TeW5

Series Air Circuit Breaker

TeW5 Series Air Circuit Breaker

1 Overview

TeW5 series air circuit breaker (hereinafter referred to as circuit breaker) is used in the AC 50Hz, 60Hz power distribution network with the rated voltage up to AC380V~AC690V and with the rated current ranged 200A~6300A for electric energy distribution and line and power equipment protection to prevent fault hazards such as overload, short circuit, undervoltage, single phase earthing or residual current. Realizing full selective protection and improving power supply reliability. The circuit breaker has the communication and intelligence functions. With Tengen intelligent power distribution system equipped, the four remotes and cloud data management can be realized to adapt to the needs of the smart grid.

Product Range:

Frame current	1600 2500 4000 6300
Breaking capacity	67kA~135kA(AC415V)
	50kA~120kA(AC690V)
Rated current	200A~6300A
Rated voltage	AC380V~AC690V
Freq.	50/60Hz
Number of poles	3P/4P
Installation method	Drawer type/Fixed type
Operation method	Electric operation/manual operation
Intelligent controller type	3M/3H
Certification	CE/CB

Standards:
IEC 60947-2

TeW5 Series Air Circuit Breaker

2 Type Designation

Te	W	5	-	1600	/	3P	1600A	□	□	3M	□	□	□	□	□	□
①	②	③		④		⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮

①	Enterprise code	
②	Product code	
③	Design code	
④	Frame current	1600/2500/4000/6300
⑤	Number of poles	3P/4P
⑥	Rated current	
⑦	Installation method	Fixed / Drawer
⑧	Wiring mode	Horizontal Vertical Mixed
⑨	Controller code	3M type 3H type
⑩	Control circuit voltage	AC220V/230V AC380V/400V DC220V DC110 If there are multiple voltage grades, this shall be indicated in the special instructions
⑪	Undervoltage release type	Default: None Optional:Undervoltage instantaneous Undervolage delay 1-10s
⑫	Undervoltage release voltage	Default: None AC220V/230V AC380V/400V When the undervoltage voltage is inconsistent with the control circuit voltage, this shall be indicated
⑬	Aux. contact code	Default: Four-open four-closed (not specified) Optional (specified) Five-open five-closed Six-open six-closed
⑭	Application scenario	Default: None Plateau Damp hot Salt spray Low temperature
⑮	Other requirements	Default: None Lever interlock Cable interlock One lock and one key Two locks and one key Three locks and two keys Electrical three-position indicator Dual power controller .....

TeW5 Series Air Circuit Breaker

3 Main Technical Parameters and Performance

Model			TeW5-1600	TeW5-2500	TeW5-4000	TeW5-6300
Rated operating current In (A)			200, 400, 630, 800, 1000, 1250, 1600	1000, 1250, 1600, 1900, 2000, 2500	2900, 3200, 3600, 3900, 4000	4900, 5000, 5900, 6300
Rated operating volage Ue (V)			AC380/400/ 415/690	AC380/400/ 415/690	AC380/400/ 415/690	AC380/400/ 415/690
Freq. (Hz)			50Hz/60Hz	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz
Rated insulation voltage Ui (V)			1000	1000	1000	1250
Rated impulse withstand voltage Uimp (kv)			12	12	12	12
Rated current of N pole IN (A)			100%In	100%In	100%In	50%In
Rated limit short-circuit breaking capacity Icu (kA)		AC415V	67	100	100	135
		AC690V	50	75	85	120
Rated operating short-circuit breaking capacity Ics (kA)		AC415V	67	85	100	135
		AC690V	50	75	85	120
Rated short time withstand current Icw (kA) 1s		AC415V	55	85	100	135
		AC690V	42	75	85	120
Rated short time withstand current Icw (kA) 3s		AC415V	30	50	65	/
		AC690V	30	50	65	/
Rated short circuit marking capacity Icm (kA)		AC415V	147	220	220	297
		AC690V	105	165	187	264
Operation performance	Electrical life	AC415/690V	5000	5000	1000	1000
	Mechanical life		10000	10000	8000	5000
Full breaking time (ms) (No additional delay)			20~30	20~30	20~30	20~30
Closing time (ms)			≤70	≤70	≤70	≤70
Installation method		Fixed type	■	■	■	■
		Drawer type	■	■	■	■
Wiring mode		Horizonal wiring	■	■	■	■
		Vertical wiring	■	■	■	■
 Outline dimensions (mm) W×H×D	Fixed type	3P	254×331×200	378×412×298	438×412×299	782×412×406
		4P	324×331×200	473×412×298	553×412×299	897.5×412×406
	Drawer type	3P	282×359×299	368×448×408	412×448×408	779×459×516
		4P	352×359×299	463×448×408	527×448×408	895×459×516
Weight (kg)	Fixed type	3P	29.5	66	83	158
		4P	34.5	80	100	185
	Drawer type	3P	50	104	132	195
		4P	60	130	167	227

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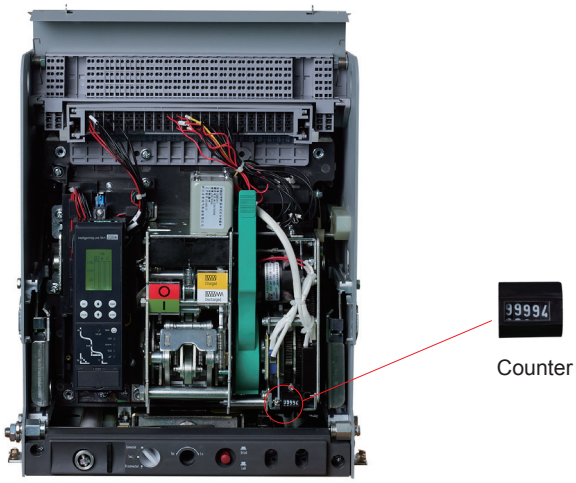

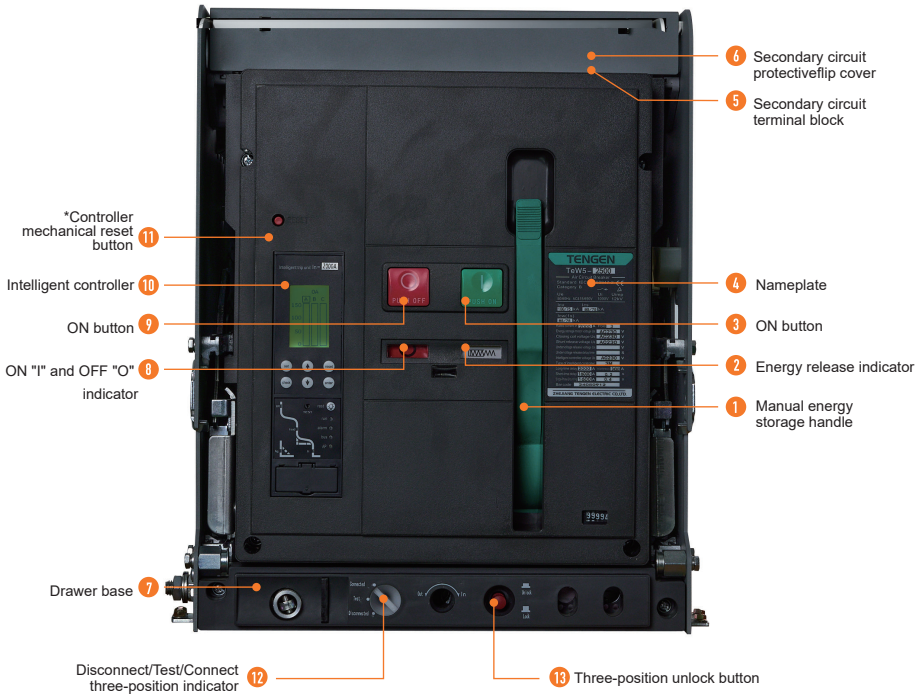

* This button will pop up in the event of fault trip or test trip. If this button is not pressed, the circuit breaker cannot be closed; when this button is pressed, the fault indicator will reset.

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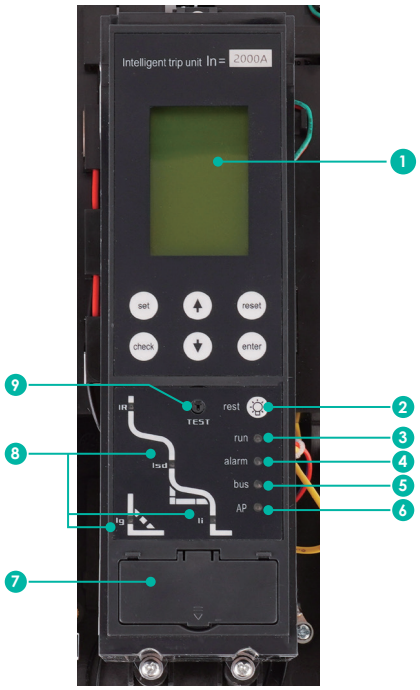


1 LED interface display

2 Fault and alarm reset button

3 "Run" LED
When the controller is energized in the normal working state, the green LED light will always flicker.

4 "Alarm" LED
LED does not light up during normal operation; the red LED light will quickly flicker in the event of fault trip; the red LED light is always on in the event of an alarm.

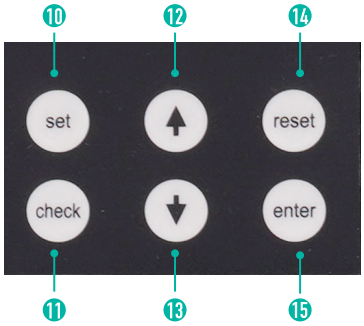
5 Communication indicator
It will be off when Profibus has no communication, and will be always on during communication; Modbus will be off if there is no communication, and will be always on during communication; Device Net will flicker if there is no communication, and will be always on during communication.

6 "AP" indicator
The blue LED is always on when the MCR and neutral line protection fails.

7 With USB communication interface and inspection and test interface included

8 Curve LED
There is a red LED indicator hidden inside the curve. The corresponding LED light flickers to indicate the fault type in the event of a fault trip; when the fault is set in the protection parameters, the LED light is always on to indicate the current set item.

9 "TEST" key
With the "TEST" button pressed, the controller will issue a trip command, and the circuit breaker is open to carry out the test to check whether the control hardware works normally.



⑩ Set
Function key to switch to the Measurement and Parameters setting topic menu (it is a "Left" button in the password entry interface).

⑪ Check
Function key to switch to the protection parameters setting and history list, maintenance topic menu (it is the other menu in the password entry interface).

⑫ Move up
Move the menu content up from the current level, or move up to change the selected parameter.

⑬ Move down
Move the menu content down from the current level, or move down to change the selected parameter.

⑭ Reset
Exit the current menu level and enter the previous menu, or cancel the current selected parameter.

⑮ Enter
Enter the next menu indicated by the current item, or select the current parameter, or save the modified parameter.

3M/3H type controller

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4 Product Control Function Table

Function of TeW5 Oversea Controller

Controller function			3M	3H
Protection	Current protection	Overload long delay protection	■	■
		Short circuit short delay protection	■	■
		Short circuit instantaneous protection	■	■
		Earth fault protection	■	■
		Electric leakage protection	-	□
		(4P/3P+N) Neutral pole protection (4P/3P+N)	□	□
		Overload pre-warning	■	■
		Current unbalance (phase loss) protection	■	■
	Voltage protection	Overvoltage protection	-	□
		Undervoltage protection	-	□
		Voltage unbalance protection	-	□
		Over-frequency protection	-	□
		Under-frequency protection	-	□
		Phase sequence protection	-	□
	Power protection	Reverse power protection	-	□
	Temperature protection	Contact/environment/busbar temperature	-	□
Measurement function	Current function: Three-phase current, neutral pole current, earthing current		■	■
	Voltage function: Frequency, line voltage, phase voltage, mean voltage, voltage unbalance		-	□
	Power function	Power: Active power, reactive power, apparent power, power factor	-	□
		Electrical energy: Active electrical energy, reactive electrical energy, apparent electrical energy	-	□
	Harmonic function		-	□
	Waveform capture		-	□
	Thermal memory		■	■
	Load monitoring		-	□
Contact output (I/O)	Programmable contact output		-	□
	Aux. contact output (Opening/Closing synchronized with circuit breaker)		■	■
	Alarm signal output (after circuit breaker trips due to fault)		■	■
Wired communications	Based on RS485, standard Modbus protocol		-	■
Function test records	Simulated functional test		■	■
	Fault records		Last 8 records	
	Displacement record		Last 8 records	
	Alarm record		Last 8 records	
	Operation times record		■	■

■ Standard □ Optional - No

Notes: 1.The controller can have a customized temperature protection(contact temperature, contact/ busbar/ ambient temperature);
2.Measurement of temperature of the primary terminal.

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Overload long delay protection

Protection characteristics		1.05Ir: ≤2h, no operation; 1.3Ir: ≤2h, operation										
Ir current setting value range		(0.4~1.0)In+OFF										
Inverse time operation characteristics		$I^2t=(1.5/N)^2*tr$										
Long delay operation Time Tr(s) Accuracy ± 10%	1.5Ir	15	30	60	120	240	360	480	600	720	840	960
	2Ir	8.44	16.9	33.7	67.5	135	202.5	270	337.5	405	472.5	540
	5Ir	0.94	1.9	3.7	7.5	15	22.5	30	37.5	45	52.5	60
	7.2Ir	0.65	1.3	2.6	5.2	10.4	15.6	20.8	26	31.3	36.5	41.7
Thermal memory time		Instantaneous/10/20/30/45/60/120/180min										

Note: N is the value of the fault current divided by the multiple of the set current, I/Ir; t is the fault action delay time.

Short circuit short delay protection

Protection characteristics		≤0.9Isd: No operation; >1.1Isd: Operation				
Isd current setting value range		Isd=(1.5~15)In+OFF				
Long delay operation Time Tr(s) Accuracy ± 10%	Definite time	Setting time s (Tsd)	0.1	0.2	0.3	0.4
		Delay (ms)	60	160	255	340
		Max. braeking time (ms)	140	240	345	460
	Inverse time	The curve is same as the overload long delay curve, but its operation delay time is 1/10 long delay time.				

Short circuit instantaneous protection

Protection characteristics	Less than 0.85Ii: No operation Greater than 1.15Ii: Operation
Ii short circuit instantaneous setting current	Ii=(1.5~20)In+OFF

Earth fault protection

Protection characteristics	< 0.8Isd: No operation >1.0Isd: Delay operation
Current setting value Ig	(0.2~1.0)In+OFF Min.100A
Time setting range tg accuracy ± 10%	0.1s~ 1s, step size 0.Is

Intelligent controller factory setting value

Trip curve	Long delay		Short delay		Instantaneous	Earth fault	
	IR	Tr	Isd	Tsd	Ii	Ig	tg
	1.0In	60s	8In	0.2s	12In	0.8In	0.4s

Overload long delay protection action time table

Curve type	Fault current	Delay time (s)															
		c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16
S1 standard reverse time	1.5xIr	0.6	0.98	1.47	2.46	3.68	4.91	6.14	9.21	11.05	17.19	24.56	36.84	49.13	61.41	73.69	85.97
	2xIr	0.36	0.57	0.86	1.43	2.15	2.87	3.58	5.37	6.45	10.03	14.33	24.49	28.65	35.82	42.98	50.15
	6xIr	0.14	0.22	0.33	0.55	0.82	1.10	1.37	2.06	2.47	3.84	5.48	8.22	10.96	13.70	16.45	19.19
	7.2xIr	0.12	0.20	0.30	0.50	0.74	0.99	1.24	1.86	2.23	3.48	4.97	7.45	9.93	12.42	14.90	17.38
V1 Velocity inverse time	1.5xIr	2.00	3.20	4.80	8.00	12.00	16.00	20.00	27.00	36.00	56.00	80.00	120.00	160.00	200.00	240.00	280.00
	2xIr	1.00	1.60	2.40	4.00	6.00	8.00	10.00	13.50	18.00	28.00	40.00	60.00	80.00	100.00	120.00	140.00
	6xIr	0.20	0.32	0.48	0.80	1.20	1.60	2.00	2.70	3.60	5.60	8.00	12.00	16.00	20.00	24.00	280.00
	7.2xIr	0.16	0.26	0.39	0.65	0.97	1.29	1.61	2.18	2.90	4.52	6.45	9.68	12.90	16.13	19.35	22.58
EI(G) Special inverse time (general power distribution protection)	1.5xIr	8.00	12.80	19.20	32.00	48.00	64.00	80.00	108.00	144.00	224.00	320.00	480.00	640.00	800.00	960.00	1040.0
	2xIr	3.33	5.33	8.00	13.33	20.00	26.67	33.33	45.00	60.00	93.33	133.33	200.00	266.67	333.33	400.00	433.33
	6xIr	0.29	0.46	0.69	1.14	1.71	2.29	2.86	3.86	5.14	8.00	11.43	17.14	22.86	28.57	34.29	37.14
	7.2xIr	0.20	0.31	0.47	0.79	1.18	1.57	1.97	2.66	3.54	5.51	7.84	11.80	15.74	19.67	23.60	25.57
EI(M) Special inverse time (motor protection)	1.5xIr	6.22	9.96	14.9	24.89	37.34	49.78	62.23	84.01	112.01	174.24	248.91	373.37	497.82	622.28	746.73	808.96
	2xIr	2.95	4.72	37.07	11.79	17.69	23.58	29.48	39.79	53.06	82.53	117.90	176.86	235.81	294.76	353.71	383.19
	6xIr	0.28	0.45	0.68	1.13	1.69	2.26	2.82	3.81	5.08	7.90	11.29	16.94	22.58	28.23	33.88	36.70
	7.2xIr	0.20	0.31	0.47	0.78	1.17	1.56	1.95	2.63	3.51	5.46	7.80	11.70	15.61	19.51	23.41	25.36
HV high-voltage fuse compatible	1.5xIr	2.46	3.94	5.91	9.85	14.77	19.69	24.62	33.23	44.31	68.92	98.46	147.69	196.92	246.15	295.38	320.00
	2xIr	0.67	1.07	1.60	2.67	4.00	5.33	6.67	9.00	12.00	18.67	26.67	40.00	53.33	66.67	80.00	86.67
	6xIr	0.01	0.01	0.02	0.03	0.05	0.06	0.08	0.10	0.14	0.22	0.31	0.46	0.62	0.77	0.93	1.00
	7.2xIr	0.00	0.01	0.01	0.01	0.02	0.03	0.04	0.05	0.07	0.10	0.15	0.22	0.30	0.37	0.45	0.48
I^2 general inverse time protection	1.5xIr	15.0	30.00	60.00	120.00	240.00	360.00	480.00	600.00	720.00	840.00	960.00					
	2xIr	8.44	16.88	33.75	67.50	135.00	202.50	270.00	337.50	405.00	472.50	540.00					
	6xIr	0.94	1.88	3.75	7.50	15.00	22.50	30.00	37.50	45	52.50	60.00					
	7.2xIr	0.65	1.30	2.60	5.21	10.42	15.60	20.83	26.04	31.25	36.46	41.67					

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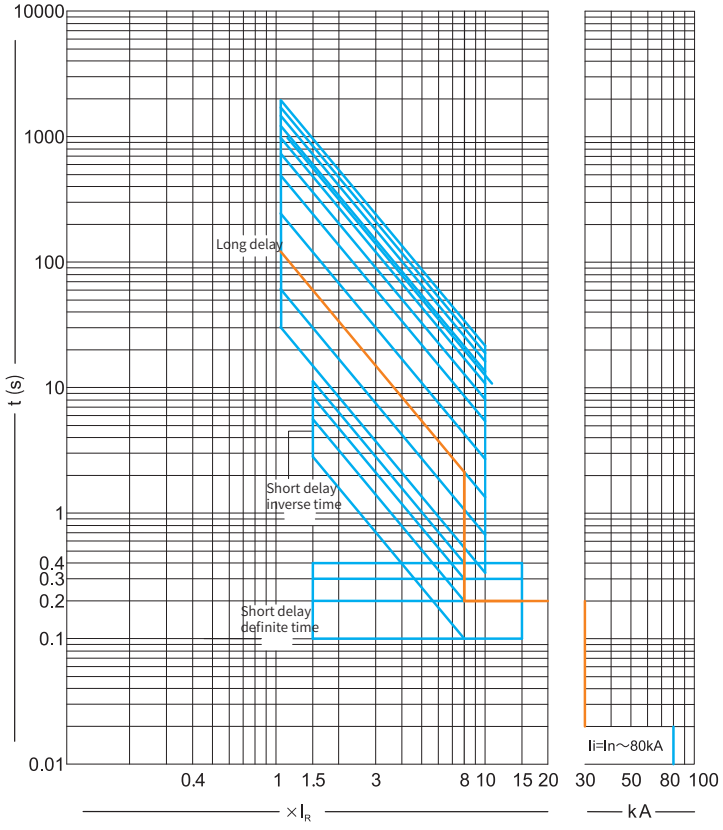
5 Production Characteristic

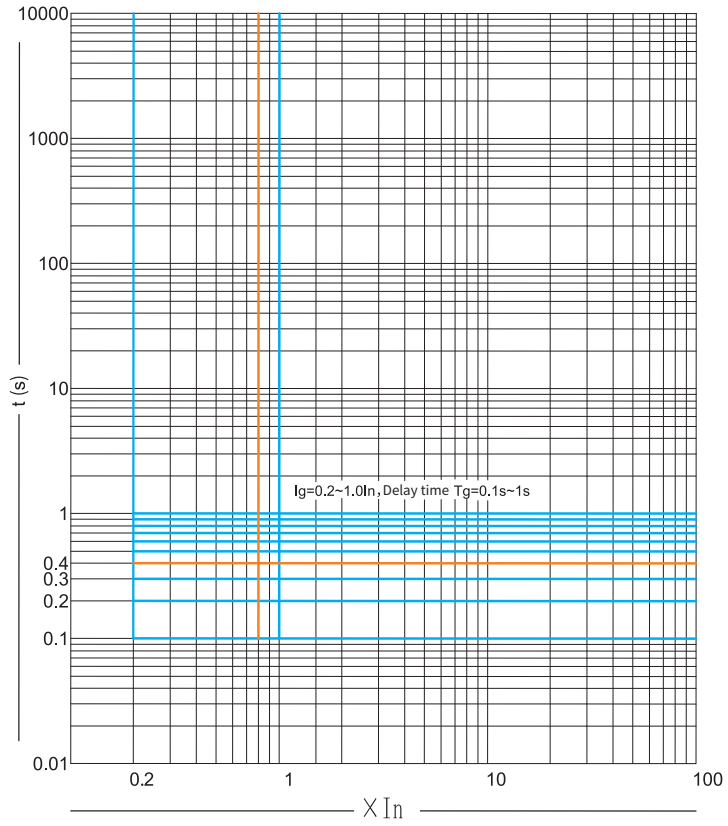
5.1 3M/3H controller earth fault protection time/current characteristic curve



I_R=0.4In~1.0In, T_R=15s~960s total of 11 grades; Isd=1.5I_R~15I_R; Ii=1.0In~20In

Note 1: Definite time short delay time Tsd=0.1s~0.4s; the short delay reverse time characteristics are same as the overload long time, but its action delay time is only 1/10 long delay time.
Note 2: The red curve is the factory setting curve, and the instantaneous Ii takes 12In=30kA as an example.

5.2 3M/3H controller general I2t protection characteristic time and current curve



6 Working and installation conditions

6.1 Ambient temperature

The product can work in the range -45°C-+70°C, and the mean temperature within 24 hours does not exceed +35°C. If higher than +40°C, derating is required.

6.2 Atmospheric conditions

The relative temperature does not exceed 50% at ambient temperature +40°C, and a higher relative humidity is allowed lower temperatures. When the mean monthly minimum temperature is +25°C, the relative humidity can be up to 90%. Condensation occurred on the surface of the product due to temperature changes shall be considered.

6.3 Altitude

5000 m altitude is available. If more than 2000 m, the altitude derating is required.

6.4 Installation Category

Main circuit and voltage release coils of circuit breaker and primarily coils of power transformer: Class IV; auxiliary circuit and control circuit: Class III.

Pollution degree: Level 3
Use category: Class B
Protection grade: IP40 (installed in the small chamber with door frame equipped of cabinet)
Electromagnetic compatibility: Electromagnetic environment A
Installation angle: The vertical slope does not exceed 5°

Accessories

Remote operation

1. Shunt release
2. Closing electromagnet
3. Undervoltage release
4. Undervoltage delay release
5. Motor mechanism

Locks

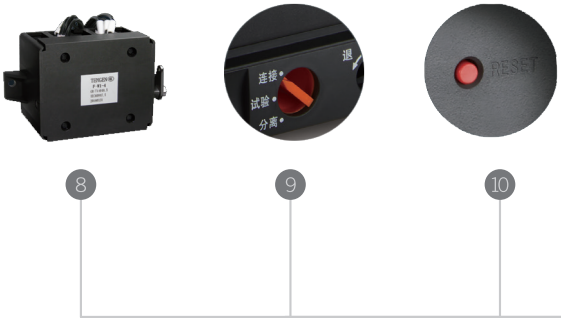
6. Key lock
7. Mechanical interlock

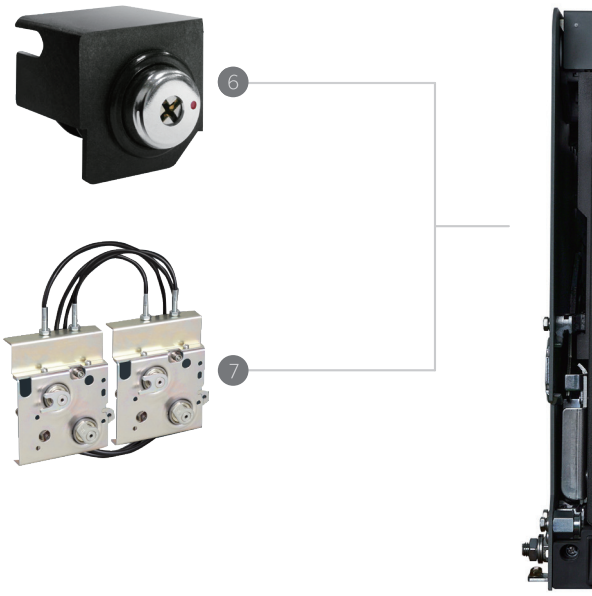
Indicators and protection accessories

8. Aux. switch
9. Three-position indicator
10. Controller reset button
11. Closing OK mechanical indicator
12. Protective cover
13. Door frame
14. Phase partition
15. Button protective cover

Controller accessories

16. N phase external transformer
17. Electric leakage transformer
18. Power module
19. Relay module
20. Temperature acquisition module
21. Dual power automatic conversion module





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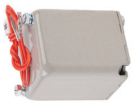

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7 Accessories

7.1 Shunt release

The shunt release works in the short time work system mode to remotely disconnect the circuit breaker.

Dedicated for TeW5-1600 frame

Rated control power voltage Us (V)	AC230V	AC400V	DC110V	DC220V
Required power	280VA	340VA	310W	380W
Operating voltage (V)	(0.7~1.1)Us			
Opening time (ms)	Up to 30			

Dedicated for TeW5-2500/4000/6300 frame

Rated control power voltage Us (V)	AC230V	AC400V	DC110V	DC220V
Required power	590VA	740VA	660W	820W
Operating voltage (V)	(0.7~1.1)Us			
Opening time (ms)	Up to 30			

7.2 Closing electromagnet

The closing electromagnet works in the short time work system mode. When the energy storage of the motor is completed, the closing electromagnet can work to release the energy storage spring force of the operating mechanism instantaneously making the circuit breaker closed quickly.

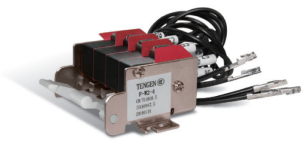
Dedicated for TeW5-1600 frame

Rated control power voltage Us (V)	AC230V	AC400V	DC110V	DC220V
Required power	280VA	340VA	310W	380W
Operating voltage (V)	(0.85~1.1)Us			
Opening time (ms)	Up to 70			

Dedicated for TeW5-2500/4000/6300 frame

Rated control power voltage Us (V)	AC230V	AC400V	DC110V	DC220V
Required power	590VA	740VA	660W	820W
Operating voltage (V)	(0.85~1.1)Us			
Opening time (ms)	Up to 70			

7.3 Aux. switch



With multiple sets of passive contacts provided for users

Dedicated for TeW5-1600

Rated operating voltage Us (V)	AC230V	AC400V	DC110V	DC220V
Rated current Ie (A)	1.5	0.9	0.55	0.27
Conventional thermal current Ith (A)	6			

Note: The standard aux. contacts are 4 normally open and 4 normally closed contacts, and the 5 normally open and 5 normally closed contacts and 6 normally open and 6 normally closed contacts are both available.

Dedicated for TeW5-2500/4000/6300 frame

Rated operating voltage Us (V)	AC400V	DC250V
Rated current Ie (A)	2	0.3
Conventional thermal current Ith (A)	10	

Note: The standard aux. contacts are 4 normally open and 4 normally closed contacts, and the 6 normally open and 6 normally closed contacts, 8 normally open and 8 normally closed contacts and 10 normally open and 10 normally closed contacts are all available.

7.4 Door frame

Installed on the cabinet door with the protection grade up to IP40, it is available for fixed type and drawer type.

7.5 Temperature acquisition module

The temperature sensor is used to collect the temperature values of the external busbars of a total of 8 circuits including 4 inlet circuits and 4 outlet circuits, and transmit those temperature values to the controller for real-time monitoring by the system.

External AC/DC24V power supply; Ambient temperature range: -10°C to 70°C
Power consumption: Less than 2W Storage temperature range: -25°C to 85°C
Protection grade: IP20 Installation method: Direct fixed type or DIN rail type
Busbar temperature range: 60°C to 180°C
Dimensions (W x H x D): 72mm x 90mm x 30mm

7.6 Motor mechanism

With electric energy storage function.

Rated control power voltage Us (V)		AC230V	AC400V	DC110V	DC220V
Power required	TeW5-1600	75VA	75VA	75W	75W
	TeW5-2500	85VA	85VA	85W	85W
	TeW5-4000	150VA	150VA	150W	150W
Operating voltage (V)		(0.85~1.1)Us			
Energy storage time (s)		Up to 5			

7.7 Mechanical interlock

Mechanical interlock forms available

Interlock form	Between two circuit breakers		Between three circuit breakers	
	Horizontal	Vertical	Horizontal	Vertical
Cable interlock	√	√	×	×
Lever interlock	×	√	×	√

Notes: The maximum distance of the cable interlock is 2 M.
The maximum distance of the lever interlock is 1 M.

7.8 Phase partition

Used to enhance the insulation strength between the busbars

7.9 Button protective cover

The protective cover of the button is used to protect the closed/open button of circuit breaker. Once locked, the manual closing and opening operation cannot be carried out to prevent mis-operation by unrelated personnel (lock shall be provided by customer)

TeW5 Series Air Circuit Breaker

7.10 Undervoltage release


If the undervoltage release is not energized, the circuit breaker cannot be closed manually or electrically.

The undervoltage release is divided into the instantaneous trip and delay trip. Which one is ordered by the user according to the actual needs.

The delay time of the delay undervoltage release is 1~10s.

Rated control power voltage Us (V)	AC230V	AC400V
Power required	125VA	110VA
Release operation time	Instantaneous/delay 1, 3, 5, 10s	
Release operating voltage value	(35%~70%)Ue	Make the circuit breaker open
	≤35%Ue	Circuit breaker unable to close
	≥85%Ue~110%Ue	Circuit breaker can be closed reliably
When the power voltage restores to 85%Ue within 1/2 delay time		Circuit breaker cannot be open

Note: The accuracy of delay time is ±10%.

7.11 Key lock

The key lock can be used to fix the circuit breaker open button in the pressed position, and at this time the circuit breaker cannot be closed.

Operation instructions:
One circuit breaker is equipped with a lock and a key, and the circuit breaker cannot be closed in the lock state;
Two circuit breakers are equipped with two same locks and a key, and only a single circuit breaker is allowed to be closed;
Three circuit breakers are equipped with three same locks and two keys, and only two circuit breakers are allowed to be closed.

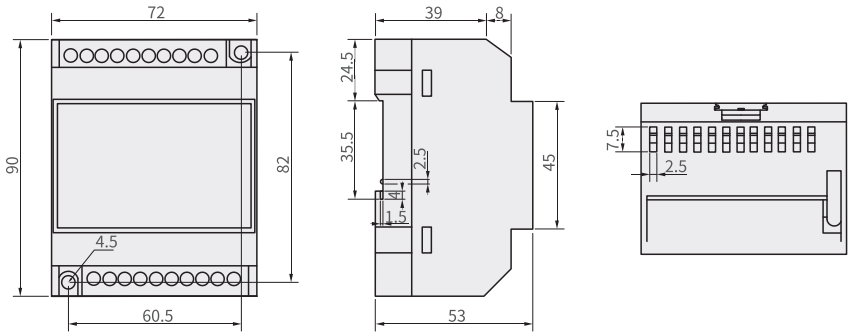
Specific operations: First insert the key into the lock hole of the circuit breaker, press the opening button and turn it clockwise; at this time the circuit breaker can be closed but the key cannot be taken out. To remove the key, please open the circuit breaker, press the opening button, and turn the key counter clockwise and take it out; at this time the circuit breaker cannot be closed.

7.12 Power modules

Used as the power supply of the relay module or TeW5-1600 controller

The TeW5-1600 controller shall have an external power module. When the power voltage is AC230V, AC400V, this voltage shall be converted to DC24V power voltage through this power module to supply it to the controller.
ST power module (IV) can provide DC 24V power supply with the power of not less than 9.6W, and can output four sets of terminal blocks and input AC or DC common voltage (AC/DC220V).
Used as a ST201 relay module power supply, the product adopts 35mm standard rail and direct fixed installation methods.
Note: Except for 1600 frame, other frames are optional accessories.

Installation dimensions are shown in figure below:



7.13 Relay module

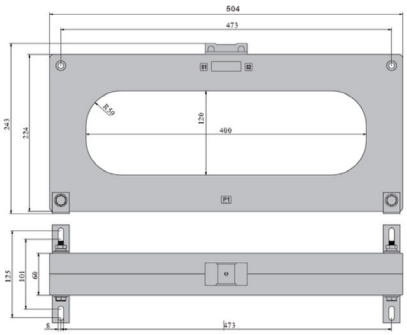
Standard module with remote control of communication function

The signal unit of the controller output is generally used for fault alarm or indication. When it is used to open or close the circuit beaker or the capacity of the carried load is larger, the conversion through the ST201 relay module is required for control. The contact capacity of the ST201 relay is as follows: AC250V, 10A, DC28V, 10A. The module is installed on a standard 35 mm rail.
The installation dimensions are same as those of the ST power module.

7.14 Leakage transformer

When the earthing protection of the electric leakage type (E), the external special rectangular transformer is required.

Outline and installation structure diagram

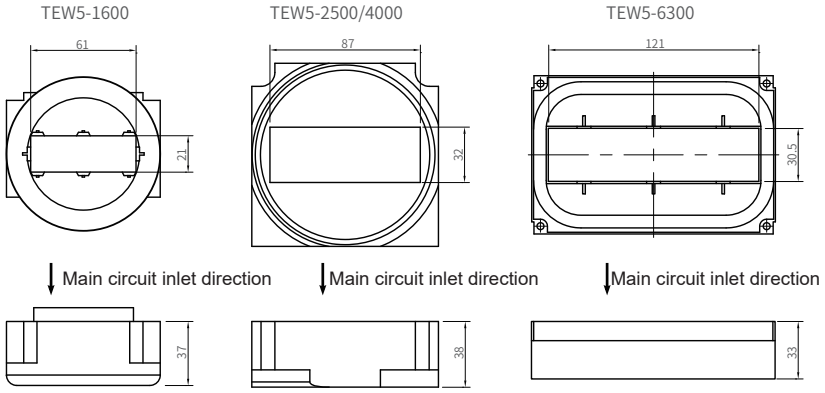


TeW5 Series Air Circuit Breaker

7.15 N phase external transformer

When the 3P+N earth mode is selected by user, an additional neutral pole transformer or earth current transformer is required.

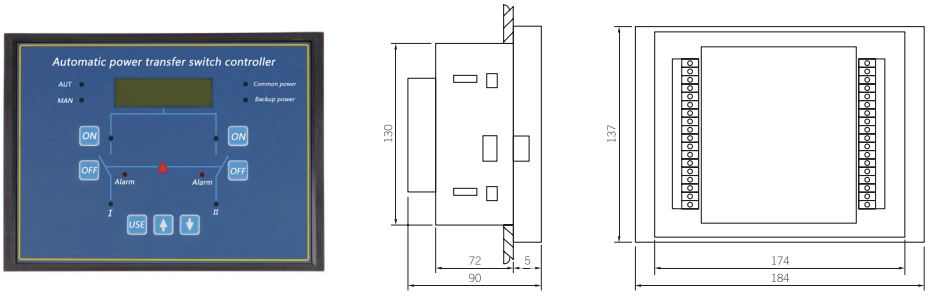
The installation dimensions are as follows: (Regardless of whether the main circuit inlet direction is the upper or lower inlet, the N-pole transformer should always be consistent with the direction of the transformers of other three poles. When the wiring mode is the upper inlet, the wiring direction of the N phase transformer is shown in figure below; when the wiring mode is the lower inlet, the direction is opposite.)



7.16 Dual power automatic conversion module

Used for automatic conversion between two circuits of mains supplies, two circuits of power generation or between one circuit of mains supply and one circuit of power generation.

Power supply: DC input DC9~35V (connected when the start signal of the oil engine is required); AC input: taken from one or two A, N phase voltage; it can work only when one of the circuits is energized, with single-phase voltage > 180V; AC input voltage: AC220V±15% (single phase)/AC380V±15% (three phases) 50HZ; input three-phase current: 0~5A.



Note: The size of the hole on the panel is 175 x 131 mm

7.17 Busbar controller

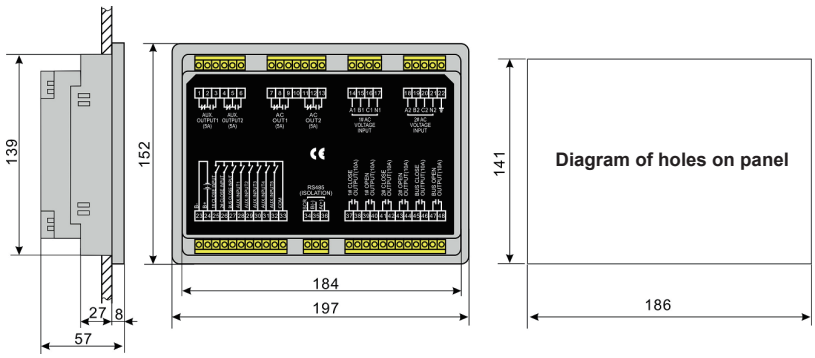
The busbar controller is an intelligent busbar control module integrating with automatic measurement, LCD display and digital communication.

The busbar controller integrates digitalization, intelligence and networking, and it is an ideal product for busbar control thanks to its automatic measurement and control process and reduction of human errors.

The busbar controller is composed of a microprocessor as the core to accurately detect three-phase voltages of two circuits, make accurate judgments on voltage abnormalities (overvoltage, undervoltage, phase loss) and output passive switching value. By fully considering the application of the two inlets and one busbar on the power supply system, this device has two optional control models of automatic busbar transfer and incoming line automatic busbar transfer. With compact structure, advanced circuit, simple wiring, and high reliability, the product can be widely used in many industries such as electric power, post and telecommunications, petroleum, coal, metallurgy, railway, municipal, and intelligent buildings.

Outline and installation structure

This controller is designed to be of the panel mounted type, and it is fixed by a clamp during installation.



Note: Unit (mm)

7.18 Counter

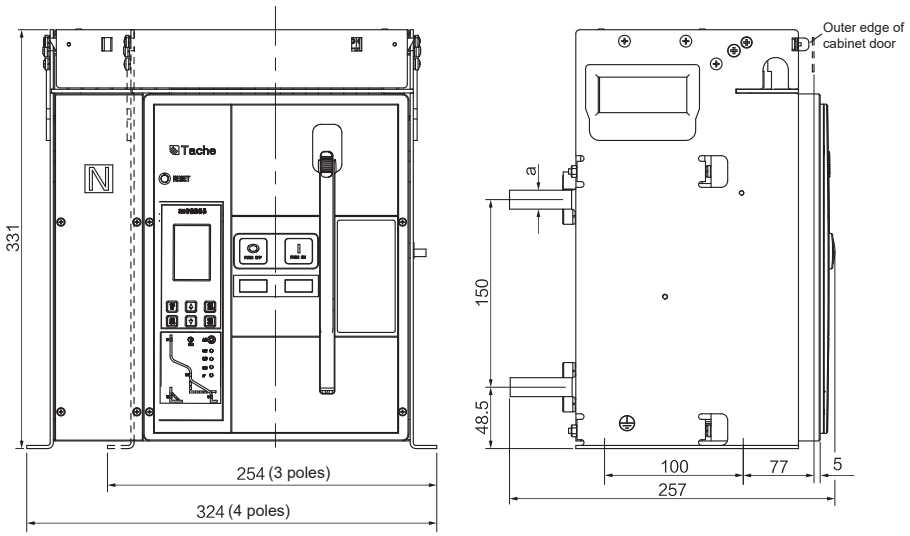
The counter increments by 1 upon com pletion of energy storage (cannot be reset) and shows the total count of operations: 1600A F/4000A.

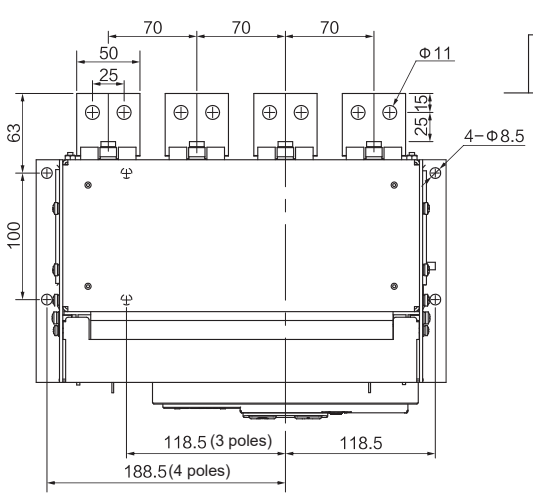
Founted on the mechanism; other housing frames are mounted on the motor.

TeW5 Series Air Circuit Breaker

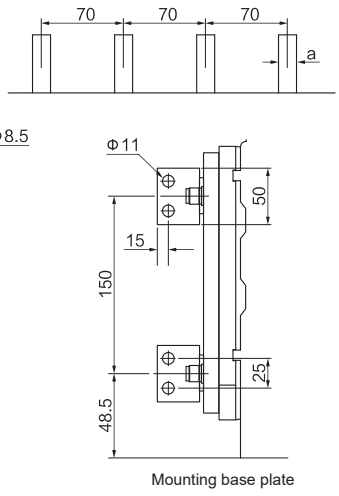
8 Installation dimensions

TeW5-1600 fixed type





Horizontal connection



Vertical connection

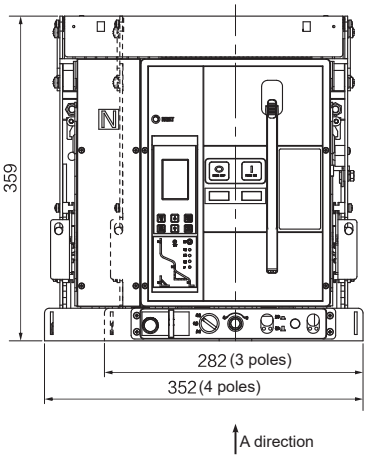
Current spec.	a
200, 400, 630, 800, 1000	10
1250, 1600	15

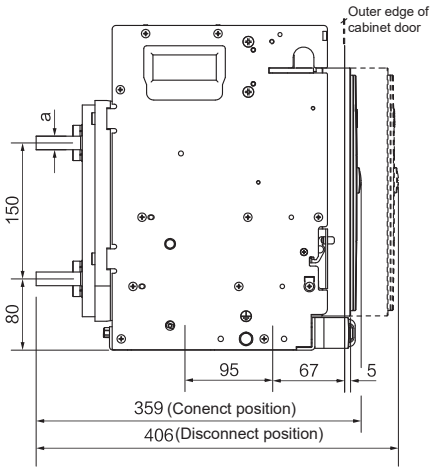
TeW5 Series Air Circuit Breaker

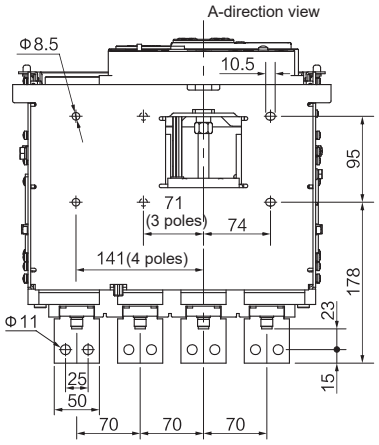
TeW5-1600 drawer type

Horizontal wiring

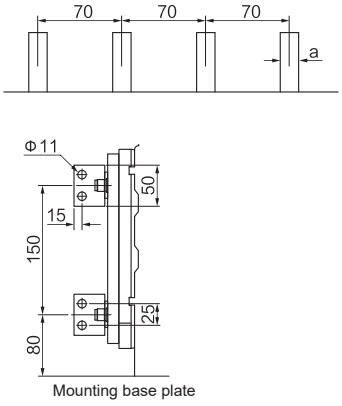
Vertical wiring







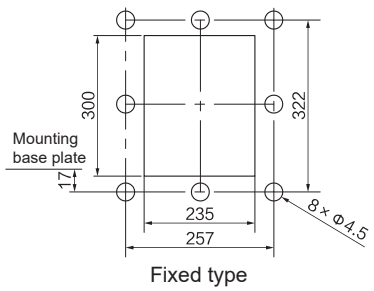
Horizontal connection



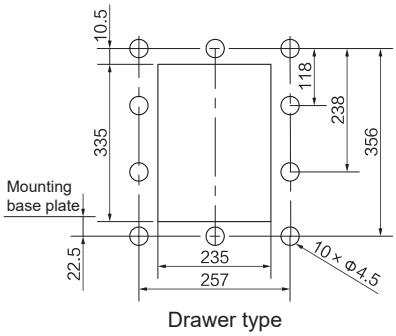
Vertical connection

Current spec.	a
200, 400, 630, 800, 1000	10
1250, 1600	15

TeW5-1600 door frame Hole size



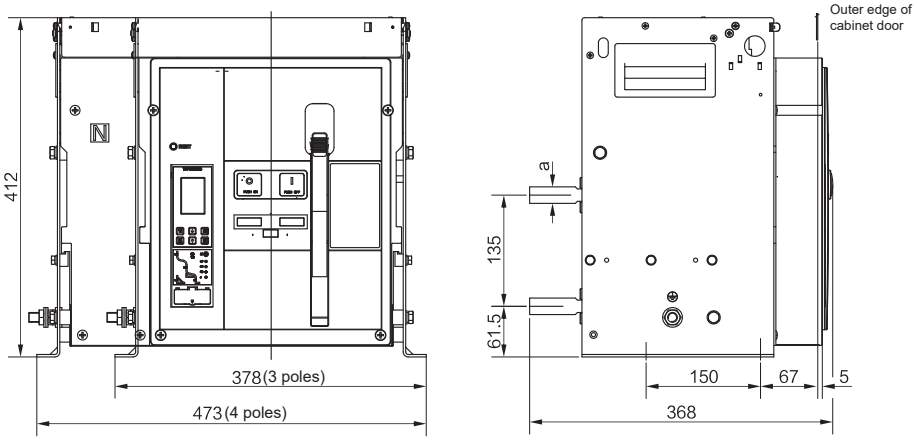
Fixed type

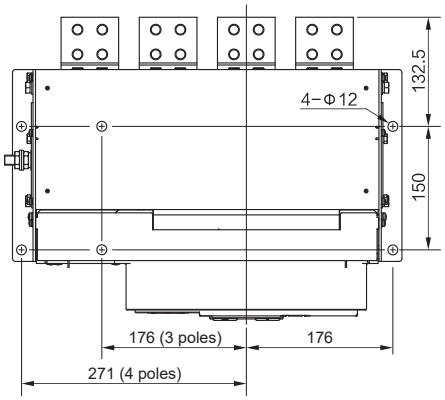


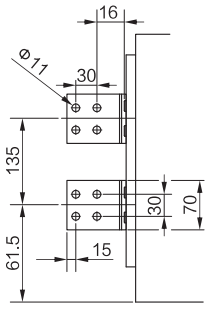
Drawer type

TeW5 Series Air Circuit Breaker

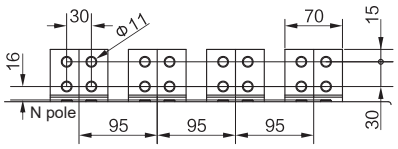
TeW5-2500 fixed type



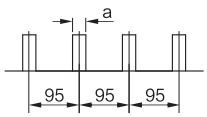




Mounting base plate



Horizontal connection

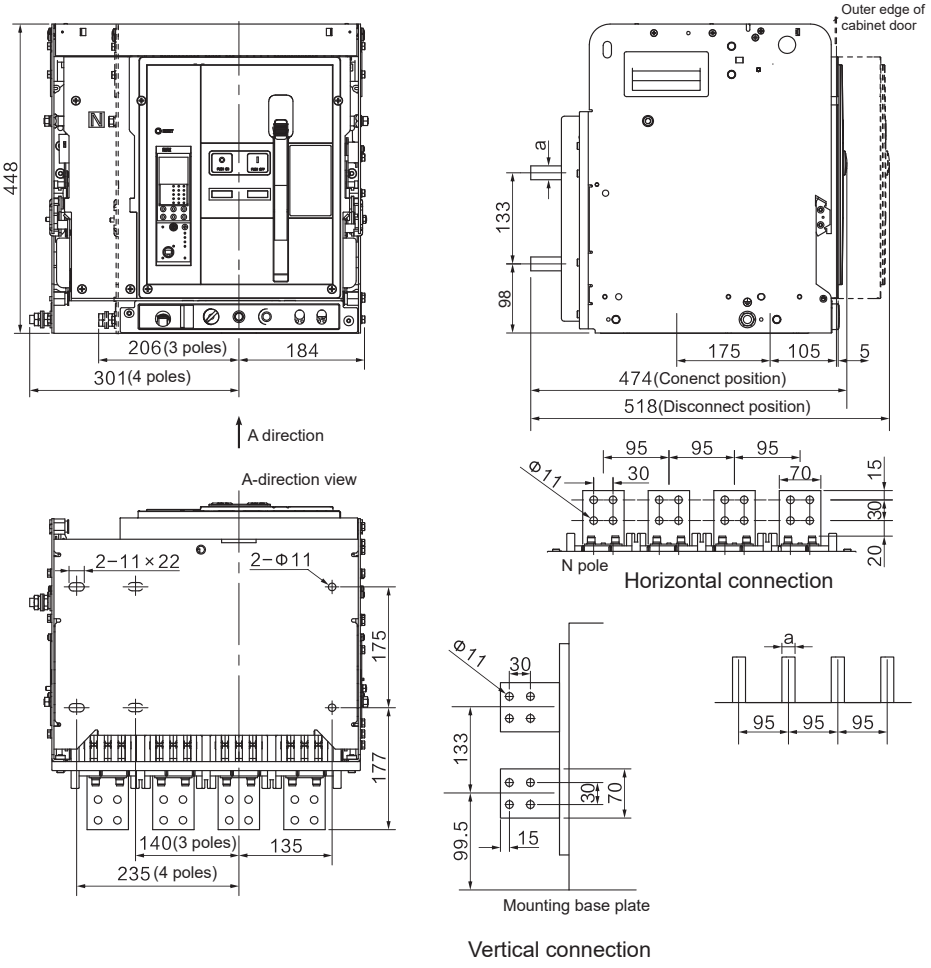


Vertical connection

Current spec.	a
800, 1000, 1250, 1600 1900, 2000, 2500	20

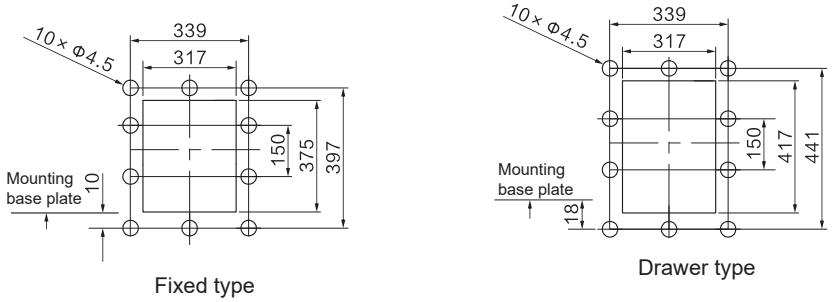
TeW5 Series Air Circuit Breaker

TeW5-2500 drawer type



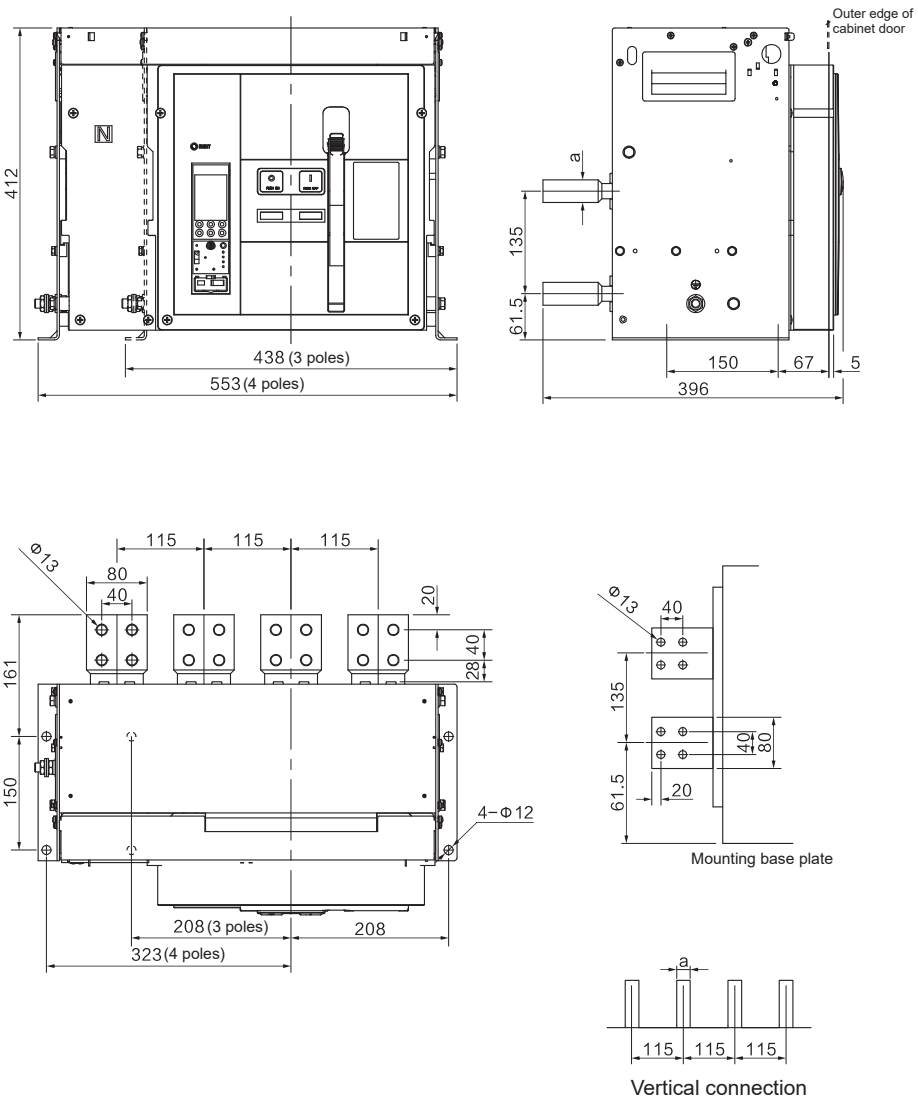
Current spec.	a
800, 1000, 1250, 1600 1900, 2000, 2500	20

TeW5-2500 door frame Hole size



TeW5 Series Air Circuit Breaker

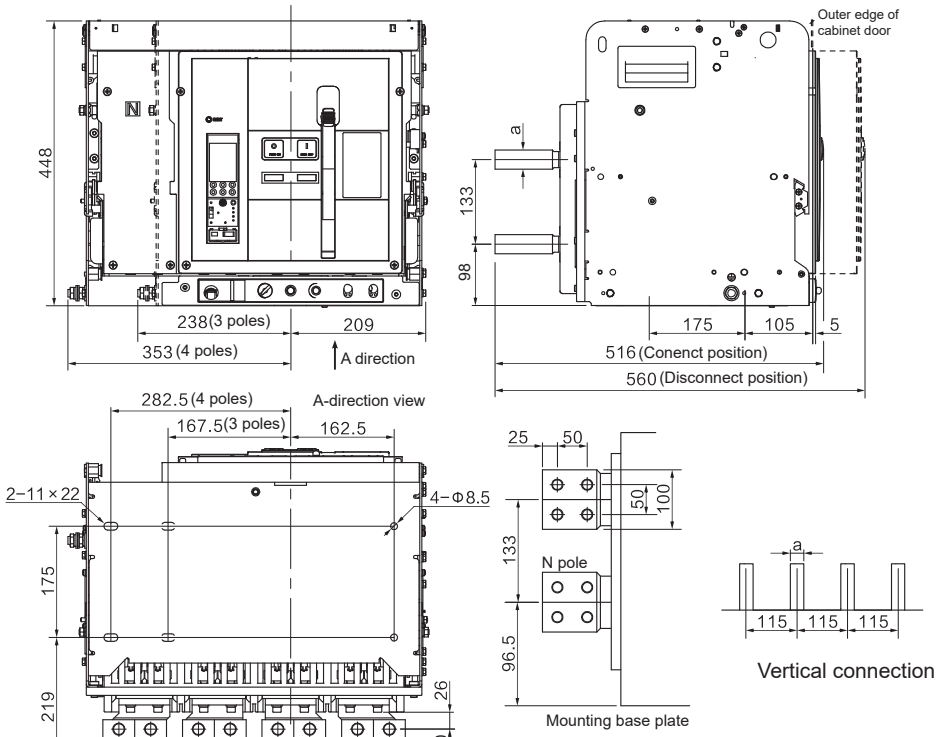
TeW5-4000 fixed type



Current spec.	a
2900, 3200, 3600, 3900, 4000	30

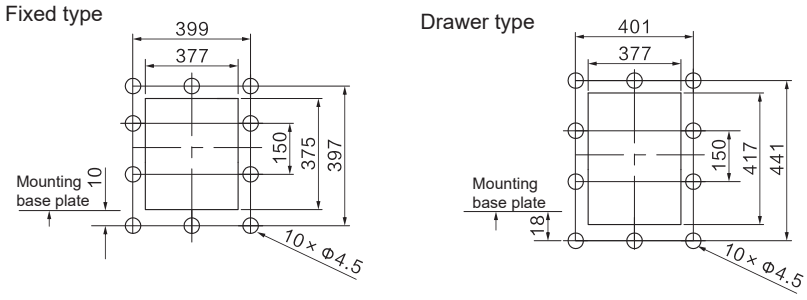
TeW5 Series Air Circuit Breaker

TeW5-4000 drawer type



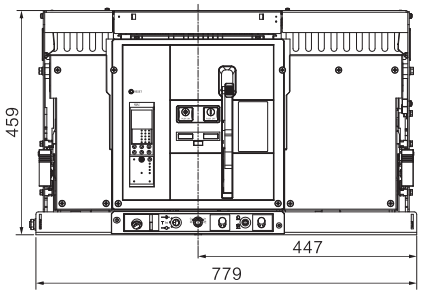
Current spec.	a
2900, 3200, 3600, 3900, 4000	30

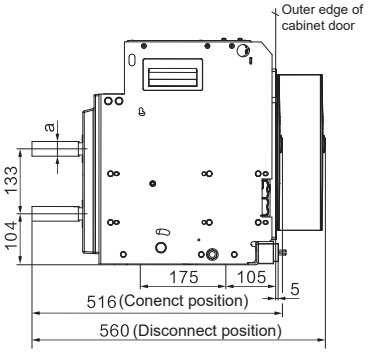
TeW5-4000 door frame Hole size

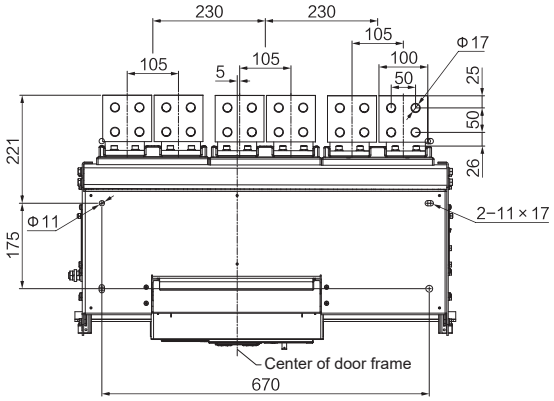


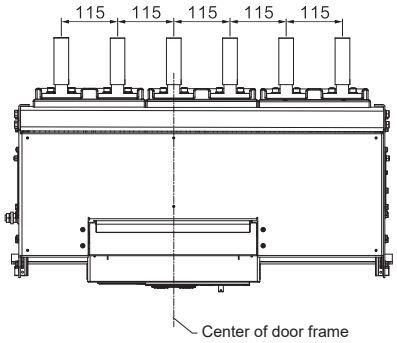
TeW5 Series Air Circuit Breaker

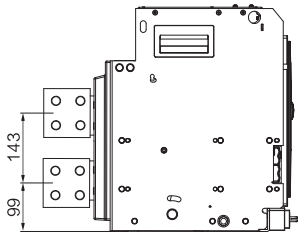
TeW5-6300/3P drawer type







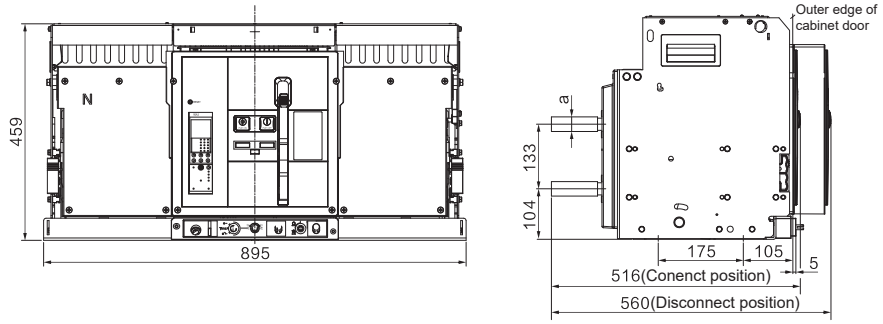


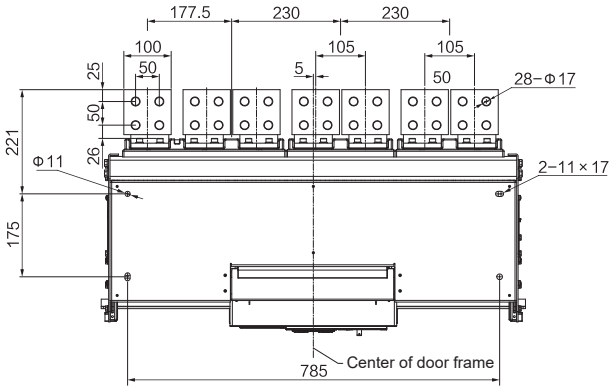


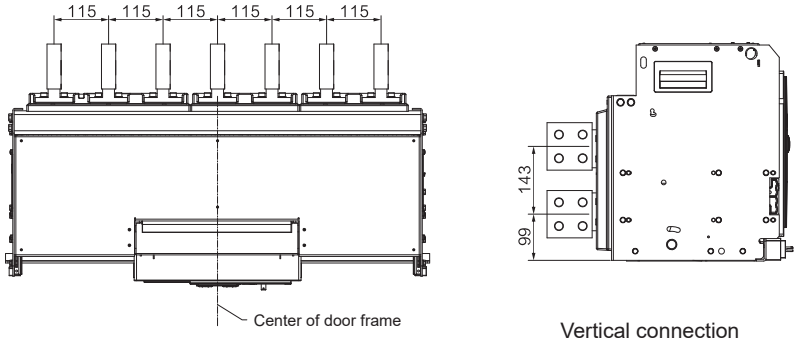
Current spec.	a
2900, 3200, 3600, 3900, 4000	30

TeW5 Series Air Circuit Breaker

TeW5-6300/4P drawer type





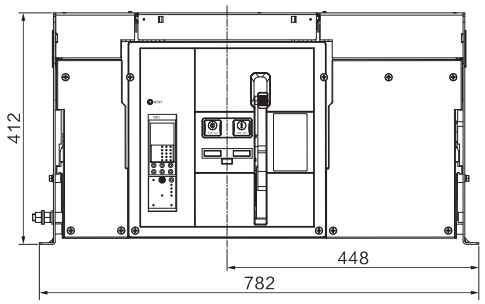


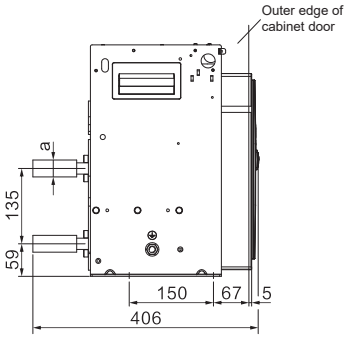
Vertical connection

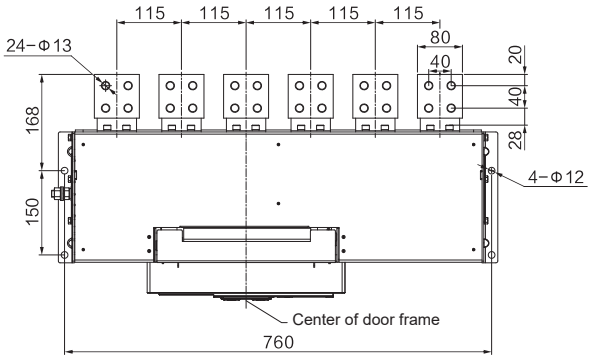
Current spec.	a
2900, 3200, 3600, 3900, 4000	30

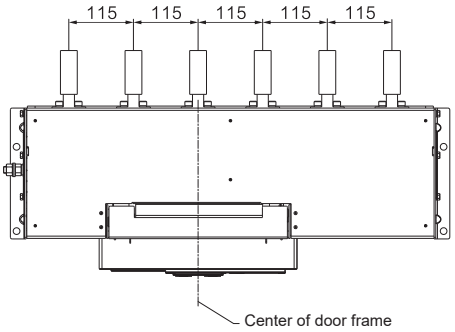
TeW5 Series Air Circuit Breaker

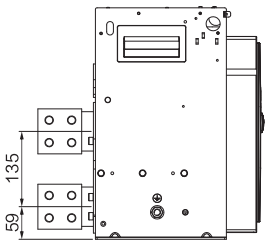
TeW5-6300/3P fixed type









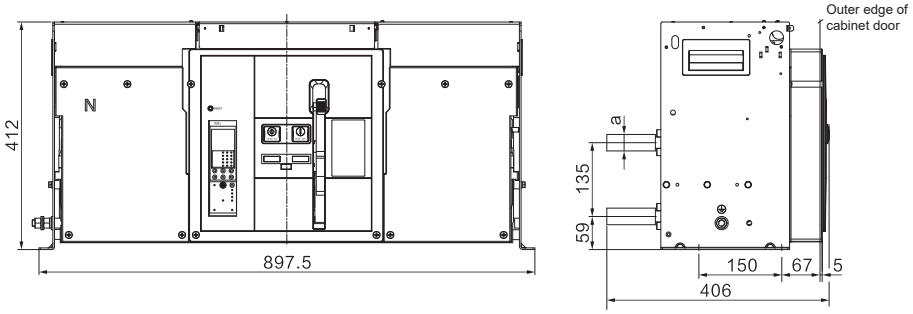


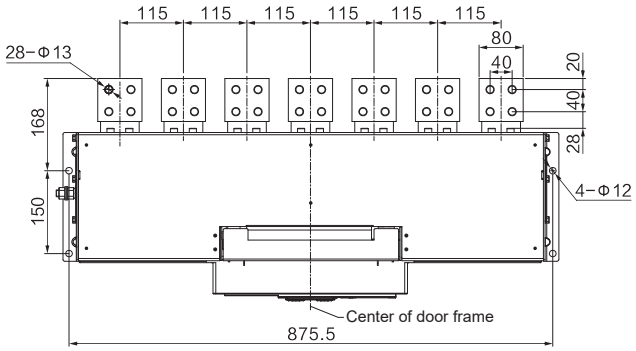
Vertical connection

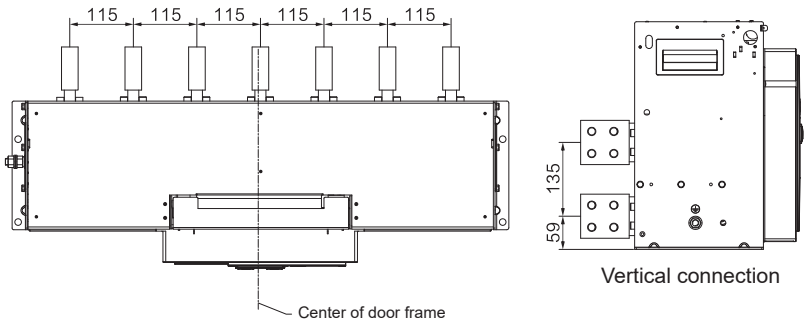
Current spec.	a
4000	20
4900, 5000, 5900, 6300	30

TeW5 Series Air Circuit Breaker

TeW5-6300/4P fixed type





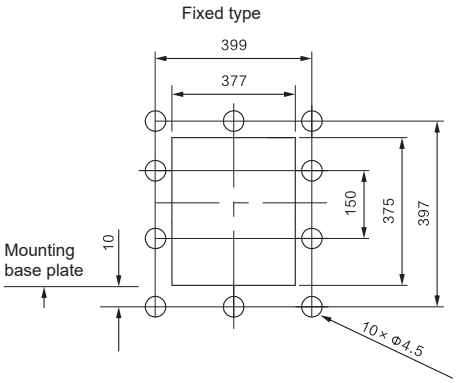


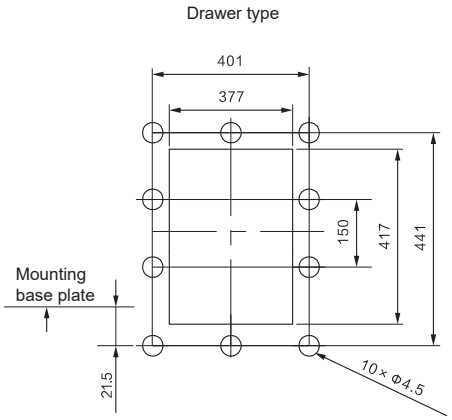
Vertical connection

Current spec.	a
4000	20
4900, 5000, 5900, 6300	30

TeW5 Series Air Circuit Breaker

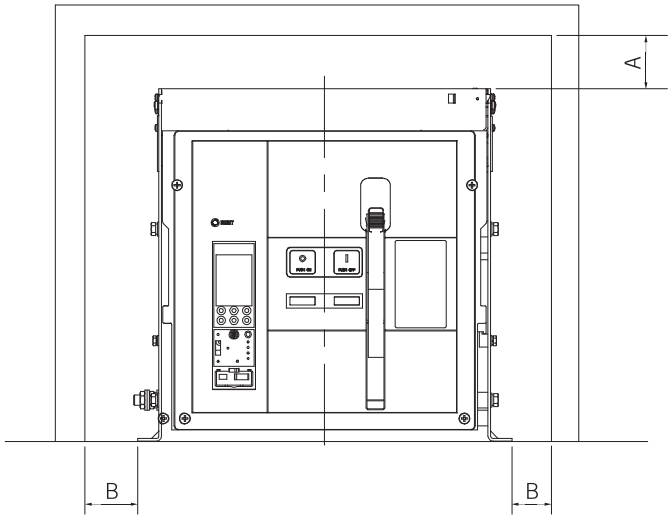
TeW5-6300 door frame Hole size

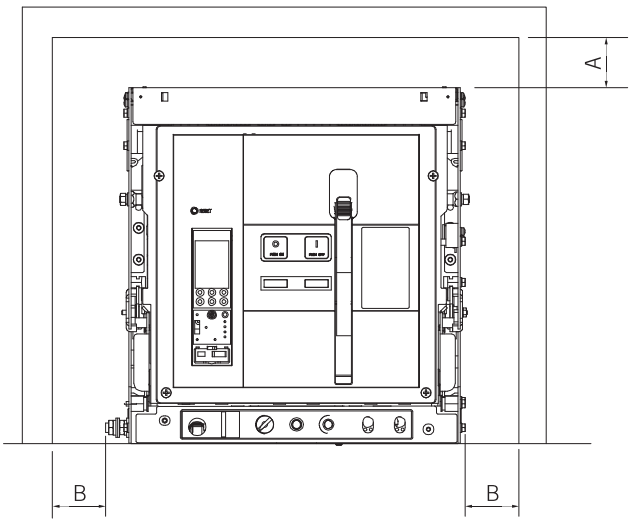




9 Safety Distance

Max. safety distance between the circuit breaker and the cabinet when the circuit breaker is installed in the cabinet

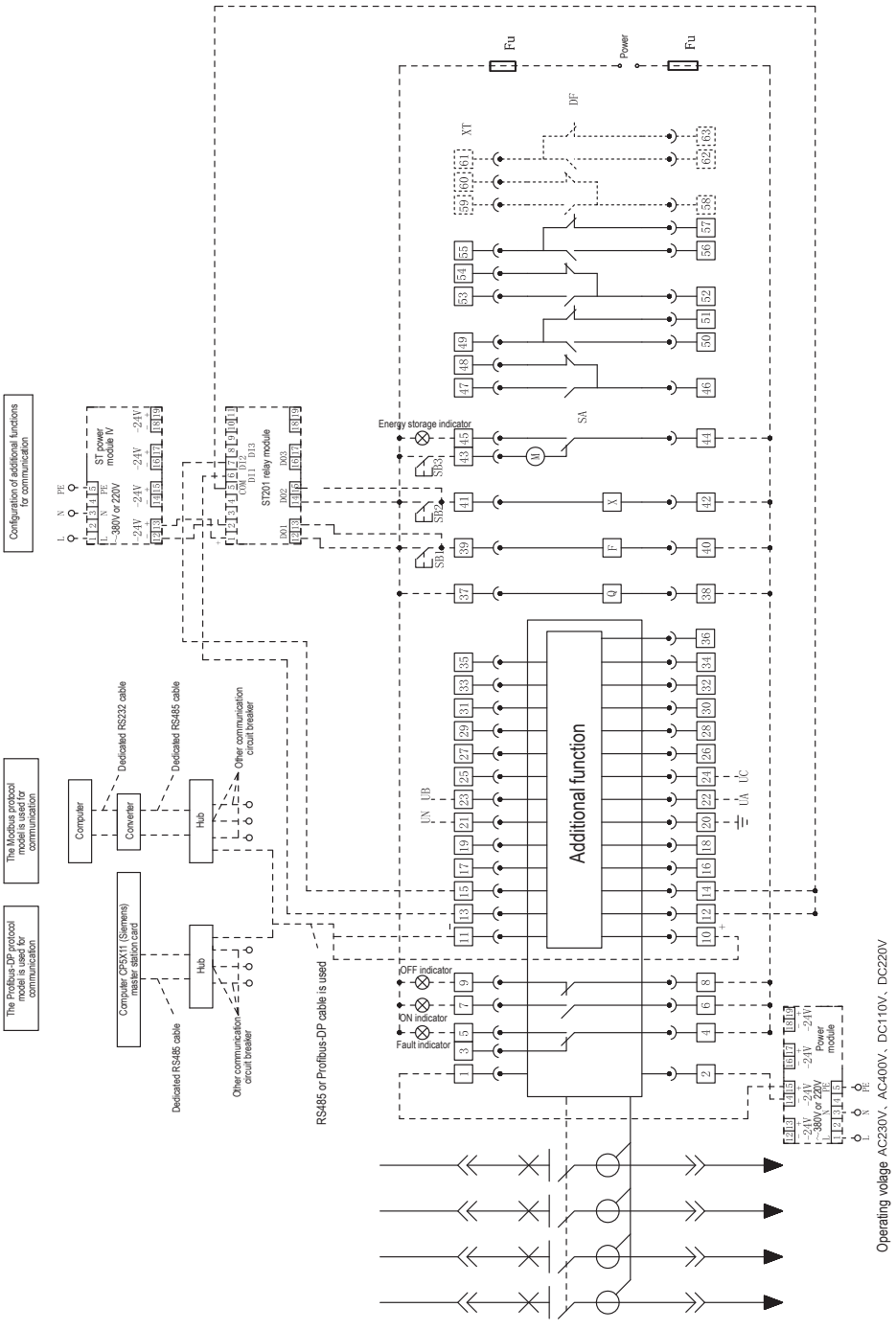




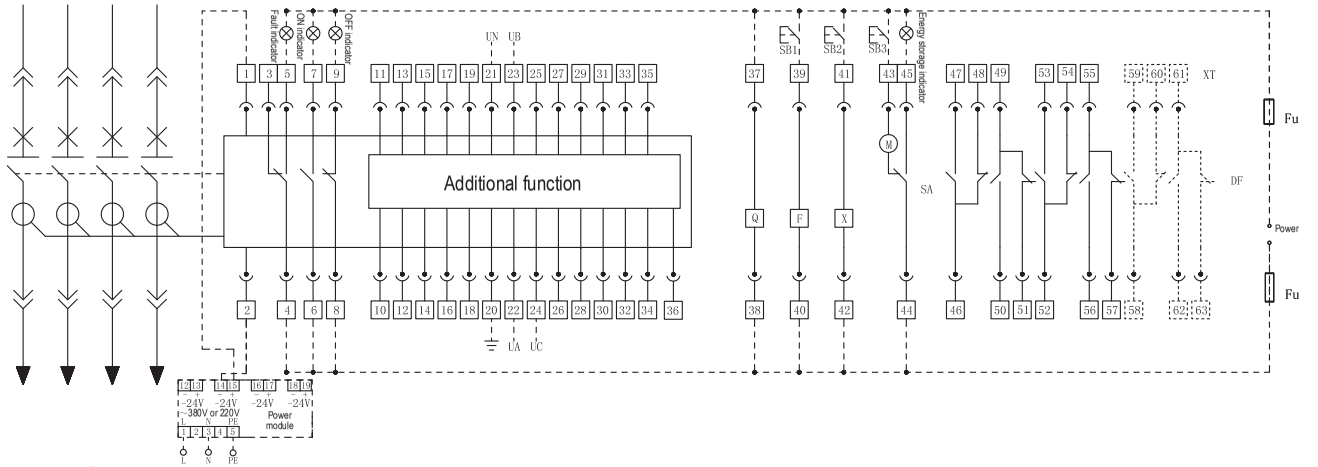
Circuit breaker installation method	To insulator		To metal body	
	A	B	A	B
Drawer type (mm)	0	0	0	0
Fixed type (mm)	0	30	0	70

10 Electrical Diagram

10.1 TeW5-1600-3H controller secondary wiring diagram



10.2 TeW5-1600-3M/M controller secondary wiring diagram



Operating volage AC230V、AC400V、DC110V、DC220V

● Power Input

1#, 2#: As there are multiple optional operating power supplies for controller, please check whether the input power supply type is consistent with the operating power type of the controller, otherwise the controller will be damaged.

● Fault trip aux. contact

3#, 4#, 5#: Fault trip contact output (four pins are common ends), contact capacity: AC250V, 16A

● Aux. contact synchronized with the circuit breaker

6#, 7#: Closing indicating contact output, contact capacity: AC250V, 16A

8#, 9#: Opening indicating contact output, contact capacity: AC250V, 16A

● Communication output

10#, 11#: Communication interface output, three communication protocol output modes are same.

12#、13#、14#、15#:

13# (DO1) remote opening output, 15# (DO2) remote closing output, 12#, 14# opening and closing common ends.

● Programmable input/output interface

16#~19#: Do: DC110V 0.5A, AC250V, 5A.

16#, 17#: Programmable output contact 4 (DO4)

18#, 19#: Programmable output contact 5 (DO5)

● Regional interlock

31#, 32#, 33#, 34#:

31#, 32#(DO3) ZSI output,

33#, 34# (DI1)ZSI input DC24V.

33# is positive and 34# is negative.

● Protective earthing

20#: It is the earth wire of the controller

● Voltage signal input

21#-24#: The pin is the input end of the voltage signal; check the wiring sequence to prevent wrong connection. If this additional function is unavailable, the pin is empty.

● External transformer input

25#, 26#: When the earthing protection is of the 3P+N type, the external N phase transformer is connected, and the 25# is positive.

27#, 28#: When the earthing protection is of the earth current type (W type), this pin is connected to the output of the earthing transformer ZT100. When the earthing protection is of the electric leakage type (type E), this pin is connected to the output of the external ZCT1 rectangular

● transformer.

Reserved interface for expansion module

35#, 36#: Reserved interface for expansion module; this pin is empty.

Codes and names of all accessories

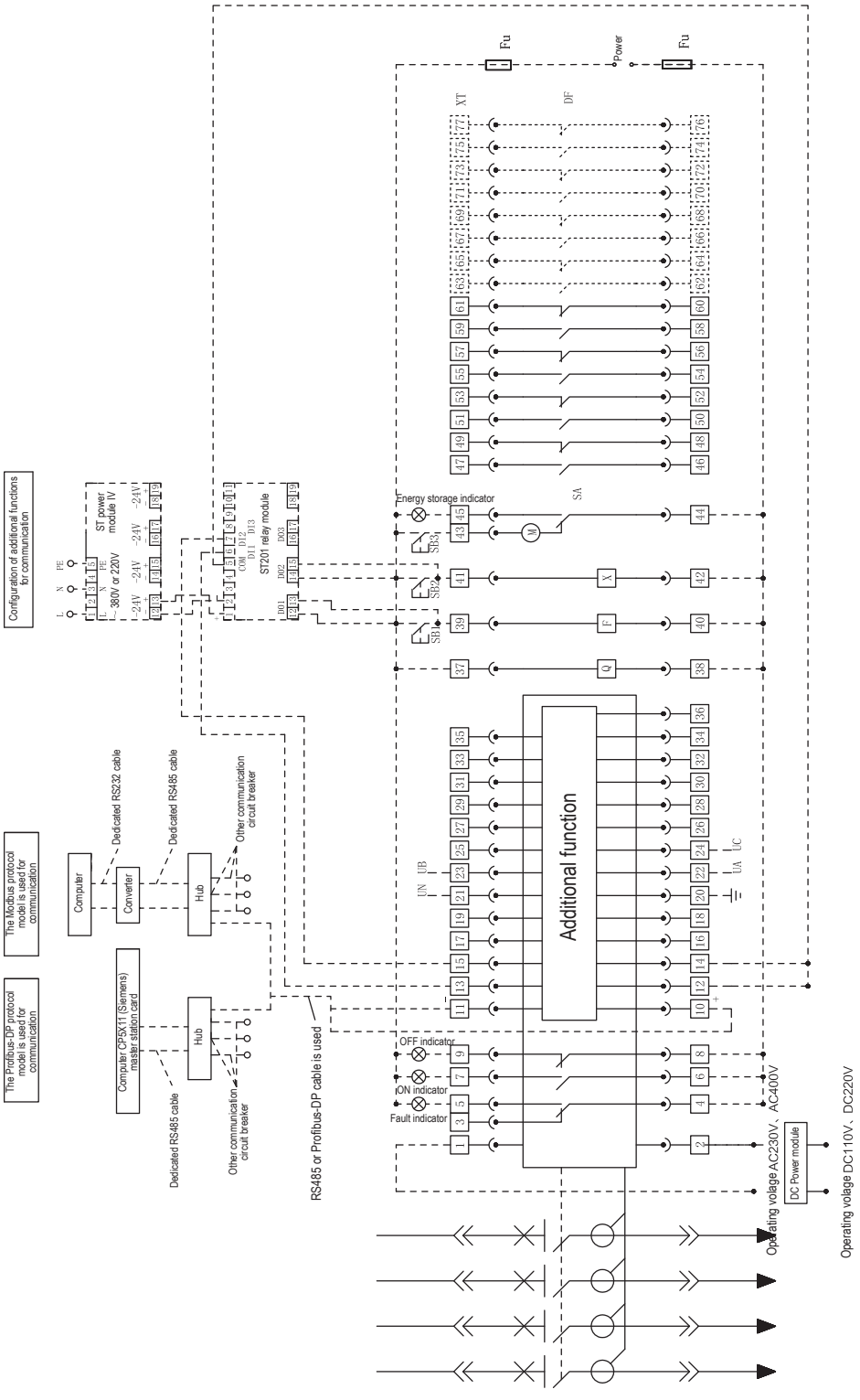
SB_1: Shunt button	Q: Undervoltage (instantaneous or delay) release
SB_2: Closing button	F: Shunt release
SB_3: Electric energy storage button	X: Closing solenoid
SA: Motor travel switch	M: Energy storage motor
DF: Aux. switch	XT: Terminal block
FU: Fuse (provided by user)	

Notes:

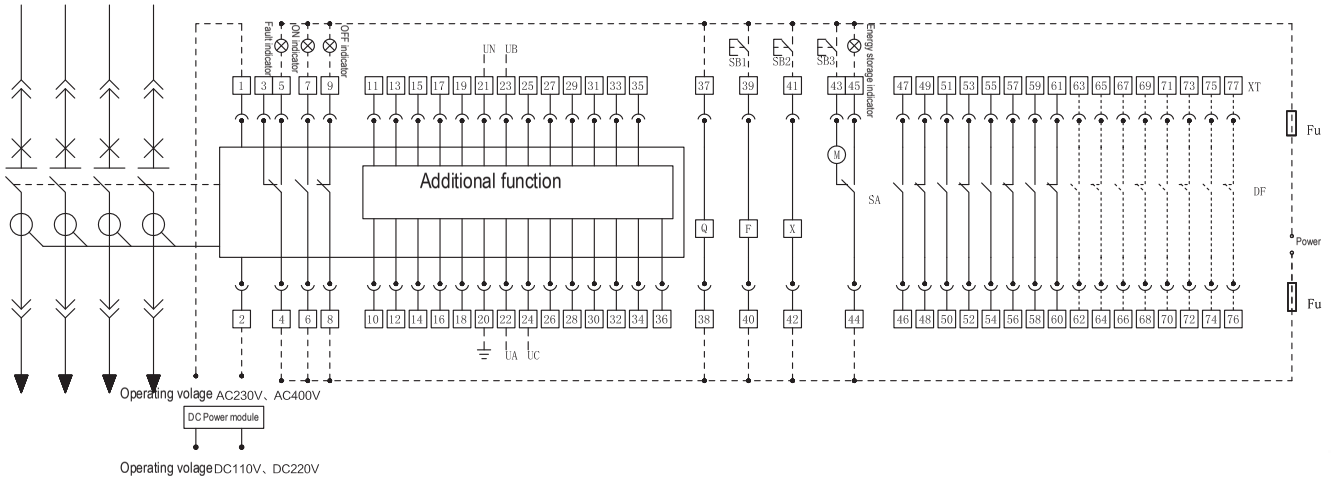
1. Those marked in the dashed box are wired by the user;
2. If the Q, F, X, M and intelligent controller have the different rated voltage, they can be connected to the power supply separately;
3. All indicators, buttons, fuses and relays should be provided by the user.
4. When the additional functions of the function meter are available, please connect the wires according to the voltage sequence to prevent wrong connection.
5. When the power distribution system is a three-phase three-wire system, 21# and 23# are short circuited to UB. For three-phase four-wire system, please connect the wire according to this diagram.
6. 43# pin can be directly connected to the power supply (automatic pre-storage of energy).
7. The Aux. contacts of the conventional configuration are four sets of conversion contacts, and the terminals after 58# are empty.

TeW5 Series Air Circuit Breaker

10.3 TeW5-2500/4000/6300-3H controller secondary wiring diagram



10.4 TeW5-2500/4000/6300-3M/M Controller Secondary Wiring Diagram



Power Input
1#, 2#: As there are multiple optional operating power supplies for controller, please check whether the input power supply type is consistent with the operating power type of the controller, otherwise the controller will be damaged.

Fault trip aux. contact
3#, 4#, 5#: Fault trip contact output (four pins are common ends), contact capacity: AC250V, 16A

Aux. contact synchronized with the circuit breaker
6#, 7#: Closing indicating contact output, contact capacity: AC250V, 16A
8#, 9#: Opening indicating contact output, contact capacity: AC250V, 16A

Communication output
10#, 11#: Communication interface output, three communication protocol output modes are same.
12#、13#、14#、15#:
13# (DO1) remote opening output, 15# (DO2) remote closing output, 12#, 14# opening and closing common ends.

Programmable input/output interface
16#~19#: Do: DC110V 0.5A, AC250V, 5A.
16#, 17#: Programmable output contact 4 (DO4)
18#, 19#: Programmable output contact 5 (DO5)

Regional interlock
31#, 32#, 33#, 34#:
31#, 32#(DO3) ZSI output,
33#, 34# (DI1) ZSI input DC24V.
33# is positive and 34# is negative.

Protective earthing
20#: It is the earth wire of the controller

Voltage signal input
21#-24#: The pin is the input end of the voltage signal; check the wiring sequence to prevent wrong connection. If this additional function is unavailable, the pin is empty.

External transformer input
25#, 26#: When the earthing protection is of the 3P+N type, the external N phase transformer is connected, and the 25# is positive.
27#, 28#: When the earthing protection is of the earth current type (W type), this pin is connected to the output of the earthing transformer ZT100. When the earthing protection is of the electric leakage type (type E), this pin is connected to the output of the external ZCT1 rectangular transformer.

Remote reset function
29#, 30#: The input of the remote reset function shall be connected to the AC220V power supply, and the circuit is connected to the button switch control in series; if this optional function is unavailable, this pin is empty.

Aux. switch: Ten-open and ten-closed is customized, this terminal number is occupied, and the corresponding function of the original terminal number is unavailable.

Reserved interface for expansion module
35#, 36#: Reserved interface for expansion module; this pin is empty.

Codes and names of all accessories

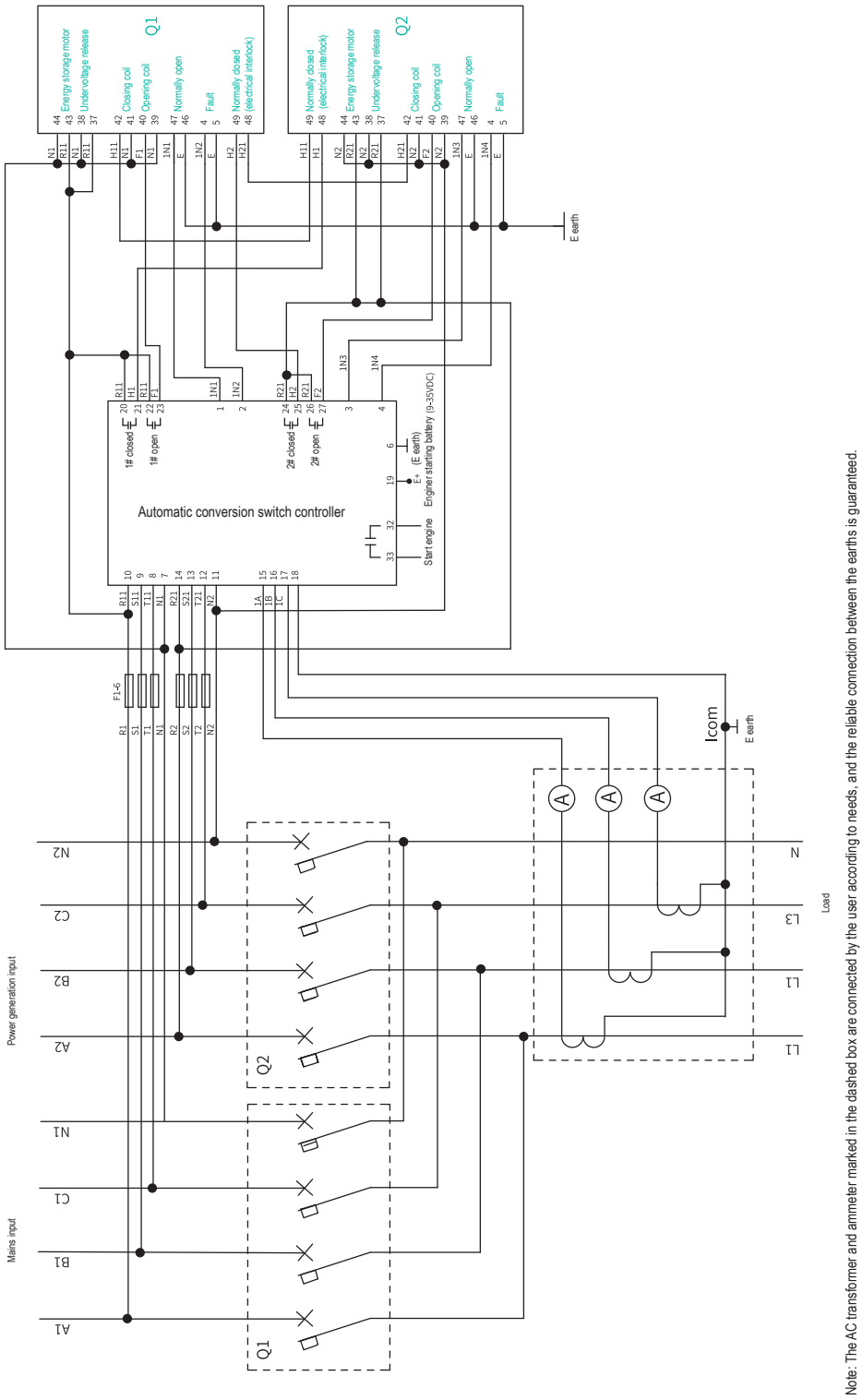
SB_1: Shunt button	Q: Undervoltage (instantaneous or delay) release
SB_2: Closing button	F: Shunt release
SB_3: Electric energy storage button	X: Closing solenoid
SA: Motor travel switch	M: Energy storage motor
DF: Aux. switch	XT: Terminal block
FU: Fuse (provided by user)	

Notes:
1. Those marked in the dashed box are wired by the user;
2. If the Q, F, X, M and intelligent controller have the different rated voltage, they can be connected to the power supply separately;
3. All indicators, buttons, fuses and relays should be provided by the user.
4. When the additional functions of the function meter are available, please connect the wires according to the voltage sequence to prevent wrong connection.
5. When the power distribution system is a three-phase three-wire system, 21# and 23# are short circuited to UB. For three-phase four-wire system, please connect the wire according to this diagram.
6. 43# pin can be directly connected to the power supply (automatic pre-storage of energy).
7. The Aux. contacts of the conventional configuration are four-open and four-closed contacts, and the terminals after 62# are empty.

TeW5 Series Air Circuit Breaker

10.5 Dual power automatic conversion system electrical wiring diagram (2500/4000/6300 frame)

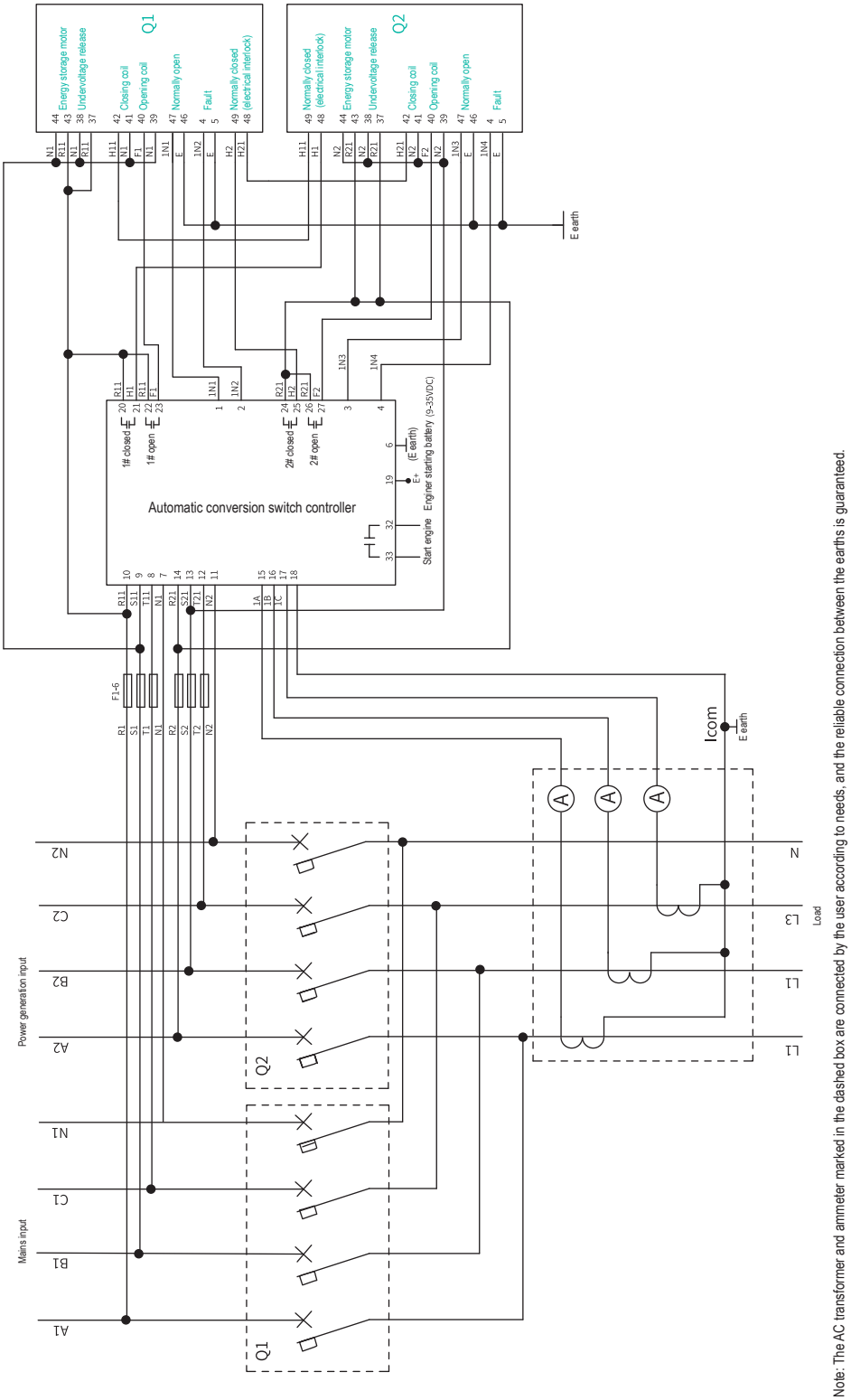
Dual power automatic conversion system AC 230V electrical wiring diagram (mains supply – power generation)



Note: The AC transformer and ammeter marked in the dashed box are connected by the user according to needs, and the reliable connection between the earths is guaranteed.

10.6 Dual power automatic conversion system electrical wiring diagram (2500/4000/6300 frame)

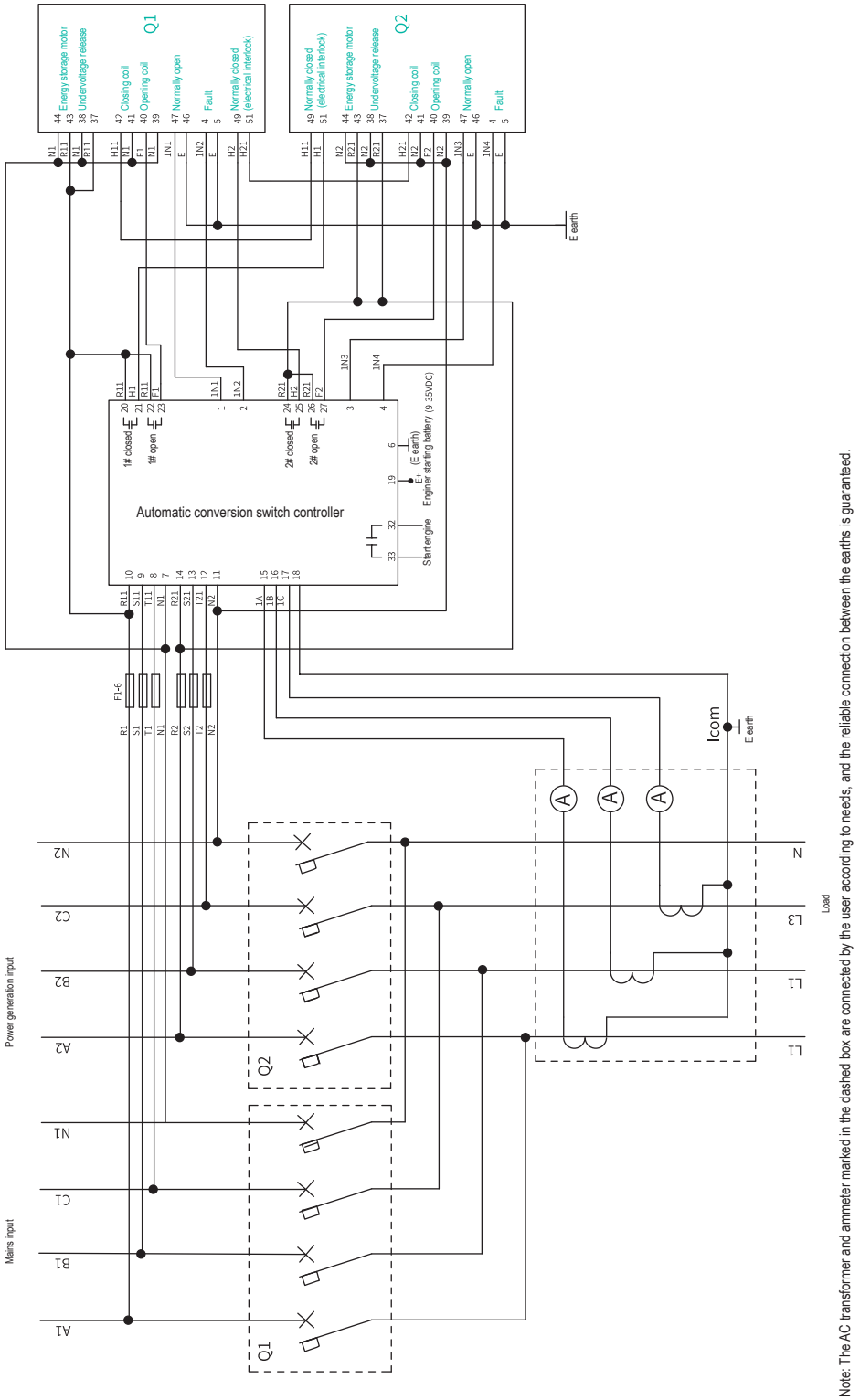
Dual power automatic conversion system AC 380V electrical wiring diagram (mains supply – power generation)



TeW5 Series Air Circuit Breaker

10.7 Dual power automatic conversion system electrical wiring diagram (1600 frame)

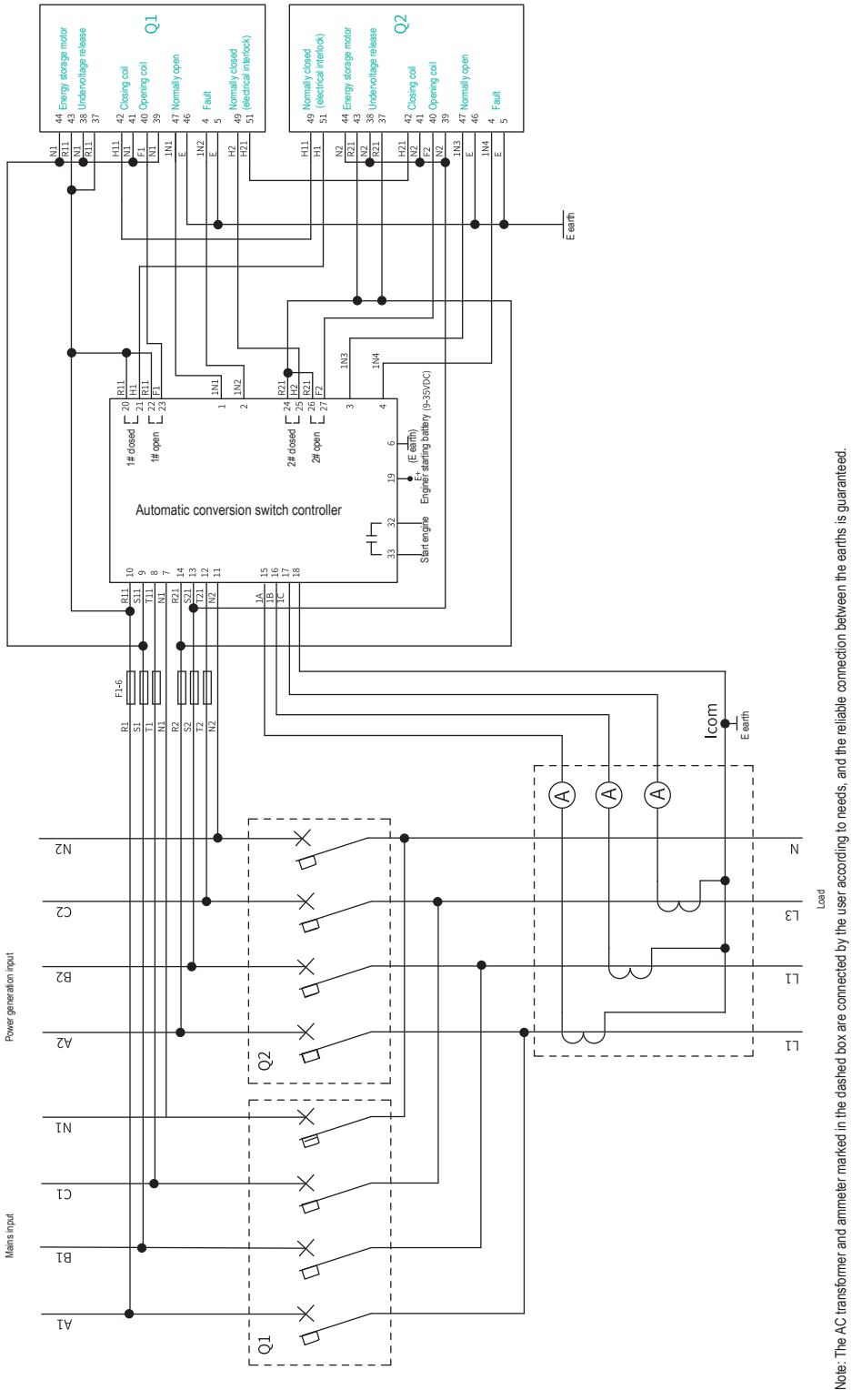
Dual power automatic conversion system AC 230V electrical wiring diagram (mains supply – power generation)



Note: The AC transformer and ammeter marked in the dashed box are connected by the user according to needs, and the reliable connection between the earths is guaranteed.

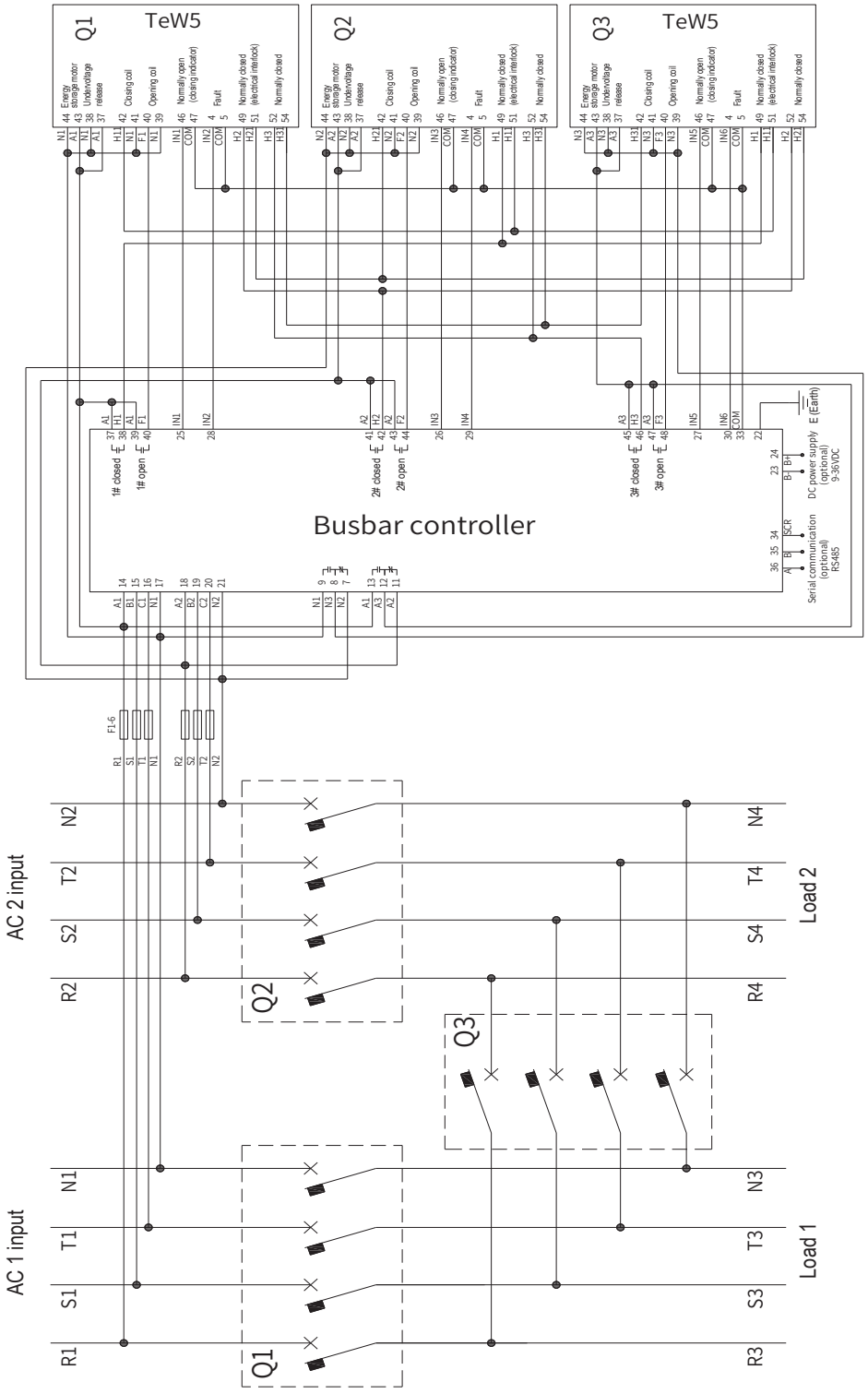
10.8 Dual power automatic conversion system electrical wiring diagram (1600 frame)

Dual power automatic conversion system AC 380V electrical wiring diagram (mains supply – power generation)

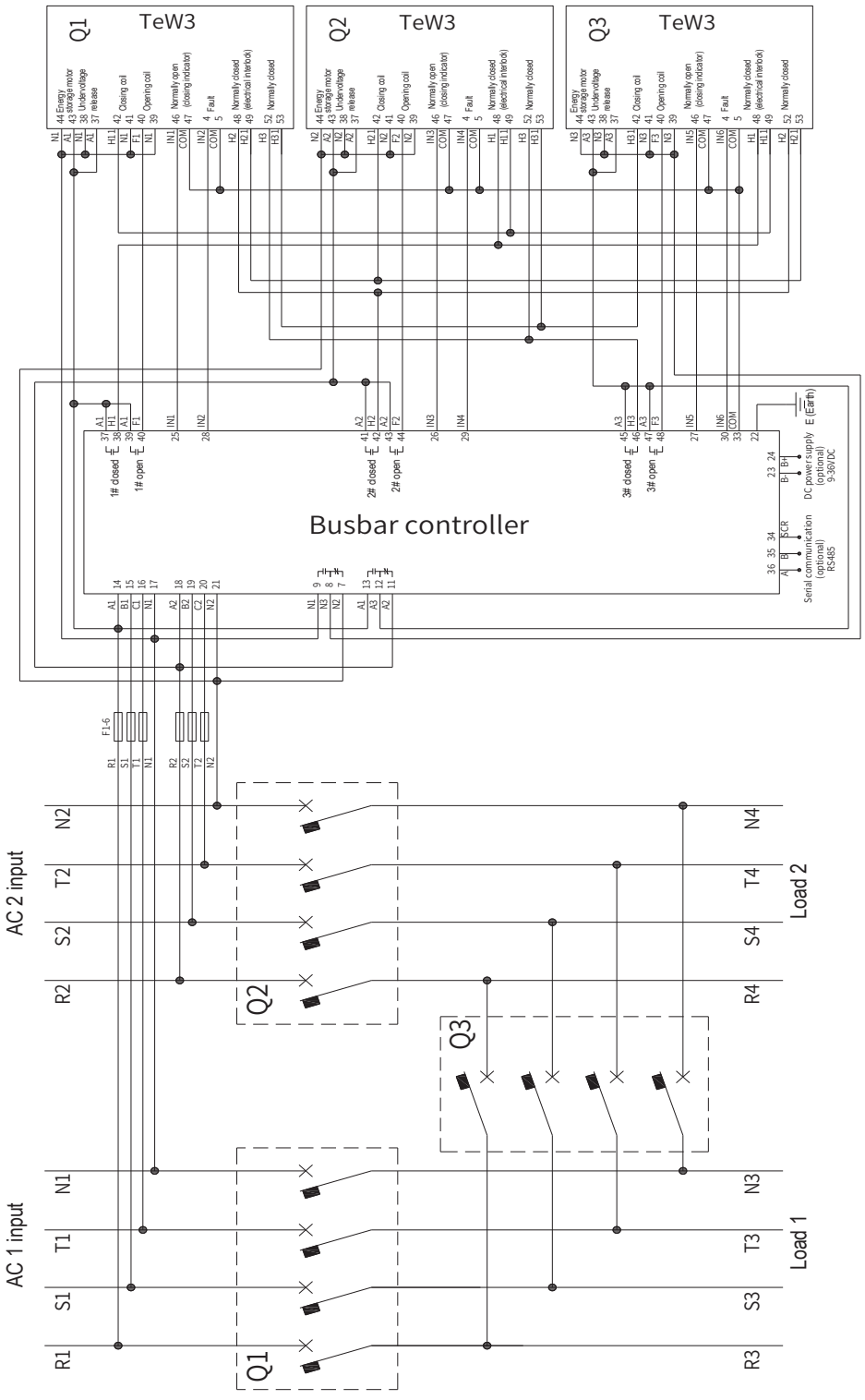


TeW5 Series Air Circuit Breaker

10.9 TeW5-1600 Busbar Controller Electrical Wiring Diagram

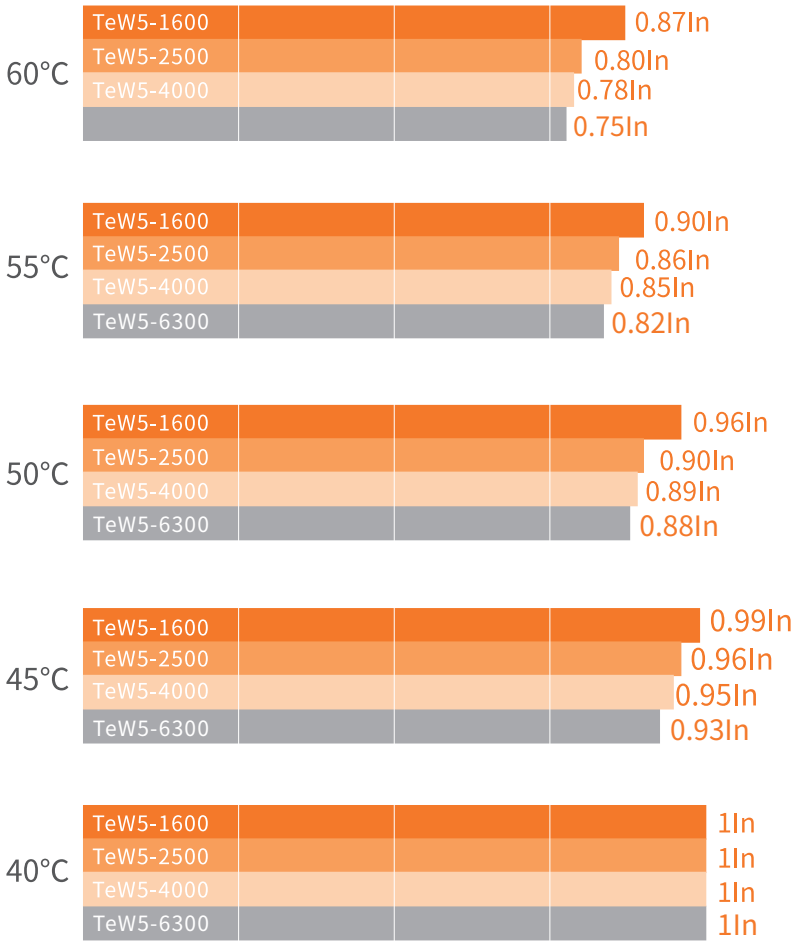


10.10 TeW5-2500/4000/6300 Busbar Controller Electrical Wiring Diagram



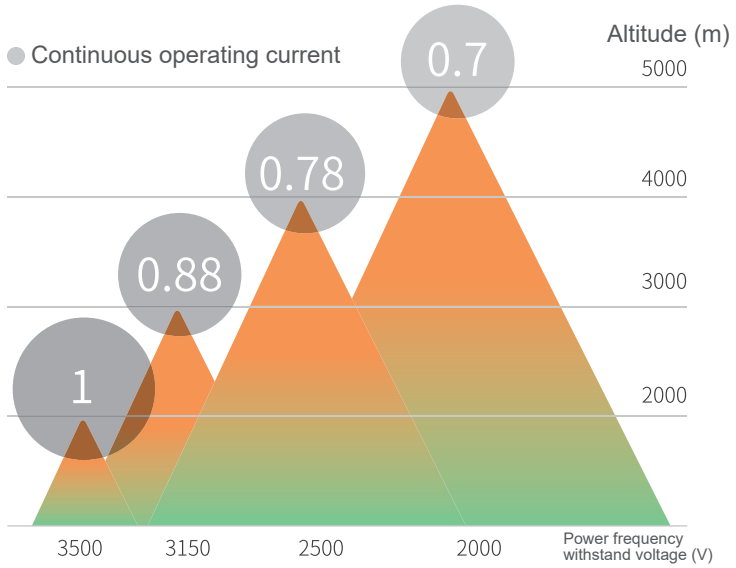
TeW5 Series Air Circuit Breaker

Table of derating coefficients under different ambient temperature



TeW5 Series Air Circuit Breaker

Table of derating coefficients when the altitude is above 2000 m



Circuit breaker wiring copper busbar specifications reference table

Frame rated current	Rated current	Copper busbar	
		Qty.	Dimensions (mm x mm)
1600	200	1	20x5
	400	1	50x5
	630	2	40x5
	800	2	50x5
	1000	3	40x5
	1250	4	40x5
	1600	2	50x10
2500	630	2	50x5
	800	2	60x5
	1000	2	60x5
	1250	3	60x5
	1600	2	60x10
	1900	3	60x10
	2000	3	60x10
	2500	4	60x10
4000	2500	4	100x5
	2900	3	100x10
	3200	4	100x10
	3600	4	100x10
	4000	4	100x10
6300	5000	3	100x10
	6300	4	100x10

TeW5 Series Air Circuit Breaker

Installation

Check whether the specifications of the circuit breaker meet the requirements before installation.

Before installation, check the insulation resistance of the circuit breaker with a 500V megohmmeter according to the regulations, and the insulation resistance shall not be less than 10 MQ under the conditions of the surrounding medium temperature of 25°C ± 5°C and the relative humidity of 50% ~ 70%. The product cannot be used if lower than 10MQ, and please contact the supplier for solution. The insulation resistance test parts are as follows: When the circuit breaker is closed, the test position is located between the poles and between the pole and the frame; when the circuit is open, the test position is located between the inlet and outlet of each pole.

When the circuit breaker is installed, its base shall be in the horizontal position and are fixed through four M10 bolts, and the circuit breaker shall be balanced when installation without additional mechanical stress and is earthed reliably. The earthing bolts are marked with .

When installation, prevent the foreign objects falling into the circuit breaker.

When installing the fixed circuit breaker, a safety space shall be provided strictly according to the instructions, with 0 mm kept above and with 70 mm kept in the left and right sides.

After the circuit breaker is installed and the wires are connected according to the secondary wiring diagram, the following operation tests are carried out before the main circuit is energized (for drawer type circuit breaker, the indicator on the drawer base points to the test position):

a Check whether the undervoltage release, shunt release, motor mechanism and closing electromagnet can work reliably within the specified range (the undervoltage release shall be pulled in, and then the circuit breaker can work);

b Pull the handle on the cover up and down, and the "Energy storage" is displayed on the panel after pulling seven times, and then the energy storage is ended when a "click" sound is heard; press the "I" button or energize the closing electromagnet to close the circuit breaker reliably (in the case of controller reset), and pull the handle to store energy again;

c Energize the motor until the "Energy storage" is displayed on the panel and a "click" sound is heard, so that the energy storage is ended, and the motor is deenergized automatically. Press the "I" button or energize the closing electromagnet to close the circuit breaker reliably;

d When the circuit breaker is in the closed state, the circuit breaker can open during the trip test of the intelligent controller no matter the undervoltage and shunt releases or the "O" button on the cover is used.

Maintenance

Each rotating part shall be regularly filled with lubricating oil during operation.

The circuit breaker shall be subject to the regular maintenance and dust removal to keep its insulation level.

The contact system shall be checked regularly especially after each short circuit breaking action. The inspection contents are as follows:

a Check whether the smoke traces on the two walls of the arc extinguishing chamber are removed, whether the arc extinguishing wall is damaged, whether the arc extinguishing grid is seriously burnt out, and replace them in time according to the situation;

b Check whether the contact is in good contact, and send the contact with a thickness of less than 1 mm to the manufac turer for replacement;

c Check whether the connecting parts are loose.

TeW5 Series Air Circuit Breaker

Common faults and solutions

Possible problems that may occur during the installation, debugging and operation of circuit breaker by user are exampled and their possible causes, inspection and solutions are listed below.

No.	Technical problem	Possible cause	Inspection and solution
1	Circuit breaker trip (fault indicator is on)	● Overload fault trip (long delay indicator is on)	1. Check the breaking current and operation time on the intelligent controller; 2. Analyze the operation conditions of the load and power grid; 3. If the overload is confirmed, find out the fault immediately for troubleshooting; 4. If the actual operating current is inconsistent with the long delay operating current, please modify the setting value of the long delay operating current according to the actual operating current for appropriate matching protection; 5. Press the reset button to reclose the circuit breaker.
		● Short circuit fault trip (short delay or instantaneous indicator is on)	1. Check the breaking current value and operation time on the intelligent controller; 2. If the short circuit is confirmed, find out the fault immediately for troubleshooting; 3. Check the setting value of the intelligent controller; 4. Check whether the circuit breaker works normally, and confirm whether it can be closed for operation; 5. Press the reset button to reclose the circuit breaker.
		● Earth fault trip (earth fault indicator is on)	1. Check the breaking current value and operation time on the intelligent controller; 2. If the earth fault is confirmed, find out the fault immediately for troubleshooting; 3. If there is no earthing fault, please check whether the setting value of the earth fault is appropriate and whether it matches with the actual protective phase; if the setting value is inappropriate, please modify the setting value of the earth fault current; 4. Press the reset button to reclose the circuit breaker.
		● Undervoltage release trip	1. Check whether the power supply voltage is lower than 70%Ue; 2. Check whether the undervoltage release and control unit are failed.
2	Circuit breaker unable to close	● Undervoltage release is not pulled in	1. Check whether the undervoltage release has been energized; 2. Check whether the power supply voltage is lower than 85%Ue; 3. Check whether the under-voltage release and the control unit are failed, and replace the under-voltage release if the fault is confirmed.
		● Reset button not pressed	Press the reset button to reclose the circuit breaker.
		● Drawer type circuit breaker failed to be turned in place	Turn the drawer type circuit breaker in place (locked in the "Connect" or "Test" position).
		● The secondary circuit of the drawer type circuit breaker has poor contact	Check the secondary circuit contact for exclusion.
		● Circuit breaker does not pre-store energy	1. Check whether the motor control power supply is connected and it must be > 85%Us; 2. Check whether the motor energy storage mechanism is failed.
		● The mechanical interlock works to lock the circuit breaker	Check whether the mechanical interlock of two circuit breakers is in normal working condition.
		● Closing electromagnet failed	1. Check that the power supply voltage of the closing electromagnet must be > 85%Us; 2. If the closing electromagnet is failed and cannot be pulled in, please replace it.

TeW5 Series Air Circuit Breaker

Common faults and solutions

No.	Technical problem	Possible cause	Inspection and solution
3	Circuit breaker trips after closing	● Trip immediately ● Delay trip	1. There is a short circuit current in the circuit when closing, and find it out for solution; 2. Check the circuit for overload current, and find it out if necessary for solution; 3. Check whether the circuit breaker mechanism is in good condition; 4. Check whether the setting value of the intelligent controller is reasonable, and re-set it if unreasonable; 5. Press the reset button to reclose the circuit breaker.
4	Circuit breaker failed to open	● Unable to remotely open the circuit breaker electrically ● Unable to use the opening button to open teh circuit breaker	1. Check whether the shunt release circuit is connected reliably and whether the shunt release is faulty, and replace the shunt release if it is confirmed that there is a fault; 2. Check the operating mechanism for mechanical failure; 3. Check whether the voltage of the shunt release is lower than 85%.
5	Circuit breaker failed to store energy	● Unable to store energy manually ● Unable to store energy electrically	1. Check that the control power supply voltage of the electric energy storage device should be > 85%Us, and that the circuit is connected properly; 2. Check the motor for fault; 3. The energy storage mechanism is failed.
6	The drawer type circuit breaker is in the "Disconnect" position, and it cannot be pulled out	● The rocker is not pulled out ● Circuit breaker does not fully reach the "Disconnect" position	1. Pull out the rocker. 2. Turn the circuit breaker completely to the "Disconnect" position.
7	Drawer type circuit breaker failed to turn to the "Connect" position	● Foreign object fallen into the drawer base to block the shake-in mechanism or the shake-in mechanism gear is damaged	Check for foreign objects and check the rack and gear.
8	No display on the intelligent controller screen	● The intelligent controller is not connected to the power supply ● The input voltage of the aux. power supply is abnormal ● The secondary output voltage of the base transformer is abnormal ● The connection between the secondary output of the base transformer and the controller is unreliable	1. Check whether the power supply of the intelligent controller is connected properly; 2. Cut off the power supply of the intelligent controller, and then turn on the power supply; if there is still a fault, the controller may be failed and shall be replaced.
9	3H controller communication is abnormal	● No reliable connection between the communication line and the circuit breaker wiring terminal ● The terminals A and B of the communication line are connected reversely ● The communication distance and connection method are failed and do not meet the requirements ● The communication address of circuit breaker is set improperly ● The communication parameters setting is mismatched	1. Check whether the communication line and the circuit breaker terminal are connected reliably or wrongly; 2. Check whether the terminals A and B of the communication line are connected reversely, and correct them if necessary; 3. Check whether the communication distance and connection mode meet the requirements; 4. Check whether the circuit breaker communication address is set correctly without confliction.
10	"ERR9I" displayed on the intelligent controller	The ambient temperature of the controller is too high	Reduce the ambient temperature

TeW5 Series Air Circuit Breaker

11 Order Specification

User unit		Order qty.	Order time
Model & Spec.	TeW5- □□□□	□ Fixed type □ Three poles □ Drawer type □ Four poles	□ Rated current In = A
Accessories	□ Current and time setting value	According to the factory setting	
	□ The current and time setting values meet the user requirements (customized by the user according to the actual demands)	1. The overload long delay setting current is A, and the setting time is S 2. The short circuit short delay reverse time setting current is A 3. The short circuit short delay reverse time setting current is A, and the setting time is S 4. The short circuit instantaneous setting current is A 5. The earthing fault setting current is A, and the setting time is S	
	Earthing mode	□ 3PT □ 4PT □ (3P+N)T	
	Electric leakage monitoring mode	□ Three-phase three-wire (external leakage transformer ZCT1) □ Three-phase three-wire (external leakage transformer ZCT1) □ With PE or PEN (external leakage transformer ZT100)	
	Power supply	□ AC220V/230V □ AC380V/400V □ DC110V □ DC24V	
	Shunt release	□ AC220V/230V □ AC380V/400V □ DC110V	
	Closing electromagnet	□ AC220V/230V □ AC380V/400V □ DC110V	
	Motor mechanism	□ AC220V/230V □ AC380V/400V □ DC110V	
	Aux. contact	□ 4a4b((standard) □ 6a6b □ 8a8b □ 10a10b	
	Undervoltage release No-voltage release	□ AC220V/230V □ AC380V/400V □ Self-suction type □ Aid-suction type □ Undervoltage instantaneous release □ No-voltage instantaneous release □ Undervoltage delay release □ Undervoltage delay release □ 1s □ 3s □ 5s □ 10s	
	Mechanical interlock	□ Steel cable interlock □ Lever interlock □ Three-lock two-key □ Two-lock one-key □ One-lock one-key	
	Wiring connection mode	□ Horizontal connection (standard) □ Vertical connection (customzied) □ Vertical connection (customzied)	
Special environment	□ Low temperature □ Plateau □ Coastal		

Controller function			3M	3H
Protection	Current protection	Overload long delay protection	■	■
		Short circuit short delay protection	■	■
		Short circuit instantaneous protection	■	■
		Earth fault protection	■	■
		Electric leakage protection	-	□
		(4P/3P+N) Neutral pole protection (4P/3P+N)	□	□
		Overload pre-warning	■	■
		Current unbalance (phase loss) protection	■	■
	Voltage protection	Overvoltage protection	-	□
		Undervoltage protection	-	□
		Voltage unbalance protection	-	□
		Over-frequency protection	-	□
		Under-frequency protection	-	□
		Phase sequence protection	-	□
	Power protection	Reverse power protection	-	□
	Temperature protection	Contact/environment/busbar temperature	-	□
Measurement function	Current function: Three-phase current, neutral pole current, earthing current		■	■
	Voltage function: Frequency, line voltage, phase voltage, mean voltage, voltage unbalance		-	□
	Power function	Power: Active power, reactive power, apparent power, power factor	-	□
		Electrical energy: Active electrical energy, reactive electrical energy, apparent electrical energy	-	□
	Harmonic function		-	□
	Waveform capture		-	□
	Thermal memory		■	■
	Load monitoring		-	□
Contact output (I/O)	Programmable contact output		-	□
	Aux. contact output (Opening/Closing synchronized with circuit breaker)		■	■
	Alarm signal output (after circuit breaker trips due to fault)		■	■
Wired communi-cations	Based on RS485, standard Modbus protocol		-	■
Function test records	Simulated functional test		■	■
	Fault records		Last 8 records	
	Displacement record		Last 8 records	
	Alarm record		Last 8 records	
	Operation times record		■	■

■ Standard □ Optional - No

Notes: 1. If the user has other special requirements for ordering, please contact the manufacturer for negotiation;
2. Unless otherwise specified, the time and current setting values of the controller shall be set according to the factory setting parameters;
3. The standard accessories of the TeW5 series include a four sets of conversion contacts, a shunt release, a closing electromagnet, a phase partition, a door frame, a motor mechanism and a drawer base (no drawer base available for fixed type);
4. TeW5-1600 frame auxiliary switch has up to six sets of conversion contacts;
5. The accessory prices refer to the price book.
6. TeW5-1600, TeW5-2500, TeW5-4000, and TeW5-6300 have rotary vertical busbars.
7. The controller can have a customized temperature protection (contact temperature, contact/ busbar/ ambient temperature). Measurement of temperature of the primary terminal.