FAMCO
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CHINT
Empower the World

Air Circuit Breaker

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group

Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲

تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

CHINT ELECTRIC | Next series

Air Circuit Breaker

NXA series air circuit breaker P-001

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Structural features of the circuit breaker

Circuit breaker description

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

N

Circuit breaker

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

Operation conditions and environment adaptability

- Operation temperature:
  The electrical and mechanical characteristics are applicable to the ambient temperature of -5℃ -+40℃ . NXA can also operate in the ambient temperature of -45℃ -+70℃ (M type, A type), -20℃ -+70℃ (P type, H type, CD-1), the derating factor is seen in P23-24.
- Storage conditions: apply to -45℃ ~+70℃
- NXA can resist the following electromagnetic interference

— Overvoltage generated by electromagnetic interference
— Overvoltage caused by environment interference or a power distributing system
— Electrostatic discharge of radio waves (radio, intercom, radar and the like)

- NXA has successfully passed the test for electromagnetic compatibility specified according to the following standards (EMC) IEC/EN 60947-2
  Annex F
  The test can guarantee no false tripping and no interference on tripping time
- Protection grade:
  Front IP 20, other side IP 00

Connection

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

Lock

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

Indication contact

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

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Drawowt type breaker


Drawer seat

+


Body

=


Drawout type breaker

Fixed type breaker


NXA16


NXA20 ~ NXA40

Note:NXA63 fixed type is seen in P45

Accessories


Interphased partition


Secondary wiring terminal-drawout type


Secondary wiring terminal-fixed type


N pole CT


Counter

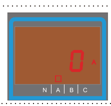

PSU-1

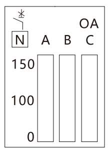
Model definition and description-intelligent controller

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

Model definition and description

NXA	16	N	04 -	M	D	3 -	AC230	M	Other
Code of Product	Code of frame size	Code of breaking capacity	Code of rated current	Code of intelligent controller	Code of installation method	Code of number of poles	Code of control circuit voltage	Code of operation mode	Code of special requirement
	16:1600A (04-16)	N: basic type	04-400A	M: basic type	D: draw-out type	3: 3 poles	AC 230: AC 230V	No code: motor operation	No code: no special requirement
	20:2000A (06-20)	S: standard type	06-630A	A: current type	F: fixed type	4: 4 poles	AC 400: AC 400V	M: manual operation	Special requirements code, such as: UVT
	32:3200A (16-32)	H: advanced type	08-800A	P: power type			DC 110: DC 110V		
	40:4000A (32-40)		10-1000A	H: harmonic type			DC 220: DC 220V		
	63:6300A (40-63)		12-1250A						
			16-1600A						
			20-2000A						
			25-2500A						
			32-3200A						
			36-3600A						
			40-4000A						
			50-5000A						
			63-6300A						





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

NXA series air circuit breaker

NXA	16	TU	M	-	04	-	3	-	AC230
Code of product	Code of frame size	Intelligent controller	Code of intelligent controller		Code of rated current		Code of number of poles		Code of auxiliary power supply
	16:1600A (04-16)		M: basic type		04-400A; 06-630A		3: 3 poles		AC 230: AC 230V
	20:2000A (06-20)		A: current type		08-800A; 10-1000A		4: 4 poles		AC 400: AC 400V
	32:3200A (16-32)		P: power type		12-1250A; 16-1600A				DC 110: DC 110V
	40:4000A (32-40)		H: harmonic type		20-2000A; 25-2500A				DC 220: DC 220V
	63:6300A (40-63)				32-3200A; 36-3600A				
					40-4000A; 50-5000A				
					63-6300A				

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Model definition and description-accessories

NXA	16	-	CC	-	230VAC
Code of product	Frame size		Code of accessories		Code of rated voltage
	16:1600A		CC: Closed electromagnet		230VAC: AC230V
	20:2000A		ST: Shunt tripper		400VAC: AC400V
	32:3200A		MO: Motor		110VDC: DC110V
	40:4000A		UVT: Undervoltage tripper		220VDC: DC220V
	63:6300A		ASUVT:Self-priming undervoltage tripper		Rated voltage+delay time (1s、3s、5s、7s)
	20/40:2000A-4000A		UVTD:UVT delay unit		
	20/32:2000A-3200A		ASUVTD: ASUVT delay unit		
	20/63:2000A-6300A				

Model definition and description-accessories

NXA	16	OF	C04
Code of product	Frame size	Code of accessories	Specification of accessories
	16:1600A	OF: Auxiliary contact	C04: Four groups of contacts
	20:2000A		C05: Five groups of contacts
	32:3200A		C06: Six groups of contacts
	40:4000A		N3: Three normally open and three normally closed
	63:6300A		N4: Four normally open and four normally closed
	20/40:2000A-4000A		N5: Five normally open and five normally closed
	20/32:2000A-3200A	KL: Key lock	1S1S: One lock and one key
	20/63:2000A-6300A		2S1S: Two locks and one key
			3S2S: Three locks and two keys
		FCDP: Fixed type door frame	
		DCDP: Draw-out type door frame	
		FD: Fixed type interphased partition	
		DD: Draw-out type interphased partition	
		CE-CD-CT: Position signal	
		ILK2: Mechanical interlocking two interlocking steel cables	
		MI-3: Triple mechanical interlock (2on+1off)	
		MI-4: Triple mechanical interlock (1on+2off)	

Note

N

Technical parameters

Features

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

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

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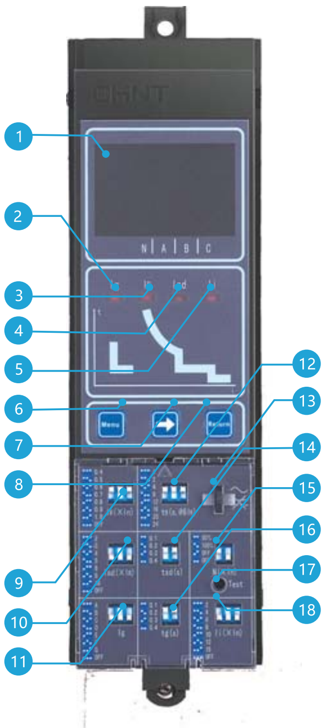
	2000A						3200A				4000A			6300A		
	630	800	1000	1250	1600	2000	1600	2000	2500	3200	3200	3600	4000	4000	5000	6300
	630	800	1000	1250	1600	2000	1600	2000	2500	3200	3200	3600	4000	2000	2500	-
	N	**S**	**H**				**N**	**S**	**H**		**N**	**S**	**H**	**H**		
	80	65	80				80	80	100		80	85	100	120		
	50	55	55				65	70	70		65	75	75	85		
	50	65	65				80	80	85		80	85	85	120		
	50	55	55				65	70	70		65	75	75	85		
	B						B				B			B		
	50	65	65				65	80	85		65	85	85	100		
	50	55	55				65	70	70		65	75	75	75		
	37	42	42				37	50	50		37	50	50	-		
	-	-	-				-	-	-		-	-	-	-		
	176	143	176				176	176	220		176	187	220	264		
	105	121	121				143	154	154		143	165	165	187		
	16	16	16				26	26	26		26	26	26	26		
	32						32				32			32		
	70						70				70			70		
	15000						10000				10000			2000		
	8000						7000				3000			500		
	▪						▪				▪			▪		
	374×344×400						439×373.5×400				550×337.5×400			897×435.5×399		
	469×344×400						554×373.5×400				700×337.5×400			897×435.5×399		
	403×430×438.5						463×499.5×438.5				569×416×438.5			923×500×435.5		
	498×430×438.5						578×499.5×438.5				719×416×438.5			923×500×435.5		



1.Display window: display the current value, the setting parameter, the fault current,the tripping time
2.Ig indicator for earth fault indication
3.Ir indicator for overload long-time-delay tripping
4.Isd indicator for short circuit short-time-delay tripping
5.Ii indicator for short circuit tripping
6.Menu button for inquiring the dial position and fault record
7.Rightward button: turn to the next state when inquiring the dial position
8.Return button: back to the previous level or resetting
9.Overload long-time-delay current setting
10.Short circuit short-time-delay current setting
11.Earth fault current setting
12.Overload long-time-delay time setting
13. Transparent cover lockhole
14.Short circuit short-time-delay time setting
15. Neutral line protection setting
16. Earth fault time-delay setting
17. Test button for simulating 6IR current
18. Short circuit instantaneous current setting

Intelligent controller

M type intelligent controller (Basic type)

Protection
All the protective threshold and time delay are set by a dial switch

● Overload protection
— Ture RMS long-time-delay protection
— Thermal memory: heat accumulation before and after tripping

● Short circuit protection
— Short-time delay (RMS) and instantaneous protection
— Optional four steps time-delay setting

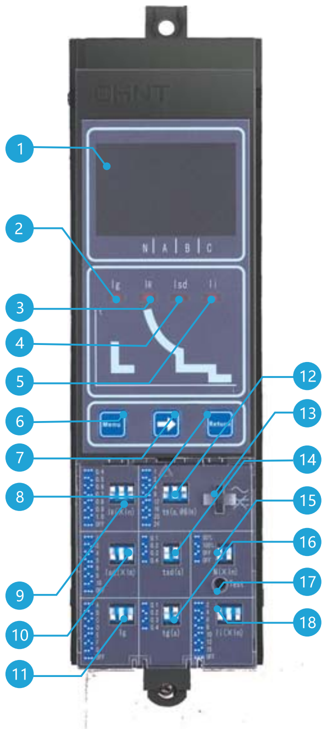
● Earth fault protection
Optional four steps time-delay setting

● Neutral line overcurrent protection (4P)
The neutral protective threshold can be adjusted to 50%, 100% and OFF

● Test function
Simulating 6Ir test current for test tripping

● Tripping record function

● Ampere meter
Measure the real and effective value (RMS) of current with the precision of 2% for 40% to 150% in setting



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8. Return button: back to the previous level or resetting
9. Overload long-time-delay current setting
10. Short circuit short-time-delay current setting
11. Earth fault current setting
12. Overload long-time-delay time setting
13. Transparent cover lockhole
14. Short circuit short-time-delay time setting
15. Neutral line protection setting
16. Earth fault time-delay setting
17. Test button for simulating 6IR current
18. Short circuit instantaneous current setting

A type intelligent controller (Current type)

Protection
All the protective threshold and time delay are set by a dial switch

● Overload protection
— Ture RMS long-time-delay protection
— Thermal memory: heat accumulation before and after tripping

● Short circuit protection
— Short-time delay (RMS) and instantaneous protection
— Optional four steps time-delay setting

● Earth fault protection
Optional four steps time-delay setting

● Neutral line overcurrent protection (4P)
The neutral protective threshold can be adjusted to 50%, 100% and OFF

● Unbalanced current protection
Protecting phase failure or three phase unbalance

● Test function
Simulating 6Ir test current for test tripping

● Tripping record function

● Ampere meter
Measure the real and effective value (RMS) of current with the precision of 2% for 40% to 150% in setting

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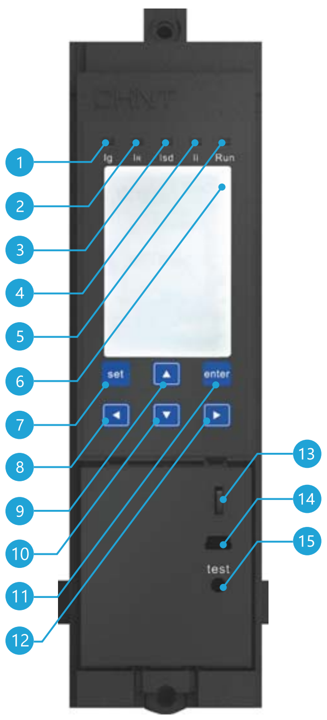


1. Ig indicator for earth fault tripping
2. Ir indicator for overload long-time-delay tripping
3. Isd indicator for short circuit short-time-delay tripping
4. Ii indicator for short circuit tripping
5. Running indicator flickering in normal running
6. LCD screen with three-color backlight. Green stands for normal running, yellow stands for alarming and red stands for tripping.
7. Setting button
8. Leftward button
9. Upward button
10. Downward button
11. Enter button
12. Rightward button
13. Transparent cover lockhole
14. Mini-USB interface
15. Test button for tripping test

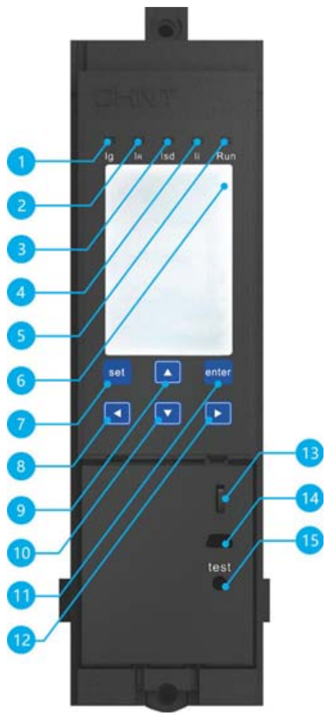
P type intelligent controller (Power type)

Protection
Setting all protective threshold values and time-delay by button
The setting values can be displayed on LCD display window

● Protection functions of all A type control units are included
● Earth current protection function (Optional)
External transformer are configured
● Advanced protection function
— Unbalanced voltage protection
— Overvoltage and undervoltage protection
— Overfrequency and underfrequency protection
— Phase sequence protection
— Reverse power protection function
— Required value protection function

The required value of the real and effective value of each current is calculated within a measurement window. When the required value is off limit, the protection action is carried out. The setting of a sliding time window is in the menu of "setting of a measurement meter".
·A-phase maximal required current value,
·B-phase maximal required current value,
·C-phase maximal required current value,
·N-phase maximal required current value are respectively set for each circumstance of the required value protection without being affected by the setting of the neutral line protection.

● Extended function
— Self-diagnosis by the intelligent controller
— Operation times/fault tripping/alarming/deflection recording function provides the latest ten times of recording
— Main contact abrasion display function for evaluating the contact abrasion degree according to mechanical life, electrical services and breaking capacities of different frames.
— Internal clock function
— A Mini-USB interface is connected with a PC to achieve the functions of protection setting, fault record downloading, whole power quantity detection and parameter reading of a circuit breaker.
— "test" push button
● Electric energy meter
— Current measurement
— Voltage measurement
— Frequency measurement
— Required value measurement
— Power (active power, reactive power and apparent) measurement
— Electric energy (active power, reactive power and apparent) measurement
— Power factor measurement
● LCD three-color backlight
Green stands for normal running, yellow stands for alarming and red stands for tripping.



1. Ig indicator for earth fault tripping
2. Ir indicator for overload long-time-delay tripping
3. Isd indicator for short circuit short-time-delay tripping
4. Ii indicator for short circuit tripping
5. Running indicator flickering in normal running
6. LCD screen with three-color backlight. Green stands for normal running, yellow stands for alarming and red stands for tripping.
7. Setting button
8. Leftward button
9. Upward button
10. Downward button
11. Enter button
12. Rightward button
13. Transparent cover lockhole
14. Mini-USB interface
15. Test button for tripping test

H type intelligent controller (Harmonic wave type)

Protection

Setting all protective threshold values and time-delay by button

Besides the protective extended function of all P type control units, H type control unit also comprises:

- Load monitoring function
- Zone selective interlock (ZSI) (Optional)
- Communication function
  Modbus-RTU communication protocol
- Input/output function
  — 2DI+2DO or 4DO
  — DI signal: AC230V (Standard configuration, and others can be selected);
  DC110V
  — DO needs to be configured with a power supply module (24VDC output) and a relay module.
- Harmonic analysis function
  — Measurement of the fundamental wave current, the fundamental wave line voltage, the fundamental wave phase voltage, the fundamental wave power and each 3-31 odd harmonic wave current percentage (HRIh), the harmonic voltage percentage (HRUh), the total harmonic wave current distortion rate (THDi, thdi) and the total harmonic wave voltage distortion rate (THDu, thdu).
  — The harmonic wave percentage(HR) refers to the ratio of root-mean-square value of the Nth harmonic wave component contained in periodic alternative current quantity to the root-mean-square value of the fundamental wave component, and is expressed in percentage.

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Protection features

The protection features of the intelligent controller comprise inverse time characteristic and constant time characteristic. When the fault current exceeds the set value of the inverse time limit, the controller performs constant time protection.
The inverse time limit corresponds to the feature curve I2t.

Overload long-time-delay protection feature

Overload long-time-delay protection action threshold value
<1.05Ir ：> 2h, no action
≥ 1.3Ir ：< 1h, action

Ir current setting value range: 0.4In, 0.5 In, 0.6 In, 0.7 In, 0.8 In, 0.9 In, 1.0 In+OFF (M/A);0.4In~1.0In+OFF(P/H)
Inverse time limit action feature: I2t, wherein t=(6/N)2*tr

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

Note: N --- the multiple I/Ir obtained by dividing failure current by set current
t --- time delay action of the failure action
tr --- long-time-delay set value
Allowed error of the action time ±15%
Conventional factory tuning:Ir=1.0In
tr=2s@6Ir

Short circuit short-time-delay protection feature

Short circuit short-time-delay protection action threshold value
< 0.85Isd: no action
> 1.15Isd: action
Isd current set value range: 2Ir, 3Ir , 4Ir, 5Ir, 6Ir , 8Ir, 10Ir +OFF (max 50kA，M/A);2Ir~10Ir+OFF(max 50kA，P/H)

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

Note: Isd---short-time-delay current set value
I--- failure current value
Ir— long-time-delay set value
t--- failure action time-delay time
tsd---short-time-delay inverse time limit set value
Permissible error of action time ±15%
Conventional factory tuning:Isd=8Ir(Ir < 6250A)
Isd=50kA(Ir ≥ 6250A)
tsd=0.4s

Short circuit instantaneous protection features

Short circuit instantaneous protection action threshold value
＜0.85Ii: no action
＞1.15Ii: action
The current setting value of instantaneous action: 2In, 4In, 6In, 8In, 10In, 12In, 15In+OFF(NXA40 max50kA，NXA63 max63kA，M/A);
2In~15In+OFF(NXA40 max 50kA，NXA63 max63kA P/H)
Note: action time ≤ 50ms
Conventional factory tuning:Ii=12In(In=400A~5000A)
Ii=63kA(In=6300A)

Earth fault protection action features

Earth fault protection action threshold value
＜0.9Ig: no action
＞1.1Ig: action
M/A

Current setting value	A	B	C	D	E	F	G	OFF
NXA16, 20	0.2In	0.3In	0.4In	0.5In	0.6In	0.8In	In	
NXA32, 40, 63	500A	640A	800A	960A	1040A	1120A	1200A	
tg(s)	**Inverse time limit**	**Action features**						
P/H NXA16、20: 0.2In~1.0In+OFF NXA32、40、63: 500A~1200A+OFF		$t=\frac{(Ig)^2}{I^2}\times tg$						
Constant time limit	Setting time (s)	0.1	0.2	0.3	0.4			
	Minimum (s)	0.06	0.16	0.255	0.34			
	Maximal (s)	0.14	0.24	0.345	0.46			
	Return time	0.05	0.14	0.25	0.33			

Note: Ig --- earth fault protection setting value. Default setting:NXA16/20:Ig=0.5In
When In ≥ 1250A，Ig max=1200A NXA32/40/63: Ig=800A
I --- failure current value
t --- failure action time-delay time
tg --- earthing inverse time limit set value
The permissible error of the inverse time limit action time: ±15%
Conventional factory tuning:OFF

Controller minimum display current

Frame	In	Minimum display value (A)
1600	400~1600	60
2000	630~2000	60
≥3200	≥1600	120

Note: Controller can work normally when single phase not less than 0.4In, three phase not less than0.2In.

Measurement precision of the intelligent controller

Current measurement	
Measurement range	Ia, Ib, Ic and I_N are not less than 15In (rated current of the circuit breaker)
Measurement precision	Below 0.1In: the measurement is inaccurate
	0.1In-0.4In: the accuracy will be changed linearly from 5% to 2%
	0.4In-1.5In: the accuracy is 2%
	＞1.5In: the accuracy will be changed linearly from 2% to 15%
	The measurement accuracy of the earthing current is 10%

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

Frequency	
Measurement range	40HZ~70HZ
Measurement precision	Error: ± 0.1HZ

Power	
Measurement mode	The effective value mode
Measurement content	3P type: total active power, total reactive power and total apparent power
	4P type: phase splitting active power, phase splitting reactive power, phase splitting apparent power, total active power, total reactive power, total apparent power
Measurement power	Active power: -32768KW~ + 32767KW
	Reactive power: -32768Kvar~ + 32767Kvar
	Apparent power: 0KVA~65535KVA
	Error: ±2.5%

Power factor	
Measurement content	phase splitting power factor，total power factor
Measurement range	-1.00~+1.00

Electric energy	
Measurement 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)
Measurement range	Active electric energy: −32768KWh~ + 32767KWh
	Reactive electric energy: −32768Kvarh~ + 32767Kvarh
	Apparent electric energy: 0~65535KVAh
Measurement precision	Error ±2.5%

Harmonic wave measurement	
Fundamental wave measurement	Current: Ia, Ib, Ic,I_N
	Voltage: Uan，Ubn，Ucn
Total harmonic wave distortion THDu and thdu	THD: the total distortion rate of the harmonic wave relatively to the fundamental wave
	Thd: the total distortion rate of the harmonic wave relatively to the effective value
Amplitude wave spectrum of harmonic wave	The controller can display FFT amplitude of odd harmonic wave from 3 to 31in percentage
Measurement precision of control unit	±2%

LSI curves

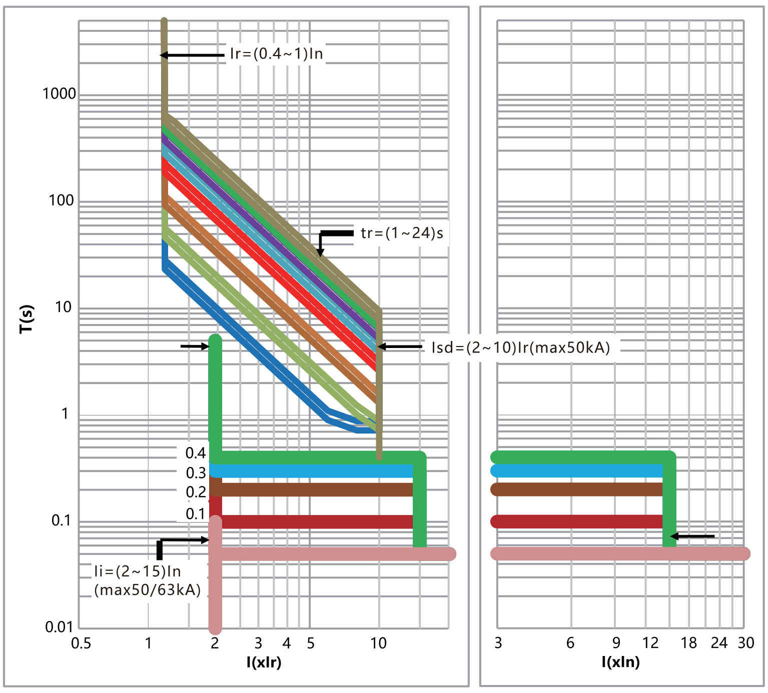


Fig.1 Overcurrent protection curves

Earth fault protection curves

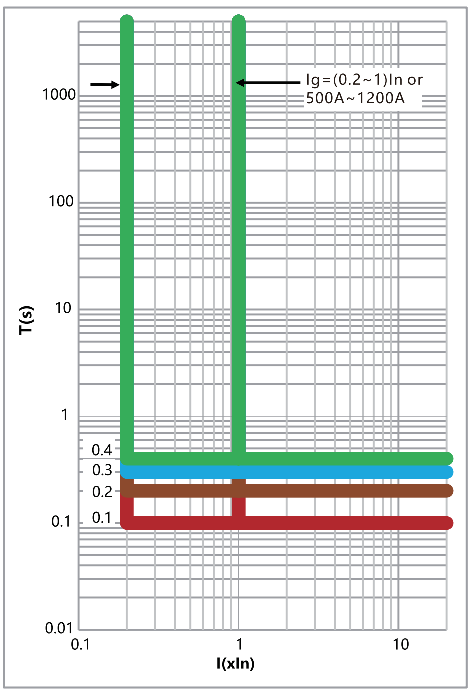


Fig.2 Asymmetrical earth fault protection curves

N

Accessories: locks

Pushbutton lock

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

Body lock

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

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

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

Hole diameter: NXA16:Φ21mm NXA20~63:Φ24mm

Safety shutters padlock

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

"Disconnected" position padlock

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

Door interlock

Circuit breaker state door interlock

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

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

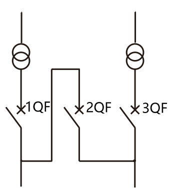
Circuit breaker position door interlock

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

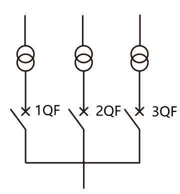
Cable mechanical interlock

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

Circuit diagram   Available running manner



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



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

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

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

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

Accessories: indication contacts

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

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

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

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

Note: 1) CO refers to a switch contact, and a one-normally-open and one-normally-closed contact is matched with a common terminal.
2) NO refers to a normally open contact. NC refers to a normally closed contact.

Source-changeover systems

- Mechanical interlock
  1 normal and 1 replacement
  2 incoming and 1 busbar
- Source-changeover controller (with adaptor)
  1 normal and 1 replacement: mechanical interlock+2A type controller
  2 incoming and 1 busbar: mechanical interlock+3A type controller

N

1600A frame MO

2000A~6300A frame MO

1600A frame CC&ST

2000A~6300A frame CC&ST

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

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

● Voltage coils (CC &ST) (Standard configuration)
● Closing coil (CC)
After the energy storage of the motor is completed, the closed electromagnet can be operated and controlled within a range of 10 meters to instantaneously release the energy storage spring force of the operating mechanism to close the circuit breaker.

Rated control power supply voltage Us(V)			AC 220/230/240	AC 380/400/415	DC220	DC110	AC110 (not available for NXA16)
Operation Voltage(V)			(0.85-1.1)Us				
Close time (ms)			≤50				
Power consumption (VA/W)	NXA16	pulse	56	56	250	250	-
	NXA20~63	intermittent	300	300	132	70	300
		pulse	880	1800	880	850	850

Notes:
1. It must select pulse type in the automatic control system.
2. power-on time of the intermittent type cannot be greater than 2 s, pulse frequency of the pulse type cannot be more than 5 times/min, or the components are easily burnt.
3. Ensure that the product is in the energy storage state so that the closed electromagnet may be energized;
4. If the product is not closed after a single power-on for 15s, must disconnect the power on the closed electromagnet immediately.

● Shunt release (ST)
The power-on time cannot be greater than 2 seconds / time, and the power-on frequency cannot be greater than 5 times / minute.
a. The shunt release should be used except for special products where the circuit breaker must be directly disconnected manually;
b. The shunt release could operated within 10 meters to break the circuit breaker.

Rated control power supply voltage Us(V)			AC 220/230/240	AC 380/400/415	DC220	DC110	AC110 (not available for NXA16)
Operation Voltage(V)			(0.7-1.1)Us				
Break time (ms)			≤28				
Power consumption (VA/W)	NXA16	pulse	56	56	250	250	-
	NXA20~63	intermittent	300	300	132	70	300
		pulse	880	1800	880	850	850

Notes:
1. It must select pulse type in the automatic control system.
2. power-on time of the intermittent type cannot be greater than 2 s, pulse frequency of the pulse type cannot be more than 5 times/min, or the components are easily burnt;
3. If the circuit breaker is not break by a single power-on of 15 s, must disconnect the power on the shunt release immediately.

1600A frame UVT   2000~4000A frame UVT

6300A frame ASUVT

2000~4000A frame UVTD

- Undervoltage release (UVT)

  Under-voltage release (UVT) (Optional, The power must be turned on before the circuit breaker is closed)

  The under-voltage release has instantaneous operation and delayed operation:

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

Notes:

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

Delay time of under-voltage release	Delay time (optional)	Accuracy
Inm=1600A	1 s, 3 s, 5 s, 7 s (not adjustable)	±15%
Inm=2000A~4000A	1 s, 3 s, 5 s (not adjustable)	0~1s
Inm=6300A	0.3 s~7.5 s (adjustable)	±15%
The under-voltage will not operate when the voltage returns to 85% Ue and higher,, within 1/2 delay time.		

Note:

A self-priming under-voltage delay release may be provided for special orders of NXA20~63. There is no external under-voltage delay controller, and the delay time is 0.3s~7.5s, selectable and adjustable with an accuracy of ±15%.

When the under-voltage release is not powered, the circuit breaker cannot be closed either electrically or manually.

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

N

Capacity derating and power loss

Temperature capacity derating table of the fixed type circuit breaker

1600A frame

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

2000A frame

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

3200A frame

Ambient temperature	1600A		2000A		2500A		3200A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-	-	-
45°	-	-	-	-	-	-	-	-
50°	-	-	-	-	-	-	3100	-
55°	-	-	-	-	2450	-	3000	3050
60°	-	-	-	-	2350	2400	2900	2950

4000A frame

Ambient temperature	3200A		3600A		4000A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-
45°	3100	-	-	-	3800	3850
50°	3000	-	-	-	3600	3650
55°	3000	3050	3400	3450	3400	3450
60°	2900	2900	3200	3250	3200	3250

6300A frame

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

Note: "-" refers to no capacity derating.

N

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

1600A frame

Ambient temperature	400A		630A		800A		1000A		1250A		1600A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-	-	-	-	-	-	-
45°	-	-	-	-	-	-	-	-	-	-	1550	-
50°	-	-	-	-	-	-	-	-	1150	1200	1500	1550
55°	-	-	550	580	-	-	-	-	1050	1100	1450	1500
60°	-	-	500	530	-	-	950	-	950	1000	1400	1450

2000A frame

Ambient temperature	630A		800A		1000A		1250A		1600A		2000A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-	-	-	-	-	-	-
45°	-	-	-	-	-	-	-	-	1500	-	1850	1900
50°	-	-	-	-	-	-	-	-	1400	1500	1750	1850
55°	-	-	-	-	-	-	-	-	1300	1400	1650	1750
60°	600	-	-	-	-	-	1200	-	1200	1300	1550	1650

3200A frame

Ambient temperature	1600A		2000A		2500A		3200A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-	-	-
45°	-	-	-	-	2450	-	3100	-
50°	-	-	-	-	2400	2450	3000	3100
55°	-	-	-	-	2350	2400	2900	3000
60°	-	-	-	-	2300	2350	2800	2900

4000A frame

Ambient temperature	3200A		3600A		4000A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-
45°	3100	-	-	-	3800	3850
50°	3000	3100	-	-	3600	3650
55°	2900	3000	3400	3450	3400	3450
60°	2800	2900	3200	3250	3200	3250

6300A frame

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

Note: "-" refers to no capacity derating.

Altitude capacity derating factor

Altitude height (m)		2000	3000	4000	5000
Rated impulse withstand voltage (kV)	Uimp	12	10	8.57	7.5
Average insulation grade (V)	Ui	1000	833	714	625
Maximal operational voltage (V) 50/60HZ	Ue	690	580	500	415
Average heat operational current(40)℃		1.0	0.88	0.78	contact with factory

Power loss and input and output resistance

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

Frame size	Rated current (A)	Draw-out type		Fixed type (W)	
		Power loss (W)	Input/output resistance (μohm)	Power loss (W)	Input/output resistance (μohm)
1600A	400	30.5	63.6	15.6	32.4
	630	75.7	63.6	38.6	32.4
	800	99.1	51.6	54.1	28.2
	1000	154.8	51.6	84.6	28.2
	1250	241.9	51.6	132.2	28.2
	1600	262.7	34.2	138.2	18.0
2000A	630	58.6	49.2	26.4	22.2
	800	73.7	38.4	36.6	19.1
	1000	115.2	38.4	57.2	19.1
	1250	180	38.4	89.4	19.1
	1600	294.9	38.4	146.5	19.1
	2000	388.8	32.4	204.5	17.0
3200A	1600	127.2	16.6	60.1	7.8
	2000	198.7	16.6	93.9	7.8
	2500	310.5	16.6	146.7	7.8
	3200	479.2	15.6	206.4	6.8
4000A	3200	435	14.1	239.6	7.8
	3600	690.5	17.7	272.9	7.0
	4000	852.5	17.7	337	7.0
6300A	4000	403.2	9.0	230.4	7.0
	5000	630	9.0	360	7.0
	6300	1000.2	8.8	571	6.4

Dimension of busbar

Bolt configuration

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

Hole size and installation twisting moment of busbar

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

N

Connection busbar specification reference under different temperature

Maximum permissible temperature of busbar: 100℃

The material of busbar is bare copper

Frame	Rated current (A)	Ambient temperature(-45~40)°C				Ambient temperature 50°C				Ambient temperature 60°C			
		5mm thick busbar		10mm thick busbar		5mm thick busbar		10mm thick busbar		5mm thick busbar		10mm thick busbar	
		Number of pieces	Specification	Number of pieces	Specification	Number of pieces	Specification	Number of pieces	Specification	Number of pieces	Specification	Number of pieces	Specification
1600A	400	2	50*5	1	50*10	2	50*5	1	50*10	2	50*5	1	50*10
	630	2	50*5	1	50*10	2	50*5	1	50*10	2	50*5	1	50*10
	800	2	50*5	1	50*10	2	50*5	1	50*10	2	50*5	1	50*10
	1000	3	50*5	2	50*10	3	50*5	2	50*10	3	50*5	2	50*10
	1250	4	50*5	2	50*10	4	50*5	2	50*10	4	50*5	2	50*10
	1600	4	50*5	2	50*10	4	50*5	2	50*10	4	50*5	2	50*10
2000A	630	2	50*5	1	50*10	2	50*5	1	50*10	2	60*5	1	60*10
	800	2	50*5	1	50*10	2	50*5	1	50*10	2	60*5	1	60*10
	1000	3	50*5	2	50*10	3	50*5	2	50*10	3	60*5	2	50*10
	1250	3	60*5	2	50*10	3	60*5	2	50*10	3	60*5	2	50*10
	1600	4	60*5	2	60*10	4	60*5	2	60*10	4	60*5	2	60*10
	2000	6	60*5	3	60*10	6	60*5	3	60*10	6	60*5	3	60*10
3200A	1600	2	100*5	1	100*10	2	100*5	1	100*10	2	100*5	1	100*10
	2000	4	100*5	2	100*10	4	100*5	2	100*10	4	100*5	2	100*10
	2500	4	100*5	2	100*10	4	100*5	2	100*10	4	100*5	2	100*10
	3200	8	100*5	4	100*10	8	100*5	4	100*10	8	100*5	4	100*10
4000A	3200	8	100*5	4	100*10	8	100*5	4	100*10	8	100*5	4	100*10
	3600	7	120*5	3	120*12	7	120*5	3	120*12	7	120*5	3	120*12
	4000	8	120*5	4	120*10	8	120*5	4	125*10	8	125*5	4	125*10
6300A	4000	12	100*5	6	100*10	12	100*5	6	100*10	14	100*5	7	100*10
	5000	14	100*5	7	100*10	14	100*5	7	100*10	16	100*5	8	100*10
	6300	16	100*5	8	100*10	16	100*5	8	100*10	18	100*5	9	100*10

Note:

a.When a copper bar selected by users is not matched with a wiring terminal of the circuit breaker, extended busbar is required to be designed to transfer, and is designed by the users of their own. The cross section of the extended busbar cannot be less than the requirement in the table above. The interval among the extended busbar is not less than the interval among wiring terminals of the circuit breaker.

b.After the busbar recommended in the table above is installed, the electric clearance between adjacent phases of the circuit breaker is not less than 18mm.

c.Electrical elements are used for three-phase rectification and high-frequency inversion, such as a high-frequency induction heating furnace (medium-frequency furnace steelmaking equipment), a solid high-frequency welding machine (such as an embedded arc electric welding machine), vacuum heating smelting equipment (such as a monocrystalline silicon growth furnace), in load equipment by controlled silicon. When a circuit breaker is selected, the influence on the circuit breaker by higher order harmonic component generated by controlled silicon is required to be considered besides the influences by the environment temperature and altitude height. At the same time, capacity derating is required, and the capacity coefficient (0.5-0.8) is recommended.

d.The electric clearance of fastening bolts of upper and lower busbar needs to be not less than 20mm after the installation of the busbar by users.

e.After the installation of the circuit breaker, the safety clearance among electrified bodies with different electric potential and between the electrified bodies and the ground are not less than 18mm.

Selective protection between NM8 and NXA

Selective protection between NM8 and NXA				Frame size rated current	NXA16						NXA20	
Downstream			Upstream	Rated current (A)	400	630	800	1000	1250	1600	630	800
				Default setting ratings of short time-delay 8In (kA)	3.2	5.04	6.4	8	10	12.8	5.04	6.4
				Setting ratings (kA)	0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
				Delayed tripping time (s)	0.1, 0.2, 0.3, 0.4							
				Returnable time	0.05, 0.14, 0.25, 0.33							
Frame size rated current	Rated current (A)	Instantaneous setting ratings (kA)										
NM8-100 NM8S-100	16	0.16			0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
	20	0.19 (Motor)			0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
		0.2			0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
	25	0.24 (Motor)			0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
		0.25			0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
	32	0.30 (Motor)			0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
		0.32			0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
	40	0.38 (Motor)			0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
		0.4			0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
	50	0.48 (Motor)			0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
		0.5			0.8～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
	63	0.60 (Motor)			0.828～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
		0.63			0.869～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
	80	0.75 (Motor)			1.035～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
		0.8			1.104～4	1.26～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.26～6.3	1.6～8
	100	0.96 (Motor)			1.325～4	1.324～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.324～6.3	1.6～8
		1			1.380～4	1.380～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.380～6.3	1.6～8
NM8-250 NM8S-250	100	1.20 (Motor)			1.656～4	1.656～6.3	1.656～8	2～10	2.5～12.5	3.2～16	1.656～6.3	1.656～8
		1			1.380～4	1.380～6.3	1.6～8	2～10	2.5～12.5	3.2～16	1.380～6.3	1.6～8
	125	1.20 (Motor)			1.656～4	1.656～6.3	1.656～8	2～10	2.5～12.5	3.2～16	1.656～6.3	1.656～8
		1.25			1.725～4	1.725～6.3	1.725～8	2～10	2.5～12.5	3.2～16	1.725～6.3	1.725～8
	160	1.5 (Motor)			2.070～4	2.070～6.3	2.070～8	2.070～10	2.5～12.5	3.2～16	2.070～6.3	2.070～8
		1.6			2.208～4	2.208～6.3	2.208～8	2.208～10	2.5～12.5	3.2～16	2.208～6.3	2.208～8
	180	1.92 (Motor)			2.650～4	2.649～6.3	2.649～8	2.649～10	2.649～12.5	3.2～16	2.649～6.3	2.649～8
		1.8			2.484～4	2.484～6.3	2.484～8	2.484～10	2.500～12.5	3.2～16	2.484～6.3	2.484～8
	200	2.16 (Motor)			2.981～4	2.980～6.3	2.980～8	2.980～10	2.980～12.5	3.2～16	2.980～6.3	2.980～8
		2			2.760～4	2.760～6.3	2.760～8	2.760～10	2.760～12.5	3.2～16	2.760～6.3	2.760～8
	225	2.4 (Motor)			3.312～4	3.312～6.3	3.312～8	3.312～10	3.312～12.5	3.312 ～16	3.312～6.3	3.312～8
		2.25			3.105～4	3.105～6.3	3.105～8	3.105～10	3.105～12.5	3.200～16	3.105～6.3	3.105～8
	250	2.7 (Motor)			3.726～4	3.726～6.3	3.726～8	3.726～10	3.726～12.5	3.720～16	3.726～6.3	3.726～8
		2.5			3.450～4	3.450～6.3	3.450～8	3.450～10	3.450～12.5	3.450～16	3.450～6.3	3.450～8
NM8-630 NM8S-630	250	3.0 (Motor)			/	4.140～6.3	4.140～8	4.140～10	4.140～12.5	4.140～16	4.140～6.3	4.140～8
		2.5			3.450～4	3.450～6.3	3.450～8	3.450～10	3.450～12.5	3.450～16	3.450～6.3	3.450～8
	315	3.0 (Motor)			/	4.140～6.3	4.140～8	4.140～10	4.140～12.5	4.140～16	4.140～6.3	4.140～8
		3.15			/	4.347～6.3	4.347～8	4.347～10	4.347～12.5	4.347～16	4.347～6.3	4.347～8
	350	3.78 (Motor)			/	5.216～6.3	5.216～8	5.216～10	5.216～12.5	5.216～16	5.216～6.3	5.216～8
		3.5			/	4.830～6.3	4.830～8	4.830～10	4.830～12.5	4.830～16	4.830～6.3	4.830～8
	400	4.2 (Motor)			/	5.796～6.3	5.796～8	5.796～10	5.796～12.5	5.796～16	5.796～6.3	5.796～8
		4			/	5.520～6.3	5.520～8	5.520～10	5.520～12.5	5.520～16	5.520～6.3	5.520～8
	500	4.8 (Motor)			/	/	6.624～8	6.624～10	6.624～12.5	6.624～16	/	6.624～8
	630	5			/	/	6.900～8	6.900～10	6.900～12.5	6.900～16	/	6.900～8
		6.0 (Motor)			/	/	/	8.280～10	8.280～12.5	8.280～16	/	/
NM8-1250 NM8S-1250	700	6.3			/	/	/	8.694～10	8.694～12.5	8.694～16	/	/
		7.56 (Motor)			/	/	/	/	10.43～12.5	10.43～16	/	/
	800	7			/	/	/	9.660～10	9.660～12.5	9.660～16	/	/
		8.4 (Motor)			/	/	/	/	11.59～12.5	11.59～16	/	/
	1000	8			/	/	/	/	11.04～12.5	11.04～16	/	/
		9.6 (Motor)			/	/	/	/	/	13.24～16	/	/
	1250	10			/	/	/	/	/	13.80～16	/	/
		12 (Motor)			/	/	/	/	/	/	/	/
		12.5			/	/	/	/	/	/	/	/
		15.0 (Motor)			/	/	/	/	/	/	/	/

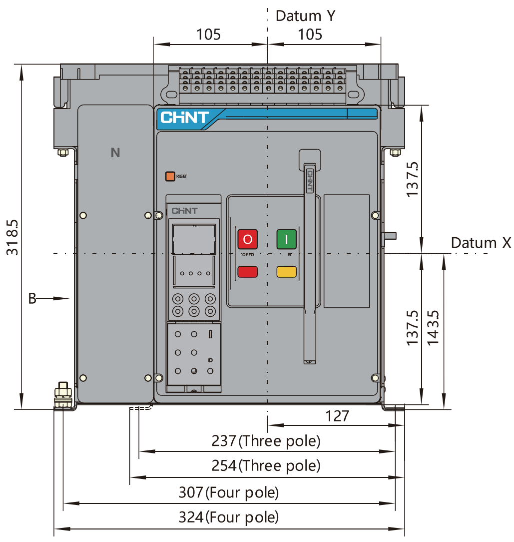
	NXA20				NXA32				NXA40			NXA63		
	1000	1250	1600	2000	1600	2000	2500	3200	3200	3600	4000	4000	5000	6300
	8	10	12.8	16	12.8	16	20	25.6	25.6	28.8	32	32	40	50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2.070~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2.208~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2.649~10	2.649~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2.484~10	2.5~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2.980~10	2.980~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	2.760~10	2.760~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	3.312~10	3.312~12.5	3.312~16	4~20	3.312~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	3.105~10	3.105~12.5	3.2~16	4~20	3.2~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	3.726~10	3.726~12.5	3.726~16	4~20	3.726~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	3.450~10	3.450~12.5	3.450~16	4~20	3.450~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	4.140~10	4.140~12.5	4.140~16	4.140~20	4.140~16	4.140~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	3.450~10	3.450~12.5	3.450~16	4~20	3.450~16	4~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	4.140~10	4.140~12.5	4.140~16	4.140~20	4.140~16	4.140~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	4.347~10	4.347~12.5	4.347~16	4.347~20	4.347~16	4.347~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	5.216~10	5.216~12.5	5.216~16	5.216~20	5.216~16	5.216~20	5.216~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	4.830~10	4.830~12.5	4.830~16	4.830~20	4.830~16	4.830~20	5~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	5.796~10	5.796~12.5	5.796~16	5.796~20	5.796~16	5.796~20	5.796~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	5.520~10	5.520~12.5	5.520~16	5.520~20	5.520~16	5.520~20	5.520~25	6.4~32	6.4~32	7.2~36	8~40	8~40	10~50	12.6~50
	6.624~10	6.624~12.5	6.624~16	6.624~20	6.624~16	6.624~20	6.624~25	6.624~32	6.624~32	7.2~36	8~40	8~40	10~50	12.6~50
	6.900~10	6.900~12.5	6.900~16	6.900~20	6.900~16	6.900~20	6.900~25	6.900~32	6.900~32	7.2~36	8~40	8~40	10~50	12.6~50
	8.280~10	8.280~12.5	8.280~16	8.280~20	8.28~16	8.280~20	8.280~25	8.280~32	8.280~32	8.280~36	8.280~40	8.280~40	10~50	12.6~50
	8.694~10	8.694~12.5	8.694~16	8.694~20	8.694~16	8.694~20	8.694~25	8.694~32	8.694~32	8.694~36	8.694~40	8.694~40	10~50	12.6~50
	/	10.43~12.5	10.43~16	10.43~20	10.43~16	10.43~20	10.43~25	10.43~32	10.43~32	10.43~36	10.43~40	10.43~40	10.43~50	12.6~50
	9.660~10	9.660~12.5	9.660~16	9.660~20	9.660~16	9.660~20	9.660~25	9.660~32	9.660~32	9.660~36	9.660~40	9.660~40	10~50	12.6~50
	/	11.59~12.5	11.59~16	11.59~20	11.59~16	11.59~20	11.59~25	11.59~32	11.59~32	11.59~36	11.59~40	11.59~40	11.59~50	12.6~50
	/	11.04~12.5	11.04~16	11.04~20	11.04~16	11.04~20	11.04~25	11.04~32	11.04~32	11.04~36	11.04~40	11.04~40	11.04~50	12.6~50
	/	/	13.24~16	13.24~20	13.24~16	13.24~20	13.24~25	13.24~32	13.24~32	13.24~36	13.24~40	13.24~40	13.24~50	13.24~50
	/	/	13.80~16	13.80~20	13.80~16	13.80~20	13.80~25	13.80~32	13.80~32	13.80~36	13.80~40	13.80~40	13.80~50	13.8~50
	/	/	/	16.56~20	/	16.56~20	16.56~25	16.56~32	16.56~32	16.56~36	16.56~40	16.56~40	16.56~50	16.56~50
	/	/	/	17.25~20	/	17.25~20	17.25~25	17.25~32	17.25~32	17.25~36	17.25~40	17.25~40	17.25~50	17.25~50
	/	/	/	/	/	/	20.70~25	20.70~32	20.70~32	20.70~36	20.70~40	20.70~40	20.70~50	20.70~50

N

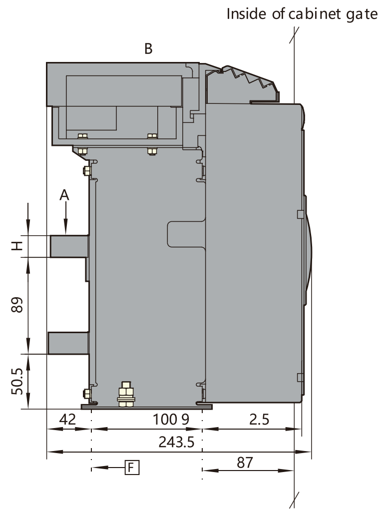
Dimensions and installation

1600A fixed type

Front view

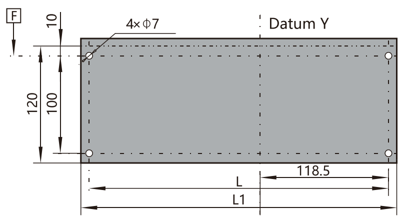


Side view



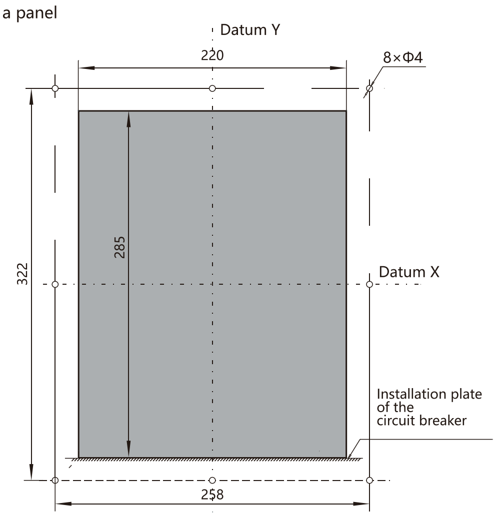
Hole size

Hole size of the base



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

Hole size of a panel

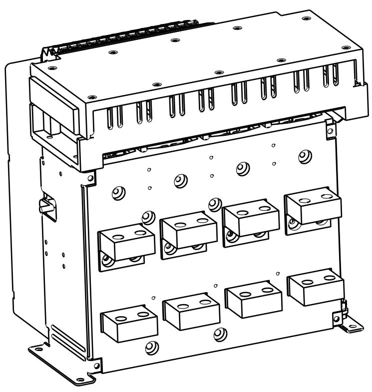


Hole size of the panel of the fixed type circuit breaker

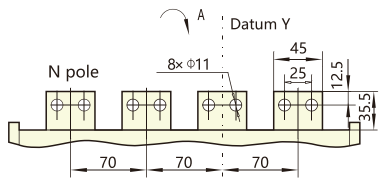
H	L	L1	Remark
5	237	254	In=400A~630A Fixed type, three pole
8	237	254	In=800A~1250A Fixed type, three pole
20	237	254	In=1600A Fixed type, three pole
5	307	324	In=400A~630A Fixed type, four pole
8	307	324	In=800A~1250A Fixed type, four pole
20	307	324	In=1600A Fixed type, four pole

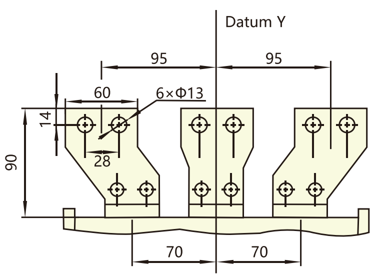
Horizontal connection

Side view

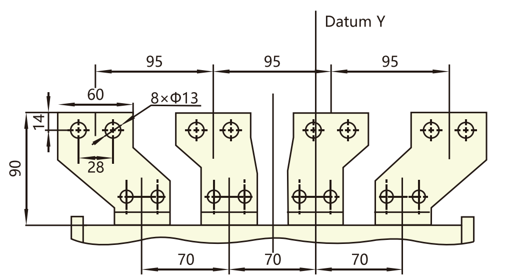


Busbar size and busbar interval





(Optional)



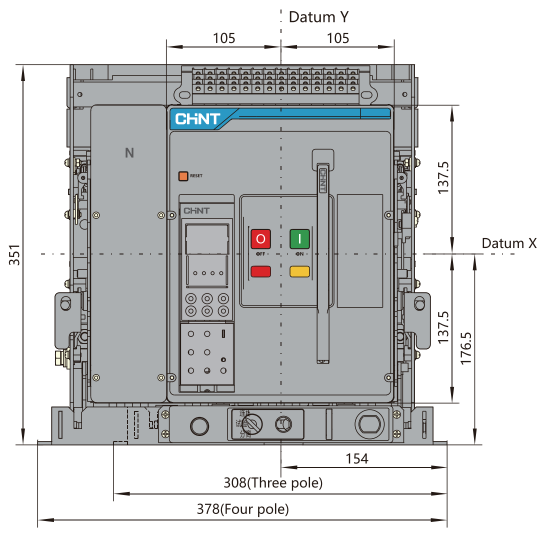
(Optional)

Number of busbar

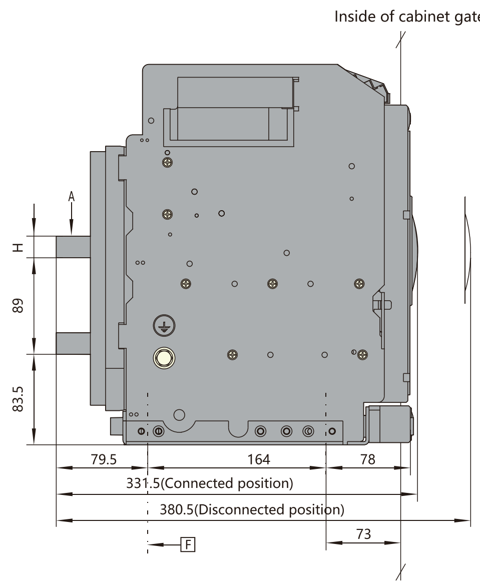
"Rated current (A) "	Number of pieces			
	Three poles		Four poles	
	A pole+C pole	B pole	A pole+B pole	C pole+N pole
400 ~ 630	4	2	4	4
800 ~ 1250	4	2	4	4
1600	8	4	8	8

1600A draw-out type

Front view

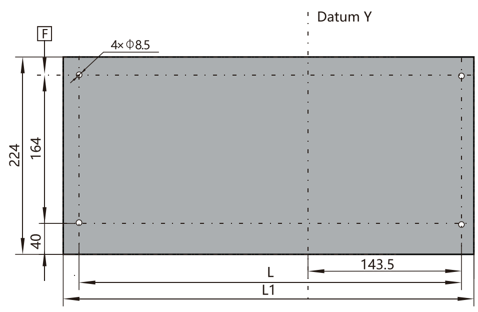


Side view



Hole size

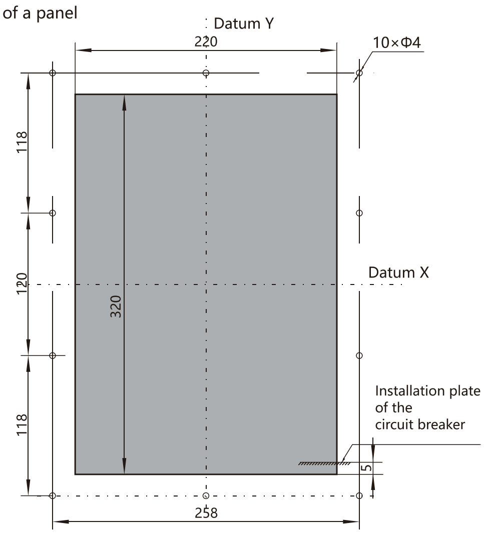
Hole size of the base



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

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

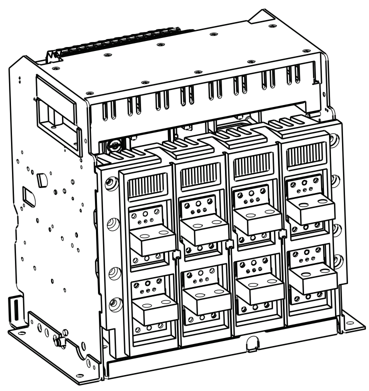
Hole size of a panel



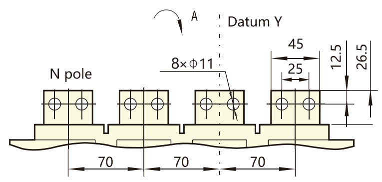
Ratio: 1:1.5 Hole size of a panel of the draw-out type circuit breaker

Horizontal connection

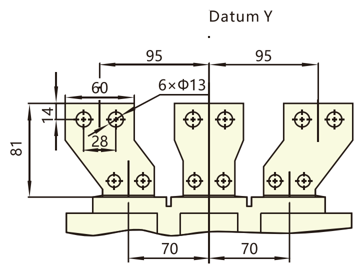
Side view



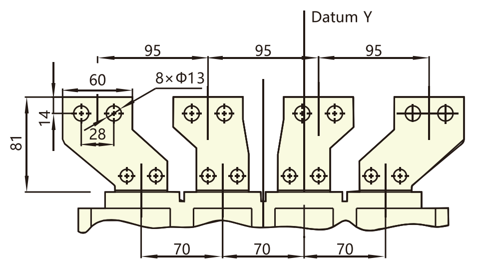
Busbar size and interval



N



Optional



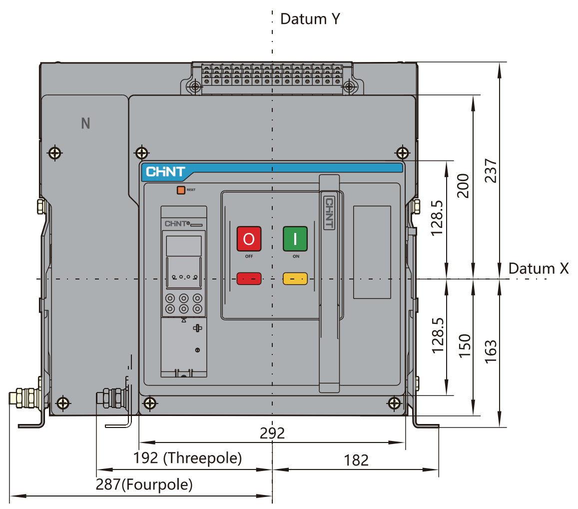
Optional

Number of busbar

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

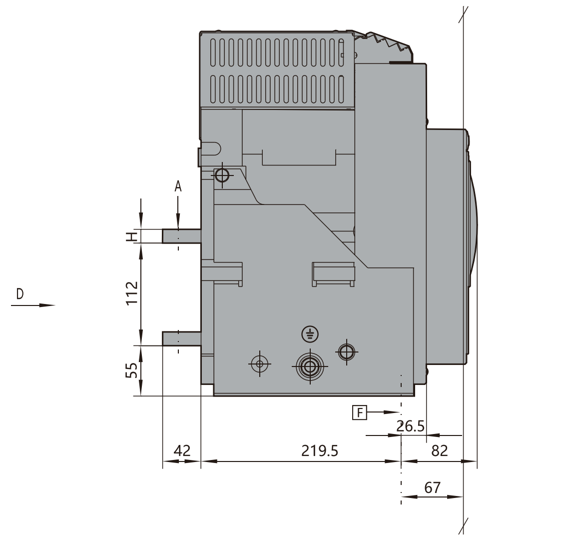
2000A fixed type

Front view



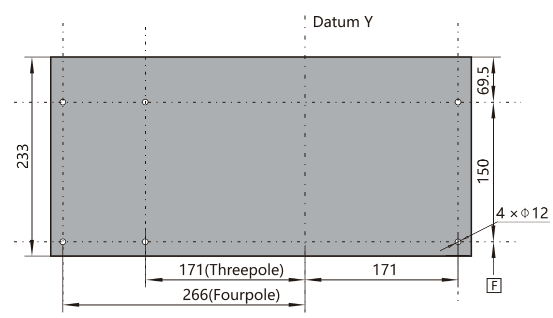
Side view

Inside of cabinet gate



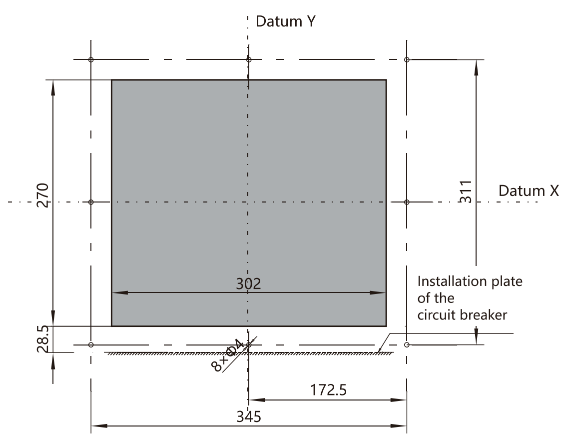
Hole size

Hole size of the base



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

Hole size of a panel

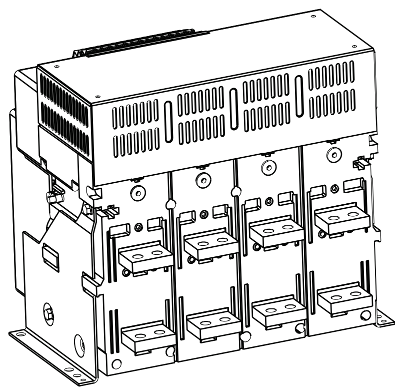


Hole of the panel

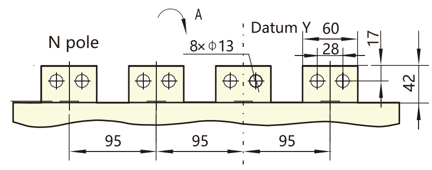
H	Remark
10	In=630A
15	In=800A~1600A
20	In=2000A

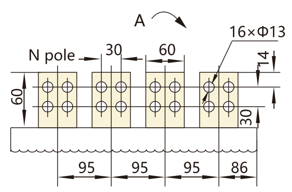
Horizontal connection

Side view

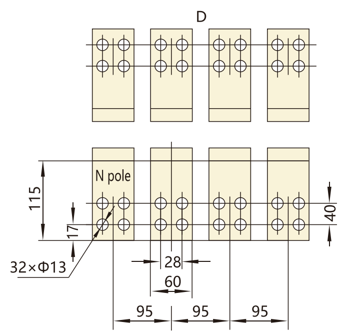


Busbar size and interval





horizontal connection Lengthen busbar

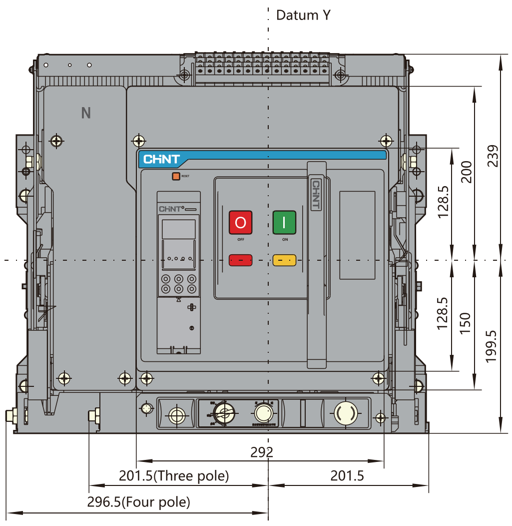


L type vertical connection

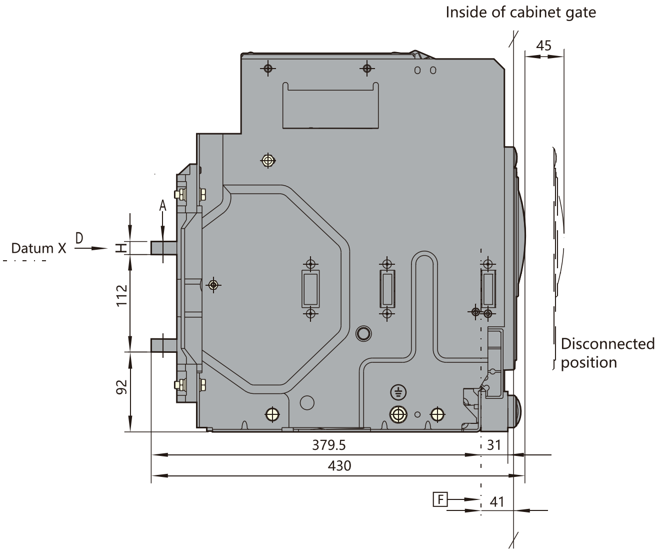
N

2000A draw-out type

Front view

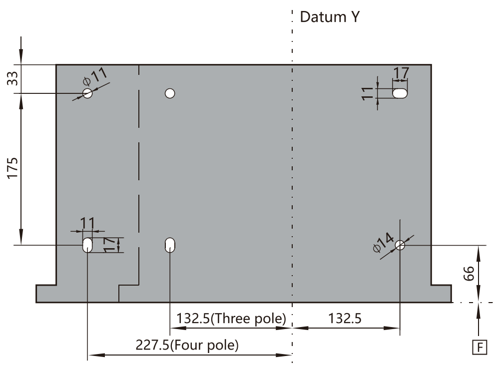


Side view



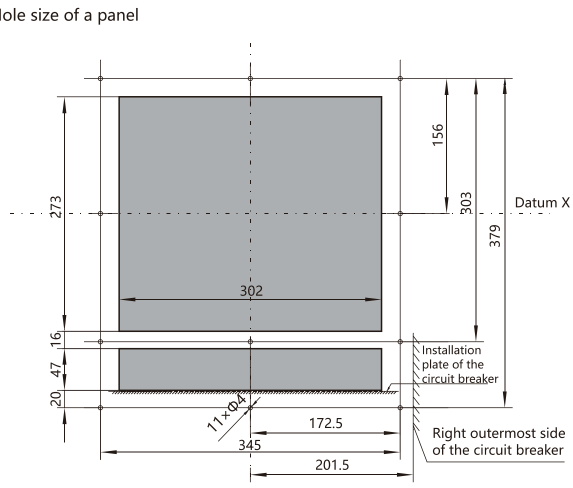
Hole size

Hole size of the base



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

Hole size of a panel

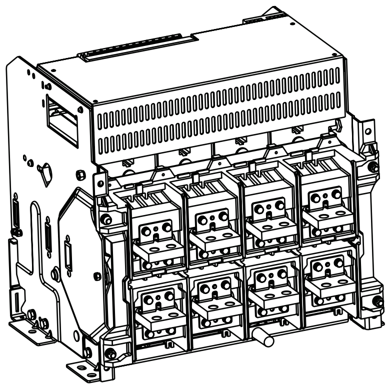


Hole of the panel

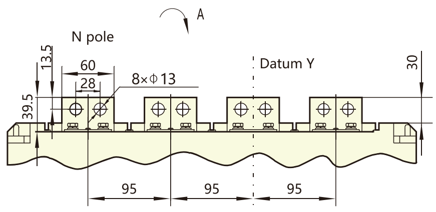
H	Remark
10	In=630A
15	In=800A~1600A
20	In=2000A

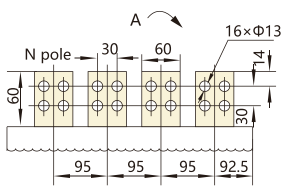
Horizontal connection

Side view

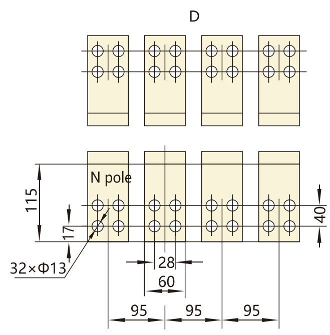


Busbar size and interval





horizontal connection Lengthen busbar

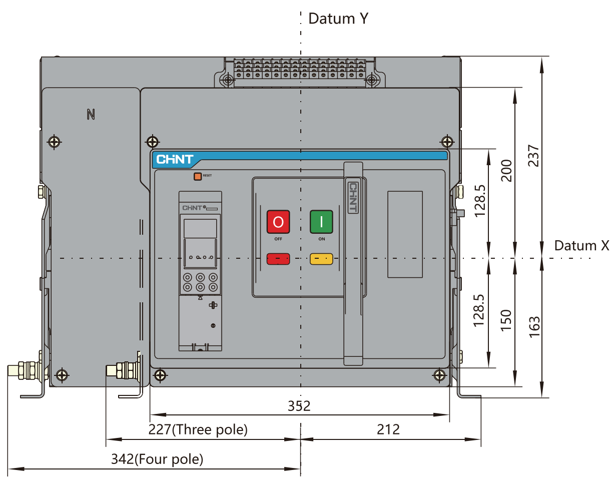


L type vertical connection

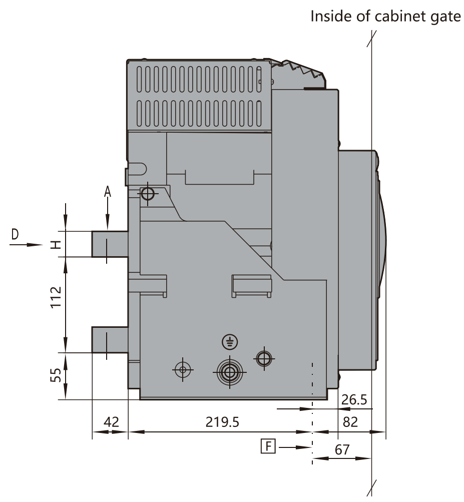
N

3200A fixed type

Front view

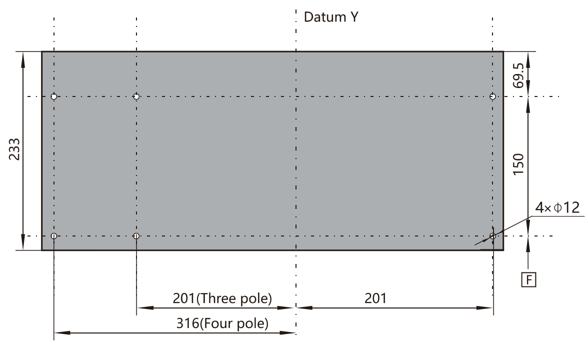


Side view



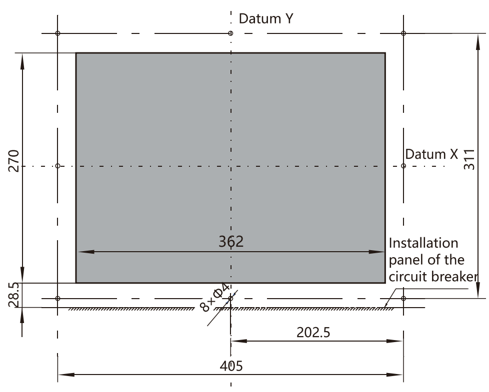
Hole size

Hole size of the base



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

Hole of the panel



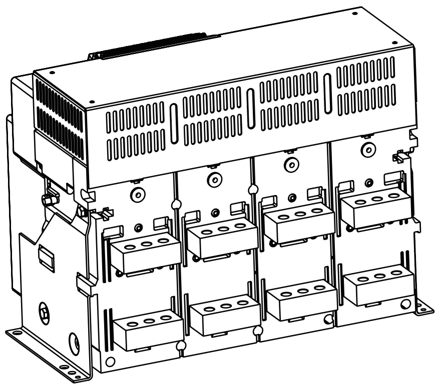
Horizontal connection

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

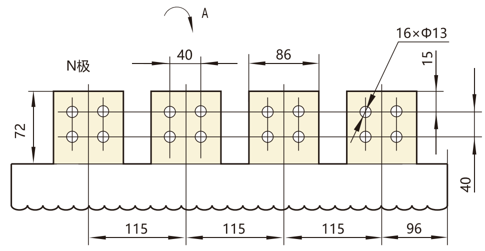
N

Horizontal connection

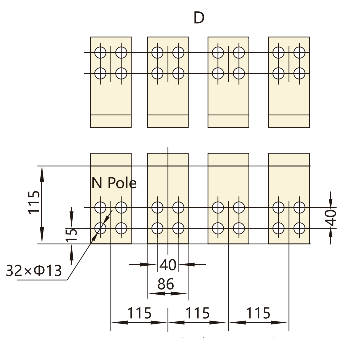
Side view



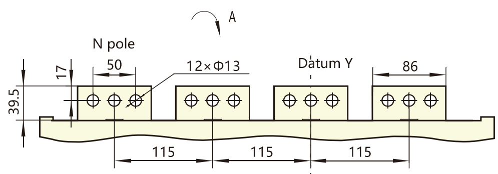
Busbar size and interval



Horizontal onnection (default configuration)



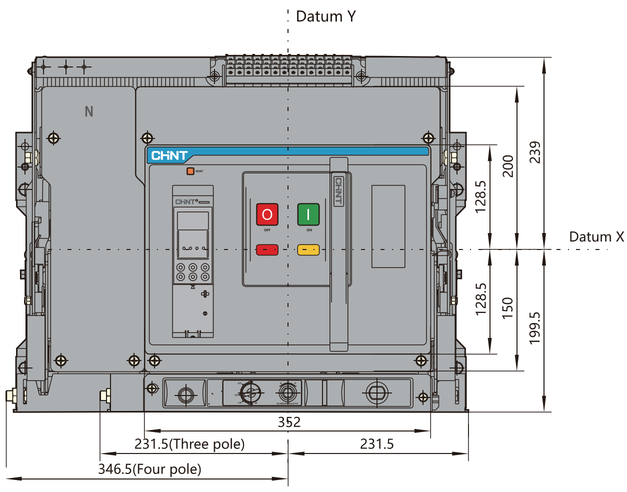
L type vertical connection



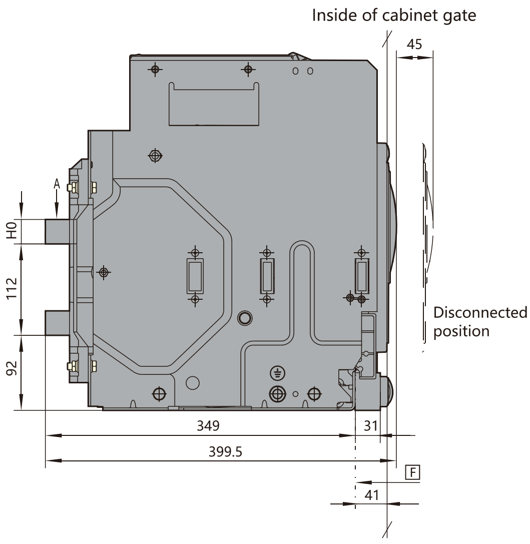
Horizontal short busbar

3200A draw-out type(Default configuration)

Front view

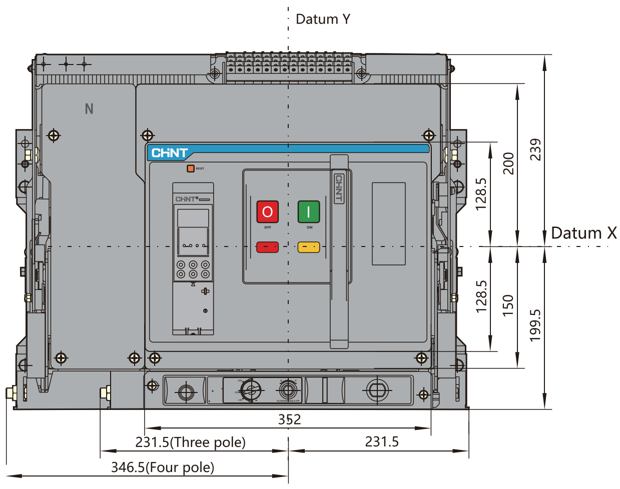


Side view

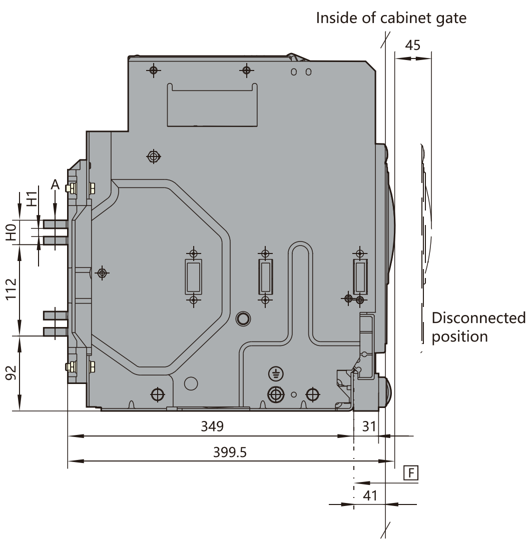


3200A draw-out type(Horizontal short busbar)

Front view

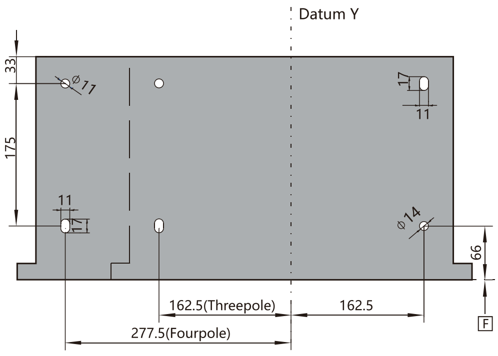


Side view



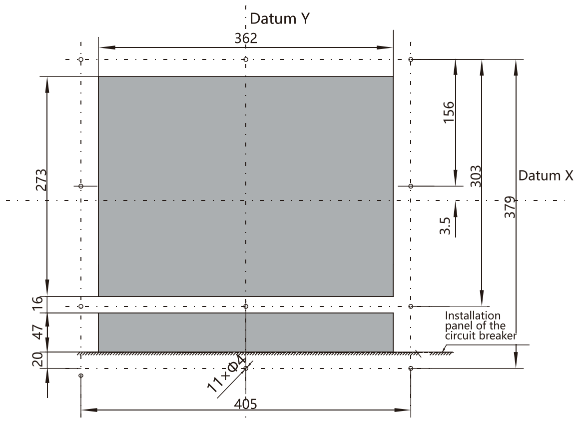
Hole size

Hole size of the base



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

Hole size of a panel

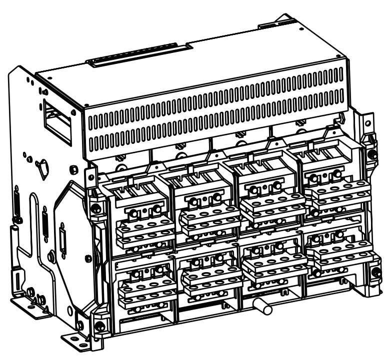


Hole of the panel

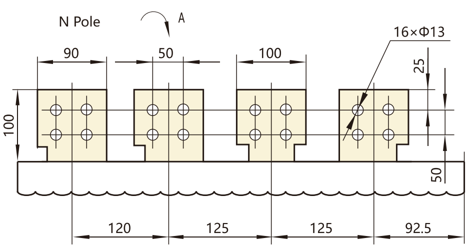
H0	H1	Remark
20	0	In=1600A~2500A
30	$10^{+0.1}_{0}$	In=3200A

Horizontal connection

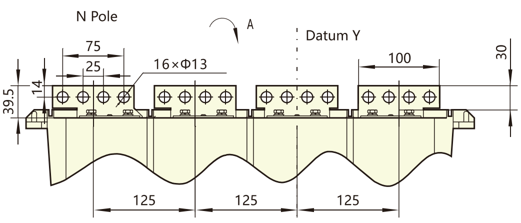
Side view



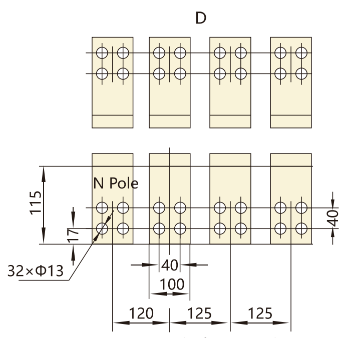
Busbar size and interval



Horizontal connection(Default configuration)



Horizontal short busbar

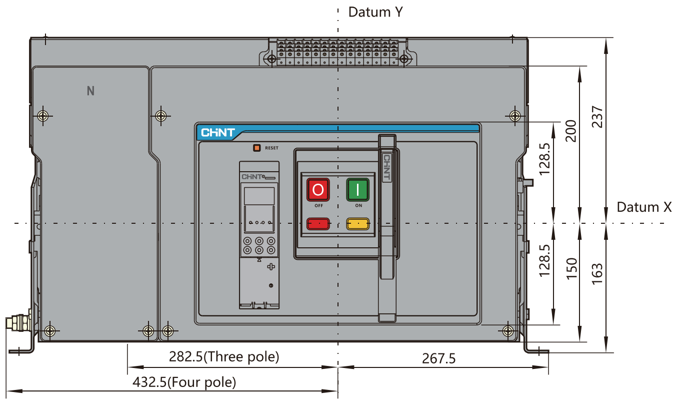


L type vertical connection

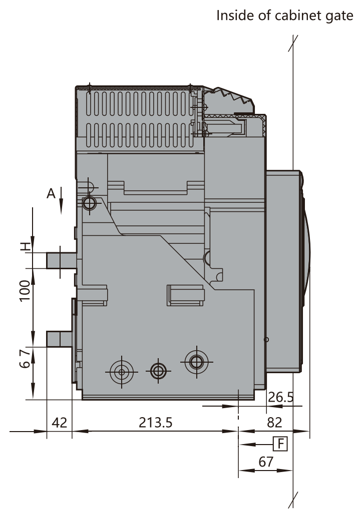
N

4000A fixed type

Front view

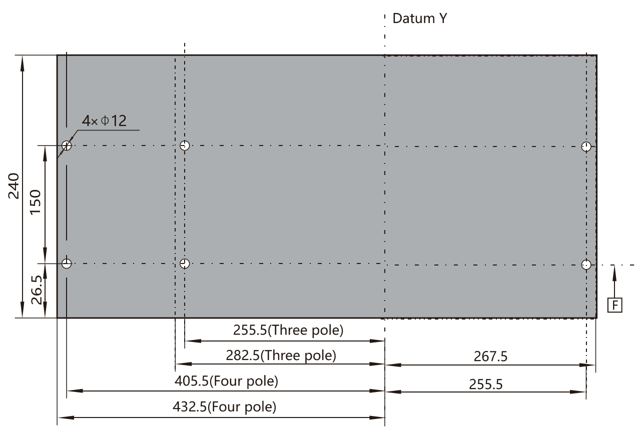


Side view



Hole size

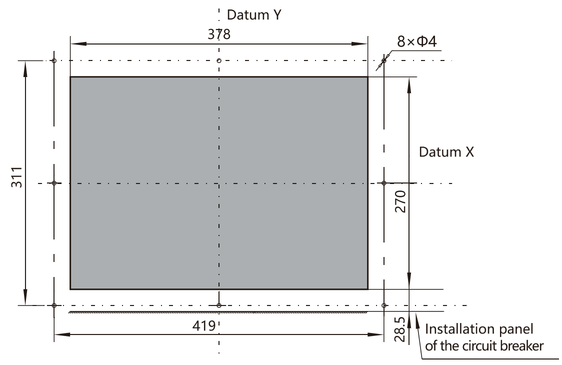
Hole size of the base



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

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

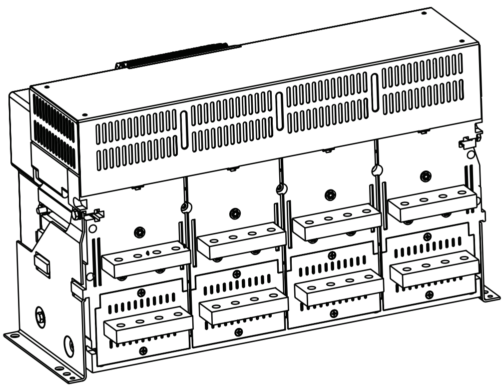
Hole size of a panel



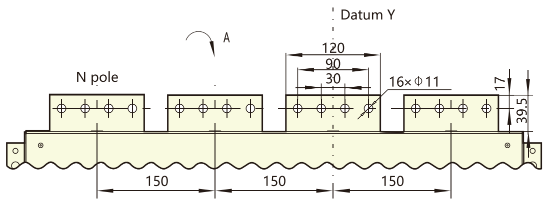
Ratio 1:2 Hole size of the panel of the fixed type circuit breaker

Horizontal connection

Side view



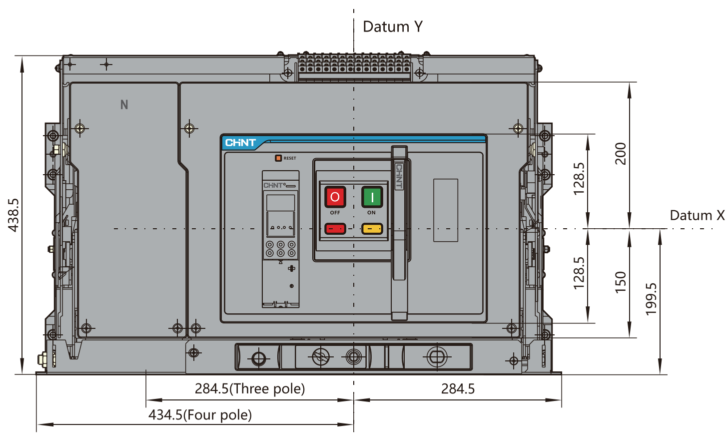
Busbar size and interval



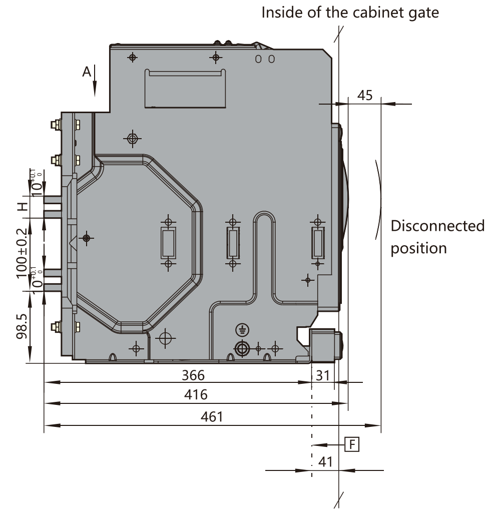
N

4000A draw-out type

Front view

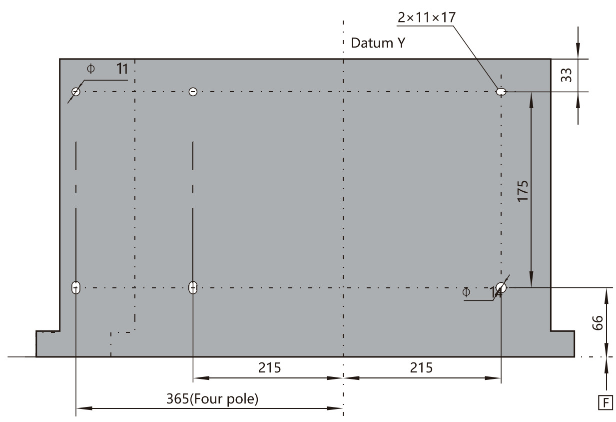


Side view



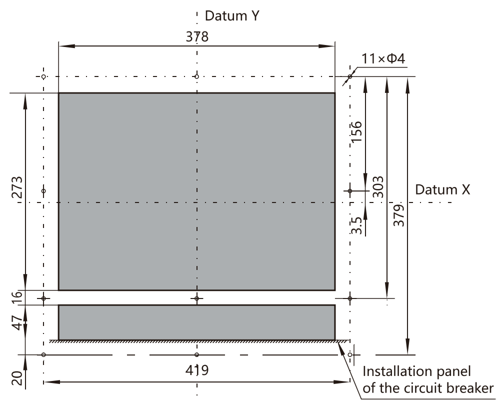
Hole size

Hole size of the base



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

Hole size of a panel

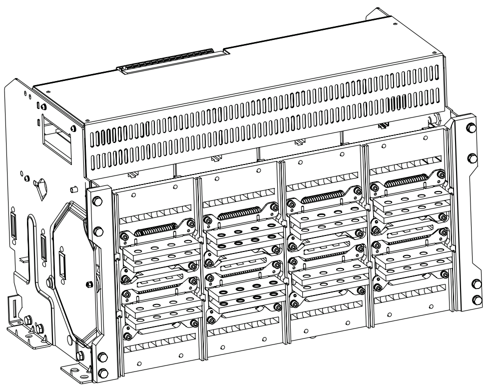


Ratio 1:1 Hole size of the panel of the draw-out type circuit breaker

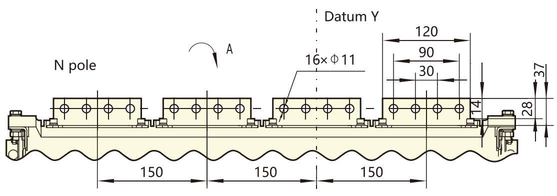
H	Remark
26	In=3200A
30	In=3600~4000A

Horizontal connection

Side view



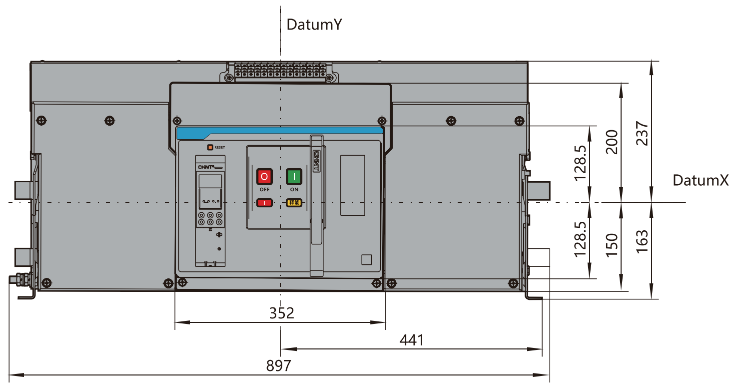
Busbar size and interval



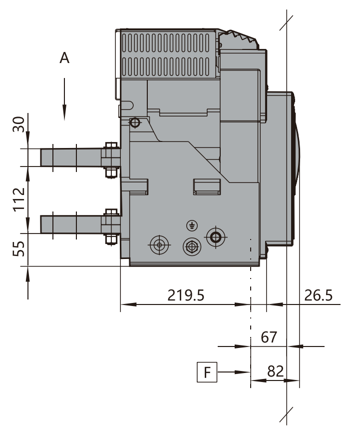
N

6300A fixed type

Front view

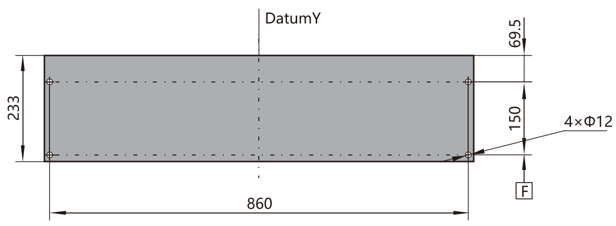


Side view



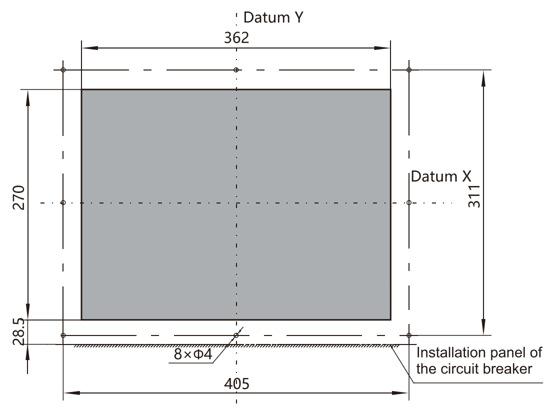
Hole size

Hole size of the base



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

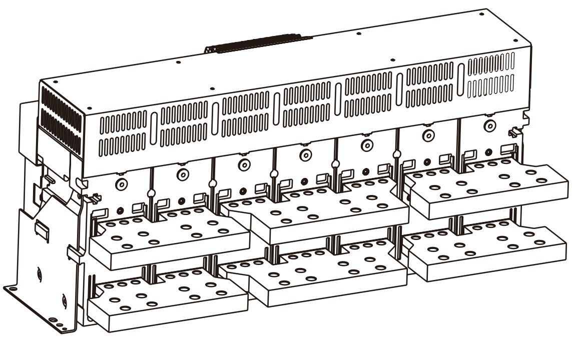
Hole size of panel



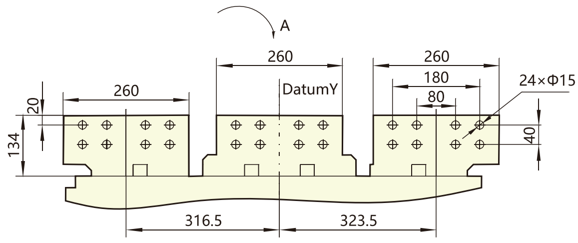
Hole size of the panel of the fixed type circuit breaker

Horizontal connection

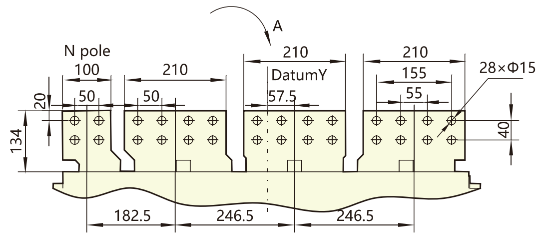
Side view



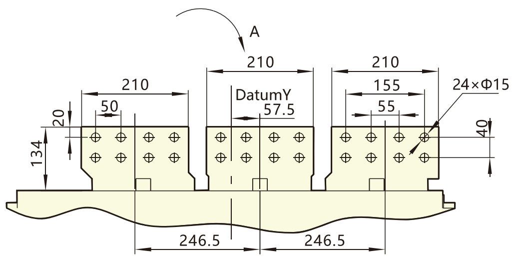
Busbar size and interval



In=6300A



In=4000A～5000A (Four pole)

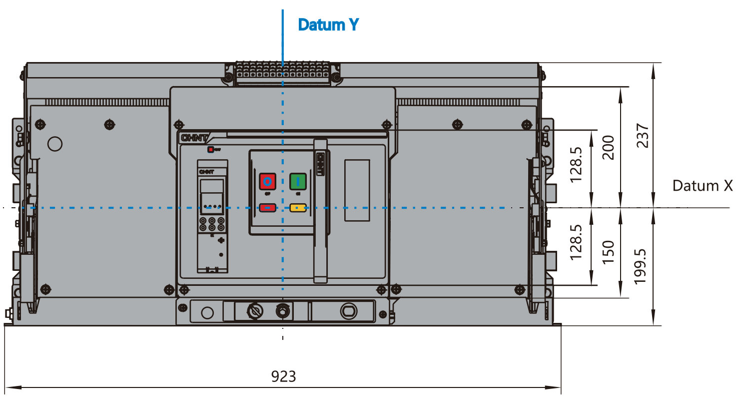


In=4000A～5000A(Three pole)

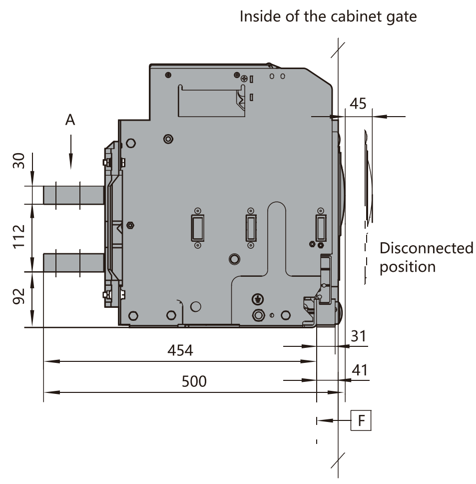
N

6300A draw-out type

Front view

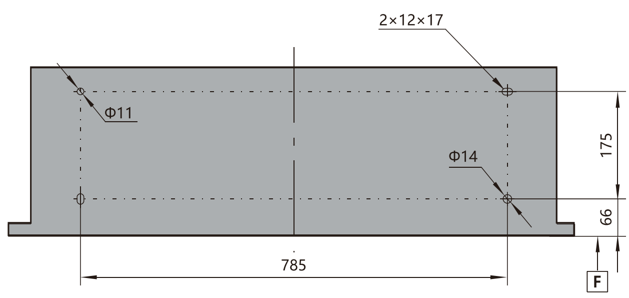


Side view



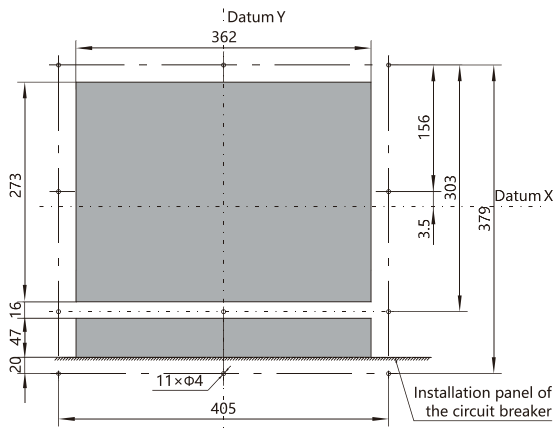
Hole size

Hole size of the base



Hole size of the panel of the fixed type circuit breaker

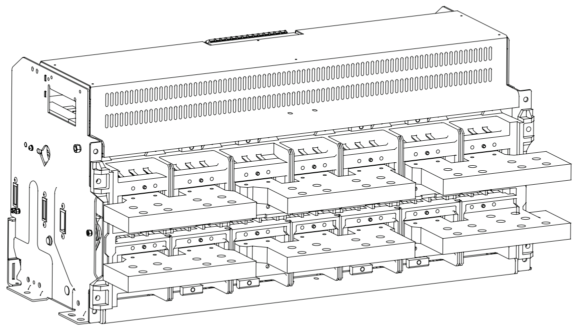
Hole size of panel



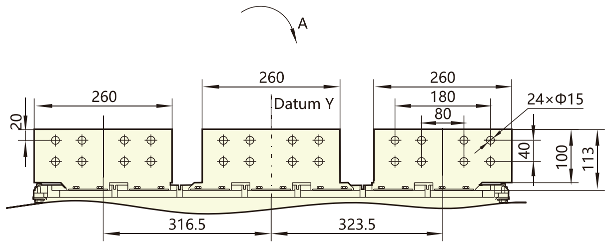
Hole size of the panel of the draw-out type circuit breaker

Horizontal connection

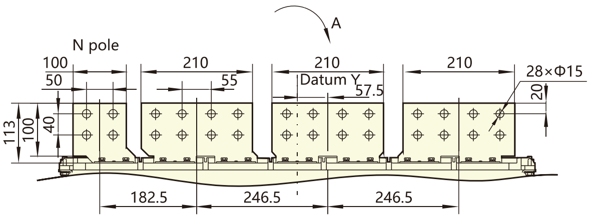
Side view



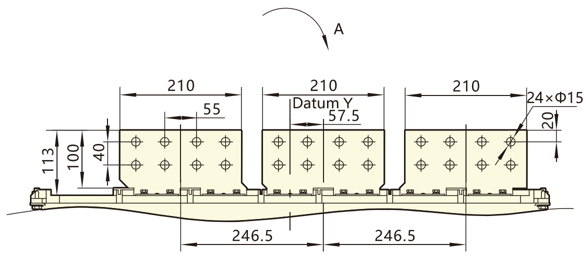
Busbar size and interval



In=6300A



In=4000A ~ 5000A (Four pole)



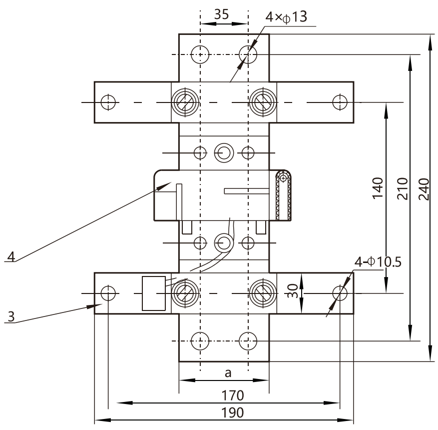
In=4000A ~ 5000A(Three pole)

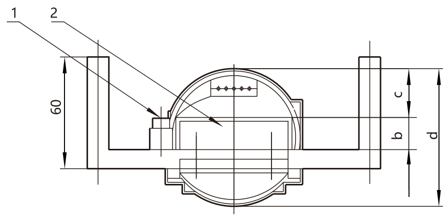
www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

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

External transformer (Neutral CT) dimension

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



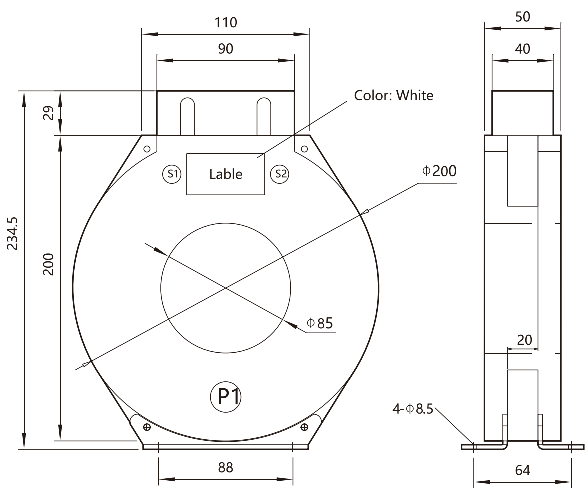


1-Wiring panel 2-Busbar 3-Fixation panel 4-Transformer

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

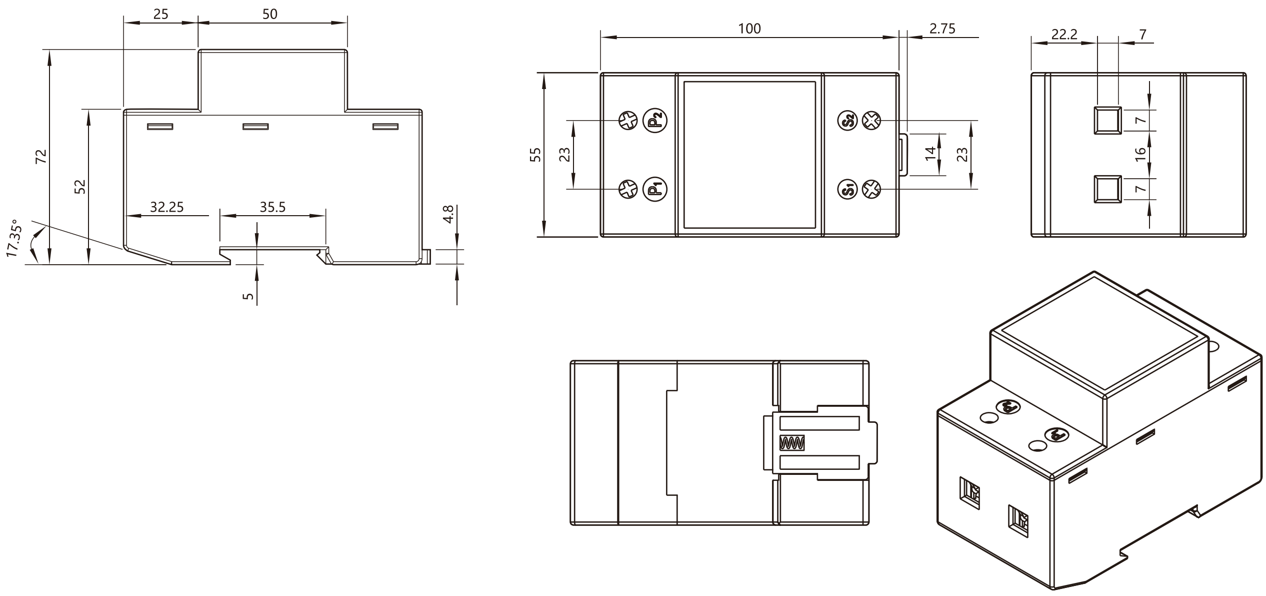
4CT Type earth current transformer

Structural dimension of external earth current transformer (W type)



CTB-2 Type earth current transformer

Structural dimension of external earth current transformer (W type)



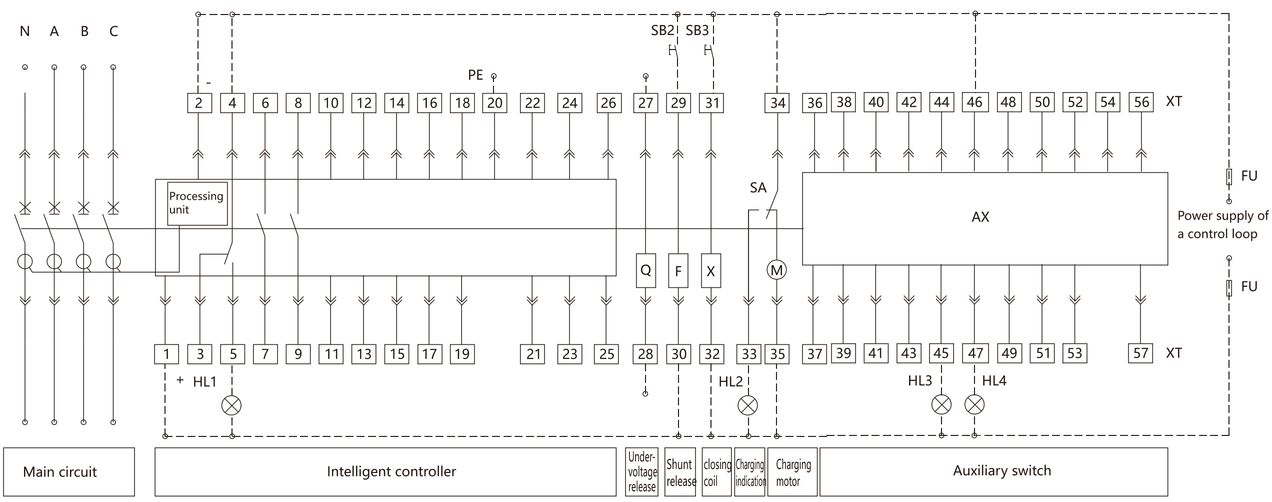
Undervoltage time delay controller

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

Secondary circuit wiring

1600A frame

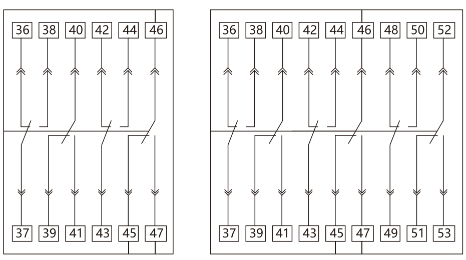
M/A type control unit



AX auxiliary contact type

For user

Four groups of adapters (Default) Six groups of adapters



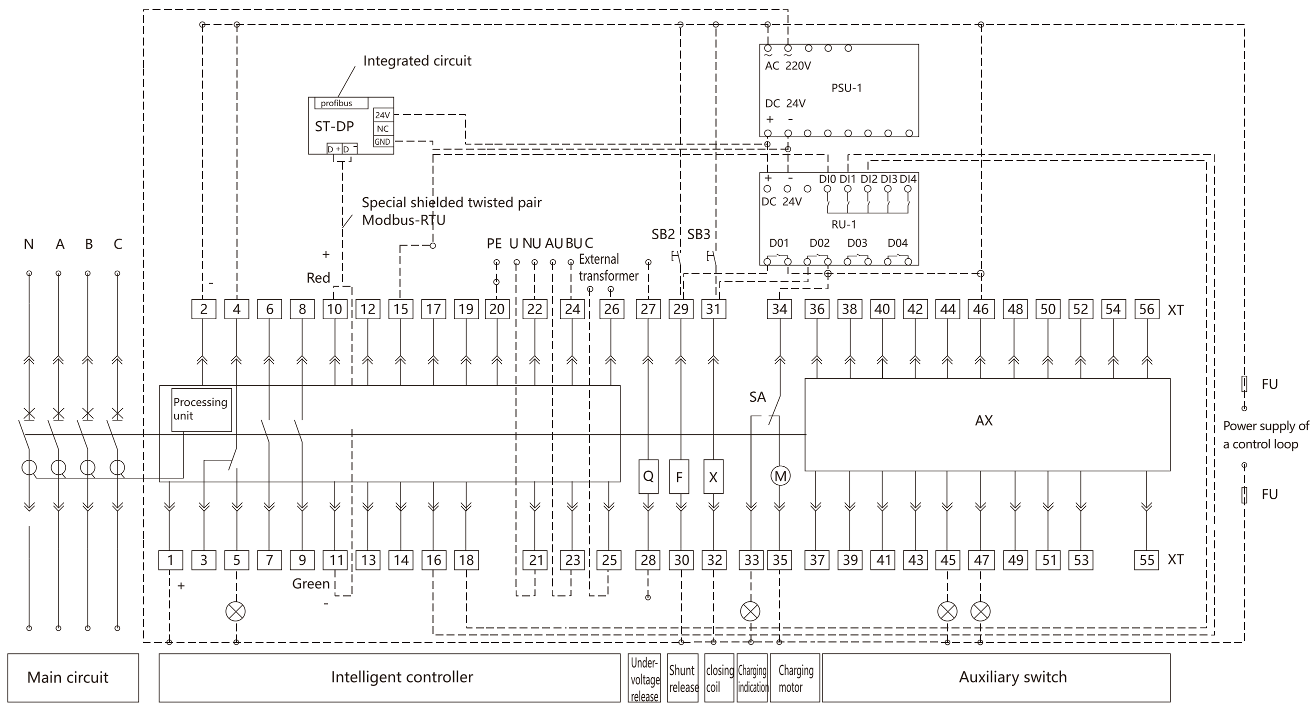
Q-Undervoltage release F-Shunt release X-Closing coil
M-Charging motor SA-Limited XT-Wiring terminal
AX-Auxiliary contact SB1-Emergency stop button
SB2-Tripping push button SB3-Closing push button HL1-Failure indication lamp
HL2-Charging indication lamp HL3-Tripping indication lamp
HL4-Closing indication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

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

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

1600A frame

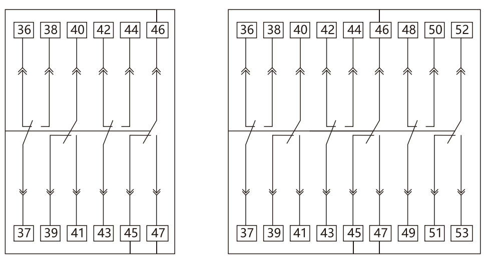
P/H type control unit



AX auxiliary contact type

For user

Four groups of adapters (Default)   Six groups of adapters

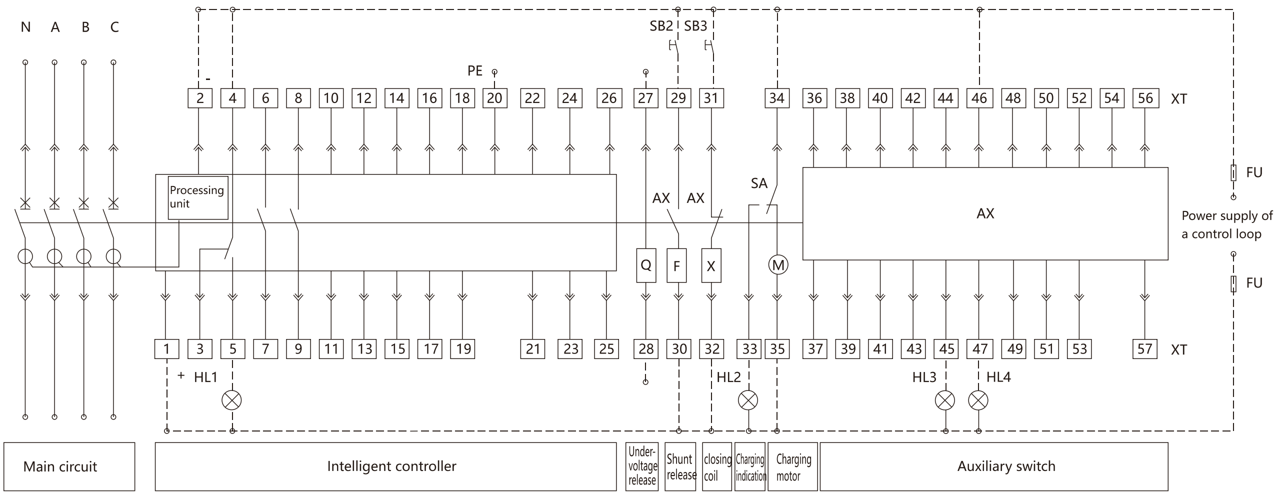


Q-Undervoltage release   F-Shunt release
X-Closing coil   M-Charging motor
SA-Limited switch   XT-Wiring terminal   AX-Auxiliary contact
SB1-Emergency stop button   SB2-Tripping push button
SB3-Closing push button   HL1-Failure indication lamp
HL2-Charging indication lamp
HL3-Tripping indication lamp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

H type intelligent controller with a programmable output contact outputs in default: 12#, 13#: load 1 alarm, 12#, 14#: load 2 alarm, 12#,16#: tripping signal output, 12#, 18#: Closing signal output
P type intelligent controller with a programmable output contact outputs in default: 12#, 13#: load 1 alarm, 12#, 14#: load C alarm, 12#, 16#: self-diagnosis alarm, 12#, 18#: failure tripping.
20#: PE line.
21#~24#: voltage display input signal contact
P/H type intelligent controller   21#:N-phase voltage signal
22#: A-phase voltage signal 23#:B-phase voltage signal,
24#: C- phase voltage signal
25#~26#: External N-phase transformer or external earth current transformer input signal contacts. Conventional products are empty. When an external transformer is required for special order for users, they are external transformer signal input contacts.
27#, 28#: Undervoltage release (Connected to the main circuit)
29#, 30#: Shunt release
31#, 32#: Closing coil
33#, 34#: Charging indication
34#, 35#: Charging motor
36#~56#: Auxiliary contact
Conventional products are four groups of adapters, and six groups of adapters can be provided for special order for users (only for AC).
ST-DP: DP protocol module. When the upper computer communication protocol is Modbus-RTU, the ST-DP protocol module is not required. When the upper computer communication protocol is Profibus-DP, the Modbus-RTU protocol module is required to be converted into Profibus-DP protocol by the ST-DP protocol module, extra fee needed.
RU-1 :relay module. The circuit breaker is used for tripping and switching via remote control, and is used for tripping and switching signal energy amplification, extra fee needed.
Note: The full line section is connected, and the dot line should be connected by customers.

2000-6300A frame

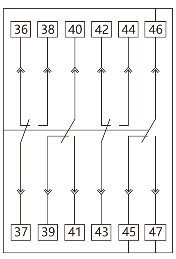
M/A type control unit



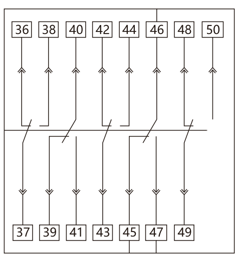
AX auxiliary contact type

For user

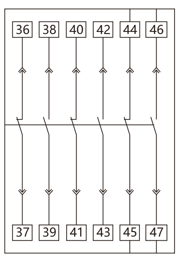
Four groups of adapters (Default)



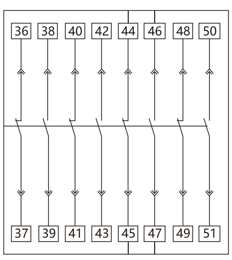
Five groups of adapters



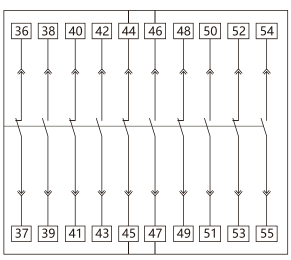
Three-open three-closed auxiliary contact



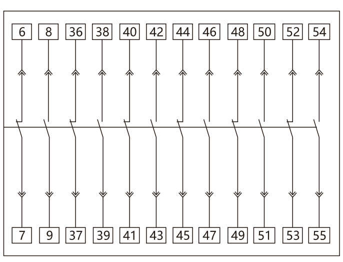
Four-open four-closed auxiliary contact



Five-open five-closed auxiliary contact



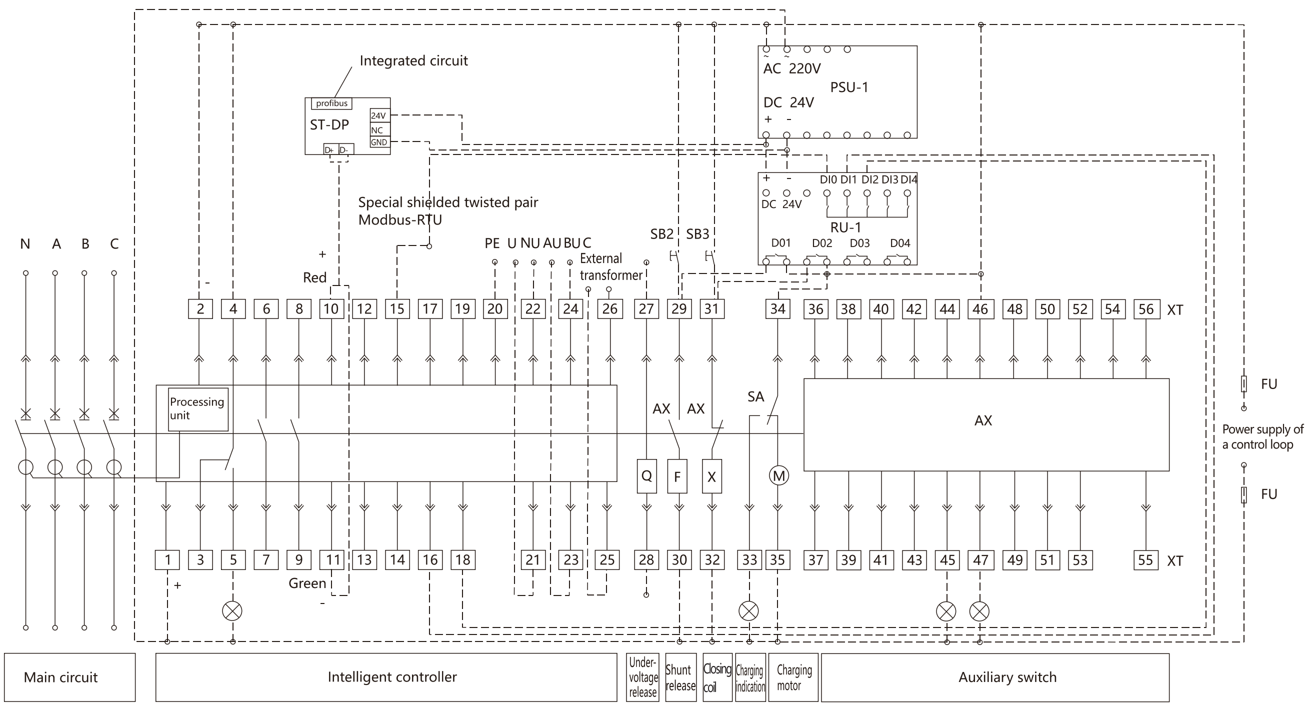
Six-open Six-closed auxiliary contact



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

2000-6300A frame

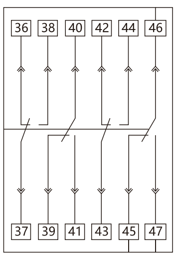
P/H type control unit



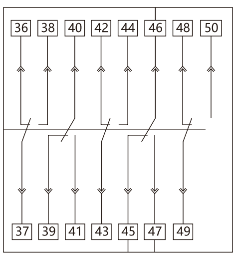
AX auxiliary contact type

For user

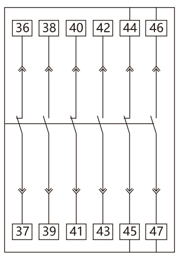
Four groups of adapters (Default)



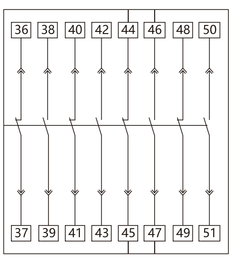
Five groups of adapters



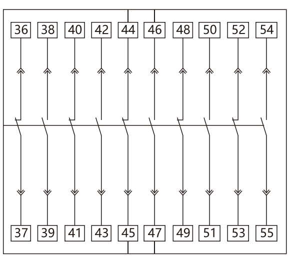
Three-open three-closed auxiliary contact



Four-open four-closed auxiliary contact



Five-open five-closed auxiliary contact



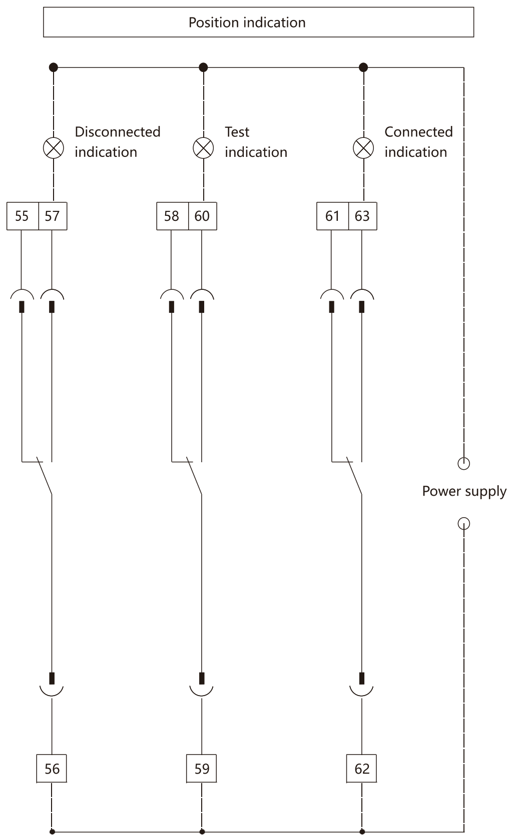
Q-Undervoltage release F-Shunt release X-Closing coil
M-Charging motor SA-Limited switch XT-Wiring terminal
AX-Auxiliary contact SB1-Emergency stop button SB2-Tripping push button
SB3-Closing push button HL1-Failure indication lamp
HL2-Charging indication lamp HL3-Tripping indication lamp
HL4-Closing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

Conventional products are four groups of adapters. The three-open three-closed auxiliary contact, the four-open four-closed auxiliary contact, the five-open five-closed auxiliary contact, and five groups of adapters can be provided for the special order for users.
ST-DP: DP protocol module. When the upper computer communication protocol is Modbus-RTU, the ST-DP protocol module is not required. When the upper computer communication protocol is Profibus-DP, the Modbus-RTU protocol module is required to be converted into Profibus-DP protocol by the ST-DP protocol module, extra fee needed.
RU-1: relay module. The circuit breaker is used for breaking and making via remote control, and is used for breaking and making signal energy amplification, extra fee needed.
Note: 1. the full line section is connected, and the dot line should be connected by customers.
Note: 2. when the voltages of the controller of the 2000-4000 frame are AC 230V/AC 400V, the controller can be directly connected to 1#, 2#terminals.
When the voltage is DC 220V/DC 110V, the controller can be connected to 1#, 2# terminals after the power supply module outputs DC 24V.

21#~24#: voltage display input signal contact
P/H type intelligent controller
21#: N-phase voltage signal, 22#: A-phase voltage signal
23#: B-phase voltage signal, 24#: C- phase voltage signal
25#~26#: External N-phase transformer or external earthing current transformer input signal contacts.
Conventional products are empty. When an external transformer is required for special order for users, they are external transformer signal input contacts.
27#, 28#: Undervoltage release (Connected to the main circuit or connedted to the output of the undervoltage delay module)
29#, 30#: Shunt release, 31#, 32#: Closing coil, 33#, 34#: Charging indication
34#, 35#: Charging motor, 36#~56#: Auxiliary contact

Chassis position indicator device

Wiring diagram



Operation requirements:

1.The chassis indication device can indicate the positions including "disconnected" ,"test" and "connected"which are completely or partially used according to the requirements of order.

2.When the body of the draw-out type circuit breaker is pushed from the "disconnected" position to the "test" position, 55# and 56# terminals should be transferred from connection into disconnection, and 56# and 57# terminals should be transferred from disconnection to connection.

3.When the body of the draw-out type circuit breaker is pushed from the "disconnected" position to the "test" position, 58# and 59# terminals should be transferred from connection into disconnection, and 59# and 60# terminals should be transferred from disconnection to connection. There is sufficient safety distance between the bus of the circuit breaker body and a bridge-type contact of the safety shutter, and tripping and switching operation can be carried out reliably.

4.When the body of the draw-out type circuit breaker is switched from the "test" position to the "connected" position, NXA16 type secondary circuit has no clearance. The NXA20-63 type safety shutter swing continuously after sending out the ‘"cracking" sound, and the safety shutter jiggle handle rotates within 1.5 circles. 61# and 62# terminals are being transferred from connection to disconnection. 62# and 63# terminals are transferred from disconnection to connection. The busbar of circuit breaker body is required to be reliably inserted into the bridge-type contact of the chassis base, and reliably bear the main circuit current to operate.

5.When the body of the draw-out type circuit breaker is pushed from the "connected" position to the "test" position, 58# and 59# terminals should be transferred from connection into disconnection, and 59# and 60# terminals should be transferred from disconnection to connection. There is sufficient safety distance between the busbar of the circuit breaker body and a bridge-type contact of the chassis, and tripping and switching operation can be carried out reliably.

6.When the body of the draw-out type circuit breaker swings from the "test" position to the "disconnected" position, 55# and 56# terminals should be transferred from connection to disconnection, and 56# and 57# terminals should be transferred from disconnection to connection, and at the same time, the circuit breaker body still cannot be drawn out, and needs to swing toward the "disconnected" position until the handle cannot swing any more, and meanwhile, the circuit breaker body can be drawn out. After the circuit breaker is pulled out, 55# and 56# terminals should be transferred from disconnection to connection, and 56# and 57# terminals should be transferred from connection to disconnection.

7.In the position transfer operation process of the chassis, the operation can only be stopped when the indicator points to "disconnected", "test" and "conncected" or the position indicator cannot display the position of the circuit breaker body in the chassis correctly.

8.The above terminal numbers are all position signal specific numbers (55#-63#), which are not compatible with secondary circuit terminal numbers.

Position signal contact capacity

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

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

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

N

Frame size	1600A	2000A	3200A	4000A	6300A
Circuit breaker	N ☐ S ☐ H ☐	N ☐ S ☐ H ☐	N ☐ S ☐ H ☐	N ☐ S ☐ H ☐	H ☐
Rated current	400A ☐	630A ☐	1600A ☐	3200A ☐	4000A ☐
	630A ☐	800A ☐	2000A ☐	3600A ☐	5000A ☐
	800A ☐	1000A ☐	2500A ☐	4000A ☐	6300A ☐
	1000A ☐	1250A ☐	3200A ☐		
	1250A ☐	1600A ☐			
	1600A ☐	2000A ☐			
Number of poles	3 pole ☐ 4 pole ☐ (While In=6300A, no four poles)				
Installation modes	Horizontal draw-out ☐ Fixed and horizontal ☐				
Intelligent controller	M type ☐ A type ☐ P type ☐ H type ☐				
	AC110V ☐ AC220/230/240V ☐ AC 380/400/415V ☐ DC110V ☐ DC220V ☐				
Electric accessories (no AC110V for NXA16)	Under-voltage release (no DC)(Optional)	AC110V ☐ AC220/230/240V ☐ AC 380/400/415V ☐ Order____V ☐			
		helped&instantaneous ☐ helped&delay (Inm≥2000A ,delay time:1s,3s,5s, non-adjustable). ☐			
		self-priming&instantaneous ☐ self-priming&delay (Inm≥2000A,delay time:0.3~7.5s, adjustable) ☐			
		Note:NXA16 don't have helped type, delay time:1s,3s,5s,7s, non-adjustable. ☐			
	shunt release (default in motor operation)	Intermittent (only for Inm≥2000A, by default in motor operation)☐	AC 110V ☐ AC220/230/240V ☐ AC380/400/415V ☐ DC110V ☐ DC220V ☐		
	closed electromagnet (default in motor operation)	pulse (must select pulse type in the automatic control system) ☐	AC110V ☐ AC220/230/240V ☐ AC380/400/415V ☐ DC110V ☐ DC220V ☐		
	Motor	AC110V ☐ AC220/230/240V ☐ AC380/400/415V ☐ DC110V ☐ DC220V ☐			
Auxiliary contact	NXA16: C04☐ C06☐ (C06 only for AC) NXA20~63: N3☐ N4☐ N5☐ C03☐ C04☐ C05☐				
Connection accessories	Interphase barrise ☐				
Controller accessories (Match)	External transformer: Earth current transformer ☐ External transformer (Neutral CT) ☐				
	Note: [1] Neutral CT is only applicable to 3P+N [2] The earth current transformer should be selected when customers select earth current return type earthing protection.				
Lock mechanism (Match)	Pushbutton lock ☐ Safety shutters padlock ☐ Body lock ☐ One-lock one-key ☐ Two-locks one-key ☐				
	Three-locks two-keys ☐ "Disconnected" position padlock ☐ Door interlock (Body) ☐ Door interlock (chassis) ☐				
Mechanical interlock (Match)	MI-3(2on+1off) ☐ MI-4 (1on+2off) ☐ ILK2 ☐				
Source-changeover controller (Match)	1 "Normal" and 1 "Replacement" ☐ 2 "Incoming" and 1 "Busbar" ☐				









Earth protection

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

a.correlation setting parameters of earth protection

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

b. Operating characteristic of earth protection

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

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

t=(1.0In or1200A/I)2×Tg

In this equation: t---action time

Tg --- setting delay time

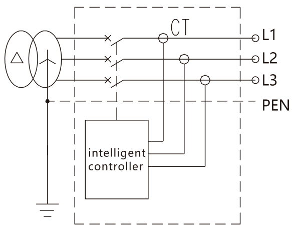
I---fault earth current

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱-۴۸۰۰۰۰۴۹
Fax:۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبروی پالایشگاه نفت پارس، پلاک ۱۲

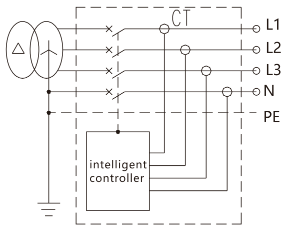
When fault current is more than 1.0In or 1200A, the protection is definite; the time delay is the setting delay time.

c. Schematic Diagram of detection

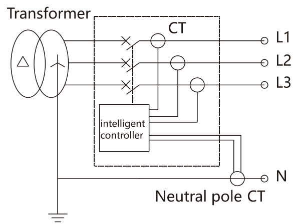
Type-T



3P

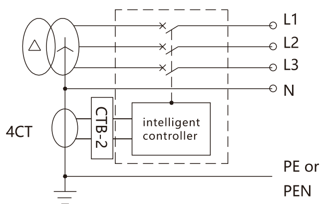


4P



3P+N

Type-W



4CT:external special transformer CTB-2:earth current transformer module

Leakage protection (E)

Leakage protection applies to leakage fault caused by insulation failure of equipment or human touching exposed electric conduction position. Leakage tripping current I?n is independent of breaker rated current. An extra rectangular transformer is needed for zero sequence sampling method. This method is appropriate for small current protection because of its high accuracy and sensitivity.

a. correlation setting parameters of leakage protection

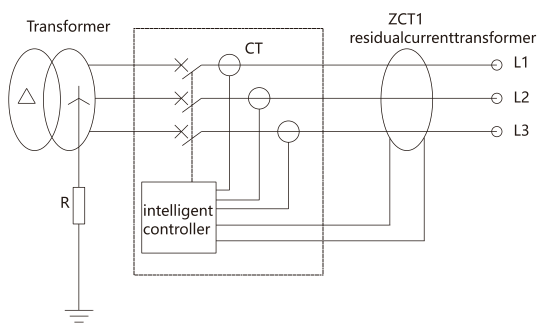
Parameter Names	Setting range	Setting step size
Set value of action current IΔn	(0.5~30.0)A	0.1A
Delay time TΔn(S)	Instantaneous，0.06，0.08，0.17，0.25，0.33，0.42，0.5，0.58，0.67，0.75，0.83	
Operation mode	Trip/Turn off	

b .Operating characteristic of leakage protection

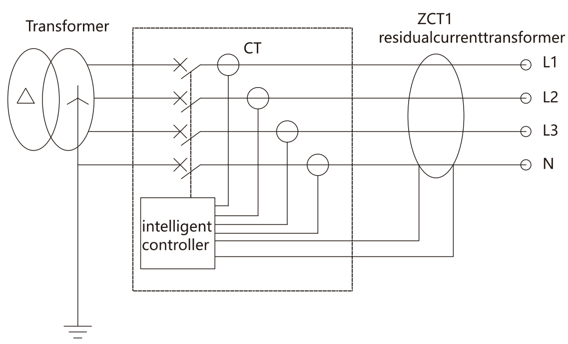
Characteristic	I/IΔn	Tripping time	Permissible error
Non-operating characteristic	＜0.8	Non-operate	
Operation characteristic	＞1.0	Operate	
Time-delay operation	≥1.0	Shown in Table 18	±10% (inherent absolute error±40ms)

Setting time(s)	0.06	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83	Instantaneous
Multiple of Fault Current	Maximum Breaking Time(s)											
1 IΔn	0.36	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	0.04
2 IΔn	0.18	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	0.04
5 IΔn 10 IΔn	0.072	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	0.04

c. Schematic Diagram of leakage protection



ZCT1:rectangular leakage transformer (NXA16&NXA20-3P)

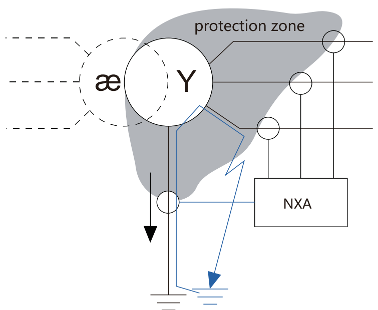


ZCT1: rectangular leakage transformer(NXA16-4P)

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

Dual earth fault protection

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

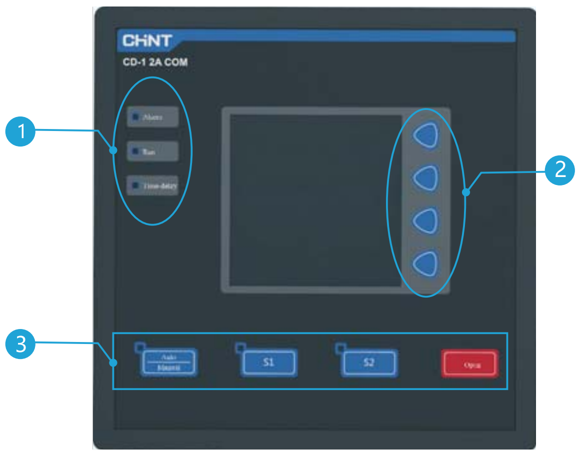


N

Functions of the controller

2A type display and operation

CD-1: A 2A type source-changeover system is used for the switch between power grids or between the power grid and generator. When a normal power supply does not supply power normally, such as undervoltage, overvolgage, phase breaking, a spare power supply is switched for supplying power. A mechanical interlock component is configured according to standard.



Switch operation zone	Automatic (The system judges the operateion automatically, and the light is on when pressing the left upper part)
	Manual (The mechanism is operated by a handle or with buttons S1, S2 and OFF operation)
	S1:load is powered by switching to S1, and the light is on when pressing S1 in the left upper part.
	S2: load is powered by switching to S2, and the light is on when pressing S2 in the left upper part.
	Disconnection: S1, S2 are stripped, and the system load is not powered
	Pressing anyone of buttons S1, S2 and OFF under the automatic condition, the system becomes manual, and corresponding operation is carried out when pressing corresponding buttons.

2A type of functions

The controller has the following functions

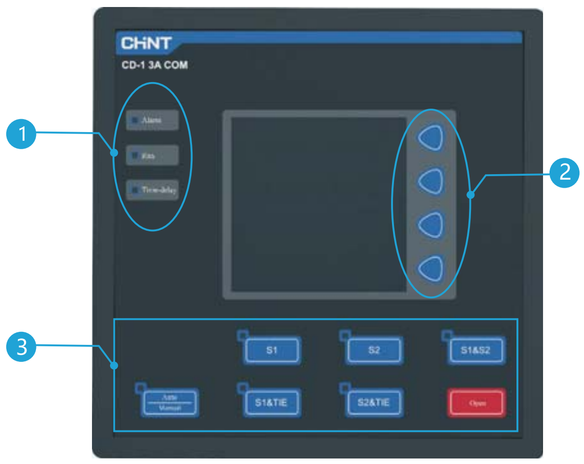
1.Dual-circuit voltage detection display
2.Overvoltage threshold value adjustment: 400V-480V
3.Undervoltage threshold value adjustment: 280V-360V
4.Adjustment of T1, T2, T3 and T4: 0.5-64S with the step size of 0.5S
5.Undervoltage and overvoltage fault indication
6.Power supply fault indication
7.State indication of the circuit breaker
8.Self-input and self-reset or self-input and self-reset selection
9.Manual or automatic selection
10.Comprehensive alarm for transfer failure (fault of the circuit breaker, sending fault of control signals and unmet transfer conditions)
11.All primary adjustment states after resetting and before defaulting
12.Alarm contact
13.Unloading contact
14.Startup contact of a power generator
15.Standard configuration
16.Mechanical interlock
17.The controller has an overvoltage protection function, and operates normally with long-term overvoltage: 130% Ue.

Truth table

S1-circuit power supply	S2-circuit power supply
1	0
0	0
0	1

3A type display and operation

CD-1 A 3A source-changeover system is applicable to a power supplying system with two power supplies and one buscouple. In the manual operation process, load cannot lead to power interruption, so that the safety running level and the power supplying continuity for power distribution are enhanced. The 3A automatic power supply conversion system is applied to electric places.



	Automatic (The system judges the operateion automatically, and the light is on when pressing the left upper part)
	Manual (The mechanism is operated by a handle or with buttons S1, S2, S1 & S2, S1&TIE, S2&TIE and OFF operation)
	S1: load is powered by switching to S1, the TIE buscouple is tripped, and the light is on at the left upper part when pressing S1.
	S2: load is powered by switching to S2, the TIE buscouple is tripped, and the light is on at the left upper part when pressing S2.
Switch operation zone	S1 & S2:Load is powered by S1 & S2, TIE buscouple is tripped; the light is on at the left upper part when pressing S1 & S2.
	S1&TIE: Load is powered by S1, TIE buscouple is tripped; the light is on at the left upper part when pressing S1&TIE
	S2&TIE: Load is powered by S2, TIE buscouple is tripped; the light is on at the left upper part when pressing S2&TIE
	Disconnection: S1,S2 and TIE are all stripped, and the system load is not powered.
	Pressing anyone of buttons S1, S2 S1 & S2, S1&TIE, S2&TIE under the automatic condition, the system becomes manual, and corresponding operation is carried out when pressing corresponding buttons.

3A type functions

The controller has the following functions

1.Dual-circuit voltage detection display
2.Overvoltage threshold value adjustment: 400V-480V
3.Undervoltage threshold value adjustment: 280V-360V
4.Adjustment of T1, T2, T3 and T4: 0.5-64S with the step size of 0.5S
5.Undervoltage and overvoltage fault indication
6.Power supply fault indication
7.State indication of the circuit breaker
8.Self-input and self-reset or self-input and self-reset selection
9.Manual or automatic selection
10.Comprehensive alarm for transfer failure (fault of the circuit breaker, sending fault of control signals and unmet transfer conditions)
11.All primary adjustment states after resetting and before defaulting
12.Alarm contact
13.Unloading function
14.Standard configuration
15.Mechanical interlock
16.The controller has an overvoltage protection function, and operates normally with long-term overvoltage: 130% Ue.

Truth table

S1-circuit power supply	TIE buscouple	S2-circuit power supply
1	0	1
1	1	0
0	1	1
1	0	0
0	0	1
0	0	0

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CHINT
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Europe

Italy

CHINT Italia Investment Srl

Add: Via Bruno Maderna 7 30174 Venezia
Tel: +39 041.446614
Fax +39 041.5845900
E-mail: info@chint.it

Spain

CHINT Electrics S.L.

Add: Calle José Echegaray, Num 8.Parque Empresarial Las RozasEdifificio 3, Planta Baja, Ofificina 7-8.C.P: 28232 Las Rozas (Madrid)
Tel: +34 91 645 03 53
E-mail: info@chint.eu

Czech Republic

NOARK Electric Europe s.r.o.

Add: Sezemická 2757/2, 193 00 Prague 9
Tel: +420 226 203 120
Email: europe@noark-electric.com

Turkey

CHINT Turca Elektrik Sanayi VE Ticaret Anonim Sirketi

Add: Zumrutevler Mahallesi Ural Sokak No. 22/18 NAS PLAZA B Block KAT 1, Maltepe, Istanbul
Tel: +90216 621 00 55
Fax.:+90216 621 00 50
E-mail: fatura@chint.com.tr

West Asia & Africa

Egypt

CHINT Electrics (Egypt) Co., Ltd

Add: Building B16 - Smart village, Abu Rawash - Giza, Egypt
Tel: +20 1097173769
P.O BOX : 00202
Email: chinteg@chintglobal.com

Kenya

ZHENGTAI ELECTRICS(KENYA) CO., LIMITED

Add: OFFICE 1A, 8TH FLOOR, KISM TOWERS, LR No. 209/945/1– NGONG ROAD – NAIROBI, KENYA
Tel: +254 072256485
Email: chintkenya@chintglobal.com

U.A.E

CHINT MIDDLE EAST AND AFRICA DMCC

Add: Unit No: 2101, 21085,2109 , Jumeirah business center 1, Cluster G, Jumeirah Lakes Towers, Dubai, UAE
Tel: +97145571532
P.O BOX: 337555
E-mail: global-sales@chint.com

Nigeria

CHINT POWER & ENERGY SERVICES CO., LIMITED

Add: 3RD FLOOR TOWER 2, CHURGATE BUILDING , VICTORIA ISLAND, LAGOS
Tel: +234 8110728119
E-mail: czjie@chintglobal.com

North America

United States

NOARK Electric (USA) Inc

Add: 2188 Pomona Blvd., Pomona, CA 91768
Tel: 626-330-7007
Fax: 626-330-8035
E-mail: nasales@noark-electric.com

Mexico

CHINT SOLAR MEXICO S DE RL DE CV

Add: Miguel Cervantes Saavedra 169 Piso 11 Col. Granada Del. Miguel Hidalgo C.P. 11520 CDMX, México
Tel: +52 1-55-8881-6127
E-mail: info@chint-mexico.com

Chint Global

CHINT GLOBAL PTE. LTD.
Building A3, 3655 SiXian Road, Songjiang District, Shanghai, China

Tel: +86-21-5677 7777 **Web:** www.chintglobal.com
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تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبروی پالایشگاه نفت پارس، پلاک ۱۲

ABOUT CHINT

CHINT A leading global provider of smart energy solutions

CHINT was established 38 years ago in 1984 and built from the capital of approximately 8,000 US dollars. With our rapid development these years, CHINT has become the world's leading intelligent energy solutions provider for the whole industrial chain with the most complete product ranges. In 2021, our annual sales revenue exceeded 16.1 billion dollars and total assets of more than 16.2 billion.

Over two decades of global expansion, our business network covers more than 140 countries and regions worldwide in business industries of low-voltage electric, power transmission and distribution, smart technology, energy instruments and meters, green energy, solar and more. CHINT has more than 40,000 employees worldwide, creating more than 200,000 jobs in the industrial chains.

As the market localization progresses steadily, CHINT Global further establishes its supply chain through business integration and industrial upgrade. Optimizing the service system and project financing, providing innovatively integrated technical services for the global energy market, and a flexible working business model.energy, intelligent manufacturing and digital technology, CHINT has adopted “One Cloud & Two Nets” as the business strategy, takes "CHINT Cloud" as the carrier of intelligent technology and data application, and takes the lead in building the energy Internet of things (EIoT) and industrial Internet of things platforms (IIoT).

Focusing on the energy system of supply, storage, transmission, distribution and consumption, CHINT has core businesses of clean energy, energy distribution, big data and energy value-added services. Furthermore, CHINT’s pillar businesses include photovoltaic equipment, energy storage, power transmission & distribution, low-voltage apparatuses, intelligent terminals, software development and control automation. By developing into a platform-based enterprise, CHINT provides a package of energy solutions for public institutions, industrial & commercial users and end-users, by building a regional smart energy operation ecosphere.

Main Businesses

Clean Energy	Low-voltage Apparatus	Power Transmission and Distribution	Instrumentation and Apparatus	Smart Home	Intelligent Building
Intelligent Manufacturing	Industry Automation	Smart Heating	Smart Water	Home Electrical Apparatus	Energy Efficiency Management

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ABOUT CHINT LOW VOLTAGE

Zhejiang CHINT Electrics Co., Ltd. is a wholly owned subsidiary of CHINT Group. Cultivating R&D, manufacturing and sales of low-voltage products, we provide system solutions for building, power supply, hoisting, HVAC, telecommunication and other industrial customers. For nearly 40 years since its founding, CHINT Electrics has provided reliable products and services to over 140 countries and regions. Today, CHINT has grown to be one of the world's renowned low-voltage brands.

CHINT Honors

2022

- "AAAAA" standardized good behavior certificate
- "Global Partnership" and "Countries along the Belt and Road" in the "2021 Best
- Practices for Realizing the Sustainable Development Goals".
  CSR Impact Leading Enterprise

2021

- No. 1 in " China's Top 100 Private Enterprises with Social Responsibility" in 2021
- For 8 consecutive years, CHINT has won the sales champion of Tmall double 11 in electrical and hardware industry
- No. 92 in "2021 China's Top 500 Private Enterprises".
- No. 244 in "2021 Top 500 Chinese Enterprises"
- The intelligent manufacturing factory of low-voltage electrical appliances was selected as the national "2021 Intelligent Manufacturing Demonstration Factory".

2020

- CHINT was selected in the 2020 Zhejiang Province "Future Factory" recognized list, and was rated as the leading " Leading Goose Factory".
- The key inverter technology of CHINT won the second prize of China Electric Power Science and Technology.
- CHINT Astrometry was selected as the smart PV demonstration enterprise list of the Ministry of Industry and Information Technology and won the honor of "Influential PV cell/module brand", "Influential PV EPC / End User", "Influential PV power station operation and maintenance brand".

2019

- National Green Factory
- National Industrial Design Center of the MIIT
- Global Top 20 PV Enterprise
- China's Top 10 Successful PV Enterprise
- Top 100 Innovative Enterprises in Zhejiang Province
- Technology innovation system was awarded the 2018 Science and Technology Progress Award in Zhejiang

Qualification Certification

The products have been accredited through China Compulsory Certification (CCC) as well as UL of US, CE of EU, VDE and TÜV of Germany, KEMA of Netherlands, RCM of Australia, RCC of South Africa and other international product certifications.

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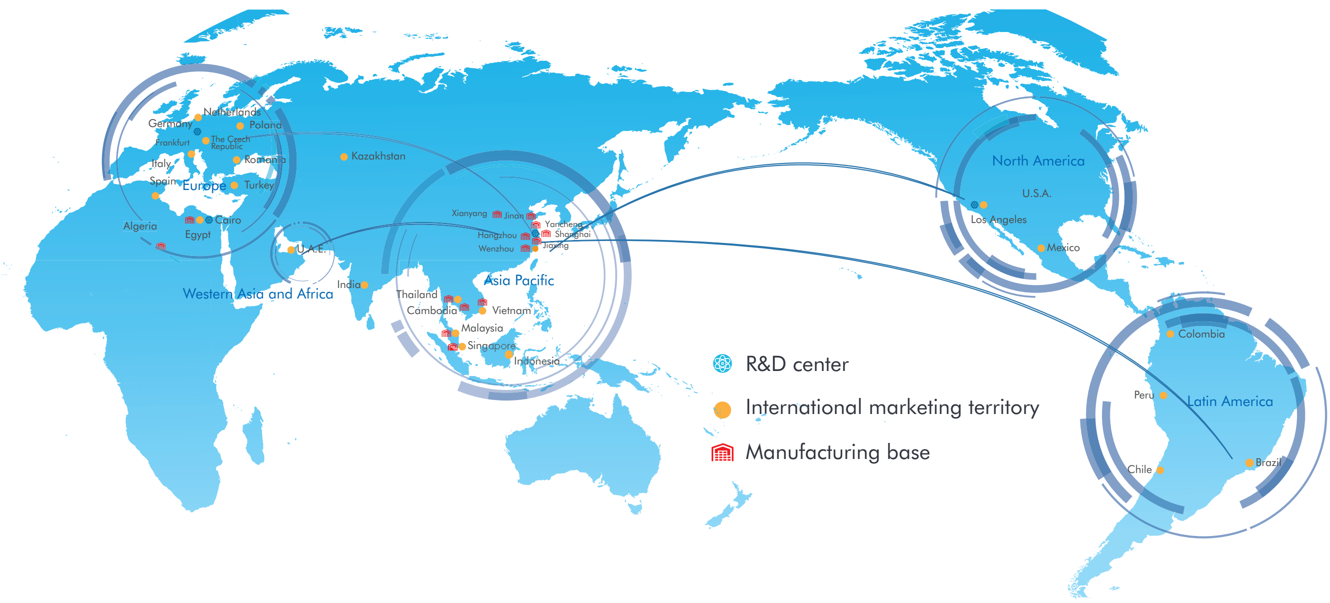
GLOBAL FOOTPRINT



4 National R&D Centers: North America, Europe, Asia Pacific, North Africa

6 International Marketing Territories: Asia Pacific, Western Asia and Africa, Europe, Latin America, North America, China

14 Manufacturing Bases: China (Wenzhou, Hangzhou, Shanghai, Jiaxing, Xianyang, Jinan, Yancheng), Thailand, Singapore, Vietnam, Malaysia, Egypt, Algeria and Cambodia

20+ International Logistics Centers

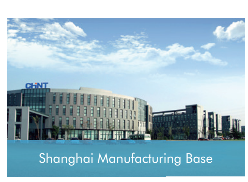
2300+ Sales Companies

GLOBAL CAPACITY LAYOUT

The industrial manufacturing bases are mainly located in Wenzhou, Hangzhou, Shanghai, Jiaxiang, Xianyang and Yancheng. Additionally, CHINT has set up factories in Thailand, Singapore, Vietnam, Malaysia, Egypt, Cambodia etc.


Wenzhou Manufacturing Base


Hangzhou Manufacturing Base


Shanghai Manufacturing Base


Jiaxing Manufacturing Base

Xianyang Manufacturing Base


Jinan Cable Manufacturing Base


Yancheng New Energy Manufacturing Base


Wuhan Manufacturing Base

Singapore Complete Electric Equipment Manufacturing Base


Vietnam Manufacturing Base


Malaysia Manufacturing Base


Egypt Manufacturing Base

Algerian Manufacturing Base


Cambodia Manufacturing Base

Thailand Solar Power Manufacturing Base

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
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R&D, QUALITY, SALES, LOGISTICS

Main Advantages

Global R&D System

CHINT has established national R&D centers in North America, Europe, Asia Pacific, North Africa and other areas. We have explored the mode of Industry-University Research Institute Collaboration and Integration together with the universities and research institutions worldwide so as to integrate the global innovation resources and promote corporate R&D innovation and talent cultivation.

- 24 research institutes
- The average annual R&D investment accounts for 4-12% of the revenue
- Over 6000 patents in total

Global Certification

The products have passed the standards and specifications in various regions around the world and obtained numerous international certifications

Honors

- No. 1 in China's Top 100 Private Enterprises with Social Responsibility in 2021
- No. 92 in 2021 China's Top 500 Private Enterprises
- No. 244 in 2021 Top 500 Chinese Enterprises
- The intelligent manufacturing factory of low-voltage electrical appliances was selected as the national 2021 Intelligent Manufacturing Demonstration Factory

Integrated Vertical R&D

By gathering the global industry elites to Provide safe and stable energy-saving green and advanced electric products.

5% At least 5% of revenue is invested in research and development

Great Quality System

Ensuring flaw-fraw-free and trouble-free products, the multi-dimensional and multilevel control is conducted through procurement, inspection, quality control and certification.

One-stop Services

CHINT's concept is that it is not difficult to fulfill a high-quality logistics distribution at one time, while it is difficult to stay as accurat e and prompt as the first-time. High-efficiency and high-precision accuracy are our requirement.

48-Hour Response

Providing end-to-end one-stop services for customers with complains, business consulting and technical support by solving problems immediately and including any possible problems in advance.

48 hour Global Services

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

FAMCO
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Air Circuit Breaker

ACB

NA8

NA1

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group

Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲

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Summary

Basic frame sizes

For your various requirements, the Air Circuit Breaker NA1 includes 5 basic frame sizes as followed. NA1-2000X,NA1-

NA1-1000X
200A to 1000A

2000XN， NA1-2000XH
630A to 2000A

NA1-3200X,NA1-3200XN,NA1-4000X
2000A to 4000A

NA1-6300X,NA1-6300XN
4000A to 6300A

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
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1. General

1.1 Application scope

NA1 series air circuit breaker is suitable for the circuit of AC 50Hz/60Hz with rated service voltage 400V, 690V and rated service current up to 6300A. It is mainly used to distribute electric energy and protect circuits and electric equipment against over-load, under-voltage, short-circuit and single-phase earthing fault.

With intelligentized and selective protection functions, the breaker can improve the reliability of power supply, and avoid unnecessary power failure. The breaker is applicable for power stations, factories, mines (for 690V) and modern high-buildings, especially for the distribution system of intelligentized building.

1.2 Standard: IEC/EN 60947-2.

2. Operating conditions

2.1 Temperature condition:

-5 ℃ ~40 ℃ ; the average value within 24h shall not exceed +35℃ (special situation excluded);

2.2 Altitude:≤2000m;

2.3 Pollution grade: Grade 3;

2.4 Air conditions:

At mounting site, relative humidity not exceed 50% at the max temperature of +40 ℃ , higher relative humidity is allowable under lower temperature, RH could be 90% at +20 ℃ , special measures should be taken to occurrence of dews;

2.5 Note: Without the intelligent controller, the breaker functions as a switch-disconnector.

2.6 Type designation

NA1 - □□ - □□ / □ - □ - □ - □ - □

Voltage of secondary circuit
AC220V, AC380V,
AC230V, AC400V
DC220V, DC110V

Wiring of main circuit:
H:Horizontal wiring of main circuit
V:Vertical wiring of main circuit

Mode of installation:
F:Fixed type
D:Draweout type

Mode of operation:
M:Manual
P: Power-driven

No. of poles:
3:3-pole
4:4-pole

Intelligent controller:
M: Standard type
3M:Multifunctional type
3H: Communication type

Rated current:

Frame size rated current	Rated current
1000A	200A
	400A
	630A
	800A
	1000A
2000A	630A
	800A
	1000A
	1250A
	1600A
	2000A
3200A	2000A
	2500A
	3200A
4000A	4000A
6300A	4000A
	5000A
	6300A

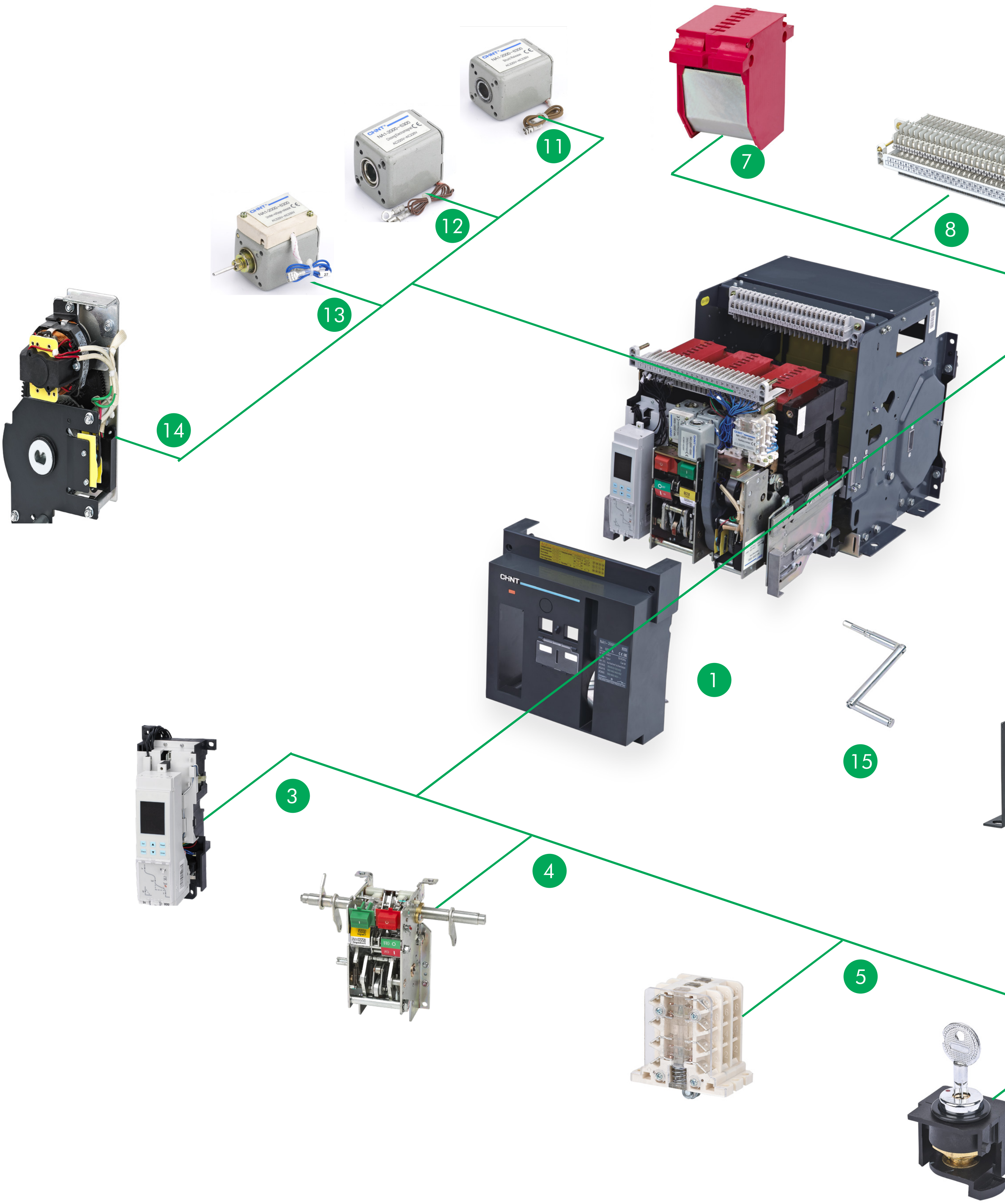
Breaking capacity:
X
XN
XH

Frame size rated current:
1000,2000,3200,4000,6300

Design sequence number

ACB

C


11
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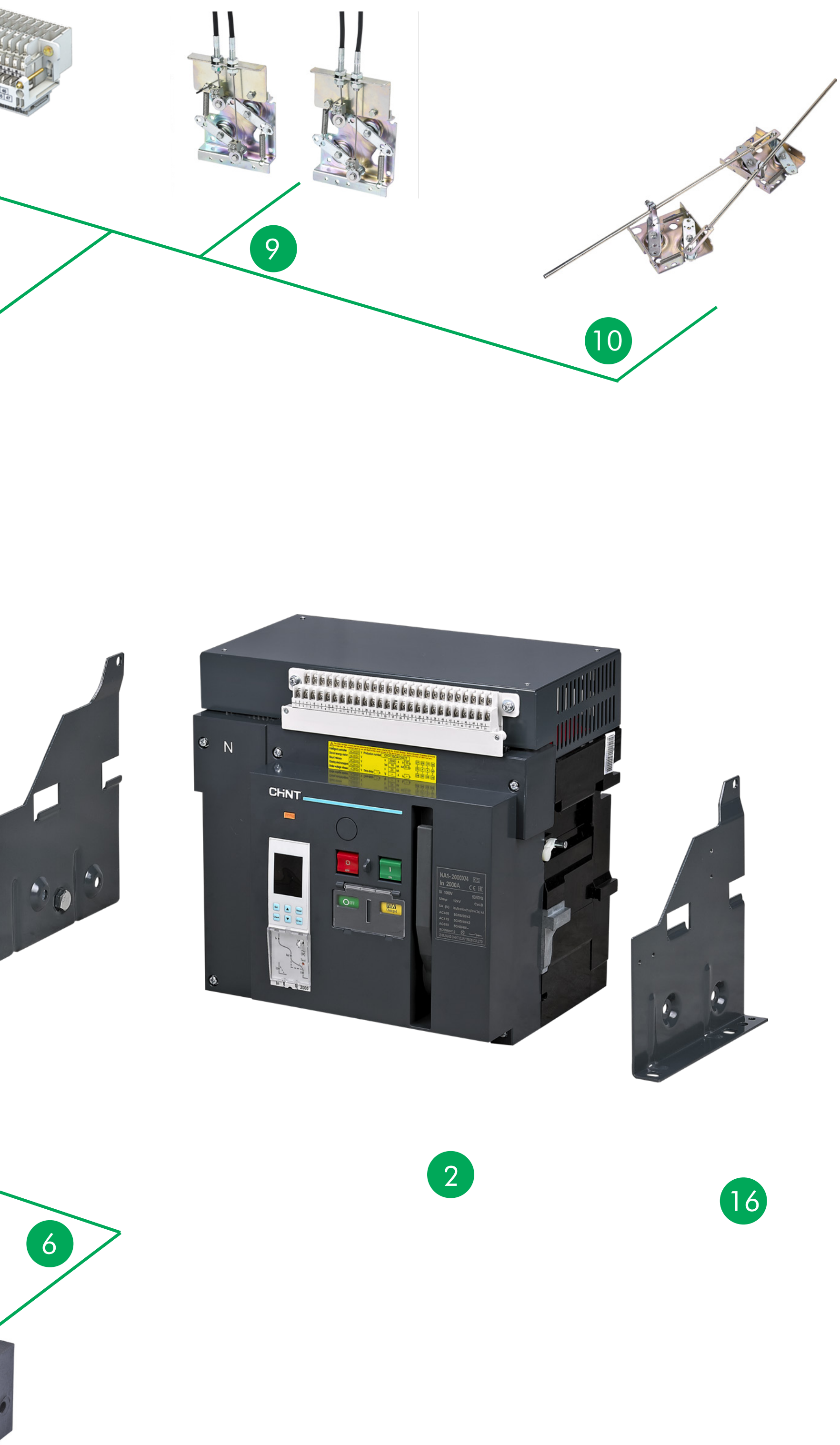
5
CHNT

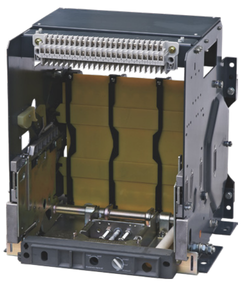
NA1 Air Circuit Breaker

1. Drawout type
2. Fixed type
3. Intelligent controller
4. Operating mechanism
5. Auxiliary contact
6. Locking-device
7. Arcing chamber
8. Secondary wiring terminal
9. Wire-cable mechanical interlock
10. Connecting-rod type mechanical interlock
11. Shunt release
12. Closing electromagnet
13. Under-voltage release
14. Motor-driven energy-storage mechanism
15. Rotary handle
16. Mounting plate

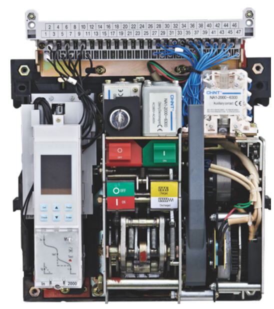
C



3. Structure



Drawer seat

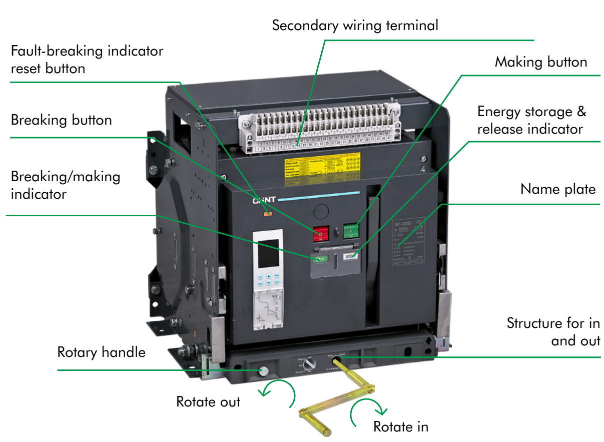


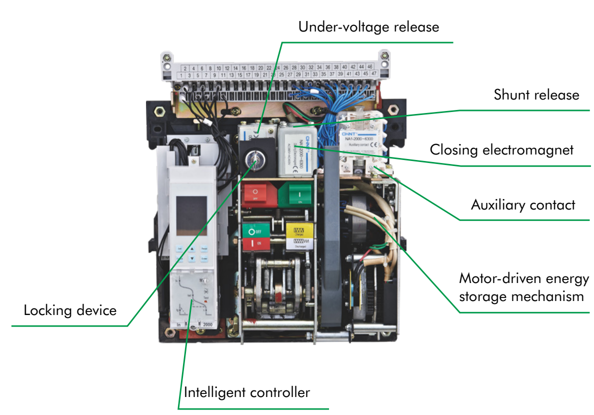
Body
Drawout type breaker/switch-disconnector

Mounting plate

Mounting plate for the
fixed type breaker/switch-disconnector

Mounting plate





4. Main technical parameter

Type		NA1-1000X				
						
Rated ultimate short circuit breaking capacity (Icu)	AC400V	42				
	AC690V	25				
Rated service short circuit breaking capacity (Ics)	AC400V	30				
	AC690V	20				
Rated short-time withstand current (Icw.1s)	AC400V	30				
	AC690V	20				
Rated current In (A)		200	400	630	800	1000
Number of poles		3, 4				
Rated voltage Ue (V)		AC 400, AC 690				
Rated insulation voltage Ui (V)		800				
Rated current of N-pole In (A)		100%In				
Intelligent controller	Standard type (M)	●	●	●	●	●
	Communication type (H)	●	●	●	●	●
Operation performance	Electric life	AC 400V:6500, AC 690V:3000				
	Mechanical life	Non-maintenance 15,000				
		Maintenance 30,000				
Connection pattern		Horizontal, Vertical				
Total breaking time (no additional delay time) (ms)		≤28				
Closing time(ms)		≤50				
Arcing distance(mm)		0				

Type		NA1-2000X		NA1-2000XN			NA1-2000XH
							
Rated ultimate short circuit breaking capacity (Icu)	AC400V	80		50			65
	AC415V	50		40			50
	AC690V	50		40			50
Rated service short circuit breaking capacity (Ics)	AC400V	65		50			65
	AC415V	40		40			40
	AC690V	40		40			40
Rated short-time withstand (Icw.1s)	AC400V	50		50			50
	AC415V	40		40			40
	AC690V	40		40			40
Rated short-time withstand (Icw.3s)	AC400V	42		42			42
	AC415V	42		42			42
Rated current I_n (A)		630	800	1000	1250	1600	2000
Number of poles		3, 4					
Rated voltage Ue (V)		AC400, AC415, AC690					
Rated insulation voltage Ui (V)		1000					
Rated current of N-pole I_n (A)		100%In					
Intelligent controller	Standard type (M)	●	●	●	●	●	●
	Communication type (H)	●	●	●	●	●	●
Operation performance	Electric life	AC400:6500 AC690V:3000					
	Mechanical life	Non-maintenance 15,000					
		Maintenance 30,000					
Connection pattern		Horizontal, Vertical					
Total breaking time (no additional delay time) (ms)		≤28					
Closing time(ms)		≤50					
Arcing distance(mm)		0					

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
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Type		NA1-3200X	NA1-3200XN	NA1-4000X
				
Rated ultimate short circuit breaking capacity (Icu)	AC400V	80	65	80
	AC415V	65	50	—
	AC690V	65	50	65
Rated service short circuit breaking capacity (Ics)	AC400V	65	65	65
	AC415V	65	50	—
	AC690V	65	50	65
Rated short-time withstand (Icw.1s)	AC400V	65	65	65
	AC415V	50	50	—
	AC690V	50	50	50
Rated short-time withstand (Icw.3s)	AC400V	45	45	—
	AC415V	45	45	—

Rated current I_n (A)		2000	2500	3200	4000
Number of poles		3, 4			3
Rated voltage Ue (V)		AC400, AC415, AC690			
Rated insulation voltage Ui (V)		1000			
Rated current of N-pole I_n (A)		100%In			
Intelligent controller	Standard type (M)	●	●	●	●
	Communication type (H)	●	●	●	●
Operation performance	Electric life	AC400V:3000 AC690V:2000			
	Mechanical life	Non-maintenance 10,000			
		Maintenance 20,000			
Connection pattern		Horizontal, Vertical			
Total breaking time (no additional delay time) (ms)		≤28			
Closing time(ms)		≤50			
Arcing distance(mm)		0			

C

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P- 009 Air Circuit Breaker | NA1

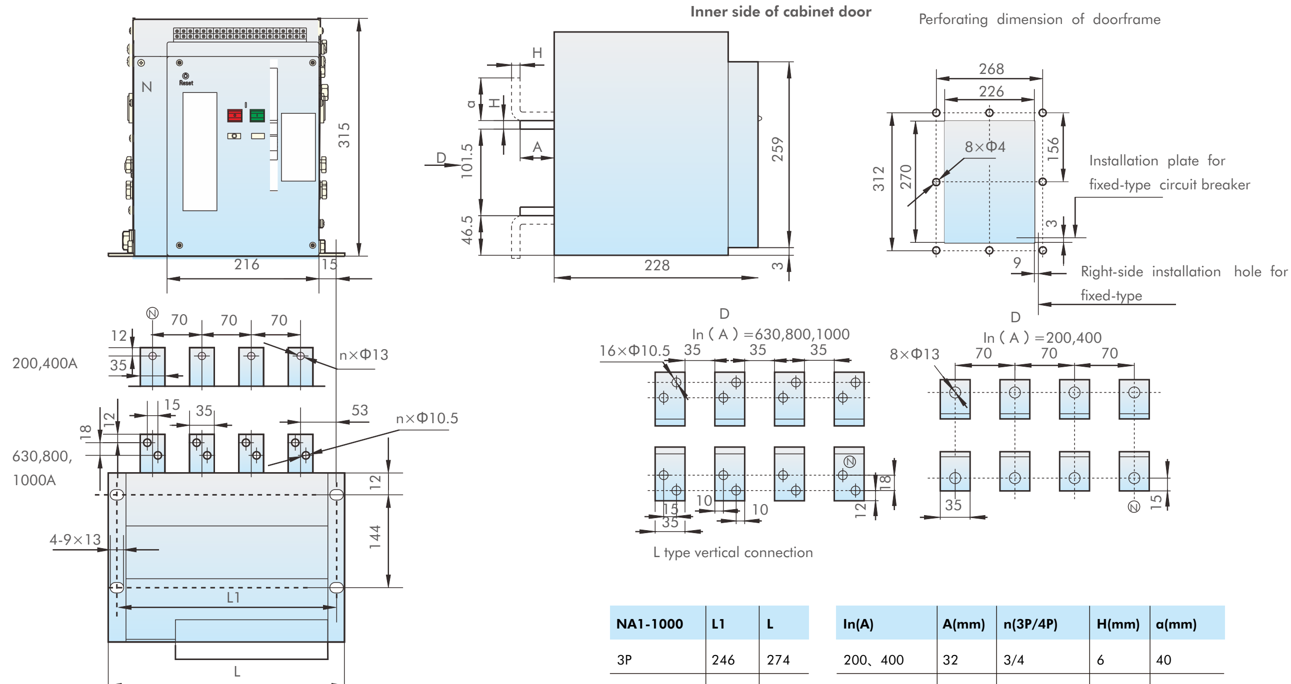
Type		NA1-6300X		NA1-6300XN
				
Rated ultimate short circuit breaking capacity (Icu)	AC400V	120		100
	AC415V	85		75
	AC690V	85		75
Rated service short circuit breaking capacity (Ics)	AC400V	100		100
	AC415V	75		75
	AC690V	75		75
Rated short-time withstand (Icw.1s)	AC400V	100		100
	AC415V	75		75
	AC690V	75		75
Rated short-time withstand (Icw.3s)	AC400V	50		50
	AC415V	50		50
rated current In (A)		4000	5000	6300
Number of poles		3, 4		3
Rated voltage Ue (V)		AC400, AC415,AC690		
Rated insulation voltage Ui (V)		1000		
Rated current of N-pole In (A)		50%In		—
Intelligent controller	Standard type (M)	●	●	●
	Communication type (H)	●	●	●
Operation performance	Electric life	AC400V:1500 AC690V:1000		
	Mechanical life	Non-maintenance 5000		
		Maintenance 10,000		
Connection pattern		Horizontal, Vertical		
Total breaking time (no additional delay time) (ms)		≤28		
Closing time(ms)		≤50		
Arcing distance(mm)		0		

Weight of single product (net weight)

Weight (kg) / Model Spec. / Installation method	NA1-1000X(3P/4P)	NA1-2000X(3/4)			NA1-3200X(3/4)		NA1-4000X/3	NA1-6300X(3/4)	
		630	800~1600	2000	2000~2500	3200		4000~5000	6300
Fixed type	21/25	44/53	45/54	46/55	57/69	59/72	91	-/-	-/-
Drawer type	38/45	67/82	73/85	75/90	96/118	106/130	135	201/233	235/-

5. Dimensions and connection

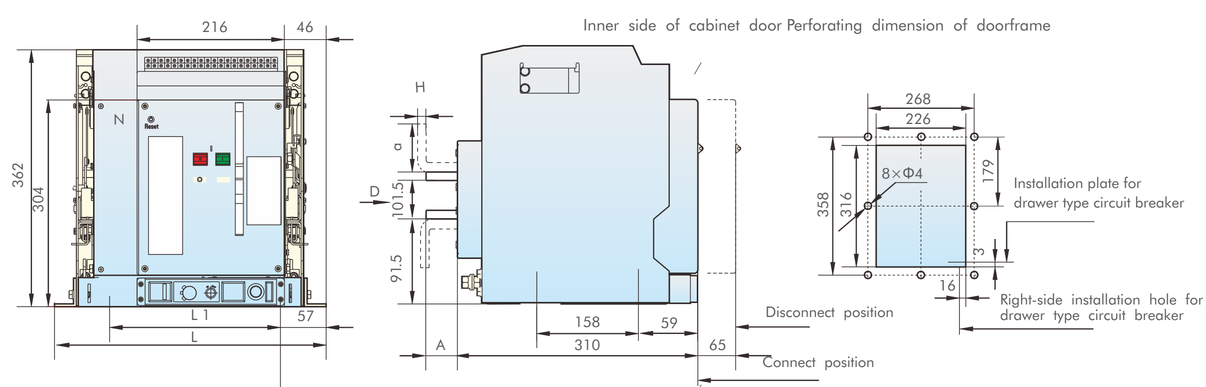
NA1-1000X Fixed-type

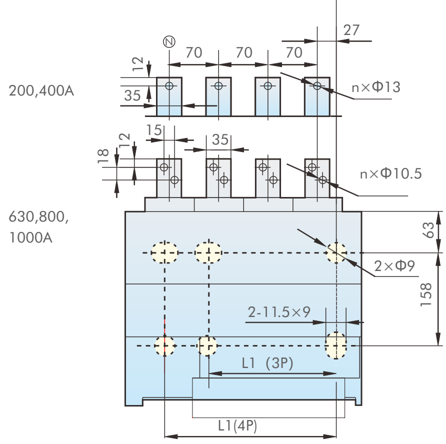


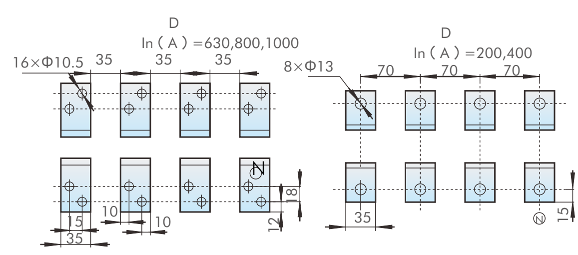
NA1-1000	L1	L
3P	246	274
4P	316	344

In(A)	A(mm)	n(3P/4P)	H(mm)	a(mm)
200、400	32	3/4	6	40
630	50	6/8	8	55
800、1000	50	6/8	10	55

NA1-1000X Drawout-type



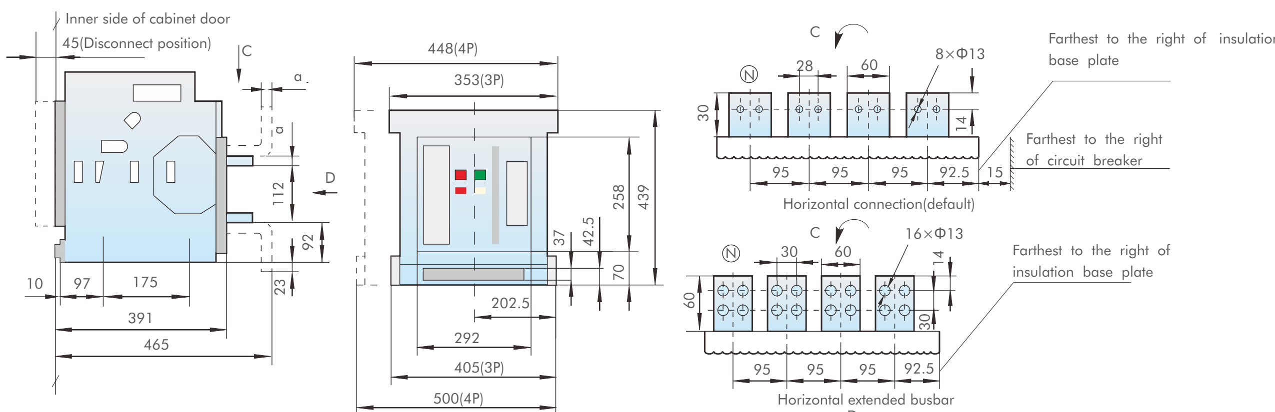




NA1-1000	L1	L
3P	194	308
4P	264	378

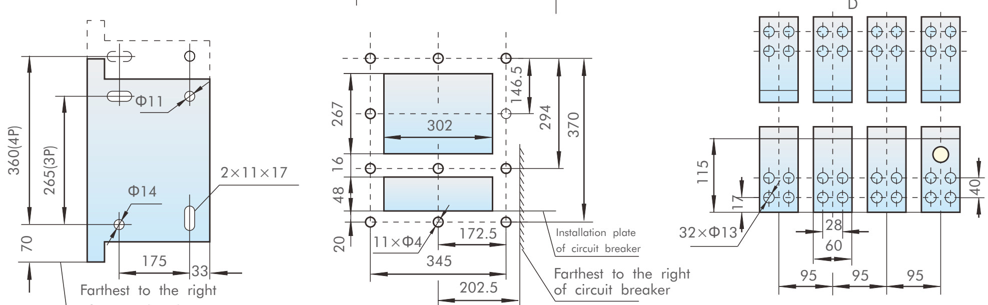
In(A)	A(mm)	n(3P/4P)	H(mm)	a(mm)
200、400	33	3/4	6	40
630	51	6/8	8	55
800、1000	51	6/8	10	55

NA1-2000X/NA1-2000XN/NA1-2000XH Drawout-type



Horizontal connection(default)

Horizontal extended busbar

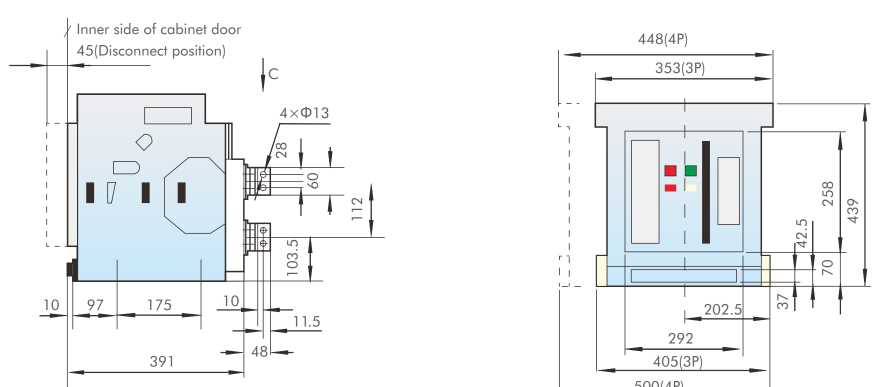


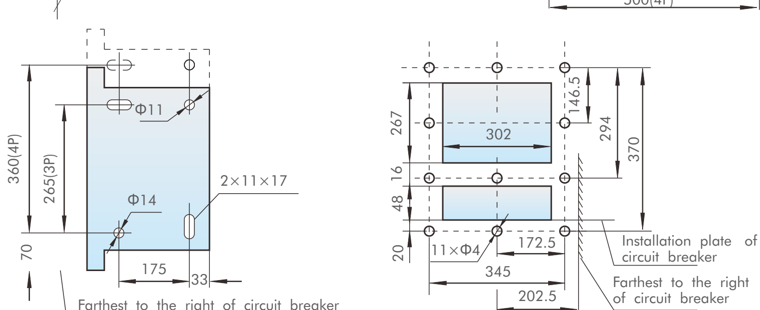
Panel hole

L type vertical connection

In A	a mm
630	10
800~1600	15
2000	20

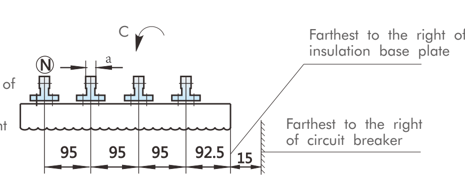
NA1-2000X/NA1-2000XN/NA1-2000XH Drawout-type,vertical,rear connection,rotation busbar





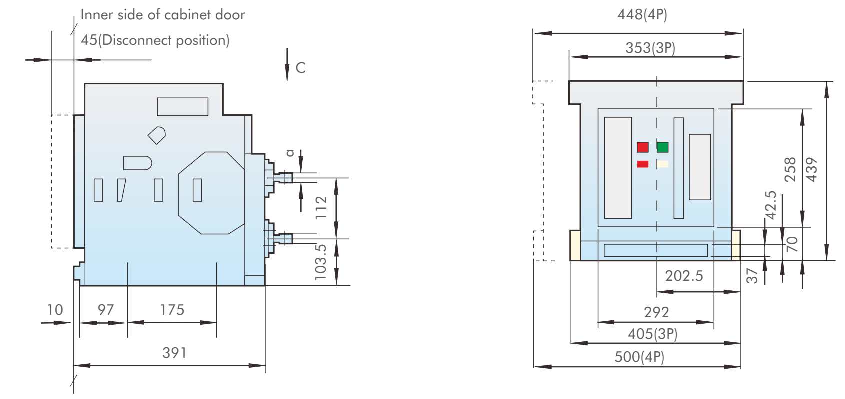
Panel hole

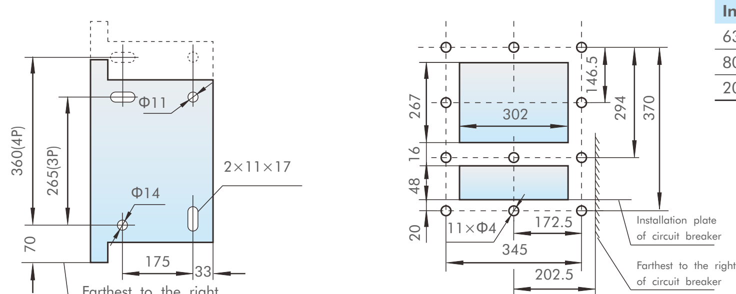
In A	a mm
630	10
800~1600	15
2000	20



User only needs to rotate the busbar for 90°to change from vertical connection to horizontal connection onsite.

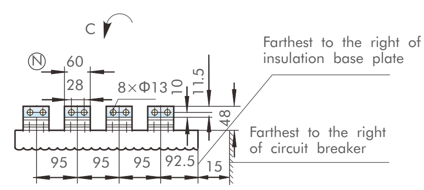
NA1-2000X/NA1-2000XN/NA1-2000XH Drawout-type, horizontal, rear connection,rotation busbar





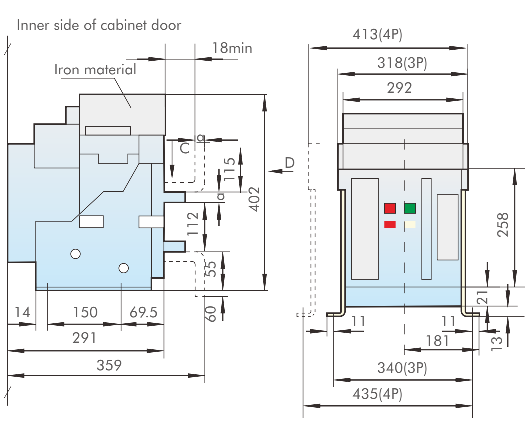
Panel hole

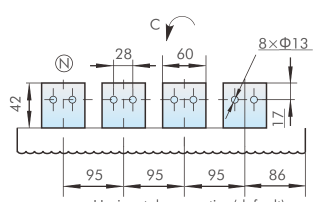
In A	a mm
630	10
800~1600	15
2000	20



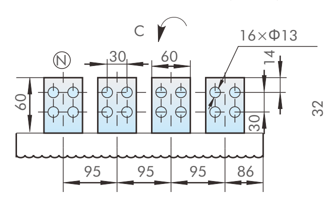
User only needs to rotate the busbar for 90°to change from horizontal connection to vertical connection onsite.

NA1-2000X/NA1-2000XN/NA1-2000XH Fixed-type

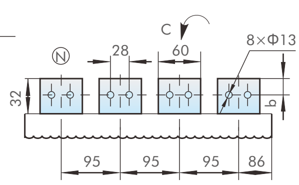




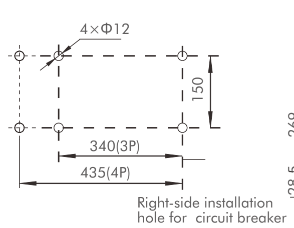
Horizontal connection(default)

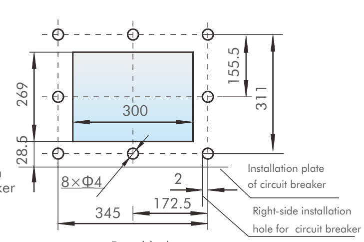


Horizontal extended connection

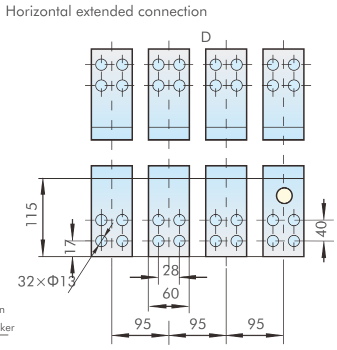


Horizontal short busbar





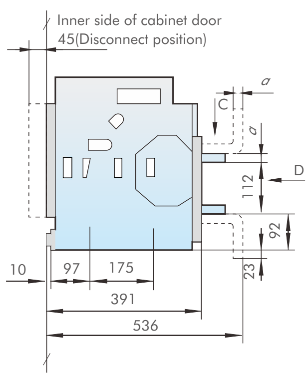
Panel hole

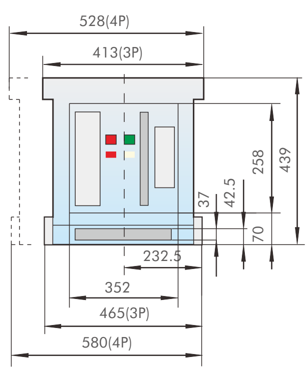


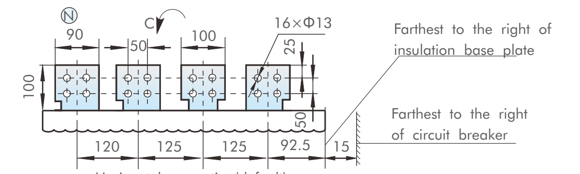
L type vertical connection

In A	a mm	b mm
630	10	17
800~1600	15	17
2000	20	18.5

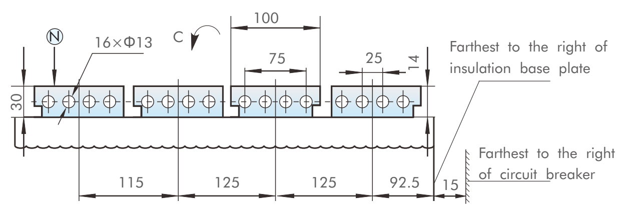
NA1-3200x/NA1-3200xN Drawout-type



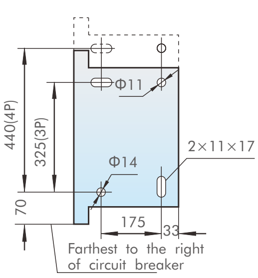


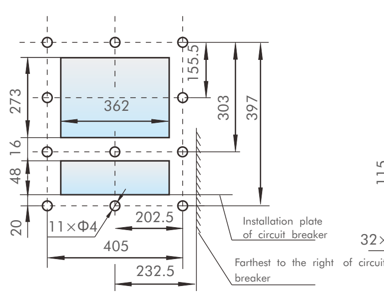


Horizontal connection(default)

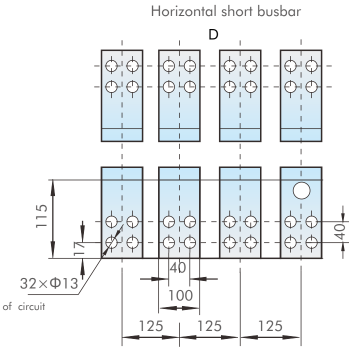


Horizontal short busbar





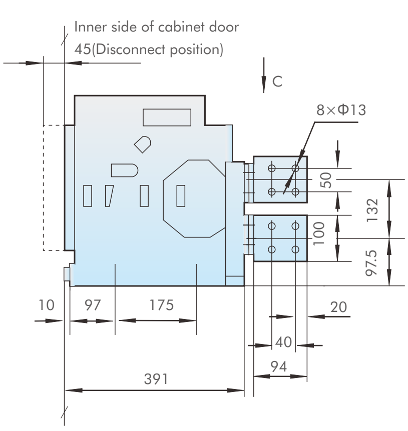
Panel hole

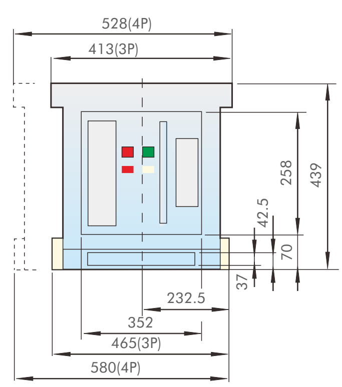


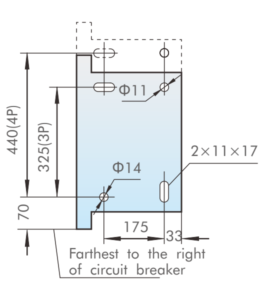
L type vertical connection

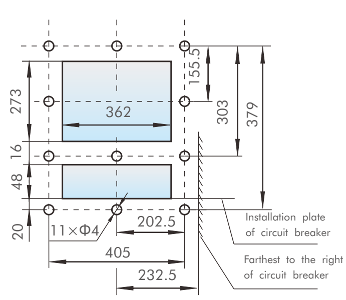
In A	a mm
2000~2500	20
3200	30

NA1-3200X/NA1-3200XN Drawout-type,vertical,rear connection,rotation busbar



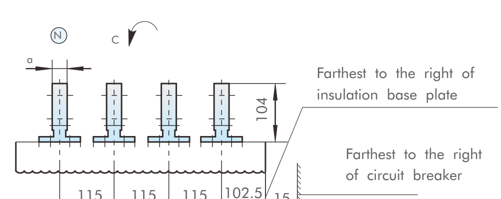






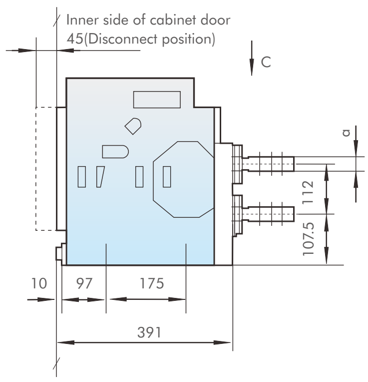
Panel hole

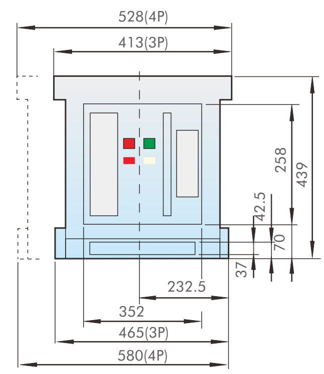
In A	a mm
2000~2500	20
3200	30



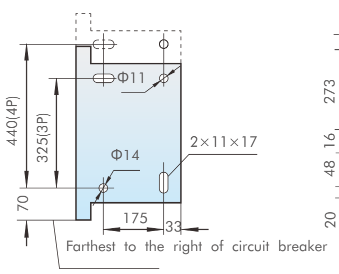
Note: In order to change vertical connection to horizontal connection onsite, user needs to change the upper and lower busbars of phase B so they are different from those of phase A and phase C.

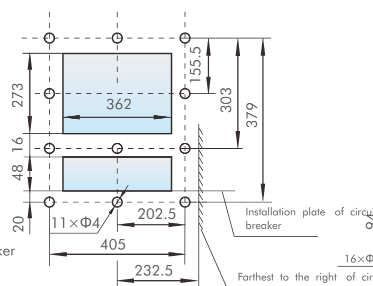
NA1-3200x/NA1-3200xN Drawout-type, horizontal, rear connection,rotation busbar



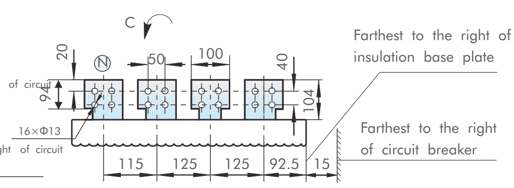


In A	a mm
2000~2500	20
3200	30



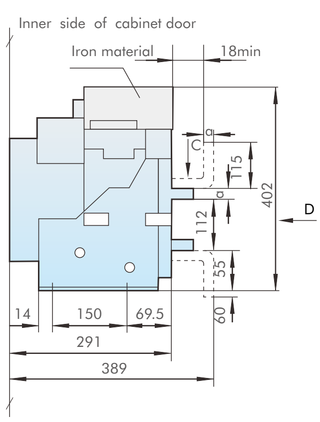


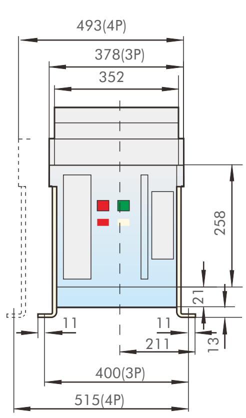
Panel hole

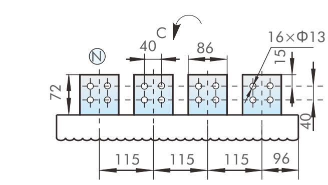


Note: In order to change horizontal connection to vertical connection onsite, user needs to change the upper and lower busbars of phase B so they are different from those of phase A and phase C.

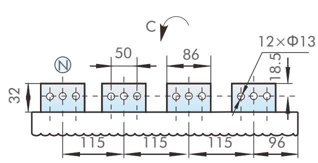
NA1-3200X/NA1-3200xN Fixed-type



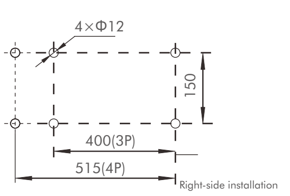


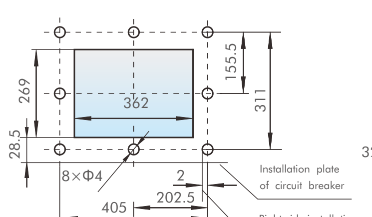


Horizontal connection(default)

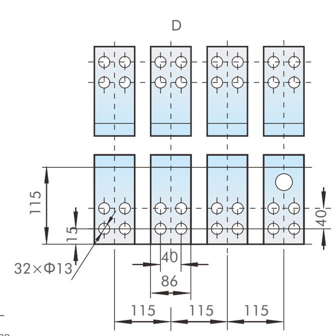


Horizontal short busbar





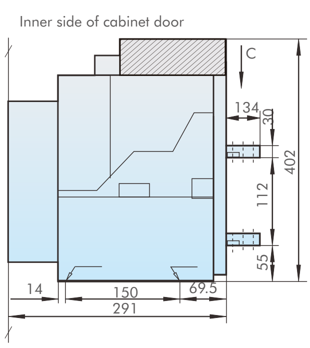
Panel hole

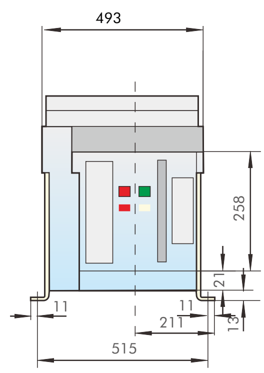


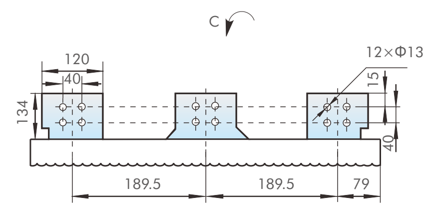
L type vertical connection

In A	a mm
2000~2500	20
3200	30

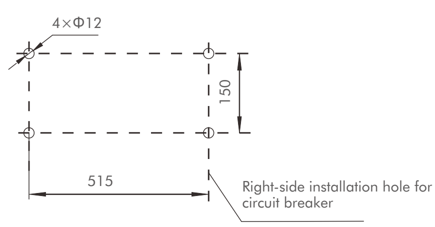
NA1-4000X Fixed-type (3P)

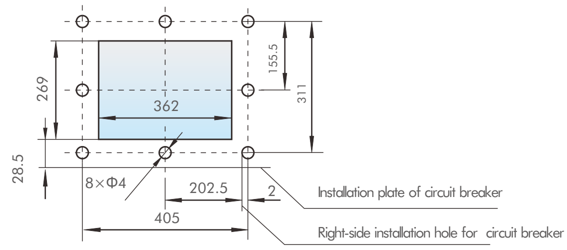






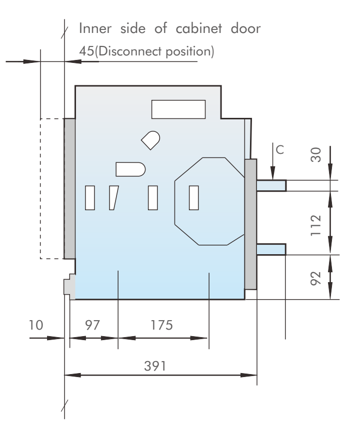
Horizontal connection

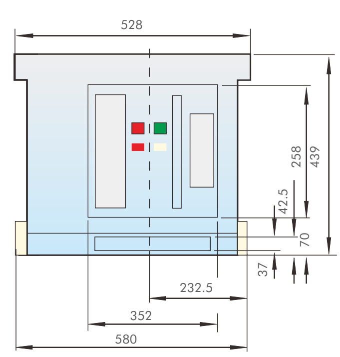


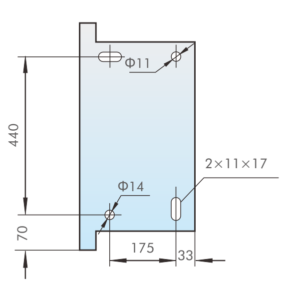


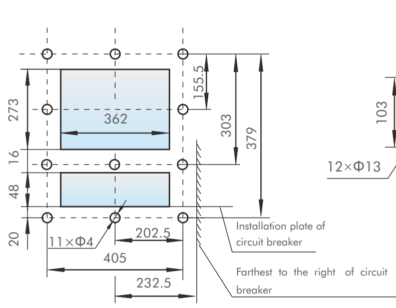
Panel hole

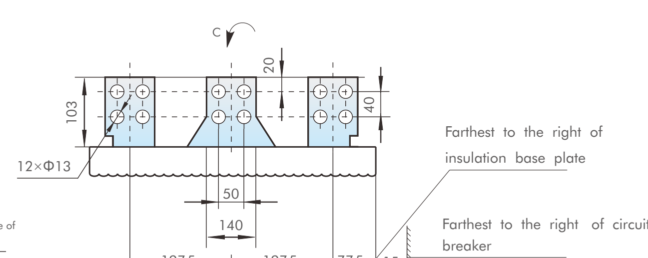
NA1-4000X Drawout-type (3P)



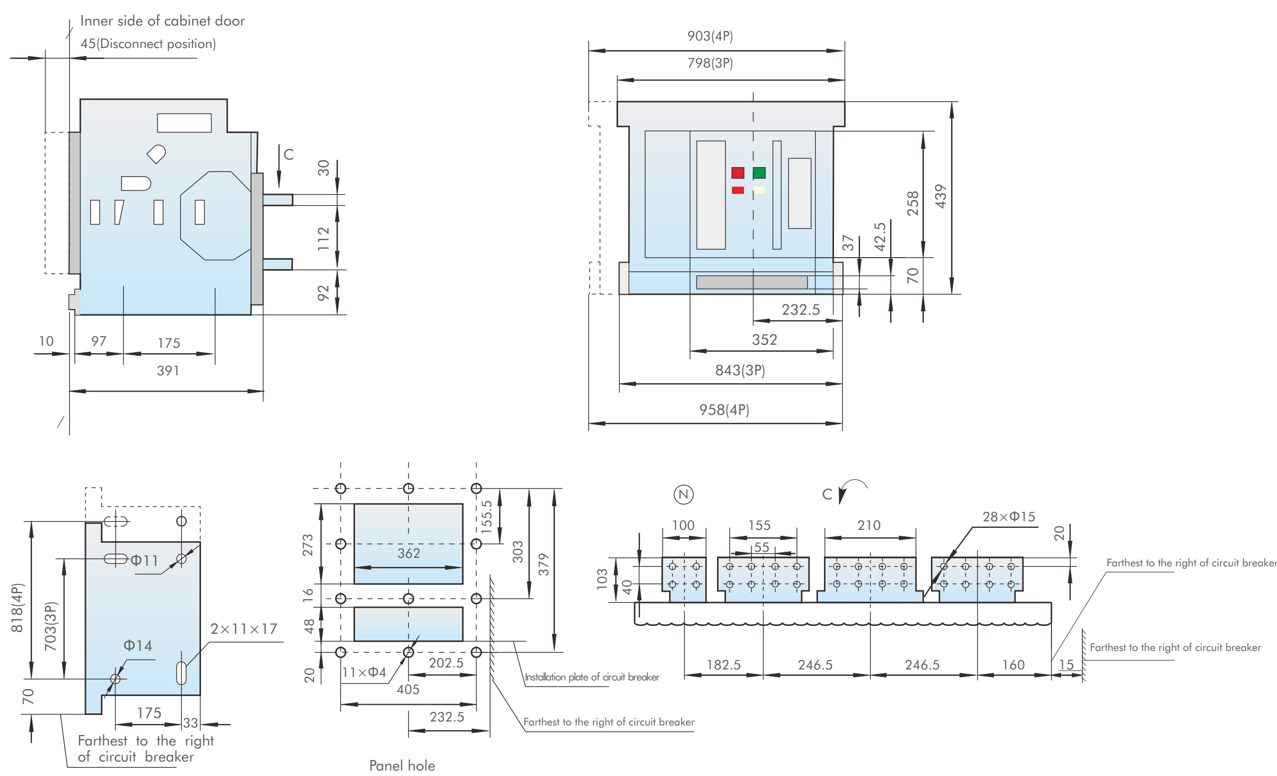




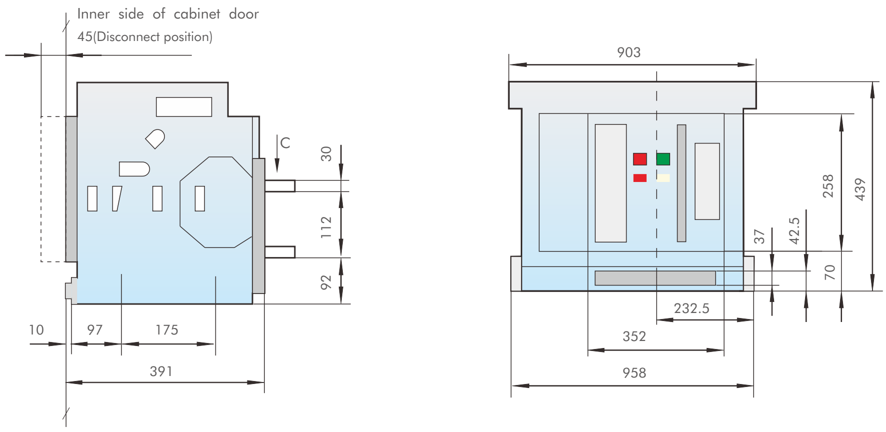


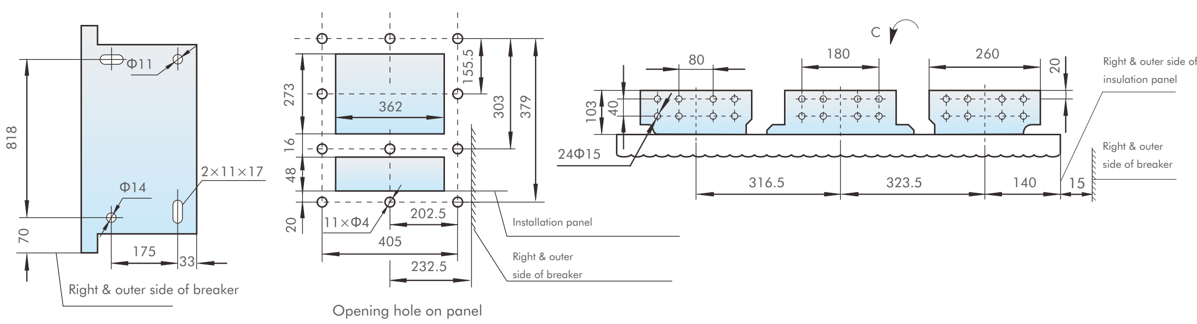


NA1-6300X/NA1-6300XN (In=4000A,5000A) Drawout-type



NA1-6300X/NA1-6300XN (In=6300A) Drawout-type (3P)

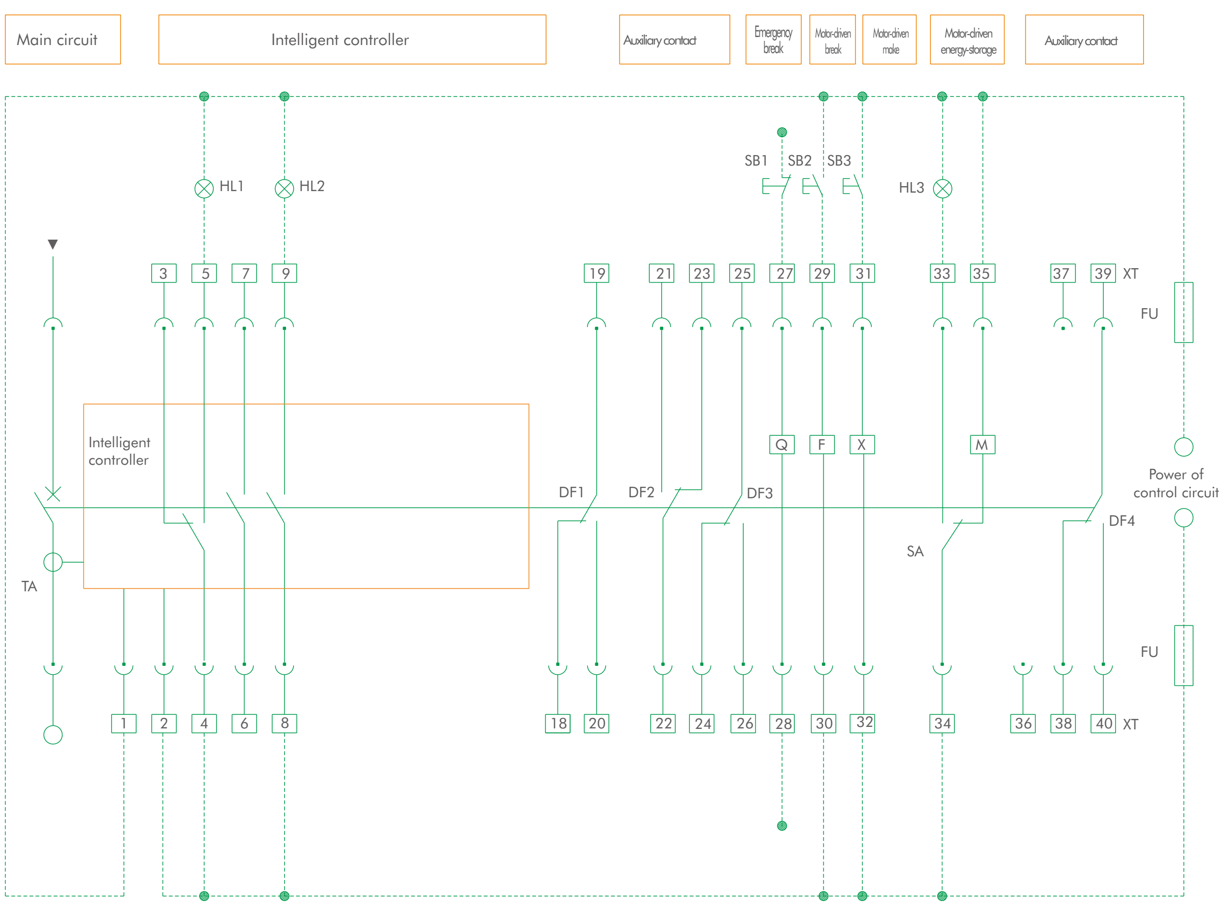




6.Secondary circuit wiring

6.1 NA1-1000X

Standard type, type (M/3M)



HL1: Failure indicator
HL2: Close indicator
HL3: Energy storage indicator
SB1: Under-voltage button
SB2: Shunt button
SB3: Close button
Q: Under-voltage release
F: Shunt release
X: Close electromagnet
M: Energy storage motor
DF1-DF4: Auxiliary switch
1#, 2#: Auxiliary power input
3#,4#,5#: Fault trip contact output(4# common terminal,
contact capacity AC230V,5A
6#,7#: To be connected with current transformer(selective)

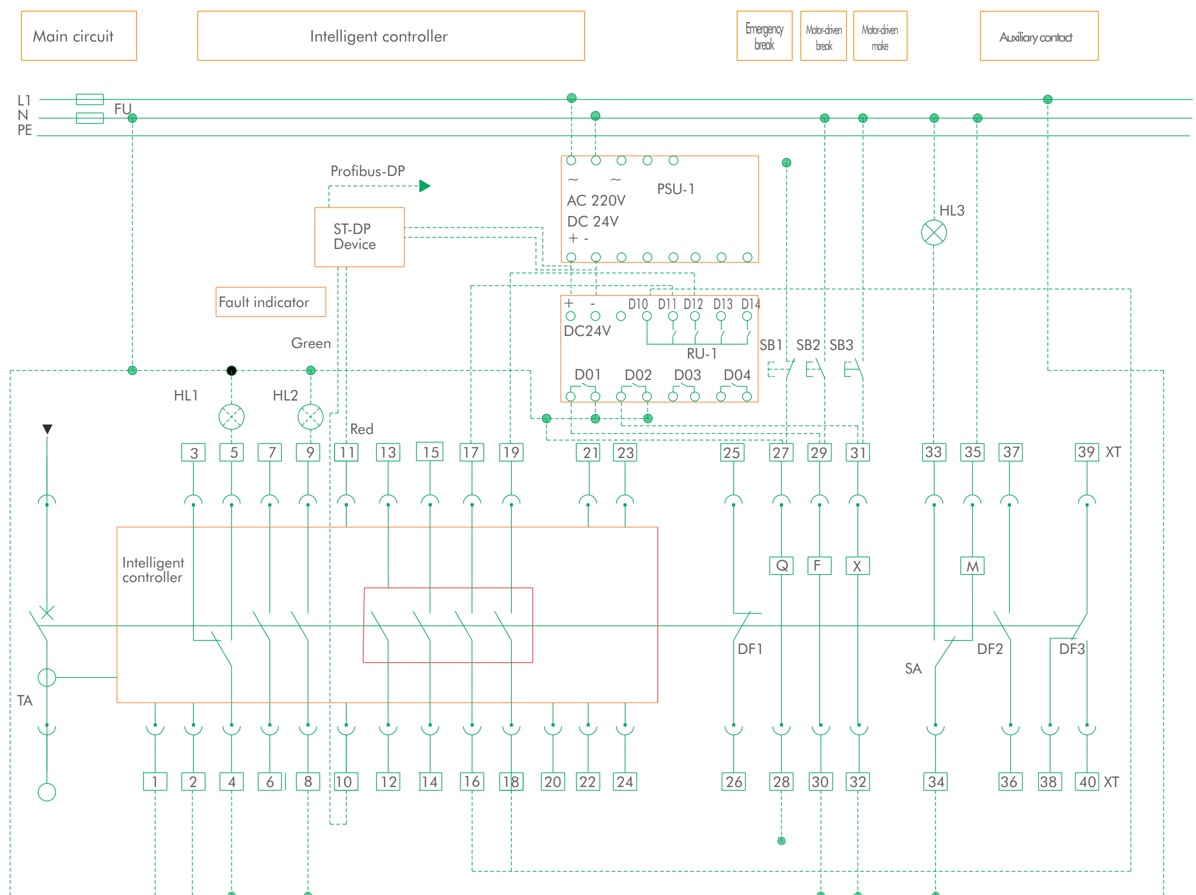
8#,9#: Making indicator (capacity AC400V,1A)
27#,28#: Under-voltage release(Connected to the main circuit)
29#,30#: Shunt release
31#,32#: Closing electromagnet
33#,34#,35#: Energy storage motor
18#~26#, 38#~40#: Auxiliary contact
(auxiliary contact capacity: AC230V,5A)

Note:

Dashed is to be connected by users.

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

Communication type, type (H/3H)



HL1: Failure indicator
HL2: Close indicator
HL3: Energy storage indicator
SB1: Under-voltage button
SB2: Shunt button
SB3: Close button
Q: Under-voltage release
F: Shunt release
X: Close electromagnet
M: Energy storage motor
DF1-DF3: Auxiliary switch
1#, 2#: Auxiliary power input(DC24)
3#,4#,5#: Fault trip contact output(4# common terminal,
contact capacity AC230V,5A
6#, 7#: To be connected with current transformer(N/O auxiliary
contact, capacity AC400V, 1A,when no current transformer)

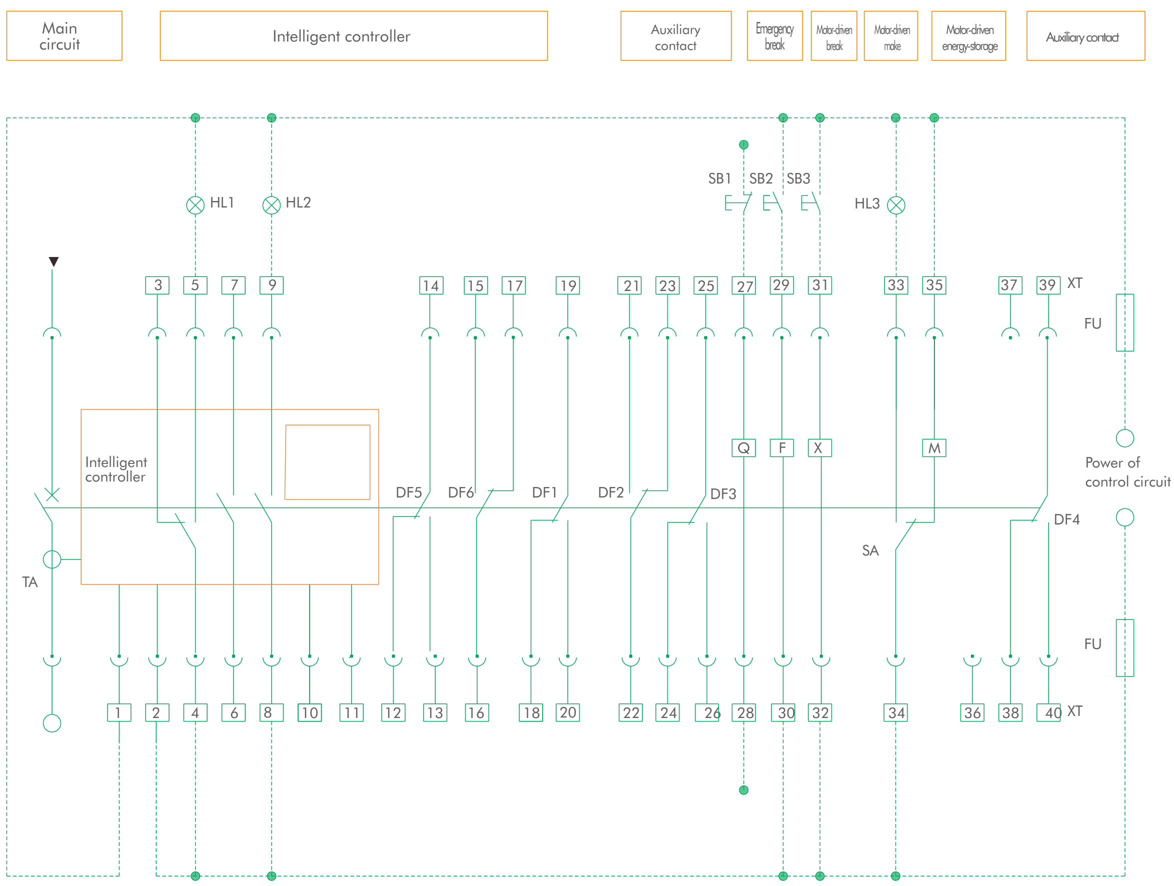
8#,9#: Making indicator(capacity AC400V,1A)
10#, 11#: communication output
12#, 13#: Signal alarm of load 1 output
14#, 15#: Signal alarm of load 2 output
16#, 17#: Making signal output
18#, 19#: Closing signal output
20#: Communication shield ground line
21#~24#: Voltage signal input of phase N,A,B,C
(With voltage measurement);
21#~23# is a set of auxiliary switches
(Without voltage measurement)
22#common terminal,contact capacity AC230V,5A
25#, 26#: Auxiliary contact (capacity:AC230V,5A)
27#,28#: Under-voltage release(Connected to the main circuit)
29#,30#: Shunt release
31#,32#: Closing electromagnet
33#,34#,35#: Energy storage motor
36#~40#: Auxiliary contact (capacity:AC230V,5A)

Note:

Dashed is to be connected by users.

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴۸۰۰۰۰۴۹
Fax:۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبروی پالایشگاه نفت پارس، پلاک ۱۲

Six pairs change-over contacts standard type (M/3M)



HL1: Failure indicator
HL2: Close indicator
HL3: Energy storage indicator
SB1: Under-voltage button
SB2: Shunt button
SB3: Close button
Q: Under-voltage release
F: Shunt release
X: Close release
M: Energy storage motor
DF1-DF6: Auxiliary switch
1#, 2#: Auxiliary power input
3#,4#,5#: Fault trip contact output(4# common terminal,contact capacity AC230V,5A
6#, 7#: to be connected with current transformer(selective)

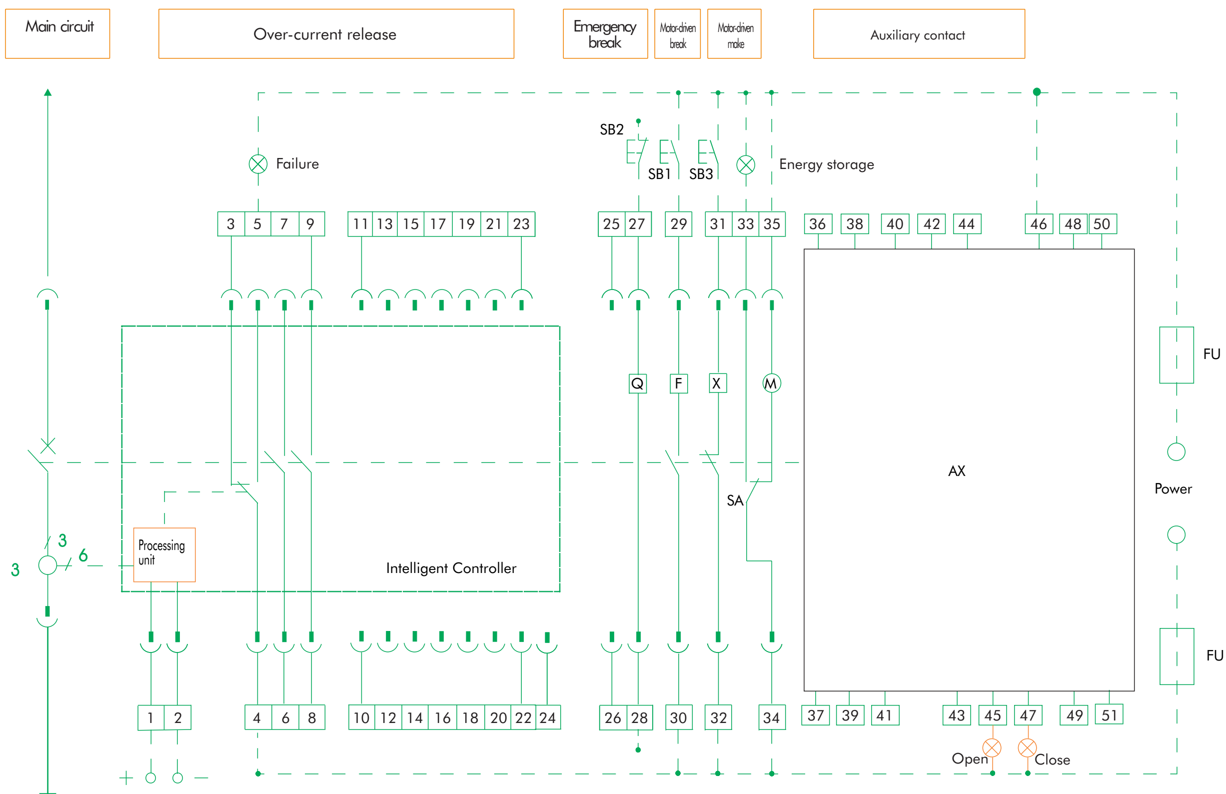
8#,9#: Making indicator (capacity AC400V,1A)
12#~26#: Auxiliary contact(auxiliary contact capacity: AC230V,1A)
27#,28#: Under-voltage release(Connected to the main circuit)
29#,30#: Shunt release
31#,32#: Closing release
33#,34#:Energy storage indicator
34#,35#: Energy storage motor
38#~40#: Auxiliary contact(auxiliary contact capacity: AC230V,1A)

Note:

Six pairs change-over contacts , without any additional function.
Dashed is to be connected by users.

6.2 NA1-2000X~6300X

The secondary circuit wiring for NA1-2000X~6300X with standard type (M) intelligent controller and instantaneous under-voltage release

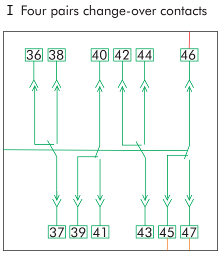


≃ 110V Intelligent release power ("1" connect positive pole, and "2" connect negative pole for direct current)
≃ 220V
~ 380V

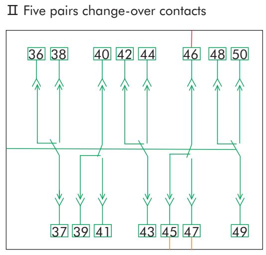
SB1: Shunt button
SB2: Under-voltage button
SB3: Making button
Q: Under-voltage release
F: Shunt release
X: Closing electromagnet
M: Energy storage motor
XT: Connection terminal
SA: Position switch
Note: If control voltage of Q, F, X is different from each other, they can be connected to different power.

The auxiliary contact modes for customer use

Ⅰ Four pairs change-over contacts



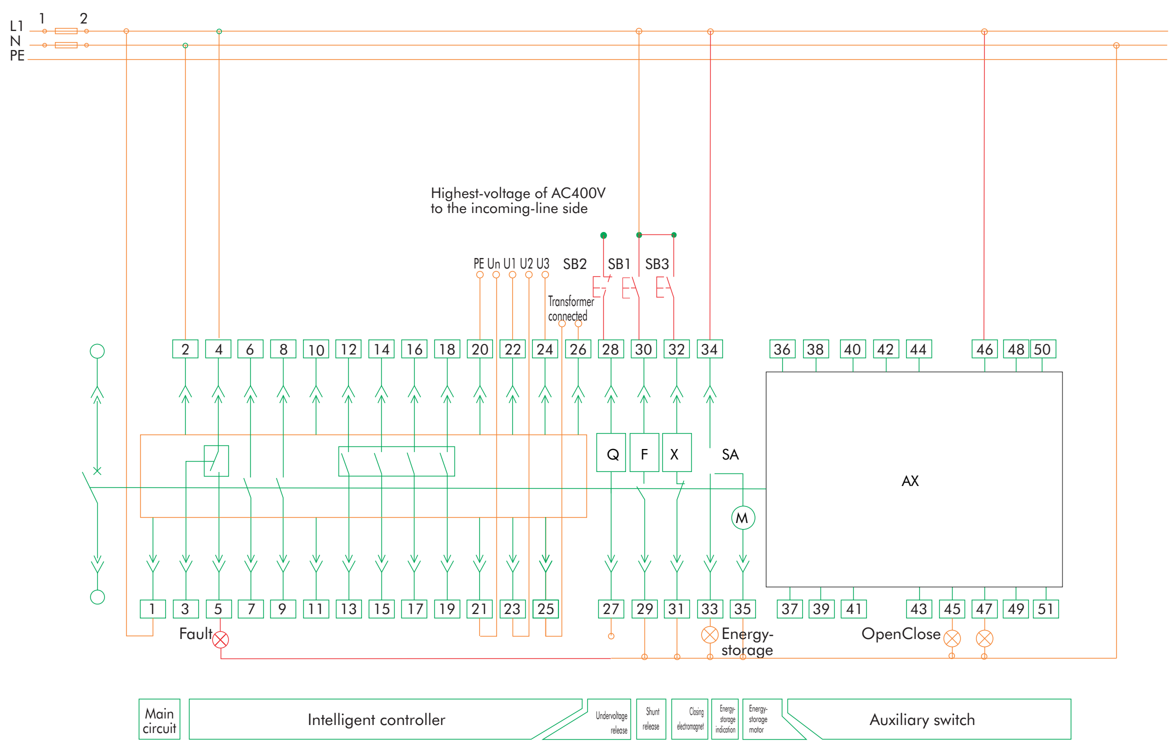
Ⅱ Five pairs change-over contacts



1#,2#: Auxiliary power input
3#,4#,5#: Fault trip contact output(4# common terminal)
6#,7#,8#,9#: Auxiliary contact, normal open,
10#~24#: empty
25#,26#: to be connected with current transformer(selective)
27#,28#: Under-voltage release(Connected to the main circuit)
29#,30#: Shunt release
31#,32#: Closing release
33#,34#: Energy storage indicator
34#,35#: Energy storage motor
36#,51#: Auxiliary contact

Circuit explanation for signal output:
a. Broken-line parts shall be provided by customers.
b. Terminals 6#,7# can output NC (normal close) contact if that is required by users.
c. Terminal 35# can be directly connected to power (automatic pre-storing energy), alternatively connect power after connecting NO button (manual-controlled pre-storing energy).
d. Terminals 21#~24# is only for wiring with function meter display. (excluding the special wiring)

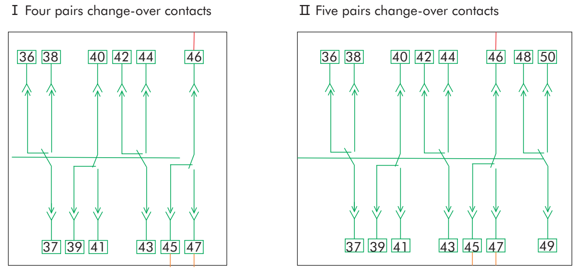
The secondary circuit wiring for NA1-2000X~6300X with type (3M) intelligent controller and instantaneous under-voltage release



The auxiliary contact modes for customer use

Ⅰ Four pairs change-over contacts

Ⅱ Five pairs change-over contacts



SB1: Shunt button
SB2: Under-voltage button
SB3: Making button
Q: Under-voltage release
F: Shunt release
X: Closing release
M: Energy storage motor
XT: connection terminal
SA: Position switch
$1^{\#}$, $2^{\#}$: Intelligent controller power input
Note: When the power supply of the intelligent controller is AC power, the $1^{\#}$~$2^{\#}$ connects to the AC power directly. When the power supply is DC power, forbid connecting the $1^{\#}$~$2^{\#}$ to the DC power directly. Add a DC power supply module, then the DC power connect to the input terminal of the DC power supply module, and the $1^{\#}$~$2^{\#}$connect to the output terminal of the DC power supply module, or else the intelligent controller will be damaged.

$3^{\#}$,$4^{\#}$,$5^{\#}$: Fault trip contact output($4^{\#}$common terminal)
$6^{\#}$,$7^{\#}$,$8^{\#}$,$9^{\#}$: Auxiliary contact(normal open)
$10^{\#}$~$11^{\#}$: empty
$12^{\#}$~$19^{\#}$: The programmable output terminal. The normal products without these terminals, but if the customer special ordered, the cost extra added.

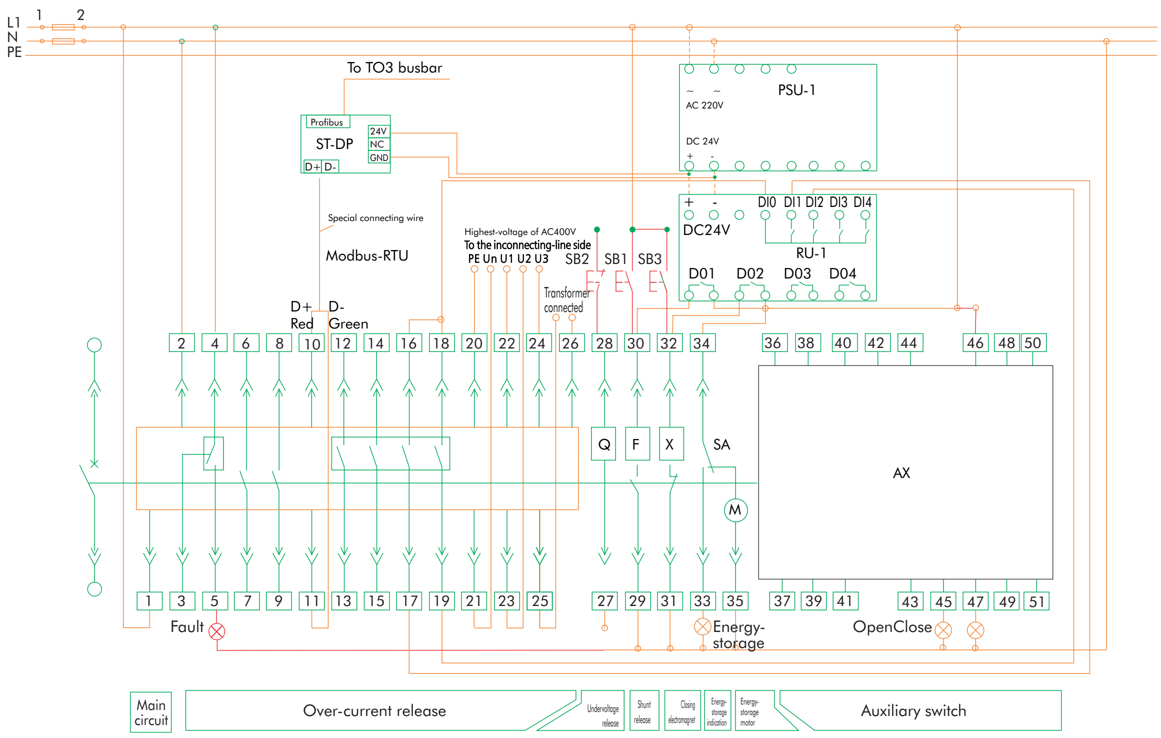
3M type acquiescence output:
$12^{\#}$,$13^{\#}$: Signal alarm of load 1 output; $14^{\#}$,$15^{\#}$: Signal alarm of load2 output
$16^{\#}$,$17^{\#}$: Self-diagnose alarm; $18^{\#}$,$19^{\#}$: Fault trip; $20^{\#}$: PE line; $21^{\#}$~$24^{\#}$: Display the voltage of the signal input.
The normal products without these terminals,
if the customer special ordered the function meter, the cost extra added.
$21^{\#}$: N phase input terminal
$22^{\#}$,$23^{\#}$,$24^{\#}$: A, B, C three phase power input terminal (note the sequence)(highest-voltage of AC 400V)

$25^{\#}$,$26^{\#}$: Connect to the N phase current transformer or the input terminal of the current leakage transformer.
The normal products without these terminals, if the customer special ordered, the cost extra added.
$27^{\#}$,$28^{\#}$: Under-voltage release(Connected to the main circuit); $29^{\#}$,$30^{\#}$: Shunt release; $31^{\#}$,$32^{\#}$: Closing release;
$33^{\#}$,$34^{\#}$: Energy storage indicator; $34^{\#}$,$35^{\#}$: Energy storage motor; $36^{\#}$~$51^{\#}$: Auxiliary contact

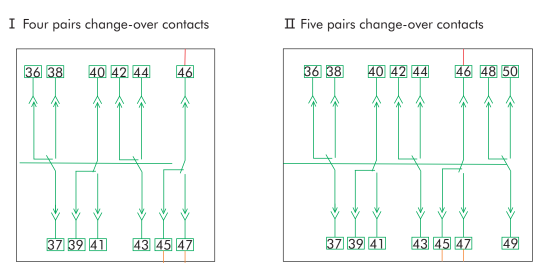
Note:

a. Red colored part is to be connected by users
b. When the power system is three phase three wire, directly connect the Un to U2.
(If the voltage exceeds 400V, special explanation when ordered)

The secondary circuit wiring for NA1-2000X~6300X with type (3H) intelligent controller and instantaneous under-voltage release



The auxiliary contact modes for customer use



SB1: Shunt button; SB2: Under-voltage button
SB3: Making button; Q: Under-voltage release
F: Shunt release; X: Closing release
M: Energy storage motor; XT: connection terminal
SA: Position switch
1#, 2#: Intelligent controller power input
Note: When the power supply of the intelligent controller is AC power, the 1#~2# connects to the AC power directly. When the power supply is DC power, forbid connecting the 1#~2# to the DC power directly. Add a DC power supply module, then the DC power connect to the input terminal of the DC power supply module, and the 1#~2# connect to the output terminal of the DC power supply module, or else the intelligent controller will be damaged.

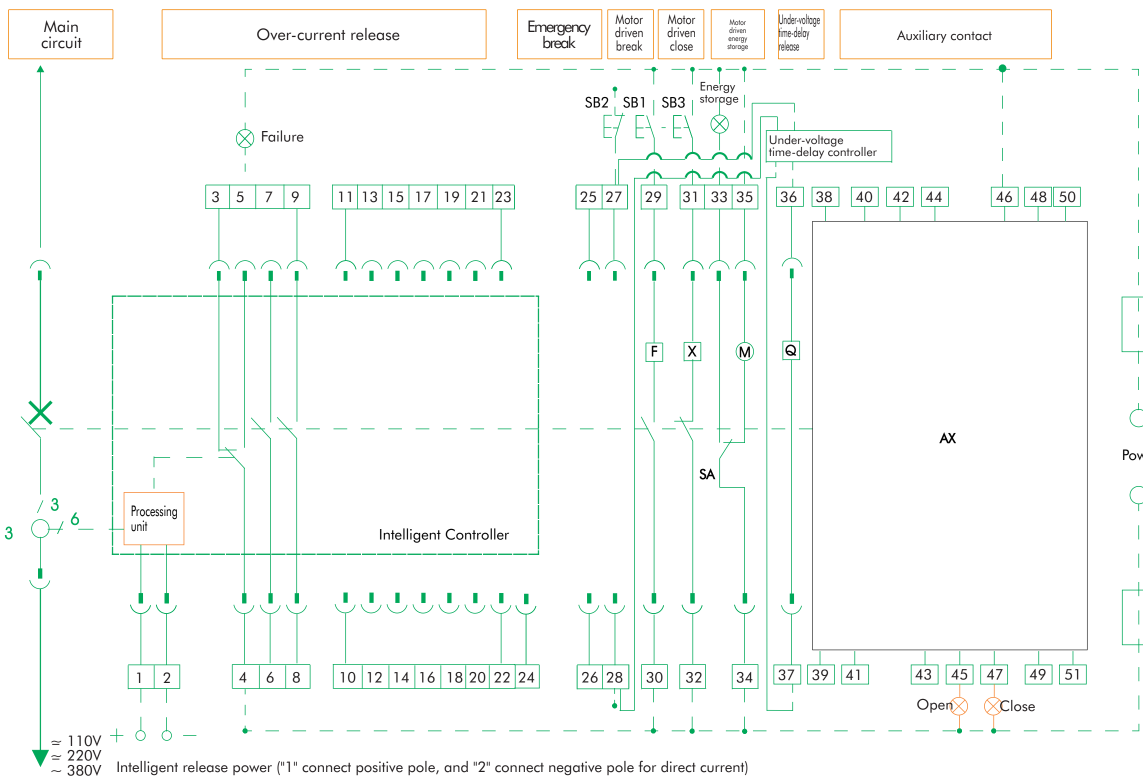
3#,4#,5#: Fault trip contact output(4# common terminal)
6#,7#,8#,9#: Auxiliary contact (normal open)
10#~11#: communication output
12#,13#: Signal alarm of load 1 output; 14#,15#: Signal alarm of load2 output
16#,17#:Breaking signal output; 18#,19#:Making signal output
20#: PE line; 21#: N phase input terminal
22#,23#,24#: A, B, C three phase power input terminal (note the sequence)(highest-voltage of AC 400V)

25#26#: Connect to the N phase current transformer or the input terminal of the current leakage transformer.
The normal products without these terminals, if the customer special ordered, the cost extra added.
ST~DP: DP protocol module. There is no need for the ST-DP protocol module,
if the communication protocol is Modbus-RTV. But when the communication protocol is Profibus-DP,
the ST-DP protocol module is necessary, but the cost extra added.
ST power module IV: power converter (optional components)
ST201: Magnify the signal capacity of the controller. (optional components) If the customer special ordered,
the cost extra added.
27#,28#: Under-voltage release(Connected to the main circuit); 29#,30#: Shunt release
31#,32#: Closing release; 33#,34#: Energy storage indicator
34#,35#: Energy storage motor; 36#~51#: Auxiliary contact

Note:

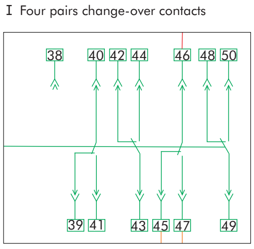
a. Red colored part is to be connected by users
b. When the power system is three phase three wire, directly connect the Un to U2.
(If the voltage exceeds 400V, special explanation when ordered)

The secondary circuit wiring for NA1-2000X~6300X with standard type (M) intelligent controller and time-delay under-voltage release



The auxiliary contact modes for customer use

I Four pairs change-over contacts

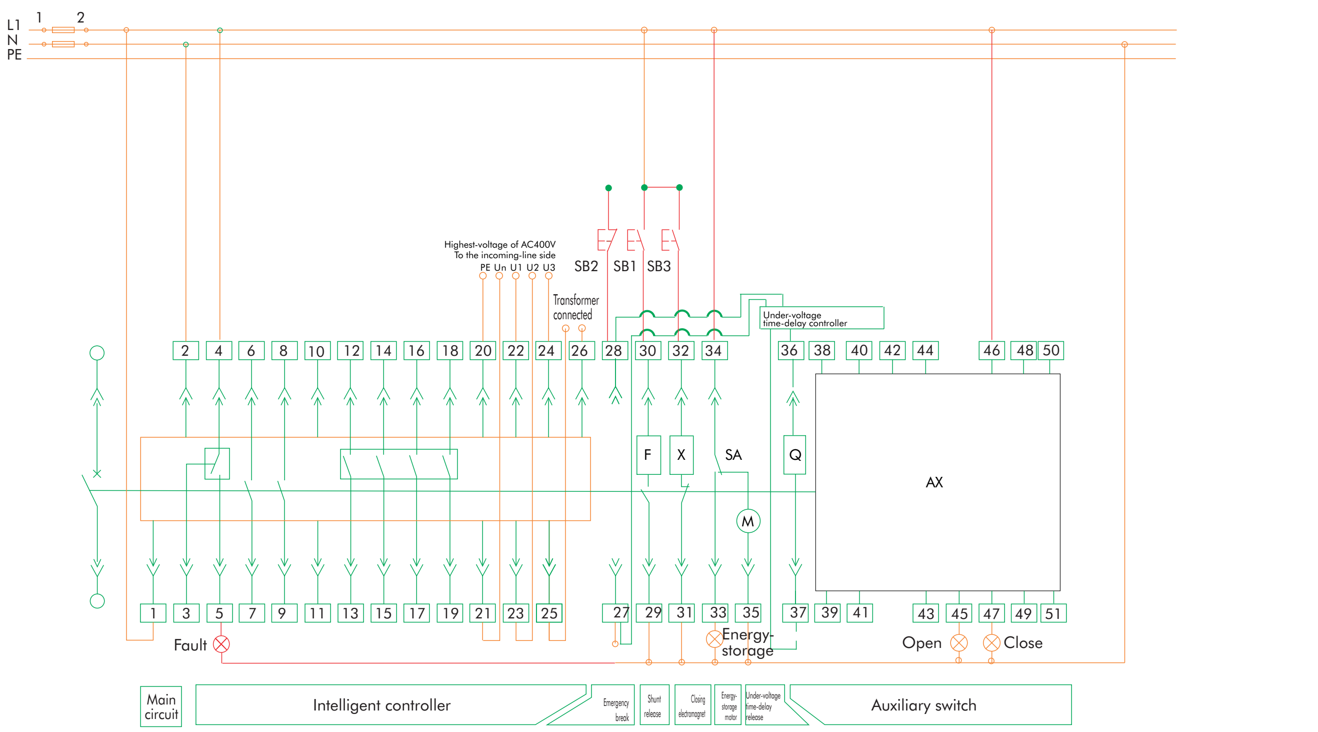


SB1: Shunt button SB2: Under-voltage button SB3: Making button
Q: Under-voltage time-delay release F: Shunt release
X: Closing electromagnet M: Energy storage motor
XT: Connection terminal SA: Position switch
Note: If control voltage of Q, F, X is different from each other, they can be connected to different power.

1#,2#: Auxiliary power input
3#,4#,5#: Fault trip contact output(4# common terminal)
6#,7#,8#,9#: Auxiliary contact (normal open)
10#~24#: empty
25#,26#: to be connected with current transformer(selective)
27#,28#: Under-voltage release(Connected to the main circuit)
29#,30#: Shunt release
31#,32#: Closing release
33#,34#: Energy storage indicator
34#,35#: Energy storage motor
36#,37#: Under-voltage time delay release
38#~51#: Auxiliary contact

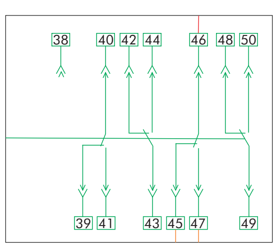
Circuit explanation for signal output:
a. Broken-line parts shall be provided by customers.
b. Terminals 6#,7# can output NC (normal close) contact if that is required by users.
c. Terminal 35# can be directly connected to power (automatic pre-storing energy), alternatively connect power after connecting NO button (manual-controlled pre-storing energy).
d. The 21#~24# is only for wiring with function meter display. (Excluding the special wiring)

The secondary circuit wiring for NA1-2000X~6300X with type (3M) intelligent controller and time-delay under-voltage release



The auxiliary contact modes for customer use

I Four pairs change-over contacts



SB1: Shunt button; SB2: Under-voltage button
SB3: Making button; Q: Under-voltage release
F: Shunt release; X: Closing release
M: Energy storage motor; XT: Connection terminal
SA: Position switch
1#, 2#: Intelligent controller power input
Note: When the power supply of the intelligent controller is AC power, the 1#~2# connects to the AC power directly. When the power supply is DC power, forbid connecting the 1#~2# to the DC power directly. Add a DC power supply module, then the DC power connect to the input terminal of the DC power supply module, and the 1#~2# connect to the output terminal of the DC power supply module, or else the intelligent controller will be damaged.

3#,4#,5#: Fault trip contact output(4# common terminal);
6#,7#,8#,9#: Auxiliary contact (normal open)
10#~11#: empty; 12#~19# are the programmable output terminal. The normal products without these terminals, but if the customer special ordered, the cost extra added.

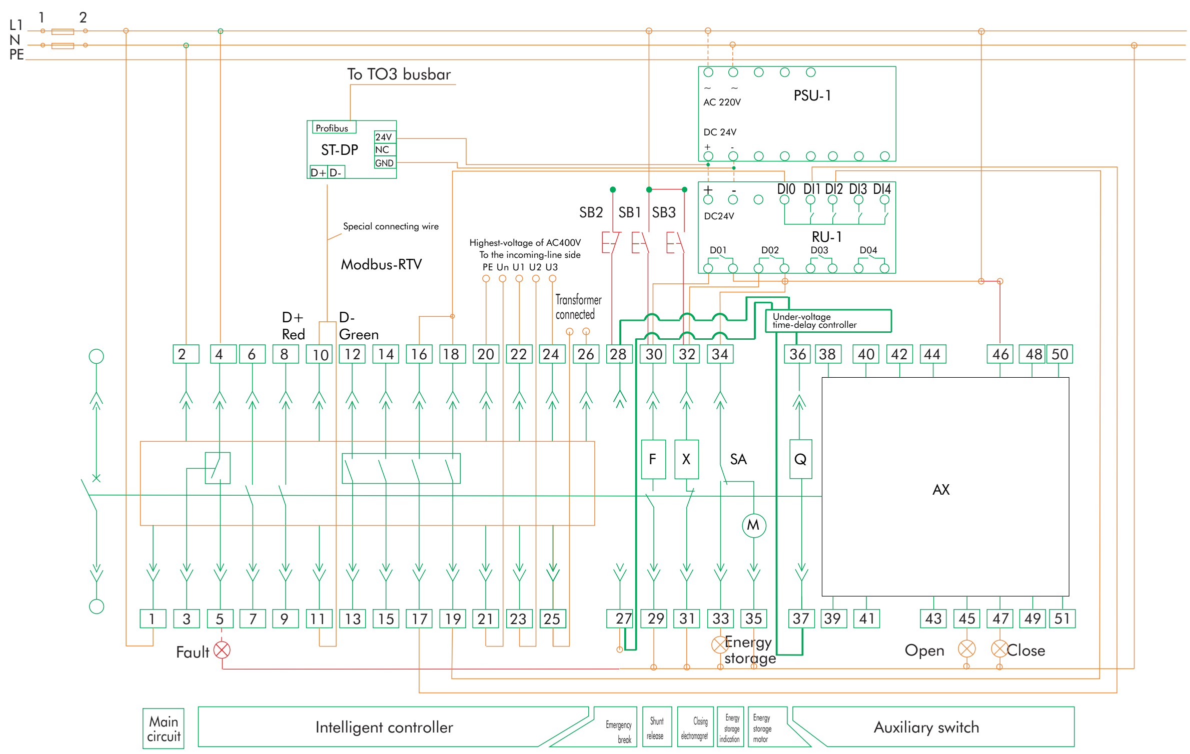
3M type acquiescence output:
12#,13#: Signal alarm of load 1 output; 14#,15#: Signal alarm of load2 output
16#,17#: Self-diagnose alarm; 18#,19#: Fault trip
20#: PE line; 21#~24#: Display the voltage of the signal input. The normal products without these terminals, if the customer special ordered the function meter, the cost extra added.
21#: N phase input terminal; 22#,23#,24#: A, B, C three phase power input terminal (note the sequence)(Highest-voltage of AC400V)

25#,26# Connect to the N phase current transformer or the input terminal of the current leakage transformer. The normal products without these terminals, if the customer special ordered, the cost extra added.
27#,28#: Under-voltage release(Connected to the main circuit); 29#,30#: Shunt release
31#,32#: Closing release; 33#,34#: Energy storage indicator
34#,35#: Energy storage motor; 36#,37#: Under-voltage time delay release
38#~51#: Auxiliary contact

Note:

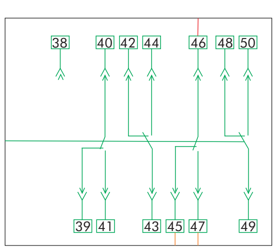
a. Red colored part is to be connected by users
b. When the power system is three phase three wire, directly connect the Un to U2. (If the voltage exceeds 400V, special explanation when ordered)

The secondary circuit wiring for NA1-2000X~6300X with type (3H) intelligent controller and time-delay under-voltage release



The auxiliary contact modes for customer use

I Four pairs change-over contacts



SB1: Shunt button; SB2: Under-voltage button
SB3: Making button; Q: Under-voltage release
F: Shunt release; X: Closing release
M: Energy storage motor; XT: Connection terminal
SA: Position switch
1#, 2#: Intelligent controller power input
Note: When the power supply of the intelligent controller is AC power, the 1#~2# connects to the AC power directly. When the power supply is DC power, forbid connecting the 1#~2# to the DC power directly. Add a DC power supply module, then the DC power connect to the input terminal of the DC power supply module, and the 1#~2# connect to the output terminal of the DC power supply module, or else the intelligent controller will be damaged.

3#,4#,5#: Fault trip contact output(4# common terminal)
6#,7#,8#,9#: Auxiliary contact (normal open)
10#~11#: Communication output; 12#,13#: Signal alarm of load 1 output
14#,15# : Signal alarm of load 2 output; 16#,17#: Breaking signal output; 18#,19#: Closing signal output
20#: PE line; 21#: N phase input terminal
22#,23#,24#: A, B, C three phase power input terminal (note the sequence)(highest-voltage of AC400V)
25#,26# Connect to the N phase current transformer or the input terminal of the current leakage transformer.
The normal products without these terminals, if the customer special ordered, the cost extra added.
ST~DP: DP protocol module. There is no need for the ST-DP protocol module,
if the communication protocol is Modbus-RTV. But when the communication protocol is Profibus-DP,
the ST-DP protocol module is necessary, but the cost extra added.
ST power module IV: power converter (optional components)
ST201: Magnify the signal capacity of the controller. (optional components)
If the customer special ordered, the cost extra added.
27#,28#: Under-voltage release(Connected to the main circuit); 29#,30#: Shunt release
31#,32#: Closing release; 33#,34#: Energy storage indicator
34#,35#: Energy storage motor; 36#,37#: Under-voltage time delay release
38#~51#: Auxiliary contact

Note:

a. Red colored part is to be connected by users
b. When the power system is three phase three wire, directly connect the Un to U2.
(If the voltage exceeds 400V, special explanation when ordered)

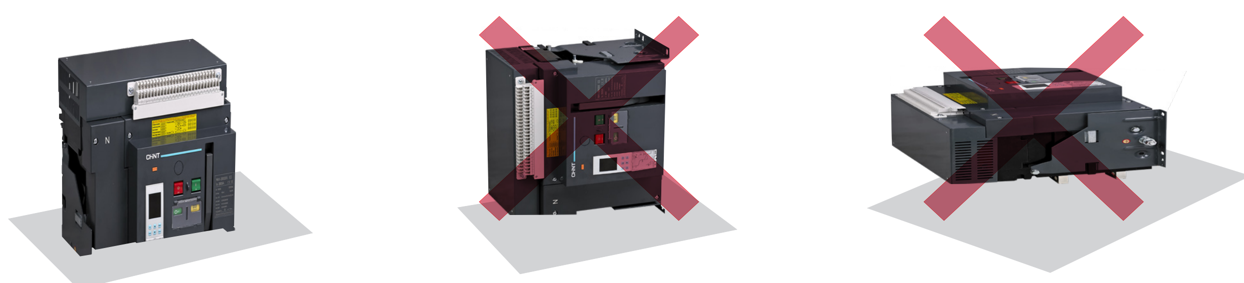
7. Installation

7.1 Installation

7.1.1 Unload the breaker from the soleplate of package. If it is drawout type, firstly pull out the handle under the drawer-base of breaker, and plug it into the hole on central part of plastic cover under the drawer-base crossbeam, anticlockwise turns the handle, the body will slowly slide along the outside of drawer-base.

When the guide rod points to separated position and handle can't be rotated any longer, pull out the handle and firmly grasp the aluminum handle on drawer-base, pull out the breaker body and remove it form the base, then move the base from the sole plate and clean up the dirty things inside the drawer-base.

Possible positions



7.1.2 Check the insulation resistance with a 500V megger, resistance should not be less than 20MΩ when ambient temperature is 20℃ ±5℃ and relative humidity is 50%~70%. Otherwise dry it.

7.1.3 Power supply

NA1 devices can be supplied either from the top or from the bottom without reduction in performance, in order to facilitate connection when installed in a switchboard.

7.1.4 Put the breaker (fixed-type) or drawer-base (drawout-type) into the installation-bracket, and make it fixed, directly connect the cable wire of main circuit to the bus wire of fixed-type circuit breaker. Alternatively put breaker body onto the slideway of drawer-base. Plug the handle into installation hole, clockwise turns it until the under-part of drawer-base points at the connection position and "click" sound is heard. It indicates that breaker body has been connected to its place, then connect the cable of main circuit to drawer-base.

Mounting the circuit-breaker

It is important to distribute the weight of the device uniformly over a rigid mounting surface such as rails or a base plate. This mounting plane should be perfectly flat (tolerance on support flatness: 2 mm).This eliminates any risk of deformation which could interfere with correct operation of the circuit breaker. NA1 devices can also be mounted on a vertical plane using the special brackets.

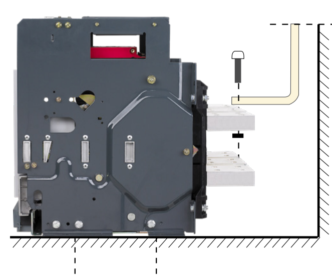
Mounting with vertical brackets

Mounting on rails

7.1.5 Partitions

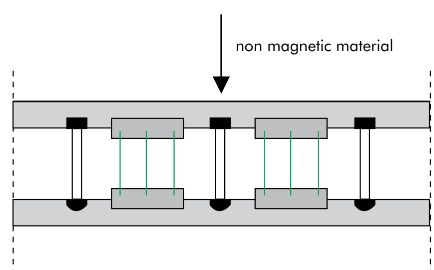
Sufficient openings must be provided in partitions to ensure good air circulation around the circuit breaker; Any partition between upstream and downstream connections of the device must be made of nonmagnetic material. For high-currents, of 2500 A and upwards, the metal supports or barriers in the immediate vicinity of a conductor ;Metal barriers through which a conductor passes must not form a magnetic loop.

A:non magnetic material



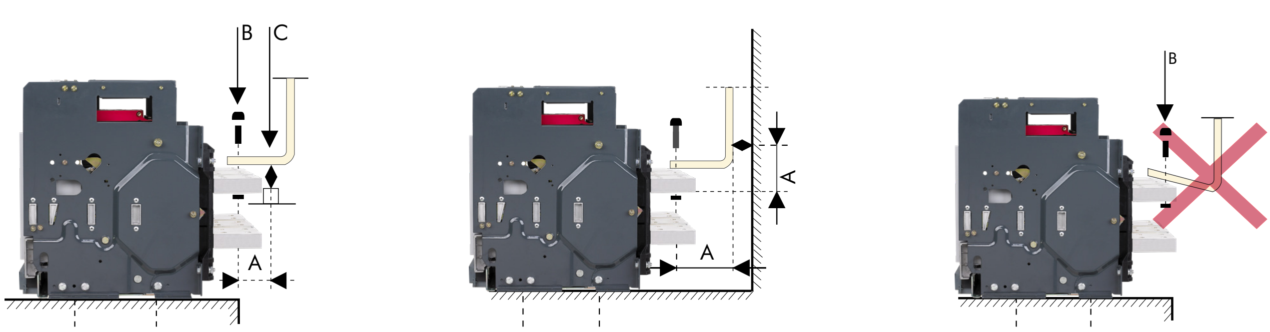
Busbars

The mechanical connection must be exclude the possibility of formation of a magnetic loop around a conductor.



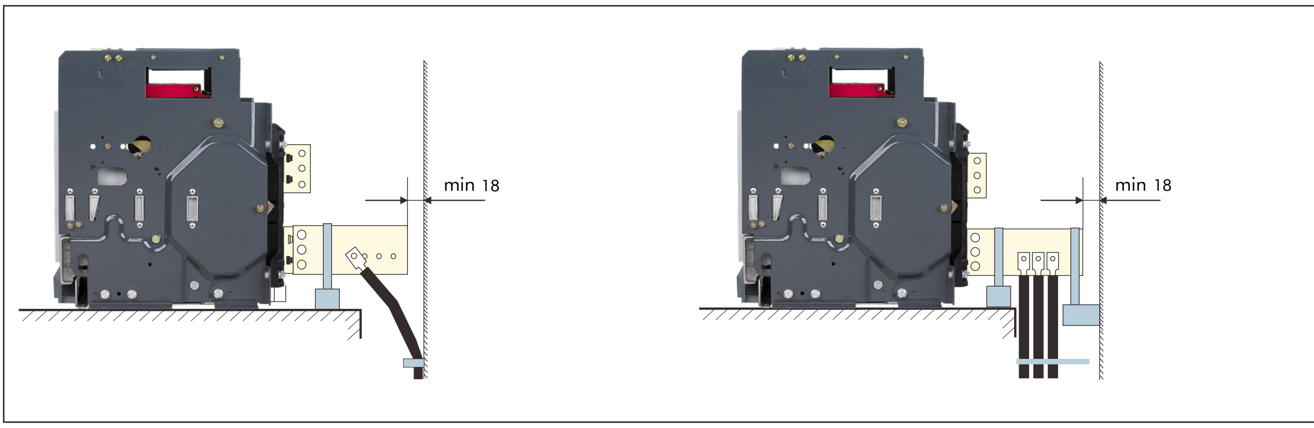
7.1.6 Busbar connections

The busbars should be suitably adjusted to ensure the connection points are positioned on the terminals before the bolts B are inserted. The connections are held by the supporter which is fixed to the framework of the switchboard, in this way the circuit breaker terminals do not have to support its weight C. (This support should be placed close to the terminals).



7.1.7 Main circuit adopts cable connection

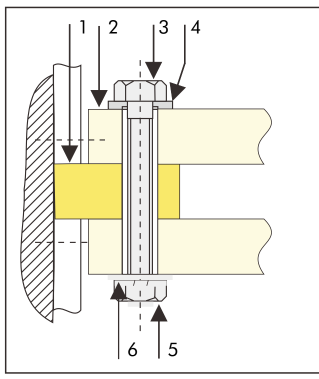
Users should not apply too strong mechanical strength on the terminals of Air Circuit Breaker. Extend the bus-bar of circuit breaker with connecting bus-bar, position the wiring piece of cable before inserting bolts; the cable should be fixed on the frame of distributing cabinet firmly.



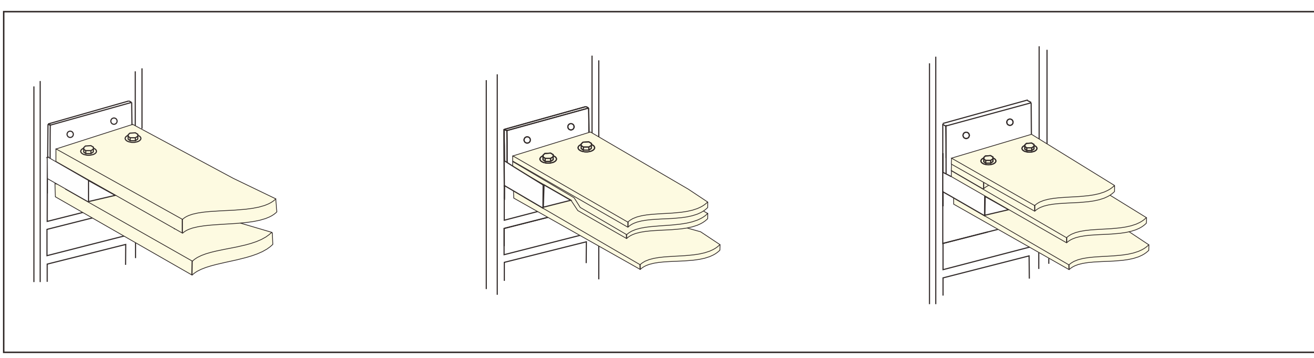
7.1.8 Clamping

Correct clamping of busbars depends on the tightening torques used for the nuts and bolts,etc. Over-tightening may have the same consequences as under-tightening.

For connecting busbars to the circuit breaker, the tightening torques to be used are shown in the table below. These values are for use with copper busbars and steel nuts and bolts, class ≥8.8.

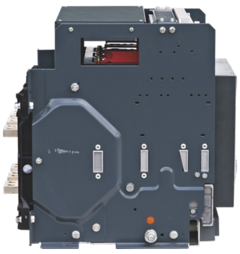
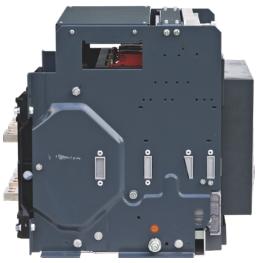
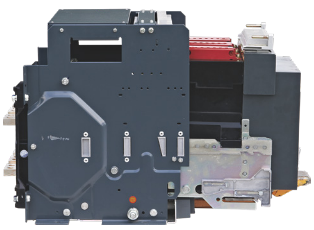
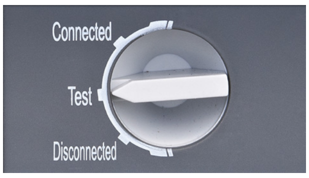
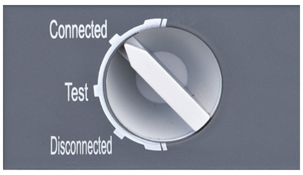
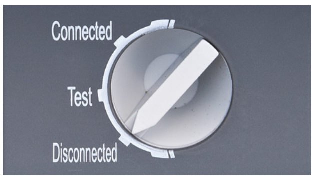
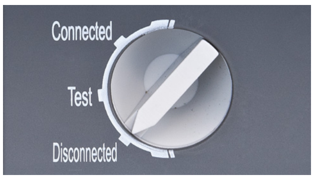


Examples



Preferred tightening torque for NA1's tightening components

Type of screw	Application	Preferred tightening torque
M3	Screws for secondary terminals	0.4~0.5 N·m
M10	Installing bolts of Air Circuit Breaker	38~55 N·m
M12	Connection terminals	61~94 N·m

Connected position	Test position	Disconnected position	Drawout position
			
			
1.Both main circuit and control circuit are connected. 2.Normal application conditions	1. The main circuit is disconnected, and the control circuit is connected. 2. Test application conditions.	Neither the main circuit nor the control circuit is connected.	Main body is out of the drawer seat.

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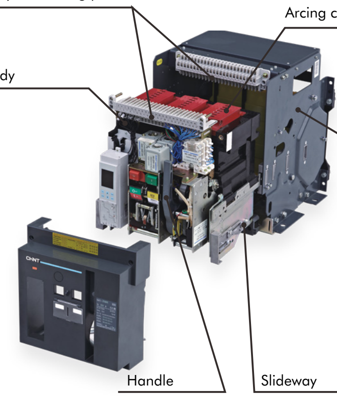
7.2 Wiring the secondary circuit according to electric principle diagram.
Note: Bolts, nuts, gaskets shouldn't be left inside the drawer seat to avoid being blocked.

7.3 Operation
Check the rated voltage of the following components whether conforms to the power voltage . Such as under voltage release, shunt release, closing electromagnet, motor-driven mechanism and intelligent controller.

7.4 Maintenance
Check the technical parameters in time or add some lubricating oil, etc.
This breaker structure is arranged vertically and modularized composition with each functioncell separated, which make the maintenance easy. It has compact structure, reliable operation and strong free maintenance capability. Please check the technical parameters on the nameplate in accordance with the requirements of order before installation.



Making the secondary circuit power, the motor-driven mechanism can store energy automatically until hearing the click and energy stored indicating on the panel.

Otherwise press the storage handle for 6 times until hearing the click and the indicator display energy stored

And the closing operation can be realized either by closing electromagnet or manual button.

8. Recommendation for user's connecting bus-bar

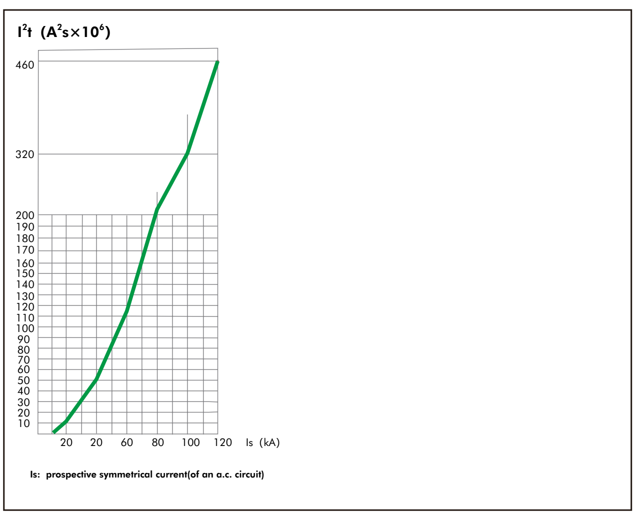
Inm(A)		NA1-1000 X					NA1-2000X/NA1-2000XN/NA1-2000XH						NA1-3200X/NA1-3200XN			NA1-4000X		NA1-6300X/NA1-6300XN		
In(A)		200	400	630	800	1000	630	800	1000	1250	1600	2000	2000	2500	3200	4000/3P	4000/4P	4000	5000	6300
Busbar	Thickness(mm)	5	5	5	6	8	5	6	8	10	12	10	8	10	10	10	-	10	10	10
	Width(mm)	30	30	40	50	50	60	60	60	60	60	60	100	100	100	120	-	100	100	100
	Number	1	2	2	2	2	2	2	2	2	2	3	2	2	4	4	-	5	7	8

Note: the specifications in the table is obtained as the ambient temperature of air circuit breaker is 40℃ , with open installation; this is in compliance with the specification of copper busbars adopted under the heating conditions regulated in IEC/EN60947-2.

9. Power loss

Inm(A)		NA1-1000 X					NA1-2000X/NA1-2000XN/NA1-2000XH						NA1-3200X/NA1-3200XN			NA1-4000X		NA1-6300X/NA1-6300XN		
In(A)		200	400	630	800	1000	630	800	1000	1250	1600	2000	2000	2500	3200	4000/3P	4000/4P	4000	5000	6300
Power loss (W)	Drawer type	40	101	123	110	171	70	110	172	268	440	530	384	600	737	921	-	575	898	1426
	Fixed type	33	85	107	94	146	34.4	50	78	122	200	262	200	312	307	450	-	-	-	-

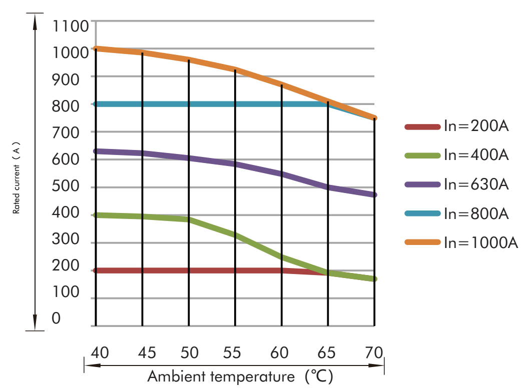
10. A^2S curve



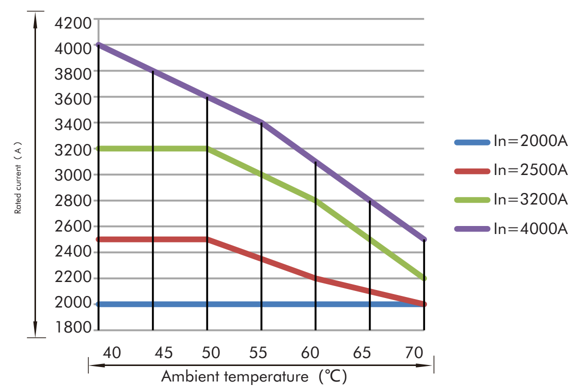
11. Temperature compensation correction

Standard	Ambient temperature	NA1-1000X					NA1-2000X/NA1-2000XN/NA1-2000XH						NA1-3200X/NA1-3200XN NA1-4000X				NA1-6300X/ NA1-6300XN		
IEC/EN60947-2	40℃	200	400	630	800	1000	630	800	1000	1250	1600	2000	2000	2500	3200	4000	4000	5000	6300
	45℃	200	395	623	800	985	630	800	1000	1250	1600	2000	2000	2500	3200	3800	4000	5000	6000
	50℃	200	384	605	800	960	630	800	1000	1250	1600	2000	2000	2500	3200	3600	4000	5000	5600
	55℃	200	328	584	800	924	630	800	1000	1250	1500	1900	2000	2300	3000	3400	4000	4800	5400
	60℃	200	248	548	800	870	610	800	1000	1250	1300	1800	2000	2200	2800	3200	4000	4800	5200
	65℃	192	192	500	800	810	610	800	1000	1250	1300	1650	2000	2200	2600	3000	4000	4600	5100
	70℃	170	170	473	750	750	473	800	1000	1200	1200	1400	2000	2000	2200	2520	4000	4000	4200

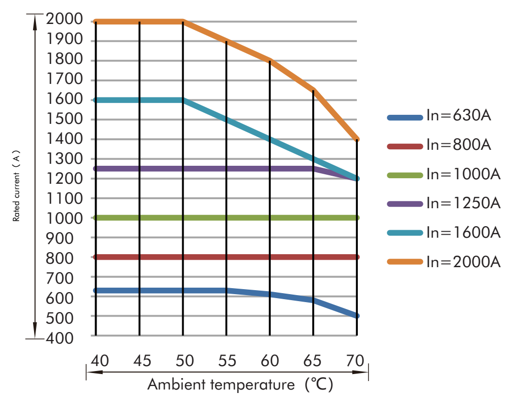
Note: The ACB is to calibrated at 40℃ , special application please refer to the table above and the curve below.



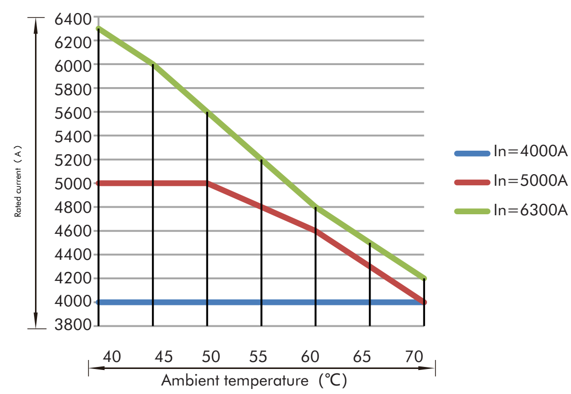
NA1-1000X



NA1-3200X/NA1-3200XN/NA1-4000X



NA1-2000X/NA1-2000XN/NA1-2000XH



NA1-6300X/NA1-6300XN

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12. Coordination recommendations

Capacity of transformer (kVA) & parallelly connected number	Rated current of transformer In(A)	Short circuit current of main circuit (kA)	Breaking capacity of air circuit breaker for main circuit (kA)
1×250	360	9	9
2×250	360	9	9
3×250	360	9	18.5
1×315	455	11.4	11.4
2×315	455	11.4	11.4
3×315	455	11.4	22.7
1×400	578	14.4	14.4
2×400	578	14.4	14.4
3×400	578	14.4	28.8
1×500	722	18	18
2×500	722	18	18
3×500	722	18	36.1
1×630	910	22.7	22.7
2×630	910	22.7	22.7
3×630	910	22.7	44.5
1×800	1154	19.3	19.3
2×800	1154	19.3	19.3
3×800	1154	19.3	38.5
1×1000	1444	24	24
3×1000	1444	24	24
3×1000	1444	24	48.1
1×1250	1805	30	30
2×1250	1805	30	30
3×1250	1805	30	60.1
1×1600	2310	36.5	36.5
2×1600	2310	36.5	36.5
3×1600	2310	36.5	73
1×2000	2887	48.2	48.2
2×2000	2887	48.2	48.2
3×2000	2887	48.2	96.3
1×2500	3608	60	60
2×2500	3608	60	60
1×3150	4550	75.8	75.8
2×3150	4550	75.8	75.8

Type of air circuit breaker for main circuit	Number and area of the busbar for main circuit (n×W×T)	Breaking capacity of air circuit breaker for branch circuit (kA)	Air circuit breaker for branch circuit
NA1-1000X-400 NA1-1000X-400 NA1-1000X-400	2×(5×30)	9 18.5 27.5	NA1, NM8
NA1-1000X-630 NA1-1000X-630 NA1-1000X-630	2×(5×40)	11.4 22.7 34.1	NA1, NM8
NA1-1000X-630 NA1-1000X-630 NA1-1000X-630	2×(5×40)	14.4 28.8 43.2	NA1, NM8
NA1-1000X-800 NA1-1000X-800 NA1-1000X-800	2×(6×50)	18 36.1 54.1	NA1, NM8
NA1-1000X-1000 NA1-1000X-1000 NA1-1000X-1000	2×(8×50)	22.7 44.5 67.2	NA1, NM8
NA1-2000X-1250 NA1-2000X-1250 NA1-2000X-1250	2×(10×60)	19.3 38.5 57.8	NA1, NM8
NA1-2000X-1600 NA1-2000X-1600 NA1-2000X-1600	2×(12×60)	24 48.1 72.1	NA1, NM8
NA1-2000X-2000 NA1-2000X-2000 NA1-2000X-2000	3×(10×60)	30 60.1 90.1	NA1, NM8
NA1-3200X-2500 NA1-3200X-2500 NA1-3200X-2500	2×(10×100)	36.5 73 109.5	NA1, NM8
NA1-3200X-3200 NA1-3200X-3200 NA1-3200X-3200	4×(10×100)	48.2 96.3 144.5	NA1, NM8
NA1-6300X-4000 NA1-6300X-4000	4×(10×120)	60 120	NA1, NM8
NA1-6300X-5000 NA1-6300X-5000	7×(10×100)	75.8 151.6	NA1, NM8

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13. Selectivity protection

13.1 Selective protection between NM8 and NA1

				Circuit breaker	NA1-2000X/NA1-2000XN/NA1-2000XH			
Downstream			Upstream	Rated current (A)	630	800	1000	1250
				Default setting ratings of short time-delay 8In (kA)	5.04	6.4	8	10
				Setting range (kA)	0.63 ~ 9.45	0.8~12	1~15	1.25~18.75
				Delayed tripping time (s)	0.1, 0.2, 0.3, 0.4			
				Returnable time	0.06, 0.14, 0.23, 0.35			
Frame size rated current	**Rated current (A)**	**Instantaneous setting ratings (kA)**						
NM8-125 NM8S-125	16	0.16 0.19(motor)			0.63~9.45 0.63~9.45	0.8~12 0.8~12	1~15 1~15	1.25~18.75 1.25~18.75
	20	0.2 0.24(motor)			0.63~9.45 0.63~9.45	0.8~12 0.8~12	1~15 1~15	1.25~18.75 1.25~18.75
	25	0.25 0.30(motor)			0.63~9.45 0.63~9.45	0.8~12 0.8~12	1~15 1~15	1.25~18.75 1.25~18.75
	32	0.32 0.38(motor)			0.63~9.45 0.63~9.45	0.8~12 0.8~12	1~15 1~15	1.25~18.75 1.25~18.75
	40	0.40 0.48(motor)			0.63~9.45 0.6624~9.45	0.8~12 0.8~12	1~15 1~15	1.25~18.75 1.25~18.75
	50	0.50 0.60(motor)			0.69~9.45 0.828~9.45	0.8~12 0.828~12	1~15 1~15	1.25~18.75 1.25~18.75
	63	0.63 0.75(motor)			0.8694~9.45 1.035~9.45	0.8694~12 1.035~12	1~15 1.035~15	1.25~18.75 1.25~18.75
	80	0.80 0.96(motor)			1.104~9.45 1.325~9.45	1.104~12 1.325~12	1.104~15 1.325~15	1.25~18.75 1.325~18.75
	100	1.0 1.20(motor)			1.38~9.45 1.656~9.45	1.38~12 1.656~12	1.38~15 1.656~15	1.38~18.75 1.656~18.75
	125	1.25 1.5(motor)			1.725~9.45 2.07~9.45	1.725~12 2.07~12	1.725~15 2.07~15	1.725~18.75 2.07~18.75
NM8-250 NM8S-250	100	1.0 1.2(motor)			1.38~9.45 1.656~9.45	1.38~12 1.656~12	1.38~15 1.656~15	1.38~18.75 1.656~18.75
	160	1.6 1.92(motor)			2.208~9.45 2.65~9.45	2.208~12 2.65~12	2.208~15 2.65~15	2.208~18.75 2.65~18.75
	200	2.0 2.4(motor)			2.76~9.45 3.312~9.45	2.76~12 3.312~12	2.76~15 3.312~15	2.76~18.75 3.312~18.75
	250	2.5 3.0(motor)			3.45~9.45 4.14~9.45	3.45~12 4.14~12	3.45~15 4.14~15	3.45~18.75 4.14~18.75

		NA1-3200X/NA1-3200XN			NA1-4000X	NA1-6300X/NA1-6300XN		
1600	2000	2000	2500	3200	4000	4000	5000	6300
12.8	16	16	20	25.6	32	32	40	50.4
1.6~24	2~30	2~30	2.5~37.7	3.2~48	4~60	4~60	5~75	6.3~94.5
0.1, 0.2, 0.3, 0.4								
0.06, 0.14, 0.23, 0.35								
1.6~24 1.6~24	2~30 2~30	2~30 2~30	2.5~37.7 2.5~37.7	3.2~48 3.2~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
1.6~24 1.6~24	2~30 2~30	2~30 2~30	2.5~37.7 2.5~37.7	3.2~48 3.2~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
1.6~24 1.6~24	2~30 2~30	2~30 2~30	2.5~37.7 2.5~37.7	3.2~48 3.2~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
1.6~24 1.6~24	2~30 2~30	2~30 2~30	2.5~37.7 2.5~37.7	3.2~48 3.2~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
1.6~24 1.6~24	2~30 2~30	2~30 2~30	2.5~37.7 2.5~37.7	3.2~48 3.2~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
1.6~24 1.6~24	2~30 2~30	2~30 2~30	2.5~37.7 2.5~37.7	3.2~48 3.2~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
1.6~24 1.6~24	2~30 2~30	2~30 2~30	2.5~37.7 2.5~37.7	3.2~48 3.2~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
1.6~24 1.6~24	2~30 2~30	2~30 2~30	2.5~37.7 2.5~37.7	3.2~48 3.2~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
1.6~24 1.656~24	2~30 2~30	2~30 2~30	2.5~37.7 2.5~37.7	3.2~48 3.2~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
1.725~24 2.07~24	1.725~30 2.07~30	1.725~30 2.07~30	1.725~37.7 2.07~37.7	1.725~48 2.07~48	1.725~60 2.07~60	1.725~60 2.07~60	1.725~75 2.07~75	1.725~94.5 2.07~94.5
1.6~24 1.656~24	2~30 2~30	2~30 2~30	2.5~37.7 2.5~37.7	3.2~48 3.2~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
2.208~24 2.65~24	2.208~30 2.65~30	2.208~30 2.65~30	2.5~37.7 2.65~37.7	3.2~48 3.2~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
2.76~24 3.312~24	2.76~30 3.312~30	2.76~30 3.312~30	2.76~37.7 3.312~37.7	2.76~48 3.312~48	4~60 4~60	4~60 4~60	5~75 5~75	6.3~94.5 6.3~94.5
3.45~24 4.14~24	3.45~30 4.14~30	3.45~30 4.14~30	3.45~37.7 4.14~37.7	3.45~48 4.14~48	4~60 4.14~60	4~60 4.14~60	5~75 5~75	6.3~94.5 6.3~94.5

				Circuit breaker	NA1-2000X/NA1-2000XN/NA1-2000XH			
Downstream			Upstream	Rated current (A)	630	800	1000	1250
				Default setting ratings of short time-delay 8In (kA)	5.04	6.4	8	10
				Setting range (kA)	0.63 ~ 9.45	0.8~12	1~15	1.25~18.75
				Delayed tripping time (s)	0.1, 0.2, 0.3, 0.4			
				Returnable time	0.06, 0.14, 0.23, 0.35			
Frame size rated current	**Rated current (A)**	**Instantaneous setting ratings (kA)**						
NM8-630 NM8S-630	250	2.5 3.0(motor)			3.45~9.45 4.14~9.45	3.45~12 4.14~12	3.45~15 4.14~15	3.45~18.75 4.14~18.75
	315	3.15 3.78(motor)			4.347~9.45 5.216~9.45	4.347~12 5.216~12	4.347~15 5.216~15	4.347~18.75 5.216~18.75
	350	3.5 4.2(motor)			4.83~9.45 5.796~9.45	4.83~12 5.796~12	4.83~15 5.796~15	4.83~18.75 5.796~18.75
	400	4.0 4.8(motor)			5.52~9.45 6.624~9.45	5.52~12 6.624~12	5.52~15 6.624~15	5.52~18.75 6.624~18.75
	500	5.0 6.0(motor)			6.9~9.45 8.28~9.45	6.9~12 8.28~12	6.9~15 8.28~15	6.9~18.75 8.28~18.75
	630	6.3 7.56(motor)			8.694~9.45	8.694~12 10.44~12	8.694~15 10.44~15	8.694~18.75 10.44~18.75
NM8S-630	630	6.3 7.56(motor)			8.694~9.45	8.694~12 10.44~12	8.694~15 10.44~15	8.694~18.75 10.44~18.75
NM8-1250 NM8S-1250	700	7.0 8.4(motor)				9.66~12 11.59~12	9.66~15 11.59~15	9.66~18.75 11.59~18.75
	800	8.0 9.6(motor)				11.04~12	11.04~15 13.25~15	11.04~18.75 13.25~18.75
	1000	10 12(motor)					13.8~15	13.8~18.75 16.56~18.75
	1250	12.5 15.0(motor)						17.25~18.75

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

			NA1-3200X/NA1-3200XN			NA1-4000X	NA1-6300X/NA1-6300XN		
	1600	2000	2000	2500	3200	4000	4000	5000	6300
	12.8	16	16	20	25.6	32	32	40	50.4
	1.6~24	2~30	2~30	2.5~37.7	3.2~48	4~60	4~60	5~75	6.3~94.5
	0.1, 0.2, 0.3, 0.4								
	0.06, 0.14, 0.23, 0.35								
	3.45~24 4.14~24	3.45~30 4.14~30	3.45~30 4.14~30	3.45~37.7 4.14~37.7	3.45~48 4.14~48	3.45~60 4.14~60	3.45~60 4.14~60	3.45~75 4.14~75	3.45~94.5 4.14~94.5
	4.347~24 5.216~24	4.347~30 5.216~30	4.347~30 5.216~30	4.347~37.7 5.216~37.7	4.347~48 5.216~48	4.347~60 5.216~60	4.347~60 5.216~60	4.347~75 5.216~75	4.347~94.5 5.216~94.5
	4.83~24 5.796~24	4.83~30 5.796~30	4.83~30 5.796~30	4.83~37.7 5.796~37.7	4.83~48 5.796~48	4.83~60 5.796~60	4.83~60 5.796~60	4.83~75 5.796~75	4.83~94.5 5.796~94.5
	5.52~24 6.624~24	5.52~30 6.624~30	5.52~30 6.624~30	5.52~37.7 6.624~37.7	5.52~48 6.624~48	5.52~60 6.624~60	5.52~60 6.624~60	5.52~75 6.624~75	5.52~94.5 6.624~94.5
	6.9~24 8.28~24	6.9~30 8.28~30	6.9~30 8.28~30	6.9~37.7 8.28~37.7	6.9~48 8.28~48	6.9~60 8.28~60	6.9~60 8.28~60	6.9~75 8.28~75	6.9~94.5 8.28~94.5
	8.694~24 10.44~24	8.694~30 10.44~30	8.694~30 10.44~30	8.694~37.7 10.44~37.7	8.694~48 10.44~48	8.694~60 10.44~60	8.694~60 10.44~60	8.694~75 10.44~75	8.694~94.5 10.44~94.5
	8.694~24 10.44~24	8.694~30 10.44~30	8.694~30 10.44~30	8.694~37.7 10.44~37.7	8.694~48 10.44~48	8.694~60 10.44~60	8.694~60 10.44~48	8.694~75 10.44~75	8.694~94.5 10.44~94.5
	9.66~24 11.59~24	9.66~30 11.59~30	9.66~30 11.59~30	9.66~37.7 11.59~37.7	9.66~48 11.59~48	9.66~60 11.59~60	9.66~48 11.59~60	9.66~75 11.59~75	9.66~94.5 11.59~94.5
	11.04~24 13.25~24	11.04~30 13.25~30	11.04~30 13.25~30	11.04~37.7 13.25~37.7	11.04~48 13.25~48	11.04~60 13.25~60	11.04~60 13.25~60	11.04~75 13.25~75	11.04~94.5 13.25~94.5
	13.8~24 16.56~24	13.8~30 16.56~30	13.8~30 16.56~30	13.8~37.7 16.56~37.7	13.8~48 16.56~48	13.8~60 16.56~60	13.8~60 16.56~60	13.8~75 16.56~75	13.8~94.5 16.56~94.5
	17.25~24 20.7~24	17.25~30 20.7~30	17.25~30 20.7~30	17.25~37.7 20.7~37.7	17.25~48 20.7~48	17.25~60 20.7~60	17.25~60 20.7~60	17.25~75 20.7~75	17.25~94.5 20.7~94.5

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13.2 Selective protection in NA1

				Circuit breaker	NA1-2000X/NA1-2000XN/NA1-2000XH			
Downstream			Upstream	Rated current (A)	630	800	1000	1250
				Default setting ratings of short time-delay 8In (kA)	5.04	6.4	8	10
				Setting range (kA)	0.63 ~ 9.45	0.8~12	1~15	1.25~18.75
				Delayed tripping time (s)	0.1, 0.2, 0.3, 0.4			
				Returnable time	0.06, 0.14, 0.23, 0.35			
Frame size rated current	**Rated current (A)**	**Default instantaneous setting ratings 12In (kA)**						
	400	4.8			6.348~9.45	6.348~12	6.348~15	6.348~18.75
	630	7.56				9.998~12	9.998~15	9.998~18.75
NA1-2000X	800	9.6					12.696~15	12.696~18.75
	1000	12						15.87~18.75
	1250	15						
	1600	19.2						
	2000	24						
NA1-3200X	2000	24						
	2500	30						
	3200	38.4						
NA1-4000X	3200	38.4						
	4000	48						
	4000	48						
	5000	60						
NA1-6300X	6300	75						

Note: It can satisfy the selective protection if only the short time-delay setting value of the superior breaker 1.32 times more than the subordinate breaker, when the instantaneous setting value is adjustive.

		NA1-3200X/NA1-3200XN			NA1-4000X	NA1-6300X/NA1-6300XN		
1600	2000	2000	2500	3200	4000	4000	5000	6300
12.8	16	16	20	25.6	32	32	40	50.4
1.6~24	2~30	2~30	2.5~37.7	3.2~48	4~60	4~60	5~75	6.3~94.5
0.1, 0.2, 0.3, 0.4								
0.06, 0.14, 0.23, 0.35								
6.348~24	6.348~30	6.348~30	6.348~37.7	6.348~48	6.348~60	6.348~60	6.348~75	6.348~94.5
9.998~24	9.998~30	9.998~30	9.998~37.7	9.998~48	9.998~60	9.998~60	9.998~75	9.998~94.5
12.696~24	12.696~30	12.696~30	12.696~37.7	12.696~48	12.696~60	12.696~60	12.696~75	12.696~94.5
15.87~24	15.87~30	15.87~30	15.87~37.7	15.87~48	15.87~60	15.87~60	15.87~75	15.87~94.5
19.837~24	19.837~30	19.837~30	19.837~37.7	19.837~48	19.837~60	19.837~60	19.837~75	19.837~94.5
	25.392~30	25.392~30	25.392~37.7	25.392~48	25.392~60	25.392~60	25.392~75	25.392~94.5
			31.74~37.7	31.74~48	31.74~60	31.74~60	31.74~75	31.74~94.5
			31.74~37.7	31.74~48	31.74~60	31.74~60	31.74~75	31.74~94.5
				39.675~48	39.675~60	39.675~60	39.675~75	39.675~94.5
					50.784~60	50.784~60	50.784~75	50.784~94.5
					50.784~60	50.784~60	50.784~75	50.784~94.5
							63.48~75	63.48~94.5
							63.48~75	63.48~94.5
								79.35~94.5

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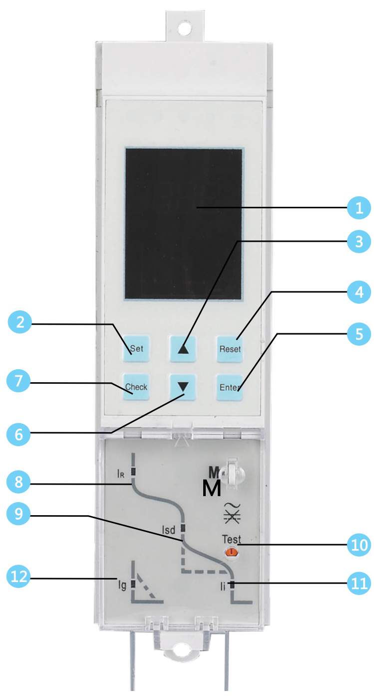
Intelligent Controller of NA1 series

14. Protection Features of intelligent controller

14.1 M/H and 3M/3H intelligent controller UI



M/H control

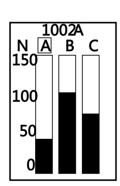
3M/3H control

1. Display window
Display current value, setting value, tripping time and so on
2. "Set"
Switch to setting menu
3. "Up"
Change the marquee or the selected parameter
4. "Return"
Escape from this grade and return to upper menu or cancel the current selected parameter
5. "Enter"
Enter into the next menu directed by the current item, or select current parameter and store modifications
6. "Down"
Change the marquee or the selected parameter
7. "Check"
Switch to query menu
8. "Ir" light
Overload long delay fault indication
9. "Isd" light
Short-circuit Short delay indication
10. "Test"
Trip test button
11. "Ii" light
Short-circuit instantaneous fault indication
12. "Ig" light
Asymmetric earthing or neutral line fault indication
13. Alarm light
14. Communication light
15. Run light

Note: Method of 3M/3H controller application please refer to 3M/3H controller instruction.

14.2 3M/3H controller default interface and menu structure 3M/3H controller has four subjects menus and a default interface:
The subjects menus are composed of 4 parts: measurement menu, parameter set menu, protection parameter set menu, history and maintenance menu.

3M/3H controller default interface



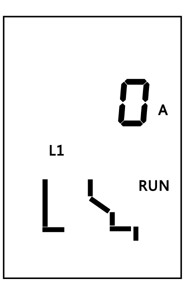
14.3 Explanation of M/H controller symbols

14.3.1 Explanation of symbols for reference

No.	symbol	NA1-2000X/NA1-2000XN/NA1-2000XH
1	Ir= tr=	Long delay current setting, long delay time setting
2	Isd= tsd=	Short delay current setting, short delay time setting
3	Ig= tg=	Earthing current setting, earthing time setting
4	Ii=	Instantaneous current setting
5	N=	Neutral line protection parameter setting
6	TM	Trip simulated by software
7	TRIP	Tripped
8	RUN	Run normally
9	SET	Normally on: in settable state; Flickering: modifiable parameter
10	LIN	Storing state
11	P ┣ 0	Protection setting interface
12	ΓES	Trip simulated by software setting interface
13	RLR	Alarm setting or query interface
14	SYS	System setting interface (current calibration , frequency setting …)
15	DBS	Communication setting interface of H-type controller
16	DOS	DO setting interface (H type with DO function)
17	FRU	Fault record query interface
18	COU	Operation times and life query interface
19	HDΓ	Thermal capacity query interface
20	DOC	DO state query interface
21	H	Thermal capacity data
22	F--	Fault record number
23	R--	Alarm record number
24	Lg L1 L2 L3 LN	Earthing ,A,B,C,N phase
25		The corresponding LED lamp will flash to indicate the fault type after tripping. The LED lamps are always on when the system is normal.

14.3.2 Operation and display instruction

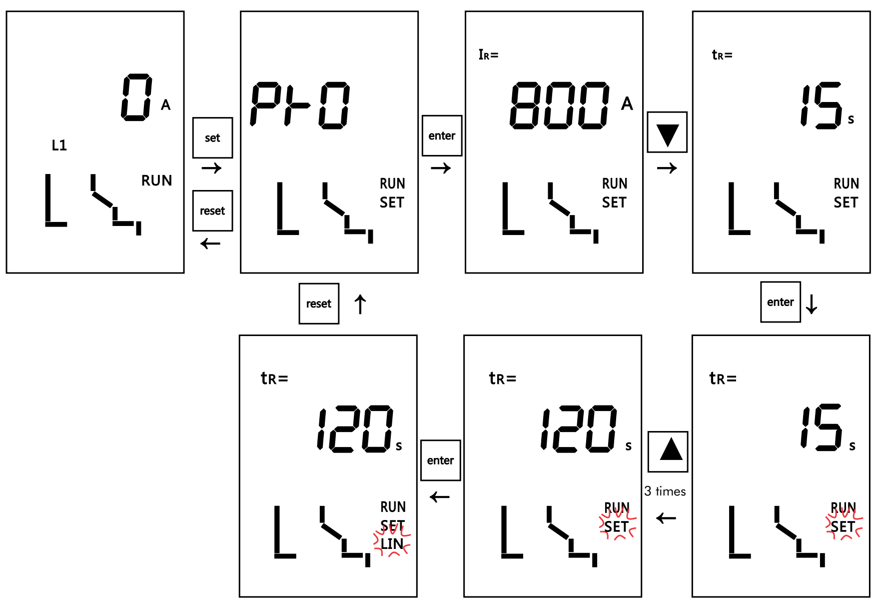
There are four states, default state, setting state, query state and tripping state.
① Default state: default state is also called measuring state. All fault indicating lamps are off and maximum phase current is displayed.
In this state, if " ▲ " or " ▼ " button is pressed, L1,L2,L3(LN),Lg current can be displayed in turn.
Example is shown below:



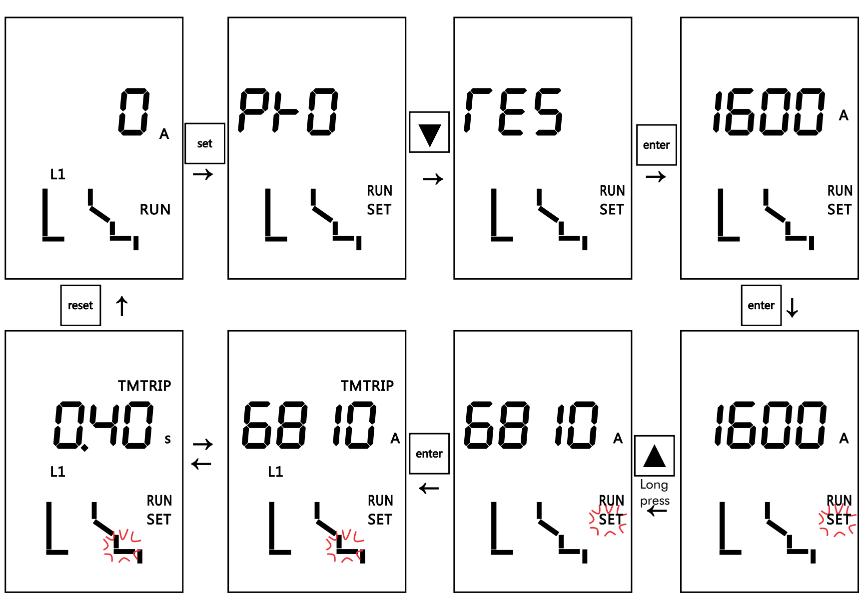
L1 phase current display interface

② Setting state: press “Set” button in default interface to enter into setting interface. Current protection parameters, overload pre-alarm value, earthing alarm threshold value and delay time can be queried or changed in setting state. Tripping can be simulated by software. In this state, “ ▲ ” or “ ▼ ” button can be pressed to add or subtract value when “SET” indicating lamp is flickering. Don’t forget to press “Enter” button to save data after setting.

Example 1 of changing long delay time is shown below:

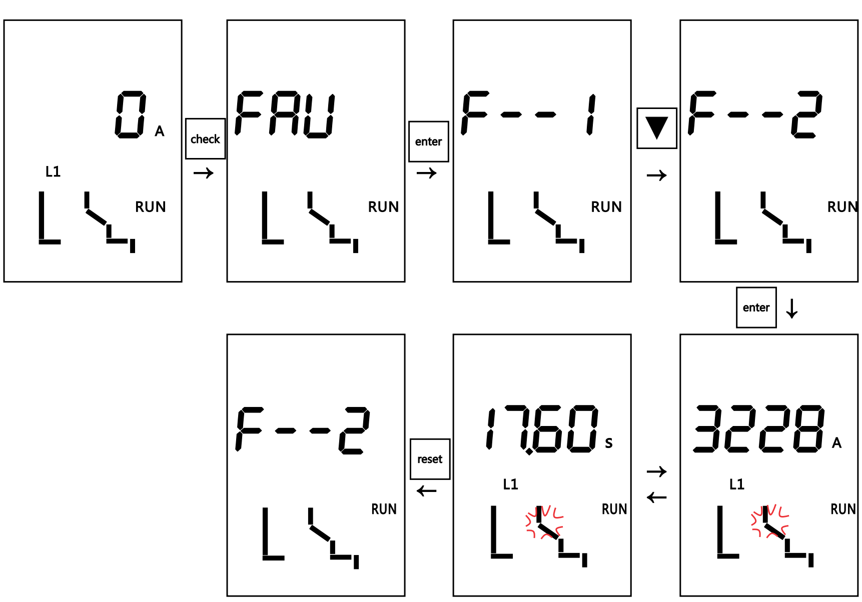


Example 2 of short delay tripping simulated by software is shown below:

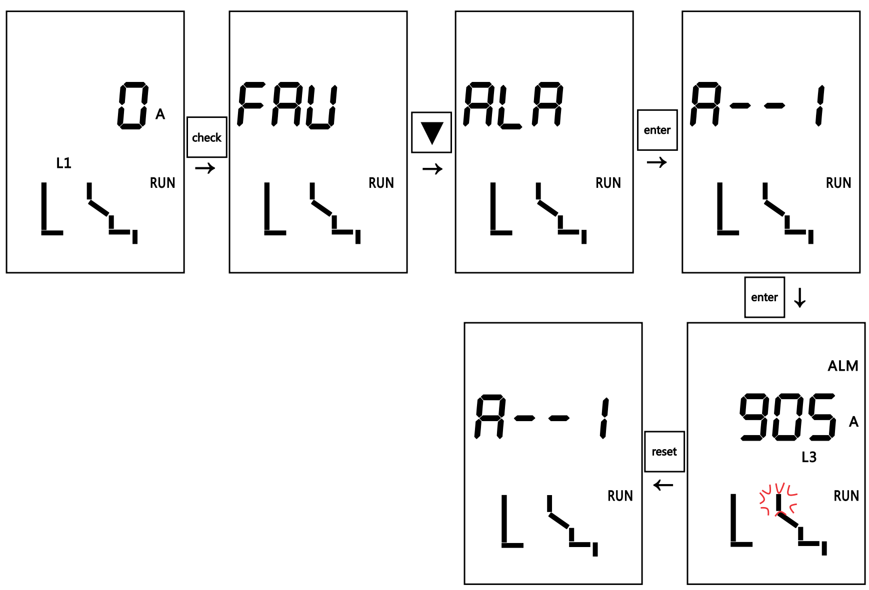


Example3 of setting earthing alarm threshold current is shown below:

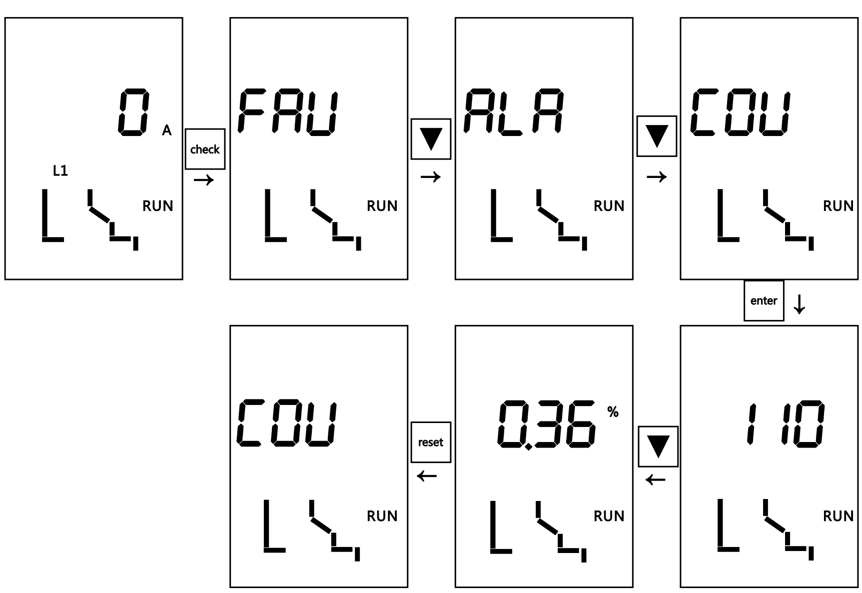
③ Query state: press "Check" button in default interface to enter into query interface. Last 8 fault records, last 8 alarm records, breaker operation times, life record and thermal capacity can be queried in query state.
Example4 of querying second fault record is shown below:



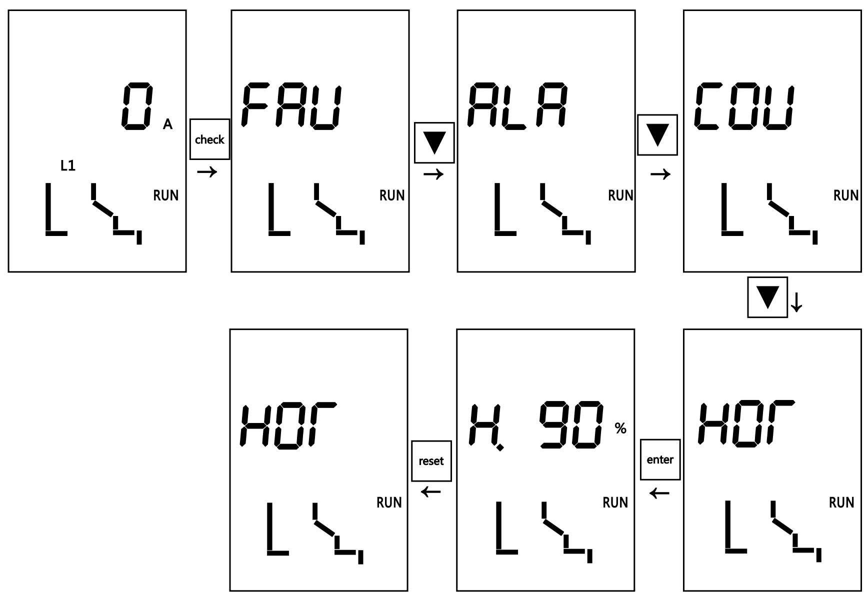
Example5 of querying first alarm record is shown below:



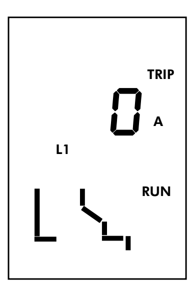
Example6 of querying breaker operation times and life record is shown below:



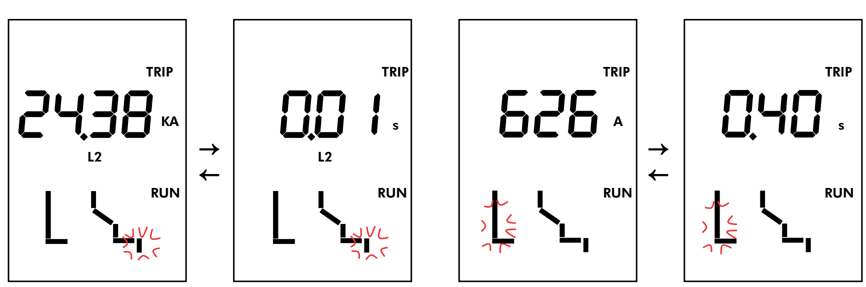
Example7 of querying thermal capacity after tripping is shown below:



④ Tripping state: "Reset" button should be press to return default interface after tripping at fault.



Press "Test" button to simulate Instantaneous trip



Instantaneous trip state

Earthing trip state

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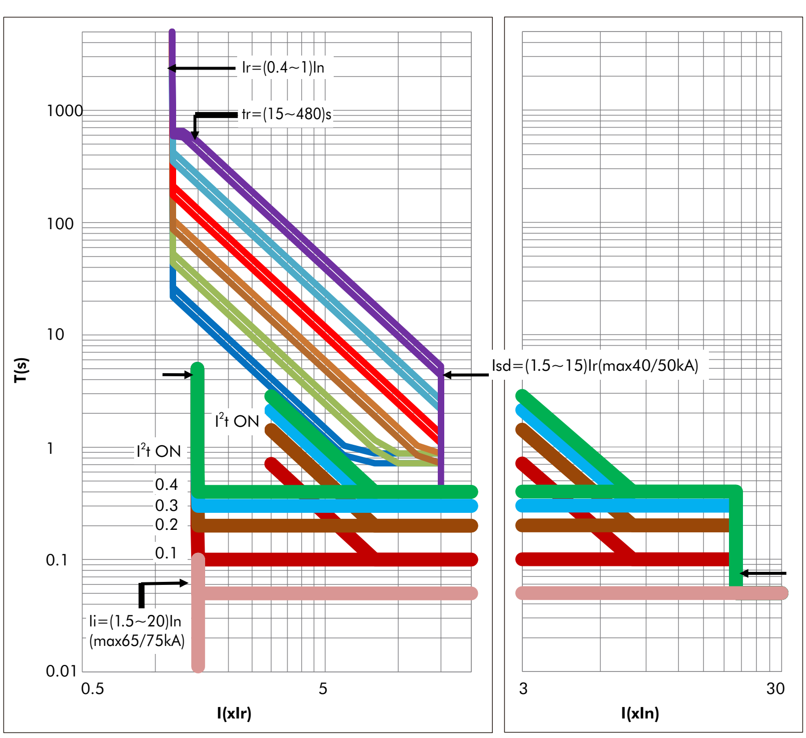
14.3.3 Controller functions list

M type	H type
1 over-current protection (overload, shortdelay,instantaneous,earthing);	1 over-current protection (overload, short delay, instantaneous, earthing);
vector sum grounding mode.	vector sum grounding mode.
2 Neutral line protection	2 Neutral line protection
3 Current measurement	3 Current measurement
4 two test functions:	4 two test functions:
(1) Instantaneous trip test simulated by mechanical button	(1) Instantaneous trip test simulated by mechanical button
(2) Other trip tests simulated by software	(2) Other trip tests simulated by software
5 Ten fault records	5 Ten fault records
6 Ten alarm records	6 Ten alarm records
7 MCR protection	7 MCR protection
8 operation times records	8 operation times records
9 thermal capacity	9 thermal capacity
10 overload pre-alarm	10 overload pre-alarm
	11 communication function: MODBUS protocol
	12 four DO function (optional)

3M type	3H type
1 all functions of M-type controller are included	1 all functions of 3M-type controller are included
2 HMI:128*64 LCD	2 voltage measurement and protection
	3 frequency measurement and protection
	4 power measurement and protection
	5 electric energy, power-factor, harmonic measurement
	6 communication function: MODBUS protocol
	7 DI/DO function

14.4 specifications of characteristics
14.4.1 Over-current protection characteristic curve



14.4.2 Overload long time-delay protection
Operating characteristics

Current Ratings Range(Ir)	tolerance	Current	Action time(s)						Time tolerance
(0.4~1)In+ OFF	±10%	≤1.05Ir	>2h Non-trip						
		> 1.3Ir	<1h trip						
		1.5Ir(setting time)	15	30	60	120	240	480	±10%
		2.0Ir	8.4	16.9	33.7	67.5	135	270	±10%
Phase N Overload and Over-Current Characteristic			100% or 50%(Applicable to 3P+N or 4P)						

14.3 Short-circuit short-delay protection
Short-circuit short delay protection has two protection modes. One is inverse time and definite time protection. I2Tsd= (8Ir)2tsd workswhen current is low. In this formula, I is actual current, Tsd is actual trip time, tsd is set trip delay time. When I is over inverse time set value but below 8Ir, controller will operate according to over-current protection characteristic curve. When I is over both of inverse time set value and 8Ir, controller will operate according to definite time protection. The other is definite time protection and set time is 0.11s, 0.21s, 0.31s, and 0.41s. When I is over Isd but below Ii, controller will operate according to definite time protection.
Operating characteristics

Current Ratings Range(Isd)	tolerance	Current	Action time(s)				Time tolerance
(1.5~15)Ir+ OFF	±10%	≤0.9Isd	In the 2tsd Non-trip				
		> 1.1Isd	In the 2tsd Delayed-trip				
		tsd	0.1	0.2	0.3	0.4	±15%
		Returnable time	0.06	0.14	0.25	0.33	±15%

Note: a. When the intelligent controller is Frame Ⅱ (Inm=3200A、4000A), Isd shouldn't be more than 40KA.
b. When the intelligent controller is Frame Ⅲ (Inm=6300), Isd shouldn't be more than 50KA.
c. When tsd is 0.1s or 0.2s, time permissible error is ±0.040s.

14.4.4 Short-circuit instantaneous protection
Tripping time for instantanous protection (including the inherent breaking time of circuit breaker) should be less than 50ms (effective value protection) or 30ms (peak value protection).
Operating characteristics

Current Ratings Range(Ii)	tolerance	Current	Time tolerance
(1.5~20)In+ OFF	±15%	≤0.85Ii	In the 0.2s Non-trip
		> 1.15Ii	In the 0.2s trip

Note: a. When the intelligent controller is Frame Ⅰ (Inm=2000A), Ii shouldn't be more than 50KA.
b. When the intelligent controller is Frame Ⅱ (Inm=3200A、4000A), Ii shouldn't be more than 65KA.
c. When the intelligent controller is Frame Ⅲ (Inm=6300), Ii shouldn't be more than 75KA.

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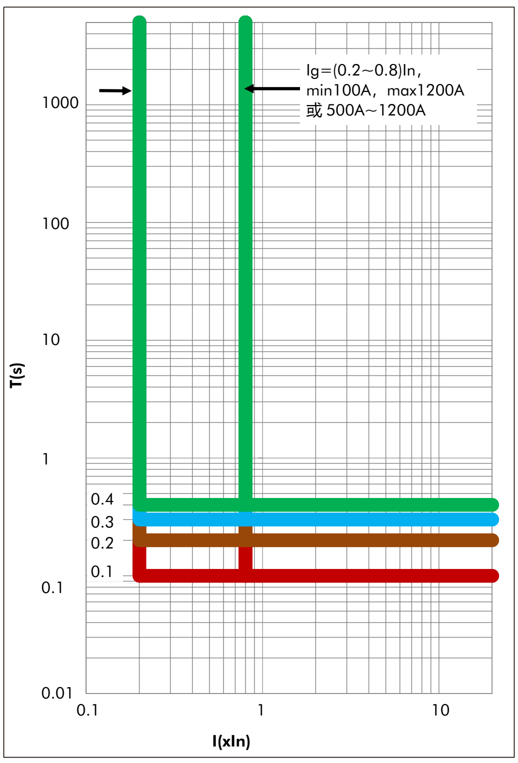
14.4.5 Earthing protection

Earthing protection has definite time characteristic. Fault delay time is shown below.

Earthing protection characteristic curve



Operating characteristics of single-phase earthing protection

Current Ratings Range(Ir)	tolerance	Current	Action time(s)				Time tolerance
Inm=1000/2000, (0.2~0.8)In+ OFF Inm=3200/4000/6300, (500~1200)A+ OFF	±10%	≤0.9Ig	In the 2tg Non-tripping				
		> 1.1Ig	In the tg±0.032s or tg(1±25%) Tripping				
		tg	0.1	0.2	0.3	0.4	±15%
		Returnable time	0.06	0.14	0.25	0.33	±15%

Note: a. When tg is 0.1s or 0.2s, time permissible error is ±0.040s;

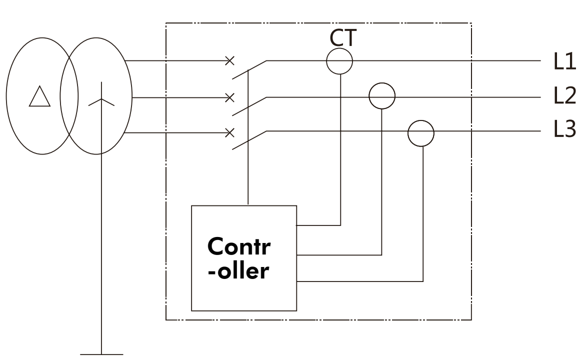
b. When Inm is 1000A, Ig should be more than 100A. When Inm is 2000A, Ig shouldn' t be more than 1200A.

c. When Inm is 3200A, 4000A or 6300A, Ig should be between 500A and 1200A.

Single-phase protection is usually used in neutral-point solid ground system. Controller has two different protection modes, being vector sum mode and external transformer mode.

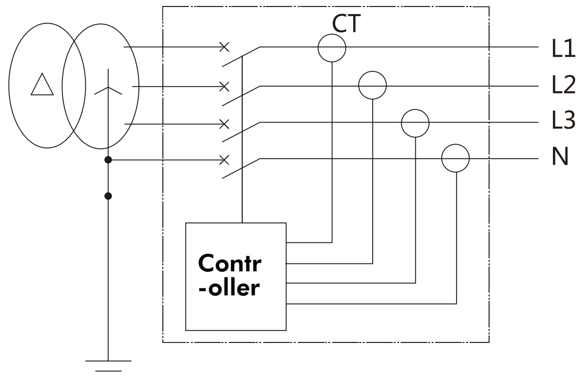
In three-phase three-wire system using 3-pole breaker without external transformer, earthing fault signal comes from three-phase current vector sum. Operating characteristic is definite time protection.

3PT mode



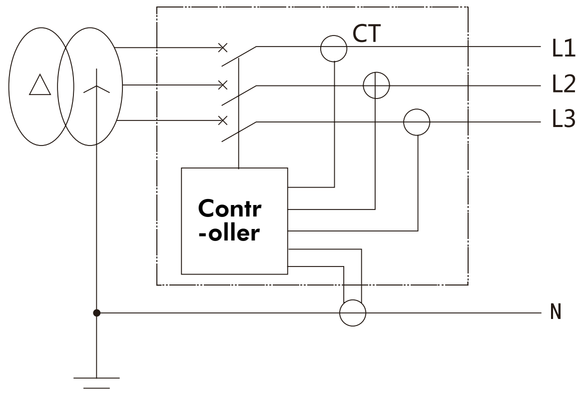
In three-phase four-wire system using 4-pole breaker without external transformer , earthing fault signal comes from three- phase current and N-Pole current vector sum. Operating characteristic is definite time protection.

4PT mode



In three-phase four-wire system using 3-pole breaker with external N-pole transformer, earthing fault signal comes from three- phase and N-Pole current vector sum. Operating characteristic is definite time protection.

(3P+N)T mode



Note:

① External N-pole transformer (connected to 6#, 7# terminal for NA1-1000, connected to 25#, 26# terminal for NA1-2000-6300) is a special product. Default lead wire is 2 meters long.

② Earthing protection in 3PT mode can only be used in balance load. It should be turned off or set value above allowable unbalance current when the load is unbalance or the controller may operate.

③ The distance between external transformer and breaker should be less than 5m in (3P+N)T mode. When lead wire of external transformer needs to be longer than 2 meters, special requirement should be noted when ordering.

15. Accessories

15.1 Shunt release

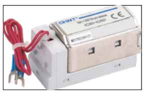
The power-on time cannot be greater than 2 seconds / time, and the power-on frequency cannot be greater than 5 times / minute.

a. The shunt release should be used except for special products where the circuit breaker must be directly disconnected manually;

b. The shunt release could operated within 10 meters to break the circuit breaker.

Characteristics of shunt release

Rated control power supply voltage Us(V)			AC220/230	AC380/400	DC220	pulse	AC110 (not available for NA1-1000X)
Operating voltage (V)			(0.7-1.1)Us				
Break time (ms)			≤28				
Power consumption (VA/W)	Inm=1000A	pulse	56	56	250	250	-
	Inm=2000A~6300A	Intermittent(default)	300	300	132	70	300
		Pulse(option)	880	1800	880	850	850



Notes:

1. It must select pulse type in the automatic control system.
2. power-on time of the intermittent type cannot be greater than 2 s,
pulse frequency of the pulse type cannot be more than 5 times/min, or the components are easily burnt;
3. If the circuit breaker is not break by a single power-on of 15 s, must disconnect the power on the shunt release immediately.

15.2 Closed Electromagnet

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

Characteristics of closed electromagnet

Rated control power supply voltage Us(V)			**AC220/230**	**AC380/400**	**DC220**	**DC110**	**AC110 (not available for NA1-1000X)**
Operating voltage (V)			**(0.85-1.1)Us**				
Close time (ms)			≤50				
Power consumption (VA/W)	Inm=1000A	pulse	56	56	250	250	-
	Inm=2000A~6300A	Intermittent(default)	300	300	132	70	300
		Pulse(option)	880	1800	880	850	850

Notes:

1. It must select pulse type in the automatic control system.
2. ppower-on time of the intermittent type cannot be greater than 2 s, pulse frequency of the pulse type cannot be more than 5 times/min, or the components are easily burnt;
3. Ensure that the product is in the energy storage state so that the closed electromagnet may be energized;
4.If the product is not closed after a single power-on for 15s, must disconnect the power on the closed electromagnet immediately.

15.3 Undervoltage release (UVT) (The power must be turned on before the circuit breaker is closed)

15.3.1 The undervoltage release has instantaneous operation and delayed operation:

Operation types of each frame under voltage release

	Self-priming	**Helped priming**
Undervoltage instantaneous release	Inm=1000A, 6300A	Inm=2000A, 3200A, 4000A/3
Undervoltage delay release	Inm=1000A, 6300A	Inm=2000A, 3200A, 4000A/3

Notes:

1. Inm=1000A undervoltage delay does not require an external delay controller. The power-off operation is an instantaneous operation. There is no zero voltage delay function;
2. Inm=6300A undervoltage delay does not require an external undervoltage delay controller. There is a delay function for low voltage and power off;
3. Inm=2000A~4000A/3 undervoltage delay requires an external delay controller. There is a delay operation when the power is off.

There is a zero voltage delay function.

Delay time of under voltage release

	Delay time (optional)	Accuracy
Inm=1000A	1 s, 3 s, 5 s, 7 s (not adjustable)	±15%
Inm=2000A~4000A/3	1 s, 3 s, 5 s (non-adjustable)	0~1s
Inm=6300A	0.3 s~7.5 s (adjustable)	±15%e
The undervoltage will not operate when the voltage returns to 85% Ue and higher,, within 1/2 delay time.		

Note:

A self-priming undervoltage delay release may be provided for special orders of NA1-2000X~6300X. There is no external undervoltage delay controller, and the delay time is 0.3s~7.5s, selectable and adjustable with an accuracy of ±15%.

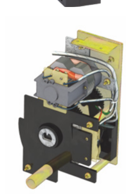
15.3.2 When the undervoltage release is not powered, the circuit breaker cannot be closed either electrically or manually:

Characteristics of under voltage release

Rated control power supply voltage Ue(V)	**AC110, AC220/230, AC380/400**
Operating voltage (V)	(0.35~0.7)Ue
Reliable closing voltage (V)	(0.85~1.1)Ue
Reliable not-closing voltage (V)	≤0.35Ue
Power consumption (Inm=1000A/Inm=2000A~6300A)	20VA/48VA (W)

15.4 The electric energy storage mechanism (the power-on time cannot be greater than 5 seconds / time, and the power-on frequency cannot be greater than 3 times/min) has an automatic re-energy storage function to facilitate dual power switching.

Characteristics of electric energy storage mechanism

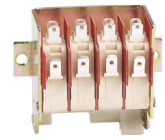


Rated control power supply voltage Ue(V)	**AC380, AC220**	**DC220, DC110**
Operating voltage (V)	(0.85-1.1)Us	(0.85-1.1)Us
Power consumption (Inm=1000A)	90W	90W
Power consumption (Inm=2000A)	85W	85W
Power consumption (Inm=3200A, 4000A/3)	110W	110W
Power consumption (Inm=6300A)	150W	150W
Energy storage time	≤5s	≤5s

Notes:

15.5 Auxiliary contact NO
Standard type: Provides users with 4 sets of conversion contacts (default configuration).
Special type: 6 sets of Inm=1000A conversion contacts (for AC only);

Characteristic



Type	**NA1-1000X**			**NA1-2000X/NA1-2000XN/NA1-2000XH/NA1-3200X/NA1-3200XN/NA1-4000X/NA1-6300X/NA1-6300XN**		
Rated voltage (V)	**AC230**	**AC400**	**DC220**	**AC230**	**AC400**	**DC220**
conventional free-air thermal current Ith (A)	10	6	0.5	6	6	6
Rated control capacity	300VA	100VA	60W	300VA	300VA	60W

NA1-1000X			**NA1-2000X/NA1-2000XN/NA1-2000XH/NA1-3200X/NA1-3200XN/NA1-4000X/NA1-6300X/NA1-6300XN**		
Category	**Voltage**	**Current**	**Category**	**Voltage**	**Current**
AC-15	AC230V	1.3A	AC-15	AC230V	1.3A
	AC400V	0.25A		AC400V	0.75A
DC-13	DC110V	0.55A	DC-13	DC110V	0.55A
	DC220V	0.27A		DC220V	0.27A

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15.6 Doorcase
Installed on the door of the distribution cubicle, for sealing the distribution cubicle and making the protection class to IP40(fixed type and drawout type).

15.7 Phases barrier (Optional)
Installed between the busbars to increase the creepage distance.

15.8 Transparent shield (NA1-2000) (Optional)
Installed on the doorcase of the cubicle's small door, make the protection class to IP54. It is suitable for the fixed, drawout type circuit breaker and the load switch.

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روبـروی پالایشگاه نفت پارس، پلاک ۱۲

15.9 Off position locking mechanism
When the circuit breaker is disconnected, padlock can be used to lock it after pulling out the lock lever, then the circuit breaker can't be "Test" or "connected" position.(Padlock is prepared by users)

15.10 Key lock

Lock the circuit breaker on the OFF position, then the circuit breaker can't be closed.
Locks and keys will be provided by us.
Separate lock and key is matched with one set of the circuit breaker.
Three same locks and two same keys are matched with three circuit breaker.
Note: Before pulling out the key, the break pushbutton should be pressed first, rotate the key anticlockwise, then pull it out.

★ NA1Install the locking system

1. Components of the locking system:

lock washer key

2. Installation sequence:

1. Boring here, and polish the hole make it smooth

2. Put the washer into the hole

3. Install the lock here

4. Push the red button"ON", and take the key out, then install the cover.

15.11 Cable mechanical interlock

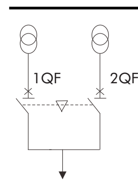
It can realize the interlock of two horizontal or vertical-installed, three poles or four poles, drawout type or fixed type circuit breaker.

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

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

c. The maximum distance between two interlock circuit breakers is 1.5m.

Circuit diagram



Available running manner

1QF	2QF
0	0
0	1
1	0

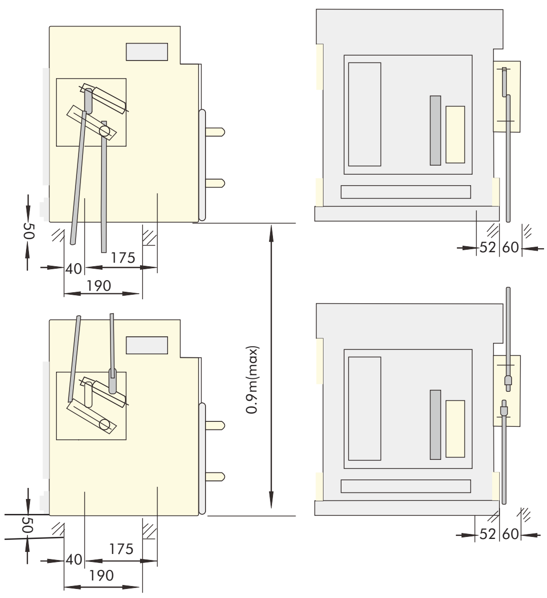
Notes:

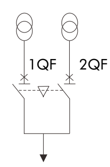
a. when the steel cable needs to be bent, enough transition arc should be reserved to guarantee flexible movement of steel cable;

b. check the steel cable and make sure there is enough lubricant in the steel cable to guarantee flexible movement of steel cable.

15.12 Connecting-rod type mechanical interlock

For two vertically mounted three-pole or four-pole circuit breakers, the interlock can be realized where one makes and the other breaks.



Circuit diagram	Available running manner	
Manner 1: three power supplies are provided for one circuit breaker only		
	1QF	2QF
	0	0
	0	1
	1	0

16. Maintenance and Overhaul of Circuit Breaker

Safety Precautions

The following operations must be executed in turn before conducting the maintenance or overhaul of circuit breakers:

a.Circuit breaker opening operation to ensure the circuit breaker is in an opening state;

b.Disconnecting the upper-level knife switch (if any) to ensure the main circuit and secondary circuit are uncharged;

c.Circuit breaker discharging, opening operation to ensure the circuit breaker is in a discharging and opening state;

d.The components which the personnel might contact must be uncharged.

Keep Safe

Maintenance and overhaul cycle

Condition	Environment	Maintenance cycle	Overhaul cycle	Remarks
General environment	The air should be always kept clean and dry. There is no corrosive gas. The temperature is in between -5℃ ~+40℃ The humidity should conform to Specification 1.3 Operating Conditions c Requirement for extreme atmosphere conditions.	Every six months	Once per year (every six months for more than 3 years of mounting period)	Confirming to IEC60947-2 Requirement for general environmental conditions.
Severe environment	Low temperature -5℃ ~-40℃ or high temperature 40℃~ 65℃ or humidity≥90%	Every three months	Every six months (every three months for more than 3 years of mounting period)	
	Places with more dust and corrosive gases	Every month	Every three months	

16.1 Maintenance of circuit breaker

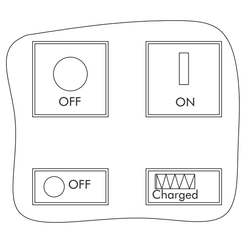
16.1.1 Foreign objects (such as tools, wire leads or fragments, metal objects) in the switchgear should be regularly cleared.

16.1.2 The dust on the circuit breaker must be regularly cleared to maintain its good insulation.

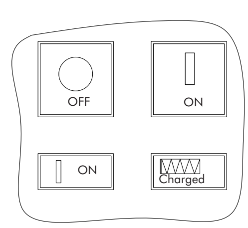
16.1.3 The spring washers of the main circuit connecting bolts, the earthing bolts must be checked for whether they are flattened and theconnection is firm.

16.1.4 Whether the opening or closing indication is correct and reliable.

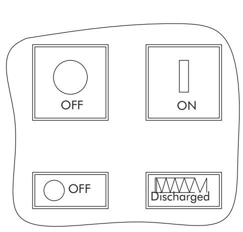
Opening charging



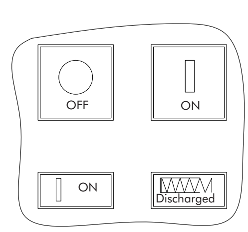
Closing charging



Opening discharging



Closing discharging



16.2 Overhaul of circuit breaker

16.2.1 Connecting and mounting inspection

It is proposed to refer to the following requirement for the torsional forces of main circuit and secondary circuit.

Fastener specification	Torque requirement N·m
M3	0.4~0.5
M4	1.2~1.7
M8	16~26
M10	36~52
M12	61~94

16.2.2 Insulating property test

The phase-phase and phase-earth insulation resistance, requirement≥20MΩ.

The insulation resistance test must be first done after overhaul and long-time (≥7days) of deenergization and before energization again.

16.2.3 Operating characteristic inspection

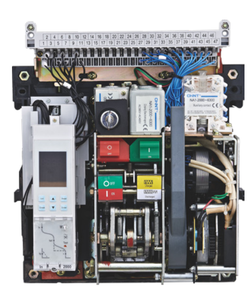
All accessories shall be connected with corresponding rated voltage according to the face shield nameplate requirement, and the following operations should be done:

Electric charging, closing and opening operation, 5times in cycle

Manual charging, closing and opening operation, 5times in cycle

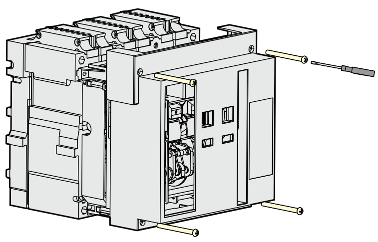
The circuit breaker charging, opening and closing should be normal.

Note: The main circuit must be uncharged. If there is an under-voltage release, the rated voltage must be first connected.



Note: The picture takes NA1-2000X as an example

16.2.4 Inspection of circuit breaker components
16.2.4.1 Face shield dismantling

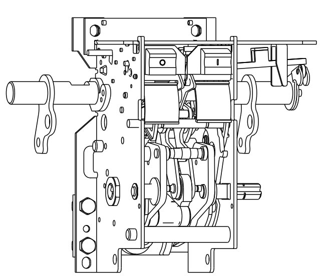


· Remove four bolts of circuit breaker fixed panel and take off the face shield.

Note: The picture takes NA1-2000X as an example.

16.2.4.2 Operating mechanism inspection

The mechanism components should be free of fracture and damage, and the fasteners are fastened.
Clear the dust and evenly apply oil onto the rotating components.



· Evenly apply 7012 low-temperature lubricating grease or lubricate same using the similar solid grease onto the mechanism rotating positions.

Note: The picture takes NA1-2000X as an example.

16.2.4.3 Intelligent controller (taking NA1-2000 type M type controller as an example)

Parameter setting should conform to the site use requirement.

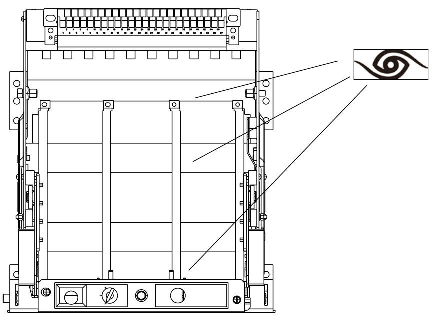
Simulated test tripping function

· 1. Press the “Set” button to enter the parameter setting interface “Pro”.
· 2. Press the “Enter” button to enter the protective parameter setting and query interface.
· 3. Press the “ ▲ ” or “ ▼ ” button to in turn select the display of protective parameter setting details.
· 4. Press the “Reset” button to return to the upper-level menu or exit from the interface.

· Press the “Test” button to simulate the tripping test.

· Press the orange “Reset” button on the face shield to return to normal state.

16.2.4.4 Drawer set inspection (conduct the test after removing the body, taking NA1-2000X as an example)
There are no foreign objects inside.



· Observe whether there are foreign objects inside the draw-out socket, like screws, wire leads, scrap iron; please clear same if any.

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تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
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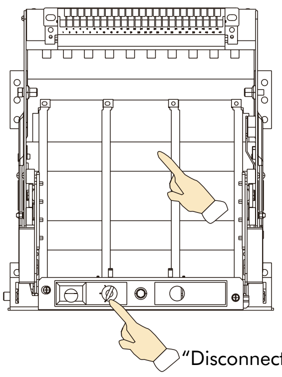
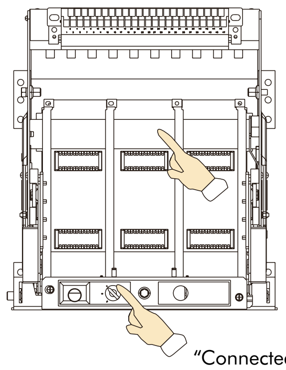
The flash barrier opening or closing is normal, and the spacing contact has no deformation or oxidization.

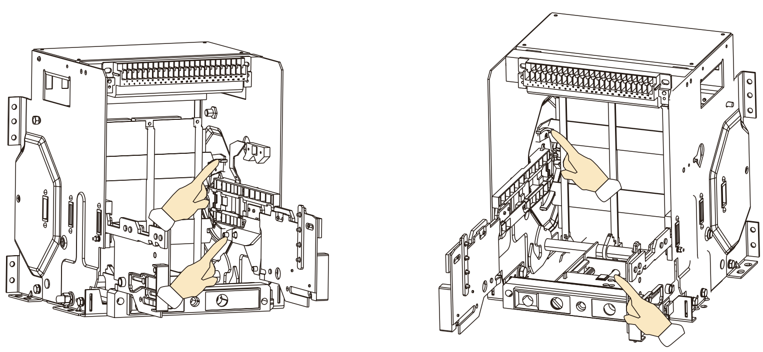


· Rotate to the "Disconnected" position, and the flash barrier is shown as the left figure.



· Rotate NA1-2000X~6300X to the Connected position.
· Press down NA1-1000X separator and open the connecting rod. The flash barrier is shown as the left figure. Observe whether each phase bridge contacts are deformed, misplaced or oxidized. If any, replace same.

Rotate the friction positions and apply oil evenly.



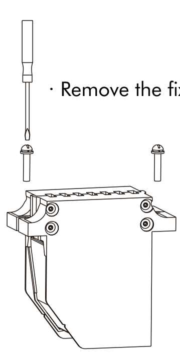
· Evenly apply 7012 low-temperature lubricating grease or similar solid grease onto the positions indicated in the left figure.

16.2.4.5 Arcing Chamber (taking NA1-2000X~6300X as an example)

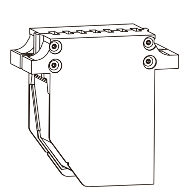
Each arc and arcing chambers are not broken. If any, please promptly replace same and clear inside dust, corrosion layer and arc discharge point. In case of serious corrosion or rust, please promptly conduct replacement.

Note: Inspection must be done after short-circuit current breaking.

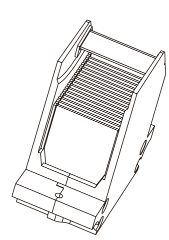
· Remove the fixing bolts



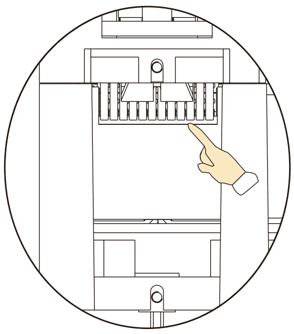
· Take out the arc chamber.



· Take out the arc chamber.



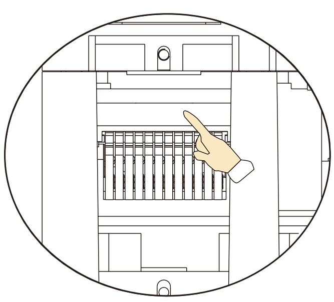
16.2.4.6 Required main contact (taking NA1-2000X~6300X as an example) over-travel≥2mm.



· Conduct manual closing operation, and observe the main contact over-travel.

Note: Please replace the contact if it reaches the position shown.

Clear dust, corrosion layer and particle burnt objects.



· Close the product and main contact is at the shown position. Observe any dust, particle burnt objects and oxidized corrosion layer of dynamic and static contacts. If any, please promptly clear same.

Note: Inspection must be done after short-circuit current breaking.

16.2.4.7 Secondary circuit inspection

No shell damage.

Inspect the contact between the draw-out body secondary circuitand drawer set secondary circuit using the multimeter.

At the "Test" or "Connection" position, the contacts are in good contact, and the connecting screws are fastened, and the conductor insulation has no damage.

16.3 Replacement of undervoltage release, shunt release and closed electromagnet accessories.The following operations must be executed before replacing the accessories.

Cut off all power supplies and ensure the main circuit and secondary circuit power supplies are uncharged.The circuit breakers are in the discharging opening state.

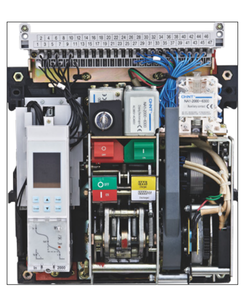
16.3.1 Replacement of fixed accessories

Remove the panel fixing bolts and dismantle the panel.

Untie the tape and remove the connecting conductor.

Remove the fixed accessory mounting screws.

Dismantle the accessories and replace same.



Note: The shunt release should be first dismantled before replacing the NA1-2000

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16.3.2 Replacement of draw-out accessories

Rotate the body to the detachment position and remove the body.

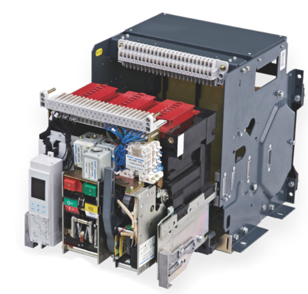
Remove the panel fixing bolts and dismantle the panel.

Untie the tape and remove the connecting conductor.

Remove the fixed accessory mounting screws.

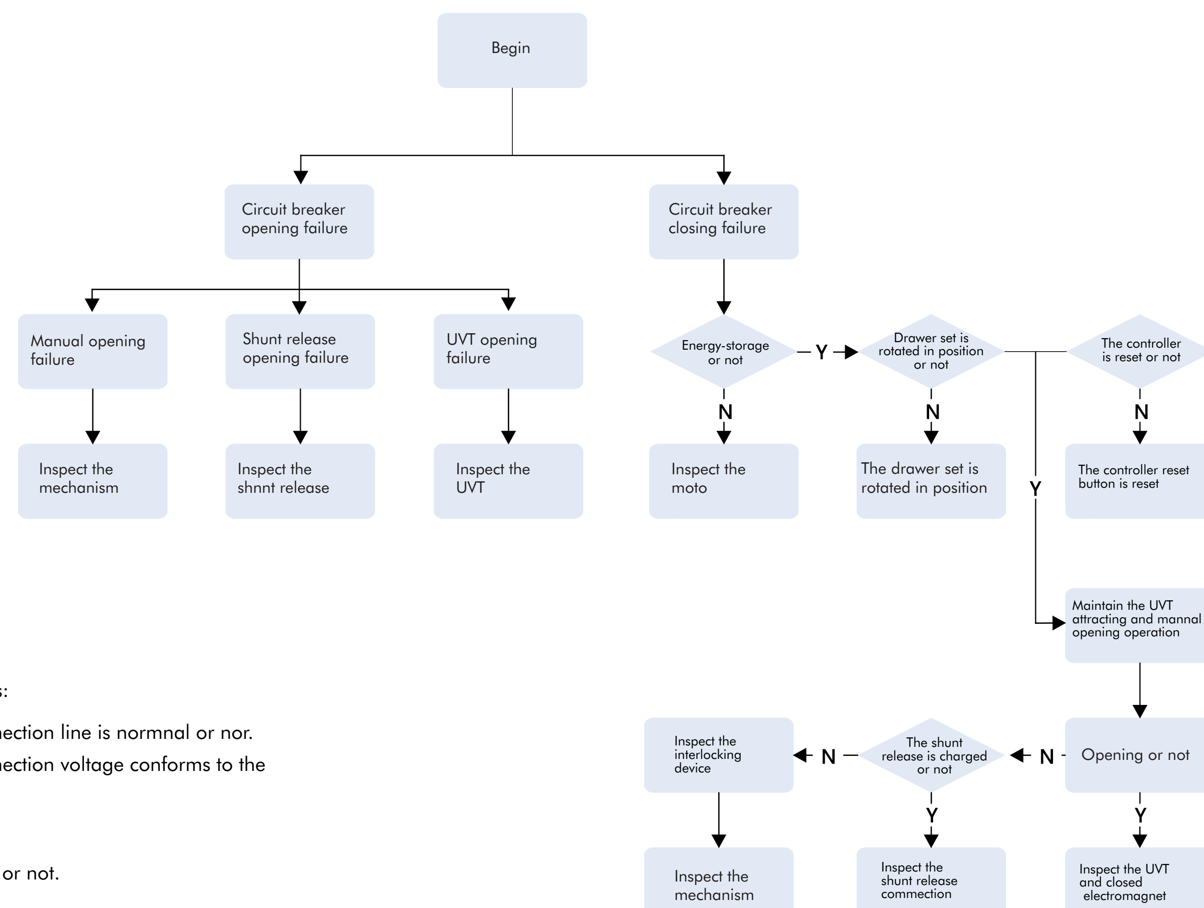
Dismantle the accessories and replace same.

Note: The shunt release should be first dismantled before replacing the NA1-2000 undervoltage release.



17. Common Failure Causes and Solutions

17.1 Troubleshooting logic



Inspect items:

1、The connection line is normnal or nor.

2、The connection voltage conforms to the

requirement or not.

3、The components are damaged or not.
please replace the damaged components

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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

17.2 Faulty tripping analysis (taking NA1-2000X M as an example) Failure cause identification.

The failures are identified through the intelligent controller indication.

· Presss the “Reset” button till it returns to the default display interface.

· Press the”Check”button to enter the query menu interface;

Press the “Enter” button to enter the failure query menu interface; press the” ▼ ”and select the failure record frequency to be viewed, and press the”Enter”button again to query the failure details.

· Presss the “Reset” button to exit from or return to the upper-level menu.

Note: The electrical closing operation is forbidden before troubleshooting.

18. Regular malfunction and solutions

Fault description	Reasons analysis	Maintenance method
Tripping of circuit breaker	Over load tripping (Ir indicator flashing)	1. Check the breaking current value and operation time of intelligent release. 2. Analyze the load and electric network, exclude the overload if it happens. 3. Match the actual operating current with long time-delay current setting value. 4. Press the reset button to reclose the breaker
	Short circuit tripping ("Isd"or"Ii"indicator flashing)	1. Check the breaking current value and operation time of intelligent release. 2. Exclude the short circuit fault if it happens 3. Check the setting value of intelligent release 4. Check the normal state of breaker 5. Press the reset button to reclose the breaker
	Earthing fault tripping (IG indicator flashing)	1. Check the breaking current value and acting time of intelligent release. 2. Exclude the earthing fault if that happens. 3. Match the fault current setting value with the actual protection. 4. Press the reset button to reclose the breaker.
	Under-voltage release fault: 1. Rated working voltage is less than 70%Ue 2. Fault of control unit	1.Check the power is on or not 2.Check the power voltage of under-voltage release, it shouldn't be less than 85%Ue. 3.Replace the control unit of under-voltage release
	Mechanical interlock acting	Check the working state of two circuit breakers fixed with mechanical interlock
The breaker can't be closed	Intelligent release don't reset (panel is raised)	Press the reset button to reclose the breaker
	Secondary circuit of drawerout-type breaker isn't connected	Make the breaker to "making" position ("click" sound will be heard)
	Breaker hasn't stored energy	Check the secondary circuit: 1. Power voltage of motor shouldn't less than 85%Ue. 2. Check the storage mechanism, replace it if necessary.
The breaker can't be closed	Mechanical interlock acting leads to locking of breaker	Check the working state of two circuit breakers fixed with mechanical interlock
	Closing electromagnet: 1.Rated control voltage is less than 85%Us; 2.Closing electromagnet is damaged	1. Power voltage of closing electromagnet shouldn't less than 85%Us. 2. Replace the electromagnet.
Tripping after closing the circuit breaker (Fault indicator flashing)	Tripping immediately: 1. Short circuit current is closed 2.Delay tripping because of transient current is high when closing; 3. Overload current is closed	1. Check the breaking current value and operation time of intelligent release; 2. Exclude the short circuit fault if it happens; 3. Exclude overload fault 4. Check the normal state of breaker 5. Modify the current setting value of intelligent release 6. Press the reset button to reclose the breaker
Circuit breaker can't be opened	The breaker can't be opened manually 1. There is fault with mechanical operating mechanism	1. Check the mechanism, if there is fault happened.
	The breaker can't be opened by motor remotely 1. There is fault with mechanical operating mechanism 2. Power voltage of shunt release is less than 70%Us; 3. Shunt release is damaged	1. Check the mechanism, if there is fault happened. 2. Check the Power voltage of shunt release is less than 70%Us or not 3. Replace shunt release

Fault description	Reasons analysis	Maintenance method
Circuit breaker can't store energy	Manual storage can't be realized	Mechanical fault with the energy-storage device
	Motor storage can't be realized 1. Power voltage of motor energy-stored device is less than 85%Us; 2. There is mechanical fault with energy-storage device	1. Power voltage of motor energy-stored device shouldn't less than 85%Us 2. Mechanical fault with the energy-storage device
Handle of drawerout-type circuit breaker can't be drawn in or out	1. There is padlock at the "opening" position 2. Slideway or breaker body isn't pulled into its position	1. Take away the padlock 2. Pull the slideway or breaker body into its position
Drawerout-type breaker can't be drawn out at the "opening" position	1. Handle isn't pulled out 2. Breaker is not totally at the "opening" position	1. Pull out the handle 2. Keep the circuit breaker totally at "opening" position
Drawerout-type breaker can't reach the "making" position	1. Something drop into the drawer base, and lock the mechanism or mechanism fault happens. 2. Breaker body not match with the frame -size rated current of drawer base	1. Check and clean the drawer base, or contact with manufacturer 2. Match the body with relevant drawer base
No display on intelligent release panel	1. Release isn't connected with power 2. There is fault with release	1. Check the power is connected or not 2. Cut off the power, then connect again. Otherwise contact with manufacturer
	Rated control voltage is less than 85%Us;	Check the electromagnet power voltage shouldn't be less than 85%Us.
Fault indicator still flashing after pressing the Reset button	Fault happened with intelligent release	Cut off the power, then connect again. Otherwise contact with manufacturer

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NA1-1000X~6300X Ordering specification

Customer: Tel: Date:

Quantity:

Model	□ NA1-1000X	□ NA1-2000X □ NA1-2000XN □ NA1-2000XH	□ NA1-3200X □ NA1-3200XN	NA1-4000X	□ NA1-6300X □ NA1-6300XN
Rated current In (A)	□ 200 □ 400 □ 630 □ 800 □ 1000	□ 630 □ 800 □ 1000 □ 1250 □ 1600 □ 2000	□ 2000 □ 2500 □ 3200	□ 4000	□ 4000 □ 5000 □ 6300(no four poles)
Installation mode	□ Drawout type	□ Fixed type (Note: no fixed type when In> 4000A)			
Number of poles	□ Three poles	□ Four poles			

		Protection function	Auxiliary functions	Optional function
Intelligent Controller	□ M type Standard (Default configuration)	1. □ Ir overload long delay, Isd short-circuit short delay inverse time + definite time, Ii transient short-circuit, Ig single-phase grounding 4-section protection 2. □ Ir overload long delay, Isd definite time short-circuit short delay,Ii transient short-circuit, Ig single-phase grounding 4-section protection	1. Ammeter function 2. Self-diagnostic function 3. Tuning function 4. Test function 5 Display function	/
	□ 3M type Multifunctional (Optional configuration)	1. □ Ir overload long delay, Isd short-circuit short delay inverse time + definite time, Ii transient short-circuit, Ig single-phase grounding 4-section protection 2. □ Ir overload long delay, Isd definite time short-circuit short delay,Ii transient short-circuit, Ig single-phase grounding 4-section protection		□ Voltage display □ Frequency display □ Power Factor show □ Active power display □ Load monitoring function Note: For the specific optional function, refer to List of controller functions in the sample (The cost of optional functions will be calculated additionally).
	□ 3H-type Communication type (Optional configuration)	1. □ Ir overload long delay Isd short-circuit short delay inverse time +definite time Ii transient short-circuit, Ig single-phase grounding 4-section protection 2. □ Ir overload long delay, Isd definite time short-circuit short delay, Ii transient short-circuit, Ig single-phase grounding 4-section protection 3. □ with PROFIBUS-DP communication protocol □ with MODBUS communication protocol		
	Notes: Protection function Settable range and conventional factory tuning	Ir long delay current setting range: (0.4 to 1) In Overload 1.5Ir action time setting range: 15,30,60 ...... 480s	! Conventional factory tuning: overload long delay 1.0In ! Conventional factory tuning: overload 1.5Ir; action 15s	
		Isd short delay current setting range: (1.5 to 15) Ir; short delay action time (0.1 ~ 0.4) s	! Conventional factory setting: short delay current 8Ir ; ! Conventional factory tuning: Short delay action time 0.4s [Note: 3M, 3H for (1.5 to 15) Ir]	
		Ii instantaneous current setting range: 1.5In ~ 50kA/65kA/75kA ! Conventional factory tuning: 12In [Note: 3M, 3H for (1.5In~50kA/65kA/75kA)		
		Ig earthing protection current setting range: (0.2 to 0.8) In; the earthing protection time setting range: (0.1to0.4)s ! Conventional factory setting: 0.5 In; OFF		
	Controller power	□ AC380V, □ AC400V, □ AC220V, □ AC230V, □ AC127V, □ DC220V, □ DC110V	(Optional)	
Electrical accessories	Under voltage release	□ AC110V, □ AC220/230V, □ AC380/400V, □ Order____V , □ Non-undervoltage		(No AC110V for NA1-1000X)
		□ Helped & instantaneous □ Helped & delay__s (Inm≥2000A, 1 s, 3 s, 5 s, non-adjustable); □ self-priming & instantaneous □ self-priming & delay __s (Inm≥2000A, 0.3 s~7.5 s,adjustable); Note: Inm=1000A no Helped priming type, delay time 1 s, 3 s, 5 s, 7 s,non-adjustable.		
	Shunt release	□ intermittent (only for Inm≥2000A and default) □ pulse (must select in automatic control system)	□ AC110V, □ AC220/230V, □ AC380/400V, □ DC110V, □ DC220V	
	Closing electromagnet		□ AC110V, □ AC220/230V, □ AC380/400V, □ DC110V, □ DC220V	
	Electric motor	□ AC110V, □ AC220/230V, □ AC380/400V, □ DC110V, □ DC220V		
Special requirements	Interlock device (surcharge)	Mechanical linkage: □ Link interlock □ Cable interlock Door interlock: □ Switch body position door interlock(drawer-type) □ Switch on/off state door interlock	(Optional)	
	Accessories (surcharge)	Key lock: □ 1 lock 1 key □ 2 locks 1 key □ 3 locks 1 key □ 3 locks 2 keys □ 5 locks 3 keys □ Special custom__lock__ key External transformer: □ External N phase transformer [(3P+N)T type □ External leakage zero sequence current transformer (E mode) □ External ground current transformer (W) Module: □ PSU-1 Power module □ RU-1 relay module □ ST-DP protocol converting module □ Position signaling devices (□ Connected □ Test □ Unconnected) □ Mechanical counting device	(Optional)	
	The main circuit connection	□ Horizontal connection (default) □ Vertical connection (with L vertical bus-bar) □ Rotation busbar horizontal connection (Drawer In ≤ 3200) □ Rotation busbar vertical connection (drawer-type In ≤ 3200)	(Optional)	

Note: The casing current, rated current and auxiliary control voltage must be specified when ordering!?
Note: 1) Please mark "√" or fill figure in the relative " □ " if no mark, we will provide according to conventional.
Note: 2) The operational fuction of the intellgent controller and special requirements require additional costs.
Tel.:0577-62877777-6213 Fax :0577-62877777-6288?

Configuration instructions

1. NA1-2000X~6300X fundamental configurations
   a. Motor-driven:
      Under-voltage instantaneous release;
      Shunt release;
      Closing electromagnet;
      4 suits of transform contact;
      Motor driven operating mechanism;
      M-type Intelligent Controller;
      Horizontal wiring of main circuit;
      Doorcase;
      Element of main circuit;
      Operating instructions of M-type Intelligent Controller
      Operating instructions of Air Circuit Breaker;
      Packing box;
      Drawer seat (Drawout type)

   b. Manual:
      Under-voltage instantaneous release;
      4 suits of transform contact;
      M-type Intelligent Controller;
      Horizontal wiring of main circuit;
      Doorcase;
      Element of main circuit;
      Operating instructions of M-type Intelligent Controller
      Operating instructions of Air Circuit Breaker;
      Packing box;
      Drawer seat(Drawout type)

2. NA1-1000X fundamental configurations
   a. Motor-driven:
      Under-voltage instantaneous release;
      Shunt release;
      Closing electromagnet;
      Motor driven operating mechanism;
      4 normal open and 4 normal close auxiliary contacts;
      M-type Intelligent Controller;
      Closing and breaking push button lock;
      Horizontal wiring of main circuit;
      Doorcase;
      Element of main circuit;
      Operating instructions of Air Circuit Breaker;
      Packing box;
      Drawer seat(Drawout type)

   b. Manual:
      Under-voltage instantaneous release;
      4 normal open and 4 normal close auxiliary contacts;
      M-type Intelligent Controller;
      Horizontal wiring of main circuit;
      Closing and breaking push button lock;
      Doorcase;
      Element of main circuit;
      Operating instructions of Air Circuit Breaker;
      Packing box;
      Drawer seat(Drawout type)

3. NA1-2000X~6300X operational configuration
   (additional costs)
   Nonadjustable under voltage delayed release (1s, 3s, 5s);
   Connecting-rod type mechanical interlock (for drawout type);
   Wire-cable mechanical interlock; Button lock; Key lock;
   Door interlock'Locking device;
   External current transformer earthing protection;
   Vertical busbar;
   Rotating busbar (IN≤3200);
   3NO (normal open) and 3NC (normal close) contacts;
   4NO and 4NC contacts; 5 groups changeover contacts;
   3 groups changeover contacts; H type intelligent controller;
   Position signal; Counter; Protecting cover (NA1-2000);
   Double power controller.

4. NA1-1000X operational configuration (additional costs)
   Under voltage delayed release; wire-cable mechanical interlock;
   key lock; External current transformer earthing protection;
   Vertical busbar; 6 groups changeover contacts;
   H type intelligent controller; Phases barrier, position signal

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Note

CHINT
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Asia Pacific

China | Global HQ
Zhejiang CHINT Electrics Co., Ltd.

Address:A3 Building, No. 3655 Sixian Road, Songjiang Shanghai 201614.
Tel: +86 21 5677 7777
Fax: +86 21 5677 7777
Email: global-sales@chintglobal.com
Website: www.chintglobal.com

Singapore | Asia Pacific HQ
CHINT Global Pte Ltd

Address: 8 Kallang Avenue, #04-06/09 Aperia Office Tower 1, Singapore 339509.
Tel: +65 6329 3110
Fax: +65 6329 3159
Website: www.chintglobal.com

Sunlight Electrical Pte Ltd

Address: 1 Third Chin Bee Road, Singapore 618679.
Tel: +65 6741 9055
Fax : +65 6265 4586
Email: sales@sunlightgroup.com
Website: www.sunlightgroup.com

India
CHINT India Energy Solution Private Limited

Address: Discovery Tower, Plot No. A-17, Ground Floor Industrial Area Sector 62
Noida, India 201309.
Tel: +91 1202 9750 57
Email: marketing@chint.co.in
Website: www.chint.co.in

Philippines
CHINT Electric Co., Ltd

Address: Unit 201, Taipan Place, F. Ortigas Jr. Road, Ortigas Center, Pasig City,
Metro Manila, Philippines.
Tel: +63 967 273 0174 / +63 977 017 6320
Email: liq07@chintglobal.com / wencell@chintglobal.com
Website: www.chintglobal.com

Indonesia
PT. CHINT Indonesia

Address: Kompleks Prima Center I, Blok C9-10, Jl. Pesing Poglar Jl. Pool PPD No. 11,
RT.9/RW.2, Cengkareng, Jakarta Barat.
Tel: +62 21 5436 3000
Email: sales@chint-indonesia.com
Website: www.chint-Indonesia.com

Vietnam
CHINT Vietnam Holding Co., Ltd

Address: So 2Bis-4-6, Le Thanh Ton, P. Ben Nghe Quan 1, Ho Chi Minh, Vietnam.
Tel: +84 0283 8270 015
Email: marketing.vn@chintglobal.com
Website: www.chintglobal.vn

Sunlight Electrical (VN) Co., Ltd

Address: 20 Doc Lap Ave, VSIP, Thuan An City, Binh Duong Province, Vietnam.
Tel: +84 0274 3743 505
Email: sales.sev@sunlightgroup-vn.com.vn
Website: www.sunlightvetnam.com.vn

Cambodia
CHINT (Cambodia) Power Equipment Co., Ltd

Address: No.15, St. 542, Sangkat Boeung Kok 1, Khan Toul Kork, Phnom Penh,
Cambodia.
Tel: +855 23 231 077
Email: lbin3@chintglobal.com
Website: www.chintglobal.com

SchneiTec CHINT Co., Ltd

Address: Ansor Kdam Village, Sna Ansa Commune, Krakor District, Pursat Province,
Cambodia
Tel: +855 09 5353 268
Email: liubin@schneitec-chint.com.kh / info@schneitec-chint.com.kh
Website: www.schneitec-chint.com.kh

Latin America

Brazil
CHINT Elétricos América do Sul Ltda.

Add: Av. Paulista, 1765 - Edifício Scarpa - Conjunto 22 , Bela Vista - CEP
01311-200 - São Paulo - SP
Tel. : +55 (11) 3266-7786
E-mail: chintbr@chint.com

Peru
CHINT LATAM (PERU) S.A.C.

Add: Av. Camino Real No.348, Torre El Pilar, Oficina 603, San Isidro, Lima 27,
Peru
Tel: +51 1 763 4917
Email: chintlatamperu@chint.com

Ecuador
CHINT ELECTRICS (HONG KONG) LIMITED (Ecaudor Branch)

Add.: Calle: REP.DEL SALVADOR Número: 10-84 Intersección: AV NACIONES
UNIDAS
Edificio: CENTRO COMERCIAL MANSION BLANCA
E-mail: lufz@chintglobal.com

FAMCO
هایپرصنعت

CHINT
Empower the World

Europe

Italy
CHINT Italia Investment Srl

Add: Via Bruno Maderna 7 30174 Venezia
Tel: +39 041.446614
Fax +39 041.5845900
E-mail: info@chint.it

Czech Republic
NOARK Electric Europe s.r.o.

Add: Sezemická 2757/2, 193 00 Prague 9
Tel: +420 226 203 120
Email: europe@noark-electric.com

Spain
CHINT Electrics S.L.

Add: Calle José Echegaray, Num 8.Parque Empresarial Las RozasEdifificio 3, Planta Baja, Ofificina 7-8.C.P: 28232 Las Rozas (Madrid)
Tel: +34 91 645 03 53
E-mail: info@chint.eu

Turkey
CHINT Turca Elektrik Sanayi VE Ticaret Anonim Sirketi

Add: Zumrutevler Mahallesi Ural Sokak No. 22/18 NAS PLAZA B Block KAT 1, Maltepe, Istanbul
Tel: +90216 621 00 55
Fax.:+90216 621 00 50
E-mail: fatura@chint.com.tr

West Asia & Africa

Egypt
CHINT Electrics (Egypt) Co., Ltd

Add: Building B16 - Smart village, Abu Rawash - Giza, Egypt
Tel: +20 1097173769
P.O BOX : 00202
Email: chinteg@chintglobal.com

U.A.E
CHINT MIDDLE EAST AND AFRICA DMCC

Add: Unit No: 2101, 21085,2109 , Jumeirah business center 1, Cluster G, Jumeirah Lakes Towers, Dubai, UAE
Tel: +97145571532
P.O BOX: 337555
E-mail: global-sales@chint.com

Kenya
ZHENGTAI ELECTRICS(KENYA) CO., LIMITED

Add: OFFICE 1A, 8TH FLOOR, KISM TOWERS, LR No. 209/945/1– NGONG ROAD – NAIROBI, KENYA
Tel: +254 072256485
Email: chintkenya@chintglobal.com

Nigeria
CHINT POWER & ENERGY SERVICES CO., LIMITED

Add: 3RD FLOOR TOWER 2, CHURGATE BUILDING , VICTORIA ISLAND, LAGOS
Tel: +234 8110728119
E-mail: czjie@chintglobal.com

North America

United States
NOARK Electric (USA) Inc

Add: 2188 Pomona Blvd., Pomona, CA 91768
Tel: 626-330-7007
Fax: 626-330-8035
E-mail: nasales@noark-electric.com

Mexico
CHINT SOLAR MEXICO S DE RL DE CV

Add: Miguel Cervantes Saavedra 169 Piso 11 Col. Granada Del. Miguel Hidalgo C.P. 11520 CDMX, México
Tel: +52 1-55-8881-6127
E-mail: info@chint-mexico.com

Chint Global

CHINT GLOBAL PTE. LTD.
Building A3, 3655 SiXian Road, Songjiang District, Shanghai, China

Tel: +86-21-5677 7777 Web: www.chintglobal.com
E-mail: global-sales@chintglobal.com

A CHINT COMPANY

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CHINT
Empower the World

NA8 Air Circuit Breaker

ABOUT CHINT

CHINT A leading global provider of smart energy solutions

CHINT was established 38 years ago in 1984 and built from the capital of approximately 8,000 US dollars. With our rapid development these years, CHINT has become the world's leading intelligent energy solutions provider for the whole industrial chain with the most complete product ranges. In 2021, our annual sales revenue exceeded 16.1 billion dollars and total assets of more than 16.2 billion.

Over two decades of global expansion, our business network covers more than 140 countries and regions worldwide in business industries of low-voltage electric, power transmission and distribution, smart technology, energy instruments and meters, green energy, solar and more. CHINT has more than 40,000 employees worldwide, creating more than 200,000 jobs in the industrial chains.

As the market localization progresses steadily, CHINT Global further establishes its supply chain through business integration and industrial upgrade. Optimizing the service system and project financing, providing innovatively integrated technical services for the global energy market, and a flexible working business model.energy, intelligent manufacturing and digital technology, CHINT has adopted “One Cloud & Two Nets” as the business strategy, takes "CHINT Cloud" as the carrier of intelligent technology and data application, and takes the lead in building the energy Internet of things (EIoT) and industrial Internet of things platforms (IIoT).

Focusing on the energy system of supply, storage, transmission, distribution and consumption, CHINT has core businesses of clean energy, energy distribution, big data and energy value-added services. Furthermore, CHINT’s pillar businesses include photovoltaic equipment, energy storage, power transmission & distribution, low-voltage apparatuses, intelligent terminals, software development and control automation. By developing into a platform-based enterprise, CHINT provides a package of energy solutions for public institutions, industrial & commercial users and end-users, by building a regional smart energy operation ecosphere.

Main Businesses

- Clean Energy
- Low-voltage Apparatus
- Power Transmission and Distribution
- Instrumentation and Apparatus
- Smart Home
- Intelligent Building
- Intelligent Manufacturing
- Industry Automation
- Smart Heating
- Smart Water
- Home Electrical Apparatus
- Energy Efficiency Management

ABOUT CHINT LOW VOLTAGE

Zhejiang CHINT Electrics Co., Ltd. is a wholly owned subsidiary of CHINT Group. Cultivating R&D, manufacturing and sales of low-voltage products, we provide system solutions for building, power supply, hoisting, HVAC, telecommunication and other industrial customers. For nearly 40 years since its founding, CHINT Electrics has provided reliable products and services to over 140 countries and regions. Today, CHINT has grown to be one of the world's renowned low-voltage brands.

CHINT Honors

2022

- "AAAAA" standardized good behavior certificate
- "Global Partnership" and "Countries along the Belt and Road" in the "2021 Best
- Practices for Realizing the Sustainable Development Goals".
  CSR Impact Leading Enterprise

2021

- No. 1 in " China's Top 100 Private Enterprises with Social Responsibility" in 2021
- For 8 consecutive years, CHINT has won the sales champion of Tmall double 11 in electrical and hardware industry
- No. 92 in "2021 China's Top 500 Private Enterprises".
- No. 244 in "2021 Top 500 Chinese Enterprises"
- The intelligent manufacturing factory of low-voltage electrical appliances was selected as the national "2021 Intelligent Manufacturing Demonstration Factory".

2020

- CHINT was selected in the 2020 Zhejiang Province "Future Factory" recognized list, and was rated as the leading " Leading Goose Factory".
- The key inverter technology of CHINT won the second prize of China Electric Power Science and Technology.
- CHINT Astrometry was selected as the smart PV demonstration enterprise list of the Ministry of Industry and Information Technology and won the honor of "Influential PV cell/module brand", "Influential PV EPC / End User", "Influential PV power station operation and maintenance brand".

2019

- National Green Factory
- National Industrial Design Center of the MIIT
- Global Top 20 PV Enterprise
- China's Top 10 Successful PV Enterprise
- Top 100 Innovative Enterprises in Zhejiang Province
- Technology innovation system was awarded the 2018 Science and Technology Progress Award in Zhejiang

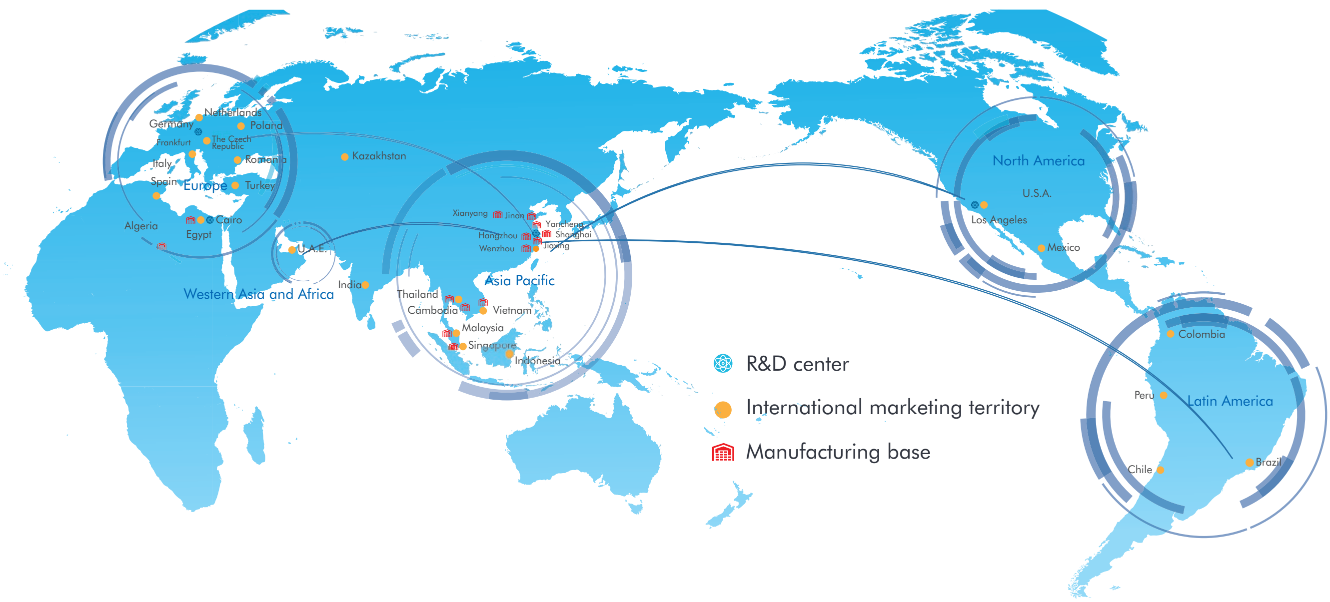
Qualification Certification

The products have been accredited through China Compulsory Certification (CCC) as well as UL of US, CE of EU, VDE and TÜV of Germany, KEMA of Netherlands, RCM of Australia, RCC of South Africa and other international product certifications.

TÜV Rheinland | KEMA EUR | DVE | CE | RCC | SNI

FAMCO
هایپرصنعت

GLOBAL FOOTPRINT



4 National R&D Centers: North America, Europe, Asia Pacific, North Africa

6 International Marketing Territories: Asia Pacific, Western Asia and Africa, Europe, Latin America, North America, China

14 Manufacturing Bases: China (Wenzhou, Hangzhou, Shanghai, Jiaxing, Xianyang, Jinan, Yancheng), Thailand, Singapore, Vietnam, Malaysia, Egypt, Algeria and Cambodia

20+ International Logistics Centers

2300+ Sales Companies

GLOBAL CAPACITY LAYOUT

The industrial manufacturing bases are mainly located in Wenzhou, Hangzhou, Shanghai, Jiaxiang, Xianyang and Yancheng. Additionally, CHINT has set up factories in Thailand, Singapore, Vietnam, Malaysia, Egypt, Cambodia etc.


Wenzhou Manufacturing Base


Hangzhou Manufacturing Base


Shanghai Manufacturing Base


Jiaxing Manufacturing Base


Xianyang Manufacturing Base


Jinan Cable Manufacturing Base


Yancheng New Energy Manufacturing Base


Wuhan Manufacturing Base


Singapore Complete Electric Equipment Manufacturing Base


Vietnam Manufacturing Base


Malaysia Manufacturing Base


Egypt Manufacturing Base


Algerian Manufacturing Base


Cambodia Manufacturing Base


Thailand Solar Power Manufacturing Base

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

R&D, QUALITY, SALES, LOGISTICS

Main Advantages

Global R&D System

CHINT has established national R&D centers in North America, Europe, Asia Pacific, North Africa and other areas. We have explored the mode of Industry-University Research Institute Collaboration and Integration together with the universities and research institutions worldwide so as to integrate the global innovation resources and promote corporate R&D innovation and talent cultivation.

- 24 research institutes
- The average annual R&D investment accounts for 4-12% of the revenue
- Over 6000 patents in total

Global Certification

The products have passed the standards and specifications in various regions around the world and obtained numerous international certifications

c UL US LISTED · KEMA EUR · EAC · DVE · Intertek · Intertek · CE · RCC · SNI

Honors

- No. 1 in China's Top 100 Private Enterprises with Social Responsibility in 2021
- No. 92 in 2021 China's Top 500 Private Enterprises
- No. 244 in 2021 Top 500 Chinese Enterprises
- The intelligent manufacturing factory of low-voltage electrical appliances was selected as the national 2021 Intelligent Manufacturing Demonstration Factory

Integrated Vertical R&D

By gathering the global industry elites to Provide safe and stable energy-saving green and advanced electric products.

5% At least 5% of revenue is invested in research and development

Great Quality System

Ensuring flaw-fraw-free and trouble-free products, the multi-dimensional and multilevel control is conducted through procurement, inspection, quality control and certification.

One-stop Services

CHINT's concept is that it is not difficult to fulfill a high-quality logistics distribution at one time, while it is difficult to stay as accurat e and prompt as the first-time. High-efficiency and high-precision accuracy are our requirement.

48-Hour Response

Providing end-to-end one-stop services for customers with complains, business consulting and technical support by solving problems immediately and including any possible problems in advance.

48 hour Global Services

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبروی پالایشگاه نفت پارس، پلاک ۱۲

FAMCO هایپرصنعت

CHINT

Air Circuit Breaker

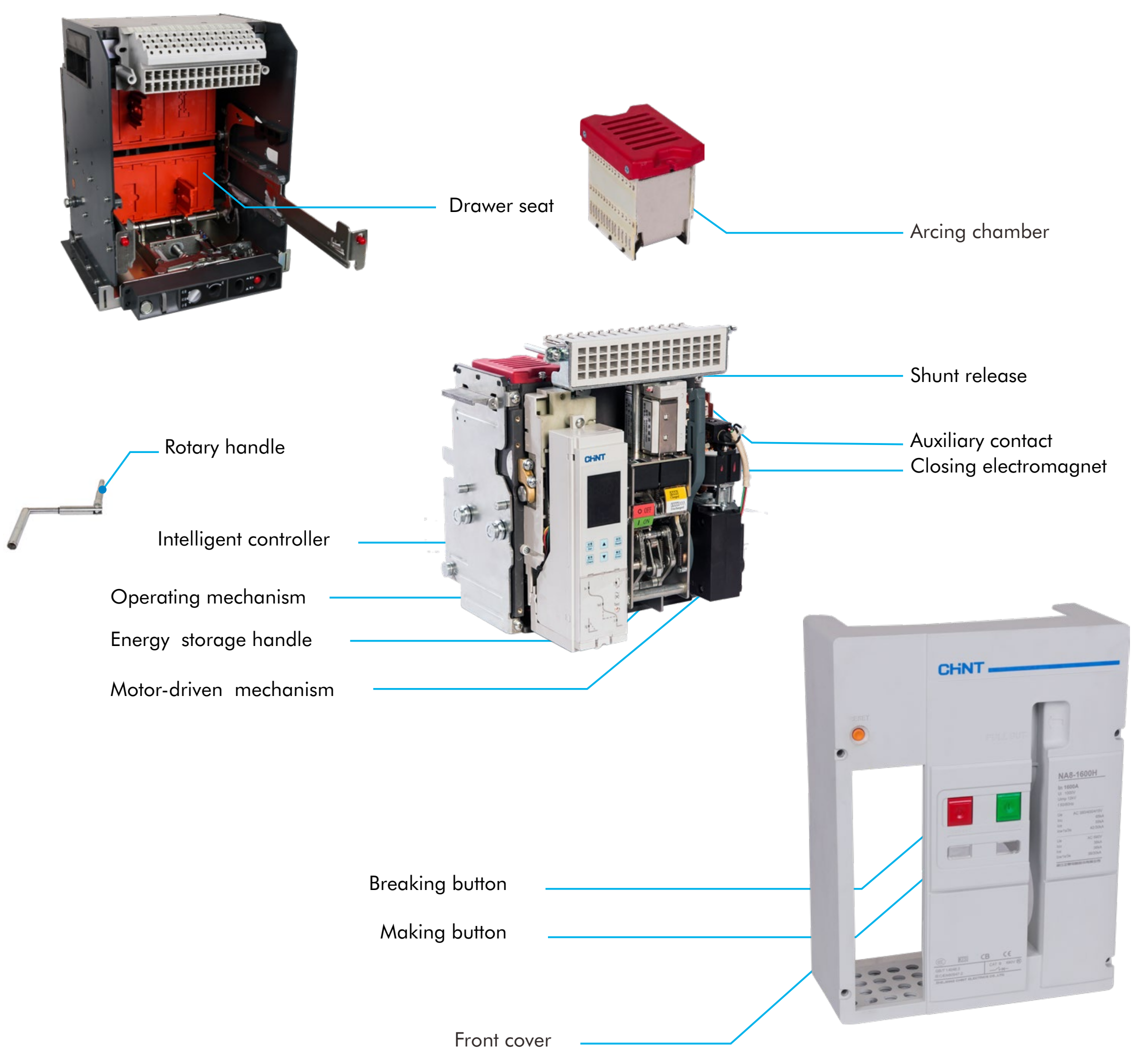
ACB


NA8


NA1

NA8 Air Circuit Breaker

Structural Features of Circuit Breaker



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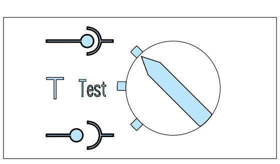
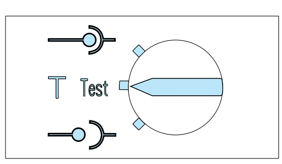
P- 002 Air Circuit Breaker | **NA8**

Identification of Circuit Breaker Panel

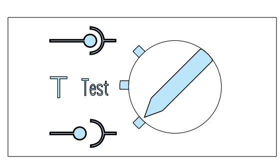
1	Trademark	9	Draw-out plate
2	Secondary wiring terminal	10	Three-position locking device
3	Breaking button	11	Drawer padlock
4	Energy- storage handle	12	Racking- handle entry
5	Making button	13	Position indicator
6	Name plate	14	Rotary handle storage hole
7	Energy-storage/release indicator	15	Intelligent controller
8	Breaking/Making indicator	16	Fault-breaking indicator reset button



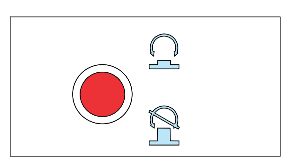
: "Connected" position, main circuit and secondary circuit are both connected



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.

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group

Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲

تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

Circuit Breaker

- Frame size (A): 1600, 2500, 4000, 7500
- Two kinds of breaking capacity: N, H (for 7500)
- Rated voltage Ue (VAC): 380/400/415, 690, 800, 1000/1150
- 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℃ ~+40℃ (certified), and also peripheral ambient temperature -45℃ ~+70℃ (M type), -20℃ ~+70℃ (H type).

- For specific derating factor, see P23.

Storage conditions: Applicable for -45℃ ~+70℃ .

- 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

C

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
  - Under-voltage delay release-zero:UVTZ

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	N	■	■	■	■	■	■	■							
NA8-2500	N、H、HU			■	■	■	■	■	■	■					
NA8-4000	N、H、HU							■	■	■	■	■			
NA8-7500	N、H											■	■	■	■

NA8 Product Model Definition and Explanations

NA8 - 1600 N - 1600 - M / 3 MO D 230VAC - OTHER

NA8	1600	N	1600	M	3	MO	D	230VAC	OTHER
Product code	Frame current	Breaking capacity code	Rated current	Intelligent controller code	Number of poles code	Operation mode code	Mounting mode code	Control circuit voltage code	Special requirement code
	1600	N: standard type	200	M: basic type (digital display type)	3: three poles	MO: motor-driven operation	D: draw-out type	230VAC: AC 230 V	None: no special requirement
	2500	H: higher type	400	H: communication type (LCD display type)	4: four poles	MN: manual operation	F: fixed type	400VAC: AC 400 V	special requirement, like: KL : key lock
	4000	HU: High voltage type	630					110VDC: DC 110 V	
	7500		800					220VDC: DC 220 V	
			1000						
			1250						
			1600						
			2000						
			2500						
			3200						
			4000						
			5000						
			6300						
			7500						

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 ntelligent controller, 3poles,motor-driven operation, draw-out type, control voltage AC230V.

NA8 Accessory Model Definition and Explanations (1)

NA8 - 1600 - CC - 230VAC

NA8	1600	CC	230VAC
Product code	Frame current	Accessory code	Rated voltage code
	1600	CC: closing electromagnet	230VAC: AC230V
	2500	ST: shunt release	400VAC: AC400V
	2500 ~ 7500	UVT: undervoltage instantaneous release	110VDC: DC110V
	4000 ~ 7500	MO: motor-driven mechanism	220VDC: DC220V
		UVTD: undervoltage time delay release	
		UVTZ ,Under-voltage delay release-zero	

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)	

C

Main Technical Parameters of Circuit Breaker

Characteristics

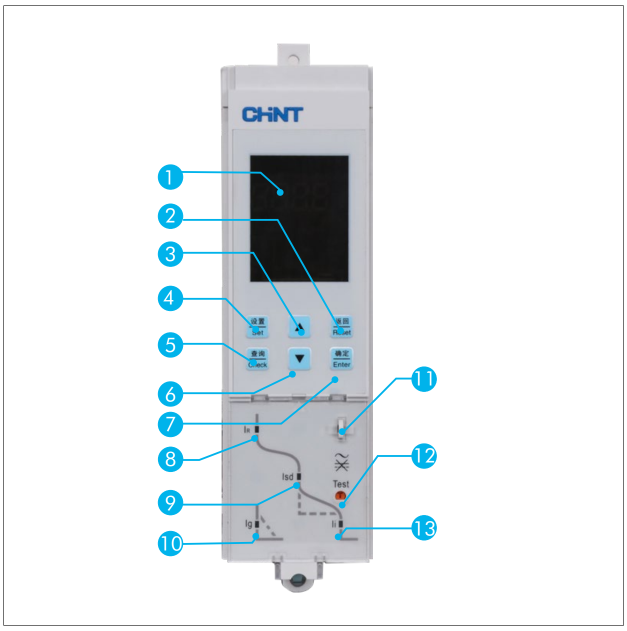
Number of poles	3/4	
Rated operational voltage Ue (V)	380/400/415、690、800、1000/1150V	
Rated insulation voltage Ui (V)	1000、1250、1500	
Rated impulse withstand voltage Uimp (kV)	12	
Rated frequency (Hz)	50/60	
Flashover distance (mm)	0	
Suitability for isolation	IEC/EN 60947-2	Applicable
Pollution grade	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、800V、1000/1150V
Rated service short-circuit breaking capacity (kA rms) VAC 50/60H z	Ics		380/400/415V、690V、800V、1000/1150V
Utilization category			
Rated short- time withstand current (kA rms) VAC 50/60Hz	Icw	1s	380/400/415V、690V、800V、1000/1150V
	Icw	3s	380/400/415V、690V
Rated short-circuit making capacity (kA peak) VAC 50/60Hz	Icm		380/400/415V、690V、800V、1000/1150V
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							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 (415V)		N (690V)					N(415V)	N(690V)	H(415V)	H(690V)	HU(800V)	HU(1000V/1150V)	
	65		36					66	55	85	65	65	55	
	50		36					66	55	85	65	65	55	
	B									B				
	50							66	55	85	65	65	55	
	30		30					-	-	50	50	-	-	
	143		76					145	121	187	143	143	121	
	10							16						
	20 ~ 30							20 ~ 30						
	30 ~ 40							30 ~ 40						
	20000							20000						
	8000 (415V)		3000 (690V)					8000 (415V)		4000 (690V)			2000 (1150V)	
	■							■						
	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			
N(415V)	N(690V)	H(415V)	H(690V)	HU(800V)	HU(1000/1150V)	N (440V)	N (690V)	H (440V)	H (690V)	N(440V)	N (690V)	H (440V)	H (690V)
85	75	100	85	75	65	135	100	150	100	135	100	150	100
85	75	100	85	75	65	135	100	135	100	135	100	150	100
		B				B							
85	75	100	85	75	65	135	100	135	100	135	100	135	100
-	-	75	75	-	-	100	100	100	100	100	100	100	100
187	165	220	187	165	143	297	220	330	220	297	220	330	220
26						26							
20 ~ 30						20 ~ 30							
30 ~ 40						30 ~ 45							
10000						1000							
6000 (415V)	3000 (690V)		600 (1150V)			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



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-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.

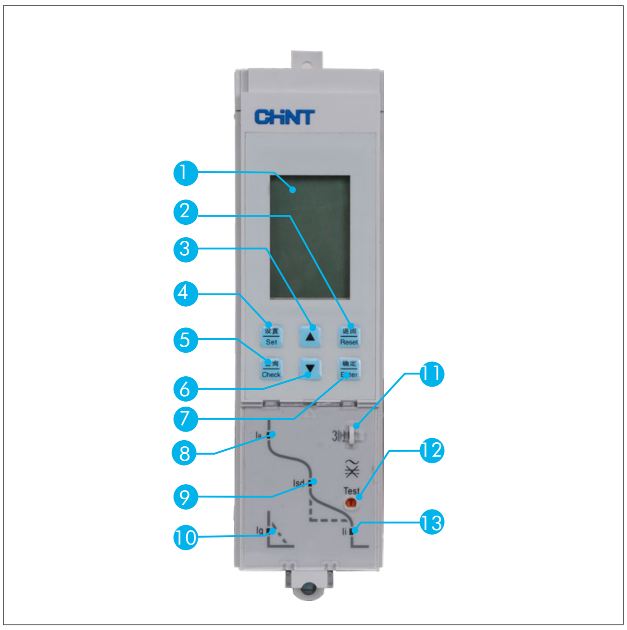
9 Isd indicator for short circuit short-time-delay tripping.

10 Ig indicator for earth fault tripping.

11 Cover lock hole

12 Button for tripping test

13 Ii indicator for short-circuit instantaneous tripping.



1 Display window: display the current value, setting parameter, fault current, tripping time, etc.

2 Return button: exit from current menu and enter the upper3.8-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

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 10times.

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

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

□ 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(HRUh), 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).

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

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				±15%				
Long time-delay setting step size	1A (1600-2500 Frame size) ; 2A(4000-7500 Frame size)								
Long time-delay setting time tr	(1-2- 4-8 -12-16-20 -24 -30)s				±10%				
Anti-time-limit characteristic curve	$t=(\frac{6}{N})^2\times tr$								
Fault current	**Action time**								
I< 0.85Ii	No action								
I> 1.l5Ii	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/Ir
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 1.0In;
Conventional factory setting: overload 6Ir; operating time 2s
Example: Given that overload long time delay current 1.0In, delay time 2s (at 6Ir), now line current I=1.8In, actual fault operating delay time t may be calculated:
N =1.8In/1.0In=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.l5Isd	Time-delay action		
Isd < I≤10I	Anti-time-limit	Action characteristics$I^2t=(10Ir)^2tsd$	
		Setting times0.1、0.2、0.3、0.4	
1≥1.1Isd	Definite-time-limit	Setting times0.11、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: Isd --- short time delay current set value
I --- fault current
Ir --- long time delay set value
t --- fault operating delay time
tsd --- short time delay inverse time-delay set value
Operating time permissible error±15%
Conventional factory setting: short time delay current 8Ir
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 Ii	(2~1 5) In+OFF
Short time-delay setting step size	1A (1600-2500 Frame size) ; 2A(4000-7500 Frame size)
Operating characteristics	I < 0.85Ii No action
	I > 1.15Ii Action
	≤100ms Action time

C

Earth Fault Protection Characteristic

Earth fault protection operating threshold

<0.9Ig: no action;

>1.1Ig: action;

NA8 -1600\2500: 0.2In~1.0In + 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	$t=\frac{(I_g)^2}{I^2}\times tg$				

Notes: Ig — earth protection setting, NA8-1600\2500 default factory setting Ig =0.5In , 4000\7500 default factory setting Ig =800A
I --- fault current
T --- fault operating delay time
tg --- earth inverse time-delay set value
Inverse time-delay operating time permissible error±15%
Conventional factory setting: OFF

Controller Minimum Factory Display Current

Frame	Rated current	Minimum display value
1600	400~1600	80
2500	630 ~ 2500	80
≥4000	≥1600	160

Measuring Accuracy of Intelligent Controller

Current measurement	
Measuring range	Ia, Ib, Ic and I_N not more than 15In (circuit breaker rated current)
Measuring accuracy	Below 0.1In, measurement is inaccurate.
	0.1In~0.4In, the accuracy will linearly change from 5% to 2%.
	0.4In~1.5In, the accuracy is 2%.
	> 1.5In, 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: ±0.1Hz

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

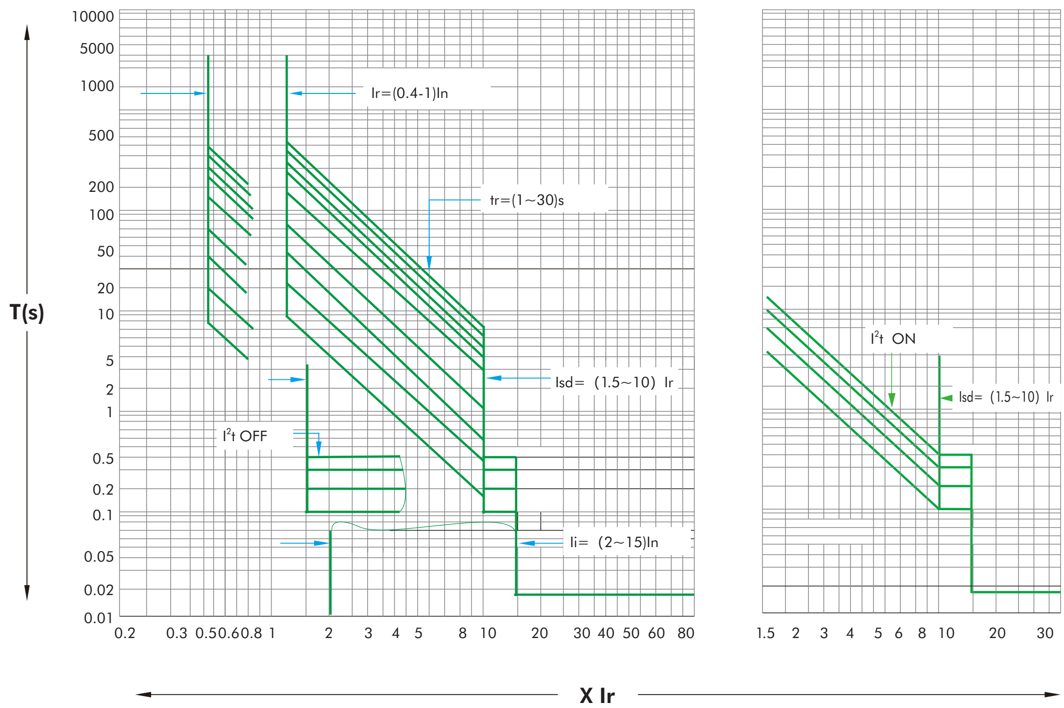


Fig.1 Overcurrent protection curves

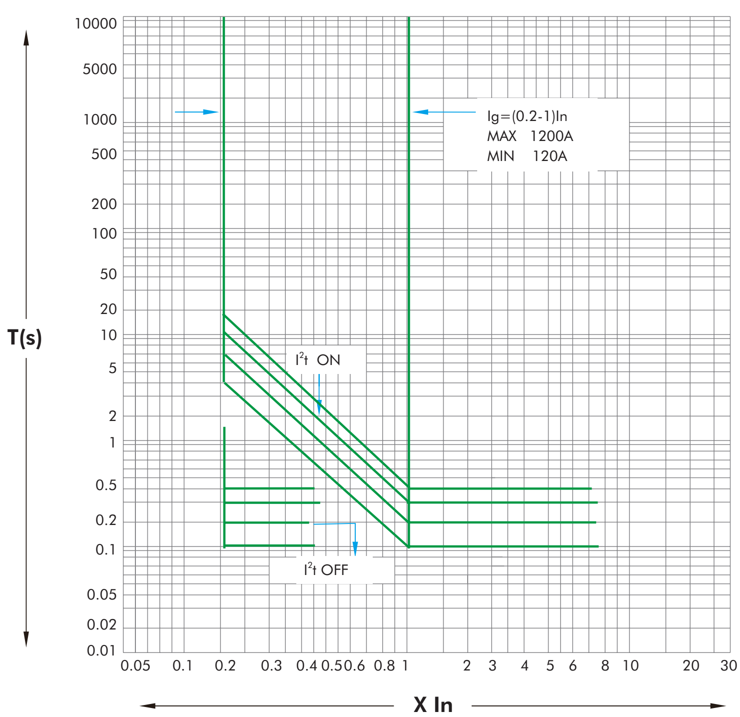
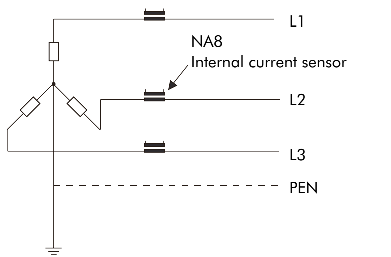


Fig.2 Asymmetrical earth fault protection curves

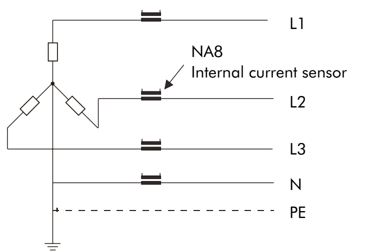
Explanations on Earth Fault Protection

Single Phase Earth Fault Protection

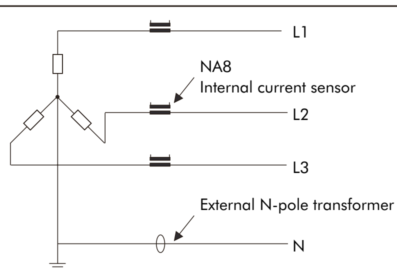
□ The three-pole circuit breaker realizes earth protection through testing whether the three-phase current vector sum is zero or not via internal three current transformers.



● 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.

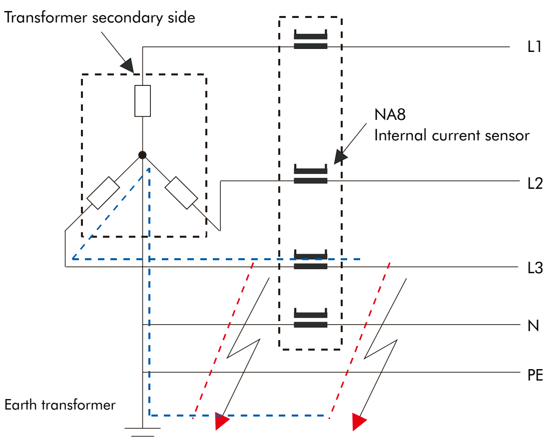


Notes: ① The external N-phase current transformer is special transformer configured by the company, and the default lead wire is 2m long.

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.

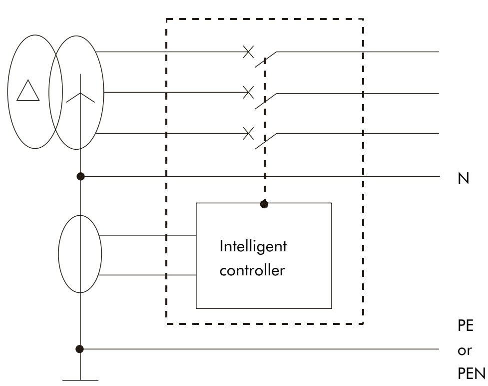
As show below, a load side fault of NA8 circuit breaker: The fault current only flows through one phase. If the three-phase current vector sum detected by 4 current sensors is higher than the set threshold, the intelligent control unit will activate the differential earth protection function. Such earth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



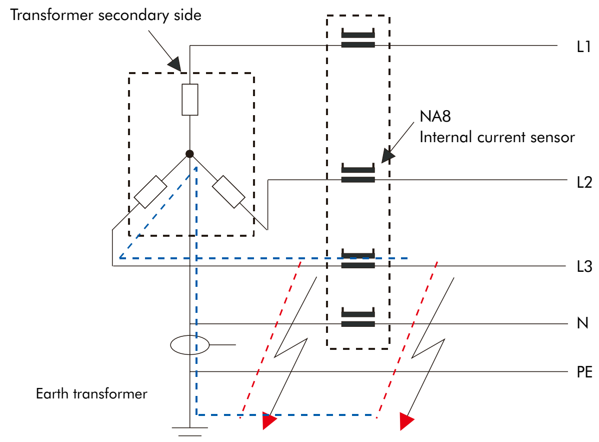
C

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.



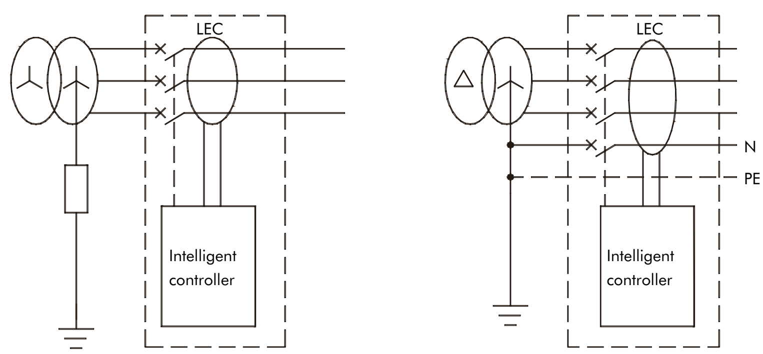
As shown below, through installing the external earth transformer, the earth fault at the power supply side of circuit breaker can be checked, and the earth fault at the load side of NA8 circuit breaker can also be detected.



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.

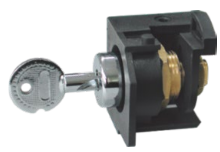
Leakage current I△n	[A]0.5-1-2-3-5-7-10-20-30
Tripping time △t	[S]0.06-0.17-0.25-0.33-0.42-0.58-0.75-0.83



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 ≤3200A,

Accessory: Lock



Key Lock KL

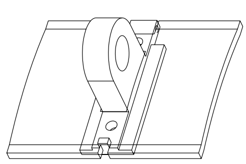
There are 3 kinds of key lock (The later two kinds are used in the distribution system of two incoming cabinets and one connection cabinet):
one lock one key (1S1S)
two locks one key (2S1S)
three locks two keys (3S2S)

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

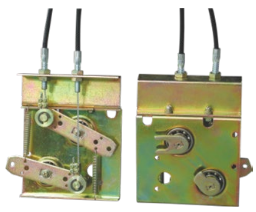
When the circuit breaker is closed, it is forbidden to open the switchgear door; when the circuit breaker is opened, it is allowed to open the switchgear door.

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

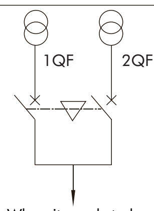
Pushbutton lock: used to lock up the mechanical button opening and closing the circuit breaker, and the padlock is used. After locking, manual opening and closing operation couldn't be done. (the padlock should be self-prepared by the user).



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.

Circuit diagram

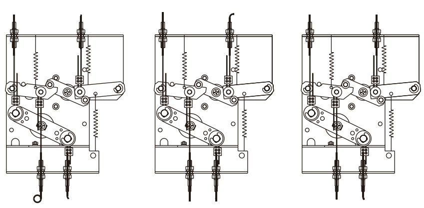


Possible mode of operation

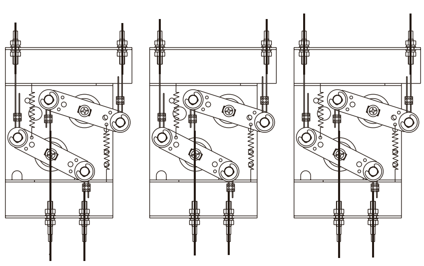
1QF	2QF
0	0
0	1
1	0

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.

ILK -3 three interlock diagram



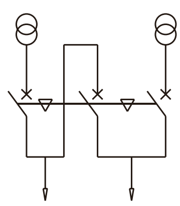
ILK -4 three interlock diagram



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

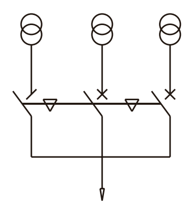
ILK-3 three interlock Circuit diagram



Possible mode of operation

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

ILK- 4 three interlock Circuit diagram

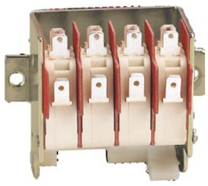


Possible mode of operation

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

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.

C

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&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

2500、4000~7500 frame CC&ST

Shunt release (ST)

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

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.

C

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبروی پالایشگاه نفت پارس، پلاک ۱۲

Capacticy Derating and Power Loss

NA8-1600

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°	-	-	-	-	-	-	-	-	-	-	-	-	1485	1540
55°	-	-	-	-	-	-	-	-	950	950	1150	1200	1390	1450
60°	-	-	-	-	580	580	700	700	900	900	1050	1100	1320	1370

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°	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50°	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55°	-	-	-	-	-	-	-	-	1500	1520	1850	1850	2420	2450
60°	-	-	-	-	-	-	-	-	1400	1420	1720	1750	2290	2320

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)	Uimp	12	11	10	8
Average insulation grade (V)	Ui	1000	900	800	700
Power frequency withstand voltage (V)		2200	2100	1950	1760
Maximum operational voltage (V)	Ue	690	580	520	460

Current performance corrections under different altitudes

Altitude (m)	Rated operating current (Ie)
2000	1.0Ie
2500	0.96Ie
3000	0.93Ie
3500	0.89Ie
4000	0.75Ie
4500	0.82Ie
5000	The factory must be contacted for confirmation

Note: If the ambient temperature is lower than 40 ℃ , Ie = In ; if the ambient temperature is higher than 40 ℃ , derating use must be done in strict accordance with the requirement of operation manual; in such case, Ie ≠ In , Ie and In can be looked up according to the temperature derating table.

Power loss

Power loss is the power consumption measured at In, 50/60 Hz.

Frame	Rated current (A)	Power loss of draw-out type (W)	Power loss of fixed type (W)
1600A	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) ℃ Recommended busbar specification				Ambient temperature 50℃ Recommended busbar specification				Ambient temperature 60℃ Recommended busbar specification			
		Width	Thickness	Number of panels	Specification	Width	Thickness	Number of panels	Specification	Width	Thickness	Number of panels	Specification
1600A	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	800	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).

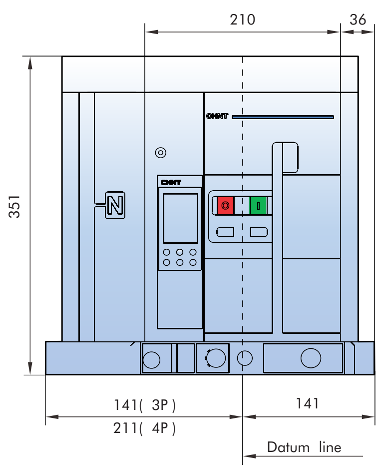
d. After the user installs the busbar, the electric clearance between upper and lower busbar fastening bolts should not be less than 20 mm.

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.

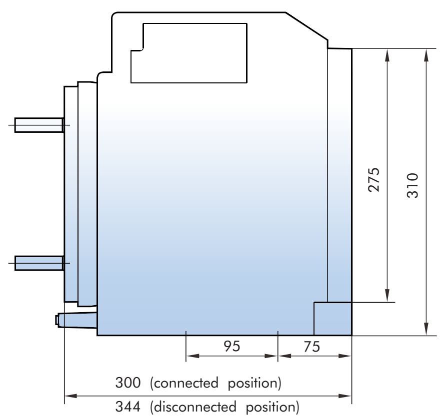
Dimension And Installation

NA8-1600 draw-out type

Front view

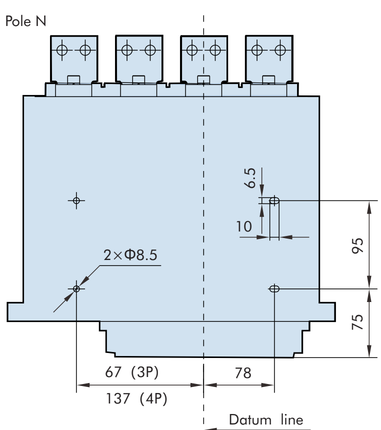


Side view

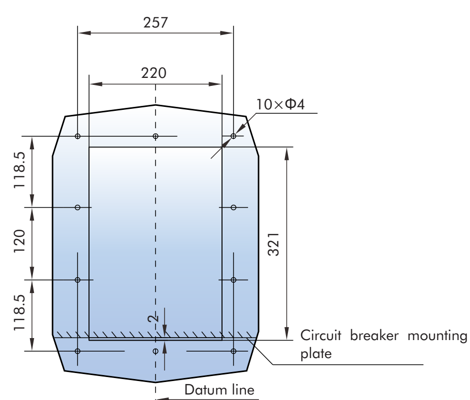


Hole size

Hole size of the base



Hole size of the panel



www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱-۴۸۰۰۰۰۴۹
Fax:۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
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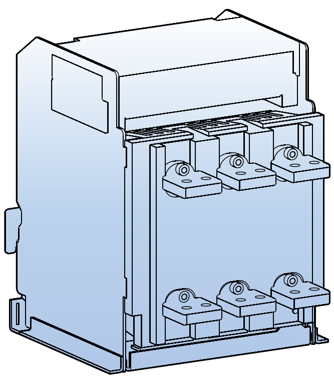
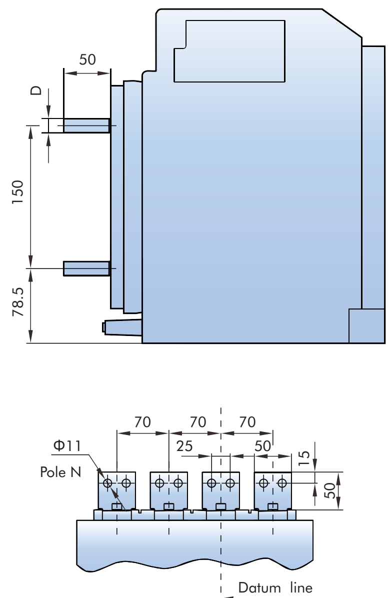
Horizontal connection

Side view



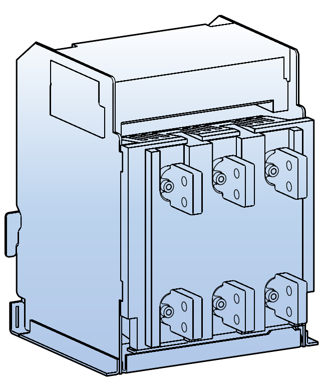
Busbar mounting dimensions

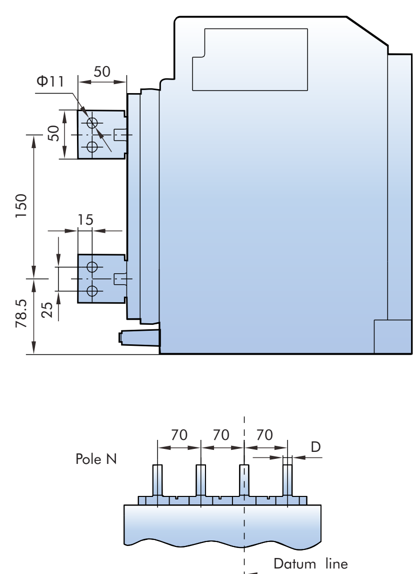


In(A)	D(mm)
200~800	10
1000~1600	16

Vertical connection

Busbar mounting dimensions





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

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E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
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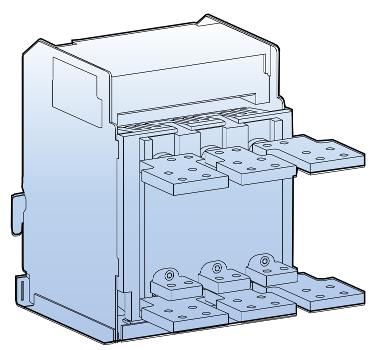
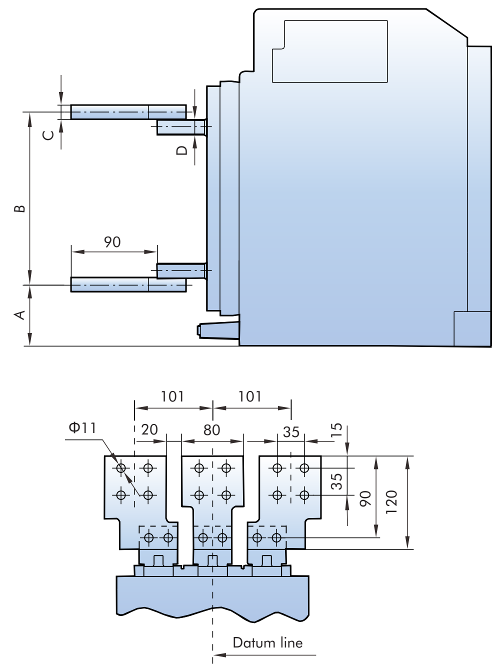
Three-pole product horizontal extension busbar (optional)

Side view



Busbar mounting dimensions



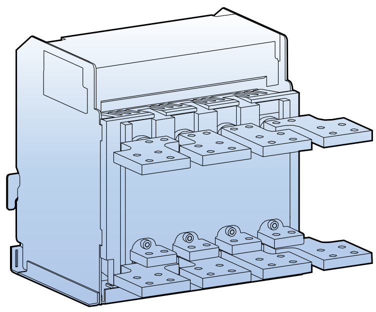
Unit: mm

In(A)	A	B	C	D
200~800	68.5	170	10	10
1000~1600	63	181	15	16

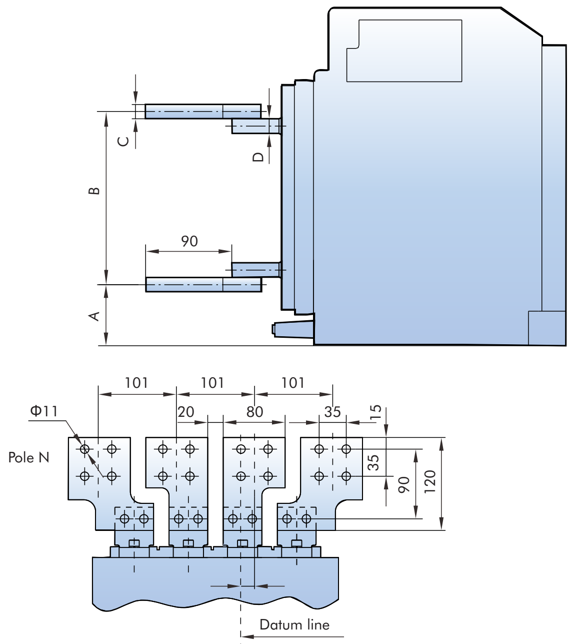
Note: The extension busbar is of optional accessory, requiring additional expense.

Four-pole product horizontal extension busbar (optional)

Side view



Busbar mounting dimensions



Unit: mm

In(A)	A	B	C	D
200~800	68.5	170	10	10
1000~1600	63	181	15	16

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

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Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
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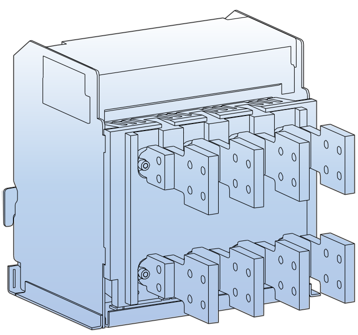
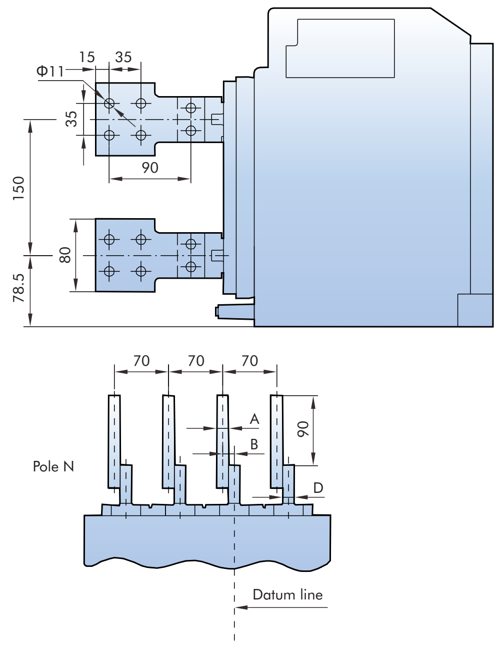
Vertical extension busbar (optional)

Side view



Busbar mounting dimensions



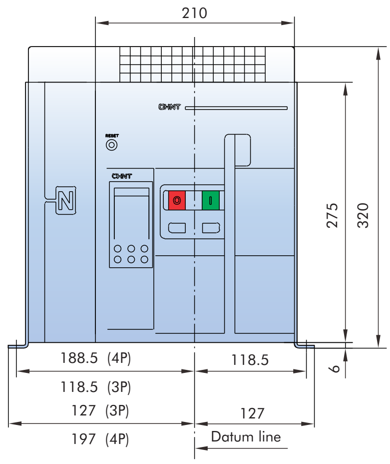
Unit: mm

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

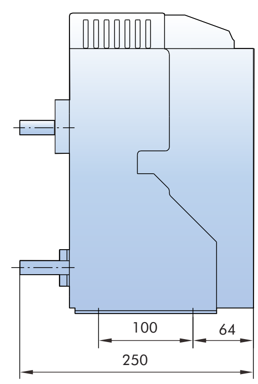
Note: The extension busbar is of optional accessory, requiring additional expense.

NA8-1600 fixed type

Front view

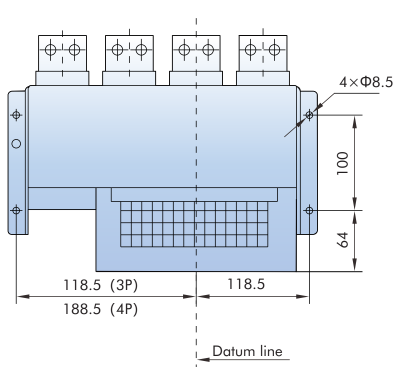


Side view

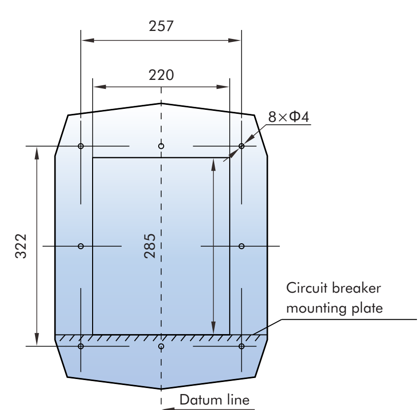


Hole size

Hole size of the base

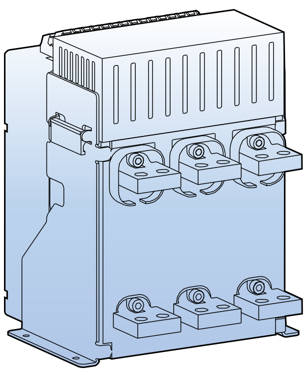


Hole size of the panel

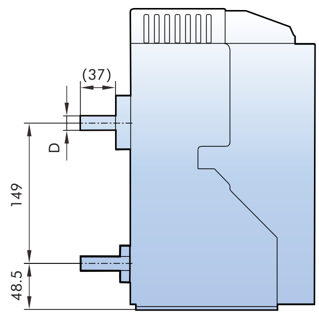


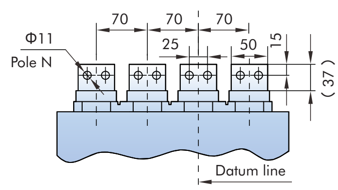
Horizontal connection

Side view



Busbar mounting dimensions



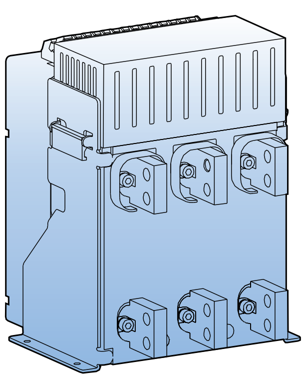


In(A)	D(mm)
200~800	10
1000~1600	16

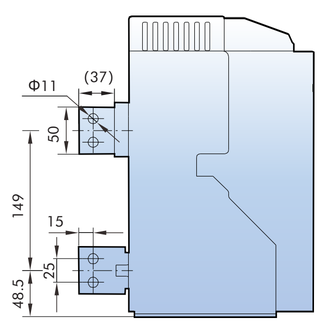
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

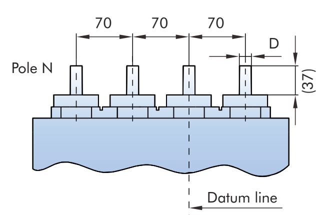
Vertical connection

Side view



Busbar mounting dimensions



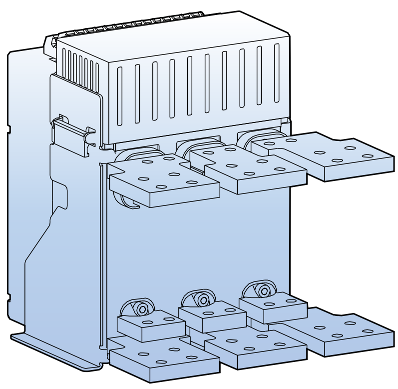


In(A)	D(mm)
200~800	10
1000~1600	16

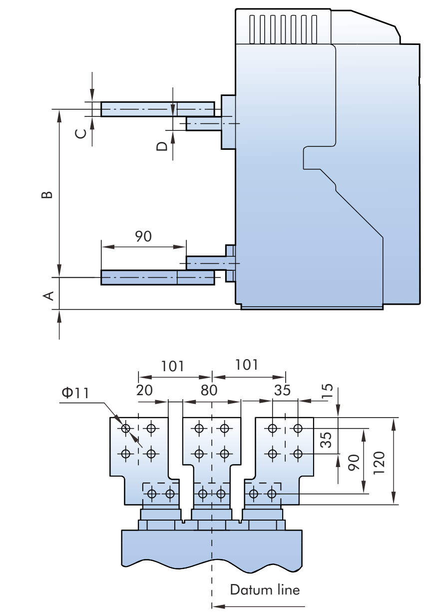
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.

Three-pole product horizontal extension busbar connection (optional)

Side view



Busbar mounting dimensions



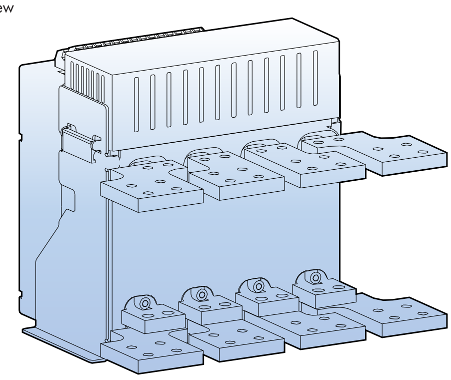
Unit: mm

In(A)	A	B	C	D
200~800	38.5	169	10	10
1000~1600	33	180	15	16

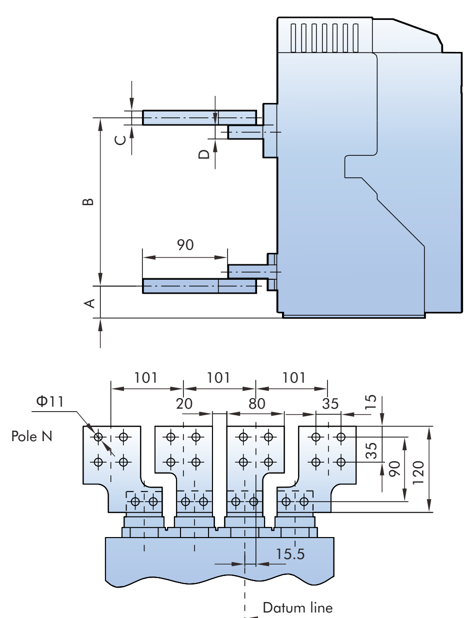
Note: The extension busbar is of optional accessory, requiring additional expense.

Four-pole product horizontal extension busbar connection (optional)

Side view



Busbar mounting dimensions



Unit: mm

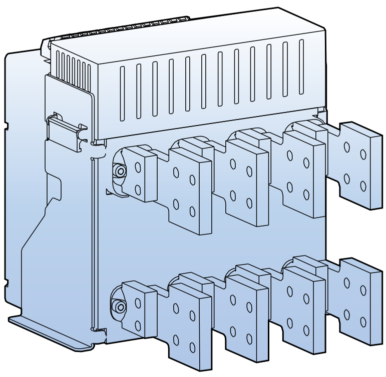
In(A)	A	B	C	D
200~800	38.5	169	10	10
1000~1600	33	180	15	16

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

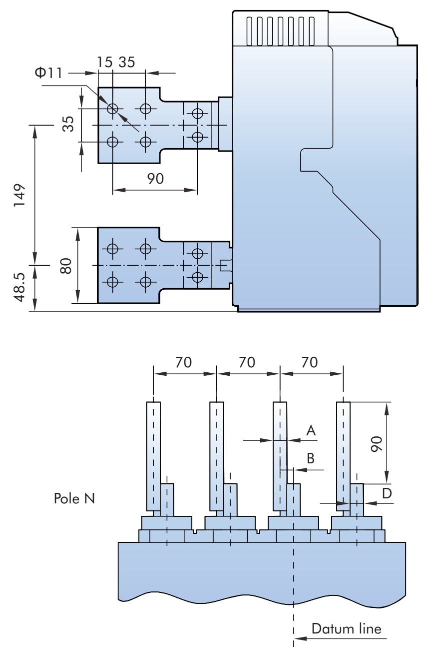
C

Vertical connection of extension busbar (optional)

Side view



Busbar mounting dimensions



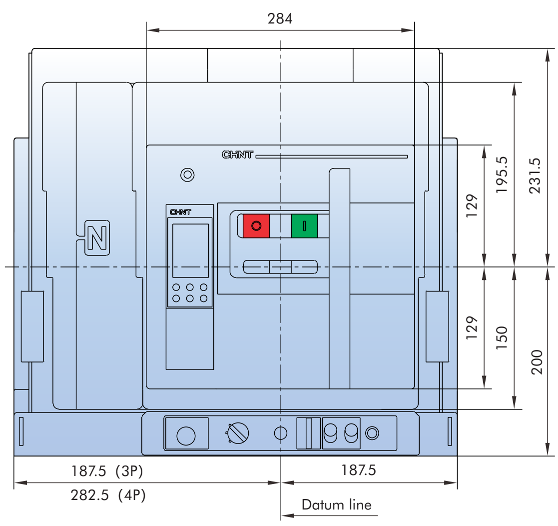
Unit: mm

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

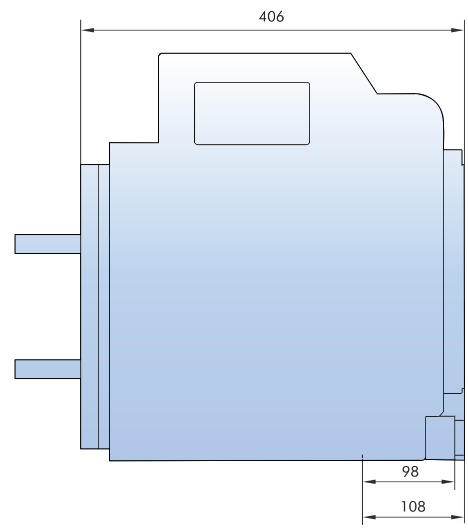
Note: The extension busbar is of optional accessory, requiring additional expense.

NA8-2500 Draw-out type

Front view



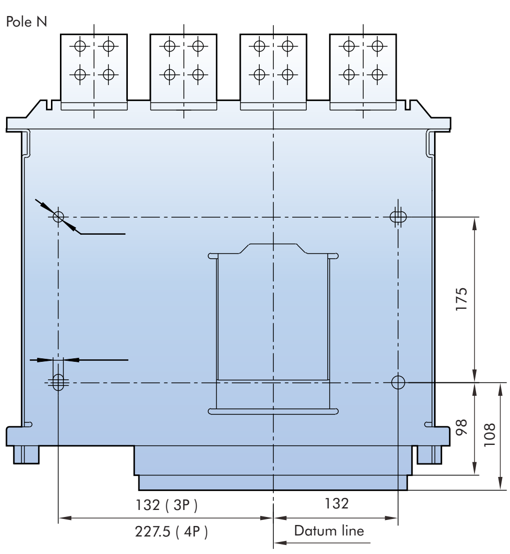
Side view



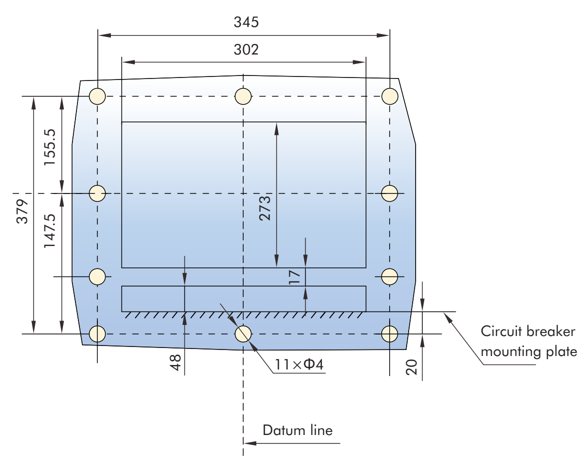
C

Hole size

Hole size of the base

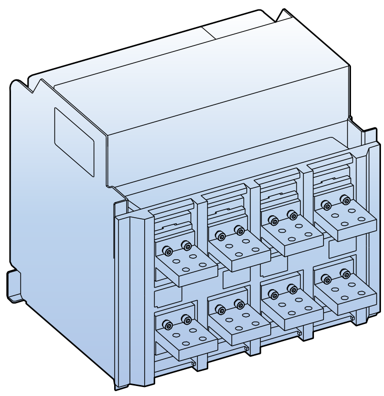


Hole size of the panel

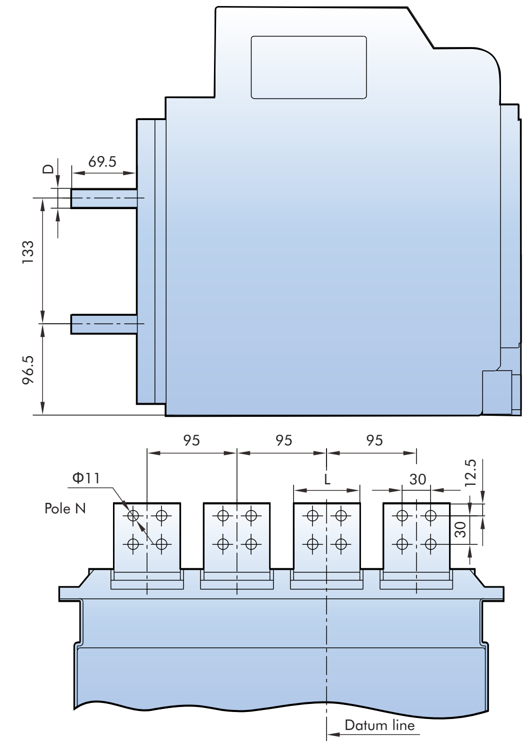


Horizontal connection

Side view



Busbar mounting dimensions



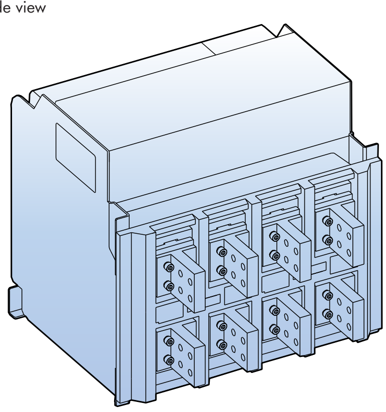
Unit: mm

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

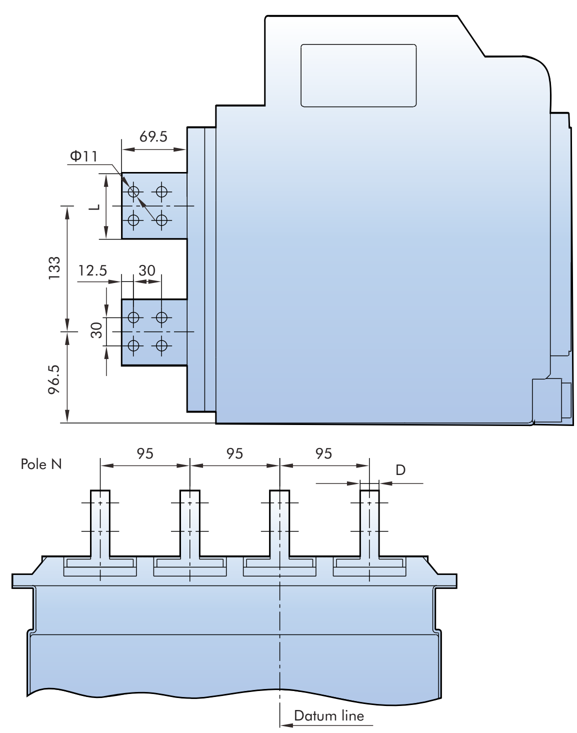
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

Vertical connection

Side view



Busbar mounting dimensions



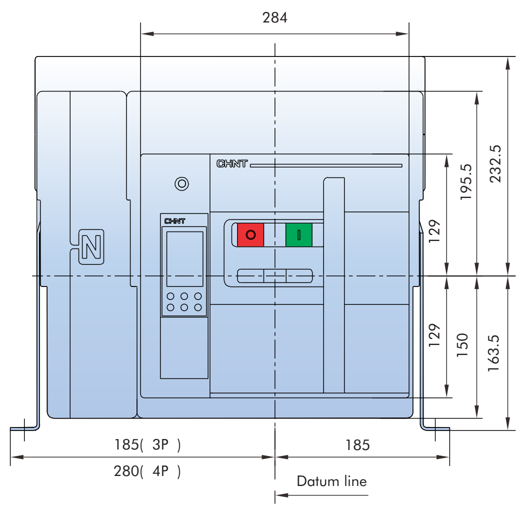
Unit: mm

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

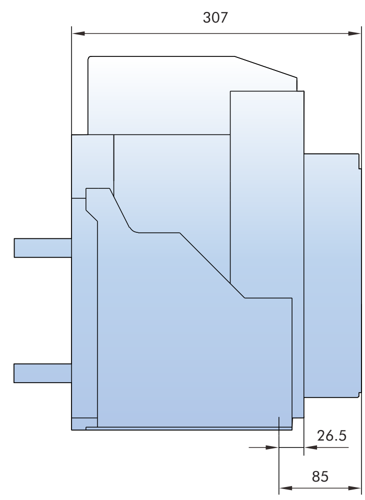
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.

NA8-2500 fixed type

Front view

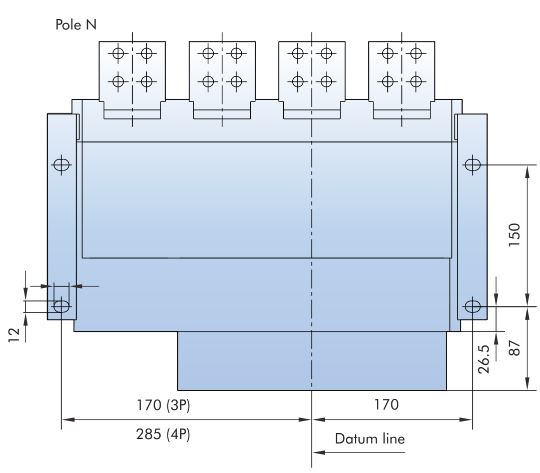


Side view

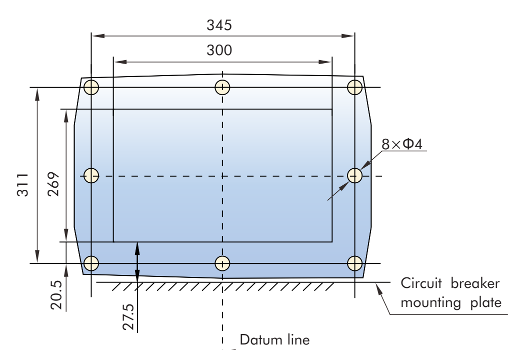


Hole size

Hole size of the base



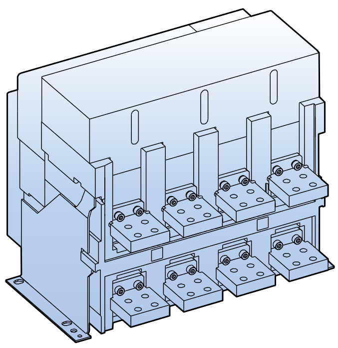
Hole size of the panel



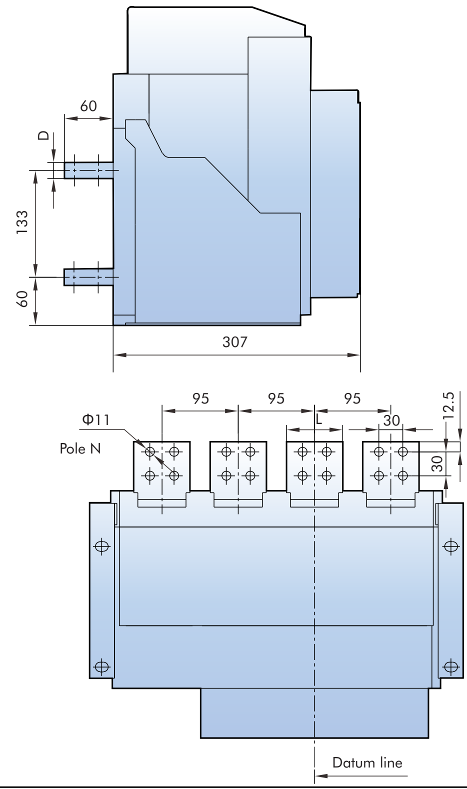
C

Horizontal connection

Side view



Busbar mounting dimensions



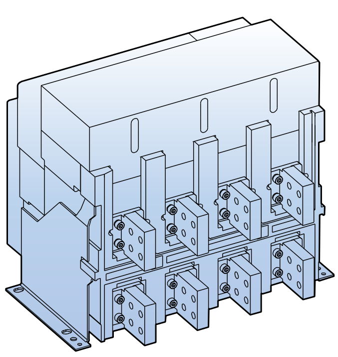
Unit: mm

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

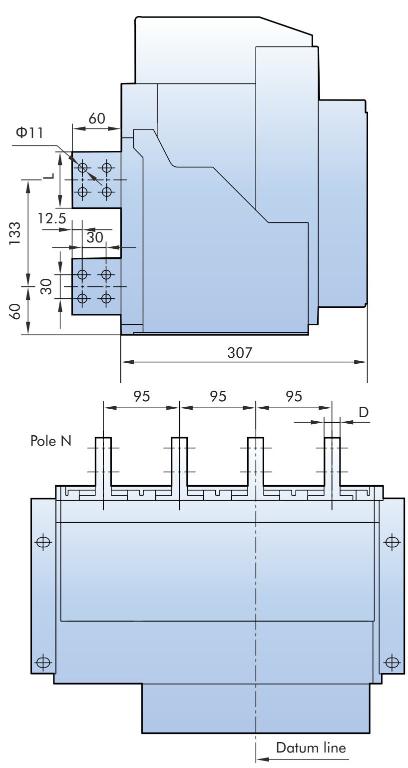
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

Vertical connection

Side view



Busbar mounting dimensions



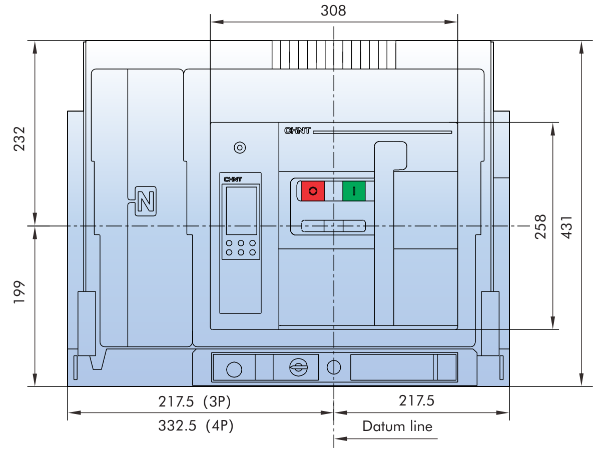
Unit: mm

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

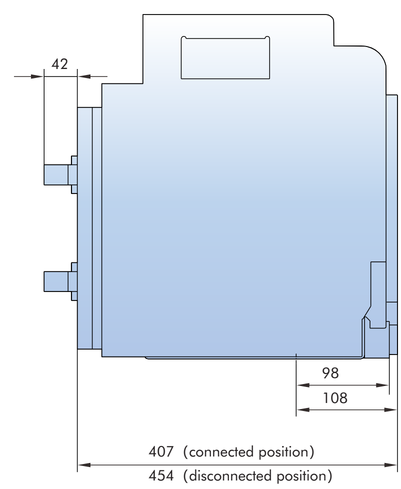
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.

NA8-4000 draw-out type

Front view

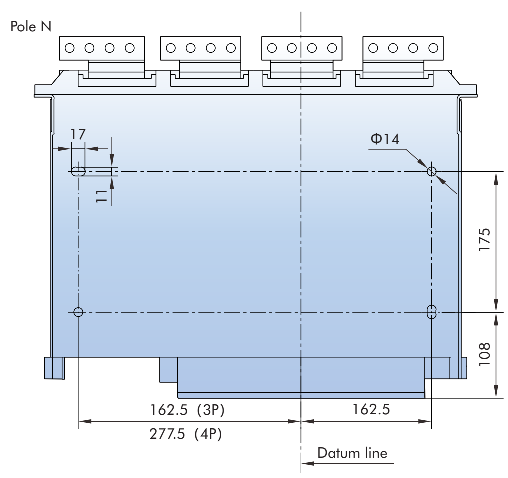


Side view

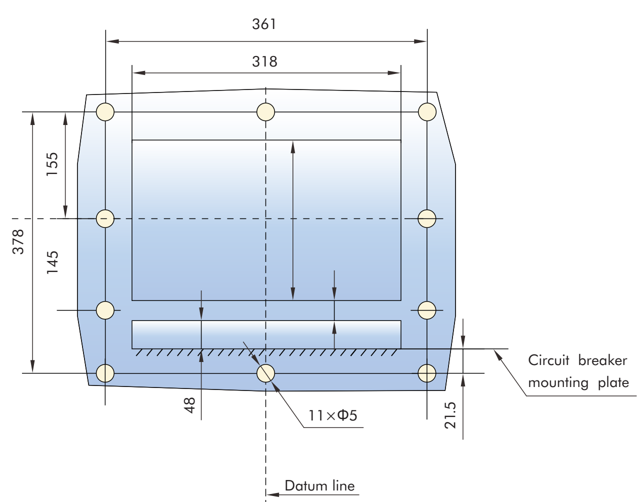


Hole size

Hole size of the base



Hole size of the panel



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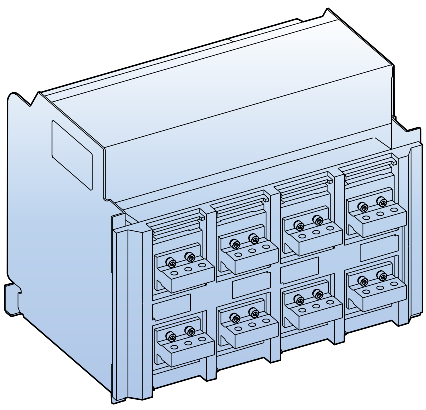
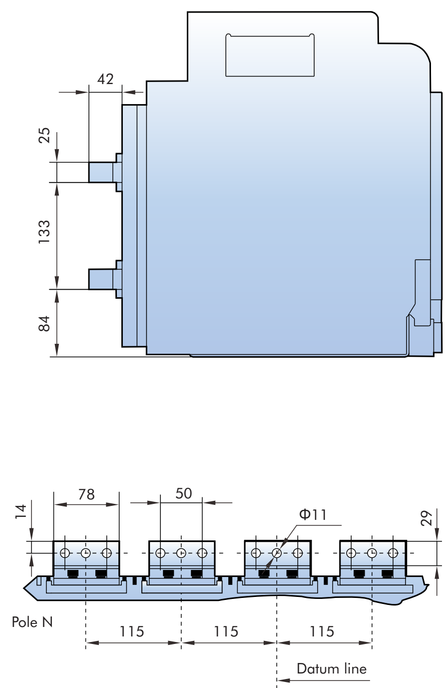
Horizontal connection (In=1600A~2500A)

Side view



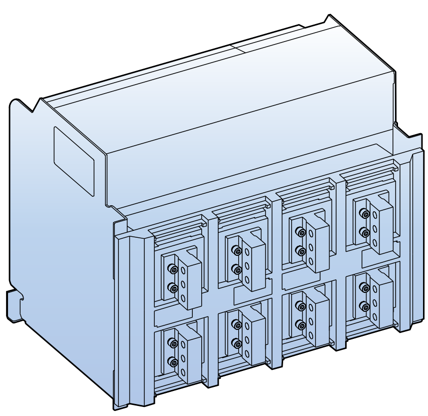
Busbar mounting dimensions



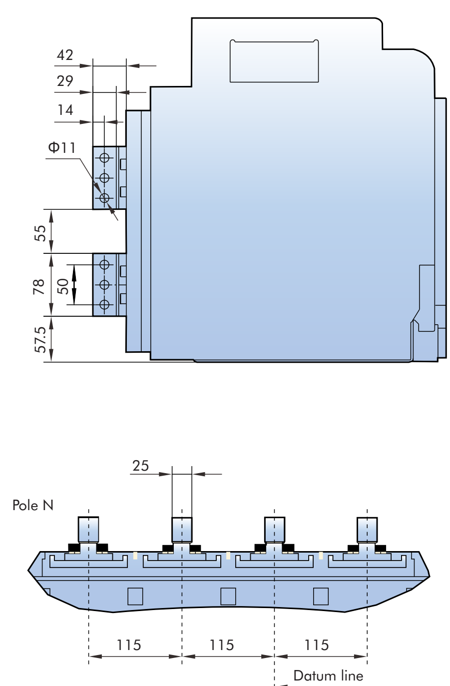
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

Vertical connection (In=1600A~2500A)

Side view



Busbar mounting dimensions

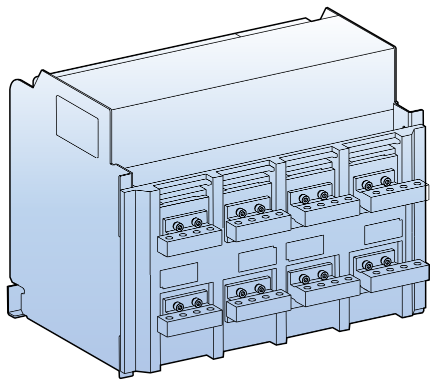


Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.

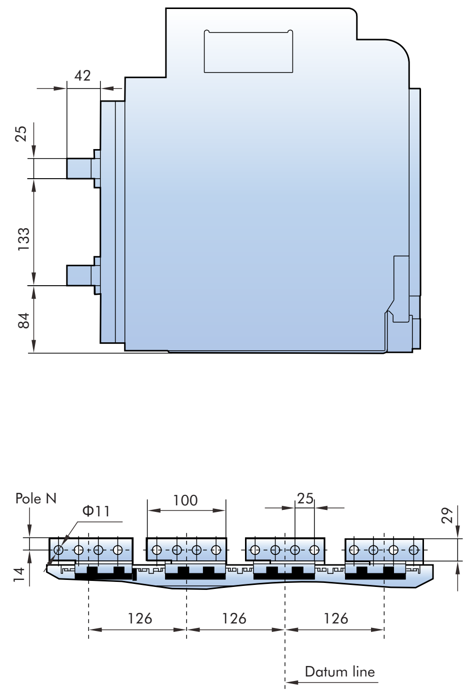
C

Horizontal connection (In=3200A~4000A)

Side view



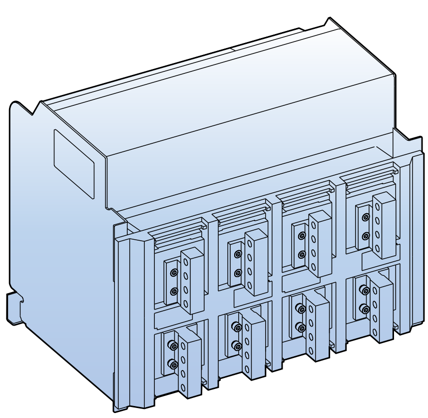
Busbar mounting dimensions



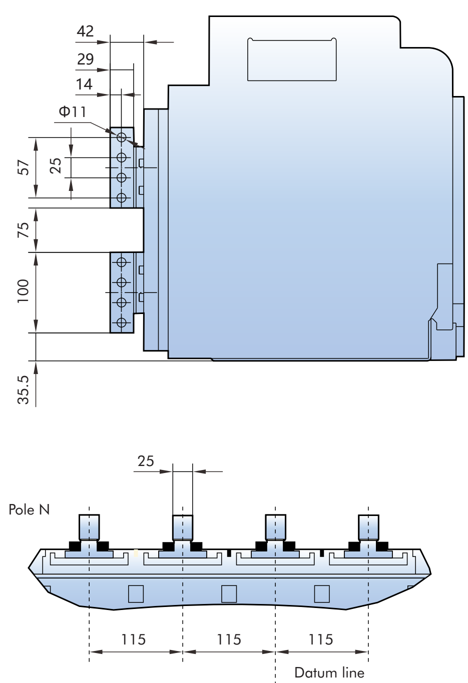
Note: If the user intends to change horizontal connection into vertical connection at site, it needs to change the upper and lower busbars of phases N and B into the same busbars of phases A and C.

Vertical connection (In=3200A~ 4000A)

Side view



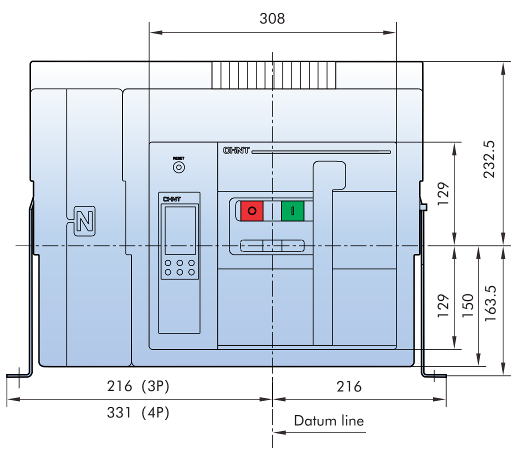
Busbar mounting dimensions



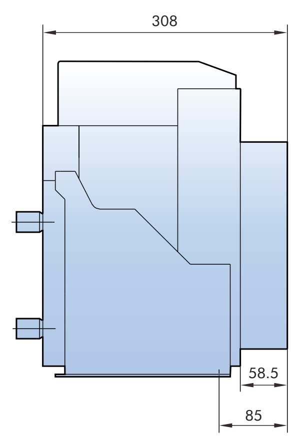
Note: If the user intends to change vertical connection into horizontal connection at site, it needs to change the upper and lower busbars of phases N and B into the same busbars of phases A and C.

NA8-4000 fixed type

Front view

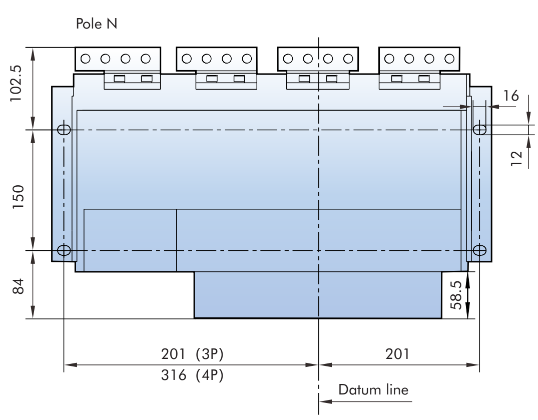


Side view

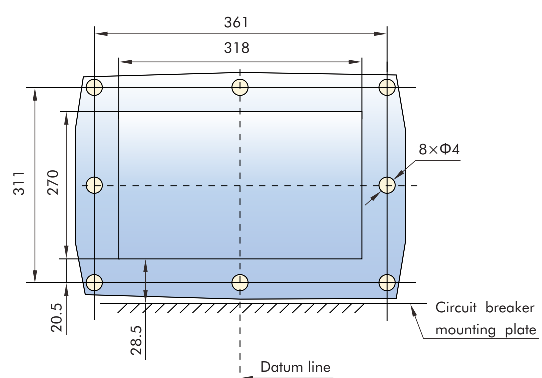


Hole size

Hole size of the base

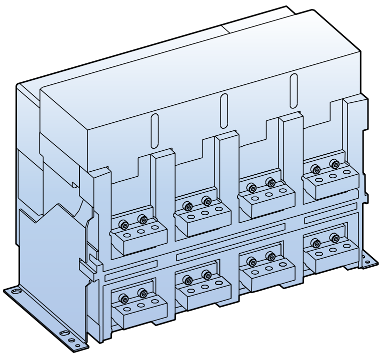


Hole size of the panel

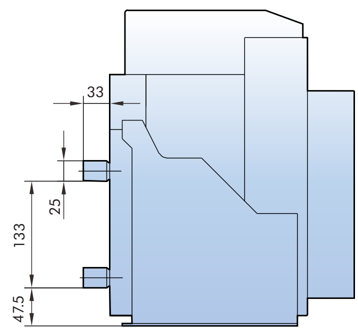


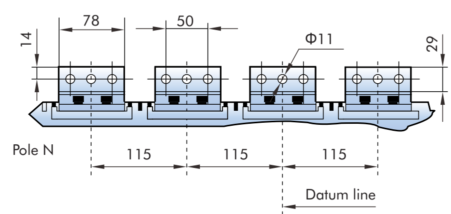
Horizontal connection (In=1600A~2500A)

Side view



Busbar mounting dimensions

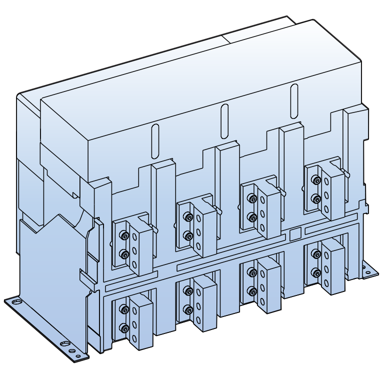




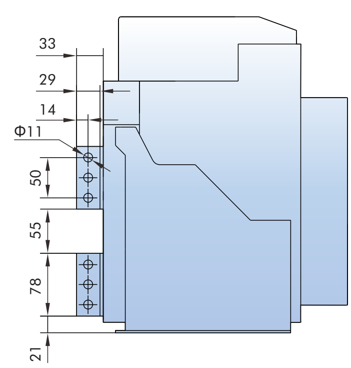
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

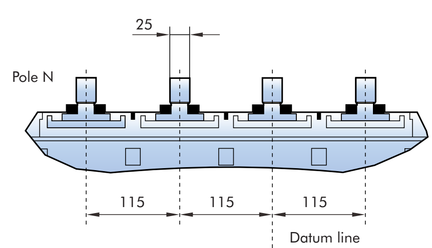
Vertical connection (In=1600A~2500A)

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°.

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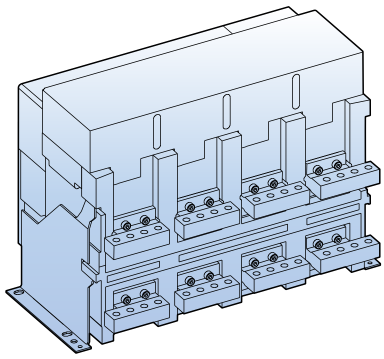
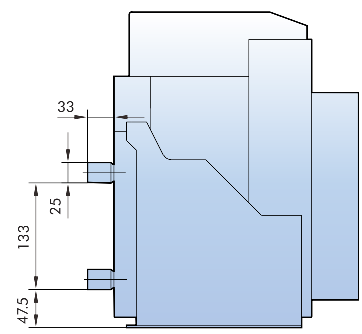
P- 044 Air Circuit Breaker | **NA8**

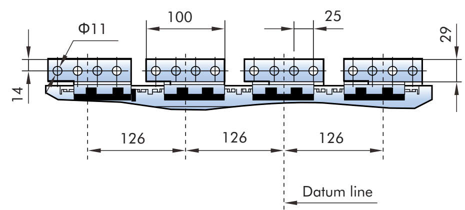
Horizontal connection (In=3200A~ 4000A)

Side view



Busbar mounting dimensions

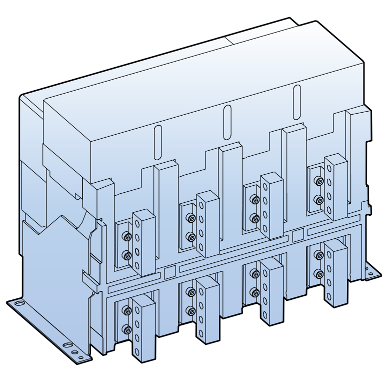




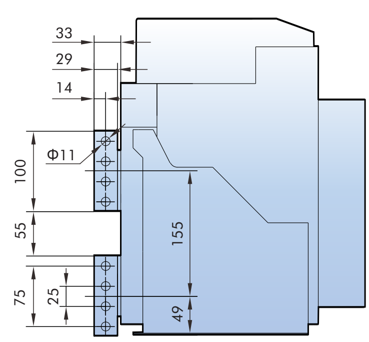
Note: If the user intends to change horizontal connection into vertical connection at site, it needs to change the upper and lower busbars of phases N and B into the same busbars of phases A and C.

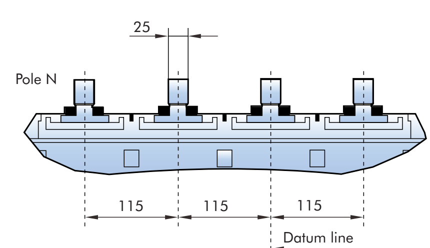
Vertical connection (In=3200A~ 4000A)

Side view



Busbar mounting dimensions



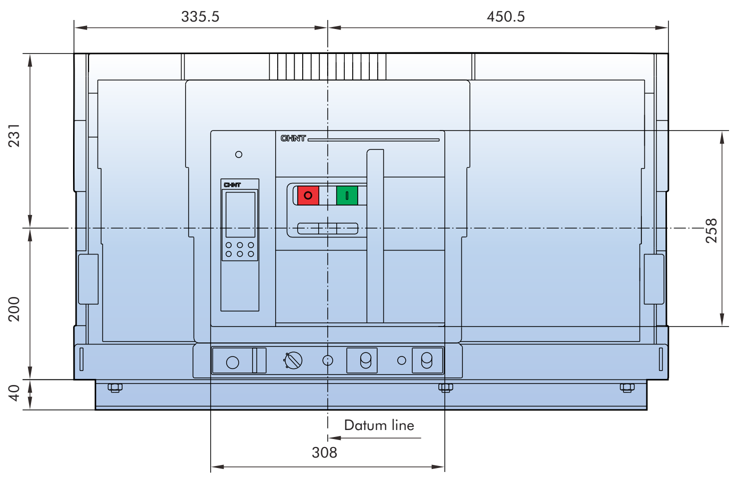


Note: If the user intends to change vertical connection into horizontal connection at site, it needs to change the upper and lower busbars of phases N and B into the same busbars of phases A and C.

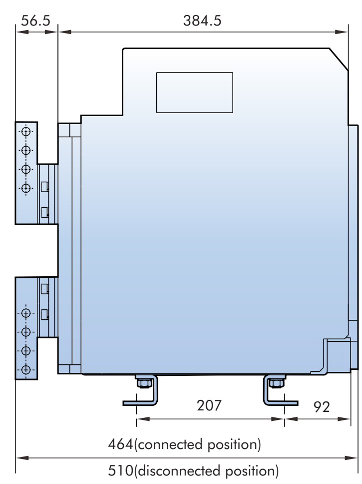
www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

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

Front view



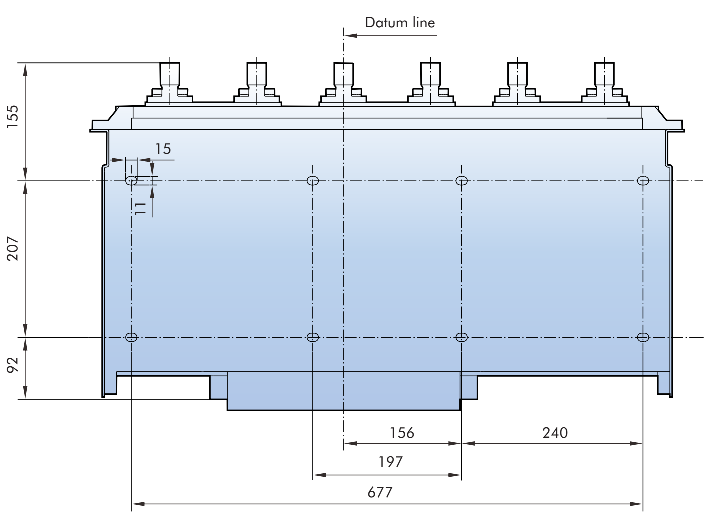
Side view



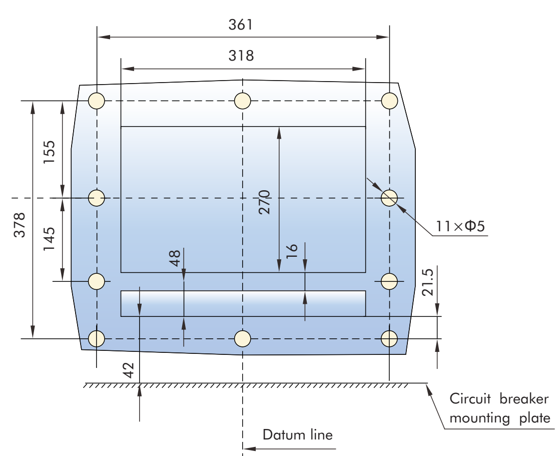
C

Hole size

Hole size of the base

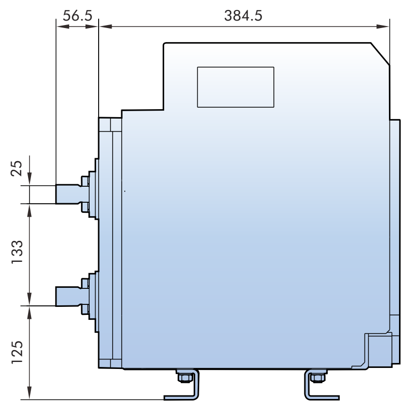


Hole size of the panel

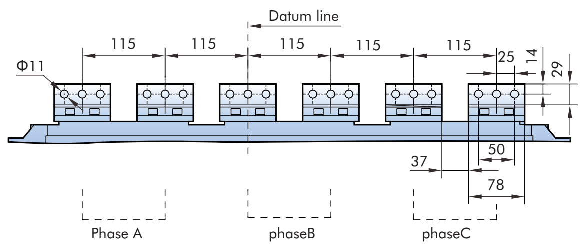


Horizontal connection (In=4000A~ 5000A/ three poles)

Side view



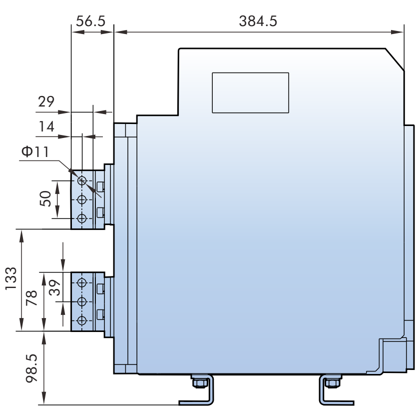
Busbar mounting dimensions



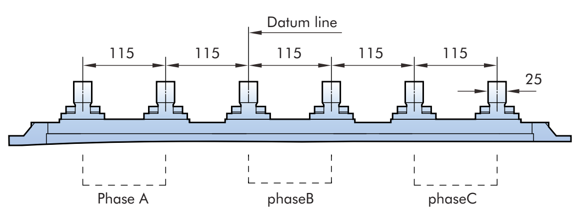
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

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

Side view



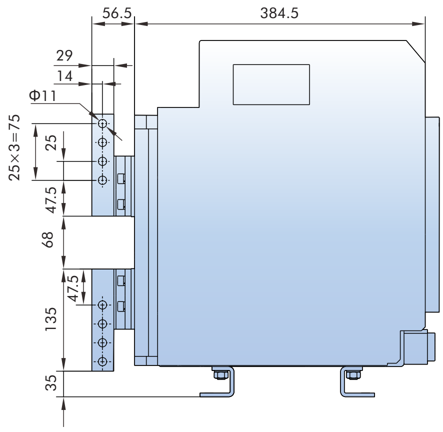
Busbar mounting dimensions



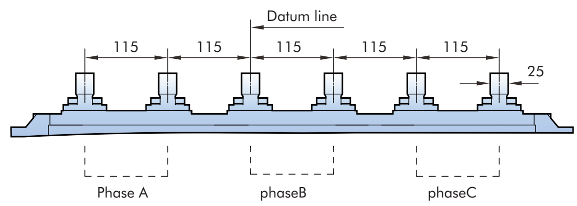
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.

Vertical connection (In=6300A/ three poles)

Side view



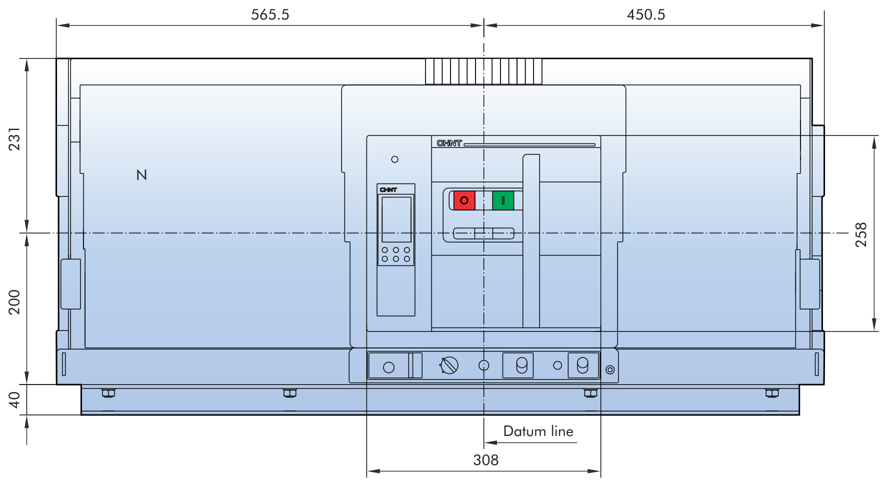
Busbar mounting dimensions



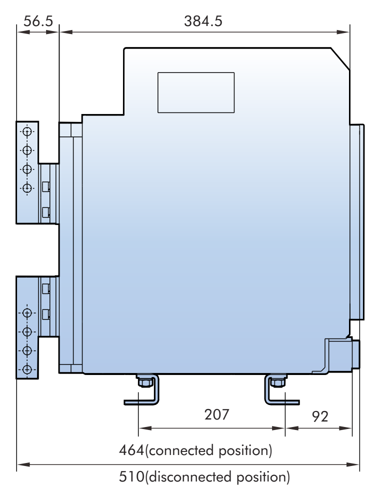
Note: In=6300A only has vertical connection and has no horizontal connection.

NA8-7500 draw-out type (In=4000A~ 6300A) four poles/ (In=7500A) three & four poles

Front view

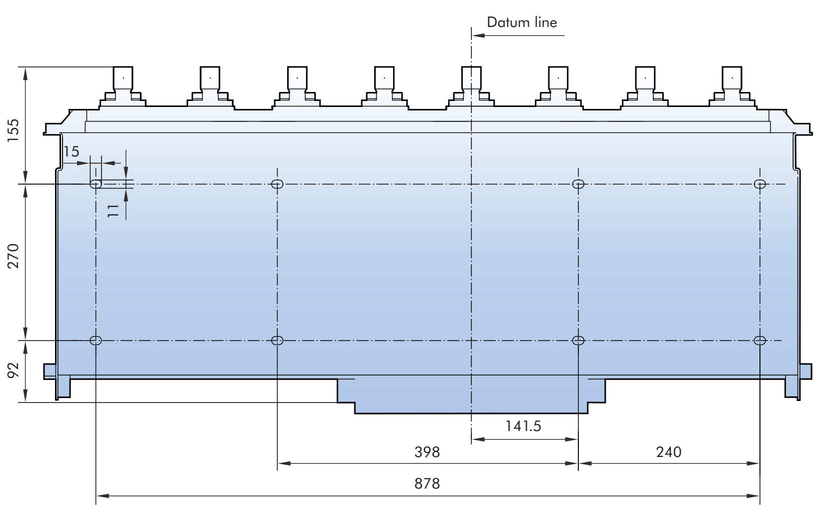


Side view

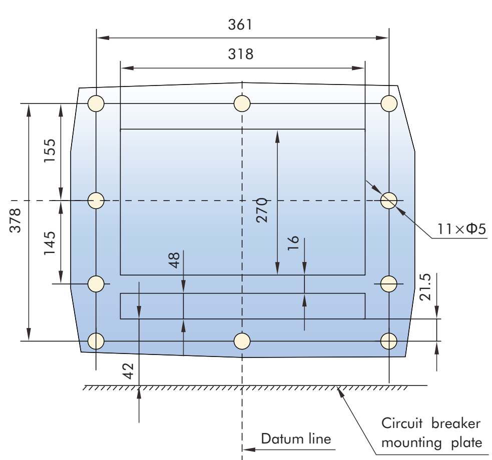


Hole size

Hole size of the base

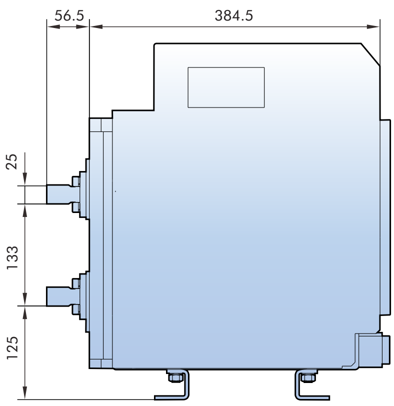


Hole size of the panel

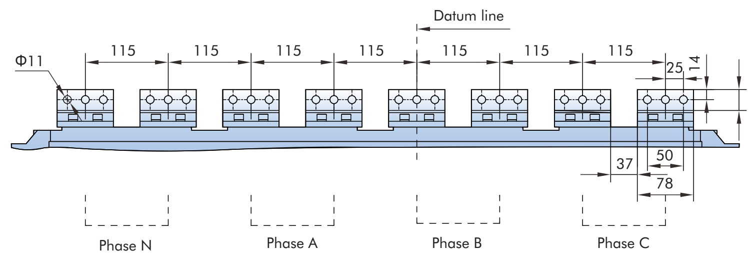


Horizontal connection (In=4000A ~ 5000A/ four poles)

Side view



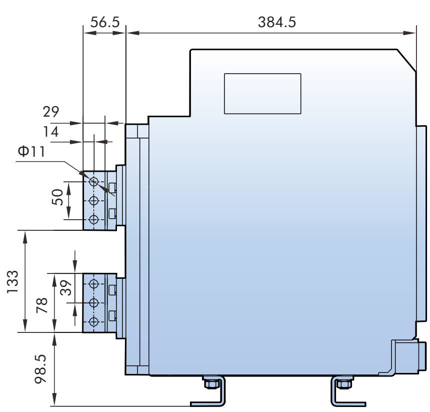
Busbar mounting dimensions



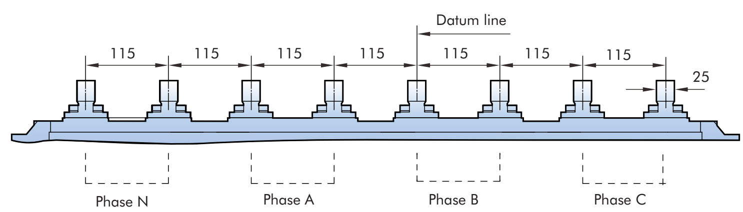
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

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

Side view



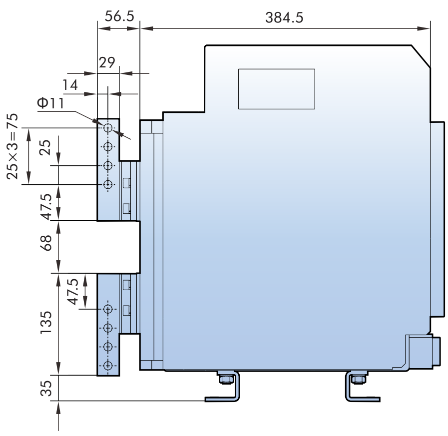
Busbar mounting dimensions



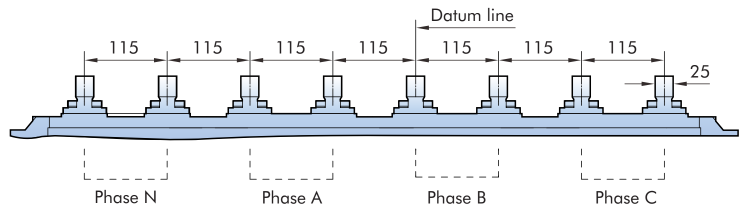
Note: If the user intends to change vertical connection into horizontal connection at site, it only needs to rotate the busbar by 90°.

Vertical connection (In=6300A/ four poles)

Side view



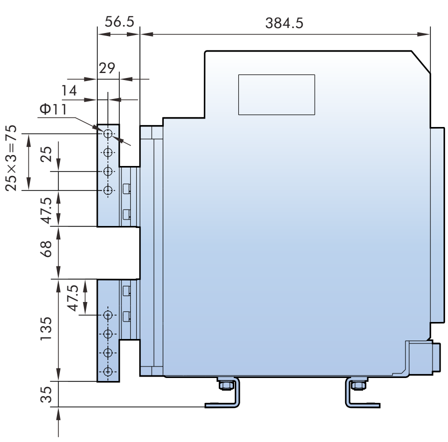
Busbar mounting dimensions



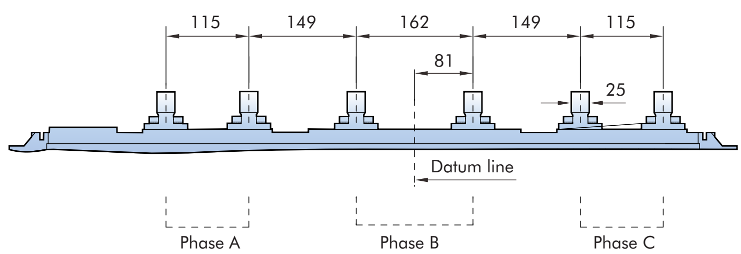
Note: In=6300A only has vertical connection and has no horizontal connection.

Vertical connection (In=7500A/ three poles)

Side view



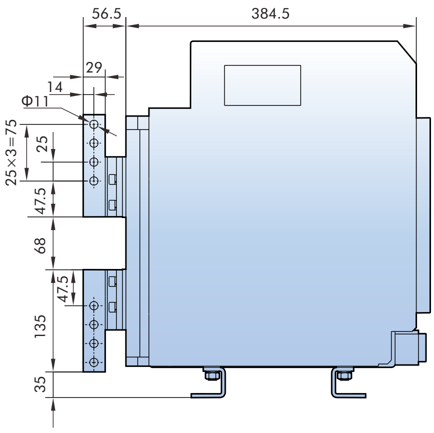
Busbar mounting dimensions

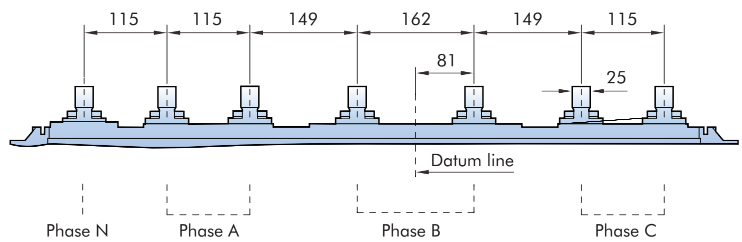


Note: In=7500A only has vertical connection and has no horizontal connection.

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

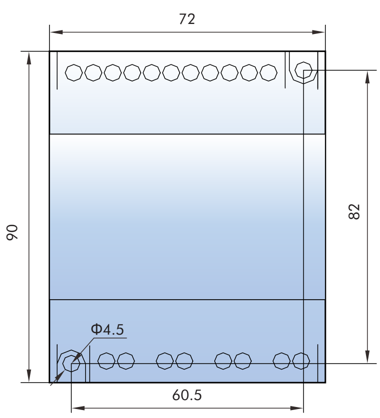
Vertical connection (In=7500A/ four poles)

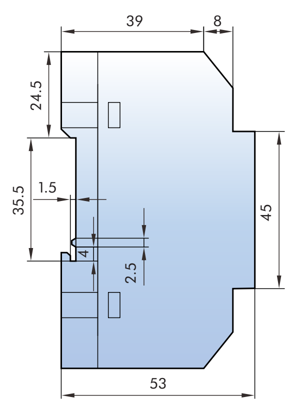




Note: In=7500A only has vertical connection and has no horizontal connection.

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.

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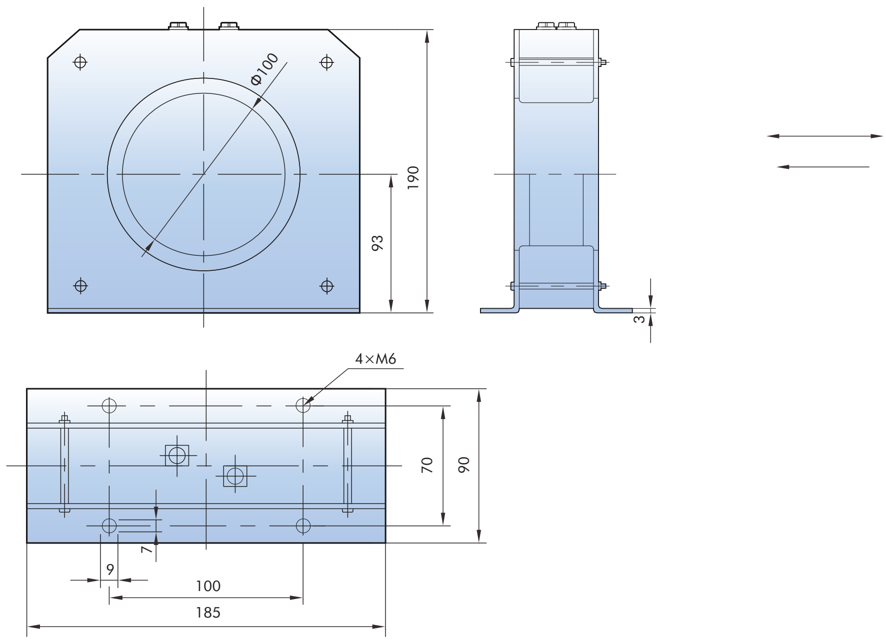
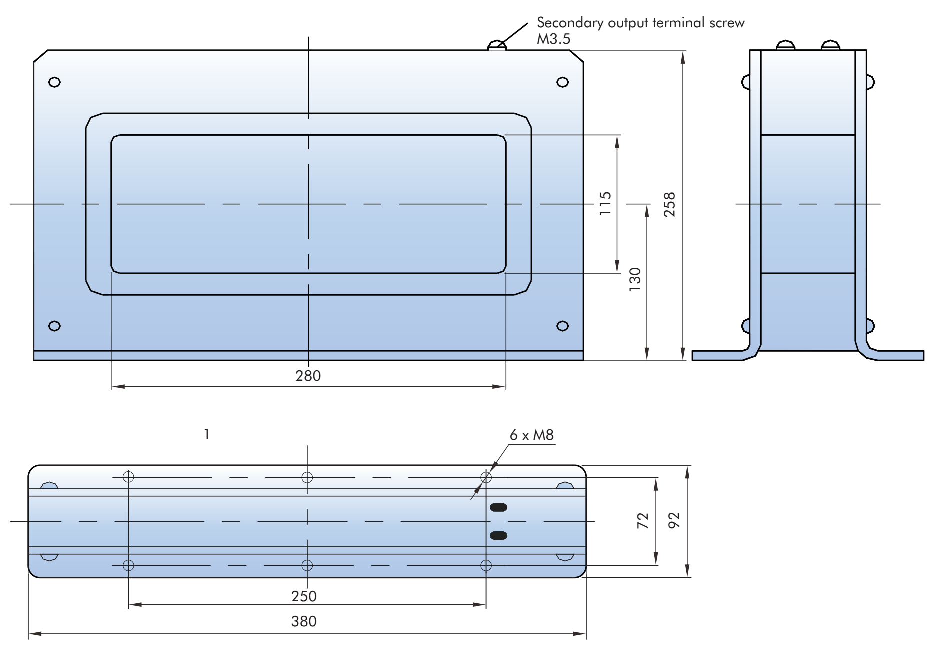
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

Dimensions of ground current transformer

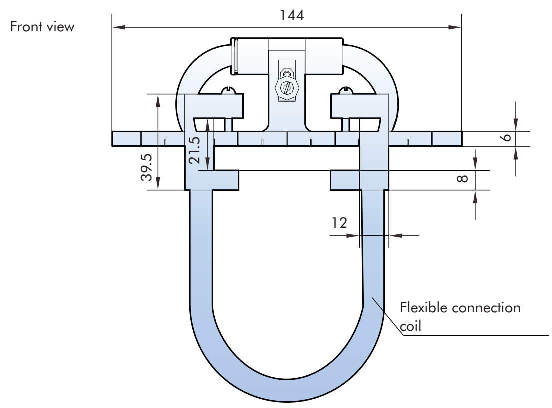


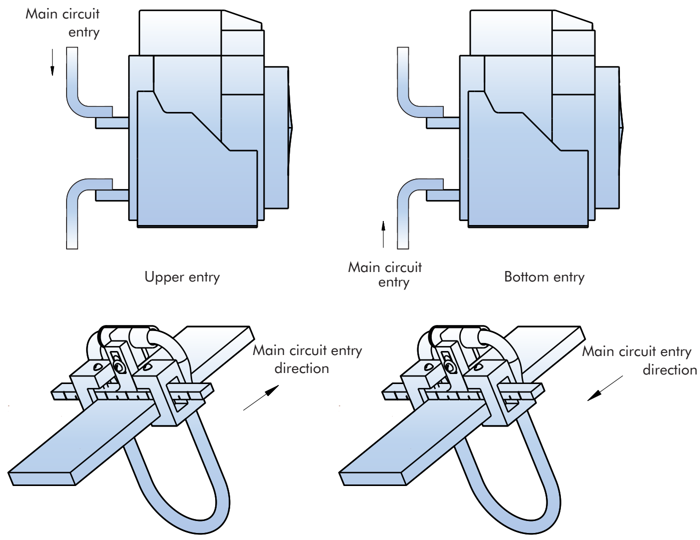
Dimensions of leakage protection transformer



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.

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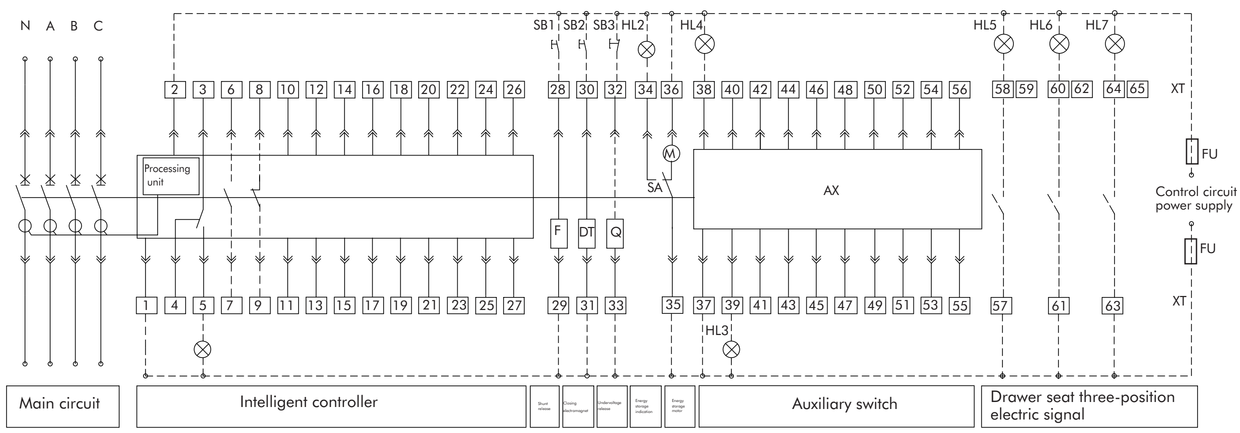
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

Secondary Circuit Wiring

NA8-1600

M Type controller

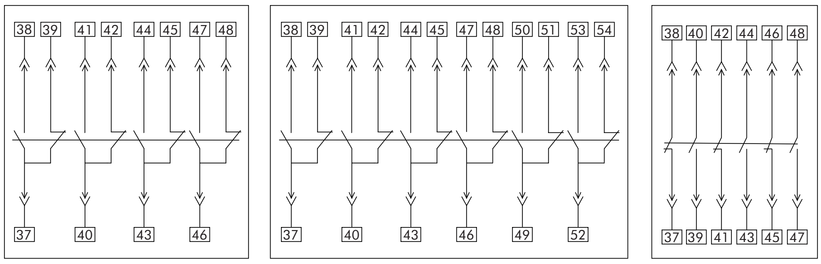


Type of AX auxiliary contact Used by the user

C04 four groups of changeover contacts (default)

C06 six groups of changeover contacts (optional)

N3 3 NO 3 NC contacts (optional)



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#~23#: 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.

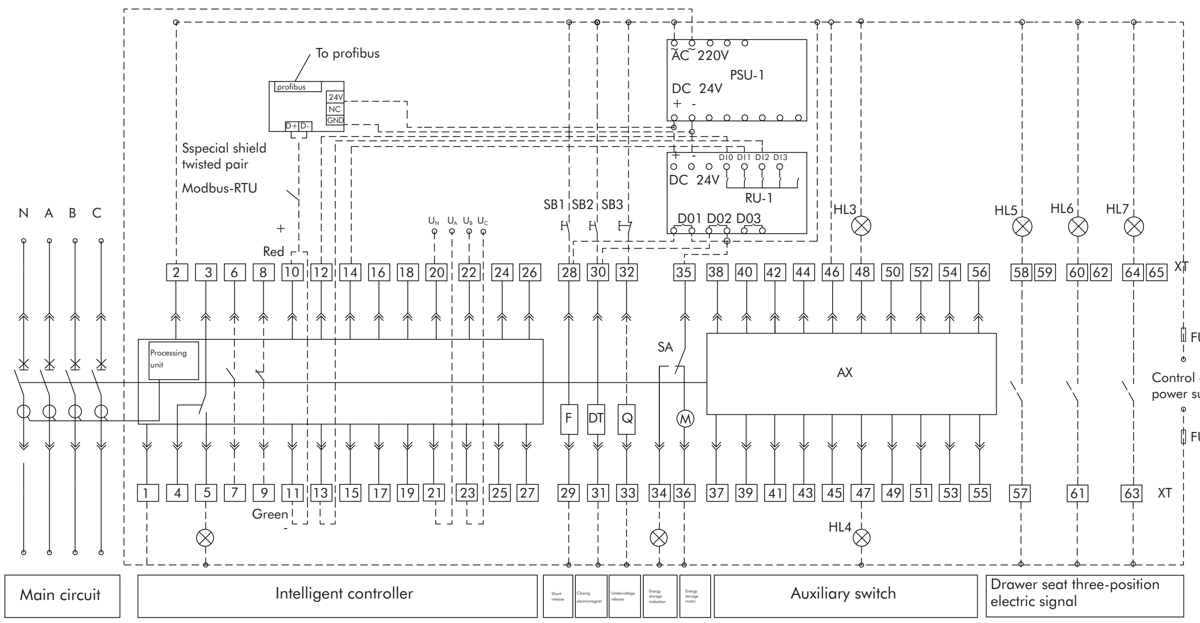
57#~65#: Draw-out type circuit breaker three-position signal indication; the conventional supply has not wire connection, is only for the draw-out type circuit breaker with the secondary functions selected.

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

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پارس، پلاک ۱۲

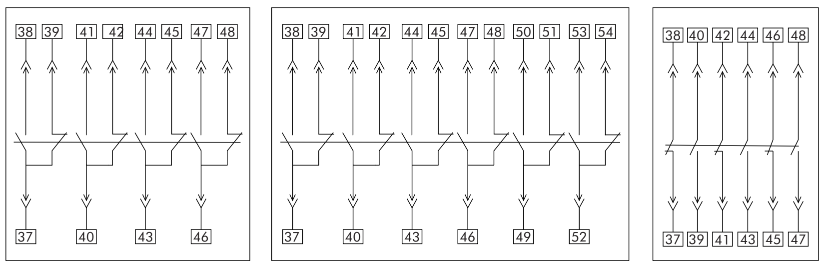
NA8-1600

H Type controller



Type of AX auxiliary contact Used by the user

C04 four groups of changeover contacts (default) C06 six groups of changeover contacts (optional) N3 3 NO 3 NC contacts (optional)



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#: 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 #: Openingsignal 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 voltagesignal, 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 currenttransformer 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 breake;

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.

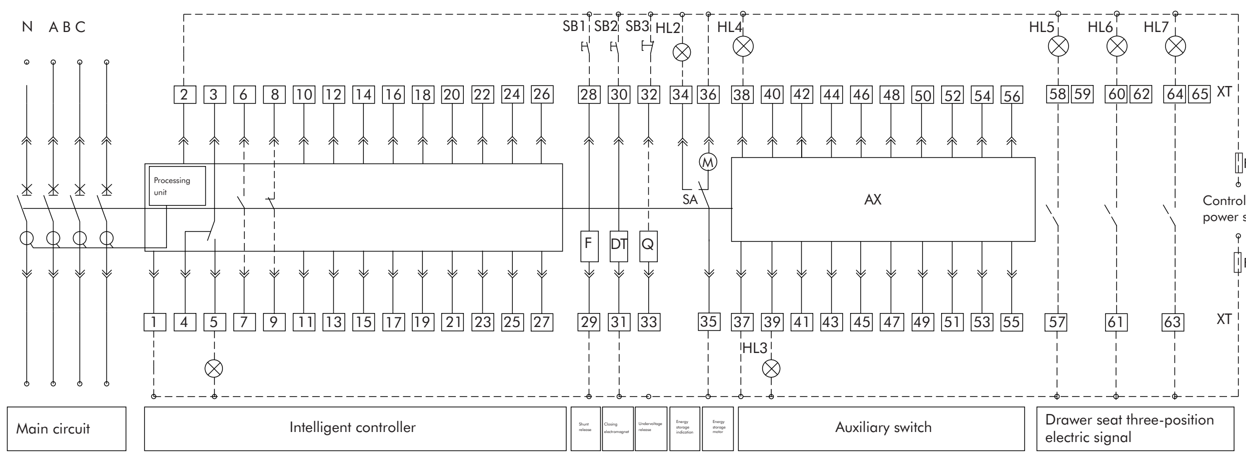
Note: The part in solid line has been connected by the factory, and the part in dashed line shall be connected by the customer.

C

Secondary Circuit Wiring

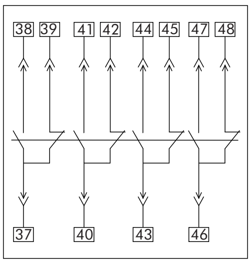
NA8-2500/4000/7500

M Type controller

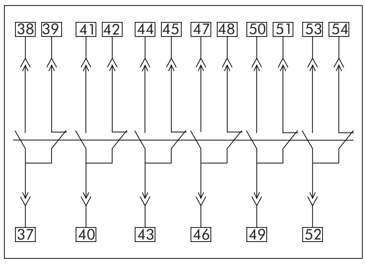


Type of AX auxiliary contact — Used by the user

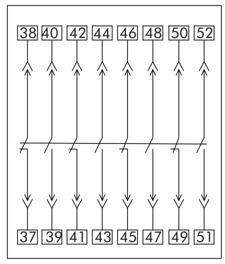
C04 four groups of changeover contacts (default)



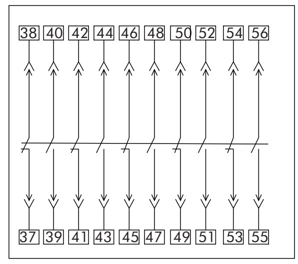
C06 six groups of changeover contacts (optional)



N4 4NO&4NC contacts (optional)



N5 5NO&5NC contacts (optional)



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 nput 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.

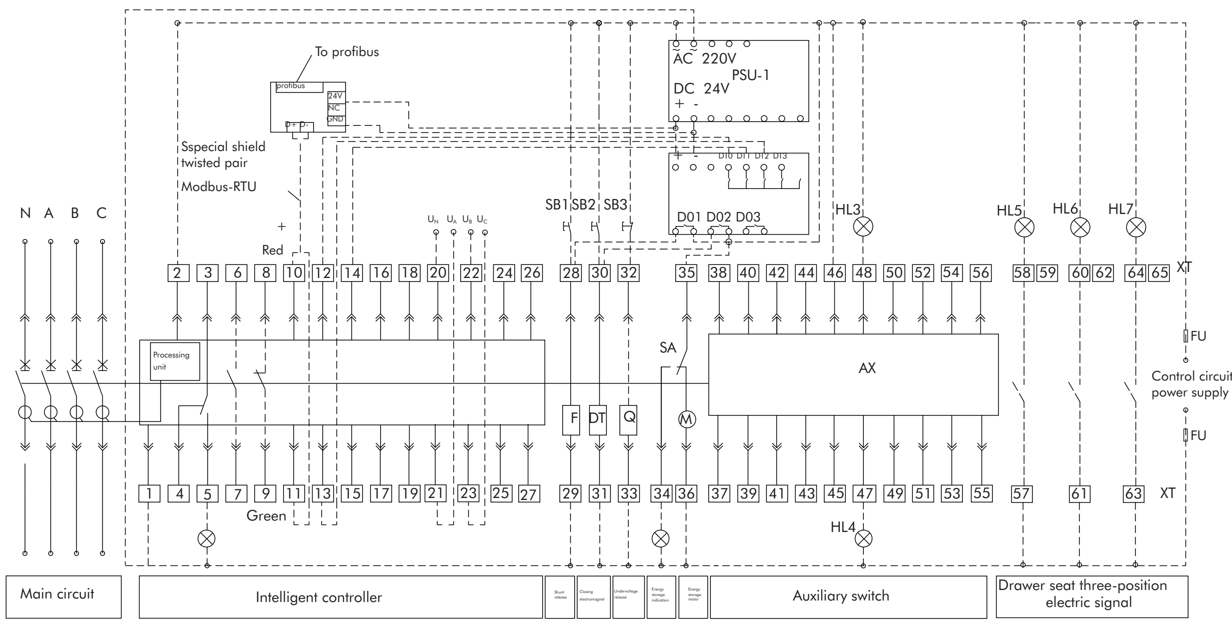
34 #~36 #: Motor-driven mechanism.

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.

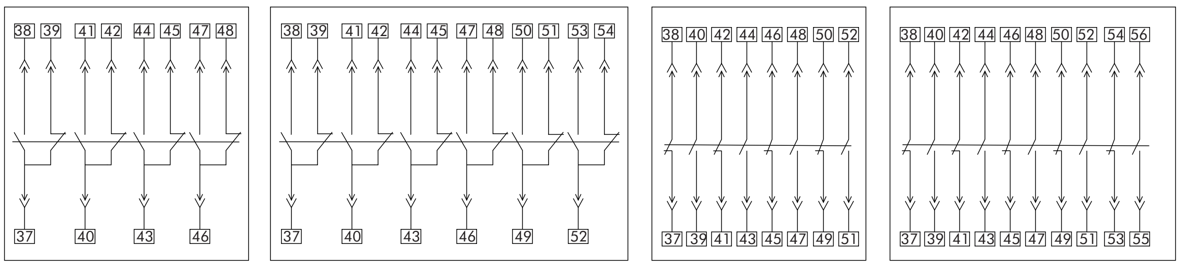
NA8-2500/4000/7500 H Type controller



Type of AX auxiliary contact

Used by the user

C 04 four groups of changeover contacts (default) — C 06 six groups of changeover contacts (optional) — N 4 4NO&4NC contacts (optional) — N 5 5NO&5NC contacts (optional)



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 (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 breake;

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 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.

C

Circuit Breaker Configuration

Standard component	NA8-1600		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		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	NA8-2500	NA8-4000	NA8-7500
Circuit breaker	N □	N □ H □	N □ H □	N □
Rated current	200A □	630A □	2000A □	4000A □
	400A □	800A □	2500A □	5000A □
	630A □	1000A □	3200 A □	6300A □
	800A □	1250A □	4000 A □	7500A □
	1000A □	1600A □		
	1250A □	2000A □		
	1600A □	2500A □		
Number of poles	3 poles □ 4 poles □			
Mounting mode	Draw-out type □ Fixed type □ (NA8-7500 has no fixed type)			
Busbar connection mode	Horizontal connection □ Vertical connection □ Mixed connection □ (indicating the connection mode)			
Intelligent controller	M type □ (basic type) H type □ (communication type)			
Shunt, closing, motor	Closing electromagnet □ Shunt release □ Energy storage motor □			
	AC220/230V AC380/400 V □ DC220V □ AC/DC110V □ DC24V □			
Undervoltage release	UVT □ UVTD			
	AC220/230V AC380/400 V □ DC220V □ AC/DC110V □ DC24V □			
Auxiliary contact	NA8-1600 C04 (standard) C 06 □ (only for AC) N3 □ (only for AC) NA8-2500、NA8-4000~7500 C04 (standard) C 06 □ N4 □ N5 □			
Auxiliary contact indication (optional)	Drawer seat three-position signal device □			
Connecting accessory (optional)	Interphase insulating barrier □ NA8-1600 extension busbar □			
Controller function and accessories (optional)	External transformer: Phase N external transformer □ External LEC leakage transformer □ Ground current protection transformer □ Controller functions: 3P + N protection function □ Leakage protection function □ Ground current protection function □ Voltage measurement and protection function □ Electric energy measurement and protection function □ Signal contact output function □ ZSI zone interlock protection function □ Load monitoring function □ 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 □ One lock one key □ Two locks one key □ Three locks two keys □			
Mechanical interlock (optional)	Wire rope interlock (two interlock) □ Wire rope interlock (MIT-3) □ Wire rope interlock (MIT- 4) □			
Module (optional)	PSU-1 □ RU-1 □ ST-DP protocol conversion module □			

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.

www.famcocorp.com
E-mail: info@famcocorp.com
@famco_group
Tel:۰۲۱- ۴ ۸ ۰ ۰ ۰ ۰ ۴ ۹
Fax :۰۲۱ - ۴۴۹۹۴۶۴۲
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبروی پالایشگاه نفت پارس، پلاک ۱۲

Configuration explanations

I. NA8-1600~2500、NA8-4000 ~7500 conventional configuration explanationsShunt 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, 5NO5NCcontacts, type H intelligent controller, optional H type function, position signal.

CHINT
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Asia Pacific

China | Global HQ
Zhejiang CHINT Electrics Co., Ltd.

Address:A3 Building, No. 3655 Sixian Road, Songjiang Shanghai 201614.
Tel: +86 21 5677 7777
Fax: +86 21 5677 7777
Email: global-sales@chintglobal.com
Website: www.chintglobal.com

Singapore | Asia Pacific HQ
CHINT Global Pte Ltd

Address: 8 Kallang Avenue, #04-06/09 Aperia Office Tower 1, Singapore 339509.
Tel: +65 6329 3110
Fax: +65 6329 3159
Website: www.chintglobal.com

Sunlight Electrical Pte Ltd

Address: 1 Third Chin Bee Road, Singapore 618679.
Tel: +65 6741 9055
Fax : +65 6265 4586
Email: sales@sunlightgroup.com
Website: www.sunlightgroup.com

India
CHINT India Energy Solution Private Limited

Address: Discovery Tower, Plot No. A-17, Ground Floor Industrial Area Sector 62
Noida, India 201309.
Tel: +91 1202 9750 57
Email: marketing@chint.co.in
Website: www.chint.co.in

Philippines
CHINT Electric Co., Ltd

Address: Unit 201, Taipan Place, F. Ortigas Jr. Road, Ortigas Center, Pasig City,
Metro Manila, Philippines.
Tel: +63 967 273 0174 / +63 977 017 6320
Email: liq07@chintglobal.com / wencell@chintglobal.com
Website: www.chintglobal.com

Indonesia
PT. CHINT Indonesia

Address: Kompleks Prima Center I, Blok C9-10, Jl. Pesing Poglar Jl. Pool PPD No. 11,
RT.9/RW.2, Cengkareng, Jakarta Barat.
Tel: +62 21 5436 3000
Email: sales@chint-indonesia.com
Website: www.chint-Indonesia.com

Vietnam
CHINT Vietnam Holding Co., Ltd

Address: So 2Bis-4-6, Le Thanh Ton, P. Ben Nghe Quan 1, Ho Chi Minh, Vietnam.
Tel: +84 0283 8270 015
Email: marketing.vn@chintglobal.com
Website: www.chintglobal.vn

Sunlight Electrical (VN) Co., Ltd

Address: 20 Doc Lap Ave, VSIP, Thuan An City, Binh Duong Province, Vietnam.
Tel: +84 0274 3743 505
Email: sales.sev@sunlightgroup-vn.com.vn
Website: www.sunlightvetnam.com.vn

Cambodia
CHINT (Cambodia) Power Equipment Co., Ltd

Address: No.15, St. 542, Sangkat Boeung Kok 1, Khan Toul Kork, Phnom Penh,
Cambodia.
Tel: +855 23 231 077
Email: lbin3@chintglobal.com
Website: www.chintglobal.com

SchneiTec CHINT Co., Ltd

Address: Ansor Kdam Village, Sna Ansa Commune, Krakor District, Pursat Province,
Cambodia
Tel: +855 09 5353 268
Email: liubin@schneitec-chint.com.kh / info@schneitec-chint.com.kh
Website: www.schneitec-chint.com.kh

Latin America

Brazil
CHINT Elétricos América do Sul Ltda.

Add: Av. Paulista, 1765 - Edifício Scarpa - Conjunto 22 , Bela Vista - CEP
01311-200 - São Paulo - SP
Tel. : +55 (11) 3266-7786
E-mail: chintbr@chint.com

Peru
CHINT LATAM (PERU) S.A.C.

Add: Av. Camino Real No.348, Torre El Pilar, Oficina 603, San Isidro, Lima 27,
Peru
Tel: +51 1 763 4917
Email: chintlatamperu@chint.com

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CHINT ELECTRICS (HONG KONG) LIMITED (Ecaudor Branch)

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