Shanghai Liangxin Electric Co., Ltd

(NDQ3-1600 Automatic Transfer Switching Appliance)

Product Specifications

(IPD-ENG-DEV-T20A1 2024-11-26)

weave	Su Kaixing	date	2025-06-17
Audit	Cao Xuehu	date	2025-06-17
Sign	Penson	date	2025-06-19
approve	Zhang Huifeng	date	2025-06-20

Revision record					
version	Reason/Content of the revision	Date of implementation	Producer	Reviewer	Approver
0	New	2022-06-28	Zhang Huifeng	Cao Xuehu	Wang Jili
1	N-type controller added	2022-09-20	Zhang Huifeng	Cao Xuehu	Wang Jili
2	Modify the document template	2022-12-01	Zhang Huifeng	Cao Xuehu	Wang Jili
3	Increase the temperature drop coefficient	2023-01-03	Zhang Huifeng	Cao Xuehu	Wang Jili
4	Modify the busbar size and wiring bolt specifications	2023-06-07	Cao Xuehu	Zhang Huifeng	Wang Jili
5	Proofreading of three books	2024-11-26	Su Kaixing	Cao Xuehu	Zhang Huifeng
6	Dual power standard upgrade	2025-06-16	Su Kaixing	Cao Xuehu	Zhang Huifeng

1. Scope of application and use

NDQ3-1600 PC-level automatic transfer switching electrical appliance is suitable for places below AC 380V/400V/415V and rated frequency 50Hz/60Hz. It complies with GB14048.1-2023 and GB/T14048.11-2024 standards, as well as the Fire Protection Code for High-rise Civil Buildings, the Fire Protection Code for Building Design, the Emergency Lighting Design Guidelines, and the Electrical Design Code for Civil Buildings.

This product is mainly used for the first-class load stipulated by the state, and is widely used in fire protection, post and telecommunications, hospitals, hotels, urban rail transit, high-rise buildings, industrial assembly lines, television stations and other important places that require continuous power supply. The main and standby power sources can be grid power supplies, self-starting generator sets, battery packs, etc.

2. Product pictures (for reference only)

NDQ3-1600 product image

3. Description of specifications and models

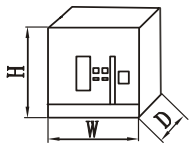
ND Q □- □ □ □/□ □ □ □ 1 2 3 4 5 6 7 8 9 10		
serial number	Serial number description	NDQ3-1600
1	Enterprise code	ND: "LAZZEN" brand low-voltage electrical appliances
2	Product code	Q: Automatic transfer switching appliances
3	Design serial number	3

4	Shell grade current rating	1600
5	Structural form	F-split 1
6	Rated working current	400A, 630A, 800A, 1000A, 1250A, 1600A
7	Extreme number	3-3P 4-4P
8	Control mode	R-self-report and self-recovery、S-Self-investment without self-recovery [2]
9	Switch position	III - Three-stage style
10	Controller type	Type N-N, type D-D

Note 1: The length of the split wiring harness is 3 meters; 2: Type D factory default self-investment and self-reset, other control methods can be adjusted by customers on site.

4. Main technical parameters

Model specifications		NDQ3-1600
Shell Grade Current Rating (A)		1600
Rated Operating Voltage Ue(V)		AC380V/AC400V/AC415V
Rated frequency f(Hz)		50/60
Rated Insulation Voltage Ui(V)		AC1000V
Rated Shock Withstand Voltage Uimp (kV)		12kV
Rated Limiting Short Circuit Current Iq(kA)		130
Contact Changeover Time (ms)		≤100
Conversion Action Time (ms)		≤200
Operational performance	Mechanical life (times)	10000
	Electrical life (times)	6000
Appliance level		PC-specific type
Use categories		AC-33B/AC-33iA
Extreme number		3P 4P
Control Voltage (V)		230V
Wiring method		Behind the board
Switch position		Three-stage format
Structural form		Split
Isolation lock		√
Working mode		self-report and self-recovery, Self-investment without self-recovery
Power mode		Grid-grid, grid-generator

Dimensions: W×H×D mm  	Pole number 3P/4P	3P：555×381×313.5 4P：665×381×313.5		
Product certification		CCC	CQC	CB

4.1 Cross-sectional area selection of dual power supply connection bus or cable:

Table 1 Selection of cross-sectional area for connecting busbars or cables

Rated	400	630	800	1000	1250	1600
Cross-	150*2	185*2	240*2	60*10	80*10	100*10

4.2 Double power terminal block and mounting screw tightening torque

Table 2 Tightening torque of terminal blocks and mounting screws

Model	Thread diameter (mm)	Torque torque (N·m).
NDQ3-1600	Terminal screw M10	20
	Mounting screw M10	20

4.3 Product weight

Table 3 Product weight

Model	Extreme number	Gross Weight (Kg)	Net Weight (Kg)
NDQ3-1600	3P	77	65
	4P	95	78

5. Controller function

Table 4 Controller function comparison

Function description:		N-type controller	D-type controller
Protection function	Overvoltage protection	√	√
	Undervoltage protection	√	√
	Cut off the phase protection	√	√
	Over frequency protection	-	√
	Under-frequency protection	-	√
	Broadband protection	-	▽
	PhaseSequence/Phase Protection	-	√
	Phase angle detection protection	-	√

	Wrong line alarm	√	√
Measurement function	Voltage value	-	√
	Frequency value	-	√
	Imbalance	-	√
Communication function	MODBUS-RTU protocol	√	√
Node input/output	Fire signal input	√	√
	Commonly used closing output	√	√
	Backup closing output	√	√
	Generator start output	√	√
	Fault alarm output	√	√
	Communication ports	√	√
	Remote switch control input	-	√
	Fault locking [1]	-	√
	Programmable port output	-	√
display	Common power supply (LED light)	√	√
	Backup power (LED light)	√	√
	Common closing (LED light)	√	√
	Spare closing (LED light)	√	√
	Automatic (LED light)	√	√
	Fault/Alarm (LED Light)	-	√
	Operation (LED light)	-	√
	Coil (LED light)	-	√
	Fire Protection (III.) (LED Light)	√	√
	Communication (LED light)	-	√
	Remote/Local (LED Light)	-	√
	Phase voltage fault alarm information [2]	√	√
	Fault connection fault alarm information [2]	√	√
	Failure Conversion Alarm Information [2]	√	√
	LCD screen	-	√
Power supply mode choose	Power grid - power grid [3]	√	√
	Power grid - generator [3]	√	√
Working mode choose	self-report and self-recovery	√	√
	Self-investment without	√	√

Power first	Common use first	√	√
	Spare priority	√	√
Delay adjustment	Split/Conversion Delay (T1)	√	√
	Closing/Return Delay (T2)	√	√
	Generator cooling delay	-	√
	Generator start delay	-	√
Voltage protection threshold	Undervoltage value	165V	(0.7~0.95) × 230V adjustable
	Overvoltage value	270V	(1.05~1.3) × 230V adjustable
keystroke	Automatic/manual	√	√
	I. Commonly used/△	√	√
	Set up	-	√
	II. Spare/▽	√	√
	reposition	-	√
	○Power Loss (III)/	√	√
	Confirm	-	√
	Test	√	√ (confirmed after selecting through the program)
other	Remote switching function	-	√
	Rated frequency selection	-	√
	buzzer	-	√
	Double enable[4]	-	▽
	Excess and underpressure recovery	_	▽
	Automatic inspection of generators	_	√
	Clear fault logs	-	▽
	Clear the operation log	-	▽
	A phase voltage coefficient is commonly used	-	▽
	Commonly used B phase voltage coefficient	_	▽
	Commonly used C phase voltage coefficient	_	▽
	Standby A phase voltage coefficient	_	▽
	Standby B phase voltage coefficient	_	▽

	Standby C phase voltage coefficient	–	▽
	Calibrate the voltage value	–	▽

"√" means only this function; "▽" means that the customer is adjustable;

Note: [1] After the fault locking enable is opened, the remote control input signal of the secondary terminal block port 16 0 is automatically switched to a fault locking signal from the power off, and the fault locking takes effect when it is connected to the common com.

[2] In the N-type controller, the phase voltage fault alarm information: common/standby overvoltage, corresponding to the power indicator flashing at 5Hz; Common/standby undervoltage, corresponding to the power indicator 1Hz slow flash; Common/standby phase absence, corresponding power indicator light is always off;

Fault alarm information for wrong wire: only power-on detection, N line is wrongly connected, all indicator lights flash at 5Hz;

Conversion failure fault alarm information: 5Hz flash flash at the same time for common closing and standby closing;

The D-type controller can provide communication query and display various fault alarm information on the panel.

[3] The power supply mode of the N-type controller does not need to be selected, and the default is a common public system (suitable for grid-grid, grid-generator).

[4] After the double enable function is turned on, the automatic transfer switch switches to the double position when the standing power supply fails at the same time. After the dual use function is turned off, the controller maintains the current state when the standing power supply fails at the same time.

6. Working conditions

6.1 Normal Conditions of Use

Ambient temperature: -25° C- +70° C

Storage temperature: -55° C- +85° C

6.1.1 Ambient air temperature

The upper limit of ambient air temperature does not exceed +70° C, the lower limit is not less than -25° C, and the 24-hour average does not exceed +35° C. When it is higher than 55° C, volume reduction should be considered.

Table 5 Temperature reduction coefficient

Model	The temperature corresponds to the volume reduction coefficient of the product				
NDQ3-1600	Temperature (° C)	55	60	65	70
	Volume reduction coefficient	1.0	0.96	0.93	0.92

6.1.2 Altitude

The altitude of the installation site does not exceed 2000m, and more than 2000m needs to be reduced for use.

Table 6 Altitude degradation coefficient

project	symbol	unit	parameter			
altitude	H	m	≤2000	3000	4000	5000
Rated operating voltage	EU	V	400	400	400	400
Power frequency withstand pressure	/	V	100%	90%	75%	60%
Insulation voltage	Ui	V	100%	90%	80%	60%
Rated current	In	A	1.0In	0.96In	0.93In	0.90In

6.1.3 Atmospheric conditions

6.1.3.1 Humidity

At a maximum temperature of +40° C, the relative humidity of the air does not exceed 50%, and at lower temperatures a higher relative humidity can be allowed, e.g. up to 90% at +20° C. Special measures should be taken against occasional condensation due to temperature changes.

6.1.3.2 Pollution level: Level 3

6.2 Installation Conditions

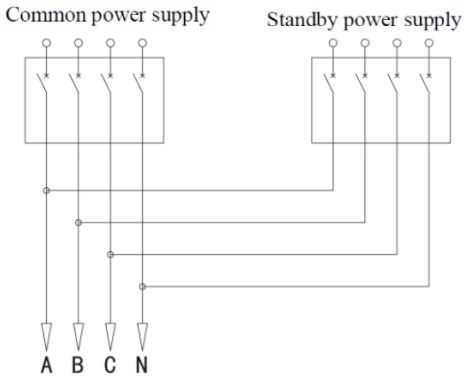
6.2.1 ATSE can be installed vertically or horizontally in the cabinet, and special requirements must be specially ordered.

6.2.2 It should be installed in a non-explosive medium, and there should be no gas or conductive dust sufficient to corrode the metal and damage the insulation.

6.2.3 It should be installed in a place where there is no rain or snow

7. Wiring diagram and external interface definition

7.1 Wiring diagram



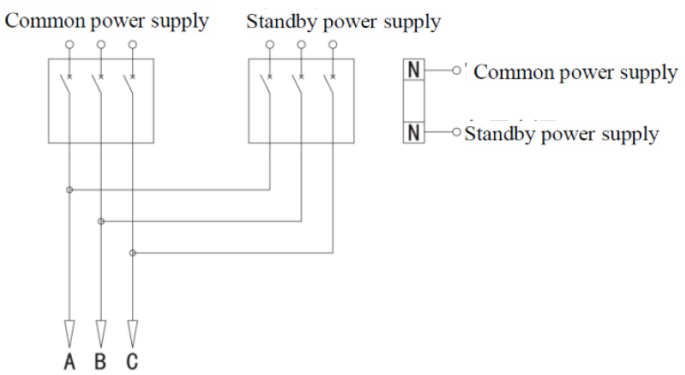


Fig.1 Schematic diagram of four-pole product wiring Fig.2 Schematic diagram of three-pole product wiring

7.2 Port Definitions

7.2.1 Product body terminal description

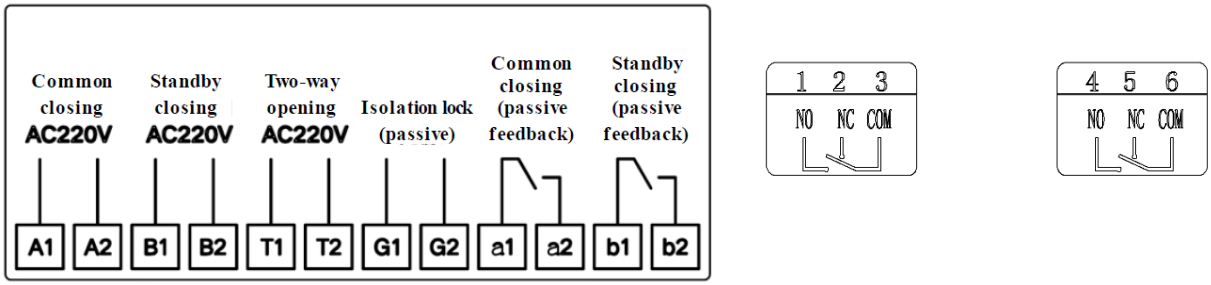


Fig.3 Schematic diagram of the wiring of the secondary terminal block of the product

●A1, A2: Commonly used closing signal input (AC-220V);

● B1, B2: Alternate closing signal input (AC-220V);

●T1, T2: Two switch signal inputs (AC-220V);

●G1, G2: isolated padlock signal output (passive opening and closing point);

●A1, A2: Commonly used closing signal output (passive opening and closing point);

●B1-B2: Backup closing signal output (passive opening and closing point)

The above contact points have been connected to the wiring harness from the factory, and the customer does not need to wire it.

●1~3, 4~6: Regular and standby each set of passive output signal (front of the body, contact capacity: 15A/AC250V)

7.2.2 NDQ3-1600 Controller User Port Description Diagram

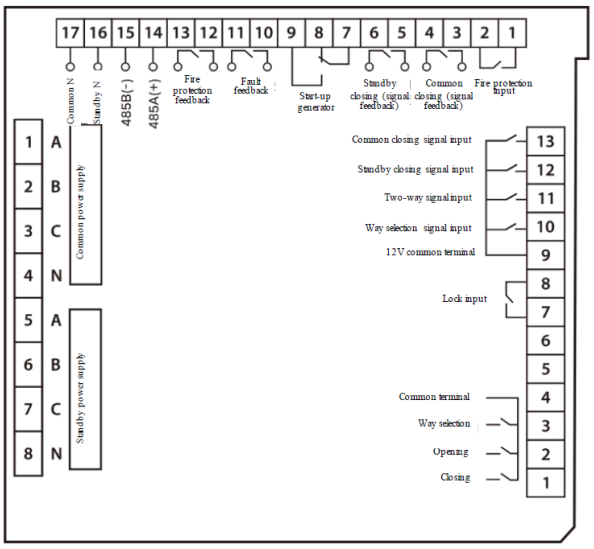


Fig. 4 User port description of N-type controller

●1-2 Fire signal input terminal, which is a passive input node, this terminal cannot be connected to the power supply, and only a short connection can trigger the fire double split of the product;

●3-4, 5-6 are the commonly used closing of the product, and the position indication of the standby closing (Note: this terminal is a passive node, and the maximum access current at the terminal is 3A AC250V);

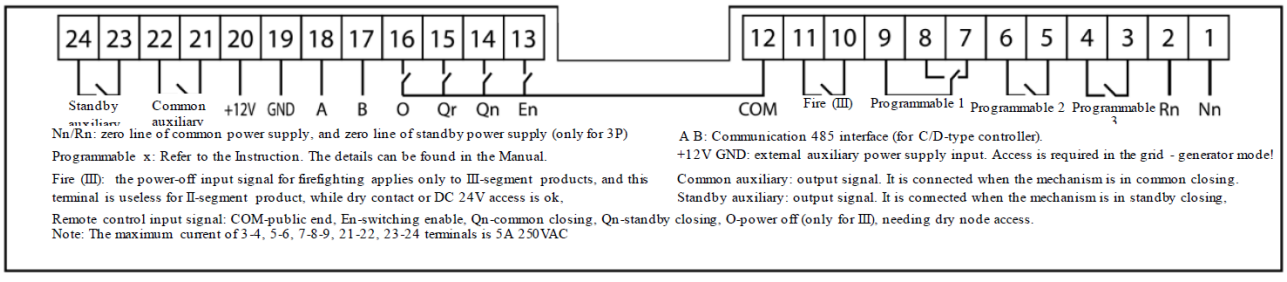
●7-8-9 terminals are generator start and unload signal terminals, when the common power supply is normal, 7 and 8 are disconnected, and 7 and 9 are on; The common power supply changes from normal to abnormal, and after a delay of 30S, 7 and 8 are turned on, and 7 and 9 are disconnected. After the common power supply returns to normal, 7 and 8 are disconnected after 30S, and 7 and 9 are turned on;

●10-11 Fault feedback, when the product conversion fails, the terminal will output a passive closure signal;

●12-13 When the product is in fire protection state, the terminal will output a passive closure signal;

●14-15 is the communication 485 interface, if you need communication protocol, please call our company's 400 technical support hotline;

●16-17 Neutral terminal block of 3P products (3P products must be connected to the neutral wire, otherwise the product will not work normally).



In the case of "Grid-Generator", programmable output port 1 is fixed as a generator/offload.

Fig. 5 User port description of the D-type controller

Table 7 Programmable port definitions of D-type controllers

0	1	2	3	4	5	6	7
Fault alarm	Grid alarm	Common power	Backup power	Commonly used	Spare closing	Generator /unloading	Input signal

		supply alarm	alarm	closing			error alarm
8	9	10	11	12	13	14	
Fire alarm	Common frequency alarm	Commonly used phase sequence/bit alarms	Commonly used voltage imbalance alarms	Alternate frequency alarm	Alternate phase sequence/bit alarm	Standby voltage imbalance alarm	

8. Product shape and installation size

8.1 NDQ3-1600 3P product shape and installation size

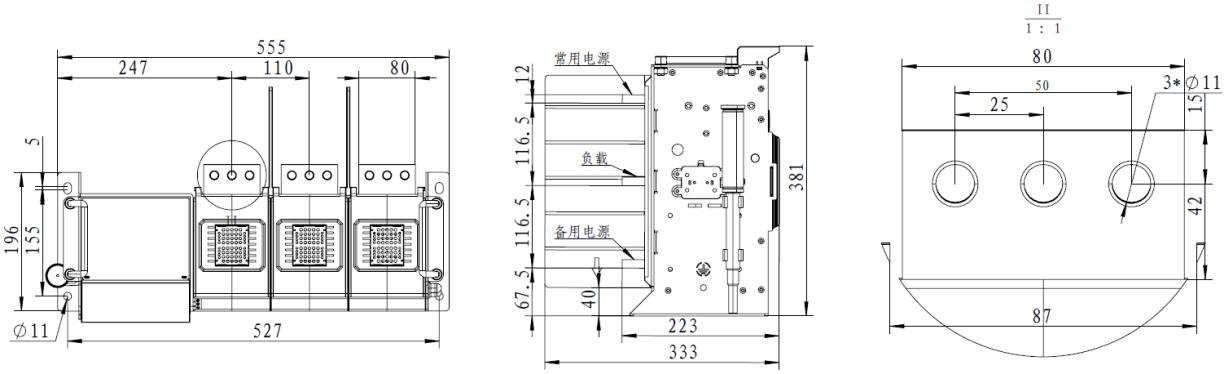


Fig.6 3P product shape and installation size

8.2 NDQ3-1600 4P product shape and installation size

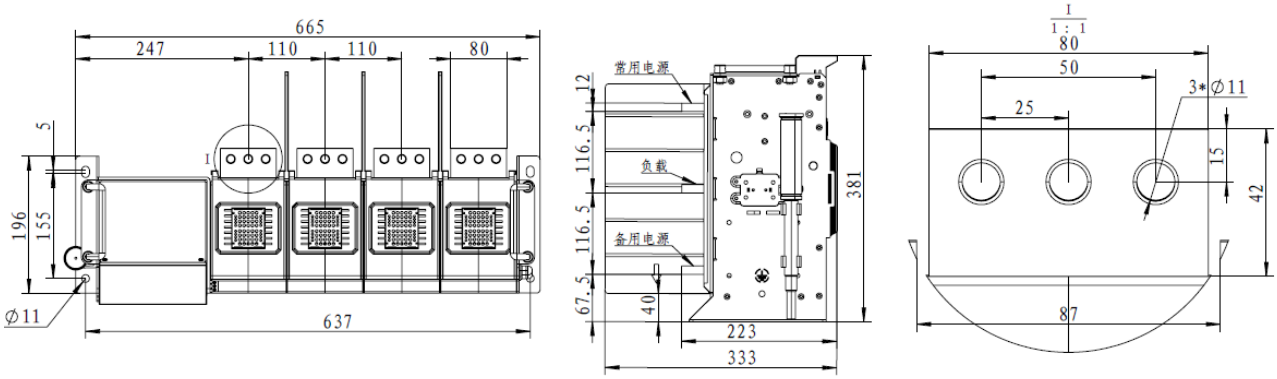


Fig.7 4P product shape and installation size

8.3 Controller shape and installation size

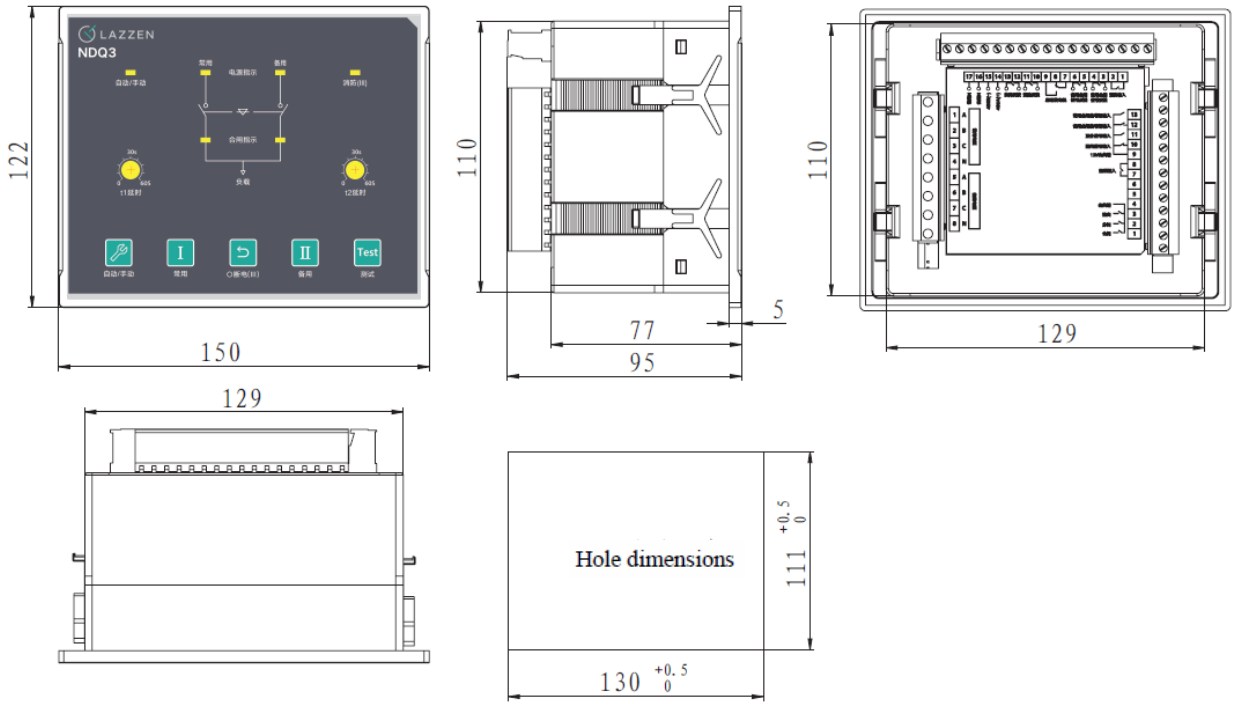


Fig.8 Installation dimensions of N-type controller

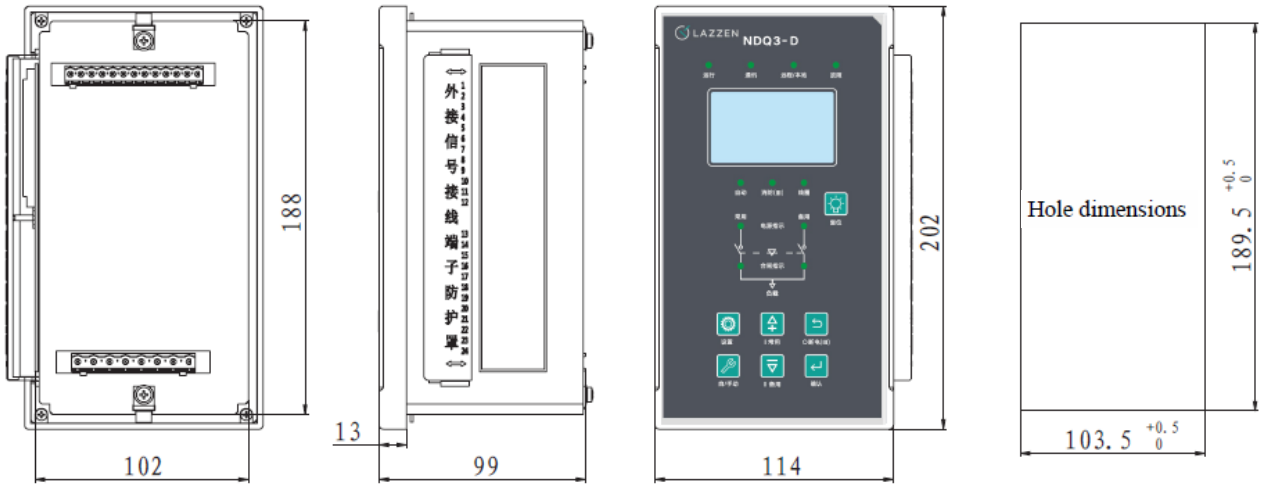


Fig.9 Installation dimensions of D-type controller

9. Installation and use

9.1 The product body is fixed and installed vertically or horizontally in the cabinet, and the maximum inclination from the vertical surface of the installation is ±22.5°.

9.2 Controller Installation

Step 1: Place the N-type/D-type split controller (the transparent cover above the secondary terminal needs to be removed) in the opening on the door panel of the screen cabinet, insert the two buckles into the slot of the controller, so that the controller is fixed on the door panel;

Step 2: As shown in Figure 17, connect the controller's connection cable to the switch body, and arrange the wiring harness.

9.3 Controller Replacement

Step 1: Unplug the connecting cable that connects the switch body.

Step 2: Remove the buckle that holds the controller, remove the old controller, replace it with a new controller, and install the buckle.

Step 3: Connect the connecting cable of the controller to the switch body and arrange the wiring harness.

9.4 Manual Operation Instructions

Warn! Because the force, speed, and angle of manual operation are not easy to master, and improper manual operation will affect the switching performance of the product, so when the power is on and loaded, try to use the controller for operation, and when manual operation is really required, please pay attention to the following points:

The operator has experience in manual operation and is familiar with manual procedures.

The operator wears complete protective equipment.

The operator confirms that the product mechanism is normal and the special handle is intact.

The operator determines that the operating power supply is disconnected.

The operator determines that the load is light, and that the load and power line are fault-free.

9.5 Manual Procedure

〇Power-off operation: Press the "two power disconnect" button shown on the face cover, and the I. and II. position indicator windows are indicated "〇".

I. Common input methods: press, the "two power disconnect" buttons shown on the face cover, the I. and II. position indicator windows are indicated "〇"", then push the cover slide, the status indicator window is placed in "manual", insert the handle, rotate down, release the handle after it is in place, and the switch I position indicator window changes from O to I.

II. Spare input method: press, the "two power supply disconnect" button shown on the face cover, I and II. position indicator windows are indicated "〇"", push the cover slide plate, the status indicator window is placed in "manual", insert the handle, press the "guide II power supply" button shown on the face cover and hold, rotate down, release the handle after it is in place, and the switch II position indicator window changes〇 from I.

10. Packaging and storage

The product is covered with a waterproof plastic bag and packed in a special box. The product is suitable for transportation and storage temperatures in the range of -25° C ~ +75° C. During transportation, the product should pay attention to moisture prevention, should not be subjected to strong bumps, vibrations, collisions, and prevent rain and snow.

11. List of attachments

Table 8 List of Annexes

serial number	name	specification	quantity

1	Arc plate	--	3P:2; 4P:3
2	Manual dedicated handle	--	1
3	Hex head bolts	M10*40	4P：36；3P：27
4	Flat pad	Φ10	4P：36；3P：27
5	Bullet pad	Φ10	4P：36；3P：27
6	nut	M10	4P：36；3P：27

12. Precautions

1. 3P product controllers must be connected to the neutral wire;

2. The switch should be installed correctly, check whether the nameplate content meets the requirements before installation, and confirm that the switch is disconnected;

3. This product can work reliably at 85%Ue~110%Ue voltage. When the product is installed and wired, the inlet and outlet ends and N poles should be strictly distinguished, and the neutral wire should not be shared;

4. It is strictly forbidden to use this product under conditions beyond normal use conditions, such as continuous water vapor or condensation without corresponding precautions, combustible or corrosive dust, no SCPD coordination or expected short-circuit current beyond the range, voltage over high or too low, current exceeding the rated current, and altitude at high altitude;

5. When wiring the switch, it should be wired strictly according to the only sign, and the neutral wire should be connected to the neutral terminal for the three-pole product. According to the actual situation, the wiring of fire linkage and power generation control is carried out, and finally the product is well grounded;

6. The isolation lock can only be locked when the middle position of the product is required,

and the controller cannot be operated when the padlock is not operated, and the handle cannot be operated;

7. Please conduct conversion tests regularly (recommended every three months) to confirm that the product is working properly. Regularly dispose of dust on the surface of the housing to maintain good insulation. Pay attention to moisture and dust proof for switches that are not used for a long time, and debug them manually or automatically before use, and the switches can only be put into operation normally.

★ This product has been insulated tested before leaving the factory, and the wrong dielectric test will destroy the control system, and it is strictly forbidden to use ATS to do dielectric tests.