



MCCB & ACB

Molded Case Circuit Breaker
Intelligent Air Circuit Breaker



UNION ELECTRICS

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Molded Case Circuit Breaker



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Intelligent Air Circuit Breaker



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MCCB UNSX Series



Excellent performance

UNSX dual rotary contact structure and the energy release system to ensure stable and reliable protection, and has excellent current-limiting characteristics.

Transparent aluminum cover protects your trip unit from settings, rotary handle, motor operation mechanism, etc. can be installed.

Compliance with standards

International standards

IEC60947-1: general rules

IEC60947-2: circuit breakers

IEC60947-4: contactors and motor starters

IEC60947-5.1: control circuit devices and switching elements; automatic control components.

National standards

GB14048.1: general rules GB14048.2: circuit breakers

Working environment The altitude belows 2,000m;

Circuit Breaker may be used between -25°C and $+70^{\circ}\text{C}$. For temperatures higher than 40°C (65°C for circuit breakers used to protect motor feeders), devices must be derated;

It can withstand the impact from humid air, salt spray, oil mist and mold;

It should be installed in places with no danger of explosion, no conductive dust, and no substance enough to corrode metal or damage the insulation;

In places with no rain and snow erosion;

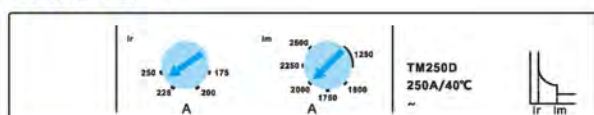
Pollution degree 3;

Installation category III.

Functions and characteristics

		UNSX 100~250	UNSX 400~630
Item No.	S-Type		
Number of poles	3-pole,4-pole		
Control	Manual	With toggle/with direct or extended rotary handle	
Connections	Fixed	front connections	
	Plug-in	front connections/rear connections	
Electrical Characteristics as per IEC60947-2 and EN60947-2			
Rated current(A)	In	40℃	
Rated insulation voltage(V)	Ui	750	
Rated impulse withstand voltage(kW)	Uimp	8	
Rated operational voltage(V)	Ue	AC50/60Hz 690V	
Utilization category		A	
Operation performance	Mechanical	8500	6000
	Electrical	1500	1000
Protection		Chart B-1 B-2	
Indication and control auxiliaries			
Auxiliary switch		●	
MX Shunt coil		●	
MN under-voltage coil		●	

Chart B-1



Protection

Overload protection: Thermal protection(I_r)

Thermal overload protection based on a bimetal strip providing an inverse timecurve I^2t , corresponding to a temperature rise limit. Above this limit, the deformation of the strip trips the circuit breaker operating mechanism.

Overload protection has the following characteristics:

- I_r that can be adjusted in amps from 0.7 to 1 times the rating of the trip unit(16A to 250A),
- corresponding to settings from 11 to 250A for the range of trip units.

Non-adjustable time delay.

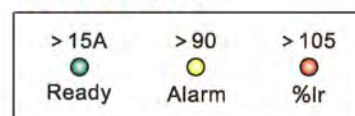
Short-circuit protection: Magnetic protection(I_m)Short-circuit protection with a fixed or adjustable pick-up I_m that initiates instantaneous tripping if exceeded.

- TM-D: fixed pick-up, I_m , for 16-160A ratings and adjustable from 5 to 10 x I_n for 200 and 250A ratings.

Chart B-2



DB112019



LED indications

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Protection

Settings are made using the adjustment dials with fine adjustment possibilities. Overload protection: long time protection (I_r)

Inverse time protection against overloads with an adjustable current pick-up I_r setting a dial and a non-adjustable time delay t_r .

Short-circuit protection: Short-time protection with fixed time delay (I_{sd})

Protection with an adjustable pick-up I_{sd} . Tripping takes place after a very short delay used to allow discrimination with the downstream device.

Short circuit instantaneous protection: (I_i)

Instantaneous short-circuit protection with a fixed pick-up.

Vigicompact UNSX100-630 circuit breakers with earth-leakage protection. Addition of the Vigi modules does not alter circuit-breaker characteristics:

- Compliance with standards;
- Degree of protection, class II front-face insulation;
- Isolation function, compliance with IEC60947-2;
- Electrical characteristics;
- Trip-unit characteristics;
- Installation and connection modes;
- Indication, measurement and control auxiliaries;
- Installation and connection accessories.

Vigi earth-leakage protection modules

Compliance with standards

- IEC60947-2, appendix B.
- IEC60255-4 and IEC60801-2~5.
- IEC60755, class A, immunity to DC components up to 6mA.
- Operation down to -25°C as per VDE664.

Remote indications

Vigi modules may be equipped with an auxiliary contact (SDV) to remotely signal tripping due to an earth fault.

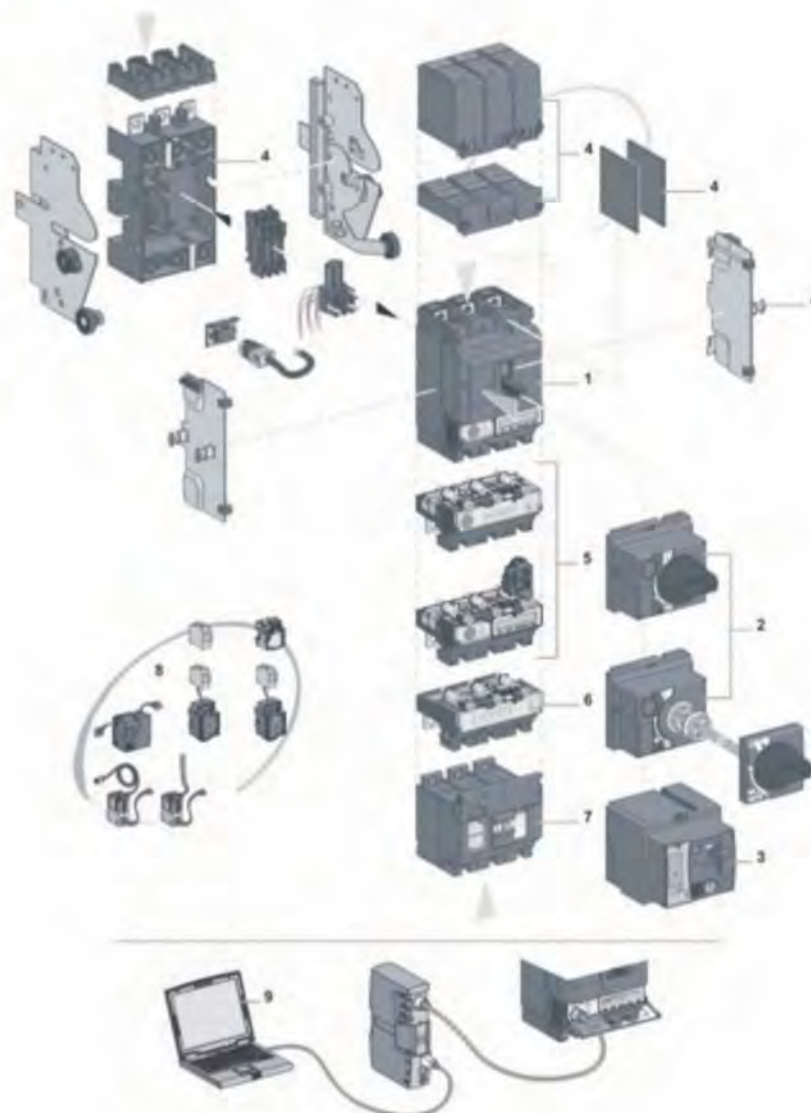
Power supply

Vigi modules are self-supplied internally, they continue to function even when supplied by only A, C two phases.



1. Sensitivity setting
2. Time-delay setting (distinguish earth fault protection)
3. Lead-seal fixture for controlled access to settings
4. Test button simulating an earth-fault for regular checks on the tripping function.
5. Reset button (reset required after earth-fault tripping)
6. Rating plate
7. Housing for sDv auxiliary contact

Mounting on plate



The main function of circuit breaker

UNSX series of MCCB offers comprehensive function choice. These functions can be used easily, and can be completely applied into every field safely.

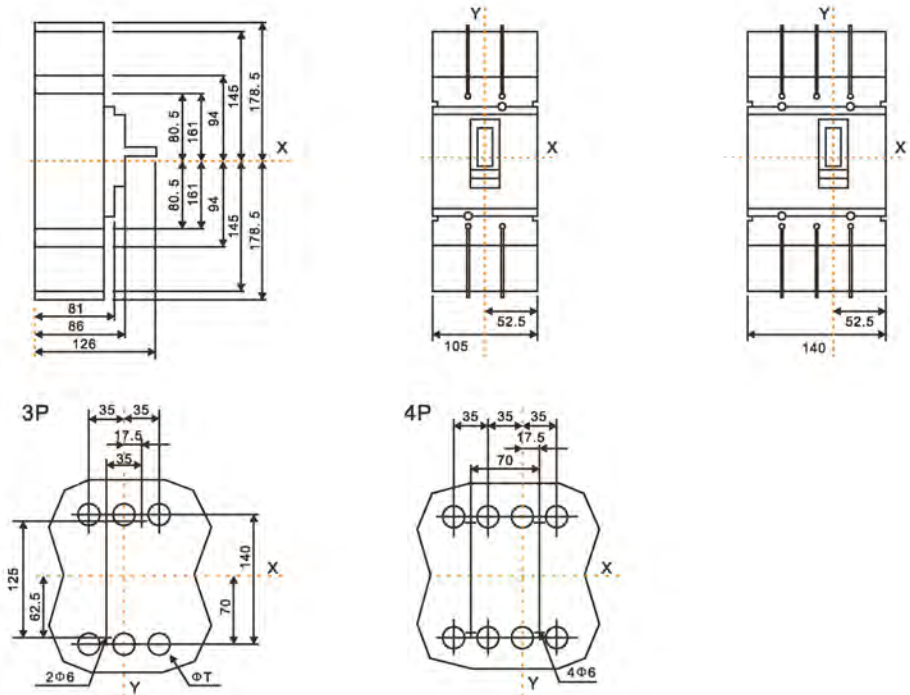
- Toggle handle
- Rotary handle
- Motor operation mechanism
- Related accessories
- Micro electronic release unit
- TM-D Thermal Magnetic release unit
- Vigi ground-fault protection module
- Micro related accessories of release unit
- Micro maintenance interface

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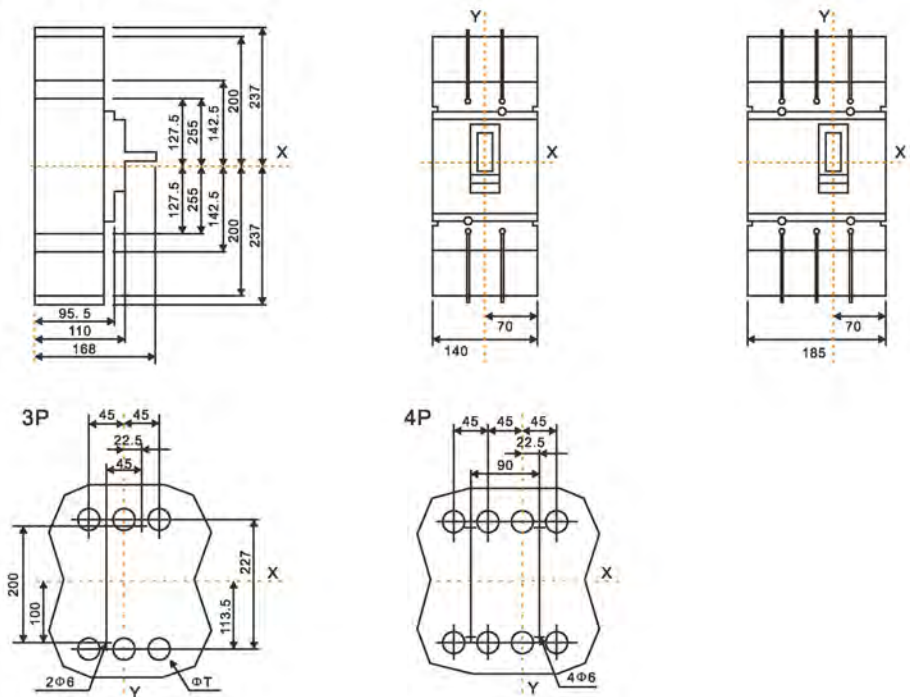
Molded Case Circuit Breaker

Outline Dimensions

UNSX 100~250

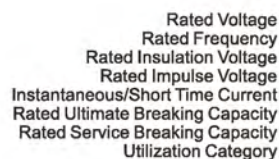


UNSX 400~630





Adjustable-Leakage Type



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Standards

UNM4 series circuit breakers and auxiliaries comply with the following international standard:

IEC/EN 60947-1

Low-voltage switchgear and controlgear-Part 1:General rules

IEC/EN 60947-2

Low-voltage switchgear and controlgear-Part 2:Circuit-breakers

UNM4 MCCB(Standard Of Environment For MCCB Application)

1)Ambient Temperature: -5 degrees~+55 degrees, avarage no more than 40 degrees within 24 hours.

2)Relative Humidity:45~85%.

3)Altitude:The altitude of the installation does not exceed 2000m.

4)Atmosphere Conditions:Where excessive steam,oil steam,smoke,dust,salt and other corrosive materials do not exist.

Type Guide

UNIQ					
MCCB	Type	Rated Current			Breaking Capacity
		63	125	250	Pole
	F(Fixed type)	16A	16A	100A	S
	A(Adjustable type)	20A	20A	125A	H
	L(Leakage type)	25A	25A	160A	
		32A	32A	180A	
		40A	40A	200A	
		50A	50A	225A	
		63A	63A	250A	
			80A		
			100A		
			125A		
			160A		

Remark:

UNM4 (125A) has 2-pole/3-pole/4-pole;

UNM4 (250A)has 3-pole/4-pole.

Product Characteristics

Security

The module housing is made of high-strength heat-resistant material. Achieve electrical isolation between phases and operating mechanisms. To ensure the safety of users and eliminate phase-to-phase current short circuit.



Reliability

The closed structure design further protects the rotating and moving conductors from the external environments and makes the electrical contacts more reliable.



High Performance

Gas-producing material is adopted in the module to produce gas flow when the gas-producing short-circuit current is generated. Obviously improve the effect of air blowing, to achieve a better current limiting effect, the product break index increased significantly.



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General Selection Table (UNSQ-F Fixed Type)



UNSQ-F63			
Type		S-Type	H-Type
Pole		-	
		2-pole	
		3-pole	
Rated current,In	A	16、20、25、32、40、50、63	
Adjustable parts	Long-time current setting(0.8In~1.0In)	-	-
	Lockup device for operating handle	-	-
Rated voltage,Ue	AC(V)	230、400、440	
Rated insulation voltage,Ui	V	750V	
Rated impulse voltage,Uimp	kV	6	
Standard		IEC/EN 60947-2	
Rated frequency	Hz	50 / 60	
Rated short-circuit breaking capacity(Icu)kA			
AC	230V	18kA	25kA
	400V	10kA	15kA
	440V	7.5kA	10kA
Ics=%*Icu		50~100	50~100
Mechanical life(circle)		20,000 / 8,500(As defined by IEC/EN 60947-2)	
Electrical life(circle)		4,000 / 1,500(As defined by IEC/EN 60947-2)	
Dimensions H*W*D (mm)	2P	50*100*60	
	3P	75*100*60	
	4P		

General Selection Table (UNIQ-F Fixed Type)



UNIQ-F125		UNIQ-F250	
S-Type	H-Type	S-Type	H-Type
2-pole		-	
3-pole		3-pole	
4-pole		4-pole	
16、20、25、32、40、50、63、80、100、125、160		100、125、160、180、200、225、250	
-	-	-	-
-	-	-	-
230、400、440		230、400、440	
750V		750V	
8		8	
IEC/EN 60947-2		IEC/EN 60947-2	
50 / 60		50 / 60	
50kA	65kA	65kA	80kA
25kA	35kA	35kA	50kA
22kA	25kA	25kA	35kA
50~100	50~100	50~100	50~100
20,000 / 8,500(As defined by IEC/EN 60947-2)		20,000 / 7,000(As defined by IEC/EN 60947-2)	
4,000 / 1,500(As defined by IEC/EN 60947-2)		4,000 / 1,000(As defined by IEC/EN 60947-2)	
140 * 50 * 60		-	
140 * 75 * 60		175 * 105 * 60	
140 * 100 * 60		175 * 140 * 60	

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General Selection Table (UNSQ-A Adjustable Type)



UNSQ-A63				
Type		S-Type	H-Type	
Pole		-		
		2-pole		
		3-pole		
Rated current,In		A	10-16A、16-20A、20-25A、25-32A、32-40A、40-50A、50-63A	
Adjustable parts		Long-time current setting(0.8In~1.0In)	√	√
		Lockup device for operating handle	-	-
Rated voltage,Ue		AC(V)	230、400、440	
Rated insulation voltage,Ui		V	750V	
Rated impulse voltage,Uimp		kV	6	
Standard		IEC/EN 60947-2		
Rated frequency		Hz	50 / 60	
Rated short-circuit breaking capacity(Icu)kA				
AC		230V	18kA	25kA
		400V	10kA	15kA
		440V	7.5kA	10kA
Ics=%*Icu		50~100	50~100	
Mechanical life(circle)		20,000 / 8,500(As defined by IEC/EN 60947-2)		
Electrical life(circle)		4,000 / 1,500(As defined by IEC/EN 60947-2)		
Dimensions H*W*D (mm)		2P	50*100*60	
		3P	75*100*60	
		4P	-	

General Selection Table (UNIQ-A Adjustable Type)



UNIQ-A125		UNIQ-A250	
S-Type	H-Type	S-Type	H-Type
2-pole		-	
3-pole		3-pole	
4-pole		4-pole	
10-16A, 16-20A, 20-25A, 25-32A, 32-40A, 40-50A, 50-63A, 63-80A, 80-100A, 100-125A, 125-160A		100-125A, 125-160A, 160-180A, 180-200A, 200-250A	
✓	✓	✓	✓
-	-	-	-
230, 400, 440		230, 400, 440	
750V		750V	
8		8	
IEC/EN 60947-2		IEC/EN 60947-2	
50 / 60		50 / 60	
50kA	65kA	65kA	80kA
25kA	35kA	35kA	50kA
22kA	25kA	25kA	35kA
50~100	50~100	50~100	50~100
20,000 / 8,500(As defined by IEC/EN 60947-2)		20,000 / 7,000(As defined by IEC/EN 60947-2)	
4,000 / 1,500(As defined by IEC/EN 60947-2)		4,000 / 1,000(As defined by IEC/EN 60947-2)	
140 * 50 * 60		-	
140 * 75 * 60		175 * 105 * 60	
140 * 100 * 60		175 * 140 * 60	

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General Selection Table (UNSQ-L Adjustable Type)



UNSQ-L63			
Type		S-Type	H-Type
Pole		2-pole	
		3-pole	
Protective function			
Rated current,In	A	10-16A、16-20A、20-25A、25-32A、32-40A、40-50A、50-63A	
Rated residual current	Operating,IΔn(mA)		
	Non-Operating,IΔno(mA)		
Adjustable parts	Long-time current setting(0.8In~1.0In)	✓	✓
	Lockup device for operating handle	✓	✓
	Residual current(IΔn) setting	30mA/100mA/200mA	
	Residual trip time setting	0.1s / 0.3s / 0.5s	
Rated voltage,Ue	AC(V)	230、400、440	
Rated insulation voltage,Ui	V	750V	
Rated impulse voltage,Uimp	kV	6	
Residual current off-time at IΔn	Sec	-	
Standard		IEC/EN 60947-2	
Rated frequency	Hz	50 / 60	
Rated short-circuit breaking capacity(Icu)kA			
AC	230V	18kA	25kA
	400V	10kA	15kA
	440V	7.5kA	10kA
Ics=%*Icu		50~100	50~100
Mechanical life(circle)		20,000 / 8,500(As defined by IEC/EN 60947-2)	
Electrical life(circle)		4,000 / 1,500(As defined by IEC/EN 60947-2)	
Dimensions H*W*D(mm)	2P	50*100*60	
	3P	75*100*60	
	4P	-	

General Selection Table (UNIQ-L Adjustable Type)

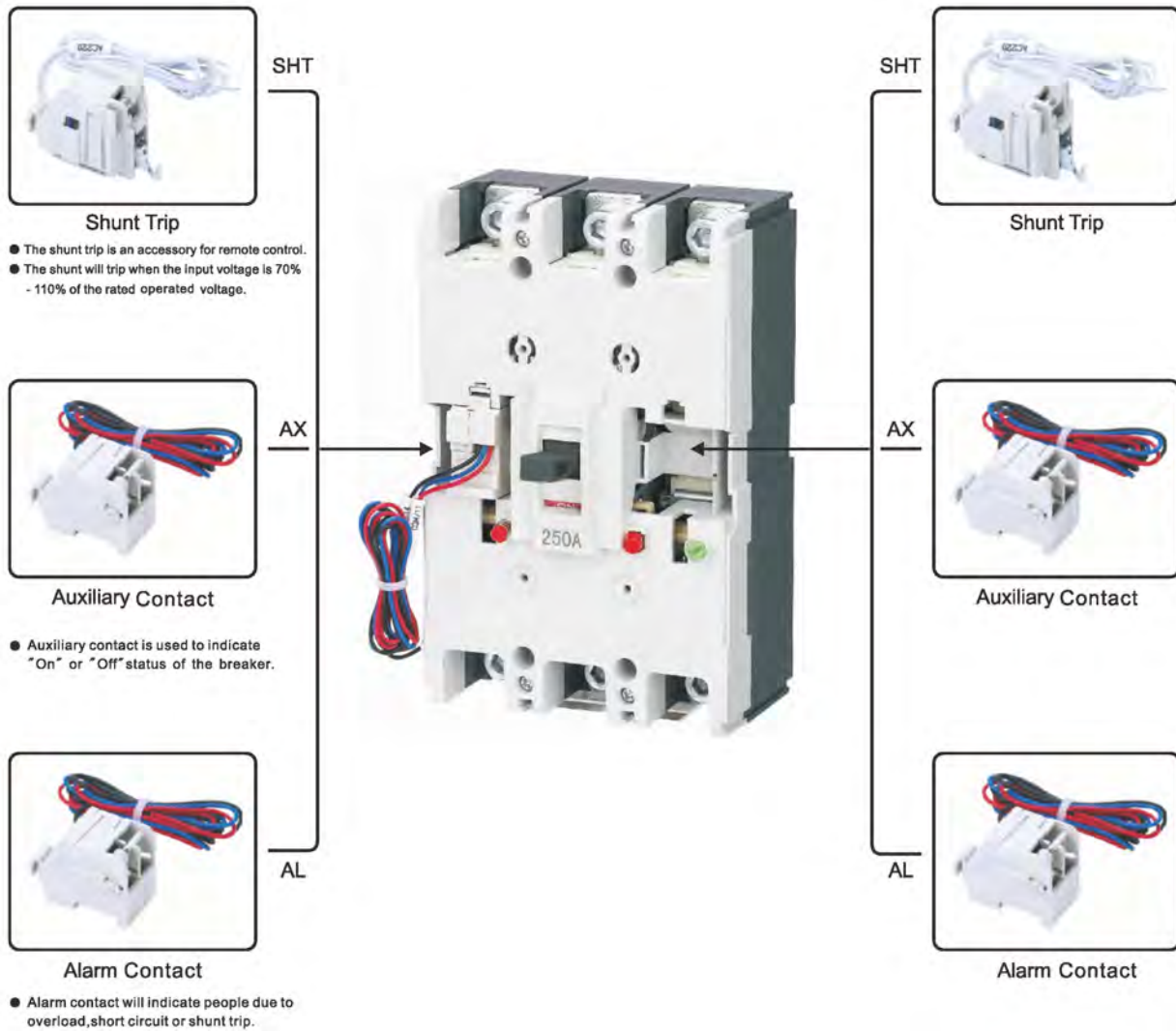


UNIQ-L125						UNIQ-L250			
S-Type			H-Type			S-Type		H-Type	
2-pole	3-pole	4-pole	2-pole	3-pole	4-pole	3-pole	4-pole	3-pole	4-pole
Overload & Short-circuit & Ground fault						Overload & Short-circuit & Ground fault			
10-16A, 16-20A, 20-25A, 25-32A, 32-40A, 40-50A, 50-63A, 63-80A, 80-100A, 100-125A, 125-160A						100-125A, 125-160A, 160-180A, 180-200A, 200-250A			
30、50、100、200、500						30、50、100、200、500			
15、25、50、100、250						15、25、50、100、250			
✓						✓			
✓						✓			
30mA / 300mA / 500mA						30mA / 300mA / 500mA			
0.1s / 0.3s / 0.5s						0.1s / 0.3s / 0.5s			
230、400、440						230、400、440			
750V						750V			
8						8			
0.1 / 0.3 / 0.5						0.1 / 0.3 / 0.5			
IEC / EN 60947-2						IEC / EN 60947-2			
50 / 60						50 / 60			
Rated short-circuit breaking capacity(Icu)kA						Rated short-circuit breaking capacity(Icu)kA			
50kA			65kA			65kA		80kA	
25kA			35kA			36kA		50kA	
22kA			25kA			25kA		36kA	
50~100			50~100			50~100		50~100	
20000 / 8500(As defined by IEC/EN 60947-2)						20000 / 7000(As defined by IEC/EN 60947-2)			
4000 / 1500(As defined by IEC/EN 60947-2)						4000 / 1000(As defined by IEC/EN 60947-2)			
140 * 50 * 60						-			
140 * 75 * 60						175 * 105 * 60			
140 * 100 * 60						175 * 140 * 60			

UNION ELECTRICS

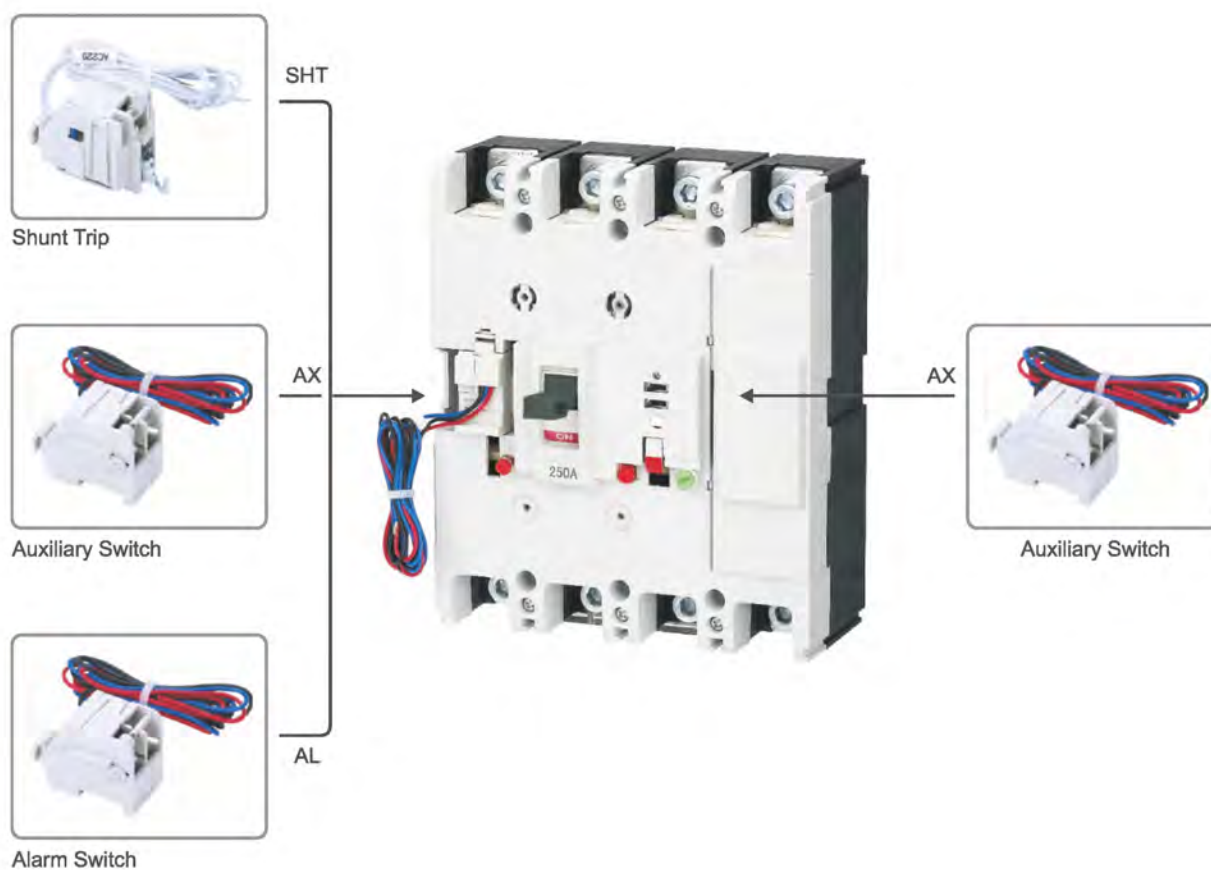
Molded Case Circuit Breaker

Built-in Accessory(UNIQ-A/UNIQ-F)



Type	Pole	Left hole position					Right hole position				
		AX	AL	SHT	AX+AX	AX+AL	AX	AL	SHT	AX+AX	AX+AL
UNIQ-A125 UNIQ-F125	2P	-	-	-	-	-	✓	✓	✓	✓	✓
	3P	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4P	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UNIQ-A250 UNIQ-F250	3P	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4P	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Built-in Accessory(UNIQ-L)



Type	Pole	Left hole position					Right hole position				
		AX	AL	SHT	AX+AX	AX+AL	AX	AL	SHT	AX+AX	AX+AL
UNIQ-L125	2P	-	-	-	-	-	-	-	-	-	-
	3P	✓	✓	✓	✓	✓	-	-	-	-	-
	4P	✓	✓	✓	✓	✓	✓	-	-	-	-
UNIQ-L250	3P	✓	✓	✓	✓	✓	-	-	-	-	-
	4P	✓	✓	✓	✓	✓	✓	-	-	-	-

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Molded Case Circuit Breaker

Built-out Accessory



Built-Out Accessory



Inter-phase Insulation Barrier

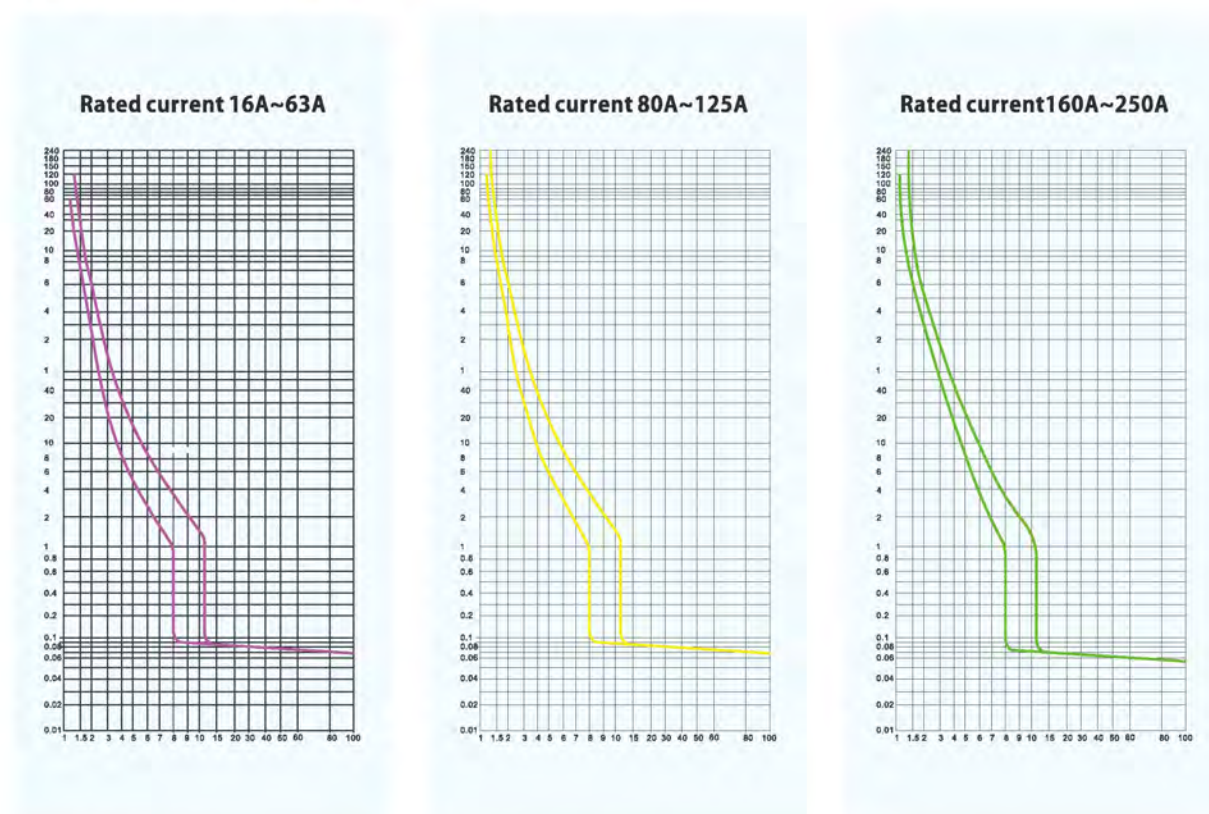
- Inter-phase insulation barrier is a kind of safety accessory, which is used for the insulation between the phases. It can guarantee the best insulation of the wiring terminal.
- They are compatible with both the short terminal covers. And it is ok to mount the inter-phase insulation barrier in both UNM1A&UNM1L series and every phase (2P, 3P and 4P).



Short Terminal Cover

- Short terminal cover is insulation accessory, which is used to prevent the direct contact between the terminal in circuit breaker and other live parts to ensure the safety of the users.
- All the terminal cover is designed with holes which can be knocked off to connect the cables of various wires and the copper platens.
- They are compatible with both the interphase insulation barrier and phase & ampere frames.

Characteristics Curve



• Remark: When $I_n \leq 32$,
 $I_i = 400A (\pm 20\%)$.

• Remark: When $I_n > 32$,
 $I_i = 10 \cdot I_n (\pm 20\%)$

• Remark: When $I_n > 32$,
 $I_i = 10 \cdot I_n (\pm 20\%)$

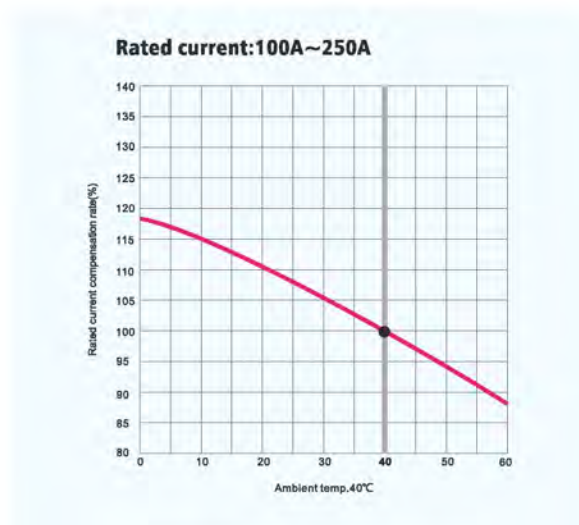
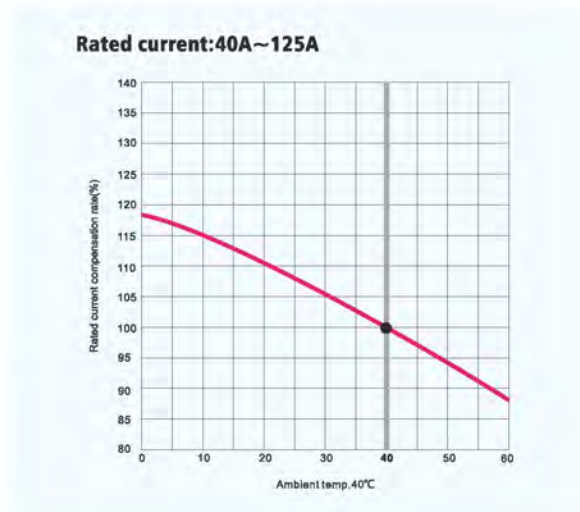
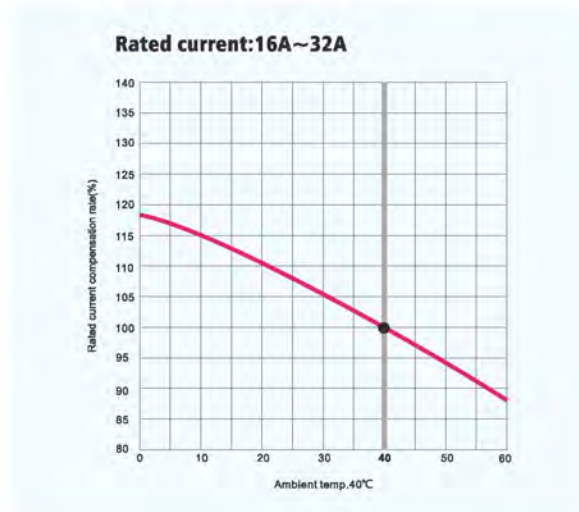
Characteristics Curve Table

Test No.	Load current	Rated current	Initial state	Time limit to trip	Estimated result
1.	1.05 I_n	$I_n \leq 63A$ $I_n > 63A$	cold state	$t \leq 1h$ $t \leq 2h$	Non tripping
2.	1.30 I_n	$I_n \leq 63A$ $I_n > 63A$	continuing the test	$t < 1h$ $t < 2h$	Trip
3.	400A*80% 400A*120%	$\leq 32A$	cold state	$t \leq 0.2s$ $t < 0.2s$	Non tripping Trip
4.	10 I_n *80% 10 I_n *120%	$> 32A$	cold state	$t \leq 0.2s$ $t < 0.2s$	Non tripping Trip

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Temperature Compensation Curve

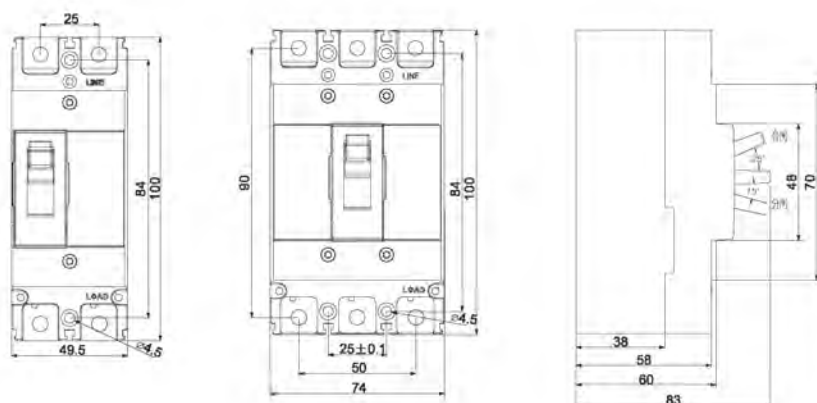


Temperature Compensation Table(IEC/EN 60947-2)

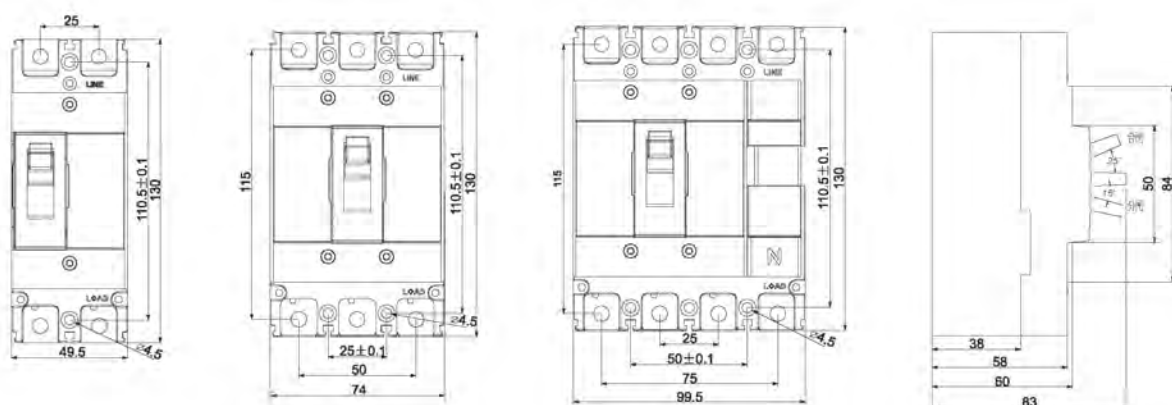
Type	Current range	Compensation Coefficient													
		-5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C
UNIQ-A125	16-32A	1.18	1.17	1.16	1.14	1.12	1.09	1.07	1.05	1.03	1	0.97	0.95	0.92	0.87
	40-125A	1.16	1.16	1.15	1.14	1.12	1.10	1.08	1.06	1.03	1	0.97	0.94	0.87	0.82
UNIQ-A250	100-250A	1.14	1.13	1.13	1.12	1.10	1.08	1.07	1.05	1.03	1	0.97	0.93	0.86	0.76

Outline Dimensions

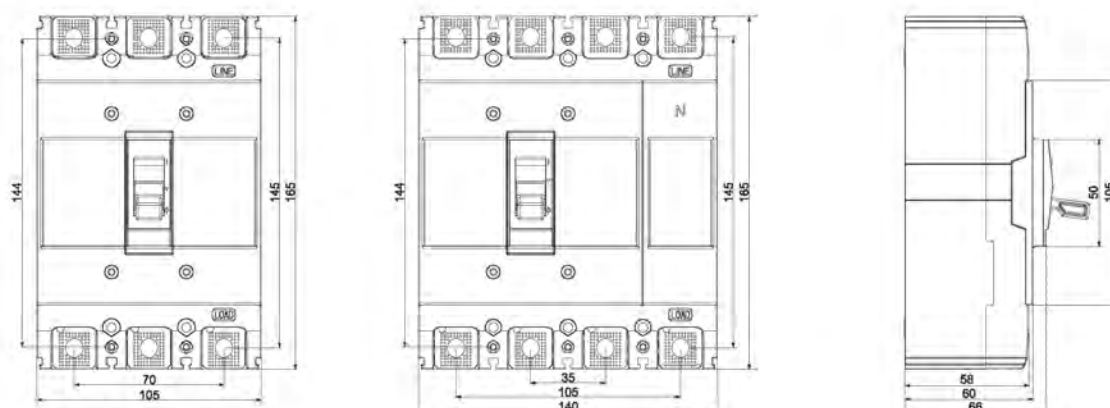
UNSQ-63



UNIQ-125



UNIQ-250



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Molded Case Circuit Breaker

MCCB UNM3-F Series



The general of UNM3-F series moulded case circuit breaker

UNM3-F series moulded case circuit breakers(hereafter simply referred to as circuit breakers) are one of the new type breakers which have been developed with international advanced design and manufacturing technology. The rated insulation voltage of the breakers is 800V. In the circuit of AC50Hz, the rated working voltage 690V or below(UNM3-F63 400V) and the rated working current up to 800A, the breakers are suitable for infrequent turn-on or turn-off and infrequent motor starting-up. The breaker has overload, short-circuit and under-voltage protection performances so as to protect the circuit and the power equipment from damage.

According to the rated ultimate short-circuit breaking ability(Icu), the breakers are classified into three kinds of types C(basic type), L(standard type), M(second high type). Those breakers have the advantages such as small size, high breaking ability, short arc, anti vibration.

The breakers could be installed vertically (upright) or horizontally (transverse).

The breakers have disconnecting function, its corresponding symbol is shown as "  ".

The breakers comply with the demands of the following standards: GB/T14048.2.

Application conditions for operation and installation

Ambient temperature : -5℃~+40℃.

Elevation of installation site: ≤2000m.

Relative humidity: not exceeding 50% at the maximum ambient temperature of +40℃. With the lower temperature, higher humidity would be permitted. E.g. when the relative humidity is 90% at the ambient temperature of 20℃, special measures should be taken to solve the dew on the surface, which would appear due to the temperature change.

Pollution protection: 3 grade.

Breakers pass the GB/T2423.10 which can tolerate the mechanical vibration(frequency: 2Hz~13.2Hz, displacement: ±1 and frequency: 13.2Hz~100Hz, acceleration: ±0.7g).

Installing categories: III for the main circuits; II for auxiliary circuit and control circuit without connecting with the main circuit.

Breakers can be used in electromagnetic environment A.

Humid and tropical type (TH) breakers pass the GB/T2423.4, which can tolerate the influence of damp air, salt mist, oil mist and mould.

Breakers should be installed in the place without any explosive medium, conductive dust and can not corrode metal and destroy the insulation.

The installation site would not be invaded by rain and snow.

Storage condition: Ambient temperature is -40℃~+70℃.

General Selection Table (UNM3-F Fixed Type)



		UNM3-F100		UNM3-F250		UNM3-F400	
Type		S	H	S	H	S	H
Pole		3-pole					
		4-pole					
Rated current,In	A	16、20、25、 32、40、50、 63、80、100、 125		125、160、 225、250		225、250、 315、400	
Adjustable parts	Long-time current setting(0.8In~1.0In)	-				-	
	Lockup device for operating handle	-				-	
Rated voltage,Ue	AC(V)	400/690					
Rated insulation voltage,Ui	V	AC800					
Rated impulse voltage,Uimp	kV	8					
Standard		IEC/EN 60947-2					
Rated frequency	Hz	50 / 60					
Rated short-circuit breaking capacity							
AC400	Icu	15kA	35kA	35kA	70kA	35kA	70kA
	Ics	10kA	25kA	25kA	50kA	35kA	50kA
Mechanical life(circle)		20000/8000(As defined by IEC/EN 60947-2)					
Electrical life(circle)		8000/1500(As defined by IEC/EN 60947-2)					
Dimensions W*L*H (mm)	3P	75*130*60		170*165*73(90)		150*257*106.5	
	4P	100*130*60		142*165*73(90)		198*257*106.5	

UNION ELECTRICS

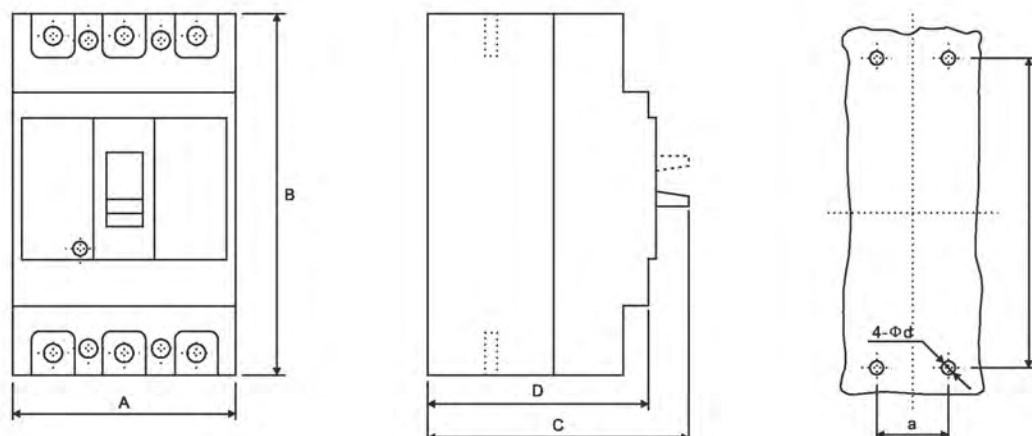
Molded Case Circuit Breaker

General Selection Table (UNM3-F Fixed Type)



		UNM3-F630		UNM3-F800	
Type		S	H	S	H
Pole		3-pole 4-pole			
Rated current,In	A	400、500、630		400、500、630、 700、800	
Adjustable parts	Long-time current setting(0.8In~1.0In)	-		-	
	Lockup device for operating handle	-		-	
Rated voltage,Ue	AC(V)	400/690			
Rated insulation voltage,Ui	V	AC800			
Rated impulse voltage,Uimp	kV	8			
Standard		IEC/EN 60947-2			
Rated frequency	Hz	50 / 60			
Rated short-circuit breaking capacity					
AC400	Icu	50kA	70kA	65kA	75kA
	Ics	35kA	50kA	65kA	65kA
Mechanical life(circle)		20000/8000(As defined by IEC/EN 60947-2)			
Electrical life(circle)		8000/1500(As defined by IEC/EN 60947-2)			
Dimensions W*L*H (mm)	3P	182*270*110		210*280*115.5	
	4P	240*270*110		280*280*115.5	

Outline Dimensions



Model	Number	A	B	C	D	a	b	Φd
63	3	75	130	130	130	25	111	3.5
	4	100				50		
125	3	75	130	130	130	25	111	3.5
	4	100				50		
125	3	92	150	150	150	30	129	4.5
	4	122				60		
250	3	107	165	165	165	35	126	4.5
	4	142				70		
250	3	107	165	165	165	35	126	4.5
	4	142				70		
400	3	150	257	257	257	44	194	7
	4	198				94		
630	3	182	270	270	270	58	200	7
	4	240				116		
800	3	210	280	280	280	70	243	7
	4	280				140		

General Selection Table (UNM1-L100 Adjustable-Leakage Type)



UNM1-L100			
Type		S	H
Pole		4-pole	3-pole 4-pole
Protective function		Overload & Short-circuit & Ground fault	
Rated current, I _n	A	16、20A、25A、32A、40A、50A、63A、80A、100A、125A	
Rated residual current	Operating, I _{Δn} (mA)	30、100、300、500	
	Non-Operating, I _{Δno} (mA)	15、50、150、250	
Adjustable parts	Long-time current setting(0.8I _n ~1.0I _n)	✓	✓
	Lockup device for operating handle	✓	✓ ✓
	Residual current(I _{Δn}) setting	30mA / 300mA / 500mA	
	Residual trip time setting	0.1s / 0.3s / 0.5s	
Rated voltage, U _e	AC(V)	400	
Rated insulation voltage, U _i	V	800V	
Rated impulse voltage, U _{imp}	kV	6	
Residual current off-time at I _{Δn}	Sec	0.1 / 0.3 / 0.5	
Standard		IEC / EN 60947-2	
Rated frequency	Hz	50 / 60	
Rated short-circuit breaking capacity(I _{cu})kA			
AC	400V	35kA	50kA
I _{cs} =%*I _{cu}		50~70	50~70
Mechanical life(circle)		20000/20000 (As defined by IEC/EN 60947-2)	
Electrical life(circle)		8000/8000 (As defined by IEC/EN 60947-2)	
Dimensions	3P	/	150*92*92
H*W*D(mm)	4P	150*122*72	150*122*92

UNION ELECTRICS

Molded Case Circuit Breaker

General Selection Table (UNM1-L250 Adjustable-Leakage Type)



UNM1-L250					
Type		S		H	
Pole		4-pole	3-pole	4-pole	
Protective function		Overload & Short-circuit & Ground fault			
Rated current,In	A	100A、125A、140A、160A、180A、200A、225A、250A			
Rated residual current	Operating,IΔn(mA)	30、100、300、500			
	Non-Operating,IΔno(mA)	15、50、150、250			
Adjustable parts	Long-time current setting(0.8In~1.0In)	√		√	
	Lockup device for operating handle	√	√	√	√
	Residual current(IΔn) setting	30mA / 300mA / 500mA			
	Residual trip time setting	0.1s / 0.3s / 0.5s			
Rated voltage,Ue	AC(V)	400			
Rated insulation voltage,Ui	V	800V			
Rated impulse voltage,Uimp	kV	6			
Residual current off-time at IΔn	Sec	0.1 / 0.3 / 0.5			
Standard		IEC /EN 60947-2			
Rated frequency	Hz	50 / 60			
Rated short-circuit breaking capacity(Icu)kA					
AC	400V	35kA	50kA		
Ics=%*Icu		50~70	50~70		
Mechanical life(circle)		20000/20000 (As defined by IEC/EN 60947-2)			
Electrical life(circle)		8000/8000 (As defined by IEC/EN 60947-2)			
Dimensions	3P	/	165*107*90		
H*W*D(mm)	4P	165*142*72	165*142*90		

General Selection Table (UNM1-L400/630 Adjustable-Leakage Type)

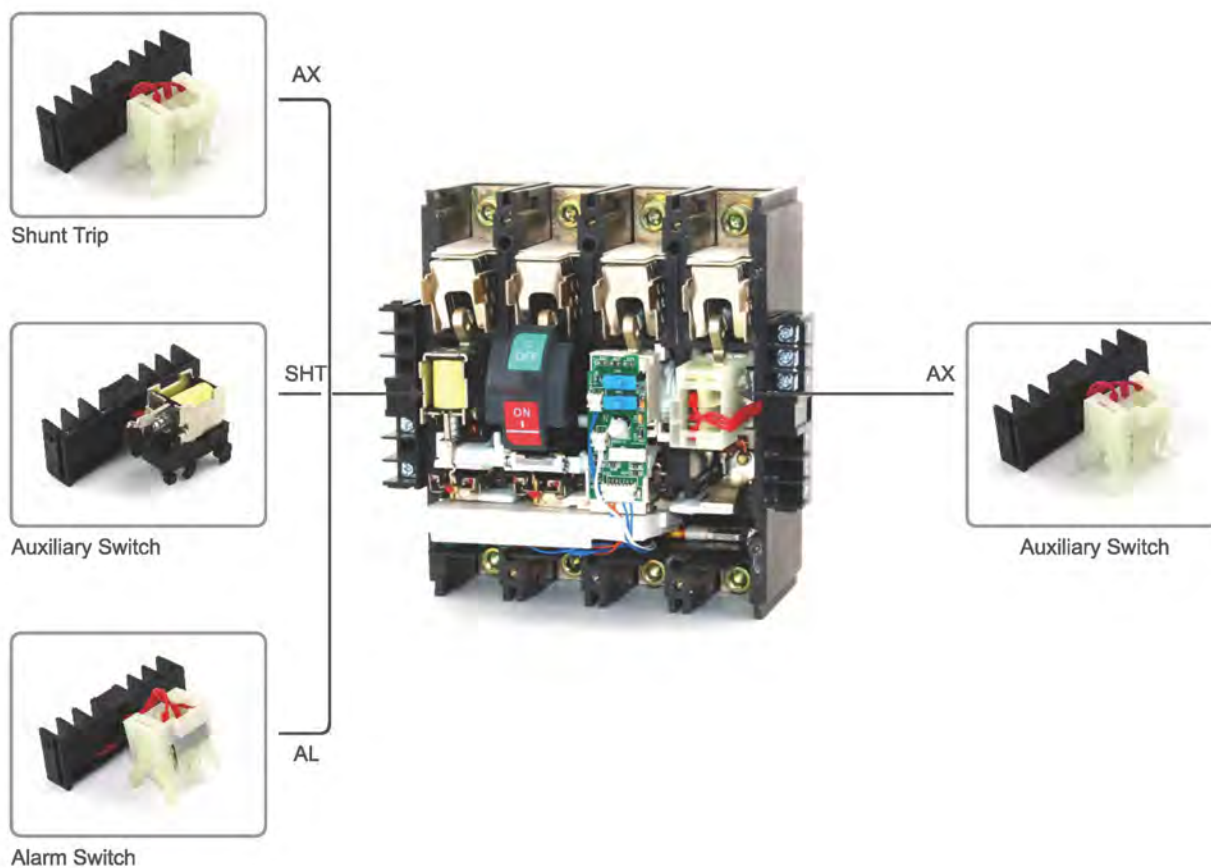


		UNM1-L400		UNM1-L630	
Type		H			
Pole		3-pole	4-pole	3-pole	4-pole
Protective function		Overload & Short-circuit & Ground fault			
Rated current,In		A		225A、250A、315A、350A、400A	400A、500A、630A
Rated residual current	Operating,IΔn(mA)	30、100、300、500		100、300、500、1000	
	Non-Operating,IΔno(mA)	15、50、150、250		50、150、250、500	
Adjustable parts	Long-time current setting(0.8In~1.0In)	√		√	
	Lockup device for operating handle	√		√	√
	Residual current(IΔn) setting	30mA / 300mA / 500mA		100mA、300mA、500mA	
	Residual trip time setting	0.1s / 0.3s / 0.5s			
Rated voltage,Ue	AC(V)	400			
Rated insulation voltage,Ui	V	800V			
Rated impulse voltage,Uimp	kV	6			
Residual current off-time at IΔn	Sec	0.1 / 0.3 / 0.5			
Standard		IEC / EN 60947-2			
Rated frequency	Hz	50 / 60			
Rated short-circuit breaking capacity(Icu)kA					
AC	400V	50kA		50kA	
Ics=%*Icu		50~70		50~70	
Mechanical life(circle)		10000/10000 (As defined by IEC/EN 60947-2)			
Electrical life(circle)		7500/7500 (As defined by IEC/EN 60947-2)			
Dimensions	3P	257*150*106.5		280*210*115.5	
H*W*D(mm)	4P	257*198*106.5		280*280*115.5	

UNION ELECTRICS

Molded Case Circuit Breaker

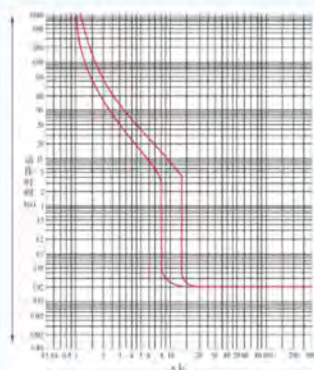
Built-in Accessory(UNM1-L)



Type	Pole	Left hole position					Right hole position				
		AX	AL	SHT	AX+AX	AX+AL	AX	AL	SHT	AX+AX	AX+AL
UNM1-L125	3P	✓	✓	✓	-	✓	-	-	-	-	-
	4P	✓	✓	✓	-	✓	✓	✓	-	-	✓
UNM1-L250	3P	✓	✓	✓	-	✓	-	-	-	-	-
	4P	✓	✓	✓	-	✓	✓	✓	-	-	✓
UNM1-L400	3P	✓	✓	✓	✓	✓	-	-	-	-	-
	4P	✓	✓	✓	✓	✓	✓	✓	✓	-	-
UNM1-L630	3P	✓	✓	✓	✓	✓	-	-	-	-	-
	4P	✓	✓	✓	✓	✓	✓	✓	✓	-	-

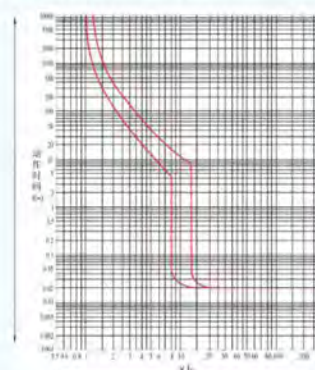
Characteristics Curve

Rated current 16A~100A



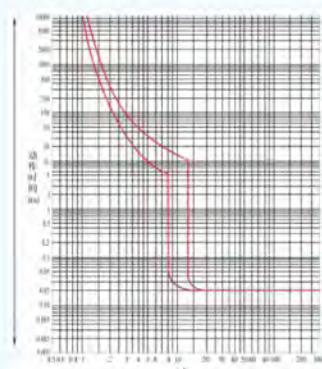
- Remark: When $I_n \leq 32$,
 $I_t = 400A (\pm 20\%)$.

Rated current 125A~250A



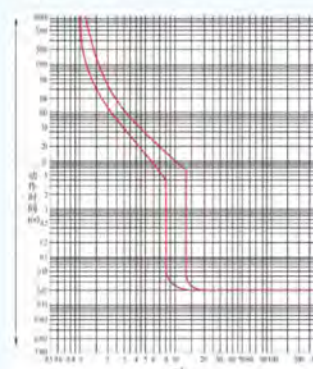
- Remark: When $I_n > 32$,
 $I_t = 10 * I_n (\pm 20\%)$

Rated current 225A~400A



- Remark: When $I_n \leq 32$,
 $I_t = 400A (\pm 20\%)$.

Rated current 400A~800A



- Remark: When $I_n > 32$,
 $I_t = 10 * I_n (\pm 20\%)$

Characteristics Curve Table

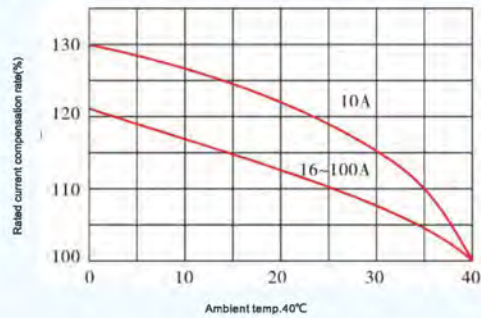
Test No.	Load current	Rated current	Initial state	Time limit to trip	Estimated result
1.	1.05 I_n	$I_n \leq 63A$ $I_n > 63A$	cold state	$t \leq 1h$ $t \leq 2h$	Non tripping
2.	1.30 I_n	$I_n \leq 63A$ $I_n > 63A$	continuing the test	$t < 1h$ $t < 2h$	Trip
3.	400A*80% 400A*120%	$\leq 32A$	cold state	$t \leq 0.2s$ $t < 0.2s$	Non tripping Trip
4.	10 I_n *80% 10 I_n *120%	$> 32A$	cold state	$t \leq 0.2s$ $t < 0.2s$	Non tripping Trip

UNION ELECTRICS

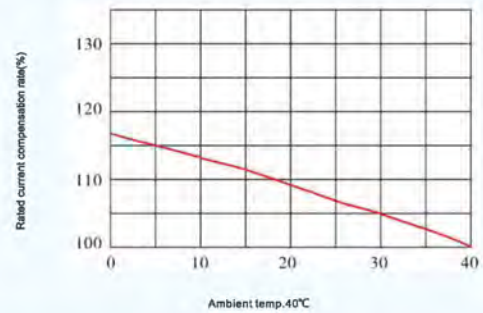
Molded Case Circuit Breaker

Temperature Compensation Curve

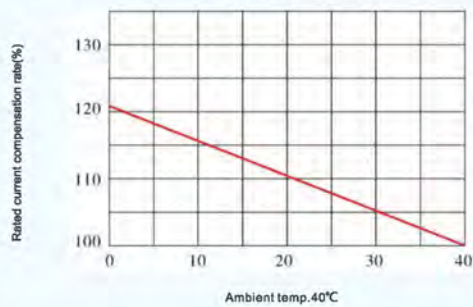
Rated current 16A~100A



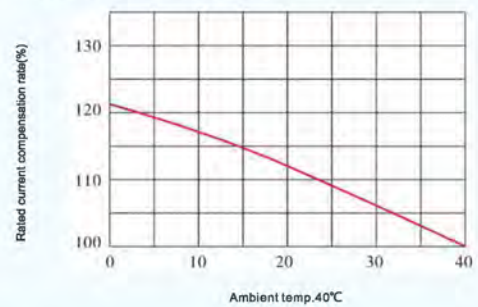
Rated current 125A~250A



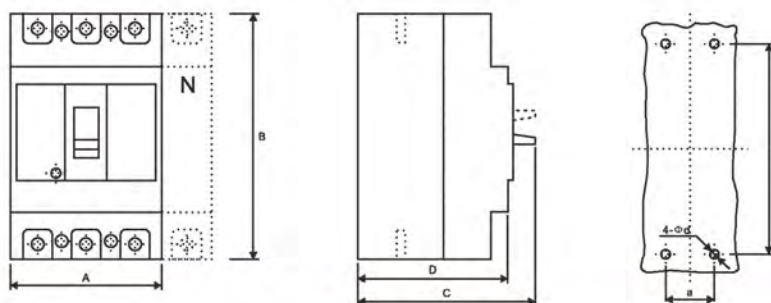
Rated current 225A~400A



Rated current 400A~800A



Outline Dimensions



Model	Number	A	B	C	D	a	b	Φd
125	3	92	150	110	92	30	129	4.5
	4	122				60		
250	3	107	165	110	90	35	126	4.5
	4	142				70		
400	3	150	257	146.5	106.5	44	194	7
	4	198				94		
630	3	210	280	155	115.5	70	243	7
	4	280				140		

MCCB UNES-F Series



Application and range of application

The UNES-F series plastic outer covering type circuit breaker (hereafter refers to as circuit breaker), is this company uses the international advanced design, one of the technique of manufacture development, development new circuit breakers Its fixed isolation voltage is 690v, is suitable in exchanges 50Hz, fixed working voltage 400V and below. Rated current to 800A circuit as frequent changeover gum less frequent motor starter. The Circuit breaker with overload, short circuit protection device, and less voltage protection circuit and power equipment are not damaged.

Model and its meaning

UNES	□	□	□	□				
MCCB	Type	Rated Current					Breaking Capacity	Pole
		63	125	250	400	630		
	F(Fixed type)	16A	30A	100A	250A	500A	C	3-pole
		20A	32A	125A	300A	600A	S	4-pole
		25A	40A	140A	315A	630A	H	
		32A	50A	150A	350A			
		40A	60A	175A	400A			
		50A	63A	180A				
		63A	80A	200A				
		80A	100A	225A				
		100A	125A	250A				
		125A						

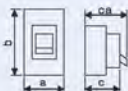
UNION ELECTRICS

Molded Case Circuit Breaker

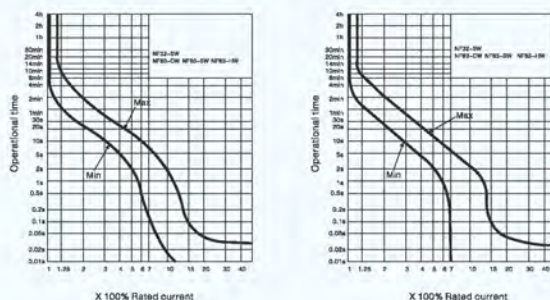
General Selection Table (UNES-F63 Fixed Type)



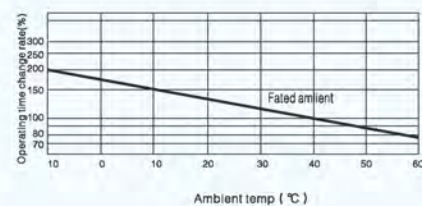
Key performance indicators

Frame current			UNES-F63								
Type			C		S			H			
Rated current in(A)			3,5(6),10,15(16),20 25,30(32),40,50,60(63)		10,15(16),20,25 30(32),40,50,60(63)			10,15(16),20,25 30(32),40,50,60(63)			
Number of poles			2	3	2	3	4	2	3	4	
Rated voltage Ue(V)			AC380-690V DC250		AC380-690V DC250			AC380-690V DC250			
Rated insulation voltage Ui(V)			AC690V		AC690V			AC690V			
Short-circuit Interrupting capacity	AC	690V	-		-			-			
	AC	500V	2.5/1		2.5/1			7.5/4			
	AC	440V	2.5/1		2.5/1			10/5			
	AC	400V	5/2		5/2			10/5			
	AC	230V	5/2		5/2			25/13			
	DC	250V	2.5/1	-	2.5/1	-	7.5/4	-	-		
Dimensions(mm)		a	50	75	50	75	50	75	100		
		b	130		130			130			
		c	68		68			68			
		ca	90		90			90			
		Weight(kg)	0.45	0.65	0.45	0.65	0.55	0.75	1.0		
Electrical-operation device(MD)			●		●			●			
External rotary handle			●		●			●			
Automatic tripping device			Hydraulic-magnetic		Hydraulic-magnetic			Hydraulic-magnetic			

Characteristics curve



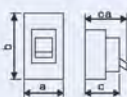
Temperature curve



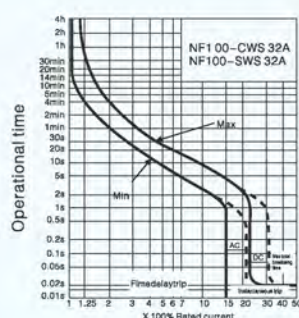
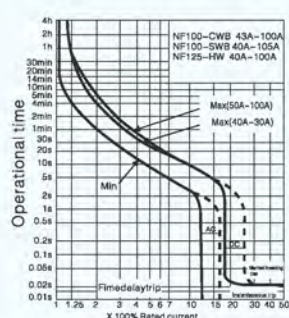
General Selection Table (UNES-F125 Fixed Type)



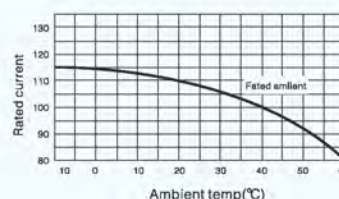
Key performance indicators

Frame current			UNES-F125								
Type			C		S			H			
Rated current in(A)			30,32,40,50,60		30,32,40,50,60			30,32,40,50,60			
			63,80,100,125		63,80,100,125			63,80,100,125			
Number of poles			2	3	2	3	4	2	3	4	
Rated voltage Ue(V)			AC380–690V DC250		AC380–690V D C250			AC380–690V DC250			
Rated insulation voltage Ui(V)			AC690V		AC690V			AC690V			
Short–circuit Interrupting capacity	AC	690V	–		–			5/3			
	AC	500V	7.5/4		15/8			30/15			
	AC	440V	10/5		25/13			50/25			
	AC	400V	10/5		30/15			50/25			
	AC	230V	25/13		50/25			100/50			
	DC	250V	7.5/4	–	15/8	–	–	40/20	–	–	
Dimensions(mm)		a	60	90	60	90	120	60	90	120	
		b	155		155			155			
		c	68		68			68			
		ca	90		90			90			
Weight(kg)			0.7	1.0	0.75	1.1	1.4	0.75	1.1	1.4	
Electrical–operation device(MD)			●		●			●			
External rotary handle			●		●			●			
Automatic tripping device			Thermal–magnetic								

Characteristics curve



Temperature curve

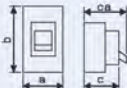


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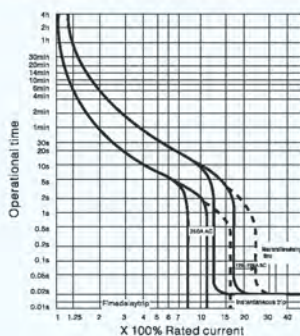
Molded Case Circuit Breaker

General Selection Table (UNES-F250 Fixed Type)

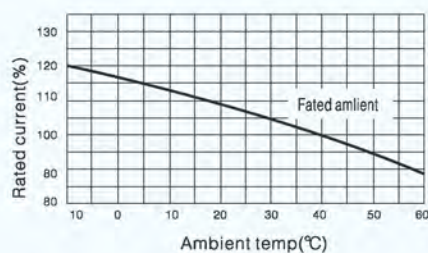


Frame current			UNES-F250															
Type			C			S			H									
Rated current in(A)			100,125,140,150,160			100,125,140,150,160			100,125,140,150,160									
			175,180,200,225,250			175,180,200,225,250			175,180,200,225,250									
Number of poles			2		3	2		3	4	2		3	4					
Rated voltage Ue(V)			AC380–690V DC250			AC380–690V DC250			AC380–690V DC250									
Rated insulation voltage Ui(V)			AC690V			AC690V			AC690V									
Short-circuit Interrupting capacity			AC	690V		–		–		5/3								
			AC	500V		10/5		15/8		30/8								
			AC	440V		15/8		25/13		50/13								
			AC	400V		18/9		30/15		50/13								
			AC	230V		30/15		50/25		100/25								
			DC	250V		10/5	–	15/8		–	40/20	–						
Dimensions(mm) 			a	105		140		105		140		105		140				
			b	165				165				165						
			c	68				68				68						
			ca	92				92				92						
			Weight(kg)			1.3		1.5		1.3		1.5		1.9		1.3		1.5
Electrical–operation device(MD)			●			●			●									
External rotary handle			●			●			●									
Automatic tripping device			Thermal–magnetic															

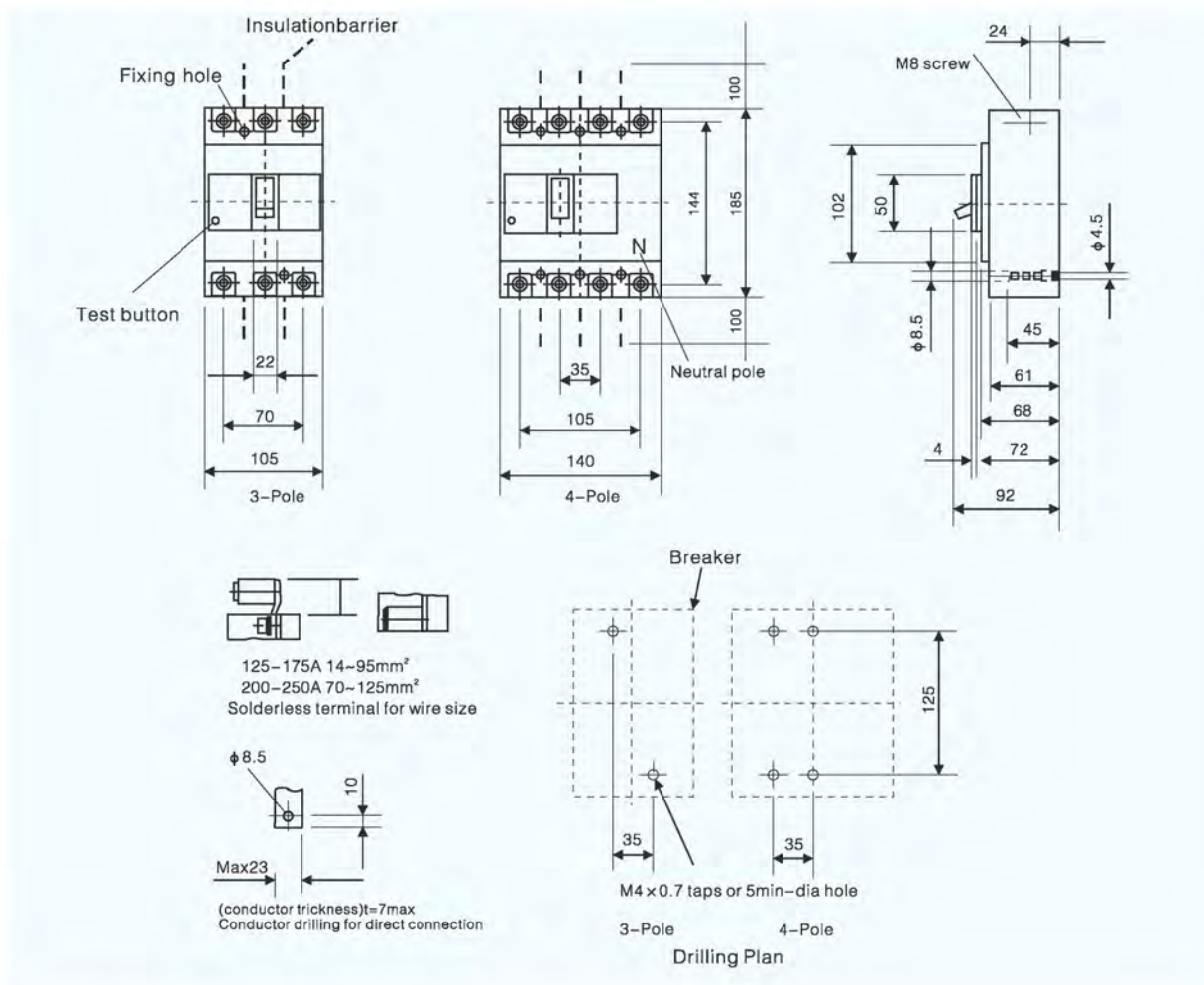
Characteristics curve



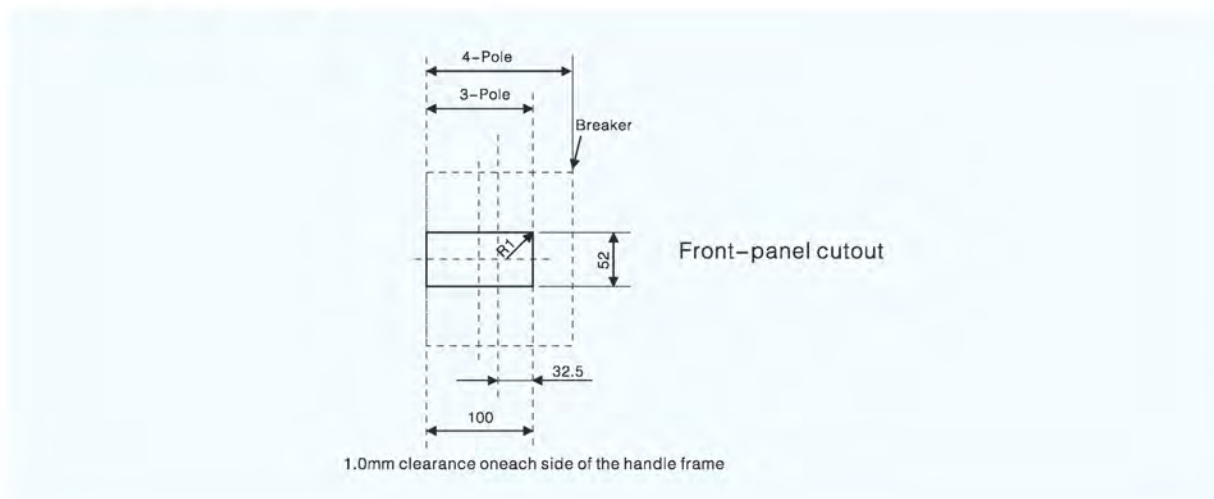
Temperature curve



Front board wiring



Back board wiring

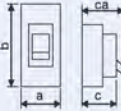


UNION ELECTRICS

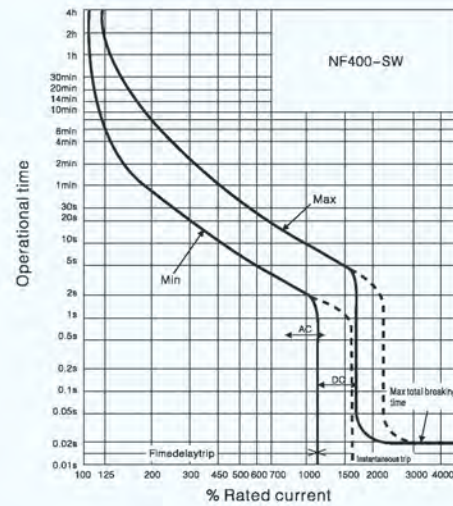
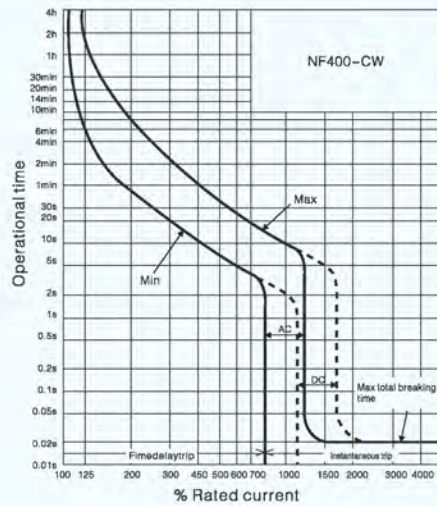
Molded Case Circuit Breaker

General Selection Table (UNES-F400 Fixed Type)

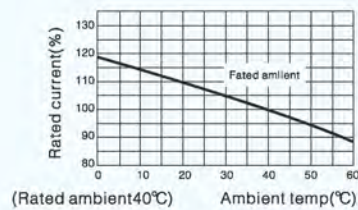


Frame current			UNES-F400						
Type			C		S		H		
Rated current in(A)			250,300,315,350,400		250,300,315,350,400		250,300,315,350,400		
Number of poles			2	3	2	3	2	3	
Rated voltage Ue(V)			AC380-690V DC250		AC380-690V DC250		AC380-690V DC250		
Rated insulation voltage Ui(V)			AC690V		AC690V		AC690V		
Short-circuit Interrupting capacity	AC	690V	-		10/10		10/10		
	AC	500V	15/8		30/30		30/30		
	AC	440V	25/13		42/42		42/42		
	AC	415V	36/18		45/45		45/45		
	AC	400V	36/18		45/45		45/45		
	AC	380V	40/20		50/50		50/50		
	AC	230V	50/25		85/85		85/85		
	DC	250V	20/10	-	40/40	-	40/40	-	
Dimensions(mm)			a	140		140		140	
			b	257		257		257	
			c	103		103		103	
			ca	134		134		134	
Weight(kg)			4.7	4.9	4.9	5.7	4.9	5.7	
Electrical-operation device(MD)			●		●		●		
External rotary handle			●		●		●		
Automatic tripping device			Hydraulic-magnetic		Hydraulic-magnetic		Thermal-magnetic		

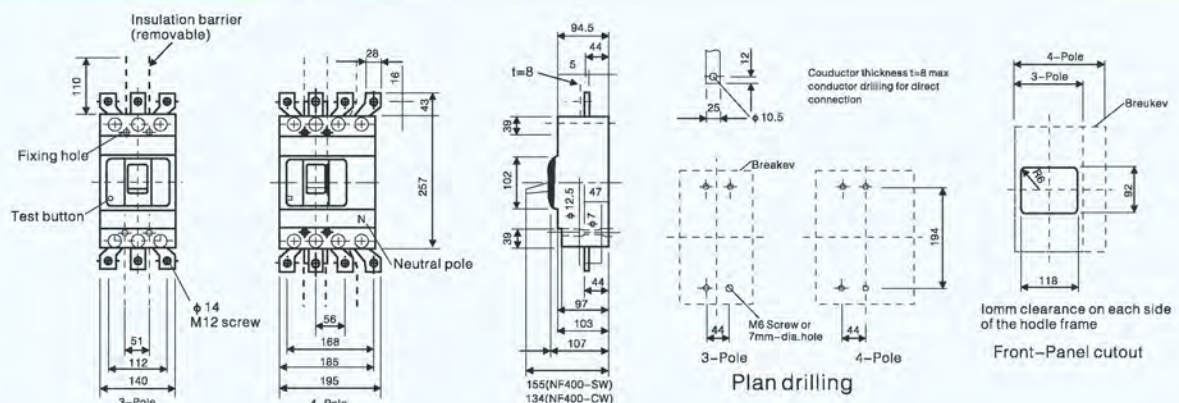
Characteristics curve



Temperature curve



Front board wiring

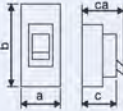


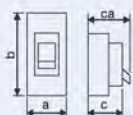
UNION ELECTRICS

Molded Case Circuit Breaker

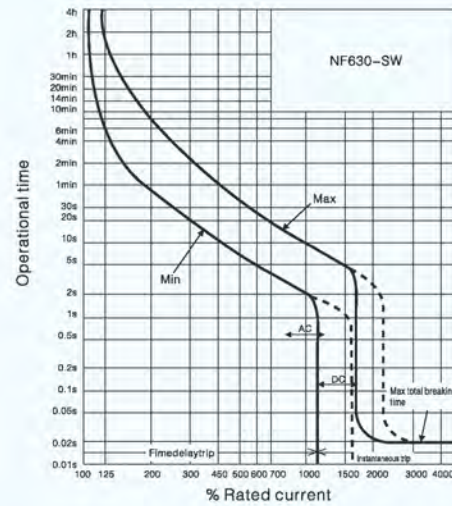
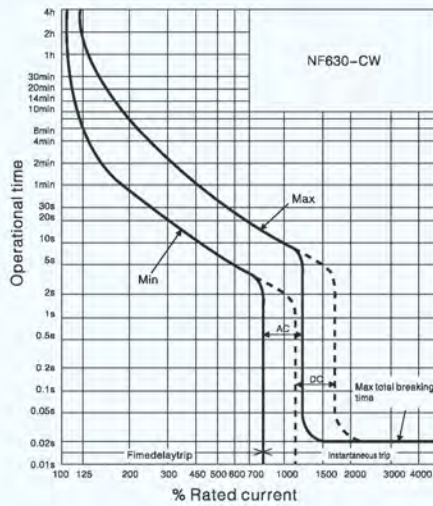
**General Selection Table
(UNES-F630 Fixed Type)**



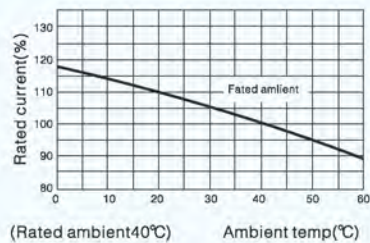
Frame current			UNES-F630			
Type			S		H	
Rated current in(A)			500,600,630		500,600,630	
Number of poles			3		3	
Rated voltage Ue(V)			AC380–690V DC250		AC380–690V DC250	
Rated insulation voltage Ui(V)			AC690V		AC690V	
Short–circuit Interrupting capacity	AC	690V	–		10/10	
	AC	500V	18/9		30/30	
	AC	440V	36/18		42/42	
	AC	415V	36/18		45/45	
	AC	400V	36/18		45/45	
	AC	380V	40/20		50/50	
	AC	230V	50/25		85/85	
	DC	250V	20/10	–	40/40	–
Dimensions(mm)		a	210		210	
		b	275		275	
		c	103		103	
		ca	155		155	
		Weight(kg)	8.5	9.5	8.5	9.5
Electrical–operation device(MD)			●		●	
External rotary handle			●		●	
Automatic tripping device			Thermal–magnetic		Thermal–magnetic	



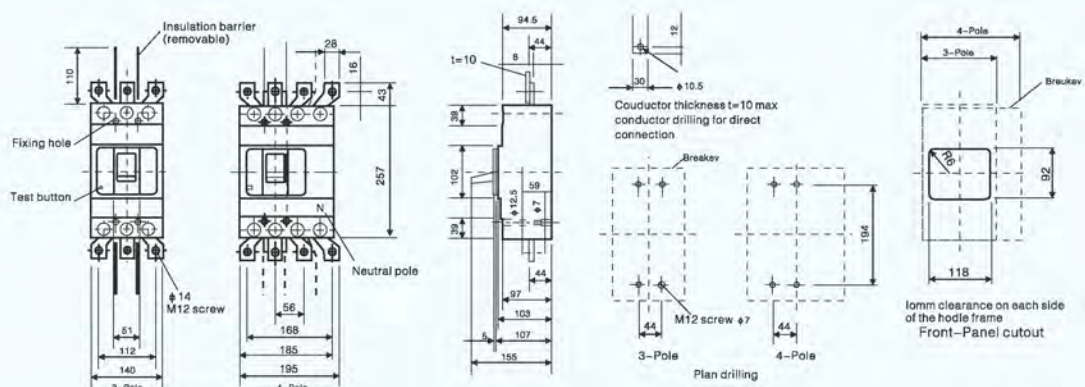
Characteristics curve



Temperature curve



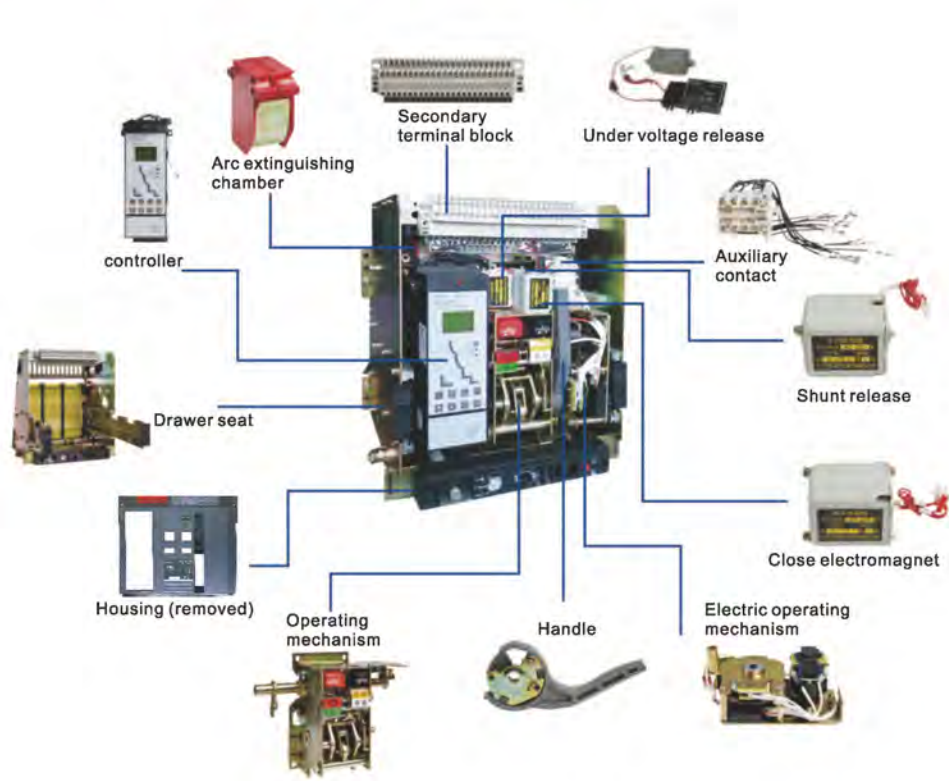
Front board wiring



UNION ELECTRICS

Intelligent Air Circuit Breaker

Breakdown drawing of draw-out type



Quick selection table

Frame Current Rating: Inm=2000 Inm=3200 Inm=4000 Inm=6300		Rated current: UNDW1-2000:630、800、1000、1250、1600、2000 UNDW1-3200:2000、2500、2900、3200、4000 UNDW1-4000:3200、3600、3900、4000 UNDW1-6300:4000、5000、6300			
UNDW1	6300		6300	3	3M
Product model	Installation method: Fixed type Draw-out type		3P、4P	Controller type: M、3M 2H、3H	

Application and scope

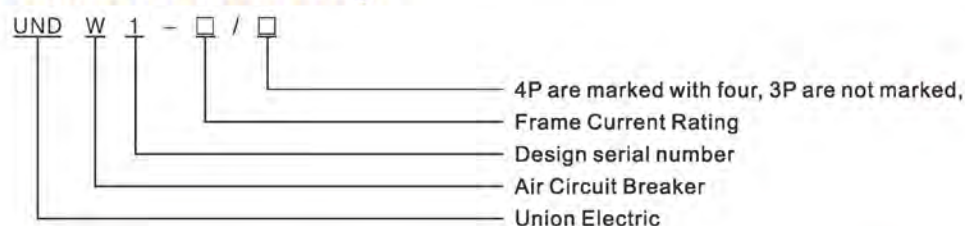
UNDW1 series Intelligent Air Circuit Breaker (hereinafter referred to as circuit breaker) is applicable to the distribution network with AC 50 Hz, rated working voltage 400V, 690V, rated working current 6300A and below. It is used to distribute electric energy and protect lines and power equipment from overload, undervoltage, short circuit, grounding and other faults. The circuit breaker adopts intelligent controller with precise selective protection and multi-function, with complete protection functions, which is especially suitable for the distribution network which needs to improve the reliability of power supply and avoid unnecessary power outage. Among them, 2h and 3H intelligent controllers have communication interface, which is convenient to connect with field bus, and can realize four remote functions of "telemetry", "remote regulation", "control" and "remote communication", and meet the requirements of control automation. Leakage protection can be realized by configuring leakage current transformer and corresponding intelligent controller.

The circuit breaker with rated working current of 1000A and below can also be used as overload, short circuit, undervoltage and ground fault protection of motor in AC 50 Hz and 400 V network, and can be used for infrequent starting of motor under normal conditions.

The products have passed the national compulsory "CCC" certification.

The circuit breaker has isolation function, and the symbol is "  ".

Model and meaning



The circuit breaker meets the following standards

- ◆ IEC60947-1 and GB/T14048.1 general principles for low voltage switchgear and controlgear
- ◆ IEC60947-2 and GB/T14048.2 low voltage switchgear and control equipment low voltage circuit breakers
- ◆ IEC60947-4-1 and GB/T14048.4 low voltage switchgear and control equipment electromechanical contactors and motor starters
- ◆ GB/TT2421.1 overview and guidelines for environmental testing of electrical and electronic products
- ◆ GB/T14597 climatic and environmental conditions of electrical products at different altitudes

Installation environment requirements

The circuit breaker shall be installed in a dry, dust-free, corrosive gas free and explosive hazardous medium free environment without impact. If the environment can not meet this condition, the protection level of the complete equipment should be improved accordingly. The specific requirements are shown in the table below:

Project	Standard
Ambient Temperature	-5℃to + 40℃, the 24hour average value does not exceed + 35℃, and the ambient temperature is not greater than + 40℃. The capacity reduction coefficient should refer to the manual
Relative Humidity	When the maximum temperature is + 50℃, the relative humidity of air is not more than 50%. Higher relative humidity can be allowed at lower temperature, for example, 90% relative humidity can be allowed at 20℃
Altitude	≤2000m, Refer to the specification for derating factor exceeding 2000m
Installation Requirements	Vertical inclination of circuit breaker installation≤5°
Class Of Pollution	III
Use Category	Intelligent universal circuit breaker: B
Protection Level	The circuit breaker is installed in the cabinet room with a door frame, and the protection grade reaches Ip40

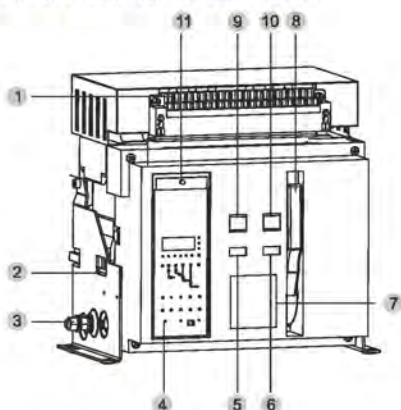
UNION ELECTRICS

Intelligent Air Circuit Breaker

Preparation before installation

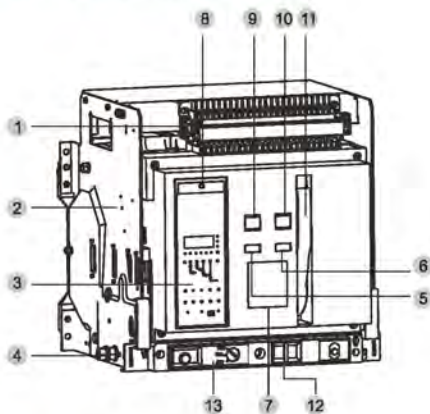
Before installation, the insulation resistance of circuit breaker shall be checked with 500VDC megger according to regulations. The ambient temperature of $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and relative humidity of 50% ~ 70% shall not be less than $500\text{m}\Omega$. Insulation resistance test parts are: when the circuit breaker is closed, between each phase and ground; when the circuit breaker is open, between each phase and each pole.

◆ Front indication of Fixed type circuit breaker



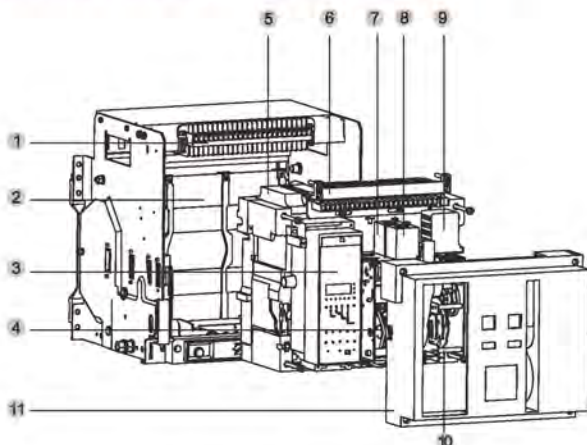
1. Secondary terminal
2. Bracket
3. Grounding bolt
4. Intelligent controller
5. Opening / closing indication
6. Energy storage indication
7. Name plate
8. Manual energy storage handle
9. Opening button
10. Closing button
11. fault trip indicator / reset button

◆ Front indication of drawer circuit breaker



1. Secondary terminal
- 2 drawers
3. Intelligent controller
4. Grounding bolt
5. Opening / closing indication
6. Energy storage indication
- 7 name plate
8. Fault trip indicator / reset button
9. Opening button
10. Closing button
- 11 manual energy storage handle
12. Separation position lock position
13. "Separation", "test", "connection" position indication

◆ Structural components of drawer circuit breaker



- Drawer type
1. Secondary terminal (Fixed type part)
 2. Safety baffle
 3. Intelligent controller
 4. Manual operation mechanism
 5. Arc extinguishing chamber
 6. Secondary terminal
 7. Shunt release
 8. Closing Electromagnet
 9. Auxiliary contact
 10. Motor Mechanism
 11. Mask

Main technical data and performance indicators

Model		UNDW1		UNDW1	
Frame current rating I _{nm} (A)		2000	3200	4000	6300
Rated working current I _n (A)		(400) 630,800,1000,1250 1600,2000	2000,2500,2900, 3200,4000	3200,3600,3900,4000	4000,5000,6300
Rated working voltage U _e (V)		AC50Hz 400V/690V		AC50Hz 400V/690V	
Rated insulation voltage U _i (V)		1000		1000	
Rated impulse withstand voltage U _{imp} (kV)		12		12	
Power frequency withstand voltage U (V) 1min		AC2500V 50Hz		AC2500V 50Hz	
Pole number		3P/4P		3P/4P	
Rated limit short circuit breaking capacity (effective value) I _{CU} (kA)	400V	100	100	138	138
	690V	65	65	105	105
Rated short circuit breaking capacity (effective value) I _{CS} (kA)	400V	65	85	138	138
	690V	65	65	105	105
Rated short time withstand current (1s) (RMS) I _{CSW} (kA)	400V	65	85	138	138
	690V	65	65	105	105
Total breaking time (without additional delay) (ms)		12~18		12~18	
Closing time (ms)		≤60		≤60	
Operational performance	Electrical life (Times)	1000	500	500	500
	Mechanical life (Times)		2500	2500	2000
			10000	10000	8000

UNION ELECTRICS

Intelligent Air Circuit Breaker

Basic functions and optional functions of intelligent controller

M



Basic function

- ◆ Overload long time delay, short circuit short time delay
- ◆ Short circuit instantaneous protection
- ◆ Functional test
- ◆ Fault memory
- ◆ Hot memory
- ◆ Self diagnosis
- ◆ Current measurement
- ◆ Fault status indication and numerical display
- ◆ Earth fault protection

Optional function

- ◇ Signal contact output
- ◇ MCR and over limit trip
- ◇ Load monitoring
- ◇ Voltage measurement

2H



Digital display type

Basic function

- ◆ Basic function
- ◆ Overload long time delay, short-circuit short-time delay, short-circuit instantaneous
- ◆ Functional test
- ◆ Fault memory
- ◆ Hot memory
- ◆ Self diagnosis
- ◆ Current measurement
- ◆ Fault status indication and numerical display
- ◆ Communication function (2H)
- ◆ Contact wear indication
- ◆ Record of operation times
- ◆ Earth fault protection

Optional function

- ◇ Current unbalance protection
- ◇ Signal contact output (2M)
- ◇ Load monitoring
- ◇ MCR and over limit trip
- ◇ Power measurement (2M)
- ◇ Power factor measurement (2M)
- ◇ Voltage measurement (2M)
- ◇ Electric energy measurement

3M/3H



Liquid crystal display

Basic function

- ◆ Overload long time delay, short-circuit short-time delay, short-circuit instantaneous
- ◆ Function test
- ◆ Fault memory
- ◆ Hot memory
- ◆ Self diagnosis
- ◆ Current measurement
- ◆ Fault status indication and numerical display
- ◆ Communication function (3H)
- ◆ Contact wear indication (3H)
- ◆ Record of operation times (3H)
- ◆ Earth fault protection

Optional function

- ◇ Current unbalance protection
- ◇ Signal contact output
- ◇ Load monitoring
- ◇ MCR and over limit trip
- ◇ Power measurement
- ◇ Power factor measurement
- ◇ Electric energy measurement
- ◇ Regional interlocking
- ◇ Harmonic measurement
- ◇ Voltage protection
- ◇ Voltage measurement

Function list of intelligent controller

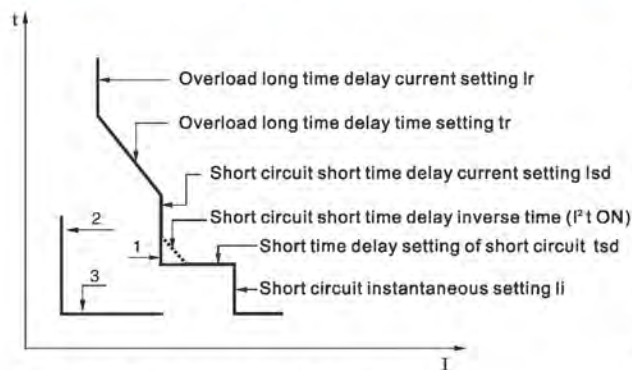
Controller model	M	3M	2H	3H
Overload long time delay protection	■	■	■	■
Short circuit short time delay protection	■	■	■	■
Short circuit instantaneous protection	■	■	■	■
Earth fault protection	■	■	■	■
Current unbalance protection	—	□	□	□
Functional test	■	■	■	■
Fault memory	■	■	■	■
Signal contact output	□	□	■	■
Hot memory	■	■	■	■
Self diagnosis	■	■	■	■
MCU work instruction	—	—	—	—
Current column display	—	—	—	—
Current measurement	■	■	■	■
MCR and over limit trip	□	□	□	□
Load monitoring	□	□	□	□
Fault status indication and numerical display	■	■	■	■
Voltage measurement	□	□	■	■
Power factor measurement	—	□	■	■
Power measurement	—	□	■	□
Electric energy measurement	—	□	□	□
Communication function	—	—	■	■
Contact wear indication	—	□	■	■
Regional interlocking	—	□	—	□
Harmonic measurement	—	□	—	□
Voltage protection	—	□	—	□
Record of operation times	—	□	■	■

Description: ■ indicates basic function; □ indicates optional function; — Indicates no such function.

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Intelligent Air Circuit Breaker

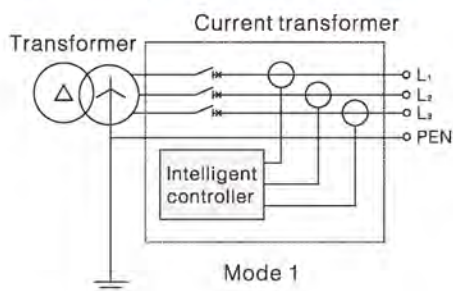
Over current protection function



1. Short circuit delay time limit (Pt OFF)
2. Grounding fault current setting I_g
3. Ground fault delay time t_g

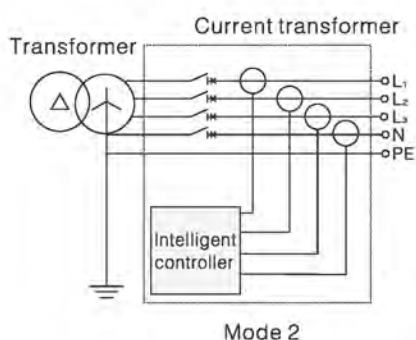
- Overload long time delay protection
- Overload long time delay inverse time protection, adjustable setting current I_r ;
- The overload long delay time t_r is adjustable.
- Short circuit short time delay protection (turn OFF)
- Short circuit short time delay inverse time protection (Pt ON), adjustable setting current I_{sd} ;
- Short circuit short time delay time t_{sd} adjustable
- Short circuit instantaneous protection
- Short circuit instantaneous (turn OFF) sketch current I_i adjustable
- Short circuit fault protection (turn OFF)
- Grounding fault time limit or inverse time limit protection, setting current I_g adjustable;
- The delay time t_g is adjustable;
- After the delay time is OFF, only alarm will be given without interruption.

◆ Particularity of long time delay, short time delay, instantaneous and grounding protection

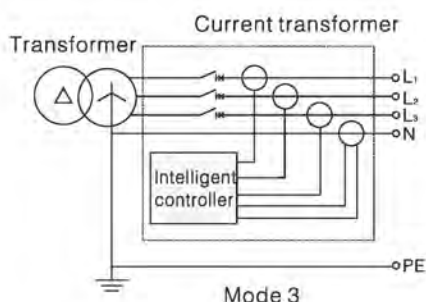


Polar fault protection mode:

- Mode1: UNDW1 three pole circuit breaker is selected in TN-C, TN-C-S and TN-S distribution systems without additional external neutral line n current transformer.
- The vector sum of three-phase current is taken as the ground fault protection signal.
- The protection feature is time limit or inverse time limit protection.

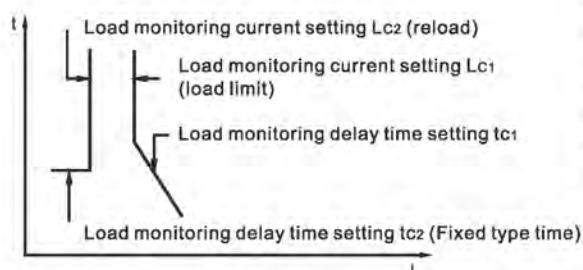
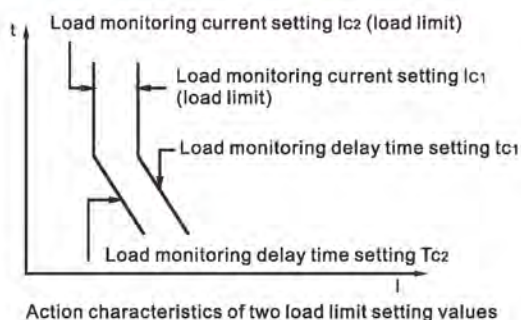


- Mode 2: UNDW1 four pole circuit breaker is selected in TN-S distribution system.
- The ground fault protection signal is the sum of three-phase current and N-phase current vector.
- The protection features are time limit or inverse time limit protection.



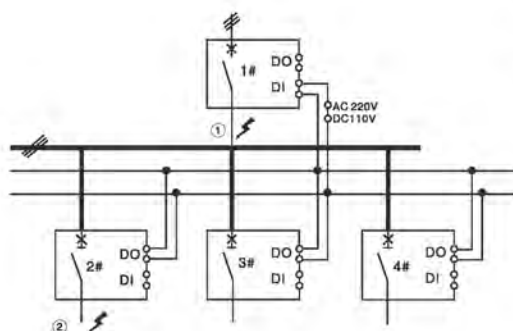
- Mode 3: UNDW1 three pole circuit breaker is selected in TN-S distribution system.
- The external neutral line n current transformer is used for ground fault protection (connected to No.25 and No.26 secondary circuit terminals), and the maximum distance between the installation site of the transformer and the open circuit is 2m.
- The ground fault protection signal is the sum of three-phase current and N-phase current vector.
- The protection feature is time limit or inverse time limit protection.

Load monitoring function



- It is used to monitor the subordinate unimportant load and ensure the power supply of the main system;
 - There are two ways of load monitoring, one of which can be selected by users. The setting value of load monitoring current is Ic1 and Ic2, generally $Ic1 \geq Ic2$;
 - Mode 1: it can control two lower level loads. When the operation current of the main circuit successively exceeds LC1 and LC2, the contact signal will be sent out after delaying Tc1 and TE2 respectively, and the controller will send instructions to cut off the two controlled loads.
 - Mode 2: only one lower level load is controlled. When the operating current of the main circuit exceeds IO1, the contact signal will be sent after Tc1 delay, and the controller will send instructions to cut off the load. If the operating current of the main circuit is lower than IC2 and the duration is TC2 after the load is disconnected, the controller can send a signal again to command the disconnected load to switch on (reload) and restore the power supply of the load.
- The load monitoring signals (1) and (2) corresponding to IC1 and IC2 are respectively output contact signals through the secondary circuit terminal of the circuit breaker. When the signal is sent out, it is indicated by the LED of the intelligent controller.

Regional interlocking



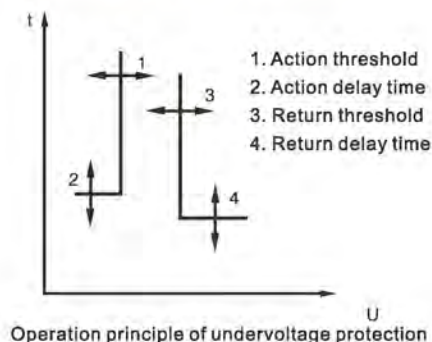
Regional selective interlocking includes short-circuit interlocking and grounding interlocking. In the same power circuit with two or more upper and lower associated circuit breakers:

- When the short circuit or grounding fault occurs at the outlet side of the lower level circuit breaker (such as position ②), the lower level circuit breaker trips and sends the regional or interlocking trip signal to the higher level circuit breaker; - the upper level circuit breaker (1 # circuit breaker) receives the regional interlocking trip signal, and delays according to the short circuit or grounding protection setting. If the fault current of the upper circuit breaker is eliminated during the delay process, the protection will return and the upper circuit breaker will not act; if the lower level circuit breaker trips, the fault current will not be eliminated. The upper circuit breaker acts according to the short circuit or grounding protection setting to cut off the fault line.
- When the short circuit or grounding fault occurs between the upper circuit breaker (1# circuit breaker) and the lower circuit breaker (2 # ~ 4 # circuit breaker) (such as position ①). The superior circuit breaker did not receive the regional interlocking signal, so it tripped instantaneously and cut off the fault line quickly.
- Parameter setting:
 - At least one Di of superior circuit breaker is set as regional interlocking detection;
 - At least one do of lower level circuit breaker is set as regional interlocking signal output.

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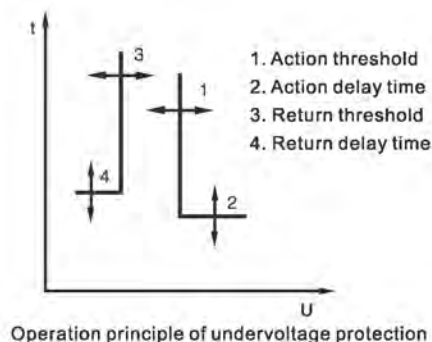
Intelligent Air Circuit Breaker

Voltage protection



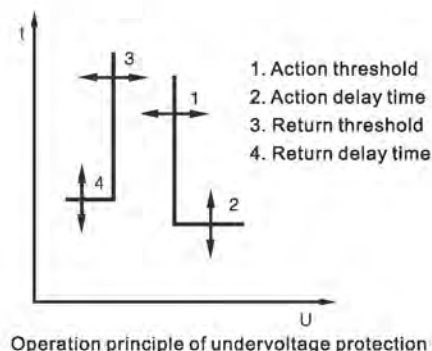
■Port undervoltage protection

- The intelligent controller measures the true effective value of the primary circuit voltage. When the three line voltages are less than the set value, that is, when the maximum value of the three line voltages is less than the set value of the under voltage protection, the under voltage protection acts; when the maximum value of the three line voltages is greater than the return value, the alarm action returns.
- Action characteristics: when the maximum voltage is less than the action threshold (1), the alarm or trip delay will be started; when the action delay time (2) arrives, the alarm or trip signal will be sent, and the undervoltage fault will act; when the maximum voltage value is greater than the return threshold value (3), the return delay will be started; when the return delay time (4) reaches, the alarm will be removed and the under voltage fault will return.



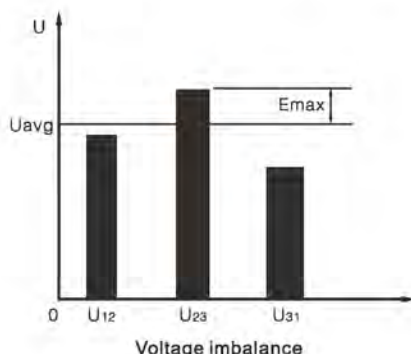
■Port overvoltage protection

- The intelligent controller measures the true RMS value of the primary circuit voltage. When the three line voltages are greater than the set value, that is, when the minimum value of the three line voltages is greater than the set value of the overvoltage protection, the over-voltage protection acts; when the three line voltages are less than the return value, the alarm action returns.
- Action characteristics: when the minimum line voltage is greater than the action threshold (1), the alarm or trip delay will be started; when the action delay time (2) arrives, the alarm or trip signal will be sent, and the overvoltage fault will act; when the execution mode is alarm, after the alarm action, when the minimum line voltage is less than the return threshold (3), the return delay will be started, and the alarm will be removed when the return delay time (4) is up Fault return.



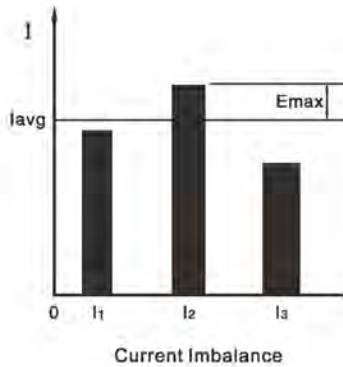
■Port voltage stability protection

- Voltage unbalance rate protection acts according to the unbalance rate of three line voltages. The intelligent controller measures the voltage unbalance rate. When the voltage unbalance rate is greater than the dynamic threshold value, the protection action will act; when the power imbalance rate is less than the return value, the alarm action will return.
- Action characteristics: when the voltage unbalance rate is greater than the action threshold (1), the alarm or trip delay will be started; when the action delay time (2) arrives, the alarm or trip signal will be sent, and the voltage imbalance rate will act in fault; when the execution mode is alarm, after the alarm action, when the voltage unbalance rate is less than the return threshold (3), the return delay will be started, and when the return delay time (4) reaches, it will be withdrawn In addition to the alarm, the voltage unbalance rate fault returns.
- Calculation method of voltage unbalance rate:



$$U_{\text{unbal}} = \frac{|E_{\text{max}}|}{U_{\text{avg}}} \times 100\% \quad U_{\text{avg}} = \frac{U_{12} + U_{23} + U_{31}}{3}$$

E_{max}: the maximum difference between the line voltage and the average value.
U_{avg}: the average value of the sum of the three-phase line voltage values.



■ Current unbalance rate protection

□ The current unbalance rate protection is used to protect the phase break and three-phase current unbalance, and the protection action is based on the unbalance rate of three-phase current.

□ Calculation method of unbalance rate:

$$I_{\text{unbal}} = \frac{E_{\text{max}}}{I_{\text{avg}}} \times 100\% \quad I_{\text{avg}} = \frac{I_1 + I_2 + I_3}{3}$$

E_{max} : the maximum difference between each phase current and I_{avg} .

I_{avg} : is the average effective value of three-phase line current value.

■ Measurement of port harmonics

The intelligent controller can measure fundamental current, fundamental line voltage, fundamental phase voltage, fundamental power, 3-31 order odd harmonic current content (Hr_{ih}), harmonic wave voltage content (hru_h), total harmonic current distortion rate [THDi, THDi], total harmonic voltage distortion rate [THDu, THDu]

Harmonic content (HR)

The ratio of the root mean square value of the H-th harmonic component to the root mean square value of the fundamental component in the periodic AC flow (expressed as a percentage).

The h-th harmonic current content is expressed in Hr_{ih}.

$$\text{Hr}_{ih} = \frac{I_h}{I_{1-1}} \times 100\%$$

Note: where I_h is the H th harmonic current of phase a (root mean square value);

The H th harmonic voltage content is expressed in hR_{uh}

$$\text{hR}_{uh} = \frac{U_h}{U_{12-1}} \times 100\%$$

Note: where U_h is the h-th harmonic line voltage of A-B phase

Total harmonic distortion (THD, thd)

The ratio (THD) of the harmonic content in periodic AC flow to the root mean square value of its fundamental component is expressed as a percentage.

$$\text{THDi} = \frac{\sqrt{\sum_{h=2}^{\infty} I_h^2}}{I_{1-1}} \times 100\% \quad \text{THDu} = \frac{\sqrt{\sum_{h=2}^{\infty} U_h^2}}{U_{1-1}} \times 100\%$$

Note: in the formula, h is the H-th harmonic current (root mean square value) of phase a; u_h is the H-th harmonic line voltage between A-B phases (root mean square value).

The ratio (thd) of the harmonic content in the periodic traffic flow to the root mean square value of the periodic traffic flow is expressed as a percentage.

$$\text{thdi} = \frac{\sqrt{\sum_{h=2}^{\infty} I_h^2}}{I_{1-1}} \times 100\% \quad \text{thdu} = \frac{\sqrt{\sum_{h=2}^{\infty} U_h^2}}{U_{1-1}} \times 100\%$$

Note: in the formula, I_h is the H-th harmonic current of phase a (root mean square value); u_h is the H-th harmonic line voltage between A-B phases (root mean square value).

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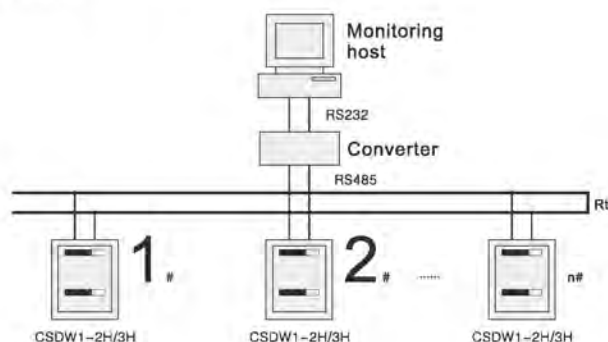
Intelligent Air Circuit Breaker

Communication

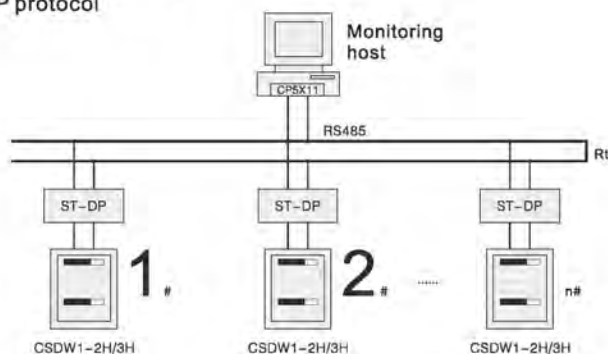
The remote "four remote" function of circuit breaker can be realized through communication port. They are "remote control", "remote communication", "remote regulation" and "telemetry".

The communication protocol uses Modbus RTU, PROFIBUS DP or device mode and standard RS-485 interface. Baud rate and communication address can be set by programmer. The maximum wiring distance is 1.5km. One line can be connected with 250 communicable circuit breakers at the same time. The communication line is twisted shielded wire, which can be extended by adding medium relay.

- Communication network connection diagram 1
Application of modubs RTU protocol



- Communication network connection diagram 2
Application of PROFIBUS DP protocol



ST-DP is the communication module, and the master station card is cp5x11 of SIEMENS company
Rt: network terminal resistance, generally 120 Ω

Contact wear instructions

The current contact wear can be displayed on the intelligent controller panel. The factory display value of the controller is 100%, indicating that the contact is not worn. When the display value drops to 60%, an alarm signal will be sent to remind the user to take timely maintenance measures. After the contact is replaced, the initial wear value can be restored by setting.

Self diagnosis

When the micro part of the intelligent controller breaks down or the ambient temperature around the microprocessor exceeds 80°C and 5°C, it will send out an alarm signal immediately.

MCR and HSISC protection

- MCR function: when the circuit breaker is closing or the controller is energized and initialized, it can immediately turn to instantaneous opening in case of short-circuit short-time delay fault.
- HSISC function: when the circuit breaker is in normal operation, when the short-circuit current exceeds a certain limit value, the controller sends a signal to break the circuit breaker, which is not affected by the setting value of short-circuit instantaneous protection.

On off and over limit trip protection		
On / off	Motor threshold	15kA~ 100kA □ step1kA □
	Default setting value	50kA □ $I_n \leq 2000A$ □ 60kA □ I_n □ 2000A □
Overrun trip	Motor threshold	15kA~ 100kA □ step1kA □
	Default setting value	65kA □ UNDW1-2000 □ □ 80kA □ UNDW1-3200/4000 □ □ 100kA □ UNDW1-6300 □

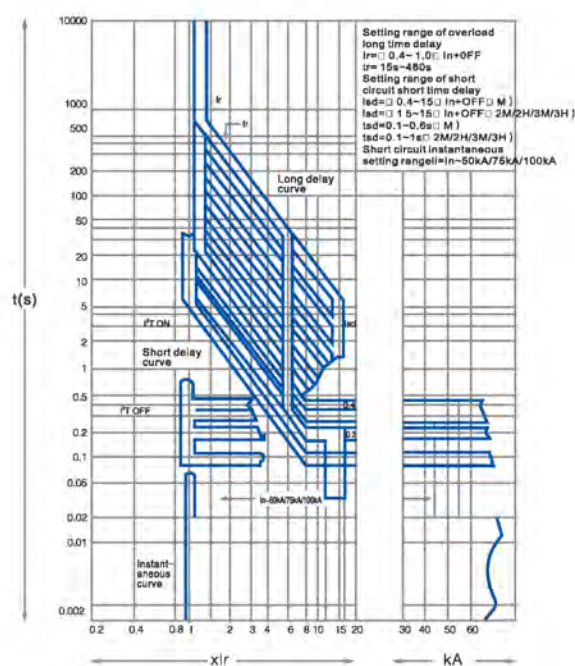
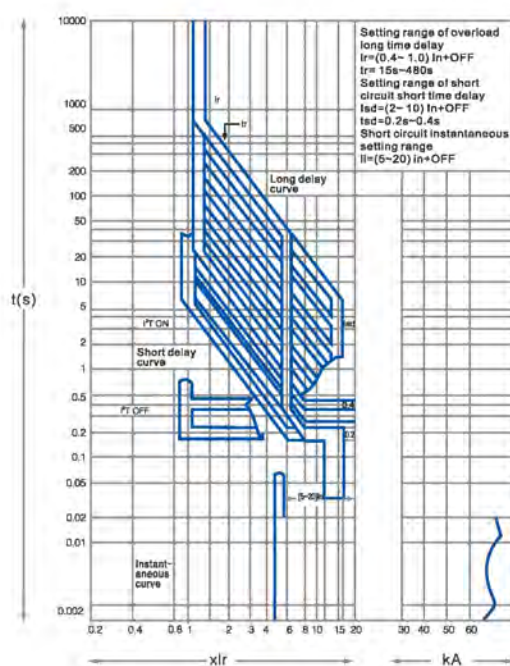
Fault memory function

- After the circuit breaker breaks down in case of fault, the intelligent controller can display the fault category, fault phase, fault current value and breaking action time value.

Signal contact output

The controller has the adjustable function of signal contact output, and the specific signal output can be contacted with our company.

On off and over limit trip protection				
	Contact 1	Contact 2	Contact 3	Contact 4
UNDW1-3M	Load monitoring 1	Load monitoring 2	Self diagnosis fault alarm	Fault trip
UNDW1- 2H/3H	Load monitoring 1	Load monitoring 2	Remote opening	Remote control switch on



UNION ELECTRICS

Intelligent Air Circuit Breaker

Overload long time delay protection

Setting current I_r adjustment range		M/2H/3M/3H	(0.4~1.0) × I_n +OFF(Adjust according to 1A step by step)					
Action time tolerance ± 5%	Electric current	Action time						
	≤1.05 I_r	No action for 2 hours						
	≥1.3 I_r	Within 1 hour						
	1.5 I_r	Setting time t_r (s)	15	30	60	120	240	480
	2.0 I_r	Action time t_r (s)	8.4	16.9	33.8	67.5	135	270
	7.2 I_r	Action time t_r (s)	0.65	1.3	2.6	5.2	10	21
Thermal memory function		30min + OFF (power OFF can be eliminated)						
Overload and over current characteristics of N phase		100% I_n or 50% I_n (for 3P + N or 4P products)						

Short circuit short time delay protection

Setting current I_{sd} adjustment range		M	$(0.4 \sim 15) \times I_n + \text{OFF}$ (adjusted by 1A step by step)					
		2H/3M/3H	$(1.5 \sim 15) \times I_n + \text{OFF}$ (adjusted by 1A step by step)					
Current tolerance $\pm 10\%$	M	Electric current	Action time					
		$I \geq I_{sd}, I \leq 8I_r$	Inverse time limit $T = (8I_r)^2 \times t_{sd} / I^2$ I – Actual current					
		$I \geq I_{sd} \square I > 8I_r \square \text{or} I \geq I_{sd} \square I \leq 8I_r$ inverse time OFF	Time limit setting time t_{sd} (s)	0.1	0.2	0.3	0.4	0.5
			Returnable time (s)	0.06	0.16	0.26	0.35	0.44
Action time tolerance $\pm 15\%$	2H/3M	Definite time delay	Time limit setting time t_{sd} (s)	0.1~1s (stage difference 0.1s) + OFF (time limit closed, inverse time open)				
	/3H	Inverse time characteristic	Curve rate	The curve is the same as the overload long delay curve, and the curve speed is 10 times faster than the overload long delay curve				
Thermal memory function				15min + OFF (power off can be eliminated)				

Short circuit instantaneous protection

Adjustment range of setting current I_i	M/2H/3M/3H	$I_n \sim 50\text{kA} + \text{OFF}$ (CSDW1-2000) $I_n \sim 75\text{kA} + \text{OFF}$ (CSDW1-3200) $I_n \sim 75\text{kA} + \text{OFF}$ (CSDW1-4000) $I_n \sim 100\text{kA} + \text{OFF}$ (CSDW1-6300)
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Earth fault protection

Setting current I_g adjustment range (A)		M/2H/3M/3H	$(0.2 \sim 1.0) \times I_n + \text{OFF}$ (Adjust according to 1A step by step)	
Current tolerance $\pm 10\%$ Action time tolerance $\pm 15\%$	M	Time limit	Setting time T_g (s)	0.1 ~ 1s (0.1-1s level difference 0.1s)
	3M/2H/3H	Time limit	Setting time T_g (s)	0.1 ~ 1s (0.1-1s level difference 0.1s)

Load monitoring

Mode 1	Setting current I_{c1} , I_{c2} adjustment range (A)	$(0.2 \sim 1.0) \times I_n + \text{OFF}$	
	Delay characteristics t_{c1} , t_{c2} (s)	$t_{c1} = (0.2 \sim 0.8) \times t_r$, $t_{c2} = (0.2 \sim 0.8) \times t_r$	
Mode 2	Setting current I_{c1} , I_{c2} adjustment range (A)	$(0.2 \sim 1.0) I_n + \text{OFF}$	
	Delay characteristics t_{c1} , t_{c2} (s)	$t_{c1} = (0.2 \sim 0.8) \times t_r$	
		Time limit $t_{c2} = 60s$	

Voltage unbalance protection

Motor threshold	2% - 30% (difference 1%)	
Action delay time (s)	0.2 ~ 60 (difference 1%)	
Return threshold value (when the working mode is "alarm")	2% - 30% (difference 1%) is not greater than the action threshold	
Return delay time (s) (when the working mode is "alarm")	0.2 ~ 60 (difference 1%)	
Alarm contact output	Optional	
Action characteristics	Actual voltage unbalance / set point	Agreed tripping time
	< 0.9	No action
	≥ 1.1	Timing action

Note: delay tolerance + 10%

Under voltage protection

Action threshold (V)	100 return threshold (step 1)	
Action delay time (s)	2 ~ 60 (in steps of 0.1)	
Return threshold (V)	Action threshold ~ 1200 (step 1)	
Return delay time (s)	0.2 ~ 60 (step 0.1)	
Action or alarm characteristics	Voltage multiple (U_{max} / action threshold)	Agreed tripping or alarm time
	< 0.9	Time limit action or alarm, contact (optional) output
	≥ 1.1	No action or alarm, no contact output

Note: the delay tolerance is more than 10%

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Intelligent Air Circuit Breaker

Current unbalance protection

Overall range of unbalance rate δ modulation	40%~ 100%+OFF
Action characteristic or alarm characteristic	0.9 δ , no action 1.1 δ , delay action
Delay time (s)	0.1 ~ 1.0s + off (OFF alarm only, no action,difference 0.1s)

Over voltage protection

Action threshold (V)	1200 return threshold (step 1)	
Action delay time (s)	0.2 ~ 60 (in steps of 0.1)	
Return threshold (V)	Action threshold ~ 100 (step 1)	
Return delay time (s)	0.2 ~ 60 (step 0.1)	
Action or alarm characteristics	Voltage multiple (U_{max} / action threshold)	Agreed tripping or alarm time
	< 0.9	Time limit action or alarm, contact (optional) output
	≥ 1.1	No action or alarm, no contact output

Note: the delay tolerance is more than 10%

Leakage protection

Action current $I\Delta n$ (A)	0.5 ~ 30 (difference 0.1A)	
Delay Time $T\Delta n$ (s)	0~0.83	
Action characteristics	Current multiple $I/I\Delta n$	Agreed release time
	< 0.8	No action
	≥ 1.0	Time limit action

Note: delay tolerance $\pm 10\%$

Action delay of leakage protection

Setting time (s)	0.06	0.08	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.83	Instantaneous
Fault current	Maximum breaking time (s)											
$I\Delta n$	0.36	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	
$2I\Delta n$	0.18	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	
$5I\Delta n$	0.072	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	0.04
$10I\Delta n$												

Users have no special requirements, the intelligent controller is set as follows

Overload long time delay protection	I_r	$1I_n$
	t_r	60s
Short circuit short time delay protection	I_{sd}	$6I_n$
	t_{sd}	0.4s
Short circuit instantaneous protection	I_i	$10I_n$
Earth fault protection	I_g	0.8 I_n or 1200A (take the minimum)
Load monitoring	I_{c1}	$1I_n$
	I_{c2}	$1I_n$

Single phase earth leakage protection refers to metal grounding protection with fault current over several hundred amperes, which is generally used in neutral point direct grounding system. The controller is divided into two different protection modes, one of which is differential type (T). The controller can be divided into 3pt, 4PT and 3P + n according to the vector sum of three-phase current and neutral pole phase current. See Fig. 3, FIG. 4 and Fig. 5 respectively. The other is ground current type (W). The controller directly takes the output current signal of an additional current transformer between the neutral point of the main power supply and the ground for protection, and a neutral pole transformer or current transformer is added between the N line of the transformer and the PE level.

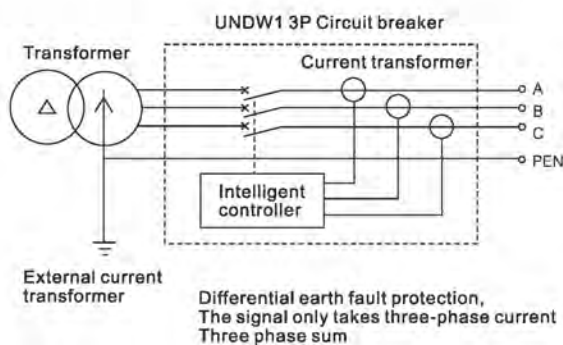


Figure 3. 3PT grounding difference type

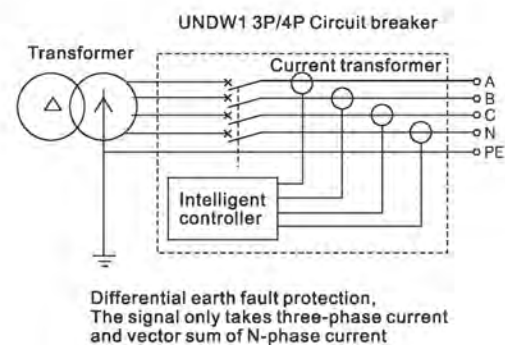


Figure 4. 4PT grounding difference type

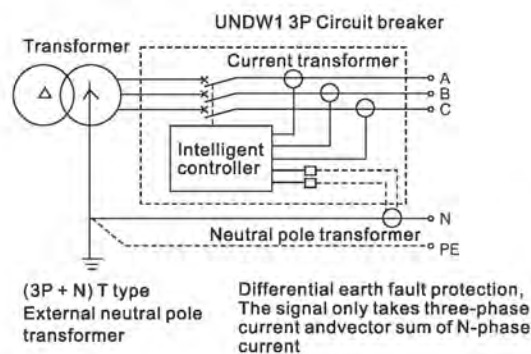


Figure 5 (3P + N) T grounding difference type

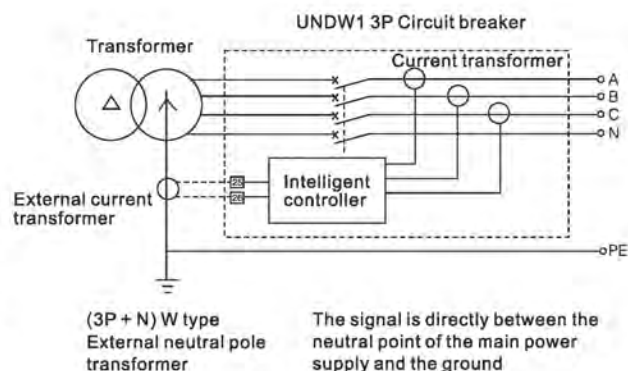


Figure 6 grounding current type

Leakage protection mainly takes signals through zero sequence transformer, with high flexibility, which is suitable for grounding protection of several ampere high resistance grounding systems and also for direct grounding systems. Generally, it only gives an alarm without tripping, and the circuit breaker can be disconnected when necessary. The connection mode is shown in Fig. 7 and Fig. 8. In addition, there are two kinds of load circuit (ZCT) or transformer grounding wire (ZT).

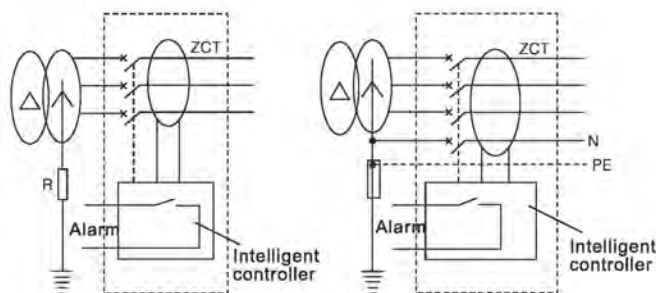


Figure 7 leakage load circuit type

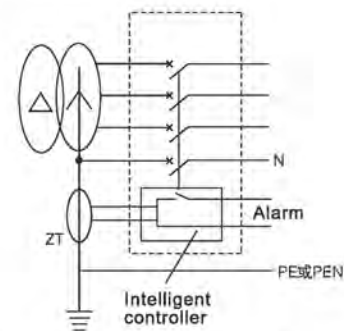


Figure 8 grounding type of leakage transformer

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Intelligent Air Circuit Breaker

Power consumption (ambient temperature + 40°C)

The power consumption is the total loss measured when the circuit breaker passes through the rated current of the shell rating I_{nm} .

Model	Power consumption (W)	
	Fixed type	Drawer type
DW1-2000	240	360
DW1-3200	600	800
DW1-4000	420	560
DW1-6300	940	1220

Lineup coefficient

The following table shows the continuous current carrying capacity of the circuit breaker under the heating conditions specified in GB / t14048.2 at ambient temperature.

Ambient temperature		+40°C	+45°C	+50°C	+55°C	+60°C
Continuous current carrying capacity	$I_{nm}=2000A$	1 I_{nm}	0.97 I_{nm}	0.91 I_{nm}	0.87 I_{nm}	0.82 I_{nm}
	$I_{nm}=3200A$	1 I_{nm}	0.96 I_{nm}	0.90 I_{nm}	0.86 I_{nm}	0.80 I_{nm}
	$I_{nm}=4000A$	1 I_{nm}	0.95 I_{nm}	0.89 I_{nm}	0.85 I_{nm}	0.78 I_{nm}
	$I_{nm}=6300A$	1 I_{nm}	0.93 I_{nm}	0.87 I_{nm}	0.82 I_{nm}	0.75 I_{nm}

If the altitude exceeds 2000m of the applicable working environment, the power frequency withstand voltage can be corrected according to the following table:

Altitude (m)	2000	3000	4000	5000
Power frequency withstand voltage (V)	3500	3150	2500	2000
Working current correction factor	1	0.93	0.88	0.82
Correction coefficient of short circuit breaking capacity	1	0.83	0.71	0.63

Copper bar specification

Shell rating current $I_{nm}(A)$	Rated current $I_n(A)$	Copper bar specification	
		Number	Size(mm × mm)
2000	630	2	40 × 5
	800	2	50 × 5
	1000	2	60 × 5
	1250	3	80 × 5
	1600	2	100 × 5
	2000	3	100 × 5
3200 4000	2000	3	100 × 5
	2500	4	100 × 5
	2900	3	100 × 10
	3200	3	100 × 10
	3600	4	100 × 10
	4000	4	100 × 10
6300	4000	4	100 × 10
	5000	6	100 × 10
	6300	8	100 × 10

The specifications in the table are the copper bar specifications adopted when the circuit breaker is in the ambient temperature up to 40 °C and open installation and meets the heating conditions specified in GB / T14048.2.

Electrical accessories



Under-voltage Release

Note: in Thunderstorm prone areas or power grid with unstable power supply voltage, it is recommended to use the release with time delay to prevent the circuit breaker from tripping due to short-term voltage drop. The delay time is generally 0.3s, 0.5s, 0.7s, 1s, 3s, 5s, which can be selected by users.

Rated working voltage U_e (V)	AC400	AC230
Action voltage of under voltage release (V)	$(0.35 \sim 0.7)U_e$	
Action voltage of voltage loss release (V)	$\leq 0.35U_e$	
Undervoltage reliable closing voltage (V)	$(0.85 \sim 1.1)U_e$	
Reliable undervoltage, unable to switch on electric energy (V)	$\leq 0.35U_e$	
Power waste	12VA	



Shunt release

The circuit breaker can be opened by remote control

Rated control supply voltage U_e (V)	AC400	AC230	DC220
Action voltage	$(0.85 \sim 1.1)U_e$		
Instantaneous current (A)	1.2	1	
Closing time (ms)	$50\text{ms} \pm 10\text{ms}$		



Closing electromagnet

After the end of energy storage, the closing electromagnet can release the energy stored in the operating mechanism instantaneously and make the circuit breaker close quickly.

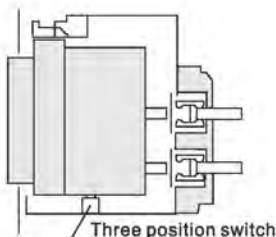
Rated control supply voltage U_e (V)	AC400	AC230	DC220
Action voltage	$(0.85 \sim 1.1)U_e$		
Instantaneous current (A)	1.2	1	
Closing time (ms)	$50\text{ms} \pm 10\text{ms}$		



Auxiliary Contact

Rated operating voltage U_e (V)	Agreed heating current I_{th} (A)	Rated control capacity
AC400	6	300VA
AC230		
DC220		60W

The standard type of auxiliary switch is 4 normally open and 4 normally closed transfer contacts

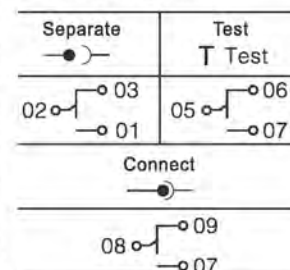


Three position switch

The three position switch is mainly used for three position indication of drawer type circuit breaker, including separation, test and connection; the separation position is equipped with one normally open and one normally closed contact; the test position is equipped with one normally open and one normally closed contact; the connection position is equipped with one normally open and one normally closed contact.

Rated voltage U_e	Rated heating current I_{th} (A)	
AC 50Hz	AC250V	3
	AC380V	1
DC	DC220V	0.3
Use category	AC-15、AC-12	
	DC-12	

Wiring diagram



UNION ELECTRICS

Intelligent Air Circuit Breaker



◆ Motor Mechanism

The circuit breaker has the function of motor energy storage and automatic re storage (the circuit breaker can also store energy manually)

Frame	2000	3200/4000	6300
Action voltage (V)	230/400		
Power	85W	110W	150W
Energy storage time (s)	< 7s		



◆ Power module

Input power supply: AC230V / AC400V / DC1 10V / dc220v (optional); when using grounding protection, communication, thermal memory functions or requiring the circuit breaker to maintain input and output signals in the opening state, auxiliary power supply must be provided.

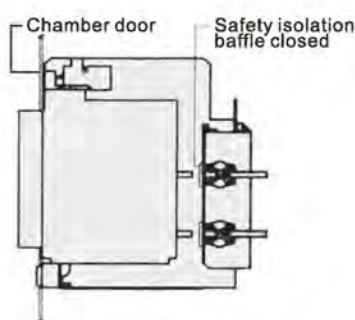
When DC intelligent controller is selected, DC power must be converted to DC24 V through DC power module, and then provided to intelligent controller.

Electrical indicating device of drawer seat position

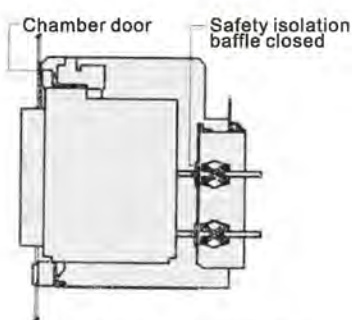
When the drawer type circuit breaker body and drawer base are in three positions of "separation", "test" and "connection", the electrical indication device of the three positions can output the electrical status signals corresponding to the three positions respectively, and the device is installed in the drawer.

Rated working voltage U_e (V)	230
Conventional heating current i_{the} (A)	10
Rated working current I_e (A)	1.5

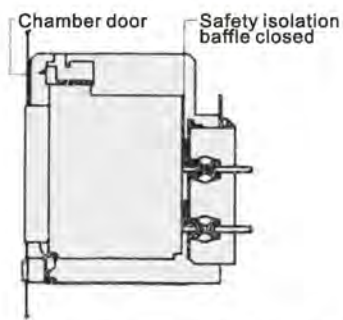
"Separation" position state "test" position state "connection" position state



The main circuit and auxiliary circuit are all disconnected
Safety baffle closed

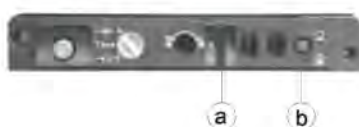


The main circuit is disconnected and the auxiliary circuit is connected
The safety baffle is closed and necessary tests can be carried out



Both the main circuit and the auxiliary circuit are connected
Safety baffle open

Connection, test and separation device of circuit breaker drawer seat



- ◆ a. Padlock device (padlock provided by users)
User drawer type locking "separation" or "test" or "connection" position;
- ◆ b. Interlocking and unlocking devices for separation, test and connection positions of circuit breaker are used for automatic searching and locking of forward and backward hand cranking handle; separation "and" test "Connection" position, to avoid the failure caused by the operator's manual handle operation is not in place.
The locking position is released
- ◆ After the position red interlock is popped up, if you want to operate the handle again, you must first press the synonym of red interlocking device to operate the handle.

◆ Interphase Barrier

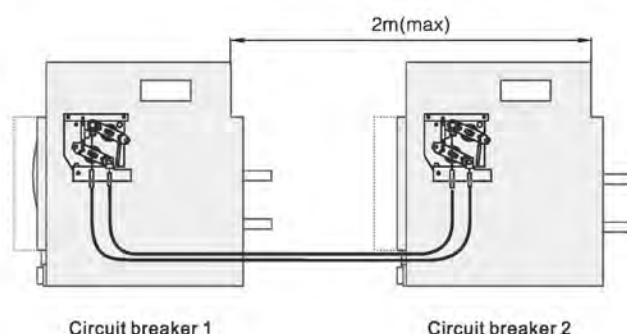
It is vertically installed between the terminal blocks of the Fixed type part of the drawer type circuit breaker to strengthen the insulation strength of the bus bar connection and prevent the arc from extending to the inside of the circuit breaker.

◆ Three locks and two keys

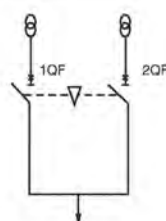
Three lock two key mechanical interlock is designed for three circuit breakers which are not adjacent. When two circuit breakers need to be closed, first insert the key into the lock hole of the two circuit breakers, and press the opening button to turn clockwise. At this time, the circuit breaker can be closed, but the key cannot be taken out. If you take out the key, you need to open the circuit breaker, press and hold the switch off button, and the key will turn anticlockwise and take it out. At this time, the circuit breaker will not be able to close.

◆ Mechanical interlock

Cable interlock of two horizontal circuit breakers or linkage interlocking of two stacked circuit breakers



Circuit diagram Possible operation mode



1QF	2QF
0	0
0	1
1	0

UNION ELECTRICS

Intelligent Air Circuit Breaker

Automatic Transfer Switch system

◆ Main performance characteristics

1. All parameters and programmable ports are digitally adjusted, which can realize on-site and monitoring center setting. Important parameters adopt two-level password to prevent non professional personnel from misoperation;
2. Microprocessor as the core, LCD with backlight Chinese display, touch button operation;
3. It has the function of reclosing and reclosing after power failure. If the voltage of the other circuit is normal, it will switch to the other circuit automatically;
4. It is equipped with automatic / manual state switching, which can be forced to switch on and off in manual mode;
5. The closing output can be set as pulse or continuous output;
6. The field can be set as on load / no load mode for generator set commissioning operation;
7. It has the function of regularly starting and stopping the generator set, which can set single operation, once a month or once a week, and can set whether to run with load or not. It can control the cycle operation of two generating sets, and the operation time and interval shutdown time of the generator set can be set;
8. Eight LED indicating lights can clearly show the working state of switch and controller;
9. The range of DC power supply is very wide, and it can bear up to 50V instantaneously;
10. With switch switching delay (i.e. intermediate dwell time), the delay time can be set;
11. Can query the current controller status (including input port, overvoltage, undervoltage and other internal switch values);
12. With RS-485 isolated communication interface, baud rate and communication address can be set. The function of "remote control, telemetry and remote signaling" of dual power supply switching can be realized by using Modbus communication protocol;
13. It has real-time calendar and clock;
14. It has alarm function of switching fault, generator set fault and other general faults;
15. 40 historical records can be saved circularly, including the time of saving records, automatic / manual conversion, fault reason, switch state during conversion, power parameters, etc;
16. With oil engine start function, and can set the starting conditions of oil engine;
17. The input value can be connected with the auxiliary contact of the two-way transfer switch, and the output value is the passive contact of the relay output;
18. It has 5-channel configurable output and 4-channel configurable input;
19. With remote control locking function, the output control port remains unchanged in the original state under the locking state;
20. Protection grade: IP55 with waterproof rubber ring, ip42 without waterproof rubber ring.



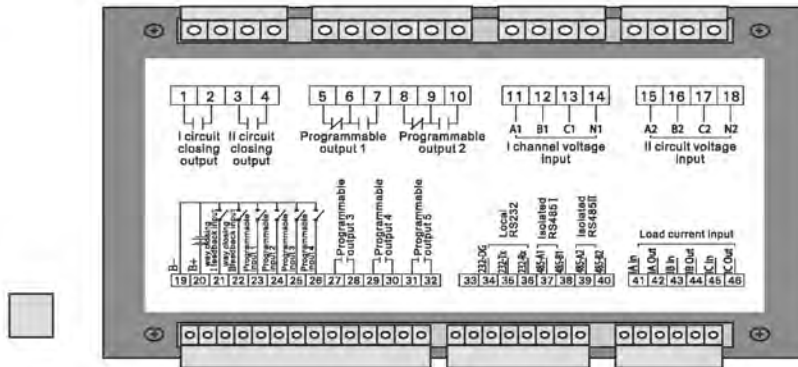
◆ Technical parameter

1. Power supply: DC input: 8 ~ 35V (connected when oil engine start signal is required); AC input: from I, II circuit A / N phase voltage, as long as one of them has power, it can work, the voltage range is 160 ~ 280v;
2. Input three-phase voltage: 50 ~ 280v (single-phase) / 80 ~ 480v (three-phase) 50 Hz / 60Hz; input three-phase current: 0 ~ 5A (rated);
3. Overall power consumption < 3V (standby mode 2Va)
4. Output capacity of closing and opening relay: 16A AC250V passive output;
5. Output capacity of programmable relay: 16A/10AAC250V passive output;
6. Digital input port: effective grounding;
7. Communication mode: standard configuration -- local RS232, - remote isolation rs485-I, MODBUS protocol. Users can select the second remote isolation rs485-II, and the function can be customized;
8. Working conditions: temperature -25°C ~ + 70°C, humidity 20% ~ 90%;
9. Insulation strength: ac1.5kv/1min is added between input and output / power supply, and leakage current is 5mA;
10. Weight: 0.8 ~ 1.0kg.

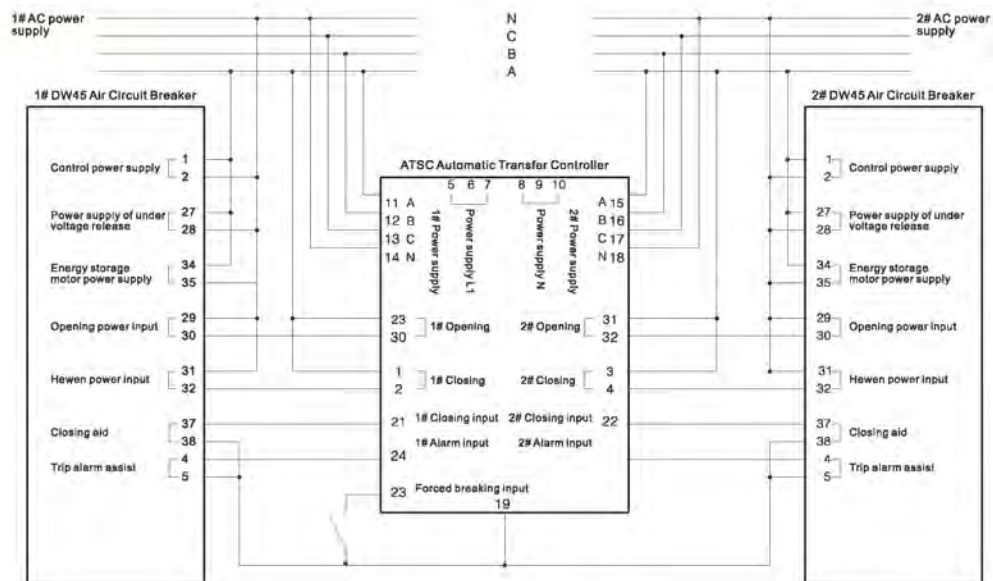
◆ Communication parameters

1. Remote isolation rs485-I module address: 1-254, user can set the wave rate: 9600 (1200, 2400, 4800, 9600) 19200 □ 57600bps □
Data bits: 8 bits
Stop bit: 1 bit (1 bit, 2 bit)
Check bit: no check (no check, even check, odd check)
2. Remote isolation RS485 II local isolation RS485 can be selected by users or customized to manufacturers

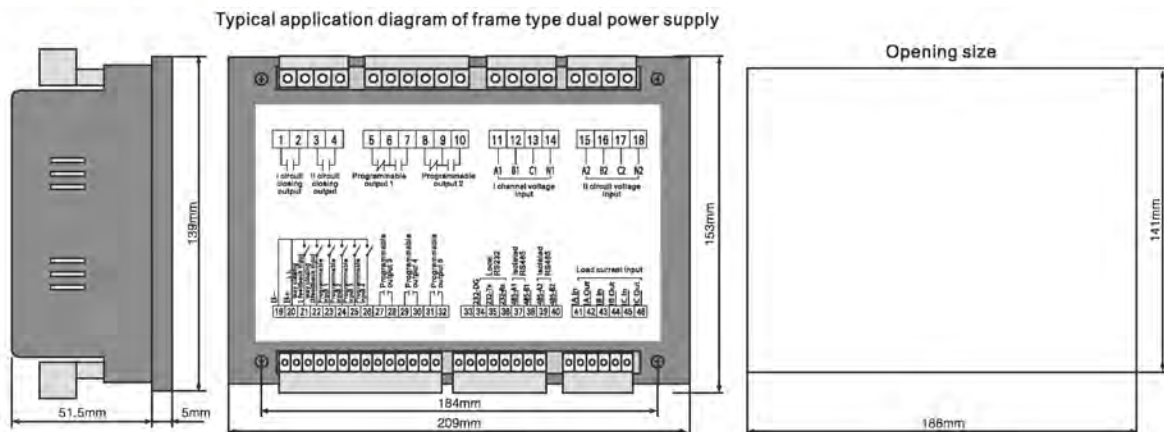
◆ Terminal function definition



◆ Typical Connection Diagram



◆ Overall Dimension

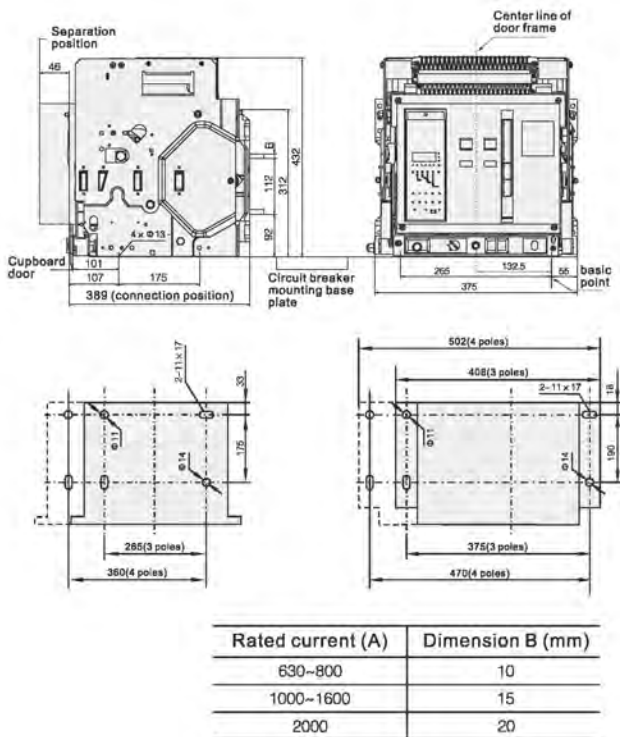


UNION ELECTRICS

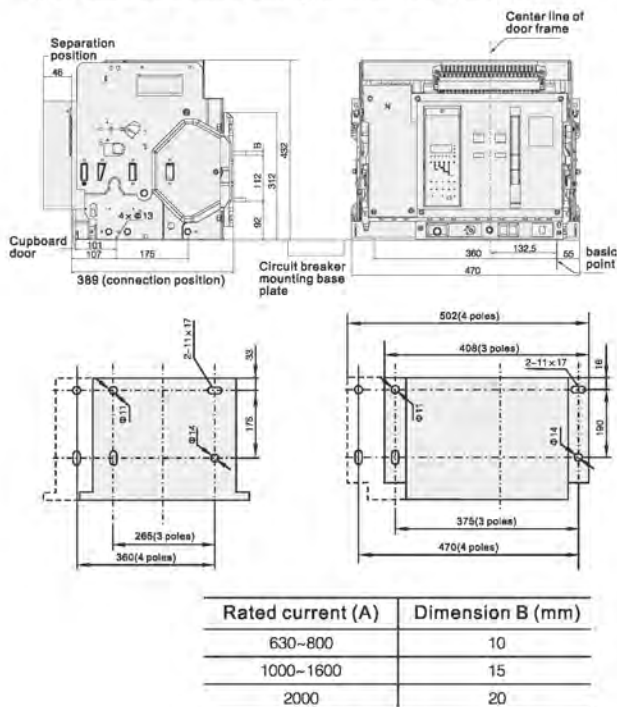
Intelligent Air Circuit Breaker

UNDW1-2000 Overall Dimension

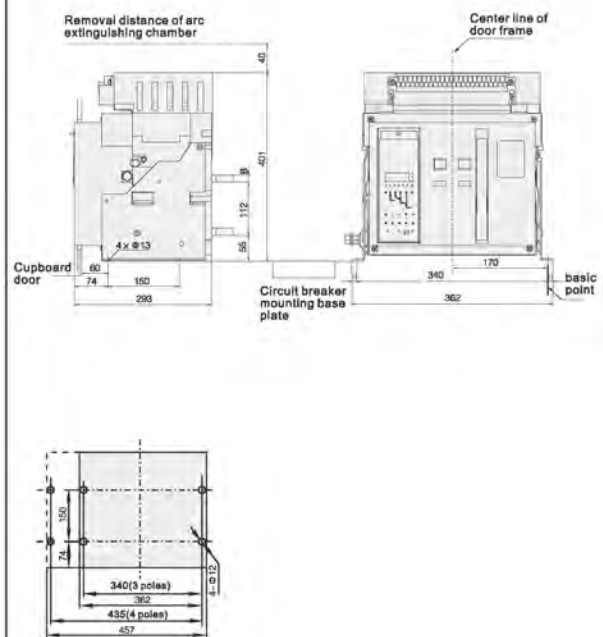
◆UNDW1-2000 Draw-out type circuit breaker (3 poles)



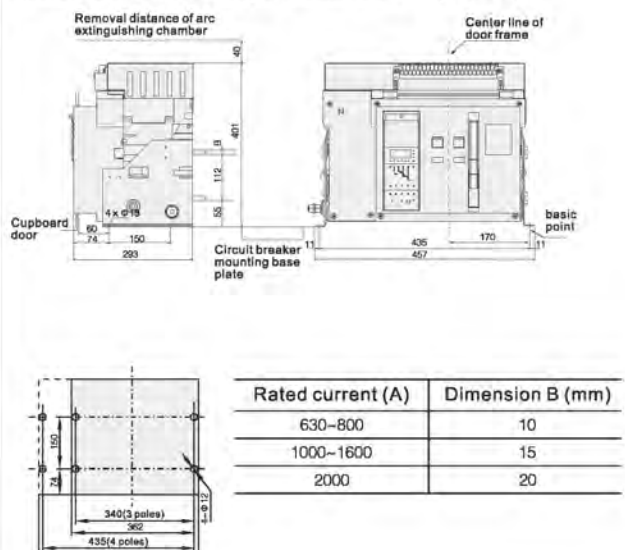
◆UNDW1-2000 Draw-out type circuit breaker (4 poles)



◆UNDW1-2000 Fixed type circuit breaker (3 poles)

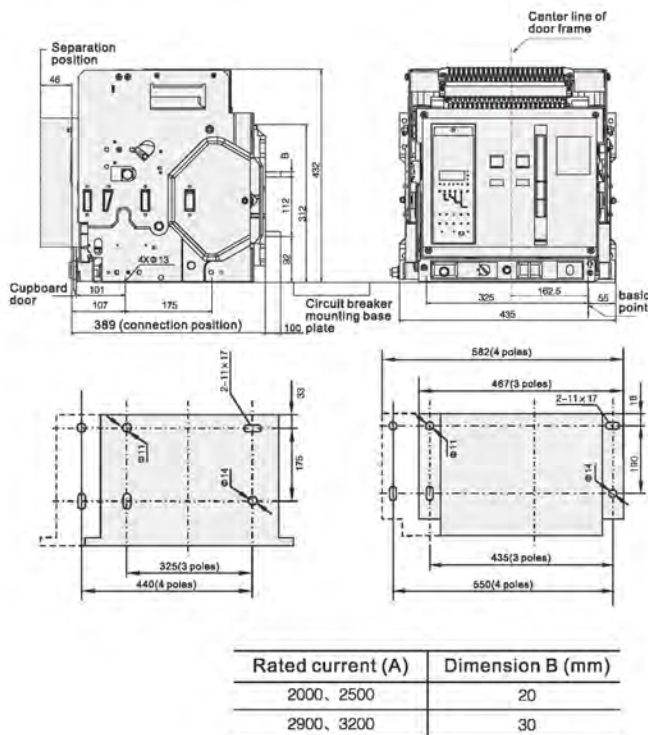


◆UNDW1-2000 Fixed type circuit breaker (4 poles)

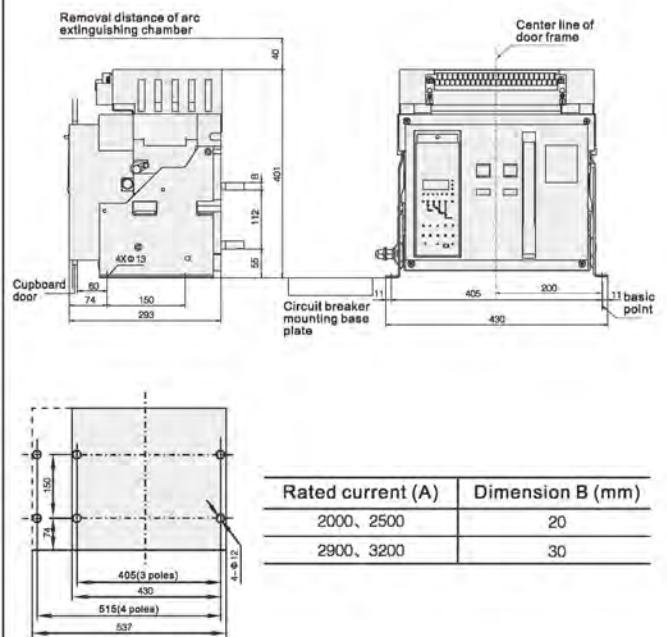


UNDW1-3200 Overall Dimension

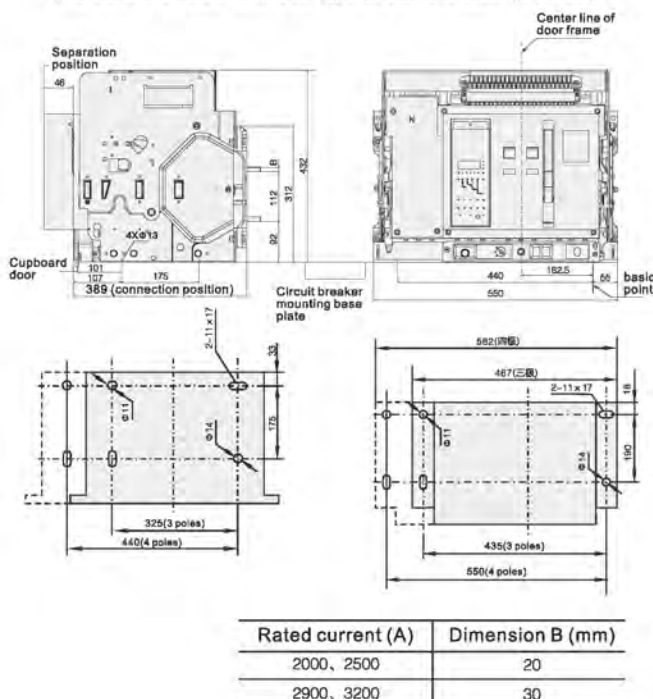
◆UNDW1-3200 Draw-out type circuit breaker (3 poles)



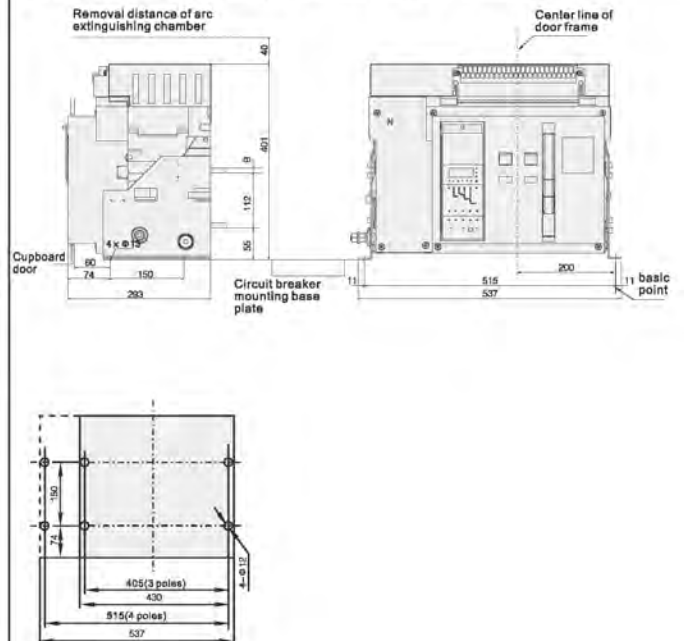
◆UNDW1-3200 Fixed type circuit breaker (3 poles)



◆UNDW1-3200 Draw-out type circuit breaker (4 poles)



◆UNDW1-3200 Fixed type circuit breaker (4 poles)

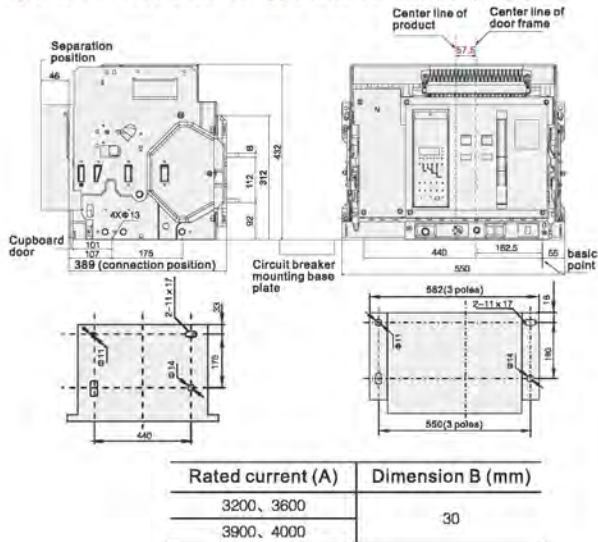


UNION ELECTRICS

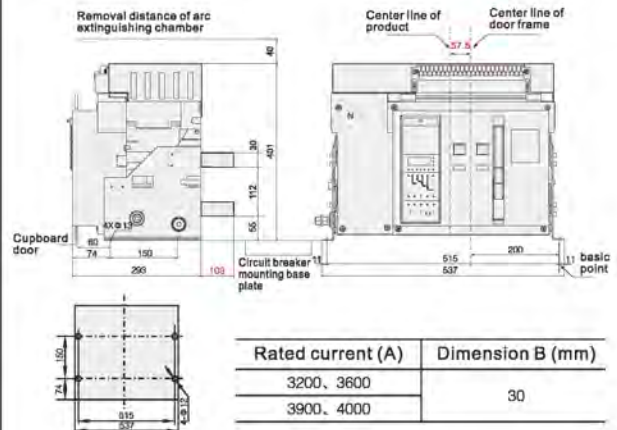
Intelligent Air Circuit Breaker

UNDW1-4000、6300 Overall Dimension

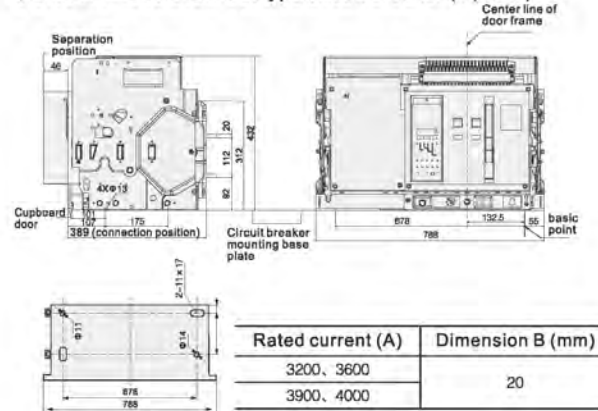
◆ UNDW1-4000 Draw-out type circuit breaker (3 poles)



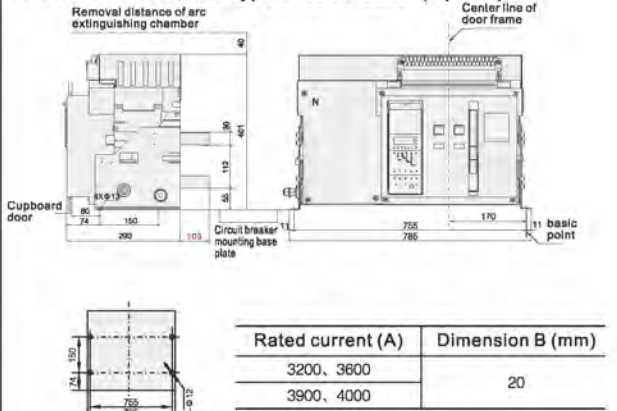
◆ UNDW1-4000 Fixed type circuit breaker (3 poles)



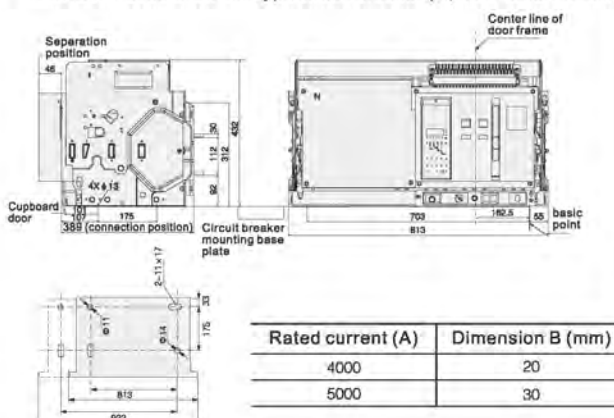
◆ UNDW1-4000 Draw-out type circuit breaker (4 poles)



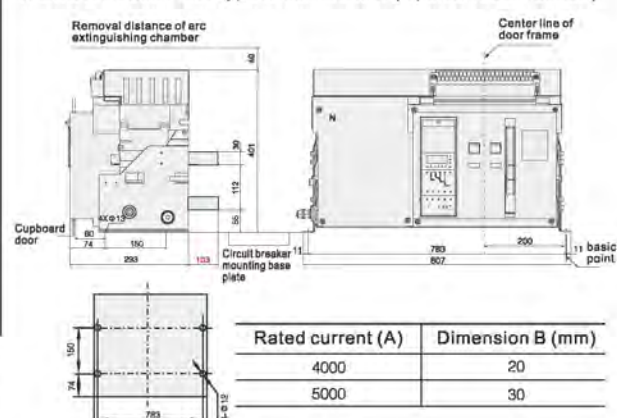
◆ UNDW1-4000 Fixed type circuit breaker (4 poles)



◆ UNDW1-6300 Draw-out type circuit breaker (3 poles 4000A 5000A)

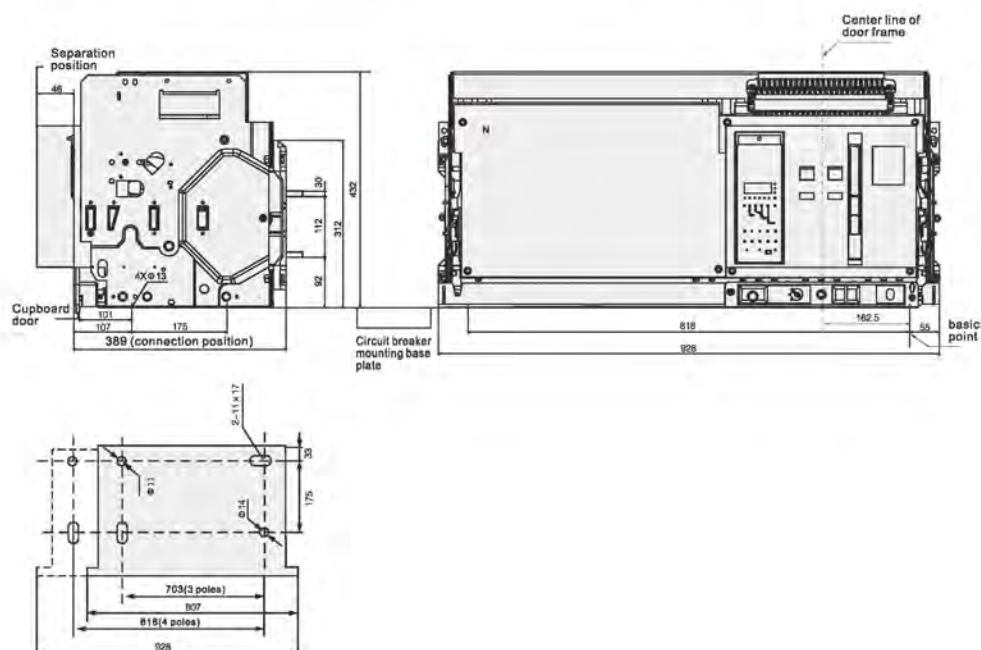


◆ UNDW1-6300 Fixed type circuit breaker (3 poles 4000A 5000A)

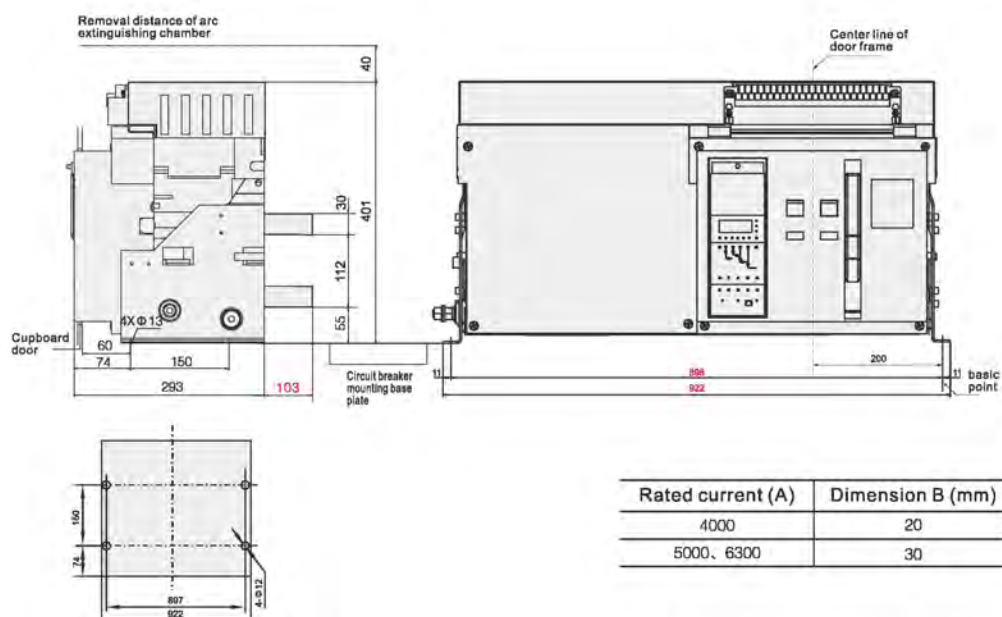


UNDW1-4000、6300 Overall Dimension

◆UNDW1-6300 Draw-out type circuit breaker 3 poles 6300A (4 poles 4000A 5000A 6300A)



◆UNDW1-6300 Fixed type circuit breaker 3 poles 6300A (4 poles 4000A 5000A 6300A)

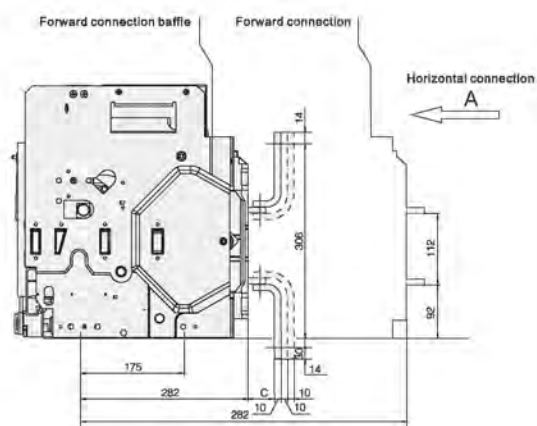


UNION ELECTRICS

Intelligent Air Circuit Breaker

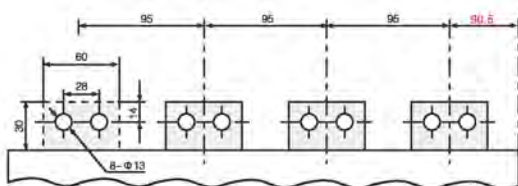
UNDW1-2000 Wiring Diagram

◆UNDW1-2000 Draw-out type

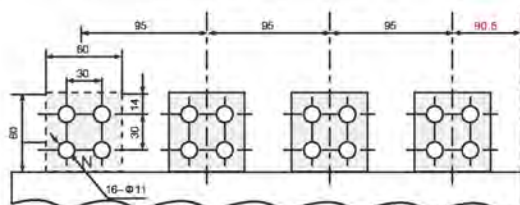


Rated current (A)	Forward connection C (mm)	
	Standard type	Elongated type
630~800	45	75
1000~1600	55	85
2000	65	95

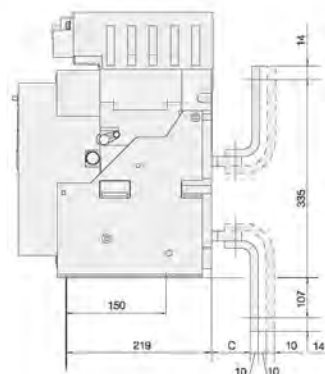
◆Standard horizontal connection



◆Extended horizontal connection

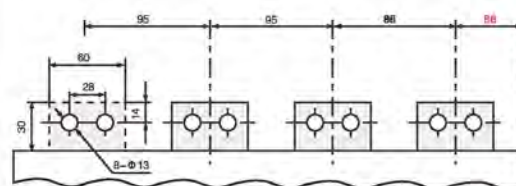


◆UNDW1-2000 Fixed type

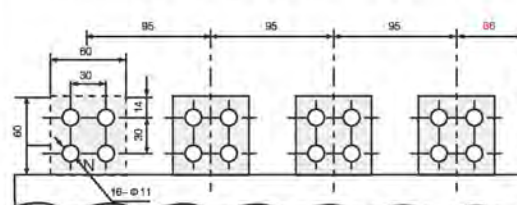


Rated current (A)	Forward connection C (mm)	
	Standard type	Elongated type
630~800	45	75
1000~1600	55	85
2000	65	95

◆Standard horizontal connection



◆Extended horizontal connection

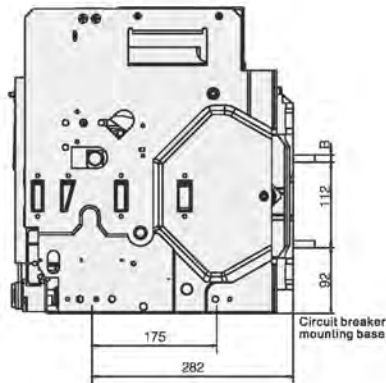


UNION ELECTRICS

Intelligent Air Circuit Breaker

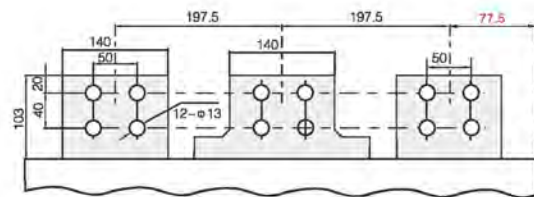
UNDW1-4000 Wiring Diagram

◆UNDW1-4000 Draw-out type

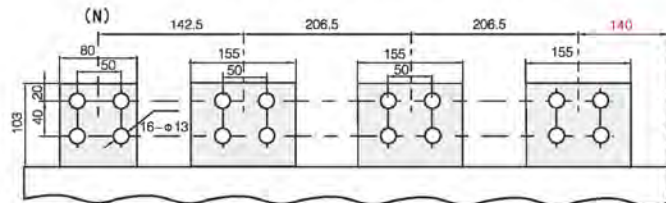


Rated current (A)	Dimension B (mm)
3200, 3600	30(3 pole)
3900, 4000	20(4 pole)

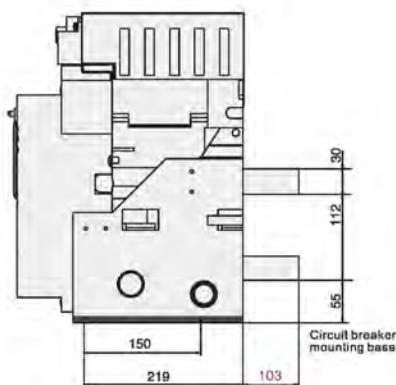
3 pole standard horizontal connection



4 pole standard horizontal connection

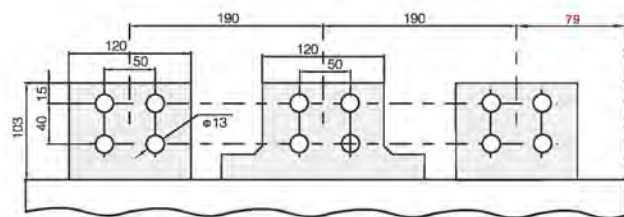


◆UNDW1-4000 Fixed type circuit breaker

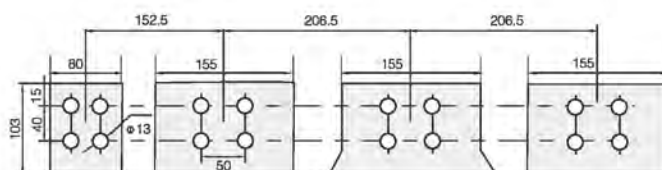


Rated current (A)	Dimension B (mm)
3200, 3600	30(3 pole)
3900, 4000	20(4 pole)

3 pole standard horizontal connection



4 pole standard horizontal connection

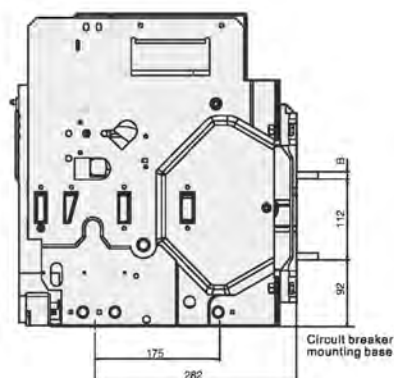


UNION ELECTRICS

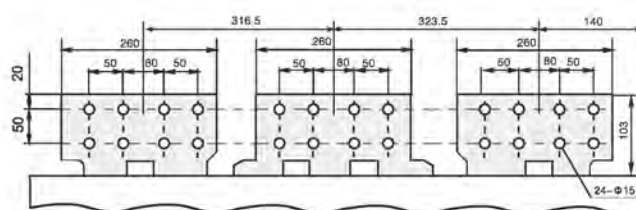
Intelligent Air Circuit Breaker

UNDW1-6300 Wiring Diagram

◆UNDW1-6300 Draw-out type(3 pole 6300A)

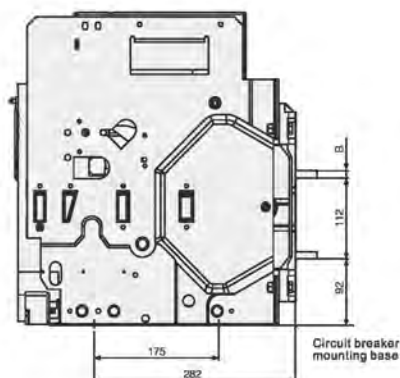


Standard horizontal wiring

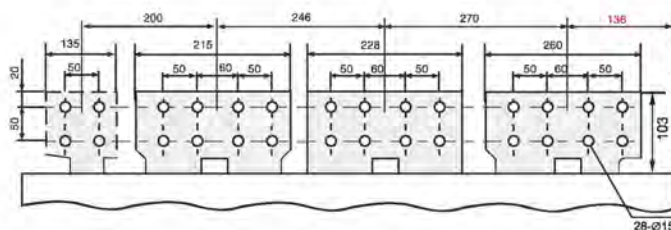


Rated current (A)	Dimension B (mm)
6300	30

◆UNDW1-6300 Draw-out type(4 pole 6300A)



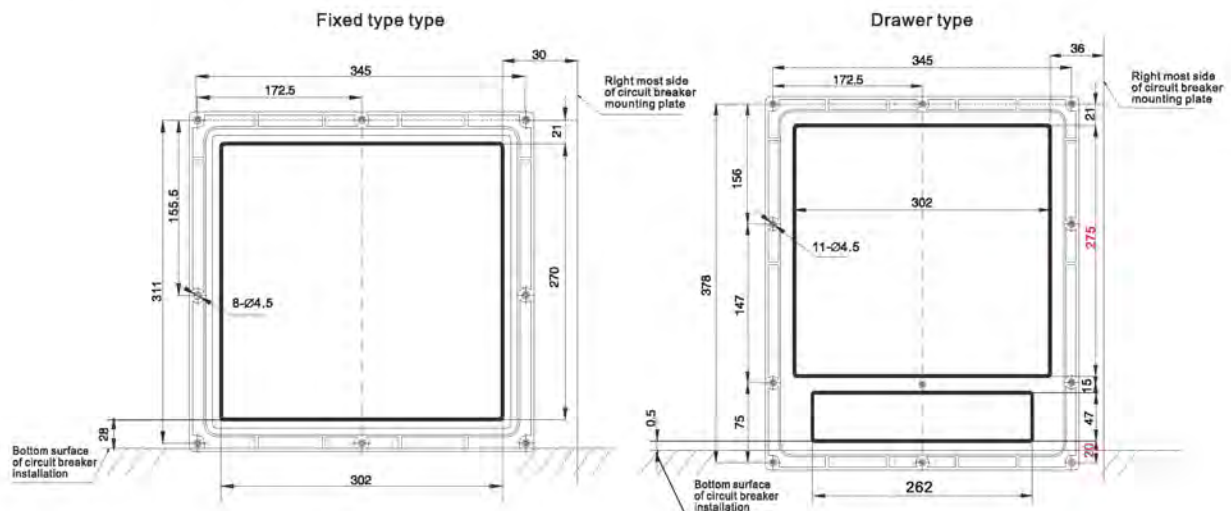
Standard horizontal wiring



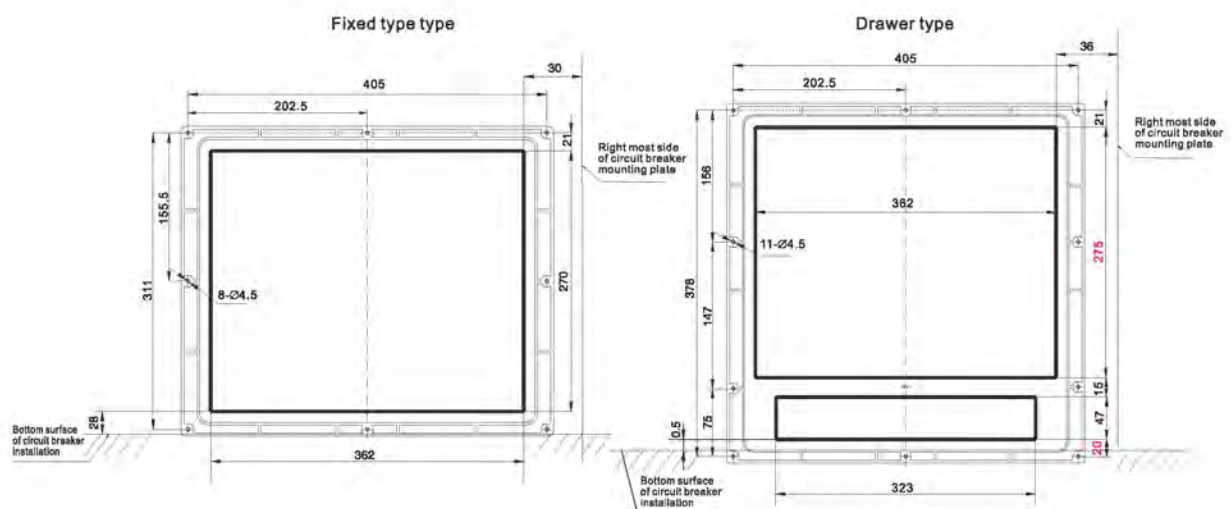
Rated current (A)	Dimension B (mm)
6300	30

Door frame size and installation hole spacing

- ◆ UNDW1 630 ~ 2000A (3 pole, 4 pole)
- UNDW1 4000A (4 pole) 4000A type



- ◆ UNDW1 3200A (3 pole, 4 pole)
- UNDW1 4000A (3 pole)
- UNDW1 4000A~6300A (3 pole, 4 pole) 6300A

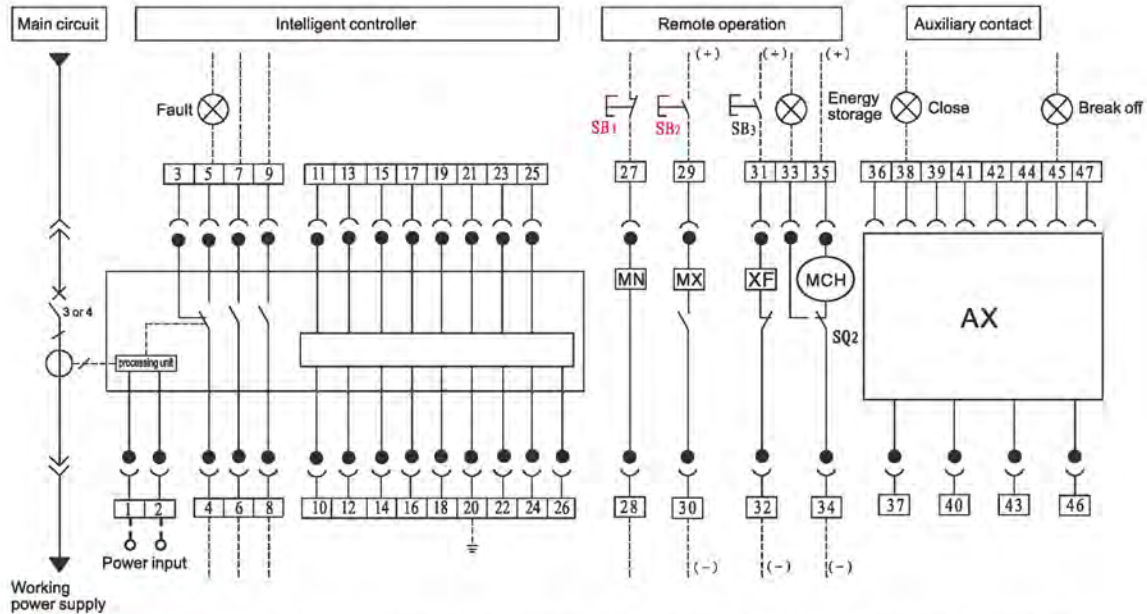


UNION ELECTRICS

Intelligent Air Circuit Breaker

Mechanical accessories

◆ UNDW1-2000 ~ 6300 electrical circuit diagram (equipped with m, L type intelligent controller)



SB1 under voltage button

SB2 shunt button

SB3 closing button

MN undervoltage, loss of voltage instantaneous or delay release

XF closed electromagnet

MX shunt release

MCH energy storage motor

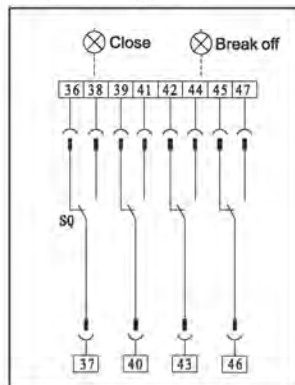
AX auxiliary contact

SQ2 motor microswitch

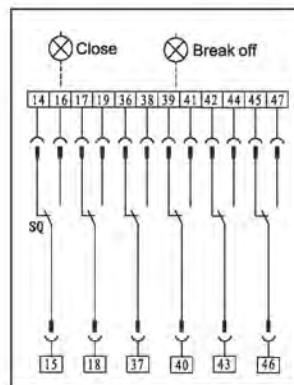
- Note: (1) If the control power supply voltage of MX, XF and MCH is different, they can be connected to different power supply respectively. XF and MX belong to short-term working elements, the power on time is (50ms ± 10ms)
- (2) Terminal 35 can be directly connected to the power supply (automatic pre energy storage), or can be connected in series with the normally open button and then connected to the power supply (manual pre stored energy).
- (3) The button and indicator light shall be provided by the user.
- (4) When the working power supply of the intelligent controller is AC power supply, no power module is needed. Terminals 1 and 2 are directly connected to the power supply;
- (5) The position indicating contact is optional for users.

◆ Auxiliary Contact

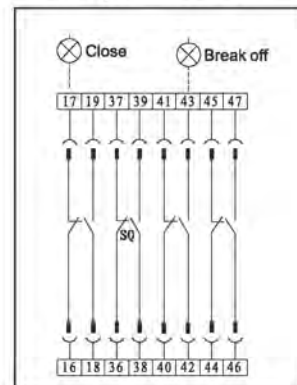
I Four sets of transfer contacts (default configuration)



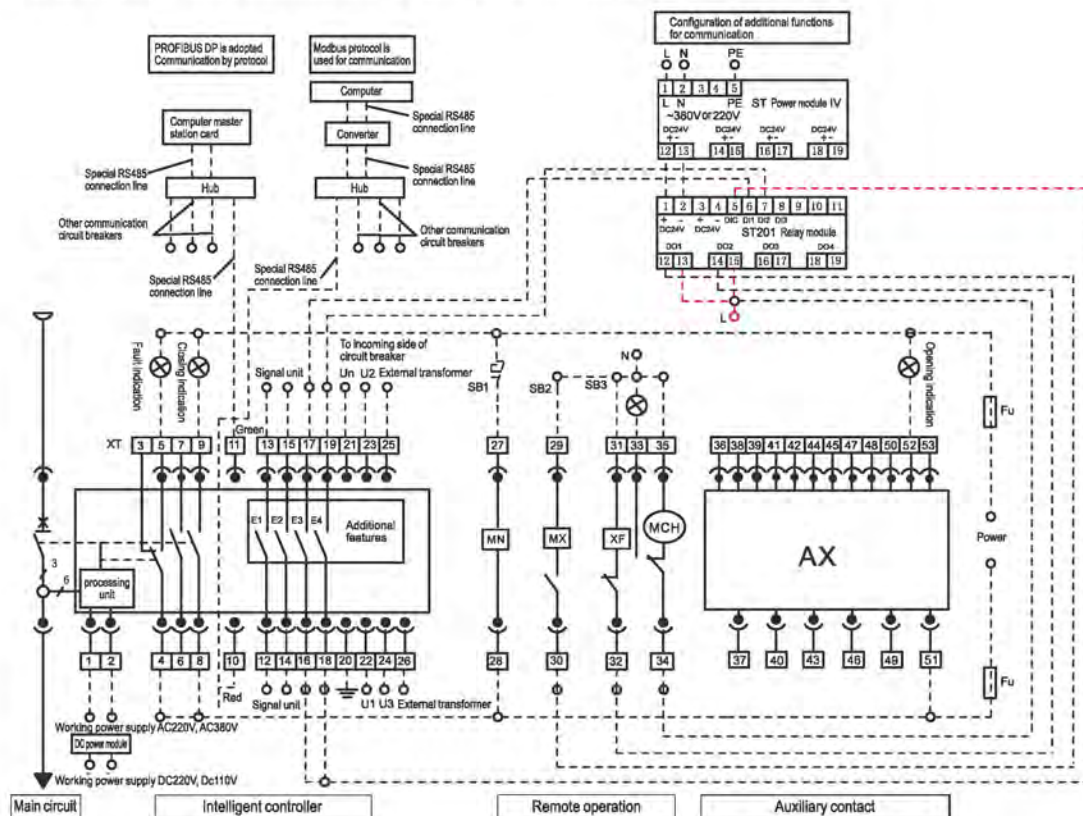
II Six sets of transfer contacts



III Four normally open and four normally closed contacts



◆UNDW1-2000 ~ 6300 electrical circuit diagram (with H-type intelligent controller)



Sb1 under voltage button

SB2 shunt button

SB3 closing button

MN undervoltage, loss of voltage instantaneous or delay release

XF closed electromagnet

MX shunt release

MCH energy storage motor

AX auxiliary contact

SQ2 motor microswitch

1 #, 2#: pin is the input terminal of auxiliary power supply, and 1 # pin is positive terminal in DC

3#, 4#, 5#: fault trip contact output (four for common terminal), contact capacity: AC380V, 5A

6#, 7#, 8#, 9#: two groups of auxiliary contacts of circuit breaker state auxiliary contacts, contact capacity: AC380V, 5A, 10#, 11#: feet are rs485a, rs485b, rs485c communication outgoing lines 12#, 13# (contact 1, load 1 alarm) and 14#, 15# (contact 2, load 2 alarm) and 16 #, 17 # (contact 3, remote control opening) and 18#, 19 # (contact 4, remote control closing): four groups of signal contact output of the controller. Contact capacity: 5A / 240VAC 7a / 24VDC

20#: the foot is the protective ground wire.

21# ~ 24#: the pin is voltage signal input terminal, 21# n-phase voltage input, 22# A-phase voltage input, 23# B-phase voltage input, 24# C-phase voltage input.

25#, 26#: the pin is the input terminal of external transformer

Note: (1) if the control power supply voltage of MX, XF and MCH is different, different power supply can be connected respectively. XF and MX belong to short-term working elements, and the power on time is (50ms to 10ms)

(2) Terminal 35# can be directly connected to the power supply (automatic pre energy storage), or can be connected in series with the normally open button and then connected to the power supply (manual pre stored energy).

(3) The button and indicator light shall be provided by the user.

(4) The input phase voltage of 21#, 22 #, 23#, 24# should not be greater than 690V.

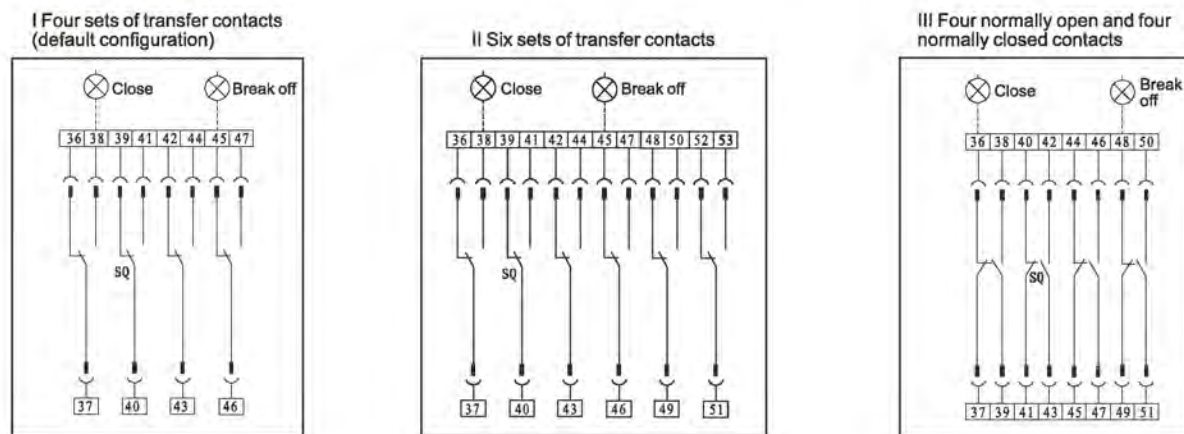
(5) When the working power supply of the intelligent controller is AC power supply, no power module is needed. Terminals 1#, 2# are directly connected to the power supply;

(6) The position indicating contact is optional for users.

UNION ELECTRICS

Intelligent Air Circuit Breaker

◆Auxiliary Contact



Warning words for installation and use

In order to ensure the safety of your personal and electrical equipment, before the circuit breaker is put into operation, please make sure that:

- ◆The operation manual of circuit breaker must be carefully read before installation and use.
- ◆The circuit breaker must be used under normal working conditions.
- ◆Check whether the specifications of the circuit breaker meet the requirements before installation.
- ◆Before installation, measure the insulation resistance of the circuit breaker with a 500V megger. When the ambient air temperature is 20 °C and the soil temperature is 5 °C and the relative humidity is 50% ~ 70%, it should not be less than 500m2. Otherwise, it should be dried and used after the insulation resistance meets the requirements.
- ◆When the circuit breaker is installed, its mounting surface should be in a horizontal position and Fixed type with the m10bolts..
- ◆During installation, please pay attention that no conductive foreign matters fall into the circuit breaker.
- ◆During installation, the conductive bus connected with the circuit breaker shall be flat without additional mechanical stress.
- ◆During installation, the circuit breaker must be reliably protected and grounded with obvious grounding symbol.
- ◆After the circuit breaker is installed, the following operation tests must be carried out before the main circuit is powered on, so as to ensure that the circuit breaker can be formally powered on after the switch is normal.
- ◆Check whether there are foreign matters falling into the circuit breaker carefully. If any, it must be completely removed, and the circuit breaker must be protected and cleaned.
- ◆Connect the secondary circuit according to the relevant wiring diagram, and check whether the working voltage of shunt release, closing electromagnet, electric operating mechanism and intelligent controller is consistent with the actual power supply voltage, and then power on the secondary circuit.
- ◆After the electric operating mechanism stores energy, press the closing button (electric or manual) to close the circuit breaker.
- ◆Press the opening button (electric or manual) to open the circuit breaker.
- ◆Use the intelligent controller test function to make the circuit breaker open reliably. Press the reset button after the test.
- ◆For manual energy storage, pull the handle on the front panel up and down, and "energy storage" will be displayed on the panel after seven actions. And hear a "click" - sound, the end of the energy storage. The circuit breaker can be put into operation only after it is proved to be normal through the above steps test!!!

Maintain

- ◆During use, lubricating oil should be injected into each rotating part regularly.
- ◆Clean the dust regularly to keep the circuit breaker well insulated.
- ◆Check the contact system regularly, especially after each short-circuit current breaking.
- ◆Check contents:
 - Whether the arc extinguishing cover is in good condition;
 - Whether the contact is good;
 - Whether the fasteners of each connection part are loose.

Ordering instructions

(Please mark ☒ or fill in the number)

User unit			Order quantity			Order date		
UNDW1-	☐ - Fixed type ☐ - Draw-out type		☐ - 3P ☐ - 4P ☐ - 3P+N (with external N current transformer)					
Rated voltage	☐ - AC400V ☐ - AC690V		Rated current	In= A				
Intelligent controller	☐ - AC230V ☐ - AC400V		☐ - DC110V ☐ - DC220V					
	Basic function		Optional function					
☐ 2L	$I_r = $ A $t_r = $ s $I_i = $ A		$I_{sd} = $ A $t_{sd} = $ s $I_g = $ A $t_g = $ s ☐ - Earth fault protection ☐ - Signal contact output ☐ - MCR and over limit trip ☐ - Short circuit short time delay protection zone					
☐ M	$I_r = $ A $t_r = $ s $I_{sd} = $ A $t_{sd} = $ s $I_i = $ A		$I_g = $ A $t_g = $ s $I_{c1} = $ A $t_{c1} = $ s $I_{c2} = $ A $t_{c2} = $ s ☐ - Load monitoring ☐ - Mode 1 ☐ - Mode 2 ☐ - MCR and trip beyond limit ☐ - Signal contact output ☐ - Ground fault protection ☐ - Voltage measurement					
☐ 2M ☐ 2H ☒ - Digital display	$I_r = $ A $t_r = $ s $I_{sd} = $ A $t_{sd} = $ s $I_i = $ A $I_g = $ A $t_g = $ s		$I_{c1} = $ A $t_{c1} = $ s $I_{c2} = $ A $t_{c2} = $ s ☐ - Port current unbalance protection ☐ - Port load monitoring ☐ - Mode 1 ☐ - Mode 1 ☐ - Port MCR and over limit trip ☐ - Mouth electric energy measurement ☐ - Port power measurement ☐ - Port power factor measurement (2M) ☐ - Port Telecom measurement (2M) ☐ - Memory of historical parameters of power grid ☐ - Port signal contact output					
☐ 3M ☐ 3H ☒ - LED	$I_r = $ A $t_r = $ s $I_{sd} = $ A $t_{sd} = $ s $I_i = $ A $I_g = $ A $t_g = $ s		$I_{c1} = $ A $t_{c1} = $ s $I_{c2} = $ A $t_{c2} = $ s ☐ - Port current unbalance protection ☐ - Port load monitoring ☐ - Mode 1 ☐ - Mode 1 ☐ - Port MCR and over limit trip ☐ - Port voltage protection ☐ - Port power measurement ☐ - Port power factor measurement ☐ - Port voltage measurement ☐ - Port area interlock ☐ - Memory of historical parameters of power grid ☐ - Mouth electric energy measurement ☐ - Port harmonic measurement ☐ - Port signal contact output					
Shunt release	☐ - AC230V ☐ - AC400V		☐ - DC110V ☐ - DC220V					
Closing electromagnet	☐ - AC230V ☐ - AC400V		☐ - DC110V ☐ - DC220V					
Energy storage motor	☐ - AC230V ☐ - AC400V		☐ - DC110V ☐ - DC220V					
☐ Port under voltage release	☐ - AC230V ☐ - AC400V		☐ - Instantaneous type ☐ - delayed type		☐ S			
☐ Port pressure loss release	☐ - AC230V ☐ - AC400V		☐ - Instantaneous type ☐ - delayed type		☐ S			
Auxiliary contact	Standard type ☐ - 4 sets of transfer auxiliary contacts (with common point) ☐ - 6 sets of transfer auxiliary contacts (with common point) Special Form ☐ - 4N.O. 4N.C ☐ - 6N.O. 6N.C ☐ - ☐ Normally open ☐ - Normally closed							
Mechanical interlock	Two circuit breakers ☐ - Cable interlock ☐ - Linkage interlock							
Opening position locking	☐ - One lock, one key ☐ - Two lock, Two key ☐ - Three lock, Two key ☐ - Five lock, Three key							
Other options	☐ - Interphase separator ☐ - Door frame ☐ - Signal output of connection test and separation position indication contact (1 N.O. 1N.C.)							
Wiring mode	☐ - Standard horizontal outlet ☐ - Extended horizontal outlet ☐ - Standard positive outgoing line ☐ - Extended forward outgoing line ☐ - Standard vertical outlet ☐ - Extended vertical outlet							

Note: ■ - basic configuration; □ - optional configuration. If selected, mark in the port ☒

- 1) The products are normally ordered for distribution protection type;
- 2) If the user chooses the controller, additional functions can be added, and additional cost is required;
- 3) Due to the continuous improvement of product technology, technical parameters are subject to change without prior notice;
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