NDW2 Series Air Circuit Breaker

Product Specifications

(New Structure)

Project Name: NDW2 Series Air Circuit Breaker

Project No.: P15004

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Revision History					
Version	Revision Reason/Content	Implementation Date	Prepared by:	Verified by:	Approved by:

Table of Contents

1. Product Overview

Circuit breaker		NDW2-1600	NDW2-2000	NDW2-3200	NDW2-4000	NDW2-6300
Number of poles		3, 4	3, 4	3, 4	3, 4	3, 4
Rated current In 40℃		200A～1600A	400A～2000A	2000A～3200A	800A～4000A	4000A～6300A
North pole rated current		100%In	100%In	100%In	100%In	50%In
Rated operational voltage Ue		AC690V	AC690V	AC690V	AC1000V	AC690V
Rated limit short-circuit breaking capacity Icu (AC415V)		65kA	80kA	100kA	100kA	120kA
Rated operating short-circuit breaking capacity Ics (AC415V)		55kA	80kA	85kA	100kA	120kA
Rated short time withstand current Icw (AC415V) 1s		42kA	60kA	85kA	85kA	100kA
Controller	Excluding controller	•	•	•	•	•
	KM controller	•	•	•	•	•
	KY controller	•	•	•	•	•
Installation type	Fixed type	•	•	•	•	
	Drawout type	•	•	•	•	•
Special application	Wind power, low-temperature circuit breakers	--	•	•	•	--
	Thermal-humidity type circuit breaker	•	•	•	•	•

Note: ●represents optional, -- represents not optional.

2. Product Feature

2.1 Design Feature

The controllers are of full range and versatile

■ NWK31 or NWK21 - Conventional function, digital tube display, practical function and simplicity, can adapt to the low-temperature places, and with optional voltage measurement function;

■ NWK32 or NWK22 - Conventional function, LCD display, multiple and diversified functions, with optional voltage and harmonics measurement and protection functions. Applicable to high-end application places, and more powerful if applied to intelligent system;

■ Measurement and protection: With current, voltage, frequency, phase sequence, power, power factor and harmonics measurement and protection functions;

■ Current protection features: A variety of overload long-time delay protection, a variety of short circuit short-time delay protection, short circuit transient protection, earthing protection, neutralline north pole protection, current unbalance protection, MCR circuit breaker making capacity protection;

■ Maintenance function: With fault record (8 times), historical current peak record, contact wear equivalent, query of operation times, clock function, self-diagnostic function, test function and fault display function;

■ With a remote reset device, can realize remote recovery after fault tripping of the controller.

Integrated communication network

NWK32 and NWK22 type controller can realize remote sensing, remote control, remote regulating and remote communication - "four remotes" data transmission function through communication interface Modbus protocol requirements.

AC 1000 V Circuit Breaker (NDW2-4000)

Select the special use site HU (AC1000V) type circuit breaker. It can meet the working environment of the rated operating voltage above 690V of the power distribution system in the wind power, Photovoltaic, metallurgical, rail traffic, etc.

Wind Power and Low-temperature Circuit Breakers (NDW2-2000/3200/4000)

FD (wind power, plateau) type circuit breaker for used in special places can meet the use under the environment condition of wind power, plateau and low temperature below 40℃, is in line with the GB/T20645 *Technical Requirements of the Plateau Low-voltage Apparatus under Special Circumstances*, and has passed standard related test

Three-proofing Circuit Breaker

TH (thermal-humidity) type circuit breaker can meet the requirements of the three-proofing products, namely, moisture-proofing, mould-proofing and salt spray-proofing, and complies with JB-T834 *Technical Requirements of Tropical Type Low-voltage Apparatus* while having passed the following standard related tests:

- Thermal-humidity test: GB/T 2423.4-2008 Environmental Testing for Electric and Electronic Products. Part 2: Test Method Test Db: Alternating thermal-humidity (12 h + 12 h cycle)
- Mould growth test: GB/T 2423.16-2008 Environmental Testing for Electric and Electronic Products. Part 2: Test Method Test J and Guidelines: Mould Growth
- Enclosure protection grade: GB/T 4208-2008 Enclosure Protection Grade (IP code)
- Salt spray test: GB/T 2423.17-2008 Environmental Testing for Electric and Electronic Products. Part 2: Test Method Test Ka: Salt

spray

Convenient Installation

Either zero flashover or upper and lower wiring.

Connection mode: horizontal or vertical connection, elongated horizontal or vertical connection, mixed connection (upper horizontal and lower vertical, upper vertical and lower horizontal).

Efficient Arc Extinguishing and Breaking Characteristics

The design of the circuit breaker arc extinguishing chamber and contact system has a number of invention patents. It adopts the principle of air-blast arc extinguishing, optimizes the arc extinguishing gate design, increases the driving force of arc, and improves the breaking ability of the product. In addition, it also optimizes the time for acquiring signal and giving command by the controller, and can greatly shorten the time when there is a large fault current.

High Electrical Life and Short Circuit Tolerance Ability

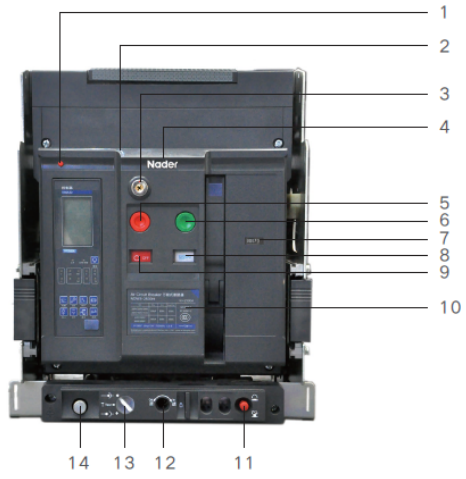
The body design adopts high strength DMC material, and has high impact strength and insulating properties. The design of the double-contact structure improves the electric life of products; the optimized design of the mechanism realizes compensation to the contact pressure, and improves the product reliability and short circuit tolerance ability.

Multiple safety protection devices

It has drawout type circuit breaker door interlocking, drawout type triolocation locking and unlocking device and disconnected position key lock, connection terminal protective cover, closing ready device and other protection devices.

2.2 Structural Features

Introduction of Structure and Indications (See Figure 1)



1. Reset button
2. Specification sign
3. Disconnected position key lock
4. Goodwill sign
5. Disconnection button
6. Closing button
7. Counter (Optional function)
8. Energy releasing and storing indication
9. Opening and closing indication
10. Nameplate
11. "Connection", "Test" and "Separation" position locking and unlocking devices
12. Rocker operating position
13. "Connection", "Test" and "Separation" position indicator
14. Rocker and its storage position

Note: 1 ~ 10 is fixed type, while 1 ~ 14 is drawout type.

Figure 1

Drawout Type Circuit Breaker Structure

Drawout type circuit breaker is composed of the circuit breaker and the drawer seat. The drawer seat has guide rails on both sides. There's guide plate on the guide rail. The circuit breaker is placed on the left and right guide plates. The drawout type circuit breaker connects to the main circuit by inserting the busbar on the circuit breaker into the bridge contact on the drawer seat.

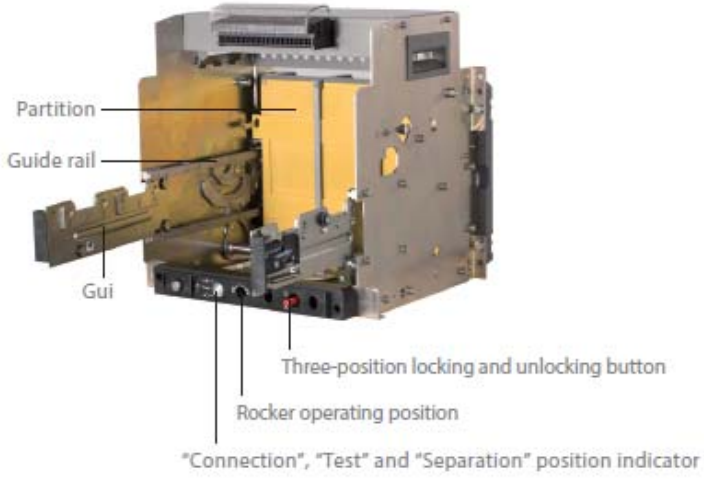


Figure 2

Figure 3

2.3 Conforming Standards and Certification

GB/T 2423.4-2008 Environmental Testing for Electric and Electronic Products - Part 2: Test Method - Test Db: Thermal, humidity, cyclic

GB/T 4207-2003 Methods for the Determination of the Proof and the Comparative Tracking Indices of Solid Insulating Materials

GB/T 14048.1-2006 Low-voltage Switchgear and Control Equipment - Part 1: General Rules (IEC 60947-1:2001, MOD)

GB/T 14048.2-2008 Low-voltage Switchgear and Control Equipment - Part 2: Low-voltage Circuit Breaker (IEC 60947-2:2006, IDT)

GB/T 14048.5-2008 Low-voltage Switchgear and Control Equipment - Part 5-1: Control Circuit Electrical Appliances and Switch Elements - Electromechanical Control Circuit Electrical Appliances (IEC 60947-5-1:2003, MOD)

GB/T 14092.3-2009 Environmental Condition for Machinery Products - High Altitude

GB/T 19608.3-2004 Classification of Special Environmental Condition - Part 3: Plateau

GB/T 20645-2006 Specific Environmental Condition - Technical Requirements of Low-voltage Apparatuses for Plateau

GB/T 20626.3-2006 Specific Environmental Condition - Electric and Electronic Products for Plateau - Part 3: Protection Requirement of Thunder and Lightning, Pollution, Condensation

NDW2 series of universal circuit breaker has obtained China Compulsory Certification (CCC) for products.

3. Field of Application

NDW2 series of universal circuit breaker (hereinafter referred to as circuit breaker) can be applied to the distribution network with AC of 50 Hz / 60 Hz, rated current of 200 A ~ 6300 A, rated insulation voltage of 1000 V, rated operational voltage of AC220V / 230 V / 240 V, AC380V / 400 V / 415 V, AC440V / 480 V, AC660V / 690 V, AC1000V for distribution of electrical energy and protecting circuit and power equipment from overload, under-voltage, short circuit, single phase grounding and harm of other faults, and can also be used as isolation switch at the same time. The circuit breaker has multiple protection functions. It can avoid unnecessary sudden power failure while realizing highly accurate selective protection, and improve the reliability and security of the power supply system.

Working Environment

Environment Temperature

Applicable environment temperature is -25℃ ~ + 70℃, the average within 24 h shall not be more than +35℃.

The circuit breaker used for environment temperature below -25℃ ~ -40℃ can be specially customized. If the environment temperature is higher than +40℃, the user needs to reduce the capacity, and the reduced capacity coefficient is shown in Table 2.

Table 2

Rated current		Allowable continuous rated current					
		+40℃	+45℃	+50℃	+55℃	+60℃	+70℃
NDW2-1600	200A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	400A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	630A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	800A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	0.97 In
	1000A	1.0 In	1.0 In	0.95 In	0.89 In	0.85 In	0.78 In
	1250A	1.0 In	1.0 In	1.0 In	0.95 In	0.89 In	0.85 In
	1600A	1.0 In	0.95 In	0.89 In	0.85 In	0.78 In	0.63 In
NDW2-2000	400A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	630A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	800A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	1000A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	1250A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	1600A	1.0 In	1.0 In	1.0 In	1.0 In	0.97 In	0.94 In
	2000A	1.0 In	0.98 In	0.95 In	0.90 In	0.88 In	0.80 In
NDW2-3200	2000A	1.0 In	1.0 In	1.0 In	1.0 In	0.95 In	0.90 In
	2500A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	2900A	1.0 In	1.0 In	1.0 In	1.0 In	0.97 In	0.95 In
	3200A	1.0 In	1.0 In	1.0 In	0.97 In	0.95 In	0.90 In
NDW2-4000	800A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	1000A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	1250A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	1600A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	2000A	1.0 In	1.0 In	1.0 In	1.0 In	0.95 In	0.90 In
	2500A	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In	1.0 In
	3200A	1.0 In	1.0 In	1.0 In	1.0 In	0.95 In	0.90 In
	4000A	1.0 In	0.95 In	0.89 In	0.85 In	0.78 In	0.63 In
NDW2-6300	4000A	1.0 In	1.0 In	0.95 In	0.89 In	0.85 In	0.78 In
	5000A	1.0 In	1.0 In	1.0 In	0.95 In	0.89 In	0.85 In
	6300A	1.0 In	0.95 In	0.89 In	0.85 In	0.78 In	0.63 In

Note: The above data is calculated according to the test and theory. The data represent only guidelines and recommendations.

Atmospheric Environment Condition

When the ambient air temperature is +40℃, the relative humidity of atmosphere shall not be more than 50%. At low temperature, a higher relative humidity is allowed, for example, in case of +25℃, the relative humidity of atmosphere can be 90%. For condensation due to temperature change, dehumidification or corresponding measures should be taken.

Altitude

Altitude of the installation site shall not exceed 2,000 m.

If the altitude of the installation site is between 2,000 m to 4,000 m, it can be specially customized. For the working performance, refer to the correction value in the following table (Table 3).

Table 3

Rated current		Allowable continuous rated current			
		2000m	3000m	4000m	5000m
NDW2-1600	200-630	1.0 In	1.0 In	1.0 In	1.0 In
	800-1000	1.0 In	1.0 In	0.97 In	0.87 In
	1250-1600	1.0 In	1.0 In	0.97 In	0.87 In
NDW2-2000	400-800	1.0 In	1.0 In	1.0 In	1.0 In
	1000-1600	1.0 In	1.0 In	1.0 In	1.0 In
	2000	1.0 In	1.0 In	0.97 In	0.87 In
NDW2-3200	1600-2500	1.0 In	1.0 In	1.0 In	1.0 In
	2900-3200	1.0 In	0.83 In	0.80In	0.75 In
NDW2-4000	1600-2500	1.0 In	1.0 In	1.0 In	1.0 In
	3200	1.0 In	1.0 In	1.0 In	1.0 In
	4000	1.0 In	0.93 In	0.88 In	0.82 In
NDW2-6300	4000	1.0 In	0.97 In	0.90 In	0.86 In
	5000	1.0 In	1.0 In	1.0 In	1.0 In
	6300	1.0 In	0.93 In	0.88 In	0.82 In

Anti-corrosion Level

Salt mist: Severe Level 2

Pollution Level

Pollution level: Level 3

Shockproof Requirement

The circuit breaker can ensure resistance to electromagnetic or mechanical shock, and has passed the IEC 60721-3-3 standard test;

Amplitude: ±1 mm (2 Hz -9 Hz);

Constant acceleration: 5 m/s^2 (9 Hz -200 Hz);

Super strong shock may result in damage to the parts, and impact the reliable action of the circuit breaker.

Electromagnetic Interference

The circuit breaker can resist the following electromagnetic interference

- Overvoltage caused by electromagnetic interference;
- Overvoltage due to aging of the distribution system or environmental interference;
- Radio wave;
- Electrostatic discharge.

The circuit breaker has passed the electromagnetic compatibility (EMC) test stipulated by following standards

- GB/T 14048.2-2008 Low-voltage Switchgear and Control Equipment - Part 2: Circuit Breaker - Appendix F;
- GB/T 14048.2-2008 Low-voltage Switchgear and Control Equipment - Part 2: Circuit Breaker - Appendix N;

The above tests can ensure that the circuit breaker won't wrongly occur tripping.

Installation Condition

With the vertical gradient of no more than 5°, the circuit breaker shall be installed under the environment condition without explosion danger, without conductive dust and without the possibility of corroding metal and damaging the insulation.

Installation Category

The circuit breaker's main circuit and undervoltage tripper coils, power transformer primary coil installation category is IV; the rest auxiliary circuit and control circuit installation category is III.

Protection Level

IP30 and IP40 (installed in a cubicle and equipped with protective doorframe).

Utilization Category

Class B

Wiring method of the main circuit of the circuit breaker (Table 4). Recommended Use

Table 4

Frame size rated current Inm (A)	Rated current In (A) 40℃	Copper bar specification	
		Dimensions	Number of bars
1600	200、400、630	40mm×5mm	2
	800	50mm×5mm	2
	1000	60mm×5mm	2
	1250	60mm×5mm	3
	1600	60mm×10mm	2
2000	400、630	60mm×5mm	2
	800	60mm×5mm	2
	1000	60mm×5mm	2
	1250	60mm×10mm	3
	1600	60mm×10mm	2
	2000	60mm×10mm	3
3200	2000	100mm×5mm	3
	2500	100mm×10mm	2
	2900、3200	100mm×10mm	3
4000	1600	80mm×5mm	3
	2000	80mm×10mm	2
	2500	80mm×10mm	3
	3200、4000	100mm×10mm	5
6300	4000	100mm×10mm	5
	5000、6300	100mm×10mm	7

Note: 1. The Table indicates the copper bar specifications adopted when the circuit breaker is under the ambient environment temperature of 40℃ and the open wide installation under the heating condition meets the stipulation in GB/T 14048.2. If the temperature is higher than 40℃, the quantity of copper bar should be increased, or the capacity should be reduced.

2. The above data is calculated according to the test and theory, and for reference only.

3. The temperature of copper bar is not allowed beyond 110℃.

4. The electric clearance of copper bar at least 15mm, And when the sea level is over 5Km or the relative humidity is over 90%, The electric clearance should changed by relevant standard principles.

The power loss of the incoming and outgoing lines of the circuit breaker (ambient temperature +40℃) is as shown in Table 5:

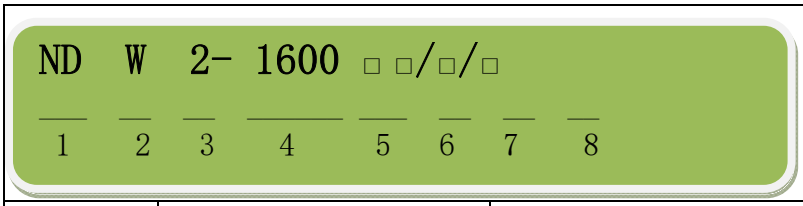
Table 5

Model	Power loss of the fixed type	Power loss of the drawout type
NDW2-1600	≥150 VA	≥400 VA
NDW2-2000	≥208 VA	≥380 VA
NDW2-3200/4000	≥650 VA	≥900 VA
NDW2-6300	/	≥1206 VA

Note: The above power loss value is measured when the circuit breaker is powered on test current (maximum rated current of the circuit breaker) In for 8 h and after the main circuit temperature rise tends to the steady state. The test method is in accordance with G.2 in Appendix G of GB/T 14048.2.

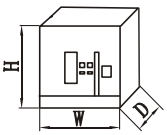
4. Technical Characteristics

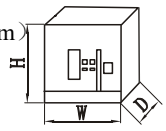
4.1 Specifications and Models Description

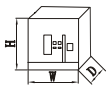


Serial No.	Name of the serial number	NDW2
1	Enterprise code	Nader Brand low-voltage electrical appliance
2	Product code	W universal circuit breaker
3	Design serial number	2
4	Frame size rated current	1600, 2000, 3200, 4000, 6300
5	Installation structure	Fixed type, not-marked
		Drawout type: C
6	Rated current	200A, 400A, 630A, 800A, 1000A, 1250A, 1600A, 2000A, 2500A, 2900A, 3200A, 4000A, 5000A, 6300A
7	Number of poles	3: 3 poles
		4: 4 poles
		5: 3P+N
8	Controller types	KM: NWK31 (Nixie tube display), applicable to NDW2-1600 NWK21 (Nixie tube display), applicable to NDW2-2000/3200/6300
		KY: NWK32 (LCD display), applicable to NDW2-1600 NWK22 (LCD display), applicable to NDW2-2000/3200/6300

4.2 Technical Parameters

Circuit breaker model			NDW2-1600		
Rated current In (A)			200, 400, 630	800, 1000	1250, 1600
North pole rated current			100%In		
Rated operational voltage Ue			AC220V/230V/240V, AC380V/400V/415V, AC440V/480V, AC660V/690V		
Rated frequency f			50/60Hz		
Rated insulation voltage Ui			1000V		
Rated impulse withstand voltage Uimp			12kV		
Number of poles			3, 4		
Full break time (≥AC690V)			＜18ms		
Closing time			＜60ms		
Rated ultimate short circuit Breaking capacity Icu (effective value) kA		AC415V	65kA		
		AC690V	42kA		
Rated operating short circuit Breaking capacity Ics (effective value) kA		AC415V	55kA		
		AC690V	35kA		
Rated short circuit making capacity Icm (peak value) kA		AC415V	143kA		
		AC690V	77kA		
Rated short time withstand current Icw (effective value) 1s kA		AC415V	42kA 1s		
		AC690V	35kA 1s		
Operating performance (Number of times)	Electrical life	AC415V	10000	10000	10000
		AC690V	10000	10000（800A） 7000（1000A）	6000
	Mechanical life	Maintenance-free	15000		
		With maintenance	30000		
Installation type			Fixed type, drawout type		
Wiring method of the main circuit			Horizontal wiring, vertical wiring, extended horizontal wiring, mixed wiring (upper horizontal and lower vertical), mixed wiring (upper vertical and lower horizontal)		
Boundary dimension: W×D×H 		Fixed type 3P	260mm×240mm×319.5mm		
		Fixed type 4P	330mm×240mm×319.5mm		
		Drawout type 3P	254mm×354.5mm×352mm		
		Drawout type 4P	324mm×354.5mm×352mm		
Weight (kg)		Fixed type 3P	19 (200A～630A)	20 (800A～1000A)	21 (1250A～1600A)
		Fixed type 4P	20 (200A～630A)	21 (800A～1000A)	25 (1250A～1600A)
		Drawout type 3P	40 (200A～630A)	41 (800A～1000A)	42 (1250A～1600A)
		Drawout type 4P	41 (200A～630A)	42 (800A～1000A)	52 (1250A～1600A)

Circuit breaker model			NDW2-2000			NDW2-3200	
Rated current In (A)			400,630,800	1000,1250,1600	2000	2000, 2500	2900, 3200
North pole rated current			100%In				
Rated operational voltage Ue			AC220V/230V/240V, AC380V/400V/415V, AC440V/480V, AC660V/690V				
Rated frequency f			50/60Hz				
Rated insulation voltage Ui			1000V				
Rated impulse withstand voltage Uimp			12kV				
Number of poles			3, 4				
Full break time (≥690V)			≥30ms				
Closing time			≥70ms				
Rated limit short-circuit breaking capacity Icu (effective value) kA		AC415V	80kA			100kA	
		AC690V	65kA			80kA	
Rated operating short-circuit breaking capacity Ics (effective value) kA		AC415V	80kA			85kA	
		AC690V	65kA			65kA	
Rated short circuit making capacity Icm (peak value) kA		AC415V	176 kA			220kA	
		AC690V	143 kA			176kA	
Rated short time withstand current Icw (effective value) 1s kA		AC415V	60kA 1s			85kA 1s	
		AC690V	50kA 1s			55kA 1s	
Operating performance (Number of times)	Electrical life	AC415V	15000	15000	11000	15000	12500(2900A) 11000(3200A)
		AC690V	15000	15000(1000-1250A) 8000(1600A)	6000	15000(2000A) 9000(2500A)	6000
	Mechanical life	Maintenance-free	15000			15000	
		With maintenance	30000			20000	
Installation type		Fixed type	▲			▲	
		Drawout type	▲			▲	
Wiring method of the main circuit		Fixed type	Horizontal wiring, vertical wiring, L-type wiring			Horizontal wiring, vertical wiring	
		Drawout type	Horizontal wiring, vertical wiring, L-type wiring			Horizontal wiring, vertical wiring	
Boundary dimension: W×D×H（mm） 		Fixed 3P	362×332×398			422×332×398	
		Fixed 4P	457×332×398			537×332×398	
		Drawout 3P	375×430×432			435×430×432	
		Drawout 4P	470×430×432			550×430×432	
Weight (kg)		Fixed 3P	39	40	41	46	56
		Fixed 4P	48	49	50	58	68
		Drawout 3P	68	70	71	92	96
		Drawout 4P	86	88	91	108	118
Note: ▲ represents this function is available							

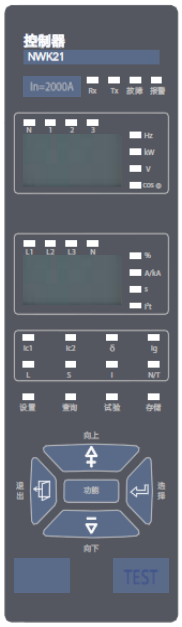
Circuit breaker model			NDW2-4000			NDW2-6300	
Rated current In (A)			800, 1000, 1250,1600	2000, 2500	3200, 4000	4000	5000, 6300
North pole rated current			100%In			50%In	
Rated operational voltage Ue			AC220V/230V/240V, AC380V/400V, AC415V, AC660V/690V, AC1000V			AC220V/230V/240V, AC380V/400V/415V, AC440V/AC480V, AC660V/690V	
Rated frequency f			50/60Hz				
Rated insulation voltage Ui			1000V				
Rated impulse withstand voltage Uimp			12kV				
Number of poles			3, 4				
Full break time (≥AC690V)			≥30ms				
Closing time			≥70ms				
Rated ultimate short circuit Breaking capacity Icu (effective value) kA		AC415V	100kA			120kA	
		AC690V	75kA			85kA	
		AC1000V	50kA			/	
Rated operating short circuit Breaking capacity Ics (effective value) kA		AC415V	100kA			120kA	
		AC690V	75kA			85kA	
		AC1000V	50kA			/	
Rated short circuit making capacity Icm (peak value) kA		AC415V	220kA			264kA	
		AC690V	165kA			187kA	
		AC1000V	110kA			/	
Rated short time withstand current Icw (effective value) 1s kA		AC415V	85kA 1s			100kA 1s	
		AC690V	75kA 1s			85kA 1s	
		AC1000V	50kA			/	
Operating performance (Number of times)	Electrical life	AC415V	10000	8000	6000	1000	
		AC690V	10000	6000	3000	800	
		AC1000V	2000	1000	500	/	
	Mechanical life	Maintenance-free	10000			5000	
		With maintenance	15000			10000	
Installation type			Fixed type, drawout type			Drawout type	
Wiring method of the main circuit			Horizontal wiring, vertical wiring, extended horizontal wiring, extended vertical wiring			Horizontal wiring	
Boundary dimension: W×D×H (mm) 		Fixed type 3P	422×339×394			/	
		Fixed type 4P	537×339×394			/	
		Drawout type 3P	435×450×432			895×497×432	
		Drawout type 4P	550×450×432			895×497×432	
Weight (kg)		Fixed type 3P	59 （08~25）	60 (32~40)		/	
		Fixed type 4P	70 （08~25）	71.5 (32~40)		/	
		Drawout type 3P	97 (08~25)	103 (32~40)		186	214
		Drawout type 4P	114 (08~25)	120 (32~40)		182	210

4.3 Controller

Controller is one of the main components of the circuit breaker, can provide overload, short circuit, grounding, current imbalance, overvoltage, undervoltage, voltage imbalance, overfrequency, underfrequency, reverse power and other failures protection function; and can realize reasonable operation of the power grid through the load monitoring, demand protection, regional interlocking and other functions. Controller has the function of measuring the current, voltage, power, frequency, electric energy, demand, harmonic and other power grid parameters; and the function of recording the fault, alarm, operation, historical maximum current, contact wear and other the record of operation and maintenance parameters; When the power network is carrying on communication network, the controller can realize the remote sensing, remote communication, remote control and remote regulating at the remote terminal of the electric power automation network.

Controller Types (See Table 6)

Table 6

Controller types	KM	KM/V	KY, KY/V, KY/P
Model	NWK21/ NWK31	NWK21/ NWK31 (V)	NWK22/ NWK32, NWK22/ NWK32 (V), NWK22/ NWK32 (P)
NDW2-1600/2000/3200/4000/6300 Controller icon			

Controller Functions

Table 7:

Functional items		NWK21 NWK31	NWK21/V NWK31/V	NWK22 NWK32	NWK22/V NWK32/V	NWK22/P NWK32/P
Display interface	Digital tube number and symbol display	√	√	—	—	—
	LCD Chinese, symbolic and graphic display	—	—	√	√	√
Protection function	Overload long delay protection	√	√	√	√	√
	Overload thermal memory	√	√	√	√	√
	Overload pre-alarm/alarm output	√/▲	√/▲	√/▲	√/▲	√/▲
	Short circuit short delay protection	√	√	√	√	√
	Short delay thermal memory	√	√	√	√	√
	Short-circuit transient protection	√	√	√	√	√
	Ground protection (difference type)	√	√	√	√	√

	Ground alarm/alarm output	√/▲	√/▲	√/▲	√/▲	√/▲
	Leakage protection/alarm/alarm output	—	—	√/√/▲	√/√/▲	√/√/▲
	Neutral line protection	√	√	√	√	√
	Current imbalance protection/alarm/alarm output	√/—/—	√/—/—	√/√/▲	√/√/▲	√/√/▲
	MCR	√	√	√	√	√
	Load monitoring/alarm/alarm output	▲	▲	√	√	√
	Under-voltage protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Overvoltage protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Voltage imbalance protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Phase sequence protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Under-frequency protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Over frequency protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Current required value protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Power required value protection/alarm/alarm output					√/√/▲
	Reverse power protection/alarm/alarm output	—	—	—	—	√/√/▲
Measurement function	Current measurement (phase pole, N pole, grounding)	√	√	√	√	√
	Voltage (phase voltage, line voltage, voltage unbalance ratio)	—	√	—	√	√
	Phase sequence detection	—	—	—	√	√
	Frequency measurement	—	√	—	√	√
	Required value measurement (current)	—	—	—	√	√
	Required value measurement (power)	—	—	—	—	√
	Power measurement (active power, reactive power, apparent power)	—	√	—	—	√
	Power Factor Measurement	—	√	—	—	√
	Electrical energy measurement (active energy, reactive energy, apparent energy)	—	—	—	—	√
	Harmonic wave measurement	—	—	—	—	√
Maintenance function	LED fault status indication	√	√	√	√	√
	Fault record (8 times) and query	√	√	√	√	√
	Historical current peak record	—	—	√	√	√
	Alarm history record query	—	—	√	√	√
	Fault trip signal output	√	√	√	√	√
	Self-diagnosis function	√	√	√	√	√
	Simulated trip test function	√	√	√	√	√
	Contact wear equivalent (alarm) query	▲	▲	√	√	√
	Operation count query	▲	▲	√	√	√
	Clock function	—	—	√	√	√
Others	DC controller（DC220V、DC110V）	▲	▲	▲	▲	▲
	Controller remote reset	▲	▲	▲	▲	▲
	Signal unit	▲	▲	▲	▲	▲
	Communication	—	—	▲	▲	▲
	Short message function	—	—	▲	▲	▲

"√" represents with this function, "▲" represents optional function for users, and "-" represents without this function

Controller of 1600 shell frame is NWK31 or NWK32.

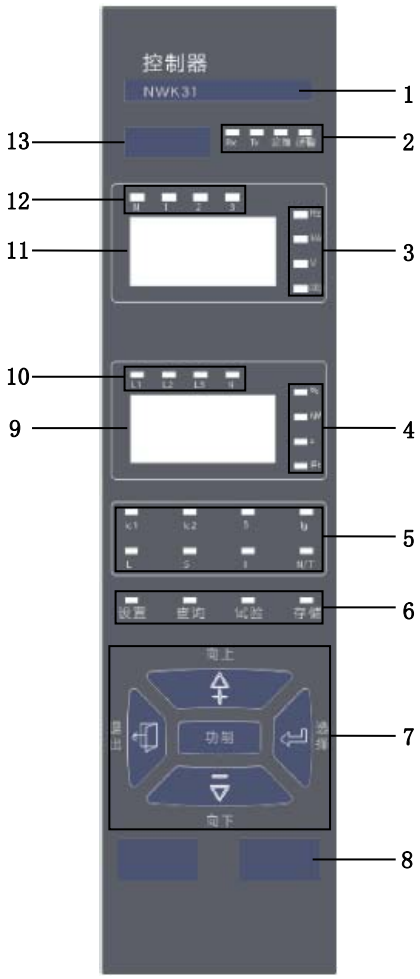
Controller Factory Setting, See Table 8:

Table 8

Protective features	Setting current	Setting current	Remarks
Overload long-time delay protection	1.0In	60s	Thermal memory ON
Short circuit short-time delay protection	$8I_R$	0.2s	Definite time, I^2t-OFF
Short circuit instantaneous protection	10In	-	-
Ground protection	0.5In	0.1s	-
Current unbalance protection	OFF	-	Users can open it as needed

Introduction of the Controller

1）NWK31 controller, as shown in Figure 4



1 Controller model

2 Tx (communication receiving), Rx (sending), fault and alarm indicators

3 Voltage indicators

4 % (current), current, time and I^2t (inverse time limit) indicators

5 Fault current protection feature, load testing indicators

6 Setup, query, test and storage indicators

7 Operating set value buttons

8 Test port

9 Digital display screen

10 Three-phase current, N current indicators

11 Digital display screen

12 N-phase and A, B, C phases voltage indicators

13 Controller rated current sign

Figure 4

2）NWK32 controller, as shown in Figure 5

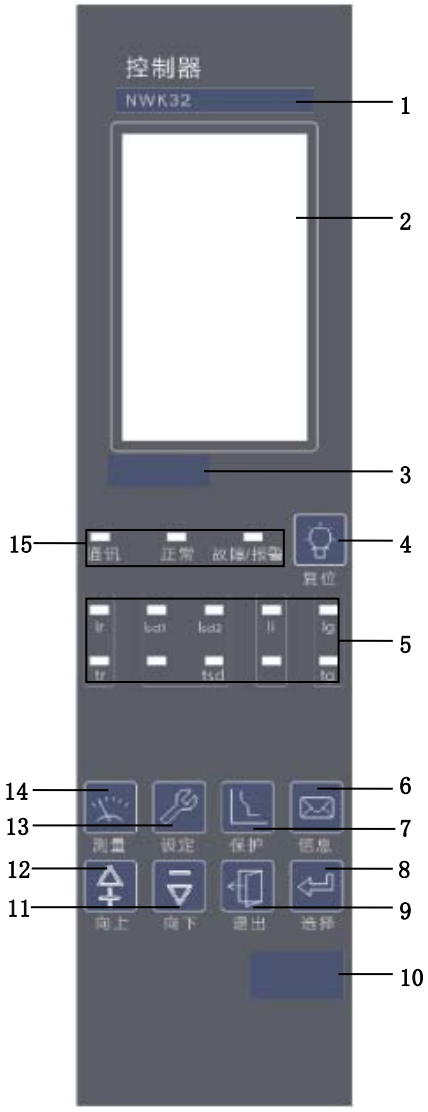


Figure 5

1 Controller model

2 LCD screen

3 Controller rated current sign

4 Fault and alarm reset buttons

5 Fault current protection feature indicators

6 “Information function” button

7 “Protection function” button

8 “Select” button

9 “Exit” button

10 Test port

11 “Down” button

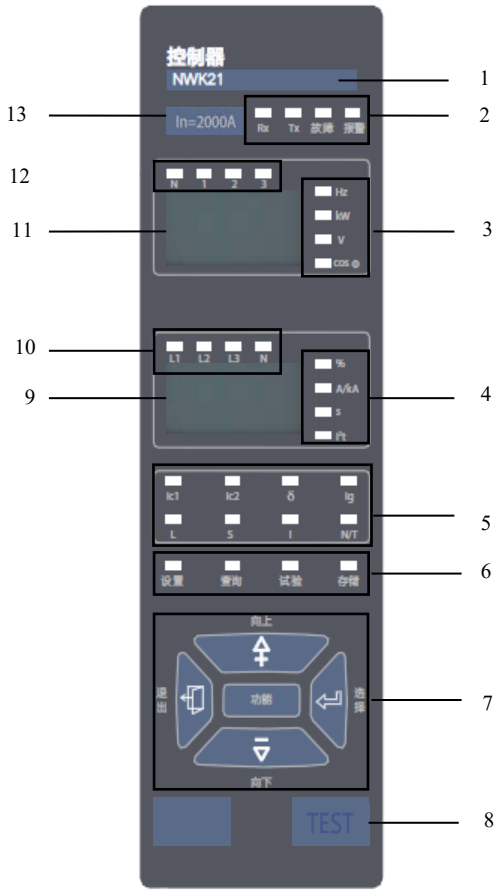
12 “Up” button

13 “Setup” button

14 “Measurement” button

15 "Communication", "normal" and "failure/alarm" indicators (LED)

3) NWK21 controller, as shown in Figure 6



1 Controller model

2 Tx (communication receiving), Rx (sending), fault and alarm indicators

3 Voltage indicators

4 %(current), current, time and I^2t (inverse time limit)indicators

5 Fault current protection feature, load testing indicators

6 Setup, query, test and storage indicators

7 Operating set value buttons

8 Test porti

9 Digital display screen

10 Three-phase current, N current indicators

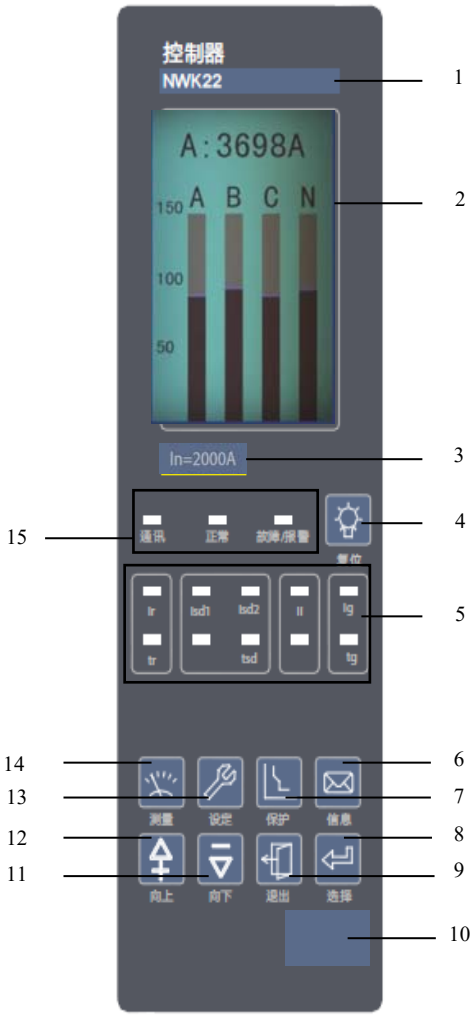
11 Digital display screen

12 N-phase and A, B, C phases voltage indicators

13 Controller rated current sign

Figure 6

4) NWK22 controller, as shown in Figure 7



1 Controller model

2 LCD screen

3 Controller rated current sign

4 Fault and alarm reset buttons

5 Fault current protection feature indicators

6 "Information function" button

7 "Protection function" button

8 "Select" button

9 "Exit" button

10 Test port

11 "Up" button

12 "Down" button

13 "Measurement" button

14 "Setup" key

15 "Communication", "normal" and "failure/alarm" indicators (LED)

Figure 7

5. Appendixes

Accessories List

Power supply module ST-IV

Secondary terminal

Auxiliary switch

Phase partition

Relay module

Undervoltage tripper

Closed/Shunt excitation coil

Electronic tripper

Electric operating mechanism

Off-position lock

Counter

Door frame

Mechanical interlocking

5.1 Accessories List

Accessories name	For what kind of circuit breakers	Supply mode
Controller power supply module	Fixed type/drawout type	Optional ordering for customers
Relay module	Fixed type/drawout type	Optional ordering for customers, to be used with ST-IV
Off-position key lock	Fixed type/drawout type	Optional ordering for customers
Door interlocking	Drawout type	Optional ordering for customers

Circuit breaker triolocation locking device	Drawout type	Standard configuration
Auxiliary switch	Fixed type/drawout type	Standard configuration
Closed electromagnet	Fixed type/drawout type	Standard configuration
Shunt tripper	Fixed type/drawout type	Standard configuration
Motor operating mechanism	Fixed type/drawout type	Standard configuration
Phase partition	Fixed type/drawout type	Optional ordering for customers
Closing ready signal output device	Fixed type/drawout type	Optional ordering for customers
Under-voltage tripper	Fixed type/drawout type	Optional ordering for customers
Counter	Fixed type/drawout type	Optional ordering for customers
Doorframe	Fixed type/drawout type	Optional ordering for customers
Dust cover	Fixed type/drawout type	Optional ordering for customers
Pushbutton lock	Fixed type/drawout type	Optional ordering for customers
Mechanical interlocking	Fixed type/drawout type	Optional ordering for customers
Power source automatic switching control equipment	Fixed type/drawout type	Optional ordering for customers

5.2 Accessories Function Description

Accessories of Controller

- Controller power supply module, as shown in Figure 8:

  ■ Role: As the power source of relay ST201, with the output voltage of DC24V;

  ■ Rated control supply voltage (Us):

  AC: AC380V/400V, AC220V/230V 50/60Hz;

  DC: DC220V, DC110V.

  ■ Features: (110% ~ 85%) Us normal work of the power supply module;

  ■ Installation method: Using 35 mm standard guide or direct fixation;

  ■ Supply mode: Optional ordering for customers.

Figure 8

■ Users indicate the rated working voltage and voluntarily install. The installation diagram is as shown in Figure 9.

Note: "+" and "-" of wiring cannot be wrongly wired.

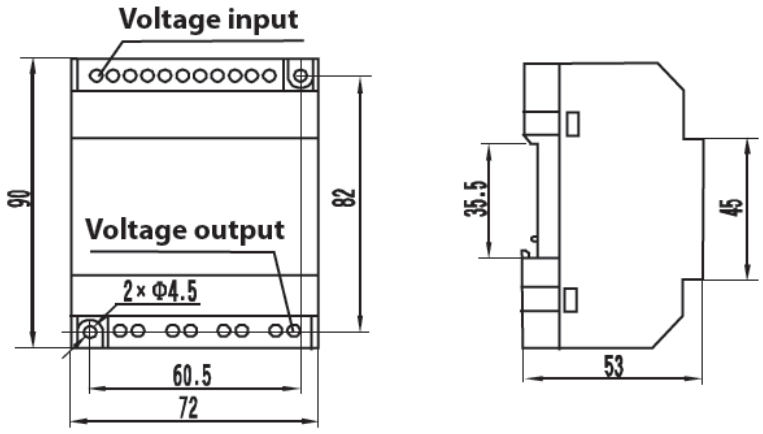


Figure 9

● Relay module, as shown in Figure 10:

■ Function: Signal unit of controller is commonly used in fault alarm or indication, etc. When the circuit breakeris opened, closed or when the load capacity is larger, the control should be carried out after conversion through this module.

Match with the power supply module ST-IV to achieve the "four remotes" function;

■ Contact capacity: AC250V, 10 A; DC24V, 10 A;

Appearance, installation, ordering: to be used with ST-IV.

Figure 10

Locks

● Off-position key lock (on the circuit breaker)

This key lock is locked on the manually disconnected position of the circuit breaker. When the key is anticlockwise locked and pulled out, the circuit breaker cannot carry out closed operation, it can prevent irregular operation, as shown in Figure 11. Specifications and models are shown in Table 9.

Figure 11

Table 9

Specification	Enterprise Name	Number of circuit breakers	Number of keys
SF11	One lock one key	1	1
SF21	Two locks one key	2	1
SF31	Three locks one key	3	1
SF32	Three locks two keys	3	2
SF53	Five locks three keys	5	3

● Drawouttriolocation lock (standard configuration on the drawer seat)

On the drawer seat, there's "connection", "test" and "separation" position status, which is indicated through a indicator.

When the handle is shaking, the circuit breaker will be locked respectively in these three positions, and it can be unlocked only through the reset button (red), as shown in Figure 12.

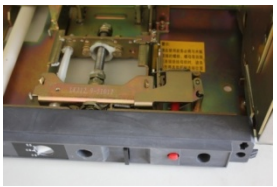


Figure 12

● Door interlock (on the drawer seat)

Installed on the right or the left side of the drawer seat. When the drawout type circuit breaker is in the separation position,it can avoid opening of the cubicle door, as shown in Figure 13.

Figure 13

● Drawout type circuit breaker "separation" position lock (on the drawer seat)

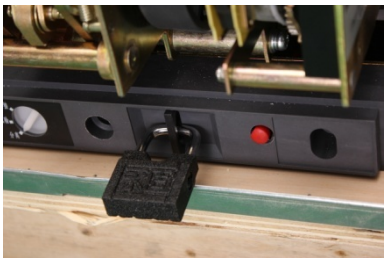


Figure 14

When the drawout type circuit breaker is in the separation position, pull out the black lever below the drawer to lock.

Then the circuit breaker can only pull out the drawer seat, and cannot be shaken to "test" or "connection" position. As shown in Figure 14.

Padlock should be prepared by users, with the specification of 40 mm or less.

Indication contact

● Auxiliary switch (Figure 15)

Figure 15

■ Conventional thermal current of the auxiliary switch is 6 A;

■ Auxiliary contact form: Four groups switch, six groups switch, four normally opened and four normally closed,five normally opened and five normally closed, six normally opened and six normally closed. See Table 10.

Table 10

Applicable shell frame	Auxiliary contact form
NDW2-1600	Four groups switch, six groups switch
NDW2-4000	Four groups switch, six groups switch, Four normally opened and four normally closed
NDW2-2000/3200/6300	Four normally opened and four normally closed, five normally opened and five normally closed, six normally opened and six normally closed.

● Closing ready signal output device

Closing ready signal output device of the circuit breaker is the output signal device that reflects the operating mechanism to achieve closed state. It can output signals if it meets the following mechanical state, as shown in Figure 16:

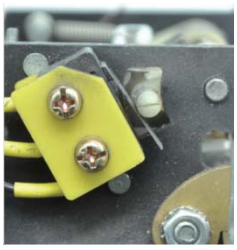


Figure 16

■ Circuit breaker off state;

■ Energy store in place;

■ No disconnection instruction;

■ Undervoltage tripper closing in place;

■ Controller fault tripping reset.

Remote operation

● Closed electromagnet (see Figure 17) (standard configuration)

Figure 17

■ Closed electromagnet action features.

a. When the power supply voltage of the closed electromagnet maintains at 85%~110% of the rated control supply voltage Us, operation of the closed electromagnet can make reliable closing of the circuit breaker;

b. Closed electromagnet is short-time duty-type.

■ Closed electromagnet is mainly composed of coil, iron core component and electronic parts. In the condition of energy storage, as long as the electromagnet is energized, the circuit breaker can be closed. Instantaneous power is shown in Table 11.

Table 11

Rated insulation voltage (Ui)	Rated control supply voltage (Us)	Instantaneous power	
		1600 Shell	2000,3200,6300 Shell
400V	AC380V/AC400V 50/60Hz	380VA	620VA
	AC220V/AC230V 50/60Hz	330VA	500VA
	DC220V	330W	500W
	DC110V	270W	400W
	DC24V	190W	145W

● Shunt tripper (see Figure 18) (standard configuration)

■ Shunt tripper action features

1) When the power supply voltage of the shunt tripper maintains at 70%~110% of the rated control supply voltage, operation of the shunt tripper can make the circuit breaker disconnect;

2) Shunt tripper is short-time duty-type.

Figure 18

■ Shunt tripper is mainly composed of coil, iron core component and electronic parts, and can disconnect the circuit breaker by remote operation.

Instantaneous power is shown in Table 12.

Table 12

Rated insulation voltage (Ui)	Rated control supply voltage (Us)	Instantaneous power	
		1600 Shell	2000,3200,6300 Shell
400V	AC380V/AC400V 50/60Hz	380VA	620VA
	AC220V/AC230V 50/60Hz	330VA	500VA
	DC220V	330W	500W
	DC110V	270W	400W
	DC24V	190W	145W

● Motor operating mechanism (see Figure 19) (standard configuration)

■ The electric storage of energy of the circuit breaker can be completed by the motor operating mechanism.

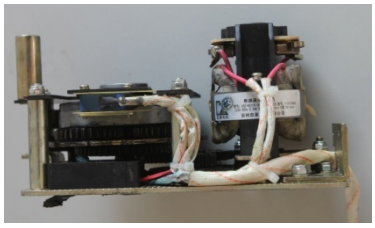


Figure 19

■ Operational characteristic

If the rated supply voltage of the motor operating mechanism is between 85%~110%, energy storage of the circuit breaker can be made in place.

Operating power is shown in Table 13.

Table 13

Rated insulation voltage (Ui)	Energy storage time	Rated control supply voltage (Us)	Operating power	
			1600 Shell	2000,3200,6300 Shell
400V	3s～5s	AC220V/AC230V AC380V/AC400V (50/60Hz)	90VA	110VA
		DC220V/DC110V	90W	110W
		DC24V	90W	/

● Undervoltage tripper (see Figure 20)

■ Undervoltage tripper action features

1) When the applied voltage drops, even slowly drops to 70%~35% of the rated operational voltage, undervoltage tripper will work to disconnect the circuit breaker;

2) When the applied voltage is less than 35% of the rated operational voltage of the undervoltage tripper, undervoltage tripper will make the circuit breaker cannot be closed;

2) When the applied voltage applies 85%~110% of the rated operational voltage of the undervoltage tripper, the undervoltage tripper can guarantee the reliable closing of the circuit breaker.

■ Undervoltage tripper is mainly composed of coil, iron core component and electronic parts.

- Undervoltage instantaneous tripper

- Undervoltage delayed tripper

■ Undervoltage delayed tripper

Figure 20

Undervoltage delayed tripper realizes the adjustment of delay operation through toggling the toggle switch on the undervoltage delayed device. The delay time is set as 1 s, 3 s, 5 s, and the factory default is 1 s.

Operating power is shown in Table 14.

Table 14

Rated insulation voltage (Ui)	Frequency (f)	Rated operational voltage (Ue)	Operating power	
			1600 Shell	2000,3200,6300 Shell
400V	50/60Hz	AC380V(AC400V)	0.8W	5.2W
		AC220V(AC230V)	0.8W	3.9W
		DC220V	0.8W	3.9W
		DC110V	0.8W	3.9W
		DC24V	1.2W	3.5W

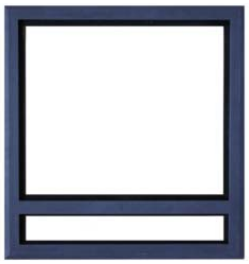
Counter

Counter is used to record the number of the "close-open" operation of the circuit breaker. As shown in Figure 21.

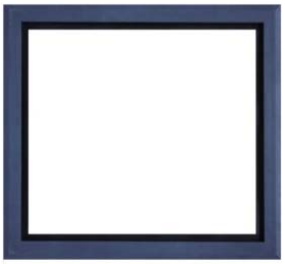
Figure 21

Doorframe

Divided into fixed type and drawout type, it is mainly placed on the door of the cubicle for sealing effect, and can make the protection level of the circuit breaker reaches IP40. It is beautiful and practical. As shown in Figure 22.



Drawout type



Fixed type

Figure 22

Dust cover

Installed on the beam of the wiring terminal, it can prevent dust and other debris falling into the terminal of the wiring terminal, leading to poor contact. It is an optional accessory. As shown in Figure 23.

Figure 23

Phase partition

Divided into fixed type and drawout type, it is installed in the groove between all the phase bus bars, used to increase the insulation strength between phase to phase of the main circuit and improve the insulation performance. It is an optional accessory. As shown in Figure 24.

Figure 24

Power supply conversion system

● Mechanical interlocking introduction

■ Mechanical interlocking mechanism can be used for interlockcing of the drawout circuit breaker and the fixed circuit breaker. See Figure 25;

■ Interlocking mechanism shall be installed by users. first, demount the nut for connecting the rear part of the interlocking device with four combination screws; then, fix the interlocking mechanism on the right-side plate of the circuit breaker with four combination screws;

■ Interlocking pattern selection is shown in Table 15:

Figure 25

Table 15

Selection mode	Code	Specification	Number of circuit breakers
1	SR11	Two sets of cables, one for close and one for open	2
2	SR12	Three sets of cables, one for close and two for open	3
3	SR21	Three sets of cables, two for close and one for open	3
4	SY11	Two sets of hard rods, one for close and one for open	2
5	SY12	Three sets of hard rods, one for close and two for open	3

■ Circuit breaker can be applicable to the following power supply state interlocking

◆Two circuit breakers (one for close and one for open)

Usage mode is shown in Figure 26, while interlocking action state is shown in Table 16.

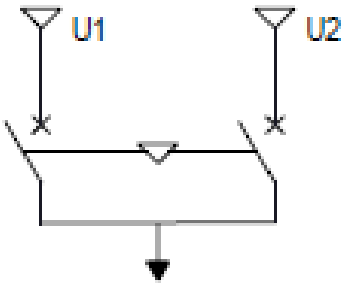


Figure 26

Table 16

U1	U2
Close	Open
Open	Close
Open	Open

◆Three circuit breakers (one for close and two for open)

Usage mode is shown in Figure 27, while interlocking action state is shown in Table 17.

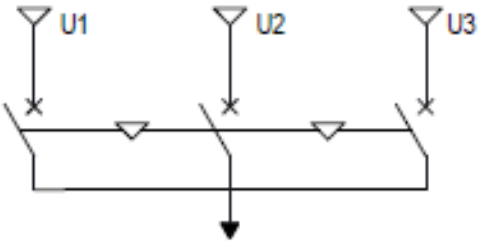


Figure 27

Table 17

U1	U2	U3
Close	Open	Open
Open	Close	Open
Open	Open	Close
Open	Open	Open

◆Three circuit breakers (two for close and one for open)

Usage mode is shown in Figure 28, while interlocking action state is shown in Table 18.

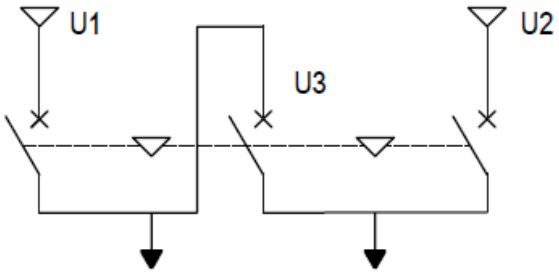


Figure 28

Table 18

U1	U2	U3
Open	Open	Open
Close	Close	Open
Close	Open	Close
Open	Close	Close

◆Two interlocking cables (one for close and one for open)

The installation schematic diagram is shown in Figure 29:

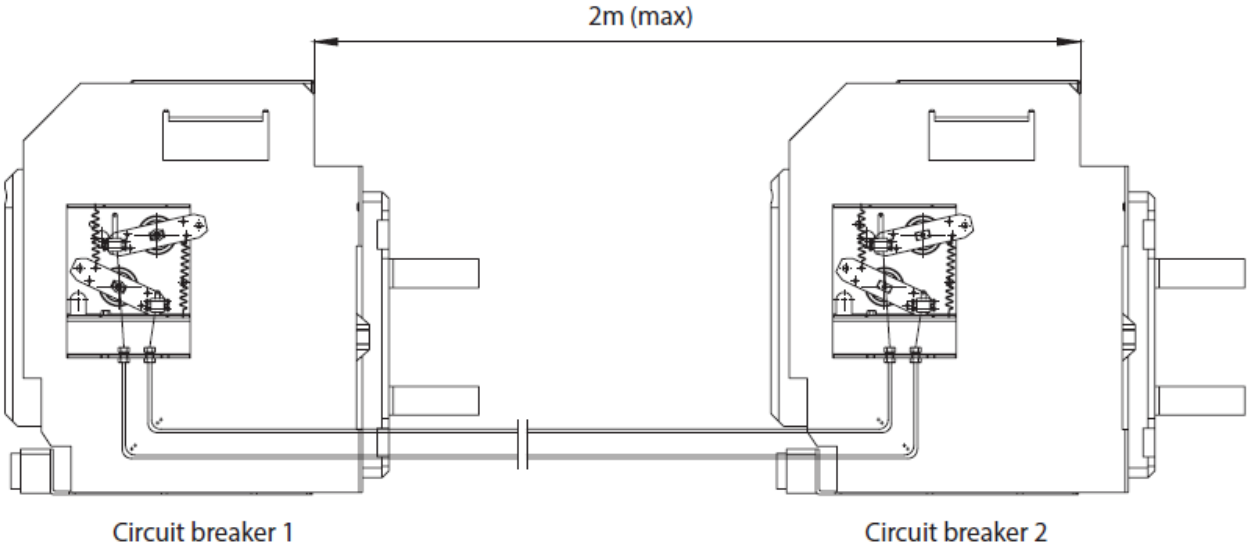


Figure 29

The adjustment schematic diagram is shown in Figure 30:

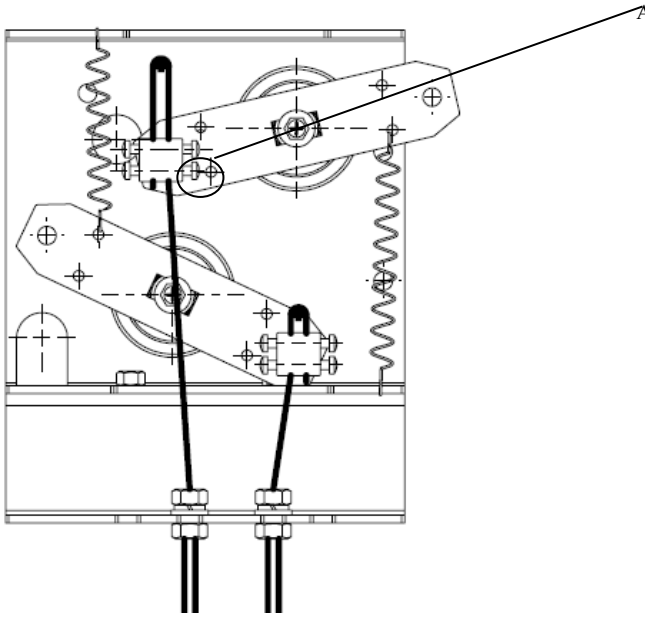


Figure 30

◆Three interlocking cables

The installation schematic diagram is shown in Figure 31:

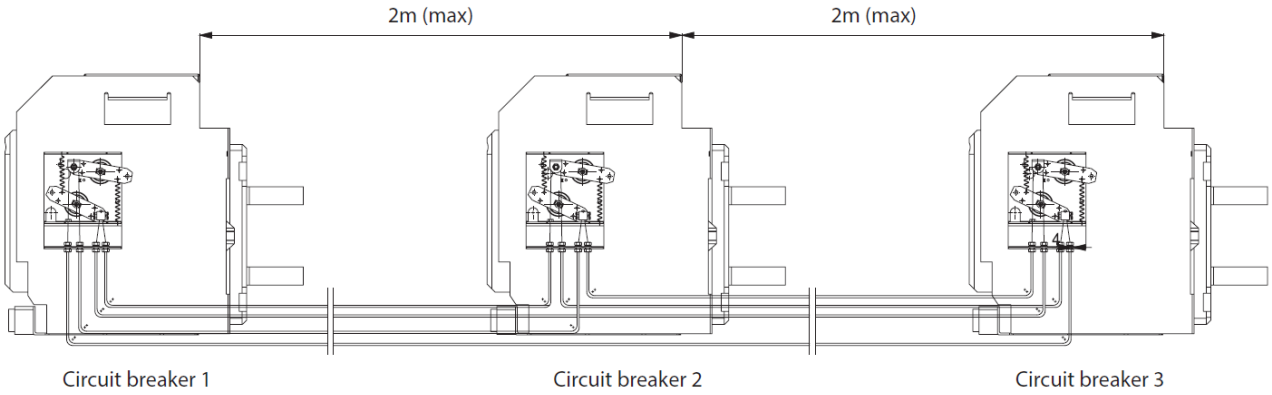


Figure 31

Adjustment schematic diagram:

One for close and two for open, as shown in Figure 32:

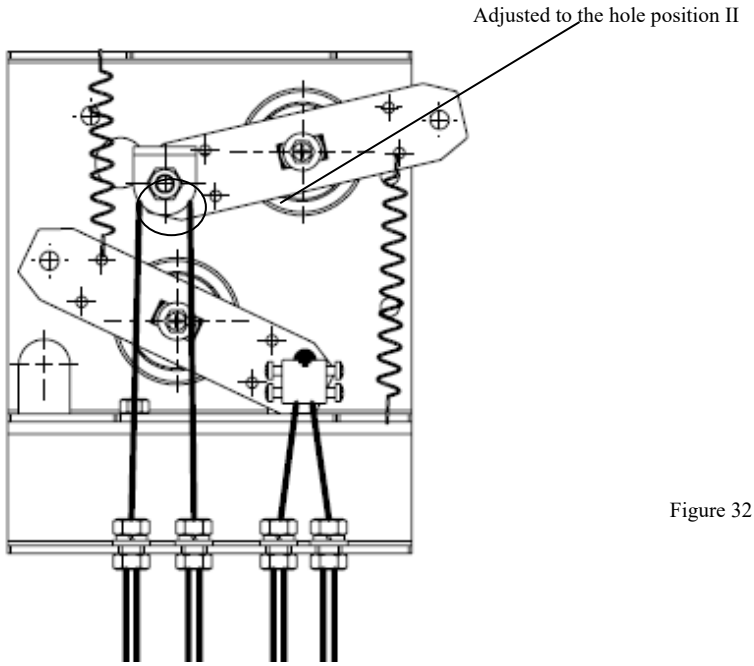


Figure 32

Two for close and one for open, as shown in Figure 33:

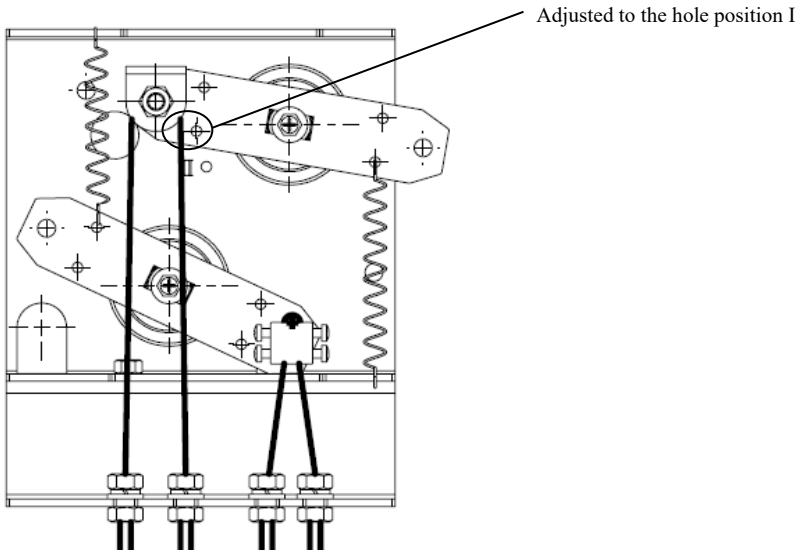


Figure 33

◆Two interlocking hard rods (one for close and one for open)

The installation schematic diagram is shown in Figure 34:

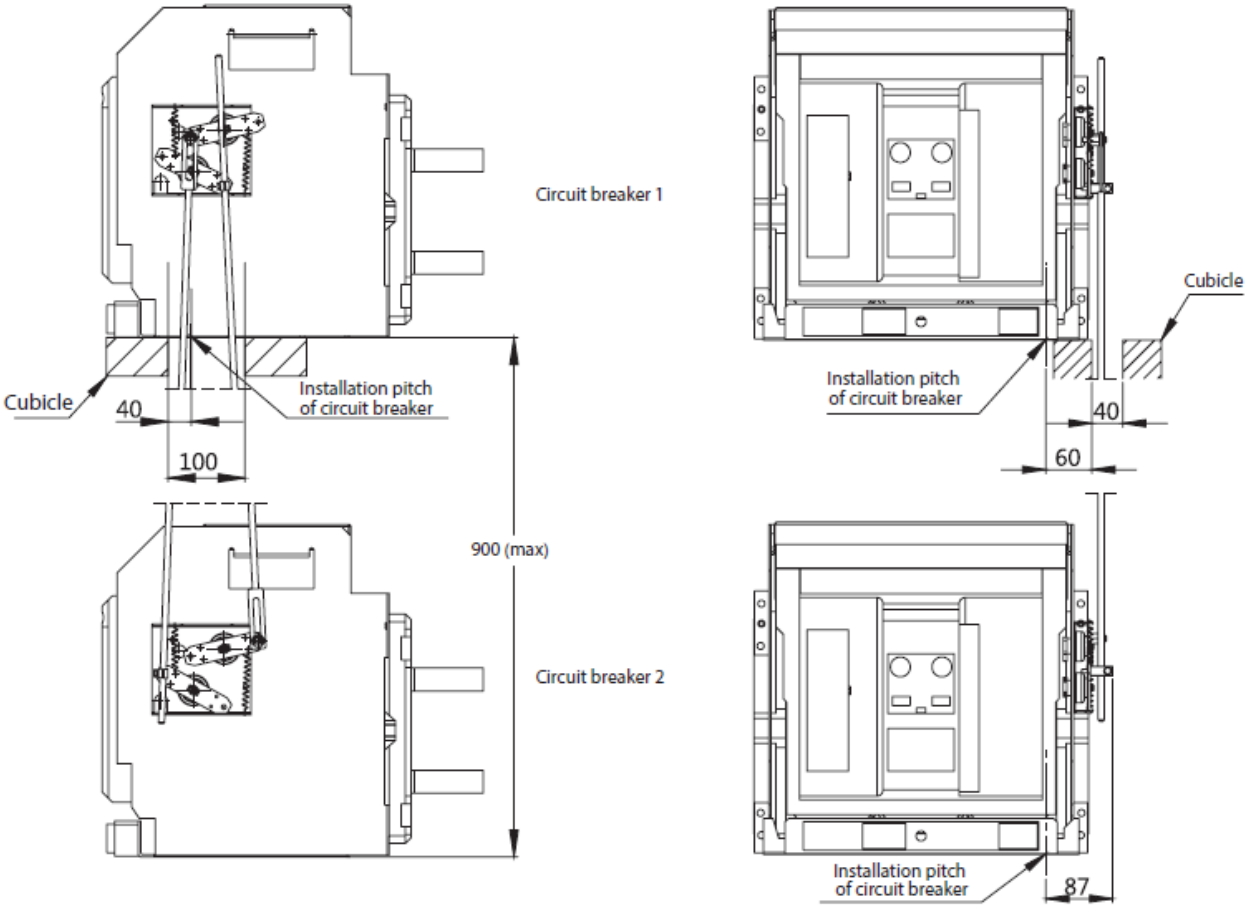


Figure 34

◆Three interlocking hard rods (one for close and two for open)

The installation schematic diagram is shown in Figure 35:

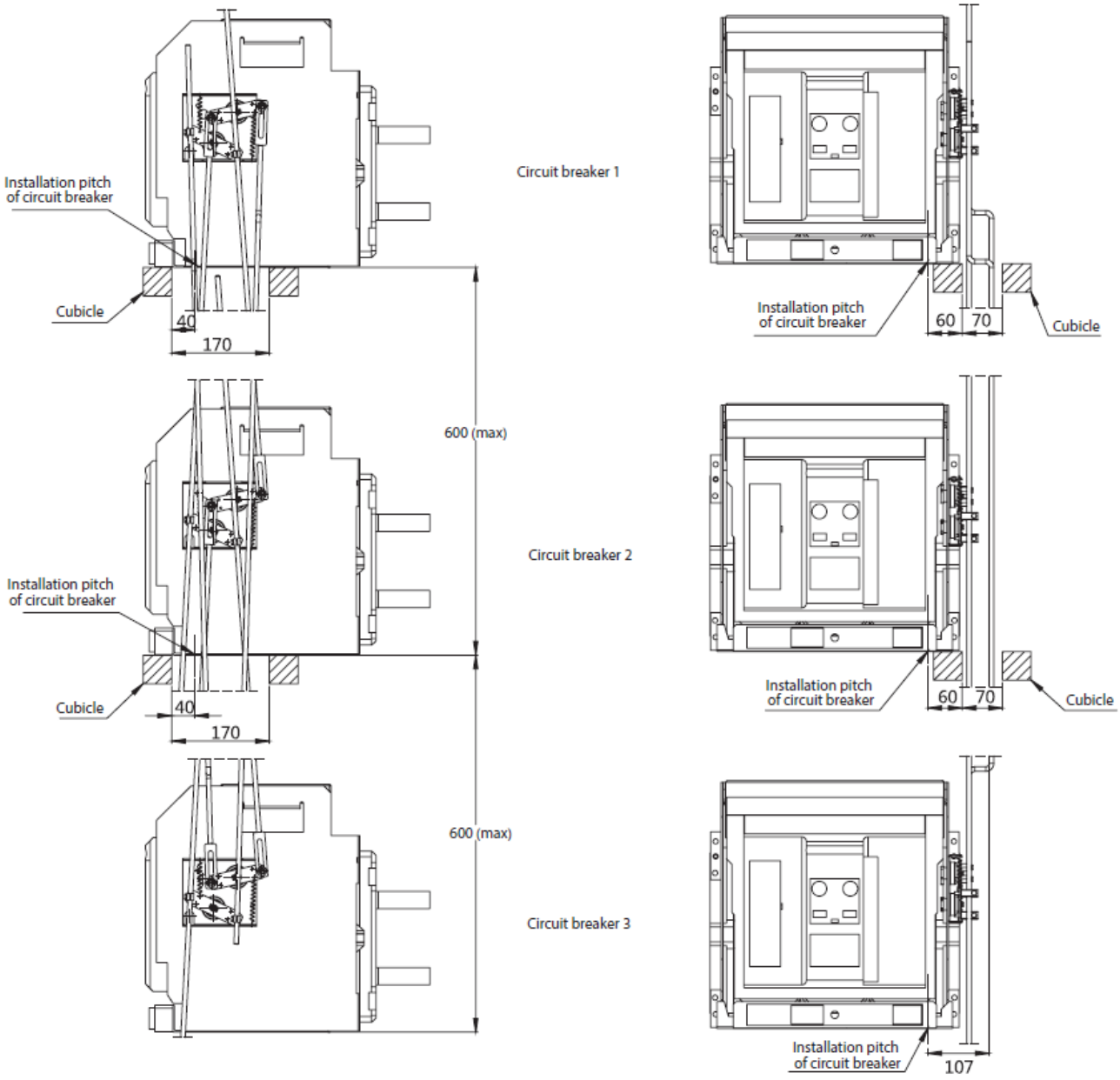


Figure 35

Note: During the process of assembly adjustment, the overlong part of the connecting rod can be appropriately eliminated.

The adjustment schematic diagram is shown in Figure 36:

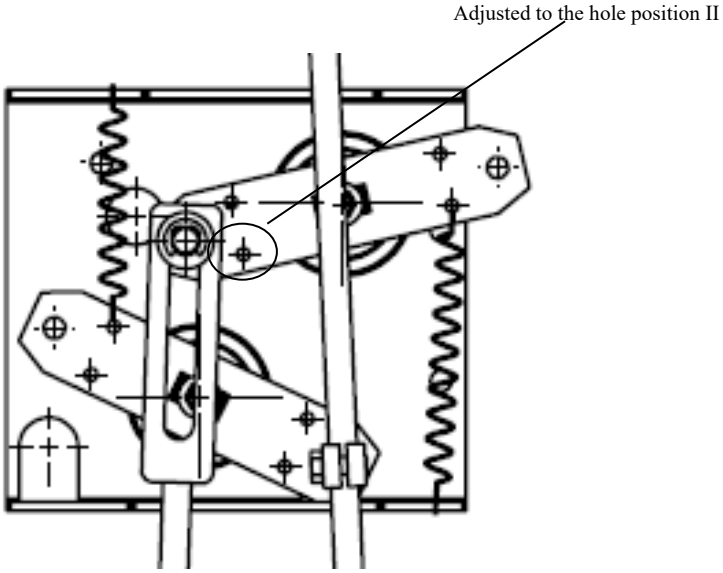


Figure 36

- Power source automatic switching control equipment, as shown in Figure 37.

Figure 37

  - ◆ Four-position switch state
    - Automatic switching;
    - Forced with "common" power supply;
    - Forced with "standby" power supply;
    - Double-open state (both "common" power supply and "standby" power supplies are disconnected).
  - ◆ Automatic operationFigure 49
    - Monitoring the "common" power supply and automatic switching;
    - Generator set start control;
    - Generator set close control;
    - Unloading and restoring the non-priority load;
    - Alarm control in case of abnormity of the "standby" power supply.
  - ◆ Indication state
    - Display the power supply state of the power supply system;
    - Display the closing and opening state of the universal circuit breaker;
    - Display the energy storage state of the universal circuit breaker mechanism;
  - ◆ Functions
    - Closing delay and opening delay can be adjustable by section;
    - Overvoltage and undervoltage protection can be adjustable by section;
    - Mode of the control function is optional (R, S, F);
    - Manual control and automatic control is adjustable.
  - ◆ Selection of power supply
    - Rated control supply voltage Us: 220～240V 50/60Hz;
    - Rated current In: 400A~6300A optional.

- Threshold value
- Undervoltage: 0.35Us≤voltage≤0.7Us;
- Default phase: 0.5Us≤voltage≤0.7Us;
- Voltage return value: 5V±2V.

Note: Due to the power automatic switching control device has overvoltage and undervoltage protection functions, in order to guarantee the consistency and reliability of the system protection, the universal circuit breaker used for power supply automatic switching control device can't install undervoltage tripper, and the power automatic switching control device and the mechanical interlocking (two interlocking) shall be used together.

External transformer

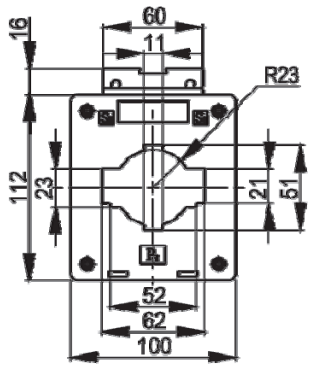
- External N-pole transformer

Three-pole circuit breaker and the external N-pole transformer can form a 3P+N system, which can realize differential type protection (T) or ground current type protection (W) by use the measured data from grounding cable. The specification is shown in table 19, and the detailed dimensions are shown in figure 38. (Pay attention to the direction when using)

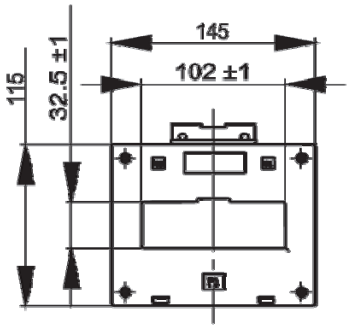
Table 19

Transformer code	Size (mm)	shell frame
N1	62×21	1600
N2	102×32.5	1600、2000
N3	122×52	2000、3200、4000、6300
N4	262×102	3200、4000、6300

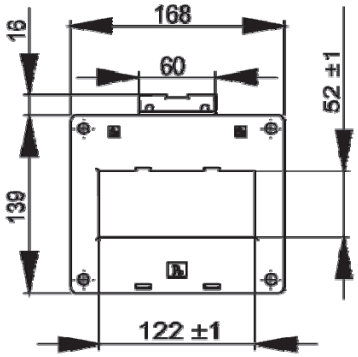
N1 External transformer



N2 External transformer



N3 External transformer



N4 External transformer

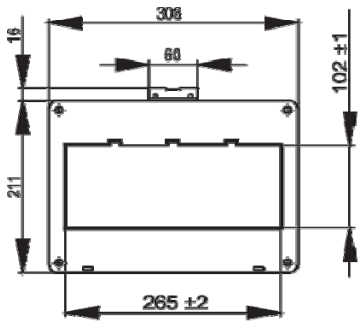


Figure 38

◆ External flexible transformer

When the normal external N-pole transformer is not suitable for the size parameters of the customer, the external flexible transformer can be used to complete the corresponding grounding protection, the specification is shown in table 20, and the detailed dimensions are shown in figure 39.

Table 20

Transformer code	Soft connecting coil circumference	Current range
NR1	280mm	200A-800A
NR2	370mm	1000A-2000A
NR3	450mm	1000A-6300A

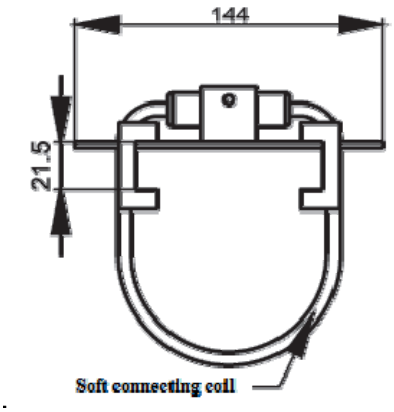


Figure 39

◆ External current leakage transformer

Three-pole circuit breaker or four-pole circuit breaker with external current leakage transformer can realize current leakage protection, detailed dimensions are shown in figure 40. (Pay attention to the direction when using)

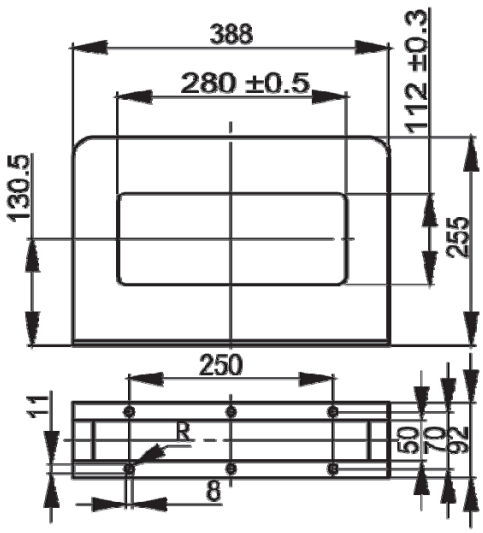


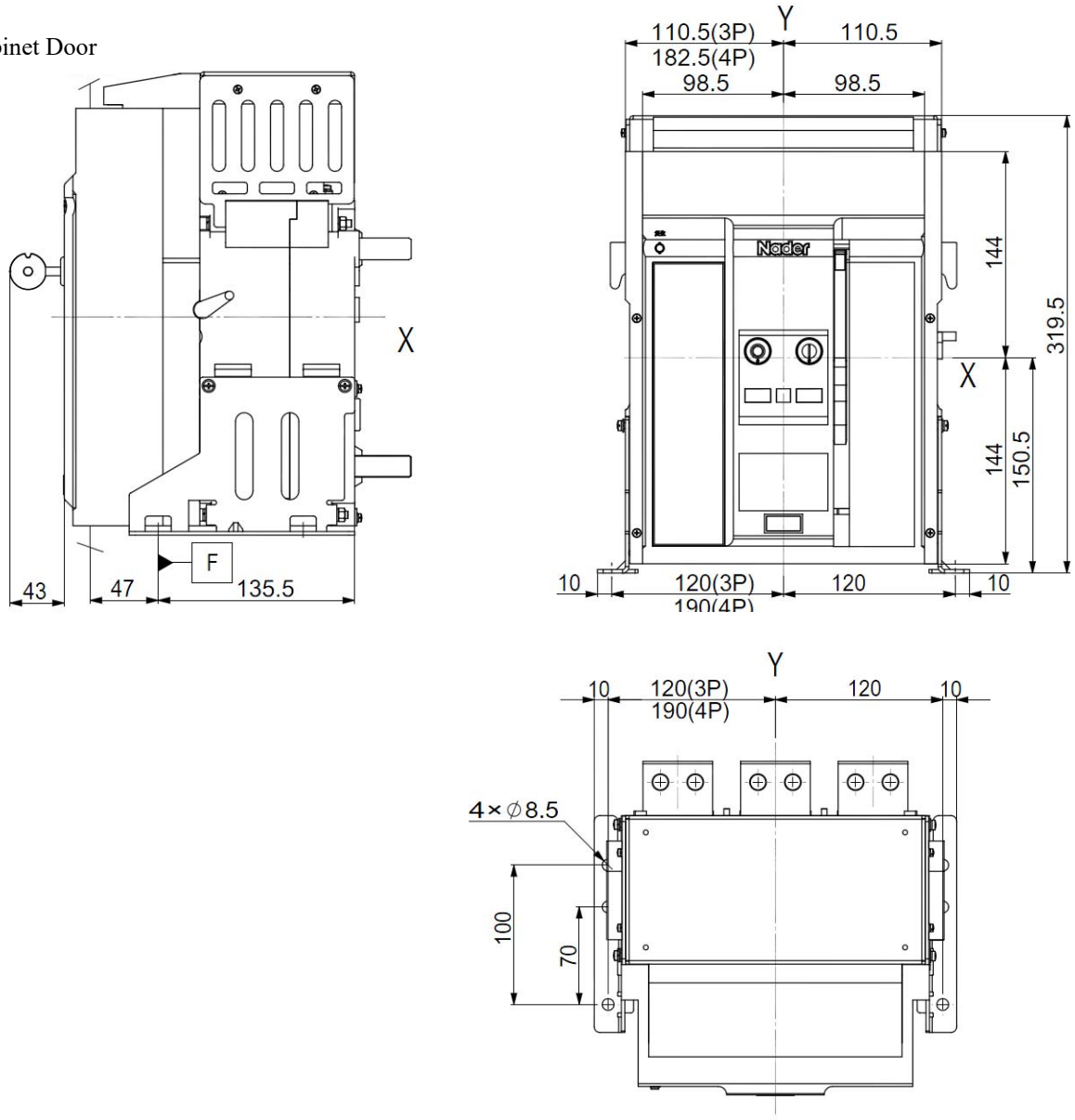
Figure 40

6. Appearance and installation dimension (in mm)

6.1 NDW2-1600

NDW2-1600 fixed type

Cabinet Door

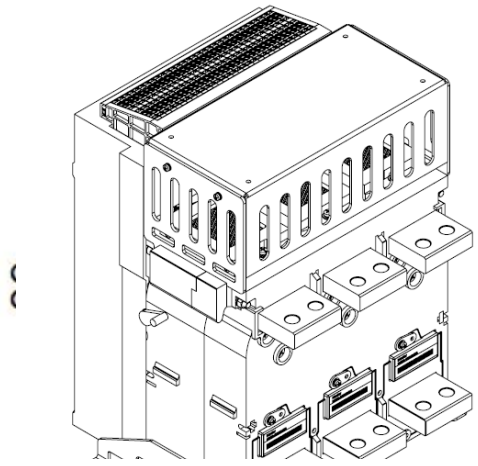


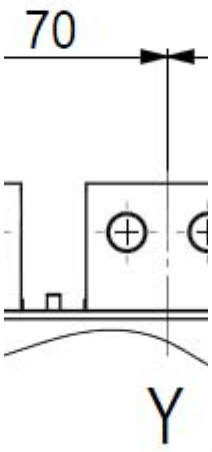
Note: 3-pole breakers X and Y are front cover symmetry axes;

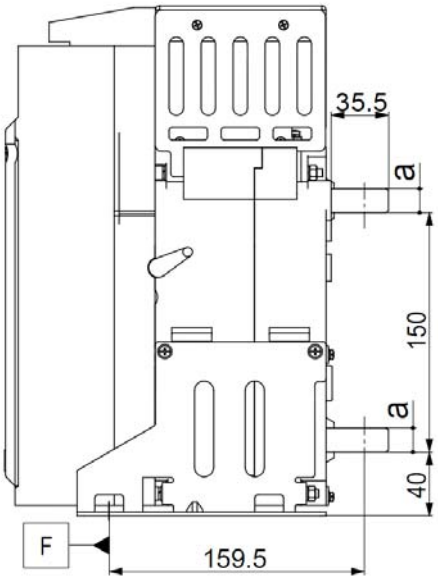
It is recommended to use connecting screws: M10 grade 8.8 with contact washers;

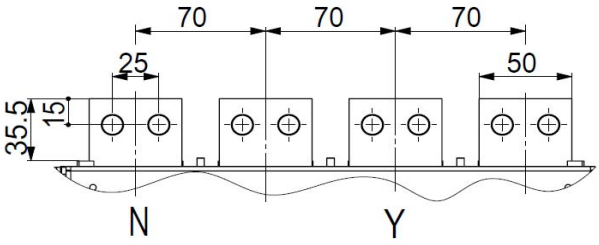
Tightening torque: 45N.m

NDW2-1600 Fixed Type Horizontal Wiring



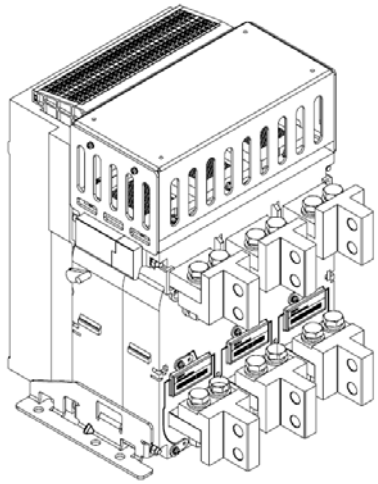


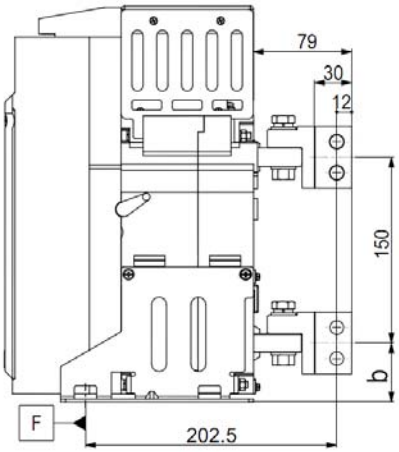


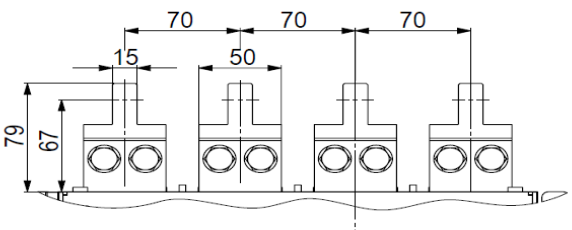


Rated Current	a size(mm)
200A、400A、630A、800A、1000A	10
1250A、1600A	15

NDW2-1600 Fixed Type Vertical Wiring



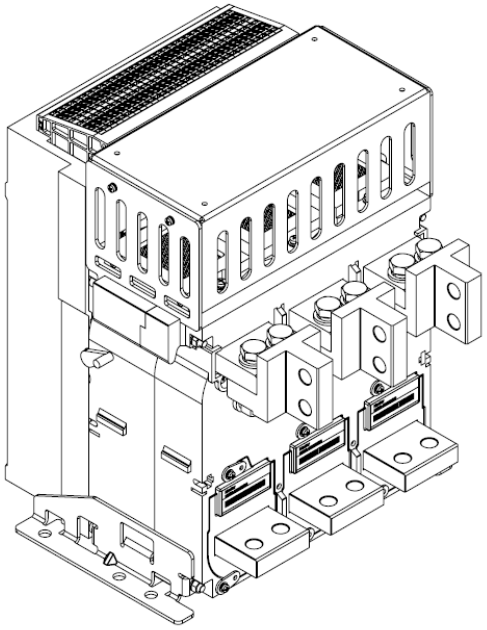


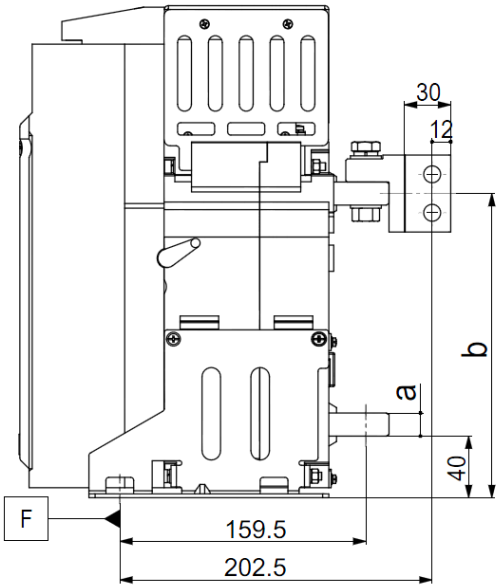


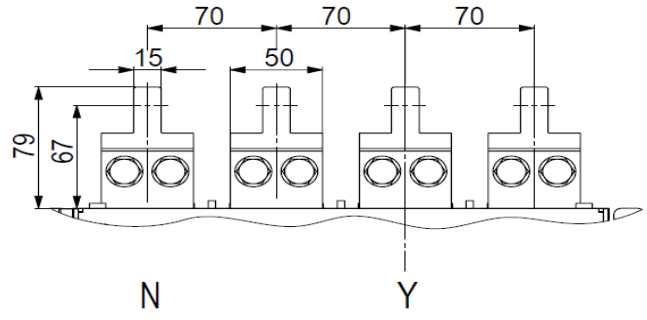
Rated Current	a size(mm)

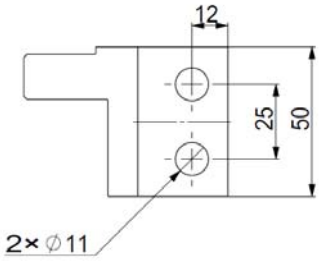
200A、400A、630A、800A、1000A	42.5
1250A、1600A	47.5

NDW2-1600 Fixed Type Hybrid Wiring (upper vertical lower horizontal wiring)

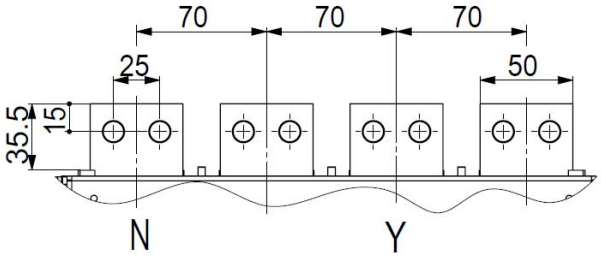








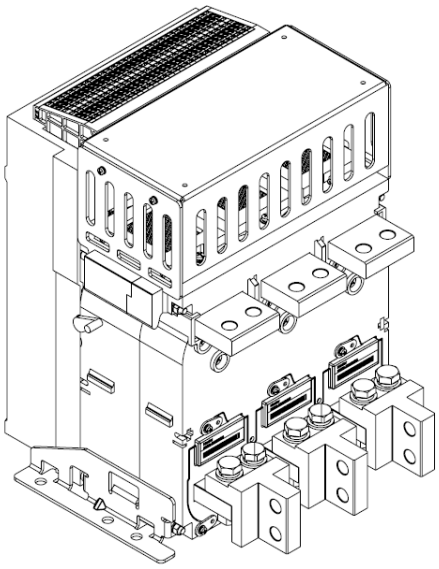
Upper Vertical

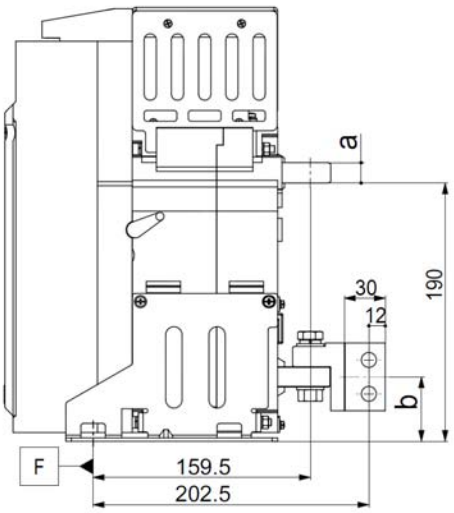


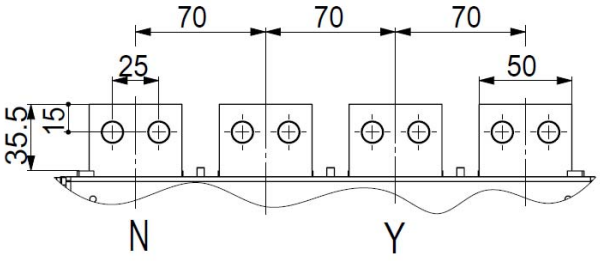
Lower Horizontal

Rated Current	a size(mm)	b size(mm)
200A、400A、630A、800A、1000A	10	192.5
1250A、1600A	15	197.5

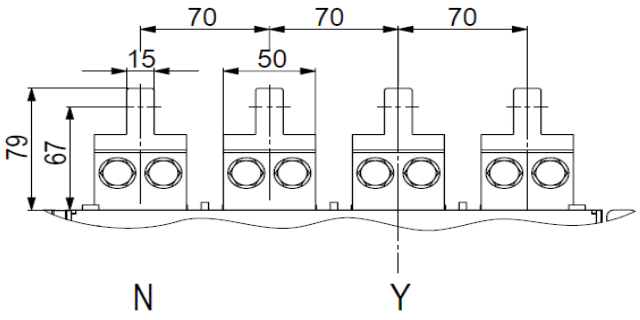
NDW2-1600 Fixed Type Hybrid Wiring (upper horizontal lower vertical wiring)

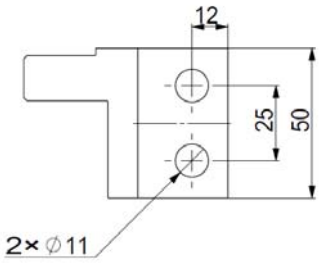






Upper Horizontal

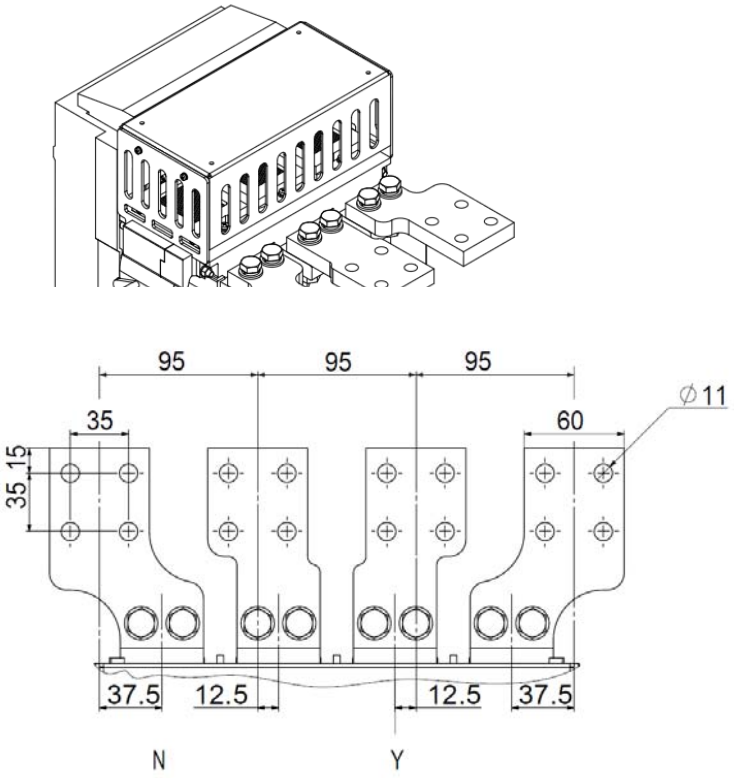




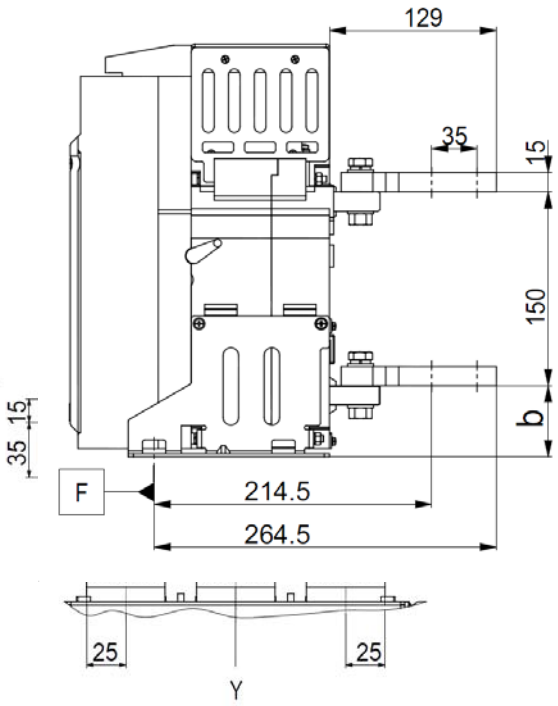
Lower Vertical

Rated Current	a size(mm)	b size(mm)
200A、400A、630A、800A、1000A	10	42.5
1250A、1600A	15	47.5

NDW2-1600 Fixed Type Horizontal Extended Wiring



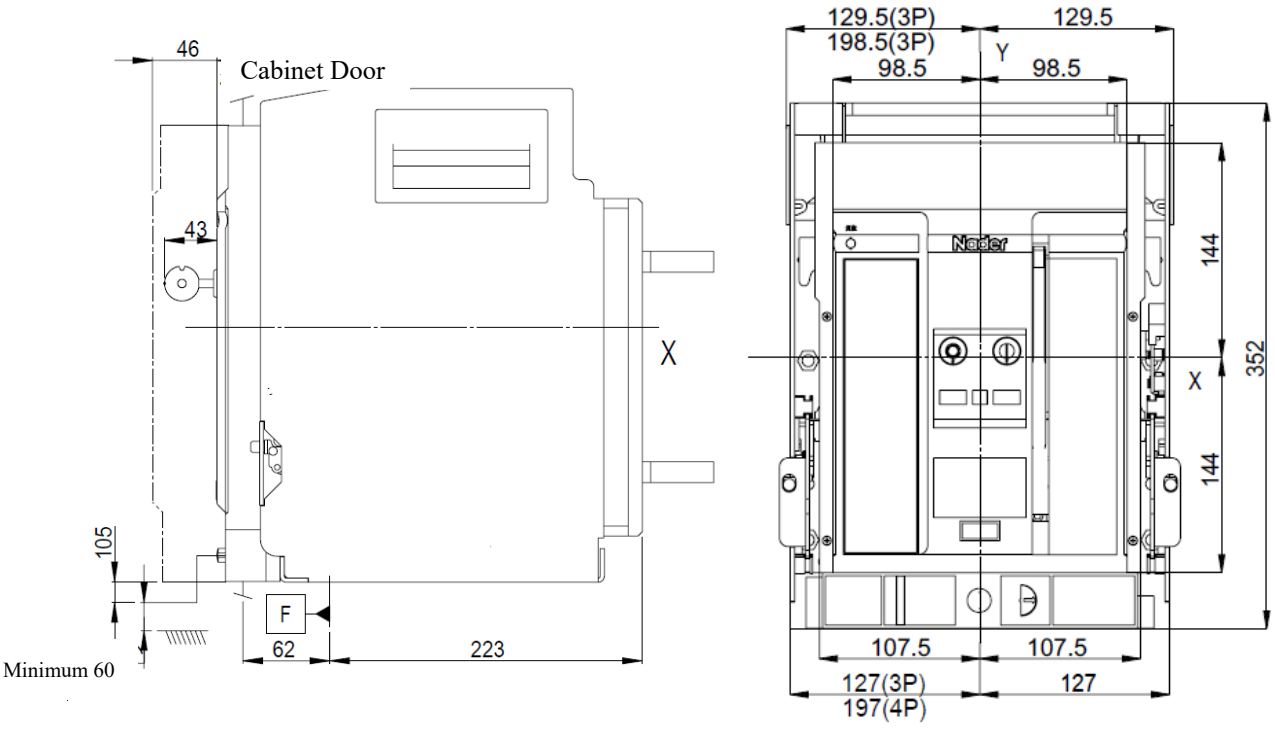
4pole

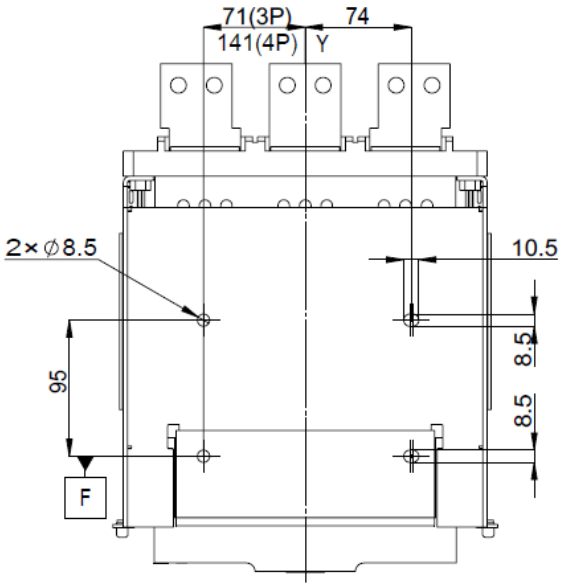


3pole

Rated Current	b size(mm)
200A、400A、630A、800A、1000A	50
1250A、1600A	55

NDW2-1600 Drawer Type



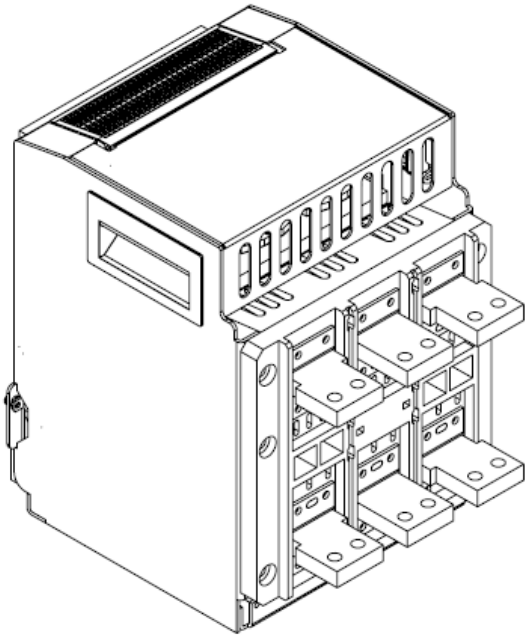


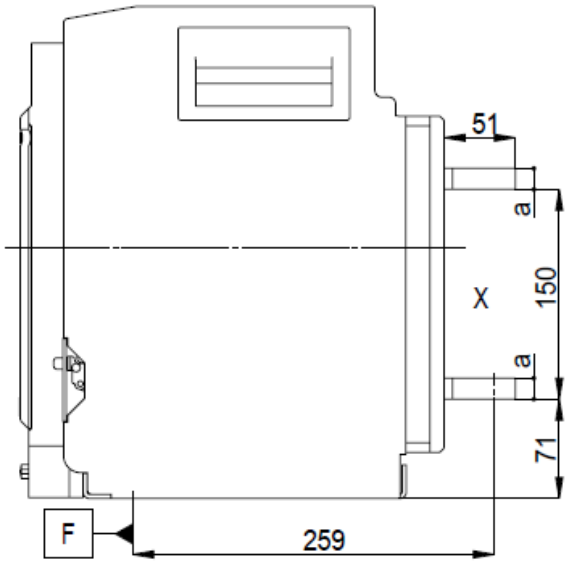
Note: 3-pole breakers X and Y are front cover symmetı

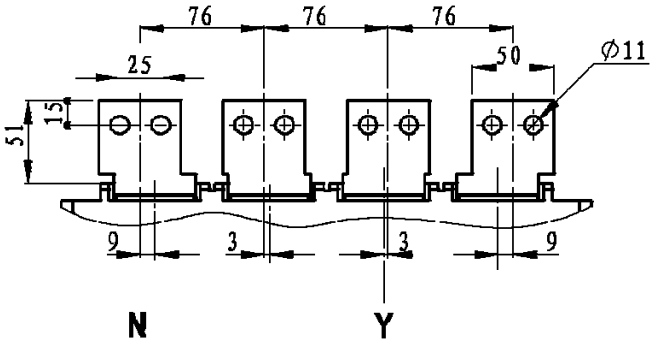
It is recommended to use connecting bolts: M10 gra

Tightening torque: 45N.m

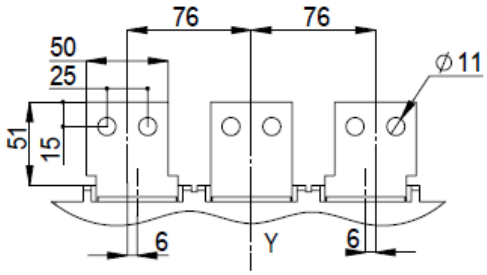
NDW2-1600 Drawer Type Horizontal Wiring







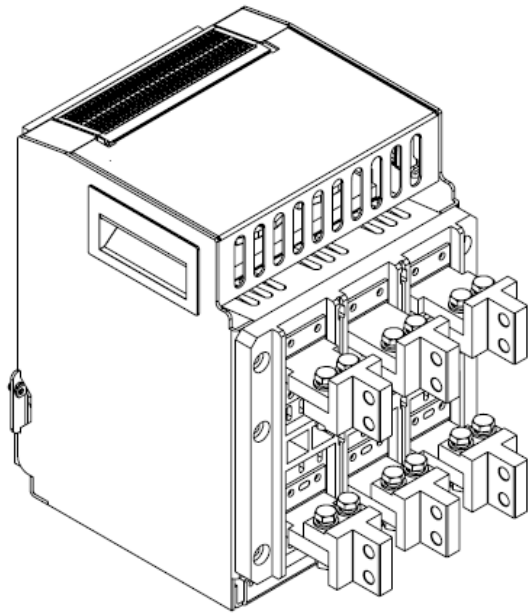
4 poles

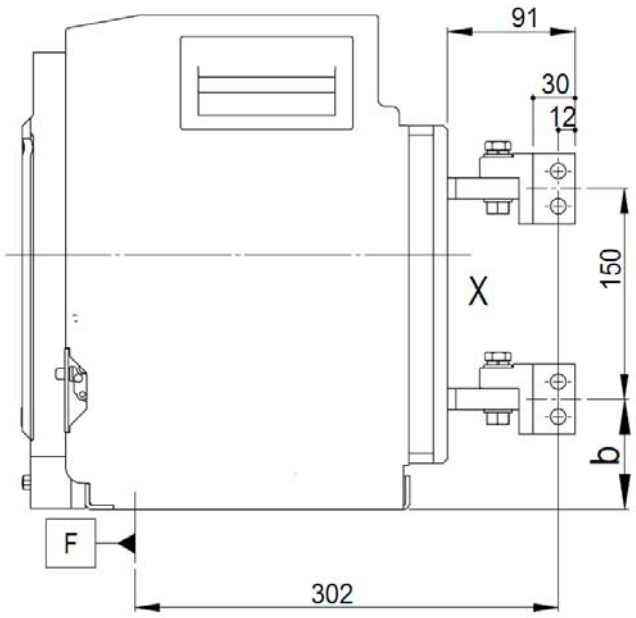


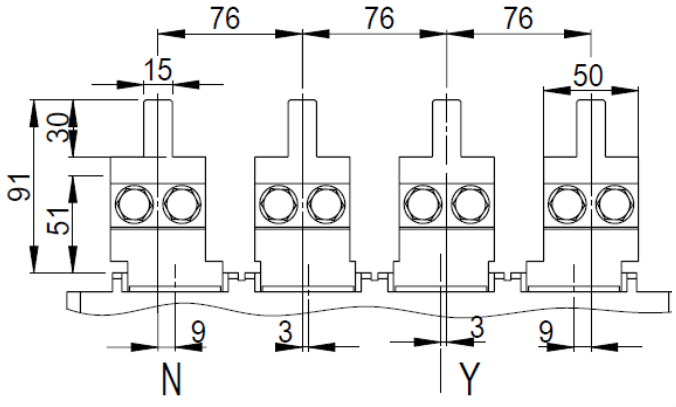
3 poles

Rated Current	a size(mm)
200A、400A、630A、800A、1000A	10
1250A、1600A	15

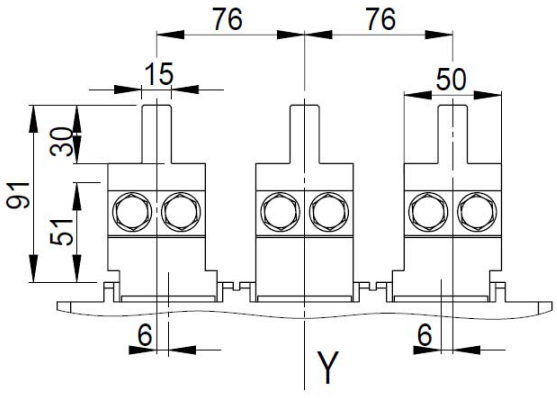
NDW2-1600 Drawer Type Vertical Wiring



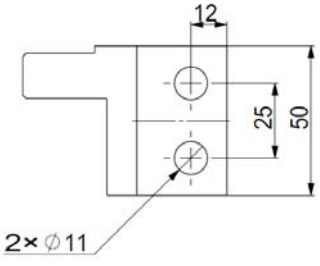




4 poles



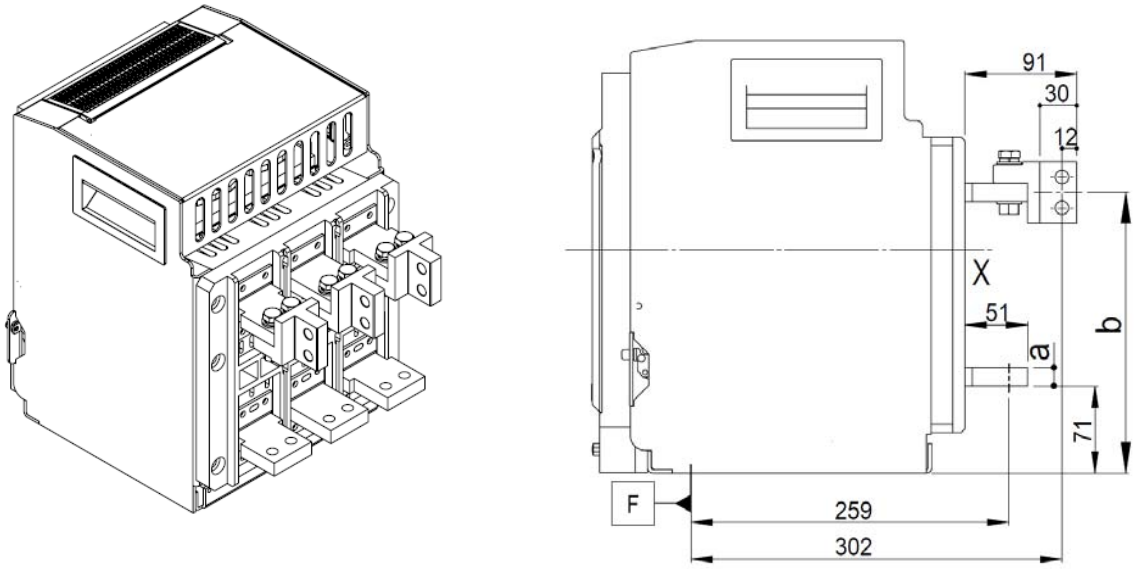
3 poles

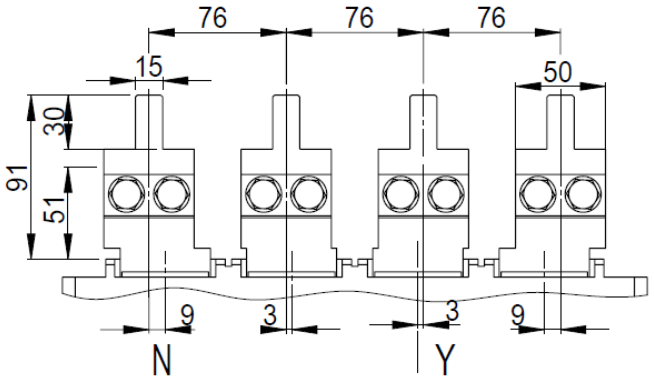


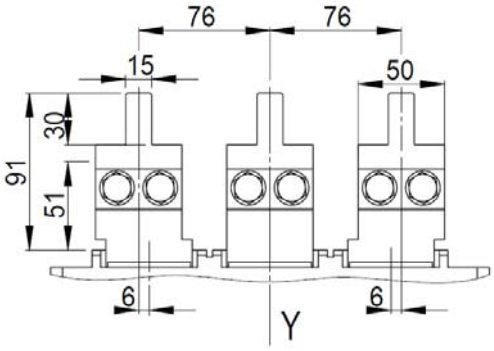
Rated Current	b size(mm)
200A、400A、630A、800A、1000A	73.5

1250A、1600A	78.5

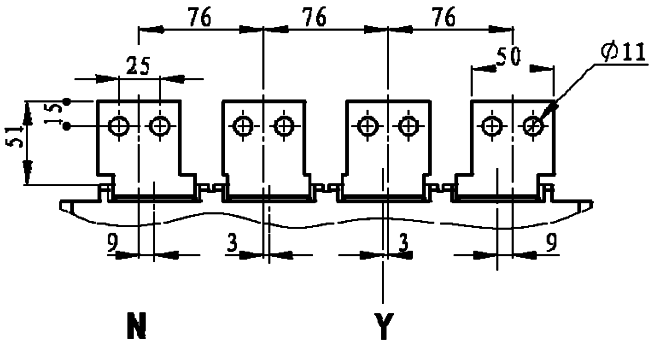
NDW2-1600 Drawer Type Hybrid Wiring (upper vertical lower horizontal wiring)

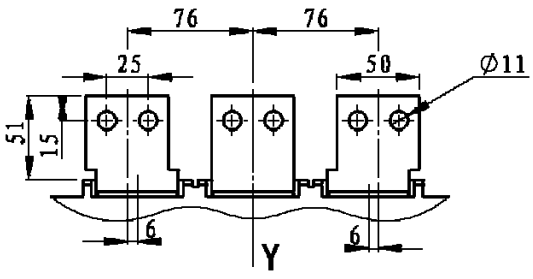






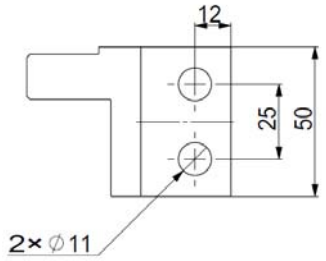
Upper Vertical





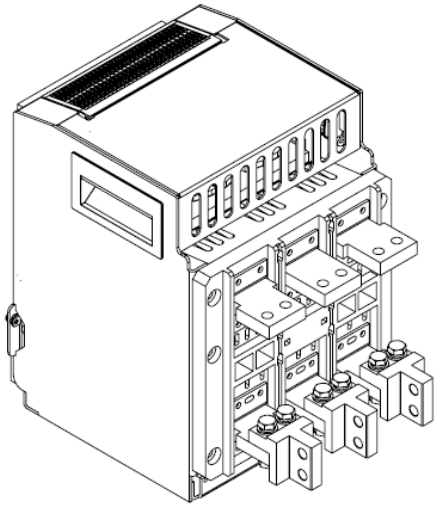
Lower Horizontal

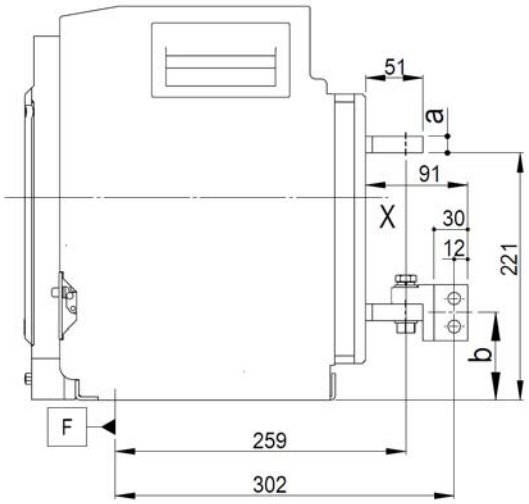
3 poles

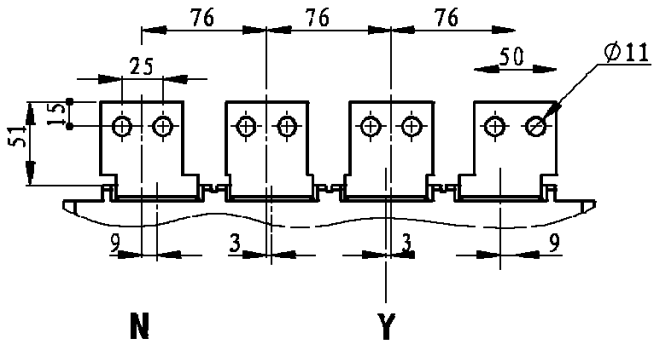


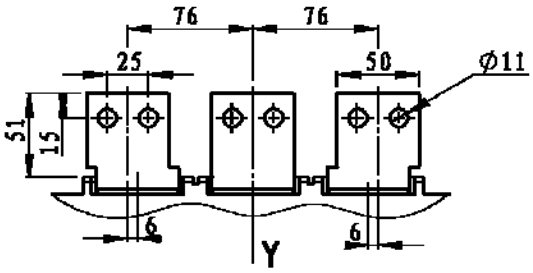
Rated Current	a size(mm)	b size(mm)
200A、400A、630A、800A、1000A	10	223.5
1250A、1600A	15	228.5

NDW2-1600 Drawer Type Hybrid Wiring (upper vertical lower horizontal wiring)

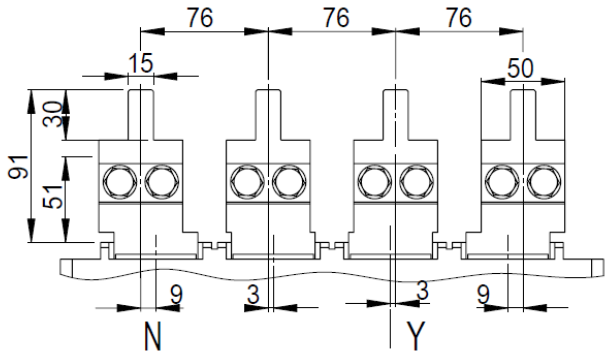


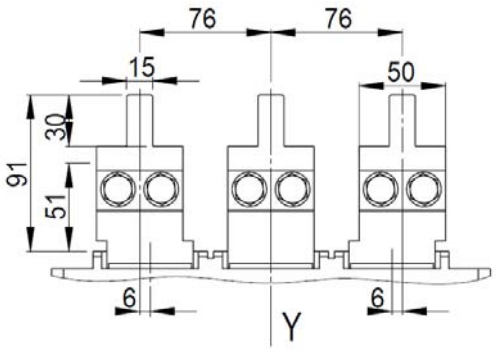






Upper Horizontal

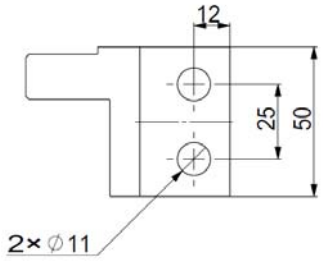




Lower Vertical

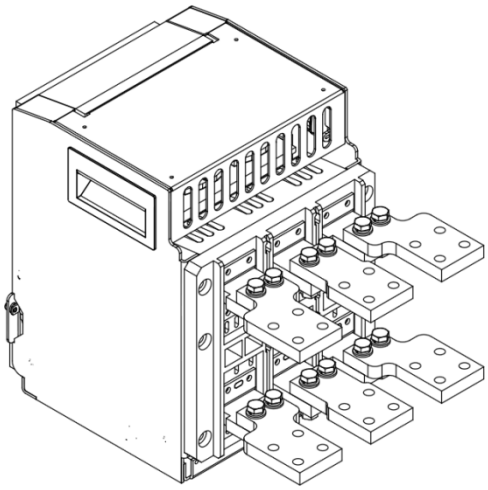
4 poles

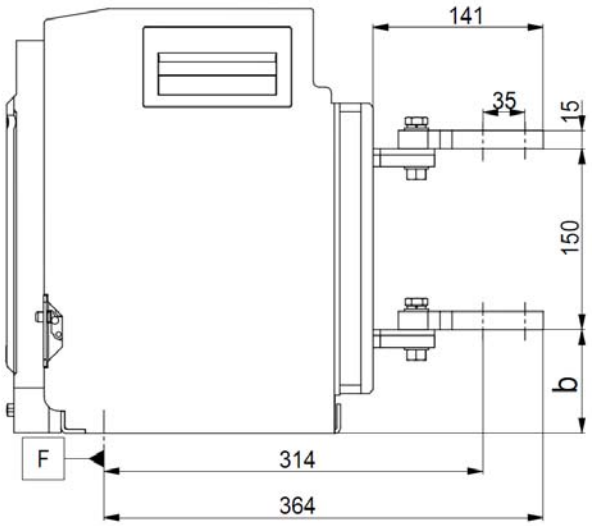
3 poles

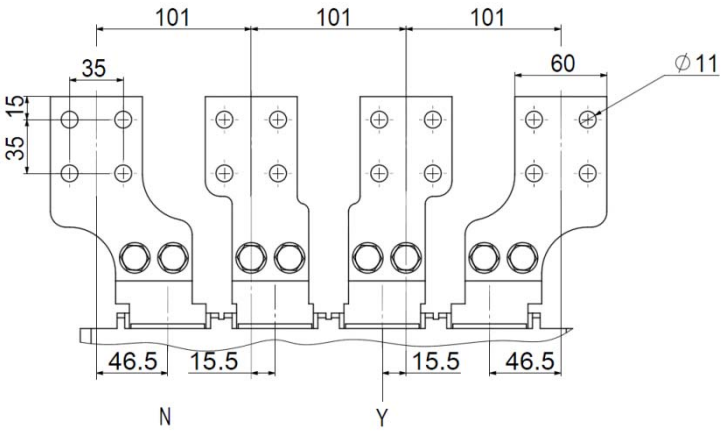


Rated Current	a size(mm)	b size(mm)
200A、400A、630A、800A、1000A	10	73.5
1250A、1600A	15	78.5

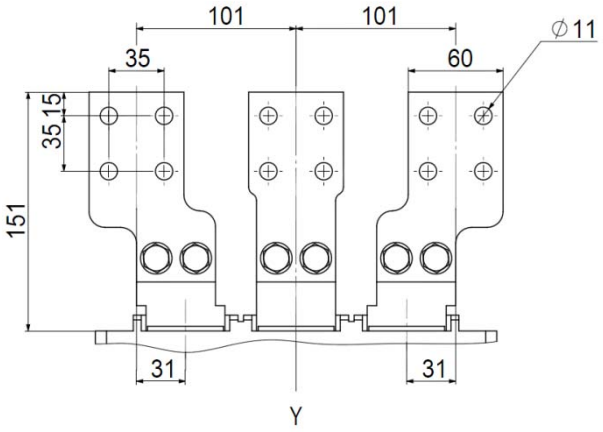
NDW2-1600 Drawer Type Horizontal Extended Wiring







4 poles



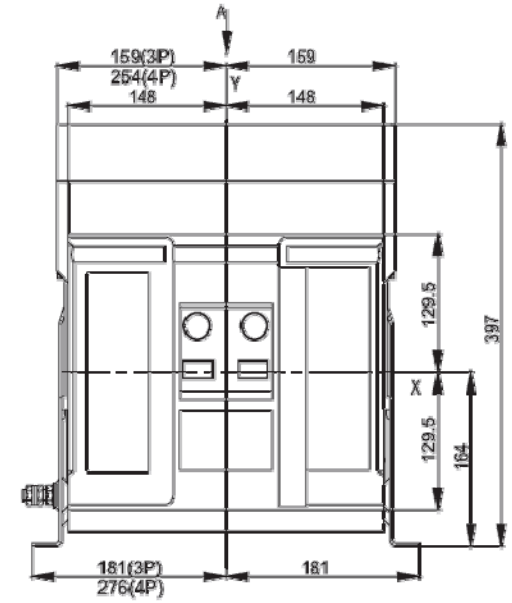
3 poles

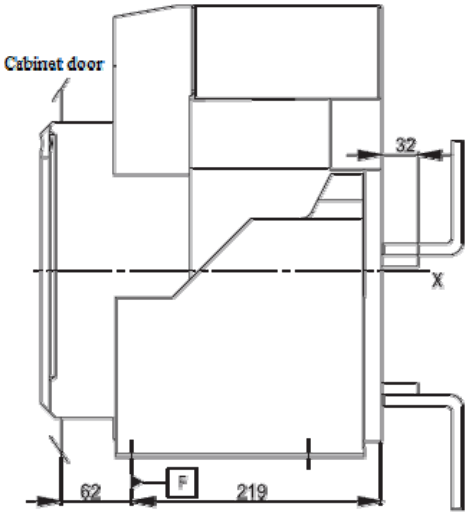
Rated Current	b size(mm)

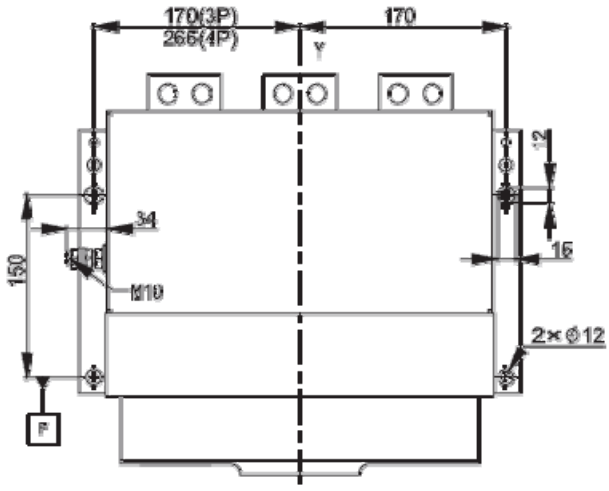
200A、400A、630A、800A、1000A	83.5
1250A、1600A	86

6.2 NDW2-2000

NDW2-2000 fixed type

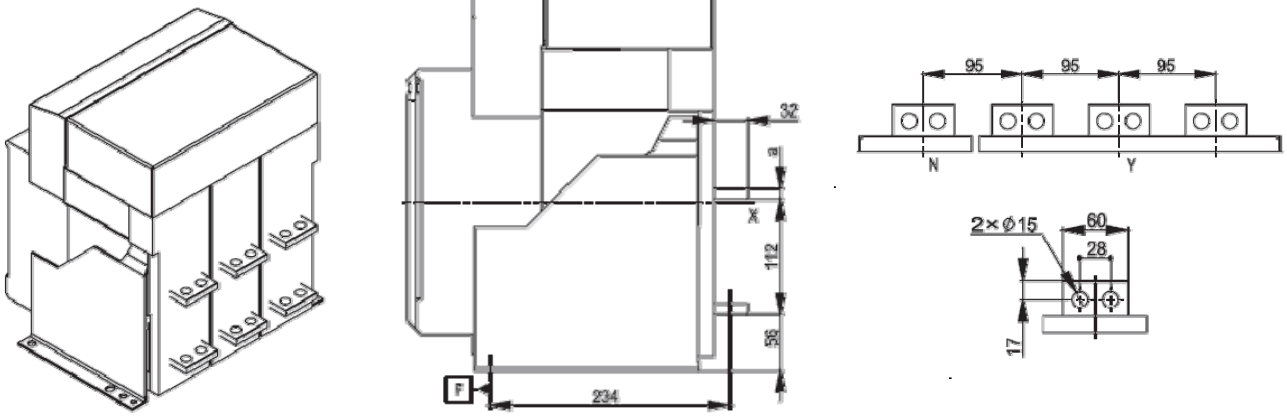




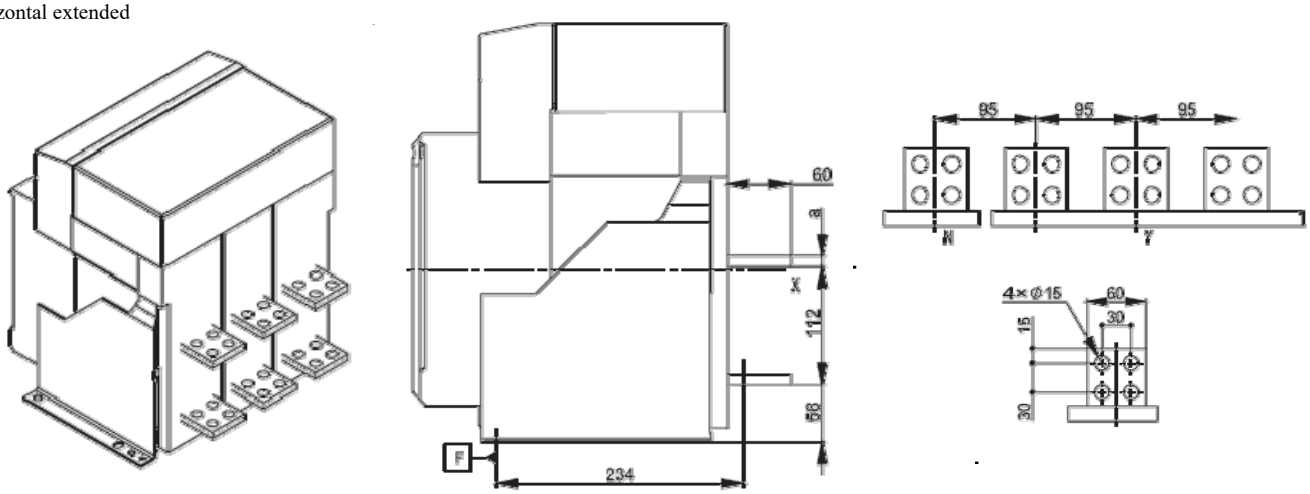


NDW2-2000 fixed type wiring

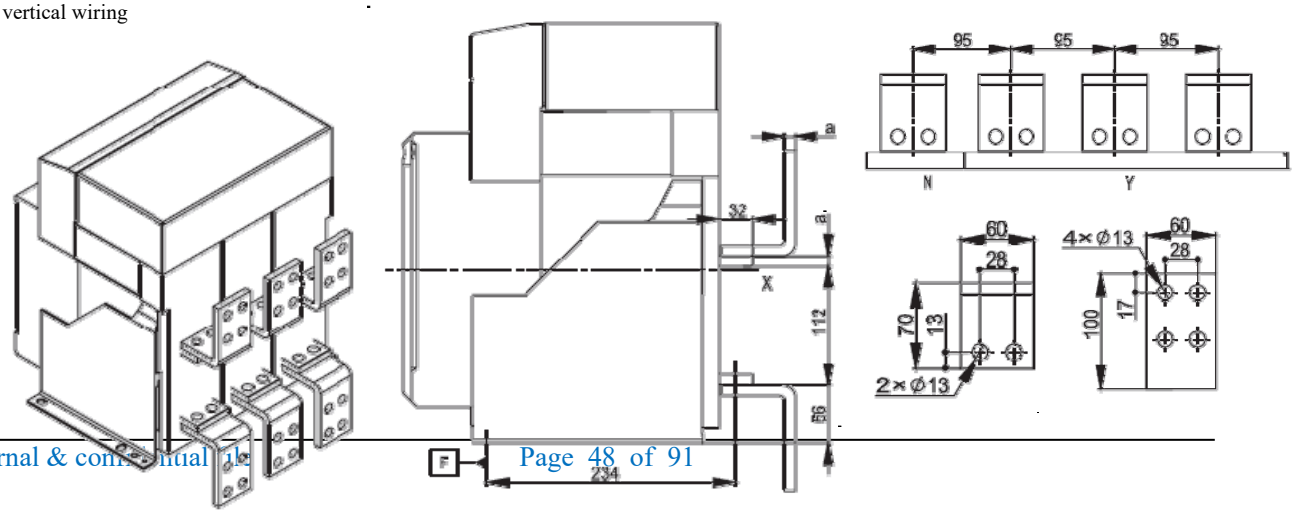
Horizontal wiring



Horizontal extended



L-type vertical wiring



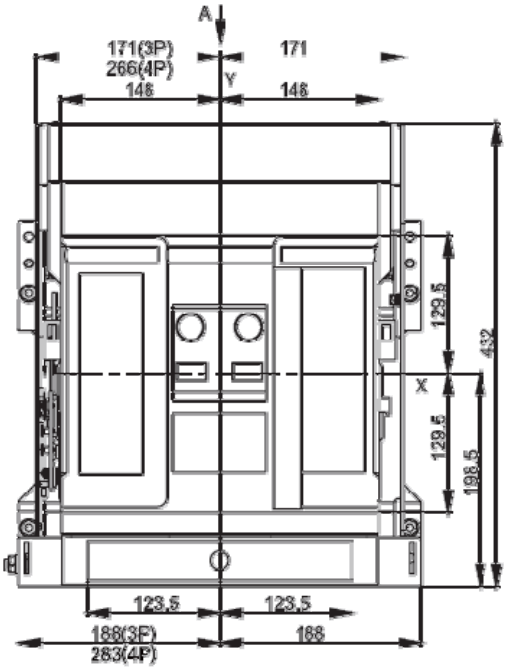
Note: For the 3-pole circuit breaker, X and Y are the symmetric axes of the front cover;

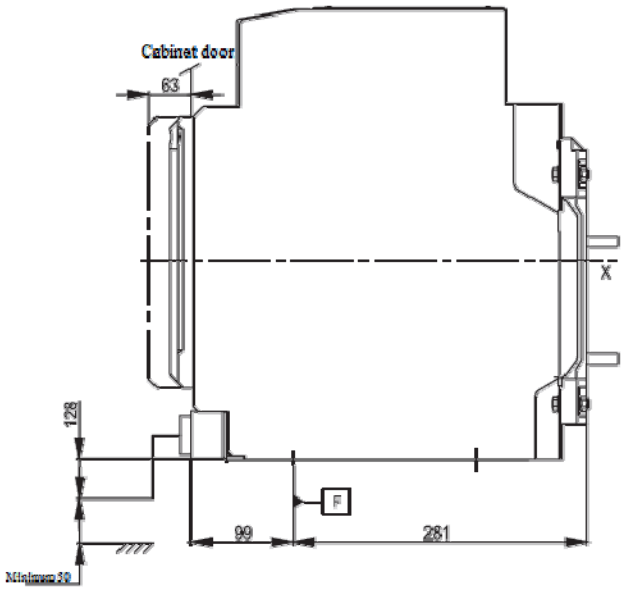
It is recommended to use coupling screw: M12 level 8.8, with contact washer;

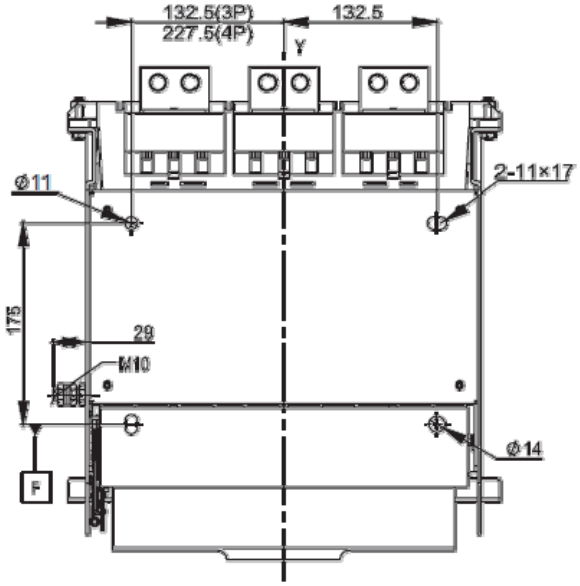
Tightening torque: 60N.m.

Rated current	Busbar “a” size (mm)
400A、630A、800A	10
1000A、1250A、1600A	15
2000A	20

NDW2-2000 drawout type

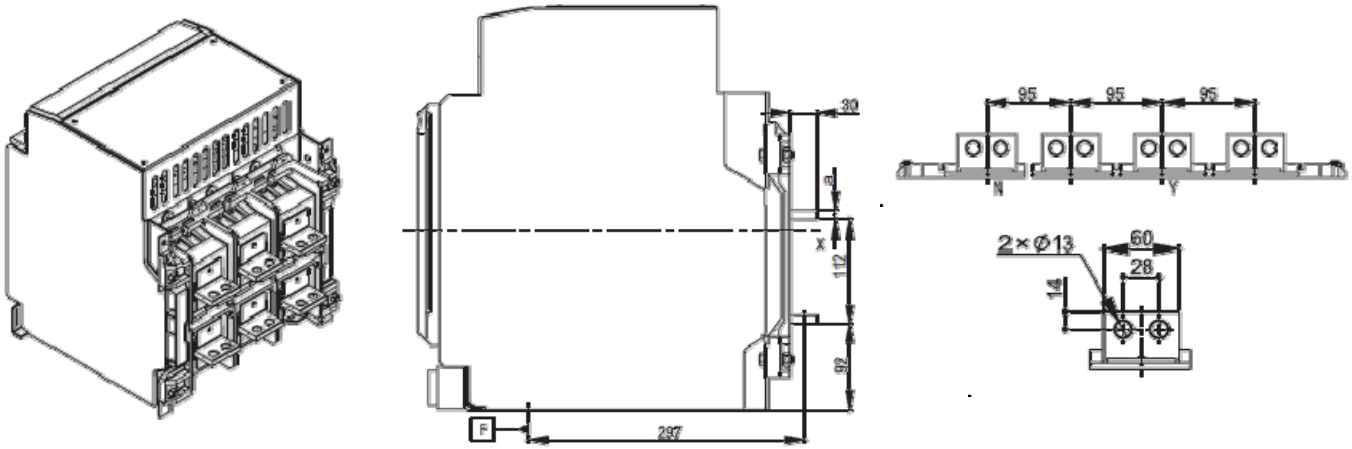




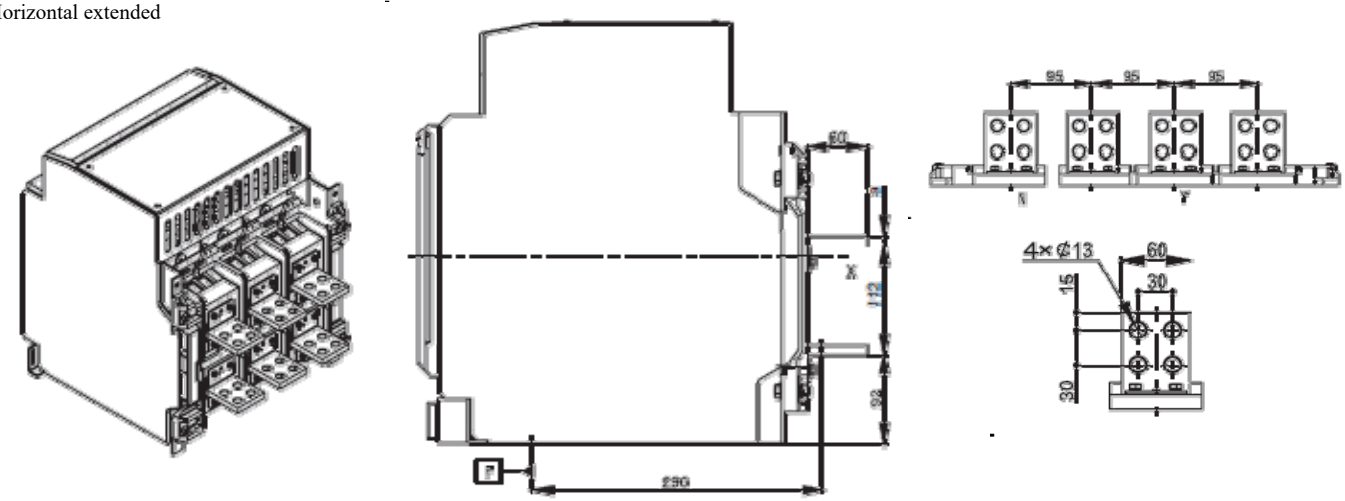


NDW2-2000 fixed type wiring

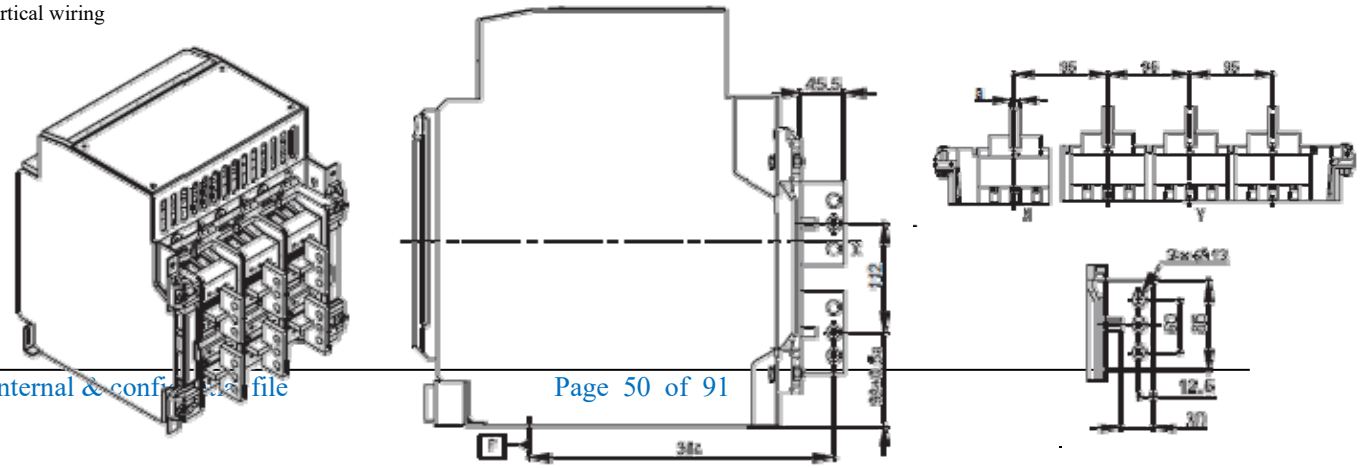
Horizontal wiring



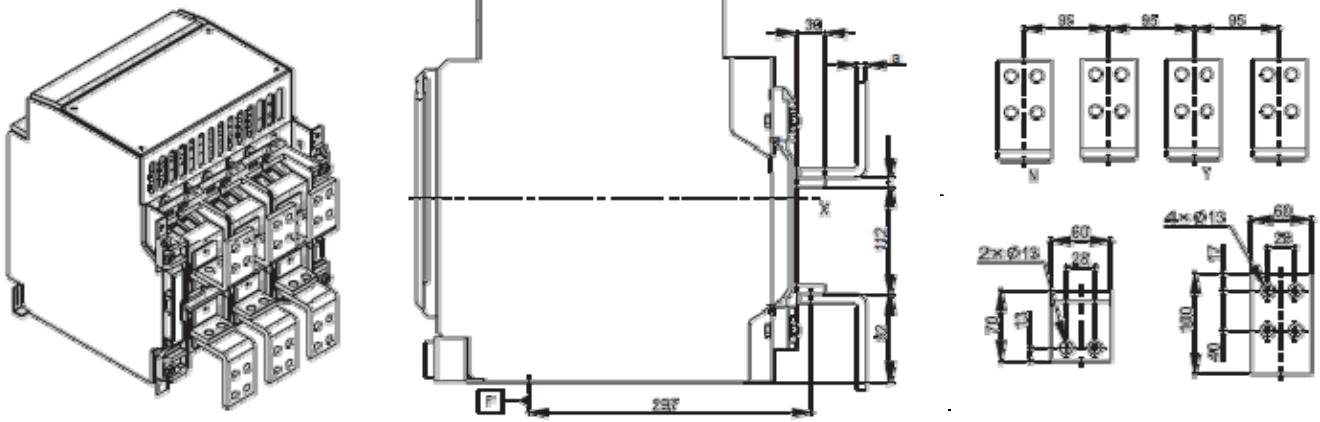
Horizontal extended



Vertical wiring



L-type vertical wiring



Note: For the 3-pole circuit breaker, X and Y are the symmetric axes of the front cover;

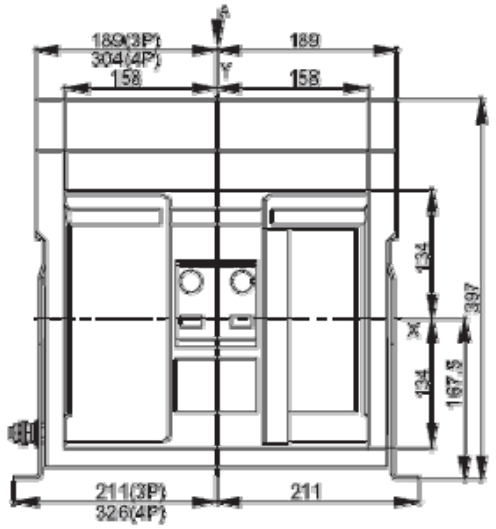
It is recommended to use connecting screws: M12 Level 8.8, with contact washer;

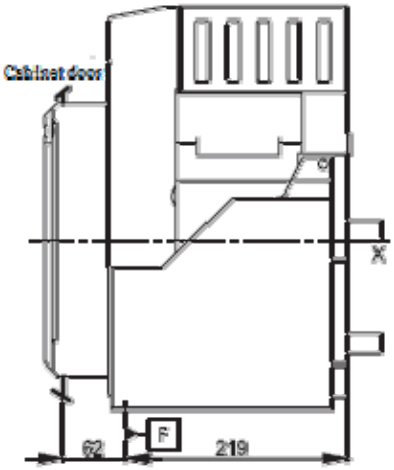
Tightening torque: 60N.m.

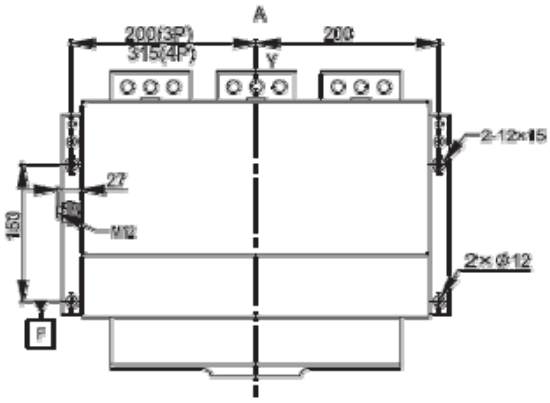
Rated current	Busbar “a” size (mm)
400A、630A、800A	10
1000A、1250A、1600A	15
2000A	20

6.3 NDW2-3200

NDW2-3200 fixed type

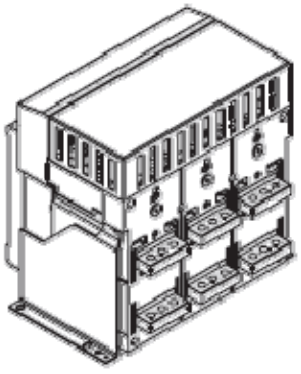


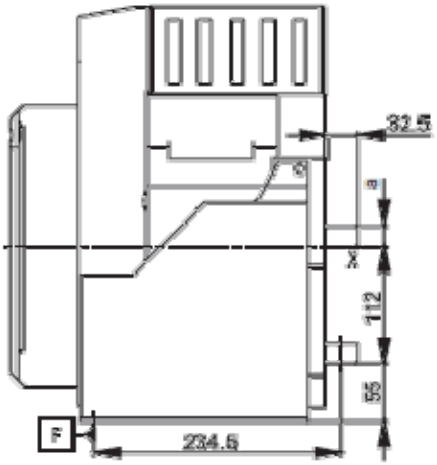


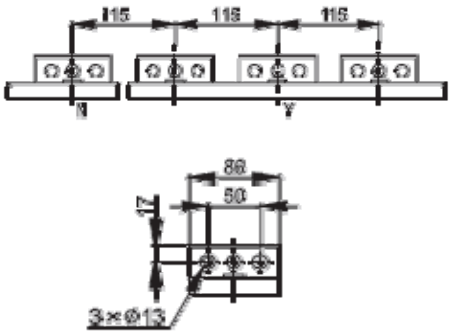


NDW2-3200 fixed type wiring

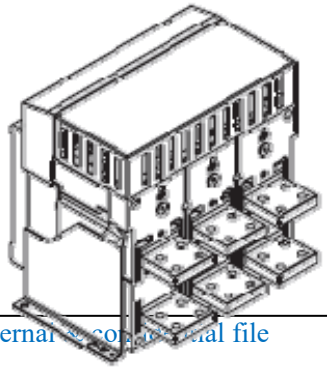
Horizontal wiring

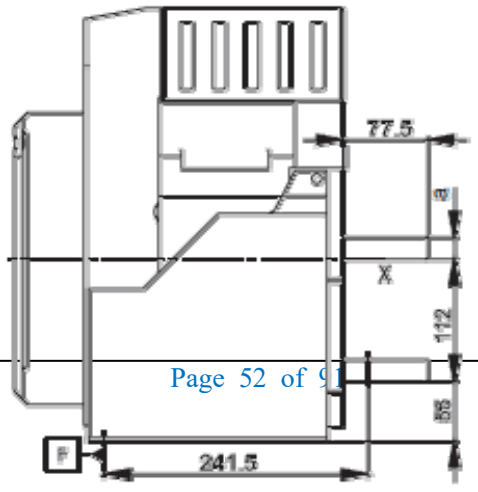


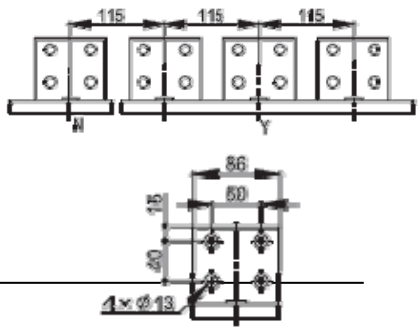




Horizontal extended







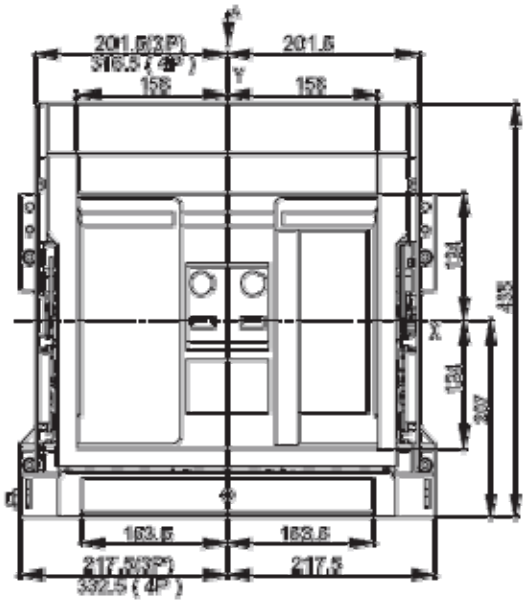
Note: For the 3-pole circuit breaker, X and Y are the symmetric axes of the front cover;

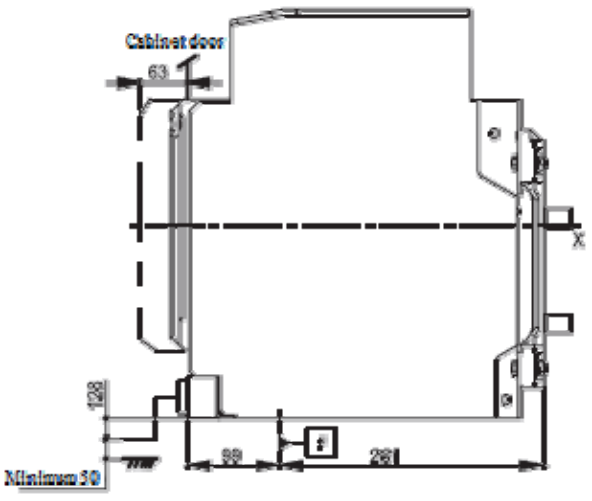
It is recommended to use connecting screws: M12 Level 8.8, with contact washer;

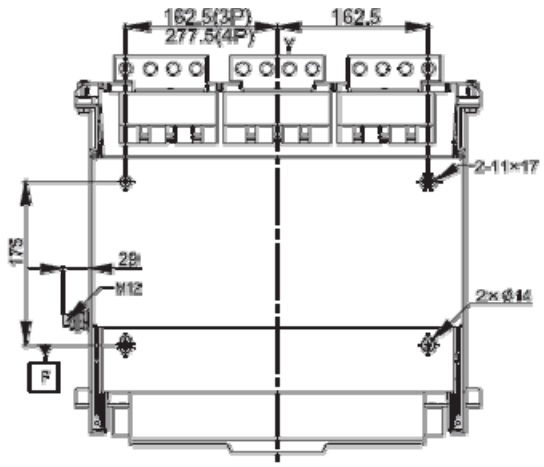
Tightening torque: 60N.m.

Rated current	Busbar “a” size (mm)
2000A、2500A	20
2900A、3200A	30

NDW2-3200 drawout type

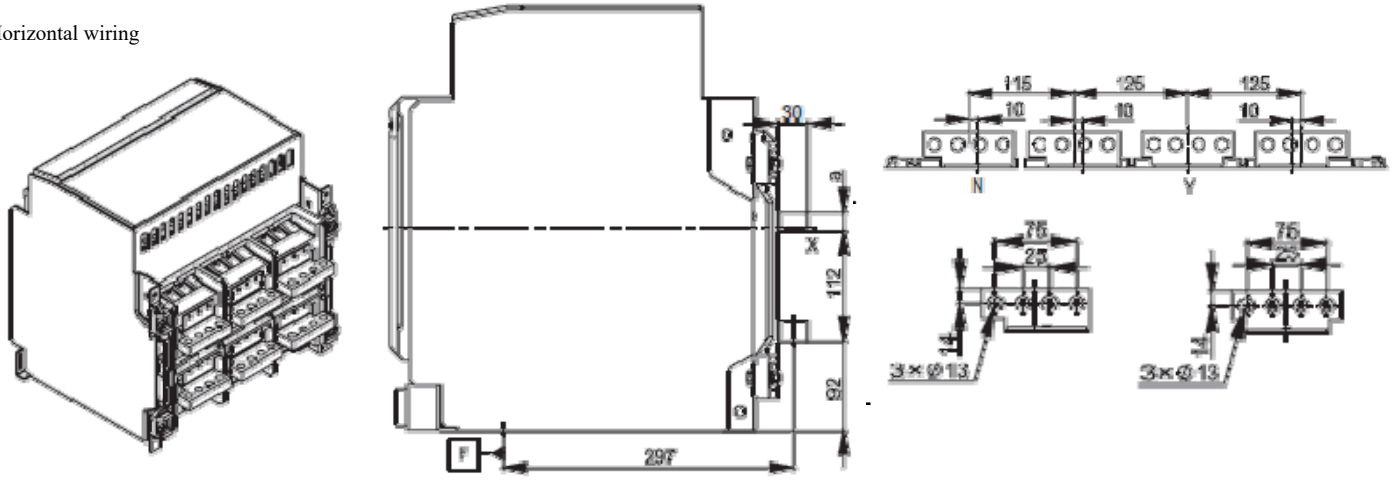




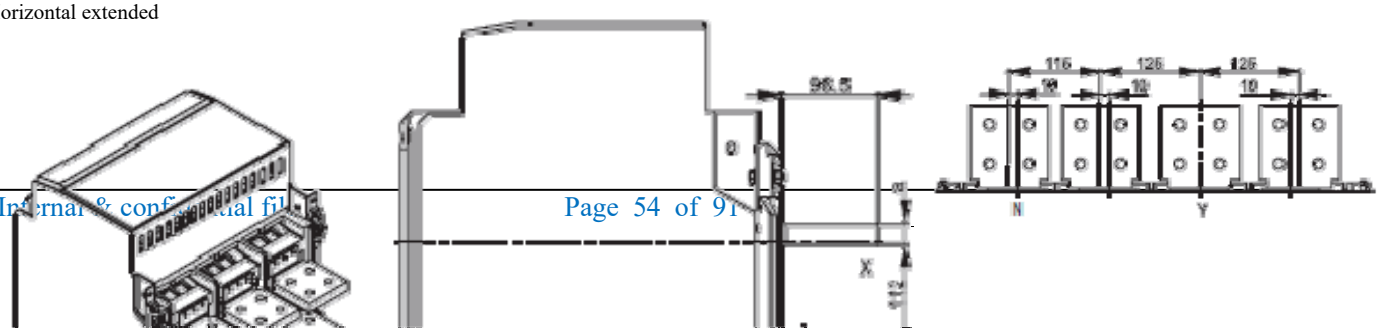


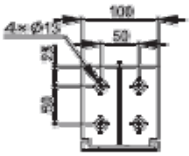
NDW2-3200 drawout type wiring

Horizontal wiring

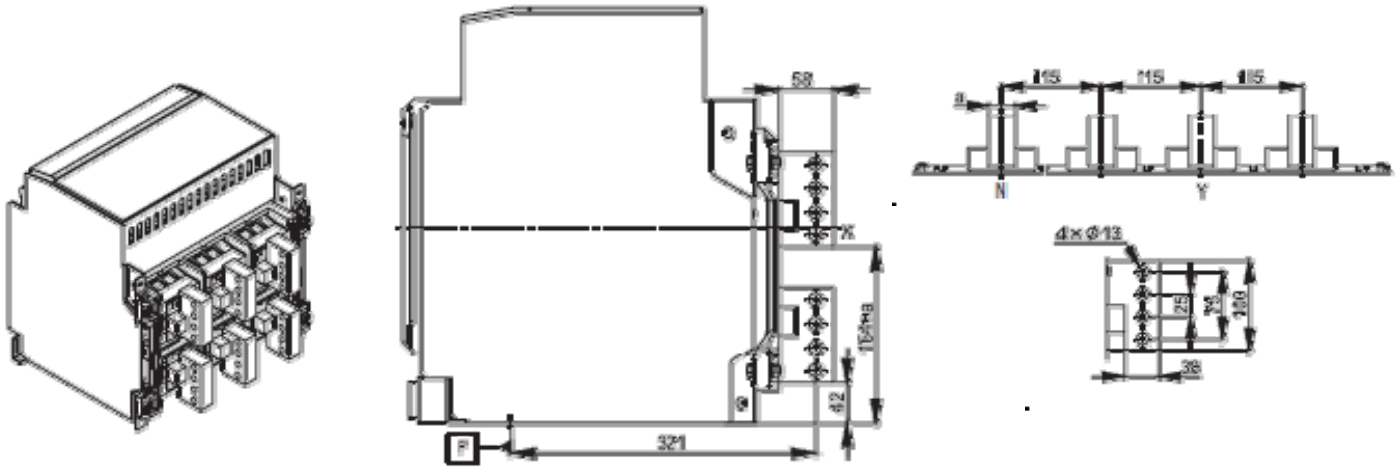


Horizontal extended





Vertical wiring



Note: For the 3-pole circuit breaker, X and Y are the symmetric axes of the front cover;

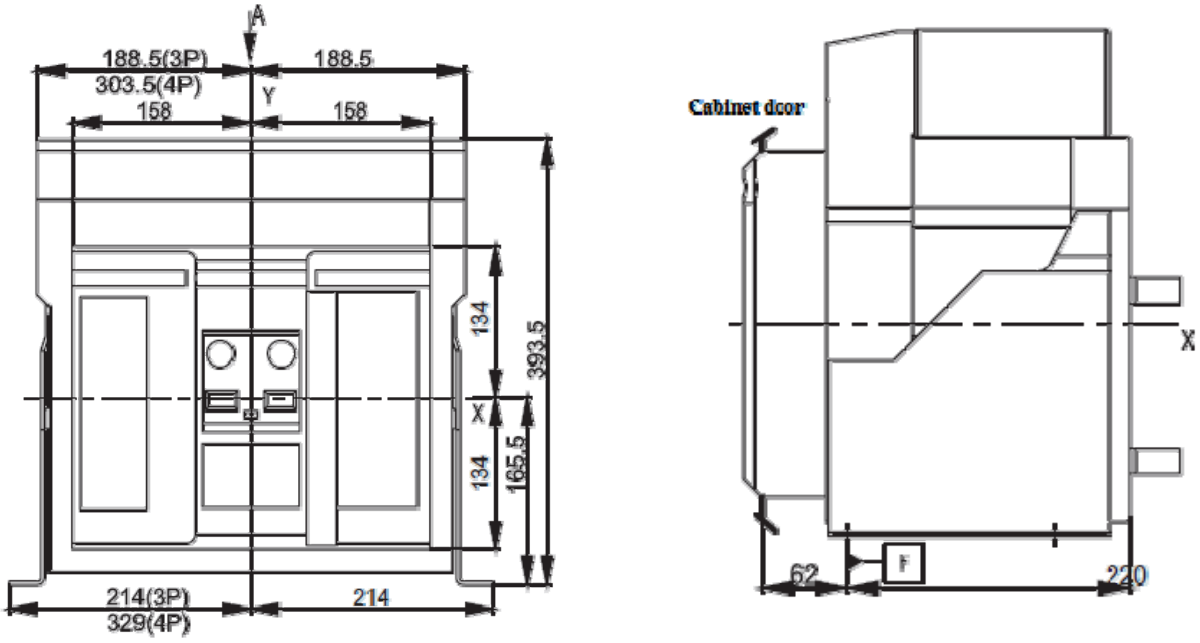
It is recommended to use connecting screws: M12 Level 8.8, with contact washer;

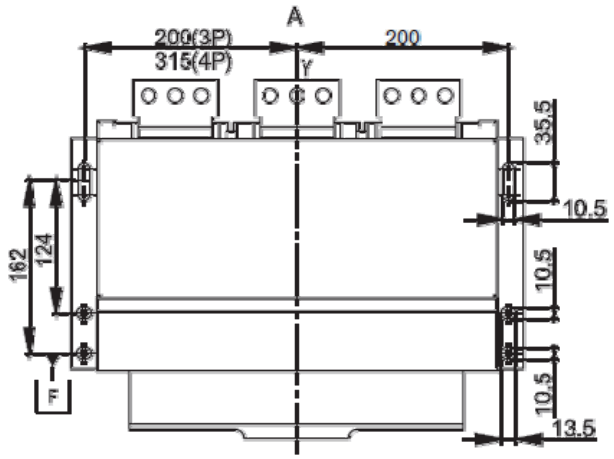
Tightening torque: 60N.m.

Rated current	Busbar “a” size (mm)
2000A、2500A	20
2900A、3200A	30

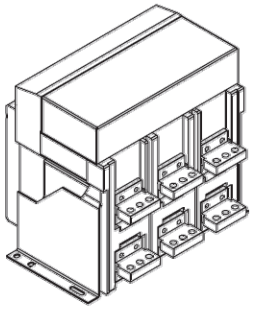
6.4 NDW2-4000

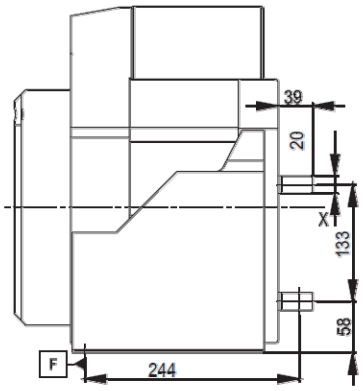
NDW2-4000 fixed type

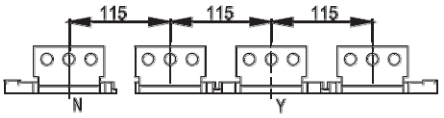


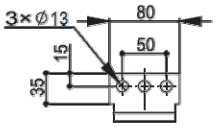


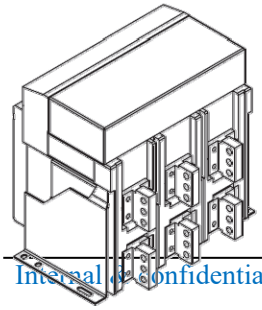
800A - 2500A Horizontal wiring, Vertical wiring

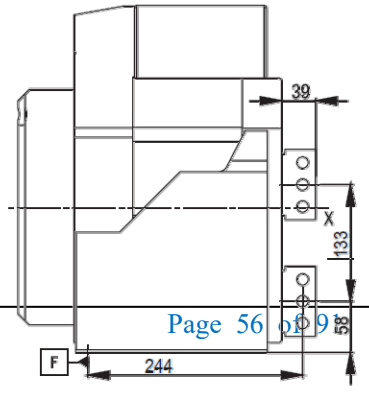


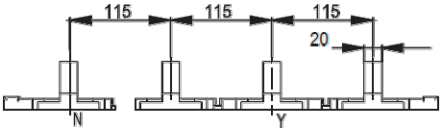


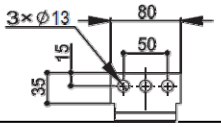




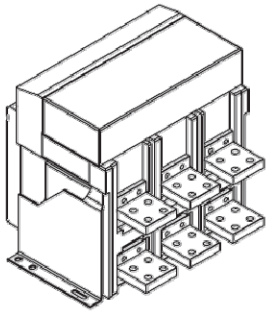


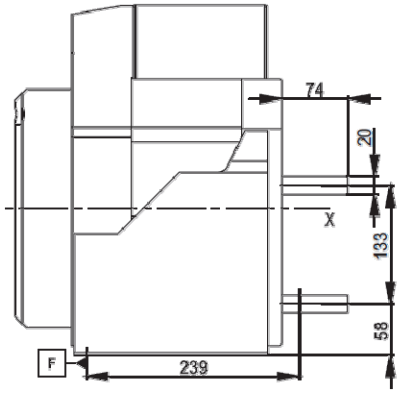


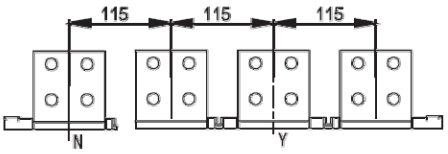


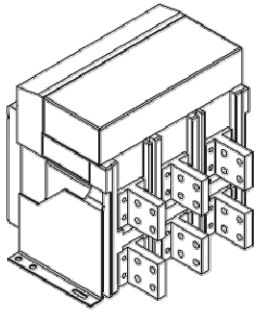


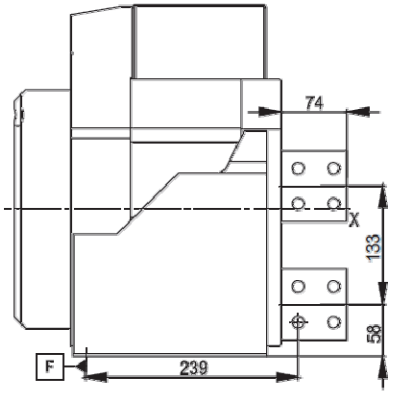
800A - 2500A Horizontal extended, Vertical extended

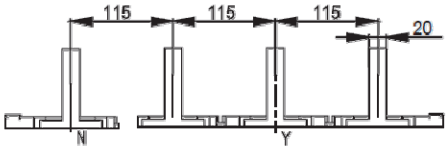


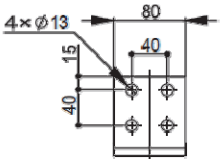




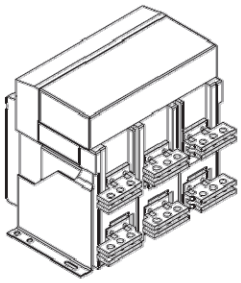


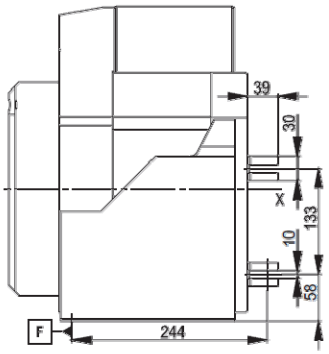


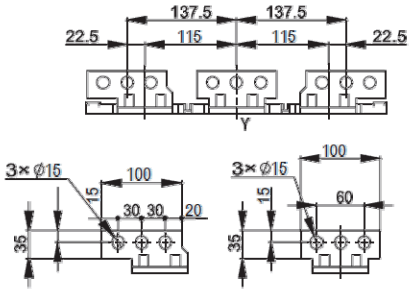


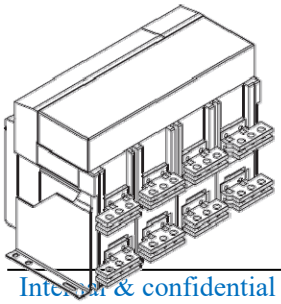


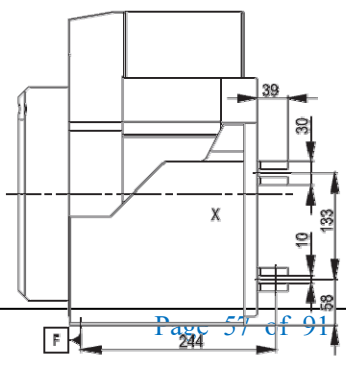
3200A, 4000A Horizontal wiring

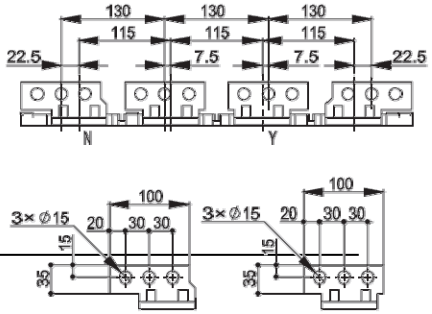




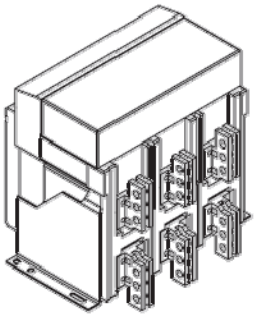


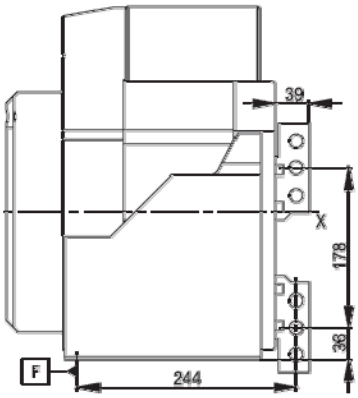


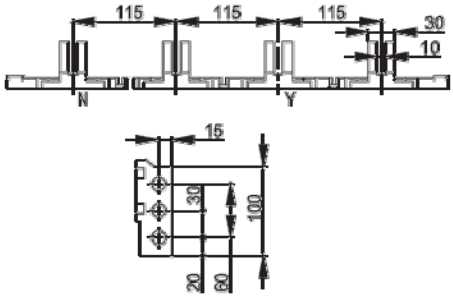




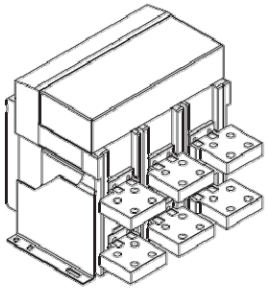
3200A、4000A Vertical wiring

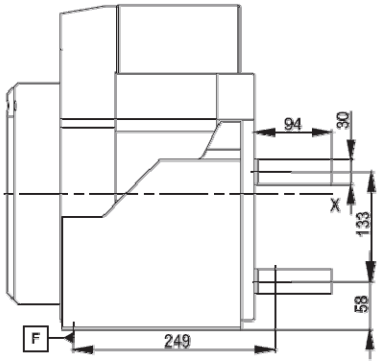


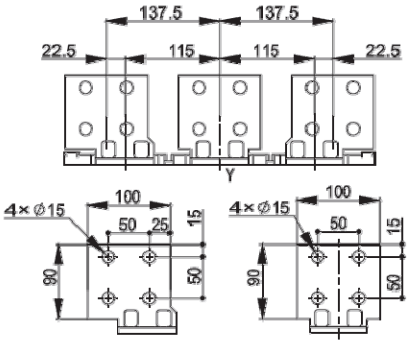


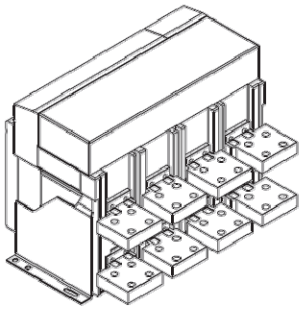


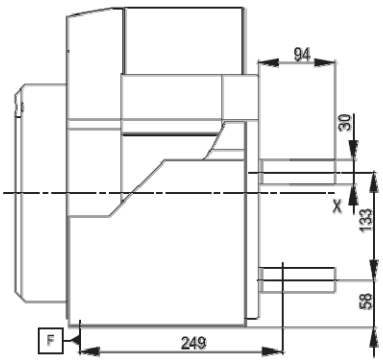
3200A、4000A Horizontal extended, Vertical extended

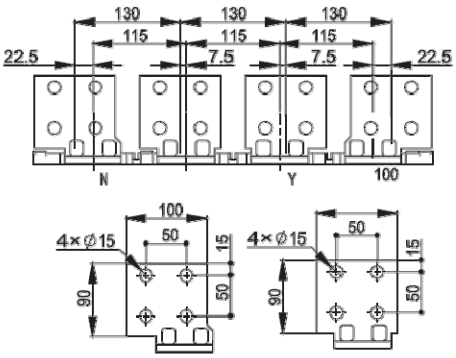


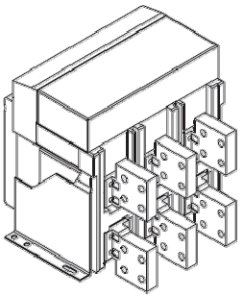


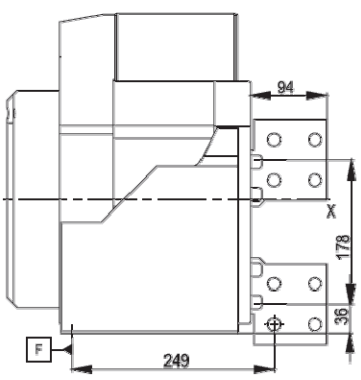


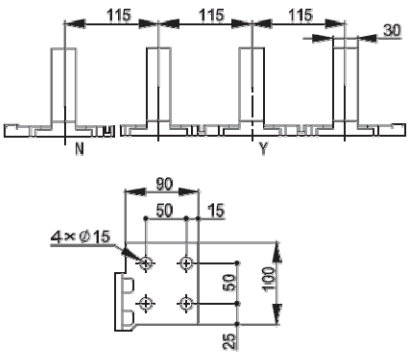










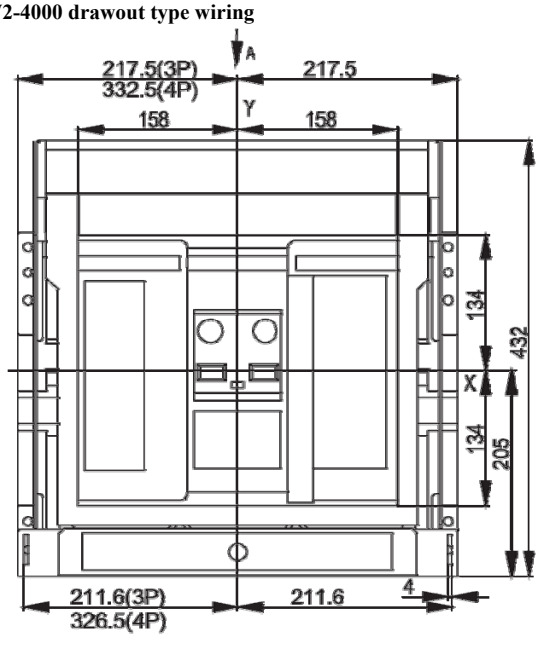


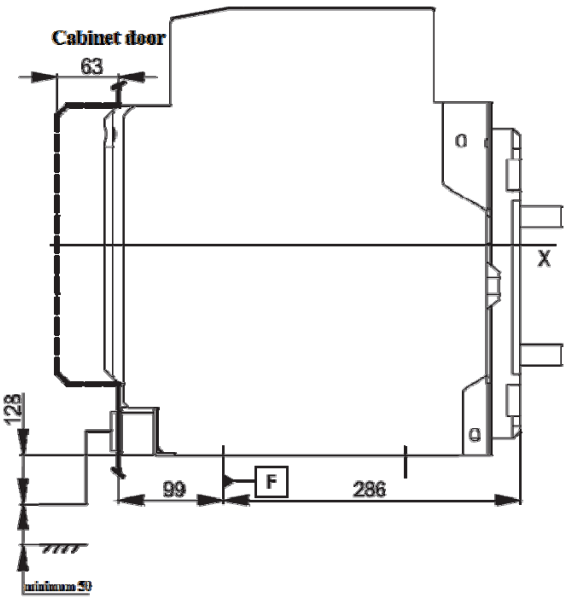
Note: For the 3-pole circuit breaker, X and Y are the symmetric axes of the front cover;

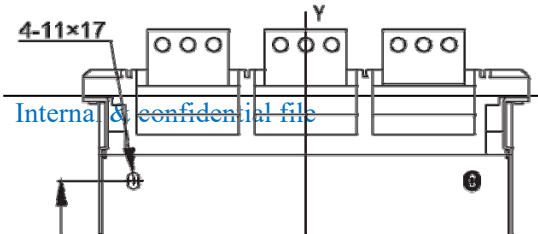
800A - 2500A recommended to use connecting screws: M12 Level 8.8, with contact washer; Tightening torque: 60N.m;

3200A - 4000A recommended to use connecting screws: M14 Level 8.8, with contact washer; Tightening torque: 97N.m.

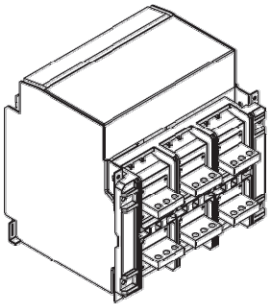
NDW2-4000 drawout type wiring

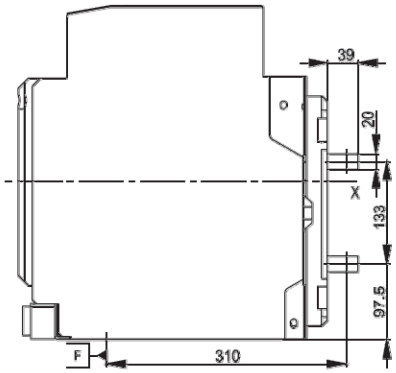


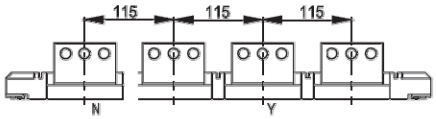


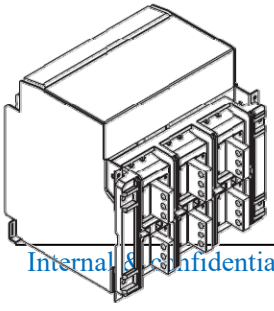


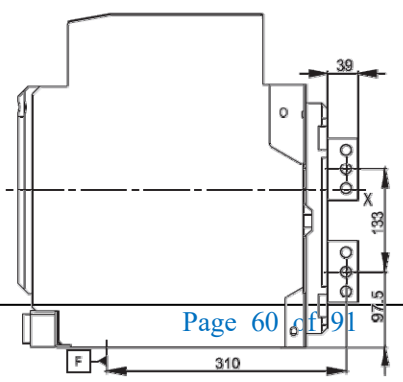
800A - 2500A Horizontal wiring, Vertical wiring

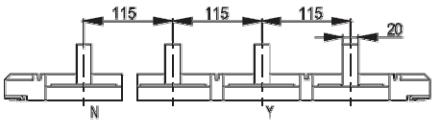


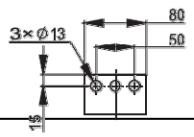




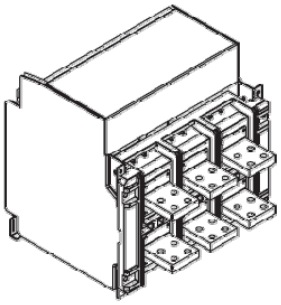


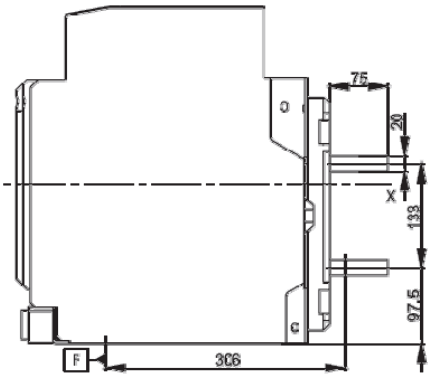


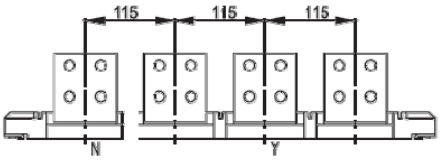


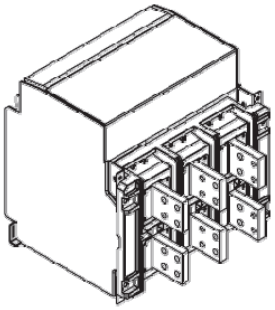


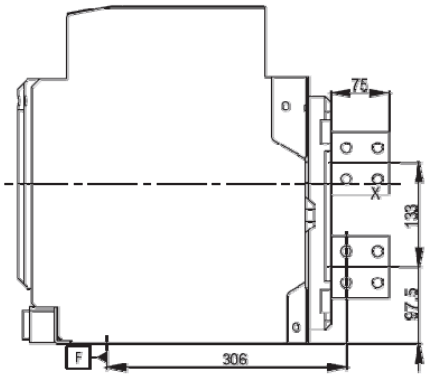
800A - 2500A Horizontal extended, Vertical extended

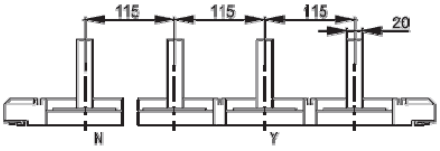


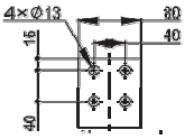




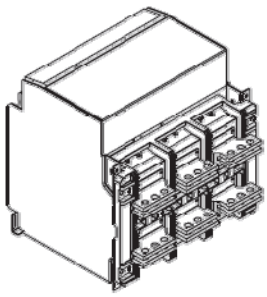


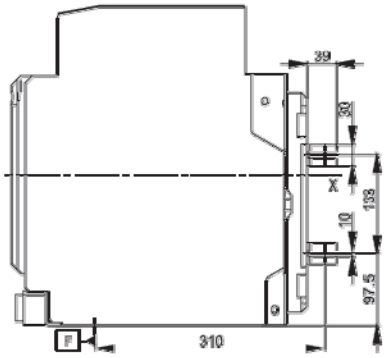


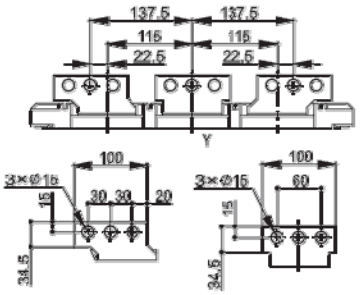


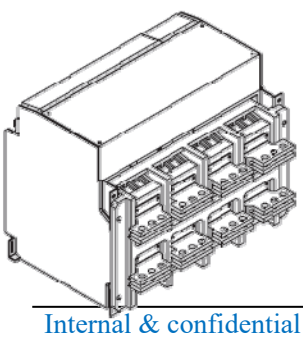


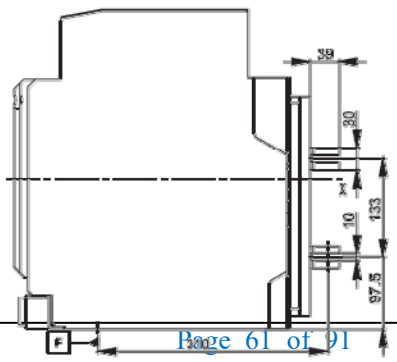
3200A, 4000A Horizontal wiring

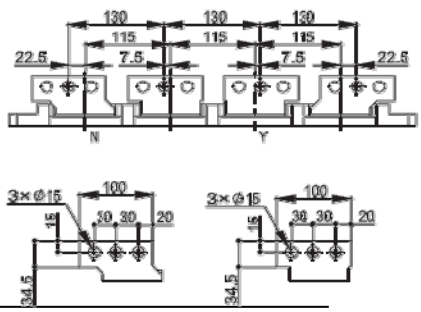




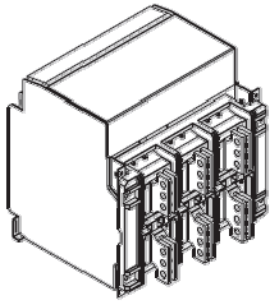


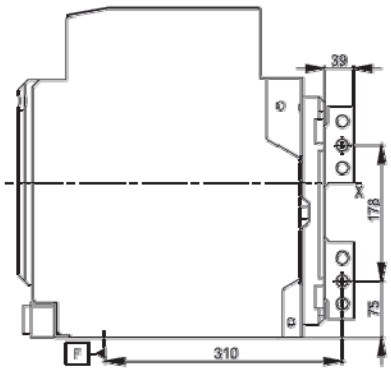


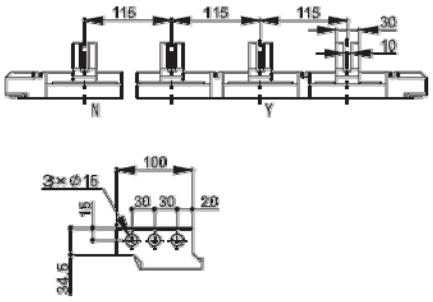




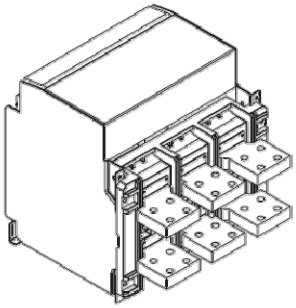
3200A, 4000A Vertical wiring

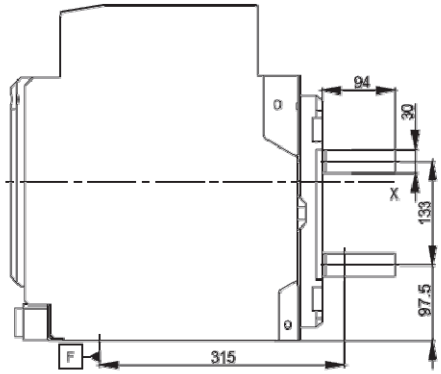


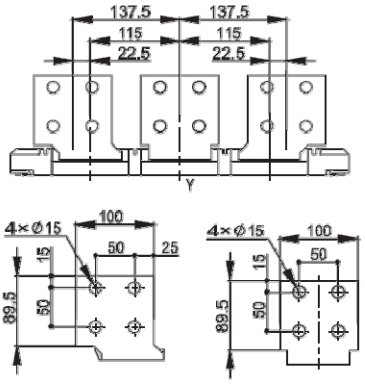


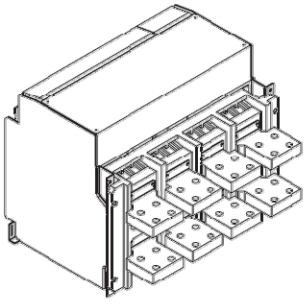


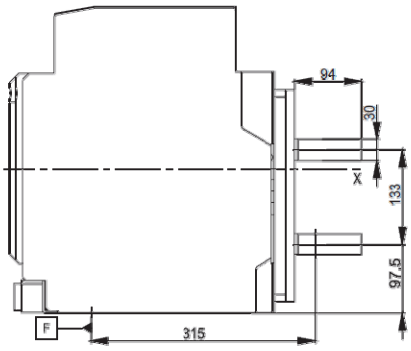
3200A, 4000A Horizontal extended, Vertical extended

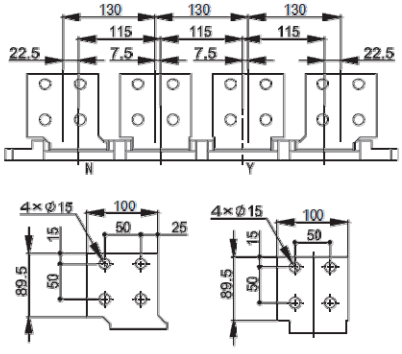


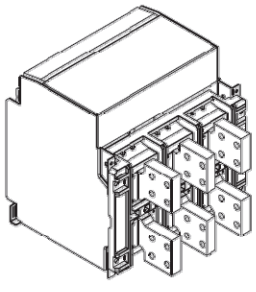


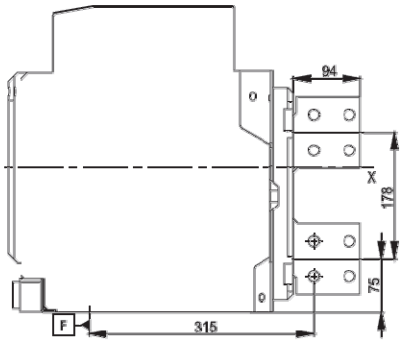


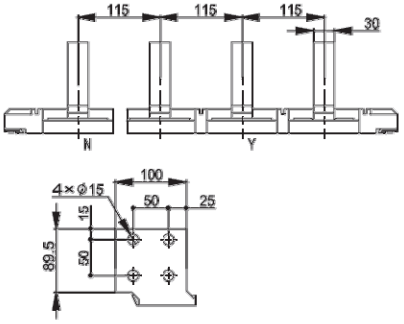












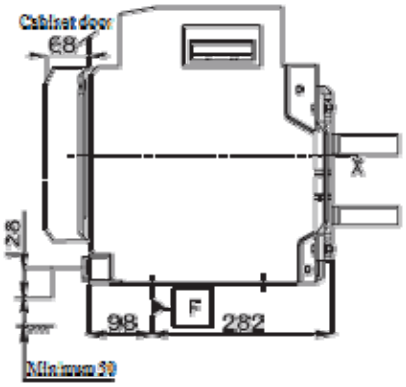
Note: For the 3-pole circuit breaker, X and Y are the symmetric axes of the front cover;

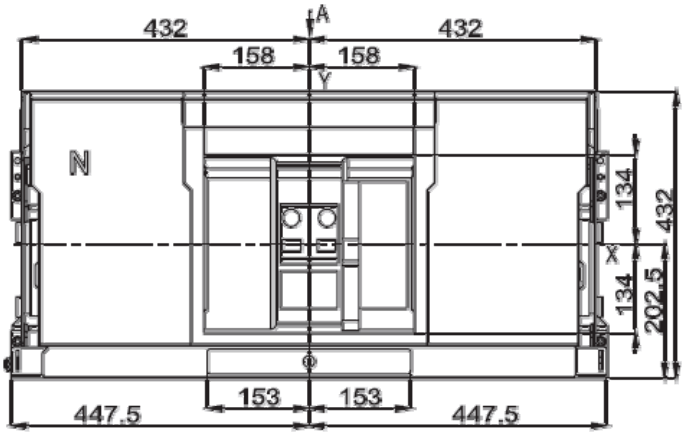
800A - 2500A recommended to use connecting screws: M12 Level 8.8, with contact washer; Tightening torque: 60N.m;

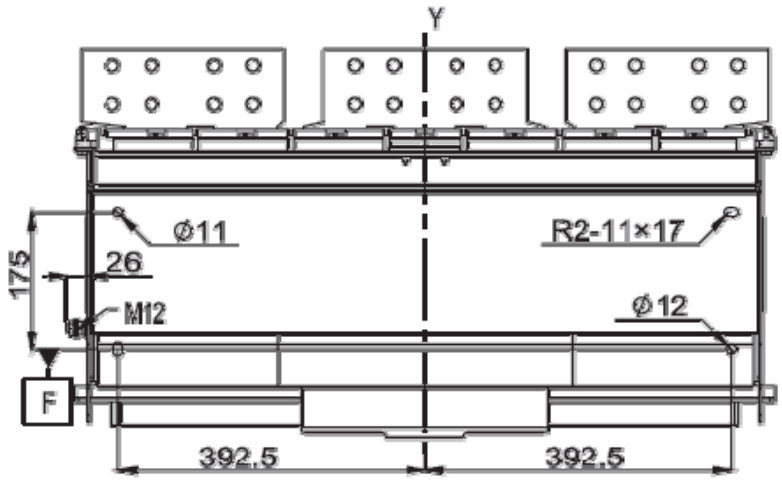
3200A - 4000A recommended to use connecting screws: M14 Level 8.8, with contact washer; Tightening torque: 97N.m.

6.5 NDW2-6300

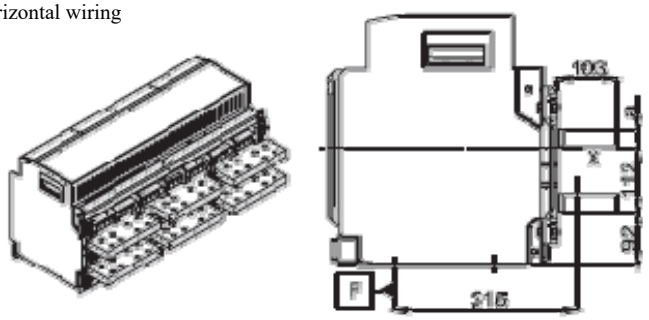
NDW2-6300 drawout type

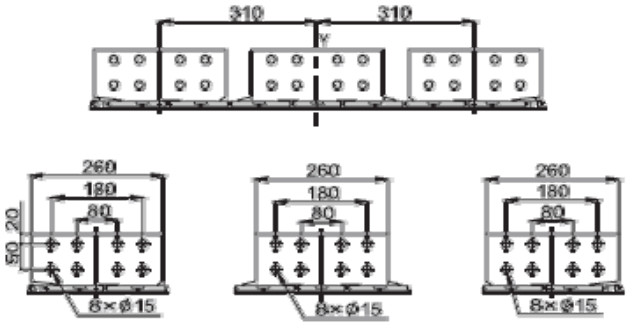


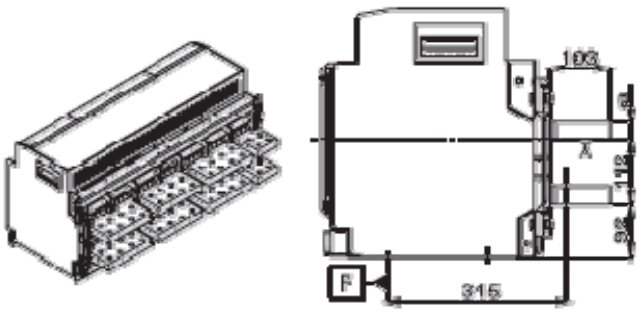


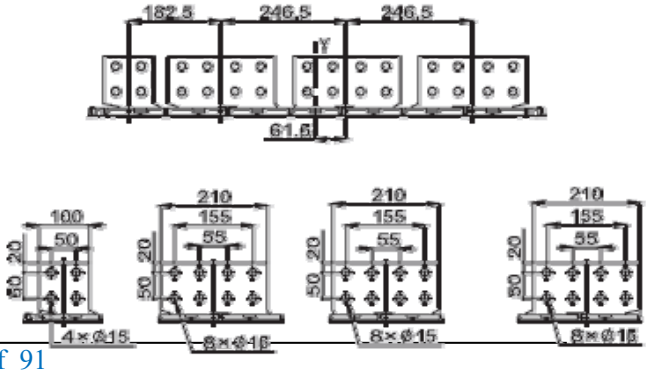


Horizontal wiring









Note: For the 3-pole circuit breaker, X and Y are the symmetric axes of the front cover;

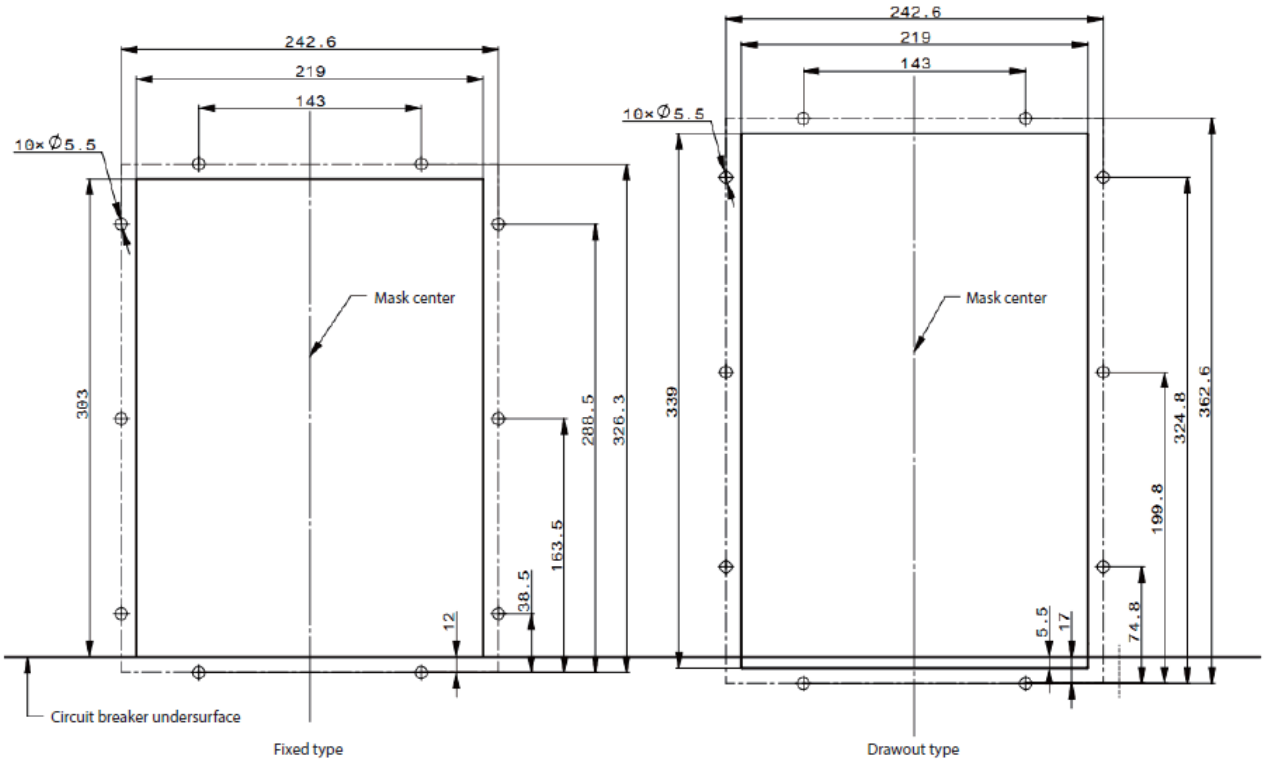
It is recommended to use connecting screws: M12 Level 8.8, with contact washer;

Tightening torque: 97N.m.

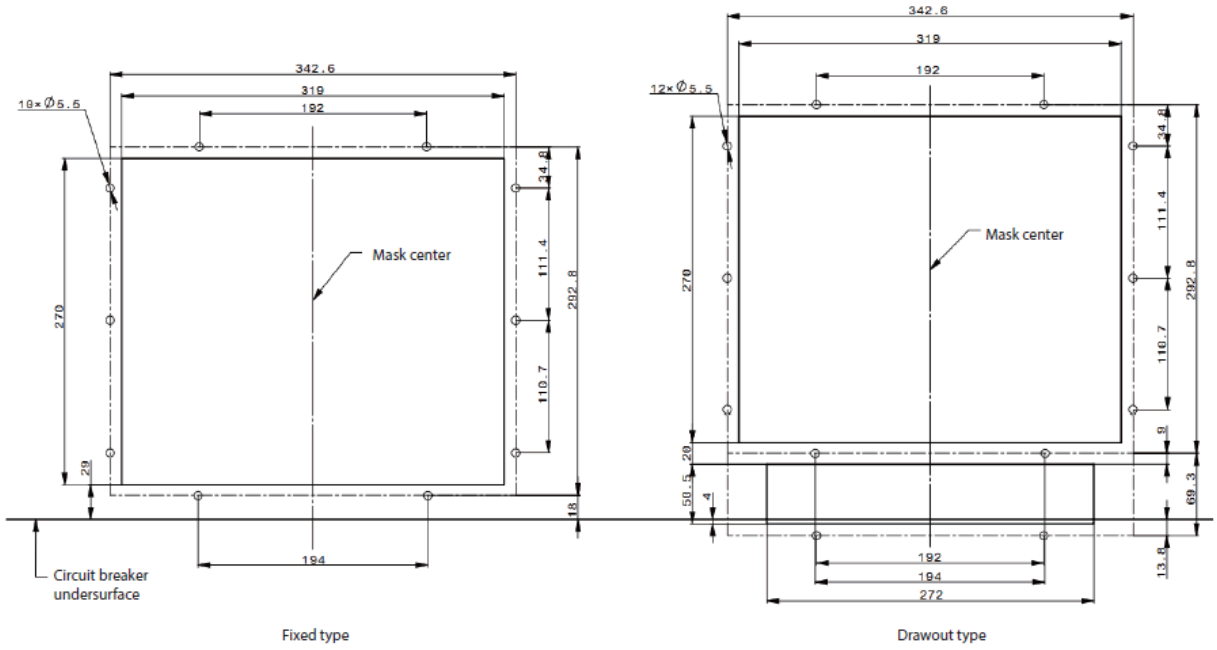
Rated current	Busbar “a” size (mm)
4000A	20
5000A、6300A	30

6.6 The circuit breaker cabinet door open hole and the installation pitch (mm)

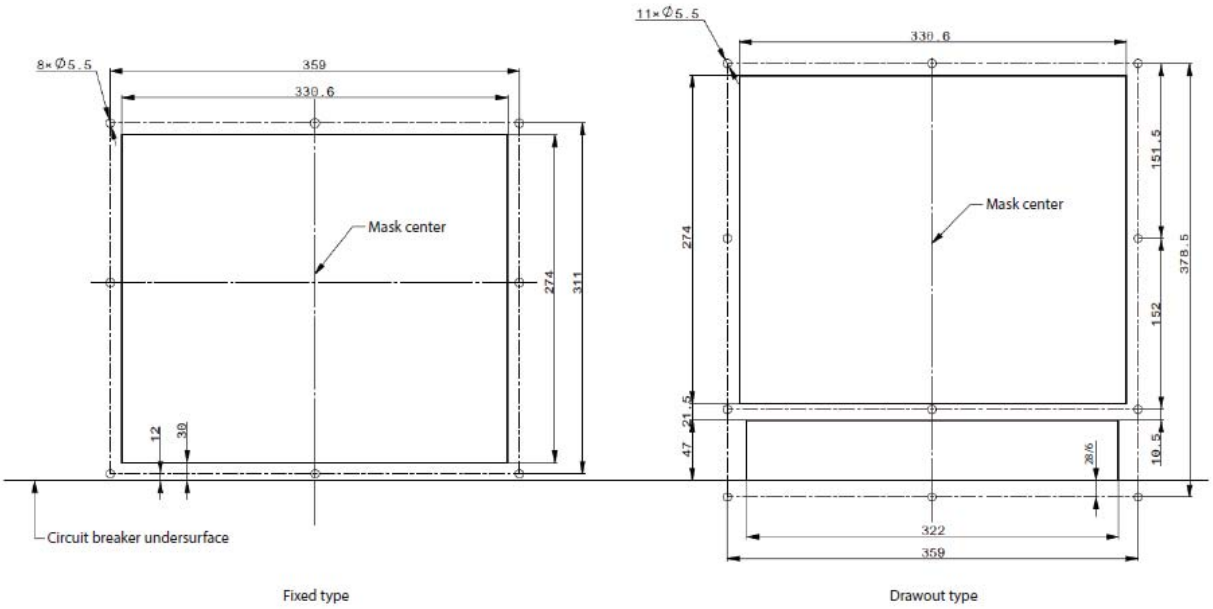
Hole dimensions of NDW2-1600 door frame



Hole dimensions of NDW2-2000 door frame



Hole dimensions of NDW2-3200/4000/6300 door frame



Fixed type Drawout type

7. Circuit Breaker Installation Notes

To ensure the safety of you and the electric equipment, before put the circuit breaker into operation, users must:

a. Carefully read the Operation Manual before installation and use of circuit breaker.

b. Check whether the specification of the circuit breaker is in line with the requirements before installation.

c. Install the circuit breaker under the environment condition without explosion danger, without conductive dust and without the possibility of corroding metal and damaging the insulation.

d. Measure the insulation resistance of circuit breaker with a 1000V megohmmeter before installation of the circuit breaker. When the surrounding medium temperature is 20℃±5℃, the relative humidity 50%-70% should not be less than 10 mge, otherwise it needs to be dried, and it can be used until the insulation resistance meets the requirement.

e. Prevent foreign matters from falling into the circuit breaker when installing the circuit breaker.

f. Ensure the circuit breaker is flat and without additional mechanical stress when installing the conductive busbar.

g. Conduct reliable grounding protection when installing the circuit breaker. The grounding place of the circuit breaker has obvious grounding symbol.

h. Carry out wiring of the control circuit according to the wiring diagram when installing the circuit breaker, check whether the working voltage of the undervoltage, shunt, closing electromagnet, motor, controller and related parts conforms to the actual voltage, and then carry out the secondary circuit energizing. In case of drawout circuit breaker, the circuit breaker should be shaken into the test position, then the undervoltage tripper will close and then the circuit breaker can be closed.

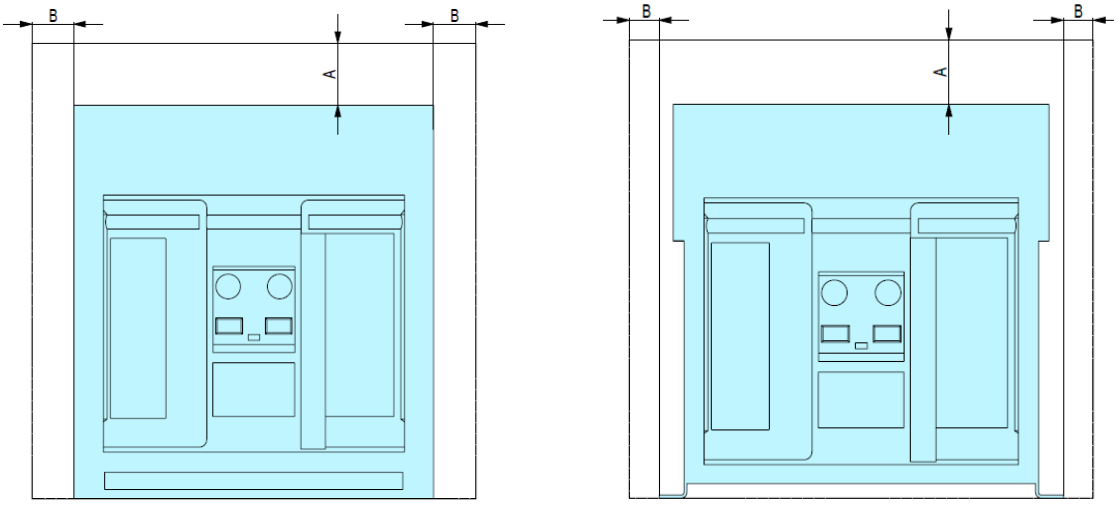
i. Press (or power on) the closing button after the energy storage of the motor, the circuit breaker will close.

j. Press (or power on) the opening button, the circuit breaker will open.

K. For manual storage of energy, pull the handle on the front panel up and down, a "click" sound can be heard after seven times, and the panel shows "storage of energy", the storage of energy ends. At this point, if there's undervoltage tripping, power on it (no need if without undervoltage tripping), then carry out closing operation.

The circuit breaker is installed in the cabinet, the safe distance between the circuit breaker and the cabinet

When users install the circuit breaker into the cabinet, the safe distance between the circuit breaker and the cabinet is as shown in Figure 41, and the installation dimensions are shown in Table 21.



Drawout circuit breaker Fixed circuit breaker

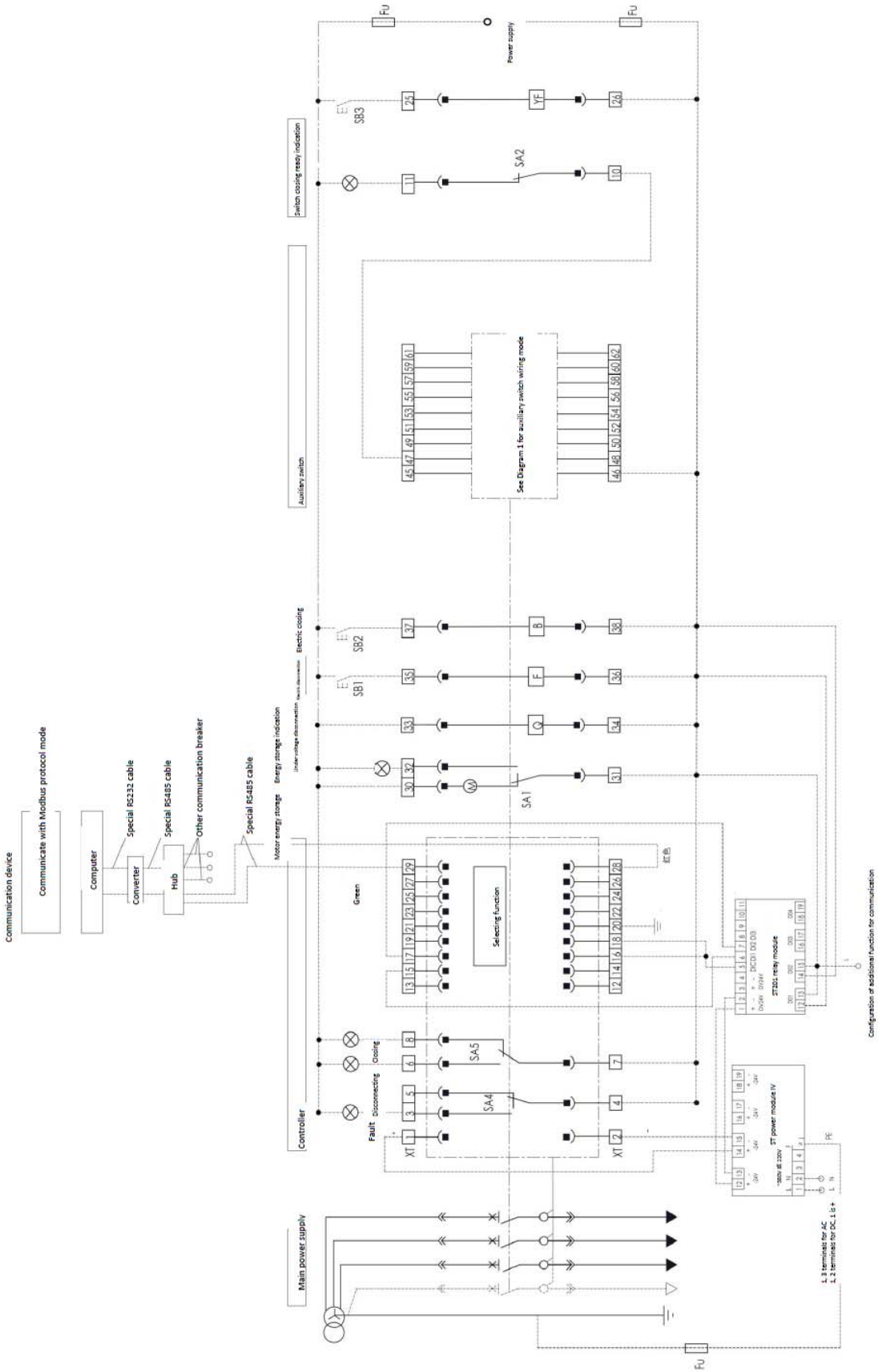
Figure 41

Table 21 Unit: mm

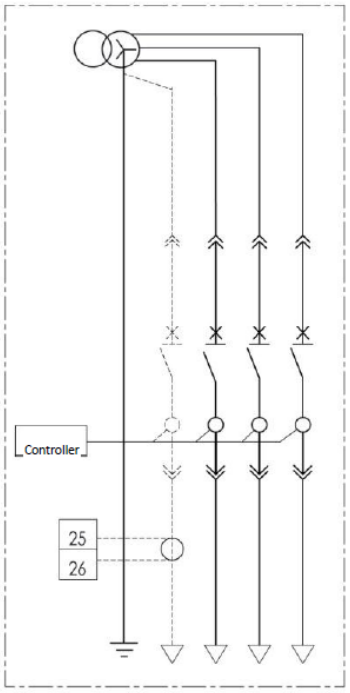
Circuit breaker installation type	To the insulator		To the metal object		To the live part	
	A	B	A	B	A	B
Drawout type	0	0	0	0	60	60
Fixed type	0	0	0	0	60	60

8. Electric Circuit Diagram

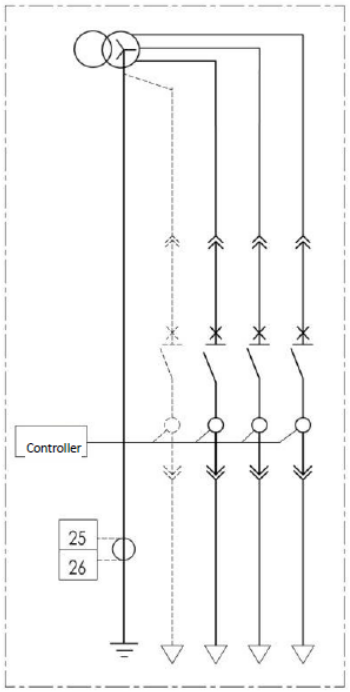
NDW2-1600 Electric Circuit Diagram



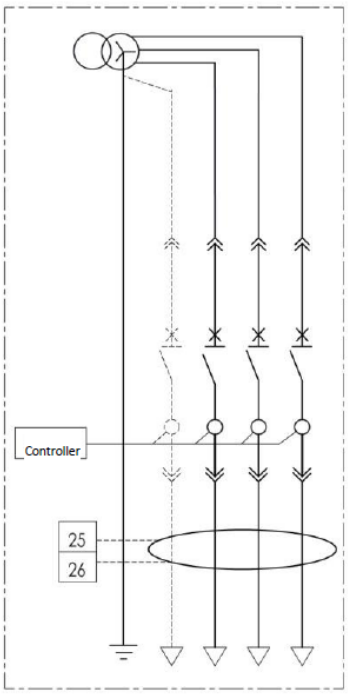
3-pole connecting N-phase difference type grounding protection



Ground current type grounding protection



Leakage grounding protection



1, 2 - Working power supply, users wiring (1 for the anode);

3, 4, 5 - Fault tripping contact output (4 for public end), contact capacity of AC250V/16A;

6, 7, 8 - Opening and closing contact output (7 for public end), contact capacity of AC250V/16A;

9, 10, 11 - Closing ready electric indication;

12, 13 and 14, 15 and 16, 17 and 18, 19 - four groups of signal output, if there's no optional signal unit, the pin will be empty;

20 - Grounding wire of controller;

21, 22, 23, 24 - Voltage signal input end, signal taken from the inlet wire side of the circuit breaker. When the power distribution system is three-phase three-wire system, 21, 23 shall be short connected to U2; when it is three-phase four-wire system, wire according to the wiring diagram. If there's no optional voltage function, the pin will be empty;

25, 26 - Input used for external transformer if there's an external transformer. When the grounding protection mode is 3P+N differential type, this pin will be the output end of the external N-phase transformer; when the external transformer is CT-W or ZCT1, this pin will be the input end of the external transformer;

27 - Communication shielding ground wire;

28, 29 - R485 communication interface (28 shall be connected to the red wire, while 29 shall be connected to the green wire).

SB1 - Disconnection button (to be prepared by users);

SB2 - Undervoltage disconnection button (to be prepared by users);

SB3 - Close button (to be prepared by users);

SB4 - Electric energy storage button (to be prepared by users);

J - Relay normally open, remote disconnection circuit breaker (to be prepared by users);

SA - Motor travel switch (to be prepared by users);

XT - Secondary terminal;

Ⅰ - Four groups conversion (auxiliary contact of the circuit breaker);

Ⅱ - Six groups conversion (auxiliary contact of the circuit breaker);

M - Energy storage motor;

Fu - Fuse (to be prepared by users);

W - Circuit breaker;

F - Shunt tripper;

B - Closed electromagnet;

Q - Undervoltage (instantaneous or delayed) tripper;

30, 31 - can directly connect the power supply (automatic energy storage beforehand).

Note: 1. The dashed part shall be wired by users;

2. If the rated working voltage of Q, F, B, M, controller power supply module is not the same, please connect different supply voltage;

3. The opening, closing and energy storage indicators shall be prepared by users;

4. Contact capacity DO: DC110V 0.5A,AC250V 5A; contact capacity DI: DC110V～DC130V or DC110V～AC250V

5. The order from 21 to 24 shall not be wrongly wired and connected into the inlet wire side of the power supply. If there's no optional function, the pin will be empty;

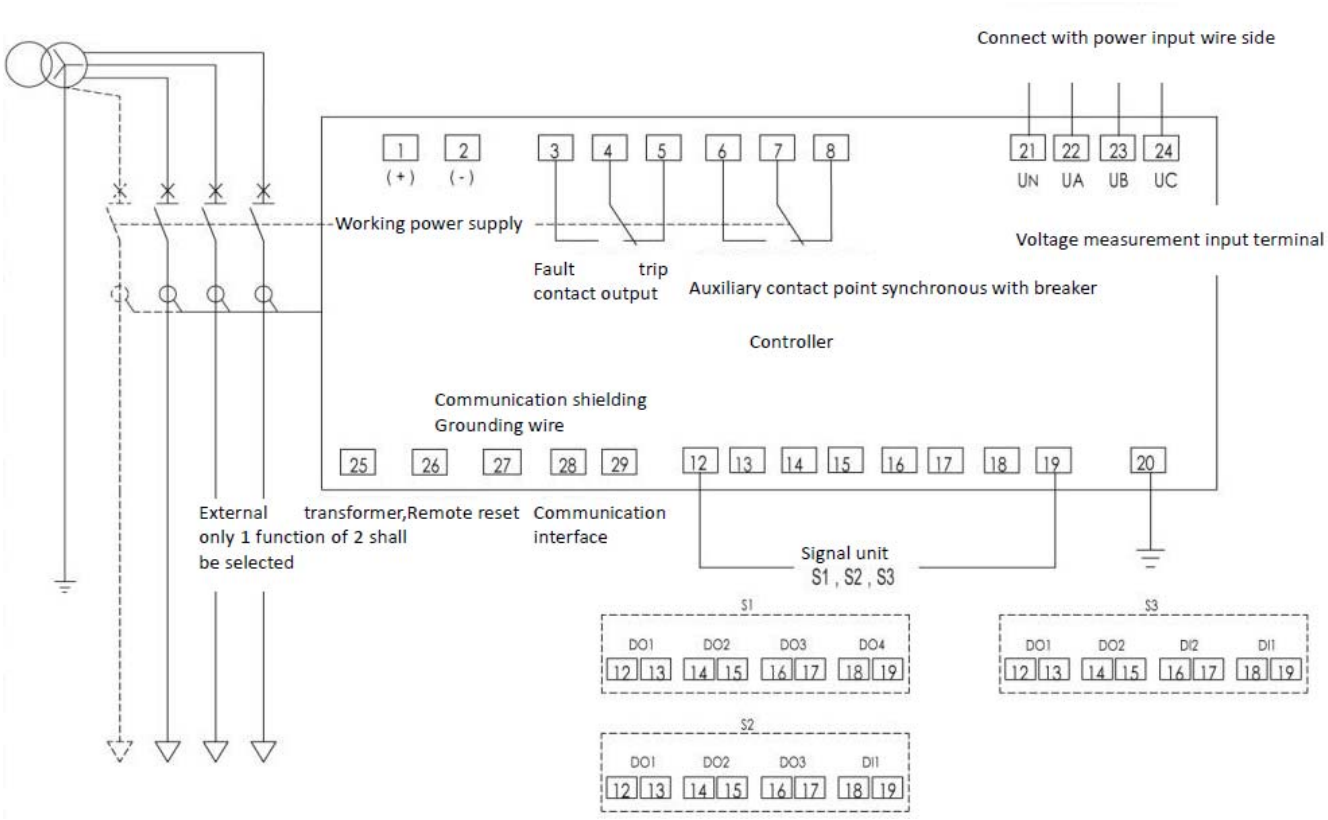
6. 45~56 are the auxiliary contacts of four groups conversion; 45~62 are the auxiliary contacts of six groups conversion;

7. Description of DI and DO is shown in *NDW2-1600 Controller Manual*;

8. If there's optional ground current or current leakage protection, it shall not be connected to CT-W or ZCT1, but shall be short connected.

9 The secondary terminal of our company is only suitable for 0.5-1.0mm^2 flexible copper wire or hard copper wire, and it is recommended to use flexible copper wire. Please pay attention to the suitable wire.

The following chart shows the input/output interface of controller



1, 2 - power supply input of controller, the working power supply AC220V/AC230V, AC380V/AC400V, DC220V, DC110V input end, 1 for anode;

3, 4, 5 - Fault tripping contact output (4 for public end), contact capacity of AC380V, 2A; DC250V, 0.3A;

6, 7, 8 and 9, 10, 11 - two groups of auxiliary state contacts of synchronous action with the circuit breaker (7 and 10 for public ends), contact capacity: AC380V, 1 A; DC250V, 0.15 A;

12, 13 - Signal contact 1, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

14, 15 - Signal contact 2, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

16, 17 - Signal contact 3, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

18, 19 - Signal contact 4, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

21, 22, 23, 24 - Voltage signal input end (N, A, B,C, respectively); when the power distribution system is three-phase three-wire system, 21 and 23 shall be short connected to U2.

25, 26 - Input used for external transformer if there's an external transformer. When the grounding protection mode is 3P+N differential type, this pin will be the output end of the external N-phase transformer; when the external transformer is CT-W or ZCT1, this pin will be the input end of the external transformer;

27 - Communication shielding ground wire (3M controller with communication);

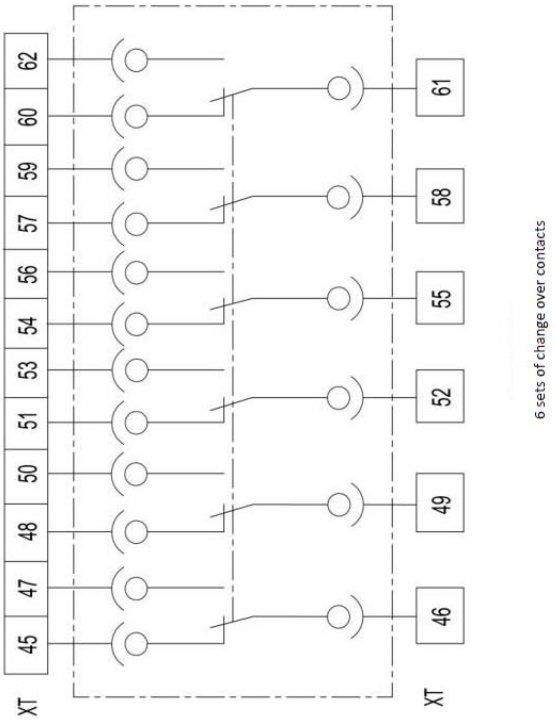
28 - Communication interface RS485A (3M controller with communication);

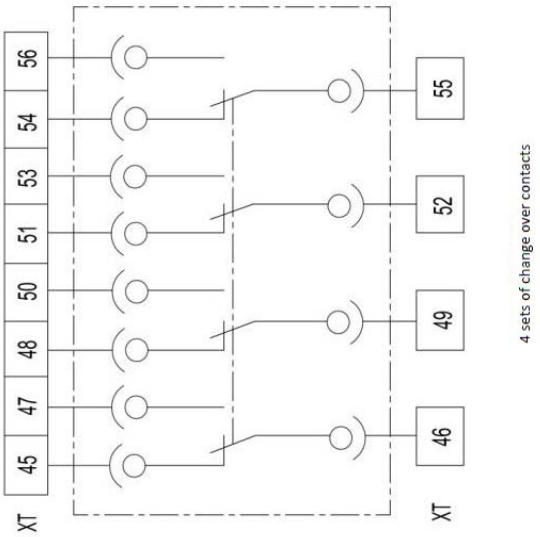
29 - Communication interface RS485B (3M controller with communication).

Note: 1. Contact capacity DO: DC110V 0.5A, AC250V 5A; contact capacity DI: DC110V～DC130V or AC110V～AC250V;

2. The order from 21 to 24 shall not be wrongly wired and connected into the inlet wire side of the power supply. If there's no optional function, the pin will be empty;

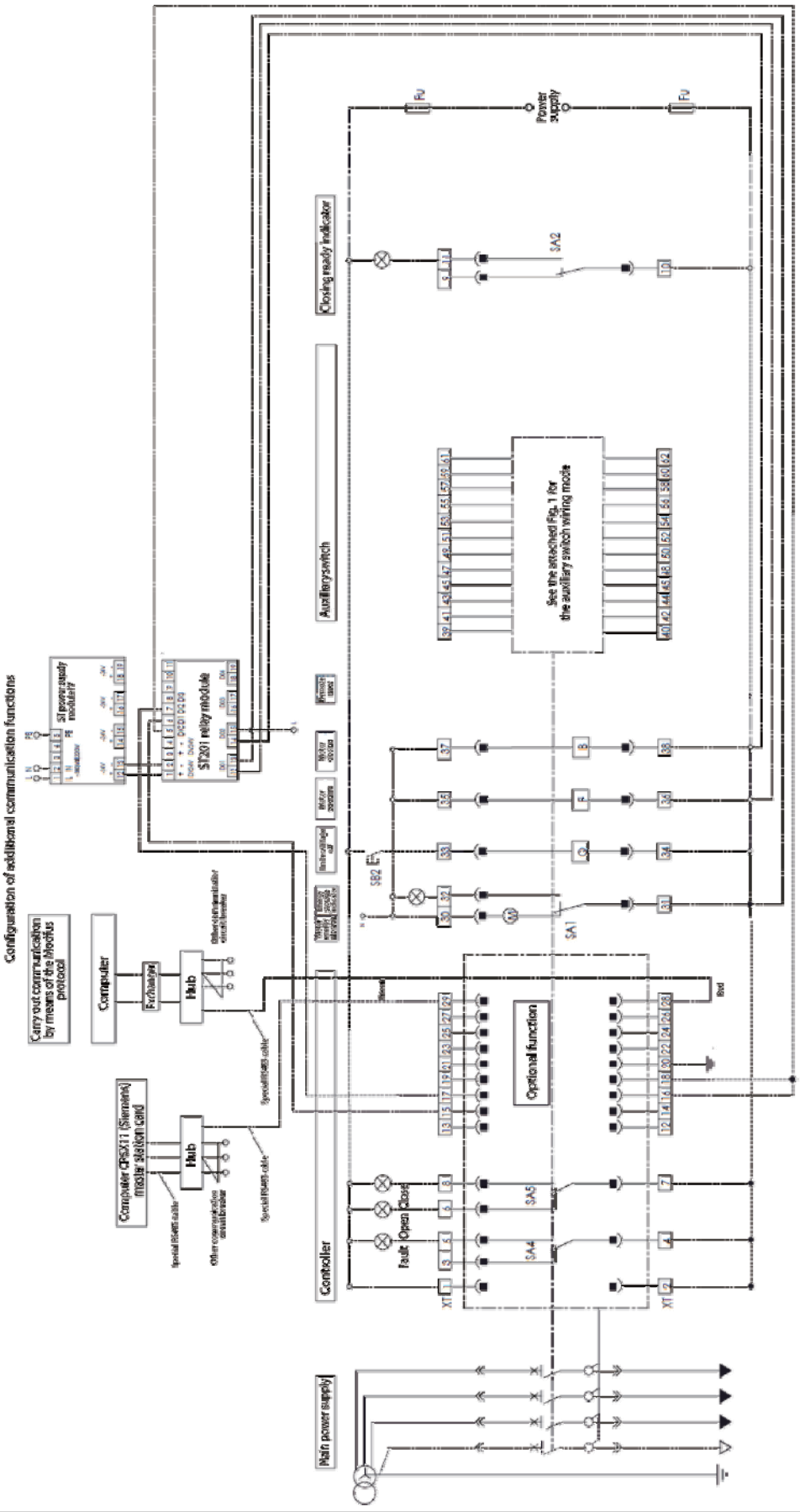
NDW2-1600 Auxiliary switch wiring mode





NDW2-2000/3200/6300 Electric Circuit Diagram

The following diagram is the full-function circuit diagram



1, 2 - Working power supply;

3, 4, 5 - Fault tripping contact output (4 for public end), contact capacity of AC250V/16A;

6, 7, 8 - Opening and closing contact output (7 for public end), contact capacity of AC250V/16A;

9, 10, 11 - Closing ready electric indication;

12, 13 and 14, 15 and 16, 17 and 18, 19 - four groups of signal output, if there's no optional signal unit, the pin will be empty;

20 - Grounding wire of controller;

21, 22, 23, 24 - Voltage signal input end (N, A, B, C, respectively). When the power distribution system is three-phase three-wire system, 21, 23 shall be short connected to U2. When it is three-phase four-wire system, wire according to the wiring diagram. If there's no optional voltage function, the pin will be empty;

25, 26 - When it is 3P+N, N-phase transformer output end or ZCT1 output end, ZT100 output end or the input end of remote reset function, can only choose one;

27 - Communication shielding ground wire;

28, 29 - Communication interface, 28 for red (+), and 29 for green (-);

30, 31, 32 - Electric energy storage and enrgy storage indication;

33, 34 - Under-voltage tripper;

35, 36 - Shunt tripper;

37, 38 - Closed electromagnet;

39-62 - Connecting terminals of auxiliary switch;

SB2 - Undervoltage button (to be prepared by users);

SB5 - Remote reset button (to be prepared by users);

SA1 - Motor travel switch;

SA2 - Closing ready travel switch;

SA3 - Undervoltage indicating travel switch;

SA4 - Fault tripping travel switch;

SA5 - Opening and closing indicating travel switch;

XT - Secondary terminal;

F - Shunt tripper;

B - Closed electromagnet;

Q - Undervoltage (instantaneous or delayed) tripper;

YF - Remote reset;

T - Auxiliary contact of the circuit breaker (see attached figure);

Fu - Fuse (to be prepared by users);

M - Energy storage motor.

Note:

1. The current state of the circuit breaker is de-energized, disconnected, connected, no energy stored;

2. The dashed part shall be wired by users;

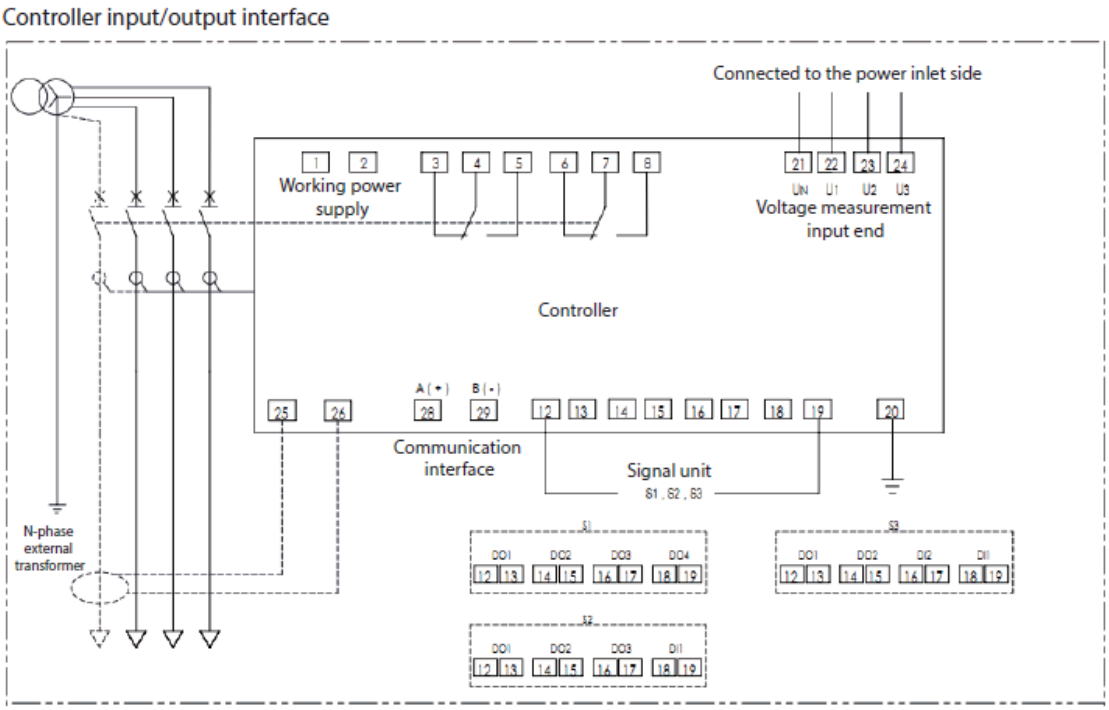
3. Power supply - when Q, F, B, M, controllers power supply is not the same, they shall be powered on respectively;

4. When the current of the main circuit is less than 0.4 In, terminal 1 and 2, must be connected to the auxiliary power supply;

5. The schematic diagram is suitable for products with the communication function.

6. The secondary terminal of our company is only suitable for 0.5-1.0mm^2 flexible copper wire or hard copper wire, and it is recommended to use flexible copper wire. Please pay attention to the suitable wire.

The following chart shows the input/output interface of controller



12, 13 - Signal contact 1, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

14, 15 - Signal contact 2, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

16, 17 - Signal contact 3, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

18, 19 - Signal contact 4, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

20 - Grounding wire of controller;

21, 22, 23, 24 - Voltage signal input end; when the power distribution system is three-phase three-wire system, 21 and 23 shall be short connected to U2;

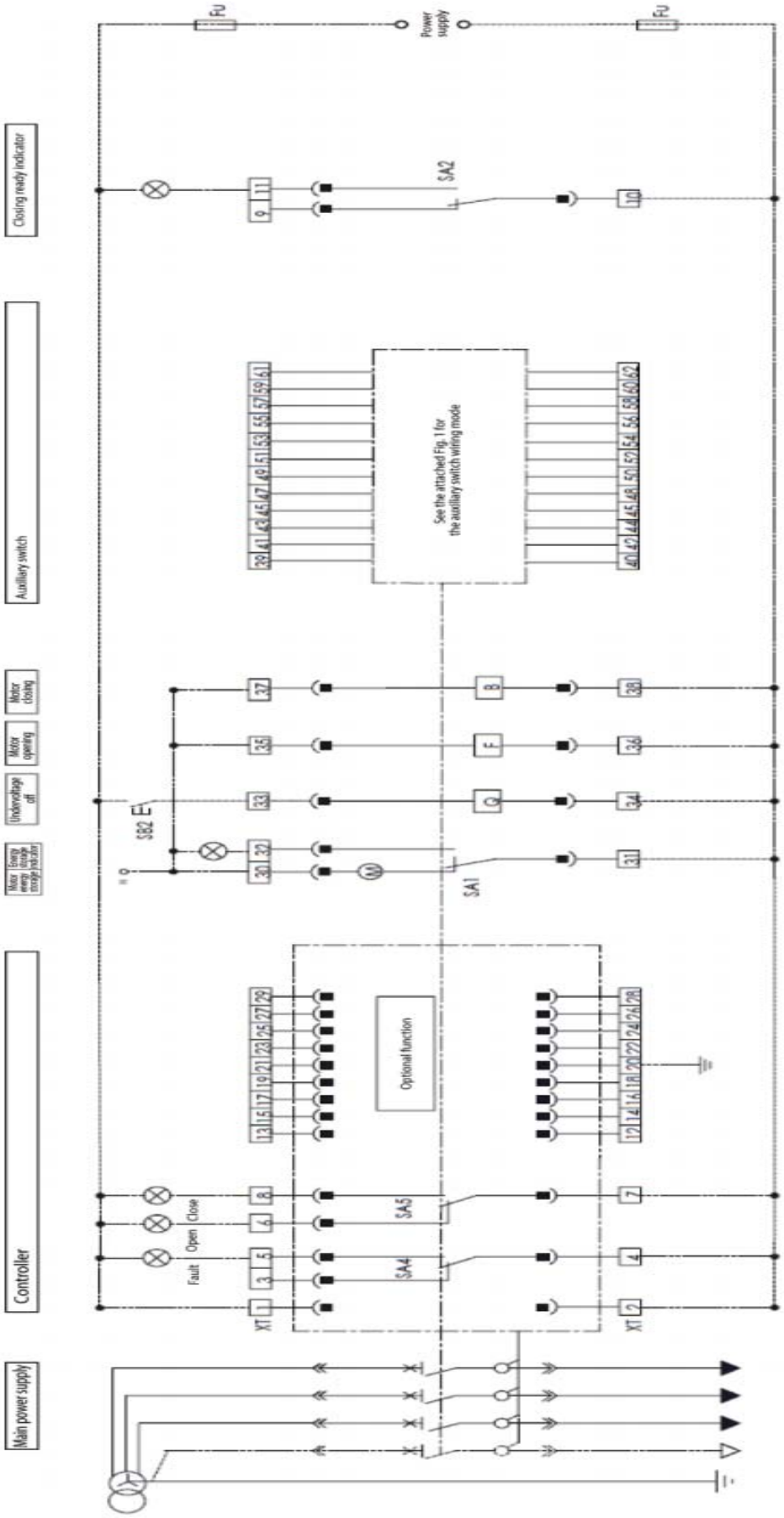
25, 26 - Input used for external transformer if there's an external transformer. When the grounding protection mode is 3P+N differential type, this pin will be the output end of the external N-phase transformer; when the external transformer is ZT100 or ZCT1, this pin will be the input end of the external transformer;

27 - Communication shielding ground wire.

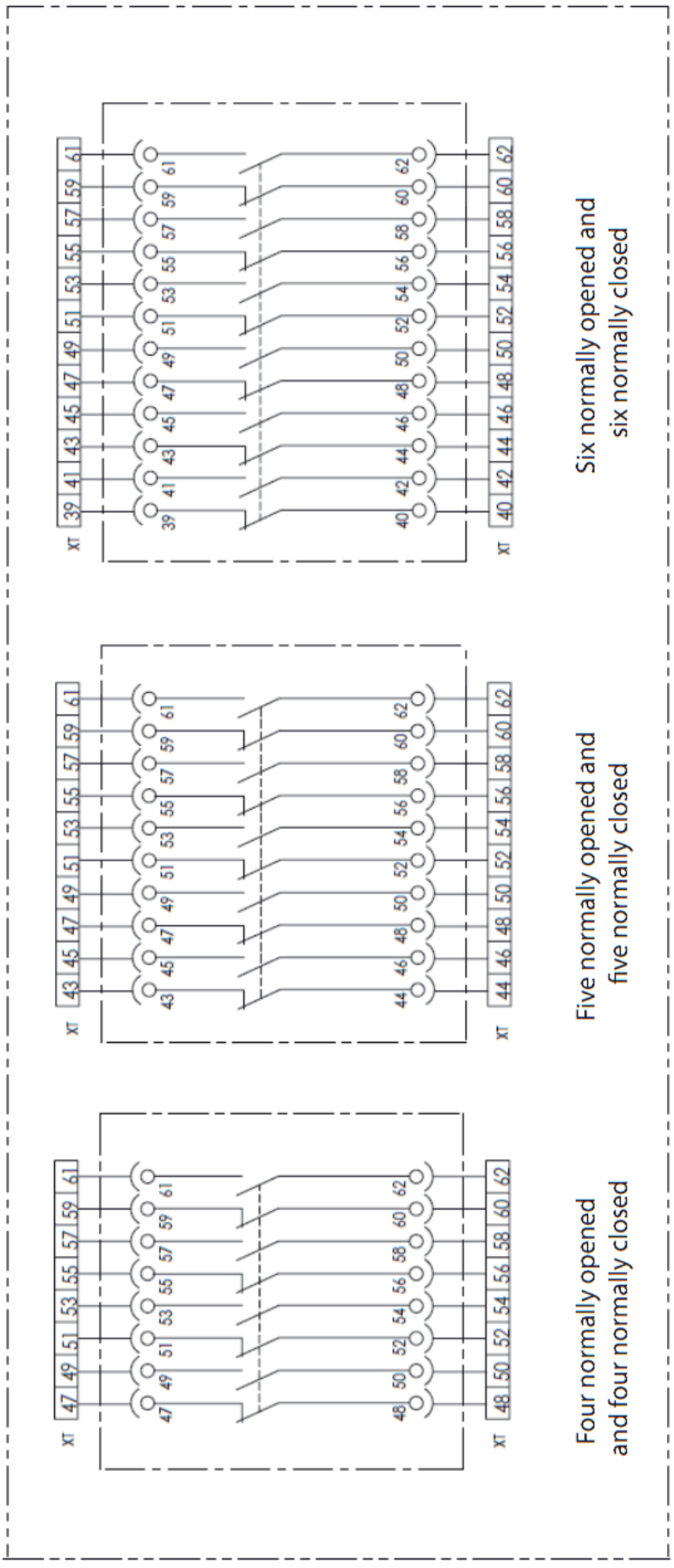
28, 29 - Communication interface, 28 for red (+), and 29 for green (-);

Note: All the signal units are passive signals. Users can choose S1, S2, S3 modes as required.

The following is the simple circuit diagram

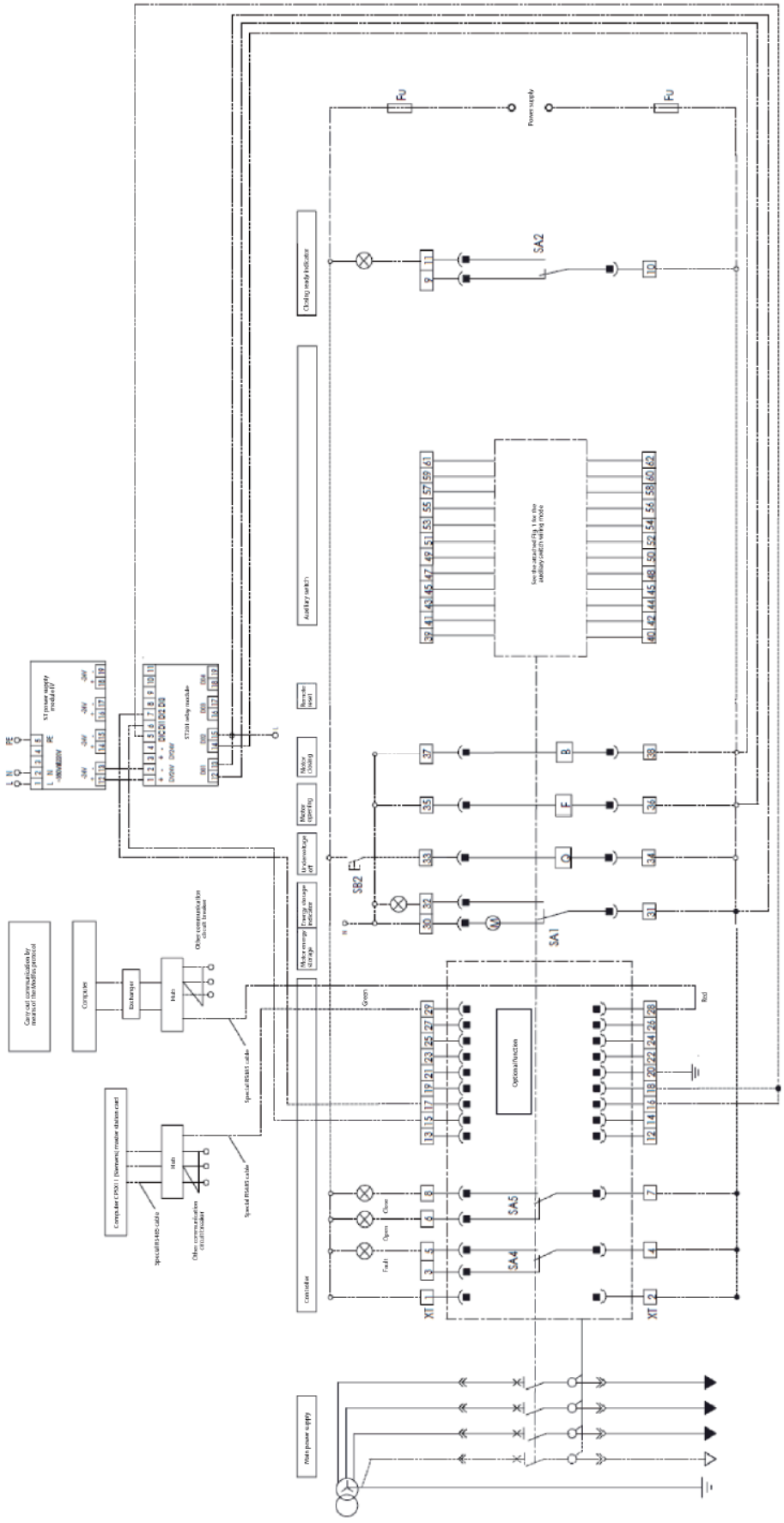


NDW2-2000/3200/6300 Auxiliary switch wiring mode



NDW2-4000 Electric Circuit Diagram

The following diagram is the full-function circuit diagram



1, 2 - Working power supply;

3, 4, 5 - Fault tripping contact output (4 for public end), contact capacity of AC250V/16A;

6, 7, 8 - Opening and closing contact output (7 for public end), contact capacity of AC250V/16A;

9, 10, 11 - Closing ready electric indication;

12, 13 and 14, 15 and 16, 17 and 18, 19 - four groups of signal output, if there's no optional signal unit, the pin will be empty;

20 - Grounding wire of controller;

21, 22, 23, 24 - Voltage signal input end (N, A, B, C, respectively). When the power distribution system is three-phase three-wire system, 21, 23 shall be short connected to U2. When it is three-phase four-wire system, wire according to the wiring diagram. If there's no optional voltage function, the pin will be empty;

25, 26 - When it is 3P+N, N-phase transformer output end or ZCT1 output end, ZT100 output end or the input end of remote reset function, can only choose one;

27 - Communication shielding ground wire;

28, 29 - Communication interface, 28 for red (+), and 29 for green (-);

30, 31, 32 - Electric energy storage and enrgy storage indication;

33, 34 - Under-voltage tripper;

35, 36 - Shunt tripper;

37, 38 - Closed electromagnet;

39-62 - Connecting terminals of auxiliary switch;

SB2 - Undervoltage button (to be prepared by users);

SB5 - Remote reset button (to be prepared by users);

SA1 - Motor travel switch;

SA2 - Closing ready travel switch;

SA3 - Undervoltage indicating travel switch;

SA4 - Fault tripping travel switch;

SA5 - Opening and closing indicating travel switch;

XT - Secondary terminal;

F - Shunt tripper;

B - Closed electromagnet;

Q - Undervoltage (instantaneous or delayed) tripper;

YF - Remote reset;

T - Auxiliary contact of the circuit breaker (see attached figure);

Fu - Fuse (to be prepared by users);

M - Energy storage motor.

Note:

1. The current state of the circuit breaker is de-energized, disconnected, connected, no energy stored;

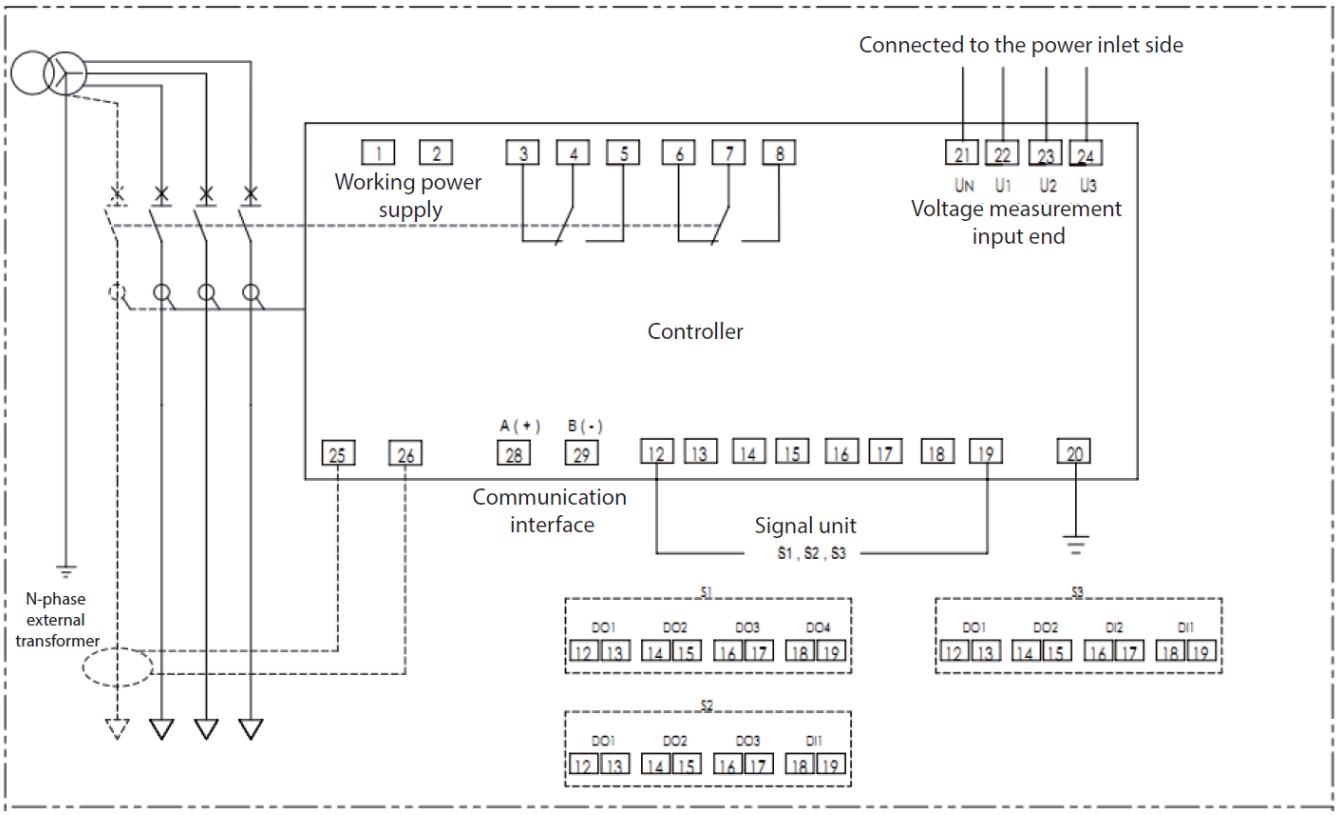
2. The dashed part shall be wired by users;

3. Power supply - when Q, F, B, M, controllers power supply is not the same, they shall be powered on respectively;

4. When the current of the main circuit is less than 0.4 In, terminal 1 and 2, must be connected to the auxiliary power supply.

5. The secondary terminal of our company is only suitable for 0.5-1.0mm^2 flexible copper wire or hard copper wire, and it is recommended to use flexible copper wire. Please pay attention to the suitable wire.

The input/output interface of NDW2-4000 controller



12, 13 - Signal contact 1, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

14, 15 - Signal contact 2, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

16, 17 - Signal contact 3, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

18, 19 - Signal contact 4, contact capacity: AC250V/5A; DC110V/0.5 A, optional function;

21, 22, 23, 24 - Voltage signal input end; when the power distribution system is three-phase three-wire system, 21 and 23 shall be short connected to U2.

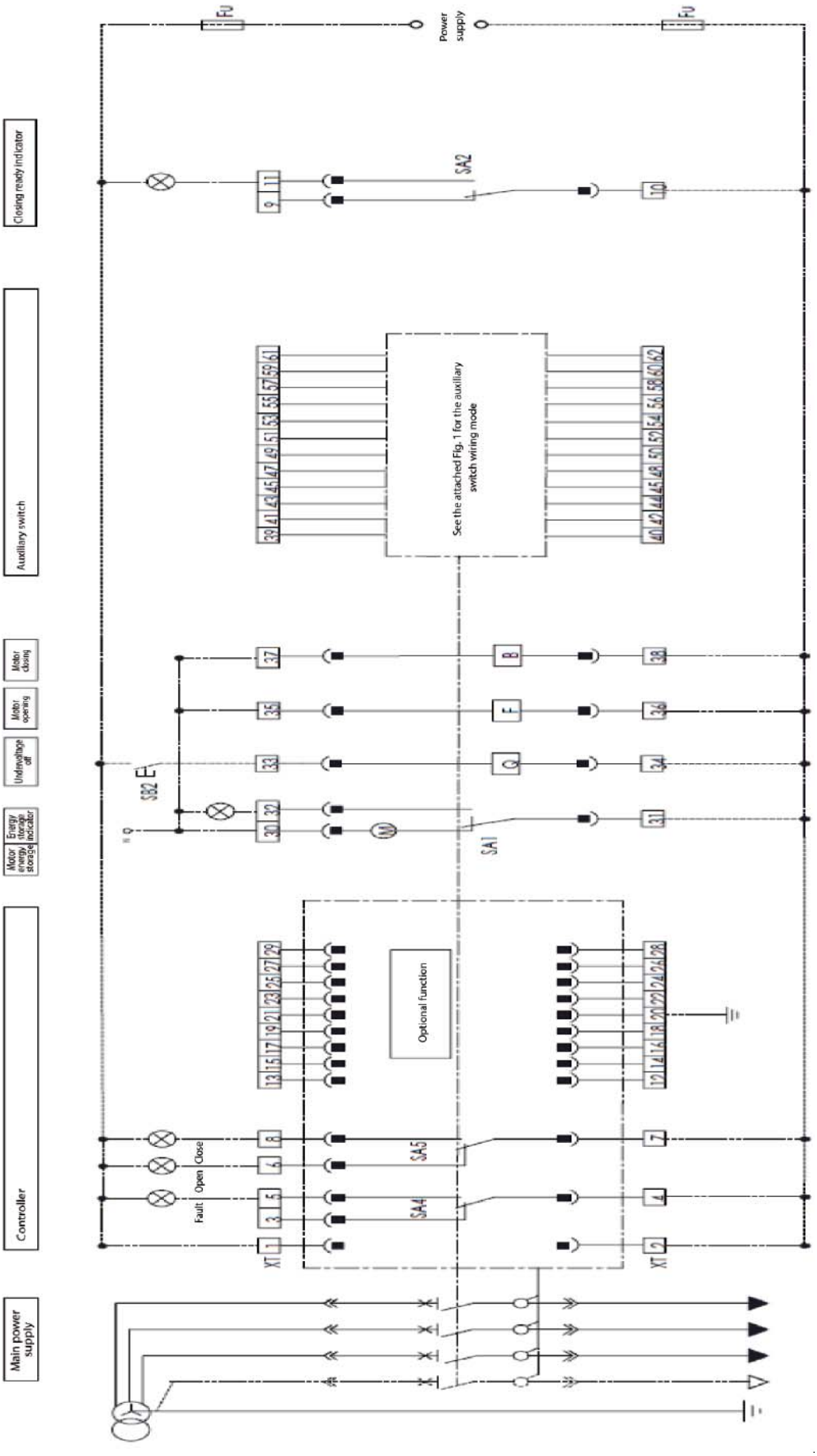
25, 26 - Input used for external transformer if there's an external transformer. When the grounding protection mode is 3P+N differential type, this pin will be the output end of the external N-phase transformer; when the external transformer is ZT100 or ZCT1, this pin will be the input end of the external transformer;

27 - Communication shielding ground wire;

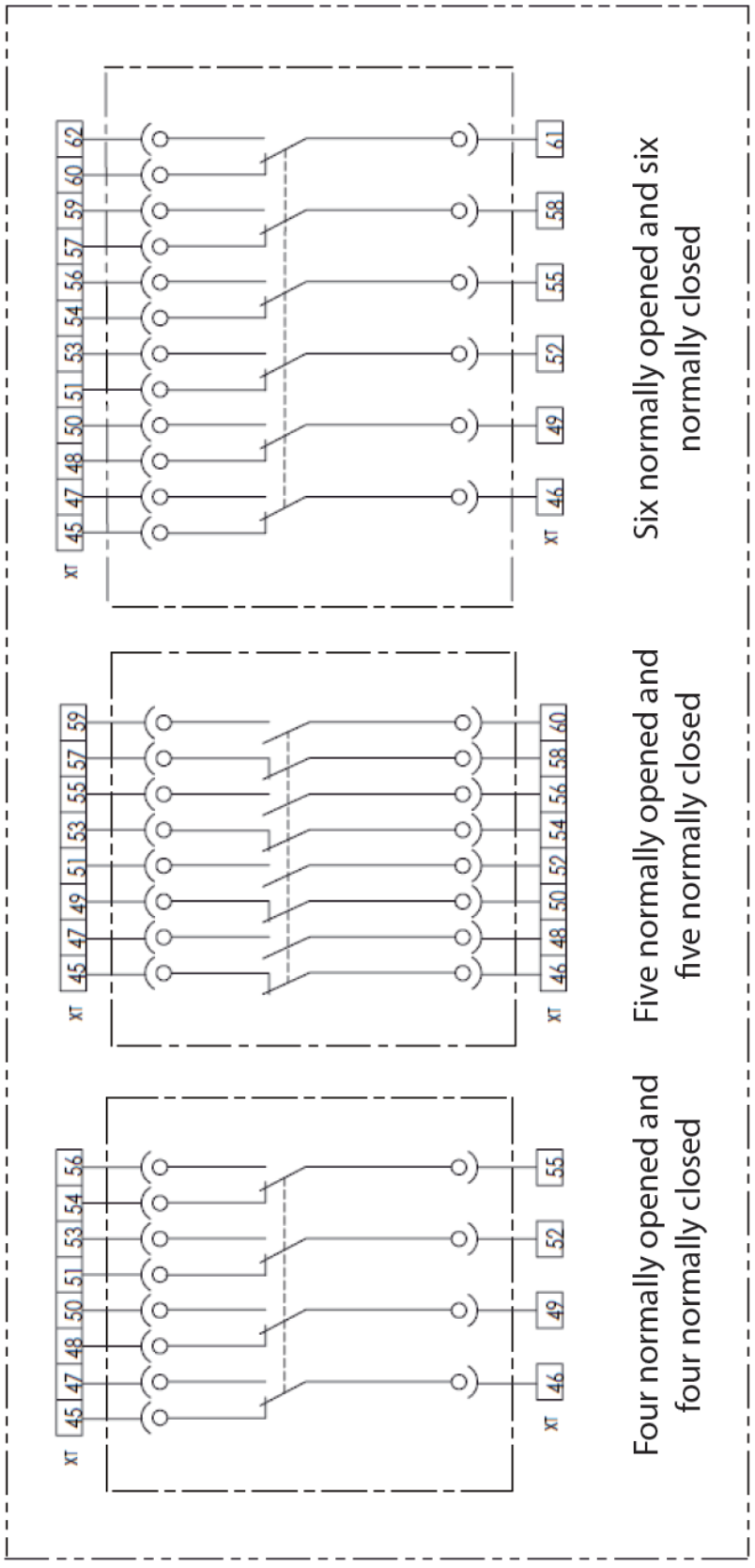
28, 29 - Communication interface, 28 for red (+), and 29 for green (-);

39, 40 - Remote reset of controller.

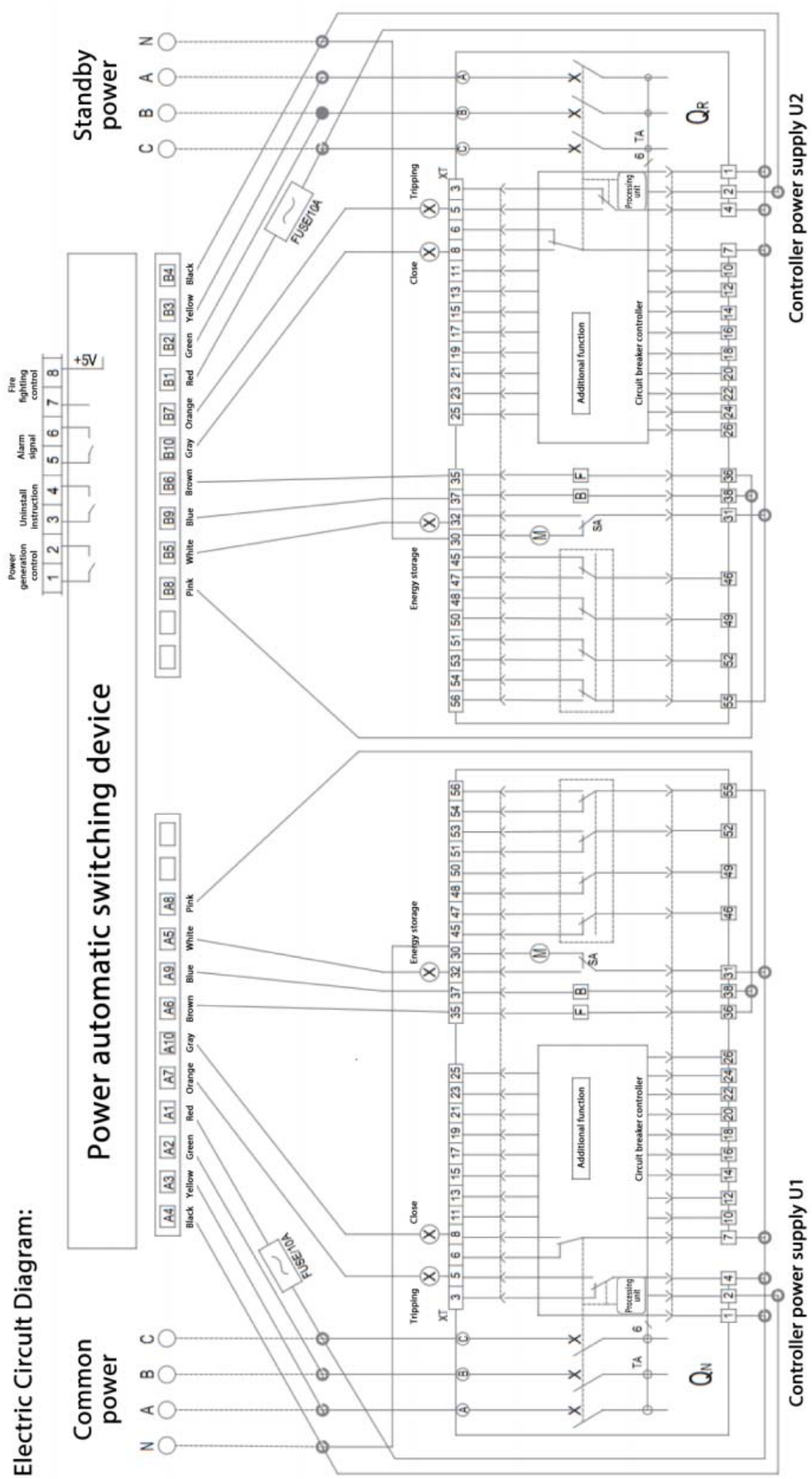
The following is the simple circuit diagram



NDW2-4000 Auxiliary switch wiring mode



Power source automatic switching control equipment (ATS) wiring diagram



QN - Frequently-used power supply universal low-voltage circuit breaker

QN - Standby power supply universal low-voltage circuit breaker

XT - Secondary wiring terminal

M - Energy storage motor

SA - Motor travel switch

F - Shunt tripper

B - Closed electromagnet

Q - Undervoltage tripper.

Note: 1. The dashed part shall be wired by users;

2. 1600 shell product normally closed contact 3-4 and 6-7 adjustment to 4-5 and 7-8;

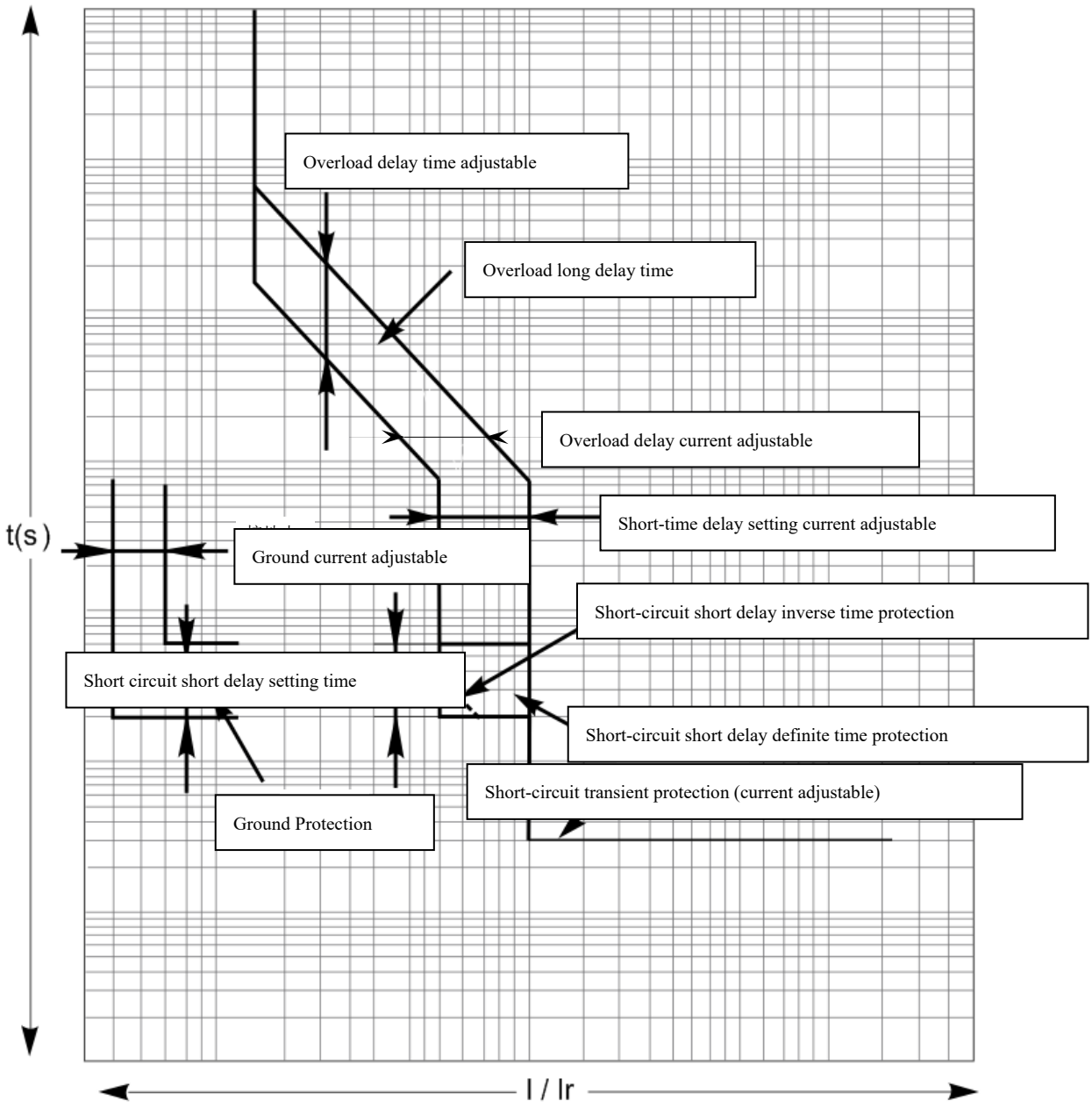
3. Controller, F, B, M rated voltage shall be AC230V;

4. For electrical accessories, Q (undervoltage tripper) cannot be selected;

5. For other wiring modes, see the circuit breaker sample electric wiring diagram.

9. Tripping Curve

Overload protection characteristic curve



Please refer to the controller instruction manual "NWK21, NWK31 Controller Operation Manual" and "NWK22, NWK 32 Controller Operation Manual" for details of the controller's protection characteristic curve.

10. Ordering type selection specification

NDW2 Series of Circuit Breaker Model Explanation and Encoding Rules

ND W 2- □ □ □/ □/ □ □/□ □ □ □ □ □/ □ □/ □/ □ /□
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Serial No.	Enterprise Name	Specification, type code	Description
1	Enterprise code	ND-Nader 良信电器	
2	Product code	W - universal circuit breaker	
3	Design code	2	
4	Shell frame level current	1600, 2000, 3200, 4000, 6300	
5	Installation structure	Non-marked - fixed type, C - drawout type	
6	Rated current	200A, 400A, 630A, 800A, 1000A, 1250A, 1600A, 2000A, 2500A, 2900A, 3200A, 4000A, 5000A, 6300A	
7	Number of poles	3-3 poles, 4-4 poles, 5-3P+N	3P+N products need to be added N-phase external transformer
8	Controller	KM1- NWK31/NWK21(AC380V/AC400V) KM2- NWK31/NWK21(AC220V/AC230V) KM3- NWK31/NWK21(DC220V) KM4- NWK31/NWK21(DC110V) KM5- NWK31/NWK21(AC24V/DC24V)	
		KY1- NWK31/NWK22(AC380V/AC400V) KY2- NWK31/NWK22(AC220V/AC230V) KY3- NWK31/NWK22(DC220V) KY4- NWK31/NWK22 (DC110V) KY5- NWK31/NWK22(AC24V/DC24V)	
9	Optional functions of controller	Protection type: Not-standard - conventional type, V - voltage measurement and protection, P - harmonic measurement and protection	◆ This shall be omitted if the controller has no optional function; ◆ NWK21 controller only has S1-4DO; ◆ NDW2-1600 has no remote
		Communication function: H (communication protocol: Modbus) MP(communication protocol: Profibus) MD(communication protocol: Devocement)	
		Signal unit: S1- 4DO; S2- 3DO, 1DI; S3-2DO, 2DI	
		Remote reset function: Z2(AC220V/AC230V), Z3(DC220V), Z4(DC110V) Z5(DC24V)	
		Contact wear equivalent, operation times query (NWK31/NWK21 optional): J	

			reset.
10	Electric energy storage mechanism	D1-AC380V/AC400V, D2-AC220V/AC230V, D3-DC220V, D4-DC110V	
11	Shunt tripper	F1-AC380V/AC400V, F2-AC220V/AC230V, F3-DC220V, F4-DC110V, F5-DC24V	6300 shell frame Cannot Choose "DC 24V"
12	Closed electromagnet	B1-AC380V/AC400V, B2-AC220V/AC230V, B3-DC220V, B4-DC110V,B5-DC24V	
13	Undervoltage tripper	Q1-AC380V/AC400V, Q2-AC220V/AC230V, Q3-DC220V, Q4-DC110V,Q5-DC24V	
14	Undervoltage tripper delay time	0-Instantaneous, 1-1s delay, 3-3s delay, 5-5s delay	This shall be omitted if without this accessory
15	Auxiliary contact	Not-marked - four groups conversion, A6 - six groups conversion	Applicable to 1600 shell frame
		Not-marked - four groups conversion, A6 - six groups conversion, A44 - four normally closed and four normally opened	Applicable to 4000 shell frame
		Not-marked - four normally opened and four normally closed, A55 - five normally opened and five normally closed, A66 - six normally opened and six normally closed	Applicable to 2000, 3200, 6300 shell frame
16	Internal Accessories	SF11 - key lock device (one lock and one key), SF21 - key lock device (two locks and one key), SF31 - key lock device (three locks and one key), SF32 - key lock device (three locks and two keys), SF53 - key lock device (five locks and three keys)	1. Select one from five key locks; 2. Select one from five mechanical interlocks; 3. This shall be omitted if without accessory; 4. Carry out the sequence arrangement according to the table, with "/" for separation.
		SR11 - Mechanical interlocking device (two sets of steel cables, one for close and one for open) SR12 - Mechanical interlocking device (three sets of steel cables, one for close and two for open) SR21 - Mechanical interlocking device (three sets of steel cables, two for close and one for open) SY11 - Mechanical interlocking device (two sets of hard rods, one for close and one for open) SY12 - Mechanical interlocking device (three sets of hard rods, one for close and two for open)	
		BX - Closing ready signal output unit.	
		JS - Counter functional unit.	
		CM1 - Drawout type (with the right side of the door interlock); CM2 - drawout type (with the left side of the door interlock).	
17	External	M - Doorframe	1. ST-IV power

	Accessories	G - Phase partition (NDW2-4000 standard configuration)		supply module and ST201 relay module should be used with the controller; 2. Carry out the sequence arrangement according to the table, with "/" for separation.
		F - Dust cover		
		R- ST201 relay module		
		P - ST-IV power supply module (AC380V/AC400V, AC220V/AC230V)		
		N1 External N-pole transformer (62*21)	Applicable to 1600 shell	
		N2 External N-pole transformer (102*32.5)	Applicable to 1600,2000 shell	
		N3 External N-pole transformer (122*52)	Applicable to 2000,3200,4000,6300 shell	
		N4 External N-pole transformer (262*102)	Applicable to 3200,4000,6300 shell	
		External current leakage transformer	Applicable to 2000,3200,4000,6300 shell	
18	Wiring mode	Not-marked - horizontal wiring, J1 - extended horizontal wiring, J2 - L-type wiring, J3 - vertical wiring, J4 - extended vertical wiring, J5 - mixed (upper horizontal and lower vertical) wiring, J6 - mixed (upper vertical and lower horizontal) wiring		
19	Product usage type	Not-marked - Conventional; FD - Wind power, plateau; TH - Thermal and humidity; DL - Electric power; KV - AC1000V; ATS-R/S/F: Power supply automatic switching device products		
20	Special users	Not-marked - No; AMS - Emerson; ...		

11. Ordering specification

(Please fill in numbers in _____, and check □. Related content can be found in the Manual)

User unit			Number of units ordered:	Date of ordering:
Shell frame level		☐ NDW2-1600 ☐ NDW2-2000 ☐ NDW2-3200 ☐ NDW2-4000 ☐ NDW2-6300		
Rated current (A)		☐200 ☐400 ☐630 ☐800 ☐1000 ☐1250 ☐1600 ☐2000 ☐2500 ☐2900 ☐3200 ☐4000 ☐5000 ☐6300		
Rated operational voltage (V)		☐AC220V/230V ☐AC380V/400V ☐AC415V ☐AC660V/690V ☐AC1000V (4000 shell frame special order)		
Number of poles		☐3 (3-pole) ☐4 (4-pole) ☐ 5 (3P+N)		
Installation structure		□ Fixed type (6300 shell frame without fixed structure) □ C Drawout type		
Wiring mode	1600 shell frame	□ Horizontal wiring □ J1 Horizontal extended wiring □ J3 Vertical wiring □ J5 Mixed wiring (upper horizontal, lower vertical) □ J6 Mixed wiring (upper vertical, lower horizontal)		
	2000 shell frame	□ Horizontal wiring □ J1 Horizontal extended wiring □ J2 L-type wiring □ J3 Vertical wiring		
	3200 shell frame	□ Horizontal wiring □ J1 Horizontal extended wiring □ J2 L-type wiring (In≥2500A) □ J3 Vertical wiring		
	4000 shell frame	□ Horizontal wiring □ J1 Horizontal wiring (extended) □ J3 Vertical wiring □ J4 Vertical wiring (extended)		
	6300 shell frame	□ Horizontal wiring		
Required Appendixes (Standard configuration)	Controller	□ KM-NWK31/NDWK21(digital screen) □ KY-NWK32/NWK22(LCD)		
		□1(AC380V/400V) □2(AC220V/AC230V) □3(DC220V) □4(DC110V) □5(AC24V/DC24V)		
	Electric operating mechanism	□D1(AC380V/AC400V) □D2(AC220V/AC230V) □D3(DC220V) □D4(DC110V)		
	Shunt tripper	□F1(AC380V/AC400V) □F2(AC220V/AC230V) □F3(DC220V) □F4(DC110V) □F5(DC24V)		
	Closed electromagnet	□B1(AC380V/AC400V) □B2(AC220V/AC230V) □B3(DC220V) □B4(DC110V) □B5(DC24V)		
	Auxiliary contact	□ Four groups conversion □A6 - six groups conversion	Applicable to 1600 shell frame	
		□ Four groups conversion □A6 - six groups conversion □A44 - Four normally opened and four normally	Applicable to 4000 shell frame	
		□ Four normally opened and four normally □ A55 - five normally opened and five normally closed □ A66 - six normally opened and six normally closed	Applicable to 2000,3200,6300 shell frame	
Controller optional functions	functions	□ V - Voltage measurement and protection type □ P - Harmonic measurement and protection type		
	Communicating functions	□ H（Modbus） □ MP（Profibus） □ MD（Devicenet）		
	Contact equivalent	□ J-Contact wear equivalent, operation times query		
	Signal element	□ S1-4DO □S2-3DO, 1DI □S3-2DO, 2DI		
	Remote reset	□ Z2-AC220V/AC230V □ Z3-DC220V □ Z4-DC110V □ Z5-DC24V		

	Protection function		□ (3P+N) T - Differential type □ (3P+N) W - earth current □ E - Current leakage protection (optional for the external N-phase transformer)
	DC controller		□ KM3(DC220V) □ KM4(DC110V) □ KY3(DC220V) □ KY4(DC110V)
Optional functions Accessories	Undervoltage tripper		□ Q1(AC380V/AC400V) □ Q2(AC220V/AC230V) □ Q3(DC230V) □ Q4(DC110V) □ Q5(DC24V)
			□ 0-Instantaneous (0s) Delay: □1 (1 s delay) □3 (3 s delay) □5 (5 s delay)
	Signal output function		□ BX-Closing ready
	Power supply module		□ ST-IV1 (AC380V/AC400V) □ ST-IV2(AC220V/AC230V) Description: To be used with ST201 system
	Relay module		□ ST201 (Note: To be used with ST-IV, for "four remote" function.)
	External N-pole transformer		□ N1 External N-pole transformer □ N2 External N-pole transformer □ N3 External N-pole transformer □ N4 External N-pole transformer
	External current leakage transformer		□ E External current leakage transformer
	Off-position key lock		□ SF11-One lock one key □ SF21-Two locks one key □ SF31-Three locks one key □ SF32-Three locks two keys □ SF53-Five locks three keys
	Doorframe		□ M Doorframe
	Phase partition		□ G Phase partition (NDW2-4000 standard configuration)
	Dust cover		□ F Doorframe
	Tally function		□ JS-Dust cover
	Drawer seat function		CS drawout triolocation lock and unlock devices (drawout circuit breaker standard configuration)
			□ CM1-Right door interlock □ CM2-Left door interlock
	Mechanical interlocking	Cable type	□ SR11-Two groups, one for close and one for open □ SR12-Three groups, one for close and two for open □ SR21-Three groups, two for close and one for open
		Hard rod type	□ SY11- Two groups, one for close and one for open □ SY12-Three groups, one for close and two for open
			Note: NDW2 - 1600 shell frame product does not support the interlocking way of two-opening and one-closing.
	Power supply automatic switching device		□ ATS-R type □ ATS-S type □ ATS-F type Note: 1. Please select a type if mechanical interlocking is included,; 2. There's no need to select undervoltage tripper if undervoltage protection is included; 3. The rest required accessories shall be equipped with AC220V working voltage.
Special usage occasions			□ FD-Wind power, plateau □ TH-Thermal and humidity □ DL-Electric power □ Power supply automatic switching device products(ATS)
Special requirements			

Note: 1. In case of no special requirements, the current and time setting value of controller shall be set according to the factory setting;
2. If you have special requirements, please indicate in the special requirements column.