

Shanghai Liangxin Electrical Co., Ltd.

NDW3A-2500 Aircuit Circuit Breaker(UL)

Product Specification

(IPD-ENG-DEV-T03 A1 2018-07-10)

Prepared by

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Revision History					
Version	Revision Reason/Content	Implementation Date	Prepared by	Reviewed by	Approved by
0	Newly prepared and issued	2021/10/29	Wang Wanlu	Zhao Peng	Yin Jiaca
1	1. Increase the instantaneous power of the loss-of-voltage tripper 2. Modify the logo 3.The product cannot be configured with a disconnect position lock	2024/04/23	Huang chengxiu	xujiewei	luoguorui
2	Add DC24V attachment information	July 11, 2025	Xu Jiewei	Huang Chengxiu	Chen Yanqin



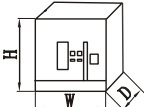
Contents

Chapter1 Product Overview	4
Chapter2 Field of Application	5
Chapter3 Controller	9
Chapter4 Accessories	16
Chapter5 Outline and Installation Dimensions	24
Chapter6 Electrical Wiring Diagram	29
Chapter7 Ordering Type Selection Specification	32



Chapter1 Product Overview

Table 1 Table of Technical Parameters

Circuit breaker model		NDW3A-2500	
Rated current In (+40℃)		(A)	1000、1250、1600、2000
Rated working voltage Ue		(V)	AC254、AC508、AC635、AC730
Rated frequency f		(Hz)	50/60
Rated insulation voltage Ui		(V)	1250
Rated impulse withstand voltage Uimp		(kV)	12
Number of poles pole			3
Full break time ^{Note 1}		(ms)	≤50
Closing time ^{Note 2}		(ms)	≤85
Rated Short-Circuit Current(kA) Power factor(cos φ ≤0.15) (UL1066)		AC254V	75
		AC508V	75
		AC635V	75
		AC730V	65
Rated Short-Time Current(kA) Power factor(cos φ ≤0.15) (UL1066)		AC254V	75
		AC508V	75
		AC635V	75
		AC730V	65
Operation performance	Electrical life (times)	AC635V	8000(2000A)
	Operation frequency (30 times/h)	AC730V	6000(2000A)
	Mechanical life (times) Operation frequency (60 times/h)	Maintenance-free	10000
Installation mode		Fixed type	
Wiring method of the main circuit		Horizontal wiring Vertical wiring Upper horizontal lower vertical wiring Upper vertical lower horizontal wiring	
Applicable standards		UL1066	
Outline dimension: W×D×H (mm) 		Fixed type 3P	368×309.5×394
Weight (kg)		Fixed type 3P	50

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

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

Chapter2 Field of Application

2.1 Working Environment

Ambient temperature

Applicable ambient temperature is $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$, the average within 24 h shall not be more than $+35^{\circ}\text{C}$.

In case the temperature is above $+40^{\circ}\text{C}$, the user shall reduce the capacity according to Table 3.

Table 2 Table of Working Environmental Parameters

Environmental requirements	Description of the specific parameters
Operating ambient temperature	The operating ambient temperature is $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$; the average within 24 h shall not be more than $+35^{\circ}\text{C}$. If the ambient temperature is higher than $+40^{\circ}\text{C}$, the user needs to reduce the capacity. (For details, see Table 3)
Altitude	The altitude of the installation site doesn't exceed 2,000m. For use with the altitude above 2,000m, it is necessary to correct the working performance, including power frequency withstand voltage and rated current. (For details, see Table 4)
Pollution degree	Pollution level: Level 3
Wet heat resistance	The relative air humidity at a maximum temperature of $+40^{\circ}\text{C}$ should not exceed 50%. A higher humidity is allowed at a lower temperature, but special measures should be taken to address occasional condensing due to temperature fluctuation.
Storage conditions	The air temperature is $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$.
Storage period and conditions	The relative air humidity at a maximum temperature of $+40^{\circ}\text{C}$ should not exceed 50%, and the product can be stored for 1 year without unpacking. The product can be stored for 3 months under the condition of packaging. For continuous use, the surface shall be subjected to dust and moisture removal, and measure the loop resistance less than $35\mu\Omega$.
Installation condition	With the vertical gradient no more than 5° , the circuit breaker shall be installed in places without explosion danger, conductive dust or the possibility of corroding metal and damaging the insulation.

Derating factor

Table 3

Ambien temperature Rated current	$+40^{\circ}\text{C}$	$+50^{\circ}\text{C}$	$+60^{\circ}\text{C}$	$+70^{\circ}\text{C}$
2000A	2000A	1900A	1700A	1500A
1600A	1600A	1600A	1600A	1500A
1250A	1250A	1250	1250A	1250A
1000A	1000A	1000	1000A	1000A

Note: Perform the temperature rise test according to UL1066.



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 5000m, it can be specially customized. For the working performance, refer to the correction value in the following table (Table 4).

Table 4

Altitude (m)	2000	3000	4000	5000
Impulse withstand voltage Uimp (kV)	12	12	12	12
Rated insulation voltage Ui (V)	1250	1250	1250	1250
Rated working voltage (V)	730	730	730	730
Power frequency withstand voltage (V)	3000	3000	3000	3000
Rated current	1.0In	0.93In	0.88In	0.85In

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

2.2 Anti-corrosion Level

Salt spray level: severity class (3)

Passed the GB/T 2423.18-2012 Environmental testing for electric and electronic products Part 2: Tests
Test Kb: Salt mist, cyclic (sodium chloride solution).

2.3 Pollution Level

Pollution level: Level 3

The circuit breaker can be operated in the industrial environment specified in IEC 60664-1. However, we still recommended that it shall be installed in a switchgear with suitable temperature and no excessive dust pollution.

2.4 Shockproof Requirement

The circuit breaker can ensure resistance to mechanical shock, and has passed the GB/T4798.3 standard test;

Amplitude: $\pm 1\text{mm}$ (2Hz~9Hz);

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

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



2.5 Electromagnetic Interference

The circuit breaker can resist the following electromagnetic interference

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

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

- GB/T14048.2-2020 Low-voltage switchgear and controlgear—Part2:Circuit-breakers
Appendix F
- GB/T14048.2-2020 Low-voltage switchgear and controlgear—Part2:Circuit-breakers
Appendix N
- IEEE Std C37.90.1™-2012
- IEEE Std C37.90.2™-2004

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

2.6 Installation Category

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

2.7 Protection Class

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

2.8 Utilization Category

Category B.

2.9 Reference Specifications of Circuit breaker's Main Circuit Copper Bar

Table 5

Rated current In (A) +40°C	Copper bar specification	
	Dimensions (mm)	Number
2000	80×5	3
	102×6.4 (inches: 4×1/4)	2
1000、1250、2000	80×6	2
	76.2×6.4 (inches: 3×1/4)	2



- 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 UL 1066-2013/ANSI C37.50-2018. If the temperature is higher than 40°C, the quantity of copper bar should be increased, or the capacity should be reduced according to Table 3.
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 (at the center of the mounting hole) is no more than +115°C.
4. The electrical gap of copper bar is $\leq 15\text{mm}$ with the altitude more than 5,000m and relative humidity more than 90%; the electrical gap shall be adjusted according to the relevant standards.

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

Table 6

Model	Power loss of the fixed type
NDW3A-2500	$\leq 356.8\text{ W}$

Specifications and Models Description

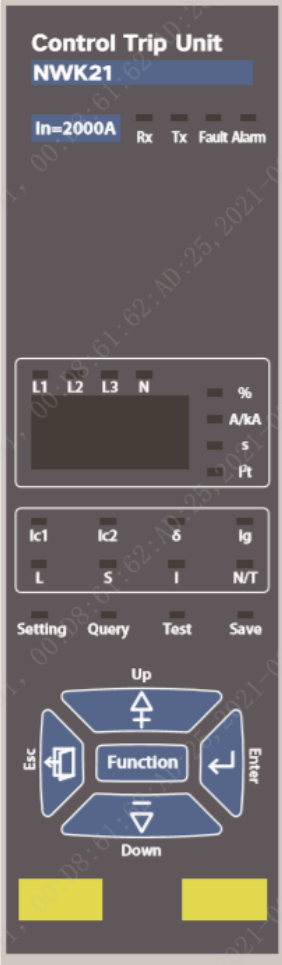
ND W 3A - □/□/□ 123456		
SN	SN name	
1	Enterprise code	ND- Nader 良信电器
2	Product code	W - Universal
3	Design code	3A
4	Shell frame level	25-2500
5	Rated current	20-2000A
6	Number of poles	3

Notes: For details of the product ordering models and specifications, see the ordering type selection specification.



Chapter3 Controller

3.1 Type of Controller

Model	NWK21
Controller Pictures	



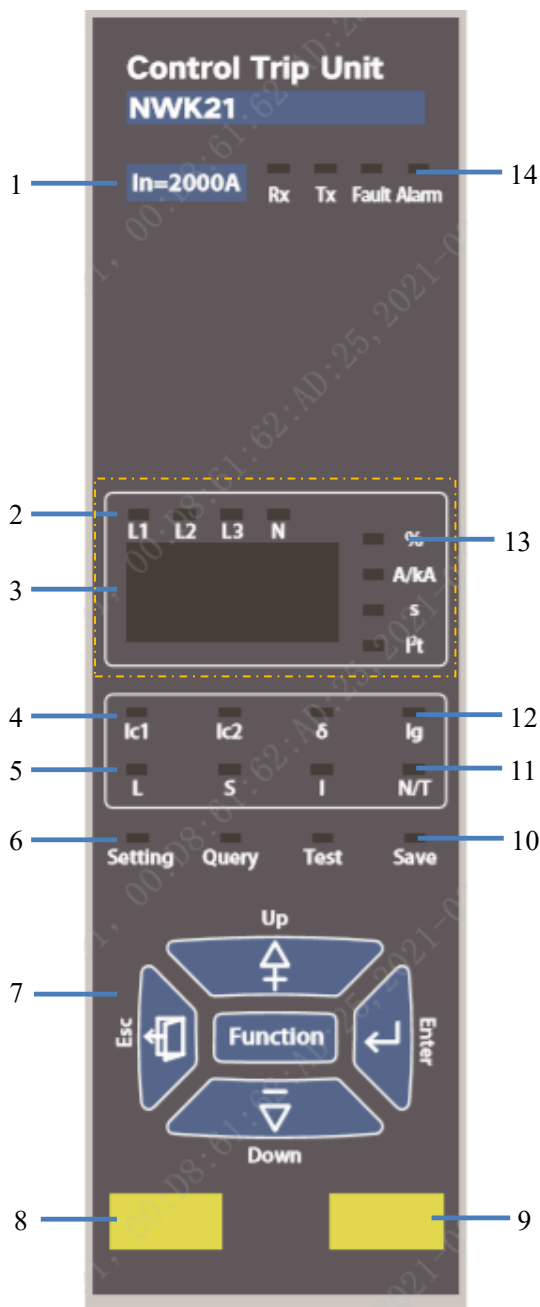
3.2 Controller Functions

Functional items		NWK21
Display interface	Nixie tube numbers and symbols display	√
Protection function	Overload long-time delay protection	Single
	Overload thermal memory	√
	Hardware thermal memory	√
	Overload alarm	▲
	Short circuit short-time delay protection	√
	Short-time delay thermal memory	√
	Short circuit instantaneous protection	√
	Ground protection	(Differential type)
	Grounding alarm	▲
	Current unbalance protection	√
	MCR	√
	HSISC	√
Measuring function	Current measurement (phase pole, grounding)	√
Maintenance function	LED fault status indication	√
	Fault record and query	8 times
	Self-diagnostic function	√
	Simulating tripping test function	√
	Contact wear equivalent (alarm) % query	▲
	Query of number of operations	▲
	Clock function	√
Others	Remote reset of controller	▲
	Signal element	▲
	RS485 communication	▲

Note: “√” represents this function is available, “▲” represents optional functions for users.

3.3 Controller Panel Description

Layout Display of NWK21 Type Controller



1. Rated current sign
2. Three-phase current, N-phase current indicators
3. Three-phase electric current display screen
4. Load monitoring signals 1 and 2 operation indicators
5. Long time delay and short time delay protection operation indicators
6. Setup, query indicators
7. 5 operation buttons
8. Unused temporarily
9. Test interface
10. Test, storage indicators
11. Instantaneous, N-phase current or self-diagnosis operation indicators
12. Unbalance, ground current protection operation indicators
13. Unbalance rate, current, time and I^2t (inverse time limit) indicators in orde
14. Rx, Tx, fault and alarm indicators in order

Note: 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													
Current setting value I _r		(0.4~1.0) In or OFF (OFF-Function off)											
Protection curve		Standard power distribution protection I ² t: t= 2.25 T _r / N ² N= I/ I _r I—Fault current t—Long time-delay action time I _r —Long time-delay setting current T _r —Long time-delay setting time											
Standard power distribution protection I ² t Time setting value T _r (@1.5 I _r)		15s, 30s, 60s, 120s, 240s, 480s											
Tripping time	1.5I _r	15	30	60	120	240	360	480	600	720	840	960	
t _r (s)	2.0 I _r	8.44	16.88	33.75	67.5	135	202.5	270	337.5	405	472.5	540	
(accuracy of ±10%)	6.0 I _r	0.94	1.88	3.75	7.5	15	22.5	30	37.5	45	52.5	60	
	7.2 I _r	0.65	1.30	2.60	5.21	10.4	15.6	20.8	26	31.3	36.5	41.7	
Protective features (accuracy of ±10%)		Current (I/I _r)					Tripping time						
		≤1.05					> 2h Inaction						
		≥1.3					< 2h Action						
Thermal memory time		30min (ON) or OFF (turn off the thermal memory)											
Overload pre-alarm													
Current setting value IP		OFF+(0.75~1.05) I _r											
Overload pre-alarm output		The signal output is required to add a signal unit. Without the signal unit output, observe the controller display screen or read from the display indicator.											
Short circuit short-time delay protection													
Current setting value I _{sd} (accuracy of ±10%)		(1.5~15) I _r or OFF (OFF-Function off)											
Time setting value T _{sd} (s)	t _{sd1} inverse time limit	0.1、0.2、0.3、0.4											
Protective features (accuracy of ±10%)		Current			Tripping time								
I ² t-ON		Isd ≤I≤8I _r			(8I _r) ² × T _{sd} /I ² inverse time-limit characteristic								
		I>8I _r			T _{sd} fixed time limit characteristic								
I ² t-OFF		I≥ Isd			T _{sd} fixed time limit characteristic								
Thermal memory time		15min ON or OFF											
Short circuit instantaneous protection													
Current setting value I _i (accuracy of ±10%)		(1.0~20) In or OFF (OFF-Function off)											

Protective features	Current (I/I _i)	Tripping time
	≤0.85	Inaction
	≥ 1.15	<40ms Action
	I> I _{MCR}	Break action time<30ms
MCR protection		
Current setting value I _{MCR}	(1.0~20) In (factory default as 10In)	
Protective features	Current (I/I _{MCR})	Tripping time
	≤0.8	Inaction
	≥ 1.1	<40ms Action (effective within 100ms after closing)
Ground protection/alarm		
Protection type	Differential type (T)	
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 the signal unit output, observe the controller display screen or read from the display indicator.	
Frequency setting		
System Frequency setting value	50HZ/60Hz; According to line frequency.	
Current unbalance protection/alarm		
Current unbalance setting value δ	(40%~100%)+OFF (OFF-Function off)	
Action delay time t _δ (s)	0.1~1.0	
Protective features (accuracy of ±10%) Inherent absolute error: ±40ms	Actual current unbalance rate/setting valu	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 “Unbalance alarm”.	

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

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
I ² t	1.5×I _r	15	30	60	120	240	360	480	600	720	840	960
	2×I _r	8.44	16.88	33.75	67.5	135	202	270	337.5	405	472.5	540
	6×I _r	0.94	1.88	3.75	7.5	15	22.5	30	37.5	45	52.5	60
	7.2×I _r	0.65	1.3	2.6	5.21	10.42	15.63	20.83	26.04	31.25	36.46	41.67

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	8I _r	0.2s	Definite time limit, I ² t-OFF
Short circuit instantaneous	10I _n	-	-
Ground protection	OFF	-	This function is off in default for 3P, but can be opened according to the user's needs;
Current unbalance protection	OFF	-	Users can open it as needed
MCR	10I _n	-	This function is on, but can be closed according to the user's needs;
Frequency	-	-	Change 50Hz to 60Hz

3.5 Working Power Supply of Controller

■ The working power supply of controller is provided by the transformer. To ensure reliable operation and breaking of small current in case of failure, the mode is 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 0.4I_n and 0.2I_n respectively.

2) 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



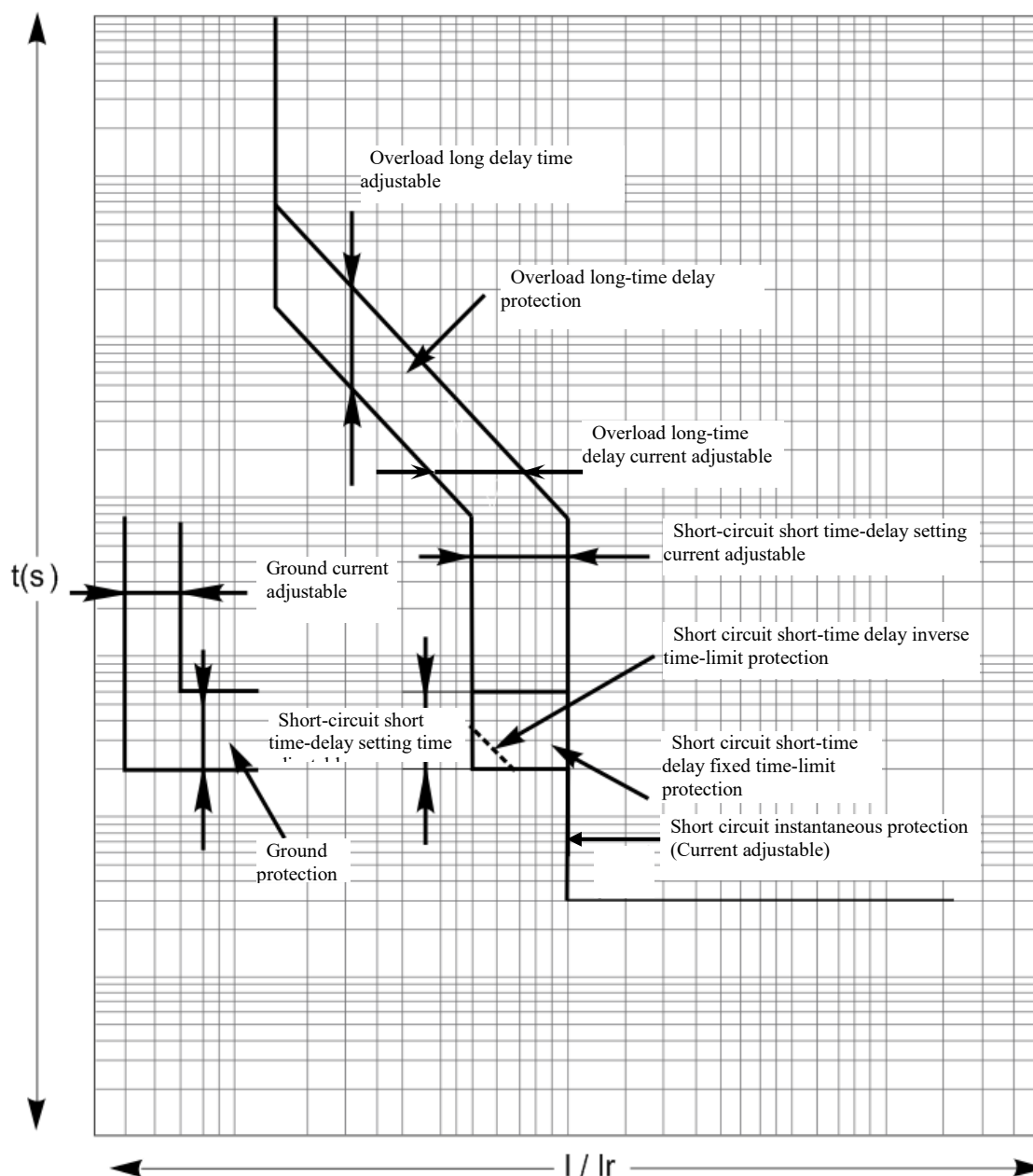
Rated power consumption: $<7W$.

3.6 Introduction of Controller Functions

For introduction of controller functions, see the User Manual of NWK21 and NWK31 Controller.

3.7 Protection Characteristic Curve

See the figure below for the 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 NWK21 and NWK31.

Chapter4 Accessories

4.1 Electrical Control Accessories

4.1.1 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%~120% 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. Disconnect the power supply for 1 minute before the next trigger;
- 3) Each power-on trigger time: $200\text{ms} < t < 3\text{s}$;
- 4) It can be energized for 3s at $1.4U_s$.
- 5) Without the overvoltage protection, $1.4U_s$ beyond the limit, long-term energization will burn.

Instantaneous power is shown in the table below.

Instantaneous power of closed electromagnet		
Rated insulation voltage (U_i)	Rated control supply voltage (U_s)	Instantaneous power
AC400V	AC230V/DC230V 50/60Hz	500VA/500W
	DC110V	400W
	DC24V	265W



Fig. 1

4.1.2 Shunt release

Shunt release is mainly composed of coil, iron core component and electronic parts, which can make the circuit breaker disconnect 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 U_s , operation of the shunt release can make the circuit breaker disconnect;



- 2) Closed electromagnet is the short-time duty-type. Disconnect the power supply for 1 minute before the next trigger;
- 3) Each power-on trigger time: $200\text{ms} < t < 3\text{s}$;
- 4) It can be energized for 3s at 1.4Us.
- 5) Without the overvoltage protection, 1.4Us beyond the limit, long-term energization will burn.

Instantaneous power of Shunt Release is shown in the table below.

Instantaneous power of Shunt Release

Rated insulation voltage (Ui)	Rated control supply voltage (Us)	Instantaneous power
AC400V	AC230V/DC230V 50/60Hz	500VA/500W
	DC110V	400W
	DC24V	265W

◆ Action features of the shunt release (holding type)

- 1) When the power supply voltage of the shunt release maintains at 70%~110% of the rated control supply voltage Us, operation of the shunt release can make the circuit breaker disconnect;
- 2) The shunt release can be energized for a long time and maintained under power supply. When the working voltage maintains/locks at 85%~110% of the rated control supply voltage Us, the circuit breaker maintains in the disconnected position and fails to perform on/off operation.
- 3) It can be energized for 3s at 1.4Us.

Power of Shunt Release (holding type) is shown in the table below.

Power Consumption table of Shunt Release (holding type)

Rated insulation voltage (Ui)	Rated control supply voltage (Us)	Instantaneous power	Off time	Holding current (holding type)	Holding power (holding type)
AC400V	AC/DC230V 50/60Hz	<500VA/W	<60ms	<30mA	<7VA/W

4.1.3 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%~120%, 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.
- 4) Each power-on trigger time: $t > 7s$, long-term energization is allowed for the secondary circuit input terminal.
- 5) Without the overvoltage protection, 1.4Us beyond the limit, long-term energization will burn. It is allowed to energize for 1s at 1.4Us during operation.
- Operating power is shown in the table below.

Power Consumption table of motor operating mechanism

Rated insulation voltage (Ui)	Energy storage time	Rated control supply voltage (Us)	Operating power consumption	Running current	Starting current maximum peak
AC400V	3s~5s	AC230V/DC230V 50/60Hz	165VA/165W	0.75A	6.5A/4.5A
		DC110V	110W	2.1A	7.5A
		DC24V	230W	9.5A	30A

4.1.4 Undervoltage release (loss of voltage protection), no-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 working 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%~120% of the rated working voltage of the loss of voltage release, the loss of voltage release can guarantee reliable closing of the circuit breaker.



- 4) Without the overvoltage protection, 1.4Us beyond the limit, long-term energization will burn. It is allowed to energize for 1s at 1.4Us during operation.

- 5) Loss of voltage release is the short-time duty-type, which will not work without the power supply input.

◆ 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. The delay time is set as 0s, 1s, 3s and 5s as required and the action time accuracy of the delay time is +10%.

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

Rated insulation voltage (Ui)	Frequency (f)	Rated operational voltage (Ue)	Operating power	Instantaneous power
400V	50Hz/60Hz	AC /DC230V	14W	≤400VA/W

Power Consumption Table of Loss of Voltage Release



Undervoltage release

◆ Action features of the undervoltage release

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

2) When the applied voltage is less than 35% of the rated operating voltage of the undervoltage release, the undervoltage release will make the circuit breaker unable to be closed;

3) When the applied voltage is 85%~110% of the rated operating 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 instantaneous.

◆ Power Consumption Table of Undervoltage Release

Power Consumption Table of Undervoltage Release

Rated insulation voltage (Ui)	Rated operating voltage (Ue)	Operating power
400V	DC24V	NDW3A2500 3.5W

4.2 Signal Output Accessories

4.2.1 Auxiliary switch

- ◆ The conventional thermal current of the auxiliary switch is 5A;
- ◆ Auxiliary contact form: Four normally opened and four normally closed, six normally opened and six normally closed;
- ◆ Technical parameters of auxiliary contact.



Applicable shell frame		NDW3A-2500
Auxiliary contact form		Four normally opened and four normally closed, Six normally opened and six normally closed
Agreed thermal current I_{th}		5A
Minimum load		2mA/DC15V
Breaking capacity	DC-12	5A/250V
	AC-12	5A/230V

4.2.2 Secondary wiring terminal

- ◆ For the number of secondary wiring terminal, there is a total of 62 groups;
- ◆ 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	UL1059
Maximum load current	5A
Rated current	5A
Rated voltage	500V
Minimum cross section area of the rigid (flexible) conductor	20AWG
Maximum cross section area of the rigid (flexible) conductor	16AWG

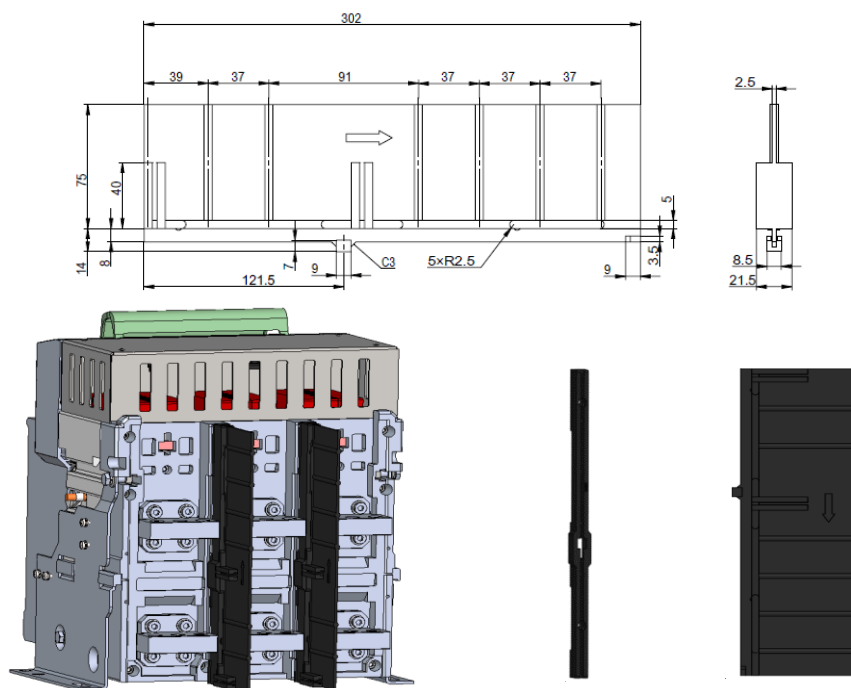
Recommended striping length

10mm±1mm

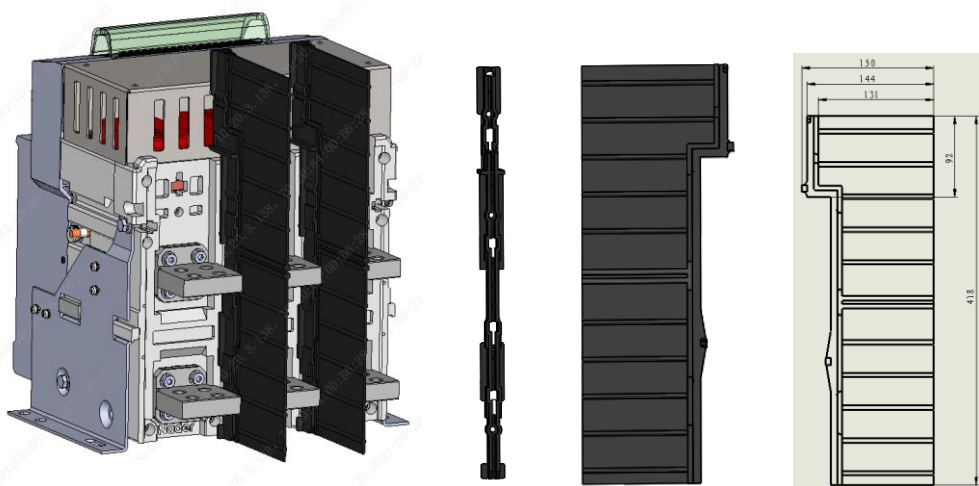
4.3 Safety accessories

4.3.1 Phase partition

It is installed in the groove between the phase bus bars, used to increase the insulation strength between phase to phase of the main circuit and improve the insulation performance. The partition has two types, i.e. conventional and extended. For the location of installation, see the Fig below.



Conventional partition plate

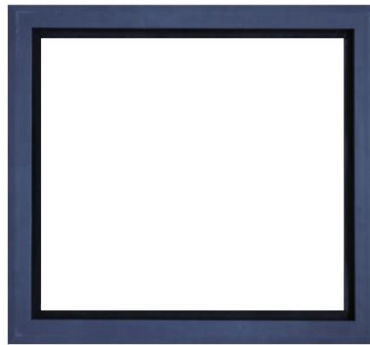


Extended partition plate

Note: Extension support and partition shall be installed by customers.

4.3.2 Door frame

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.



4.3.3 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.



4.3.4 Counter

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



4.4 Lock

4.4.1 Button lock

文件控制
2025-07-16

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).



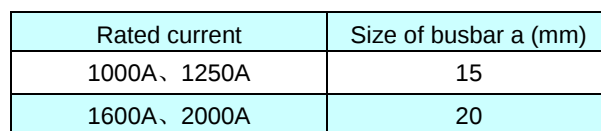
4.4.2 Safety lock

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). After padlock is installed for the safety lock, the product may be locked at the closing state, in which case, the product cannot be switched on. 1-3 padlocks with a diameter of 5mm or 1-2 padlocks with a diameter of 6mm may be installed. The product can only be switched on when all the padlocks have been taken down.



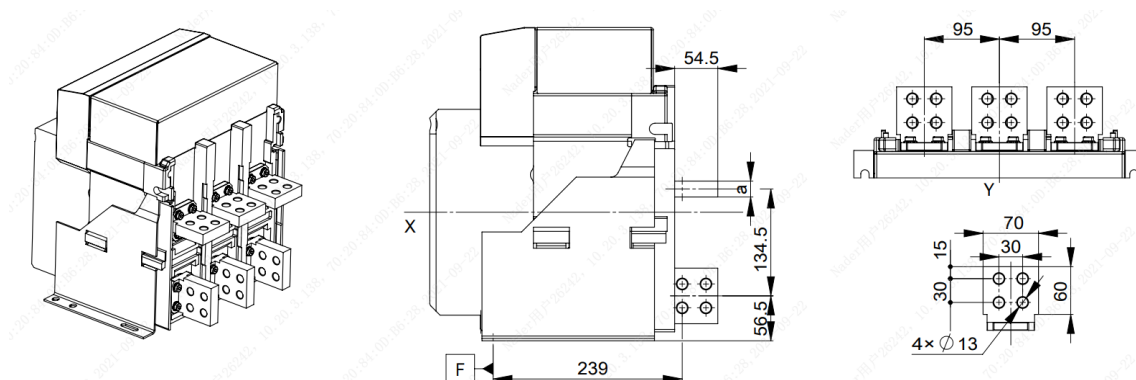
5.1 NDW3A-2500 fixed type (unit: mm)

Fixed Details



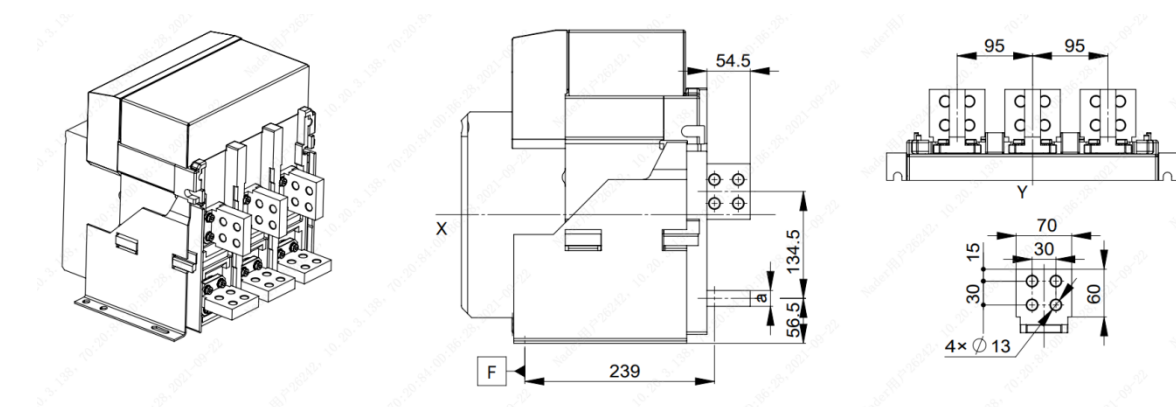
Upper Horizontal, Lower Vertical Wiring

Detail



Upper Vertical, Lower Horizontal Wiring

Detail

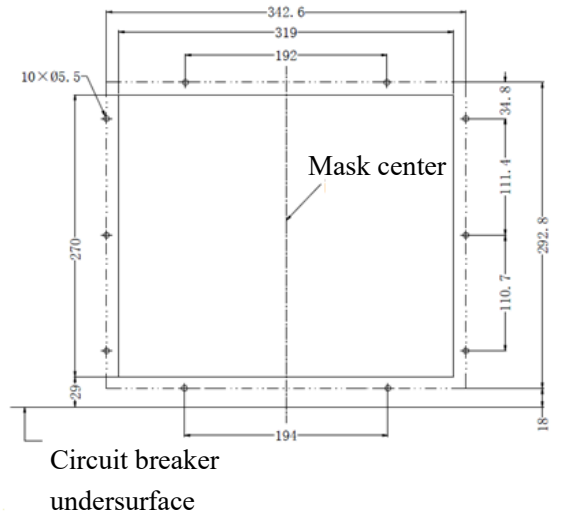


Note: X and Y are the symmetric axes of the front panel;

Rated current	Size of busbar a (mm)
1000A、1250A	15
1600A、2000A	20

5.2 The Circuit Breaker Cabinet door open hole and installation pitch

Hole dimensions of NDW3A-2500 door frame(unit: mm)



5.3 Circuit Breaker Installation Notes

To ensure your safety and the safety of electrical 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 $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$, 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.

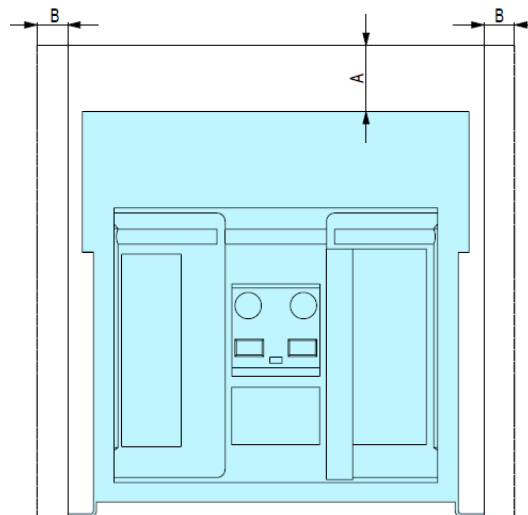


- Carry out wiring of the control circuit according to the wiring diagram when installing the circuit breaker; check whether the working voltage of the no-voltage, shunt, closing electromagnet, motor, controller and related parts conforms to the actual voltage, and then carry out the secondary circuit energizing.
- 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 no-voltage tripping, power on it (no need if without no-voltage tripping), then carry out closing operation.
- Installation screws of the circuit breaker: M12 bolt, level 8.8, with contact washer, tightening torque 60N.m

5.4 Safe Distance and Flashover Distance

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

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



Unit: mm

Installation type 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	70	60	70	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;
3. The flashover distance is consistent with the safe distance.



Chapter6 Electrical Wiring Diagram

NDW3A-2500 electrical wiring diagram

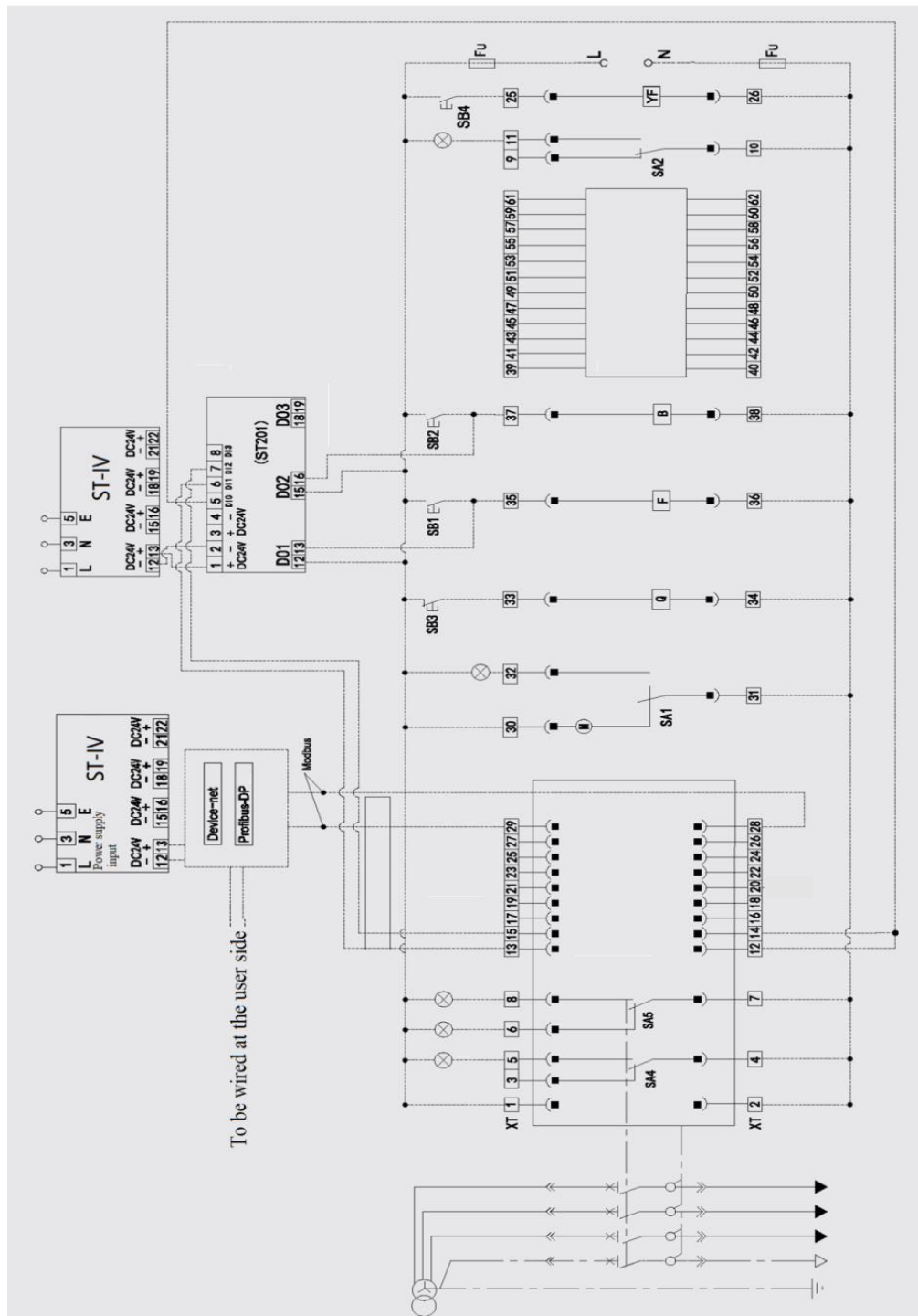


Figure 1: NDW3A-2500Auxiliary Wiring Diagram

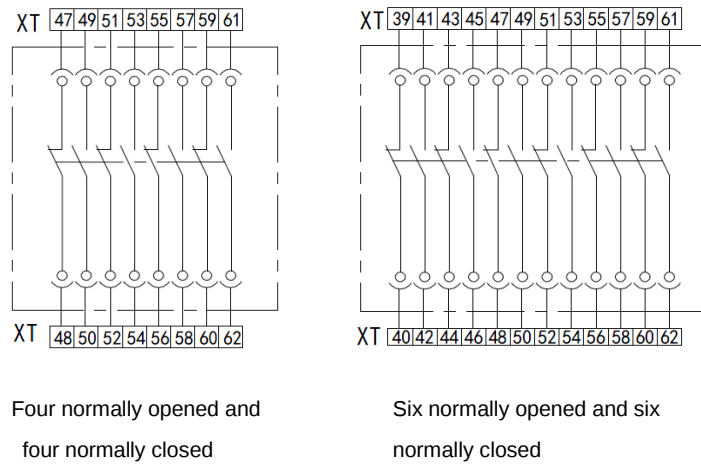
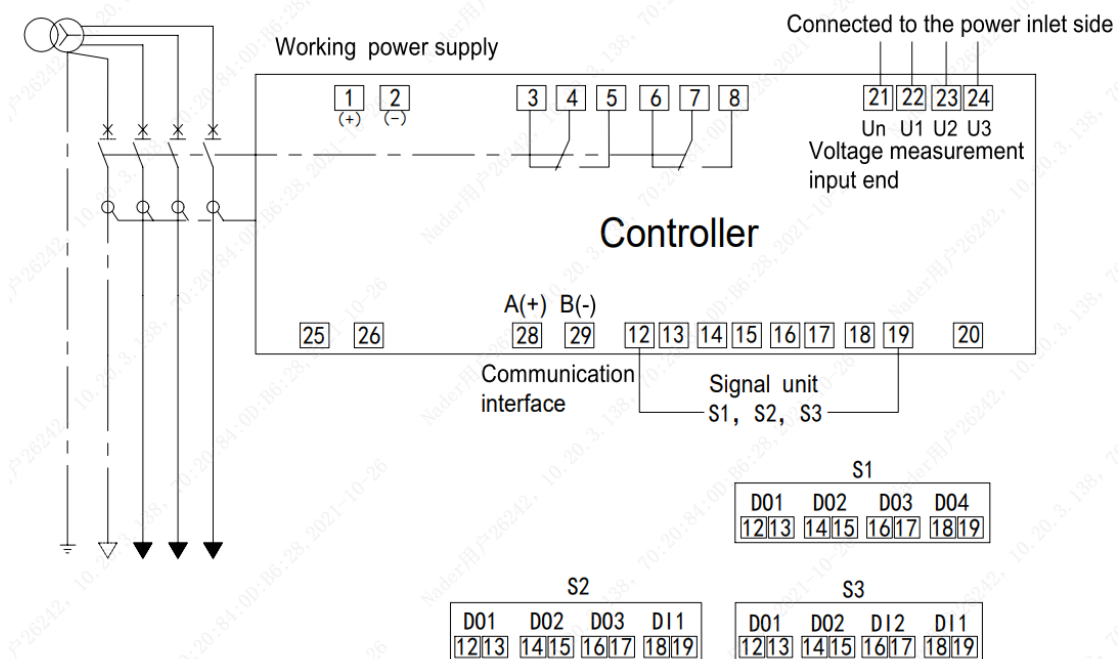


Figure 2: NDW3A-2500 controller input and output interfaces



SB1 - Shunt button (to be prepared by users) SB2 - Close button (to be prepared by users)
SB3 – No-voltage 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 S – No- 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, 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. 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;
6. All the signal units are passive signals; users can choose S1, S2, S3 modes as required;
7. The user needs to select the signal unit to achieve the "four remotes" function, while the power supply module and relay module are optional.
8. 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. The user should not connect it in series with the auxiliary switch contacts of the circuit breaker itself.



Chapter7 Ordering Type Selection Specification

7.1 NDW3A-Series Circuit breaker Model Explanation and Encoding Rules

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

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	25-2000	
5	Rated current	10-1000A、12-1250A、16-1600A、20-2000A	
6	Installation mode	Non-marked - fixed type	
7	Number of poles	3-3 poles	
8	Controller	KM2-NWK21(AC230V/DC230V),	
9	Controller	Protect type: Non-marked - conventional type	This shall be omitted if the controller has no optional function;
	Optional function	Grounding mod: T - Differential type (not to write in default)	
10	Electric energy storage mechanism	DE-AC230V/DC230V D4- DC110V □D5-DC24V	This shall be omitted if without this accessory
11	Shunt release	FE-AC230V/DC230V F4- DC110V □F5-DC24V F6- AC230V/DC230V (holding type)	This shall be omitted if without this accessory
12	Closed electromagnet	BE-AC230V/DC230V B4- DC110V □B5-DC24V	This shall be omitted if without this accessory
13	Voltage of no-voltage release	SE-AC230V/DC230V	Optional, this shall be omitted if without this accessory
14	Delay time of no-voltage release	0-Instantaneous 1- 1s delay 3-3s delay 5-5s delay	
15	Voltage of Undervoltage release	Undervoltage release: Q5-DC24V	Optional
16	Delay time of Undervoltage release	□ 0 (Instantaneous) □ 1 (1s delay) □ 3 (3s delay) □ 5 (5s delay)	Optional
17	Auxiliary contact	Not-marked - four normally opened and four normally closed A66 - six normally opened and six normally closed	
	External accessories	M - Door frame	

18		Not-marked - Phase partition (conventional)	Carry out the sequence arrangement according to the table, with “/” for separation.
		G - Phase partition (extended)	
		F - Dust cover	
		S - Button lock A - Safety lock (either)	
		JS - Counter	
19	Wiring mode	Not-marked- Horizontal wiring J3-Vertical wiring J5-Upper horizontal lower vertical wiring, J6-Upper vertical lower horizontal wiring	
20	Rated working voltage	V1-AC254V, V2-AC508V , V3-AC635V, V4-AC730V	
21	Special notes	Customer's special requirements	
22	UL compliance	UL - With UL certification	



7.2 Circuit breaker Ordering Notes

 (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	Frame size	☐ NDW3A-2500		
	Rated current (A)	☐ 1000 ☐ 1250 ☐ 1600 ☐ 2000		
	Installation mode	☐ Fixed type		
	Number of poles	☐ 3 (3-pole)		
Controller parameters	Controller model	☐ KM2-NWK21 (AC230V/DC230V)		
	Protection type	☐ Conventional type		
	Grounding mode	☐ T type (default)		
Required accessories	Electric operating mechanism	☐ DE-AC230V/DC230V ☐ D4-DC110V ☒ D5-DC24V		
	Shunt release	☐ FE-AC230V/DC230V ☐ F4-DC110V ☒ F5-DC24V ☐ F6-AC230V/DC230V (holding type)		
	Closed electromagnet	☐ BE-AC230V/DC230V ☐ B4-DC110V ☒ B5-DC24V		
	Auxiliary contact	☐ Not-marked - four normally opened and four normally closed (standard) ☐ A66 - six normally opened and six normally closed		
Optional accessories	No- voltage release	voltage specification	☐ SE-AC230V/DC230V	
		Delay time	☐ 0 (Instantaneous) ☐ 1 (1s delay) ☐ 3 (3s delay) ☐ 5 (5s delay)	
	Undervoltage release	voltage specification	☒ Q5-DC24V	
		Delay time	☐ 0 (Instantaneous) ☐ 1 (1s delay) ☐ 3 (3s delay) ☒ 5 (5s delay)	
	Door frame	☐ M-Doorframe		
	Phase partition	☐ Not-marked - Phase partition (conventional) ☐ G - Phase partition (extended)		
	Dust cover	☐ F-Dust cover		
	Lock	☐ S - Button lock ☐ A - Safety lock (either)		
	Counter	☐ JS - Counter		
	Wiring mode	☐ Not-marked- Horizontal wiring ☐ J3-Vertical wiring ☐ J5-Upper horizontal lower vertical wiring ☐ J6-Upper vertical lower horizontal wiring		
Rated working voltage	☐ V1-AC254V ☐ V2-AC508V ☐ V3-AC635V ☐ V4-AC730V			
Special notes	Customer's special requirements			
UL compliance	UL - With UL certification			
Special requirements	As special requirements, NWK21 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			

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 2025-07-16

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.
3. The product cannot be configured with a disconnect position lock

