derating

Ambient temperature	1600A	2000A	2500A	3200A
Connection method	Level	Level	Level	Level
40°	-	-	-	-
45°	-	-	-	-
50°	-	-	-	3100
55°	-	-	2450	3000
60°	-	-	2350	2900

4000 frame temperature derating

Ambient temperature	3200A	3600A	4000A
Connection method	Level	Level	Level
40°	-	-	-
45°	3100	-	3800
50°	3000	-	3600
55°	3000	3400	3400
60°	2900	3200	3200

6300 frame temperature derating

Ambient temperature	4000A	5000A	6300A
Connection method	Level	Level	Level
40°	-	-	-
45°	-	-	-
50°	-	-	5600
55°	-	4800	5400
60°	-	4800	5200



### Temperature capacity derating table of the draw-out type circuit breaker

1600 frame temperature derating

Ambient temperature	400A	630A	800A	1000A	1250A	1600A
Connection method	Level	Level	Level	Level	Level	Level
40°	-	-	-	-	-	-
45°	-	-	-	-	-	-
50°	-	-	-	-	-	1550
55°	-	-	-	-	1150	1500
60°	-	550	-	-	1050	1450

2000 frame temperature derating

Ambient temperature	630A	800A	1000A	1250A	1600A	2000A
Connection method	Level	Level	Level	Level	Level	Level
40°	-	-	-	-	-	-
45°	-	-	-	-	1550	1900
50°	-	-	-	-	1500	1850
55°	-	-	-	-	1400	1800
60°	600	-	-	-	1300	1700

3200 frame temperature derating

Ambient temperature	1600A	2000A	2500A	3200A
Connection method	Level	Level	Level	Level
40°	-	-	-	-
45°	-	-	-	-
50°	-	-	-	3100
55°	-	-	2450	3000
60°	-	-	2350	2900

4000 frame temperature derating

Ambient temperature	3200A	3600A	4000A
Connection method	Level	Level	Level
40°	-	-	-
45°	3100	-	3800
50°	3000	-	3600
55°	3000	3400	3400
60°	2900	3200	3200

6300 frame temperature derating

Ambient temperature	4000A	5000A	6300A
Connection method	Level	Level	Level
40°	-	-	-
45°	-	-	-
50°	-	-	5600
55°	-	4800	5400
60°	-	4800	5200

### Altitude capacity derating factor

Altitude(m)	2000	2500	3000	3500	4000	4500	5000
Rated impulse withstand voltage Uimp(kV)	12	12	12	12	11	10	8
Average insulation voltage Ui(V)	1000	1000	1000	1000	917	833	800
Maximum operating voltage Ue(V)(50/60Hz)	690	690	690	690	690	690	560
Average hot operating current(40)° C	1.0le	0.93le	0.88le	0.83le	0.78le	0.73le	Contact the factory
Power frequency withstand voltage(V)	3500	3500	3500	3250	3000	2500	2200

Product model	Rated current (A)	Altitude (m)						
		2000	2500	3000	3500	4000	4500	5000
NXA16	400~630	1	1	1	1	1	1	1
	800~1250	1	1	1	1	0.97	0.9	0.87
	1600	1	1	1	1	0.97	0.9	0.87
NXA20	6300~1600	1	1	1	1	1	1	1
	2000	1	1	1	1	0.97	0.9	0.87
NXA32	1600	1	1	1	1	1	1	1
	2000~2500	1	1	1	1	0.97	0.9	0.87
	3200	1	0.97	0.93	0.9	0.88	0.85	0.82
NXA40	3200	1	1	1	0.97	0.9	0.87	0.85
	3600~4000	1	0.97	0.93	0.9	0.88	0.85	0.82
NXA63	4000~5000	1	1	0.98	0.95	0.93	0.9	0.87
	6300	1	0.97	0.93	0.9	0.88	0.85	0.82

### Power loss and input and output resistance

Power loss is the power loss of each pole measured at In, 50/60Hz. The input/output resistance is the DC resistance value of each pole at the cold state.

Frame	Rated current (A)	Drawer type	Fixed type
		Power loss (W)	Power loss (W)
1600A	400	30.5	15.6
	630	75.7	38.6
	800	99.1	54.1
	1000	154.8	84.6
	1250	241.9	132.2
	1600	262.7	138.2
2000A	630	58.6	26.4
	800	73.7	36.6
	1000	115.2	57.2
	1250	180	89.4
	1600	294.9	146.5
	2000	388.8	204.5
3200A	1600	127.2	60.1
	2000	198.7	93.9
	2500	310.5	146.7
	3200	479.2	206.4
4000A	3200	435	239.6
	3600	690.5	272.9
	4000	852.5	337
6300A	4000	403.2	230.4
	5000	630	360
	6300	1000.2	571

## Dimension of busbar

### Bolt configuration

Type of bolt	Application	Fastening busbar
16: M10	Fastening busbar	(36~52)N·m
20~63: M12	Fastening busbar	(61~94)N·m
16~63: M3	Fastening secondary connector	(0.4~0.5)N·m

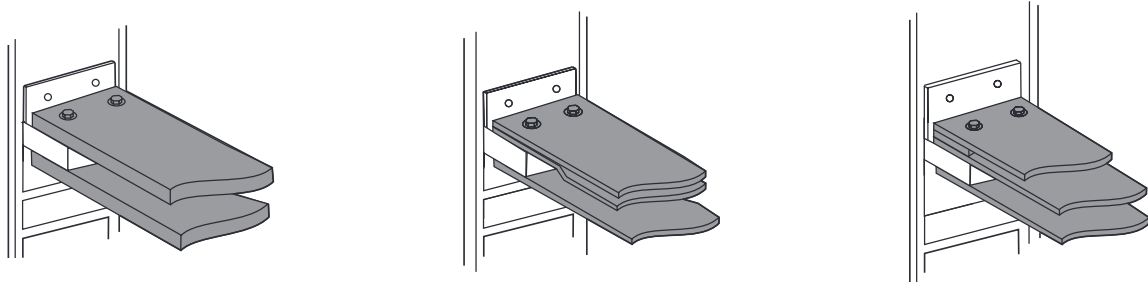
### Hole size and installation twisting moment of busbar

DrillingΦ (mm)	Diameter of bolt	Fastening twisting moment
16:Φ11	M10	(36~52)N·m
20~63:Φ13	M12	(61~94)N·m

### Connection busbar specification reference under different temperature

Maximum permissible temperature of busbar: 100°C

The material of busbar is bare copper



Recommended installation

Note:

- a. When a copper bar selected by users is not matched with a wiring terminal of the circuit breaker, extended busbar is required to be designed to transfer, and is designed by the users of their own. The cross section of the extended busbar cannot be less than the requirement in the table above. The interval among the extended busbar is not less than the interval among wiring terminals of the circuit breaker.
- b. After the busbar recommended in the table above is installed, the electric clearance between adjacent phases of the circuit breaker is not less than 18mm.
- c. Electrical elements are used for three-phase rectification and high-frequency inversion, such as a high-frequency induction heating furnace (medium-frequency furnace steelmaking equipment), a solid high-frequency welding machine (such as an embedded arc electric welding machine), vacuum heating smelting equipment (such as a monocrystalline silicon growth furnace), in load equipment by controlled silicon. When a circuit breaker is selected, the influence on the circuit breaker by higher order harmonic component generated by controlled silicon is required to be considered besides the influences by the environment temperature and altitude height. At the same time, capacity derating is required, and the capacity coefficient (0.5-0.8) is recommended.
- d. The electric clearance of fastening bolts of upper and lower busbar needs to be not less than 20mm after the installation of the busbar by users.
- e. After the installation of the circuit breaker, the safety clearance among electrified bodies with different electric potential and between the electrified bodies and the ground are not less than 18mm.



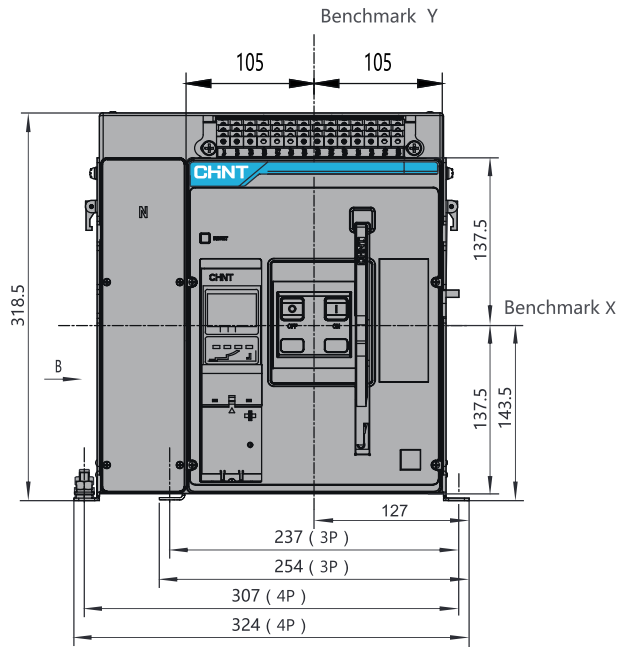




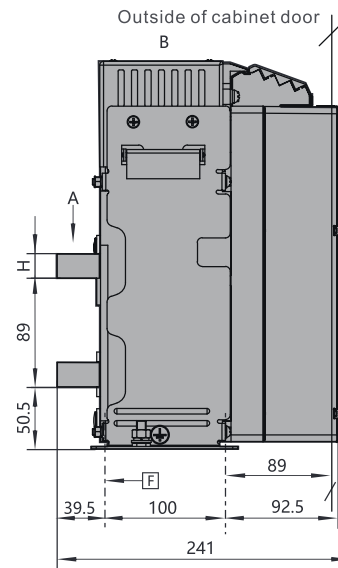
# Dimensions and installation

## 1600A fixed type

Front view

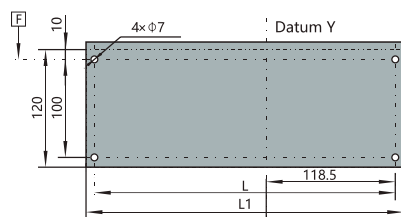


Side view



## Hole size

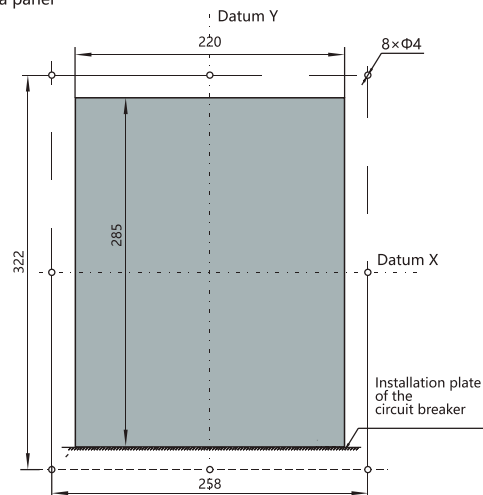
Hole size of the base



Schematic diagram of the overall size of the bottom surface and the installation hole pitch

H	L	L1	Remark
5	237	254	In=400A~630A Fixed type, three pole
8	237	254	In=800A~1250A Fixed type, three pole
20	237	254	In=1600A Fixed type, three pole
5	307	324	In=400A~630A Fixed type, four pole
8	307	324	In=800A~1250A Fixed type, four pole
20	307	324	In=1600A Fixed type, four pole

Hole size of a panel

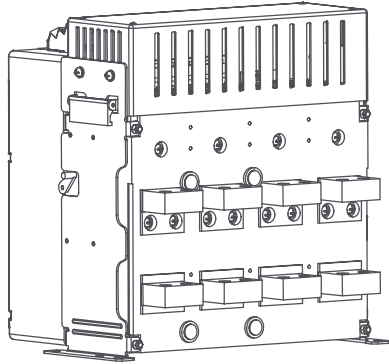


Hole size of the panel of the fixed type circuit breaker

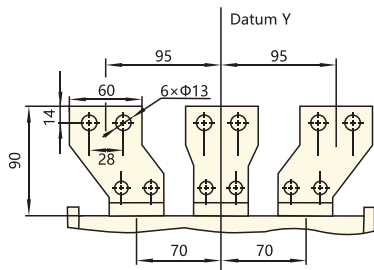
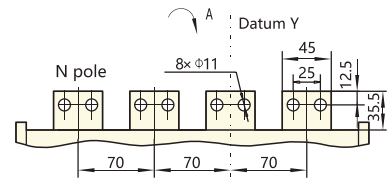


Horizontal connection

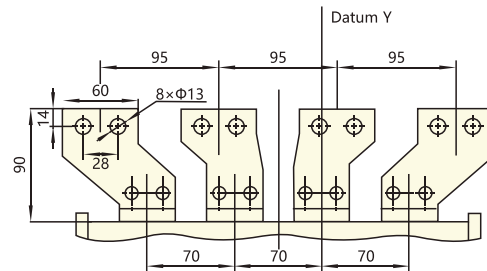
Side view



Busbar size and busbar interval



(Optional)



(Optional)

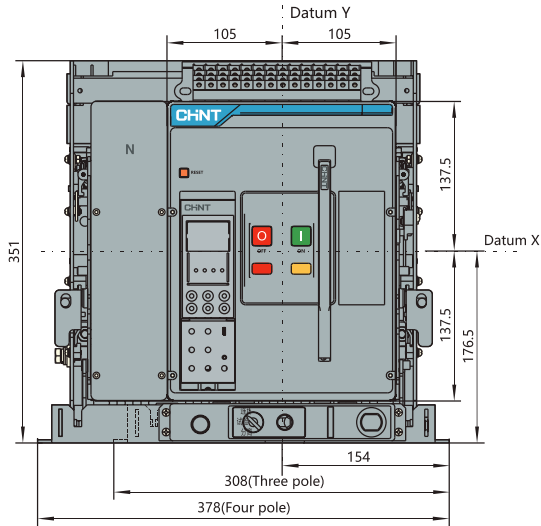
Number of busbar

"Rated current (A) "	Number of pieces			
	Three poles		Four poles	
	A pole+C pole	B pole	A pole+B pole	C pole+N pole
400 ~ 630	4	2	4	4
800 ~ 1250	4	2	4	4
1600	8	4	8	8

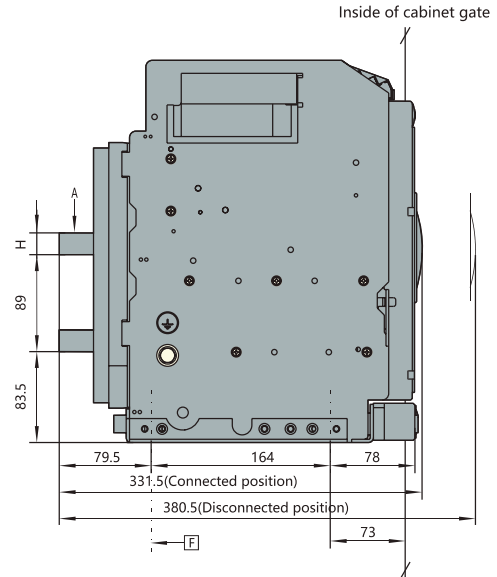


## 1600A draw-out type

Front view

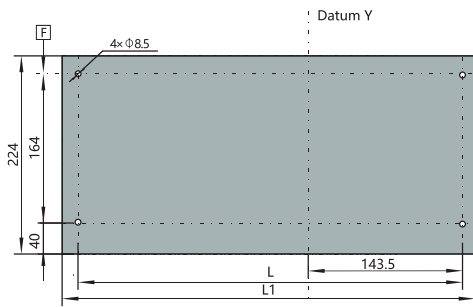


Side view



## Hole size

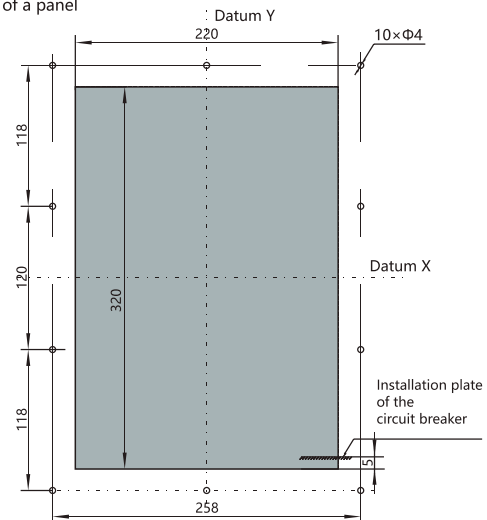
Hole size of the base



Schematic diagram of the overall size of the bottom surface and the installation hole pitch

H	L	L1	Remark
5	287	308	In=400A~630A Three pole
8	287	308	In=800A~1250A Three pole
20	287	308	In=1600A Three pole
5	357	378	In=400A~630A Four pole
8	357	378	In=800A~1250A Four pole
20	357	378	In=1600A Four pole

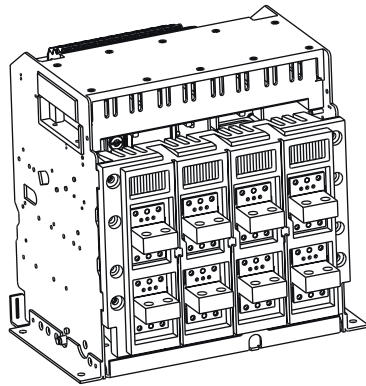
Hole size of a panel



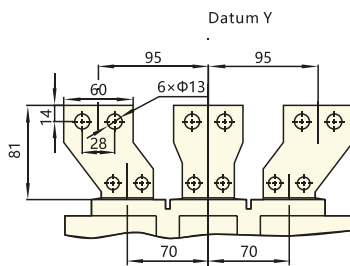
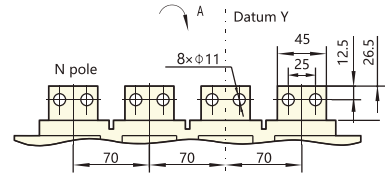
Ratio: 1:1.5 Hole size of a panel of the draw-out type circuit breaker

Horizontal connection

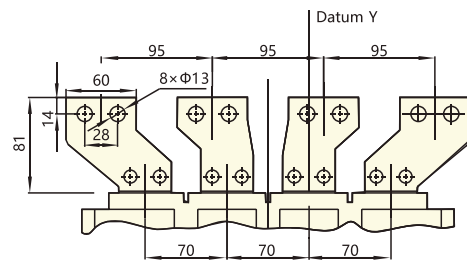
Side view



Busbar size and interval



Optional



Optional

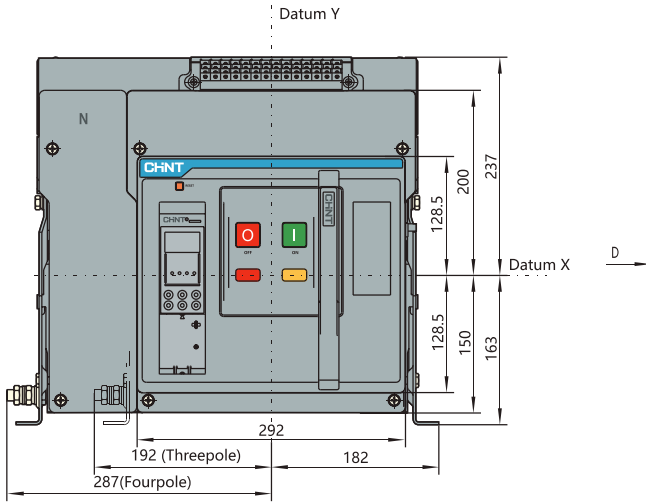
Number of busbar

"Rated current (A) "	Number of pieces			
	Three poles		Four poles	
	A pole+C pole	B pole	A pole+B pole	C pole+N pole
400 ~ 630	4	2	4	4
800 ~ 1250	4	2	4	4
1600	8	4	8	8

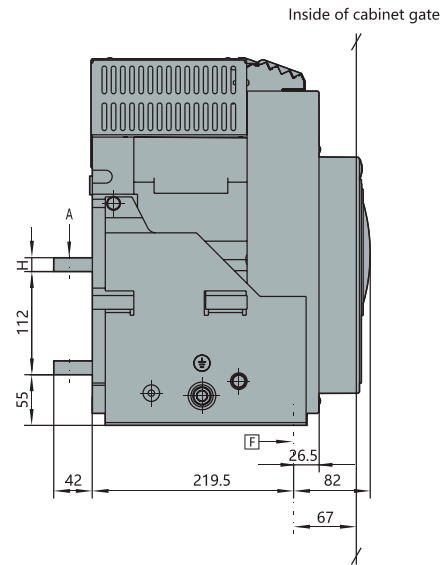


## 2000A fixed type

Front view



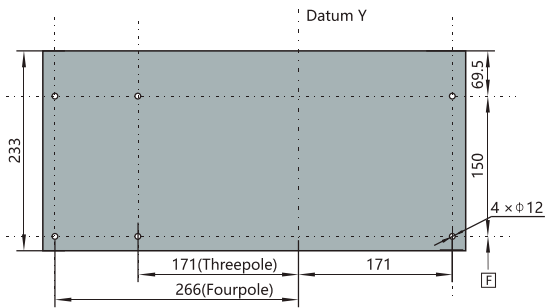
Side view



Inside of cabinet gate

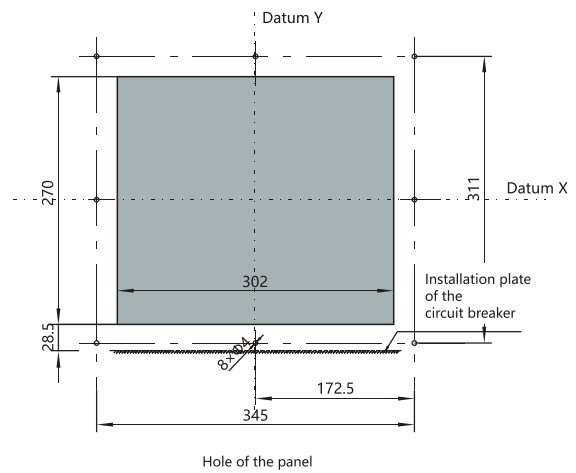
## Hole size

Hole size of the base



Schematic diagram of the overall size of the bottom surface and the installation hole pitch

Hole size of a panel

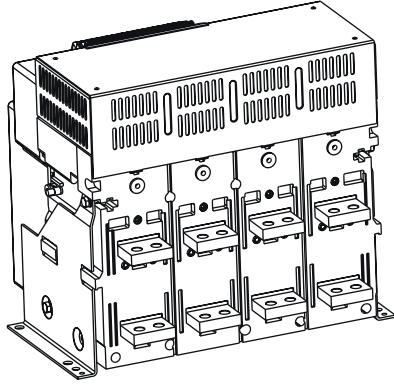


Hole of the panel

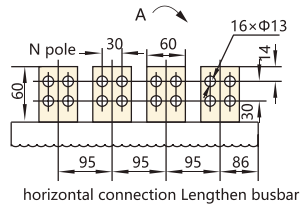
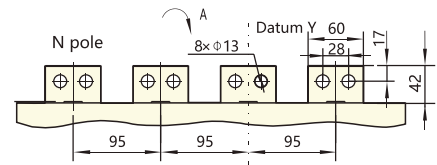
H	Remark
10	In=630A
15	In=800A~1600A
20	In=2000A

Horizontal connection

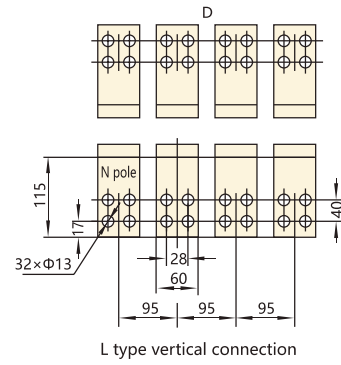
Side view



Busbar size and interval



horizontal connection Lengthen busbar

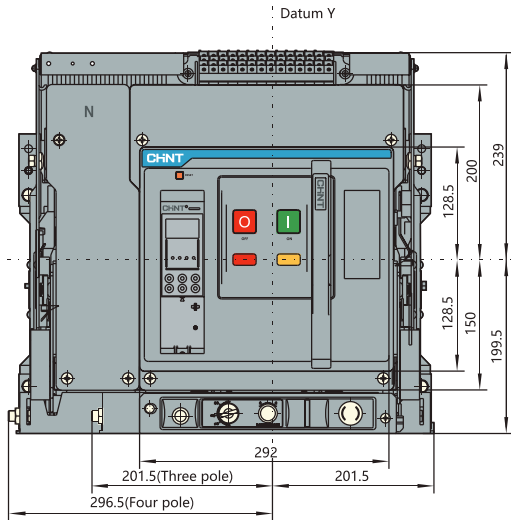


L type vertical connection

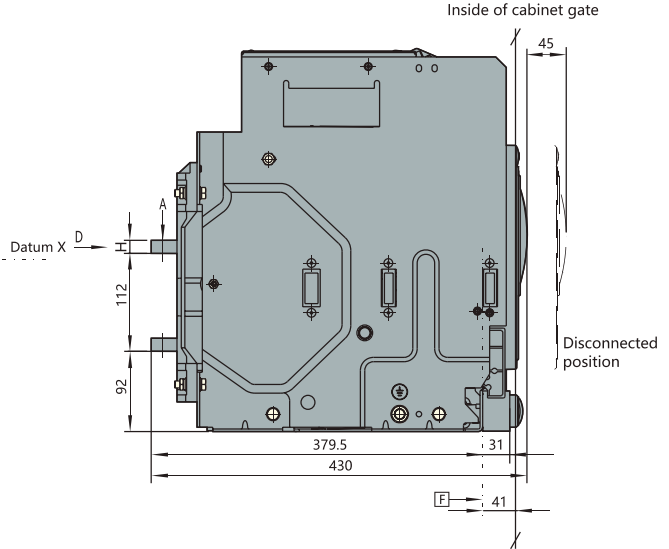


## 2000A draw-out type

Front view

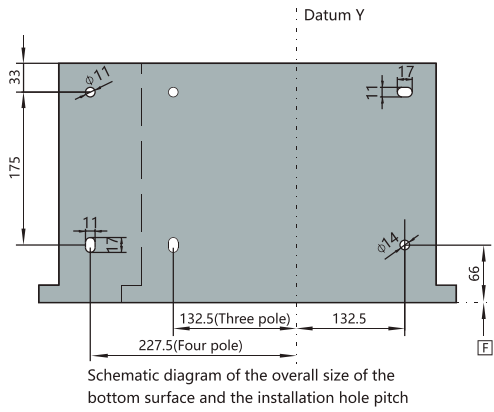


Side view

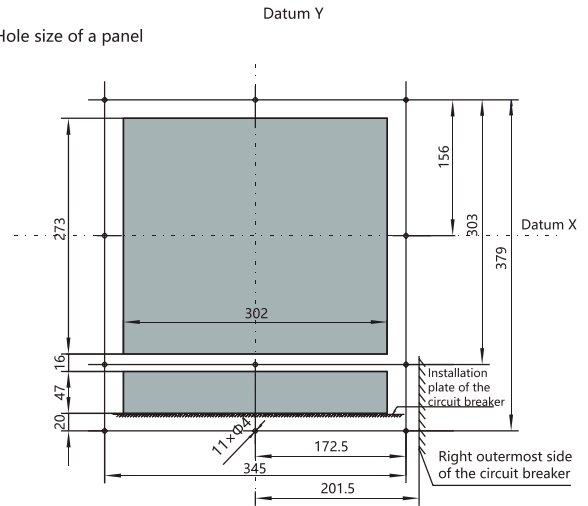


## Hole size

Hole size of the base



Hole size of a panel

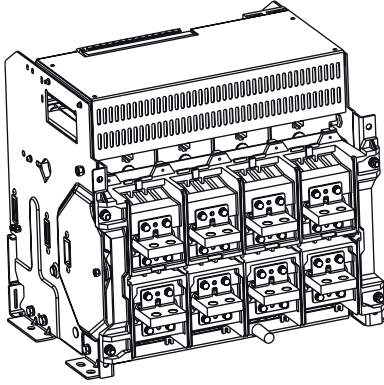


Hole of the panel

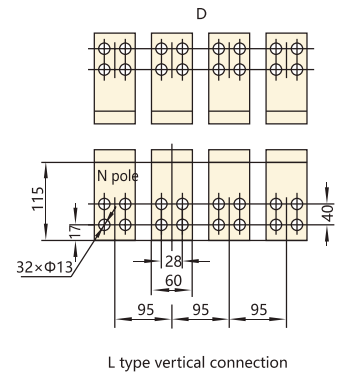
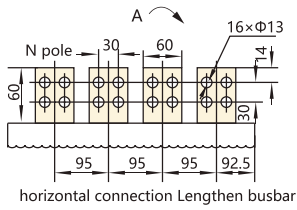
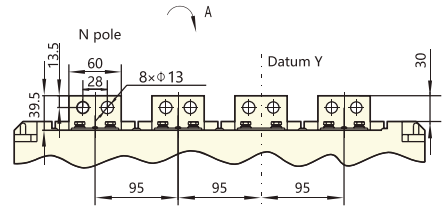
H	Remark
10	In=630A
15	In=800A~1600A
20	In=2000A

Horizontal connection

Side view

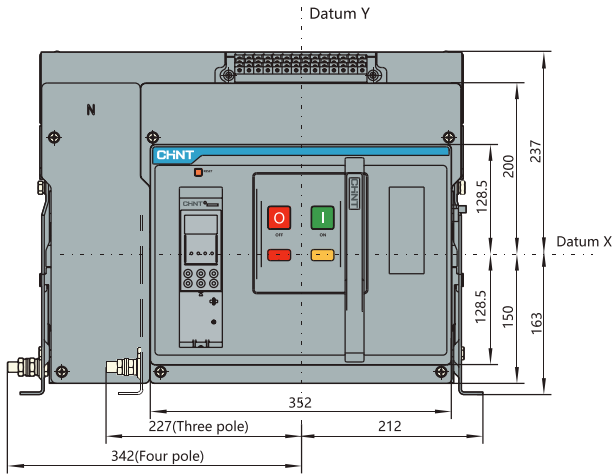


Busbar size and interval

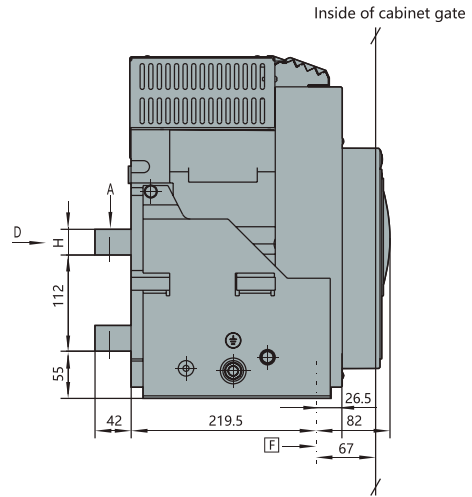


### 3200A fixed type

Front view

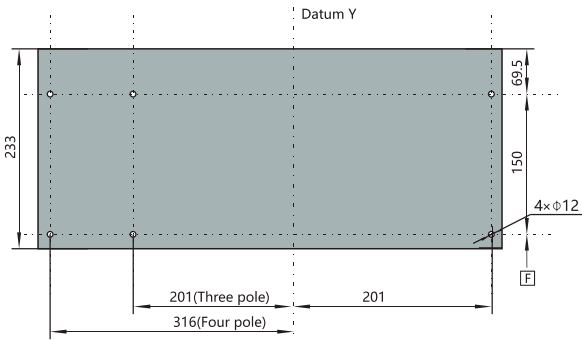


Side view



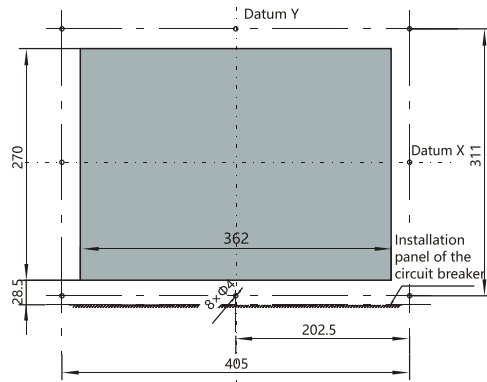
### Hole size

Hole size of the base



Schematic diagram of the overall size of the bottom surface and the installation hole pitch

Hole of the panel



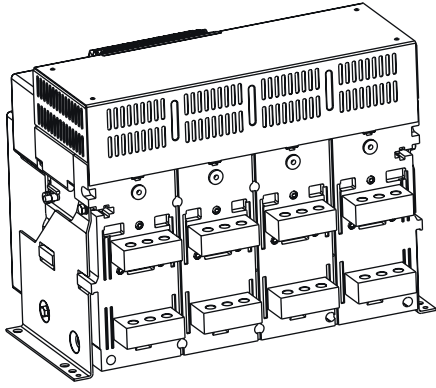
Horizontal connection

H	Remark
20	In=1600A~2500A
30	In=3200A

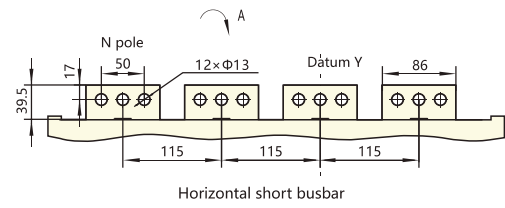
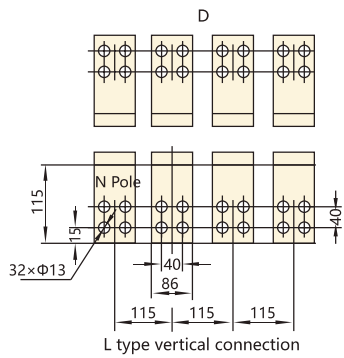
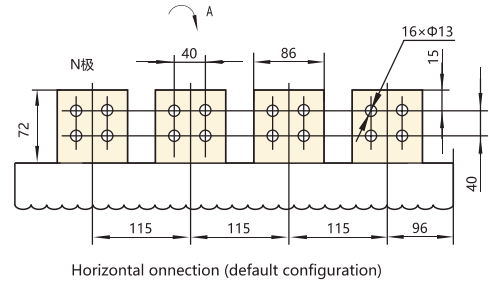


Horizontal connection

Side view

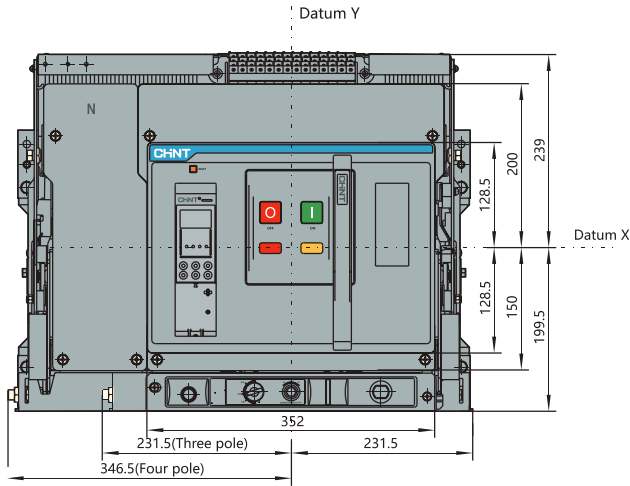


Busbar size and interval

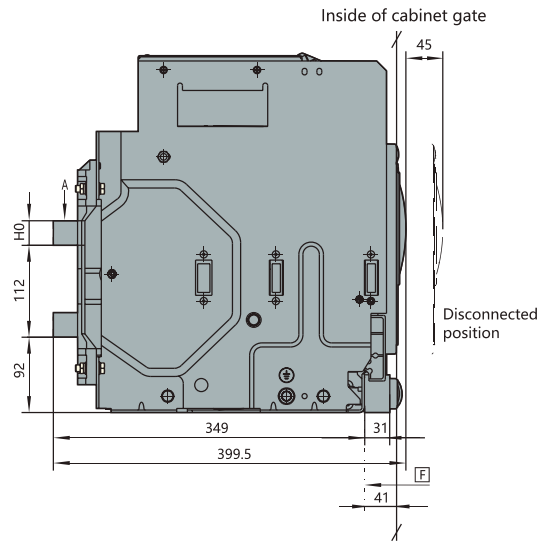


3200A draw-out type(Default configuration)

Front view

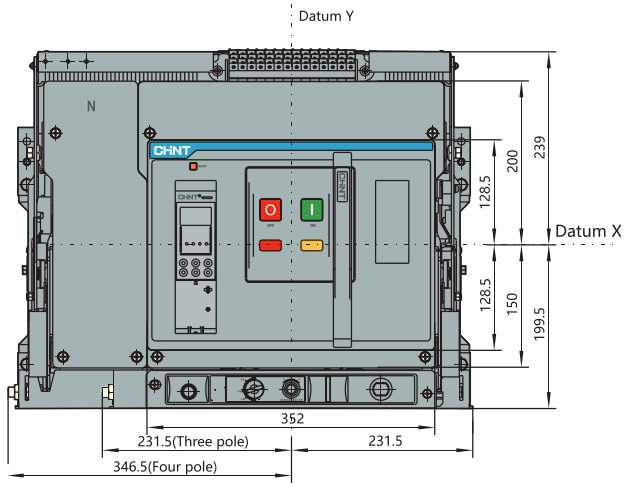


Side view

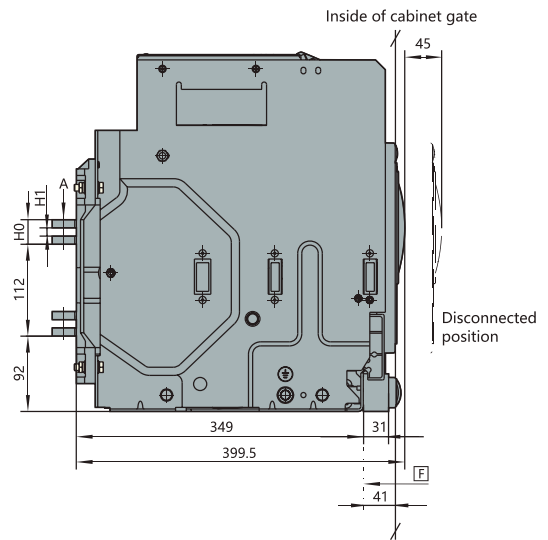


3200A draw-out type(Horizontal short busbar)

Front view

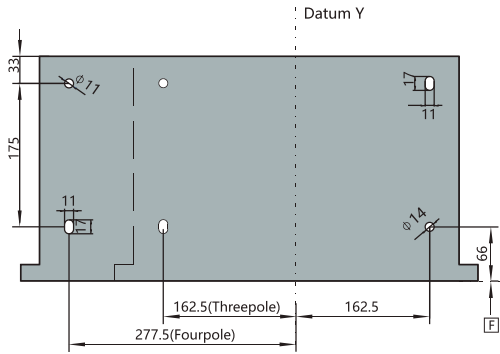


Side view



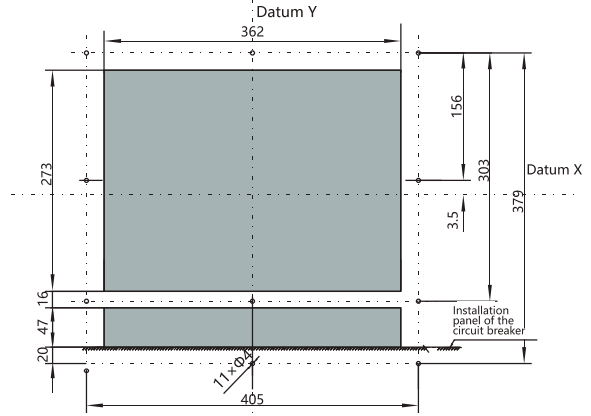
## Hole size

Hole size of the base



Schematic diagram of the overall size of the bottom surface and the installation hole pitch

Hole size of a panel

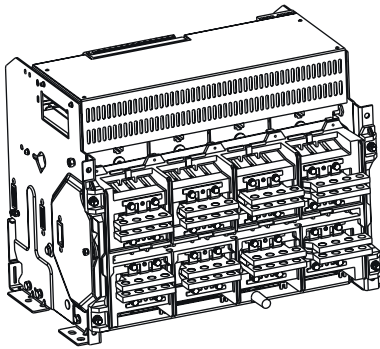


Hole of the panel

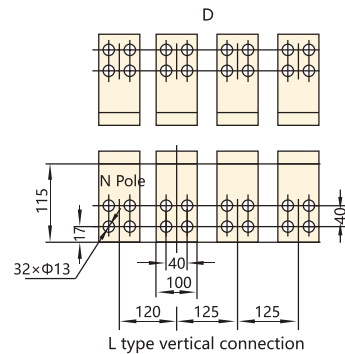
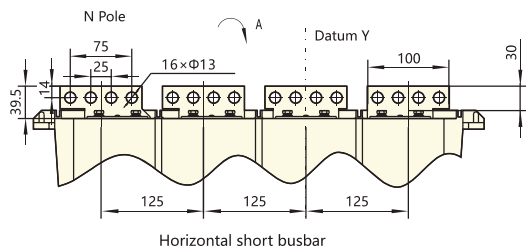
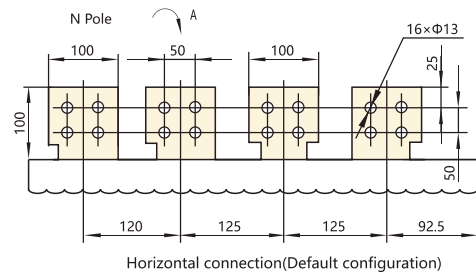
H0	H1	Remark
20	0	In=1600A~2500A
30	10 <sup>+0.1</sup>	In=3200A

## Horizontal connection

Side view



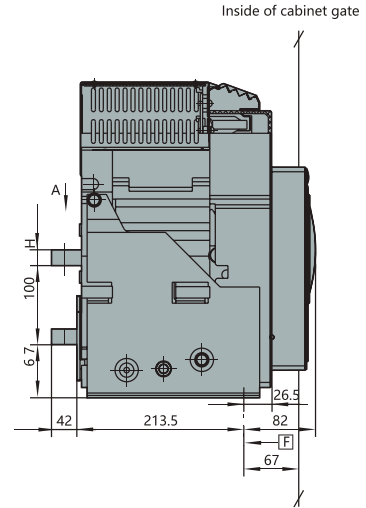
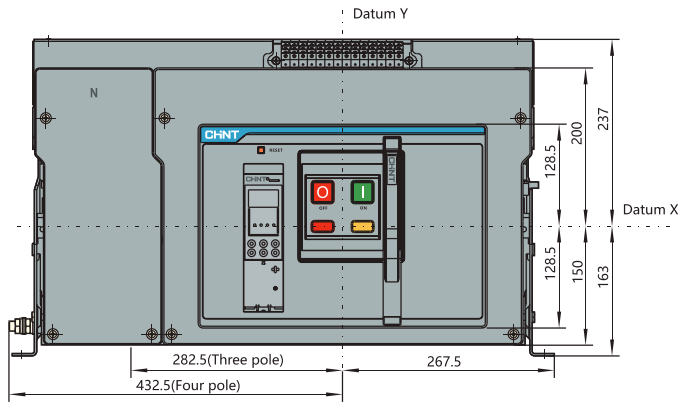
Busbar size and interval



### 4000A fixed type

Front view

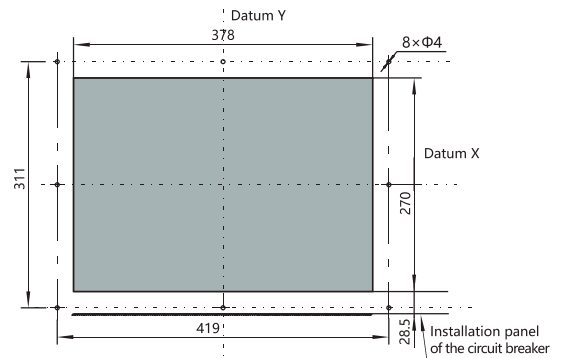
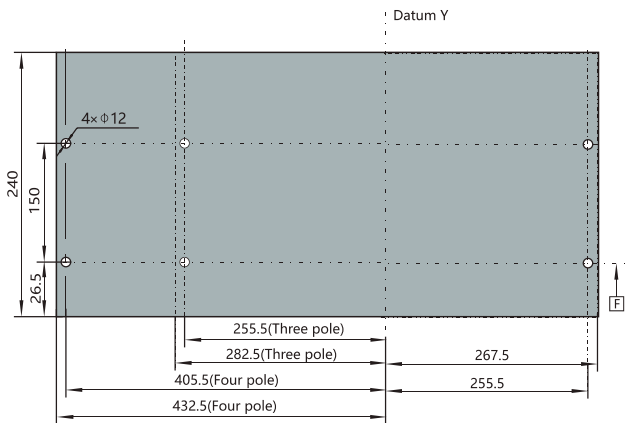
Side view



### Hole size

Hole size of the base

Hole size of a panel



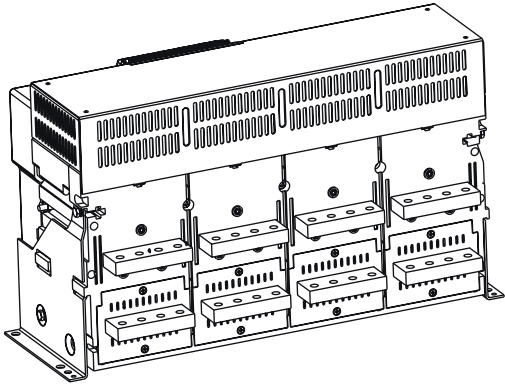
Schematic diagram of the overall size of the bottom surface and the installation hole pitch

Ratio 1:2 Hole size of the panel of the fixed type circuit breaker

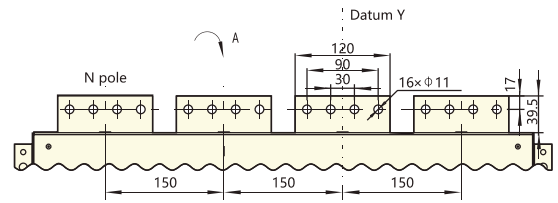
H	Remark
16	In=3200A
20	In=3600A~4000A

## Horizontal connection

Side view

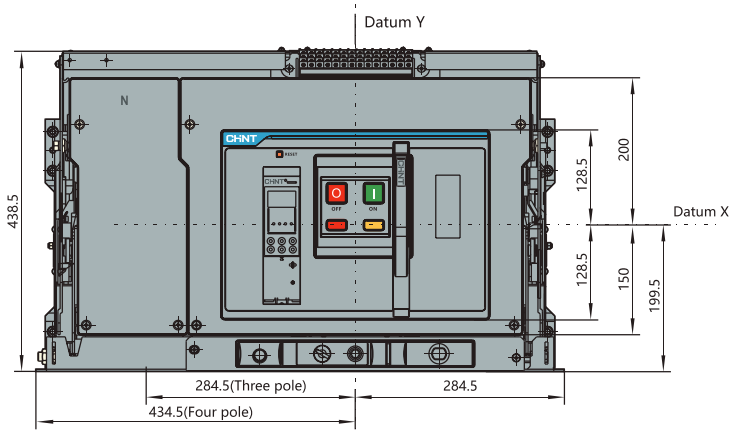


Busbar size and interval

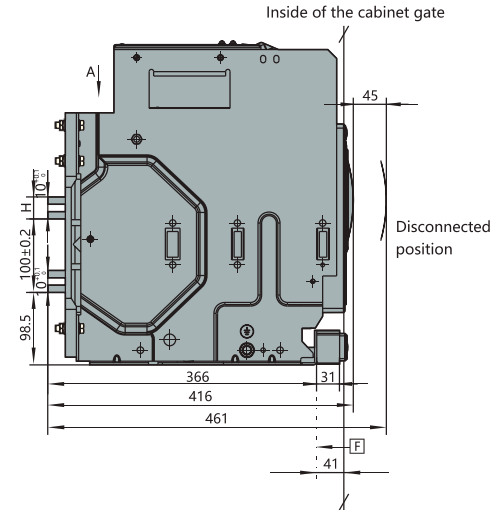


### 4000A draw-out type

Front view

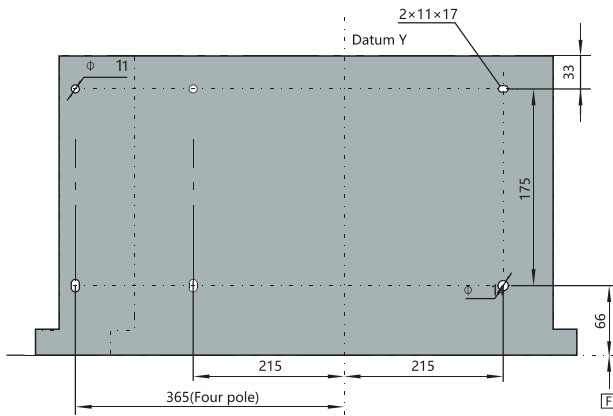


Side view



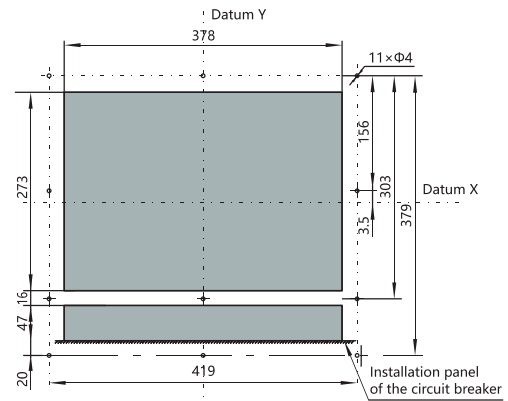
### Hole size

Hole size of the base



Schematic diagram of the overall size of the bottom surface and the installation hole pitch

Hole size of a panel

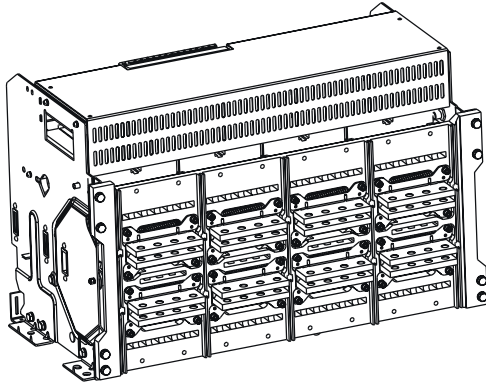


Ratio 1:1 Hole size of the panel of the draw-out type circuit breaker

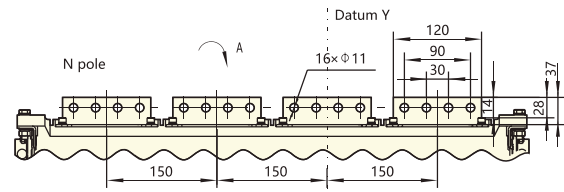
H	Remark
26	In=3200A
30	In=3600~4000A

## Horizontal connection

Side view



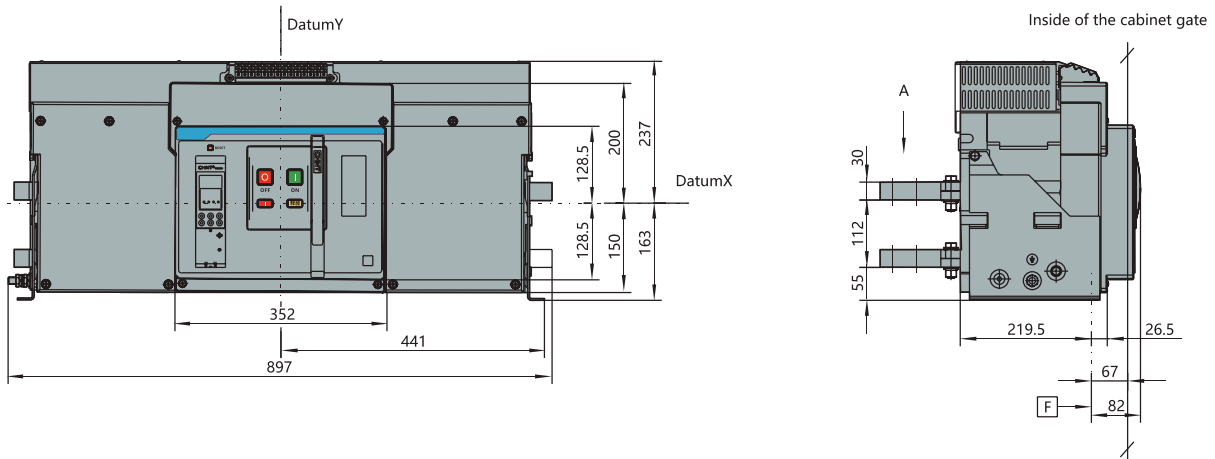
Busbar size and interval



### 6300A fixed type

Front view

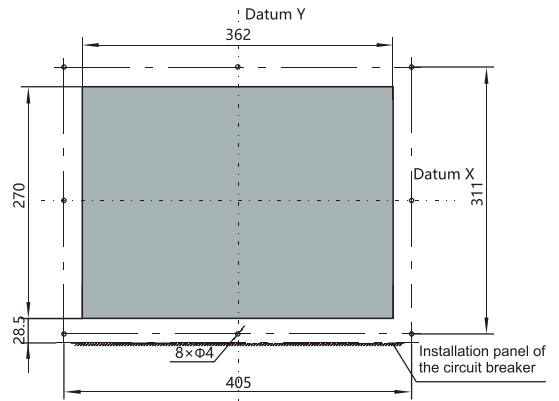
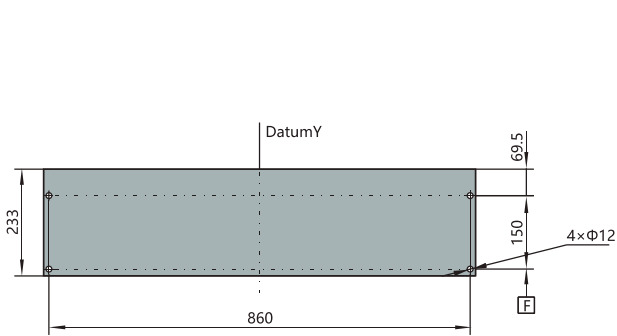
Side view



### Hole size

Hole size of the base

Hole size of panel



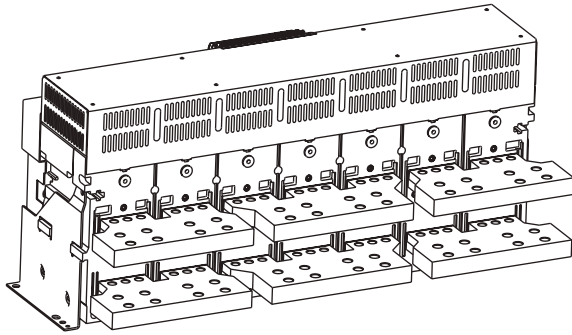
Schematic diagram of the overall size of the bottom surface and the installation hole pitch

Hole size of the panel of the fixed type circuit breaker

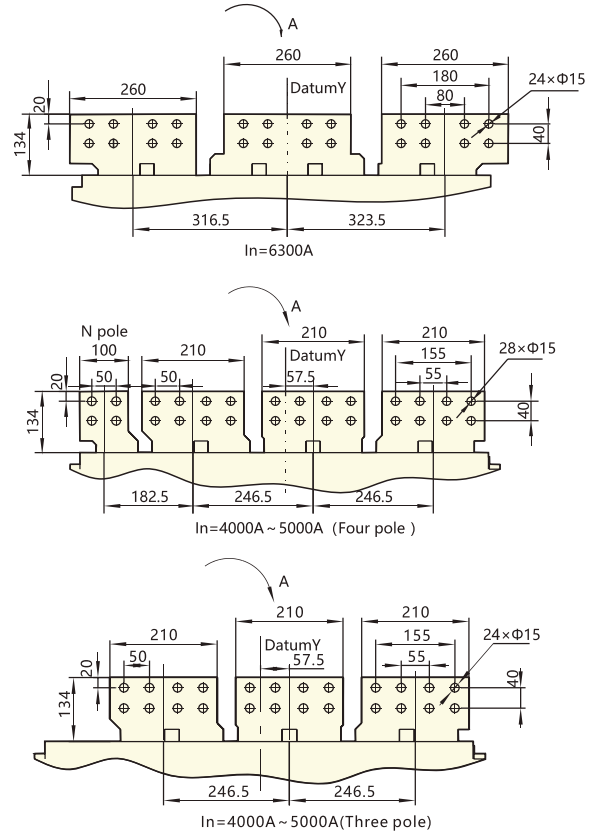


Horizontal connection

Side view

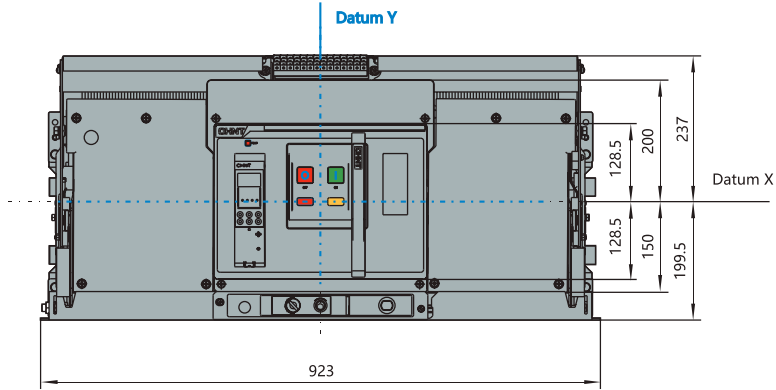


Busbar size and interval

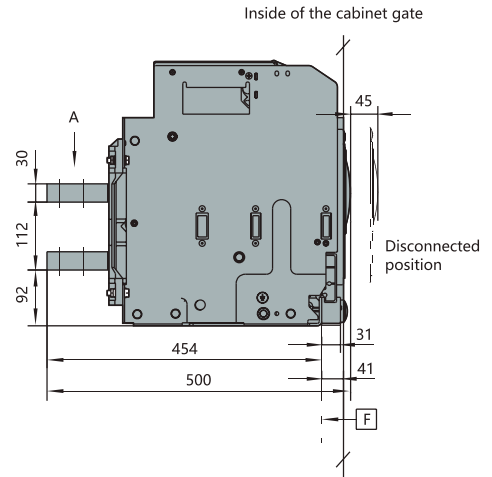


### 6300A draw-out type

Front view

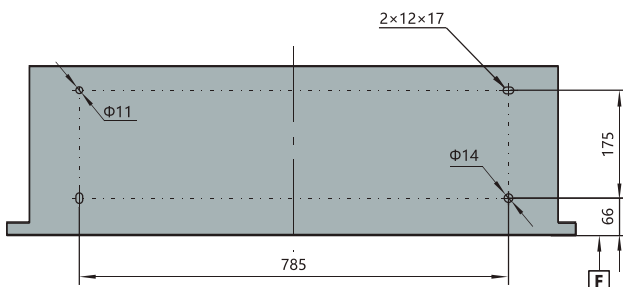


Side view



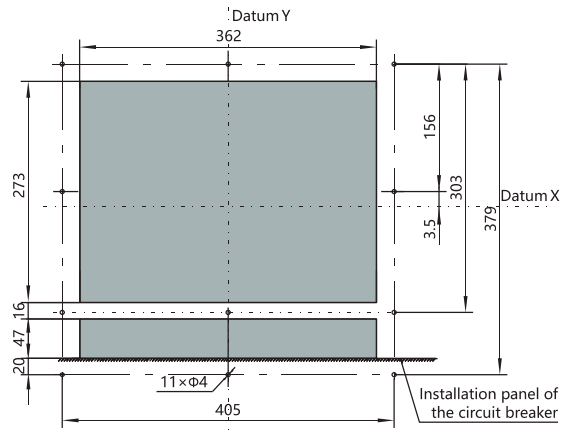
### Hole size

Hole size of the base



Hole size of the panel of the fixed type circuit breaker

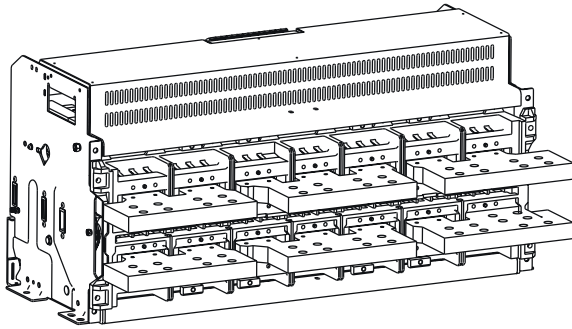
Hole size of panel



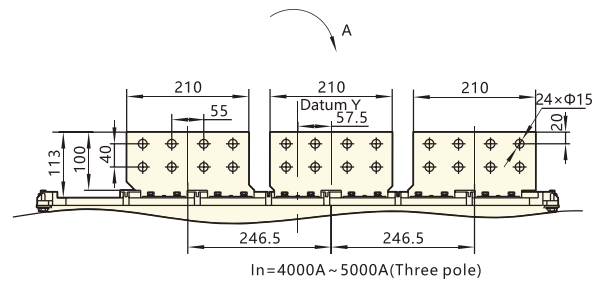
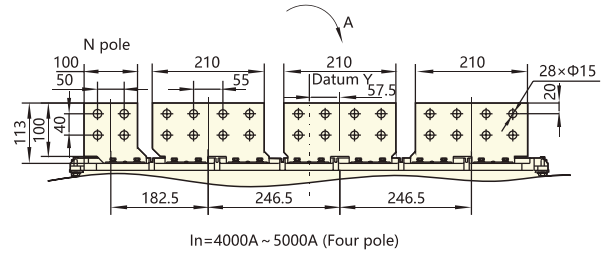
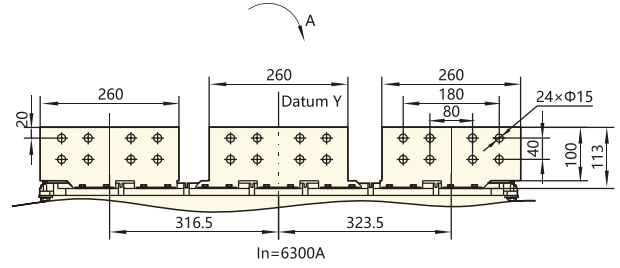
Hole size of the panel of the draw-out type circuit breaker

Horizontal connection

Side view



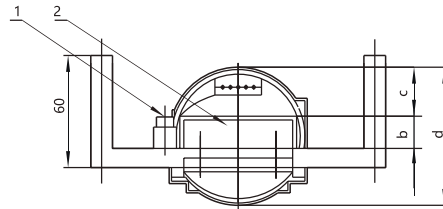
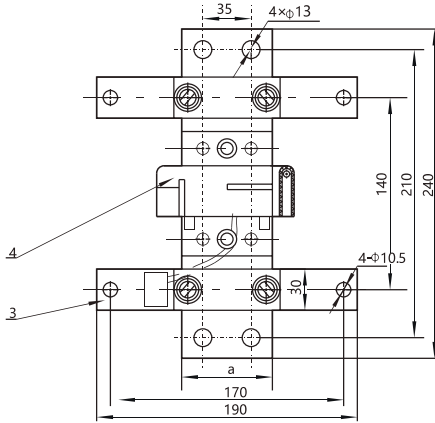
Busbar size and interval



### External transformer (Neutral CT) (3P+N mode)

External transformer (Neutral CT) dimension

The installation overall dimension of an external N-phase transformer is as below when the controller is of 3P+N type.  
The transformer is provided by the manufacturer. A connection copper bar and an installation support are manufactured by users.

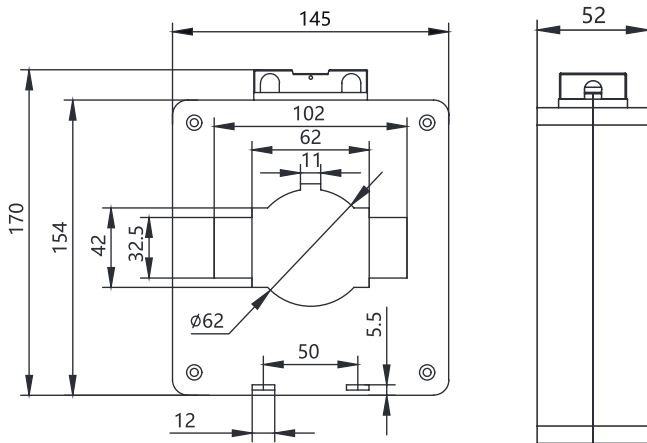


1-Wiring panel 2-Busbar 3-Fixation panel 4-Transformer

Frame size	a	b	c	d
1600	45	20	40	88
2000	60	20	34	89
3200	80	20	35	110
4000	120	20	16	58
6300	80	20	35	110

### 4CT Type earth current transformer

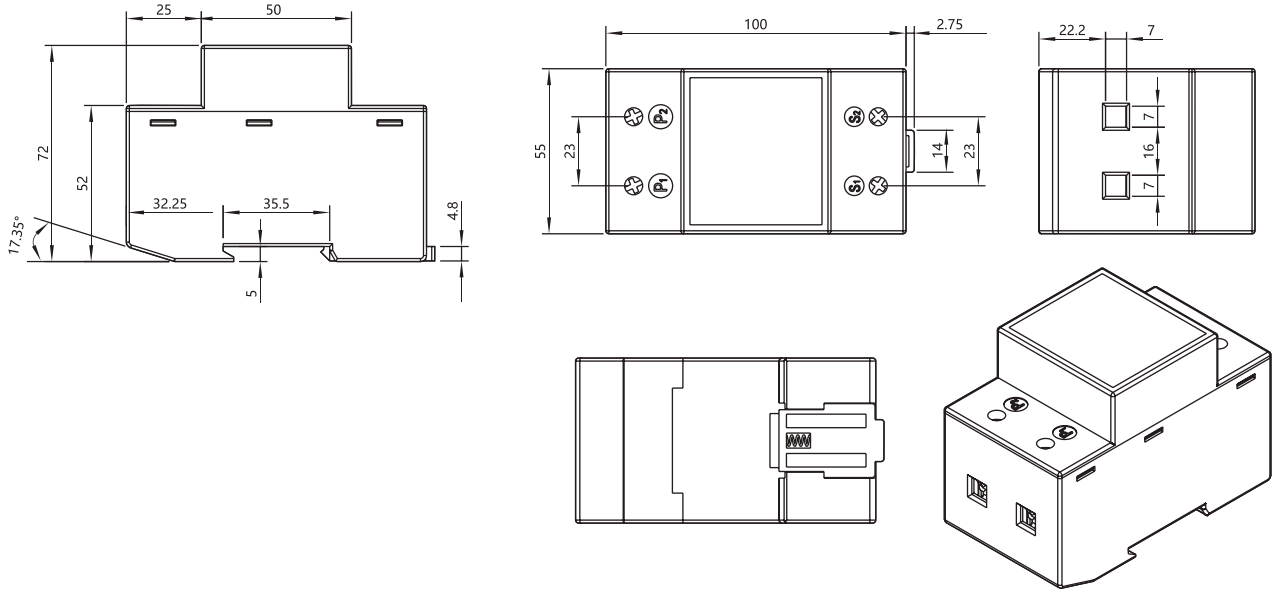
Structural dimension of external earth current transformer (W type)



External ground current transformer size

CTB-2 Type earth current transformer

Structural dimension of external earth current transformer (W type)



Undervoltage time delay controller

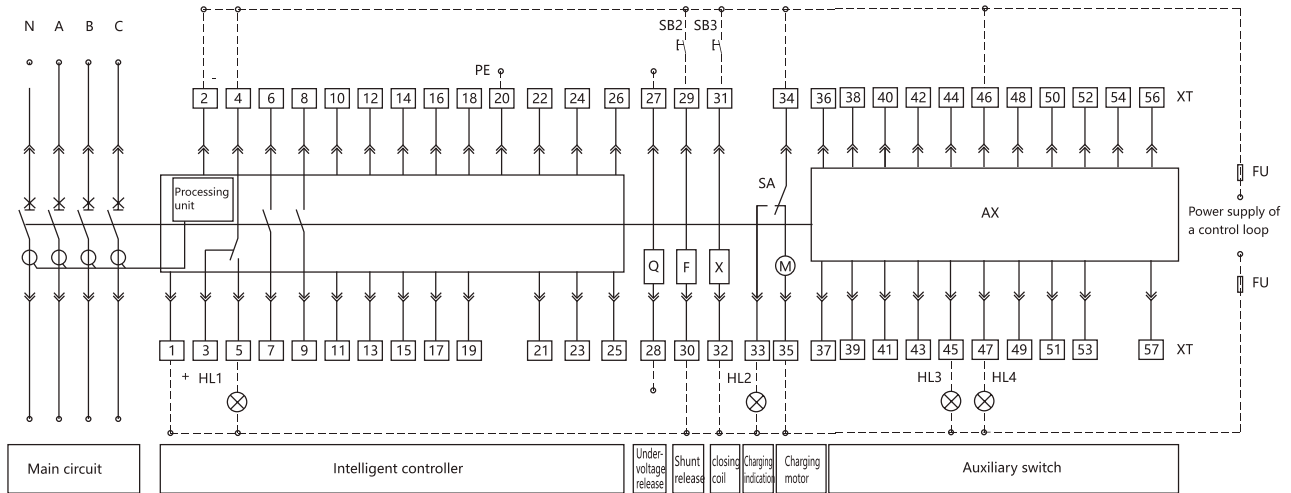
Installation overall dimension of undervoltage time-delay controller which is required to be plugged in the undervoltage time-delay tripper



# Secondary circuit wiring

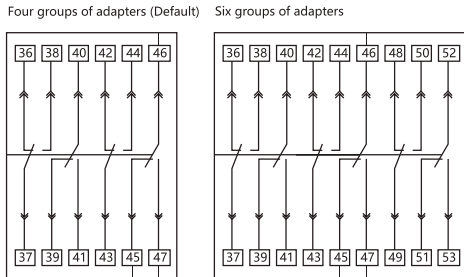
1600A frame

M/A type control unit



## AX auxiliary contact type

For user

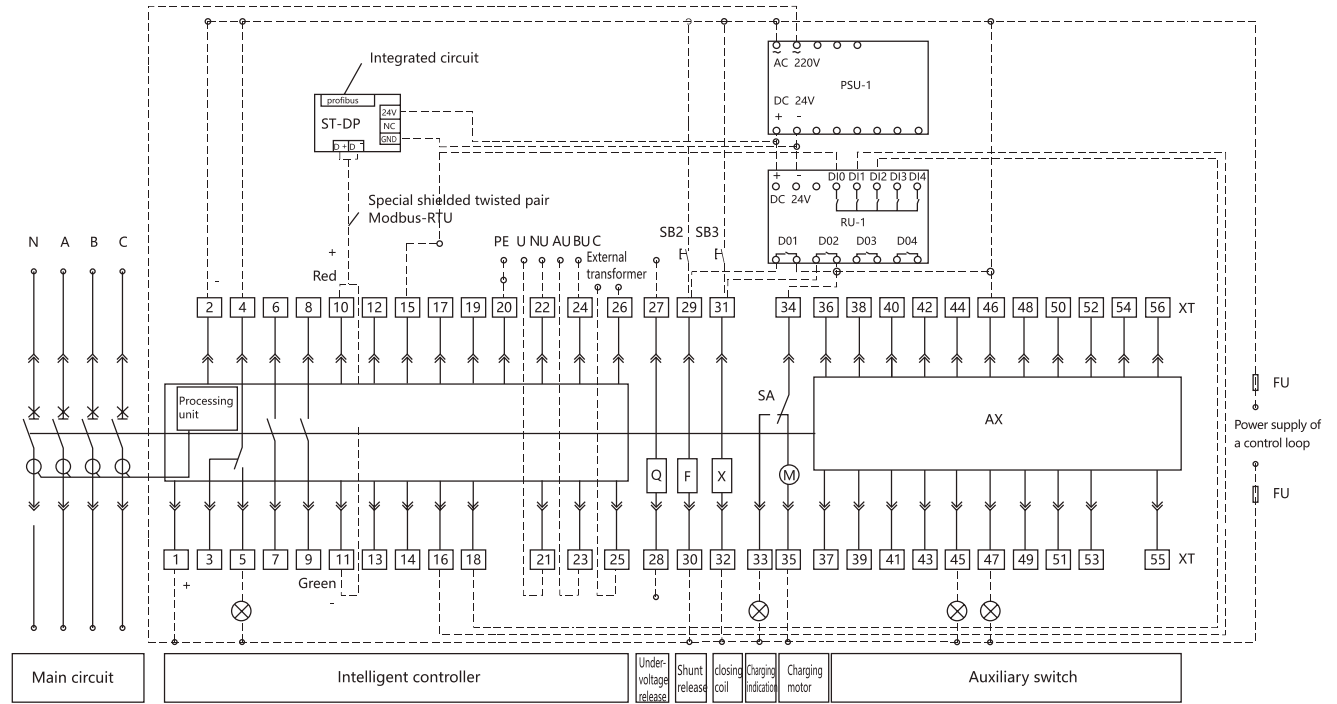


- Q-Undervoltage release F-Shunt release X-Closing coil
- M-Charging motor SA-Limited XT-Wiring terminal
- AX-Auxiliary contact SB1-Emergency stop button
- SB2-Tripping push button SB3-Closing push button HL1-Failure indication lamp
- HL2-Charging indication lamp HL3-Tripping indication lamp
- HL4-Closing indication lamp FU-Fuse (6A)
- 1#, 2#: Power supply of intelligent controller
- 3#~5#: Tripping alarm contact (4-common point)
- 6#, 9#: Auxiliary contact, normally open contact
- 10#~11#: Empty
- 12#~19#: Empty
- 20#: PE line
- 21#~24#: Empty

- 25#~26#: External N-phase transformer input signal contacts. Conventional products are empty. When an external transformer is required to be attached for special order of users, they are external transformer signal input contacts.
- 27#, 28#: Undervoltage release (Connected to the main circuit)
- 29#, 30#: Shunt release
- 31#, 32#: Closing coil
- 33#, 34#: Charging indication
- 34#, 35#: Charging motor
- 36#~56#: Auxiliary contact
- Conventional products are four groups of adapters, and six groups of adapters can be provided(only for AC) for special order for users.
- Note: The full line section is connected, and the dot line is connected by customers.

1600A frame

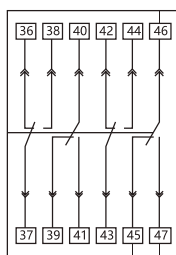
P/H type control unit



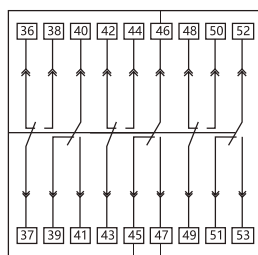
AX auxiliary contact type

For user

Four groups of adapters (Default)



Six groups of adapters



- Q-Undervoltage release F-Shunt release
- X-Closing coil M-Charging motor
- SA-Limited switch XT-Wiring terminal AX-Auxiliary contact
- SB1-Emergency stop button SB2-Tripping push button
- SB3-Closing push button HL1-Failure indication lamp
- HL2-Charging indication lamp
- HL3-Tripping indication lamp HL4-Closing indication lamp
- FU-Fuse (6A) PSU-1—power module
- 1#, 2#: Power supply of intelligent controller
- 3#~5#: Tripping alarm contact (4-common point)
- 6#~9#: Auxiliary contact, normally open contact
- 10#~11#: Defaulted communication output contact for a H type intelligent controller. P type is empty
- 12#~19#: Four groups of programmable output contacts
- 12#: com, 18#:D01, 16#:D02, 14#D03, 13#D04

H type intelligent controller with a programmable output contact outputs in default: 12#, 13#: load 1 alarm, 12#, 14#: load 2 alarm, 12#,16#: tripping signal output, 12#, 18#: Closing signal output

P type intelligent controller with a programmable output contact outputs in default: 12#, 13#: load 1 alarm, 12#, 14#: load C alarm, 12#, 16#: self-diagnosis alarm, 12#, 18#: failure tripping.

20#: PE line.

21#~24#: voltage display input signal contact

P/H type intelligent controller 21#:N-phase voltage signal

22#: A-phase voltage signal 23#:B-phase voltage signal,

24#: C- phase voltage signal

25#~26#: External N-phase transformer or external earth current transformer input signal contacts. Conventional products are empty. When an external transformer is required for special order for users, they are external transformer signal input contacts.

27#, 28#: Undervoltage release (Connected to the main circuit)

29#, 30#: Shunt release

31#, 32#: Closing coil

33#, 34#: Charging indication

34#, 35#: Charging motor

36#~56#: Auxiliary contact

Conventional products are four groups of adapters, and six groups of adapters can be provided for special order for users (only for AC).

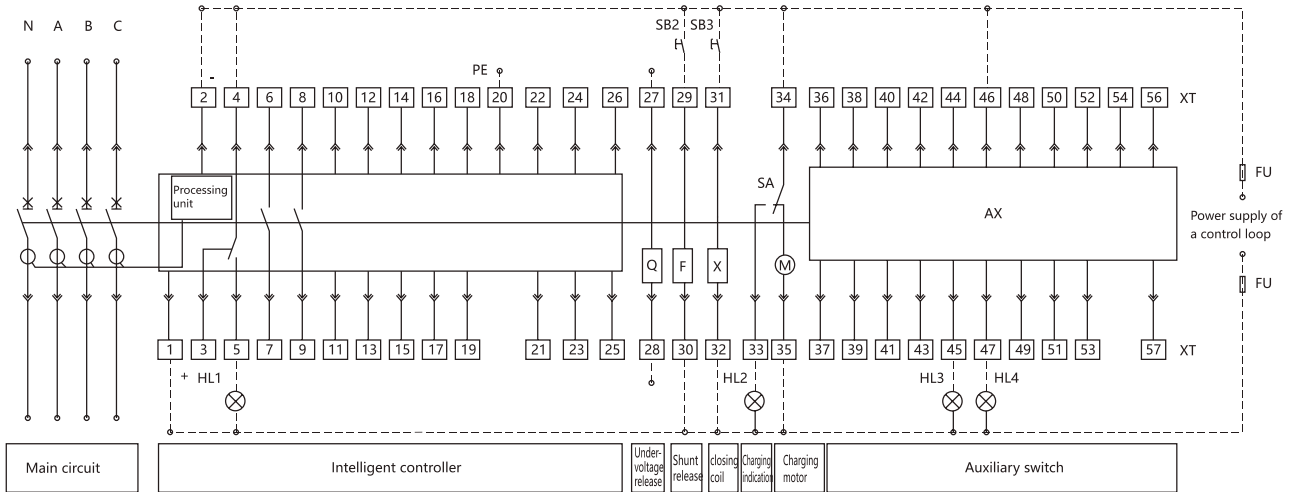
ST-DP: DP protocol module. When the upper computer communication protocol is Modbus-RTU, the ST-DP protocol module is not required. When the upper computer communication protocol is Profibus-DP, the Modbus-RTU protocol module is required to be converted into Profibus-DP protocol by the ST-DP protocol module, extra fee needed.

RU-1 :relay module. The circuit breaker is used for tripping and switching via remote control, and is used for tripping and switching signal energy amplification, extra fee needed.

Note: The full line section is connected, and the dot line should be connected by customers.

2000-6300A frame

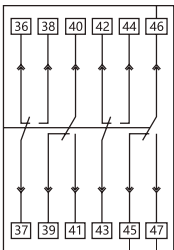
M/A type control unit



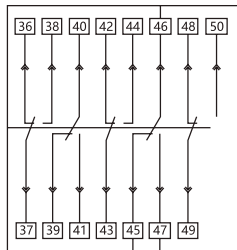
AX auxiliary contact type

For user

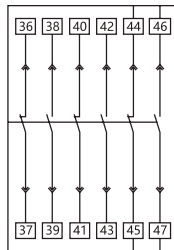
Four groups of adapters (Default)



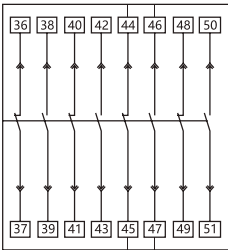
Five groups of adapters



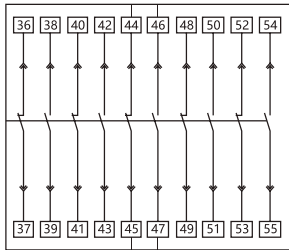
Three-open three-closed auxiliary contact



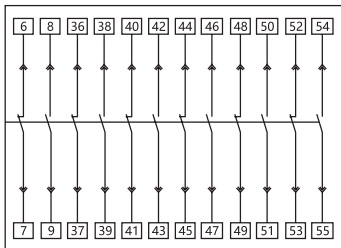
Four-open four-closed auxiliary contact



Five-open five-closed auxiliary contact



Six-open Six-closed auxiliary contact

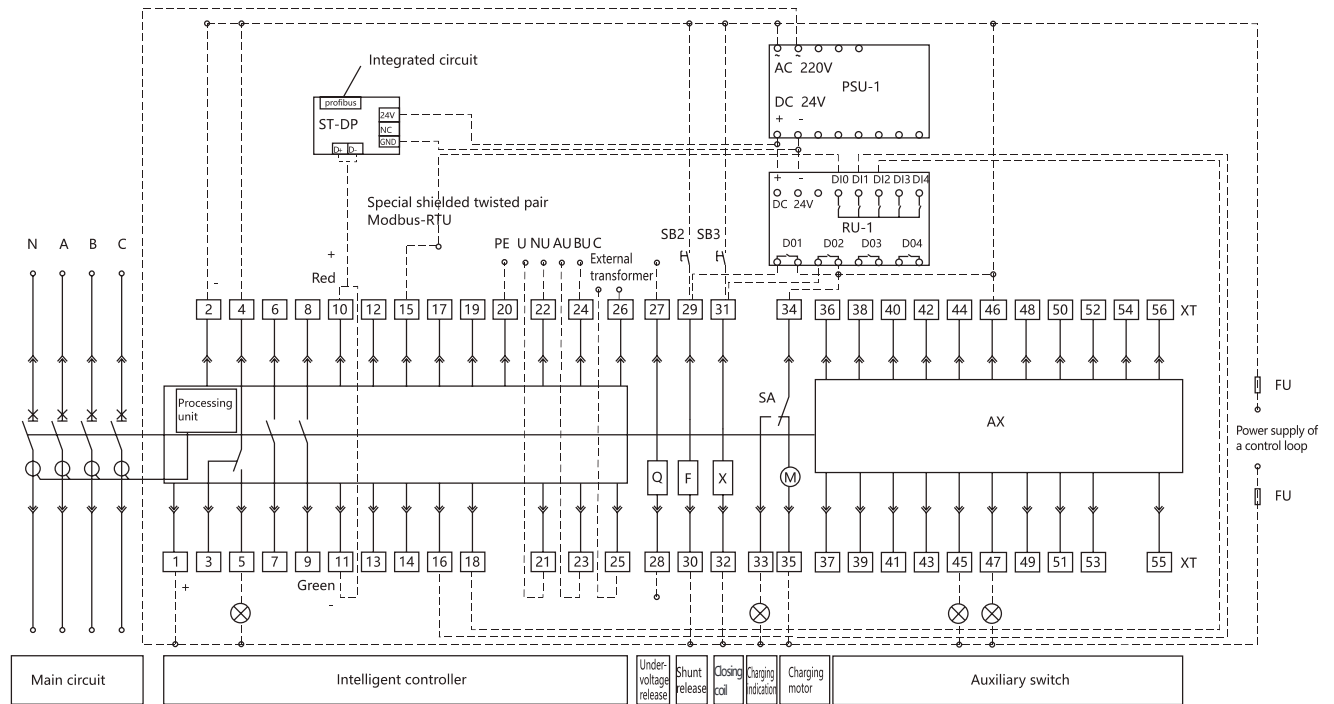


- Q-Undervoltage release F-Shunt release X-Closing coil
  - M-Charging motor SA-Limited switch XT-Wiring terminal
  - AX-Auxiliary contact SB1-Emergency stop button SB2-Tripping push button
  - SB3-Closing push button HL1-Failure indication lamp
  - HL2-Charging indication lamp HL3-Tripping indication lamp
  - HL4-Closing indication lamp FU-Fuse (6A)
  - 1#, 2#: Power supply of intelligent controller
  - 3#~5#: Tripping alarm contact (4-common point)
  - 6#~9#: Auxiliary contact, normally open contact
  - 10#~11#: Empty
  - 12#~19#: Empty
  - 20#: PE line
  - 21#~24#: Empty
  - 25#~26#: External N-phase input signal contacts.
- Conventional products are empty. When an external transformer is required to be attached for special order of users, they are external transformer signal input contacts.
- 27#, 28#: Undervoltage release (Connected to the main circuit or connected to the output of the undervoltage delay module)
  - 29#, 30#: Shunt release
  - 31#, 32#: Closing coil
  - 33#, 34#: Charging indication
  - 34#, 35#: Charging motor
  - 36#~56#: Auxiliary contact
- Conventional products are four groups of adapters.
- The three-open three-closed auxiliary contact, the four-open four-closed auxiliary contact, the five-open five-closed auxiliary contact, and five groups of adapters can be provided for the special order for users.
- Note: 1. the full line section is connected, and the dot line should be connected by customers.
- Note: 2. when the voltages of the controller of the 2000-4000 frame are AC 230V/AC 400V, the controller can be directly connected to 1#, 2#terminals. When the voltage is DC 220V/DC 110V, the controller can be connected to 1#, 2# terminals after the power supply module outputs DC 24V.



2000-6300A frame

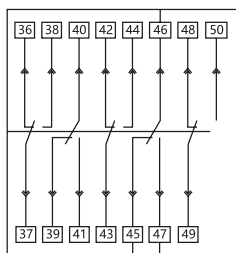
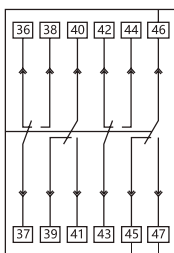
P/H type control unit



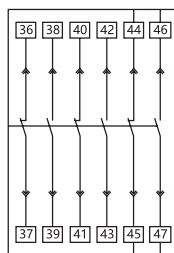
AX auxiliary contact type

For user

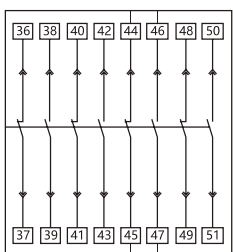
Four groups of adapters (Default) Five groups of adapters



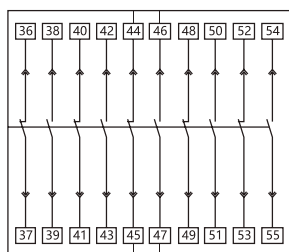
Three-open three-closed auxiliary contact



Four-open four-closed auxiliary contact



Five-open five-closed auxiliary contact



- Q-Undervoltage release F-Shunt release X-Closing coil
- M-Charging motor SA-Limited switch XT-Wiring terminal
- AX-Auxiliary contact SB1-Emergency stop button SB2-Tripping push button
- SB3-Closing push button HL1-Failure indication lamp
- HL2-Charging indication lamp HL3-Tripping indication lamp
- HL4-Closing indication lamp FU-Fuse (6A) PSU-1—power module
- 1#, 2#: Power supply of intelligent controller
- 3#~5#: Tripping alarm contact (4-common point)
- 6#~9#: Auxiliary contact, normally open contact
- 10#~11#: Defaulted communication output contact for a H type intelligent controller.
- P type is empty
- 12#~19#: Four groups of programmable output contacts
- 12#: com, 18 #:D01,16 #:D02,14 #D03,13 #D04
- H type intelligent controller with a programmable output contact outputs in default: 12#, 13#: load 1 alarm, 12#, 14#: load 2 alarm, 12#,16#: tripping signal output, 12#, 18#: switching signal output.
- P type intelligent controller with a programmable output contact outputs in default: 12#, 13#: load 1 alarm, 12#, 14#: load C alarm, 12#,16#: self-diagnosis alarm, 12#, 18#: failure tripping.
- 20#: PE line.

21#~24#: voltage display input signal contact  
P/H type intelligent controller

21#: N-phase voltage signal, 22#: A-phase voltage signal  
23#: B-phase voltage signal, 24#: C-phase voltage signal

25#~26#: External N-phase transformer or external earthing  
current transformer input signal contacts.

Conventional products are empty. When an external transformer  
is required for special order for users, they are external transformer  
signal input contacts.

27#, 28#: Undervoltage release (Connected to the main circuit or connected to the output of  
the undervoltage delay module)

29#, 30#: Shunt release, 31#, 32#: Closing coil, 33#, 34#: Charging indication

34#, 35#: Charging motor, 36#~56#: Auxiliary contact

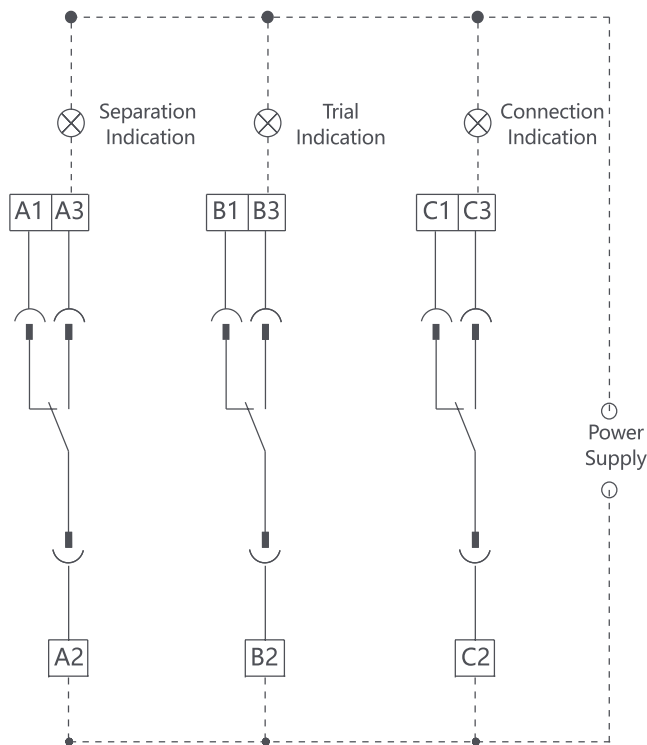
Conventional products are four groups of adapters. The three-open three-closed auxiliary  
contact, the four-open four-closed auxiliary contact, the five-open five-closed auxiliary  
contact, and five groups of adapters can be provided for the special order for users.  
ST-DP: DP protocol module. When the upper computer communication protocol  
is Modbus-RTU, the ST-DP protocol module is not required. When the upper computer  
communication protocol is Profibus-DP, the Modbus-RTU protocol module is  
required to be converted into Profibus-DP protocol by the ST-DP protocol module, extra  
fee needed.

RU-1: relay module. The circuit breaker is used for breaking and making via remote  
control, and is used for breaking and making signal energy amplification, extra fee needed.  
Note: 1. the full line section is connected, and the dot line should be connected by  
customers.

Note: 2. when the voltages of the controller of the 2000-4000 frame are AC 230V/AC 400V,  
the controller can be directly connected to 1#, 2#terminals.  
When the voltage is DC 220V/DC 110V, the controller can be connected to  
1#, 2# terminals after the power supply module outputs DC 24V.

Chassis position indicator device

Wiring diagram



Operation requirements:

- 1.The chassis indication device can indicate the positions including "disconnected" , "test" and "connected"which are completely or partially used according to the requirements of order.
- 2.When the body of the draw-out type circuit breaker is pushed from the "disconnected" position to the "test" position, 55# and 56# terminals should be transferred from connection into disconnection, and 56# and 57# terminals should be transferred from disconnection to connection.
- 3.When the body of the draw-out type circuit breaker is pushed from the "disconnected" position to the "test" position, 58# and 59# terminals should be transferred from connection into disconnection, and 59# and 60# terminals should be transferred from disconnection to connection. There is sufficient safety distance between the bus of the circuit breaker body and a bridge-type contact of the safety shutter, and tripping and switching operation can be carried out reliably.
- 4.When the body of the draw-out type circuit breaker is switched from the "test" position to the "connected" position, NXA16 type secondary circuit has no clearance. The NXA20-63 type safety shutter swing continuously after sending out the "cracking" sound, and the safety shutter jiggle handle rotates within 1.5 circles. 61# and 62# terminals are being transferred from connection to disconnection. 62# and 63# terminals are transferred from disconnection to connection. The busbar of circuit breaker body is required to be reliably inserted into the bridge-type contact of the chassis base, and reliably bear the main circuit current to operate.
- 5.When the body of the draw-out type circuit breaker is pushed from the "connected" position to the "test" position, 58# and 59# terminals should be transferred from connection into disconnection, and 59# and 60# terminals should be transferred from disconnection to connection. There is sufficient safety distance between the busbar of the circuit breaker body and a bridge-type contact of the chassis, and tripping and switching operation can be carried out reliably.
- 6.When the body of the draw-out type circuit breaker swings from the "test" position to the "disconnected" position, 55# and 56# terminals should be transferred from connection to disconnection, and 56# and 57# terminals should be transferred from disconnection to connection, and at the same time, the circuit breaker body still cannot be drawn out, and needs to swing toward the "disconnected" position until the handle cannot swing any more, and meanwhile, the circuit breaker body can be drawn out. After the circuit breaker is pulled out, 55# and 56# terminals should be transferred from disconnection to connection, and 56# and 57# terminals should be transferred from connection to disconnection.
- 7.In the position transfer operation process of the chassis, the operation can only be stopped when the indicator points to "disconnected", "test" and "connected" or the position indicator cannot display the position of the circuit breaker body in the chassis correctly.
- 8.The above terminal numbers are all position signal specific numbers (55#-63#), which are not compatible with secondary circuit terminal numbers.

Position signal contact capacity

Rated voltage (V)	Rated heating current Ith(A)	Rated operating current Ie(A)	Rated control capacity
Ac230	5	1.3	300VA
Ac400	5	0.75	300VA

Standard configuration	1600A frame		2000A frame		3200A frame		4000A frame		6300A frame	
	Fixed type	draw-out type	Fixed type	draw-out type	Fixed type	draw-out type	Fixed type	draw-out type	Fixed type	draw-out type
Circuit breaker body	■	■	■	■	■	■	■	■	■	■
Chassis		■		■		■		■		■
Intelligent controller	■	■	■	■	■	■	■	■	■	■
Vertical and horizontal connection	■	■	■	■	■	■	■	■	■	■
ON/OFF indication contact 4CO	■	■	■	■	■	■	■	■	■	■
Failure tripping indication contact	■	■	■	■	■	■	■	■	■	■
Motor operating mechanism	■	■	■	■	■	■	■	■	■	■
Closing coil	■	■	■	■	■	■	■	■	■	■
Shunt release	■	■	■	■	■	■	■	■	■	■
Door frame	■	■	■	■	■	■	■	■	■	■

Optional accessories	1600A frame		2000A frame		3200A frame		4000A frame		6300A frame	
	Fixed type	draw-out type	Fixed type	draw-out type	Fixed type	draw-out type	Fixed type	draw-out type	Fixed type	draw-out type
Standard undervoltage release	■	■	■	■	■	■	■	■	■	■
Adjustable time-delay undervoltage unit	■	■	■	■	■	■	■	■	■	■
Pushbutton lock	■	■	■	■	■	■	■	■	■	■
"Disconnected" position padlock		■		■		■		■		■
Safety shutters padlock		■		■		■		■		■
Body lock	■	■	■	■	■	■	■	■	■	■
Position door interlock		■		■		■		■		■
State door interlock		■		■		■		■		■
ON/OFF indication contact 6CO	■	■								
ON/OFF indication contact 5NO + 5NC			■	■	■	■	■	■	■	■
ON/OFF indication contact 3NO + 3NC			■	■	■	■	■	■	■	■
ON/OFF indication contact 4NO+4NC			■	■	■	■	■	■	■	■
ON/OFF indication contact 5CO			■	■	■	■	■	■	■	■
"Connected", "Disconnected" and "test" position indication contact		■		■		■		■		■
Mechanical interlock	■	■	■	■	■	■	■	■	■	■
Source-changeover controller	■	■	■	■	■	■	■	■	■	■
External transformer (Neutral CT)	■	■	■	■	■	■	■	■	■	■
Earth current transformer and accessories thereof	■	■	■	■	■	■	■	■	■	■
Interphase barrier	■	■	■	■	■	■	■	■	■	■
Triple mechanical interlock			■	■	■	■	■	■	■	■

Frame size	1600A			2000A			3200A			4000A			6300A			
Circuit breaker	N <input type="checkbox"/>	S <input type="checkbox"/>	H <input type="checkbox"/>	N <input type="checkbox"/>	S <input type="checkbox"/>	H <input type="checkbox"/>	N <input type="checkbox"/>	S <input type="checkbox"/>	H <input type="checkbox"/>	N <input type="checkbox"/>	S <input type="checkbox"/>	H <input type="checkbox"/>	H <input type="checkbox"/>			
Rated current	400A <input type="checkbox"/>			630A <input type="checkbox"/>			1600A <input type="checkbox"/>			3200A <input type="checkbox"/>			4000A <input type="checkbox"/>			
	630A <input type="checkbox"/>			800A <input type="checkbox"/>			2000A <input type="checkbox"/>			3600A <input type="checkbox"/>			5000A <input type="checkbox"/>			
	800A <input type="checkbox"/>			1000A <input type="checkbox"/>			2500A <input type="checkbox"/>			4000A <input type="checkbox"/>			6300A <input type="checkbox"/>			
	1000A <input type="checkbox"/>			1250A <input type="checkbox"/>			3200A <input type="checkbox"/>									
	1250A <input type="checkbox"/>			1600A <input type="checkbox"/>												
Number of poles	3 pole <input type="checkbox"/>			4 pole <input type="checkbox"/> (While In=6300A, no four poles)												
Installation modes	Horizontal draw-out <input type="checkbox"/>						Fixed and horizontal <input type="checkbox"/>									
Intelligent controller	M type <input type="checkbox"/>			A type <input type="checkbox"/>			P type <input type="checkbox"/>			H type <input type="checkbox"/>						
	AC110V <input type="checkbox"/>			AC220/230/240V <input type="checkbox"/>			AC 380/400/415V <input type="checkbox"/>			DC110V <input type="checkbox"/>			DC220V <input type="checkbox"/>			
Electric accessories (no AC110V for NXA16)	Under-voltage release (no DC)( Optional)			AC110V <input type="checkbox"/>			AC220/230/240V <input type="checkbox"/>			AC 380/400/415V <input type="checkbox"/>			Order_____ V <input type="checkbox"/>			
				helped & instantaneous <input type="checkbox"/> helped & delay (Inm≥2000A ,delay time:1s,3s,5s, non-adjustable). <input type="checkbox"/>									self-priming & instantaneous <input type="checkbox"/> self-priming & delay (Inm≥2000A,delay time:0.3~7.5s, adjustable) <input type="checkbox"/>			
	shunt release (default in motor operation)			Intermittent (only for Inm≥2000A, by default in motor operation) <input type="checkbox"/>						AC 110V <input type="checkbox"/>			AC220/230/240V <input type="checkbox"/>	AC380/400/415V <input type="checkbox"/>		
	closed electromagnet (default in motor operation)			pulse (must select pulse type in the automatic control system) <input type="checkbox"/>						DC110V <input type="checkbox"/>			DC220V <input type="checkbox"/>			
Auxiliary contact	Motor AC110V <input type="checkbox"/>												AC220/230/240V <input type="checkbox"/>	AC380/400/415V <input type="checkbox"/>	DC110V <input type="checkbox"/>	DC220V <input type="checkbox"/>
Connection accessories	NXA16: C04 <input type="checkbox"/> C06 <input type="checkbox"/> (C06 only for AC) NXA20~63: N3 <input type="checkbox"/> N4 <input type="checkbox"/> N5 <input type="checkbox"/> C03 <input type="checkbox"/> C04 <input type="checkbox"/> C05 <input type="checkbox"/>															
Controller accessories (Match)	Interphase barrise <input type="checkbox"/>															
Lock mechanism (Match)	External transformer: Earth current transformer <input type="checkbox"/>												External transformer (Neutral CT) <input type="checkbox"/>			
Mechanical interlock (Match)	Note: <sup>1)</sup> Neutral CT is only applicable to 3P+N <sup>2)</sup> The earth current transformer should be selected when customers select earth current return type earthing protection.															
Source-changeover controller (Match)	Pushbutton lock <input type="checkbox"/> Safety shutters padlock <input type="checkbox"/> Body lock <input type="checkbox"/> One-lock one-key <input type="checkbox"/> Two-locks one-key <input type="checkbox"/>															
	Three-locks two-keys <input type="checkbox"/> "Disconnected" position padlock <input type="checkbox"/> Door interlock (Body) <input type="checkbox"/> Door interlock (chassis) <input type="checkbox"/>															
	MI-3(2on+1off) <input type="checkbox"/> MI-4 (1on+2off) <input type="checkbox"/> ILK2 <input type="checkbox"/>															
	1 "Normal" and 1 "Replacement" <input type="checkbox"/> 2 "Incoming" and 1 "Busbar" <input type="checkbox"/>															



## Earth protection

There are two protected modes for metal single-phase earth fault, namely vector sum(T) and earth current(W).Type-T detects zero sequence current and four-phase current vector(three-phase four-wire system) or three-phase current vector(three-phase three-wire system) will be added to provide reference for earth protection. Type-W detects earthing cable current directly by special external transformer. Type-W can protect both stages of breaker at the same time. Distance between the transformer and breaker should be no more than 5m. Zone interlocking can be used in the condition of vector sum earth fault.

a.correlation setting parameters of earth protection

Parameter Names	Setting range	Setting step size	Remarks
Set value of action current I <sub>g</sub>	OFF+(0.2~1.0)×I <sub>n</sub> (Frame NXA16/NXA20, Max= 1200A) OFF+(500A~1200A) (Frame NXA32/NXA40/NXA63)	1A	
delay time T <sub>g</sub>	(0.1~0.4)S	0.1s	
Zone interlocking of earth fault (for T-type earth fault) (ZSI)	1.At least one way of DO should be set as "Zone Interlocking" or "earth Interlocking" 2.At least one way of DI should be set as "Zone Interlocking" or "earth Interlocking"		Signal unit options must be S2 or S3 When DI/DO is set as zone interlocking , it effects "Earth Zone Interlocking" and "Short Zone Interlocking" When DI/DO is set as earth interlocking, it only effects "earth Zone Interlocking". If the function isn't set, it has no effect.

b. Operating characteristic of earth protection

Characteristic	I/I <sub>g</sub>	Tripping time	Permissible error
Non-operating characteristic	< 0.9	Non-operate	
Operation characteristic	> 1.1	Operate	
Time-delay operation	≥1.1	Note	±15% or inherent absolute error±40ms(choose the max value)

Note: The delay time of earth fault is divided into two stages, inverse time and definite time. When fault current is less than 1.0I<sub>n</sub> or 1200A,the protection is inverse, the time delay is calculated as follow:

$$t=(1.0I_n \text{ or } 1200A/I)^2 \times T_g$$

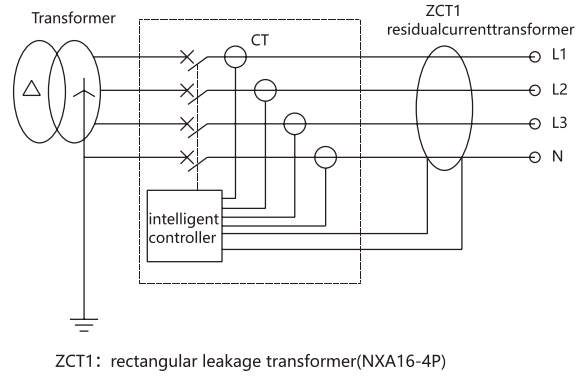
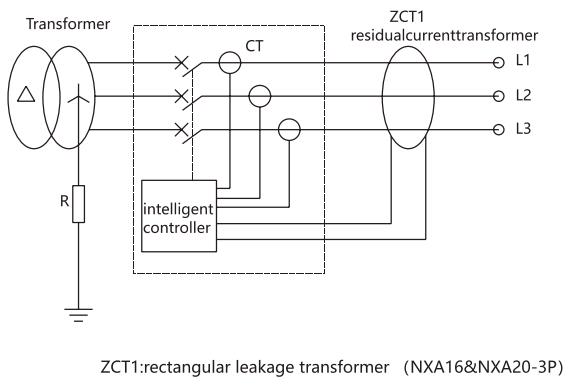
In this equation: t---action time

T<sub>g</sub> --- setting delay time

I---fault earth current



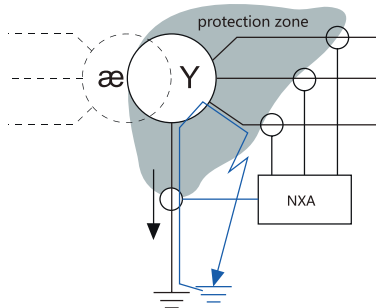
c. Schematic Diagram of leakage protection



Note: For Frame nxa16(3P&4P) and NXA20(3P) products, busbar can go through ZCT1, however, not for Frame NXA20 4P and FrameNXA32/NXA40/NXA63.

Dual earth fault protection

NXA P/H type controller has a unique feature: the installation of two independent earth fault protection curves is permissible, so that two kinds of configurations can be managed at the same time. The release can differentiate unlimited regional earth faults because of the feature to command the NXA circuit breaker to trip and the limited regional earth fault to command the medium-voltage circuit breaker to strip.







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