

VOZWEI

Application for
Solar Energy
Wind Power
5G Communication



CIRCUIT BREAKER PRODUCT MANUAL

VOZWEI

Brief Introduction

VOZWEI is a dual drive company driven by technology and client's demand, focusing on people's electricity safety and striving to contribute to the development of green energy. We specialize in the research and development, production, sales, and service of terminal electrical apparatus, electrical distribution apparatus, and control electrical apparatus, such as miniature circuit breakers, molded case circuit breakers, Air circuit breakers, DC contactors, and other electrical products.

Since its establishment, VOZWEI has adhered to the core value of "achieving clients" and driven product research and development based on client's needs. We focus on 5G communication, solar energy, and wind power applications, etc. relying on the manufacturing advantages of China's industry and the excellent cost control and quality management advantages of our team to achieve cost control for clients, while ensuring the business philosophy of providing high-quality electrical products and solutions. At present, our products have involved in dozens of countries and regions such as Germany, France, Italy, Britain, Brazil, Argentina, Colombia, Canada, Israel, Thailand, Vietnam, South Korea, India, etc.



**5G
Communication**



**Solar
Energy**



**Wind
Power**

Corporate Cultures

Our Vision

Pursuing excellence, creating the electrical future of a safer, more reliable and smarter

Our Mission

Steady development, bring the electric products of premium quality and reasonable prices to world

Core values

Value, Reliability, Efficiency, Innovation, Low-carbon, Vitality

Work Philosophy

Relying on responsibility and diligence to aim at perfection, respect everyone, and happiness comes from striving

Contents



01

VW3

Air Circuit Breaker

Design Features

Selection Guide

Controller

Accessories

Main Characteristic

Size and Connection

Order Notes

1-2

1-3

1-11

1-27

1-37

1-38

1-57

02

VM3

Molded Case Circuit Breaker

Design Features

Selection Guide

Main Characteristic

Accessories

Characteristics Curve

Size and Connection

2-2

2-3

2-6

2-8

2-15

2-16

03

VM5

Molded Case Circuit Breaker

Design Features

Selection Guide

Main Characteristic

Accessories

Size and Connection

3-2

3-3

3-5

3-6

3-10

04

VB2

Miniature Circuit Breaker

Design Features

VB2-63

VB2T-63

VB2TS-63

VB2Z-63

4 - 2

4 - 3

4 - 7

4 - 12

4 - 15

VW3

Air Circuit Breaker



Design Features

VOZWEI



- Tailored for solar energy, wind power and energy storage systems
- High-voltage air circuit breaker, optional 800Vac, 1140Vac, 1250Vac, 1500Vac
- With ultra-high breaking capacity, max meet 80KA at 800Vac
- With excellent anti damp heat and dew solidification capabilities
- Strong ability to adapt to alternating changes in high and low temperatures
- Strong resistance to salt spray and humid environments
- High altitude adaptability, still safe working at an altitude of 5000 meters
- Can be used in complex mixed gas environments (Cl₂, SO₂, NO₂, H₂S)
- Low energy consumption and temperature rise of the product itself
- Integrated communication network, capable of remote control, telemetry, remote signaling, and remote adjustment

Ambient conditions

Operating ambient temperature/storage temperature

- Operating environment temperature:-40°C- +70°C

Altitude conditions

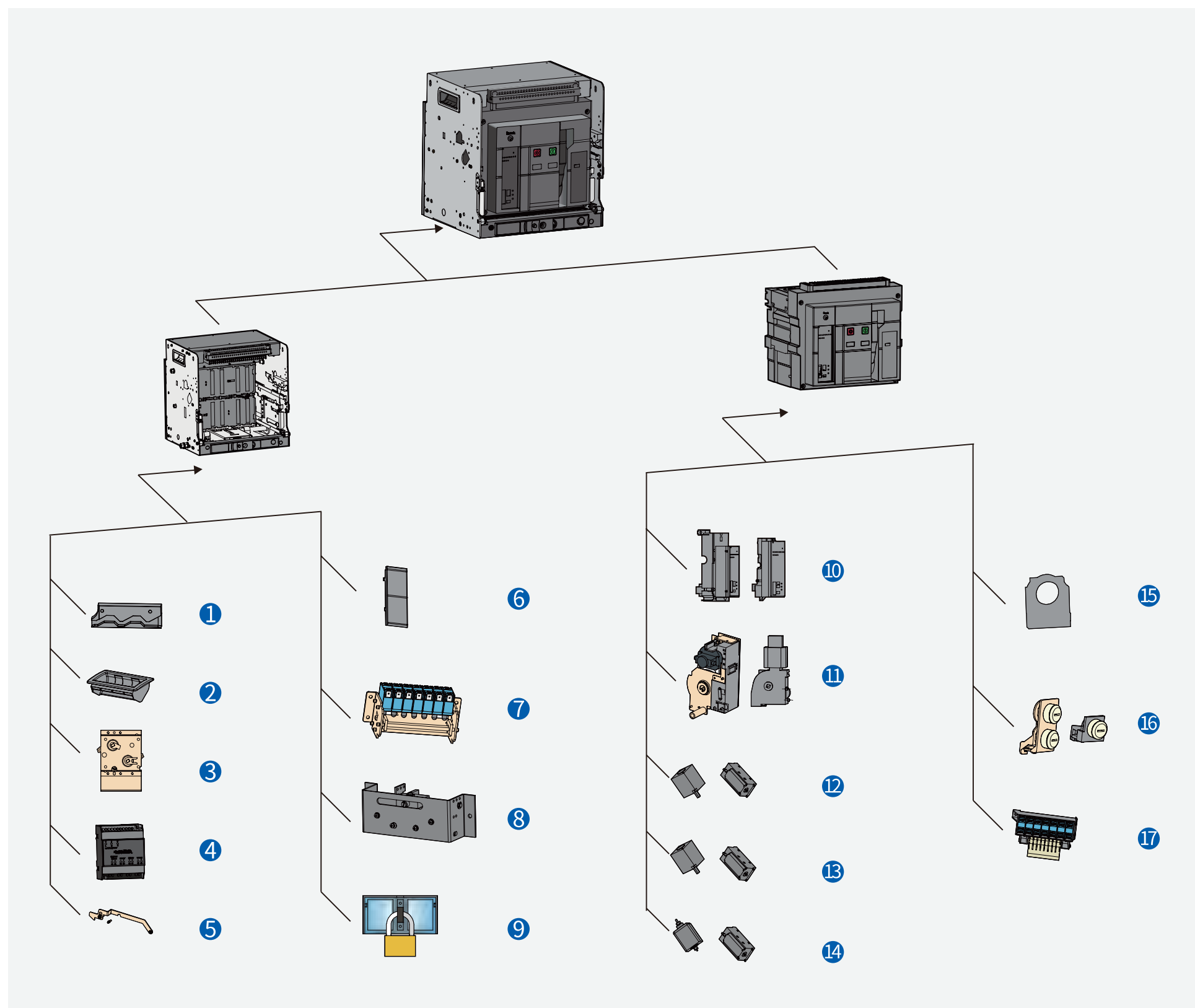
- Altitude of installation site ≤ 5000m (Over 2000 meters need capacity reduction for using)

Shockproof level

- Passed the impact test with a peak acceleration of 30g and three axes and six directions
- Passed the vibration test with an acceleration of 10g and a frequency of 10-200Hz
- Excessive vibration may cause component damage and affect the reliable operation of the circuit breaker

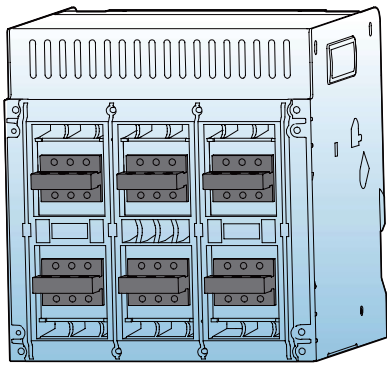
Corrosion prevention

- Passed the C4-H level anti-corrosion test specified in ISO12944-6 and GB/T 30790.6-2014 standards

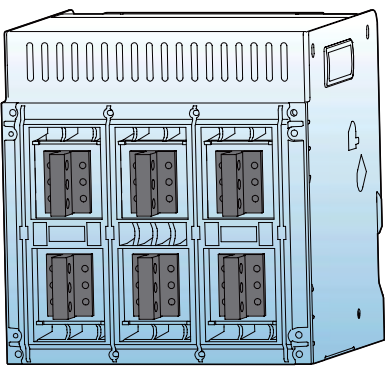


VW3 Accessories

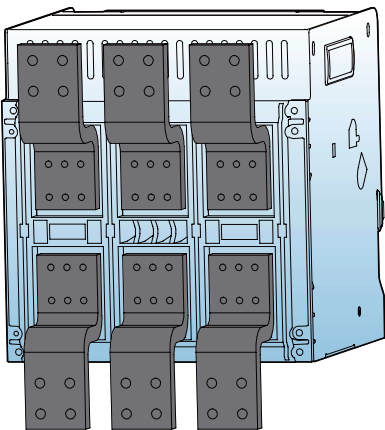
- | | | | |
|---------------------------|------------------------------|---|------------------------|
| ① Positioning component | ⑥ Phase partition | ⑪ Motor operating mechanism | ⑫ Prevent closing lock |
| ② Sheath | ⑦ External auxiliary contact | ⑬ Shunt release | ⑭ Auxiliary contact |
| ③ Mechanical interlocking | ⑧ Position indication | ⑮ Undervoltage(loss of voltage) release | |
| ④ Power supply module | ⑨ Button lock | ⑯ Closed electromagnet | |
| ⑤ Door interlocking | ⑩ Controller | ⑰ External transformer | |



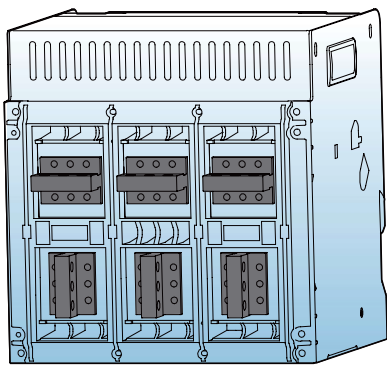
Horizontal Wiring C1



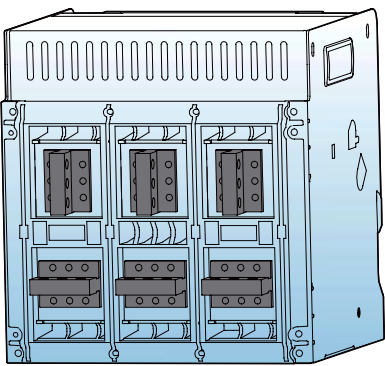
Vertical Wiring C2



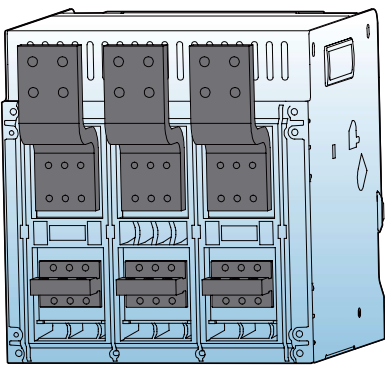
Forward Wiring C3



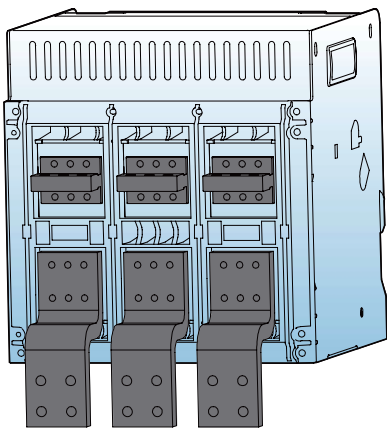
Mixed Wiring C4
(Upper Horizontal, Lower Vertical)



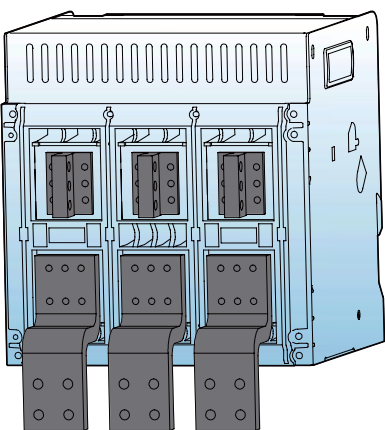
Mixed Wiring C5
(Upper Vertical, Lower Horizontal)



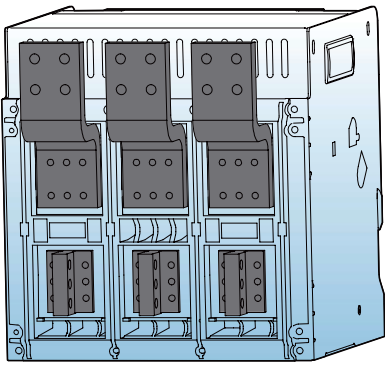
Mixed Wiring C6
(Upper Forward, Lower Horizontal)



Mixed Wiring C7
(Upper Horizontal, Lower Forward)



Mixed Wiring C8
(Upper Vertical, Lower Forward)



Mixed Wiring C9
(Upper Forward, Lower Vertical)

Wiring mode	VW3-25	VW3-40		VW3-63
		1000~3200A	3600~4000A	
Horizontal Wiring	●	●	●	●
Vertical Wiring	—	○	○	—
Forward Wiring	—	○	—	—
Mixed Wiring (Upper Horizontal, Lower Vertical)	—	○	○	—
Mixed Wiring (Upper Vertical, Lower Horizontal)	—	○	○	—
Mixed Wiring (Upper Forward, Lower Horizontal)	—	○	—	—
Mixed Wiring (Upper Horizontal, Lower Forward)	—	○	—	—
Mixed Wiring (Upper Vertical, Lower Forward)	—	○	—	—
Mixed Wiring (Upper Forward, Lower Vertical)	—	○	—	—

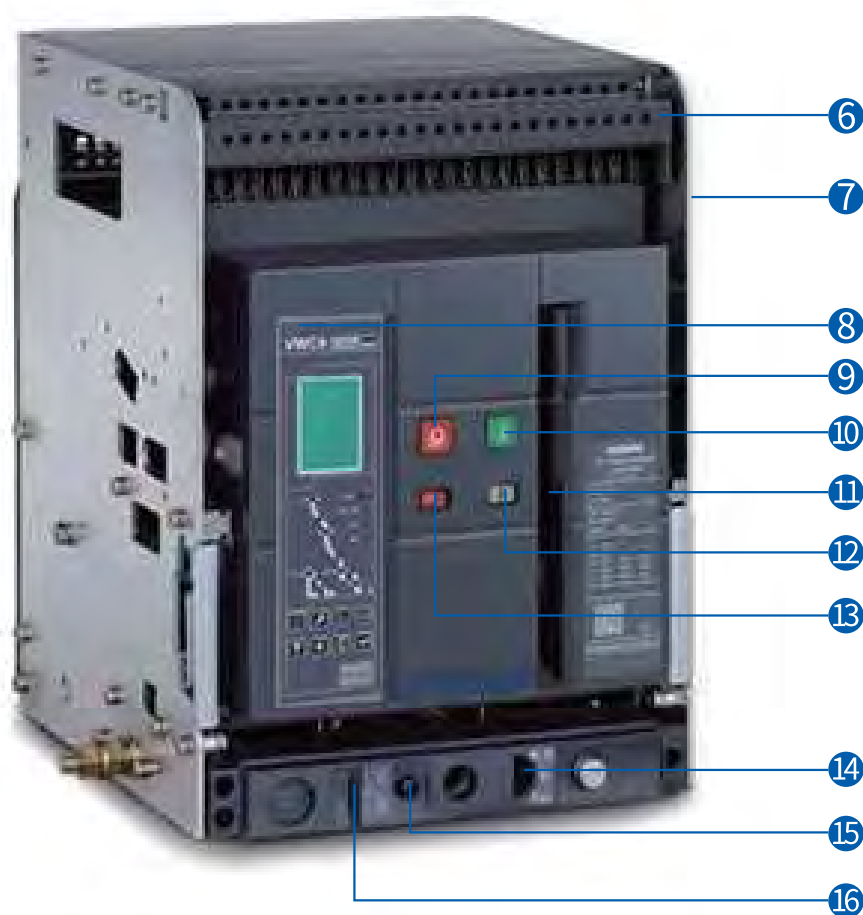
Note: ● standard wiring, ○ optional wiring, — without wiring

Fixed type



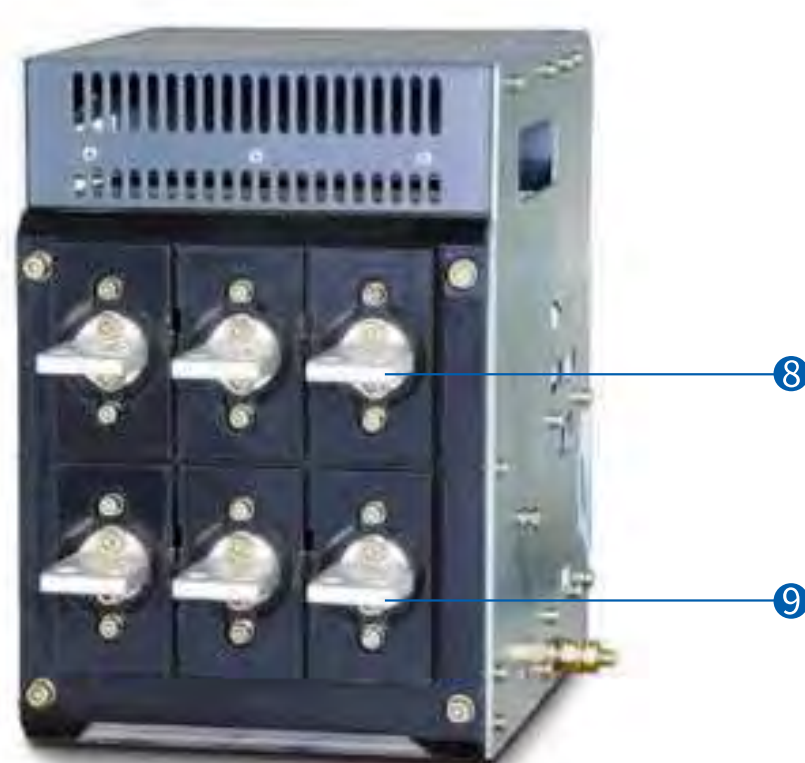
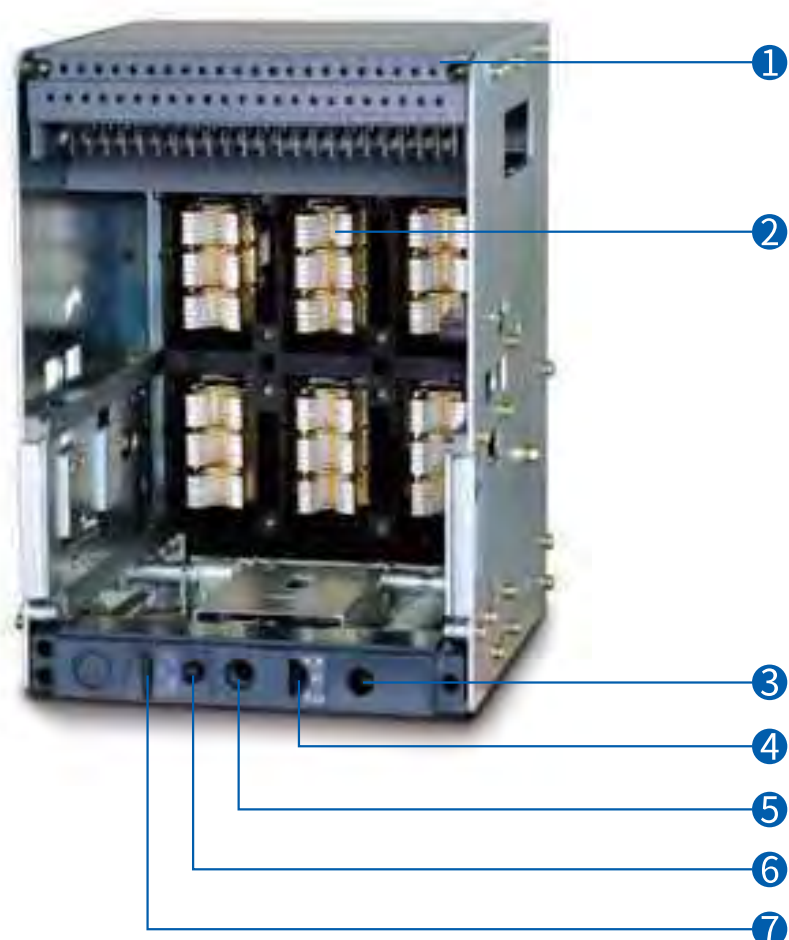
- ① Secondary wiring chart
- ② Controller
- ③ Nameplate
- ④ Fixed bracket
- ⑤ Grounding bolt
- ⑥ Secondary wiring terminal
- ⑦ Drawer seat
- ⑧ Reset button
- ⑨ Disconnection button
- ⑩ Closing button

Drawout type



- ⑪ Manual energy storage handle
- ⑫ Energy releasing and storing indication
- ⑬ Disconnection and closing indication
- ⑭ Three position indication
- ⑮ Unlocking button
- ⑯ Separation position locking device

Drawer seat



- ① Secondary wiring terminal
- ② Bridge contact
- ③ Rocker and storage position
- ④ Three position indication
- ⑤ Rocker operating position

- ⑥ Unlocking button
- ⑦ Separation position locking device
- ⑧ Upper wiring terminal
- ⑨ Lower wiring terminal

Model Explanation and Encoding Rules

VW3 - 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19																		
SN	Name	Specification, type code														Description		
1	Design code	VW3: Design code																
2	Frame rating	25: 2500A; 40: 4000A; 63: 6300A																
3	Breaking type	H: High breaking level; HU: High voltage level; HV: Ultra height voltage level																
4	Rated current	06: 630A; 08: 800A; 10: 1000A; 12: 1250A; 16: 1600A; 20: 2000A; 25: 2500A; 29: 2900A; 32: 3200A; 36: 3600A; 40: 4000A; 50: 5000A; 63: 6300A																
5	Installation mode	F: Fixed type; D: Drawout type																
6	Number of poles	3: 3P; 4: 4P; 5: 3P+N														3P+N: 3P products are added with N-phase external transformers		
7	Controller	VWC4 (digital screen), VWC6 (LCD)																
8	Controller optional function	Protection type		Empty: Conventional type; V: Voltage measurement; P: Harmonic measurement and protection												1.VWC4 controller only has S1-4DO; 2. Choose one from the communication functions of "H", "MP", "MD";		
		Communication function		H: Modbus protocol; MP: Profibus-DP protocol; MD: Devicenet protocol														
		Signal unit		S1: 4DO; S2: 3DO+1DI; S3:2DO+2DI														
		Remote reset function		Z2: AC230V														
		Grounding mode		T: Differential type W: Ground current type Note: 3P+N needs to be added with an external transformer														
		External N-phase transformer		N1; N2; N3; N4														
		Protection form of current leakage: E-type (including the external current leakage transformer)																
Contact wear equivalent: J																		
9	Electric energy storage mechanism	D1:AC400V; D2:AC230V/DC220V; D4: AC/DC110V; D5:DC24V																
10	Shunt release	F1:AC400V; F2:AC230V/DC220V; F4: AC/DC110V; F5:DC24V																
11	Closed electromagnet	B1:AC400V; B2:AC230V/DC220V; B4: AC/DC110V; B5:DC24V																
12	Under-voltage release / Loss of voltage release / Voltage-check release	Under-voltage release		Q1: AC400V; Q2: AC230V; Q5: DC24V												1. Choose one from the Under-voltage release, Loss of voltage release, Voltage-check release;		
		Loss of voltage release		S1: AC400V; S2: AC230V														
		Voltage-check release		J1: AC400V; J2: AC230V														
13	Under-voltage release / loss of voltage release Delay time	0: Instantaneous; 1: 1s delay; 3: 3s delay; 5: 5s delay																
14	Auxiliary contact	A33: 3NO3NC; A44: 4NO4NC; ... ; A1414: 14NO14C																
		A3: Three-group switching; A4: Four-group switching; ...; A14: Fourteen-group switching																

Model Explanation and Encoding Rules

VW3

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

SN	Name	Specification, type code		Description
15	Internal Accessories	BX: Closing ready signal output unit		
		JS: Counter functional unit		
		CM1: Drawout type (with the right side of the door interlock);		
		CX: Drawer seat three-position signal output		
16	External accessories	M: Doorframe Note: standard		
		R: Relay module		
		Power supply module	AC65~500V, DC80~700V Note: standard	
		S: Button lock		
		P2: Voltage conversion module		
17	Wiring mode	C1: Horizontal wiring, C2: Vertical wiring. C3: Forward wiring; C4: Mixed wiring (upper horizontal, lower vertical); C5: Mixed wiring (upper vertical, lower horizontal); C6: Mixed wiring (upper forward, lower horizontal); C7: Mixed wiring (upper horizontal, lower forward); C8: Mixed wiring (upper vertical, lower forward); C9: Mixed wiring (upper forward, lower vertical)		
		1: Standard wiring, 2: Extended wiring		
18	Rated working voltage	Empty: AC690V and below; KV4: AC800V; KV6: AC1140V; KV8: AC1500V		
19	Language type	Empty: Chinese; Y: English		

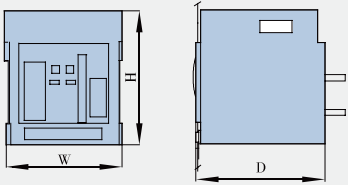
Interlocking Piece Model Explanation and Encoding Rules

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

Series

VW3-25



Rated current In(A)		
Rated working voltage Ue(V) 50Hz/60Hz		
Rated insulation voltage Ui(V)		
Rated impulse withstand voltage Uimp(kV)		
Power frequency withstand voltage U(V) 1min		
Number of poles		
N-pole rated current		
Breaking capacity code		
Rated limit short-circuit breaking capacity (effective value) Icu(kA)		
Rated operating short-circuit breaking capacity (effective value) Ics(kA)		
Rated short circuit making capacity (peak value) Icm(kA)		
Rated short-time withstand current (effective value) Icw(kA) 1s		
Rated conditional short-circuit current Icc(kA)		
Full break time (no additional delay) (ms)		
Closing time (ms)		
Operating performance	Electrical life (times)	
	Mechanical life (times)	Without maintenance
		Maintenance
Operational condition	Utilization category	
	Pollution degree	
	Protection grade	
	Ambient temperature	
	Altitude	
Outline dimension (mm) (H × W × D) 		Drawout type 3P
		Drawout type 4P
		Fixed type 3P
		Fixed type 4P

630, 800, 1000, 1250, 1600, 2000, 2500				
AC400	AC500	AC690	AC800/AC1140	AC1500
1800				
18				
AC5000V 50Hz/60Hz				
3P/4P			3P	3P
100%I _n				
H			HU	HV
85	75	65	75	50
85	75	65	75	50
187	165	143	165	105
85	75	65	70	50
85	75	65	70	50
12~18				
≤60				
15000 (630~1250A) 11500 (1600~2000A) 11000 (2500A)	12500 (630~1250A) 10000 (1600~2000A) 8000 (2500A)		5000 (630~1250A) 5000 (1600~2000A) 5000 (2500A)	500 (630~1250A) 500 (1600~2000A) 500 (2500A)
15000				
30000				
B				
3				
IP40				
≥-40℃				
≤5000m				
430 × 407 × 395				
430 × 522 × 395				
390 × 422 × 297.5				
390 × 537 × 297.5				

VW3-40



1000, 1250, 1600, 2000, 2500, 2900, 3200, 3600, 4000					
AC400	AC690	AC800	AC1140	AC1250	AC1500
1800					
18					
AC5000V 50Hz/60Hz					
3P/4P		3P		3P	
100%In					
H		HU		HV	
100	85	80	75	66	50
100	85	80	75	66	50
220	187	176	165	145	105
100	85	80	75	66	50
100	85	80	75	66	50
12~18					
≤60					
10000 (1000~2500A) 8000 (2900~3200A) 8000 (3600~4000A)		5000 (1000~2500A) 5000 (2900~3200A) 5000 (3600~4000A)		500 (1000~2500A) 500 (2900~3200A) 500 (3600~4000A)	
10000					
20000					
B					
3					
IP40					
≥-40℃					
≤5000m					
430 × 407 × 395					
430 × 522 × 395					
390 × 422 × 297.5					
390 × 537 × 297.5					

VW3-63



4000, 5000, 6300			
AC400	AC690	AC800/AC1140	AC1500
1800			
18			
AC5000V 50Hz/60Hz			
3P/4P		3P	3P
50%In			
H		HU	HV
135	120	85	50
135	120	85	50
297	264	187	105
135	120	85	50
135	120	85	50
12~18			
≤60			
6000 (4000A) 4000 (5000A) 2000 (6300A)	3500 (4000A) 2500 (5000A) 1500 (6300A)	2500 (4000A) 1500 (5000A) 1000 (6300A)	500 (4000A) 400 (5000A) 500 (6300A)
6500			
13000			
8			
3			
IP40			
≥-40℃			
≤5000m			
480 × 853 × 395			
480 × 900 × 395			
390 × 800 × 297.5			
390 × 915 × 297.5			

Model	VWC4	VWC4(V)	VWC6	VWC6(V)	VWC6(P)
					
Display interface					
Digital tube numbers and symbols display	✓	✓			
LCD panel symbols and graphics display			✓	✓	✓
Protection function					
Overload long-time delay protection	✓	✓	✓	✓	✓
Overload thermal memory	✓	✓	✓	✓	✓
Overload pre-alarm/alarm output	✓ / ■	✓ / ■	✓ / ■	✓ / ■	✓ / ■
Short circuit short-time delay protection	✓	✓	✓	✓	✓
Short-time delay thermal memory	✓	✓	✓	✓	✓
Short circuit instantaneous protection	✓	✓	✓	✓	✓
Ground protection (differential type/ W ground current type)	✓	✓	✓	✓	✓
Grounding alarm/alarm output	✓ / ■	✓ / ■	✓ / ■	✓ / ■	✓ / ■
Current leakage protection/alarm/ alarm output	—	—	■ / ■ / ■	■ / ■ / ■	■ / ■ / ■
Neutral wire protection	✓	✓	✓	✓	✓
Current unbalance protection/alarm/ alarm output	✓ / — / —	✓ / — / —	✓ / ✓ / ■	✓ / ✓ / ■	✓ / ✓ / ■
MCR&HSISC	✓	✓	✓	✓	✓
Load monitoring/alarm/alarm output	■ / ■ / ■	■ / ■ / ■	■ / ■ / ■	■ / ■ / ■	■ / ■ / ■
Undervoltage protection /alarm/alarm output	—	—	—	✓ / ✓ / ■	✓ / ✓ / ■
Overvoltage protection /alarm/ alarm output	—	—	—	✓ / ✓ / ■	✓ / ✓ / ■
Voltage unbalance protection/alarm/ alarm output	—	—	—	✓ / ✓ / ■	✓ / ✓ / ■
Phase sequence protection/alarm/ alarm output	—	—	—	✓ / ✓ / ■	✓ / ✓ / ■
Underfrequency protection/alarm/ alarm output	—	—	—	✓ / ✓ / ■	✓ / ✓ / ■
Overfrequency protection/alarm/ alarm output	—	—	—	✓ / ✓ / ■	✓ / ✓ / ■
Current required value protection/alarm/ alarm output	—	—	—	✓ / ✓ / ■	✓ / ✓ / ■
Reverse power protection/alarm/ alarm output	—	—	—	—	✓ / ✓ / ■

Measuring function					
Current measurement (phase pole, N-pole, grounding)	✓	✓	✓	✓	✓
Voltage (phase voltage, circuit voltage, voltage unbalance rate)	—	✓	—	✓	✓
Phase sequence detection	—	—	—	✓	✓
Frequency measurement	—	✓	—	✓	✓
Required value measurement (current)	—	—	—	✓	✓
Required value measurement (power)	—	—	—	—	✓
Power measurement (active power, reactive power, apparent power) ①	—	✓	—	—	✓
Power factor measurement	—	✓	—	—	✓
Electric energy measurement (active electric energy, reactive electric energy, apparent electric energy)	—	—	—	—	✓
Harmonics measurement	—	—	—	—	✓
Maintenance function					
LED fault status indication	✓	✓	✓	✓	✓
Fault record (8 times) and query ②	✓	✓	✓	✓	✓
Displacement record (8 times) ③	—	—	✓	✓	✓
Alarm history query (8 times) ④	—	—	✓	✓	✓
Fault tripping signal output ⑤	✓	✓	✓	✓	✓
Self-diagnostic function	✓	✓	✓	✓	✓
Simulating tripping test function	✓	✓	✓	✓	✓
Contact wear equivalent (alarm) query	■	■	✓	✓	✓
Query of number of operations	✓	✓	✓	✓	✓
Clock function	✓	✓	✓	✓	✓
Other					
Remote reset of controller	■	■	■	■	■
Signal unit	■	■	■	■	■
Selective area interlock	—	—	■	■	■
Communication	—	—	■	■	■
Protection curve	I2T (Default), Standard inverse time limit, Fast inverse time limit, Express inverse time limit (G), Express inverse time limit(M), High-voltage fuse compatible				

Note: ①. VWC4 (V) power measurement only have active power;
②. VWC4/VWC4(V) only have the record of last one fault type and data value;
③. Record the displacement include: displacement type (closing, opening, or tripping), displacement reason (local/remote operation, fault/test tripping), displacement time (year, month, day, hour, minute, second);
④. Record the alarm history: Alarm type, alarm domain value, alarm time (year, month, day, hour, minute, second);
⑤. Trip parameters: trip type, trip domain value, delay time, current or voltage value, time (year, month, day, hour, minute, second), MCR trip, undervoltage trip, except for HSISC trip;
⑥. "✓"represents with this function, "—" - "represents without this function , "■"represents optional function;
⑦. V and P function type are optional;
⑧. If selected the unit function, that will be achieved alarm and switch output functions or area selective interlocking functions.

Controller

VOZWEI

VWC4 Controller

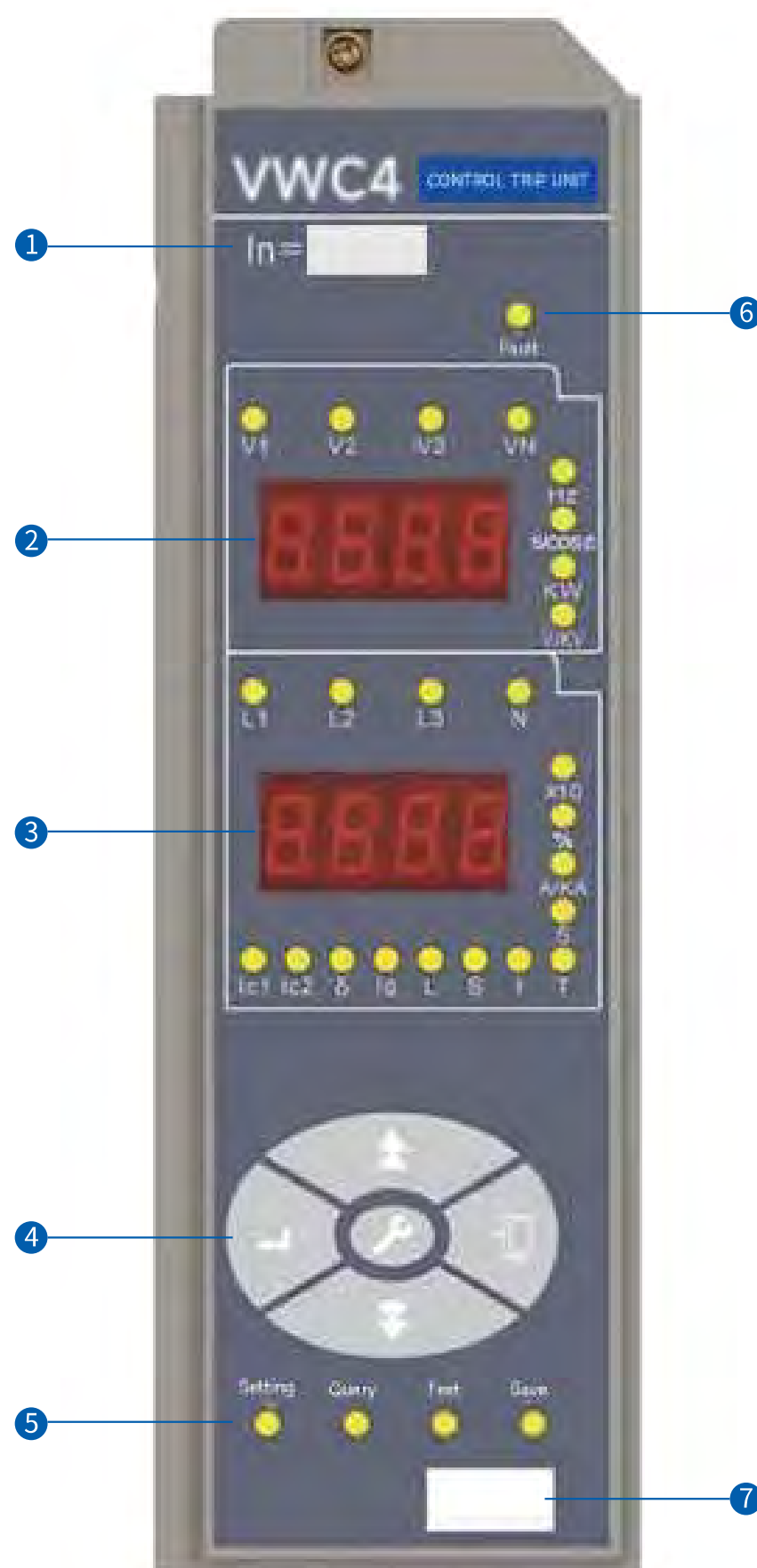
Standard function

- Overload long-time delay protection,
Short circuit short-time delay protection,
Short circuit instantaneous protection
- Ground Fault Protection
- Function test
- Fault record
- Overload thermal memory
- Self-diagnostic function
- Current measurement
- Fault status indication & Fault value indication

Optional function

- Current unbalance protection
- Signal unit
- MCR & HCISC
- Load monitoring
- Voltage measurement
- Contact wear equivalent indication
- Voltage protection
- Current leakage protection
- Power factor measurement
- frequency measurement
- Power measurement
- Electric energy measurement
- Voltage measurement

- ① Rated current
- ② Voltage and Power
- ③ Current
- ④ Setting button
- ⑤ Setup, query indicators
- ⑥ Fault and alarm indicators
- ⑦ Test port



Note: Protection parameters must not be cross set,
 $I_r < I_{sd} < I_{io}$

Panel Display Description

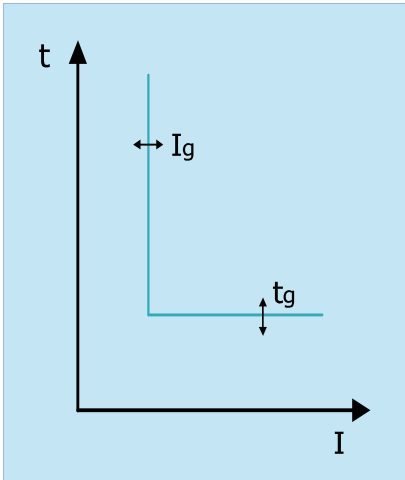
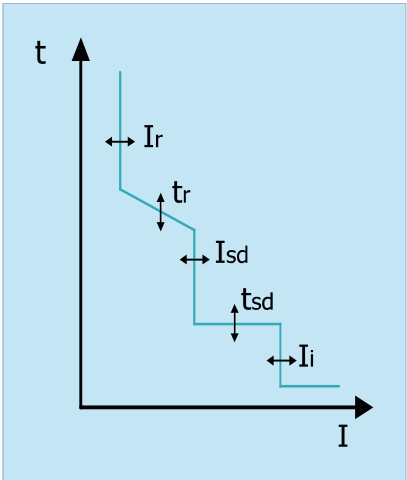
- “HZ” Lighting on,is frequency
- “S/COSΦ” Lighting on,is time;flashing is power factor
- “kW” Lighting on,is active power;flashing is active electric energy
- “%” Lighting on,is contact wear equivalent indication
- “×10” Lighting on,is number of opening and closing operations
- “δ” “%” and “L1/L2/L3” Lighting on,is the imbalance ratio
- “Ig” and “A/kA” Lighting on,is grounding current
- “L1/L2/L3” and “A/kA” Lighting on,is current
- “N” and “A/kA” Lighting on,is N-phase current
- “A/kA” Flashing is kA,lighting on is A
- One of “V1”, “V2”, “V3” and V lighting on,is three phase line voltage
- One of “V1”, “V2”, “V3” and “N” and “V” lighting on,is corresponding phase voltage
- When the “T” lighting on,have the self-diagnostic fault,press Enter show the fault code
- If the fault is resolved, press the return button to clear self-diagnostic fault, “T” no lighting
- If there are multiple diagnostic faults, press the ▲ and ▼ keys to view the fault codes
- Fault code:

ER01	ER02	ER03	ER12	ER13
E ² PROM error	A/D error	overtemperature	Circuit breaker refused to operate	contact maintained indication

Controller running status:

- ① Setting status:Set lighting on,view or modify the protection setting value
- ② Query status:Query lighting on ,view the fault history
- ③ Test status:Test lighting on,can do the tripping test
- ④ Fault status:Fault lighting on,indication the fault type and cycle display of fault current and time
- ⑤ Communication status:Communication lighting on ,the controller is communicating
- ⑥ Storage status:Storage lighting on,change data once
- ⑦ Self-diagnostic status: “T” lighting on ,have the self-diagnostic fault

Overload long-time delay protection



Overload long-time delay									
Current setting value I _r ,Current tolerance error ±10%		(0.4 ~ 1.0)×I _n +OFF (step 1A)							
Tripping time t _r tolerance error±15%	Current	Tripping time							
	≤ 1.05I _r	Inaction within 2h							
	> 1.20I _r	Action within 1h							
	Protection curve (default is I ² T)	Tripping time t _r (factor K in bracket)							
	Standard inverse time limit t=K/(N ^{0.02} -1)	0.61(0.005)	0.98(1.0)	1.47(0.012)	2.46(0.02)	3.68(0.03)	4.91(0.04)	6.14(0.05)	8.29(0.075)
		11.1(0.09)	17.2(0.14)	24.6(0.2)	36.8(0.3)	49.1(0.4)	61.4(0.5)	73.7(0.6)	86(0.6)
	Fast inverse time limit t=K/(N-1)	2(1)	3.2(1.6)	4.8(2.4)	8(4)	12(6)	16(8)	20(10)	27(13.5)
		36(18)	56(28)	80(40)	120(60)	160(80)	200(100)	240(120)	280(140)
	Express inverse time limit t=K/(N ² -1)	8(10)	12.8(16)	19.2(24)	32(40)	48(60)	64(80)	80(100)	108(135)
		144(180)	224(280)	320(400)	480(600)	640(800)	800(1000)	960(1200)	1120(1300)
	Express inverse time limit t=(K/1.15)×log _e [N ² /(N ² -1.15)]	6.22(10)	9.96(16)	14.9(24)	24.9(40)	37.3(60)	49.8(80)	62.2(100)	84(135)
		112(180)	174(280)	249(400)	373(600)	498(800)	622(1000)	747(1200)	871(1300)
	High-voltage fuse compatible t=K/(N ⁴ -1)	2.46(10)	3.94(16)	5.9(24)	9.85(40)	14.8(60)	19.7(80)	24.6(100)	33.2(135)
44.3(180)		68.9(280)	98.5(400)	147(600)	197(800)	246(1000)	295(1200)	344(1300)	
I ² T Table t=(1.5/N) ² ×K	15(15)	30(30)	60(60)	120(120)	240(240)	360(360)	480(480)	600(600)	
	720(720)	840(840)	960(960)						
Note: N=I/I _r (I is the actual fault current, I _r is the set value of overload current). The above set time value is action delay time when I=1.5I _r , with the of current I increase,the delay time will be decreases which can be calculated according to the curve formula.									
Thermal memory protection		30min+OFF(clear the thermal memory when the power off)							
Short-circuit short time-delay protection									
Current setting value I _{sd} ,Current tolerance error ±10%		(1.5 ~ 15)×I _r +OFF (step1A)							
Tripping time t _{sd} tolerance error±15%	Fixed time-limit current setting value	0.1~1s (step 0.1s)							
	Inverse time-limit current setting value	The curve is the same as the overload long delay curve, and the curve speed is 10 times faster than the overload long delay (dividing the time calculated by the overload delay curve formula by 10 is the inverse delay time of the short delay)							
Thermal memory protection		15min+OFF (clear the thermal memory when the power off)							
Note: When both the inverse time limit and fixed time limit protection are enabled, the inverse time limit current setting value must be less than the fixed time limit current setting value, otherwise the inverse time limit function will automatically fail. In addition, the actual delay time is not less than the set time of the fixed time limit									

Short-circuit instantaneous protection		
Current setting value I _i ,Current tolerance error ±10%		(1~20)×I _n + OFF
Action features		≤ 0.85I _i , inaction
		>1.15 I _i , action
Ground protection		
Current setting value I _r ,Current tolerance error ±10%		(0.2~1.0)×I _n + OFF (min100A)
Action features		≤ 0.8I _g , inaction
		≥ 1.0 I _g , delay action
Tripping time t _g tolerance error±10%	Fixed time-limit	0.1 ~ 100s+OFF (0.1~1s , step0.1s , 1s~100s , step1s , OFF : alarm does not trip)
	Inverse time shear coefficient C _r	1.5 ~ 6 + OFF (step 0.5 , OFF : inverse time-limit OFF)
	Inverse time-limit formula	Formula t=t _g × C _r × I _g /I t - Delay time; T _g - Set delay time; C _r - Shear coefficient; I _g - Set actioncurrent; I - Ground current; When the multiple of fault current (I/I _g) is less than C _r , the action characteristic is inverse time characteristic; When the fault current multiple is greater than or equal to C _r , the action characteristic is a fixed time limit
Neutral line protection		
Current setting value I _N ,Current tolerance error ±10%		(0.5, 1.0) × I _n + OFF
Action time		same as long time-delay time
Current unbalance protection		
Protection setting value		40%~100%+OFF
Action or alarm features		≤ 0.9δ , inaction
		> 1.1δ , action delay or alarm
Delay time (s)		0.1 ~ 100s+OFF (OFF : Alarm only, inaction,step0.1s)
Load monitoring function		
Mode 1	Current setting I _{c1} , I _{c2} Adjustment(A)	(0.2 ~ 1.0) ×I _n +OFF (min100A)
	Inverse time-limit t _{c1} , t _{c2} (s)	Same overload long delay curve
Mode 2	Current setting I _{c1} , I _{c2} Adjustment(A)	(0.2 ~ 1.0) ×I _n +OFF (min100A)
	Inverse time-limit t _{c1}	Same overload long delay curve
	Fixed time-limit t _{c2}	60s

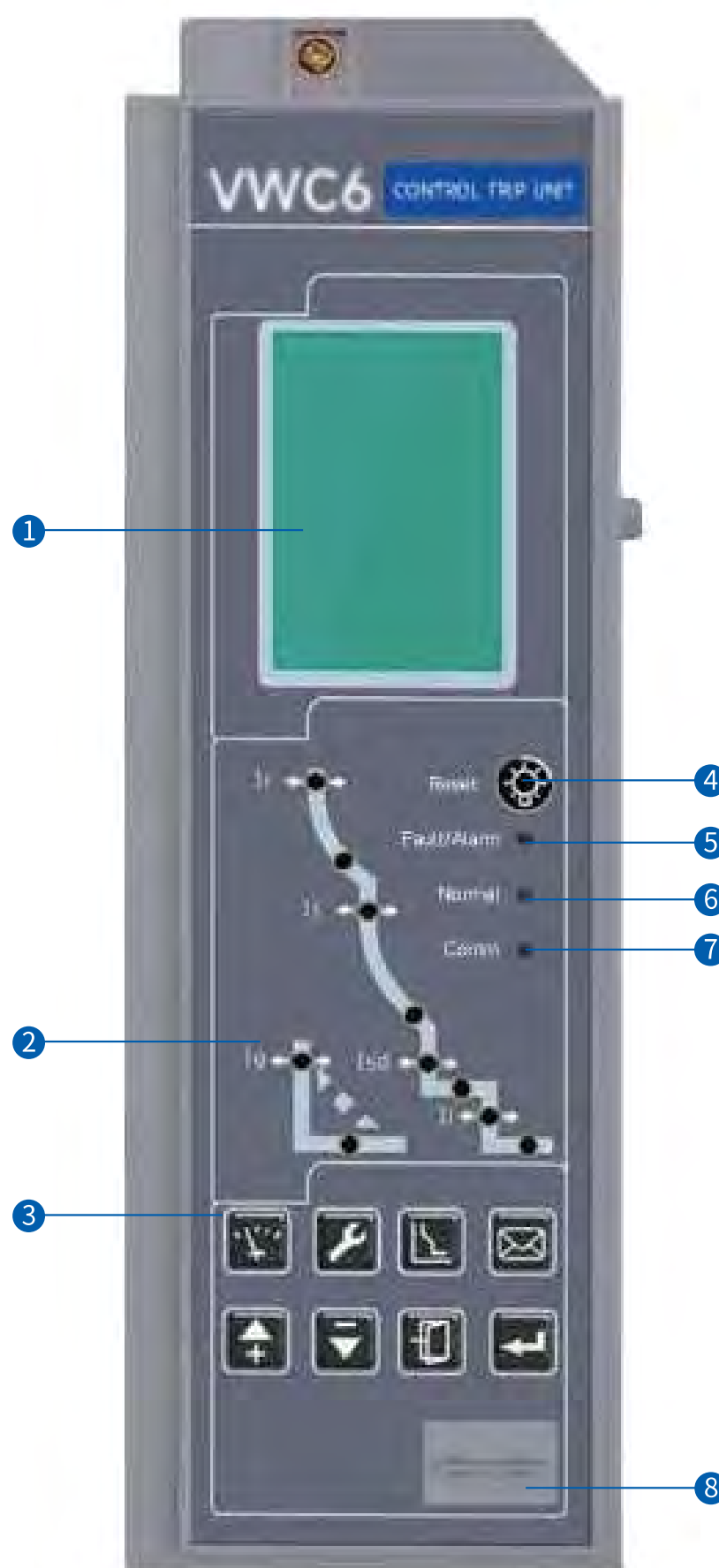
VWC6 Controller

Standard function

- Overload long-time delay protection,
Short circuit short-time delay protection,
Short circuit instantaneous protection
- Ground Fault Protection
- Function test
- Fault record
- Overload thermal memory
- Self-diagnostic function
- Current measurement
- Fault status indication & Fault value indication
- Contact wear equivalent indication
- Record of operations

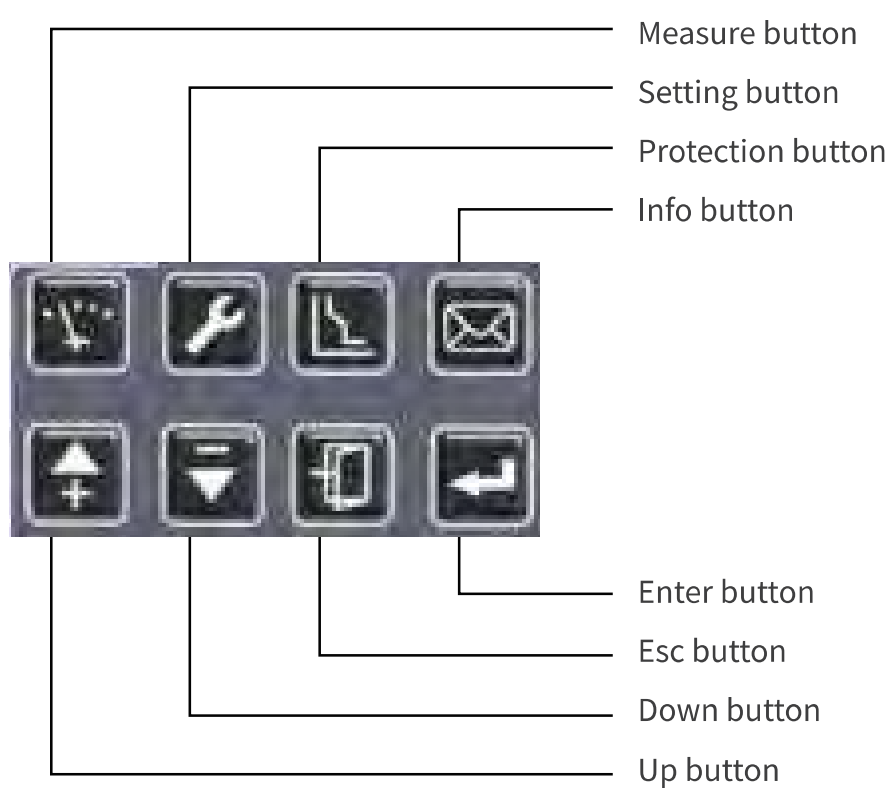
Optional function

- Current unbalance protection
- Signal input
- Signal unit
- MCR & HCISC
- Load monitoring
- Power measurement
- Voltage measurement
- Voltage protection
- Current leakage protection
- Required value protection
- Power factor measurement
- Electric energy measurement
- Selective area interlock
- Harmonics measurement
- Frequency measurement
- Reverse power measurement
- Electric energy measurement
- Communication

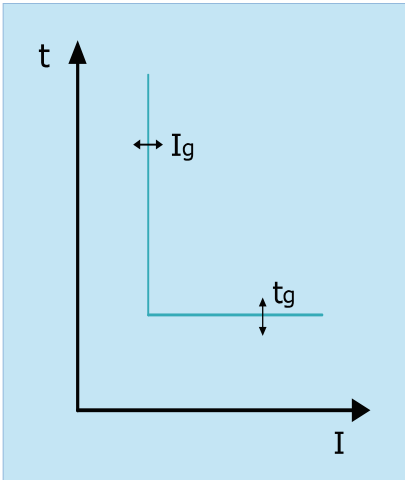
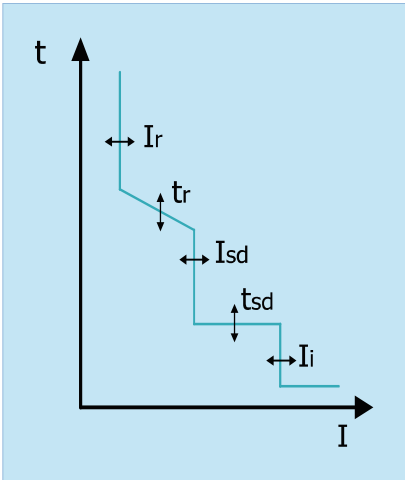


Note: Protection parameters must not be cross set,
 $I_r < I_{sd} < I_{io}$

- ① LCD interface display
- ② Protection curve
- ③ Function buttons
- ④ Fault and alarm reset button
- ⑤ Fault alarm indicators
- ⑥ Normal indicators
- ⑦ Communication indicators
- ⑧ Test port



Overload long-time delay protection



Overload long-time delay									
Current setting value I _r ,Current tolerance error ±10%		(0.4 ~ 1.0)×I _n +OFF (step 1A)							
Tripping time t _r tolerance error±15%	Current	Tripping time							
	≤ 1.05I _r	Inaction within 2h							
	> 1.20I _r	Action within 1h							
	Protection curve (default is I ² T)	Tripping time t _r (factor K in bracket)							
	Standard inverse time limit t=K/(N ^{0.02} -1)	0.61(0.005)	0.98(1.0)	1.47(0.012)	2.46(0.02)	3.68(0.03)	4.91(0.04)	6.14(0.05)	8.29(0.075)
		11.1(0.09)	17.2(0.14)	24.6(0.2)	36.8(0.3)	49.1(0.4)	61.4(0.5)	73.7(0.6)	86(0.6)
	Fast inverse time limit t=K/(N-1)	2(1)	3.2(1.6)	4.8(2.4)	8(4)	12(6)	16(8)	20(10)	27(13.5)
		36(18)	56(28)	80(40)	120(60)	160(80)	200(100)	240(120)	280(140)
	Express inverse time limit t=K/(N ² -1)	8(10)	12.8(16)	19.2(24)	32(40)	48(60)	64(80)	80(100)	108(135)
		144(180)	224(280)	320(400)	480(600)	640(800)	800(1000)	960(1200)	1120(1300)
	Express inverse time limit t=(K/1.15)×log _e [N ² /(N ² -1.15)]	6.22(10)	9.96(16)	14.9(24)	24.9(40)	37.3(60)	49.8(80)	62.2(100)	84(135)
		112(180)	174(280)	249(400)	373(600)	498(800)	622(1000)	747(1200)	871(1300)
	High-voltage fuse compatible t=K/(N ⁴ -1)	2.46(10)	3.94(16)	5.9(24)	9.85(40)	14.8(60)	19.7(80)	24.6(100)	33.2(135)
44.3(180)		68.9(280)	98.5(400)	147(600)	197(800)	246(1000)	295(1200)	344(1300)	
I ² T Table t=(1.5/N) ² ×K	15(15)	30(30)	60(60)	120(120)	240(240)	360(360)	480(480)	600(600)	
	720(720)	840(840)	960(960)						
Note: N=I/I _r (I is the actual fault current, I _r is the set value of overload current). The above set time value is action delay time when I=1.5I _r , with the of current I increase,the delay time will be decreases which can be calculated according to the curve formula.									
Thermal memory protection		30min+OFF(clear the thermal memory when the power off)							
Short-circuit short time-delay protection									
Current setting value I _{sd} ,Current tolerance error ±10%		(1.5 ~ 15)×I _r +OFF (step1A)							
Tripping time t _{sd} tolerance error±15%	Fixed time-limit current setting value	0.1~0.4s (step 0.1s)							
	Inverse time-limit current setting value	The curve is the same as the overload long delay curve, and the curve speed is 10 times faster than the overload long delay (dividing the time calculated by the overload delay curve formula by 10 is the inverse delay time of the short delay)							
Thermal memory protection		15min+OFF (clear the thermal memory when the power off)							
Note: When both the inverse time limit and fixed time limit protection are enabled, the inverse time limit current setting value must be less than the fixed time limit current setting value, otherwise the inverse time limit function will automatically fail. In addition, the actual delay time is not less than the set time of the fixed time limit									

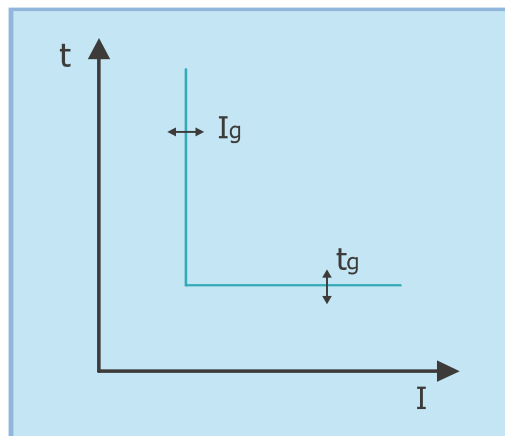
Short-circuit instantaneous protection		
Current setting value I _i ,Current tolerance error ±10%		(1~20)×I _n + OFF (min100A)
Action features		≤ 0.85I _i , inaction
		>1.15 I _i , action
Ground protection		
Current setting value I _r ,Current tolerance error ±10%		(0.2~1.0)×I _n + OFF (min100A)
Action features		≤ 0.8I _g , inaction
		≥ 1.0 I _g , delay action
Tripping time t _g tolerance error±10%	Fixed time-limit	0.1 ~ 100s+OFF (0.1~1s , step0.1s , 1s~100s , step1s , OFF : alarm does not trip)
	Inverse time shear coefficient C _r	1.5 ~ 6 + OFF (step 0.5 , OFF : inverse time-limit OFF)
	Inverse time-limit formula	Formula t=t _g × C _r × I _g /I t - Delay time; T _g - Set delay time; C _r - Shear coefficient; I _g - Set actioncurrent; I - Ground current; When the multiple of fault current (I/I _g) is less than C _r , the action characteristic is inverse time characteristic; When the fault current multiple is greater than or equal to C _r , the action characteristic is a fixed time limit
Execution mode:tripping + close		
Ground protection (The ground alarm and ground protection functions are independent of each other and have their own independent parameter settings, which can exist simultaneously		
Alarm action setting value	current	(0.2 ~ 1.0) × I _n (min100A)
	time	0.1 ~ 100s+OFF
Alarm cleared setting	current	(0.2 ~ 1.0) × I _n (min100A)
	time	0.1 ~ 100s+OFF
Neutral line protection		
Current setting value I _N ,Current tolerance error ±10%		(0.5、 1.0、 1.6、 2.0) × I _n + OFF
Action time		same as long time-delay time
Current unbalance protection		
Protection setting value		5% ~ 60% (step1%)
Delay time		0.1 s ~ 40s (step 0.1s)
Protection return setting value		5% ~ start value (step 1%)
Delay time		start value (step 1%)
Action or alarm features		≤ 0.9δ , inaction
		> 1.1δ , action delay or alarm
Execution mode :Tripping+alarm+close		
Load monitoring function		
Mode 1	Current setting I _{c1} , I _{c2}	(0.2 ~ 1) ×I _r (min100A , step1A)
	Inverse time-limit t _{c1} , t _{c2}	(20% ~ 80%) ×t _r
Mode 2	Current setting I _{c1} (unloading)	(0.2 ~ 1) ×I _r (min100A)
	Current setting I _{c2} (return)	0.2×I _r ~ I _{c1}
	Inverse time-limit t _{c1}	(20% ~ 80%) ×t _r
	Fixed time-limit t _{c2}	10s ~ 600s

VWC4 Controller

Voltage unbalance protection				
Protection start setting value	2%~30% （accuracy 1%）			
Protection action delay time setting （s）	0.2~60 （accuracy 0.1）			
Protection action return setting value	2%~start value （accuracy 1%）	This set value only exists when the "alarm" execution method , and the return value must be less than or equal to the start value.		
Protection return delay time (s)	0.2~60 （accuracy 0.1）			
Action features of voltage unbalance protection/alarm (Accuracy of ±10%)	Actual voltage unbalance rate/setting value ≥1.1	Action or alarm according to the set delay time		
	Actual voltage unbalance rate/setting value <0.9	Inaction (no alarm)		
Voltage unbalance alarm return action features(Accuracy of ±10%)	Actual voltage unbalance rate/setting value ≤0.9	Returns according to the set delay time		
	Actual voltage unbalance rate/setting value >1.1	Non-return		
Voltage unbalance protection alarm DO output	Added the "Voltage Unbalance Alarm" contact output when the alarm execution mode			
Undervoltage protection				
Action setting value(V)	100~return setting value(step 1)			
Protection action delay time setting value(s)	0.2~60(step 0.1)			
Action return setting value (V)	action setting value~1200(step 1)	This set value only exists when the "alarm" execution method , and the return value must be less than or equal to the start value.		
Protection action delay time setting value(s)	0.2~60(step 0.1)			
Action features of voltage unbalance protection/alarm (Accuracy of ±10%)	Umax / action setting value<0.9	Action or alarm according to the set delay time		
	Umax / action setting value≥1.1	Inaction (no alarm)		
Undervoltage alarm return action features (Accuracy of ±10%)	Umin / action setting value>1.1	Returns according to the set delay time		
	Umax / action setting value≤0.9	Non-return		
Undervoltage protection alarm DO output	Added the "Undervoltage Alarm" contact output when the alarm execution mode			
Overvoltage protection				
Action setting value(V)	return setting value~1200 （step 1）			
Protection action delay time setting value(s)	0.2~60 （step 0.1）			
Action return setting value (V)	100~action setting value （step 1）	This set value only exists when the "alarm" execution method , and the return value must be less than or equal to the start value.		
Return action delay time setting value(s)	0.2~60 （step 0.1）			
Action features of overvoltage protection/alarm (Accuracy of ±10%)	Umin / action setting value≥1.1	Action or alarm according to the set delay time		
	Umin / action setting value<0.9	Inaction (no alarm)		
Overvoltage protection alarm return features (Accuracy of ±10%)	Umax / action setting value≤0.9	Returns according to the set delay time		
	Umax / action setting value>1.1	Non-return		
Overvoltage protection alarm DO output	Added the "Overvoltage Alarm" contact output when the alarm execution mode			
Required current value protection				
Protection start setting value	(0.2~1.0)×In （step 2）			
Protection action delay time setting value(s)	15~1500 （step 1）			
action return setting value	0.2In~start value （step 2）	This set value only exists when the "alarm" execution method , and the return value must be less than or equal to the start value.		
Return action delay time setting value(s)	15~3000 （step 1）			
Action features of required current value protection protection/alarm (Accuracy of ±10%)	I /setting value≥1.1	Action or alarm according to the set delay time		
	I /setting value<0.9	Inaction (no alarm)		
Voltage unbalance alarm return action features(Accuracy of ±10%)	I /setting value≤0.9	Returns according to the set delay time		
	I /setting value>1.1	Non-return		
Required current value protection alarm DO output	Added the "Required current value protection" contact output when the alarm execution mode			
Phase sequence protection				
Setting range of action phase sequence	△φ: A, B, C /△φ: A, C, B			
Phase sequence protection alarm DO output	Added the "Phase sequence protection" contact output when the alarm execution mode			
Execution mode	Alarm/tripping/close			
Underfrequency, overfrequency protection				
Start setting value	Action start setting value	underfrequency	45~return value （step 0.5Hz）	
		overfrequency	return value~65 （step 0.5Hz）	
	Action delay time setting value (s)	0.1~5s+OFF （0.1~1s step 0.1, 1~5s step 1s）		
	Alarm action return setting value (Hz)	underfrequency	start value~65Hz （step 0.5Hz）	This setting value only exists when the "alarm" execution mode
		overfrequency	45Hz~Start value （step 0.5Hz）	
	Alarm return delay time (s)	0.2~36.0s （step 0.1s）		
Underfrequency, overfrequency protection alarm DO output	Added the "Underfrequency, overfrequency protection alarm" contact output when the alarm execution mode			
Execution mode	Phase sequence protection alarm Alarm/tripping/closeDO output			

Controller protection function description

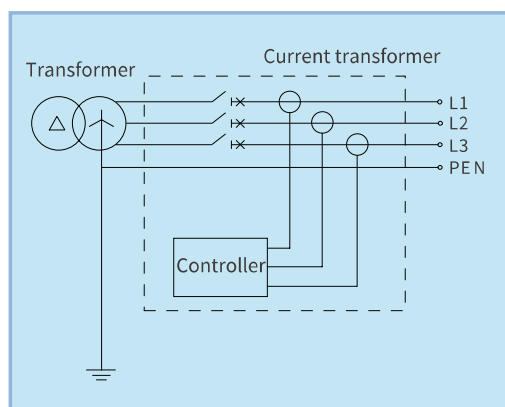
Ground fault protection features



Ground fault protection

- Current setting value I_g adjustable , when fixed or inverse time limit ground fault protection
- Delay time t_g adjustable
- Turning off (OFF), only alarm, no tripping
- Ground protection type
- ☐ Type 1
- ☐ Type 2
- ☐ Type 3
- ☐ Type 4

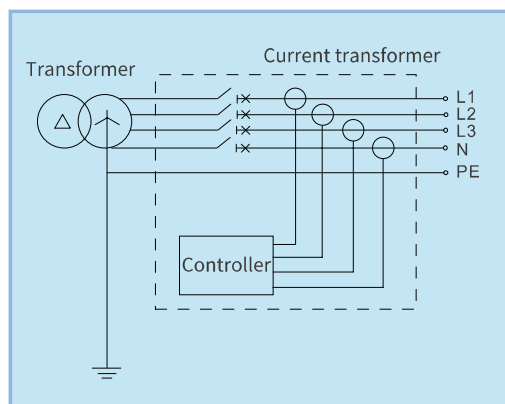
Type 1



Type1: The TN-C and TN-C-S distribution systems use three-pole circuit breakers without neutral current transformers.

- ☐ The ground fault protection signal from the vector sum of the three-phase current.
- ☐ The protection feature is fixed limit time or inverse limit time protection
- ☐ Only applicable when the three-phase unbalanced current and harmonic current flowing through the PEN neutral protection line are very small

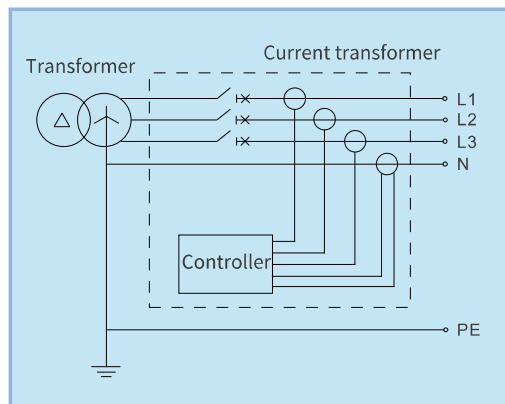
Type 2



Type 2: The TN-S distribution system use four pole circuit breaker with internal neutral current transformer.

- ☐ The ground fault protection signal from the vectors sum of the three-phase current and N-phase current .
- ☐ The protection feature is fixed limit time or inverse limit time protection

Type 3

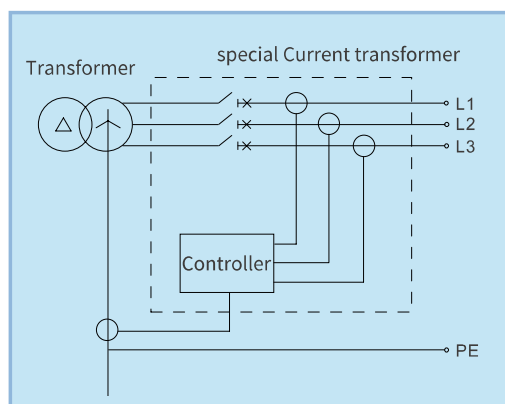


Type 3: The TN-S distribution system use three-pole circuit breaker and external neutral current transformer.

- ☐ The ground fault protection signal from the vectors sum of the three-phase current and N-phase current .
- ☐ The protection feature is fixed limit time or inverse limit time protection

Note: The transformer wire length shall not exceed 2m

Type 4



Type 4: The T-T distribution system use three-pole circuit breaker and external ground current transformer.

- ☐ The ground fault protection signal from the current on the grounding wire at the center point of the low-voltage terminal of the transformer
- ☐ The protection feature is fixed limit time or inverse limit time protection

Note: The transformer wire length shall not exceed 2m

Signal unit

DI: input

1-2 programmable optoelectronic coupling switch input (DI)

Function setting	General,alarm, tripping, regional interlocking, grounding interlocking, short circuit interlocking	
DI Input form	Normally open	Normally closed

DO: output

2-4 Switch Output (DO)

Function setting	See the table below, “Parameter Settings of Switch Output (DO)”			
Execution mode	Normally opened level	Normally closed level	Normally opened Impulse	Normally closed Impulse
Impulse time	N/A		1~360s (step 1s)	

Parameter Settings of Switch Output (DO)

General	Alarm	Fault tripping	Self-diagnostic function alarm	Instantaneous fault
Grounding/current leakage fault	Overload pre-alarm	Overload fault	Short-time delay fault	Undervoltage fault
Overvoltage fault	Grounding/leakaging alarm	Current unbalance fault	Neutral line fault	Required value fault
Reverse power fault	Voltage unbalance fault	Underfrequency fault	Overfrequency fault	Phase sequence fault
MCR/HSISC fault	Short circuit interlocking	Remote On	Remote Off	Required value out-of-limit
A-phase required value fault	B-phase required value fault	C-phase required value fault	N-phase required value fault	

Note: The general table function can be setting on the computer in the communication group,when the DI/DO not be setting in the controller

Communication

Communication type controller connects to the communication products ,achieve the remote communication, remote regulating, remote control and remote sensing functions,for monitor the circuit breaker working on time.As "Communication Networking Diagram" showing, achieved the local monitoring and ultra remote monitoring to monitor the operating status of circuit breakers and control them on time

The specific configuration and communication interface parameters as the below table show:

Applicable controller		VWC4, VWC6 (Communication)
Communication mode		RS485(Photoelectric isolation)
Communication cable		Shielded twisted pair cable
Communication distance		1200m ⁽¹⁾
Communication protocol	Standard	Modbus-RTU
	Optional	Profibus-DP or DeviceNet Accessories required: Profibus-DP conversion module or DeviceNet conversion module
Communication instructions		《PTU series intelligent controller Modbus communication protocol V3.0》
Transmission rate (bit/s)		9.6K、 19.2K、 38.4K (Settable)
Communication address		0~255 (Settable)
The 'remote control' function requires additional accessories ⁽²⁾		1) 201 Relay moudle; 2) power supply moudle
When connecting the monitoring system (RS232 interface) with the system, accessories ⁽³⁾ are required		RS485/RS232 conversion module
When connecting the monitoring system (Ethernet interface) with the system, accessories are required		(ModBUS / TCP / IP) Ethernet conversion module

Note: (1).When the bus length exceeds 1200 meters, addtional a "communication relay module";
(2).Achieve the remote communication, remote regulating, remote control and remote sensing functions without addtional accessories
(3).When monitor system have the RS485 interface,no need "RS485/RS232 conversion module

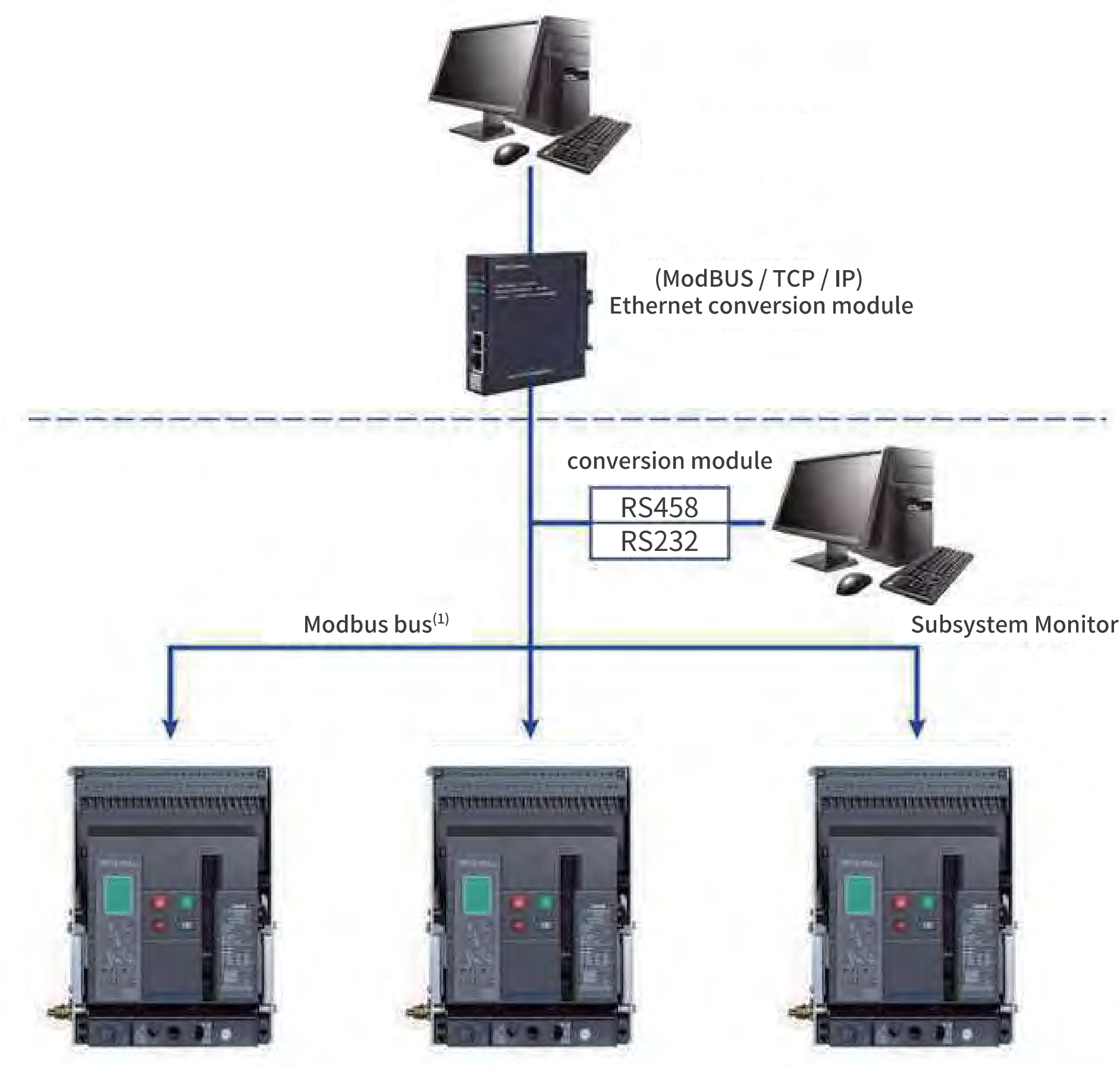
Controller factory setting



Overload long-time delay protection		I _r	I _n
		t _r	60s
Short circuit short-time delay protection		I _{sd}	3I _r
		t _{sd}	0.1s
Short circuit instantaneous protection		I _i	6I _n
Ground Fault Protection		I _g	OFF
Current unbalance protection		OFF	
Neutral line protection		100%I _r	
Current unbalance protection		OFF	
Undervoltage protection		OFF	
Overvoltage protection		OFF	
Required current value protection		OFF	
Phase sequence protection		OFF	
Underfrequency, overfrequency protection		OFF	
MCR	VW3-25(H/HU/HV)	30kA	
	VW3-40(H/HU/HV)	45kA	
	VW3-63(H/HU/HV)	75kA	
HSISC	VW3-25(H/HU/HV)	30kA	
	VW3-40(H/HU/HV)	45kA	
	VW3-63(H/HU/HV)	75kA	

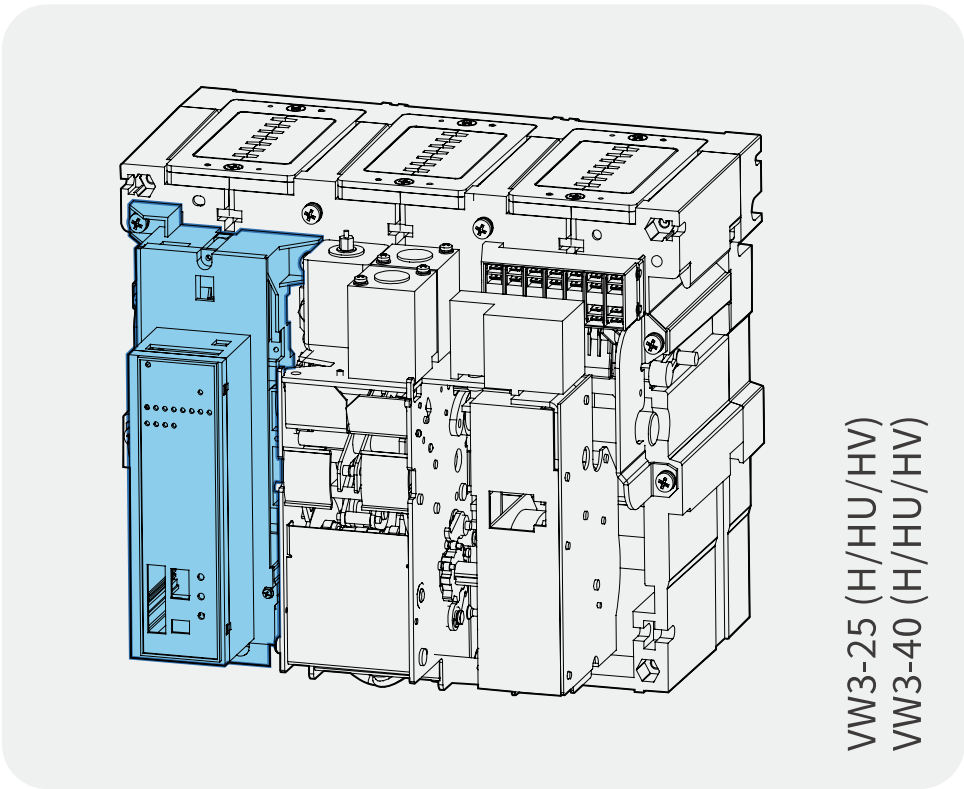
Contact factory setting				
	Contact 1	Contact 2	Contact 3	Contact 4
VWC4 / VWC6	Overload fault output	Fault tripping output	Self-diagnostic function alarm	Fault tripping
VWC4 / VWC6 (Communication)			Remote Off	Remote On

Main network communication



Note: (1) When the bus with Profibus-DP or DeviceNet, need to be converted by Profibus-DP or DeviceNet conversion module

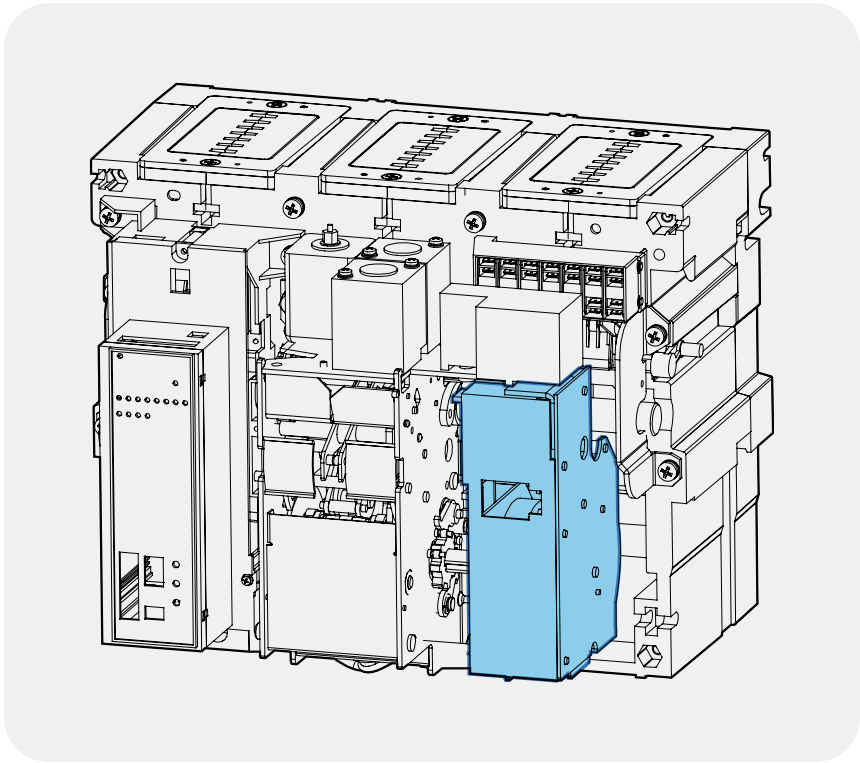
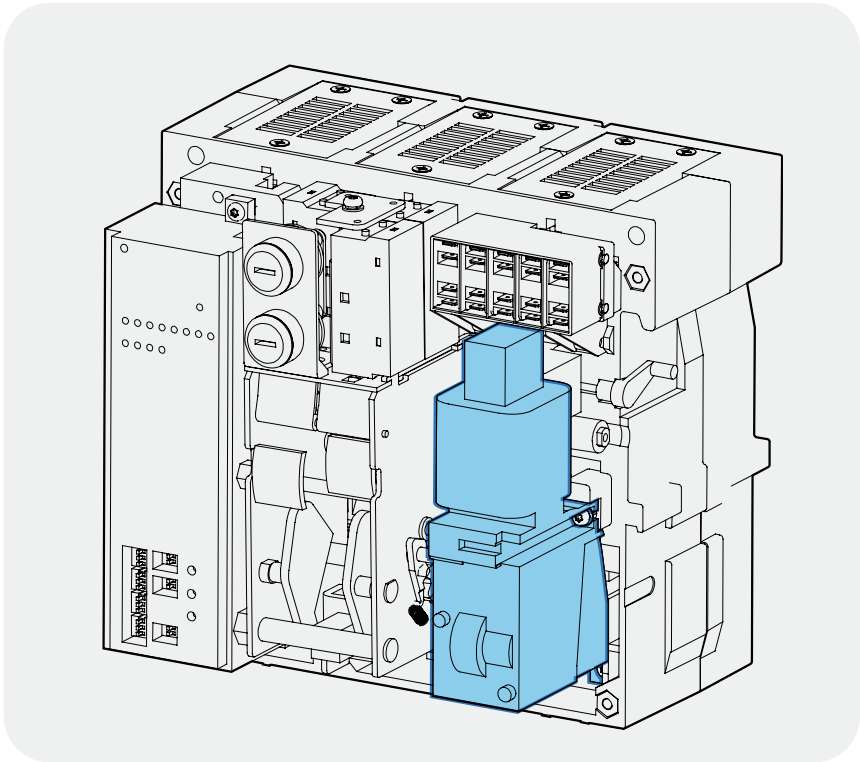
Controller



Controller	Controller mode	Supply voltage Ue (V)
	VWC4	AC65~500V, DC80~700V
	VWC6	
	VWC6 (Communication)	

Motor operating mechanism (D)

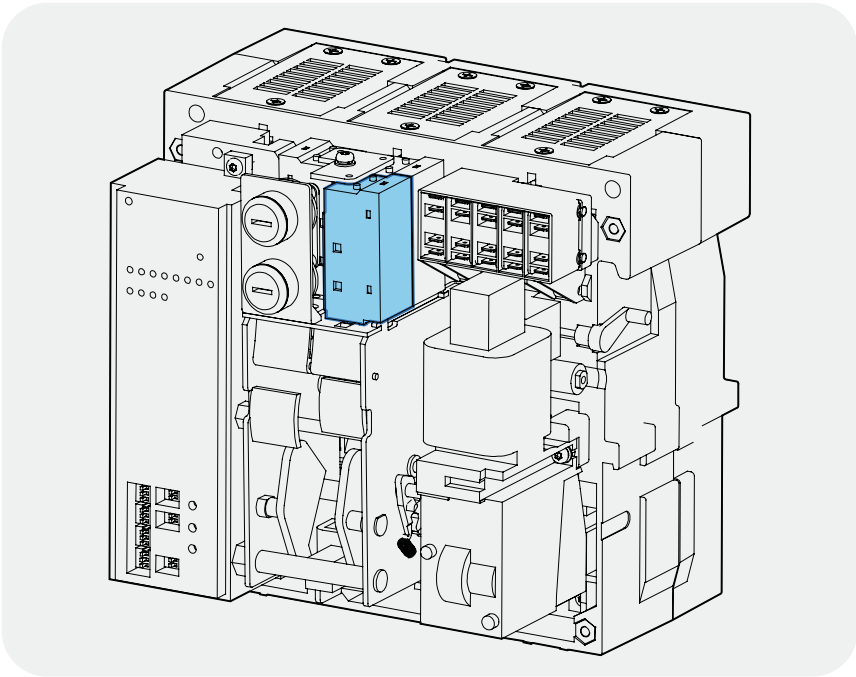
The circuit breaker has motor energy storage and automatic energy re-storage function (also energy storage by manual)



Rated control supply voltage Us (V)		AC230	AC400	DC110	DC220
Operation voltage		(0.85~1.1) Us			
Power consumption	VW3-25 (H/HU/HV)	150VA		150W	
	VW3-40 (H/HU/HV)	150VA		150W	
	VW3-63 (H/HU/HV)	190VA		190W	
Energy storage time(s)		5s			

Closed electromagnet (B)

After the energy storage is completed, closed electromagnet release the operating mechanism energy , make the circuit breaker quickly closed.

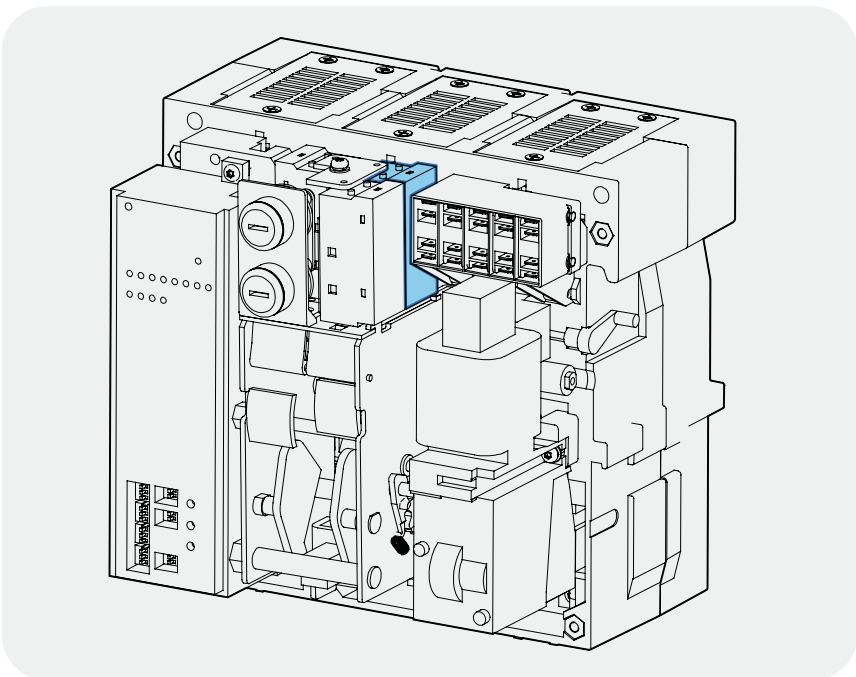


Power Consumption Table of Closed Electromagnet

Rated insulation voltage(Ui)	Rated control supply voltage(Us)	Closed current	Instantaneous power
		VW3 (H/HU/HV)	VW3 (H/HU/HV)
400V	AC380V/AC400V	2.1A	780VA
	AC220V/AC230V	2.8A	575VA
	DC220V	2.9A	630W
	DC110V	5.2A	550W

Shunt release (F)

Can disconnect the circuit breaker by remote operation.

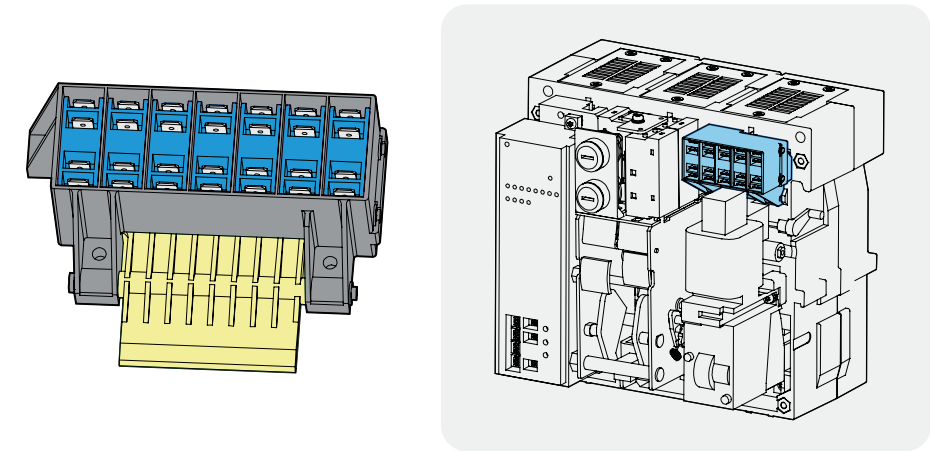


Power Consumption Table of Shunt Release

Rated insulation voltage(Ui)	Rated control supply voltage(Us)	Closed current	Instantaneous power
		VW3 (H/HU/HV)	VW3 (H/HU/HV)
400V	AC380V/AC400V	2.1A	780VA
	AC220V/AC230V	2.8A	575VA
	DC220V	2.9A	630W
	DC110V	5.2A	550W

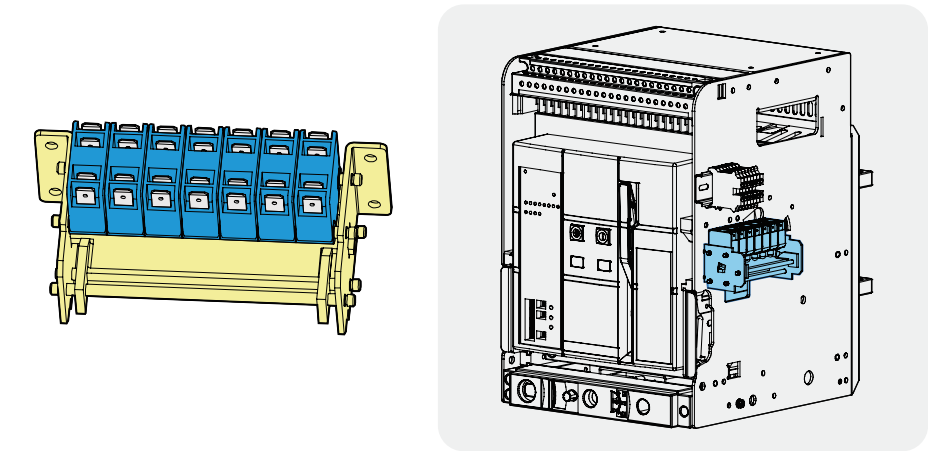
Auxiliary contact

Internal auxiliary contact



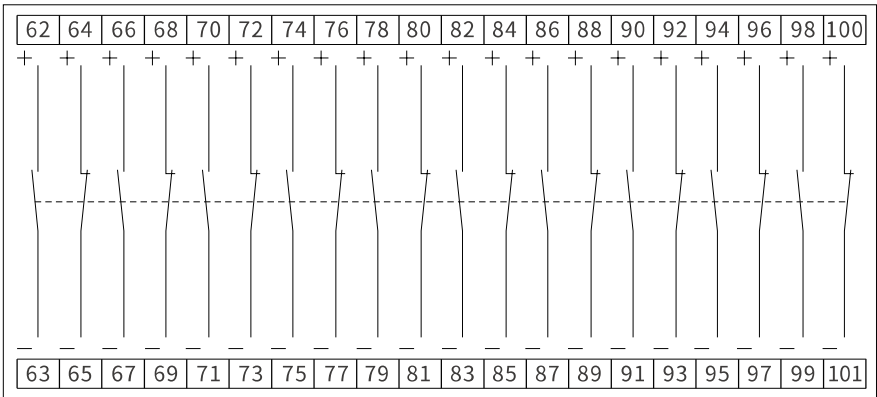
External auxiliary contact

Min 60mm safety distance of circuit breaker after installation

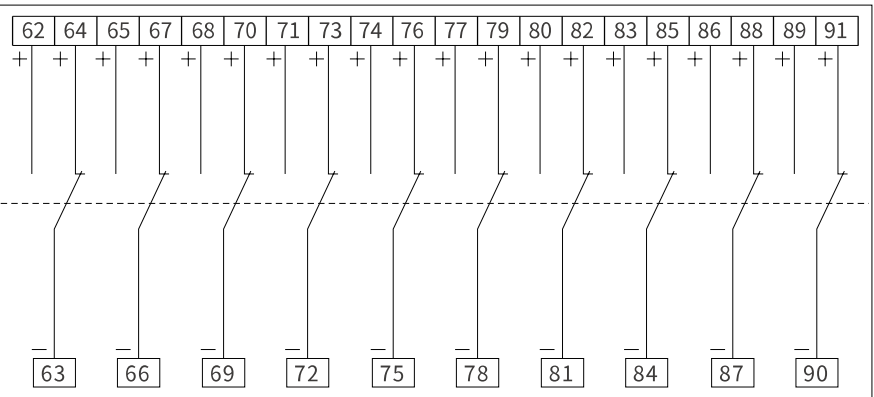


External auxiliary contact terminal number

Without common point



With common point

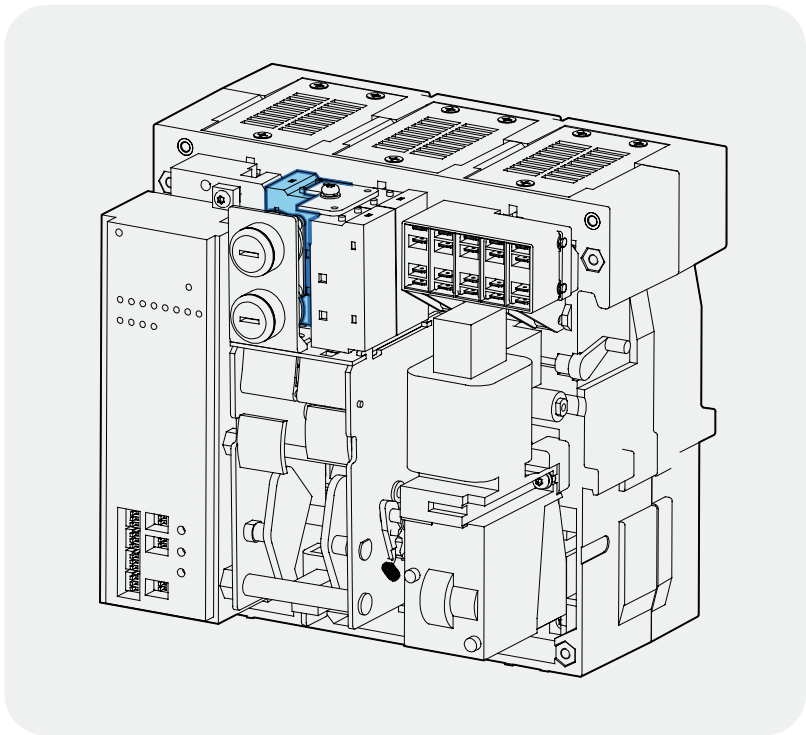


H/HU/HV/Standard have Max 4NO+4NC internal auxiliary contact,if more auxiliary contact ,need the external auxiliary contact

Auxiliary contact	Rated operational voltage Ue(V)	Rated breaking capacity	Agreed thermal current I _{th} (A)
	AC400	800VA	16
	AC230		
	DC220	300W	
	DC110		
Type	Code	Type	
3NO3NC	A33	4NO4NC	A44
5NO5NC	A55	6NO6NC	A66
7NO7NC	A77	8NO8NC	A88
9NO9NC	A99	10NO10NC	A1010
11NO11NC	A1111	12NO12NC	A1212
13NO13NC	A1313	14NO14NC	A1414

Note: 1.H/HU/HV series have 3NO 3NC~14NO 14NC
NO:normally open contact
NC:normally closed contact

Undervoltage (loss-of-voltage) release (Q)



Rated operational voltage (V)		Undervoltage release		Loss-of-voltage release	
		AC230	AC400	AC230	AC400
Action type	Type	Code			
	Instantaneous time	Q20	Q10	S20	S10
	Delay time 1s	Q21	Q11	S21	S11
	Delay time 3s	Q23	Q13	S23	S13
	Delay time 5s	Q25	Q15	S25	S15
Action voltage (V)		(0.35-0.7) Ue		(0.1-0.35) Ue	
Guarantee the reliable closing voltage (V)		(0.85-1.1) Ue			
Not guarantee the reliable closing voltage		≤ 0.35Ue			
Power consumption		15VA			

Note: In thunderstorm prone areas or power grids with unstable power supply voltage, it is recommended to use undervoltage tripping with delay to prevent circuit breaker tripping due to short-term voltage drop. The delay time is generally 0.3S, 0.7S, 1S, 3S, 5S

Undervoltage release

Rated insulation voltage(Ui)	Rated control supply voltage(Us)	Instantaneous power	Maintained power
		VW3 (H)(Includes high voltage series)	VW3 (H)(Includes high voltage series)
400V	AC380V/AC400V	115W	3.6W
	AC220V/AC230V	118W	3.4W

Loss-of-voltage release

Rated insulation voltage(Ui)	Rated control supply voltage(Us)	Instantaneous power	Maintained power
		VW3 (H)(Includes high voltage series)	VW3 (H)(Includes high voltage series)
400V	AC380V/AC400V	280W	6.36W
	AC220V/AC230V	105W	3.24W

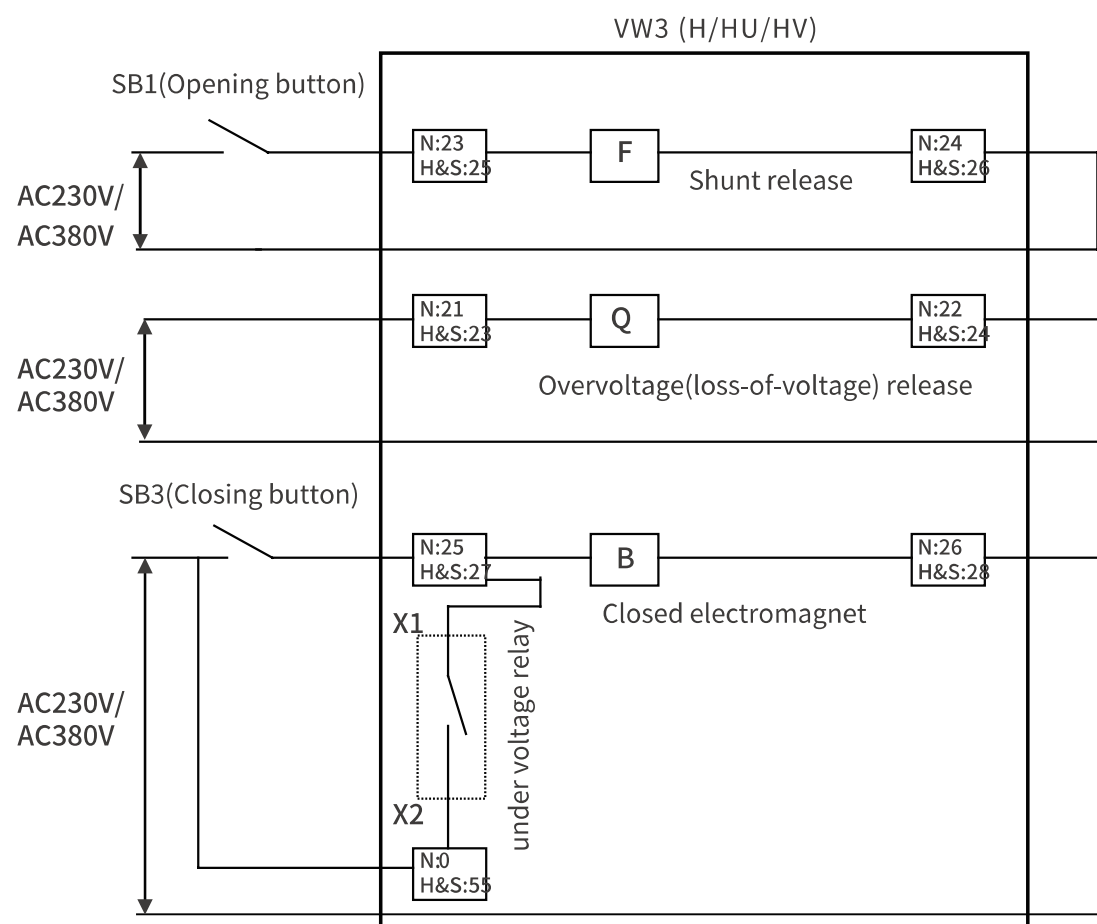
Grid Undervoltage (loss-of voltage) release



Suitable for distributed PV low-voltage grid connection, achieving voltage loss tripping, overvoltage tripping, and automatic closing upon voltage detection.

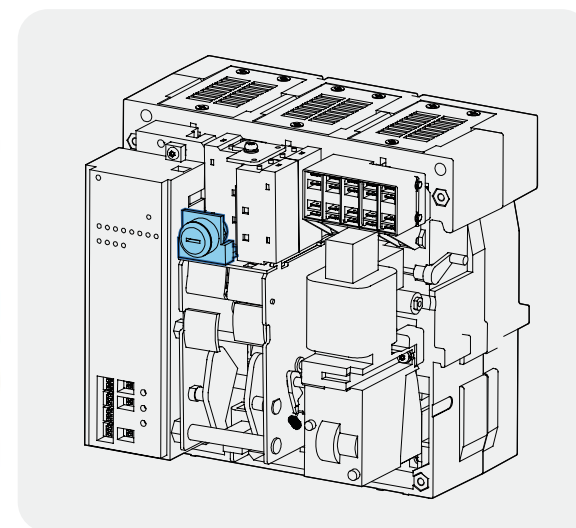
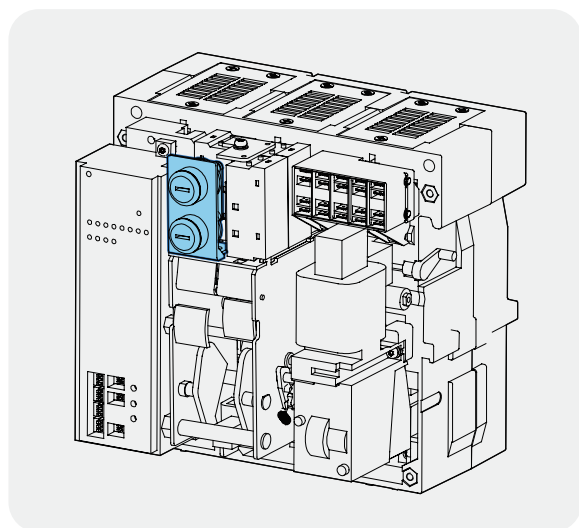
Action value of loss-of voltage: $\leq 20\%U_e$	Action delay time of loss-of voltage: 1-10s
Action value of overvoltage: $\geq 135\%U_n$	Automatic closing voltage: $(0.85-1.1)U_e$

Note: 1. X1 and X2 only send a short signal (200ms) after overvoltage(loss-of-voltage) release recover for 1 second, then the closed electromagnet act .
2. The number in the box represents the secondary wiring terminal number, and H&S represents the terminal number of VW3 (H/HU/HV).



Lock

Off-position key lock (SF11,SF21,SF31,SF32,SF53)



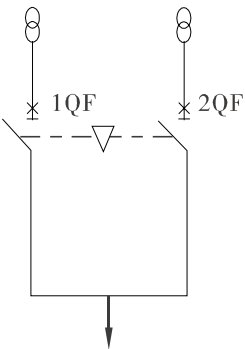
This key lock is locked on the manually disconnected position of the circuit breaker

Key lock :

One lock one key (SF11): One circuit breaker with one lock and one key, and not allowed to closed when locked
Two locks one key (SF21): Two circuit breakers with two same lock and one key, and only allowed one circuit breaker closed
Three locks one key (SF31): Three circuit breakers with three same lock and one key, and only allowed one circuit breaker closed
Three locks two keys (SF32): Three circuit breakers with three same lock and two keys, and only allowed two circuit breakers closed
Five locks three keys (SF53): Five circuit breakers with five same lock and three keys, and only allowed three circuit breakers closed

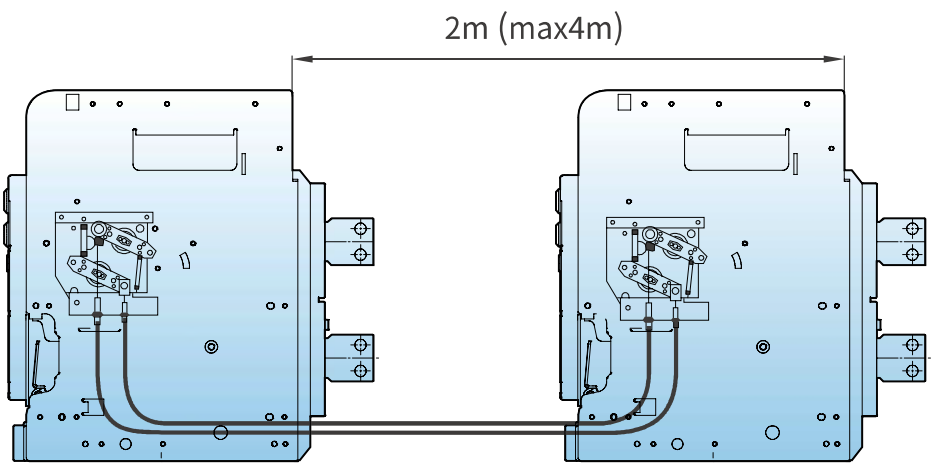
Mechanical interlocking (SR11,SR12,SR21,SY11)

Circuit figure Possible operating modes



1QF	2QF
0	0
0	1
1	0

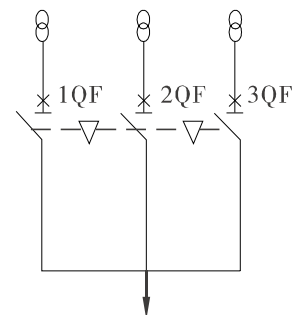
Two interlocking cables circuit breakers or two interlocking hard rods circuit breakers



Circuit breaker 1 Circuit breaker 2

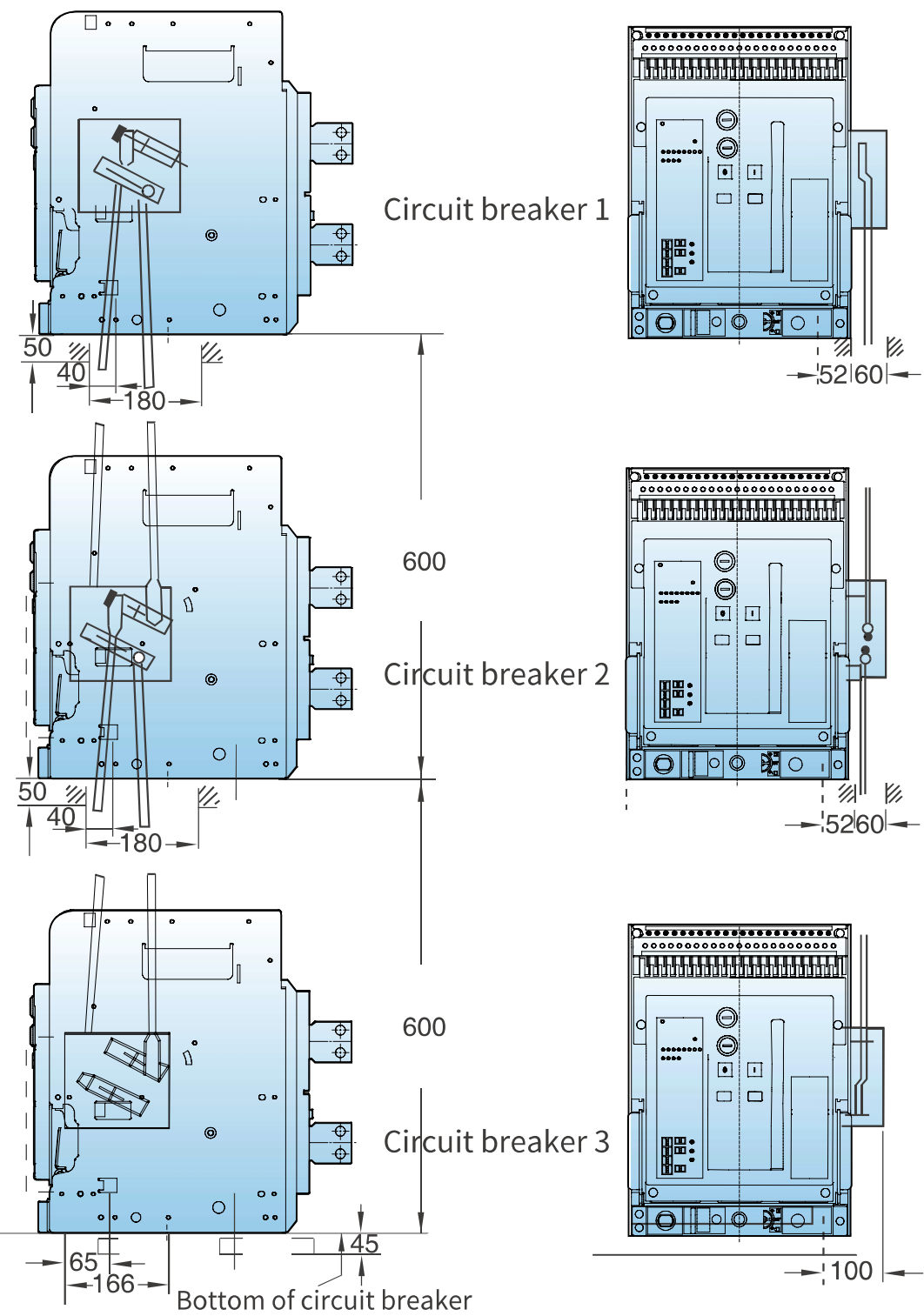
Circuit figure Possible operating modes

Mode 1: Three power supplies can only close one circuit breaker

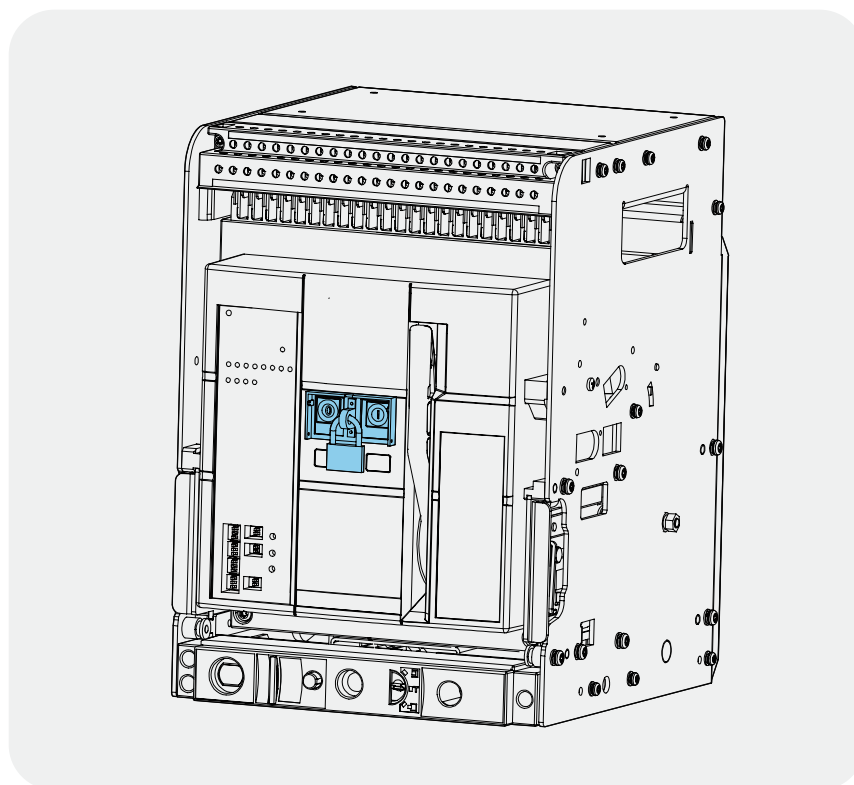
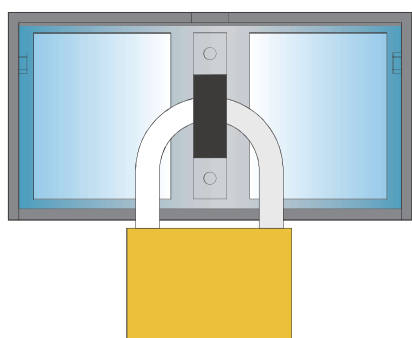


1QF	2QF	3QF
0	0	0
1	0	0
0	1	0
0	0	1

Three circuit breaker interlocking hard rods

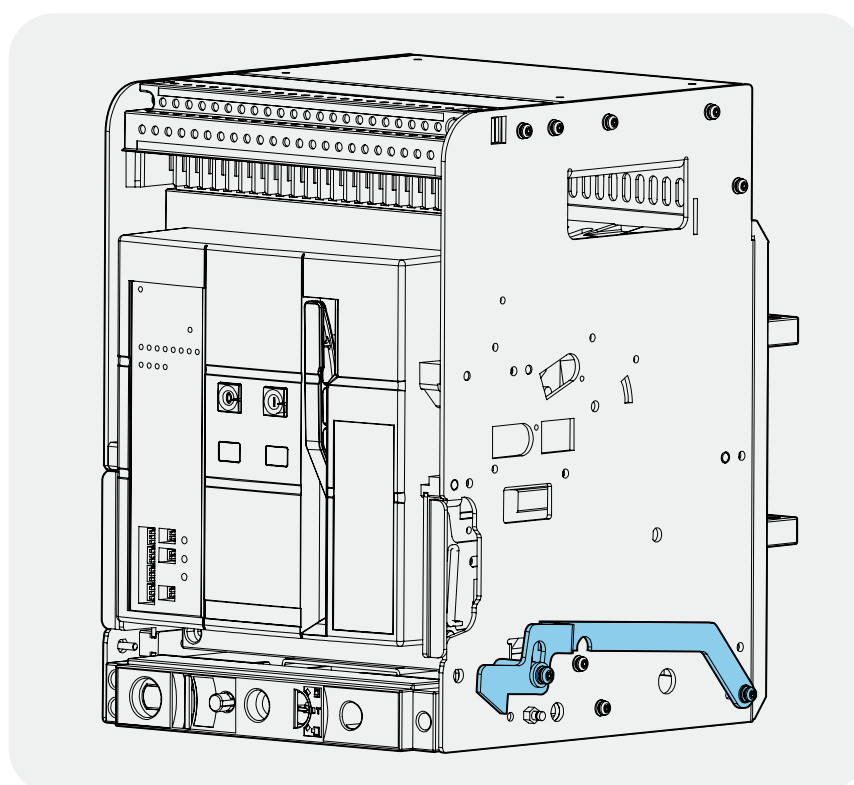
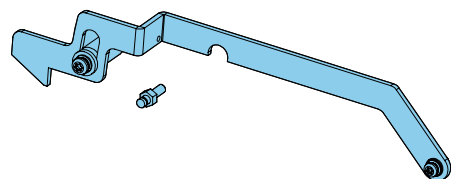


Button lock (S) (The minimum safety distance 35mm between the cases)

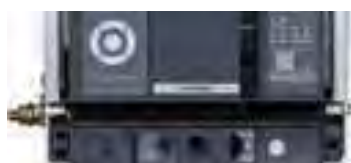


Door interlock (The minimum safety distance 40mm between the circuit breaker)

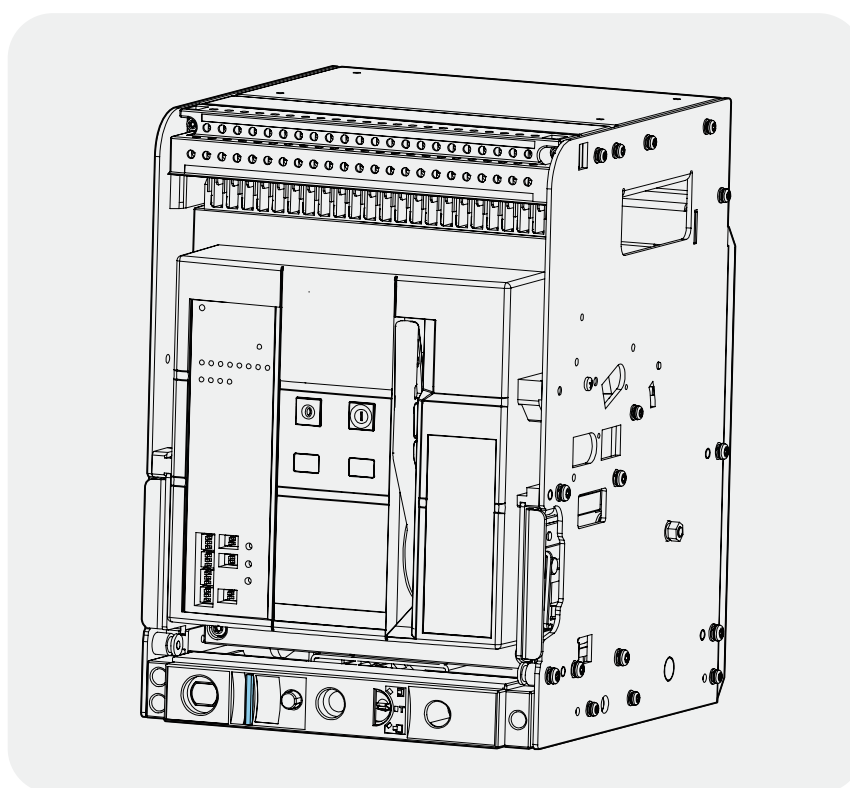
When the circuit breaker at the working or testing position, prohibited to open the cabinet door; The door is opened and the circuit breaker at the connected position, close the door without disconnecting the circuit breaker.



Drawer type circuit breaker locking device at "separation" position

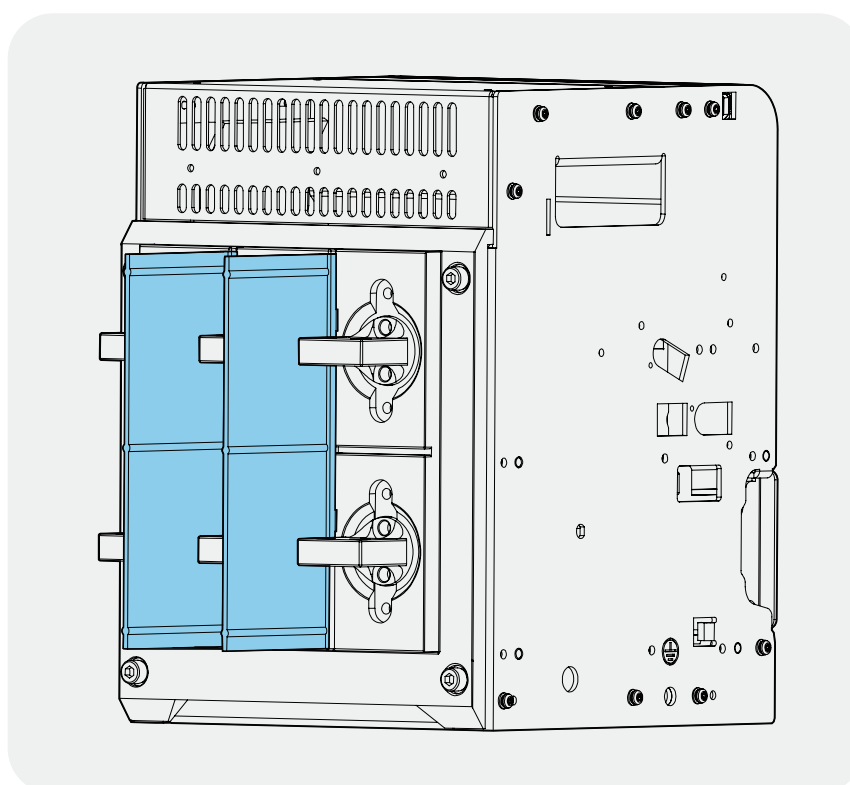
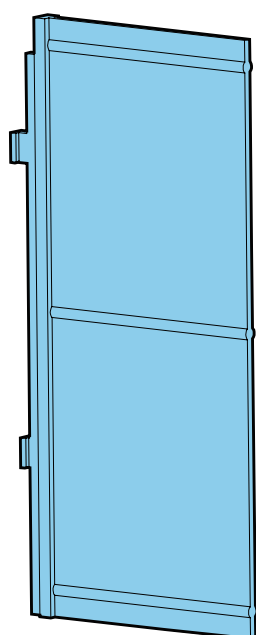


When the drawer type circuit breaker at the separated position, lock the circuit breaker by pull out the rod. After locking, the circuit breaker will not be able to "test" and "connection" positions.



Phase partition (The minimum safety distance 180mm between the circuit breakers)

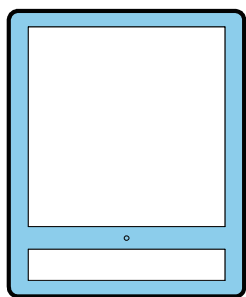
the phase partition is installed in the groove between all the phase bus bars, used to increase the insulation strength between phases of the main circuit so as to prevent the short circuit in case of the insulation breakdown and improve the power reliability.



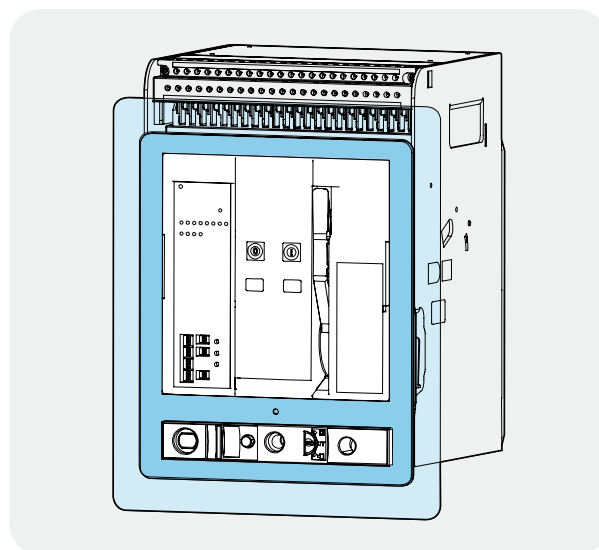
Accessories

VOZWEI

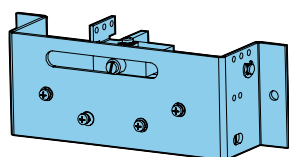
Doorframe(M)



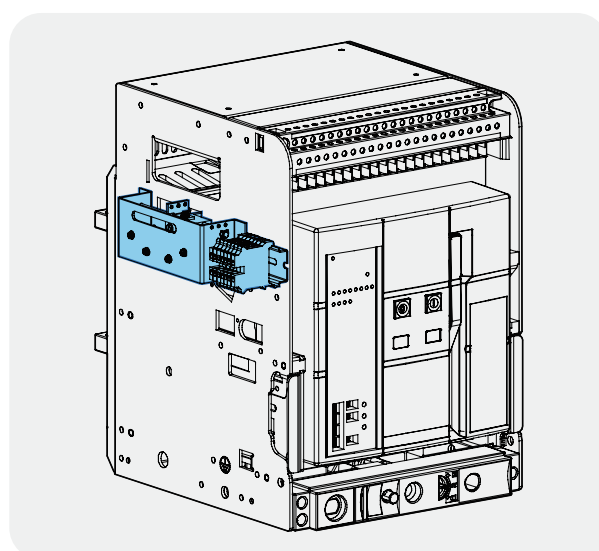
Have the fixed type and drawout type, it is mainly placed on the door of the cubicle for sealing, and can make the protection level of the circuit breaker reaches IP40. It is beautiful and practical.



Position indication(CX) (The minimum safety distance 50mm between the circuit breakers)

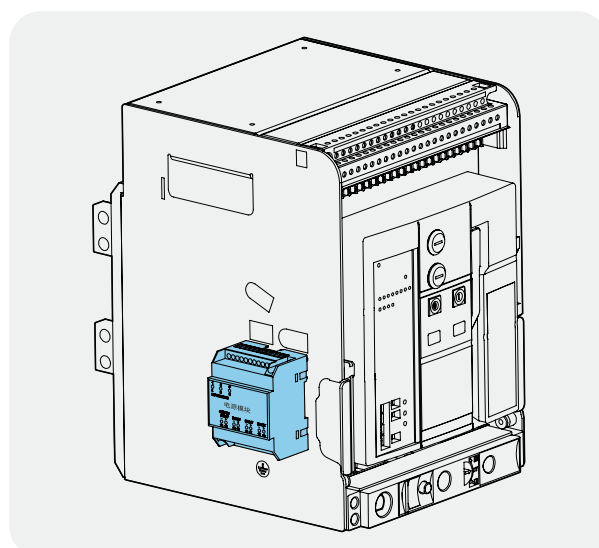
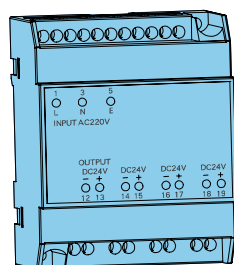


With three contacts to indicate the position status of the circuit breaker (connection, testing, separation). When the circuit breaker is in a certain position, the corresponding contact will be closed.

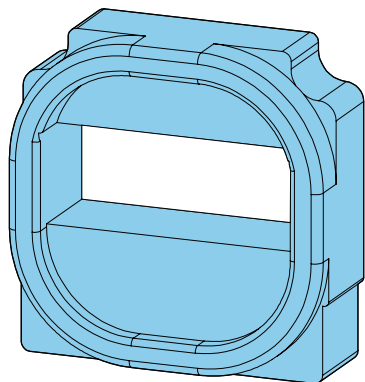


Power supply module (The minimum safety distance 60mm between the circuit breakers)

AC65~500V, DC80~700V

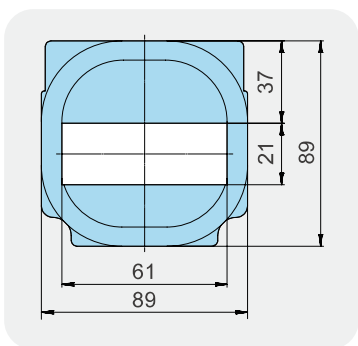
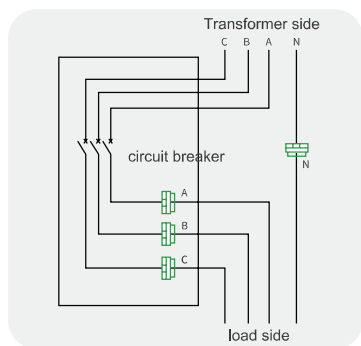


External neutral current transformer (N)

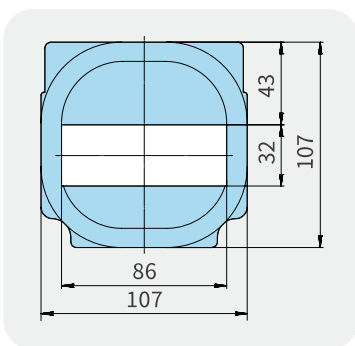


The TN-S distribution system use the three pole circuit breaker and requires an external neutral current transformer.
The earth current protection type distribution system use the three pole circuit breaker and requires an external neutral current transformer.
The installation cautions as follows:

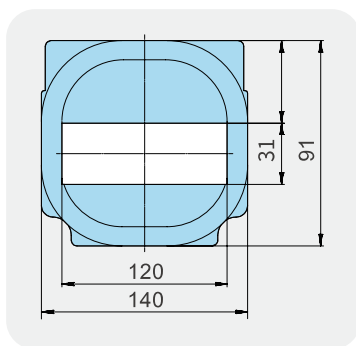
1. The external neutral current transformer has a twisted pair wire with codes 6 and 7 ,connect to same terminal code of the secondary terminal
- 2.The installation direction of the external neutral current transformer depends on the wiring method of the circuit breaker:
If the line of the circuit breaker upper , the convex surface of the external neutral current transformer should face the neutral grounding point side;
If the line of the circuit breaker down , the plane surface of the external neutral current transformer should face the neutral grounding point side;
3. Current transformer type based on the width of the N-phase busbar



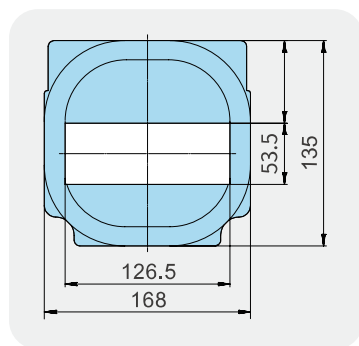
N1



N2



N3



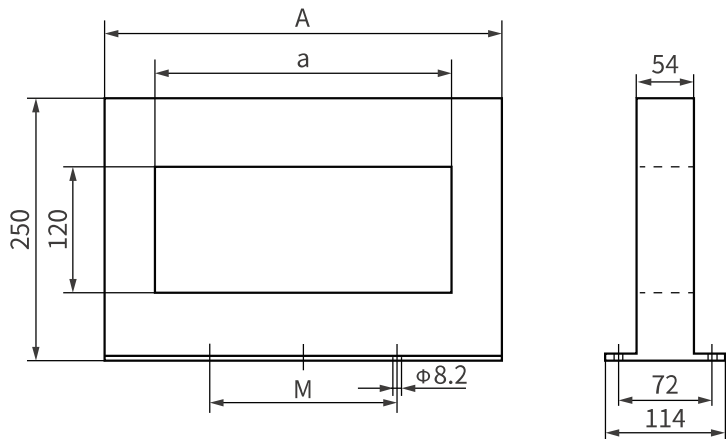
N4

External leakage current transformer

When the residual current protection function, required an external residual current transformer, and the controller does not have the ground protection function.
The external neutral current transformer has a twisted pair wire with codes 6 and 7 ,connect to same terminal code of the secondary terminal
The principle of residual current protection is shown in the following figure



Outline Dimension



	A	M	a
Type I	380	250	285
Type II	465	250	370
Type III	595	350	500

Power consumption (ambient air temperature +40°C)

Power consumption is the total Power consumption which measured at the circuit breaker frame rated current Inm

Type	Power consumption (W)	
	Fixed type	Drawout type
VW3-25(H/HU/HV)	356.8	823.4
VW3-40(H/HU/HV)	486.7	856.8
VW3-63(H/HU/HV)	787	1145

Temperature derated coefficient

If the ambient temperature is higher than +40°C,capacity can be corrected according to the following table

Type	Rated current (A)	+40°C	+45°C	+50°C	+55°C	+60°C	+65°C	+70°C
VW3-25(H/HU/HV)	630~2000	1	1	1	1	1	1	1
	2500	1	1	1	1	0.99	0.94	0.88
VW3-40(H/HU/HV)	1000~2500	1	1	1	1	1	1	1
	2900	1	1	1	1	1	1	0.96
	3200	1	1	1	1	1	1	1
	3600	1	1	1	0.94	0.92	0.9	0.85
	4000	1	0.95	0.92	0.89	0.85	0.85	0.80
	4000~5000	1	1	1	1	1	1	1
VW3-63(H/HU/HV)	4000~5000	1	1	1	1	1	1	1
	6300	1	1	0.98	0.93	0.89	0.85	0.82

If the altitude is higher than 2000m,capacity can be corrected according to the following table

Altitude (m)		2000	3000	4000	4500	5000
Power-frequency withstand voltage(V)		5000	4500	4000	3500	3150
Correction coefficient for short-circuit breaking capacity		1	0.83	0.77	0.7	0.63
Correction coefficient for working current	VW3-25(H/HU/HV)	1	1	1	1	0.97
	VW3-40(H/HU/HV)	1	0.93	0.88	0.85	0.82
	VW3-63(H/HU/HV)	1	0.98	0.93	0.90	0.87

The derating correction factor is only applicable to the maximum current of the shell frame

Copper busbar specification

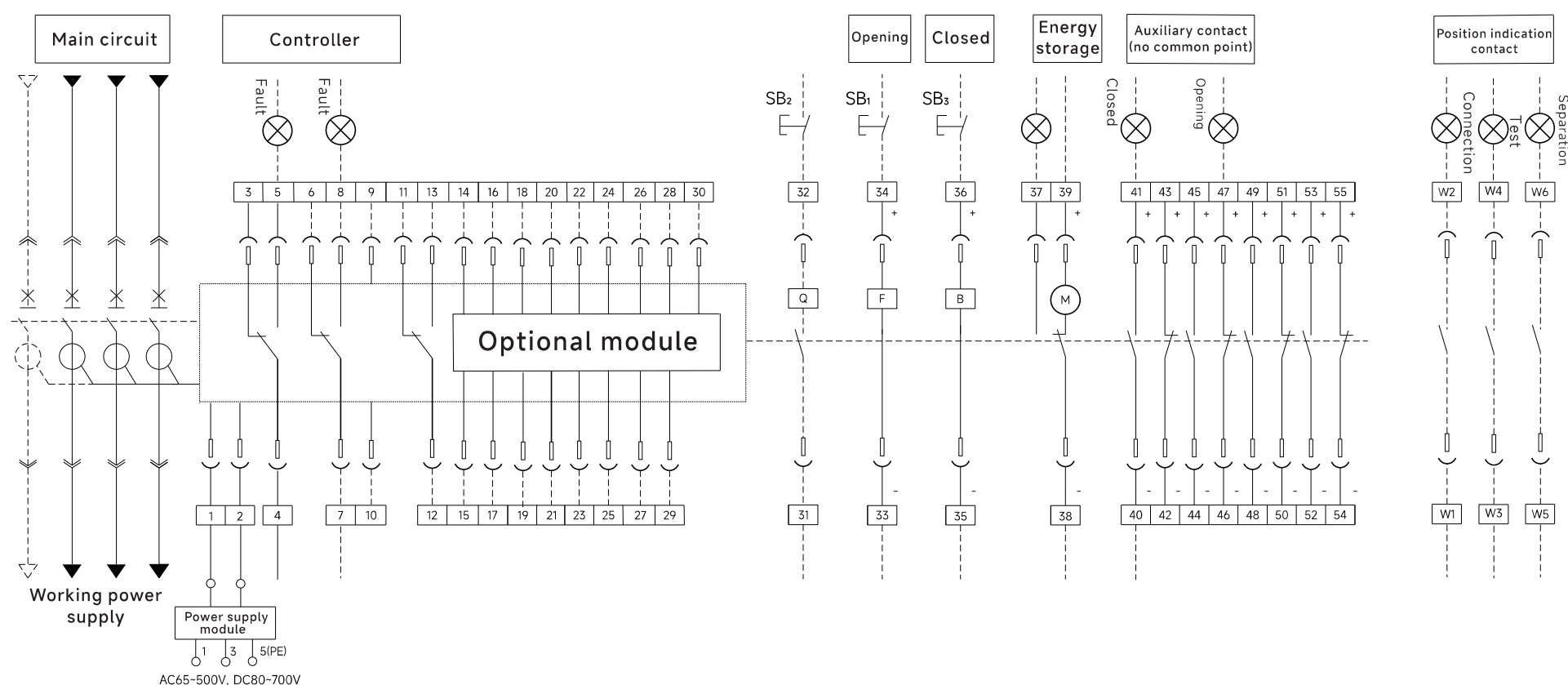
Frame size rated current Inm (A)	Rated current In (A)	Copper busbar specification		
		Number of busbar		Dimension
		Horizontal wiring	Vertical wiring	
VW3-25(H/HU/HV)	630	2	/	80×5
	800	2	/	80×5
	1000	2	/	80×5
	1250	3	/	80×5
	1600	2	/	80×10
	2000	3	/	80×10
	2500	3	/	80×10
VW3-40(H/HU/HV)	1000	2	1	80×5
	1250	3	2	80×5
	1600	2		80×10
	2000	3	2	80×10
	2500	3		80×10
	2900	2		100×10
	3200	3		100×10
	3600	4		100×10
	4000	5	4	100×10
VW3-63(H/HU/HV)	4000	5	4	100×10
	5000	7	5	100×10
	6300	10	8	100×10

The table indicates the copper busbar specifications adopted when the circuit breaker is under the ambient temperature of 40℃ and the open wide installation under the heating condition meets the stipulation in GB14048.2.

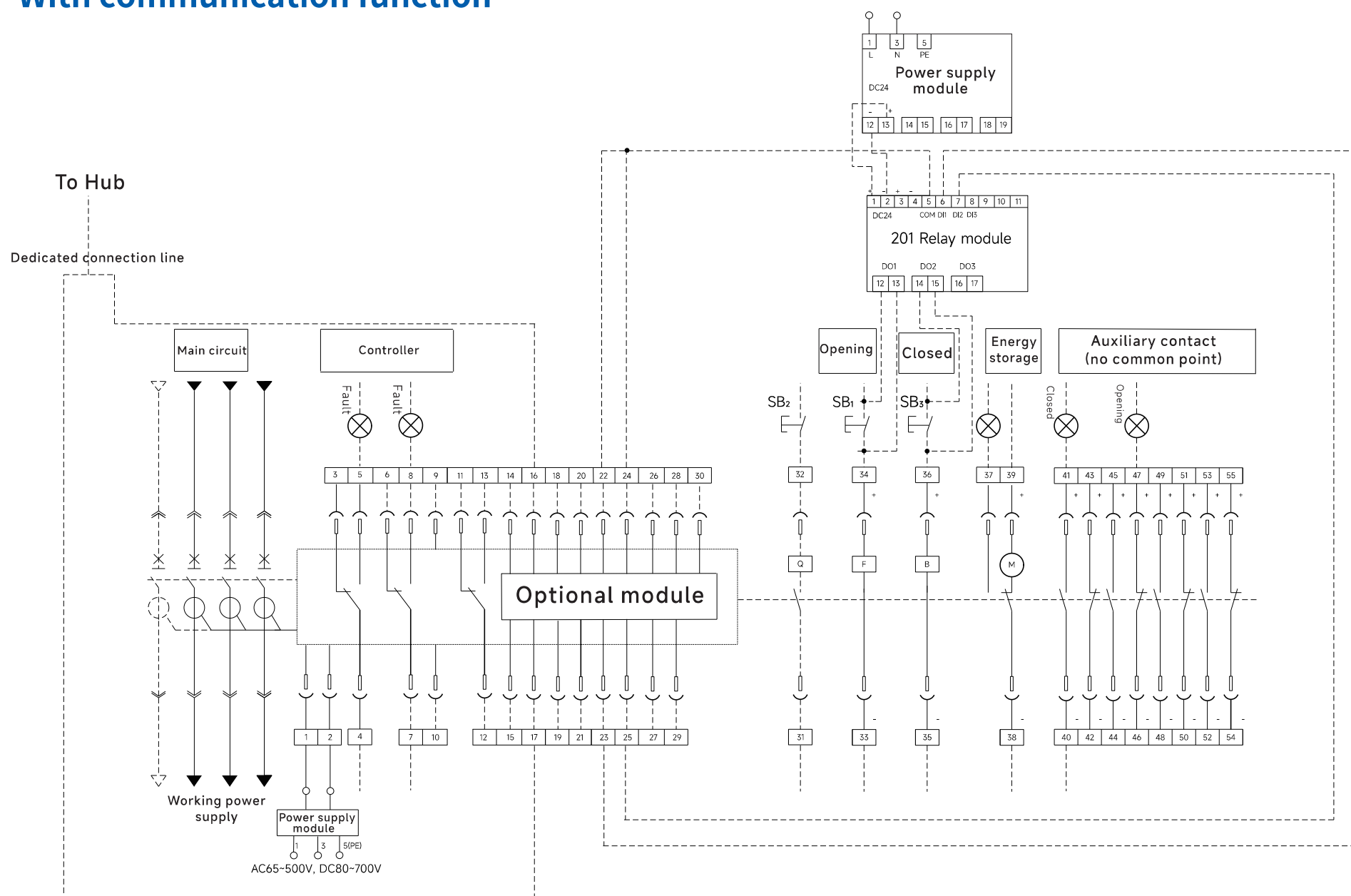
Recommended screw used of outlet busbar diameter

Circuit breaker type	Outlet busbar diameter	Screws grade 8.8 (with washer)	Tightening torque
VW3 (H/HU/HV)	φ13	M12	70N.m

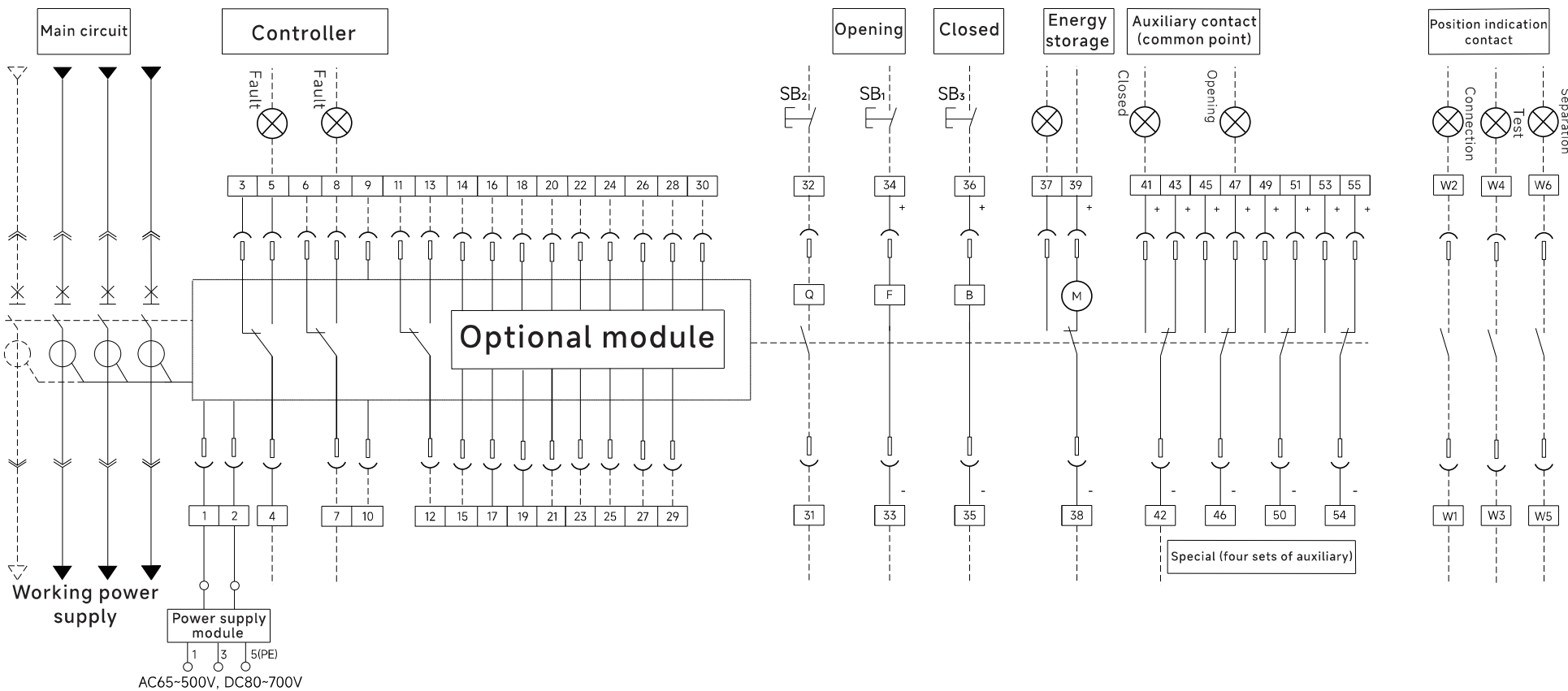
VW3-25(H/HU/HV), VW3-40(H/HU/HV), VW3-63(H/HU/HV) Electrical Wiring Diagram



With communication function



Special (four sets of auxiliary)



Note: SB1 Shunt button SB3 Close button F Shunt release B Closed electromagnet M Motor operating mechanism

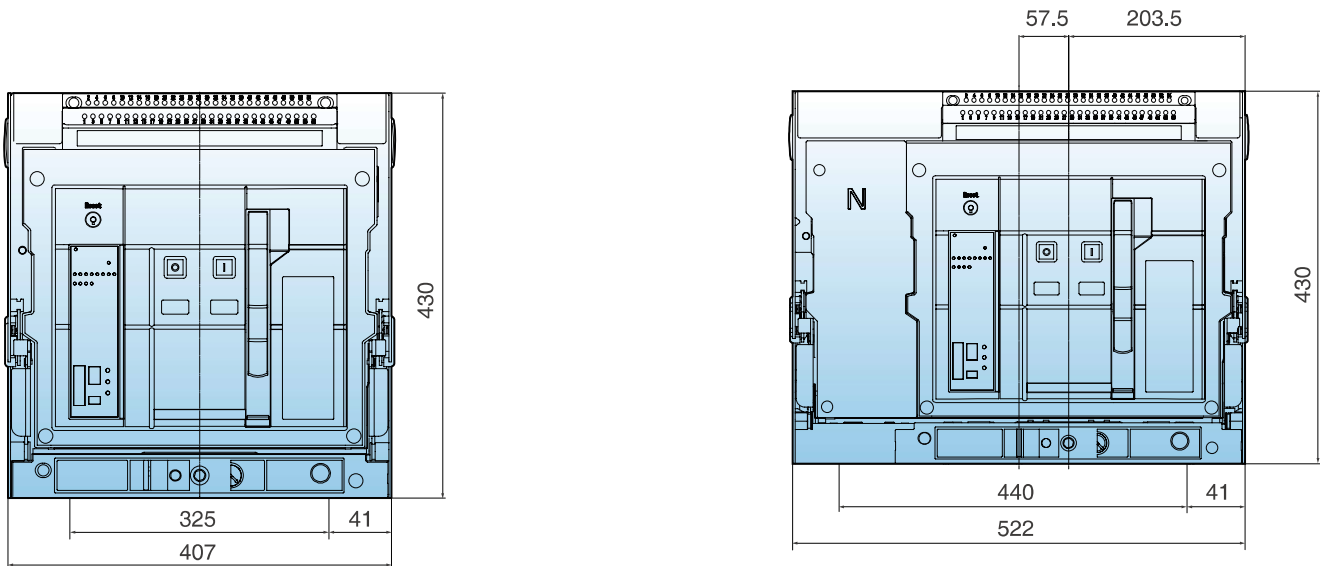
Terminal Number

1#, 2#	Working power supply	26#	A-phase wiring (input voltage ≤ 230V)
3#, 4#, 5#	Fault tripping contact output 1	27#	B-phase wiring (input voltage ≤ 230V)
6#, 7#, 8#	Fault tripping contact output 2	28#	C-phase wiring (input voltage ≤ 230V)
9#, 10#	Remote reset	29#	N-phase wiring
11#, 12#, 13#	Close ready signal output unit	30#	PE-phase wiring
14#, 15#	External transformer or external leakage current transformer	31#, 32#	Under-voltage release or loss of voltage release
16#, 17#	Communication	33#, 34#	Shunt release
18#, 19#	First contact output	35#, 36#	Closed electromagnet
20#, 21#	Second contact output	37#, 38#, 39#	Motor operating mechanism
22#, 23#	Third contact output	40#~55#	Auxiliary contact
24#, 25#	Fourth contact output		

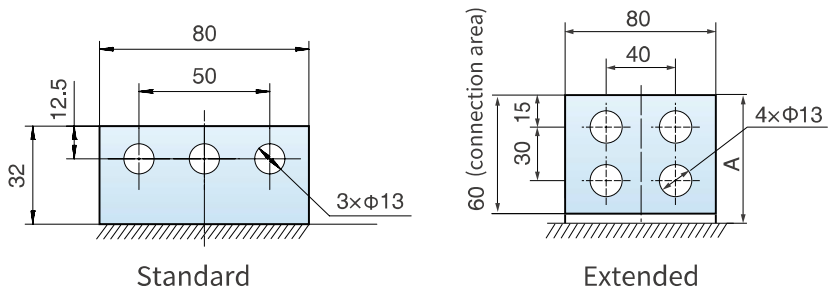
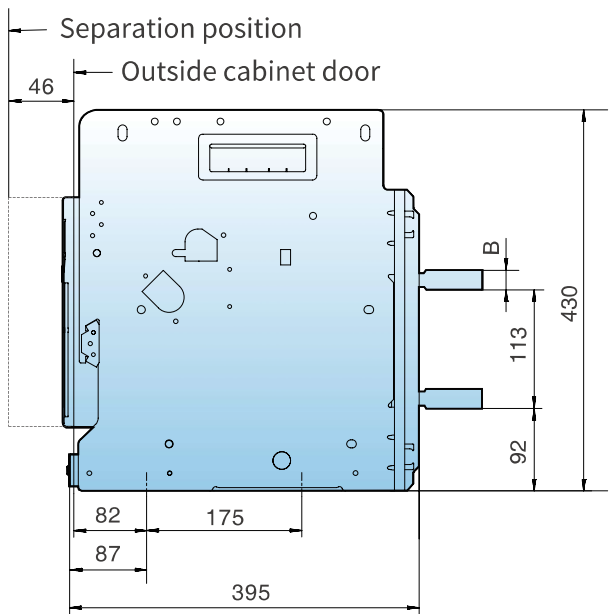
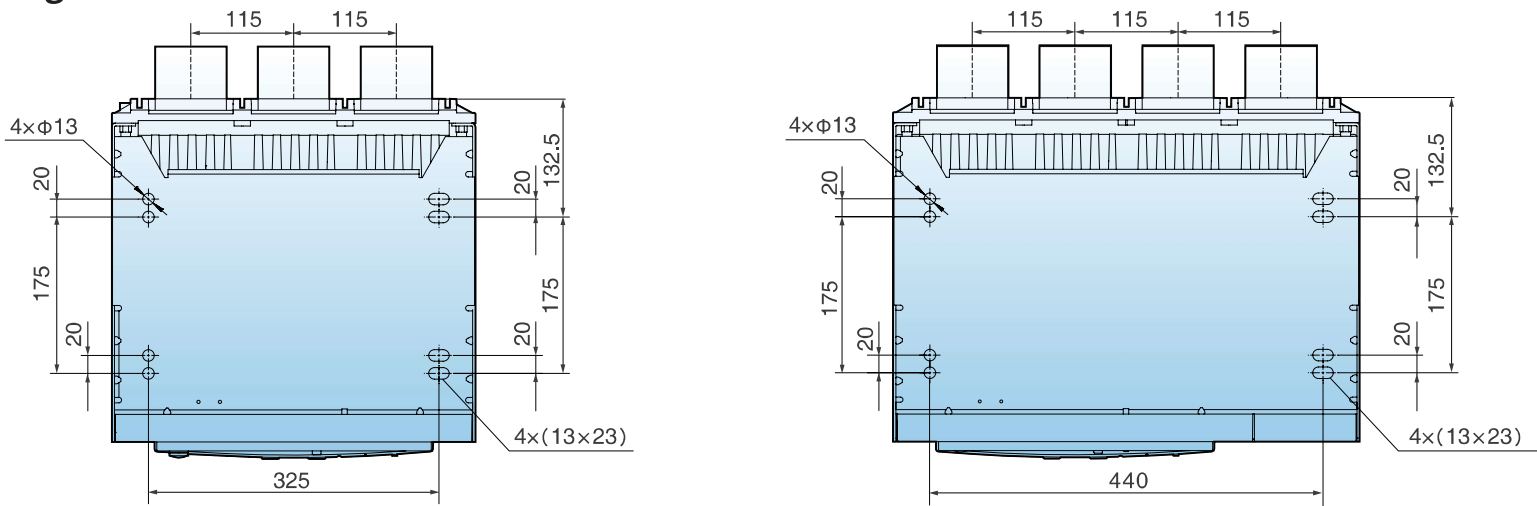
Note: (1) Position contact terminal numbers W1 # -W6 # do not connect the secondary terminal
(2) If the control power supply voltage of F, B and M is different, connect to different power sources separately
(3) Terminals 39 # (VW3-25H/VW3-40H/VW3-63H) can be directly connect to the power supply (automatic pre energy storage), or can be connect to the power supply after the normally open button (manual pre energy storage)
(4) Indicator light, button switch are provided by user
(5) Select the contact output function according to the "DO Function Setting Table" on page 1-23
(6) The above circuit diagrams is the circuit breaker in the open position.
(7) The shunt release coil is of the long-term energized type and defaults to the pulse type. If choose to maintain type coil, please contact the manufacturer.

Drawout type (VW3-25H/VW3-25HU/VW3-25HV)

Front view

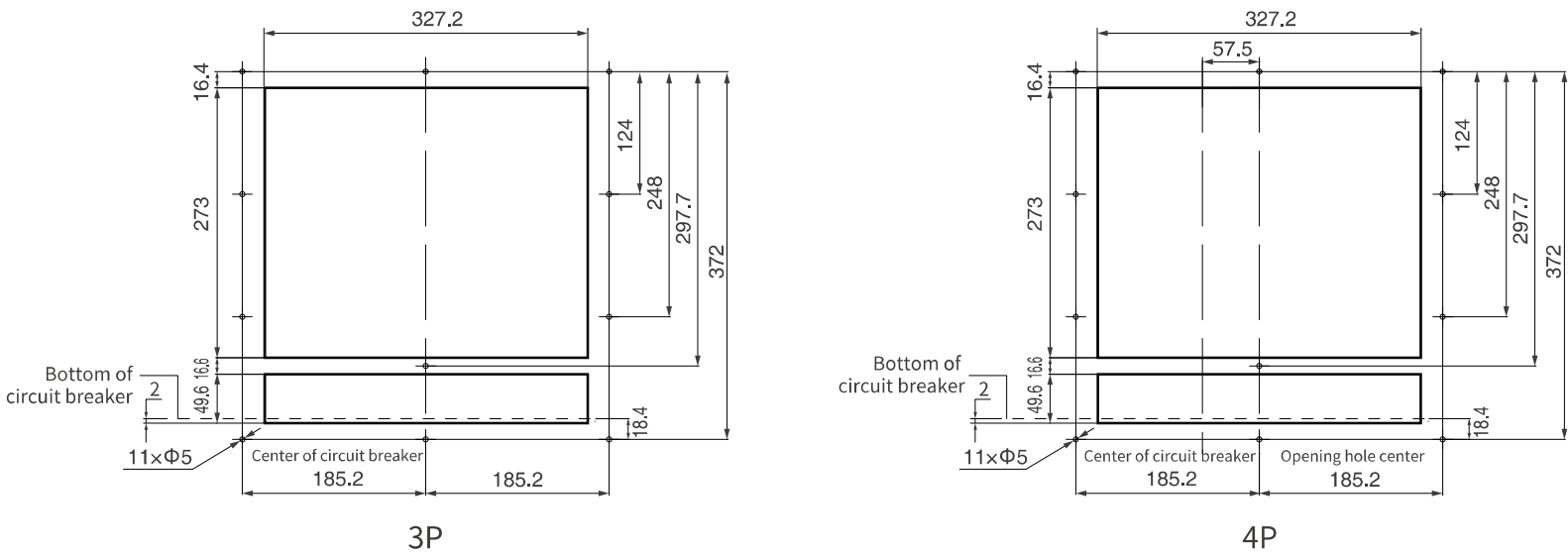


Horizontal Wiring



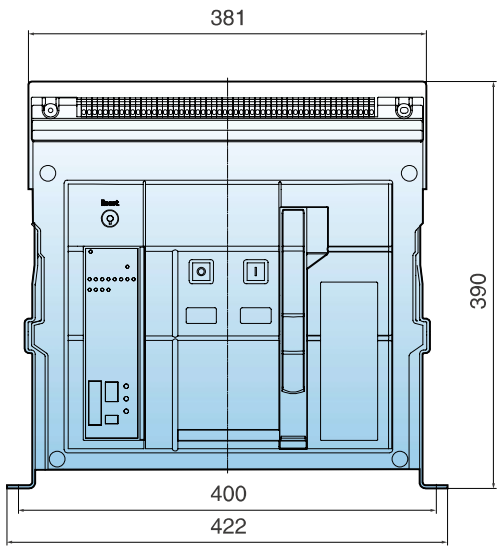
Current	VW3-25H (630~1600A)	VW3-25H (2000~2500A)
Dimension A(mm)	65	75
Dimension B(mm)	10	20

Cabinet door open hole dimension

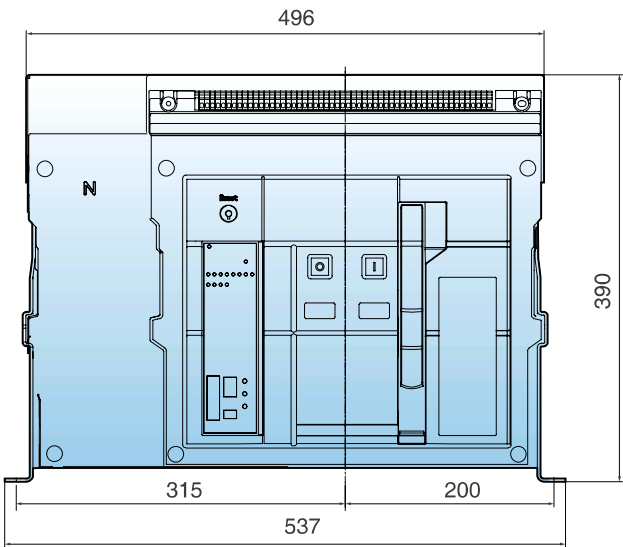


Fixed type

Front view

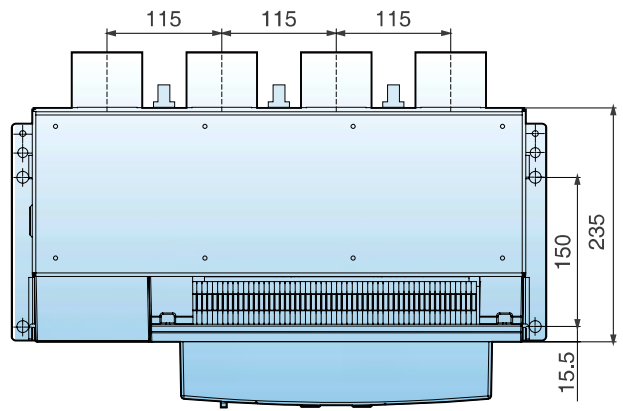
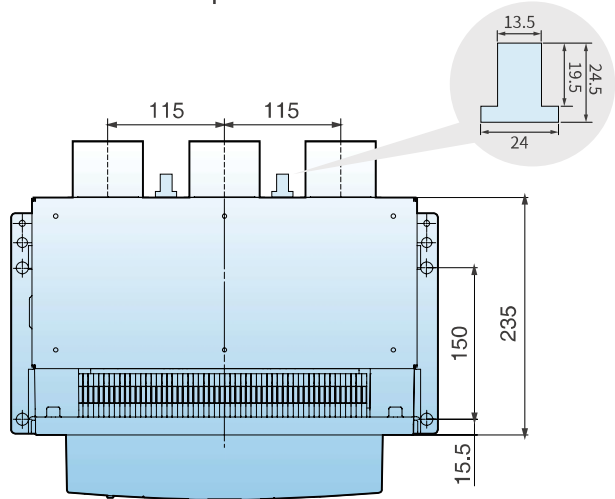


3 pole

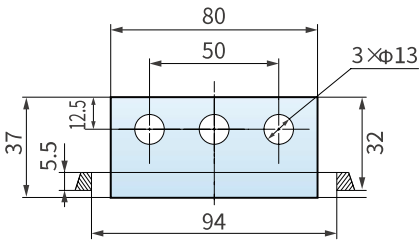
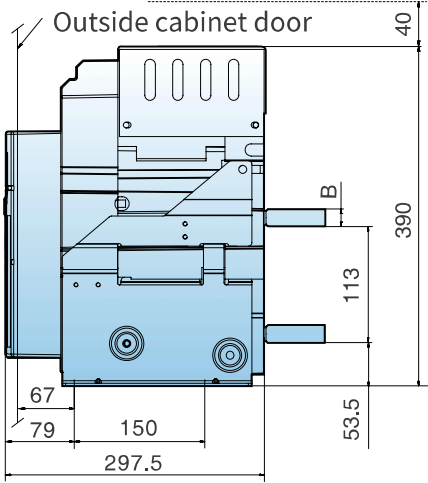


4 pole

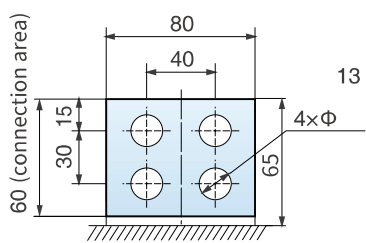
Horizontal Wiring



Distance for dismantling the arc extinguishing chamber



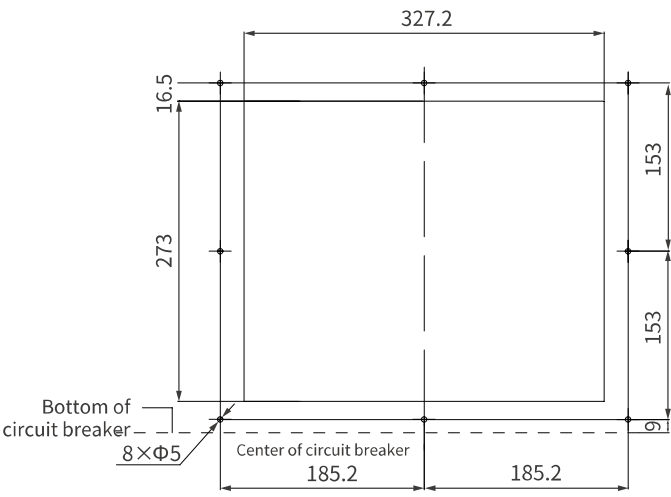
Standard



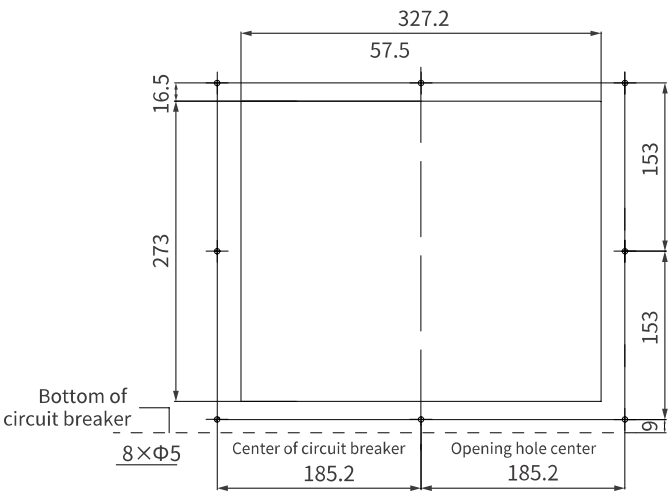
Extended

Current	VW3-25H (630~1600A)	VW3-25H (2000~2500A)
Dimension B(mm)	10	20

Cabinet door open hole dimension

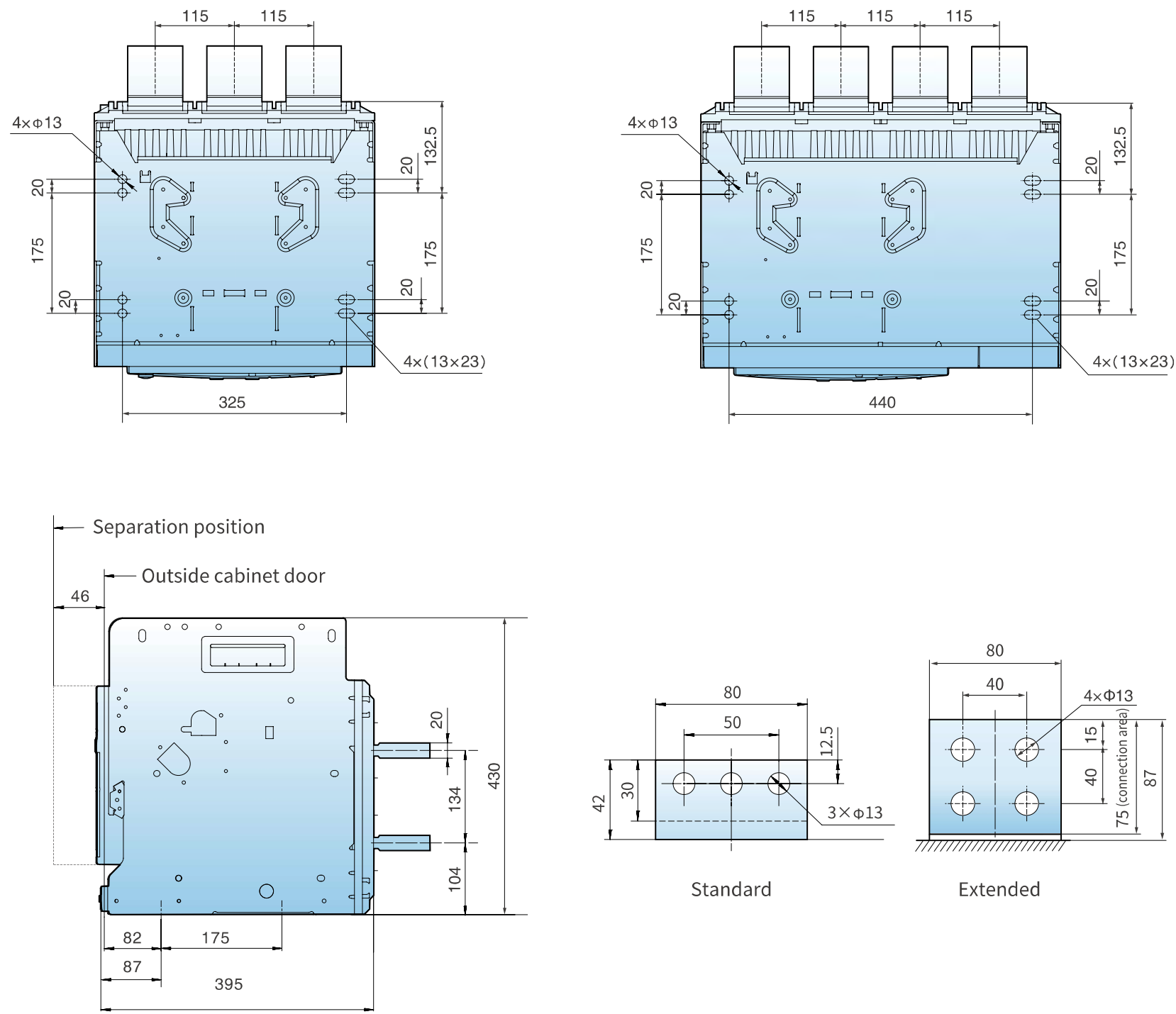


3P

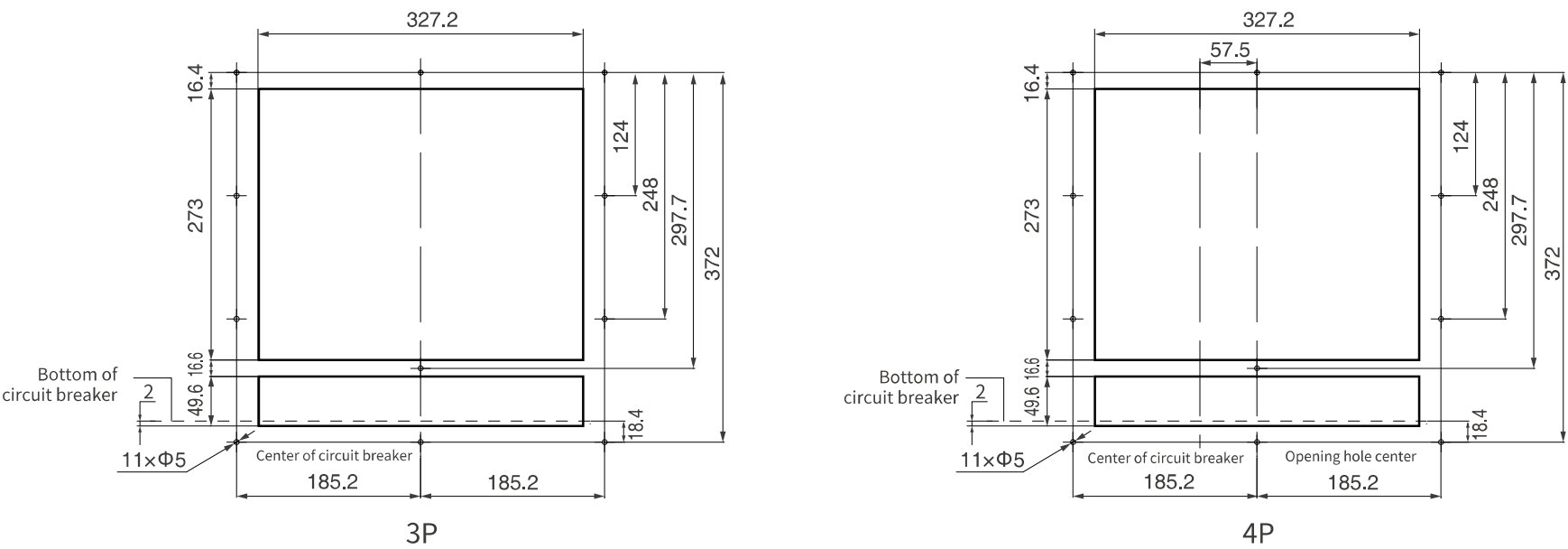


4P

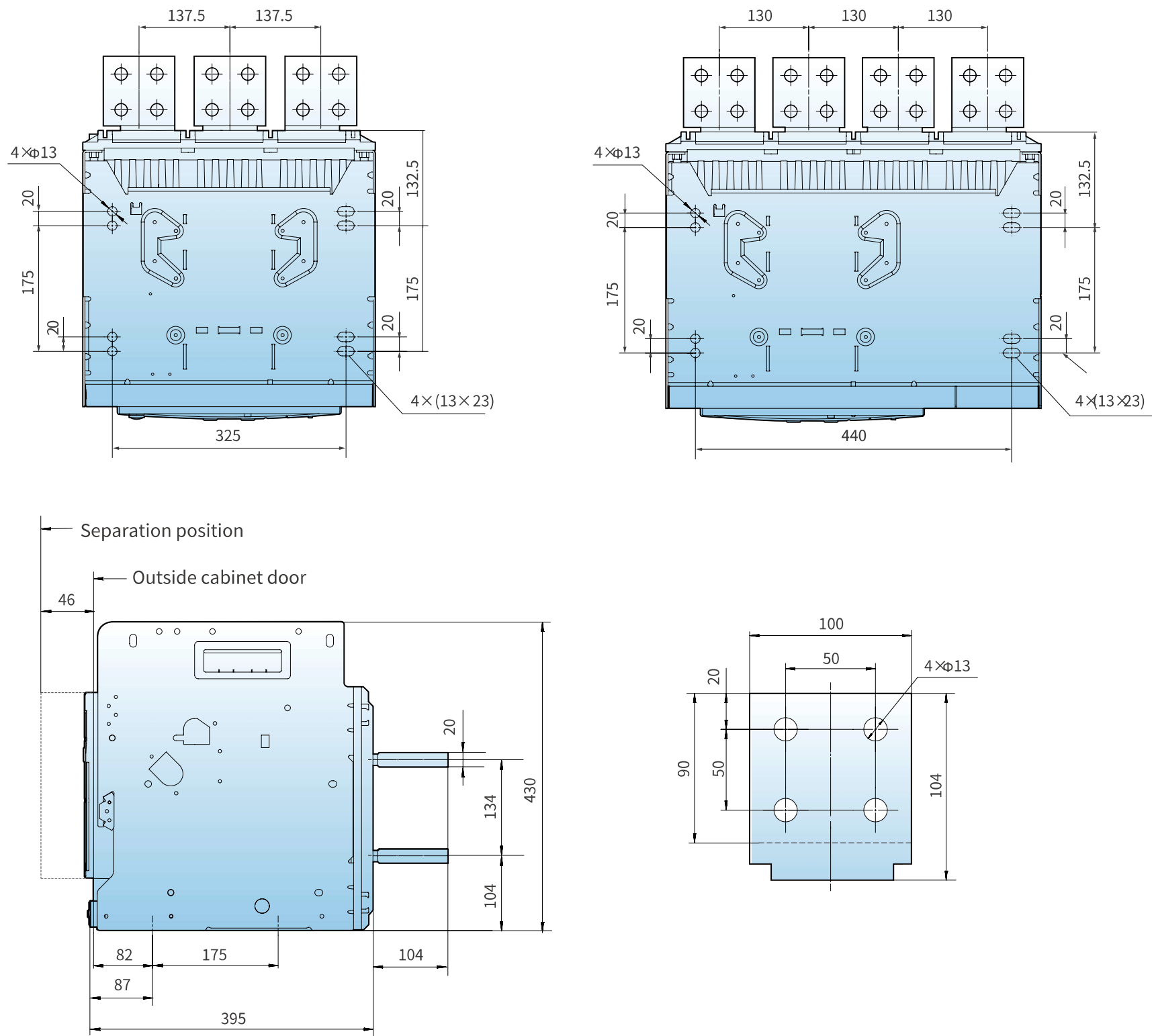
Horizontal Wiring



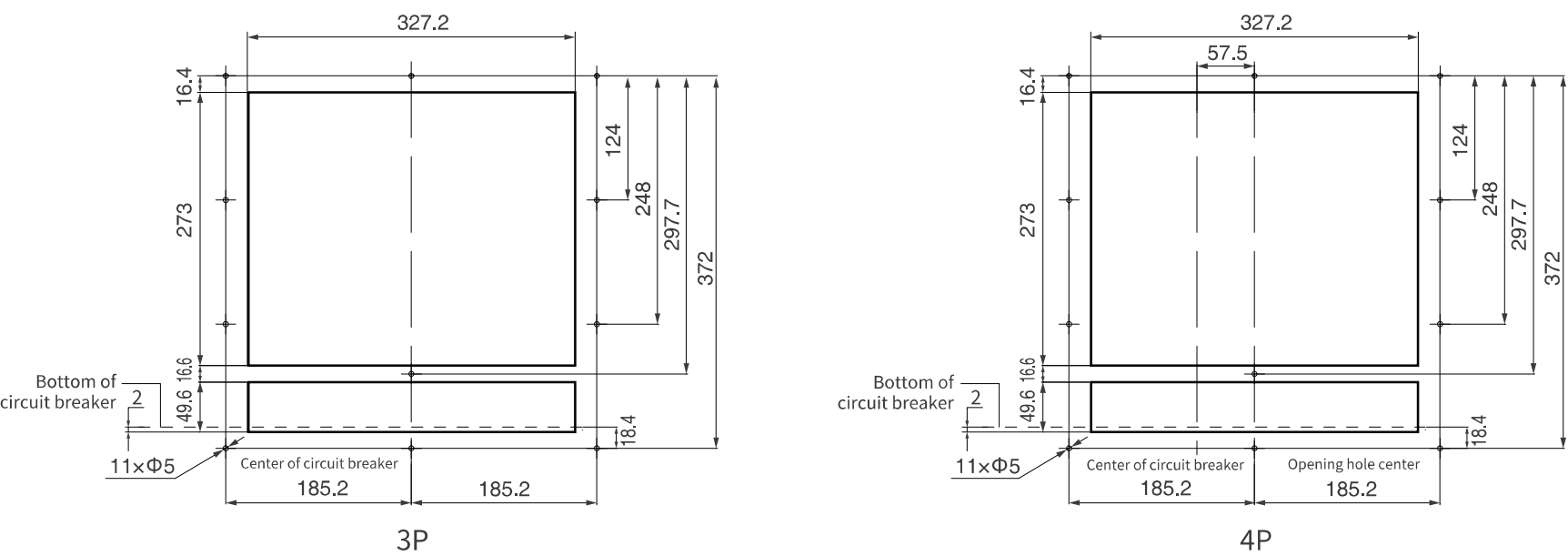
Cabinet door open hole dimension



Horizontal Wiring

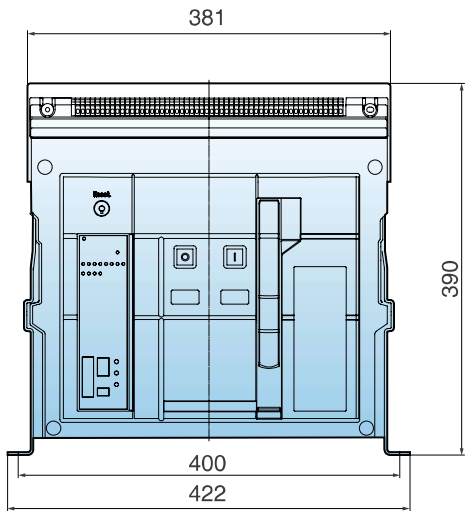


Cabinet door open hole dimension

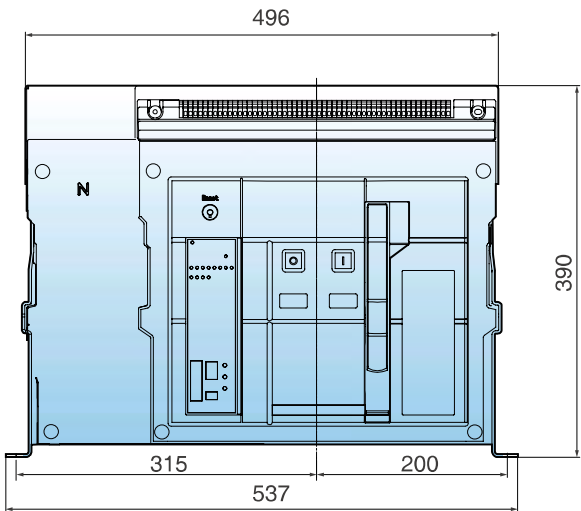


Fixed type (VW3-40H/VW3-40HU/VW3-40HV, 1000~3200A)

Front view

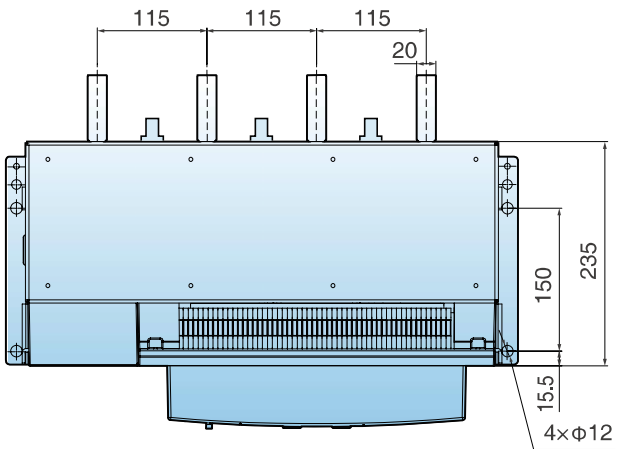
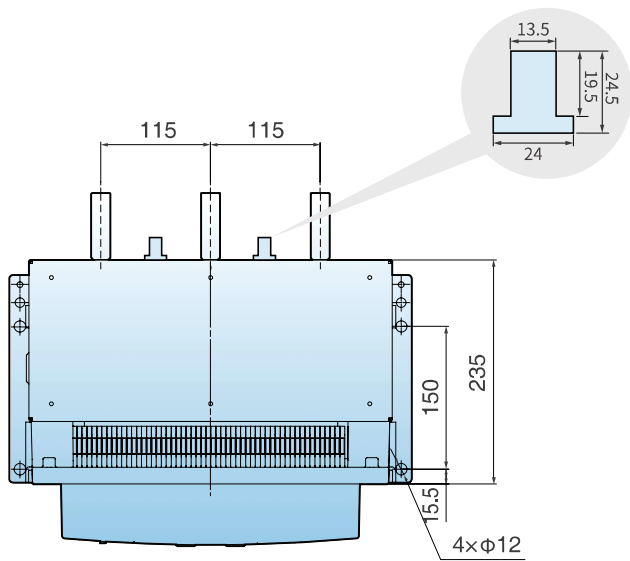


3pole

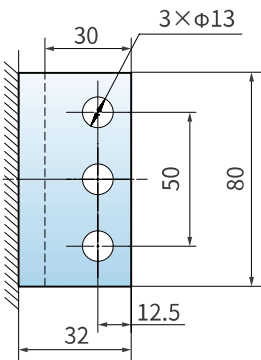
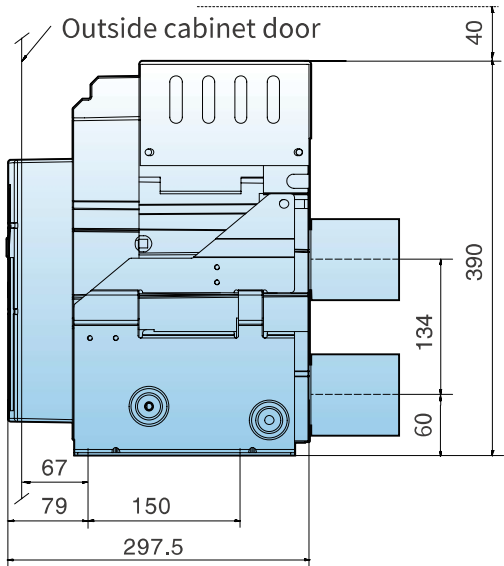


4pole

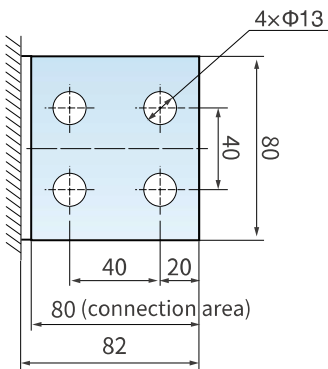
Vertical Wiring



Distance for dismantling the arc extinguishing chamber

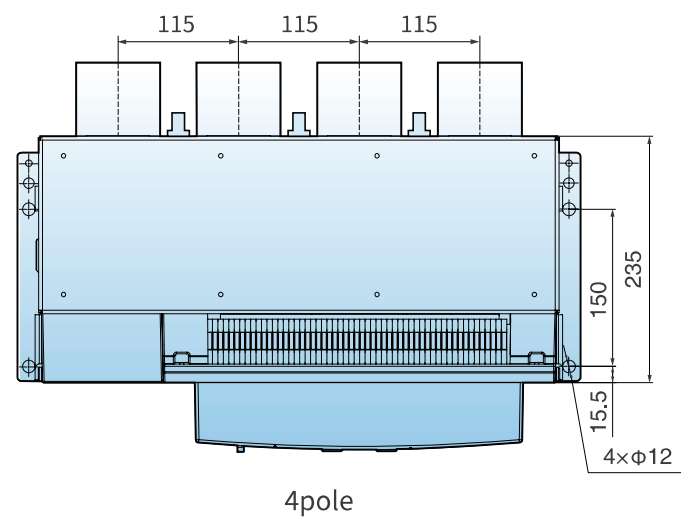
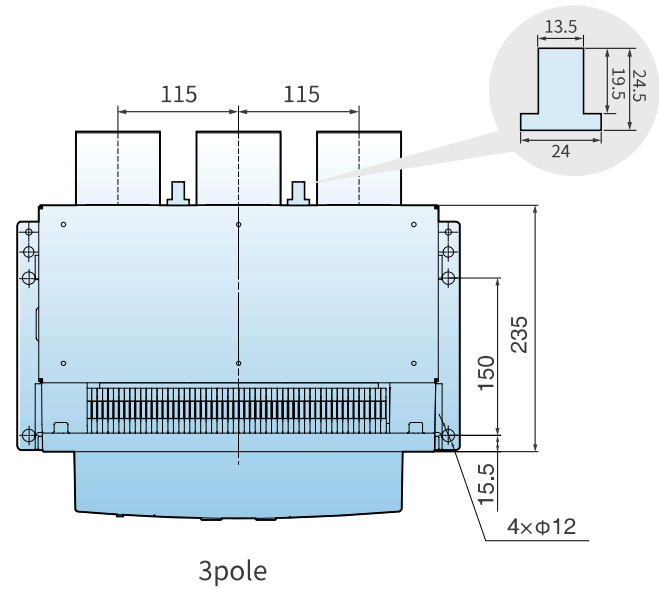


Standard

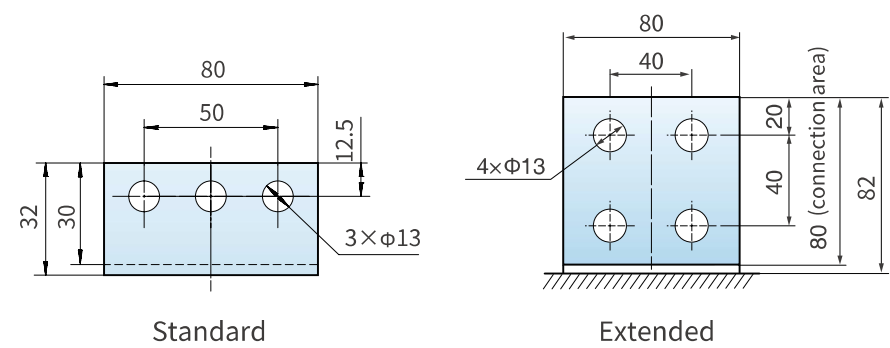
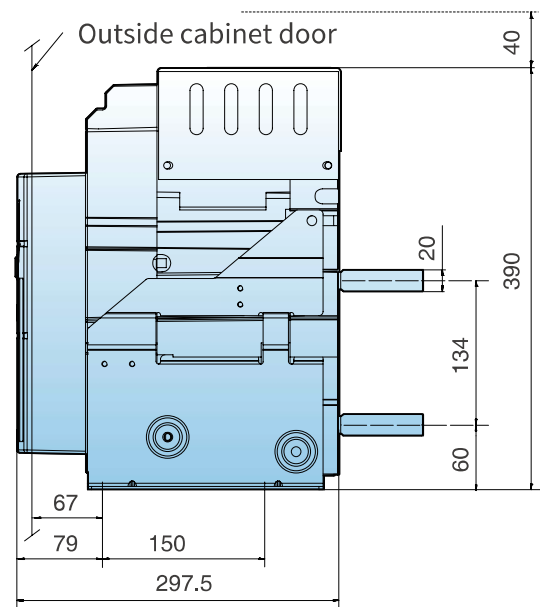


Extended

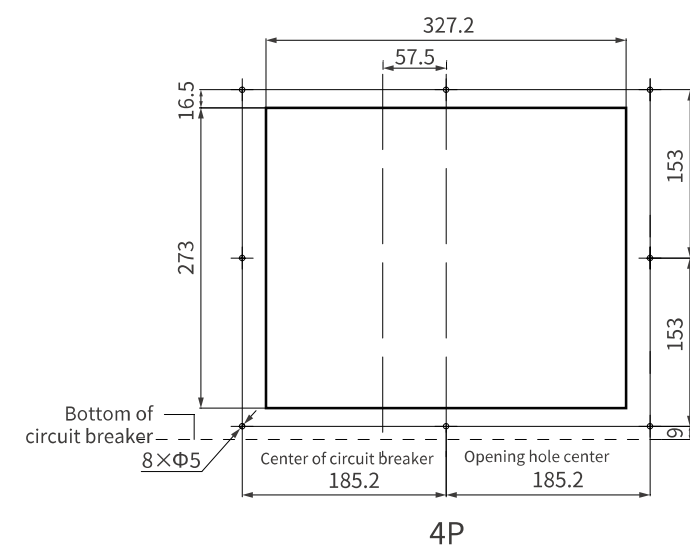
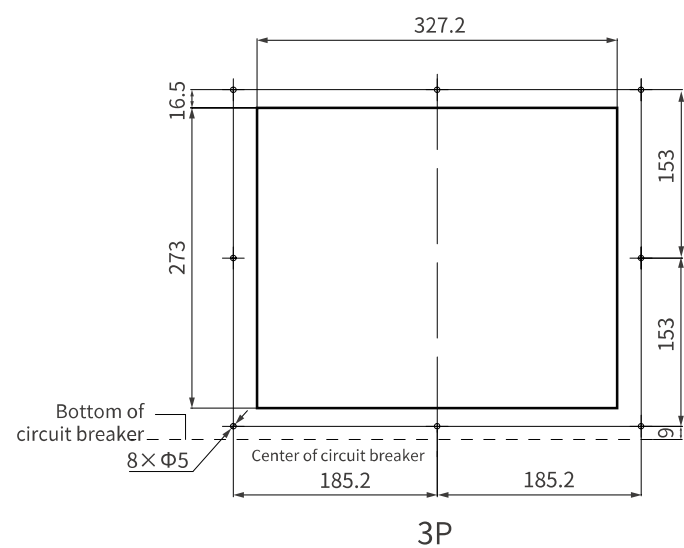
Horizontal Wiring



Distance for dismantling the arc extinguishing chamber

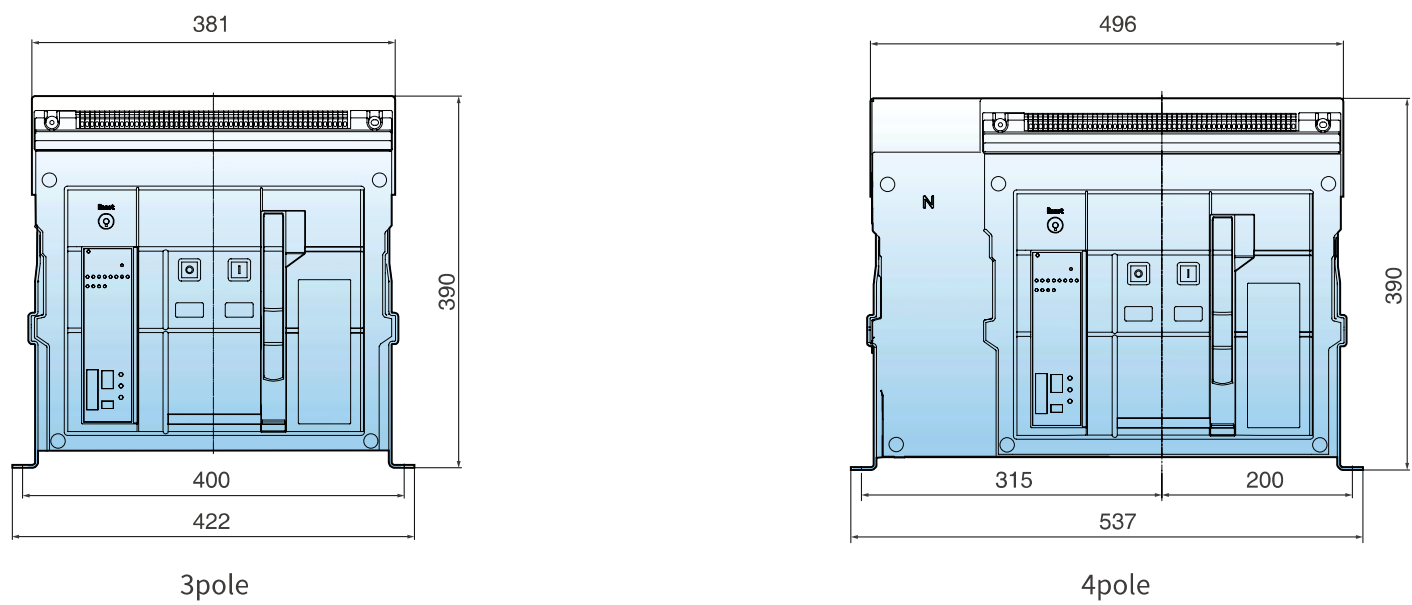


Cabinet door open hole dimension

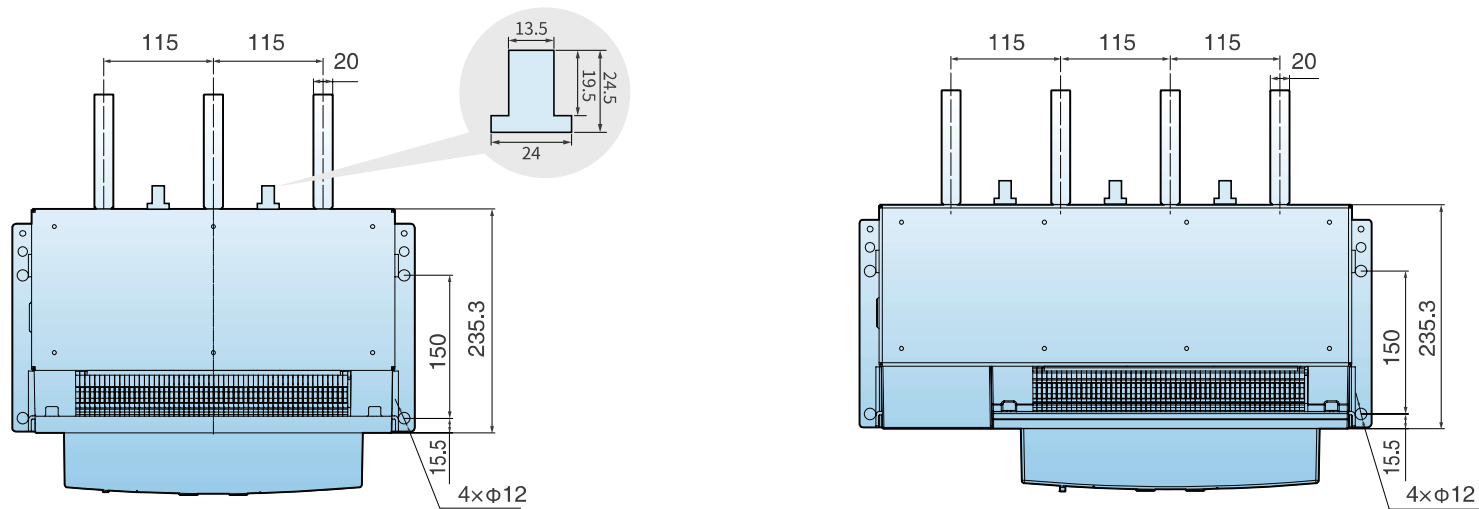


Fixed type (VW3-40H/VW3-40HU/VW3-40HV, 3600~4000A)

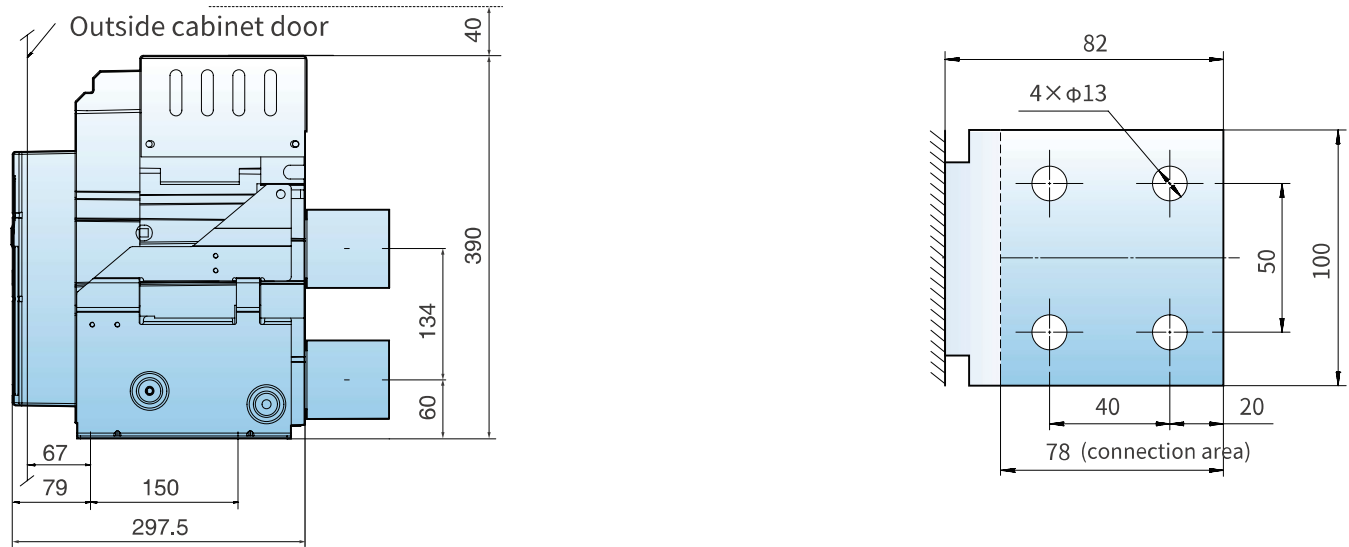
Front view



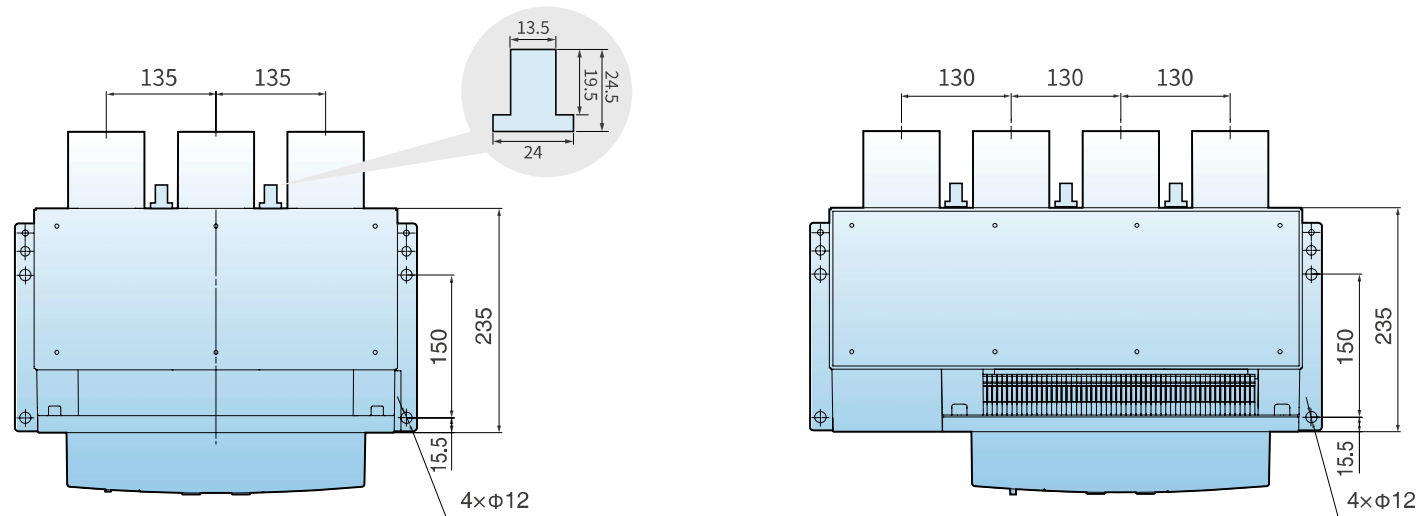
Vertical Wiring



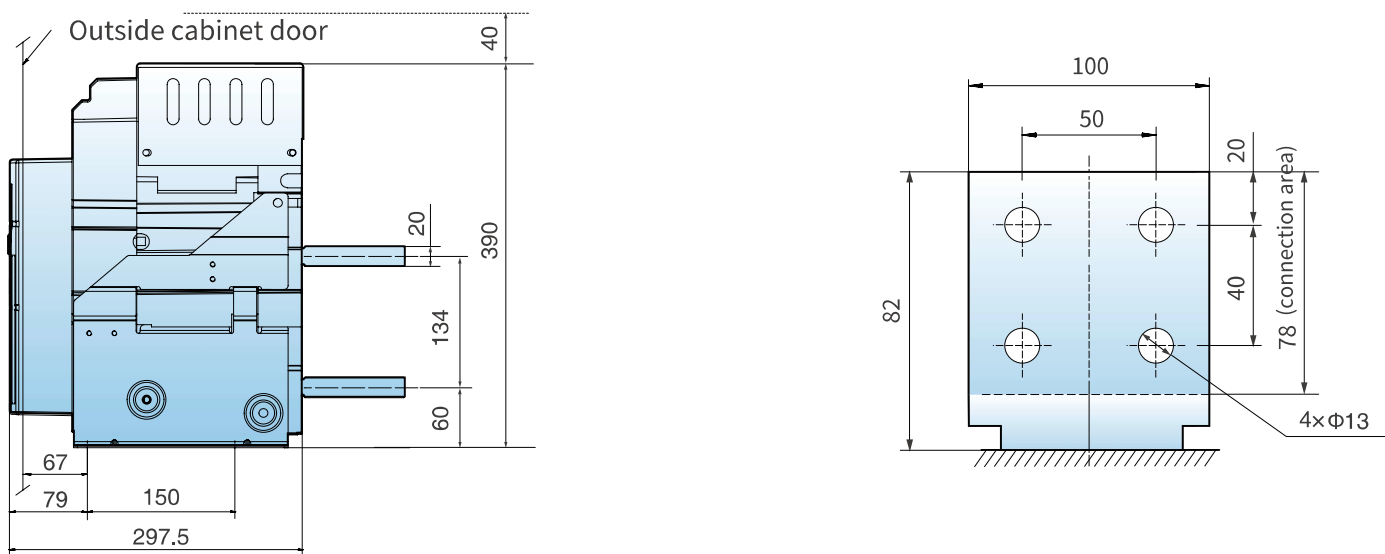
Distance for dismantling the arc extinguishing chamber



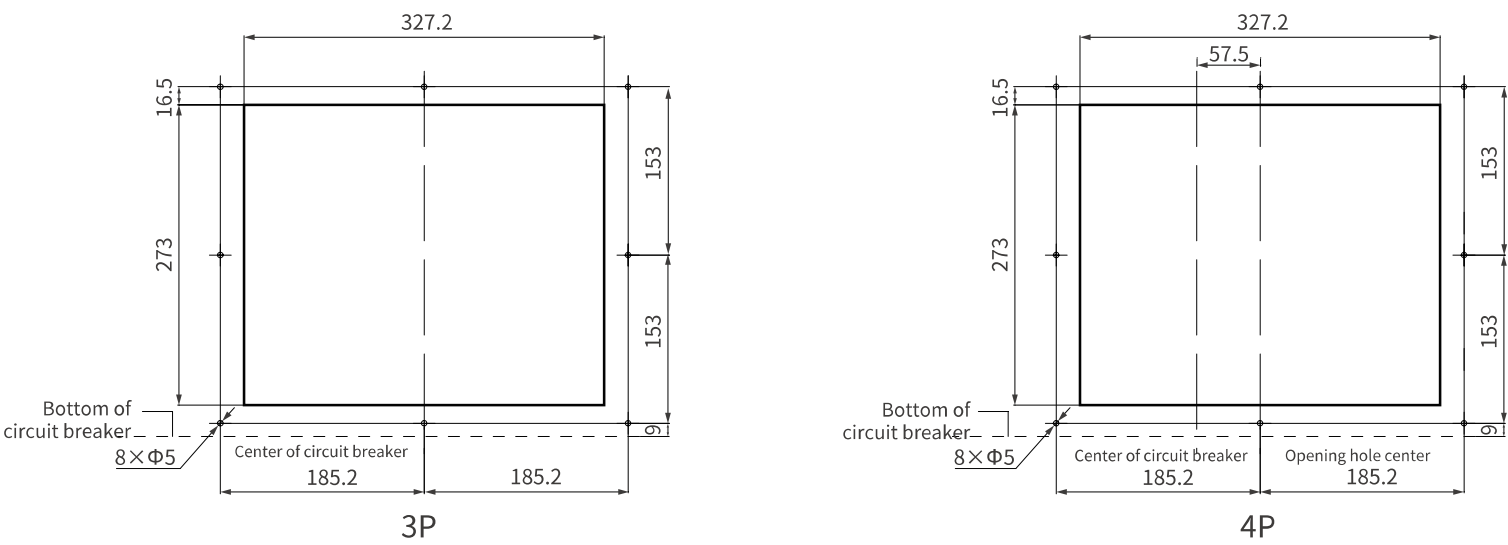
Horizontal Wiring



Distance for dismantling the arc extinguishing chamber

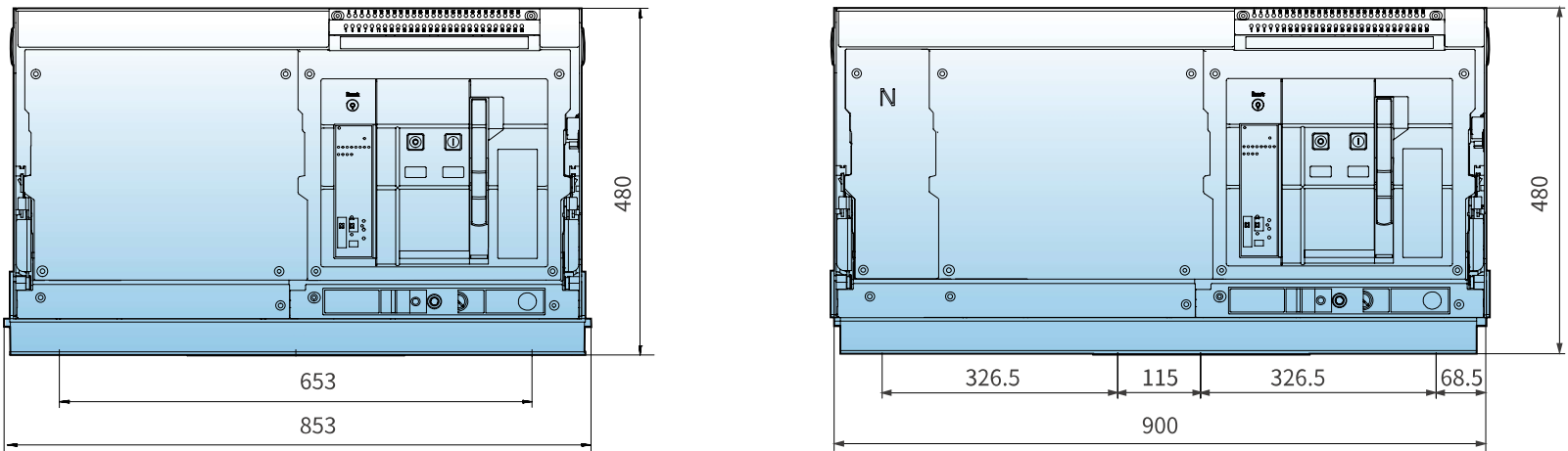


Cabinet door open hole dimension

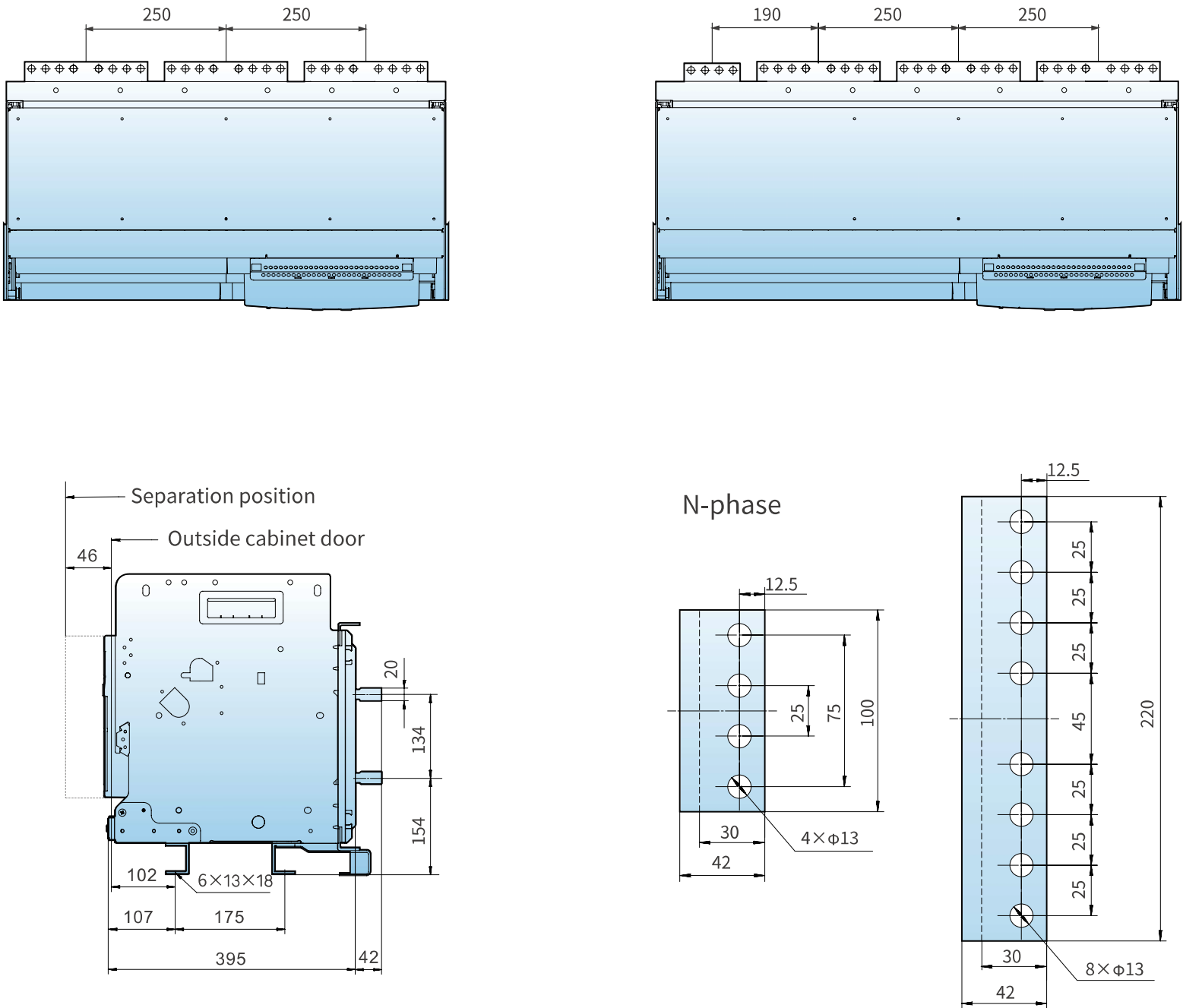


Drawout type (VW3-63H/VW3-63HU/VW3-63HV, 4000~5000A)

Front view



Horizontal Wiring

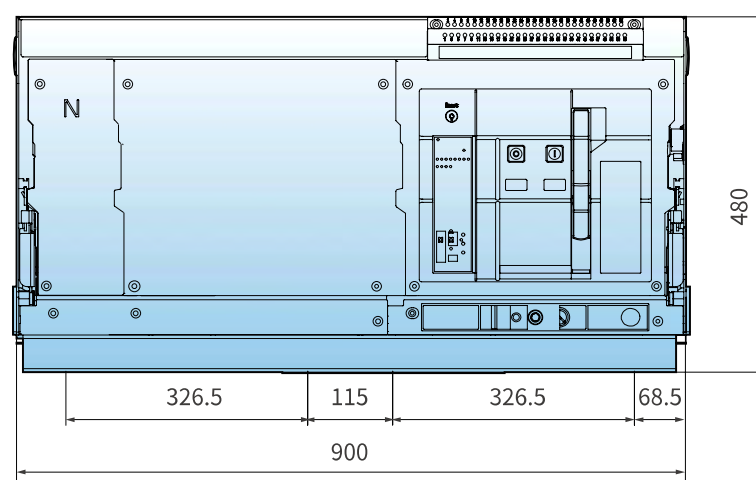
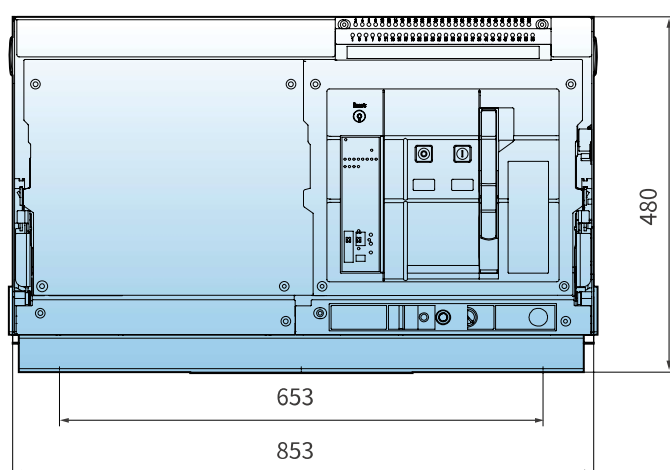


Size and Connection

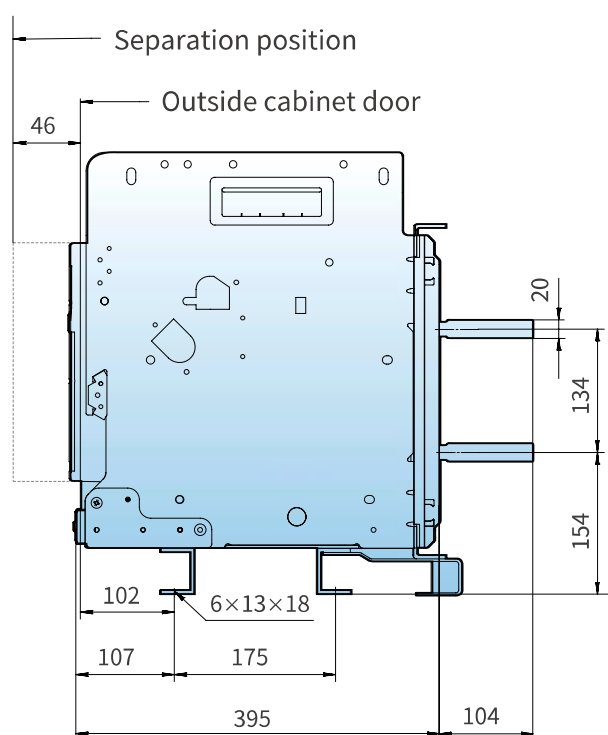
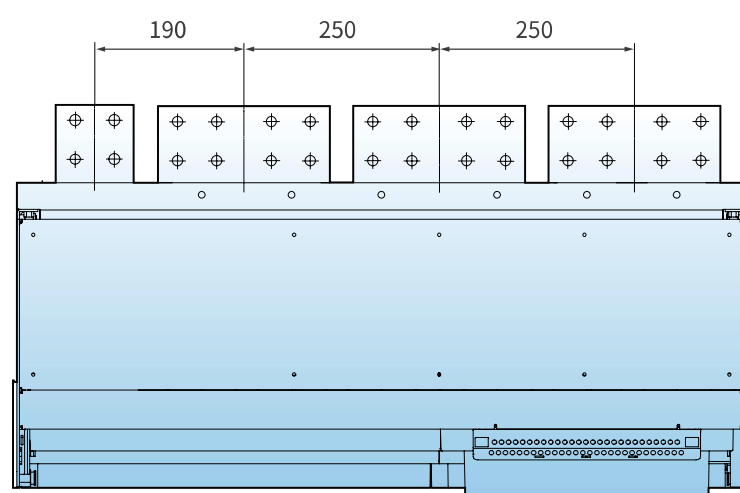
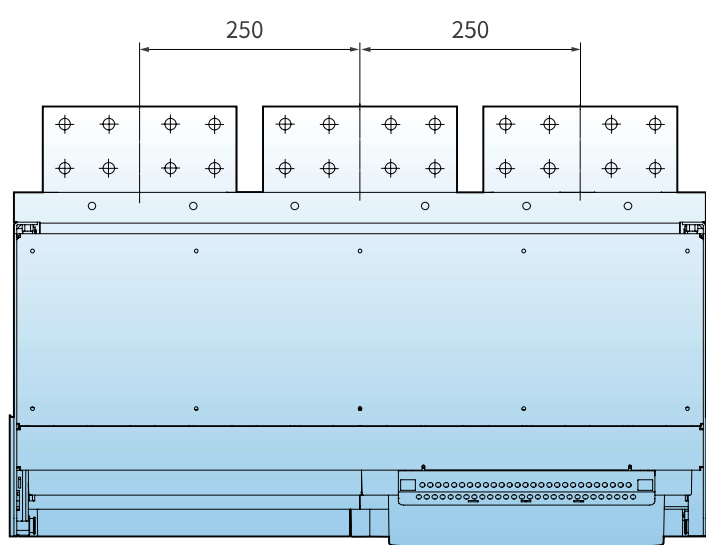
VOZWEI

Drawout type (VW3-63H/VW3-63HU/VW3-63HV, 6300A)

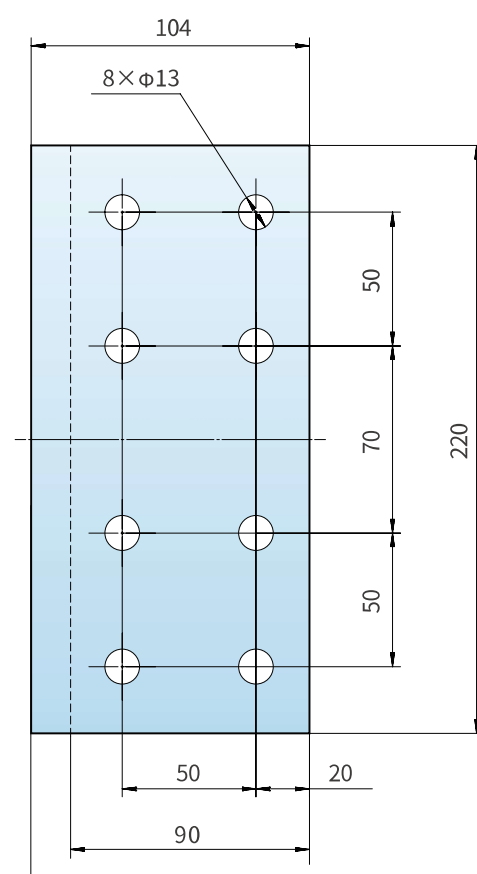
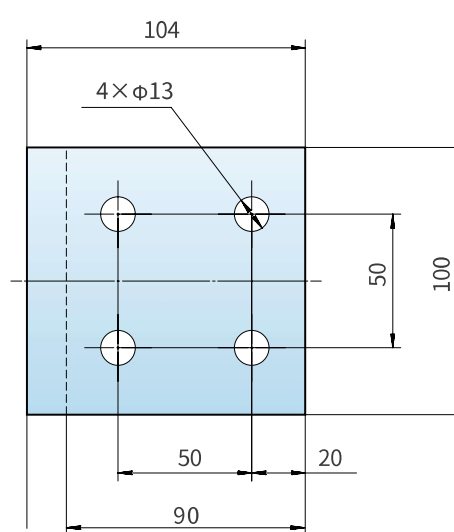
Front view



Horizontal Wiring

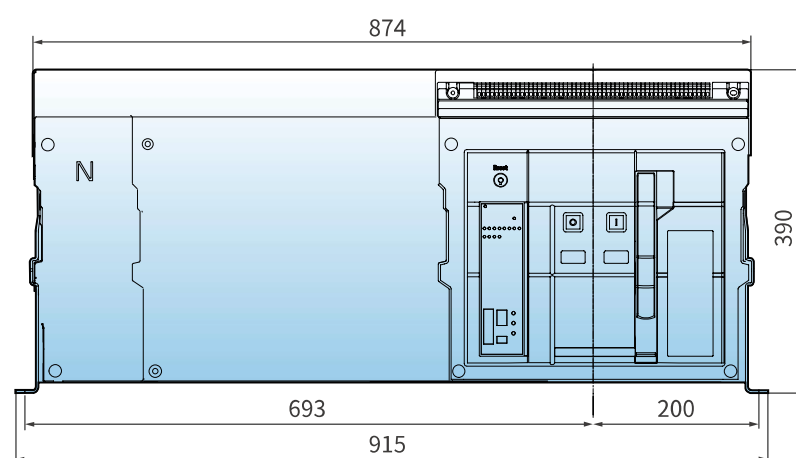
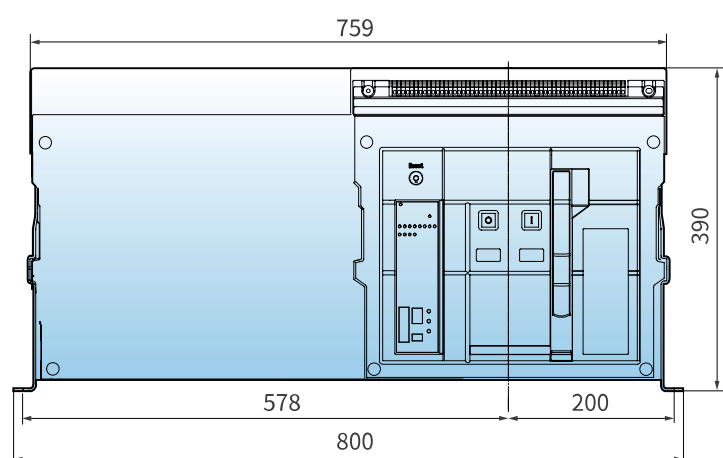


N-phase

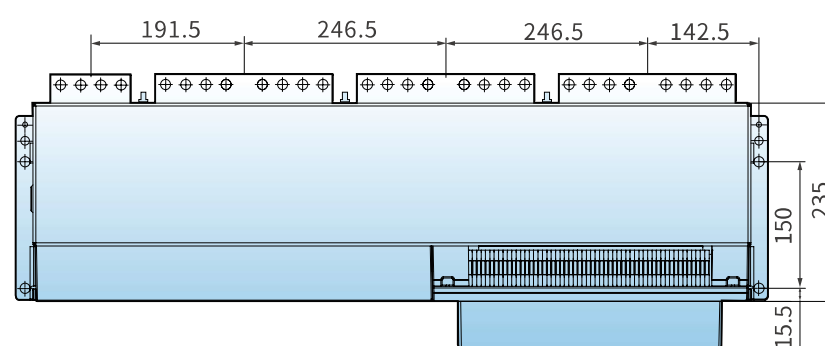
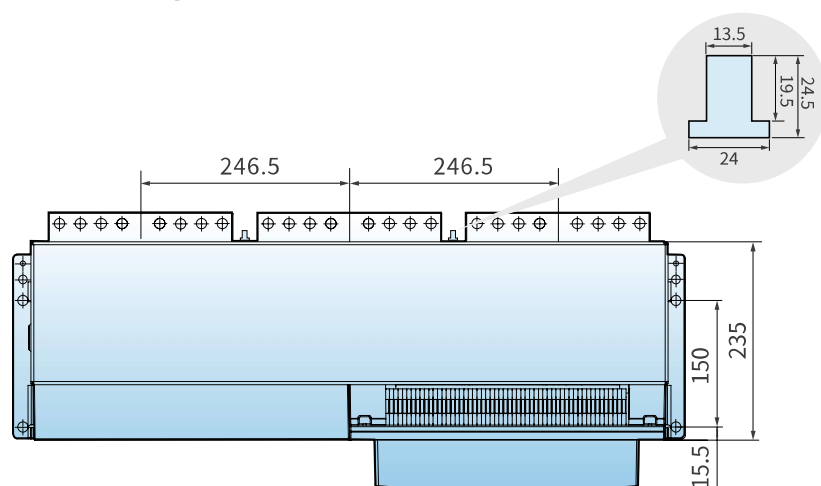


Fixed type (VW3-63H/VW3-63HU/VW3-63HV, 4000~5000A)

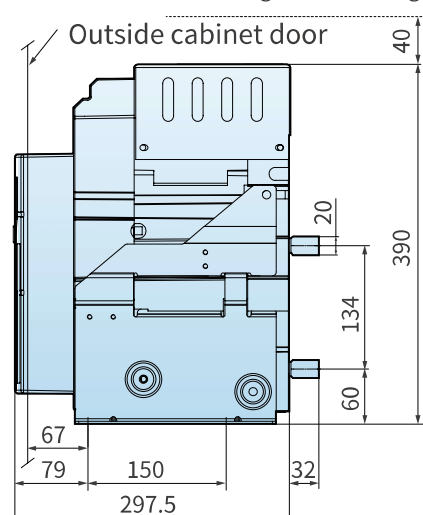
Front view



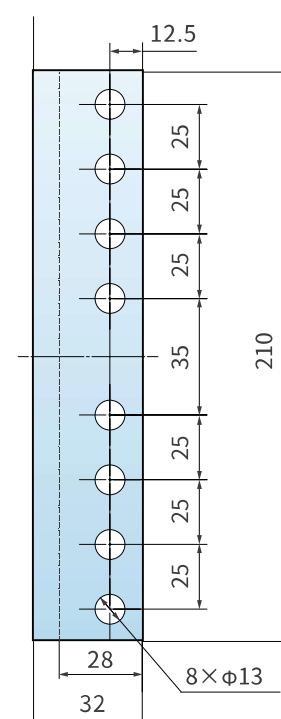
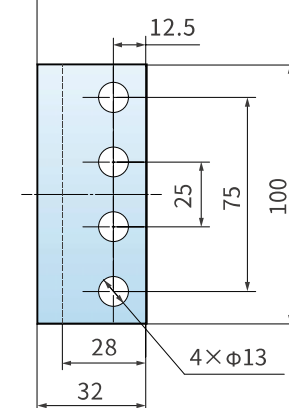
Horizontal Wiring



Distance for dismantling the arc extinguishing chamber

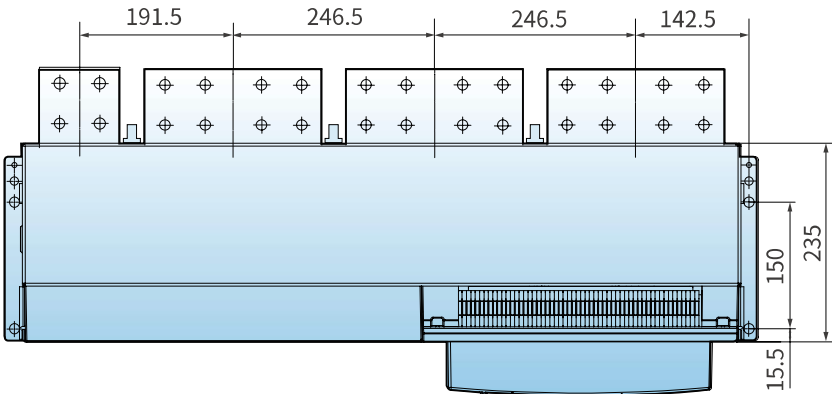
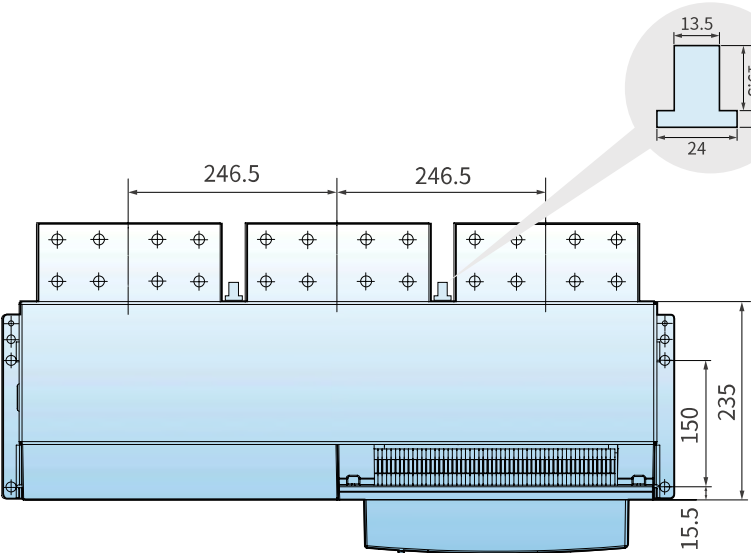
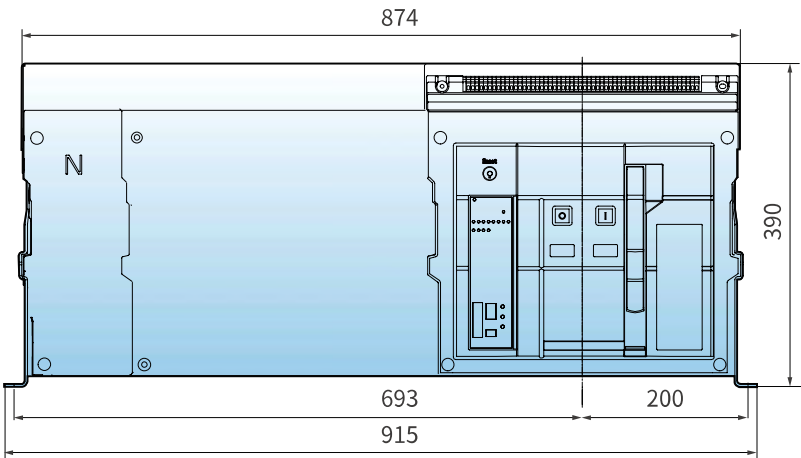
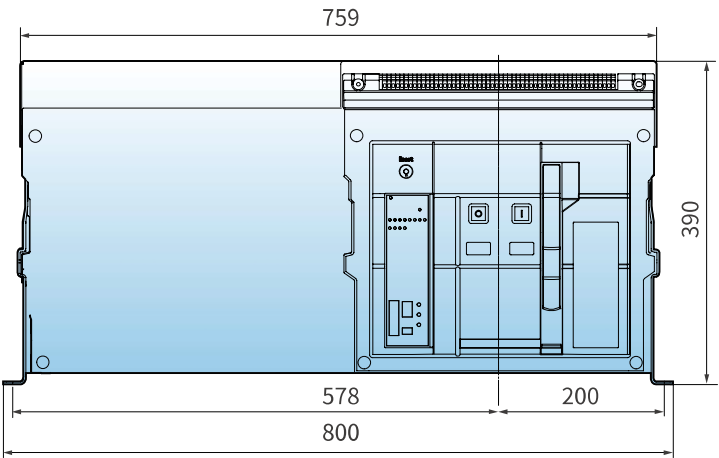


N-phase

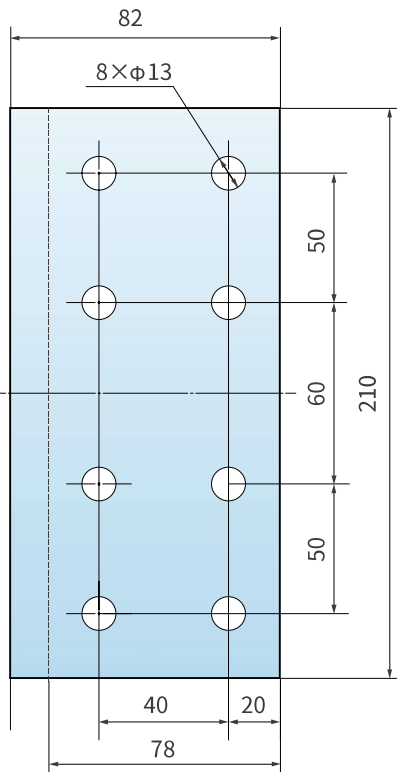
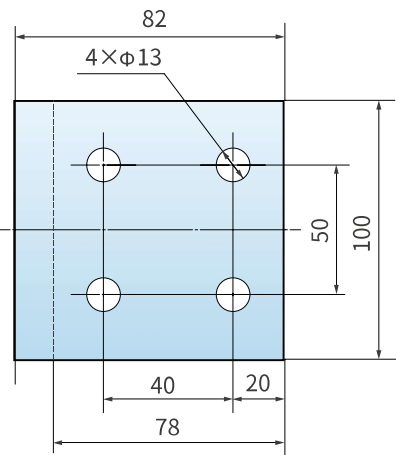
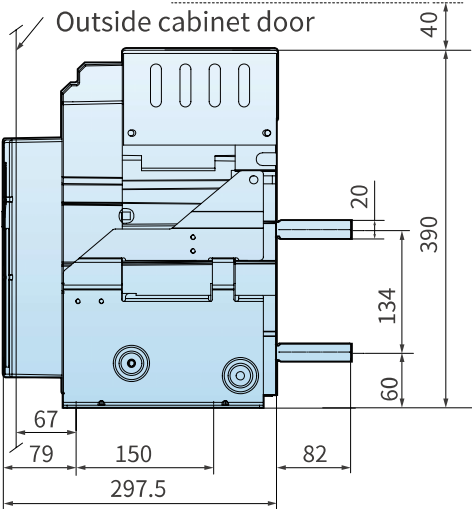


Fixed type (VW3-63H/VW3-63HU/VW3-63HV, 6300A)

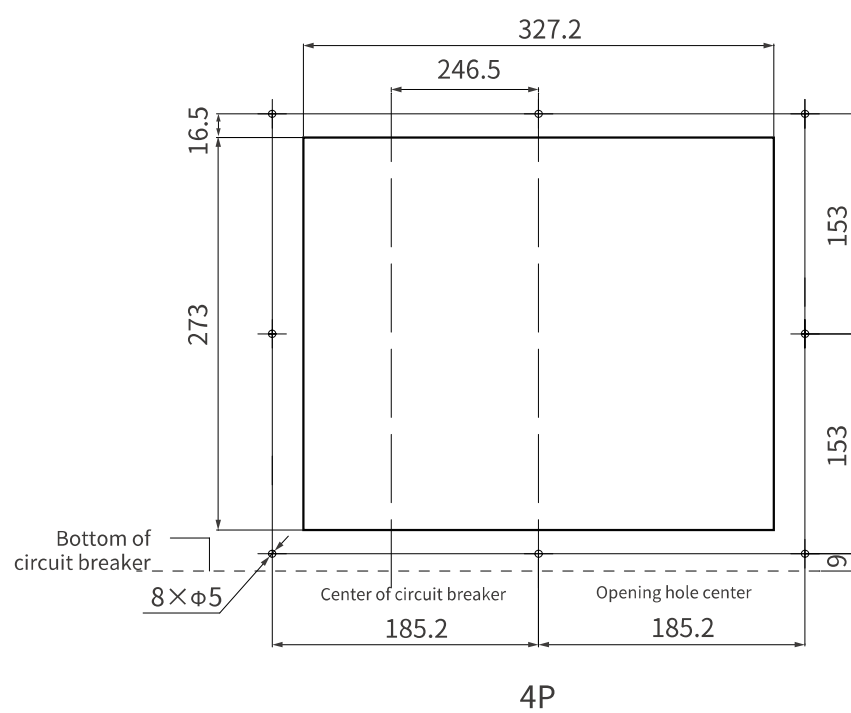
Front view



Distance for dismantling the arc extinguishing chamber



Technical drawing of a 3P circuit breaker layout. The drawing shows a rectangular panel with dimensions 327.2 (width) and 273 (height). The panel is divided into three vertical sections, each 185.2 wide. The distance between the centers of the circuit breakers is 189. The distance from the bottom of the circuit breaker to the center of the opening hole is 16.5. The distance from the bottom of the circuit breaker to the center of the opening hole is 9. The panel is labeled 3P. The mounting holes are labeled 8 x $\phi 5$. The bottom of the circuit breaker is labeled Bottom of circuit breaker. The center of the circuit breaker is labeled Center of circuit breaker. The opening hole center is labeled Opening hole center.



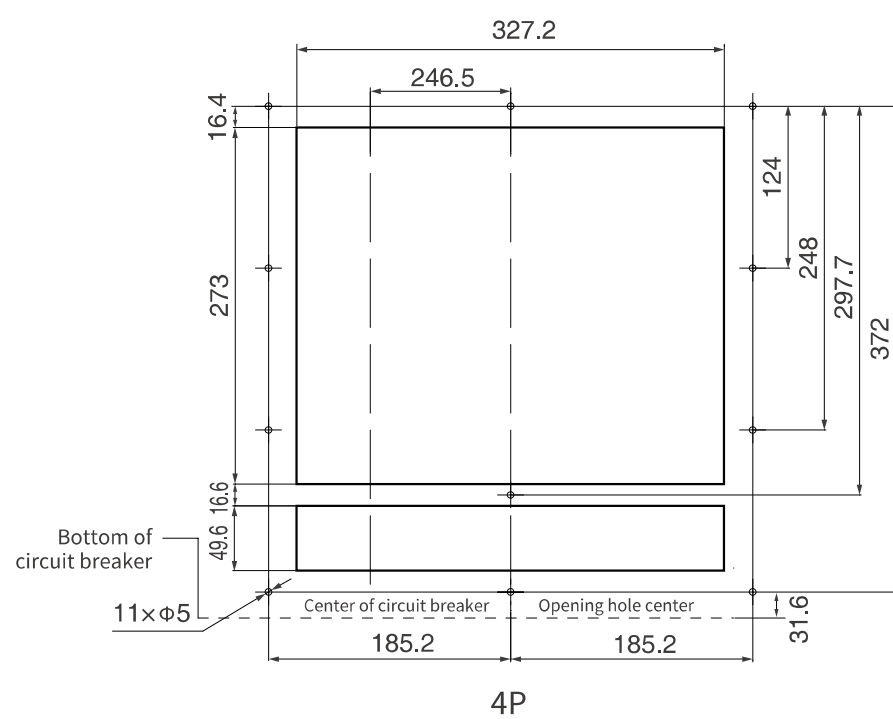
Technical drawing of a 3P circuit breaker assembly. The drawing shows a top view of the assembly with dimensions in millimeters (mm).

Dimensions:

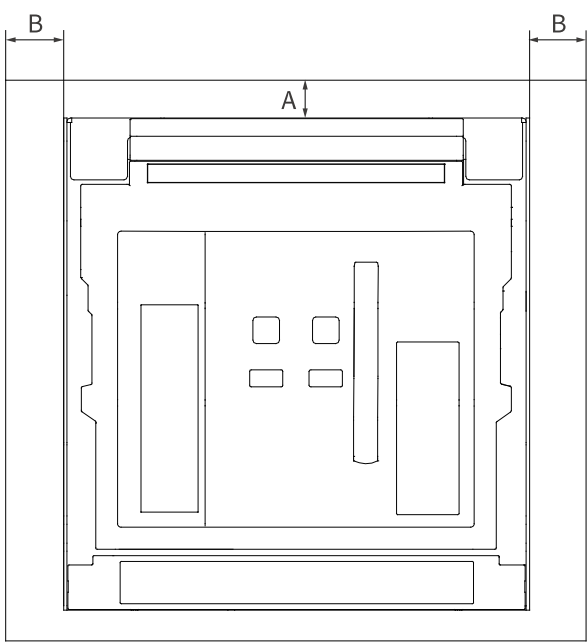
- Overall width: 327.2
- Overall height: 372
- Distance from top edge to center of circuit breaker: 16.4
- Distance from center of circuit breaker to top edge of opening hole: 124
- Distance from center of circuit breaker to bottom edge of opening hole: 248
- Distance from center of circuit breaker to bottom edge of assembly: 297.7
- Distance from left edge to center of circuit breaker: 189
- Distance from center of circuit breaker to right edge: 185.2
- Distance from center of circuit breaker to center of opening hole: 185.2
- Distance from center of opening hole to right edge: 185.2
- Distance from bottom edge of circuit breaker to bottom edge of opening hole: 49.6
- Distance from bottom edge of opening hole to bottom edge of assembly: 31.6

Labels:

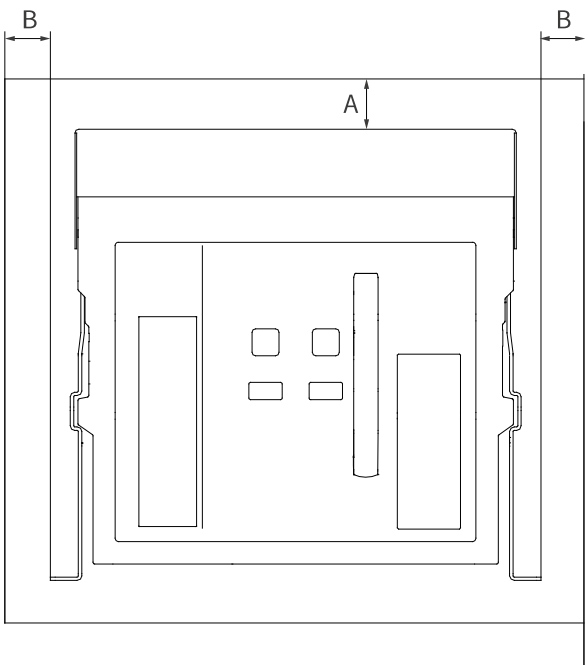
- Bottom of circuit breaker
- Center of circuit breaker
- Opening hole center
- 11 $\times$ Φ 5
- 3P



When users install the circuit breaker into the cabinet, the safe distance between the circuit breaker and the cabinet is shown in the figure below, and the installation dimensions are shown in the table below.



Drawout type circuit breaker



Fixed type circuit breaker

unit: mm

Installation type of the circuit breaker	To the insulator		To the metallic body grounded safely		To the live part	
	A	B	A	B	A	B
Drawout type	0	0	0	0	60	60
Fixed type	0	0	0	0	60	60

Note: 1. The safety distance of the fixed circuit breaker should consider the space required to remove the arc extinguishing chamber of 150mm;

Please fill in numbers in _____, and check ✓ in ☐

User:						
Number of units ordered:						
Date of ordering:						
Basic parameters	Shell frame level	☐ VW3-2500 ☐ VW3-4000 ☐ VW3-6300				
	Installation mode	☐ F-Fixed type ☐ D-Drawout type				
	Rated current (A)	VW3-2500	☐ 630 ☐ 800 ☐ 1000 ☐ 1250 ☐ 1600 ☐ 2000 ☐ 2500			
		VW3-4000	☐ 1000 ☐ 1250 ☐ 1600 ☐ 2000 ☐ 2500 ☐ 2900 ☐ 3200 ☐ 3600 ☐ 4000			
		VW3-6300	☐ 4000 ☐ 5000 ☐ 6300			
	Breaking type	☐ H-high breaking (below AC690V) ☐ HU-High voltage breaking(AC800V) ☐ HU-High voltage breaking(AC1140V) ☐ HV-Ultra height voltage breaking(AC1250V) ☐ HV-Ultra height voltage breaking(AC1500V) Note: 1. HU-AC1250V only for VW3-4000; 2. VW3-6300 haven't HU-AC800V				
	Number of poles	☐ 3-3P ☐ 4-4P ☐ 5-3P+N				
Wiring mode	VW3-2500(H/HU/HV): ☐ C11-Standard Horizontal Wiring ☐ C12-Extended Horizontal Wiring VW3-4000(H, 1000-3200A): ☐ C11-Standard Horizontal Wiring ☐ C12-Extended Horizontal Wiring ☐ C21-Standard Vertical Wiring ☐ C22-Extended Vertical Wiring ☐ C31-Standard Forward Wiring ☐ C41-Standard Mixed Wiring (Upper Horizontal, Lower Vertical) ☐ C42-Extended Mixed Wiring (Upper Horizontal, Lower Vertical) ☐ C51-Standard Mixed Wiring (Upper Vertical, Lower Horizontal) ☐ C52-Extended Mixed Wiring (Upper Vertical, Lower Horizontal) ☐ C61-Standard Mixed Wiring (Upper Forward, Lower Horizontal) ☐ C71-Standard Mixed Wiring (Upper Horizontal, Lower Forward) ☐ C81-Standard Mixed Wiring (Upper Vertical, Lower Forward) ☐ C91-Standard Mixed Wiring (Upper Forward, Lower Vertical) VW3-4000(HU/HV, 1000-3200A): ☐ C11-Standard Horizontal Wiring ☐ C12-Extended Horizontal Wiring ☐ C21-Standard Vertical Wiring VW3-4000(H/HU/HV, 4000A): ☐ C12-Extended Horizontal Wiring ☐ C22-Extended Vertical Wiring VW3-6300(H/HU/HV, 4000-5000A): ☐ C11-Standard Horizontal Wiring VW3-6300(H/HU/HV, 6300A): ☐ C12-Extended Horizontal Wiring					
Controller parameters	Controller model	☐ VWC4 (digital screen) ☐ VWC6 (LCD)				
	Protection type	☐ Conventional type (standard configuration) ☐ V-Voltage measurement and protection type ☐ P-Harmonic measurement and protection type				
	Communication function	☐ H-Modbus protocol ☐ MP-Profibus-DP protocol ☐ MD-Devicenet protocol Note: Only VWC6 have communication function				
	Signal unit	☐ S1-4DO ☐ S2-3DO+1DI ☐ S3-2DO+2DI Note: VWC4 only S1-4DO				
	Remote reset	☐ Z2-AC230V				
	External transformer	3P+N required: ☐ N1 ☐ N2 ☐ N3 ☐ N4			☐ E	
	Grounding mode	☐ T(default) ☐ W			☐ E	
Required accessories	Contact wear equivalent	☐ J				
	Electric operating mechanism	☐ D1-AC400V ☐ D2-AC230V/DC220V ☐ D4-AC/DC110V ☐ D5-DC24V				
	Shunt release	☐ F1-AC400V ☐ F2-AC230V/DC220V ☐ F4-AC/DC110V ☐ F5-DC24V				
Optional accessories	Closed electromagnet	☐ B1-AC400V ☐ B2-AC230V/DC220V ☐ B4-AC/DC110V ☐ B5-DC24V				
	Under-voltage release	Voltage specifications	☐ Q1-AC400V ☐ Q2-AC230V ☐ Q5-DC24V			
		Delay time	☐ 0-Instantaneous ☐ 1-1s delay ☐ 3-3s delay ☐ 5-5s delay			
	Loss of voltage release	Voltage specifications	☐ S1-AC400V ☐ S2-AC230V			
Delay time		☐ 0-Instantaneous ☐ 1-1s delay ☐ 3-3s delay ☐ 5-5s delay				

Optional accessories	Voltage-check closing device	☐ J1-AC400V ☐ J2-AC230V	
	Auxiliary contact	☐ A33-3NO3NC ☐ A44-4NO4NC ☐ A55-5NO5NC ☐ A66-6NO6NC ☐ ____NO____NC (Max. 14)	
		☐ A3-Three-group switching ☐ A4-Four-group switching ☐ A5-Five-group switching ☐ A6-Six-group switching ☐ ____-group switching (Max. 14)	
	Closing ready	☐ BX-Closing ready signal output unit	
	Counter	☐ JS-Counter	
	Drawer seat door interlock	☐ CM1-Drawout type (with the right side of the door interlock)	
	Door frame	☐ M-Door frame Note: standard	
	Position indicator	☐ CX-Drawer seat three-position signal output	
	Relay module	☐ R-Relay module	
	Power supply	☐ AC65~500V, DC80~700V Note: standard	
	Button lock	☐ S-Button lock	
	Voltage conversion module	☐ P2-Voltage conversion module	
Language type		☐ Chinese ☐ Y-English	
Interlocking accessories	Off-position lock	☐ SF11-Key lock device (one lock and one key) ☐ SF21-Key lock device (two locks and one key) ☐ SF31-Key lock device (three locks and one key) ☐ SF32-Key lock device (three locks and two keys) ☐ SF53-Key lock device (five locks and three keys)	
	Mechanical interlocking	Cable type	☐ SR11-Mechanical interlocking device (two sets of steel cables, one for closing and one for opening) ☐ SR12-Mechanical interlocking device (three sets of steel cables, one for closing and two for opening) ☐ SR21-Mechanical interlocking device (three sets of steel cables, two for closing and one for opening)
		Hard rod type	☐ SY11-Mechanical interlocking device (two sets of hard rods, one for closing and one for opening)
Special requirements		Overload and long-time delay current I_r =____A	Overload and long-time delay time t_r =____s
		Short-circuit short-time delay current I_{sd} =____A	Short-circuit short-time delay time t_{sd} =____s
		Short circuit instantaneous current I_i =____A	
		Grounding fault current I_g =____A	Grounding fault time t_g =____s
		Current imbalance percentage δ =____%	Current imbalance action time δ =____s
		Current leakage setting value $I_{\Delta n}$ ____A	Current leakage action time $t_{\Delta n}$ ____s
		Load monitoring1 current setting value I_{c1} ____A	Inverse time-limit time t_{c1} ____s
		Load monitoring2 currentl setting value I_{c2} ____A	Fixed time-limit t_{c2} ____s
Other requirements			

VM3

Molded Case Circuit Breaker





- Tailored for solar energy and wind power
- With higher breaking capacity
- With excellent anti damp heat and dew solidification capabilities
- Working voltage up to 1000V
- Strong ability to adapt to alternating changes in high and low temperatures
- High altitude adaptability

Ambient conditions

Operating ambient temperature/storage temperature

- Operating environment temperature: -40 °C~+70 °C, with an average value of no more than +35 °C within 24 hours
- Storage temperature: -40 °C~+75 °C

Altitude conditions

- Altitude of installation site $\leq$ 2000m (Over 2000 meters need capacity reduction for using)

Pollution level

- Level 3

Protection level

- Product protection level: IP20

Installation Category

- Class II (load) and Class III (distribution and control)

Installation Environment

- The product is installed in a medium without explosion risk, and the medium is not sufficient to corrode metal, there is no gas that damages the insulation layer of the product, there is no conductive dust, and it should be avoided from being used in places invaded by rain and snow

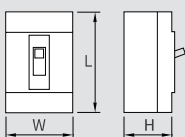
Environmental requirements

- The product meets RoHS standards

Electrical Characteristics

VM3 Series Molded Case Circuit Breaker (TMF)				VM3-250HUL		VM3-250HUM	
Poles				3P		3P	
Control	Rotary handle operator			■		■	
	Motor-operated mechanism			■		■	
Connection	Wiring in front of the board			■		■	
	Wiring on back of the board			—		—	
	Plug-in			—		—	
	Draw-out			—		—	
IEC 60947-2							
Release rated current I _n (A)				63, 80, 100, 125, 140, 160, 180, 200, 225, 250		63, 80, 100, 125, 140, 160, 180, 200, 225, 250	
Rated insulation voltage(V)			U _i	AC1150		AC1150	
Rated impulse withstand voltage(kV)			U _{imp}	8		8	
Rated operating voltage(V)			U _e	AC800		AC800/AC1000	
Breaker Type				L		M	
Rated ultimate short circuit breaking capacity(kA)	I _{cu}	AC 50/60 Hz	400V				
			500V				
			690V				
			800V	30		40	
			1000V			15	
Rated service short circuit breaking capacity(kA)	I _{cs}	AC 50/60 Hz	400V				
			500V				
			690V				
			800V	23		36.5	
			1000V			15	
Utilization category				A		A	
Number of operation cycles		Machinery		10000		10000	
		Electrical	AC400V				
			AC500V				
			AC690V				
			AC800V	1500		1500	
	AC1000V			1000			
Protection unit				Thermal-Magnetic		Thermal-Magnetic	
Protection unit							
Overload protection		Long time delay	I _r (I _n ×...)	■		■	
Short-circuit protection		Instantaneous	I _i (I _n ×...)	■		■	
Indication and control accessories							
Alarm switch(AL)				■		■	
Auxiliary switch(AX)				■		■	
Shunt release(SHT)				■		■	
Under-voltage release(UVT)				■		■	
Installation							
Accessories		Terminal		■		■	
		Phase separator		■		■	
Circuit breaker size(mm)			W	116		116	
			L	200		200	
			H	107		107	

Note : 1.HUL,HUM,HUH type only provides front wiring of 3P;
2.The symbol "-" indicates that this option is not available; The symbol "■" indicates that this option is optional.

VM3 Series Molded Case Circuit Breaker (TMF)				VM3-250HUH		VM3-630HUL	
							
Poles				3P		3P	
Control	Rotary handle operator			■		■	
	Motor-operated mechanism			■		■	
Connection	Wiring in front of the board			■		■	
	Wiring on back of the board			—		—	
	Plug-in			—		—	
	Draw-out			—		—	
IEC 60947-2							
Release rated current I _n (A)				63,80,100,125,140,160,180,200,225,250		200,250,315,350,400	
Rated insulation voltage(V)			U _i	AC1150		AC1150	
Rated impulse withstand voltage(kV)			U _{imp}	8		8	
Rated operating voltage(V)			U _e	AC800		AC800/AC1000	
Breaker Type				H		L	
Rated ultimate short circuit breaking capacity(kA)	I _{cu}	AC 50/60 Hz	400V				
			500V				
			690V				
			800V	50		36.5	
			1000V			15	
Rated service short circuit breaking capacity(kA)	I _{cs}	AC 50/60 Hz	400V				
			500V				
			690V				
			800V	36.5		36.5	
			1000V			15	
Utilization category				A		A	
Number of operation cycles		Machinery		10000		10000	
		Electrical	AC400V				
			AC500V				
			AC690V				
			AC800V	1500		1500	
		AC1000V	1000		1000		
Protection unit							
Protection unit				Thermal-Magnetic		Thermal-Magnetic	
Overload protection		Long time delay	I _r (I _n ×...)	■		■	
Short-circuit protection		Instantaneous	I _i (I _n ×...)	■		■	
Indication and control accessories							
Alarm switch(AL)				■		■	
Auxiliary switch(AX)				■		■	
Shunt release(SHT)				■		■	
Under-voltage release(UVT)				■		■	
Installation							
Accessories		Terminal		■		■	
		Phase separator		■		■	
Circuit breaker size(mm)			W	116		150	
			L	200		257	
			H	107		103	

Note : 1.HUL,HUM,HUH type only provides front wiring of 3P;
2.The symbol "-" indicates that this option is not available; The symbol "■" indicates that this option is optional.

VM3 — 250 HU M 250 / TMF / 3 / AX/SHT							
1 2 3 4 5 6 7 8							
SN	Name		Specification, type code				
1	Design code		VM3: Design code				
2	Frame rating		250: 250A 630: 630A				
3	High voltage type		HU: Hight voltage				
4	Breaking capacity		L, M, H				
5	Rated current		63~400A				
6	Protection unit type		TMF: Thermal magnetic protection unit (For power distribution protection)				
7	Number of poles		3P				
8	Accessories (separated with"/" between different accessories)		Connection accessories	Empty: Fixed type wiring in front of the board			
			Electrical accessories	AL: Alarm contact AX: Auxiliary contact SHT: Shunt release UVT: Under-voltage release			
			Control Accessories Note: VM3-630HU optional	CD2: Motor operator CS1: Manual operator CS2: Manual operator-eccentric CS3: Box-type manual operator eccentric SF: Rotary handle F type SR: Rotary handle R type			

* Electrical accessories

Accessories	Voltage				
SHT Shunt release	AC230V	AC400V	DC220V	AC/DC110V	DC24V
UVT Under-voltage release	AC230V	AC400V			
Motor operator	AC110V	AC230V	DC110V	AC/DC220V	DC24V

If the accessory voltage and voltage control loop is inconsistent,please use indicate the accessory voltage after accessory.

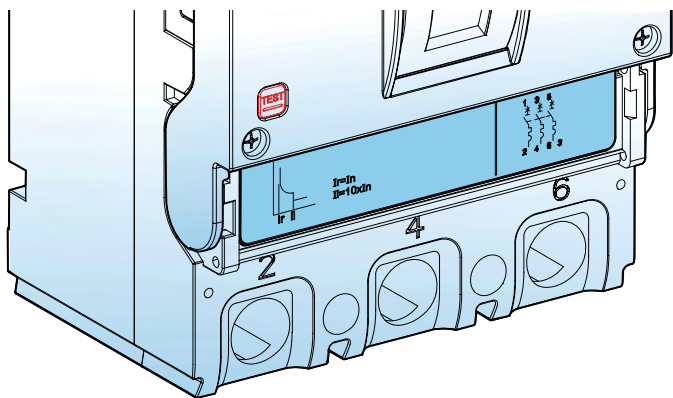
Example

VM3-250HUL250/TMF/3/AX/SHT (AC230)

Meaning: VM3 series circuit breaker; the frame level is 250A; breaking capacity is 30kA, 3 poles; rated current is 250A; fixed type wiring on front of the board; accessory contains auxiliary contact and shunt release with voltage (AC230V).

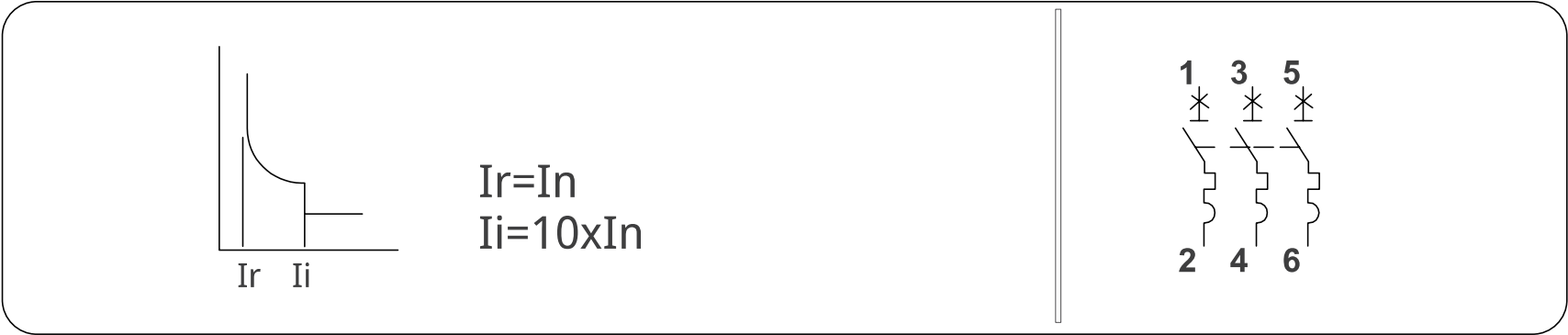
Notice: 1. HU type only provides front wiring of 3P.

TMF Protection unit



TMF: Thermal magnetic protection unit (For power distribution protection)

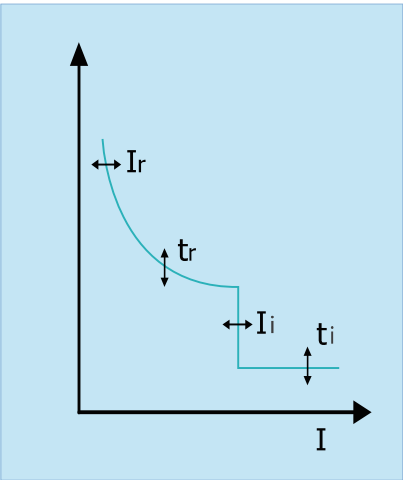
TMF Sign interpretation



Protection curve

Protection unit type

TMF Protection characteristics



TMF: Data sheet of protection characteristics

Rated current(A)	Inverse time acting characteristic (Ambient air temperature +40°C)		Instantaneous acting current(A)
	1.05I _n (Cold state) Not acting time	1.3I _n (Hot state) Acting time	
I _n ≤ 63	≥ 1h	<1h	10I _n ±20%
63<I _n ≤ 800	≥ 2h	<2h	

TMF Protection unit power loss

Power loss

Circuit Breaker Model	Rated current(A)	Total power loss of three-phase(W)	
		Wiring in front of the board, Wiring on back of the board	Plug-in / Wiring on back of the board
VM3-250	250	35	40
VM3-630	630	43	51

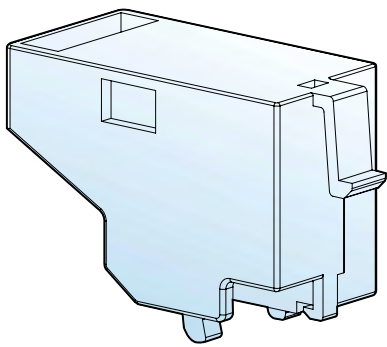
Derated coefficient of rated current

Circuit Breaker Model	+40℃	+45℃	+50℃	+55℃	+60℃	+65℃	+70℃
VM3-250	1.0 I _n	1.0 I _n	1.0 I _n	1.0 I _n	0.98 I _n	0.95 I _n	0.92 I _n
VM3-630	1.0 I _n	1.0 I _n	1.0 I _n	1.0 I _n	0.97 I _n	0.94 I _n	0.91 I _n

Derated coefficient of high altitude of VM3 series MCCB

Item	Parameter						
Elevation	2000	2500	3000	3500	4000	4500	5000
Power frequency withstand voltage(V)	3000	3000	2500	2400	2200	2200	2200
Isolation voltage	1	1	0.95	0.91	0.87	0.87	0.87
Breaking capacity correction factor	1	1	0.95	0.91	0.87	0.80	0.74
Working current correction factor	1	1	0.98	0.97	0.96	0.95	0.94

Electrical accessories



Alarm contact (AL)

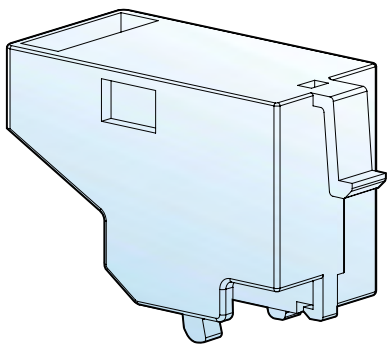
Alarm contact (AL)

Function

The product outputs alarm signal when it is tripped by outer excitation signal due to overload, short circuit, undervoltage, or when the release button is pressed. This function is particularly useful in an automatic system, since that a fault signal can be sent to the designated place. And the fault signal will turn on due to an internal microswitch, when circuit breaker releases. But for normal opening or closing operations, it does not have any action.

Alarm contact operating characteristics

Circuit breaker status	Alarm contact status
The statuses of open and close	B14 ————— B12 ————— ————— B11
The statuses of tripping	B14 ————— B12 ————— ————— B11



Auxiliary contact (AX)

Auxiliary contact (AX)

Function

Auxiliary switch is used for indication of remote "ON" and "OFF". Each switch contains two contacts, which share a common end of connection. The ON/OFF position depends on the state of main contact. When the circuit breaker is open, one of them is normally open, and the other is closed, or vice versa.

Auxiliary contact operating characteristics

Circuit breaker status	Auxiliary contact status
The statuses of open	F14 (F24) ————— F12 (F22) ————— ————— F11 (F21)
The statuses of close	F14 (F24) ————— F12 (F22) ————— ————— F11 (F21)

Alarm contact,Auxiliary contact rated operational current

Classification	Rated current Inm	Conventional thermal current Ith(A)	Rated working current Ie(A)	
			AC400V	DC220V
Auxiliary contact	≤ 250	3	0.3	0.15
	400 ≤ Inm ≤ 1000	3	0.4	0.2
Alarm contact	10 ≤ Inm ≤ 1000	-	AC220V/1.0A	0.15

ON-OFF capacity of Alarm contact and Auxiliary contact under normal conditions

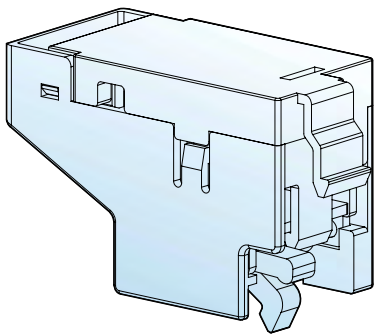
Utilization category	ON				OFF				Number of operation cycles	Number of operation cycles per minute	Power time
	I/Ie	U/UE	cosφ	T0.95	I/Ie	U/UE	cosφ	T0.95			
AC-15	10	1	0.7	-	1	1	0.7	-	6050	6	≥ 0.05s
DC-13	1	1	-	6 × Pe	1	1	-	6 × Pe			≥ 0.05s

ON-OFF capacity of Alarm contact and Auxiliary contact under abnormal conditions

Utilization category	ON				OFF				Number of operation cycles	Number of operation cycles per minute	Power time
	I/Ie	U/UE	cosφ	T0.95	I/Ie	U/UE	cosφ	T0.95			
AC-15	6	1	0.7	-	1	1	0.7	-	10	6	≥ 0.05s
DC-13	1.1	1.1	-	6 × Pe	1.1	1.1	-	6 × Pe			≥ 0.05s

- Note:** 1. $T_{0.95}=6Pe$ is an empirical formula in which the unit of “Pe” is watt and the unit of $T_{0.95}$ is millisecond.
2. The number of operation of Auxiliary contact can equal to that of the circuit breaker, if the number of operation of circuit breaker is less than 6050.
3. The operation frequency and power-on time of an auxiliary contact are allowed to be the same as those of the main circuit.
4. If $T_{0.95}$ is more than 0.05s, the power-on time is at least $T_{0.95}$.

Electrical accessories



Shunt release (SHT)

Shunt release (SHT)

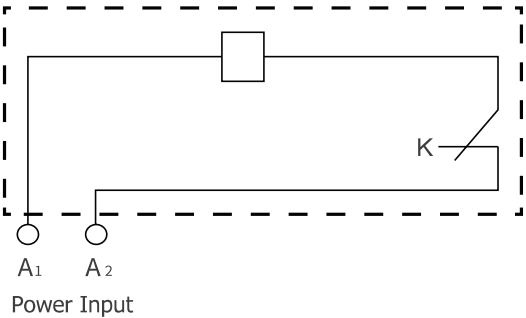
Function

Shunt release refers to the device which disconnect circuit breaker with current from a distance. A shun release can cut off the signal circuit automatically after tripping.

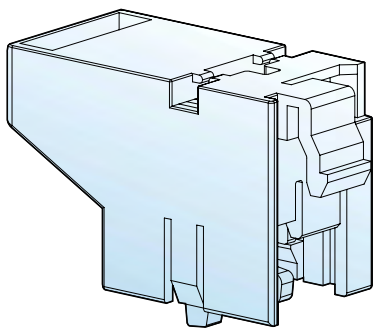
Operating Characteristics

Voltage specification	AC50Hz: 110V 230V 400V DC: 24V 110V 220V
Operating characteristics	When the operation voltage is 70%~110% of the rated control voltage, the shunt release should trip the circuit breaker reliably.

Connection diagram (internal accessories of a circuit breaker)



K is a microswitch closed contact of micro switch installed in series with the coil in shunt tripper, when the breaker is tripping,the switch is off by itself, when the breaker is closing, and then the switch is on.



Under-voltage release (UVT)

Under-voltage release (UVT)

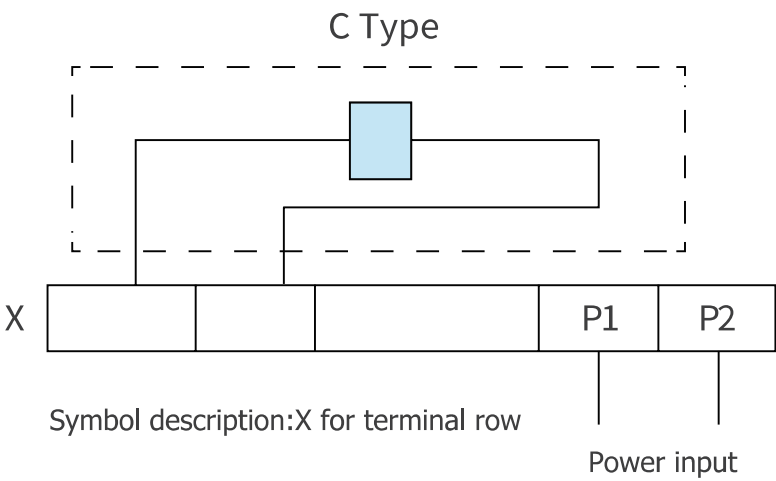
Function

Under-voltage release is a device which can automatically disconnect the circuit breaker when voltage is reduced.

Operating characteristics of the under-voltage release

Rated operational voltage	AC400V AC230V
Operating Characteristics	When the operation voltage is 70%~110% of the rated control voltage,the under-voltage should trip the circuit breaker reliably. When the working voltage is 85%~110% of the rated voltage, the under-voltage release should make the circuit breaker switch on. When the working voltage is less than 35% of the rated voltage, the under-voltage release should prevent the circuit breaker from being switched on.

Wiring digram of under-voltage release module
(the internal accessories of circuit breaker are depicted in the dotted area)



Under-voltage release power meter

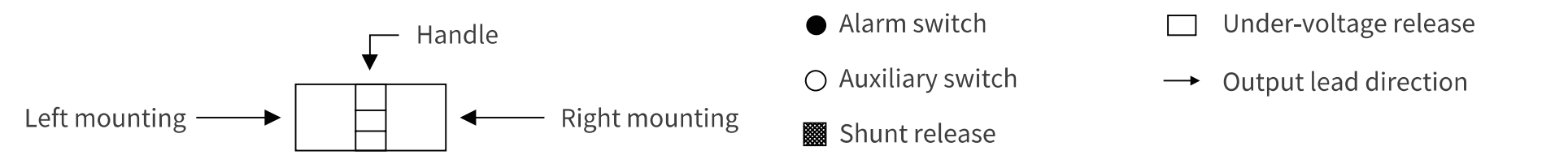
Equipped with circuit breaker type	Under-voltage release power	
	AC230V	AC400V
VM3-630 (Thermal-magnetic)	0.75	0.75



Before switch on a circuit breaker, the undervoltage release must be electrified otherwise the circuit breaker may be damaged.

Electrical accessories (TMF)

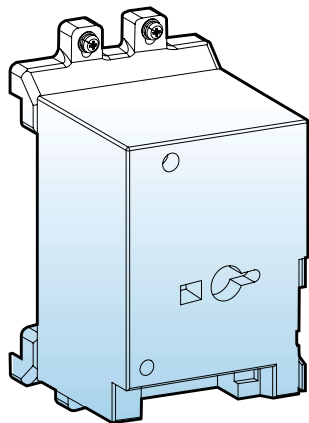
Combined mode of electrical accessories



Model			VM3-250	VM3-630
Accessory code	Accessory name	Poles	3	3、4 ①
AL	Alarm contact			
AX	Auxiliary contact			
SHT	Shunt release			
UVT	Under-voltage release			
SHT + UVT	Shunt release and under-voltage release			
AL+AX	Alarm contact and auxiliary contact			
AL+SHT	Alarm contact and shunt release			
AL+UVT	Alarm contact and under-voltage release			
AX+SHT	Auxiliary contact and shunt release			
AX+UVT	Auxiliary contact and under-voltage release			
AX+AL+SHT	Auxiliary contact, alarm contact and shunt release			
AX+AL+UVT	Auxiliary contact, alarm contact and under-voltage release			

Note: 1.If there is need to learn about the instructions of installation of accessories of a 4 poles circuit breaker, please contact with the manufacturer;
2.If there is need for a UVT, a voltage module for the UVT is needed firstly(no voltage module is needed for a SHT).
3.The standard installation of a SHT is the left pole installation, UVT is the right pole installation, please note if there is any special request.
4.AL module of a VM3-630 product is special supply for the right pole installation, please contact with the manufacturer

Control accessories



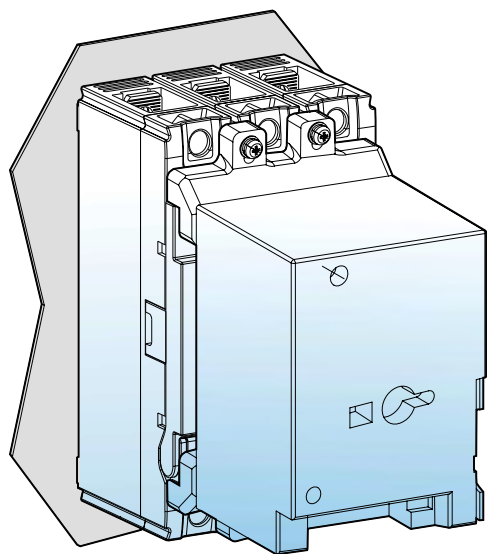
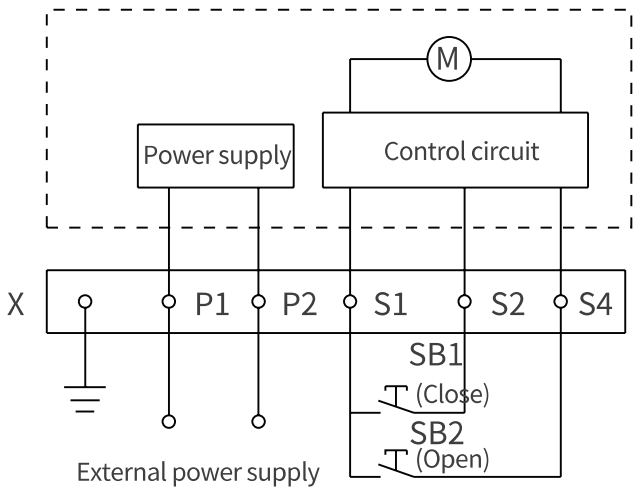
Motor-operated mechanism (CD2)

Motor-operated mechanism (CD2)

Motor-operated mechanism which consists of an energy storage spring, an opening coil and a closing coil is used to control a circuit breaker from a distance. And a CD2 Motor-operated mechanism has the following features: CD2 type electric operating mechanism has

- The operation mode, manual or automatic mode, can be chosen.
- Hand drive handle is in front of a face cover.

The wiring diagram of a CD2 motor-operated mechanism is shown as following (internal accessories are indicated in the dotted square)



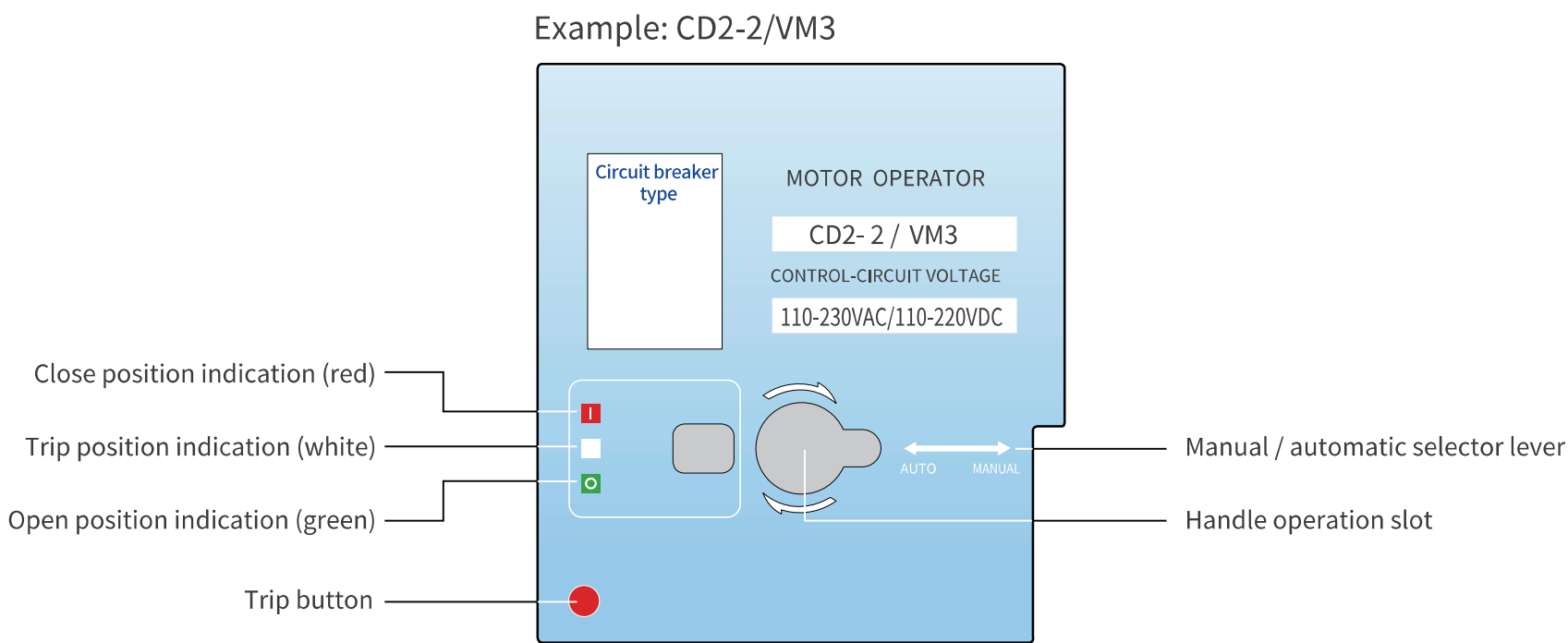
Manual operation

- The internal power supply is automatically closed, if the switch is operated to "manual" position.
- Put the handle into the slot in the front of an electric operating mechanism and then turn in a clockwise direction.
- Do not turn it in a counterclockwise direction.

Electric operation

- Auto connection
- Operating frequency should be no more than 3 times per minute.
- Using ON/OFF switches in the frequency range.
- Please do not input ON/OFF signal during automatic operation.
- Under-voltage release accessory(UVT) need to be applied a rated voltage before electric operation, if a Under-voltage release accessory(UVT) is mounted in a circuit breaker.

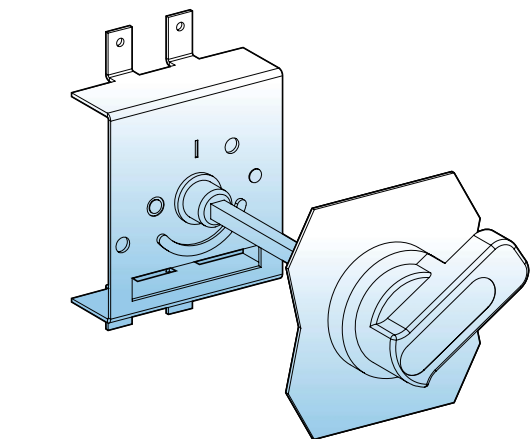
Motor-operated mechanism appearance



Acting Current, Motor Power and Longevity of CD2 type Power-driven Operating Mechanism

Equipped with circuit breaker type	Electric operating mechanism type	Control voltage	Starting current(A)	Response time(ms)		Power consumption	Durability
				Closed	Disconnect		
VM3-630 (Thermal-magnetic)	CD2-3	AC 110V/230V/400V DC 110V/220V/24V	≤ 0.5	500	350	14	10000

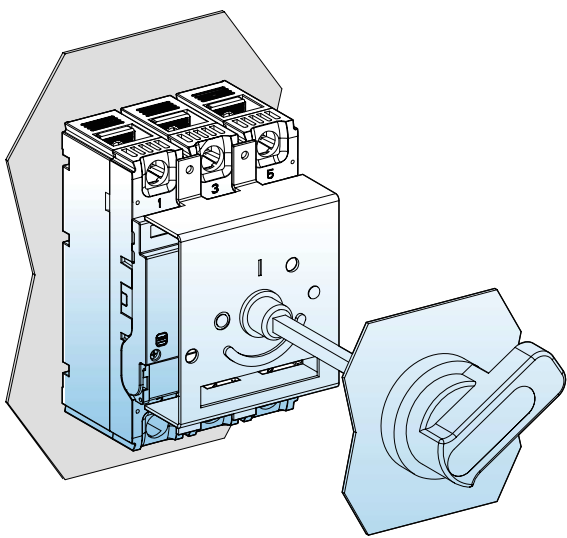
Note: After the circuit breaker trips,power-driven operating mechanism has to make the circuit reaker recramped,then it can be turned on.



Rotary handle operator (CS1、CS2、CS3) *

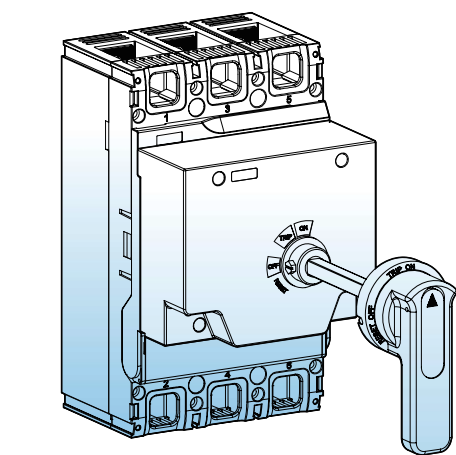
With the unique design and transmission mechanism, the rotary handle operator can make the circuit breaker open, close and lock the tripping part by turning the handle.

Note: Rotary handle operator CS1、CS2、CS3 types details as P2-21 show



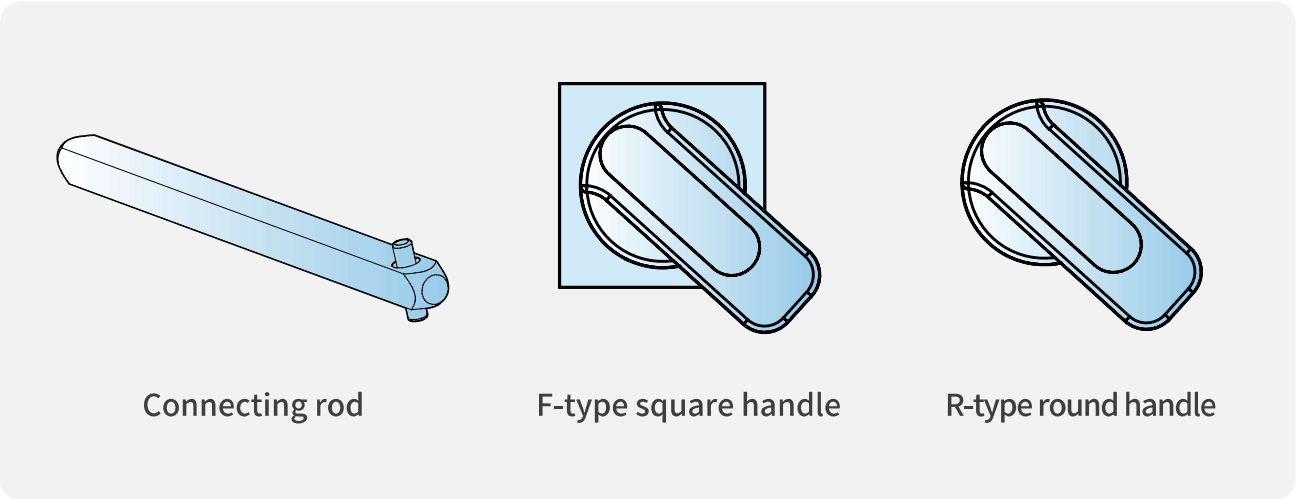
CS series rotary handle operator has the following features:

- Equipped with circular and square rotary operating handles.
- The panel sheet of the cabinet cannot be opened when the circuit breaker is on (i.e interlock with the door).
- The handle can related supporting drawers, and interlock with the drawer unit.
- If fault of the operation handle occurs during its closing state, the panel sheet can be opened by operating the emergency reliever.
- Extended rotary handle can be used and the length of the extension handle is determined according to the distance between the rotary handle and the door. The shortest and the longest are 150mm and 500mm

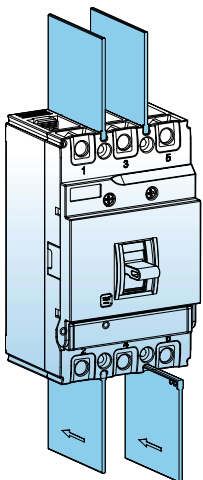


Classification

The rotary handle mechnism contains central type and eccentric type.
The rotary handle contains R type(circular) and F type(square).



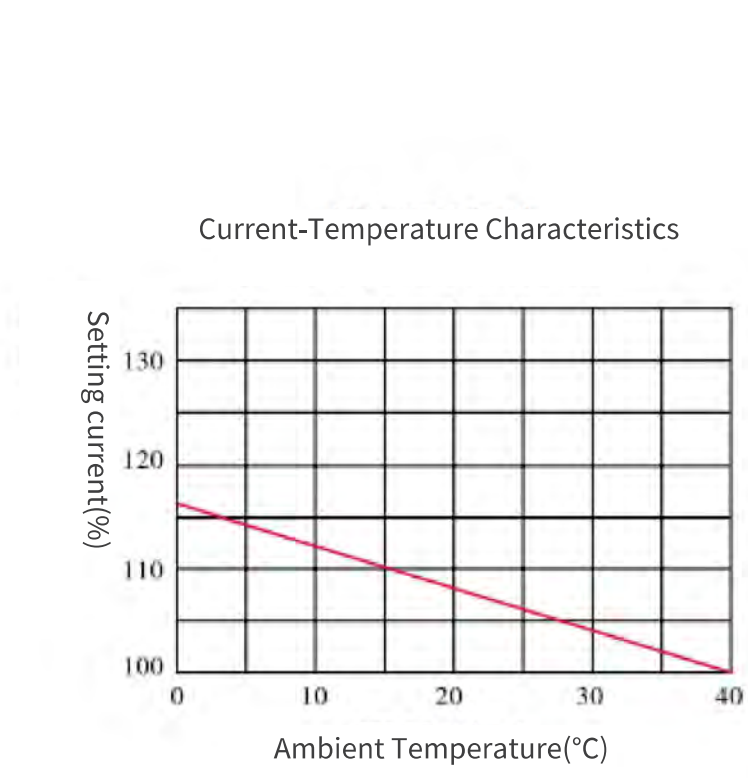
Insulation accessories



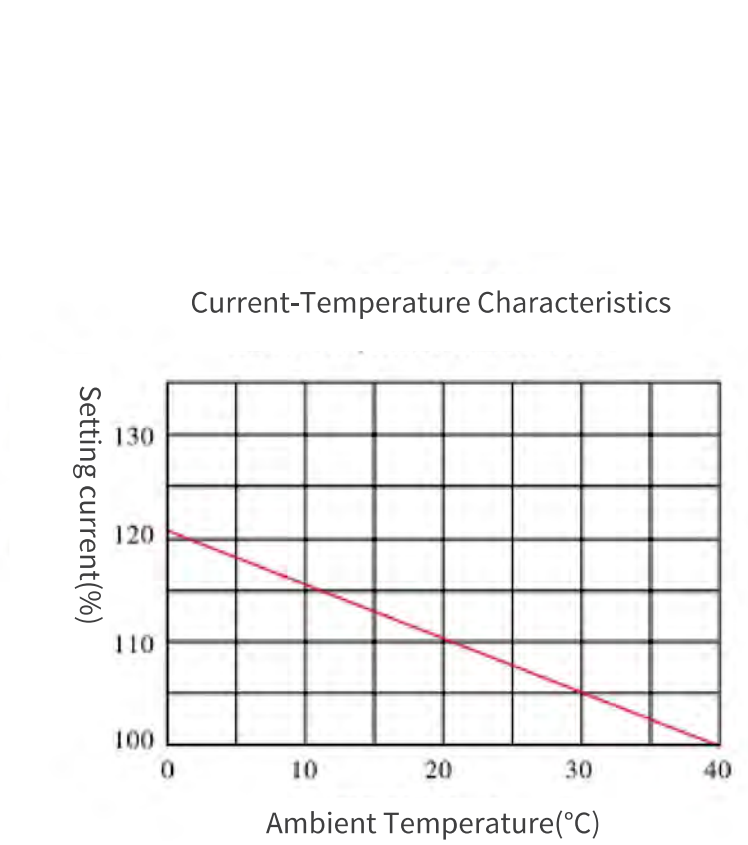
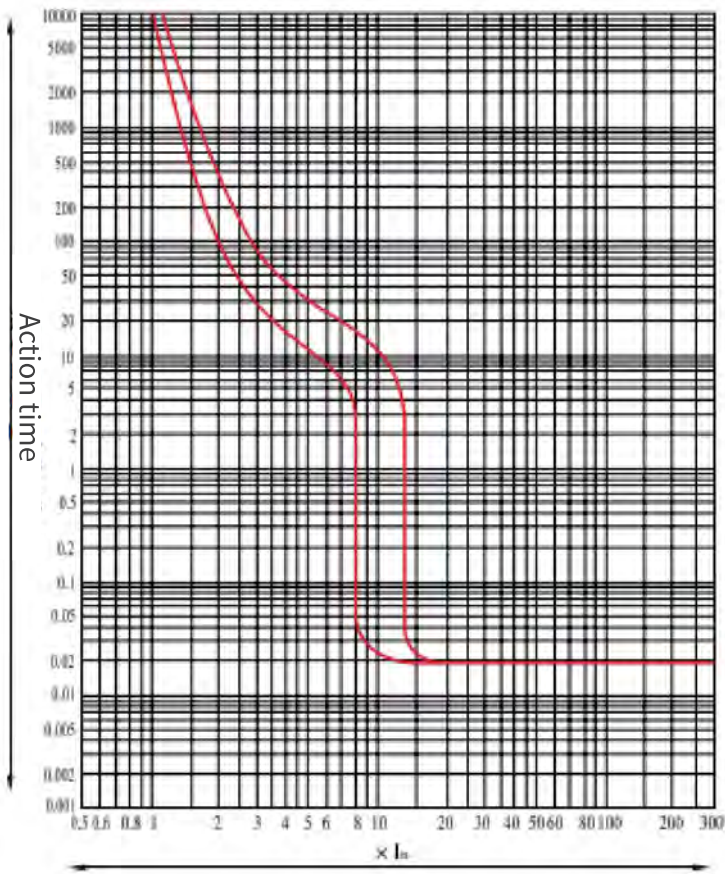
Phase separator

- The insulation strength can be enhanced by phase separators.
- It can be installed from a slot of a switch after the switch is mounted.
- It can be used with all the other accessories except long and short covers.

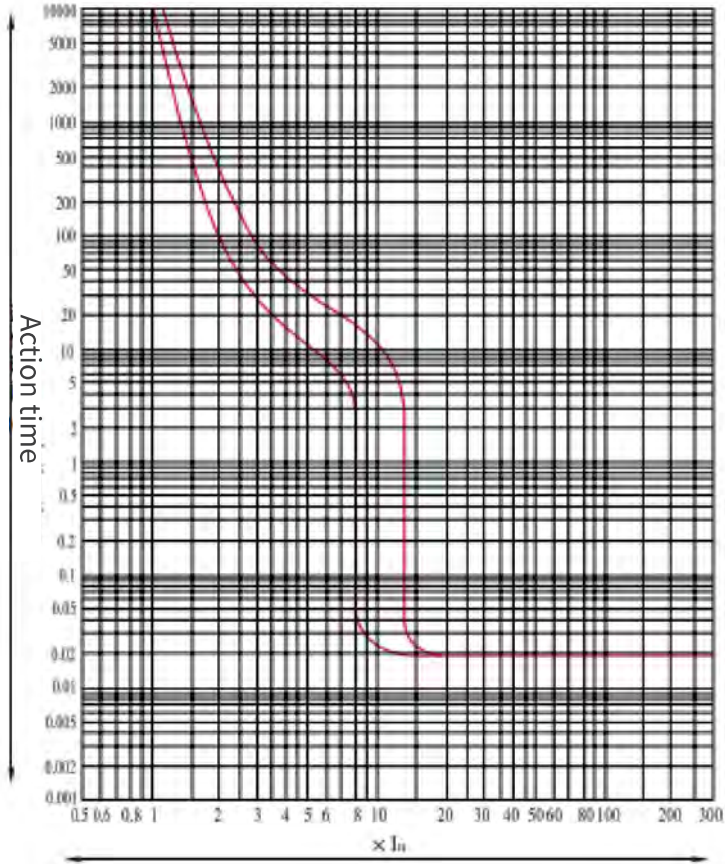
Thermal magnetic protection operating characteristic curve



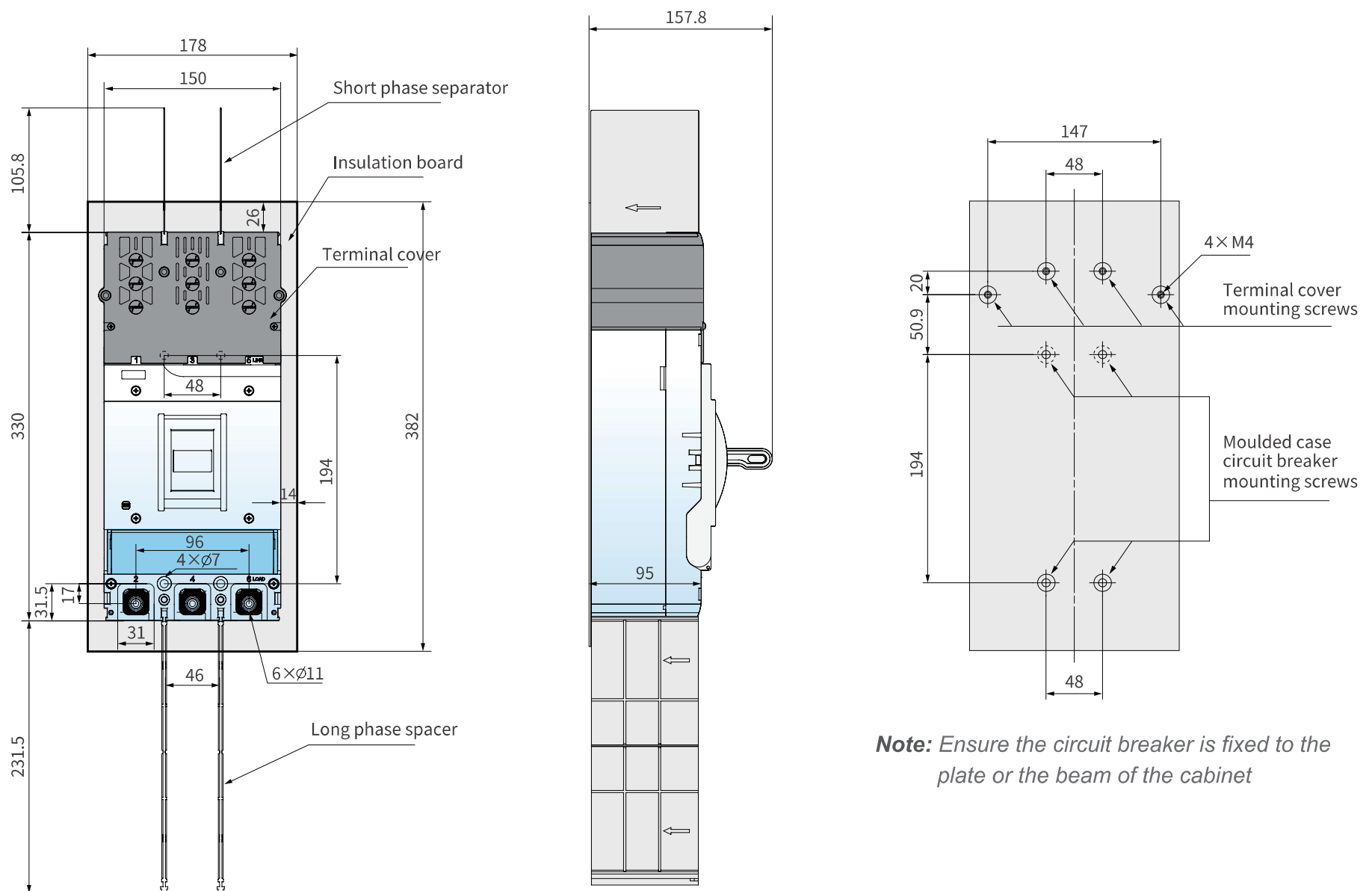
VM3-250 Time/Current Characteristic curve



VM3-630 Time/Current Characteristic curve

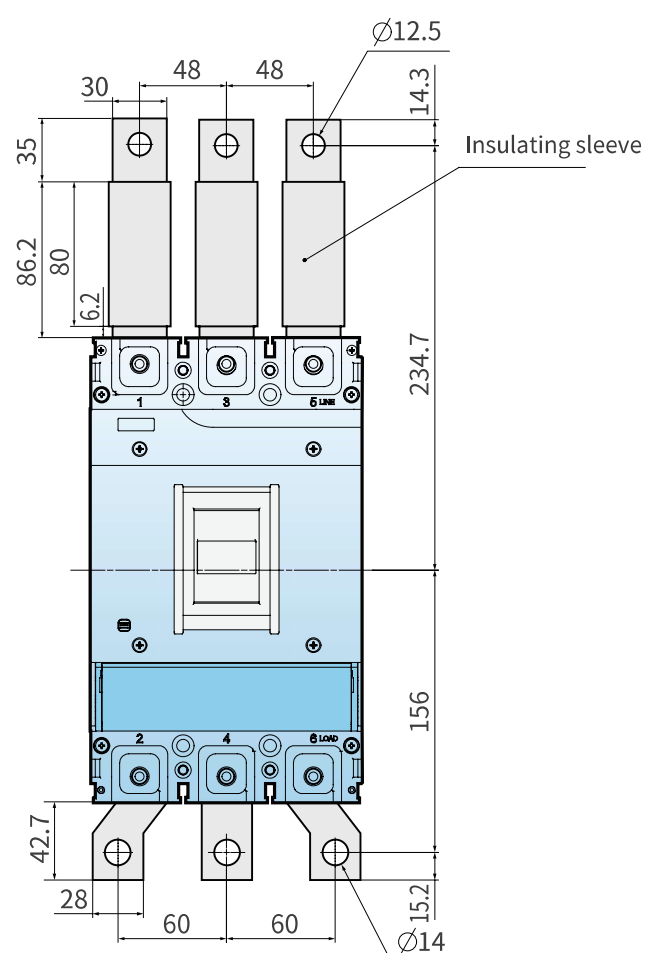


VM3-630HU series wiring in front of the board

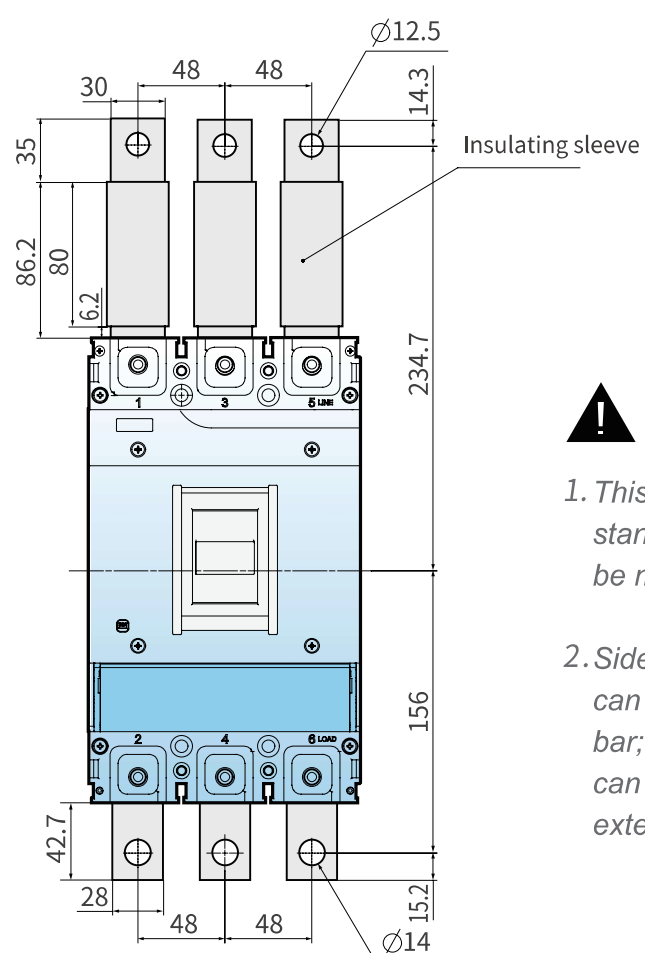


This diagram removes the terminal cover, interphase barrier and insulation board.

Connection terminal between poles



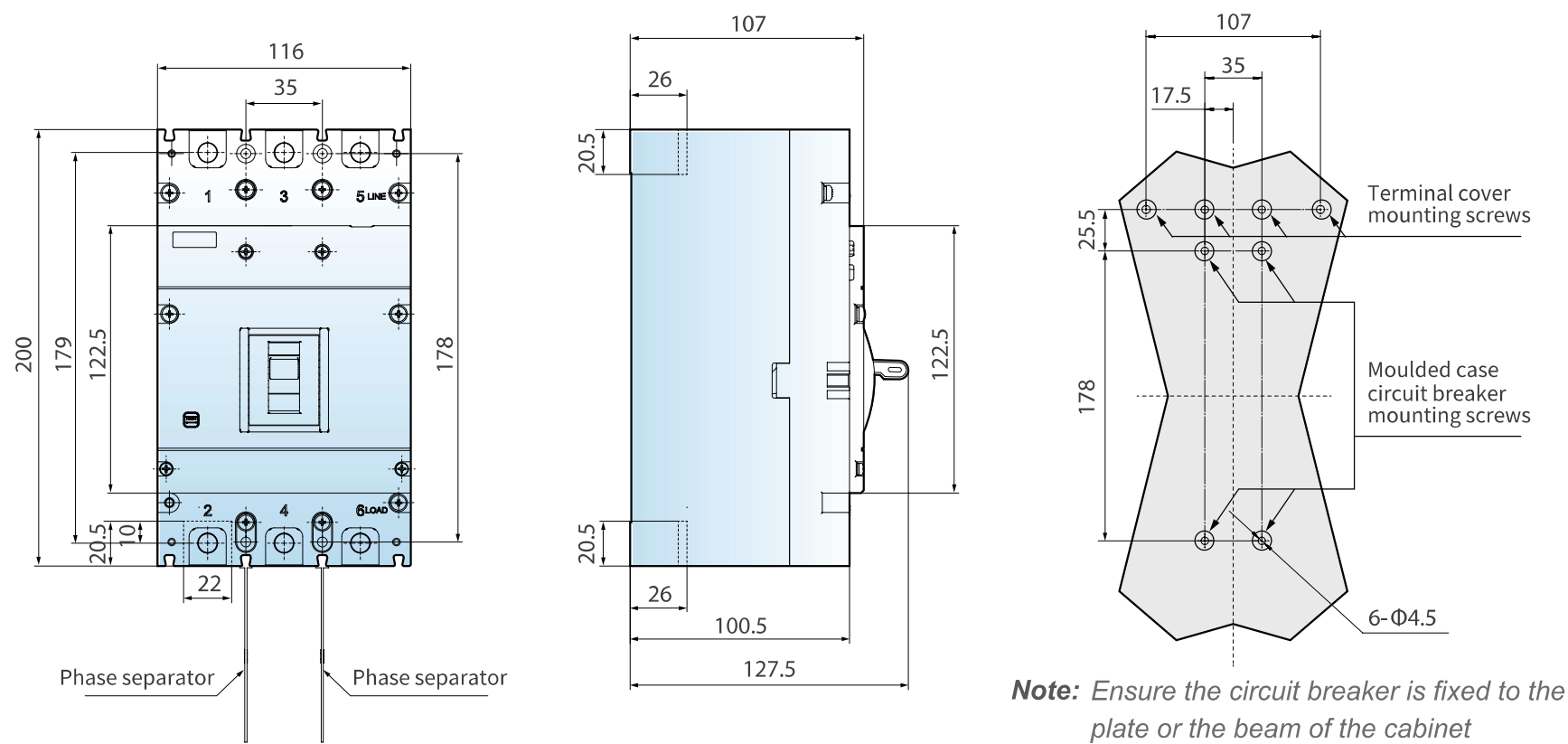
Straight Terminal Extender Connection



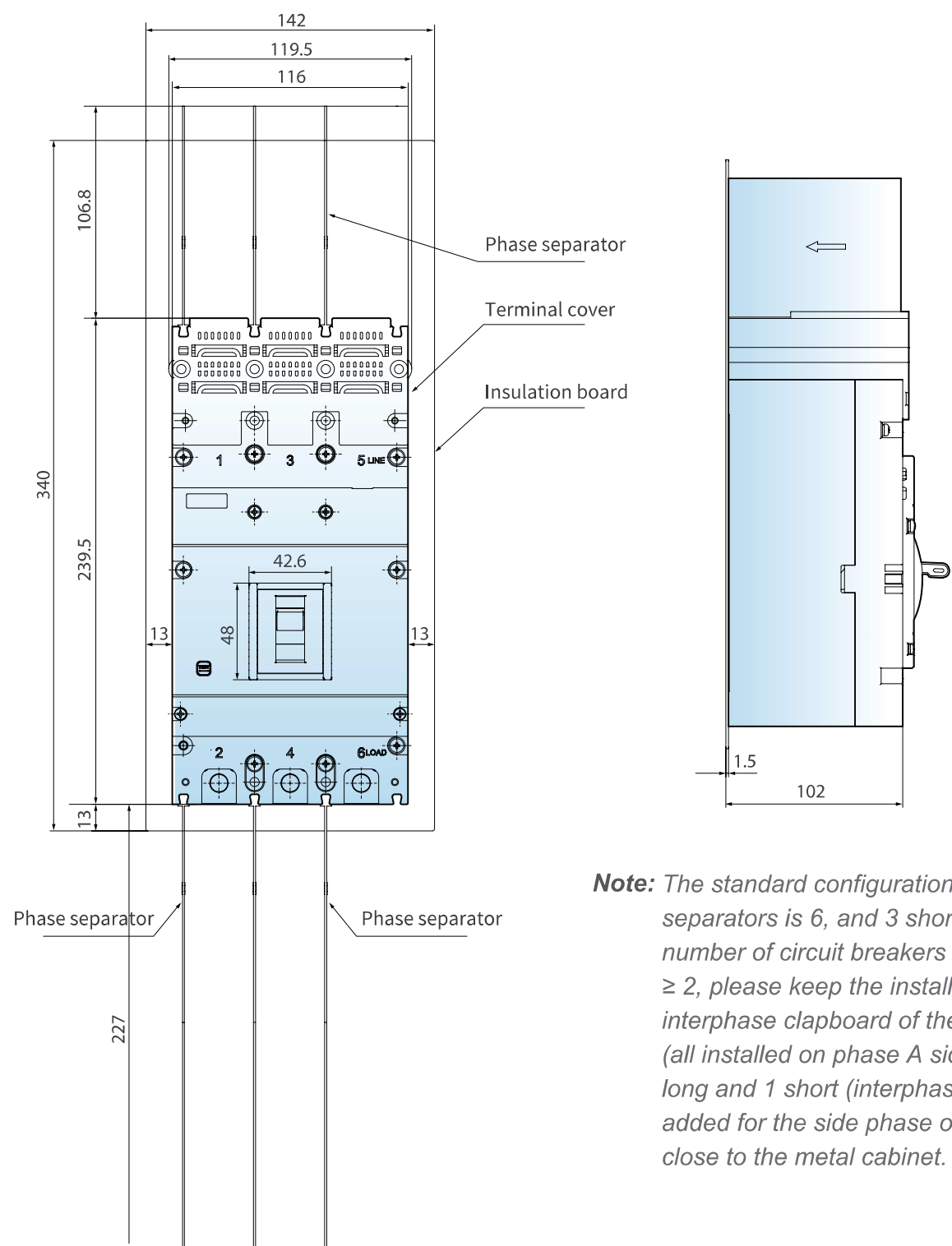
Note

1. This terminal expander is not standard matching and needs to be matched.
2. Sides 1,3,5 terminal expander can only be matched with straight bar; 2,4,6 terminal expander can choose both straight bar or extend bent bar.

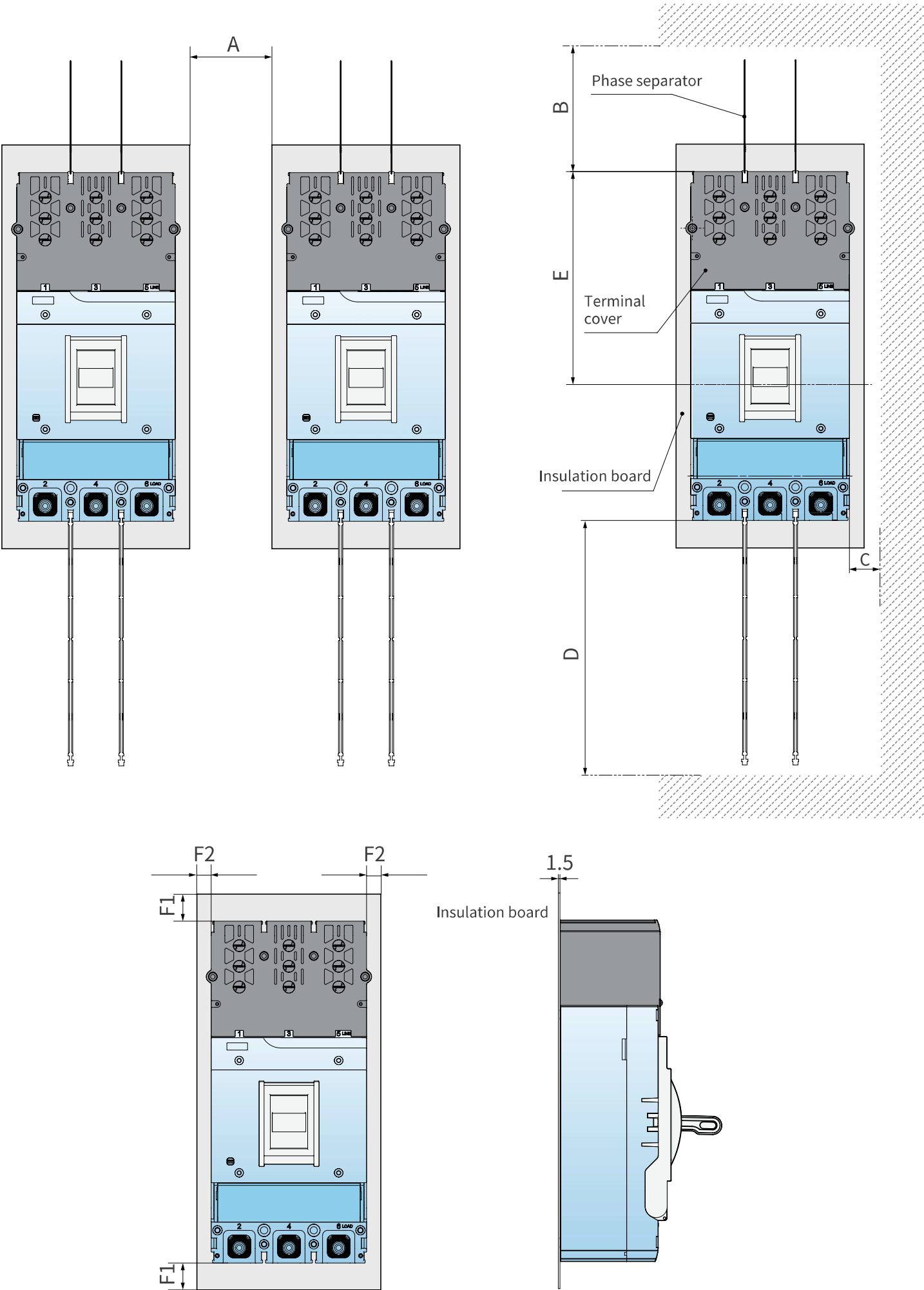
VM3-250HU series wiring in front of the board



VM3-250HU dimensions with terminal cover



Installation diagram for VM3-630HU



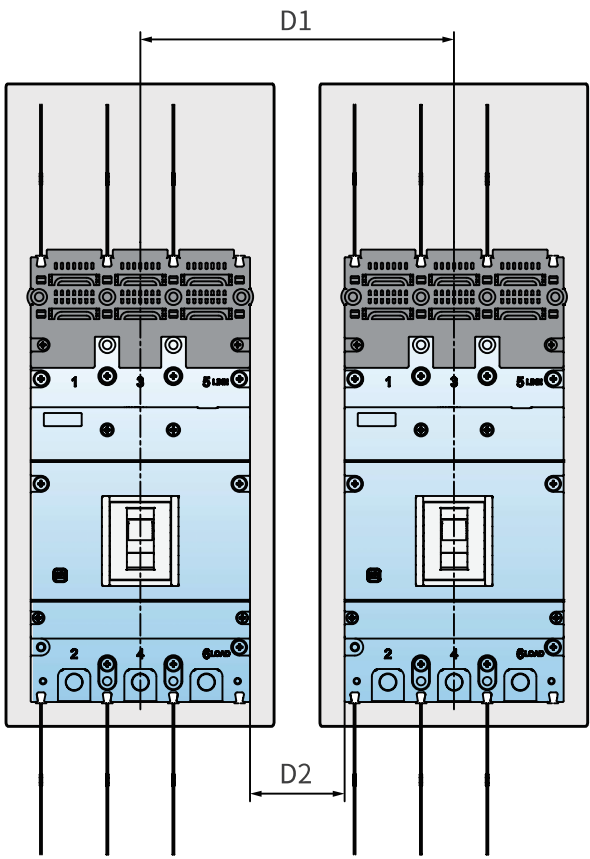
VM3 • Molded Case Circuit Breaker

Model	A	B	C	D	E	F1	F2
VM3-630HU	30	150	30	180	201.5	26	14

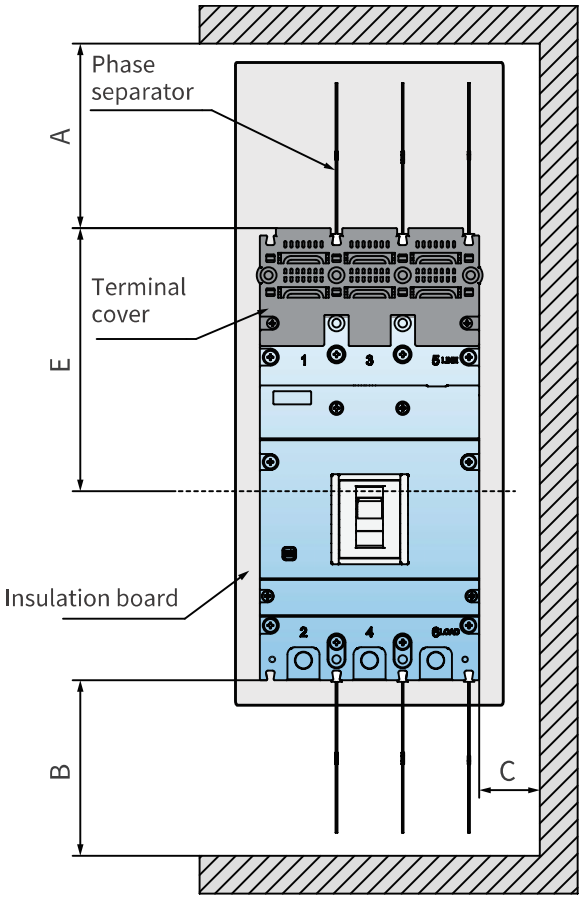
Note: When users use, terminals 1,3 and 5 of the circuit breaker connect to transformer side and install terminal cover and phase separator according to graphics. Terminals 2,4 and 6 connect to inverter side and install phase separator according to graphics. Insulation board is installed between circuit breaker and metal installation board.

Installation diagram for VM3-250HU

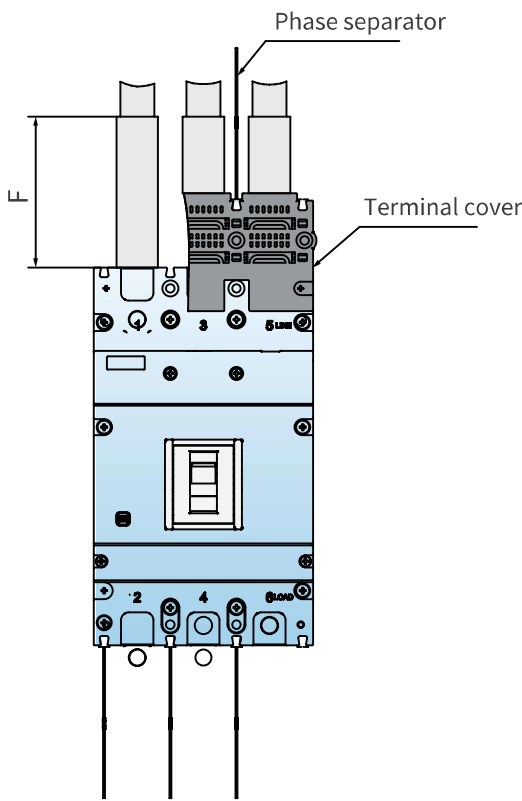
The minimum spacing between adjacent circuit breakers



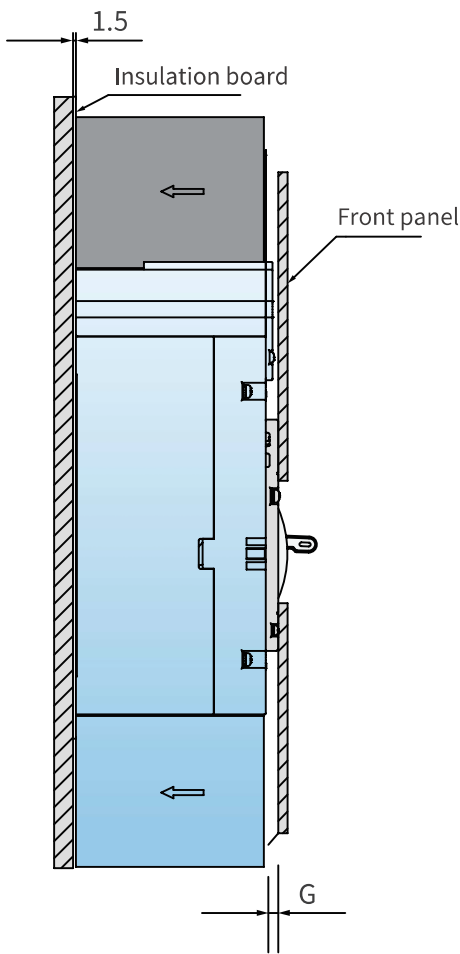
The minimum spacing of the top, baseplate and side plate of the circuit breaker



The minimum insulation length of wiring bar when it is front panel connection



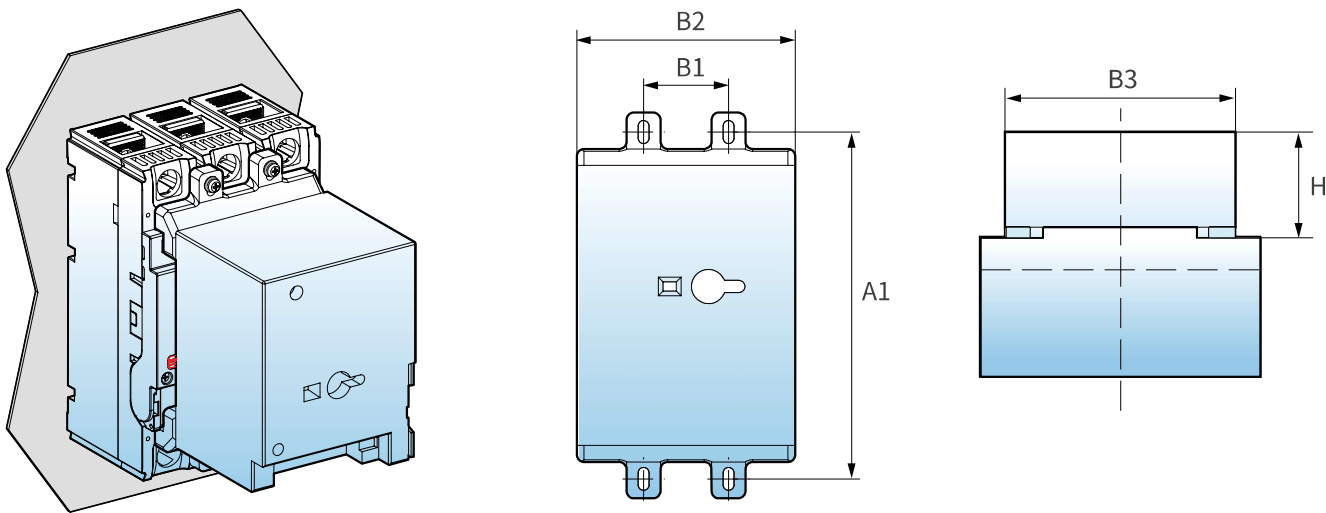
The minimum spacing between the circuit breaker and front panel



Model	Distance (mm)								
	A	B	C	D1	D2	E	F	G	
								Insulation board	Metal board
VM3-250HU	150	228	30	146	30	139.5	350	0	30

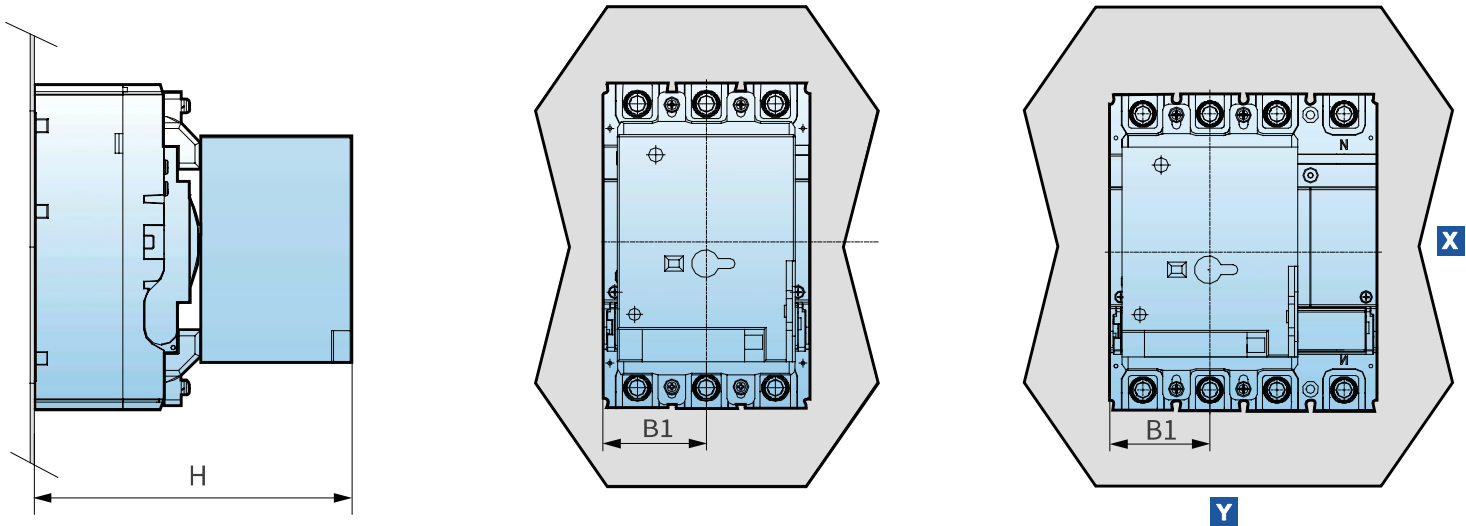
Note: When users use, terminal cover and phase separator should be assembled on terminals 1,3 and 5 of circuit breaker according to graphics. Phase separator should be assembled on terminals 2,4 and 6 of circuit breaker according to graphics. Insulation board is installed between circuit breaker and metal installation board.

Motor-operated mechanism



Motor-operated mechanism dimension table

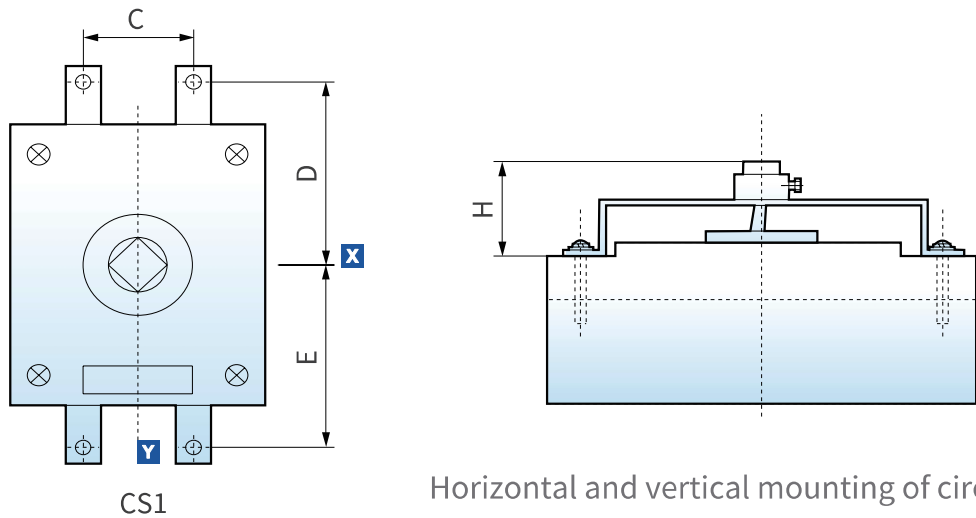
Circuit breaker type	Motor operator model	A1	B1	B2	B3	H
VM3-630 (Thermal-magnetic)	CD2-3	194	48	129	175	156



Model	B1	H		
VM3-630 (Thermal-magnetic)	75	250.5		

Extended rotary handle dimension

Centric

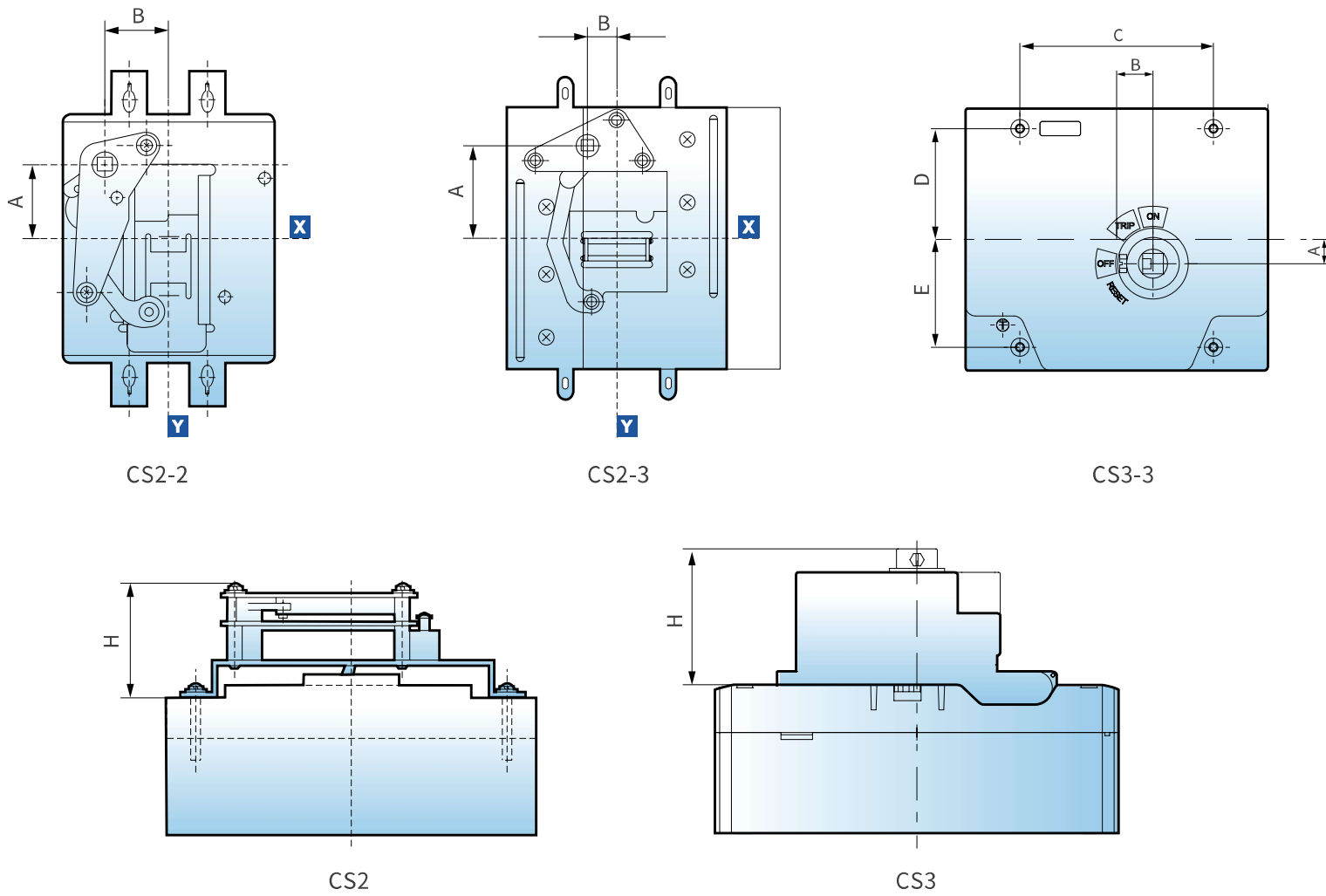


Horizontal and vertical mounting of circuit breaker

Centric size table

Model	Circuit breaker type	C	D	E	H	Remark
CS1-3	VM3-630 (Thermal-magnetic)	48	97	97	87	Used for vertical or horizontal installation of circuit breakers (centric trepanning)

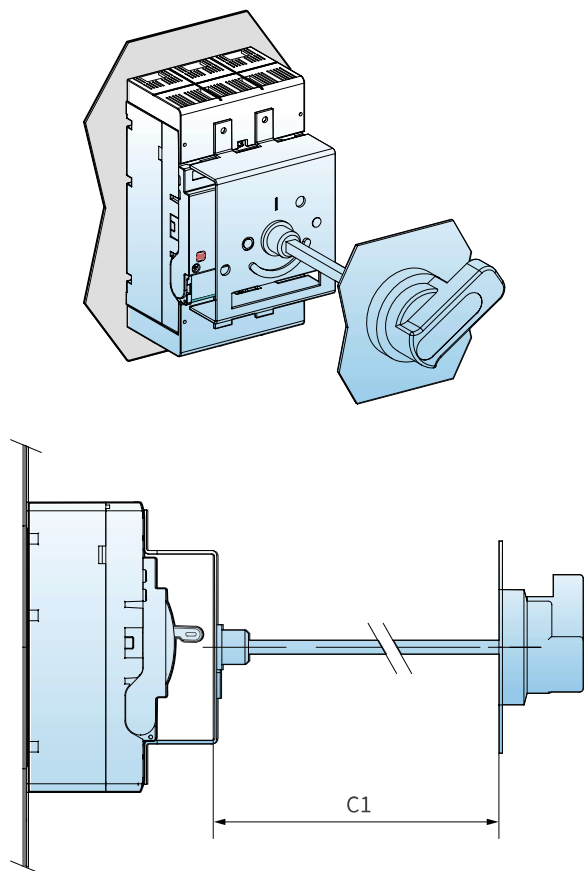
Eccentric type



Eccentric size table

Model	Circuit breaker type	A	B	H	D	E	Remark
CS2-3	VM3-630 (Thermal-magnetic)	68	15	59			Used for vertical or horizontal installation of circuit breakers (eccentric trepanning)
CS3-3	VM3-630 (Thermal-magnetic)	12	18	86.5	55	53.5	

Extended rotary handle installation

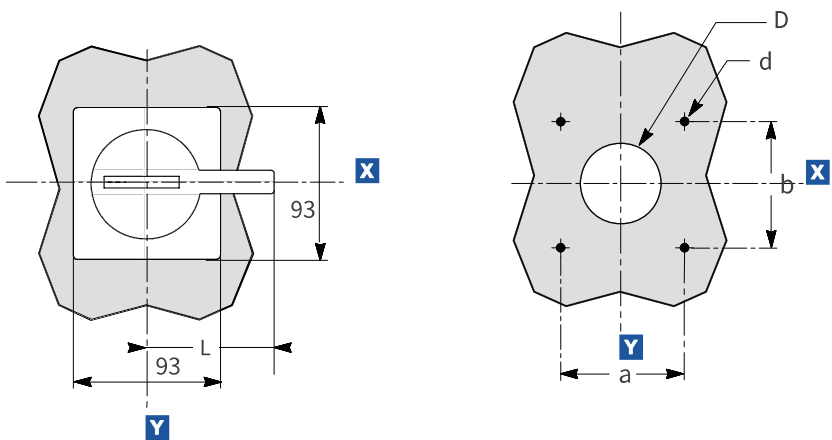


Circuit breaker model	C1	
	min	max
VM3-630	150	300

Extended rotary handle installation
Size and door sheet trepanning

VM3 • Molded Case Circuit Breaker

F-type (F1 type used for VM3-250, F2 type used for VM3-630)

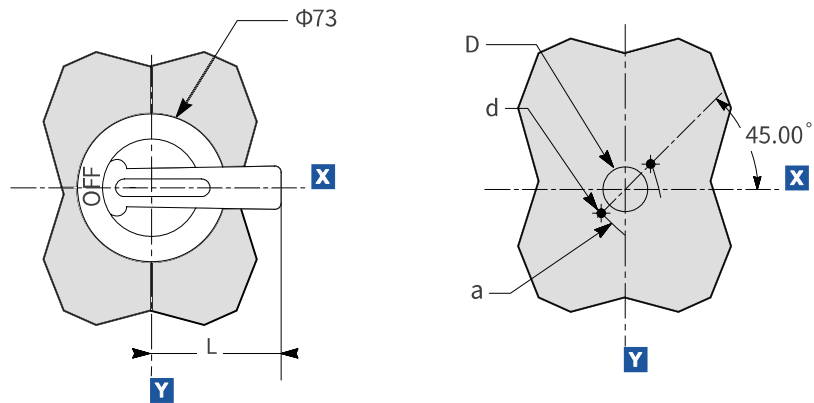


F-type

F type handle mounting dimensions

Handle specifications	F1	F2
D	φ 42	φ 42
d	φ 4.5	φ 4.5
a	65	65
b	65	65
L	65	95

R-type (R1 type used for VM3-250, R2 type used for VM3-630)



R-type

R type handle mounting dimensions

Handle specifications	R1	R2
D	φ 34	φ 34
d	φ 5.5	φ 5.5
a	φ 53	φ 53
L	65	95

Note: 1. The standard configuration of CS1 and CS2 type rotating handle is R type and the length of square shaft is 200mm which connects rotary handle and the operating mechanism. Please specify if you have special requirement.
2. For three pole and four pole circuit breakers, rotating handles have the same parameters.
3. VM3-250 hand aperture dimensions refers to F1, R1 and VM3-630 aperture dimensions refers to F2, R2.

VM5

Molded Case Circuit Breaker





- Tailored for solar energy and wind power
- Working voltage up to 1000V
- With ultra-high breaking capacity
- With excellent anti damp heat and dew solidification capabilities
- Strong ability to adapt to alternating changes in high and low temperatures
- With thermal and magnetic adjustability

Ambient conditions

Operating ambient temperature/storage temperature

- Operating environment temperature: -40 °C~+70 °C, with an average value of no more than +35 °C within 24 hours
- Storage temperature: -40 °C~+75 °C

Altitude conditions

- Altitude of installation site $\leq 2000\text{m}$ (Over 2000 meters need capacity reduction for using)

Pollution level

- Level 3

Protection level

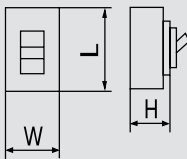
- Product protection level: IP20

Installation Category

- Class II (load) and Class III (distribution and control)

Installation Environment

- The product is installed in a medium without explosion risk, and the medium is not sufficient to corrode metal, there is no gas that damages the insulation layer of the product, there is no conductive dust, and it should be avoided from being used in places invaded by rain and snow

Type			VM5-320HU		VM5-630HU	
						
Rated current		A	63, 80, 100, 125, 140, 160, 180, 200, 225, 250, 320		315, 350, 400, 500, 630	
Pole number			3			
Rated operating voltage		AC50~60Hz (V)	800, 1000			
Rated insulation voltage		V	1000			
Rated impulse withstand voltage Uimp		kV	8			
Breaking capacity			L	M	L	M
Ultimate short-circuit breaking(lcu)		AC800V	30	50	50	50
		AC1000V	15	30	15	18
Service short-circuit breaking(lcs)		AC800V	30	50	36.5	50
		AC1000V	12	18	15	18
Mechanical durabillity		Times	12000		8000	
Electrical durabillity	AC800V	Times	1000			
	AC1000V	Times	1000			
	With	mm	185		257	
	Heigh		112.5		140	
	Depth		106.5		110	
Isolatiion function			Have isolation function			
Optional trip unit		TA	Thermally adjustable (0.7~1.0) Magnetic adjustable (5~10)			
		TAL	Thermally adjustable (0.7~1.0) Magnetic fixation (10In)			

Note:

VM5-320: 63A is thermally adjustable magnetic fixation, 80~320A is thermo-magnetic adjustable;
VM5-630: Only thermo-magnetic adjustable;

VM5	—	320	HU	M	320	/	TMD	/	3	/	AX/SHT
1		2	3	4	5		6		7		8

SN	Name	Specification, type code	
1	Design code	VM5: Design code	
2	Frame rating	320: 320A 630: 630A	
3	High voltage	HU: Hight voltage	
4	Breaking capacity	L, M	
5	Rated current	63A~630A	
6	Protection unit type	TAL: Thermal protection unit (power distribution protection, 63A) TMD: Thermal magnetic adjustable unit (For power distribution protection, 80~630A)	
7	Number of poles	3P	
8	Accessories (separated with"/" between different accessories)	Connection accessories	Empty: Fixed type wiring in front of the board
		Electrical accessories	AL: Alarm contact AX: Auxiliary contact SHT: Shunt release
		Expansion accessories	K6: Phase separator K11: Insulating mounting plate

* Electrical accessories

Accessories	Voltage				
SHT Shunt release	AC230V	AC400V	DC220V	AC/DC110V	DC24V

If the accessory voltage and voltage control loop is inconsistent,please use indicate the accessory voltage after accessory.

Example

VM5-630HUM630/TMD/3/AX/SHT (AC230V)
Meaning: VM5 series circuit breaker; the frame level is 630; 3 poles; rated current is 630A; fixed rear connection; accessory contains auxiliary contact and shunt release with voltage (AC230V).

TMD/TAL: Data sheet of protection characteristics

Rated current	Inverse time acting characteristic (Ambient air temperature +40°C)		Instantaneous acting current
	1.05I _n (Cold state) Not acting time	1.3I _n (Cold state) Not acting time	
I _n ≤ 63	≥ 1h	<1h	TMD: 5~10±20% TAL: 10I _n ±20%
63<I _n ≤ 800	≥ 2h	<2h	

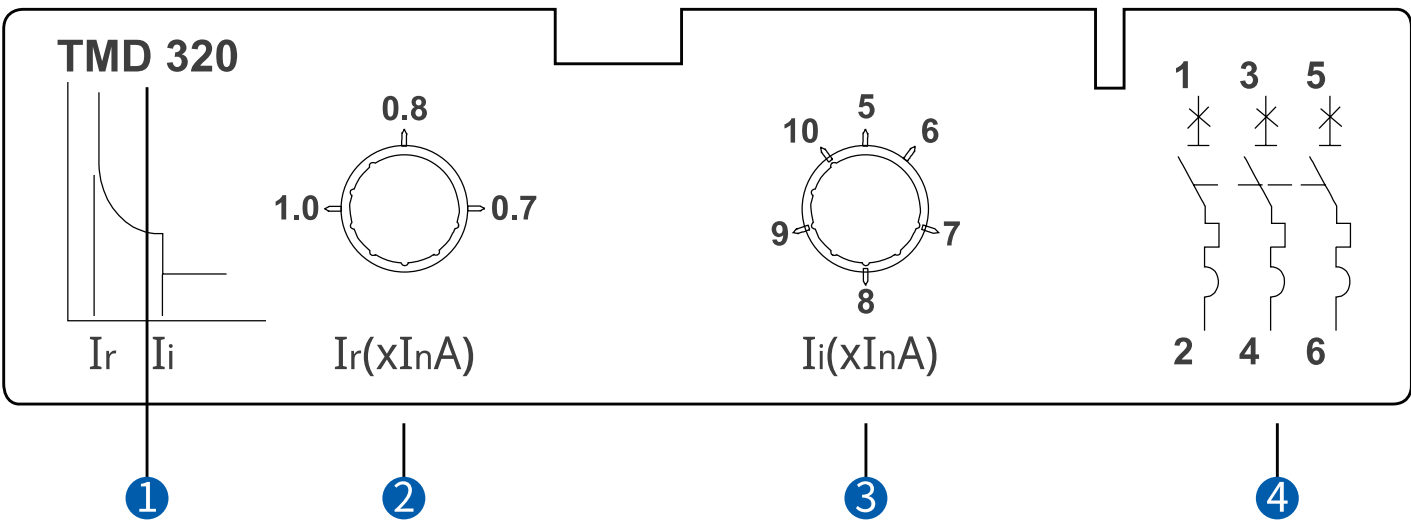
Derated coefficient of rated current

Circuit Breaker Model	+40°C	+45°C	+50°C	+55°C	+60°C	+65°C	+70°C
VM5-320HU	1.0 I _r	0.98 I _r	0.96 I _r	0.94 I _r	0.92 I _r	0.91 I _r	0.88 I _r
VM5-630HU	1.0 I _r	0.97 I _r	0.95 I _r	0.93 I _r	0.91 I _r	0.89 I _r	0.87 I _r

Derated coefficient of high altitude of VM5 series MCCB

Item	Parameter						
Elevation	2000	2500	3000	3500	4000	4500	5000
Power frequency withstand voltage	3500	3500	3200	3000	2800	2750	2500
Isolation voltage	1250	1250	1250	1140	1140	1140	1140
Breaking capacity correction factor	1	1	0.9	0.85	0.8	0.75	0.7
Working current correction factor	1	1	0.98	0.97	0.96	0.95	0.94

Sign interpretation

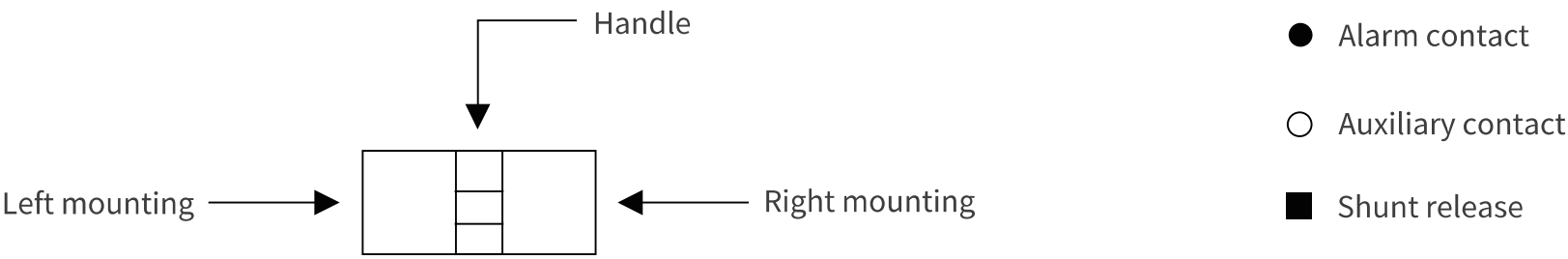


- ① Thermal magnetic adjustable unit
Rated current is 320A

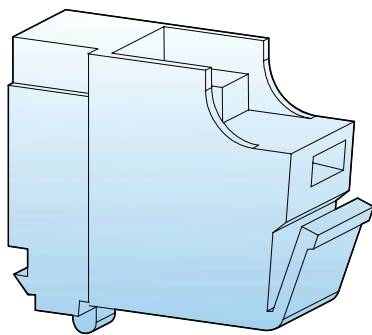
② Thermally adjustable
- ③ Magnetic adjustable

④ Wiring diagram

Combined mode of electrical accessories



Model			VM5-320HU	VM5-630HU
Accessory code	Accessory name	Poles	3	3
AL	Alarm contact		●	●
SHT	Shunt release		■	■
AX	Auxiliary contact		○ ○	○ ○ ○
AX+SHT	Shunt release and alarm contact		■ ○ ○	○ ○ ○ ■
AL+SHT	Shunt release and alarm contact		● ■	■ ●
AL+AX	Auxiliary contact and alarm contact		● ○ ○	○ ○ ○ ●
AX+AL+SHT	Shunt release, auxiliary contact and alarm contact		■ ● ○ ○	○ ○ ○ ■ ●
	Without accessory			



Alarm contact (AL)

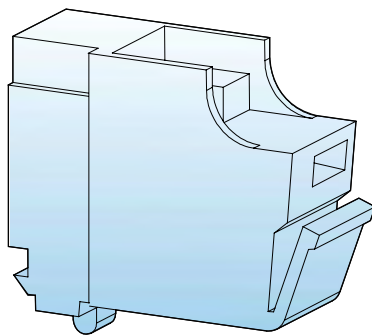
Alarm contact (AL)

Function

The product outputs alarm signal when it is tripped by outer excitation signal due to overload, short circuit, undervoltage, or when the release button is pressed. This function is particularly useful in an automatic system, since that a fault signal can be sent to the designated place. And the fault signal will turn on due to an internal microswitch, when circuit breaker releases. But for normal opening or closing operations, it does not have any action.

Alarm contact operating characteristics

Circuit breaker status	Alarm contact status
The statuses of open and close	B14 B12 B11
The statuses of tripping	B14 B12 B11



Auxiliary contact (AX)

Auxiliary contact (AX)

Function

Auxiliary switch is used for indication of remote "ON" and "OFF". Each switch contains two contacts, which share a common end of connection. The ON/OFF position depends on the state of main contact. When the circuit breaker is open, one of them is normally open, and the other is closed, or vice versa.

Auxiliary contact operating characteristics

Circuit breaker status	Auxiliary contact status
The statuses of open	F14 (F24) F12 (F22) F11 (F21)
The statuses of close	F14 (F24) F12 (F22) F11 (F21)

Alarm contact, Auxiliary contact rated operational current

Classification	Rated current I_{nm}	Conventional thermal current $I_{th}(A)$	Rated working current $I_e(A)$	
			AC400V	DC220V
Auxiliary contact	≤ 250	3	0.3	0.15
	$400 \leq I_{nm} \leq 1000$	3	0.4	0.2
Alarm contact	$10 \leq I_{nm} \leq 1000$	-	AC220V/1.0A	0.15

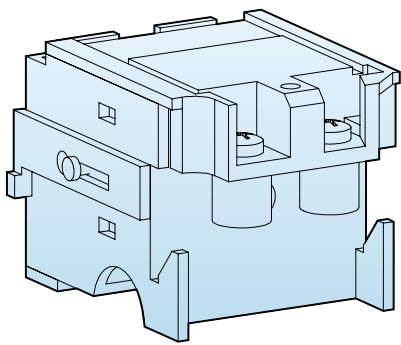
ON-OFF capacity of Alarm contact and Auxiliary contact under normal conditions

Utilization category	ON				OFF				Number of operation cycles	Number of operation cycles per minute	Power time
	I/I_e	U/U_e	$\cos\phi$	$T_{0.95}$	I/I_e	U/U_e	$\cos\phi$	$T_{0.95}$			
AC-14	10	1	0.7	-	1	1	0.7	-	6050	6	$\geq 0.05s$
DC-13	1	1	-	$6 \times P_e$	1	1	-	$6 \times P_e$			$\geq 0.05s$

ON-OFF capacity of alarm contact and auxiliary contact under abnormal conditions

Utilization category	ON				OFF				Number of operation cycles	Number of operation cycles per minute	Power time
	I/I_e	U/U_e	$\cos\phi$	$T_{0.95}$	I/I_e	U/U_e	$\cos\phi$	$T_{0.95}$			
AC-14	6	1	0.7	-	1	1	0.7	-			$\geq 0.05s$
DC-13	1.1	1.1	-	$6 \times P_e$	1.1	1.1	-	$6 \times P_e$	10	6	$\geq 0.05s$

- Note: 1. $T_{0.95}=6Pe$ is an empirical formula in which the unit of “Pe” is watt and the unit of $T_{0.95}$ is millisecond.
2. The number of operation of Auxiliary contact can equal to that of the circuit breaker, if the number of operation of circuit breaker is less than 6050.
3. The operation frequency and power-on time of an auxiliary contact are allowed to be the same as those of the main circuit.
4. If $T_{0.95}$ is more than 0.05s, the power-on time is at least $T_{0.95}$.



Shunt release (SHT)

Shunt release (SHT)

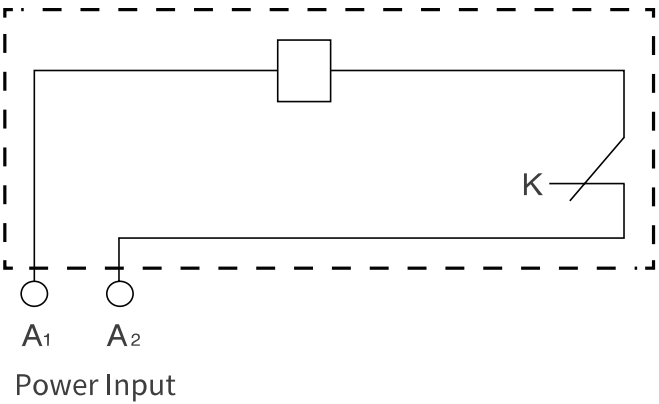
Function

Shunt release refers to the device which disconnect circuit breaker with current from a distance.
A shunt release can cut off the signal circuit automatically after tripping.

Operating Characteristics

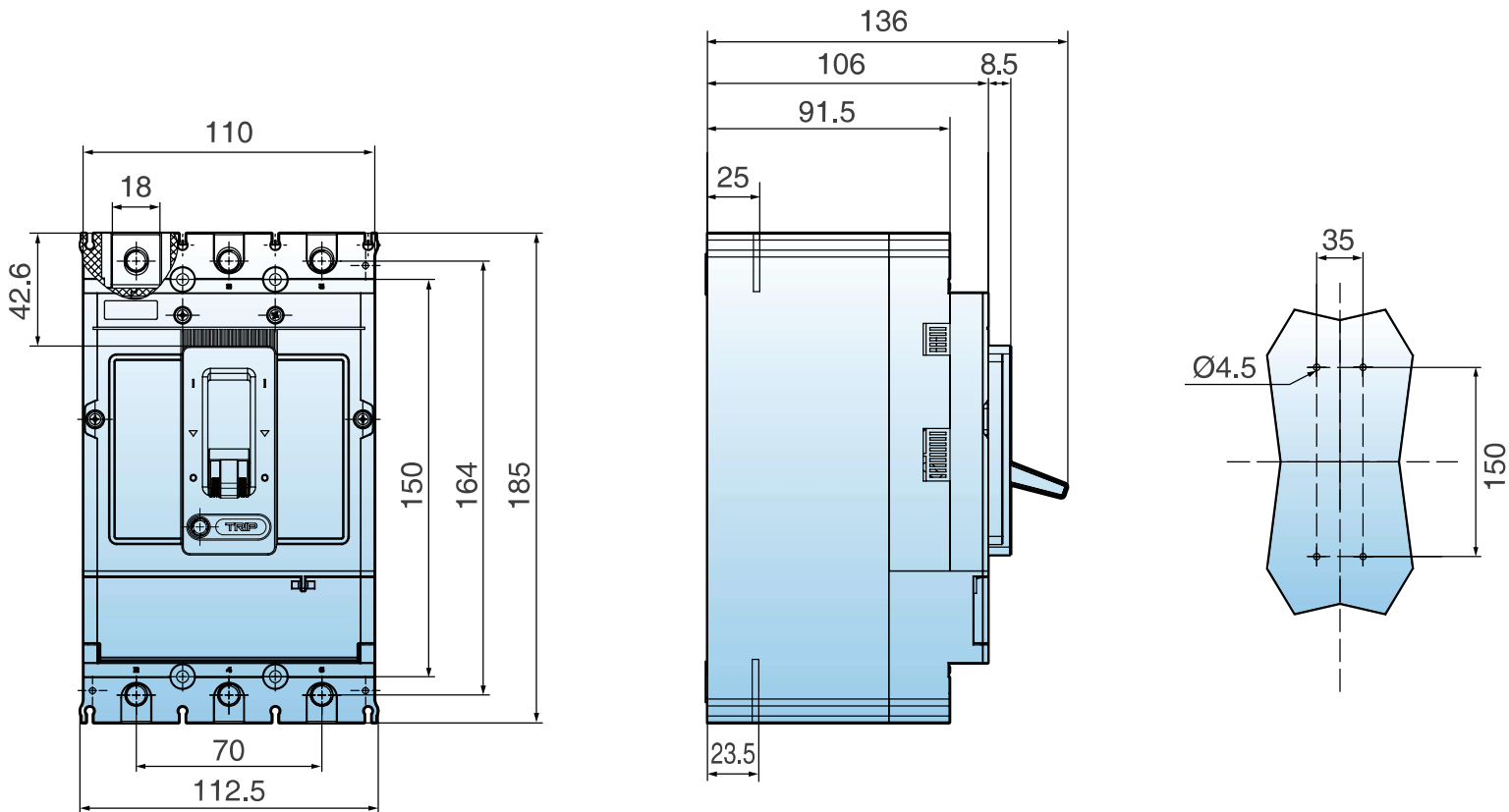
Voltage specification	AC50Hz: 110V 230V 400V DC: 24V 110V 220V
Operating characteristics	When the operation voltage is 70%~110% of the rated control voltage,the shunt release should trip the circuit breaker reliably.

Connection diagram (internal accessories of a circuit breaker)



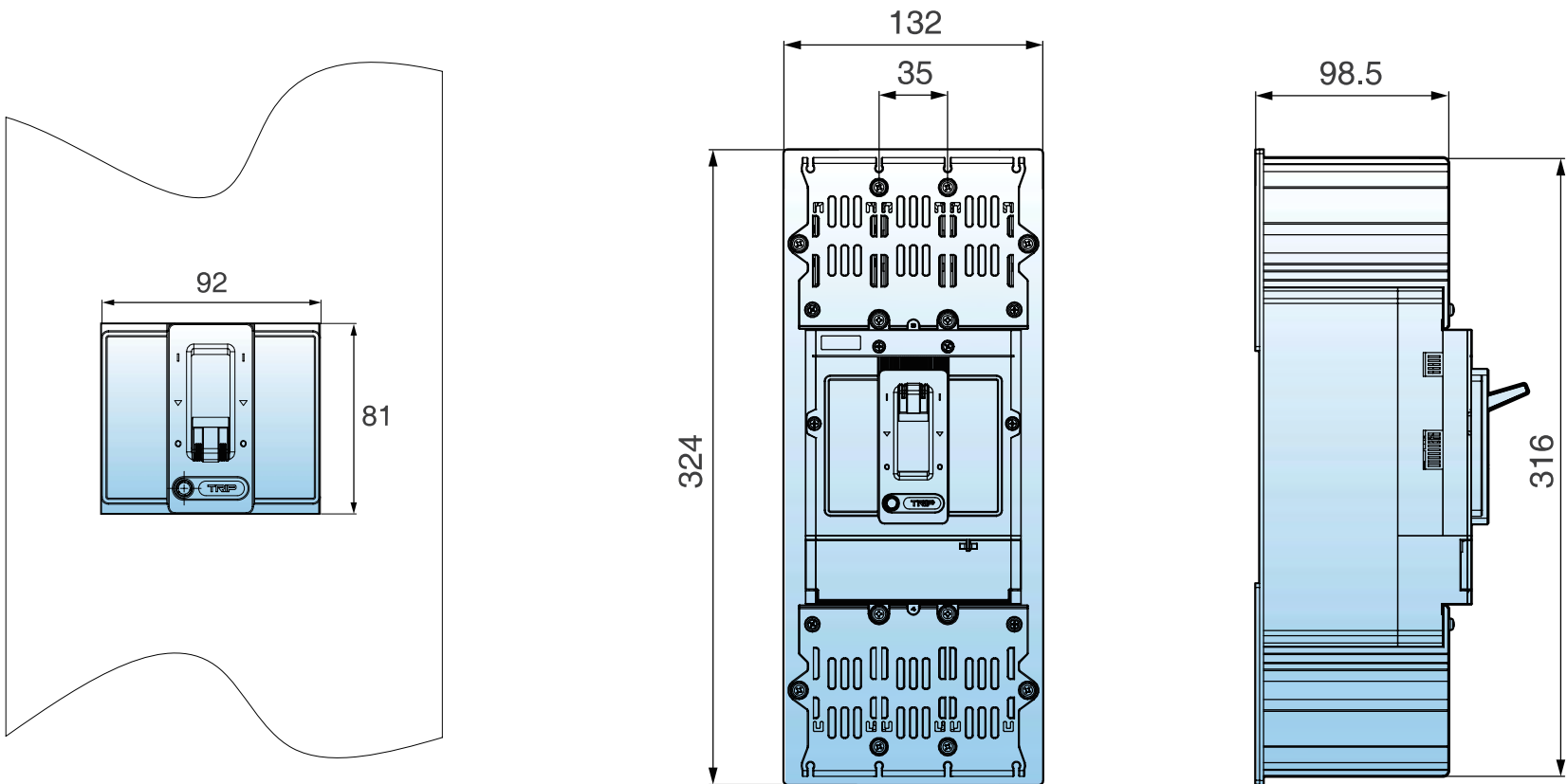
K is a microswitch closed contact of micro switch installed in series with the coil in shunt tripper, when the breaker is tripping,the switch is off by itself, when the breaker is closing, and then the switch is on.

VM5-320HU series dimensions and installation

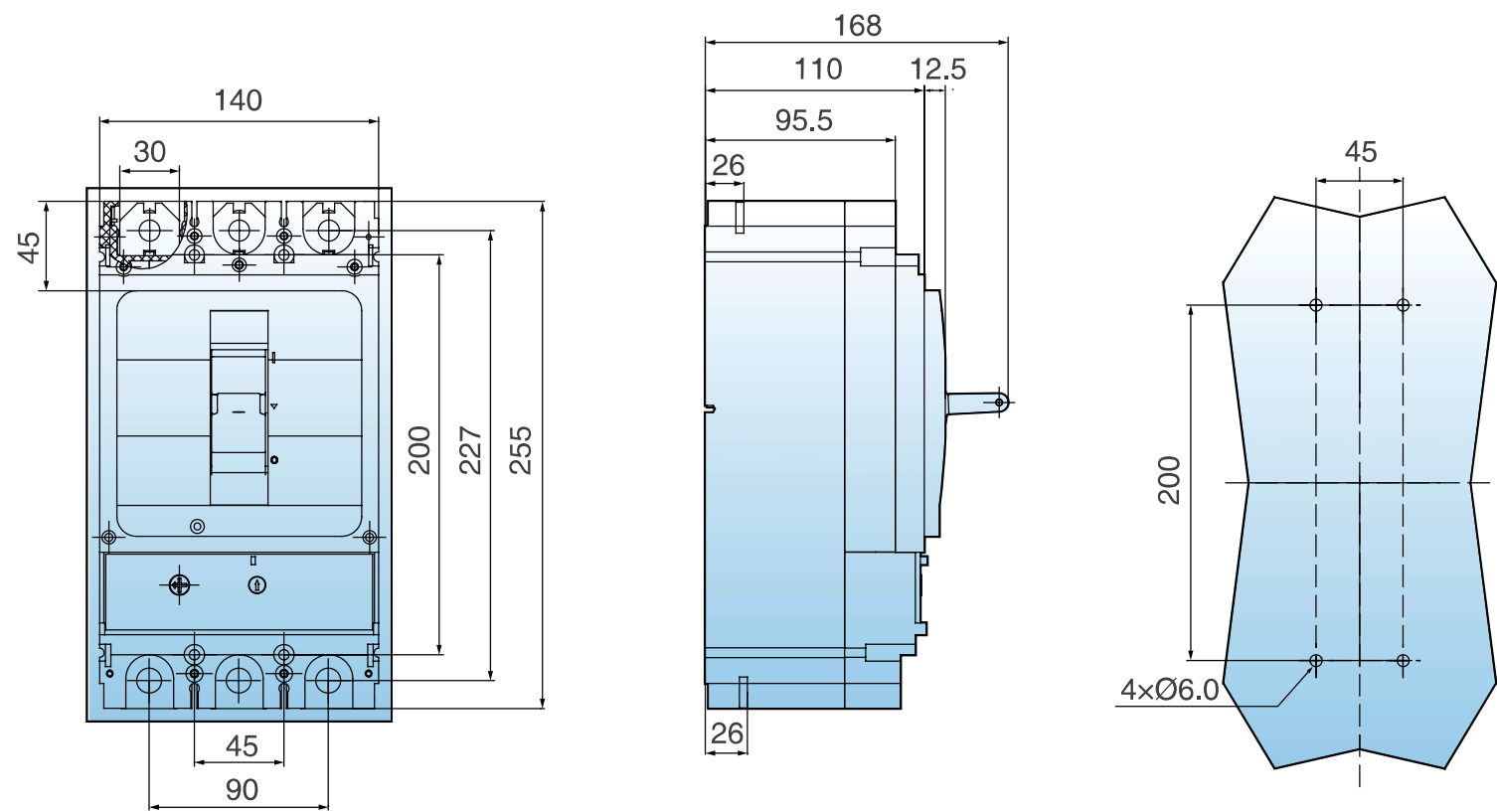


For toggling handle

VM5-320HU series dimensions with terminal cover

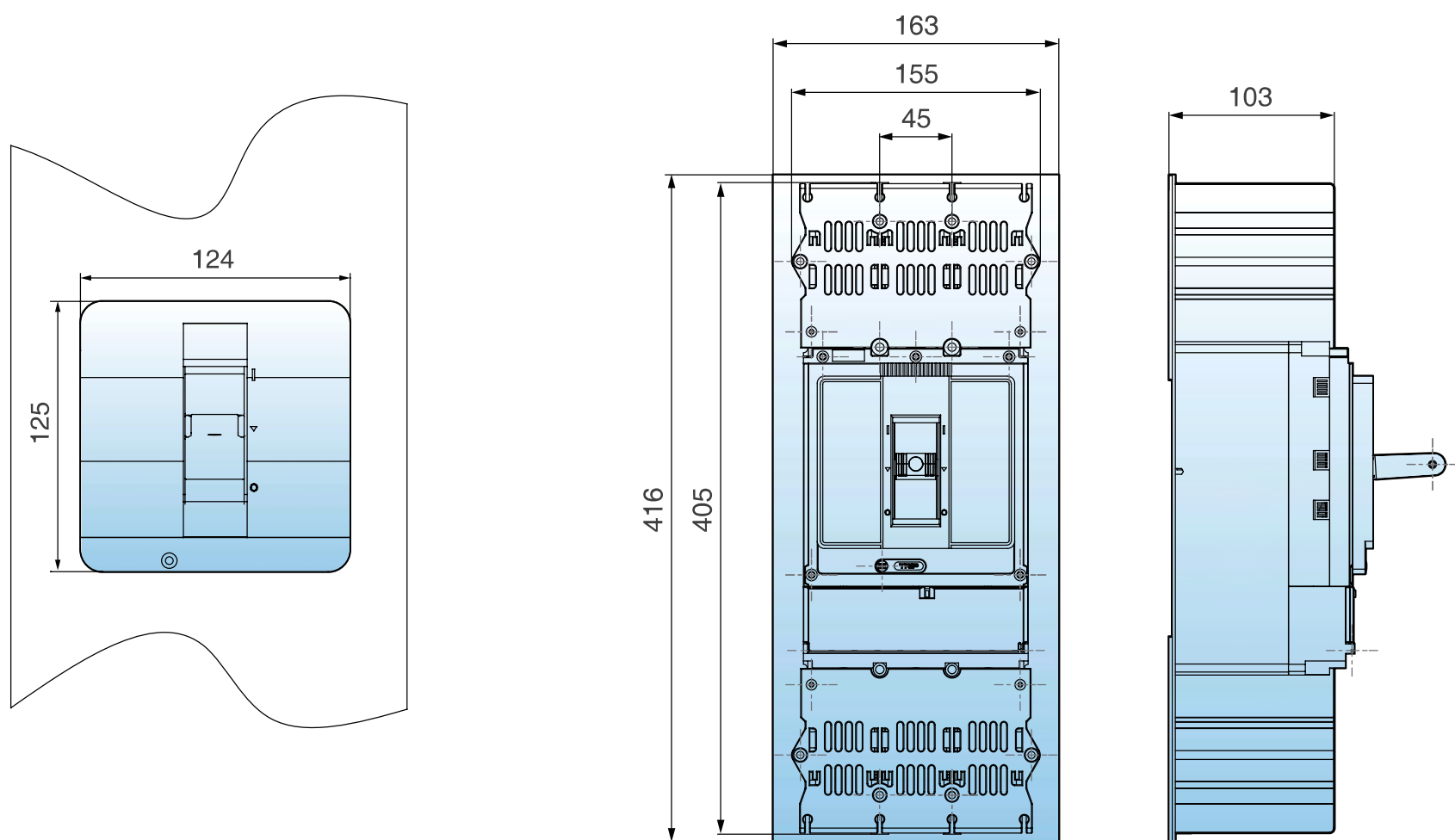


VM5-630HU series dimensions and installation



For toggling handle

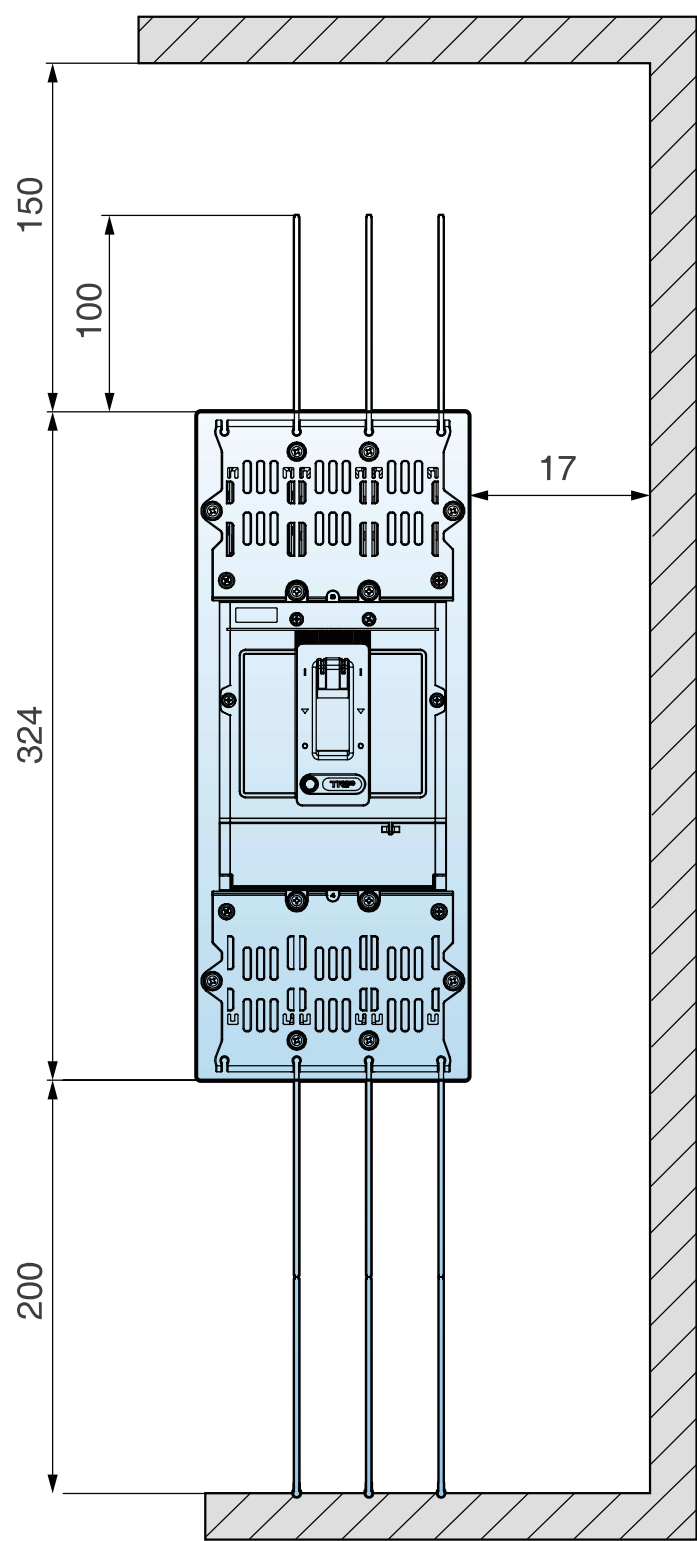
VM5-630HU series dimensions with terminal cover



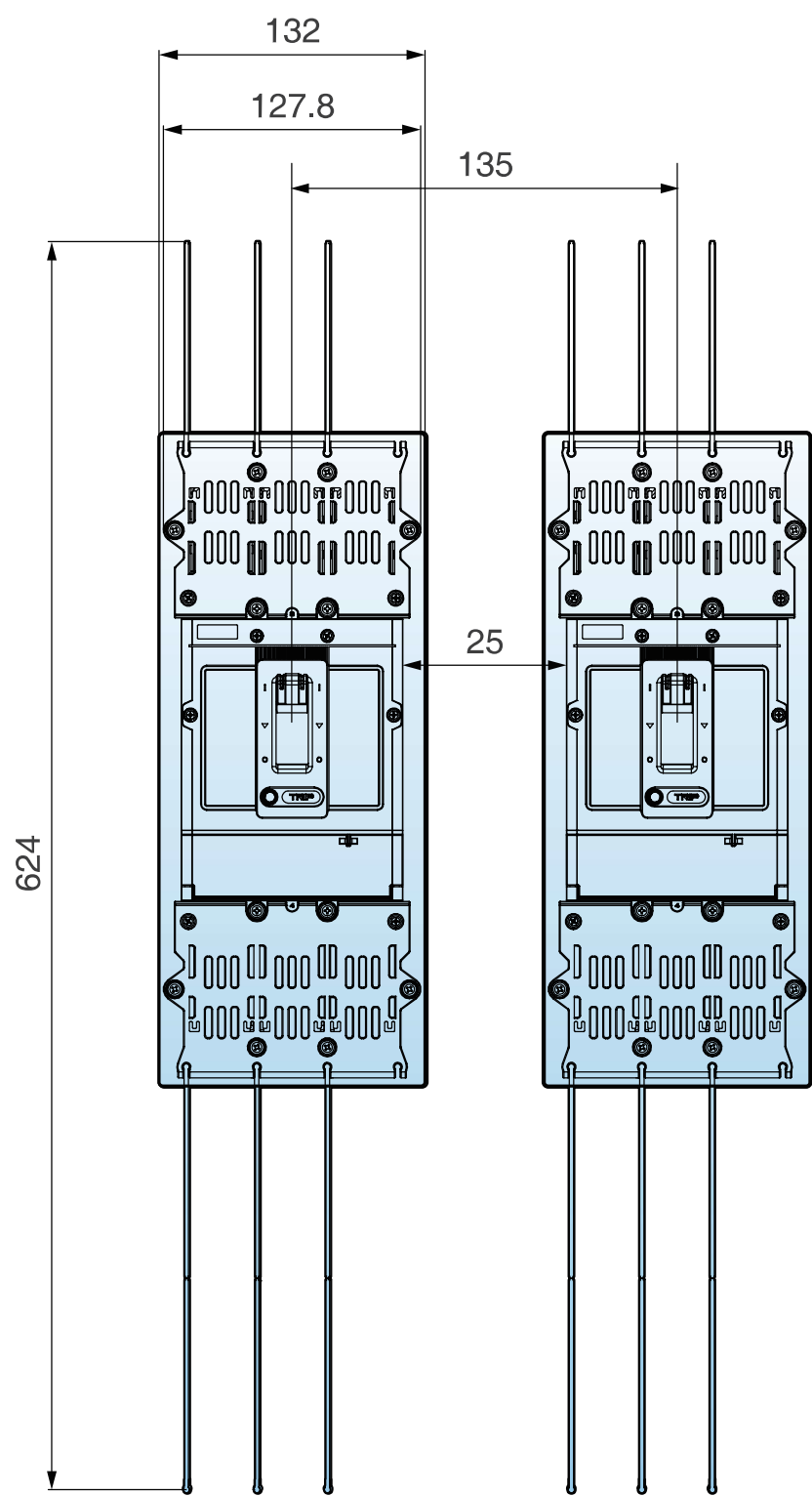
Safty distance

VM5-320HU

Safty distance

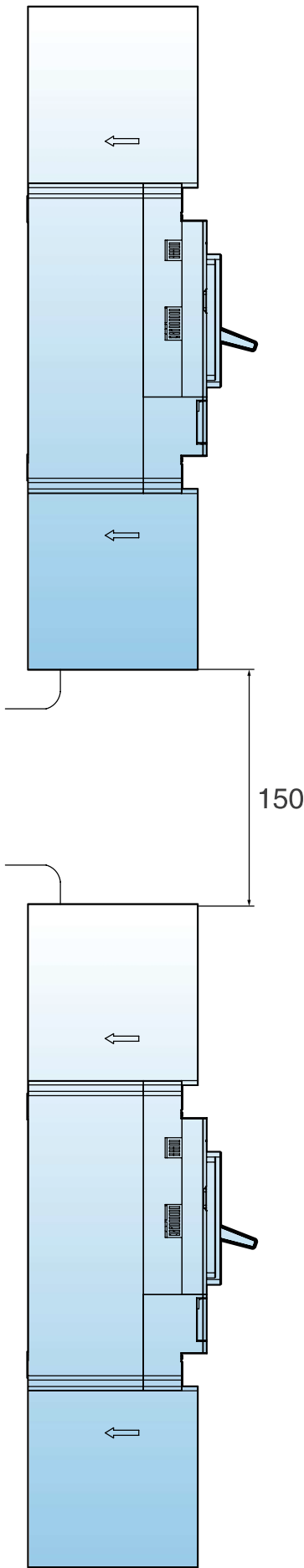


Minimum distance between two adjacent circuit breakers

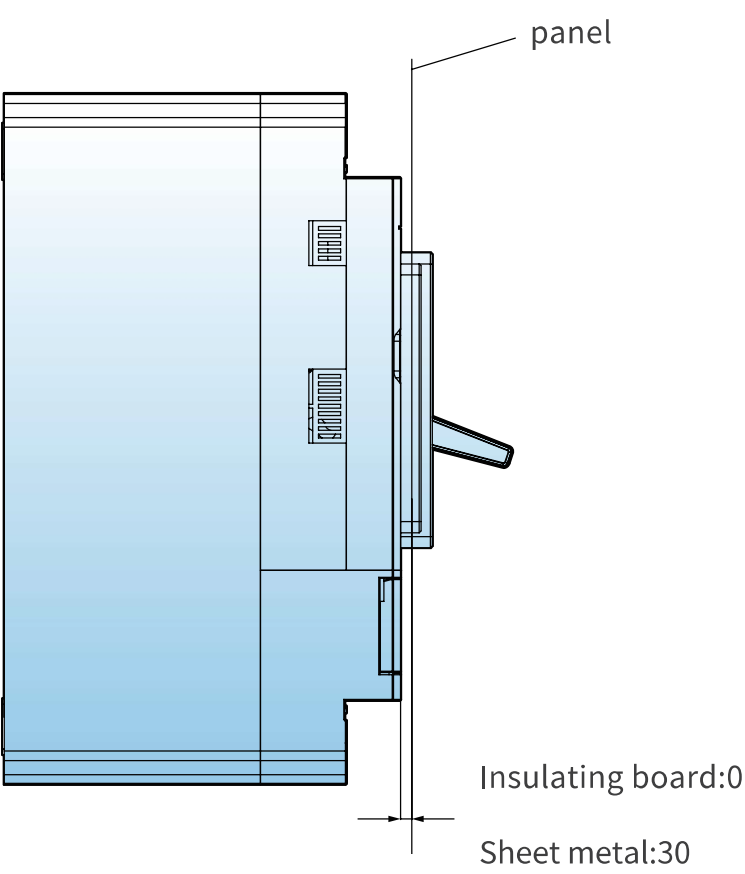


Note: There are 6 terminal covers as standard, the top is short and the bottom is long, When the number of circuit breakers installed side by side is ≥ 2 , please keep the installation position of the interphase clapboard of the side phase consistent (all installed on phase A side or phase C side), 1 long and 1 short (interphase separator) should be added for the side phase of the circuit breaker close to the metal cabinet.

Short terminal shield rear connected



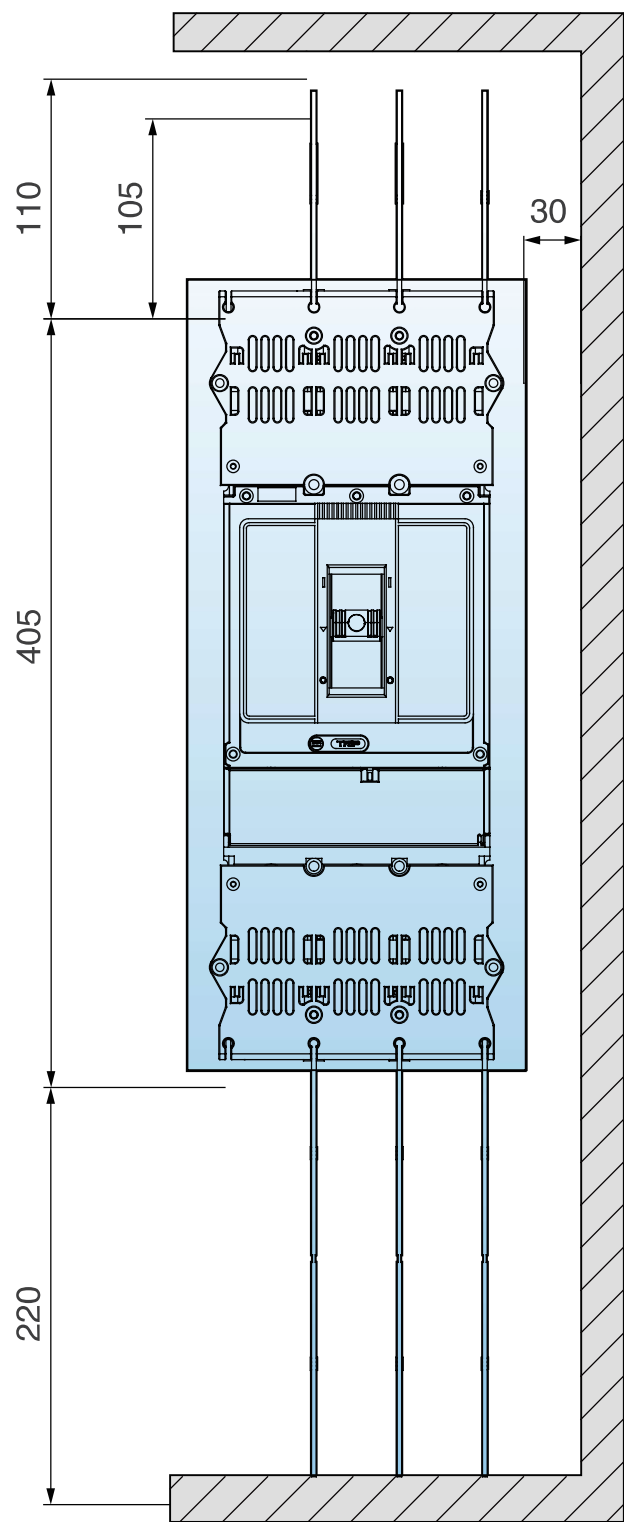
Minimum distance between circuit breaker and front panels



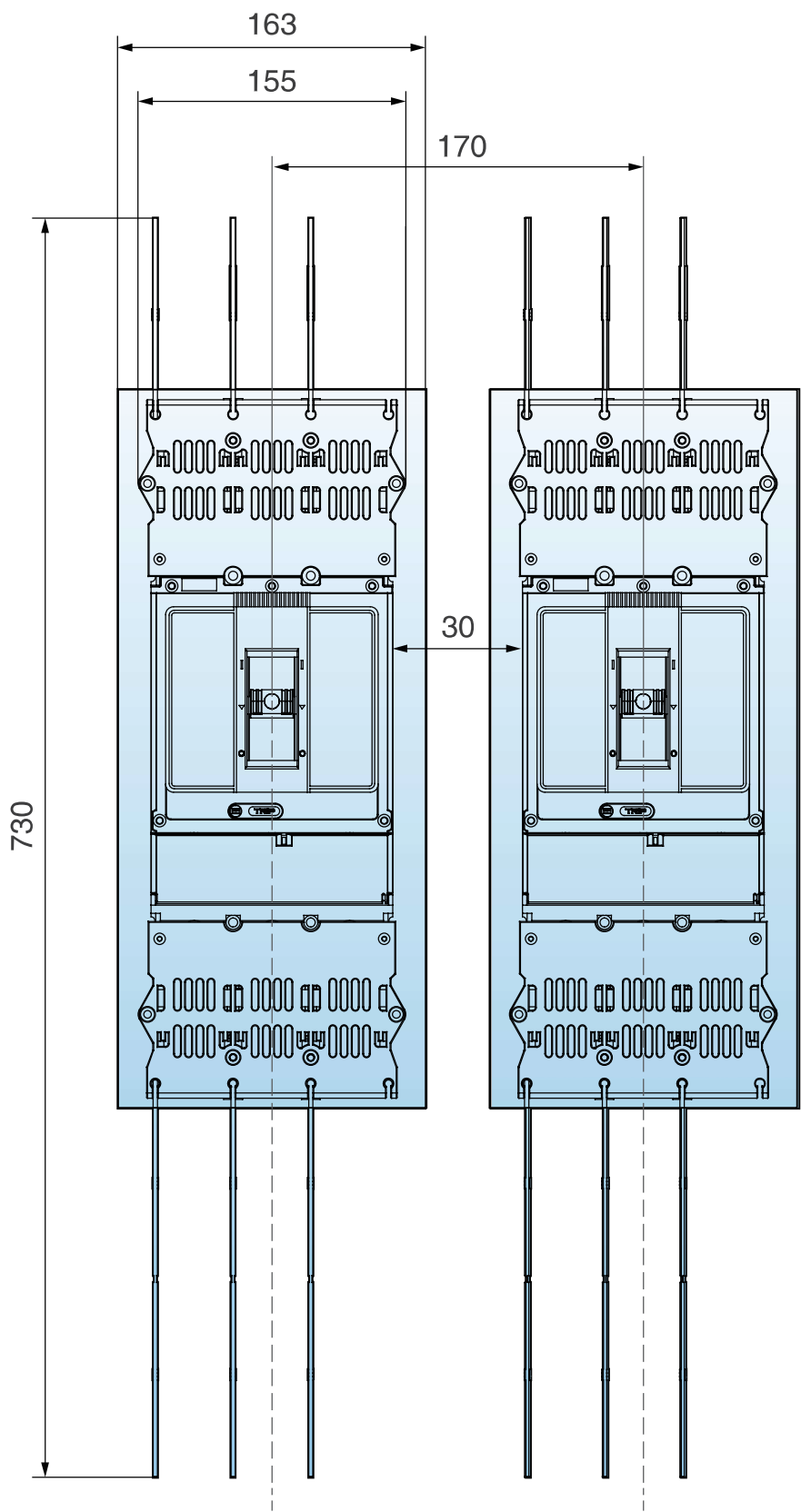
Safty distance

VM5-630HU

Safty distance

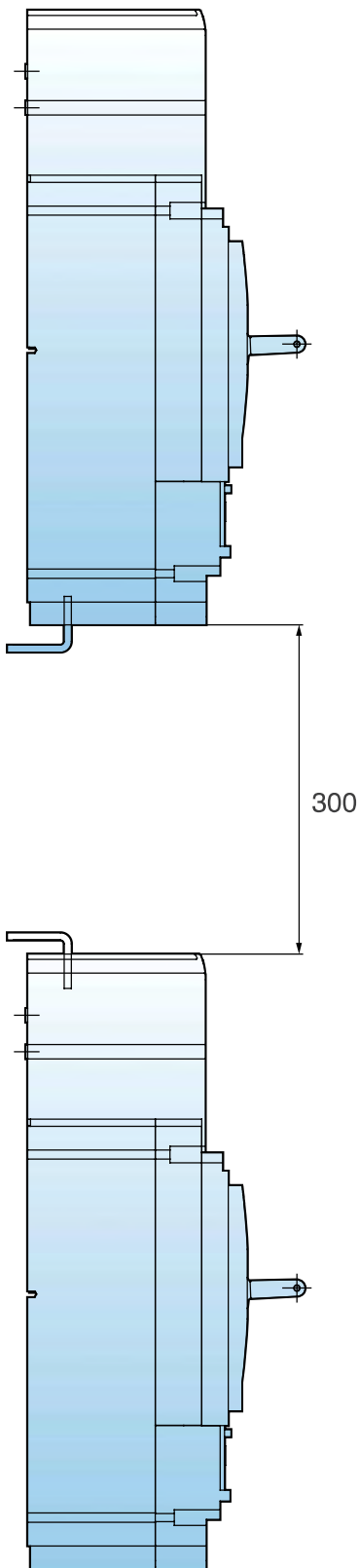


Minimum distance between two adjacent circuit breakers

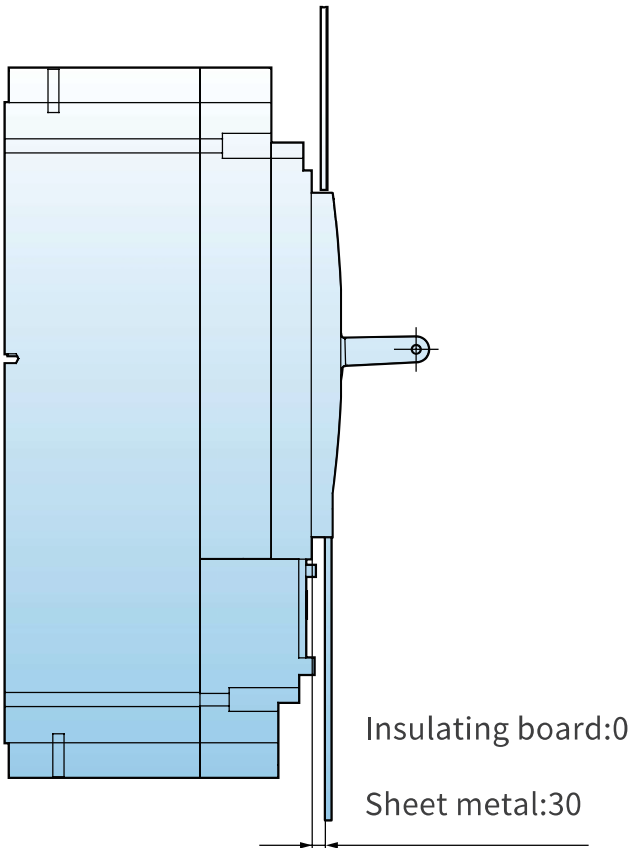


Note: There are 6 terminal covers as standard, the top is short and the bottom is long, When the number of circuit breakers installed side by side is ≥ 2 , please keep the installation position of the interphase clapboard of the side phase consistent (all installed on phase A side or phase C side), 1 long and 1 short (interphase separator) should be added for the side phase of the circuit breaker close to the metal cabinet.

Short terminal shield rear connected



Minimum distance between circuit breaker and front panels



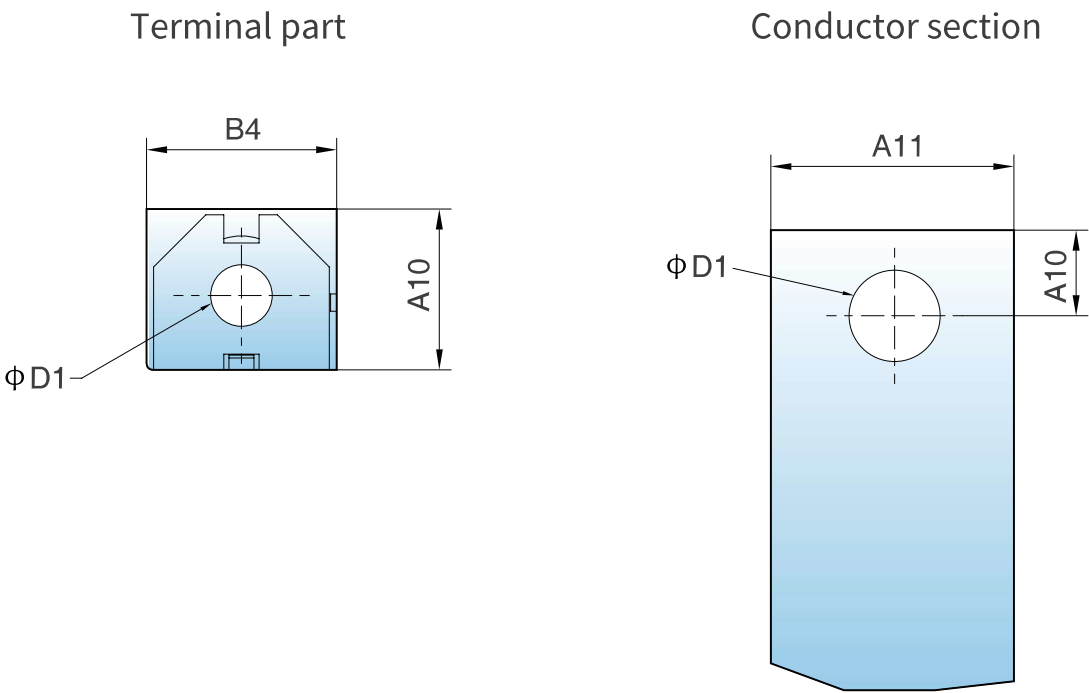
Cross-sectional area of wire

Cross-sectional areas of connection wiring with different rated currents

Rated current (A)	10	16 20	25	32	40 50	63	80	100	125 140	160	180 200 225	250	315 350	400
Rated current (mm ²)	1.5	2.5	4	6	10	16	25	35	50	70	95	120	185	240

Rated current (A)	Cable		Copper bar	
	Sectional area (mm ²)	Quantity	Size	Quantity
500	150	2	30×5	2
630	185	2	40×5	2

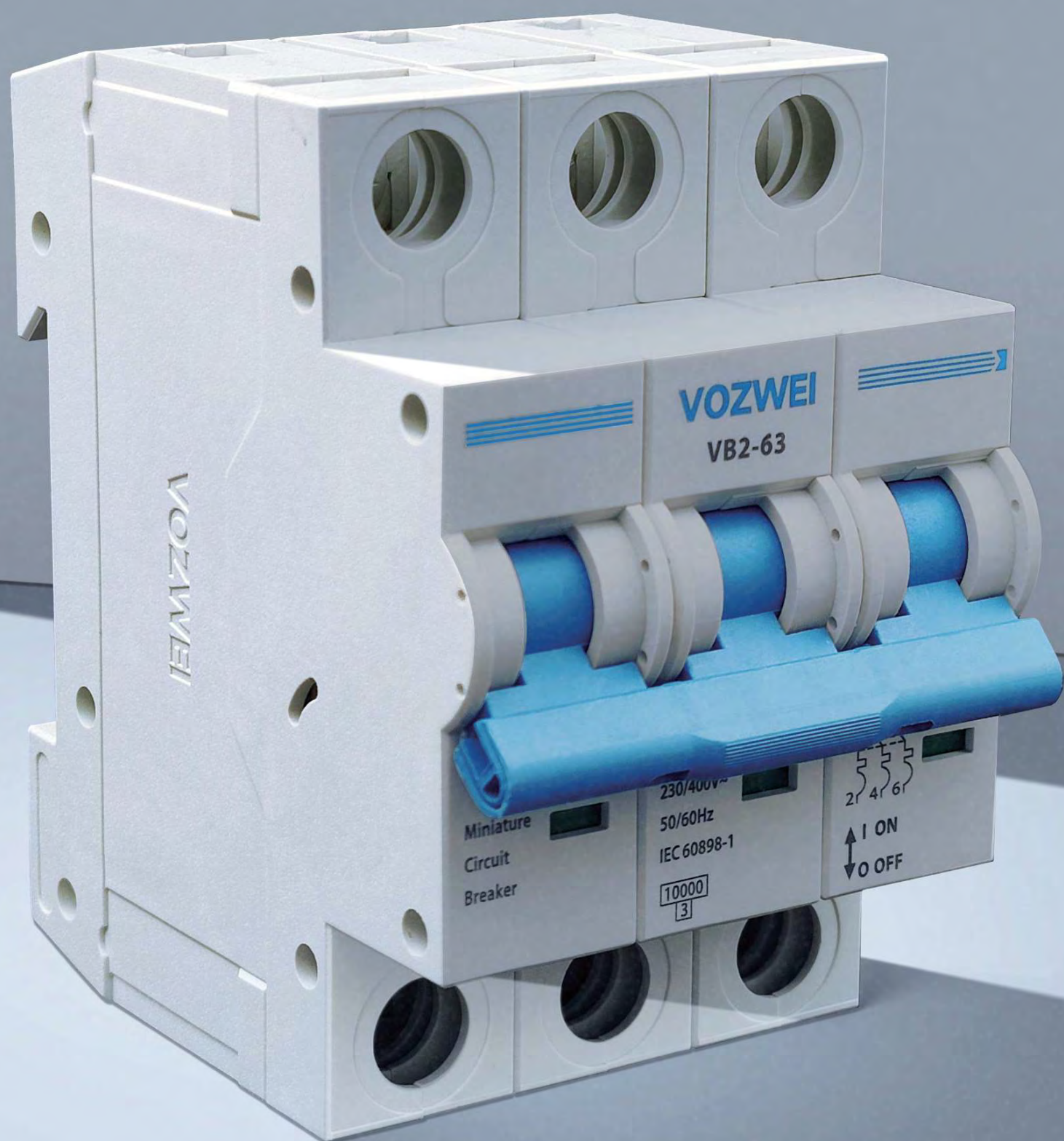
Fixed connection



Model	B4	A10	A11	A12	ΦD1
VM5-320	24	20.5	22	9.5	8.5
VM5-630	32	30	30	15	11

VB2

Miniature Circuit Breaker





- Quick closing ensures reliable operation and extends the lifetime of circuit breakers
- The temperature-rise of the product itself is lower
- Rated impulse withstand voltage up to 6.0kV
- Tunnel type wiring structure and busbar type wiring structure, reliable and fast wiring
- Modular and modular structure, can be combined arbitrarily

Ambient conditions

Operating ambient temperature/storage temperature

- Operating environment temperature: -40 °C~+70 °C, with an average value of no more than +35 °C within 24 hours
- Storage temperature: -40 °C~+80 °C

Altitude conditions

- Altitude of installation site $\leq 2000\text{m}$ (Over 2000 meters need capacity reduction for using)

Damp heat resistance

- Category 2 (at a temperature of 55 °C and a relative humidity of 95%)

Pollution level

- Level 2

Protection level

- Product protection level: IP20

Installation Category

- Class II (load) and Class III (distribution and control)

Installation method

- Installed on TH35mm $\times$ 7.5 (EN50022) Standard Guide

Installation Direction

- Vertical installation of the product, with an inclination of $\leq \pm 5^\circ$ between the installation surface and the vertical surface
- Horizontal installation

Environmental requirements

- The product meets RoHS standards

Technical parameters

Series		VB2-63
		
Rated Operational Voltage (U _e)		AC 230/400V, DC 48/60V (1P/2P)
Rated Current		1A, 2A, 3A, 4A, 6A, 8A, 10A, 13A, 16A, 20A, 25A, 32A, 35A, 40A, 50A, 63A
Tripping Characteristic		B Curve 3I _n ~5I _n , C Curve 5I _n ~10I _n , D Curve 10I _n ~14I _n
Number of Poles		1P, 2P, 3P, 4P
Rated Insulation Voltage (U _i)		690 V
Rated Impulse Withstand Voltage (U _{imp})		6.0 kV
Rated Short-Circuit Capacity (I _{cn})		10.0kA (Type B/C, I _n =1-63A), 6.0KA (Type D, I _n =1-63A)
Running Short-Circuit Capacity (I _{cs})		10.0kA (Type B/C, I _n =1-40A), 7.5kA (Type B/C, I _n =50A,63A), 6.0kA (Type D, I _n =1-63A)
Rated Frequency		50/60 Hz
Operating performance	Mechanical Endurance	15000 Cycle
	Electrical Endurance	10000 Cycle
Standard		IEC 60898-1
Connection		Tunnel type, Bus-bar
Connecting Capacity		1.0 mm ² ...25 mm ²
Tightening Torque		2.5 N·m

VB2			—	63	C	63	/	1
1				2	3	4		5
SN	Name		Specification, type code					
1	Design code		VB2: Design code					
2	Frame rating		63: 63A					
3	Tripping characteristic		B : 3I _n ~ 5I _n C : 5I _n ~ 10I _n D : 10I _n ~ 14I _n					
4	Rated current		1A, 2A, 3A, 4A, 6A, 8A, 10A, 13A, 16A, 20A, 25A, 32A, 35A, 40A, 50A, 63A					
5	Number of poles		1P, 2P, 3P, 4P					

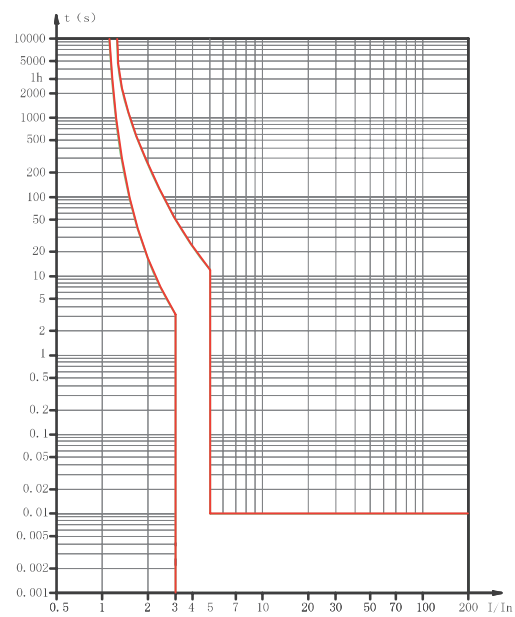
Temperature and Breaking Capacity Coefficient

Ambient °C	-40 °C	-30 °C	-20 °C	-10 °C	0 °C	10 °C	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C
Coefficient	133.97%	125.18%	119.90%	116.95%	113.05%	109.52%	105.62%	100%	95.24%	91.33%	88.38%	83.62%

Breaking Capacity Coefficient and High Altitude Derating Tables

Altitude	Rated current	Rated voltage	Rated frequency voltage tolerance	Breaking Capacity	Breaking Capacity and Electrical life
2 km	1.00I _n	U _e	1.00	1.00	1.00
3 km	0.96I _n	U _e	0.92	0.88	0.88
4 km	0.92I _n	U _e	0.83	0.82	0.82
5 km	0.87I _n	U _e	0.77	0.70	0.70

B curve

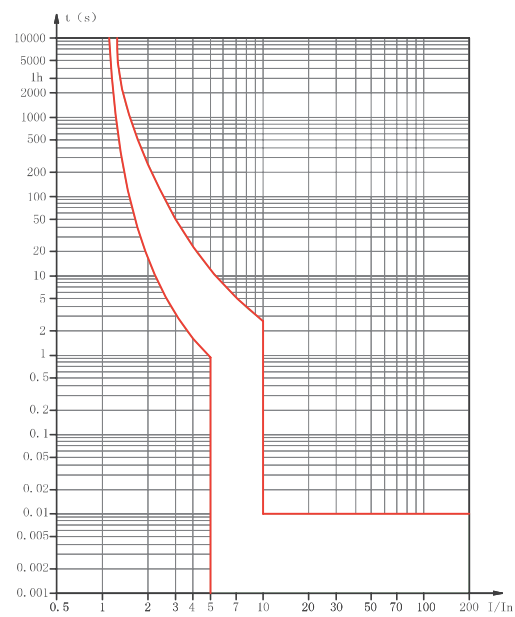


Protection against loads with small short circuit currents (e.g., non-inductive or micro-inductive circuits)

Trip characteristics:
The instantaneous trip range is $3I_n \sim 5I_n$

Base temperature:
 $+30^{\circ}\text{C}$

C curve

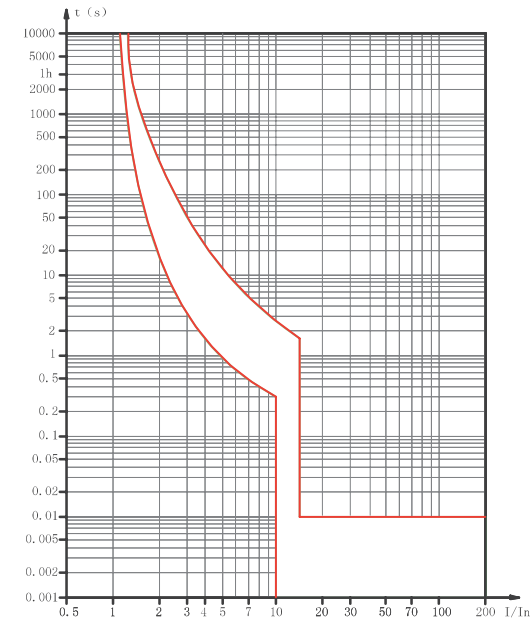


Protection of conventional loads and distribution circuits

Trip characteristics:
The instantaneous trip range is $5I_n \sim 10I_n$

Base temperature:
 $+30^{\circ}\text{C}$

D curve

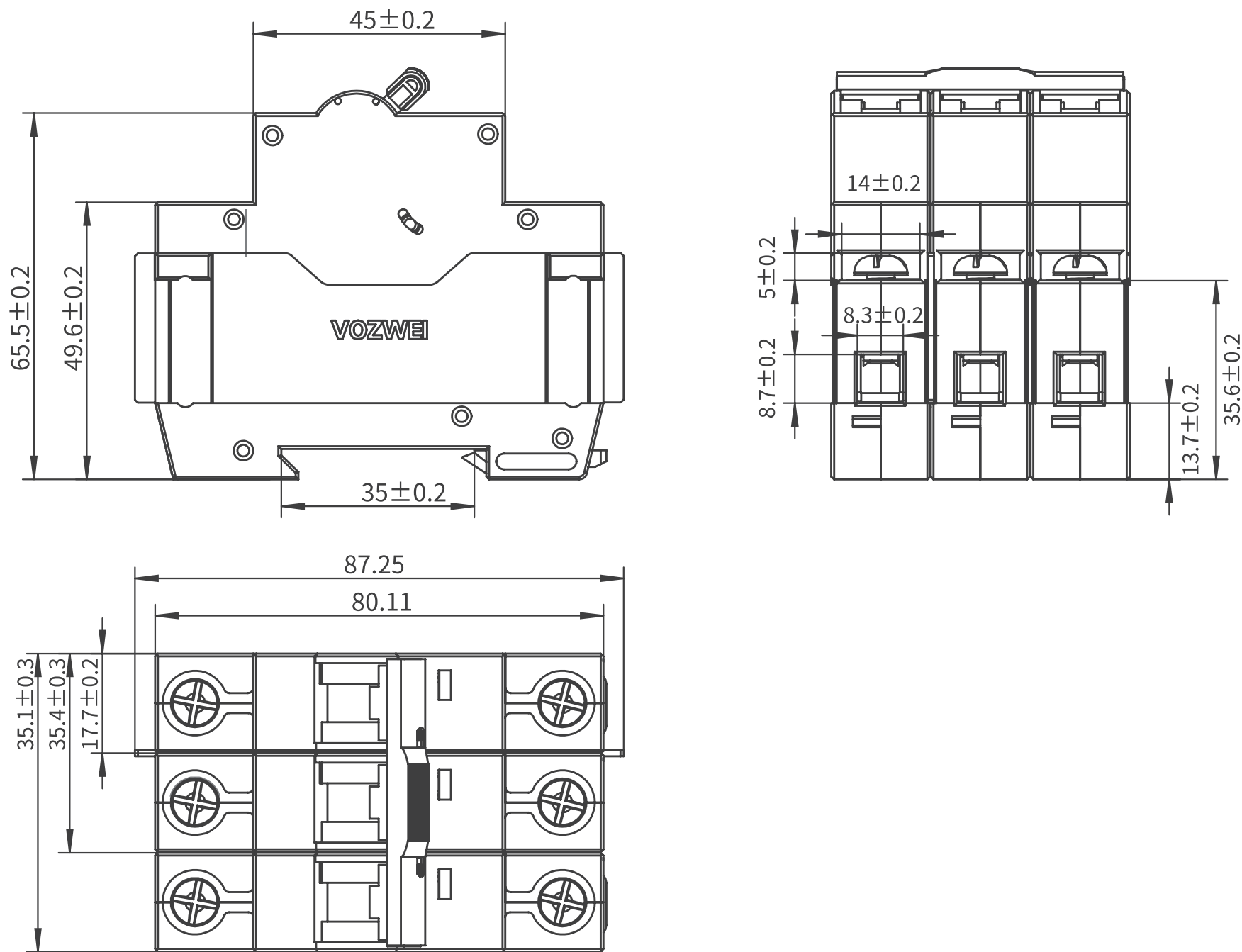


Protection of impulse loads with large starting current (e.g., motors, transformers, etc.)

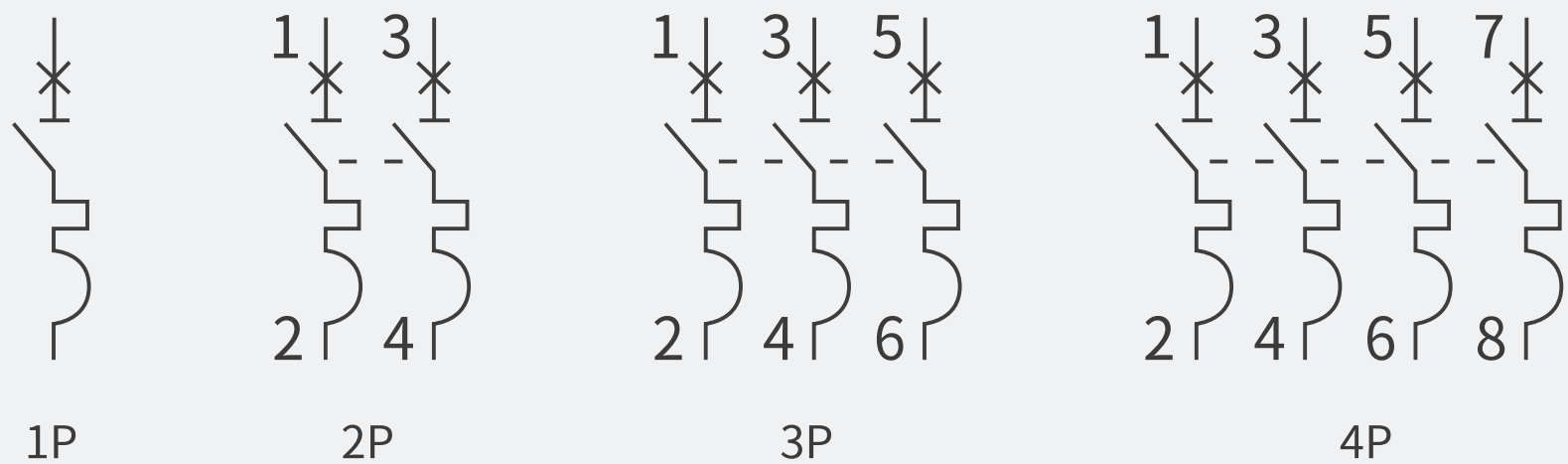
Trip characteristics:
The instantaneous trip range is $10I_n \sim 14I_n$

Base temperature:
 $+30^{\circ}\text{C}$

Overall and Mounting Dimensioned



Wiring Diagram



Technical parameters

Series		VB2T-63
		
Rated Operational Voltage (U _e)		AC 230/400V (1P), AC 400/415V (2P, 3P, 4P), DC 60/80V (1P), DC 80/125V (2P)
Rated Current		1A, 2A, 3A, 4A, 6A, 8A, 10A, 13A, 16A, 20A, 25A, 32A, 35A, 40A, 50A, 63A
Tripping Characteristic		B Curve 4I _n ±20%, C Curve 8I _n ±20%, D Curve 12I _n ±20%, K Curve 10I _n ±20%, Z Curve 2.5I _n ±20%
Number of Poles		1P, 2P, 3P, 4P
Rated Insulation Voltage (U _i)		690 V
Rated Impulse Withstand Voltage (U _{imp})		6.0 kV
Rated Short-Circuit Capacity (I _{cu})		10.0kA
Running Short-Circuit Capacity (I _{cs})		10.0kA
Rated Frequency		50/60 Hz
Operating performance	Mechanical Endurance	15000 Cycle
	Electrical Endurance	10000 Cycle
Standard		IEC 60947-2
Connection		Tunnel type, Bus-bar
Connecting Capacity		1.0 mm ² ...25 mm ²
Tightening Torque		2.5 N·m

VB2T			—	63	C	63	/	1
1				2	3	4		5
SN	Name		Specification, type code					
1	Design code		VB2T: Design code					
2	Frame rating		63: 63A					
3	Tripping characteristic		B, C, D, K, Z					
4	Rated current		1A, 2A, 3A, 4A, 6A, 8A, 10A, 13A, 16A, 20A, 25A, 32A, 35A, 40A, 50A, 63A					
5	Number of poles		1P, 2P, 3P, 4P					

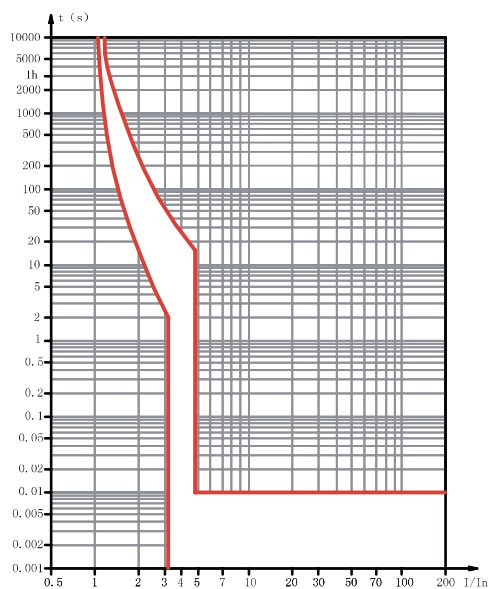
Temperature and Breaking Capacity Coefficient

Ambient °C	-40 °C	-30 °C	-20 °C	-10 °C	0 °C	10 °C	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C
Coefficient	133.97%	125.18%	119.90%	116.95%	113.05%	109.52%	105.62%	100%	95.24%	91.33%	88.38%	83.62%

Breaking Capacity Coefficient and High Altitude Derating Tables

Altitude	Rated current	Rated voltage	Rated frequency voltage tolerance	Breaking Capacity	Breaking Capacity and Electrical life
2 km	1.00In	Ue	1.00	1.00	1.00
3 km	0.96In	Ue	0.92	0.88	0.88
4 km	0.92In	Ue	0.83	0.82	0.82
5 km	0.87In	Ue	0.77	0.70	0.70

B curve

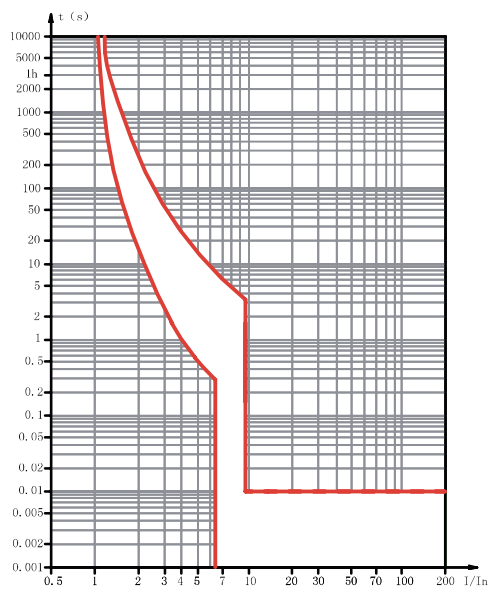


Protection against loads with small short circuit currents (e.g., non-inductive or micro-inductive circuits)

Trip characteristics:
The instantaneous trip range is $4I_n \pm 20\%$

Base temperature:
 $+30^{\circ}\text{C}$

C curve

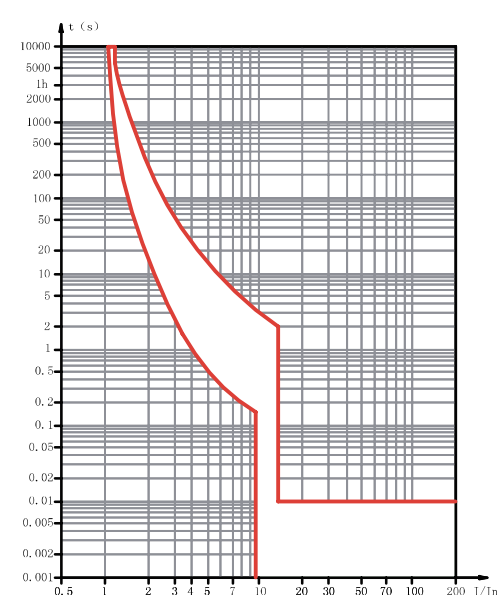


Protection of conventional loads and distribution circuits

Trip characteristics:
The instantaneous trip range is $8I_n \pm 20\%$

Base temperature:
 $+30^{\circ}\text{C}$

D curve

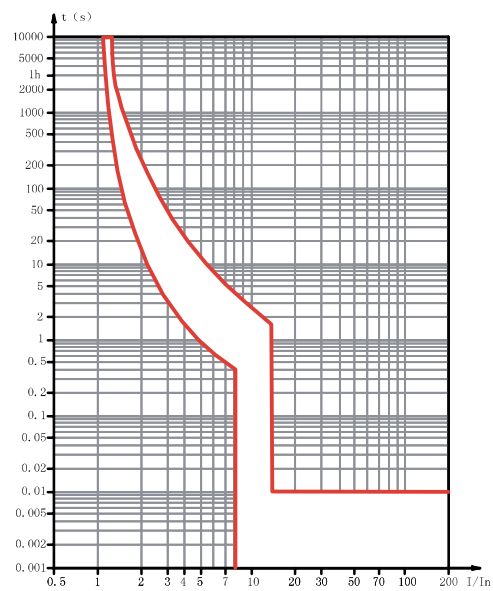


Protection of impulse loads with large starting current (e.g., motors, transformers, etc.)

Trip characteristics:
The instantaneous trip range is $12I_n \pm 20\%$

Base temperature:
 $+30^{\circ}\text{C}$

K curve

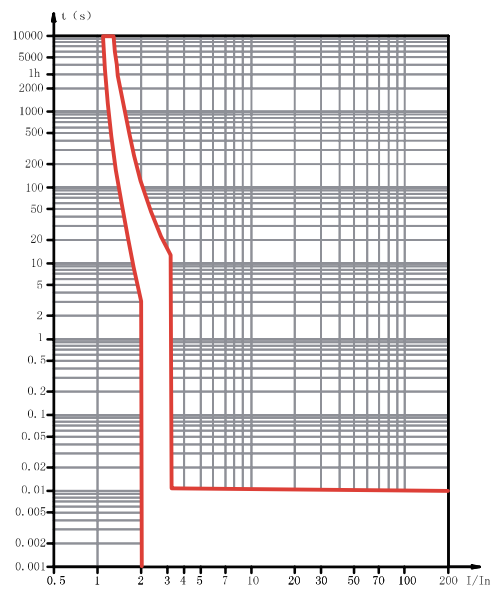


Protection of impulse loads with large starting current

Trip characteristics:
The instantaneous trip range is $10I_n \pm 20\%$

Base temperature:
 $+30^{\circ}\text{C}$

Z curve

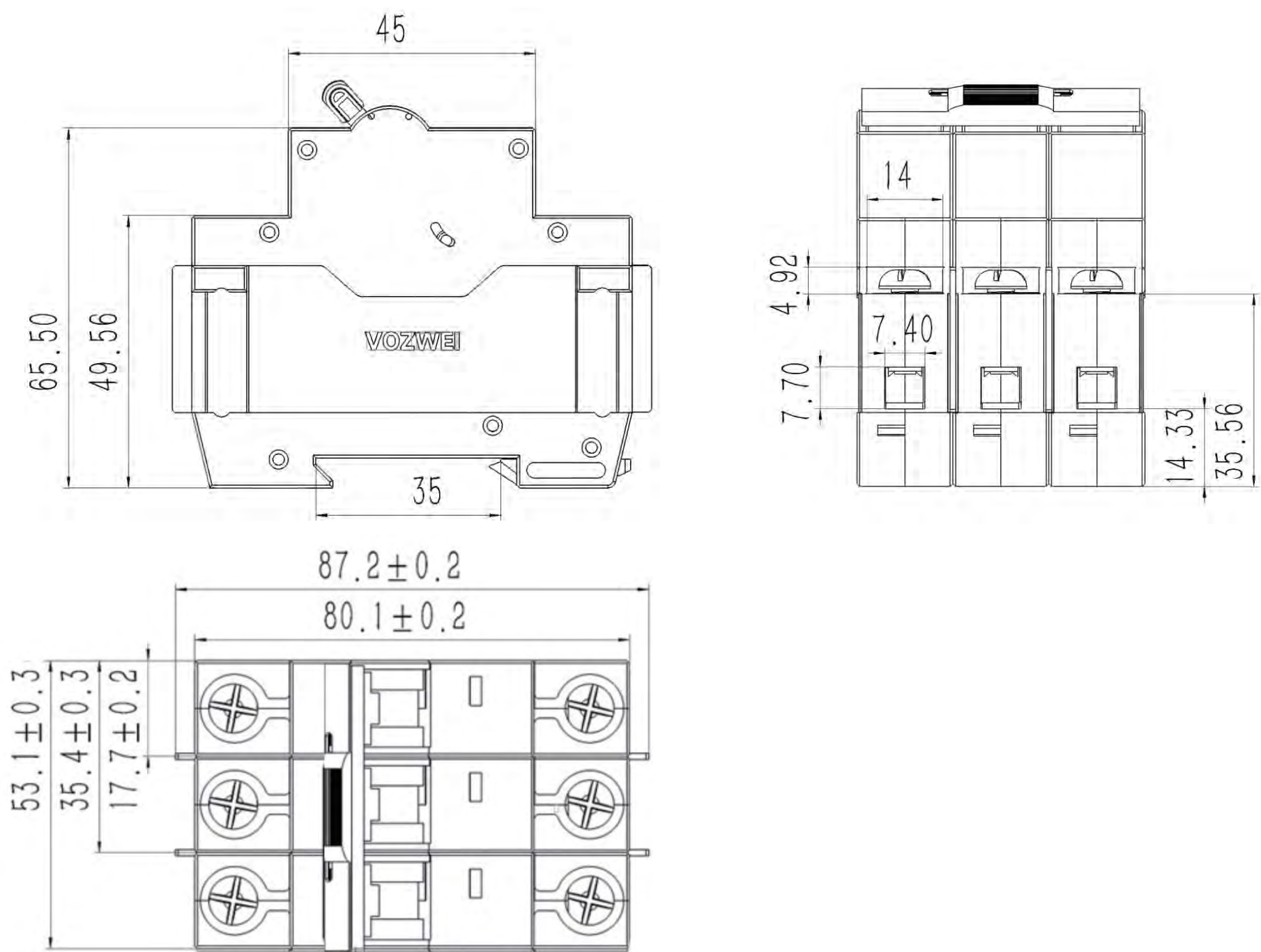


Protecting loads or distribution circuits that require more sensitive action

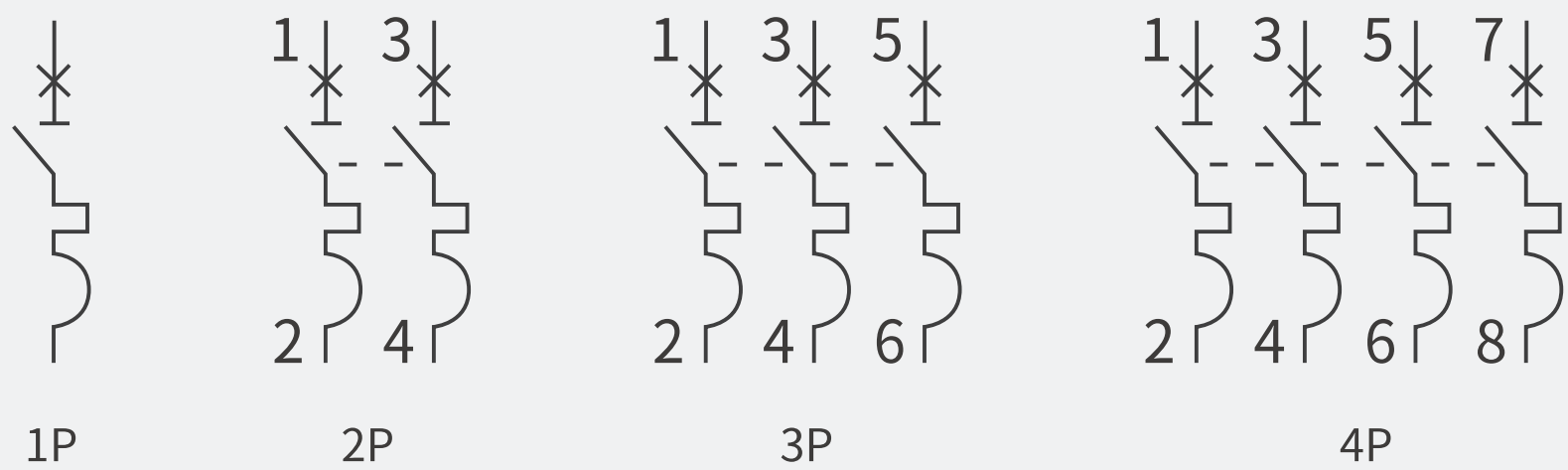
Trip characteristics:
The instantaneous trip range is $2.5I_n \pm 20\%$

Base temperature:
 $+30^{\circ}\text{C}$

Overall and Mounting Dimensioned



Wiring Diagram

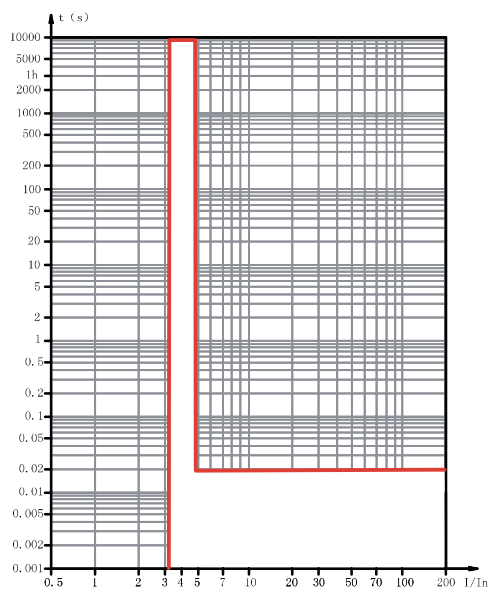


Technical parameters

Series		VB2TS-63 (Magnetic protection only)	
			
Rated Operational Voltage (U _e)		AC 230/400V (1P), AC 400/415V (2P, 3P, 4P), DC 60/80V (1P), DC 80/125V (2P)	
Rated Current		1A, 2A, 3A, 4A, 6A, 8A, 10A, 13A, 16A, 20A, 25A, 32A, 35A, 40A, 50A, 63A	
Tripping Characteristic		B Curve 4I _n ±20%, C Curve 8I _n ±20%, D Curve 12I _n ±20%	
Number of Poles		1P, 2P, 3P, 4P	
Rated Insulation Voltage (U _i)		690 V	
Rated Impulse Withstand Voltage (U _{imp})		6.0 kV	
Rated Short-Circuit Capacity (I _{cu})		10.0kA	
Running Short-Circuit Capacity (I _{cs})		10.0kA	
Rated Frequency		50/60 Hz	
Operating performance	Mechanical Endurance	15000 Cycle	
	Electrical Endurance	10000 Cycle	
Standard		IEC 60947-2	
Connection		Tunnel type, Bus-bar	
Connecting Capacity		1.0 mm ² ...25 mm ²	
Tightening Torque		2.5 N·m	

VB2T S — 63 C 63 / 1 1 2 3 4 5 6					
SN	Name		Specification, type code		
1	Design code		VB2T: Design code		
2	Function code		S: Magnetic protection only		
3	Frame rating		63: 63A		
4	Tripping characteristic		B, C, D		
5	Rated current		1A, 2A, 3A, 4A, 6A, 8A, 10A, 13A, 16A, 20A, 25A, 32A, 35A, 40A, 50A, 63A		
6	Number of poles		1P, 2P, 3P, 4P		

B curve

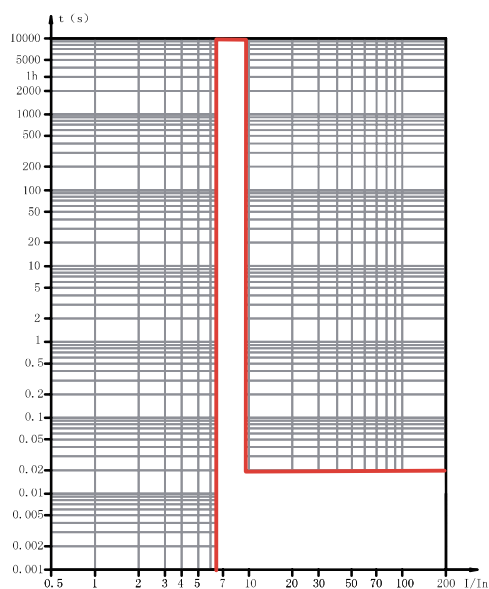


Protection against loads with small short circuit currents (e.g., non-inductive or micro-inductive circuits)

Trip characteristics:
The instantaneous trip range is $4I_n \pm 20\%$

Base temperature:
 $+30^{\circ}\text{C}$

C curve

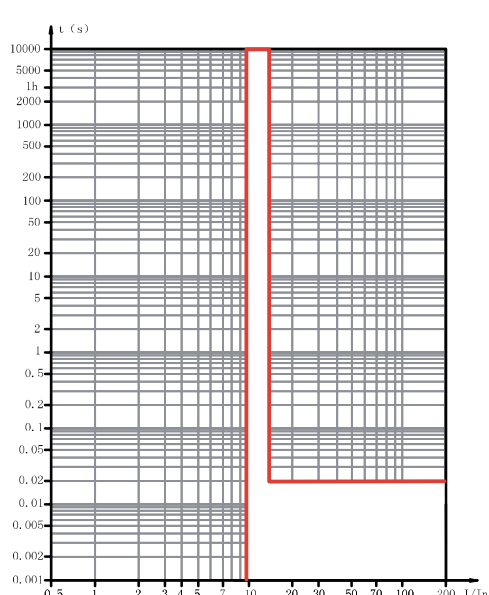


Protection of conventional loads and distribution circuits

Trip characteristics:
The instantaneous trip range is $8I_n \pm 20\%$

Base temperature:
 $+30^{\circ}\text{C}$

D curve

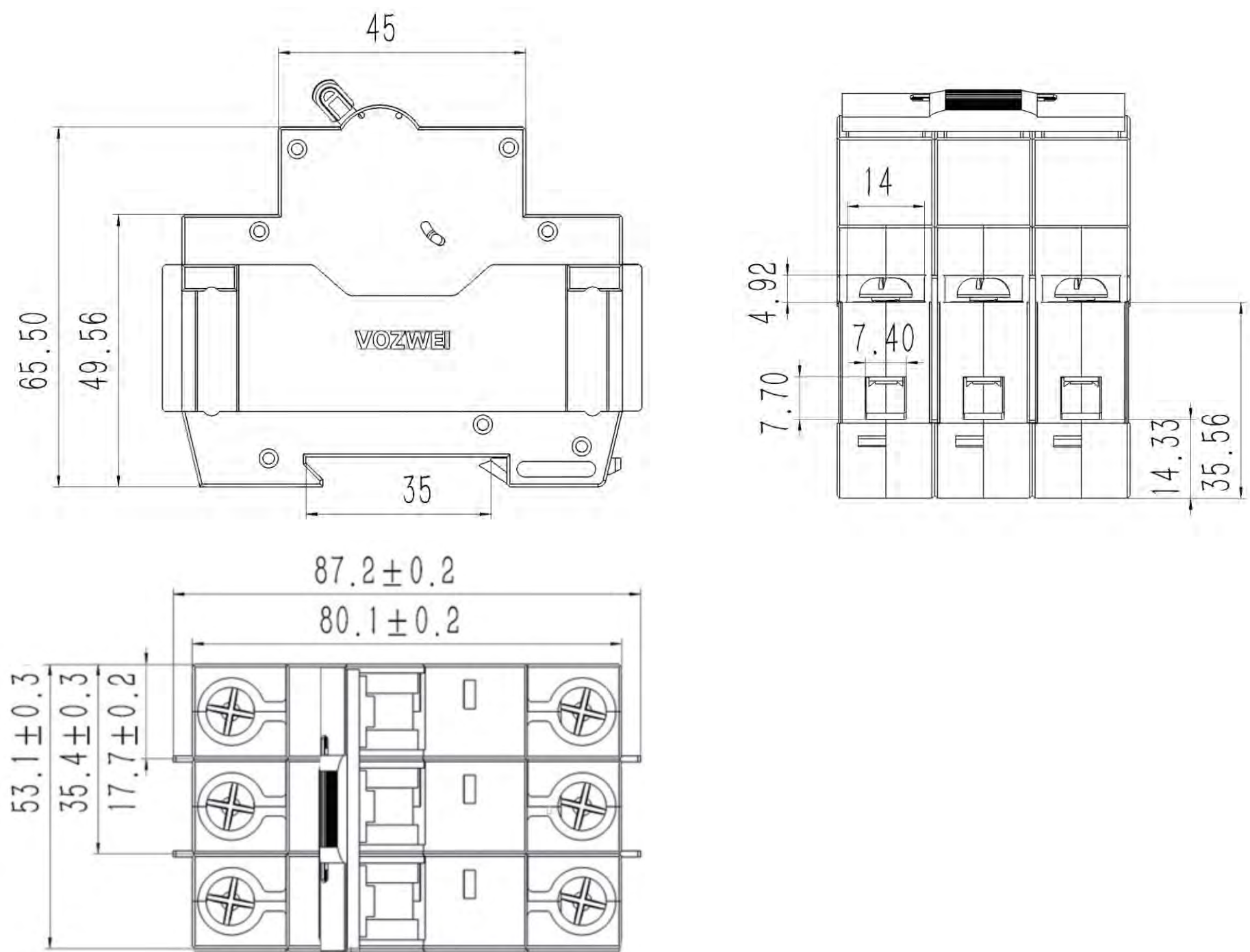


Protection of impulse loads with large starting current (e.g., motors, transformers, etc.)

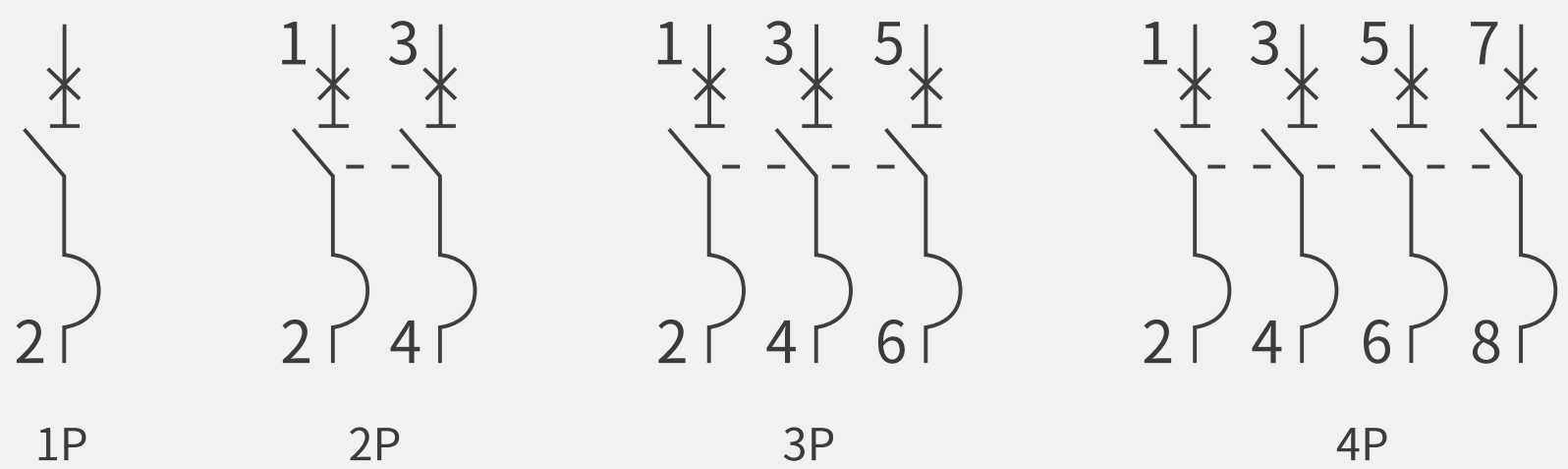
Trip characteristics:
The instantaneous trip range is $12I_n \pm 20\%$

Base temperature:
 $+30^{\circ}\text{C}$

Overall and Mounting Dimensioned



Wiring Diagram



Technical parameters

Series		VB2Z-63
		
Rated Operational Voltage (U _e)		DC 125/220/250V (1P), DC 250/440/500/690/800V (2P), DC 750/800V (3P), DC 800/1000V (4P)
Rated Current		1A, 2A, 3A, 4A, 6A, 8A, 10A, 13A, 16A, 20A, 25A, 32A, 35A, 40A, 50A, 63A
Tripping Characteristic		B Curve 6I _n ±20%, C Curve 12I _n ±20%
Number of Poles		1P, 2P, 3P, 4P
Rated Insulation Voltage (U _i)		1000 V
Rated Impulse Withstand Voltage (U _{imp})		6.0 kV
Rated Short-Circuit Capacity (I _{cu})		DC 125/220/250V (1P), DC 250/440/500V (2P):10kA DC 690/800V (2P):6kA DC 750/800V (3P), DC 800/1000V (4P):5kA
Running Short-Circuit Capacity (I _{cs})		DC 125/220/250V (1P):7.5kA DC 250/440/500V (2P):6kA DC 690V (2P):4.5kA DC 800V (2P):3kA DC 750/800V (3P):5kA DC 800/1000V (4P):5kA
Operating performance	Mechanical Endurance	15000 Cycle
	Electrical Endurance	10000 Cycle
Standard		IEC 60947-2
Connection		Tunnel type, Bus-bar
Connecting Capacity		1.0 mm ² ...25 mm ²
Tightening Torque		2.5 N·m

VB2

1

Z

2

—

63

3

C

4

63

5

/

1

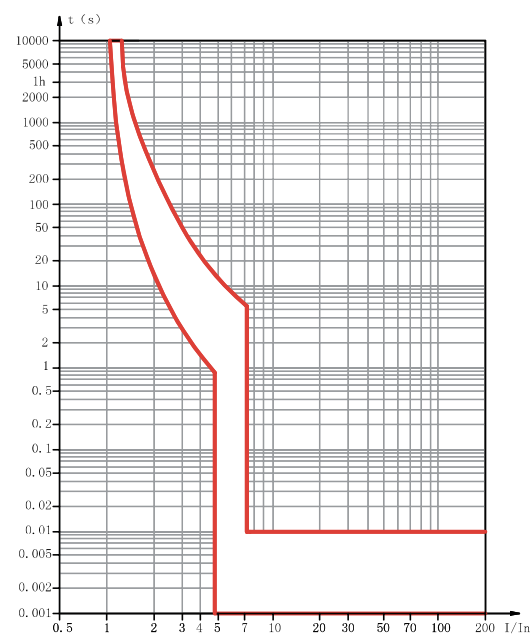
6

SN	Name	Specification, type code
1	Design code	VB2: Design code
2	Function code	Z: DC type
3	Frame rating	63: 63A
4	Tripping characteristic	B, C
5	Rated current	1A, 2A, 3A, 4A, 6A, 8A, 10A, 13A, 16A, 20A, 25A, 32A, 35A, 40A, 50A, 63A
6	Number of poles	1P, 2P, 3P, 4P

Temperature and Breaking Capacity Coefficient

Ambient °C	-40 °C	-30 °C	-20 °C	-10 °C	0 °C	10 °C	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C
Coefficient	131.59%	127.14%	123.10%	118.81%	114.40%	109.76%	105.07%	100%	94.44%	88.77%	82.63%	76.20%

B curve

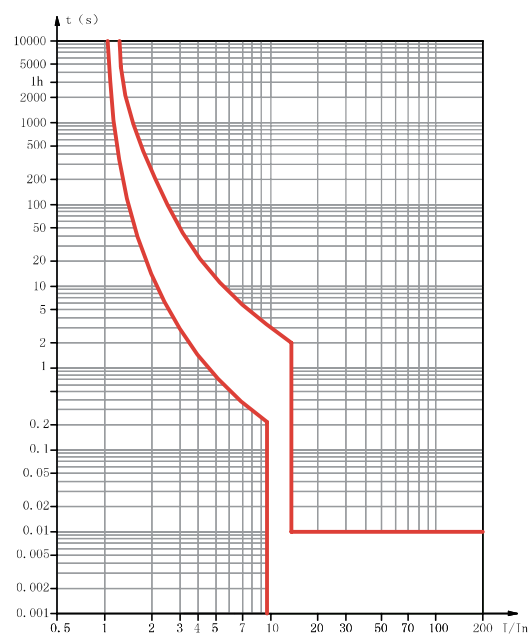


Protection against loads with small short circuit currents (e.g., non-inductive or micro-inductive circuits)

Trip characteristics:
The instantaneous trip range is $6(1\pm20\%) I_n$

Base temperature:
 $+30^{\circ}\text{C}$

C curve

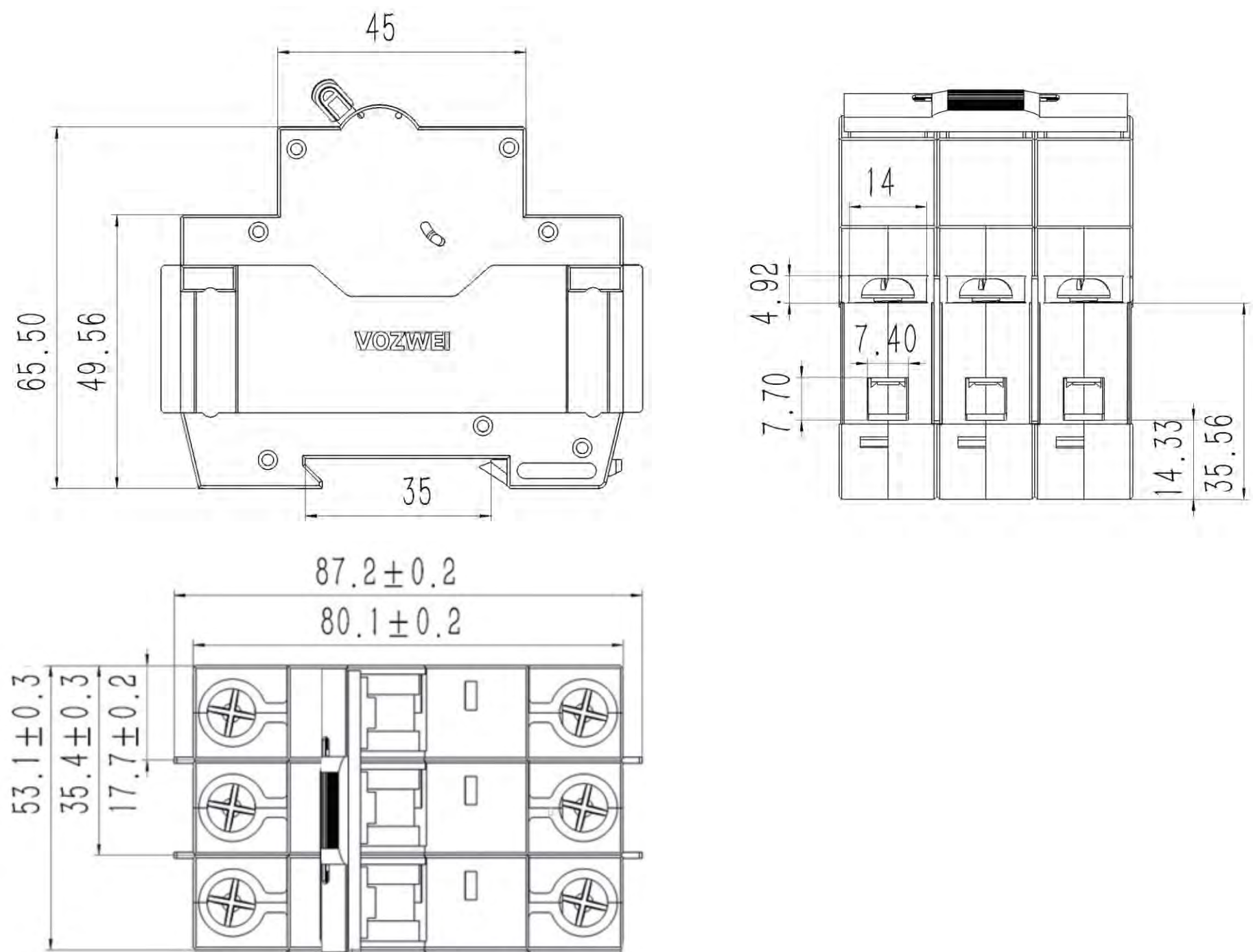


Protection of conventional loads and distribution circuits

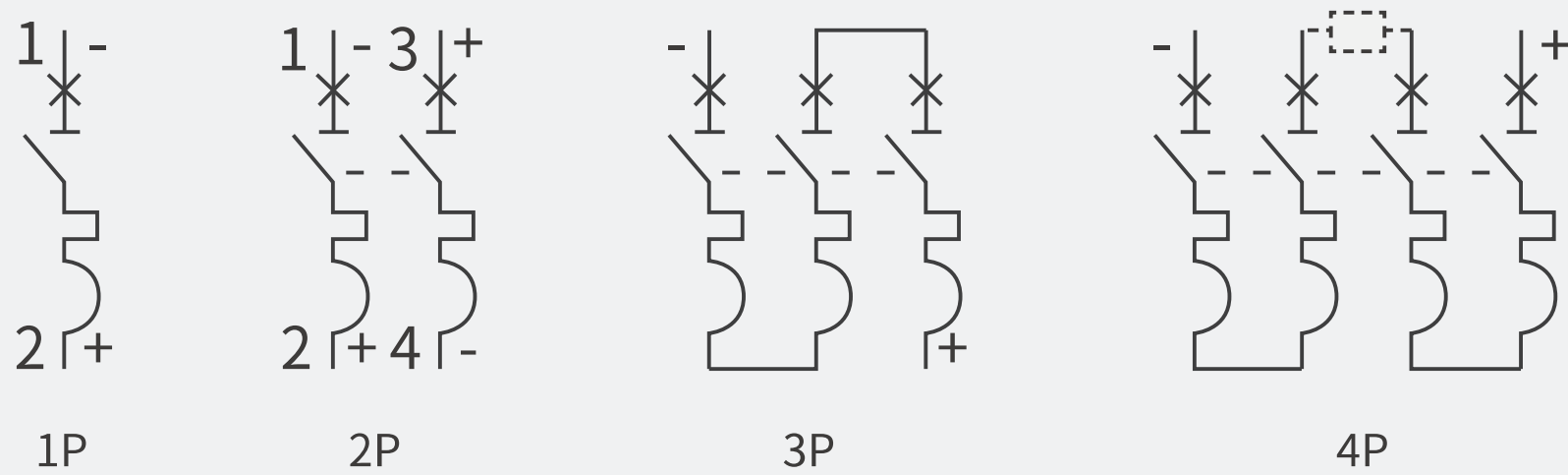
Trip characteristics:
The instantaneous trip range is $12(1\pm20\%) I_n$

Base temperature:
 $+30^{\circ}\text{C}$

Overall and Mounting Dimensioned



Wiring Diagram



Shanghai Vozwei Electric Technology Co., Ltd.

Address: Sales and Marketing: No. 166, Miyi Road,
Sijing Town, Songjiang District, Shanghai China.
Postcode: 201601
Telephone: +86-21-33555507
Url: www.vozwei.com

Email:
rfq@vozwei.com (Inquiry for price)
dis@vozwei.com (Want to be a distributor)
support@vozwei.com (Get technical support)
info@vozwei.com (Others information)