NO:2024.01

CHINT ELECTRICS

# NXA Series
# Air Circuit Breaker

# User Instruction

Standard: IEC 60947-2

# ⚠ 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 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.

CHINT ELECTRICS

# Catalog


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# 1 Scope of Application

The NXA series air circuit breaker (hereinafter referred to as the "breaker") is suitable for power distribution networks of AC50/60Hz power supply, AC690V and lower rated operating voltage and 6300A and lower rated operating current. It is used to distribute power and protect the line and power equipment from overload, undervoltage, short circuit, single-phase grounding and other faults. It has an intelligent protection function with accurate selective protection and can improve power supply reliability to avoid unnecessary power outage.

The breaker can be widely used for power distribution systems of power stations, factories, mines (600V in particular) and modern high-rise buildings, especially those of smart buildings, as well as for green energy projects such as wind and solar power generation.

# 2 Model Specifications

Frame size (A): 1600, 2000, 3200, 4000, 6300
Breaking capacity: N,S,H
Rated operational voltage Ue (VAC): 380/400/415, 440/525/690
Number of poles: 3P, 4P
Installation method: draw-out type, fixed type

CE KEMA EUR

| Frame size | Rated current / Breaking capacity | 400 | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3200 | 3600 | 4000 | 5000 | 6300 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1600A | N | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | |
| | S | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | |
| | H | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | |
| 2000A | N | | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | S | | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | H | | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | |
| 3200A | N | | | | | | ■ | ■ | ■ | ■ | | | | |
| | S | | | | | | ■ | ■ | ■ | ■ | | | | |
| | H | | | | | | ■ | ■ | ■ | ■ | | | | |
| 4000A | N | | | | | | | | | ■ | ■ | ■ | | |
| | S | | | | | | | | | ■ | ■ | ■ | | |
| | H | | | | | | | | | ■ | ■ | ■ | | |
| 6300A | H | | | | | | | | | | | ■ | ■ | ■ |

# 3 Conditions for Normal Application, Installation, Transportation and Storage

### 3.1 Conditions for normal Application

3.1.1 The electrical and mechanical characteristics are suitable for ambient temperatures between -5℃ and +40℃. The M and A type intelligent controller can also be used in ambient temperatures between -45℃ and +70℃, and the P, H type intelligent controller can be used in ambient temperatures between -20℃ and +70℃. The specific derating factor is given in section 4.1.2.

3.1.2 The installation location should not exceed 2,000 m. If the breaker is used above an altitude of 2,000 m, the air cooling effect and the dielectric strength degradation should be considered. The breaker should be derated as shown in section 4.1.3 when it is operated under the above conditions.

3.1.3 The relative humidity of the atmosphere should not exceed 50% at a maximum temperature of +40℃, and a higher relative humidity is allowed at a lower temperature, such as 90% at 20℃. Special measures should be taken for condensation that occasionally occurs 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 breaker is Ⅳ. When the rated operating voltage of the main circuits is ≤AC415V, the installation category on the control circuits and the auxiliary circuit is Ⅲ except the undervoltage release coil and the primary coil of the power transformer of the intelligent control, whose installation category is the same as the breaker. When the rated operating voltage of the main circuits > AC415V and ≤AC690V, if the control circuits and the auxiliary circuit need to take power from the main circuits, they must be isolated from the main circuits by an isolating transformer; the capacity of the isolating transformer should ≥ 2kVA and the maximum operating voltage of the control circuits and the auxiliary circuit should be AC415V. The installation category of the control circuits and the auxiliary circuit should be Ⅲ.

**3.2 Installation Conditions**

Installation conditions: The breaker should be installed in accordance with the installation requirements of this manual, and the vertical inclination should not exceed 5°.The product should be installed in a power distribution cabinet which protection class does not exceed IP20.

**3.3 Protection class of circuit breaker:** IP20 on the front and IP00 on the other sides.

**3.4 Conditions for Transportation and Storage**

Unless otherwise specified, the following temperature scope applies to transportation and storage: -35℃-+70℃, and up to +70℃ within a short period (24 h).

## 4 Main Technical Parameters

### 4.1 Technical Parameters of Main Circuit

**Table 1 Specification**

| | | |
|---|---|---|
| Number of poles | 3/4 (6300A only 3P) | |
| Rated operational voltage Ue (V) | AC 380/400/415 , AC 440/525/690 | |
| Rated insulation voltage Ui (V) | 1000 | |
| Rated impulse withstand voltage Uimp (kV) | 12 | |
| Rated frequency (Hz) | 50/60 | |
| Flashover distance (mm) | 0 | |
| Applicable to isolation | IEC/EN 60947-2 | Applicable |
| Pollution grade | IEC 60664-1 | N:3 |

**Table 2 Technical parameters of main circuit**

| **Frame size** | | | **1600A** | | | | | |
|---|---|---|---|---|---|---|---|---|
| Rated current (A) | | | 400 | 630 | 800 | 1000 | 1250 | 1600 |
| Rated current of the fourth pole (A) | | | 400 | 630 | 800 | 1000 | 1250 | 1600 |
| **Type of the circuit breaker** | | | **N** | **S** | **H** | | | |
| Rated ultimate short circuit breaking capacity (kA rms) VAC 50/60Hz | Icu | 380/400/415V | 50 | 42 | 50 | | | |
| | | 440/525/690V | 30 | 36 | 36 | | | |
| Rated service short circuit breaking capacity (kA rms) VAC 50/60Hz | Ics | 380/400/415V | 42 | 42 | 50 | | | |
| | | 440/525/690V | 30 | 36 | 36 | | | |
| Utilization category | | | B | | | | | |
| Rated short-time withstand current (kA rms) VAC 50/60Hz | Icw 1s | 380/400/415V | 42 | 42 | 42 | | | |
| | | 440/525/690V | 30 | 36 | 36 | | | |
| | Icw 3s | 380/400/415V | 20 | 25 | 25 | | | |
| | | 440/525/690V | - | - | - | | | |
| Closed capacity (kA peak) VAC 50/60Hz | Icm | 380/400/415V | 105 | 88.2 | 105 | | | |
| | | 440/525/690V | 63 | 75.6 | 75.6 | | | |
| Making current tripping protection function (MCR kA rms) | | | 10 | 16 | 16 | | | |
| Breaking time (ms) | | | ≤28 | | | | | |
| Closing time (ms) | | | ≤50 | | | | | |
| | | | | | | | | |
| Service life C/O cycle | Mechanical | Without maintenance | 15000 | | | | | |
| | Electrical | Without maintenance | AC415V: 8000; AC690V: 5000 | | | | | |
| | | | | | | | | |
| Size (width × depth × height) | Fixed type | 3P | 254×243.5×318.5 | | | | | |
| | | 4P | 324×243.5×318.5 | | | | | |
| | Draw-out type | 3P | 308×331.5×351 | | | | | |
| | | 4P | 378×331.5×351 | | | | | |

### 4.1.1 Power Loss

The power loss is shown in Table 3.

The power loss is the power consumption measured at In and 50/60Hz, and the input/output resistance is the DC resistance value in the cold state.

| | 2000A | | | | | | 3200A | | | | 4000A | | | 6300A | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 1600 | 2000 | 2500 | 3200 | 3200 | 3600 | 4000 | 4000 | 5000 | 6300 |
| | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 1600 | 2000 | 2500 | 3200 | 3200 | 3600 | 4000 | 2000 | 2500 | - |
| | **N** | **S** | **H** | | | | **N** | **S** | **H** | | **N** | **S** | **H** | **H** | | |
| | 80 | 65 | 80 | | | | 80 | 80 | 100 | | 80 | 85 | 100 | 120 | | |
| | 50 | 55 | 55 | | | | 65 | 70 | 70 | | 65 | 75 | 75 | 85 | | |
| | 50 | 65 | 65 | | | | 80 | 80 | 85 | | 80 | 85 | 85 | 120 | | |
| | 50 | 55 | 55 | | | | 65 | 70 | 70 | | 65 | 75 | 75 | 85 | | |
| | B | | | | | | B | | | | B | | | B | | |
| | 50 | 65 | 65 | | | | 65 | 80 | 85 | | 65 | 85 | 85 | 100 | | |
| | 50 | 55 | 55 | | | | 65 | 70 | 70 | | 65 | 75 | 75 | 75 | | |
| | 37 | 42 | 42 | | | | 37 | 50 | 50 | | 37 | 50 | 50 | - | | |
| | - | - | - | | | | - | - | - | | - | - | - | - | | |
| | 176 | 143 | 176 | | | | 176 | 176 | 220 | | 176 | 187 | 220 | 264 | | |
| | 105 | 121 | 121 | | | | 143 | 154 | 154 | | 143 | 165 | 165 | 187 | | |
| | 16 | 16 | 16 | | | | 26 | 26 | 26 | | 26 | 26 | 26 | 26 | | |
| | ≤28 | | | | | | ≤28 | | | | ≤28 | | | ≤28 | | |
| | ≤50 | | | | | | ≤50 | | | | ≤50 | | | ≤50 | | |
| | | | | | | | | | | | | | | | | |
| | 15000 | | | | | | 10000 | | | | 10000 | | | 2000 | | |
| | AC415V: 8000; AC690V: 5000 | | | | | | AC415V: 7000; AC690V: 5000 | | | | AC415V: 5000; AC690V: 3000 | | | 1500 | | |
| | ▪ | | | | | | ▪ | | | | ▪ | | | ▪ | | |
| | 374×344×400 | | | | | | 439×373.5×400 | | | | 550×337.5×400 | | | 897×435.5×399 | | |
| | 469×344×400 | | | | | | 554×373.5×400 | | | | 700×337.5×400 | | | 897×435.5×399 | | |
| | 403×430×438.5 | | | | | | 463×499.5×438.5 | | | | 569×416×438.5 | | | 923×500×435.5 | | |
| | 498×430×438.5 | | | | | | 578×499.5×438.5 | | | | 719×416×438.5 | | | 923×500×435.5 | | |

**Table 3 Power loss and output resistance**

| Frame | Rated current (A) | Drawer type | Fixed type |
|---|---|---|---|
| | | Power loss (W) | Power loss (W) |
| 1600A | 400 | 30.5 | 15.6 |
| | 630 | 75.7 | 38.6 |
| | 800 | 99.1 | 54.1 |
| | 1000 | 154.8 | 84.6 |
| | 1250 | 241.9 | 132.2 |
| | 1600 | 262.7 | 138.2 |
| 2000A | 630 | 58.6 | 26.4 |
| | 800 | 73.7 | 36.6 |
| | 1000 | 115.2 | 57.2 |
| | 1250 | 180 | 89.4 |
| | 1600 | 294.9 | 146.5 |
| | 2000 | 388.8 | 204.5 |
| 3200A | 1600 | 127.2 | 60.1 |
| | 2000 | 198.7 | 93.9 |
| | 2500 | 310.5 | 146.7 |
| | 3200 | 479.2 | 206.4 |
| 4000A | 3200 | 435 | 239.6 |
| | 3600 | 690.5 | 272.9 |
| | 4000 | 852.5 | 337 |
| 6300A | 4000 | 403.2 | 230.4 |
| | 5000 | 630 | 360 |
| | 6300 | 1000.2 | 571 |

4.1.2 Derating of Circuit Breaker

In an IP20 cabinet, connect copper bars according to Table 30. The temperature derating of the fixed breaker is shown in Table 4-Table 8;

**Table 4 1600 frame temperature derating**

| Ambient temperature | 400A | 630A | 800A | 1000A | 1250A | 1600A |
|---|---|---|---|---|---|---|
| Connection method | Level | Level | Level | Level | Level | Level |
| 40℃ | — | — | — | — | — | — |
| 45°C | — | — | — | — | — | — |
| 50°C | — | — | — | — | — | 1550 |
| 55°C | — | — | — | — | 1150 | 1500 |
| 60°C | — | 550 | — | — | 1050 | 1450 |

Note: "-" means no derating is required, the same below.

**Table 5 2000 frame temperature derating**

| Ambient temperature | 630A | 800A | 1000A | 1250A | 1600A | 2000A |
|---|---|---|---|---|---|---|
| Connection method | Level | Level | Level | Level | Level | Level |
| 40°C | — | — | — | — | — | — |
| 45°C | — | — | — | — | 1550 | 1900 |
| 50°C | — | — | — | — | 1500 | 1850 |
| 55°C | — | — | — | — | 1400 | 1800 |
| 60°C | — | — | — | — | 1300 | 1700 |

**Table 6 3200 frame temperature derating**

| Ambient temperature | 1600A | 2000A | 2500A | 3200A |
|---|---|---|---|---|
| Connection method | Level | Level | Level | Level |
| 40°C | — | — | — | — |
| 45°C | — | — | — | — |
| 50°C | — | — | — | 3100 |
| 55°C | — | — | 2450 | 3000 |
| 60°C | — | — | 2350 | 2900 |

**Table 7 4000 frame temperature derating**

| Ambient temperature | 3200A | 3600A | 4000A |
|---|---|---|---|
| Connection method | Level | Level | Level |
| 40°C | — | — | — |
| 45°C | 3100 | — | 3800 |
| 50°C | 3000 | — | 3600 |
| 55°C | 3000 | 3400 | 3400 |
| 60°C | 2900 | 3200 | 3200 |

**Table 8 6300 frame temperature derating**

| Ambient temperature | 4000A | 5000A | 6300A |
|---|---|---|---|
| Connection method | Level | Level | Level |
| 40°C | — | — | — |
| 45°C | — | — | — |
| 50°C | — | — | 5600 |
| 55°C | — | 4800 | 5400 |
| 60°C | — | 4800 | 5200 |

The temperature derating of the drawer breaker is shown in Table 9-Table 13:

**Table 9 1600 frame temperature derating**

| Ambient temperature | 400A | 630A | 800A | 1000A | 1250A | 1600A |
|---|---|---|---|---|---|---|
| Connection method | Level | Level | Level | Level | Level | Level |
| 40°C | — | — | — | — | — | — |
| 45°C | — | — | — | — | — | — |
| 50°C | — | — | — | — | — | 1550 |
| 55°C | — | — | — | — | 1150 | 1500 |
| 60°C | — | 550 | — | — | 1050 | 1450 |

**Table 10 2000 frame temperature derating**

| Ambient temperature | 630A | 800A | 1000A | 1250A | 1600A | 2000A |
|---|---|---|---|---|---|---|
| Connection method | Level | Level | Level | Level | Level | Level |
| 40°C | — | — | — | — | | |
| 45°C | — | — | — | — | 1550 | 1900 |
| 50°C | — | — | — | — | 1500 | 1850 |
| 55°C | — | — | — | — | 1400 | 1800 |
| 60°C | 600 | — | — | — | 1300 | 1700 |

**Table 11 3200 frame temperature derating**

| Ambient temperature | 1600A | 2000A | 2500A | 3200A |
|---|---|---|---|---|
| Connection method | Level | Level | Level | Level |
| 40°C | — | — | — | — |
| 45°C | — | — | — | — |
| 50°C | — | — | — | 3100 |
| 55°C | — | — | 2450 | 3000 |
| 60°C | — | — | 2350 | 2900 |

**Table 12 4000 frame temperature derating**

| Ambient temperature | 3200A | 3600A | 4000A |
|---|---|---|---|
| Connection method | Level | Level | Level |
| 40°C | — | — | — |
| 45°C | 3100 | — | 3800 |
| 50°C | 3000 | — | 3600 |
| 55°C | 3000 | 3400 | 3400 |
| 60°C | 2900 | 3200 | 3200 |

**Table 13 6300 frame temperature derating**

| Ambient temperature | 4000A | 5000A | 6300A |
|---|---|---|---|
| Connection method | Level | Level | Level |
| 40°C | — | — | — |
| 45°C | — | — | — |
| 50°C | — | — | 5600 |
| 55°C | — | 4800 | 5400 |
| 60°C | — | 4800 | 5200 |

4.1.3 Altitude derating factor

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 14.

**Table 14 High altitude derating factor**

| Altitude (m) | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 |
|---|---|---|---|---|---|---|---|
| Rated impulse withstand voltage Uimp (kV) | 12 | 12 | 12 | 12 | 11 | 10 | 8 |
| Average insulation voltage Ui (V) | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 800 |
| Maximum operating voltage Ue(V) (50/60Hz) | 690 | 690 | 690 | 690 | 690 | 690 | 560 |
| Power frequency withstand voltage (V) | 3500 | 3500 | 3500 | 3500 | 3000 | 2500 | 2200 |

**Table 14 (To continue)**

| Product model | Rated current(A) | Altitude (m) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 |
| NXA16 | 400~630 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 800~1250 | 1 | 1 | 1 | 1 | 0.97 | 0.9 | 0.87 |
| | 1600 | 1 | 1 | 1 | 1 | 0.97 | 0.9 | 0.87 |
| NXA20 | 630~1600 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 2000 | 1 | 1 | 1 | 1 | 0.97 | 0.9 | 0.87 |
| NXA32 | 1600 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 2000~2500 | 1 | 1 | 1 | 1 | 0.97 | 0.9 | 0.87 |
| | 3200 | 1 | 0.97 | 0.93 | 0.9 | 0.88 | 0.85 | 0.82 |
| NXA40 | 3200 | 1 | 1 | 1 | 0.97 | 0.9 | 0.87 | 0.85 |
| | 3600~4000 | 1 | 0.97 | 0.93 | 0.9 | 0.88 | 0.85 | 0.82 |
| NXA63 | 4000~5000 | 1 | 1 | 0.98 | 0.95 | 0.93 | 0.9 | 0.87 |
| | 6300 | 1 | 0.97 | 0.93 | 0.9 | 0.88 | 0.85 | 0.82 |

### 4.2 Protection Characteristics of Intelligent Controller

4.2.1 Overcurrent Protection Characteristic Curve

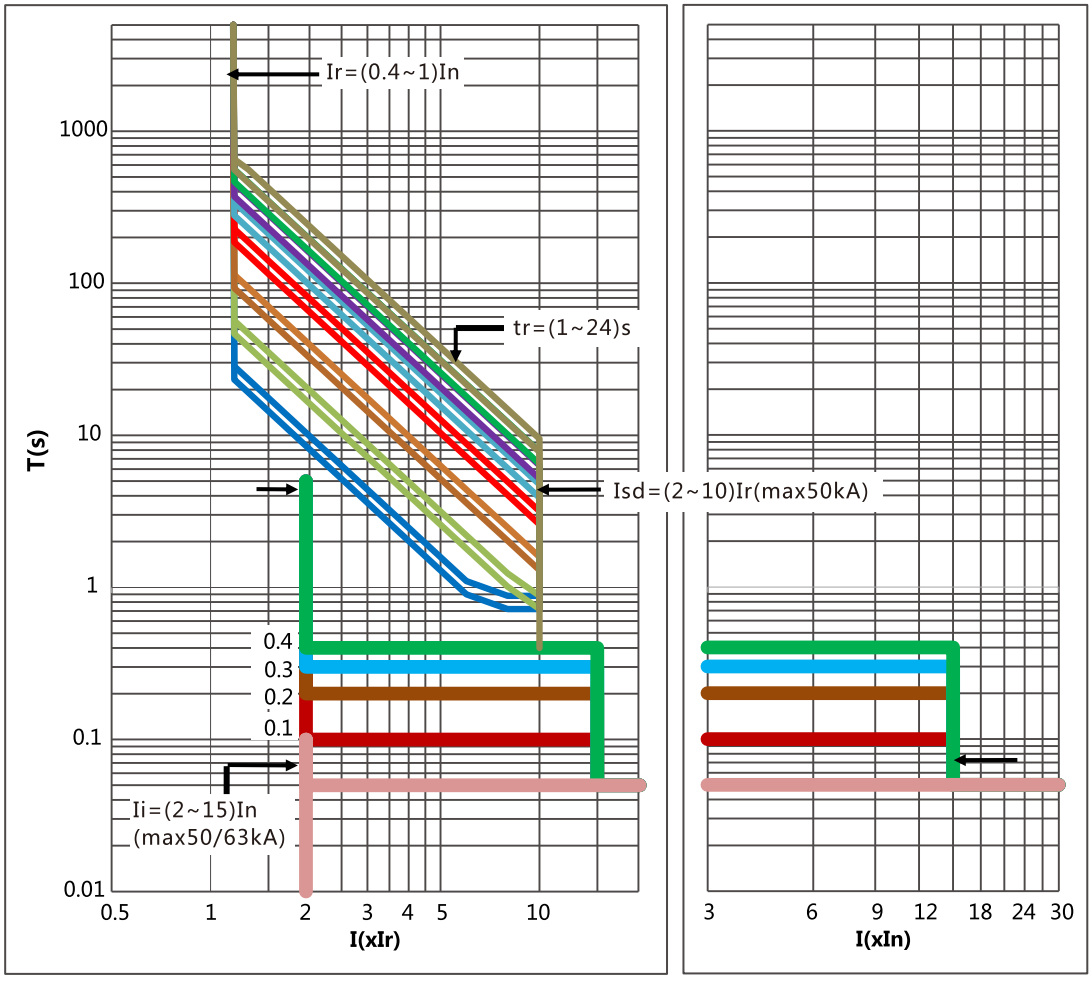



**Figure 1 Overcurrent protection characteristic curve**

4.2.2 Overload long-delay protection action characteristics

< 1.05Ir: > 2h Non-trip

≥1.3Ir: 1h Trip

Ir current setting value range:

M type and A type(Shift position regulation): 0.4In, 0.5In, 0.6In, 0.7In, 0.8In, 0.9In, 1.0In+OFF

P type and H type(Continuous regulation): 0.4In~1.0In+OFF

Inverse time action characteristics $I^2t$:$t=(6/N)^2*tr$

**Table 15 Ir protection action time**

| Setting current multiple | Trip Time | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1.5Ir | 16 | 32 | 64 | 128 | 192 | 256 | 320 | 384 |
| 2Ir | 9 | 18 | 36 | 72 | 108 | 144 | 180 | 216 |
| 6Ir | 1 | 2 | 4 | 8 | 12 | 16 | 20 | 24 |

Note: Ir -- long-delay current set value
N -- fault current divided by a multiple of set current I/Ir
t -- fault action delay time
tr -- long delay time set value
Action allowed time tolerance ±15%
Regular factory setting: Ir=1.0In
Regular factory setting: tr=2s(@6Ir)

4.2.3 Short-circuit Short-delay Protection Action Characteristics

Short-circuit short-delay protection action threshold

＜0.85Isd: Non-trip;

＞1.15Isd: Trip

Isd current setting value range: M type and A type(Shift position regulation)：2Ir, 3Ir, 4Ir, 5Ir, 6Ir, 8Ir, 10Ir+OFF(max50kA)

P type and H type(Continuous regulation)：2Ir~10Ir+OFF(max50kA)

**Table 16 Isd protection action time**

| Current | Action Time | | Remarks |
|---|---|---|---|
| Isd＜I≤10Ir | Inverse time | Action characteristic $I^2t=(10Ir)^2tsd$ | P、H<br>When I > 10Ir,it's definite time |
| | | Setting time (s) 0.1, 0.2, 0.3, 0.4 | |
| I≥1.1Isd | Definite time | Setting time (s) 0.1, 0.2, 0.3, 0.4 | M、A、P、H |
| | | Minimum (s) 0.06, 0.16, 0.255, 0.34 | |
| | | Maximum (s) 0.14, 0.24, 0.345, 0.46 | |
| | Return time (s) | 0.05, 0.14, 0.25, 0.33 | |

Note: Isd -- short-delay current set value
I -- fault current value
Ir -- long-delay set value.
t -- fault action current delay time
tsd -- short-delay time set value
Action allowed time tolerance ±15%
Regular factory setting: Isd=8Ir(Ir ＜ 6250A)　Isd=50kA(Ir≥6250A)
Regular factory setting: tsd=0.4s

4.2.4 Short-circuit Instantaneous Protection Action Characteristics

Short-circuit instantaneous protection action threshold

＜0.85Ii: Non-trip;

＞1.15Ii: fast type ≤30ms, standard type ≤50ms trip

Current setting value of instantaneous action:

M type and A type(Shift position regulation)：2In, 4In, 6In, 8In, 10In, 12In,15In+OFF(NXA40 max50kA,NXA63 max63kA)

P type and H type(Continuous regulation)：2In~15In+OFF(NXA40 max50kA,NXA63 max63kA)

Current mode setting：Peak value：0.01 Effective value：0.02

Note: Ii -- short-circuit instantaneous set value Regular factory setting: Ii=12In(In=400A-5000A) Ii=63kA(In=6300A)

4.2.5 Ground Protection

4.2.5.1 Ground protection has the definite time protection characteristics (M type and A type), and definite time + inverse time protection characteristics (P and H types). See Figure 2.

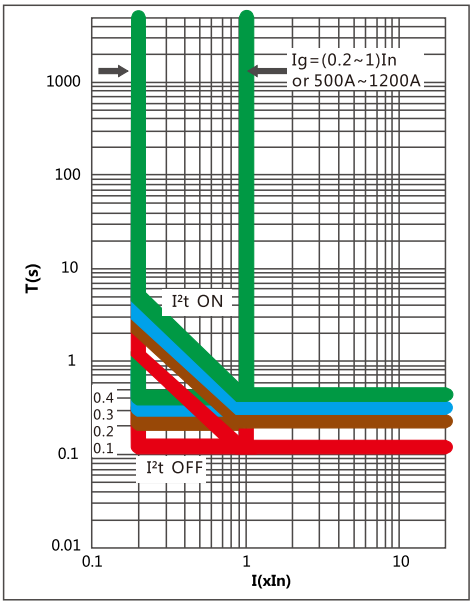



**Figure 2 Asymmetric ground protection characteristic curve**

4.2.5.2 Ground Protection Current Set Value Ig

**Table 17 Protection current setting value Ig**

| Ground current setting range | | A | B | C | D | E | F | G | OFF | Default | Accuracy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| M type, A type | 0.2In-1.0In+OFF(NXA16, 20) | 0.2In | 0.3In | 0.4In | 0.5In | 0.6In | 0.8In | In | — | OFF | ±10% |
| | 500A-1200A+OFF(NXA32, 40, 63) | 500A | 640A | 800A | 960A | 1040A | 1120A | 1200A | — | OFF | |
| P type, H type | 0.2In-1.0In+OFF(NXA16, 20) | Step size 1A | | | | | | | — | OFF | |
| | 500A-1200A+OFF(NXA32, 40, 63) | | | | | | | | — | OFF | |

Note: When In≥1250A, Igmax=1200A

4.2.5.3 Ground Protection Delay Time Set Value tg

**Table 18 Ground protection action time tg**

| Fault Current | | Set time (s) | 0.1 | 0.2 | 0.3 | 0.4 | Default |
|---|---|---|---|---|---|---|---|
| M type, A type | I>1.1Ig | Minimum (s) | 0.06 | 0.16 | 0.255 | 0.34 | OFF |
| | | Maximum (s) | 0.14 | 0.24 | 0.345 | 0.46 | |
| P type, H type | I>1.1Ig and I≥In or 1200A | Minimum (s) | 0.06 | 0.16 | 0.255 | 0.34 | |
| | | Maximum (s) | 0.14 | 0.24 | 0.345 | 0.46 | |
| | I>1.1Ig and I<In or 1200A | Inverse time delay | $t=\frac{(1.0In)^2}{I^2}\times tg$ or $t=\frac{(1200)^2}{I^2}\times tg$ (error±15%) | | | | |
| | | Return time | 0.05 | 0.14 | 0.25 | 0.33 | |

Note: I -- fault current value ; t -- fault action delay time

4.2.5.4 Ground Fault Protection Action Threshold

I < 0.9Ig: Non-trip within 2tg;

I > 1.1Ig: Trip within tg±0.040s or (1±15%)tg

### 4.3 CT power supply

Single phase of CT not less than 0.4In, or three phases of CT not below 0.2In, the intelligent controller can work normally.

**Table 19 Controller minimum display current**

| Frame | In | Minimum display value ( A ) |
|---|---|---|
| 1600 | 400 ~ 1600 | 60 |
| 2000 | 630 ~ 2000 | 60 |
| ≥3200 | ≥1600 | 120 |

# 5 Structure

## 5.1 Product Structure

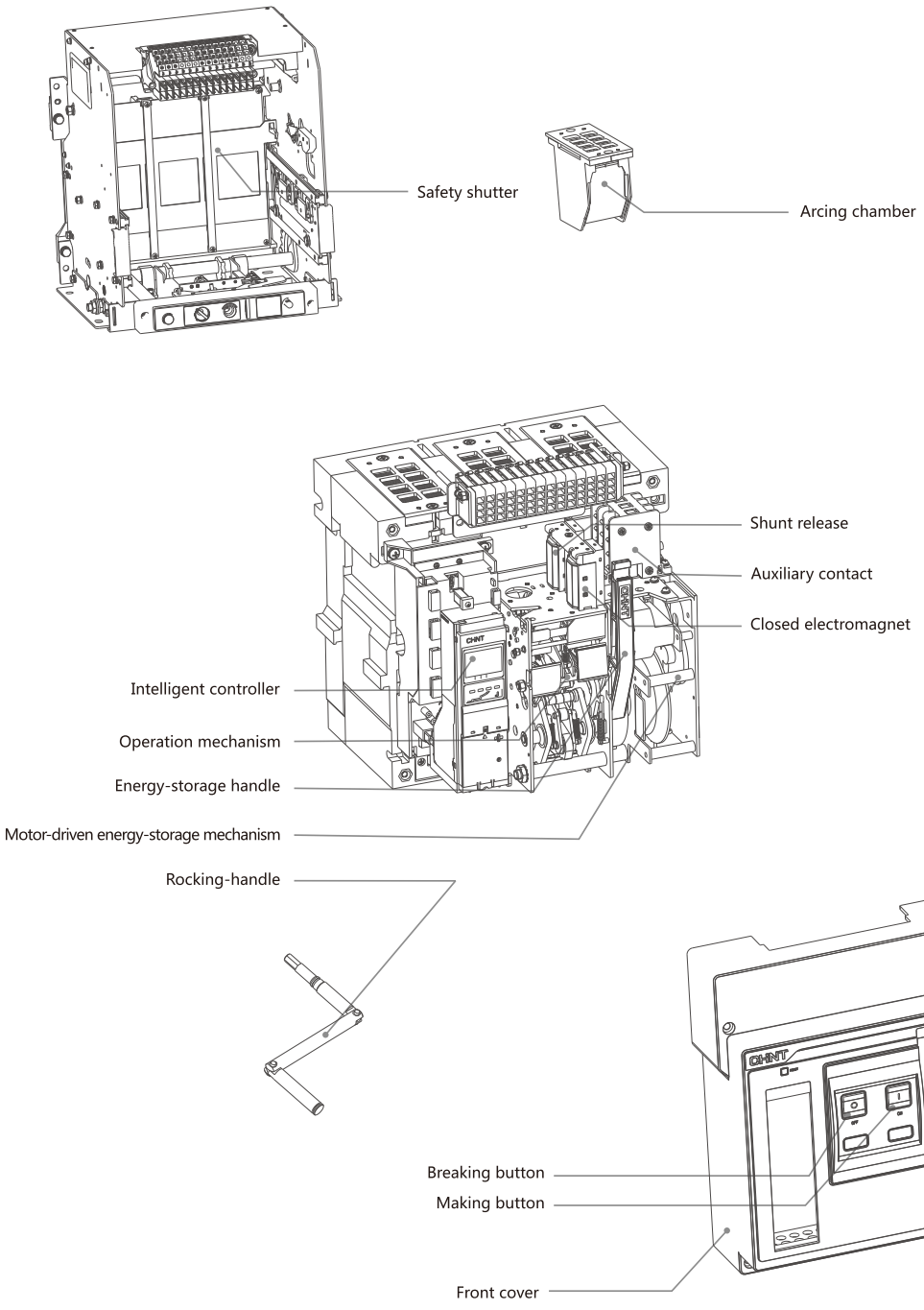



**Figure 3 Drawer type product structure**

## 5.2 Breaker Identification Panel

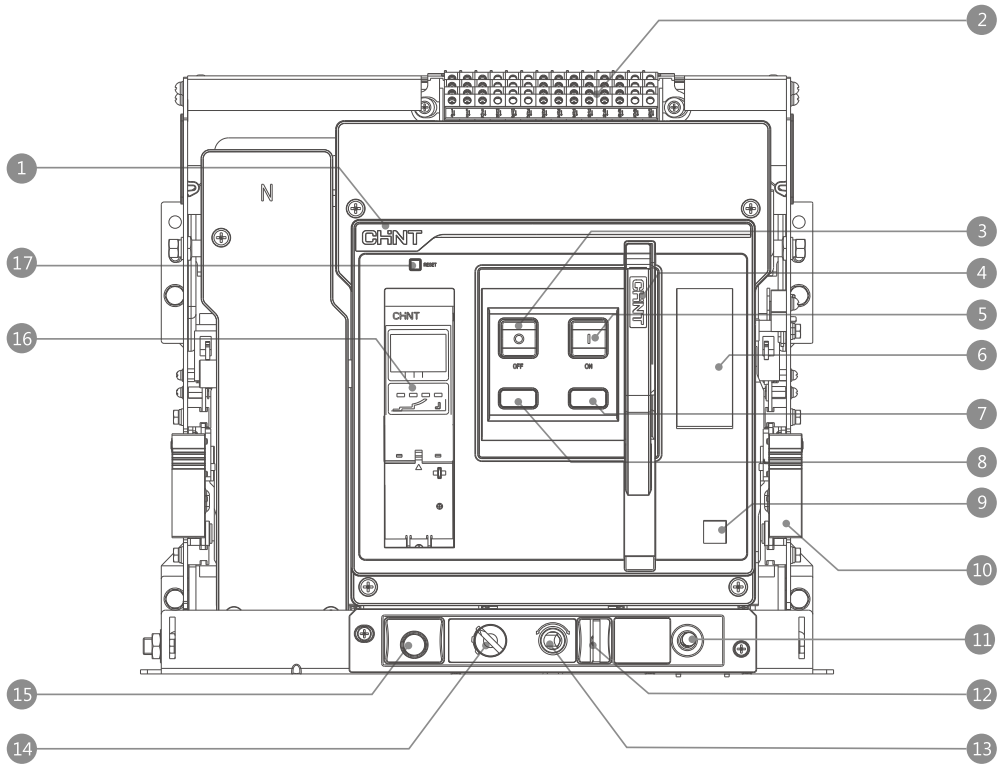



**Figure 4 Drawer type product front**

| | | | |
|---|---|---|---|
| 1 | Trademark | 10 | Extraction draw plate (only applicable to draw-out type) |
| 2 | Secondary wiring terminal | 11 | Drawer seat position lock |
| 3 | Breaking button | 12 | "Disconnected" position locking device(only applicable to draw-out type |
| 4 | Energy-storage handle | 13 | Rocking-handle entry (only applicable to draw-out type) |
| 5 | Making button | 14 | Position indication (only applicable to draw-out type) |
| 6 | Nameplate | 15 | Rocking-handle storage (only applicable to draw-out type) |
| 7 | Energy-storage/release indicator | 16 | Intelligent controller |
| 8 | Breaking/making indicator | 17 | Fault-breaking indicator reset button |
| 9 | QR code | | |

# 6 Appearance, Installation Dimensions and Weight

## 1600A fixed type

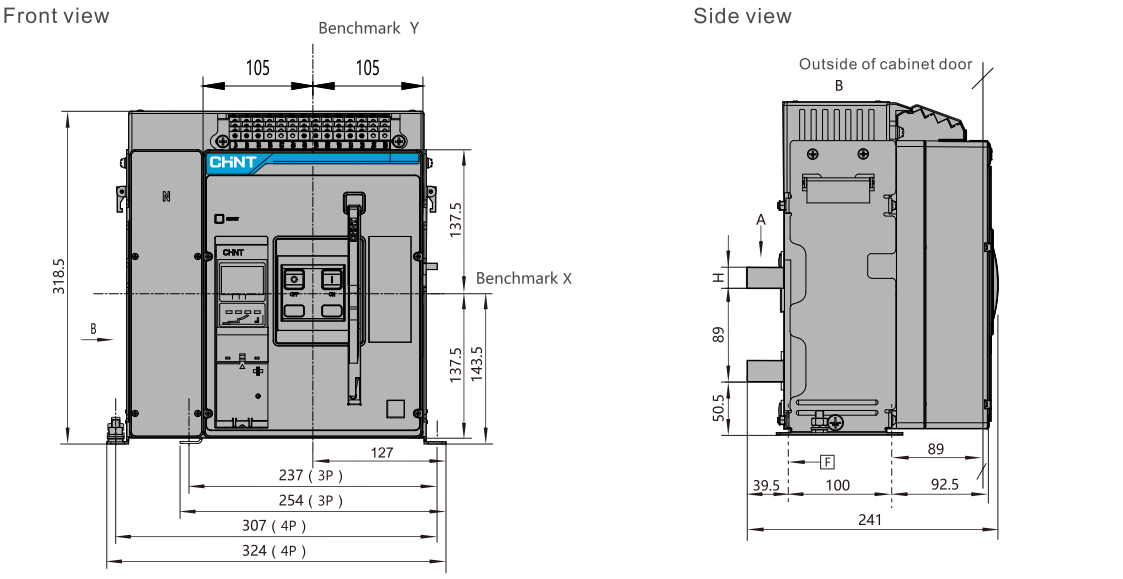



**Figure 5 Product size of NXA16 fixed type**

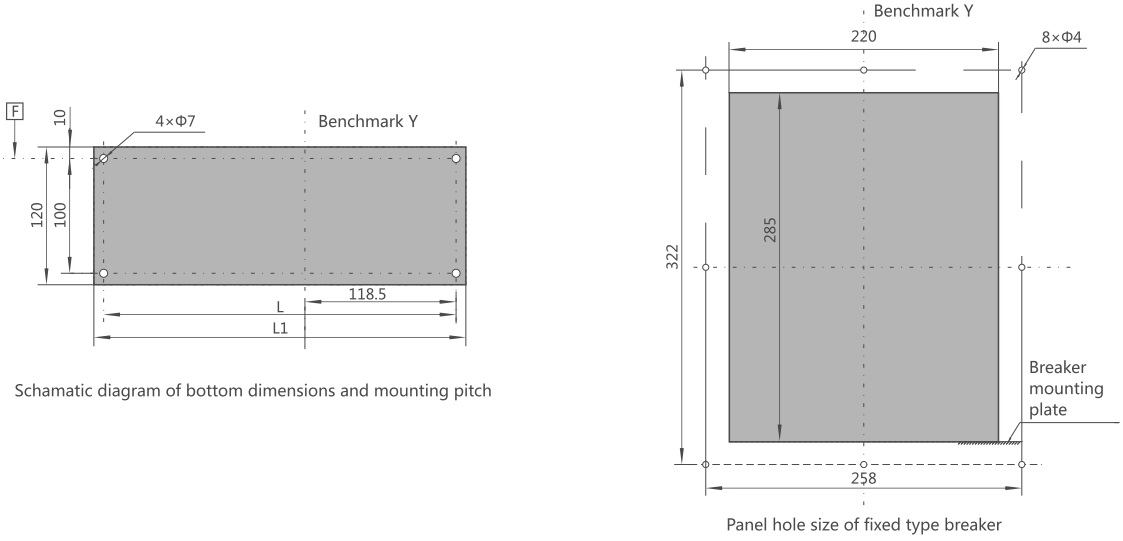
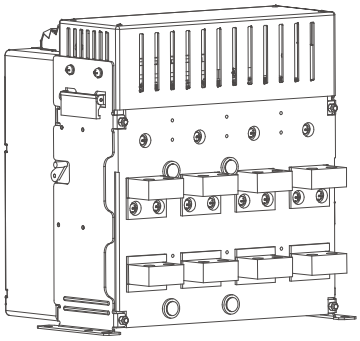
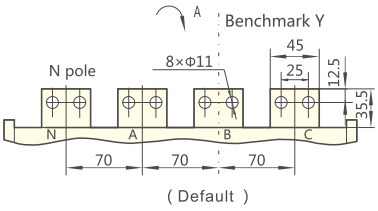


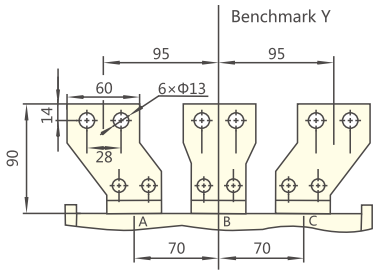

**Figure 6 Installation dimensions of NXA16 fixed type**

**Table 20 NXA16 busbar and installation dimensions (fixed type)**

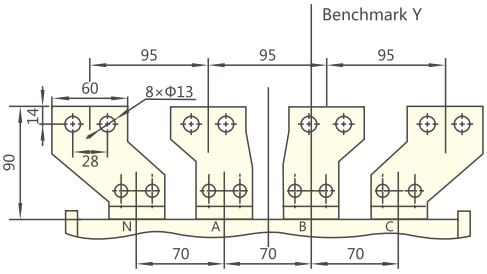
| H | L | L1 | Remarks |
|---|---|---|---|
| 5 | 237 | 254 | In=400A-630A, fixed type, 3p |
| 8 | 237 | 254 | In=800A-1250A, fixed type, 3p |
| 20 | 237 | 254 | In=1600A, fixed type,3p |
| 5 | 307 | 324 | In=400A-630A, fixed type, 4p |
| 8 | 307 | 324 | In=800A-1250A, fixed type,4p |
| 20 | 307 | 324 | In=1600A, fixed type,4p |






Three-pole extended busbar




Four-pole extended busbar

Note: See Table 22 on Page 16 for the number of extended busbars

**Figure 7 NXA16 fixed type busbar size (horizontally connected)**

## 1600A drawer type

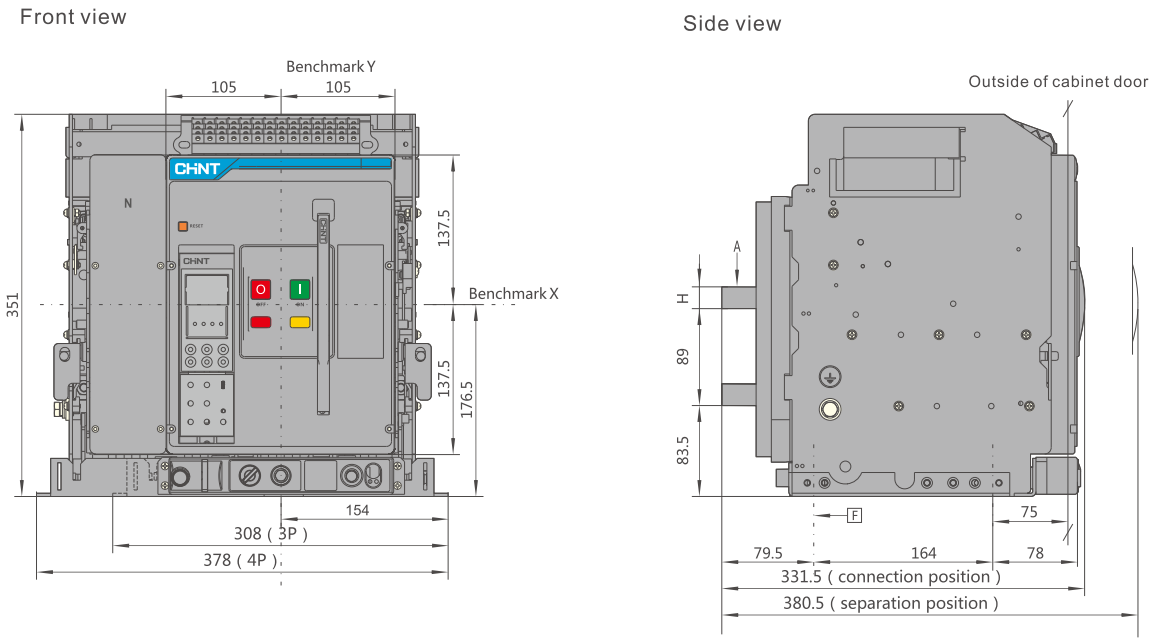



**Figure 8 Product size of NXA16 drawer type**

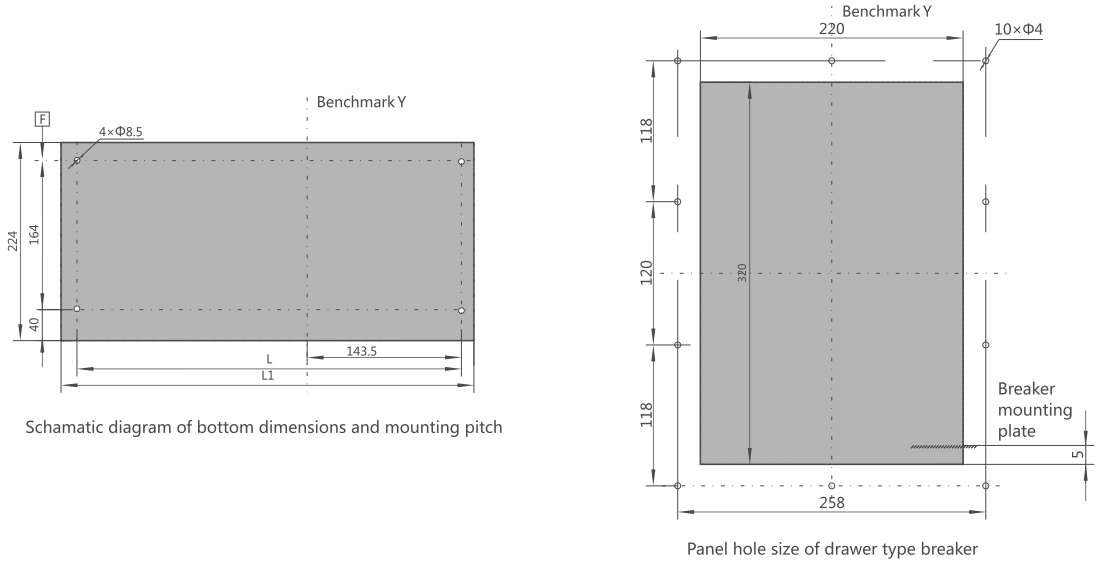
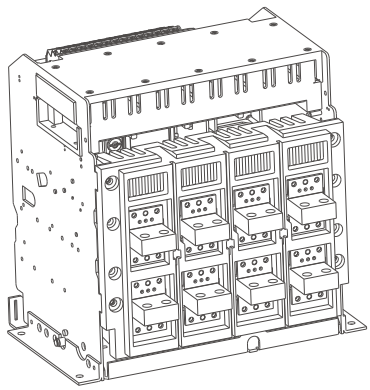
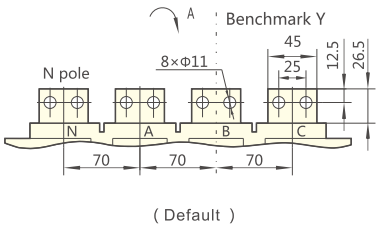



**Figure 9 Installation dimensions of NXA16 drawer type**

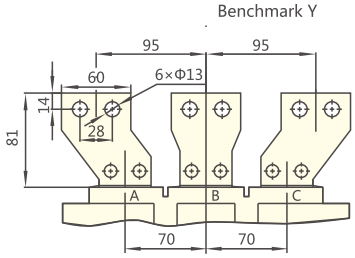
**Table 21 NXA16 busbar and installation dimensions (drawer type)**

| H | L | L1 | Remarks |
|---|---|---|---|
| 5 | 287 | 308 | In=400A-630A, 3P |
| 8 | 287 | 308 | In=800A-1250A, 3P |
| 20 | 287 | 308 | In=1600A, 3P |
| 5 | 357 | 378 | In=400A-630A, 4P |
| 8 | 357 | 378 | In=800A-1250A, 4P |
| 20 | 357 | 378 | In=1600A, 4P |

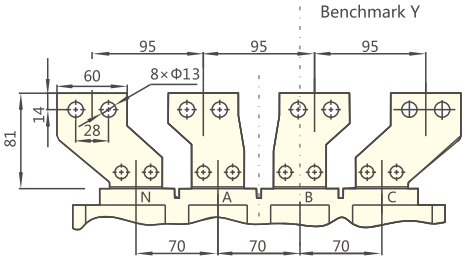





( Default )




(Optional)




(Optional)

Note: See Table 22 for the number of extended busbars.

**Figure 10 NXA16 drawer type busbar size (horizontal connection)**

**Table 22 Number of extended busbars**

| In(A) | Number of extended busbars | | | |
|---|---|---|---|---|
| | 3P | | 4P | |
| | Phase A + Phase C | Phase B | Phase A + Phase B | Phase N + Phase C |
| 400、630 | 4 | 2 | 4 | 4 |
| 800～1250 | 4 | 2 | 4 | 4 |
| 1600 | 8 | 4 | 8 | 8 |

Note: 1.The extended busbar thickness is all 10mm ;

2.For example, the number for(Phase A + Phase C) is 4, which means that Phase A and Phase C have the same number of extended busbars, two for Phase A and two for Phase C, a total of 4.

## 2000A fixed type

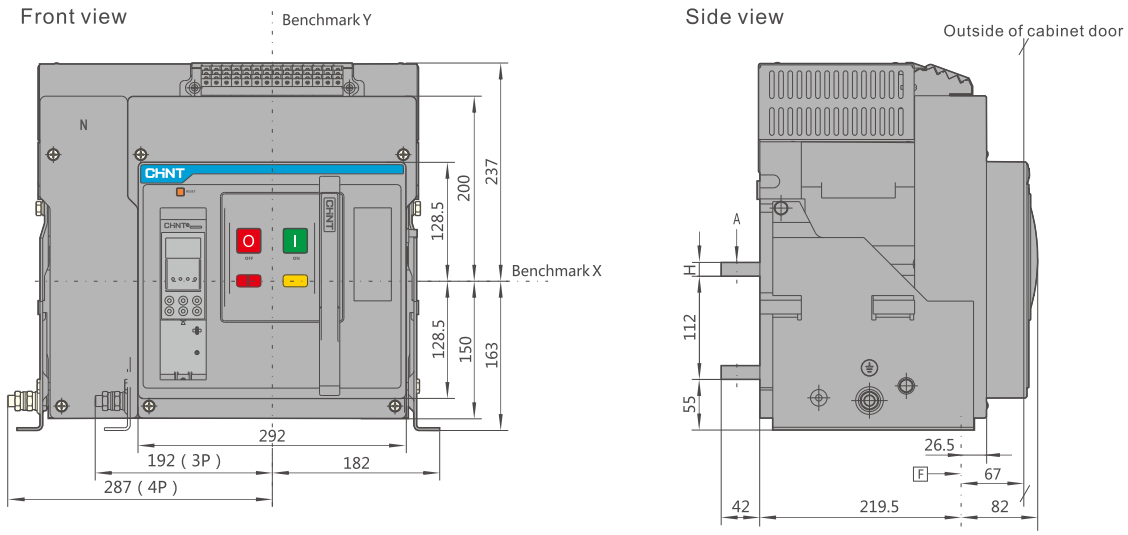



Figure 11 Product size of NXA20 fixed type

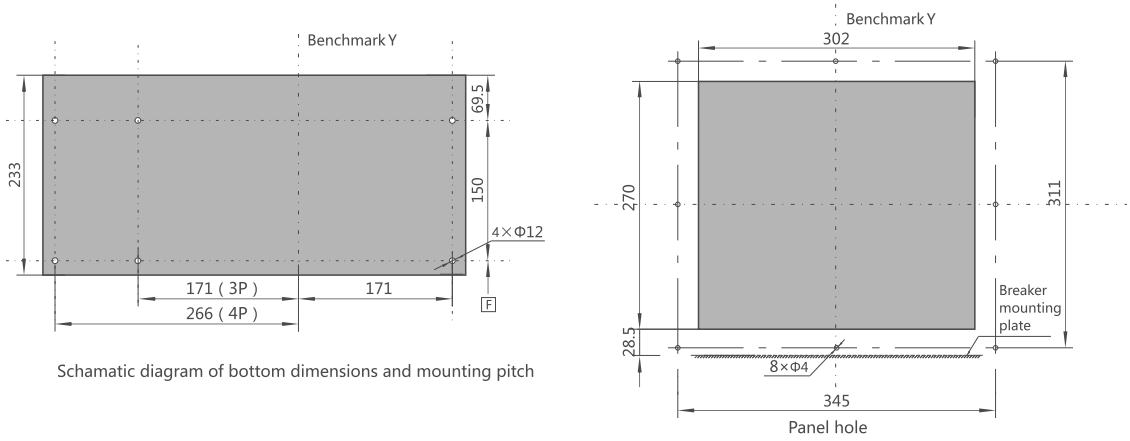



Figure 12 Installation dimensions of NXA20 fixed type

Table 23 NXA20 busbar size (fixed type)

| H | Remarks |
|---|---|
| 10 | In=630A |
| 15 | In=800A～1600A |
| 20 | In=2000A |

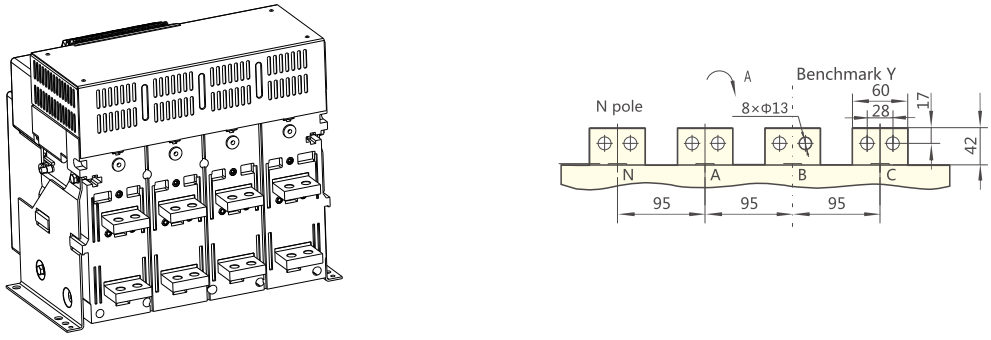



Figure 13 Installation dimensions of NXA20 fixed type (horizontally connected)

## 2000A drawer type

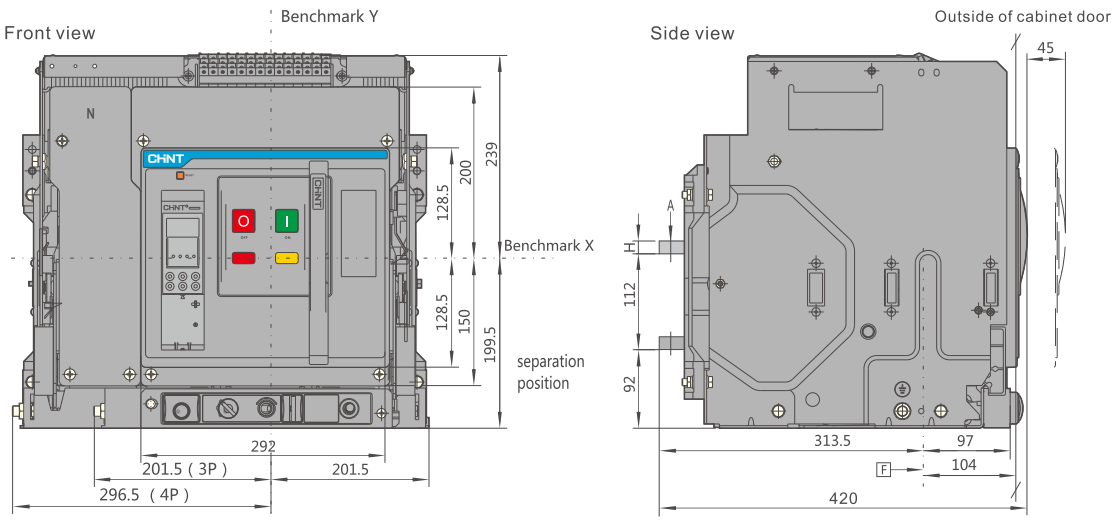



Figure 14 Product size of NXA20 drawer type

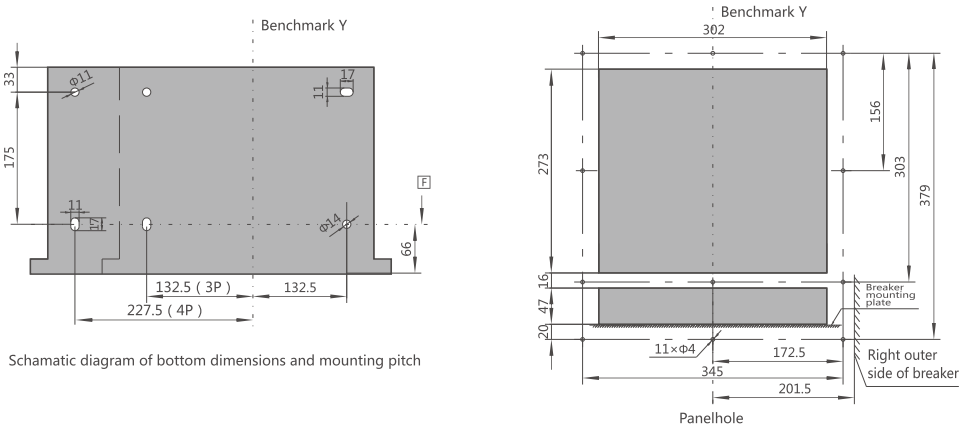



Figure 15 Installation dimensions of NXA20 drawer type

Table 24 NXA20 busbar size (drawer type)

| H | Remarks |
|---|---|
| 10 | In=630A |
| 15 | In=800A～1600A |
| 20 | In=2000A |

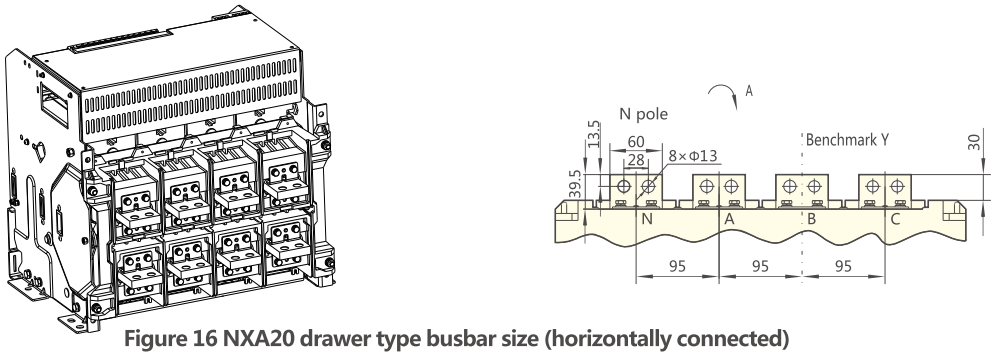



Figure 16 NXA20 drawer type busbar size (horizontally connected)

## 3200A fixed type

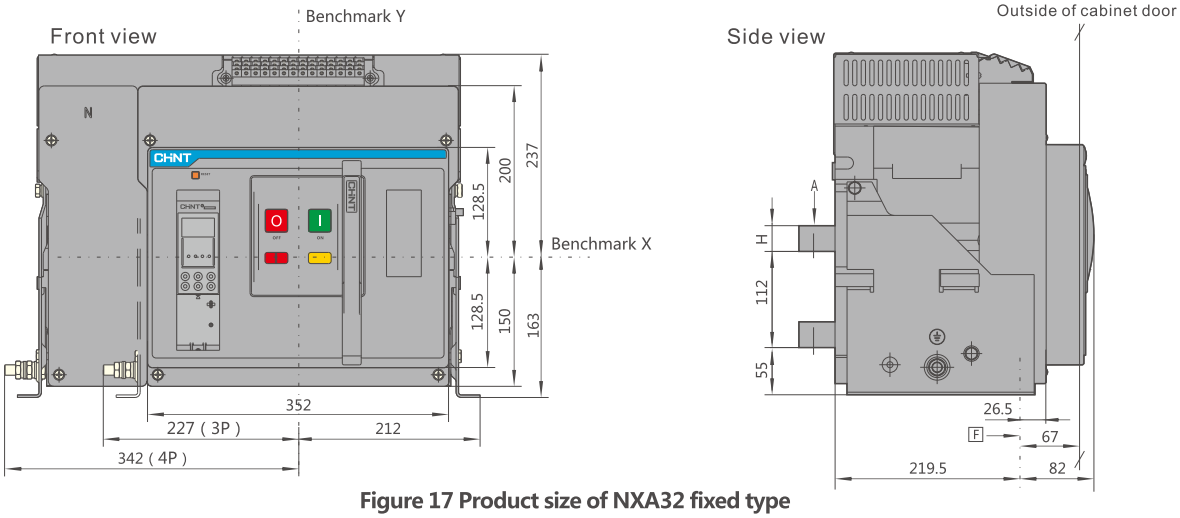



Figure 17 Product size of NXA32 fixed type

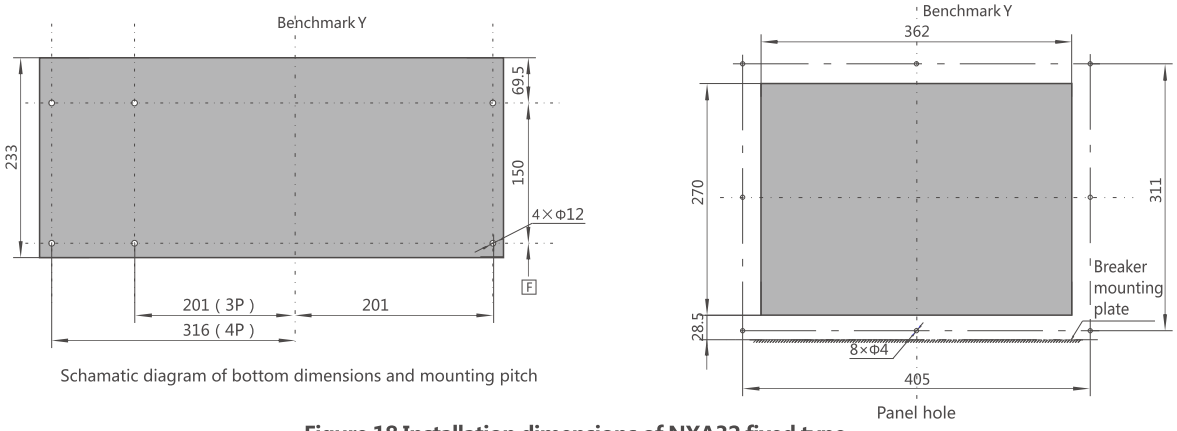



Figure 18 Installation dimensions of NXA32 fixed type

Table 25 NXA32 busbar size (fixed type)

| H | Remarks |
|---|---|
| 20 | In=1600A～2500A |
| 30 | In=3200A |

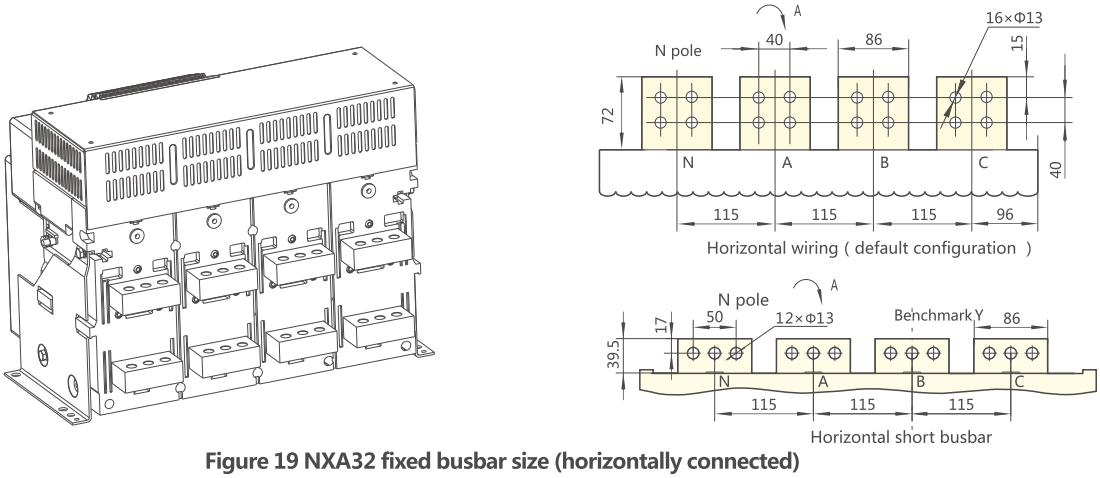
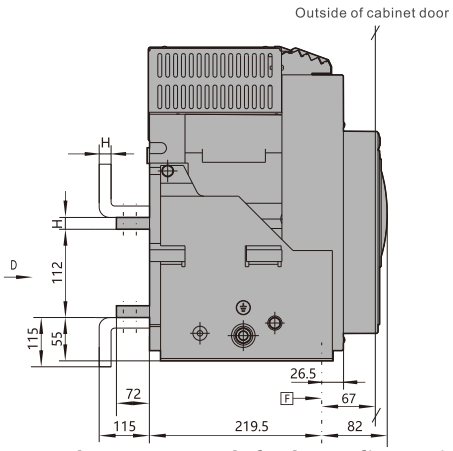
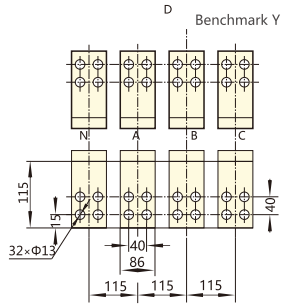



Figure 19 NXA32 fixed busbar size (horizontally connected)




L-shaped vertical wiring

| H | Remarks |
|---|---|
| 20 | In=630A～2500A |
| 30 | In=3200A |

## 3200 drawer type (default configuration)

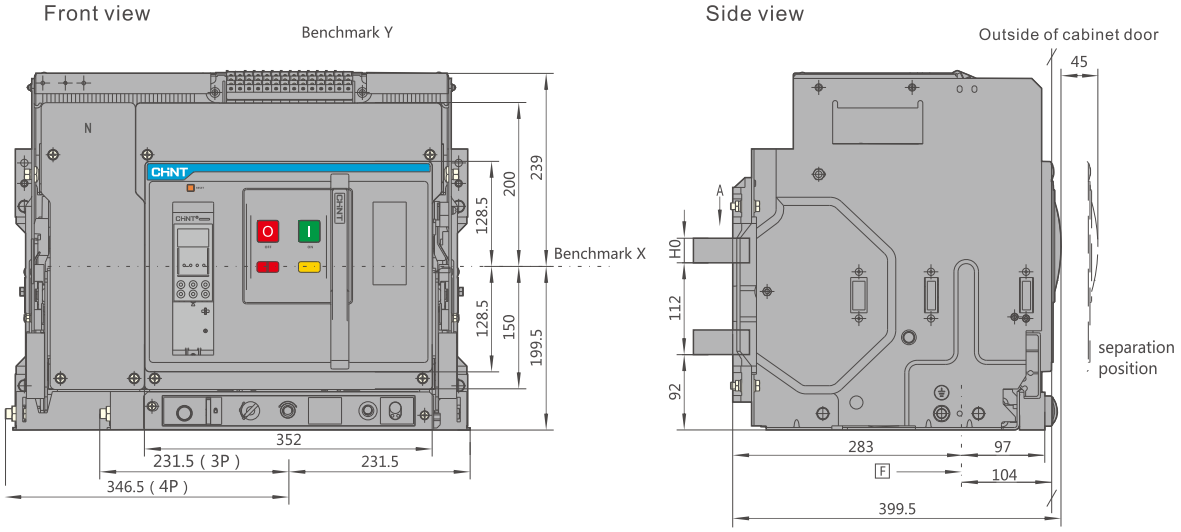



Figure 20 Product size of NXA32 drawer type (default configuration)

## 3200A drawer type (horizontal short busbar)

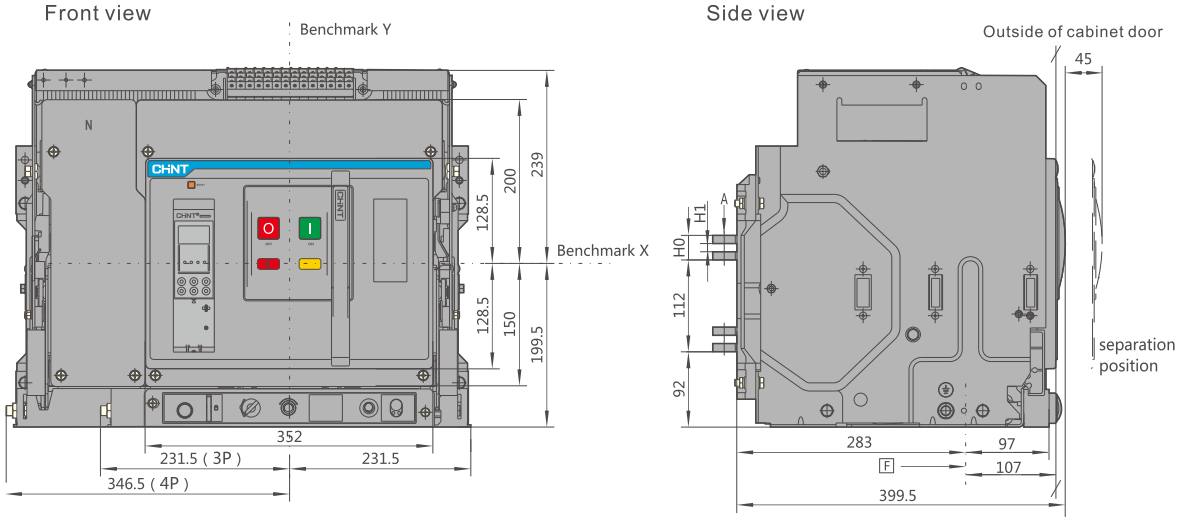



Figure 21 Product size of NXA32 drawer type (horizontal short busbar)

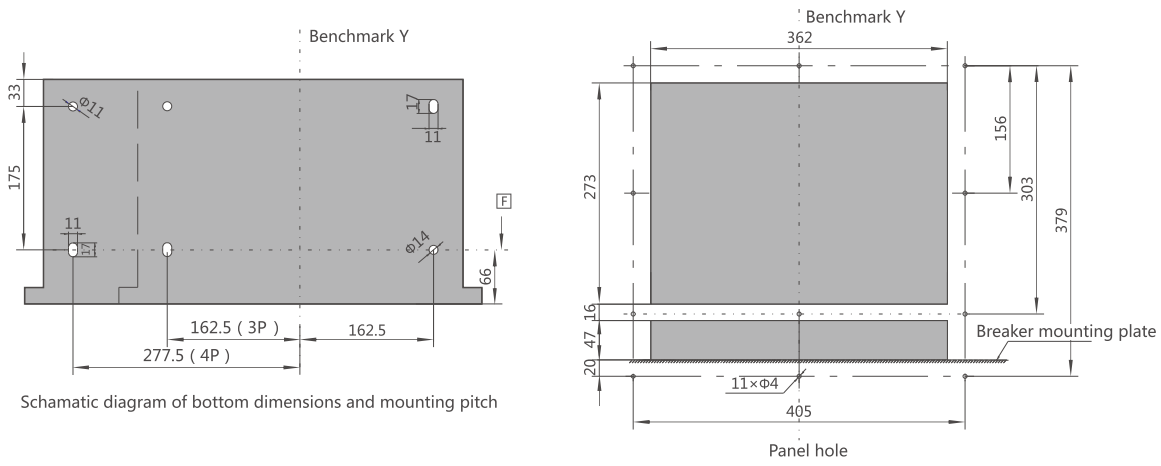



**Figure 22 Installation dimensions of NXA32 drawer type**

**Table 26 NXA32 busbar size (drawer type)**

| H0 | H1 | Remarks |
|---|---|---|
| 20 | 0 | In=1600A～2500A |
| 30 | 10 | In=3200A |

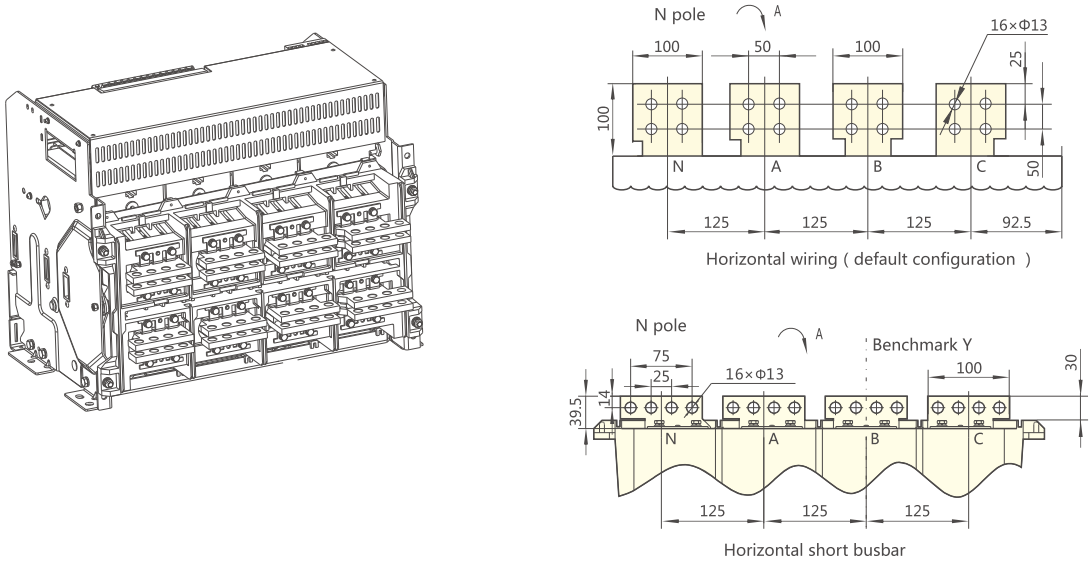



**Figure 23 NXA32 drawer type busbar size (horizontally connected)**

## 4000A fixed type

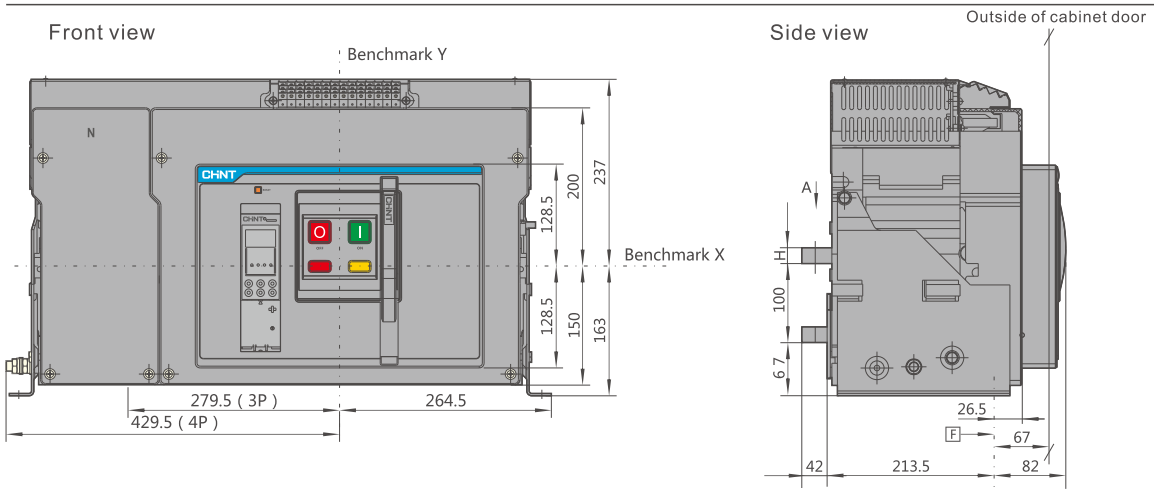



**Figure 24 Product size of NXA40 fixed type**

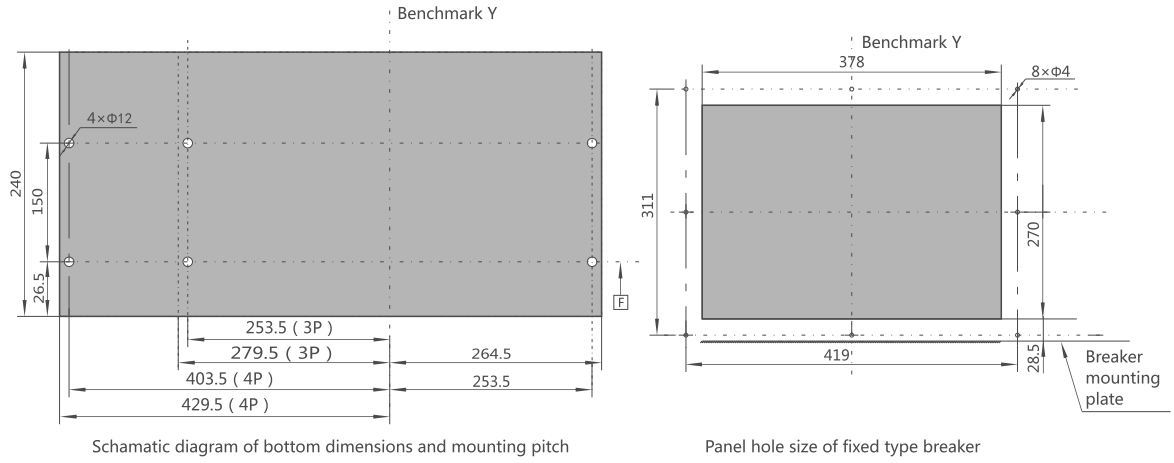



**Figure 25 Installation dimensions of NXA40 fixed type**

**Table 27 NXA40 busbar size (fixed type)**

| H | Remarks |
|---|---|
| 16 | In=3200A |
| 20 | In=3600A~4000A |

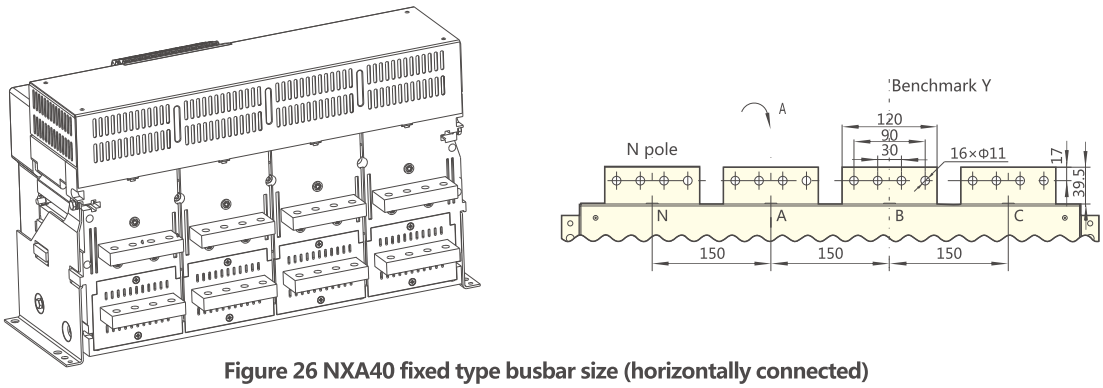



**Figure 26 NXA40 fixed type busbar size (horizontally connected)**

## 4000A drawer type

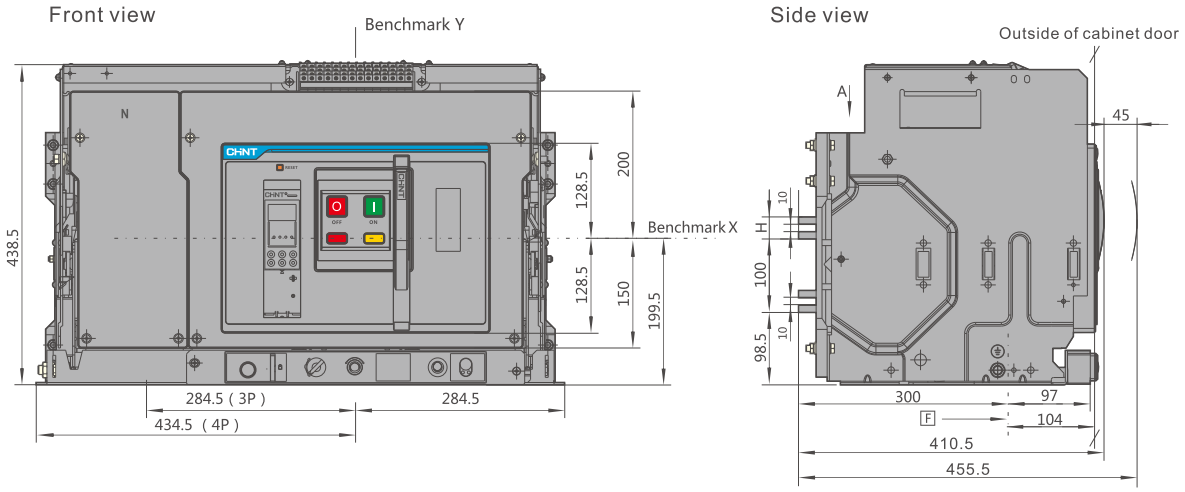
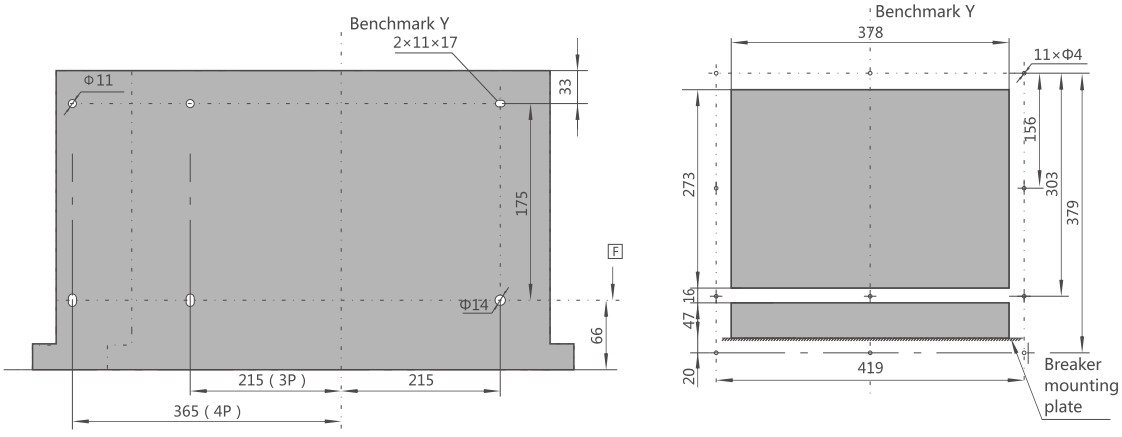



Figure 27 Product size of NXA40 drawer type




Schamatic diagram of bottom dimensions and mounting pitch

Panel hole size of drawer type breaker

Figure 28 Installation dimensions of NXA40 drawer type

Table 28 NXA40 busbar size (drawer type)

| H | Remarks |
|---|---|
| 26 | In=3200A |
| 30 | In=3600~4000A |

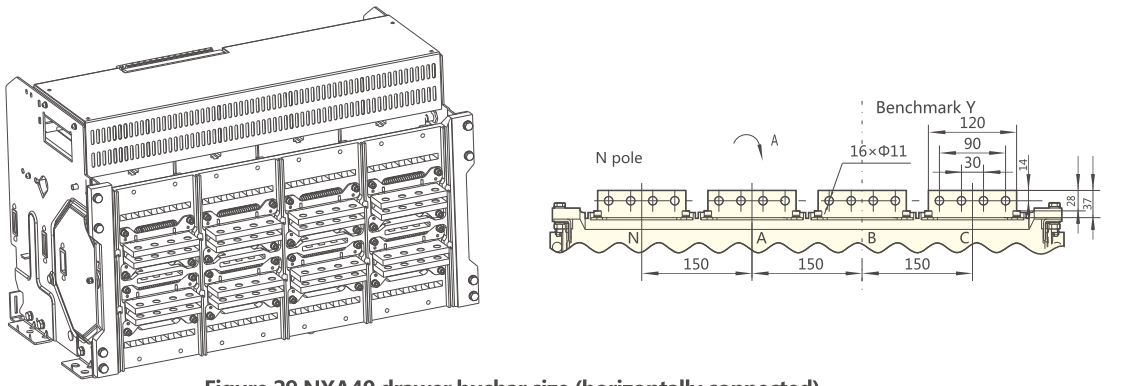



Figure 29 NXA40 drawer busbar size (horizontally connected)

## 6300 fixed type

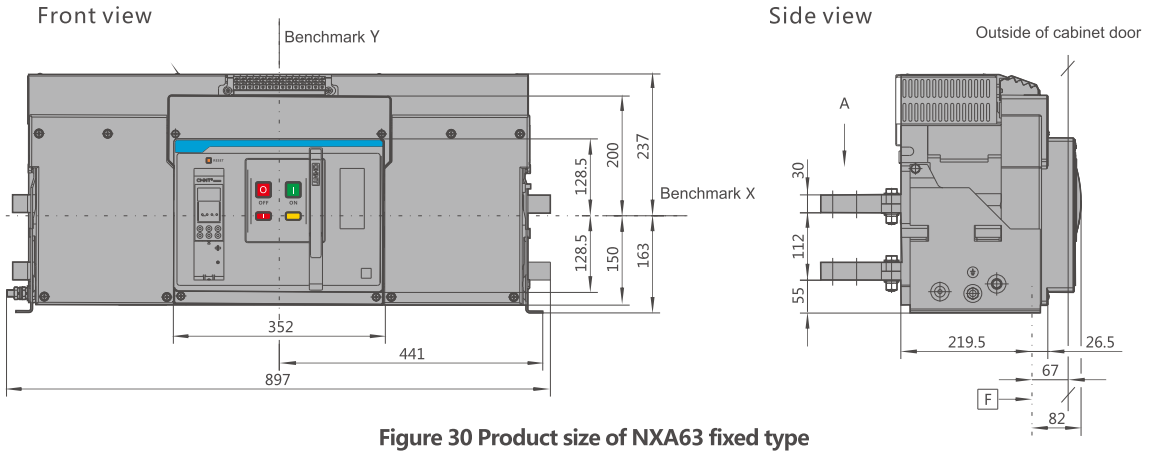



Figure 30 Product size of NXA63 fixed type

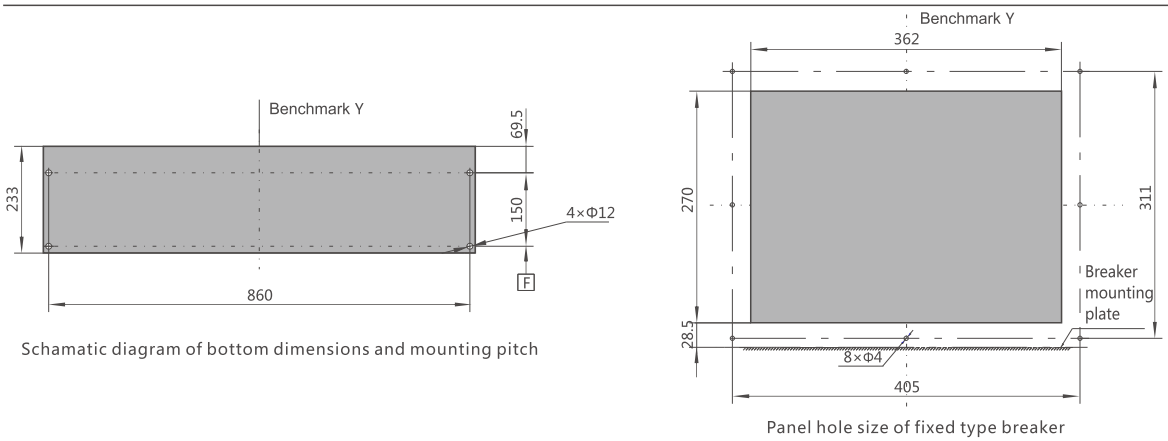



Figure 31 Installation dimensions of NXA63 fixed type

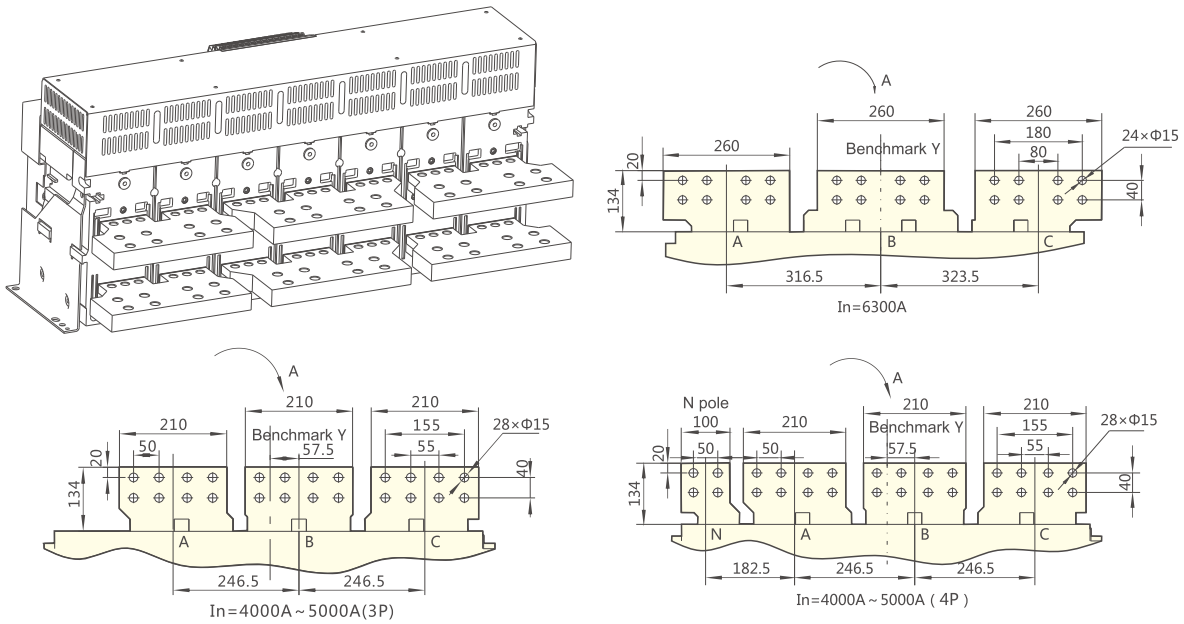



Figure 32 NXA63 fixed type busbar size (horizontally connected)

## 6300A drawer type

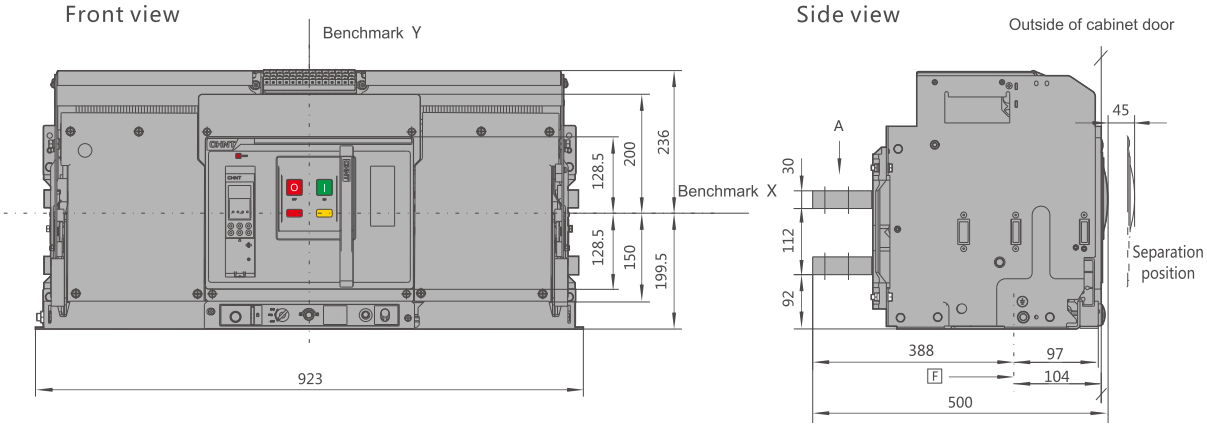



**Figure 33 Product size of NXA63 drawer type**

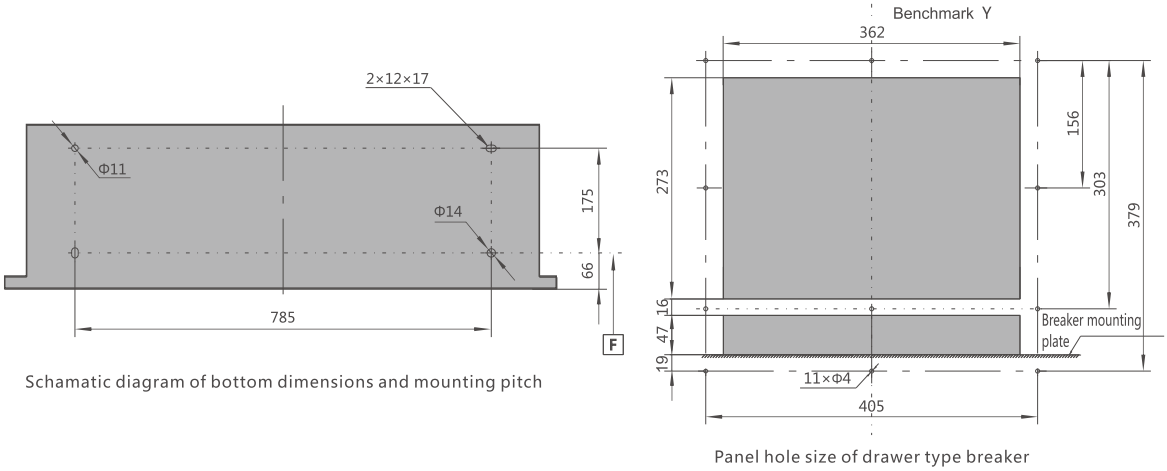



**Figure 34 Installation dimensions of NXA63 drawer type**

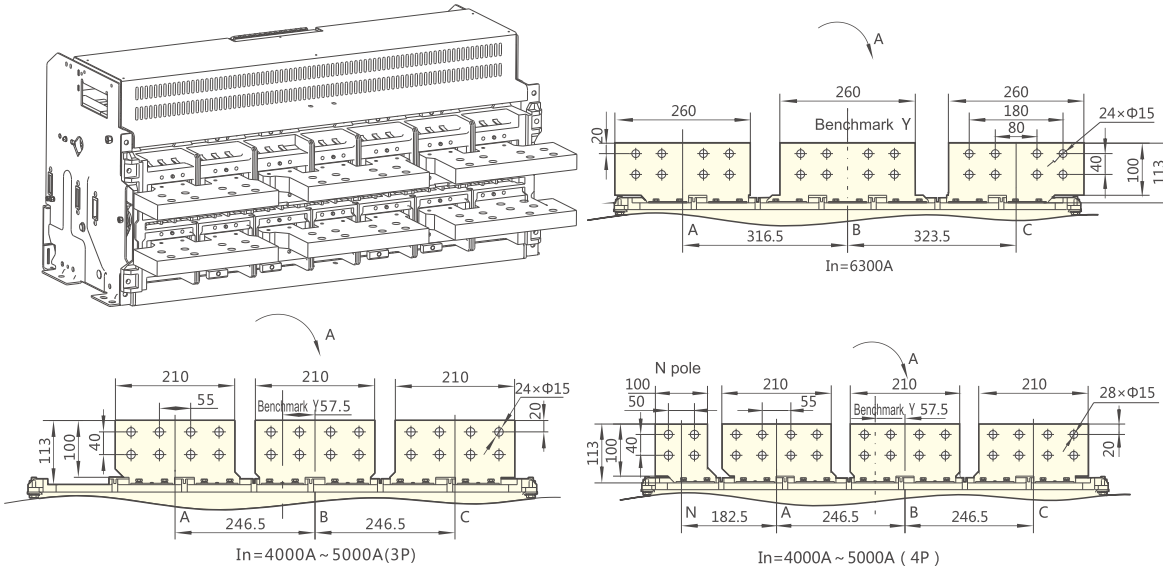



**Figure 35 NXA63 drawer busbar size (horizontally connected)**

**Table 29 Single product weight (net weight)**

| Weight (kg) / Model specification / Installation method | NXA16/NE(3/4) | | | NXA20/NE(3/4) | | | NXA32/NE(3/4) | | NXA40/NE(3/4) | | NXA63/NE(3/4) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 400 ~630 | 800~ 1250 | 1600 | 630 | 800~ 1600 | 2000 | 1600 ~2500 | 3200 | 3200 | 3600 ~4000 | 4000 ~5000 | 6300 |
| Fixed type | 18/22 | 18/22 | 20/24 | 44/53 | 45/55 | 46/55 | 57/69 | 59/72 | 53/67 | 56/71 | 127/136 | 138/- |
| Drawer type | 34/40 | 34/40 | 38/46 | 67/82 | 71/85 | 75/91 | 96/118 | 106/130 | 101/121 | 103/127 | 211/229 | 231/- |

# 7 Installation, Commissioning and Operation

## 7.1 Basic Inspection and Technical Requirements for Installation

7.1.1 Inspection items before installation

a. Check that your order matches the nameplate parameters on this breaker:

(1) Rated current, setting current;

(2) Main circuits voltage;

(3) Installation mode , operation mode;

(4) Intelligent controller voltage, shunt release voltage, under-voltage release voltage and delay time, closed electromagnet voltage, and energy storage motor voltage;

(5) Other special ordering requirements.

b. Check the packing contents according to the configuration instructions in the manual;

c. Be sure to read this manual before installation, operation, maintenance and overhaul to avoid human damage to the breaker and unnecessary trouble;

7.1.2 Preparation before installation

a. Unpack according to the unpacking order on the top cover of the packaging box. Do not use barbaric means;

b. 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 after removing the bottom plate, and clean foreign objects in the drawer seat;

c. Check the insulation resistance of the breaker with a 500V megohmmeter. When the ambient temperature is 20℃±5℃ and the relative humidity is 50%-70%, the insulation resistance should not be less than 20MΩ, otherwise the isolating switch should be dried.

7.1.3 Recommendations for Busbar Installation by User

The busbar material is red copper.

**Table 30 Recommendations for busbar installation by user**

| Frame | Rated current (A) | Ambient temperature (-45-40)℃ | | | |
|---|---|---|---|---|---|
| | | 5mm thick busbar | | 10mm thick busbar | |
| | | Number of pieces | Specif-ication | Number of pieces | Specif-ication |
| 1600A | 400 | 2 | 50*5 | 1 | 50*10 |
| | 630 | 2 | 50*5 | 1 | 50*10 |
| | 800 | 2 | 50*5 | 1 | 50*10 |
| | 1000 | 3 | 50*5 | 2 | 50*10 |
| | 1250 | 4 | 50*5 | 2 | 50*10 |
| | 1600 | 4 | 50*5 | 2 | 50*10 |
| 2000A | 630 | 2 | 50*5 | 1 | 50*10 |
| | 800 | 2 | 50*5 | 1 | 50*10 |
| | 1000 | 3 | 50*5 | 2 | 50*10 |
| | 1250 | 3 | 60*5 | 2 | 50*10 |
| | 1600 | 4 | 60*5 | 2 | 60*10 |
| | 2000 | 6 | 60*5 | 3 | 60*10 |
| 3200A | 1600 | 2 | 100*5 | 1 | 100*10 |
| | 2000 | 4 | 100*5 | 2 | 100*10 |
| | 2500 | 4 | 100*5 | 2 | 100*10 |
| | 3200 | 8 | 100*5 | 4 | 100*10 |
| 4000A | 3200 | 8 | 100*5 | 4 | 100*10 |
| | 3600 | 7 | 120*5 | 3 | 120*12 |
| | 4000 | 8 | 120*5 | 4 | 120*10 |
| 6300A | 4000 | 12 | 100*5 | 6 | 100*10 |
| | 5000 | 14 | 100*5 | 7 | 100*10 |
| | 6300 | 16 | 100*5 | 8 | 100*10 |

Note: a. When the copper bars selected by the user do not match the terminal block of the breaker, it is necessary to design and process extended bus for transfer, which should be designed by the user. The cross-sectional area of the extended bus should not be less than the requirements in the table above, and the gap between extended busbar should not be less than the gap between the terminal blocks of the breaker.

b. After the isolating switch is installed with the busbar recommended in the above table, it should be ensured that the clearance between adjacent phases of the breaker is not less than 18 mm.

c. When the breaker 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 breaker in addition to the influence of ambient temperature and altitude, the breaker must be derated with a recommended derating factor of 0.5-0.8.

d. After the user installs the busbar, the clearance between the upper and lower busbar fastening bolts must not be less than 20 mm.

e. After the breaker 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.

f. It is shown in the table that the circuit breaker is installed at the ambient temperature of +40°C, and the open installation meets the copper bar specifications specified in GB/T 14048.2 underheating conditions. If the ambient temperature is higher than +40°C, increase the number of copper bars or reduce the capacity.

g. The above data are calculated according to the test and theory, and the data are for reference only.

### 7.2 Installation of Circuit Breaker

7.2.1 Installation of Drawer Circuit Breaker

For the NXA16 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 (10.3-14.4) N · m; for the NXA20-63 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 (20-28) N · m, as shown in Figure 36 (the drawer breaker can be installed vertically with the special bracket).

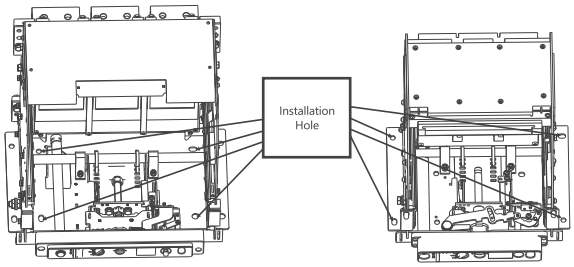



**Figure 36 Installation of drawer circuit breaker**

In the NXA16 model, the breaker body is directly placed on the drawer seat rail and pushed into the drawer seat until it cannot be pushed. In the NXA20-63 model, the rail is pulled out and the breaker body is placed on the rail as shown in the figure. Note that the two protruding brackets of the breaker should be stuck in the groove of the rail and the breaker body should be pushed inward until it cannot be pushed.

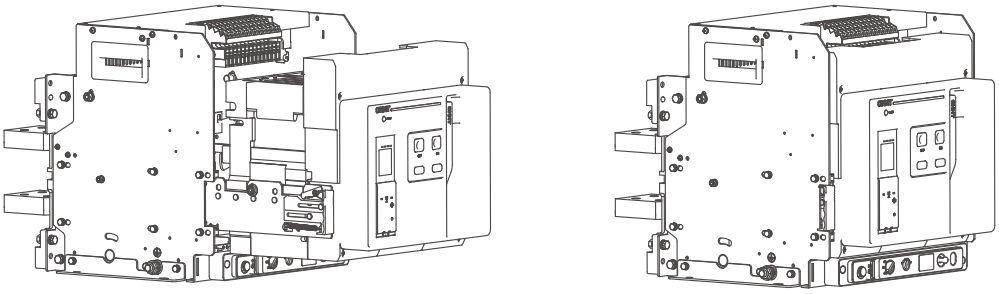


**Figure 37 Installing the body into the drawer seat**

Pull out the handle and fully insert the hex head of the handle into the handle hole of the drawer seat. Turn the handle clockwise until the position indicator reaches the "connected" position. When the secondary circuit of the NXA16 model is tightly joined without gaps or clicks are heard on both sides inside the drawer seat of the NXA20-63 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 breaker must be opened first to avoid accidents.

### 7.2.2 Installation of Fixed type Breaker

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

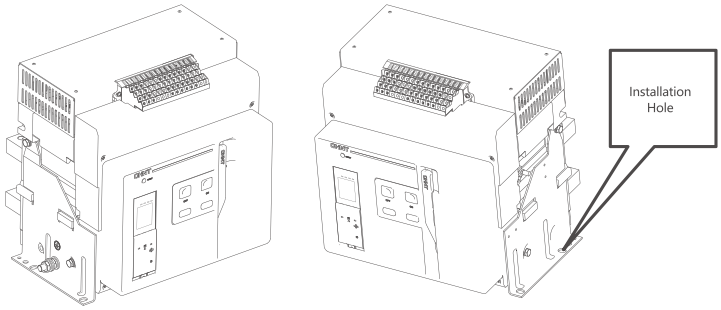



**Figure 38 Installation of fixed breaker**

Note: It is very important to evenly distribute the weight of the breaker 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 breaker.

**7.3 Connection of Main Circuit**

7.3.1 Power Supply Incoming Line

The NXA series air circuit breaker can be equipped with either upper incoming line or lower incoming line without affecting the performance of the breaker, for easy installation in the power distribution cabinet.

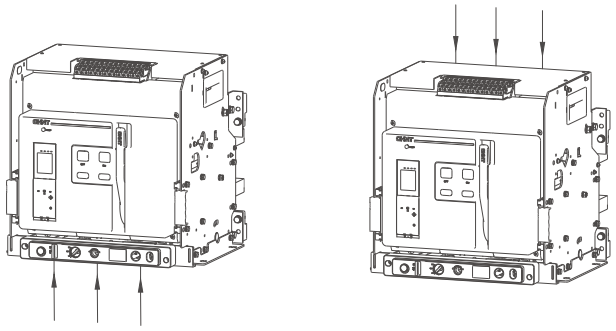


**Figure 39 Incoming mode of breaker**

7.3.2 Spacing

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

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

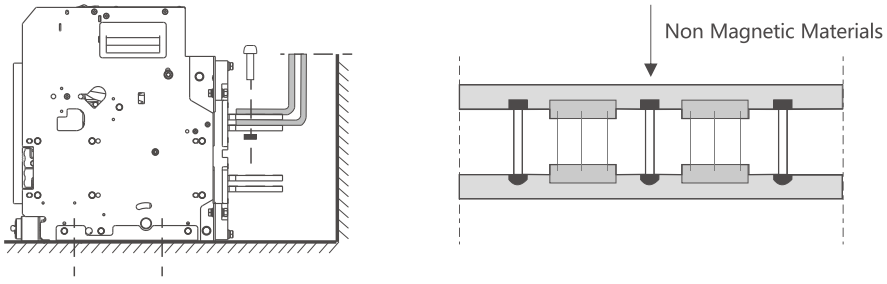



**Figure 40 The metal support or separator is non-magnetic**

7.3.3 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 breaker terminal does not have to bear its weight C (the support should be installed near the terminal).

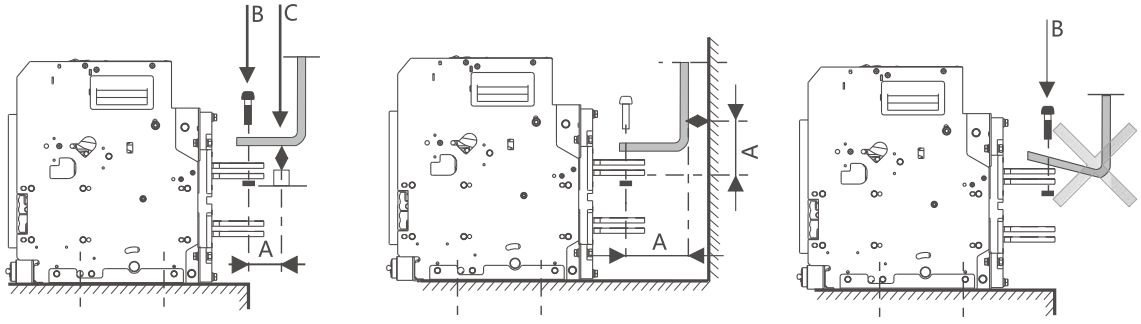



**Figure 41 Breaker busbar connection**

Dynamic stability: The first support rod should be kept within the maximum distance from the breaker connection point (see Table 31). In order to prevent phase-to-phase short-circuit faults, this distance must meet the requirements of dynamic stability.

**Table 31 Maximum distance between the support rod and the breaker connection point**

| Ics(kA) | ≤30 | 40 | 50 | 75 | 80 | ≥100 |
|---|---|---|---|---|---|---|
| distance(mm) | 350 | 320 | 300 | 200 | 150 | 150 |

7.3.4 Cable Connection

The cable connection should ensure that there is no excessive mechanical force on the breaker terminals. The user can use the power supply busbar to extend the terminal of the breaker. 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.

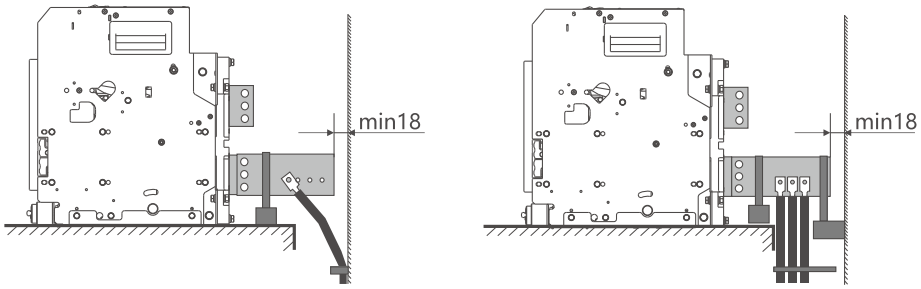
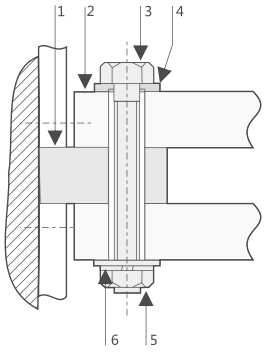



**Figure 42 Breaker cable connection**

7.3.5 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 breaker, 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.




1 Circuit Breaker Terminal
2 Busbar
3 Bolt
4 Washer
5 Nut
6 Elastic Washer

**Figure 43 Busbar fixing diagram**

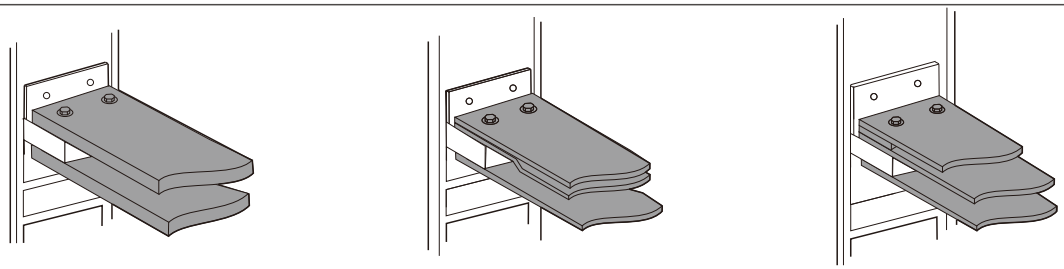


Figure 44 Recommended installation

Table 32 Bolt Configuration

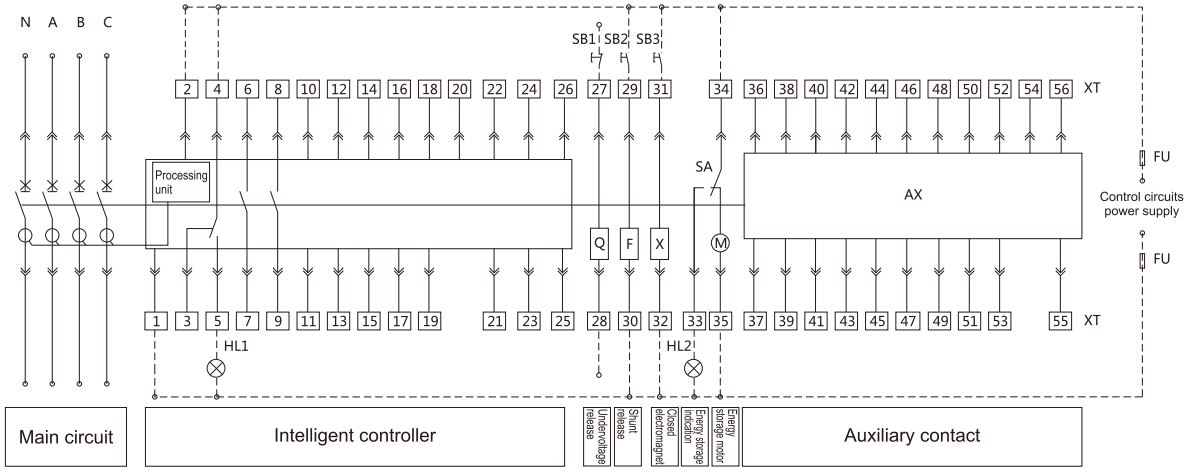
| Bolt type | Application | Preferred fixed torque |
|---|---|---|
| NXA16、NXA40:M10 | Fastening the busbar | (36~52)N·m |
| NXA20、NXA32、NXA63:M12 | Fastening the busbar | (61~94)N·m |
| NXA16~NXA63:M3 | Fastening the secondary wiring wire | (0.4~0.5)N·m |

Table 33 Busbar opening hole size and mounting torque

| Drilling Φ(mm) | Bolt diameter | Tightening torque |
|---|---|---|
| NXA16、NXA40:Φ11 | M10 | (36~52)N·m |
| NXA20、NXA32、NXA63:Φ13 | M12 | (61~94)N·m |

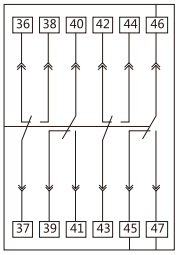
## 7.3.6 Secondary Circuit Wiring Diagram

### 1600 frame M/A control unit

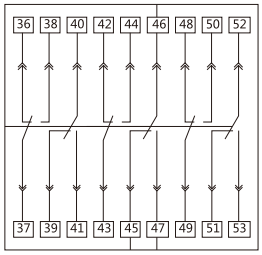



### AX auxiliary contact type

Four sets of conversion auxiliary contacts (default)




Six sets of conversion auxiliary contacts




Q -- under-voltage releases F -- shunt release X -- closed electromagnet

M -- electric operating mechanism SA -- stroke switch XT -- terminal block

AX -- auxiliary contact SB1 -- emergency stop button SB2 -- opening button

SB3 -- closing button HL1 -- fault indicator HL2 -- energy storage indicator

HL3 -- opening indicator HL4 -- closing indicator FU -- fuse (6A)

1# and 2#: Intelligent controller power supply 3#-5#: Trip alarm contact (4 is common point)

6#-9#: Auxiliary contacts (normally open contacts) 10#-11#: Empty 12#-19#: Empty 20#: Empty

21#-24#: Empty

25#-26#:The input signal terminal of external transformer, only provided for special orders requiring external transformer (N-phase);

27# and 28#: Under-voltage release (Connected to the main circuit with the same rated voltage. With external control module, according to the module wiring diagram) ; During the voltage withstand test,Under-voltage release should be disconnected first.

29# and 30#: Shunt release. 31# and 32#: Closed electromagnet.

33# and 34#: Energy storage indication; 34# and 35#: Electric operating mechanism.

36#-56#: Auxiliary contacts. The six-set conversion auxiliary contacts are only suitable AC.

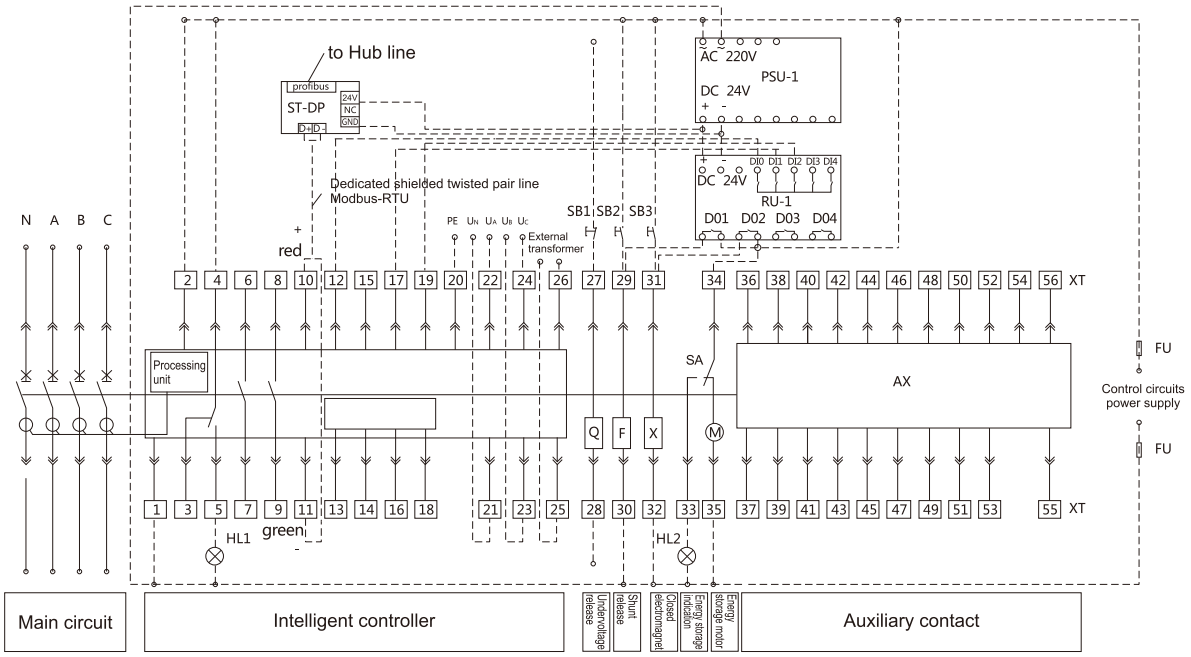
The regular products have four sets of conversion auxiliary contacts. Six sets of conversion auxiliary contacts may be provided for special orders.

Note: 1. The solid line part has been connected at the factory, and the dotted line part is to be wired by the user.

2. If 33# is required for use, please connect the indicator in series.

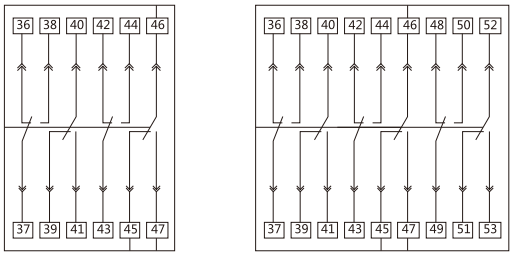
3. wiring diagram shows :the circuit no power, ACB is opening and in connection location, the operating mechanism has no power.

## 1600 frame P/H control unit




## AX auxiliary contact type

Four sets of conversion auxiliary contacts (default) Six sets of conversion auxiliary contacts




Q – under-voltage releases F -- shunt release

X -- closed electromagnet M -- electric operating mechanism

SA -- stroke switch XT -- terminal block AX -- auxiliary contact

SBI -- emergency stop button SB2 -- opening close

SB3 -- closing button HL1 -- fault indicator

HL2 -- energy storage indicator HL3 -- opening indicator

HL4 -- closing indicator FU -- fuse (6A) PSU-1 -- power unit

1# and 2#: Intelligent controller power supply

3#-5#: Trip alarm contact (4 is common point)

6#-9#: Auxiliary contacts (normally open contacts)

10#-11#: Default communication output contact of H-type intelligent controller; P-type is empty

12#-19#: 4 sets of programmable output signals, must be connected to an external RU-1 relay unit.

12#: COM, 13#: DO1, 15#: DO2, 17#: DO3, 19#: DO4

When the H-type intelligent controller comes with the programmable output signal, it has default outputs: 12# and 13#: load 1 alarm; 12# and 15#: load 2 alarm; 12# and 17#: opening signal output; 12# and 19#: closing signal output.

When the P-type intelligent controller comes with the programmable output signal, it has default outputs: 12# and 13#: load 1 alarm, 12:# and 15#: load 2 alarm, 12# and 17#: self-diagnosis alarm, 12# and 19#: fault trip, and 20#: PE line.

21#-24#: Voltage display input signal contacts.

P/H intelligent controller: 21#: N-phase voltage signal, 22#: A-phase voltage signal, 23#: B-phase voltage signal, 24#: C-phase voltage signal

25#-26#: The input signal terminal of external transformer, only provided for special orders requiring external transformer (N-phase/ground current/leakage transformer);

27# and 28#: Under-voltage release (Connected to the main circuit with the same rated voltage. With external control module, according to the module wiring diagram);

During the voltage withstand test,Under-voltage release should be disconnected first.

29# and 30#: Shunt release;

31# and 32#: Closed electromagnet; 33# and 34#: Energy storage indication;

34# and 35#: Electric operating mechanism; 36#-56#: Auxiliary contacts.

The regular products have four sets of conversion auxiliary contacts. Six sets of conversion auxiliary contacts may be provided for special orders. The six-set conversion is only suitable for AC.

ST-DP: DP protocol module. When the host machine communication protocol is Modbus-RTU, the ST-DP protocol module is not required; When the host machine communication protocol is Profibus-DP, the ST-DP protocol module is used to convert the Modbus-RTU protocol into the Profibus-DP protocol, and the cost is extra.

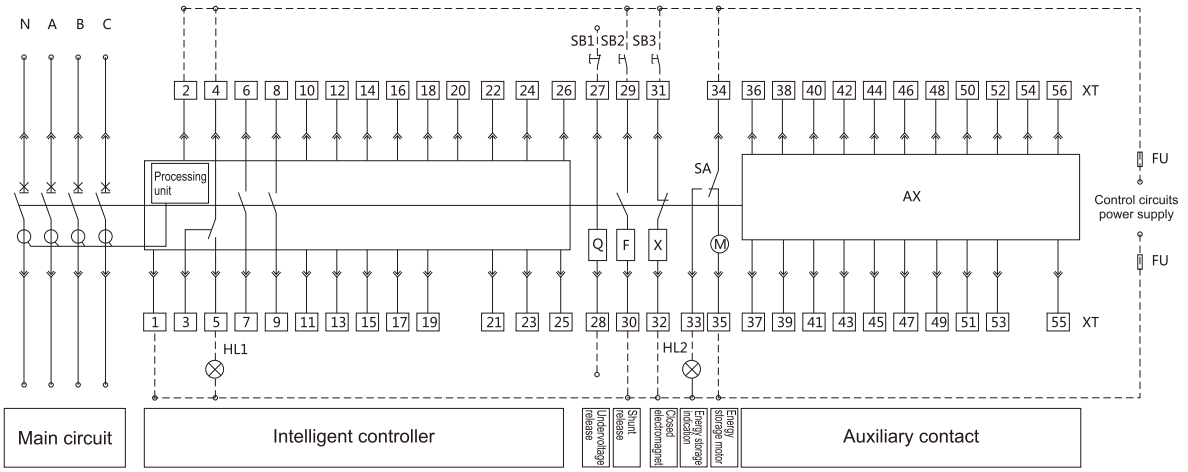
RU-1: Relay unit. The hose machine opens and closes the breaker through remote control, and is used to amplify the opening and closing signal, and the cost is extra.

Note: 1. The solid line part has been connected at the factory, and the dotted line part is to be wired by the user.

2. If 33# is required for use, please connect the indicator in series.

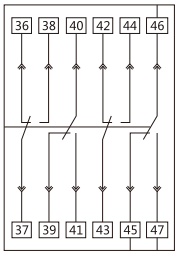
3. wiring diagram shows :the circuit circuits no power, ACB is opening and in connection location, the operating mechanism has no power.

## 2000-6300 frame M/A type control unit

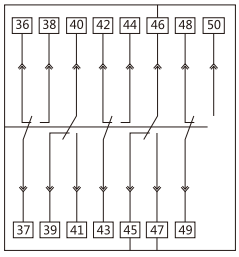



## AX auxiliary contact type

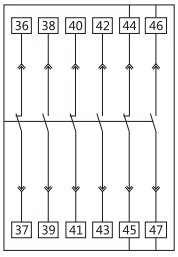
Four sets of conversion auxiliary contacts (default)



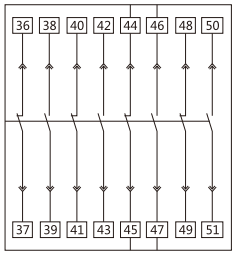

Five sets of conversion auxiliary contacts



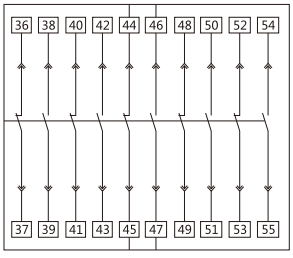

Three normally open and three normally closed contacts



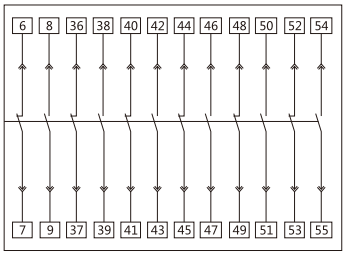

Four normally open and four normally closed contacts



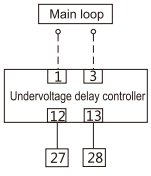

Five normally open and five normally closed contacts




Six normally open and six normally closed contacts



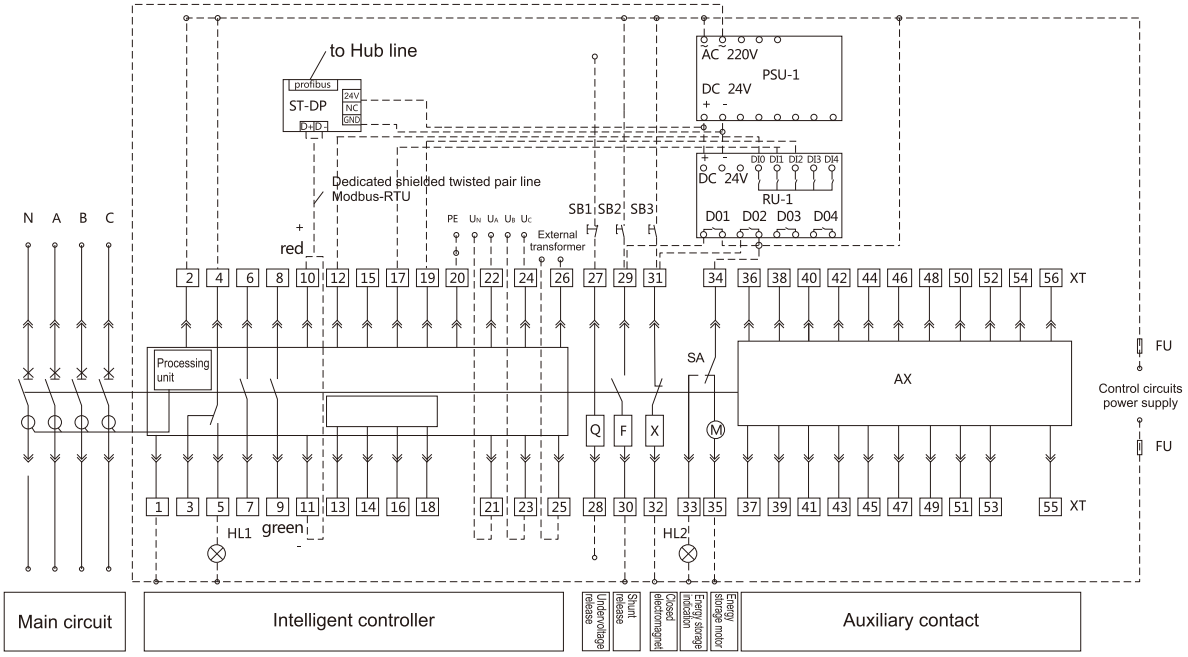

Undervoltage delay controller wiring




Q -- undervoltage releases F -- shunt release
X -- closed electromagnet M -- electric operating mechanism
SA -- stroke switch XT -- terminal block
AX -- auxiliary contact SB1 -- emergency stop button
SB2 -- opening button SB3 -- closing button
HL1 -- fault indicator HL2 -- energy storage indicator
HL3 -- opening indicator HL4 -- closing indicator
FU -- fuse (6A)
1# and 2#: Intelligent controller power supply
3#-5#: Trip alarm contact (4 is common point)
6#-9#: Auxiliary contacts (normally open contacts)
10#-11#: empty; 12#-19#: empty; 20#: empty
21 #-24#: Empty
25#-26#: The input signal terminal of external transformer, only provided for special orders requiring external transformer (N-phase);
27# and 28#: Under-voltage release (Connected to the main circuit with the same rated voltage. With external control module, according to the module wiring diagram);
During the voltage withstand test,Under-voltage release should be disconnected first.
29# and 30#: Shunt release.
31# and 32#: Closed electromagnet;
33# and 34#: Energy storage indication;
34# and 35#: Electric operating mechanism;
36#-56#: Auxiliary contacts.
The regular products have four sets of conversion auxiliary contacts.
The user may require three open and three closed auxiliary contacts, four open and four closed auxiliary contacts, five open and five closed auxiliary contacts, six open and six closed auxiliary contacts, and five sets of conversion contacts by special orders.

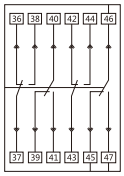
Note:
1. The solid line part has been connected at the factory, and the dotted line part is to be wired by the user.
2. When configuring the undervoltage delay release (helped priming type), please connect the control circuits to the input of the external undervoltage delay controller. At this time, the input of the controller is connected to the 27# and 28# ports of the product.
3. When the product is equipped with six open and six closed auxiliary contacts, the 6#-7# ports in the above wiring diagram are changed from normally open to normally closed and form one open and one closed auxiliary contacts with the 8#-9# ports. At this time, please use the 6#-9# ports for opening and closing indication of the control circuits.
4. wiring diagram shows :the circuit no power, ACB is opening and in connection location, the operating mechanism has no power.

## 2000-6300 frame P/H type control unit

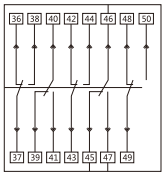



## AX auxiliary contact type

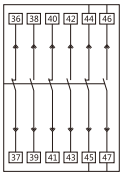
Four sets of conversion auxiliary contacts (default)



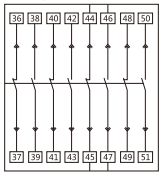

Five sets of conversion auxiliary contacts



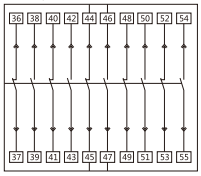

three normally open and three normally closed contacts



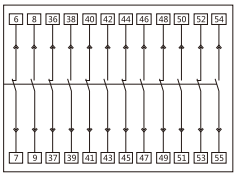

Four normally open and four normally closed contacts




Five normally open and five normally closed contacts

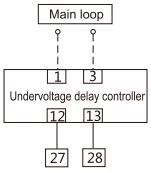



Six normally open and six normally closed contacts



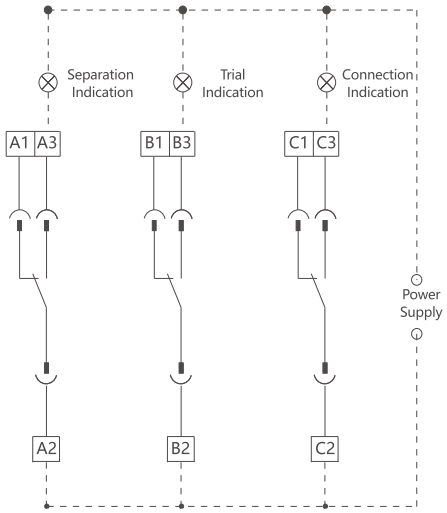

Q -- undervoltage release F -- shunt release X -- closed electromagnet
M -- electric operating mechanism SA -- stroke switch XT -- terminal block
AX -- auxiliary contact SBI -- emergency stop button
SB2 -- opening button SB3 -- closing button HL1 -- fault indicator
HL2 -- energy storage indicator HL3 -- opening indicator
HL4 -- closing indicator FU -- fuse (6A) PSU-1 -- power module
1# and 2#: intelligent controller power supply; 3#-5#: Trip alarm contact (4 is common point)
6#-9#: auxiliary contacts (normally open contacts); 10#-11#: default communication ouput contact of H-type intelligent controller, P-type being empty; 12#-19#: four sets of programmable output signals, must be connected to an external RU-1 relay unit; 12#: COM, 13#: DO1, 15#: DO2, 17#: DO3, 19#: DO4
Default output when the H-type intelligent controller has programmable output signals:
12# and 13#: load 1 alarm; 12# and 15#: load 2 alarm;
12# and 17#: opening signal output; 12# and 19#: closing signal ouput.

Undervoltage delay controller wiring




When the P-type intelligent controller comes with the programmable output signal, it has default outputs:
12# and 13#: load 1 alarm; 12# and 15#: load 2 alarm;
12# and 17#: self-diagnosis alarm; 12# and 19#: fault trip; and 20#: PE line.
21#-24#: Voltage display input signal contacts.
P/H intelligent controller: 21#: N-phase voltage signal, 22#: A-phase voltage signal,23#: B-phase voltage signal, 24#: C-phase voltage signal
25#-26#:The input signal terminal of external transformer, only provided for special orders requiring external transformer (N-phase/ground current/leakage transformer);
27# and 28#: Under-voltage release (Connected to the main circuit with the same rated voltage. With external control module, according to the module wiring diagram); During the voltage withstand test,Under-voltage release should be disconnected first.
29# and 30#: Shunt release; 31# and 32#: closed electromagnet;
33# and 34#: Energy storage indication; 34# and 35#: Electric operating mechanism;
36#-56#: Auxiliary contacts.
The regular products have four sets of conversion auxiliary contacts. The user may require three open and three closed auxiliary contacts, four open and four closed auxiliary contacts, five open and five closed auxiliary contacts, six open and six closed auxiliary contacts, and five sets of conversion contacts by special orders.
ST-DP: DP protocol module. When the host machine communication protocol is Modbus-RTU, the ST-DP protocol module is not required; When the host machine communication protocol is Profibus-DP, the ST-DP protocol module is used to convert the Modbus-RTU protocol into the Profibus-DP protocol, and the cost is extra.
RU-1: Relay unit. The hose machine opens and closes the breaker through remote control, and is used to amplify the opening and closing signal, and the cost is extra.
Note: 1. The solid line part has been connected at the factory, and the dotted line part is to be wired by the user.
2. When configuring the undervoltage delay release (helped priming type), please connect the control circuits to the input of the external undervoltage delay controller. At this time, the input of the controller is connected to the 27# and 28# ports of the product.
3. When the product is equipped with six open and six closed auxiliary contacts, the 6#-7# ports in the wiring diagram above are changed from normally open to normally closed and form one open and one closed auxiliary contacts with the 8#-9# ports. At this time, please use the 6#-9# ports for opening and closing indication of the control circuits.
4. If 33# is required for use, please connect the indicator in series.
5. wiring diagram shows :the circuit no power, ACB is opening and in connection location, the operating mechanism has no power.

7.3.7 Wiring Diagram of Position Signal Indication Device (PSID)




**7.4 Use of Circuit Breaker**

7.4.1 Operation of Drawer Circuit Breaker

7.4.1.1 Breaker Body Insertion Operation

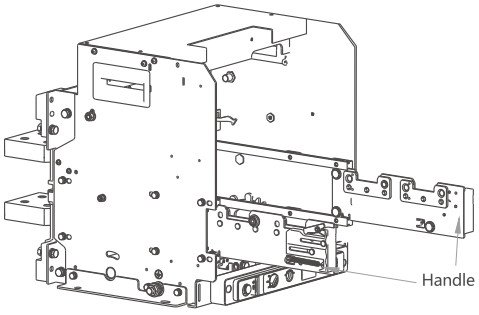



**Fig45 Pulling Out the DIN**

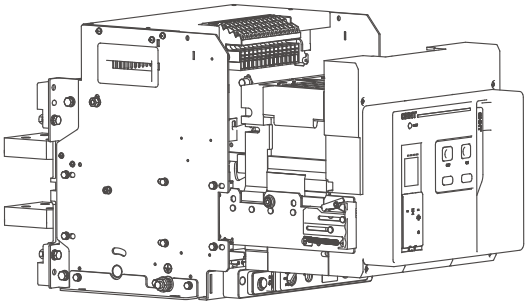


**Fig46 Putting the Circuit Breaker Into the Drawer Seat**

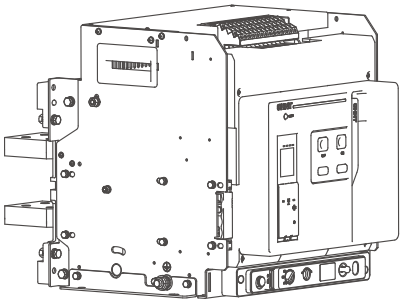


**Fig47 Pushing the Circuit Breaker In It**

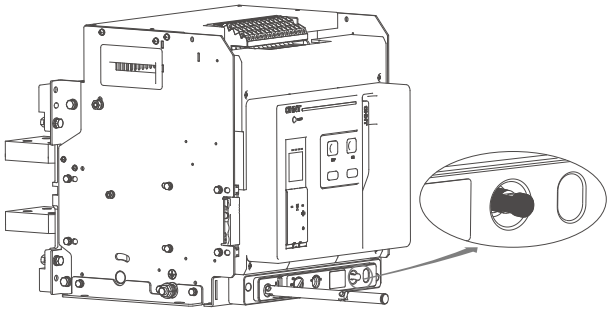
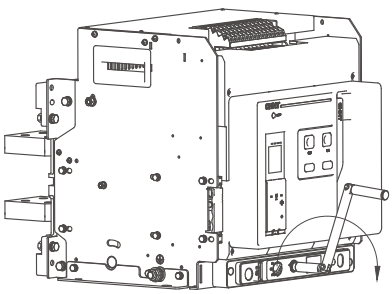


**Fig48Preparation for Rocking In (Rocker and Unlock)**



TIP: If the button DOES NOT0 pop up, the handle can be shaken in and out.

WARMING: If the button pops up, the handle CANNOT be shaken in or out; Please press the button before operation.



By shaking the handle clockwise, the Circuit Breaker is pushed inward. By shaking the handle counterclockwise, the Circuit Breaker is exited outward.

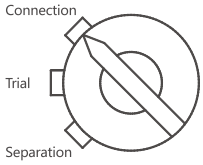
During the process of shaking in and out of the handle, when the position indicator indicates the "Separation", "Trial" and "Connection" positions, the Circuit Breaker will automatically lock, and the "Unlock" button will pop up. Only after pressing the button down, the handle can continue to be shaken in and out.

**Fig49 Operation of Rocking In (Three-position Unlock)**

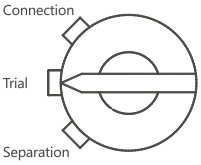
Note: 1. When operating the breaker, be sure to close the power distribution cabinet door to prevent accidents;
2. When cranking inward from the "test" position to the "connected" position, the breaker must be opened first to avoid accidents.

7.4.1.2 Drawer Seat Position Indication

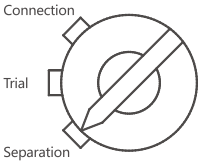
a. "Connection" Position: Both the main circuit and secondary circuit are connected;
b. "Trial" Position: The main circuit is disconnected and has a reliable isolation distance. Only the secondary circuit is connected, and necessary action tests can be carried out;
c. "Separation" Position: Both the main circuit and secondary circuit are disconnected, and the Circuit Breaker can be removed at this time.




50-a. "Connection" Position




50-b. "Trial" Position




50-c. "Separation" Position

**Fig50 Schematic Diagram of Drawer Seat Position Indication**

7.4.1.2 Breaker Body Pull out Operation

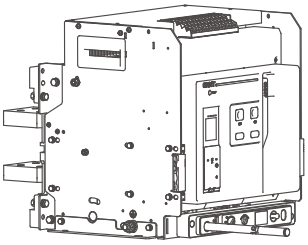


**Fig51 Preparation for Rocking Out (Rocker and Unlocking)**

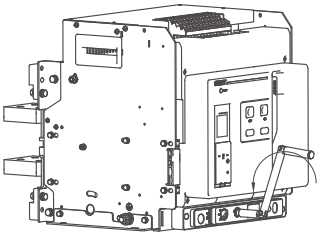


**Fig52 Operation of Rocking Out (Three-position Unlock)**

Note: 1. When operating the breaker, 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 breaker must be opened first to avoid accidents.

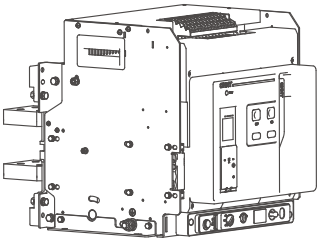


**Fig53 Drawing Out the Circuit Breaker**

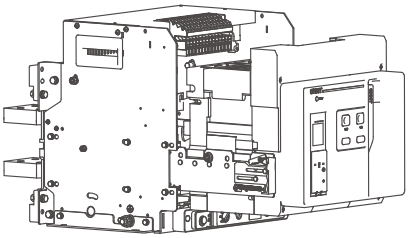


**Fig54 Putting the Circuit Breaker Out of the Drawer Seat**

7.4.2 Energy Storage Operation

7.4.2.1 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 Figure55.

7.4.2.2 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).

7.4.3 Opening and Closing Operations

7.4.3.1 Manual Opening and Closing Operations

a. Closing: When the breaker is storing energy and in the off state, press the green"**I**"button and the breaker closes, and the "opening/closing"indictor switches from"**o**"to "**I**", and the "energy storage/relese"indicator switches from"energy storage" to"energy release"tate.

b. Opening: When the breaker is in the closed state, press the red "o"button and the breaker opens , and the "opening/closing"indicator switches from "I"to "o",as shown in Figure 56.

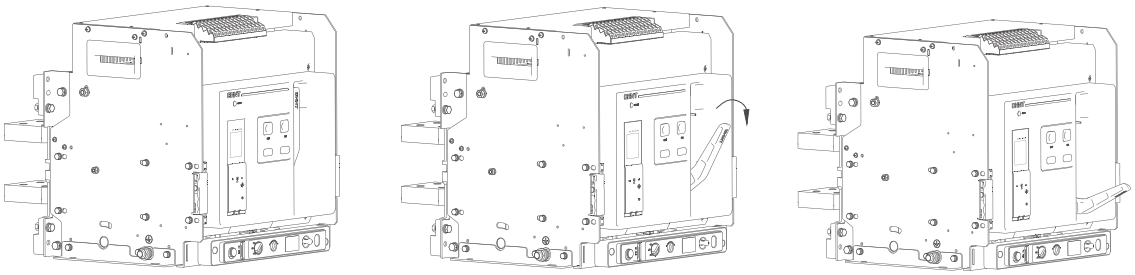
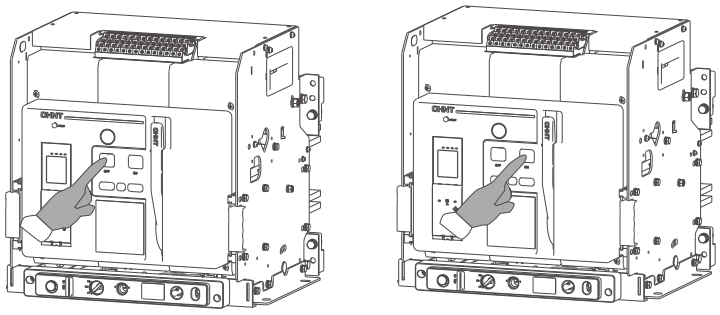


**Fig55 Energy Storage by Manual**



Opening Closing

**Fig39 Closing/Opening by Manual**

Note: When operating the isolating switch, be sure to close the power distribution cabinet door to prevent accidents.
When the product is equipped with an undervoltage release, it cannot be closed until the undervoltage release is energized.

7.4.3.2 Electric Opening and Closing Operations

a. Closing: When the breaker 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 breaker.

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

## 7.5 Selective protection between NM8 and NXA

### Table 34 Selective protection between NM8 and NXA

| Selective protection between NM8 and NXA | | | Upstream | Frame size rated current | NXA16 | | | | | | NXA20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Downstream | | | | Rated current ( A ) | 400 | 630 | 800 | 1000 | 1250 | 1600 | 630 | 800 |
| | | | | Default setting ratings of short time-delay 8In ( kA ) | 3.2 | 5.04 | 6.4 | 8 | 10 | 12.8 | 5.04 | 6.4 |
| | | | | Setting ratings ( kA ) | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | | | | Delayed tripping time (s) | 0.1 , 0.2 , 0.3 , 0.4 | | | | | | | |
| | | | | Returnable time | 0.05 , 0.14 , 0.25 , 0.33 | | | | | | | |
| Frame size rated current | Rated current ( A ) | Instantaneous setting ratings ( kA ) | | | | | | | | | | |
| NM8-100 NM8S-100 | 16 | 0.16 | | | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | | 0.19 ( Motor ) | | | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | 20 | 0.2 | | | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | | 0.24 ( Motor ) | | | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | 25 | 0.25 | | | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | | 0.30 ( Motor ) | | | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | 32 | 0.32 | | | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | | 0.38 ( Motor ) | | | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | 40 | 0.4 | | | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | | 0.48 ( Motor ) | | | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | 50 | 0.5 | | | 0.8～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | | 0.60 ( Motor ) | | | 0.828～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | 63 | 0.63 | | | 0.869～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | | 0.75 ( Motor ) | | | 1.035～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | 80 | 0.8 | | | 1.104～4 | 1.26～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.26～6.3 | 1.6～8 |
| | | 0.96 ( Motor ) | | | 1.325～4 | 1.324～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.324～6.3 | 1.6～8 |
| | 100 | 1 | | | 1.380～4 | 1.380～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.380～6.3 | 1.6～8 |
| | | 1.20 ( Motor ) | | | 1.656～4 | 1.656～6.3 | 1.656～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.656～6.3 | 1.656～8 |
| NM8-250 NM8S-250 | 100 | 1 | | | 1.380～4 | 1.380～6.3 | 1.6～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.380～6.3 | 1.6～8 |
| | | 1.20 ( Motor ) | | | 1.656～4 | 1.656～6.3 | 1.656～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.656～6.3 | 1.656～8 |
| | 125 | 1.25 | | | 1.725～4 | 1.725～6.3 | 1.725～8 | 2～10 | 2.5～12.5 | 3.2～16 | 1.725～6.3 | 1.725～8 |
| | | 1.5 ( Motor ) | | | 2.070～4 | 2.070～6.3 | 2.070～8 | 2.070～10 | 2.5～12.5 | 3.2～16 | 2.070～6.3 | 2.070～8 |
| | 160 | 1.6 | | | 2.208～4 | 2.208～6.3 | 2.208～8 | 2.208～10 | 2.5～12.5 | 3.2～16 | 2.208～6.3 | 2.208～8 |
| | | 1.92 ( Motor ) | | | 2.650～4 | 2.649～6.3 | 2.649～8 | 2.649～10 | 2.649～12.5 | 3.2～16 | 2.649～6.3 | 2.649～8 |
| | 180 | 1.8 | | | 2.484～4 | 2.484～6.3 | 2.484～8 | 2.484～10 | 2.500～12.5 | 3.2～16 | 2.484～6.3 | 2.484～8 |
| | | 2.16 ( Motor ) | | | 2.981～4 | 2.980～6.3 | 2.980～8 | 2.980～10 | 2.980～12.5 | 3.2～16 | 2.980～6.3 | 2.980～8 |
| | 200 | 2 | | | 2.760～4 | 2.760～6.3 | 2.760～8 | 2.760～10 | 2.760～12.5 | 3.2～16 | 2.760～6.3 | 2.760～8 |
| | | 2.4 ( Motor ) | | | 3.312～4 | 3.312～6.3 | 3.312～8 | 3.312～10 | 3.312～12.5 | 3.312 ～16 | 3.312～6.3 | 3.312～8 |
| | 225 | 2.25 | | | 3.105～4 | 3.105～6.3 | 3.105～8 | 3.105～10 | 3.105～12.5 | 3.200～16 | 3.105～6.3 | 3.105～8 |
| | | 2.7 ( Motor ) | | | 3.726～4 | 3.726～6.3 | 3.726～8 | 3.726～10 | 3.726～12.5 | 3.720～16 | 3.726～6.3 | 3.726～8 |
| | 250 | 2.5 | | | 3.450～4 | 3.450～6.3 | 3.450～8 | 3.450～10 | 3.450～12.5 | 3.450～16 | 3.450～6.3 | 3.450～8 |
| | | 3.0 ( Motor ) | | | / | 4.140～6.3 | 4.140～8 | 4.140～10 | 4.140～12.5 | 4.140～16 | 4.140～6.3 | 4.140～8 |
| NM8-630 NM8S-630 | 250 | 2.5 | | | 3.450～4 | 3.450～6.3 | 3.450～8 | 3.450～10 | 3.450～12.5 | 3.450～16 | 3.450～6.3 | 3.450～8 |
| | | 3.0 ( Motor ) | | | / | 4.140～6.3 | 4.140～8 | 4.140～10 | 4.140～12.5 | 4.140～16 | 4.140～6.3 | 4.140～8 |
| | 315 | 3.15 | | | / | 4.347～6.3 | 4.347～8 | 4.347～10 | 4.347～12.5 | 4.347～16 | 4.347～6.3 | 4.347～8 |
| | | 3.78 ( Motor ) | | | / | 5.216～6.3 | 5.216～8 | 5.216～10 | 5.216～12.5 | 5.216～16 | 5.216～6.3 | 5.216～8 |
| | 350 | 3.5 | | | / | 4.830～6.3 | 4.830～8 | 4.830～10 | 4.830～12.5 | 4.830～16 | 4.830～6.3 | 4.830～8 |
| | | 4.2 ( Motor ) | | | / | 5.796～6.3 | 5.796～8 | 5.796～10 | 5.796～12.5 | 5.796～16 | 5.796～6.3 | 5.796～8 |
| | 400 | 4 | | | / | 5.520～6.3 | 5.520～8 | 5.520～10 | 5.520～12.5 | 5.520～16 | 5.520～6.3 | 5.520～8 |
| | | 4.8 ( Motor ) | | | / | / | 6.624～8 | 6.624～10 | 6.624～12.5 | 6.624～16 | / | 6.624～8 |
| | 500 | 5 | | | / | / | 6.900～8 | 6.900～10 | 6.900～12.5 | 6.900～16 | / | 6.900～8 |
| | | 6.0 ( Motor ) | | | / | / | / | 8.280～10 | 8.280～12.5 | 8.280～16 | / | / |
| NM8-1250 NM8S-1250 | 630 | 6.3 | | | / | / | / | 8.694～10 | 8.694～12.5 | 8.694～16 | / | / |
| | | 7.56 ( Motor ) | | | / | / | / | / | 10.43～12.5 | 10.43～16 | / | / |
| | 700 | 7 | | | / | / | / | 9.660～10 | 9.660～12.5 | 9.660～16 | / | / |
| | | 8.4 ( Motor ) | | | / | / | / | / | 11.59～12.5 | 11.59～16 | / | / |
| | 800 | 8 | | | / | / | / | / | 11.04～12.5 | 11.04～16 | / | / |
| | | 9.6 ( Motor ) | | | / | / | / | / | / | 13.24～16 | / | / |
| | 1000 | 10 | | | / | / | / | / | / | 13.80～16 | / | / |
| | | 12 ( Motor ) | | | / | / | / | / | / | / | / | / |
| | 1250 | 12.5 | | | / | / | / | / | / | / | / | / |
| | | 15.0 ( Motor ) | | | / | / | / | / | / | / | / | / |

| | NXA20 | | | | NXA32 | | | | NXA40 | | | NXA63 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1000 | 1250 | 1600 | 2000 | 1600 | 2000 | 2500 | 3200 | 3200 | 3600 | 4000 | 4000 | 5000 | 6300 |
| | 8 | 10 | 12.8 | 16 | 12.8 | 16 | 20 | 25.6 | 25.6 | 28.8 | 32 | 32 | 40 | 50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2.070~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2.208~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2.649~10 | 2.649~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2.484~10 | 2.5~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2.980~10 | 2.980~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 2.760~10 | 2.760~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 3.312~10 | 3.312~12.5 | 3.312~16 | 4~20 | 3.312~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 3.105~10 | 3.105~12.5 | 3.2~16 | 4~20 | 3.2~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 3.726~10 | 3.726~12.5 | 3.726~16 | 4~20 | 3.726~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 3.450~10 | 3.450~12.5 | 3.450~16 | 4~20 | 3.450~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 4.140~10 | 4.140~12.5 | 4.140~16 | 4.140~20 | 4.140~16 | 4.140~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 3.450~10 | 3.450~12.5 | 3.450~16 | 4~20 | 3.450~16 | 4~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 4.140~10 | 4.140~12.5 | 4.140~16 | 4.140~20 | 4.140~16 | 4.140~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 4.347~10 | 4.347~12.5 | 4.347~16 | 4.347~20 | 4.347~16 | 4.347~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 5.216~10 | 5.216~12.5 | 5.216~16 | 5.216~20 | 5.216~16 | 5.216~20 | 5.216~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 4.830~10 | 4.830~12.5 | 4.830~16 | 4.830~20 | 4.830~16 | 4.830~20 | 5~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 5.796~10 | 5.796~12.5 | 5.796~16 | 5.796~20 | 5.796~16 | 5.796~20 | 5.796~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 5.520~10 | 5.520~12.5 | 5.520~16 | 5.520~20 | 5.520~16 | 5.520~20 | 5.520~25 | 6.4~32 | 6.4~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 6.624~10 | 6.624~12.5 | 6.624~16 | 6.624~20 | 6.624~16 | 6.624~20 | 6.624~25 | 6.624~32 | 6.624~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 6.900~10 | 6.900~12.5 | 6.900~16 | 6.900~20 | 6.900~16 | 6.900~20 | 6.900~25 | 6.900~32 | 6.900~32 | 7.2~36 | 8~40 | 8~40 | 10~50 | 12.6~50 |
| | 8.280~10 | 8.280~12.5 | 8.280~16 | 8.280~20 | 8.28~16 | 8.280~20 | 8.280~25 | 8.280~32 | 8.280~32 | 8.280~36 | 8.280~40 | 8.280~40 | 10~50 | 12.6~50 |
| | 8.694~10 | 8.694~12.5 | 8.694~16 | 8.694~20 | 8.694~16 | 8.694~20 | 8.694~25 | 8.694~32 | 8.694~32 | 8.694~36 | 8.694~40 | 8.694~40 | 10~50 | 12.6~50 |
| | / | 10.43~12.5 | 10.43~16 | 10.43~20 | 10.43~16 | 10.43~20 | 10.43~25 | 10.43~32 | 10.43~32 | 10.43~36 | 10.43~40 | 10.43~40 | 10.43~50 | 12.6~50 |
| | 9.660~10 | 9.660~12.5 | 9.660~16 | 9.660~20 | 9.660~16 | 9.660~20 | 9.660~25 | 9.660~32 | 9.660~32 | 9.660~36 | 9.660~40 | 9.660~40 | 10~50 | 12.6~50 |
| | / | 11.59~12.5 | 11.59~16 | 11.59~20 | 11.59~16 | 11.59~20 | 11.59~25 | 11.59~32 | 11.59~32 | 11.59~36 | 11.59~40 | 11.59~40 | 11.59~50 | 12.6~50 |
| | / | 11.04~12.5 | 11.04~16 | 11.04~20 | 11.04~16 | 11.04~20 | 11.04~25 | 11.04~32 | 11.04~32 | 11.04~36 | 11.04~40 | 11.04~40 | 11.04~50 | 12.6~50 |
| | / | / | 13.24~16 | 13.24~20 | 13.24~16 | 13.24~20 | 13.24~25 | 13.24~32 | 13.24~32 | 13.24~36 | 13.24~40 | 13.24~40 | 13.24~50 | 13.24~50 |
| | / | / | 13.80~16 | 13.80~20 | 13.80~16 | 13.80~20 | 13.80~25 | 13.80~32 | 13.80~32 | 13.80~36 | 13.80~40 | 13.80~40 | 13.80~50 | 13.8~50 |
| | / | / | / | 16.56~20 | / | 16.56~20 | 16.56~25 | 16.56~32 | 16.56~32 | 16.56~36 | 16.56~40 | 16.56~40 | 16.56~50 | 16.56~50 |
| | / | / | / | 17.25~20 | / | 17.25~20 | 17.25~25 | 17.25~32 | 17.25~32 | 17.25~36 | 17.25~40 | 17.25~40 | 17.25~50 | 17.25~50 |
| | / | / | / | / | / | / | 20.70~25 | 20.70~32 | 20.70~32 | 20.70~36 | 20.70~40 | 20.70~40 | 20.70~50 | 20.70~50 |

# 8 Maintenance, Handling and Storage Precautions

**8.1 Precautions**

Before maintenance and repair of Circuit Breakers, the following operations must be carried out in sequence:

a. Making the Circuit Breaker to operate for opening, ensuring that it is in the opening state;

b. Making the higher-level knife switch to operate for disconnecting (If any), ensuring that the main circuit and secondary circuit are not live;

c. Making the Circuit Breaker to operate for releasing energy and opening, ensuring that the Circuit Breaker is in the releasing and opening state.

d. All components that may be touched by Personnel must be electrically neutral;

e. For Drawer Type Circuit Breaker, shaking the Circuit Breaker out of the drawer seat to the "Separation" position;

f. Compliance with current regulations and standards, ensuring equipment safety;

g. Inspection and maintenance operations should only be carried out by Skilled Technical Personnel who are very familiar with the Circuit Breaker. Our company (CHINT ELECTRICS) will NOT be responsible for personal injury or property damage caused by non-compliance with the instructions in this Instruction Manual.

**8.2 Inspection Cycle**

The inspection cycle of Circuit Breaker should be determined based on the operating environment, service life and number of operating cycles of the Circuit Breaker. The inspection should be carried out by Skilled Technical Personnel who are very familiar with the Circuit Breaker, with the aim of preventing faults caused by the performance degradation of Circuit Breaker components.

8.2.1 Inspection and Maintenance Cycle based on Operating Environment and Service Life.

**Table35 Inspection Cycle based on Operating Environment and Service Life**

| Condition | Environment | Inspection Cycle | Remark |
|---|---|---|---|
| General Environment | The air is keeping clean and dry, and free from corrosive gases, with a temperature between -5°C and +40°C; And the temperature meets the operating conditions specified in section 3.1 of the Instruction Manual. | Once a year | Compliance with the General Environmental Conditions Requirements of GB/T 14048.2. |
| Harsh Environment | Low temperature ranging from -5°C to -45°C or high temperature ranging from +40°C to +70°C. | Once every 3 months | |
| | Place with dust and corrosive gases. | Once a month | |

8.2.2 Inspection Cycle based on the Number of Operation Cycles

**Table36 Inspection Cycle based on the Number of Operation Cycles**

| Case Frame Current | Number of Operation Cycles(Cycle) | |
|---|---|---|
| | Opening On Load | Total Cycles (Including loaded and unloaded) |
| Inm≤2500A | Every 500 Cycles | Every 3000 Cycles |
| Inm≥3200A | Every 500 Cycles | Every 3000 Cycles |
| TIPs: 1. One operation cycle represents closing and opening once;<br>2. The on-load opening current value is less than In. | | |

8.2.3 Inspection Cycle for Special Situations

8.2.3.1 When the Following Special Situations Occur, the Circuit Breaker Should Be Immediately inspected.

a. Before the Circuit Breaker is put into use after being idle for a long period of time (Three months).

b. After short-circuit breaking of the Circuit Breaker.

c. After the Circuit Breaker is affected by overheating or moisture.

d. After the Circuit Breaker is hit or other physical damage

8.2.3.2 The Circuit Breaker must be replaced in the following situations.

a. Water ingress into the Circuit Breaker;

b. The insulation resistance of the conductive components of the main circuit is less than 5MΩ and the insulation cannot be restored;

c. After the short-circuit current is broken, the arc extinguishing chamber or contact system is severely damaged.

**8.3 Inspection and Maintenance Items**

**Table 37 Inspection Items**

| No. | Situation | | Items |
|---|---|---|---|
| 1 | Regular | According to Section 8.2.1 | Appearance, Action, Dielectric Performance, Circuit Connection, Smart Controller, Drawer Seat, Accessory, Operating Mechanism. |
| | | According to Section 8.2.2 | Action, Dielectric Performance, Circuit Connection, Smart Controller, Drawer Seat, Accessory, Operating Mechanism,Contact. |
| 2 | Special | According to Section 8.2.3.1 a | Appearance, Action, Dielectric Performance, Circuit Connection, Smart Controller, Drawer Seat, Accessory,Contact. |
| | | According to Section 8.2.3.1 b | Appearance, Action, Dielectric Performance, Circuit Connection, Smart Controller, Arc Extinguishing Chamber,Contact. |
| | | According to Section 8.2.3.1 c | Dielectric Performance, Smart Controller, Contact. |
| | | According to Section 8.2.3.1 d | Appearance, Action, Smart Controller, Circuit Connection, Drawer Seat. |

8.3.1 Inspection for Appearance

To check the housing, secondary terminal and insulation base for crack, fracture or deformation. If any abnormalities occur, please contact our company (CHINT ELECTRICS).

There should be no harmful dust or pollution deposits on the conductive components and insulation parts of the main circuit. If there are any, they should be cleaned.

8.3.2 Inspection for Action

Inspection for Energy Storage: Performing energy storage operation by Manual according to section 7.4.2.1 when the Circuit Breaker is in the released energy state. After the energy storage is completed, the "Energy Storage/Released Energy" indicator should indicate correctly. If any abnormal situation occurs, please contact our company (CHINT ELECTRICS).

Inspection for Closing and Opening: After the energy storage of the Circuit Breaker, eliminate other factors that limit the closing of the Circuit Breaker, Perform closing and openingoperations by Manual according to section 7.4.3.1. The Circuit Breaker should be reliably closed and opened, and the "Closing/Opening" and "Energy Storage/Released Energy" indications should be correct.

8.3.3 Inspection for Dielectric Performance

Insulation Resistance Measurement: Use a 1000VDC megohmmeter to check the insulation resistance of the Circuit Breaker, and the insulation resistance should not be less than 20MΩ.

The Insulation Resistance Testing Positions: For the condition that Circuit Breaker is closed, the testing positions are between each pole and between each pole and the case frame; For the condition that the Circuit Breaker is disconnected, the testing positions are between the incoming and outgoing lines of each pole.

8.3.4 Inspection for Circuit Connection

To check if the terminals of the main circuit and secondary circuit are loose. If they are loose, need tighten them again to ensure reliable connection. Tightening torque is shown in Table 32 and Table 33.

8.3.5 Inspection for Smart Controller

To conduct a simulated trip test on the smart controller, ensuring that the Circuit Breaker has closed without load during the test. Power on the Controller separately and conduct a simulated trip test according to the Operating Instruction of the Smart Controller. The Circuit Breaker should be able to reliably open, and the action current and time should meet the requirements. If the measured value deviates from the standard value, please contact our company (CHINT ELECTRICS).

8.3.6 Inspection for Accessory

To check the Operating Mechanism of Motor-driven: Within the specified voltage range, the Circuit Breaker should complete electric energy storage within 7 seconds.

To check the Under-voltage Trip: Apply 85% of the rated voltage to the Under-voltage Trip, and the Circuit Breaker should be able to close normally. When the rated voltage drops to 35%~70% of the rated voltage, it will trip.

To check the Closing Electromagnet and Shunt Release: Conduct electric closing/opening operation on the Circuit Breaker, and ensure reliable closing/opening within the specified voltage range of the Closing Electromagnet and Shunt Release.

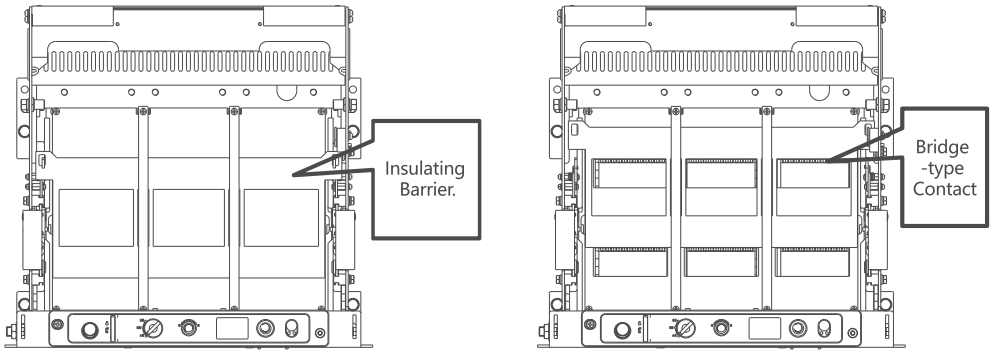
To check the Auxiliary Switch: Conduct closing/opening operation on the Circuit Breaker, and the contacts of the Auxiliary Switch should switch reliably.

8.3.7 Inspection for Drawer Seat

When the indication of the drawer seat is switched from Trial to Connection, the Circuit Breaker cannot remain closed. Before the bus of the Circuit Breaker contacts the bridge-type contact of the drawer seat, the main contact of the Circuit Breaker must be disconnected first; When the drawer seat indication is switched from Connection to Trial, the Circuit Breaker cannot remain closed. Before the bus of the Circuit Breaker leaves the bridge-type contact of the drawer seat, the main contact of the Circuit Breaker must be disconnected first.

There are no foreign objects inside the drawer seat.

To shake the Circuit Breaker in and out, and the safety insulating barrier should be able to open and close smoothly without deformation, misalignment or oxidation of the bridge-type contact.




Insulating Barrier Closing　　Insulating Barrier Opening

**Fig57 Inspection for Drawer Seat**

8.3.8 Inspection for Operating Mechanism

To check the cleanness of the Circuit Breaker, and use a clean and dry cloth to remove all dust and pollution. If the dirt is thick, please use a neutral cleaner to clean it and wipe it clean.

To remove foreign objects inside the Circuit Breaker, including foreign objects falling from the outside and wear and tear inside the Circuit Breaker.

To check the lubrication of the Operating Mechanism. If the lubricating grease of the operating mechanism is found to be dry, the Operating Mechanism should be filled with lubricating grease. It is recommended to use the original recommended lubricating grease. The part that need be lubricated for the operating mechanism are as follows:

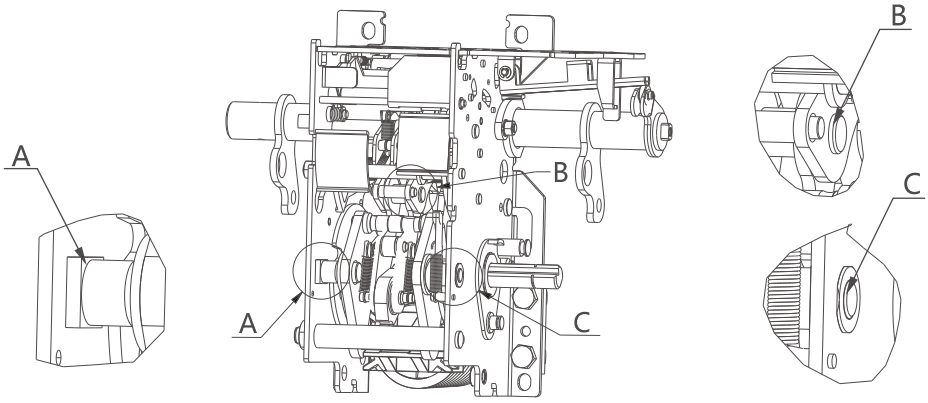



**Fig58 Part that Need Be Lubricated for the Operating Mechanism**

8.3.9 Inspection for Arc Extinguishing Chamber

There are no defects in each grating and arcing blade, and the arc extinguishing cover is not cracked. If there are any, please replace them and remove indoor dust, corrosion layer and arcing fault location in a timely manner. If there is severe corrosion and rust, please replace them in a timely manner.

TIP: After short- circuit current breaking, it must be checked.




**Fig59 Inspection for Arc Extinguishing Chamber**

8.3.10 Inspection for Contacts

8.3.10.1 Contact Surfaces

To check the cleanliness of the contacts and remove all dust and pollution with a clean and dry cloth. If the dirt is thick, it can be polished with fine sandpaper and wiped clean.

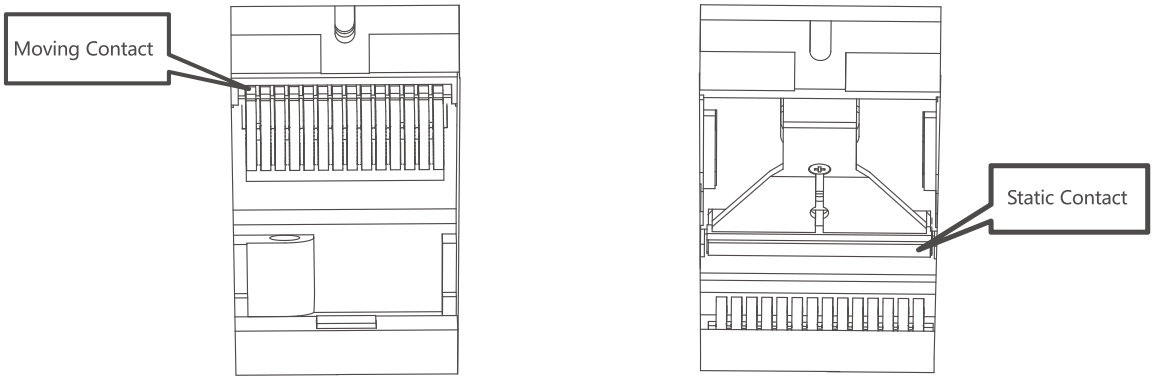



**Fig60 Inspection for Contact Surfaces**

8.3.10.2 Inspection for Overtravel

To observe the position of the tail end of the contact strip in both the opening and closing states of the Circuit Breaker, and ensure that the difference in the position of the tail end of the contact strip is not less than 3mm between the two states.

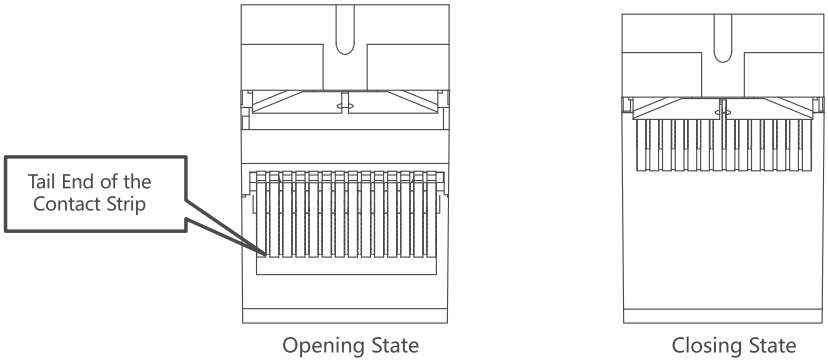



**Fig61 Inspection for Overtravel**

**8.4 Replacement of Common Accessories**

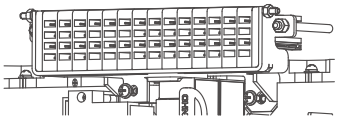
TIPs: Before Replacing Accessories: All power supplies, including the main circuit and secondary circuit power supplies, should be cut off; The Circuit Breaker is in the opening and releasing states; After replacing the accessories, the Circuit Breaker housing should be installed for debugging and confirmed to be correct before being put into use.

8.4.1 Removal

① Removing the fixing screws of the secondary circuit bracket of the Circuit Breaker and removing the secondary circuit (Only for NXA-1600 Drawer Type Circuit Breaker); Removing the fixing screws of the zero arcing and removing the secondary circuit (Only for NXA-1600 Fixed-mounted Type Circuit Breaker );

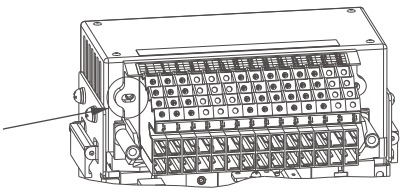
② Removing the fixing screws on the cover plate above the Circuit Breaker accessories and taking out the accessory cover plate outwards;

③ Pulling out the Shunt Release, Closing Electromagnet and Under-voltage Trip upwards to complete the removal of the accessories.

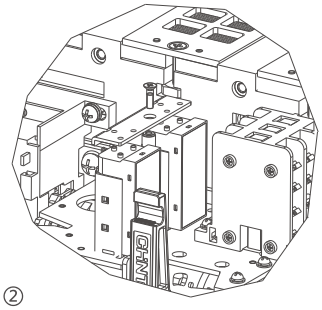


①

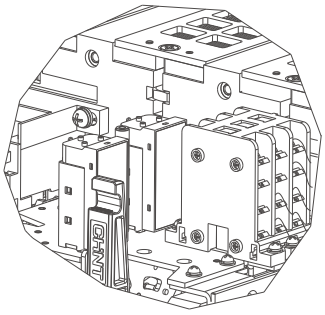
Only for 1600 Case Frame Drawer Type Circuit Breaker



Only for 1600 Case Frame Fixed-mounted Type Circuit Breaker



②



③

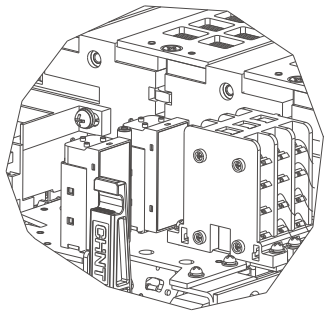
**Fig62 Removal of the Accessories**

8.4.2 Installation

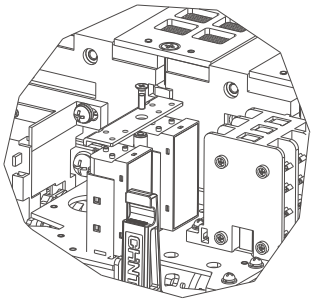
① Inserting the Shunt Release, Closing Electromagnet and Under-voltage Trip into the designated positions. If there is resistance during insertion, slightly twist the accessory to insert the positioning boss at the bottom of the accessory into the corresponding hole of the mechanism cover plate;

② Aligning the middle hole of the accessory cover plate with the installation column, slightly twist the accessory to insert the top boss of the accessory into the limit hole of the cover plate; Pressing the accessory cover plate and tightening the fixing screws to complete the installation of the accessory.

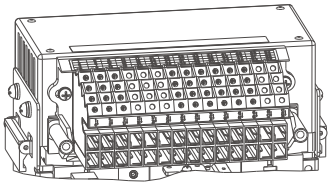
③ Aligning the installation holes of the secondary circuit bracket with the corresponding screw holes of the Circuit Breaker, and tightening the screws (Only for NXA-1600 Drawer Type Circuit Breaker); Aligning the installation holes of the secondary circuit bracket with the corresponding screw holes of the zero arcing , and tightening the screws (Only for NXA-1600 Fixed-mounted Type Circuit Breaker).



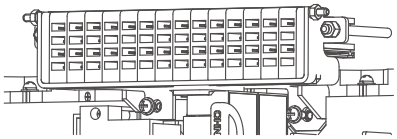
①



②



③



Only for 1600 Case Frame Fixed-mounted Type Circuit Breaker

Only for 1600 Case Frame Drawer Type Circuit Breaker

**Fig63 Installation of Accessories**

# 9 Analysis and Elimination of Faults

## 9.1 Troubleshooting Logic

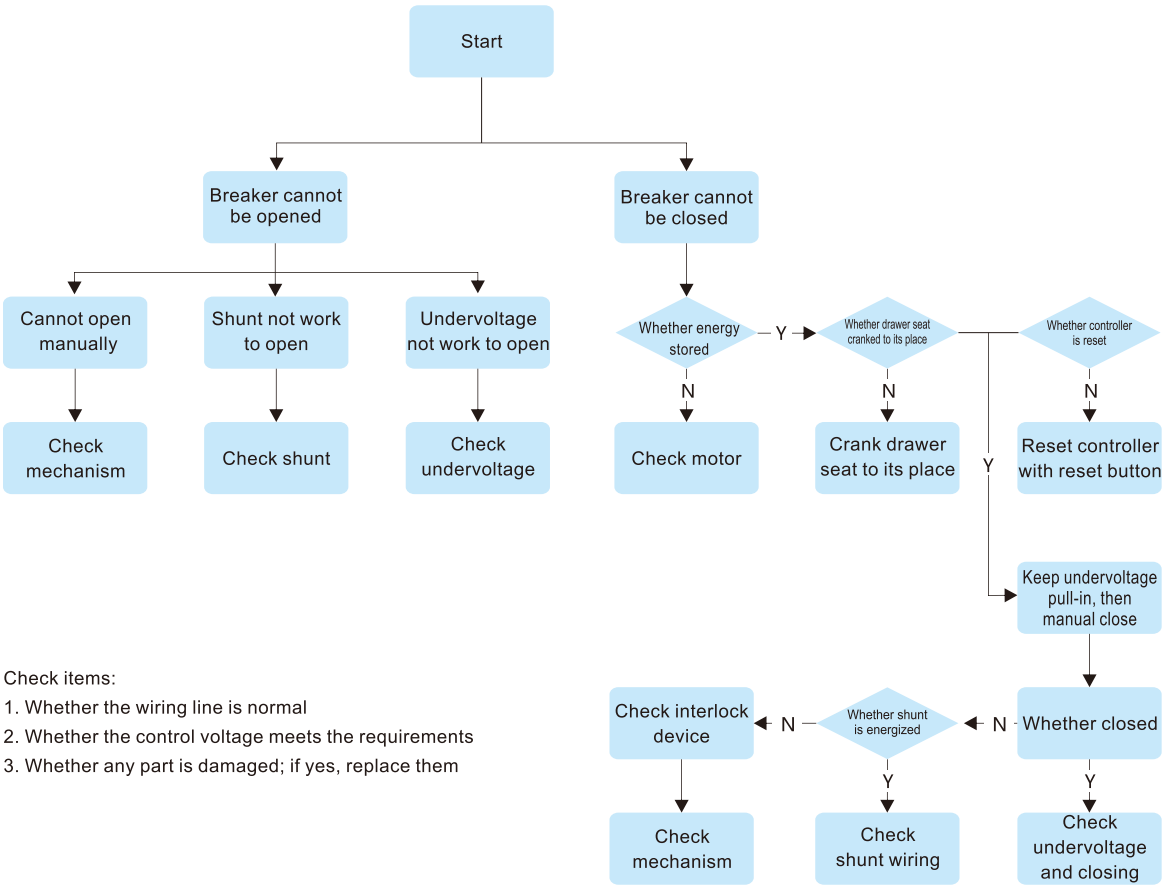



**Figure 64 Fault logic analysis**

## 9.2 Fault Trip Analysis

Identification of fault causes

Fault identification through intelligent controller indication

Note: The operation is shown in section 12.2.2. Live closing operation is prohibited before the fault is eliminated.

### 9.3 Common Fault Causes and Solutions

**Table 38 Common Fault Causes and Solutions**

| Problem | Cause | Solution |
|---|---|---|
| Circuit breaker trip | Overload fault trip (Ir indicator on) | 1. Check the breaking current value and operation time on the intelligent controller;<br>2. Analyze the conditions of the load and grid;<br>3. If there is overload, eliminate the overload fault;<br>4. If the actual running current does not match the long delay operation current setting value, modify the long delay operation current setting value according to the actual running current to achieve appropriate matching protection;<br>5. Press the Reset button and reclose the circuit breaker. |
| | Short circuit fault trip (Isd or Ii indicator on) | 1. Check the breaking current value and operation time on the intelligent controller;<br>2. If there is short circuit, find and eliminate short circuit fault;<br>3. Check the setting value of the intelligent controller;<br>4. Check the integrity of the circuit breaker;<br>5. Press the Reset button and reclose the circuit breaker. |
| | Ground fault trip (Ig indicator on) | 1. Check the breaking current value and operation time on the intelligent controller;<br>2. If there is ground fault, find and eliminate the ground fault;<br>3. Modify the ground fault current setting value of the intelligent controller;<br>4. If there is no ground fault, check whether the fault current setting value matches the actual protection;<br>5. Press the Reset button. Reclose the circuit breaker. |
| | Mechanical interlocking operation | Check the working status of the two circuit breakers with mechanical interlocks. |
| | Undervoltage release is faulty:<br>a. The rated operating voltage is less than 70% Ue;<br>b. The undervoltage release control unit is faulty. | 1. Check whether the undervoltage release is powered on;<br>2. The power supply voltage of the undervoltage release must be 85% Ue or higher;<br>3. Change the control unit of the undervoltage release. |
| The circuit breaker cannot be closed | The intelligent controller is not reset | Press the Reset button (on the raised panel) and reclose the circuit breaker. |
| | Poor contact in the secondary circuit of the drawer circuit breaker | Shake the drawer circuit breaker to the "on" position (clattering is heard). |
| | The circuit breaker has not stored energy | Check whether the secondary circuit is connected:<br>1. The motor control power supply voltage must be 85%Us or higher;<br>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 circuit breaker has been locked | Check the working status of the two circuit breakers with mechanical interlocks. |
| | Closed electromagnet:<br>a. The rated control voltage is less than 85% Us;<br>b. The closed electromagnet is faulty and damaged. | 1. The power supply voltage of the closed electromagnet must be 85% Us or higher;<br>2. Replace the closed electromagnet. |

| Problem | Cause | Solution |
|---|---|---|
| Trip after the circuit breaker is closed (fault indicator is on) | 1. Trip immediately:<br>The short circuit current is closed;<br>2. Delayed trip:<br>The overload current is closed. | 1. Check the breaking current value and operation time on the intelligent controller;<br>2. If there is short circuit, find and eliminate short circuit fault;<br>3. If there is overload, find and eliminate the overload fault;<br>4. Check the integrity of the circuit breaker;<br>5. Modify the current setting value of the intelligent controller;<br>6. Press the Reset button and reclose the circuit breaker. |
| The circuit breaker cannot be disconnected | 1. The circuit breaker cannot be manually disconnected locally:<br>The mechanical operating mechanism is faulty;<br>2. The circuit breaker cannot be electrically disconnected remotely:<br>a. The mechanical operating mechanism is faulty;<br>b. The shunt release power voltage is less than 70% Us;<br>c. The shunt release is damaged. | 1. Check the mechanical operating mechanism. If there is any fault such as a stuck, contact the manufacturer.<br>1.a. Check the mechanical operating mechanism. If there is any fault such as a stuck, contact the manufacturer;<br>b. Check whether the shunt release power voltage is less than 70% Us;<br>c. Replace the shunt release. |
| The circuit breaker cannot store energy | 1. Cannot store energy manually;<br>2. Cannot store energy electrically:<br>a. The control power voltage of the rated control electric energy storage device is less than 80% Us;<br>b. The energy storage device has a mechanical failure. | 1. The energy storage device has a mechanical failure. Contact the manufacturer.<br>2.a. Check whether the control power supply of the electric energy storage device is 85% Us or higher;<br>b. Check the energy storage device machinery and contact the manufacturer. |
| Drawer circuit breaker The handle cannot be inserted Shake in and out the circuit breaker | 1. There is a padlock in the off position.<br>2. The plugging rail or the circuit breaker body is not fully inserted | 1. Remove the padlock<br>2. Push the rail or circuit breaker to the end. |
| The drawer circuit breaker cannot be pulled out in the "off" position | 1. The handle is not pulled out.<br>2. The circuit breaker does not fully reach the "off" position. | 1. Pull out the handle.<br>2. Fully shake the circuit breaker to the "off" position. |
| The drawer circuit breaker cannot be shaken to the "on" 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. |
| | The frame rated current of the circuit breaker body does not match that of the drawer seat. | Select the circuit breaker body and drawer seat with the same frame rated current. |
| The intelligent controller screen has no display | 1. The intelligent controller is not connected to the power supply.<br>2. The intelligent controller is faulty.<br>3. The rated control power supply voltage is less than 85% Us. | 1. Check whether the intelligent controller has been connected to the power supply. If not, connect to the power supply immediately.<br>2. Turn off the control power of the intelligent controller and then send power. If the fault persists, contact the manufacturer.<br>3. The power supply voltage of the intelligent controller must be 85% Us or higher. |
| The fault indicator of the intelligent controller is on and is still on after pressing the "Back" button. | The intelligent controller is faulty | Turn off the control power of the intelligent controller and then send power. If the fault persists contact the manufacturer. |

## 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 and model definition and description

## 11.1 Ordering specification

**Table 39 Ordering specification**

| Frame size | 1600A | | | 2000A | | | 3200A | | | 4000A | | | 6300A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Circuit breaker | N ☐ | S ☐ | H ☐ | N ☐ | S ☐ | H ☐ | N ☐ | S ☐ | H ☐ | N ☐ | S ☐ | H ☐ | H ☐ |
| Rated current | 400A ☐ | | | 630A ☐ | | | 1600A ☐ | | | 3200A ☐ | | | 4000A ☐ |
| | 630A ☐ | | | 800A ☐ | | | 2000A ☐ | | | 3600A ☐ | | | 5000A ☐ |
| | 800A ☐ | | | 1000A ☐ | | | 2500A ☐ | | | 4000A ☐ | | | 6300A ☐ |
| | 1000A ☐ | | | 1250A ☐ | | | 3200A ☐ | | | | | | |
| | 1250A ☐ | | | 1600A ☐ | | | | | | | | | |
| | 1600A ☐ | | | 2000A ☐ | | | | | | | | | |
| Number of poles | 3 pole ☐ | | | 4 pole ☐ (While In=6300A , no four poles) | | | | | | | | | |
| Installation modes | Horizontal draw-out ☐ | | | | | | Fixed and horizontal ☐ | | | | | | |
| Intelligent controller | M type ☐ | | A type ☐ | | P type ☐ | | H type ☐ | | | | | | |
| | AC110V ☐ | | AC220/230/240V ☐ | | AC 380/400/415V ☐ | | DC110V ☐ | | DC220V ☐ | | | | |
| Electric accessories (no AC110V for NXA16) | Under-voltage release (no DC)( Optional) | AC110V ☐ | AC220/230/240V ☐ | AC 380/400/415V ☐ | Order____V ☐ | | | | | | | | |
| | | helped&instantaneous ☐ | helped&delay (Inm≥2000A ,delay time:1s,3s,5s, non-adjustable). ☐ | | | | | | | | | | |
| | | self-priming&instantaneous ☐ | self-priming&delay (Inm≥2000A,delay time:0.3~7.5s, adjustable) ☐ | | | | | | | | | | |
| | | Note:NXA16 don't have helped type, delay time:1s,3s,5s,7s, non-adjustable. ☐ | | | | | | | | | | | |
| | shunt release (default in motor operation) | Intermittent (only for Inm≥2000A, by default in motor operation)☐ | AC 110V ☐ | AC220/230/240V ☐ | AC380/400/415V ☐ | DC110V ☐ | DC220V ☐ | | | | | | |
| | closed electromagnet (default in motor operation) | pulse (must select pulse type in the automatic control system) ☐ | AC110V ☐ | AC220/230/240V ☐ | AC380/400/415V ☐ | DC110V ☐ | DC220V ☐ | | | | | | |
| | Motor | AC110V ☐ | AC220/230/240V ☐ | AC380/400/415V ☐ | DC110V ☐ | DC220V ☐ | | | | | | | |
| Auxiliary contact | NXA16: C04☐ C06☐ (C06 only for AC)<br>NXA20~63: N3☐ N4☐ N5☐ C03☐ C04☐ C05☐ | | | | | | | | | | | | |
| Connection accessories | Interphase barrise ☐ | Mechanical counter counter ☐ | | | | | | | | | | | |
| Controller accessories (Match) | External transformer: Earth current transformer ☐ | | | | | | External transformer (Neutral CT) ☐ | | | | | | |
| | Note: 1) Neutral CT is only applicable to 3P+N<br>2) The earth current transformer should be selected when customers select earth current return type earthing protection. | | | | | | | | | | | | |
| Lock mechanism (Match) | Pushbutton lock ☐ | Safety shutters padlock ☐ | Body lock ☐ | One-lock one-key ☐ | Two-locks one-key ☐ | | | | | | | | |
| | Three-locks two-keys ☐ | "Disconnected" position padlock ☐ | Status door interlock ☐ | Location Door interlock ☐ | | | | | | | | | |
| Mechanical interlock (Match) | MI-3(2on+1off ) ☐ | MI-4 ( 1on+2off ) ☐ | ILK2 ☐ | | | | | | | | | | |





## 11.2 Model definition and description

### Model definition and description

| NXA | 16 | N | 04 | - M | | D | 3 | - AC230 | M | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| Code of Product | Code of frame size | Code of breaking capacity | Code of rated current | Code of intelligent controller | | Code of installation method | Code of number of poles | Code of control circuit voltage | Code of operation mode | Code of special requirement |
| | 16:1600A (04-16) | N: basic type | 04-400A | M: basic type | | D: draw-out type | 3: 3 poles | AC 230: AC 230V | No code: motor operation | No code: no special requirement |
| | 20:2000A (06-20) | S: standard type | 06-630A | A: current type | | F: fixed type | 4: 4 poles | AC 400: AC 400V | M: manual operation | Special requirements code, such as: UVT |
| | 32:3200A (16-32) | H: advanced type | 08-800A | P: power type | | | | DC 110: DC 110V | | |
| | 40:4000A (32-40) | | 10-1000A | H: harmonic type | | | | DC 220: DC 220V | | |
| | 63:6300A (40-63) | | 12-1250A | | | | | | | |
| | | | 16-1600A | | | | | | | |
| | | | 20-2000A | | | | | | | |
| | | | 25-2500A | | | | | | | |
| | | | 32-3200A | | | | | | | |
| | | | 36-3600A | | | | | | | |
| | | | 40-4000A | | | | | | | |
| | | | 50-5000A | | | | | | | |
| | | | 63-6300A | | | | | | | |

Note: [1] Manual operation does not contain motor-driven mechanism, closing electromagnet and shunt release. Motor operation contains all standard accessories of remote operation.

[2] NXA16N10-AD3-AC230: frame size is 1600A, N type breaking capacity, rated current is 1000A, A type intelligent controller, draw-out type and 3 poles, control voltage is AC 230V motor operation.

### Model definition and description-intelligent controller

| NXA | 16 | TU | M | - 04 | - 3 | - AC230 |
|---|---|---|---|---|---|---|
| Code of product | Code of frame size | Intelligent controller | Code of intelligent controller | Code of rated current | Code of number of poles | Code of auxiliary power supply |
| | 16:1600A (04-16) | | M: basic type | 04-400A; 06-630A | 3: 3 poles | AC 230: AC 230V |
| | 20:2000A (06-20) | | A: current type | 08-800A; 10-1000A | 4: 4 poles | AC 400: AC 400V |
| | 32:3200A (16-32) | | P: power type | 12-1250A; 16-1600A | | DC 110: DC 110V |
| | 40:4000A (32-40) | | H: harmonic type | 20-2000A; 25-2500A | | DC 220: DC 220V |
| | 63:6300A (40-63) | | | 32-3200A; 36-3600A | | |
| | | | | 40-4000A; 50-5000A | | |
| | | | | 63-6300A | | |

## Model definition and description-accessories

| NXA | 16 | - | CC | - | 230VAC |
|---|---|---|---|---|---|
| Code of product | Frame size | | Code of accessories | | Code of rated voltage |
| | 16:1600A | | CC: Closed electromagnet | | 230VAC: AC230V |
| | 20:2000A | | ST: Shunt tripper | | 400VAC: AC400V |
| | 32:3200A | | MO: Motor | | 110VDC: DC110V |
| | 40:4000A | | UVT: Undervoltage tripper | | 220VDC: DC220V |
| | 63:6300A | | ASUVT:Self-priming undervoltage tripper | | Rated voltage+delay time (1s、3s、5s、7s) |
| | 20/40:2000A-4000A | | UVTD:UVT delay unit | | |
| | 20/32:2000A-3200A | | ASUVTD: ASUVT delay unit | | |
| | 20/63:2000A-6300A | | | | |

## Model definition and description-accessories

| NXA | 16 | OF | C04 |
|---|---|---|---|
| Code of product | Frame size | Code of accessories | Specification of accessories |
| | 16:1600A | OF: Auxiliary contact | C04: Four groups of contacts |
| | 20:2000A | | C05: Five groups of contacts |
| | 32:3200A | | C06: Six groups of contacts |
| | 40:4000A | | N3: Three normally open and three normally closed |
| | 63:6300A | KL: Key lock | N4: Four normally open and four normally closed |
| | 20/40:2000A-4000A | | N5: Five normally open and five normally closed |
| | 20/32:2000A-3200A | | 1S1S: One lock and one key |
| | 20/63:2000A-6300A | FCDP: Fixed type door frame | 2S1S: Two locks and one key |
| | | DCDP: Draw-out type door frame | 3S2S: Three locks and two keys |
| | | FD: Fixed type interphased partition | |
| | | DD: Draw-out type interphased partition | |
| | | CE-CD-CT: Position signal | |
| | | ILK2: Mechanical interlocking two interlocking steel cables | |
| | | MI-3: Triple mechanical interlock ( 2on+1off ) | |
| | | MI-4: Triple mechanical interlock ( 1on+2off ) | |

# 12 Product Addendum

## 12.1 Breaker Configuration

Table 40 Product default accessories

| Standard accessories | 1600 frame | | 2000 frame | | 3200 frame | | 4000 frame | | 6300 frame | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Fixed type | Drawer type | Fixed type | Drawer type | Fixed type | Drawer type | Fixed type | Drawer type | Fixed type | Drawer type |
| Breaker body | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Drawer seat | -- | ■ | -- | ■ | -- | ■ | -- | ■ | -- | ■ |
| Intelligent controller | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Upper and lower horizontal connection | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Auxiliary contact 4CO | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Fault trip indication contact | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Electric operating mechanism | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Closed electromagnet | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Shunt release | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Door frame | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

Table 41 Optional accessories

| Optional accessories | 1600 frame | | 2000 frame | | 3200 frame | | 4000 frame | | 6300 frame | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Fixed type | Drawer type | Fixed type | Drawer type | Fixed type | Drawer type | Fixed type | Drawer type | Fixed type | Drawer type |
| Instantaneous undervoltage release | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Time-delay undervoltage release | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Opening and closing twistlock | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Rack position padlock | -- | ■ | -- | ■ | -- | ■ | -- | ■ | -- | ■ |
| Body key lock | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Position door interlock | -- | -- | -- | ■ | | ■ | -- | ■ | | ■ |
| State door interlock | -- | -- | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Auxiliary contact 6CO | ■ | ■ | -- | -- | -- | -- | -- | -- | -- | -- |
| Auxiliary contact 5NO+5NC | -- | -- | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Auxiliary contact 3NO+3NC | -- | -- | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Auxiliary contact 4NO+4NC | -- | -- | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Auxiliary contact 5CO | -- | -- | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Rack position indication contact | -- | ■ | -- | ■ | -- | ■ | -- | ■ | -- | ■ |
| Double Mechanical interlock | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| External neutral line transformer | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Ground current transformer and its accessories | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Phase spacer | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Triple Mechanical lock | -- | -- | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

Note: "■" means that this accessory is available; "--" means that this accessory is not available.

## 12.2 Intelligent Controller

### 12.2.1 Controller Model

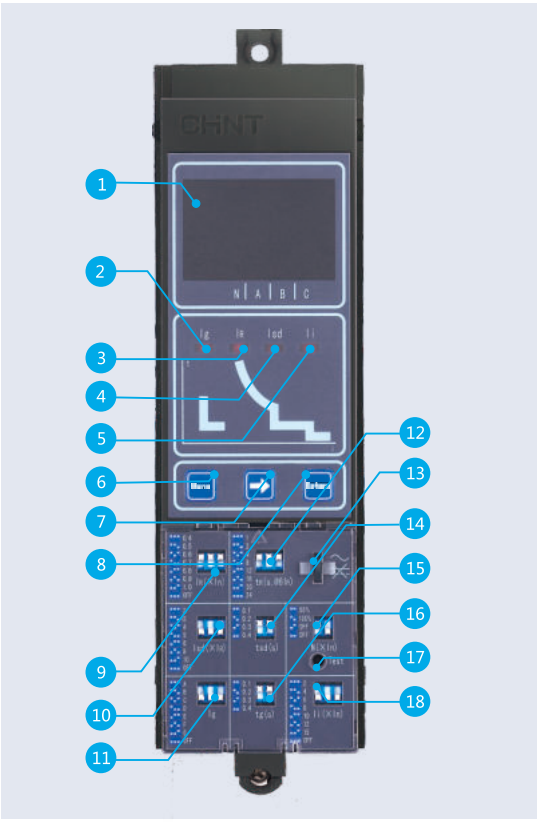



**Figure 65 M/A-type intelligent controller**

1.Display window: display current value, setting parameter, fault current, trip time, etc.
2.Ig indicator: This light is on after ground fault trip
3.Ir indicator: This light is on after overload long-delay trip
4.Isd indicator: This light is on after short-circuit short-delay trip
5.Ii indicator: This light is on after short-circuit instantaneous trip.
6.Menu button: Query the DIP position and fault record
7.Right button: Switch to the next state when querying the DIP position
8.Return button: Return to the previous level, or reset
9.Overload long-delay current multiple setting switch
10.Short-circuit short-delay current multiple setting switch
11.Ground fault current multiple setting switch
12.Overload long-delay time setting switch
13.Mask keyhole
14.Short-circuit short-delay time setting switch
15.N-pole protection setting switch
16.Ground fault delay time setting switch
17.Ground fault delay time setting switch
18.Short-circuit instantaneous current multiple setting switch

**M-type intelligent controller (basic protection)**

Protection

The setting of all protected thresholds and DIP switches for delay. The setting value can be displayed in the display window.

- Overload protection.

True RMS long delay protection

Thermal memory: Accumulation of heat before and after tripping.

- Short-circuit protection

Short delay (RMS) and instantaneous protection

4-speed definite time is optional in terms of delay.

- Ground fault protection

4-speed definite time is optional in terms of delay.

- Neutral line overcurrent protection

The neutral line protection threshold can be adjusted to 50%,100% and off for 3P+N or 4P products (6300 shell frame only 50%)

- Test function

Simulate 6Ir test current for test tripping

- Trip record function

One-time failure memory function

- Ammeter

The M-type intelligent controller measures the true current rms between 40% and 150% with an accuracy of 2%.

- Operation times record function

**A-type intelligent controller (current type)**

Protection

The setting of all protected thresholds and DIP switches for delay. The setting value can be displayed in the display window.

- In addition to the protection and extended functions of all M-type control units, the A-type control unit also includes
- Voltage imbalance protection

The main circuits current phase failure or three phase current imbalance can be protected.

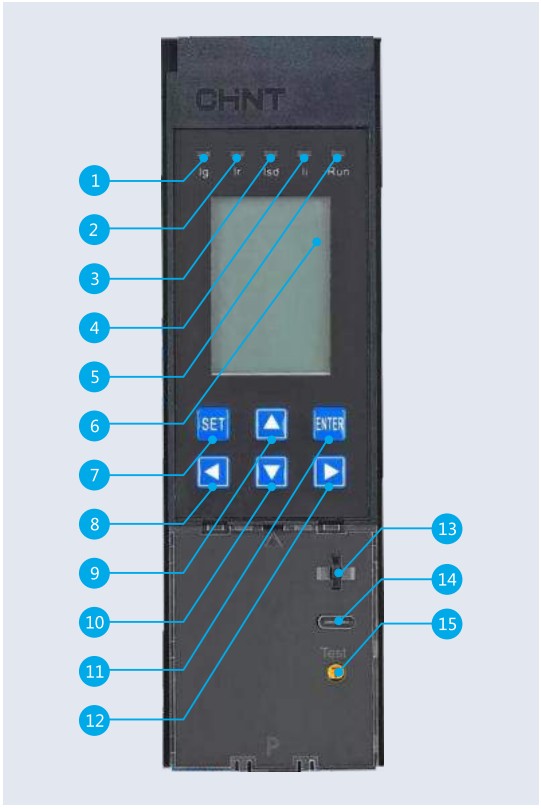



**Figure 66 P-type intelligent controller**

1.Ig indicator: This light is on after ground fault trip
2.Ir indicator: This light is on after overload long-delay trip
3.Isd indicator: This light is on after short-circuit short-delay trip
4.Ii indicator: This light is on after short-circuit instantaneous trip.
5.Running indicator: This light flashes during normal operation.
6.LED screen: Tri-color backlight, green during normal operation, yellow upon an alarm, and red after tripping.
7.Setting button
8.Left button
9.Up button
10.Down button
11.OK button
12.Right button
13.Mask keyhole
14.USB interface
15.Test button: trip test

**P-type intelligent controller (power type)**

Protection

The setting of all protected thresholds and buttons for delay.

- Include the protection functions of all A-type control units
- Ground current protection function (optional)

Equipped with a dedicated external transformer and disconnection protector for power grounding protection

- Advanced protection function

Voltage imbalance protection
Overvoltage and undervoltage protection
Over-frequency and under-frequency protection
Phase sequence protection
Reverse power protection function
Required value protection function
The required value of the true RMS of each phase current is calculated in a measurement window, and the protection works when the required value exceeds the limit.
When the execution mode is an alarm, the action is in principle the same as the grounding alarm. The settings for the sliding time window are in the "measurement table settings" menu. The required value protection is set for each item:
Maximum required current value of phase A;
Maximum required current value of phase B;
Maximum required current value of phase C;
Maximum required current value of phase N;
(not affected by neutral line protection setting)

- Extended functions

Intelligent controller self-diagnosis
Recording function of the number of operations / fault trip / alarm / displacement: providing the last 8 records
Main contact wear display function: The contact wear degree is evaluated according to the mechanical life, electrical life and breaking capacity of different frames.
Internal clock function
Button Trip-test function

- Electric energy meter

Current measurement
Voltage measurement
Frequency measurement
Required value measurement
Power (active, reactive, apparent) measurement
Electric energy (active, reactive, apparent) measurement
Power factor measurement

- LCD tri-color backlight

Green during normal operation, yellow upon an alarm, and red after tripping.

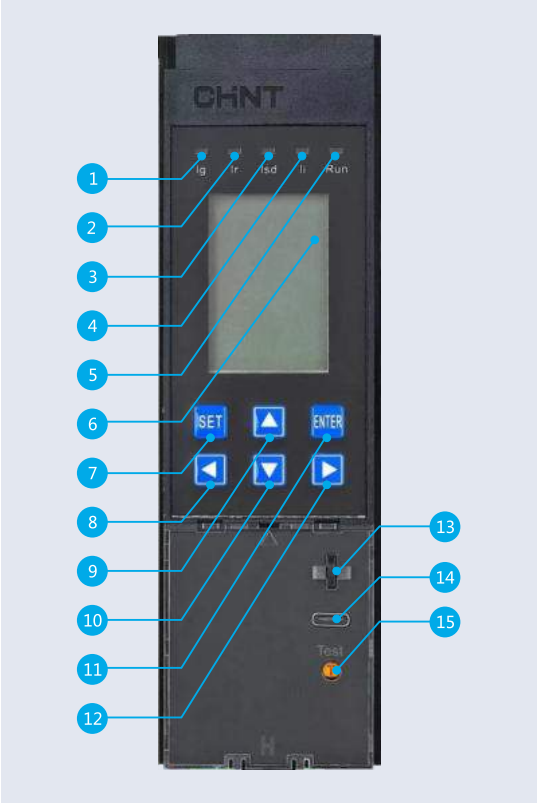



**Figure 67 H-type intelligent controller**

1.Ig indicator: This light is on after ground fault trip
2.Ir indicator: This light is on after overload long-delay trip
3.Isd indicator: This light is on after short-circuit short-delay trip
4.Ii indicator: This light is on after short-circuit instantaneous trip.
5.Running indicator: This light flashes during normal operation.
6.LCD screen: Three-color backlight, green during normal operation, yellow during an alarm, and red after tripping.
7.Setting button
8.Left button
9.Up button
10.Down button
11.OK button
12.Right button
13.Mask keyhole
14.USB interface
15.Test button: trip test

**H-type intelligent controller (harmonic type)**

Protection

The setting of all protected thresholds and buttons for delay.

- In addition to the protection and extended functions of all P-type control units, the H-type control unit also includes

- Load monitoring function

- Zone selective interlock

- Communication function

Modbus-RTU communication protocol

- Input/output function

2DI2DO or 4DO

DI signal : AC(220~250)V

DO requires a power unit (24VDC output) and a relay unit

- Harmonic analysis function

Measure the fundamental current, fundamental phase voltage, fundamental power and 3-31 odd-order harmonic current content (HRIh), harmonic voltage content (HRUh), total harmonic current distortion rate [THDi, thdi], total harmonic voltage distortion rate [THDu, thdu]. Harmonic content (HR): The ratio of the square root mean of the hth harmonic component contained in the periodic AC amount to the square root mean of the fundamental component (expressed as a percentage).

12.2.2 Intelligent Controller Operation Description

**Table 42 Minimum display current of the controller at the factory**

| Frame | Rated current | Minimum display value |
|---|---|---|
| 1600 | 400~1600 | 80 |
| 2000 | 630~2000 | 80 |
| ≥3200 | ≥1600 | 160 |

12.2.2.1 M/A-type Intelligent Controller

The status of the M/A intelligent controller can be divided into default status, setting status, query status, and trip status.

① Default status: The default status is the measurement status where all the fault indicators are off and the controller has no button operations and shows the maximum current.

In the default status, if you press "→" ,the L1, L2, L3(LN) and Lg current values are displayed cyclically. Figure below is an example figure.

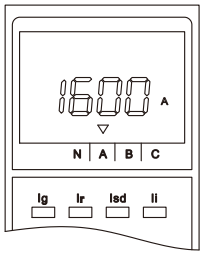



**Figure 68 A phase current display interface**

② Setting status: The four-stage protection setting value is set by DIP adjustment. Adjusting the DIP up and down according to the shape on the left can change the corresponding parameter, as shown in figures below. Changing the protection parameters must be done on the default interface, otherwise the set value must be realized by pressing the "return" button after changing.

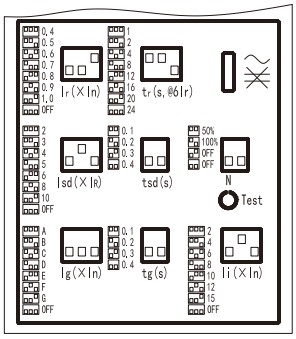



**Figure 69 Four-stage protection adjustment DIP**

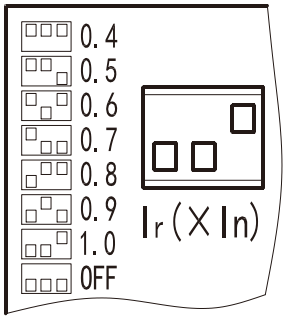



**Figure 70 Ir=1.0In**

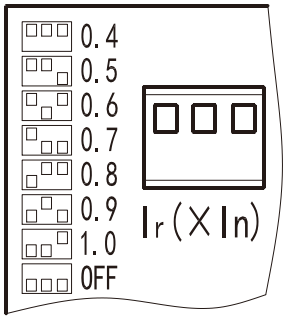



**Figure 71 Ir=0.4In**

③ Query states: In the default interface, press the "menu" button once to enter the setting value query status, and then press the"→"button to query other parameter setting values one by one. See figures below for details The specific adjustment data range is shown in Section 4.2

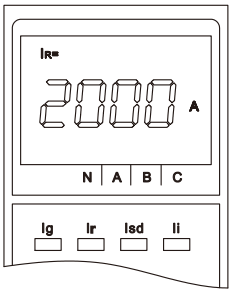



Figure 72 Ir set value

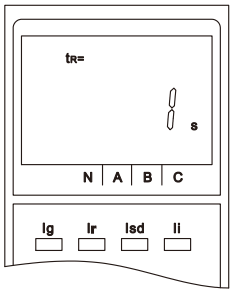



Figure 73 tr set value

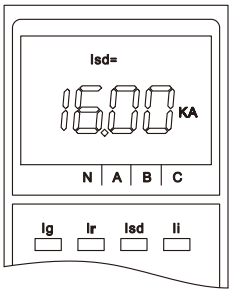



Figure 74 Isd set value

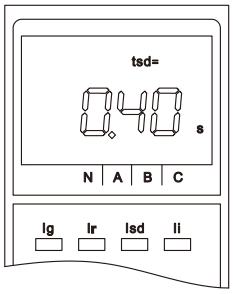



Figure 75 tsd set value

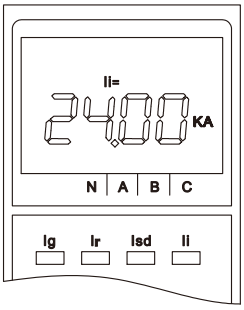



Figure 76 Ii set value

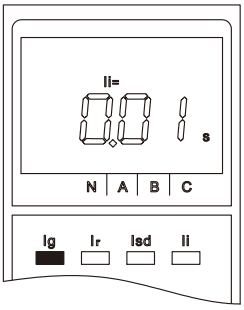



Figure 77 Ii peak or effective value setting

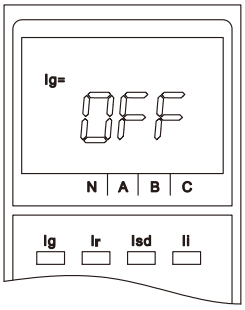



Figure 78 Ig set value

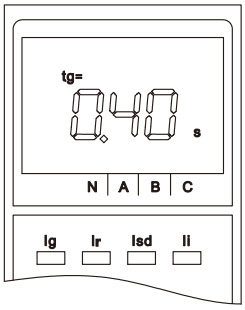



Figure 79 tg set value

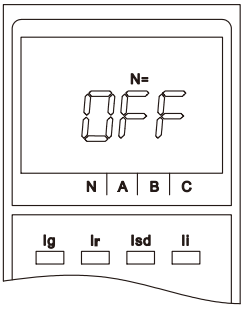



Figure80 N-phase current value

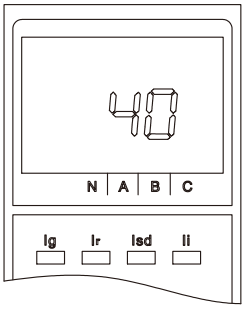



Figure 81 operation times

④ Trip status: When the controller is running normally, press the "menu" button and the the last trip information will be displayed and the controller will enter the normal running state within 1 min, or press the "return" button and the controller will be reset. See Figure below for details.

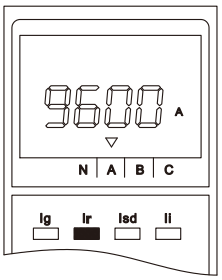



Figure 82 Trip current

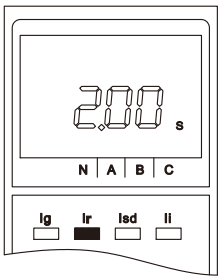



Figure 83 Trip time

12.2.2.2 P/H-type Intelligent Controller

The P/H intelligent controller provides four theme menus and one main interface. The theme menus are system settings, protection settings, measurement, and records.

① Main interface: The main interface is the measurement status where all the fault indicators are off and the controller has no button operations, and the phase currents are displayed in a column.

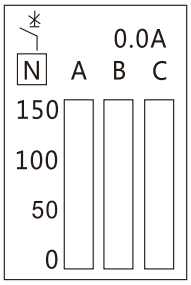



Figure 84 Current display interface

② System settings: Long press the "menu" button on the main interface to enter the theme menu, press the "enter" button to enter the system settings interface, press the "↑" and "↓" buttons to select the option to be set, and press "enter" to enter the option. An example is shown in Figure below (clock settings)

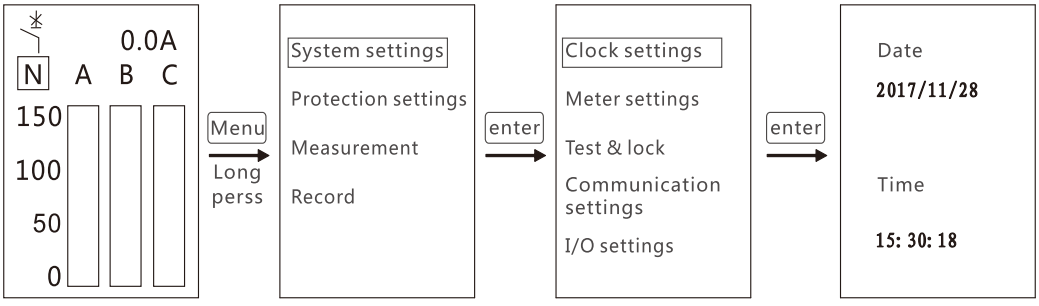



Figure 85 Clock setting steps

③ Protection settings: Long press the "menu" button on the main interface to enter the theme menu, and press the "↓" and " enter " buttons to enter the protection settings interface.

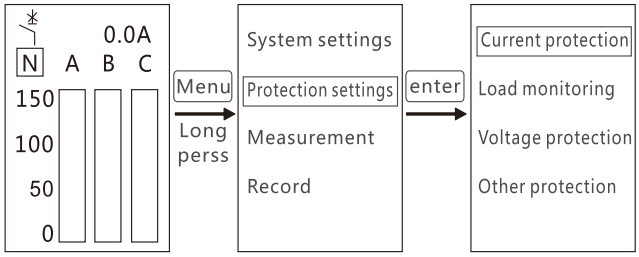



**Figure 86 Protection setting interface**

④ Measurement: Long press the "menu" button on the main interface to enter the theme menu, and press the "↓"and " enter " buttons to enter the protection measurement interface.

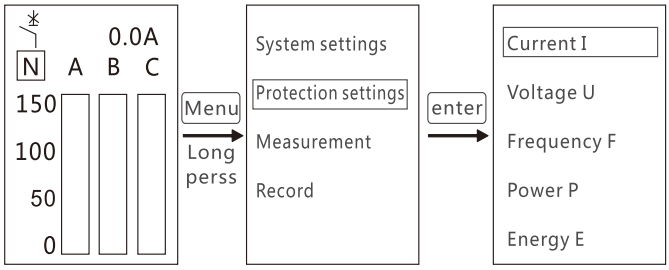



**Figure 87 Measurement interface**

⑤ Records: Long press the "menu" button on the main interface to enter the theme menu, and press the "↓" and "enter" buttons to enter the protection records interface.

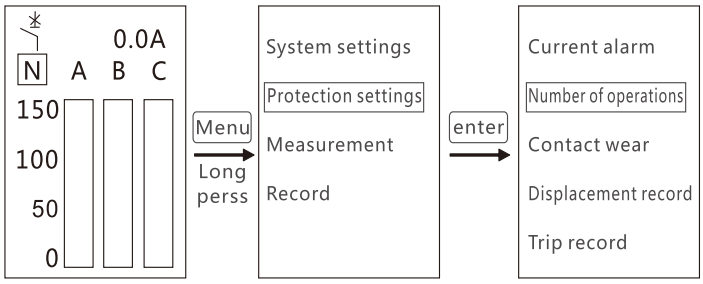



**Figure 88 Records interface**

12.2.3 Intelligent Controller Measurement Accuracy

**Table 43 Intelligent Controller measurement accuracy**

| | |
|---|---|
| **Current measurement** | |
| **Measuring range** | Ia, Ib, Ic and In, not less than 15In (breaker rated current) |
| **Measurement accuracy** | Not accurate below 0.1In |
| | accuracy varying linearly from 5% to 2% between 0.1In and 0.4In |
| | accuracy is 2% between 0.4In and 1.5In |
| | accuracy varying linearly from 2% to 15% above 1.5In |
| | accuracy is 10% for ground current |
| **Voltage measurement** | |
| **Measuring range** | Linear voltage: 0-600V |
| | Phase voltage: 0-300V |
| **Measurement accuracy** | Tolerance: ±1% |
| **Frequency** | |
| **Measuring range** | 45Hz-65Hz |
| **Tolerance** | Tolerance: ±0.1Hz |
| **Power** | |
| **Measurement method** | RMS mode |
| **Measurement content** | 3P-type: total active power, total reactive power, total apparent power |
| | 4P-type: split-phase active power, split-phase reactive power, split-phase apparent power, total active power, total reactive power, total apparent power |
| **Measuring range** | Active power: -32768kW-+32767kW |
| | Reactive power: -32768 kvar-+32767 kvar |
| | Apparent power: 0kVA-65535kVA |
| | Tolerance: ±2.5% |
| **Power factor** | |
| **Measurement content** | total power factor, split-phase power factor |
| **Measuring range** | -1.00-+1.00 |
| **Electric energy** | |
| **Measurement content** | Input reactive energy (EQin), output reactive energy (EQout) |
| | Input active energy (EPin), output active energy (EPout) |
| | Total active energy (EPtotal), total reactive energy (EQtotal), total apparent energy (EStotal) |
| **Measuring range** | Active energy: (0~4294967295)kWh |
| | Reactive energy: (0~4294967295)kvarh |
| | Apparent energy: (0~4294967295)kVAh |
| **Measurement accuracy** | ±2.5% |
| **Harmonic measurement** | |
| **Fundamental measurement** | Current: Ia, Ib, Ic |
| | Fundamental measurement voltage: Uab, Ubc, Uca |
| **Total harmonic distortion** | THD: total distortion rate of harmonic relative to fundamental wave |
| | Thd: total distortion rate of harmonic relative to RMS |
| **Amplitude spectrum of harmonics** | The Controller can display the FFT amplitude of 3-31 odd-order harmonics and display as a percentage. |
| **Control unit measurement accuracy** | ±2% |

### 12.3 Shunt Release (SHT)

The Shunt Release (SHT) is used to remotely disconnect the Circuit Breaker. When the Circuit Breaker is in the closed state, it can be opened at any time.

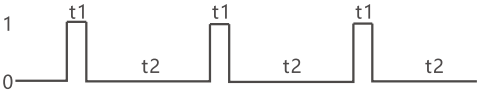
The SHT device has both AC and DC control modes. When the power supply voltage is equal to any voltage value between 70% and 110% of the rated control power supply voltage, the SHT can reliably disconnect the Circuit Breaker.

**Table 44 Characteristics of shunt release**

| Rated control power supply voltage Us(V) | AC220/230/240 | AC380/400/415 | DC220 | DC110 | AC110 |
|---|---|---|---|---|---|
| Operating voltage (V) | (0.7-1.1)Us | | | | |
| Break time (ms) | ≤28 | | | | |
| Power consumption (VA/W) | 500 | 620 | 500 | 400 | 400 |

**TIP:**

The Shunt Release and Closing Electromagnet belong to the pulse energization working mode, and it is necessary to ensure that the pulse time t1 is not less than 200ms and the energization interval t2 is greater than 15s.



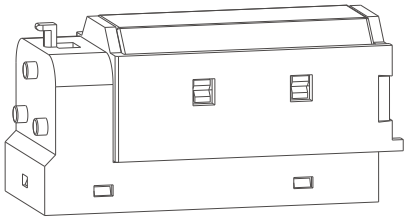



**Figure 89 Shunt Release**

### 12.4 Closed electromagnet

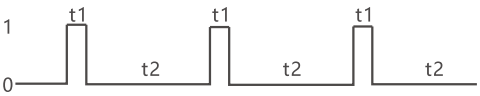
After the energy storage of the motor is completed, the closed electromagnet can be operated and controlled within a range of 10 meters to instantaneously release the energy storage spring force of the operating mechanism to close the circuit breaker.

**Table 45 Characteristics of closed electromagnet**

| Rated control power supply voltage Us(V) | AC220/230/240 | AC380/400/415 | DC220 | DC110 | AC110 |
|---|---|---|---|---|---|
| Operating voltage (V) | (0.85-1.1)Us | | | | |
| Close time (ms) | ≤50 | | | | |
| Power consumption (VA/W) | 500 | 620 | 500 | 400 | 400 |

**TIP:**

The Shunt Release and Closing Electromagnet belong to the pulse energization working mode, and it is necessary to ensure that the pulse time t1 is not less than 200ms and the energization interval t2 is greater than 15s.



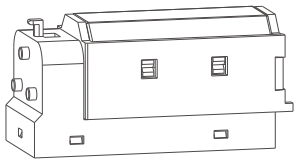


**Figure 90 Closed electromagnet**

## 12.5 Undervoltage release (Optional, The power must be turned on before the circuit breaker is closed)

12.5.1 The under-voltage release has instantaneous operation and delayed operation:

**Table 46 Operation types of each frame under-voltage release**

| | Self-priming | Helped priming |
|---|---|---|
| Under-voltage instantaneous release | Inm=1600A, 6300A | Inm=2000A, 3200A, 4000A |
| Under-voltage delay release | Inm=1600A, 6300A | Inm=2000A, 3200A, 4000A |

Note: 1. Inm=1600A under-voltage 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=6300A under-voltage delay does not require an external under-voltage delay controller. There is a delay function for low voltage and power off;

3. Inm=2000A~4000A under-voltage delay requires an external delay controller. There is a delay operation when the power is off. There is a zero voltage delay function.



**Figure 91 Undervoltage release**

**Table 47 Delay time of under-voltage release**

| Product shell | Delay time(optional) | Accuracy |
|---|---|---|
| Inm=1600A | 1s,3s,5s,7s(not adjustable) | ±15% |
| Inm=2000A～4000A | 1s(not adjustable) | (0~1)s |
| | 3s(not adjustable) | (0~1.2)s |
| | 5s(not adjustable) | (0~1.5)s |
| Inm=6300A | 0.3s～7.5s(adjustable) | ±15% |
| The under-voltage will not operate when the voltage returns to 85% Ue and higher,within 1/2 delay time. | | |

Note: A self-priming under-voltage delay release may be provided for special orders of NXA20~63. There is no external under-voltage delay controller, and the delay time is 0.3s~7.5s, selectable and adjustable with an accuracy of ±15%.



**Figure 92 Undervoltage delay controller**

12.5.2 When the under-voltage release is not powered, the circuit breaker cannot be closed either electrically or manually.

**Table 48 Characteristics of under-voltage release**

| | |
|---|---|
| **Rated control power supply voltage Ue(V)** | AC110, AC220/230/240, AC380/400/415 |
| **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=1600A/Inm=2000A~6300A)** | 20VA/48VA (W) |

**12.6 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 49 Characteristics of electric energy storage mechanism**

| | | |
|---|---|---|
| **Rated control power supply voltage Us(V)** | AC380/400/415<br>AC220/230/240 | DC220, DC110 |
| **Operating voltage (V)** | (0.85-1.1) Us | (0.85-1.1) Us |
| **Power consumption (Inm=1600A)** | 90W | 90W |
| **Power consumption (Inm=2000A)** | 85W | 85W |
| **Power consumption (Inm=3200A, 4000A)** | 110W | 110W |
| **Power consumption (Inm=6300A)** | 150W | 150W |
| **Energy storage time** | ≤5s | ≤5s |

Note: The single power-time time must not exceed 7s to avoid damage.



**Figure 93 Motor**

**12.7 Auxiliary Contacts**

12.7.1 NXA16 model

Standard type: 4 sets of conversion contacts

Special type: 6 sets of conversion contacts(for AC only)

12.7.2 NXA20~NXA63 model

Standard type: 4 sets of conversion contacts

Special type:3 normally open and 3 normally closed contacts, 4 normally open and 4 normally closed contacts, 5 normally open and 5 normally closed contacts, 4 sets of conversion contacts, and 5 sets of conversion contacts

Table 50 Auxiliary contact capacity

| Rated voltage (V) | Rated heating current Ith (A) | Rated control capacity |
|---|---|---|
| AC230 | 10/6 | 300VA |
| AC400 | 6 | 100VA/300VA |
| DC220(Inm=1600A/Inm=2000-6300A) | 0.5/6 | 60W |

Table 51 Auxiliary rated operating current

| Category | Voltage | Current |
|---|---|---|
| AC-15 | AC240V | 1.3A |
| (Inm=1600A/Inm=2000-6300A) | AC415V | 0.25A/0.75A |
| DC-13 | DC110V | 0.55A |
| | DC220V | 0.27A |



Figure 94 Auxiliary Contacts

**12.8 Door Frame and Pad (fixed and drawer types)**

The door frame and pad are installed on the door of the power distribution cabinet for sealing, and the protection level reaches IP20.

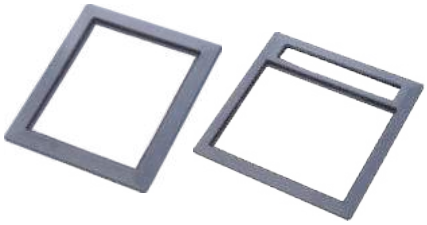


Figure 95 Door Frame and Pad

**12.9 Inter phased partition**

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

Note: 1. The fixed and drawer type products have different phase spacers;
2. NXA16 and NXA20-63 products have different phase spacers;
3. Three-pole products use two phase spacers, and four-pole products use three phase spacers.



Figure 96 Inter phased partition

### 12.10 "Separated" Position Locking Device

When the drawer type circuit breaker is in the "separated" position, the lock lever can be pulled out and locked with the padlock. The circuit breaker cannot be shaken to the "test" or "connected" position (self-supplied by the padlock user).



**Figure 97 "Separated" Position Locking Device**

### 12.11 Keys and locks

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

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

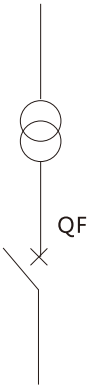


**Figure 98 Keys and locks**

12.11.3 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 Φ28mm for NXA20-63 and Φ21mm NXA16. 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 opening button, turn the key counterclockwise, and then pull out the key.

Circuit diagram

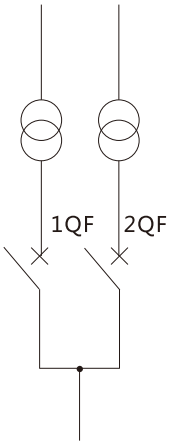



Possible mode of operation

| QF |
|---|
| 0 |
| 1 |

99-a One lock and one key: One circuit breaker is equipped with one separate lock and one key

Circuit diagram

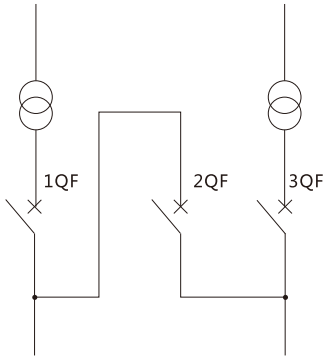



Possible mode of operation

| 1QF | 2QF |
|---|---|
| 0 | 0 |
| 0 | 1 |
| 1 | 0 |

99-b Two locks and one key: Two circuit breakers are equipped with two identical locks and one key

Circuit diagram

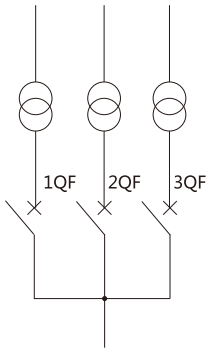



Possible mode of operation

| 1QF | 2QF | 3QF |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 0 | 1 |
| 0 | 1 | 1 |
| 1 | 0 | 0 |
| 1 | 1 | 0 |
| 1 | 0 | 1 |

99-c Three locks and two keys: Three circuit breakers are equipped with three identical locks and two identical keys

Circuit diagram




Possible mode of operation

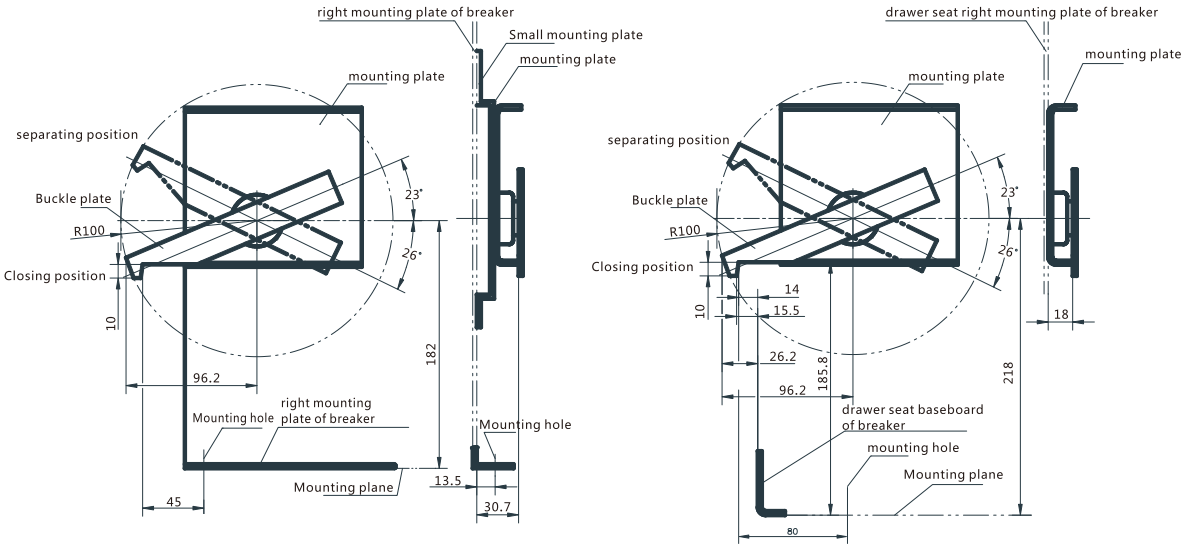
| 1QF | 2QF | 3QF |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |

99-d Three locks and one key: Three circuit breakers are equipped with three identical locks and one key

**Figure 99 Operation mode of circuit breaker equipped with locks and keys**

### 12.12 Door Interlock(only available for NXA20-63 model)

a. Circuit breaker status door interlock: The cabinet door is forbidden to open when the circuit breaker is closed and is allowed to open when the circuit breaker is disconnected.




101-a Fixed type

101-b Drawer type

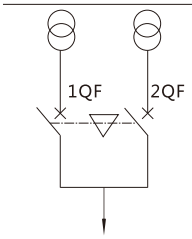
**Figure 100 Installation dimension drawing of NXA20-63 air circuit breaker status door interlock**

b. Circuit breaker position door interlock: The cabinet door is forbidden to open when the circuit breaker is in the connection and test positions and is allowed to open when the circuit breaker is in the separation position.

### 12.13 Steel Cable Interlock (see Appendix 12.22 for installation method)

12.13.1 Double Interlock (can realize interlocking of two horizontal or three vertical three-pole or four-pole circuit breakers)





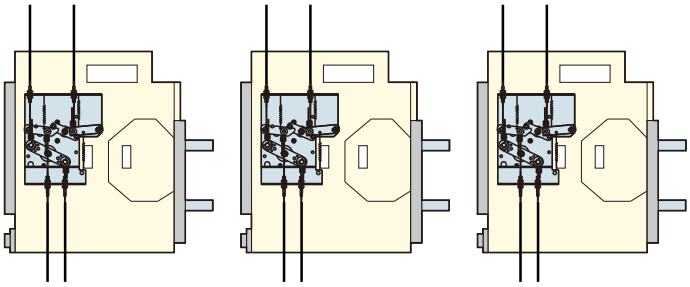

Circuit diagram

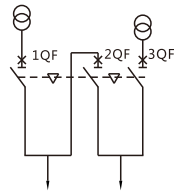
Possible mode of operation

| 1QF | 2QF |
|---|---|
| 0 | 0 |
| 0 | 1 |
| 1 | 0 |

**Figure 101 Steel cable interlock**

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






| 1QF | 2QF | 3QF |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

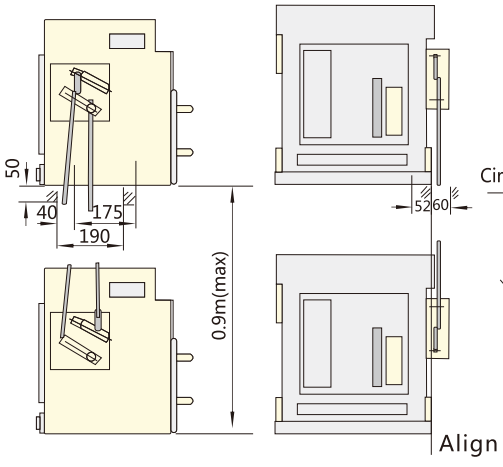
Circuit diagram Possible mode of operation

**Figure 102 Steel cable triple interlock**

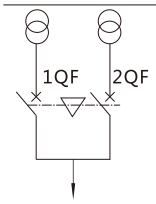
### 12.14 Connecting Rod Interlock (available for NXA20-63 products, not for NXA16 products)

For two vertically mounted three-pole or four-pole circuit breakers, the interlock can be realized when one is closed and the other is opened.






Circuit diagram Possible mode of operation




| 1QF | 2QF |
|---|---|
| 0 | 0 |
| 0 | 1 |
| 1 | 0 |

**Figure 103 Connecting rod interlock**

### 12.15 External Leakage Transformer (E Mode)

The external leakage transformer is suitable for leakage faults caused by equipment insulation damage or by human body exposure to exposed conductive parts. The leakage trip value $I_{\triangle n}$ is directly expressed in amperes, irrelevant to the rated current of the circuit breaker. The signal is taken in a zero-sequence sampling mode, and a rectangular transformer is required. This sampling has high precision and high sensitivity and is suitable for protection of a small current.

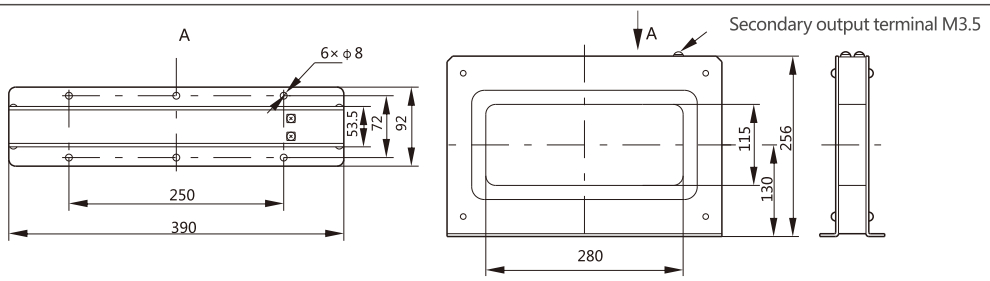



**Figure 104 ZCT1: rectangular leakage transformer**

Note: ZCT1 provides the bus pass-through method for NXA16 (3P/4P) and NXA20(3P) products, not for NXA20(4P) and NXA32-63 products.

12.15.1 Leakage Protection Related Setting Parameters

**Table 52 grounding protection parameter setting**

| Parameter name | Setting range | Setting step |
|---|---|---|
| Operating current setting value I△n | (0.5-30.0)A | Step size 0.1 A |
| Delay time T△n(S) | Instantaneous, 0.06, 0.08, 0.17, 0.25, 0.33, 0.42, 0.5, 0.58, 0.67, 0.75, 0.83 | |
| Execution mode | trip / close | |

12.15.2 Leakage Protection Action Characteristics

**Table 53 Leakage protection action characteristics**

| Characteristics | Current multiple (I/I△n) | Appointed trip time | Delay tolerance |
|---|---|---|---|
| Non-action characteristics | < 0.8 | Non-action | |
| Action characteristics | > 1.0 | Action | |
| Action characteristics | ≥1.0 | See Table 54 | ±10% (inherent absolute tolerance ±40ms) |

**Table 54 Leakage protection action delay**

| Maximum disconnection time(s) / Setting time(s) / Fault current | 0.06 | 0.08 | 0.17 | 0.25 | 0.33 | 0.42 | 0.5 | 0.58 | 0.67 | 0.75 | 0.83 | Instantaneous |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I△n | 0.36 | 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 0.04 |
| 2I△n | 0.18 | 0.25 | 0.5 | 0.75 | 1 | 1.25 | 1.5 | 1.75 | 2 | 2.25 | 2.5 | 0.04 |
| 5I△n | 0.072 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1 | 0.04 |
| 10I△n | | | | | | | | | | | | |

12.15.3 Leakage protection detection principle shown in Figure 103

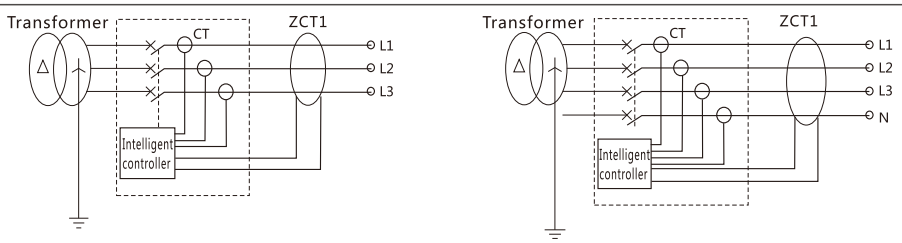



**Figure 105 Leakage protection detection principle**

### 12.16 External Ground Current Transformer (W Mode)

When the grounding mode is ground current type(W), the ground current transformer is installed on the ground line at the transformer. The current sampling signal is connected to the intelligent controller of the circuit breaker through the CTB-2 grounding protection. The protection mode is fixed time protection, and the protection characteristics are the same as that of vector sum type

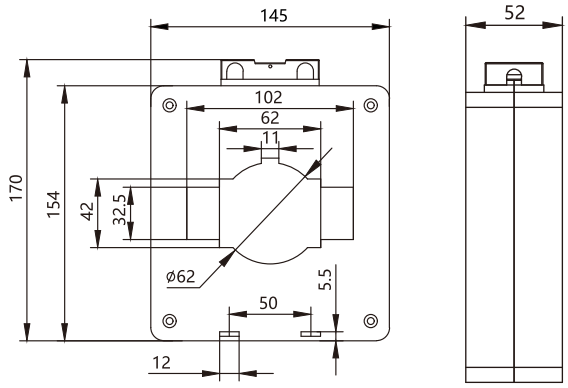
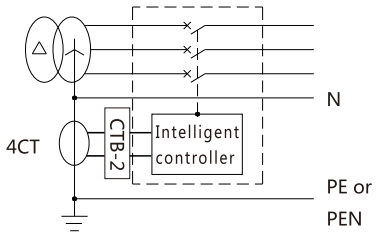



**Figure 106 External ground current transformer size**




4CT : external special transformer ,

CTB-2 : ground current transformer module

**Figure 107 Ground current protection principle**

Structure size of external ground current transformer (W Mode)

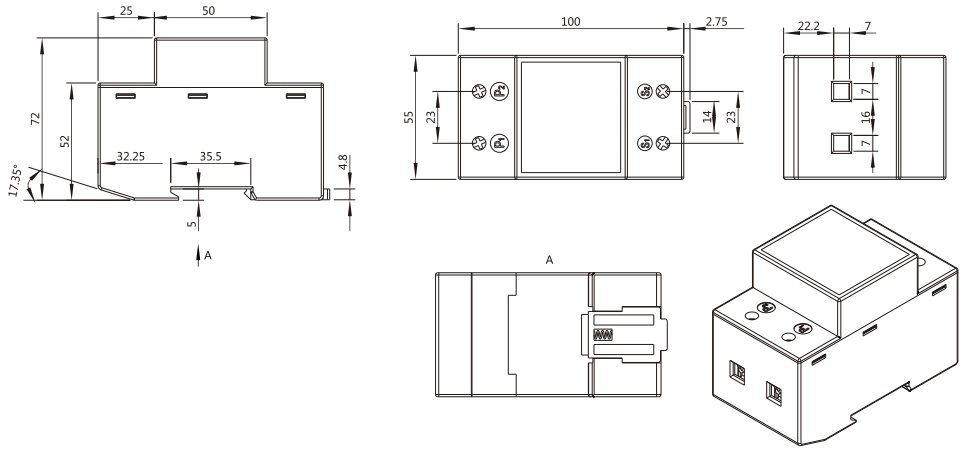



**Figure 108 CTB-2 ground current transformer module**

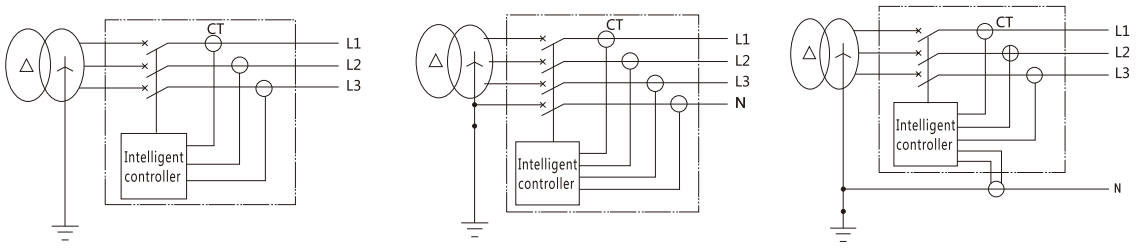
### 12.17 Grounding Protection Principle

Metal grounding protection with single-phase grounding protection fault current of several hundred amperes is generally used for neutral point direct ground system. The controller has two different protection modes: one is the vector sum mode, and the other is the external transformers mode. As shown in Figure 109

a、 In the three-phase three-wire system, the three-pole circuit breaker is selected without a transformer, the ground fault signal only takes the vector sum of the three-phase current, and the protection characteristic is the time-limited protection. (See 3PT mode)

b、 In the three-phase four-wire system, the four-pole circuit breaker is selected without a transformer, the ground fault signal only takes the vector sum of the three-phase current and the N pole current, and the protection characteristic is the time-limited protection. (See 4PT mode)

c、 In the three-phase four-wire system, the three-pole circuit breaker is selected with an external neutral pole N current transformer for grounding protection (the NXA16 model is connected to 6# and 7# terminal blocks and NXA20-63 models connected to 25# and 26# terminal blocks), the ground fault signal takes the vector sum of the three-phase current and the N pole current, and the protection characteristic is the time-limited protection. (See (3P+N)T mode)




**3PT mode** **4PT mode** **(3P+N)T mode**

**Figure 109 grounding protection modes**

Note: (1) The external N-phase current transformer is a specially configured transformer of the company.

(2) In the 3PT mode,when the unbalanced current of the system exceeds Ig, the ground fault protection of the circuit breaker will trip incorrectly. To prevent false switching, disable the ground fault protection function;

(3) In the (3P+N)T mode, the maximum distance between the transformer and the circuit breaker should not exceed 5 m. In the 4PT mode The P/H type controller has a unique feature. It allows two independent ground fault protection curves to be set so that two configurations can be managed simultaneously. Due to this feature, the trip can distinguish between ground faults in an unlimited area (command the breaker to open) and ground faults in a limited area (command the medium voltage breaker to open).

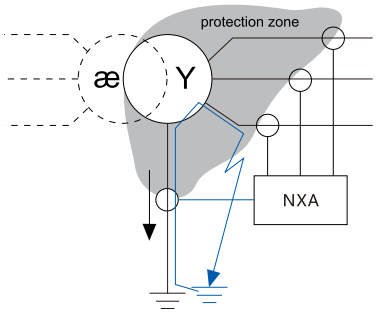



**Figure 110 Double ground protection**

## 12.18 Installation Dimensions of Undervoltage Delay Controller

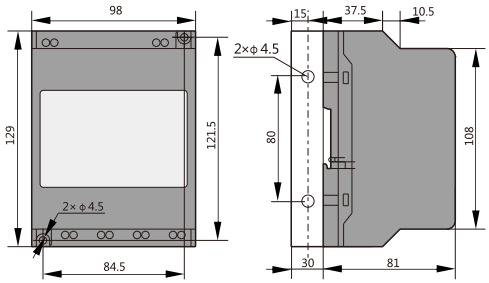
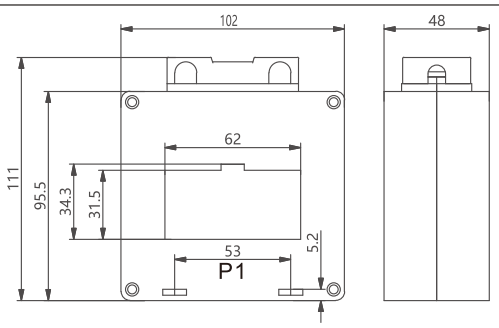


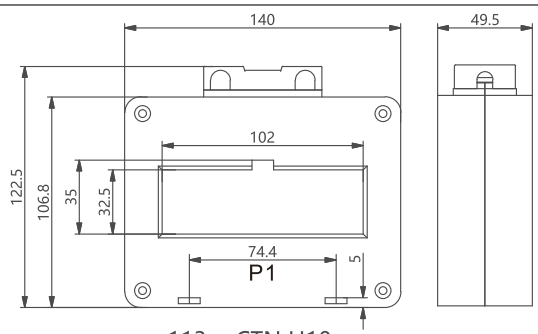

**Figure 111 Undervoltage delay controller**

### 12.19 External N phase current transformer (3P+N Mode)

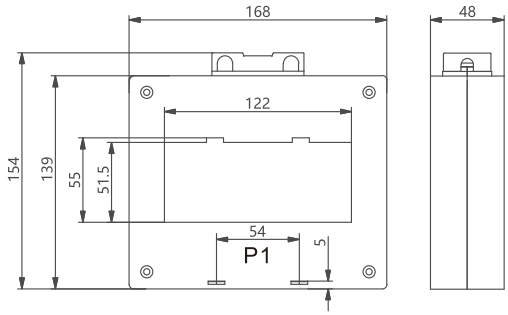
If a 3P+N controller is selected, for the overall and mounting dimensions of the external N phase transformer, please refer to the figure below.




113-a CTN H6




113-a CTN H10




113-c CTN H12

TIPs: 1. When the incoming line of the Circuit Breaker is at the upper end, the P1 side should face the incoming line; When the incoming line of the Circuit Breaker is at the lower end, the P1 side should face the load;

2. The Transformer should be connected to the Circuit Breaker using twisted pair wires, with a cross-sectional area of not less than 0.75mm$^2$ and a length of less than 2m. S1 should be connected to the secondary circuit terminal 25 of Circuit Breaker;S2 should be connected to the secondary circuit terminal 26 of Circuit Breaker.

3. CTN prohibits grounding.

**Table 55 Recommended Models for External N-pole Transformer**

| Case Frame | Rated Current (A) | Transformer Ratio Code | Transformer Perforation Size | | |
|---|---|---|---|---|---|
| | | | H6:60*30 | H10:100*30 | H12:120*50 |
| 1600 | 400~630 | T2 | ● | ○ | |
| | 800~1600 | T3 | ● | ○ | ○ |
| 2000 | 630~2000 | T3 | ● | ○ | ○ |
| 3200 | 1600~3200 | T4 | | ● | ○ |
| 4000 | 3200~4000 | T4 | | | ● |
| 6300 | 4000~6300 | T4 | | | ● |
| TIP: ●Default Configuration, ○Optional Configuration | | | | | |

**Figure 113 External N phase transformer**

Note: If the ACB is up lead connection, side A should face the load side. If the ACB is down lead connection, side A should face the power supply side.

## 12.20 PSU-1 Power Supply Unit

The PSU-1 power supply unit can provide DC 24 V power with a power not less than 9.6 W. It can output two sets of terminals, input AC (AC220V, AC400V) or DC (DC110V, AC220V) power. It can be used as the power supply for the RU-1 relay unit. The product adopts the 35 mm standard rail mounting method. The shape and installation dimensions are shown in Figure 115.




Figure 114 PSU-1 power supply unit

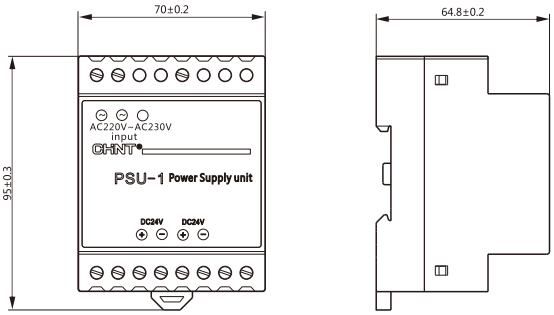



Figure 115 PSU-1 power supply unit installation structure

## 12.21 RU-1 Power Relay Unit

The signal unit output by the controller is generally used for fault alarm or indication. When it is used to control the opening and closing of the circuit breaker or the load capacity is large, it needs to be controlled after converted by the RU-1 relay unit. The capacity of the RU-1 contact is AC250V, 10A; DC28V, 10A. Its shape and installation dimensions are the same as those of the PSU-1 power module.

## 12.22 RU-1 Power Module

The signal unit output by the controller is generally used for fault alarm or indication. When it is used to control the opening and closing of the circuit breaker or the load capacity is large, it needs to be controlled after converted by the RU-1 relay module. The capacity of the RU-1 contact is AC250V, 10A; DC28V, 10A. Its shape and installation dimensions are the same as those of the PSU-1 power unit.




Figure 116 RU-1 Relay Unit

### 12.23 Push button lock

The push button lock the circuit breaker by a transperant conver blocks so as to prevent the breaking button and the making button of the circuit breaker from misoperation and guarantee the reliable running of the circuit breaker.



**Figure 117 Push button lock**

### 12.24 other accessories

**Table 56 Alarming contact**

| | | |
|---|---|---|
| Standard configuration | | 1CO |
| Breaking capacity | | Current (A) / Voltage (V) |
| Utilization category | VAC(AC-15) | 1.3/240, 0.75/415 |
| | VDC(DC-13) | 0.55/110, 0.27/220 |

**Table 57 Spring charging indication contact**

| | | |
|---|---|---|
| Standard configuration | | 1NO |
| Breaking capacity | | Current (A)/ Voltage (V) |
| Utilization category | VAC(AC-15) | 1.3/240, 0.75/415 |
| | VDC(DC-13) | 0.55/110, 0.27/220 |

Note: [1] CO refers to a switch contact, and a one-normally-open and one-normally-closed contact is matched with a common terminal.
[2] NO refers to a normally open contact. NC refers to a normally closed contact.



Secondary wiring terminal-drawout type



Secondary wiring terminal-fixed type

**Figure 118 other accessories**

CHINT ELECTRICS

# NXA Series
# Air Circuit Breaker
# User Instruction


**Zhejiang Chint Electrics Co., Ltd.**

Add: No.1, CHINT Road, CHINT Industrial Zone,North Baixiang,
Yueqing, Zhejiang 325603,P.R.China
E-mail: global-sales@chint.com
Website: http://en.chint.com