NDW3 Series
Air Circuit Breaker Product Specification

Project Name: NDW3 Series of Universal Circuit Breaker

Project No.: P05009

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Contents

Chapter 1 Product Overview

Product Overview 1

1.1 NDW3 Product Series


NDW3-1600


NDW3-2500

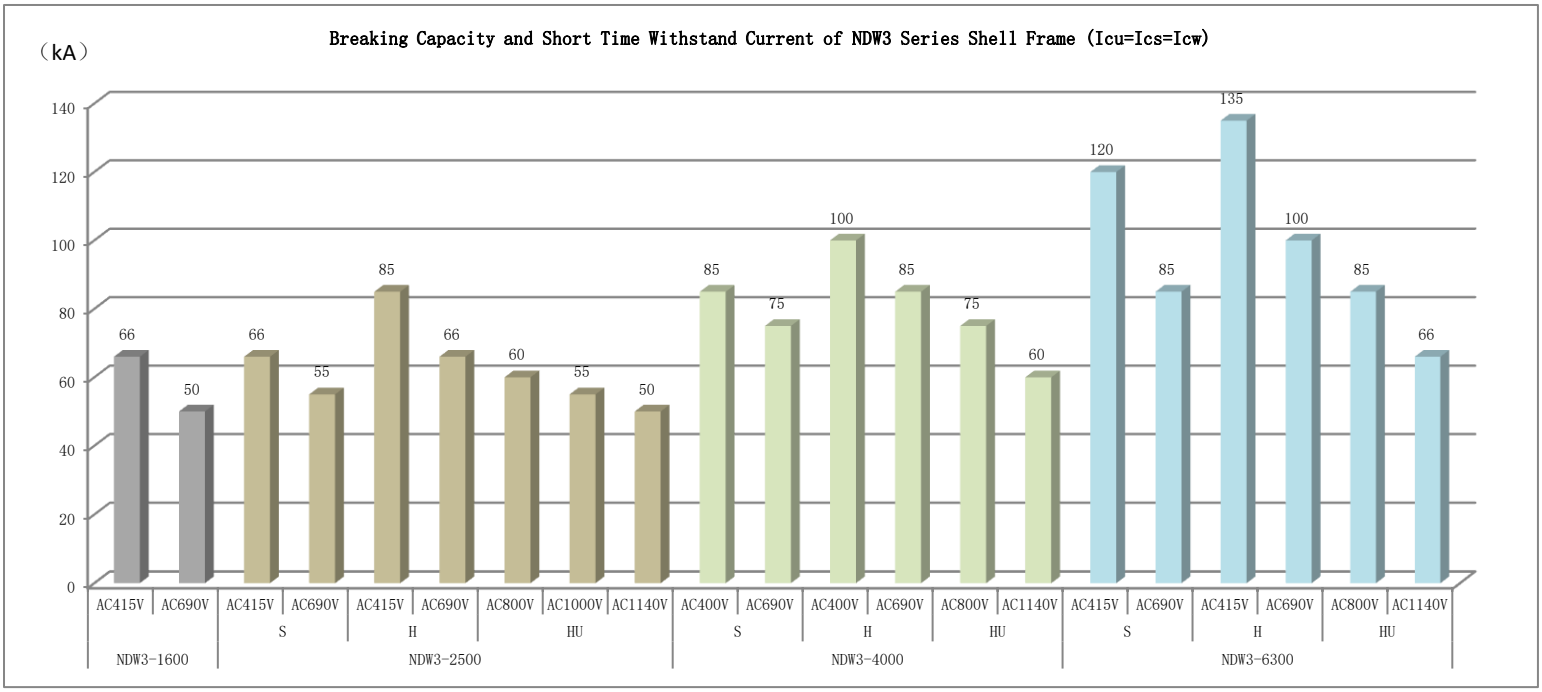

NDW3-4000


NDW3-6300

1.2 Rated Current of NDW3 Series Circuit Breaker

Rated current (A) / Shell frame level	200	400	630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300
NDW3-1600													
NDW3-2500													
NDW3-4000													
NDW3-6300													

1.3 Breaking Capacity and Short Time Withstand Current of NDW3 Series Circuit Breaker



Note:1) S-Conventional breaking, H-High breaking, HU-High voltage breaking. NDW3-1600 only has one breaking capacity, which is not distinguished;

2) Icu＝Ics＝Icw for NDW3-2500, 4000, 6300. For details of NDW3-1600 breaking indicators, see NDW3-1600 technical parameter list.

1.4 Structure Design

■ Installation Structure

Fixed type

Drawout type

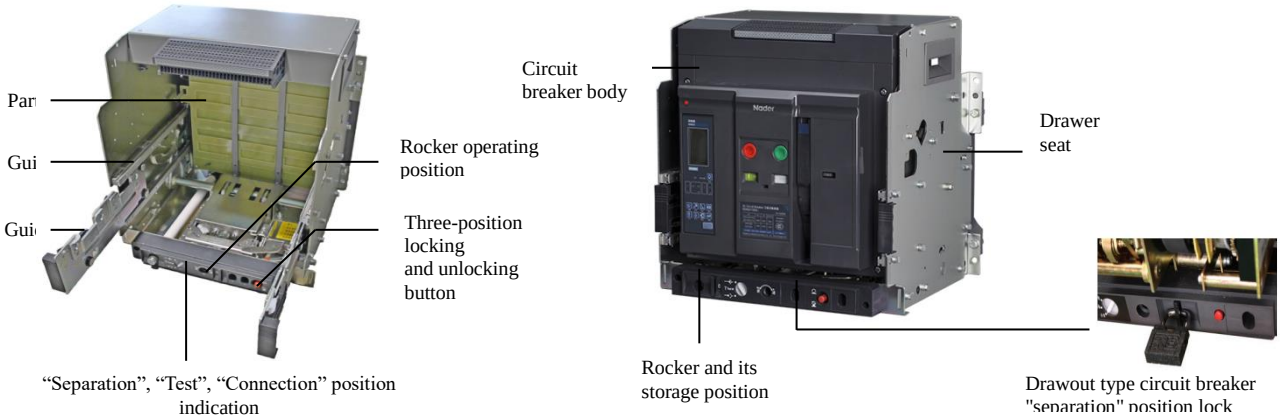
■ Brief Description of Structure and Indications

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

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

■ 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.



◆ Drawout type circuit breaker "separation" position lock:

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

◆ Drawout three-position lock:

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

When the handle shakes, the circuit breaker will be locked respectively in these three positions, and unlocked only through the reset button (red).

1.5 Product Features

1.5.1 Efficient arc extinguishing and breaking

■ 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 designs and 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.

■ Zero flashover.

1.5.2 High electrical life and short time tolerance ability

The body design adopts high strength reinforced moulded plastics, and has extremely high impact strength and insulating properties. The design of the arcing contact structure improves the electric life of products; the greatly optimized design of the contact system and operating mechanism realizes compensation to the contact pressure, and improves the product reliability and short time tolerance ability with more strength of the metal structure.

1.5.3 The controllers are of full range and versatile

■ NWK21/NWK31 type controller - Digital tube display, practical function and simplicity, which can adapt to the low-temperature places with the optional voltage measurement function;

■ NWK22/NWK32 type controller - 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, neutral line N-pole protection, current unbalance protection, MCR 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, realize remote recovery (optional accessories) after fault tripping of the controller.

1.5.4 Integrated communication network

The NWK22/NWK32 type controller can realize remote sensing, remote control, remote regulating and remote communication - "four remotes" data transmission function through the communication interface (to be used with the communication adapter and signal unit).

With the communication adapter, realize the conversion of DeviceNet and Profibus-DP protocols for data transmission.

1.5.5 AC 1140V circuit breaker

The HU (AC1140V) type circuit breaker is selected, which can be used in the power distribution system in special fields such as metallurgy, rail transportation, pipe gallery, energy saving and environmental protection.

1.5.6 Three-proofing circuit breaker

The TH (thermal-humidity) type circuit breaker can be selected to meet the three-proofing requirements, 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 (12h + 12h 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;

■ Salt spray test: GBT 2423.18-2012 Environmental Testing for Electric and Electronic Products. Part 2: Test Method Test Kb: Salt Spray;

■ Enclosure protection grade: GB/T 4208-2008 Enclosure Protection Grade (IP code).

1.5.7 Convenient installation

■ Upper and lower wiring of the main circuit is available;

■ Connection mode.

Wiring mode		NDW3-1600	NDW3-2500	NDW3-4000	NDW3-6300
Conventional	■ Horizontal wiring ■ Vertical wiring	√	√	√	√
Special	■ Horizontal extended wiring ■ Vertical extended wiring	—	√	√	√
	■ Mixed wiring (upper horizontal, lower vertical) ■ Mixed wiring (upper vertical, lower horizontal)	√	√	—	√

	■ Mixed extended wiring (upper horizontal, lower vertical) ■ Mixed extended wiring (upper vertical, lower horizontal)	—	√	—	√

Annotation:6300A of NDW3-6300 only have two wiring modes: vertical wiring、vertical extended wiring.

1.5.8 Multiple safety protection devices

It has drawout type circuit breaker door interlocking, drawout type three-position locking and unlocking device and off-position key lock, connection terminal protective cover and other protection devices.

1.6 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 14048.1-2012 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;

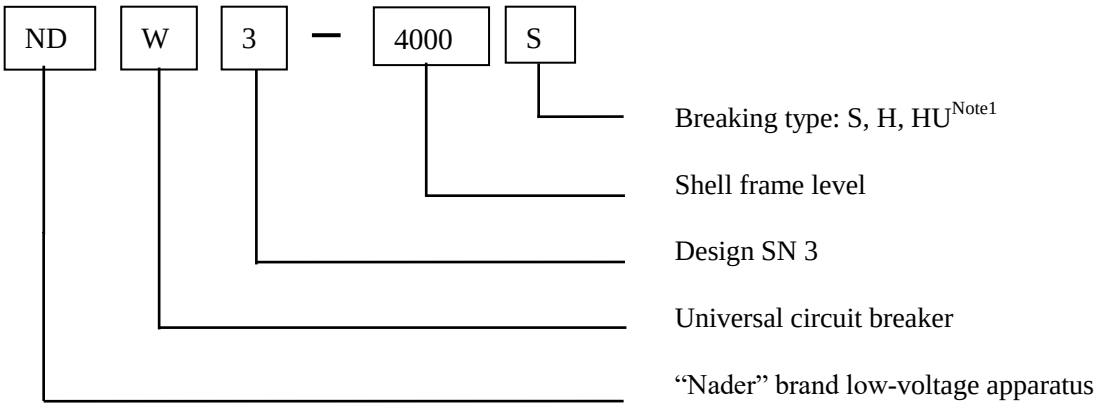
GB/T 20645-2006 Specific Environmental Condition - Technical Requirements of Low-voltage Apparatuses for Plateau;

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

NDW3 series of universal circuit breaker has obtained China Compulsory Certification (CCC) for products.

1.7 Product Model

Description of the certification model:



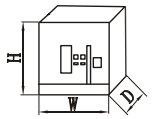
Note: 1. S-Conventional breaking, H-High breaking, HU-High voltage breaking. NDW3-1600 only has one breaking capacity, which is not distinguished;

2. For details of the product ordering models and specifications, see Chapter 8.

Chapter 2 Technical Characteristics

Technical Characteristics 2

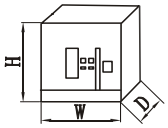
2.1 NDW3-1600 Technical Parameter List

Circuit breaker model			NDW3-1600	
Rated current In (+40℃).....(A)			200, 400, 630, 800, 1000, 1250, 1600	
North pole rated current			100%In	
Rated working voltage Ue.....(V)			AC220/230/240, AC380/400/415, AC440/480, AC660/690	
Rated frequency f .....(Hz)			50/60	
Rated insulation voltage Ui .....(V)			1000	
Rated impulse withstand voltage Uimp.....(kV)			12	
Number of poles.....pole			3, 4	
Full break time[Note 1] .....(ms)			＜25	
Closing time[Note 2] .....(ms)			＜60	
Rated limit short-circuit breaking capacity Icu (effective value) (kA)		AC220V/230V/240V AC380V/400V/415V	66	
		AC440V/480V AC660V/690V	50	
Rated operating short-circuit breaking capacity Ics (effective value) (kA)		AC220V/230V/240V AC380V/400V/415V	55	
		AC440V/480V AC660V/690V	42	
Rated short circuit making capacity Icm (peak value) (kA)		AC220V/230V/240V AC380V/400V/415V	145	
		AC440V/480V AC660V/690V	105	
Rated short-time withstand current Icw (effective value) 1s (kA)		AC220V/230V/240V AC380V/400V/415V	50	
		AC440V/480V AC660V/690V	42	
Operating performance	Electrical life (times) Operation frequency (20 times/h)	AC220V/230V/240V AC380V/400V/415V	15000 (200A~630A)、9000 (800A~1250A)、6500 (1600A)	
		AC440V/480V AC660V/690V	15000 (200A~630A)、5000 (800A~1250A)、3000 (1600A)	
	Mechanical life (times) Operation frequency (60 times/h)	Maintenance-free	15000	
		With maintenance	30000	
Installation type		Fixed type, drawout type		
Wiring method of the main circuit		Horizontal wiring, vertical wiring, mixed wiring (upper horizontal and lower vertical), mixed wiring (upper vertical and lower horizontal)		
Boundary dimension: W×D×H (mm) 		Fixed type 3P	259×195×318	
		Fixed type 4P	329×195×318	
		Drawout type 3P	248×297×351.5	
		Drawout type 4P	318×297×351.5	
Weight (kg)		Fixed type 3P	22 (200A～630A)	23 (800A～1600A)
		Fixed type 4P	34 (200A～630A)	35 (800A～1600A)
		Drawout type 3P	43 (200A～630A)	44 (800A～1600A)
		Drawout type 4P	56 (200A～630A)	57 (800A～1600A)

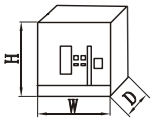
Note: 1. Full break time: Interval from the beginning of the circuit breaker disconnection to the end of the arcing time (the same below);

2. Closing time: Interval from the beginning of the circuit breaker closing to the end of the contact time for all pole contacts (the same below).

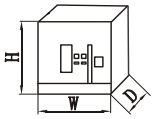
2.2 NDW3-2500 Technical Parameter List

Circuit breaker model			NDW3-2500		
Rated current In (+40℃) ..... (A)			630, 800, 1000, 1250, 1600, 2000, 2500		
North pole rated current.....			100%In		
Rated working voltage Ue..... (V)			AC220/230/240, AC380/400/415, AC440/480, AC660/690, AC800, AC1000, AC1140		
Rated frequency f..... (Hz)			50/60		
Rated insulation voltage Ui ..... (V)			1140		
Rated impulse withstand voltage Uimp ..... (kV)			12		
Number of poles ..... pole			3, 4		
Full break time..... (ms)			＜30		
Closing time..... (ms)			＜70		
Breaking type			S	H	HU
Rated limit short-circuit breaking capacity Icu (effective value) (kA)		AC220V~415V	66	85	-
		AC440V/480V/660V/690V	55	66	-
		AC800V	-	-	60
		AC1000V	-	-	55
		AC1140V	-	-	50
Rated operating short-circuit breaking capacity Ics (effective value) (kA)		AC220V~415V	66	85	-
		AC440V/480V/660V/690V	55	66	-
		AC800V	-	-	60
		AC1000V	-	-	55
		AC1140V	-	-	50
Rated short circuit making capacity Icm (peak value) (kA)		AC220V~415V	145.2	187	-
		AC440V/480V/660V/690V	121	145.2	-
		AC800V	-	-	132
		AC1000V	-	-	121
		AC1140V	-	-	110
Rated short-time withstand current Icw (effective value) 1s (kA)		AC220V~415V	66	85	-
		AC440V/480V/660V/690V	55	66	-
		AC800V	-	-	60
		AC1000V	-	-	55
		AC1140V	-	-	50
Operating performance	Electrical life (times) Operation frequency (20 times/h)	AC220V~ 415V	15000 (630A~1250A)、11500 (1600A~2000A)、11000 (2500A)		
		AC440V/480V/660V/690V	12500 (630A~1250A)、10000 (1600A~2000A)、8000 (2500A)		
		AC800V	5000(630A~2000A)、4500 (2500A)		
		AC1000V/1140V	3000(630A~2000A)、2000 (2500A)		
	Mechanical life (times) Operation frequency (60 times/h)	Maintenance-free	17000(3P)	15000(4P)	
		With maintenance	30000		
Installation type			Fixed type, drawout type		
Wiring method of the main circuit			Horizontal wiring, vertical wiring, horizontal extended wiring, vertical extended wiring, Mixed wiring (upper horizontal and lower vertical), mixed wiring (upper vertical and lower horizontal)		
Boundary dimension: W×D×H (mm) 		Fixed type 3P	368×309.5×394		
		Fixed type 4P	463×309.5×394		
		Drawout type 3P	375×393×432		
		Drawout type 4P	470×393×432		
Weight (kg)		Fixed type 3P	49.4 (630A～1250A)	50 (1600A～2500A)	
		Fixed type 4P	61.5 (630A～1250A)	62.3 (1600A～2500A)	
		Drawout type 3P	87.1 (630A～1250A)	87.4 (1600A～2500A)	
		Drawout type 4P	106.2 (630A～1250A)	106.7 (1600A～2500A)	

2.3 NDW3-4000 Technical Parameter List

Circuit breaker model			NDW3-4000		
Rated current In (+40℃) .....(A)			800, 1000, 1250, 1600, 2000, 2500, 3200, 4000		
North pole rated current			100%In		
Rated working voltage Ue.....(V)			AC220/230/240、AC380/400、AC415、AC440/480、AC660/690、AC800、AC1000/1140		
Rated frequency f .....(Hz)			50/60		
Rated insulation voltage Ui .....(V)			1140		
Rated impulse withstand voltage Uimp.....(kV)			12		
Number of poles.....pole			3, 4		
Full break time .....(ms)			＜30		
Closing time .....(ms)			＜70		
Breaking type			S	H	HU
Rated limit short-circuit breaking capacity Icu (effective value) (kA)		AC220V~ 400V	85	100	-
		AC415V、AC440V/480V AC660V/690V	75	85	-
		AC800V	-	-	75
		AC1000V/1140V	-	-	60
Rated operating short-circuit breaking capacity Ics (effective value) kA		AC220V~ 400V	85	100	-
		AC415V、AC440V/480V AC660V/690V	75	85	-
		AC800V	-	-	75
		AC1000V/1140V	-	-	60
Rated short circuit making capacity Icm (peak value) (kA)		AC220V~ 400V	187	220	-
		AC415V、AC440V/480V AC660V/690V	165	187	-
		AC800V	-	-	165
		AC1000V/1140V	-	-	132
Rated short-time withstand current Icw (effective value) 1s (kA)		AC220V~ 400V	85	100	-
		AC415V、AC440V/480V AC660V/690V	75	85	-
		AC800V	-	-	75
		AC1000V/1140V	-	-	60
Operating performance	Electrical life (times) Operation frequency (20 times/h)	AC220V~400V	10000 (800A~1600A)、8000 (2000A, 2500A)、6000 (3200A, 4000A)		
		AC415V、AC440V/480V AC660V/690V	10000 (800A~1600A)、6000 (2000A, 2500A)、3000 (3200A, 4000A)		
		AC800V	2000(800A~1600A)、1000(2000A~4000A)		
		AC1000V/1140V	2000 (800A~1600A)、1000 (2000A, 2500A)、600 (3200A, 4000A)		
	Mechanical life (times) Operation frequency (60 times/h)	Maintenance-free	12000(3P)		10000(4P)
		With maintenance	15000		
Installation type			Fixed type, drawout type		
Wiring method of the main circuit			Horizontal wiring, vertical wiring, horizontal extended wiring, vertical extended wiring		
Boundary dimension: W×D×H (mm) 		Fixed type 3P	428×300×392		
		Fixed type 4P	543×300×392		
		Drawout type 3P	435×401×432(800A~2500A)		435×395.5×432(3200A、4000A)
		Drawout type 4P	550×401×432(800A~2500A)		550×395.5×432(3200A、4000A)
Weight (kg)		Fixed type 3P	59 (800A~2500A)		60 (3200A, 4000A)
		Fixed type 4P	70 (800A~2500A)		71.5 (3200A, 4000A)
		Drawout type 3P	97 (800A~2500A)		103 (3200A, 4000A)
		Drawout type 4P	114 (800A~2500A)		120 (3200A, 4000A)

2.4 NDW3-6300 Technical Parameter List

Circuit breaker model			NDW3-6300		
Rated current In (+40℃)..... (A)			4000, 5000, 6300		
North pole rated current.....			100%In		
Rated working voltage Ue ..... (V)			AC220/230/240, AC380/400/415, AC440/480, AC660/690, AC800, AC1000/1140		
Rated frequency f..... (Hz)			50/60		
Rated insulation voltage Ui..... (V)			1140		
Rated impulse withstand voltage Uimp ..... (kV)			12		
Number of poles ..... pole			3, 4		
Full break time..... (ms)			＜30		
Closing time..... (ms)			＜70		
Breaking type			S	H	HU
Rated limit short-circuit breaking capacity Icu (effective value) (kA)		AC220V~415V	120	135	-
		AC440V/480V/660V/690V	85	100	-
		AC800V	-	-	85
		AC1000V/1140V	-	-	66
Rated operating short-circuit breaking capacity Ics (effective value) (kA)		AC220V~415V	120	135	-
		AC440V/480V/660V/690V	85	100	-
		AC800V	-	-	85
		AC1000V/1140V	-	-	66
Rated short circuit making capacity Icm (peak value) (kA)		AC220V~415V	264	297	-
		AC440V/480V/660V/690V	187	220	-
		AC800V	-	-	187
		AC1000V/1140V	-	-	145.2
Rated short-time withstand current Icw (effective value) 1s (kA)		AC220V~415V	120	135	-
		AC440V/480V/660V/690V	85	100	-
		AC800V	-	-	85
		AC1000V/1140V	-	-	66
Operating performance	Electrical life (times) Operation frequency (20 times/h)	AC220V~415V	6000 (4000A)、4000 (5000A)、2000 (6300A)		
		AC440V/480V/660V/690V	3500 (4000A)、2500 (5000A)、1500 (6300A)		
		AC800V	3000(4000A)、1500(5000A)、1000(6300A)		
		AC1000V/1140V	2000 (In=4000A)、1000 (In=5000A)、500 (In=6300A)		
	Mechanical life (times) Operation frequency (60 times/h)	Maintenance-free	7000(3P)	6500(4P)	
		With maintenance	13000		
Installation type			Fixed type, drawout type		
Wiring method of the main circuit			Horizontal wiring, vertical wiring, horizontal extended wiring, vertical extended wiring, Mixed wiring (upper horizontal and lower vertical), mixed wiring (upper vertical and lower horizontal), Mixed extended wiring (upper horizontal and lower vertical), mixed extended wiring (upper vertical and lower horizontal)		
Boundary dimension: W×D×H (mm) 		Fixed type 3P	803×300×392		
		Fixed type 4P	1033×300×392		
		Drawout type 3P	809×399×475		
		Drawout type 4P	1039×399×475		
Weight (kg)		Fixed type 3P	125 (4000A, 5000A)	127 (6300A)	
		Fixed type 4P	167 (4000A, 5000A)	170 (6300A)	
		Drawout type 3P	193 (4000A, 5000A)	195 (6300A)	
		Drawout type 4P	257 (4000A, 5000A)	260 (6300A)	

Chapter 3 Controller

Controller 3

Controller is one of the main components of the circuit breaker, which can provide the function of protecting the overload, short circuit, grounding, current unbalance, overvoltage, undervoltage, voltage unbalance, overfrequency, underfrequency, reverse power and other failures, and realize reasonable operation of the power grid through the load monitoring, required value protection, regional interlocking and other functions. Controller has the function of measuring the current, voltage, power, frequency, electric energy, required value, harmonic and other power grid parameters; and the function of recording the fault, alarm, operation, maximum historical current, contact wear and other operating 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.

3.1 Controller Types

Model	NWK21/NWK31	NWK21(V)/NWK31(V)	NWK22 /NWK32 NWK22(V)/NWK32(V) NWK22(P)/NWK32(P)
Controller Pictures			
	NWK31 and NWK32 are applied to NDW3-1600,NWK21 and NWK22 are applied to NDW3-2500、NDW3-4000 and NDW3-6300		

3.2 Controller Functions

Functional items		NWK21 NWK31	NWK21/V NWK31/V	NWK22 NWK32	NWK22/V NWK32/V	NWK22/P NWK32/P
Display interface	Digital tube numbers and symbols display	√	√	—	—	—
	LCD panel symbols and graphics display in Chinese	—	—	√	√	√
Protection function	Overload long-time delay protection	√	√	√	√	√
	Overload thermal memory	√	√	√	√	√
	Overload pre-alarm/alarm output	√/▲	√/▲	√/▲	√/▲	√/▲
	Short circuit short-time delay protection	√	√	√	√	√
	Short-time delay thermal memory	√	√	√	√	√
	Short circuit instantaneous protection	√	√	√	√	√
	Ground protection (differential type)	√	√	√	√	√
	Grounding alarm/alarm output	√/▲	√/▲	√/▲	√/▲	√/▲
	Current leakage protection/alarm/alarm output	—	—	√/√/▲	√/√/▲	√/√/▲
	Neutral wire protection	√	√	√	√	√
	Current unbalance protection/alarm/alarm output	√/—/—	√/—/—	√/√/▲	√/√/▲	√/√/▲
	MCR	√	√	√	√	√
	Load monitoring/alarm/alarm output	▲	▲	√	√	√
	Undervoltage protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Overvoltage protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Voltage unbalance protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Phase sequence protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Underfrequency protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Overfrequency protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Current required value protection/alarm/alarm output	—	—	—	√/√/▲	√/√/▲
	Reverse power protection/alarm/alarm output	—	—	—	—	√/√/▲
Measuring function	Current measurement (phase pole, N-pole, grounding)	√	√	√	√	√
	Voltage (phase voltage, circuit voltage, voltage unbalance rate)	—	√	—	√	√
	Phase sequence detection	—	—	—	√	√
	Frequency measurement	—	√	—	√	√
	Required value measurement (current)	—	—	—	√	√
	Required value measurement (power)	—	—	—	—	√
	Power measurement (active power, reactive power, apparent power)	—	√/—/—	—	—	√
	Power factor measurement	—	√	—	—	√
	Electric energy measurement (active electric energy, reactive electric energy, apparent electric energy)	—	—	—	—	√
	Harmonics measurement	—	—	—	—	√
Maintenance function	LED fault status indication	√	√	√	√	√
	Fault record (8 times) and query	√	√	√	√	√
	Historic peak current record	—	—	√	√	√
	Alarm history query	—	—	√	√	√
	Fault tripping signal output	√	√	√	√	√
	Self-diagnostic function	√	√	√	√	√
	Simulating tripping test function	√	√	√	√	√
	Contact wear equivalent (alarm) query	▲	▲	√	√	√
	Query of number of operations	▲	▲	√	√	√
	Clock function	—	—	√	√	√
Others	DC controllers (DC220V, DC110V)	▲	▲	▲	▲	▲
	Remote reset of controller	▲	▲	▲	▲	▲
	Signal element	▲	▲	▲	▲	▲
	Communication	—	—	▲	▲	▲
	SMS function	—	—	▲	▲	▲

Note: 1. "√" represents this function is available, "▲" represents optional functions for users, and "—" represents this function is not available

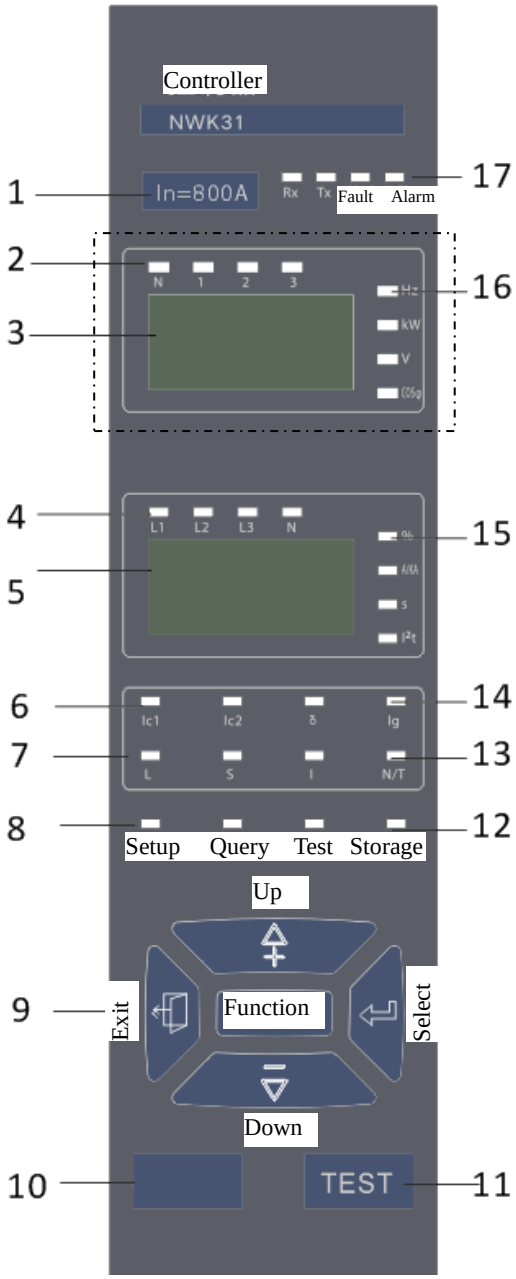
2. For NWK21/V, NWK31/V, NWK22/V, NWK32/V, NWK22/P and NWK32/P controllers, when the rated voltage of main circuit is over AC800V, voltage module P2 must be chosen;

3. "V" and "P" functions are addtional types of normal controller.

3.3 Controller Panel Description

■ NWK21/NWK31 Type Controller

Panel Display of NWK21/NWK31 Type Controller



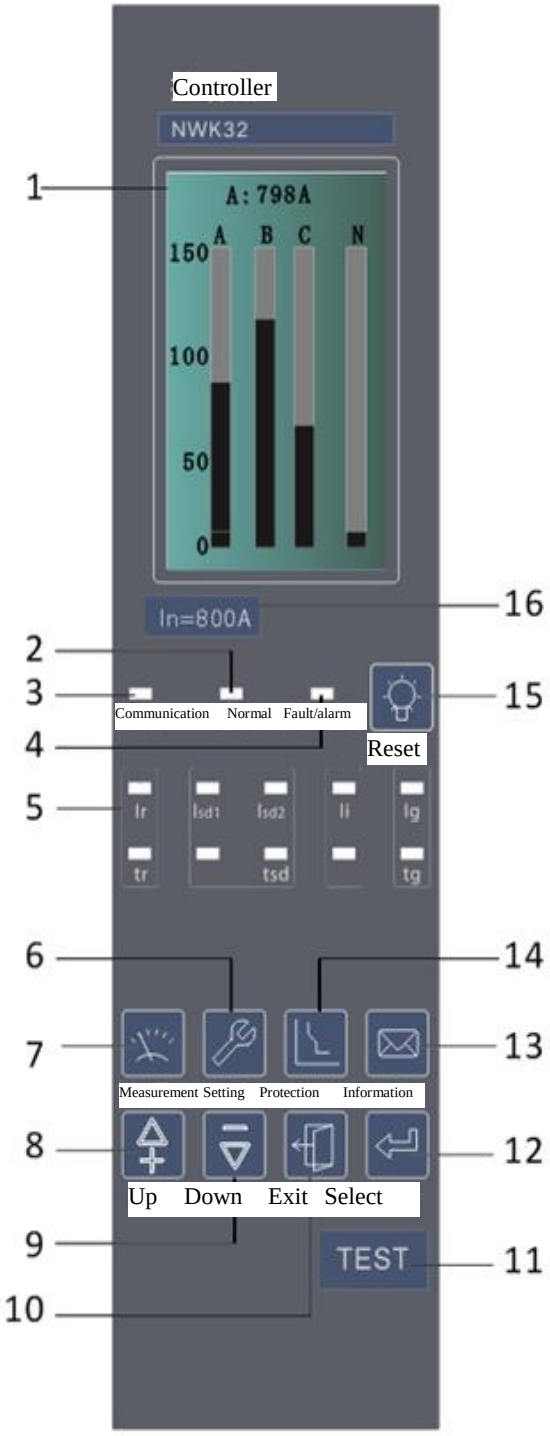
1. Rated current sign
2. N-phase and A, B, C phases voltage indicators in order
3. Three-phase voltage and frequency value display screen
4. Three-phase current, N-phase current indicators
5. Three-phase electric current display screen
6. Load monitoring signals 1 and 2 operation indicators
7. Long time delay and short time delay protection operation indicators
8. Setup, query indicators
9. 5 operation buttons
10. Unused temporarily
11. Test interface
12. Test, storage indicators
13. Instantaneous, N-phase current or self-diagnosis operation indicators
14. Unbalance, ground current protection operation indicators
15. %, current, time and I^2t (inverse time limit) indicators in order
16. Frequency, power, voltage and power factor indicators in order
17. Communication Rx, Tx, fault and alarm indicators in order

Note: 1. The double-point underline frame displays a controller with the voltage display function, while this display isn't available without the optional voltage function;

2. Tx,Rx is only used for internal testing in the company.

■ NWK22/NWK32 Type Controller

Panel Display of NWK22/ NWK32 Type Controller



1. LCD interface display
2. “Normal” indicator (LED): The green LED always flashes as long as the controller is turned on and works properly.
3. ‘Communication’ indicator (LED): It flashes during the communication connection.
4. ‘Fault/Alarm’ indicator (LED): During normal operation, LED is not on; in case of fault tripping, the red LED flashes quickly; in case of an alarm, the red LED is always on.
5. Protection indicator (LED): The corresponding LED flashes respectively from left to right to indicate the fault type in case of fault disconnection; for the protection parameter settings, the LED is always on to indicate the currently selected items.
6. “Setting” button: Switch to the topic menu of parameter settings.
7. “Measurement” button: Switch to the default topic menu of measurement.
8.“Up” button: Move the menu content up on the current option, or incrementally change the parameters.
9.“Down” button: Move the menu content down on the current option, or decrementally change the parameters.
10.“Exit” button: Exit the current option to the previous menu, or cancel the current parameter settings
11. TEST test interface: Plugged into the portable power box or test unit.
12. “Select” button: Go to the next menu pointed by the specified item,
or select and store parameters.
13. “Information function” button: Switch to the topic menu of history and maintenance.
14. “Protection function” button: Switch to the topic menu of protection parameter settings.
15. Fault and alarm reset buttons.
16. Rated current sign.

3.4 Setting Values and Protective Features of Controller

Setting Values and Protective Features of Controller

Overload long time-delay protection NWK21/NWK31 &NWK22/NWK32												
Current setting value I_R	(0.4~1.0 or 1.25[Note]) In or OFF (OFF-Function off) Note: 1.0In in case of the power distribution protection; 1.25In in case of the generation protection.											
4 types of protection curve	1） Standard power distribution protection I^2t: $t= 2.25\ T_R / N^2$ (factory default) Standard generator protection I^2t (F): $t= 2.25\ T_R / N^2$ 2) Express inverse time limit (power distribution protection) EI(G): $t= 1.25\ T_R /(N^2-1)$ 3) Express inverse time limit (motor protection) EI(M): $t= 1.3974\ T_R \times \ln[N^2/(N^2-1.15)]$ 4) High-voltage fuse compatible HV: $t = 4.0625\ T_R /(N^4-1)$ N= I/ Ir I—Fault current t—Long time-delay action time Ir—Long time-delay setting current T_R—Long time-delay setting time Description: NWK21/NWK31 controller has only standard power distribution protection I^2t; NWK22/NWK32 controller provides 4 types of protection curves.											
1) Standard power distribution protection I^2t Time setting valve t_R (1.5 Ir)	NWK21/NWK31: 15s, 30s, 60s, 120s, 240s, 480s											
	NWK22/NWK32: 15s, 30s, 60s, 120s, 240s, 360s, 480s, 600s, 720s, 840s, 960s											
Tripping time t (s) (Accuracy of ±10%)	1.5Ir	15	30	60	120	240	360	480	600	720	840	960
	2.0 Ir	8.44	16.88	33.75	67.5	135	202.5	270	337.5	405	472.5	540
	6.0 Ir	0.94	1.88	3.75	7.5	15	22.5	30	37.5	45	52.5	60
	7.2 Ir	0.65	1.30	2.60	5.21	10.4	15.6	20.8	26	31.3	36.5	41.7
2)~4) Protection curve type	NWK22/NWK32: See the table below for the overload long-time delay protection action delay time of C1~C16											

Protective features (accuracy of ±10%)	**Current (I/Ir)**	**Tripping time**
	1.05	> 2h Inaction
	1.3 (power distribution protection)	< 1h Action
	1.2 (generator protection)	< 1h Action
	≥1.2 Ir	The action time is calculated according to four types of protection formula or curve queried

Thermal memory time	NWK21/NWK31: 30min (ON) or OFF NWK22/NWK32: Instantaneous, 10min, 20 min, 30 min, 45 min, 1h, 2h, 3h or OFF Description: 1. The auxiliary power supply of controller features the thermal memory function; turn off the auxiliary power supply to clear the thermal memory; 2. Setting OFF, it is possible to turn off the thermal memory function.

Overload pre-alarm NWK21/NWK31 &NWK22/NWK32	
Current setting value Ip	OFF+(0.75~1.05) Ir
Overload pre-alarm output	The signal output is required to add a signal unit. Without signal output, observe the controller display screen or read from the display indicator.

Short circuit short-time delay protection NWK21/NWK31 &NWK22/NWK32				
Current setting value I_{sd} (accuracy of ±10%)	(1.5~15) Ir or OFF (OFF-Function off)			
Time setting value Tsd (s)	t_{sd1} inverse time limit t_{sd2} definite time limit	NWK21/NWK31: 0.1, 0.2, 0.3, 0.4 NWK22/NWK32: 0.1~1.0		
Protective features (accuracy of ±10%)	Current (I/Isd)	**Tripping time**		
	≤0.9	Inaction		
	≥ 1.1	I^2t-ON	NWK21/NWK31: $I_{sd}\leq I\leq 8Ir$: $t=(8Ir)^2\times T_{sd1}/I^2$ inverse time-limit characteristic NWK22/NWK32: $t =(1.5/N)^2\times T_{sd1}/10$ inverse time-limit characteristic	
		I^2t-OFF	I＞8 Ir (or I≥Isd): 0.1s, 0.2s, 0.3s, 0.4s definite time limit	
Thermal memory time	NWK21/NWK31: 15min ON or OFF (OFF-Function off) NWK22/NWK32: Instantaneous, 10min, 20 min, 30 min, 45min, 1h, 2h, 3h or OFF			

Continued: Setting Values and Protective Features of Controller

Short-circuit instantaneous protection NWK21/NWK31 &NWK22/NWK32		
Current setting value I_i (accuracy of ±10%)	(1.0~20) In or OFF (OFF-Function off)	
Protective features (accuracy of ±10%)	**Current (I/Ii)**	**Tripping time**
	≤0.85	Inaction
	≥ 1.15	＜40ms Action
	$I > I_{MCR}$	Break action time＜30ms
MCR protection NWK21/NWK31 &NWK22/NWK32		
Current setting value I_{MCR}	(1.0~20) In (factory default as 10In)	
Protective features (accuracy of ±10%)	**Current (I/I_{MCR})**	**Tripping time**
	≤0.8	Inaction
	≥ 1.1	＜100ms Action
Ground protection/alarm NWK21/NWK31		
Protection type	Differential type (T), ground current type (W), with the latter as the optional function	
Current setting value I_g	(0.2~1.0) In or OFF (OFF-Function off)	
Time setting value T_g (s)	0.1~0.4 definite time limit	
Protective features (accuracy of ±10%) Inherent absolute error: ±40ms	**Current (I/I_g)**	**Tripping time**
	≤0.8	Inaction (no alarm)
	≥ 1.0	For action (or alarm), see the time setting value
Grounding alarm output	The signal output is required to add a signal unit. Without signal output, observe the controller display screen or read from the display indicator.	
Ground protection/alarm NWK22/NWK32		
Current setting value I_{gh}	(0.2~1.0) In or OFF (OFF-Function off)	
Action /alarm time setting value T_g (s)	0.1~1.0	
Alarm return current setting value	(0.2~1.0)×In	Only when the execution mode is “alarm”, this setting is available
Alarm return time setting value (s)	0.1~1.0	
Protective/alarm features (accuracy of ±10%) Inherent absolute error: ±40ms	**Current (I/I_g)**	**Tripping time**
	≤0.9	Inaction (no alarm)
	≥ 1.0	For action (or alarm), see the action time as the inverse or definite time limit[Note]
Returnable features (accuracy of ±10%) Inherent absolute error: ±40ms	≥ 1.0	Non-return
	≤0.9	For alarm, see the alarm return time setting value
Grounding alarm output	The signal output is required to add a signal unit; set one DO of the signal unit as “Grounding alarm”. Without signal output, observe the controller display screen or read from the display indicator.	
Note: For details of the reverse and definite time limit, see the *User Manual of NWK22 and NWK32 Controller*, with the definite time limit as T_g		
Neutral line protection NWK21/NWK31 &NWK22/NWK32		
Neutral wire protection setting value	NWK21/NWK31 controller: 50%In, 100%In or OFF; NWK21/NWK31 controller: 50%In, 100%In, 160%In, 200%In or OFF. OFF— Turn off N-phase protection function	
Protective features	Same-phase pole overload long time-delay protection, short-circuit short time-delay protection, short-circuit instantaneous protection, ground protection	

Continued: Setting Values and Protective Features of Controller

<table>
<tr><td colspan="14">Current leakage protection/alarm (namely the residual current protection, applicable for the shell frame level 2500A and below) NWK22/NWK32</td></tr>
<tr><td colspan="3">Current setting value I△n (A)</td><td colspan="11">0.5~30.0 or OFF (OFF-Function off)</td></tr>
<tr><td colspan="3">Action delay time T△n (s)</td><td colspan="11">Instantaneous, 0.06, 0.08, 0.17, 0.25, 0.33, 0.42, 0.5, 0.58, 0.67, 0.75 0.83</td></tr>
<tr><td colspan="3">Alarm delay time T△nb (s)</td><td colspan="11">0.1~1.0</td></tr>
<tr><td colspan="3">Alarm return current setting value (A)</td><td colspan="11">0.5~30.0</td></tr>
<tr><td colspan="3">Alarm return delay time (s)</td><td colspan="11">0.1~1.0</td></tr>
<tr><td colspan="3" rowspan="3">Protective action/alarm features (accuracy of ±10%)
Inherent absolute error: ±40ms</td><td colspan="5">Current (I/I△n)</td><td colspan="6">Tripping time</td></tr>
<tr><td colspan="5">＜0.8</td><td colspan="6">Inaction (no alarm)</td></tr>
<tr><td colspan="5">≥ 1.0</td><td colspan="6">Action (see the data below) or alarm (see the alarm delay time)</td></tr>
<tr><td colspan="3" rowspan="2">Alarm return features (accuracy of ±10%)
Inherent absolute error: ±40ms</td><td colspan="5">≥ 1.0</td><td colspan="6">Non-return</td></tr>
<tr><td colspan="5">≤0.9</td><td colspan="6">For alarm, see the alarm return delay time</td></tr>
<tr><td rowspan="5">Tripping time t (s)
(Accuracy of ±10%)</td><td>Setting time</td><td>Instantaneous</td><td>0.06</td><td>0.08</td><td>0.17</td><td>0.25</td><td>0.33</td><td>0.42</td><td>0.5</td><td>0.58</td><td>0.67</td><td>0.75</td><td>0.83</td></tr>
<tr><td>I△n</td><td>0.36</td><td>0.5</td><td>1</td><td>1.5</td><td>2</td><td>2.5</td><td>3</td><td>3.5</td><td>4</td><td>4.5</td><td>5</td><td>0.36</td></tr>
<tr><td>2I△n</td><td>0.18</td><td>0.25</td><td>0.5</td><td>0.75</td><td>1</td><td>1.25</td><td>1.5</td><td>1.75</td><td>2</td><td>2.25</td><td>2.5</td><td>0.04</td></tr>
<tr><td>5I△n</td><td rowspan="2">0.072</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td><td>0.5</td><td>0.6</td><td>0.7</td><td>0.8</td><td>0.9</td><td>1</td><td>0.04</td></tr>
<tr><td>10I△n</td></tr>
<tr><td colspan="3">Current leakage alarm output</td><td colspan="11">The signal output is required to add a signal unit; set one DO of the signal unit as “Current leakage alarm”.
Without signal output, observe the controller display screen or read from the display indicator.</td></tr>
<tr><td colspan="14">Current unbalance protection/alarm NWK21/NWK31 &NWK22/NWK32</td></tr>
<tr><td colspan="3" rowspan="2">NWK21/NWK31</td><td colspan="5">Current unbalance setting value δ</td><td colspan="6">(40%~100%)+OFF (OFF-Function off)</td></tr>
<tr><td colspan="5">Action delay time $t_δ$ (s)</td><td colspan="6">0.1~1.0</td></tr>
<tr><td colspan="3" rowspan="4">NWK22/NWK32</td><td colspan="5">Protection/alarm start setting value</td><td colspan="6">5%～60%</td></tr>
<tr><td colspan="5">Action/alarm delay time (s)</td><td colspan="6">0.1~40.0</td></tr>
<tr><td colspan="5">Alarm action return setting value</td><td colspan="3">5%～start value</td><td colspan="3" rowspan="2">Only when the execution mode is "alarm", this setting is available</td></tr>
<tr><td colspan="5">Alarm return delay time (s)</td><td colspan="3">10~200</td></tr>
<tr><td colspan="3" rowspan="3">Protective features (accuracy of ±10%)
Inherent absolute error: ±40ms</td><td colspan="5">Actual current unbalance rate/setting value</td><td colspan="6">Tripping time</td></tr>
<tr><td colspan="5">≤0.9</td><td colspan="6">Inaction (no alarm)</td></tr>
<tr><td colspan="5">≥ 1.1</td><td colspan="6">Acts (or gives an alarm) according to the set delay time</td></tr>
<tr><td colspan="3" rowspan="3">Protective return features (accuracy of ±10%)
Inherent absolute error: ±40ms</td><td colspan="5">Actual current unbalance rate/setting value</td><td colspan="6">Tripping time</td></tr>
<tr><td colspan="5">≥ 1.1</td><td colspan="6">Non-return</td></tr>
<tr><td colspan="5">≤0.9</td><td colspan="6">Returns according to the alarm return delay time</td></tr>
<tr><td colspan="3">Current unbalance protection alarm DO output</td><td colspan="11">The signal output is required to add a signal unit; set one DO of the signal unit as “I unbalanced alarm”.
Without signal output, observe the controller display screen or read from the display indicator.</td></tr>
<tr><td colspan="3">Execution mode</td><td colspan="11">Alarm/tripping/close</td></tr>
</table>

Continued: Setting Values and Protective Features of Controller

<table>
<tr><td colspan="8">Required current value protection/alarm NWK22/NWK32</td></tr>
<tr><td colspan="2">Protection/alarm start setting value</td><td colspan="6">(0.2~1.0) In</td></tr>
<tr><td colspan="2">Protection action delay time setting value (s)</td><td colspan="6">15~1500</td></tr>
<tr><td colspan="2">Alarm action return setting value</td><td colspan="6">0.2In～start value</td></tr>
<tr><td colspan="2">Alarm return delay time (s)</td><td colspan="6">15~1500</td></tr>
<tr><td colspan="2" rowspan="3">Protective features (accuracy of ±10%)
Inherent absolute error: ±40ms</td><td colspan="3">Multiple of current (I/setting value)</td><td colspan="3">Tripping time</td></tr>
<tr><td colspan="3">≤0.9</td><td colspan="3">Inaction (no alarm)</td></tr>
<tr><td colspan="3">≥ 1.1</td><td colspan="3">Acts (or gives an alarm) according to the set delay time</td></tr>
<tr><td colspan="2" rowspan="3">Return features (accuracy of ±10%)
Inherent absolute error: ±40ms</td><td colspan="3">Multiple of current (I/setting value)</td><td colspan="3">Tripping time</td></tr>
<tr><td colspan="3">≥ 1.1</td><td colspan="3">Non-return</td></tr>
<tr><td colspan="3">≤0.9</td><td colspan="3">Returns according to the set delay time</td></tr>
<tr><td colspan="2">Required current value protection alarm DO output</td><td colspan="6">The signal output is required to add a signal unit; set one DO of the signal unit as “Required value fault”.
Without signal output, observe the controller display screen or read from the display indicator.</td></tr>
<tr><td colspan="2">Protection execution mode</td><td colspan="3">Alarm/tripping/close</td><td colspan="3"></td></tr>
<tr><td colspan="8">Load monitoring function NWK21/NWK31 &NWK22/NWK32</td></tr>
<tr><td rowspan="5">NWK21/NWK31</td><td colspan="2">Operation mode</td><td></td><td colspan="2">Current setting</td><td>Time setting</td><td></td></tr>
<tr><td colspan="2" rowspan="2">Current way 1</td><td>Ic1</td><td colspan="2" rowspan="3">(0.2~1.0) In+OFF</td><td>Tc1</td><td rowspan="3">15s, 30s, 60s, 120s, 240s, 480s</td></tr>
<tr><td>Ic2</td><td>Tc2</td></tr>
<tr><td colspan="2" rowspan="2">Current way 2</td><td>Ic1</td><td>Tc1</td></tr>
<tr><td>Ic2</td><td>Tc2</td><td>60s, 120s, 240, 480s</td></tr>
<tr><td colspan="2">Thermal memory</td><td colspan="5">15min (ON), OFF</td></tr>
<tr><td rowspan="7">NWK22/NWK32</td><td colspan="2">Operation mode</td><td colspan="3">Current/power setting</td><td colspan="2">Time setting</td></tr>
<tr><td rowspan="4">Unload Ⅰ</td><td>Current way 1</td><td colspan="3" rowspan="2">0.2~1.0Ir</td><td colspan="2" rowspan="2">20~80%T_R</td></tr>
<tr><td>Current way 2</td></tr>
<tr><td>Power way 1</td><td colspan="3" rowspan="2">200kW～10000kW</td><td colspan="2" rowspan="2">10s~3600s</td></tr>
<tr><td>Power way 2</td></tr>
<tr><td rowspan="3">Unload Ⅱ</td><td>Current way 1</td><td colspan="3">0.2~1.0Ir</td><td colspan="2">20~80%T_R</td></tr>
<tr><td>Current way 2</td><td colspan="3">0.2Ir~unload Ⅰ</td><td colspan="2">10s~600s</td></tr>
<tr><td>Power way 1</td><td colspan="3">200kW～10000kW</td><td colspan="2" rowspan="2">10s~3600s</td></tr>
<tr><td>Power way 2</td><td colspan="3">100kW~unload Ⅰ</td></tr>
<tr><td colspan="2">Load monitoring alarm DO output</td><td colspan="6">The signal output is required to add a signal unit; set one DO of the signal unit as “load monitoring 1”, another as “load monitoring 2”.
Without signal output, observe the controller display screen or read from the display indicator.</td></tr>
<tr><td colspan="8">Undervoltage protection/alarm NWK22/NWK32</td></tr>
<tr><td colspan="2">Protection/alarm start setting value V</td><td colspan="6">100~return value</td></tr>
<tr><td colspan="2">Protection action delay time setting value (s)</td><td colspan="6">0.2~6</td></tr>
<tr><td colspan="2">Alarm action return setting value V</td><td colspan="6">Start value~600</td></tr>
<tr><td colspan="2">Alarm return delay time (s)</td><td colspan="6">0.2~60</td></tr>
</table>

Continued: Setting Values and Protective Features of Controller

Undervoltage protection/alarm NWK22/NWK32		
Undervoltage protection action /alarm features (Accuracy of ±10%) inherent absolute error: ±40 ms	**Umin/action setting value**	**Tripping time**
	＞1.1	Inaction (no alarm)
	≤0.9	Acts (or gives an alarm) according to the set delay time
Alarm return features of undervoltage protection (Accuracy of ±10%) inherent absolute error: ±40 ms	**Umin/return setting value**	**Tripping time**
	＜0.9	Non-return
	≥ 1.1	Returns according to the set delay time
Undervoltage protection alarm DO output	The signal output is required to add a signal unit; set one DO of the signal unit as “Undervoltage fault”. Without signal output, observe the controller display screen or read from the display indicator.	
Execution mode	Alarm/tripping/close	
Overvoltage protection/alarm NWK22/NWK32		
Protection/alarm start setting value V	Return value~1200	
Protection action delay time setting value (s)	0.2~60	
Alarm return setting value V	100~start value	
Alarm return delay time (s)	0.2~60	
Overvoltage protection/alarm action features (Accuracy of ±10%) Inherent absolute error: ±40ms	**Umax/action setting value**	**Tripping time**
	≤0.9	Inaction (no alarm)
	≥ 1.1	Acts (or gives an alarm) according to the set delay time
Overvoltage alarm return features (Accuracy of ±10%) inherent absolute error: ±40 ms	**Umax/return setting value**	**Tripping time**
	≥ 1.1	Non-return
	≤0.9	Returns according to the set delay time
Overvoltage protection alarm DO output	The signal output is required to add a signal unit; set one DO of the signal unit as “Overvoltage fault”. Without signal output, observe the controller display screen or read from the display indicator.	
Protection execution mode	Alarm/tripping/close	
Voltage unbalance protection/alarm NWK22/NWK32		
Protection/alarm start setting value	2%～30%	
Protection action delay time setting value (s)	0.2~60	
Protection action return setting value	2%～start value	
Protection return delay time (s)	0.2~60	
Action features of voltage unbalance protection/alarm (Accuracy of ±10%) inherent absolute error: ±40 ms	**Actual voltage unbalance rate/setting value**	**Tripping time**
	≤0.9	Inaction (no alarm)
	≥ 1.1	Acts (or gives an alarm) according to the set delay time
Alarm action features of voltage unbalance protection (Accuracy of ±10%) inherent absolute error: ±40 ms	**Actual voltage unbalance rate/setting value**	**Tripping time**
	≥ 1.1	Non-return
	≤0.9	Returns according to the set delay time
Voltage unbalance protection alarm DO output	The signal output is required to add a signal unit; set one DO of the signal unit as “U unbalanced alarm” output. Without signal output, observe the controller display screen or read from the display indicator.	
Execution mode	Alarm/tripping/close	

Continued: Setting Values and Protective Features of Controller

Underfrequency, overfrequency protection/alarm NWK22/NWK32		
Underfrequency	Protection/alarm start setting value (Hz)	45.0~return value
	Action delay time setting value (s)	0.2~5.0
	Alarm action return setting value (Hz)	Start value~65.0
	Alarm return delay time (s)	0.2~36.0 (the return value must be greater than or equal to the start value)
Overfrequency	Protection/alarm start setting (Hz)	Return value~65.0
	Action delay time setting value (s)	0.2~5.0
	Alarm return setting value (Hz)	45.0~start value
	Alarm return delay time (s)	0.2~36.0 (the return value must be less than or equal to the start value)
Underfrequency, overfrequency protection alarm DO output		The signal output is required to add a signal unit; set one DO of the signal unit as "Underfrequency fault" or "Overfrequency fault" output. Without signal output, observe the controller display screen or read from the display indicator.
Execution mode		Alarm/tripping/close
Reverse power protection/alarm NWK22/NWK32		
Protection/alarm start setting value (kW)		5~500
Protection action delay time setting value (s)		0.2~20
Alarm return setting value (kW)		5~start value
Alarm return delay time (s)		1.0~360 (the return value must be greater than or equal to the start value)
Reverse power protection action/alarm features (Accuracy of ±10%) inherent absolute error: ±40 ms	**Reverse power value/Setting value**	**Tripping time**
	≤0.9	Inaction (no alarm)
	≥ 1.1	Acts (or gives an alarm) according to the set delay time
Reverse power protection/alarm return features (Accuracy of ±10%) inherent absolute error: ±40 ms	**Reverse power value/Setting value**	**Tripping time**
	≥ 1.1	Non-return
	≤0.9	Returns according to the set delay time
Reverse power protection alarm DO output		The signal output is required to add a signal unit; set one DO of the signal unit as "Reverse power fault" output. Without signal output, observe the controller display screen or read from the display indicator.
Execution mode		Alarm/tripping/close
Phase sequence protection/alarm NWK22/NWK32		
Setting range of action phase sequence		Δφ: A, B, C / Δφ: A, C, B
Phase sequence protection alarm DO output		The signal output is required to add a signal unit; set one DO of the signal unit as "Phase sequence fault". Without signal output, observe the controller display screen or read from the display indicator.
Execution mode		Alarm/tripping/close

Signal unit NWK21/NWK31 &NWK22/NWK32			
NWK21/NWK31	**DO output**	**General Functions**	**Optional Load Monitoring Functions**
	DO1	Overload pre-alarm output	Load monitoring 1
	DO2	Grounding pre-alarm output	Load monitoring 1
	DO3	Fault tripping output	Fault tripping output
	DO4	Short circuit instantaneous action output	Short circuit instantaneous action output

Continued: Setting Values and Protective Features of Controller

Signal unit NWK21/NWK31 &NWK22/NWK32

	Type of signal unit		Rated current		Field of Application	
NWK22/NWK32	S1		4DO (4 output contacts)		Without regional interlocking	
	S2		3DO (3 output contacts) 1DI (1 input contact)		Regional interlocking between air circuit breakers	
	S3		2DO (2 output contacts) 2DI (2 input contacts)		Regional interlocking between air circuit breakers	
	DI	Function setting	Alarm, tripping, regional interlocking, general, grounding interlocking, short circuit interlocking			
		Input form	Normally opened		Normally closed	
	DO	Function setting	See the table below, “Parameter Settings of Switch Output (DO)”			
		Execution mode	Normally opened level	Normally closed level	Normally opened impulse	Normally closed impulse
		Impulse time	None		1～360s	

Parameter Settings of Switch Output (DO)				
General	Alarm	Fault tripping	Self-diagnosis alarm	Load monitoring 1
Load monitoring 2	Overload pre-alarm	Overload fault	Short time delay fault	Transient fault
Grounding/current leakage fault	Grounding/ current leakage alarm	Current unbalance fault	Middle-phase fault	Undervoltage fault
Overvoltage fault	Voltage unbalance fault	Underfrequency fault	Overfrequency fault	Required value fault
Reverse power fault	Regional interlocking	On	Off	Phase order fault
MCR fault	Grounding interlocking	Short circuit interlocking	A-phase required value fault	B-phase required value fault
C-phase required value fault	N-phase required value fault	Required value out-of-limit	Alarm of operation times	Contact wear alarm
Remote reset	—	—	—	—

See the table below for the overload long-time delay protection action delay setting time and the corresponding multiple of current time

Curve type	Fault current	Delay time (s)															
		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
I^2t	$1.5\times I_R$	15.00	30.00	60.00	120.00	240.00	360.00	480.00	600.00	720.00	840.00	960.00					
	$2\times I_R$	8.44	16.88	33.75	67.50	135.00	202.0	270.00	337.50	405.00	472.50	540.00					
	$6\times I_R$	0.94	1.88	3.75	7.50	15.00	22.50	30.00	37.50	45.00	52.50	60.00					
	$7.2\times I_R$	0.65	1.30	2.60	5.21	10.42	15.63	20.83	26.04	31.25	36.46	41.67					
EI (G)	$1.5\times I_R$	8.00	12.80	19.20	32.00	48.00	64.00	80.00	108.0	144.00	224.00	320.00	480.00	640.00	800.00	960.00	1120.00
	$2\times I_R$	3.33	5.33	8.00	13.33	20.00	26.67	33.33	45.00	60.00	93.33	133.33	200.0	266.67	333.33	400.00	466.67
	$6\times I_R$	0.29	0.46	0.69	1.14	1.71	2.29	2.86	3.86	5.14	8.00	11.43	17.14	22.86	28.57	34.29	40.00
	$7.2\times I_R$	0.20	0.31	0.47	0.79	1.18	1.57	1.97	2.26	3.54	5.51	7.87	11.80	15.74	19.67	23.60	27.54
EI (M)	$1.5\times I_R$	6.22	9.96	14.90	24.90	37.30	49.80	62.20	84.00	112.00	174.00	249.00	373.00	498.00	622.00	747.00	871.00
	$2\times I_R$	2.95	4.72	7.06	11.79	17.67	23.59	29.46	39.79	53.05	82.42	117.95	176.68	235.89	294.63	353.84	412.58
	$6\times I_R$	0.28	0.45	0.68	1.13	1.69	2.26	2.82	3.81	5.08	7.89	11.30	16.92	22.59	28.22	33.89	39.52
	$7.2\times I_R$	0.19	0.31	0.47	0.78	1.17	1.56	1.95	2.63	3.51	5.45	7.81	11.69	15.61	19.50	23.42	27.30
HV	$1.5\times I_R$	2.46	3.94	5.90	9.85	14.80	19.70	24.60	33.20	44.30	68.90	98.50	147.00	197.00	246.00	295.00	344.00
	$2\times I_R$	0.67	1.07	1.60	2.67	4.01	5.34	6.66	8.99	12.00	18.66	26.68	39.81	53.35	66.63	79.90	93.17
	$6\times I_R$	0.01	0.01	0.02	0.03	0.05	0.06	0.08	0.10	0.14	0.22	0.31	0.46	0.62	0.77	0.93	1.08
	$7.2\times I_R$	0.00	0.01	0.01	0.01	0.02	0.03	0.04	0.05	0.07	0.10	0.15	0.22	0.30	0.37	0.45	0.52

Controller factory setting

Protective features	Setting current	Setting time	Remarks
Overload long-time delay protection	1.0In	60s	Thermal memory ON
Short circuit short-time delay protection	$8I_R$	0.2s	Definite time limit, I^2t-ON
Short circuit instantaneous	10In	-	-
Neutral wire protection	100%In	-	-
Ground protection	0.5In	0.2s	3P products usually close this function as a default, and 4P open it as a default; Clients of 3P products can open the function according to their requirements
Current unbalance protection	OFF	-	Users can open it as needed

3.5 Working Power Supply of Controller

■ The working power supply of controller is provided by the transformer and auxiliary power supply. To ensure reliable operation and breaking of small current in case of failure, please adopt the power supply mode of 1) and 2), with the mode as follows:

1) To be powered by the power supply CT

Normal operating conditions of the controller: the primary current single-phase and three-phase are no less than 0.4In and 0.2In respectively. When the rated current is ≤400A, the primary current single-phase and three-phase of the main circuit are no less than 1.0In and 0.6In respectively. Otherwise, it must be powered by the auxiliary power supply.

2) To be powered by the auxiliary power supply

Normal operating conditions of the controller: (85%~110%) Us.

AC power voltage (50/60Hz): AC230V, AC400V, with an allowable error of ±15%

DC power voltage: DC220V, DC110V, DC24V, with an allowable error of ±5%

NDW3-1600 frame controller input voltage of port 1 and 2 can only be DC24V, when clients require AC230V/AC400V/DC110V/DC220V, we must switch it to DC24V by external DC power source module, and it has been installed in factory； 2500 frame and above controllers have been transformed internally, and therefore there is no need in transforming. There is DC power source module transformation in internal controllers of NDW3-2500 and above frames. See Chapter 7 Electrical Wiring Diagram.

3) To be powered by the test port

Rated voltage: DC24V, with an allowable error of ±5%. The panel power supply is used for separately testing the controller, rather than the working power supply.

■ Rated power consumption of controller

Rated power consumption: ＜7W.

■ Contact capacity of controller

DO signal alarm output, contact capacity: AC250V/3A;

Fault tripping contact output, contact capacity: AC250V/16A;

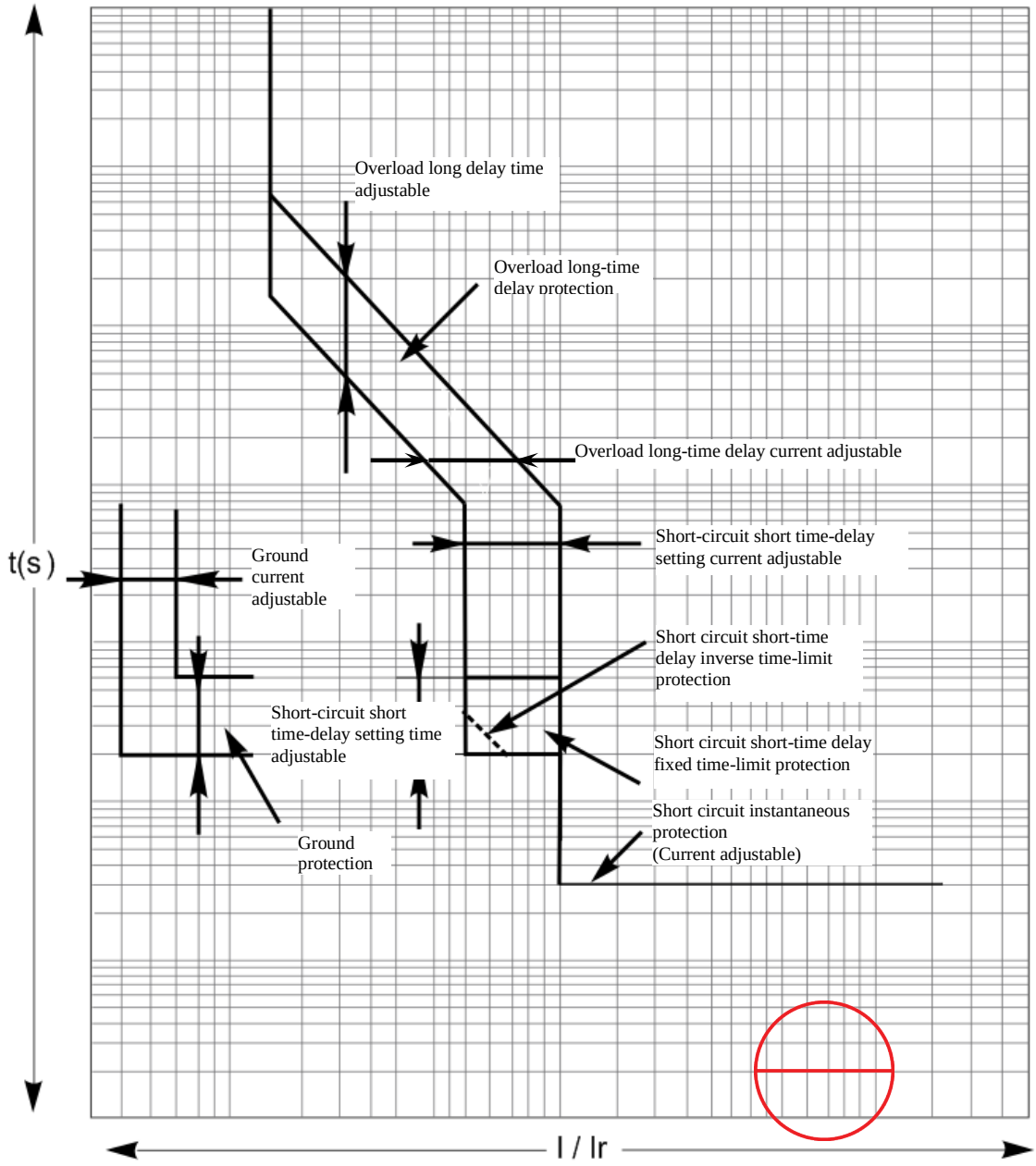
Auxiliary contact output of the circuit breaker status, contact capacity: AC250V/16A

3.6 Introduction of Controller Functions

For introduction of controller functions, see the *User Manual of NWK21 and NWK31 Controller* and *User Manual of NWK22 and NWK32 Controller*

3.7 Protection Characteristic Curve

Overlaod long time delay protection, short-circuit short time delay protection, short-circuit instantaneous protection and grounding protection curves are seen in the following diagram.



For each protection characteristic curve of controller, see the *User Manual of NWK21 and NWK31 Controller* and *User Manual of NWK22 and NWK 32 Controller*

Chapter 4 Accessories

Accessories 4

4.1 Accessories list

Accessory category	Accessory name	Configuration	Type of the installation structure	Remarks
Electrical control accessories	Closed electromagnet	Standard configuration	Fixed type/drawout type	
	Shunt release	Standard configuration	Fixed type/drawout type	
	Motor operating mechanism	Standard configuration	Fixed type/drawout type	
	Undervoltage release	Optional	Fixed type/drawout type	Either
	Undervoltage release (loss of voltage protection)	Optional	Fixed type/drawout type	
	Remote reset electromagnet	Optional	Fixed type/drawout type	
Signal output accessories	Auxiliary switch	Standard configuration	Fixed type/drawout type	
	Closing ready signal output device	Optional	Fixed type/drawout type	
	Three-position status signal output device of the drawer seat	Optional	Drawout type	
	Secondary terminal	Standard configuration	Fixed type/drawout type	
Related accessories of controller	External N-pole transformer (rectangular, flexible type)	Optional	Fixed type/drawout type	
	External current leakage transformer	Optional	Fixed type/drawout type	Shell frame level ≤4000A
	Power supply module NWDF1	Optional	Fixed type/drawout type	
	Relay module NWDF1-RM	Optional	Fixed type/drawout type	To be used with the power supply module
	Communication adapter NWDF1-MD/MP	Optional	Fixed type/drawout type	
	Message notification module NWDF1-SMS	Optional	Fixed type/drawout type	
	Temperature alarm protection device	Optional	Fixed type/drawout type	
	Remote intelligent I/O module NWDF1-C8/S12/SC64/SCM423	Optional	Fixed type/drawout type	
	6-channel programmable output module NWDF1-C6	Optional	Fixed type/drawout type	
	Accessory monitoring unit NWDF1-AM	Optional	Fixed type/drawout type	
	Energy-storing signal communication module NWDF1-S1	Optional	Fixed type/drawout type	
	Voltage conversion module NWDF1-P2	Optional	Fixed type/drawout type	
Safety accessories	Phase partition	Standard configuration	Fixed type/drawout type	
	Counter	Optional	Drawout type	
	Door frame	Optional	Fixed type/drawout type	
	Dust cover	Optional	Drawout type	
Lock and interlocking device	Off-position key lock	Optional	Fixed type/drawout type	
	Button lock	Optional	Fixed type/drawout type	
	Door interlock	Optional	Drawout type	
Power supply conversion system	Mechanical interlocking	Optional	Fixed type/drawout type	
	Power automatic switching device (ATS)	Optional	Fixed type/drawout type	For the two-way power supply

4.2 Electrical Control Accessories

4.2.1 Closed electromagnet

Closed electromagnet is mainly composed of coil, iron core component and electronic parts. In the condition of mechanism energy storage, as long as the closed electromagnet is energized, the circuit breaker can be closed.

◆ Action features of the closed electromagnet.

1) 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;

2) Closed electromagnet is the short-time duty-type;

3) Power-on time >200ms.

◆ Technical Parameters of Closed Electromagnet

Power Consumption Table of Closed Electromagnet

Rated insulation voltage (Ui)	Rated control supply voltage (Us)	Instantaneous power	
		NDW3-1600	NDW3-2500, 4000, 6300
400V	AC380V/AC400V 50/60Hz	380 VA	620VA
	AC220V/AC230V 50/60Hz	330 VA	500VA
	DC220V	330W	500W
	DC110V	270W	400W
	DC24V	156W	135W

4.2.2 Shunt release

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

◆ Action features of the shunt release

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

2) Shunt release is the short-time duty-type;

3) Power-on time >200ms.

◆ Technical Parameters of Shunt Release

Power Consumption Table of Shunt Release

Rated insulation voltage (Ui)	Rated control supply voltage (Us)	Instantaneous power	
		NDW3-1600	NDW3-2500, 4000, 6300
400V	AC380V/AC400V 50/60Hz	380 VA	620VA
	AC220V/AC230V 50/60Hz	330 VA	500VA
	DC220V	330W	500W
	DC110V	270W	400W
	DC24V	156W	135W

4.2.3 Motor operating mechanism

The circuit breaker can only be closed after the motor operating mechanism make the circuit breaker to store energy in advance.

◆ Operation features

1) 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.

2) The motor will close the power supply automatically and stop operation after it stores energy in place.

3) The motor operating mechanism can realize the automatic pre-energy storing.

◆ Technical Parameters of Motor Operating Mechanism

Power Consumption Table of Motor Operating Mechanism

Rated insulation voltage (Ui)	Energy storage time	Rated control supply voltage (Us)	Power consumption			
			NDW3-1600	NDW3-2500	NDW3-4000	NDW3-6300
400V	3s~5s	AC220V/AC230V AC380V/AC400V (50/60Hz)	90 VA	110VA	150 VA	180 VA
		DC220V/DC110V	90W	110W	150W	180W

4.2.4 Undervoltage release

◆ Action features of the undervoltage release

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

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

3) When the applied voltage is 85%~110% of the rated operational voltage of the undervoltage release, the undervoltage release can be closed reliably to guarantee the reliable closing of the circuit breaker.

◆ Undervoltage release can be divided into two types (instantaneous release and delayed release), which is mainly composed of coil, iron core component and electronic parts.

◆ Undervoltage delayed release

The undervoltage delayed release sets the delay time of the release action through toggling the toggle switch on the undervoltage delayed device. The delay time is set as 1 s, 3 s, 5 s as required, and the factory default is 1 s.

◆ See the table below for the power consumption of undervoltage release.

Power Consumption Table of Undervoltage Release

Rated insulation voltage (Ui)	Rated operational voltage (Ue)	Operating power	
		NDW3-1600	NDW3-2500, 4000, 6300
400V	AC220V/AC230V 50/60Hz	0.8 VA	3.9VA
	AC380V/AC400V 50/60Hz	0.8 VA	5.2VA
	DC220V	0.8W	3.9W
	DC110V	0.8W	3.9W
	DC24V	1.9W	1.55W

4.2.5 Undervoltage release (loss of voltage protection), loss of voltage release for short

◆ Action features of the loss of voltage release

1) When the applied voltage suddenly drops to 0~30% of the rated operational voltage, the loss of voltage release will work to disconnect the circuit breaker;

2) When the applied voltage is less than 30% of the rated operational voltage of the loss of voltage release, the loss of voltage release will make the circuit breaker cannot be closed;

3) When the applied voltage is 85%~110% of the rated operational voltage of the loss of voltage release, the loss of voltage release can guarantee the reliable closing of the circuit breaker.

4) When the applied voltage drops no less than 35% of the rated operational voltage, the loss of voltage release can be closed to guarantee the reliable closing of the circuit breaker.

◆ The loss of voltage release can be divided into instantaneous release and delayed release, which is mainly composed of coil, iron core component and electronic parts.

◆ Loss of voltage delayed release

The loss of voltage delayed release sets the delay time of the release action through toggling the toggle switch on the loss of voltage delayed device. Delay time: NDW3-1600/6300：0s～10s adjustable for clients(factory default setting value is 3s), and its step length is 1s; NDW3-2500/4000：1s、3s、5s.

◆ See the table below for the power consumption of loss of voltage release.

Power Consumption Table of Loss of Voltage Release

Rated insulation voltage (Ui)	Rated operational voltage (Ue)	Operating power	
		NDW3-1600	NDW3-2500、4000、6300
400V	AC220V(AC230V) 50Hz/60Hz	0.8VA	4VA
	AC380V(AC400V) 50Hz/60Hz	0.8VA	8VA

4.2.6 Remote reset electromagnet

This accessory is installed in the controller base. In case of fault tripping and troubleshooting of controller, the remote reset electromagnet can reset the reset button of the circuit breaker for the normal closing/opening operation of the circuit breaker

◆ Action features of remote reset electromagnet

1） When the power supply voltage of the remote reset electromagnet maintains at 85%~110% of the rated control supply voltage, operation of the shunt release can make the circuit breaker disconnect;

2) Remote reset electromagnet is the short-time duty-type;

3) Power-on time >200ms.

◆ Technical Parameters of Remote Reset Electromagnet

Power Consumption Table of Remote Reset Electromagnet

Rated insulation voltage (Ui)	Rated control supply voltage (Us)	Instantaneous power
400V	AC220V/AC230V 50/60Hz	55VA
	DC220V	
	DC110V	50W
	DC24V	

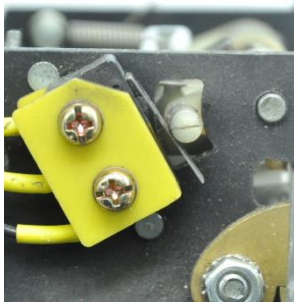
4.3 Signal Output Accessories

4.3.1 Auxiliary switch

- The 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.
- Technical Parameters of Auxiliary Contact

Applicable shell frame		NDW3-1600	NDW3-4000	NDW3-2500/6300
Auxiliary contact form	Conventional	■ Four groups switch	■ Four groups switch	■ Four normally opened and four normally closed
	Special	■ Six groups switch	■ Four normally opened and four normally closed ■ Six groups switch	■ Five normally opened and five normally closed ■ Six normally opened and six normally closed
Agreed thermal current I_{th}		6A		
Minimum load		2mA/DC15V		
Breaking capacity	DC-13	5A/250V		
	AC-15	16A/380V		

4.3.2 Closing ready signal output device



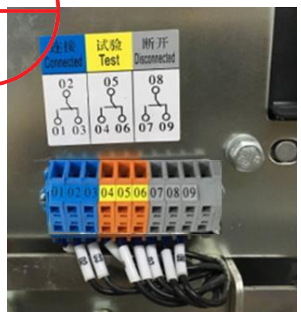
Closing ready signal output device of the circuit breaker is the output signal device that reflects the operating mechanism to achieve the closed state. It can output signals if it meets the following mechanical states. See the table below for technical parameters.

- ◆Circuit breaker off state;
- ◆Energy storage in place;
- ◆No disconnection instruction;
- ◆Undervoltage release closing in place;
- ◆Controller fault tripping reset.

Table of Technical Parameters

Applicable shell frame		NDW3-1600, NDW3-2500, NDW3-4000, NDW3-6300	
Breaking capacity	AC	250V	3A
		125V	5A

4.3.3 Position status signal output device of the drawer seat (on the drawer seat)



When the drawer-seat circuit breaker body is in the "Separation", "Test" and “Connection" positions of the drawer seat（Pop-up the red reset button in front of the drawer seat）, the triolocation electric indication device can output the electrical status signal corresponding to the three positions with the signal output terminal located on the left side of the drawer seat. See the table below for technical parameters

Table of Technical Parameters

Applicable shell frame		NDW3-1600, NDW3-2500, NDW3-4000, NDW3-6300	
Breaking capacity	DC	125V	0.4A
	AC	250V	16A

4.3.4 Secondary wiring terminal

■ For the number of secondary wiring terminal, there is a total of 62 groups (identical for the fixed type and drawout type); see Chapter 8 for the definition and its electrical wiring diagram of each terminal number.

■ See the table below for parameters of the secondary wiring terminal

Item	Parameter
Connection mode	Clamping
Flame retardant rating, according to UL 94	V0
Pollution level	3
Voltage category	III
Material group	IIIa
Applicable connection standards	GB/T 14048.7-2006
Maximum load current	10A
Rated current	10A
Rated Voltage	500V
Minimum cross section area of the rigid (flexible) conductor	0.2mm^2
Maximum cross section area of the rigid (flexible) conductor	1.5mm^2
Recommended striping length	10mm
Minimum test pull-force after the conductor connection	10N

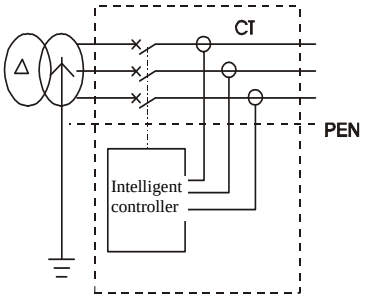
4.4 Related Accessories of Controller

4.4.1 External N-pole transformer

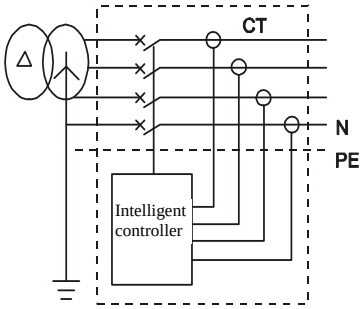
◆Ground type

The 3P+N system can be formed by using a 3P circuit breaker and an external N-phase transformer. It can measure data on the grounding cable via an external N-pole transformer to realize the ground protection of the differential type (T) or the ground current type (W). The electric circuit diagram is shown as below:

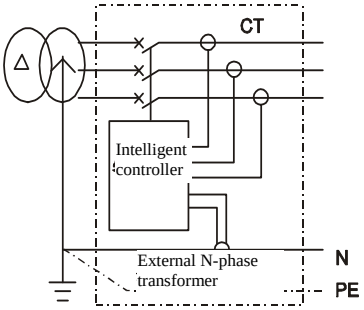
1) Electric circuit diagram of differential type (T)



3P

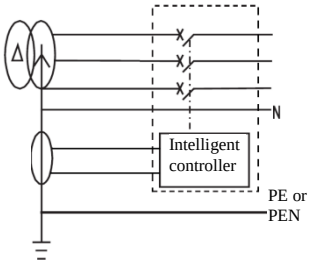


4P



(3P+N)T

2) Electric circuit diagram of ground current type (W)



◆ Transformer type

For rectangular and flexible-type transformers, users can select the shell frame current (or N-pole current) and dimensions.

1） Rectangular transformer

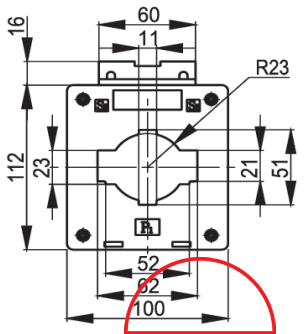
★ Rectangular transformer code

Transformer code	Hole dimensions mm	Applicable shell frame
N1	62×21	1600
N2	102×32.5	1600
N3	122×52	2500, 4000, 6300
N4	262×102	2500, 4000, 6300

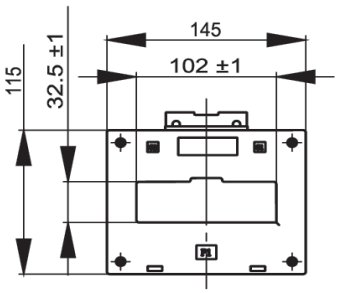
★ See the figure below for outline and installation dimensions of the rectangular transformer.

★ pay attention to the direction for use:the current flows from P1 to P2.

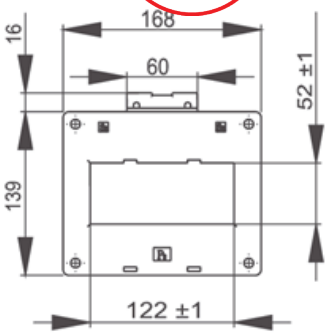
N1 external transformer



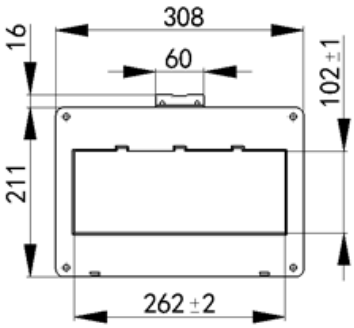
N2 external transformer



N3 external transformer



N4 external transformer



Outline and Installation Dimension Diagram of the N-pole Transformer

★ With conductors to be supplied by customers, it is recommended to use the shielded twisted pair (with the metal shield layer, 0.2~0.3mm², namely the AWG24/AWG22 conductor). The recommended conductor length is no more than 3 meters for connection of Y-type terminals at the wire end, with a tightening torque of 1.2N.m.

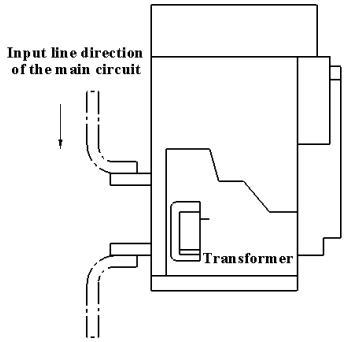
2） Flexible transformer

★ Flexible transformer code

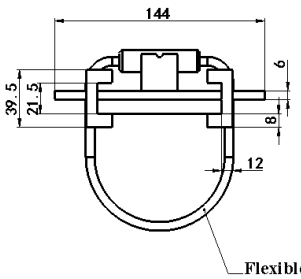
Transformer code	Circumference of soft connection coil	Applicable current range
NR1	280mm	200A-800A
NR2	370mm	1000A-2000A
NR3	450mm	1000A-6300A

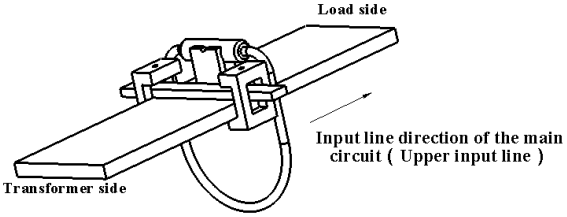
★ See the figure below for outline and installation dimensions of the flexible transformer.

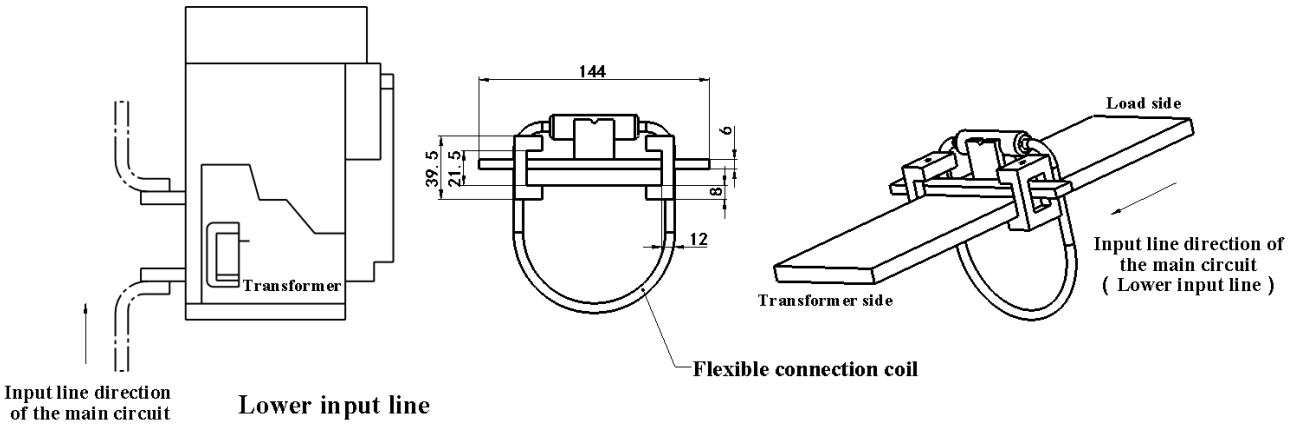
★ pay attention to the direction for use:the inlet wire direction is shown in the picture.



Upper input line





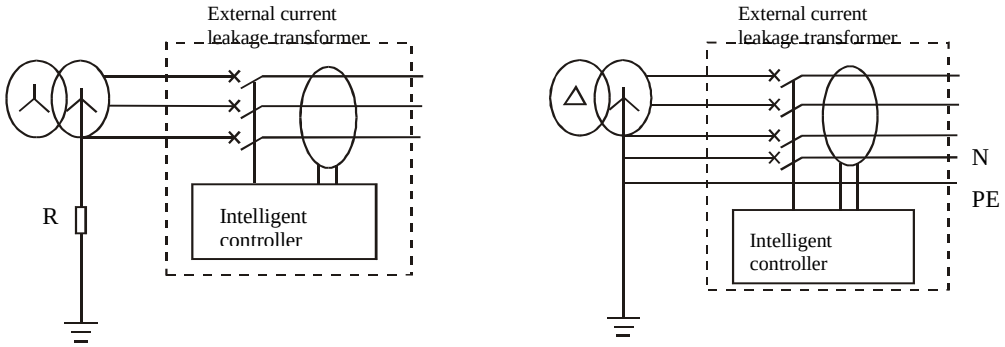


★ Install the flexible transformer on the busbar as shown in the figure, and connect the transformer conduction to the secondary circuit: Red to No. 25 and green to No. 26. Standard configuration of the conductor is 3m.

4.4.2 External current leakage transformer

◆ When the grounding protection mode is residual current protection (E) type, an external current leakage transformer is required. The controller judges action via the output signal of the external current leakage transformer.

◆ See the figure below for the current leakage protection schematic (3P and 4P system).



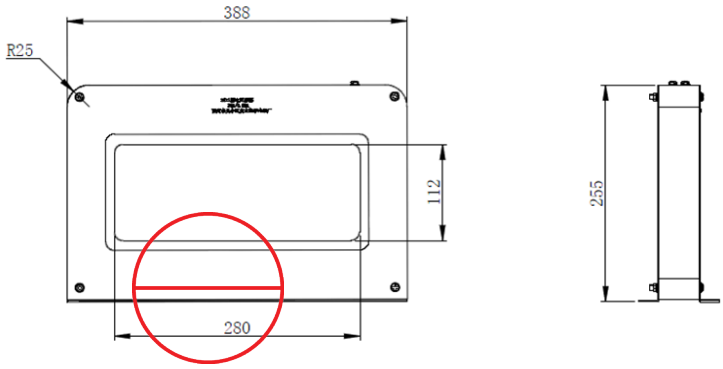
Schematic Diagram of Current Leakage Protection

◆ NDW3-1600 mode can pass through busbar while the NDW3-1600 and 2500 modes can pass through cable.

◆ With conductors to be supplied by customers, it is recommended to use the shielded twisted pair (with the metal shield layer, 0.2~0.3mm ², namely the AWG24/AWG22 conductor). The recommended conductor length is no more than 3 meters for connection of Y-type terminals at the wire end, with a tightening torque of 1.2N.m.

◆ See the figure below for outline and installation dimensions of the external current leakage transformer

◆ When install the circumscribed electric leakage mutual inductor, there is no need in distinguishing directedns.



Outline and Installation Dimension Diagram of the External Current Leakage Transformer

4.4.3 Power supply module NWDF1

◆ Role: As the power source of relay module NWDF1-RM, the output voltage is DC24V;

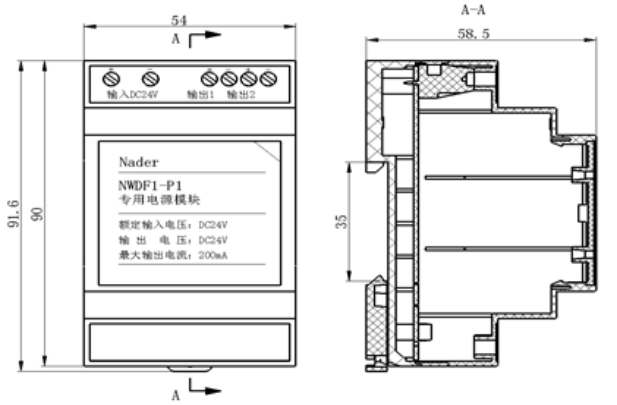
◆ Type: See the table below

		NWDF1-P1	NWDF1-P3	NWDF1-P5
Working power supply	Nominal voltage	24 VDC	400/230VAC	220/110VDC
	Allowable input range	12-36 VDC	180VAC-430VAC	85VDC-265VDC
	Isolation voltage	1500Vrms	1500Vrms	1500Vrms
	Reverse polarity effects	With polarity effects	Without polarity effects	With polarity effects
Protection class		IP20	IP20	IP20
Dimensions		90 x 54 x 58.5mm	90×72×58.5	90×72×58.5
Installation mode		Installed with a 35mm standard guide rail	1. With a 35mm standard guide rail 2. Screw installation	1. With a 35mm standard guide rail 2. Screw installation

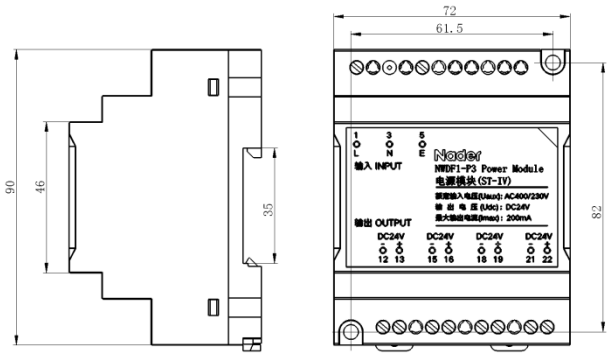
◆ Supply mode: Optional ordering by customers;

Users indicate the rated operational voltage and carry out installation by themselves. Pay attention to “+” and “-” polarities of wiring, which cannot be wrongly wired.

- See the figure below for outline and installation dimensions.



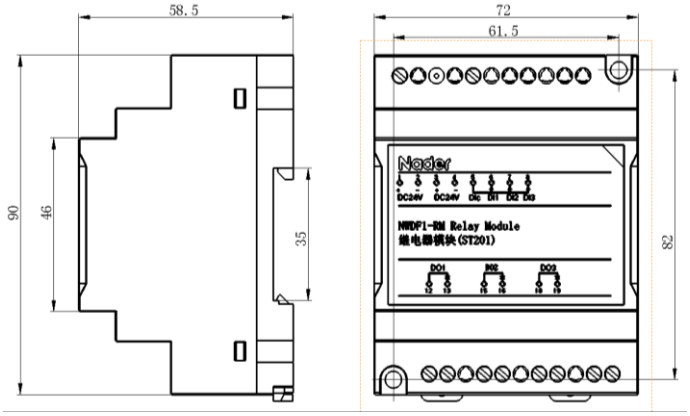
Outline and Installation Dimension Diagram of Power Supply Module NWDF1-P1



Outline and Installation Dimension Diagram of Power Supply Module NWDF1-P3/P5

4.4.4 Relay module NWDF1-RM

- Function: Signal unit of controller is commonly used in fault alarm or indication, etc. When the circuit breaker is 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 NWDF1 to achieve the "four remotes" function;
- Contact capacity: AC250V, 10 A; DC24V, 10 A;
- Appearance and installation: To be used with the controller power supply module ST-IV, see the installation diagram of relay module.



Installation Diagram of Relay Module

4.4.5 Communication adapters NWDF1-MD, NWDF1-MP, NWDF1-ME and NWDF1-MC

- The communication adapter can be divided into the following types: NWDF1-MD and NWDF1-MP. It connects with the intelligent communication products with our ModBus RTU standard protocol interface to realize conversion of different protocols, thus making the intelligent communication

products to achieve the remote communication, remote regulating, remote control and remote sensing functions on DeviceNet and ProfiBus DP.

1） NWDF1-MD(MDC-225) communication adapter realizes conversion from the ModBus-RTU protocol to the DeviceNet protocol;

2） NWDF1-MP(PM-127) communication adapter realizes conversion from the ModBus-RTU protocol to the Profibus DP protocol;

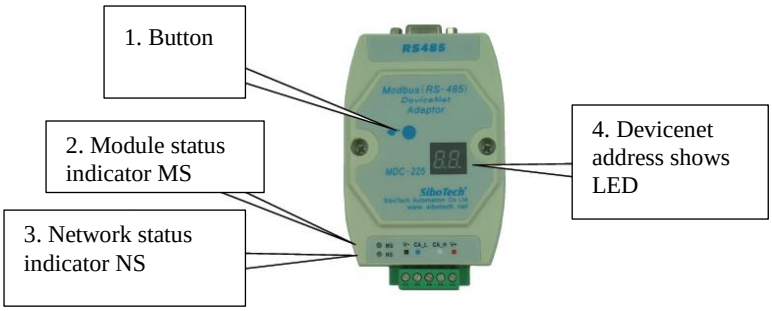
3） NWDF1-ME(ES-301A) communication adapter realizes conversion from the ModBus-RTU protocol to the Ethernet protocol;

4） NWDF1-MC(NT50-CO-RS) communication adapter realizes conversion from the ModBus-RTU protocol to the CAN protocol;

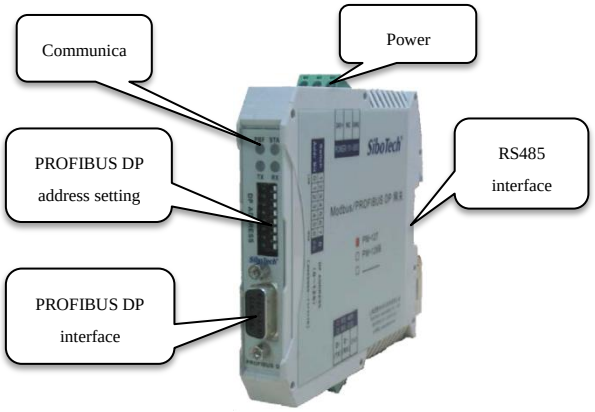
5） See the attached manual of each accessory for the communication protocol.

6） NWDF1-MD and NWDF1-MP only support communication for a single device.

◆ Appearance and function indication

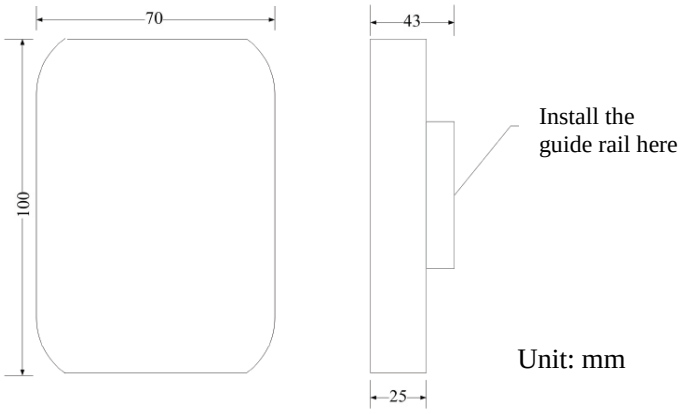


NWDF1-MD

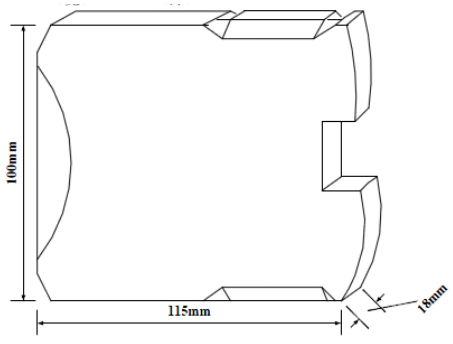


NWDF1-MP

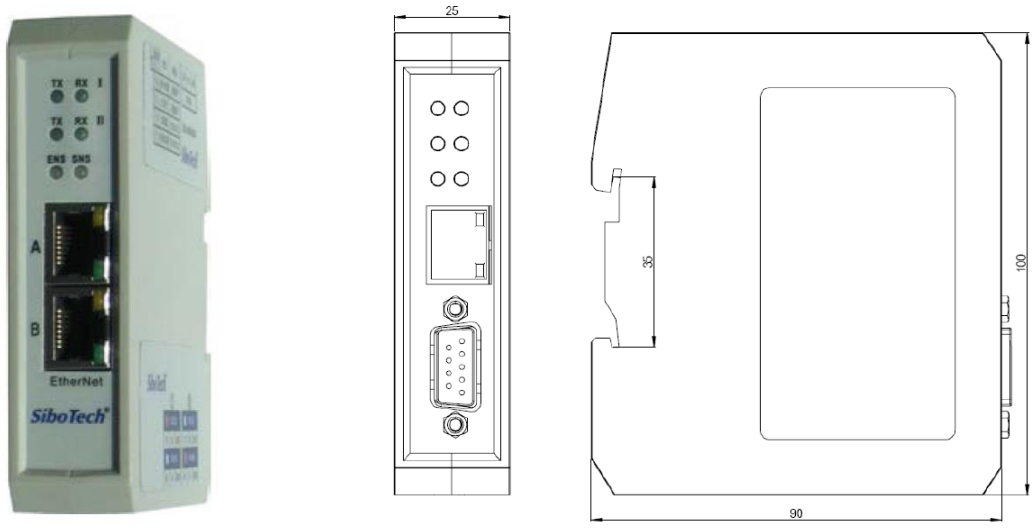
◆ See the figure below for outline and installation dimensions.



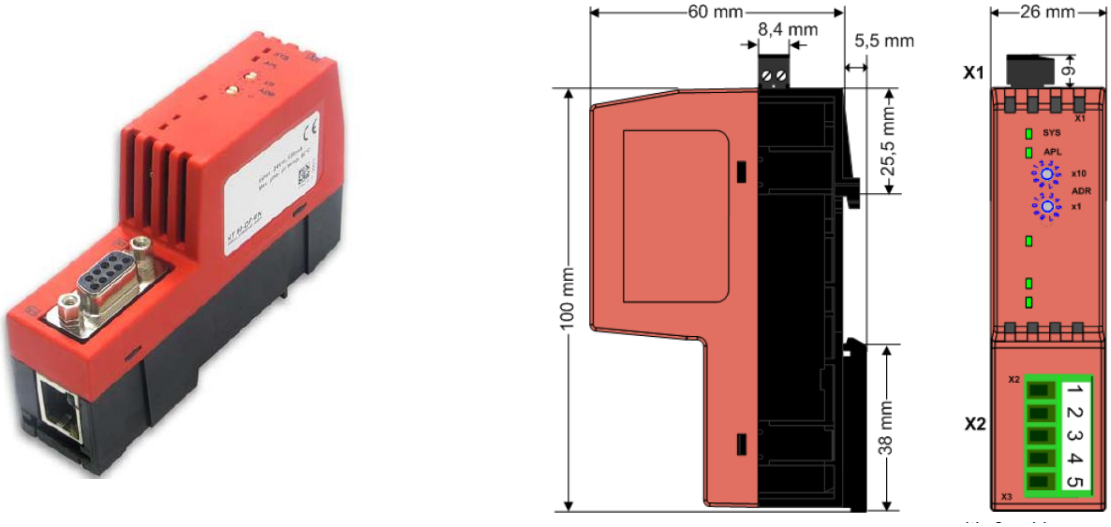
NWDF1-MD Outline and Installation Dimension Diagram



NWDF1-MP Outline and Installation Dimension Diagram



NWDF1-ME Outline and Installation Dimension Diagram

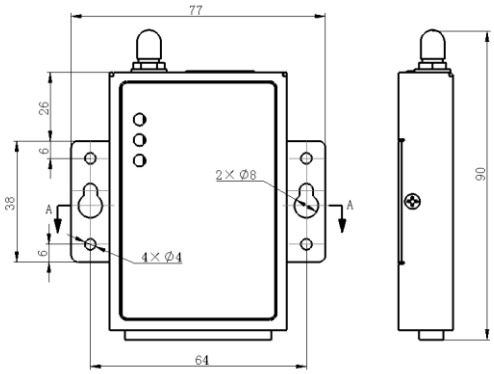


NWDF1-MC Outline and Installation Dimension Diagram

4.4.6 Message notification module NWDF1-SMS(JYC311A6)

- The message notification module directly connects one communication circuit breaker via the standard RS485 communication mode.

When a fault tripping event occurs to the circuit breaker, send a message to one or up to 5 phones via the GSM network so as to prompt the user for timely treatment. The message content includes tripping type, fault current, delay time, tripping time (year/month/day/hour/minute/second); users can add their own mobile phone users via the framework controller (enter the phone number). Note: Users shall buy their own mobile phone SIM card with China mobile number. Other network is not supported and shall be guaranteed to be in the renewal state. The message center number setting must be correct at the same time; otherwise the message can't be sent normally. See the figure below for outline and installation dimensions.



4.4.7 Remote intelligent I/O module NWDF1-C8/S12/SC64/SCM423

◆The remote intelligent I/O module is a simple, practical and reliable monitoring communication module (installed with a 35mm standard guide rail), which enables the remote communication, remote control and remote measurement of the system via the standard RS485 interface and ModBus-RTU protocol. When using a non-communication circuit breaker, users can monitor the corresponding power distribution circuit via the module. Users can remotely monitor the circuit current, circuit breaker on-off status, fault status and other important information.

◆After the module is energized, the power/status indicator will flash quickly (0.5s on/0.5s off) while the rest indicators will be constantly on for 1s and then enter into the working state. During this period, any input, output and communication are invalid. After normal startup, this module can realize the following functions: Setting the communication parameters by pressing the key (communication initialization button); detecting the current input, i.e. the analog input; detecting the digital input, i.e. the passive dry contact input; controlling the digital output, that is, self-holding output/pulse output.

◆NWDF1-SCM423 features 4 common-side switch inputs, 2 relay outputs and 3 5A current inputs. Users can know the 3-phase current and 4-channel switch of the feeder line (such as: switch on-off status, fault status, etc.) via it combined with inputs & outputs of the circuit breaker and the standard current transformer in the line

.

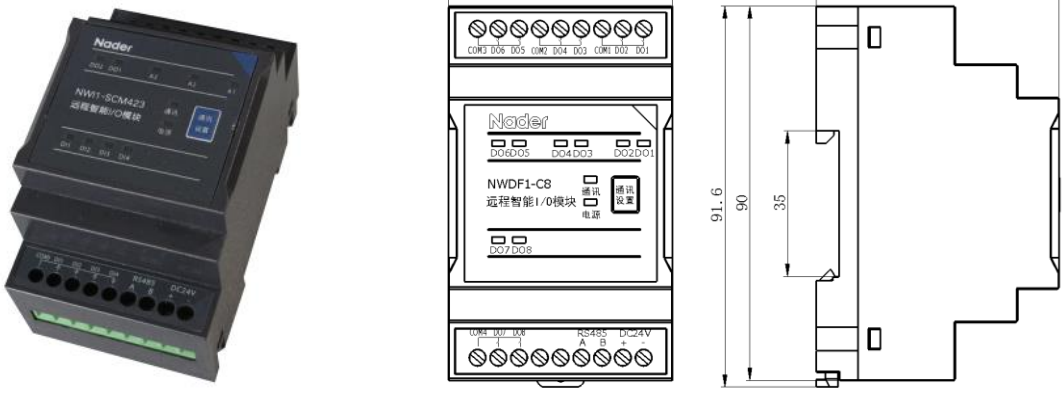
◆NWDF1-S12 features 12 common-side switch inputs. Users can learn the on-off status up to 12 circuit breakers or the on-off status and fault status of 6 circuit breakers.

- ◆ NWDF1-C8 has 4 groups of 8 relay outputs, for controlling the on-off status of 4 circuit breakers.
- ◆ NWDF1-SC64 features 6 switch inputs and 4 relay outputs, for monitoring its important status while controlling the circuit breaker.
- ◆ See the table below for general parameters

Working power supply	Nominal voltage	24VDC
	Allowable input range	18V~36VDC
	Isolation voltage	1000Vrms

	Reverse polarity effects	Does not work, but does not damage the module
	Voltage mismatch	Voltage above 40VDC may cause the permanent damage of the module
	Voltage sag	Sag for 10ms can still work without interruption
Communication	interface	Standard RS485, 2-wire, Modbus RTU
	Optional Modbus address	1~247
	Baud rate	1200/2400/4800/9600/19200/38400bps
	Parity bit	CRC check, without support for parity
	Isolation voltage	1000Vrms
	Maximum number of modules for a single bus	32
Protection class		IP20
Dimensions		91.6 x 54 x 58.5mm
Installation mode		Installed with two 35mm standard guide rails

- See the figure below for outline and installation dimensions.



Outline and Installation Dimension Diagram of the Remote Intelligent I/O Module

4.4.8 6-channel programmable output moduleNWDF1-C6

- For the NDWF1-C6 programmable output module (installed with a 35mm standard guide rail),

For the programmable content details, see the NWDF1-C6 6-channel programmable expansion output module part in the NDT2920191 “Operation Manual of NWDF1 Series Frame Electrical Accessories”.

- For the communication protocol details of the programmable module, see the NWDF1-C6 6-channel programmable expansion output module part in the NDT2920191 “Operation Manual of NWDF1 Series Frame Electrical Accessories”.

Function Table of Wiring Mode and Terminal Definition

Model	Terminal code	Connection position	Input/output	Remarks
NWDF1-C6	AC230V	Power-supply AC220V input end	Input	Power-supply AC220V input, including neutral wire, live wire
	B	RS485 communication AB ports	Input/output	RS485 communication ports, do not reverse
	A			
	1	Relay output 1 NC contact	Output	Relay output 1 NC contact
	2	Relay output 1 NO contact	Output	Relay output 1 NO contact
	3	Relay output 1 public contact	Input	Relay output 1 public contact
	4	Relay output 2 NC contact	Output	Relay output 2 NC contact
	5	Relay output 2 NO contact	Output	Relay output 2 NO contact
	6	Relay output 2 public contact	Input	Relay output 2 public contact
	7	Relay output 3 NC contact	Output	Relay output 3 NC contact
	8	Relay output 3 NO contact	Output	Relay output 3 NO contact
	9	Relay output 3 public contact	Input	Relay output 3 public contact
	10	Relay output 4 NC contact	Output	Relay output 4 NC contact
	11	Relay output 4 NO contact	Output	Relay output 4 NO contact
	12	Relay output 4 public contact	Input	Relay output 4 public contact
	13	Relay output 5 NC contact	Output	Relay output 5 NC contact
	14	Relay output 5 NO contact	Output	Relay output 5 NO contact
	15	Relay output 5 public contact	Input	Relay output 5 public contact
	16	Relay output 6 NC contact	Output	Relay output 6 NC contact
	17	Relay output 6 NO contact	Output	Relay output 6 NO contact
	18	Relay output 6 public contact	Input	Relay output 6 public contact

Programmable Output Module Contact Type Table

Non-locking contact	In case the alarm triggered by fault isn't eliminated, the contact holds action
Locking contact	The contact holds action until reset (reset menu)
Time delay contact	The contact holds action within the adjustable time delay or is reset (reset menu)

Time Setting Table of the Time Delayed Contact

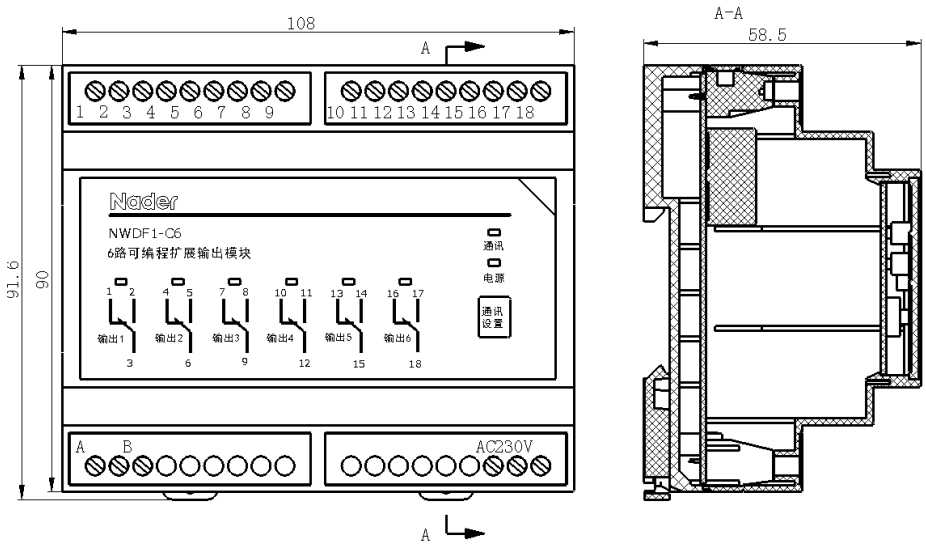
Item	Scope	Step	Accuracy
Delay time of the delay time contact	1s-360s	1s	±10%

Electric Parameters Table of the Programmable Module Relay Output

Rated working voltage Ue/V		Agreed thermal current Ith/A	Rated working current Ie/A	Rated control capacity
AC	230	5 (2-channel programmable	AC-15: 5(2-channel programmable output module	1200VA (2-channel programmable

		output module is 1A)	is 1A)	output module is 230VA)
	400		AC-15: 3	1200 VA
DC	220		DC-13: 0.15	50W
	110		DC-13: 0.4	

- See the figure for outline and installation dimensions of 6-channel programmable output module.



Outline and Installation Dimension Diagram of 6-channel Programmable Output Module

4.4.9 Accessory monitoring unit NWDF1-AM

- After installed with the accessory monitoring unit, the circuit breaker can perform the online monitoring of coil break for the shunt release, closing electromagnet, undervoltage release and energy storage motor, to ensure normal operation of the circuit breaker.
- For the communication protocol details, see the NWDF1-AM accessory monitoring module part in the NDT2920191 “Operation Manual of NWDF1 Series Frame Electrical Accessories”.
- See the table below for technical parameters

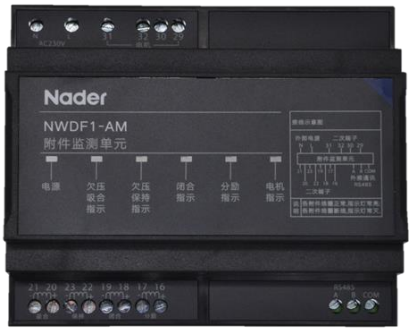
Working power supply	Nominal voltage	230VAC
	Allowable input range	180V~270VAC
	Isolation voltage	1000Vrms
	Reverse polarity effects	Without polarity effects
	Voltage mismatch	Voltage above 260VAC may cause the permanent damage of the module
	Voltage sag	Sag for 10ms can still work without interruption
Communication	interface	Standard RS485, 2-wire; Modbus RTU
	Optional modbus address	2~127
	Baud rate	9600
	Parity bit	CRC check, without support for parity
	Isolation voltage	1000Vrms

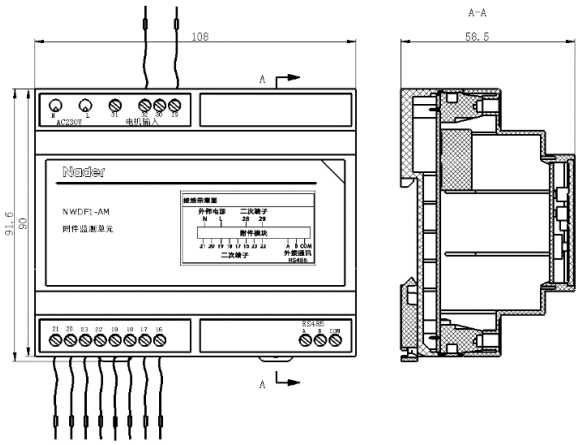
	Number of modules for a single bus	32
Protection class		IP20
Dimensions		90 x 72 x 58.5mm
Installation mode		Installed with a 35mm standard guide rail

◆ Function Table of Wiring Mode and Terminal Definition

Model	Terminal code	Connection position	Port notes	Remarks
NWDF1-AM Accessory monitoring module	L	Power supply 230V	Power supply	Without positive and negative polarities
	N			
	A	RS485 A	Communication port	The terminal code is consistent with that of the communication module
	B	RS485 B	Communication port	The terminal code is consistent with that of the communication module
	COM	COM	Communication shied earthing	No wiring required
	29	Motor detection line	Motor coil break monitoring	The terminal code is the definition number of the body secondary terminal
	30	Motor detection line	Motor coil break monitoring	The terminal code is the definition number of the body secondary terminal
	31	Motor detection line	Motor coil break monitoring	The terminal code is the definition number of the body secondary terminal
	32	Motor detection line	Motor coil break monitoring	The terminal code is the definition number of the body secondary terminal
	16	Shunt+	Shunt coil break monitoring	The terminal code is the definition number of the body secondary terminal
	17	Shunt-	Shunt coil break monitoring	The terminal code is the definition number of the body secondary terminal
	18	Closing+	Closing coil break monitoring	The terminal code is the definition number of the body secondary terminal
	19	Closing-	Closing coil break monitoring	The terminal code is the definition number of the body secondary terminal
	20	Pull-in+	Pull-in coil break monitoring	The terminal code is the definition number of the body secondary terminal
	21	Pull-in-	Pull-in coil break monitoring	The terminal code is the definition number of the body secondary terminal
	22	Hold+	Hold coil break monitoring	The terminal code is the definition number of the body secondary terminal
	23	Hold-	Hold coil break monitoring	The terminal code is the definition number of the body secondary terminal

◆ See the figure below for outline and installation dimensions.





NWDF1-AM Outline and Installation Dimension Diagram

4.4.10 Energy-storing signal communication module NWDF1-S1

- Energy-storing signal communication module components can obtain the “Energy storage” or “Energy release” status information of the electric operating mechanism of the circuit breaker via the upper computer.

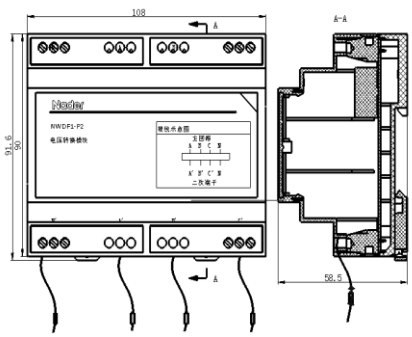
Outline and installation dimensions are the same with the outline and installation dimension diagram of the remote intelligent I/O module.

4.4.11 Voltage conversion module NWDF1-P2

- As the maximum rated input of the frame controller is AC400V in case of voltage detection, a voltage conversion module is required to reduce the voltage below AC400V when the input is greater than AC400V.
- See the table below for technical parameters:

Working power supply	Input voltage	690VAC~1200VAC
	Allowable input range	690VAC~1200VAC
Protection class		IP20
Dimensions		90 x 54 x 58.5mm/90×72×58.5
Installation mode		Installed with a 35mm standard guide rail

- See the figure below for outline and installation dimensions.



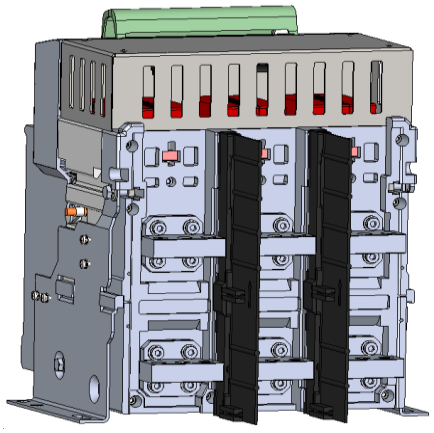
NWDF1-P2 Outline and Installation Dimension Diagram

4.5 Safety Accessories

4.5.1 Phase partition

Divided into fixed type and drawout type, the phase partition is installed in the groove between all the phase bus bars, used to increase the insulation strength between phases of the main circuit so as to prevent the short circuit in case of the insulation breakdown and improve the power reliability.

- Conventional phase partition

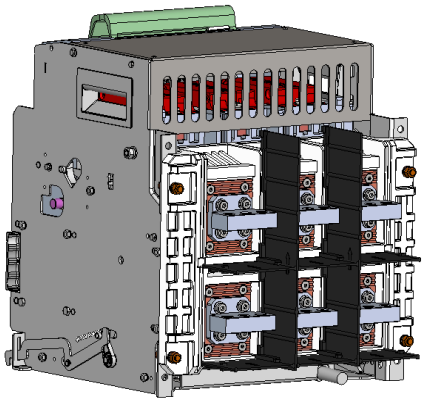


Fixed type appropriative holder

Phase Partition

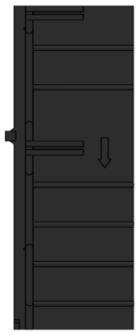
- HU Type Circuit Breaker Phase Partition

The phase partition is divided into fixed type and drawer type, and is installed in the grooves between all phase bus-bars. It is used to strengthen the dielectric insulation between phase and phase, input lines and output lines of main circuits, to prevent short-circuit caused by insulation breakdown, and therefore increase reliability of power supply.

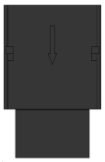


NDW3-2500HU

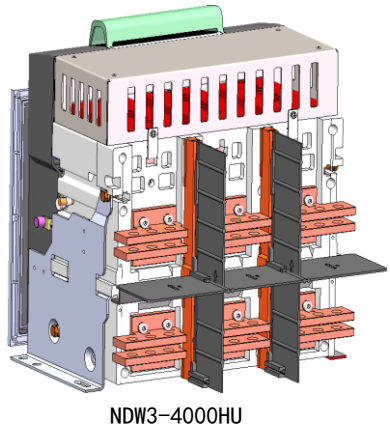
Fixed type appropriative holder



Phase Partition

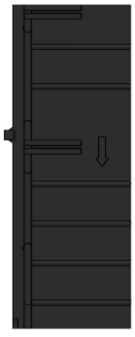


Input and output line partition



NDW3-4000HU

Fixed type appropriative holder



Phase Partition

Input and output line partition

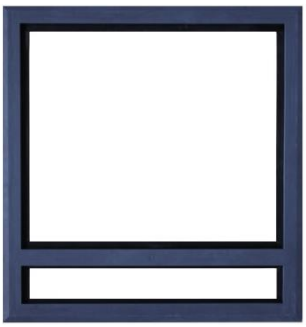
Note：When installing, NDW3-4000HU input and output line partition side with N, A, B and C should be installed upturned.

4.5.2 Counter

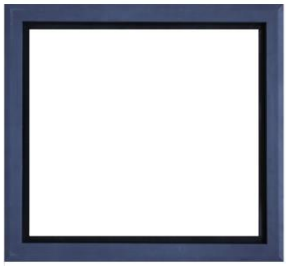
Counter is used to record the number of the "close-open" operation of the circuit breaker.

4.5.3 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.



Drawout type



Fixed type

4.5.4 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.

4.6 Lock and interlocking device

4.6.1 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,

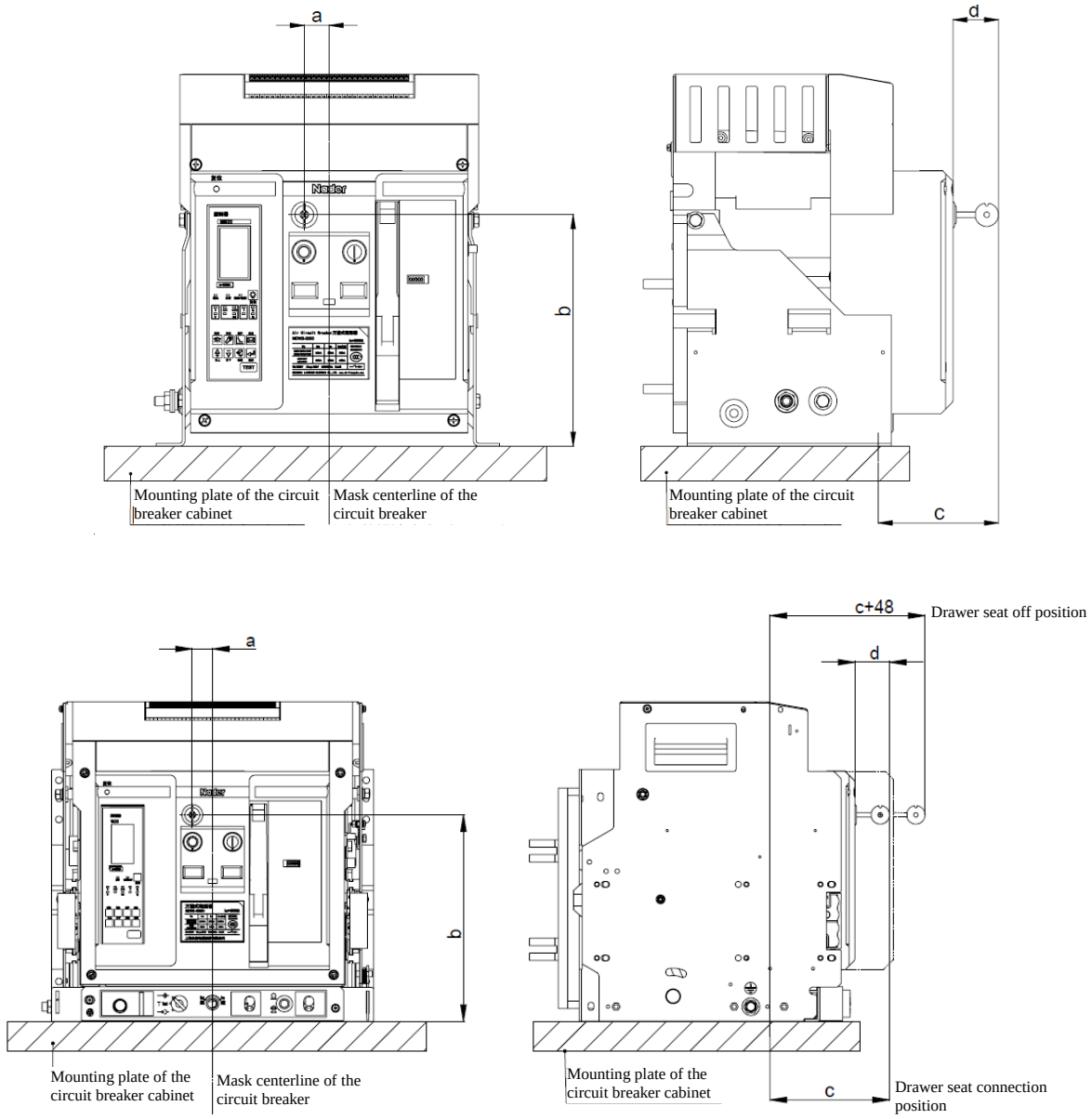
The circuit breaker cannot carry out closed operation, so as to prevent irregular operation. Model and type are shown in the table below.

Model and Type Table of Off-position Key Lock

Model	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

◆When the off-position lock is optionally selected, this accessory is sent to the user after being assembled with the circuit breaker. As the off-position lock protrudes out of the circuit breaker mask, the installer shall pay attention to the protruding dimension when opening the power distribution cabinet door. This dimension diagram and data are as follows.



Drawout type

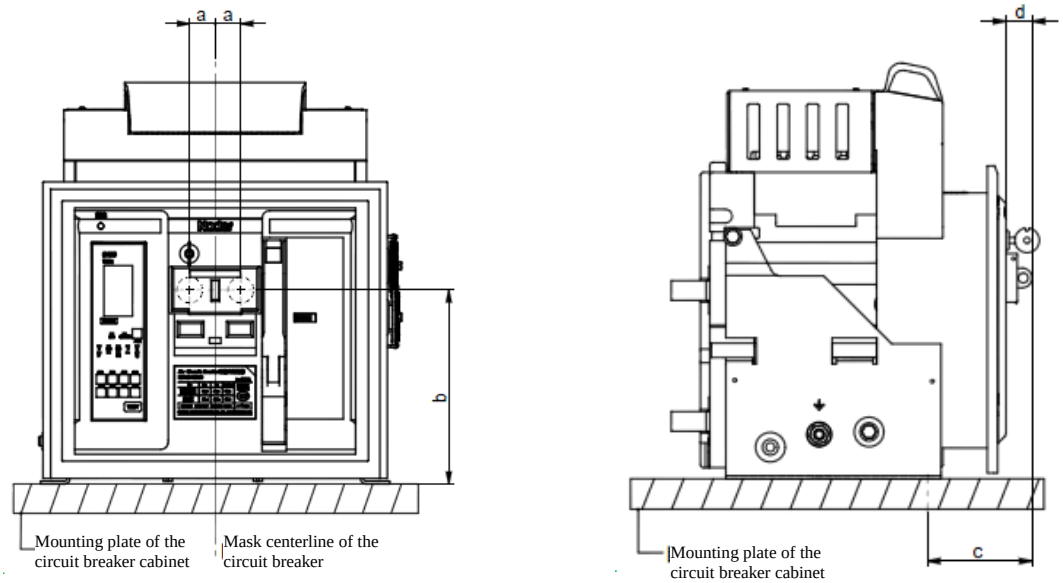
Unit: mm

Model	a		b		c		d	
	Fixed type	Drawout type	Fixed type	Drawout type	Fixed type	Drawout type	Fixed type	Drawout type
NDW3-1600	17		220		134	114	42	
NDW3-2500	27		247		125	163	45	

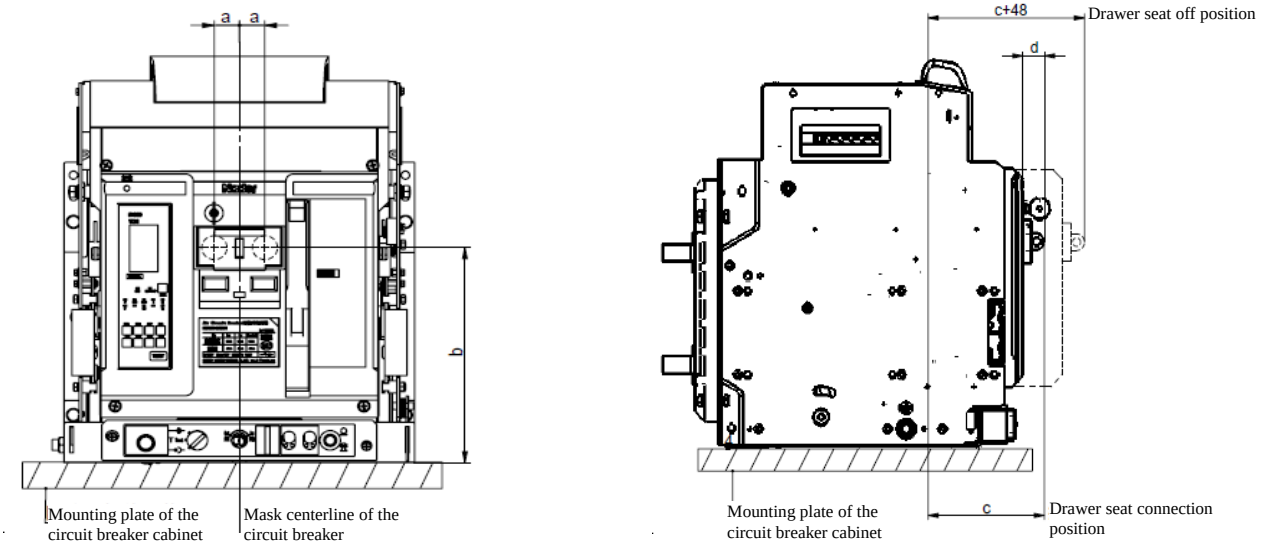
NDW3-4000 NDW3-6300					

4.6.2 Button lock

- To be used with a padlock, it is used to prevent non-staff from illegally operating the opening/closing button (padlock should be prepared by users).
- When the off-position lock is optionally selected, this accessory is sent to the user after being assembled with the circuit breaker. As the off-position lock protrudes out of the circuit breaker cover, the installer shall pay attention to the protruding dimension when opening the power distribution cabinet door.
  This dimension diagram and data are as follows.



Fixed



Drawo

Unit: mm

Model	a		b		c		d	
	Fixed type	Drawout type	Fixed type	Drawout type	Fixed type	Drawout type	Fixed type	Drawout type
NDW3-1600	18		155	187.5	91.7	108.2	26.4	
NDW3-2500 NDW3-4000	27		204	243.7	106	143.8	26.4	
NDW3-6300	27		204	243.7	106	104.4	26.4	

4.6.3 Door interlock (on the drawer seat)

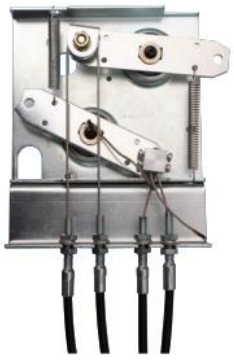
Installed on the right or the left side of the drawer seat. When the drawout type circuit breaker is in the separation position, it can avoid opening of the cubicle door.

4.7 Power Supply Conversion System

4.7.1 Mechanical interlocking

- Mechanical interlocking mechanism can be used for interlocking of the drawout circuit breaker and the fixed circuit breaker;
- 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 the table below

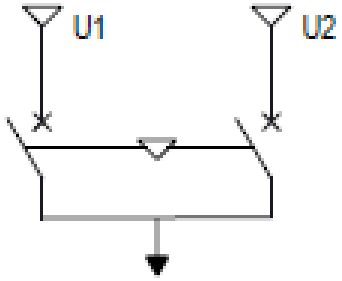
Selection mode	Code	Type	Number of circuit breakers
1	SR11	Two sets of cables, one for closing and one for opening	2
2	SR12	Three sets of cables, one for closing and two for opening	3
3	SR21	Three sets of cables, two for closing and one for opening	3
4	SY11	Two sets of hard rods, one for closing and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



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

1) Two circuit breakers (one for closing and one for opening)

Usage mode is shown in the figure below, while interlocking action state is shown in the figure below.

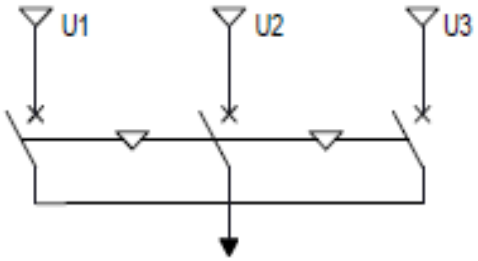


Status Table of Two Circuit Breaks

U1	U2
Close	Open
Open	Close
Open	Open

2) Three circuit breakers (one for closing and two for opening)

Usage mode is shown in the figure below, while interlocking action state is shown in the figure below.

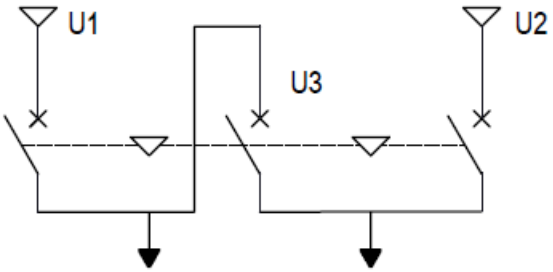


Status Table of Three Circuit Breakers (One for Closing and Two for Opening)

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

3） Three circuit breakers (two for closing and one for opening)

Usage mode is shown in the figure below, while interlocking action state is shown in Table 64.



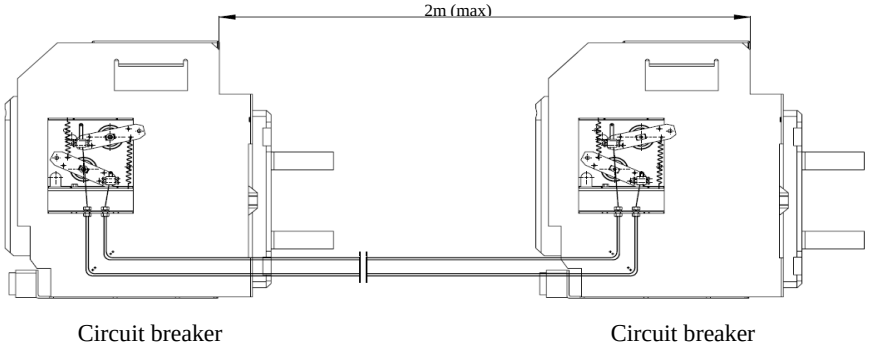
Status Table of Three Circuit Breakers (One for Closing and Two for Opening)

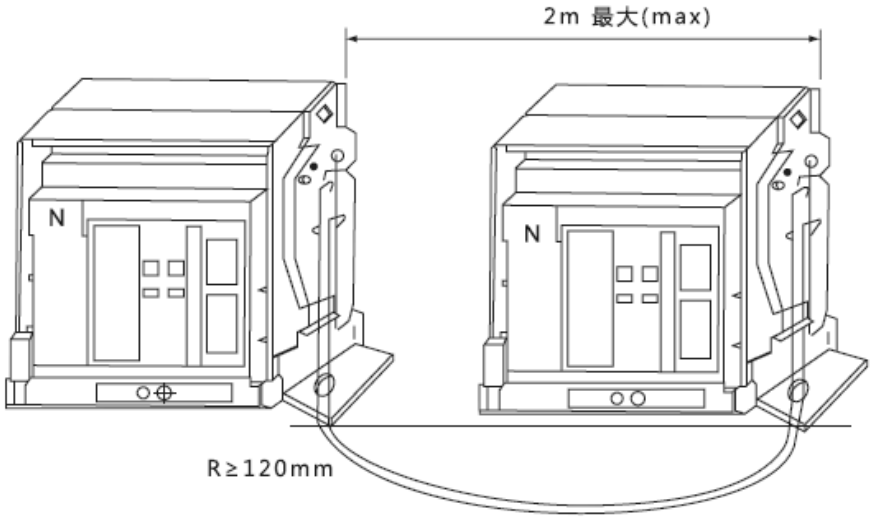
U1	U2	U3
Open	Open	Open
Close	Close	Open
Close	Open	Close
Open	Close	Close

◆ Type description

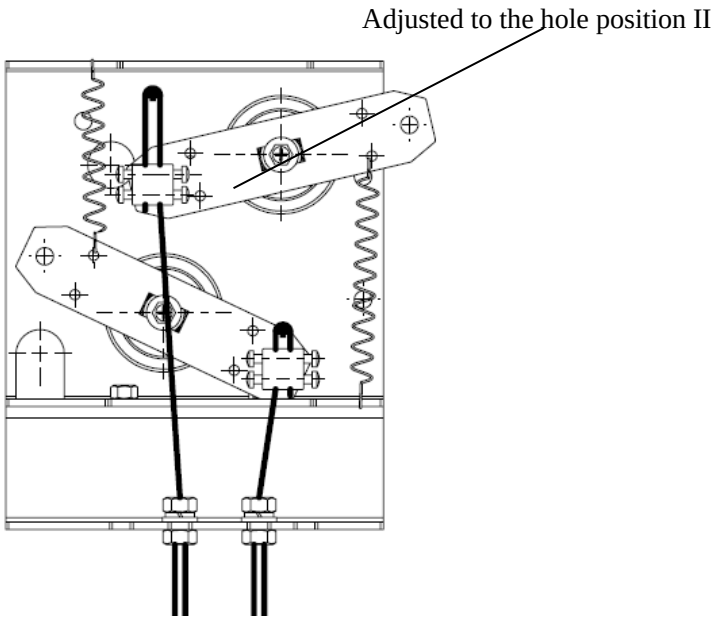
1) Two interlocking cables (one for closing and one for opening)

Installation schematic diagram:



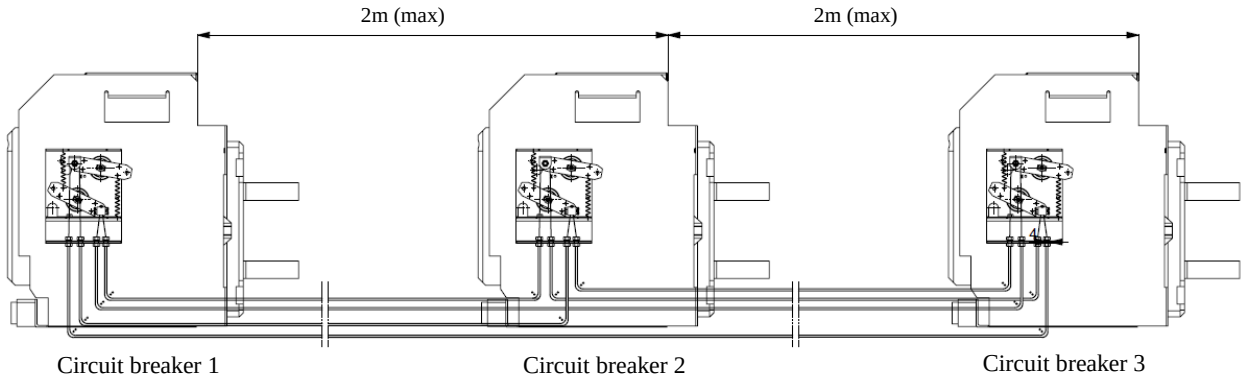


Adjustment schematic diagram:

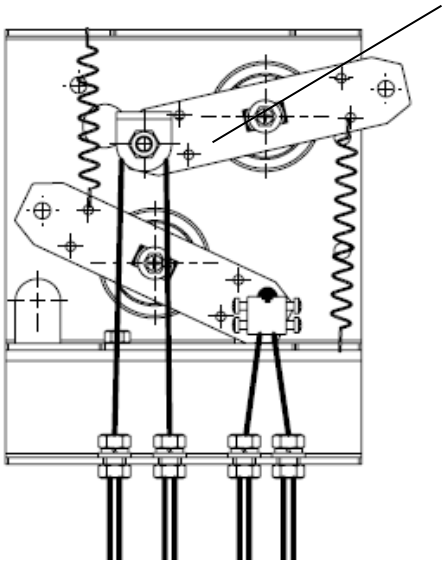


2) Three interlocking cables

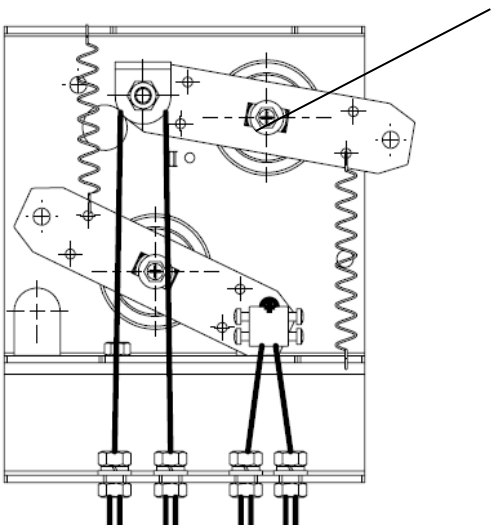
Installation schematic diagram:



Adjustment schematic diagram: One for closing and two for opening

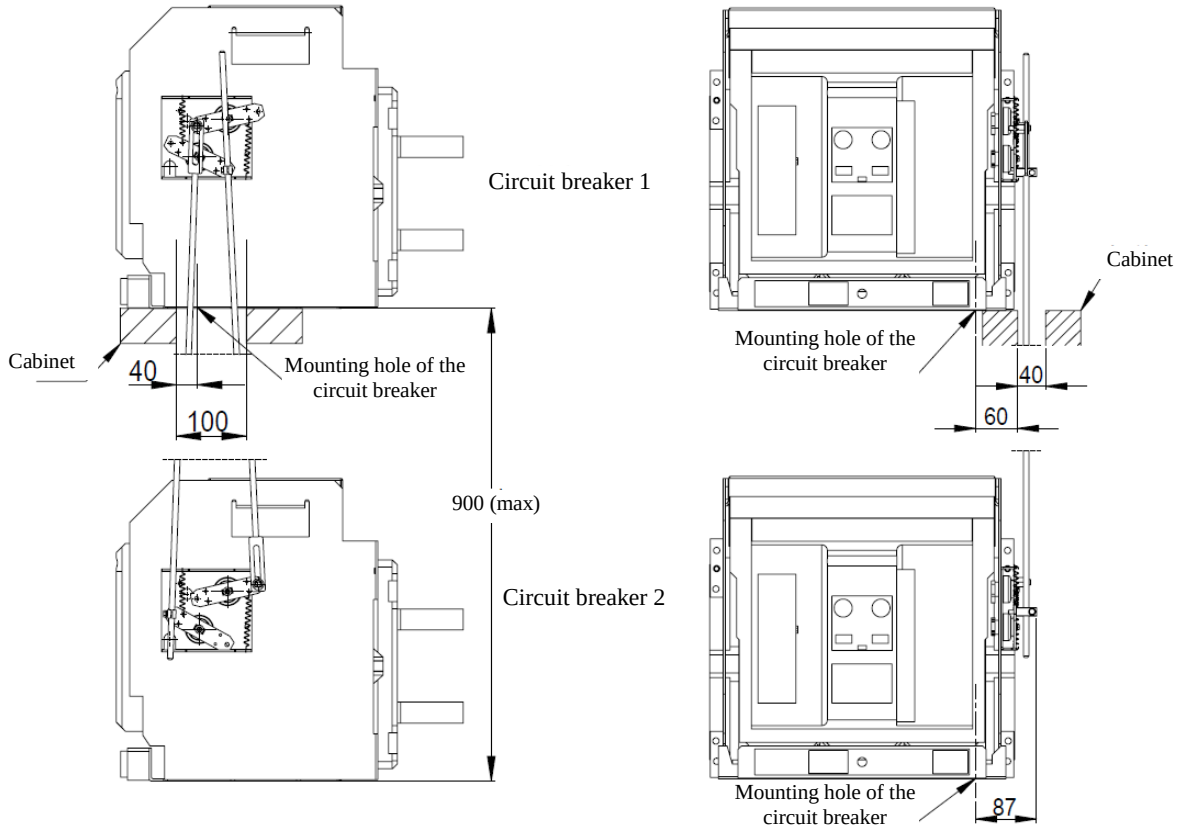


Adjustment schematic diagram: Two for closing and one for opening



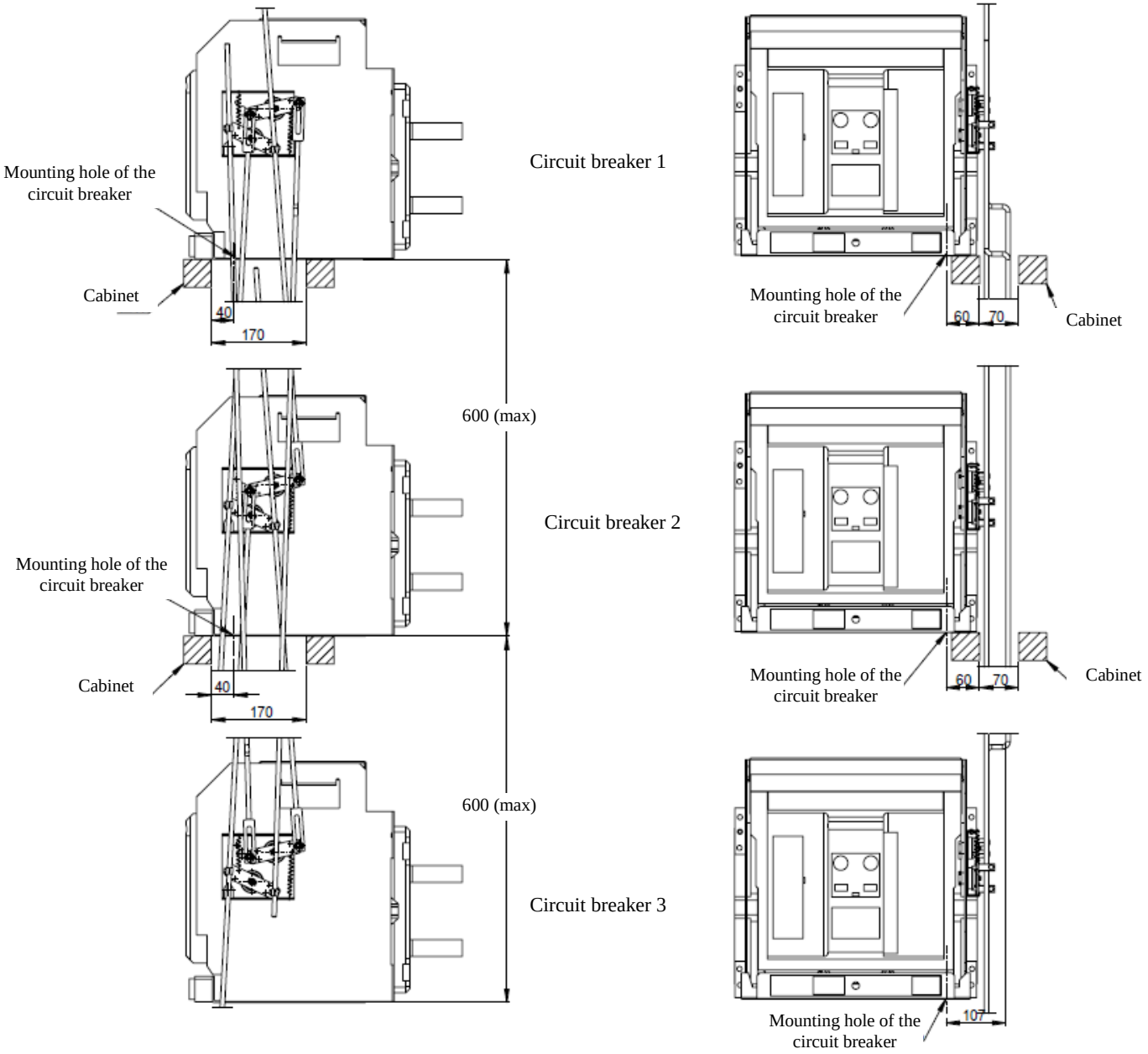
3) Two interlocking hard rods

Installation schematic diagram: (One for closing and one for opening)



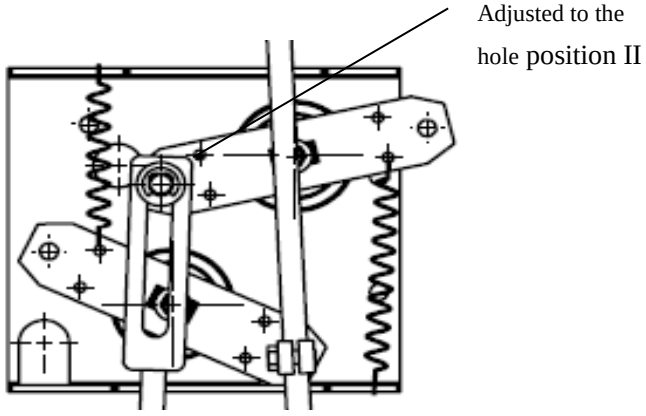
4) Three interlocking hard rods

Installation schematic diagram: (One for closing and two for opening)



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

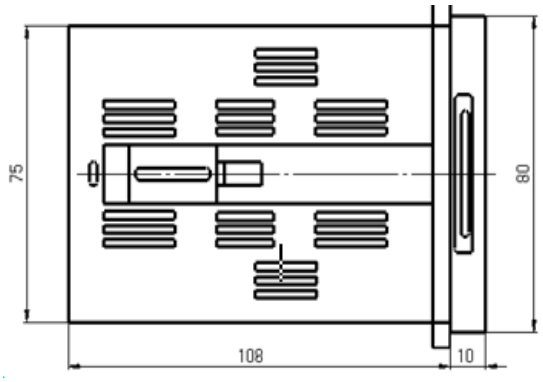
Adjustment schematic diagram:

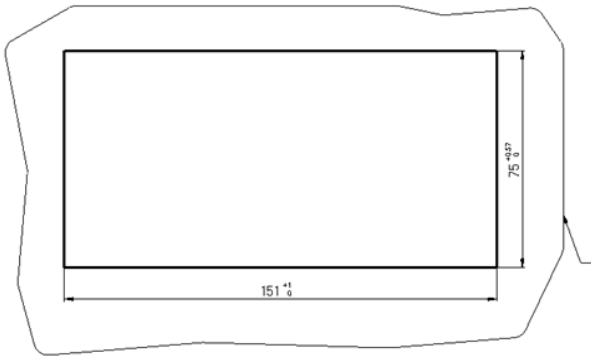


4.7.2 Power automatic switching device

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 supply are disconnected).	**Automatic operation** ★ Monitor 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 abnormality 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;	**Function** ★ 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: 220V~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.

◆ See the figure below for outline and installation dimensions





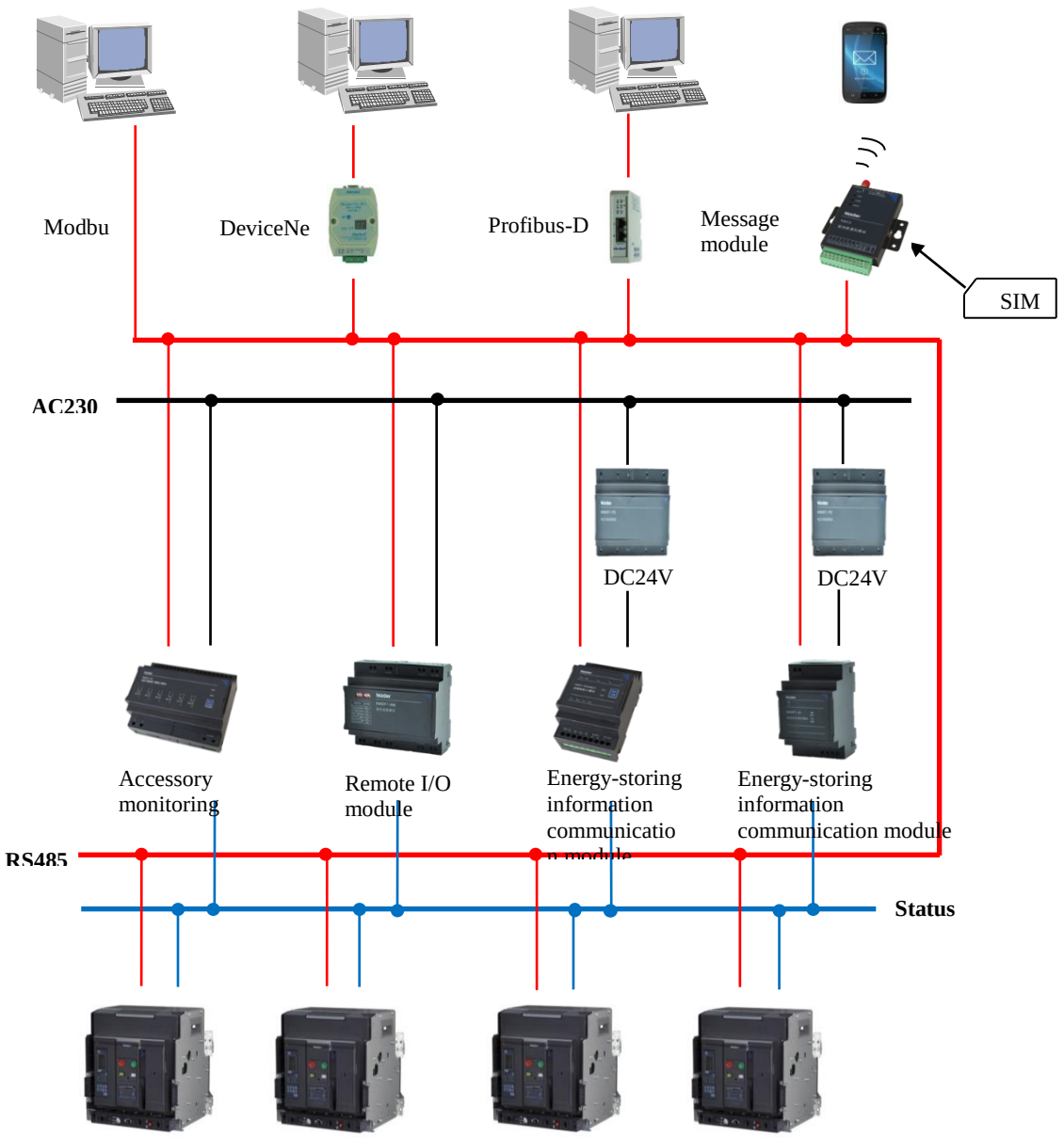
Hole dimensions

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 release, and the power automatic switching control device and the mechanical interlocking (two interlocking) shall be used together.

4.8 Communication System

The controller with the communication function can realize four remotes data transmission function, i.e., “remote metering, remote control, remote adjustment and remote communication”, through the communication port according to the stipulated agreement requirements. Communication port output uses photoelectric isolation, and is suitable for strong electrical interference environment. The Modbus communication protocol is built in the controller, and does not need additional conversion module.

■ Computer communication network



Note: 1. The red line represents the RS485 communication line, which is connected from the communication interface of controller; the black line represents the power supply line; the blue line represents the signal output line of the circuit breaker secondary terminal to output the circuit breaker status or control signal.

2. The message notification module needs to use a SIM card, which shall be prepared by users.

With the Modbus-RTU mode, connect to the computer system via the conversion interface of RS485/RS232 and twisted shielded wire line from the controller RS485 interface, or connect the RS485 signal interface of circuit breaker via the serial port server or communication manager, and then connect with computer via the Ethernet interface (RJ45 interface). Related communication parameters of Modbus-RTU are shown in the table below.

Communication protocol	Modbus
Communication address	0~255
Baud rate (bit/s)	9.6k, 19.2k, 38.4k, 115.2k
Distance (to be extended with a repeater)	1200m

With the communication network, the same line can connect up to 32 communication circuit breakers (16 drawout circuit breakers) at the same time.

Chapter 5 Field of Application

The NDW3 series of universal circuit breakers (hereinafter referred to as circuit breakers) can be applied to the distribution network with AC of 50 Hz / 60 Hz, rated current of 200A ~ 6300A, rated insulation voltage of 1140V, rated operational voltage of AC220/230/240V, AC380/400/415V, AC440/480V, AC660/690V , AC800V, AC1000V and AC1140Vfor distribution of electrical energy and protecting circuit and power equipment from overload, under-voltage, short circuit, single phase grounding and harm of other faults. It also has an isolating function 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.

5.1 Working Environment

5.1.1 Ambient temperature

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

The circuit breaker with the ambient temperature below -25℃~-40℃ can be specially customized. If the ambient temperature is higher than +40℃, the user needs to reduce the capacity, and the reduced capacity coefficient is shown in Table 3.

Table 3

Ambient temperature		+40℃	+45℃	+50℃	+55℃	+60℃	+70℃
NDW3-1600	200A	200A	200A	200A	200A	200A	200A
	400A	400A	400A	400A	400A	400A	400A
	630A	630A	630A	630A	630A	630A	630A
	800A	800A	800A	800A	800A	800A	800A
	1000A	1000A	1000A	1000A	1000A	1000A	1000A
	1250A	1250A	1250A	1250A	1250A	1250A	1250A
	1600A	1600A	1600A	1600A	1600A	1600A	1520A
NDW3-2500	630A	630A	630A	630A	630A	630A	630A
	800A	800A	800A	800A	800A	800A	800A
	1000A	1000A	1000A	1000A	1000A	1000A	1000A
	1250A	1250A	1250A	1250A	1250A	1250A	1250A
	1600A	1600A	1600A	1600A	1600A	1600A	1600A
	2000A	2000A	2000A	2000A	2000A	1950A	1825A
	2500A	2500A	2375A	2225A	2125A	1950A	1825A
NDW3-4000	800A	800A	800A	800A	800A	800A	800A
	1000A	1000A	1000A	1000A	1000A	1000A	1000A
	1250A	1250A	1250A	1250A	1250A	1250A	1250A
	1600A	1600A	1600A	1600A	1600A	1600A	1600A
	2000A	2000A	2000A	2000A	2000A	2000A	2000A
	2500A	2500A	2500A	2500A	2500A	2500A	2500A
	3200A	3200A	3200A	3200A	3200A	3120A	2920A
	4000A	4000A	3800A	3560A	3400A	3120A	2920A
NDW3-6300	4000A	4000A	4000A	4000A	4000A	4000A	4000A
	5000A	5000A	5000A	5000A	5000A	4914A	4599A
	6300A	6300A	5985A	5607A	5355A	4914A	4599A

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

5.1.2 Atmospheric environment conditions

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.

5.1.3 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 5,000 m, it can be specially customized. For the working performance, refer to the correction value in the following table.

Rated working current		Altitude			
Type	Rated current（A）	2000m	3000m	4000m	5000m
NDW3-1600	200~630	1.0In	1.0In	1.0In	1.0In
	800~1000	1.0In	1.0In	1In	1In
	1250~1600	1.0In	1.0In	0.97In	0.87In
NDW3-2500	630~1600	1.0In	1.0In	1.0In	1.0In
	2000~2500	1.0In	0.93In	0.88In	0.85In
NDW3-4000	800~2500	1.0In	1.0In	1.0In	1.0In
	3200	1.0In	1.0In	1.0In	1.0In
	4000	1.0In	0.93In	0.88In	0.82In
NDW3-6300	4000、5000	1.0In	1.0In	1.0In	1.0In
	6300	1.0In	0.93In	0.88In	0.82In

Altitude	m	2000	3000	4000	5000
Impulse withstand voltage Uimp	(kV)	12	11	10	8
Rated insulation voltage Ui	(V)	1140	900	800	700
Rated working voltage	(V)	690	690	620	550
		1140	900	800	700
Power frequency withstand voltage	(V)	3500	3150	2500	2500

Annotation:NDW3-1600 is not included in this table, the correction value of NDW3-1600 refer to the following table.

Altitude	m	2000	3000	4000	5000
Impulse withstand voltage Uimp	(kV)	12	11	10	8
Rated insulation voltage Ui	(V)	1000	900	800	700
Rated working voltage	(V)	690	690	620	550
Power frequency withstand voltage	(V)	3500	3150	2500	2500

5.1.4 Anti-corrosion Level

Salt mist: Severe Level 3

5.1.5 Pollution level

Pollution level: Level 3

5.1.6 Shockproof requirements

- The circuit breaker can ensure resistance to electromagnetic or mechanical shock, and has passed the IEC 60721-3-3 standard test;
- Amplitude: ±1mm (2 Hz -9Hz);
- Constant acceleration: $5m/s^2$ (9 Hz -200Hz);
- Super strong shock may result in damage to the parts, and impact the reliable action of the circuit breaker.

5.1.7 Electromagnetic interference

1) 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.

2) 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.

5.2 Installation Conditions

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

5.2.1 Installation category

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

5.2.2 Protection class

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

5.2.3 Utilization category

Category B.

5.3 Main Circuit Wiring of the Circuit Breaker

Main Circuit Wiring of the Circuit Breaker

Rated current of frame Inm (A)	Rated operating current In(A) 40℃	Copper bar specification	
		Dimension (mm)	Number
1600	200	20×5	1
	400	50×5	1
	630	40×5	2
	800	50×5	2
	1000	40×5	3
	1250	40×5	4
	1600	50×10	2
2500	630	80×5	1
	800, 1000	80×5	2
	1250	80×5	3
	1600	80×5	3
	2000	80×10	2
	2500	80×10	3
4000	800~1600	80×5	3
	2000	80×10	2
	2500	80×10	3
	3200, 4000	100×10	5
6300	4000	100×10	5
	5000, 6300	100×10	6

Note: 1. The table indicates the copper bar specifications adopted when the circuit breaker is under the ambient temperature of 40℃ and the open wide installation under the heating condition meets the stipulation in GB/T14048.2. 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 maximum permissible temperature of the copper bar is no more than +110℃.

4. The electrical gap of copper bar is ≥15mm with the altitude more than 5, 000m and relative humidity more than 90%; the electrical gap shall be adjusted according to the table 1 of 7.1.1in the sdandard GB/T 20645.

5.4 The power loss of the incoming and outgoing lines of the circuit breaker (ambient temperature +40℃)

The power loss of the incoming and outgoing lines of the circuit breaker

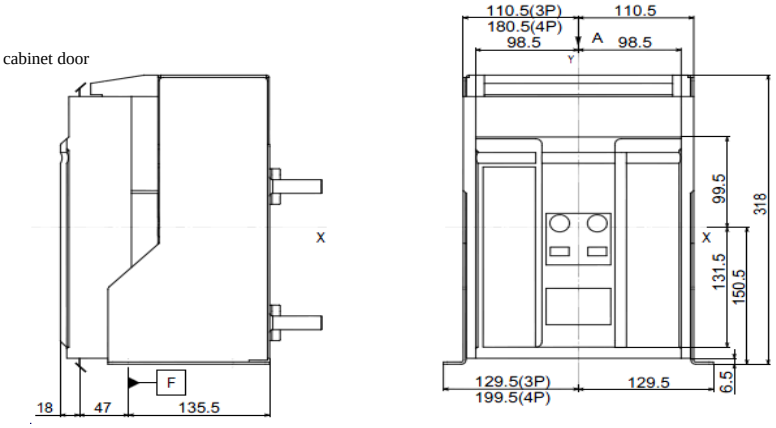
Model	Power loss of the fixed type	Power loss of the drawout type
NDW3-1600	≤123.5 W	≤331.5 W
NDW3-2500	≤356.8W	≤823.4 W
NDW3-4000	≤486.7W	≤856.8 W
NDW3-6300	≤787 W	≤1145W

Chapter 6 Outline and Installation Dimensions

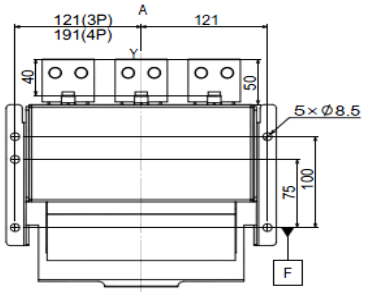
6.1 NDW3-1600

NDW3-1600 fixed type (unit: mm)

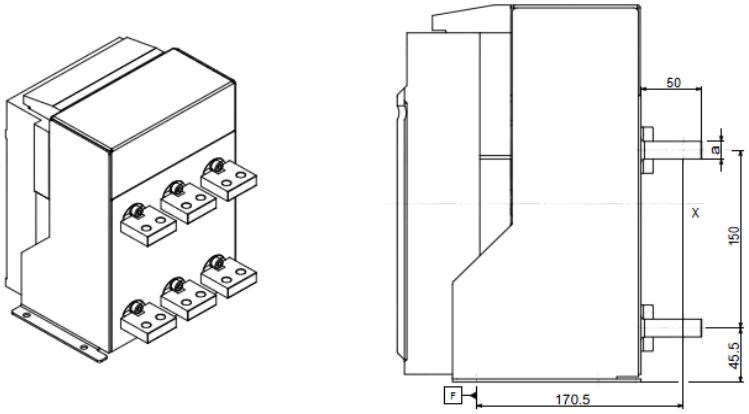
Dimensions



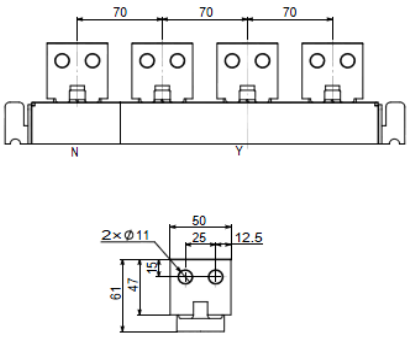
Fixed Details



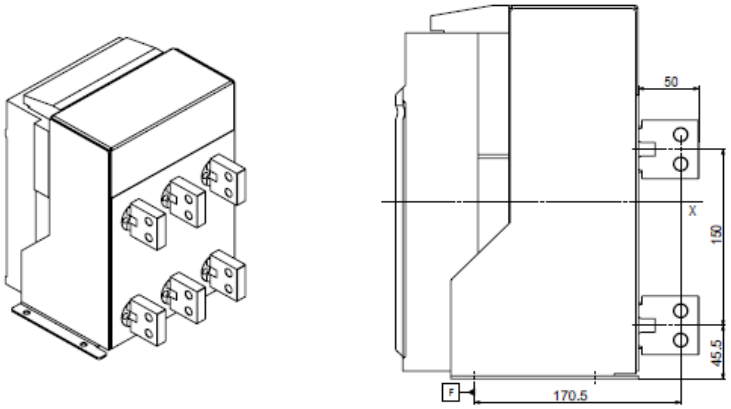
Horizontal Wiring



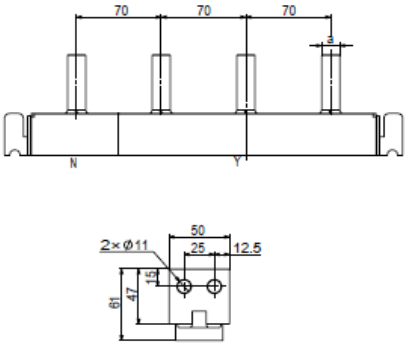
Detail



Vertical Wiring



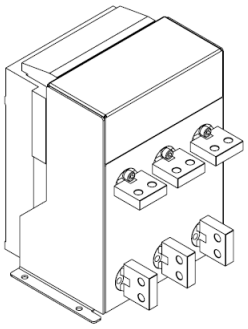
Detail

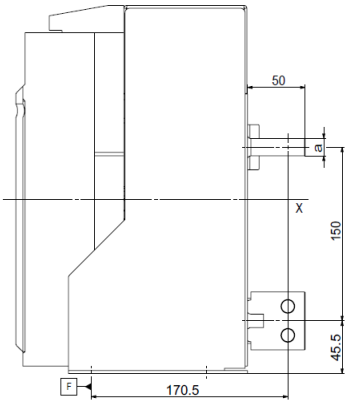


Note: For the 3-pole circuit breaker, X and Y are the symmetric axes of the front panel;

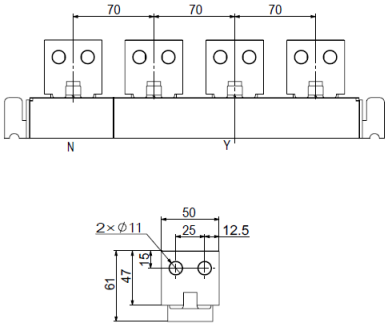
Rated current	Size of busbar a (mm)
200A, 400A, 630A	10
800A, 1000A, 1200A, 1600A	15

Mixed Wiring (Upper Horizontal, Lower Vertical)

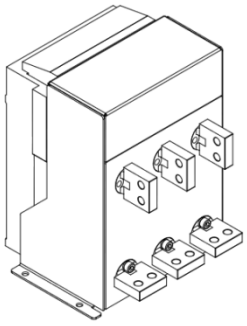


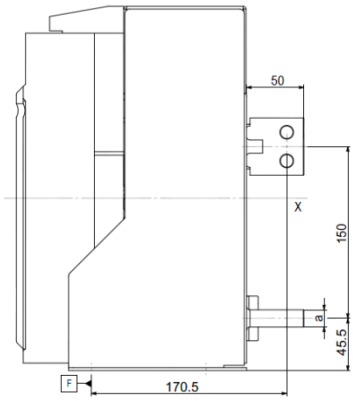


Detail

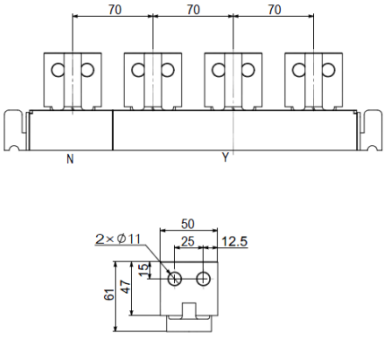


Mixed Wiring (Upper Vertical, Lower Horizontal)





Detail

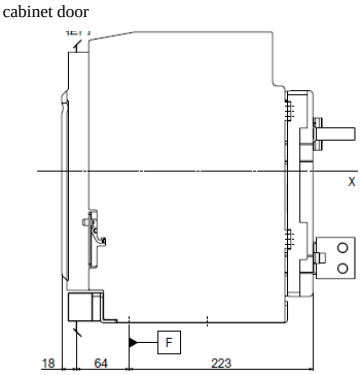


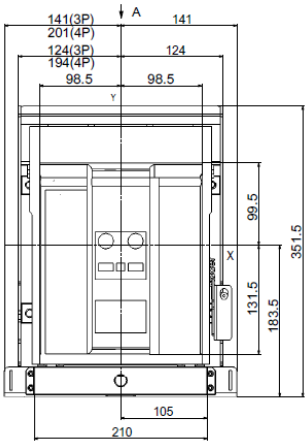
Note: For the 3-pole circuit breaker, X and Y are the symmetric axes of the front panel;

Rated current	Size of busbar a (mm)
200A, 400A, 630A	10
800A, 1000A, 1200A, 1600A	15

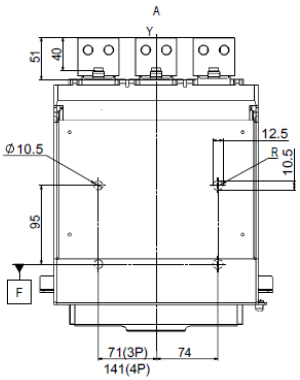
NDW3-1600 drawout type (unit: mm)

Dimensions

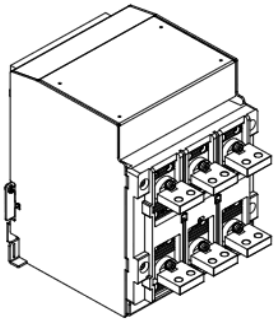


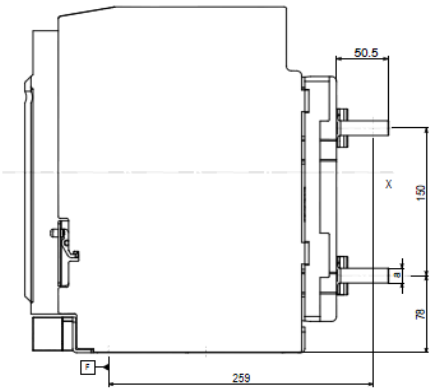


Fixed Details

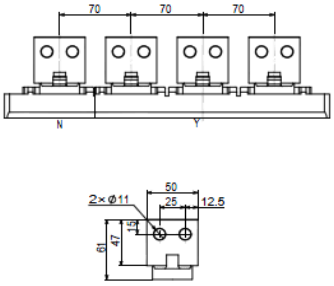


Horizontal Wiring

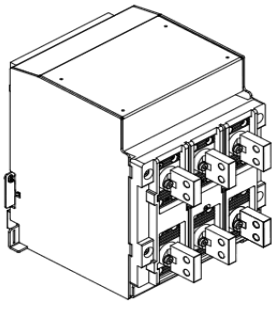


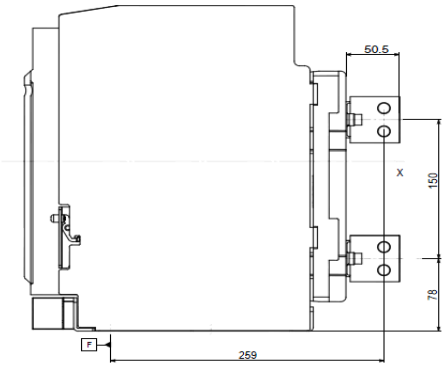


Detail

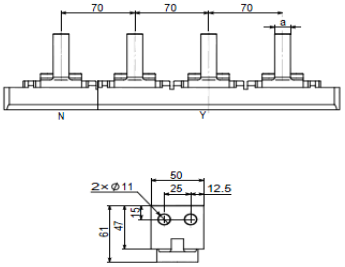


Vertical Wiring





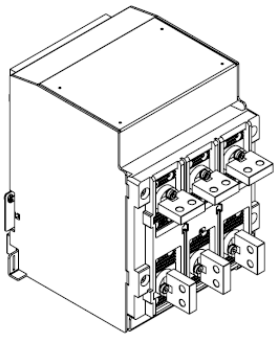
Detail

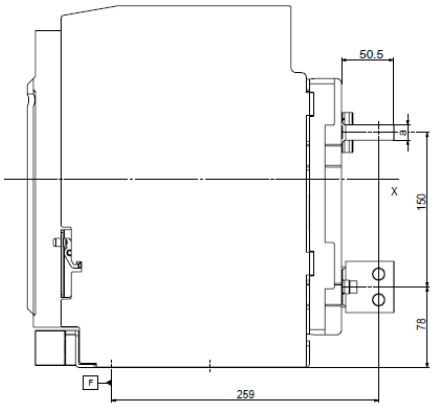


Note: For the 3-pole circuit breaker, X and Y are the symmetric axes of the front panel;

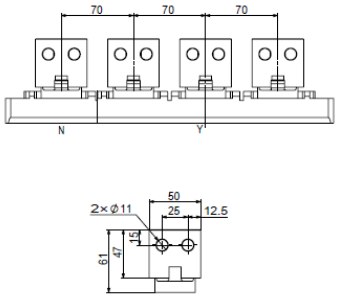
Rated current	Size of busbar a (mm)
200A, 400A, 630A	10
800A, 1000A, 1200A, 1600A	15

Mixed Wiring (Upper Horizontal, Lower Vertical)

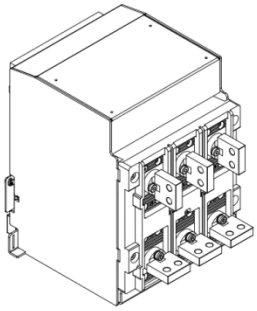


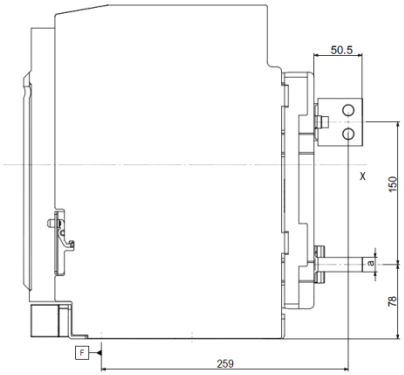


Detail

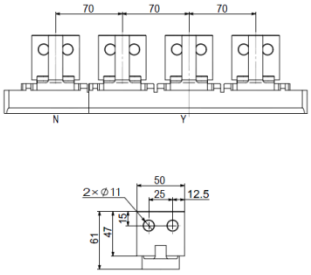


Mixed Wiring (Upper Vertical, Lower Horizontal)





Detail



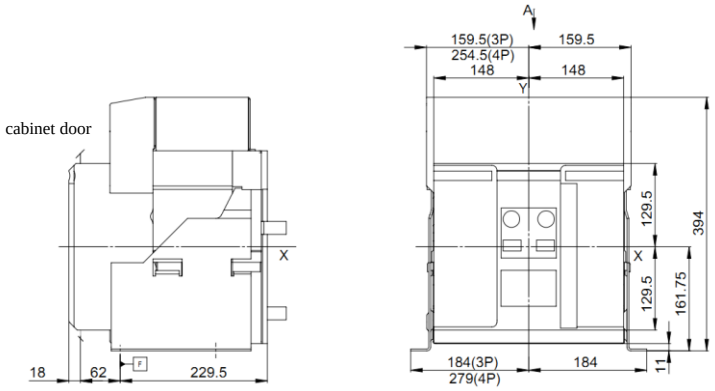
Note: For the 3-pole circuit breaker, X and Y are the symmetric axes of the front panel;

Rated current	Size of busbar a (mm)
200A, 400A, 630A	10
800A, 1000A, 1200A, 1600A	15

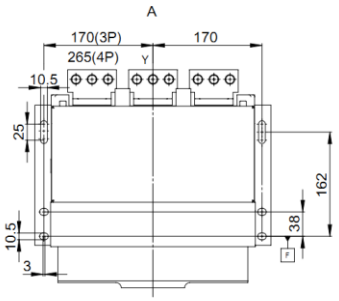
6.2 NDW3-2500

NDW3-2500 fixed type (unit: mm)

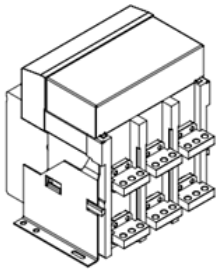
Dimensions

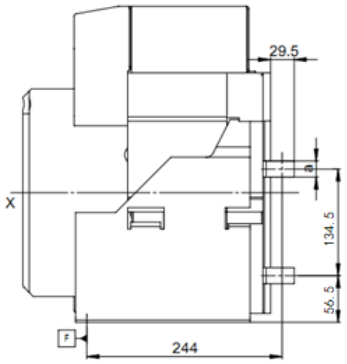


Fixed Details

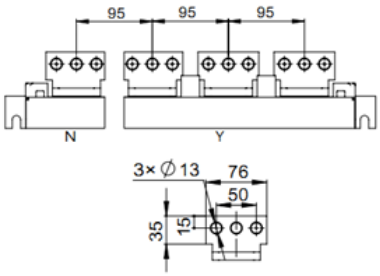


Horizontal Wiring

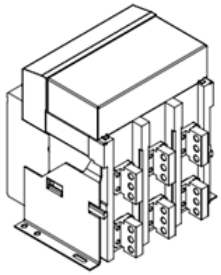


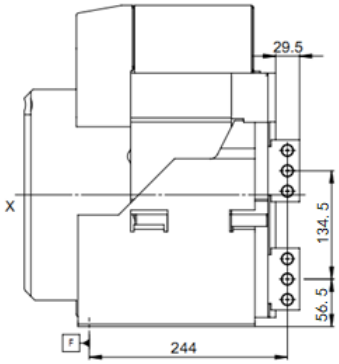


Detail

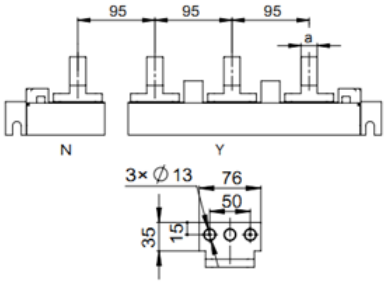


Vertical Wiring





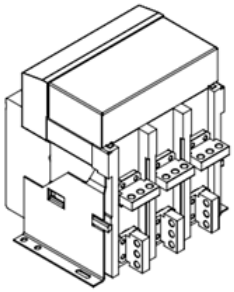
Detail

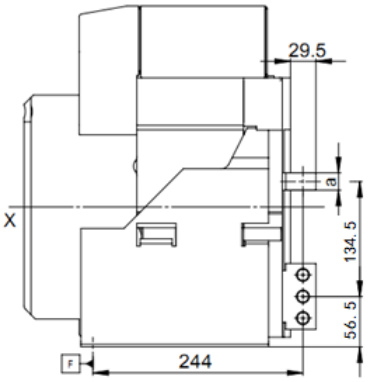


Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

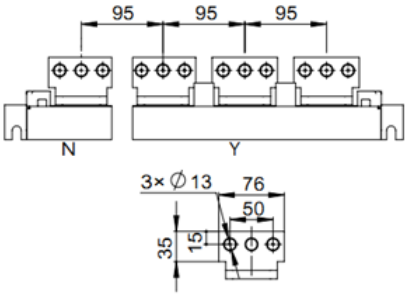
Rated current	Size of busbar a (mm)
630A, 800A, 1000A, 1250A	15
1600A, 2000A, 2500A	20

Mixed Wiring (Upper Horizontal, Lower Vertical)

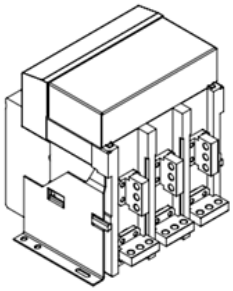


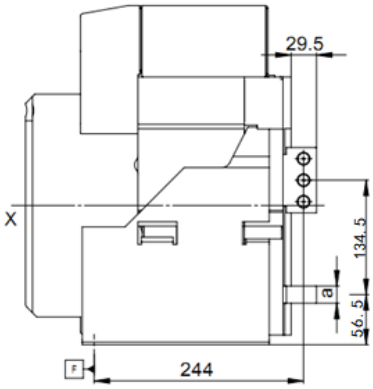


Detail

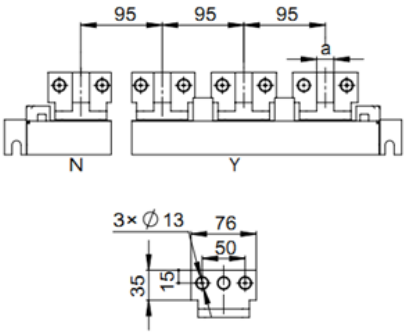


Mixed Wiring (Upper Vertical, Lower Horizontal)

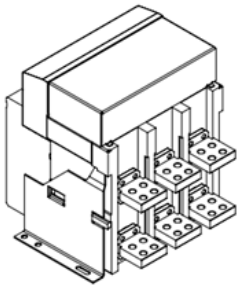


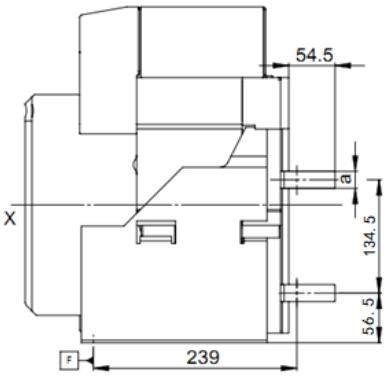


Detail

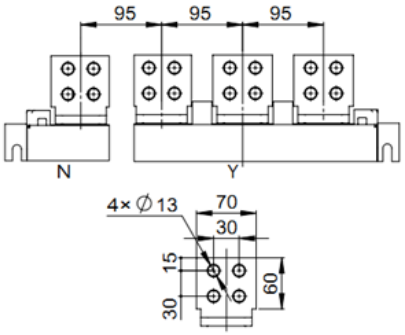


Horizontal Extended Wiring





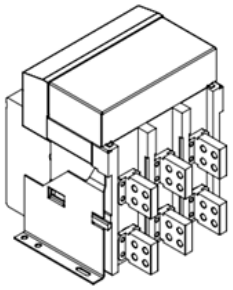
Detail

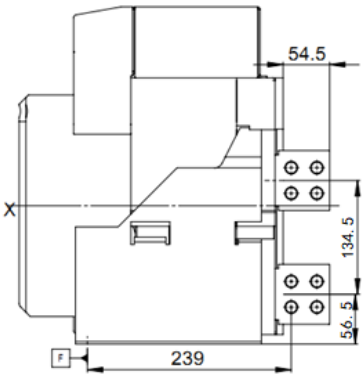


Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

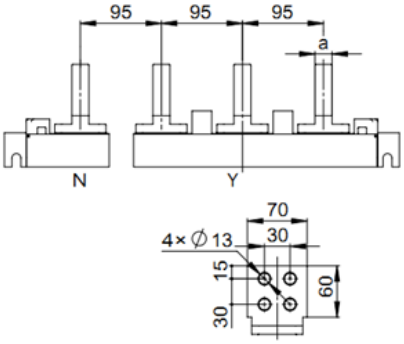
Rated current	Size of busbar a (mm)
630A, 800A, 1000A, 1250A	15
1600A, 2000A, 2500A	20

Vertical Extended Wiring

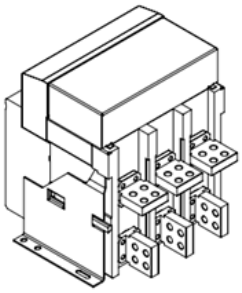


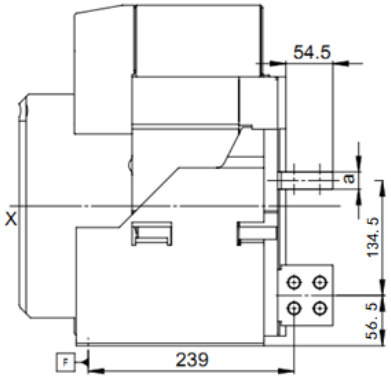


Detail

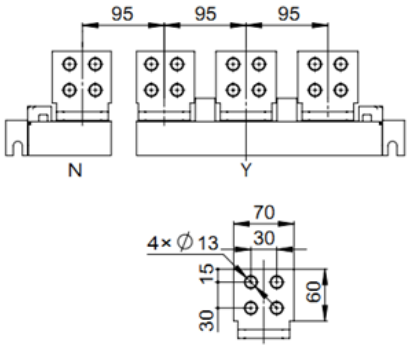


Mixed Wiring (Upper Horizontal, Lower Vertical)

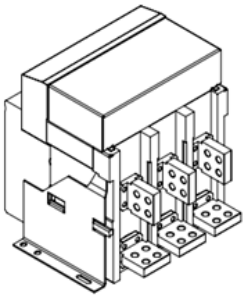


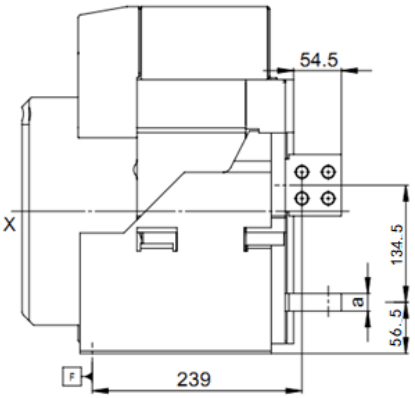


Detail

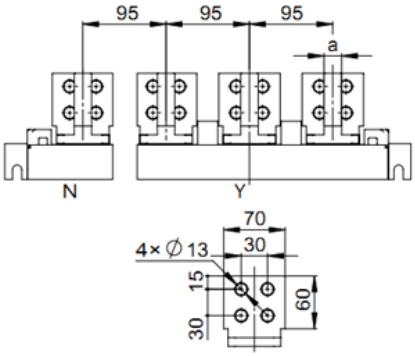


Mixed Wiring (Upper Vertical, Lower Horizontal)





Detail

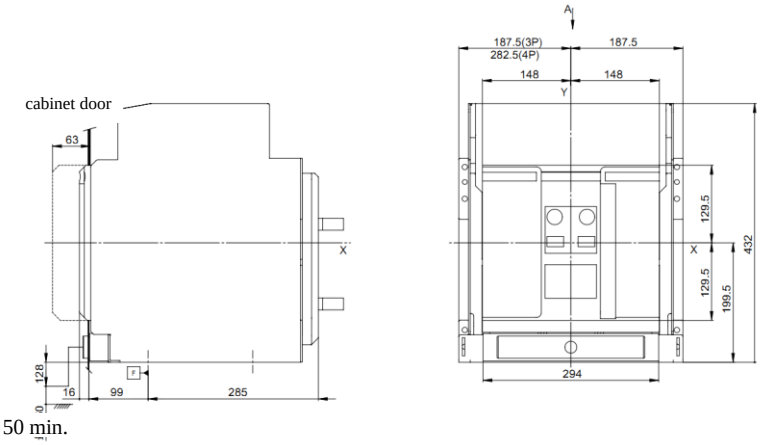


Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

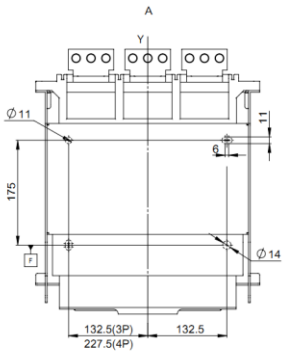
Rated current	Size of busbar a (mm)
630A, 800A, 1000A, 1250A	15
1600A, 2000A, 2500A	20

NDW3-2500 drawout type (unit: mm)

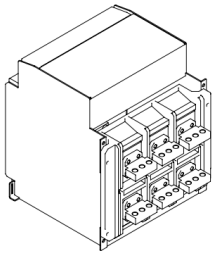
Dimensions

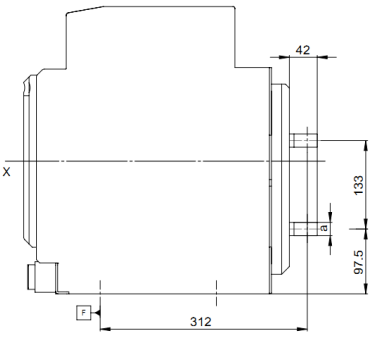


Fixed Details

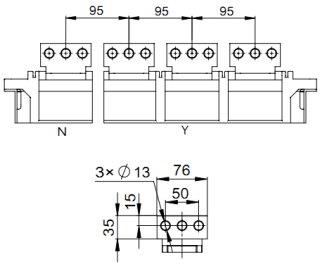


Horizontal Wiring

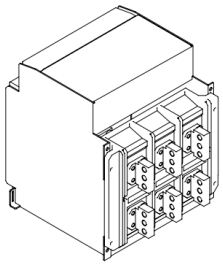


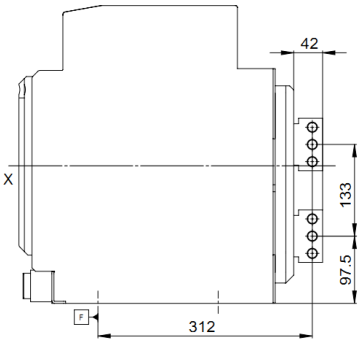


Detail

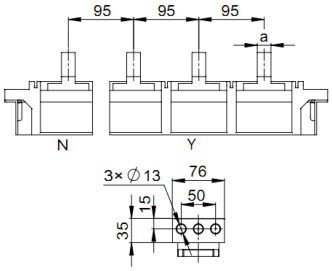


Vertical Wiring





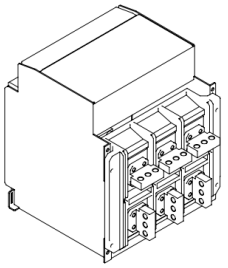
Detail

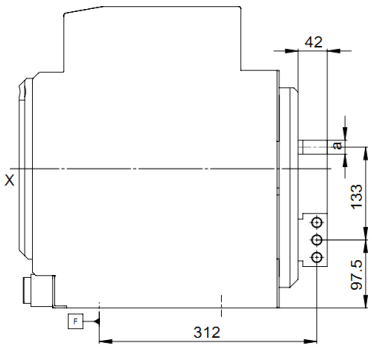


Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

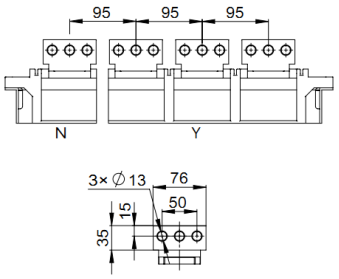
Rated current	Size of busbar a (mm)
630A, 800A, 1000A, 1250A	15
1600A, 2000A, 2500A	20

Mixed Wiring (Upper Horizontal, Lower Vertical)

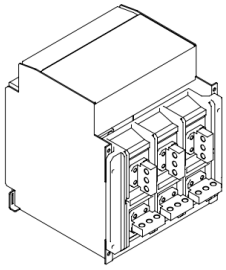


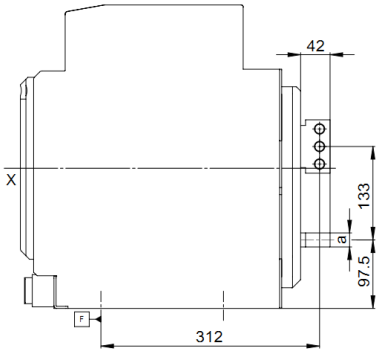


Detail

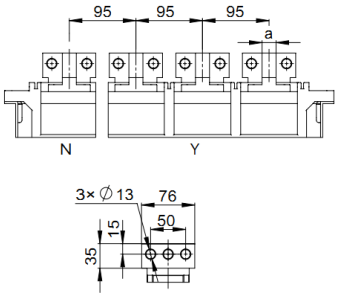


Mixed Wiring (Upper Vertical, Lower Horizontal)

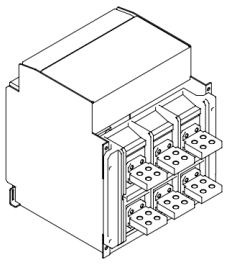


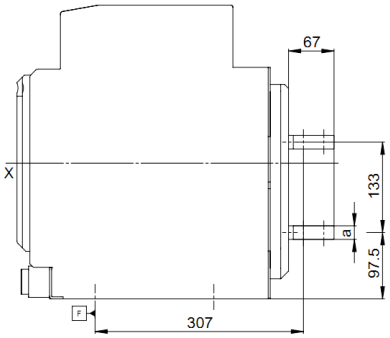


Detail

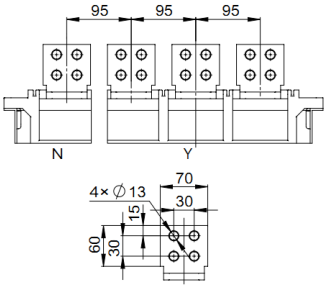


Horizontal Extended Wiring





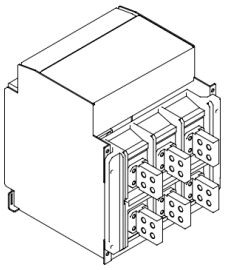
Detail

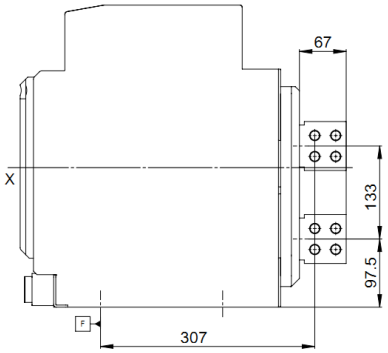


Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

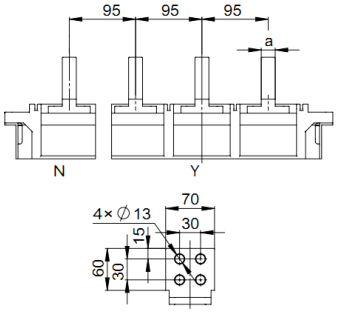
Rated current	Size of busbar a (mm)
630A, 800A, 1000A, 1250A	15
1600A, 2000A, 2500A	20

Vertical Extended Wiring

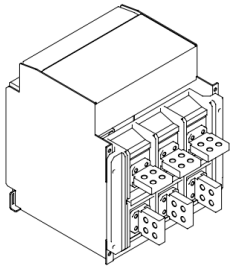


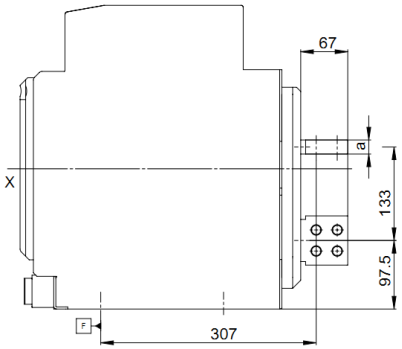


Detail

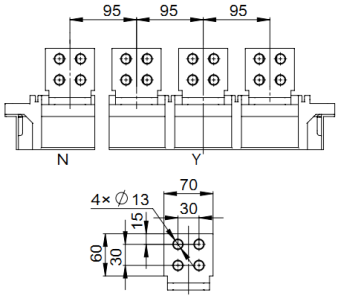


Mixed Wiring (Upper Horizontal, Lower Vertical)

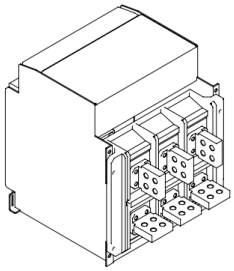


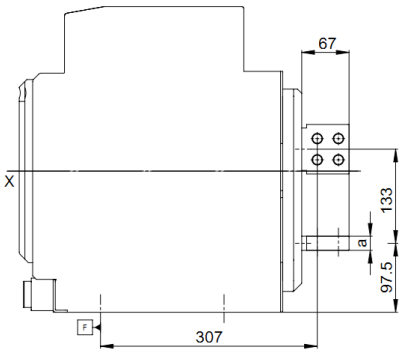


Detail

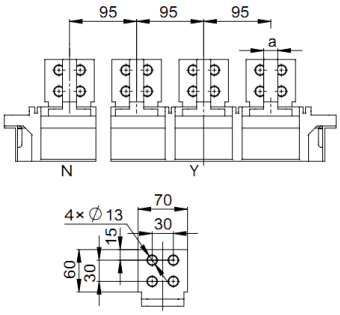


Mixed Wiring (Upper Vertical, Lower Horizontal)





Detail



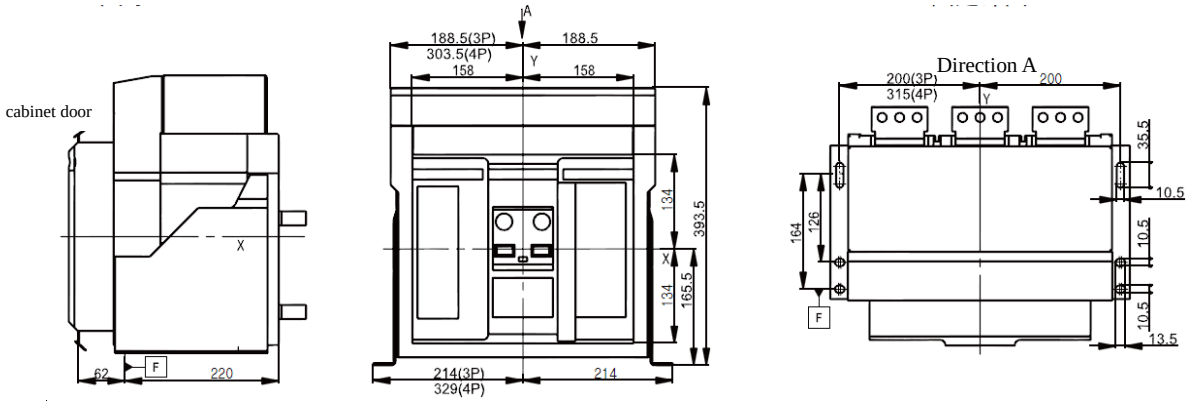
Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

Rated current	Size of busbar a (mm)
630A, 800A, 1000A, 1250A	15
1600A, 2000A, 2500A	20

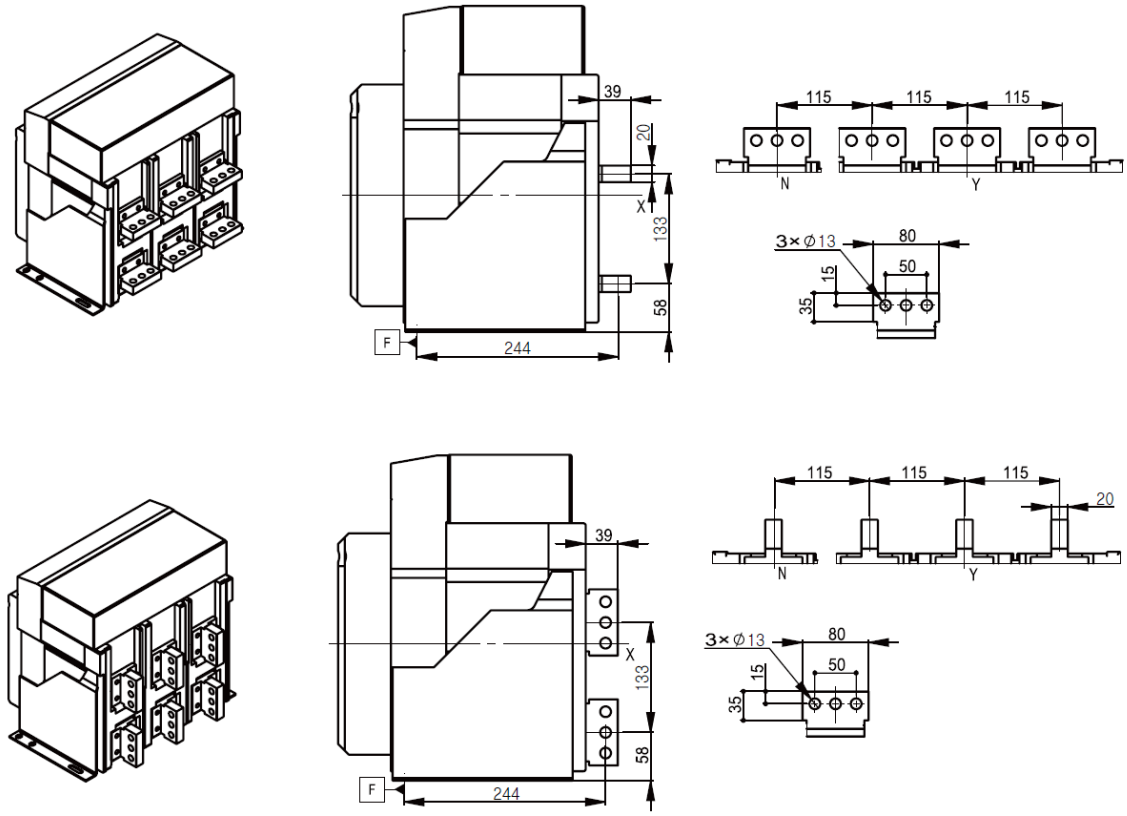
6.3 NDW3-4000

NDW3-4000 fixed type (unit: mm)

Dimensions **Fixed Details**



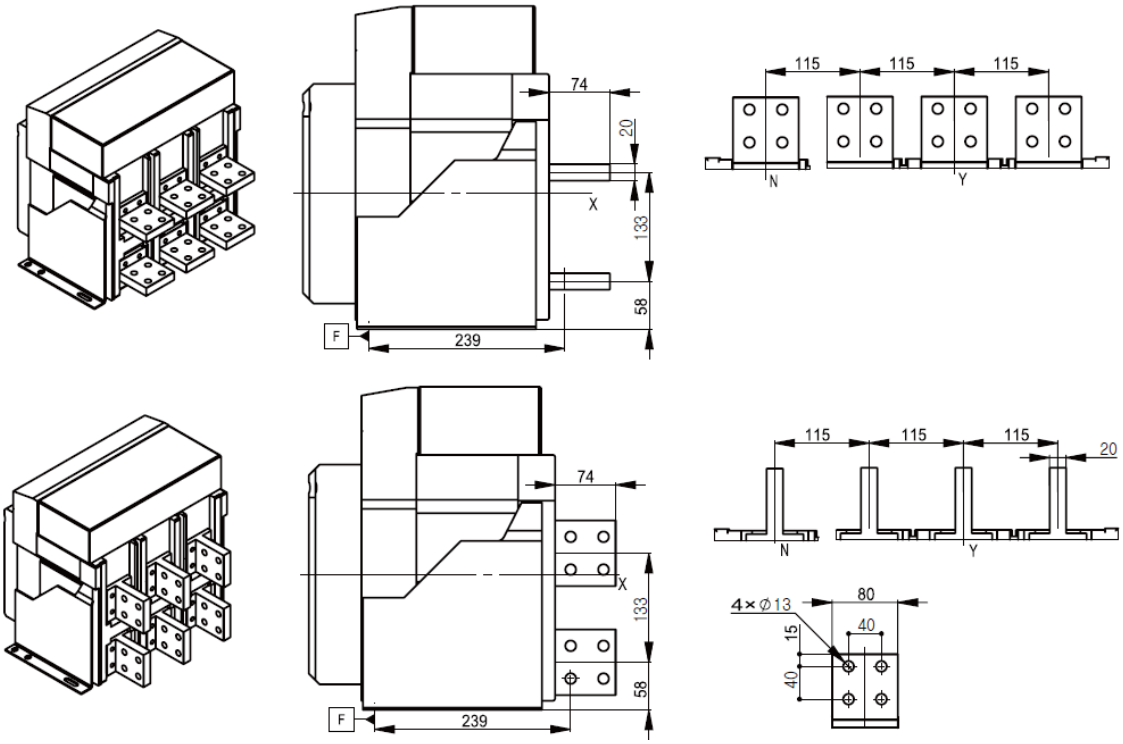
800A-2500A Horizontal and Vertical Wiring **Detail**



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

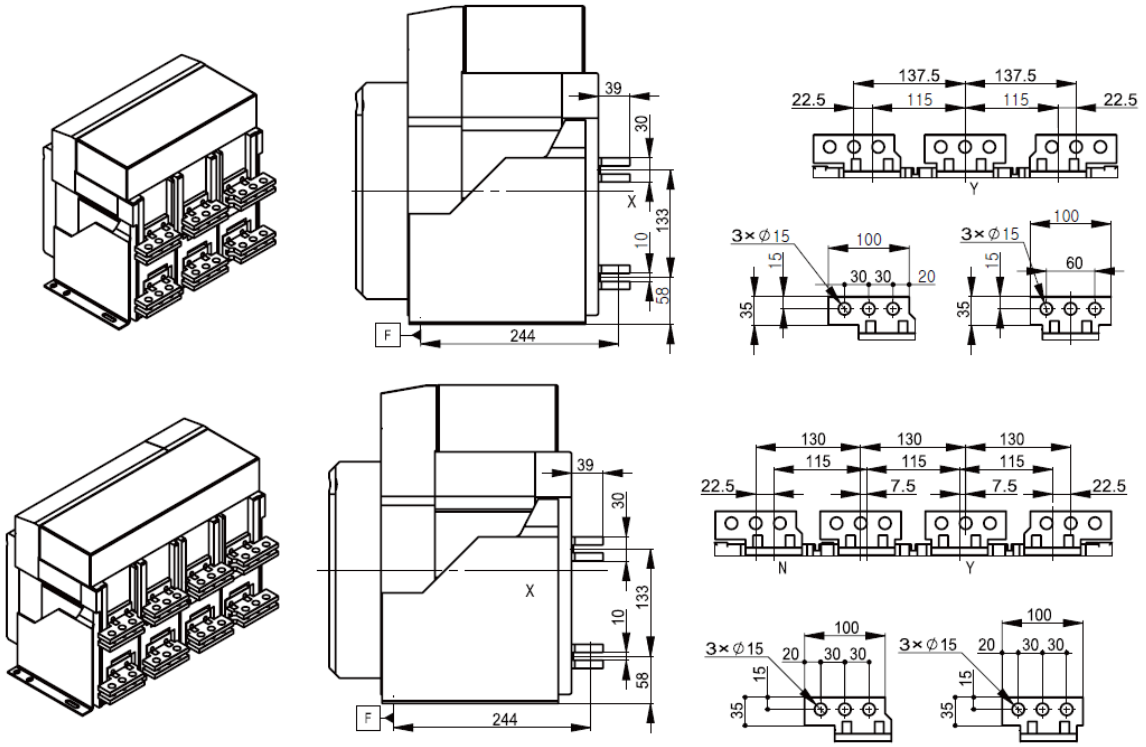
800A-2500A Horizontal Extended and Vertical Extended Wiring

Detail



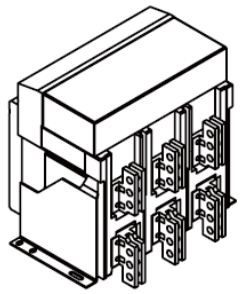
3200A-4000A Horizontal Wiring

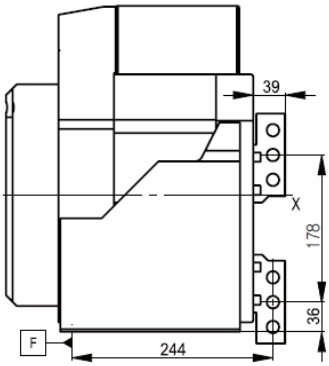
Detail



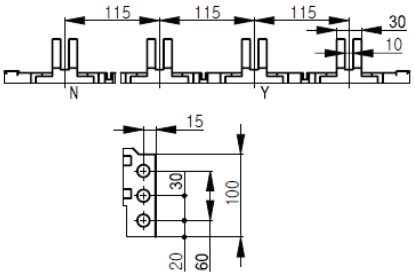
Note: X and Y axes are the symmetric axes of the front mask;

3200A-4000A Vertical Wiring

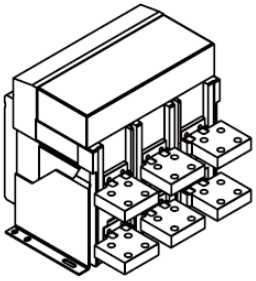


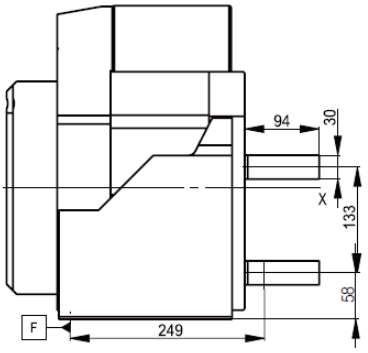


Detail

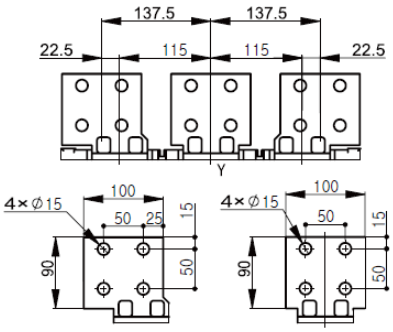


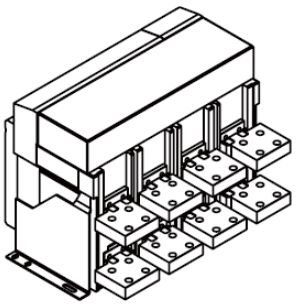
3200A-4000A Horizontal Extended and Vertical Extended Wiring

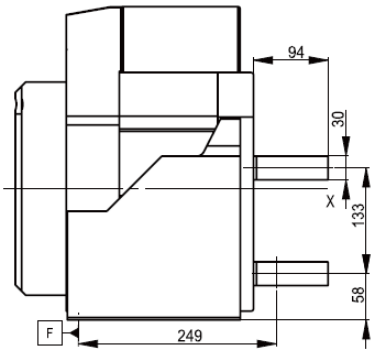


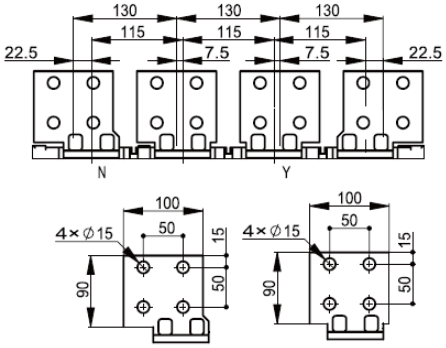


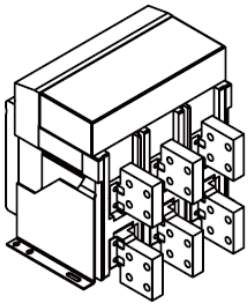
Detail

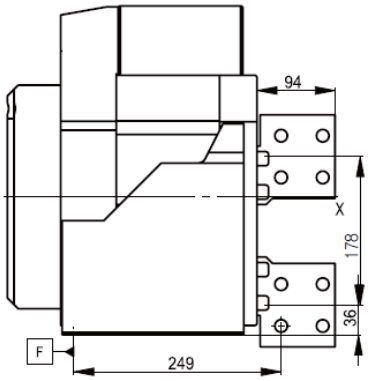


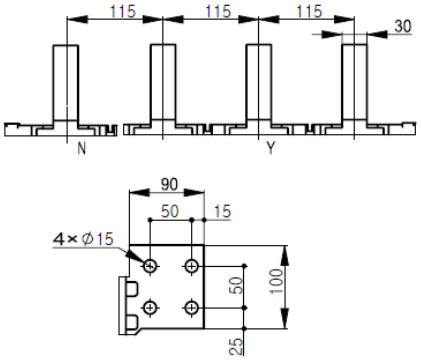








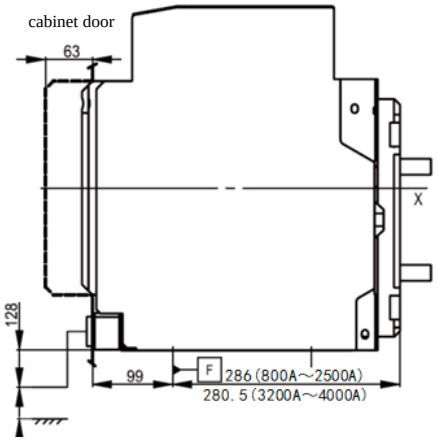


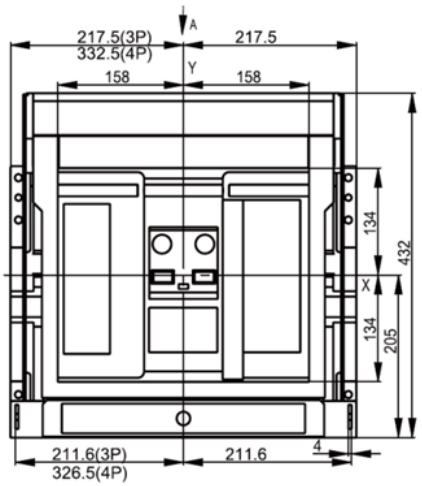


Note: X and Y axes are the symmetric axes of the front mask;

NDW3-4000 drawout type (unit: mm)

Dimensions

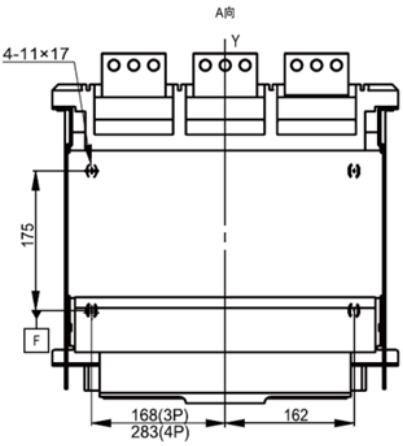




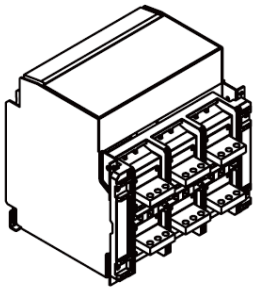
50 min.

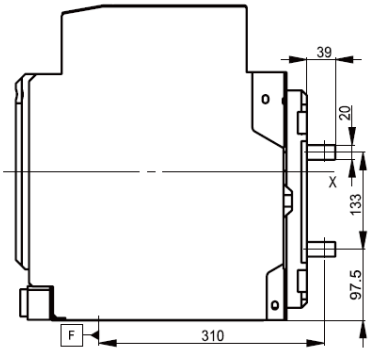
Fixed Details

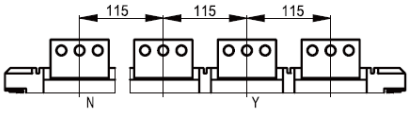
Direction A

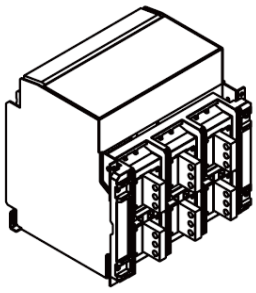


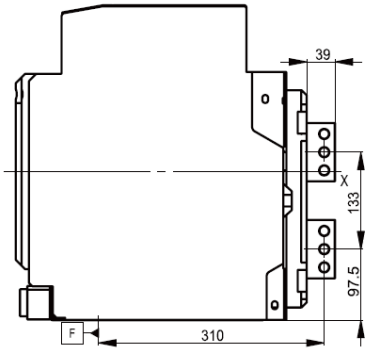
800A-2500A Horizontal and Vertical Wiring Detail

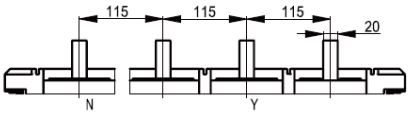


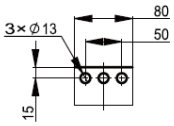






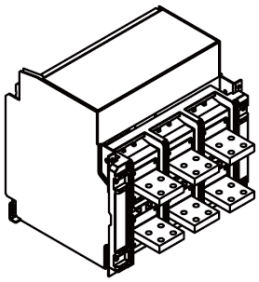


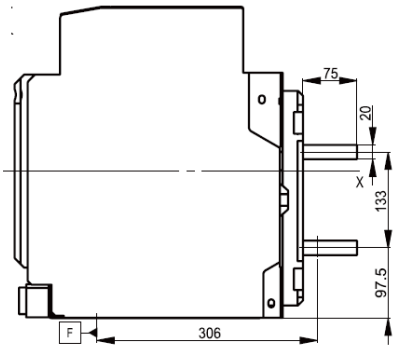


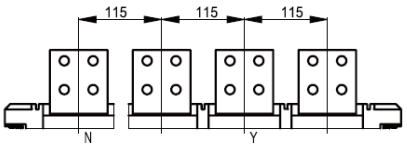


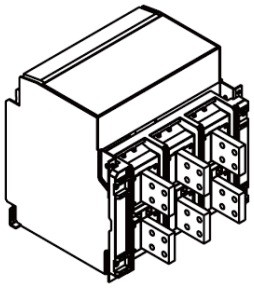
800A-2500A Horizontal Extended and Vertical Extended Wiring

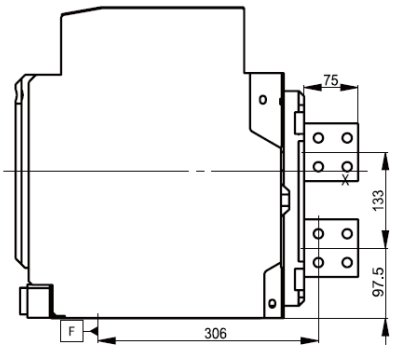
Detail

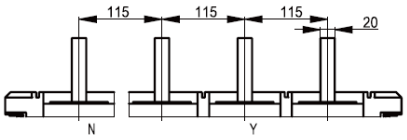


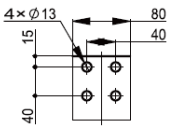






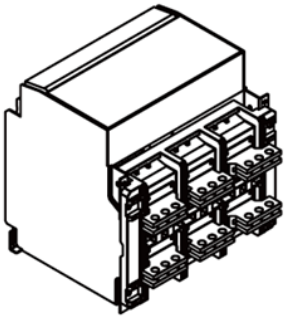


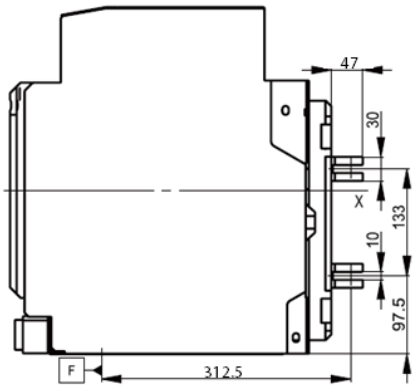


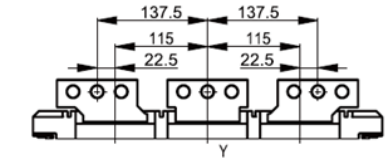


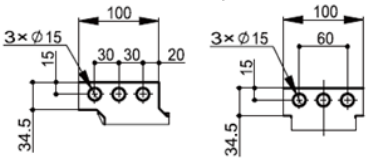
3200A-4000A Horizontal Wiring

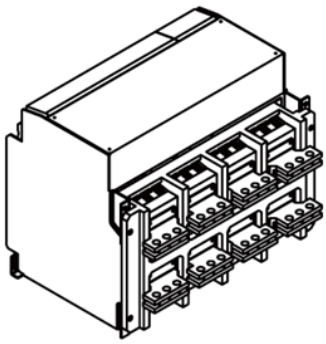
Detail

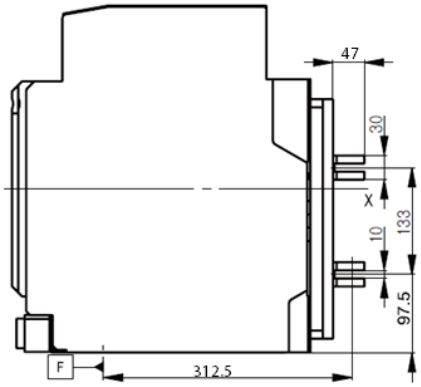


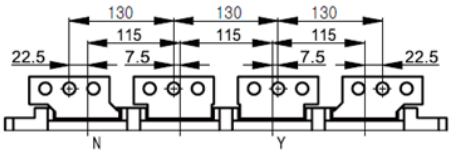


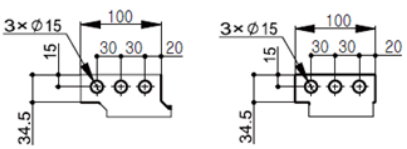








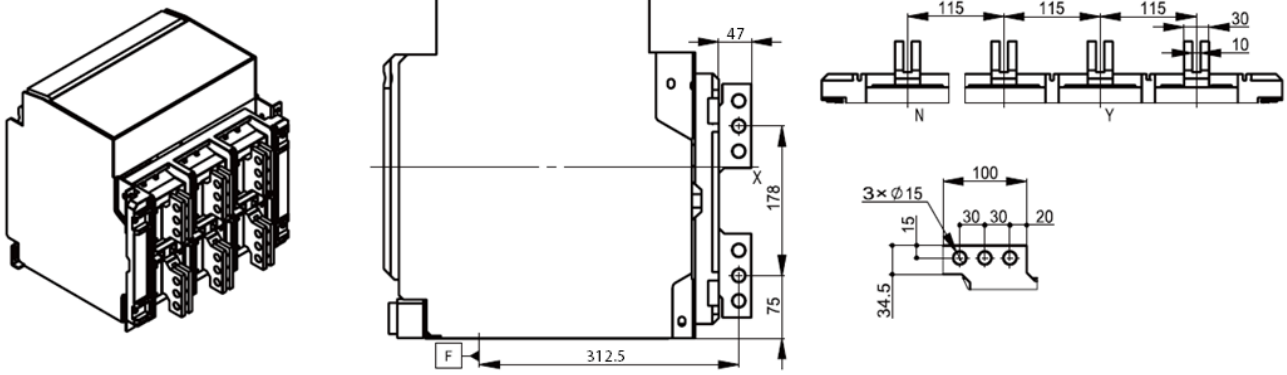




Note: X and Y axes are the symmetric axes of the front mask;

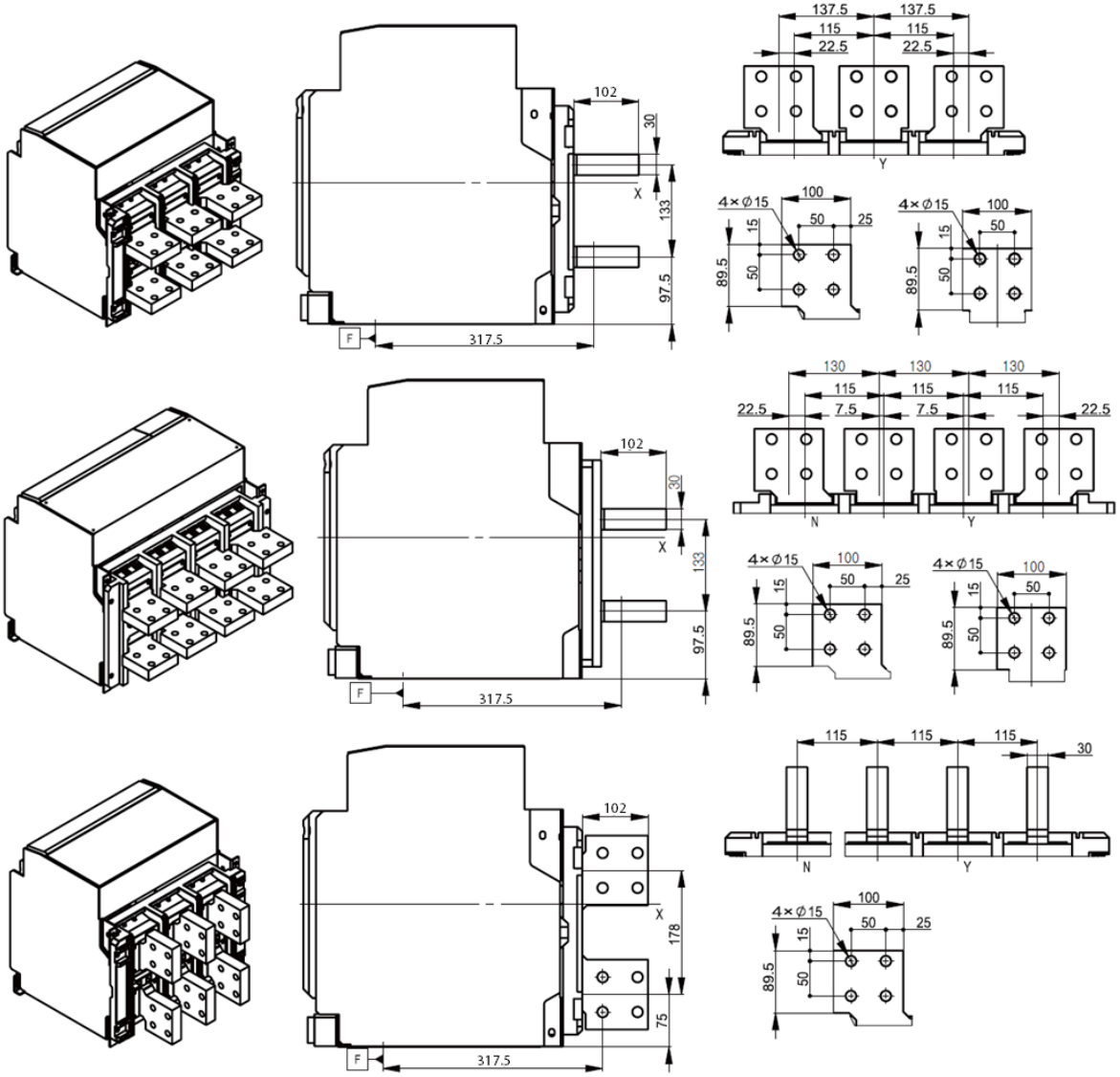
3200A-4000A Vertical Wiring

Detail



3200A-4000A Horizontal Extended and Vertical Extended Wiring

Detail

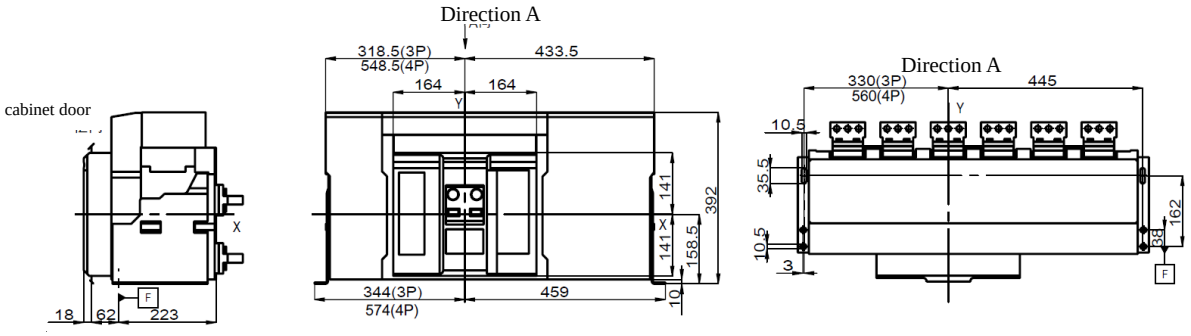


Note: X and Y axes are the symmetric axes of the front mask;

6.4 NDW3-6300

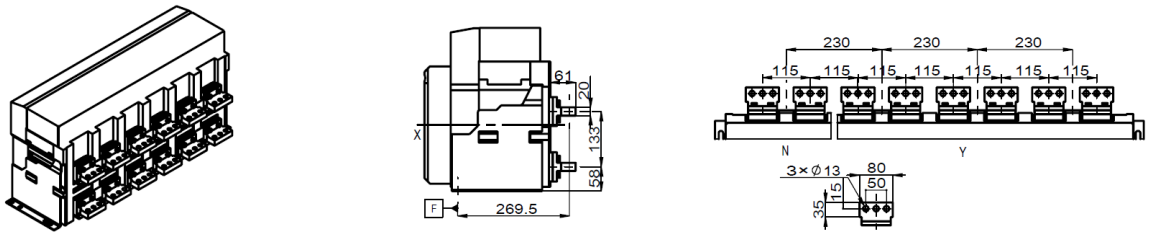
NDW3-6300 fixed type (unit: mm)

Dimensions **Fixed Details**

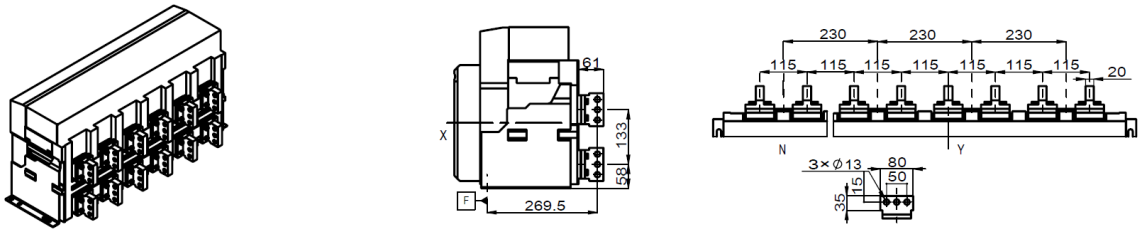


4000A-5000A Horizontal, Vertical and Mixed Wiring

Horizontal Wiring **Detail**

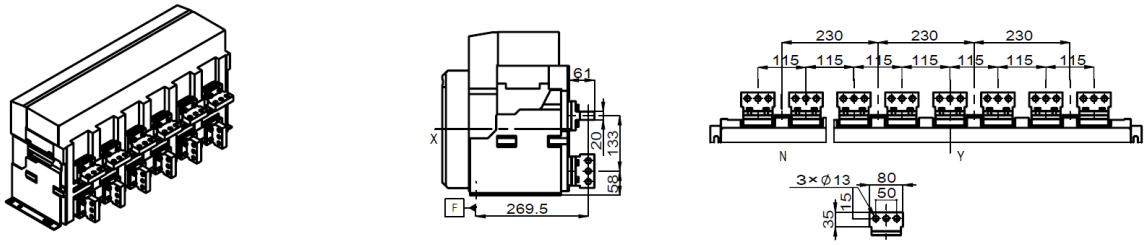


Vertical Wiring **Detail**

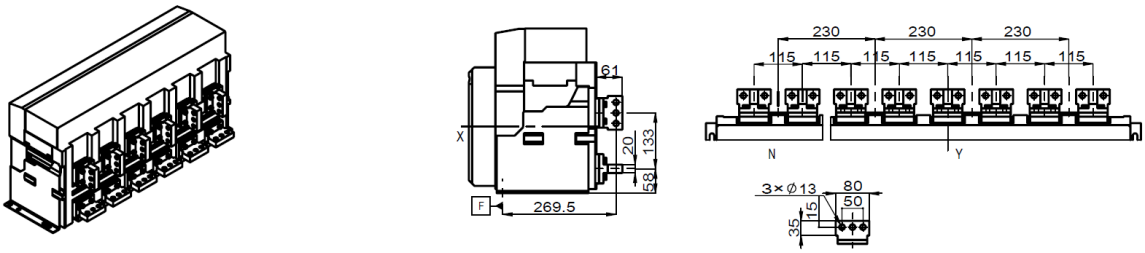


Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

Mixed Wiring (Upper Horizontal, Lower Vertical) **Detail**

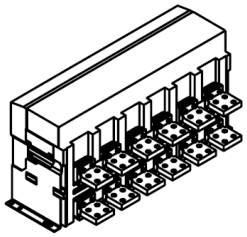


Mixed Wiring (Upper Vertical, Lower Horizontal) **Detail**

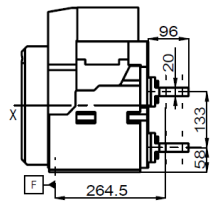


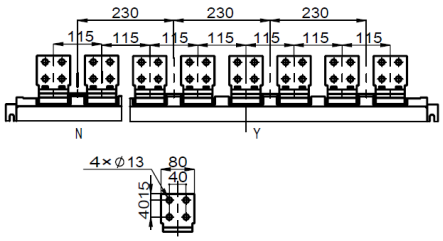
4000A-5000A Horizontal Extended, Vertical Extended and Mixed Extended Wiring

Horizontal Extended Wiring



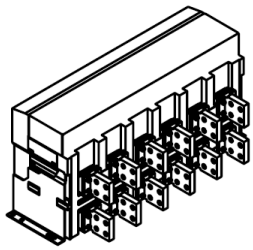
Detail



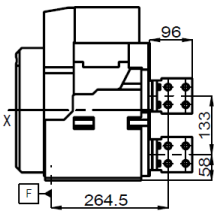


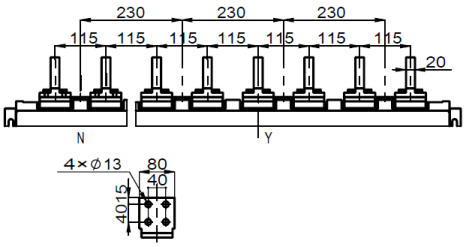
Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

Vertical Extended Wiring

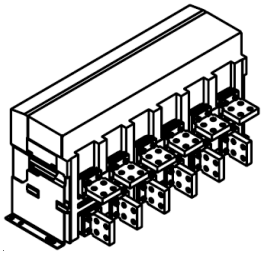


Detail

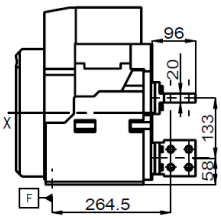


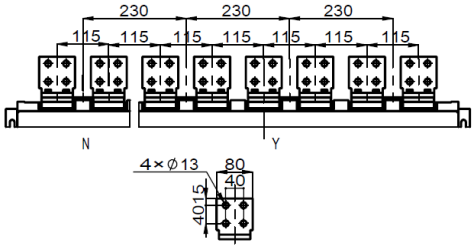


Mixed Wiring (Upper Horizontal, Lower Vertical)

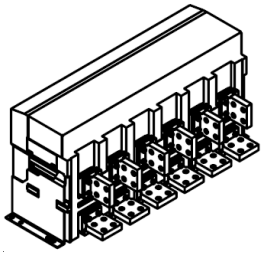


Detail

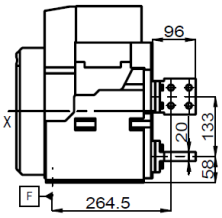


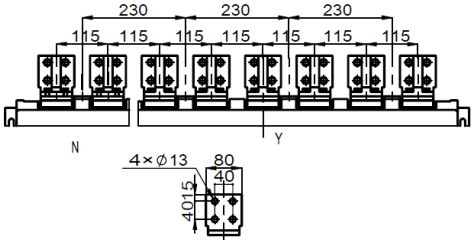


Mixed Wiring (Upper Vertical, Lower Horizontal)



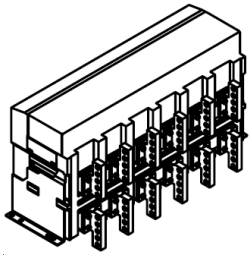
Detail

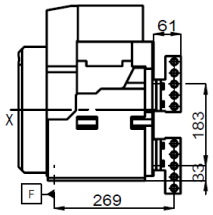




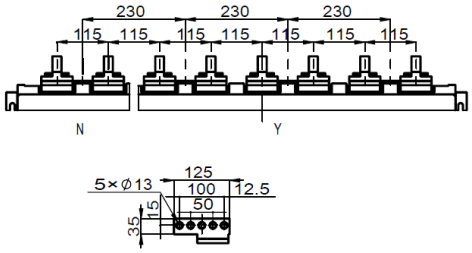
Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

6300A Vertical Wiring



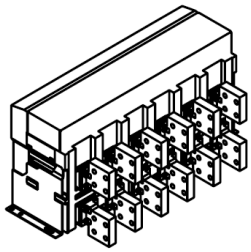


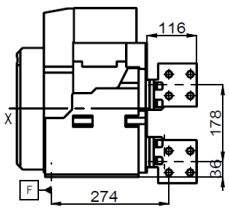
Detail



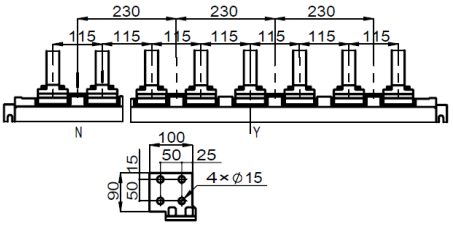
Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

6300A Vertical Wiring





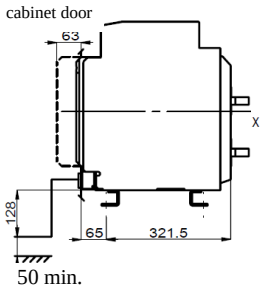
Detail

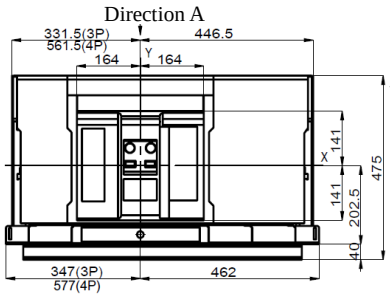


Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

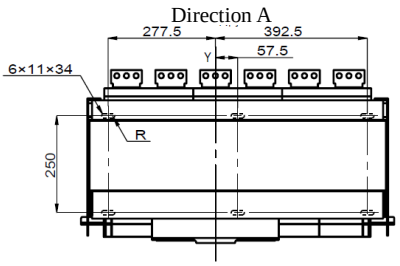
NDW3-6300 drawout type (unit: mm)

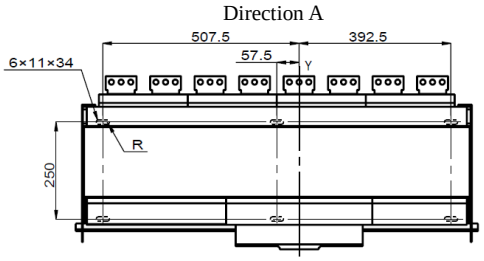
Dimensions





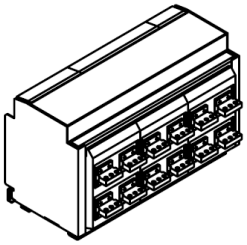
Fixed Details

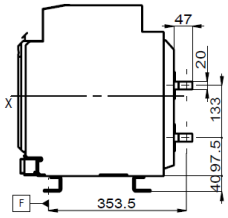




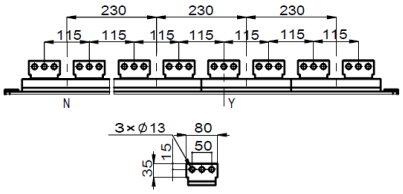
4000A-5000A Horizontal, Vertical and Mixed Wiring

Horizontal Wiring

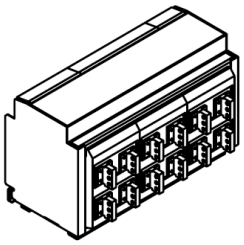


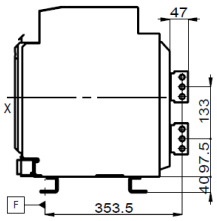


Detail

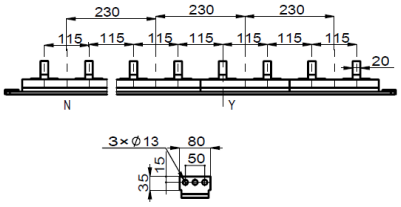


Vertical Wiring



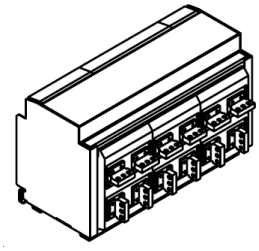


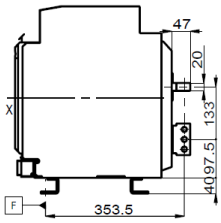
Detail



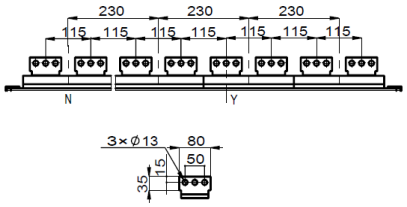
Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

Mixed Wiring (Upper Horizontal, Lower Vertical)

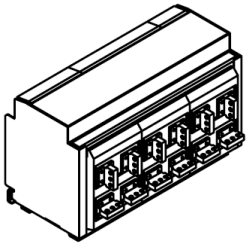


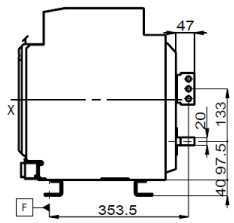


Detail

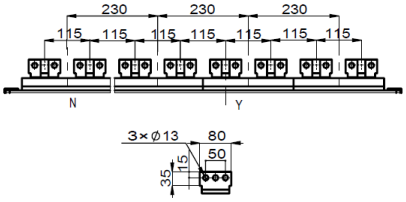


Mixed Wiring (Upper Vertical, Lower Horizontal)



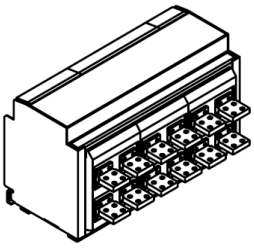


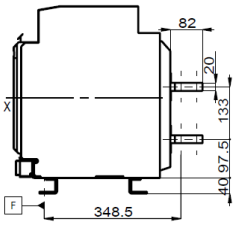
Detail



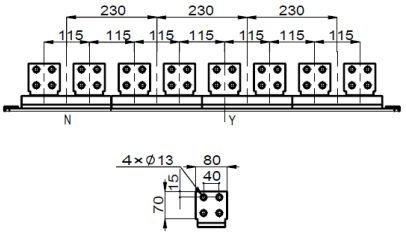
4000A-5000A Horizontal Extended, Vertical Extended and Mixed Extended Wiring

Extended Horizontal Wiring



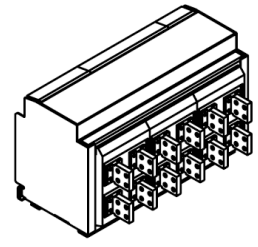


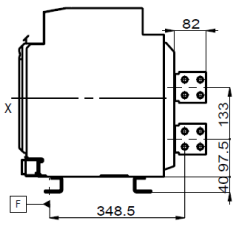
Detail



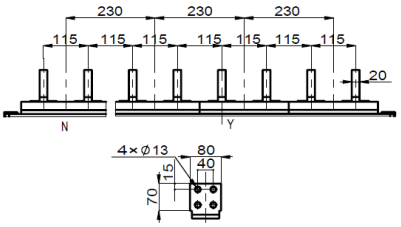
Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

Extended Vertical Wiring

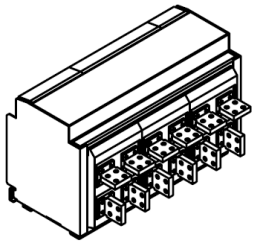


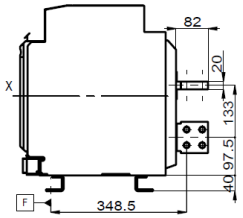


Detail

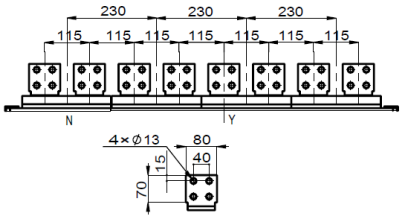


Mixed Wiring (Upper Horizontal, Lower Vertical)

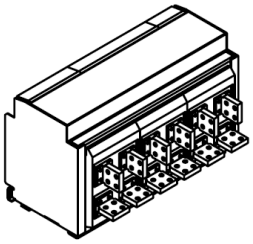


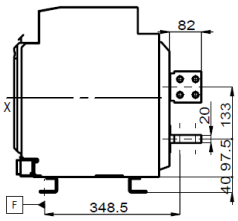


Detail

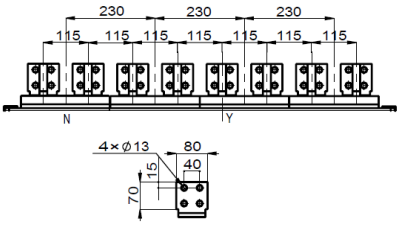


Mixed Wiring (Upper Vertical, Lower Horizontal)



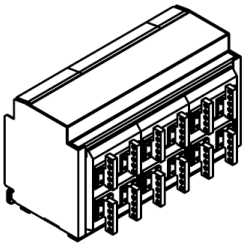


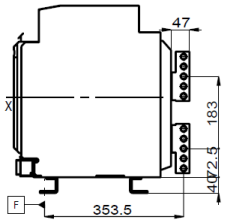
Detail



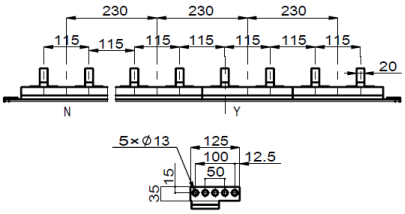
Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

6300A Vertical Wiring



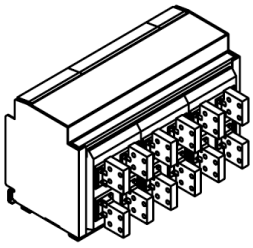


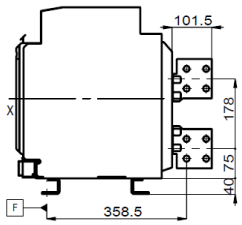
Detail



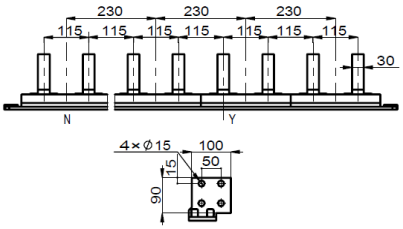
Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

6300A Extended Vertical Wiring





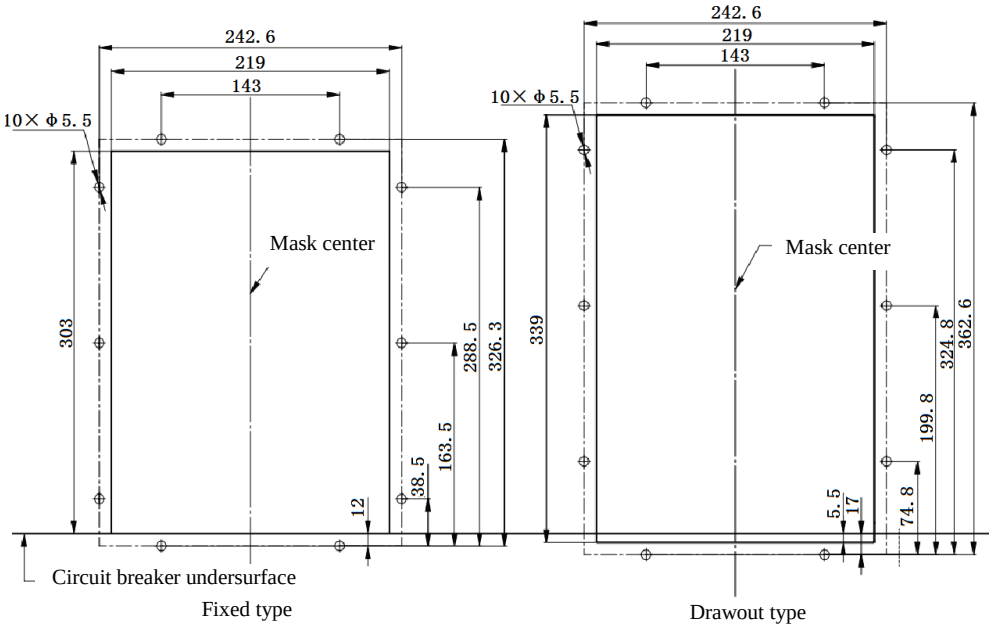
Detail



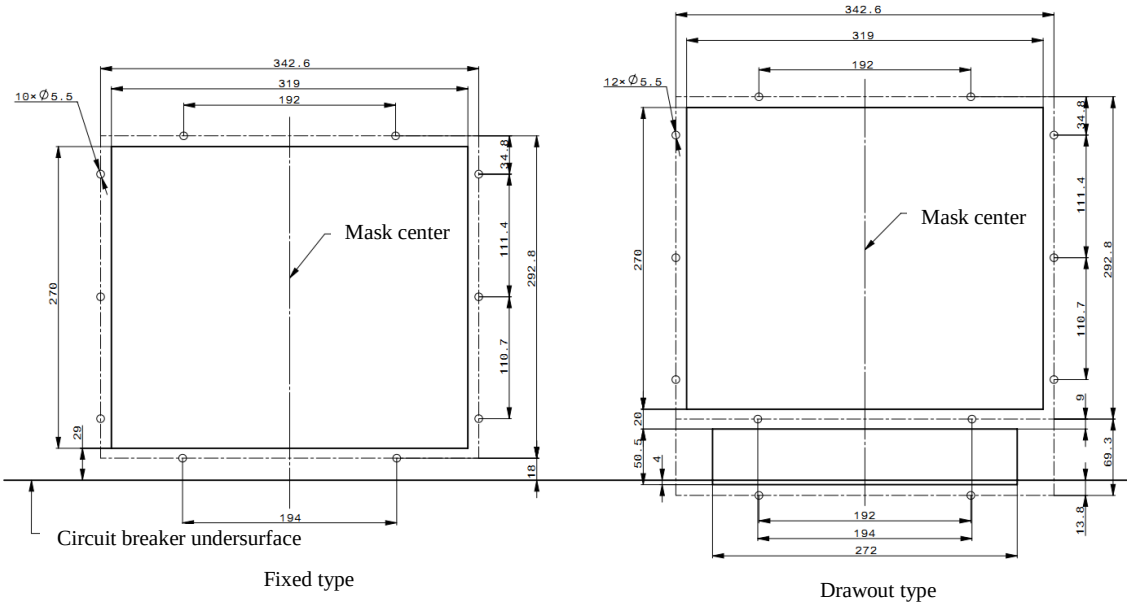
Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

6.5 The Circuit Breaker Cabinet Door Open Hole and the Installation Pitch

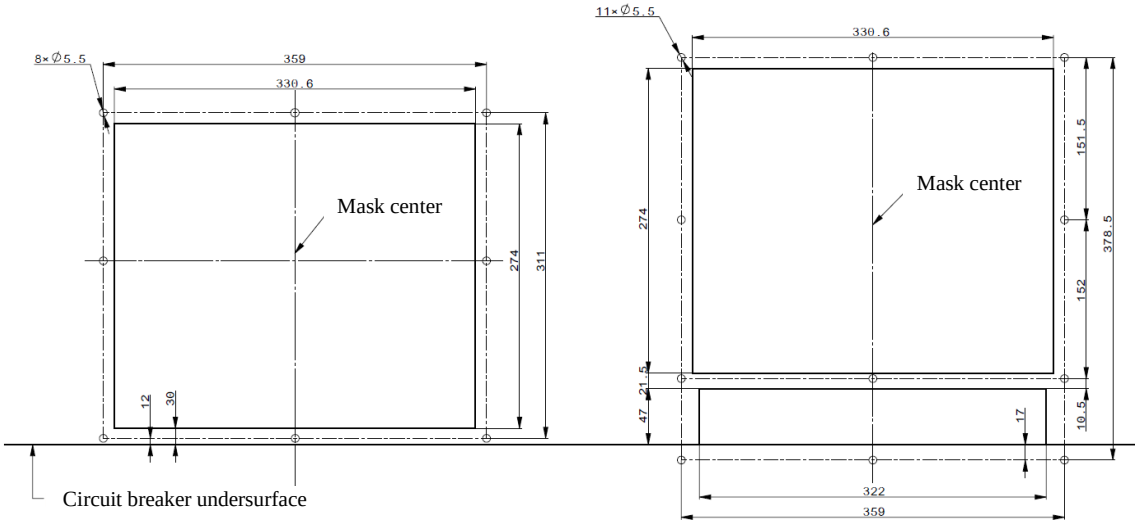
Hole dimensions of NDW3-1600 door frame (unit: mm)



Hole dimensions of NDW3-2500 door frame (unit: mm)

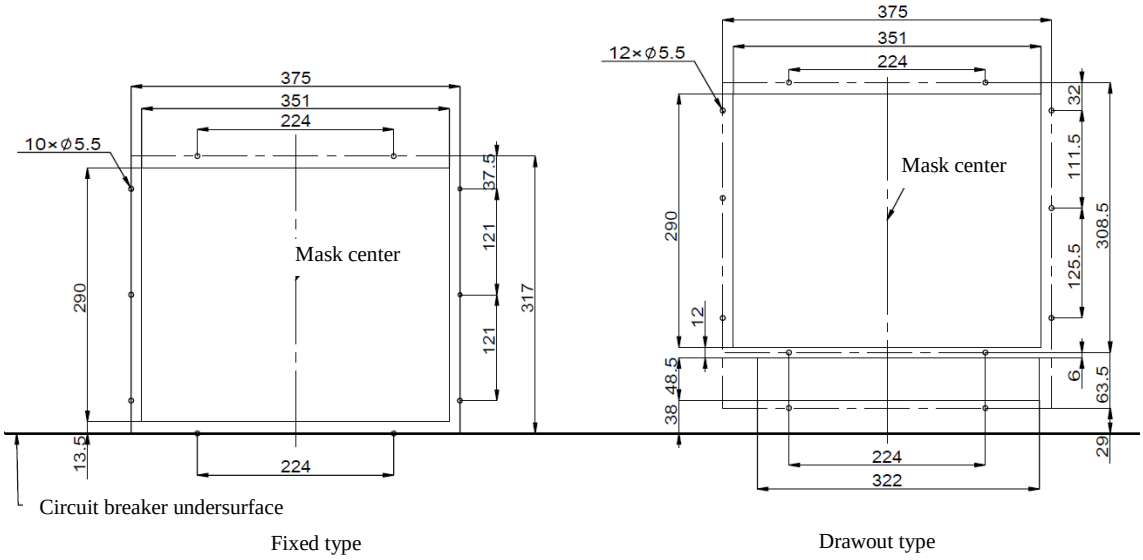


Hole dimensions of NDW3-4000 door frame (unit: mm)



Fixed type Drawout type

Hole dimensions of NDW3-6300 door frame (unit: mm)



Fixed type Drawout type

6.6 Circuit Breaker Installation Notes

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

- ★ Carefully read the Operation Manual before installation and use of the circuit breaker.
- ★ Check whether the specification of the circuit breaker is in line with the requirements before installation.
- ★ Install the circuit breaker under the environment condition without explosion danger, conductive dust or the possibility of corroding metal and damaging the insulation.
- ★ Measure the insulation resistance of the 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 20 mge; otherwise it needs to be dried, and it can be used until the insulation resistance meets the requirements.
- ★ Prevent foreign matters from falling into the circuit breaker when installing the circuit breaker.
- ★ Ensure the circuit breaker is flat without additional mechanical stress when installing the conductive busbar.

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

★ 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, closed 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 release will close and then the circuit breaker can be closed.

★ Pressing (or powering on) the closing button after the energy storage of the motor, the circuit breaker will close.

★ Pressing (or powering on) the opening button, the circuit breaker will open.

★ For manual storage of energy, pull the handle on the front panel up and down, when a "click" sound can be heard after seven times; the panel shows "storage of energy", and 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.

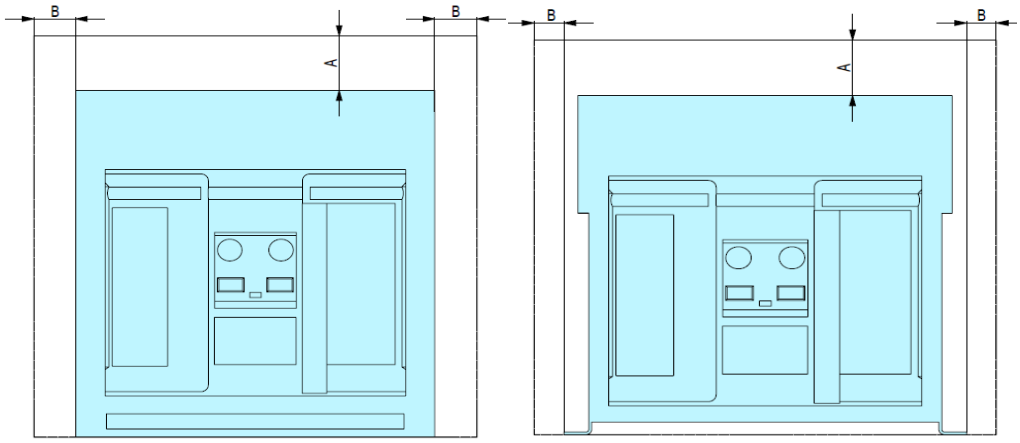
★ Installation screws of the circuit breaker is shown in the table below

Installation Screws of the Circuit Breaker

Circuit breaker		Connection conditions between bus and terminal
NDW3-1600		M10 bolt, level 8.8, with contact washer, tightening torque 45N.m
NDW3-2500		M12 bolt, level 8.8, with contact washer, tightening torque 60N.m
NDW3-4000	800-2500A	M12 bolt, level 8.8, with contact washer, tightening torque 60N.m
	3200-4000A	M14 bolt, level 8.8, with contact washer, tightening torque 97N.m
NDW3-6300	Extended vertical wiring	M12 bolt, level 8.8, with contact washer, tightening torque 60N.m
	Other wiring modes	M14 bolt, level 8.8, with contact washer, tightening torque 97N.m

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 shown in the figure below, and the installation dimensions are shown in the table below.



Drawout circuit breaker Fixed circuit breaker

Unit: mm

Installation mode of the circuit breaker	To the insulator		To the grounded metallic body		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

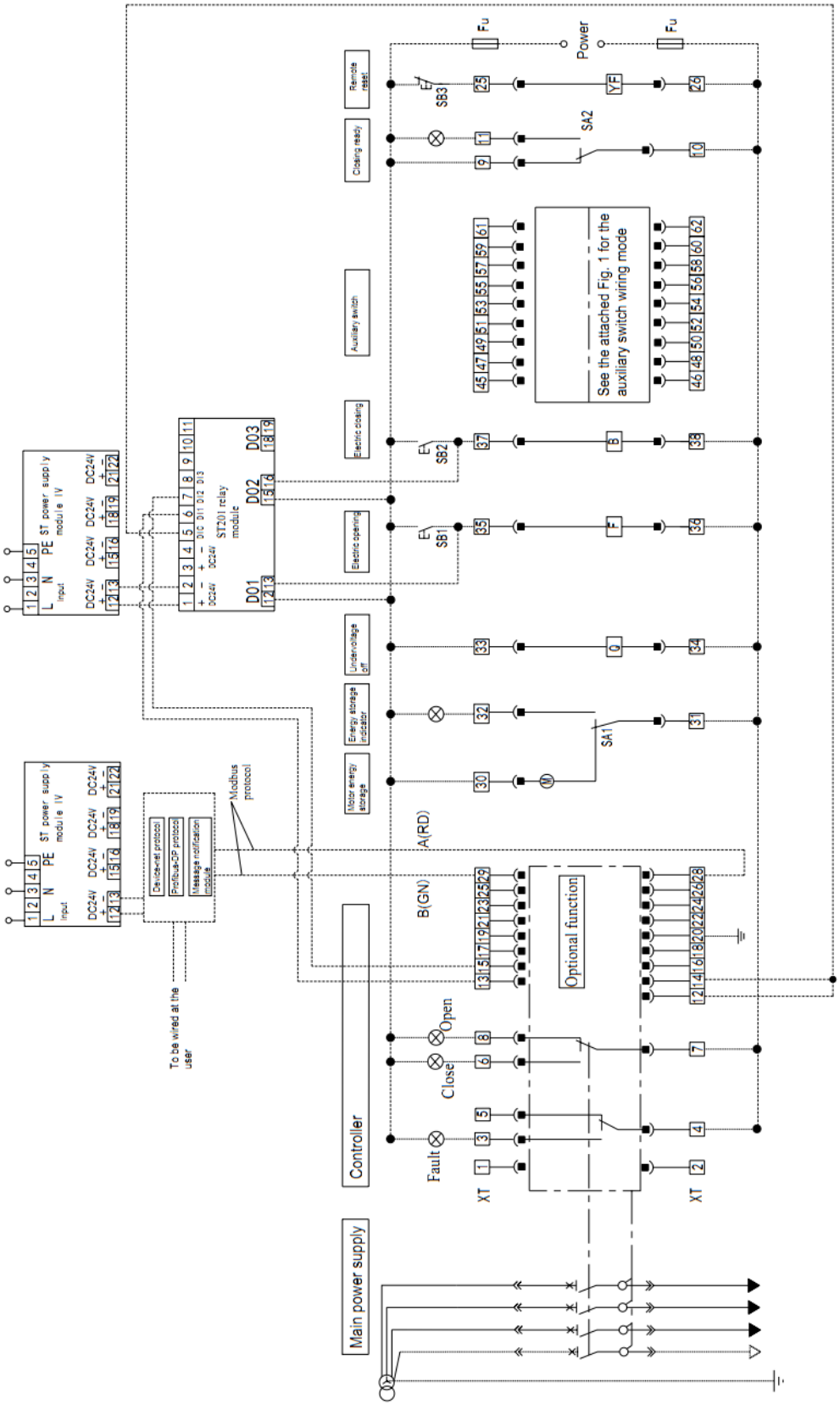
Note: 1. 150 mm space needed for removing the arc-extinguishing chamber should be considered for the safe spacing of the fixed type circuit breaker;

2. If dust cover is added, height space of 70 mm for installation and rotating of the dust cover should be considered.

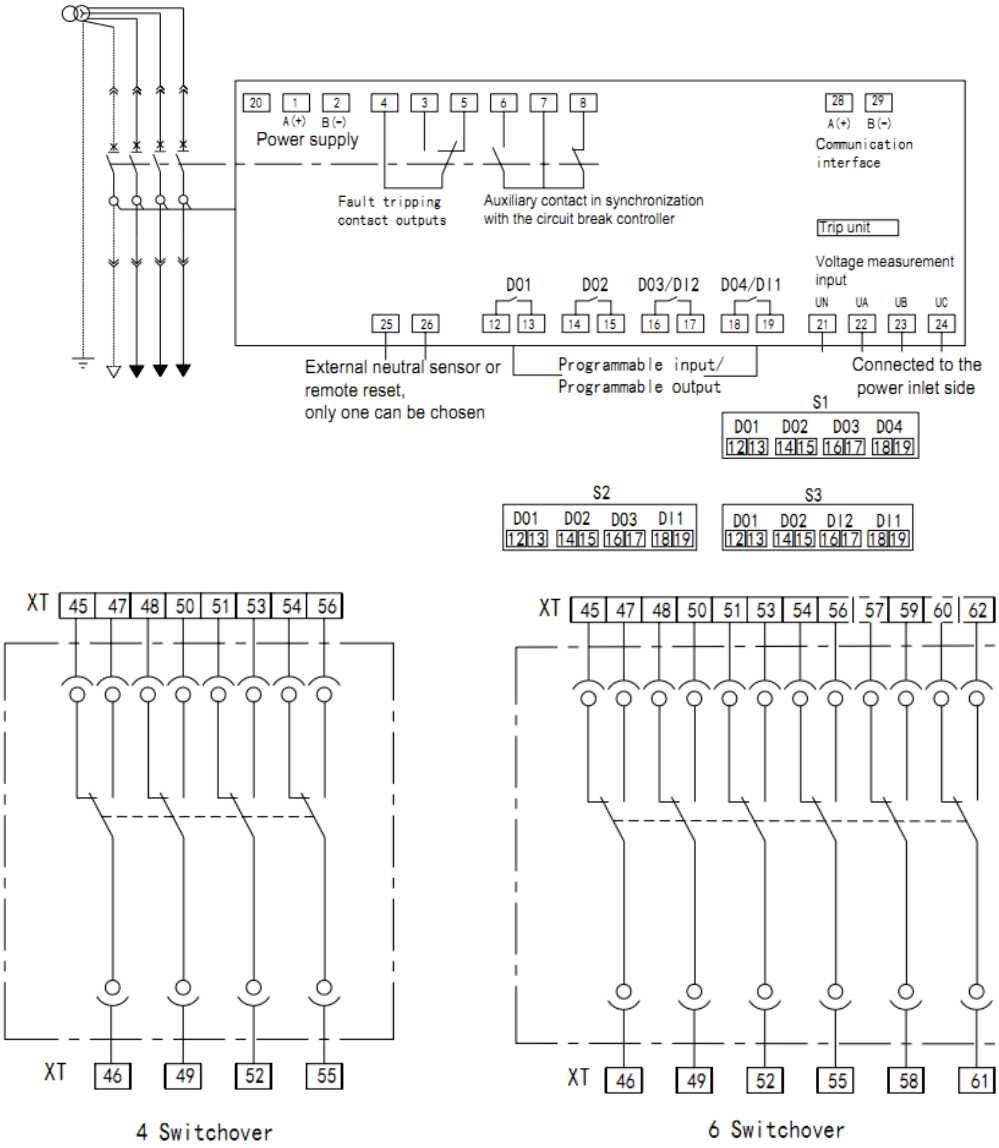
Chapter 7 Electrical Wiring Diagram

7.1 NDW3-1600 Electrical Wiring Diagram and Terminal Number Definition

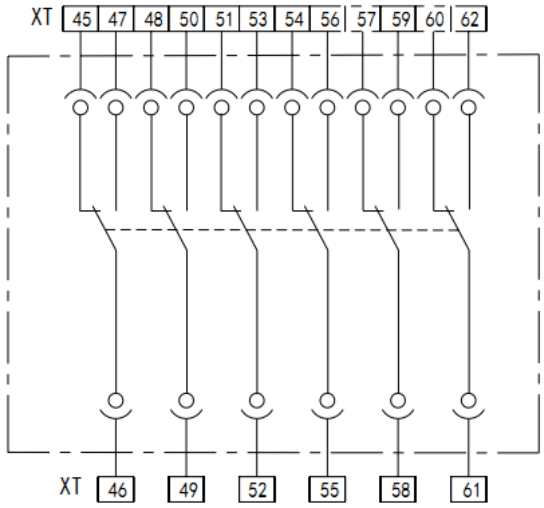
The following diagram is the NDW3-1600 full-function wiring diagram



The following diagram is the input/output interface of NDW3-1600 controller



4 Switchover



6 Switchover

Definition table of NDW3-1600 terminal number is shown in the following table

	Wiring terminal line number																																								备注
Function	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	45~62	
Working power supply	■	■																																								Users only need to connect the power supply to the input end of the power supply module.
Fault tripping indication contac			■	■	■																																					Contact capacity of 7# public end: AC250V/16A
Opening and closing indication contact						■	■	■																																		Contact capacity of 4# public end: AC250V/16A
Closing ready electric indicator									■	■	■																															
Four groups of optional signal unit outputs												■	■	■	■	■	■	■	■																							
Shunt output with break monitoring																■	■																									
Closing output with break monitoring																		■	■																							
Grounding wire of controller																				■																						
Voltage signal input ends (N, A, B, C)																					■	■	■	■																		Three-phase three-wire system: 21#23# shall be short connected to U2
Under-voltage release break monitoring output																				■	■	■	■																			
N-pole transformer output (3P+N)																									■	■																
Current leakage transformer output end																									■	■																
Remote reset function input end																																							■	■		
Energy-storing signal unit output																								■			■															
Communication interface																												■	■													
Electric energy storage and energy storage indicators																														■	■	■										
Undervoltage release																																	■	■								
Loss of voltage release																																	■	■								
Shunt release																																			■	■						
Closed electromagnet																																					■	■				
Connecting terminals of auxiliary switch																																									■	

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. When the power supply of Q, F, B, M, controllers is not the same, they shall be powered on respectively;

4. Each terminal number can only be used once;

5. The secondary terminal wiring is only suitable for the 0.5-1.5mm^2 multi-strand soft wire or hard wire with the soft wire recommended; pay attention to adopt the appropriate conductor.

6. Terminal number 39~45 - user-defined.

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

SB1 - Shunt button (to be prepared by users); SB2 - Close button (to be prepared by users);

SB3 - Remote reset button (to be prepared by users); SA1 - Motor travel switch;

SA2 - Closing ready travel switch; SA4 - Fault tripping travel switch;

SA5 - Opening and closing indicating travel switch;

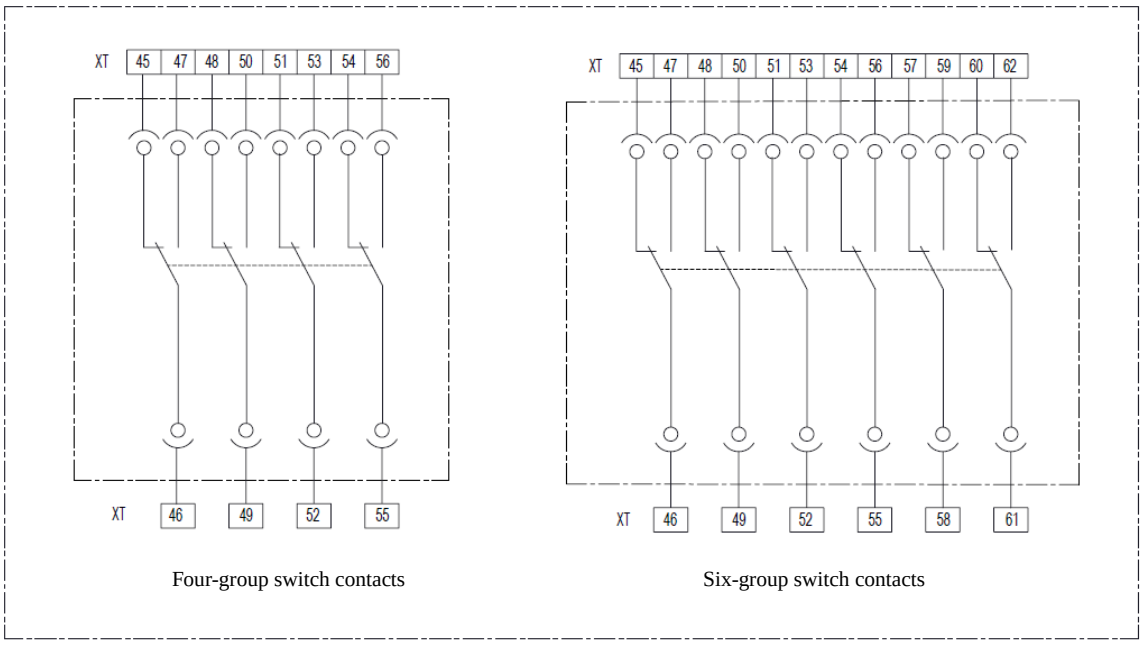
XT - Secondary terminal; F - Shunt release;

B - Closed electromagnet; Q - Undervoltage release or loss of voltage release (instantaneous or delayed);

YF - Remote reset; Fu - Fuse (to be prepared by users);

M - Energy storage motor.

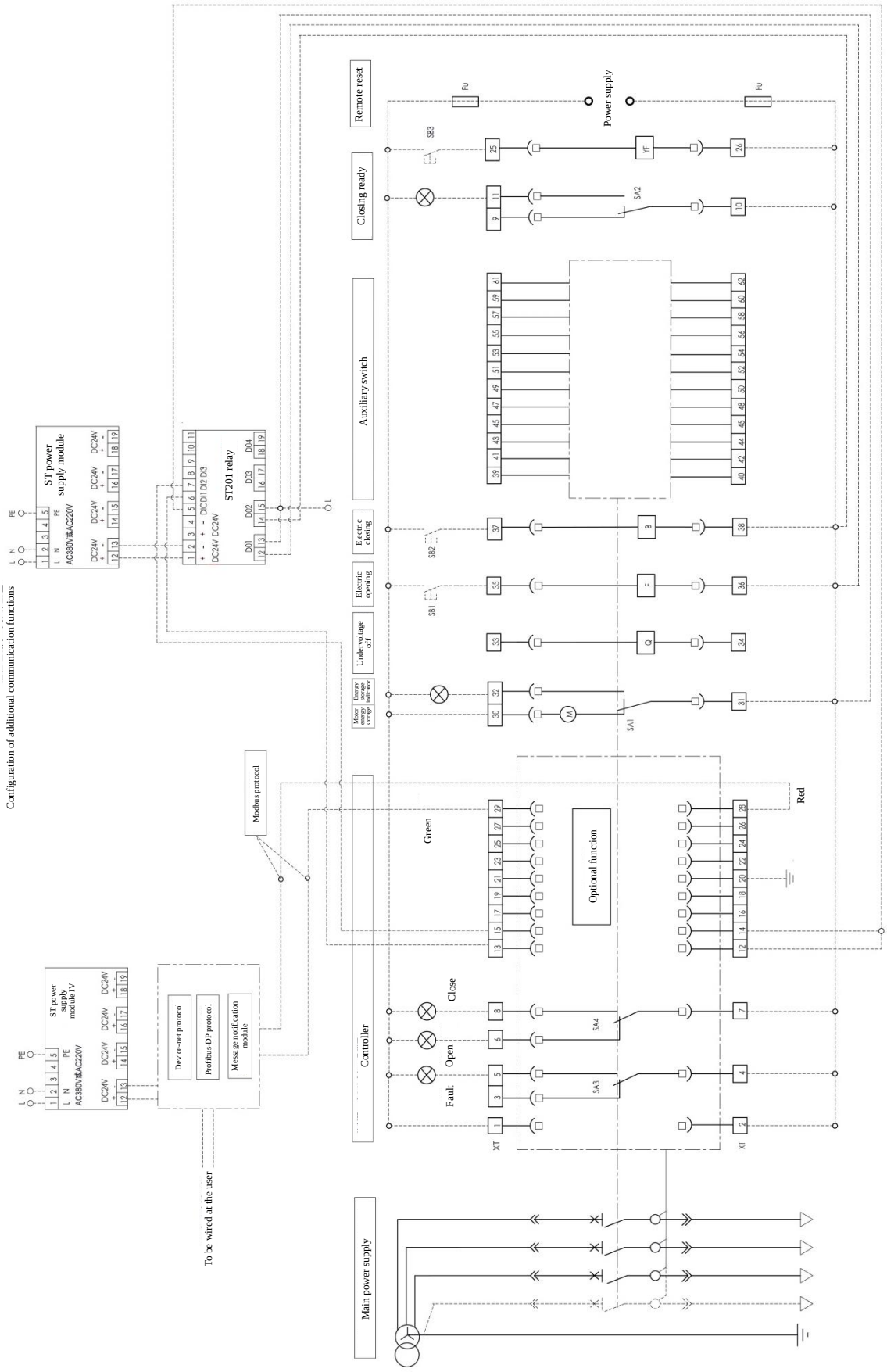
Appendix: NDW3-1600 Auxiliary Wiring Diagram



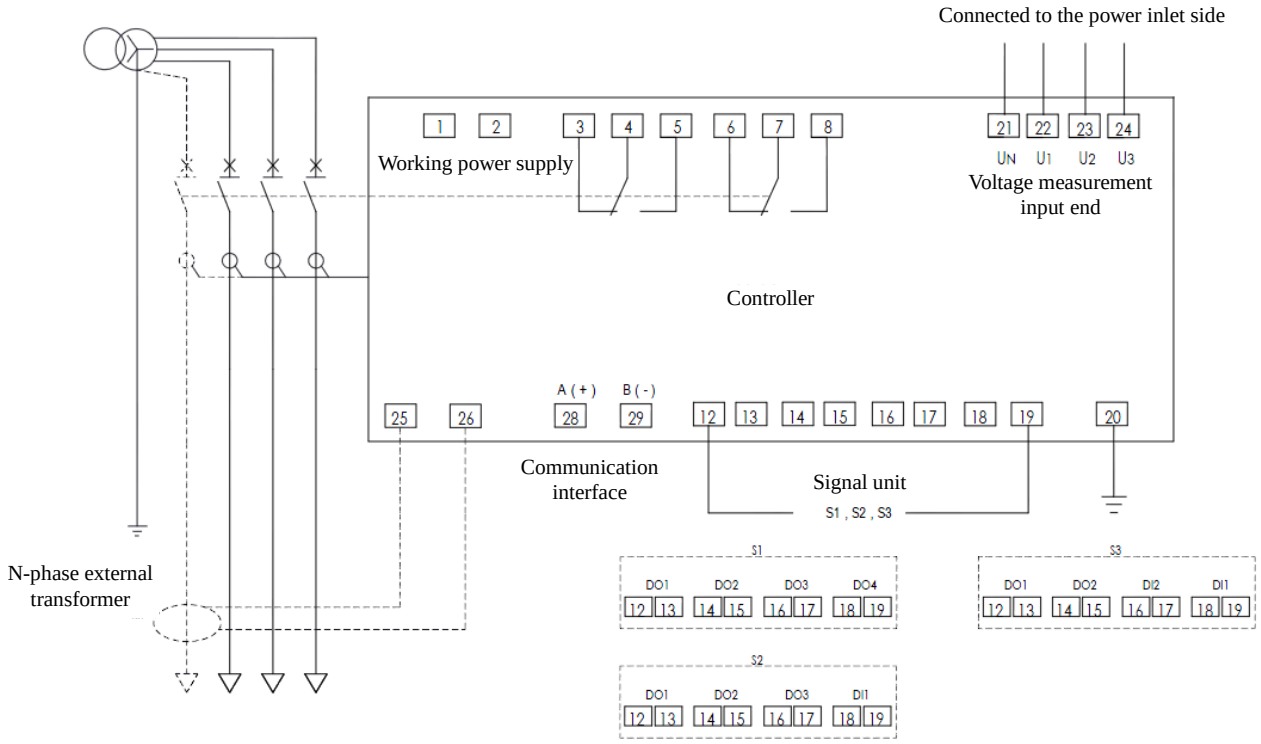
Four-group switch contacts Six-group switch contacts

7.2 NDW3-2500/6300 Electrical Wiring Diagram and Terminal Number Definition

The following diagram is the NDW3-2500 and NDW3-6300 full-function wiring diagram



The following diagram is the input/output interface of NDW3-2500 and NDW3-6300 controller



12、13——signal contactor 1，contactor capacity：AC250V/5A；DC110V/0.5A，additional function：We cannot choose both it and check-for-voltage closing device.

14、15——signal contactor 1，contactor capacity：AC250V/5A；DC110V/0.5A，additional function：We cannot choose both it and check-for-voltage closing device.

Definition table of NDW3-2500 and NDW3-6300 terminal number is shown in the following table

	Wiring terminal line number																																						Note
Function	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39~62	
Working power supply	■	■																																						Users only need to connect the power supply to the input end of the power supply module.
Fault tripping indication contac			■	■	■																																			Contact capacity of 4# public end: AC250V/16A
Opening and closing indication contact						■	■	■																																Contact capacity of 7# public end: AC250V/16A
Closing ready electric indicator									■	■	■																													Contact capacity of 10# public end: AC250V/5A
Four groups of optional signal unit outputs												■	■	■	■	■	■	■	■																					Contact capacity: AC250V/5A、DC110/0.5A
Shunt output with break monitoring																■	■																							
Closing output with break monitoring																		■	■																					
Grounding wire of controller																				■																				
Voltage signal input ends (N, A, B, C)																					■	■	■	■																Three-phase three-wire system: module N phase should be connected to system PE wire.
Under-voltage release break monitoring output																				■	■	■	■																	
N-pole transformer output (3P+N)																									■	■														
Current leakage transformer output end																									■	■														
Remote reset function input end																									■	■														
Energy-storing signal unit output																								■			■													
Communication interface																												■	■											
Motor output with breaking monitoring																													■	■	■	■								
Electric energy storage and energy storage indicators																														■	■	■								
Undervoltage release																																	■	■						
Loss of voltage release																																	■	■						
Check-for-voltage Closing Device												■	■	■	■																									Wire according to check-for-voltage closing device electrical wiring diagram.
Shunt release																																			■	■				
Closed electromagnet																																					■	■		
Connecting terminals of auxiliary switch																																							■	Contact capacity: AC380V/16A、DC250/5A

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. When the power supply of Q, F, B, M, controllers is not the same, they shall be powered on respectively;

4. Each terminal number can only be used once;

5. The secondary terminal wiring is only suitable for the 0.5-1.5mm^2 multi-strand soft wire or hard wire with the soft wire recommended; pay attention to adopt the appropriate conductor.

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

7. To realize “four-remote” functions, clients should choose signal unit, and add power source module and relay module.

8. When choose check-for-voltage closing device, electrical wiring diagram of closed electromagnet and under-voltage trip controlled by check-for-voltage is seen in the check-for-voltage electrical wiring diagram of appendix.

9. Check-for-voltage closing device is an appropriative accessory of NDW3-2500.

SB1 - Shunt button (to be prepared by users); SB2 - Close button (to be prepared by users); SB3 - Remote reset button (to be prepared by users);

SA1 - Motor travel switch; SA2 - Closing ready travel switch; SA4 - Fault tripping travel switch;

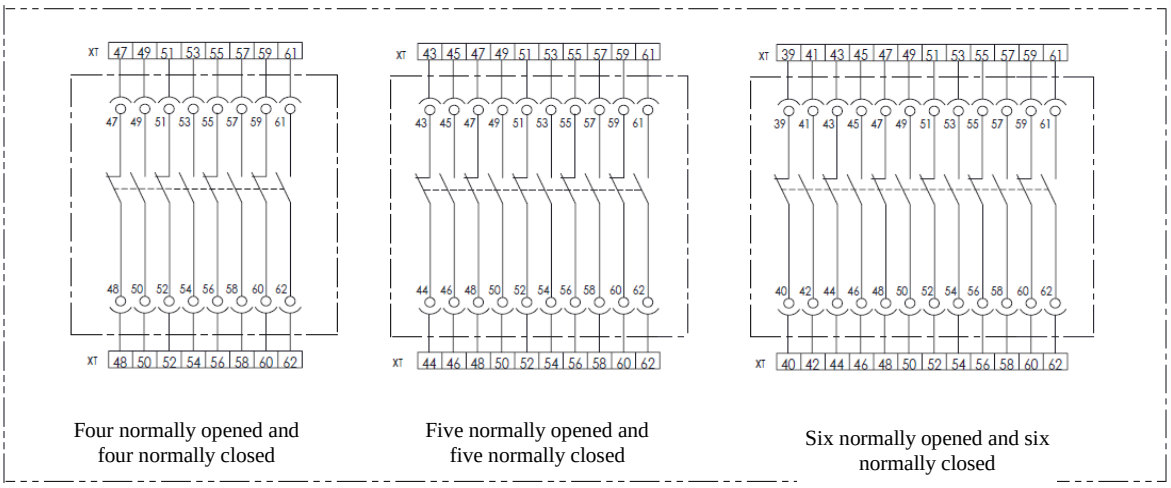
SA5 - Opening and closing indicating travel switch;

XT - Secondary terminal; F - Shunt release; B - Closed electromagnet;

Q - Undervoltage release or loss of voltage release (instantaneous or delayed);

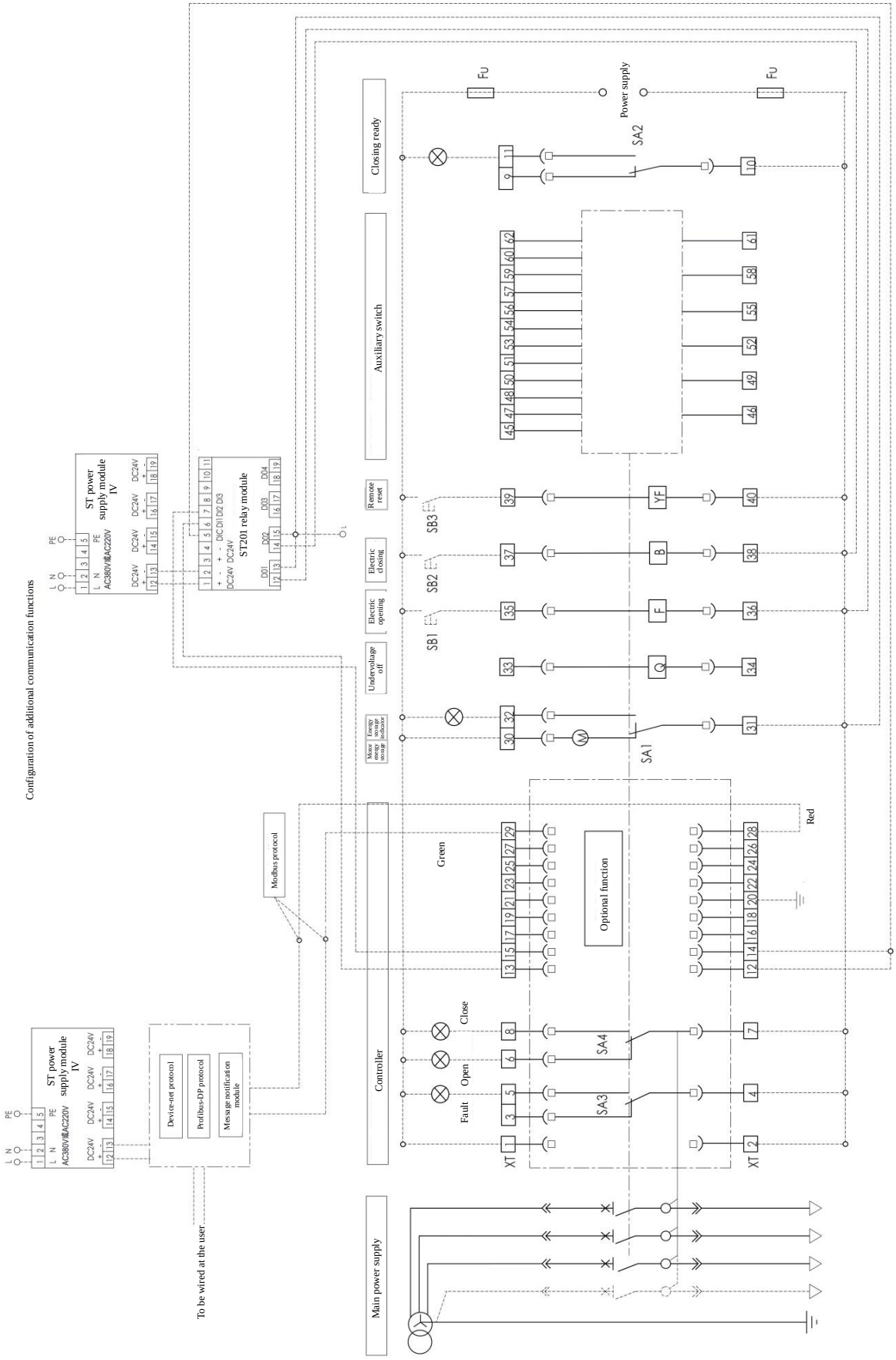
YF - Remote reset; Fu - Fuse (to be prepared by users); M - Energy storage motor.

Appendix: NDW3-2500/6300 Auxiliary Wiring Diagram

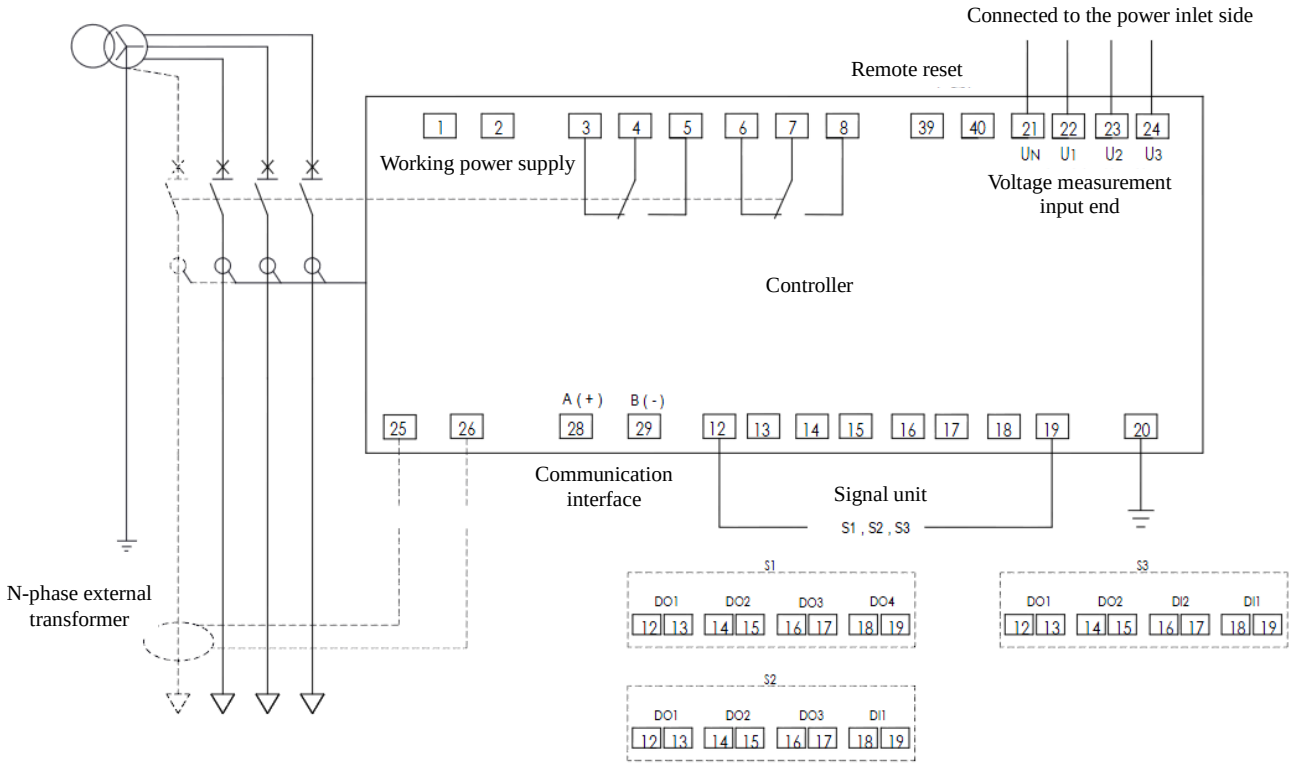


7.3 NDW3-4000 Electrical Wiring Diagram and Terminal Number Definition

The following diagram is the NDW3-4000 full-function wiring diagram



The following diagram is the input/output interface of NDW3-4000 controller



Definition table of NDW3-4000 terminal number is shown in the following table

Function	Wiring terminal line number																																								备注
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	45~62	
Working power supply	■	■																																								
Fault tripping indication contac			■	■	■																																					Users only need to connect the power supply to the input end of the power supply module.
Opening and closing indication contact						■	■	■																																		Contact capacity of 7# public end: AC250V/16A
Closing ready electric indicator									■	■	■																															
Four groups of optional signal unit outputs												■	■	■	■	■	■	■	■																							
Shunt output with break monitoring																■	■																									
Closing output with break monitoring																		■	■																							
Grounding wire of controller																				■																						
Voltage signal input ends (N, A, B, C)																					■	■	■	■																		Three-phase three-wire system: 21#23# shall be short connected to U2
Under-voltage release break monitoring output																				■	■	■	■																			
N-pole transformer output (3P+N)																									■	■																
Current leakage transformer output end																									■	■																
Remote reset function input end																																							■	■		
Energy-storing signal unit output																								■			■															
Communication interface																												■	■													
Electric energy storage and energy storage indicators																														■	■	■										
Undervoltage release																																	■	■								
Loss of voltage release																																	■	■								
Shunt release																																			■	■						
Closed electromagnet																																					■	■				
Connecting terminals of auxiliary switch																																									■	

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. Each wiring terminal number can only be used once.

5. The secondary terminal wiring is only suitable for the 0.5-1.5mm^2 multi-strand soft wire or hard wire with the soft wire recommended; pay attention to adopt the appropriate conductor.

6. Terminal number 41~44 - user-defined.

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

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; SA2 - Closing ready travel switch;

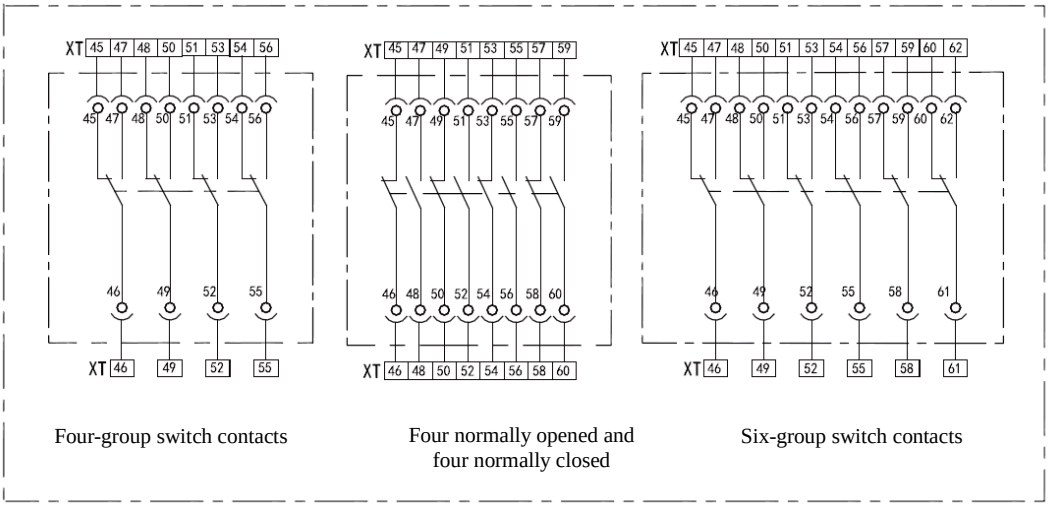
SA3 - Undervoltage indicating travel switch; SA4 - Fault tripping travel switch;

SA5 - Opening and closing indicating travel switch; XT - Secondary terminal; F - Shunt release;

B - Closed electromagnet; Q - Undervoltage release or loss of voltage release (instantaneous or delayed); YF - Remote reset;

T - Auxiliary contact of the circuit breaker (see attached figure); Fu - Fuse (to be prepared by users); M - Energy storage motor.

Appendix: NDW3-4000 Auxiliary Wiring Diagram

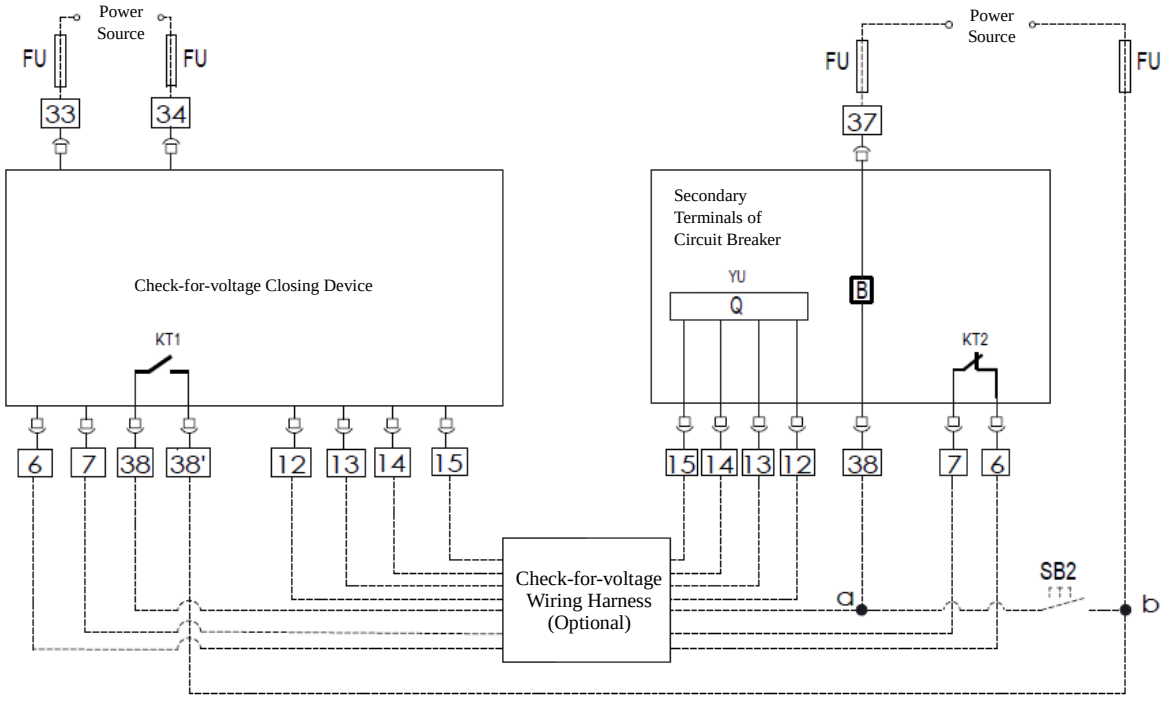


Four-group switch contacts

Four normally opened and four normally closed

Six-group switch contacts

7.4 Electrical Wiring Diagram of Check-for-voltage Closing Device



1）6、7——The check-for-voltage closing device need to monitor the state of circuit breaker, and clients should make a choice between it and circuit open contactors output function.

Note: Check-for voltage module's 6 and 7terminals should be connected to without-power normally closed contactors;

2）12、13 和 14、15——Choose one of appropriative under-voltage trip controlled by check-for-voltage closing device, PV appropriative under-voltage (voltage-loss) trip (adjustable from 0~10s) and signal unit function；

3）33、34——Check-for-voltage closing device power source is the same to common under-voltage trip power source, and clients can wire according to practical requirements, and only AC220V/230V、AC380V/AC400V power source can be allowed to connect.

4）37、38——When choose check-for-voltage closing device function, the closed electromagnet will be 37 and 38, and turn closing voltage rotary button of check-for-voltage closing device to non-off state, the closed electromagnet will be controlled by check-for-voltage closing device automatically, and a to b wires are suggested not to be connected.

5）If only take controlling closed electromagnet manually, we should turn off closing voltage rotary button of check-for-voltage closing device module, and connect a to b wires including SB2.

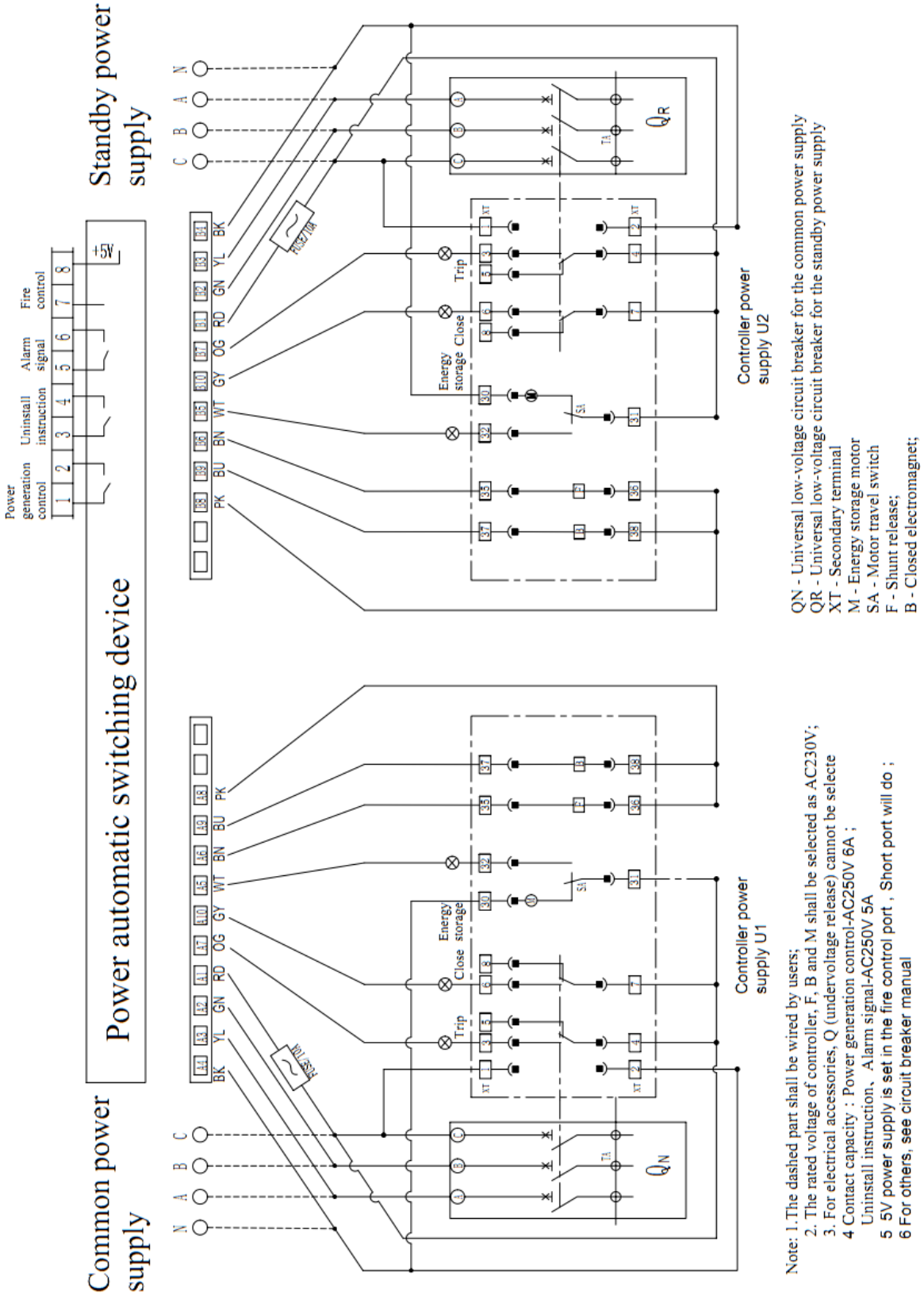
6）If clients do not choose check-for-voltage closing device, and the closed electromagnet is still 37 and 38, then they should wire according to general electrical wiring diagram of ACB.

7）6, 7, 12, 13, 14, 15, 38 should be connected to corresponding secondary terminals by wiring harness.

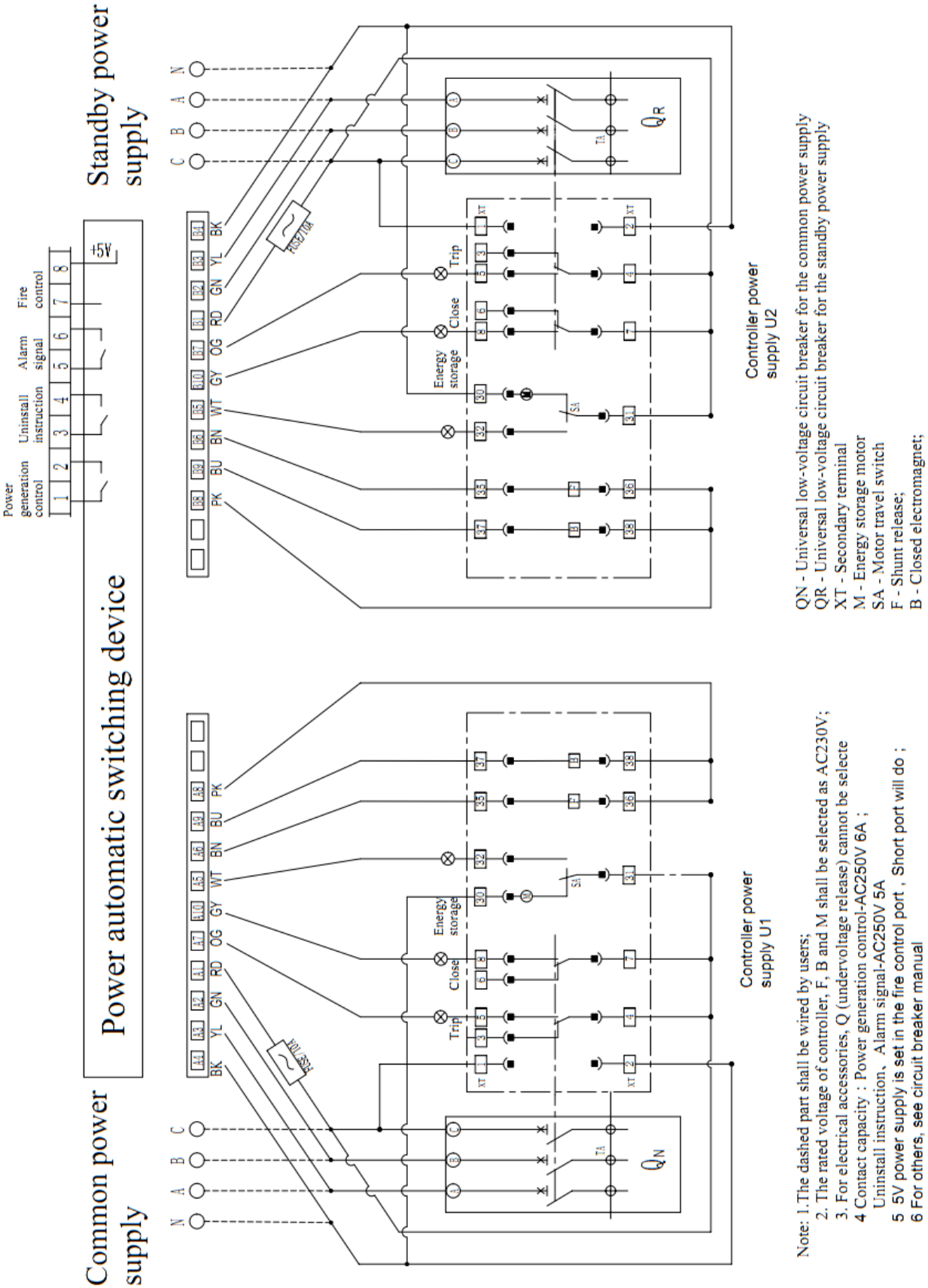
8）The imaginary line is wiring of clients, and real line is internal wiring of products.

7.5 Wiring Diagram of the Power Automatic Switching Device (ATS)

7.5.1 Wiring diagram of the power automatic switching device (ATS) of



7.5.2 Wiring diagram of the power automatic switching device (ATS) of NDW3-2500 & NDW3-4000& NDW3-6300



Chapter 8 Ordering Type Selection Specification

Ordering Type Selection Specification 8

8.1 NDW3 Series of Circuit Breaker Model Explanation and Encoding Rules

ND W 3- □ □/□ □/□/□ □ /□ □ □/□ □ □ □/□/□/□/□/□

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

SN	Name	Specification, type code	Description
1	Enterprise code	Nader brand low-voltage electrical appliance	
2	Product code	Air circuit breaker	
3	Design SN	3	
4	Shell frame level	16-1600, 25-2500, 40-4000, 63-6300	
5	Breaking type	S-Conventional breaking level, H-High breaking level, HU-High voltage level	NDW3-1600 is only available with one breaking type, which is not to write in default
6	Rated current	02-200A, 04-400A, 06-630A, 08-800A, 10-1000A, 12-1250A, 16-1600A, 20-2000A, 25-2500A, 32-3200A, 40-4000A, 50-5000A, 63-6300A	
7	Installation structure	Non-marked - fixed type, C - drawout type	
8	Number of poles	3-3 poles, 4-4 poles, 5-3P+N	3P+N: 3P products are added with N-phase
9	Controller	KM1-NWK21/NWK31 (AC380V/AC400V), KM2-NWK21/NWK31 (AC220V/AC230V), KM3-NWK21/NWK31 (DC220V), KM4-NWK21/NWK31 (DC110V), KM5-NWK21/NWK31 (DC24V)	NWK31 and NWK32 are applicable to NDW3-1600 controllers while NWK21 and NWK22 are applicable to the rest
		KY1-NWK22/NWK32 (AC380V/AC400V), KY2-NWK22/NWK32 (AC220V/AC230V), KY3-NWK22/NWK32 (DC220V), KY4-NWK22/NWK32 (DC110V), KY5-NWK22/NWK32 (DC24V)	

Continued:

10	Controller Optional function	Protection type: Not-standard - conventional type, V - voltage measurement and protection, P - harmonic measurement and protection	1. This shall be omitted if the controller has no optional function; NWK21/NWK31 controller only has S1-4DO; 2. Z1 is not available with the NDW3-1600 remote reset function; 3. Choose one from the communication functions of "H", "MP", "MD" and "DXX"; 4. For the controller with "V" and "P"functions, the voltage module P2 is optional for the main circuit rated voltage above AC800V.
		Communication function: H (Modbus protocol) MP (Profibus-DP protocol) MD (Devicenet protocol) DXX-Message notification module	
		Signal unit: S1- 4DO S2- 3DO, 1DI S3-2DO, 2DI	
		Remote reset function: Z1(AC380V/AC400V), Z2(AC220V/AC230V), Z3(DC220V), Z4(DC110V), Z5DC(24V)	
		3P+N grounding mode (optional for the external N-pole transformer): T - Differential type (not to write in default) W - Ground current type	
		N1 - External N-phase transformer (62*21) — Applicable to NDW3-1600	
		N2 - External N-phase transformer (102*32.5) — Applicable to NDW3-1600/2500	
		N3 - External N-phase transformer (122*52) — Applicable to NDW3-2500/4000/6300	
		N4 - External N-phase transformer (262*102) — Applicable to NDW3-2500/4000/6300	
		NR1 - External flexible transformer (280mm) — Applicable to 200A-800A	
		NR2 - External flexible transformer (370mm) — Applicable to 1000A-2000A	
		NR3 - External flexible transformer (450mm) — Applicable to 1000A-6300A	
		Protection form of current leakage: E-type (including the external current leakage transformer)	
		Contact wear equivalent, operation times query (NWK21/31 optional): J	
11	Electric energy storage mechanism	D1-AC380V/AC400V, D2-AC220V/AC230V, D3-DC220V, D4-DC110V, D5-DC24V	
12	Shunt release	F1-AC380V/AC400V, F2-AC220V/AC230V, F3-DC220V, F4-DC110V, F5-DC24V	
13	Closed electromagnet	B1-AC380V/AC400V, B2-AC220V/AC230V, B3-DC220V, B4-DC110V, B5-DC24V	
14	Under-voltage release/loss of voltage release/voltage-check closing device	Under-voltage release: Q1-AC380V/AC400V, Q2-AC220V/AC230V, Q3-DC220V, Q4-DC110V, Q5-DC24V	1. One out three of the under-voltage release, loss of voltage release and voltage-check closing device 2. To be selected during ordering; this shall be omitted if without this accessory
		Loss of voltage release: S1-AC380V/AC400V, S2-AC220V/AC230V	
		Voltage-check release: J1-AC380V/AC400V, J2-AC220V/AC230V	

Continued:

15	Under-voltage release/loss of voltage release Delay time/voltage-check harness	Conventional undervoltage delay: 0-Instantaneous, 1-1s delay, 3-3s delay, 5-5s delay	3. The special under-voltage release and closed electromagnet controlled by the voltage-check closing device are internal accessories, while the voltage-check closing controller module is the external accessory (applicable to NDW3-2500)
		NDW3-1600/6300 loss of voltage: 0s~10s adjustable by users (the factory default setting value is 3s), with a step of 1s;	
		NDW3-2500/4000 loss of voltage delay: 1-1s delay, 3-3s delay, 5-5s delay	
		0- Without harness, 1 - With harness	
16	Auxiliary contact	Not-marked - four groups conversion, A6 - six groups conversion	Applicable to NDW3-1600
		Not marked - Four opened and four closed, A55 - Five opened and five closed, A66 - Six opened and six closed	Applicable to NDW3-2500 and NDW3-6300
		Not-marked - Four groups conversion, A6 - Six groups conversion, A44 - Four opened and four closed	Applicable to NDW3-4000
17	Internal Accessories	BX - Closing ready signal output unit	This shall be omitted if without this accessory
		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)	
		CX - Drawer seat three-position signal output	

Continued:

18	External accessories	M - Doorframe	1. Power supply module, relay module, external current leakage transformer, programmable output module, message module, communication adapter and N-pole external transformer should be used with the controller; 2. Carry out the sequence arrangement according to the table, with "/" for separation; 3. The accessory monitoring unit can't be selected with the communication function, signal unit and controller with "V" and "P" functions simultaneously; 4. The energy-storing signal communication module component can't be selected with the controller with "V" and "P" functions simultaneously.
		F - Dust cover	
		R - Relay module	
		P - Power supply module (in line with the controller voltage in default)	
		S - Button lock	
		BC - Programmable output module (6-channel)	
		IO1 - Remote I/O module C8 IO2 - Remote I/O module S12 IO3 - Remote I/O module SC64 IO4 - Remote I/O module SCM423	
		AM - Accessory monitoring unit	
		P2 - Voltage conversion module	
		TC - Energy-storing signal communication module component	
19	Wiring mode	Not marked - Horizontal wiring, J1 - Horizontal extended wiring, J3 Vertical wiring, J4 - Vertical extended wiring J5 - Mixed wiring (upper horizontal, lower vertical), J6 - Mixed wiring (upper vertical, lower horizontal) J7 - Mixed extended wiring (upper horizontal and lower vertical), J8 - Mixed extended wiring (upper vertical and lower horizontal)	NDW3-6300 with the rated current of 6300A only has two wiring modes: Vertical wiring and vertical extended wiring.
20	Product usage type	Not-marked - Conventional, TH - Thermal and humidity	
21	Special notes	Customer's special requirements	
22	Rated working voltage	Not-marked - AC690V and below, KV4-AC800V, KV5-AC1000V, KV6-AC1140V	

Interlocking Accessory Model Explanation and Encoding Rules

Key lock	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. SR21 and SR12 are only applicable to the NDW3-2500 frame and above; 4. NDW3-1600 fixed type is not provided with a mechanical interlock.
Mechanical interlocking	SR11 - Mechanical interlocking device (two sets of steel cables, one for closing and one for opening) SR12 - Mechanical interlocking device (three sets of steel cables, one for closing and two for opening) SR21 - Mechanical interlocking device (three sets of steel cables, two for closing and one for opening) SY11 - Mechanical interlocking device (two sets of hard rods, one for closing and one for opening) SY12 - Mechanical interlocking device (three sets of hard rods, one for closing and two for opening)	
Power automatic switching device	ATS-R/S/F (R: Auto switch and auto recover; S: Auto switch and non-auto recover; F: Mains - Generator)	1. It is standard with a mechanical interlock with the type selected by customers; 2. NDW3-1600 fixed type is not provided with this accessory.

8.2 Order Specifications

(Please fill in numbers in_____, and check √ in □. Related contents can be found in the Manual)

User unit			Number of units ordered:	Date of ordering:
Basic parameters	Shell frame level	□ NDW3-1600 □ NDW3-2500 □ NDW3-4000 □ NDW3-6300		
	Installation structure	□ Fixed type □ C - Drawout type		
	Rated current (A)	NDW3-1600: □200 □400 □630 □800 □1000 □1250 □1600 NDW3-2500: □630 □800 □1000 □1250 □1600 □2000 □2500 NDW3-4000: □800 □1000 □1250 □1600 □2000 □2500 □3200 □4000 NDW3-6300: □4000 □5000 □6300		
	Breaking type	□ S-Conventional breaking (AC690V and below) □ H-High breaking (AC690V and below) □ HU-High voltage breaking (AC800V) □ HU-High voltage breaking (AC1000V) □ HU-High voltage breaking (AC1140V) Note: These options are not distinguished with NDW3-1600, no selection required		
	Number of poles	□ 3 (3 poles) □ 4 (4 poles) □ 5(3P+N)		
	Wiring mode	NDW3-1600	□ Horizontal wiring (standard configuration) □ J3 - Vertical wiring □ J5 - Mixed wiring (upper horizontal and lower vertical) □ J6 - Mixed wiring (upper vertical and lower horizontal)	
		NDW3-2500	□ Horizontal wiring (standard configuration) □ J1 - Horizontal extended wiring □ J3 - Vertical wiring □ J4 - Vertical extended wiring □ J5 - Mixed wiring (upper horizontal, lower vertical) □ J6 - Mixed wiring (upper vertical, lower horizontal)	
		NDW3-4000	□ Horizontal wiring (standard configuration) □ J1 - Horizontal extended wiring □ J3 - Vertical wiring □ J4 - Vertical extended wiring	
		NDW3-6300	□ Horizontal wiring (standard configuration) □ J1 - Horizontal extended wiring □ J3 - Vertical wiring □ J4 - Vertical extended wiring □ J5 - Mixed wiring (upper horizontal, lower vertical) □ J6 - Mixed wiring (upper vertical, lower horizontal) □ J7 - Mixed extended wiring (upper horizontal and lower vertical) □ J8 - Mixed extended wiring (upper vertical and lower horizontal)	
	Product type	□ Not-marked - Conventional (standard configuration) TH - Thermal and humidity		
Controller parameters	Controller model	NDW3-1600	□ KM-NWK31 (digital screen) □ KY-NWK32 (LCD)	
		NDW3-2500/4000/6300	□ KM-NWK21 (digital screen) □ KY-NWK22 (LCD)	
	Controller voltage	□ 1(AC380V/400V) □ 2(AC220V/AC230V) □ 3(DC220V) □ 4(DC110V) □ 5(DC24V)		
	Protection type	□ Conventional type (standard configuration) □ V - Voltage measurement and protection type □ P - Harmonic measurement and protection type Note: 1. The NWK22/32 LCD type is only optional for P, while V and P can't be selected with the accessory monitoring unit simultaneously 2. For the AC800V and above, select the V - voltage measurement and protection type while the P2-voltage conversion module is optional		
	Communication functions	□ Modbus □ Profibus □ DeviceNet Note: It can't be selected with the accessory monitoring unit simultaneously		

	Signal element	□ S1-4DO □ S2-3DO, 1DI □ S3-2DO, 2DI Note: It can't be selected with the accessory monitoring unit simultaneously		
	Remote reset	□ Z1(AC380V/AC400V) □ Z2(AC220V/AC230V) □ Z3(DC220V) □ Z4(DC110V) □ Z5(DC24V) Note: Z1 is not available with NDW3-1600		
	External transformer	3P+N required: □ N1 □ N2 □ N3 □ N4 □ NR1 □ NR2 □ NR3		E type: □ E
	Grounding mode	□ T type (default) □ W type Note: 3P+N needs to be added with an external transformer		□ E type
	Contact wear equivalent	□ J - Contact wear equivalent Note: NWK21/31 is optional		
Required accessories	Electric operating mechanism	□ D1(AC380V/AC400V) □ D2(AC220V/AC230V) □ D3(DC220V) □ D4(DC110V)		
	Shunt release	□ 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)		
Optional accessories	Under-voltage release	Voltage specifications	□ Q1(AC380V/AC400V) □ Q2(AC220V/AC230V) □ Q3(DC220V) □ Q4(DC110V) □ Q5(DC24V)	
		delay time	□ 0-Instantaneous (0s) Delay: □ 1 (1s delay) □ 3 (3s delay) □ 5 (5s delay)	
	Loss of voltage release	Voltage Specifications	□ S1(AC380V/AC400V) □ S2(AC220V/AC230V)	
		delay time	NDW3-1600/6300	0s-10s adjustable by users Note: The factory default setting is 3s, with a step of 1s
			NDW3-2500/4000	□ 1 (1s delay) □ 3 (3s delay) □ 5 (5s delay)
	Voltage-check closing device	□ J1(AC380V/AC400V) □ J2(AC220V/AC230V) Note: Applicable to NDW3-2500		
		Included harness or not: □ 0(without harness) □ 1 (with harness)		
	Auxiliary contact	NDW3-1600	□ Four-group conversion (standard configuration) □ A6 - Six-group conversion	
		NDW3-2500/6300	□ Four normally opened and four normally closed (standard configuration) □ A55 - five normally opened and five normally closed □ A66 - six normally opened and six normally closed	
		NDW3-4000	□ Four-group conversion(standard configuration) □ A6 - six-group conversion □ A44 - four normally opened and four normally closed	
	Closing ready	□ BX - Closing ready signal output unit		
	Counter	□ JS - Counter		
	Drawer seat door interlock	□ CM1 - Right side of the door interlock □ CM2 - Left side of the door interlock		
	Position indicator	□ CX - Drawer seat three-position signal output		
	Door frame	□ M Door frame		
	Dust cover	□ F Dust cover		
	Relay module	□ R Relay module		
	Power supply	□ P Power supply module (in line with the operating voltage of controller in default)		

<table>
<tr><td rowspan="7"></td><td>module</td><td colspan="3"></td></tr>
<tr><td>Button lock</td><td colspan="3">□ S Button lock</td></tr>
<tr><td>Programmable module</td><td colspan="3">□ BC Programmable output module (6-channel)</td></tr>
<tr><td>Remote I/O module</td><td colspan="3">□ IO1 remote I/O module C8 □ IO2 remote I/O module S12 □ IO3 remote I/O module SC64 □ IO4 remote I/O module SCM423
Note: To be used with the optional power supply module</td></tr>
<tr><td>Accessory monitoring unit</td><td colspan="3">□ AM - Accessory monitoring unit
Note: It can’t be selected with the communication function, signal unit and controller with “V” and “P” functions simultaneously</td></tr>
<tr><td>Voltage conversion module</td><td colspan="3">□ P2 - Voltage conversion module</td></tr>
<tr><td>Energy-storing signal communication</td><td colspan="3">□ TC - Energy-storing signal communication module component
Note: It can’t be selected with the controller with “V” and “P” functions simultaneously</td></tr>
<tr><td rowspan="4">Interlocking accessories</td><td>Off-position lock</td><td colspan="3">□ 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</td></tr>
<tr><td rowspan="2">Mechanical interlocking</td><td>Cable type</td><td>□ SR11 - Two groups, one for closing and one for opening
□ SR12 - Three groups, one for closing and two for opening
□ SR21 - Three groups, two for closing and one for opening</td><td rowspan="2">Note: SR21 and SR12 are only applicable to the NDW3-2500 frame and above, while the NDW3-1600 fixed type is not provided with a mechanical interlock.</td></tr>
<tr><td>Hard rod type</td><td>□ SY11 - Two groups, one for closing and one for opening
□ SY12 - Three groups, one for closing and two for opening</td></tr>
<tr><td>Power supply automatic switching device</td><td colspan="3">□ ATS-R type □ ATS-S type □ ATS-F type
Note: 1. Please select a type if mechanical interlocking is standard,; 2. There's no need to select undervoltage release if undervoltage protection is included; 3. The electrical accessories must select the working voltage of AC220V; 4. NDW3-1600 fixed type is not provided with this accessory.</td></tr>
<tr><td colspan="2" rowspan="2">Special requirements</td><td colspan="3">Factory setting of the special requirements:
Overload long time-delay current____A time_____s; short-circuit short time-delay current____A time_____s
short circuit transient current____A; ground fault current ____A time____s</td></tr>
<tr><td colspan="3">Other requirements:</td></tr>
<tr><td colspan="5">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.</td></tr>
</table>