

Empower the World



NA8 Air Circuit Breaker

CHINT GLOBAL



CHINT was established in 1984. Over the years, thanks to our rapid development, CHINT has become the world's leading provider of intelligent energy solution for the entire industrial chain, offering the most comprehensive range of products, from Plant to Plug. In 2023, our annual sales revenue exceeded 22.1 billion dollars, with total assets surpassing 25 billion dollars.

Over three decades of global expansion, our business network has grown to cover more than 140 countries and regions worldwide. We operate in various areas including low-voltage, power transmission and distribution, water, gas and electricity metering, and green energy sectors such as solar. CHINT employs more than 50,000 people worldwide, creating over 500,000 jobs in the supply chains.

Through the integration of businesses and continuous upgrading, CHINT Global has further established its supply chain. This market localization has also enabled us to adopt flexible business models such as smart operation and maintenance, financing, and other integrated technical services for the global market.



USD **22.1** Billion Annual Sales Revenue of CHINT Group



4%-12% Annual R&D Investment Obtained from the Percentage of Sales



50,000+ Employees Worldwide



USD **25** Billion Annual Total Assets of CHINT Group



Global Subsidiaries





140 Countries and Regions

24%

66%+

YoY Revenue Growth in 2023 of CHINT Global



Localization Rate of CHINT Global Employees

* Data as of December 31, 2023





GLOBAL OPERATION

Rooted Locally, Serving the Globe



Sunlight Singapore & Malaysia Main Products: Low-voltage Switchgears



Metering Factory Main Products: Meters



Solar Factory Main Products: PV Module, PV Cell



Sunlight Vietnam Main Products: MSB, MCC, SDB, DB, CU, Fire Pump Panel, Weatherproof Panel, String Combine Box, Solar Switchboard



SchneiTec CHINT Cambodia Main Products: MV Equipment including 22kV Distribution Transformer, Switchgear, Smart RMU, Capacitor Bank



CHINT – EGEMAC E Main Products: Full Series of Low-voltage Switchgears

Egypt



After more than 30 years of overseas expansion, CHINT Global has subsidiaries and offices in Europe, North America, Asia-Pacific, West Asia & Africa and Latin America. Its business footprint covers more than 140 countries and regions worldwide, continuously providing the world with more efficient smart electricity and clean energy.

Power T&D



Haining Solar Intelligent FactoryFactory Main Products: PV Module, PV Cell



China

Wenzhou Low-voltage Intelligent Factory

Main Products: Low-voltage Components



Jiaxing Factory

China

Main Products: MV and LV Switchgear, C-GIS, MV Circuit Breaker, Prefabricated Substation



CHINT ATC Saudi Arabia Main Products: RMU and Intelligent Power T&D Products of 33kV and below



Power T&D ShanghaiFactory China

Main Products: Power Transformer, GIS, MV and LV Switchgear, HGIS, HV Circuit Breaker, Disconnector



CHINT-AJLAN & Bros Saudi Arabia Main Products: Low-voltage Components







CHINT ELECTRIC

CHINT Electric Co., Ltd is a subsidiary of CHINT Group Corporation. With the wide range of transmission and distribution products, as well as the systematic and professional solution, CHINT Electric has supplied products and EPC services to customers over 140 countries across different industrial sectors, including power utility, renewable energy, oil and gas, metallurgy, railway and so on. Now CHINT Electric Co., Ltd has become one of the main players for Power T&D equipment and EPC services in the



CHINT ELECTRIC





The 1st 220kV Turnkey Project (EPC)

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.







Air Circuit Breaker

ACB



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 access

 13
 Position indicator

 14
 Racking handle storage

 15
 Intelligent controller
- 16) Fault-breaking indicator reset button











Button pops up, and handle cannot be rotated until button is depressed manually



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 voltage, power and other measurement functions advanced protection function harmonic measurement and analysis multiple auxiliary functions
 S type (loT type) Demand current protection Controller temperature measurement History max/min value record Program upgrade
 - Authorities setup

Connection

- Rear connection
 Standard: Horizontal connection
 Optional: Vertical or Mixed connection
- 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
- Opening/Closing pushbutton padlock
- Door interlock

Indication Contacts

- Standard contacts
 Open/Close indication contact
 Fault trip indication contact
 Spring energy storage indication contact
- Options

Drawer seat position indication contact

Optional : Ready-to-close contact (for 2000A frame and above)



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	N, H, S	•	•	-	•	-	•	-							
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 can be omitted for type N breaking capacity of NA8-7500. If type H breaking capacity is selected, H' must be indicated. 2) Manual operation: excludes motor-driven mechanism, closing electromagnet, and shunt release. Mator-driven operation: includes all remote operation standard accessories. 3) Code instance: NA8-250H-2000M/3MO-D AC230V: 2500h 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 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	2S1S: two locks one key			
			3S2S: three locks two keys			
		FCDP: fixed door frame				
		DCDP: Withdrawable type door frame				
		FD3: fixed three-pole interphase insulatin	g barrier			
		FD4: fixed four-pole interphase insulating) barrier			
		DD3: Withdrawable type three-pole inter	phase insulating barrier			
		DD4 : Withdrawable type four-pole interp	phase insulating barrier			
		CE-CD-CT: drawer seat three-position sig	gnal			
		ILK2: Withdrawable type two wire rope m	echanical interlock			
		ILK2F: fixed two wire rope mechanical int	erlock			
		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)	380/400/415/440、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	380/400/415/440V、690V、800V、1000/1150V
Rated service short-circuit breaking capacity (kA rms) VAC 50/60H z	lcs	380/400/415/440V、690V、800V、1000/1150V
Utilization category		
Rated short- time withstand current (kA rms) VAC 50/60Hz	lcw 1s	380/400/415/440V、690V、800V、1000/1150V
	Icw 3s	380/400/415/440V、690V
Rated short-circuit making capacity (kA peak) VAC 50/60Hz	lcm	380/400/415/440V、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
	Eined to be	3P
Size (H×W×D)	гіхеа туре	4P
· · ·	Withdrawahlo	3P
	wind dwdble	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 (440	V)	N (690	V) H	(440V)	H (6	90V)	N(415V) N(690V)	H(415V)	H(690V) I	U(800V)	HU(1000)	//1500V)	N(415V)	N(690V)		
55		42	6	6	50		65	55	85	65	65	55		100	75		
55		42	6	6	50		65	55	85	65	65	55		100	75		
В							В							В	В		
42		42	5	5	50		65	55	85	65	65	55		85	65		
-		-	3	0	30				50	50							
121		88	1	45	105		143	121	176	143	143	121		220	165		
							16							26			
							20 ~ 30)						20 ~ 30			
							30 ~ 40)						30 ~ 40			
10000							15000							10000			
1600A:	8000(41	5V) 60	000(690v) <125	0A: 1000	00(415)	8000(41	5V)	4000	0(690V)	20	00(1150V)		6500(415)	/) 3000(690	IV)	
•							-							•			
320×2	54×250						367×37	′0×357						402×422>	<341		
320×3	24×250						367×46	51×357						402×537>	<341		
351×2	82×350						431×37	′5×478						431.5×455	5×456		
351×3	52×350						431×47	′0×478						431.5×550)×456		

NA8-40	00					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(690\	/) 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	DA:60	D(1150V) 3	000(690V)	≤4000A:3000(1150V)	1500(400V) 1000	(690V)					
402×42	2×341												
402×53	7×341												
431.5×4	155×456					472×786×	464						
431.5×5	550×456					472×1016	×464						



Function Overview of Intelligent Controller

M type controller (standard type)

01 Ir indicator: overload long delay fault indication

02 Isd/li indicator: short circuit short delay fault indication/short circuit instantaneous/fault indication

03 lg indicator: earth fault indication

04 Run indicator: green LED flashing during normal operation of the controller

05 Display window: displays currents, set parameters, fault currents, and tripping time etc. (on LED)

06 Set key: switch to parameters setup menu to set protection and alarm parameters

07 Up key: in current menu, move selection box submenu up or set parameter "+" in parameters setup

08 Reset key: exit current menu to enter upper level menu or cancel value of current set parameter

09 Check key: switch to the inquiry menu to check tripping records and alarm records etc.

10 Enter key: enter next level menu of current selected box or save current set parameter

11 Down key: in current menu, move selection box submenu down or set parameter "-" in parameters setup

12 Key lock hole: prevent change of parameter settings via lead seal

13 Test key: simulate instantaneous tripping



H type controller (harmonic type)

01 Ir indicator: overload long delay fault indication

02 Isd/li indicator: short circuit short delay fault indication/short circuit instantaneous fault indication

03 Ig indicator: earth fault indication/electric leakage fault indication

04 Alarm indicator: LED not lit during normal operation; LED glowing upon alarm

05 Run indicator: green LED flashing during normal operation of the controller

06 Display window: displays currents, set parameters, fault currents, and tripping time etc. (on LED)

07 Set key: switch to parameters setup menu to set protection and alarm parameters

08 Up key: in current menu, move selection box submenu up or set parameter "+" in parameters setup

09 Reset key: exit current menu to enter upper level menu or cancel value of current set parameter

10 Check key: switch to the inquiry menu to check tripping records and alarm records etc.

11 Enter key: enter next level menu of current selected box or save current set parameter

12 Down key: in current menu, move selection box submenu down or set parameter "-" in parameters setup

- 13 Key lock hole: prevent change of parameter settings via lead seal
- 14 USB interface: change parameter and read data via USB
- 15 Test key: simulate instantaneous tripping

16 NFC touch control area: via mobile phone NFC, read last tripping record

(P-011)



S type controller (IoT type)

01 Ir indicator: overload long delay fault indication

02 Isd/li indicator: short circuit short delay fault indication/short circuit instantaneous fault indication

03 Ig indicator: earth fault indication/electric leakage fault indication

04 Alarm indicator: LED is not lit during normal operation and glows upon alarm

05 Run indicator: green LED flashing during normal operation of controller

06 Display window and touch control area: displays currents, set parameters, fault currents, and tripping time etc.; use touch control to switch interfaces and input data (TFT display)

07 Reset key: exit current menu to enter upper level menu or cancel value of current set parameter

08 Home key: switch to the parameters setup menu to set protection and alarm parameters; press this key twice to switch to the quick view mode

09 Enter key: save current set parameter; press once to display last tripping record

10 Key lock hole: prevent change of parameter settings via lead seal

11 USB interface: change parameter and read data via USB

12 Test key: simulate instantaneous tripping

13 NFC touch control area: via mobile phone NFC, read last tripping record

Controller type selection

				NA8		
Controller function				М	н	S
			-	Standard type	Harmonic type	loT type
Display mode				LED digitron	LCD	Color LCD
		Overload long delay		•	•	•
		Short circuit short delay		•	-	
		Short circuit instantaneou	s	•	•	•
		Earth fault protection (1 of 2)	Vector and earth fault protection Transformer center point	•	•	•
			earth fault protection	-		
	Current protections	Electric leakage protectio	n	-		
	Corrent protections	Neutral pole protection (4	1P, 3P+N)			
Protection functions		Overload pre-alarm		•	•	•
		Current open phase prote	ection			•
		Current unbalance protec	tion	•	•	•
		MCR (make/break function	on)	•	•	•
		HSISC (overreach tripping	g function)	•	•	•
		Required current protection	n	-		•
		Overvoltage/undervoltag protection	e/phase sequence	-	-	•
	Voltage protections	Voltage unbalance protec	tion	-	-	
		Voltage open phase prote	ection	-		•
	Fraguency protections	Over-frequency/under-fre	equency protection	-	•	
	rrequency protections	Frequency change rate p	rotection	-	-	•
	Power protection	Inverse power protection		-		•
		Thermal memory		•	•	•
	Other	Load monitoring		-		
		Regional selective interloo	:k	-		
		Phase/neutral line/earth a	currents	•	•	•
	Currents	Residual current		-		
	Corrents	Main current		-	•	•
		Current unbalance rate		•	•	•
		Phase voltage/line voltag	e	-	•	•
	Voltages	Voltage unbalance rate		-	•	•
		Phase sequence		-	•	•
Measurement functions	Power	Active/reactive/apparent	power	-	•	•
	Ele. energy	Active/reactive/apparent	electric energy	-	•	
	Power factor			-	•	
	Frequency			-	•	
	Waveform display			-	-	•
	Measurement of harmoni	ces		-	-	•
	Required value	Required current/required	power	-		•

Notes:

1. ■ Yes; □ Optional; -None

 $\ensuremath{\text{2. For Ethernet communication module, additional power supply module PSU-A51 A220 D1 is required. } \ensuremath{\text{2. For Ethernet communication module, additional power supply module PSU-A51 A220 D1} \ensuremath{\text{2. For Ethernet communication module, additional power supply module PSU-A51 A220 D1} \ensuremath{\text{2. For Ethernet communication module, additional power supply module PSU-A51 A220 D1} \ensuremath{\text{2. For Ethernet communication module, additional power supply module PSU-A51 A220 D1} \ensuremath{\text{2. For Ethernet communication module, additional power supply module PSU-A51 A220 D1} \ensuremath{\text{2. For Ethernet communication module, additional power supply module PSU-A51 A220 D1} \ensuremath{\text{2. For Ethernet communication module} \ensuremath{\text{2. For Ethernet communication} \ensuremath{\text$

3. Load monitoring, regional selective interlock, programmable signal output, and "4-remote" functions need to be based on the additional functions, with additional PSU-1 power supply module and RU-1 relay module.

(P-013)

Controller type selection

				NA8					
Controller function				м	н	S			
				Standard type	Harmonic type	loT type			
	Health test	Fault tripping test		•	•	•			
		Controller functions mon	itoring	•	•	•			
	Haalth aromata	CB accessories monitorin	g	-	-				
	nealin prompis	Temperature monitoring	Controller temp	-	-	•			
Health diagnosis		Contact wear equivalent		-	•				
	Health forecast	Remaining service life		-	•	•			
		Trip/close function mainte	enance	-	-	•			
	Maintenance prompts	Controller accessory mod	dules maintenance	-	-	-			
		CB maintenance (life/tem	np. etc.)	-	-	•			
	Trip/alarm records (10 tir	nes)		•	•	•			
	Displacement records (10) times)		-	•	-			
	Operation times record			-		-			
	Internal clock functions			-	•				
Event records	History maximum/minim	um currents		-	-	•			
	History maximum/minim	um voltages		-	-	•			
	Maximum/minimum freq	uencies		-	-	•			
	Peak value of required p	ower		-	-	•			
	Maximum value of requi	red current		-	-	•			
	Electric energy quality an	alysis records		-	-	•			
	Wireless radio frequency			-					
	frequency USB			-	•	•			
	NFC			-	•	-			
Smart interconnection	Modbus RTU			-	•	-			
Shan merconnection	DL/T645 protocol			-	-				
	DL/T698 protocol			-	-				
	HPLC			-	-				
	Ethernet			-					
	Programmable signal ou	tput		-					
	Voltage check closing			-	-	-			
	Setup of dual parameters	5		-	-				
	Maintenance mode prote	ection		-	-				
Expanded functions	Program upgrade			-	-	-			
	Remote reset	Remote reset			Remote reset			-	-
	Authorities setup			-	-	-			
	Harmonic alarm			-	-	-			
	Overload reclosing			-	-	-			

Notes:

1. ■ Yes; □ Optional; -None

2. For Ethernet communication module, additional power supply module PSU-A51 A220 D1 is required.

3. Load monitoring, regional selective interlock, programmable signal output, and "4-remote" functions need to be based on the additional functions, with additional PSU-1 power supply module and RU-1 relay module.

Protection type		Characteristic	Action value	Time delay
		Constant time-limit DT		Refer to characteristics table of DT
Long delay protections		Reverse time-limit IT		Refer to characteristics table of IT
Long delay protections		Reverse time-limit I ² T	II=0.4m~ III	Refer to characteristics table of $\ensuremath{I^2 T}$
		Reverse time-limit I ⁴ T		Refer to characteristics table of I ⁴ T
Short circuit short delay protections		Constant time-limit	lsd=1.51r~151r(In<3600A)	0.1s, 0.2s, 0.3s, 0.4s
		Constant time-limit +Reverse time-limit	lsd=1.5lr~50kÅ(ln≥3600Å)	0.1s, 0.2s, 0.3s, 0.4s (Isd>8Ir) (8Ir/I) ² ×tsd (Isd8Ir)
Instantaneous protections		-	li=1.5ln~15ln(ln≤5000A) li=1.5ln~75kA(ln≥6300A)	-
Verter som er ter ti		Constant time-limit	$\begin{array}{l} lg\!=\!100A\!\!\sim\!\!1ln(ln\!\leq\!\!400A)\\ lg\!=\!0.2ln\!\!\sim\!\!1ln(630A\!\leq\!\!ln\!\leq\!\!3200A)\\ lg\!=\!0.2ln\!\!\sim\!\!3200A(ln\!\!>\!\!3200A) \end{array}$	0.1s, 0.2s, 0.3s, 0.4s
	Vector sum protections	Constant time limit + Pauses time limit	$\begin{array}{l} lg\!=\!100A\!\!\sim\!\!1ln(ln\!\le\!400A) \\ lg\!=\!0.2ln\!\sim\!1ln(630A\!\le\!ln\!\le\!3200A) \end{array}$	$\begin{array}{l} 0.1 \text{s}, \ 0.2 \text{s}, \ 0.3 \text{s}, \ 0.4 \text{s}(\text{Ig} \! > \! \text{In}) \\ (1.0 \text{In}/\text{I})^2 \times \text{tg}(1.1 \text{Ig} \! < \! \text{I} \! < \! \text{I.0In}) \end{array}$
Earth protections		Constant time-limit + keverse time-limit	lg=0.2ln~3200A(ln>3200A)	0.1s, 0.2s, 0.3s, 0.4s(lg>3200A) (3200/l) ² ×tg(1.1lg <l<3200a)< td=""></l<3200a)<>
		Constant time-limit	lg=100A~1ln(ln≤400A) lg=0.2ln~1ln(630A≤ln<1200A) lg=500A~1200A(ln≥1250A)	0.1s, 0.2s, 0.3s, 0.4s
	Earth current protections	Constant time limit + Reverse time limit	lg=100A~1In(In≤400A) lg=0.2In~1In(630A≤In<1200A)	0.1s, 0.2s, 0.3s, 0.4s (lg>ln) (1.0ln/l)²×tg (1.1lg <l<1.0ln)< td=""></l<1.0ln)<>
			lg=500A~1200A(In≥1250A)	0.1s~0.4s (lg>1200A) (1200/I)²×tg (1.1lg <i<1200a)< td=""></i<1200a)<>
Electric leakage protection	on	Constant time-limit +Reverse time-limit	I △ n=0.5A~30A	Refer to electric leakage characteristics table
MCR protection		-	-	
HSISC protection		-	-	
Current unbalance prote	ection	Constant time-limit	20% ~ 60%	1s~40s
Required current protect	ion	Constant time-limit	0.4ln~1ln	15s~1500s
Current open phase pro	tection	Constant time-limit	90% ~ 99%	0.1s~3s
	I _N =50%	Constant time-limit +Reverse time-limit	IrN=50%Ir IsdN=50%Isd IiN=50%Ii IgN=100%Ig	
Neutral line protections	I _N =100%	Constant time-limit +Reverse time-limit	IrN=100%Ir IsdN=100%Isd IiN=100%Ii IgN=100%Ig	-

Notes:

1. ■ Yes; □ Optional; -None

2. For Ethernet communication module, additional power supply module PSU-A51 A220 D1 is required.

3. Load monitoring, regional selective interlock, programmable signal output, and "4-remote" functions need to be based on the additional functions, with additional PSU-1 power supply module and RU-1 relay module.

(P-015)

Smart controller protection characteristics

Table of protection functional parameters

Protection	n type	Protection characteristics	Alarm return value	Alarm return time	Graded difference (step length)	Action tolerance (accuracy)	Alarm or not	Close or not
		Constant time-limit DT						
		Reverse time-limit IT		1 10	1A (1600/2500 frame size)	. 10%	~	
Long delay	y protections	Reverse time-limit I2T	0.9lr	Is~IUs	2A (3200/4000/7500 frame size)	±10%	res	res
		Reverse time-limit I4T						
		Constant time-limit			Isd<10kA: 1A (1600/2500 frame size)			
Short circu protections	it short delay s	Constant time-limit +Reverse time-limit	0.8lsd	1s~10s	2A (3200/4000/7500 frame size) Isdd≥10kA: 10A (1600/2500 frame size) 20A (3200/4000/7500 frame size)	±10%	Yes	Yes
Instantane protection	ous	-	0.7li	1s~5s	li<10kA: 1A (1600/2500 frame size) 2A (3200/4000/7500 frame size) li≥10kA: 10A (1600/2500 frame size) 20A (3200/4000/7500 frame size)	±10%	Yes	Yes
Easth avei	Vector sum	Constant time-limit Constant time-limit +Reverse time-limit	0.2In~setting	1s~10s	1A (1600/2500 frame size) 2A (3200/4000/7500 frame size)	±10%	Yes	Yes
Earin proi.	Earth curent	Constant time-limit Constant time-limit +Reverse time-limit	0.2In~setting	1s~10s	1A	±10%	Yes	Yes
Electric lea protection	ikage	Constant time-limit +Reverse time-limit	0.5A~setting	1s~10s	0.1A	-20%	Yes	Yes
MCR prote	ection	-				±15%	No	Yes for S
HSISC pro	tection	-				±15%	No	Yes for S
Current un	balance	Constant time-limit	20%~setting	1s~360s	1%	±10%	Yes	Yes
Required c	urrent	Constant time-limit	0.4In~setting	15s~3000s	1A	±10%	Yes	Yes
Current op	oen phase	Constant time-limit	20%~setting	1s~360s	1%	±10%	Yes	Yes
	I _N =50%	Constant time-limit +Reverse time-limit	-				Yes	Yes
Neutral line protection	I _N =100%	Constant time-limit +Reverse time-limit	-				Yes	Yes

Notes:

1. Long delay protection: M type controller only has I2T characteristics. H type controller has IT, I2T, and I4T characteristics. S type controller has DT, IT, I2T, and I4T characteristics.

2. Product default settings: as shown below; please set controller overcurrent protection parameters according to actual demands:

Long delay protection: Ir=1.0In; tr=15s (@1.5Ir);

Short circuit short delay protection: Isd=8Ir (Ir < 6250A) Isd=50kA (Ir 6250A); tsd=0.4s

Instantaneous protection: li=12In (In=200A~5000A); li=75kA (In 6300A);

Earth protection: Ig=OFF; tg=0.4s

Protection functions parameters table

Protection ty	ре	Characteristic	Action value	Time delay	Alarm return value	Alarm return time
Overvoltage	protection	Constant time-limit	1.0Ue~1.35Ue	1s~5s	Ue~setting	1s~36s
Undervoltage	protection	Constant time-limit	0.2Ue~0.7Ue	0.2s~10s	setting~Ue	1s~36s
Voltage unba	lance prot.	Constant time-limit	2%~30%	1s~40s	2%~setting	1s~360s
Phase sequer	ice prot.	Constant time-limit	ABC, ACB	0.3s	-	-
Voltage missi protection	ng phase	Constant time-limit	90%~99%	0.1s~3s	20%~setting	1s~360s
Overfrequenc	cy protection	Constant time-limit	50Hz~64Hz	0.2s~5s	50Hz~setting	1s~360s
Underfrequer	ncy protection	Constant time-limit	46Hz~60Hz	0.2s~5s	setting~60Hz	1s~360s
Freq. change	rate prot.	Constant time-limit	0.4Hz/s~10Hz/s	0.5s~10s	0.4Hz/s~setting/s	1s~360s
Inverse power (active)	r protection	Constant time-limit	0.1Sn~1Sn	0.2s~20s	0.1Sn~setting	1s~360s
Inverse power (reactive)	r protection	Constant time-limit	0.1Sn~1Sn	0.2s~20s	0.1Sn~setting	1s~360s
Overpower p (active)	rotection	Constant time-limit	0.4Sn~1.5Sn	0.2s~20s	0.4Sn~setting	1s~360s
Overpower p (reactive)	rotection	Constant time-limit	0.4Sn~1.5Sn	0.2s~20s	0.4Sn~setting	1s~360s
Underpower (active)	protection	Constant time-limit	0.1Sn~1Sn	0.2s~20s	setting~1Sn	1s~360s
Required pow (total power)	ver protection	Constant time-limit	0.4Sn~1Sn	15s~1500s	0.4Sn~setting	15s~3000s
Current load	monitoring	Constant time-limit	0.4lr (min. 100A)~1lr	(20%~80%)Tr	0.2Ir (min. 80A) ~ unloading threshold	10s~3600s
Active power monitoring	load	Constant time-limit	200kW~10000kW	10s~3600s	100kW~enable unloading threshold	10s~3600s
Bus temperat	ure monitoring	Constant time-limit	100°C ~150°C	10s~3600s	100C ~setting	10s~3600s
Overload pre-alarm		Constant time-limit	lr0=0.75lr~1.05lr	0.5Tr	0.9lr0	0.5Tr
3-phase pow	er factor alarm	Constant time-limit	0.2~0.95	1s~40s	Setting +0.05	1s~360s
Harmonic	THDi		10%~30%	10 100	S	10 0/0
alarm	THD∪	Constant time-limit	3%~10%	10s~120s	Seming -2%	1US~36US

Notes:

1. Tr can be set to 15s, 30s, 60s, 120s, 240s, 480s;

2. For unimportant fault protections, the smart controller can be configured with automatic reclosing, of the following two modes:

Mode 1: With automatic reclosing function enabled, CB will be tripped via shunt release as controlled by DO output, and the reclosing will adopt DO output to control the closing electromagnet to close the CB.

If the DO output controlled shunt release cannot trip the CB, tripping will occur via the magnetic flux converter and in this case, automatic reclosing is not possible.

Mode 2: With automatic reclosing function enabled, the magnetic flux converter will trip the CB and then the DO output will control the remote reset module and the closing electromagnet to reset the interlock mechanism and close the CB.

No matter mode 1 or mode 2, if closing is not possible after 2 reclosing operations, the controller will generate an alarm (the DO function must be set correctly for this purpose) and the CB product must be electric (with motor). By default, overload reclosing will adopt mode 1. Upon overcurrent, after operation of the overload long delay protection, automatic reclosing will be realized according to the following reclosing delay.

(P-017)

Protection functions parameters table

Protection type		Graded difference (step length)	Action tolerance (accuracy)	Alarm or not	Close or not
Overvoltage protection		۱V	±10%	Yes	Yes
Undervoltage protection		1V	±10%	Yes	Yes
Voltage unbalance protection		1%	±10%	Yes	Yes
Phase sequence prot.		-	±10%	Yes	Yes
Voltage missing phase protection		1%	±10%	Yes	Yes
Overfrequency protection		0.1Hz	±10%	Yes	Yes
Underfrequency protection		0.1Hz	±10%	Yes	Yes
Frequency change rate protection		0.1Hz	±10%	Yes	Yes
Inverse power protection (active)		1kW(1600/2500 frame size) 2kW(3200/4000/7500 frame size)	±10%	Yes	Yes
Inverse power protection (reactive)		1kW(1600/2500 frame size) 2kW(3200/4000/7500 frame size)	±10%	Yes	Yes
Overpower protection (active)		1kW(1600/2500 frame size) 2kW(3200/4000/7500 frame size)	±10%	Yes	Yes
Overpower protection (reactive)		1kW(1600/2500 frame size) 2kW(3200/4000/7500 frame size)	±10%	Yes	Yes
Underpower protection (active)		1kW(1600/2500 frame size) 2kW(3200/4000/7500 frame size)	±10%	Yes	Yes
Required power protection (total po	ower)	1kW(1600/2500 frame size) 2kW(3200/4000/7500 frame size)	±10%	Yes	Yes
Current load monitoring		1A(1600/2500 frame size) 2A(3200/4000/7500 frame size)	±10%	Yes	Yes
Active power load monitoring		1kW	±10%	Yes	Yes
Bus temperature monitoring		1C	±10%	Yes	Yes
Overload pre-alarm		1A(1600/2500 frame size) 2A(3200/4000/7500 frame size)	±10%	Yes	Yes
3-phase power factor alarm		0.01	±10%	Yes	Yes
THDi		1%	±10%	Yes	Yes
	THDu	1%	±10%	Yes	Yes

Notes:

1. Tr can be set to 15s, 30s, 60s, 120s, 240s, 480s;

2. For unimportant fault protections, the smart controller can be configured with automatic reclosing, of the following two modes:

Mode 1: With automatic reclosing function enabled, CB will be tripped via shunt release as controlled by DO output, and the reclosing will adopt DO output to control the closing electromagnet to close the CB.

If the DO output controlled shunt release cannot trip the CB, tripping will occur via the magnetic flux converter and in this case, automatic reclosing is not possible.

Mode 2: With automatic reclosing function enabled, the magnetic flux converter will trip the CB and then the DO output will control the remote reset module and the closing electromagnet to reset the interlock mechanism and close the CB.

No matter mode 1 or mode 2, if closing is not possible after 2 reclosing operations, the controller will generate an alarm (the DO function must be set correctly for this purpose) and the CB product must be electric (with motor). By default, overload reclosing will adopt mode 1. Upon overcurrent, after operation of the overload long delay protection, automatic reclosing will be realized according to the following reclosing delay.

Parameter name	Setting range	Setting step length	Remark
Reclosing delay	(10~3600)s	ls	In case of operation after 2 reclosing actions, manually check resetting.
Protection type	Open/closed		

Notes:

- 1. Use of this function requires purchase of additional PSU-1 power supply module and RU-1 relay module.
- 2. If mode 2 is selected, specify this when ordering. Besides, for mode 2, purchase additional remote reset module and closing ready device.

DT characteristics table

Curve type	Fault current	Action time	tr(s)		Pomark			
		15	30	60	120	240	480	Kemurk
	1.5×Ir	2	4	8	16	32	64	
DT	2l×r	2	4	8	16	32	64	+T-/7.5
	6l×r	2	4	8	16	32	64	II = II/7.5
	7.2×Ir	2	4	8	16	32	64	

IT characteristics table

Curve type	Fault current	Action time	tr(s)		Pemark				
		15	30	60	120	240	480	кепагк	
	1.5×lr	15	30	60	120	240	480		
т	2×lr	11.25	22.5	45	90	180	360	4	
	6×lr	3.75	7.5	15	30	60	120	$I = (1.5171) \times II (min. 0.65, max. 6555)$	
	7.2×lr	3.125	6.25	12.5	25	50	100		

I²T characteristics table

Curve type	Fault current	Action time	tr(s)		Pomork				
		15	30	60	120	240	480	Keniurk	
	1.5×lr	15	30	60	120	240	480		
1 ² T	2×lr	8.44	16.87	33.75	67.5	135	270	$(1.51)^{1/2} (T_{1})^{1/2} (T_{2})^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.00) (5.51)^{1/2} (0.$	
FI	6×lr	0.94	1.87	3.75	7.5	15	30	tr=(1.5ir/1) × ir (min. 0.8s, max. 655s)	
	7.2×Ir	0.8	1.3	2.6	5.2	10.41	20.83		

I⁴T characteristics table

Curve type	Fault current	Action time	tr(s)		Pemark				
		15	30	60	120	240	480	Keniuik	
	1.5×lr	15	30	60	120	240	480		
1 ⁴ T	2×Ir	4.75	9.5	19	38	75.94	151.87	$(1.51)^{1/4}$ (T. (, 0.0	
F1	6×lr	0.8	0.8	0.8	0.8	0.94	1.87	tr=(1.5ir/i) × Ir (min. 0.8s, max. 655s)	
	7.2×Ir	0.8	0.8	0.8	0.8	0.8	0.904		

Electric leakage characteristics table

Set time (s)	Instant	0.18	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	Remark
Set current multiple	Action time Tn(s)												
l∆n	0.04	0.36	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	
2l∆n	0.04	0.18	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	Reverse time-limit T _△ n=(2I _△ n/I)t _△ n
5l∆n	0.04	0.072	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
>5l∆n	0.04	0.072	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	Constant time-limit
Allowed return time	0.02	0.06	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83	

MCR parameter settings table

Product model	Controller type	MCR setting range	Setting step	Ex-factory default	Current action error
		5.1kA(In=200A~400A)	-	5.1kA	±15%
	м, н	10kA(In=630A~800A)	-	10kA	±15%
NA9 1/00		16kA(In=1000A~1600A)	-	16kA	±15%
140-1000		5.1kA~10kA+OFF(In=200A~400A)	1kA	5.1kA	±15%
	S	10kA~20kA+OFF(In=630A~800A)	1kA	10kA	±15%
		16kA~30kA+OFF(In=1000A~1600A)	1kA	16kA	±15%
		10kA(In=400A~800A)	-	10kA	±15%
NA9. 2500	м, п	16kA(In=1000A~2500A)	-	16kA	±15%
NA6-2300	S	10kA~20kA+OFF(In=630A~800A)	1kA	10kA	±15%
		16kA~30kA+OFF(In=1000A~1600A)	1kA	16kA	±15%
	мн	16kA(In=630A~1250A)	-	16kA	±15%
NAS 2200	м, п	25kA(In=1600A~3200A)	-	25kA	±15%
146-3200	c	16kA~30kA+OFF(In=630A~1250A)	2kA	16kA	±15%
	3	25kA~50kA+OFF(In=1600A~3200A)	2kA	25kA	±15%
		16kA(In=800A~1600A)	-	16kA	±15%
NA9 4000	м, п	25kA(In=2000A~4000A)	-	25kA	±15%
NA8-4000	c	16kA~30kA+OFF(In=800A~1600A)	2kA	16kA	±15%
	5	25kA~50kA+OFF(In=2000A~4000A)	2kA	25kA	±15%
NA8 7500	м, н	40kA	-	40kA	±15%
UUC 1-0MM	S	40kA~80kA+OFF	2kA	40kA	±15%

Notes:

1. Symbol OFF indicates exiting this function.

2. Symbol – indicates fixed setting that cannot be adjusted.

MCR parameter	settings table				
Product model	Controller type	HSISC setting range	Setting step	Ex-factory default	Current action error
		16kA(In=200A~400A)	-	OFF	±15%
NA9 1/00	м, н	32kA(In=630A~800A)	-	OFF	±15%
NA8-1600		50kA(In=1000A~1600A)	-	OFF	±15%
	S	40kA~60kA+0FF	1kA	OFF	±15%
		32kA(In=400A~800A)	-	OFF	±15%
NA8-2500	м, п	50kA(In=1000A~2000A)	-	OFF	±15%
	S	40kA~60kA+0FF	1kA	OFF	±15%
		50kA(In=630A~1250A)	-	OFF	±15%
NA8-3200	м, н	80kA(In=1600A~3200A)	-	OFF	±15%
	S	50kA~80kA+0FF	2kA	OFF	±15%
		50kA(In=800A~1600A)	-	OFF	±15%
NA8-4000	м, н	80kA(In=2000A~3200A)	-	OFF	±15%
	S	50kA~80kA+0FF	2kA	OFF	±15%
140 7500	м, н	80kA	-	OFF	±15%
NA8-7500	S	80kA~100kA+0FF	2kA	OFF	±15%

Notes:

1. Symbol OFF indicates exiting this function.

2. Symbol – indicates fixed setting that cannot be adjusted.

Controller working power supply

Simultaneous power supply by auxiliary power and power mutual transformer is adopted to ensure reliable operation of the controller at very small load and upon short circuit. There are 3 power supply modes for this controller:

a.By power supply CT: this mode can satisfy protections upon overload or short circuit at CB load side;

b.By auxiliary power supply: in case CB load is less than 20%In, this power supply can satisfy protections, display, communication, and control functions;

c.USB power supply: supply power at open CB state, e.g. tripped, commissioning, or maintenance etc.

P-021)



Overcurrent protection characteristic curve DT



Overcurrent protection characteristic curve IT



Overcurrent protection characteristic curve $\mathsf{I}^2\mathsf{T}$



Overcurrent protection characteristic curve $\mathsf{I}^4\mathsf{T}$



(P- 023)



Electric leakage protection characteristic curve



Earth protection characteristic curve (vector sum)







Smart controller measurement accuracy

Table of smart controller measurement accuracy

				Measurement accuracy					
Ifem		Symbol	Measuring range	Μ	н	S			
	Phase current	I _A , I _B , I _C		±1.5% (I<100A: ±1.5A)					
	Neutral line current	I _N	0.2ln~1.2ln		$\pm 1\%$ (I<100A: $\pm 1A$)	±0.5% (I<100A: ±0.5A)			
Currents	Mean current	l _{avg}		-					
Contenis	Earth current	l _g	0.2ln~1.2ln	±5%	±5%	±5%			
	Residual current	l∆n	0.3>~36A	-	±10%	±10%			
	Current unbalance rate	l _{unbal}	0~100%	-	±5	±5			
	Phase voltage	U_{AN}, U_{BN}, U_{CN}	69V~300V	-	±1%	±0.5%			
Valtance	Line voltage	U_{AB},U_{BC},U_{CA}	120V~600V	-	±1%	±0.5%			
Voltages	Mean line voltage	U _{avg}	120V~600V	-	±1%	±0.5%			
	Voltage unbalance rate	U _{unbal}	0~100%	-	±5	±5			
	Active power	Р		-	±2.5%	±1%			
Power	Reactive power	Q	0.8Ue~1.2Ue 0.2In~1.2In	-	±2.5%	±2%			
	Apparent power	S		-	±2.5%	±1%			
	Active electric energy	E.P	-799999999.9KWh~+ 79999999.9KWh	-	±2.5%	±1%			
Electric energy	Reactive electric energy	E.Q	-799999999.9Kvarh~+ 79999999.9Kvarh	-	±2.5%	±2%			
	Apparent electric energy	E.S	0~79999999.9KVAh	-	±2.5%	±1%			
Power factor		PF	0.5L~0.8C	-	±0.04	±0.02			
Frequency		F	45Hz~65Hz	-	±0.1Hz	±0.1%			
	Period correct	I _A , I _B , I _C	0.21- 1.21-	-	-	$\pm 0.5\%$ ($1 < 100$ Å, ± 0.5 Å)			
	Required correni	In	0.211~1.211	-	-	±0.5% (I< 100A: ±0.5A)			
Required value		Р		-	-	±1%			
	Required power	Q	0.8Ue~1.2Ue 0.2In~1.2In	-	-	±2%			
		S		-	-	±1%			

Notes:

1. This smart controller can provide different grades of measurement accuracy according to different applications and user demands.

2. Voltage measurements are based on 380/400/415V system and the voltage measurement ranges can be expanded by setting rated voltages.

(P-025)

Explanations on Earth Fault Protection

Single Phase Earth Fault Protection

□ The three-pole circuit breaker achieves earth fault protection by internally testing whether the sum of the three-phase current vectors is zero, using three current transformers.



• The four-pole circuit breaker achieves earth fault protection by internally testing whether the sum of the three-phase current and the neutral phase current vectors is zero, using four current transformers.



• The 3P+N system achieves earth fault protection by calculating the vector sum using the three-pole circuit breaker and an 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 For 3PT, earth fault protection is applicable only for balanced loads. For unbalanced loads, this function must either be disabled or the set value adjusted above the permissible unbalanced current to prevent unintended operation of the intelligent controller.

(3) For (3P+N) T configurations, the maximum distance between the transformer and circuit breaker must not exceed 5 meters. If the transformer lead wire exceeds 2 meters in length, it should be specifically indicated when placing the order.
As shown below, for a load side fault in the NA8 circuit breaker, where the fault current flows through only one phase, the intelligent control unit activates the differential earth protection function if the sum of the three-phase currents detected by four current sensors exceeds the set threshold. This provides earth fault protection specifically tailored for load side faults.



Earth Current Type Earth Fault Protection

The external Ground current transformer, installed at the MV/LV transformer's star earthing point, is used for earth fault protection. It requires the NA8 circuit breaker be equipped with an H type controller (ground current protection transformer should be selected). This setup allows the Ground current transformer to directly measure earth fault currents on both the power supply and load sides of an NA8 circuit breaker.



(P-027)

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 Current Protection

Ideal for areas with requirements to prevent indirect contact. For the NA8 circuit breaker, select the H type controller and add the leakage protection function and leakage transformer (LEC) accessory to achieve effective 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 with residual current protection and must 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 three types of key locks available (the latter two are used in distribution systems with two incoming cabinets and one coupler cabinet):

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

Drawer shutters Padlock

Users must provide their own padlocks.

If a padlock is used, it must ensure that when the circuit breaker is in the disconnected or test position, the isolating contacts cannot be connected to the external live conductors.

Drawer Position Padlock

Users must provide their own padlocks.

When the drawer seat and circuit breaker are locked in the disconnected position using a padlock, the racking access is blocked and the racking handle cannot be inserted, preventing any positional change of the withdrawable breaker body.

Door Interlock Circuit breaker condition door interlock

When the circuit breaker is closed, the switchgear door is prevented from opening. When the circuit breaker is open, the switchgear door may be opened.

Circuit breaker position door interlock

When the circuit breaker is at the connection and test position, the switchgear door is prevented from opening. When the circuit breaker is at the disconnected position, the switchgear door may be opened.

Pushbutton Lock PL

Users must provide their own padlocks.

The pushbutton lock is used to secure the pushbutton that opens and closes the circuit breaker, utilizing a padlock. Once locked, manual opening and closing operations are disabled.







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

 IQF
 2QF

 0
 0

 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.

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)/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)					
I William tion and a series	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)					
I Hilization antonom	VAC (AC-15)	1.3/240, 0.75/415					
Utilization 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- 031)





1600 frame MO

2500~7500 frame MO



It features motorized energy storage charging with automatic recharging after the circuit breaker closes, ensuring immediate reclosure capability. In the absence of auxiliary power

supply, the energy storage charging handle serves as a standby option.



1600~4000 frame CC and ST



7500 frame CC and 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 consumption ()(A 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	
F	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					
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 consumptio	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 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.

(P-033)

Capacity Derating and Power Loss

Derating Under different temperature

NA8-1600

Ambient temperature	200A	00A 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	00A 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°	-	-	-	-	/	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
Rate impulse withstand voltage (kV)	Uimp	12	11	10	8
Insulation class (V)	Ui	1000	900	800	700
Power frequency withstand voltage (V)		3500	3100	2500	2200
Maria (1997)		690	580	520	460
Maximum operating voltage (v)	Ue	1150	900	800	700

Current performance corrections under different altitudes

Altitude (m)	Rated operating current (le)
2000	1.0le
2500	0.96le
3000	0.93le
3500	0.89le
4000	0.85le
4500	0.82le
5000	Must confirm with manufacturer

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 ≠ 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
20004	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	-
/ 3UUA	6300	950	-
	7500	1500	-

(P-035)

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			Ambient temperature 50°C				Ambient temperature 60°C				
Frame	Rated	Recor	nmended b	usbar specific	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.

Overall and installation dimensions







Perforating size of NA8-1600 withdrawable type

(P-037)



In(A)	D(mm)
200~630	5
800~1000	10
1250~1600	16



Horizontal busbar connection of NA8-1600 withdrawable type

In(A)	D(mm)
200~630	5
800~1000	10
1250~1600	16

Busbar installation dimensions





Vertical busbar connection of NA8-1600 withdrawable type

(P-039)







Note: The extended bus is an optional accessory, which will be charged separately.



Busbar installation dimensions



3 poles extended bus horizontal connection of NA8-1600 withdrawable type

Side view



			ι	Jnit: mm
In(A)	A(mm)	B(mm)	C(mm)	D(mm)
200~630	74.5	160.5	5	5
800~1000	69.5	170.5	10	10
1250~1600	64	181.5	15	16

Note: The extended bus is an optional accessory, which will be charged separately.





4 poles horizontal extended bus connection of NA8-1600 withdrawable type

Side view



			Unit: mm
In(A)	A(mm)	B(mm)	D(mm)
200~630	5	5	5
800~1000	10	10	10
1250~1600	15	15.5	16

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

Busbar installation dimensions



Extended bus vertical connection of NA8-1600 withdrawable type





Overall dimensions of NA8-1600 fixed type

Hole size of the base

Hole size of the panel





Perforating size of NA8-1600 fixed type





In(A)	D(mm)
200~630	5
800~1000	10
1250~1600	16

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

Busbar installation dimensions



Vertical busbar connection of NA8-1600 fixed type



3 poles horizontal extended busbar connection of NA8-1600 fixed type



4poles horizontal extended busbar connection of NA8-1600 fixed type

C

(P-043)



In(A)	A(mm)	B(mm)	D(mm)
200~630	10	7.5	5
800~1000	10	10	10
1250~1600	15	15.5	16

Note: The extended bus is an optional accessory, which will be charged separately. Busbar installation dimensions



Vertical extended busbar connection of NA8-1600 fixed type



Overall dimensions of NA8-2500 withdrawable type



Hole size of the base

Hole size of the panel



Perforating size of NA8-2500 withdrawable type

С

(P-045)





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

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



Horizontal busbar connection of NA8-2500 withdrawable type

Side view



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

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



Vertical busbar connection of NA8-2500 withdrawable type

Busbar installation dimensions



Overall dimensions of NA8-2500 fixed type

Hole size of the base

Hole size of the panel



Perforating size of NA8-2500 fixed type

(P- 047)





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

Unit: mm

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

Busbar mounting dimensions





Vertical busbar connection of NA8-2500 fixed type

(P-049)



Overall dimensions of NA8-3200 withdrawable type

Hole size of the base



Hole size of the panel



Perforating size of NA8-3200 withdrawable type



Horizontal busbar connection of NA8-3200 withdrawable type(In=1600A~2500A)

Side view



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

Busbar installation dimensions



Vertical busbar connection of NA8-3200 withdrawable type(In=1600A~2500A)

(P-051)



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.

Horizontal busbar connection of NA8-3200 withdrawable type(In=3200A)

Side view

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 installation dimensions

Busbar installation dimensions





Vertial busbar connection of NA8-3200 withdrawable type(In=3200A)





Overall dimensions of NA8-3200 fixed type

Hole size of the base

Hole size of the panel





Perforating size of NA8-3200 fixed type

Front view

(P- 053)



Busbar installation dimensions



Horizontal busbar connection of NA8-3200 fixed type (In=1600A~2500A)

Side view

Note: User only needs to rotate the bus 90°to change

horizontal connection to vertical connection.

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

Busbar installation dimensions



Vertical busbar connection of NA8-3200 fixed type (In=1600A~2500A)

Side view



Busbar installation dimensions



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.

Horizontal busbar connection of NA8-3200 fixed type (In=3200A)

Side view



Hole size of the panel





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.

Vertical busbar connection of NA8-3200 fixed type (In=3200A)

(P-055)



Overall dimensions of NA8-4000 withdrawable type

Hole size of the base



Hole size of the panel



Perforating size of NA8-4000 withdrawable type



Side view Busbar installation dimensions

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

Horizontal busbar connection of NA8-4000 withdrawable type(In=1600A~2500A)

N pole

Side view



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

Busbar installation dimensions

115

115

115 Baseline





Vertical busbar connection of NA8-4000 withdrawable type(In=1600A~2500A)

(P-057)



Busbar installation dimensions



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.

Horizontal busbar connection of NA8-4000 withdrawable type (In=3200A~4000A)

Side view

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 installation dimensions



Vertical busbar connection of NA8-4800 withdrawable type (In=3200A \sim 4000A)







Overall dimensions of NA8-4000 fixed type

Hole size of the base

Hole size of the panel





Perforating size of NA8-4000 fixed type

Front view

Side view

(P-059)







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

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Horizontal busbar connection of NA8-4000 fixed type (In=1600A~2500A)

Side view

Side view



Busbar installation dimensions





Note: User only needs to rotate the bus $90^\circ \mbox{to}$ change vertical connection to horizontal connection.

Vertical busbar connection of NA8-4000 fixed type (In=1600A~2500A)



Busbar installation dimensions





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.

Horizontal busbar connection of NA8-4000 fixed type (In=3200A~4000A)

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 installation dimensions





Vertical busbar connection of NA8-4000 fixed type (In=3200A~4000A)

(P-061)



Overall dimensions of NA8-7500 3-pole withdrawable type (In=4000A \sim 6300A)

Hole size of the base

1



156

197

677

Hole size of the panel



Perforating size of NA8-7500 3-pole withdrawable type (In=4000A~6300A)

П

240





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

Horizontal busbar connection of NA8-7500 3-pole withdrawable type (In=4000A \sim 5000A)

Side view



Busbar installation dimensions

Busbar installation dimensions



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

Vertical busbar connection of NA8-7500 3-pole withdrawable type (In=4000A \sim 5000A)
NA8 | Air Circuit Breaker





Side view



Busbar installation dimensions

Note: In=6300A is only available with vertical connection, horizontal connection is not available.

Vertical busbar connection of NA8-7500 3-pole withdrawable type (In=6300A)





Overall dimensions of NA8-7500 withdrawable type 4 poles (In=4000A~6300A) /3&4 poles (In=7500A)

Hole size of the base

Panel perforating size



318 .d 155.5 270 379 147 160 48 16 9 **** 20.5 1111111 13×Ф4 Circuit breaker installation plate Baseline

361

Perforating size of NA8-7500 withdrawable type 4 poles (In=4000A~6300A) /3&4 poles (In=7500A)

Front view







Horizontal busbar connection of NA8-7500 4-pole withdrawable type (In=4000A~5000A)

Side view







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

Vertical busbar connection of NA8-7500 4-pole withdrawable type (In=4000A~5000A)

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Note: In=6300A is only available with vertical connection, horizontal connection is not available.

Vertical busbar connection of NA8-7500 4-pole withdrawable type (In=6300A)

Side view Busbar installation dimensions 56.5 384.5 162 Φí 115 149 149 115 25×3=7 81 25 Â α Baseline | |___ ا لـــــ 35 Phase C Phase A

Note: In=7500A is only available with vertical connection, horizontal connection is not available.

Vertical busbar connection of NA8-7500 3-pole withdrawable type (In=7500A)









Side view

Busbar installation dimensions



Note: In=7500A is only available with vertical connection, horizontal connection is not available.

Vertical busbar connection of NA8-7500 4-pole withdrawable type (In=7500A)



Note: Undervoltage delay control module(UVTZ-1), power module(PSU-1) and relay signal module(RU-1) are of same outline dimension, 35mm standard guide rail installation can also be used for installation.

Overall dimensions of undervoltage delay control module, power module, RU-1 relay signal module



Dimensions of ground current transformer



Dimensions of leakage protection transformer



Note: 1. The circuit breaker selected for the configuration of leakage current transformer can only be selected if the rated current is ≤ 3200A. 2.1600 frame can be horizontally or vertically outgoing, 2500 and 3200 frames use vertical outgoing. Dimensions of neutral pole current transformer



P- 069

Control circuit electrical wiring diagram



Control circuit wiring diagram of NA8-1600 M controller

C04 4 group conversion contact (default)

C06 6 group conversion contact (optional) N3 3NO, 3NC contact (optional)



F-shunt release DT-closing electromagnet Q-undervoltage release M-motor operating mechanism

SA-position switch XT-terminal AX-auxiliary terminal SB1-Opening Pushbutton SB2-Closing Pushbutton SB3-emergency stop button HL1-fault indicator

HL2-energy storage indicator

HL3-Breaking indicator HL4-Making indicator HL5~7-position indicator FU-fuse (6A)

1#, 2#: intelligent controller power: voltage AC220/380V, can be directly connected to 1#, 2#; If voltage is DC220/110V, a 24V output from power module is required before being connected to 1#, 2#

 $3\#{\sim}~5\#{:}$ trip alarm contact (3 is the common contact)

 $6\#{\sim}$ 9#: auxiliary contact (1 NO and 1 NC contact), optional

10#, 11#: empty

12#~ 19#: empty

20#: empty

21#~ 24#: empty

24#, 25#: signal input contact for external N phase transformer, normally empty, used as signal input contact for external transformer if specially ordered by user. 27#: protectively earthed, connected to exterior panel of circuit breaker.

28#, 29#: shunt release; 30#, 31#: closing electromagnet; 32#, 33#: undervoltage release

34#~36#: Motor driven mechanism

37#~ 56#: auxiliary contact. Normally 4 groups of changeover auxiliary contacts, 6 groups of changeover auxiliary contacts or 3NO/3NC contacts are available if specially ordered by user. 6-group conversion auxiliary contacts are only applicable to AC current.

57#~65#: 3 position signal indicator for withdrawable circuit breaker, no connection for regular delivery, only for withdrawable circuit breakers with the functions Note: Solid lines are factory connected, dotted lines need to be connected by user.

AX auxiliary contact wiring diagram of NA8-1600 M controller



Control circuit wiring diagram of NA8-1600 H/S controller

N3 3NO, 3NC contact (optional) C04 4 group conversion contact (default) C06 6 group conversion contact (optional)



F-shunt release DT-closing electromagnet Q-under voltage release M-motor operating mechanism SA-position switch XT-terminal AX-auxiliary terminal SB1-Opening Pushbutton

SB2-Closing Pushbutton SB3-emergency stop button HL1-fault indicator

HL2-energy storage indicator HL3-Breaking indicator HL4-Makeing indicator HL5~7-position indicator

FU-fuse (6A)

1#, 2#: intelligent controller power: voltage AC220/380V, can be directly connected to 1#, 2#; If voltage is DC220/110V, a 24V output from power module is required before being connected to 1#, 2#

 $3\#\sim5\#$: trip alarm contact (3 is the common contact)

6#~ 9#: H-type controller,6#, 7#:normally open contact:

8#, 9#:normally closed contact;optional

S-type controller,6#, 7#:Internal communication interface

(used for AMU and PMU detection modules)

8#, 9#:internal switch state detection

10#, 11#: H and S type intelligent controller default communication output terminal

12#~ 19#: 4 groups of programmable output signals, must be connected

with external RU-1 relay module. Prohibit access to high voltage signal

12#, 13#:load 1 alarm;14#, 15#:load 2 alarm;16#, 17#:open signal output;

18#, 19#:closing signal output;

20#: PE line

21#~ 24#: voltage display input signal terminal, 21#: Phase N voltage signal, 22#: phase A voltage signal, 23#: phase B voltage signal, 24#: phase C voltage signal.

25#, 26#: signal input contact for external N phase transformer or external earth current transformer, normally empty, used as signal input contact for external transformer if specially ordered by user.

27#: empty.

28#, 29#: shunt release; 30#, 31#: closing electromagnet; 32#, 33#: undervoltage

release

34#~36#: Motor driven mechanism

 $37\#{\sim}~56\#{:}$ auxiliary contact. 6-group conversion auxiliary contacts are only applicable to AC current.

Normally 4 groups of changeover auxiliary contacts, 6 groups of changeover auxiliary contacts or 3NO/3NC contacts are available if specially ordered by user. $57\#{\sim}65\#{:}$ 3 position signal indicator for withdrawable circuit breaker, no connection

for regular delivery, only for withdrawable circuit breakers with the functions. RU-1: relay module. Upstream machine opens and closes circuit breaker through remote control, used for opening and closing signal energy amplification, which will be charged separately.

Note: Solid lines are factory connected, dotted lines need to be connected by user.

AX auxiliary contact wiring diagram of NA8-1600 H/S controller

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Control circuit wiring diagram of NA8-2500~7500 M controller

C04 4 group conversion contact (default)



C06 6 group conversion contact (optional	al	I)
------------------------------------------	----	----

N4 4NO, 4NC contact (optional)

N5 5NO, 5NC contact (optional)



27#: protectively earthed, connected to exterior panel of circuit breaker. 28#, 29#: shunt release; 30#, 31#: closing electromagnet; 32#, 33#: undervoltage release

34#~36#: Motor driven mechanism

 $37\# \sim 56\#$: auxiliary contact. 6-group conversion auxiliary contacts are only applicable to AC current.

24#, 25#: signal input contact for external N phase transformer, normally empty, used as signal input contact for external transformer if specially ordered by user. Normally 4 groups of changeover auxiliary contacts, 6 groups of changeover auxiliary contacts or 4NO/4NC contacts and 5NO/5NC contacts are available if specially ordered by user.

57#~65#: 3 position signal indicator for withdrawable circuit breaker, no connection for regular delivery, only for withdrawable circuit breakers with the functions. Note: Solid lines are factory connected, dotted lines need to be connected by user.

F—shunt release DT—closing electromagnet Q—under voltage release M—motor operating mechanism

SA—position switch XT—terminal AX—auxiliary terminal SB1—Opening Pushbutton SB2—Closing Pushbutton SB3—emergency stop button HL1—fault indicator HL2—energy storage indicator HL3—Breaking indicator HL4—Makeing indicator

- HL5~7—position indicator
- FU—fuse (6A)

1#, 2#: intelligent controller power: voltage AC220/380V, can be directly connected to 1#, 2#; If voltage is DC220/110V, a 24V output from power module will be

required before being connected to 1#, 2#

 $\label{eq:2.1} \begin{array}{l} 3\#\sim~5\#:~trip~alarm~contact~(3~is~common~contact)\\ 6\#\sim~9\#:~auxiliary~contact~(1~NO~and~1~NC~contact),~optional \end{array}$

12#~ 19#: empty

10#, 11#: empty

20#: empty

21#~ 24#: empty

AX auxiliary contact wiring diagram of NA8-2500~7500 M controller



Control circuit wiring diagram of NA8-2500~7500 H/S controller

[52]

C04 4 group conversion contact (default) 41 42 44 45 47 48

C06 6 group conversion contact (optional)

43 46 49

38 39 41 42 44 45 47 48 50 51 53 54

N4 4NO, 4NC contact (optional)

N5 5NO, 5NC contact (optional)



F—shunt release DT—closing electromagnet Q—under voltage release M—motor operating mechanism SA—position switch XT—terminal AX—auxiliary terminal SB1—Opening Pushbutton

37

40

FU—fuse (6A)

1#, 2#; intelligent controller power: voltage AC220/380V, can be directly connected to 1#, 2#; If voltage is DC220/110V, a 24V output from power module is required

before being connected to 1*#*, 2*#* SB2—Closing Pushbutton SB3—emergency stop button HL1—fault indicator HL2—energy storage indicator HL3—Breaking indicator HL4—Makeing indicator

46

38 39

37

40 43

HL5~7—position indicator 3#~ 5#: trip alarm contact (3 is the common contact)

6#~ 9#: H-type controller,6#, 7#:normally open contact: 8#, 9#:normally closed contact;optional S-type controller, 6#, 7#: Internal communication interface (used for AMU and PMU detection modules)

8#, 9#:internal switch state detection

10#, 11#: H and S type intelligent controller default communication output terminal 12#~ 19#: 4 groups of programmable output signals, must be connected with external RU-1 relay module. Prohibit access to high voltage signal

12#, 13#:load 1 alarm;14#, 15#:load 2 alarm;16#, 17#:open signal output; 18#, 19#:closing signal output;

20#: PE line 21#~ 24#: voltage display input signal terminal, 21#: Phase N voltage signal, 22#: phase A voltage signal, 23#: phase B voltage signal, 24#: phase C voltage signal.

25#, 26#: signal input contact for external N phase transformer or external earth current transformer, normally empty, used as signal input contact for external transformer if specially ordered by user.

27#: empty.

28#, 29#: shunt release; 30#, 31#: closing electromagnet; 32#, 33#: undervoltage release

34#~36#: Motor driven mechanism

 $37\#{\sim}$ 56#: auxiliary contact. 6-group conversion auxiliary contacts are only applicable to AC current.

Normally 4 groups of changeover auxiliary contacts, 6 groups of changeover auxiliary contacts or 4NO/4NC contacts and 5NO/5NC contacts are available if specially ordered by user.

 $57\#{\sim}65\#{:}\ 3$ position signal indicator for withdrawable circuit breaker, no connection for regular delivery, only for withdrawable circuit breakers with the functions. ST-DP: DP protocol module, no need for ST-DP protocol module if upstream

communication protocol is Modbus-RTU; use ST-DP protocol module to transfer Modbus-RTU protocol into Profibus-DP protocol if upstream communication protocol is Profibus-DP, which will be charged separately.

RU-1: relay module. Upstream machine opens and closes circuit breaker through remote control, used for opening and closing signal energy amplification, which will be charged separately.

Note: Solid lines are factory connected, dotted lines need to be connected by user.

AX auxiliary contact wiring diagram of NA8-2500~7500 H/S controller

(P-073)

Circuit Breaker Configuration

	NA8-1600		NA8-2500		NA8-3200		NA8-4000		NA8-7500
Standard component	Fixed type	Withdrawable type	Withdrawable 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	Withdrawable type	Withdrawable 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 selection table

Frame size current	NA8-1600	NA8-2500		NA8-3200	NA8-4000		NA8-7500			
Circuit breaker	N 🗆 H 🗆	N 🗆	Η□		N 🗆	Η□	N 🗆	Η□		
	200A 🗆	630A 🗆	630A 🗆	1600A 🗆	1600A 🗆	1600A 🗆	4000A 🗆	4000A 🗆		
	400A 🗆	800A 🗆	800A 🗆	2000A 🗆	2000A 🗆	2000A 🗆	5000A 🗆	5000A 🗆		
	630A 🗆	1000A 🗆	1000A 🗆	2500A 🗆	2500A 🗆	2500A 🗆	6300A 🗆	6300A 🗆		
Rate current	800A 🗆	1250A 🗆	1250A 🗆	3200 A 🗆	3200 A 🗆	3200 A 🗆	7500A 🗆	7500A 🗆		
	1000A 🗆	1600A 🗆	1600A 🗆		4000 A 🗆	4000 A 🗆				
	1250A 🗆	2000A 🗆	2000A 🗆							
	1600A 🗆	2500A 🗆	2500A 🗆							
Number of poles	3p □	4	p 🗆							
Installation method	Withdrawable	E Fi	xed □ (not availa	ble for NA8-750	D)					
Bus connection	Horizontal 🗆	Ve	ertical 🗆	Mixed □ (s	pecify)					
Intelligent controller	M type □ (basic	:) H	type □ (commun	ication)	S type □ (LOT)				
Shunt class motor	Closing electro	magnet 🗆 🛛 Sl	nunt release 🗆	Energy sto	rage motor 🗆					
Shori, close, molor	AC220/230V	. A0	C380/400 V 🗆	DC220V 🗆	DC	C110V 🗆				
Lindon/oltago rologgo	UVT UVTD UVTZ-1 (only for NA8-1600)									
	AC220/230V	1 A0	C380/400V 🗆							
Auxilians contact	NA8-1600	C04 (st	andard)	C06 □ (onl	y for AC)	N3 □ (or	nly for AC)			
	NA8-2500~7500 C04 (standard) C06 □ N4 □ N5 □									
Auxiliary contact indicator(optional)	3 position signal device for drawer seat 🗆									
Connection accessories (optional)	³ Interphase barrier NA8-1600 extended bus									
Controller functions External transformer: N phase external transformer _ External LEC leakage transformer _ Controller functions Controller function: 3P+N protection _ Leakage protection _ Earth current protection _ (optional) Controller function: 3P+N protection _ Leakage protection _ Signal contact output _ XI zone selective interlock protection _ Load monitoring _ Notes: 1) 3P+N protection requires external LEC leakage transformer; 2) Leakage protection requires external transformer; 2) Leakage protection requires earth current protection requires earth current protection requires sternal LEC leakage transformer.and rated current of ACB with leakage transformer should <= 3200A;										
Locking mechanism (Optional) Mechanical interlock (Optional) Module (Optional)	g mechanism nnal) Opening/Closing button lock I 1 lock 1 key I 2 locks 1 key I 3 locks 2 keys I ganical interlock Steel cable interlock (dual interlock) I Steel cable interlock (MIT-3) (only for NA8-2500~7500) ganical interlock PSU-1 RU-1 ST-DP protocol conversion module I le (Optional) PSU-1 PSU-1 PSU-1									

Notes: 1) specify frame size current, rated current and auxiliary control voltage when ordering 2) Please mark " □ " or ")" in the "-" to select the option you need; if not marked, we will delivery with factory settings. 3) Extra charges are required for additional functions and special requirements. Telephone:

Fax: 0577-62877777-706288

Configuration Explaination

1. NA8-1600-7500 regular configuration Shunt release, closing electromagnet, 4 groups of

auxiliary changeover contacts, motor, M type intelligent controller, main circuit horizontal connection, door frame, main circuit installation bolts, circuit

breaker manual, package box, drawer seat (withdrawable circuit breaker)

2. Optional configuration (extra charges) NA8-1600 optional configuration: undervoltage

instantaneous release, undervoltage delayed release, steel cable interlock, keylock, external transformer ground protection, 6 groups of auxiliary

changeover contacts, 3 NO 3 NC contacts, H type intelligent controller, optional H type functions, interphase barrier, position signal.NA8-2500-7500

optional configuration: undervoltage delayed release (1s-5s adjustable), steel cable interlock, button lock, keylock, door interlock, external transformer

ground protection, vertical connection, 6 groups of auxiliary changeover contacts, 4 NO 4 NC contacts, 5 NO 5 NC contacts, H type intelligent

controller, optional H type functions, position signal.

(P-075)

Asia Pacific

China | Global HQ

ZHEJIANG CHINT ELECTRICS CO., LTD.

Add: A3 Building, No. 3655 Sixian Road, Songjiang Shanghai 201614. Tel: +86 21 5677 7777 Fax: +86 21 5677 7777 E-mail: global-sales@chintglobal.com Web: www.chintglobal.com

Vietnam

CHINT Vietnam Holding Co., Ltd

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

Sunlight Electrical (VN) Co., Ltd

Add: 20 Doc Lap Ave, VSIP, Thuan An City, Binh Duong Province, Vietnam. Tel: +84 0274 3743 505 E-mail: sales.sev@sunlightgroup-vn.com.vn Web: www.sunlightvietnam.com.vn

Korea

CHINT Electric Korea Co.,LTD

Add: B501, 40, Imiro, Uiwang-Si, Gyeonggi-Do, KOREA 16006. Tel: +82 31 8068 7099 E-mail: Irning@chint.com Web: https://www.chintglobal.kr

India

CHINT India Energy Solution Private Limited

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

Malaysia

Alpha Automation (Selangor) Sdn. Bhd. Add: No. 11, Temasya 18, Jalan Pelukis U1/46B, Seksyen U1, 40150 Shah Alam, Selangor. Tel: +603-5569 7787 Fax: +603-5569 9295 Email: chintmalaysia@alphasel.com Web: www.alphasel.com

West Asia & Africa

Egypt

CHINT Electrics (Egypt) Co., Ltd

Add: Building (B123-C11) Smart Village, Abu Rawash, Giza - Egypt Tel: (+20) 235 373 725/(+20) 235 373 735 P.O BOX : 00202 E-mail: chinteg@chintglobal.com

CHINT EGEMAC for Electrical Products co. Ltd

Add: Area No.4B inside area No.6 Developers Industrial Zone, Eloula industrial compound, 6th of October, Giza, Egypt. E-mail: ahmed.bayoumi@chint-egemac.com Tel: (+2) 01064108151/01202348586 Fax: (+2)38642389 Web: www.CHINT-EGEMAC.com

Saudi Arabia

CHINT AJLAN AND BROTHERS ELECTRICAL CO., LTD

Add: East Ring Rd Ext, New Industry Area, Riyadh 14338 KSA E-mail: chint-ajlanbros@chint.com Web: www.chint-ajlanbros.com

CHINT ARABIAN ELECTRICAL INDUSTRIAL CO., LTD.

Building NO 7183, 3RD Industrial City, Damman Kingdom of Saudi Arabian Tel: 966557951923 E-mail: Belal.Abdel@chintglobal.com Web: www.chint-atc.com

Singapore | Asia Pacific HQ

CHINT GLOBAL INTERNATIONAL PTE LTD

Add: 8 Kallang Avenue, #04-06/09 Aperia Office Tower 1, Singapore 339509. Tel: +65 6329 3110 Fax: +65 6329 3159 E-mail: sales.apac@chint.com Website: www.ChinfGlobal.com

SUNLIGHT ELECTRICAL PTE LTD Add: 1 Third Chin Bee Road, Singapore 618679. Tel: +65 6741 9055 Fax: +65 6265 4586 E-mail: sales@sunlightgroup.com Web: www.sunlightgroup.com

Cambodia

CHINT (Cambodia) Power Equipment Co., Ltd

Add: No.15, St. 542, Sangkat Boeung Kok 1, Khan Toul Kork, Phnom Penh, Cambodia. Tel: +855 23 231 077 E-mail: Ibin3@chintglobal.com Web: www.chintglobal.com

SchneiTec CHINT Co., Ltd

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

Indonesia

PT. CHINT Indonesia Add: 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 E-mail: sales@chint-indonesia.com Web: www.chint-Indonesia.com

Philippines

CHINT ELECTRIC CO., LTD

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

U.A.E

CHINT MIDDLE EAST AND AFRICA DMCC

Add: Unit No. 2101, Jumeirah Business Center 1, Jumeirah Lakes Towers, Dubai, UAE Tel: +97145571532 P.O BOX: 337555 E-mail: global-sales@chintglobal.com Web: https://chintglobal.com

Uganda

CHINT METERS&ELECTRICAL UGANDA CO. LTD

Add: PLOT 378,TIRINYI ROAD, TANGSHAN MBALE INDUSTRIAL PARK, MBALE,UGANDA Tel: +256 741242096 E-mail: chintuganda@chint.com

Nigeria

CHINT POWER&ENERGY SERVICES LIMITED

Add: 3rd Floor, Churchgate Tower 2, PC 31 Churchgate Street, Victoria Island, Lagos Nigeria Tel: 08034339907 E-mail: gazubuike@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: +254 713 871 243 E-mail: chintkenya@chintglobal.com



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 E-mail: europe@noark-electric.com

Turkey

CHINT Turca Elektrik Sanavi 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

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

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, Ofificina 603, San Isidro, Lima 27, Peru Tel: +51 1 763 4917 E-mail: chintlatamperu@chint.com

Ecuador

CHINT ELECTRICS (HONG KONG) LIMITED (ECUADOR BRANCH)

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



CHINT GLOBAL PTE. LTD.

E-mai: global-sales@chintglobal.com

A CHNT COMPANY

Netherlands

CHINT ELECTRICS NETHERLANDS B.V Add: Kabelweg 57, 1014 BA Amsterdam Tel: +31 85 210 08 06

E-mail: salesnl@chintglobal.com

Kazakhstan

LLP CHINT KZ

Add: Almaty, Dostyk Avenue 210A, Business Centre "Koktem Grand, 5th Floor, Office 51 Tel: +7 727 325 9990 E-mail: chint-kz@chintglobal.com

CG.No.ENLV006

Romania

NOARK ELECTRIC ROMANIA

Add: Tudor Vladimirescu nr. 45 et. 5 cod postal 050881 Sector 5 , Bucuresti Tel: +40 371 444 920 E-mail: InfoRO@noark-electric.com

Poland

NOARK ELECTRIC POLAND

Add: []w. Michała 62 61-005 Pozna[] Tel: +48 785 765 825 E-mail: monika.malczewska@noark-electric.com

UK

CHINT GLOBAL (UK) LIMITED

Add: 4TH FLOOR 1-3 PEMBERTON ROW, LONDON, UNITED KINGDOM EC4A 3GB

France

CHINT ELECTRICS FRANCE Add: Tour Trinity, 1b place de la Défense,92400 Courbevoie, France

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: Blvd. Miguel de Cervantes 301, Piso 15, C.P 11520, Colonia Granada, Alcaldía Miguel Hidalgo, CDMX C.P. 11520 CDMX, México Tel: +52 1-55-8881-6127 E-mail: info@chint-mexico.com

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