

Shanghai Liangxin Electrical Co., Ltd.
(NDQ5W-4000 Automatic Transfer Switching Equipment)
Product Specification
(IPD-ENG-DEV-T20 A1 2025-05-01)

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Reviewed by	Zhong Kunlin	Date	May 1, 2025
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1. Applicable Scope and Purpose

The NDQ5W-4000 automatic transfer switch device can be applied to the power distribution system with the AC 50Hz/60Hz, the rated working current of 800A~4000A, the rated insulation voltage of 1000V, the rated working voltage of AC415V and below for automatically disconnecting from one power supply and connecting to another power supply. The NDQ5W-4000 automatic transfer switch device not only provides the dual power transfer system, but also provides the triple power transfer system and incoming power transfer system of “Two lines plus busbar”. Besides the conventional transfer, it also provides the parallel transfer function, thus comprehensively guaranteeing the uninterrupted power supply at special occasions as well as safety and reliability of the load power supply.

The products comply with GB/T14048.1-2023, GB14048.2-2020, GB/T14048.11-2016, IEC 60947-1:2020, IEC 60947-2:2019, IEC 60947-6-1:2013 standards.

2. Picture of the Product



3. Specification and Model Description

ND Q 5 W - □ □ / □ / □ / □ / □									
1	2	3	4	5	6	7	8	9	10
SN	SN name		NDQ5W						
1	Enterprise code		ND: Enterprise Code						
2	Product code		Q: Automatic transfer switch equipment						
3	Design SN		5						
4	Actuating circuit breaker		W: NDW2/NDW3 series universal circuit breaker						

5	Rated current of frame	4000A
6	Installation mode of the actuating circuit breaker	C: Drawout type
7	Rated working current	08: 800A, 10: 1000A, 12: 1250A, 16: 1600A, 20: 2000A, 25: 2500A, 32: 3200A, 40: 4000A
8	Number of poles	3: 3P; 4: 4P
9	Rated operating voltage	K1: AC380/400/415V
10	Controller type	2L: Dual power transfer 3L: Triple power transfer QL: Two lines plus busbar transfer 2LB: Dual power transfer with the manual parallel operation function 3LB: Triple power transfer with the manual parallel operation function QLB: Two lines plus busbar transfer with the manual parallel operation function
Example and description: Choose the same or different rated current in the same frame; consult the after-sales engineer. 1. NDQ5W-4000 C/40 /4/K1/2L (one type is possible for the same rated current) 2. NDQ5W-4000 C/25 32 40/4/K1/3L (different types shall be indicated separately for the different rated current)		

4. Main Technical Parameters

Rated working voltage U_e : AC380/400/415V;

Controller rated control power supply voltage U_s : AC230V;

Rated frequency: 50/60Hz

Rated insulation voltage U_i : AC1000V

Rated impulse withstand voltage U_{imp} : 12kV

Use category: AC-33B

Electrical equipment level: Level CB

Rated short-circuit breaking capacity I_{cn} : 100kA

Rated short-circuit making capacity I_{cm} (peak value): 220kA

Rated short-time withstand current I_{cw} (effective value): 100kA 1s

Contact switching time: 200ms

Electrical life: 6,000 times

Mechanical life: 12000 times (3P), 10000 times (4P) (maintenance free) 15000 times (with maintenance)

Isolating function: Available

5. Controller Functions

Controller model			2L	2LB	3L	3LB	QL	QLB
Rated control power supply voltage Us			AC230V					
Auxiliary power supply			DC24V					
Applicable application mode		Power grid- power grid	■	■			■	■
		Grid-oiler	■	■			■	■
		Grid-grid-oiler			■	■		
		Grid-oiler-oiler			■	■		
Applicable type	Dual power transfer		■	■				
	Triple power transfer				■	■		
	Two lines plus busbar transfer						■	■
Automatic transfer	Undervoltage protection	Power supply for detection	S1/S2 three-phase		S1/S2/S3 three-phase		S1/S2 three-phase	
		Under-voltage start value	OFF+ Us * (75~95%)					
		Under-voltage return value	AC230V: Under-voltage start value + (4V~30V)					
	Overvoltage protection	Power supply for detection	S1/S2 three-phase		S1/S2/S3 three-phase		S1/S2 three-phase	
		Overvoltage start value	Us *(105%~125%)+ OFF					
		Overvoltage return value	AC230V: Overvoltage start value - (4V~30V)					
	Open-phase protection	Power supply for detection	S1/S2 three-phase		S1/S2/S3 three-phase		S1/S2 three-phase	
		Open-phase value	Us *25%					
	Underfrequency protection	Underfrequency start value	OFF+rated frequency * (90%~98%)					
		Underfrequency return value	Rated frequency * (95%~99%)					
	Overfrequency protection	Overfrequency start value	Rated frequency * (102%~110%) + OFF					
		Overfrequency return value	Rated frequency* (101% to 105%)					
	Voltage unbalance protection	Voltage unbalance Start value	(3%~30%) + OFF					
		Voltage unbalance Return value	(2%-10%)					
	Phase order protection	Phase order mode	A-B-C (A-B-C, A-C-B, OFF)					
Power priority		Mode selection	Qs1, Qs2		Qs1, Qs2, Qs3		Qs1+Qs2 Qs1+Qql Qs2+Qql	
Energy storage setting			Energy storage before closing, energy storage after closing					
Operation mode			Automatic charge and automatic recovery, and Automatic charge					

		without automatic recovery					
Manual key transfer		Manual transfer	■	■	■	■	■
		Manual parallel transfer		■		■	■
Display	Supply voltage/frequency/unbalance parameter display		■	■	■	■	■
	Power open phase/abnormal/normal display		■	■	■	■	■
	Making, breaking and tripping status display of the circuit breaker		■	■	■	■	■
	Communication status display		■	■	■	■	■
	Power failure display		■	■	■	■	■
	Parameter setting display		■	■	■	■	■
Transfer delay		T1-T4	T1-T4	T1-T6	T1-T6	T1-T6	T1-T6
Communication function	Communication function	■	■	■	■	■	■
	Modbus protocol	■	■	■	■	■	■
Auxiliary functions	RTC real time	■	■	■	■	■	■
	Key locking function	■	■	■	■	■	■
	Generator starting/stopping control	■	■	■	■	■	■
	Load removal (optional)	■	■	■	■	■	■
	Fault locking	■	■	■	■	■	■
	Event recording	■	■	■	■	■	■
	Alarm function	■	■	■	■	■	■
	Switching of Chinese and English languages for the controller	■	■	■	■	■	■
	Adaptive frequency sampling	■	■	■	■	■	■
Extended function	Load monitoring ^[2]	■	■	■	■	■	■
	Smart Load Unloading ^[2]	■	■	■	■	■	■
	Control in place ^{[2] [3]}	■	■	■	■	■	■
	Busbar overcurrent locking ^[3]					■	■
	Overload busbar unloading ^[3]					■	■
	Automatic parallel return		■		■		■
	Remote parallel switching		■		■		■

Notes: 1. ■ Standard configuration;

2. The delay time of Model 2L and 2LB controllers does not include T5 and T6 delay;

3. It is required to use dual-communication controller for load monitoring, smart load unloading, local control, busbar overcurrent locking, overload busbar unloading;

4. The frame circuit breakers with numerical markings in the extended functions shall have the communication function, and the communication ports are occupied internally;

5. The frame circuit breaker with local control function must be optionally equipped with the S3-2DI2DO signaling unit.

6. Normal Working Environment and Installation Conditions

- Ambient temperature
 - Applicable ambient temperature is $-25^{\circ}\text{C} \sim +70^{\circ}\text{C}$, and the average within 24 hours shall not be more than $+35^{\circ}\text{C}$;
 - The circuit breaker with the ambient temperature of $-25^{\circ}\text{C} \sim -45^{\circ}\text{C}$ can be specially customized. If the ambient temperature is higher than $+40^{\circ}\text{C}$, the user needs to reduce the capacity; for the derating factor, refer to the derating factor table in the product's actuator-universal circuit breaker manual of the specific model.
- Atmospheric environment condition

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 $+25^{\circ}\text{C}$, the relative humidity of atmosphere can reach 90%. For condensation due to temperature change, dehumidification or corresponding measures should be taken.
- Anti-corrosion level

Salt mist: Severity Level 2
- Pollution level

Pollution level: 3
- Altitude

Altitude of the installation site shall not exceed 2,000 m.
If the altitude of the installation site is between 2,000 m to 5,000 m, it can be specially customized. For the working performance, refer to the correction value in the product's actuator-universal circuit breaker manual of the specific model.
- Anti-vibration requirement

The automatic transfer switch device can ensure resistance to electromagnetic or mechanical shock, and has passed the IEC 60721-3-3 standard test.

 - Amplitude: $\pm 1\text{mm}$ ($2 \sim 9\text{Hz}$)
 - Constant acceleration: 5m/s^2 ($9 \sim 200\text{Hz}$)
- Installation condition

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

The installation category of the actuator-universal circuit breaker's main circuit is IV; the installation category of the rest auxiliary circuit and control circuit is III.
- Protection class

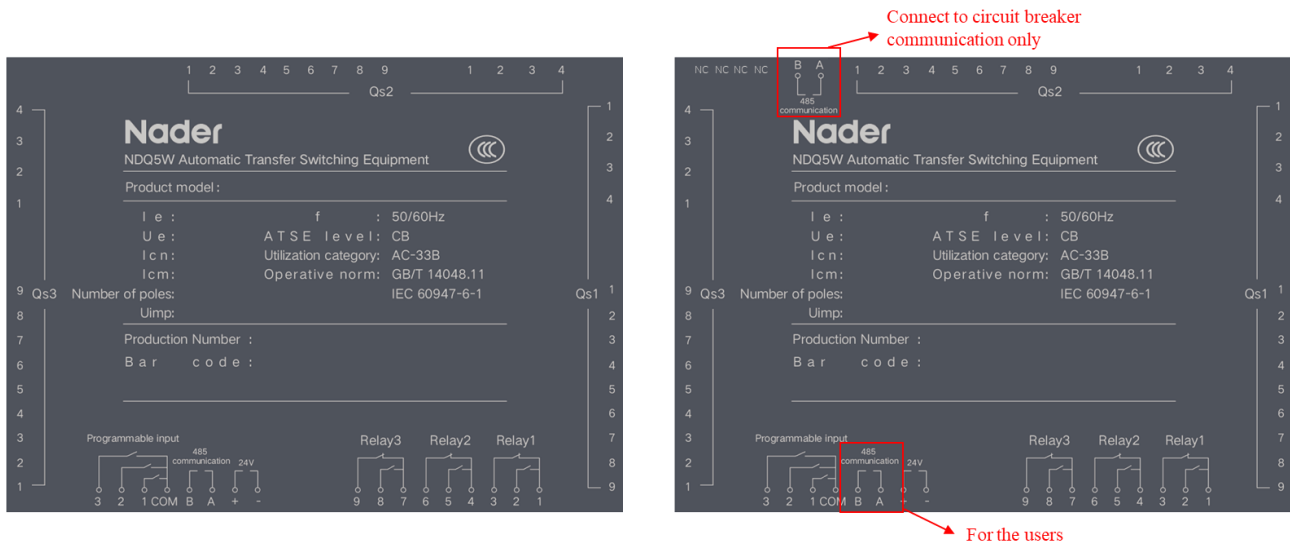
IP30 and IP40 (the circuit breaker is installed in a cubicle and equipped with a protective door frame);
IP65 (the controller is installed in a cubicle and equipped with a waterproof rubber gasket).

7. Definition of External Interfaces



The 1 group (optional) above and two groups of yellow wiring slots underneath are secondary wiring terminals provided to customers with the wiring terminal functions shown below:

Definition and Description of NDQ5W Controller Terminal



Conventional Type

1. 控制器类型需要用户根据实际需要选配，详见选型规范；
2. 双通讯型产品上端的通讯端口仅用于与框架断路器或DIDO模块通讯使用，下端通讯端口供用户使用；
3. 在电网-油机模式下，继电器3固定位油机启动；
4. 继电器功能详见下表（注4仅对双通讯型控制器有效）：

继电器可编程 输出端口设置	故障报警	转换动作故障	脱扣故障	电网报警	Qs1电源报警	Qs2电源报警
	Qs3电源报警	#1油机启动	#2油机启动	母联卸载	全分事件	一级负荷卸载 ^[4]
	二级负荷卸载 ^[4]	三级负荷卸载 ^[4]	母联过流闭锁 ^[4]	过载母联卸载 ^[4]	并联转换失败（并联有效）	

5. 可编程输入功能详见下表（注5仅对双通讯型控制器有效）：

可编程输入 端口设置	2L型	消防功能（全分）	强制Qs1合闸	强制Qs2合闸	母联过流闭锁 ^[5]	过载母联卸载 ^[5]	短路故障闭锁	
	3L型	消防功能（全分）	强制Qs1合闸	强制Qs2合闸	强制Qs3合闸	母联过流闭锁 ^[5]	过载母联卸载 ^[5]	短路故障闭锁
	QL型	消防功能（全分）	强制Qs1+Qs2合闸	强制Qs1+QqL合闸	强制Qs2+QqL合闸	母联过流闭锁 ^[5]	过载母联卸载 ^[5]	短路故障闭锁

B A terminals --- 485 communication interface;

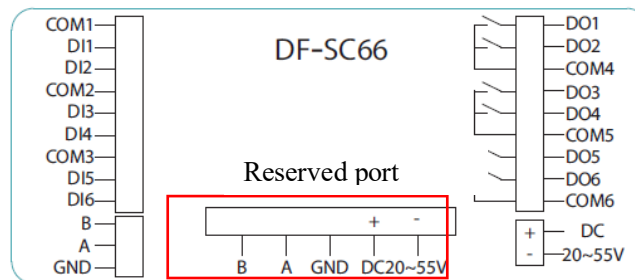
+ - terminals --- External DC24V power supply, with the power supply capacity of DC24V, 1A;

Programmable input ports: There are three groups of input ports with each port as the NO contact. For the input

status of each group of ports, customers can select three types of the required status inputs and dry contact inputs according to the port programming input table;

Relay output ports: There are three groups of relay output ports with each port consisting of two pairs of the corresponding NO and NC contacts. For the output status of each group of ports, customers can select three types of the required status outputs and dry contact outputs according to the port programming output table;

Definition and Description of DIDO Added Module Terminal (Optional)



1. The module must be connected to an external DC power supply (DC20V~55V) for normal operation (DC power supply is provided by the user);
2. COM1 is used for DI1 and DI2, COM2 is used for DI3 and DI4, and COM3 is used for DI5 and DI6;
3. Input and output are passive contact signals, DO relay contact capacity is AC250V/DC30V, 2.5A;
4. Applicable for NDQ5W dual communication controller
5. The NDQ5W controller is provided with the standard configuration of 3 DIDO ports, and the users are required to add the option only if the standard configuration is not enough;
6. Standard rail mounting.

8. Outline and Installation Dimensions

The NDQ5W-4000 automatic transfer switch device consists of controller, adapter, electric interlocking harness and actuating circuit breaker. The controller is installed separately on the instrument door of the power distribution cabinet; the adapter can be installed on the left side of the actuating circuit breaker, which can be installed freely by the user; the electric interlocking harness is wired according to the blue wire in the figure below while the actuating circuit breaker is installed in the power distribution cabinet. For external dimensions of the above product parts, see the following table (see the subsequent figure for the detailed dimensions).

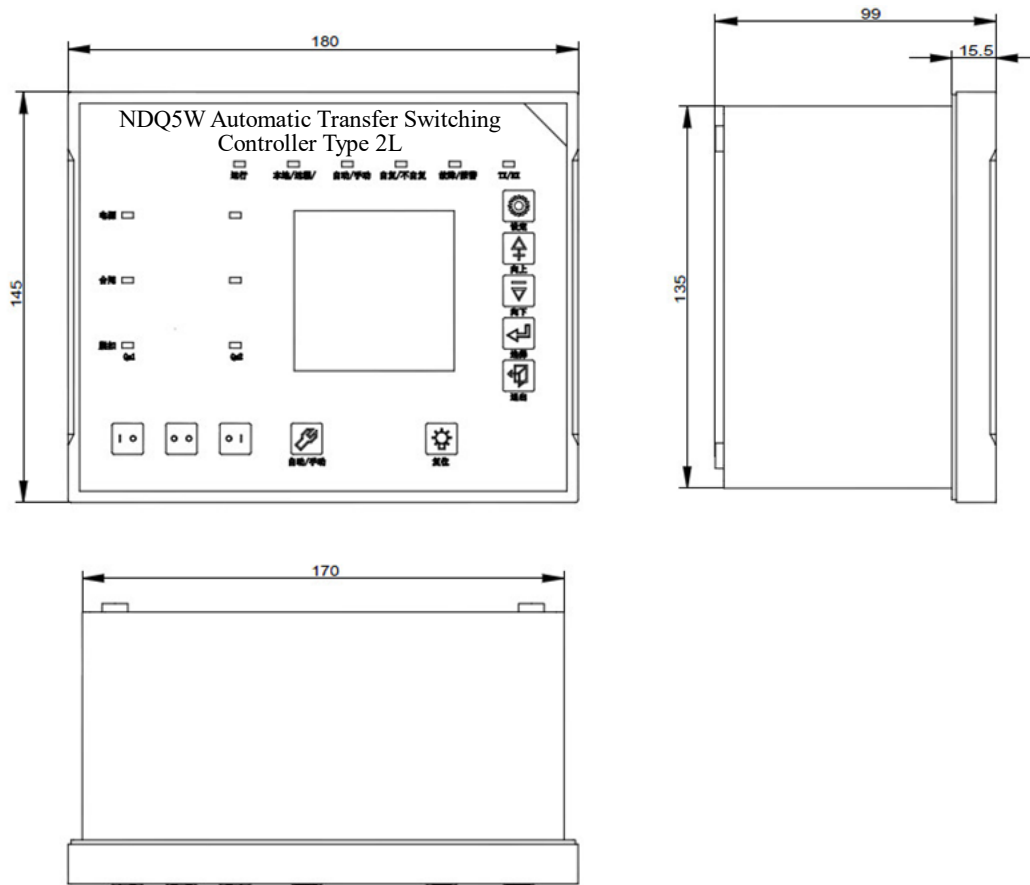
Name	Model and specifications	External dimensions (W×D×H)
Controller	2L/3L/QL/2LB/3LB/QLB	180mm×99mm×145mm
Adapter	-	83mm×80mm×219mm
Actuating circuit breaker installed with an adapter	NDW3-4000/3P drawout type	517mm×495mm×432mm
	NDW3-4000/4P drawout type	632mm×495mm×432mm

Note: The controller dimension doesn't include the wiring terminal dimension.



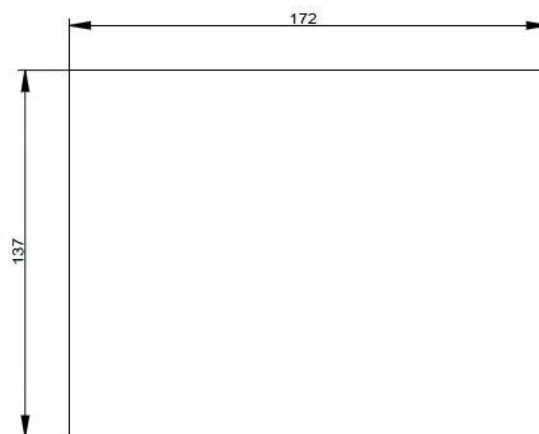
Note: 1#, 2#, 3# harness is the control line; 4#, 5#, 6# harness is the interlocking line; 7#, 8#, 9# harness is the actuating line.

External dimensions of controller (in mm)



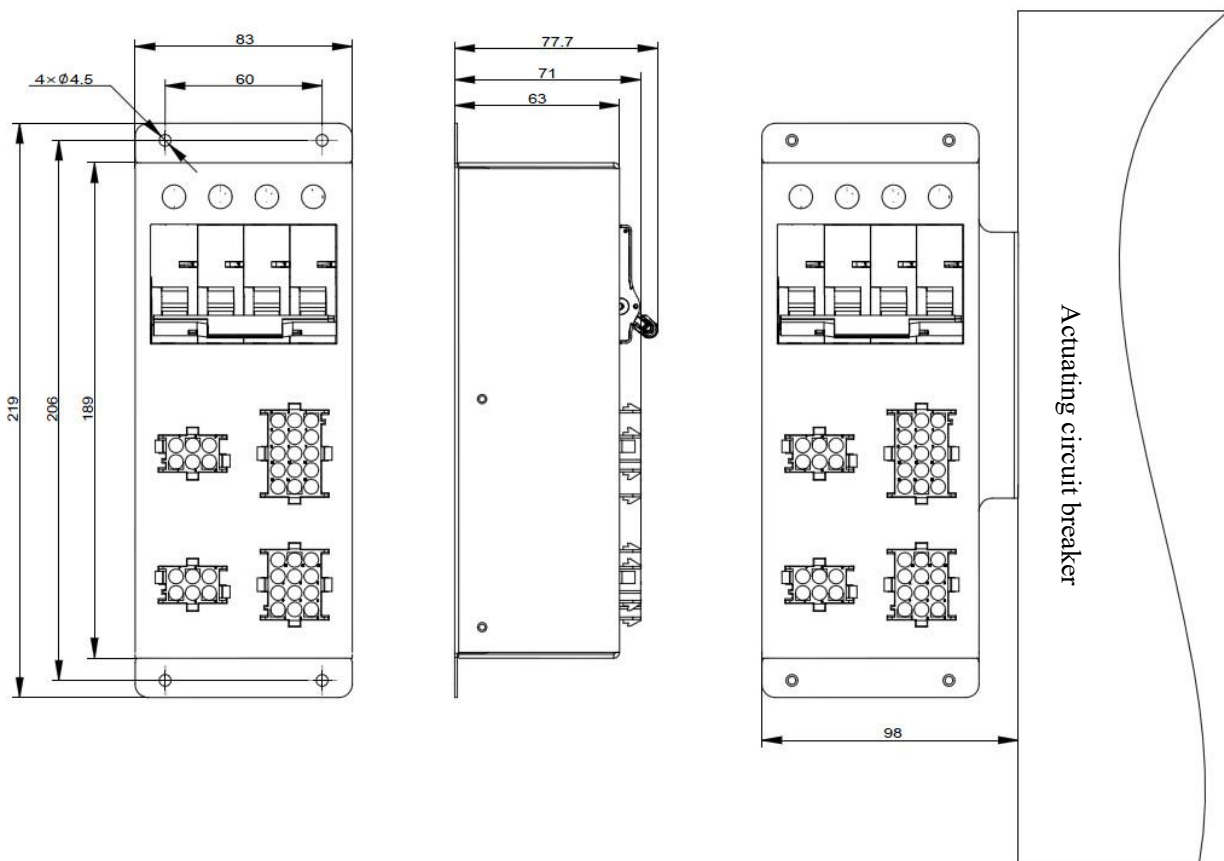
Note: External and installation dimensions of all controller models (2L, 3L, QL, 2LB, 3LB, QLB) are the same.

Cabinet door opening dimensions of controller (in mm)

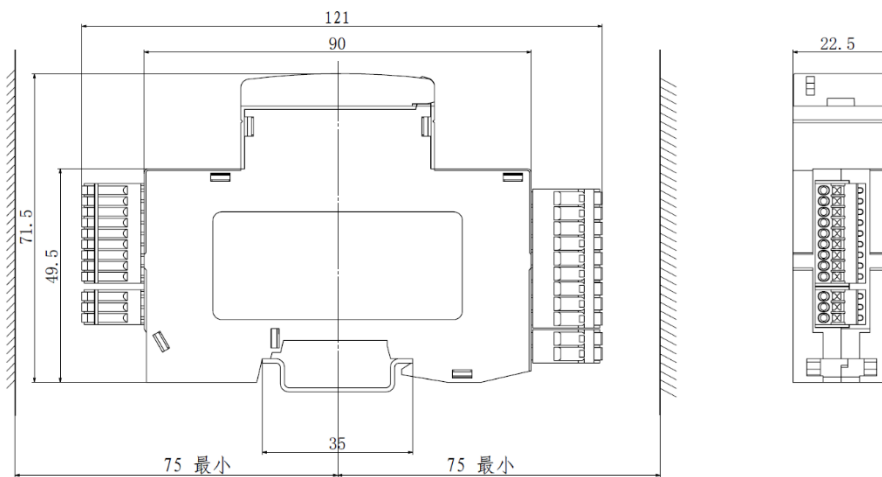


Note: The limit deviation of the opening dimensions is ± 0.5 .

External and installation dimensions of adapter (in mm)

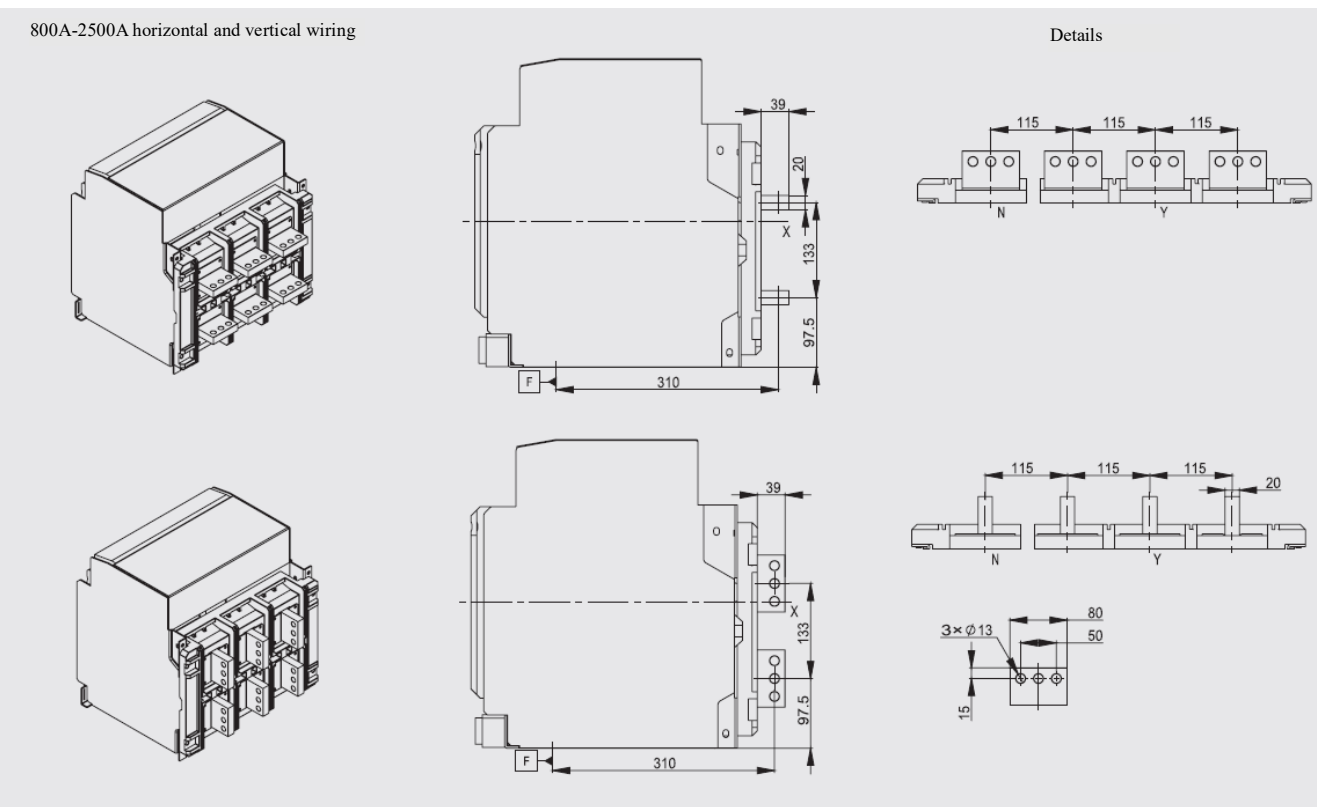
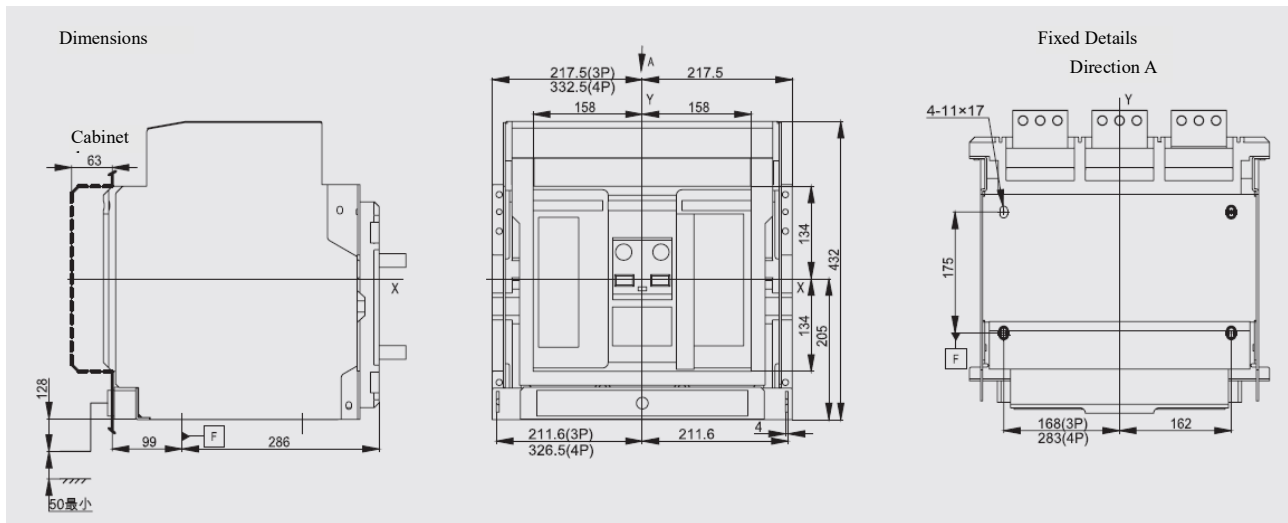


Outline and Mounting Dimensions of Optional DIDO Module (in mm)



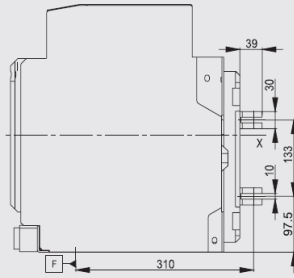
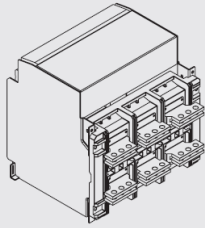
Rail mounting, minimum installation space size 150mm, recommended size ≥ 160 mm

External and installation dimensions of NDW3-4000 actuating circuit breaker (in mm)

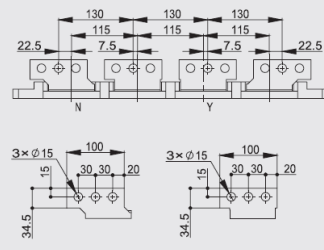
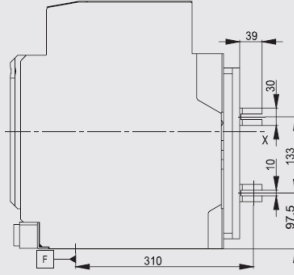
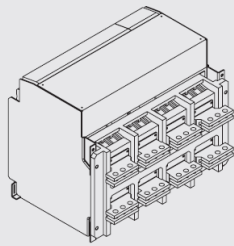
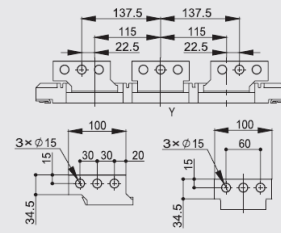


Note: X and Y are the symmetric axes of the front mask

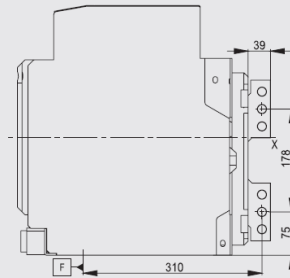
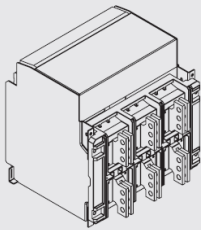
3200A-4000A horizontal wiring



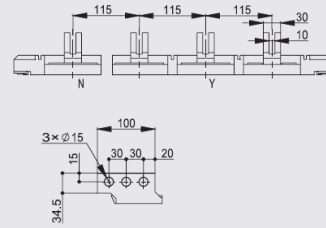
Details



3200A-4000A vertical wiring



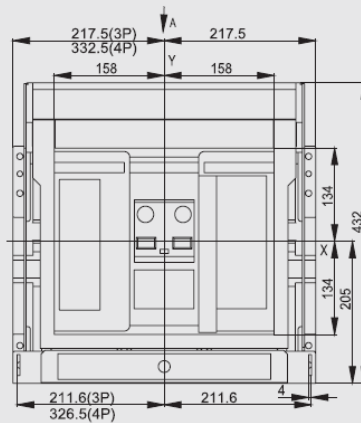
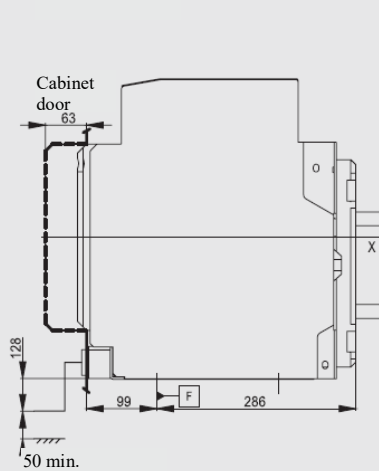
Details



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

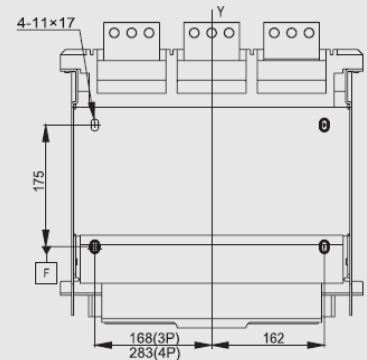
External and installation dimensions of the NDW2-4000 actuating circuit breaker (in mm)

Dimensions



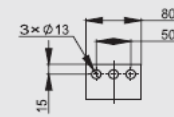
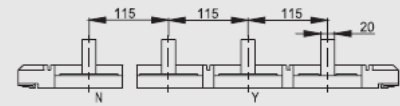
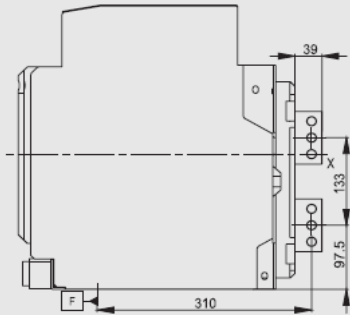
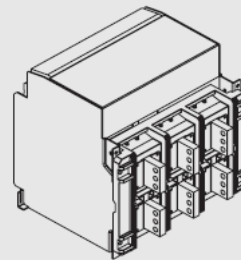
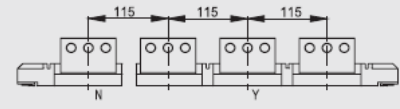
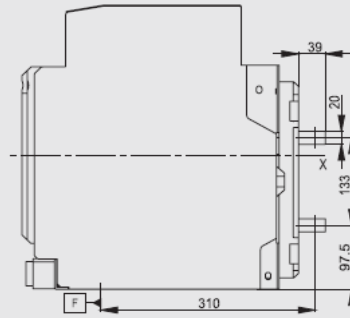
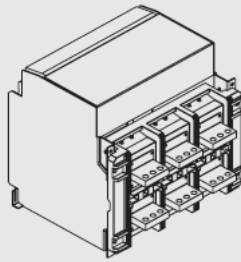
Fixed Details

Direction A



800A-2500A horizontal and vertical wiring

Details

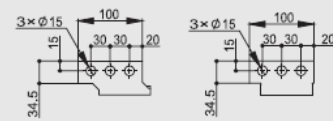
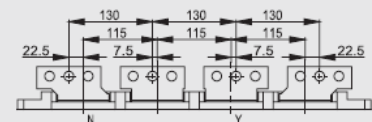
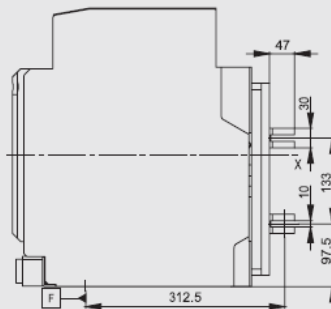
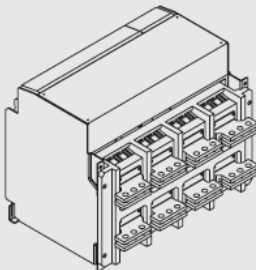
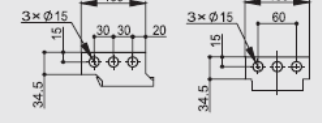
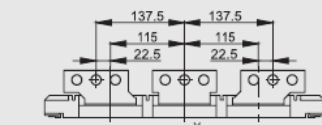
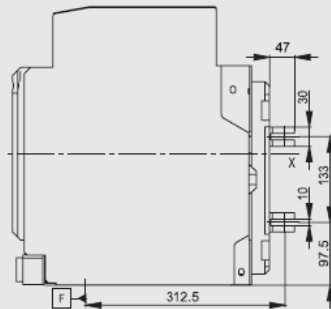
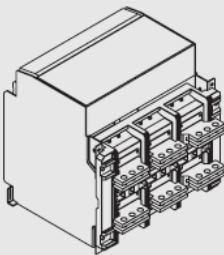


Note: X and Y axes are the symmetric axes of the front mask;

Connection bolt between bus and terminal	Applied torque with flat shims (N.m)
M12(800-2500A)	60
M14(3200-4000A)	97

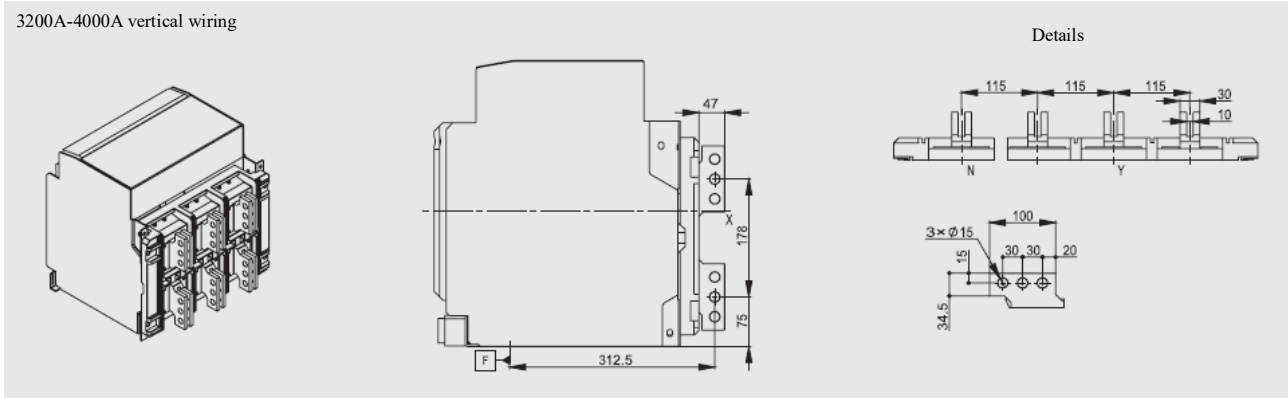
3200A-4000A horizontal wiring

Details



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

3200A-4000A vertical wiring



9. Electrical Circuit Diagram

Type 2L controller

NDQ5WV Wiring Instructions:

18 Wire Harness: Qs1 control wire, connecting adapter and controller, pre-fabricated harness, which will directly plugged by the customer into the corresponding terminal;

2 # Wire Harness: Qs2 control wire, connecting the adapter and controller, pre-fabricated harness, which will be directly plugged by the customer into the corresponding terminal;

4# Harness: Qs1 and Qs2 interlocking wires, connecting the adapter to the adapter, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;

7# harness-8# harness: connect the adapter with the secondary terminals of the circuit breaker, the secondary terminals of the circuit breaker have been connected in the factory, and the adapter end users can insert the corresponding terminals;

The unbroken sampling line of the adapter will be accessed by the user in the site (3P products must be connected to an external N line).

Wiring Instructions of Secondary Wiring Port for Added Functions of Circuit Breaker

Ports 12 and 13: DO output signal of S1/S2/S3 signal unit or loss-of-voltage release;

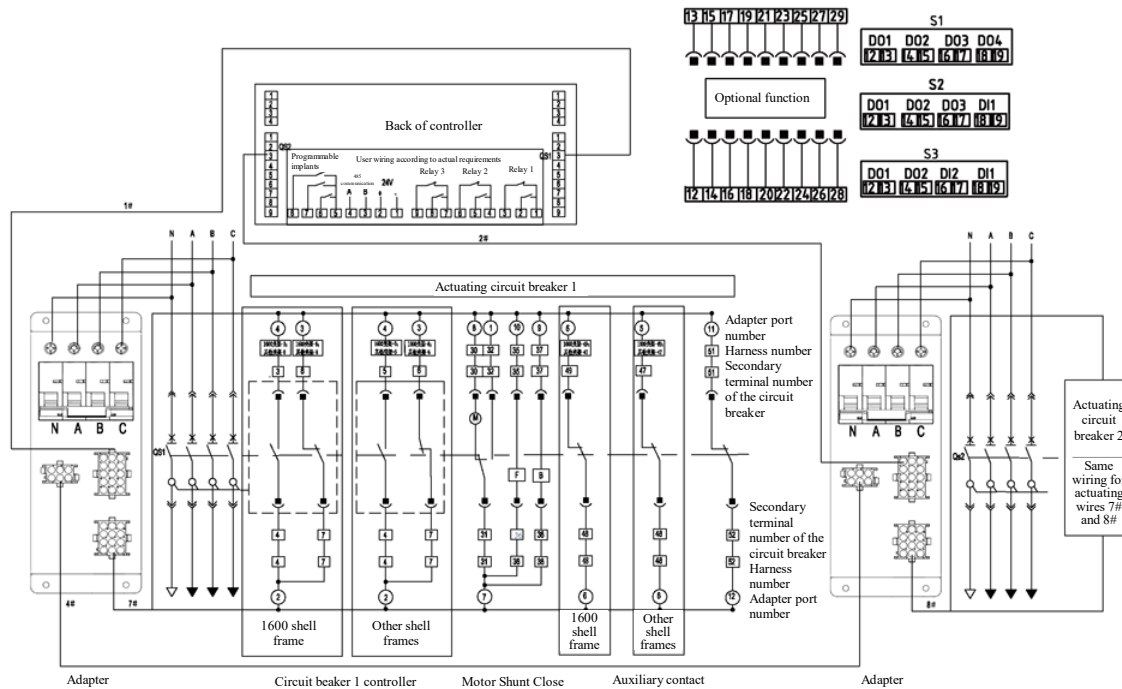
Ports 14 and 15: DO output signals of S1/S2/S3 signaling unit or loss-of-voltage release;

Ports 16 and 17: DO output signal of S1/S2 signal unit or DI1 input signal of S3 signal unit;

Ports 18 and 19: DO output signal of S1 signal unit or DI1 input signal of S2/S3 signal unit;

Ports 28 and 29: Communication interface, port 28 is red (A) and port 29 is green (B);

Ports 12-19: DO contact capacity: 0.5AVDC110V, 5A/AC250V; D signal input: shorted.



Notes: 1. The controller operating power supply of the circuit breaker needs to be connected to the secondary wiring terminals 1 and 2 of the frame by the user;

2. The secondary wiring terminal conversion system of the circuit breaker has been occupied, and the user is not allowed to use it again

3. Circuit breaker ports occupy 1600 shell frame 3,4,7,8,30,31,32,35,36,37,38,48,49,51,52

Other shell frames 4,5,6,7,30,31,32,35,36,37,38,47,48,51,52

Type 2LB controller

NDQ5W Wiring Instructions:

- 1# Harness: Qs1 control wire, connecting the adapter with the controller, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;
 - 2 # Wire Harness: Qs2 control wire, connecting the adapter and controller, pre-fabricated harness, which will be directly plugged by the customer into the corresponding terminal;
 - 7# harness-9# harness: connect the adapter with the secondary wiring terminals of the circuit breaker, the secondary wiring terminals of the circuit breaker have been factory connected, and the adapter end users can insert the corresponding terminals;
- The unbroken sampling line of the adapter will be accessed by the user in the site (3P products must be connected to an external N line).

Wiring Instructions of Secondary Wiring Terminals for Added Functions of Circuit Breaker:

Ports 12 and 13: DO output signal of S1/S2/S3 signal unit or loss-of-voltage release;

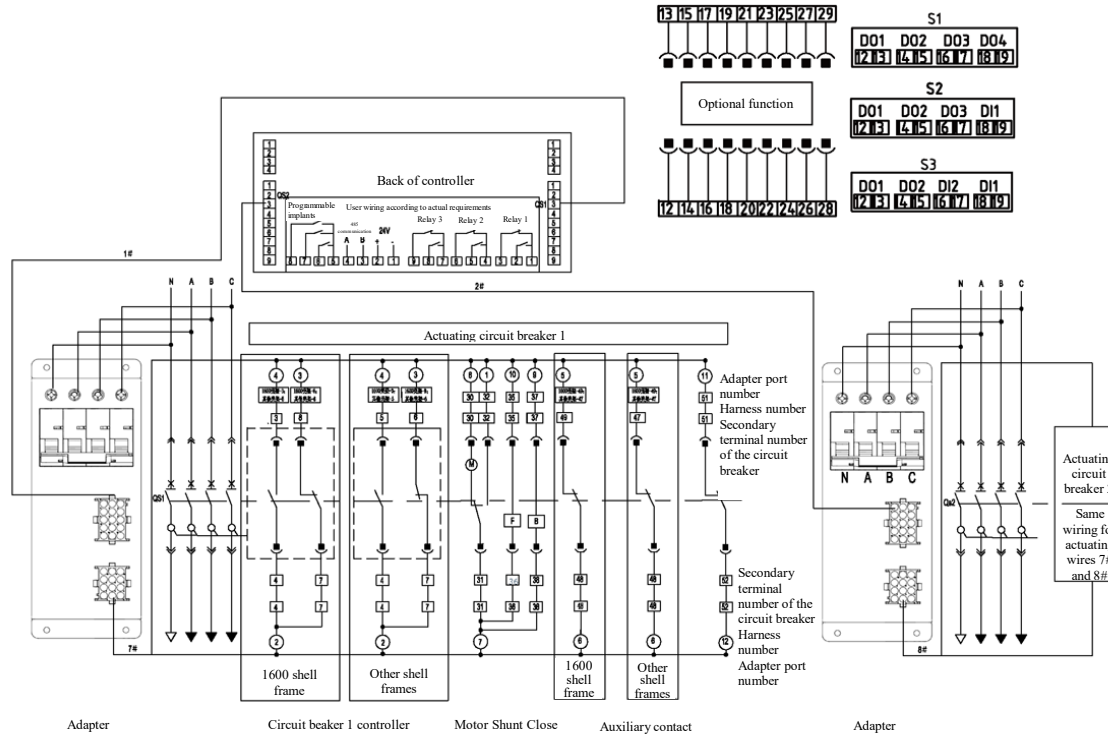
Ports 14 and 15: DO output signals of S1/S2/S3 signal unit or loss-of-voltage release

Ports 16 and 17: DO output signal of S1/S2 signal unit or DI2 input signal of S3 signal unit;

Ports 18 and 19: S1 signal unit DO output signal or S2/S3 signal unit DI1 input signal;

Ports 28 and 29: Communication interface, Port 28 is red (A) and Port 29 is green (B)

Port 12- Port 19: DO contact capacity: 0.5AVDC110V, 5AVAC250V; DI signal input: shorted.



- Notes:
1. The controller operating power supply of the circuit breaker needs to be connected to the secondary wiring terminals 1 and 2 of the frame by the user
 2. The secondary wiring terminal conversion system of the circuit breaker has been occupied, and the user is not allowed to use it again
 3. Circuit breaker ports occupy 1600 shell frame 3,4,7,8,30,31,32,35,36,37,38,48,49,51,52
- Other shell frames 4,5,6,7,30,31,32,35,36,37,38,47,48,51,52

Type 3L controller

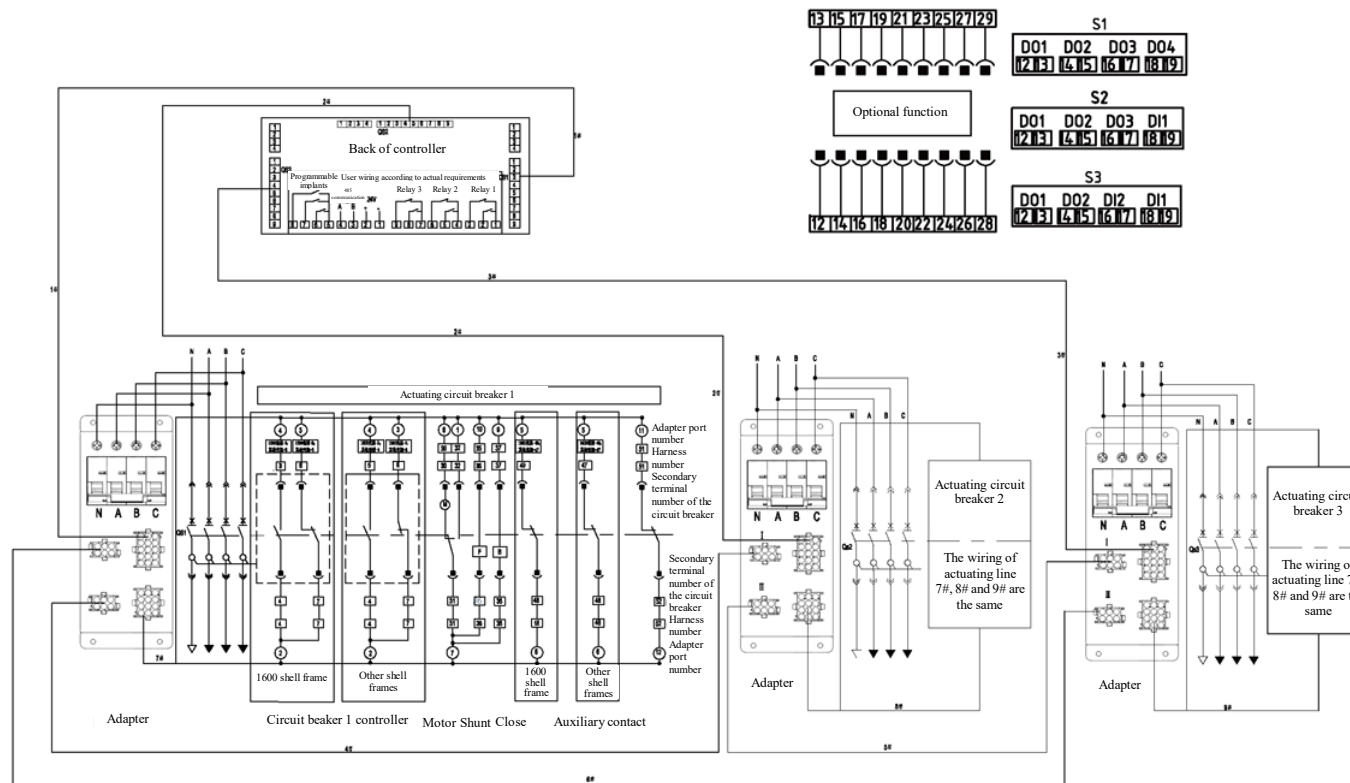
NDQ5W Wiring Instructions:

- 1# Harness: Qs1 control wire, connecting the adapter and the controller, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;
- 2# Harness: Qs2 control wire, connecting the adapter and the controller, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;
- 3# Harness: Qs3 control wire, connecting the adapter and the controller, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;
- 4# Harness: Qs1 and Qs2 interlocking wires, connecting the adapter to the adapter, prefabricated wiring harness, which will be directly plugged by the customer into the corresponding terminal;
- 5# Harness: Qs2 and Qs3 interlocking wires, connecting the adapter to the adapter, prefabricated wiring harness, which will be directly plugged by the customer into the corresponding terminal;
- 6# Harness: Qs1 and Qs3 interlocking wires, connecting the adapter to the adapter, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;
- 7# harness-9# harness: connect the adapter with the secondary terminals of the circuit breaker, the secondary terminals of the circuit breaker have been factory connected, and the adapter end users can insert the corresponding terminals:

The unbroken sampling line of the adapter will be accessed by the user in the site (3P products must be connected to an external N line).

Wiring Instructions of Secondary Wiring Port for Added Functions of Circuit Breaker:

- Ports 12 and 13: DO output signal of S1/S2/S3 signal unit or loss-of-voltage release;
- Ports 14 and 15: DO output signals of S1/S2/S3 signal unit or loss-of-voltage release;
- Ports 16 and 17: DO output signal of S1/S2 signal unit or DI2 input signal of S3 signal unit;
- Ports 18 and 19: DO output signal of S1 signal unit or DI1 input signal of S2/S3 signal unit;
- Ports 28 and 29: communication interfaces, port 28 is red (A), port 29 is green (B)
- Ports 12-19: DO contact capacity: 0.5A/DC110V, 5AVAC250V; DI signal input: shorted.



Notes:

1. The controller operating power supply of the circuit breaker needs to be connected to the secondary wiring terminals 1 and 2 of the frame by the user;
 2. The secondary wiring terminal conversion system of the circuit breaker has been occupied, and the user is not allowed to use it again
 3. Circuit breaker ports occupy 1600 shell frame 3,4,7,8,30,31,32,35,36,37,38,48,49,51,52
- Other shell frames 4,5,6,7,30,31,32,35,36,37,38,47,48,51,52

Type 3LB controller

NDQ5W wiring instructions: prefabricated wiring harness, which will be directly plugged by the customer into the corresponding terminal;

1# Harness: Qs1 control wire connects the adapter and the controller;

2# Harness: Qs2 control wire, connecting the adapter and the controller, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;

3# Harness: Qs3 control wire, connecting the adapter and the controller, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;

7# harness-9# harness: connect the adapter with the circuit breaker's secondary terminals, the circuit breaker's secondary terminals have been factory connected, and the adapter end users can insert the corresponding terminals;

The unbroken sampling line of the adapter will be accessed by the user in the site (3P products must be connected to an external N line).

Wiring Instructions of Secondary Wiring Terminals for Added Functions of Circuit Breaker:

Ports 12 and 13: DO output signal of S1/S2/S3 signal unit or loss-of-voltage release;

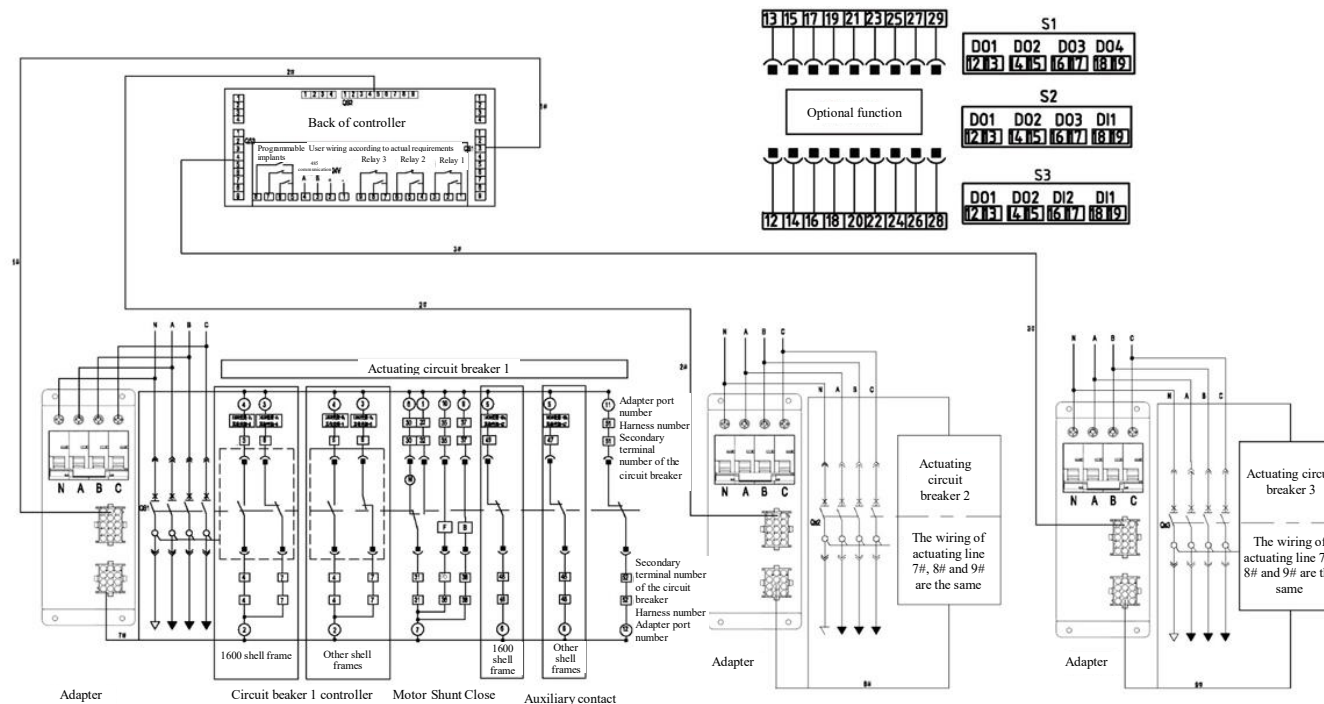
Ports 14 and 15: DO output signals of S1/S2/S3 signal unit or loss-of-voltage release;

Ports 16 and 17: DO output signal of S1/S2 signal unit or DI2 input signal of S3 signal unit;

Ports 18 and 19: DO output signal of S1 signal unit or DI1 input signal of S2/S3 signal unit;

Ports 28 and 29: communication interfaces, port 28 is red (A), port 29 is green (B);

Ports 12-19: DO contact capacity: 0.5A/DC110V, 5AVAC250V; DI signal input: shorted.



Notes:

1. The controller operating power supply of the circuit breaker needs to be connected to the secondary wiring terminals 1 and 2 of the frame by the user
2. The secondary wiring terminal conversion system of the circuit breaker has been occupied, and the user is not allowed to use it again
3. Circuit breaker ports occupy 1600 shell frame 3,4,7,8,30,31,32,35,36,37,38,48,49,51,52
Other shell frames 45,6,7,30,31,32,35,36,37,38,47,48,51,52

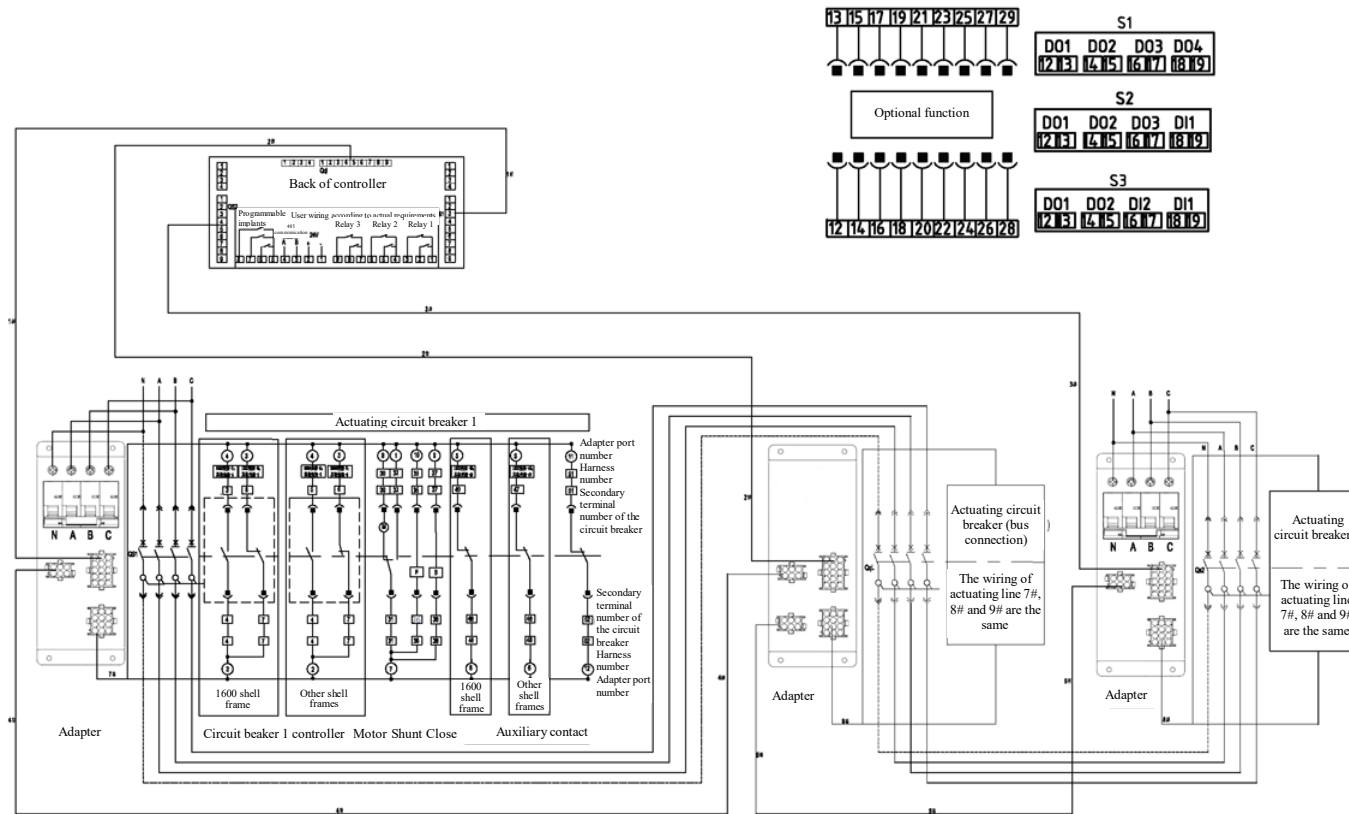
Type QL controller

NDQ5W Wiring Instructions:

- 1# Harness: Qs1 control wire, connecting the adapter and controller, prefabricated wiring harness, which will be directly plugged by the customer into the corresponding terminal;
 - 2# Harness: QqL control wire, connecting the adapter and controller, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;
 - 3# Harness: Qs2 control wire, connecting the adapter and controller, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;
 - 4# Harness: Qs1 and QaL interlocking wire, connecting adapter to adapter, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;
 - 5# Harness: Qs2 and QqL interlocking wires, connecting the adapter to the adapter, prefabricated wiring harness, which will be directly plugged by the customer into the corresponding terminal;
 - 7# harness-9# harness: connect the adapter with the circuit breaker's secondary terminals, the circuit breaker's secondary terminals have been factory connected, and the adapter end users can insert the corresponding terminals;
- The unbroken sampling line of the adapter will be accessed by the user in the site (3P products must be connected to an external N line).

Wiring Instructions of Secondary Wiring Terminals for Added Functions of Circuit Breaker:

- Ports 12 and 13: S1/S2/S3 signaling unit DO output signals or loss-of-voltage release;
 Ports 14 and 15: DO output signals of S1/S2 signal unit or loss-of-voltage release;
 Ports 16 and 17: DO output signal of S1/S2 signal unit or DI2 input signal of S3 signal unit;
 Ports 18 and 19: S1 signal unit DO output signal or S2/S3 signal unit DI1 input signal;
 Ports 28 and 29: communication interfaces, port 28 is red (A), port 29 is green (B);
 Ports 12-19: Do contact capacity: 0.5A/DC110V, 5A/AC250V; DI signal input: shorted.



Notes

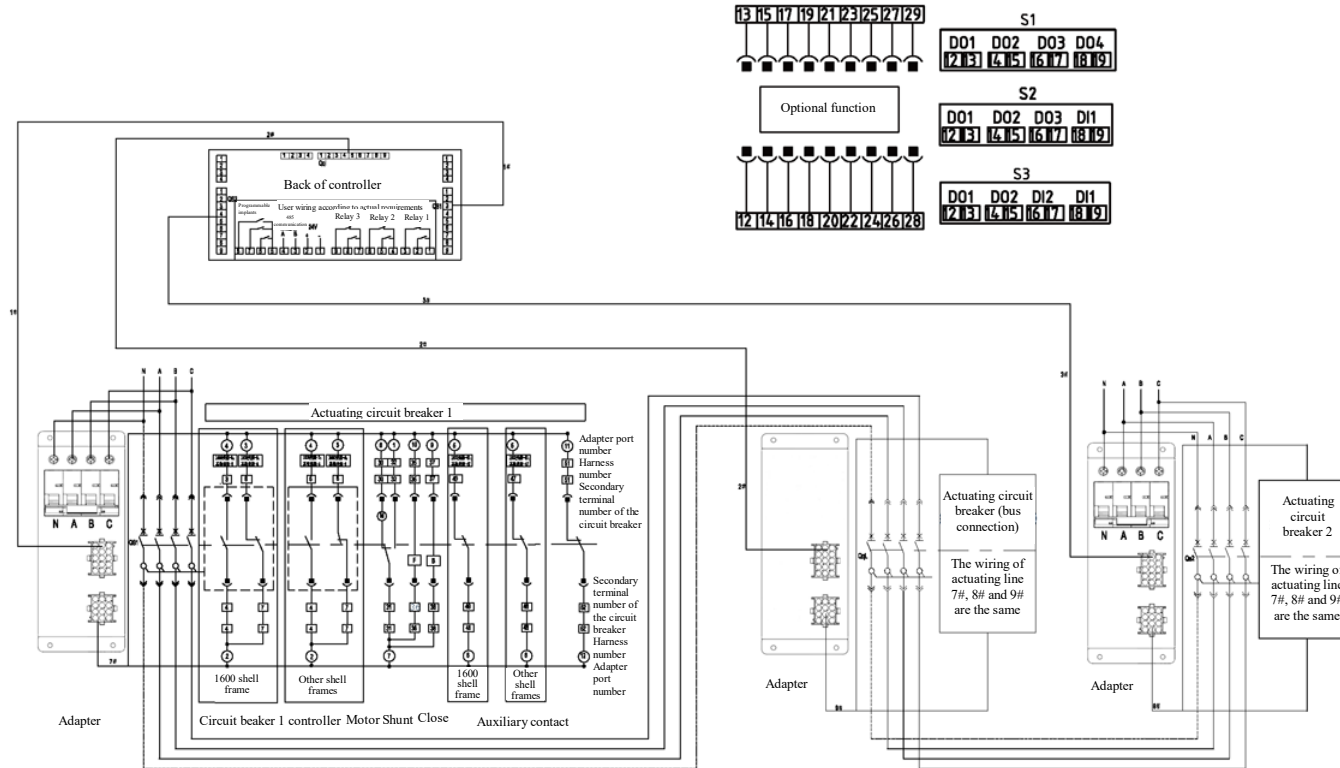
1. The controller operating power supply of the circuit breaker needs to be connected to the secondary wiring terminals 1 and 2 of the frame by the user
 2. The secondary wiring terminal conversion system of the circuit breaker has been occupied, and the user is not allowed to use it again
 3. Circuit breaker ports occupy 1600 shell frame: 3,4,7,8,30,31,32,35,36,37,38,48,49,51,52
- Other shell frames 4,5,6,7,30,31,32,35,36,37,38,47,48,51,52

Type QLB controller

NDQ5W Wiring Instructions:

1# Harness: Qs1 control wire, connecting the adapter and controller, prefabricated wiring harness, which will be directly plugged by the customer into the corresponding terminal;
 2# Harness: QqL control wire, connecting the adapter and controller, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;
 3# Harness: Qs2 control wire, connecting the adapter and controller, prefabricated harness, which will be directly plugged by the customer into the corresponding terminal;
 7# harness-9# harness: connect the adapter with the secondary wiring terminals of the circuit breaker, the secondary wiring terminals of the circuit breaker have been factory connected, and the adapter end users can insert the corresponding terminals;
 The unbroken sampling line of the adapter will be accessed by the user in the site (3P products must be connected to an external N line).

Wiring Instructions of Secondary Wiring Terminals for Added Functions of Circuit Breaker:
 Ports 12 and 13: S1/S2/S3 signaling unit DO output signals or loss-of-voltage release;
 Ports 14 and 15: DO output signals of S1/S2/S3 signaling unit or loss-of-voltage release;
 Ports 16 and 17: DO output signal of S1/S2 signal unit or DI2 input signal of S3 signal unit;
 Ports 18 and 19: S1 signal unit DO output signal or S2/S3 signal unit DI1 input signal;
 Ports 28 and 29: Communication interface, Port 28 is red (A) and Port 29 is green (B)
 Port 12- Port 19: Do contact capacity: 0.5AVDC110V, 5AVAC250V; DI signal input: shorted;



Notes:

1. The controller operating power supply of the circuit breaker needs to be connected to the secondary wiring terminals 1 and 2 of the frame by the user
2. The secondary wiring terminal conversion system of the circuit breaker has been occupied, and the user is not allowed to use it again
3. Circuit breaker ports occupy 1600 shell frame 3,4,7,8,30,31,32,35,36,37,38,48,49,51,52
 Other shell frames 4,5,6,7,30,31,32,35,36,37,38,47,48,51,52

10. Method of installation

The actuating circuit breaker with an adapter of the products is installed vertically in the cabinet, and the maximum slope with the vertical installation plane is $\pm 5^\circ$.

11. Packaging and Storage

Each actuating circuit breaker of the products covered with a waterproof plastic bag shall be packaged with special wooden cases, which are fixed in the case with screws. If the mechanical interlock and other circuit breaker accessories are required, they shall be placed in wooden cases. Controller, adapter, electrical interlocking harness, adapter mounting bracket, and set screws in the product are each covered with a waterproof plastic bag, of which the controller and adapter are in special packaging.

Products should be stored in a warehouse with the ambient temperature of $-55^\circ\text{C}\sim+70^\circ\text{C}$ and the corresponding relative humidity below 80% without acidic, alkali or other corrosive gas in the surrounding air. Under the conditions above, the storage period shall be no more than 18 months since the manufacturing date.

12. Environmental Compliance

Comply with the requirements of RoHS directives.

13. List of Accessories and Installation

For the accessory list of the actuating circuit breaker, please refer to the product specification of the NDW3-2500 frame circuit breaker;

The accessory list of other controller components is as follows:

SN	Name	Specification	Quantity	
			Products with a 2L/2LB controller	Products with a 3L/3LB/QL/QLB controller
1	Adapter mounting bracket	--	2 pcs	3 pcs
2	Adapter and mounting bracket fastening screws	M4	14 pieces	21 pieces

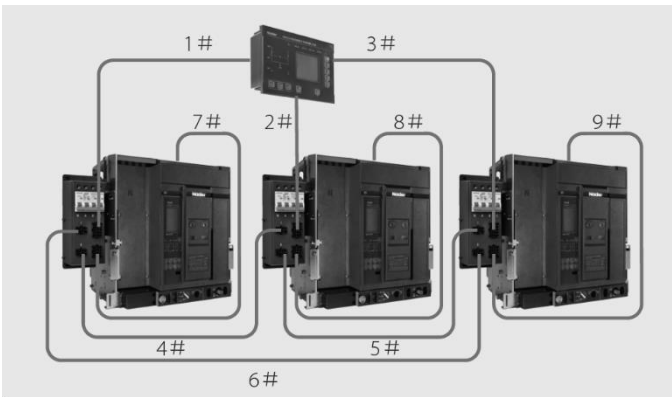
14. Precautions

- Installation, operation, use and maintenance of the electrical equipment shall be performed by qualified professionals;
- The main circuit wiring shall be proper; the N-pole of the different power supplies must be connected with that of each actuating circuit breaker of ATSE properly and reliably in the TT/TN power distribution system;
- 3P products must be connected to the zero line in the TT/TN power distribution system;
- When the transfer controller is connected for commissioning and normal operation, the button lock of each actuating circuit breaker must be locked (self-supplied). It is strictly prohibited to operate the circuit breaker manually with power on and test run shall be done with the transfer switching controller;
- Be sure to choose the controller with the control voltage of 380V in the IT power distribution system;
- This product has been subject to the insulation test before the factory delivery, and wrong dielectric test

will damage the control system. Dielectric test with the controller is prohibited;

- The controller operating power supply of the circuit breaker needs to be connected to the secondary wiring terminals 1 and 2 of the frame by the user;
- If the conversion system for the secondary wiring port of the circuit breaker has been occupied, the users are prohibited to use it twice, otherwise it will result in the damage to the controller of the conversion system, with the ports occupied by the conversion system: 4,5,6,7,30,31,32,35,36,37,38,47,48,51,52;
- 2L, 3L, QL type products are supplied in the standard configuration of electrical interlocking, mechanical interlocking is optional, the longest distance is 2 meters, and it cannot be used in case of more than 2 meters;
- Controller is provided with locking screen protection, and goes into the lock screen mode in case of no operation for a long time, and it will be unlocked by pressing the setting key for about 5S.

NDQ5W Ordering Notes (Please fill in numbers in _____, and check ☒ in ☐. For details, please refer to the instruction manual)

User unit	Number of units ordered:				Date of ordering:					
Example of wire harness location										
Controller model and the harness code of the corresponding control circuit	☐ 2L 1□, 2□, 4□, 7□, 8□	☐ 2LB 1□, 2□, 7□, 8□	☐ 3L 1□, 2□, 3□, 4□, 5□, 6□, 7□, 8□, 9□	☐ 3LB 1□, 2□, 3□, 7□, 8□, 9□	☐ QL 1□, 2□, 3□, 4□, 5□, 7□, 8□, 9□	☐ QLB 1□, 2□, 3□, 7□, 8□, 9□				
Control circuit Harness	Length of control line (1#/2#/3#)		Length of interlocking wires (4#/5#/6#)		Actuating line (7#/8#/9#)					
	3m ☐ X 4m ☐ X 6m ☐ X 10m ☐ X 15m ☐ X 20m ☐ X 25m ☐ X 30m ☐ X 35m ☐ X		3m ☐ X 4m ☐ X 6m ☐ X 10m ☐ X 15m ☐ X 20m ☐ X 25m ☐ X 30m ☐ X 35m ☐ X		1 meter as standard <i>Optional with 2m, 4m</i>					
	注: 当导线长度不同时, 请单独检查, 如 35m X2 或 X3 后, 如 35m X2					In case of the same harness length, mark X2 or X3 after it, such as 35m X2				
Shell frame level	☐ NDQ5W-1600 ☐ NDQ5W-2500 ☐ NDQ5W-4000 ☐ NDQ5W-6300									
Rated current (A)	☐ 200 ☐ 400 ☐ 630 ☐ 800 ☐ 1000 ☐ 1250 ☐ 1600				1600 shell frame					
	☐ 630 ☐ 800 ☐ 1000 ☐ 1250 ☐ 1600 ☐ 2000 ☐ 2500 Note 2				2500 shell frame					
	☐ 800 ☐ 1000 ☐ 1250 ☐ 1600 ☐ 2000 ☐ 2500 ☐ 3200 ☐ 4000				4000 shell frame					
	☐ 4000 ☐ 5000 ☐ 6300				6300 shell frame					
	Note 1: The default current is the same if a single item is checked; if multiple items are checked, give the remark ×2 after it if the current of 2 sets is the same, such as: √800×2; Note 2: In case of 2500A current for 2500 shell frame, it is allowed to choose NDW3 products only									
Rated Operating Voltage (V)	☐ AC380/400/415V (TT/TN)									
Number of poles	☐ 3 (3-pole) ☐ 4 (4-pole)									
Installation structure	☒ C drawout type									
Wiring mode	☐ Horizontal wiring (default) ☐ J3-Vertical wiring									
	Note: In case of rated current 6300A for NDW2-6300/NDW3-6300, only vertical wiring mode is available									
NDQ5W Controller Type	☐ Conventional type (default) ☐ Dual communication type									
Type selection specification for the actuation body (frame circuit breaker)										
Frame Series	☐ NDW2 ☐ NDW3									

Required Accessories (Standard configuration)	Intelligent controller	☐ KM2-NWK31 (AC220V/AC230V) (Digital Screen)		1600 shell frame
		☐ KY2-NWK32 (AC220V/AC230V) (LCD)		
	Auxiliary contact	☐ KM2-NWK21 (AC220V/AC230V) (Digital Screen)		2500/4000/6300 shell frame
		☐ KY2-NWK22 (AC220V/AC230V) (LCD)		
	Electric operating mechanism	A6-Six-group conversion		1600 shell frame
		A66-Six normally opened and six normally closed		2500/4000/6300 shell frame
	Shunt release	☐ F2(AC220V/AC230V)		
	Closing electromagnet	☐ B2(AC220V/AC230V)		
	Phase partition	G phase partition		
	Door frame	M door frame		
	Dust cover	F dust cover		
	Three-position locking device	CS drawout triolocation lock and unlock devices		
	Button lock	☐ S1	1600 shell frame	
☐ S2		2500/4000/6300 shell frame		
The following items are optional and can be left unchecked in case of no special requirement				
Optional functions for the controller of frame body	Protection type	☐ Conventional type (standard configuration) ☐ V - Voltage measurement and protection type ☐ P - Harmonic measurement and protection type		
	Communication function	☐ H (Modbus) (communication function is included in the NDQ5W controller, and this option involves the communication function of the frame body controller)		
	Contact wear equivalent	☐ J-Contact wear equivalent, operation times query (optional for NWK31 or NWK21)		
	Signal unit	☐ S1-4DO ☐ S2-3DO, 1DI ☐ S3-2DO, 2DI		
	Grounding mode	☐ T type (default) ☐ W type (external transformer is required for 3P+N)		
	External transformer (3P+N mandatory)	☐ N1 (62*21) for NDW2-1600, NDW3-1600 shell frames ☐ N2 (102*32.5) for NDW2-1600/2000, NDW3-1600/2500 shell frames ☐ N3 (122*52) for NDW2-2000/3200/4000/6300, NDW3-2500/4000/6300 shell frames ☐ N4 (262*102) for NDW2-3200/4000/6300, 3-2500/4000/6300 shell frames		
Optional Function Accessories	Signal output function	☐ BX-Signal output unit for the closing ready ☐ CX - Drawout three-position signal output function		
	Drawer seat function	☐ CM1-Right door interlock ☐ CM2-Left door interlock		
	Extended Signal Unit	☐ 6DI6DO signaling unit (NDQ5W controller is delivered with 3DIDO as standard, and when the standard is not enough, it is required to extend the use of dual-communication type controller)		
	Mechanical interlocking	Cable type (optional up to 2 meters, and not available for products larger than 2 meters or for the parallel products)	☐ SR11 - two sets, one for closing and one for opening (2L type) ☐ SR12-Three sets, one for opening and two for opening (3L type) ☐ SR21-Three groups, two for closing and one for opening (Type QL) Notes: 1. 1600 shell frame is supplied without SR12 and SR21 2. In case of the distance greater than 2 meters, adaptation is impossible	
Special requirements				

Notes:

1. If there are special requirements, please indicate in the special requirements column;
2. In case of no special requirements for the intelligent controller of the actuating circuit breaker, the corresponding current and time setting values shall be set according to the factory setting;
3. Load detection, smart load unloading, local control, busbar overcurrent locking, overload busbar unloading and other functions must be equipped with the dual communication type controller;
4. The frame circuit breaker with load detection, smart load unloading, local control, busbar overcurrent locking, overload busbar unloading and other functions needs to be added with the communication function, and the communication function of the frame circuit breaker is occupied by the conversion system;
5. 2DI2DO signaling unit must be selected for local control of frame circuit breakers.