

# Catalogue

Wenzhou Xucky Electric Co.,Ltd

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Air Circuit Breaker

# ABOUT CONTENTS

## XUW2

### Series Air Circuit Breaker

General .....	01~04
Product Characteristics .....	05
Technical Specification .....	05
Controller .....	06~15
Accessories .....	16~22
List of accessories .....	16
Electrical control accessories .....	17~18
Signal output accessories .....	18~19
Controller accessories .....	20
Safety protection accessories .....	21
Lock & interlock device .....	21~22
Power supply switching device .....	22
Overall & mounting dimension .....	23~29
XUW2-2500 .....	23~24
XUW2-4000 .....	25~26
XUW2-6300 .....	27
Bore diameter for frame .....	27
Notes .....	27
Connection diagram .....	28~29
Order .....	29

## XUW3

### Series Air Circuit Breaker

General .....	30~35
Product Characteristics .....	36
Technical Specification .....	36
Controller .....	37~46
Accessories .....	47~53
List of accessories .....	47
Electrical control accessories .....	48~49
Signal output accessories .....	50~51
Controller accessories .....	52
Safety protection accessories .....	52
Lock & interlock device .....	52~53
Power supply switching device .....	53
Overall & mounting dimension .....	54~62
XUW3-1600 .....	54~55
XUW3-2500 .....	56~57
XUW3-4000 .....	58~61
Bore diameter for frame .....	61~62
Notes .....	62
Connection diagram .....	63

# XUW2

Series Air Circuit Breaker





### Mounting Construction

Draw out-type  
Fixed-type

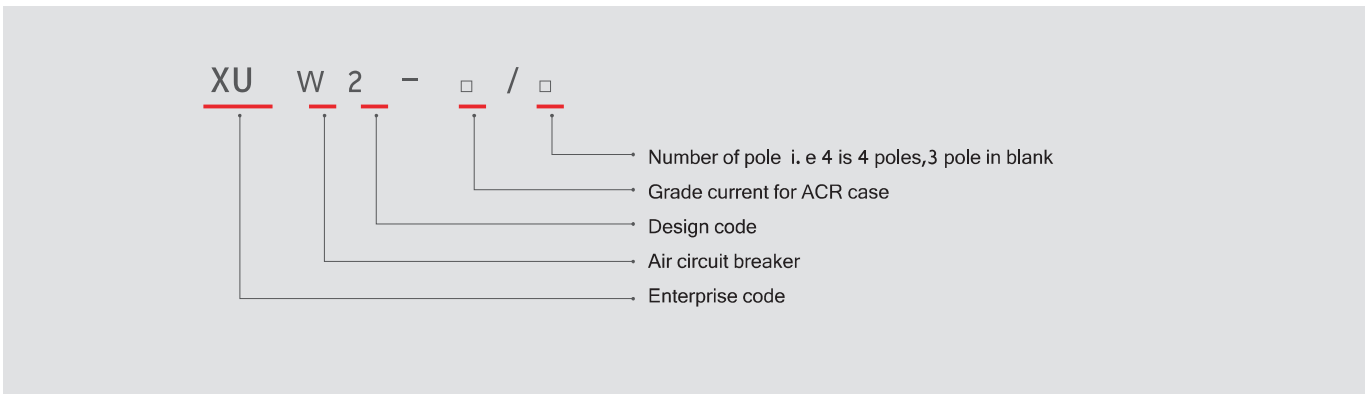
### Mounting Mode

Upper & Bottom incoming for main circuit are acceptable.  
EPRW2 series with horizontal connection mode.

### Application Scope

XUW2 series air circuit breaker, which is suitable for AC 50Hz, Rated current 630A~6300A, Rated insulation voltage 1000V, Rated operation voltage AC400V, AC690V in distribution system and which distribute the power and protect circuits, power supply device against fault to overload, under-voltage, short-circuit, single-phase grounding damage and also disconnect function. Air circuit breaker with multiple protective functions and high selection protection, which improve the reliability of power supply.

### Type symbol



### Standard & Certificate

©Compliance with Part No.:1 General of IEC60947 Low Switch and Control Equipment  
Compliance with Part No.: 2 Low Voltage Switch Circuit Breaker of IEC60947 Low Switch and Control Equipment

## Normal service conditions

Ambient temperature: -5°C~+40°C; the average value no more than +35°C within 24 hours. Over +40°C the user shall be de-rating capacity as described in the following

Ambient temperature		+40°C	+50°C	+60°C
XUW2-2500	630	630	630	630
	800	800	800	800
	1000	1000	1000	1000
	1250	1250	1250	1250
	1600	1600	1550	1550
	2000	2000	1900	1750
	2500	2500	2150	2000
XUW2-4000	2500	2500	2500	2500
	2900	2900	2900	2900
	3200	3200	3100	2900
	4000	4000	3550	3200
XUW2-6300	5000	5000	5000	5000
	6300	6300	5500	4800

Ultimate air conditions: Maximum temperature +40°C, Air relative humidity no more than 50%. Higher relative humidity while lower temperature, for example, 20°C up to 90%. To make provision for occasional incur due to dewing.

Site altitude: ≤ 2000m.

Level of contamination: III

Mounting conditions: Perpendicularity & angularity ≤ 5° . Air circuit breaker shall be installed under non-explosive, non-conducted dust, non-sufficient corrosion metal and without destructive insulation conditions.

## Mounting category

Mounting category IV for main circuits of air circuit breaker, under-voltage trip coil and the power transformer primary coil. Mounting category III for auxiliary circuits, control circuits.

## Degree of protection

IP30, IP40 (Mounting protective frame)

## Utilization category

B

## Draw out -type air circuit breaker three positions lock

Draw out-type base shall have connection, testing and opening position by a indicator. Air circuit breakers shall be locked respectively on the three positions by the handle and shall push three-position unlock button for release.

## Draw out -type air circuit breaker position locking device

Draw out -type base shall have connection/testing/opening position locking padlock. Drawer-type base cannot be moved other position after pulling out the padlock. The padlock is provided for the user.

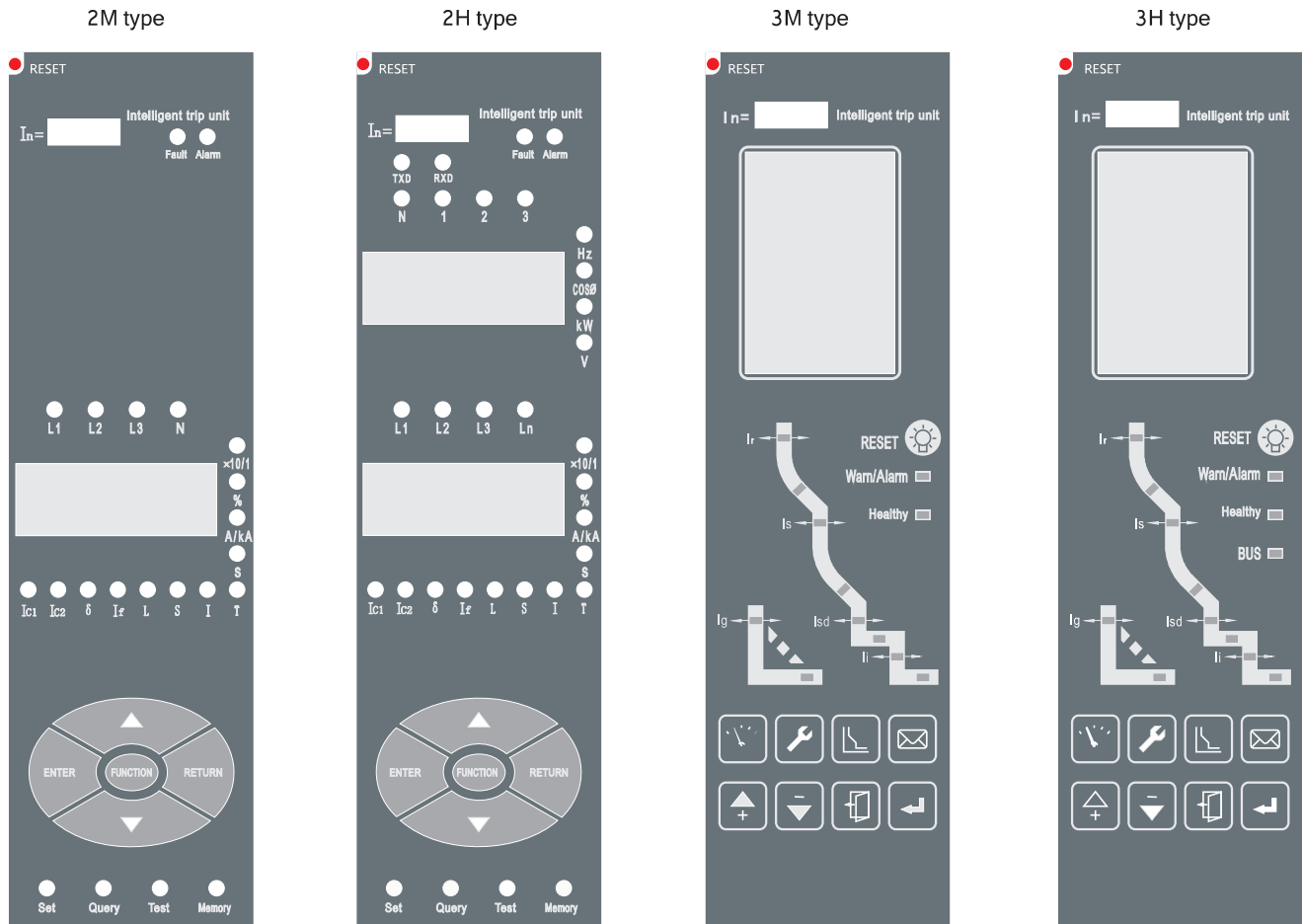
## Product Characteristics

### Product Characteristics

Type		XUW2-2500	XUW2-4000	XUW2-6300	
Rated current (A)	In	630,800,1000,1250, 1600,2000,2500	2500,2900,3150,3200, 3600,3900,4000	5000,6300	
Rated service voltage (V)	Ue	AC 400V,690V	AC 400V,690V	AC 400V,690V	
Rated insulation voltage (V)	Ui	1000V	1000V	1000V	
Rated impulse withstand voltage (kV)	Uimp	12	12	12	
Number of poles	P	3,4	3,4	3,4	
Rated current for N pole (A)		100%In	100%In	50%In	
Rated ultimate short-circuit breaking capacity (kA)	Icu	400V	80	100	120
		690V	50	65	75
Rated operation short-circuit breaking	Ics	400V	80	80	100
		690V	40	65	65
Rated short-circuit withstand current (kA)	Icw	400V	55	80	100
		690V	40	50	65
Breaking time (ms)		< 30			
Closing time (ms)		< 70			
Life (C/O period)	Mechanism	15000	10000	5000	
	Electric	7000	7000	1500	
Overall dimension : H×W×D (mm)	Draw out -type	3P	433×375×390	433×435×390	433×895×390
		4P	433×470×390	433×550×390	433×895×390
	Fixed- type	3P	402×368×290	402×426×290	/
		4P	402×463×290	402×541×290	/

# Controller

## Controller category



## Controller functions

Function items	2M	2H	3M	3H
<b>Display interface</b>				
Digital tube display	●	●	—	—
LCD display	—	—	●	●
<b>Protection function</b>				
Overload long delay protection	●	●	●	●
Overload thermal memory	●	●	●	●
Overload pre-alarm/alarm signaling operation	●/○	●/○	●/○	●/○
Short-circuit short delay protection	●	●	●	●
Short delay thermal memory	●	●	●	●
Short-circuit instantaneous protection	●	●	●	●
Grounding protection (Differential T)	●	●	●	●
Grounding alarm/ alarm signaling operation	●/○	●/○	●/○	●/○
Leakage protection/alarm/ alarm signaling operation (and grounding protection for selection)	○/○/○	○/○/○	○/○/○	○/○/○
Neutral solidly grounding protection	●	●	●	●
Current asymmetric protection/alarm/alarm signaling operation	●/●/○	●/●/○	●/●/○	●/●/○
MCR/HSISC	○/○	○/○	○/○	○/○
Load monitor/alarm/alarm signaling operation	○/○/○	●/●/○	○/○/○	●/●/○

## Controller functions

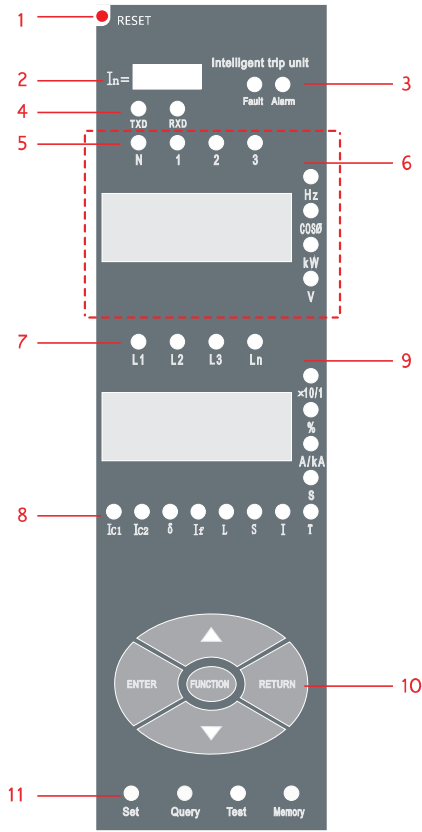
Function items	2M	2H	3M	3H
<b>Protection function</b>				
Under-voltage protection/ alarm/alarm signaling operation	—	—	●/●/○	●/●/○
Over-voltage protection/ alarm/alarm signaling operation	—	—	●/●/○	●/●/○
Voltage asymmetric protection/alarm/alarm signaling operation	—	—	●/●/○	●/●/○
Phase sequence protection/alarm/alarm signaling operation	—	—	●/●/○	●/●/○
Under-frequency protection /alarm/alarm signaling operation	—	—	●/●/○	●/●/○
Over-frequency protection /alarm/alarm signaling operation	—	—	●/●/○	●/●/○
Current allowable-value protection/alarm/alarm signaling operation	—	—	●/●/○	●/●/○
Reverse-power protection/alarm/alarm signaling operation	—	—	●/●/○	●/●/○
<b>Testing functions</b>				
Current testing (Phase-poles, N pole and Grounding)	●	●	●	●
Voltage testing (Phase-voltage, Cable-voltage and Voltage asymmetric rate)	○	● (no-voltage asymmetric rate)	●	●
Phase sequence testing	—	—	●	●
Frequency testing	○	●	●	●
Allowable-value testing (Current)	—	—	●	●
Allowable-value testing (Power)	—	—	●	●
Power testing (Active & Reactive power)	○	● (active power)	●	●
Power factor testing	—	● (total power factor)	●	●
Power energy testing (Active & Reactive power energy)	—	—	●	●
Harmonics testing	—	—	○	○
<b>Maintenance functions</b>				
Fault status indicating	●	●	●	●
Fault record and query	●	●	●	●
Past record of peak current	—	—	●	●
Past record of alarm and query	—	—	●	●
Fault to trip signaling operation	●	●	●	●
Self-diagnostics function	●	●	●	●
Analog tripping test function	●	●	●	●
Contacts abrasion equivalent(alarm) query	●	●	●	●
Operation times query	●	●	●	●
Clock functions	○	○	●	●
<b>Other</b>				
Signal unit	○	●	○	●
Communication	—	●	—	●
Regional selection interlock	○	○	○	○

Remarks: "●" with this function "○" functions for selection "—" without this function



# Controller

## Controller Panel

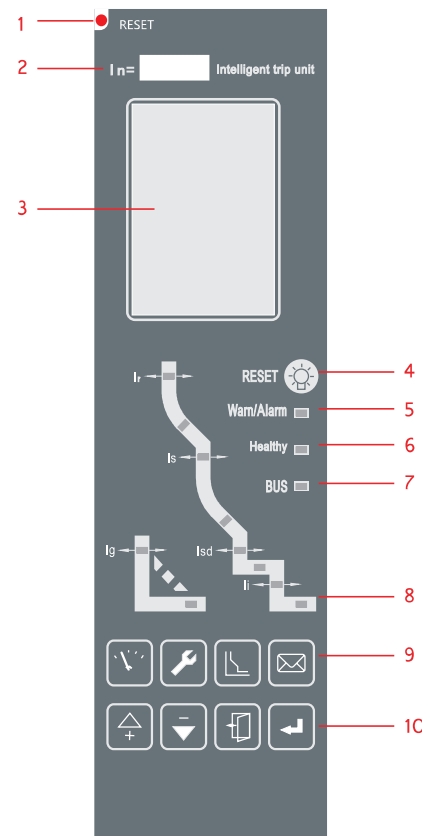


### 2M/2H type controller

1. Fault to trip & reset
2. Rated current for name-plate
3. In sequence of fault & alarm indicating
4. In sequence of communication emission & receiver indicating
5. In sequence of N phase, A phase, B phase, C phase voltage indicating
6. In sequence of frequency, power factor, power, voltage indicating from upper to bottom
7. In sequence of A phase, B phase, C phase, N phase current indicating
8. In sequence of load monitor 1, load monitor 2, asymmetric current, grounding protection, over-load long delay, short-circuit instantaneous indicating
9. In sequence of opening & closing time, main contacts abrasion rate, current unit, time, self-diagnostics fault statues indicating from upper to bottom
10. 5 pieces operation buttons
11. In sequence of controller setting, query, testing, store service statues indicating

Notes:

1. The dashed box is controller with voltage indicating function. Without indicating if no.,
2. Serial 4 is controller with communication function. Without indicating if no.
3. A/K/A of serial 9, light fixed is current A and continuous blinking in kA
4. kW of serial 1, light fixed is active power and continuous blinking is reactive power



### 3M/3H type controller

1. Fault to trip & reset
2. Rated current for name-plate
3. LCD indicating interface
4. Fault/alarm resetting button
5. Fault/alarm LED indicating (LED without light while normal working, LED with continuous blinking quickly while fault to trip, LED with light fixed while alarm)
6. LED always continuous blinking while controller on power and normal working status
7. Communication indicating (Modbus: extinguish without communication. Continuous blinking while communication. Proibus: extinguish without communication. Light fixed while communication)
8. Current LED (Fault to trip at corresponding LED light flash indicating fault type. LED light fixed indicating present setting items while protective parameter setting)
9. In sequence of testing function, setting function, protection function and information function button from left to right.
10. In sequence of upward, downward, ESC and selection OK button from left to right

Remarks: Serial 7 is controller with communication function. No indicating if no-communication function.

Controller Setting and Protective Characteristics

Over-load long delay protection 2M/2H type & 3M/3H type			
Current setting IR	(0.4~1.0 or 1.25) In or OFF (OFF-function close) Notes: Distribution protection is 1.0 In. Generator protection 1.25In.		
6 categories protective curve	SI: Normal inverse time = 0.01396 T <sub>R</sub> / (N0.02-1) VI: Fast inverse time t = T <sub>R</sub> / (N-1) EI (G) : Express inverse time (use of general distribution protection) t = 3 T <sub>R</sub> / (N2-1) EI (M) : Express inverse time (use of generator protection) t = 2.95 T <sub>R</sub> × ln [N2/ (N2-1.15) ] HV: High voltage fuse compatibility t = 15T <sub>R</sub> / (N4-1) I <sup>2</sup> t Normal distribution protection t = 2.25T <sub>R</sub> /N2 (factory default) N = I/I <sub>R</sub> I-fault current t-long delay acting time I <sub>R</sub> -long delay setting current T <sub>R</sub> -long delay setting time  Remarks: only normal distribution protection I <sup>2</sup> t for 2M/2H type controller. other protection curve shall be order. 3M/3H type controller with 6 protective curve for selection.		
6) Normal distribution protection I <sup>2</sup> t time setting T <sub>R</sub> (1.5I <sub>R</sub> )	2M/2H: 15,20,25,30,40,50,60,80,100,120,160,200,240,320,400,480 (s) 3M/3H: 15,30,60,120,240,360,480,600,720,840,960 (s)		
1) -5) Protective curve type	3M/3H: C1-C16 over-load long delay protective operating delay time in the drop-down list		
Protective characteristics (Accuracy ±10%)	Current (I/I <sub>R</sub> )	Trip time	
	1.05	> 2h no-acting	
	1.3 (Distribution protection)	< 2h acting	
	1.2 (Motor protection)	< 2h acting	
	≥ 1.2I <sub>R</sub>	Acting time as per 6 categories protection type formula calculator or curve query	
Thermal memory time	2M/2H type: 30 ms (ON) or power failure release 3M/3H type: instantaneous, 10ms, 20ms, 30ms, 45ms, 1h, 2hrs, 3hrs or power failure release Remarks: connecting controller for auxiliary power supply with thermal memory function and auxiliary power supply failure, that is, release thermal memory.		
Short-circuit short delay 2M/2H type & 3M/3H type			
Current setting I <sub>sd</sub>	(1.5~15) I <sub>R</sub> or OFF (OFF-function close)		
Time setting T <sub>sd</sub> (s)	Tsd1 inverse time	2M/2H type: 0.1~1	
	Tsd2 definite time	3M/3H type: 0.1, 0.2, 0.3, 0.4 (selection: 0.1~1)	
Protective characteristics (Accuracy ±10%)	Current (I/I <sub>sd</sub> )	Trip time	
	≤ 0.9	No-acting	
	≥ 1.1	inverse time I <sub>sd</sub> ≤ I ≤ 8I <sub>R</sub>	curve 1-5 and over-load long delay simultaneously, but curve speed faster 10 times. curve 6 characteristics formula t = 64T <sub>sd</sub> /N2
		definite time I > 8I <sub>R</sub> (or I ≥ I <sub>sd</sub> )	delay protection as per definite time delay setting time T <sub>sd</sub>
Thermal memory time	2M/2H type: 15min (ON) or power failure release 3M/3H type: instantaneous, 10ms, 20ms, 30ms, 45ms, 1h, 2hrs, 3hrs or power failure release Remarks: connecting controller for auxiliary power supply with thermal memory function and auxiliary power supply failure, that is, release thermal memory.		
Short-circuit instantaneous protection 2M/2H type & 3M/3H type			
Current setting I <sub>i</sub>	2M/2H type: 1.0In~50kA or OFF (OFF-function close) 3M/3H type: (1.0~20) In or OFF (OFF-function close)		
Protective characteristics (Accuracy ±10%)	Current (I/I <sub>i</sub> )	trip time	
	≤ 0.85	no-acting	
	> 1.15	< 40ms acting	

## Controller

### Controller setting and Protective Characteristics

MCR/HSISC protection 2M/2H type & 3M/3H type			
Current setting $I_{MCR}$		Factory default : 35kA Remarks: this is factory default which the user cannot adjust (30~100kA for selection)	
Current setting $I_{HSISC}$		EPRW2-2500: 50kA EPRW2-4000、6300: 65kA Remarks: this is factory default which the user cannot adjust (30~100kA for selection)	
Protective characteristics (Accuracy $\pm 10\%$ )	Current ( $I/I_{MCR}/I_{HSISC}$ )		Trip time
	<0.8		no-acting
	>1.0		<30ms acting
Grounding protection/alarm 2M/2H type & 3M/3H type			
Protection type		Differential type (T) , Earth current type (W) ,alternative. factory default is differential type (T)	
Current setting $I_g$		(0.2~1.0) In or OFF (OFF-fuction close)	
Time setting $T_g$	Definite time delay $T_g$ (s)	0.1~1or OFF (OFF-only alarm and no trip)	
	Inverse time factor KG	1.5~6 or OFF (OFF-grounding protection is definite time)	
Protective characteristics (Accuracy $\pm 10\%$ )	Current ( $I/I_g$ )		Trip time
	$\leq 0.8$		No-acting (no alarm)
	$\geq 1.0$	$(I/I_g) < KG$	Inverse time delay acting (or alarm) $t=T_g \times KG \times I_g/I$ Definite time delay acting (or alarm) as per time setting
Grounding alarm 3M/3H type			
Performance mode		Alarm /Close	
Alarm operating current setting		(0.2~1.0) In	
Alarm operating delay time setting		0.1~1.0 (s)	
Alarm return current setting		(0.2~1.0) In	
Alarm return delay time setting		0.1~1.0 (s)	
Alarm operating characteristics (Accuracy $\pm 10\%$ )	Multiple of current ( $I/I$ setting)		Acting time
	<0.8		No-alarm
	$\geq 1.0$		Alarm (time as per alarm operating time setting)
Alarm return characteristics (Accuracy $\pm 10\%$ )	$\geq 1.0$		Alarm without return
	$\leq 0.9$		alarm return (time as per alarm operating time setting)
Neutral protection 2M/2H type & 3M/3H type			
Neutral protection setting		2M/2H type: 50%In,100%In or OFF 3M/3H type: 50%In,100%In,160%In,200%In or OFF OFF-close N phase protective function	
Protective characteristics		Same as phase and poles over-load long delay protection, short-circuit short delay protection,short-circuit instantaneous protection and grounding protection.	
Leakage protection/alarm 2M/2H type & 3M/3H type			
Current setting $I_{\Delta n}$ (A)		0.5~30 or OFF (OFF-function close)	
Operating delay time $T_{\Delta n}$ (s)		Instantaneous,0.06,0.08,0.17,0.25,0.33,0.42,0.5,0.58,0.67,0.75,0.83	
Protective characteristics (Accuracy $\pm 10\%$ )	Multiple of current ( $I/I_{\Delta n}$ )		Trip time
	<0.8		No-acting
	$\geq 1.0$		Acting (time in the drop-down list)

## Controller Setting and Protective Characteristics

Trip time t (s) Accuracy ( $\pm 10\%$ )	Setting time	Instantaneous	0.06	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83	
	$I\Delta n$	0.04	0.36	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	
	$2I\Delta n$	0.04	0.18	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	
	$5I\Delta n$	0.04	0.072	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
$10I\Delta n$														
Alarm performance mode (3M/3H type controller)			Alarm/ Close											
Alarm acting current setting			0.5~30 (A)											
Alarm acting delay time setting			0.1~1.0 (s)											
Alarm return current setting			0.5~30 (A)											
Alarm return delay time setting			0.1~1.0 (s)											
Alarm operating characteristics (Accuracy $\pm 10\%$ )			Multiple of current ( $I/I\Delta n$ )				Acting time							
			$< 0.8$				No alarm							
Alarm return characteristics (Accuracy $\pm 10\%$ )			$\geq 1.0$				Alarm (time as per alarm acting time setting)							
			$\leq 0.9$				Alarm return (time as per alarm return time setting)							
Current asymmetric protection/Alarm 2M/2H type & 3M/3H type														
2M/2H type			Current asymmetric rate setting $\delta$					(40%~100%) or OFF (OFF-function close)						
			Acting delay time setting T $\delta$					0.1~1.0 (s) or OFF (OFF-alarm no trip)						
3M/3H type			Performance mode					Alarm /Trip /Close						
			Protective start setting					5%~60%						
			Acting delay time setting T $\delta$					0.1~40 (s)						
			Alarm acting return setting					5%~Start setting				Performance mode is alarm for setting this item		
			Alarm return delay time					10~200 (s)						
Protective characteristics (Accuracy $\pm 10\%$ )			Actual current asymmetric rate/setting					Trip time						
			$< 0.9$					No-acting (No-alarm)						
			$\geq 1.1$					Acting (or alarm) as per setting delay time						
Alarm return characteristics (Accuracy $\pm 10\%$ )			Actual current asymmetric rate/setting					Acting time						
			$\geq 1.1$					No return						
			$\leq 0.9$					Return as per alarm return delay time						
Allowable current value protection/Alarm 3M/3H type														
Performance mode			Close / Trip / Alarm (required current value protection for each phase setting)											
Protection/Alarm start setting			(0.2~1.0) $I_n$											
Protection acting delay time setting			15~1500 (s)											
Alarm acting return setting			0.2 $I_n$ ~ Start value					Performance mode is alarm for setting this item						
Alarm return delay time			15~3000 (s)											
Protective characteristics (Accuracy $\pm 10\%$ )			Multiple of current ( $I/I$ operating setting)					Trip time						
			$< 0.9$					No-acting (No-alarm)						
			$\geq 1.1$					Acting (or alarm) as per setting delay time						
Alarm return characteristics (Accuracy $\pm 10\%$ )			Multiple of current ( $I/I$ operating setting)					Acting time						
			$\geq 1.1$					No return						
			$\leq 0.9$					Return as per alarm return delay setting time						

## Controller

### Controller Setting and Protective Characteristics

Under-voltage protection /Alarm 3M/3H type		
Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	100 (v) ~Return value	
Protection acting delay time setting	0.2~60 (s)	
Alarm acting return setting	Start value~1200 (v)	Performance mode is alarm for setting this item,, Return value $\geq$ start value
Alarm return delay time	0.2~60 (s)	
Protective characteristics (Accuracy $\pm 10\%$ )	Multiple of voltage (Umin /Acting setting)	Trip time
	>1.1	No-acting (No-alarm)
	$\leq 0.9$	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$ )	Multiple of voltage (U min /Operating setting)	Acting time
	<0.9	No return
	$\geq 1.1$	Return as per alarm return delay setting time
Over-voltage protection/Alarm 3M/3H type		
Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	Return value ~1200 (v)	
Protection acting delay time setting	0.2~60 (s)	
Alarm acting return setting	100 (v) ~ Start value	Performance mode is alarm for setting this item,, Return value $\geq$ start value
Alarm return delay time	0.2~60 (s)	
Protective characteristics (Accuracy $\pm 10\%$ )	Multiple of voltage (U min /Acting setting)	Trip time
	<0.9	No-acting (No-alarm)
	$\geq 1.1$	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$ )	Multiple of voltage (U min /Return setting)	Acting time
	$\geq 1.1$	No return
	$\leq 0.9$	Return as per alarm return delay setting time
Voltage asymmetric protection/Alarm 3M/3H type		
Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	2%~30%	
Protection acting delay time setting	0.2~60 (s)	
Alarm acting return setting	2%~ Start value	Performance mode is alarm for setting this item,, Return value $\geq$ start value
Alarm return delay time	0.2~60 (s)	
Protective characteristics (Accuracy $\pm 10\%$ )	Actual voltage asymmetric rate/setting	Trip time
	<0.9	No-acting (No-alarm)
	$\geq 1.1$	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$ )	Actual voltage asymmetric rate/setting	Acting time
	>1.1	No return
	$\leq 0.9$	Return as per alarm return delay setting time

## Controller Setting and Protective Characteristics

Under-frequency, Over-frequency/Alarm 3M/3H type					
Performance mode		Close / Trip / Alarm			
Under-frequency	Protection/Alarm start setting		45 (Hz) ~ Return value		
	Acting delay time setting		0.2~5.0 (s)		
	Alarm acting return setting		Start value ~65 (Hz)	Performance mode is alarm for setting this item. Return value $\geq$ start value	
	Alarm return delay time setting		0.2~36 (s)		
Over-frequency	Protection/Alarm start setting		Return value ~65 (Hz)		
	Acting delay time setting		0.2~5.0 (s)		
	Alarm acting return setting		45 (Hz) ~Start value	Performance mode is alarm for setting this item. Return value $\geq$ start value	
	Alarm return delay time setting		0.2~36 (s)		
Protection/Alarm acting characteristics		Same as under-voltage, over-voltage protection/Alarm			
Reverse power protection/Alarm 3M/3H type					
Performance mode		Close / Trip / Alarm			
Protection/Alarm start setting		5~500 (kW)			
Protection acting delay time setting		0.2~20 (s)			
Alarm acting return setting		5 (kW) ~ Start value	Performance mode is alarm for setting this item. Return value $\geq$ start value		
Alarm return delay time		1.0~360 (s)			
Protection/Alarm operating characteristics		Same as over-voltage protection/Alarm			
Phase sequence /Alarm 3M/3H type					
Performance mode		Close / Trip / Alarm			
Acting sequence setting range		$\Delta\varphi$ : A,B,C / $\Delta\varphi$ : A,C,B			
Acting/Alarm characteristics		Instantaneous			
Load monitor 2M/2H type & 3M/3H type					
2M/2H type	Current setting IC1、IC2		(0.2~1) In or OFF (OFF-function close)		
	Time setting		15, 20, 25, 30, 40, 50, 60, 80, 100, 120,160, 200, 240, 320, 400, 480 (s)		
	Output characteristics (Accuracy $\pm 10\%$ )	Load monitor mode		Multiple of current	Acting time
		Mode 1 (Independent control two branches load)		$\leq 1.05IC1$ or $IC2$	No operation
				$> 1.2 IC1$ or $IC2$	Delay replay operating (same as over-load delay characteristics curre)
		Mode 2 (Control the same branch load, require $IC1 > IC2$ )		$\leq 1.05 IC1$	No operation
$> 1.2 IC1$	Delay relay operating (same as over-load delay characteristics curre)				
		$< IC2$	Delay relay operating (delay fixed 60s)		
Thermal memory time		30min (OFF) or power failure release			
3M/3H type	Operating mode		Current setting	Time setting	
	Discharge I	Current mode 1	(0.2~1.0) In	(20%~80%) TR (TR: over-load long delay acting time)	
		Current mode 2			
		Power mode 1	200~10000 (kW)	10~3600 (s)	
		Power mode 2			
	Discharge II	Current mode 1	(0.2~1.0) In	(20%~80%) TR (TR: over-load long delay acting time)	
		Current mode 2	0.2In~ Discharge I	10~600 (s)	
		Power mode 1	200~10000 (kW)	10~3600 (s)	
Power mode 2		100 (kW) ~ Discharge I			

## Controller

### Controller Setting and Protective Characteristics

Signal unit (for selection) 2M/2H type & 3M/3H type					
2M/2H type controller					
Controller type	Contact 1	Contact 2	Contact 3	Contact 4	
2M	Load monitor 1 Discharge output	Load monitor 2 Discharge output	Alarm for system self-diagnostic fault alarm	Alarm for fault to trip	
2H	Load monitor 1 Discharge output	Load monitor 2 Discharge output	Remote control opening	Remote control closing	
Output function for signal contacts (Programmable)	1.alarm for short-circuit instantaneous fault to trip 2.alarm for grounding fault or residual current fault to trip 3.alarm for current asymmetric fault to trip 4.alarm for short-circuit delay fault to trip 5.alarm for over-load long delay fault to trip 6.alarm for fault to trip 7.load monitor 1 discharge output 8. load monitor 2 discharge output 9. alarm for system self-diagnostic fault 10.alarm for power grid fault status				
3M/3H type controller					
Function setting	In the drop- list for Switch output (DO) parameter				
Performance mode	Normally open level	Normally close level	Normally open impulse	Normally close impulse	
Impulse time	/		1~360 (s)		
Switch variable output (DO) parameter setting	General	Alarm	Fault to trip	Self-diagnostic alarm	Load monitor 1
	Load monitor 2	Over-load pre-report	Over-load fault	Short delay fault	Instantaneous fault
	Grounding/ Leakage fault	Grounding fault	Asymmetric current fault	Neutral phase fault	Under-voltage fault
	Over-voltage fault	Voltage asymmetric fault	Under-frequency fault	Over-frequency fault	Allowable-value fault
	Reverse power fault	Regional interlock	Closing	Opening	Phase sequence fault
	MCR/HSISC fault	Grounding interlock	Short-circuit interlock	A phase allowable-value fault	B phase allowable-value fault
	C phase allowable-value fault	N phase allowable-value fault	Allowable-value threshold		

### Controller Factory Setting (Approval)

Protection characteristics		Setting current	Setting time	Remarks
Over-load long delay		1.0In	30s	Thermal memory (ON-30ms)
Short-circuit short delay	Inverse time	4lr	/	—
	Definite time	6lr	0.2s	
Short-circuit instantaneous		10In	—	—
Neutral protection		100%In	—	—
Grounding protection	In ≤ 1250A	0.8In	Alarm no trip	—
	In ≥ 1600A	1200A		
Asymmetry current		OFF	—	The user open by themselves according to their request

## Controller Setting and Protective Characteristics

Over-load long delay protective operating delay table C1-C163M/3H type																	
Curre type	Fault current	Delay time (s)															
		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
SI	1.5Ir	0.61	0.98	1.47	2.46	3.68	4.91	6.14	8.29	11.1	17.2	24.6	36.8	49.1	61.4	73.7	86
	6Ir	0.14	0.22	0.33	0.55	0.82	1.1	1.37	2.06	2.47	3.84	5.48	8.22	10	13.7	16.4	19.2
	7.2Ir	0.12	0.2	0.3	0.5	0.75	0.99	1.24	1.86	2.23	3.48	4.97	7.45	9.93	12.4	14.9	17.4
VI	1.5Ir	2	3.2	4.8	8	12	16	20	27	36	56	80	120	160	200	240	280
	6Ir	0.2	0.32	0.48	0.8	1.2	1.6	2	2.7	3.6	5.6	8	12	16	20	24	28
	7.2Ir	0.16	0.26	0.39	0.65	0.97	1.29	1.61	2.18	2.9	4.52	6.45	9.68	12.9	16.1	19.4	22.6
EI (G)	1.5Ir	8	12.8	19.2	32	48	64	80	108	144	224	320	480	640	800	960	1120
	6Ir	0.29	0.46	0.69	1.14	1.71	2.29	2.86	3.86	5.14	8	11.4	17.1	22.9	28.6	34.3	37.1
	7.2Ir	0.2	0.32	0.47	0.79	1.18	1.57	1.97	2.66	3.54	5.51	7.87	11.8	15.7	19.7	23.6	25.6
EI (M)	1.5Ir	6.22	9.96	14.9	24.9	37.3	49.8	62.2	84	112	174	249	373	498	622	747	871
	6Ir	0.28	0.45	0.68	1.13	1.69	2.26	2.82	3.81	5.08	7.9	11.3	16.9	22.6	28.2	33.9	36.7
	7.2Ir	0.2	0.31	0.47	0.78	1.17	1.56	1.95	2.63	3.51	5.46	7.8	11.7	15.6	19.5	23.4	25.4
HV	1.5Ir	2.46	3.94	5.9	9.85	14.8	19.7	24.6	33.2	44.3	68.9	98.5	147	197	246	295	344
	6Ir	0.01	0.01	0.02	0.03	0.05	0.06	0.08	0.1	0.14	0.22	0.31	0.46	0.62	0.77	0.93	1
	7.2Ir	0	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.07	0.1	0.15	0.22	0.3	0.37	0.45	0.48
I2t	1.5Ir	15	30	60	120	240	360	480	600	720	840	960					
	6Ir	0.938	1.875	3.75	7.5	15	22.5	30	37.5	45	52.5	60					
	7.2Ir	0.651	1.302	2.604	5.208	10.4	15.6	20.8	26.0	31.3	36.5	41.7					

## Controller service power supply

Instrument transformer and auxiliary power supply for controller service source, so as to ensure normal operation for low current or normal breaking for fault by means of 1& 2 power supply modes simultaneously

## 1) CT power supply

Normal service conditions for controller: Primary single phase current no less than  $0.4I_n$ . Three-phase no less than  $0.2I_n$ . Rated current  $\leq 400A$ , main circuits primary current no less than  $1.0I_n$ , three-phase no less than  $0.6I_n$ . Otherwise, it shall be connected auxiliary power supply.

## 2) Auxiliary power supply

- ◎ Normal service conditions for controller (85%~110%) Us
- ◎ AC voltage (50/60Hz) : AC230V, AC400V, AC110V
- ◎ DC voltage: DC220V, DC110V, DC24V
- ◎ Voltage for 1 & 2 contacts of DC24V
- ◎ External DC power module shall convert DC 110V/DC220V into DC24V by the user incoming.



## Accessories

### List of Accessories

Category	Name/Code	Configuration	Mounting construction	Remarks
Electric control accessories	Closing electromagnet (X)	Standard	Fixed-type/Draw out-type	
	Shunt release (F)	Standard	Fixed-type/Draw out-type	
	Motor operating mechanism (M)	Standard	Fixed-type/Draw out-type	
	Under-voltage release(Q)/under-voltage delay module(QY)	For selection	Fixed-type/Draw out-type	Alternative
	No-voltage release (Q) / under-voltage delay module (QY)	For selection	Fixed-type/Draw out-type	
Signal output accessories	Auxiliary switch (FK)	Standard	Fixed-type/Draw out-type	
	Drawer base three position status signal output device	For selection	Draw out - type	
	Secondary terminals	Standard	Fixed-type/Draw out-type	
Controller related accessories	External connecting N pole current transformr (HGQ)	For selection	Fixed-type/Draw out-type	
	Power module (DM)	For selection	Fixed-type/Draw out-type	
	Relay module (RM)	For selection	Fixed-type/Draw out-type	Be used with power module
Protection accessories	Insulating barrier between phases	Standard	Fixed-type/Draw out-type	
	Frame	Standard	Fixed-type/Draw out-type	
Lock and interlock device	Opening position key-lock	For selection	Fixed-type/Draw out-type	
	Button lock	For selection	Fixed-type/Draw out-type	
	Door interlock	For selection	Draw out-type	
Power supply switching device	Mechanism interlock (Soft/Hard)	For selection	Fixed-type/Draw out-type	Be used for two circuits power supply

## Electric control accessories

### Closing electromagnet

Closing electromagnet shall be made of coil, steel core assembly and electronic component.  
Disconnect shall be managed remotely under mechanism energy storage conditions.

Rated insulation voltage (Ui)	Operational voltage range	Rated control voltage Us	Instantaneous power
			XUW2-2500,4000,6300
500V	(85%~110%) Us	AC230V (220V) 50/60Hz	300VA
		AC400V (380V) 50/60Hz	300VA
		AC110V	300VA
		DC220V	135W
		DC110V	135W

### Shunt release

Shunt release shall be made of coil, steel core assembly and electronic component.  
Disconnect shall be managed remotely.

Rated insulation voltage (Ui)	Operational voltage range	Rated control voltage Us	Instantaneous power
			XUW2-2500,4000,6300
500V	(70%~110%) Us	AC230V (220V) 50/60Hz	300VA
		AC400V (380V) 50/60Hz	300VA
		AC110V	300VA
		DC220V	135W
		DC110V	135W

### Motor operating mechanism

Disconnect shall be managed after motor operating mechanism for air circuit breaker prior to energy storage.

Rated insulation voltage (Ui)	Operational voltage range	Rated control voltage Us	Operating power	
			XUW2-2500,4000	XUW2-6300
500V	(85%~110%) Us	AC230V (220V) 50/60Hz	110W	150W
		AC400V (380V) 50/60Hz		
		AC110V		
		DC220V		
		DC110V		

### Under-voltage release

Under-voltage release shall include instantaneous release and release, which is made of coil, steel core assembly and control unit.

©Under-voltage delay release set the release operating delay time through toggle switch inside toggle under-voltage delay device. Delay time setting is 1s,3s,5s according to the request and factory default is 1s.

### Under-voltage release operating characteristics

- 1) External voltage drop or drop slowly up to 35%~70%  $U_e$ , under-voltage release shall discharge for air circuit breaker braking.
- 2) External voltage below 35% $U_e$ , air circuit breaker cannot be close for under-voltage release;
- 3) External voltage is 85%~110% $U_e$ , under-voltage release operating ensure air circuit breaker reliable close.

Rated insulation voltage (Ui)	Rated service voltage $U_e$	Operating power
		XUW2-2500,4000,6300
500V	AC230V (220V) 50/60Hz	48VA
	AC400V (380V) 50/60Hz	48VA
	AC110V	48VA
	DC220V	48W
	DC110V	48W

## Accessories

### No-voltage release (Under-voltage release—no-voltage protection)

No-voltage release shall include instantaneous release and delay release, which is made of coil, steel core assembly and control unit.

⊙No-voltage delay release set the release operating delay time through toggle switch inside toggle under-voltage delay device. Delay time is 1~5s which the user can adjust. Step is 1s.

### No-voltage release operating characteristics

- 1) External voltage drop suddenly up to 0~30%U<sub>e</sub>,no-voltage release discharge and disconnect air circuit breaker.
- 2) No-voltage release cannot be close air circuit breaker for external voltage below 30%U<sub>e</sub>.
- 3) External voltage is 85%~110%U<sub>e</sub>,no-voltage release ensure air circuit breaker close reliable.

Rated insulation voltage (U <sub>i</sub> )	Rated service voltage U <sub>e</sub>	Operating power
		XUW2-2500,4000,6300
500V	AC230V (220V) 50/60Hz	48VA
	AC400V (380V) 50/60Hz	48VA

### Signal output accessories

#### Auxiliary switch

Auxiliary switch parameter

Case		XUW2-2500,4000,6300
Auxiliary switch mode		4 gang switching
Conventional thermal current I <sub>th</sub>		6A
Minimum load		2mA/DC15V
Breaking capacity	DC-13	5A/DC250V
	AC-15	16A/AC380V

#### Signal output device for drawer case position status

Draw out-type air circuit breaker body is in the position of opening, test, connection, three positions electric indicating device output electric status signal respectively.

Case		XUW2-2500,4000,6300
Breaking capacity	DC	0.4A/DC125V
	AC	16A/AC250V

#### Secondary terminals

Draw out-type and fixed-type secondary terminals parameter in the following table

Case	XUW2-2500,4000,6300
Numbers of Terminals (total)	47 units (55 units for selection)
Connection mode	Tighter-screw
Level of contamination	3
Voltage category	III
Maximum load current	10A
Rated current	10A
Rated voltage	500V

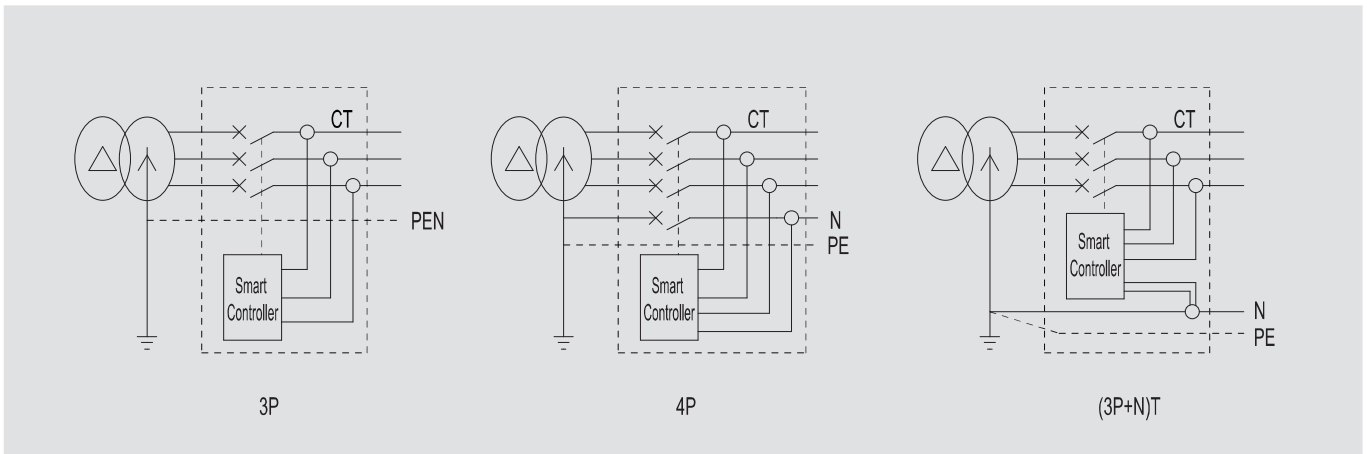
Controller related accessories

External connection N pole instrument transformer

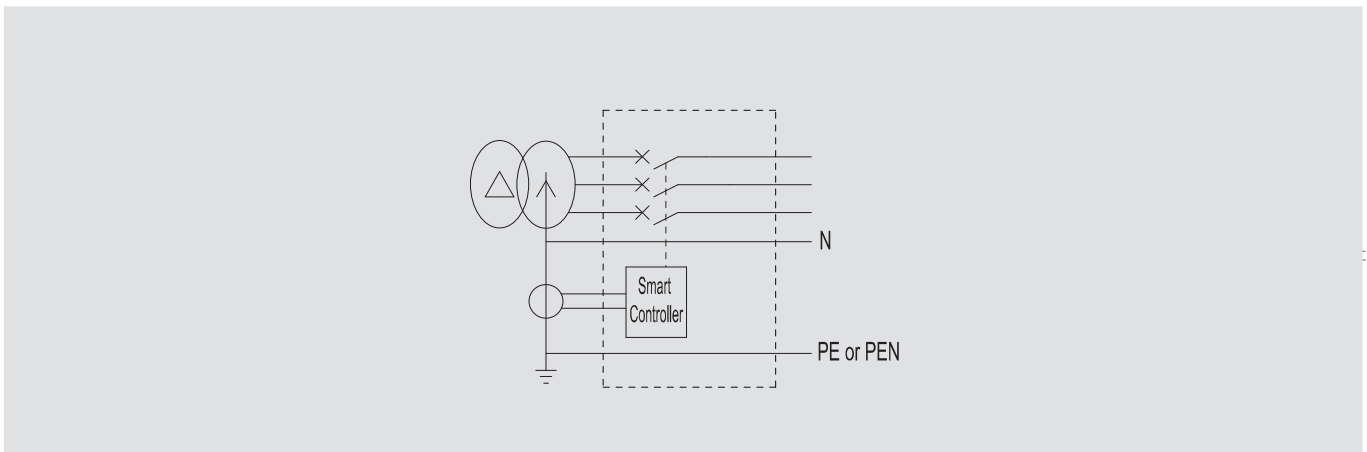
Grounding mode

The use of III air circuit breaker with external N phase instrument transformer comprise 3P+N system enabling grounding protection for differential-type (T) or earth current-type (W) .Electric schematic diagram in the following:

1) Differential-type (T)



2) Earth current-type (W)



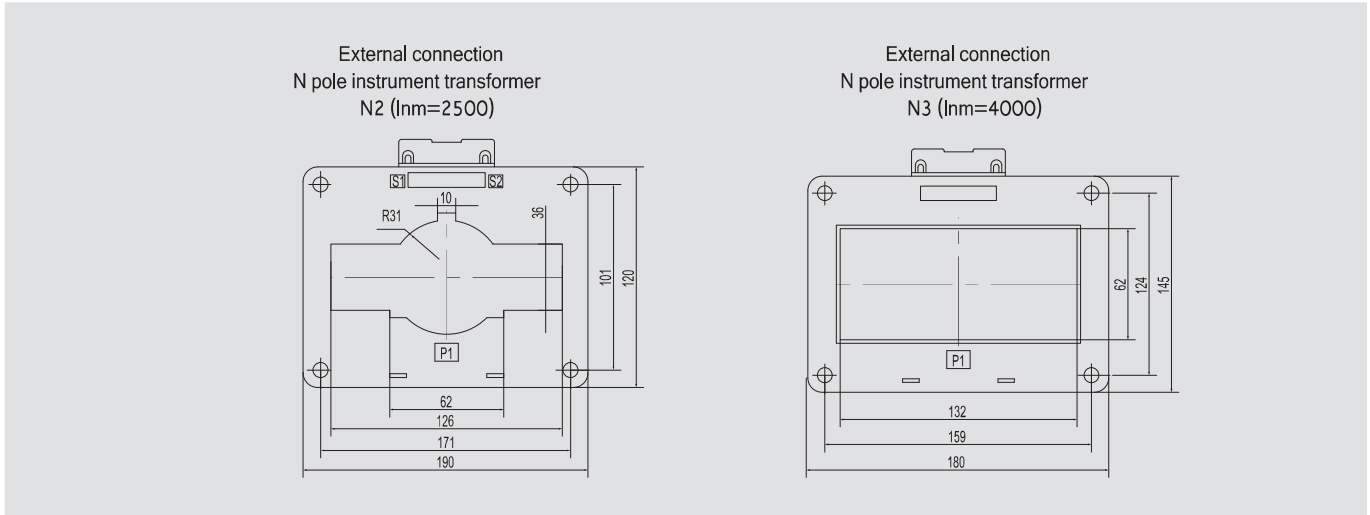
Instrument transformer type:

External connection N pole instrument transformer which is rectangular. Case and busbar dimension for the user selection.

## Accessories

### Controller accessories

#### Rectangular instrument transformer code and dimension



Note: busbar current incoming from P1 and outgoing from P2.

### Power Module

Output voltage of DC controller and relay module:DC24V.

Category:

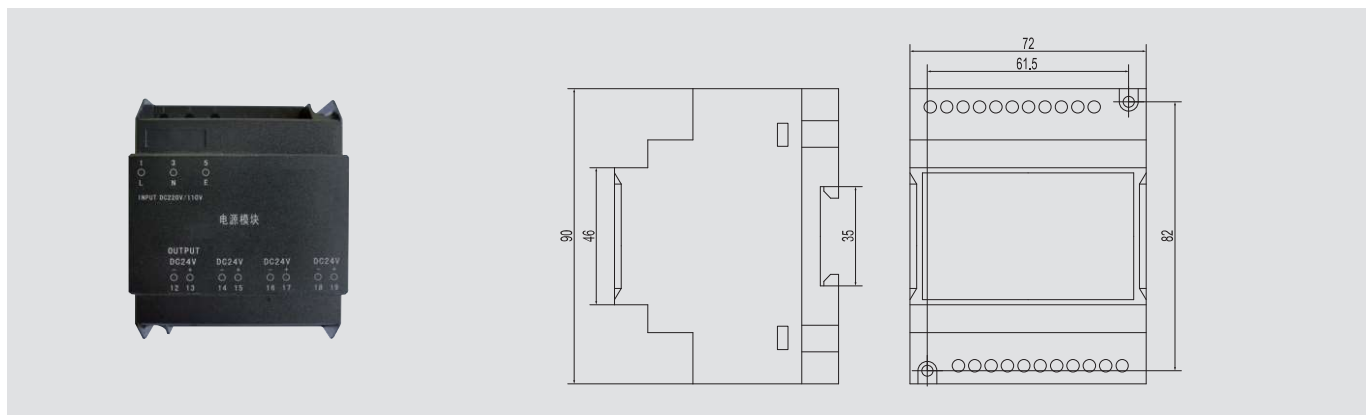
Type	Voltage	Size (mm)	Influence of poles connection
DM-P1	AC230V/AC400V	90×72×54	Influence of non-pole
DM-P2	DC220V/DC110V	90×72×54	Influence of pole
DM-P3	AC110V	90×72×54	Influence of non-pole

Characteristics: (85%~110%) Us power module normal working

Mounting mode by means of 35mm standard or screw fixed

Connection by themselves according to rated service voltage

Overall and Mounting dimension drawing:



### Relay module

Air circuit breaker open, close or larger load capacity, relay module shall be equipped with power module to enable four distance function through this module switching to control.

Contacts capacity: AC250V,10A; DC24V,10A;

Overall and Mounting: Same as power module

**Protective accessories**

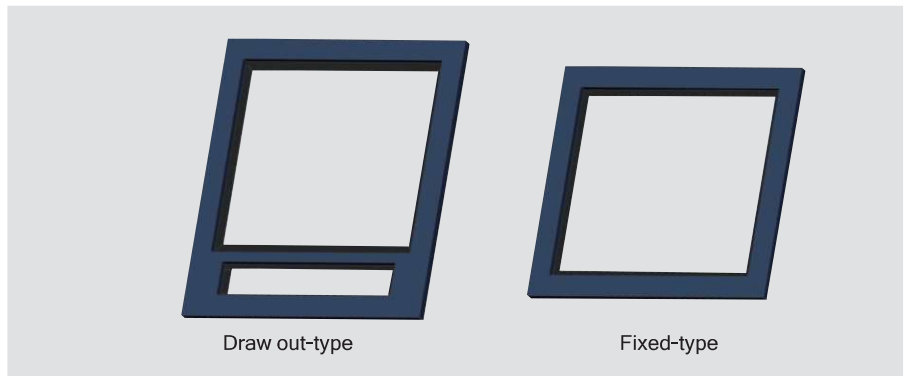
**Insulating barrier between phases**

Insulating barrier between phases shall include fixed-type and draw out-type, which shall be fitted to the groove between each phase and busbar for adding electric insulation strength between main circuits and phases.



**Frame**

Case shall include fixed-type and draw out-type, which is fitted to the door of cabinet for sealing. The degree of protection for air circuit breaker shall be IP40. Air circuit breaker shall be compact, rugged and reliable in design.



**Lock and Interlock**

**Disconnection position key-lock**



Key-lock shall be fitted to lock air circuit breaker in manual opening position. Circuit breaker cannot be close operation for locking clockwise with the key.

Type	Name	Qty of circuit breaker	Qty of key
YS11	One lock with one key	1	1
YS21	Two locks with one key	2	1
YS31	Three locks with one key	3	1
YS32	Three locks with two keys	3	2
YS53	Five locks with three keys	5	3

## Accessories

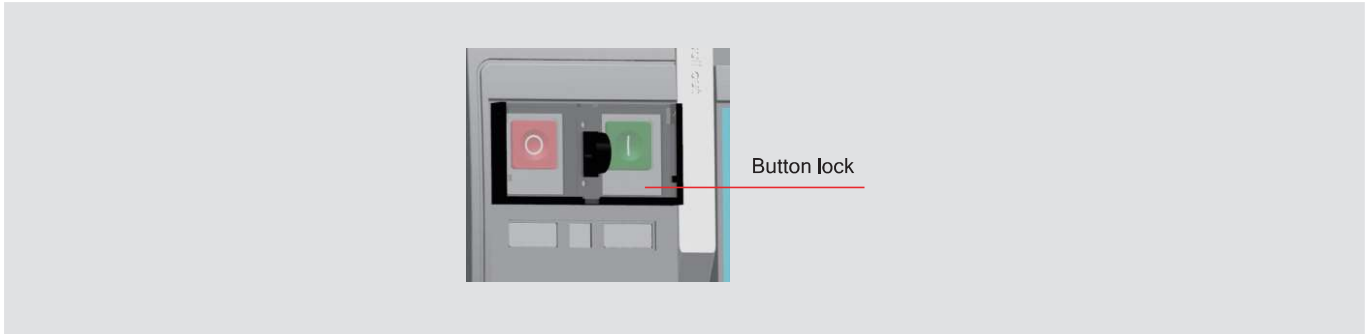
### Lock & Interlock device

#### Button lock

- Air circuit breaker shall be equipped with a locking system to avoid non-operator operating open/close button.
- Provide the lock by the user

#### Door interlock

Door interlock shall be fitted to the right or left side of drawer base to avoid open the small door of cabinet in the no-disconnect position for draw out-type air circuit breaker.



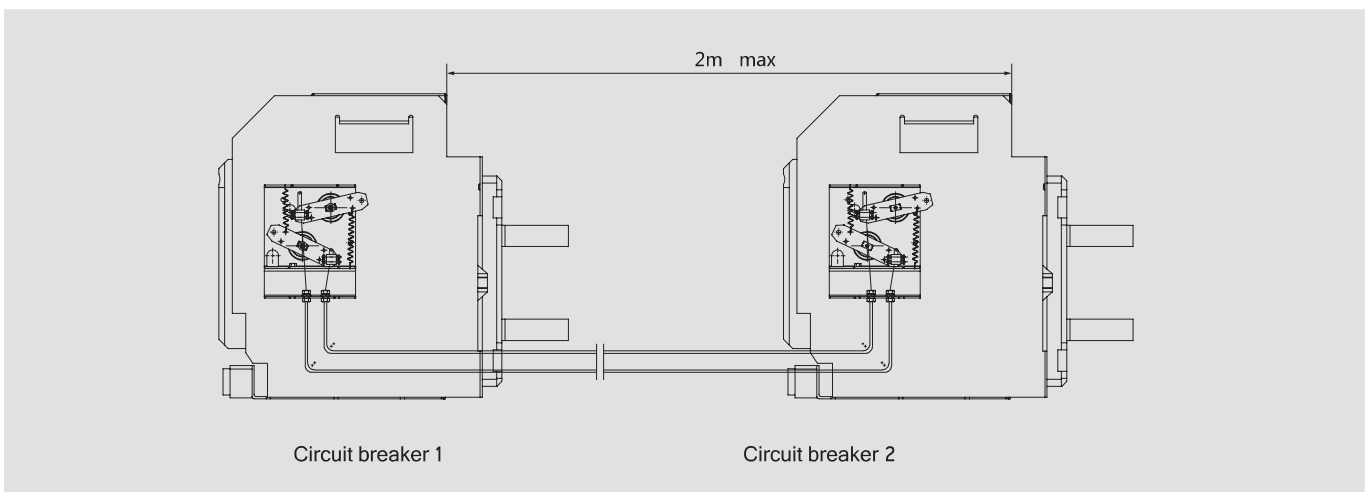
### Power supply switching device

#### Mechanical interlock

- Mechanical interlock mechanism shall be suitable for interlock between draw out-type or fixed-type air circuit breaker.
- Interlock mechanism is fixed on the right side panel of air circuit breaker with 4 screws by the user.
- Maximum distance between two air circuit breakers with mechanism interlock no more than 2m.
- Interlock type in the following table:

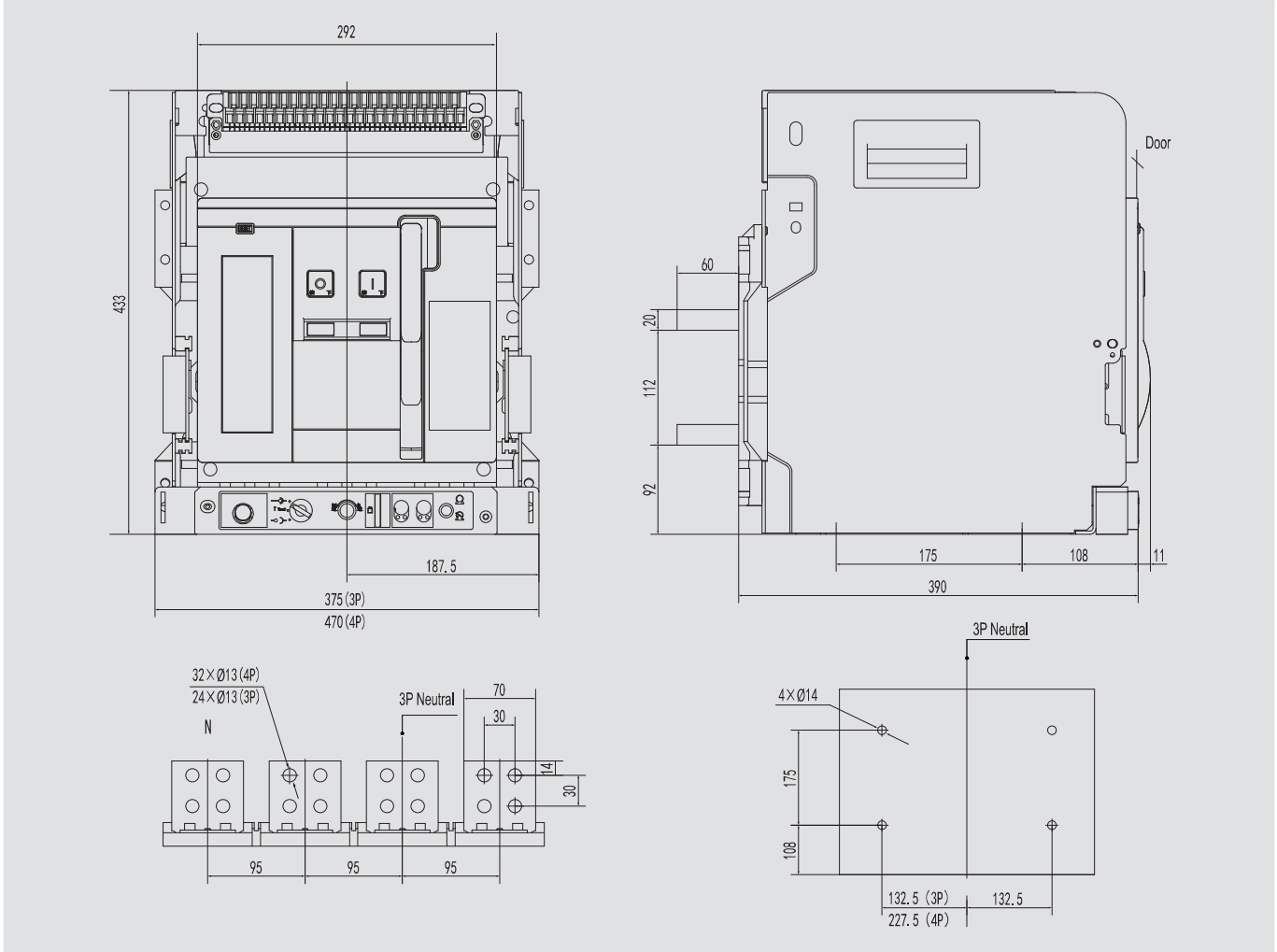
Mode for selection	Type	Qty of circuit breaker
1	Two sets soft interlock, one close one open	2
2	Three sets soft interlock, one close two open	3
3	Three sets soft interlock, two close two open	3
4	Two sets hard interlock, one close one open	2
5	Three sets hard interlock, one close two open	3

#### Mounting drawing:

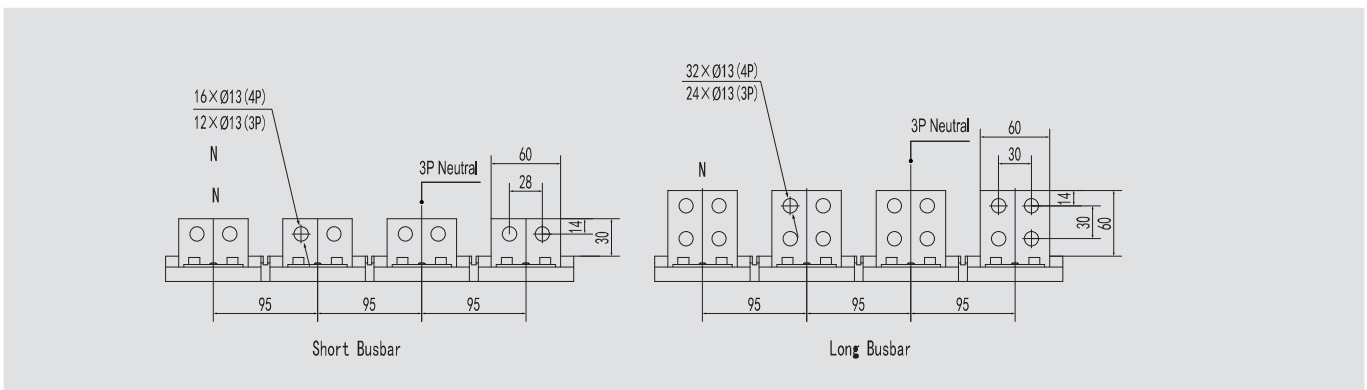


# Overall and mounting dimension

## XUW2-2500 draw out-type (In=2500A)



## XUW2-2500 draw out-type (In=630-2000A)



Notes: XUW2-2500 draw out-type

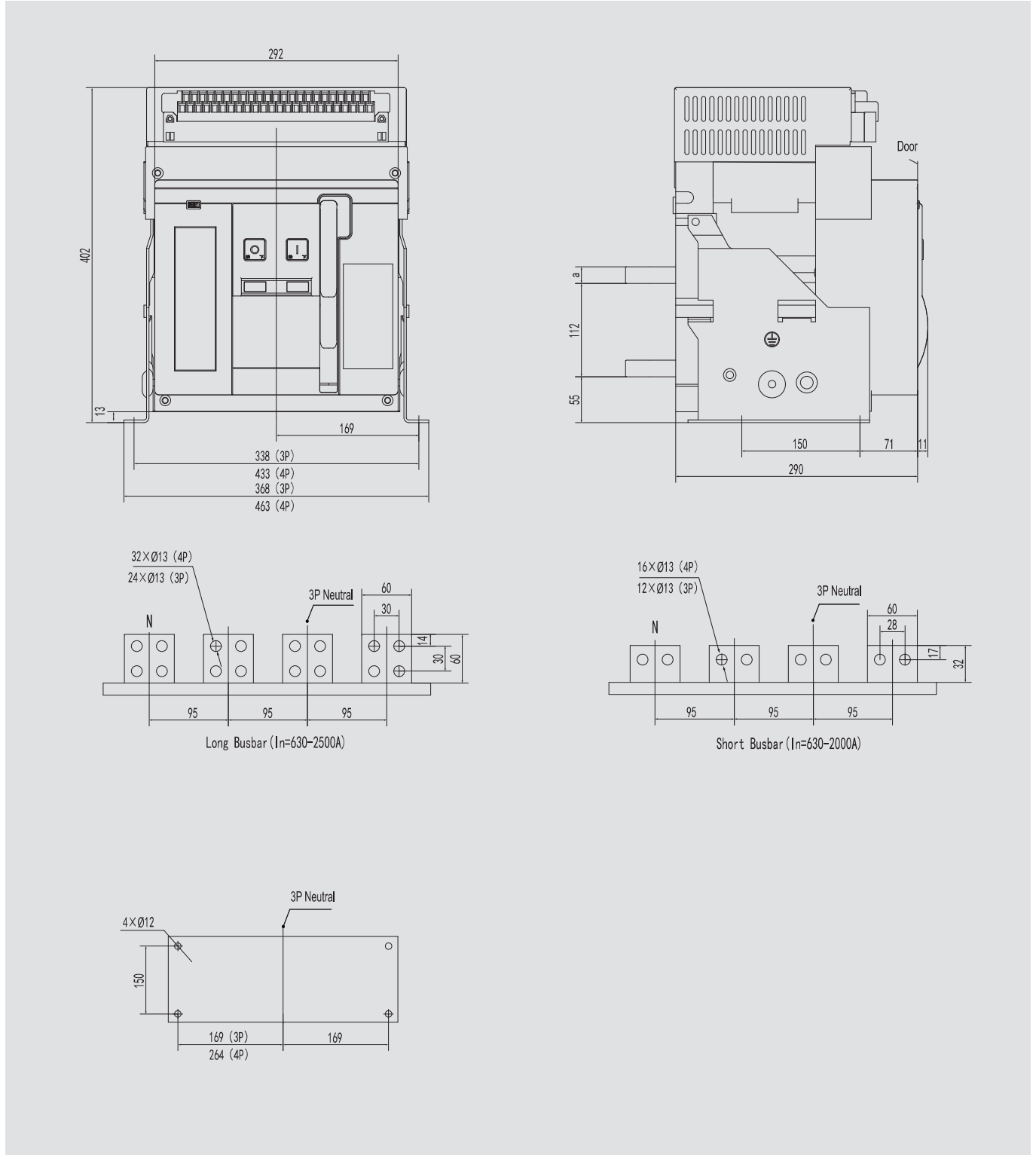
1. In=630-2000A shall be equipped with short busbar(default) and long busbar.

Rated current (A)	Thickness of busbar (mm)
630-800	10
1000-1600	15
2000	20



# Overall and mounting dimension

## XUW2-2500 fixed-type

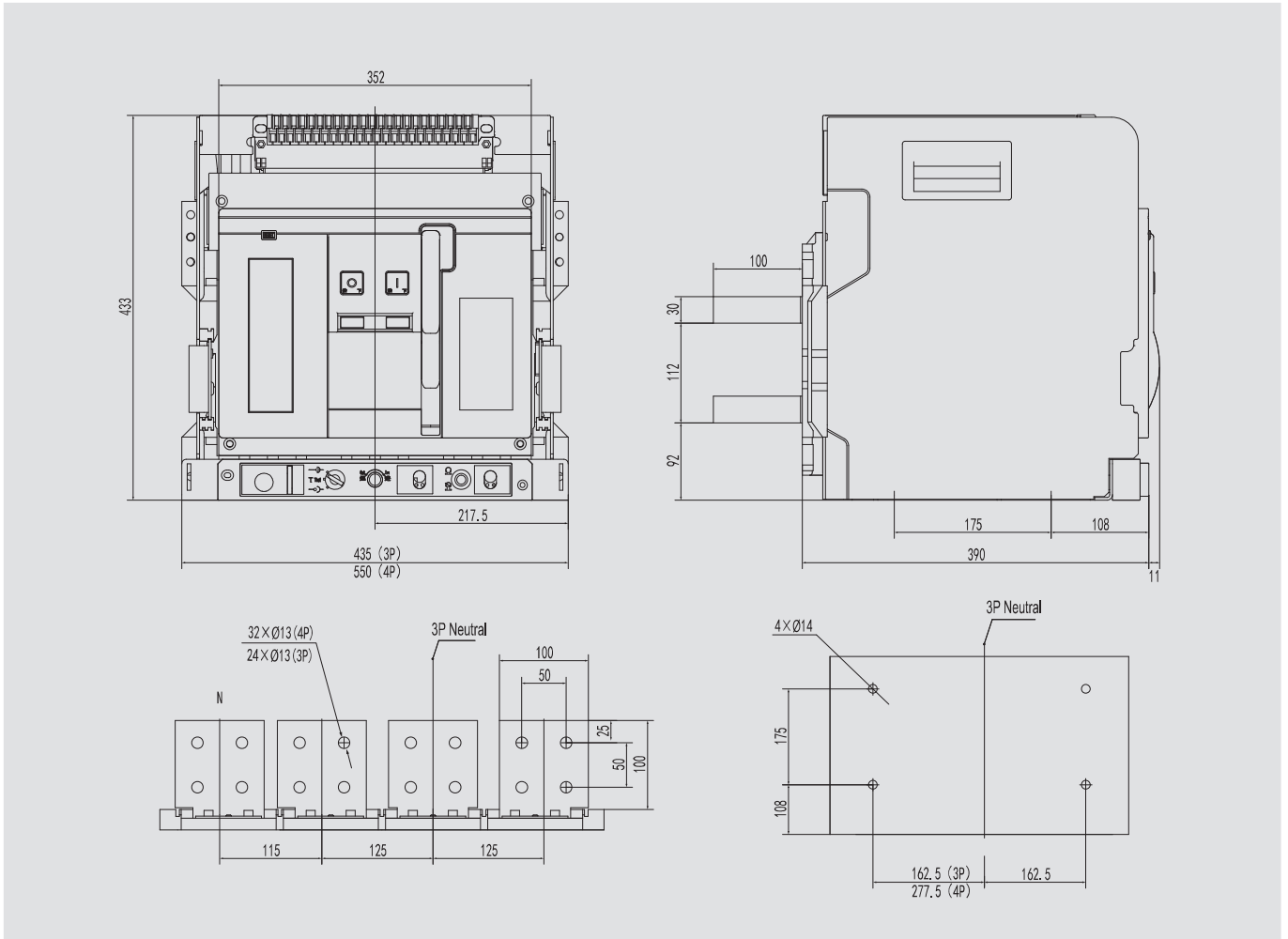


Note: XUW2-2500 fixed-type

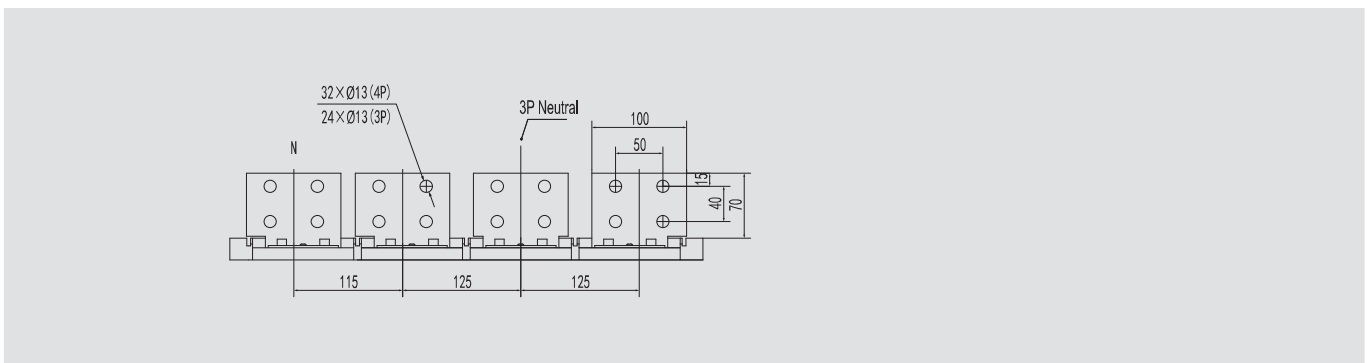
- In=630-2000A shall be equipped with short busbar(default) and long busbar.
- In=2500A shall be equipped with long busbar only.

Rated current (A)	Thickness of busbar (mm)
630-800	10
1000-1600	15
2000-2500	20

XUW2-4000 draw out-type (In=3600-4000A)



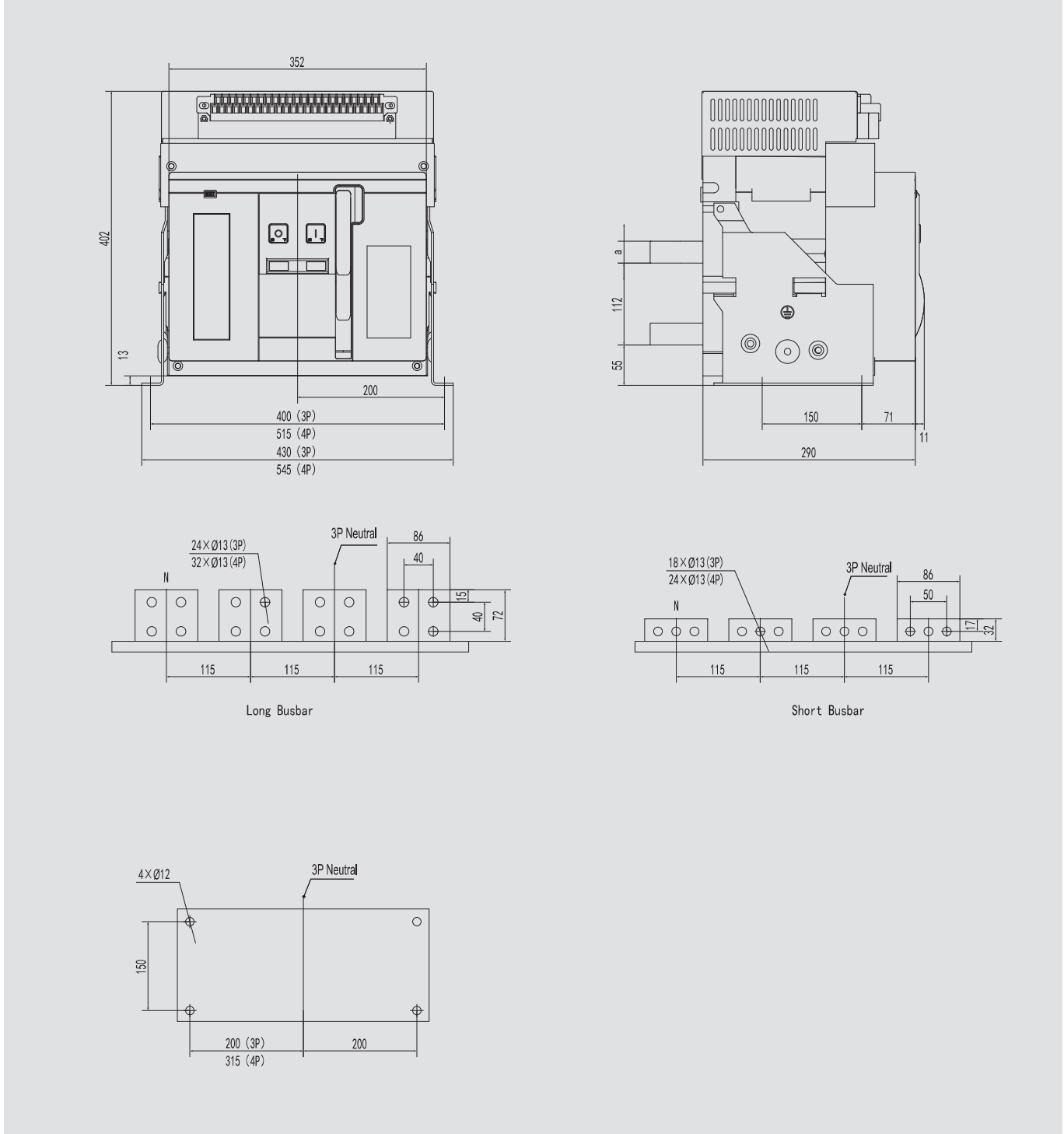
XUW2-4000 draw out-type (In=2500-3200A)



Rated current (A)	Thickness of busbar (mm)
2500	20
2900-3200	30

# Overall and mounting dimension

## XUW2-4000 fixed-type

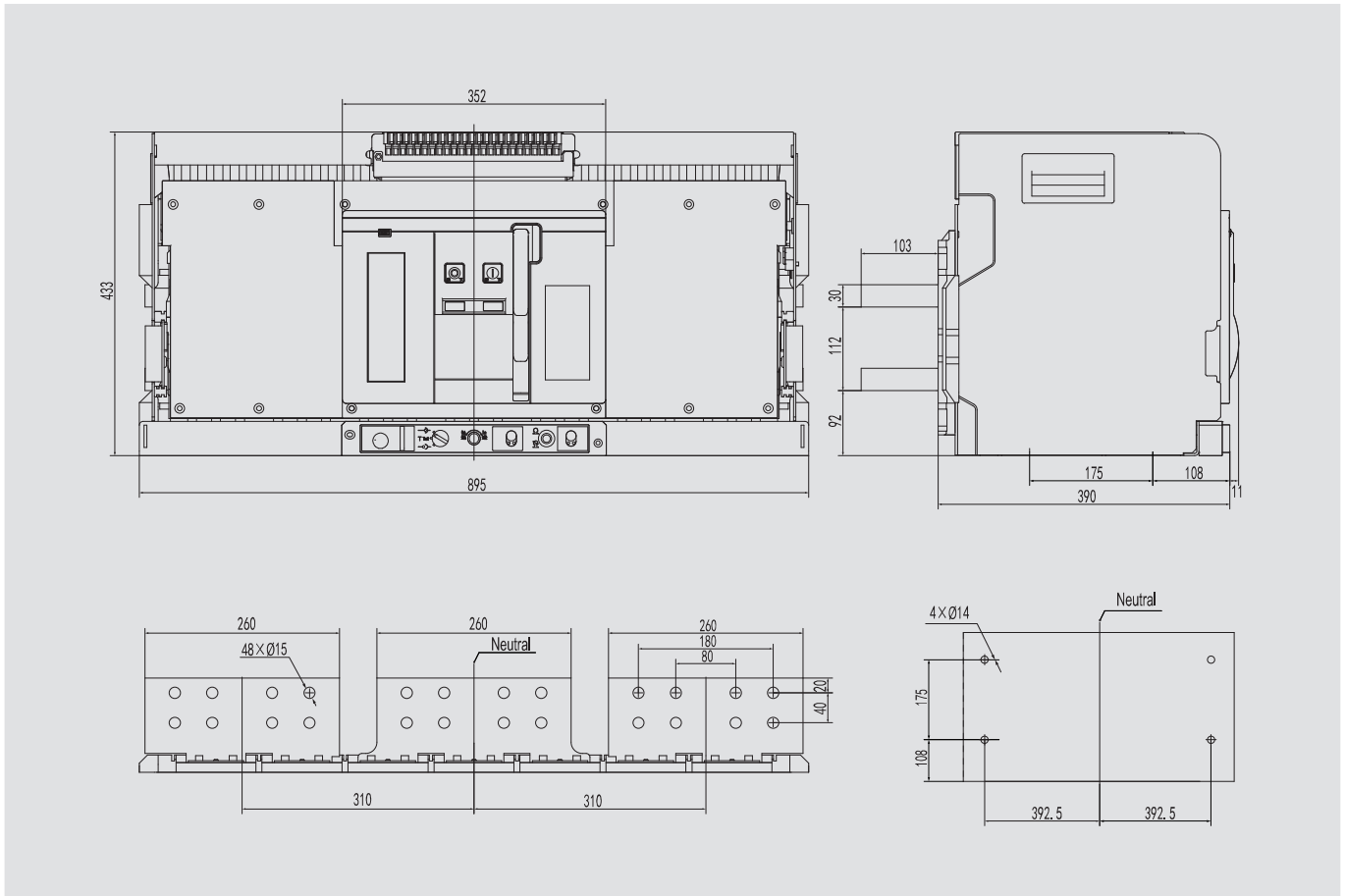


Note: XUW2-4000 fixed-type

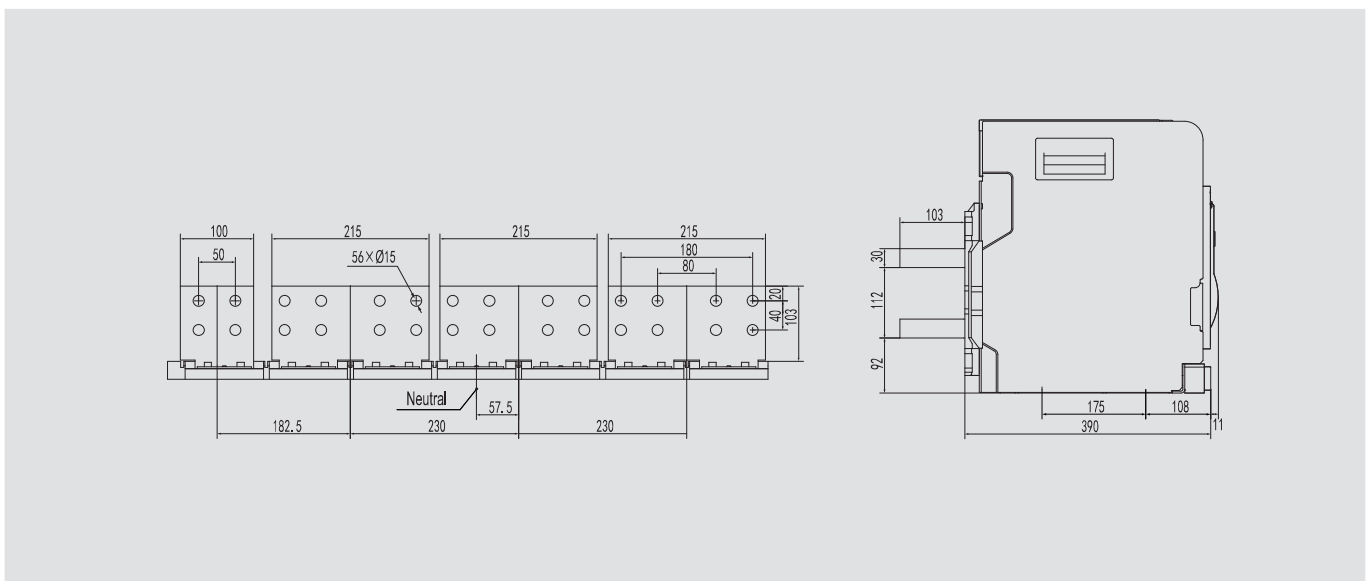
1.  $I_n=2500-3200A$  shall be equipped with short busbar(default) and long busbar.
2.  $I_n=3600-4000A$  shall be equipped with long busbar only.

Rated current (A)	Thickness of busbar (mm)
2500	20
2900-4000	30

XUW2-6300/3P draw out-type

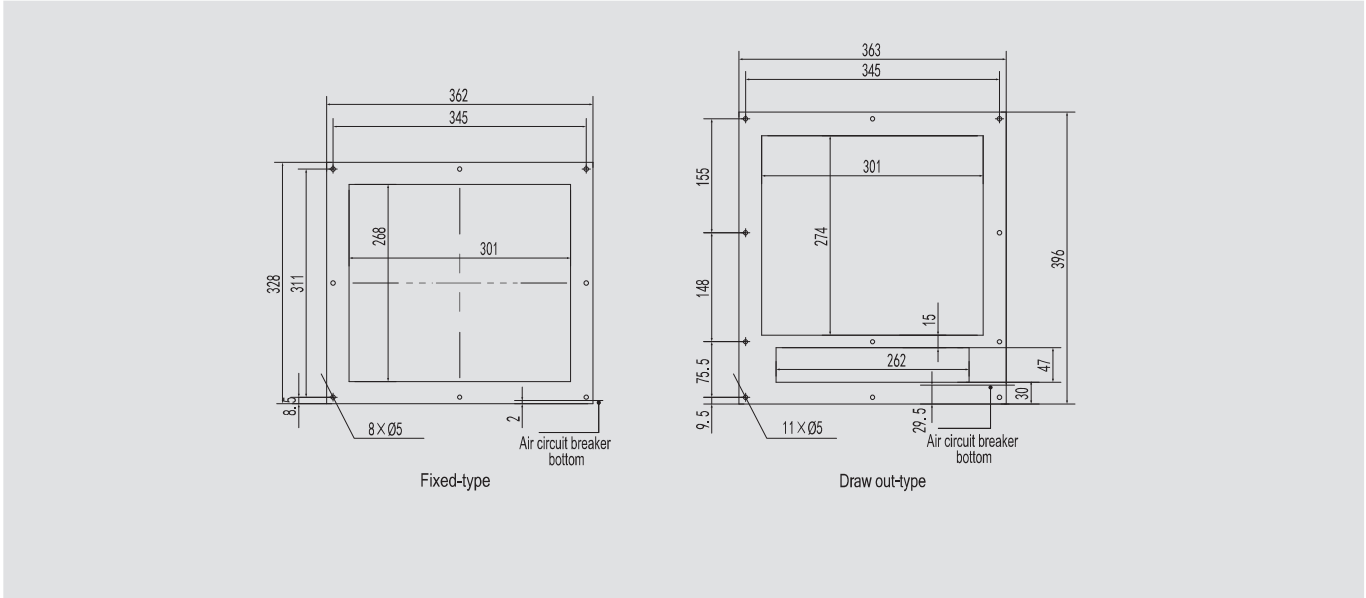


XUW2-6300/4P draw out-type

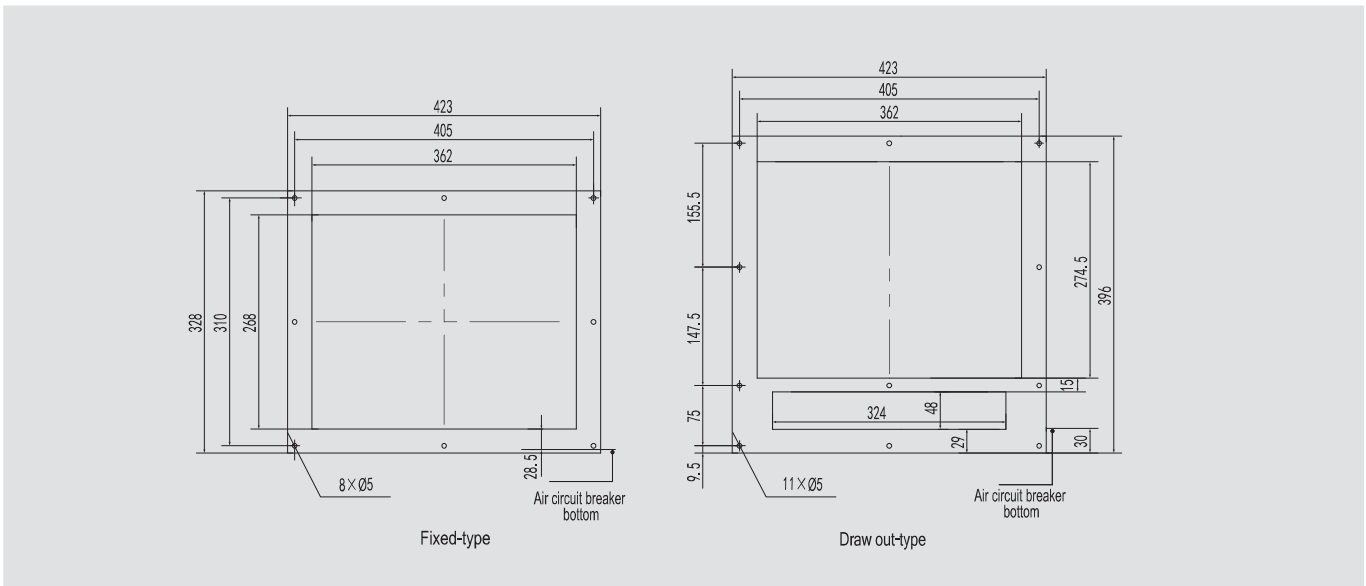


## Overall and mounting dimension

### XUW2-2500 bore diameter for frame



### XUW2-4000,6300 bore diameter for frame



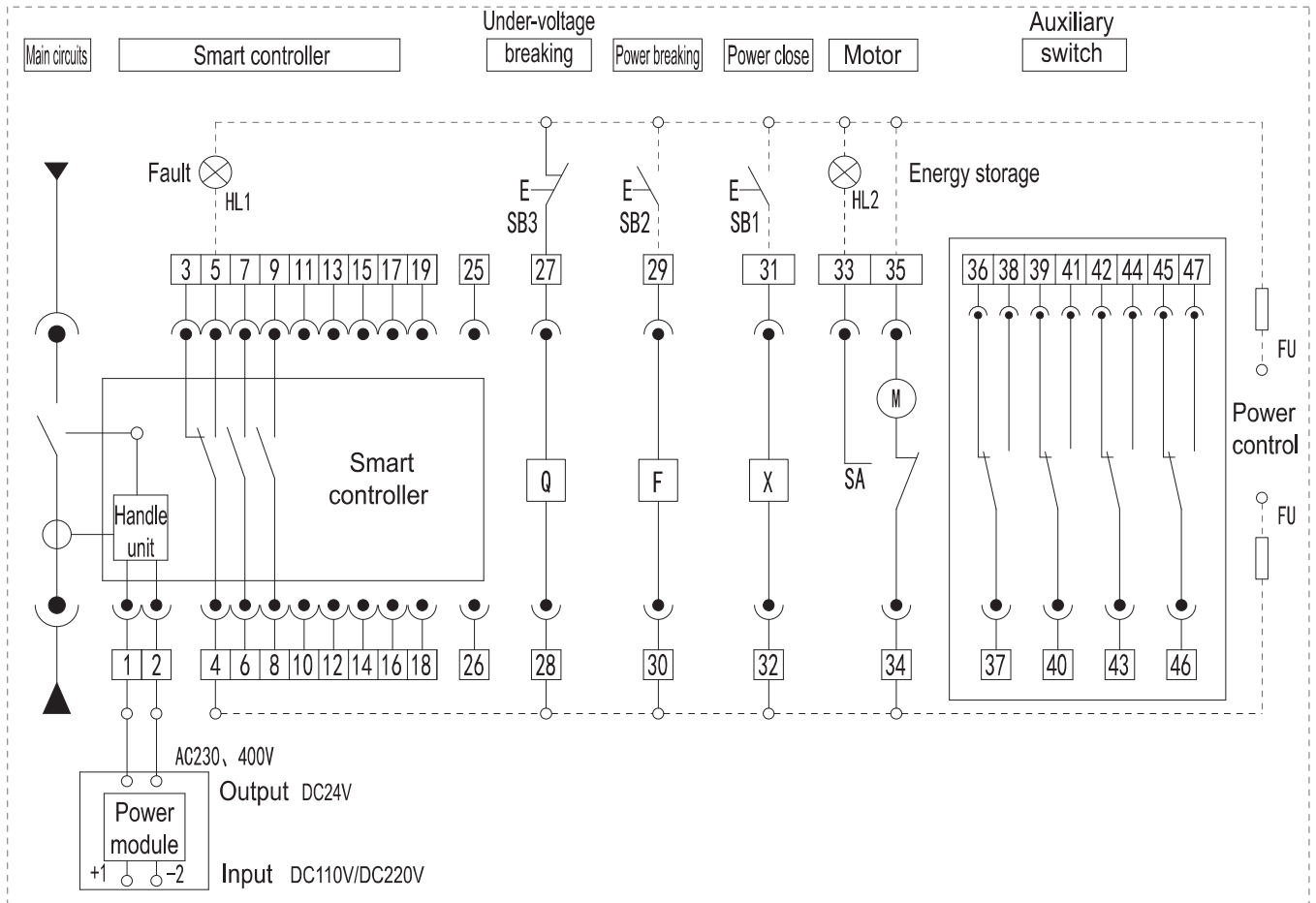
#### Notes:

To ensure the safety of personnel and equipment before air circuit breaker operation, clause-by-clause compliance in the following:

- 1) To read the instruction carefully before mounting and use of air circuit breaker.
- 2) To check air circuit breaker specification before use of air circuit breaker.
- 3) To test insulation resistance of air circuit breaker with 1000V megger. Ambient temperature  $20 \pm 5^{\circ}\text{C}$ , relative humidity 50~70% no less than 10 M $\Omega$ .
- 4) During installation against dust, water, and vermin dropping into air circuit breaker.
- 5) Mounting conductor bus-bar in air circuit breaker shall be symmetric without additional mechanical stress.
- 6) Mounting air circuit breaker shall be reliable grounding with clear grounding marking.
- 7) Mounting air circuit breaker shall control circuits connection as per connection diagram and check working voltage and actual voltage of shunt, open/close electromagnet, motor, controller, then secondary circuits on power.

## Electric connection diagram

## M type controller connection diagram



1,2: auxiliary power supply incoming for smart controller. auxiliary power supply is DC, which add the power module

3,4,5: signal contacts for release fault to trip indicating, 4 for common terminal

6,7 & 8,9: two sets of auxiliary open contacts for circuit breakers (for selection)

10,11: /

12,13: group 1 controller signal outgoing (for selection)

14,15: group 2 controller signal outgoing (for selection)

16,17: group 3 controller signal outgoing (for selection)

18,19: group 4 controller signal outgoing (for selection)

20: controller grounding

21,22,23,24: N,A,B,C phase voltage signal incoming (for selection)

25,26: external connection N pole or incoming of earth current transformer

27,28: under-voltage release

29,30: shunt release

31,32: Closing electromagnet

33,34,35: motor operation mechanism, 34 for common terminal

Q,F,X,M: under-voltage release, shunt release, closing electromagnet, motor operation mechanism

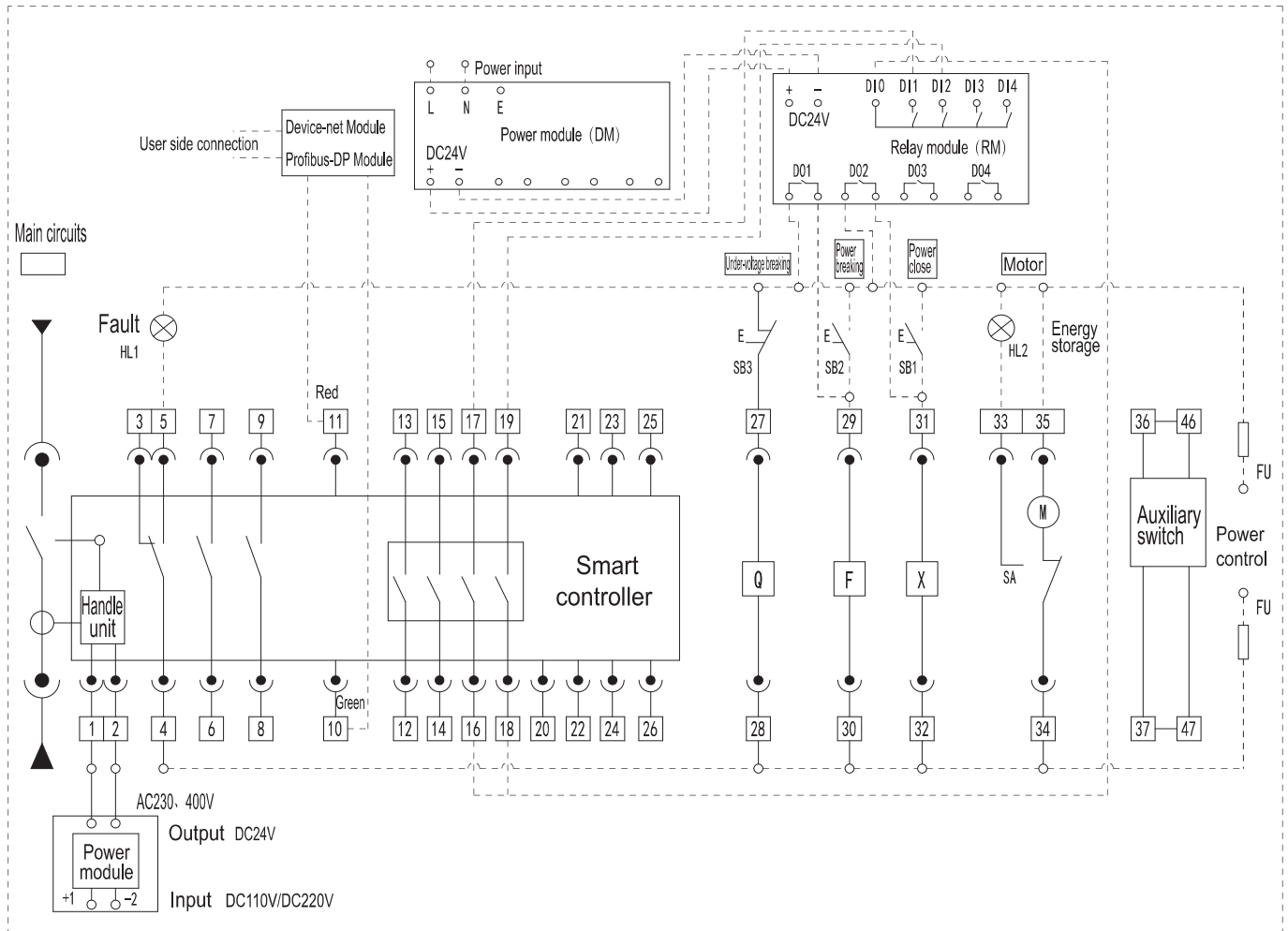
HL1,HL2: fault to trip indicating, motor energy storage fulfill indicating (provide by the user)

SB1,SB2,SB3: close, open, under-voltage button (provide by the user/under-voltage shall be short connection)

SA,FU: motor travel switch (with motor), fuse (provide by the user)

# Electric connection diagram

## H type controller connection diagram



1,2: auxiliary power supply incoming for smart controller. auxiliary power supply is DC, which add the power module

3,4,5: signal contacts for release fault to trip indicating, 4 for common terminal

6,7 & 8,9: two sets of auxiliary open contacts for circuit breakers

10,11: communication interface

12,13: load monitor 1 (default)

14,15: load monitor 2 (default)

16,17: opening signal output

18,19: closing signal output

20: controller grounding

21,22,23,24: N,A,B,C phase voltage signal incoming

25,26: external connection N pole or earth current transformer incoming

27,28: under-voltage release or no-voltage release

29,30: shunt release

31,32: close electromagnet

33,34,35: motor operation mechanism (34 for common terminal)

36~47: auxiliary switch

Q,F: under-voltage release and shunt release

X,M: close electromagnet and operation mechanism

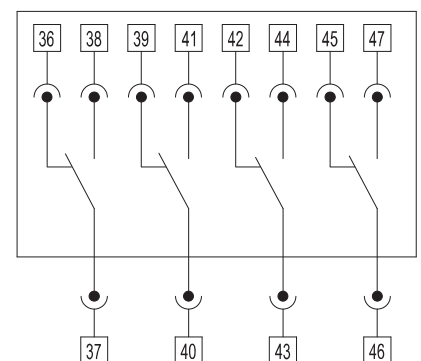
HL1,HL2: fault to trip indicating and motor energy storage finish indicating(provide by the user)

SB1,SB2,SB3: opening, closing and under-voltage button(provide by the user)

SA: motor travel switch with the motor

FU: fuse (provide by the user)

### Auxiliary switch connection diagram



4 gang switching

# XUW3

Series Air Circuit Breaker



**XUCKY**



# General

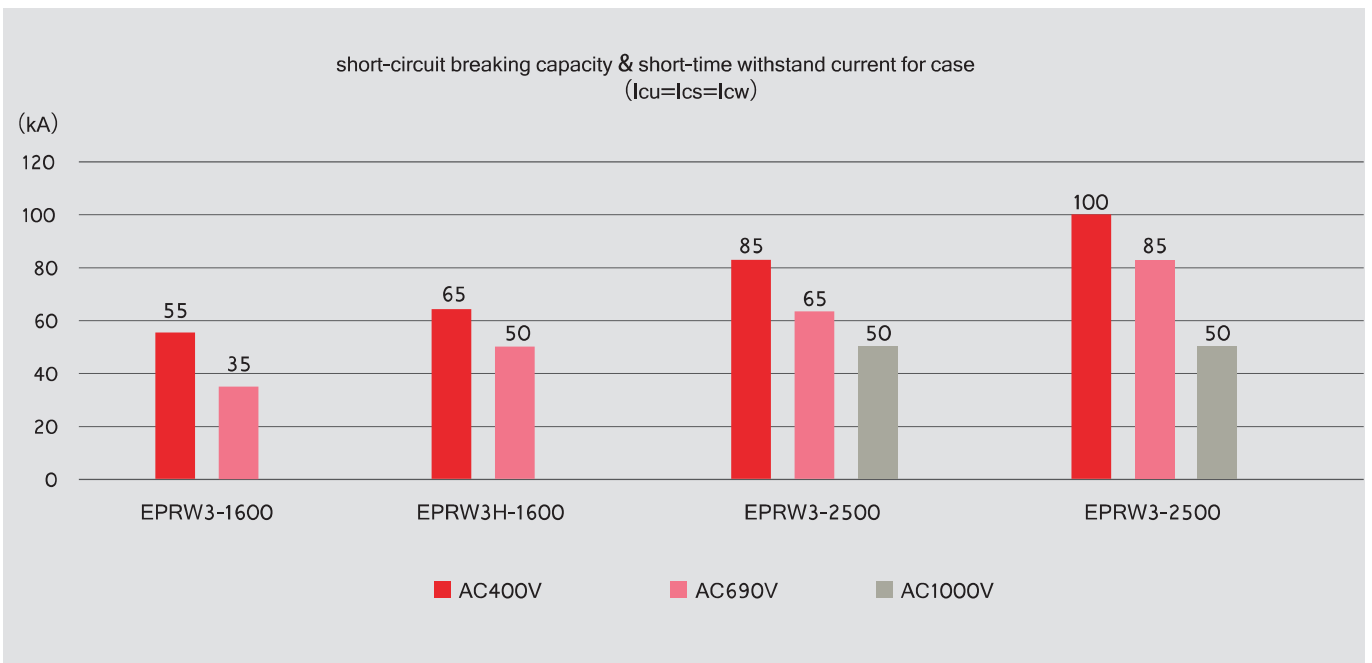
## XUW3 series



### Rated current

Rated current(A)	200	400	630	800	1000	1250	1600	2000	2500	3200	4000
Degree of Case											
XUW3-1600	[Red bar]										
XUW3-2500			[Red bar]								
XUW3-4000								[Red bar]			

### Short-circuit breaking capacity & Short-time withstand current



Notes: I<sub>cu</sub>=I<sub>cs</sub>=I<sub>cw</sub> for XUW3-2500 & 4000. As described for XUW3 technical specification table

## Mounting mode

Upper & Bottom incoming for main circuit are acceptable.

XUW3-1600 with horizontal connection mode, XUW3,2500、4000 with multiple connection modes

Connection mode		XUW3-1600	XUW3-2500	XUW3-4000
Routine	Horizontal	✓	✓	✓
	Vertical	—	✓	✓
Special	Different	—	✓	✓
	Upper horizontal & Bottom vertical Upper vertical & Bottom horizontal	—	✓	✓

## Multiple Protection Device

Draw out-type air circuit breaker shall include door-interlock, draw out-type three positions lock and unlock device, disconnection position key-lock, closing / opening button lock protection device.

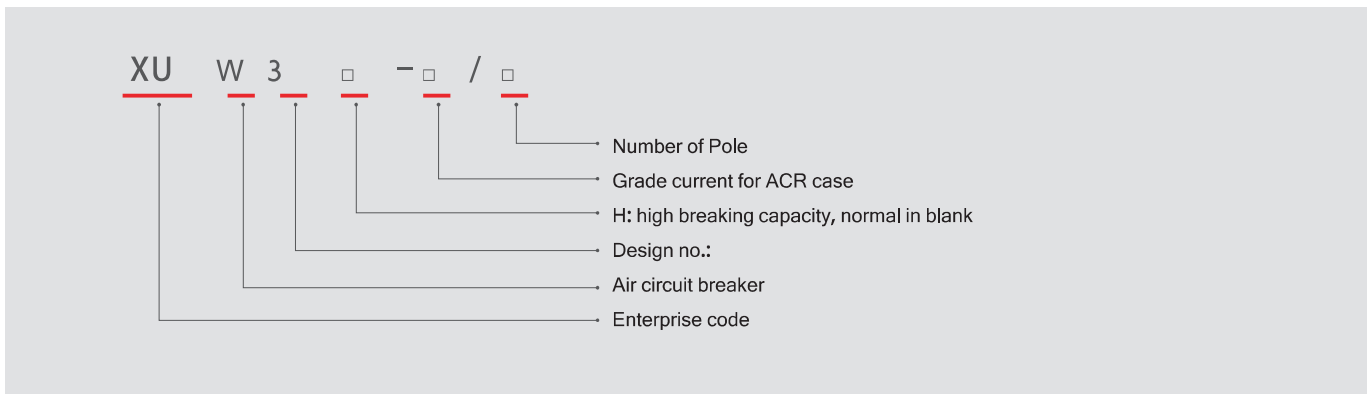
## Application Scope

XUW3 series air circuit breaker ,which is suitable for AC 50Hz. Rated current 200A~4000A, Rated insulation voltage 1140V, Rated operation voltage AC400V/AC690V/AC1140V in distribution system and which distribute the power and protect circuit, power supply device against fault to overload, under-voltage, short-circuit and single-phase damage and also disconnect function. Air circuit breaker with multiple functions and high selection protection, which improve the reliability of power supply.

## Characteristics

- Width pole pitch, easy to connect & install, more safety
- High breaking capacity, zero arcing distance and high safety,
- Module construction, flexible application and small size
- Be equipped with three positions lock and unlock device, safety and reliability operation,
- Completing and reliability smart protection function
- Horizontal, vertical and hybrid connection modes,
- Upper or bottom connection is acceptable,
- Integrated communication mode is suitable for multiple protocol.

## Type symbol



## Standard & Certificate

- Compliance with Part No.:1 General of IEC60947 Low Switch and Control Equipment
- Compliance with Part No.: 2 Low Voltage Switch Circuit Breaker of IEC60947 Low Switch and Control Equipment

## General

### Normal service conditions:

Ambient temperature:  $-5^{\circ}\text{C}\sim+40^{\circ}\text{C}$ ; the average value no more than  $+35^{\circ}\text{C}$  within 24 hours

Ultimate air conditions: Maximum temperature:  $+40^{\circ}\text{C}$ , Air relative humidity no more than 50%. Higher relative humidity

While lower temperature, for example:  $20^{\circ}\text{C}$  up to 90%. To make provision for occasional incur due to dewing.

Site altitude:  $\leq 2000\text{m}$ .

### Level of contamination

Level of contamination: III

### Mounting conditions

Perpendicularity & angularity of air circuit breaker  $\leq 5^{\circ}$ . Air circuit breaker is installed under non-explosive, non-conducted dust, non-sufficient corrosion metal and without destructive insulation conditions.

### Mounting category

Mounting category IV for main circuit of air circuit breaker, under-voltage trip coil and the power transformer primary coil. Mounting category III for other supplement circuit and control circuit.

### Degree of protection

IP30, IP40 (Mounting protective frame)

### Utilization category

B

## Construction diagram



## Construction diagram

Secondary circuits



Arc suppression devices



Auxiliary contacts



Closing electromagnet  
Shunt release  
Under-voltage release



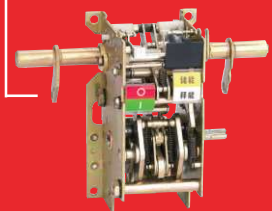
Manual energy-storage handle



Power energy-storage mechanism



Operating mechanism



Smart controller



Case



## General

### Draw out-type air circuit breaker three positions lock

Draw out-type base must have connection, testing and closing position by a indicator. Air circuit breaker shall be locked respectively on the three positions by the handle and, shall push three-position unlock button for release.

### Use of air circuit breaker

#### Draw out-type air circuit breaker body inserting operation

- a. Both sides of rails on the base by the handle for manual operation.
- b. Air circuit breaker body is put on the rails, please note that protruding support of both sides of air circuit breaker shall be inserted into rails groove.
- c. Hands hold and lift slight upward handles of both sides of air circuit breaker and vigorously push air circuit breaker body until stop. Air circuit breaker indicator shall be verified in the OFF position before push air circuit breaker body.
- d. Insert into the handle, push three positions unlock button and turn handle until give off "TA" sound, then pop-up three positions unlock button. Now three positions indicator show "TEST" position, second push three position unlock button and turn handle until give off "TA" sound. However, not turn the handle and air circuit breaker body reach connection position.
- e. Pull out the handle and reset

#### Notes:

1. Air circuit breaker shall be disconnected, air circuit breaker body shall be moved from testing position to connection against accident.
2. the base shall be verified in OFF position before push air circuit breaker body into drawer base against accident.

### Draw out-type air circuit breaker withdrawing operation

Air circuit breaker shall be moved from connection to close position after inserting the handle and push three positions unlock button, then turn the handle counterclockwise. Three positions unlock mode is compliance with air circuit breaker body inserting operation.

#### Notes:

Air circuit breaker body shall be close against accident before pull air circuit breaker from connection to testing position.

### Draw out-type air circuit breaker position lock device

the base must have connection/testing/closing position padlock. the base cannot be moved other positions after pulling out the padlock. The padlock is provided for the user.

### Air circuit breaker energy storage operation

#### Energy storage manual

Pull energy storage handle 6-7 times until hear "click" , the hands cannot feel counter-force and show energy storage simultaneously. Energy storage, which is over.

#### Power energy storage

Store the energy automatically after controlling circuits on power. Stop automatically after energy storage.

### Air circuit breaker close/open operation

#### Close/open manual

- Close: Air circuit breaker is in the state of energy storage and trip, push green I button and air circuit breaker close, close/open show the status from "O" to "I" .
- Open: Air circuit breaker is in the state of closing, push red O button, air circuit breaker trip, close/open show the status from "I" to "O" .

#### Close/open power

- Close: Air circuit breaker is in a state of energy storage and trip for imposing rated control voltage on close electromagnet. Close electromagnet action and air circuit breaker close.
- Open: Air circuit breaker is in a state of close and impose rated control voltage on shunt release. Shunt release action and air circuit breaker.

## Product Characteristics

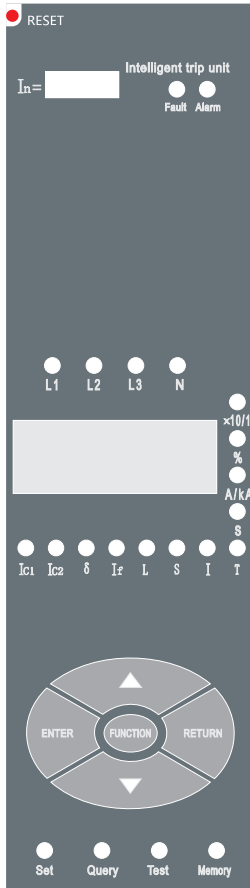
### Product Characteristics

Type		XUW3-1600	XUW3H-1600	XUW3-2500	XUW3-4000	
Breaking capacity		S-normal	H-high breaking	/	/	
Rated current (A)	In	200,400,630,800, 1000,1250,1600		630,800,1000, 1250,1600, 2000,2500	2000,2500,2900, 3150,3200,3600, 3900,4000	
Rated service voltage (V)	Ue	AC 400V/690V		AC 400V / 500V / 690V / 800V / 1140V		
Rated insulation voltage (V)	Ui	1000V		1140V		
Rated impulse withstand voltage (kV)	Uimp	12				
Number of poles	P	3,4				
Rated current for N pole (A)		100%In				
Rated ultimate short-circuit breaking capacity (kA)	Icu	400V	55	65	85	100
		690V	35	50	65	85
		1000V	/	/	50	50
Rated operation short-circuit breaking capacity (kA)	Ics	400V	42	55	85	100
		690V	35	42	65	85
		1000V	/	/	50	50
Rated short-circuit withstand current (kA/1s)	Icw	400V	42	50	85	100
		690V	35	42	65	85
		1000V	/	/	50	50
Rated short-circuit making capacity (kA)	Icm	400V	110	143	187	220
		690V	73.5	105	145.2	187
		1000V	/	/	110	110
Breaking time (ms)		< 30				
Closing time (ms)		< 70				
Life (C/O period)	Mechanism	25000		20000	15000	
	Electric	10000		8000	8000	
Overall dimension : H×W×D (mm) D no including busbar	Draw out -type	3P	354×254×305		435×375×410	435×435×410
		4P	354×324×305		435×470×410	435×550×410
	Fixed- type	3P	324×269×203		398×368×299	398×430×299
		4P	324×339×203		398×463×299	398×545×299

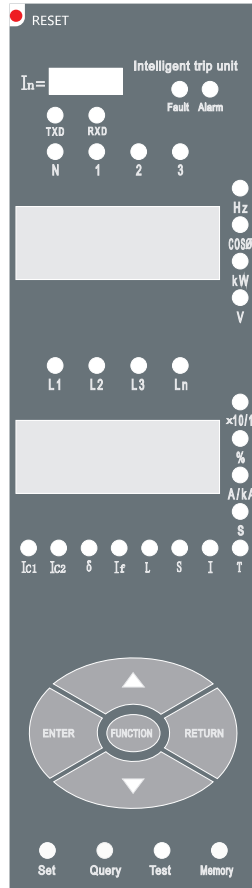
# Controller

## Controller category

2M type



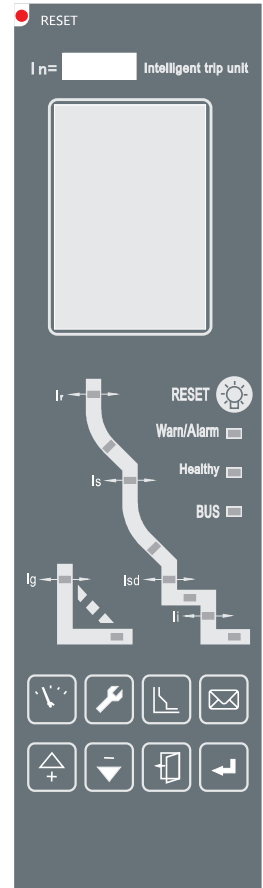
2H type



3M type



3H type



## Controller functions

Function items	2M	2H	3M	3H
<b>Display interface</b>				
Digital tube display	●	●	—	—
LCD display	—	—	●	●
<b>Protection functions</b>				
Overload long delay protection	●	●	●	●
Overload thermal memory	●	●	●	●
Overload pre-alarm/alarm signaling operation	●/○	●/○	●/○	●/○
Short-circuit short delay protection	●	●	●	●
Short delay thermal memory	●	●	●	●
Short-circuit instantaneous protection	●	●	●	●
Grounding protection (Differential T)	●	●	●	●
Grounding alarm/ alarm signaling operation	●/○	●/○	●/○	●/○
Leakage protection /alarm/ alarm signaling operation (and grounding protection for selection)	○/○/○	○/○/○	○/○/○	○/○/○
Neutral solidly grounded protection	●	●	●	●
Current asymmetric protection/alarm/ alarm signaling operation	●/●/○	●/●/○	●/●/○	●/●/○
MCR/HSISC	○/○	○/○	○/○	○/○
Load monitor/ alarm/ alarm signaling operation	○/○/○	●/●/○	○/○/○	●/●/○

## Controller functions

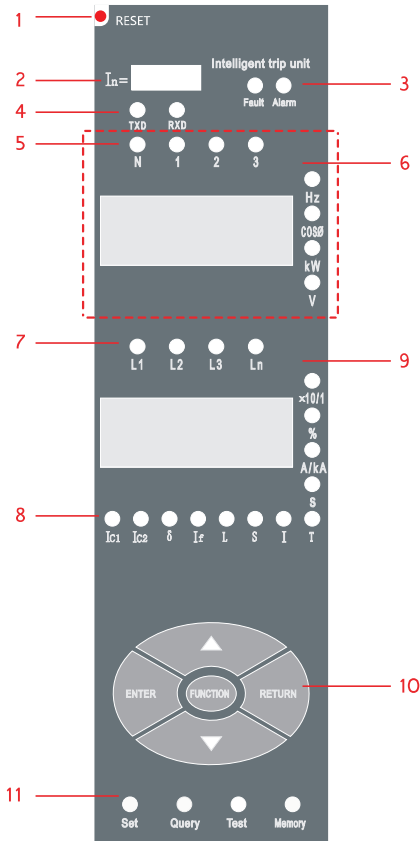
Function items	2M	2H	3M	3H
<b>Display interface</b>				
Under-voltage protection/ alarm/ alarm signaling operation	—	—	●/●/○	●/●/○
Over-voltage protection/ alarm/ alarm signaling operation	—	—	●/●/○	●/●/○
Voltage asymmetric protection / alarm/ alarm signaling operation	—	—	●/●/○	●/●/○
Phase sequence protection/ alarm/ alarm signaling operation	—	—	●/●/○	●/●/○
Under-frequency protection / alarm/ alarm signaling operation	—	—	●/●/○	●/●/○
Over-frequency protection / alarm/ alarm signaling operation	—	—	●/●/○	●/●/○
Current allowable-value protection/ alarm/ alarm signaling operation	—	—	●/●/○	●/●/○
Reverse-power protection / alarm/ alarm signaling operation	—	—	●/●/○	●/●/○
<b>Testing functions</b>				
Current testing (Phase-poles, N-pole and Grounding)	●	●	●	●
Voltage testing (Phase-voltage, Cable-voltage and Voltage asymmetric rate)	○	● (no-voltage asymmetric rate)	●	●
Phase sequence testing	—	—	●	●
Frequency testing	○	●	●	●
Allowable-value testing (Current)	—	—	●	●
Allowable-value testing (Power)	—	—	●	●
Power testing (Active & Reactive power)	○	● (active power)	●	●
Power factor testing	—	● (total power factor)	●	●
Power energy testing (Active & Reactive power energy)	—	—	●	●
Harmonics testing	—	—	○	○
<b>Maintenance functions</b>				
Fault status indicating	●	●	●	●
Fault record and query	●	●	●	●
Past record of peak current	—	—	●	●
Past record of alarm and query	—	—	●	●
Fault to trip signaling operation	●	●	●	●
Self-diagnostics function	●	●	●	●
Analog tripping test function	●	●	●	●
Contacts abrasion equivalent (alarm) query	●	●	●	●
Operation times query	●	●	●	●
Clock functions	○	○	●	●
<b>Other</b>				
Signal unit	○	●	○	●
Communication	—	●	—	●
Regional selective interlock	○	○	○	○

Remarks: “●” with this function, “○” function for selection, “—” without this function



# Controller

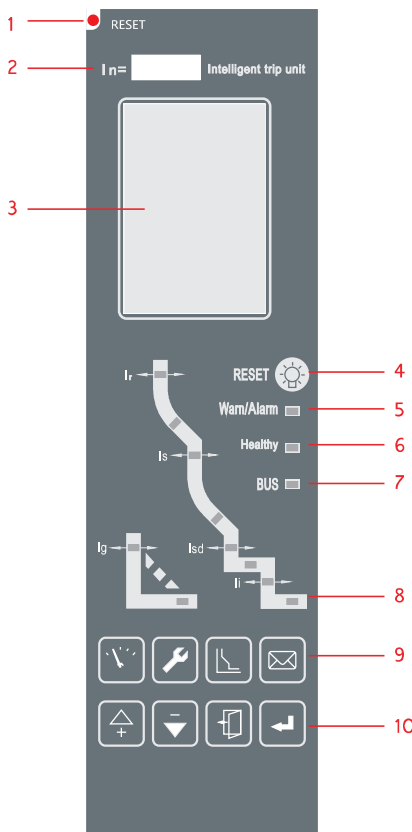
## Controller Panel



### 2M/2H type controller

1. Fault to trip & reset
2. Rated current for name-plate
3. In sequence of fault & alarm indicating
4. In sequence of communication emission & receiver indicating
5. In sequence of N phase, A phase, B phase, C phase voltage indicating
6. In sequence of frequency, power factor, power, voltage indicating from upper to bottom
7. In sequence of A phase, B phase, C phase, N phase current indicating
8. In sequence of load monitor1, load monitor 2, asymmetric current, grounding protection, over-load long delay, short-circuit short delay, short-circuit instantaneous indicating
9. In sequence of opening & closing time, main contacts abrasion rate, current unit, time, self-diagnostics fault statues indicating from upper to bottom
10. 5 pieces operation buttons
11. In sequence of controller setting, query, testing, store service status indicating
12. Notes:

1. The dashed box is controller with voltage indicating function. Without indicating if no.
2. Serial no.: 4 is with communication function controller. Without indicating if no.
3. A/kA of serial no.: 9, light fixed is current A and continuous blinking in kA
4. kW of serial no.: 6, light fixed is active power and continuous blinking is reactive power



### 3M/3H type controller

1. Fault to trip & reset
2. Rated current for name-plate
3. LCD indicating interface
4. Fault/alarm resetting button
5. Fault/alarm LED indicating (LED without light while normal working, LED with continuous blinking quickly while fault to trip. LED with light fixed while alarm)
6. LED always continuous blinking while controller on power and normal working status
7. Communication indicating (Modbus: extinguish without communication. Continuous blinking while communication. Proibus: extinguish without communication. Light fixed while communication) .
8. Curve LED (Fault to trip at corresponding LED light flash indicating fault type. LED light fixed indicating present setting items while protective parameter setting) .
9. In sequence of testing function, setting function, protection function and information function button. From left to right
10. In sequence of upward, downward, ESC and selection OK button. from left to right

Remarks: Serial no.: 7 is with communication function controller. No indicating if no-communication function

Controller Setting and Protective Characteristics

Over-load long delay protection 2M/2H type & 3M/3H type		
Current setting IR	(0.4~1.0 or 1.25) In or OFF (OFF-function close) Notes: Distribution protection is 1.0In; Generator protection is 1.25In.	
6 categories protective curve	SI: Normal inverse time $t=0.01396 T_R / (N0.02-1)$ VI: Fast inverse time $t= T_R / (N-1)$ EI (G) : Express inverse time (use of general distribution protection) $t=3 T_R / (N2-1)$ EI (M) : Express inverse time (use of generator protection) $t=2.95 T_R \times \ln [N2 / (N2-1.15)]$ HV: High voltage fuse compatibility $t=15 T_R / (N4-1)$ I2t: Normal distribution protection $t=2.25 T_R / N2$ (factory default) N=I/Ir I-fault current t-long delay acting time Ir-long delay setting current T <sub>R</sub> -long delay setting time Remarks: only normal distribution protection I2t for 2M/2H type controller. other protective curves shall be order. 3M/3H type controller with 6 categories protective curve for selection.	
6) Normal distribution protection I2t time setting T <sub>R</sub> (1.5Ir)	2M/2H: 15,20,25,30,40,50,60,80,100,120,160,200,240,320,400,480 (s) 3M/3H: 15,30,60,120,240,360,480,600,720,840,960 (s)	
1) -5) Protective curve type	3M/3H: C1-C16 over-load long delay protective operating delay time in the drop-down list	
Protective characteristics (Accuracy ±10%)	Current (I/Ir)	Trip time
	1.05	> 2h no-acting
	1.3 (Distribution protection)	< 2h acting
	1.2 (Motor protection)	< 2h acting
	≥ 1.2Ir	Acting time as per 6 categories protection type formula calculator or curve query
Thermal memory time	2M/2H type: 30ms (ON) or power failure release 3M/3H type: instantaneous,10ms,20ms,30ms,45ms,1hr,2hrs,3hrs or power failure release Remarks: connecting controller for auxiliary power supply with thermal memory function and auxiliary power supply failure, that is, release thermal memory.	
Short-circuit short delay protection 2M/2H type & 3M/3H type		
Current setting Isd	(1.5~15) IR or OFF (OFF-functions close)	
Time setting Tsd (s)	Tsd1 inverse time	2M/2H type: 0.1~1
	Tsd2 definite time	3M/3H type: 0.1,0.2,0.3,0.4 (selection: 0.1~1)
	Current (I/Isd)	Trip time
	≤ 0.9	No-acting
	≥ 1.1	inverse time $I_{sd} \leq I \leq 8I_R$ curre 1-5 and over-load long delay simultaneously, but curve speed faster 10 times. curre 6 characteristics formula $t=64Tsd/N2$ definite time $I > 8I_R$ (or $I \geq I_{sd}$ ) delay protection as per definite time delay setting time Tsd
Thermal memory time	2M/2H type: 15min (ON) or power failure release 3M/3H type: instantaneous,10ms,20ms,30ms,45ms,1hr,2hrs,3hrs or power failure release Remarks: connecting controller for auxiliary power supply with thermal memory function and auxiliary power supply failure, that is, release thermal memory.	
Short-circuit instantaneous protection 2M/2H type & 3M/3H type		
Current setting li	2M/2H type: 1.0In~50kA or OFF (OFF-function close) 3M/3H type: (1.0~20) In or OFF (OFF-function close)	
Protective characteristics (Accuracy ±10%)	Current (I/li)	Trip time
	≤ 0.85	no-acting
	> 1.15	< 40ms acting

## Controller

### Controller setting and Protective Characteristics

MCR/HSISC protection 2M/2H type & 3M/3H type					
Current setting $I_{MCR}$	XUW3-1600: 35kA XUW3-2500: 50kA XUW3-4000:50kA Remarks: this is factory default which the user cannot adjust (for selection 30~100kA)				
Current setting $I_{HSISC}$	XUW3-1600: 50kA XUW3-2500: 65kA XUW3-4000: 80kA Remarks: this is factory default which the user cannot adjust (for selection 30~100kA)				
Protective characteristics (Accuracy $\pm 10\%$ )	Current ( $I/I_{MCR}/HSISC$ )	Trip time			
	<0.8	no-acting			
	>1.0	<30ms acting			
Grounding protection/alarm 2M/2H type & 3M/3H type					
Protection type	Differential type (T)、Earth current type (W) , alternative .factory default is differential type (T)				
Current setting $I_g$	(0.2~1.0) In or OFF (OFF-function close)				
Time setting $T_g$	Definite time delay $T_g$ (s)	0.1~1or OFF (OFF-only alarm and no trip)			
	Inverse time factor KG	1.5~6 or OFF (OFF-grounding protection is definite time)			
Protective characteristics (Accuracy $\pm 10\%$ )	Current ( $I/I_g$ )	Trip time			
	$\leq 0.8$	No-acting (no alarm)			
	$\geq 1.0$	<table border="1"> <tr> <td><math>(I/I_g) &lt; KG</math></td> <td>Inverse time delay acting (or alarm) <math>t=T_g \times KG \times I_g/I</math></td> </tr> <tr> <td><math>(I/I_g) \geq KG</math></td> <td>Definite time delay acting (or alarm) as per time setting</td> </tr> </table>	$(I/I_g) < KG$	Inverse time delay acting (or alarm) $t=T_g \times KG \times I_g/I$	$(I/I_g) \geq KG$
$(I/I_g) < KG$	Inverse time delay acting (or alarm) $t=T_g \times KG \times I_g/I$				
$(I/I_g) \geq KG$	Definite time delay acting (or alarm) as per time setting				
Grounding alarm 3M/3H type					
Performance mode	Alarm /Close				
Alarm operating current setting	(0.2~1.0) In				
Alarm operating delay time setting	0.1~1.0 (s)				
Alarm return current setting	(0.2~1.0) In				
Alarm return delay time setting	0.1~1.0 (s)				
Alarm operating characteristics (Accuracy $\pm 10\%$ )	Multiple of current ( $I/I$ setting)	Acting time			
	<0.8	No-alarm			
	$\geq 1.0$	Alarm (time as per alarm operating time setting)			
Alarm return characteristics (Accuracy $\pm 10\%$ )	$\geq 1.0$	Alarm without return			
	$\leq 0.9$	Alarm return (time as per alarm return time setting)			
Neutral protection 2M/2H type & 3M/3H type					
Neutral protective setting	2M/2H type: 50%In,100%In or OFF; 3M/3H type: 50%In,100%In,160%In,200%In or OFF。 OFF- close N phase protective function				
Protective characteristics	Same as phases and poles over-load long delay protection, short-circuit short delay protection, short-circuit instantaneous protection and grounding protection				
Leakage protection/alarm 2M/2H type & 3M/3H type					
Current setting $I_{\Delta n}$ (A)	0.5~30 or OFF (OFF-function close)				
Operating delay time $T_{\Delta n}$ (s)	Instantaneous,0.06,0.08,0.17,0.25,0.33,0.42,0.5,0.58,0.67,0.75,0.83				
Protective characteristics (Accuracy $\pm 10\%$ )	Multiple of current ( $I/I_{\Delta n}$ )	Trip time			
	<0.8	No-acting			
	$\geq 1.0$	Acting (time in the drop-down list)			

## Controller Setting and Protective Characteristics

Trip time t (s) Accuracy ( $\pm 10\%$ )	Setting time	Instantaneous	0.06	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83
	$I\Delta n$	0.04	0.36	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
	$2I\Delta n$	0.04	0.18	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5
	$5I\Delta n$ $10I\Delta n$	0.04	0.07 2	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Alarm performance mode (3M/3H type controller )		Alarm/ Close											
Alarm acting current setting		0.5~30 (A)											
Alarm acting delay time setting		0.1~1.0 (s)											
Alarm return current setting		0.5~30 (A)											
Alarm return delay time setting		0.1~1.0 (s)											
Alarm operating characteristics (Accuracy $\pm 10\%$ )		Multiple of current ( $I/I\Delta n$ )					Acting time						
		$< 0.8$					No alarm						
		$\geq 1.0$					Alarm (time as per alarm acting time setting)						
Alarm return characteristics (Accuracy $\pm 10\%$ )		$\geq 1.0$					Alarm without return						
		$\leq 0.9$					Alarm return (time as per alarm return time setting)						
Current asymmetric protection/Alarm 2M/2H type & 3M/3H type													
2M/2H type		Current asymmetric rate setting $\delta$					(40%~100%) or OFF (OFF-function close)						
		Acting delay time setting T $\delta$					0.1~1.0 (s) or OFF (OFF-alarm no trip)						
3M/3H type		Performance mode					Alarm /Trip /Close						
		Protective start setting					5%~60%						
		Acting delay time setting T $\delta$					0.1~40 (s)						
		Alarm acting return setting					5%~Start setting				Performance mode is alarm for setting this item		
		Alarm return delay time					10~200 (s)						
Protective characteristics (Accuracy $\pm 10\%$ )		Actual current asymmetric rate/setting					Trip time						
		$< 0.9$					No-acting (No-alarm)						
		$\geq 1.1$					Acting (or alarm) as per setting delay time						
Alarm return characteristics (Accuracy $\pm 10\%$ )		Actual current asymmetric rate/setting					Acting time						
		$\geq 1.1$					No return						
		$\leq 0.9$					Return as per alarm return delay time						
Allowable current value protection/Alarm 3M/3H type													
Performance mode		Close / Trip / Alarm (required current value protection for each phase setting)											
Protection/Alarm start setting		(0.2~1.0) In											
Protection acting delay time setting		15~1500 (s)											
Alarm acting return setting		0.2In~ Start value					Performance mode is alarm for setting this item						
Alarm return delay time		15~3000 (s)											
Protective characteristics (Accuracy $\pm 10\%$ )		Multiple of current ( $I/I$ operating setting )					Trip time						
		$< 0.9$					No-acting (No-alarm)						
		$\geq 1.1$					Acting (or alarm) as per setting delay time						
Alarm return characteristics (Accuracy $\pm 10\%$ )		Multiple of current ( $I/I$ operating setting)					Acting time						
		$\geq 1.1$					No return						
		$\leq 0.9$					Return as per alarm return delay setting time						

## Controller

### Controller Setting and Protective Characteristics

Under-voltage protection/Alarm 3M/3H type		
Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	100 (v) ~Return value	
Protection acting delay time setting	0.2~60 (s)	
Alarm acting return setting	Start value~1200 (v)	Performance mode is alarm for setting this item,. Return value $\geq$ start value
Alarm return delay time	0.2~60 (s)	
Protective characteristics (Accuracy $\pm 10\%$ )	Multiple of voltage (Umin /Acting setting)	Trip time
	> 1.1	No-acting (No-alarm)
	$\leq 0.9$	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$ )	Multiple of voltage (U min /Operating setting)	Acting time
	< 0.9	No return
	$\geq 1.1$	Return as per alarm return delay setting time
Over-voltage protection/Alarm 3M/3H type		
Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	Return value ~1200 (v)	
Protection acting delay time setting	0.2~60 (s)	
Alarm acting return setting	100 (v) ~ Start value	Performance mode is alarm for setting this item,. Return value $\geq$ start value
Alarm return delay time	0.2~60 (s)	
Protective characteristics (Accuracy $\pm 10\%$ )	Multiple of voltage (U min /Acting setting)	Trip time
	< 0.9	No-acting (No-alarm)
	$\geq 1.1$	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$ )	Multiple of voltage (U min /Return setting)	Acting time
	$\geq 1.1$	No return
	$\leq 0.9$	Return as per alarm return delay setting time
Voltage asymmetric protection/Alarm 3M/3H type		
Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	2%~30%	
Protection acting delay time setting	0.2~60 (s)	
Alarm acting return setting	2%~ Start value	Performance mode is alarm for setting this item,. Return value $\geq$ start value
Alarm return delay time	0.2~60 (s)	
Protective characteristics (Accuracy $\pm 10\%$ )	Actual voltage asymmetric rate/setting	Trip time
	< 0.9	No-acting (No-alarm)
	$\geq 1.1$	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$ )	Actual voltage asymmetric rate/setting	Acting time
	> 1.1	No return
	$\leq 0.9$	Return as per alarm return delay setting time

Controller Setting and Protective Characteristics

Under-frequency, Over-frequency/Alarm 3M/3H type					
Performance mode		Close / Trip / Alarm			
Under-frequency	Protection/Alarm start setting		45 (Hz) ~ Return value		
	Acting delay time setting		0.2~5.0 (s)		
	Alarm acting return setting		Start value ~65 (Hz)	Performance mode is alarm for setting this item m,. Return value ≥ start value	
	Alarm return delay time setting		0.2~36 (s)		
Over-frequency	Protection/Alarm start setting		Return value ~65 (Hz)		
	Acting delay time setting		0.2~5.0 (s)		
	Alarm acting return setting		45 (Hz) ~Start value	Performance mode is alarm for setting this item,. Return value ≥ start value	
	Alarm return delay time setting		0.2~36 (s)		
Protection/Alarm acting characteristics		Same as under-voltage, over-voltage protection/Alarm			
Reverse power protection/Alarm 3M/3H type					
Performance mode		Close / Trip / Alarm			
Protection/Alarm start setting		5~500 (kW)			
Protection acting delay time setting		0.2~20 (s)			
Alarm acting return setting		5 (kW) ~ Start value	Setting this item while only performance mode is alarm,. Return value ≥ start value		
Alarm return delay time		1.0~360 (s)			
Protection/Alarm operating characteristics		Same as over-voltage protection/Alarm			
Phase sequence /Alarm 3M/3H type					
Performance mode		Close / Trip / Alarm			
Acting sequence setting range		$\Delta \varphi$ : A,B,C / $\Delta \varphi$ : A,C,B			
Acting/Alarm characteristics		Instantaneous			
Load monitor 2M/2H type & 3M/3H type					
2M/2H type	Current setting IC1、 IC2		(0.2~1) In or OFF (OFF-function close)		
	Time setting		15,20,25,30,40,50,60,80,100,120,160,200,240,320,400,480 (s)		
	Output characteristics (Accuracy ±10%)	Load monitor mode		Multiple of current	Acting time
		Mode1 (Independent control two branches load)		≤ 1.05IC1 or IC2	No operation
				> 1.2 IC1 or IC2	Delay replay operating (same as over-load long delay characteristics curve)
		Mode 2 (Control the same branch load, require IC1 > IC2)		≤ 1.05 IC1	No operation
	> 1.2 IC1			Delay relay operating (same as over-load long delay characteristics curve)	
		< IC2	Delay relay operating (delay fixed 60s)		
Thermal memory time		30min (OFF) or power failure release			
3M/3H type	Operating mode		Current setting	Time setting	
	Discharge I	Current mode 1	(0.2~1.0) In	(20%~80%) TR (TR: over-load long delay acting time)	
		Current mode 2			
		Power mode 1	200~10000 (kW)	10~3600 (s)	
		Power mode 2			
	Discharge II	Current mode 1	(0.2~1.0) In	(20%~80%) TR (TR: over-load long delay acting time)	
		Current mode 2	0.2In~ Discharge I	10~600 (s)	
		Power mode 1	200~10000 (kW)	10~3600 (s)	
Power mode 2		100 (kW) ~ Discharge I			

# Controller

## Controller Setting and Protective Characteristics

Signal unit ( for selection) 2M/2H type & 3M/3H type					
2M/2H type controllerClose / Trip / Alarm					
Controller type	Contact 1	Contact 2	Contact 3	Contact 4	
2M	Load monitor 1 Discharge output	Load monitor 2 Discharge output	Alarm for system self-diagnostic fault alarm	Alarm for fault to trip	
2H	Load monitor 1 Discharge output	Load monitor 2 Discharge output	Remote control opening	Remote control closing	
Output function for signal contacts (Programmable)	1.Alarm for short-circuit instantaneous fault to trip 2.Alarm for grounding fault or Residual current fault to trip 3.Alarm for .current asymmetric fault to trip 4.Alarm for short-circuit delay fault to trip 5.Alarm for over-load long delay fault to trip 6. Alarm for fault to trip 7. Load monitor 1 Discharge output 8. Load monitor 2 Discharge output 9.Alarm for system diagnostic fault 10.Alarm for power grid fault status				
3M/3H type controller					
Function setting	In the drop- list for Switch output (DO) parameter				
Performance mode	Normally open level	Normally close level	Normally open impulse	Normally close impulse	
Impulse time	/		1~360 (s)		
Switch variable output (DO) parameter setting	General	Alarm	Fault to trip	Self-diagnostic alarm	Load monitor 1
	Load monitor 2	Over-load pre-report	Over-load fault	Short delay fault	Instantaneous fault
	Grounding/ Leakage fault	Grounding fault	Asymmetric current fault	Neutral phase fault	Under-voltage fault
	Over-voltage fault	Voltage asymmetric fault	Under-frequency fault	Over-frequency fault	Allowable-value fault
	Reverse power fault	Regional interlock	Closing	Opening	Phase sequence fault
	MCR/HSISC fault	Grounding interlock	Short-circuit interlock	A phase allowable-value fault	B phase allowable-value fault
	C phase allowable-value fault	N phase allowable-value fault	Allowable-value threshold		

## Controller Factory Setting (Approval)

Protection characteristics		Setting current	Setting time	Remarks
Over-load long delay		1.0In	30s	Thermal memory (ON-30ms)
Short-circuit short delay	Inverse time	4Ir	/	—
	Definite time	6Ir	0.2s	
Short-circuit instantaneous		10In	—	—
Neutral protection		100%In	—	—
Grounding protection	In ≤ 1250A	0.8In	Alarm no trip	—
	In ≥ 1600A	1200A		
Asymmetry current		OFF	—	The user open by themselves according to their request

Controller Setting and Protective Characteristics

Over-load long delay protective operating delay table C1-C163M/3H type																	
Curre type	Fault current	Delay time (s)															
		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
SI	1.5Ir	0.61	0.98	1.47	2.46	3.68	4.91	6.14	8.29	11.1	17.2	24.6	36.8	49.1	61.4	73.7	86
	6Ir	0.14	0.22	0.33	0.55	0.82	1.1	1.37	2.06	2.47	3.84	5.48	8.22	10	13.7	16.4	19.2
	7.2Ir	0.12	0.2	0.3	0.5	0.75	0.99	1.24	1.86	2.23	3.48	4.97	7.45	9.93	12.4	14.9	17.4
VI	1.5Ir	2	3.2	4.8	8	12	16	20	27	36	56	80	120	160	200	240	280
	6Ir	0.2	0.32	0.48	0.8	1.2	1.6	2	2.7	3.6	5.6	8	12	16	20	24	28
	7.2Ir	0.16	0.26	0.39	0.65	0.97	1.29	1.61	2.18	2.9	4.52	6.45	9.68	12.9	16.1	19.4	22.6
EI (G)	1.5Ir	8	12.8	19.2	32	48	64	80	108	144	224	320	480	640	800	960	1120
	6Ir	0.29	0.46	0.69	1.14	1.71	2.29	2.86	3.86	5.14	8	11.4	17.1	22.9	28.6	34.3	37.1
	7.2Ir	0.2	0.32	0.47	0.79	1.18	1.57	1.97	2.66	3.54	5.51	7.87	11.8	15.7	19.7	23.6	25.6
EI (M)	1.5Ir	6.22	9.96	14.9	24.9	37.3	49.8	62.2	84	112	174	249	373	498	622	747	871
	6Ir	0.28	0.45	0.68	1.13	1.69	2.26	2.82	3.81	5.08	7.9	11.3	16.9	22.6	28.2	33.9	36.7
	7.2Ir	0.2	0.31	0.47	0.78	1.17	1.56	1.95	2.63	3.51	5.46	7.8	11.7	15.6	19.5	23.4	25.4
HV	1.5Ir	2.46	3.94	5.9	9.85	14.8	19.7	24.6	33.2	44.3	68.9	98.5	147	197	246	295	344
	6Ir	0.01	0.01	0.02	0.03	0.05	0.06	0.08	0.1	0.14	0.22	0.31	0.46	0.62	0.77	0.93	1
	7.2Ir	0	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.07	0.1	0.15	0.22	0.3	0.37	0.45	0.48
I2t	1.5Ir	15	30	60	120	240	360	480	600	720	840	960					
	6Ir	0.938	1.875	3.75	7.5	15	22.5	30	37.5	45	52.5	60					
	7.2Ir	0.651	1.302	2.604	5.208	10.4	15.6	20.8	26.0	31.3	36.5	41.7					

Controller service power supply

Instrument transformer and auxiliary power supply for controller service source, so as to ensure normal operation for low current or normal breaking for fault by means of 1 & 2 power supply modes simultaneously

1) CT power supply

Normal service conditions for controller: Primary single phase current no less than 0.4In. Three-phase no less than 0.2In. Rated current ≤ 400A. Main circuits primary current no less than 1.0 In. Three-phase no less than 0.6In. Otherwise, it shall be connected auxiliary power supply.

2) Auxiliary power supply

- ◎Normal service conditions for controller (85%~110%) Us
- ◎AC voltage (50/60Hz) : AC230V,AC400V,AC110V
- ◎DC voltage: DC220V,DC110V,DC24V
- ◎Voltage for 1 & 2 contacts of DC controller: DC24V
- ◎External DC power module shall convert DC110V/DC220V into DC24V by the user incoming.



## Accessories

### List of Accessories

Category	Name/ Code	Configuration	Mounting construction type	Remarks
Electric control accessories	Closing electromagnet (X)	Standard	Fixed-type/Draw out-type	
	Shunt release (F)	Standard	Fixed-type/Draw out-type	
	Motor operating mechanism (M)	Standard	Fixed-type/Draw out-type	
	Under-voltage release (Q) /Under-voltage delay module (QY)	For selection	Fixed-type/Draw out-type	Alternative
	No-voltage release (Q) / No-voltage delay module (QY)	For selection	Fixed-type/Draw out-type	
Signal output accessories	Auxiliary switch (FK)	Standard	Fixed-type/Draw out-type	
	Drawer base three-position status signal output device	For selection	Draw out-type	
	Secondary terminals	Standard	Fixed-type/Draw out-type	
Controller related accessories	External connecting N pole current transformer (HGQ)	For selection	Fixed-type/Draw out-type	
	Power module (DM)	For selection	Fixed-type/Draw out-type	
	Relay module (RM)	For selection	Fixed-type/Draw out-type	Be used with power module
Protection accessories	Insulating barrier between phases	Standard	Fixed-type/Draw out-type	
	Frame	Standard	Fixed-type/Draw out-type	
Lock and interlock device	Opening position key-lock	For selection	Fixed-type/Draw out-type	
	Button-lock	For selection	Fixed-type/Draw out-type	
	Door interlock	For selection	Draw out-type	
Power supply switching device	Mechanism interlock (Soft/Hard)	For selection	Fixed-type/Draw out-type	Be used for two circuits power supply

## Electric control accessories

### Closing electromagnet

Closing electromagnet shall be made of coil, steel core assembly and electronic component.  
Disconnect shall be managed remotely under mechanism energy storage conditions.

Rated insulation voltage (Ui)	Operational voltage range	Rated control voltage Us	Instantaneous power	
			XUW3-1600	XUW3-2500,4000
500V	(85%~110%) Us	AC230V (220V) 50/60Hz	300VA	300VA
		AC400V (380V) 50/60Hz	300VA	300VA
		AC110V	300VA	300VA
		DC220V	135W	135W
		DC110V	135W	135W
		DC24V	70W	70W

### Shunt release

Shunt release shall be made of coil, steel core assembly and electronic component.  
Disconnect shall be managed remotely.

Rated insulation voltage (Ui)	Operational voltage range	Rated control voltage Us	Instantaneous power	
			XUW3-1600	XUW3-2500,4000
500V	(70%~110%) Us	AC230V (220V) 50/60Hz	300VA	300VA
		AC400V (380V) 50/60Hz	300VA	300VA
		AC110V	300VA	300VA
		DC220V	135W	135W
		DC110V	135W	135W
		DC24V	70W	70W

### Motor operating mechanism

Disconnect shall be managed after motor operating mechanism for air circuit breaker prior to energy storage.

Rated insulation voltage (Ui)	Operable voltage range	Rated control voltage Us	Operating power	
			XUW3-1600	XUW3-2500,4000
500V	(85%~110%) Us	AC230V (220V) 50/60Hz	90W	110W
		AC400V (380V) 50/60Hz		
		AC110V		
		DC220V		
		DC110V		

### Under-voltage release

Under-voltage release shall include instantaneous release and delay release, which is made of coil, steel core assembly and control unit.

⊙ Under-voltage delay release set the release operating delay time through toggle switch inside toggle under-voltage delay device. Delay time setting is 1s, 3s, 5s according to the request and factory default is 1s.

⊙ EPRW3-1600 delay time for under-voltage delay release is not adjusted after delivery according to the user request.

### Under-voltage release operating characteristics

- 1) External voltage drop or drop slowly up to 35%~70%Ue, under-voltage release shall discharge for air circuit breaker breaking.
- 2) External voltage below 35%Ue, air circuit breaker cannot be close for under-voltage release.
- 3) External voltage is 85%~110%Ue, under-voltage release operating ensure air circuit breaker reliable close.

## Accessories

Rated insulation voltage (U <sub>i</sub> )	Rated service voltage U <sub>e</sub>	Operating power	
		XUW3-1600	XUW3-2500,4000
500V	AC230V (220V) 50/60Hz	0.8VA	3.9VA
	AC400V (380V) 50/60Hz	0.8VA	5.2VA
	AC110V	0.8VA	3.9VA
	DC220V	0.8W	3.9W
	DC110V	0.8W	3.9W
	DC24V	1.9W	1.6W

### No-voltage release (Under-voltage release--no-voltage protection)

No-voltage release shall include instantaneous release and delay release, which is made of coil, steel core assembly and control unit.

◎No-voltage delay release set the release operating delay time through toggle switch inside toggle under-voltage delay device. Delay time is 1~5s which the user can adjust. Step is 1s.

◎No-voltage delay release delay time of EPRW3-1600 cannot be adjusted after delivery, according to the user request.

### No-voltage release operating characteristics

- 1) External voltage drop suddenly up to 0~30%U<sub>e</sub>, no-voltage release discharge and disconnect air circuit breaker.
- 2) No-voltage release cannot be close air circuit breaker for external voltage below 30%U<sub>e</sub>.
- 3) External voltage is 85%~110%U<sub>e</sub>, no-voltage release ensure air circuit breaker close reliable.

Rated insulation voltage (U <sub>i</sub> )	Rated service voltage U <sub>e</sub>	Operating power	
		XUW3-1600	XUW3-2500,4000
500V	AC230V (220V) 50/60Hz	0.8VA	0.8VA
	AC400V (380V) 50/60Hz	0.8VA	0.8VA

## Signal output accessories

### Auxiliary switch

Auxiliary switch parameter

Case	XUW3-1600	XUW3-2500	XUW3-4000
Auxiliary switch mode	Standard	4 gang switching	4 gang switching
	For selection	6 gang switching	4 normal open 4 normal close 6 normal open 6 normal close 6 gang switching
Conventional thermal current I <sub>th</sub>	6A		
Minimum load	2mA/DC15V		
Breaking capacity	DC-13	5A/DC250V	
	AC-15	16A/AC380V	

### Signal output device for drawer base position status

Draw out-type air circuit breaker body is in the position of opening, test, connection, three positions electric indicating device output electric status signal respectively.

Case	XUW3-1600,2500,4000
DC	0.4A/DC125V
AC	16A/AC250V

## Secondary terminals

Draw out-type and fixed secondary terminals parameter in the following table

Case	XUW3-1600	XUW3-2500,4000
Numbers of Terminals (total)	60 units	88 units
Level of contamination		3
Voltage category		III
Maximum load current		10A
Rated current		10A
Rated voltage		500V

## Controller related accessories

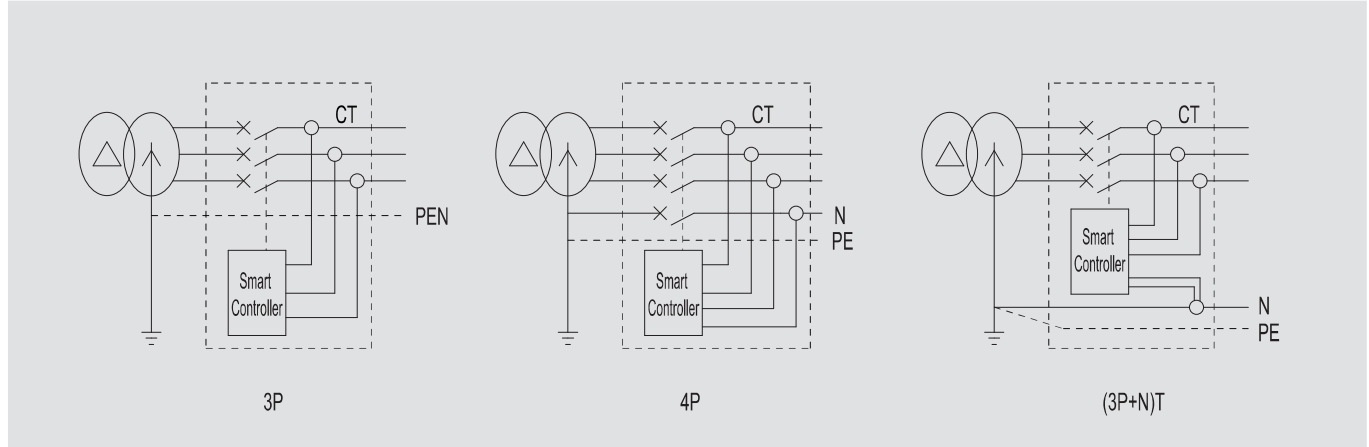
### External connection N pole instrument transformer

Grounding mode

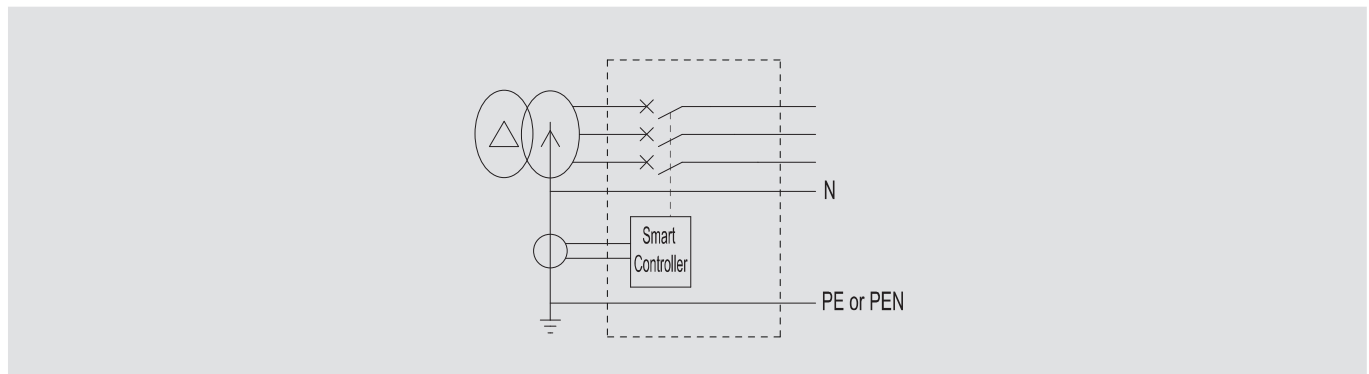
The use of III air circuit breaker with external N phase instrument transformer comprise 3P+N system

enabling grounding protection for differential-type (T) or earth current-type (W). Electric schematic diagram in the following:

#### 1) Differential-type (T)



#### 2) Earth current-type (W)



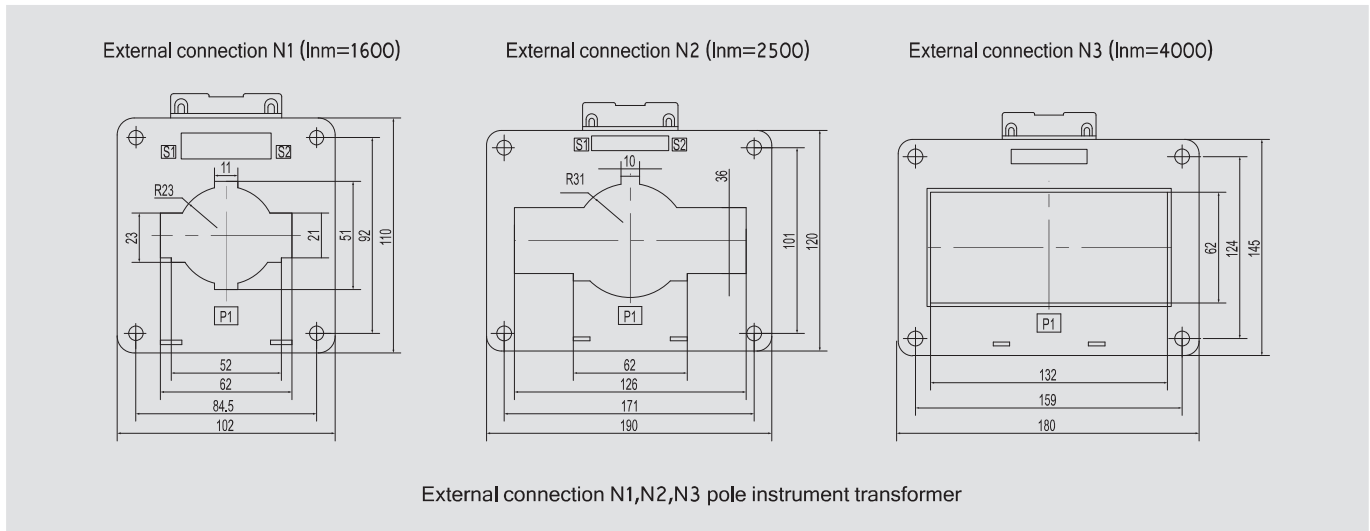
Instrument transformer type:

External connection N pole instrument transformer which is rectangular. Case and bus bar dimension for the user selection.

## Accessories

### Controller accessories

#### Rectangular instrument transformer code and dimension



Note: bus bar current incoming from P1 and outgoing from P2.

### Power Module

Output voltage of DC controller and relay module: DC24V.

Category:

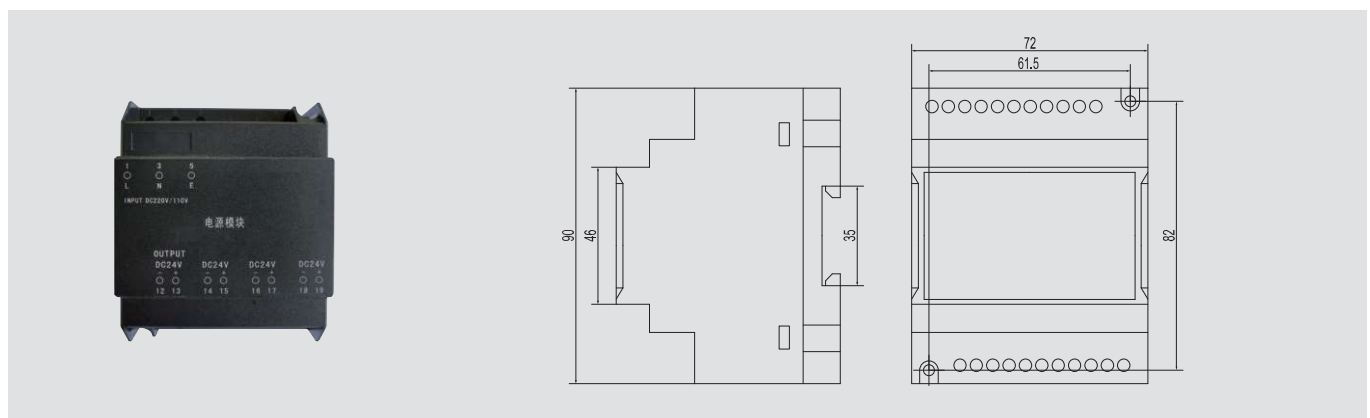
Type	Voltage	Size (mm)	Influence of poles connection
DM-P1	AC230V/AC400V	90×72×54	Influence of non-pole
DM-P2	DC220V/DC110V	90×72×54	Influence of pole
DM-P3	AC110V	90×72×54	Influence of non-pole

Characteristics: (85%~110%) Us power module normal working

Mounting mode: by means of 35mm standard rails or screw fixed

Connection by themselves according to rated service voltage

Overall and Mounting dimension drawing:



### Relay module

Air circuit breaker open, close or larger load capacity, relay module shall be equipped with power module to enable four distance functions through this module switching to control.

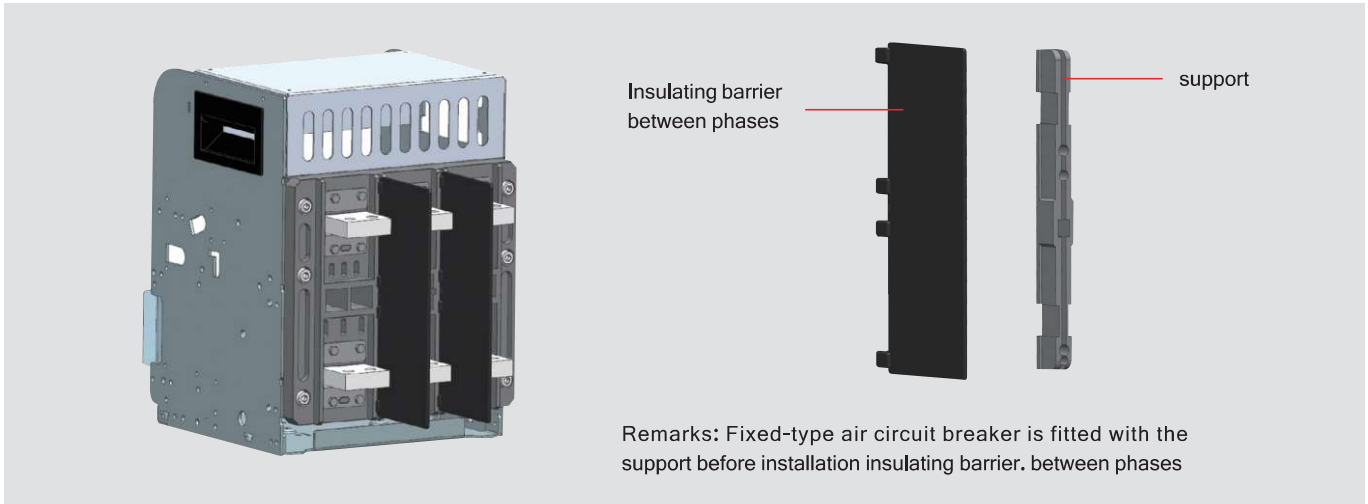
Contacts capacity: AC250V,10A; DC24V,10A;

Overall and Mounting: Same as power module

Protective accessories

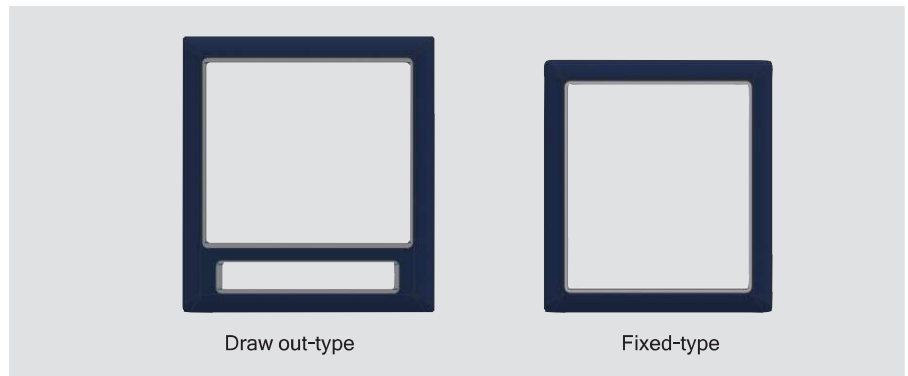
Insulating barrier between phases

Insulating barrier between phases shall include fixed-type and draw out-type, which shall be fitted to the groove between each phase and bus-bar for adding electric insulation strength between main circuits and phases.



Frame

Case shall include fixed-type and draw out-type, which is fitted to the door of cabinet for sealing. The degree of protection for air circuit breaker shall be IP40. Air circuit breaker shall be compact, rugged and reliable in design.



Lock & Interlock device

Disconnection position key-lock



Key-lock shall be fitted to lock air circuit breaker in manual opening position. Circuit breaker cannot be close operation for locking clockwise with the key.

Type	Name	Qty of circuit breaker	Qty of key
YS11	One lock with one key	1	1
YS21	Two locks with one key	2	1
YS31	Three locks with one key	3	1
YS32	Three locks with two keys	3	2
YS53	Five locks with three keys	5	3

## Accessories

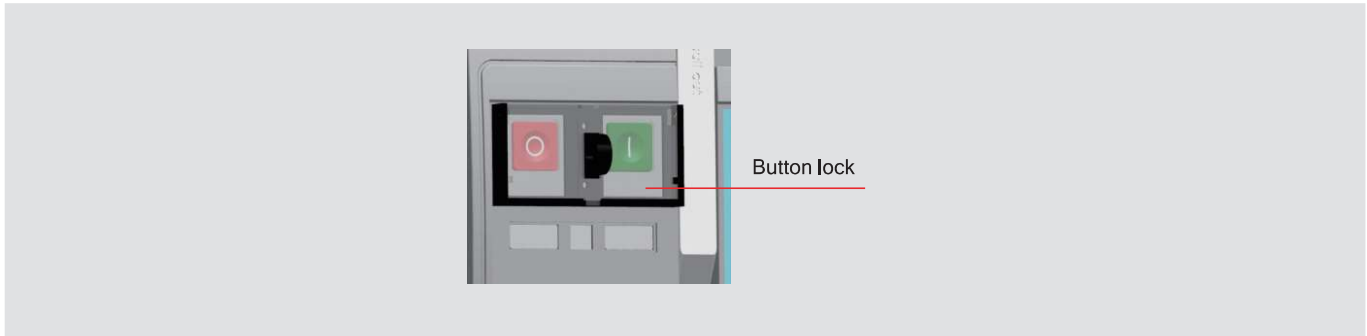
### Lock & Interlock device

#### Button lock

- Air circuit breaker shall be equipped with a locking system to avoid non-operator operating open/close button.
- Provide the lock by the user

#### Door interlock

Door interlock shall be fitted to the right or left side of drawer base to avoid open the small door of cabinet in the no-disconnect position for drawer-type air circuit breaker.



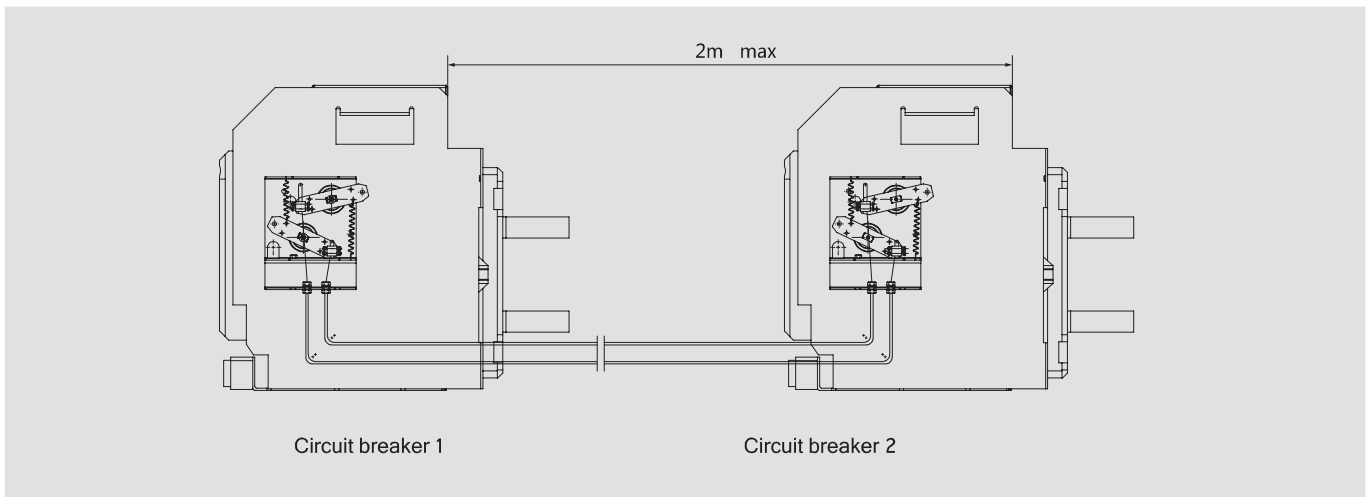
### Power supply switching device

#### Mechanical interlock

- Mechanical interlock mechanism shall be suitable for interlock between draw out-type or fixed-type air circuit breaker.
- Interlock mechanism is fixed on the right side panel of air circuit breaker with 4 screws by the user.
- Maximum distance between two air circuit breakers with mechanism interlock no more than 2m.
- Interlock type in the following table:

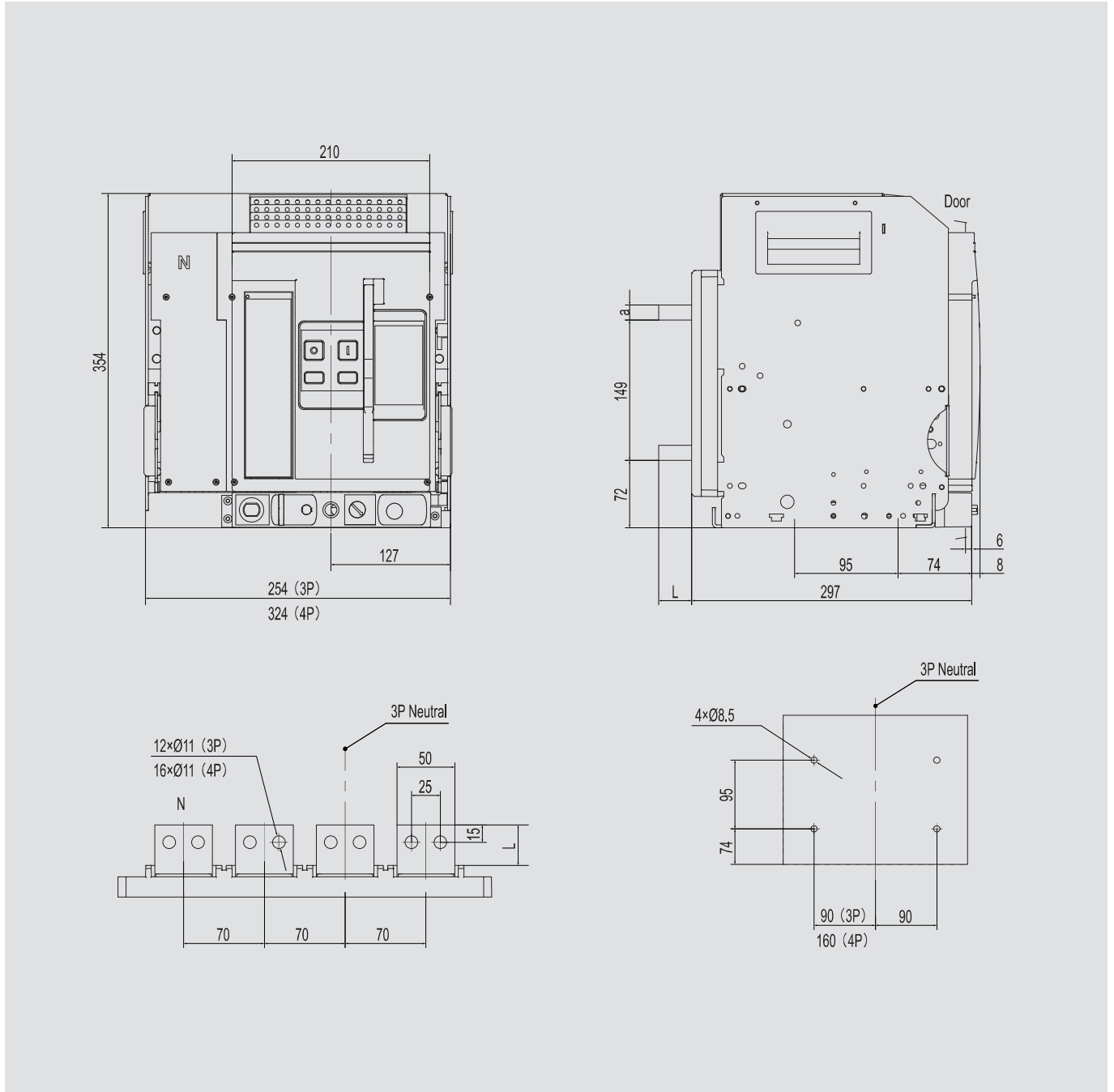
Mode for selection	Type	Qty of circuit breaker
1	Two sets soft interlock, one close one open	2
2	Three sets soft interlock, one close two open	3
3	Three sets soft interlock, two close two open	3
4	Two sets hard interlock, one close one open	2
5	Three sets hard interlock, one close two open	3

#### Mounting drawing:



## Overall and mounting dimension

### XUW3-1600 Draw out-type

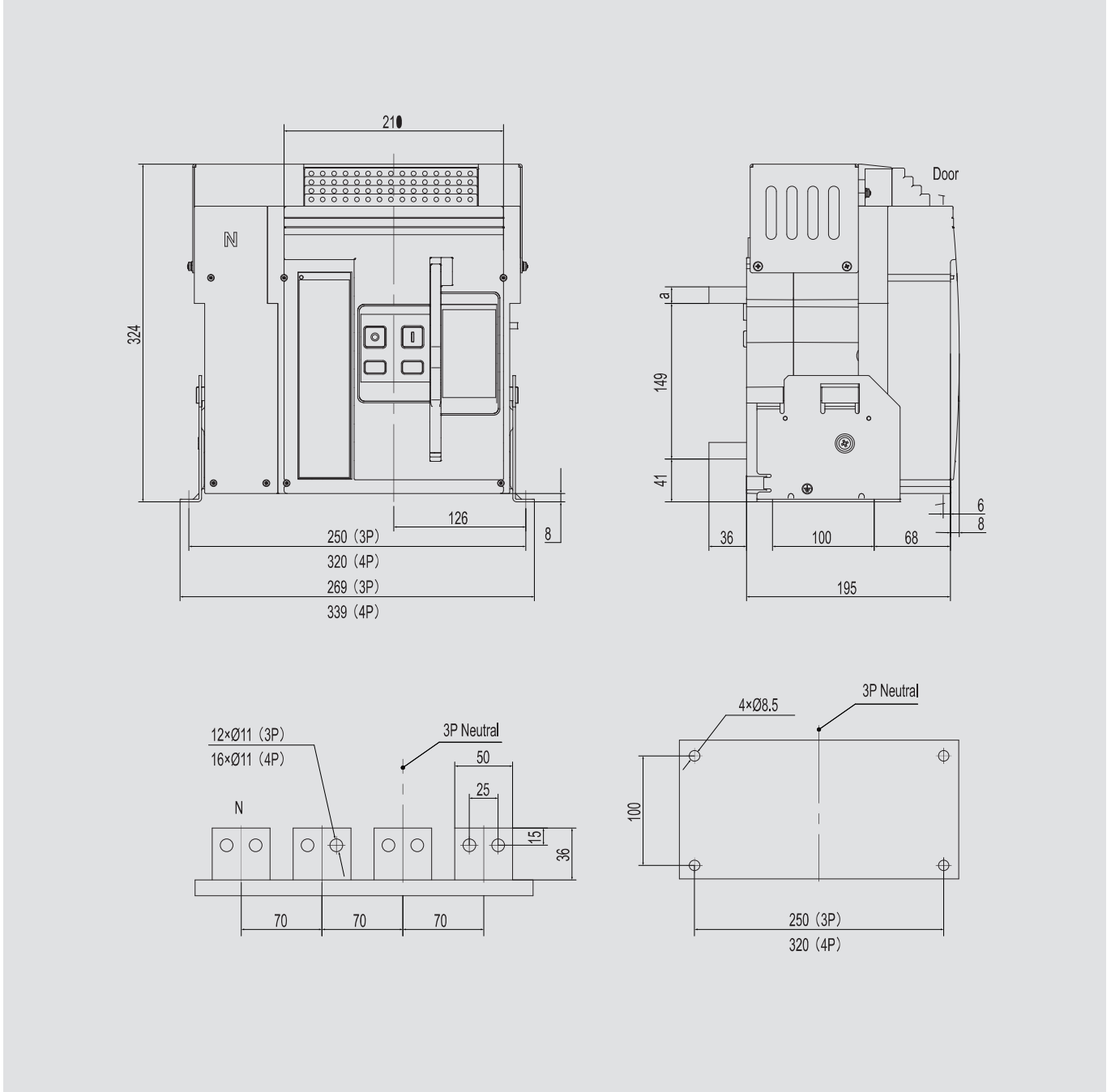


Rated current (A)	a (mm)	L (mm)
200~800	5	Normal: 35 (default) Extend: 50
1000~1250	10	
1600	16	



Overall and mounting dimension

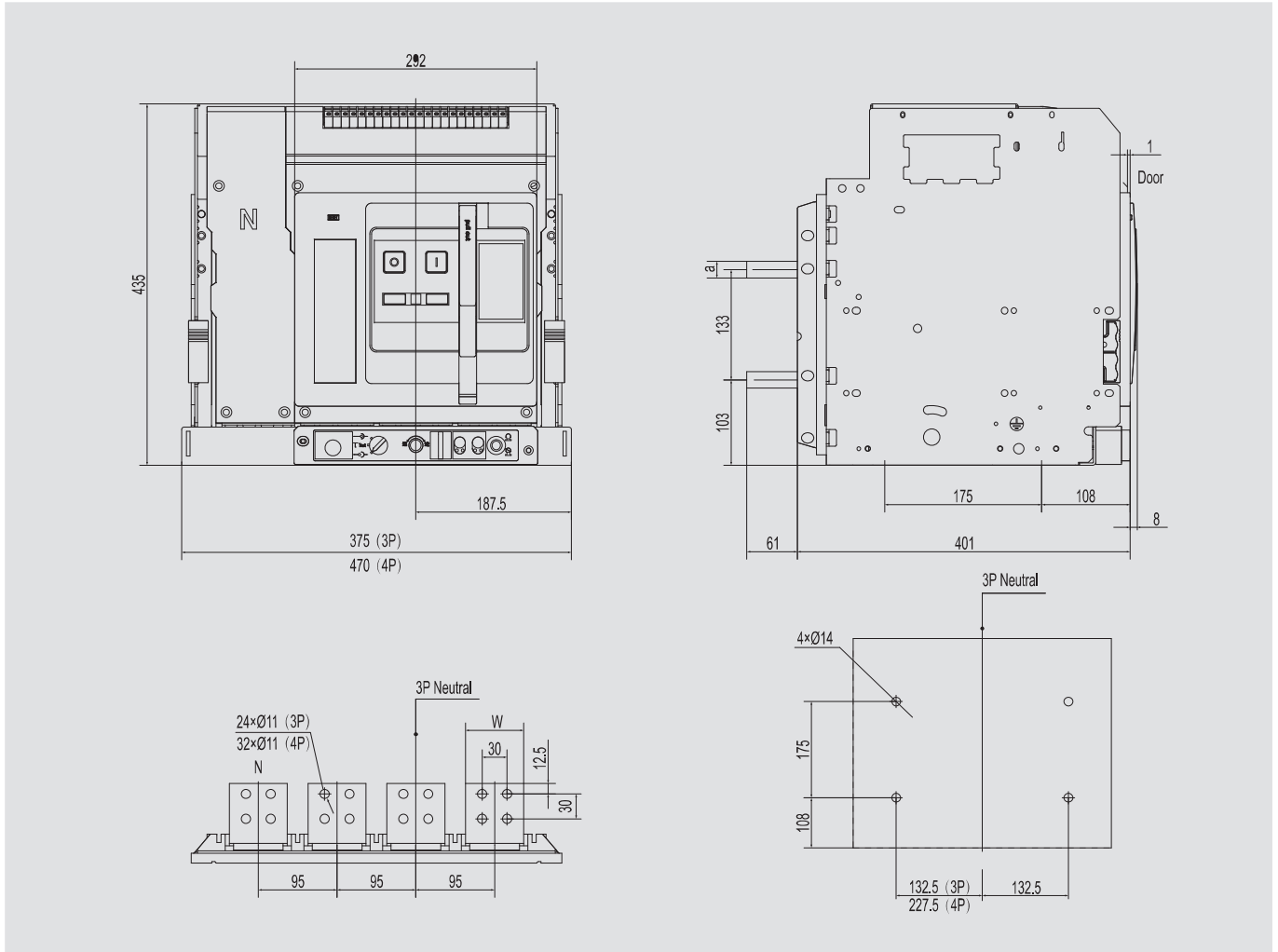
XUW3-1600 Fixed-type



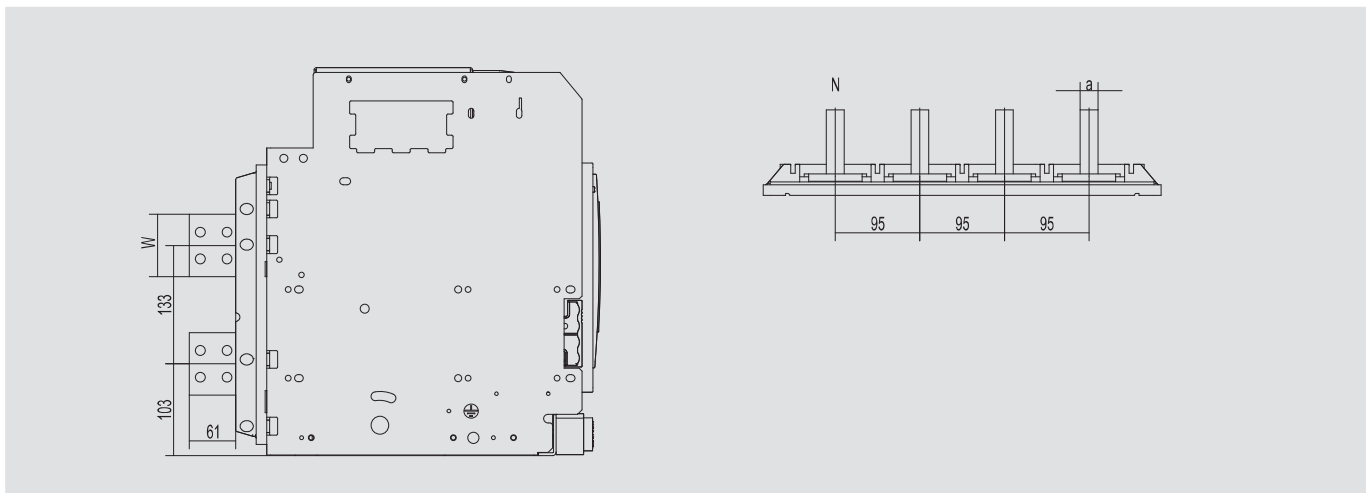
Rated current (A)	a (mm)
200~800	5
1000~1250	10
1600	16

XUW3-2500 Draw out-type

Horizontal connection



Vertical connection

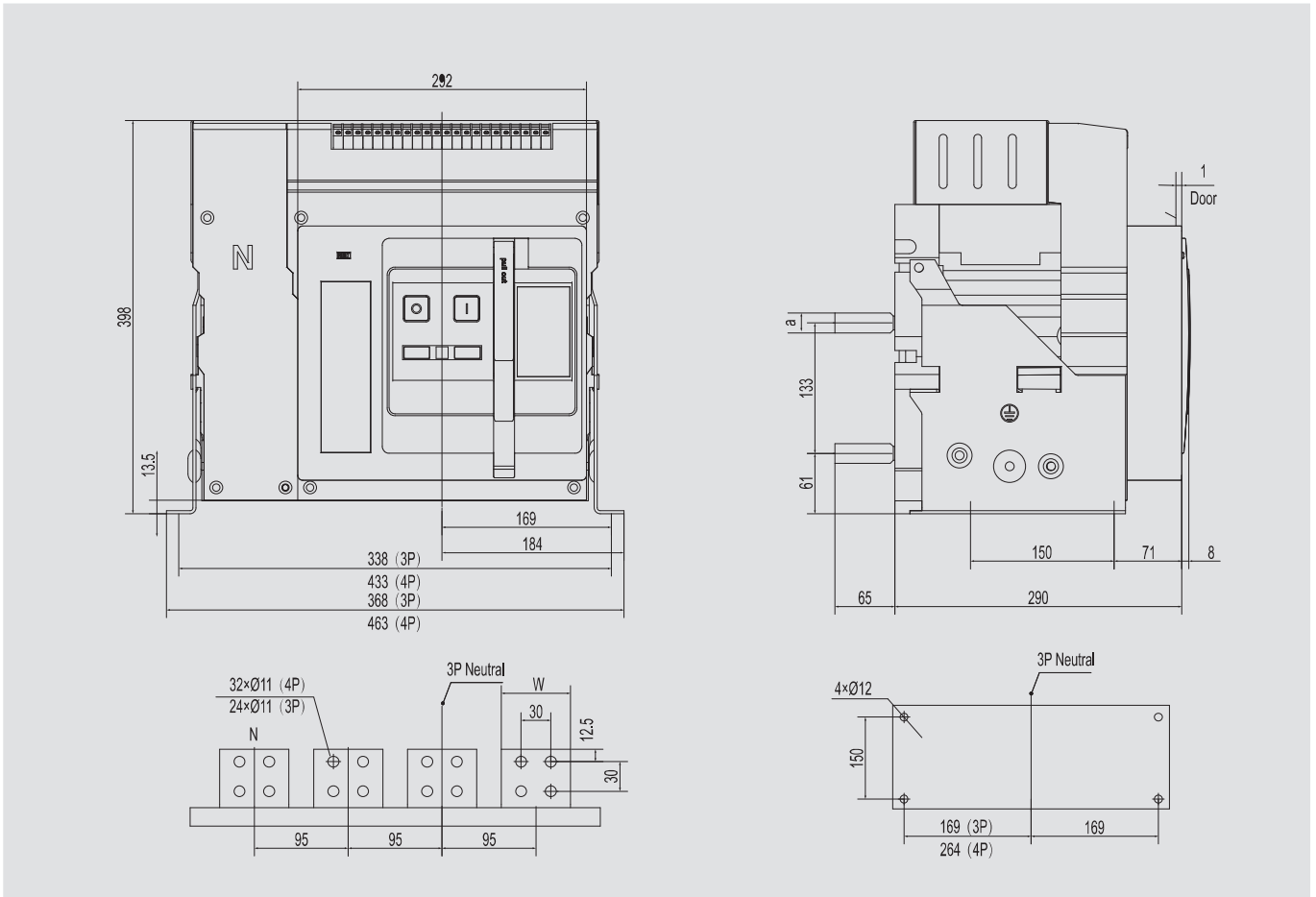


Rated current (A)	a (mm)	w (mm)
630~1600	15	60
2000~2500	20	70

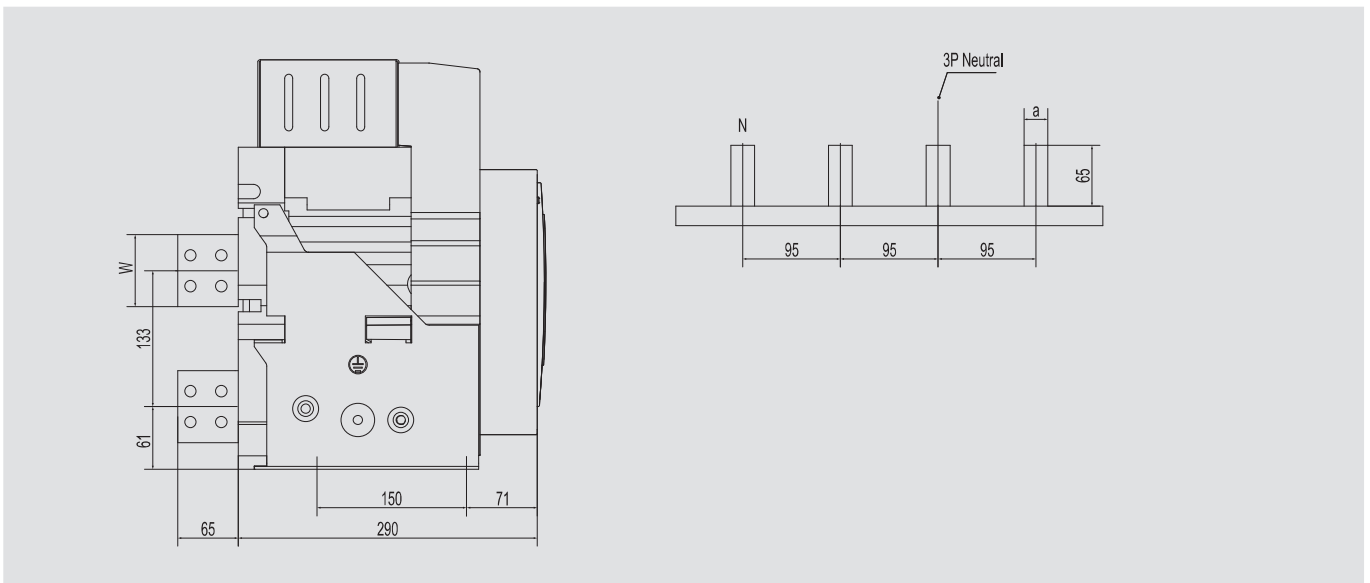
# Overall and mounting dimension

## XUW3-2500 Fixed-type

### Horizontal connection



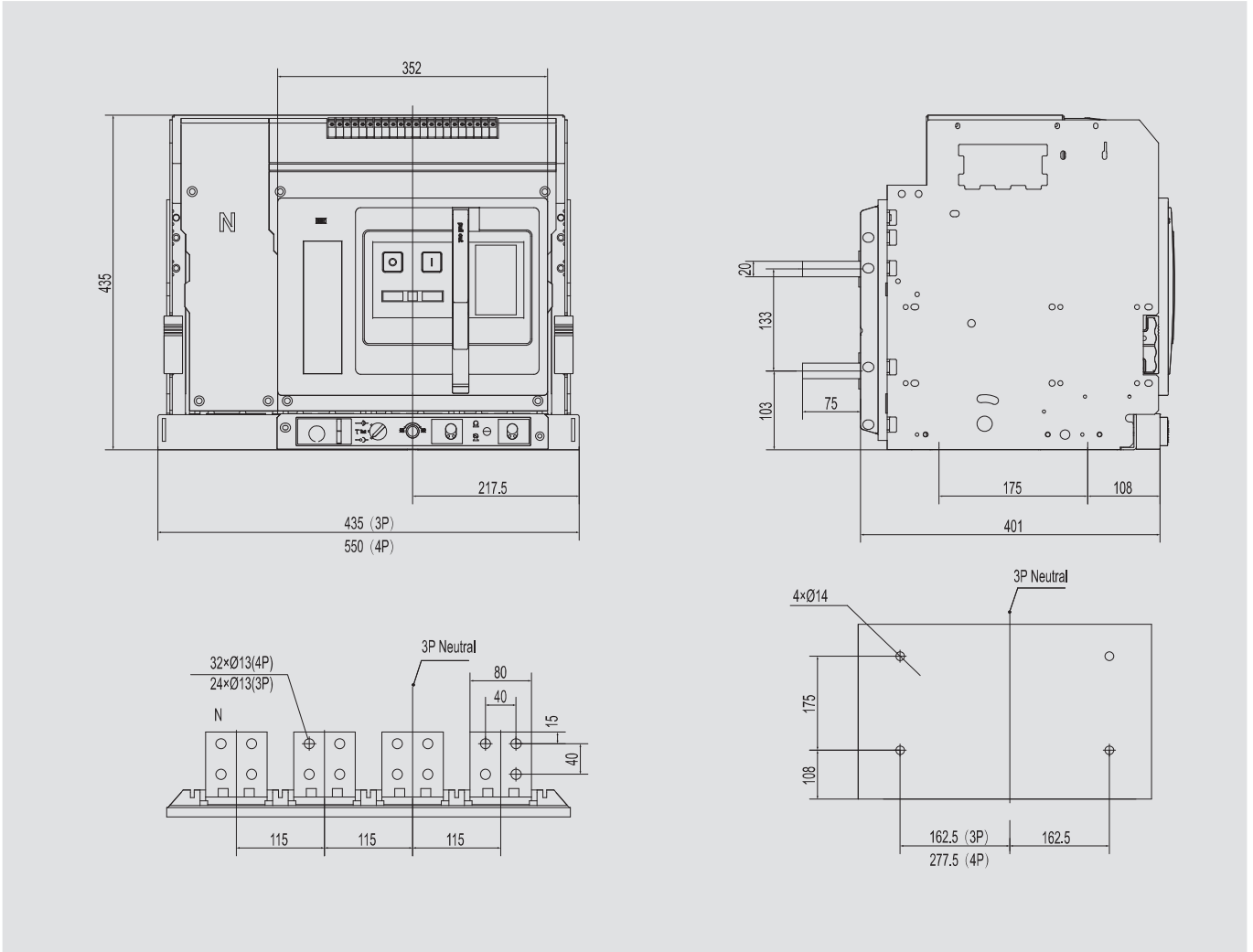
### Vertical connection



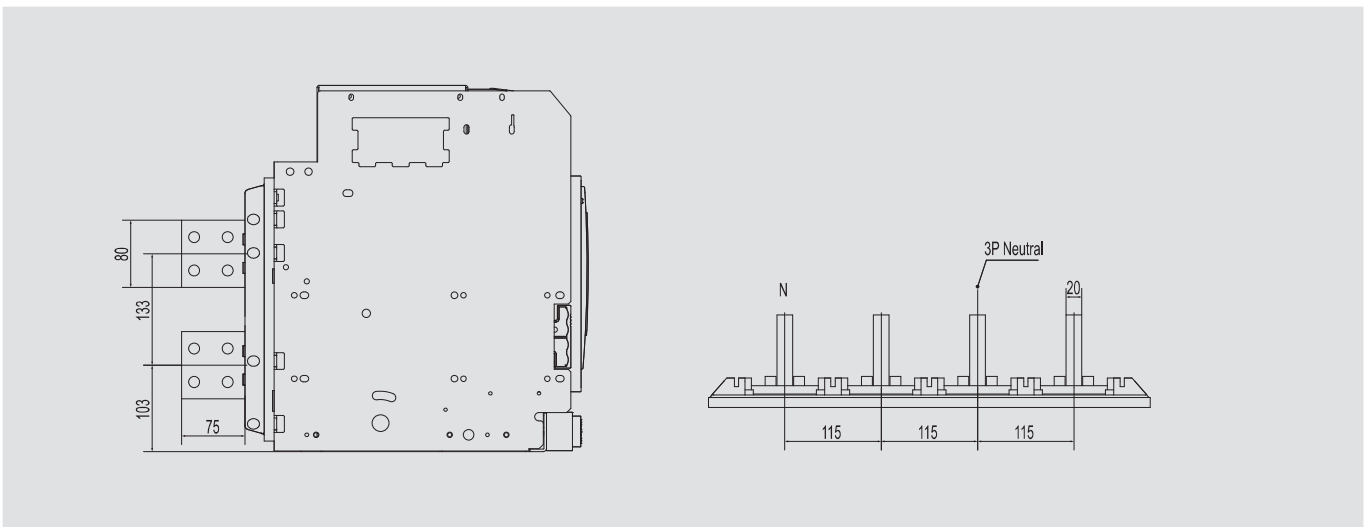
Rated current (A)	a (mm)	w (mm)
630~1600	14	60
2000~2500	20	70

## XUW3-4000 Draw out-type

Horizontal connection (In=2000-3200A)



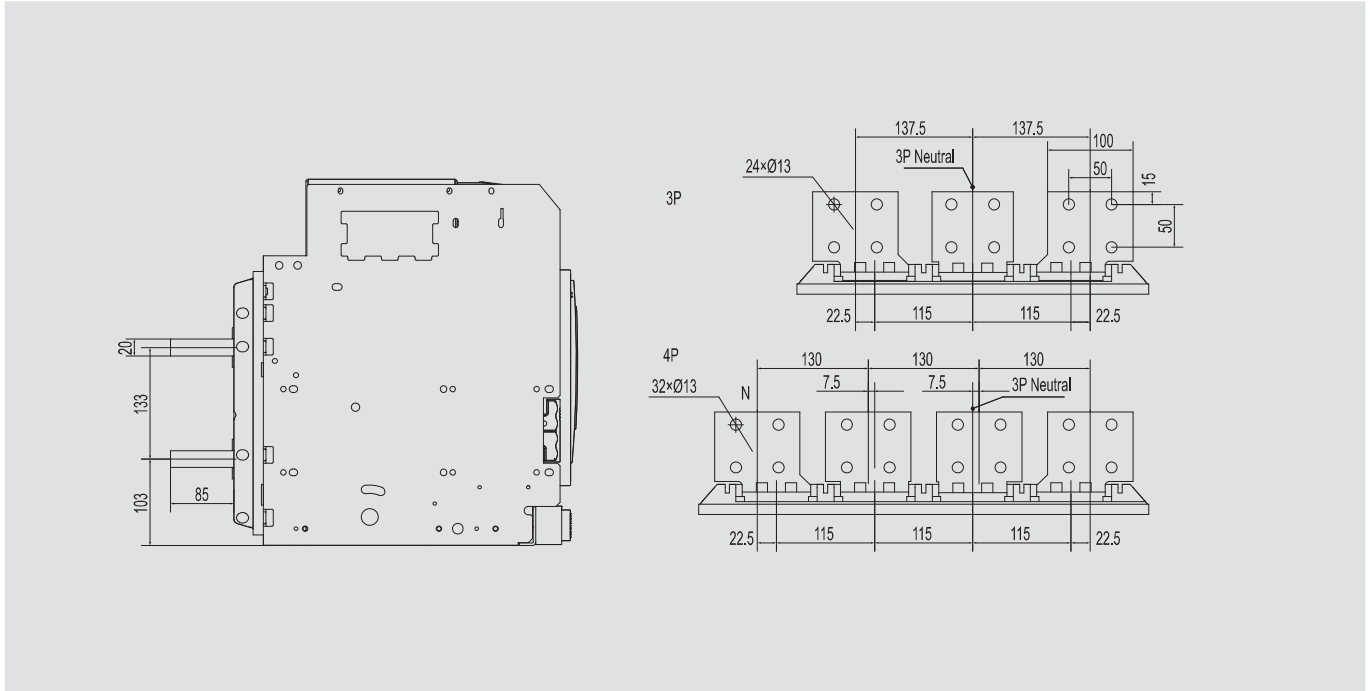
Vertical connection (In=2000-3200A)



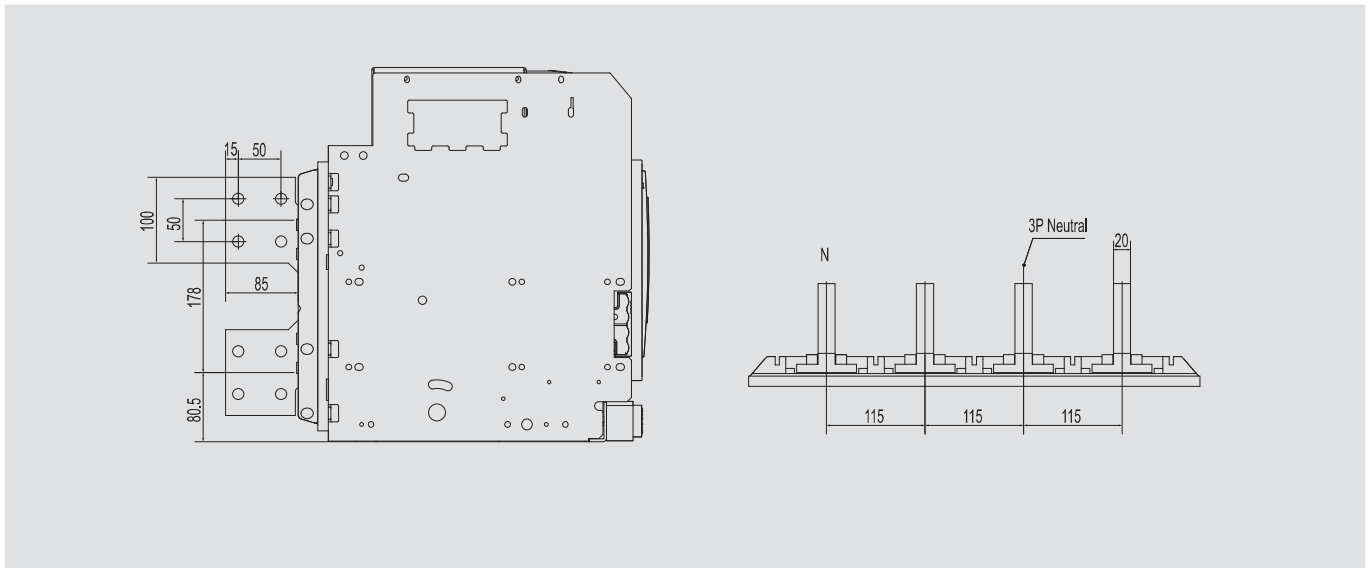
## Overall and mounting dimension

### XUW3-4000 Drawout-type

Horizontal connection (In=3600~4000)

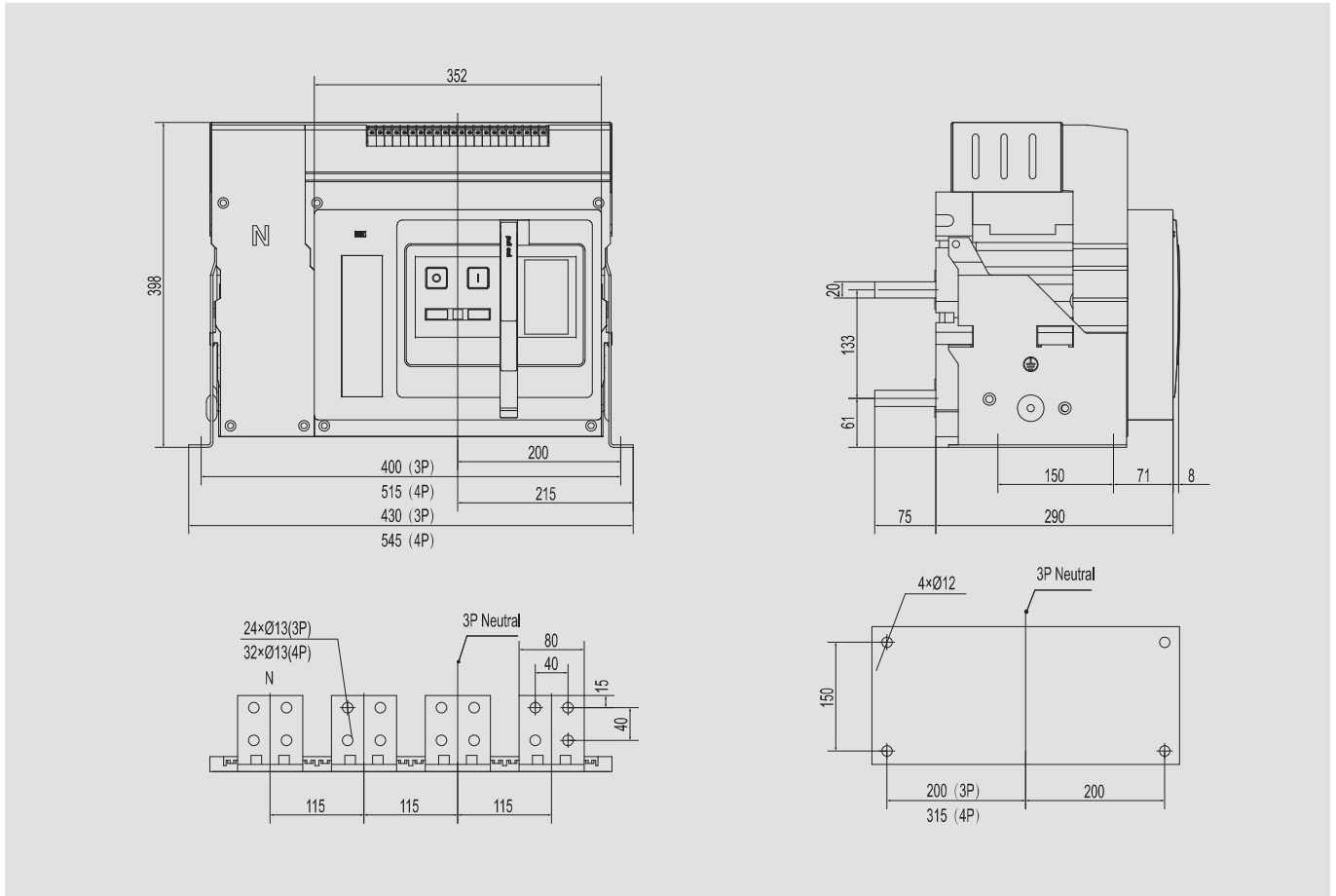


Vertical connection (In=3600~4000)

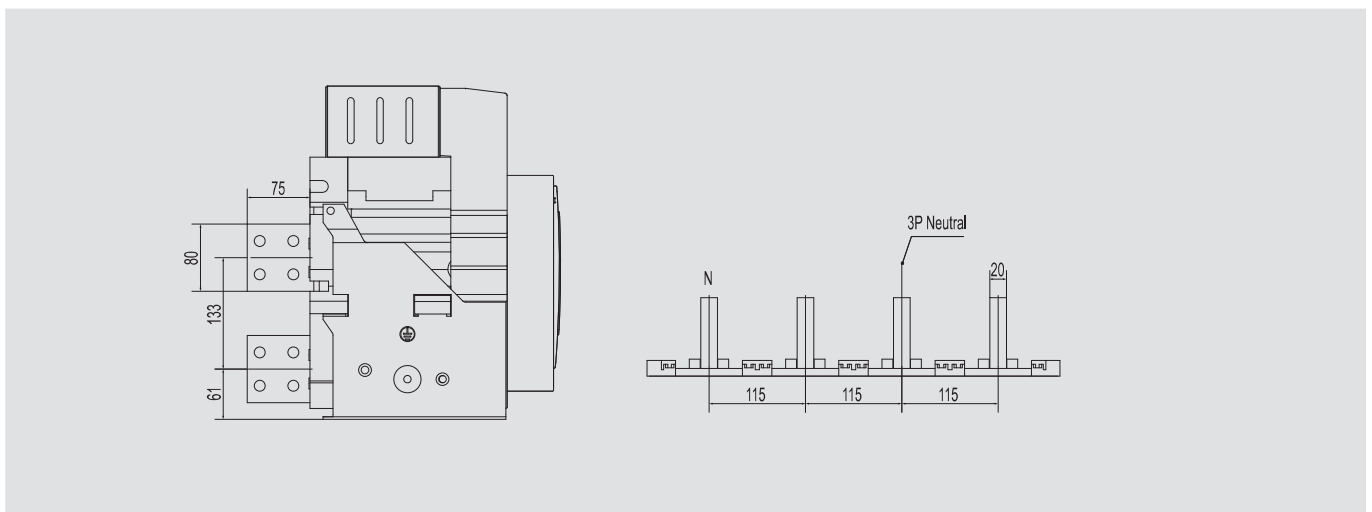


XUW3-4000 Fixed-type

Horizontal connection (In=2000-3200)



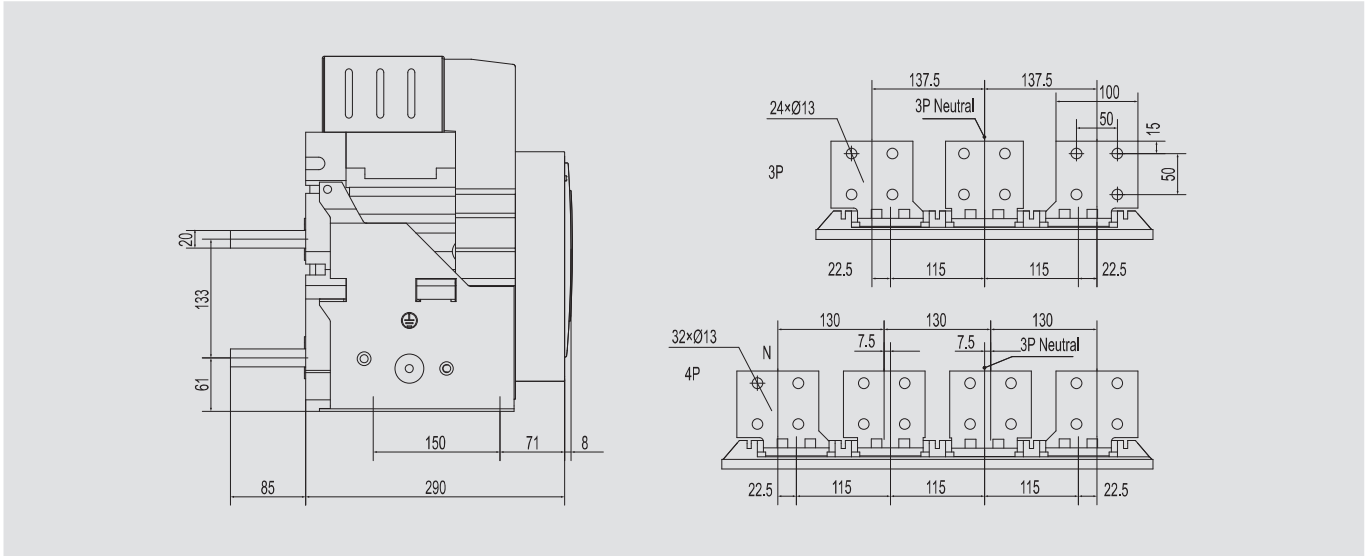
Vertical connection (In=2000-3200)



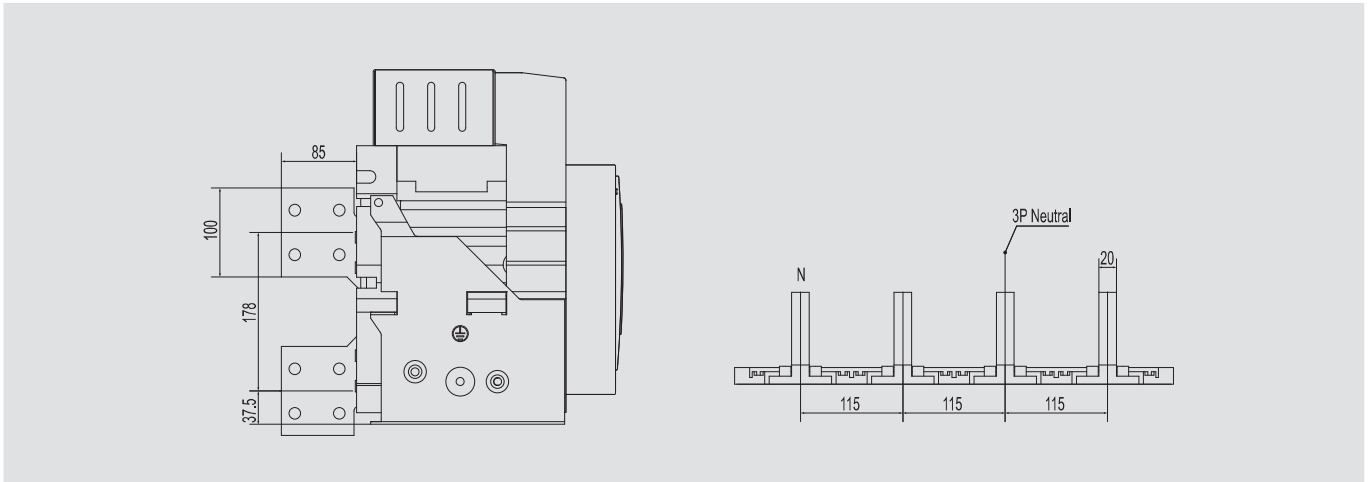
## Overall and mounting dimension

### XUW3-4000 Fixed-type

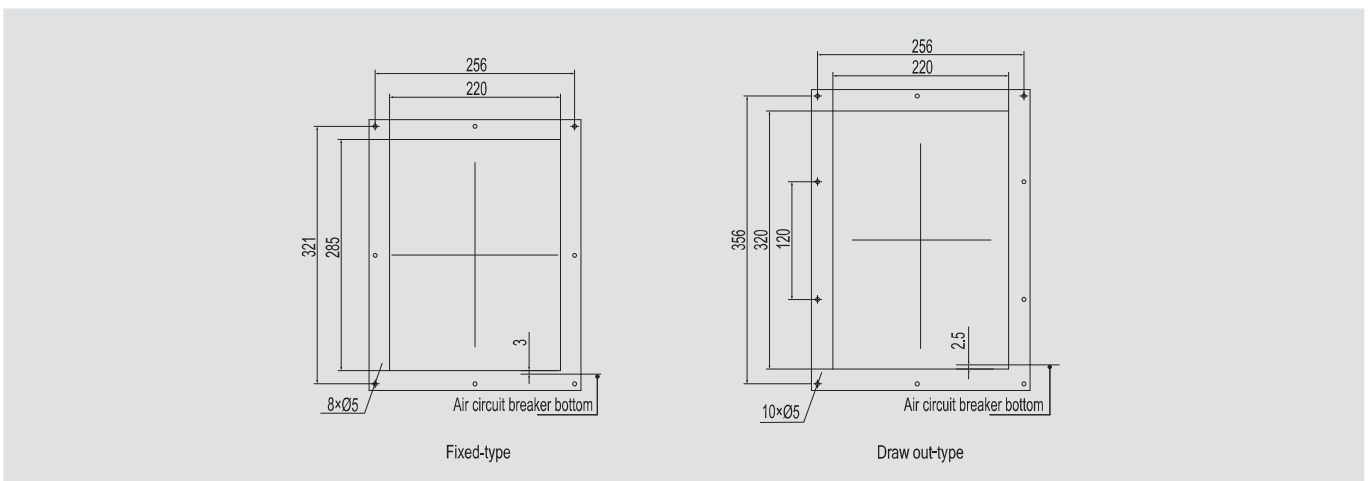
Horizontal connection (In=3600~4000)



Vertical connection (In=3600~4000)

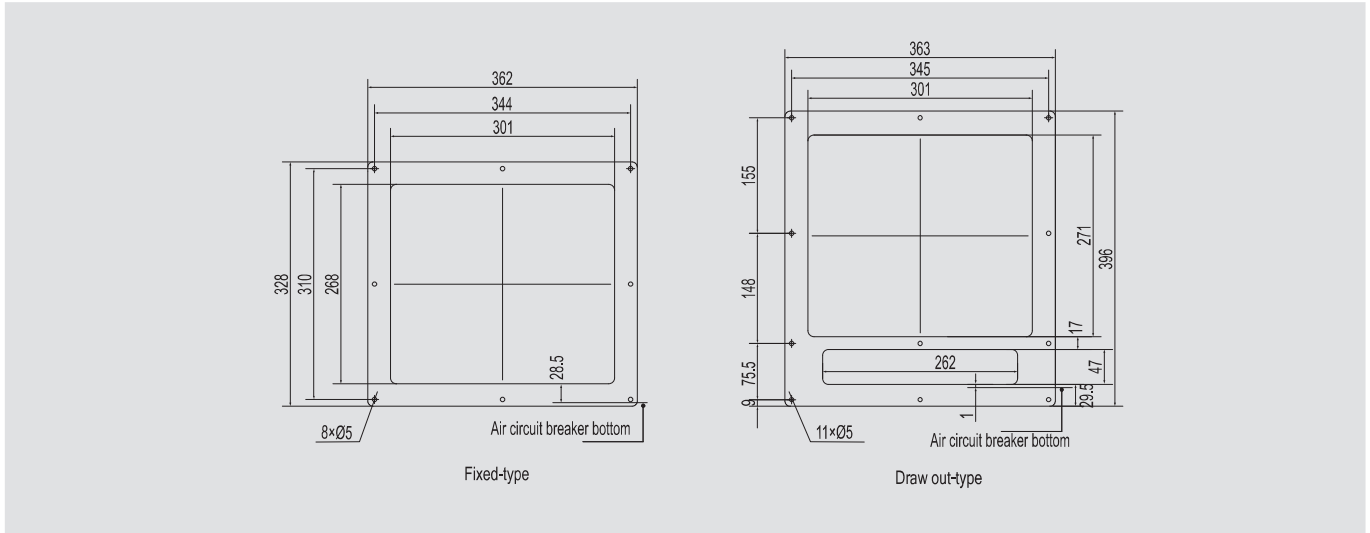


### XUW3-1600 bore diameter for frame

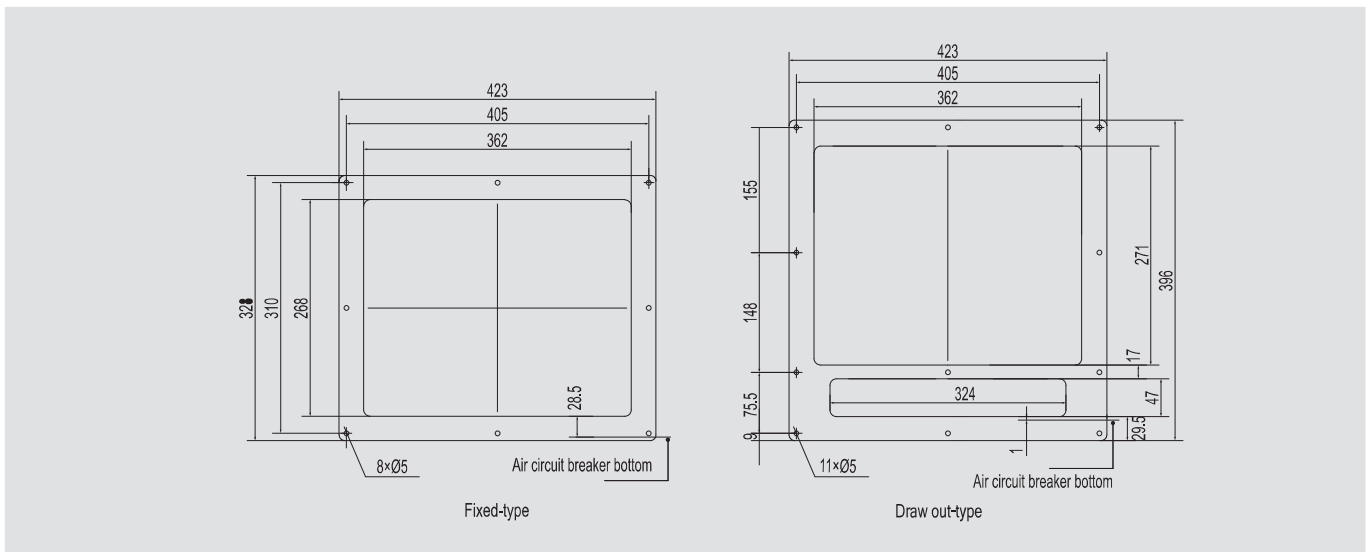


## XUW3-2500 bore diameter for frame

Draw out-Type



## XUW3-4000 bore diameter for frame



## Notes:

To ensure the safety of personnel and equipment before air circuit breaker operation, clause-by-clause compliance in the following:

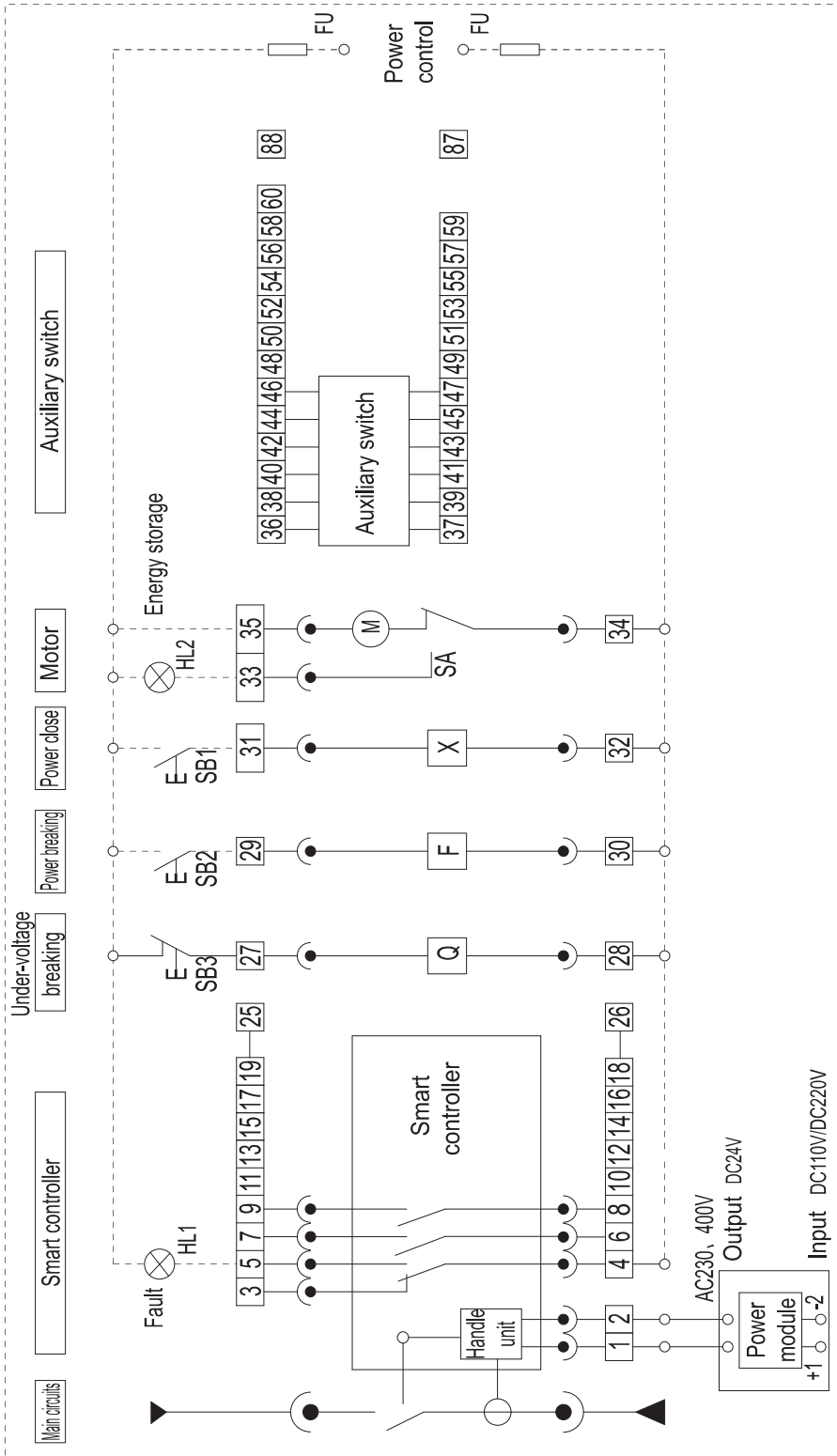
- 1) To read the instruction carefully before mounting and use of air circuit breaker.
- 2) To check air circuit breaker specification before use of air circuit breaker.
- 3) To test insulation resistance of air circuit breaker with 1000V megger. Ambient temperature  $20 \pm 5^{\circ}\text{C}$ , relative humidity 50~70% no less than  $10\text{ M}\Omega$ .
- 4) During installation against dust, water, and vermin dropping into air circuit breaker.
- 5) Mounting conductor bus-bar in air circuit breaker shall be symmetric without additional mechanical stress.

- 6) Mounting air circuit breaker shall be reliable grounding with clear grounding marking.
- 7) Mounting air circuit breaker shall control circuits connection as per connection diagram and check working voltage and actual voltage of shunt, open/close electromagnet, motor, controller, then secondary circuits on power.



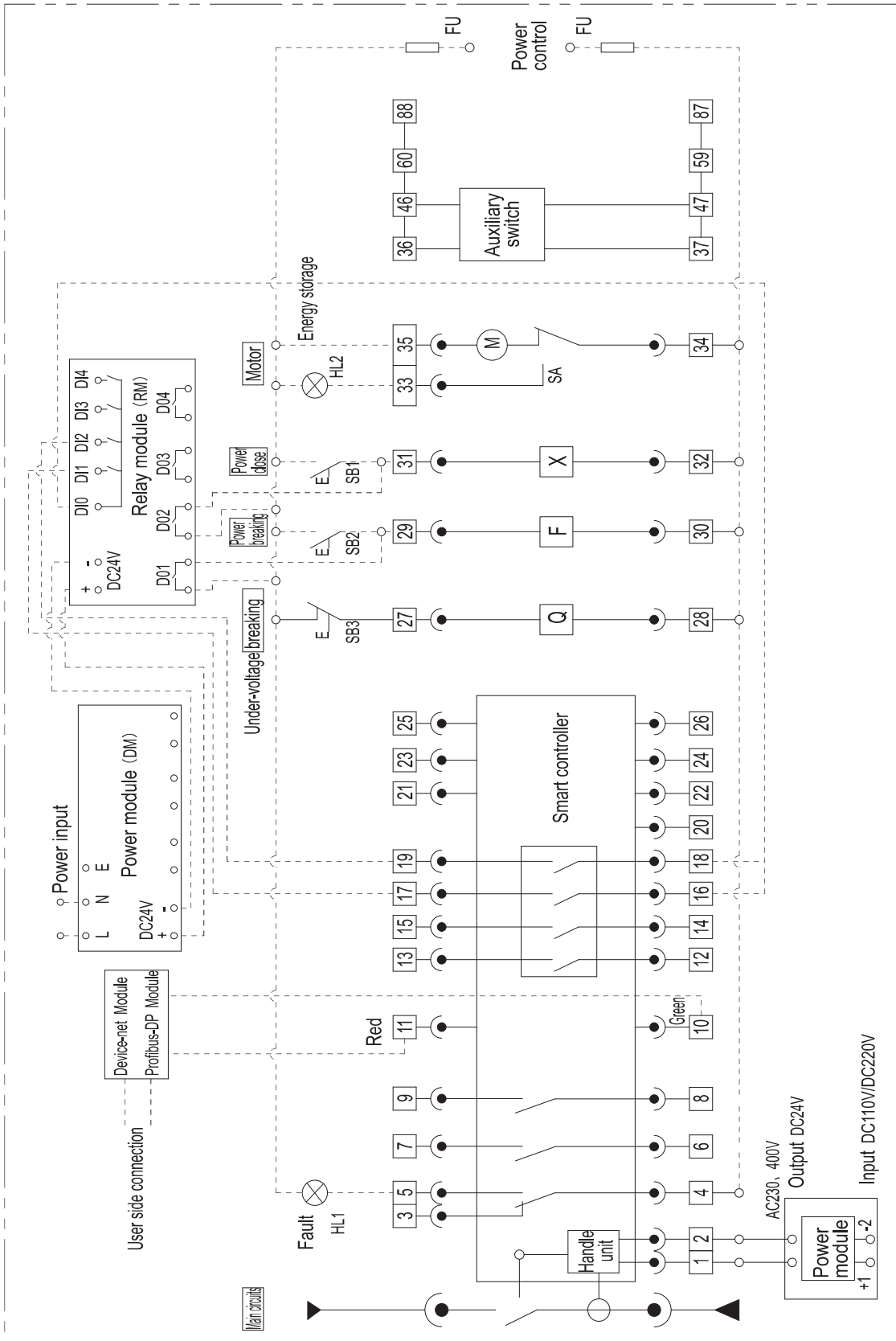
# Electric connection diagram

## M type controller connection diagram



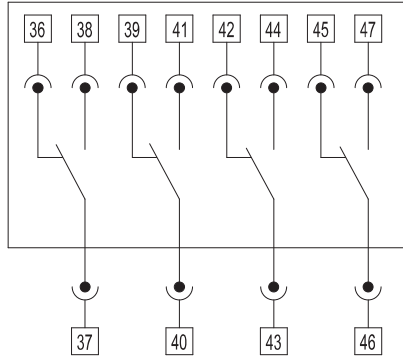
- 1,2: Power supply is direct current, which add supply module.
- 3,4,5: Signal contacts for release fault to trip indicating.4 is common terminal.
- 6,7,8,9,10,11: Two sets auxiliary signal contacts (additional for selection) , 6,9 is common terminal.
- 12,13: Group 1 controller signal outgoing terminal (additional for selection)
- 14,15: Group 2 controller signal outgoing terminal (additional for selection)
- 16,17: Group 3 controller signal outgoing terminal (additional for selection)
- 18,19: Group 4 controller signal outgoing terminal (additional for selection)
- 20: Controller grounding
- 21,22,23,24: N,A,B,C phase voltage signal incoming (additional for selection)
- 25,26: External connection N pole or incoming terminal of earth current transformer
- 27,28: Under-voltage release
- 29,30: Shunt release
- 31,32: Closing electromagnet
- 33,34,35: Motor operation mechanism, 34 :Common terminal
- Q,F,X,M: Under-voltage release, Shunt release, Closing electromagnet, Motor operation mechanism
- HL1,HL2: Fault to trip indicating, Motor energy storage fulfill indicating( Provide by the user )
- SB1,SB2,SB3: Close. Open. Under-voltage button ( Provide by the user /Under-voltage can be short connection)
- SA,FU: Motor travel switch (with the motor) ,Fuse (Provide by the user)

## H type controller connection diagram

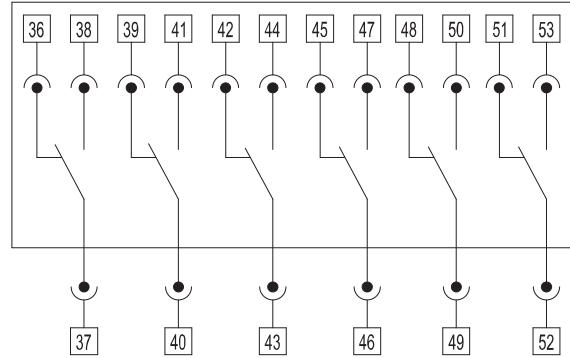


# Electric connection diagram

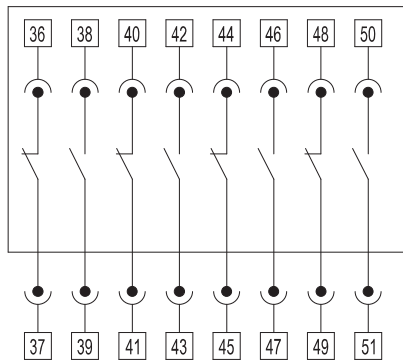
## Auxiliary switch connection diagram



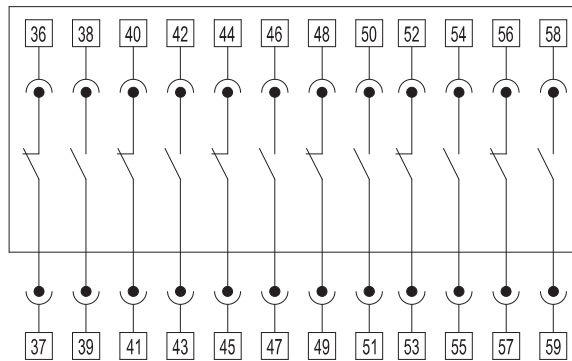
4 gang switching



6 gang switching



4 normal open 4 normal close



6 normal open 6 normal close

Remarks:	
1,2: Auxiliary power supply incoming terminals for smart controller Auxiliary power supply is DC, which add the power supply module	27,28: Under-voltage release or no-voltage release
3,4,5: Signal contacts for release fault to trip indicating, 4 is common terminal	29,30: Shunt release
6,7: Air circuit breaker opening indicating	31,32: Close electromagnet
8,9: Air circuit breaker closing indicating	33,34,35: Motor operation mechanism.34 is common terminal34
10,11: Communication interface	36~47: Auxiliary switch
12,13: Load monitor 1(Default)	Q,F: Under-voltage release and Shunt release.
14,15: Load monitor 2 (Default)	X,M: Close electromagnet and Motor operation mechanism.
16,17: Opening signal output	HL1,HL2: Fault to trip indicating and Motor energy storage finish indicating (Provided by the user)
18,19: Closing signal output	Circuit breaker
20: Controller grounding	SB1,SB2,SB3: Closing, Opening and Under-voltage button (Provided by the user)
21,22,23,24: N,A,B,C Phase voltage signal input	SA: Motor travel switch with the motor
25,26: External connection N pole or CT input terminal	FU: Fuse (Provided by the user)