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

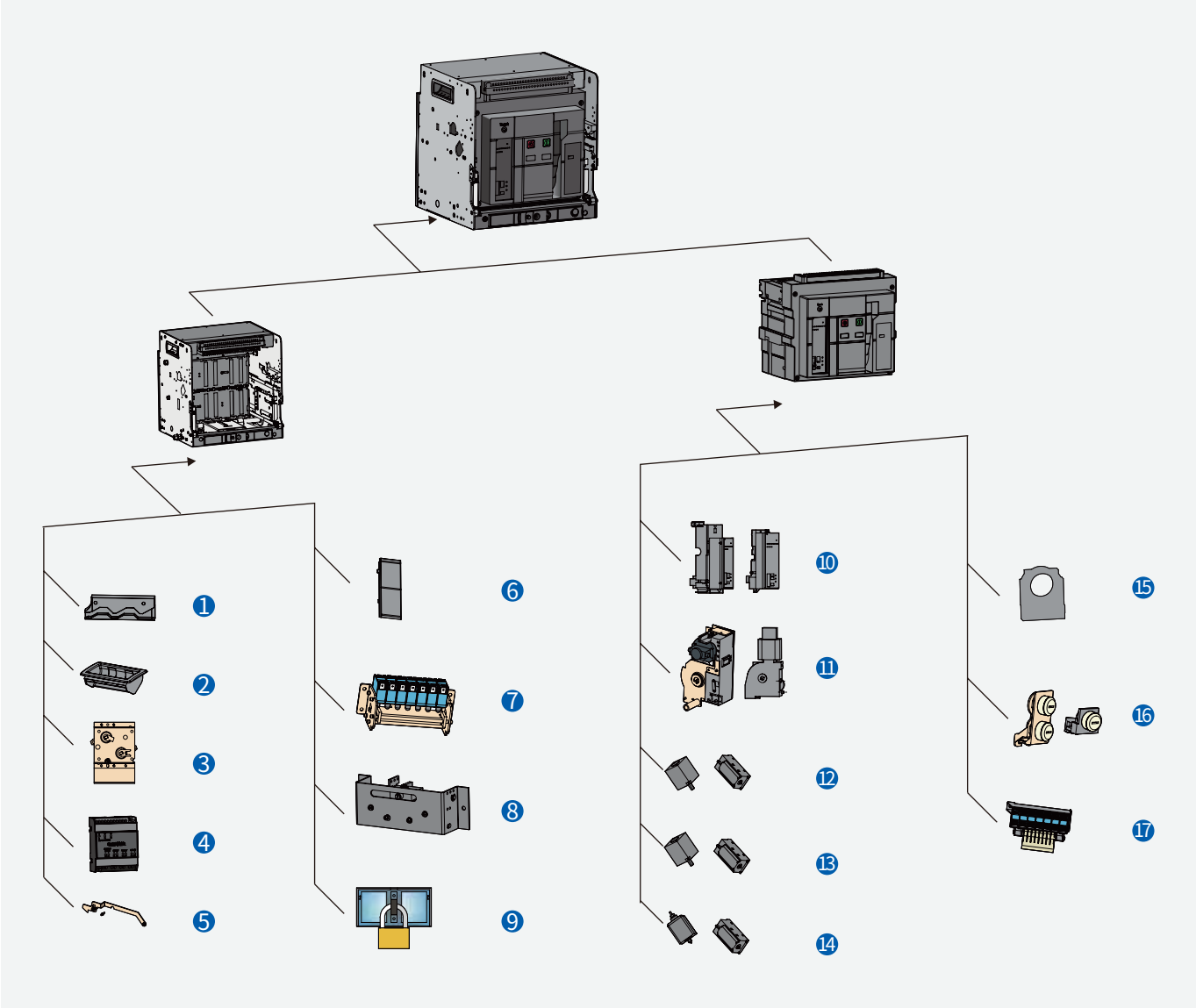
- Altitude of installation site ⩽ 5000m (Over 2000 meters need capacity reduction for using)

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 preventiont

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

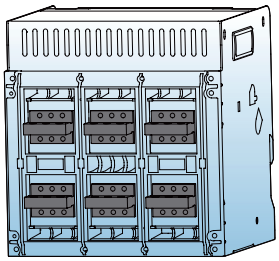


VW3 Accessories

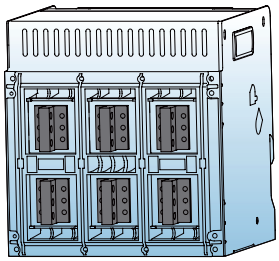
1. Positioning component
2. Sheath
3. Mechanical interlocking
4. Power supply module
5. Door interlocking
6. Phase partition
7. External auxiliary contact
8. Position indication
9. Button lock
10. Controller
11. Motor operating mechanism
12. Shunt release
13. Undervoltage(loss of voltage) release
14.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

Selection Guide

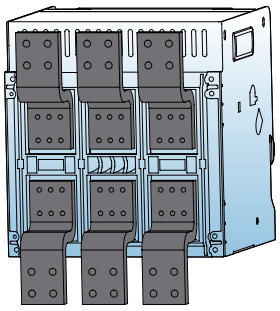
VOZWEI



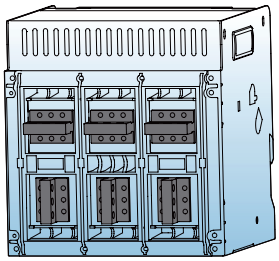
Horizontal Wiring C1



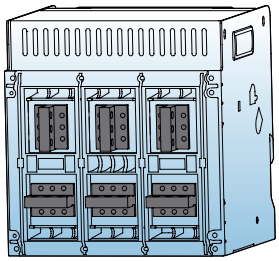
Vertical Wiring C2



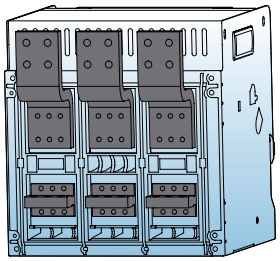
Forward Wiring C3



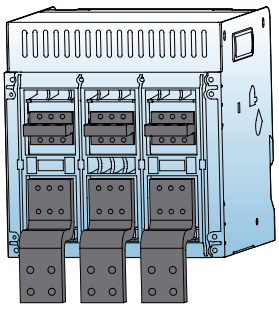
Mixed Wiring C4
(Upper Horizontal, Lower Vertical)



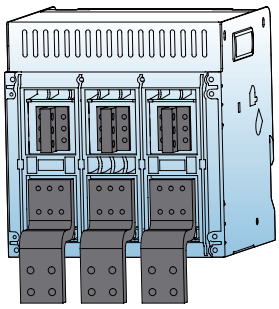
Mixed Wiring C5
(Upper Vertical, Lower Horizontal)



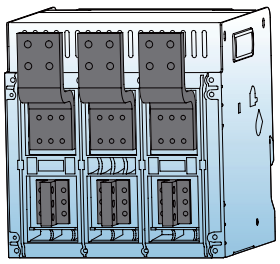
Mixed Wiring C6
(Upper Forward, Lower Horizontal)



Mixed Wiring C7
(Upper Horizontal, Lower Forward)



Mixed Wiring C8
(Upper Vertical, Lower Forward)



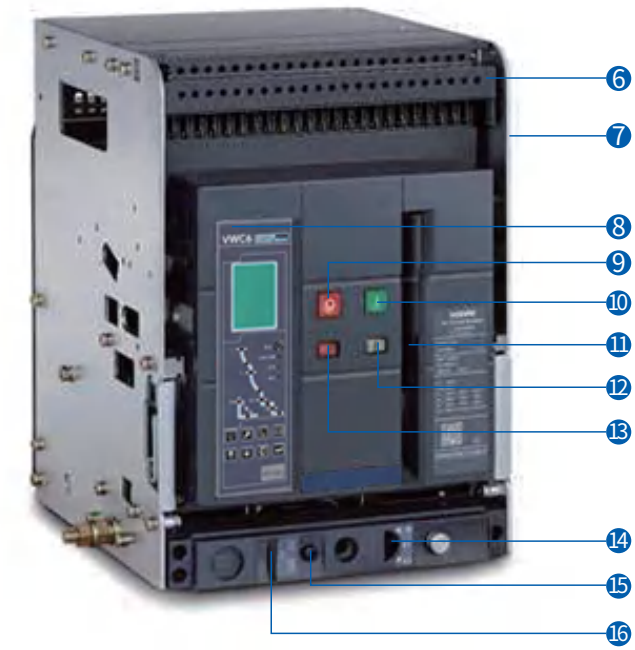
Mixed Wiring C9
(Upper Forward, Lower Vertical)

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: ● *standardwiring,* ○ *optional wiring,* — *without wiring*

Fixed type

Drawout 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

11 Manual energy storage handle

12 Energy releasing and storing indication

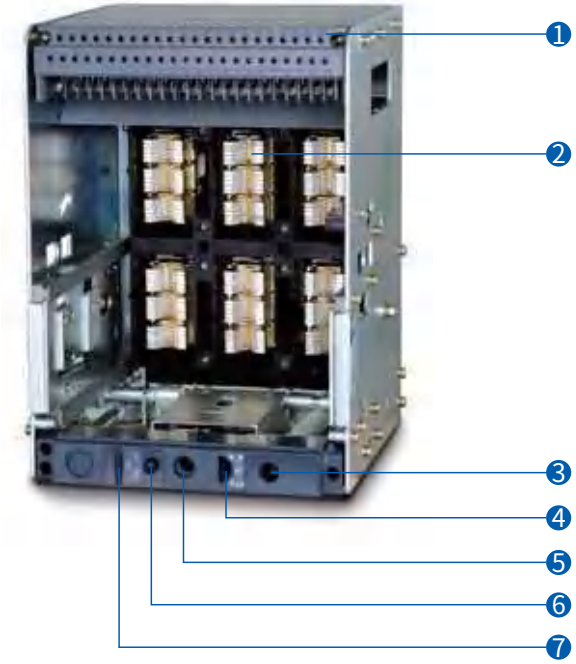
13 Disconnection and closing indication

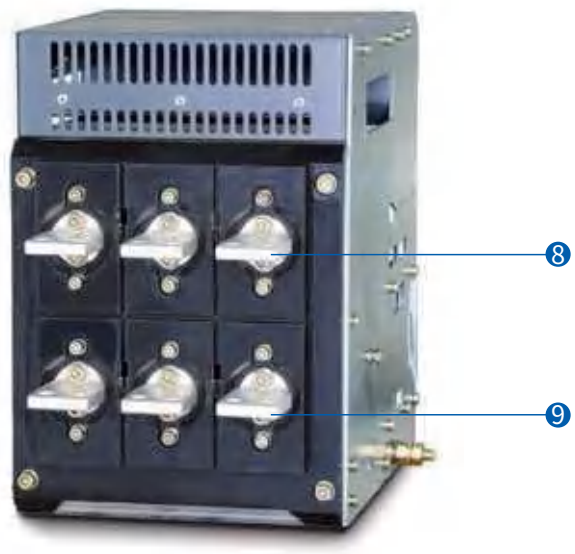
14 Three position indication

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		

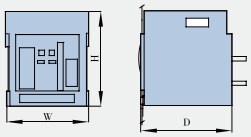
Interlocking Piece Model Explanation and Encoding Rules

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;

Selection Guide

VOZWEI

Series	VW3-25				
					
Rated current In(A)	630, 800, 1000, 1250, 1600, 2000, 2500				
Rated working voltage Ue(V) 50Hz/60Hz	AC400	AC500	AC690	AC800/AC1140	AC1500
Rated insulation voltage Ui(V)	1800				
Rated impulse withstand voltage Uimp(kV)	18				
Power frequency withstand voltage U(V) 1min	AC5000V 50Hz/60Hz				
Number of poles	3P/4P			3P	3P
N-pole rated current	100%In				
Breaking capacity code	H			HU	HV
Rated limit short-circuit breaking capacity (effective value) Icu(kA)	85	75	65	75	50
Rated operating short-circuit breaking capacity (effective value) Ics(kA)	85	75	65	75	50
Rated short circuit making capacity (peak value) Icm(kA)	187	165	143	165	105
Rated short-time withstand current (effective value) Icw(kA) 1s	85	75	65	70	50
Rated conditional short-circuit current Icc(kA)	85	75	65	70	50
Full break time (no additional delay) (ms)	12~18				
Closing time (ms)	⩽60				
Operating performance — Electrical life (times)	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)
Operating performance — Mechanical life (times) — Without maintenance	15000				
Operating performance — Mechanical life (times) — Maintenance	30000				
Operational condition — Utilization category	B				
Operational condition — Pollution degree	3				
Operational condition — Protection grade	IP40				
Operational condition — Ambient temperature	⩾-40°C				
Operational condition — Altitude	⩽5000m				
Outline dimension (mm) (H × W × D) — Drawout type 3P	430 × 407 × 395				
Outline dimension (mm) (H × W × D) — Drawout type 4P	430 × 522 × 395				
Outline dimension (mm) (H × W × D) — Fixed type 3P	390 × 422 × 297.5				
Outline dimension (mm) (H × W × D) — Fixed type 4P	390 × 537 × 297.5				



Selection Guide

VOZWEI

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°C					
⩽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°C			
⩽5000m			
480 × 853 × 395			
480 × 900 × 395			
390 × 800 × 297.5			
390 × 915 × 297.5			

Controller

VOZWEI

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	–	–	–	–	✓ /✓ / ■

Controller

VOZWEI

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.

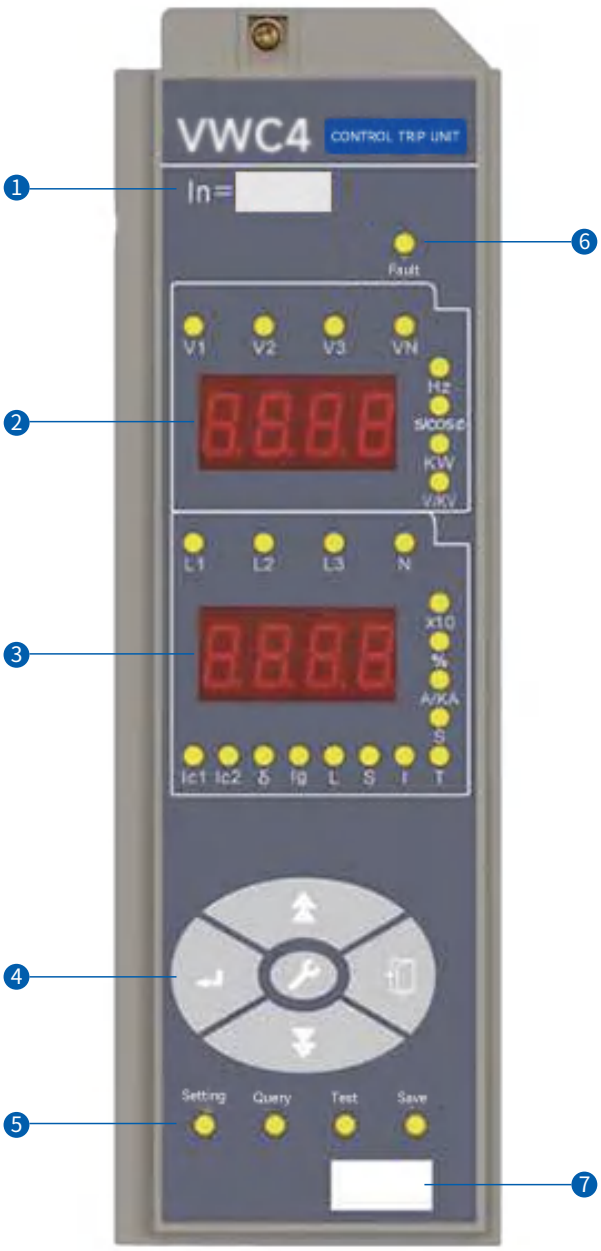
VWC4 Controller

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 protetion
- ☐ Current leakage protetion
- ☐ 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

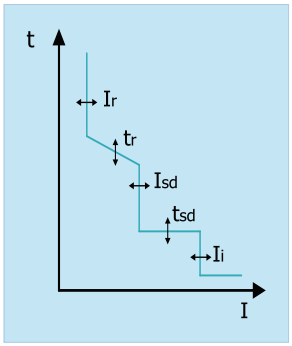
- “HZ” Lighting on,is frequency
- “S/COSΦ” Lighting on,is time;flashing is power factor
- “kW” Lighting on,is active power;flashing is active electric energy
- “%” Lighting on,is contact wear equivalent indication
- “×10” Lighting on,is number of opening and closing operations
- “δ” “%” and “L1/L2/L3” 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:

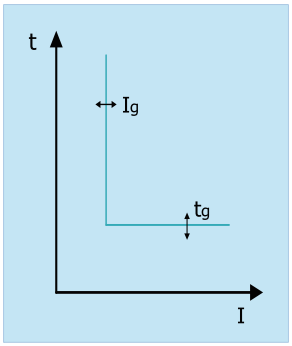
ER01	ER02	ER03	ER12	ER13
E^2PROM error	A/D error	overtemperature	Circuit breaker refused to operate	contact maintained indication

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^2T)	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 $t=(K/1.15)\times\log_e[N^2/(N^2-1.15)]$	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^2T Table $t=(1.5/N)^2\times K$	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 $t=t_g \times C_r \times I_g/I$ 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

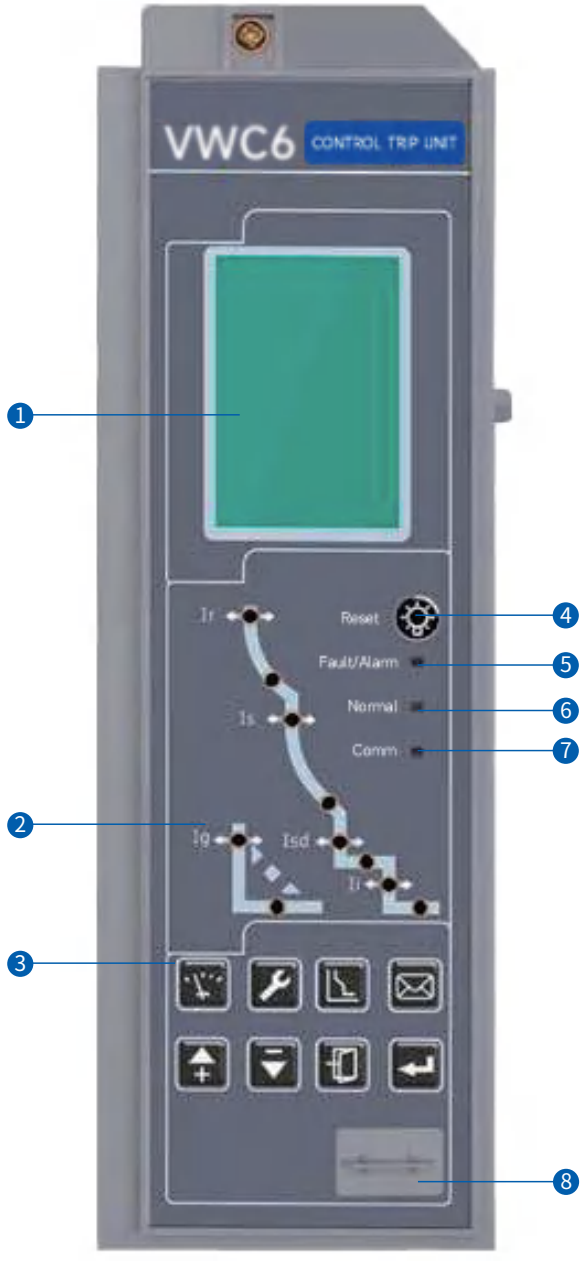
VWC6 Controller

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 protetion
- Current leakage protetion
- Required value protection
- Power factor measurement
- Electric energy measurement
- Selective area interlock
- Harmonics measurement
- Frequency measurement
- Reverse power measurement
- Electric energy measurement
- Communication

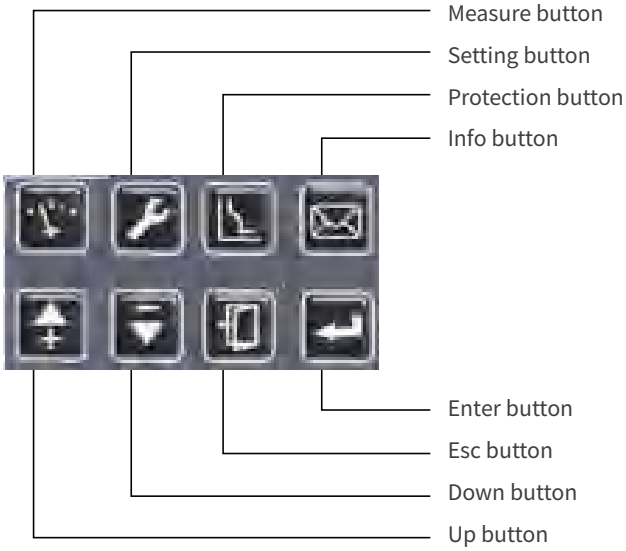


Note: *Protection parameters must not be cross set,*
$I_r < I_{sd} < I_{io}$

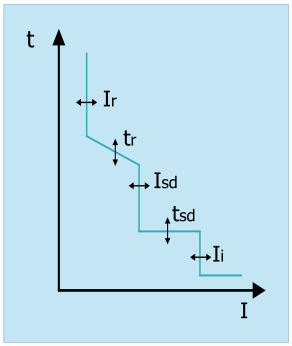
Controller

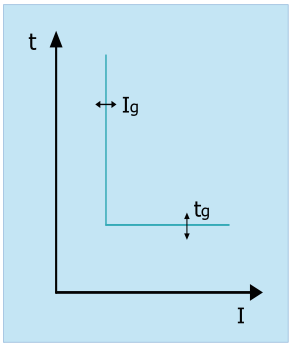
VOZWEI

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^2T)	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 $t=(K/1.15)\times\log_e[N^2/(N^2-1.15)]$	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^2T Table $t=(1.5/N)^2\times K$	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 $t=t_g \times C_r \times I_g/I$ 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

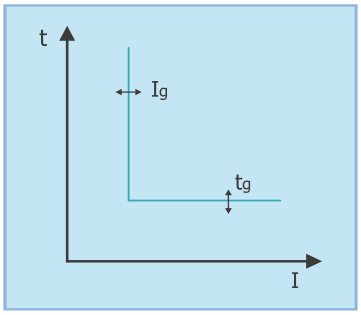
VWC4 Controller

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）
		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		

This setting value only exists when the "alarm" execution mode

Controller protection function description

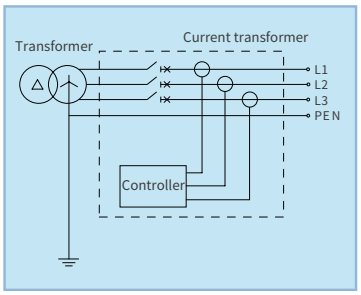
Ground fault protection features



Ground fault protection

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

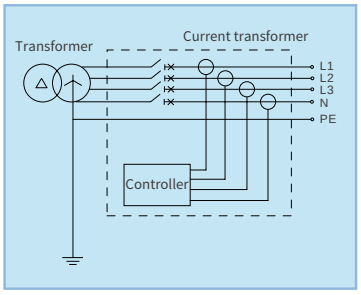
Type 1



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

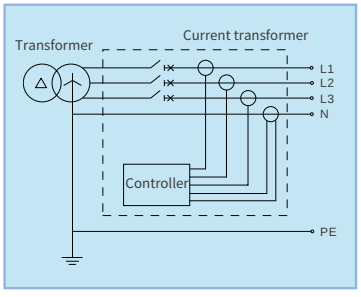
Type 2



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

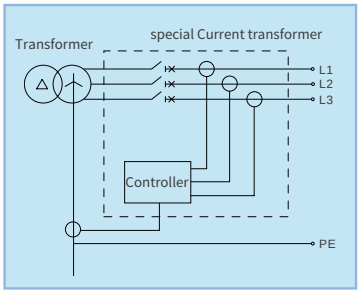


Type 3: The TN-S distribution system use three-pole circuit breaker and external neutral current transformer.

- □ 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

Controller

VOZWEI

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

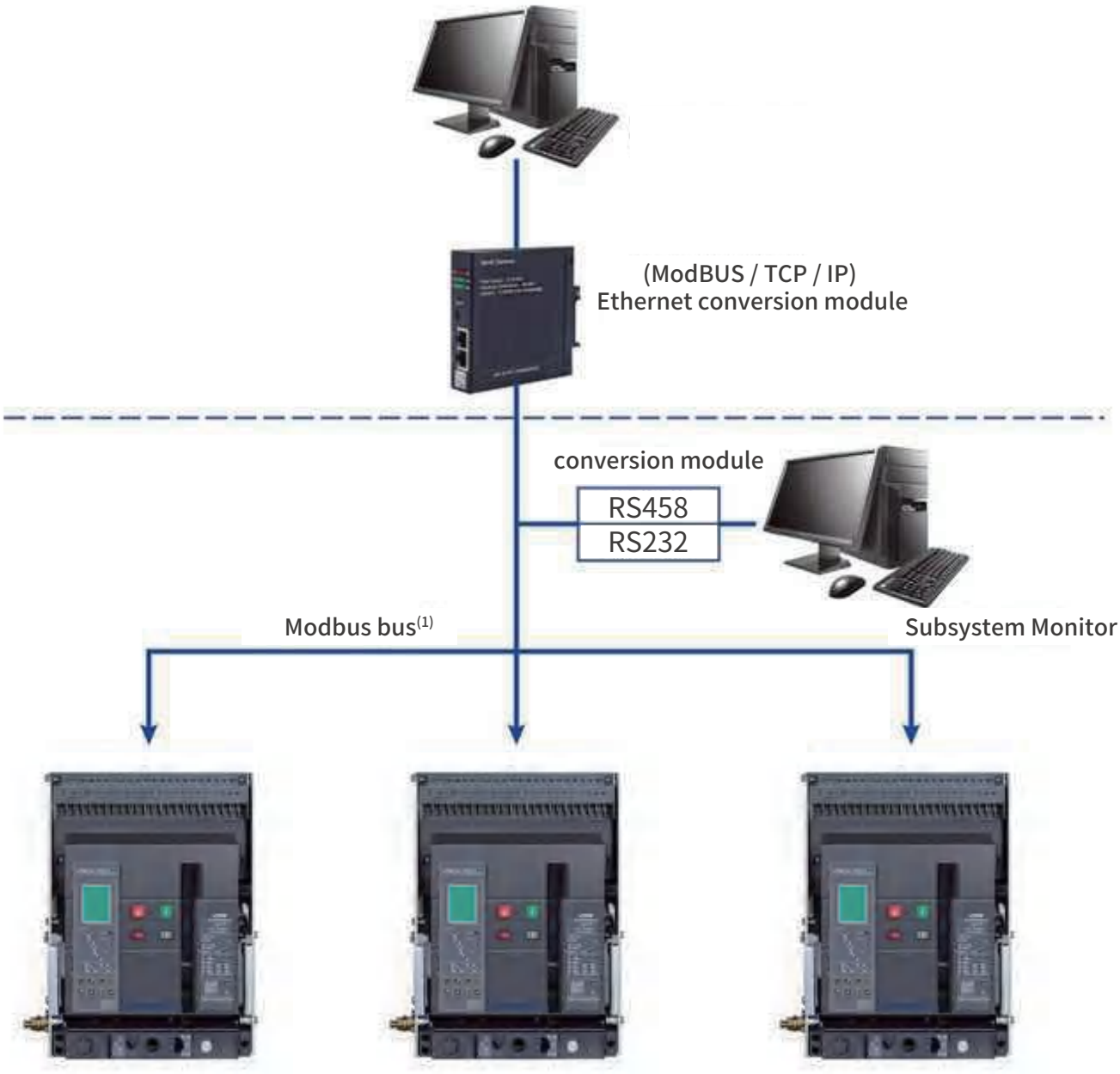
Note: *(1).When the bus length exceeds 1200 meters, addational a "communication relay module";*
(2).Achieve the remote communication, remote regulating, remote control and remote sensing functions without addational accessories
(3).When monitor system have the RS485 interface,no need "RS485/RS232 conversion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

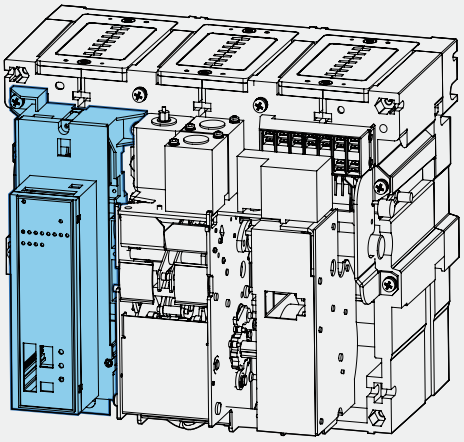
Contact factory setting				
	Contact 1	Contact 2	Contact 3	Contact 4
VWC4 / VWC6	Overload fault output	Fault tripping output	Self-diagnostic function alarm	Fault tripping
VWC4 / VWC6 (Communication)			Remote Off	Remote On

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

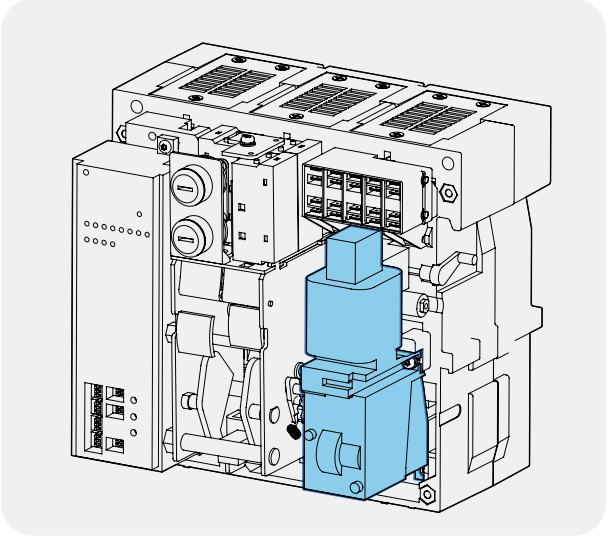


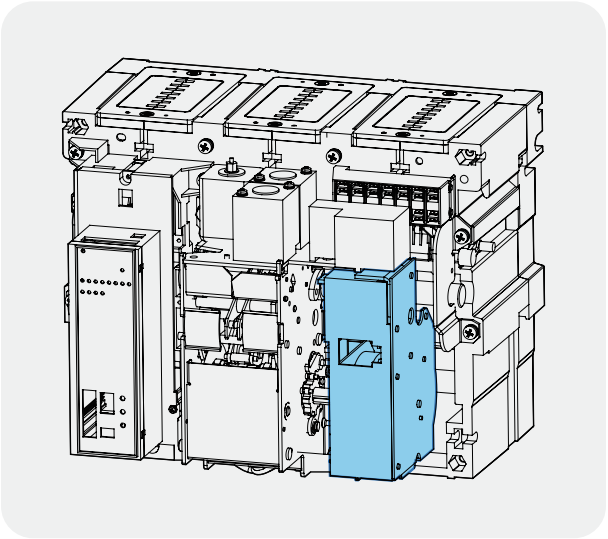
VW3-25 (H/HU/HV)
VW3-40 (H/HU/HV)

	Controller mode	Supply voltage Ue (V)
Controller	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)

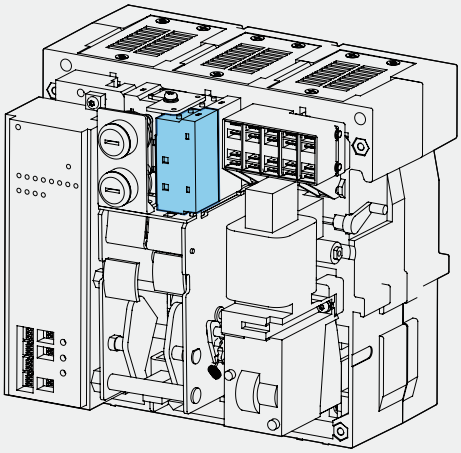




Rated control supply voltage Us (V)		AC230	AC400	DC110	DC220
Operation voltage		(0.85～1.1) Us			
Power consumption	VW3-25 (H/HU/HV)	150VA		150W	
	VW3-40 (H/HU/HV)	150VA		150W	
	VW3-63 (H/HU/HV)	190VA		190W	
Energy storage time(s)		5s			

Closed electromagnet (B)

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

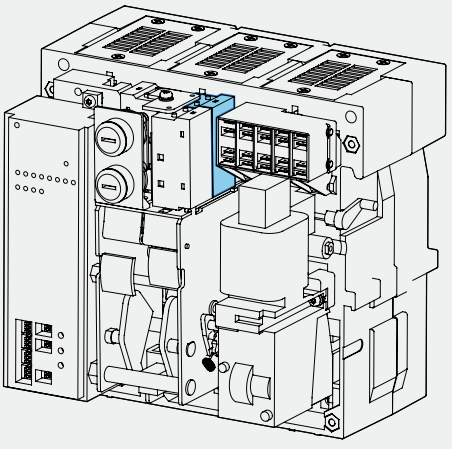


Power Consumption Table of Closed Electromagnet

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.

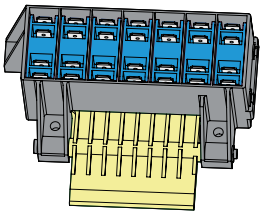


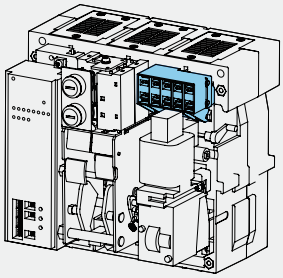
Power Consumption Table of Shunt Release

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

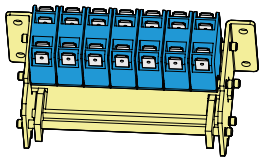
Internal auxiliary contact

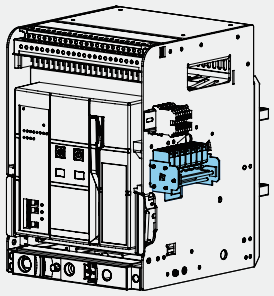




External auxiliary contact

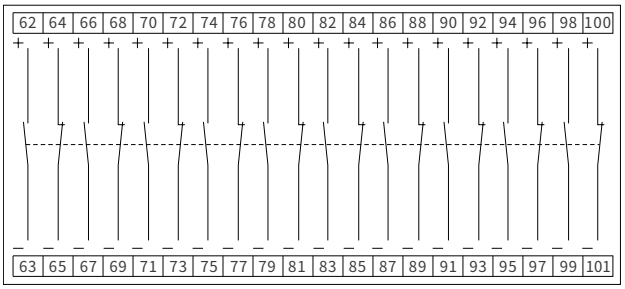
Min 60mm safety distance of circuit breaker after installation



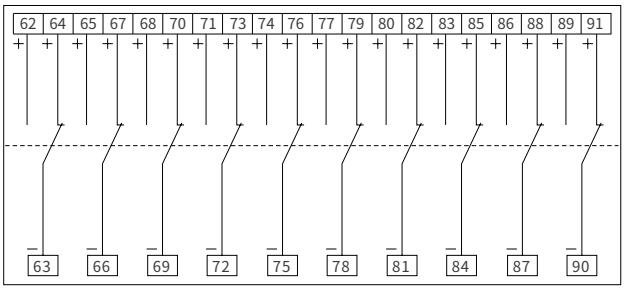


External auxiliary contact terminal number

Without common point



With common point



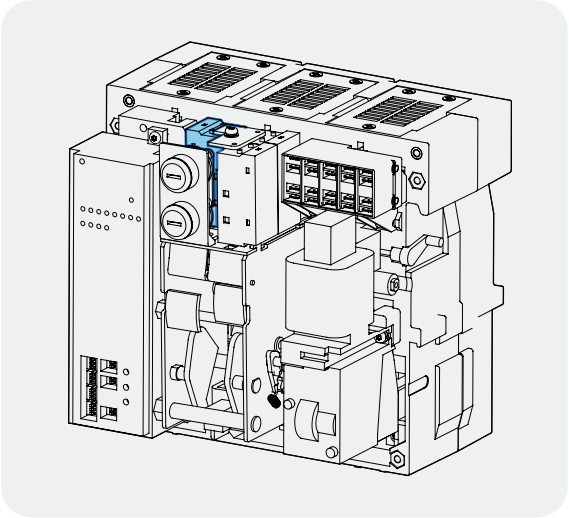
H/HU/HV/Standard have Max 4NO+4NC internal auxiliary contact,if more auxiliary contact ,need the external auxiliary contact

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	Code
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

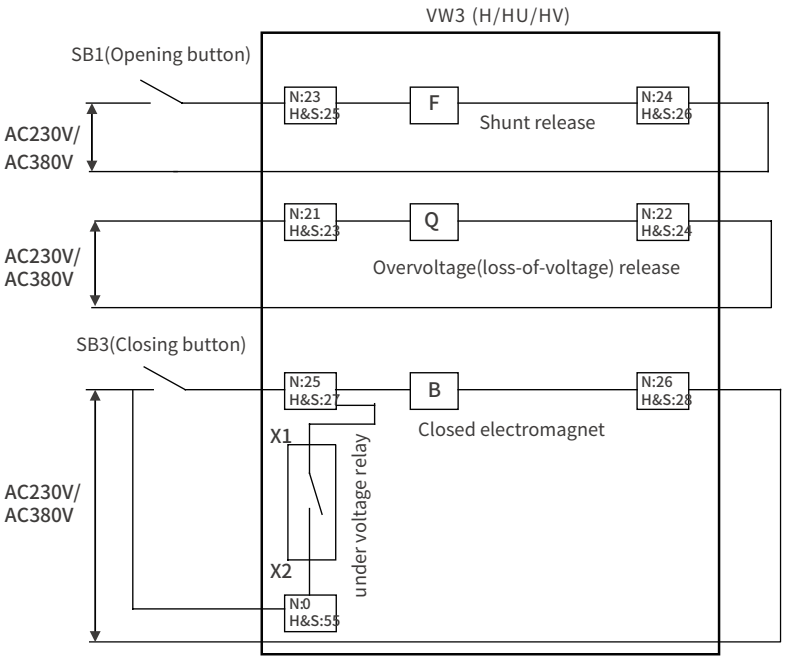
Loss-of-voltage release

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.

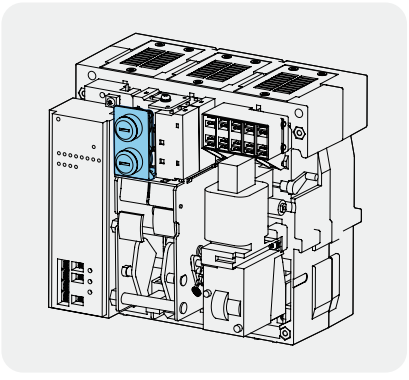
Action value of loss-of voltag:⩽20%Ue	Action delay time of loss-of voltage:1-10s
Action value of overvoltage:⩾135%Un	Automatic closing voltage:(0.85-1.1)Ue

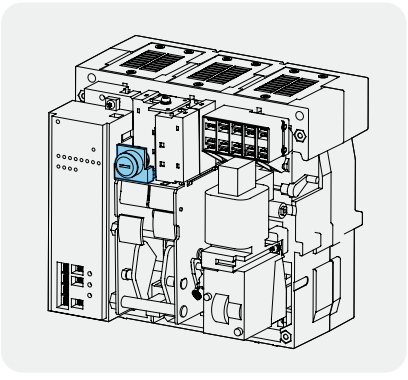


Note: *1. X1 and X2 only send a short signal (200ms) after overvoltage(loss-of-voltage) release recover for 1 second, then the closed electromagnet act .*
2.The number in the box represents the secondary wiring terminal number, and H&S represents the terminal number of VW3 (H/HU/HV).

Lock

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





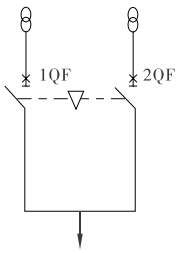
This key lock is locked on the manually disconnected position of the circuit breaker

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

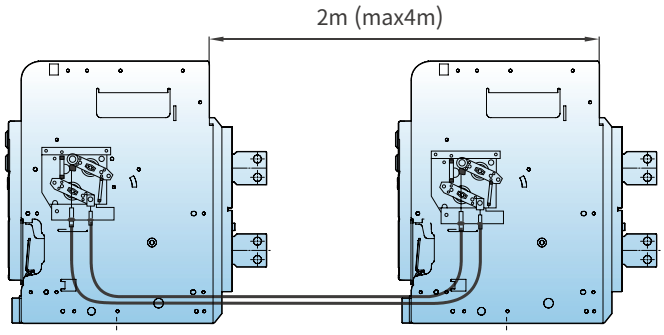
Mechanical interlocking (SR11,SR12,SR21,SY11)

Circuit figure Possible operating modes



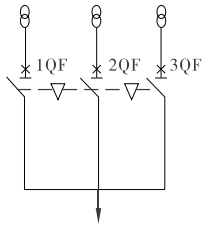
1QF	2QF
0	0
0	1
1	0

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



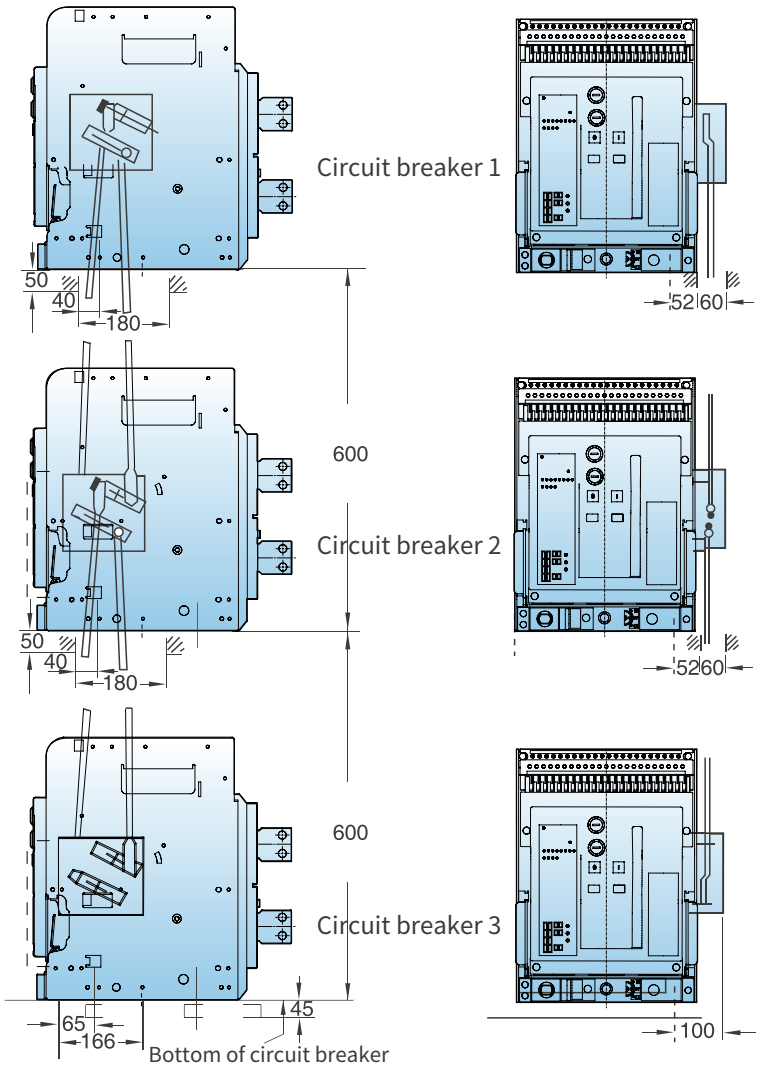
Circuit figure Possible operating modes

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

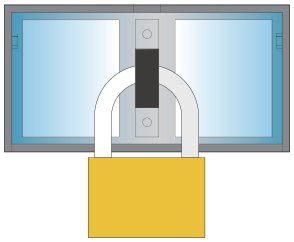


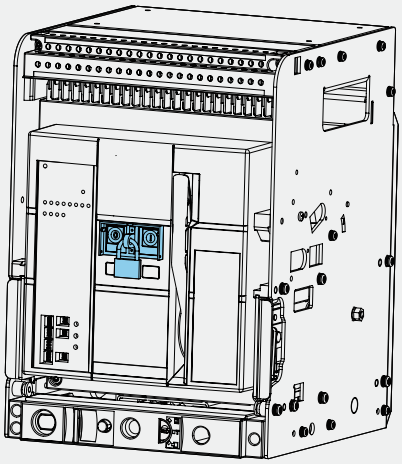
1QF	2QF	3QF
0	0	0
1	0	0
0	1	0
0	0	1

Three circuit breaker interlocking hard rods



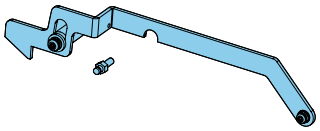
Button lock (S) (The minimum safety distance 35mm between the cases)

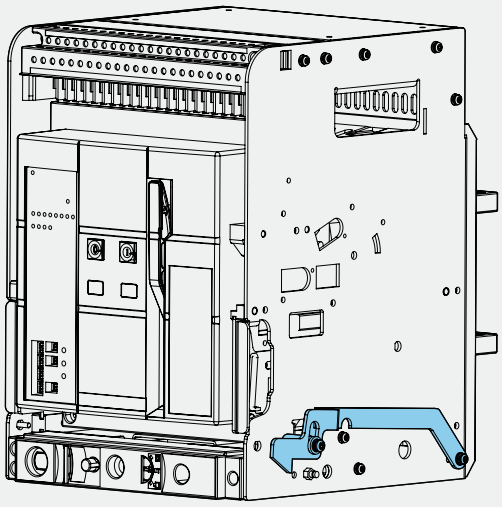




Door interlock (The minimum safety distance 40mm between the circuit breaker)

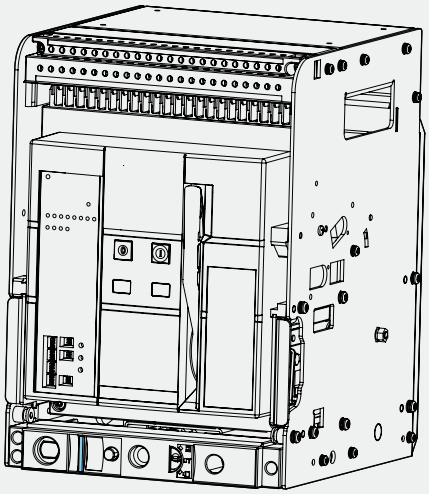
When the circuit breaker at the working or testing position, prohibited to open the cabinet door; The door is opened and the circuit breaker at the connected position, close the door without disconnecting the circuit breaker.





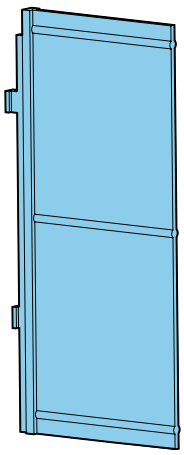
Drawer type circuit breaker locking device at "separation" position

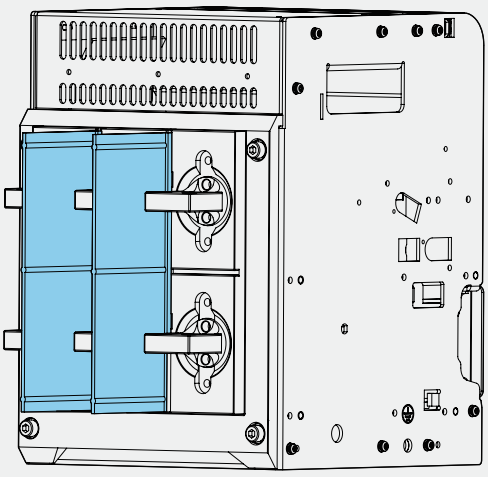
When the drawer type circuit breaker at the separated position, lock the circuit breaker by pull out the rod. After locking, the circuit breaker will not be able to "test" and "connection" positions.



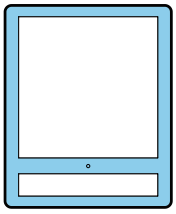
Phase partition (The minimum safety distance 180mm between the circuit breakers)

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.

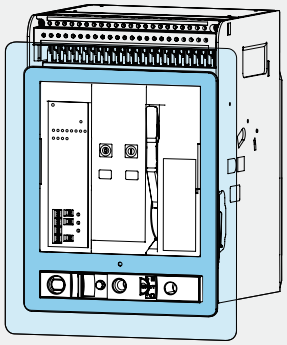




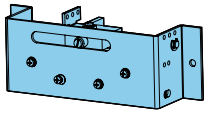
Doorframe(M)



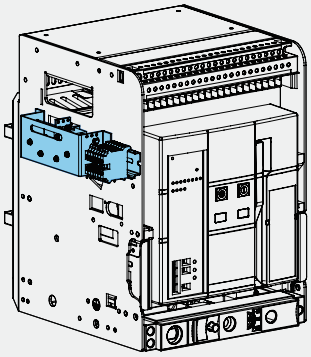
Have the fixed type and drawout type, it is mainly placed on the door of the cubicle for sealing, and can make the protection level of the circuit breaker reaches IP40. It is beautiful and practical.



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

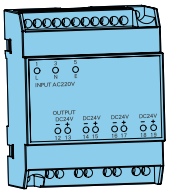


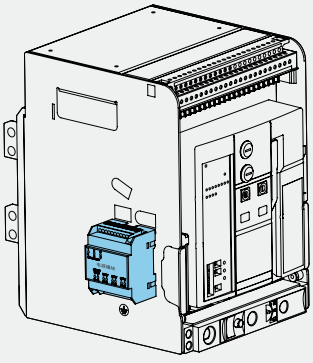
With three contacts to indicate the position status of the circuit breaker (connection, testing, separation). When the circuit breaker is in a certain position, the corresponding contact will be closed.



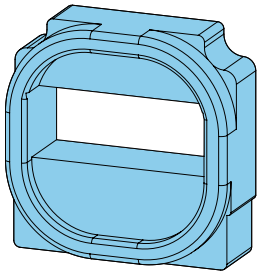
Power supply module (The minimum safety distance 60mm between the circuit breakers)

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:

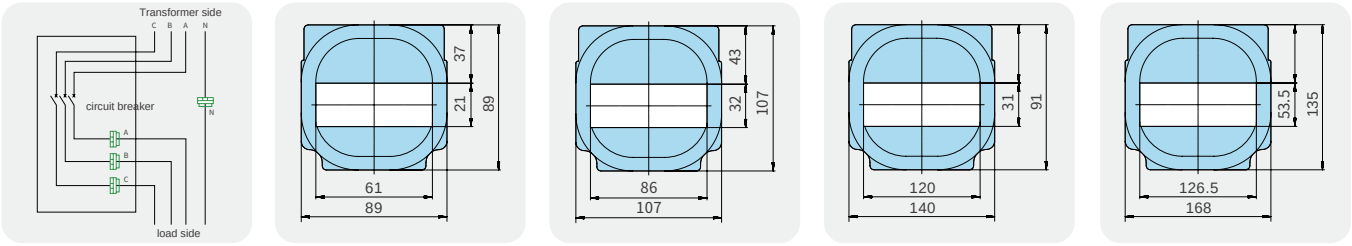
1. The external neutral current transformer has a twisted pair wire with codes 6 and 7 ,connect to same terminal code of the secondary terminal

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

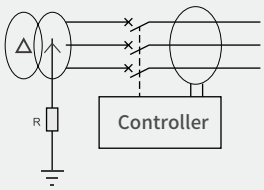


N1 N2 N3 N4

External leakage current transformer

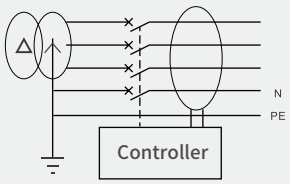
When the residual current protection function, required an external residual current transformer, and the controller does not have the ground protection function.
The external neutral current transformer has a twisted pair wire with codes 6 and 7 ,connect to same terminal code of the secondary terminal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

External leakage current transformer



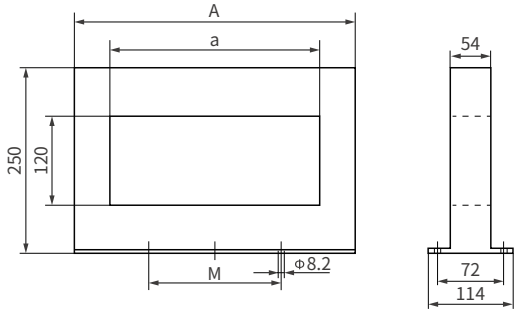
3P

External leakage current transformer



4P

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
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

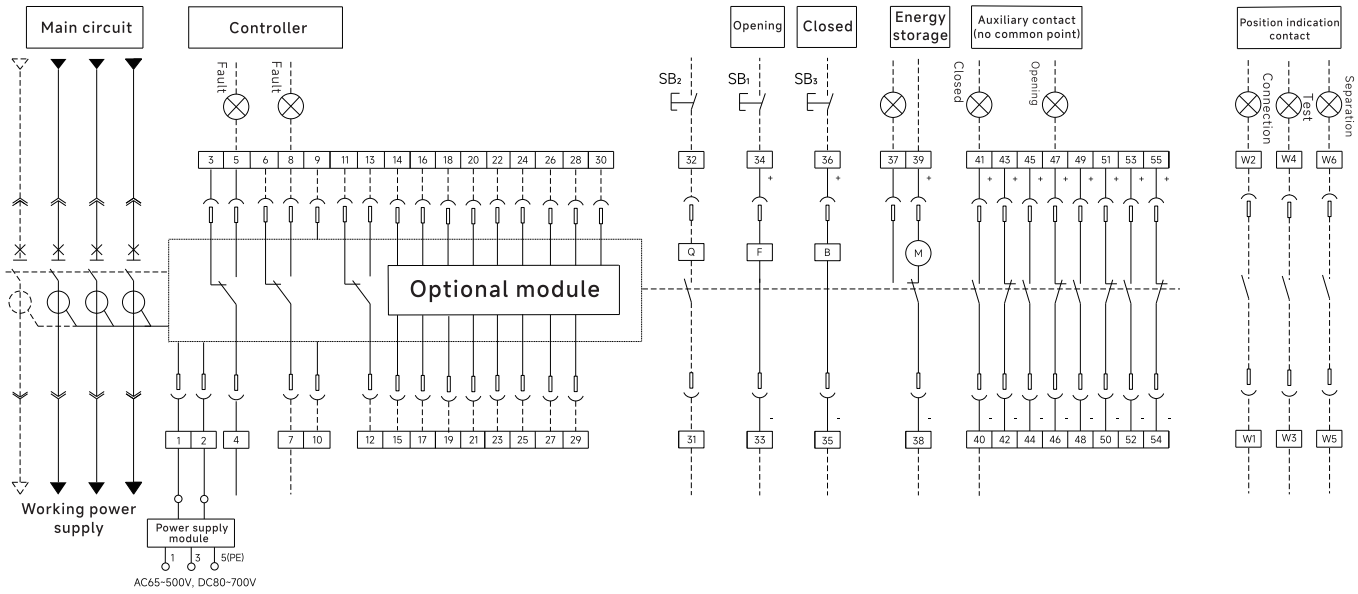
Frame size rated current Inm (A)	Rated current In (A)	Copper busbar specification		
		Number of busbar		Dimension
		Horizontal wiring	Vertical wiring	
VW3-25(H/HU/HV)	630	2	/	80×5
	800	2	/	80×5
	1000	2	/	80×5
	1250	3	/	80×5
	1600	2	/	80×10
	2000	3	/	80×10
	2500	3	/	80×10
VW3-40(H/HU/HV)	1000	2	1	80×5
	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.

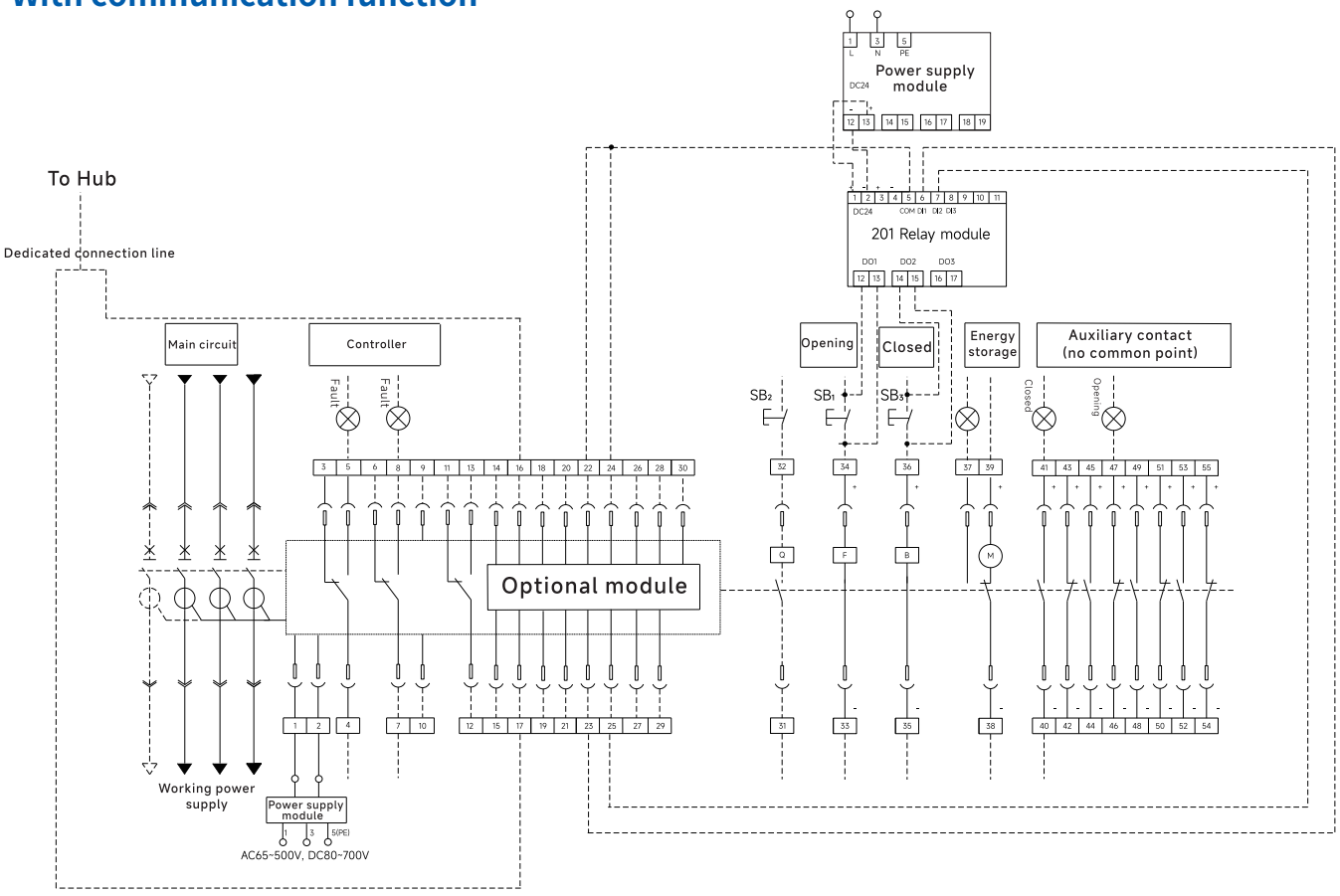
Recommended screw used of outlet busbar diameter

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

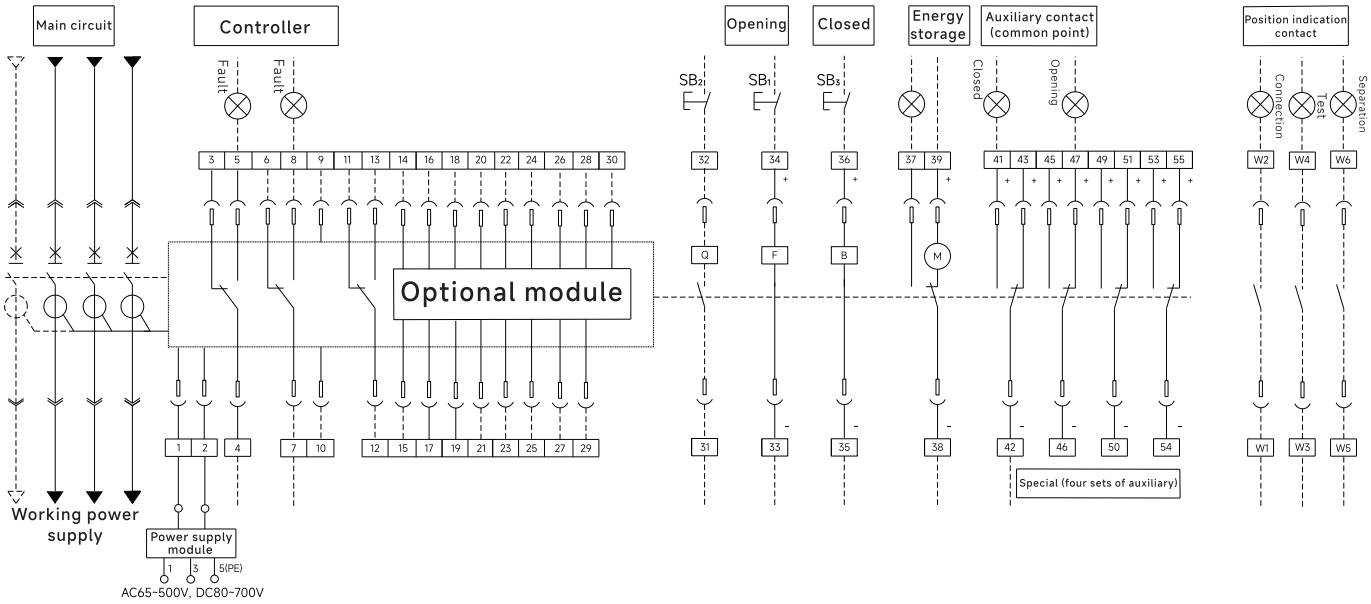
VW3-25(H/HU/HV), VW3-40(H/HU/HV), VW3-63(H/HU/HV) Electrical Wiring Diagram



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*

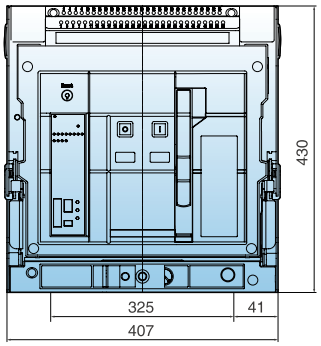
Terminal Number

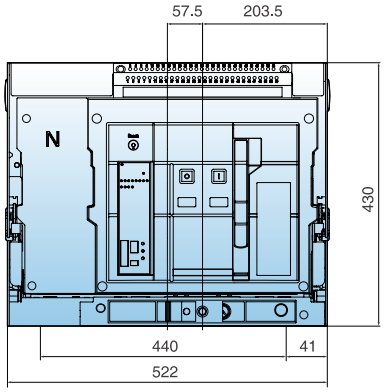
1#, 2#	Working power supply	26#	A-phase wiring (input voltage ⩽ 230V)
3#, 4#, 5#	Fault tripping contact output 1	27#	B-phase wiring (input voltage ⩽ 230V)
6#, 7#, 8#	Fault tripping contact output 2	28#	C-phase wiring (input voltage ⩽ 230V)
9#, 10#	Remote reset	29#	N-phase wiring
11#, 12#, 13#	Close ready 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, cconnect 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.

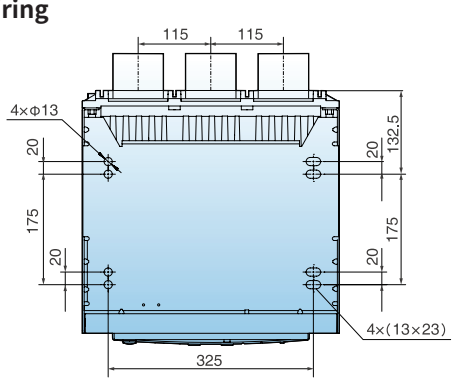
Drawout type (VW3-25H/VW3-25HU/VW3-25HV)

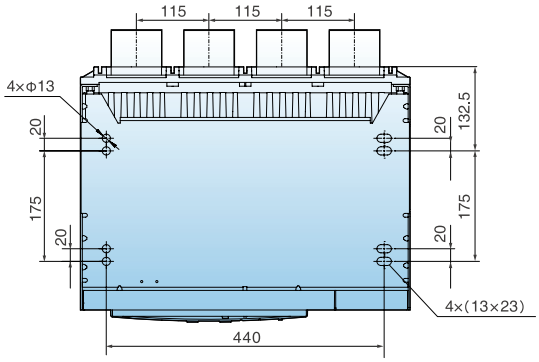
Front view

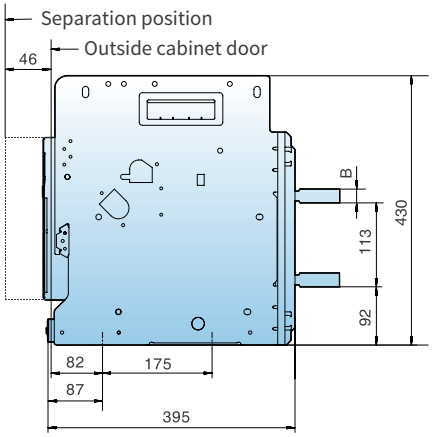


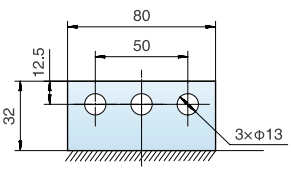


Horizontal Wiring

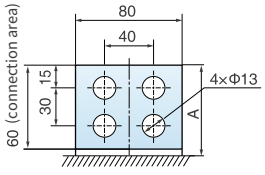








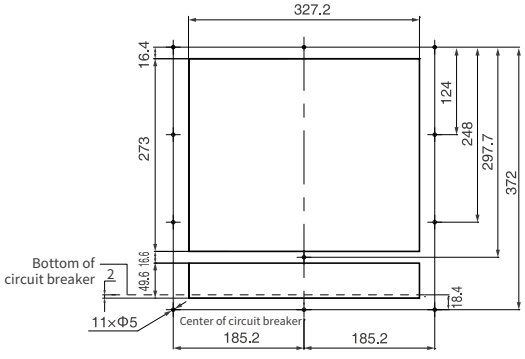
Standard



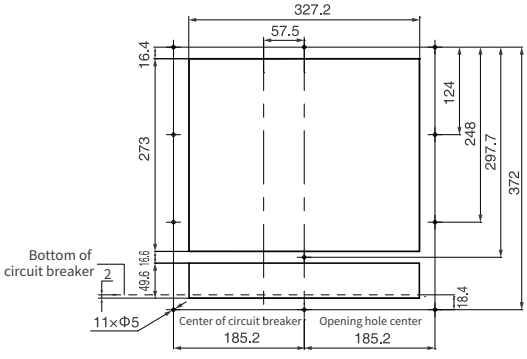
Extended

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

Cabinet door open hole dimension



3P



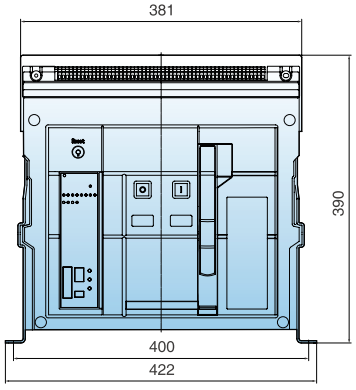
4P

Size and Connection

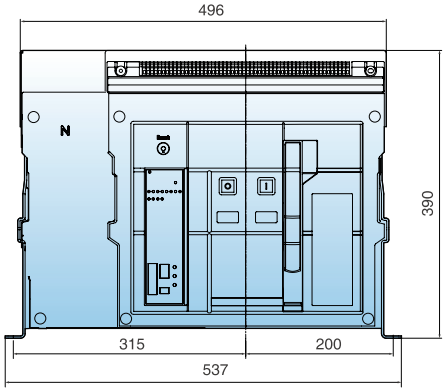
VOZWEI

Fixed type

Front view

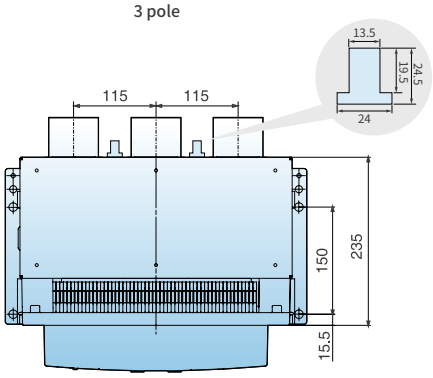


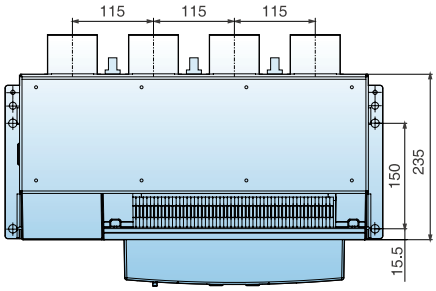
3 pole



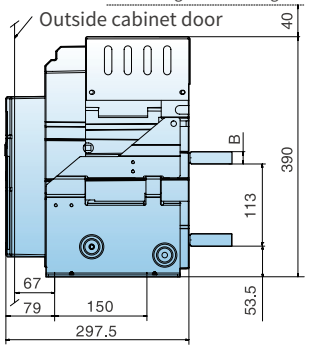
4 pole

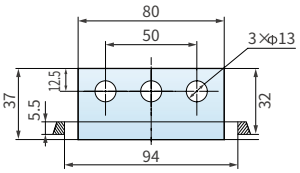
Horizontal Wiring



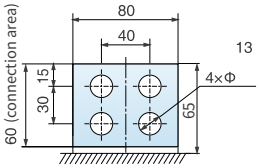


Distance for dismantling the arc extinguishing chamber





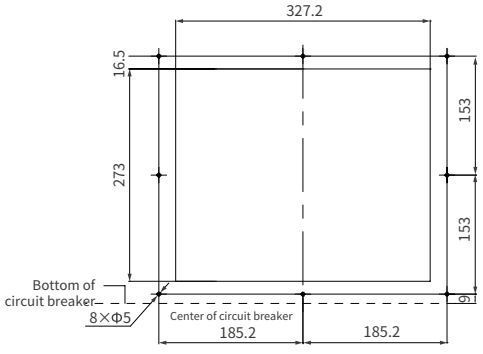
Standard



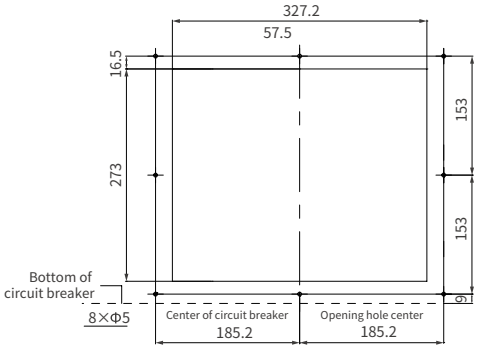
Extended

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

Cabinet door open hole dimension



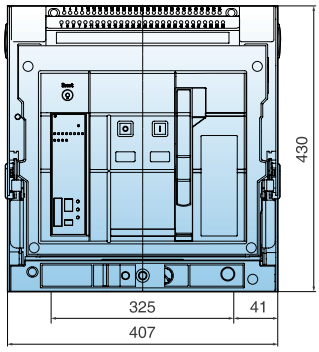
3P



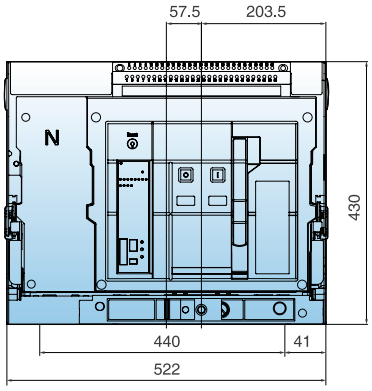
4P

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

Front view

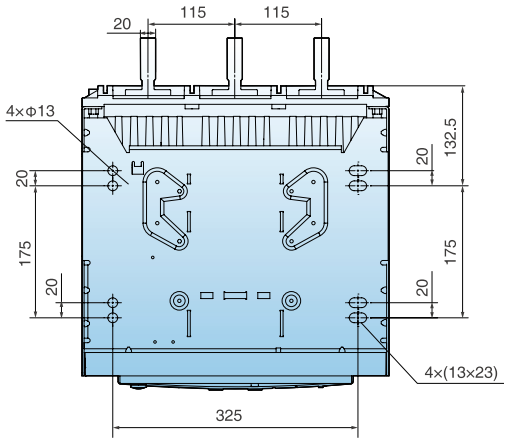


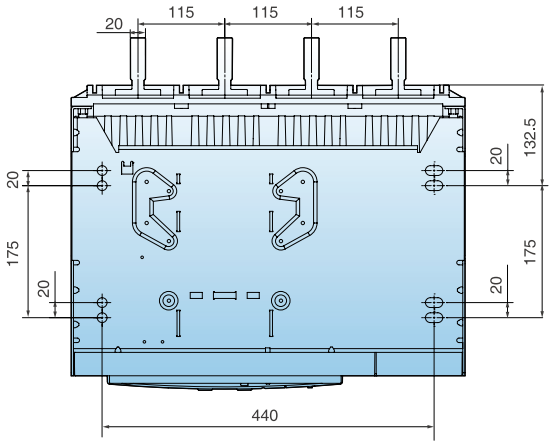
3 pole

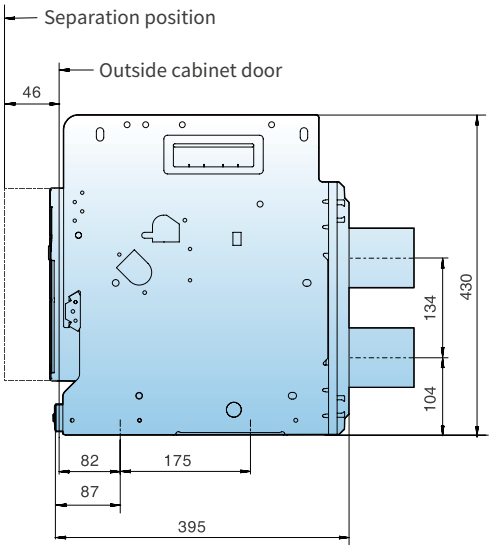


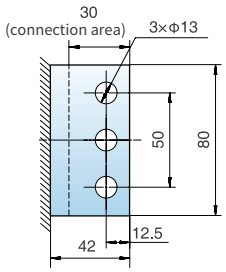
4 pole

Vertical Wiring

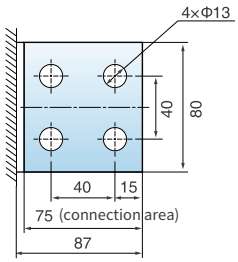






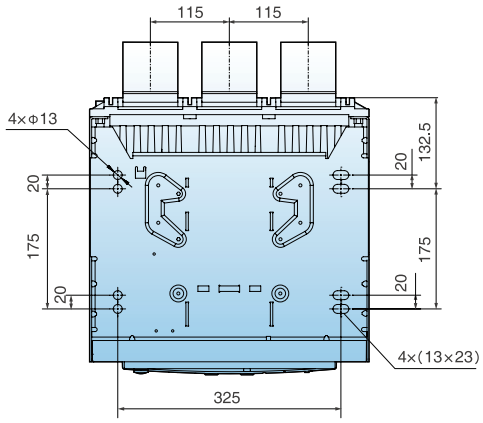


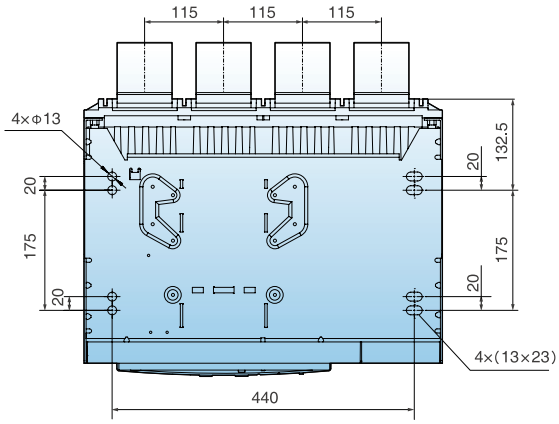
Standard

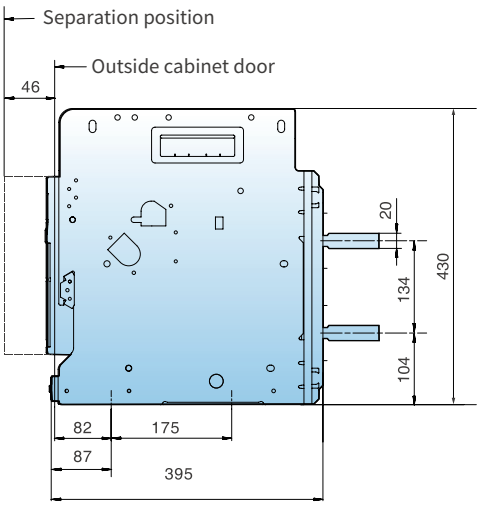


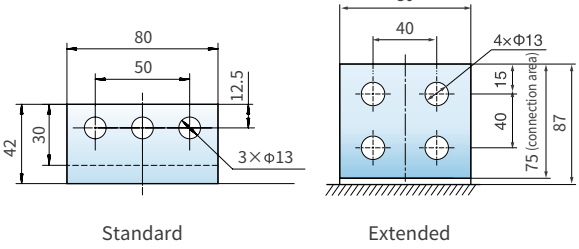
Extended

Horizontal Wiring

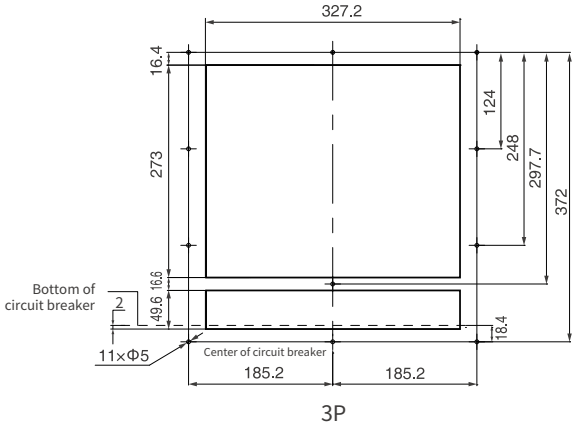


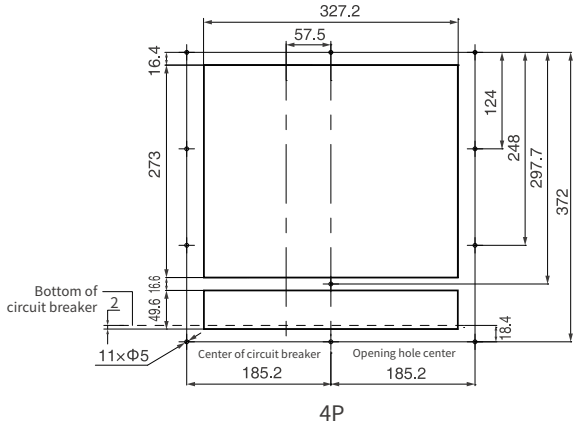






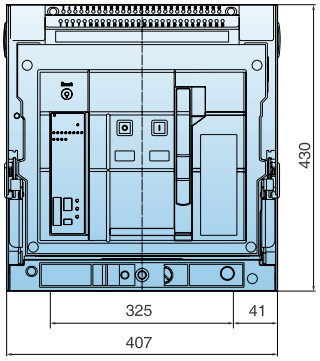
Cabinet door open hole dimension



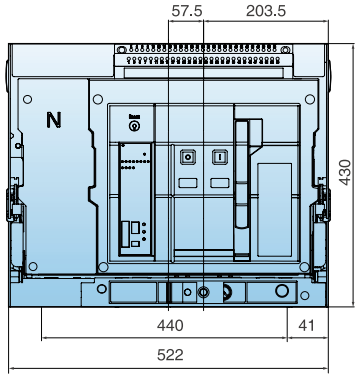


Drawout type (VW3-40H/VW3-40HU/VW3-40HV, 3600～4000A)

Front view

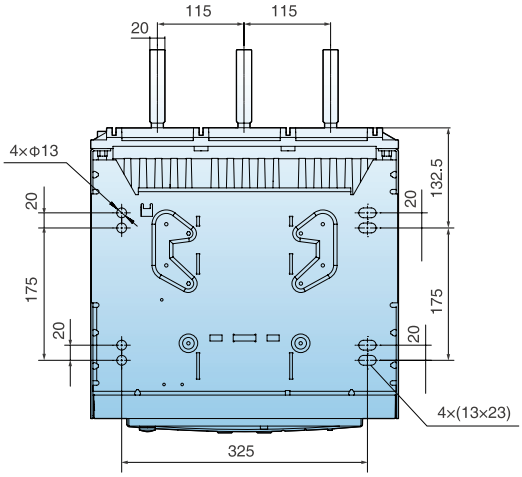


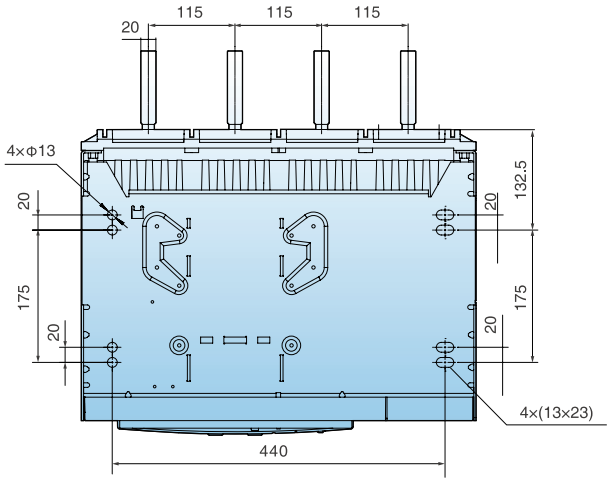
3pole

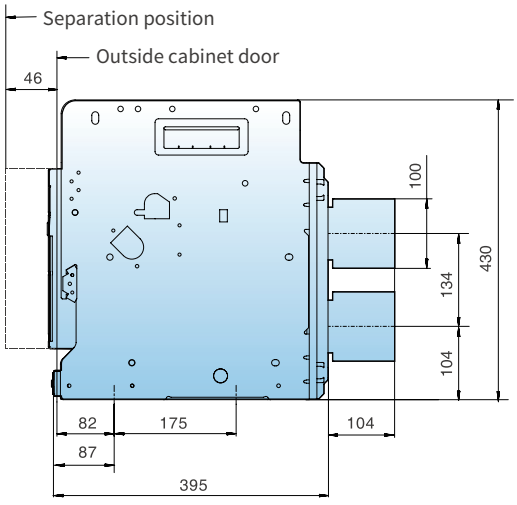


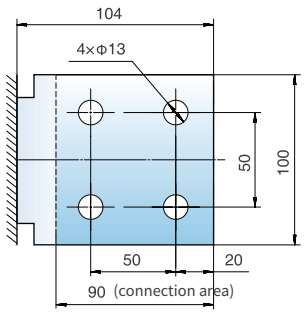
4pole

Vertical Wiring





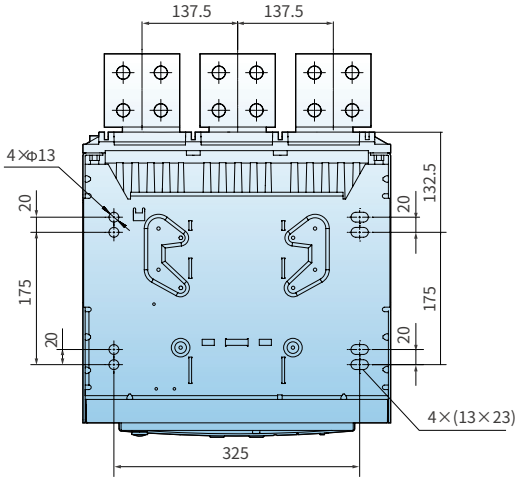


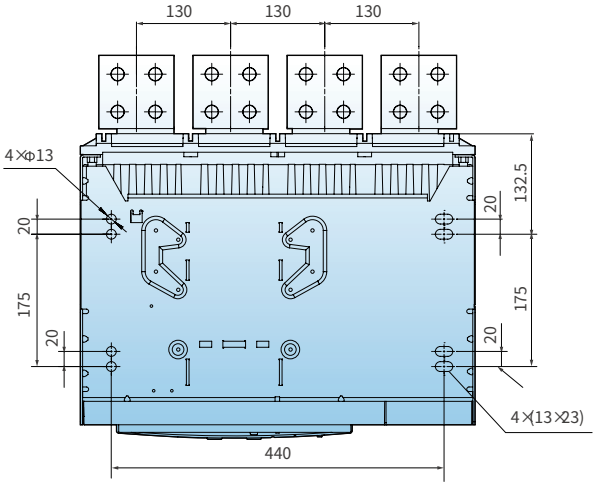


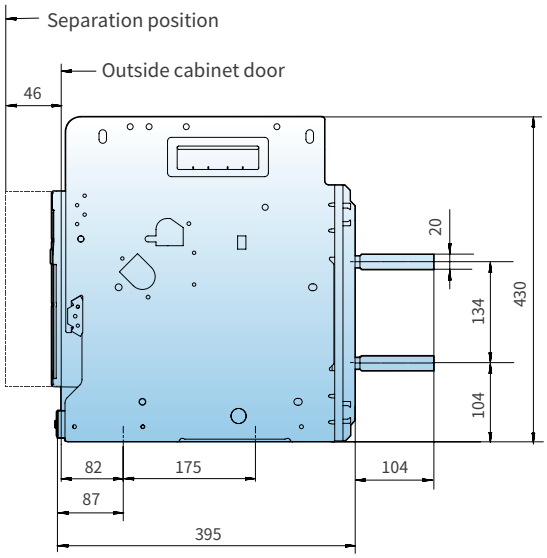
Size and Connection

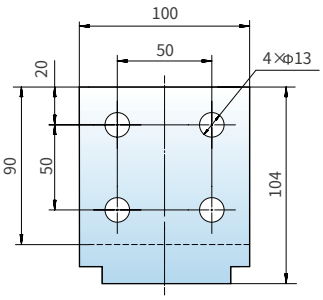
VOZWEI

Horizontal Wiring

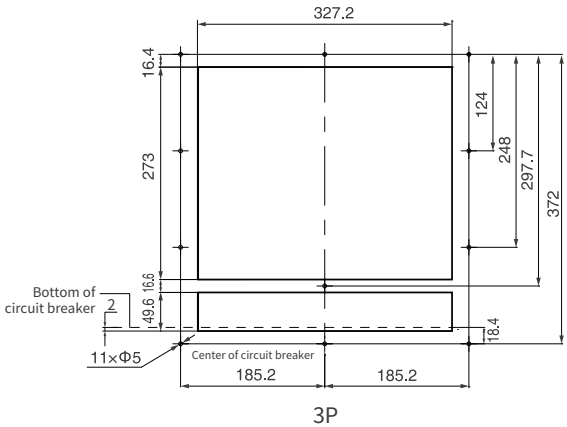




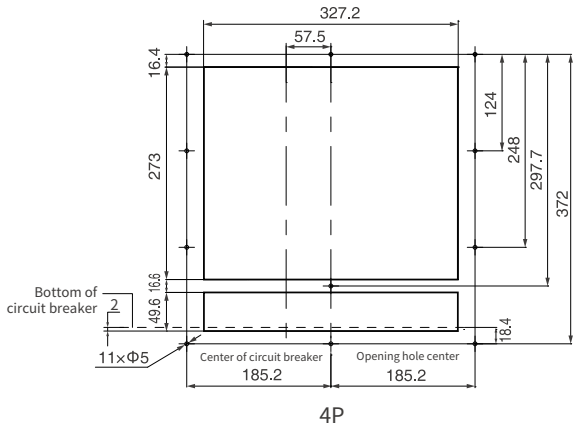




Cabinet door open hole dimension



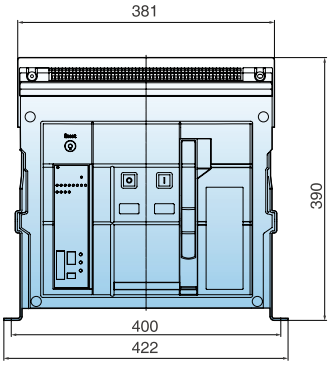
3P



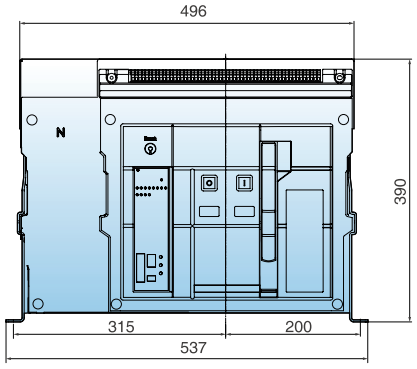
4P

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

Front view

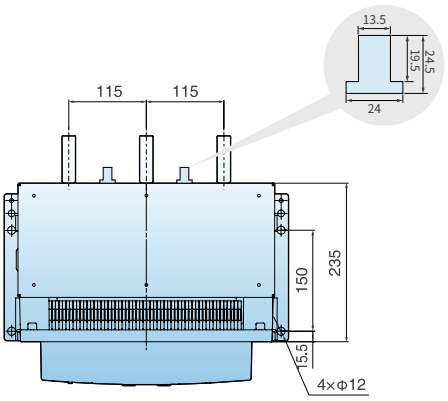


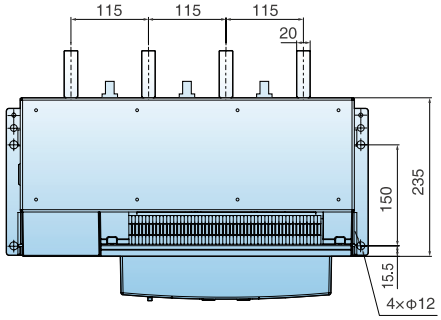
3pole



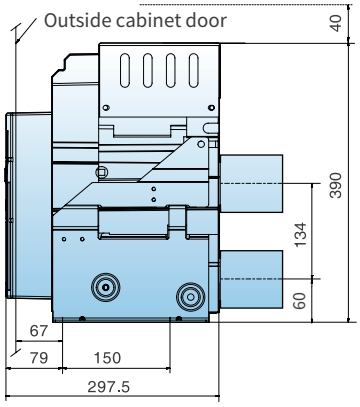
4pole

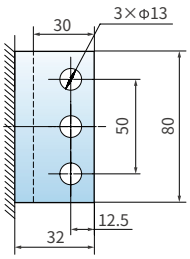
Vertical Wiring



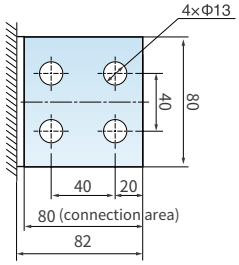


Distance for dismantling the arc extinguishing chamber



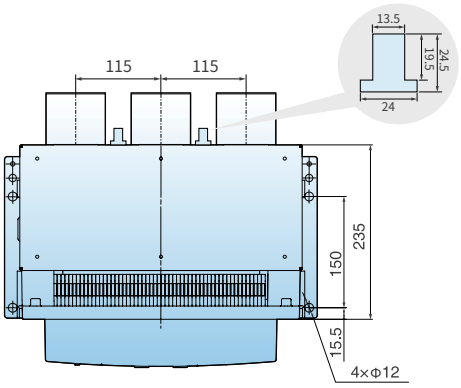


Standard

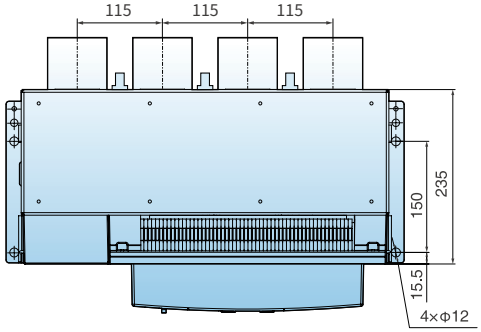


Extended

Horizontal Wiring

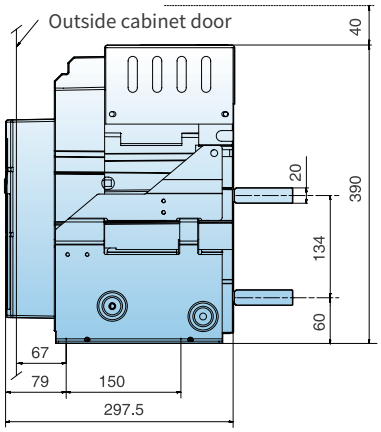


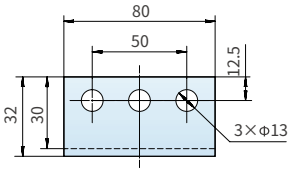
3pole



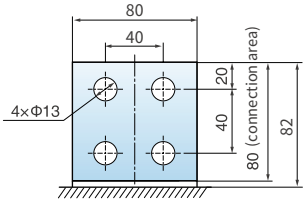
4pole

Distance for dismantling the arc extinguishing chamber



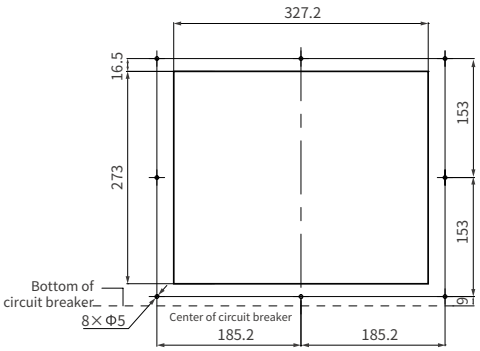


Standard

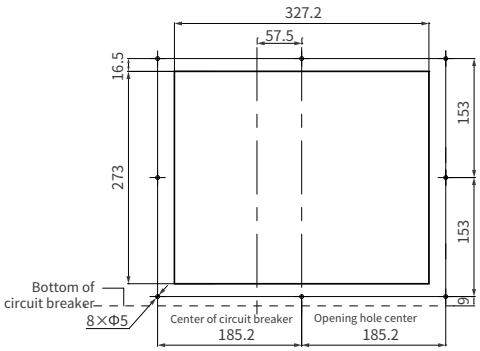


Extended

Cabinet door open hole dimension



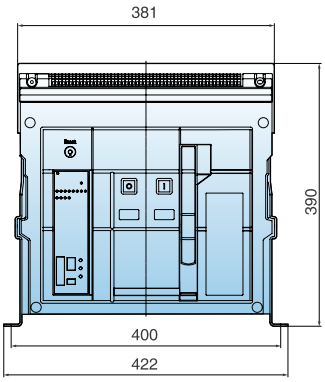
3P



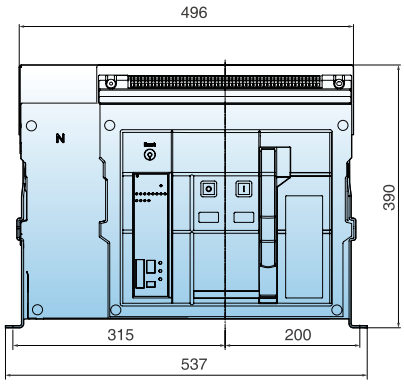
4P

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

Front view

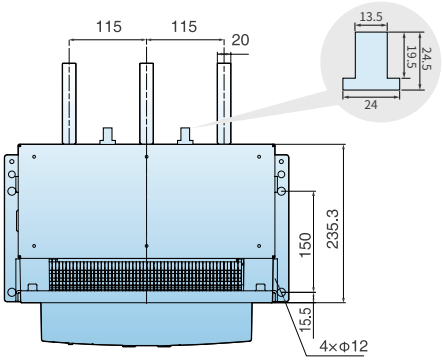


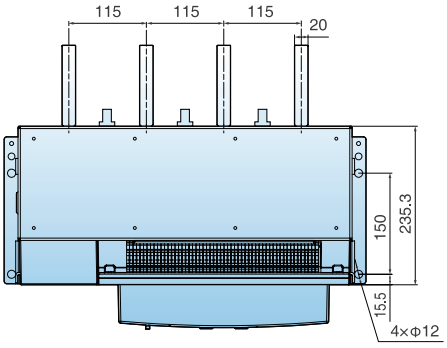
3pole



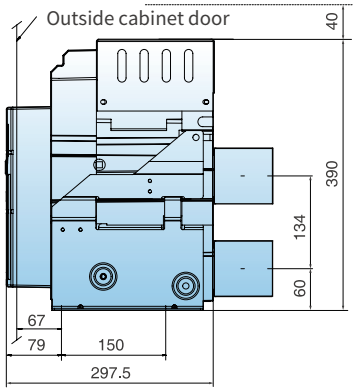
4pole

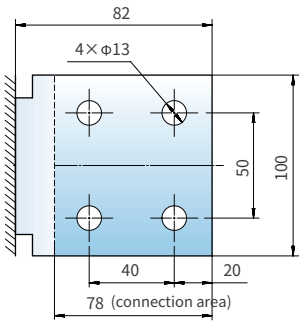
Vertical Wiring





Distance for dismantling the arc extinguishing chamber

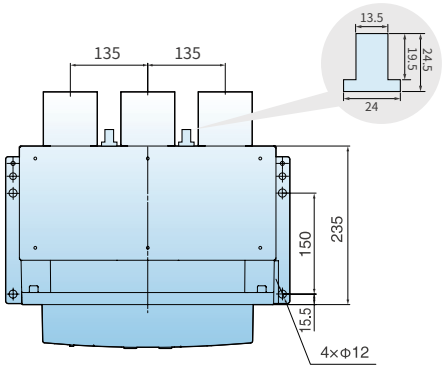


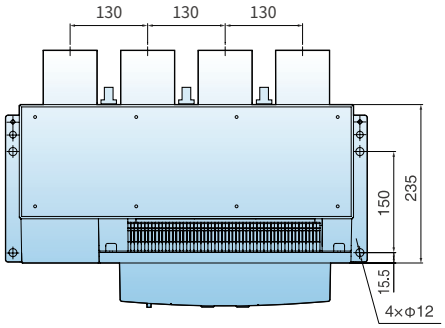


Size and Connection

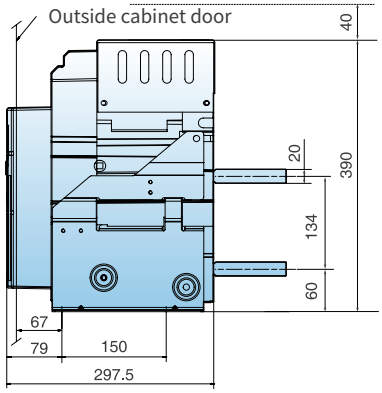
VOZWEI

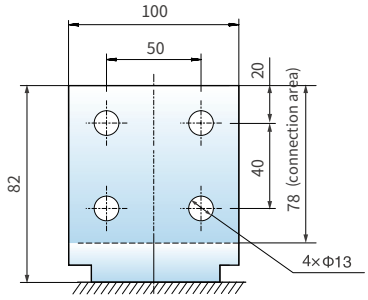
Horizontal Wiring



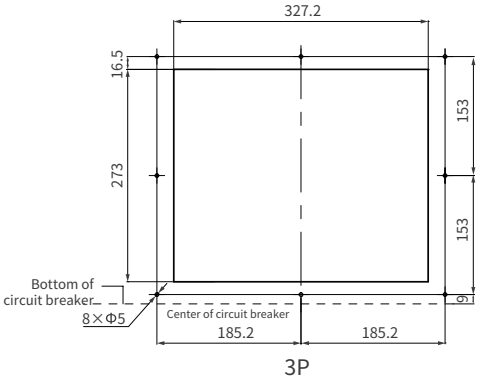


Distance for dismantling the arc extinguishing chamber

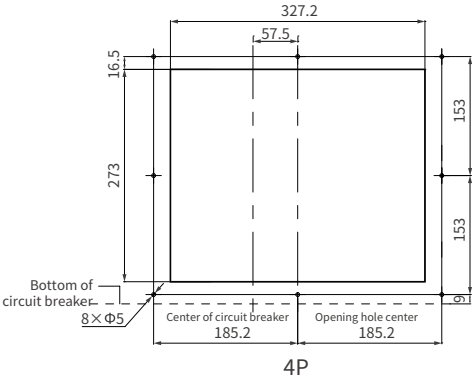




Cabinet door open hole dimension



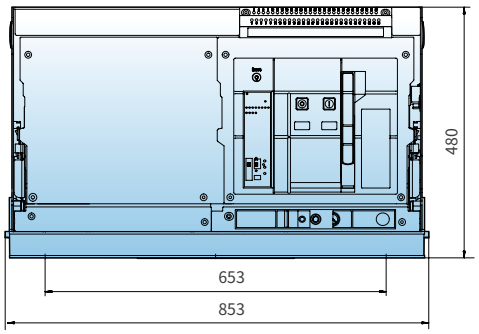
3P

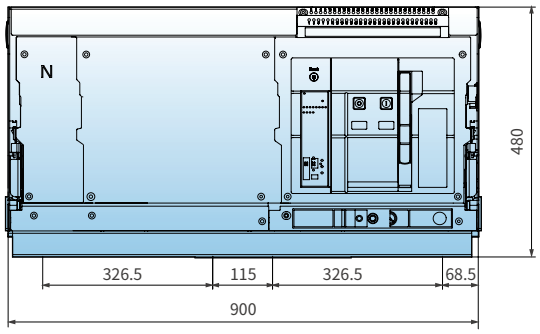


4P

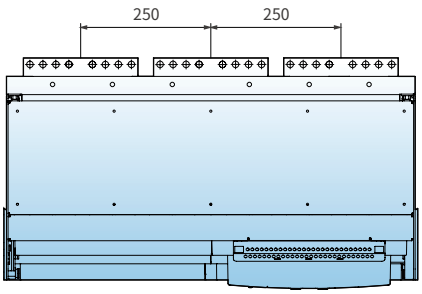
Drawout type (VW3-63H/VW3-63HU/VW3-63HV, 4000～5000A)

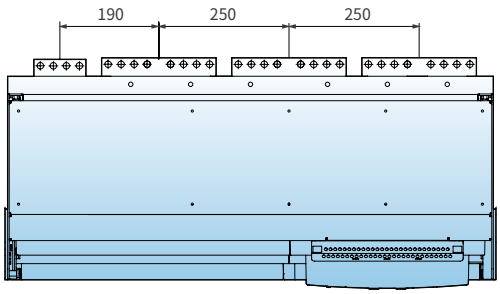
Front view

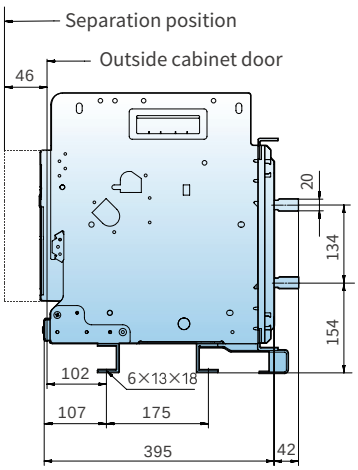


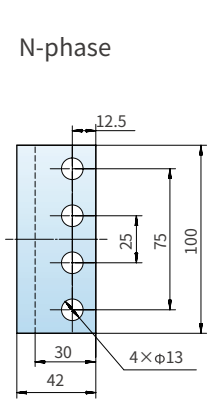


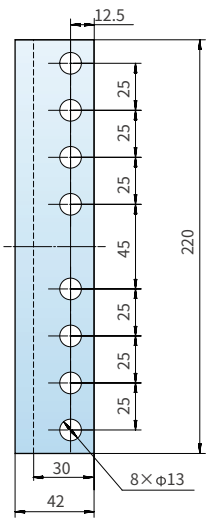
Horizontal Wiring





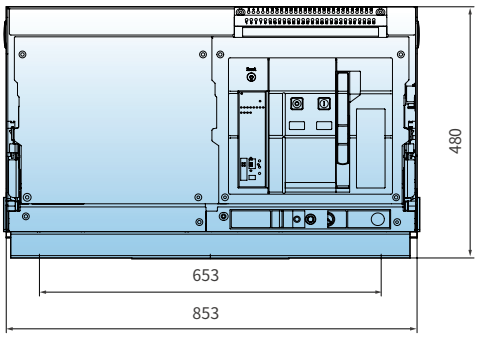


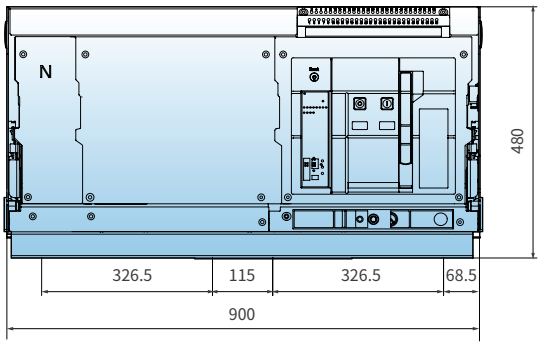




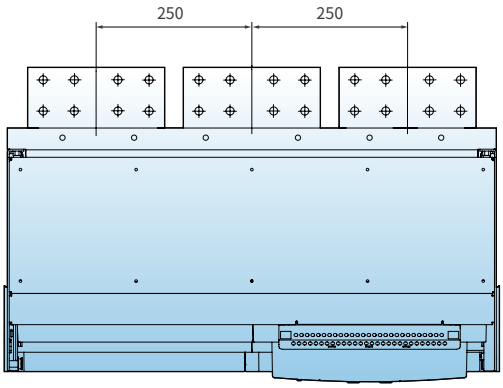
Drawout type (VW3-63H/VW3-63HU/VW3-63HV, 6300A)

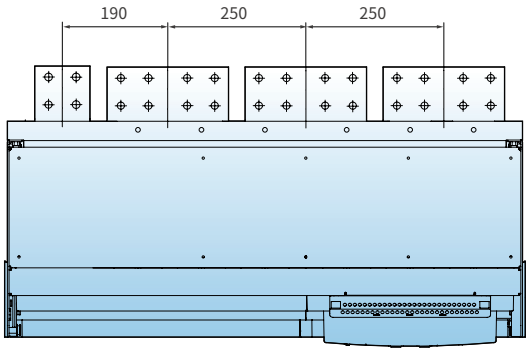
Front view

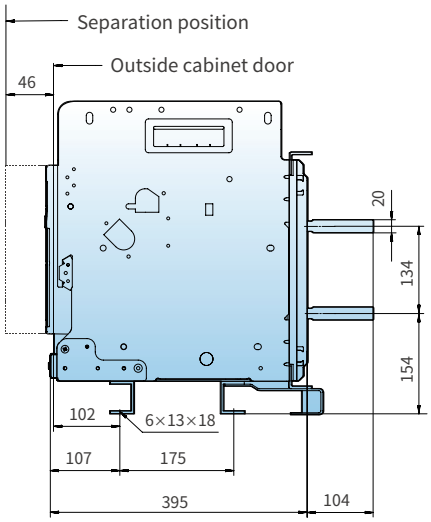




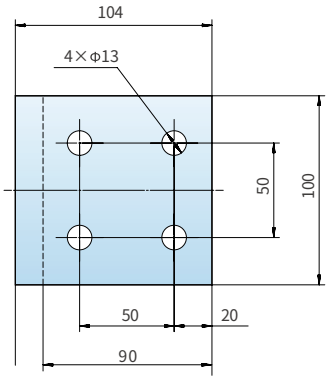
Horizontal Wiring

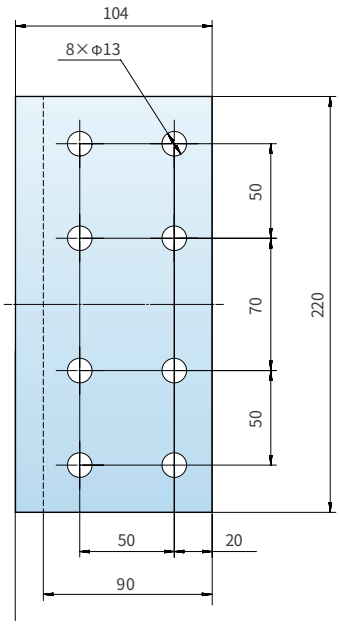






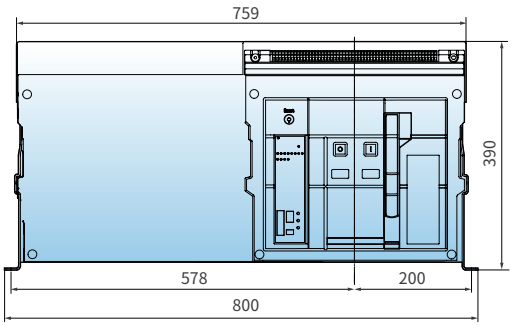
N-phase

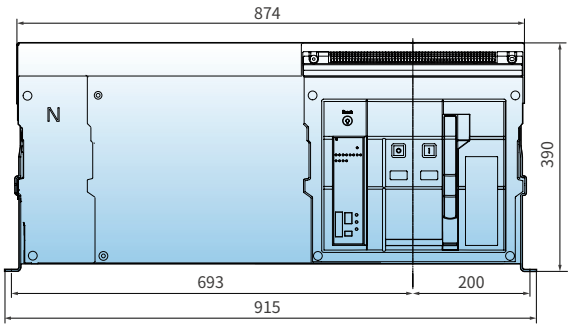




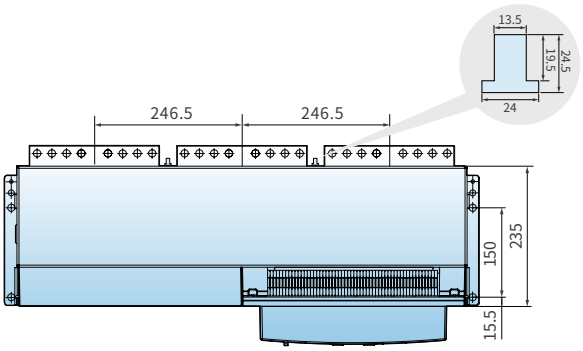
Fixed type (VW3-63H/VW3-63HU/VW3-63HV, 4000~5000A)

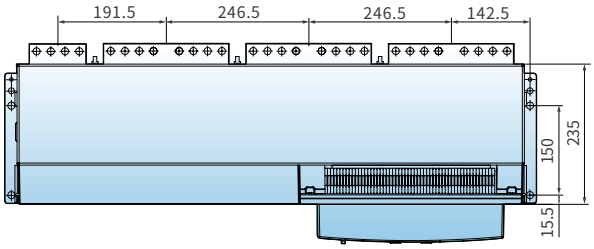
Front view



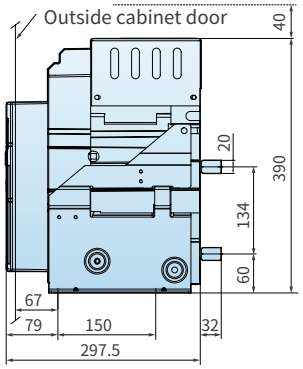


Horizontal Wiring

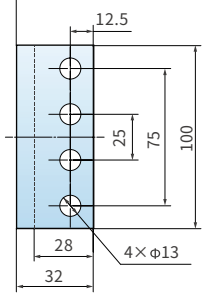


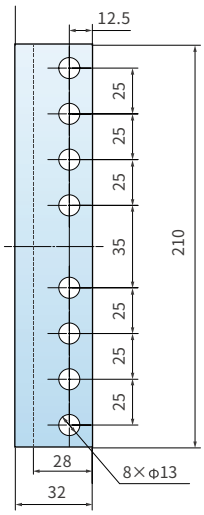


Distance for dismantling the arc extinguishing chamber



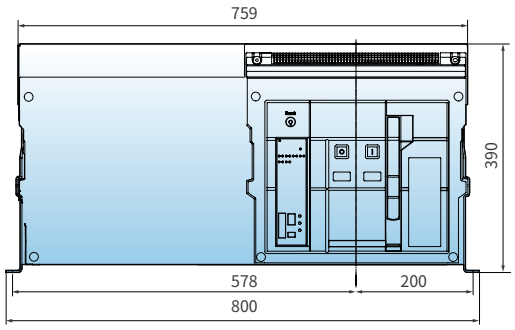
N-phase

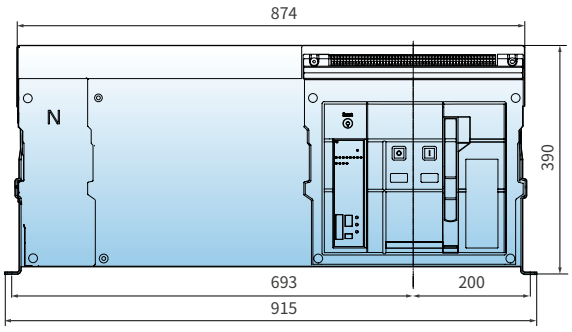


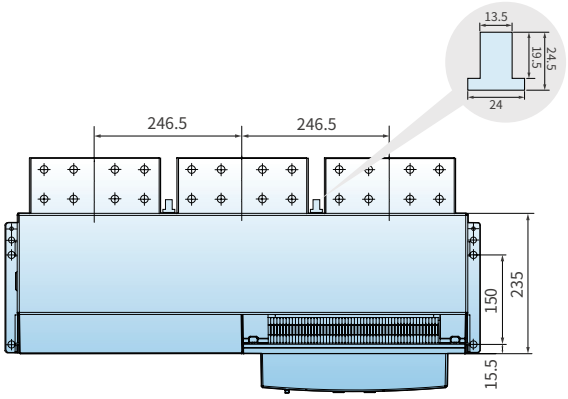


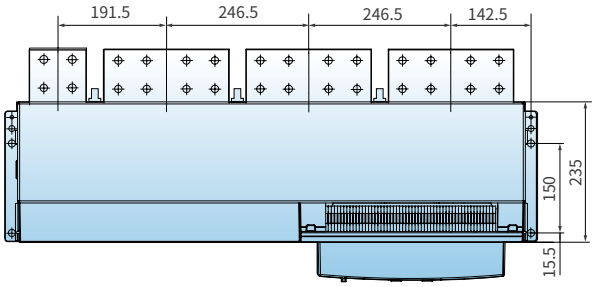
Fixed type (VW3-63H/VW3-63HU/VW3-63HV, 6300A)

Front view

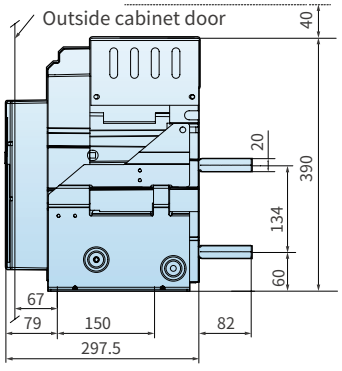


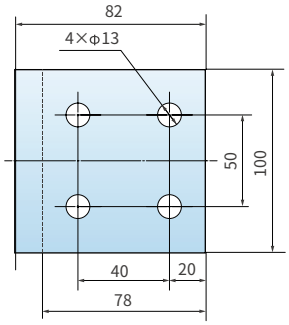


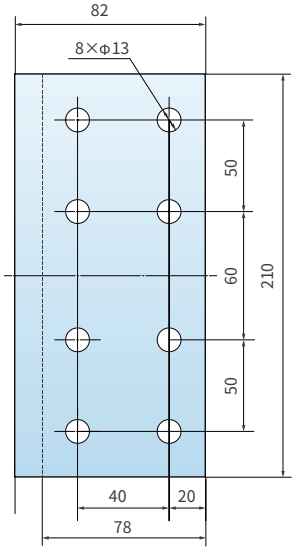




Distance for dismantling the arc extinguishing chamber

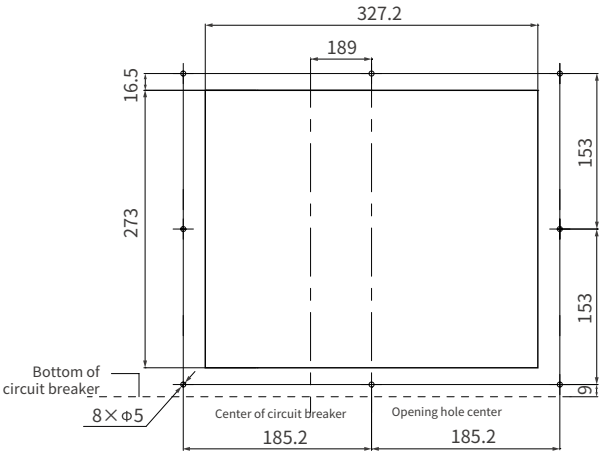




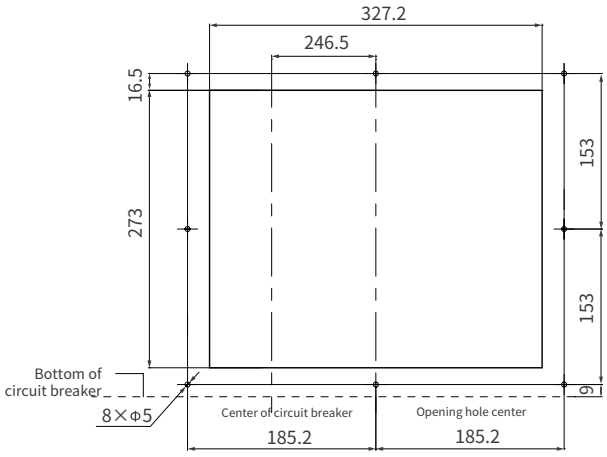


VW3-63H/VW3-63HU/VW3-63HV Cabinet door open hole dimension

Cabinet door open hole dimension Fixed type

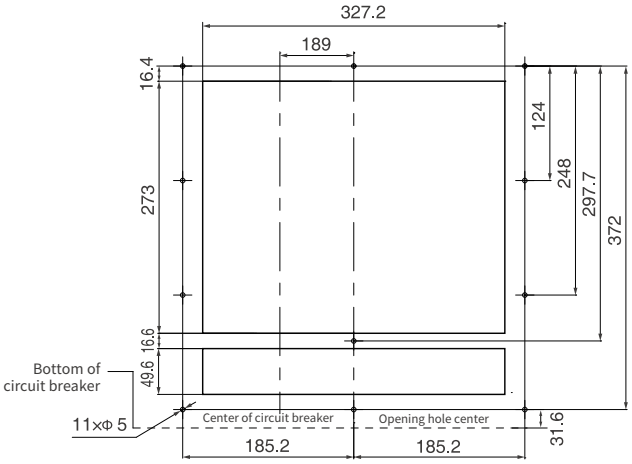


3P

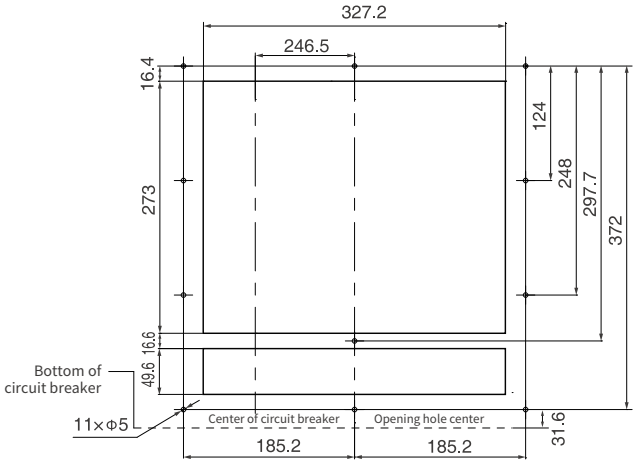


4P

Cabinet door open hole dimension Drawout type



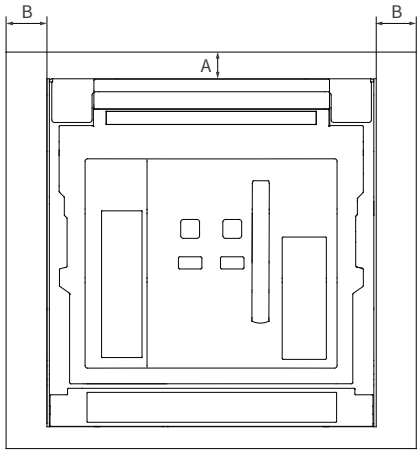
3P



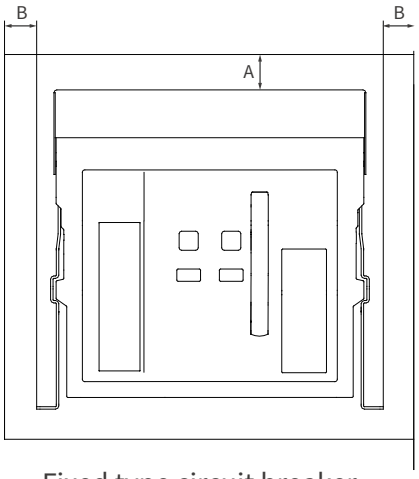
4P

Size and Connection

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
	Contact wear equivalent	☐ J
Required accessories	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
	Closed electromagnet	☐ B1-AC400V ☐ B2-AC230V/DC220V ☐ B4-AC/DC110V ☐ B5-DC24V
Optional accessories	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

Ordering Notes

VOZWEI

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 $I_{\triangle n}$_____A	Current leakage action time $t_{\triangle n}$_____s
		Load monitoring1 current setting value I_{c1}_____A	Inverse time-limit time t_{c1}_____s
		Load monitoring2 currentI setting value I_{c2}_____A	Fixed time-limit t_{c2}_____s
Other requirements			