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A CHNT COMPANY



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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



Intelligent Manufacturing



Apparatus



Industry Automation







Smart Heating



Instrumentation and Apparatus





Smart Water



dЪ





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.





GLOBAL FOOTPRINT



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.



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





<u>[]</u>

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.



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









Great Quality System

 \otimes 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

5 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

👔 🛛 🖬 🖬 ng 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.





Air Circuit Breaker

ACB





NA1

NA8 Air Circuit Breaker

Structural Features of Circuit Breaker



(P-001)



Identification of Circuit Breaker Panel





9 Draw-out plate 10 Three-position locking device 11 Drawer padlock (12) Racking- handle entry 13 Position indicator Rotary handle storage hole (14) (15) Intelligent controller 16 Fault-breaking indicator reset button





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









Circuit Breaker

- Frame size (A): 1600, 2500, 3200, 4000, 7500
- Three kinds of breaking capacity: N, H, HU
- 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°C \sim +40°C (certified), and also peripheral

ambient temperature -45°C $\sim\!+70^\circ C$ (M type), -20°C $\sim\!+70^\circ C$ (H type).

• For specific derating factor, see P23.

Storage conditions: Applicable for -45°C $\sim\!+70^\circ\!C$.

• NA8 may resist against the following electromagnetic

interference:

EMI-generated overvoltage;

Overvoltage caused by environmental disturbance or

distribution system;

Radio wave (radio, interphone, radar, etc.)

Static discharge of terminal users

 \bullet 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

(P-003)





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

(P-005)

NA8 Air Circuit Breaker

Product model	Rated Breaking current capacity	200	400	630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300	7500
NA8-1600	Ν	-	-	•	•	-	-	-							
NA8-2500	N, H, HU			-	-	-	-	-	-	-					
NA8-3200	Ν							•	-	•	•				
NA8-4000	N, H, HU							-	-	-	•	-			
NA8-7500	N, H											-		-	-

NA8 Product Model Definition and Explanations



Notes: 1) 'N 'needs not be indicated for type N breaking capacity of NA8-7500, and may be omitted; if type H breaking capacity is selected,"H"needs to be indicated." 2) Manual operation: excluding mator-driven mechanism and closing electromagnet, shunt release. mator-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 nelligent controller, 3poles,motor-driven operation, draw-out type, control voltage AC230V.

NA8 Accessory Model Definition and Explanations (1)



NA8 Accessory Model Definition and Explanations (2)

NA8	1600	OF	C04				
4	4	4	4				
Product code	Frame current	Accessory code	Accessory specification				
	1600		C04: four groups of contacts				
	2500		C06: six groups of contacts				
	4000		N3: 3 NO 3 NC				
	7500	OF: auxiliary contact	N4: 4 NO 4 NC				
	2500 ~ 7500		N5: 5 NO 5 NC				
	4000 ~ 7500						
			1S1S: one lock one key				
		KL: key lock	2\$1\$: two locks one key				
			3S2S: three locks two keys				
		FCDP: fixed door frame					
		DCDP: draw-out type door frame					
		FD3: fixed three-pole interphase insulation	g barrier				
		FD4: fixed four-pole interphase insulating) barrier				
		DD3: draw-out type three-pole interphase	e insulating barrier				
		DD4 : draw-out type four-pole interphase	e insulating barrier				
		CE-CD-CT: drawer seat three-position sig	gnal				
		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)					

(P-007)

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	lcu	380/400/415V、690V、800V、1000/1150V
Rated service short-circuit breaking capacity (kA rms) VAC 50/60H z	lcs	380/400/415V、690V、800V、1000/1150V
Utilization category		
Rated short- time withstand current (kA rms) VAC 50/60Hz	lcw 1s	380/400/415V、690V、800V、1000/1150V
	Icw 3s	380/400/415V、690V
Rated short-circuit making capacity (kA peak) VAC 50/60Hz	lcm	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		
	Mechanical	No maintenance
Service life C/O cycle	Electrical	No maintenance
Connection	Horizontal、Verti	ical, Mixed
	Eived two	3P
Size (H×W×D)	Fixed type	4P
· · · –	Draw out type	ЗР
	Draw-out type	4P

NA8-1	600						NA8-25	00						NA8-3200)		
200	400	630	800	1000	1250	1600	630	800	1000	1250	1600	2000	2500	1600	2000	2500	3200
200	400	630	800	1000	1250	1600	630	800	1000	1250	1600	2000	2500	1600	2000	2500	3200
N (415	V)		N (6	90V)			N(415V) N(690V)	H(415V)	H(690V) H	HU(800V)	HU(1000\	//1500V)	N(415V)	N(690V)		
65			36				65	55	85	65	65	55		100	75		
50			36				65	55	85	65	65	55		100	75		
В							В							В	В		
50			36				65	55	85	65	65	55		85	65		
30			30						50	50							
143			75				143	121	176	143	143	121		220	165		
16							16							26			
20 ~ 3	0						20 ~ 30)						20 ~ 30			
30 ~ 4	0						30 ~ 40)						30 ~ 40			
15000							15000							10000			
1600A:	10000(4	15V) 30	000(690V) ≤125	0A:8000(415V)	8000(41	5V)	4000	0(690V)	20	00(1150V)		6500(415)	/) 3000(690	DV)	
•							-							-			
320×2	54×250						396×37	0×367						396×430>	<340		
320×324×250					396×465×367						396×545×340						
351×282×348				431.5×375×476						427.5×439×449							
351×3	52×348						431.5×4	170×476						427.5×554	1×449		

NA8-40	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(41	5V) H(690V) HU(800V)	HU(1000V/1500V)	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
В						В							
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							
6500(41	5V) 4000	A:600	D(1150V) 3	000(690V)	≤4000A:3000(1150V)	1500(400V) 1000(690V)							
-						•							
396×43	0×340												
396×545×340													
427.5×4	39×449					471.5×786	×464						
427.5×5	54×449					471.5×101	6×464						

Function Overview of Intelligent Controller



- 1 Display window: display the current value, setting parameter, fault current, tripping time, etc.
- 2 Return button: exit from current menu and enter the upperlevel 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 lg indicator for earth fault tripping.
- 11 Cover lock hole
- 12 Button for tripping test
- 13 li indicator for short-circuit instantaneous tripping.

M Type intelligent controller (basic type)

Protection

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

- Overload protection True RMS long time delay protection.
 - Thermal memory: heat accumulation before and after tripping.
- Short circuit protection
 Short time delay (RMS) and instantaneous protection
 4 definite time-delay options in terms of time delay
- Earth fault protection
 4 definite time-delay options in terms of time delay
 Test function
 Simulate 6l_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 upper3.8level 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 li 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)
 - -----
 - Power factor measurement
- □ Load monitoring function

measurement

- □ 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).

P-011

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 l²t.

Overload long-time-delay protection characteristics

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

Setting parameter	Setting range	etting range					Error				
Long time-delay setting current Ir	(0.4-1.0) In+	0.4-1 .0) In+OFF					±15%				
Long time-delay setting step size	1A (1600-250	1A (1600-2500 Frame size) ; 2A(4000-7500 Frame size)									
Long time-delay setting time tr	(1-2- 4-8 -12-	1-2- 4-8 -12-16-20 -24 -30)s ±10%									
Anti-time-limit characteristic curve	$t = (\frac{6}{N})^2 \times tr$	$=\left(\frac{6}{N}\right)^2 \times tr$									
Fault current	Action time										
I< 0.85li	No action										
l> 1.l5li	Action										
1.5lr	16	32	64	128	192		256	320	384	480	
2.0lr	9	18	36	72	108		144	180	216	270	
6.0lr	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 1.0ln;

Conventional factory setting: overload 6Ir; operating time 2s

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

 $N = 1.8 \ln/1.0 \ln = 1.8$

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

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	e size) ; 2A(4000-7500 Frame size)				
Short time-delay setting time tsd	Definite-time-limit: 0.1 Anti-time-limit:0.1、0.	1、0.21、0.31、0.41; 2、0.3、0.4	$\pm 15\%$ or inherent 40ms (take the maximum)			
Fault current	Action time					
I< 0.91sd	No action					
I> 1.151sd	Time-delay action					
led < 1<101	Anti timo limit	Action characteristicsl ² t=(10Ir) ² tsd				
150 < 15101	Ann-nine-ninn	Setting times0.1、0.2、0.3、0.4				
		Setting times0.11、0.21、0.31、0.41				
1≥1.11sd	Definite-time-limit	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 $error\pm 15\%$

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 li	(2~1 5) In+OFF	
Short time-delay setting step size	1A (1600-2500 Fr	ame size); 2A(4000-7500 Frame size)
Operating characteristics	l < 0.85li	No action
	l > 1.15li	Action
	≤100ms	Action time

Earth Fault Protection Characteristic

Earth fault protection operating threshold

<0.9lg: no action;

>1.11g: 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
Demine inne-deidy	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 $\pm 15\%$

Conventional factory setting: OFF

Controller Minimum Factory Display Current

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

Measuring Accuracy of Intelligent Controller

Current mensurement						
Medsuring range		la lb lc and L. not more than 15ln (circuit breaker rated current)				
Medsoning range		Relow 0. The measurement is inaccurate				
		0.11_{∞} 0 (In the accuracy will linearly change from 5% to 2%				
Measuring accuracy		0. Alocal Starting and a second of the angle of the second				
		> 15 [n the accuracy will linearly change from 2% to 15%				
Voltage measurement						
Measuring range		Line voltage: 0~600 V				
Medsoning range		Phase voltage: 0~300 V				
Measuring accuracy		Error: ±1%				
Frequency						
Measuring range		40Hz~70Hz				
Error		Error: ±0.1Hz				
Deutor						
rower						
Measurement mode	Effective v	alue				
	3P: total a	ctive power, total reactive power, total apparent power				
Measuring content	4P: split p	hase active power, split phase reactive power, split phase apparent power, total active power, total				
	reactiv	ve power, total apparent power				
	Active pov	/er: -32768kW~+32767kW				
Measuring range	Reactive p	ower: -32768Kvar~+32767Kvar				
	Apparent	pparent 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						
	Input reacti	ve electric energy (EQin), output reactive electric energy (EQout)				
Measuring content	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)				
	Active elect	ric energy: -32768kWh~+32767kWh				
Measuring range	Reactive ele	sctric energy: -32768Kvarh~+32767Kvarh				
	Apparent e	lectric energy: 0~65535kVAh				
Measuring accuracy	±2.5%					

Harmonic measurement	
Fundamental wave measurement	Current: Ia, Ib, Ic
ronddmenidi wave medsoremeni	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





(P-015)

Explanations on Earth Fault Protection

Single Phase Earth Fault Protection

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



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



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



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

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

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

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



Earth Current Type Earth Protection

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

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



(P-017)

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 l 🏻 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 \leq 3200A,

Accessory: Lock

Key Lock KL

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

one lock one key (1S1S) two locks one key (2S1S) three locks two keys (3S2S)

Drawer shutters Padlock

The padlock should be self prepared by the user.

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

Drawer Position Padlock

The padlock should be self prepared by the user.

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

Door Interlock Circuit breaker condition door interlock

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

Circuit breaker position door interlock

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

Pushbutton Lock PL

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







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

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





Notes: a. When it needs to bend the wire rope, the transition arc at the

bend should be higher than R120mm to ensure it can move flexibly.

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

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



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



Notes: a. When it needs to bend the wire rope, the transition arc at the bend should be higher than R120mm to ensure it can move flexibly.

b . Check the wire rope and ensure enough lubricating oil in it to ensure its flexible movement.

Accessory: Indication Contact





Auxiliary contact OF			
Standard configuration		4CO	6CO (NA8-1600)
Breaking capacity	current (A)/voltage (V) current (A)/v		current (A)/voltage (V)
	VAC (AC-15)	1.3/240, 0.75/415	1.3/240, 0.75/415
Utilization category	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)					
Little attack and a second	VAC (AC-15)	1.3/240, 0.75/415					
Utilization category	VDC (DC-13)	0.55/110, 0.27/220					

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

Spring energy storage indication contact								
Standard configuration		1NO						
Breaking capacity		current (A)/voltage (V)						
LINE CONTRACTOR	VAC (AC-15)	1.3/240, 0.75/415						
Unitation category	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. (P- 021)





1600 frame MO

2500~7500 frame 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.





1600 frame CC&ST



2500、4000~7500 frame CC&ST

Electric remote operation coil (CC and ST)

Closing electromagnet (CC)

Motor-driven mechanism (MO)

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

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

Shunt release (ST)

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

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

Undervoltage release (UVT)



2500、4000~7500 frame UVT

1600 frame 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							
	VAC 50/60Hz		220/230/240, 380/400/415				
Power supply	VAC 50/60Hz VDC 0 Opening 0.35-0 Closing 0.85Ue		-				
Operating threshold	Opening	0.35-0.7Ue	0.35-0.7Ue				
Operating Intestiola	VAC 50/60Hz VDC old Opening 0.35-0.7U Closing 0.85Ue	0.85Ue	0.85-1.1Ue				
Frame: power consumption	n (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					
Operating meshold	Closing	0.85Ue					
Frame: power consumption (VA)	1600: 20VA; 25	00~7500: 48VA					
Adjustable time	1s∼5s, the time d	elay 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.

(P-023)

Capacticy Derating and Power Loss

NA8-1600

Ambient temperature	200A		400A	400A 630A		800A 1		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

NA8-3200

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

NA8-4000

Ambient temperature	1600A		2000A		2500A		3200A		4000A	
Connection mode	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°	-	-	-	-	1	-	1	-
45°	-	-	-	-	1	6100	1	7000
50°	-	-	4700	4800	1	6000	1	6550
55°	3900	3900	4600	4650	1	5500	1	6050
60°	3800	3800	4400	4500	1	5200	1	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 impusle 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	1.0le
2500	0.96le
3000	0.93le
3500	0.89le
4000	0.75le
4500	0.82le
5000	The factory must be contacted for confirmation

Note: If the ambient temperature is lower than 40 °C , le = In ; if the ambient temperature is higher than 40 °C , derating use must be done in strict accordance with the requirement of operation manual; in such case, le \neq In , le 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)
	200	115	45
	400	140	80
	630	161	100
1600A	800	215	110
	1000	230	120
	1250	250	130
	1600	460	220
	630	58.6	26.4
	800	73.7	36.6
	1000	172	78
2500A	1250	268	122
	1600	440	200
	2000	530	262
	2500	600	312
	1600	390	170
22004	2000	470	250
3200A	2500	550	280
	3200	670	420
	1600	390	170
	2000	470	250
4000A	2500	550	280
	3200	670	420
	4000	1047	656
	4000	550	-
75004	5000	590	-
/ JUUA	6300	950	-
	7500	1500	-

(P-025)

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°C

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

	Ambient temperature (-5~40) °C				Ambie	ent temperc	ture 50°C		Ambient temperature 60°C				
Frame	Rated	Recor	nmended b	usbar specifie	ation	Recon	nmended b	usbar specific	ation	Recom	mended bu	sbar specifica	ition
current	current (A)	Width	Thickness	Number of panels	Specification	Width	Thickness	Number of panels	Specification	Width	Thickness	Number of panels	Specification
	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
1600A	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
	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
2500A	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
	1600	80	6	2	80*6*2	80	5	3	80*5*3	80	6	3	80*6*3
22004	2500	80	10	2	80*10*2	80	10	2	80*10*2	100	10	2	100*10*2
3200A	3200	100	10	2	100*10*2	100	10	2	100*10*2	100	10	3	100*10*3
	4000	100	10	4	100*10*4	100	10	4	100*10*4	100	10	5	100*10*5
	1600	80	6	2	80*6*2	80	5	3	80*5*3	80	6	3	80*6*3
40004	2000	80	10	2	80*10*2	80	10	2	80*10*2	100	10	2	100*10*2
4000A	2500	100	10	2	100*10*2	100	10	2	100*10*2	100	10	3	100*10*3
	3200	100	10	4	100*10*4	100	10	4	100*10*4	100	10	5	100*10*5
	4000	100	10	5	100*10*5	100	10	5	100*10*5	120	10	5	120*10*5
	4000	100	10	5	100*10*5	100	10	5	100*10*5	100	10	6	100*10*5
75004	5000	100	10	7	100*10*7	100	10	7	100*10*7	120	10	7	120*10*7
7 JUUA	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





Hole size

Hole size of the base



Hole size of the panel

Side view







Horizontal connection

Side view



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

Busbar mounting dimensions





Vertical connection



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

Busbar mounting dimensions





Three-pole product horizontal extension busbar (optional)

Side view



Unit: mm

In(A)	Α	В	С	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

Unit: mm

In(A)	Α	В	С	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.

Busbar mounting dimensions





Busbar mounting dimensions



(P-029)


Vertical extension busbar (optional)

Side view



Unit: mm

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

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



Busbar mounting dimensions

NA8-1600 fixed type

Front view



Side view



Hole size

Hole size of the base



Hole size of the panel



C

(P- 031)



Horizontal connection



Vertical connection



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

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

Busbar mounting dimensions









Four-pole product horizontal extension busbar connection (optional)



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

(P-033)

Vertical connection of extension busbar (optional)



NA8-2500 Draw-out type



Hole size



Hole size of the panel



(P- 035)



Horizontal connection



Vertical connection



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



Hole size

Hole size of the base



Hole size of the panel



(P- 037)



Horizontal connection



Vertical connection



Unit: mm

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

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

Busbar mounting dimensions



NA8-3200 Withdrawable type



Hole size

Hole size of the base



Hole size of the panel



(P-039)



Horizontal connection (In=1600A~2500A)



Vertical connection (In=1600A~2500A)

Side view



Busbar mounting dimensions



Note: User only needs to rotate the bus 90° to change vertical connection to horizontal connection.

Horizontal connection (In=3200A)



Vertical connection (In=3200A)

Side view



Note: To change vertical connection to horizontal connection, user needs to change the upper and lower buses of phase N and phase B to the same as those of phase A and phase C.

Busbar mounting dimensions





C

(P-041)

P-042 Air Circuit Breaker | NA8

NA8-3200 fixed type

Front view

Side view





Hole size

Hole size of the base

Hole size of the panel





Horizontal connection (In=1600A~2500A)



Vertical connection (In=1600A~2500A)

Hole size of the base



Note: User only needs to rotate the bus 90° to change vertical connection to horizontal connection.

Hole size of the panel



(P-043)



Horizontal connection (In=3200A)



Note: To change horizontal connection to vertical connection, user needs to change the upper and lower buses of phase N and phase B to the same as those of phase A and phase C.

Vertical connection (In=3200A)

Hole size of the base



Note: To change vertical connection to horizontal connection, user needs to change the upper and lower buses of phase N and phase B to the same as those of phase A and phase C. Hole size of the panel





NA8-4000 draw-out type



Hole size

Hole size of the base



Hole size of the panel



(P-045)



Horizontal connection (In=1600A~2500A)





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)



Busbar mounting dimensions





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

Horizontal connection (In=3200A~4000A)



Vertical connection (In=3200A~ 4000A)

Side view



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.

Busbar mounting dimensions





(P-047)

P- 048 Air Circuit Breaker | NA8

NA8-4000 fixed type

Front view





Hole size

Hole size of the base



Hole size of the panel

Side view



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°.

(P-049)



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



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. Busbar mounting dimensions





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

Front view

Side view





Hole size

Hole size of the base



Hole size of the panel



(P- 051)

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



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 \sim 5000A/ three poles)



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)



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

(P- 053)



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

Front view

Side view

Hole size



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



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°.

(P-055)



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)



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

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. (P-057)



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



Secondary Circuit Wiring

NA8-1600

M Type controller



Type of AX auxiliary contact

(P-061)



- 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 \sim 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#.
- $3#\sim5#$: Tripping alarm contact (3 is the common point.)
- $6\#{\sim}$ 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.



NA8-1600

H Type controller



Type of AX auxiliary contact

Used by the user

P- 063



- 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 \sim 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)
- $6#\sim9#$: 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



(P-065)



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 \sim 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#.

 $3# \sim 5#$: Tripping alarm contact (3 is the common point)

 $6\#{\sim}$ 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



- 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#.
- $3\#\sim5\#$: 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.



- 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.



(P-067)

Circuit Breaker Configuration

Standard component	NA8-1600		NA8-2500		NA8-3200		NA8-4000		NA8-7500	
	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

	NA8-1600		NA8-2500		NA8-3200		NA8-4000		NA8-7500	
Optional accessory	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	NA8-3200	NA8-4000		NA8-7500					
Circuit breaker	N 🗆	N 🗆 H 🗆		N 🗆	Η□	N 🗆	Η□				
Rated current	200A 🗆	630A 🗆	1600A 🗆	1600A 🗆	1600A 🗆	4000A 🗆	4000A 🗆				
	400A 🗆	800A 🗆	2000A 🗆	2000A 🗆	2000A 🗆	5000A 🗆	5000A 🗆				
	630A 🗆	1000A 🗆	2500A 🗆	2500A 🗆	2500A 🗆	6300A 🗆	6300A 🗆				
	800A 🗆	1250A 🗆	3200 A 🗆	3200 A 🗆	3200 A 🗆	7500A 🗆	7500A 🗆				
	1000A 🗆	1600A 🗆		4000 A 🗆	4000 A 🗆						
	1250A 🗆	2000A 🗆									
	1600A 🗆	2500A 🗆									
Number of poles	3 poles □	4 poles □									
Mounting mode	Draw-out type 🗆	Fixed type □ (NA8-7500 has	s 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 🛛								
shorn, closing, molor	AC220/230V	AC380/400 V 🗆	DC220V DC110V D								
Undervoltage release	UVT 🗆	UVTD 🗆	UVTZ-1 [(only for NA8-1600)								
	AC220/230V	AC380/400 V 🗆									
Auxiliary contact	NA8-1600 C04 (standard) C 06 □ (only for AC) N3 □ (only for AC) NA8-2500~7500 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 □ Signal contact output function □ Load monitoring 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) Leakage protection requires external LEC leakage transformer, and rated current of ACB with leakage transformer should <= 3200A;										
Lock mechanism (optional)	Breaking/Making button lock	 One lock one ke 	y 🗆 Two locks one l	key □	Three locks two	o keys □					
Mechanical interlock (optional)	Wire rope interlock (two interlock) Wire rope interlock (MIT-3) Wire rope interlock (MIT-4)										
Module (optional)	PSU-1 II RU-1 II	ST-DP protocol conve	ersion module 🗆								

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

Notes: 1) Please check the \Box corresponding to required option with " $\sqrt{}$ " 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.

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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.



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