



NH1 Series Switch Disconnect

User Instruction



Safety Warning

- ① Only professional technicians are allowed for installation and maintenance.
- ② It is strictly prohibited to install in the environment containing inflammable, explosive gas and moist condensation.
- ③ Power must be turned off when the product is installed or maintained.
- ④ Please do not touch the conductive part of the product during working.
- ⑤ In order to avoid dangerous accidents, the product must be installed, fixed and wired in strict accordance with the requirements of the instructions for use.

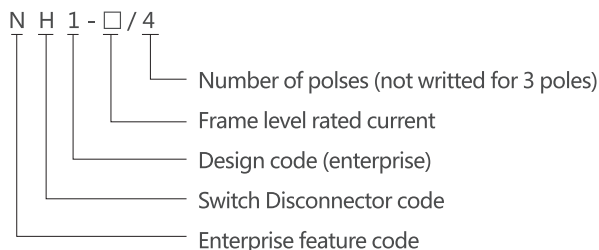
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1 Scope of Application

The NH1 series switch disconnecter is suitable for power distribution networks with a frequency of AC 50Hz and 60Hz, a rated working voltage of AC690V and below, and rated working current of 4000A and below, and is used to infrequently connect and disconnect circuit and isolate power supply.

2 Model Specifications and Their Meanings



3 Conditions for Normal Application, Installation, Transportation and Storage

3.1 Normal Conditions

3.1.1 The ambient air temperature should be between -5°C and +40°C, and the average temperature within 24 hours should not exceed +35°C (unless specifically stated).

Note: In case of a special order, the user should indicate the low temperature type product whose ambient air temperature is between -45°C and +40°C;

2. When the ambient temperature exceeds +40°C, the product should be derated according to the provisions of Table 3 in section 4.1.3.1, and the maximum allowable ambient temperature is +65°C.

3.1.2 The altitude of the installation site should not exceed 2,000 m. (Derate it according to section 4.1.3.2 when the altitude exceeds 2,000 m.)

3.1.3 The relative humidity of the atmosphere should not exceed 50% at a maximum temperature of +40°C; a higher relative humidity is allowed at lower temperatures; the monthly average minimum relative humidity of the wettest month is 90%, and the average minimum temperature of that month is +25°C, taking into account the condensation on the surface of the product due to temperature changes.

3.1.4 The pollution level is level 3.

3.1.5 The utilization category is B.

3.1.6 The installation category of the switch disconnecter is IV. When the rated working voltage of the main circuit is less than or equal to AC400V, the installation category of the auxiliary circuit and control circuit is III; When the rated working voltage of the main circuit is larger than AC400V and no more than AC690V, the auxiliary circuit and control circuit need to be isolated from the main circuit by an isolating transformer with a capacity ≥2kVA, and the maximum working voltage of the auxiliary and control circuit is AC400V and the installation category of the auxiliary circuit is III.

3.2 Installation conditions: The switch disconnecter should be installed in accordance with the installation requirements of this manual, and the vertical inclination should not exceed 5°.

3.3 Protection level: IP20 on the front and IP00 on the other sides.

3.4 Conditions for Transportation and Storage -25°C~+55°C; up to +70°C within a short time (24 hours).

4 Main Technical Parameters and Performance

4.1 Technical Parameters of Main Circuit

4.1.1 Technical Parameters of Main Circuit of switch disconnecter

Table 1 Technical parameters of main circuit

No.	Technical Parameter										
	Frame Rated Level Current Inm(A)	1000			2000			3200		4000	
1	Rated free air heating current Ith(A)	400	630	1000	630	1600	2000	2500	3200	4000	
2	Rated operating voltage Ue(V)	AC 415/690			AC 400			AC 400/690		AC 400	
3	Rated current In (A)	200 400	630	800 1000	630	800 1000 1250 1600	2000	2000 2500	3200	2000 2500 2900 3200 3600 4000	
4	Rated frequency (Hz)	50/60									
5	Rated insulation voltage Ui(V)	800			1000						
6	Rated impulse withstand voltage Uimp (kV)	8									
7	Rated short-time withstand current Icw/1s(kA)	AC 400/415V	30		50			80		80	
		AC 690V			-					-	
8	Rated limit short -circuit making capacity Icm(kA)	AC 400/415V	63		105			176		176	
		AC 690V			-					-	
9	Number of poles of main contact	3/4								3	
10	Installation method	Drawer type / fixed type									
11	Electrical life (times)	AC 400/415 V	6500		8000			7000			
		AC 690V	3000		3000			2000			
12	Mechanical life	Maintenance free	15000					10000			
		Maintenance required	30000					20000			
13	Operating frequency (times/hour)	20								10	
14	Arcing distance (mm)	0									
15	Wiring mode	Horizontal / vertical									

4.1.2 Power Loss of Incoming and Outgoing Lines of switch disconnecter

Table 2 Power loss of incoming and outgoing lines of switch disconnecter (per pole)

Inm(A)		NH1-1000					NH1-2000						NH1-3200			NH1-4000					
In(A)		200	400	630	800	1000	630	800	1000	1250	1600	2000	2000	2500	3200	2000	2500	2900	3200	3600	4000
Power loss (W)	Drawer type	40	101	123	110	171	70	110	172	268	440	530	384	600	737	230	330	484	590	746	921
	Fixed type	33	85	107	94	146	34.4	50	78	122	200	262	200	312	307	96	150	202	246	311	384

4.1.3 Derating of switch disconnecter

4.1.3.1 Derating at Different Temperatures

Table 3 Derating of switch disconnecter at different temperatures

Standard	Ambient temperature	NH1-1000						NH1-2000						NH1-3200				NH1-4000					
IEC/EN 60947-3	40°C	200	400	630	800	1000	630	800	1000	1250	1600	2000	2000	2500	2900	3200	2000	2500	2900	3200	3600	4000	
	45°C	200	395	623	800	985	630	800	1000	1250	1600	1900	2000	2400	2900	3000	2000	2500	2900	3200	3600	3800	
	50°C	200	384	605	800	960	630	800	1000	1250	1500	1900	2000	2300	2900	3000	2000	2500	2900	3200	3600	3600	
	55°C	200	328	584	800	924	630	800	1000	1250	1500	1800	2000	2200	2800	2800	2000	2500	2900	3200	3400	3400	
	60°C	192	192	548	800	870	610	800	1000	1250	1300	1700	2000	2200	2800	2800	2000	2500	2900	3200	3200	3200	
	65°C	170	170	500	800	810	610	800	1000	1250	1300	1650	2000	2200	2600	2600	2000	2500	2900	3000	3000	3000	

4.1.3.2 Derating Requirements at Different Altitudes

When the altitude exceeds 2,000 m, the insulation performance, cooling performance, pressure, etc. in the atmosphere will change. The performance can be corrected by referring to Table 4 and Table 5.

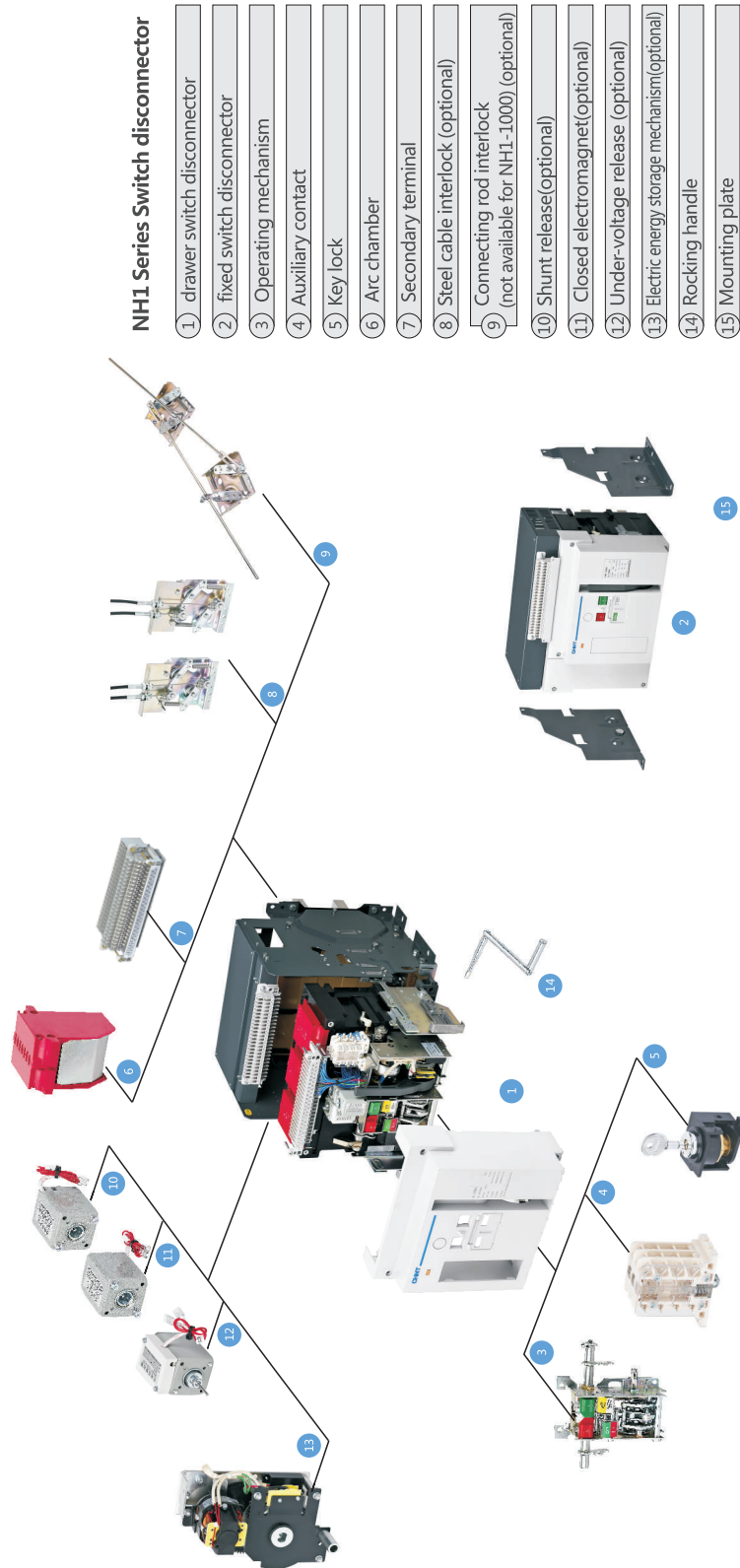
Table 4 Derating requirements at different altitudes

Altitude (m)	2000	2500	3000	3500	4000	4500	5000
Power frequency withstand voltage (V)	2200	2077	1955	1857	1760	1680	1600
Insulation voltage (V)	1000	900	800	750	700	650	600
Rated operating voltage (Ue)	690	635	580	540	500	450	400
Rated operating current (Ie)	Ie	0.93Ie	0.88Ie	0.83Ie	0.78Ie	0.73Ie	Contact the factory

Note: 1. If the ambient temperature is less than 40°C, $I_e = I_n$;

2. If the ambient temperature is higher than 40°C, the equipment must be derated according to the requirements of the instruction manual. At this time, $I_e \neq I_n$, and I_e can be detected according to the correspondence between current and temperature.

5 Structure



Product structure diagram

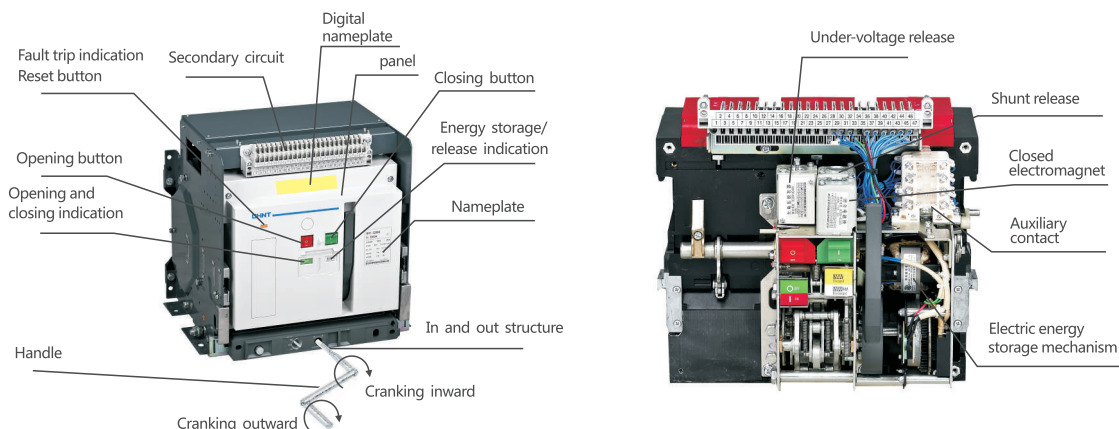


Figure 1 Product outline structure

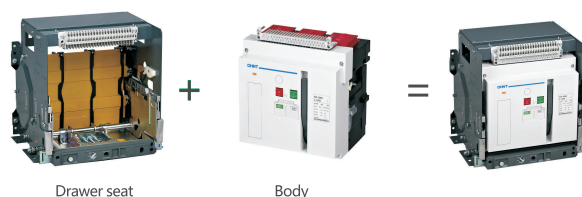


Figure 2-a drawer switch disconnector



Figure 2-b fixed switch disconnector

Figure 2 Product installation type

6 Appearance, Installation Dimensions and Weight

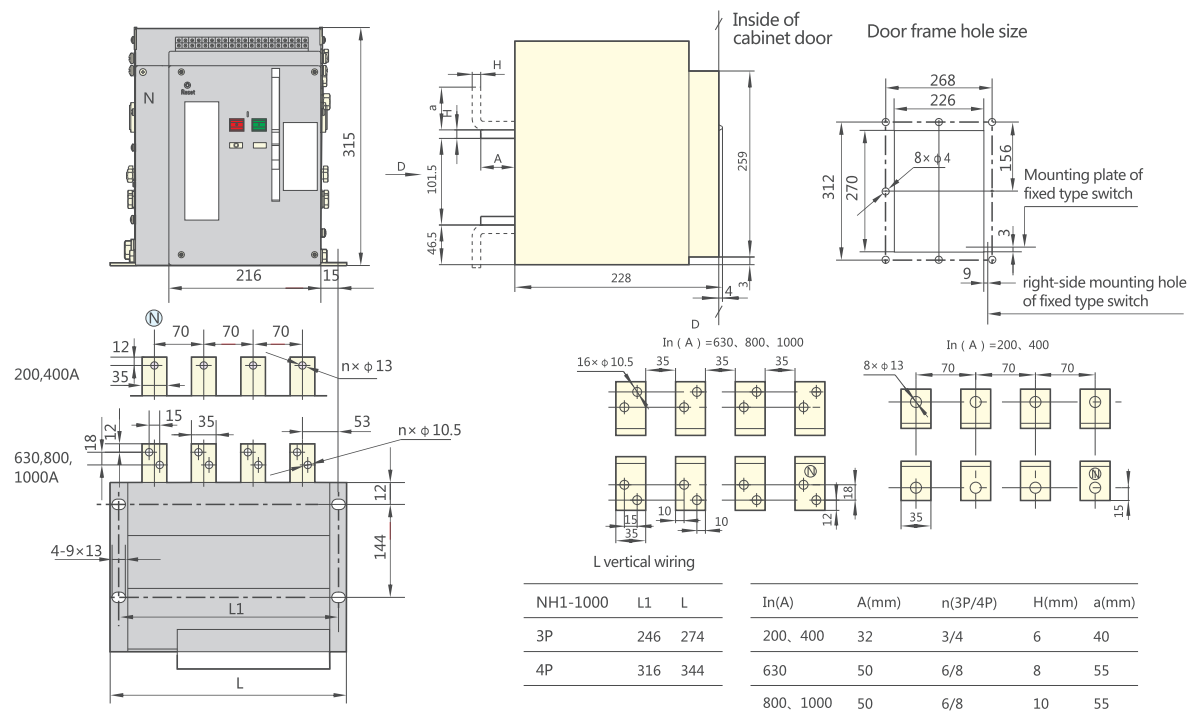


Figure 3 NH1-1000 fixed type



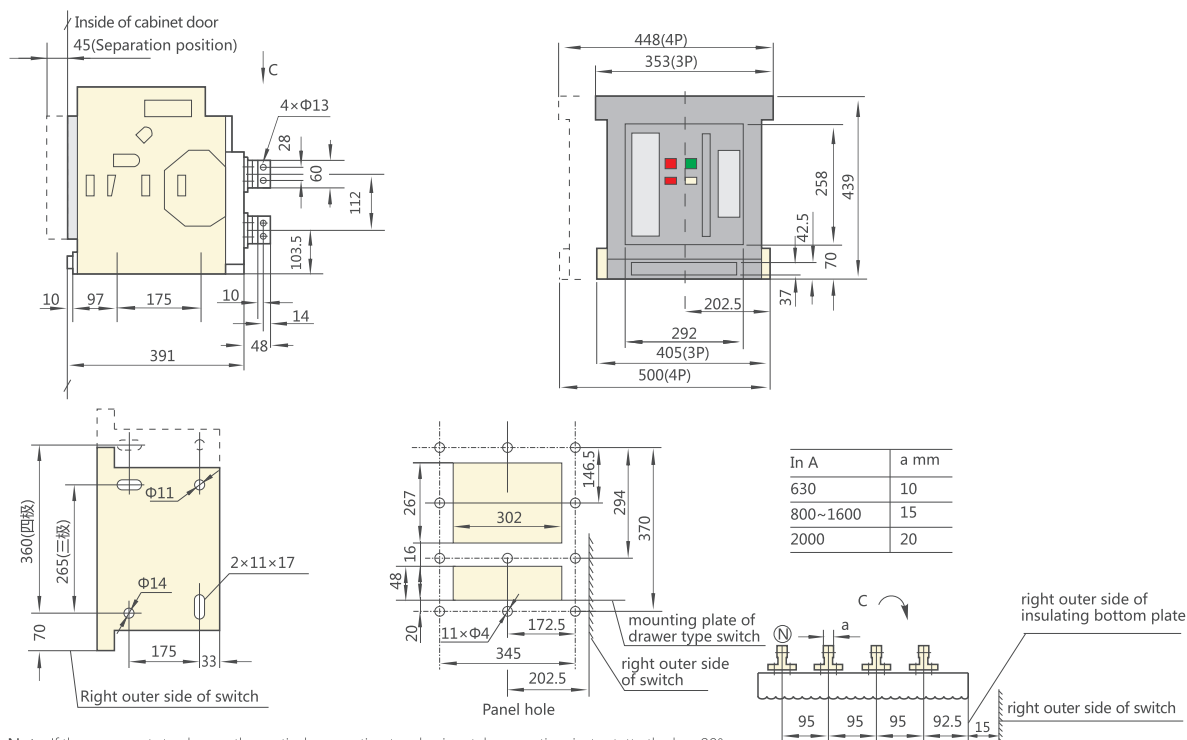


Figure 6 Installation diagram of NH1-2000 drawer type vertically connected of the rotating bus (vertical connection by default)

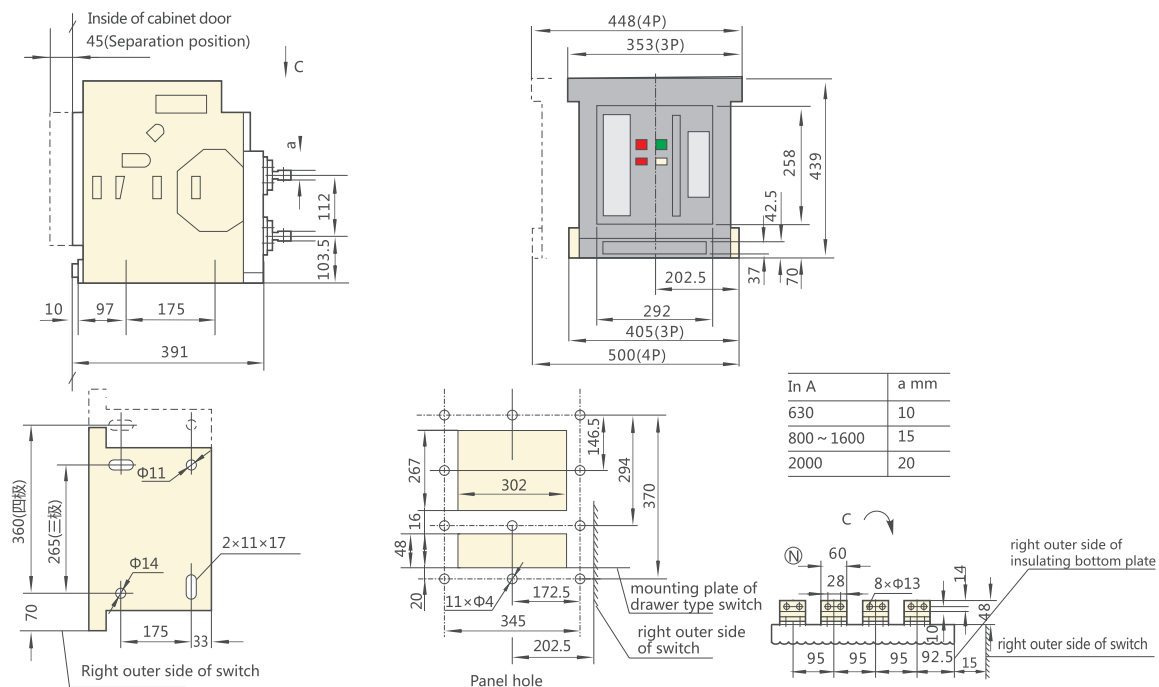
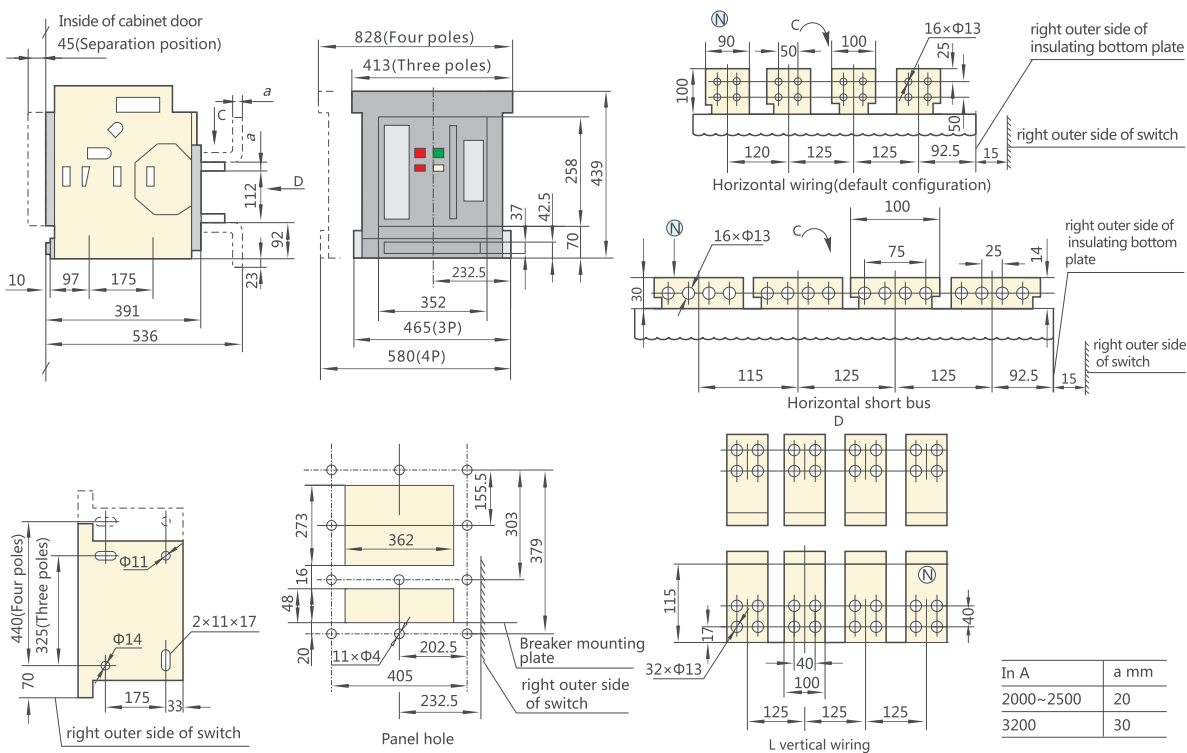
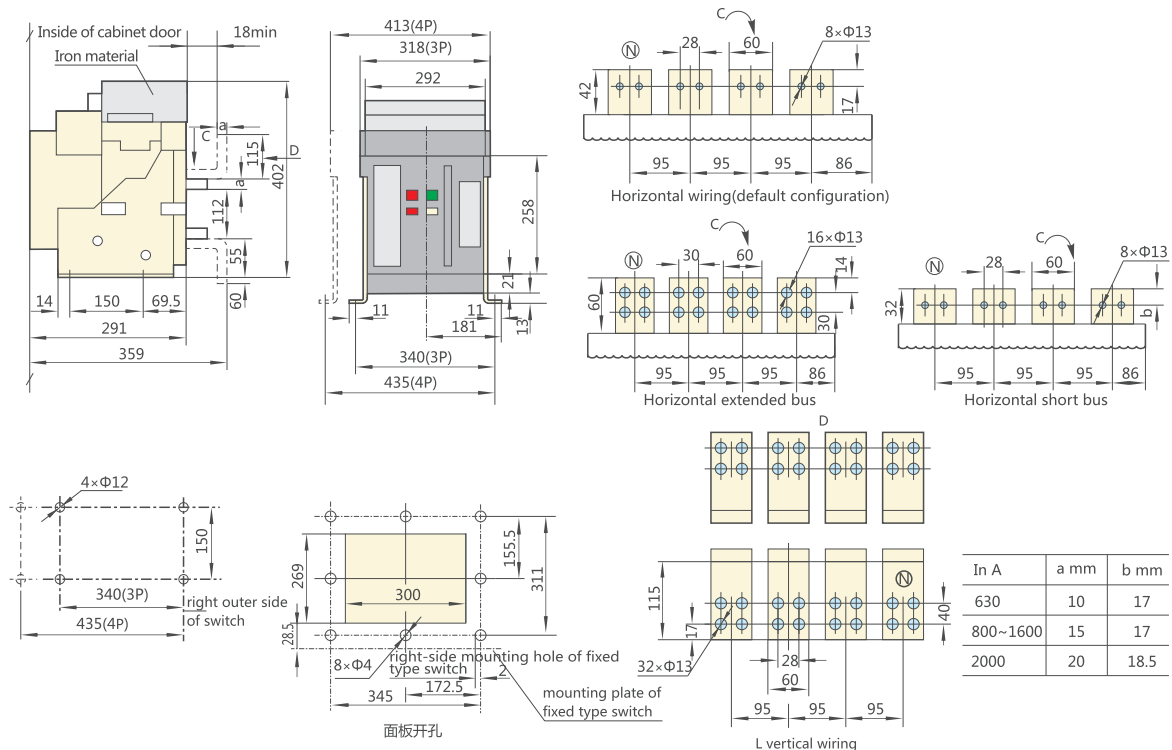
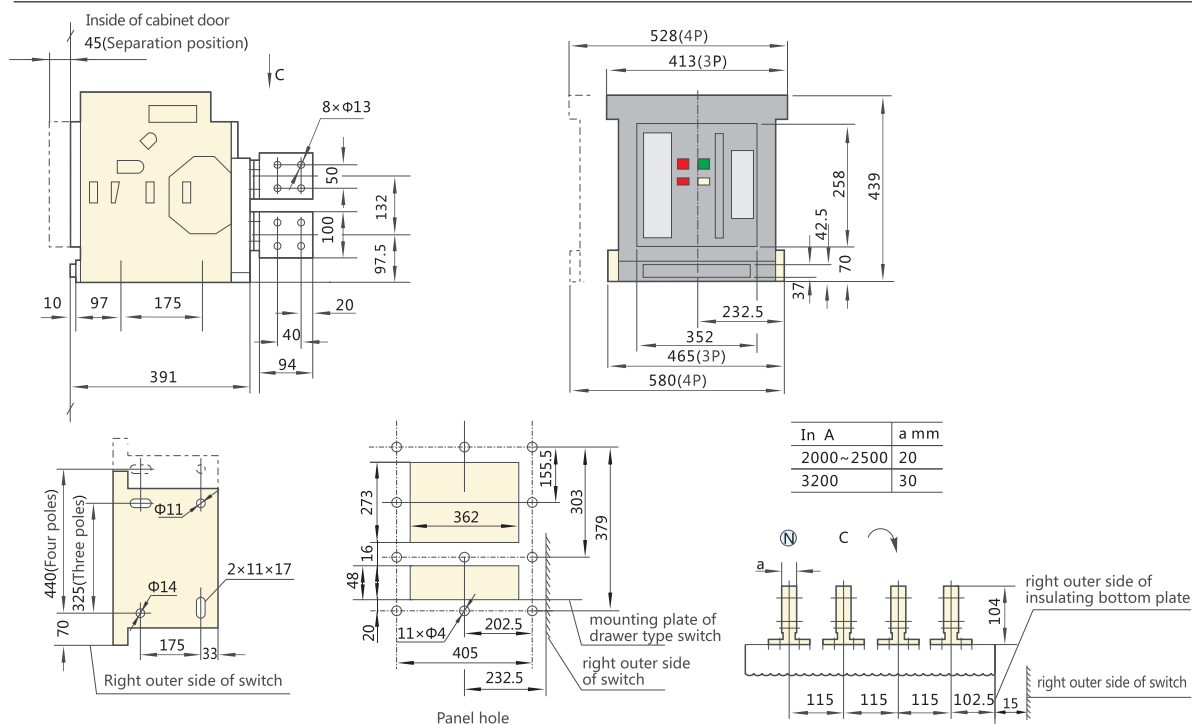


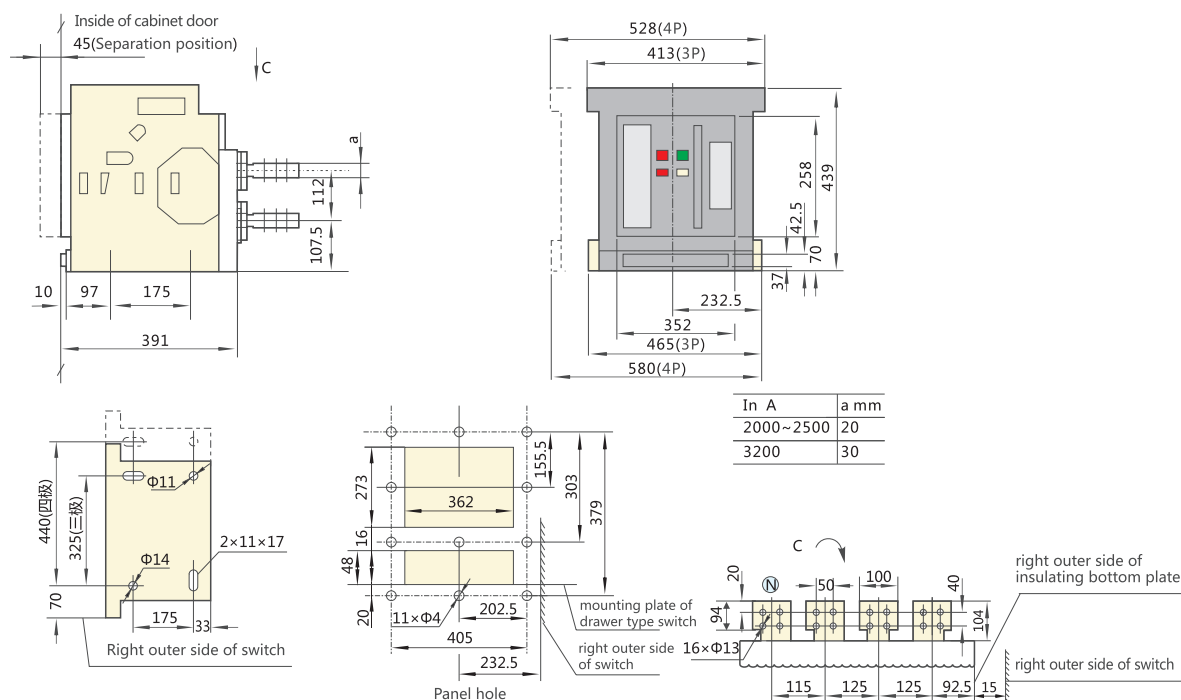
Figure 7 Installation diagram of NH1-2000 drawer type horizontally connected of the rotating bus (horizontal connection to be completed by the user)





Note: If the user wants to change the vertical connection to a horizontal connection, change the upper and lower bus of group B to be different from A and C phases.

Figure 10 Installation diagram of NH1-3200 drawer type vertically connected of the rotating bus (vertical connection by default)



Note: If the user wants to change the horizontal connection to a vertical connection, change the upper and lower bus of group B to be as same as A and C phases.

Figure 11 Installation diagram of NH1-3200 drawer type horizontally connected of the rotating bus (horizontal connection to be completed by the user)

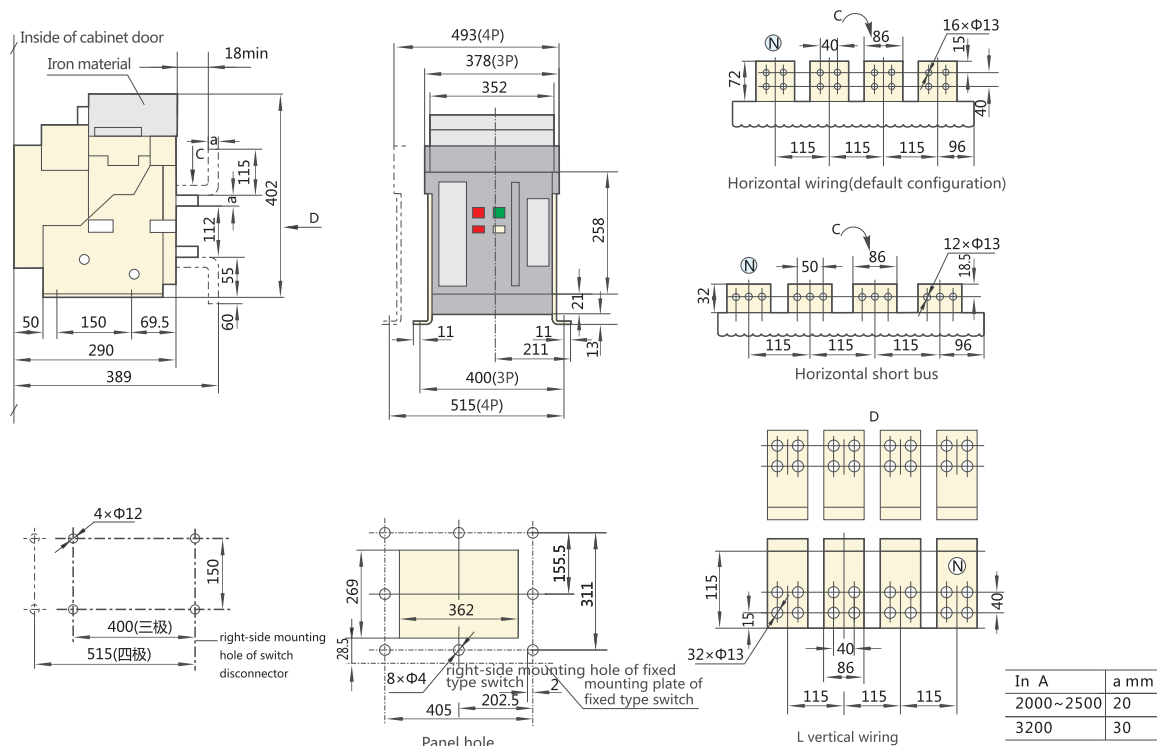


Figure 12 NH1-3200 fixed type

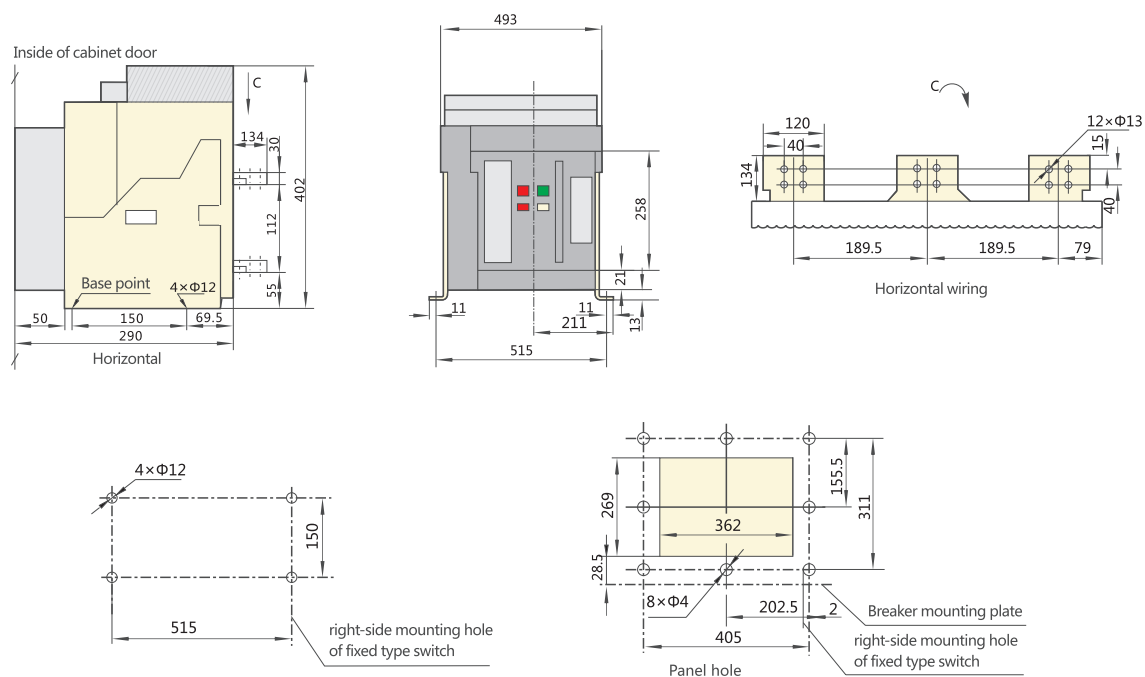


Figure 13 NH1-4000 fixed type (three poles)

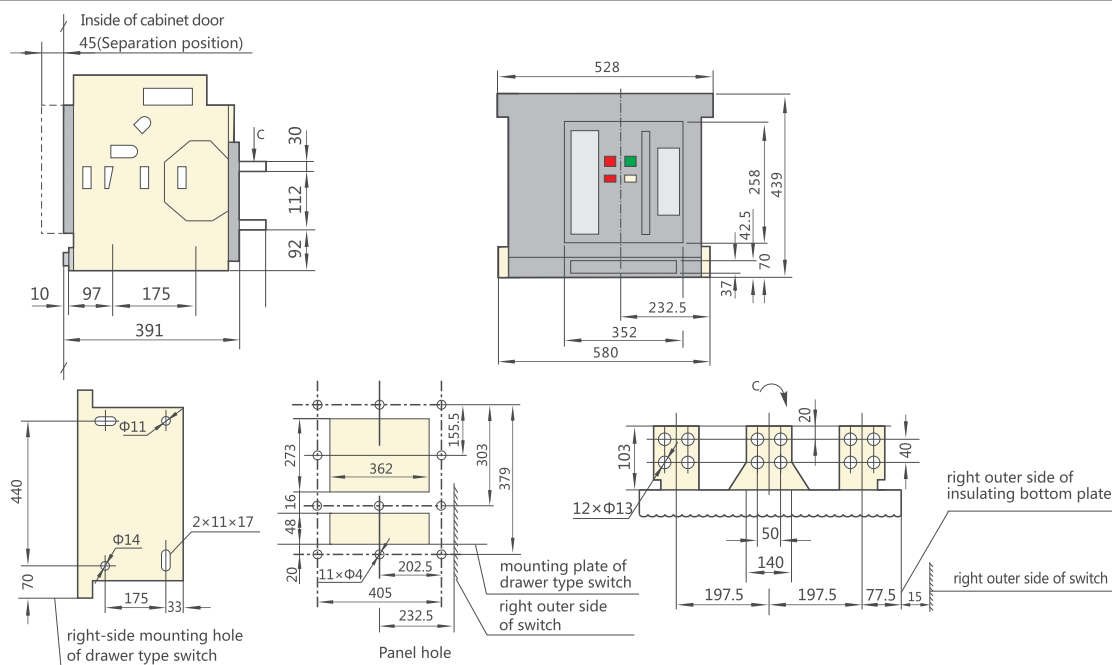


Figure 14 NH1-4000 drawer type (three poles)

Table 5 Single product weight (net weight)

Weight (kg)	Model Spec.	NH1-1000 (3P/4P)	NH1-2000(3P/4P)			NH1-3200(3P/4P)		NH1-4000 (3P)
			630	800 ~1600	2000	2000 ~2500	3200	
Installation method								
Fixed type		19/23	39/48	40/50	41/52	52/64	54/67	86
Drawer type		36/43	62/77	65/80	70/85	91/113	101/125	130

7 Installation, Commissioning and Operation

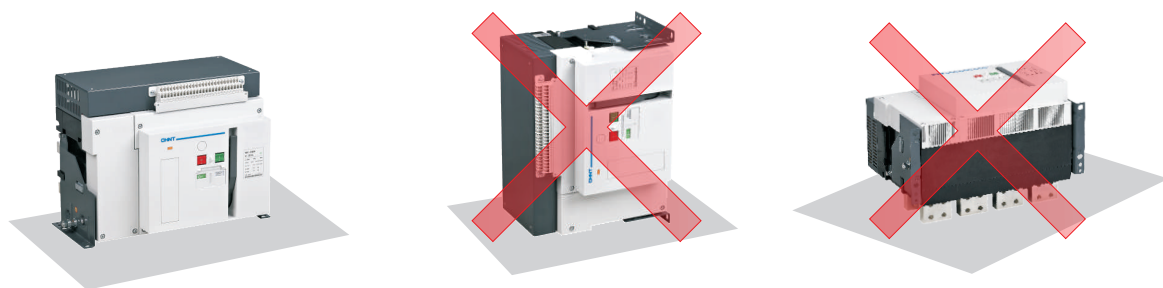
7.1 Basic Inspection and Technical Requirements for Installation

7.1.1 Inspection Items Before Installation

- Check that your order matches the nameplate parameters on this switch disconnecter:
 - Rated current;
 - main circuit voltage;
 - installation mode and operation mode;
 - shunt release voltage, closed electromagnet voltage, and delay time, and energy storage motor voltage; and
 - other special ordering requirements;
- Check the packing contents according to the configuration instructions in the manual;
- Be sure to read this manual before installation, operation, maintenance and overhaul to avoid human damage to the switch disconnecter and unnecessary trouble;

7.1.2 Preparation Before Installation

- Unpack according to the unpacking order on the top cover of the packaging box. Do not use barbaric means;
- Remove the breaker from the fixed bottom plate of the packaging box. If it is a drawer type breaker, remove the body out of the drawer seat according to the method shown in section 7.6.1.2 after removing the bottom plate, and clean foreign objects in the drawer seat;

**Figure 15 Switch disconnector placement**

- c. Check the insulation resistance of the switch disconnector with a 500V megohmmeter. When the ambient temperature is $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and the relative humidity is 50%-70%, the insulation resistance should not be less than $20\text{M}\Omega$, otherwise the switch disconnector should be dried.

7.1.3 Recommendations for Busbar Installation by User

Table 6 Recommendations for busbar installation by user

Inm(A)		NH1-1000					NH1-2000					NH1-3200			NH1-4000						
In(A)		200	400	630	800	1000	630	800	1000	1250	1600	2000	2000	2500	3200	2000	2500	2900	3200	3600	4000
Busbar	Thickness (mm)	5	5	5	6	8	5	6	8	10	12	10	8	10	10	8	10	10	10	10	10
	Width (mm)	30	30	40	50	50	60	60	60	60	60	60	100	100	100	100	100	100	100	120	120
	Number of busbar	1	2	2	2	2	2	2	2	2	3	2	2	2	4	2	2	3	4	4	4

Note: a. The specifications in the table are the specifications of the copper bars used when the switch disconnector is in an open environment at 40°C and meets the heat conditions specified in IEC/EN 60947.3.

b. When the copper bars selected by the user do not match the terminal block of the switch disconnector, it is necessary to design and process extended busbar for transfer, which should be designed by the user.

The cross-sectional area of the extended busbar should not be less than the requirements in the table above, and the gap between extended busbars should not be less than the gap between the terminal blocks of the switch disconnector.

c. After the switch disconnector is installed with the busbar recommended in the above table, it should be ensured that the clearance between the same poles of the switch disconnector is not less than 18 mm.

d. When the switch disconnector is selected for the electrical components in the load device that use thyristor for three-phase rectification and high-frequency inverter, such as the high-frequency induction heating furnace (medium frequency furnace steelmaking equipment), solid-state high-frequency welding machine (such as submerged arc welding machine) and vacuum heating melting equipment (such as monocrystalline silicon growth furnace), if it is necessary to consider the influence of the higher harmonics generated by the thyristor on the switch disconnector in addition to the influence of ambient temperature and altitude, the switch disconnector must be derated with a recommended derating factor of 0.5-0.8.

e. After the switch disconnector is installed, the safety distance between the charged bodies of different potentials and between the charged body and the ground should not be less than 18 mm.

7.2 Installation of drawer switch disconnector

7.2.1 For the NH1-1000 model, fix the drawer seat on the mounting plate of the power distribution cabinet and fasten with 4 M8 bolts (with washers), with a mounting torque of $10.3\text{--}14.4\text{ N} \cdot \text{m}$; for the NH1-2000~4000/3 model, fix the drawer seat on the mounting plate of the power distribution cabinet and fasten with 4 M10 bolts (with washers), with a mounting torque of $20\text{--}28\text{ N} \cdot \text{m}$, as shown in the figure 16(the drawer switch disconnector can be installed vertically with the special bracket).

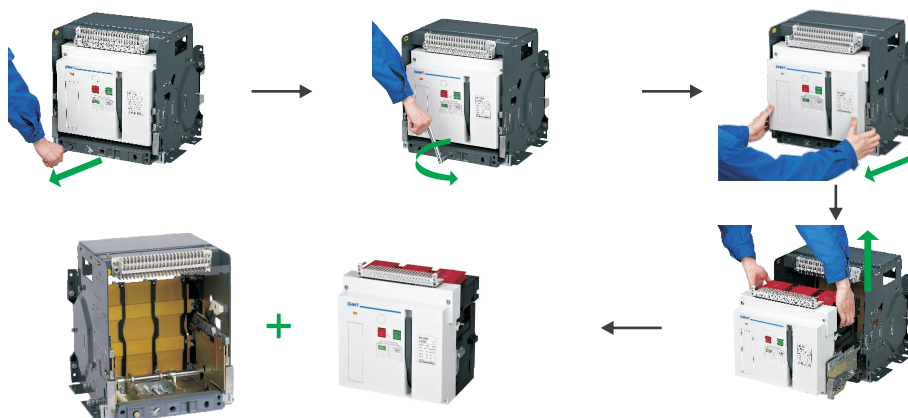


Figure 16 Installation of drawer switch disconnector

7.2.2 In the NH1-1000 model, the switch disconnector body is directly placed on the drawer seat rail and pushed into the drawer seat until it cannot be pushed. In the NH1-2000~4000/3 model, the breaker rail is pulled out from the seat rail and the switch disconnector body is placed on the rail as shown in the figure. Note that the two protruding brackets of the switch disconnector should be stuck in the groove of the rail and the switch disconnector body should be pushed inward until it cannot be pushed.

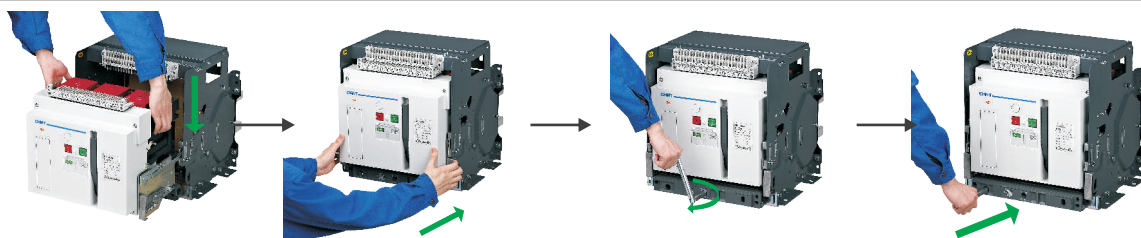


Figure 17 Installing the body into the drawer seat

7.2.3 Pull out the handle and fully insert the hex head of the handle into the handle hole of the drawer seat. Turn the handle clockwise until the position indicator reaches the "connected" position. When the secondary circuit of the NH1-1000 model is tightly joined without gaps or clicks are heard on both sides inside the drawer seat of the NH1-2000~4000/3 model, immediately stop cranking inward and pull out the handle and put it in its original place.

Note: 1. Before placing the body into the drawer seat, check whether the rated current of the body is consistent with that of the drawer seat, otherwise the product may be damaged.
2. When cranking inward from the "test" position to the "connected" position, the switch disconnector must be opened first to avoid accidents.

7.3 Installation of Fixed Switch disconnector

Place the switch disconnector (fixed type) on the mounting bracket and tighten it, and connect the main circuit bus directly to the fixed switch disconnector bus.



Installed on the rail

Figure 18 Installation of fixed switch disconnector

Note: It is very important to evenly distribute the weight of the switch disconnect on the hard mounting surface, such as installing on a rail or substrate. The mounting surface should be flat (with a tolerance of 2 mm) to prevent deformation that will affect the normal operation of the switch disconnect.

7.4 Connection of Main Circuit

7.4.1 Power Supply Incoming Line

The NH1 series switch disconnect can be equipped with either upper incoming line or lower incoming line without affecting the performance of the switch disconnect, for easy installation in the power distribution cabinet.

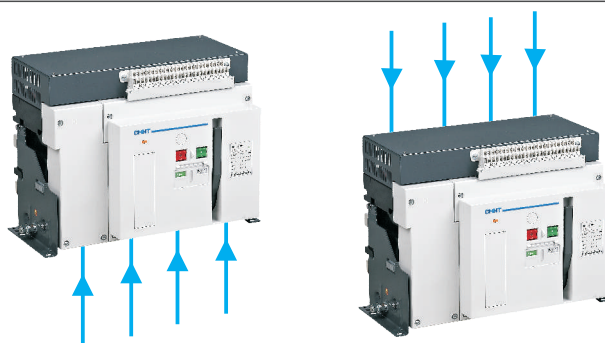


Figure 19 Switch disconnect can be equipped with either upper or lower incoming line

7.4.2 Spacing

Sufficient space must be provided to ensure good air circulation. The spacer between the upper and lower ends of the switch disconnect must be non-magnetic.

For the switch disconnect with a current of 2500A or more, no magnetic circuit is formed when the metal separator has a current.

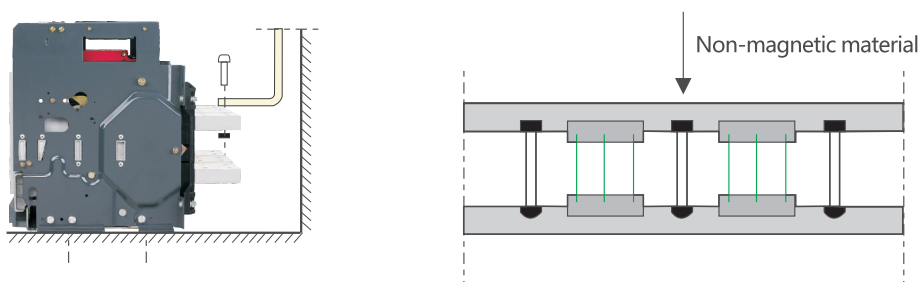


Figure 20 The metal support or separator is non-magnetic

7.4.3 Busbar Connection

Before the bolt B is inserted into the bus and busbar, the position of the support rod and the busbar should be adjusted and positioned. The support rod should be fixed on the power distribution cabinet frame so that the switch disconnect terminal does not have to bear its weight C (the support should be installed near the terminal).

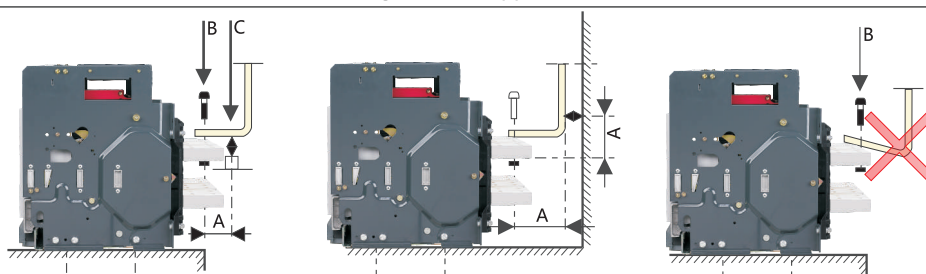


Figure 21 Switch disconnect busbar connection

Dynamic stability: The first support rod should be kept within the maximum distance from the switch disconnector connection point (see Table 8). In order to prevent phase-to-phase short-circuit faults, this distance must meet the requirements of dynamic stability.

Table 7 Maximum distance between the support rod and the switch disconnector connection point

Ics(kA)	≤30	40	50	75	80	100
Distance A(mm)	350	320	300	200	150	150

7.4.4 Cable Connection

The cable connection should ensure that there is no excessive mechanical force on the switch disconnector terminals. The user can use the power supply busbar to extend the terminal of the switch disconnector. The cable can be either a single-core cable or a multi-core cable. The cable can usually be connected to the busbar according to the following rules:

- (1) Position the cable lug before inserting the bolt;
- (2) Firmly fix the cable on the power distribution cabinet frame.

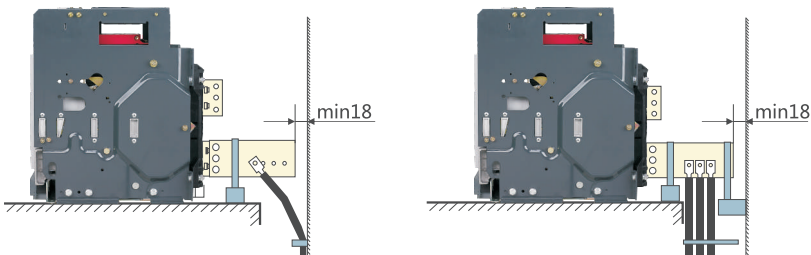


Figure 22 Switch disconnector cable connection

7.4.5 Fixing

The correct fixing of the busbar depends on the appropriate torque of the bolt and nut. Too large or too small a torque is not allowed. If the torque is too large, the bolts are easy to slide and the fastening effect is not achieved; if the torque is too small, the bolts and nuts are not fastened enough and the fastening effect is not achieved. Too high temperature rise will be caused in both of the circumstances. For the connection of the switch disconnector, the tightening torque is shown in the table below. These data are suitable for copper busbars and steel bolts and nuts, and the level is ≥ 8.8. The same torque can be used for aluminum busbars.

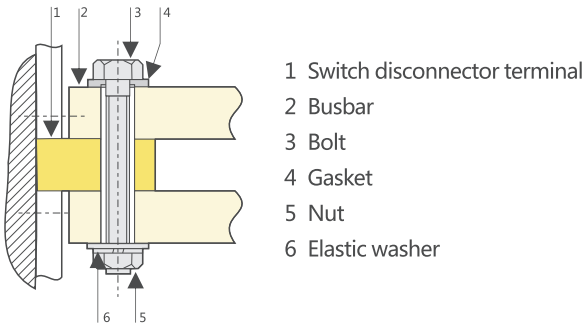


Figure 23 Busbar fixing diagram

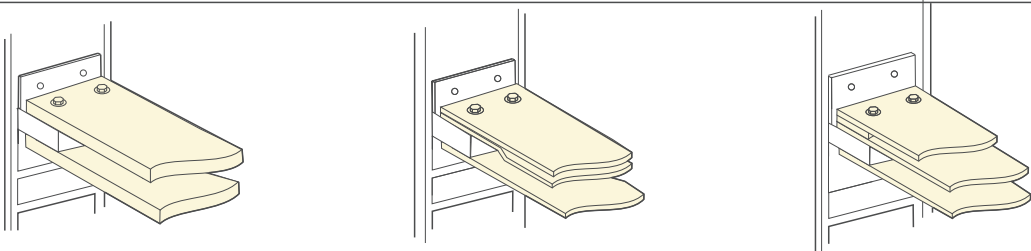
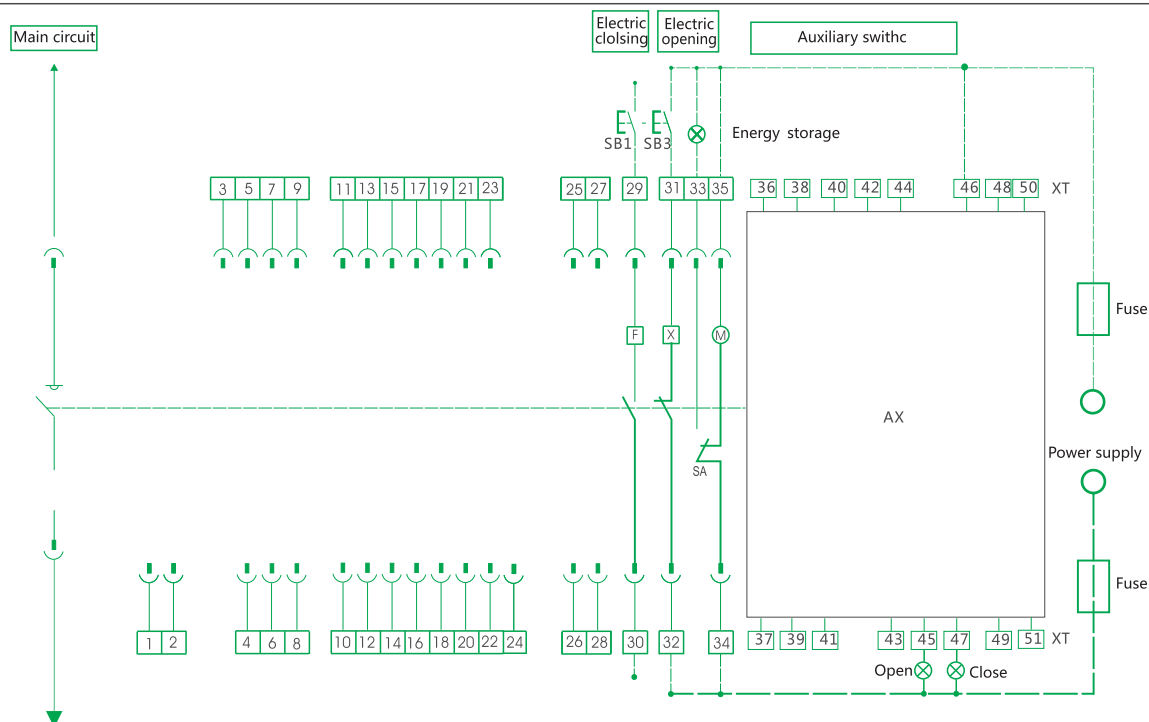


Figure 24 Recommended installation

Table 8 Tightening Torque

Bolt type	Application	Torque size (N·m)
M3	Fastening the secondary terminal	0.4~0.5
M10	Fastening the busbar	36~52
M12	Fastening the busbar	61~94

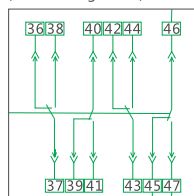
7.5 Secondary Circuit Wiring Diagram



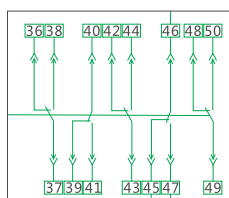
AX auxiliary switch type for the user's use

NH1-2000~4000/3 type

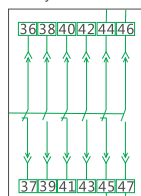
I. Four sets of conversion contacts (default configuration)



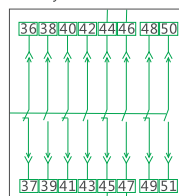
II. Five sets of conversion contacts



III. Three normally open and three normally closed contacts

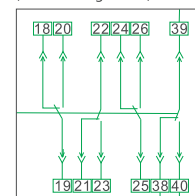


IV. Four normally open and four normally closed contacts



NH1-1000 type

I. Four sets of conversion contacts (default configuration)



SB1 shunt button, SB3 closing button, F shunt release, X closing electromagnet, M energy storage motor, XT wiring terminal, SA stroke switch

Note: If the control power supply voltages of F and X are different, F and X may be connected to different power supplies)

1#~26#: empty; 27# and 28# under-voltage release(optional), must connect to the main circuit. 29# and 30#: shunt release; 31# and 32#: closed electromagnet; 33# and 34#: energy storage indication; 34# and 35#: energy storage motor; 36#~51#: auxiliary contacts

Signal output circuit description:

- The dotted line part is provide by the user. Fuses should be added to the control circuit for protection.
- The terminal 35# can be connected to the power supply (automatic energy pre-storage) directly or after connected to the normally open button serially (manual energy pre-storage). 33# must connect to the indication light for use.
- Wiring diagram shows: the circuit loop no power, ACB is opening and in connection location, the operating mechanism has no power.

Figure 25 Switch disconnector secondary circuit wiring

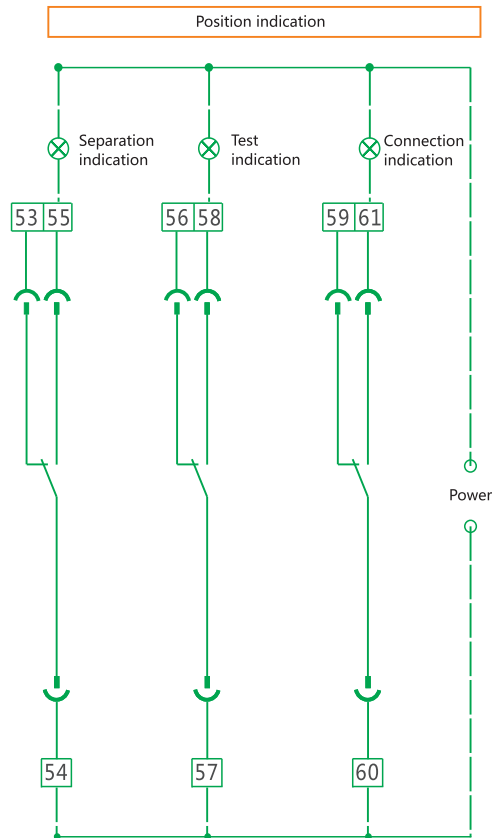


Figure 26 Position signal device wiring

Operational requirements:

1. The drawer seat position indicating device can indicate the "separated", "test" and "connected" positions, which can be selected fully or partially according to the order requirements.

2. When the body of the drawer switch disconnector is pushed from the "pulled" position to the "separated" position, the 53# and 54# terminals should be switched from on to off, and the 54# and 55# terminals should be switched from off to on.

3. When the body of the drawer switch disconnector is cranked from the "separated" position to the "test" position, the 56# and 57# terminals should be switched from on to off, and the 57# and 58# terminals should be switched from off to on; there should be a sufficient safety distance between the switch disconnector body bus and the drawer seat bridge contact, and the opening and closing operation can be reliably performed.

4. When the body of the drawer switch disconnector is cranked from the "test" position to the "connected" position, do not continue cranking until when there is no gap in the secondary circuit for the 1000 model or the drawer seat clatters for the 2000-4000/3 model. It is required that the 59# and 60# terminals should be switched from on to off and the 60# and 61# terminals should be switched from off to on within 1.5 rounds of the rocker handle of the drawer seat, and it is required that the bus of the switch disconnector body is reliably inserted into the bridge contact of the drawer seat and can reliably carry the main circuit current for operation.

5. When the body of the drawer switch disconnector is turning from the "connected" position to the "test" position, the 56# and 57# terminals should be switched from on to off, and the 57# and 58# terminals should be switched from off to on; there should be a sufficient safety distance between the switch disconnector body bus and the drawer seat bridge contact, and the opening and closing operation can be reliably performed.

6. When the body of the drawer switch disconnector is pushed from the "test" position to the "separated" position, the 53# and 54# terminals should be switched from on to off, and the 54# and 55# terminals should be switched from off to on. At this time, the switch disconnector body still cannot be pulled out. It is necessary to continue to crank to the "separated" position until the handle cannot be cranked any longer, and then the switch disconnector body can then be pulled out. After the drawer switch disconnector body is pulled out, the 53# and 54# terminals should be switched from off to on, and the 54# and 55# terminals should be switched from on to off.

7. During the drawer seat position switching operation, the pointer must be pointed to the "separated", "test" and "connected" positions before stopping cranking, otherwise the position indicating device will not correctly indicate the position of the switch disconnecter body in the drawer seat.

Attached:

Table 9 Position signal contact capacity

Rated voltage (V)	Rated heating current $I_{th}(A)$	Rated operating current $I_e(A)$	Rated control capacity
AC230	5	1.3	300VA
AC400	5	0.75	300VA
DC220	5	0.25	60W
DC110	5	0.55	60W

7.6 Use of Switch Disconnecter

7.6.1 Operation of Drawer Switch Disconnecter

7.6.1.1 Switch disconnecter Body Insertion Operation

- Pull out the rail;
- The breaker body is placed on the drawer seat rail in the NH1-1000 model and on the rail as shown in the figure in the NH1-2000~4000 model. Note that the two protruding brackets of the switch disconnecter should be stuck in the groove of the rail, as shown in Figure 27.
- Hold the handles on both sides of the switch disconnecter, lift the switch disconnecter slightly upwards, and push the body inward on both sides at the same time until it cannot be pushed, as shown in Figure 28.

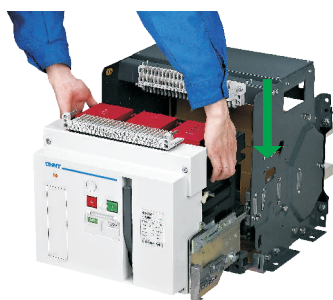


Figure 27 Switch disconnecter body on drawer seat rail



28-a NH1-1000



28-b NH1-2000~4000

Figure 28 Push the body into the drawer seat

- Pull out the handle and fully insert the hex head of the handle into the handle hole of the drawer seat, as shown in Figure 29.

- Turn the handle of the NH1-1000 model clockwise until the position indicator reaches the "connected" position, and when the secondary circuit is tightly joined without gaps, immediately stop cranking inward and pull out the handle and put it in its original place; Turn the handle of the NH1-2000~4000/3 model clockwise until the position indicator reaches the "connected" position, and when clicks are heard on both sides inside the drawer seat, immediately stop cranking inward and pull out the handle and put it in its original place, as shown in Figure 30.

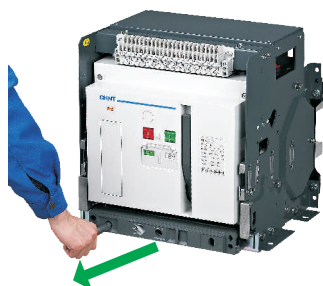


Figure 29 Pulling out the handle



30-a NH1-1000



30-b NH1-2000~4000

Figure 30 Cranking the switch disconnecter inward

Note: 1. When operating the switch disconnector, be sure to close the power distribution cabinet door to prevent accidents;
2. When cranking inward from the "test" position to the "connected" position, the switch disconnector must be opened first to avoid accidents.

7.6.1.2 Pulling Out Switch disconnector Body

a. First, move the switch disconnector body from the "connected" position to the "separated" position (turn the handle counter clockwise), as shown in Figure 31.

b. After pulling out the handle, pull out the switch disconnector body (for the NH1-1000 model, press the handle first and then pull the body out), as shown in Figure 32. Be careful not to tilt or drop the switch disconnector when pulling out the switch disconnector body because the center of gravity moves forward.

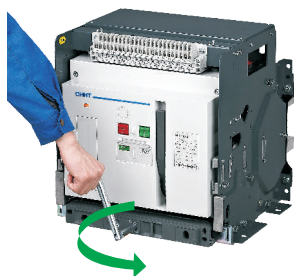


Figure 31 Turning the handle counter anti-clockwise



32-a NH1-1000

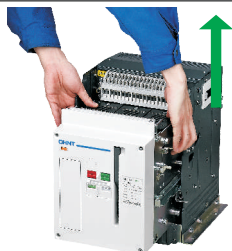


32-b NH1-2000~4000

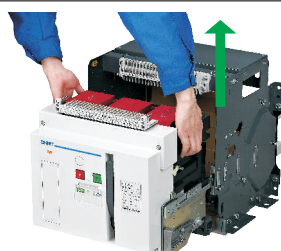
Figure 32 Pulling out switch disconnector body

c. Remove the switch disconnector body from inside the drawer as shown in Figure 33, and then push the extracted rail back to its original place.

Note: 1. When operating the switch disconnector, be sure to close the power distribution cabinet door to prevent accidents;
2. When cranking outward from the "connected" position to the "test" position, the switch disconnector must be opened first to avoid accidents.



33-a NH1-1000



33-b NH1-2000~4000/3P

Figure 33 Pulling out switch disconnector body

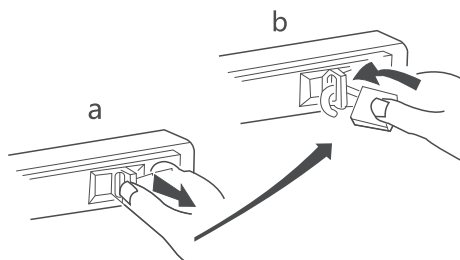


Figure 34 Drawer padlock

7.6.1.3 Locking of "Separated" Position of Drawer Switch disconnector (padlock to be purchased by the user)

Pull out the lock lever and thread it into the padlock, as shown in figure 34. At this point, the switch disconnector cannot be cranked from the "separated" position to the "test" or "connected" position.

7.6.2 Energy Storage Operation

7.6.2.1 Manual energy storage: When storing energy, move the energy storage handle up and down repeatedly six to seven times until a click is heard. When the hand does not feel the reaction force and the energy storage indicators indicates "energy stored", the energy storage ends, as shown in Figure 35.



Figure 35 Manual energy storage operation

7.6.2.2 Electric energy storage: After the control circuit is energized, the electric energy storage mechanism immediately performs energy storage automatically (when the control circuit has connected to the automatic pre-storage form).

7.6.3 Opening and Closing Operations Manual energy storage operation

a. Closing: When the switch disconnecter is storing energy and in the off state, press the green "I" button and the switch disconnecter closes, and the "opening/closing" indicator switches from "○" to "I", and the "energy storage/release" indicator switches from "energy storage" to "energy release" state, as shown in Figure 36.

b. Opening: When the switch disconnecter is in the closed state, press the red "○" button and the switch disconnecter opens, and the "opening/closing" indicator switches from "I" to "○", as shown in Figure 37.

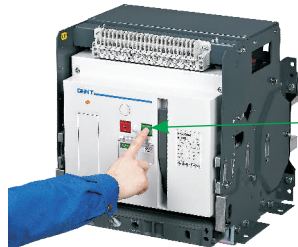


Figure 36 Manual closing operation

Note: Before closing, the undervoltage release must be connected to a power supply first!



Figure 37 Manual opening operation

Note: When operating the switch disconnecter, be sure to close the power distribution cabinet door to prevent accidents.

7.6.3.2 Electric Opening and Closing Operations

a. Closing: When the switch disconnecter is storing energy and is in the off state (ensure that undervoltage has been sucked), apply the rated voltage to the closing electromagnet to close the switch disconnecter.

b. Opening: When the switch disconnecter is in the closed state, applying the rated voltage to the shunt release can open the switch disconnecter.

8 Maintenance, Handling and Storage Precautions

8.1 Safety Precautions

The following operations must be performed in sequence before the maintenance and overhaul of the circuit breaker:

- Open the circuit breaker to ensure that the switch disconnecter is in the open state;
- Disconnect the upper level knife switch to ensure that the main circuit and the secondary circuit are not energized;
- Energy release and open the switch disconnecter to ensure that the switch disconnecter is in the energy release and open state;
- All components that may be touched by the staff must be unpowered.



Be careful

8.2 Maintenance and Overhaul Cycle Shown in Table 10

Table 10 Maintenance and overhaul cycle

Conditions	Environment	Maintenance cycle	Overhaul cycle	Remarks
General environment	The air is kept clean and dry without corrosive gases, the temperature is between -5°C to +40°C, and the humidity meets 3.1.3 operating conditions in the manual.	Once every six months	Once a year (once every six months if installed for more than three years)	In line with IEC/EN 60947.3 General environmental conditions requirements
Harsh environment	-5°C to -40°C or 40°C to 65°C, or humidity ≥90%	Once every three months	Once every six months (once every three months if installed for more than three years)	
	A place with much dust and corrosive gases	Once a month	Once every three months	

Note: The circuit breaker must be checked after breaking the short-circuit current.

8.3 Maintenance of Switch disconnector

- 8.3.1 Regularly remove foreign objects (such as tools, wire ends or debris, metal foreign objects, etc.) from the power distribution cabinet.
- 8.3.2 Regularly remove dust from the switch disconnector to keep the switch disconnector well insulated.
- 8.3.3 Check whether the spring washer of the connecting bolt and grounding bolt of the main circuit is flattened and the connection is firm.
- 8.3.4 Check whether the opening and closing indications are correct and reliable. See Figure 38.

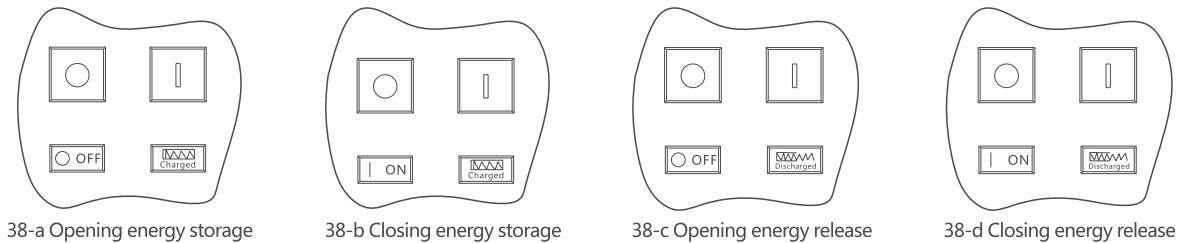


Figure 38 Opening and closing indications

8.4 Overhaul of Switch disconnector

8.4.1 Connection and Installation Inspection

It is recommended to refer to the requirements in the table for the torque force of the main circuit and secondary circuit.

Table 11 Recommended reference table for the torque force of fasteners

Fastener specifications	M3	M4	M8	M10	M12
Torque requirements (N · m)	0.4-0.5	1.2-1.7	16-26	36-52	61-94

8.4.2 Insulation Performance Testing

The insulation resistance between phases or between a phase and the ground is required to be 20MΩ or greater.

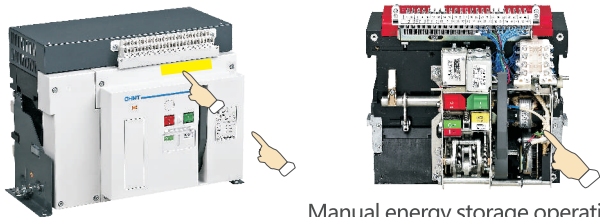
The insulation resistance test must be performed before power is applied again after overhaul or a long period of power off (≥ 7 days).

8.4.3 Operational Characteristic Inspection

Connect the accessories to the corresponding rated voltage according to the nameplate on the mask and perform the following operations:

- Electric energy storage, closing and opening operations, cycled 5 times;
- Manual energy storage, closing and opening operations, cycled 5 times;
- The switch disconnector is required to store, close and open normally.

Note: The main circuit must be unpowered; if there is an undervoltage release, it must be applied with a rated voltage first.

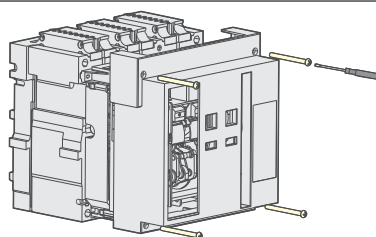


Manual energy storage operation

First 39 Parameter requirements and operation indications

8.4.4 Inspection of Components of Switch disconnecter

8.4.4.1 Mask Removal



- Remove the four bolts of the switch disconnecter that fix the panel and take the mask

Figure 40 Mask Removal

8.4.4.2 Operating Mechanism Inspection

Check the parts of the mechanism for breakage and whether the fasteners are tight.

Remove dust, and evenly apply oil (7012 low-temperature grease or similar solid grease) to each rotating part.

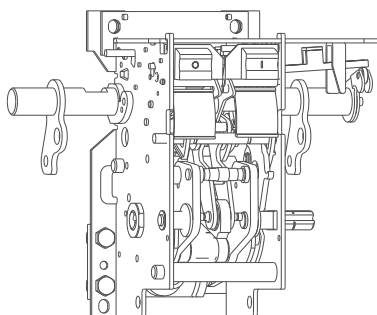
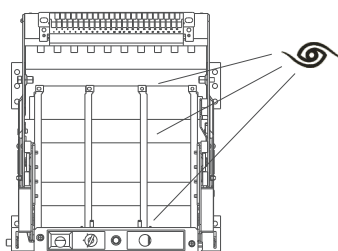


Figure 41 Operating mechanism

8.4.4.3 Inspection of Drawer Seat (tested after removing the body, taking NH1-2000 as an example)

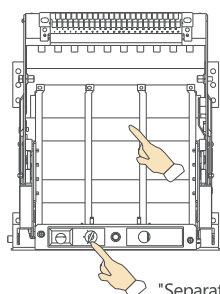
a. Check for foreign objects inside



- Check whether there are foreign objects in the drawer seat, such as screws, thread ends, iron filings, etc.. If any, remove them.

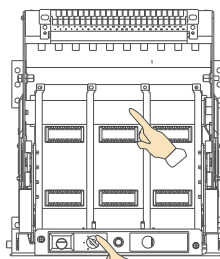
Figure 42 Inspection of foreign objects inside the drawer seat

b. Check whether the arc-proof plate opens and closes normally and whether the insulation contact has deformation or oxidation



"Separated"

- Empty crank to the separated position. The arc-proof plate is shown as the left figure

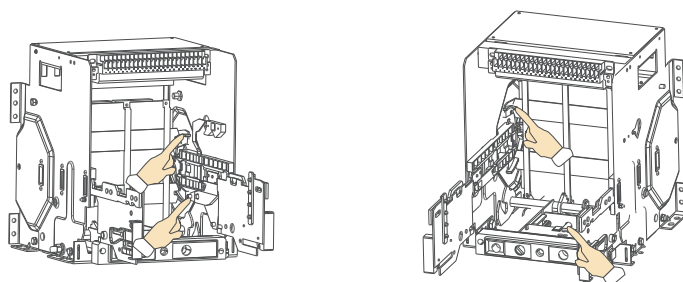


"Connected"

- For the NH1-2000-4000/3 model, crank it in empty to the connected position; for the NH1-1000 model, press the partition and open the connecting rod, the arcing plate being shown on the left. Check if there are deformation, misalignment or oxidation in the bridge contacts of each phase. If so, replace them.

Figure 43 Inspection of arc-proof plate and contact of drawer seat

c. Turn the friction places and evenly apply oil there



- Evenly apply low-temperature grease or similar solid grease in the position as indicated in the left figure for lubrication)

Figure 44 Inspection of rotating parts of drawer seat

8.4.4.4 Inspection of Arc Chute (taking the NH1-2000~4000/3 type as an example)

Check grid pieces and arc-lead pieces for defects, and check the arc chute for breakage. If any, timely replace and remove dust, corrosion layer and arcing point in the room. If corrosion and rust are serious, replace in time

Note: The switch disconnector must be checked after breaking the short-circuit current.

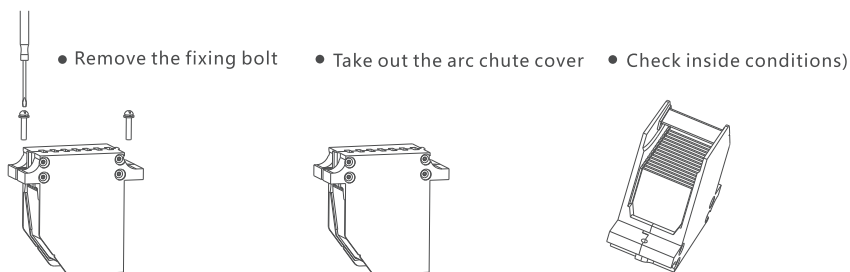
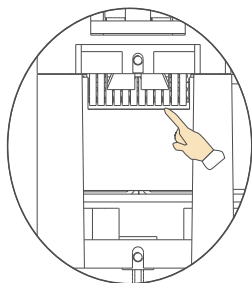


Figure 45 Inspection of Arc chute

8.4.4.5 Inspection of Main Contact (taking the NH1-2000~4000/3 type as an example)

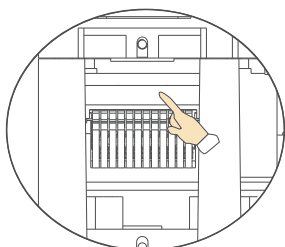
a. The overtravel is required to be greater than 2 mm



- Manually close the product and observe the main contact stroke
Note: Replace the contact when the shown position is reached)

Figure 46 Overtravel inspection

b. Remove dust, corrosive layer and particular burnt materials



- Close the product and, when the main contact is in the shown position, check whether there is dust, granular burnt materials or oxidized corrosion layer on the dynamic and static contacts. If any, remove them timely)

Figure 47 Check the contact surface for foreign objects

Note: The switch disconnector must be checked after breaking the short-circuit current.

8.4.4.6 Inspection of Secondary Circuit

Check the casing for damage

Use the universal meter to check the contact between the secondary circuit of the body and the secondary circuit of the drawer seat, and whether the contacts are in good contact at the "test" and "connection" positions and whether the wiring screws are tight and the wire insulation is damaged.

8.5 Replacement of Undervoltage release, Shunt release and Closed Electromagnet Accessories (see Figure 1)

The following operations must be performed before replacing the accessories:

Cut off all power and ensure that the power to the main circuit and secondary circuit is dead.

The switch disconnector is in the energy release opening state

8.5.1 Replacement of Fixed Accessories

Remove the penal fixing bolts and remove the penal

Untie the cable tie and remove the wiring wires

Remove the fixed accessory mounting screws

Remove and replace the accessory

8.5.2 Replacement of Drawer Accessories

Shake out the body to the separation position and remove the body

Remove the penal fixing bolts and remove the penal

Untie the cable tie and remove the wiring wires

Remove the fixed accessory mounting screws

Remove and replace the accessory

8.6 Keep the surrounding environment cool and dry during storage period



Figure 48 Inspection of secondary circuit

9 Analysis and Elimination of Faults

9.1 Common Fault Causes and Solutions Shown in Figure 12

Table 12 Fault analysis and repair

Problem	Cause	Solution
The switch disconnector cannot be closed	Poor contact in the secondary circuit of the drawer switch disconnector	Crank the drawer switch disconnector to the "on" position (a click is heard).
	Switch disconnector does not store energy	Check whether the secondary circuit is connected: 1. The motor control power supply voltage must be 85% U_e or higher. 2. Check the motor energy storage mechanism. If there is any fault, contact the manufacturer to replace the motor operating mechanism.
	Mechanical interlocking operation; the switch disconnector has been locked	Check the working status of the two switch disconnectors with mechanical interlocks.
	Closed electromagnet: 1. The rated control voltage is less than 85% U_s ; 2. The closed electromagnet is faulty and damaged.	1. The power supply voltage of the closed electromagnet must be 85% U_s or higher. 2. Replace the closed electromagnet.

Problem	Cause	Solution
Switch disconnecter cannot be disconnected	<ol style="list-style-type: none"> 1. The switch disconnecter cannot be manually disconnected locally: The mechanical operating mechanism is faulty. 2. The switch disconnecter cannot be electrically disconnected remotely: <ol style="list-style-type: none"> a. The mechanical operating mechanism is faulty; b. The shunt release power voltage is less than 70% Us; c. The shunt release is damaged. 	<ol style="list-style-type: none"> 1. Check the mechanical operating mechanism. If there is any fault such as a stuck, contact the manufacturer. 2. a. Check the mechanical operating mechanism. If there is any fault such as a stuck, contact the manufacturer. b. Check whether the power supply voltage of the shunt release is less than 70% Us. c. Replace the shunt release.
Switch disconnecter does not store energy	<ol style="list-style-type: none"> 1. Cannot store energy manually 2. Cannot store energy electrically <ol style="list-style-type: none"> a. The control power voltage of the rated control electric energy storage device is less than 85% Us; b. The energy storage device has a mechanical failure. 	<ol style="list-style-type: none"> 1. The energy storage device has a mechanical failure. Contact the manufacturer. 2. a. Check whether the control power supply of the electric energy storage device is 85% Us or higher; b. Check the energy storage device machinery and contact the manufacturer.
The rocker handle of the drawer switch disconnecter cannot be cranked into or out of the switch disconnecter	<ol style="list-style-type: none"> 1. There is a padlock in the off position. 2. The plugging rail or the switch disconnecter body is not fully inserted 	<ol style="list-style-type: none"> 1. Remove the padlock; 2. Push the rail or switch disconnecter to the end.
The drawer switch disconnecter cannot be pulled out in the "disconnected" position	<ol style="list-style-type: none"> 1. The handle is not pulled out. 2. The switch disconnecter does not fully reach the "off" position. 	<ol style="list-style-type: none"> 1. Pull out the handle. 2. Fully crank the switch disconnecter to the "disconnected" position.
The drawer switch disconnecter cannot be cranked to the "connected" position	There is a problem such as some foreign objects fall into the drawer seat and stick the shake mechanism or the shake mechanism jump over teeth.	Check and remove foreign objects. If the circuit breaker still cannot be shaken in, contact the manufacturer.
	1The frame rated current of the switch disconnecter body does not match that of the drawer seat.	Select the switch disconnecter body and drawer seat with the same frame rated current.

10 Environmental Protection

In order to protect the environment, when this product or its components are scrapped, please dispose of them as industrial waste, or hand them over to the recycling station for classified disassembly, recycling and reuse according to the relevant local regulations.

11 Ordering specification

User name	quantity	date	Tel	
specification	NH1-1000	NH1-2000	NH1-3200	NH1-4000
Rated current In(A)	<input type="checkbox"/> 200 <input type="checkbox"/> 400 <input type="checkbox"/> 630 <input type="checkbox"/> 800 <input type="checkbox"/> 1000	<input type="checkbox"/> 630 <input type="checkbox"/> 800 <input type="checkbox"/> 1000 <input type="checkbox"/> 1250 <input type="checkbox"/> 1600 <input type="checkbox"/> 2000	<input type="checkbox"/> 2000 <input type="checkbox"/> 2500 <input type="checkbox"/> 2900 <input type="checkbox"/> 3200	<input type="checkbox"/> 2000 <input type="checkbox"/> 2500 <input type="checkbox"/> 2900 <input type="checkbox"/> 3200 <input type="checkbox"/> 3600 <input type="checkbox"/> 4000
Pole	<input type="checkbox"/> 3-pole <input type="checkbox"/> 4-pole (no 4-pole for NH1-4000)			
Operation	<input type="checkbox"/> motor operation <input type="checkbox"/> manual operation			
Install type	<input type="checkbox"/> drawer type <input type="checkbox"/> fixed type			
Electrical accessories (no AC110V for NH1-1000)	Under voltage release (optionl)	<input type="checkbox"/> AC110V <input type="checkbox"/> AC220/230V <input type="checkbox"/> AC380/400V <input type="checkbox"/> Order ____V <input type="checkbox"/> Non-under voltage		
		<input type="checkbox"/> Helped & instantaneous <input type="checkbox"/> Helped & delay __s (Inm≥2000A, 1 s, 3 s, 5 s, non-adjustable) <input type="checkbox"/> self-priming & instantaneous <input type="checkbox"/> self-priming & delay __s (Inm≥2000A, 0.3 s~7.5 s, adjustable) Note: Inm=1000A no Helped priming type, delay time 1 s, 3 s, 5 s, 7 s, non-adjustable.		
	Shunt release(optionl)	<input type="checkbox"/> intermittent (only for Inm≥2000A and default) <input type="checkbox"/> pulse (must select in automatic control system)	<input type="checkbox"/> AC110V <input type="checkbox"/> AC220/230V <input type="checkbox"/> AC380/400V <input type="checkbox"/> DC110V <input type="checkbox"/> DC220V	
	Closing electromagnet (optionl)		<input type="checkbox"/> AC110V <input type="checkbox"/> AC220/230V <input type="checkbox"/> AC380/400V <input type="checkbox"/> DC110V <input type="checkbox"/> DC220V	
	Electric motor (optionl)	<input type="checkbox"/> AC110V <input type="checkbox"/> AC220/230V <input type="checkbox"/> AC380/400V <input type="checkbox"/> DC110V <input type="checkbox"/> DC220V		
Special requirements	Main circuit connection	<input type="checkbox"/> horizontal <input type="checkbox"/> vertical <input type="checkbox"/> rotation busbar (<input type="checkbox"/> horizontal <input type="checkbox"/> vertical)(only for NH1-2000 and NH1-3200)		
	Accessory configuration	<input type="checkbox"/> mechanical interlock <input type="checkbox"/> interphase barrier <input type="checkbox"/> Position signal device <input type="checkbox"/> counter		
		key lock <input type="checkbox"/> 1 key 1 lock <input type="checkbox"/> 2 key 1 lock <input type="checkbox"/> 3 key 2 lock <input type="checkbox"/> 5 key 3 lock <input type="checkbox"/> 7 key 4 lock		

12 Appendix

12.1 Shunt release

The power-on time cannot be greater than 2 seconds / time, and the power-on frequency cannot be greater than 5 times / minute.

- The shunt release should be used except for special products where the switch disconnecter must be directly disconnected manually;
- The shunt release could operated within 10 meters to break the switch disconnecter.

Table 13 Characteristics of shunt release

Rated control power supply voltage $U_s(V)$			AC220/230	AC380/400	DC220	DC110	AC110 (not available for NH1-1000)
Operating voltage (V)			(0.7-1.1) U_s				
Break time (ms)			≤ 28				
Power consumption (VA/W)	Inm=1000A	pulse	56	56	250	250	-
	Inm=2000A	Intermittent (default)	300	300	132	70	300
	~4000A/3	Pulse(option)	880	1800	880	850	850

- Notes:
- 1. It must select pulse type in the automatic control system.
 - 2. power-on time of the intermittent type cannot be greater than 2 s, pulse frequency of the pulse type cannot be more than 5 times/min, or the components are easily burnt;
 - 3. If the circuit breaker is not break by a single power-on of 15 s, must disconnect the power on the shunt release immediately.



Figure 49.shunt release

12.2 Closed Electromagnet

After the energy storage of the motor is completed, the closed electromagnet can be operated and controlled within a range of 10 meters to instantaneously release the energy storage spring force of the operating mechanism to close the circuit breaker.

Table 14 Characteristics of closed electromagnet

Rated control power supply voltage $U_s(V)$			AC220/230	AC380/400	DC220	DC110	AC110 (not available for NH1-1000)
Operating voltage (V)			(0.85-1.1) U_s				
Close time (ms)			≤ 50				
Power consumption (VA/W)	Inm=1000A	pulse	56	56	250	250	-
	Inm=2000A	Intermittent (default)	300	300	132	70	300
	~4000A/3	Pulse(option)	880	1800	880	850	850

- Notes:
- 1. It must select pulse type in the automatic control system.
 - 2. power-on time of the intermittent type cannot be greater than 2 s, pulse frequency of the pulse type cannot be more than 5 times/min, or the components are easily burnt;
 - 3. Ensure that the product is in the energy storage state so that the closed electromagnet may be energized;
 - 4. If the product is not closed after a single power-on for 15s, must disconnect the power on the closed electromagnet immediately.



Figure 50.closed electromagnet

12.3 Undervoltage release (UVT) (The power must be turned on before the circuit breaker is closed)

12.3.1 The undervoltage release has instantaneous operation and delayed operation:

Table 15 Operation types of each frame under voltage release

	Self-priming	Helped priming
Undervoltage instantaneous release	Inm=1000A, 4000A/3	Inm=2000A, 3200A, 4000A/3
Undervoltage delay release	Inm=1000A, 4000A/3	Inm=2000A, 3200A, 4000A/3

Notes: 1. Inm=1000A undervoltage delay does not require an external delay controller. The power-off operation is an instantaneous operation. There is no zero voltage delay function;
 2. Inm=2000A~4000A/3 self-priming type undervoltage delay does not require an external undervoltage delay controller. There is a delay function for low voltage and power off;
 3. Inm=2000A~4000A/3 helped type undervoltage delay requires an external delay controller. There is a delay operation when the power is off. There is a zero voltage delay function.

Table 16 Delay time of under voltage release

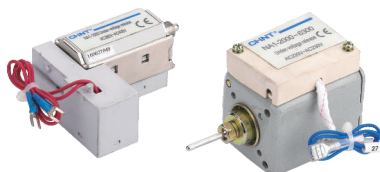
	Delay time (optional)	Accuracy
Inm=1000A	1 s, 3 s, 5 s, 7 s (not adjustable)	±15%
Inm=2000A~4000A/3	1 s, 3 s, 5 s (non-adjustable)(helped type)	±1s
	0.3 s~7.5 s (adjustable)(self-priming type)	±15%
The undervoltage will not operate when the voltage returns to 85% Ue and higher, within 1/2 delay time.		

Note: A self-priming undervoltage delay release may be provided for special orders of NH1-2000~4000/3. There is no external undervoltage delay controller, and the delay time is 0.3s~7.5s, selectable and adjustable with an accuracy of ±15%.

12.3.2 When the undervoltage release is not powered, the circuit breaker cannot be closed either electrically or manually.

Table 17 Characteristics of under voltage release

Rated control power supply voltage Ue(V)	Ac110, AC220/230, AC380/400
Operating voltage (V)	(0.35~0.7)Ue
Reliable closing voltage (V)	(0.85~1.1)Ue
Reliable not-closing voltage (V)	≤0.35Ue
Power consumption (Inm=1000A/Inm=2000A~4000A/3)	20VA/48VA (W)

**Figure 51. under voltage release**

12.4 The electric energy storage mechanism (the power-on time cannot be greater than 5 seconds / time, and the power-on frequency cannot be greater than 3 times/min) has an automatic re-energy storage function to facilitate dual power switching.

Table 18 Characteristics of electric energy storage mechanism

Rated control power supply voltage Us(V)	AC380/400V、AC220/230V	DC220V、DC110V
Operating voltage (V)	(0.85-1.1)Us	(0.85-1.1)Us
Power consumption (Inm=1000A)	90W	90W
Power consumption (Inm=2000A)	85W	85W
Power consumption (Inm=3200A, 4000A/3)	110W	110W
Energy storage time	≤5s	≤5s

Note: It is forbidden to turn on the power for 7 seconds to avoid damage

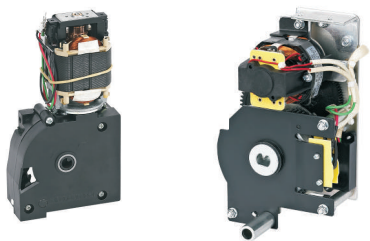


Figure 52.Motor

12.5 Auxiliary Contacts

Standard type: Provides users with 4 sets of conversion contacts (default configuration).
Special type: 6 sets of Inm=1000A conversion contacts (for AC only).

Table 19 Auxiliary contact capacity

Rated voltage (V)	Rated thermal current Ith (A)	Rated control capacity
AC230	6	300VA
AC400	6	300VA
DC220(Inm=1000A/Inm=2000A-4000A/3)	0.5/6	60W

Table 20 Auxiliary rated operating current

Category	Voltage	Current
AC-15 (Inm=1000A/Inm=2000A-4000A/3)	AC230V	1.3A
	AC400V	0.25A/0.75A
DC-13	DC110V	0.55A
	DC220V	0.27A

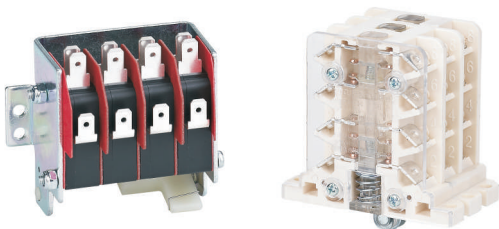


Figure 53.Auxiliary contact

12.6 Door frame and pad (fixed and drawer type)

The door frame and pad are installed on the door of the power distribution cabinet for sealing, and the protection level reaches IP40.

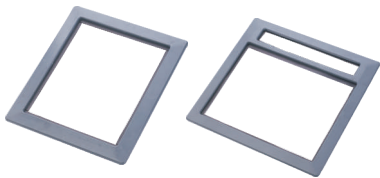


Figure 54.Door frame and pad

12.7 Inter phased partition

Inter phased partition are installed between the terminal blocks to increase the phase insulation of the circuit breaker.

Note: 1. inter phased partition used in the fixed and drawer type products are different;
2. Three-pole products use two inter phased partitions, and four-pole products use three inter phased partitions.

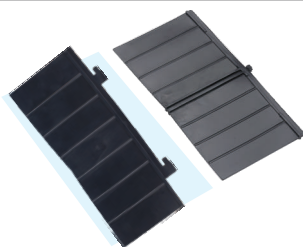


Figure 55.Inter phased partition

12.8 Off Position Locking Device

When the drawer type switch disconnector is in the "Disconnected" position, the lock lever can be pulled out and locked with the padlock. The switch disconnector cannot be shaken to the "Test" or "Connected" position (User purchase padlock).



Figure 56.Off Position Locking Device

12.9 Key Lock

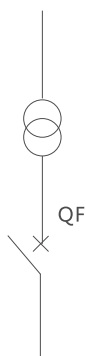
12.9.1 The separation button of the circuit breaker can be locked in the pressed position. At this time, the circuit breaker cannot perform the making operation.

12.9.2 After the user has selected the product, the factory provides the lock and key.

12.9.3 The user purchases the key lock separately. When installing, it is recommended that the panel be opened with a hole opener. The hole opener has a diameter of $\Phi 26\text{mm}$ for NH1-2000~4000/3 and $\Phi 24\text{mm}$ for NH1-1000. The hole opener is provided by the user.

Note: After the circuit breaker is locked with the key lock, the circuit breaker cannot be closed either manually or electrically. To remove the key, press the breaking button, turn the key counterclockwise, and then pull out the key.

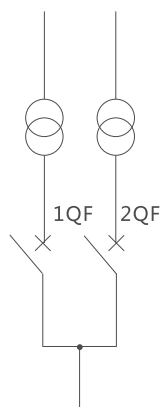
Circuit diagram



Possible mode of operation

QF
0
1

Circuit diagram



Possible mode of operation

1QF	2QF
0	0
0	1
1	0

80-a One lock and one key: One switch disconnector is equipped with one separate lock and one key

80-b Two locks and one key: Two switch disconnector are equipped with two identical locks and one key

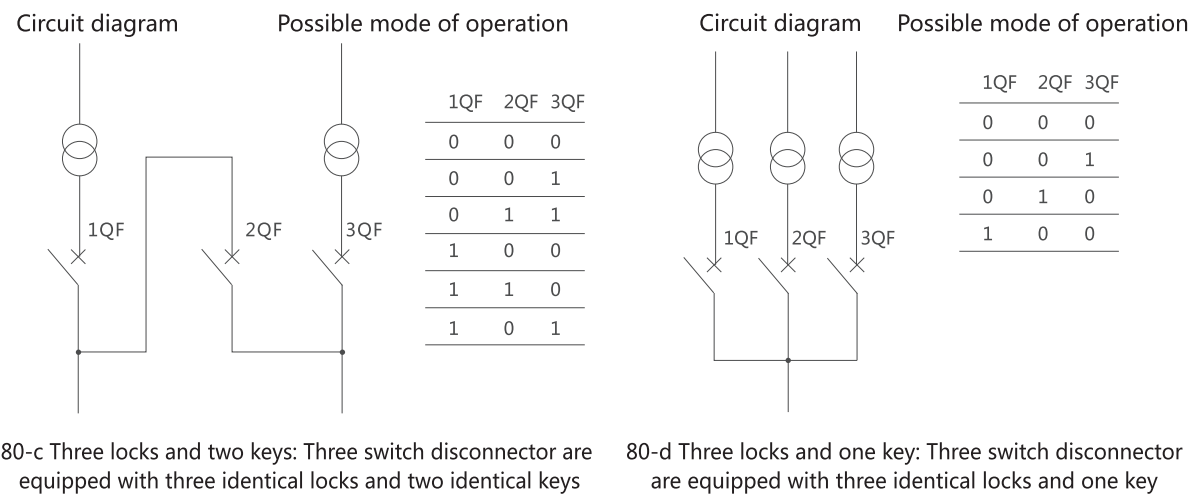


Figure 57.Operation mode of switch disconnecter equipped with locks and keys



Figure 58.Key Lock

12.10 Transparent protective cover (only available for NH1-2000 drawer type)

The transparent protective cover is installed on the door frame of the cabinet door to achieve IP54 protection.



Figure 59.Transparent protective cover

12.11 Counter (only available for NH1-2000~4000/3 model)

The counter accumulates the number of mechanical operations of the switch disconnecter, which is clear to the user and is convenient for maintenance and overhaul.

12.12 Drawer switch disconnecter position signal: installed on the drawer seat to indicate the position of the drawer circuit breaker body in the drawer seat. The positions that can be indicated are "disconnection ", "Test" and "Connection".

12.13 Door Interlock (available only for NH1-2000~4000/3 models)

- a. Circuit breaker status door interlock: The cabinet door is forbidden to open when the switch disconnecter is making and is allowed to open when the switch disconnecter is disconnected.
- b. Circuit breaker position door interlock: The cabinet door is forbidden to open when the switch disconnecter is in the connection or test positions and is allowed to open when the switch disconnecter is in the breaking position.

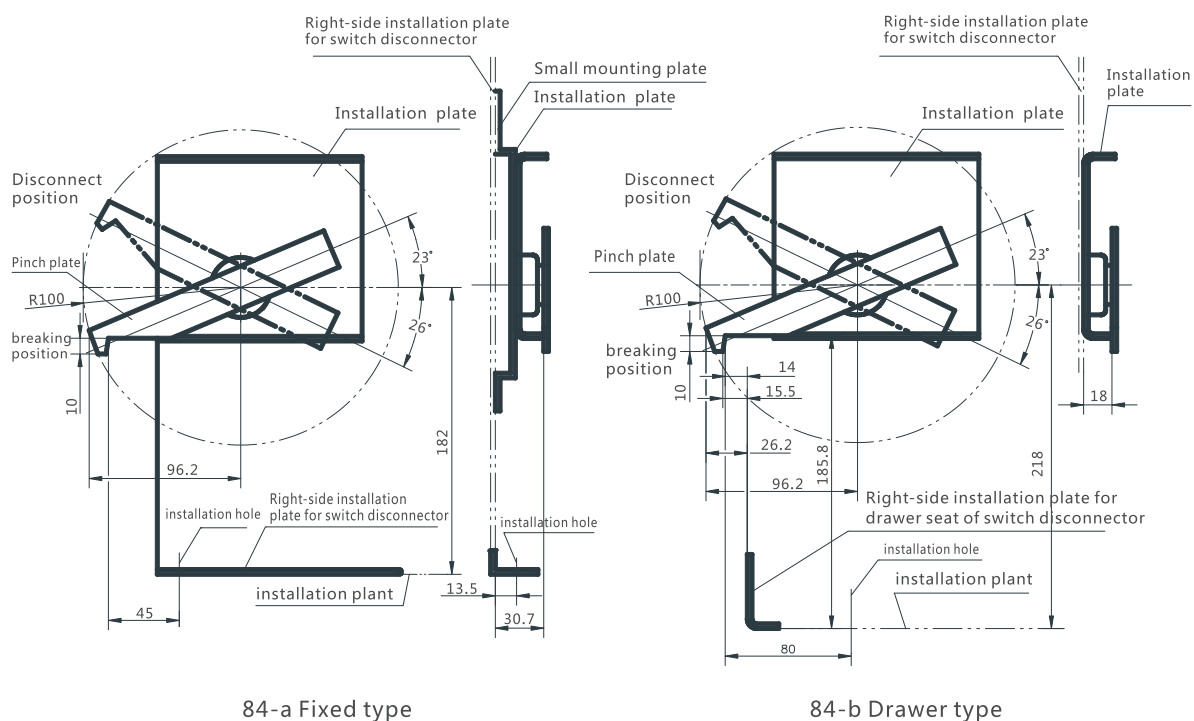


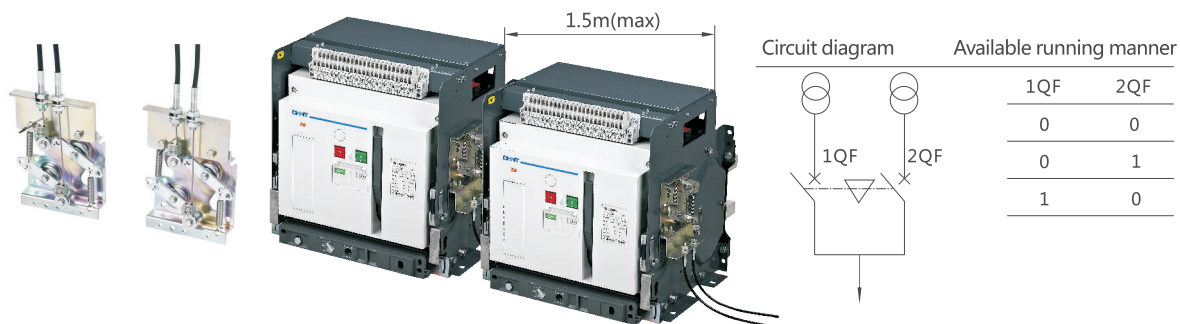
Figure 60. Installation dimension drawing of NH1-2000~4000/3 switch disconnector status door interlock

12.14 Steel Cable Interlock (see Appendix 12.19 for installation method)

12.14.1 Double Interlock (can realize interlocking of two three-pole or four-pole switch disconnector which installed in horizontal or vertical)

It can realize the interlock of two or three horizontal or vertical-installed, three poles or four poles drawout type or fixed type switch disconnector.

- If need bend the cable, make sure the radian is more than 120° .
- Check and make sure enough lubricating oil of the cable.
- The maximum distance between two interlock switch disconnector is 1.5m.



Note: a. when the steel cable needs to be bent, enough transition arc should be reserved to guarantee flexible movement of steel cable;
b. check the steel cable and make sure there is enough lubricant in the steel cable to guarantee flexible movement of steel cable.

Figure 61. Steel cable interlock

12.14.2 Triple Interlock (can realize interlocking of three horizontal three-pole or four-pole circuit breakers)

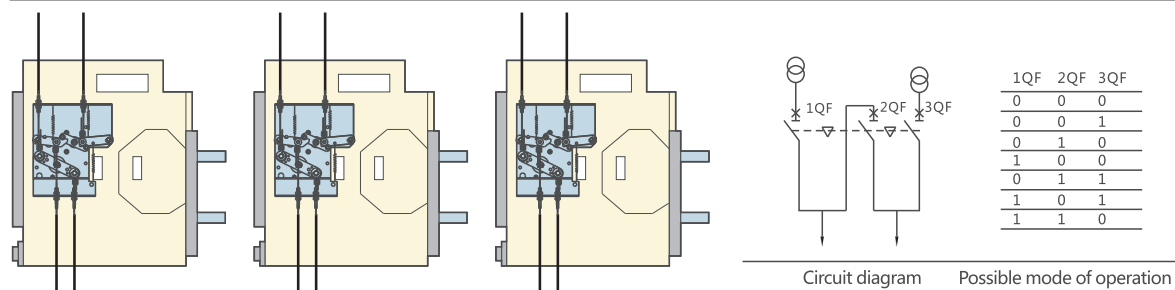


Figure 62. Steel cable triple interlock

12.15 Connecting Rod Interlock (available for NH1-2000~4000/3 products, not for NH1-1000 products)

For two vertically mounted three-pole or four-pole switch disconnecter, the interlock can be realized where one makes and the other breaks.

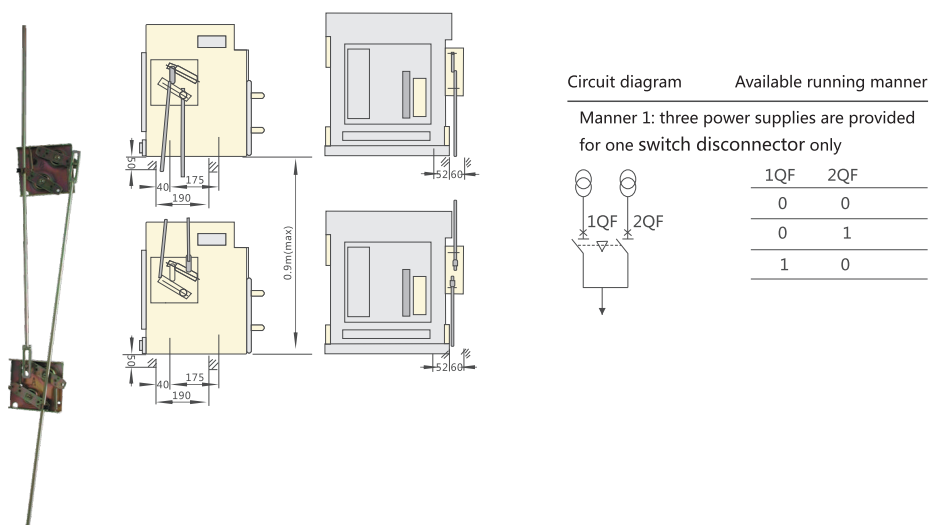


Figure 63. Connecting rod interlock

12.16 NH1 Mechanical Interlock Installation Method

The following precautions should be considered before installing the mechanical interlock:

1. When the steel cable needs to be bent, there should be enough transition arc (greater than R120 mm) at the bend to ensure flexible movement of the steel cable;
2. Check the steel cable and ensure that there is enough oil in the cable to ensure flexible movement of the cable;
3. Add low temperature grease to the steel cable at both ends and the roller;
4. The length of the steel cable is 2 m by default. The recommended installation distance is no more than 1.6 meters.

12.16.1 NH1 Drawer Switch Disconnecter Mechanical Interlock Installation Method.

a. Mechanical interlock components

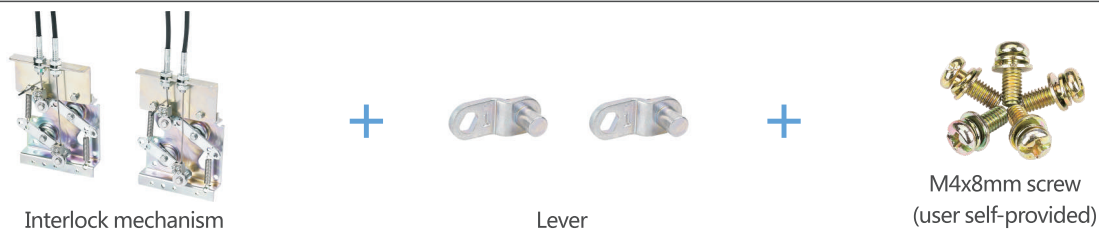


Figure 64. NH1-1000 mechanical interlock components



Figure 65.NH1-2000~4000/3 mechanical interlock components

b. Installation steps

Install the lever on the right spindle of the body and secure it with the M4x10mm screw.



Fix the mechanical interlock on the right side of the drawer seat with 4 M4x8mm screws. The steel cable arc should be reasonable to ensure a reliable interlock mechanism.

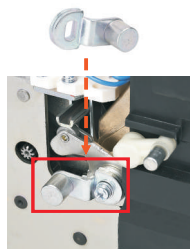


Figure 66.NH1-1000 mechanical interlock installation

Remove the cover and pry off the edge here.



Install the lever on the right spindle of the body and secure it with the M5x10mm screw.



The steel cable should be facing down when installing the interlock mechanism. Fix the interlock mechanism on the right side of the drawer seat with 4 M5x8 mm screws. The steel cable arc should be reasonable to ensure a reliable interlock mechanism.

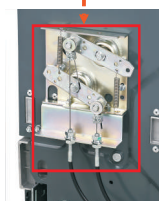


Figure 67.NH1-2000~4000/3 mechanical interlock installation

12.16.2 NH1 Fixed Circuit Breaker Mechanical Interlock Installation Method

a. Mechanical interlock components

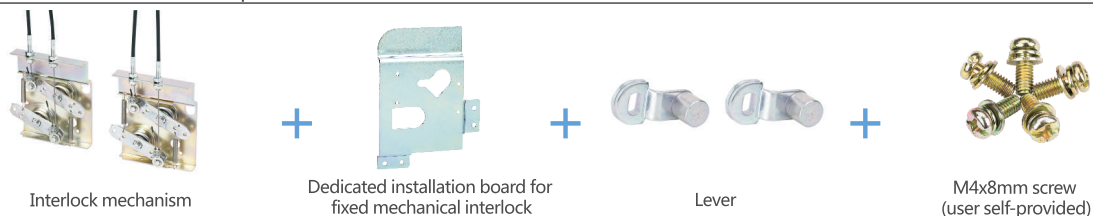


Figure 68.NH1-1000 mechanical interlock components

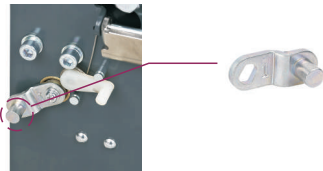


Figure 69.NH1-2000~4000/3 mechanical interlock components

Note: The fixed special interlocking mechanism installation board needs to be purchased separately, and the cost is extra.

b. Installation steps

Install the lever on the right spindle of the body and secure it with the M4x10mm screw.



Fix the fixed mechanical interlock installation board on the right side of the circuit breaker and secure it with 3 M4x8mm screws.



Fix the mechanical interlock on the right side of the drawer seat with 4 M4x8 mm screws. The steel cable arc should be reasonable to ensure a reliable interlock mechanism.

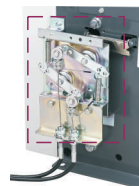


Figure 70.NH1-1000 mechanical interlock installation

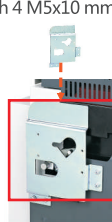
Remove the cover and pry off the edge here.



Install the lever on the right spindle of the body and secure it with the M5x10mm screw.



Fix the interlock installation board on the right side of the switch disconnector and secure it with 4 M5x10 mm screws.



The steel cable should be facing down when installing the interlock mechanism. Fix the interlock mechanism on the installation board with 4 M5x8 mm screws. The steel cable arc should be reasonable to ensure a reliable interlock mechanism.



Figure 71. NH1-2000~4000/3 mechanical interlock installation

12.17 Installation Dimensions of Undervoltage Delay Controller

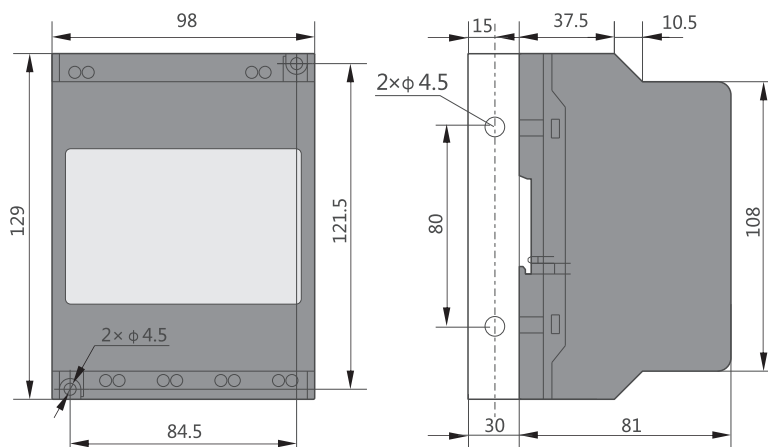


Figure 72.Undervoltage Delay Controller

12.18 Mechanical interlock baseplate bore hole dimensions

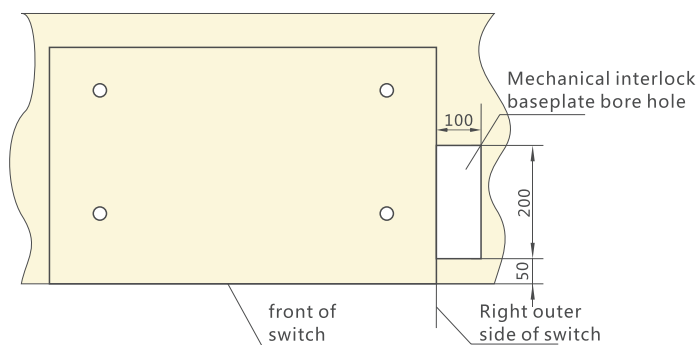


Figure 73. Mechanical interlock baseplate bore hole dimensions

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NH1 Series Switch Disconnecter User Instruction

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