

Shanghai Liangxin Electrical Co., Ltd.

NDW3-2500/4000 Offshore Wind Power Air Circuit Breaker Product Specification

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Chapter 1 Product Overview

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Product Overview

1.1 NDW3-2500/4000 Offshore Wind Power Air Circuit Breaker



NDW3-2500 Fixed Type

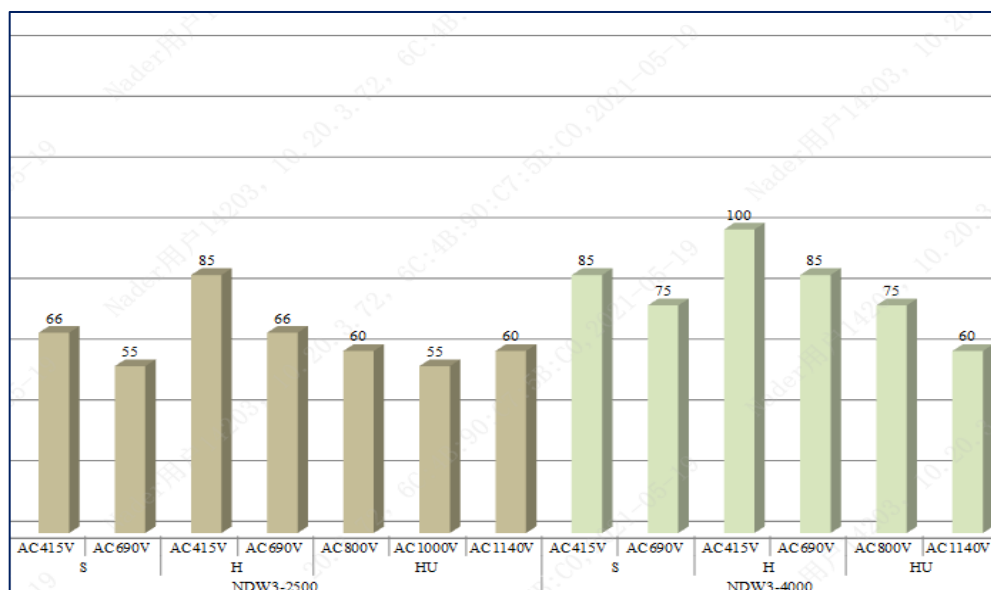


NDW3-4000 Fixed Type

1.2 NDW3-2500/4000 Offshore Wind Power Air Circuit Breaker Rated Current

Rated current(A) Frame size	200	400	630	800	1000	1250	1600	2000	2500	3200	4000
NDW3-2500											
NDW3-4000											

1.3 NDW3-2500/4000 Offshore Wind Power Air Circuit Breaker Short Time Withstand Current (kA)



注：1) S: Regular type、H:High break ability、HU:High voltage break ability。

1.4 Structure Design

■ Installation method



NDW3-2500 Fixed type



NDW3-4000 Fixed type

■ Brief Description of Structure and Indications



1. Reset button
2. Specification sign
3. Disconnected position key lock (Optional function)
4. Nader Logo
5. Open button
6. Close button
7. Charge-discharge indicator
8. Open-close indicator
9. Nameplate

1.5 Product Features

1.5.1 High capacity of arc chuting and current breaking

- The design of the circuit breaker's arc chamber and contact system has a number of invention patents. Using the principle of air blowing and magnetic blowing to extinguish the arc, optimize the design of the arc extinguishing grid, increase the driving force of the arc, and improve the breaking capacity of the product. Optimize the design and optimization of the time for the controller to collect signals and issue commands. When a large fault current occurs, the full breaking time can be greatly shortened.

■ Zero arc flash

1.5.2 High electrical endurance and short time short-circuit withstand 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 electrical 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 controller - Digital tube display, practical function and simplicity, which can adapt to the low-temperature places with the optional voltage measurement function
- 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 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.

1.5.5 Three-proofing circuit breaker

The TH (thermal-humidity) type circuit breaker can meet the three-proofing requirements of 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: GB/T 2423.18-2012 Environmental Testing Part 2: Test Method Test Kb: Salt spray, Alternating salt spray (Sodium chloride solution)
- Enclosure protection grade: GB/T 4208-2008 Enclosure Protection Grade (IP code)

1.5.6 Climatic environment

Climatic test conforms to GB/T 4798.3-2007 3C2 level for fixed use in weather-protected places, test method GB/T2423.51-2012 flowing mixed gas corrosion test method 4, severity level 14d

1.5.7 Anticorrosion of steel structure

The corrosion protection of steel structure complies with GB/T 30790.6-2014 The corrosion protection of steel structure C4H level, severity level Ri0

1.5.8 Convenient wiring mode

- Upper and lower wiring of the main circuit is available;
- Connection mode.: Horizontal wiring, vertical wiring

1.6 Conforming Standards and Certification

GB/T 2423.4-2008 Environmental Testing for Electric and Electronic Products - Part 2: Test Method - Test Db: Alternating Thermal-humidity (12h + 12h Cycle)

GB/T 4207-2012 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 Principles (IEC 60947-1:2011, MOD)

GB/T 14048.2-2020 Low-voltage Switchgear and Control Equipment - Part 2: Low-voltage Circuit Breaker (IEC 60947-2:2019, IDT)

GB 14048.5-2017 Low-voltage Switchgear and Control Equipment - Part 5-1: Control Circuit Electrical Appliances and Switch Elements - Electromechanical Control Circuit Electrical Appliances (IEC 60947-5-1:2016, 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 of Thunder and Lightning, Pollution, Condensation

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

Chapter 2 Technical Characteristics

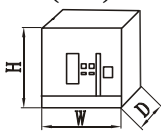
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Technical Characteristics

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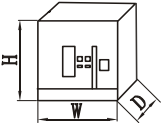
2.1 NDW3-2500 Technical Parameter List

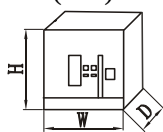
Circuit breaker model		NDW3-2500		
Rated current I_n (+40°C) (A)		630、800、1000、1250、1600、2000、2500		
Rated working voltage U_e (V)		AC220/230/240、AC380/400/415、AC440/480、 AC660/690、AC800、AC1000、AC1140		
Rated frequency f (Hz)		50/60		
Rated insulation voltage U_i (V)		1250		
Rated impulse withstand voltage U_{imp} (kV)		12		
Number of poles		3		
Full break time (ms)		≤ 30		
Closing time (ms)		≤ 70		
Current Breaking Type		S	H	HU
Rated limit short-circuit breaking capacity I_{cu} (kA) I_{cu} (RMS) (kA)	AC220V/230V/240V AC380V/400V/415V	66	85	—
	AC440V/480V AC660V/690V	55	66	—
	AC800V	—	—	60
	AC1000V	—	—	55
	AC1140V	—	—	50
Rated operating short-circuit breaking capacity I_{cs} (RMS) (kA)	AC220V/230V/240V AC380V/400V/415V	66	85	—
	AC440V/480V AC660V/690V	55	66	—
	AC800V	—	—	60
	AC1000V	—	—	55
	AC1140V	—	—	50
Rated short circuit making capacity I_{cm} (peak value) (kA)	AC220V/230V/240V AC380V/400V/415V	145.2	187	—
	AC440V/480V AC660V/690V	121	145.2	—
	AC800V	—	—	132
	AC1000V	—	—	121
	AC1140V	—	—	110
Rated short-time withstand current I_{cw} (RMS) 1s (kA)	AC220V/230V/240V AC380V/400V/415V	66	85	—
	AC440V/480V AC660V/690V	55	66	—
	AC800V	—	—	60
	AC1000V	—	—	55

		AC1140V	-	-	50
Operating performance	Electrical endurance (times) Operation frequency (20 times/h)	AC220V/230V/240V AC380V/400V/415V	15000 (630A~1250A)、11500 (1600A~2000A)、11000 (2500A)		
		AC440V/480V AC660V/690V	12500 (630A~1250A)、10000 (1600A~2000A)、8000 (2500A)		
		AC800V	5000 (630A~2000A)、4500 (2500A)		
		AC1000V/1140V	3000 (630A~2000A)、2000 (2500A)		
	Mechanical endurance (times) Operation frequency (60 times/h)	Maintenance-free	15000		
		With maintenance	30000		
Installation mode		Fixed type			
Wiring method of the main circuit		Horizontal wiring			
Outline dimension: W×D×H (mm) 		Fixed type 3P	368×309.5×394		
Weight (kg)		Fixed type 3P	49.4 (630A~1250A)		50 (1600A~2500A)

2.2 NDW3-4000 Technical Parameter List

Circuit breaker model		NDW3-4000		
Rated current I_n (+40℃) (A)		800、1000、1250、1600、2000、2500、3200、4000		
Rated working voltage U_e (V)		AC220/230/240、AC380/400、AC415、 AC440/480、AC660/690、AC800、AC1000/1140		
Rated frequency f (Hz)		50/60		
Rated insulation voltage U_i (V)		1250		
Rated impulse withstand voltage U_{imp} (kV)		12		
Number of poles		3		
Full break time (ms)		≤30		
Closing time (ms)		≤70		
Current Breaking Type		S	H	HU
Rated limit short-circuit breaking capacity I_{cu} (kA) I_{cu} (RMS) (kA)	AC220V~400V	85	100	-
	AC415V、 AC440V/480V AC660V/690V	75	85	-
	AC800V	-	-	75
	AC1000V/1140V	-	-	60
	AC220V~400V	85	100	-

Rated operating short-circuit breaking capacity Ics (RMS) (kA)		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 (RMS) 1s (kA)		AC220V~ 400V	85	100	-
		AC415V、 AC440V/480V AC660V/690V	75	85	-
		AC800V	-	-	75
		AC1000V/1140V	-	-	60
Operating performance	Electrical endurance (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 endurance (times) Operation frequency (60 times/h)	Maintenance-free	10000		
		With maintenance	15000		
Installation mode		Fixed type			
Wiring method of the main circuit		Horizontal wiring			
Outline dimension: W×D×H (mm) 		Fixed type 3P	428×300×393.5		
Weight (kg)		Fixed type 3P	59 (800A~2500A)		60 (3200A、4000A)



Chapter 3 Controller

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Controller

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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 and other failures, and realize reasonable operation of the power grid through the load monitoring, required value protection, regional interlocking and other functions.

3.1 Type of Controller

Model	NWK21
Controller Pictures	

3.2 Controller Functions

Functional items		NWK21
Display interface	Digital tube numbers and symbols display	√
	LCD panel symbols and graphics display	—
Protect functions	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 functions	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	√
	Displacement 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	—
Other	Remote reset of controller	▲
	Signal unit	▲
	Communication	—

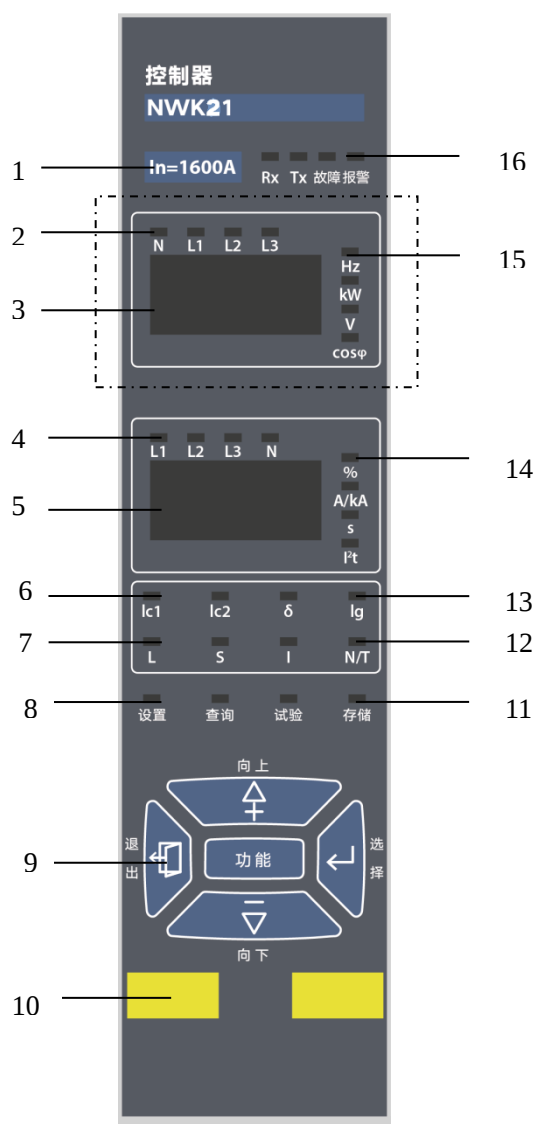
Note:

1. "√" represents with this function, "▲" represents optional function for users, and "-" represents without this function;
2. For the controller with "V" and "P" functions, the voltage module P2 is optional for the main circuit rated voltage AC500V and above;
3. The controller with "V" and "P" functions is optional for the conventional controller.

3.3 Controller Panel Description

■ NWK21 Controller

NWK21 Controller Panel Description



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, storage indicators
12. Instantaneous, N-phase current or self-diagnosis operation indicators
13. Unbalance, ground current protection operation indicators
14. Unbalance rate, current, time and I2t (inverse time limit) indicators in order
15. Frequency, power, voltage and power factor indicators in order
16. Rx, Tx, fault and alarm indicators in order

Note:

1. Dot box is the controller with a voltage displaying function, and it is not displayed if there is no such voltage displaying function;
2. Tx, Rx is only used for internal testing in the company.

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 Ir		(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 ² t: tr= 2.25 Tr/ N ² (factory default) Standard generator protection I ² t (F): tr = 2.25 Tr/ N ² 2) Express inverse time limit (power distribution protection) EI(G): tr= 1.25 Tr/ (N ² -1) 3) Express inverse time limit (motor protection) EI(M): tr = 1.3974 Tr ×Ln[N ² / (N ² -1.15)] 4) High-voltage fuse compatible HV: tr = 4.0625 Tr/ (N ⁴ -1) N= I/ Ir I—Fault current tr—Long time-delay action time Ir—Long time-delay setting current Tr—Long time-delay setting time Description: NWK21/NWK31 controller has only standard power distribution protection I ² t; NWK22/NWK32 controller provides 4 types of protection curves.										
Standard power distribution protection I ² t.Time setting value Tr (@1.5 Ir)		NWK21: 15s, 30s, 60s, 120s, 240s, 480s NWK22: 15s, 30s, 60s, 120s, 240s, 360s, 480s, 600s, 720s, 840s, 960s										
Tripping time tr (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
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 (function off), 10min, 20 min, 30 min, 45min, 1h, 2h, 3h Description: 1. The auxiliary power supply of controller features the thermal memory function; turn off the auxiliary power supply to clear the thermal memory; 										

Short-circuit short time-delay protection NWK21 &NWK22			
NWK21			
Current setting value I _{sd}	(1.5～15) Ir or OFF (OFF-Function off)		
Time setting value T _{sd} (s)	0.1, 0.2, 0.3, 0.4		
I ² t	ON or OFF		
Protective features (accuracy of ±10%)	Current		Tripping time
	I _{sd} ≤ I ≤ 8Ir		(8Ir) ² × T _{sd} /I ² inverse time-limit characteristic
I ² t-ON	I > 8Ir		T _{sd} fixed time limit characteristic
	I ≥ I _{sd}		T _{sd} fixed time limit characteristic
I ² t-OFF			
Thermal memory time	15min (ON) or OFF (OFF-Function off)		
NWK22			
I _{sd1} inverse time-limit current setting value	(1.5～15) Ir or OFF (OFF-Function off)		
I _{sd2} fixed time-limit current setting value	(1.5～15) Ir or OFF (OFF-Function off)		
Fixed time-limit time setting value T _{sd} (s)	0.1~1.0		
Protective features (accuracy of ±10%)	Current (I/I _{sd1} or I/I _{sd2})		Tripping time
	≤0.9		Inaction
	≥1.1	Reverse time limit	The delay features of the short time delay inverse time limit are the same with those of the overload long time delay, but the time is 1/10 of the long time delay, and ≥T _{sd}
		Fixed time limit	Tsd
	Thermal memory time	Instantaneous (Function off), 10min, 20 min, 30 min, 45min, 1h, 2h, 3h	

Continued: Setting Values and Protective Features of Controller

Short-circuit instantaneous protection NWK21 & NWK22		
Current setting value I_i	(1.0~20)In or OFF (OFF-Function off)	
Protective features (accuracy of $\pm 10\%$)	Current (I/I_i)	Tripping time
	≤ 0.85	Inaction
	≥ 1.15	<40ms Action
MCR protection NWK21 & NWK22		
Current setting value I_{MCR}	(1.0~20) In or OFF (factory default as 10In)	
Protective features (accuracy of $\pm 10\%$)	Current (I/I_{MCR})	Tripping time
	≤ 0.8	Inaction
	≥ 1.1	<30ms

The MCR provides the high-speed instantaneous protection, which is valid at the closing moment of the circuit breaker. When the circuit breaker is closed for 100ms, the MCR protection will be automatically cancelled.

Ground protection/alarm NWK21		
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 Fixed time limit	
Protective features (accuracy of ±10%)	Current (I/I _g)	Tripping time
	≤0.8	Inaction (no alarm)
	Inherent absolute error: ±40ms	≥1.0
Grounding alarm output	The signal output is required to add a signal unit. Without the signal output, observe the controller display screen or read from the display indicator.	
Ground protection/alarm NWK22		
Current setting value I _{gb}	(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%)	Current (I/I _g)	Tripping time
	≤0.8	Inaction (no alarm)
	Inherent absolute error: ±40ms	≥1.0
Returnable features (accuracy of ±10%)	≥1.0	Non-return
	≤0.8	For alarm, see the alarm return time setting value
Inherent absolute error: ±40ms		
Grounding alarm output	The signal output is required to add a signal unit; set one DO of the signal unit as “grounding	

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	alarm”.
	Without the 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 & NWK22	
Neutral wire protection setting value	NWK21 controller: 50%In, 100%In or OFF; NWK22 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

Current leakage protection/alarm (namely the residual current protection) NWK22														
Current setting value IΔn (A)			0.5~30.0 or OFF (OFF-Function off)											
Action delay time TΔn (s)			Instantaneous, 0.06, 0.08, 0.17, 0.25, 0.33, 0.42, 0.5, 0.5 , 0.67, 0.75 , 0.83											
Alarm delay time TΔn (s)			0.1~1.0											
Alarm return current setting value (A)			0.5~30.0											
Alarm return delay time (s)			0.1~1.0											
Protective action/alarm features (accuracy of ±10%) Inherent absolute error: ±40ms			Current (I/IΔn)				Tripping time							
			<0.8				Inaction (no alarm)							
			≥1.0				Action (see the data below) or alarm (see the alarm delay time)							
Alarm return features (accuracy of ±10%) Inherent absolute error: ±40ms			≥1.0				Non-return							
			≤0.9				For alarm, see the alarm return delay time							
(Accuracy of ±10%)	Setting time	Instantaneous	0.06	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83	
	IΔn	0.04	0.36	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	
	2IΔn	0.04	0.18	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	
	5IΔn	0.04	0.072	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
	10IΔn													
Current leakage alarm output			The signal output is required to add a signal unit; set one DO of the signal unit as “current leakage fault”. Without the signal output, observe the controller display screen or read from the display indicator.											
Current unbalance protection/alarm NWK21 &NWK22														
NWK21/NWK31			Current unbalance setting value δ				(40%~100%) + OFF (OFF-Function off)							
			Action delay time tδ(s)				0.1~1.0							

NWK22/NWK32	Protection/alarm start setting value	5%~60%	
	Action/alarm delay time (s)	0.1~40.0	
	Alarm action return setting value	5%~start value	Only when the execution mode is "alarm", this setting is available
	Alarm return delay time (s)	10~200	
Protective features (accuracy of ±10%) Inherent absolute error: ±40ms	Actual current unbalance rate/setting value	Tripping time	
	≤0.9	Inaction (no alarm)	
	≥1.1	Acts (or gives an alarm) according to the set delay time	
Protective return features (accuracy of ±10%) Inherent absolute error: ±40ms	Actual current unbalance rate/setting value	Tripping time	
	≥1.1	Non-return	
	≤0.9	Returns according to the alarm return delay time	
Current unbalance protection alarm DO output	The signal output is required to add a signal unit; set one DO of the signal unit as I unbalance alarm. Without the 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

Required current value protection/alarm NWK22		
Protection/alarm start setting value	(0.2~1.0) In	
Protection action delay time setting value (s)	15~1500	
Alarm action return setting value	0.2In~start value	
Alarm return delay time (s)	15~1500	
Protective features (accuracy of ±10%) Inherent absolute error: ±40ms	Multiple of current (Required curren/setting value)	Tripping time
	≤0.9	Inaction (no alarm)
	≥1.1	Acts (or gives an alarm) according to the set delay time
Return features (accuracy of ±10%) Inherent absolute error: ±40ms	Multiple of current (Required curren/setting value)	Tripping time
	≥1.1	Non-return
	≤0.9	Returns according to the set delay time
Required current value protection alarm DO output	The signal output is required to add a signal unit; set one DO of the signal unit as “Required value fault”. Without the signal output, observe the controller display screen or read from the display indicator.	

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Protection execution mode			Alarm/tripping/close		
Load monitoring function NWK21 &NWK22					
NWK21/NWK31	Operation mode			Current setting	Time setting
	Current way 1	Ic1	(0.2~1.0) In+OFF	Tc1	15s, 30s, 60s, 120s, 240s, 480s
		Ic2		Tc2	
	Current way 2	Ic1		Tc1	
		Ic2		Tc2	60s, 120s, 240, 480s
	Off (OFF)				
Thermal memory		30min (ON), OFF			
NWK22/NWK32	Operation mode		Current/power setting		Time setting
	Un load I	Current way 1	0.2~1.0Ir		20~80%Tr
		Current mode 2			
		Power way 1	200kW~10000kW		10s~3600s
		Power mode 2			
	Un load II	Current way 1	0.2~1.0Ir		20~80%Tr
		Current mode 2	0.2Ir~unloading I		10s~600s
		Power way 1	200kW~10000kW		10s~3600s
		Power mode 2			
	Off (OFF)				
Load monitoring alarm DO output			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 the signal output, observe the controller display screen or read from the display indicator.		
Undervoltage protection/alarm NWK22					
Protection/alarm start setting value V			100~return value		
Protection action delay time setting value (s)			0.2~60		
Alarm action return setting value V			Start value~600		
Alarm return delay time (s)			0.2~60		
Continued: Setting Values and Protective Features of Controller					
Undervoltage protection/alarm NWK22					
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			Umin/return setting value		Tripping time

protection	<0.9		Non-return
(Accuracy of ±10%) inherent absolute error: ±40 ms	≥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 the signal output, observe the controller display screen or read from the display indicator.		
Execution mode	Alarm/tripping/close		
Undervoltage protection/alarm NWK22			
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		
Undervoltage protection/alarm action features (Accuracy of ±10%) Inherent absolute error: ±40ms	Umin/action setting value	Tripping time	
	≤0.9	Inaction (no alarm)	
	≥1.1	Acts (or gives an alarm) according to the set delay time	
Undervoltage alarm return features (Accuracy of ±10%) inherent absolute error: ±40 ms	Umin/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 the signal output, observe the controller display screen or read from the display indicator.		
Protection execution mode	Alarm/tripping/close		
Voltage unbalance protection/alarm NWK22			
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 $\pm 10\%$) 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 unbalance alarm" output. Without the 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

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 greater 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". Without the signal output, observe the controller display screen or read from the display indicator.	
Execution mode	Alarm/tripping/close	

Reverse power protection/alarm NWK22

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 $\pm 10\%$) 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 $\pm 10\%$) 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 the signal output, observe the controller display screen or read from the display indicator.		
Execution mode	Alarm/tripping/close		
Phase sequence protection/alarm NWK22			
Setting range of action phase sequence	$\Delta\phi$: A, B, C / $\Delta\phi$: 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 protection/alarm fault”. Without the signal output, observe the controller display screen or read from the display indicator.		
Execution mode	Alarm/tripping/close		
Signal unit NWK21/NWK31 & NWK22			
NWK21	DO output	General functions	Optional load monitoring functions
	DO1	Overload pre-alarm output	Load monitoring 1
	DO2	Grounding pre-alarm output	Load monitoring 2
	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			
NWK22	Type of signal unit	Rated current	Field of Application
	S1	4DO (4 output contacts)	No 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 open		Normally closed	
DO	Function setting	See the table below, “Parameter Settings of Switch Output (DO)”			
	Execution mode	Normally opened level	Normally closed level	Execution mode	Normally opened level
	Impulse time	N/A		1~360s	
Parameter Settings of Switch Output (DO)					
General		Alarm	Fault tripping	General	Alarm
Load monitoring 2		Overload pre-alarm	Overload fault	Load monitoring 2	Overload pre-alarm
Grounding/current leakage fault		Grounding/leakaging alarm	Current unbalance fault	Grounding/current leakage fault	Grounding/leakaging alarm
Overvoltage fault		Voltage unbalance fault	Underfrequency fault	Overvoltage fault	Voltage unbalance fault
Reverse power fault		Regional interlocking	Remote On	Reverse power fault	Regional interlocking
MCR fault		Ground interlocking	Short circuit interlocking	MCR fault	Ground interlocking
C-phase required value fault		N-phase required value fault	Required value out-of-limit	C-phase required value fault	N-phase required value fault
Remote reset		Temperature alarm	—	Remote reset	Temperature alarm

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		$1.0I_n$	60s	Thermal memory ON
Short circuit short-time delay protection	NWK21	$8I_r$	0.2s	Definite time, I ₂ t-OFF
	NWK22	$I_{sd1}-6I_r$, $I_{sd2}-8I_r$	0.2s	I_{sd1} Inverse time lag, I_{sd2} Constant time lag
Short circuit instantaneous		$10I_n$	-	-
Neutral wire protection		$100\%I_n$	-	-
Ground protection		$0.5I_n$	0.2s	3P products usually close this function as a default; Users 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 following 1), 2) Dual-power supply mode, as below:

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 $0.4I_n$ and $0.2I_n$ respectively. When the rated current is $\leq 400A$, the primary current single-phase and three-phase of the main circuit are no less than $1.0I_n$ and $0.6I_n$ 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, the allowable error is $\pm 15\%$. DC power voltage: DC220V, DC110V, DC24V; the allowable error is $\pm 15\%$. 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; there is DC power source module transformation in internal controllers of NDW3-2500 and above frames. See the electric wiring diagram in Chapter 7.

3) To be powered by the test port

Rated voltage: DC24V, with an allowable error of $\pm 5\%$. 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: 5A/AC250V;

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

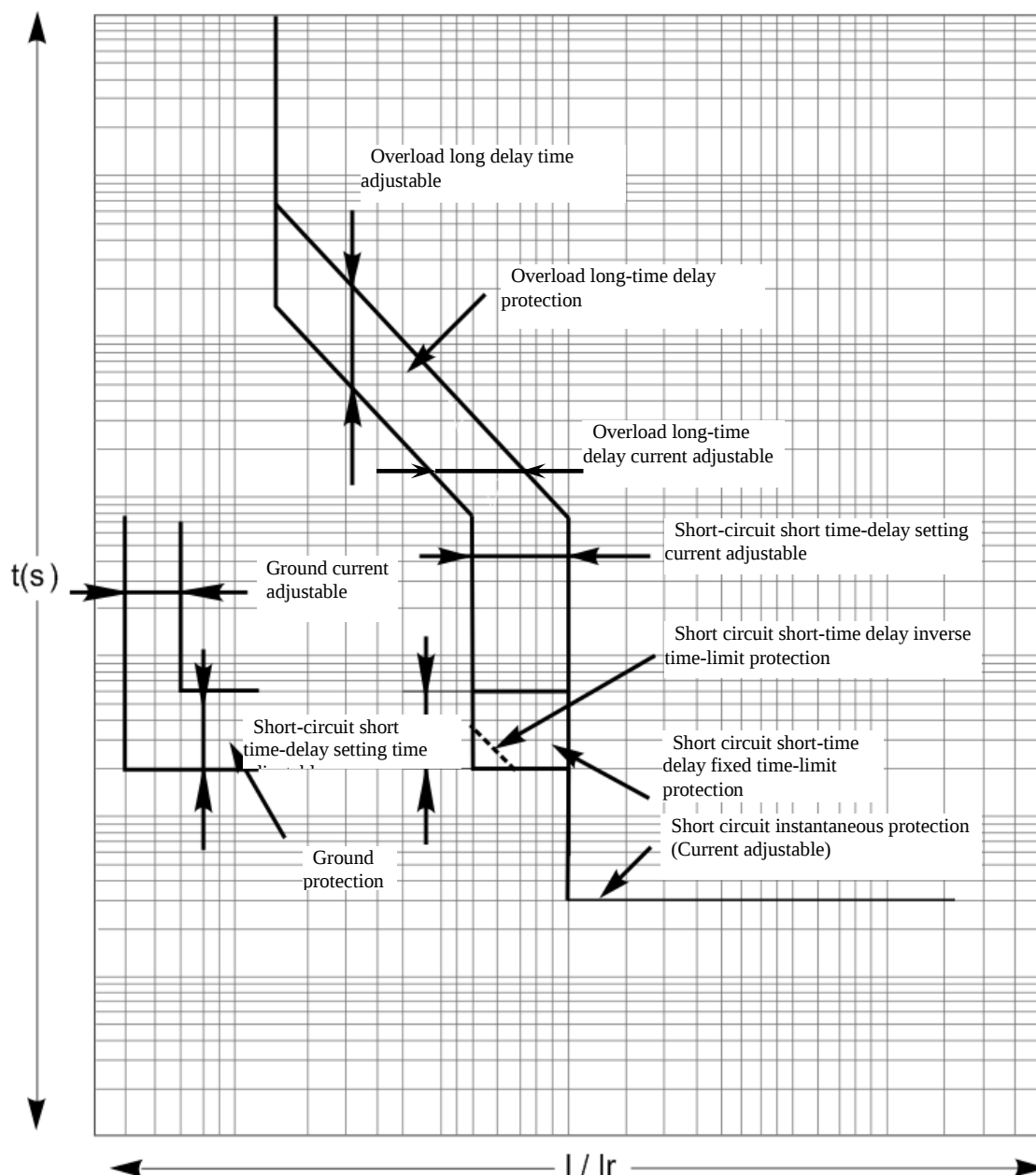
Auxiliary contact output of the circuit breaker status, contact capacity: 10A/AC250V.

3.6 Introduction of Controller Functions

For introduction of controller functions, see the Controller Manuals of NWK21

3.7 Protection Characteristic Curve

See the figure below for the schematic diagram of overload long time delay, short-circuit short time delay, short-circuit instantaneous and ground protection curve.



For details of each protective characteristic curve of the controller, please see the Controller Manual of NWK21.

Chapter 4 Accessories

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Accessories

4

4.1 Accessories list

Accessory category	Accessory name	Configuration	Installation method and type	Remarks
Electrical control accessories	Closed electromagnet	Standard configuration	Fixed type	Either
	Shunt release	Standard configuration	Fixed type	
	Motor operating mechanism	Standard configuration	Fixed type	
	Undervoltage release	Optional ordering for customers	Fixed type	
	Loss of voltage release	Optional ordering for customers	Fixed type	
	Remote reset electromagnet	Optional ordering for customers	Fixed type	
Signal output accessories	Auxiliary switch	Standard configuration	Fixed type	
	Closing ready signal output device	Optional ordering for customers	Fixed type	
	Three-position status signal output device of the drawer seat	Optional ordering for customers	Fixed type	
	Secondary terminal	Standard configuration	Fixed type	
Related accessories of controller	External N-pole transformer (rectangular, flexible type)	Optional ordering for customers	Fixed type	
	External current leakage transformer	Optional ordering for customers	Fixed type	Frame size level $\leq 2500A$
	Power supply module NWDF1	Optional ordering for customers	Fixed type	
	Relay module NWDF1-RM	Optional ordering for customers	Fixed type	To be used with the power supply module
	Communication adapter NWDF1-MD/MP	Optional ordering for customers	Fixed type	
	Removable I/O Module NWDF1-C8/S12/SC64/SCM423	Optional ordering for customers	Fixed type	
	Outline and Installation Dimension Diagram of the Remote Intelligent I/O Module NWDF1-C8/S12/SC64/SCM423	Optional ordering for customers	Fixed type	
	6-channel programmable output module NWDF1-C6	Optional ordering for	Fixed type	

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		customers		
	Accessory monitoring unit NWDF1-AM	Optional ordering for customers	Fixed type	
	Energy-storing communication signal module NWDF1-S1	Optional ordering for customers	Fixed type	
	Voltage conversion module NWDF1-P2	Optional ordering for customers	Fixed type	
Safety accessories	Phase partition	Standard configuration	Fixed type	
	Counter	Optional ordering for customers	Fixed type	
	Door frame	Optional ordering for customers	Fixed type	
	Dustproof cover	Optional ordering for customers	Fixed type	
Lock and interlocking device	Off-position key lock	Optional ordering for customers	Fixed type	

4.2 Electrical Control Accessories

4.2.1 Close electromagnet

Close 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 U_s , operation of the closed electromagnet can make reliable closing of the circuit breaker;

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

3) There is the control circuit inside to ensure the long-time energizing, which shall be $>200\text{ms}$. The user cannot connect it with the auxiliary switch point of the circuit breaker in series. Power-on time $>200\text{ms}$.

◆ Technical Parameters of Closed Electromagnet

Power Consumption Table of Closed Electromagnet

Rated insulation voltage (U_i)	Rated control supply voltage (U_s)	Instantaneous power	
		NDW3-1600	NDW3-2500, 4000, 6300, 7500
400V	AC380V/AC400V 50/60Hz	380VA	620VA
	AC220V/AC230V 50/60Hz	330VA	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) There is the control circuit inside to ensure the long-time energizing, which shall be $>200\text{ms}$. Do not connect to the auxiliary switch contact of the circuit breaker in series. Power-on time $>200\text{ms}$.



◆ 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、7500
400V	AC380V/AC400V 50/60Hz	380VA	620VA
	AC220V/AC230V 50/60Hz	330VA	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
			NDW3-2500/4000
400V	3s~5s	AC220V/AC230V AC380V/AC400V (50/60Hz)	110VA
		DC220V/DC110V	110W

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 0s, 1 s, 3 s, 5 s or instantaneous as required.

◆ Power Consumption Table of Undervoltage Release

Power Consumption Table of Undervoltage Release

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

4.2.5 Loss-of-voltage release

◆ Action features of the loss of voltage release

1) When the applied voltage suddenly drops to 0~35% 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 35% 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: NDW3-1600/6300/7500: 0s~10s adjustable for clients (factory default setting value is 3s), and its step length is 1s; NDW3-2500/4000: 1s, 3s, 5s or instantaneous.

◆ 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
		NDW3-2500/4000
400V	AC220V(AC230V) 50Hz/60Hz	4VA
	AC380V(AC400V) 50Hz/60Hz	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	55W
	DC110V	50W
	DC24V	

4.3 Signal Output Accessories

4.3.1 Auxiliary switch

- ◆ The conventional thermal current of the auxiliary switch is 10A;
- ◆ Auxiliary contact form: Four groups switch, six groups switch, four normally opened and four normally closed, six normally opened and six normally closed.



◆ Technical Parameters of Auxiliary Contact

Applicable frame size	NDW3-2500	NDW3-4000
-----------------------	-----------	-----------

Auxiliary contact form		■ Four normally opened and four normally closed ■ Four groups switch ■ Six groups switch ■ Six normally opened and six normally closed		■ Four groups switch ■ Four normally opened and four normally closed ■ Six groups switch ■ Six normally opened and six normally closed ■ Four normally opened and four normally	
Agreed thermal current Ith		10A			
Minimum load		2mA/DC15V			
Breaking capacity	DC-12	0.3A/DC250V	0.3A/DC250V	5A/DC250V	
	AC-12	10A/AC250V	10A/AC250V	10A/AC250V	
	DC-13	0.2A/DC220V	0.2A/DC220V	1.2A/DC220V	
	AC-15	0.29A/AC400V	3A/AC400V	3A/AC400V	

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.

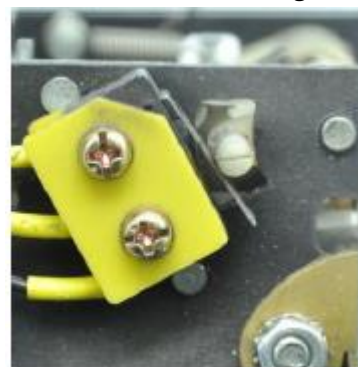


Table of Technical Parameters

Frame size	NDW3-2500/4000	
Breaking capacity	3A /AC250V	
	5A /AC125V	

4.3.3 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



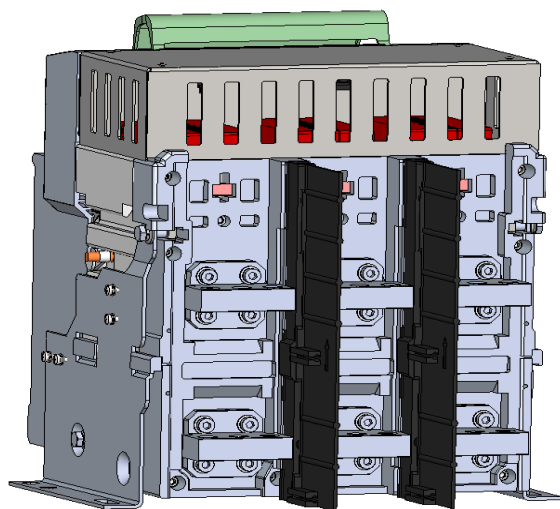
Item	Parameter
Connection mode	Clamping
Flame retardant rating, according to UL 94	V0
Pollution level	3
Voltage category	III
Material group	IIIa
Applicable connection standards	GB/T 14048.7-2016
Maximum load current	10A
Rated current	10A
Rated voltage	500V
Minimum cross section area of the rigid (flexible) conductor	0.5mm ²
Maximum cross section area of the rigid (flexible) conductor	1.5mm ²
Recommended striping length	10±1mm
Minimum test pull-force after the conductor connection	30N

4.4 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



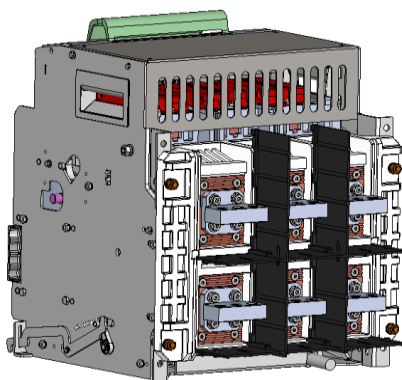
Fixed type
appropriate holder



Phase partition

◆ HU type (AC1140V) circuit breaker phase partition plate

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 and between the incoming and outgoing ends so as to prevent the short circuit in case of the insulation breakdown and improve the power reliability.



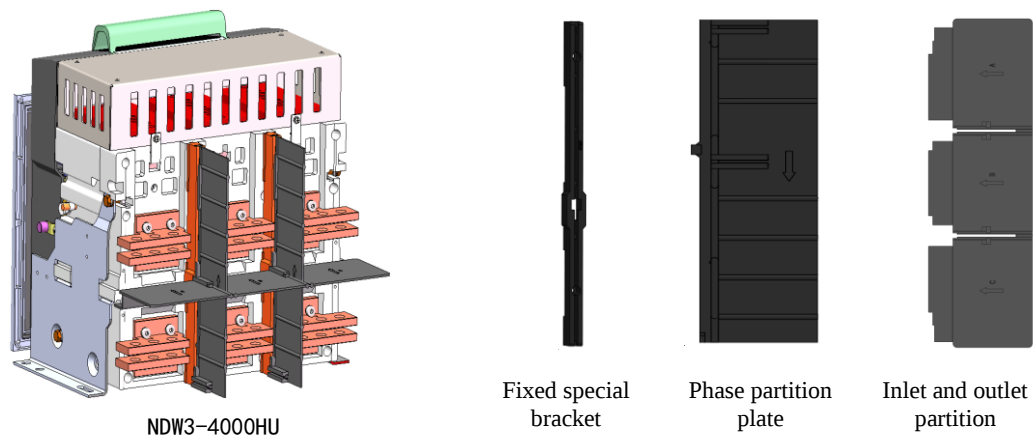
Fixed special
bracket



Phase partition
plate



Inlet and outlet
partition



Note: NDW3-4000HU inlet and outlet spacers are installed with the words N, A, B and C when they are installed.

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.



Fixed type

4.5.4 Dustproof 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)

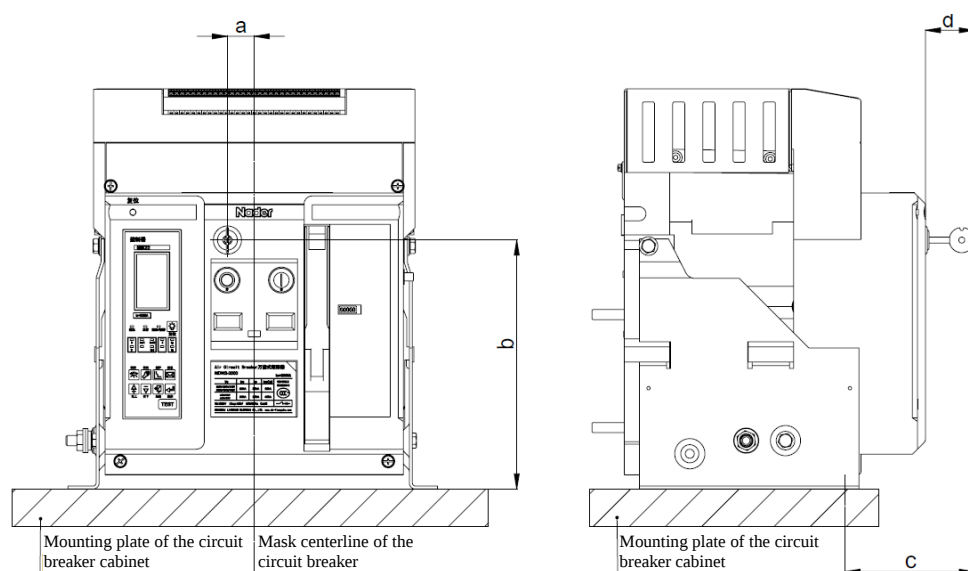
◆ This key lock is locked on the manually disconnected position of the circuit breaker. When the key is anticlockwise locked and pulled out, The circuit breaker cannot carry out closed operation, so as to prevent irregular operation. Model and type are shown in the table below.



Models and types of off-position key locks

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.



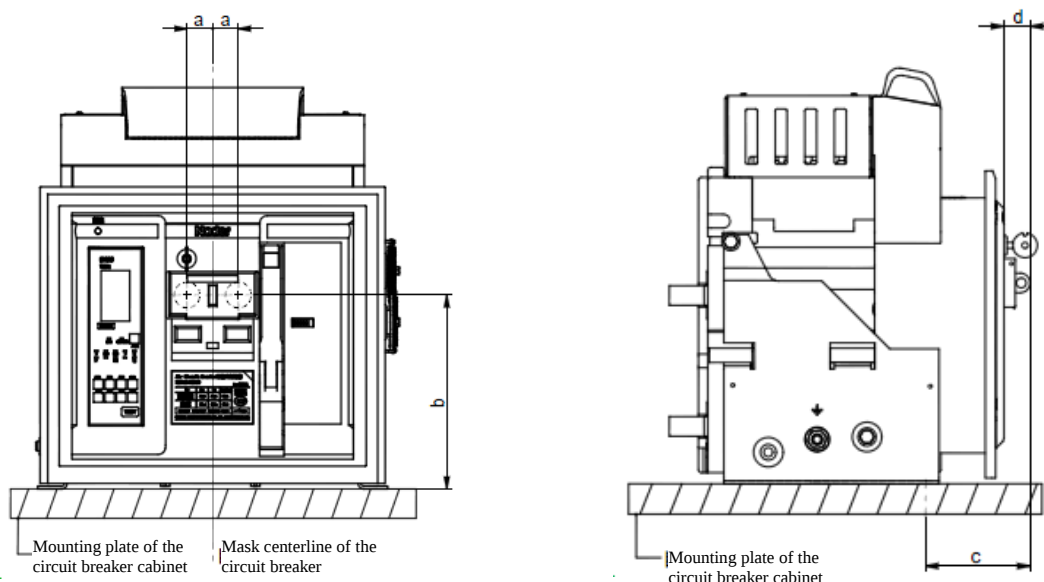
Fixed type

Unit: mm

Frame size	a	b	c	d
	Fixed type	Fixed type	Fixed type	Fixed type
NDW3-2500/4000	27	247	115	35

4.5.2 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 type

Unit:mm

Frame size	a	b	c	d
	Fixed type	Fixed type	Fixed type	Fixed type
NDW3-2500/4000	27	204	106	26.4

Chapter 5 Field of Application

5.1 Working Environment	37
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5.4 The power loss of the incoming and outgoing lines of the circuit breaker (ambient temperature +40 °C)	47

Scope of application

5

NDW3-2500/4000 series universal circuit breaker (hereinafter referred to as circuit breaker), suitable for AC 50Hz/60Hz, rated current 630A~4000A, rated insulation voltage 1250V, rated working voltage AC220/230/240V, AC380/400/415V, AC440/480V, AC660/690V, AC800V, AC1000, AC1140V power distribution network, used to distribute electric energy and protect lines and power equipment from overload, undervoltage, short circuit, single-phase grounding and other faults. It also has an isolation function. The circuit breaker has multiple protection functions. While achieving high-precision and selective protection, it can also avoid unnecessary sudden power outages and improve the reliability and safety of the power supply system.

5.1 Working Environment

5.1.1 Ambient temperature

Applicable ambient temperature is $-25^{\circ}\text{C} \sim +70^{\circ}\text{C}$; the average within 24 h shall not be more than $+35^{\circ}\text{C}$.

The circuit breaker with the ambient temperature below $-40^{\circ}\text{C} \sim -25^{\circ}\text{C}$ can be specially customized. If the ambient temperature is higher than $+40^{\circ}\text{C}$, the user needs to reduce the capacity. The reduced capacity coefficient is shown in the following table.

Ambient temperature		+40°C	+45°C	+50°C	+55°C	+60°C	+70°C
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

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 $+40^{\circ}\text{C}$, 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 $+20^{\circ}\text{C}$, 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 High Altitude Derating Tables 1 and 2.

Electric Current High-altitude Derating Table 1

Working current		Altitude			
Model	Rated current (A)	2000m	3000m	4000m	5000m
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

Voltage and breaking capacity high altitude derating table 2

Altitude m	2000	3000	4000	5000
Impulse withstand voltage Uimp (kV)	12	12	12	12
Rated insulation voltage Ui (V)	1250	1250	1140	1000
Rated insulation voltage(NDW3-7500) Ui (V)	1000	1000	900	800
Rated working voltage (V)	690	690	690	690
	1140	1140	1140	1000
Power frequency withstand voltage (V)	3500	3500	3500	3000
Breaking capacity derating factor	1.0	0.97	0.93	0.89

Note: This table does not include NDW3-1600. See Table 3 for the derating data of NDW3-1600.

5.1.4 Anti-corrosion Level

Salt mist: Severe Level (3), passed GB/T 2423.18-2012 Environmental Testing for Electric and Electronic Products. Part II: Test Method Test Kb: Salt spray.

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 GB/T 4798.3 standard test.

- ◆ Amplitude: $\pm 1.5\text{mm}$ (2 -9Hz)
- ◆ Constant acceleration: 5 m/s^2 (9~200 Hz)
- ◆ 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 14048.2-2020 Low-voltage Switchgear and Control Equipment - Part 2: Circuit Breaker - Appendix F
- ◆ GB/T 14048.2-2020 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 type

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 level

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

5.2.3 Utilization category

Category B

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 type

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 level

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

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 working current In (A) 40°C	Copper bar specification	
		Dimension (mm)	Number
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

Note:

1. The table indicates the copper bar specifications adopted when the circuit breaker is under the ambient temperature of +40°C and the open wide installation under the heating condition meets the stipulation in GB/T 14048.2. If the temperature is higher than +40°C, 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°C.
4. The electrical gap of copper bar is $\geq 15\text{mm}$ with the altitude more than 5,000m and relative humidity more than 90%; the electrical gap shall be adjusted according to the content of 7.1.1 Table 1 in GB/T 20645.

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

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
NDW3-2500	$\leq 356.8\text{ W}$	$\leq 823.4\text{ W}$
NDW3-4000	$\leq 486.7\text{ W}$	$\leq 856.8\text{ W}$

Chapter 6 Outline and Installation Dimensions

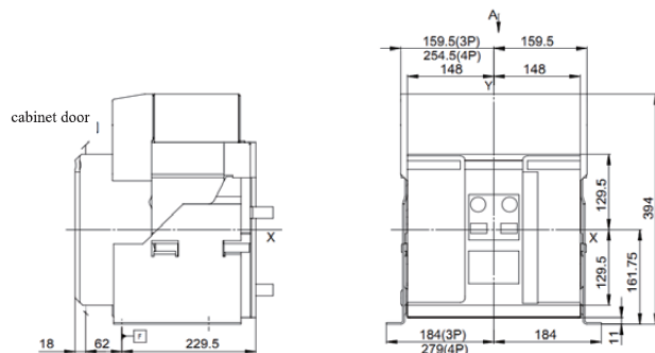
6.1 NDW3-2500 Outline and Installation Dimensions	41
6.2 NDW3-4000 Outline and Installation Dimensions	43
6.3 The Circuit Breaker Cabinet Door Open Hole and the Installation Pitch	46
6.4 Circuit Breaker Installation Notes.....	46

Outline and Installation Dimensions

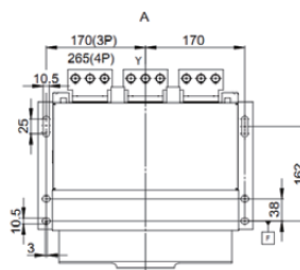
6

6.1 NDW3-2500 fixed type(unit:mm)

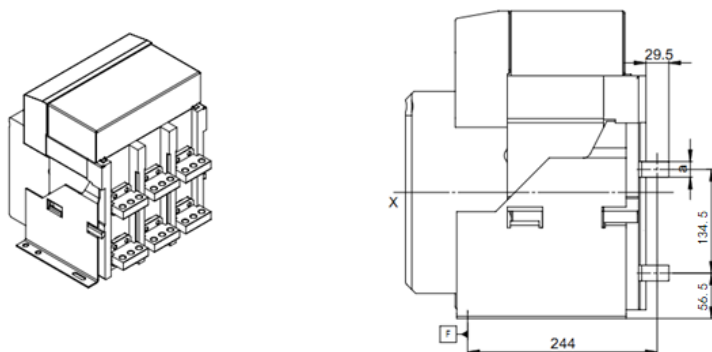
Dimensions



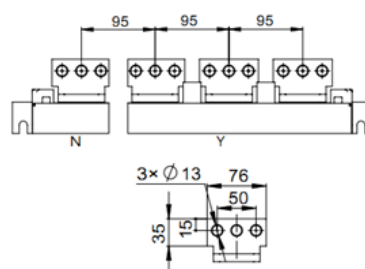
Fixed Details



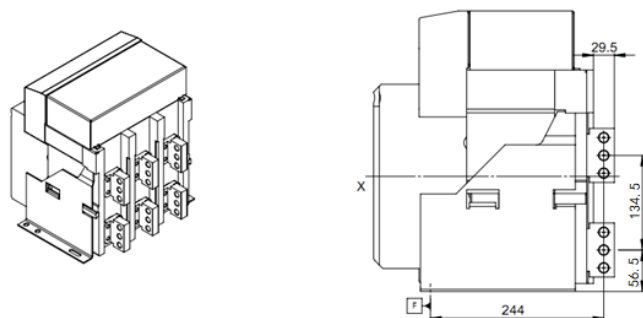
Horizontal Wiring



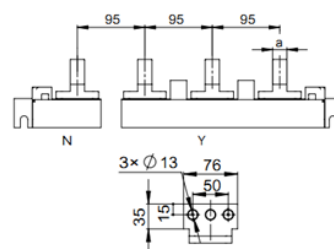
Detail



Vertical Wiring



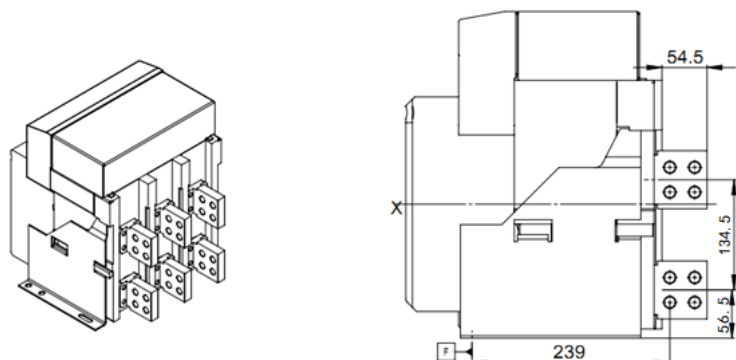
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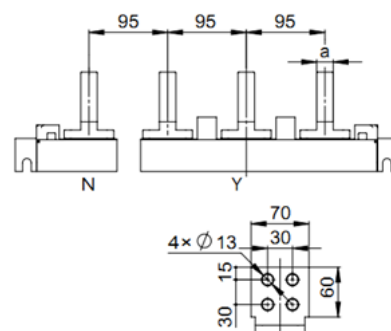
Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

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

Vertical extension wiring

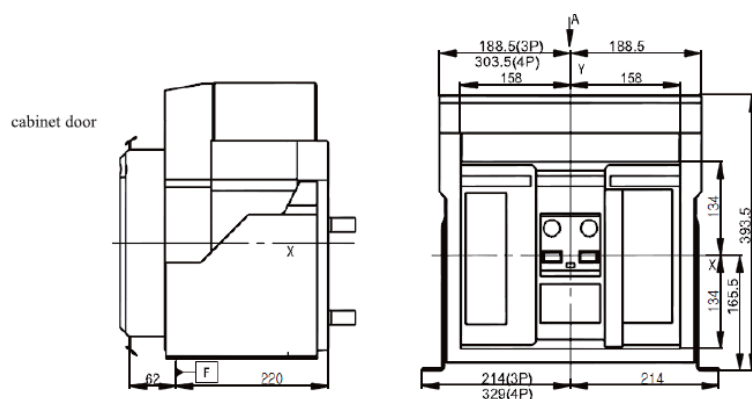


Detail

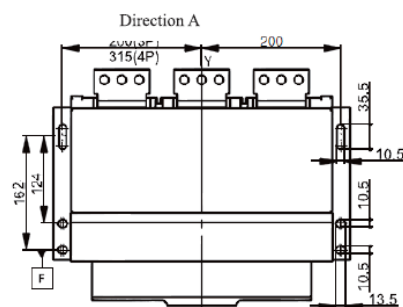


6.2 NDW3-2500 fixed type(unit:mm)

Dimensions

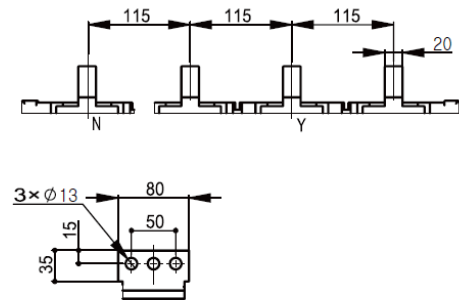
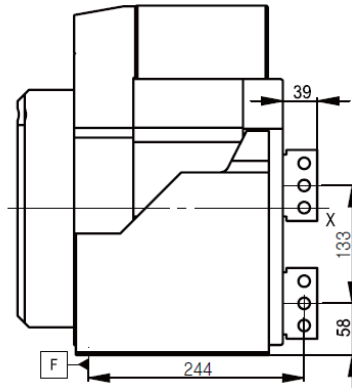
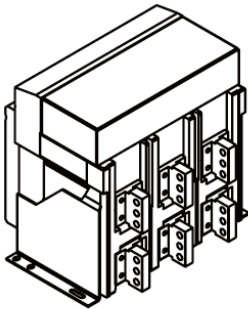
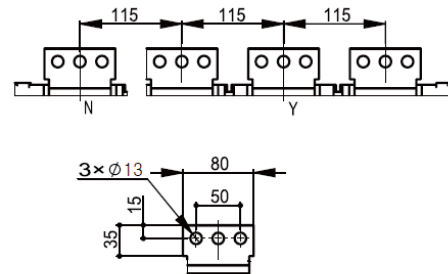
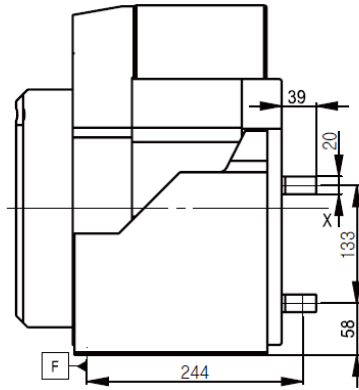
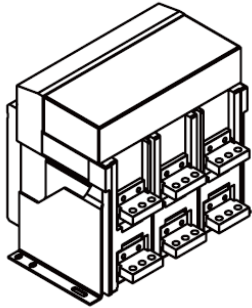


Fixed Details



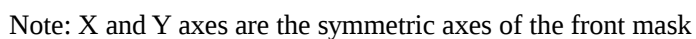
800A-2500A horizontal and vertical wiring

Detail



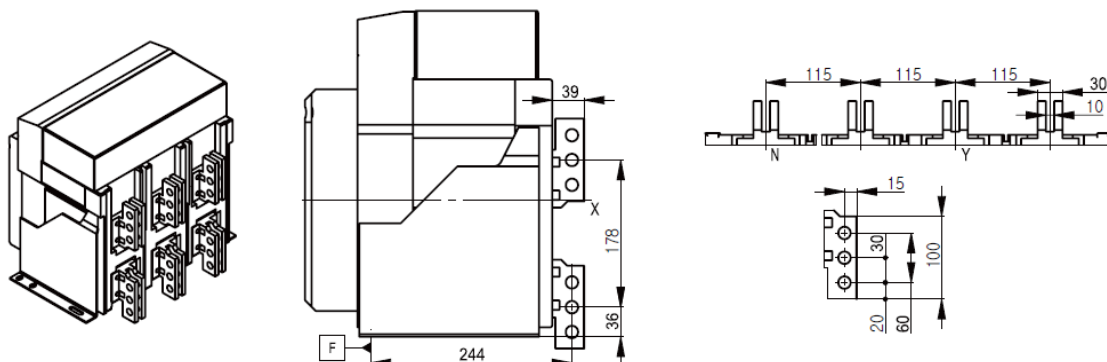
Note: For the circuit breaker, X and Y are the symmetric axes of the front cover;

Detail



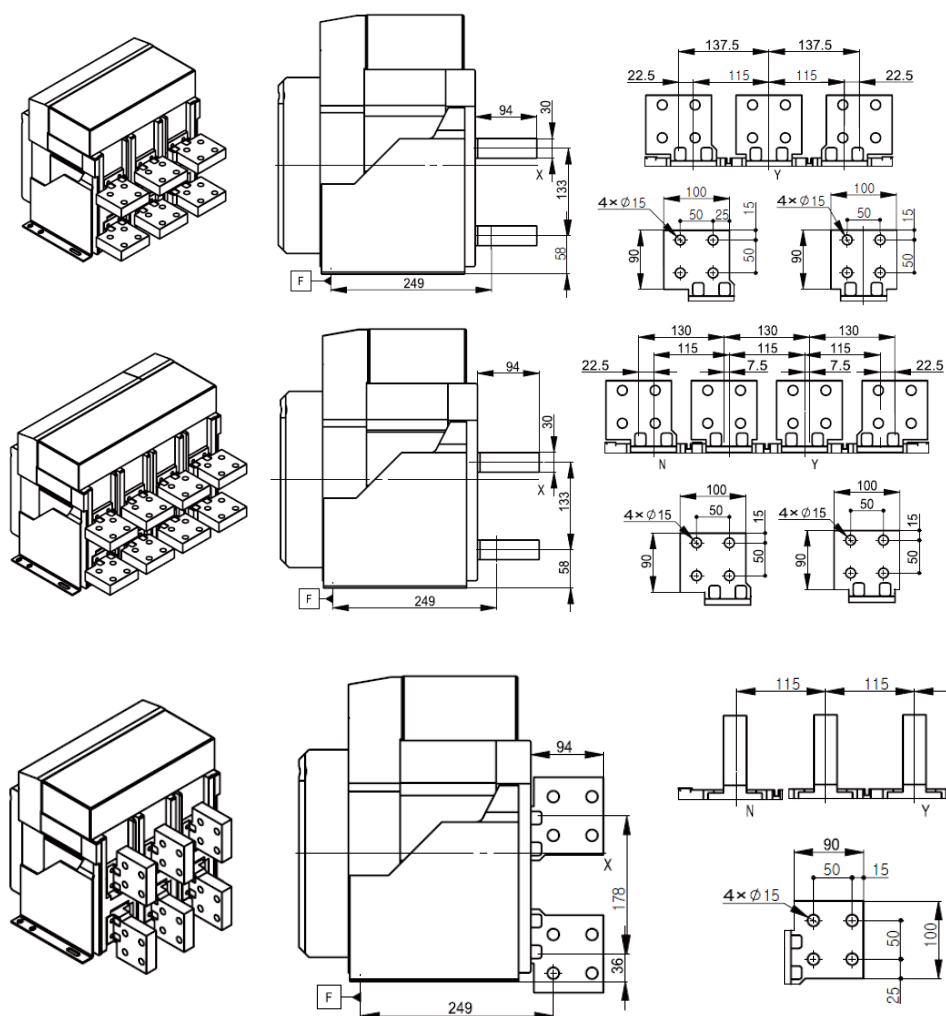
3200A-4000A vertical wiring

Detail



3200A-4000A horizontal extended and vertical extended wiring

Detail



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

NDW3-2500/4000 门框开孔尺寸 (单位: mm)



Address: No. 2000 Shenjiang South Road, Pudong New Area, Shanghai Post Code: 201315 Tel: (021) 68586699 Fax: (021) 23025796

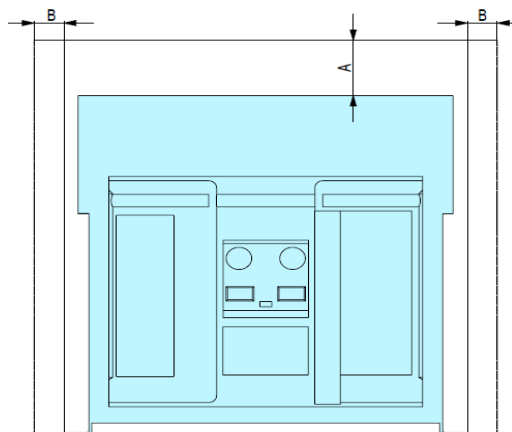
- ★ Conduct reliable grounding protection when installing the circuit breaker. The grounding place of the circuit breaker has an obvious grounding symbol.
- ★ Carry out wiring of the control circuit according to the wiring diagram when installing the circuit breaker; check whether the working voltage of the undervoltage, shunt, closing electromagnet, motor, controller and related parts conforms to the actual voltage, and then carry out the secondary circuit energizing. In case of drawout circuit breaker, the circuit breaker should be shaken into the test position, then the undervoltage 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
NDW3-2500		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

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.



Fixed circuit breaker

Unit: mm

Installation mode of the circuit breaker	To the insulator		To the metallic body grounded safely		To the live part	
	A	B	A	B	A	B
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 Dustproof cover is added, height space of 70 mm for installation and rotating of the Dustproof cover should be considered.

Chapter 7 Electrical Wiring Diagram

7.1 NDW3-2500/4000 Electric Wiring Diagram and Terminal Number Definition..... 49

Electric Wiring Diagram

7

7.1 NDW3-2500/4000/6300/7500 Electric Wiring Diagram and Terminal Number Definition

7.1.1 NDW3-2500, NDW3-6400 full-function wiring diagram

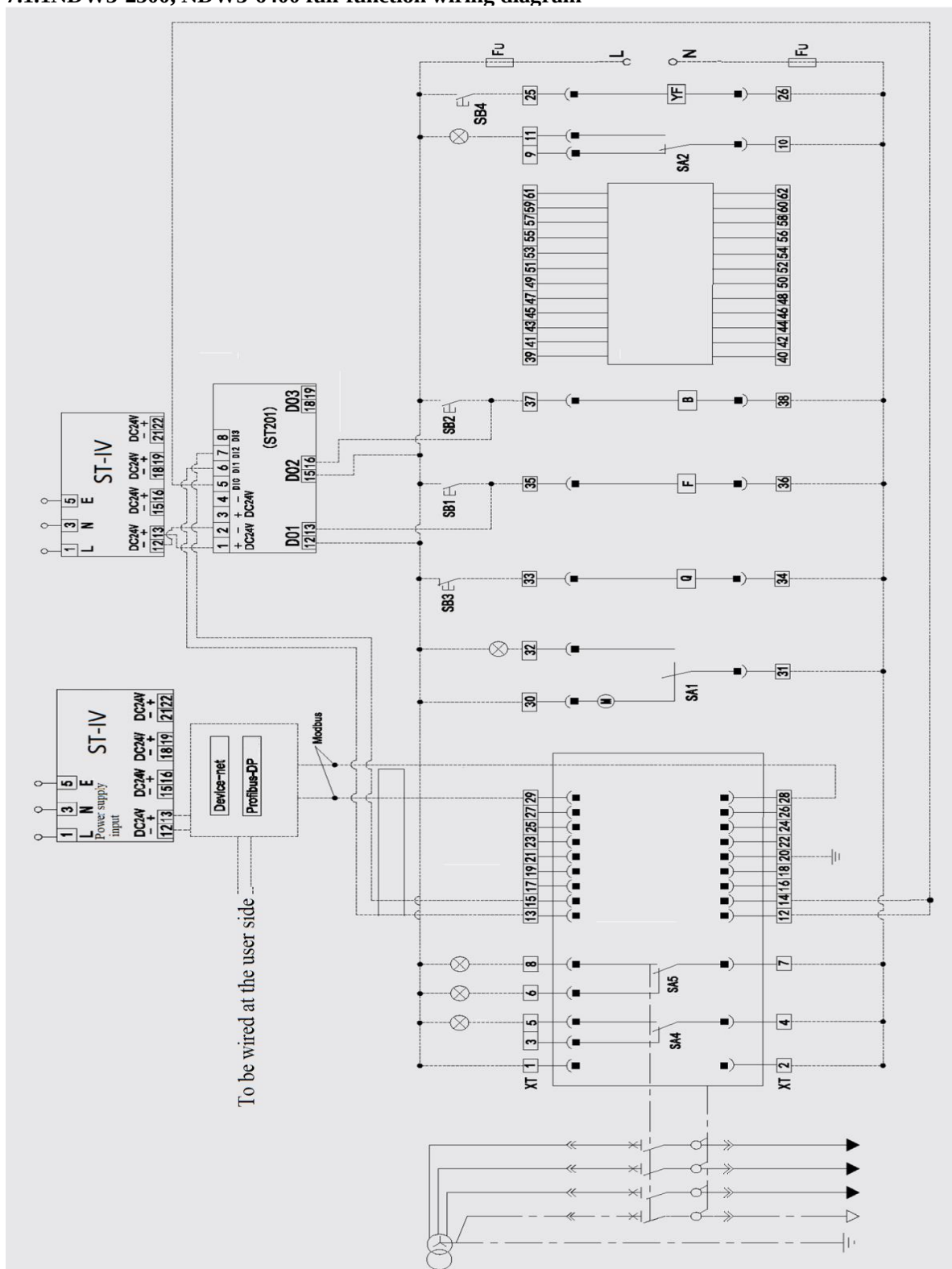


Figure 1: NDW3-2500/4000 Auxiliary Wiring Diagram

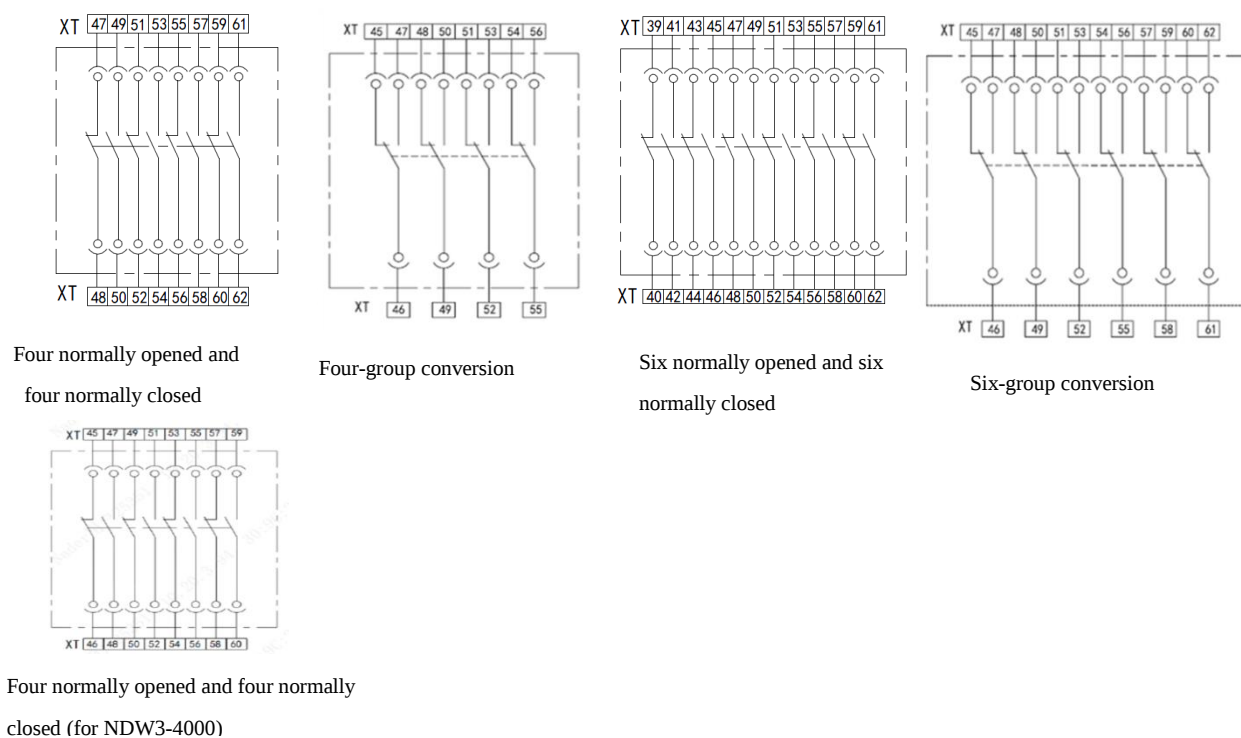
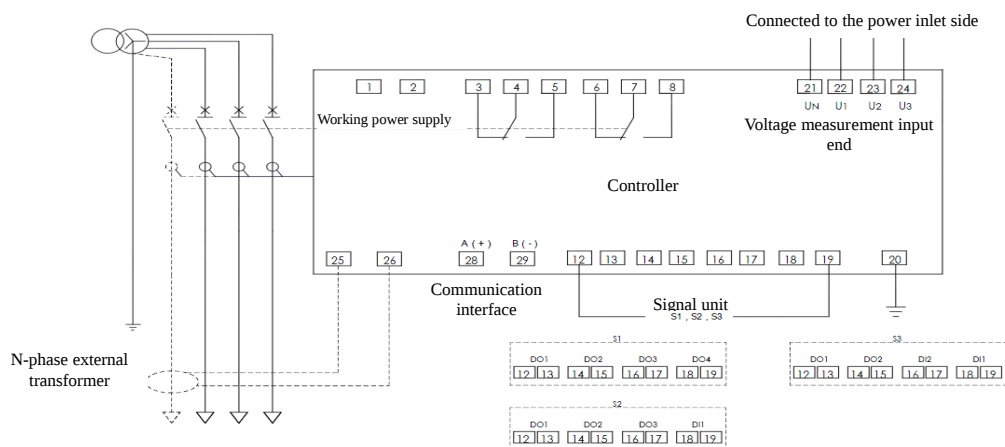


Figure 2: NDW3-2500/4000, controller input and output interfaces



NDW3-2500/4000, terminal number definition table

[illegible]

SB1 - Shunt button (to be prepared by users) SB2 - Close button (to be prepared by users)
 SB3 - Undervoltage disconnection button (to be prepared by users) SB4 - 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

Note:

1. The current state of the circuit breaker is de-energized, disconnected, connected, no energy stored;
2. Status indicator light, button switch and communication equipment are provided by users, and the dashed part shall be wired by users;
3. if the rated working voltages of Q, F, B, M and controller are not the same, please connect to the rated voltage of control power supply;
4. In order to ensure the reliable operation of the controller, 1# and 2# need to be connected to auxiliary power;
5. 25#、26#——Select one from N pole transformer output (3P+N), leakage transformer output and remote reset input. If earth current type ground protection or leakage protection is additionally selected, but external transformer is not connected, then terminal 25# and 26# should be short connected;
6. The secondary terminal wiring is only suitable for the 0.5~1.5mm² multi-strand soft wire or hard wire with the soft wire recommended; pay attention to adopt the appropriate conductor;
7. All the signal units are passive signals; users can choose S1, S2, S3 modes as required;
8. The user needs to select the signal unit to achieve the "four remotes" function, while the power supply module and relay module are optional.
9. There is a control circuit inside the shunt release and closing electromagnet, which can be powered on for a long time, and the power-on time is more than 200ms. Users should not connect them in series with the circuit breaker itself.

Auxiliary switch contacts;

10. When the voltage closing device is selected, the electrical wiring diagram of the closing electromagnet and the undervoltage release controlled by the voltage station is shown in the attached drawing, i.e. electrical wiring diagram of voltage closing device;
11. The voltage-check closing device is a special accessory for NDW3-2500.
12. The wiring terminals number of NDW3-4000 product four normally open and four normally closed auxiliary contacts is 45~60.

Chapter 8 Ordering Type Selection Specification

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8.1 NDW3 Series of Circuit Breaker Model Explanation and Encoding Rules

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 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

SN	Name	Specification, type code	Description
1	Enterprise code	brand low-voltage electrical appliance	
2	Product code	Air circuit breaker	
3	Design SN	3	
4	Frame size level	16-1600, 25-2500, 40-4000, 63-6300, 75-7500	
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	06-630A, 08-800A, 10-1000A, 12-1250A, 16-1600A, 20-2000A, 25-2500A, 32-3200A, 40-4000A	
7	Installation mode	Non-marked - fixed type	
8	Number of poles	3-3 poles	
9	Controller	KM1-NWK21 (AC380V/AC400V), KM2-NWK21 (AC220V/AC230V), KM3-NWK21 (DC220V), KM4-NWK21 (DC110V), KM5-NWK21 (DC24V)	Omit when the controller has no additional selection function, NWK21 controller only has S1-4DO;

Continued:

10	Controller Optional function	Protection type: Not-standard - conventional type, V - voltage measurement and protection,	
		Contact wear equivalent, operation times query (NWK21optional): J	
11	Electric energy storage mechanism	D1-AC380V/AC400V, D2-AC220V/AC230V, D3-DC220V, D4-DC110V, D5-DC24V	NDW3-6300/7500 frame without 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	Under-voltage release: Q1-AC380V/AC400V, Q2-AC220V/AC230V, Q3-DC220V, Q4-DC110V, Q5-DC24V	
15	Under-voltage release Delay time/voltage-check harness	Conventional undervoltage delay: 0-Instantaneous, 1-1s delay, 3-3s delay, 5-5s delay	
	Auxiliary contact	A4-Four-group conversion, A6-Six-group conversion A44-Four normally opened and four normally closed A66 - Six normally opened and six normally closed	
16	Internal Accessories	BX - Closing ready signal output unit	This shall be omitted if without this accessory
		JS - Counter functional unit	
17	External accessories	M - Doorframe	
		F - Dustproof cover	
		S - Button lock	
18	Wiring mode	Not marked - Horizontal wiring, J1 - Horizontal extended wiring, J3 Vertical wiring, J4 - Vertical extended wiring	
19	Special notes	Customer's special requirements	
20	Rated working voltage	Not-marked - AC690V and below, KV4-AC800V, KV5-AC1000V, KV6-AC1140V	
21	Product use type	OW-Off shore wind power type	

8.2 Order Specifications

(Please fill in numbers in _____, and check ☒ in ☐. Related information can be found in the Manual)

User unit			Number of units ordered:	Date of ordering:
Basic parameters	Frame size level	☐ NDW3-2500 ☐ NDW3-4000		
	Installation mode	☐ Fixed type		
	Rated current (A)	☐ 630 ☐ 800 ☐ 1000 ☐ 1250 ☐ 1600 ☐ 2000 ☐ 2500 ☐ 3200 ☐ 4000		
	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)		
	Number of poles	☐ 3 (3-pole)		
	Wiring mode	☐ Horizontal wiring (standard configuration) ☐ J1 - Horizontal extended wiring ☐ J3 - Vertical wiring ☐ J4 - Vertical extended wiring		
	Product type	☐ OW-Off fshore wind power type		
	Controller model	☐ KM-NWK21(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		
	Grounding mode	☐ T type (default)		
	Contact wear equivalent	☐ J-Contact wear equivalent (NWK21/31 optional)		
Required accessories	Electric operating mechanism	☐ D1(AC380V/AC400V) ☐ D2(AC220V/AC230V) ☐ D3(DC220V) ☐ D4(DC110V) ☐ D5(DC24V)		
	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)
	Auxiliary contact	NDW3-2500/NDW3-4000	☐ A4-Four-group switching ☐ A6-Six-group switching ☐ A44-Four normally opened and four normally closed ☐ A66-Six normally opened and six normally closed
	Closing ready	☐ BX - Closing ready signal output unit	
	Counter	☐ JS - Counter	
	Door frame	☐ M Doorframe	
	Button lock	☐ S Button lock	
Interlocking accessories	Off-position lock	☐ SF11-One lock one key ☐ SF21-Two locks one key ☐ SF31-Three locks one key ☐ SF32-Three locks two keys ☐ SF53-Five locks three keys	
Special requirements		As special requirements, NWK21/NWK31 must be set before the factory delivery: Overload and long-time delay current____A time____s Short-circuit short-time delay current____A time____s Short circuit instantaneous current____A Grounding fault current____A time____s	
		Other requirements:	
Note: 1. In case of no special requirements, the current and time setting value of controller shall be set according to the factory setting; 2. If you have special requirements, please indicate in the special requirements column.			