CHINT

Empower the World

CG.No.ENLV006

Europe

Italy

CHINT ITALIA INVESTMENT SRL

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

Czech Republic

NOARK Electric Europe s.r.o.

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

Turkey

CHINT Turca Elektrik Sanayi VE Ticaret Anonim Sirketi

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

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

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

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: ul. w. Michała 62 61-005 Poznań
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

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

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

Chint Global

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

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

A CHNT COMPANY

NA8 Air Circuit Breaker

CHINT
GLOBAL

Founded in 1984, CHINT Group Co., Ltd. (hereinafter referred to as "CHINT") is a global leading smart energy solutions provider. Over the past 40 years since its establishment, CHINT has always focused on industry and brand building, deeply implemented the strategy of "Industrialization, Technologization, Internationalization, Digitalization and Platformization", and formed three major segments of "Green Energy, Intelligent Electric and Smart Low-carbon" and two major platforms of "CHINT International Platform and Sci-tech Innovation Incubation Platform", and endeavored to build up "211X" Management Capabilities, including Intelligent Electric and New Energy Industry Cluster Capabilities, Regional Localization Capability, Middle and Backstage Integration Capability, and Innovation Incubation Capability. Its business covers more than 140 countries and regions, with over 50,000 employees worldwide. In 2023, CHINT's operating revenue reached USD 22.1 billion, and CHINT has been listed among the Top 500 Chinese Enterprises for more than 20 consecutive years. CHINT Electrics (stock code: 601877) is the first A-share listed company in China with LV electrical appliances as its main business.

USD **25** Billion
Annual Sales Revenue of CHINT Group

USD **22.1** Billion
Annual Total Assets of CHINT Group

Business Covering
140+
Countries and Regions

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

29+
Global Subsidiaries

24%
YoY Revenue Growth in 2023, CHINT Global

50,000+
Employees Worldwide

8,000+
Accumulated Authorized Patents

66%+
Localization Rate of CHINT Global Employees

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

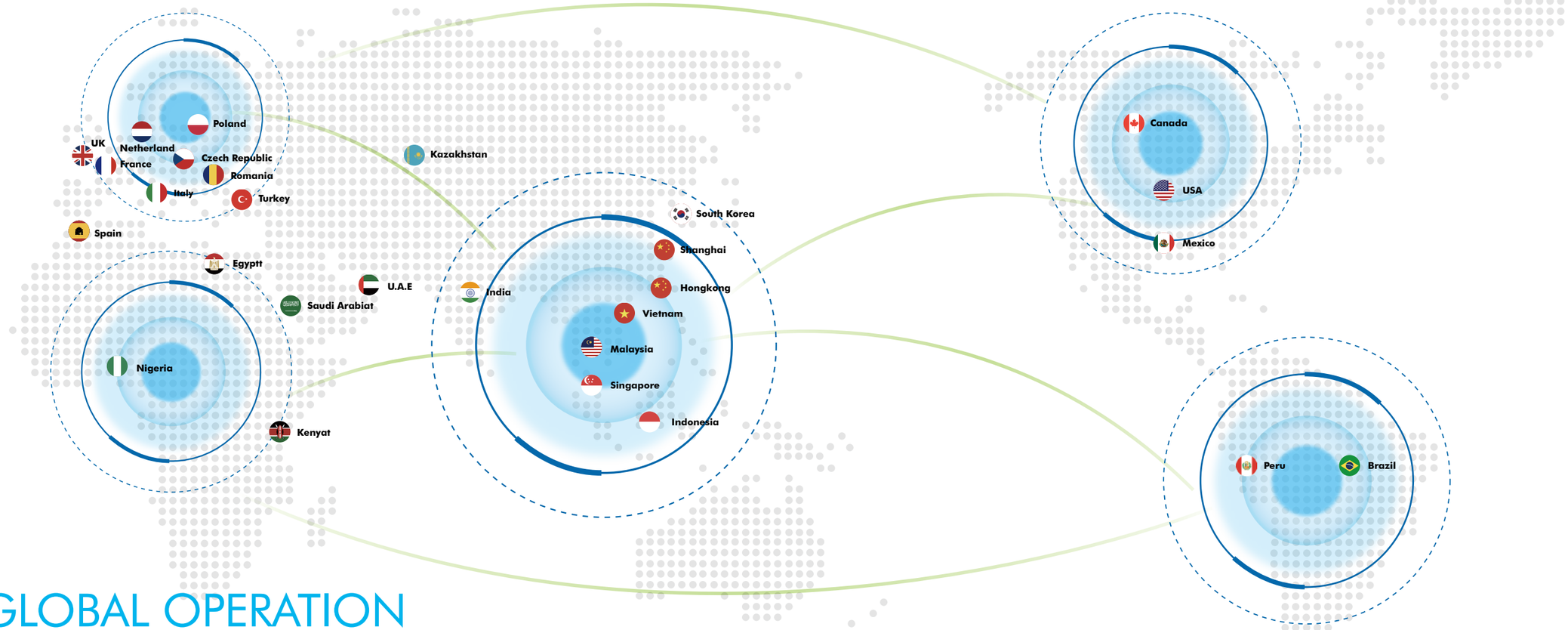
- CHINT was selected in the 2020 Zhejiang Province "Future Factory" recognized list, and was rated as the leading " Leading Goose Factory".
- The key inverter technology of CHINT won the second prize of China Electric Power Science and Technology.
- CHINT Astrometry was selected as the smart PV demonstration 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.



Business Covering

140+

Countries and Regions

29+

Global Subsidiaries

2,300+

Global Distributors

66%+

Localization Rate of Global Employees

GLOBAL OPERATION LOCALIZATION

Rooted Locally, Serving the Globe

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.

Sunlight **Singapore & Malaysia**

Main Products: Low-voltage Switchgears

Metering Factory **Uganda**

Main Products: Meters

Solar Factory **Thailand**

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 **Egypt**

Main Products: Full Series of Low-voltage Switchgears

Haining Solar Intelligent Factory **China**

Main Products: PV Module, PV Cell

Power T&D Jiaxing Factory **China**

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

Power T&D Shanghai Factory **China**

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

Wenzhou Low-voltage Intelligent Factory **China**

Main Products: Low-voltage Components

CHINT ATC **Saudi Arabia**

Main Products: RMU and Intelligent Power T&D Products of 33kV and below

CHINT-AJLAN & Bros **Saudi Arabia**

Main Products: Low-voltage Components

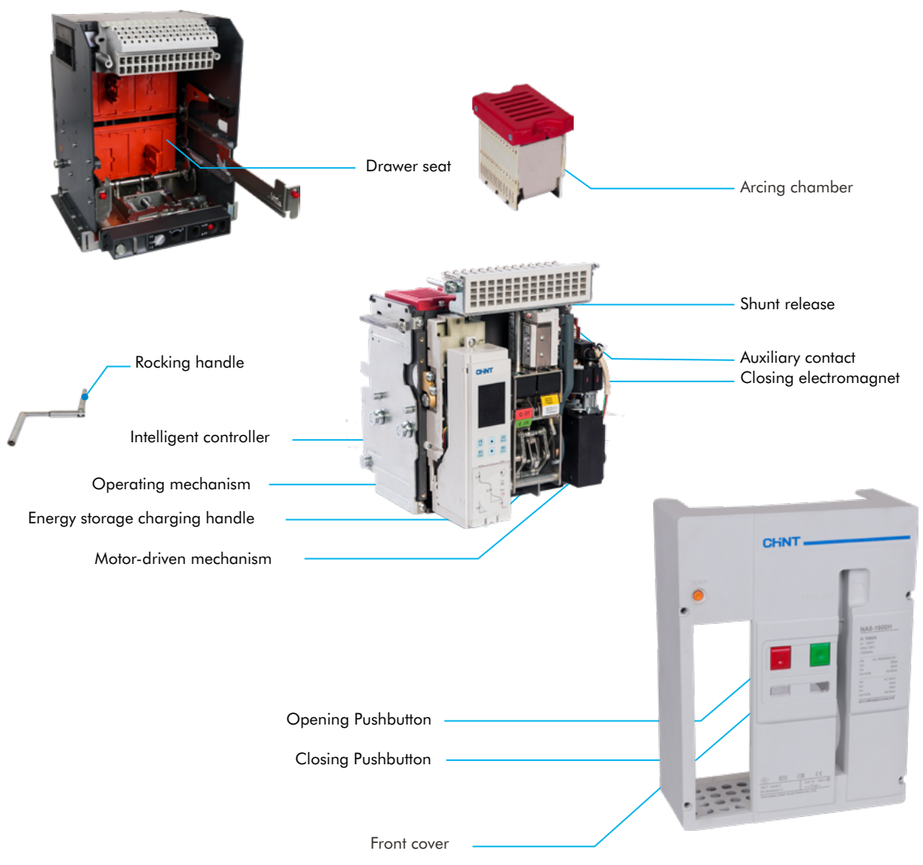
Air Circuit Breaker

ACB

NA8

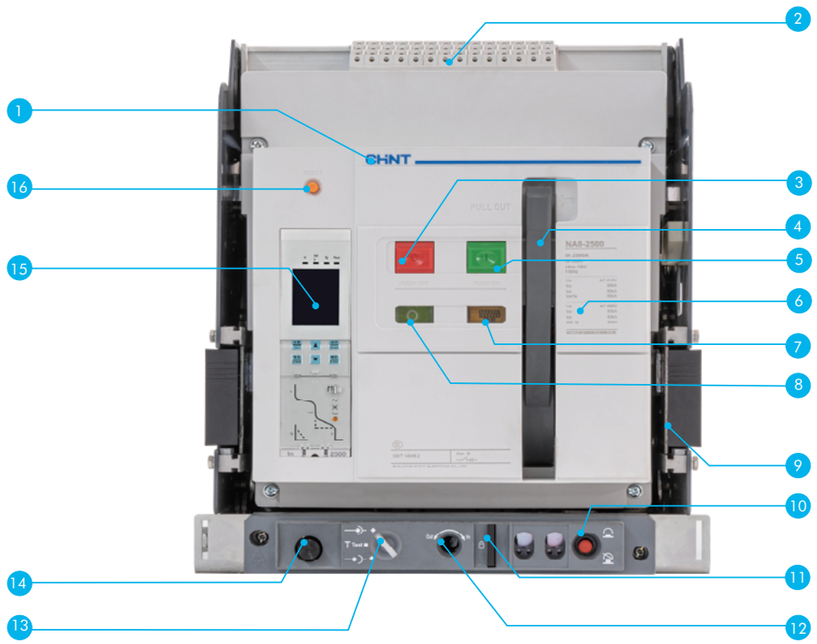
NA8 Air Circuit Breaker

Structural Features of Circuit Breaker

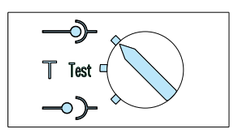


C

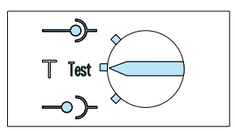
Identification of Circuit Breaker Panel



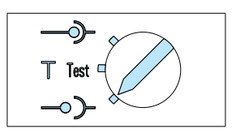
1	Trademark	9	Draw-out plate
2	Secondary wiring terminal	10	Three-position locking device
3	Opening Pushbutton	11	Drawer padlock
4	Energy storage charging handle	12	Racking handle access
5	Making button	13	Position indicator
6	Name plate	14	Racking handle storage
7	Energy storage spring Charged/Release indicator	15	Intelligent controller
8	Close / Open indicator	16	Fault-breaking indicator reset button



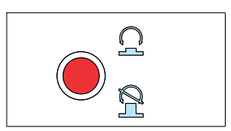
: "Connected" position
Isolating contacts are connected to the mains and Auxiliary circuits are engaged



Test: "Test" position
Isolating contacts are disconnected from the mains and Auxiliary circuits are engaged



: "Disconnected" position
Isolating contacts are disconnected from the mains and Auxiliary circuits are disengaged



: Button does not pop up, and handle is free to rotate;

: 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℃～+40℃ (certified), and also peripheral ambient temperature -45℃～+70℃ (M type), -20℃～+70℃ (H type).

- For specific derating factor, see P23.

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

- NA8 may resist against the following electromagnetic interference:

EMI-generated overvoltage;

Overvoltage caused by environmental disturbance or distribution system;

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

Static discharge of terminal users

- NA8 circuit breakers have successfully accredited through the EMC test specified in the following standards:

IEC/ EN 60947-2

The above tests may ensure:

no false tripping fault, tripping time not interrupted.

- Protection grade

Front IP20 , other sides IP00

C

Intelligent Controller

- M type (basic type)
  Basic functions: current measurement and display,
  protection function (L, S, I&G)
- H type (communication type)
  Including all protection functions of M Type
  LCD display
  Communication function
  voltage, power and other measurement functions
  advanced protection function
  harmonic measurement and analysis
  multiple auxiliary functions
- S type (IoT 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

C

NA8 Air Circuit Breaker

Product model	Breaking capacity \ Rated current	200	400	630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300	7500
NA8-1600	N、H、S	■	■	■	■	■	■	■							
NA8-2500	N、H、HU			■	■	■	■	■	■	■					
NA8-3200	N							■	■	■	■				
NA8-4000	N、H、HU							■	■	■	■	■			
NA8-7500	N、H											■	■	■	■

NA8 Product Model Definition and Explanations

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

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

NA8 Accessory Model Definition and Explanations (1)

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

NA8 Accessory Model Definition and Explanations (2)

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

C

Main Technical Parameters of Circuit Breaker

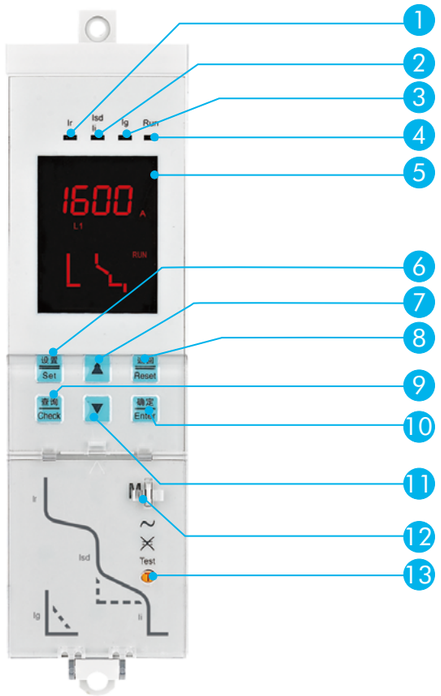
Characteristics

Number of poles	3/4	
Rated operational voltage Ue (V)	380/400/415/440、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			**NA8-1600**							**NA8-2500**							**NA8-3200**			
Rated current (A)			200	400	630	800	1000	1250	1600	630	800	1000	1250	1600	2000	2500	1600	2000	2500	3200
Rated current of the N pole (A)			200	400	630	800	1000	1250	1600	630	800	1000	1250	1600	2000	2500	1600	2000	2500	3200
Type of the circuit breaker			**N (440V)**		**N (690V)**		**H (440V)**		**H (690V)**	**N(415V)**	**N(690V)**	**H(415V)**	**H(690V)**	**HU(800V)**	**HU(1000V/1500V)**		**N(415V)**	**N(690V)**		
Rated ultimate short-circuit breaking capacity (kA rms) VAC 50/60Hz	Icu	380/400/415/440V、690V、800V、1000/1150V	55		42		66		50	65	55	85	65	65	55		100	75		
Rated service short-circuit breaking capacity (kA rms) VAC 50/60H z	Ics	380/400/415/440V、690V、800V、1000/1150V	55		42		66		50	65	55	85	65	65	55		100	75		
Utilization category			B							B							B	B		
Rated short- time withstand current (kA rms) VAC 50/60Hz	Icw 1s	380/400/415/440V、690V、800V、1000/1150V	42		42		55		50	65	55	85	65	65	55		85	65		
	Icw 3s	380/400/415/440V、690V	-		-		30		30			50	50							
Rated short-circuit making capacity (kA peak) VAC 50/60Hz	Icm	380/400/415/440V、690V、800V、1000/1150V	121		88		145		105	143	121	176	143	143	121		220	165		
Making current tripping protection function (MCR kA rms)										16							26			
Breaking time (ms)										20 ~ 30							20 ~ 30			
Closing time (ms)										30 ~ 40							30 ~ 40			
Mounting, connection and service life																				
Service life C/O cycle	Mechanical	No maintenance	10000							15000							10000			
	Electrical	No maintenance	1600A:8000(415V) 6000(690v) <1250A: 10000(415)							8000(415V) 4000(690V) 2000(1150V)							6500(415V) 3000(690V)			
Connection	Horizontal、Vertical、Mixed		■							■							■			
Size (H×W×D)	Fixed type	3P	320×254×250							367×370×357							402×422×341			
		4P	320×324×250							367×461×357							402×537×341			
	Withdrawable	3P	351×282×350							431×375×478							431.5×455×456			
		4P	351×352×350							431×470×478							431.5×550×456			

NA8-4000						**NA8-7500**							
1600	2000	2500	3200	4000		4000	5000	6300		7500			
1600	2000	2500	3200	4000		4000	5000	6300		3750			
N(415V)	**N(690V)**	**H(415V)**	**H(690V)**	**HU(800V)**	**HU(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
B						B							
85	75	100	85	75	65	135	100	135	100	135	100	135	100
		75	75			100	100	100	100	100	100	100	100
187	165	220	187	165	143	297	220	330	220	297	220	330	220
26						26							
20 ~ 30						20 ~ 30							
30 ~ 40						30 ~ 45							
10000						1000							
6500(415V) 4000A:600(1150V) 3000(690V) ≤4000A:3000(1150V)						1500(400V) 1000(690V)							
■						■							
402×422×341													
402×537×341													
431.5×455×456						472×786×464							
431.5×550×456						472×1016×464							

Function Overview of Intelligent Controller



M type controller (standard type)

01 Ir indicator: overload long delay fault indication

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

03 Ig 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

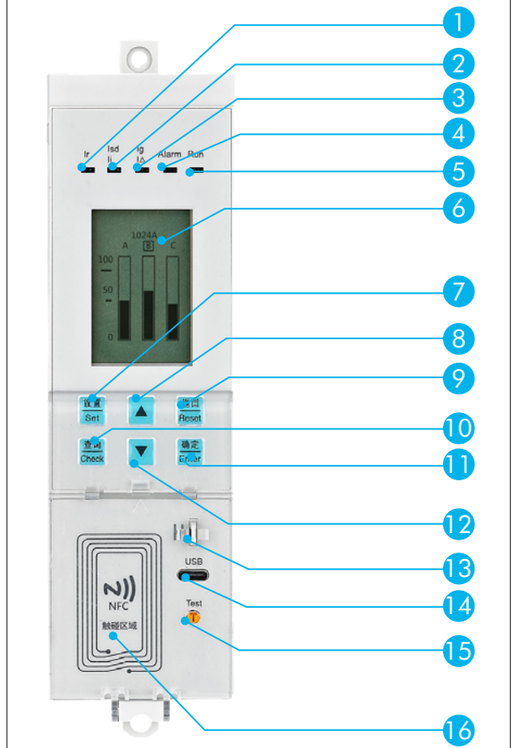
09 Check key: switch to the inquiry menu to check tripping records and alarm records etc.

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/Ii 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

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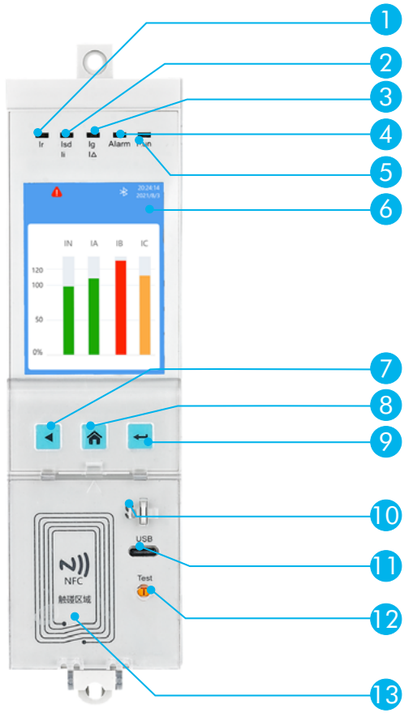


S type controller (IoT type)

01 Ir indicator: overload long delay fault indication

02 Isd/Ii 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

C

Controller type selection

Controller function			NA8		
			M	H	S
			Standard type	Harmonic type	IoT type
Display mode			LED digitron	LCD	Color LCD
Protection functions	Current protections	Overload long delay	■	■	■
		Short circuit short delay	■	■	■
		Short circuit instantaneous	■	■	■
		Earth fault protection (1 of 2): Vector and earth fault protection	■	■	■
		Earth fault protection (1 of 2): Transformer center point earth fault protection	-	□	□
		Electric leakage protection	-	□	□
		Neutral pole protection (4P, 3P+N)	□	□	□
		Overload pre-alarm	■	■	■
		Current open phase protection	□	□	■
		Current unbalance protection	■	■	■
		MCR (make/break function)	■	■	■
		HSISC (overreach tripping function)	■	■	■
		Required current protection	-	□	■
	Voltage protections	Overvoltage/undervoltage/phase sequence protection	-	■	■
		Voltage unbalance protection	-	■	■
		Voltage open phase protection	-	□	■
	Frequency protections	Over-frequency/under-frequency protection	-	■	■
		Frequency change rate protection	-	-	■
	Power protection	Inverse power protection	-	■	■
	Other	Thermal memory	■	■	■
		Load monitoring	-	□	□
		Regional selective interlock	-	□	□
Measurement functions	Currents	Phase/neutral line/earth currents	■	■	■
		Residual current	-	□	□
		Main current	-	■	■
		Current unbalance rate	■	■	■
	Voltages	Phase voltage/line voltage	-	■	■
		Voltage unbalance rate	-	■	■
		Phase sequence	-	■	■
	Power	Active/reactive/apparent power	-	■	■
	Ele. energy	Active/reactive/apparent electric energy	-	■	■
	Power factor		-	■	■
	Frequency		-	■	■
	Waveform display		-	■	■
	Measurement of harmonices		-	■	■
	Required value	Required current/required power	-	□	■

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.

Controller type selection

Controller function				NA8		
				M	H	S
				Standard type	Harmonic type	IoT type
Health diagnosis	Health test	Fault tripping test		■	■	■
	Health prompts	Controller functions monitoring		■	■	■
		CB accessories monitoring		-	-	□
		Temperature monitoring	Controller temp.	-	-	■
			Bus temperature	-	-	□
	Health forecast	Contact wear equivalent		-	■	■
		Remaining service life		■	■	■
	Maintenance prompts	Trip/close function maintenance		-	-	■
		Controller accessory modules maintenance		-	-	□
		CB maintenance (life/temp. etc.)		-	-	■
Event records	Trip/alarm records (10 times)			■	■	■
	Displacement records (10 times)			-	■	■
	Operation times record			■	■	■
	Internal clock functions			-	■	■
	History maximum/minimum currents			-	-	■
	History maximum/minimum voltages			-	-	■
	Maximum/minimum frequencies			-	-	■
	Peak value of required power			-	-	■
	Maximum value of required current			-	-	■
	Electric energy quality analysis records			-	-	■
Smart interconnection	Bluetooth			-	■	■
	USB			-	■	■
	NFC			-	■	■
	Modbus RTU			-	■	■
	DL/T645 protocol			-	-	□
	DL/T698 protocol			-	-	□
	HPLC			-	-	□
	Ethernet			-	□	□
Expanded functions	Programmable signal output			-	□	□
	Voltage check closing			-	□	□
	Setup of dual parameters			-	-	□
	Maintenance mode protection			-	-	□
	Program upgrade			-	-	■
	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
Long delay protections		Constant time-limit DT	Ir=0.4In~1In	Refer to characteristics table of DT
		Reverse time-limit IT		Refer to characteristics table of IT
		Reverse time-limit I^2T		Refer to characteristics table of I^2T
		Reverse time-limit I^4T		Refer to characteristics table of I^4T
Short circuit short delay protections		Constant time-limit	Isd=1.5Ir~15Ir(In<3600A) Isd=1.5Ir~50kA(In≥3600A)	0.1s, 0.2s, 0.3s, 0.4s
		Constant time-limit +Reverse time-limit		0.1s, 0.2s, 0.3s, 0.4s (Isd>8Ir) $(8Ir/I)^2$×tsd (Isd8Ir)
Instantaneous protections		-	Ii=1.5In~15In(In≤5000A) Ii=1.5In~75kA(In≥6300A)	-
Earth protections	Vector sum protections	Constant time-limit	Ig=100A~1In(In≤400A) Ig=0.2In~1In(630A≤In≤3200A) Ig=0.2In~3200A(In>3200A)	0.1s, 0.2s, 0.3s, 0.4s
		Constant time-limit +Reverse time-limit	Ig=100A~1In(In≤400A) Ig=0.2In~1In(630A≤In≤3200A)	0.1s, 0.2s, 0.3s, 0.4s(Ig>In) $(1.0In/I)^2$×tg(1.1Ig<I<1.0In)
			Ig=0.2In~3200A(In>3200A)	0.1s, 0.2s, 0.3s, 0.4s(Ig>3200A) $(3200/I)^2$×tg(1.1Ig<I<3200A)
	Earth current protections	Constant time-limit	Ig=100A~1In(In≤400A) Ig=0.2In~1In(630A≤In<1200A) Ig=500A~1200A(In≥1250A)	0.1s, 0.2s, 0.3s, 0.4s
		Constant time-limit +Reverse time-limit	Ig=100A~1In(In≤400A) Ig=0.2In~1In(630A≤In<1200A)	0.1s, 0.2s, 0.3s, 0.4s (Ig>In) $(1.0In/I)^2$×tg (1.1Ig<I<1.0In)
			Ig=500A~1200A(In≥1250A)	0.1s~0.4s (Ig>1200A) $(1200/I)^2$×tg (1.1Ig<I<1200A)
Electric leakage protection		Constant time-limit +Reverse time-limit	I△n=0.5A~30A	Refer to electric leakage characteristics table
MCR protection		-	-	
HSISC protection		-	-	
Current unbalance protection		Constant time-limit	20% ∽ 60%	1s~40s
Required current protection		Constant time-limit	0.4In~1In	15s~1500s
Current open phase protection		Constant time-limit	90% ∽ 99%	0.1s~3s
Neutral line protections	I_N=50%	Constant time-limit +Reverse time-limit	IrN=50%Ir IsdN=50%Isd IiN=50%Ii IgN=100%Ig	-
	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.

C

Smart controller protection characteristics

Table of protection functional parameters

Protection type		Protection characteristics	Alarm return value	Alarm return time	Graded difference (step length)	Action tolerance (accuracy)	Alarm or not	Close or not
Long delay protections		Constant time-limit DT	0.9Ir	1s~10s	1A (1600/2500 frame size) 2A (3200/4000/7500 frame size)	±10%	Yes	Yes
		Reverse time-limit IT						
		Reverse time-limit I2T						
		Reverse time-limit I4T						
Short circuit short delay protections		Constant time-limit	0.8Isd	1s~10s	Isd<10kA: 1A (1600/2500 frame size) 2A (3200/4000/7500 frame size) Isdd≥10kA: 10A (1600/2500 frame size) 20A (3200/4000/7500 frame size)	±10%	Yes	Yes
		Constant time-limit +Reverse time-limit						
Instantaneous protection		-	0.7Ii	1s~5s	Ii<10kA: 1A (1600/2500 frame size) 2A (3200/4000/7500 frame size) Ii≥10kA: 10A (1600/2500 frame size) 20A (3200/4000/7500 frame size)	±10%	Yes	Yes
Earth prot.	Vector sum	Constant time-limit	0.2In~setting	1s~10s	1A (1600/2500 frame size) 2A (3200/4000/7500 frame size)	±10%	Yes	Yes
		Constant time-limit +Reverse time-limit						
	Earth curent	Constant time-limit	0.2In~setting	1s~10s	1A	±10%	Yes	Yes
		Constant time-limit +Reverse time-limit						
Electric leakage protection		Constant time-limit +Reverse time-limit	0.5A~setting	1s~10s	0.1A	-20%	Yes	Yes
MCR protection		-				±15%	No	Yes for S
HSISC protection		-				±15%	No	Yes for S
Current unbalance		Constant time-limit	20%~setting	1s~360s	1%	±10%	Yes	Yes
Required current		Constant time-limit	0.4In~setting	15s~3000s	1A	±10%	Yes	Yes
Current open phase		Constant time-limit	20%~setting	1s~360s	1%	±10%	Yes	Yes
Neutral line protection	I_N=50%	Constant time-limit +Reverse time-limit	-				Yes	Yes
	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: Ii=12In (In=200A~5000A); Ii=75kA (In 6300A);
Earth protection: Ig=OFF; tg=0.4s

Protection functions parameters table

Protection type		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 unbalance prot.		Constant time-limit	2%~30%	1s~40s	2%~setting	1s~360s
Phase sequence prot.		Constant time-limit	ABC, ACB	0.3s	-	-
Voltage missing phase protection		Constant time-limit	90%~99%	0.1s~3s	20%~setting	1s~360s
Overfrequency protection		Constant time-limit	50Hz~64Hz	0.2s~5s	50Hz~setting	1s~360s
Underfrequency 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 protection (active)		Constant time-limit	0.1Sn~1Sn	0.2s~20s	0.1Sn~setting	1s~360s
Inverse power protection (reactive)		Constant time-limit	0.1Sn~1Sn	0.2s~20s	0.1Sn~setting	1s~360s
Overpower protection (active)		Constant time-limit	0.4Sn~1.5Sn	0.2s~20s	0.4Sn~setting	1s~360s
Overpower protection (reactive)		Constant time-limit	0.4Sn~1.5Sn	0.2s~20s	0.4Sn~setting	1s~360s
Underpower protection (active)		Constant time-limit	0.1Sn~1Sn	0.2s~20s	setting~1Sn	1s~360s
Required power protection (total power)		Constant time-limit	0.4Sn~1Sn	15s~1500s	0.4Sn~setting	15s~3000s
Current load monitoring		Constant time-limit	0.4Ir (min. 100A)~1Ir	(20%~80%)Tr	0.2Ir (min. 80A) ~ unloading threshold	10s~3600s
Active power load monitoring		Constant time-limit	200kW~10000kW	10s~3600s	100kW~enable unloading threshold	10s~3600s
Bus temperature monitoring		Constant time-limit	100°C ~150°C	10s~3600s	100C ~setting	10s~3600s
Overload pre-alarm		Constant time-limit	Ir0=0.75Ir~1.05Ir	0.5Tr	0.9Ir0	0.5Tr
3-phase power factor alarm		Constant time-limit	0.2~0.95	1s~40s	Setting +0.05	1s~360s
Harmonic out-of-limit alarm	THDi	Constant time-limit	10%~30%	10s~120s	Setting -2%	10s~360s
	THDu		3%~10%			

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.

Protection functions parameters table

Protection type		Graded difference (step length)	Action tolerance (accuracy)	Alarm or not	Close or not
Overvoltage protection		1V	±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 power)		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
Harmonic out-of-limit alarm	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	1s	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)						Remark
		15	30	60	120	240	480	
DT	1.5×Ir	2	4	8	16	32	64	tr=Tr/7.5
	2I×r	2	4	8	16	32	64	
	6I×r	2	4	8	16	32	64	
	7.2×Ir	2	4	8	16	32	64	

IT characteristics table

Curve type	Fault current	Action time tr(s)						Remark
		15	30	60	120	240	480	
IT	1.5×Ir	15	30	60	120	240	480	tr=(1.5Ir/I) ×Tr (min. 0.8s, max. 655s)
	2×Ir	11.25	22.5	45	90	180	360	
	6×Ir	3.75	7.5	15	30	60	120	
	7.2×Ir	3.125	6.25	12.5	25	50	100	

I^2T characteristics table

Curve type	Fault current	Action time tr(s)						Remark
		15	30	60	120	240	480	
I^2T	1.5×Ir	15	30	60	120	240	480	$tr=(1.5Ir/I)^2\times Tr$ (min. 0.8s, max. 655s)
	2×Ir	8.44	16.87	33.75	67.5	135	270	
	6×Ir	0.94	1.87	3.75	7.5	15	30	
	7.2×Ir	0.8	1.3	2.6	5.2	10.41	20.83	

I^4T characteristics table

Curve type	Fault current	Action time tr(s)						Remark
		15	30	60	120	240	480	
I^4T	1.5×Ir	15	30	60	120	240	480	$tr=(1.5Ir/I)^4\times Tr$ (min. 0.8s, max. 655s)
	2×Ir	4.75	9.5	19	38	75.94	151.87	
	6×Ir	0.8	0.8	0.8	0.8	0.94	1.87	
	7.2×Ir	0.8	0.8	0.8	0.8	0.8	0.904	

C

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)												
I△n	0.04	0.36	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	Reverse time-limit $T_{△}n=(2I_{△}n/I)t_{△}n$
2I△n	0.04	0.18	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	
5I△n	0.04	0.072	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
>5I△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
NA8-1600	M, H	5.1kA(In=200A~400A)	-	5.1kA	±15%
		10kA(In=630A~800A)	-	10kA	±15%
		16kA(In=1000A~1600A)	-	16kA	±15%
	S	5.1kA~10kA+OFF(In=200A~400A)	1kA	5.1kA	±15%
		10kA~20kA+OFF(In=630A~800A)	1kA	10kA	±15%
		16kA~30kA+OFF(In=1000A~1600A)	1kA	16kA	±15%
NA8-2500	M, H	10kA(In=400A~800A)	-	10kA	±15%
		16kA(In=1000A~2500A)	-	16kA	±15%
	S	10kA~20kA+OFF(In=630A~800A)	1kA	10kA	±15%
		16kA~30kA+OFF(In=1000A~1600A)	1kA	16kA	±15%
NA8-3200	M, H	16kA(In=630A~1250A)	-	16kA	±15%
		25kA(In=1600A~3200A)	-	25kA	±15%
	S	16kA~30kA+OFF(In=630A~1250A)	2kA	16kA	±15%
		25kA~50kA+OFF(In=1600A~3200A)	2kA	25kA	±15%
NA8-4000	M, H	16kA(In=800A~1600A)	-	16kA	±15%
		25kA(In=2000A~4000A)	-	25kA	±15%
	S	16kA~30kA+OFF(In=800A~1600A)	2kA	16kA	±15%
		25kA~50kA+OFF(In=2000A~4000A)	2kA	25kA	±15%
NA8-7500	M, H	40kA	-	40kA	±15%
	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
NA8-1600	M, H	16kA(In=200A~400A)	-	OFF	±15%
		32kA(In=630A~800A)	-	OFF	±15%
		50kA(In=1000A~1600A)	-	OFF	±15%
	S	40kA~60kA+OFF	1kA	OFF	±15%
NA8-2500	M, H	32kA(In=400A~800A)	-	OFF	±15%
		50kA(In=1000A~2000A)	-	OFF	±15%
	S	40kA~60kA+OFF	1kA	OFF	±15%
NA8-3200	M, H	50kA(In=630A~1250A)	-	OFF	±15%
		80kA(In=1600A~3200A)	-	OFF	±15%
	S	50kA~80kA+OFF	2kA	OFF	±15%
NA8-4000	M, H	50kA(In=800A~1600A)	-	OFF	±15%
		80kA(In=2000A~3200A)	-	OFF	±15%
	S	50kA~80kA+OFF	2kA	OFF	±15%
NA8-7500	M, H	80kA	-	OFF	±15%
	S	80kA~100kA+OFF	2kA	OFF	±15%

Notes:

1. Symbol OFF indicates exiting this function.
2. Symbol – indicates fixed setting that cannot be adjusted.

Controller working power supply

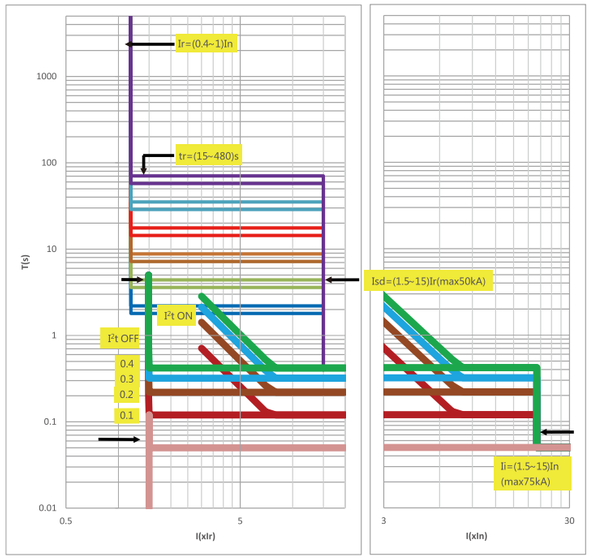
Simultaneous power supply by auxiliary power and power mutual transformer is adopted to ensure reliable operation of the controller at very small load and upon short circuit. There are 3 power supply modes for this controller:

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

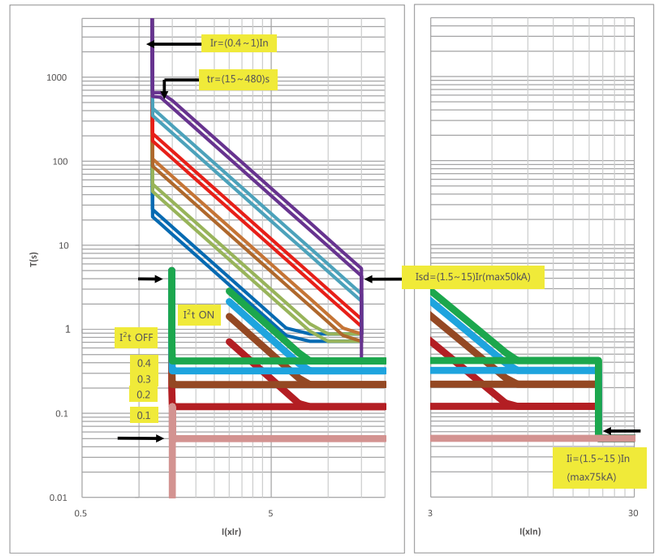
b.By auxiliary power supply: in case CB load is less than 20%In, this power supply can satisfy protections, display, communication, and control functions;

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

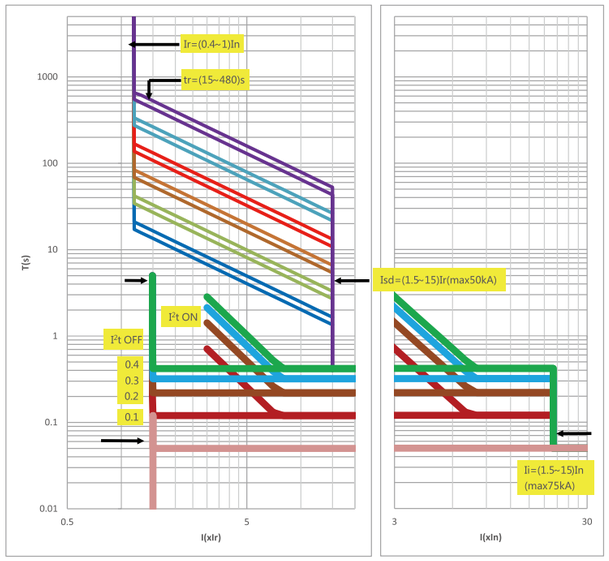
Overcurrent protection characteristic curve DT



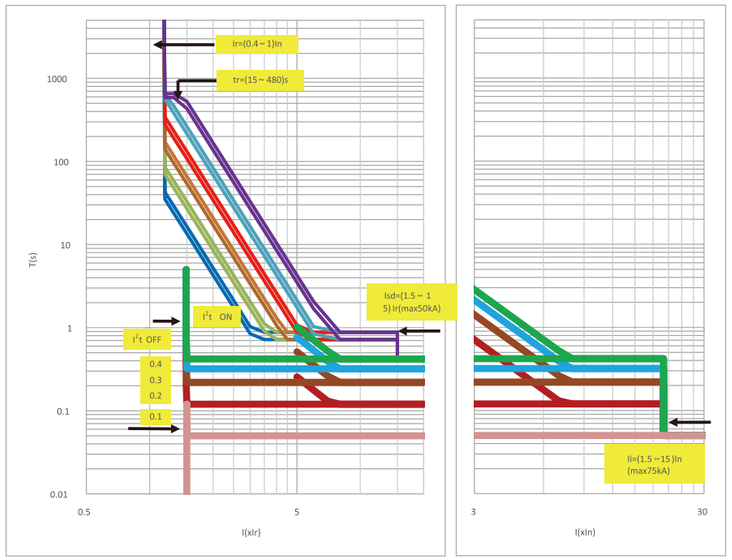
Overcurrent protection characteristic curve I^2T



Overcurrent protection characteristic curve IT

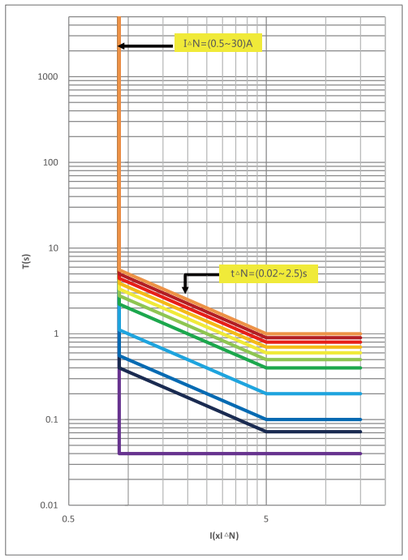


Overcurrent protection characteristic curve I^4T

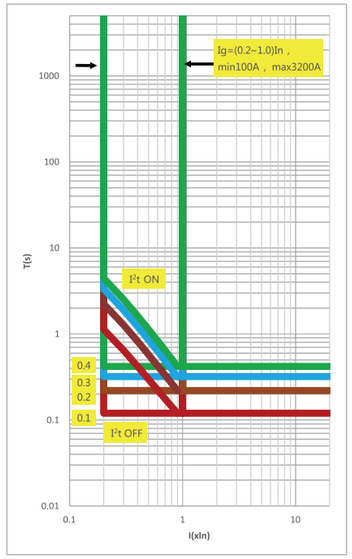


C

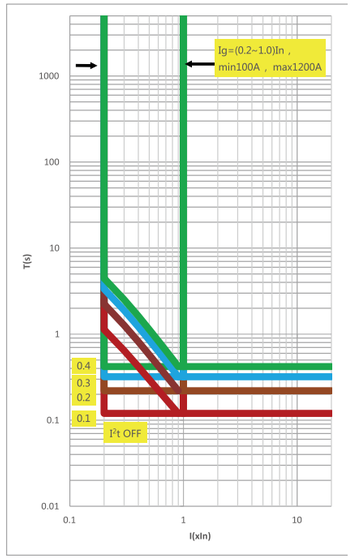
Electric leakage protection characteristic curve



Earth protection characteristic curve (vector sum)



Earth protection characteristic curve (earth current)



Smart controller measurement accuracy

Table of smart controller measurement accuracy

Item		Symbol	Measuring range	Measurement accuracy		
				M	H	S
Currents	Phase current	I_A, I_B, I_C	0.2In~1.2In	±1.5% (I<100A: ±1.5A)	±1% (I<100A: ±1A)	±0.5% (I<100A: ±0.5A)
	Neutral line current	I_N				
	Mean current	I_{avg}		-		
	Earth current	I_g	0.2In~1.2In	±5%	±5%	±5%
	Residual current	I△n	0.3>~36A	-	±10%	±10%
	Current unbalance rate	I_{unbal}	0~100%	-	±5	±5
Voltages	Phase voltage	U_{AN}, U_{BN}, U_{CN}	69V~300V	-	±1%	±0.5%
	Line voltage	U_{AB}, U_{BC}, U_{CA}	120V~600V	-	±1%	±0.5%
	Mean line voltage	U_{avg}	120V~600V	-	±1%	±0.5%
	Voltage unbalance rate	U_{unbal}	0~100%	-	±5	±5
Power	Active power	P	0.8Ue~1.2Ue 0.2In~1.2In	-	±2.5%	±1%
	Reactive power	Q		-	±2.5%	±2%
	Apparent power	S		-	±2.5%	±1%
Electric energy	Active electric energy	E.P	-79999999.9KWh~+79999999.9KWh	-	±2.5%	±1%
	Reactive electric energy	E.Q	-79999999.9Kvarh~+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%
Required value	Required current	I_A, I_B, I_C	0.2In~1.2In	-	-	±0.5% (I<100A: ±0.5A)
		In		-	-	
	Required power	P	0.8Ue~1.2Ue 0.2In~1.2In	-	-	±1%
		Q		-	-	±2%
		S		-	-	±1%

Notes:

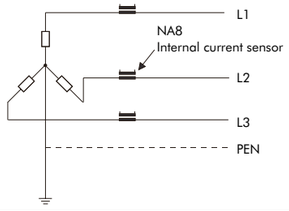
1. This smart controller can provide different grades of measurement accuracy according to different applications and user demands.
2. Voltage measurements are based on 380/400/415V system and the voltage measurement ranges can be expanded by setting rated voltages.

C

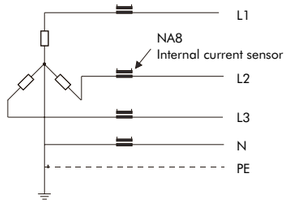
Explanations on Earth Fault Protection

Single Phase Earth Fault Protection

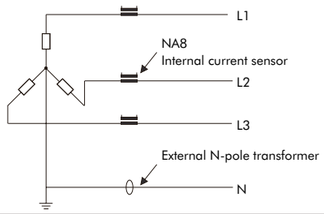
□ The three-pole circuit breaker achieves earth fault protection by internally testing whether the sum of the three-phase current vectors is zero, using three current transformers.



● 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.

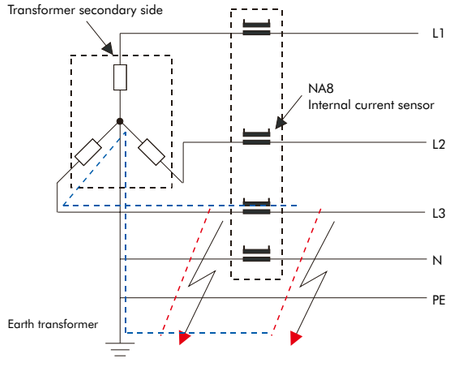


Notes: ① The external N-phase current transformer is special transformer configured by the company, and the default lead wire is 2m long.

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.

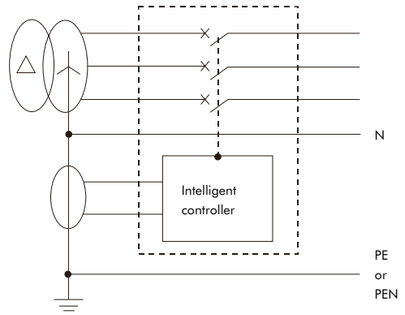
③ For (3P+N) T configurations, the maximum distance between the transformer and circuit breaker must not exceed 5 meters. If the transformer lead wire exceeds 2 meters in length, it should be specifically indicated when placing the order.

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.



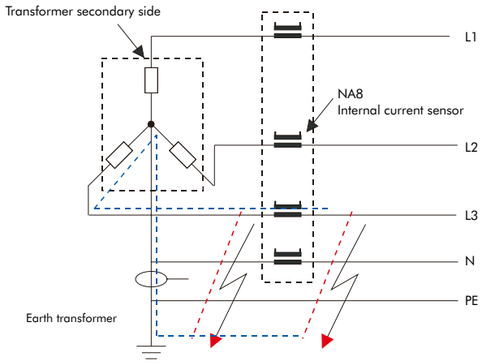
Earth Current Type Earth Fault Protection

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.



C

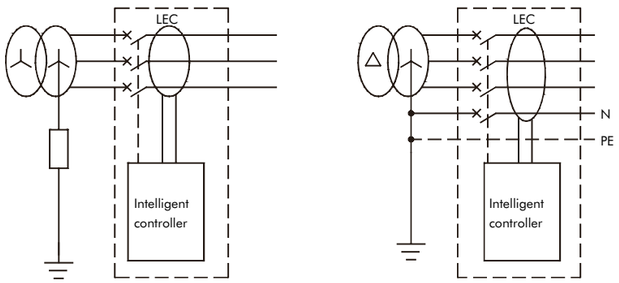
As shown below, through installing the external earth transformer, the earth fault at the power supply side of circuit breaker can be checked, and the earth fault at the load side of NA8 circuit breaker can also be detected.



Residual Current Protection

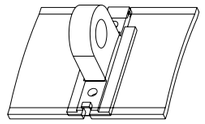
Ideal for areas with requirements to prevent indirect contact. For the NA8 circuit breaker, select the H type controller and add the leakage protection function and leakage transformer (LEC) accessory to achieve effective leakage protection.

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



The NA8 circuit breaker 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 ≤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.

C

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

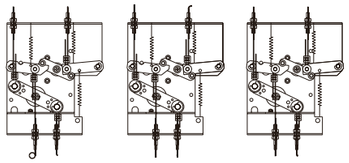
It may realize the interlocking of two horizontal or vertically installed three- or four-pole circuit breakers.

Circuit diagram	Possible mode of operation	
	1QF	2QF
	0	0
	0	1
	1	0

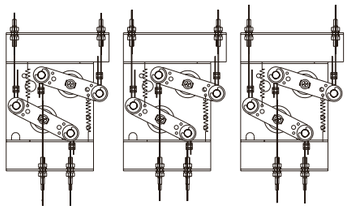
Notes: a. When it needs to bend the wire rope, the transition arc at the bend should be higher than R120mm to ensure it can move flexibly.

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

ILK -3 three interlock diagram



ILK -4 three interlock diagram



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

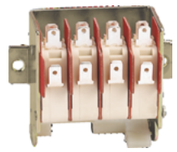
It may realize the interlocking of three flat or vertically installed three- or four-pole circuit breakers

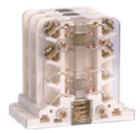
ILK-3 three interlock Circuit diagram	Possible mode of operation		
	1QF	2QF	2QF
	0	0	0
	0	0	1
	0	1	0
	1	0	0
	0	1	1
	1	1	0
	1	1	1

ILK- 4 three interlock Circuit diagram	Possible mode of operation		
	1QF	2QF	2QF
	0	0	0
	0	0	1
	0	1	0
	1	0	0

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

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





Accessory: Indication Contact

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

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

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

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

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

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

C

1600 frame MO

2500~7500 frame MO

Motor-driven mechanism (MO)

It 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.

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

1600~4000 frame CC and ST

Electric remote operation coil (CC and ST)

Closing electromagnet (CC)

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

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

7500 frame CC and ST

Shunt release (ST)

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

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

1600 frame UVT

2500、4000~7500 frame UVT

Undervoltage release (UVT)

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

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

Note: attracting/holding.

Undervoltage time delay release (UVTD)

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

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

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

C

Capacity Derating and Power Loss

Derating Under different temperature

NA8-1600

Ambient temperature	200A		400A		630A		800A		1000A		1250A		1600A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-	-	-	-	-	-	-	--	
45°	-	-	-	-	-	-	-	-	-	-	-	-	1550	-
50°	-	-	-	-	-	-	-	-	-	-	-	-	1485	1540
55°	-	-	-	-	-	-	-	-	950	950	1150	1200	1390	1450
60°	-	-	-	-	580	580	700	700	900	900	1050	1100	1320	1370

NA8-2500

Ambient temperature	630A		800A		1000A		1250A		1600A		2000A		2500A	
Connection mode	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45°	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50°	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55°	-	-	-	-	-	-	-	-	1500	1520	1850	1850	2420	2450
60°	-	-	-	-	-	-	-	-	1400	1420	1720	1750	2290	2320

NA8-3200

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	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
40°	-	-	-	-	-	-	-	-	-	-
45°	-	-	-	-	-	-	-	-	3800	3850
50°	-	-	-	-	-	-	3100	-	3600	3650
55°	-	-	-	-	2450	-	3000	3050	3400	3450
60°	-	-	1900	1950	2350	2400	2900	2950	3200	3250

NA8-7500

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

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

Altitude Capacity Derating Factor

Voltage performance corrections under different altitudes

Altitude (m)		2000	3000	4000	5000
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
Maximum operating voltage (V)	Ue	690	580	520	460
		1150	900	800	700

Current performance corrections under different altitudes

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

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

Power loss

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

Frame	Rated current (A)	Power loss of draw-out type (W)	Power loss of fixed type (W)
1600A	200	115	45
	400	140	80
	630	161	100
	800	215	110
	1000	230	120
	1250	250	130
	1600	460	220
2500A	630	58.6	26.4
	800	73.7	36.6
	1000	172	78
	1250	268	122
	1600	440	200
	2000	530	262
	2500	600	312
3200A	1600	390	170
	2000	470	250
	2500	550	280
	3200	670	420
4000A	1600	390	170
	2000	470	250
	2500	550	280
	3200	670	420
	4000	1047	656
7500A	4000	550	-
	5000	590	-
	6300	950	-
	7500	1500	-

-
-
-

Dimension Of Busbar

Bolt Configuration and Mounting Torque

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

Connection Busbar Specification Reference under Different Temperatures

Permissible maximum busbar temperature: 100℃

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

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

Notes: a. When the copper busbar selected by the user is not matched with the circuit breaker connection terminal, it needs to design and process the extension busbar for connection. The extension busbar will be designed by the user; its section area cannot be less than the above requirement, and the clearance between extension busbars cannot be less than that between the circuit breaker connection terminals.

b. After installing the above recommended busbar, it shall ensure the electric clearance between adjacent phases of the circuit breakers is not less than 18mm.

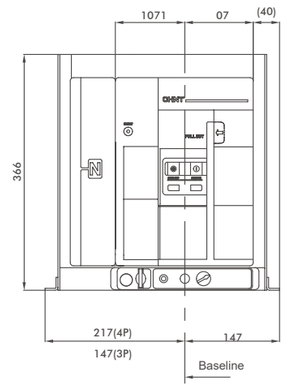
c. For electric components using thyristor for three-phase rectification and high-frequency inversion in the load devices, like high-frequency induction heating electric furnace (intermediate frequency furnace steel facility), solid state high frequency welder (such as submerged arc welder), vacuum heating melting facility (like single crystal growing furnace) , upon selecting the circuit breaker, it should take into account not only the impact of ambient temperature and altitude, but also the impact of higher harmonic generated by thyristor on the circuit breaker; in such case, it must be used by derating, and the recommended derating factor is (0.5~0.8).

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

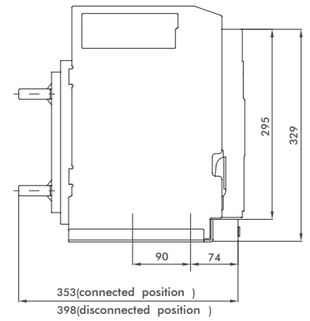
e. After the circuit breaker is installed, the safe spacing between different potential electrified bodies and between the electrified body and ground should be not less than 18mm.

Overall and installation dimensions

Front view

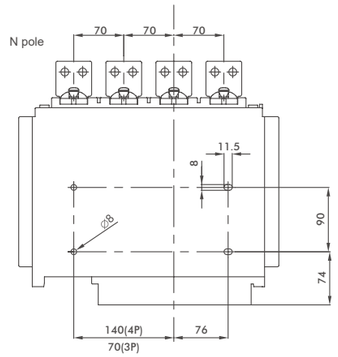


Side view

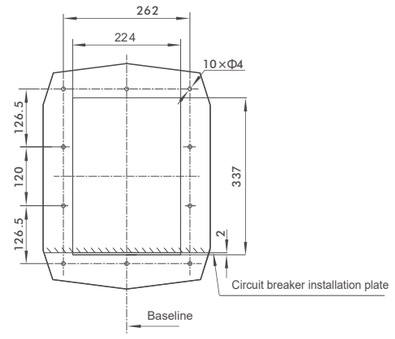


Overall dimension of NA8-1600 withdrawable type

Hole size of the base

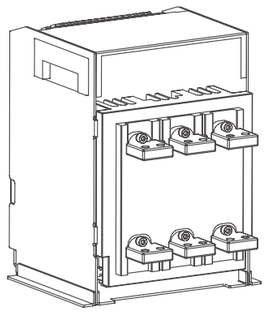


Hole size of the panel



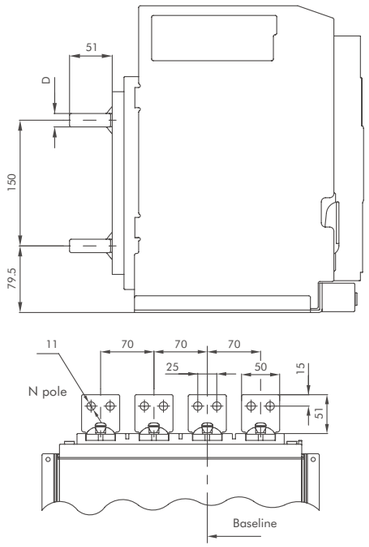
Perforating size of NA8-1600 withdrawable type

Side view

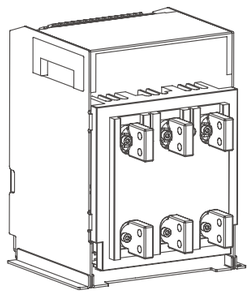


In(A)	D(mm)
200~630	5
800~1000	10
1250~1600	16

Busbar installation dimensions

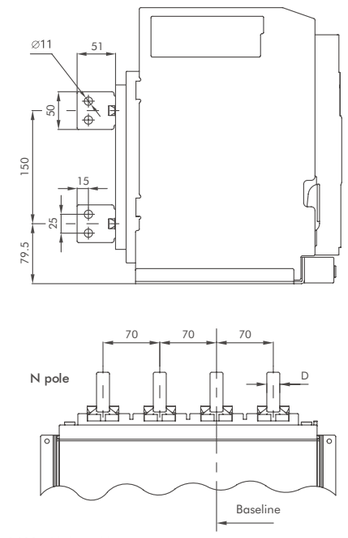


Horizontal busbar connection of NA8-1600 withdrawable type



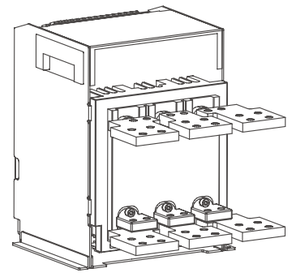
In(A)	D(mm)
200~630	5
800~1000	10
1250~1600	16

Busbar installation dimensions



Vertical busbar connection of NA8-1600 withdrawable type

Side view

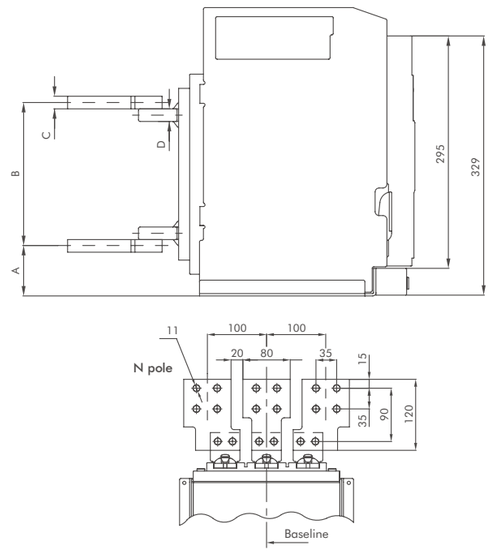


Unit: mm

In(A)	A(mm)	B(mm)	C(mm)	D(mm)
200~630	74.5	160.5	5	5
800~1000	68.5	170	10	10
1250~1600	63	181	15	16

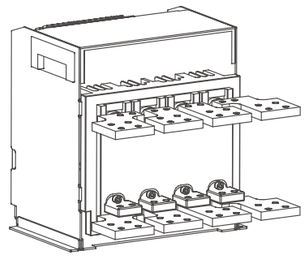
Note: The extended bus is an optional accessory, which will be charged separately.

Busbar installation dimensions



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

Side view

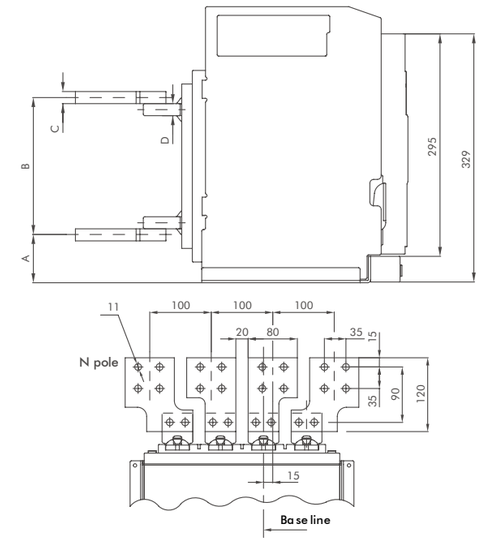


Unit: mm

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.

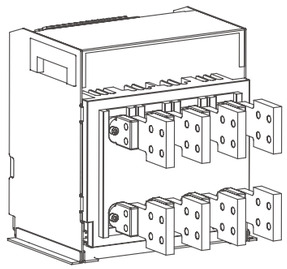
Busbar installation dimensions



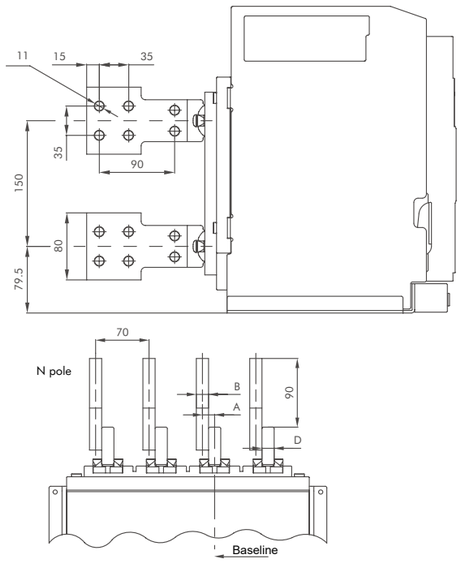
4 poles horizontal extended bus connection of NA8-1600 withdrawable type

C

Side view



Busbar installation dimensions



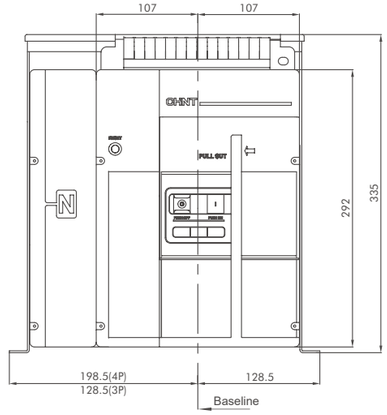
Unit: mm

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

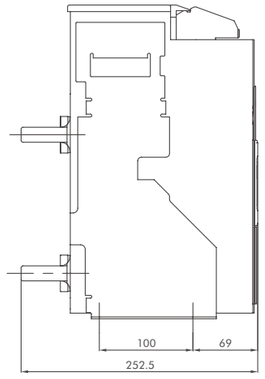
Note: The extension busbar is of optional accessory, requiring additional expense.

Extended bus vertical connection of NA8-1600 withdrawable type

Front view

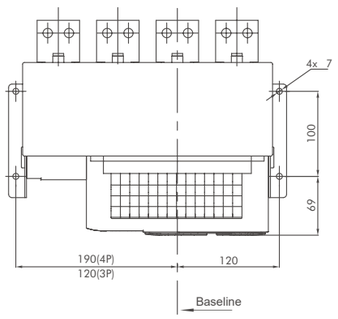


Side view

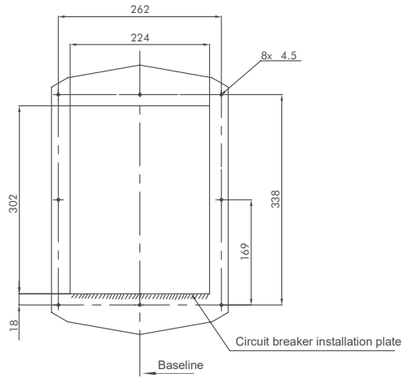


Overall dimensions of NA8-1600 fixed type

Hole size of the base

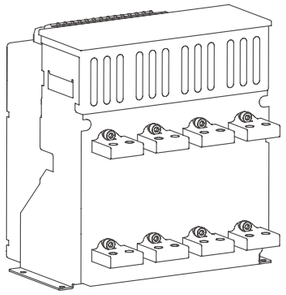


Hole size of the panel



Perforating size of NA8-1600 fixed type

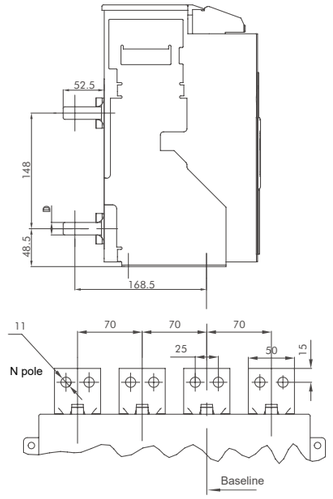
Side view



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

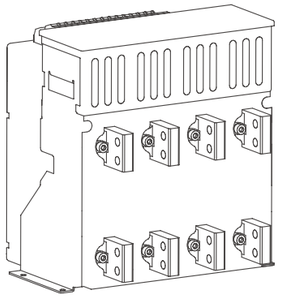
Note: If the user intends to change horizontal connection into vertical connection at site, it only needs to rotate the busbar by 90°.

Busbar installation dimensions



Busbar horizontal connection of NA8-1600 fixed type

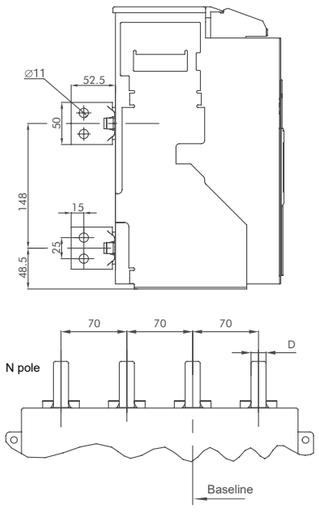
Side view



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

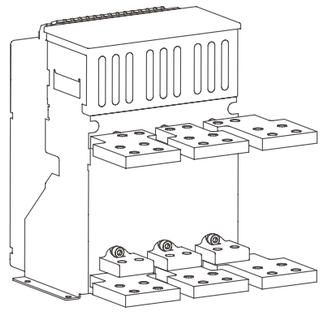
Note: User only needs to rotate the bus 90° to change vertical connection to horizontal connection.

Busbar installation dimensions



Vertical busbar connection of NA8-1600 fixed type

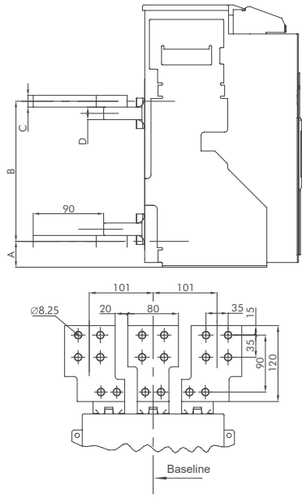
Side view



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

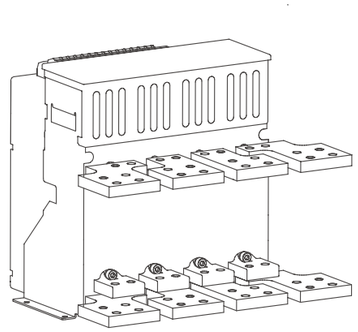
Note: The extended bus is an optional accessory, which will be charged separately.

Busbar installation dimensions



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

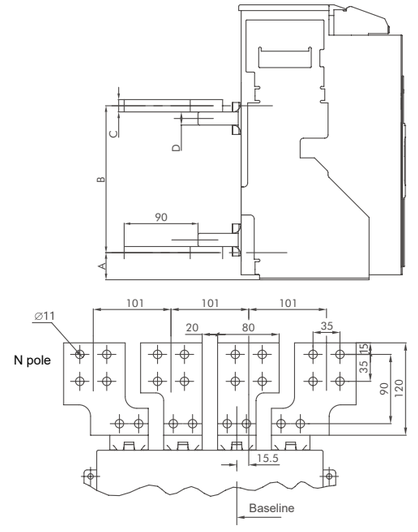
Side view



In(A)	A(mm)	B(mm)	C(mm)	D(mm)
200~630	41	163	10	5
800~1000	38.5	168	10	10
1250~1600	33	179	15	16

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

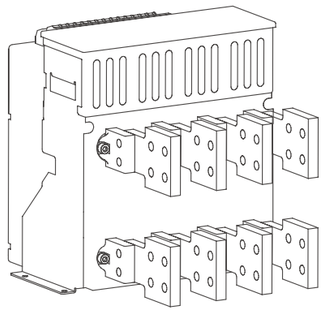
Busbar installation dimensions



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

C

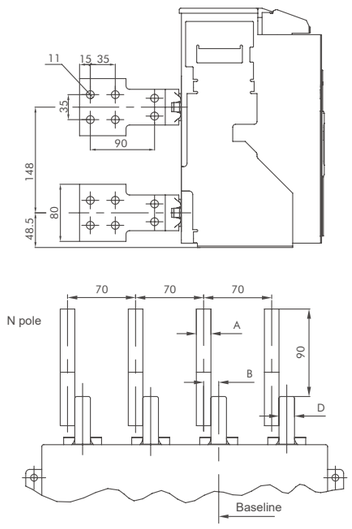
Side view



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

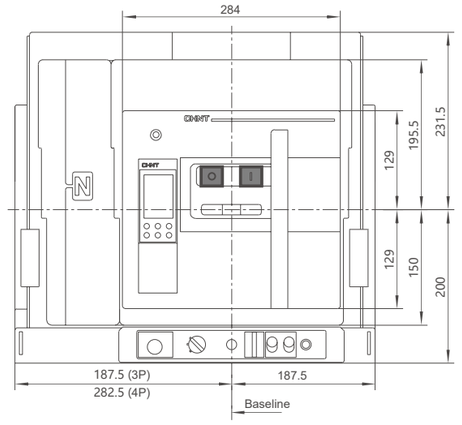
Note: The extended bus is an optional accessory, which will be charged separately.

Busbar installation dimensions

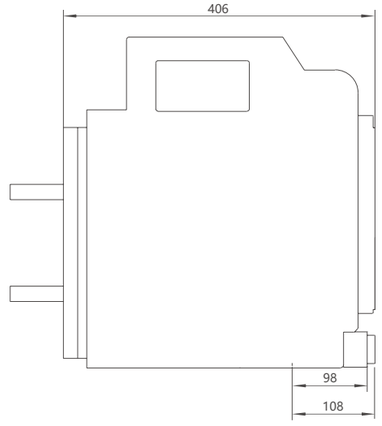


Vertical extended busbar connection of NA8-1600 fixed type

Front view

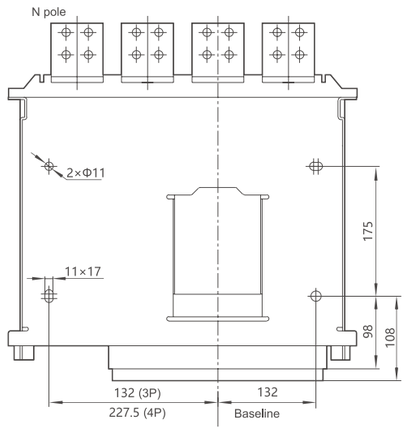


Side view

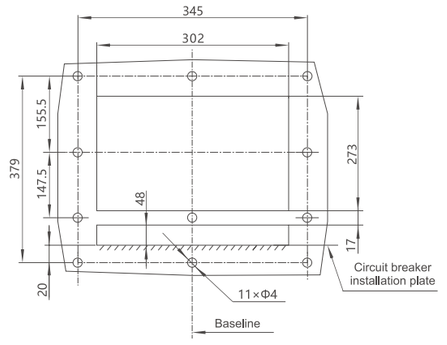


Overall dimensions of NA8-2500 withdrawable type

Hole size of the base



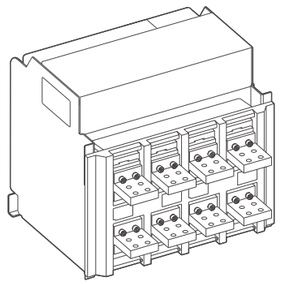
Hole size of the panel



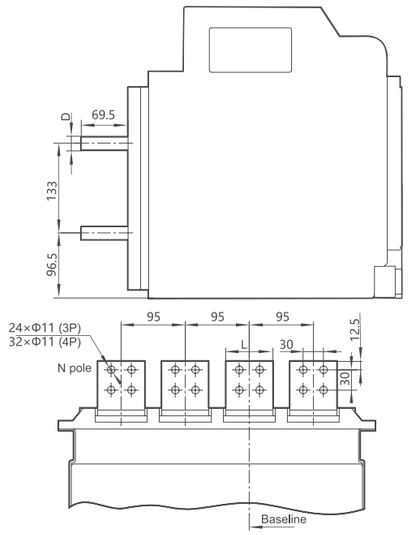
Perforating size of NA8-2500 withdrawable type

C

Side view



Busbar installation dimensions



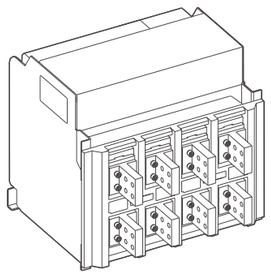
Unit: mm

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

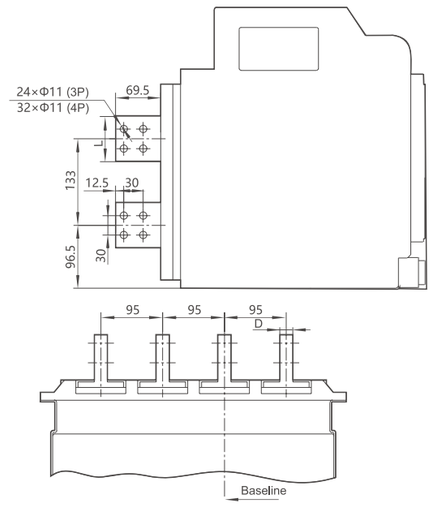
Note: User only needs to rotate the bus 90°to change horizontal connection to vertical connection.

Horizontal busbar connection of NA8-2500 withdrawable type

Side view



Busbar installation dimensions



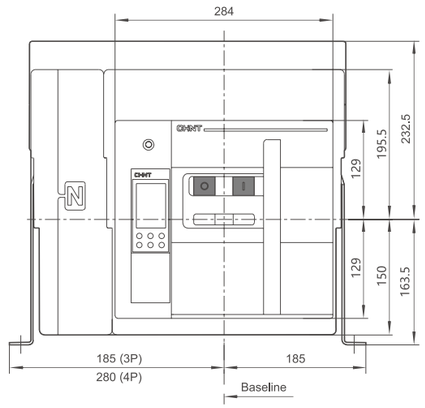
Unit: mm

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

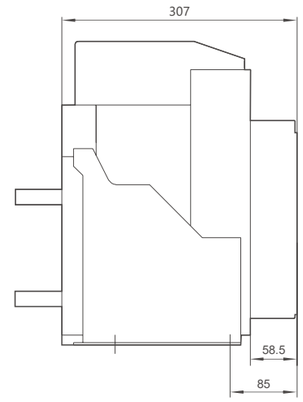
Note: User only needs to rotate the bus 90°to change horizontal connection to vertical connection.

Vertical busbar connection of NA8-2500 withdrawable type

Front view

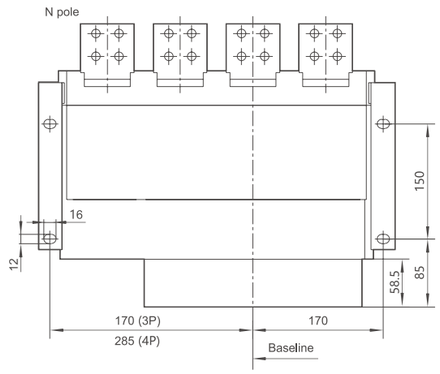


Side view

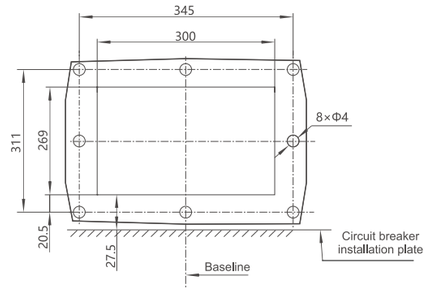


Overall dimensions of NA8-2500 fixed type

Hole size of the base



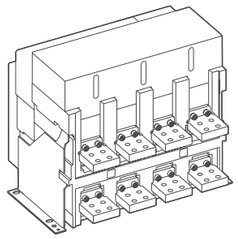
Hole size of the panel



Perforating size of NA8-2500 fixed type

C

Side view

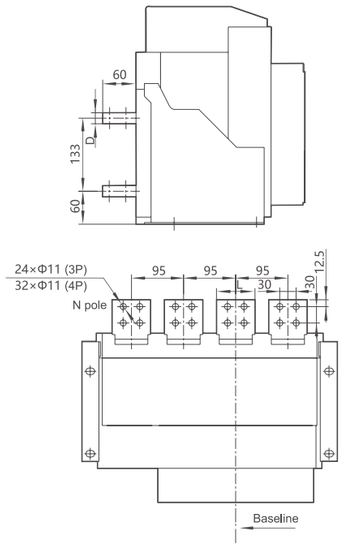


Unit: mm

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

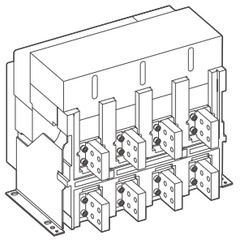
Note: User only needs to rotate the bus 90°to change horizontal connection to vertical connection.

Busbar installation dimensions



Horizontal busbar connection of NA8-2500 fixed type

Side view

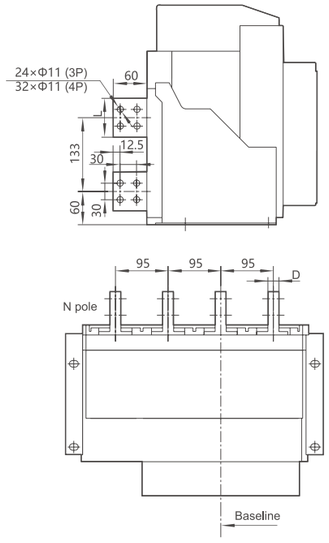


Unit: mm

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

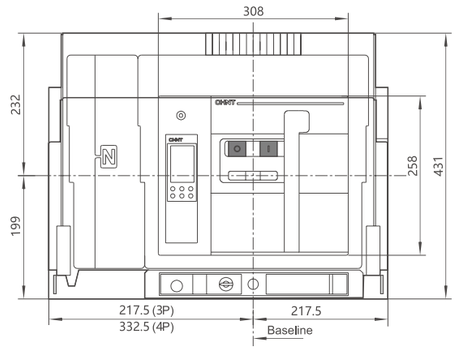
Note: User only needs to rotate the bus 90° to change vertical connection to horizontal connection.

Busbar mounting dimensions

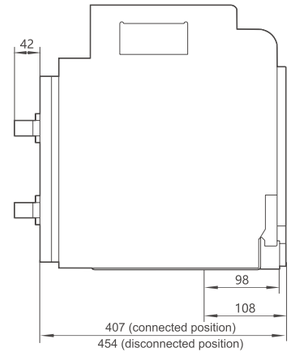


Vertical busbar connection of NA8-2500 fixed type

Front view

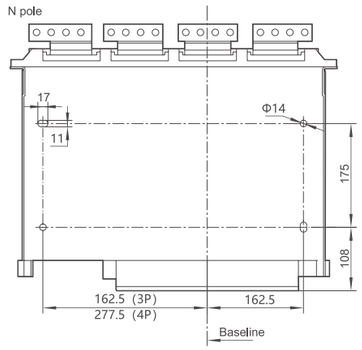


Side view

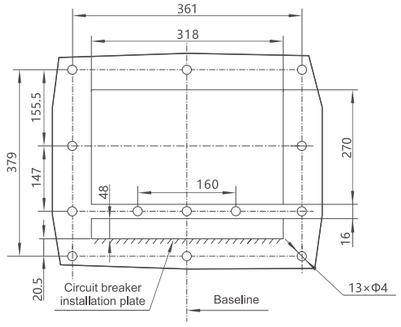


Overall dimensions of NA8-3200 withdrawable type

Hole size of the base



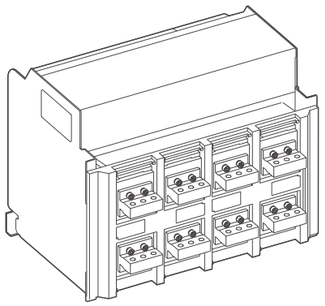
Hole size of the panel



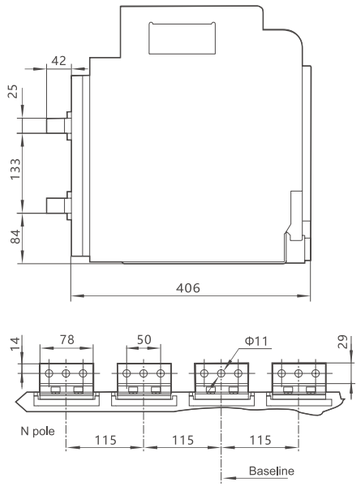
Perforating size of NA8-3200 withdrawable type

C

Side view



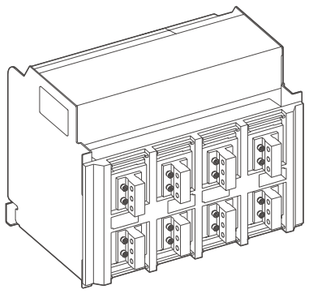
Busbar installation dimensions



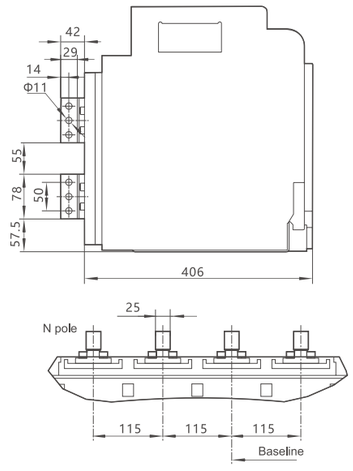
Note: User only needs to rotate the bus 90°to change horizontal connection to vertical connection.

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

Side view



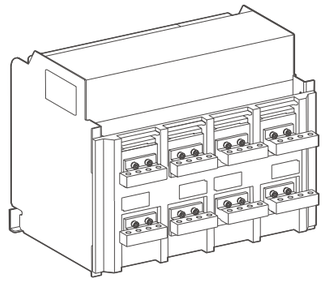
Busbar installation dimensions



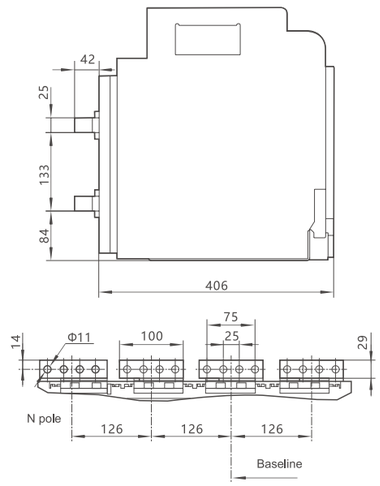
Note: User only needs to rotate the bus 90° to change vertical connection to horizontal connection.

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

Side view



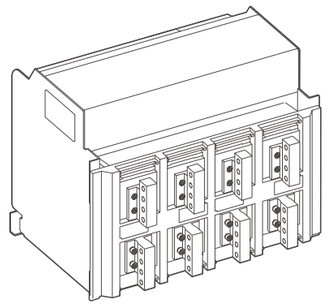
Busbar installation dimensions



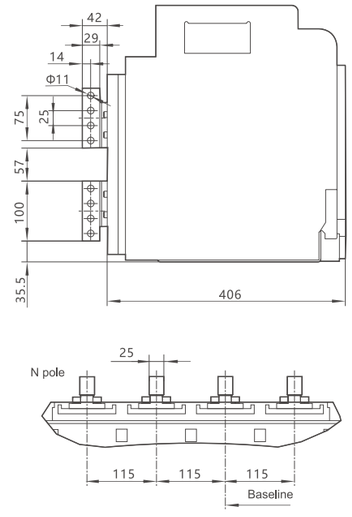
Note: To change horizontal connection to vertical connection, user needs to change the upper and lower buses of phase N and phase B to the same as those of phase A and phase C.

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

Side view



Busbar installation dimensions

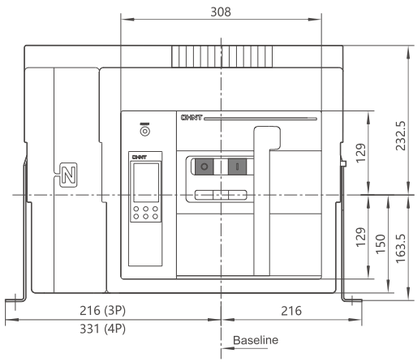


Note: To change vertical connection to horizontal connection, user needs to change the upper and lower buses of phase N and phase B to the same as those of phase A and phase C.

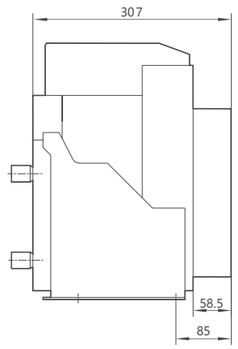
Vertial busbar connection of NA8-3200 withdrawable type(In=3200A)

C

Front view

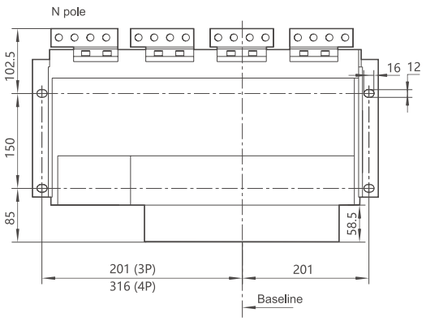


Side view

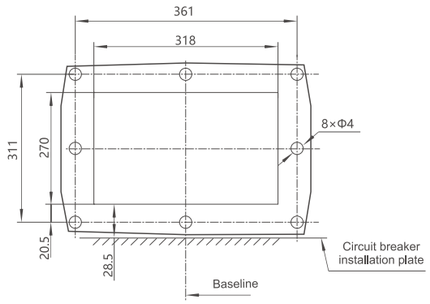


Overall dimensions of NA8-3200 fixed type

Hole size of the base



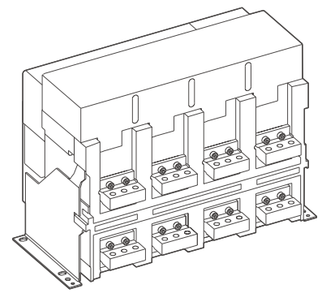
Hole size of the panel



Perforating size of NA8-3200 fixed type

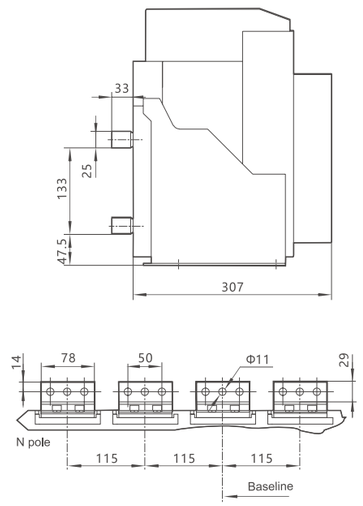
C

Side view



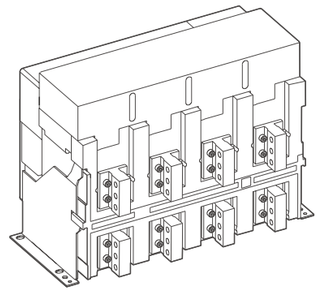
Note: User only needs to rotate the bus 90°to change horizontal connection to vertical connection.

Busbar installation dimensions



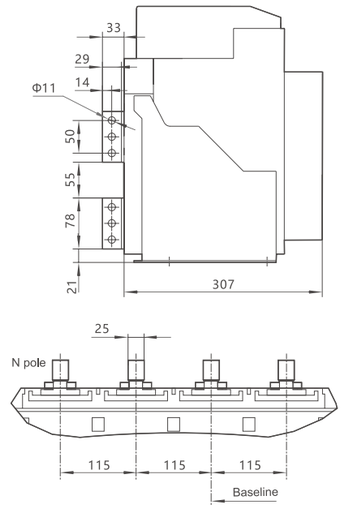
Horizontal busbar connection of NA8-3200 fixed type (In=1600A~2500A)

Side view



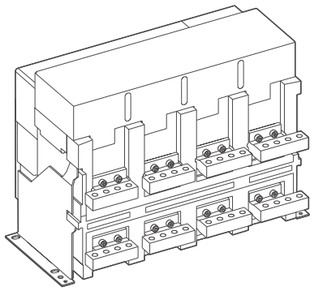
Note: User only needs to rotate the bus 90° to change vertical connection to horizontal connection.

Busbar installation dimensions

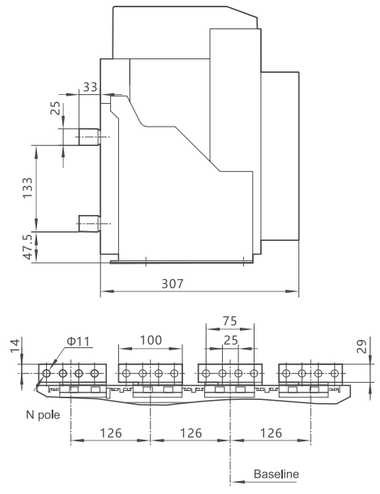


Vertical busbar connection of NA8-3200 fixed type (In=1600A~2500A)

Side view



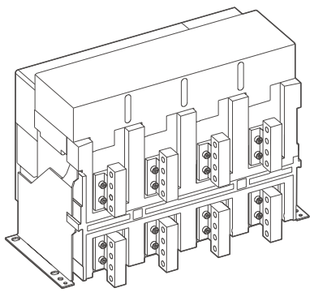
Busbar installation dimensions



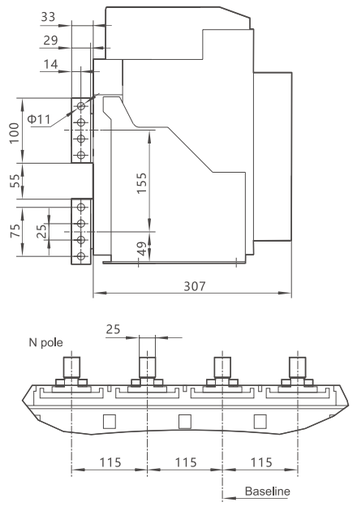
Note: To change horizontal connection to vertical connection, user needs to change the upper and lower buses of phase N and phase B to the same as those of phase A and phase C.

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

Side view



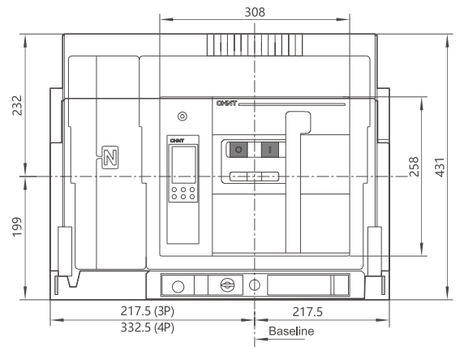
Hole size of the panel



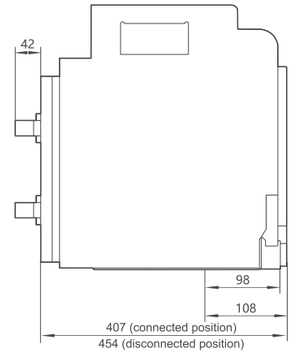
Note: To change vertical connection to horizontal connection, user needs to change the upper and lower buses of phase N and phase B to the same as those of phase A and phase C.

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

Front view

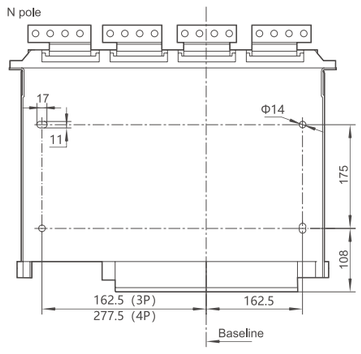


Side view

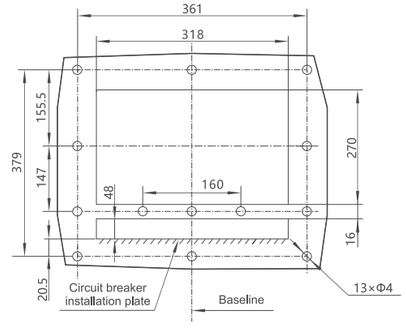


Overall dimensions of NA8-4000 withdrawable type

Hole size of the base



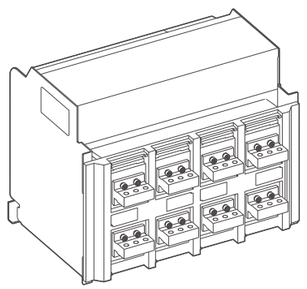
Hole size of the panel



Perforating size of NA8-4000 withdrawable type

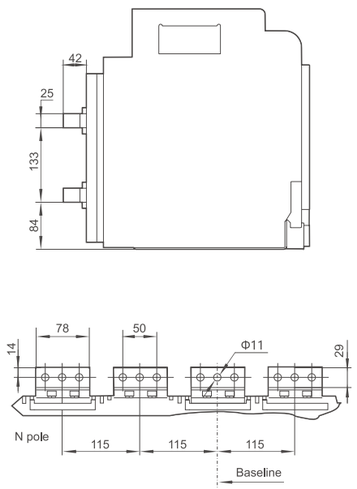
C

Side view



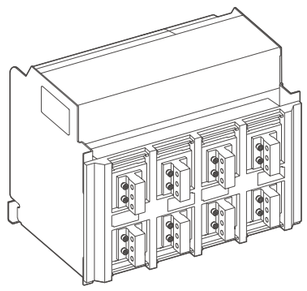
Note: User only needs to rotate the bus 90°to change horizontal connection to vertical connection.

Busbar installation dimensions



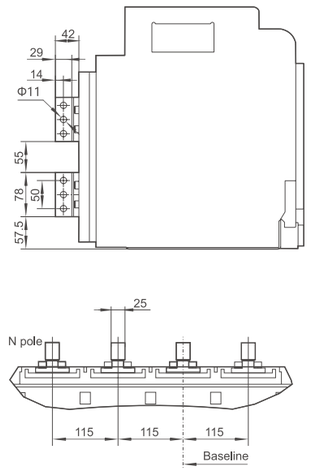
Horizontal busbar connection of NA8-4000 withdrawable type(In=1600A~2500A)

Side view



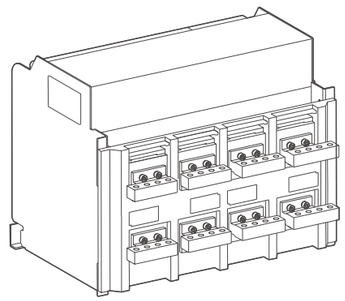
Note: User only needs to rotate the bus 90°to change vertical connection to horizontal connection.

Busbar installation dimensions



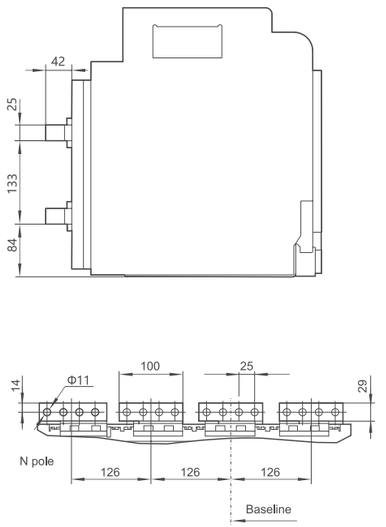
Vertical busbar connection of NA8-4000 withdrawable type(In=1600A~2500A)

Side view



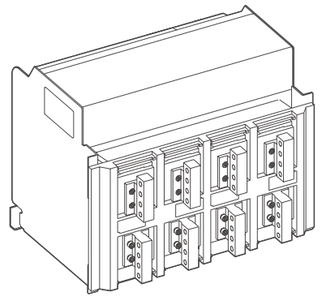
Note: To change horizontal connection to vertical connection, user needs to change the upper and lower buses of phase N and phase B to the same as those of phase A and phase C.

Busbar installation dimensions



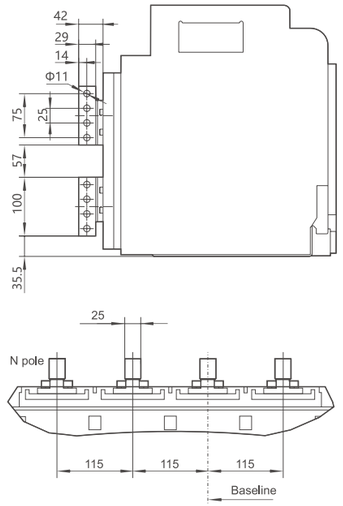
Horizontal busbar connection of NA8-4000 withdrawable type (In=3200A~4000A)

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.

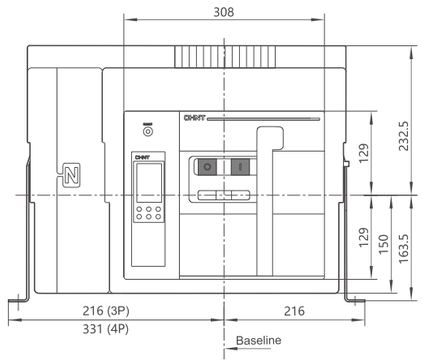
Busbar installation dimensions



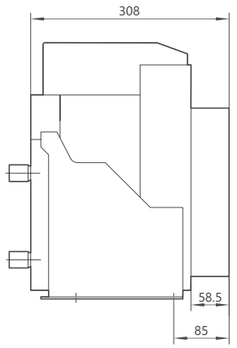
Vertical busbar connection of NA8-4800 withdrawable type (In=3200A~4000A)

C

Front view

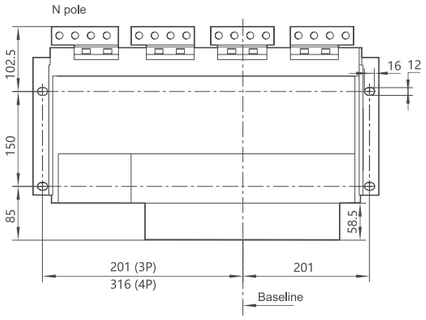


Side view

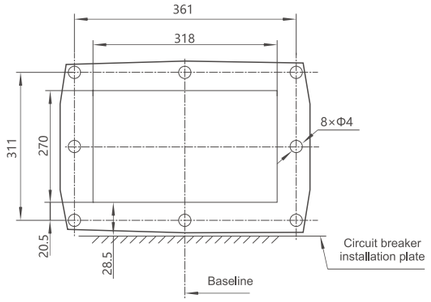


Overall dimensions of NA8-4000 fixed type

Hole size of the base

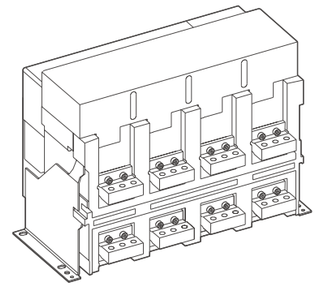


Hole size of the panel

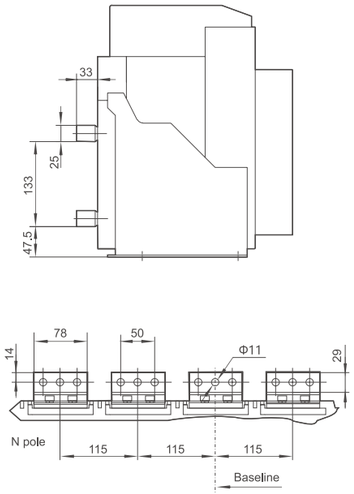


Perforating size of NA8-4000 fixed type

Side view



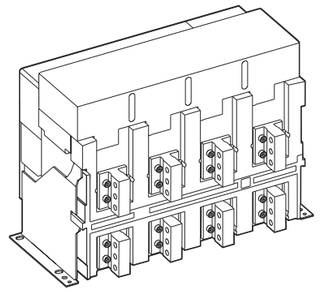
Busbar installation dimensions



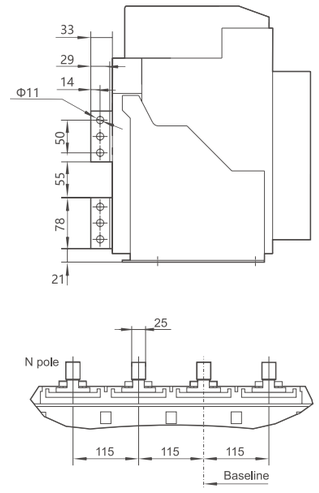
Note: User only needs to rotate the bus 90° to change horizontal connection to vertical connection.

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

Side view



Busbar installation dimensions

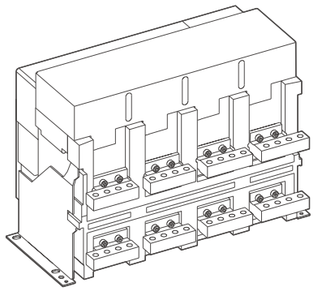


Note: User only needs to rotate the bus 90°to change vertical connection to horizontal connection.

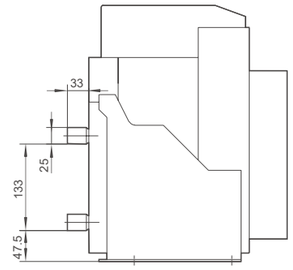
Vertical busbar connection of NA8-4000 fixed type (In=1600A~2500A)

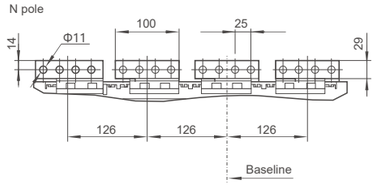
C

Side view



Busbar installation dimensions

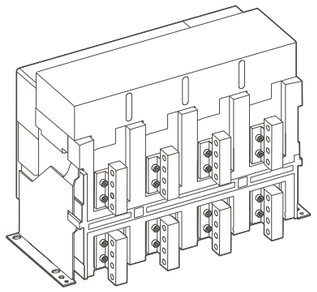




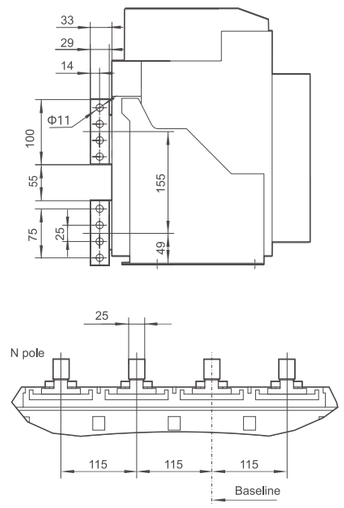
Note: To change horizontal connection to vertical connection, user needs to change the upper and lower buses of phase N and phase B to the same as those of phase A and phase C.

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

Side view



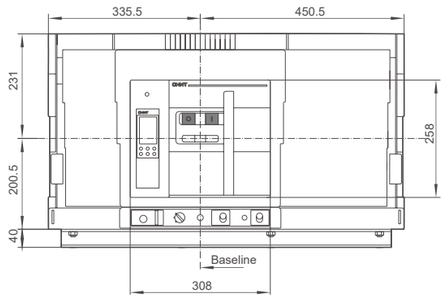
Busbar installation dimensions



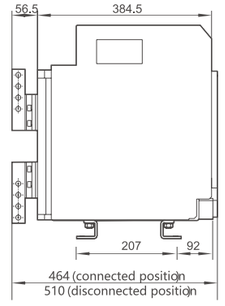
Note: To change vertical connection to horizontal connection, user needs to change the upper and lower buses of phase N and phase B to the same as those of phase A and phase C.

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

Front view

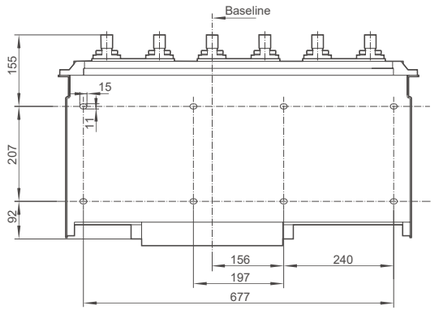


Side view

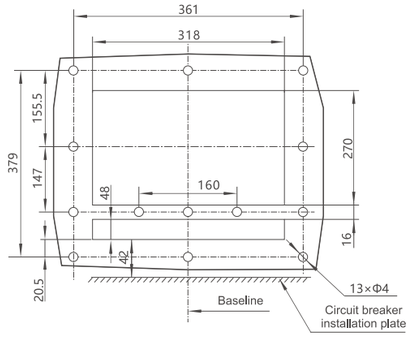


Overall dimensions of NA8-7500 3-pole withdrawable type (In=4000A~6300A)

Hole size of the base



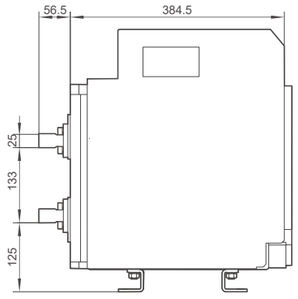
Hole size of the panel



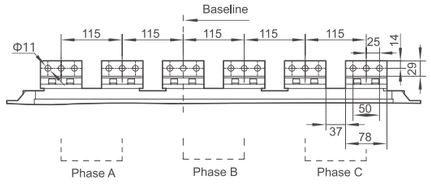
Perforating size of NA8-7500 3-pole withdrawable type (In=4000A~6300A)

C

Side view



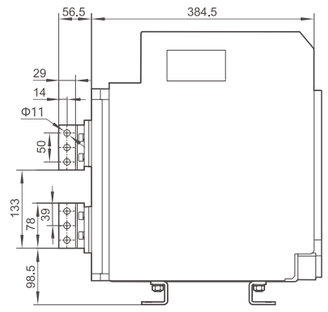
Busbar installation dimensions



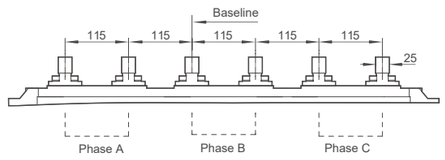
Note: User only needs to rotate the bus 90° to change horizontal connection to vertical connection.

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

Side view



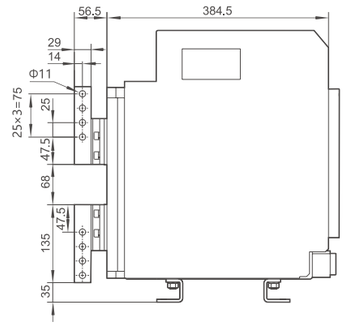
Busbar installation dimensions



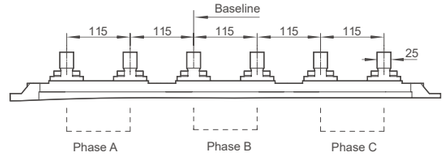
Note: User only needs to rotate the bus 90° to change vertical connection to horizontal connection.

Vertical busbar connection of NA8-7500 3-pole withdrawable type (In=4000A~5000A)

Side view



Busbar installation dimensions

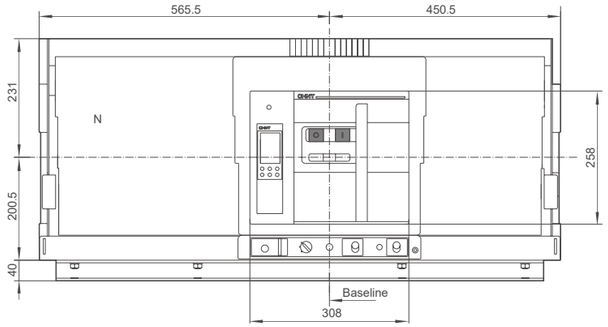


Note: In=6300A is only available with vertical connection, horizontal connection is not available.

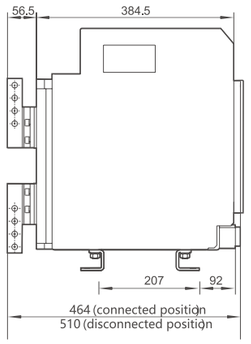
Vertical busbar connection of NA8-7500 3-pole withdrawable type (In=6300A)

C

Front view

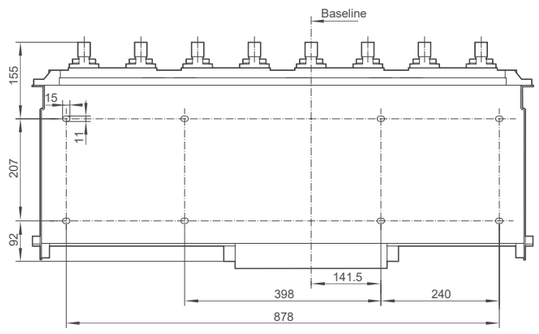


Side view

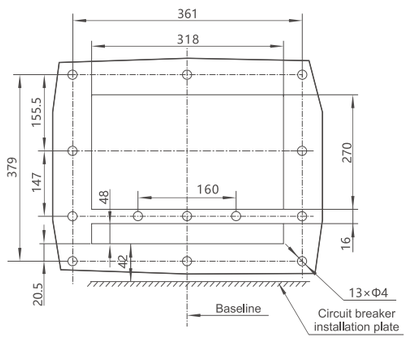


Overall dimensions of NA8-7500 withdrawable type 4 poles (In=4000A~6300A) /3&4 poles (In=7500A)

Hole size of the base

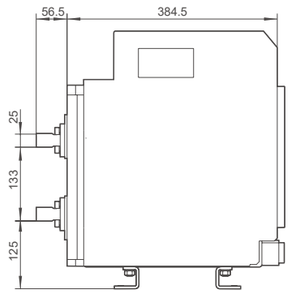


Panel perforating size



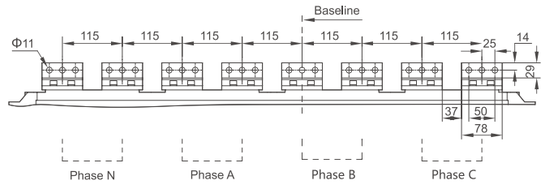
Perforating size of NA8-7500 withdrawable type 4 poles (In=4000A~6300A) /3&4 poles (In=7500A)

Side view



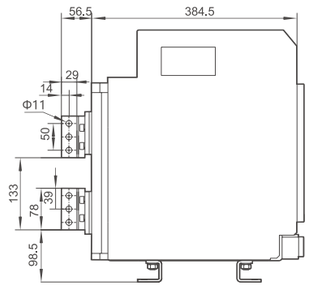
Note: User only needs to rotate the bus 90° to change horizontal connection to vertical connection.

Busbar installation dimensions



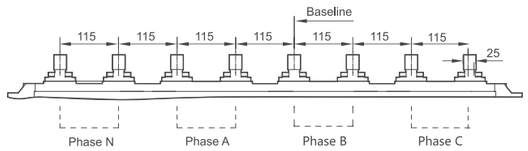
Horizontal busbar connection of NA8-7500 4-pole withdrawable type (In=4000A~5000A)

Side view



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

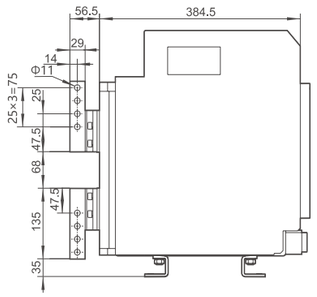
Hole size of the panel



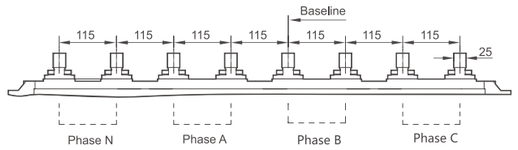
Vertical busbar connection of NA8-7500 4-pole withdrawable type (In=4000A~5000A)

C

Side view



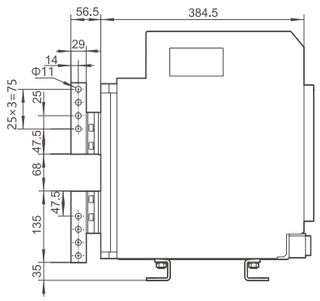
Busbar installation dimensions



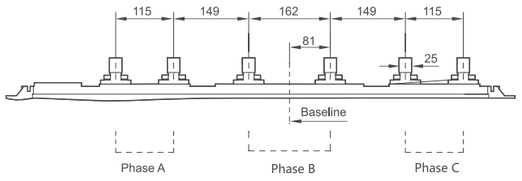
Note: In=6300A is only available with vertical connection, horizontal connection is not available.

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

Side view



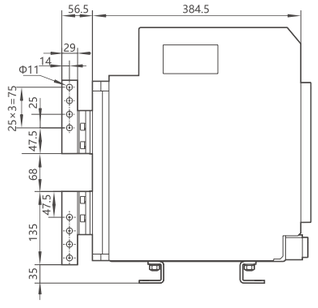
Busbar installation dimensions



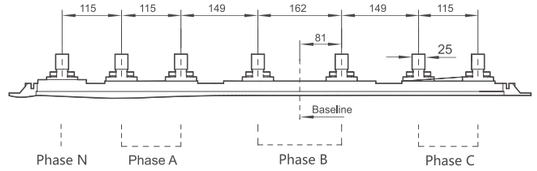
Note: In=7500A is only available with vertical connection, horizontal connection is not available.

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

Side view

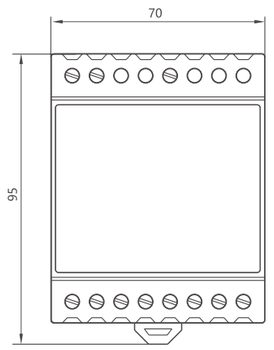


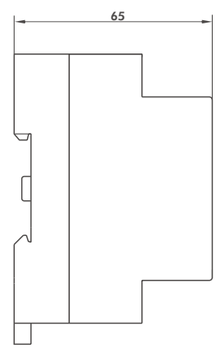
Busbar installation dimensions



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)



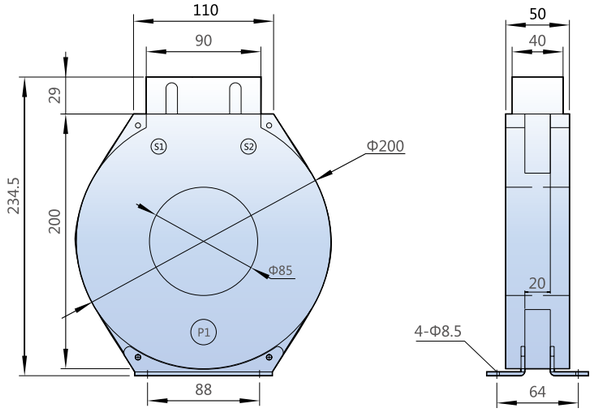


Note: Undervoltage delay control module(UVTZ-1), power module(PSU-1) and relay signal module(RU-1) are of same outline dimension, 35mm standard guide rail installation can also be used for installation.

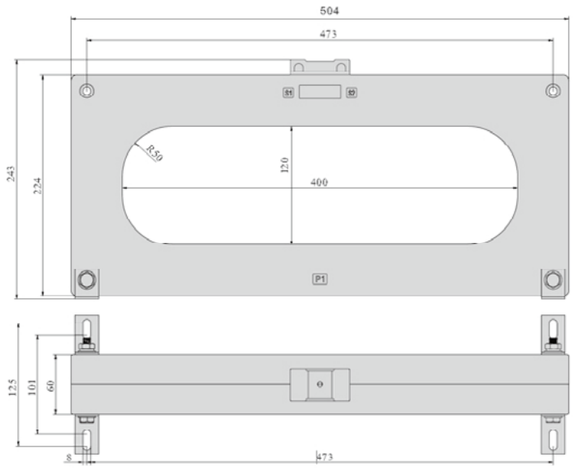
Overall dimensions of undervoltage delay control module, power module, RU-1 relay signal module

C

Dimensions of ground current transformer

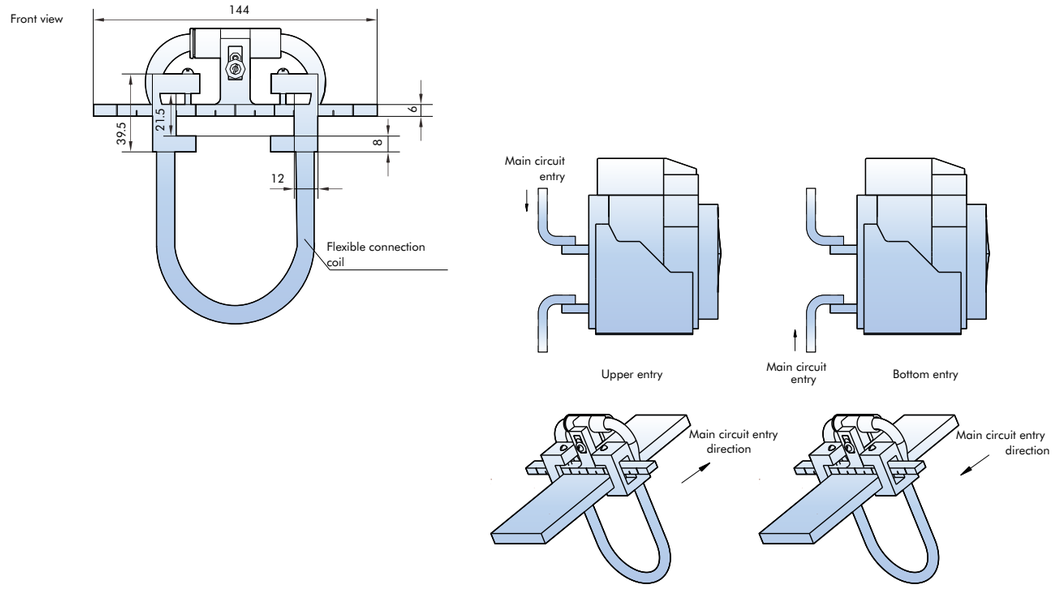


Dimensions of leakage protection transformer



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.

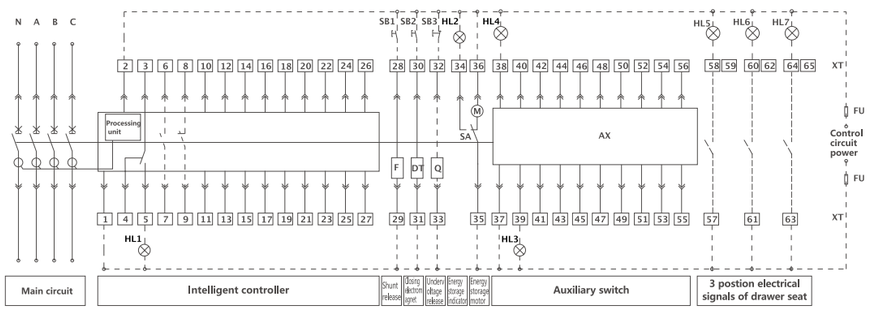
Dimensions of neutral pole current transformer



Note: 1. Upon fixing the neutral transformer, it needs to install it at the entry end of circuit breaker, and one side of its flexible cable should face the entry direction of main circuit.
2.When the frame is 1600 and rated current is 200~630A, the transformer needs to be wrapped around the busbar twice to be used normally.

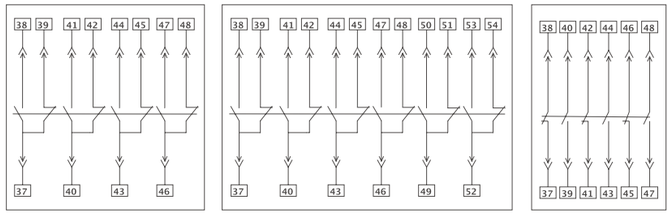
C

Control circuit electrical wiring diagram



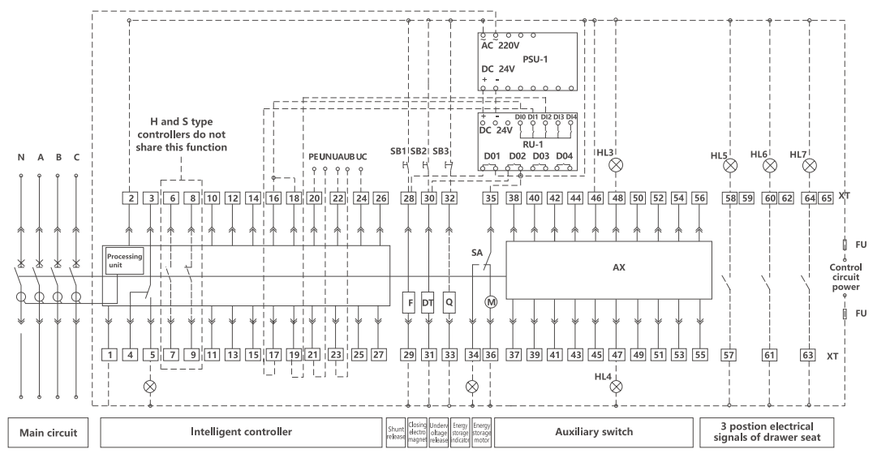
Control circuit wiring diagram of NA8-1600 M controller

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



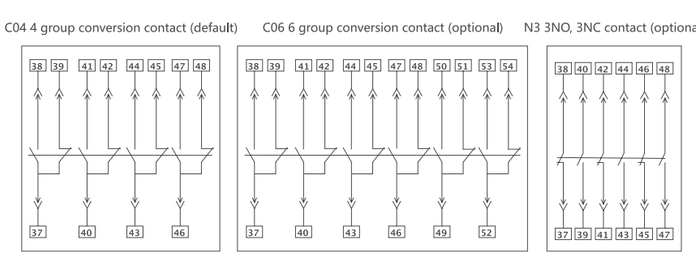
F-shunt release DT-closing electromagnet Q-undervoltage release
M-motor operating mechanism
SA-position switch XT-terminal AX-auxiliary terminal SB1-Opening Pushbutton
SB2-Closing Pushbutton SB3-emergency stop button HL1-fault indicator
HL2-energy storage indicator
HL3-Breaking indicator HL4-Making indicator 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#～ 5#: trip alarm contact (3 is the common contact)
6#～ 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

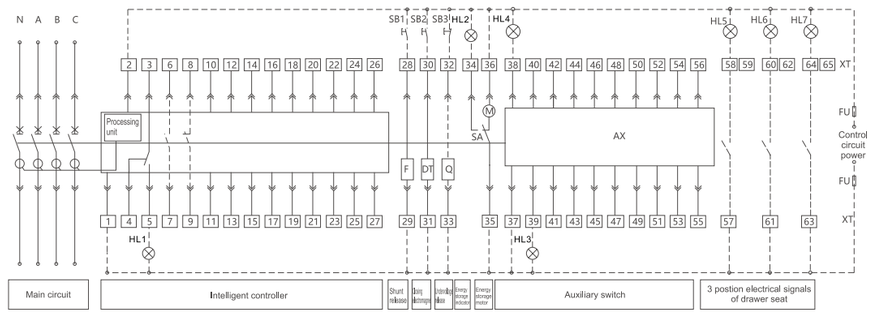
C04 4 group conversion contact (default) C06 6 group conversion contact (optional) N3 3NO, 3NC contact (optional)



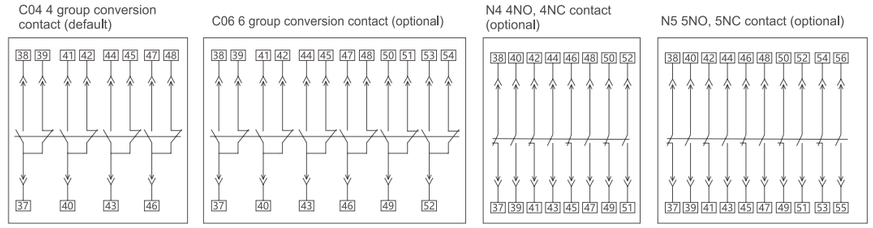
F-shunt release DT-closing electromagnet Q-under voltage release M-motor operating mechanism SA-position switch XT-terminal AX-auxiliary terminal
SB1-Opening Pushbutton
SB2-Closing Pushbutton SB3-emergency stop button HL1-fault indicator
HL2-energy storage indicator HL3-Breaking indicator HL4-Makeing 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#～ 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#～ 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#～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

C

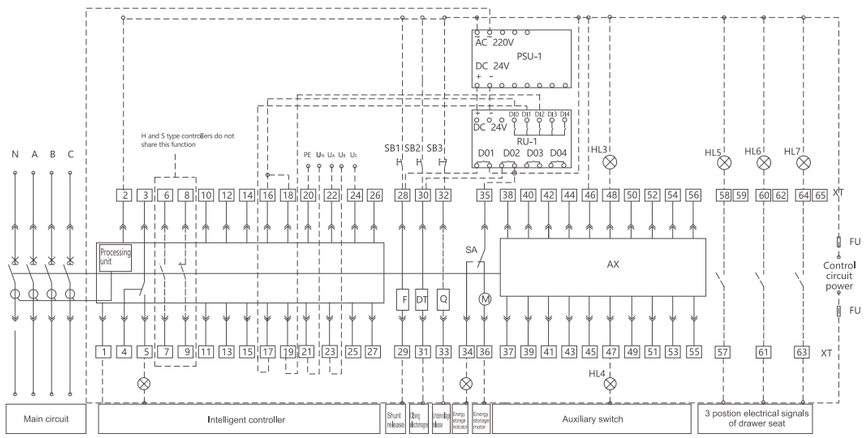


Control circuit wiring diagram of NA8-2500~7500 M controller

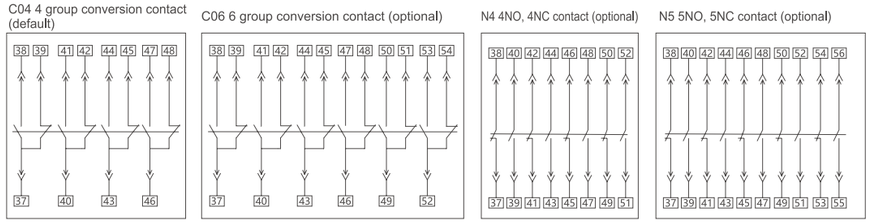


F—shunt release DT—closing electromagnet Q—under voltage release M—motor operating mechanism
SA—position switch XT—terminal AX—auxiliary terminal SB1—Opening Pushbutton
SB2—Closing Pushbutton SB3—emergency stop button HL1—fault indicator
HL2—energy storage indicator HL3—Breaking indicator HL4—Makeing 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#
3#~ 5#: trip alarm contact (3 is common contact)
6#~ 9#: auxiliary contact (1 NO and 1 NC contact), optional
12#~ 19#: empty
10#, 11#: empty
20#: empty
21#~ 24#: empty
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. 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.

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



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



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
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
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#~ 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#~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

C

Circuit Breaker Configuration

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

Optional accessory	NA8-1600		NA8-2500		NA8-3200		NA8-4000		NA8-7500
	Fixed type	Withdrawable type	Fixed type	Withdrawable type	Fixed type	Withdrawable type	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)			■	■	■	■	■	■	■

C

Circuit breaker selection table

Frame size current	NA8-1600	NA8-2500		NA8-3200	NA8-4000		NA8-7500	
Circuit breaker	N □ H □	N □	H □		N □	H □	N □	H □
Rate current	200A □	630A □	630A □	1600A □	1600A □	1600A □	4000A □	4000A □
	400A □	800A □	800A □	2000A □	2000A □	2000A □	5000A □	5000A □
	630A □	1000A □	1000A □	2500A □	2500A □	2500A □	6300A □	6300A □
	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 □	4p □						
Installation method	Withdrawable □	Fixed □ (not available for NA8-7500)						
Bus connection	Horizontal □	Vertical □		Mixed □ (specify)				
Intelligent controller	M type □ (basic)	H type □ (communication)			S type □ (LOT)			
Shunt, close, motor	Closing electromagnet □	Shunt release □		Energy storage motor □				
	AC220/230V □	AC380/400 V □		DC220V □	DC110V □			
Undervoltage release	UVT □	UVTD □		UVTZ-1 □ (only for NA8-1600)				
	AC220/230V □	AC380/400V □						
Auxiliary contact	NA8-1600	C04 (standard)		C06 □ (only for AC)		N3 □ (only for AC)		
	NA8-2500~7500	C04 (standard)		C06 □	N4 □		N5 □	
Auxiliary contact indicator(optional)	3 position signal device for drawer seat □							
Connection accessories (optional)	Interphase barrier □	NA8-1600 extended bus □						
Controller functions and accessories (optional)	External transformer: N phase external transformer □ External LEC leakage transformer □ Earth current protection transformer □ Controller function: 3P+N protection □ Leakage protection □ Earth current protection □ Voltage measurement and protection □ Energy measurement and protection □ Signal contact output □ ZSI zone selective interlock protection □ Load monitoring □ Notes: 1) 3P+N protection requires N phase external transformer; 2) Leakage protection requires external LEC leakage transformer,and rated current of ACB with leakage transformer should <= 3200A; 3) Earth current protection requires earth current protection transformer							
Locking mechanism (Optional)	Opening/Closing button lock □ 1 lock 1 key □ 2 locks 1 key □ 3 locks 2 keys □							
Mechanical interlock (Optional)	Steel cable interlock (dual interlock) □ Steel cable interlock (MIT-3) □ (only for NA8-2500~7500)							
Module (Optional)	PSU-1 □ RU-1 □ ST-DP protocol conversion module □							

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.

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

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.ChintGlobal.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: lbin3@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

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

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