

Shanghai Liangxin Electric Co., Ltd

NDQ3-250 Series Automatic Transfer
Switch
Product Specifications

(IPD-ENG-DEV-T20 A1 2024-08-09)

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
11	Increase the torque requirement of the volume reduction coefficient	2023-07-12	Cao Xuehu	Zhang Huifeng	Wang Jili
12	Added D-type programmable port definition table	2024-08-12	Su Kaixing	Cao Xuehu	Zhang Huifeng
13	Dual power standard version	2025-06-16	Su Kaixing	Cao Xuehu	Zhang Huifeng

1. Scope of application and use

NDQ3-250 PC-level automatic transfer switching appliance is suitable for places with AC AC380V/AC400V/AC415V or below, rated frequency 50Hz. It complies with GB14048.1-2023 and GB/T14048.11-2024 standards, as well as the "Fire Protection Code for High-rise Civil Buildings", "Fire Protection Code for Building Design", "Emergency Lighting Design Guidelines", "Electrical Design Code for Civil Buildings", etc.

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, subject to the actual product)



NDQ3 two-stage overall NDQ3 two-stage split NDQ3 three-segment overall NDQ3 three-stage split

3. Description of specifications and models

ND Q 3 - /

1 2 3 4 5 6 7 8 9 10

Table 1 Specifications and models

serial number	Serial number description	NDQ3
1	Enterprise code	ND Nader brand low voltage appliances
2	Product code	Q Automatic transfer switching appliances
3	Design serial number	3
4	Shell grade current rating	250
5	Structural form	Z-monolithic F-split
6	Rated working current	160、180、200、225、250
7	Extreme number	3-3P 4-4P
8	Control mode	R - self-throwing self-reset, S - self-throwing non-self-resetting, F - grid generator ^{Note 4}
9	Switch position (structure)	II-two-stage, III-three-stage
10	Controller type	Blank Type ^{Note 1} , N Type ^{Note 2} , Type D, ^{Note 3}

Note 1: There are only two sections of the blank type, and the whole is split

Note 2: N type indicates three-stage type (there are whole splits), and communication type needs to go through special contract review (integral type only)

Note 3: Type D is only available in split type (there are two and three stages), and the factory defaults to self-investment and self-investment, and customers can set the control method by themselves

Note 4: N-type products can only choose R and S type products, and F-generator products do not need to be equipped with generator instructions as standard

4. Main technical parameters

Rated working voltage U_e : AC380V/AC400V/AC415V

Rated frequency: 50Hz

Rated insulation voltage U_i : AC800V

Rated impact withstand voltage U_{imp} : 8kV

Using categories: AC-33B/AC-33iA

Rated short-term withstand current I_{cw} : 10kA/60ms

Rated short-circuit connection capability I_{cm} : 17kA

Rated Limit Short Circuit Current I_q : 120 kA

Contact Conversion Time: Two-Stage: $\leq 50ms$ Three-Stage: $\leq 150ms$

Conversion time: two-stage: $\leq 130ms$ Three-stage: $\leq 400ms$

Mechanical life (maintenance value): 15000 times

Electrical life (maintenance value): 6000 times

5. Controller function

Table 2 Controller functions

function		Blank, N (N-type controller)
Protection function	Overvoltage protection	✓
	Undervoltage protection	✓
	Cut off the phase protection	✓
Node input/output	Fire signal input	✓
	Commonly used closing output	✓
	Backup closing output	✓
	Generator start output	✓
	Communication ports	N type optional Note 1
Display (LED)	Common power supply	✓
	Backup power	✓
	Commonly used closing	✓
	Spare closing	✓
	automatic	✓
	Fire Protection (III)	✓
Working mode choose	self-report and self-recovery	▽Note 2
	Self-investment without self-recovery	▽
Delay adjustment	Split/changeover delay	0-30s
	Closing/Return Delay	0-30s

Voltage protection threshold	Undervoltage value	165±5V
	Overvoltage value	270±5V
keystroke	Self/Manual	√
	I is commonly used	√
	II. Backup	√
	OPower	√
function		D-type controller
Protection function	Overvoltage protection	√
	Undervoltage protection	√
	Cut off the phase protection	√
	Over frequency protection	√
	Under-frequency protection	√
	Phase Sequence/Phase 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	√
display	Programmable port output	√
	Common Power Supplies (LEDs)	√
	Backup Power Supply (LED)	√
	Common Closing (LED)	√
	Backup Closing (LED)	√
	Automatic (LED)	√
	Fault (LED)	√
	Operation (LED)	√

	Coil (LED)	√
	Fire Protection (III) (LED)	√
	Communication (LED)	√
	Remote/Local (LED)	√
	LCD screen	√
Power supply method selection	Power grid - power grid	√
	Power grid - generator	√
Working mode selection	self-report and self-recovery	√ [1]
	Self-investment without self-recovery	√ [1]
Delay adjustment	Split/changeover delay	√
	Closing/Return Delay	√
	Delay adjustment of the chiller	√
	Generator start delay	√
Voltage protection threshold	Undervoltage value	187V (0.7~0.85)×230V adjustable
	Overvoltage value	264V (1.05~1.3)×230V adjustable
keystroke	Self/Manual	√
	I commonly used/△	√
	Set up	√
	II. Spare/▽	√
	reposition	√
	Power Loss / Esc	√
	Confirm	√
other	Remote switching function	√
	Rated frequency selection	√
	Wide frequency detection	√
	buzzer	√
	Adjustable power priority	√
	III/II optional features	▽
	Pole switch	▽
	Communication function	▽
	Double Enable[2]	▽
	Excess and underpressure recovery	▽
	Action log	√
	Fault logging	√
	Clear fault logs	▽
	Clear the action 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	▽

Note 1: The communication function of the N-type overall product needs to go through a special contract review, the split blank type has no communication function, and the D-type split has a communication function.

Note 2: "√" means with this function; "▽" means that the company can be adjusted internally;

Note: The split blank type and D-type controller connection harness are 1.8 meters and 3 meters respectively (3 meters need to go through special contract review)

[1]: When the power supply mode of the D-type controller is selected as "grid-grid", self-throwing and self-recovering can be selected, and when the power supply mode is selected as "grid-generator", self-throwing and self-recovering and self-recovering can be selected

6. Working conditions

6.1 Normal Conditions of Use

Ambient temperature: -25° C- +70° C

Storage temperature: -55° C- +85° C

6.1.1 Altitude

The altitude of the installation site does not exceed 2000m.

6.1.2 Altitude reduction worksheet

Table 3 Altitude reduction worksheet

project	symbol	unit	parameter			
altitude	H	m	≤2000	3000	4000	5000
Rated operating voltage	EU	V	415	415	415	415
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 Relative 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 The product is installed vertically, and the inclination of the mounting surface and the vertical surface is $\leq \pm 22.5^\circ$

Horizontal installation

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 secondary terminal interface definition

7.1 Wiring diagram

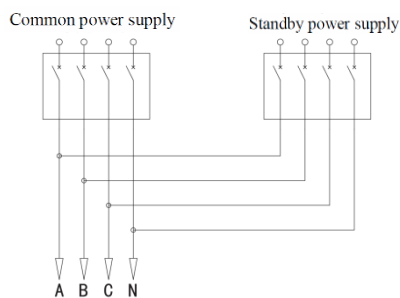


Fig.1 Schematic diagram of four-pole product wiring

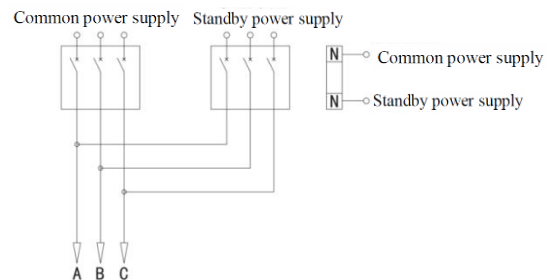


Fig.2 Schematic diagram of three-pole product wiring

7.2 Definition of Secondary Terminal Interface

7.2.1 Wiring instructions for auxiliary terminals of II-section blank products

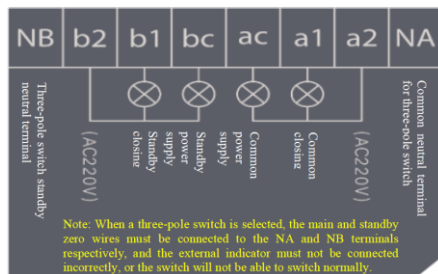


Fig.3 Schematic diagram of blank R/S secondary terminal wiring in section II

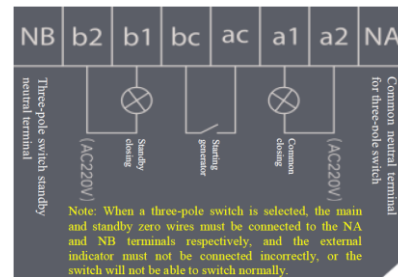


Fig.4 Schematic diagram of wiring of blank F secondary terminal in section II

●AC, A1, A2 are the active node voltage of 220V, which means the common power indicator and the common closing indicator respectively;

●bc, b1, b2 are the active node voltage 220V, which means the backup power indicator light and the standby closing indicator respectively;

●NA and NB are 3-pole commonly used neutral terminals and 3-pole standby neutral terminals respectively;

●AC and bc are the starting terminals of the F-type generator, which are used to start the generator;

7.2.2 Description of secondary terminals of N-type overall products

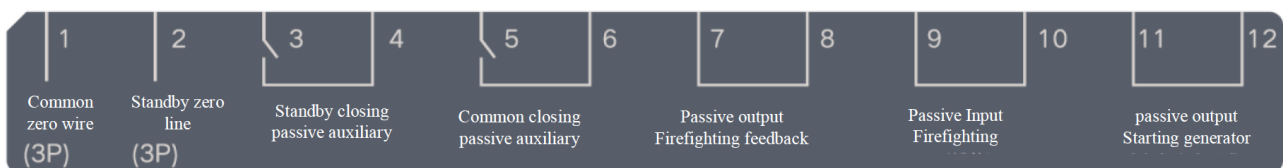


Fig.5 Schematic diagram of the wiring of the secondary terminal block of the N-type overall product

●1 and 2 are the neutral wire wiring of 3P products respectively (Note: 3P products must be connected to

the neutral wire, otherwise the product will not work normally)

●3 and 4, 5 and 6 are the commonly used closing and standby closing position indications of the product respectively (Note: This terminal is a passive node, and the maximum access current at the terminal is 3A AC250V).

●9,10 fire signal input terminal, which is a passive input node, which cannot be connected to the power supply, and only needs to be shorted to trigger the fire double split of the product

●7,8 When the product is in fire condition, the terminal will output a passive closure signal

●11 and 12 terminals are generator start and unload signal terminals, and 11 and 12 are closed after 5s delay when the common power supply is abnormal and the backup generator is out of power

7.2.4 Description of Auxiliary Terminal Block of N-type Integral Communication Type (Only N-type Integral Communication Type has this interface)

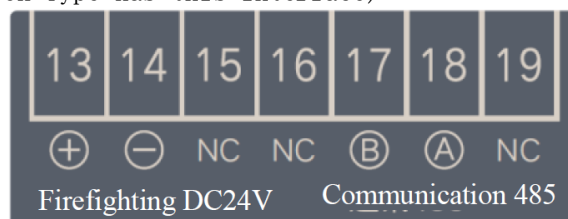


Fig.6 Diagram of N-type overall communication type auxiliary terminal block

●13 and 14 are DC24V fire input interfaces, pay attention to positive and negative when wiring.

●17 and 18 are communication 485 interfaces, if you need communication protocol, please call our company's 400 technical support hotline to request the electronic version of the communication protocol

● NC is an empty node

7.2.5 Secondary terminal block of D-type controller

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

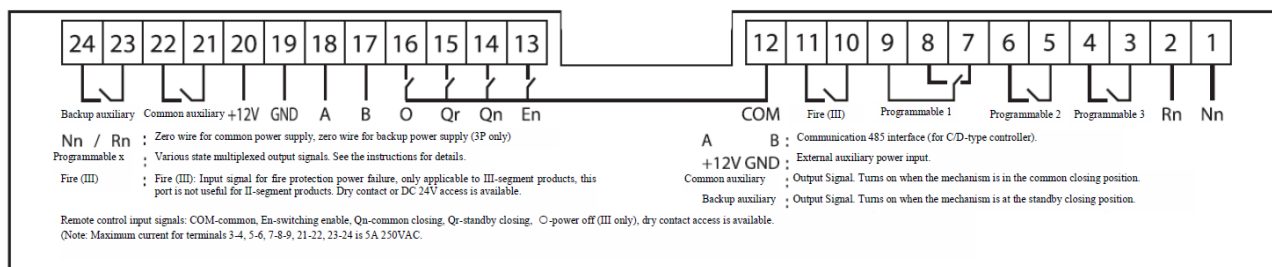


Fig.7 Schematic diagram of the wiring of the secondary terminal block of the D-type controller

Table 4 Programmable port definitions of D-type controllers

0	1	2	3	4	5	6	7
Fault alarm	Grid alarm	Common power supply alarm	Backup power alarm	Commonly used closing	Spare closing	Generator/unloading	Input signal error alarm
8	9	10	11	12	13	14	
Fire alarm	Common frequency alarm	Commonly used phase sequence/bi t alarms	Commonly used voltage imbalance alarms	Alternate frequency alarm	Alternate phase sequence/bi t alarm	Standby voltage imbalance alarm	

7.2.6 Description of the secondary terminal block of the blank type II segment split product

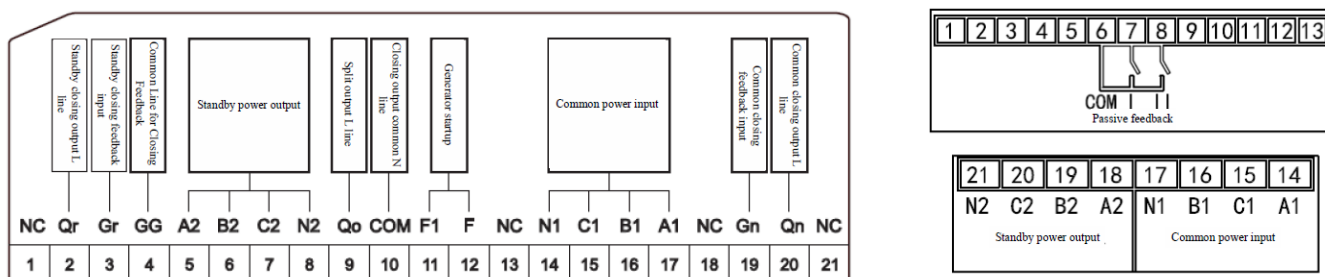


Fig.8 Schematic diagram of secondary terminal of blank II-segment split controller

Fig.9 Schematic diagram of blank II-segment split body terminal

●No. 6, No. 7, No. 8 are passive feedback terminals, No. 6 is the common terminal, No. 7 is the commonly used closing indicator signal, No. 8 is the standby closing indicator signal (on the terminal of this node), the maximum access current is 3A, and the voltage is AC250V;

●11 and 12 (F1, F) are the generator start signal output terminals, F and F1 are disconnected when the common power supply is normal, and F and F1 are closed after a delay of 3 seconds when the common power supply is abnormal and the standby generator is out of power (this node is on the back of the controller);

●3P products require users to connect the N wire to the controller, the N wire of the common power supply is connected to terminal 14, and the N wire of the backup power supply is connected to terminal 8 (this node is on the back of the controller);

●Except for the above terminals, the rest of the terminals have been occupied, and customers do not need to connect the rest of the wires, just plug the terminals into the controller according to the color.

●Except for the above terminals, the rest of the terminals have been occupied, and the customer does not need to connect the rest of the wires, just plug the terminals into the controller according to the color.

7.2.7 Description of secondary terminal blocks for N-type III segment split products

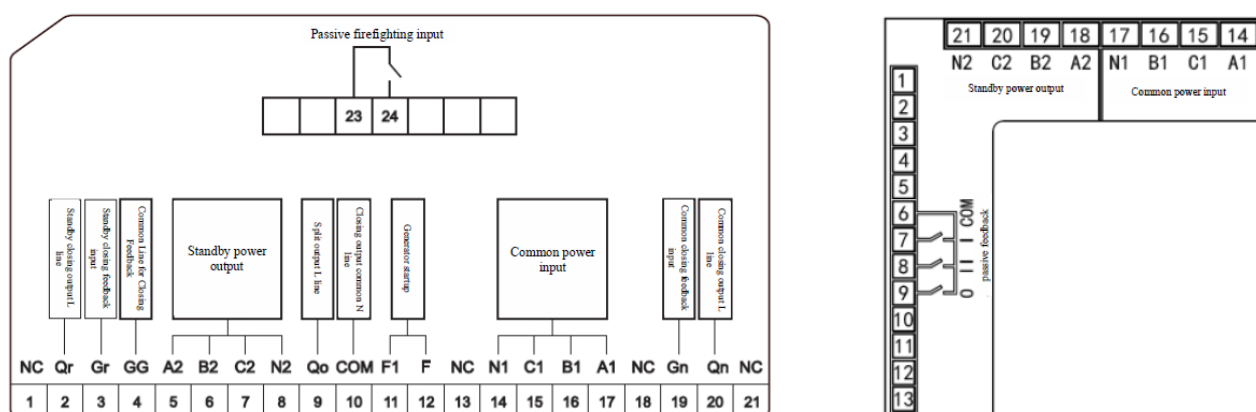


Fig.10 Schematic diagram of the secondary terminal of N-type III-segment split controller

Fig.11 Schematic diagram of N-type III-segment split body terminal

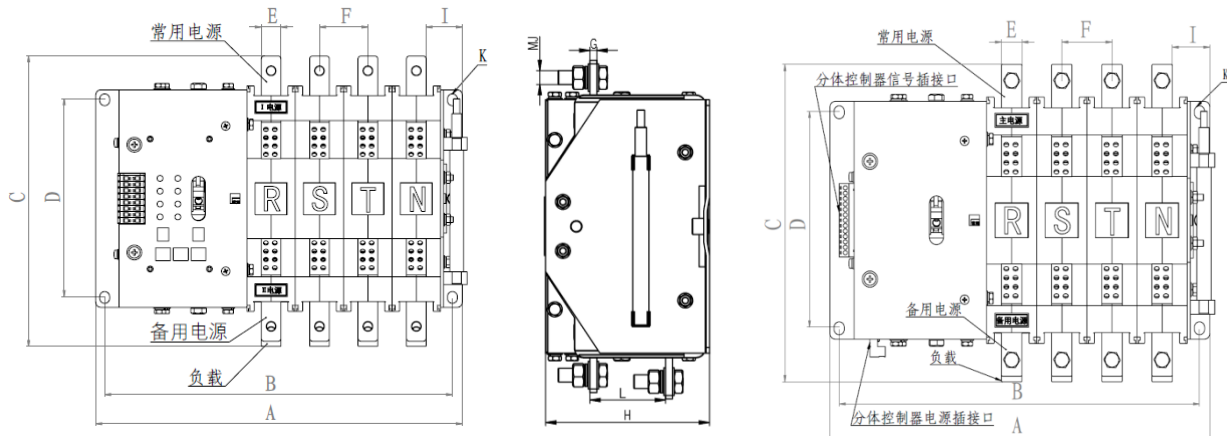
●No. 6, 7, 8, No. 9 are passive feedback terminals, No. 6 is the common terminal, No. 7 is the common closing indicator signal, No. 8 is the standby closing indicator signal, No. 9 is the double indication signal (on the terminal of this node), the maximum access current is 3A, and the voltage is AC250V;

●11 and 12 (F1, F) are the generator start signal output terminals, F and F1 are disconnected when the common power supply is normal, and F and F1 are closed after a delay of 3 seconds when the common power supply is abnormal and the standby generator is out of power (this node is on the back of the controller);

- 23 and 24 are passive fire input signals (this node is on the back of the controller);
- 3P products require users to connect the N wire to the controller, the N wire of the common power supply is connected to terminal 14, and the N wire of the backup power supply is connected to terminal 8 (this node is on the back of the controller);
- Except for the above terminals, the rest of the terminals have been occupied, and customers do not need to connect the rest of the wires, just plug the terminals into the controller according to the color.

8. Product shape and installation size

8.1 Blank Type II Type Product Shape and Installation Dimensions



Overall outline drawing of blank type II segment Blank type II split outline drawing (including type D split body)

Fig.12 Two-stage overall split shape and installation dimensions

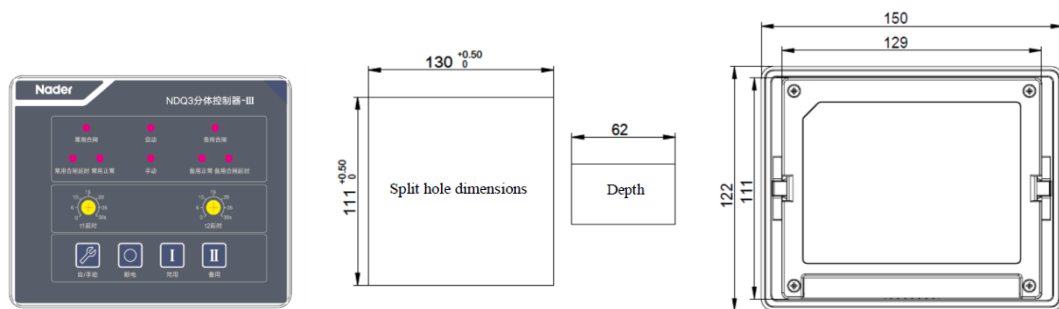


Fig.13 Shape and opening size of N-type/blank II-stage split controller

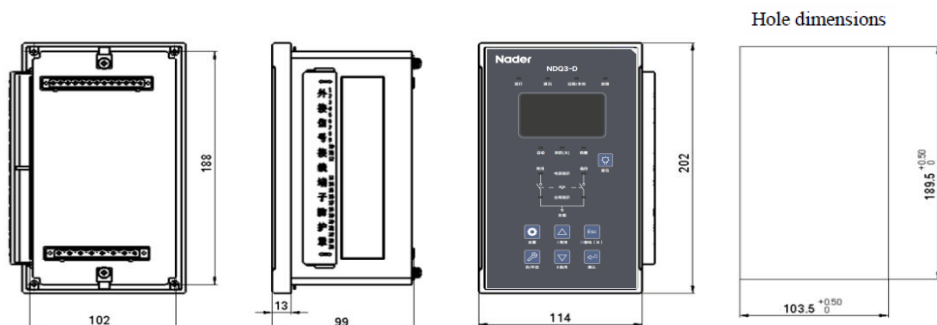


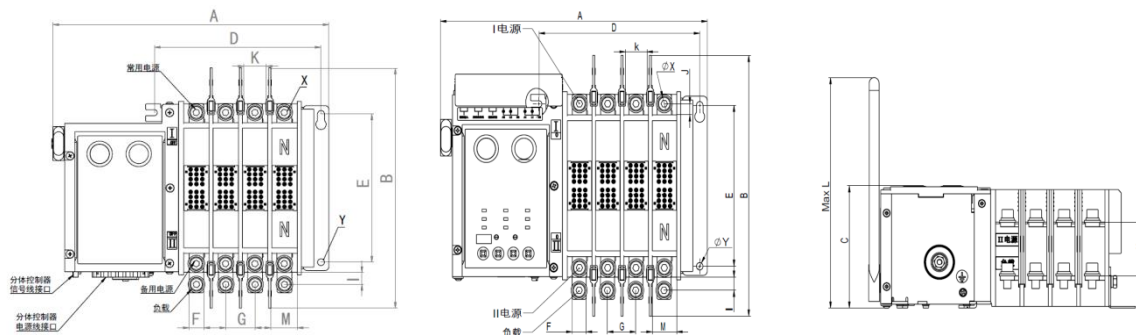
Fig.14 Installation dimensions of D-type controller

Table 5 Integral/split shape and installation dimensions of two-stage products

Model		Overall Dimensions (mm)			Mounting Size (mm)			Other Dimensions (mm)					
		Long A	Wide C	High H	Long B	Wider	ΦK	And	F	G	I	MJ	L
NDQ3-250 Two-stage monolithic / split type	3P	322	294	143	303	200	10	20	49	5	36.5	8	65.5
	4P	371	294	143	352	200	10	20	49	5	36.5	8	65.5

Note: The limit deviation of the unspecified tolerance dimensions of the external dimension and installation size shall be implemented in accordance with GB/T 1804-C.

8.3 Overall split shape and installation size of N-type products



Split appearance drawing (including D-type split body) Overall appearance drawing

Fig.15 Overall split shape and installation dimensions of N-type products

Table 6 Overall/split product shape and installation dimensions of N-type products

Model		Overall Dimensions (mm)			Mounting Size (mm)			Other Dimensions (mm)								
		Long A	Wide B	High C	Long D	Wide E	Mounting hole Y	F	G	H	I	J	K	M	X	L
NDQ3-250 Three-stage format	3P	268.5	245	115	156	151	φ 7	20	35	50.5	12.5	10.5	28	30	M8x16	215
	4P	302	245	115	191	151	φ 7	20	35	50.5	12.5	10.5	28	30	M8x16	215

8.4 Tighten the torque torque of the wiring screw

Table 7 Tightening torque of terminal screws

Model	Thread diameter	Torque Torque (N.m)
NDQ3-250	M8	≤ 12
Controller secondary terminal wiring screws	M3	≤ 1

9. 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 $-55^{\circ}\text{C} \sim +85^{\circ}\text{C}$. During transportation, the product should pay attention to moisture prevention, should not be subjected to strong bumps, vibrations, collisions, and prevent rain and snow.

10. Accessory list and installation

Table 8 List of annexes

serial number	name	specification	quantity
1	Arc plate	--	3P:4; 4P:6
2	Manual dedicated handle	--	1

11. Precautions

- ★ This product can work reliably at 85% $U_e \sim 110\%U_e$ voltage. When installing wiring of the product, the inlet and outlet ends and the N pole should be strictly distinguished, and the neutral wire should not be shared.
- ★ It is strictly forbidden to use this product outside of normal use conditions, such as continuous water vapor or condensation without corresponding precautions, combustible or corrosive dust, no SCPD or expected short-circuit current out of range, voltage over or below voltage, current exceeding rated current, altitude at high altitude, etc.
- ★ When manually converting, use the dedicated handle provided with the product.
- ★ If the protective appliance is disconnected due to a line or load failure, the fault should be eliminated first and then the load should be energized.
- ★ The product should be checked periodically (such as every three months of operation) during use, and the power supply should be changed manually or automatically once to check whether the product is normal.
- ★ This product has been insulated before leaving the factory, and the wrong dielectric test will destroy the control system, and it is strictly forbidden to do dielectric test with ATS.