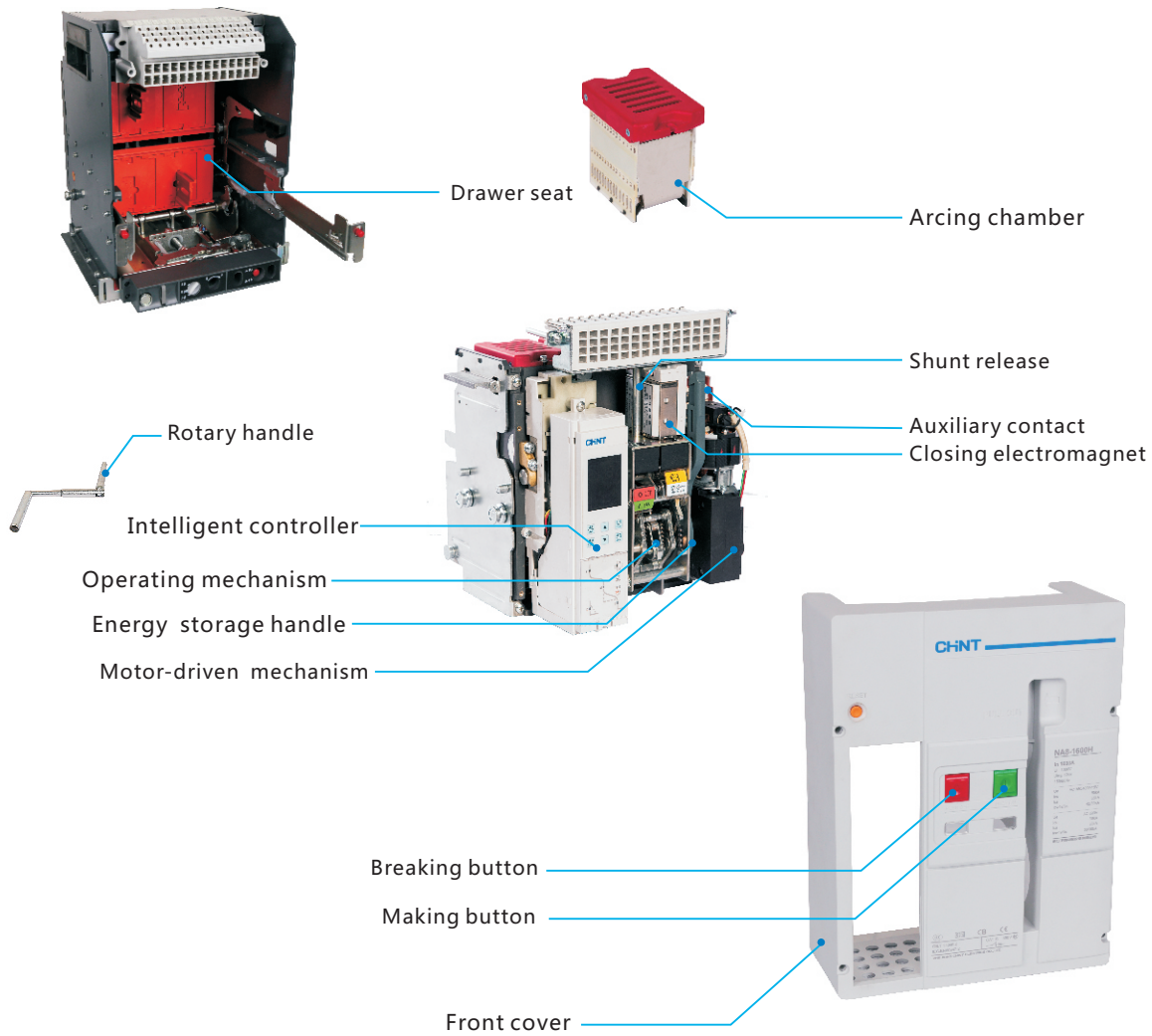


## NA8 Air Circuit Breaker

### Structural Features of Circuit Breaker



## Identification of Circuit Breaker Panel



1 Trademark

2 Secondary wiring terminal

3 Breaking button

4 Energy-storage handle

5 Making button

6 Name plate

7 Energy-storage/release indicator

8 Breaking/Making indicator

9 Draw-out plate

10 Three-position locking device

11 Drawer padlock

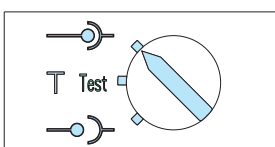
12 Racking-handle entry

13 Position indicator

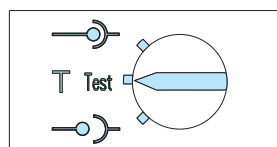
14 Rotary handle storage hole

15 Intelligent controller

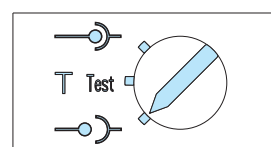
16 Fault-breaking indicator reset button



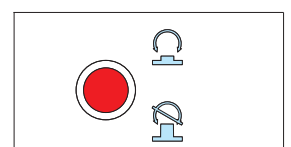
—●— : "Connected" position, main circuit and secondary circuit are both connected



T Test : "Test" position, main circuit disconnected and isolated with safety barrier, only secondary circuit is connected



—○— : "Disconnected" position, main circuit and secondary circuit are both disconnected



○ : Button does not pop up, and handle is free to rotate;  
● : Button pops up, and handle can not be rotated until button is reset manually.



## Circuit Breaker

- Frame size (A): 1600 ( In preparation... ) , 2500, 4000, 7500
- Two kinds of breaking capacity: N, H (for 7500)
- Rated voltage  $U_e$  (VAC): 380/400/415, 690,
- Number of poles: 3 or 4 poles
- Mounting mode: draw-out type or fixed type
- Mode of connection: horizontal connection, vertical connection, mixed connection

## Operating Conditions and Environmental Suitability

- NA8 products can operate normally at the following temperature.  
Electric and mechanical characteristic applicable for ambient temperature  $-5^{\circ}\text{C} \sim +40^{\circ}\text{C}$  (certified), and also peripheral ambient temperature  $-45^{\circ}\text{C} \sim +70^{\circ}\text{C}$  (M type ),  $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$  (H type ).
- For specific derating factor, see P23.  
Storage conditions: Applicable for  $-45^{\circ}\text{C} \sim +70^{\circ}\text{C}$ .
- NA8 may resist against the following electromagnetic interference:  
EMI-generated overvoltage;  
Overvoltage caused by environmental disturbance or distribution system;  
Radio wave (radio, interphone, radar, etc.)  
Static discharge of terminal users
- NA8 circuit breakers have successfully accredited through the EMC test specified in the following standards:  
IEC/ EN 60947-2  
The above tests may ensure:  
no false tripping fault, tripping time not interrupted.
- Protection grade  
Front IP20 , other sides IP00



### Intelligent Controller

- M type (basic type)

Basic functions: current measurement and display, protection function (L, S, I&G)

- H type (communication type)

Including all protection functions of M Type

LCD display

Communication function

- H type + optional functions

Including all protection and measurement functions of H type

(optional) voltage, power and other measurement functions

(optional) advanced protection function

(optional) harmonic measurement and analysis

(optional) multiple auxiliary functions

### Connection

- Rear connection

Horizontal connection, vertical connection, mixed connection are optional, and horizontal connection is of standard configuration

- Optional accessories

Interphase insulating barrier, NA8-1600 expansion busbar

### Lock

- Key lock

- Drawer position padlock (to lock the circuit breaker at the disconnected position)

- Drawer shutters padlock

- Breaking/Making button padlock

- Door interlock

### Indication Contacts

- Standard contacts

Breaking/Making indication contact

Fault tripping indication contact

Spring energy storage indication contact

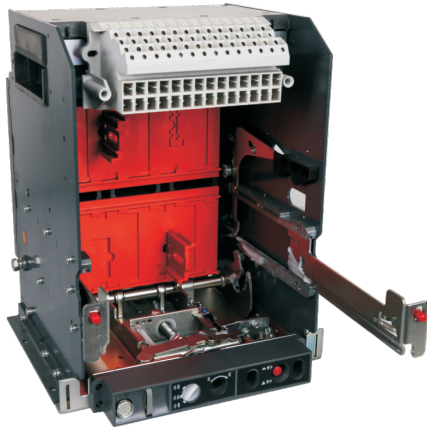
- Options

Drawer seat position indication contact

The ready to close contact may be added

(There is no such function for 1600A frame).





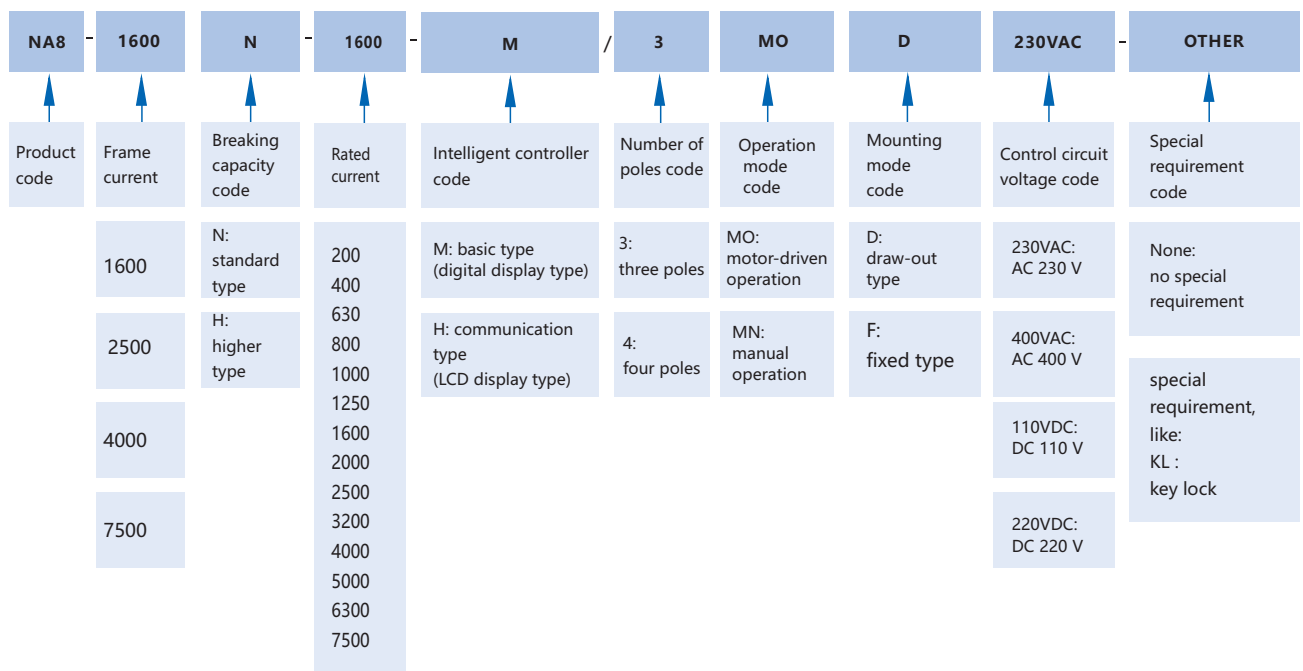
## Remote Operation

- Standard accessories
  - Motor-driven mechanism: MO
  - Closing electromagnet: CC
  - Shunt release: ST
- Options
  - Undervoltage time delay release: UVTD
  - Undervoltage instantaneous release: UVT

## NA8 Air Circuit Breaker

Product model	Breaking capacity	Rated current	200	400	630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300	7500
NA8-1600 (In preparation...)	N		■	■	■	■	■	■	■							
NA8-2500	H				■	■	■	■	■	■	■					
NA8-4000	H								■	■	■	■	■			
NA8-7500	N												■	■	■	■
	H												■	■	■	■

## NA8 Product Model Definition and Explanations

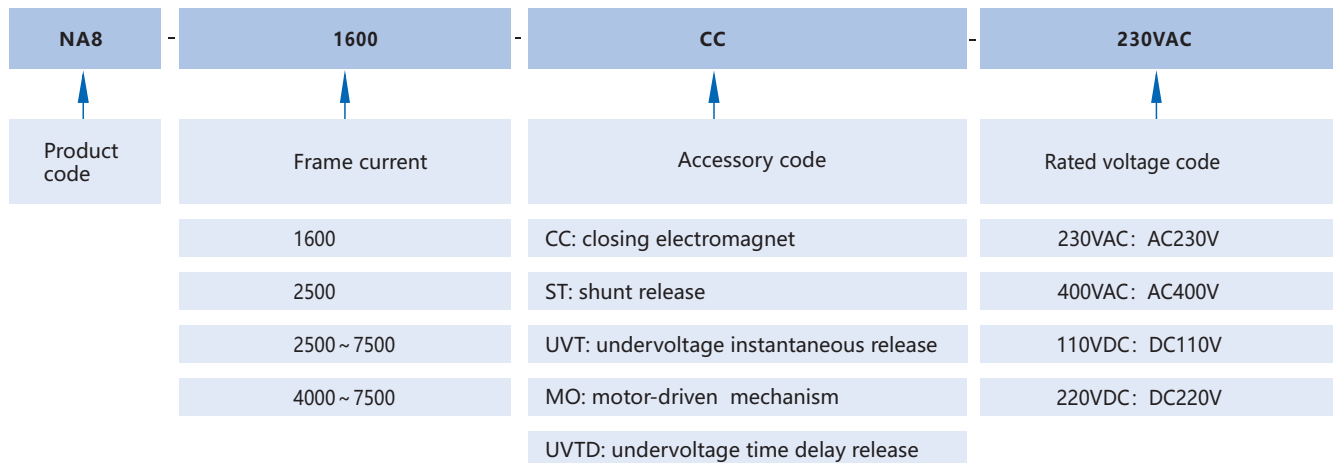


Notes: 1) "N" needs not be indicated for type N breaking capacity of NA8-7500, and may be omitted; if type H breaking capacity is selected, "H" needs to be indicated."

2) Manual operation: excluding motor-driven mechanism and closing electromagnet, shunt release. motor-drivenoperation: including all remote operation standard accessories.

3) Code instance: NA8-2500H-2000M/3MO-D AC230V: 2500A frame H type breaking capacity, rated current 2000A, M type intelligent controller, 3poles,motor-driven operation, draw-out type, control voltage AC230V.

## NA8 Accessory Model Definition and Explanations (1)



## NA8 Accessory Model Definition and Explanations (2)

NA8	1600	OF	C04
Product code	Frame current	Accessory code	Accessory specification
	1600	OF: auxiliary contact	C04: four groups of contacts
	2500		C06: six groups of contacts
	4000		N3: 3 NO 3 NC
	7500		N4: 4 NO 4 NC
	2500~7500		N5: 5 NO 5 NC
	4000~7500		
		KL: key lock	1S1S: one lock one key
			2S1S: two locks one key
			3S2S: three locks two keys
		FCDP: fixed door frame	
		DCDP: draw-out type door frame	
		FD3: fixed three-pole interphase insulating barrier	
		FD4: fixed four-pole interphase insulating barrier	
		DD3: draw-out type three-pole interphase insulating barrier	
		DD4 : draw-out type four-pole interphase insulating barrier	
		CE-CD-CT: drawer seat three-position signal	
		ILK2: draw-out type two wire rope mechanical interlock	
		ILK2F: fixed two wire rope mechanical interlock	
		ILK3: mechanical interlock (3 in 2)	
		ILK4 :mechanical interlock (3 in 1)	

### Note

This image shows a full page of a worksheet designed for handwriting practice. It features 20 evenly spaced, horizontal dashed lines across the entire page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.



# Main Technical Parameters of Circuit Breaker

## Characteristics

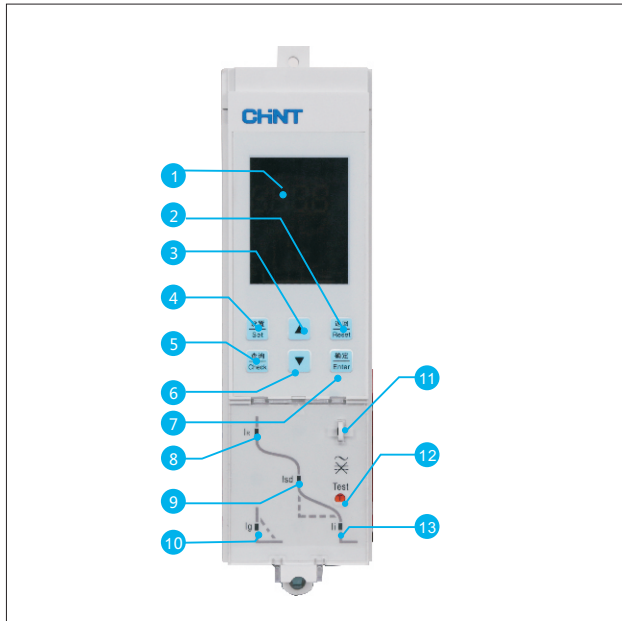
Number of poles	3/4	
Rated operational voltage Ue (V)	380/400/415、 690	
Rated insulation voltage Ui (V)	1000	
Rated impulse withstand voltage Uimp (kV)	12	
Rated frequency (Hz)	50/60	
Flashover distance (mm)	0	
Suitability for isolation	IEC/EN 60947-2	Applicable
Pollution grade	IEC 60664-1	N:3

Frame size		
Rated current (A)		
Rated current of the N pole (A)		
Type of the circuit breaker		
Rated ultimate short-circuit breaking capacity (kA rms) VAC 50/60Hz	Icu	380/400/415V、 690V
Rated service short-circuit breaking capacity (kA rms) VAC 50/60Hz	Ics	380/400/415V、 690V
Utilization category		
Rated short- time withstand current (kA rms) VAC 50/60Hz	Icw 1s	380/400/415V、 690V
	Icw 3s	380/400/415V、 690V
Rated short-circuit making capacity (kA peak) VAC 50/60Hz	Icm	380/400/415V、 690V
Making current tripping protection function (MCR kA rms)		
Breaking time (ms)		
Closing time (ms)		
Mounting, connection and service life		
Service life C/O cycle	Mechanical	No maintenance
	Electrical	No maintenance
Connection	Horizontal、 Vertical、 Mixed	
Size (H×W×D)	Fixed type	3P
		4P
	Draw-out type	3P
		4P

NA8-1600 (In preparation... )								NA8-2500						
200	400	630	800	1000	1250	1600		630	800	1000	1250	1600	2000	2500
200	400	630	800	1000	1250	1600		630	800	1000	1250	1600	2000	2500
N(400V)				N(690V)				H (415V)				H (690V)		
55				36				85				65		
50				36				85				65		
B								B						
50								85				65		
30				30				50				50		
121				76				187				143		
10								16						
20 ~ 30								20 ~ 30						
30 ~ 40								30 ~ 40						
20000								20000						
8000								8000						
■								■						
320×254×250								396×370×367						
320×324×250								396×465×367						
351×282×350								431.5×375×476						
351×352×350								431.5×470×476						

NA8-4000					NA8-7500				
1600	2000	2500	3200	4000	4000	5000	6300	7500	
1600	2000	2500	3200	4000	4000	5000	6300	3750	
H(415V)	H(690V)				N(440V)	N(690V)	H(440V)	H(690V)	N(440V) N(690V) H(440V) H(690V)
100	85				135	100	150	100	135 100 150 100
100	85				135	100	135	100	135 100 150 100
B					B				
100	85				135	100	135	100	135 100 135 100
75	75				100	100	100	100	100 100 100 100
220	187				297	220	330	220	297 220 330 220
26					26				
20 ~ 30					20 ~ 30				
30 ~ 40					30 ~ 45				
10000					1000				
6000					1500(440v) 1000(690v)				
■					■				
396×422×341									
396×547×341									
431×435×449					472×786×464				
431×550×449					472×1016×464				

## Function Overview of Intelligent Controller



- 1 Display window: display the current value, setting parameter, fault current, tripping time, etc.
- 2 Return button: exit from current menu and enter the upper-level menu, or cancel current setting parameter value.
- 3 Up button: move up the check box submenu at the current menu, or realize "+" parameter setting in parameter setting.
- 4 Set button: switch to the default setting menu.
- 5 Check button: switch to the default query menu.
- 6 Down button: move down the check box submenu at the current menu, or realize "-" parameter setting in parameter setting.
- 7 Enter button: enter the next-level menu of current selected box, or save current parameter setting.
- 8 Ir indicator for overload long-time-delay tripping.
- 9 Isd indicator for short circuit short-time-delay tripping.
- 10 Ig indicator for earth fault tripping.
- 11 Cover lock hole
- 12 Button for tripping test
- 13 Ii indicator for short-circuit instantaneous tripping.

### M Type intelligent controller (basic type)

#### Protection

All protective threshold values and time delays are set using buttons.

#### ● Overload protection

True RMS long time delay protection.

Thermal memory: heat accumulation before and after tripping.

#### ● Short circuit protection

Short time delay (RMS) and instantaneous protection

4 definite time-delay options in terms of time delay

#### ● Earth fault protection

4 definite time-delay options in terms of time delay

#### ● Test function

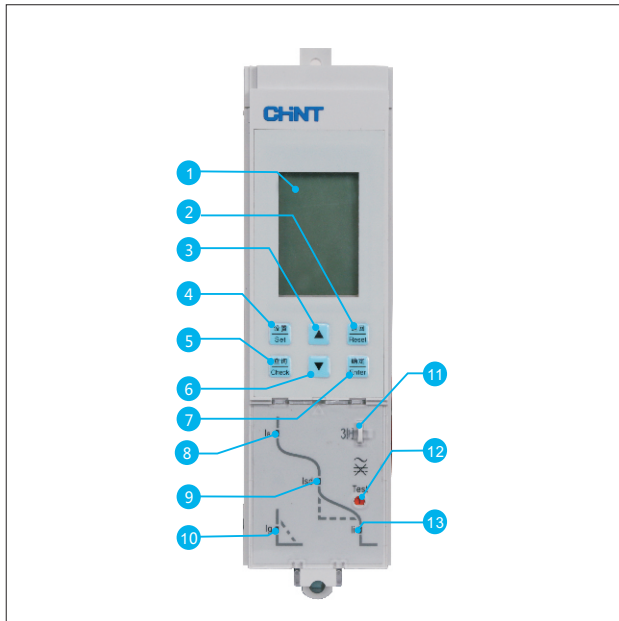
Simulate  $6I_R$  test current for tripping test.

#### ● Tripping recording function

Tripping reason display function

#### ● Ammeter

M Type intelligent controller measures the current true effective value (RMS) from 40% to 150% with an accuracy of 2%.



- 1 Display window: display the current value, setting parameter, fault current, tripping time, etc.
- 2 Return button: exit from current menu and enter the upper 3.8-level menu, or cancel current setting parameter value.
- 3 Up button: move up the check box submenu at the current menu, or realize "+" parameter setting in parameter setting.
- 4 Set button: switch to the default setting menu.
- 5 Check button: switch to the default query menu
- 6 Down button: move down the check box submenu at the current menu, or realize "-" parameter setting in parameter setting.
- 7 Enter button: enter the next-level menu of current selected box, or save current parameter setting.
- 8 Ir indicator for overload long-time-delay tripping.
- 9 Isd indicator for short circuit short-time-delay tripping .
- 10 Ig indicator for earth fault tripping.
- 11 Cover lock hole
- 12 Test button for tripping test
- 13 Ii indicator for overload long-time-delay tripping.

## H Type Intelligent Controller (communication type)

### Protection

All protective threshold values and time delays are set using buttons.

- Contain all protection functions of M type control unit.
- Communication function
  - Modbus - RTU communication protocol
- Leakage protection function (optional)
  - Special external transformer is equipped.
- Advanced protection function (optional)
  - Voltage unbalance protection
  - Overvoltage and undervoltage protection
  - Overfrequency and under-frequency protection
  - Phase sequence protection
  - Reverse power protection function
  - Demand value protection function
- Expanded functions
  - Intelligent controller self-diagnostics
  - Operation times/fault tripping/alarm/ deflection recording function: providing the record of the latest 10 times.
  - Main contact abrasion display function: evaluate the contact abrasion degree according to the mechanical life, electric life and breaking capacity of different frames.
  - Internal clock function.
  - Button Trip-test function.
- Electric energy meter (optional)
  - Voltage measurement
  - Frequency measurement
  - Demand value measurement
  - Power (active power, reactive power, apparent power) measurement
  - Electric energy (active power, reactive power, apparent power) measurement
  - Power factor measurement
- Load monitoring function (optional)
- Zone selectivity interlock (optional)
- Input/output function (optional)
  - 3DO, 4DO or 2DI, 2DO
  - DI signal: AC230 V (standard, other optional); DC110V;
  - DO requires the power module (24VDC output) and relay module.
- Harmonic analysis function (optional)
  - Measuring the fundamental wave current, fundamental wave line voltage, fundamental wave phase voltage, fundamental wave power and each 3-31 odd harmonic current ratio (HRIh), harmonic voltage ratio (HRIUh), total harmonic current distortion [THDi, thdi], total harmonic voltage distortion [THDu, thdu].
  - Harmonic wave ratio (HR):
  - the ratio of the RMS value of the hth of harmonic component contained in the cyclic AC quantity to the RMS value of fundamental wave component (in percentage).



## Protective Characteristics of Intelligent Controller

Protective characteristics of intelligent controller consist of inverse time-delay and definite time-delay.

When the fault current exceeds the inverse time-delay

setting, the controller provides time delay protection according to the definite time-delay.

The inverse time-delay current conforms to the characteristic curve  $I^2t$ .

### Overload long-time-delay protection characteristics

Overload long-time-delay protection acting by threshold value.

Setting parameter	Setting range					Error				
Long time-delay setting current Ir	( 0.4-1.0) In+OFF 1A (1600-2500 Frame size ) ; 2A(4000-7500 Frame size ) (1-2- 4-8 -12-16-20 -24 -30)s					±15%				
Long time-delay setting step size										
Long time-delay setting time tr	$t=(\frac{6}{N})^2\times tr$					±10%				
Anti-time-limit characteristic curve										
Fault current	Action time									
I < 0.85Ii	No action									
I > 1.15Ii	Action									
1.5Ir	16	32	64	128	192	256	320	384	480	
2.0Ir	9	18	36	72	108	144	180	216	270	
6.0Ir	1	2	4	8	12	16	20	24	30	

Notes: N --- the multiple of fault current divided by set current  $I/I_r$

t --- fault operating delay time

$t_r$  --- long time delay set value

Operating time permissible error±15%

Conventional factory setting: overload long time delay current 1.0 $I_n$ ;

Conventional factory setting: overload 6 $I_r$ ; operating time 2s

Example: Given that overload long time delay current 1.0 $I_n$ , delay time 2s ( at 6 $I_r$ ), now line current  $I=1.8I_n$ , actual fault operating delay time t may be calculated:

$$N = 1.8I_n / 1.0I_n = 1.8$$

$$t = (6/1.8)^2 \times 2 = 22.2s$$

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

Short circuit short time delay protection acting by threshold value.

Setting parameter	Setting range	Error
Short time-delay setting current Isd	( 1.5-10) In+ OFF	± 10%
Short time-delay setting step size	1A (1600-2500 Frame size ) ； 2A(4000-7500 Frame size )	
Short time-delay setting time tsd	Definite-time-limit: 0.11、 0.21、 0.31、 0.41; Anti-time-limit:0.1、 0.2、 0.3、 0.4	± 15% or inherent 40ms (take the maximum)
Fault current	Action time	
I < 0.9Isd	No action	
I > 1.15Isd	Time-delay action	
Isd < I ≤ 10I	Anti-time-limit	Action characteristics I²t=(10Ii)²tsd
		Setting times 0.1、 0.2、 0.3、 0.4
1 ≥ 1.1Isd	Definite-time-limit	Setting times 0.11、 0.21、 0.31、 0.41
		Min.s 0.06、 0.16、 0.255、 0.34
		Max.s 0.14、 0.24、 0.345、 0.46
	Return time	0.05、 0.14、 0.25、 0.33

Notes:  $I_{sd}$  --- short time delay current set value

I --- fault current

$I_r$  --- long time delay set value

t --- fault operating delay time

$t_{sd}$  --- short time delay inverse time-delay set value

Operating time permissible error±15%

Conventional factory setting: short time delay current 8 $I_r$

Conventional factory setting: short time delay operating time 0.4s

## Short circuit instantaneous protection characteristic

Short circuit instantaneous protection acting by threshold value.

Setting parameter	Setting range
Instantaneous setting current $I_i$	( 2~1.5 ) $I_n$ + OFF
Short time-delay setting step size	1A (1600-2500 Frame size ) ; 2A(4000-7500 Frame size )
Operating characteristics	$I < 0.85I_i$ No action
	$I > 1.15I_i$ Action
	$\leq 100\text{ms}$ Action time

## Earth Fault Protection Characteristic

Earth fault protection operating threshold

$< 0.9I_g$ : no action;

$> 1.1I_g$ : action;

NA8 -1600\2500:  $0.2I_n \sim 1.0I_n$  + OFF (MAX:1200A)

NA8-4000\7500: 500 A~1200 A + OFF

Definite time-delay	Setting time (s)	0.1	0.2	0.3	0.4
	Min (s)	0.06	0.16	0.255	0.34
	Max (s)	0.14	0.24	0.345	0.46
	Return time	0.05	0.14	0.25	0.33
Inverse time-delay	$t = \frac{(I_g)^2}{I^2} \times t_g$				

Notes:  $I_g$  --- earth protection setting, NA8-1600\2500 default factory setting  $I_g = 0.5I_n$  , 4000\7500 default factory setting  $I_g = 800\text{A}$

$I$  --- fault current

$T$  --- fault operating delay time

$t_g$  --- earth inverse time-delay set value

Inverse time-delay operating time permissible error  $\pm 15\%$

Conventional factory setting: OFF

## Controller Minimum Factory Display Current

Frame	Rated current	Minimum display value
1600	400~1600	80
2500	630~2500	80
$\geq 4000$	$\geq 1600$	160

## Measuring Accuracy of Intelligent Controller

Current measurement	
Measuring range	Ia, Ib, Ic and I <sub>N</sub> not more than 15I <sub>N</sub> (circuit breaker rated current)
Measuring accuracy	Below 0.1I <sub>N</sub> , measurement is inaccurate.
	0.1I <sub>N</sub> ~0.4I <sub>N</sub> , the accuracy will linearly change from 5% to 2%.
	0.4I <sub>N</sub> ~1.5I <sub>N</sub> , the accuracy is 2%.
	> 1.5I <sub>N</sub> , the accuracy will linearly change from 2% to 15%.
	Measuring accuracy of earth current is 10%.

Voltage measurement	
Measuring range	Line voltage: 0~600 V Phase voltage: 0~300 V
Measuring accuracy	Error: ±1%

Frequency	
Measuring range	40Hz~70Hz
Error	Error: ±0.1H z

Power	
Measurement mode	Effective value
Measuring content	3P: total active power, total reactive power, total apparent power
	4P: split phase active power, split phase reactive power, split phase apparent power, total active power, total reactive power, total apparent power
Measuring range	Active power: -32768kW~+32767kW
	Reactive power: -32768Kvar~+32767Kvar
	Apparent power: 0KVA~65535kVA
	Error: ±2.5%

Power factor	
Measuring content	3P: total power factor
	4P: split phase power factor
Measuring range	-1.00~+1.00

Electric energy	
Measuring content	Input reactive electric energy (EQin), output reactive electric energy (EQout)
	Input active electric energy (EPin), output active electric energy (EPout)
	Total active electric energy (EPtotal), total reactive electric energy (EQtotal), total apparent electric energy (ESTotal)
Measuring range	Active electric energy: -32768kWh~+32767kWh
	Reactive electric energy: -32768Kvarh~+32767Kvarh
	Apparent electric energy: 0~65535kVAh
Measuring accuracy	±2.5%

Harmonic measurement	
Fundamental wave measurement	Current: Ia, Ib, Ic
	Voltage: Uab, Ubc, Uca
Total harmonic distortion	THD: total distortion ratio of harmonic wave in relative to fundamental wave
THD and Thd	Thd: total distortion ratio of harmonic wave in relative to effective value
Harmonic amplitude spectrum	The controller may display FFT amplitude of 3~31 odd harmonic in percentage “%” .
Control unit measuring accuracy	±2%

## Tripping Characteristic Curve of Intelligent Controller

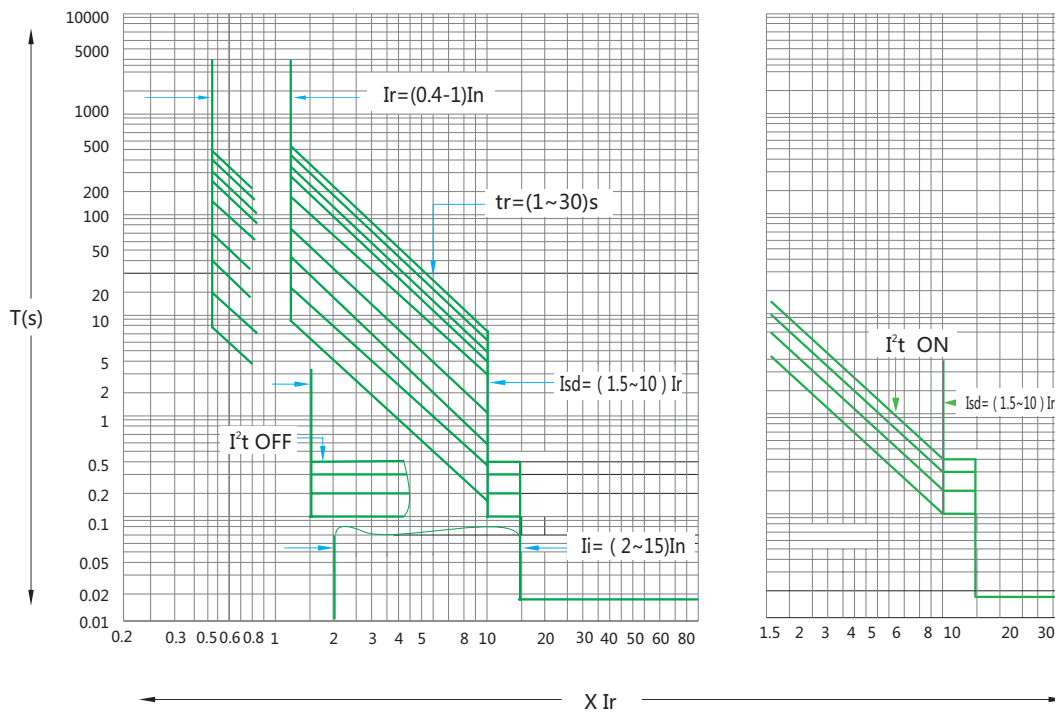


Fig.1 Overcurrent protection curves

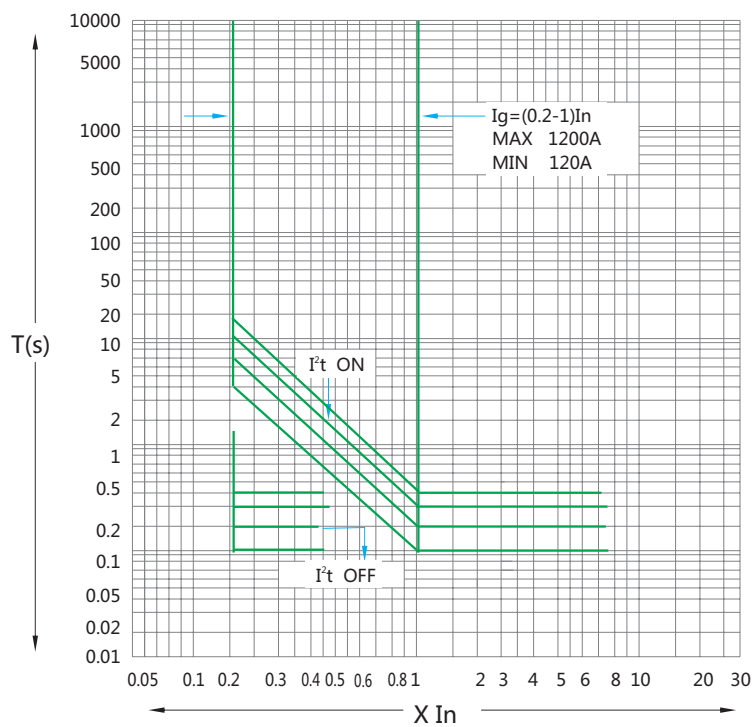
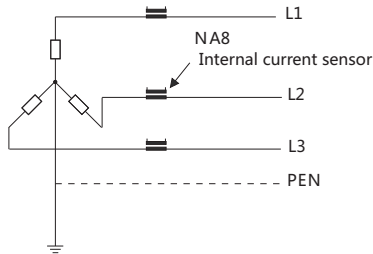


Fig.2 Asymmetrical earth fault protection curves

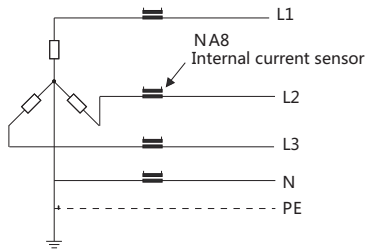
## Explanations on Earth Fault Protection

### Single Phase Earth Fault Protection

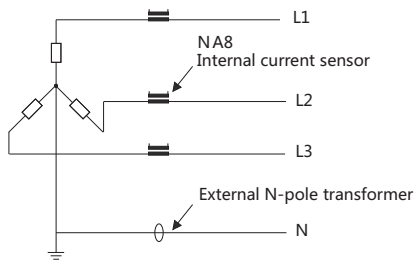
- The three-pole circuit breaker realizes earth protection through testing whether the three-phase current vector sum is zero or not via internal three current transformers.



- The four-pole circuit breaker realizes earth protection through testing whether the three-phase current and N phase current vector sum is zero or not via internal four current transformers.



- The 3P+N system realizes earth protection through the vector sum calculation via the three-pole circuit breaker and external N-pole transformer.

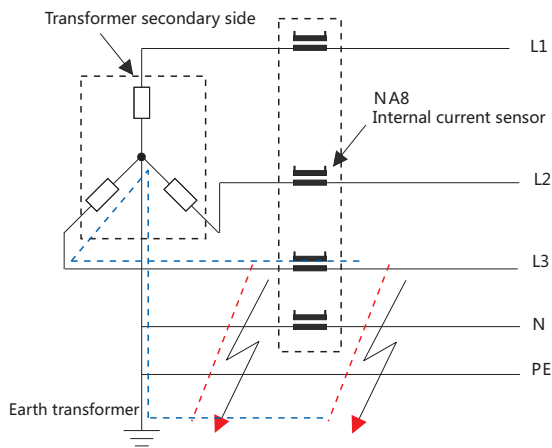


Notes: ① The external N-phase current transformer is special transformer configured by the company, and the default lead wire is 2m long.

② At 3PT, the earth protection can be only used for balanced load; for unbalanced load, this function should be closed or the set value is set above the permissible unbalanced current; otherwise, it might cause the operation of intelligent controller.

③ At (3P+N) T, maximum distance between transformer and circuit breaker cannot exceed 5m; when the transformer lead wire exceeds 2m long, it should be particularly indicated upon placing an order.

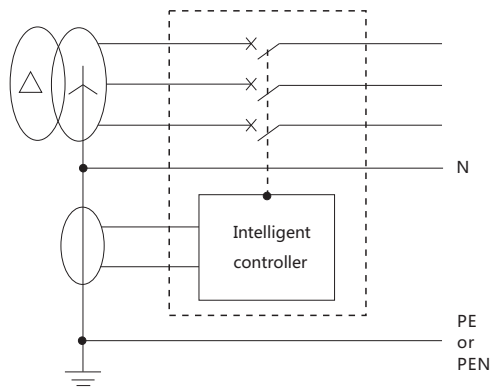
As show below, a load side fault of NA8 circuit breaker: The fault current only flows through one phase. If the three-phase current vector sum detected by 4 current sensors is higher than the set threshold, the intelligent control unit will activate the differential earth protection function. Such earth protection realizes the load side earth fault protection.



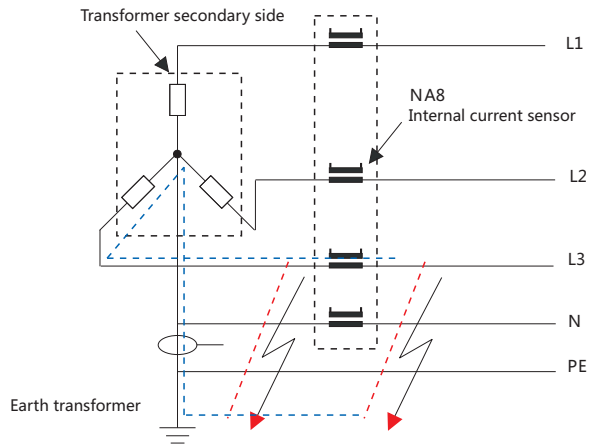
### Earth Current Type Earth Protection

The earth transformer is used at the transformer star center to fulfill earth protection.

On condition of the circuit breaker protection of medium voltage/low voltage transformer, an earth transformer can be equipped at the transformer star connection center (the circuit breaker should be equipped with the H type controller, and the earth current protection transformer should be selected), and this earth transformer may measure the earth fault current at the power supply side and load side of NA8 circuit breaker, as shown below.



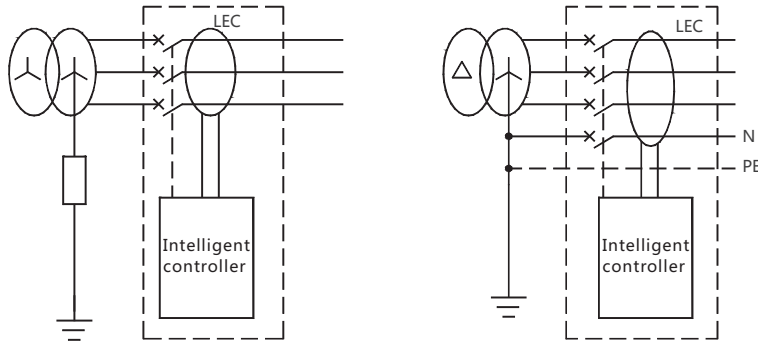
As shown below, through installing the external earth transformer, the earth fault at the power supply side of circuit breaker can be checked, and the earth fault at the load side of NA8 circuit breaker can also be detected.



### Residual Leakage Protection

It is especially suitable for places having high-sensitivity requirement for the residual current protection to prevent man-made indirect contact. For NA8 circuit breaker, the H type controller should be selected, and the leakage protection function and leakage transformer (LEC) accessory should be added so as to realize leakage protection.

Leakage current $I_{\Delta N}$	[A]0.5-1-2-3-5-7-10-20-30
Tripping time $\Delta t$	[s]0.06-0.17-0.25-0.33-0.42-0.58-0.75-0.83

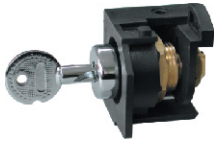


The NA8 circuit breaker realizes the residual current protection function and needs to meet the following requirements:

1. Select the H-type controller;
2. Adding the leakage protection function of the controller;
3. Adding leakage current transformer (LEC) accessories;
4. The outgoing terminal of the circuit breaker is connected vertically;
5. It is available when the rated current of the circuit breaker is  $\leq 3200A$ ,

## Accessory: Lock

### Key Lock KL



There are 3 kinds of key lock (The later two kinds are used in the distribution system of two incoming cabinets and one connection cabinet):

one lock one key (1S1S)

two locks one key (2S1S)

three locks two keys (3S2S)

### Drawer shutters Padlock

The padlock should be self prepared by the user.

If the padlock is selected, when the circuit breaker body is at the disconnected or test position, it should ensure the body terminal is not connected with external live circuit.



### Drawer Position Padlock

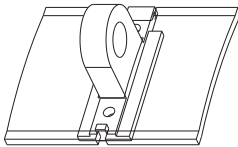
The padlock should be self prepared by the user.

After the drawer seat and body are locked at the disconnected using the padlock, the drawer seat rocker couldn't be inserted into the drawer seat rocking-handle hole, so the draw-out type circuit breaker body position cannot be changed.

### Door Interlock

#### Circuit breaker condition door interlock

When the circuit breaker is closed, it is forbidden to open the switchgear door; when the circuit breaker is opened, it is allowed to open the switchgear door.



#### Circuit breaker position door interlock

When the circuit breaker is at the connection and test position, it is forbidden to open the switchgear door; when the circuit breaker is at the detachment position, it is allowed to open the switchgear door.

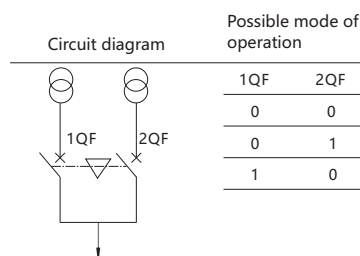
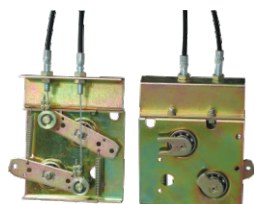
### Pushbutton Lock PL

Pushbutton lock: used to lock up the mechanical button opening and closing the circuit breaker, and the padlock is used. After locking, manual opening and closing operation couldn't be done. (the padlock should be self-prepared by the user).



## Mechanical Interlock IKL-2 (Wire rope two interlock):

It may realize the interlocking of two horizontal or vertically installed three- or four-pole circuit breakers.

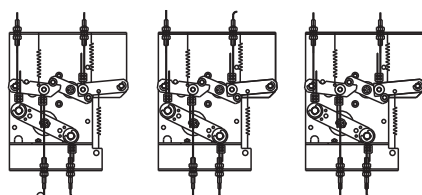


Notes: a. When it needs to bend the wire rope, the transition arc at the bend should be higher than R120mm to ensure it can move flexibly.  
b. Check the wire rope and ensure enough lubricating oil in it to ensure its flexible movement.

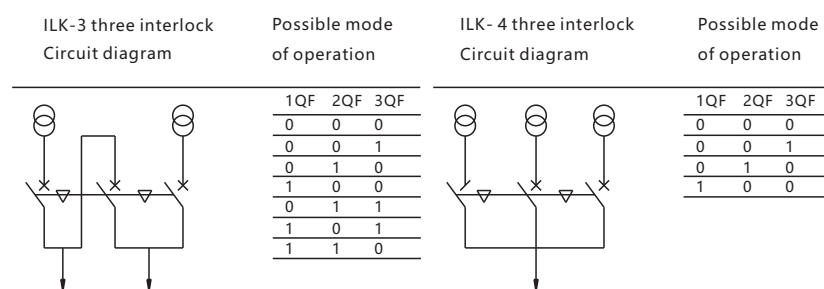
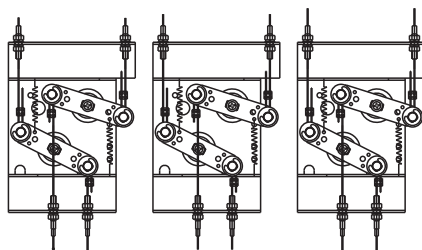
## Mechanical Interlock ILK-3/4 (wire rope three interlock)

It may realize the interlocking of three flat or vertically installed three- or four-pole circuit breakers

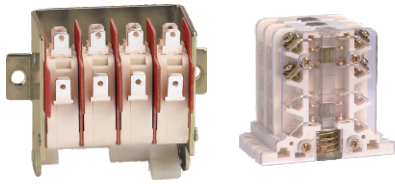
ILK -3 three interlock diagram



ILK -4 three interlock diagram



Notes: a. When it needs to bend the wire rope, the transition arc at the bend should be higher than R120mm to ensure it can move flexibly.  
b. Check the wire rope and ensure enough lubricating oil in it to ensure its flexible movement.



## Accessory: Indication Contact

Auxiliary contact OF			
Standard configuration		4CO	6CO (NA8-1600)
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	- -

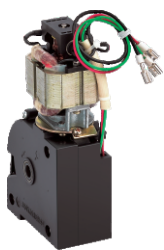
Drawer seat three-position indication contact CD - CE - CT			
Standard configuration		1CO/3	
Breaking capacity		current (A)/voltage (V)	
Utilization category	VAC (AC-15)	1.3/240, 0.75/415	
	VDC (DC-13)	0.55/110, 0.27/220	

Tripping alarm 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	

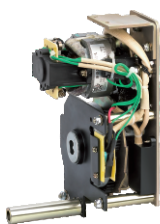
Spring energy storage indication contact			
Standard configuration		1NO	
Breaking capacity		current (A)/voltage (V)	
Utilization category	VAC (AC-15)	1.3/240, 0.75/415	
	VDC (DC-13)	0.55/110, 0.27/220	

Notes: 1) CO is the changeover contact, 1NO 1NC is matched with a common terminal.

2) NO is normally open contact, NC is normally closed contact.



1600 frame MO



2500~7500 frame MO

#### Motor-driven mechanism (MO)

It has the function of motor energy storage and automatic re-energy storage after closing of circuit breaker to ensure the circuit breaker can be closed immediately after opening. Where there is no auxiliary power supply, the energy storage handle is used as standby.

Characteristic		
Power supply	VAC 50/60Hz	220/230/240, 380/400/415
	VDC	110, 220
Operating threshold		0.85-1.1Us
Frame: power consumption (VA or W)		1600:75W; 2500:85W; 4000~7500: 150W
Motor over-current time		≤1min
Energy storage time		≤7s
Operating frequency		≤2times/min



1600 frame CC&amp;ST



#### Electric remote operation coil (CC and ST)

##### Closing electromagnet (CC)

If energy storage of the mechanism is done, CC may fulfill remote closing after being energized.

Characteristic		CC
Power supply	VAC 50/60Hz	220/230/240 380/400/415
	VDC	220,110
Operating voltage		0.85-1.1Us
Frame: power consumption (VA or W)	AC	400VA
	DC	1600: 380W; 2500~7500: 130W
Circuit breaker response time		30ms-45ms

##### Shunt release (ST)

After being energized, ST will open the circuit breaker instantaneously.



2500, 4000~7500 frame CC&amp;ST



Characteristic		ST
Power supply	VAC 50/60Hz	220/230/240 380/400/415
	VDC	220,110
Operating voltage		0.85-1.1Us
Frame: power consumption (VA or W)	AC	400VA
	DC	1600: 380W; 2500~7500: 130W
Circuit breaker response time		20ms-30ms



1600 frame UVT      2500, 4000~7500 frame UVT

### Undervoltage release (UVT)

If the supply voltage reduced to a value between 35% and 70% of rated voltage, this tripping coil leads to the instantaneous opening of circuit breaker. If the UVT tripping coil is not energized, the circuit breaker cannot be closed, manually (closing button) or electrically (closed electromagnet). Only when the supply voltage of UVT tripping coil reaches 85% of rated voltage, the circuit breaker can be closed.

Characteristic			
Power supply	VAC 50/60Hz	220/230/240, 380/400/415	
	VDC	-	
Operating threshold	Opening	0.35-0.7Ue	0.35-0.7Ue
	Closing	0.85Ue	0.85-1.1Ue
Frame: power consumption (W)			1600: 220W/15W; 2500, 4000~7500: 220W/13W

Note: attracting/holding.

### Undervoltage time delay release (UVTd)

To prevent the false tripping circuit breaker resulting from short time voltage drop, it requires UVT operating time delay. A time delay unit is added besides UVT to realize this function.

Characteristic		
Power supply	VAC 50/60Hz	
Operating threshold	Opening	0.35-0.7Ue
	Closing	0.85Ue
Frame: power consumption (VA)	1600: 20VA; 2500~7500 : 48VA	
Adjustable time	1s~5s, the time delay can be selected and adjustable.	

Note: Only NA8 - 1600 uses the external undervoltage time delay module, and 2500, 4000~7500 product undervoltage time delay release has built-in undervoltage time delay unit.

## Capacity Derating and Power Loss

NA8-1600 ( In preparation... )

Ambient temperature	200A		400A		630A		800A		1000A		1250A		1600A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45°	-	-	-	-	-	-	-	-	-	-	-	-	1550	-
50°	-	-	-	-	-	-	-	-	-	-	-	-	1500	1550
55°	-	-	-	-	-	-	-	-	950	950	1150	1200	1450	1500
60°	-	-	-	-	550	580	700	700	900	900	1050	1100	1350	1450

NA8-2500

Ambient temperature	630A		800A		1000A		1250A		1600A		2000A		2500A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45°	-	-	-	-	-	-	-	-	-	-	1900	-	2400	2400
50°	-	-	-	-	-	-	-	-	1500	1550	1850	1900	2300	2300
55°	-	-	-	-	-	-	-	-	1400	1450	1800	1800	2200	2200
60°	-	-	-	-	-	-	-	-	1300	1350	1700	1700	2100	2100

NA8-4000

Ambient temperature	1600A		2000A		2500A		3200A		4000A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-	-	-	-	-
45°	-	-	-	-	-	-	-	-	3800	3850
50°	-	-	-	-	-	-	3100	-	3600	3650
55°	-	-	-	-	2450	-	3000	3050	3400	3450
60°	-	-	1900	1950	2350	2400	2900	2950	3200	3250

NA8-7500

Ambient temperature	4000A		5000A		6300A		7500A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	/	-	/	-
45°	-	-	-	-	/	6100	/	7000
50°	-	-	4700	4800	/	6000	/	6550
55°	3900	3900	4600	4650	/	5500	/	6050
60°	3800	3800	4400	4500	/	5200	/	5650

Note: "-" represents no derating; "/" means no horizontal connection.

## Altitude Capacity Derating Factor

### Voltage performance corrections under different altitudes

Altitude (m)		2000	3000	4000	5000
Rated impulse withstand voltage (kV)	U <sub>imp</sub>	12	10	8.5	7.5
Average insulation grade (V)	U <sub>i</sub>	1000	800	700	600
Power frequency withstand voltage (V)		2200	1955	1760	1600
Maximum operational voltage (V)	U <sub>e</sub>	690	580	500	400

### Current performance corrections under different altitudes

Altitude (m)	Rated operating current (I <sub>e</sub> )
2000	1.0I <sub>e</sub>
2500	0.93I <sub>e</sub>
3000	0.88I <sub>e</sub>
3500	0.83I <sub>e</sub>
4000	0.78I <sub>e</sub>
4500	0.73I <sub>e</sub>
5000	The factory must be contacted for confirmation

Note: If the ambient temperature is lower than 40 °C, I<sub>e</sub> = I<sub>n</sub>; if the ambient temperature is higher than 40 °C, derating use must be done in strict accordance with the requirement of operation manual; in such case, I<sub>e</sub> ≠ I<sub>n</sub>, I<sub>e</sub> and I<sub>n</sub> can be looked up according to the temperature derating table.

## Power loss

Power loss is the power consumption per pole measured at I<sub>n</sub>, 50/60 Hz.

Frame	Rated current (A)	Power loss of draw-out type (W)	Power loss of fixed type (W)
1600A (In preparation...)	200	115	45
	400	140	80
	630	161	100
	800	215	110
	1000	230	120
	1250	250	130
	1600	460	220
2500A	630	58.6	26.4
	800	73.7	36.6
	1000	172	78
	1250	268	122
	1600	440	200
	2000	530	262
	2500	600	312
4000A	2000	470	250
	2500	550	280
	3200	670	420
	4000	1047	656
7500A	4000	550	-
	5000	590	-
	6300	950	-
	7500	1500	-

# Dimension Of Busbar

## Bolt Configuration and Mounting Torque

Bolt type	Application	Preferred tightening torque
M3	Fasten the secondary connecting conductor	(0.5~0.7) N·m
M8 (with flat washer only)	Fasten the product on the switchgear (1600A frame)	(18~25) N·m
M10 (with flat washer only)	Fasten the product on the switchgear ( 2500A and above frame)	(25~40) N·m
M10	Fasten the busbar	(36~52) N·m

## Connection Busbar Specification Reference under Different Temperatures

Permissible maximum busbar temperature: 100℃

The busbar material is bare copper, and the unit of width and thickness is both mm.

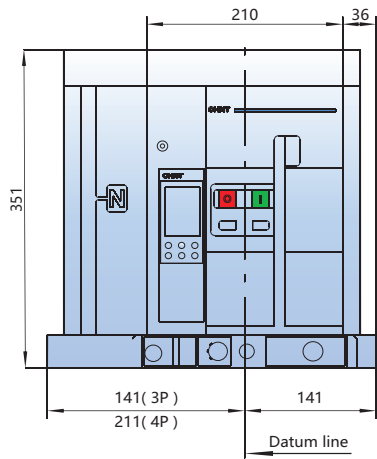
Frame current	Rated current (A)	Ambient temperature (-5~40) ℃				Ambient temperature 50℃				Ambient temperature 60℃			
		Recommended busbar specification				Recommended busbar specification				Recommended busbar specification			
		Width	Thickness	Number of panels	Specification	Width	Thickness	Number of panels	Specification	Width	Thickness	Number of panels	Specification
1600A (In preparation...)	200	30	5	1	30*5*1	30	5	1	30*5*1	40	5	1	40*5*1
	400	30	5	2	30*5*2	30	5	2	30*5*2	30	10	1	30*10*1
	630	40	5	2	40*5*2	40	5	2	40*5*2	50	5	2	50*5*2
	800	50	5	2	50*5*2	50	5	2	50*5*2	50	6	2	50*6*2
	1000	50	5	3	50*5*3	50	5	3	50*5*3	50	6	3	50*6*3
	1250	60	8	2	60*8*2	60	8	2	60*8*2	60	10	2	60*10*2
	1600	60	10	2	60*10*2	60	10	2	60*10*2	60	10	3	60*10*3
2500A	630	40	5	2	40*5*2	50	5	2	50*5*2	50	5	2	50*5*2
	800	50	5	2	50*5*2	50	5	2	50*5*2	60	5	2	60*5*2
	1000	50	5	3	50*5*3	50	5	3	50*5*3	60	5	3	60*5*3
	1250	60	8	2	60*8*2	60	8	2	60*8*2	60	8	3	60*8*3
	1600	60	10	2	60*10*2	60	10	2	60*10*2	60	10	3	60*10*3
	2000	100	5	3	100*5*3	100	5	3	100*5*3	100	5	4	100*5*4
	2500	100	10	2	100*10*2	100	10	2	100*10*2	80	10	3	80*10*3
4000A	2000	80	8	3	80*8*3	80	8	3	80*8*3	80	10	3	80*10*3
	2500	80	6	4	80*6*4	80	6	4	80*6*4	80	8	4	80*8*4
	3200	100	10	4	100*10*4	100	10	4	100*10*4	100	10	4	100*10*4
	4000	100	10	5	100*10*5	100	10	5	100*10*5	120	10	5	120*10*5
7500A	4000	100	10	5	100*10*5	100	10	5	100*10*5	100	10	6	100*10*5
	5000	100	10	7	100*10*7	100	10	7	100*10*7	120	10	7	120*10*7
	6300	120	10	7	120*10*7	120	10	7	120*10*7	120	10	8	120*10*8
	7500	120	10	9	120*10*9	120	10	9	120*10*9	120	10	10	120*10*10

- Notes: a. When the copper busbar selected by the user is not matched with the circuit breaker connection terminal, it needs to design and process the extension busbar for connection. The extension busbar will be designed by the user; its section area cannot be less than the above requirement, and the clearance between extension busbars cannot be less than that between the circuit breaker connection terminals.
- b. After installing the above recommended busbar, it shall ensure the electric clearance between adjacent phases of the circuit breakers is not less than 18mm.
- c. For electric components using thyristor for three-phase rectification and high-frequency inversion in the load devices, like high-frequency induction heating electric furnace (intermediate frequency furnace steel facility), solid state high frequency welder (such as submerged arc welder), vacuum heating melting facility (like single crystal growing furnace) , upon selecting the circuit breaker, it should take into account not only the impact of ambient temperature and altitude, but also the impact of higher harmonic generated by thyristor on the circuit breaker; in such case, it must be used by derating, and the recommended derating factor is (0.5~0.8).
- d. After the user installs the busbar, the electric clearance between upper and lower busbar fastening bolts should not be less than 20 mm.
- e. After the circuit breaker is installed, the safe spacing between different potential electrified bodies and between the electrified body and ground should be not less than 18mm.

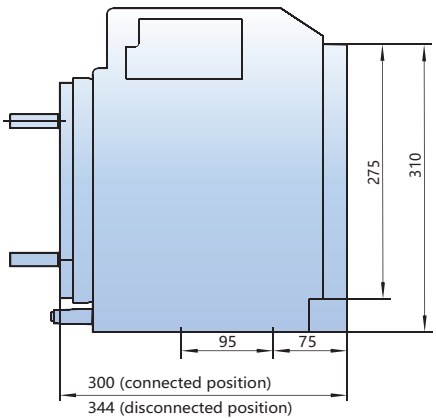
# Dimension And Installation

NA8-1600 draw-out type (In preparation... )

Front view

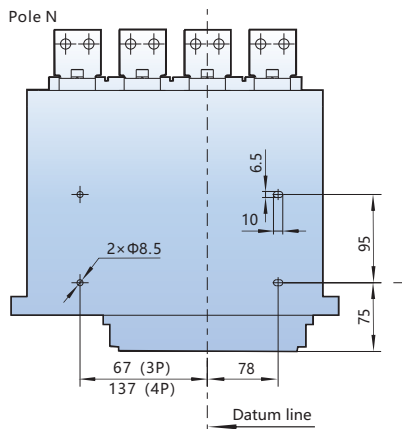


Side view

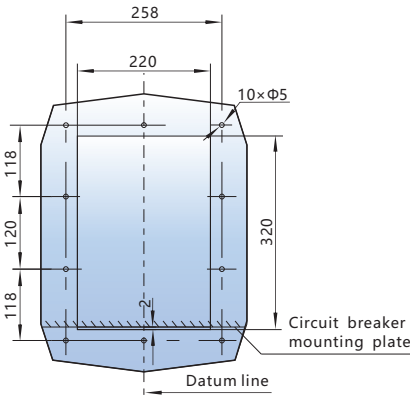


## Hole size

Hole size of the base



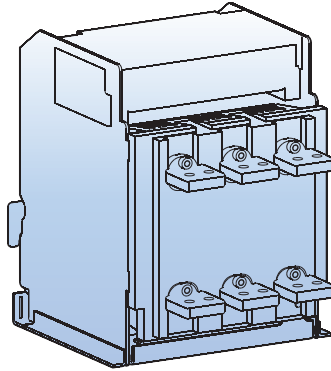
Hole size of the panel





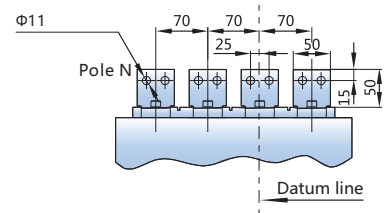
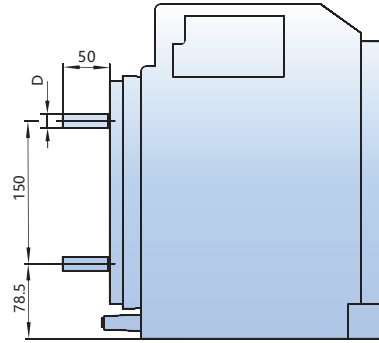
## Horizontal connection

Side view

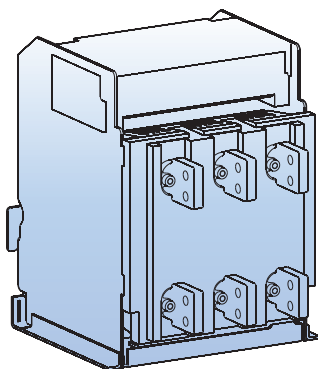


In(A)	D(mm)
200~800	10
1000~1600	16

Busbar mounting dimensions

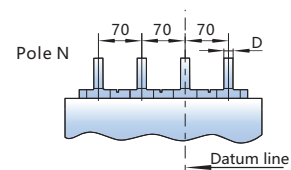
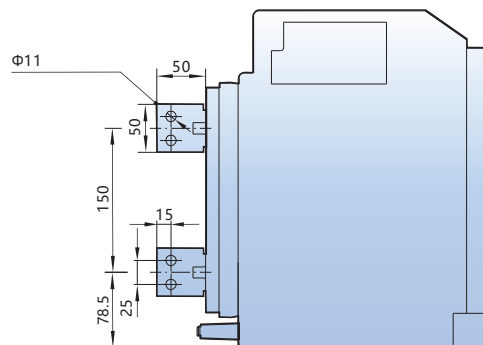


## Vertical connection



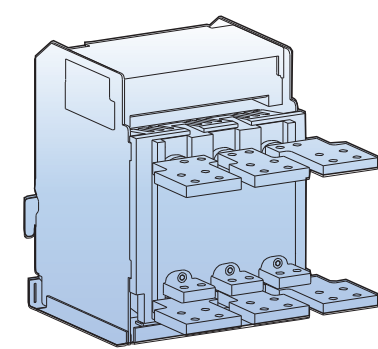
In(A)	D(mm)
200~800	10
1000~1600	16

Busbar mounting dimensions



Three-pole product horizontal extension busbar (optional)

Side view

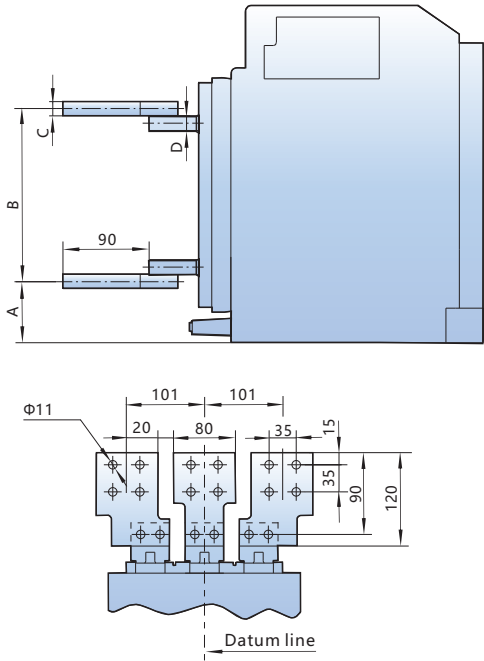


Unit: mm

In(A)	A	B	C	D
200~800	68.5	169	10	10
1000~1600	63	179	15	16

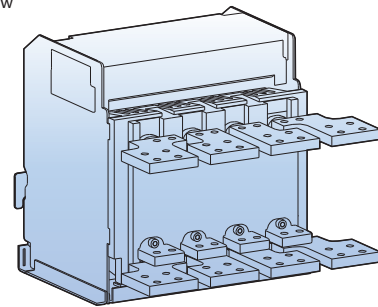
Note: The extension busbar is of optional accessory, requiring additional expense.

Busbar mounting dimensions



Four-pole product horizontal extension busbar (optional)

Side view

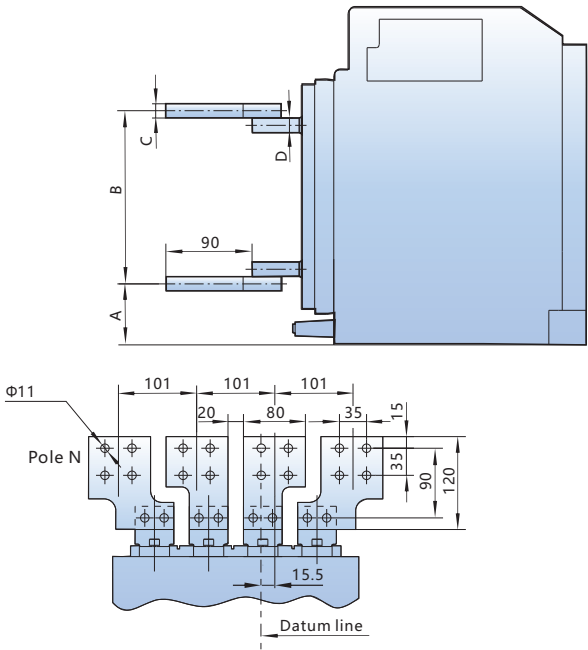


Unit: mm

In(A)	A	B	C	D
200~800	68.5	169	10	10
1000~1600	63	179	15	16

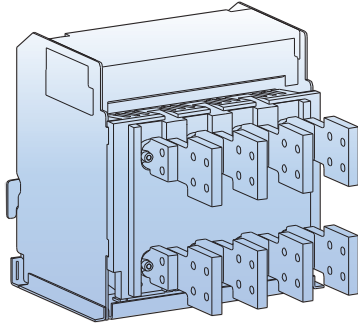
Note: The extension busbar is of optional accessory, requiring additional expense.

Busbar mounting dimensions



## Vertical extension busbar (optional)

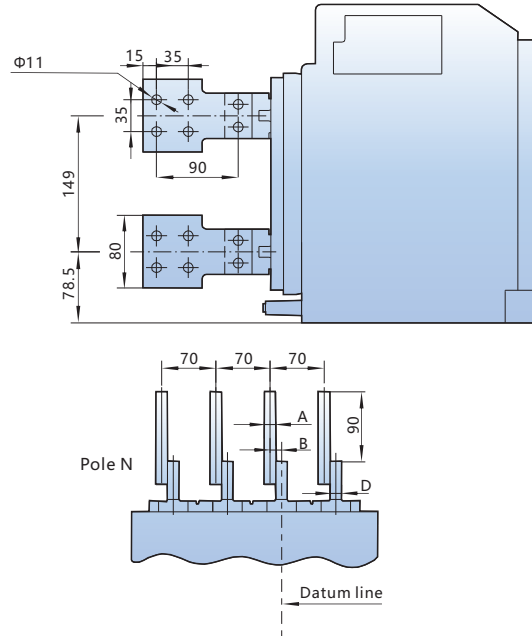
Side view



Unit: mm

In(A)	A	B	D
200~800	10	10	10
1000~1600	15	15.5	16

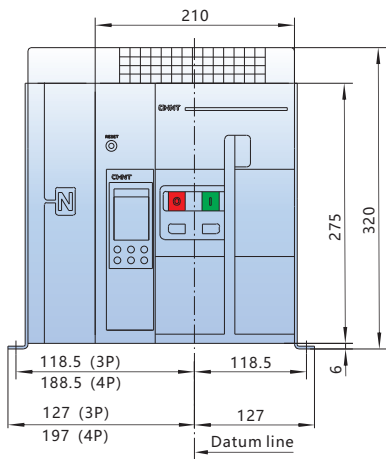
Busbar mounting dimensions



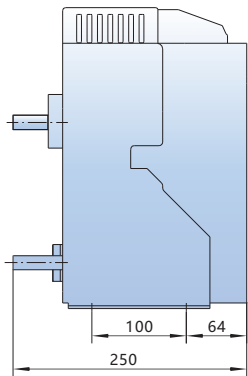
Note: The extension busbar is of optional accessory, requiring additional expense.

NA8-1600 fixed type (In preparation...)

Front view

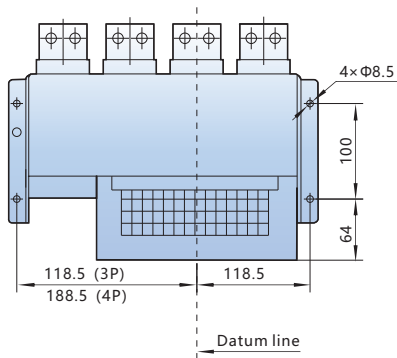


Side view

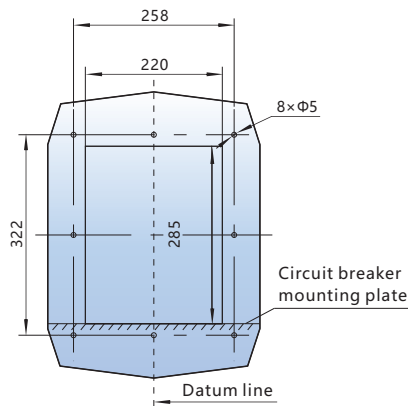


Hole size

Hole size of the base

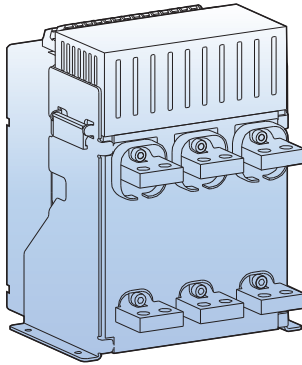


Hole size of the panel



## Horizontal connection

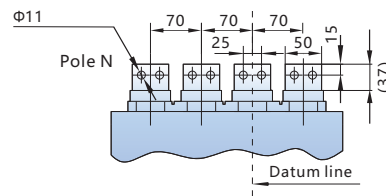
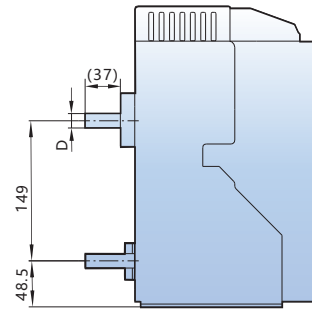
Side view



In(A)	D(mm)
200~800	10
1000~1600	16

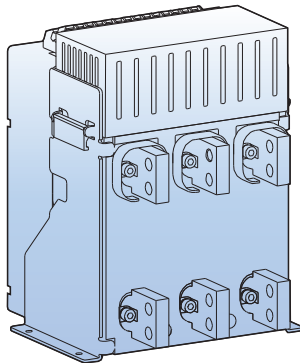
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

Busbar mounting dimensions



## Vertical connection

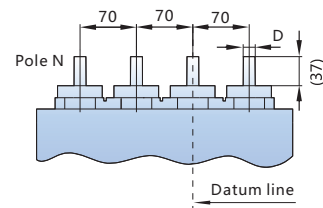
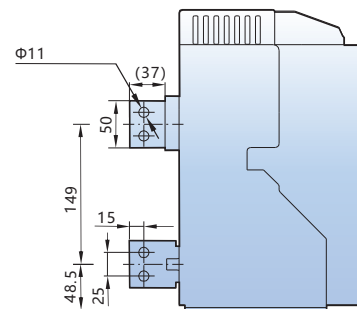
Side view



In(A)	D(mm)
200~800	10
1000~1600	16

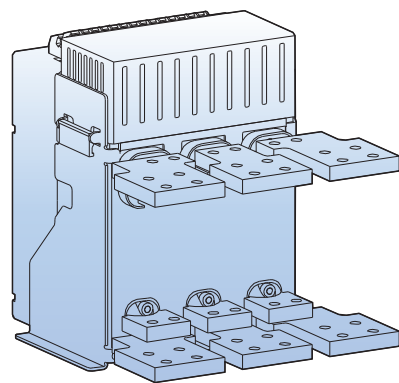
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.

Busbar mounting dimensions



Three-pole product horizontal extension busbar connection (optional)

Side view

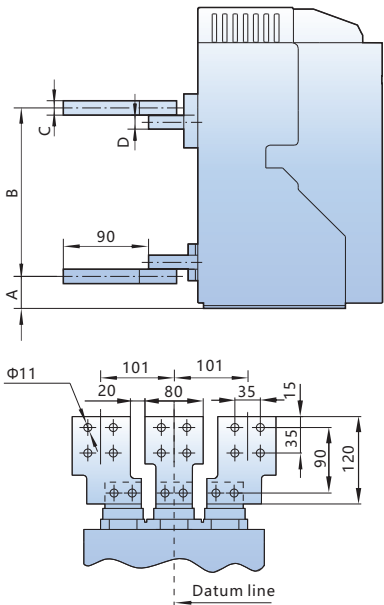


Unit: mm

In(A)	A	B	C	D
200~800	38.5	169	10	10
1000~1600	33	179	15	16

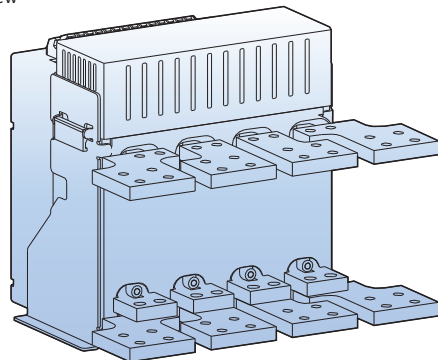
Note: The extension busbar is of optional accessory, requiring additional expense.

Busbar mounting dimensions



Four-pole product horizontal extension busbar connection (optional)

Side view

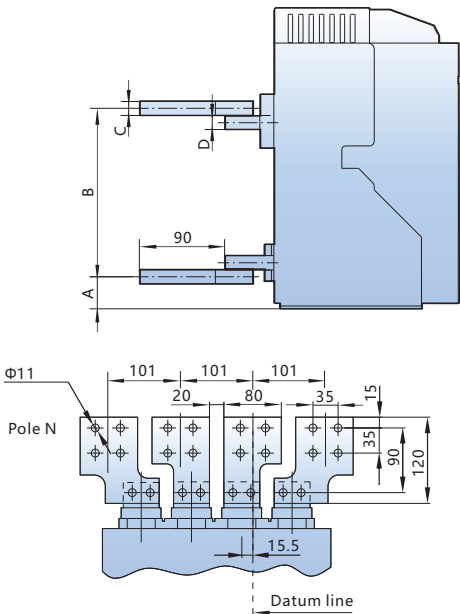


Unit: mm

In(A)	A	B	C	D
200~800	38.5	169	10	10
1000~1600	33	179	15	16

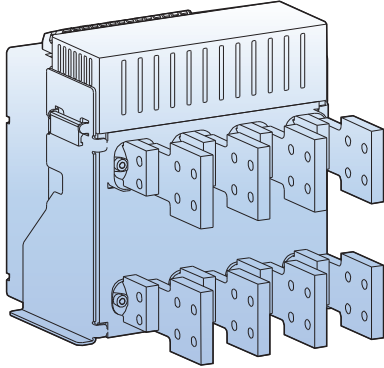
Note: The extension busbar is of optional accessory, requiring additional expense.

Busbar mounting dimensions



## Vertical connection of extension busbar (optional)

Side view

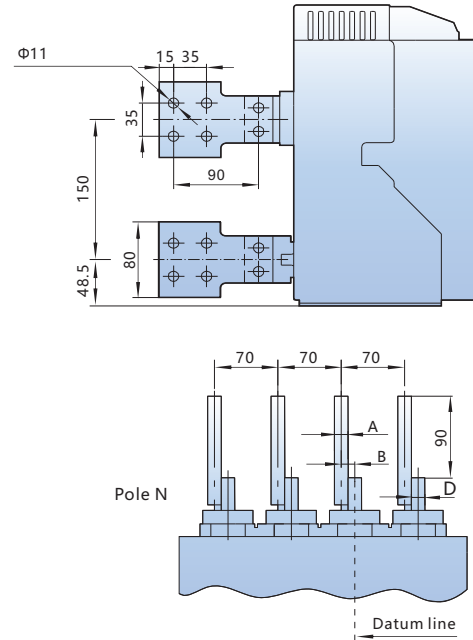


Unit: mm

In(A)	A	B	D
200~800	10	10	10
1000~1600	15	15	16

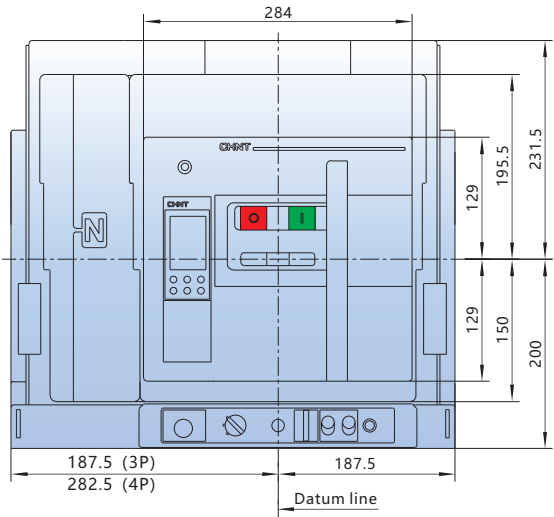
Note: The extension busbar is of optional accessory, requiring additional expense.

Busbar mounting dimensions

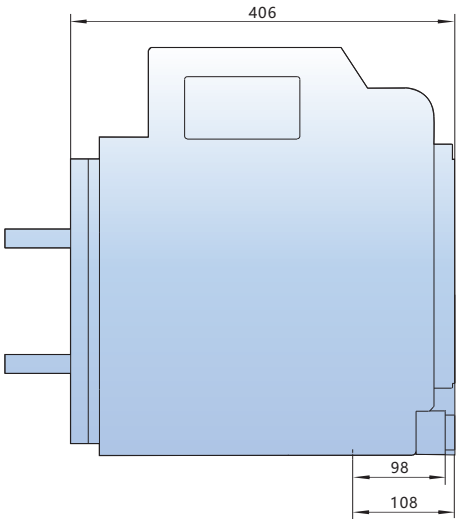


NA8-2500 Draw-out type

Front view

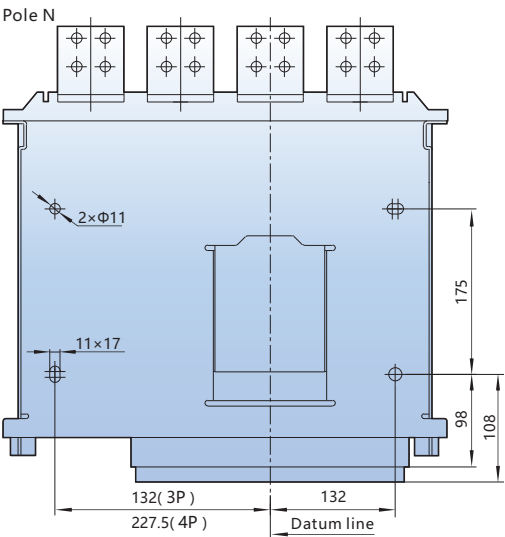


Side view

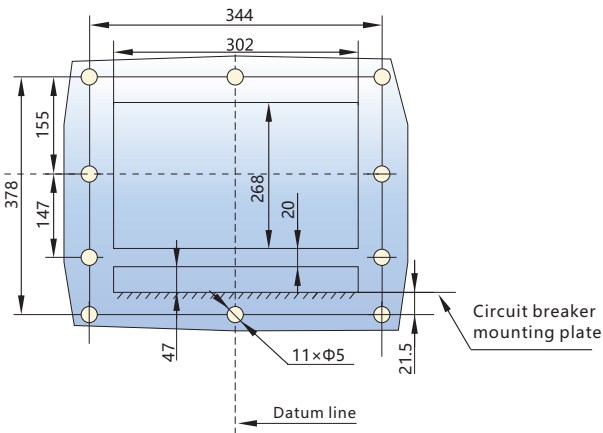


Hole size

Hole size of the base



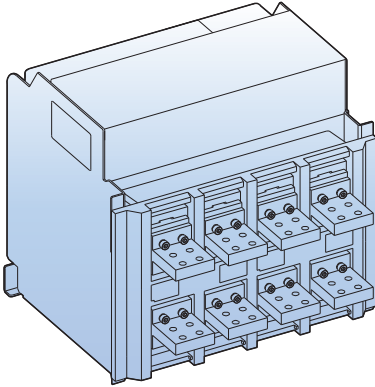
Hole size of the panel





## Horizontal connection

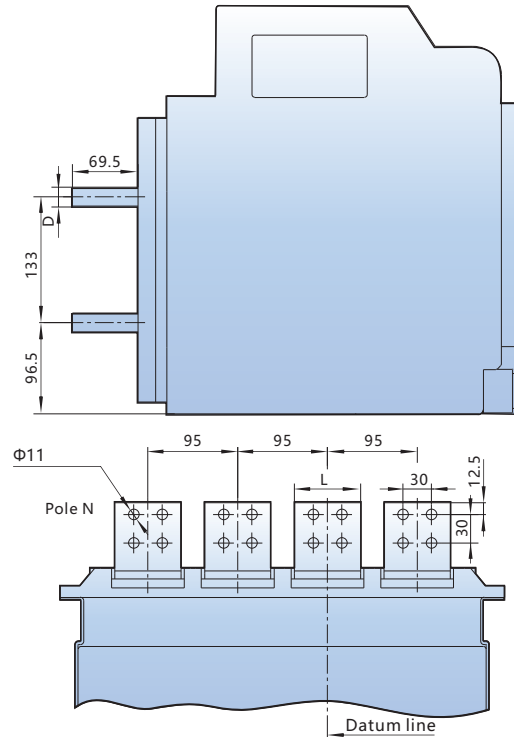
Side view



Unit: mm		
In (A)	D	L
630 ~ 1600	15	60
2000 ~ 2500	20	70

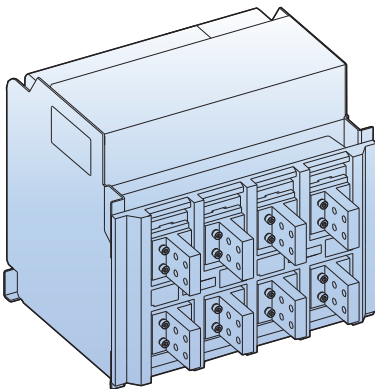
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

Busbar mounting dimensions



## Vertical connection

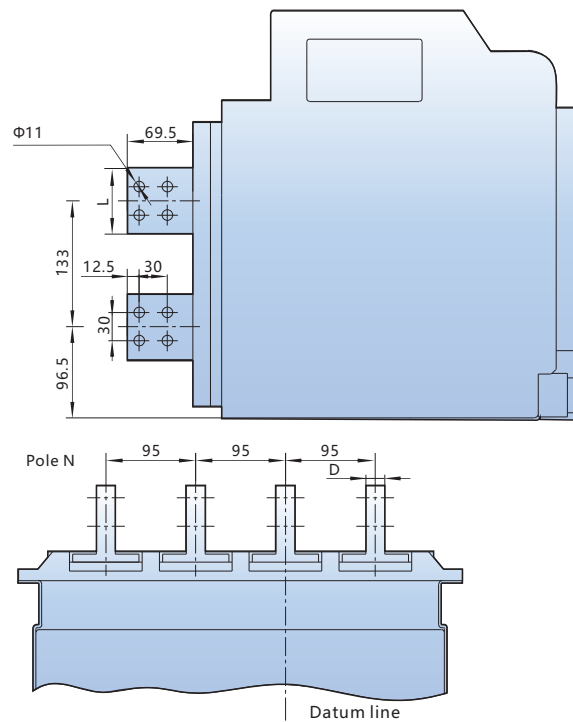
Side view



Unit: mm		
In (A)	D	L
630 ~ 1600	15	60
2000 ~ 2500	20	70

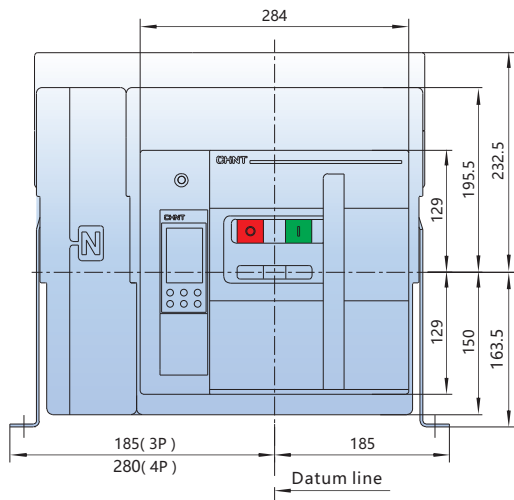
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.

Busbar mounting dimensions

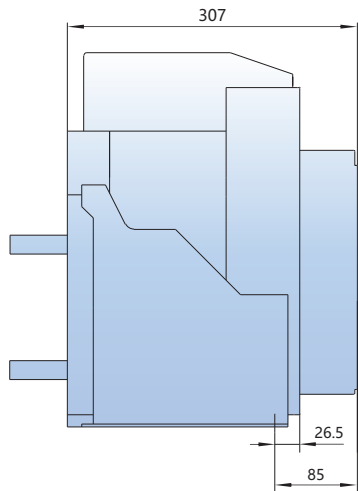


NA8-2500 fixed type

Front view

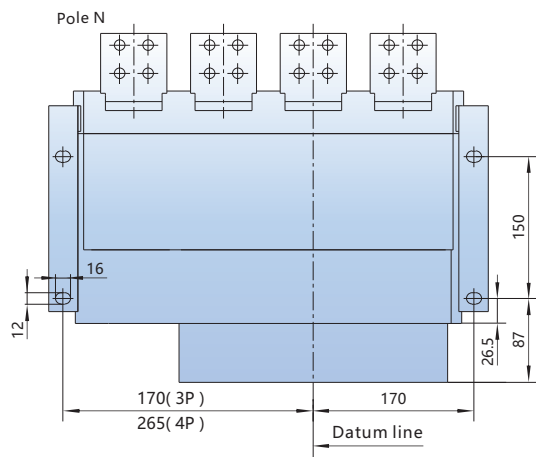


Side view

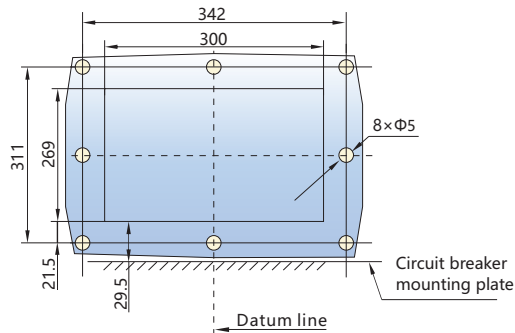


Hole size

Hole size of the base

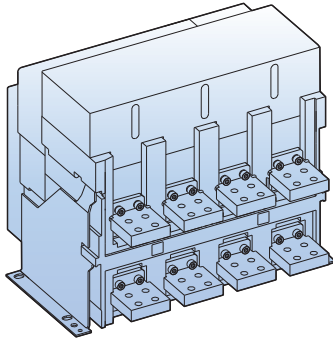


Hole size of the panel



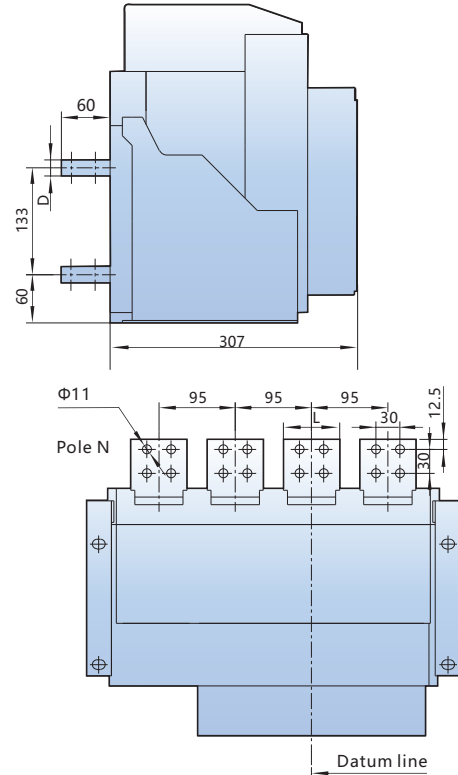
## Horizontal connection

Side view



Unit: mm		
In (A)	D	L
630~1600	15	60
2000~2500	20	70

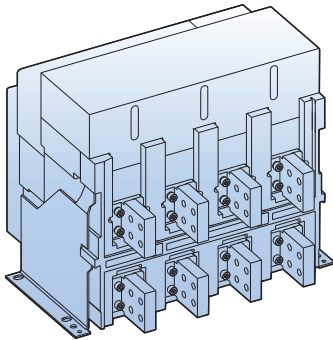
Busbar mounting dimensions



Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

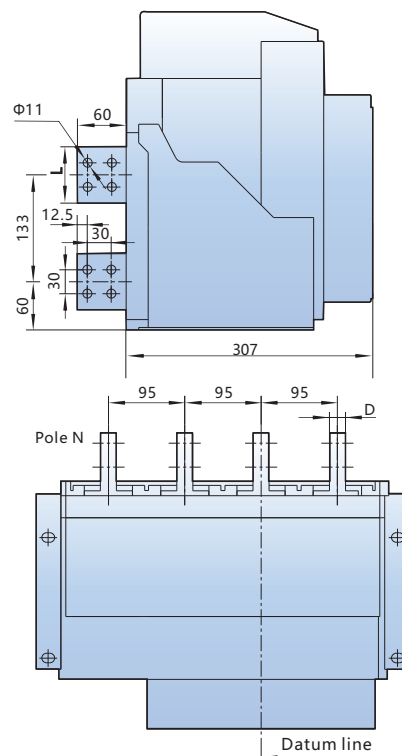
## Vertical connection

Side view



Unit: mm		
In (A)	D	L
630~1600	15	60
2000~2500	20	70

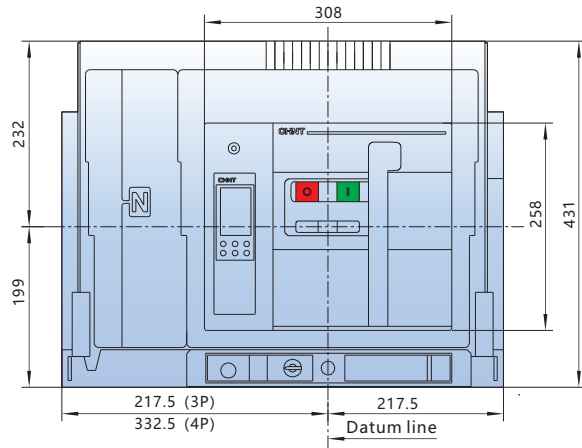
Busbar mounting dimensions



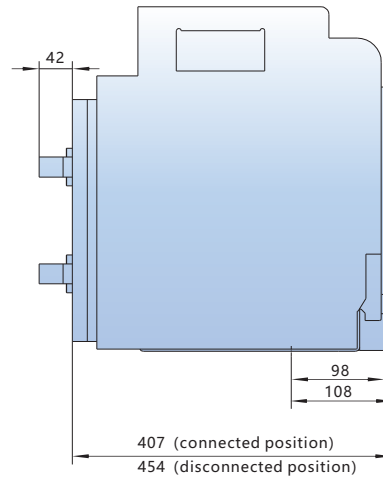
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.

## NA8-4000 draw-out type

Front view

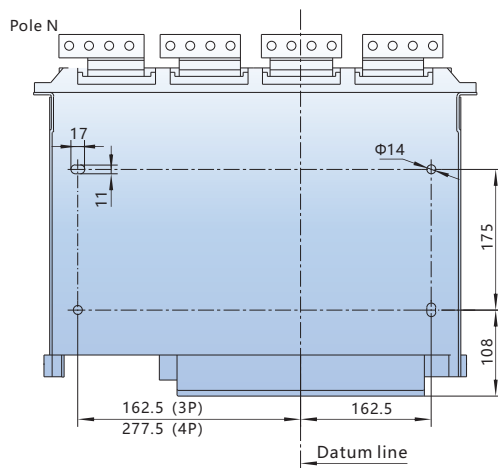


Side view

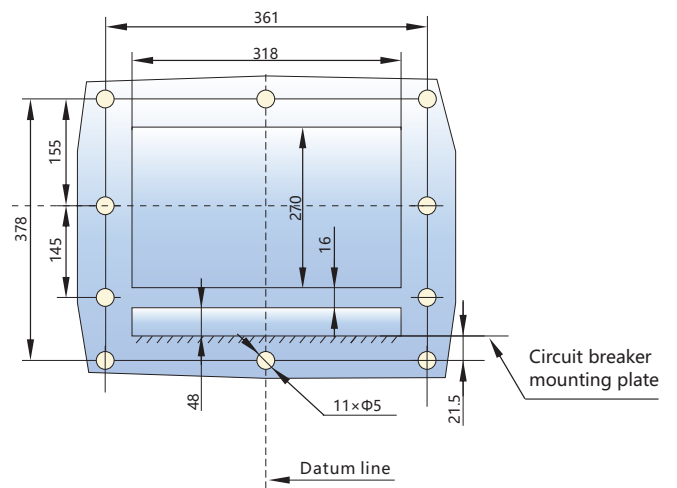


## Hole size

Hole size of the base

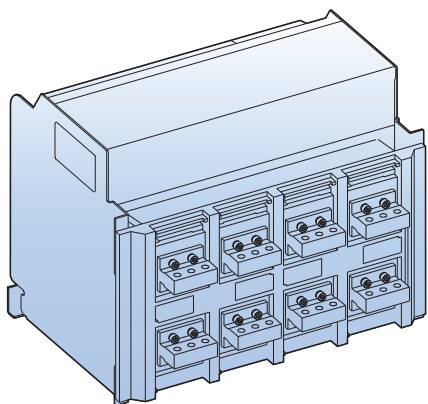


Hole size of the panel

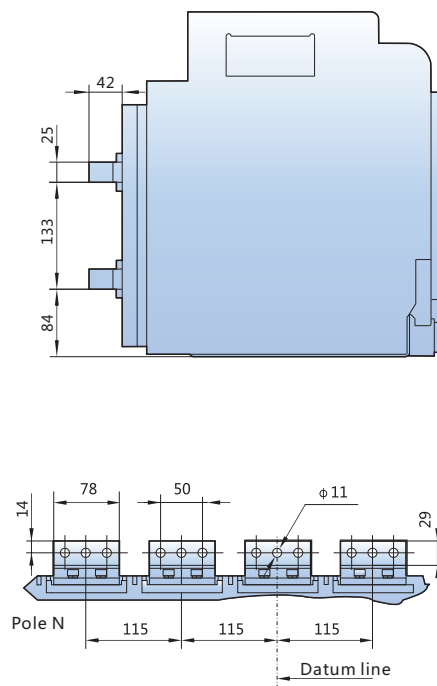


## Horizontal connection (In=1600A~2500A)

Side view



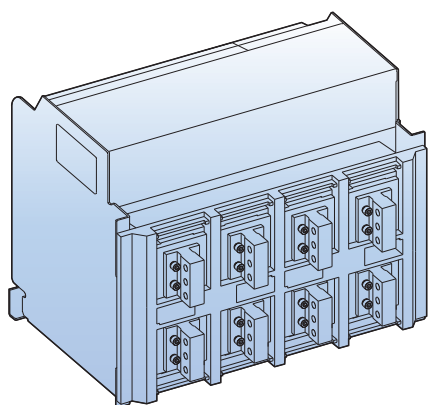
Busbar mounting dimensions



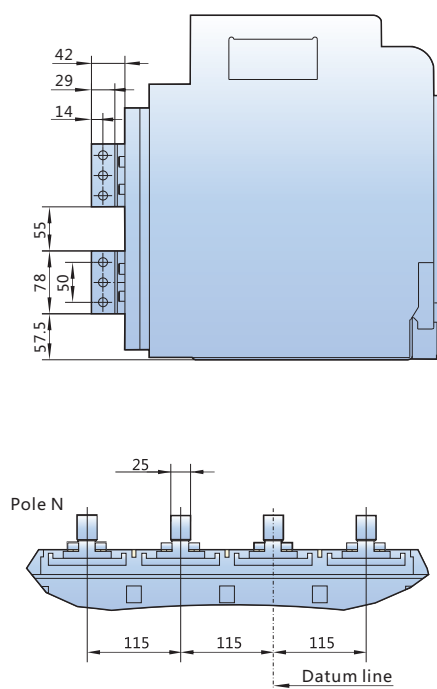
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

## Vertical connection (In=1600A~2500A)

Side view



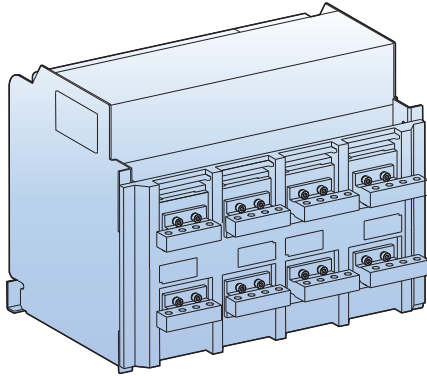
Busbar mounting dimensions



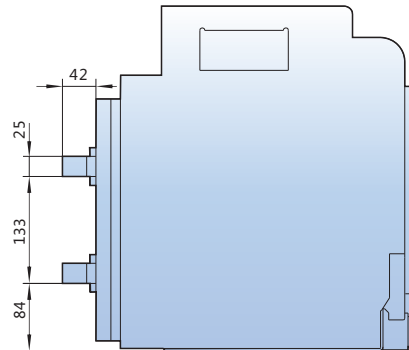
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.

## Horizontal connection (In=3200A~4000A)

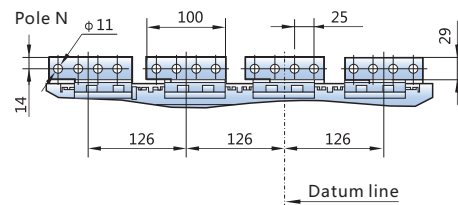
Side view



Busbar mounting dimensions

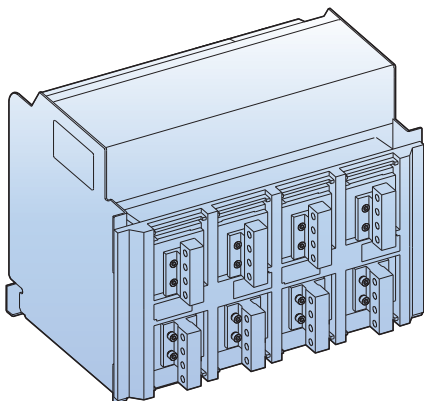


Note: If the user intends to change horizontal connection into vertical connection at site, it needs to change the upper and lower busbars of phases N and B into the same busbars of phases A and C.

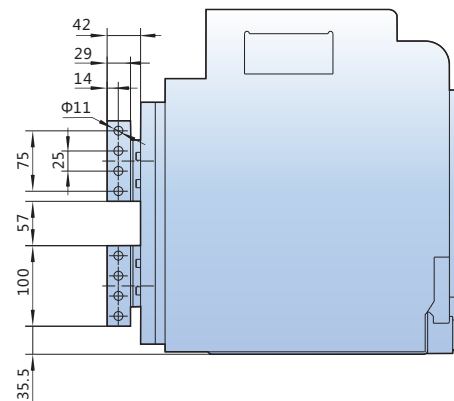


## Vertical connection (In=3200A~ 4000A)

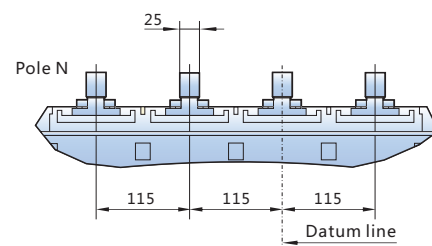
Side view



Busbar mounting dimensions

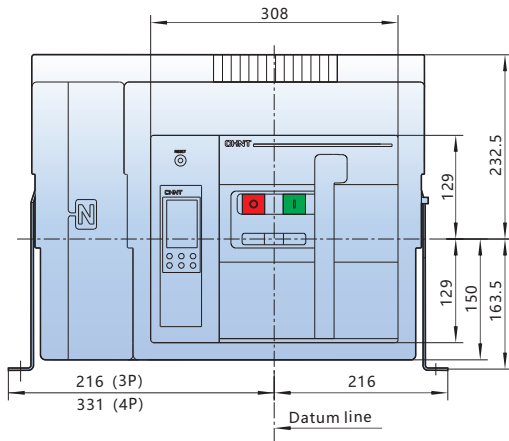


Note: If the user intends to change vertical connection into horizontal connection at site, it needs to change the upper and lower busbars of phases N and B into the same busbars of phases A and C.

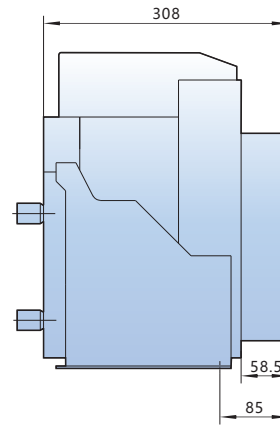


## NA8-4000 fixed type

Front view

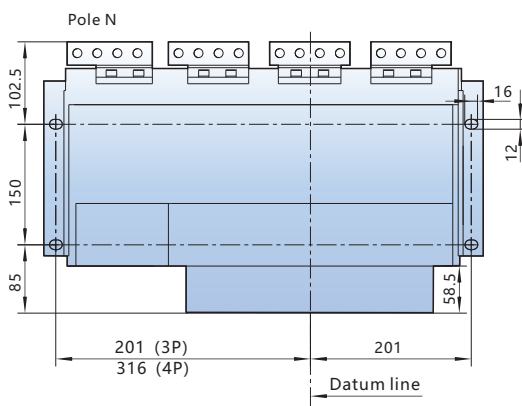


Side view

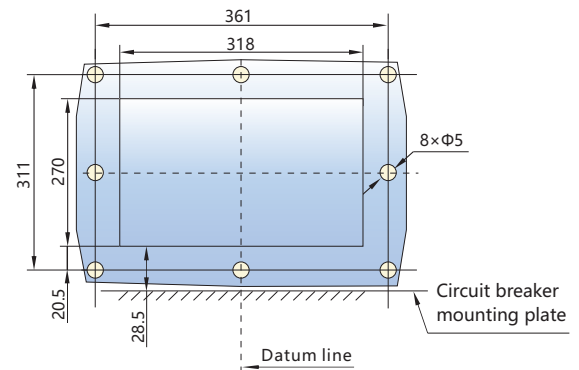


## Hole size

Hole size of the base

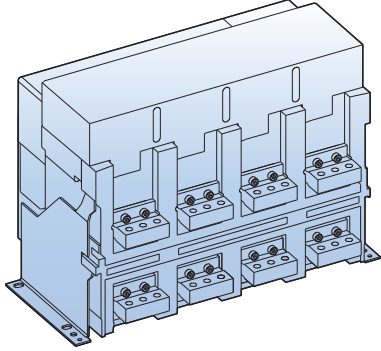


Hole size of the panel

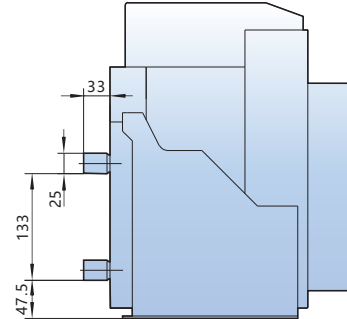


## Horizontal connection (In=1600A~2500A)

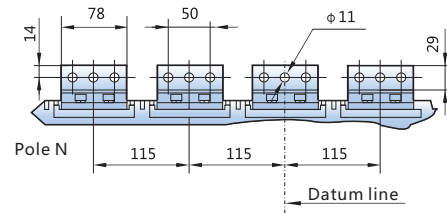
Side view



Busbar mounting dimensions

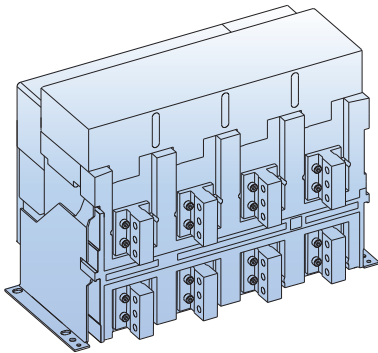


Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

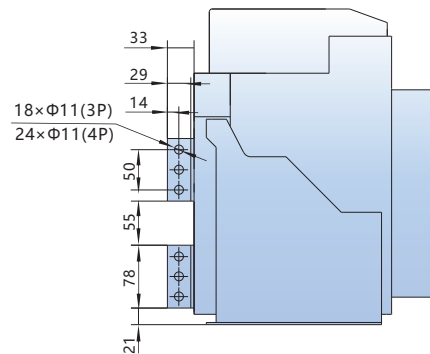


## Vertical connection (In=1600A~2500A)

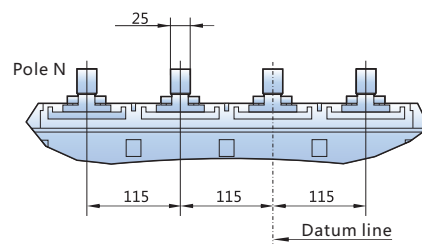
Side view



Busbar mounting dimensions



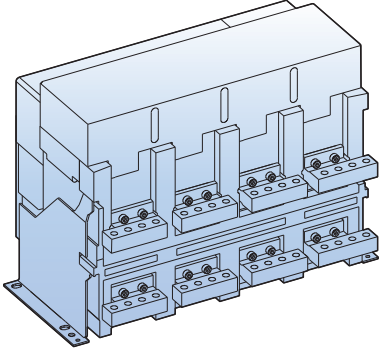
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.



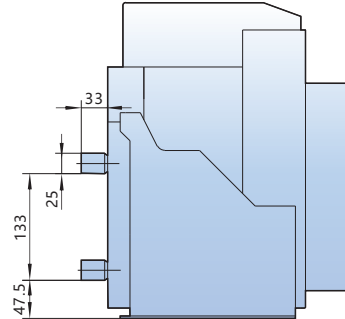


## Horizontal connection (In=3200A~ 4000A)

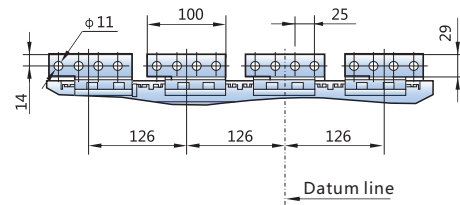
Side view



Busbar mounting dimensions

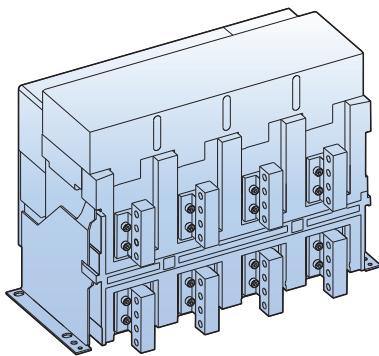


Note: If the user intends to change horizontal connection into vertical connection at site, it needs to change the upper and lower busbars of phases N and B into the same busbars of phases A and C.

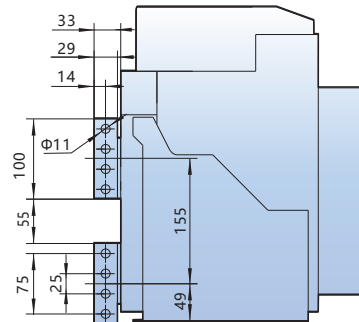


## Vertical connection (In=3200A~ 4000A)

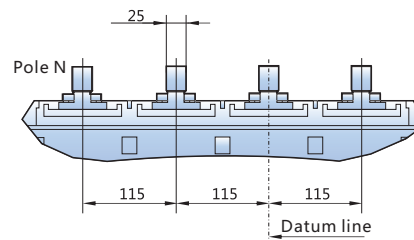
Side view



Busbar mounting dimensions

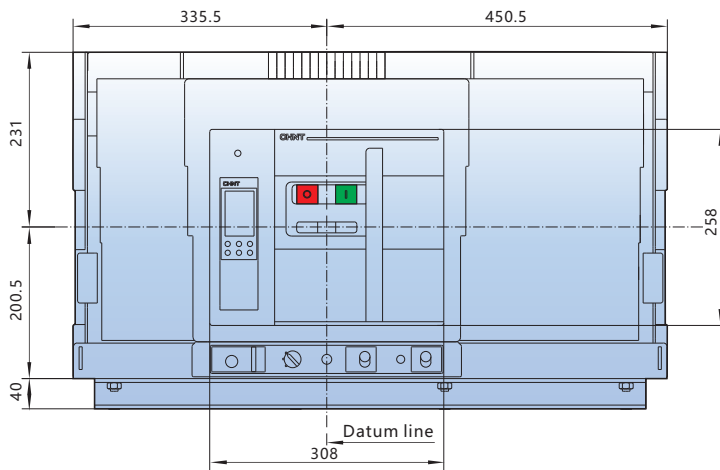


Note: If the user intends to change vertical connection into horizontal connection at site, it needs to change the upper and lower busbars of phases N and B into the same busbars of phases A and C.

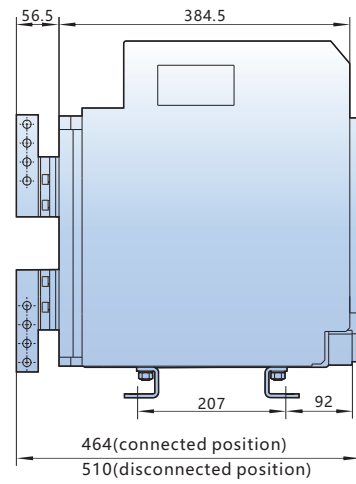


## NA8-7500 (In=4000A~ 6300A) three-pole draw-out type

Front view

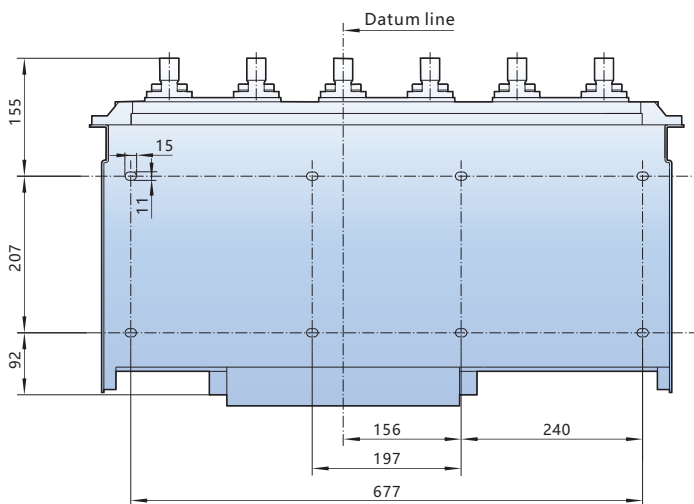


Side view

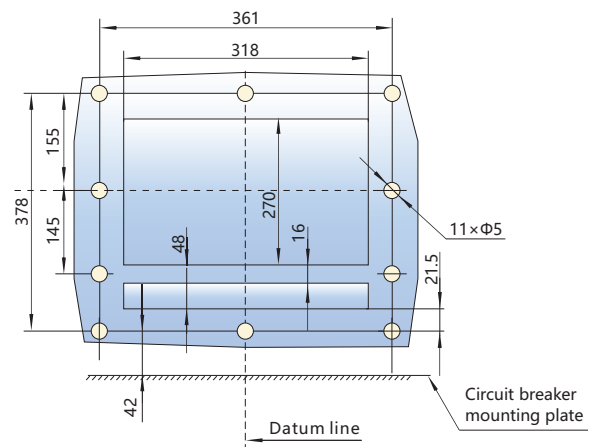


## Hole size

Hole size of the base

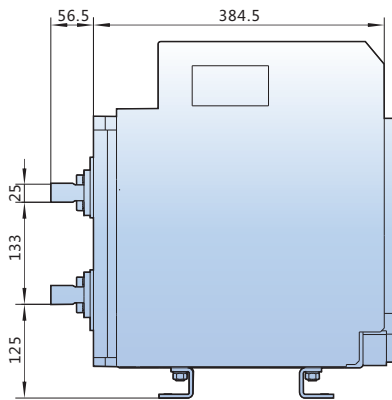


Hole size of the panel

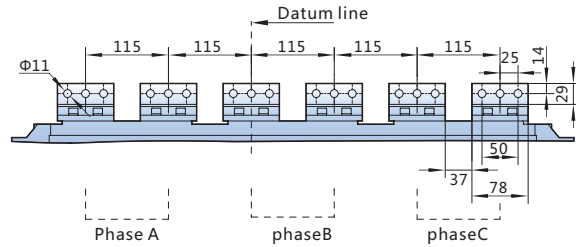


### Horizontal connection (In=4000A~ 5000A/ three poles)

Side view



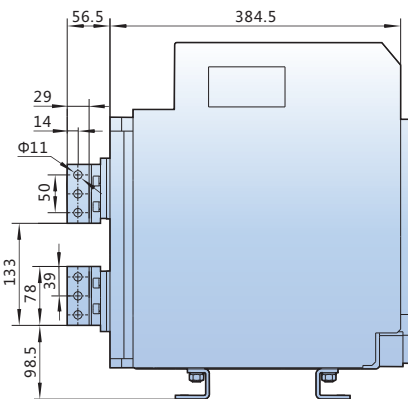
Busbar mounting dimensions



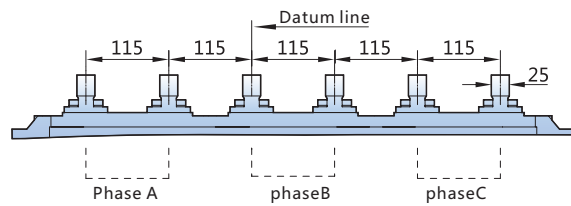
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

### Vertical connection (In=4000A~ 5000A/ three poles)

Side view



Busbar mounting dimensions



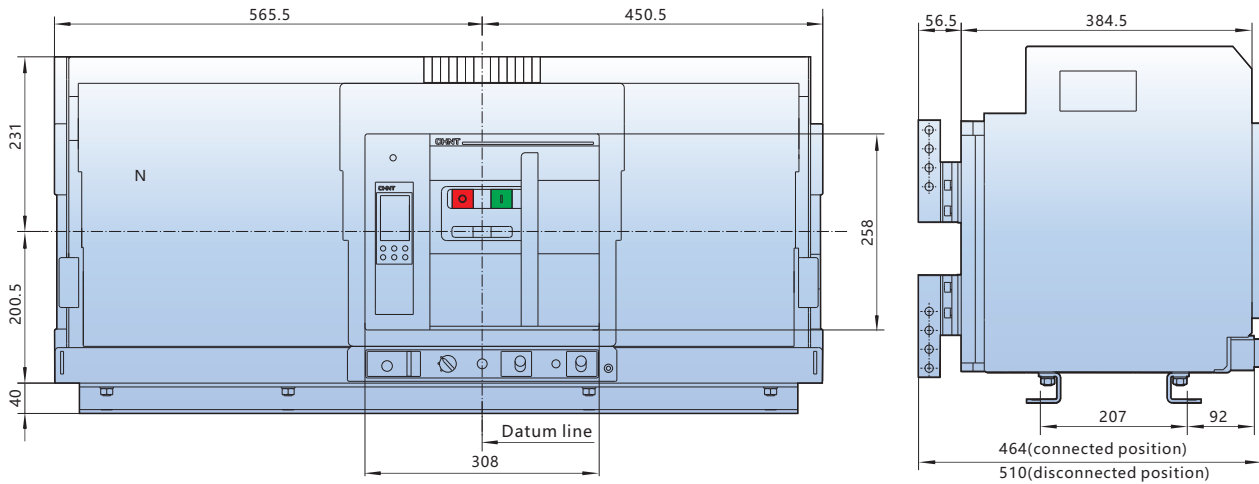
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.



NA8-7500 draw-out type ( $I_n=4000A \sim 6300A$ ) four poles/ ( $I_n=7500A$ ) three & four poles

Front view

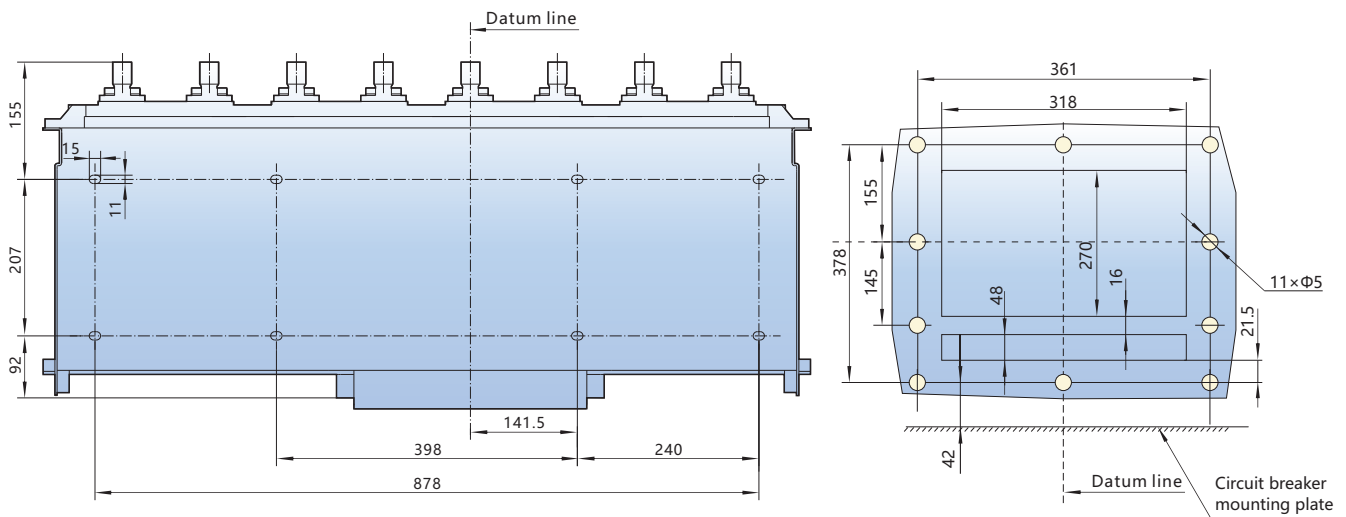
Side view



Hole size

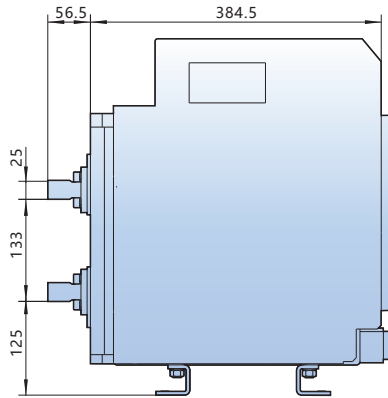
Hole size of the base

Hole size of the panel

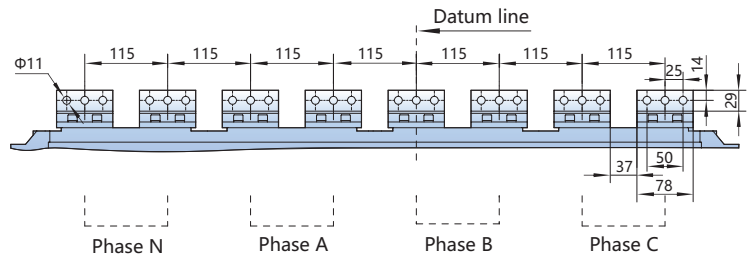


## Horizontal connection (In=4000A ~ 5000A/ four poles)

Side view



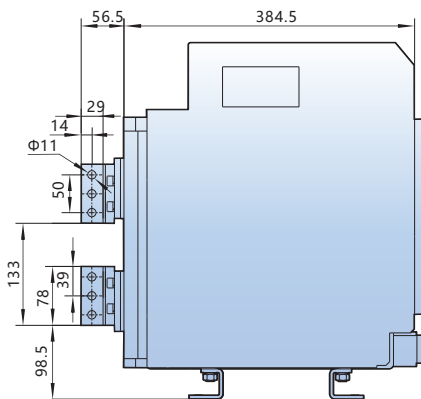
Busbar mounting dimensions



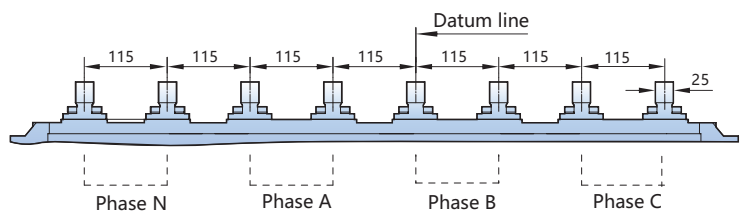
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

## Vertical connection (In=4000A~ 5000A/ four poles)

Side view



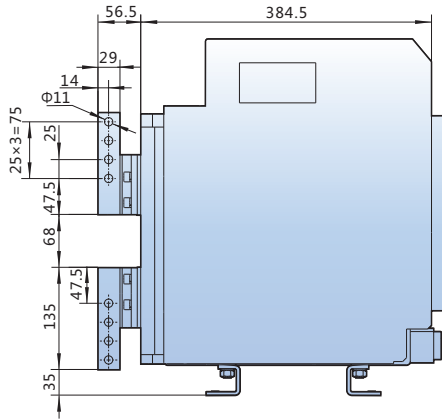
Busbar mounting dimensions



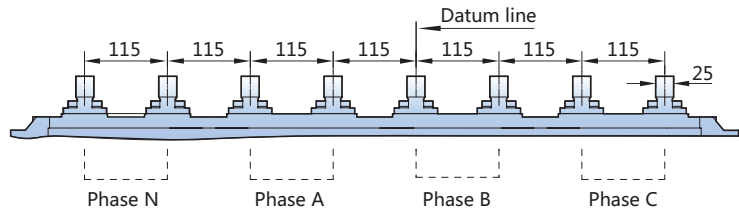
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.

Vertical connection (In=6300A/ four poles)

Side view



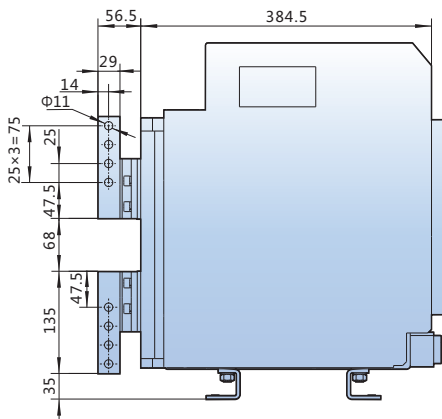
### Busbar mounting dimensions



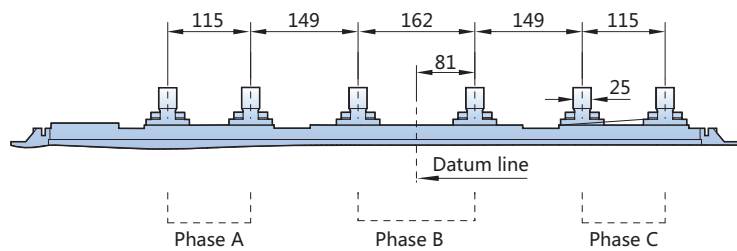
Note: In=6300A only has vertical connection and has no horizontal connection.

Vertical connection ( $I_n=7500\text{A}$ / three poles)

Side view



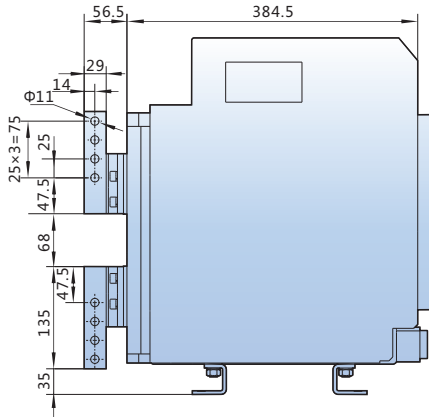
### Busbar mounting dimensions



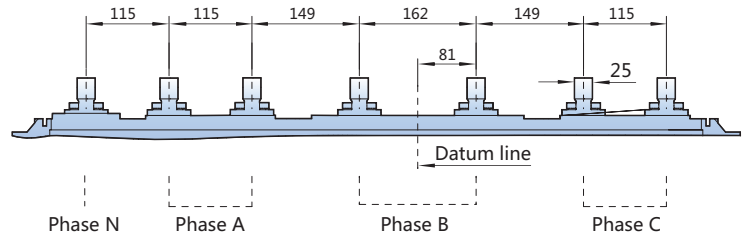
Note: In=7500A only has vertical connection and has no horizontal connection.

## Vertical connection (In=7500A/ four poles)

Side view

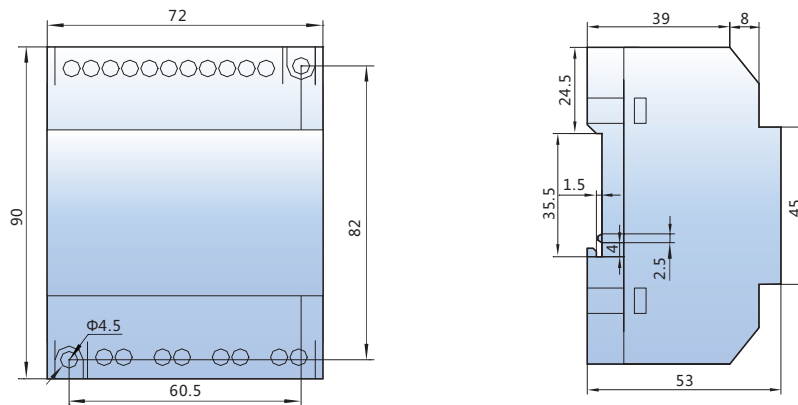


Busbar mounting dimensions



Note: In=7500A only has vertical connection and has no horizontal connection.

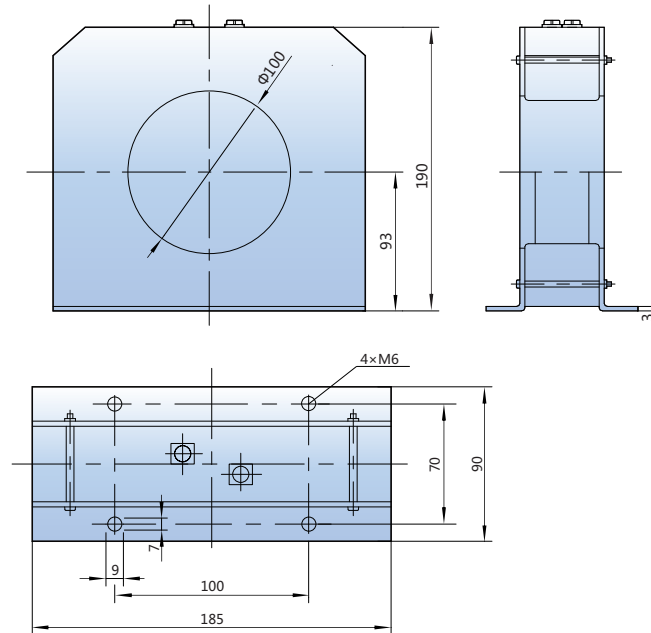
## Dimensions of undervoltage time delay control module, power module, RU-1 relay signal module



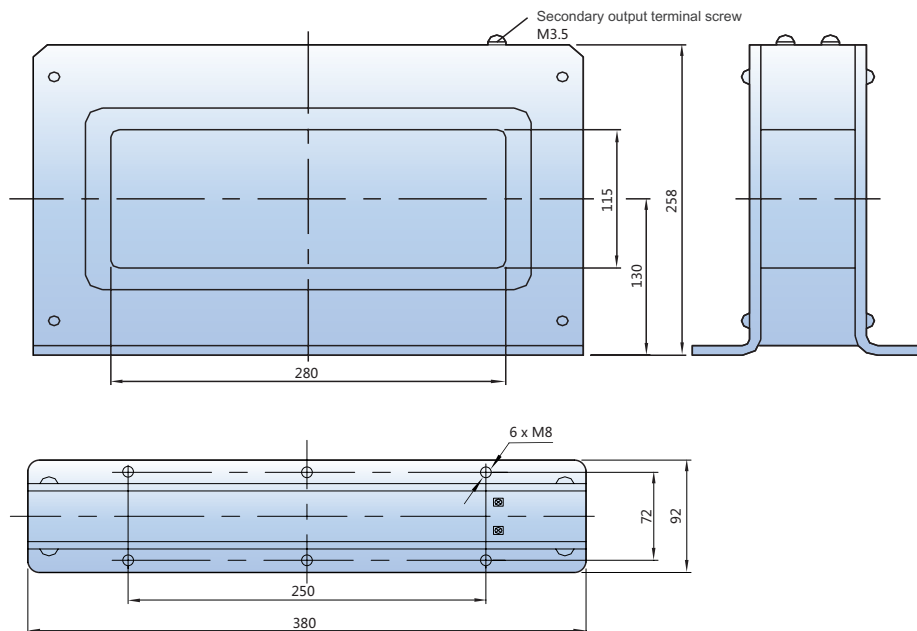
Note: Undervoltage time delay control module, power module, RU-1 relay signal module have consistent overall dimensions, and can be installed using the 35mm standard DIN rail mounting.



### Dimensions of ground current transformer

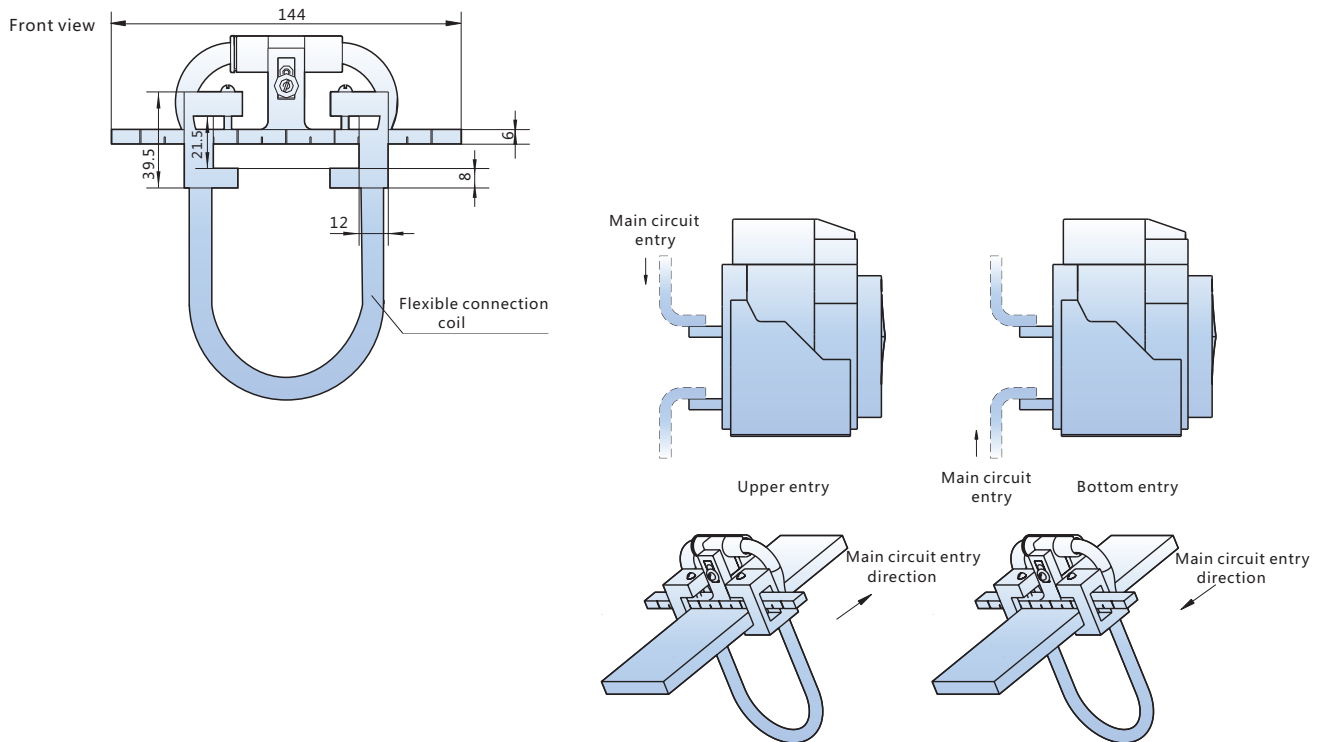


### Dimensions of leakage protection transformer



Note: The circuit breaker selected with the leakage transformer should use the vertical busbar connection mode.

## Dimensions of neutral pole current transformer

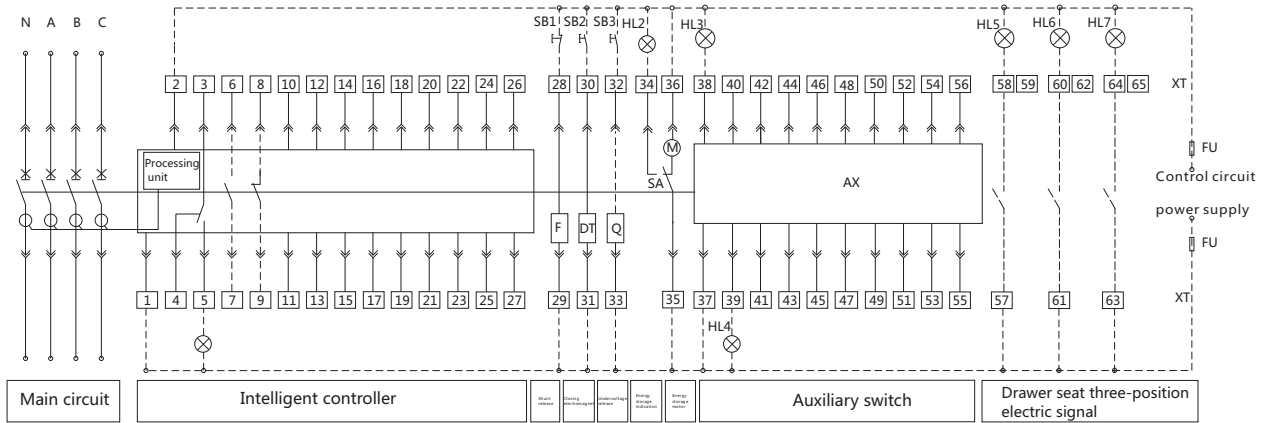


- Note: 1. Upon fixing the neutral transformer, it needs to install it at the entry end of circuit breaker, and one side of its flexible cable should face the entry direction of main circuit.  
 2. When the rated current is 200A-630A, the transformer needs to be wrapped around the busbar twice to be used normally.

## Secondary Circuit Wiring

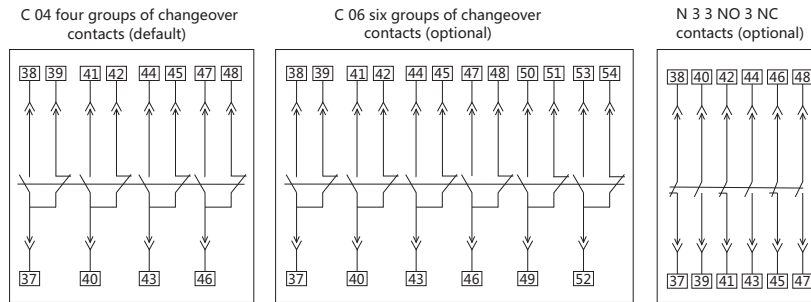
NA8-1600 ( In preparation... )

M Type controller



## Type of AX auxiliary contact

Used by the user



F—Shunt release DT—Closing electromagnet

Q—Undervoltage release

M—Motor-driven mechanism

SA—Travel switch XT—Connection terminal

AX—Auxiliary contact SB1—Breaking button

SB2—Making button SB3—Emergency stop button

HL1—Fault indicator light HL2—Energy storage indicator light

HL3—Breaking indicator light

HL4—Making indicator light

HL5 ~7 —Position indicator light

FU—Fuse (6A)

1#, 2#: Intelligent controller power supply: voltage AC220/380V can be directly connected to 1#, 2#; If voltage is DC220/110V, it needs to through the power module, and the power module outputs 24V which can be connected to 1#, 2#.

3#~5#: Tripping alarm contact (3 is the common point.)

6#~ 9#: Auxiliary contact (1 NO and 1 NC ), optional.

10#, 11#: Empty

12#~ 19#: Empty

20#: Empty

21#~24#: Empty

24#, 25#: The contacts for external phase N transformer input signal; for conventional product, they are empty, and should be ordered by the user specifically. Where external transformer is required, they are the external transformer signal input contacts.

27# : Protective grounding, is connected to the outer board of the circuit breaker;

28#, 29#: Shunt release;

30#, 31#: Closing electromagnet;

32#, 33#: Undervoltage release.

34#~36#: Motor-driven mechanism.

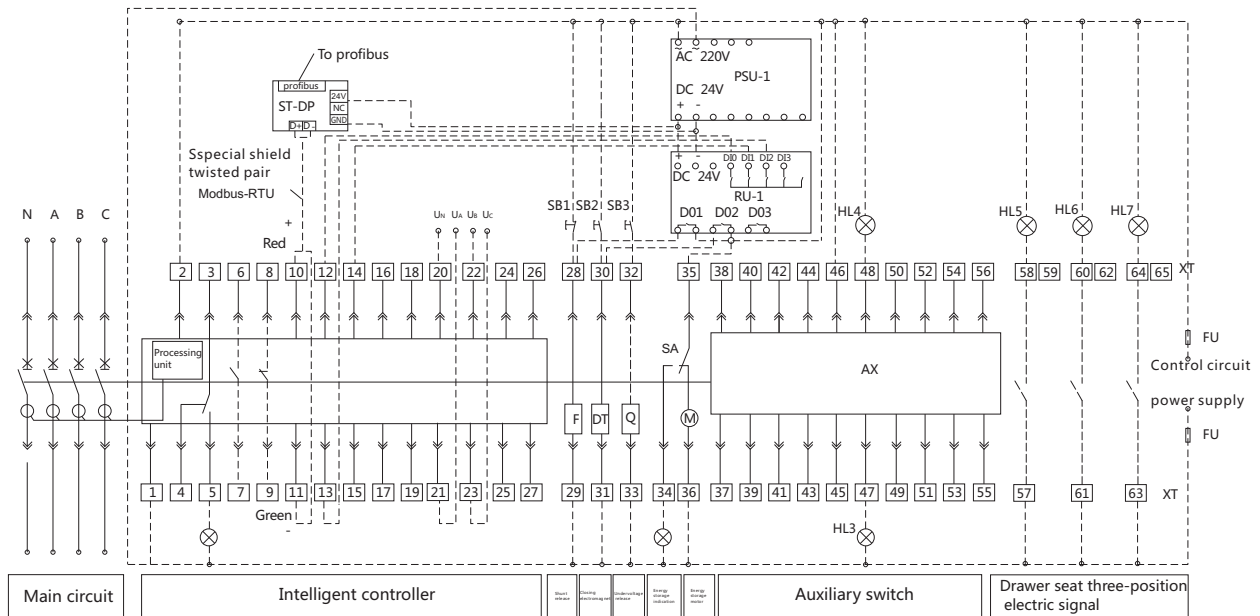
37#~56#: Auxiliary contact. The conventional product has 4 groups of changeover auxiliary contacts; in case of special order from the user, 6 groups of changeover contacts can be provided, 3 NO 3C contacts. 6 groups of changeover contacts are used for AC only.

57#~65#: Draw-out type circuit breaker three-position signal indication; the conventional supply has not wire connection, is only for the draw-out type circuit breaker with the secondary functions selected.

Note: The part in solid line has been connected by the factory, and the part in dashed line shall be connected by the customer.

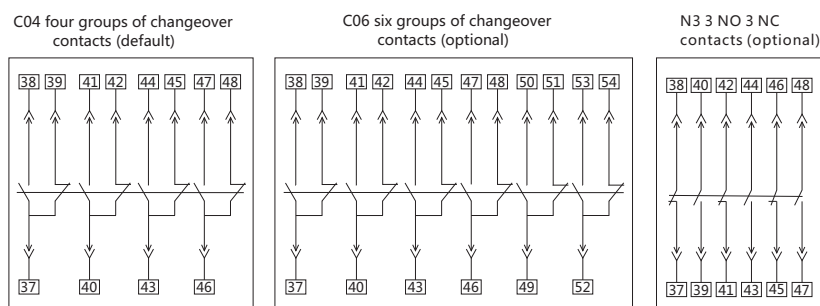
NA8-1600 ( In preparation... )

H Type controller



Type of AX auxiliary contact

Used by the user



F —Shunt release DT —Closing electromagnet

Q —Undervoltage release

M —Motor-driven mechanism

SA —Travel switch XT —Connection terminal

AX —Auxiliary contact SB1 —Breaking button

SB2 —Making button SB3 —Emergency stop button

HL1 —Fault indicator light

HL2 —Energy storage indicator light

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HL4 —Making indicator light

HL5 ~ 7 —Position indicator light

FU —Fuse (6A)

1#, 2#: Intelligent controller power supply: voltage AC220/380V can be directly connected to 1#, 2#; If voltage is DC220/110V, it needs to through the power module, and the power module outputs 24V which can be connected to 1#, 2#.

3#~5#: Tripping alarm contact (3 is the common point)

6#~9#: Auxiliary contact (1 NO and 1 NC ), optional.

10#, 11#: Type H intelligent controller default communication output contact.

12#~15#: 3 groups of programmable output signal, which must be connected with external RU-1 relay module. When type H intelligent controller has programmable output signal, default output: 12 #, 13#: Closing signal output, 12#,14 #: Opening signal output,12 #, 15 #: Fault tripping. The conventional product has no such connection.

19# : H type intelligent controller communication shielding ground wire

20#~23#: Voltage display input signal contact,20#: Phase N voltage signal,21#: Phase A voltage signal, 22#: Phase B voltage signal,23# : Phase C voltage signal. The conventional product has no such connection.

24#, 25#: External Phase N transformer or external earth current transformer input signal contact; for conventional product, they are empty, and should be ordered by the user specifically. Where external transformer is required, they are the external transformer signal input contacts.

27# : Protective grounding, is connected to the outer board of the circuit breaker;

28#, 29#: Shunt release;

30#, 31#: Closing electromagnet;

32#, 33#: Undervoltage release.

34 #~ 36 #: Motor-driven mechanism.

37 #~ 56 #: Auxiliary contact. 6 groups of changeover contacts are used for AC only.The conventional product has 4 groups of changeover auxiliary contacts; in case of special order from the user, 6 groups of changeover contacts, 3 NO 3C contacts can be provided.

57#~ 65#: Draw-out type circuit breaker three-position signal indication; the conventional supply has not wire connection, is only for the draw-out type circuit breaker with the secondary functions selected.

ST-DP: DP protocol module; when the upper computer communication protocol is Modbus-RTU, ST-DP protocol module is not required; when the upper computer communication protocol is Profibus-DP, ST-DP protocol module is required to change the Modbus-RTU protocol into Profibus-DP protocol with the cost separately charged.

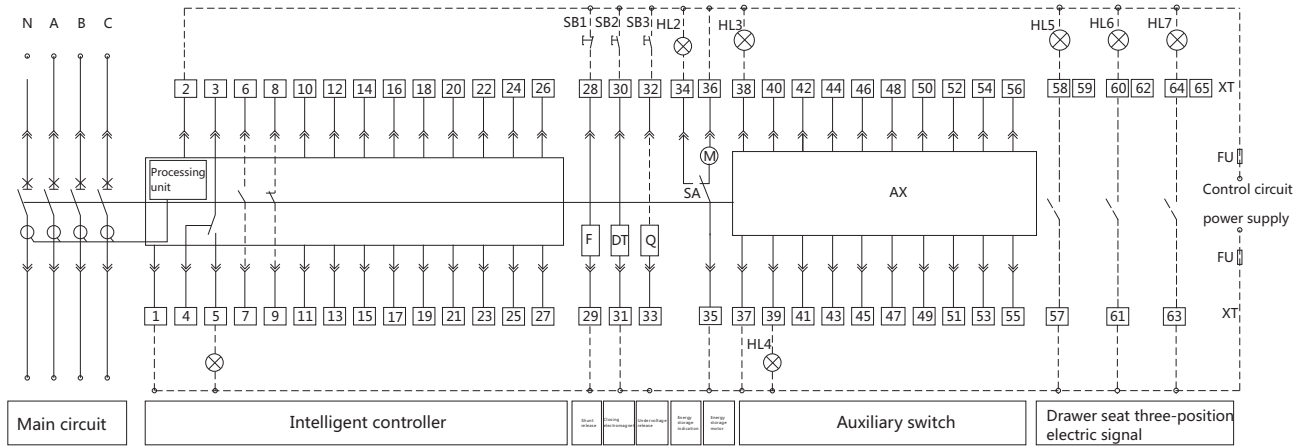
RU-1:Relay module.The upper computer remotely controls it to open or close the circuit breaker, and it is used for amplifying the opening and closing signal energy with the cost separately charged.

Note: The part in solid line has been connected by the factory, and the part in dashed line shall be connected by the customer.

## Secondary Circuit Wiring

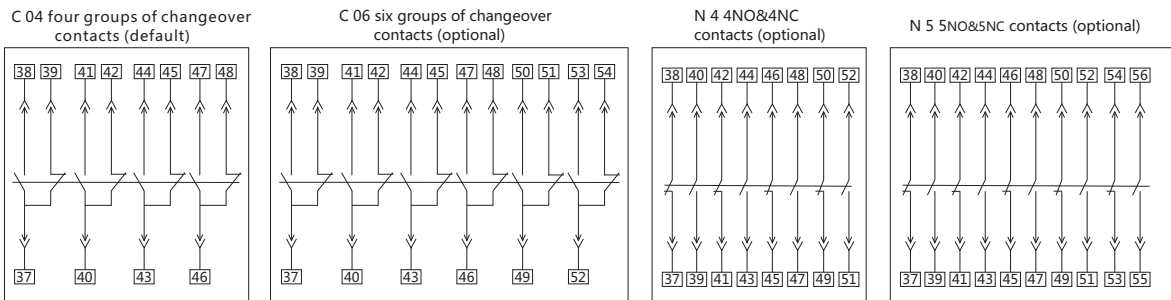
NA8-2500/4000/7500

M Type controller



## Type of AX auxiliary contact

Used by the user



F—Shunt release DT —Closing electromagnet

Q —Undervoltage release

M—Motor-driven mechanism

SA—Travel switch XT—Connection terminal

AX—Auxiliary contact SB1—Breaking button

SB2—Making button SB3—Emergency stop button

HL1—Fault indicator light HL2—Energy storage indicator light

HL3—Breaking indicator light HL4—Making indicator light

HL5 ~ 7—Position indicator light

FU—Fuse (6A)

1#, 2#: Intelligent controller power supply: voltage AC220/380V can be directly connected to 1#, 2#; If voltage is DC220/110V, it needs to through the power module, and the power module outputs 24V which can be connected to 1#, 2#.

3#~ 5#: Tripping alarm contact (3 is the common point)

6#~ 9#: Auxiliary contact (1 NO and 1 NC), optional

10#, 11#: Empty

12#~ 19#: Empty

20#: Empty

21#~ 24#: Empty

24#, 25#: The contacts for external Phase N transformer input signal; for conventional product, they are empty, and should be ordered by the user specifically. Where external transformer is required, they are the external transformer signal input contacts.

27#: Protective grounding, is connected to the outer board of the circuit breaker ;

28 #, 29 #: Shunt release;

30#, 31#: closing electromagnet;

32 #, 33 #: Undervoltage release.

34 #~36 #: Motor-driven mechanism.

37#~56#: Auxiliary contact. 6 groups of changeover contacts are used for AC only. The conventional product has 4 groups of changeover auxiliary contacts; in case of special order from the user, 6 groups of changeover contacts, 4 NO 4 NC contacts and 5 NO 5 NC contacts can be provided.

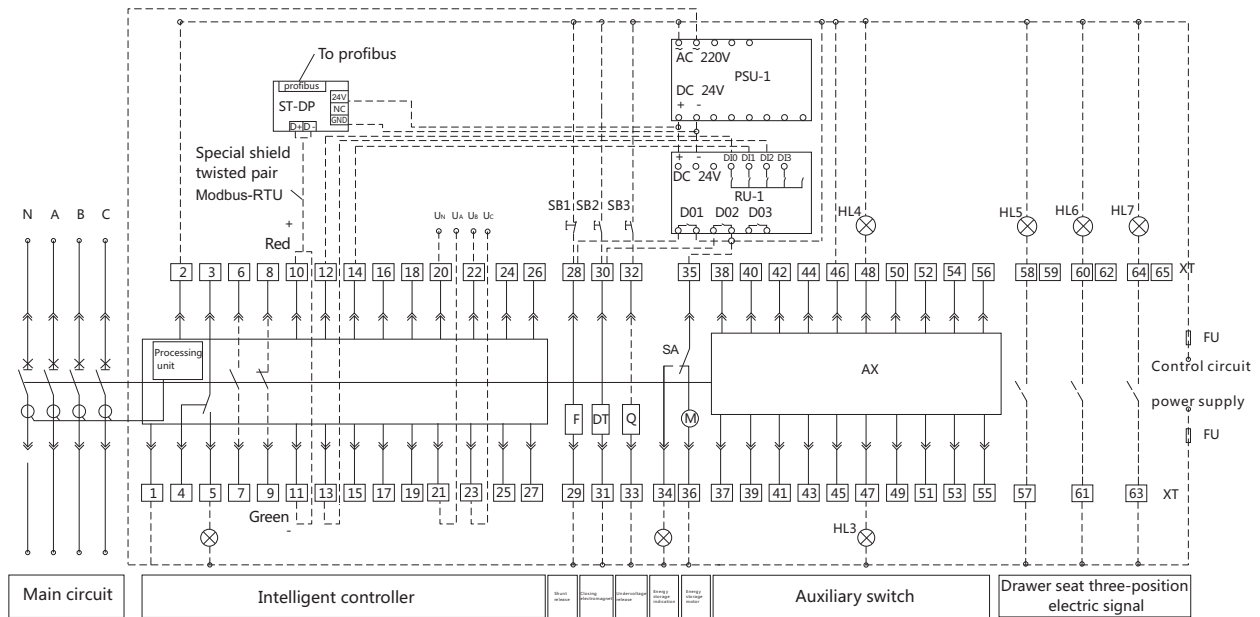
57#~ 65#: Draw-out type circuit breaker three-position signal indication, the conventional supply has not wire connection, is only for the draw-out type circuit breaker with the secondary functions selected.

Note: The part in solid line has been connected by the factory, and the part in dashed line shall be connected by the customer.



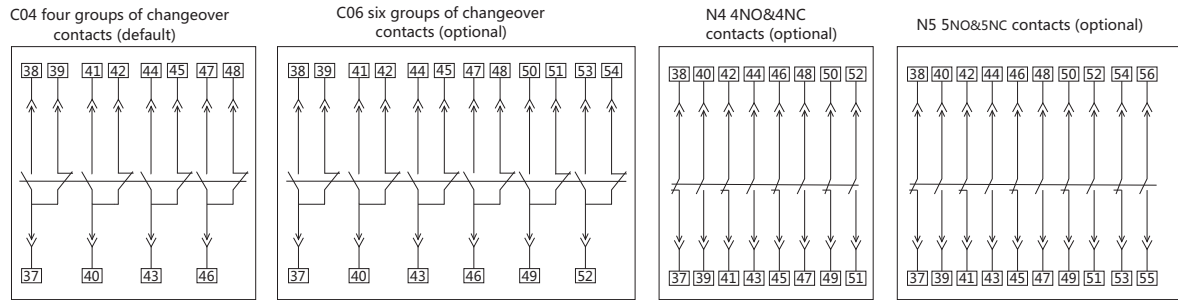
NA8-2500/4000/7500

H Type controller



## Type of AX auxiliary contact

Used by the user



F —Shunt release DT —Closing electromagnet

Q —Undervoltage release

M —Motor-driven mechanism

SA —Travel switch XT —Connection terminal

AX —Auxiliary contact SB1 —Breaking button

SB2 —Making button SB3 —Emergency stop button

HL1 —Fault indicator light HL2 —Energy storage indicator light

HL3 —Breaking indicator light HL4 —Making indicator light

HL5~7 —Position indicator light

FU —Fuse (6A)

1#, 2#: Intelligent controller power supply: voltage AC220/380V can be directly connected to 1#, 2#; If voltage is DC220/110V, it needs to be through the power module, and the power module outputs 24V which can be connected to 1#, 2#.

3#~5#: Tripping alarm contact (3 is the common point)

6#~9#: Auxiliary contact (NO contact), optional.

10#, 11#: Type H intelligent controller default communication output contact.

12#~15#: 3 groups of programmable output signal, which must be connected with external RU-1 relay module. When type H intelligent controller has programmable output signal, default output: 12#, 13#: Closing signal output, 12#, 14#: Opening signal output, 12#, 15 #: Fault tripping. The conventional product has no such connection.

19#: H type intelligent controller communication shielding ground wire

20#~23#: Voltage display I nput signal contact, 20#: Phase N voltage signal, 21#: Phase A voltage signal, 22#: Phase B voltage signal, 23#: Phase C voltage signal. The conventional product has nsuch connection.

24#, 25#: External Phase N transformer or external earth current transformer input signal contact; for conventional product, they are empty, and should be ordered by the user specifically., where external transformer is required, they are the external transformer signal input contacts.

27#: Protective grounding, is connected to the outer board of the circuit breaker;

28 #, 29 #: Shunt release;

30#, 31#: Closing electromagnet;

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34 #~ 36 #: Motor-driven mechanism.

37 #~56 #: Auxiliary contact. 6 groups of changeover contacts are used for AC only. The conventional product has 4 groups of changeover auxiliary contacts; in case of special order from the user, 6 groups of changeover contacts, 4 NO 4 NC contacts or 5 NO 5 NC can be provided.

57#~ 65#: Draw-out type circuit breaker three-position signal indication, the conventional supply has not wire connection, is only for the draw-out type circuit breaker with the secondary functions selected.

ST-DP: DP protocol module, when the upper computer communication protocol is Modbus-RTU, ST-DP protocol module is not required; when the upper computer communication protocol is Profibus-DP, ST-DP protocol module is required to change the Modbus-RTU protocol into Profibus-DP protocol with the cost separately charged.

RU-1: Relay module. The upper computer remotely controls it to open or close the circuit breaker, and it is used for amplifying the opening and closing signal energy with the cost separately charged.

Note: The part in solid line has been connected by the factory, and the part in dashed line shall be connected by the customer.

## Circuit Breaker Configuration

Standard component	NA8-1600 (In preparation... )		NA8-2500		NA8-4000		NA8-7500
	Fixed type	Draw-out type	Fixed type	Draw-out type	Fixed type	Draw-out type	Draw-out type
Circuit breaker body	■	■	■	■	■	■	■
Drawer seat		■		■		■	■
Intelligent controller	■	■	■	■	■	■	■
Upper and lower horizontal connection	■	■	■	■	■	■	■
Auxiliary contact 4CO	■		■		■		■
Fault tripping indication contact	■	■	■	■	■	■	■
Motor-driven operating mechanism	■	■	■	■	■	■	■
Closed electromagnet	■	■	■	■	■	■	■
Shunt release	■	■	■	■	■	■	■
Door frame	■	■	■	■	■	■	■

Note: The table above is the standard configuration of motor-driven type

Optional accessory	NA8-1600 (In preparation... )		NA8-2500		NA8-4000		NA8-7500
	Fixed type	Draw-out type	Fixed type	Draw-out type	Fixed type	Draw-out type	Draw-out type
Undervoltage time delay release	■	■	■	■	■	■	■
Undervoltage instantaneous release	■	■	■	■	■	■	■
Opening/closing button lock	■	■	■	■	■	■	■
Drawer position padlock		■		■		■	■
Drawer safety barrier padlock		■		■		■	■
Body key lock	■	■	■	■	■	■	■
Position door interlock		■		■		■	■
Condition door interlock		■		■		■	■
Auxiliary contact 6CO	■	■	■	■	■	■	■
Auxiliary contact 3NO + 3NC	■	■					
Auxiliary contact 4NO + 4NC			■	■	■	■	■
Auxiliary contact 5NO + 5NC			■	■	■	■	■
Drawer position indication contact		■		■		■	■
Mechanical interlock (two)	■	■	■	■	■	■	■
External neutral line transformer	■	■	■	■	■	■	■
Ground current transformer and accessories	■	■	■	■	■	■	■
Interphase insulating barrier	■	■	■	■	■	■	■
Mechanical interlock (three)			■	■	■	■	■

## Circuit Breaker Type Selection Table

Frame current	NA8-1600 (In preparation...)	NA8-2500	NA8-4000	NA8-7500	
Circuit breaker	N <input type="checkbox"/>	H <input type="checkbox"/>	H <input type="checkbox"/>	N <input type="checkbox"/>	H <input type="checkbox"/>
Rated current	200A <input type="checkbox"/>	630A <input type="checkbox"/>	2000A <input type="checkbox"/>	4000A <input type="checkbox"/>	4000A <input type="checkbox"/>
	400A <input type="checkbox"/>	800A <input type="checkbox"/>	2500A <input type="checkbox"/>	5000A <input type="checkbox"/>	5000A <input type="checkbox"/>
	630A <input type="checkbox"/>	1000A <input type="checkbox"/>	3200A <input type="checkbox"/>	6300A <input type="checkbox"/>	6300A <input type="checkbox"/>
	800A <input type="checkbox"/>	1250A <input type="checkbox"/>	4000A <input type="checkbox"/>	7500A <input type="checkbox"/>	7500A <input type="checkbox"/>
	1000A <input type="checkbox"/>	1600A <input type="checkbox"/>	1600A <input type="checkbox"/>		
	1250A <input type="checkbox"/>	2000A <input type="checkbox"/>			
	1600A <input type="checkbox"/>	2500A <input type="checkbox"/>			
Number of poles	3 poles <input type="checkbox"/> 4 poles <input type="checkbox"/>				
Mounting mode	Draw-out type <input type="checkbox"/> Fixed type <input type="checkbox"/> ( NA8-7500 has no fixed type )				
Busbar connection mode	Horizontal connection <input type="checkbox"/> Vertical connection <input type="checkbox"/> Mixed connection <input type="checkbox"/> ( indicating the connection mode )				
Intelligent controller	M type <input type="checkbox"/> ( basic type ) H type <input type="checkbox"/> ( communication type )				
Shunt, closing, motor	Closing electromagnet <input type="checkbox"/> Shunt release <input type="checkbox"/> Energy storage motor <input type="checkbox"/>				
	AC220/230V <input type="checkbox"/>	AC380/400V <input type="checkbox"/>	DC220V <input type="checkbox"/>	AC/DC110V <input type="checkbox"/>	DC24V <input type="checkbox"/>
Undervoltage release	UVT <input type="checkbox"/> UVTD <input type="checkbox"/>				
	AC220/230 V <input type="checkbox"/>	AC380/400 V <input type="checkbox"/>	DC220V <input type="checkbox"/>	AC/DC110V <input type="checkbox"/>	DC24V <input type="checkbox"/>
Auxiliary contact	NA8-1600 C04 ( standard ) C06 <input type="checkbox"/> ( only for AC ) N3 <input type="checkbox"/> ( only for AC )				
	NA8-2500、NA8-4000~7500 C04 ( standard ) C06 <input type="checkbox"/> N4 <input type="checkbox"/> N5 <input type="checkbox"/>				
Auxiliary contact indication (optional)	Drawer seat three-position signal device <input type="checkbox"/>				
Connecting accessory (optional)	Interphase insulating barrier <input type="checkbox"/> NA8-1600 extension busbar <input type="checkbox"/>				
Controller function and accessories (optional)	External transformer : Phase N external transformer <input type="checkbox"/> External LEC leakage transformer <input type="checkbox"/> Ground current protection transformer <input type="checkbox"/>				
	Controller functions : 3P + N protection function <input type="checkbox"/> Leakage protection function <input type="checkbox"/> Ground current protection function <input type="checkbox"/>				
	Voltage measurement and protection function <input type="checkbox"/> Electric energy measurement and protection function <input type="checkbox"/>				
	Signal contact output function <input type="checkbox"/> ZSI zone interlock protection function <input type="checkbox"/> Load monitoring function <input type="checkbox"/>				
Notes:	1) For 3P + N protection function, the phase N external transformer must be selected at the same time;				
	2) For the leakage protection function, the external LEC leakage transformer must be selected at the same time;				
	3) For the ground current protection function, the ground current protection transformer must be selected at the same time.				
Lock mechanism (optional)	Breaking/Making button 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"/>				
Mechanical interlock (optional)	Wire rope interlock (two interlock) <input type="checkbox"/> Wire rope interlock (MIT-3) <input type="checkbox"/> Wire rope interlock (MIT-4) <input type="checkbox"/>				
Module (optional)	PSU-1 <input type="checkbox"/> RU-1 <input type="checkbox"/> ST-DP protocol conversion module <input type="checkbox"/>				

Remark: Upon placing an order, the frame current, rated current and auxiliary control voltage must be indicated!

Notes: 1) Please check the ☐ corresponding to required option with “√” or “-”, and fill the figure; if there is no marking, we will provide the goods according to the conventional factory setting.

2) If the additional functions and special requirement are selected, additional expense will incur separately. TEL: 0577-62877777 – 706213. FAX: 0577 - 62877777-706288.

## Configuration explanations

I. NA8-1600~2500、NA8-4000 ~7500 conventional configuration explanations Shunt release, closing electromagnet, 4 groups changeover contacts, motor, M type intelligent controller, main circuit horizontal connection, door frame, main circuit mounting bolts, circuit breaker operation manual, packing case, drawer seat (draw-out type circuit breaker)

II. Optional configuration (with additional expense)

NA8-1600 optional configuration explanations: undervoltage instantaneous release, undervoltage time delay release, wire rope interlock, key lock, external transformer earth protection function, 6 groups of changeover contacts, 3NO 3NC contacts, H type intelligent controller, optional type H function, interphase insulating barrier, position signal.

NA8-2500、NA8-4000~7500 optional configuration explanations: undervoltage time delay release (1s~5s adjustable), wire rope interlock, button lock, key lock, door interlock, external transformer ground protection function, vertical connection, 6 groups of changeover contacts, 4NO 4NC contacts, 5NO 5NC contacts, type H intelligent controller, optional H type function, position signal.

### Note

This image shows a full page of a handwriting practice worksheet. It consists of multiple sets of three horizontal dashed lines, providing a guide for letter height and placement. The lines are evenly spaced across the entire page, leaving ample room for writing practice. There is no text or other markings on the page.