

NDW2GZ-4000

Product Specification of Disconnecting Switch

Project name: NDW2GZ-4000

Project No.: /

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Product Overview

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1.1 NDW2GZ-4000



NDW2GZ-4000

1.2 Rated current of NDW2GZ-4000 disconnecting switch

Rated current (A)	1250	1600	2000	2500	3200	4000
Shell frame current						
NDW2GZ: 4000						
NDW2GZF: 4000						

1.3 Breaking capacity and short-time withstand current of NDW2GZ disconnecting switch

Disconnecting Switch	NDW2GZ-4000/NDW2GZF-4000
Number of poles	3, 4
Rated current I_n (A) (+40°C)	1250A~4000A
N-pole rated current	100% I_n
Rated working voltage U_e	DC750V (3P), DC1000V (4P), DC1200V (4P), DC1500V (4P)
Rated short circuit making capacity I_{cm} (peak value) kA ¹⁾	100kA
Rated short time withstand current I_{cw} (effective value) 1s kA ¹⁾	50kA ^{Note 1} /100kA/200kA ^{Note 2}

Note: 1) DC750V product parameters are 50kA.

Note: 2) Short-term withstand of 200kA requires the use of a fuse.

1.4 Structural features

■ Installation structure



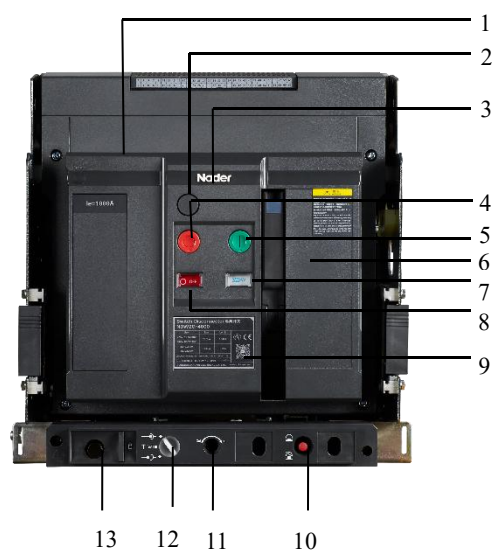
Fixed type



Drawout type

■ Brief description of structure and indications

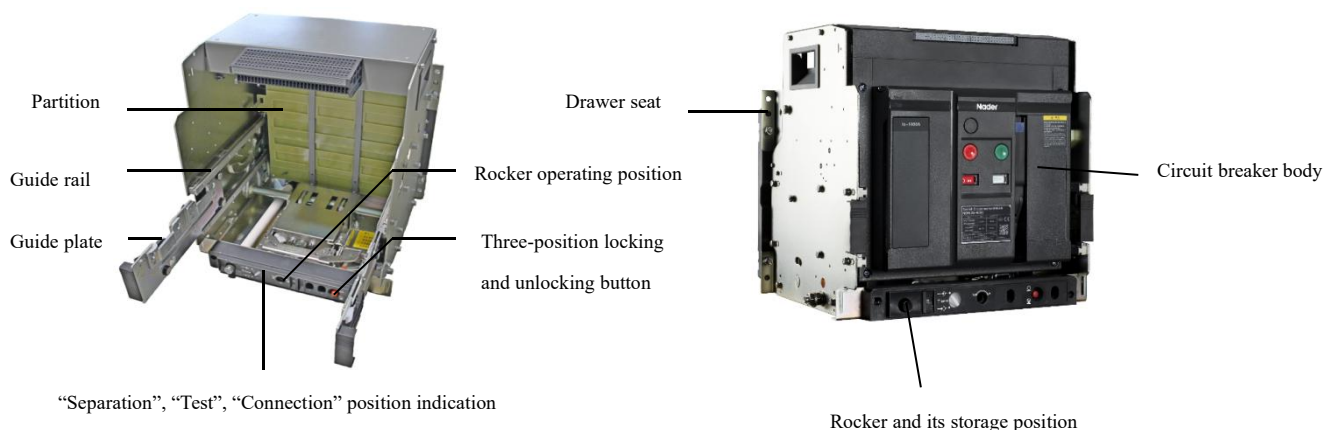
- | | |
|---|--|
| 1. Specification sign | 8. Opening and closing indication |
| 2. Off-position key lock
(optional function) | 9. Nameplate |
| 3. Nader sign | 10 "Connection", "Test", "Separation" |
| 4. Disconnection button | Position locking and unlocking device |
| 5. Closing button | 11. Rocker operating position |
| 6. Counter (optional function) | 12. "Connection", "Test", "Separation" |
| 7. Energy releasing and
storing indicator | position indicator |
| | 13. Rocker and its storage position |



Note: 1 ~ 9 is fixed type, while 1 ~ 13 is drawout type.

■ Structure of drawout-type disconnecting switch

Drawout type disconnecting switch is composed of the disconnecting switch body and the drawer seat. The drawer seat has guide rails on both sides. There's a movable guide plate on the guide rail. The disconnecting switch is placed on the left and right guide plates. The drawout type disconnecting switch connects to the main circuit by inserting the busbar on the disconnecting switch body into the bridge contact on the drawer seat.



1.5 Design features

1.5.1 Low-temperature and plateau type disconnecting switch

The low temperature, plateau type disconnecting switch used in special places can meet the use under the environment condition of plateau and low temperature below 40°C, and complies with the GB/T 20645

1.5.2 Thermal-humidity type disconnecting switch

The TH (thermal-humidity) type disconnecting switch can meet the requirements of the three-proofing products, namely, moisture-proofing, mould-proofing and salt spray-proofing, and complies with JB/T834 Technical Requirements of Tropical Type Low-voltage Apparatus while having passed the following standard related tests:

- Thermal-humidity test: GB/T 2423.4: 2008 Environmental Testing for Electric and Electronic Products. Part 2: Test Method Test Db: Alternating Thermal-humidity (12h + 12h Cycle)
- Mould growth test: GBT2423.16: 2008 Environmental Testing for Electric and Electronic Products. Part 2: Test Method Test J and Guidelines: Mould Growth
- Enclosure protection grade: GB/T 4208: 2008 Enclosure Protection Grade (IP code).
- Salt spray test: GB/T 2423.18-2012 Environmental Testing. Part 2: Test Method Test Kb: Salt Spray, Alternating (Sodium Chloride Solution)

1.5.3 Efficient arc extinguishing

The design of the disconnecting switch arc extinguishing chamber and contact system has a number of invention patents. It adopts the principle of air-blast arc extinguishing, optimizes the arc extinguishing gate design, increases the driving force of arc, and improves the arc extinguishing ability of the product.

1.5.4 High electrical life and short-circuit withstand capacity

The body design adopts high strength DMC material, and has high impact strength and insulating properties. The design of the double-contact structure improves the electric life of products; the optimized design of the mechanism realizes compensation to the contact pressure, and improves the product reliability and short circuit tolerance ability.

1.5.5 Multiple safety protection device

It has drawout type disconnecting switch door interlocking, drawout type three-position locking and unlocking device and off-position key lock, connection terminal protective cover and other protection devices.

1.6 Conforming standards and certification

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

GB/T 4207:2012 Methods for the Determination of the Proof and the Comparative Tracking Indices of Solid Insulating Materials

GB/T 14048.1:2012 Low-voltage Switchgear and Control Equipment - Part 1: General Rules (IEC 60947-1:2011, MOD)

GB/T 14048.3:2017 Low-voltage Switchgear and Controlgear - Part 3: Switches, Disconnectors, Switch-disconnectors and Fuse-combination units

GB/T 14092.3:2009 Environmental Condition for Machinery Products - High Altitude

GB/T 19608.3:2004 Classification of Special Environmental Condition Part 3: Plateau

GB/T 20645:2006 Specific Environmental Condition - Technical Requirements of Low-voltage Apparatuses for Plateau

GB/T 20626.3:2006 Specific Environmental Condition - Electric and Electronic Products for Plateau - Part 3: Protection Requirement of Thunder and Lightning, Pollution, Condensation

Certified CCC mark.

1.7 Product model

ND W 2 G □- □ □/□ □/□

1 2 3 4 5 6 7 8 9 10

SN	SN name	NDW2GZ
1	Enterprise code	"Nader" brand low-voltage electrical appliance
2	Product code	W: Universal
3	Design code	2
4	Derived code	G: Disconnecting switch Z: DC
5	Derived code	Not-marked: Conventional, F: Power generation products
6	Shell frame level current	40 : 4000
7	Installation mode	Not marked: fixed type, C: drawout type
8	Rated current	12 : 1250A, 16 : 1600A, 20 : 2000A, 25 : 2500A, 32 : 3200A, 40 : 4000A
9	Number of poles	3: 3P in series, 4P in series

Note: Derivative code "F" under serial number 5 is applicable for wind power and plateau environments.

Chapter 2 Technical Characteristics

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Technical Characteristics

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2.1 Main technical indicators of NDW2GZ-4000 DC disconnecting switch

Disconnecting switch model			NDW2GZ-4000/NDW2GZF-4000	
Rated current In (A) (+40℃)			1250, 1600 2000, 2500	3200, 4000
Rated working voltage Ue			DC750V (3P), DC1000V (4P), DC1200V (4P), DC1500V (4P)	
Rated insulation voltage Ui			1500V	
Rated impulse withstand voltage UimP			12kV	
Number of poles			3P in series, 4P in series	
Full break time			≤30ms	
Closing time			≤70ms	
Rated short circuit making capacity Icm (peak value) kA	DC750V		100	
	DC1000V			
	DC1500V			
Rated short-time withstand current Icw (effective value) 1s kA	DC750V		50	
	DC1000V		100 (200 ^{Note})	
	DC1500V			
Utilization category			DC-22A, DC-23A	
Operation Performance (Number of times)	Electrical life	DC750V	1000	
		DC1000V	800	
		DC1500V	500	
	Mechanical life	Maintenance-free	10000	
		With maintenance	15000	
Installation mode		Fixed type	▲	
		Drawout type	▲	
Wiring method of the main circuit		Fixed type	Horizontal extended wiring	
		Drawout type	Horizontal extended wiring	
Dimensions: W×D×H (mm)		Fixed type 3P	428×300×393.5	
		Fixed type 4P	543×300×393.5	
		Drawout type 3P	435×403×432 (800~2500A)	435×397.5×432 (3200A, 4000A)
		Drawout type 4P	550×403×432 (800~2500A)	550×397.5×432 (3200A, 4000A)
Weight (kg)		Fixed type 3P	59	60
		Fixed type 4P	70	71.5
		Drawout type 3P	97	103
		Drawout type 4P	114	120
Note: ▲ represents this function is available				

Note: ▲ represents this function is available

Note: 200kA needs to be used with a fuse.

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3.1 Accessories list

Accessory name	For which kind of disconnecting switches	Supply mode
Off-position key lock	Fixed type/drawout type	Optional ordering for customers
Door interlocking	Drawout type	Optional ordering for customers
Disconnecting switch three-position locking device	Drawout type	Standard configuration
Auxiliary switch	Fixed type/drawout type	Standard configuration
Closed electromagnet	Fixed type/drawout type	Standard configuration
Shunt release	Fixed type/drawout type	Standard configuration
Motor operating mechanism	Fixed type/drawout type	Standard configuration
Interphase partition	Fixed type/drawout type	Optional ordering for customers
Closing ready signal output device	Fixed type/drawout type	Optional ordering for customers
Undervoltage release	Fixed type/drawout type	Optional ordering for customers
Counter	Fixed type/drawout type	Optional ordering for customers
Dust cover	Fixed type/drawout type	Optional ordering for customers
Door frame	Fixed type/drawout type	Optional ordering for customers

3.2 Electrical control accessories

3.2.1 Closed electromagnet (standard configuration)

◆ Action features of the closed electromagnet:

a. When the power supply voltage of the closed electromagnet maintains at 85%~110% of the rated control supply voltage U_s , operation of the closed electromagnet can make reliable closing of the disconnecting switch;

b. Closed electromagnet is the short-time duty-type;

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

◆ Instantaneous power is shown in the table below.



Rated insulation voltage (Ui)	Rated control supply voltage (Us)	Instantaneous power
400V	AC380V/AC400V 50/60Hz	620VA
	AC220V/AC230V 50/60Hz	500VA
	DC220V	500W
	DC110V	400W
	DC24V	145W

3.2.2 Shunt release (standard configuration)

◆ Action features of the shunt release

a. When the power supply voltage of the shunt release maintains at 70%~110% of the rated control supply voltage, operation of the shunt release can make the disconnecting switch disconnect;

b. Shunt release is the short-time duty-type;

3) Shunt release is mainly composed of coil, iron core component and electronic parts, which can make the disconnecting switch disconnect by remote operation.

There is the control circuit inside to ensure the long-time energizing, which shall be >200ms. The user cannot connect it with the auxiliary switch point of the disconnecting switch in series.

◆ Instantaneous power is shown in the table below.

Rated insulation voltage (Ui)	Rated control supply voltage (Us)	Instantaneous power
400V	AC380V/AC400V 50/60Hz	620VA
	AC220V/AC230V 50/60Hz	500VA
	DC220V	500W
	DC110V	400W
	DC24V	145W



3.2.3 Retention-type shunt release

Retention shunt release is mainly composed of coil, iron core component and electronic parts, and can disconnect the circuit breaker by remote operation.

◆ Action features of the retention shunt release

1) When the power supply voltage of the retention shunt release maintains at 70%~110% of the rated control supply voltage, operation of the shunt release can make the circuit breaker disconnect.

2) When the applied voltage is 85%~110% of the rated working voltage of the retention shunt release, the shunt release ensures that the circuit breaker will be reliable and not be



closed.

3) The retention shunt release is the long-term duty type, which can send closing signal with an interval of more than 500ms after power failure.

4) Each power-on trigger time $t > 200\text{ms}$.

5) 1.3Us withstand time is 9.5s without damage, 1.4Us withstand time is 0.5s without damage.

◆ Technical parameters of retention shunt release

Power Consumption Table of Retention Shunt Release

Rated insulation voltage (Ui)	Rated control supply voltage (Us)	Instantaneous power	Operating power
400V	AC230V 50/60Hz	< 600VA	< 5VA
	DC220V	< 600W	< 5W

3.2.4 Motor operating mechanism (standard configuration)

◆ The electric energy storage of the disconnecting switch can be completed by the electric operating mechanism.

◆ Operation features

If the rated supply voltage of the motor operating mechanism is between 85%~110%, energy storage of the disconnecting switch can be made in place. For the operating power, see the table below



Rated insulation voltage (Ui)	Energy storage time	Rated control supply voltage (Us)	Operating power
			4000 shell frame
400V	3s~5s	AC220V/AC230V AC380V/AC400V (50/60Hz)	110VA
		DC220V/DC110V	110W
		DC24V	110W

3.2.5 Undervoltage release

◆ Action features of the undervoltage release

a. When the applied voltage drops, even slowly drops to 70%~35% of the rated operating voltage, the undervoltage release will work to disconnect the disconnecting switch;

b. When the applied voltage is less than 35% of the rated operating voltage of the undervoltage release, the undervoltage release will make the disconnecting switch cannot be closed;

c. When the applied voltage is 85%~110% of the rated operational voltage of the undervoltage release, the undervoltage release can be closed reliably to guarantee the reliable closing of the disconnecting switch.

◆ Undervoltage release is mainly composed of coil, iron core component and electronic parts.

a. Undervoltage instantaneous release



b. Undervoltage delayed release

◆ 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 1s, 3s or 5s as required.

◆ For the operating power, see the table below.

Power Consumption Table of Undervoltage Release

Rated insulation voltage (Ui)	Frequency (f)	Rated operating voltage (Ue)	Operating power
400V	50/60Hz	AC380V (AC400V)	5.2W
		AC220V (AC230V)	3.9W
		DC220V	3.9W
		DC110V	3.9W
		DC24V	3.5W

3.2.6 Loss-of-voltage release

◆ Action features of the no-voltage release

- 1) When the applied voltage suddenly drops to 0~35% of the rated operational voltage, the undervoltage release will make the disconnecting switch opened.
- 2) When the applied voltage is less than 30% of the rated operating voltage of the no-voltage release, the undervoltage release will make the circuit breaker cannot be closed.



3) When the applied voltage is 85%~110% of the rated operational voltage of the loss of voltage release, the loss of voltage release can guarantee the reliable closing of the disconnecting switch.

4) When the applied voltage drops no less than 35% of the rated operational voltage, the loss of voltage release can be closed to guarantee the reliable closing of the disconnecting switch.

◆ The loss-of-voltage release can be divided into instantaneous release and delayed release, mainly composed of coil, iron core component and electronic parts.

◆ No-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 1 s, 3 s, 5 s as required.

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

Rated insulation voltage (Ui)	Frequency (f)	Rated operating voltage (Ue)	Operating power
400V	50Hz/60Hz	AC220V (AC230V)	1.75W
		AC380V (AC400V)	1.35W

3.3 Signal output accessories

3.3.1 Auxiliary switch

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



◆ Technical Parameters of Auxiliary Contact

Table of Technical Parameters

Applicable shell frame		4000 shell frame	
Auxiliary contact form		■ Four groups switch ■ Four normally open and four normally closed ■ Six groups switch ■ Six normally open and six normally closed	
		2mA/DC15V	
		10A	
Minimum load		2mA/DC15V	
Agreed thermal current I _{th}		10A	
Breaking capacity	DC-12	0.3A/DC250V	5A/DC250V
	AC-12	10A/AC250V	10A/AC250V
	DC-13	0.2A/DC220V	1.2A/DC220V
	AC-15	3A/AC400V	3A/AC400V

3.3.2 Closing ready signal output device

Closing ready signal output device of the disconnecting switch is the output signal device that reflects the operating mechanism to achieve the closed state. It can output signals if it meets all of the following mechanical states. See the figure below:

- ◆ Disconnecting switch in opening state
- ◆ Energy storage in place
- ◆ No disconnection instruction
- ◆ Under-voltage release, no-voltage release (optional accessories) maintain the pull-in state
- ◆ Off-position lock (interlocking accessory) to keep closed in place
- ◆ Mechanical interlocking (interlocking accessory) not interlocked



3.3.3 Secondary wiring terminal

- ◆ For the number of secondary wiring terminal, there is a total of 62 groups (identical for the fixed type and drawout type); See Chapter 8 for the definition and its electrical wiring diagram of each terminal number.
- ◆ See the table below for parameters of the secondary wiring terminal



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

3.4 Safety accessories

3.4.1 Phase partition

Divided into fixed type and drawout type, the phase partition is installed in the groove between all the phase bus bars, used to increase the insulation strength between phases of the main circuit so as to prevent the short circuit in case of the insulation breakdown and improve the power reliability; optional accessories. See the diagram below.

◆ Conventional phase partition



Phase partition and bracket

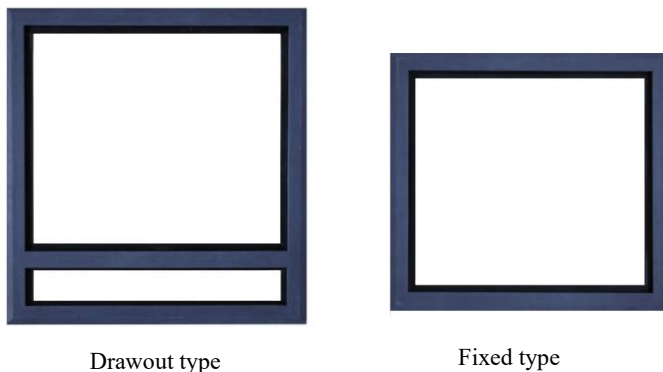
3.4.2 Counter

Counter is used to record the number of the "close-open" operation of the disconnecting switch.



3.4.3 Doorframe

Divided into fixed type and drawout type, it is mainly placed on the door of the cubicle for sealing effect, and can make the protection level of the disconnection switch reaches IP40. It is beautiful and practical. See the figure below.



3.4.4 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. See the figure below.



3.5 Locks

3.5.1 Off-position key lock (on the disconnecting switch)

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



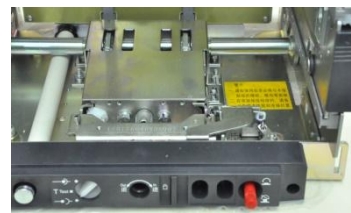
Models and types of off-position key locks

Model	Name	Number of disconnecting switches	Number of keys
SF11	One lock one key	1	1
SF21	Two locks one key	2	1
SF31	Three locks one key	3	1
SF32	Three locks two keys	3	2
SF53	Five locks three keys	5	3

3.5.2 Drawout-type three-position lock (standard configuration on the drawer seat)

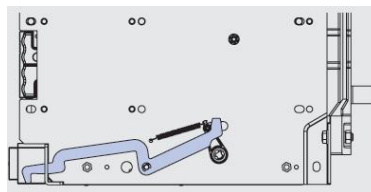
On the drawer seat, there's "connection", "test" and "separation" position status, which is indicated through an indicator.

When the handle rolls, the Disconnecting switch will be locked at these three positions, and it can be unlocked only through the unlock button (red), as shown in the figure below.



3.5.3 Door interlock (on the drawer seat)

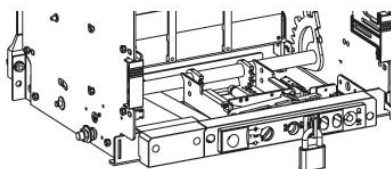
Installed on the right or the left side of the drawer seat. When the drawout type disconnecting switch is in the separation position, it can avoid opening of the cubicle door. See the diagram below.



3.5.4 Operating position lock of the drawout-type disconnecting switch rocker (standard configuration on the drawer seat)

In any position, when the rocker is not placed in the operating position of the rocker, it can lock the operating position of the drawout-type disconnecting switch through padlock. At this time, the rocker can't be normally inserted into the operating position of the rocker, so it can't perform the shake in or out operation. Padlock should be prepared by users, the diameter of the lock beam is 4mm to 8 mm.

It is generally applied to the following scenarios: When the drawout type disconnecting switch is in the separation position and the rocker isn't placed in the rocker operating position, pull out the black lever below the drawer seat and pass through the lever with the padlock beam. Then the disconnecting switch body can only pull out the drawer seat, and cannot be shaken to "test" or "connection" position.



Chapter 4 Field of Application

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Field of Application

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NDW2GZ-4000 universal disconnecting switches (hereinafter referred to as switches) are applicable to the DC system and mainly installed in the low-voltage distribution circuit. The products can be used for making and breaking as well as isolation.

- Rated working current: 800A~4000A
- Rated working voltage: DC1500V and below
- Drawout type and fixed type

4.1 Operating environment

4.1.1 Ambient temperature

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

Special customization can be arranged if the ambient temperature is below -25°C or above $+40^{\circ}\text{C}$. If the ambient temperature is higher than $+40^{\circ}\text{C}$, the user needs to reduce the capacity.

See Table 2 for the derating factor of the disconnecting switch

Table 2

Ambient temperature	$+40^{\circ}\text{C}$	$+45^{\circ}\text{C}$	$+50^{\circ}\text{C}$	$+60^{\circ}\text{C}$	$+65^{\circ}\text{C}$	$+70^{\circ}\text{C}$
Allowable continuous rated current	1.0In	1.0In	1.0In	0.9In	0.88In	0.84In

4.1.2 Atmospheric environment conditions

When the ambient air temperature is $+40^{\circ}\text{C}$, the relative humidity of atmosphere shall not be more than 50%. At low temperature, a higher relative humidity is allowed; for example, in case of $+25^{\circ}\text{C}$, the relative humidity of atmosphere can be 90%. For condensation due to temperature change, dehumidification or corresponding measures should be taken.

NDW2GF and NDW2GZF meet GB/T2423.4, with alternating and cyclic thermal humidity (temperature 55°C , relative humidity 95%). For the condensation due to temperature change, it is required to take the dehumidification or corresponding measures, or contact the manufacturer.

4.1.3 Altitude

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 3).

Table 3

Altitude	2000m	3000m	4000m	5000m
Power frequency withstand voltage	3500V	3150V	2500V	2200V
Rated current	1.0In	0.93In	0.88In	0.82In

4.1.4 Anti-corrosion level

Salt spray level: severe level 2

4.1.5 Pollution level

Pollution level: 3

The disconnecting switch 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.

4.1.6 Shockproof requirements

The disconnecting switch can ensure resistance to mechanical shock, and has passed the GB/T 4798.3 standard test;

Amplitude: $\pm 1.5\text{mm}$ (2~9Hz);

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

Super strong shock may result in damage to the parts, and impact the reliable action of the disconnecting switch.

4.1.7 Electromagnetic interference

The disconnecting switch 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 disconnecting switch has passed the electromagnetic compatibility (EMC) test stipulated by following standards

- GB/T 14048.3: 2017;

The above tests can ensure that the disconnecting switch won't wrongly occur tripping.

4.2 Installation conditions

With the vertical gradient no more than 5° , the disconnecting switch shall be installed under the environment condition without explosion danger, conductive dust or the possibility of corroding metal and damaging the insulation.

4.2.1 Installation category

The disconnecting switch's main circuit and undervoltage release coils, power transformer primary coil installation category is IV; the rest auxiliary circuit and control circuit installation category is III.

4.2.2 Protection class

IP30, IP40 (mounted in cabinet compartment with protective door frame).

4.2.3 Utilization category

AC-22A, AC-23A, DC-22A, DC-23A.

4.3 Reference specifications of disconnecting switch's main circuit copper bar (Table 4).

Table 4

Rated current of frame Inm (A)	Rated current In (A) 40°C	Copper bar specification	
		Dimensions	Number
4000	1250, 1600, 2000, 2500	100mm×5mm	4
	3200, 4000	100mm×10mm	5

Note: 1. The table indicates the copper bar specifications adopted when the disconnecting switch is under the ambient temperature of +40°C and the open wide installation under the heating condition meets the stipulation in GB 14048.3. If the temperature is higher than +40°C, the quantity of copper bar should be increased, or the capacity should be reduced.

2. The above data is calculated according to the test and theory, and for reference only.

3. The maximum permissible temperature of the copper bar is no more than +110°C.

4. The electrical gap of copper bar is $\geq 15\text{mm}$ with the altitude more than 5,000m and relative humidity more than 90%; the electrical gap shall be adjusted according to the content of 7.1.1 Table 1 in GB/T 20645.

4.4 The power loss of the incoming and outgoing lines of the disconnecting switch (ambient temperature +40°C) is as shown in Table 5.

Table 5

Shell frame level	Power loss of the fixed type	Power loss of the drawout type
4000	$\leq 650\text{ W}$	$\leq 900\text{ W}$

Note: The above power loss value is measured when the disconnecting switch is powered on test current (maximum rated current of the disconnecting switch) In for 8 h and after the main circuit temperature rise tends to the steady state. The test method is in accordance with G.2 in Appendix G of GB14048.2.

Chapter 5 Outline and Installation Dimensions

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5.3 Cabinet door open hole and installation pitch	32
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5.1 Outline and installation dimensions

In the DC system, consider the following aspects for selecting the switching device:

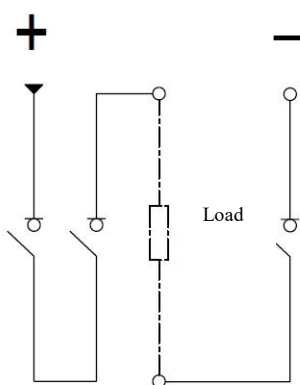
- Rated working voltage, considering the number of poles in series to be broken
- Rated current, considering the load power
- Grounding system mode

Three pole string disconnecting switch -----B type wiring

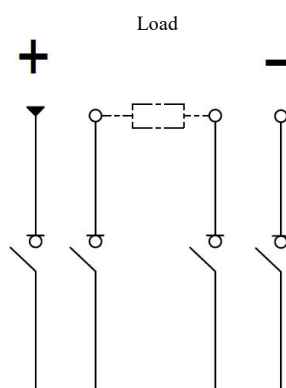
Four pole string disconnecting switch -----C type wiring

Recommended wiring mode of NDW2GZ DC disconnecting switch

Rated voltage	Power supply/load wiring mode	
	Non-grounding system	Center grounding system
DC750V	C	B
DC1000V/DC1500V	C	C



Type B wiring mode



Type C wiring mode

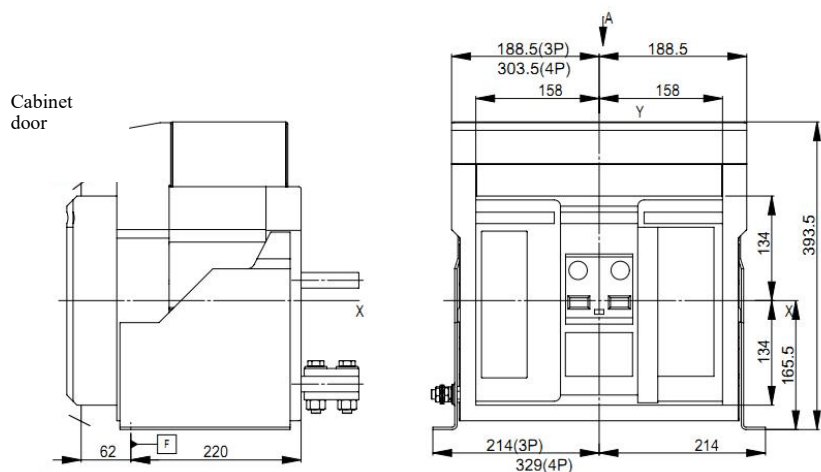
Note: In case of connection in parallel or series with the bus directly, the continuous load of the disconnecting switch will be only 80% of the maximum operating current due to heating reasons.

In case of implementing the parallel or series connection in a place about 1m from the bus, the disconnecting switch can operate at full load.

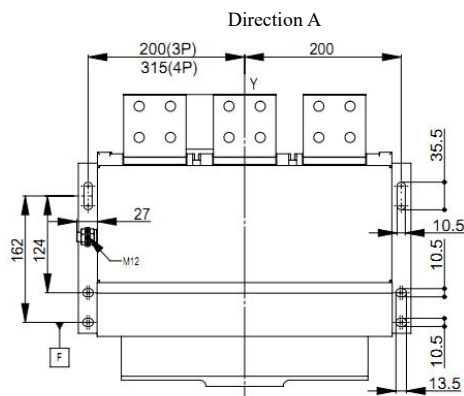
5.2 NDW2GZ-4000/NDW2GZF-4000

NDW2GZ-4000/NDW2GZF-4000 fixed wiring

Dimensions

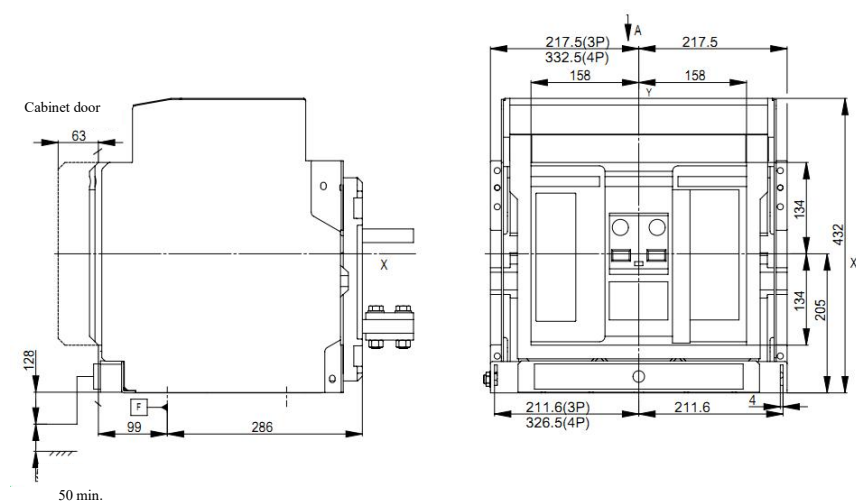


Fixed Details

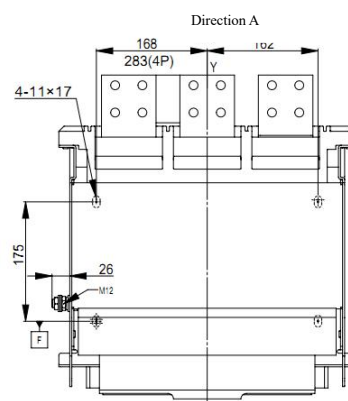


NDW2GZ-4000/NDW2GZF-4000 drawout wiring

Dimensions



Fixed Details



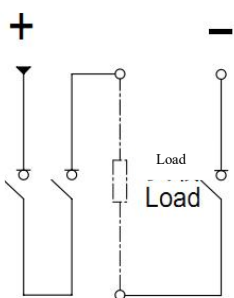
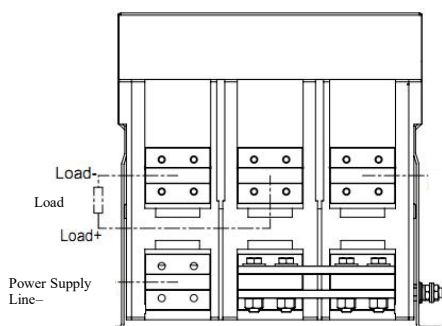
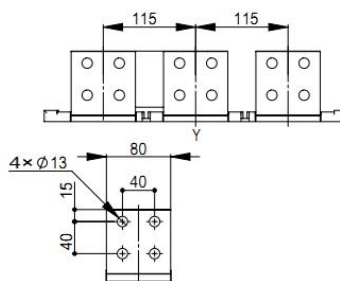
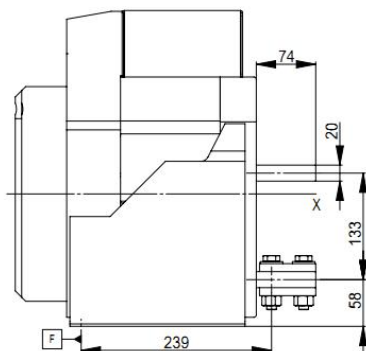
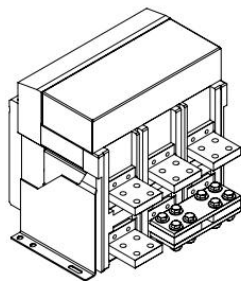
Note: For the 3-pole disconnecting switch, X and Y are the symmetric axes of the front mask;

Except as specified, outline dimensions of NDW2GZ and NDW2GZF are consistent;

Connection bolt between bus and terminal	Torque applied with a flat washer (N.m)
M12 (800: 2500A)	60
M14 (3200: 4000A)	97

800A-2500A fixed type (DC Type B wiring mode)

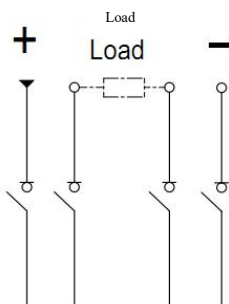
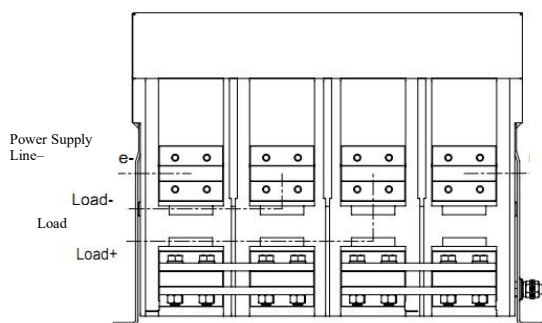
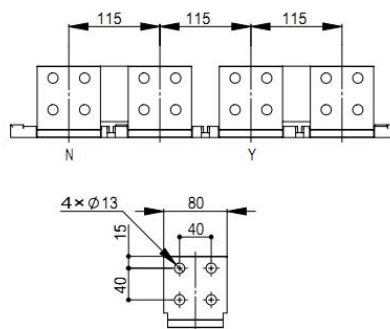
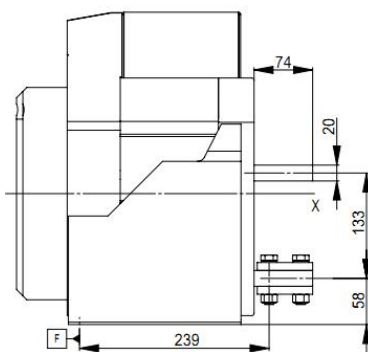
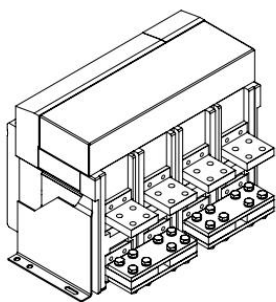
Dimensions



Type B wiring mode

800A-2500A fixed type (DC Type C wiring mode)

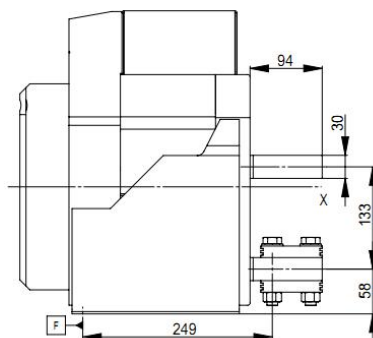
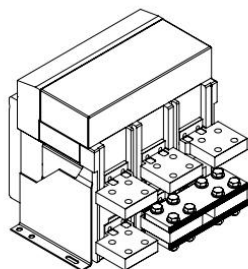
Dimensions



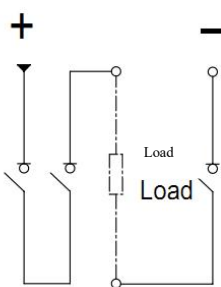
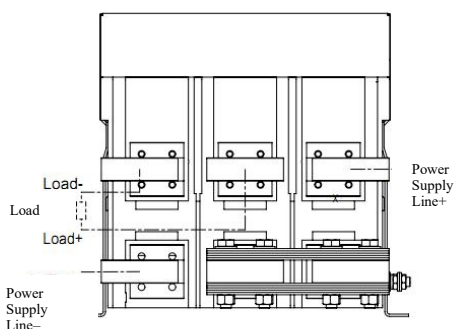
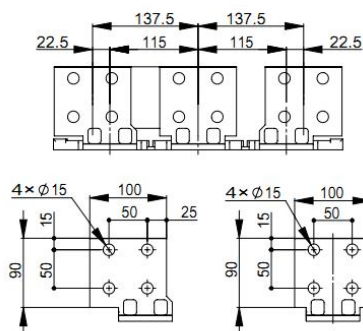
Type C wiring mode

3200A-4000A fixed type (DC Type B wiring mode)

Dimensions



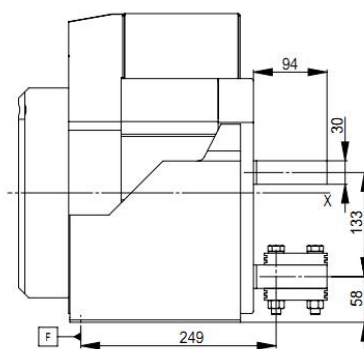
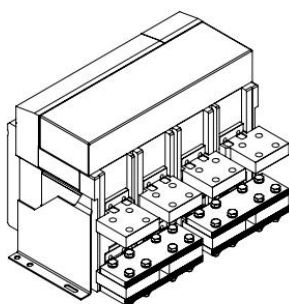
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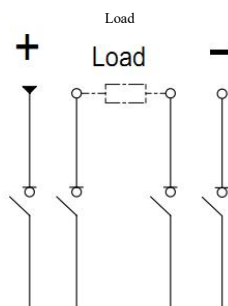
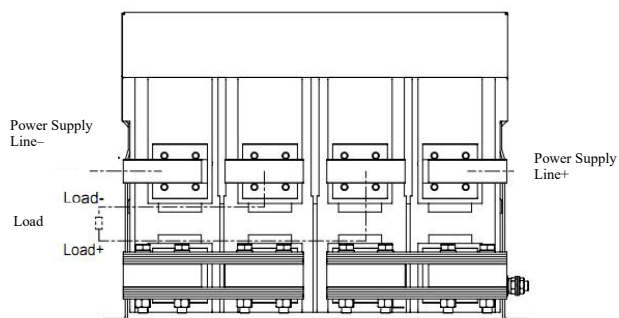
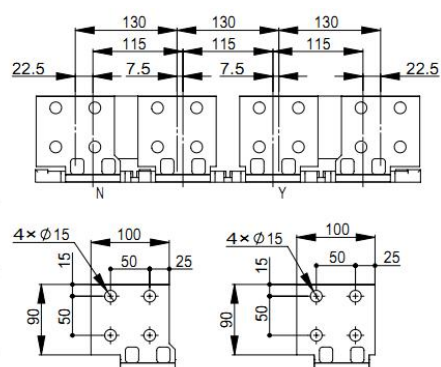
Type B wiring mode

3200A-4000A fixed type (DC Type C wiring mode)

Dimensions



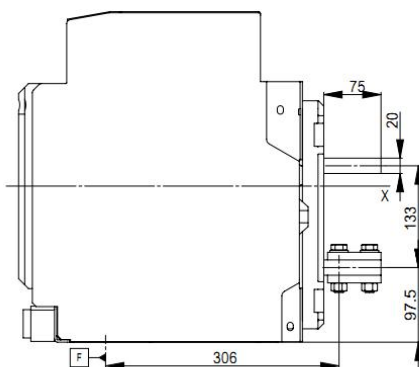
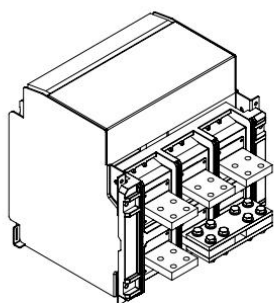
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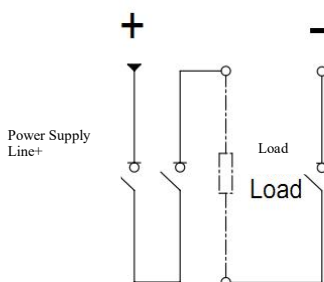
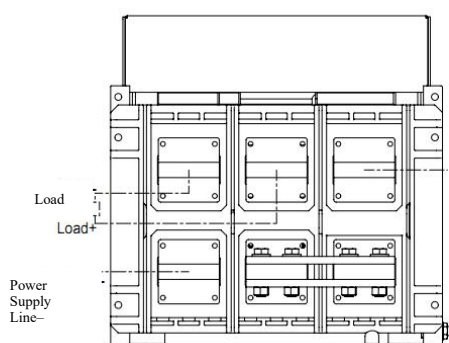
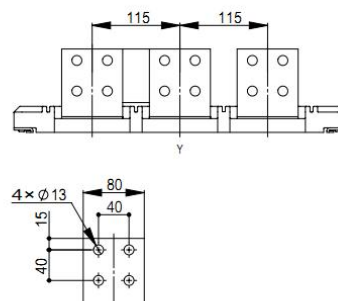
Type C wiring mode

800A-2500A drawout type (DC Type B wiring mode)

Dimensions



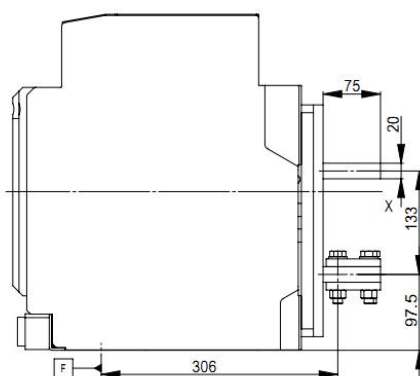
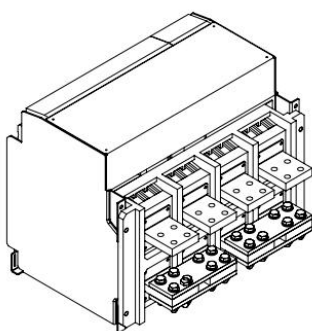
Details



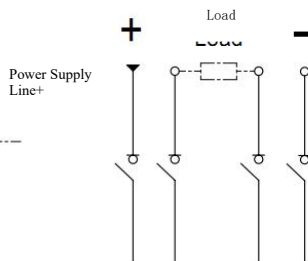
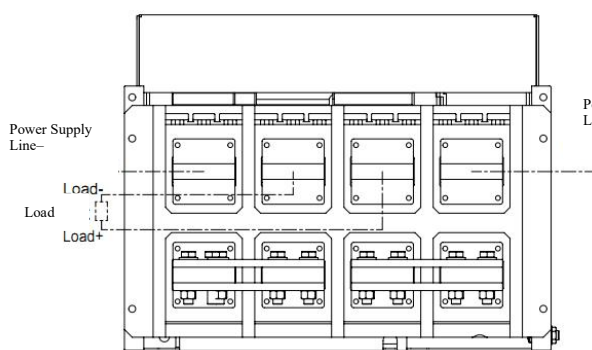
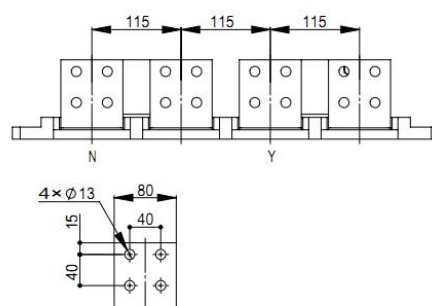
Type B wiring mode

800A-2500A drawout type (DC Type C wiring mode)

Dimensions



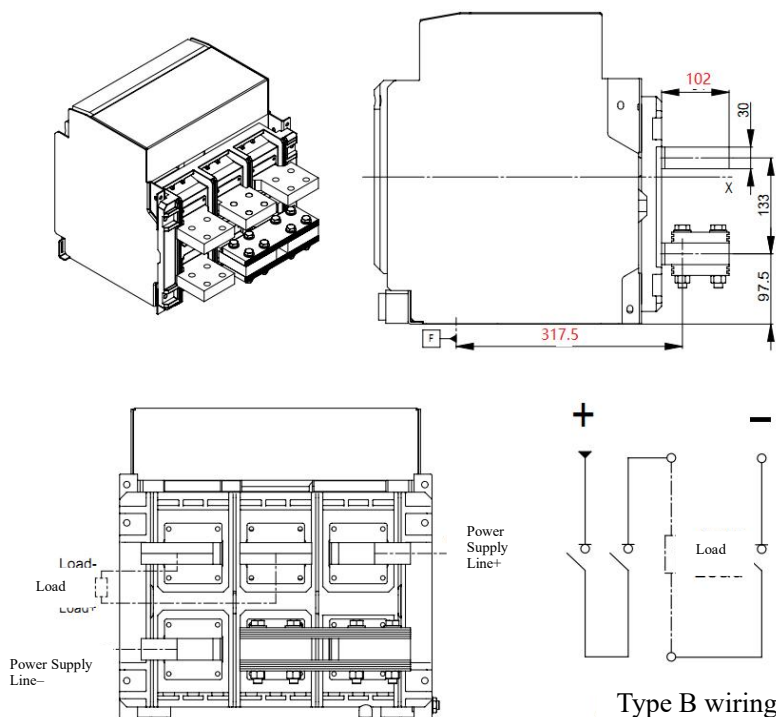
Details



Type C wiring mode

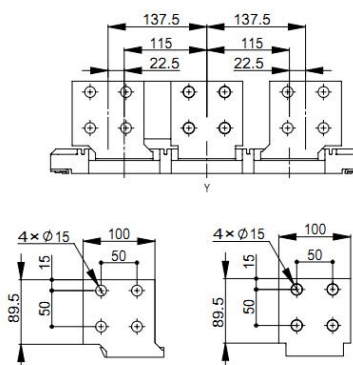
DC3200A-4000A drawout type (DC Type B wiring mode)

Dimensions



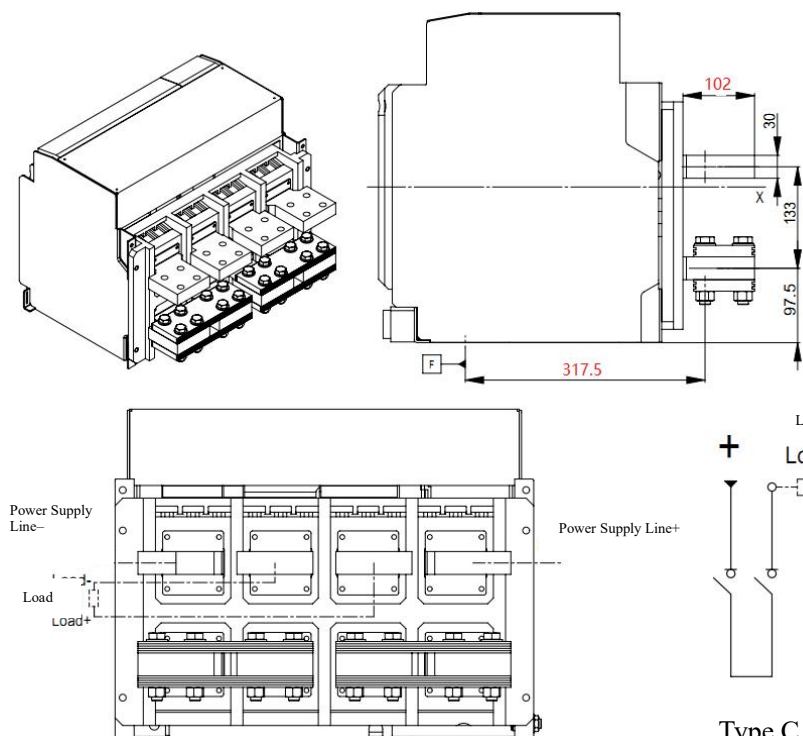
Type B wiring mode

Details



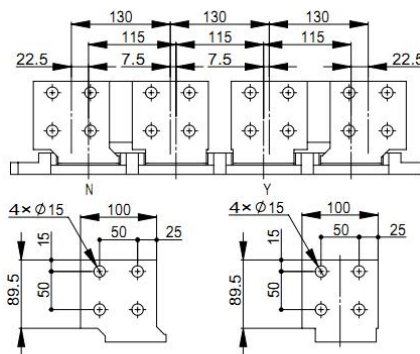
DC3200A-4000A drawout type (DC Type C wiring mode)

Dimensions



Type C wiring mode

Details

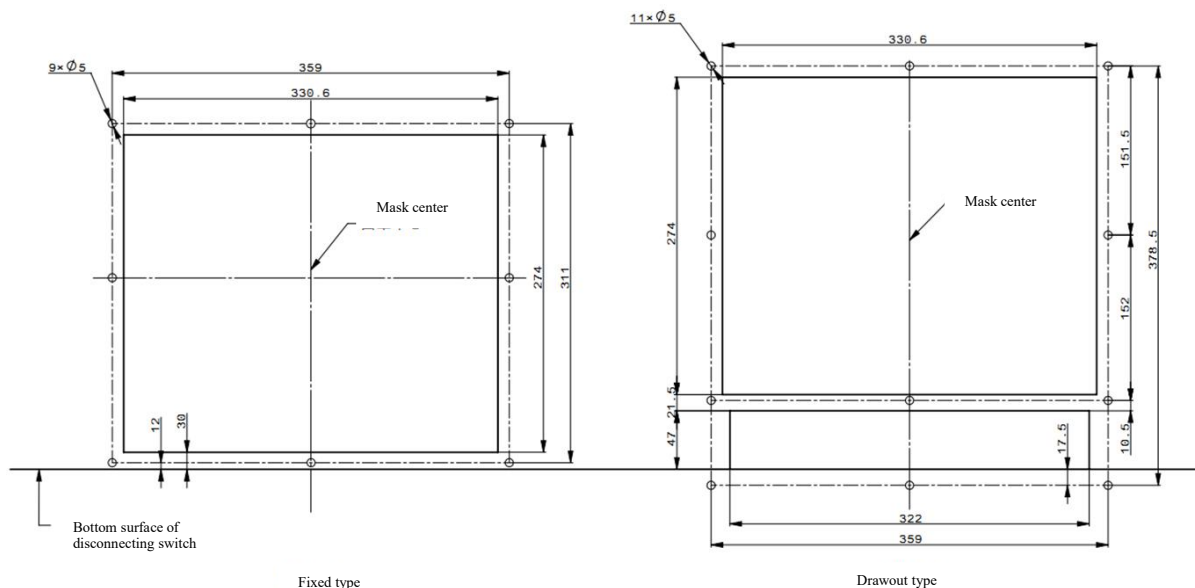


Notes: 1. For the circuit breaker. X and Y are the symmetric axes of the front cover;

2. Dimension tolerance $\pm 3\text{mm}$.

5.3 Cabinet door open hole and installation pitch

Hole dimensions of 4000 door frame (unit: mm)



5.4 Installation notes on disconnecting switch

To ensure the safety of you and the electric equipment, before put the disconnecting switch into operation, users must:

- Carefully read the Operation Manual before installation and use of the disconnecting switch.
- Check whether the specification of the disconnecting switch is in line with the requirements before installation.
- Install the disconnecting switch 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 disconnecting switch with a 1000V megohmmeter before installation of the disconnecting switch. 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 10 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 disconnecting switch when installing the disconnecting switch.
- Ensure the disconnecting switch is flat without additional mechanical stress when installing the conductive busbar.
- Conduct reliable grounding protection when installing the disconnecting switch. The grounding place of the disconnecting switch has an obvious grounding symbol.

h. Carry out wiring of the control circuit according to the wiring diagram when installing the disconnecting switch; check whether the working voltage of the undervoltage, shunt, closed electromagnet, motor and related parts conforms to the actual voltage, and then carry out the secondary circuit energizing. In case of drawout disconnecting switch, the disconnecting switch should be shaken into the test position, then the undervoltage release will close and then the disconnecting switch can be closed.

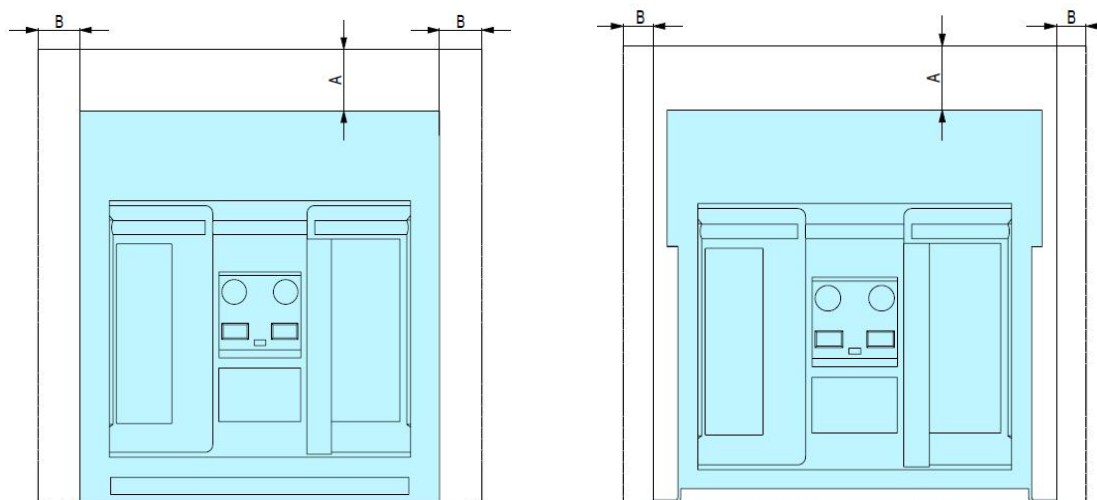
i. Pressing (or powering on) the closing button after the energy storage of the motor, the disconnecting switch will close.

j. Pressing (or powering on) the opening button, the disconnecting switch will open.

k. For manual storage of energy, pull the handle on the front panel up and down, a "click" sound can be heard after seven times, and the panel shows "storage of energy", the storage of energy ends. At this point, if there's undervoltage tripping, power on it (no need if without undervoltage tripping), then carry out closing operation.

The disconnecting switch is installed in the cabinet, the safe distance between the disconnecting switch and the cabinet

When users install the disconnecting switch into the cabinet, the safe distance between the disconnecting switch and the cabinet is as shown in Figure 37, and the installation dimensions are shown in Table 12.



Drawout disconnecting switch

Fixed disconnecting switch

Figure 37

Table 12

Unit: mm

Installation type of the disconnecting switch	To the insulator		To the metallic body	To the live part		
	A	B	A	B	A	B
Drawout type	0	0	0	0	60	60
Fixed type	0	0	0	0	60	60

Notes: 1. 150 mm space needed for removing the arc-extinguishing chamber should be considered for the safe spacing of the fixed type disconnecting switch;

2. If dust cover is added, height space of 70 mm for installation and rotating of the dust cover should be considered.

Chapter 6 Electrical Wiring Diagram

6.1 4000 electrical wiring diagram and terminal number definition36

Electrical Wiring Diagram

6

6.1 4000 electrical wiring diagram and terminal number definition

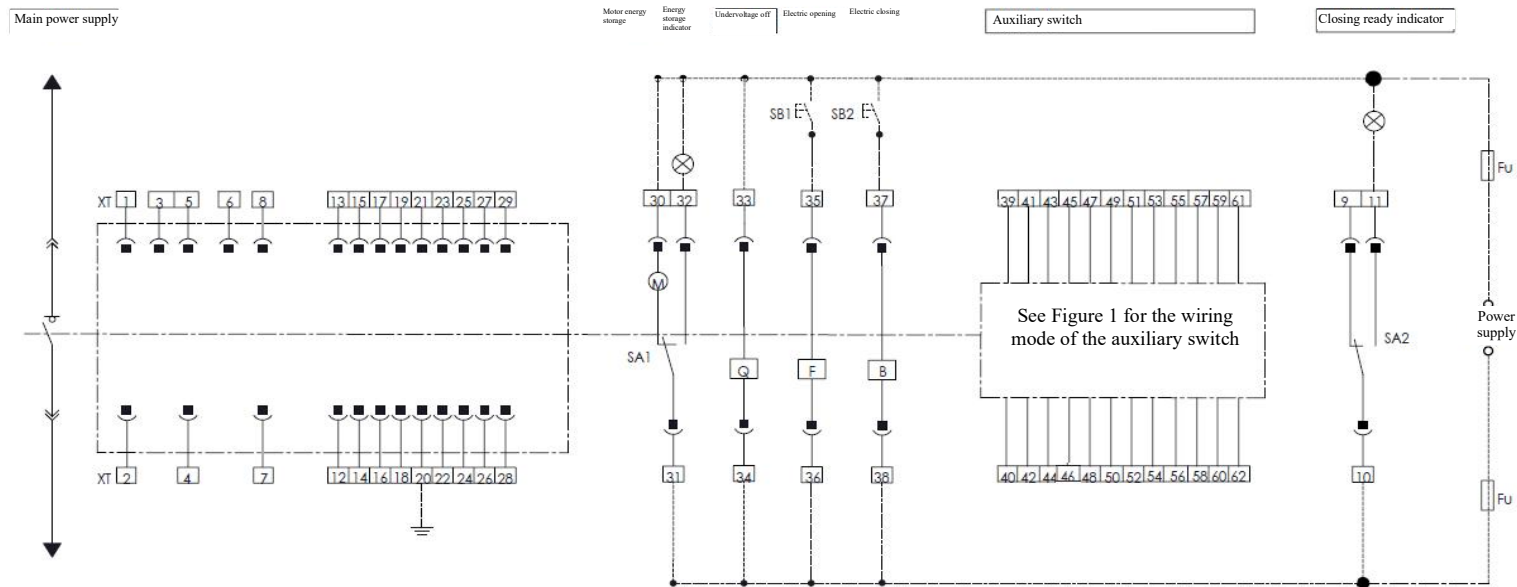
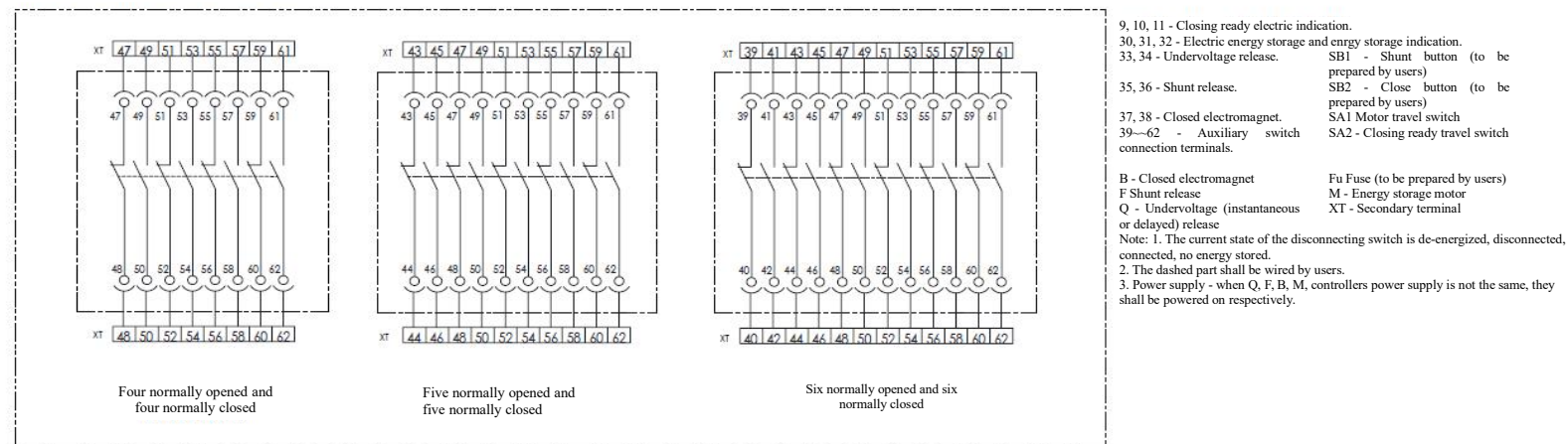
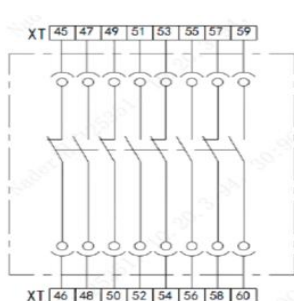
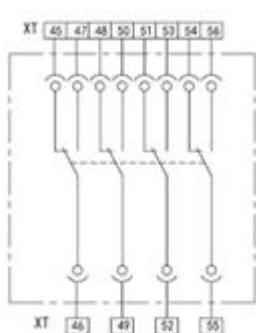


Figure 1 - NDW2G-2000 Auxiliary Switch Wiring Mode

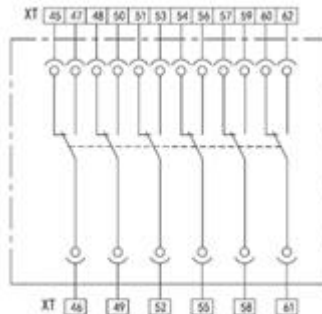




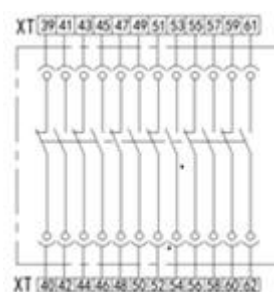
Four normally opened and
four normally closed



Four-group conversion
contacts



Six groups of changeover
contacts



Six normally opened and
six normally closed

Chapter 7 Ordering Selection Specification

7.1 NDW2GZ Series Disconnecting Switch Model Explanation and Encoding Rules	39
7.2 Ordering selection specification	41

Ordering Selection Specification

7.1 NDW2GZ Series Disconnecting Switch Model Explanation and Encoding Rules

ND W 2 GZ □: □ □/□/□ □ □/□ □ □ □/□/□/□/□

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

SN	Name	Specification, type code		Note	
1	Enterprise code	ND: “Nader” brand low-voltage electrical appliance			
2	Product code	W: Universal			
3	Design code	2			
4	Derived code	G : Disconnecting switch Z: DC			
5	Derived code	Not-marked: Conventional, F: Power generation products		F: Suitable for Wind Power and Plateau Applications	
6	Shell frame level current	40 : 4000			
7	Installation mode	Not marked: fixed type, C: drawout type			
8	Rated current	12: 1250A, 16: 1600A, 20: 2000A, 25: 2500A, 29: 2900A, 32: 3200A, 40: 4000A,			
9	Number of poles in series	3: 3P in series, 4: 4P in series			
10	Electric energy storage mechanism	D1: AC380V/AC400V, D2: AC220V/AC230V, D3: DC220V, D4: DC110V, D5: DC24V			
11	Shunt release	F1: AC380V/AC400V, F2: AC220V/AC230V, F3: DC220V, F4: DC110V, F5: DC24V F6-AC220V/DC220V (retention type)			
12	Closed electromagnet	B1: AC380V/AC400V, B2: AC220V/AC230V, B3: DC220V, B4: DC110V, B5: DC24V			
13	Internal accessories	Undervoltage/loss-of-voltage release	Q1: AC380V/AC400V, Q2: AC220V/AC230V, Q3: DC220V, Q4: DC110V, Q5: DC24V		
S1: AC380V/AC400V, S2: AC220V/AC230V					
Undervoltage/loss-of-voltage release delay time		Conventional undervoltage: 0: Instantaneous, 1: 1s delay, 3: 3s delay, 5: 5s delay		This shall be omitted if without this accessory	
		Loss of voltage: 1: 1s delay, 3: 3s delay, 5: 5s delay			
15		Auxiliary contact	Not-marked: four-group conversion, A6: six-group conversion, A44: four normally opened and four normally closed		
16		BX: Closing ready signal output unit		This shall be omitted if without accessory;	
		JS: Counter functional unit			
	CM1: Drawout type (with the right side of the door interlock), CM2: drawout type (with the left side of the door interlock).				
	CX: Drawer seat three-position signal output				

17	External accessories	M: door frame	Carry out the sequence arrangement according to the table, with “/” for separation.
		G: Phase partition (standard configuration for 4000 shell frame)	
		F: dust cover	
		S: Button lock	
		L- Connection bolt	
18	Wiring mode	J1: Extended horizontal wiring	Default wiring
19	Power supply/load connecting mode	B: Type B wiring (3P), C: Type C wiring (4P), Not-marked: Free wiring (applicable to 3P/4P)	Type B and C configuration transfer bus
20	Rated operating voltage	Not marked: DC750V (3P), KV1: DC1000V (4P), KV2: DC1200V (4P), KV3: DC1500V (4P)	
21	Product usage type	Not marked - Conventional, GD - Plateau, low temperature type, HD - Enhanced type	HD to be used with fuses
22	Special notes	Customer's special requirements	

Interlocking accessory model explanation and encoding rules

SF11: key lock device (one lock and one key), SF21: key lock device (two locks and one key), SF31: key lock device (three locks and one key), SF32: key lock device (three locks and two keys), SF53: key lock device (five locks and three keys)	1. Select one from five key locks; 2. Select one from five mechanical interlocks;
SR11: Mechanical interlocking device (two sets of steel cables, one for closing and one for opening) SR12: Mechanical interlocking device (three sets of steel cables, one for closing and two for opening) SR21: Mechanical interlocking device (three sets of steel cables, two for closing and one for opening) SY11: Mechanical interlocking device (two sets of hard rods, one for closing and one for opening) SY12: Mechanical interlocking device (three sets of hard rods, one for closing and two for opening)	

7.2 Ordering selection specification

(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:
Basic parameters	Shell frame level	AC	☐ NDW2G: 4000 ☐ NDW2GF: 4000 Note: NDW2GF is suitable for wind power and plateau applications.	
		DC	☐ NDW2GZ: 4000 ☐ NDW2GZF: 4000 Note: NDW2GZF is suitable for wind power and plateau applications.	
	Product type	☐ Not-marked: Conventional		
	Installation mode	☐ Fixed type ☐ C Drawout type		
	Rated current (A)	☐ 1250 ☐ 1600 ☐ 2000 ☐ 2500 ☐ 2900 ☐ 3200 ☐ 4000		
	Rated operating voltage	☐ Not marked: DC750V (3P) ☐ KV1: DC1000V (4P) ☐ KV2: DC1200V (4P) ☐ KV3: DC1500V (4P)		
	Wiring mode	☐ J1 Horizontal extended wiring		
	Product type	☐ Not marked - regular (standard) ☐ GD - Plateau, low temperature ☐ HD - enhanced (for use with fuses)		
Required accessories	Load connecting method (DC)	☐ Not marked: Free wiring (applicable to 3P/4P) ☐ B: Type B wiring (3P) ☐ C: Type C wiring (4P)		
	Electric Operating Mechanism	☐ D1(AC380V/AC400V) ☐ D2(AC220V/AC230V) ☐ D3(DC220V) ☐ D4(DC110V) ☐ D5 (DC24V)		
	Shunt release	☐ F1(AC380V/AC400V) ☐ F2(AC220V/AC230V) ☐ F3(DC220V) ☐ F4(DC110V) ☐ F5(DC24V) ☐ F6 (AC230V/DC220V) Retention type		
	Closed electromagnet	☐ B1(AC380V/AC400V) ☐ B2(AC220V/AC230V) ☐ B3(DC220V) ☐ B4(DC110V) ☐ B5(DC24V)		
Optional accessories	Undervoltage release	☐ Q1(AC380V/AC400V) ☐ Q2(AC220V/AC230V) ☐ Q3(DC220V) ☐ Q4(DC110V) ☐ Q5(DC24V)		
		☐ 0: Instantaneous (0s) Delay: ☐ 1 (1s delay) ☐ 3 (3s delay) ☐ 5 (5s delay)		
	No-voltage release	☐ S1(AC380V/AC400V) ☐ S2(AC220V/AC230V)		
		Delay: ☐ 1 (1s delay) ☐ 3 (3s delay) ☐ 5 (5s delay)		
	Auxiliary contact	☐ Four-group switching (standard configuration) ☐ A6: six-group switching ☐ A44: four normally opened and four normally closed		
	Closing ready	☐ BX: Closing ready signal output unit		
	Counter	☐ JS: Counter		
Drawer seat door interlock	☐ CM1: Right side of the door interlock ☐ CM2: Left side of the door interlock			

	Position indication	☐ CX: Drawer seat three-position signal output	
	Door frame	☐ M Doorframe	
	Interphase partition	☐ G Phase partition (4000 standard configuration)	
	Dust cover	☐ F Dust cover	
	Button lock	☐ S Button lock	
	Temperature alarm	☐ WD Temperature alarm protection device	
	Connection bolt	☐ L- Connection bolt	
Interlock accessories	Off-position lock	☐ SF11: One lock one key ☐ SF21: Two locks one key ☐ SF31: Three locks one key ☐ SF32: Three locks two keys ☐ SF53: Five locks three keys	
	Mechanical interlocking	Cable type	☐ SR11: Two groups, one for closing and one for opening ☐ ☐ SR12: Three groups, one for closing and two for opening ☐ SR21: Three groups, two for closing and one for opening (SR21 is not available for 1600 shell frame)
		Hard rod type	☐ SY11: Two groups, one for closing and one for opening ☐ ☐ SY12: Three groups, one for closing and two for opening
	Special requirements	Other requirements:	
Note: If you have special requirements, please indicate in the special requirements column.			