TGW3

Series Air Circuit Breaker

TGW3 Series Air Circuit Breaker

1 Overview

TGW3 series air circuit breaker (hereinafter referred to as circuit breaker) is used in the AC 50/60Hz power distribution network with a rated operating voltage AC690V and below and a rated operating current 4000A and below to distribute electric energy and protect lines and power equipment to prevent damages caused by overload, undervoltage, short circuit, and single-phase earthing faults. The circuit breaker has intelligent protection function and precise selective protection, which can improve power supply reliability and avoid unnecessary power outages. The circuit breaker can be widely used in power stations, factories, mines (especially 690V) and modern high-rise buildings, especially in the distribution system in intelligent buildings, and is also widely used in green energy projects such as wind power generation and solar power generation.

2 Normal Operation, Installation, Transportation and Storage Conditions

2.1 Normal working conditions

2.1.1 The electrical and mechanical characteristics are applicable to ambient temperatures of -5°C~+40°C; they can also be applicable to ambient temperatures of -45°C~+70°C (for 3-M type, 3-V type), -20°C+70°C (for 3-H type, 3-S type). However, the derating is required if greater than +40°C.

2.1.2 The altitude at the installation site does not exceed 2000m. For circuit breakers used at altitudes above 2000m, the air cooling effect and the decrease in dielectric strength shall be considered. The derating is required for circuit breakers used under the above conditions. The derating factors are listed in Table 8.

2.1.3 The relative humidity of the atmosphere shall not exceed 50% at a maximum temperature of +40°C. A higher relative humidity can be allowed at lower temperatures, such as up to 90% at 20°C. Special measures should be taken for condensation occasionally occurred due to temperature changes.

2.1.4 The pollution degree is Level 3.

2.1.5 The use category is Class B.

2.1.6 The installation category of the circuit breaker is Class IV. When the rated operating voltage of the main circuit is ≤AC415V, the

TGW3 Series Air Circuit Breaker

installation category of the control circuit and auxiliary circuit is Class III except that the undervoltage release coil and the primary coil of the power transformer of the intelligent trip unit are the same as that of the circuit breaker; when the rated operating voltage of the main circuit is >AC415V and ≤AC690V, the control circuit and auxiliary circuit must be isolated from the main circuit by an isolation transformer when they are powered from the main circuit. When the capacity of the isolation transformer is ≥2KVA and the maximum operating voltage of the control circuit and auxiliary circuit is AC415V, the installation category of the control circuit and auxiliary circuit is Class III.

2.2 Installation conditions

The circuit breaker should be installed according to the installation requirements of this manual, and the vertical inclination should not exceed 5°. The product should be installed in a distribution cabinet with a protection grade not higher IP20.

2.3 Circuit breaker protection grade

Front side: IP20; other sides: IP00.

2.4 Transportation and storage conditions

Unless otherwise specified, the following temperature ranges are observed when transportation and storage: Ranged -35°C to +70°C, and up to +70°C for a short time (within 24h).

3 Type Designation

TG	W	3	-	1600	H	/	3N	400	M	D	A230	D	Accessory
①	②	③		④	⑤		⑥	⑦	⑧	⑨	⑩	⑪	⑫

①	Characteristic code	
②	Category code	
③	Design code	
④	Frame current	1600A, 2000A, 2500A, 3200A, 4000A
⑤	Breaking capacity	By default: Standard type H: High breaking type
⑥	Number of poles	3P: Three poles 4P: Four poles 3N: 3P+N
⑦	Rated current A	1600A: 200~1600 2000A: 200~2000A 2500A: 630~2500 3200A: 2000~3200 4000A: 2500~4000
⑧	Trip unit model	M: 3-M type V: 3-V type H: 3-H type S: 3-S type
⑨	Installation method	D: Drawer type F: Fixed type
⑩	Control voltage	A110V, A230V, A400V, D110V, D220V……
⑪	Operation method	D: Electric operation (by default) M: Manual operation
⑫	Additional requirements	By default: General Undervoltage release Key lock: One lock and one key Three locks and two keys Mechanical interlock: Mechanical two-interlock Mechanical three-interlock Aux. switch: Five sets transfer Five–OFF and five–ON ……

TGW3 Series Air Circuit Breaker

4 Key Technical Parameters and Performance

4.1 Technical parameters of main circuit

Table 1

No.	Technical parameters											
	Frame rated current Inm (A)			1600		2000		2500		3200		4000	
1	Rated operating voltage Ue (V)			AC380/400/415V, AC660/690V									
2	Rated operating current In (A)			200/400/630/800/1000/1250/1600		200/250/400/500/630/800/1000/1250/1600/1900/2000		630/800/1000/1250/1600/2000/2500		2000/2500/2900/3150/3200		2500/2900/3200/3600/3900/4000	
3	Rated freq. (Hz)			50/60									
4	Rated insulation voltage Ui (V)			1000									
5	Rated impulse withstand voltage Uimp (kV)			12									
6	Circuit breaker type			General	H	General	H	General	H	General	H	General	H
7	Rated limit short circuit breaking capacity Icu (kA)	AC380/400/415V		50	65	70	80	80	85	80	100	100	100
		AC660/690V		36	42	50	65	65	65	65	70	65	75
8	Rated short time withstand current Icw/1s (kA)	AC380/400/415V		50	65	70	80	80	85	80	85	85	100
		AC660/690V		36	42	50	65	65	65	65	70	65	75
9	Rated short time withstand current Icw/1s (kA)	AC380/400/415V		42	50	66	66	66	85	80	85	85	85
		AC660/690V		36	42	50	50	55	65	65	70	65	75
10	Number of poles			3/4									
11	Max. continuous current of N pole, IN			100%In									
12	Installation method			Drawer type / Fixed type									
13	Electrical life (times)	Non-maintenance	AC415V	8000						7000		6000	
			AC690V	5000						3000			
14	Mechanical life (times)	With maintenance		30000						20000			
		Maintenance-free		12000						10000			
15	Full breaking time (additional delay not included) (ms)			≤30									
16	Closing time (ms)			≤70									
17	Flashover distance (mm)			0									
18	Wiring method			Horizontal, vertical									

4.2 Power loss

Table 2

Frame	Rated current (A)	Power consumption for drawer type (W)	Power consumption for fixed type (W)
1600	1600	≤400	≤150
2000	2000	≤380	≤208
2500	2500	≤520	≤350
3200	3200	≤640	≤450
4000	4000	≤900	≤640

4.3 Derating at different temperatures (under IP20 cabinet conditions, copper busbar wiring recommended)

4.3.1 The temperature derating table of the circuit breaker sees Table 3 to Table 7:

1600 frame temperature derating table

Table 3

Ambient temp.	200A	400A	630A	800A	1000A	1250A	1600A
Connection method	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
40°C	—	—	—	—	—	—	—
45°C	—	—	—	—	—	—	—
50°C	—	—	—	—	—	—	1550
55°C	—	—	—	—	—	—	1500
60°C	—	—	—	—	—	1050	1450
65°C	—	—	—	—	—	950	1400
70°C	—	—	—	—	—	850	1350

Note: “—” indicates no derating is required.

2000 frame temperature derating table

Table 4

Ambient temp.	200A~630A	800A	1000A	1250A	1600A	2000A
Connection method	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
40°C	—	—	—	—	—	—
45°C	—	—	—	—	—	—
50°C	—	—	—	—	—	—
55°C	—	—	—	—	—	—
60°C	—	—	—	—	1580	—
65°C	—	—	—	—	1552	—
70°C	—	—	—	—	1525	1900

Note: “—” indicates no derating is required.

TGW3 Series Air Circuit Breaker

2500 frame temperature derating table

Table 5

Ambient temp.	630A	800A	1000A	1250A	1600A	2000A	2500A
Connection method	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
40°C	—	—	—	—	—	—	—
45°C	—	—	—	—	—	—	2475
50°C	—	—	—	—	—	—	2400
55°C	—	—	—	—	—	—	2375
60°C	—	—	—	—	—	—	2250
65°C	—	—	—	—	1552	—	2125
70°C	—	—	—	—	1525	1900	2050

Note: "—" indicates no derating is required.

3200 frame temperature derating table

Table 6

Ambient temp.	2000A	2500A	2900A	3150A	3200A
Connection method	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
40°C	—	—	—	—	—
45°C	—	—	—	—	—
50°C	—	—	—	—	3100
55°C	—	—	—	—	3000
60°C	—	—	—	—	2900
65°C	—	—	—	—	2600
70°C	—	—	—	—	2400

Note: "—" indicates no derating is required.

4000 frame temperature derating table

Table 7

Ambient temp.	2500A	2900A	3200A	3600A	3900A	4000A
Connection method	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
40°C	—	—	—	—	—	—
45°C	—	—	—	—	—	3800
50°C	—	—	3100	—	—	3600
55°C	—	—	3000	3400	3400	3400
60°C	—	—	2900	3200	3200	3200
65°C	—	2800	2600	3000	3000	3000
70°C	—	2600	2400	2800	2800	2800

Note: "—" indicates no derating is required.

4.4 Derating at different altitudes

High altitude derating factor

Table 8

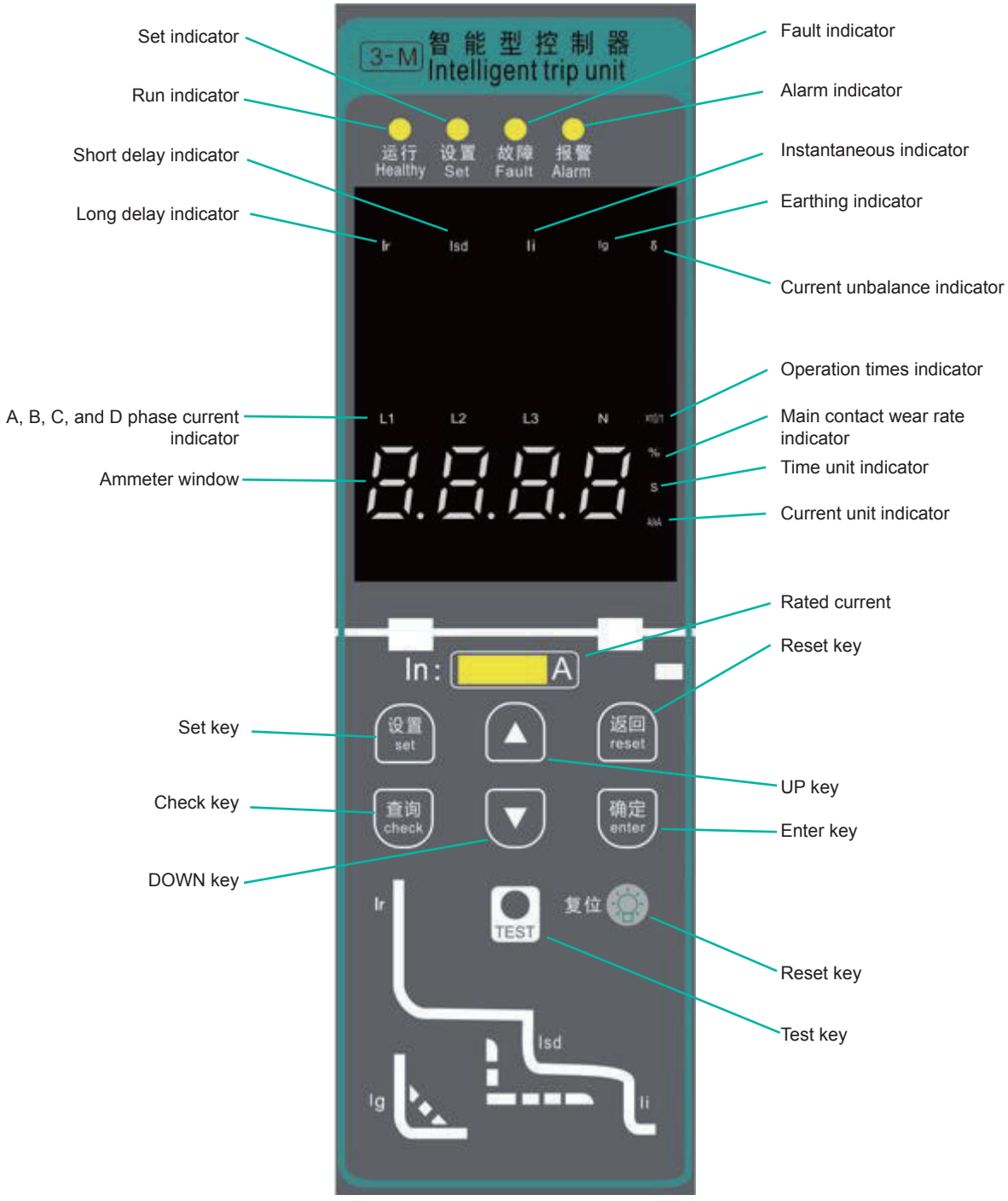
Altitude (m)		2000	2500	3000	3500	4000	4500	5000
Rated impulse withstand voltage Uimp (kV)		12	12	12	12	12	12	9.6
Mean insulation voltage Ui (V)		1000	1000	1000	1000	1000	1000	800
Max. operating voltage Ue (V) (50/60Hz)		690	690	690	690	690	690	560
Power frequency withstand voltage (V)		3500	3500	3500	3250	3000	2500	2200
Product model	Rated current (A)	Current correction factor						
1600 frame	200~630	1	1	1	1	1	1	1
	800~1250	1	1	1	1	1	1	1
	1600	1	1	1	1	0.97	0.9	0.87
2000 frame	630~1600	1	1	1	1	1	1	1
	1900~2000	1	1	1	1	0.97	0.9	0.87
2500 frame	630~1600	1	1	1	1	0.98	0.95	0.92
	2000~2500	1	1	1	1	0.97	0.9	0.87
3200 frame	630~1600	1	1	1	1	1	1	1
	2000~2500	1	1	1	1	0.97	0.9	0.87
	2900A~3200	1	0.97	0.93	0.9	0.88	0.85	0.82
4000 frame	2500~2900	1	0.97	0.93	0.9	0.88	0.85	0.82
	3200~4000	1	0.95	0.9	0.88	0.85	0.82	0.78

TGW3 Series Air Circuit Breaker

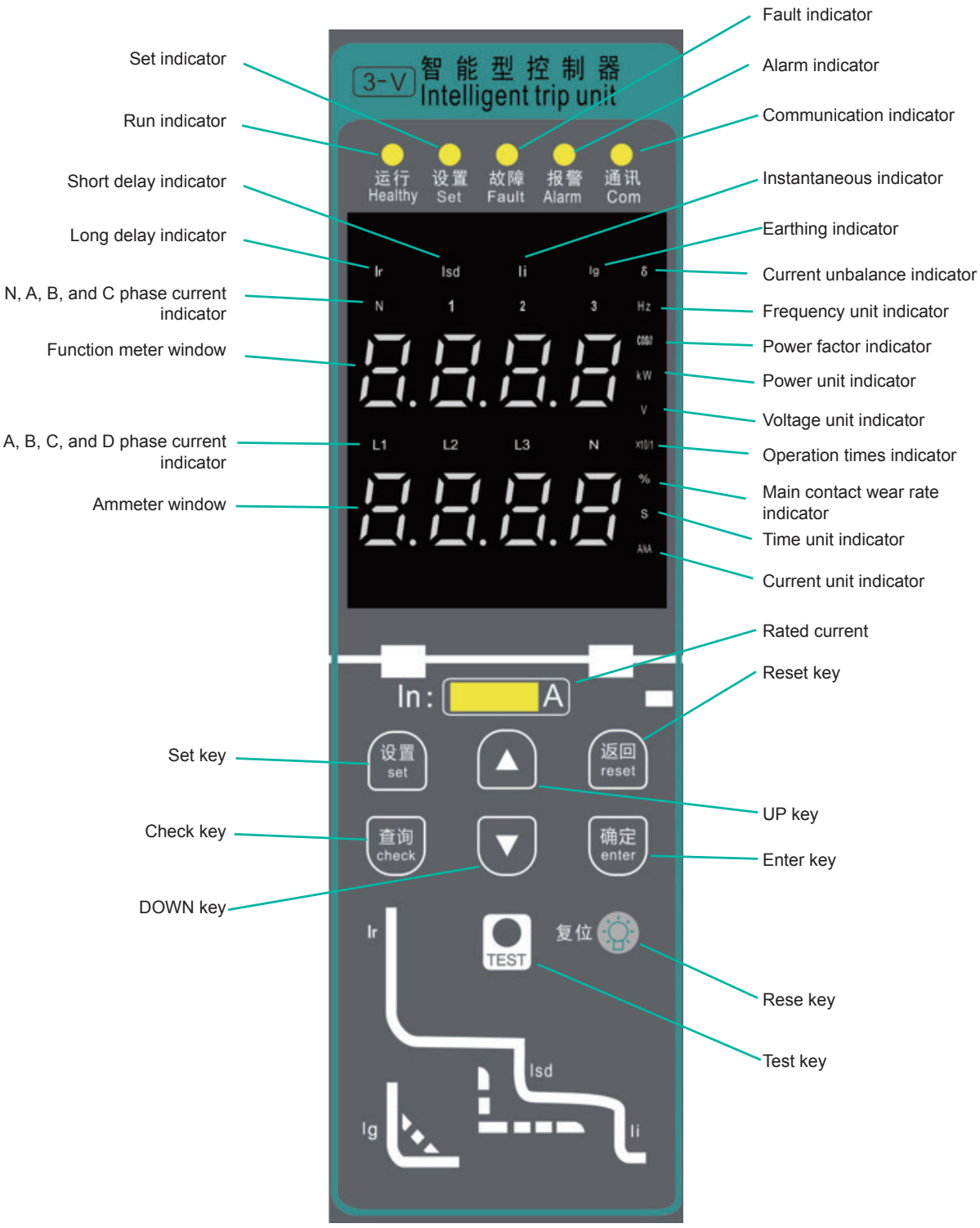
5 Intelligent trip unit

5.1 Trip unit panel indicator diagram

5.1.1 3-M type trip unit panel indication diagram

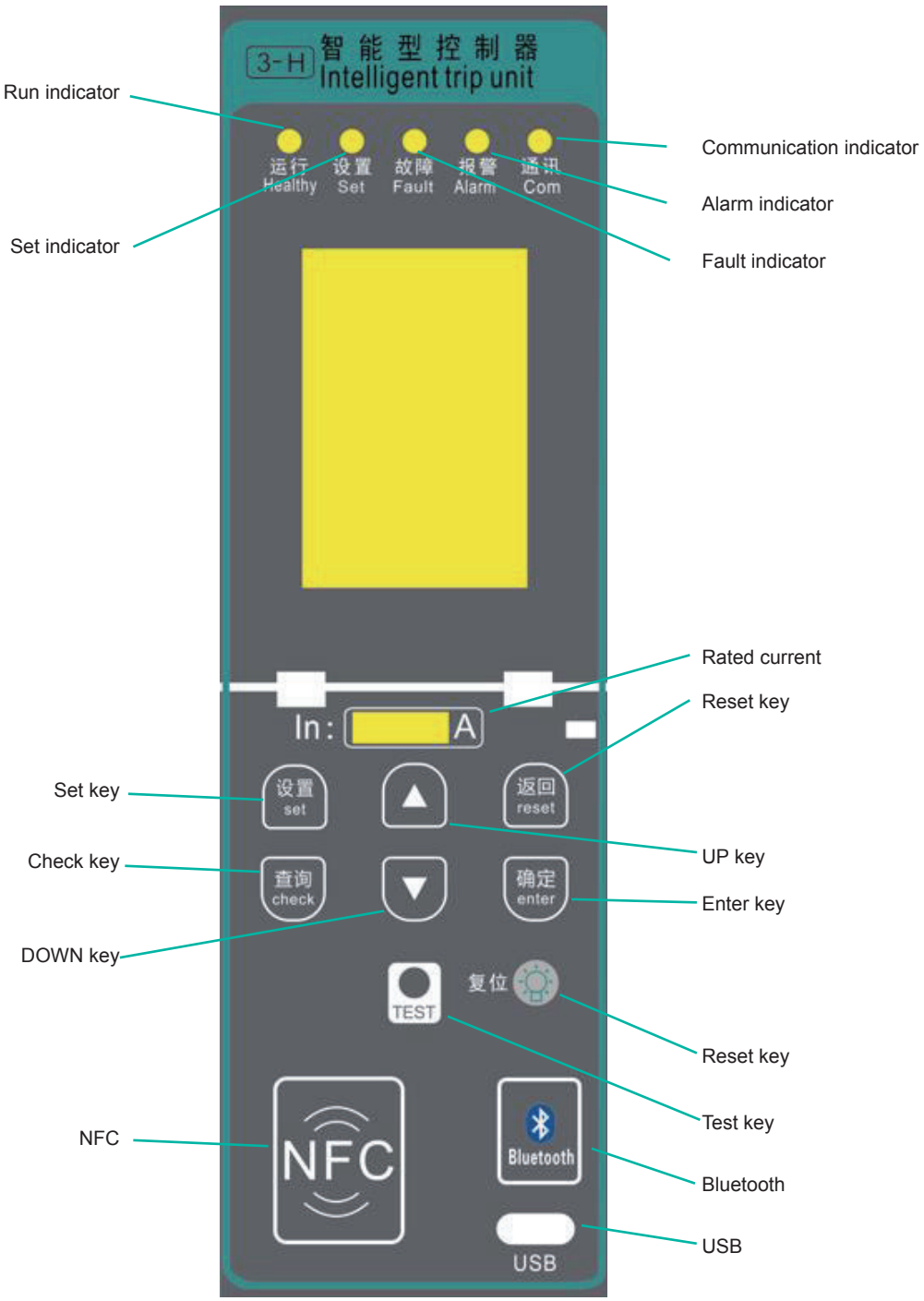


5.1.2 3-V type trip unit panel indication diagram

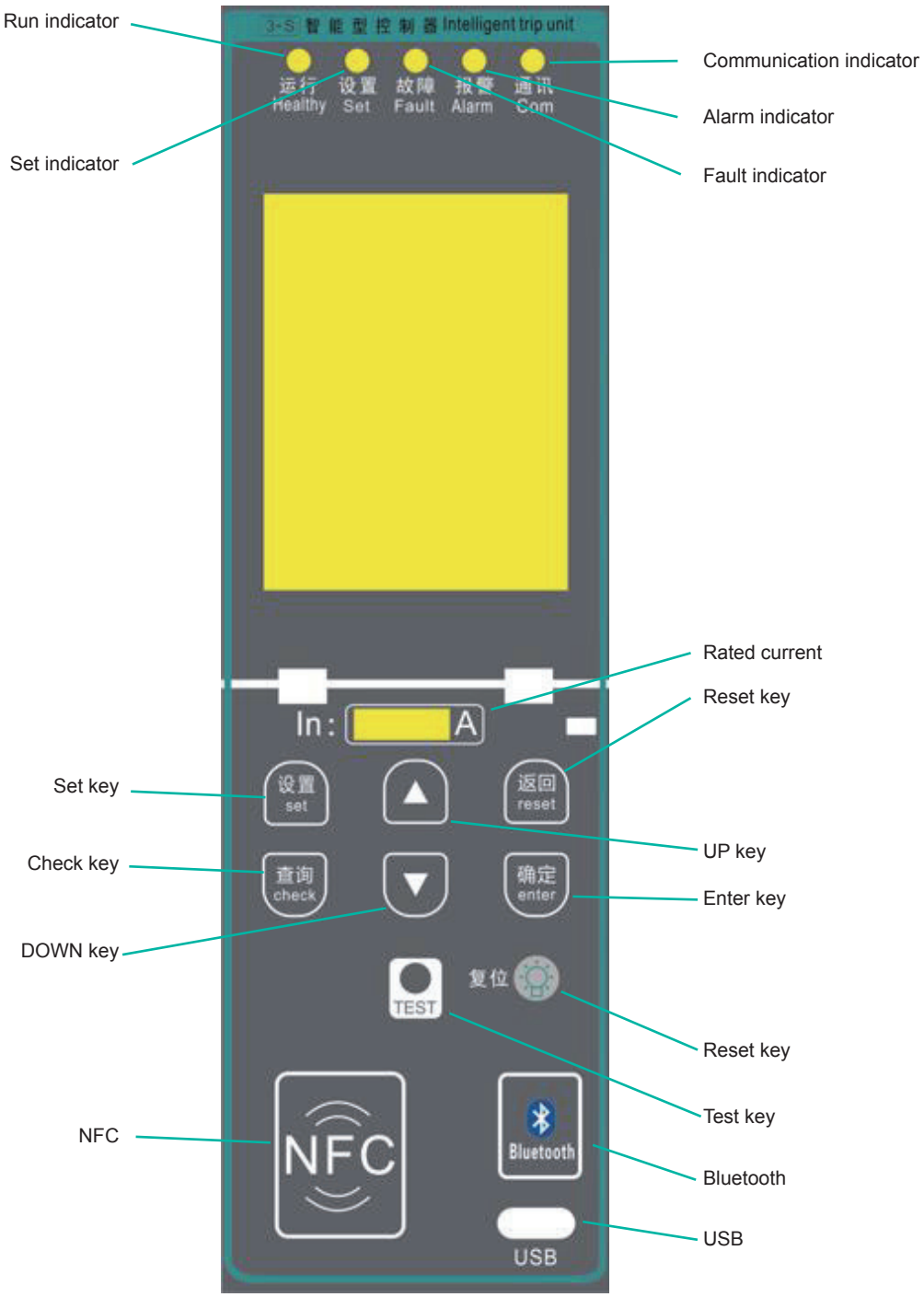


TGW3 Series Air Circuit Breaker

5.1.3 3-H trip unit panel indicator diagram



5.1.4 3-S trip unit panel indicator diagram



TGW3 Series Air Circuit Breaker

5.1.5 Trip unit functions table

Trip unit functions table

Table 9

Trip unit model				3-M (Current type)	3-V (Voltage type)	3-H (Advanced)	3-S (Internet of Things)
Screen display + Operation method				Digital tube + Key	LED display + Key	LCD display + Key	Color LCD display + Touch
Protection functions	Current protection	Overload long delay		■Standard	■Standard	■Standard	■Standard
		Short circuit short delay		■Standard	■Standard	■Standard	■Standard
		Short circuit instantaneous		■Standard	■Standard	■Standard	■Standard
		Earthing fault protection (one out of two)	Vector and earthing fault protection (T type)	■Standard	■Standard	■Standard	■Standard
			Transformer center point earthing fault protection (W type)	□Optional	□Optional	□Optional	□Optional
		Electric leakage protection		□Optional	□Optional	□Optional	□Optional
		Neutral pole protection (4P, 3P+N)		□Optional	□Optional	□Optional	□Optional
		Overload pre-alarm		□Optional	□Optional	■Standard	■Standard
		Current phase loss protection		- No	□Optional	■Standard	■Standard
		Current unbalance protection		- No	■Standard	■Standard	■Standard
		MCR (making and breaking function)		□Optional	□Optional	■Standard	■Standard
		HSISC (out-of-limit trip function)		□Optional	□Optional	□Optional	□Optional
		Demand current protection		- No	- No	■Standard	■Standard
	Voltage protection	Overvoltage protection		- No	- No	■Standard	■Standard
		Undervoltage protection		- No	- No	■Standard	■Standard
		Voltage unbalance protection		- No	□Optional	■Standard	■Standard
		Voltage phase loss protection		- No	- No	□Optional	■Standard
		Phase sequence protection		- No	- No	■Standard	■Standard
	Frequency protection	Over-frequency protection		- No	- No	■Standard	■Standard
		Underfrequency protection		- No	- No	■Standard	■Standard
		Frequency change rate protection		- No	- No	- No	■Standard
	Power protection	Reverse power protection (active)		- No	- No	■Standard	■Standard
		Overpower protection (active)		- No	- No	- No	■Standard
		Underpower protection (active)		- No	- No	- No	■Standard
		Reverse power protection (reactive)		- No	- No	■Standard	■Standard
		Demand power protection		- No	- No	- No	■Standard
		Three-phase power factor alarm		- No	- No	- No	■Standard
	Thermal memory			■Standard	■Standard	■Standard	■Standard
	Load monitoring			- No	- No	■Standard	■Standard
	Zone selective interlocking			- No	- No	□Optional	□Optional

Table 9, continued

Trip unit model				3-M (Current type)	3-V (Voltage type)	3-H (Advanced)	3-S (Internet of Things)
Measurement functions	Current	Phase current		■Standard	■Standard	■Standard	■Standard
		Neutral line current		■Standard	■Standard	■Standard	■Standard
		Earthing current		■Standard	■Standard	■Standard	■Standard
		Residual current		□Optional	□Optional	□Optional	□Optional
		Mean current		- No	- No	■Standard	■Standard
		Current unbalance (rate)		- No	- No	■Standard	■Standard
	Voltage	Phase voltage		- No	■Standard	■Standard	■Standard
		Line voltage		- No	■Standard	■Standard	■Standard
		Mean voltage		- No	- No	- No	■Standard
		Phase sequence		- No	- No	■Standard	■Standard
	Power	Active power		- No	- No	■Standard	■Standard
		Reactive power		- No	- No	■Standard	■Standard
		Apparent power		- No	- No	■Standard	■Standard
	Electric energy	Active electric energy		- No	- No	■Standard	■Standard
		Reactive electric energy		- No	- No	■Standard	■Standard
		Apparent electric energy		- No	- No	■Standard	■Standard
	Power factor			- No	■Standard	■Standard	■Standard
	Frequency			- No	■Standard	■Standard	■Standard
	Demand value	Demand current		- No	- No	■Standard	■Standard
		Demand power		- No	- No	■Standard	■Standard
	Quality of electric energy	Harmonics measurement		- No	- No	■Standard	■Standard
		Voltage unbalance rate		- No	- No	■Standard	■Standard
		Waveform capture		- No	- No	■Standard	■Standard
		Mean voltage per hour		- No	- No	- No	■Standard
		Short-time voltage interruption		- No	- No	- No	■Standard
		Voltage sag or swell		- No	- No	- No	■Standard
Maintenance diagnosis	Health test	Fault trip test		■Standard	■Standard	■Standard	■Standard
	Health alert	Measurement/Trip circuit monitoring		- No	- No	- No	■Standard
		Circuit breaker temperature monitoring	Trip unit temp.	- No	- No	- No	■Standard
			Busbar temp.	- No	- No	- No	□Optional
	Health prediction	Contact wear equivalent		- No	- No	■Standard	■Standard
		Remaining life		- No	- No	- No	■Standard
		Health degree		- No	- No	- No	■Standard

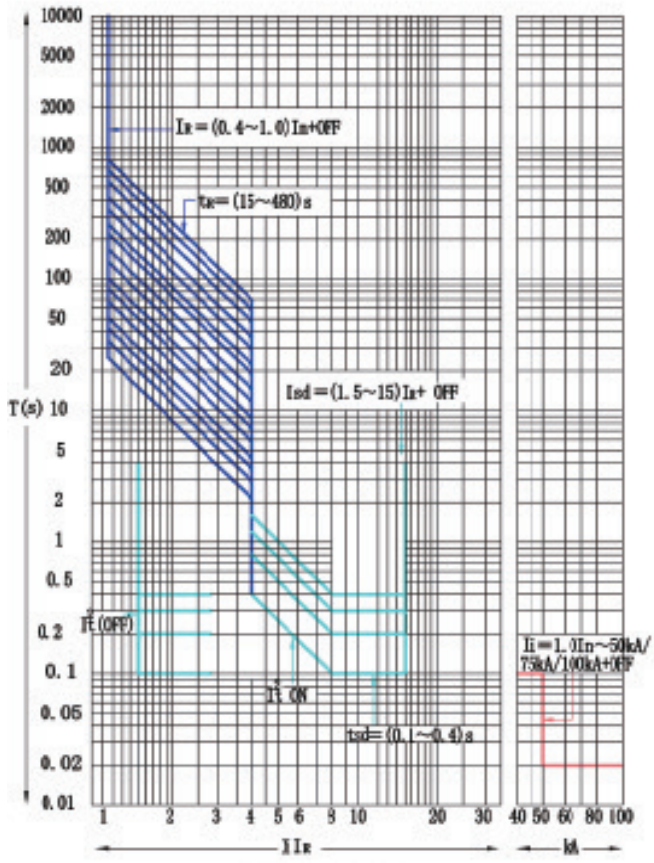
TGW3 Series Air Circuit Breaker

Table 9, continued

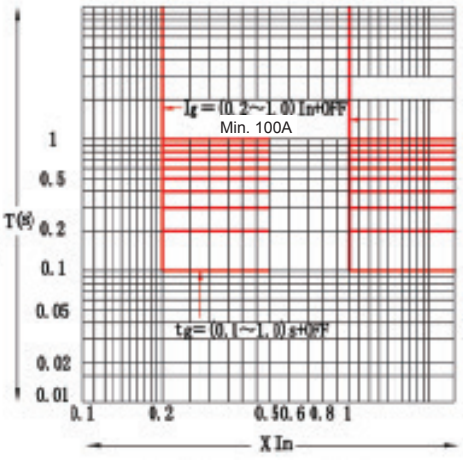
Trip unit model			3-M (Current type)	3-V (Voltage type)	3-H (Advanced)	3-S (Internet of Things)
Maintenance diagnosis	Maintenance alert	OFF / ON function maintenance alert	-No	-No	-No	■Standard
		Circuit breaker maintenance alert (life / temp.)	-No	-No	-No	■Standard
Events record	Trip records (10 times)		■Standard	■Standard	■Standard	■Standard
	Alarm records (10 times)		■Standard	■Standard	■Standard	■Standard
	Operation times records		■Standard	■Standard	■Standard	■Standard
	Max. and min. historical current		-No	-No	■Standard	■Standard
	Max. and min. historical voltage		-No	-No	■Standard	■Standard
	Max. and min. frequency		-No	-No	■Standard	■Standard
	Peak demand power		-No	-No	-No	■Standard
	Max. demand current		-No	-No	-No	■Standard
	Electric energy quality analysis record		-No	-No	-No	□Optional
	fault recording (front 100ms, rear 50ms)		-No	-No	-No	□Optional
Intelligent interconnection	Bluetooth		-No	-No	■Standard	■Standard
	USB		-No	-No	■Standard	■Standard
	NFC		-No	-No	■Standard	■Standard
	Modbus RTU		□Optional	□Optional	■Standard	■Standard
	Modbus TCP		□Optional	□Optional	□Optional	□Optional
	Profibus-DP		□Optional	□Optional	□Optional	□Optional
	Devicenet		□Optional	□Optional	□Optional	□Optional
	645 protocol		□Optional	□Optional	□Optional	□Optional
	HPLC		-No	-No	□Optional	□Optional
	Ethernet		□Optional	□Optional	□Optional	□Optional
	Displacement recording function		-No	-No	■Standard	■Standard
	Four-way DO output function, DI/DO function, relay output function		□Optional	□Optional	■Standard	■Standard
	Detecting voltage closing		-No	-No	□Optional	□Optional
	Overload reclosing		-No	□Optional	□Optional	□Optional
	Internal clock function		-No	■Standard	■Standard	■Standard
	Program upgrading		-No	-No	-No	■Standard
	Remote reset		□Optional	□Optional	□Optional	□Optional
	Permission setting		-No	-No	-No	■Standard
	Hot-pluggable		-No	-No	-No	□Optional
	Self-diagnosis		■Standard	■Standard	■Standard	■Standard
	Topology identification function		-No	-No	□Optional	□Optional

5.2 Protection characteristics of intelligent trip unit

5.2.1 Current protection characteristic curve



Protection action characteristic curve



Asymmetrical earthing protection characteristic curve

5.3 Overload long delay protection operation characteristics

Long delay protection operation time table

Table 10

Current set range		I_R=(0.4~1.0)In+OFF								
Operation delay time Tr(s)	I≤1.05I_R	No operation > 2h								Error ±10%
	I≥1.3I_R	Operation < 1h								
Long delay setting time (I=1.5I_R)		15	20	25	30	40	50	60	80	
		100	120	160	200	240	320	400	480	
		OFF								

Notes: $T = t_R * (1.5\ I_R / I)^2$
I_R: Long delay current setting value
I: Actual operating current
T: Actual protection delay operation time
t_R: Long delay time setting value
Current setting step: 2500AF and below: setting step size is 1A; 2500AF and above: setting step size is 2A.
Normal factory setting: I_R=1.5In, t_R=60s.

5.4 Short circuit short delay protection characteristics

Technical parameters of short circuit short delay protection characteristics

Table 11

Current setting range	Isd=(1.5~15)I_R+OFF	
Operation characteristics	Definite time mode (default)	≤ 0.9Isd: No operation
		≥ 1.1Isd: Definite time operation
	Definite time + inverse time mode (Customizable)	≤ 0.9Isd: No operation
		≥ 1.1Isd , ≥8 I_R: Definite time operation
		≥ 1.1Isd , <8 I_R: Inverse time operation
Definite time delay setting value tsd	tsd (s)	0.1~0.4+OFF; Step size 0.1
	Accuracy	±15%
Inverse limit protection operation characteristics		T= tsd * (8 I_R / I)^2

Notes: T = tsd * (8 I_R / I)^2
Isd: long delay current setting value
I: Fault current
T: Actual protection delay operation time value
tsd: Short delay time setting value
Current setting step size: The setting step size for 2500AF and below is 1A; the setting step size for 2500AF and above is 2A.
Normal factory setting: Isd=8I_R, tsd=0.2s.

5.5 Short circuit instantaneous protection operation characteristics

Technical parameters of short circuit instantaneous protection characteristics

Table 12

Current setting range	Ii =1.0In~50kA/75kA/100kA + OFF
Operation characteristics	≤0.85Ii: No operation
	≥1.15Ii: Operation

Notes: The instantaneous protection setting current value of 1600AF, 2000AF, and 2500AF is 1.0In~50kA + OFF;
The instantaneous protection setting current value of 3200AF and 4000AF is 1.0In~75kA + OFF.

Current setting step size: The setting step size for 2500AF and below is 1A; the setting step size for 2500AF and above is 2A.
Normal factory setting: 12In.

5.6 Earthing fault protection characteristics

Technical parameters of earthing fault protection characteristics

Table 13

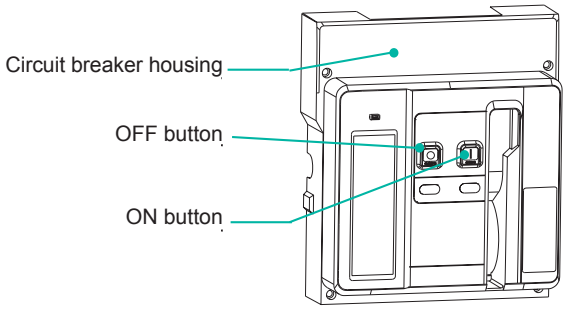
Current setting range	Ig=(0.2~1.0) In+OFF (The minimum value is 100A)	
Operation characteristics	≤0.9Ig; No operation within 2tg	
	≥1.1Ig: Operation after delay time	
Delay setting value	Definite time delay tg (s)	0.1~1+OFF; Step size 0.1
	Accuracy	±15%

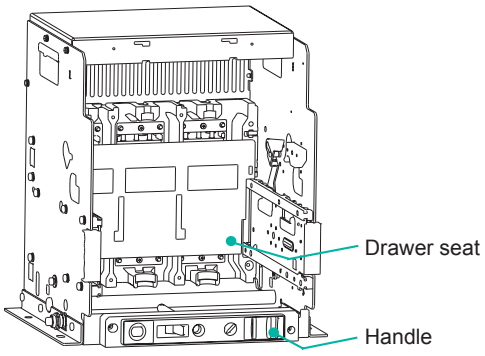
Notes: Current setting step size: The setting step size for 2500AF and below is 1A; the setting step size for 2500AF and above is 2A.

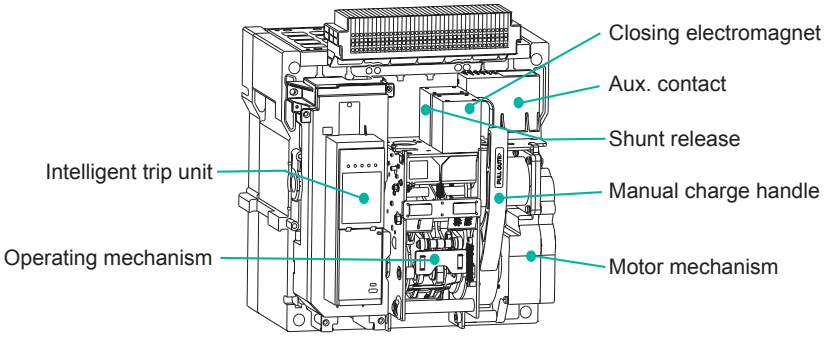
Normal factory setting: 0.8In, 0.4s.

6 Structural Characteristics

6.1 Product structure







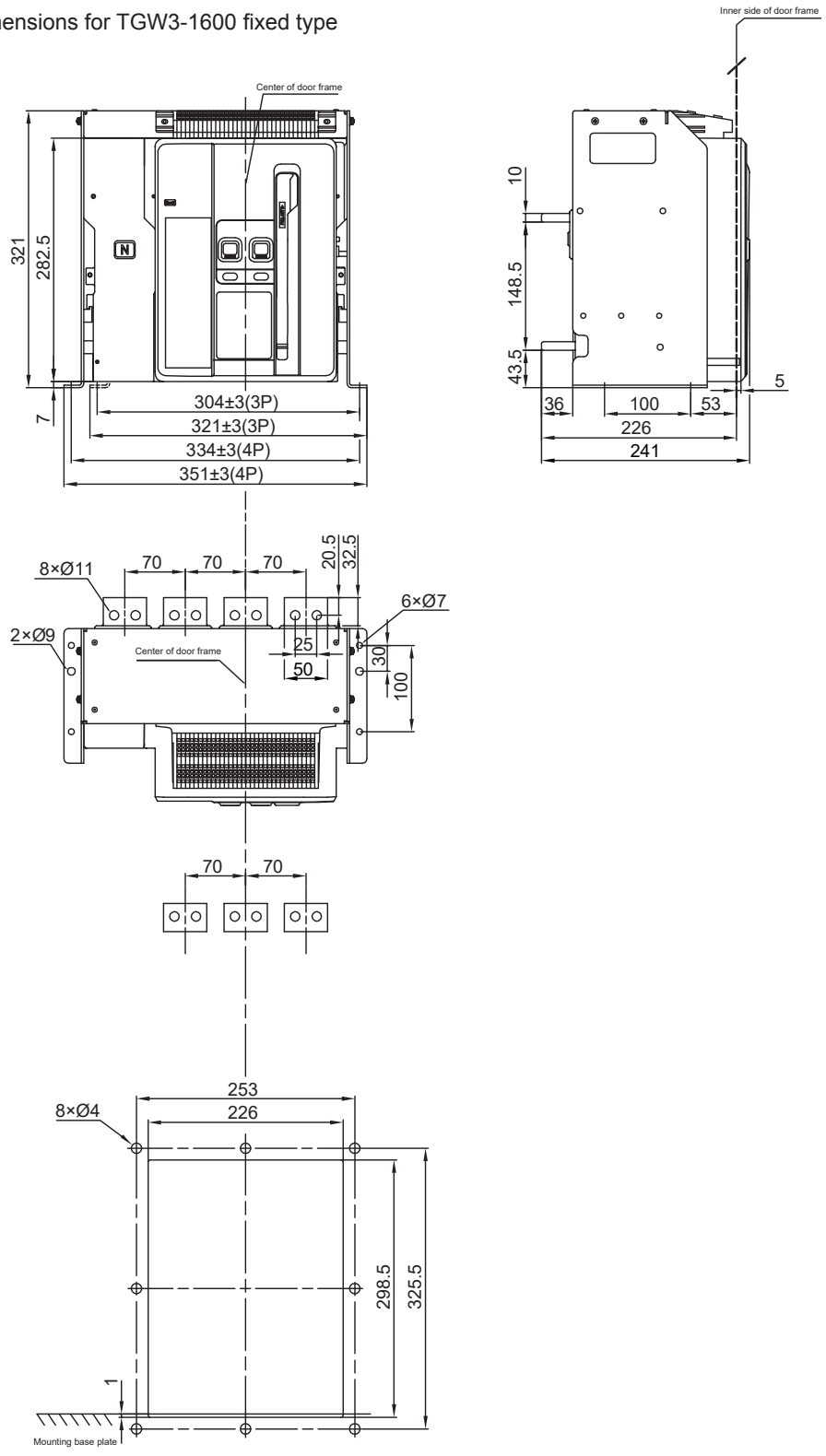
TGW3 Series Air Circuit Breaker

7 Outline and Installation Dimensions

7.1.1 TGW3-1600 installation dimensions

7.1.1 Installation dimensions for TGW3-1600 fixed type

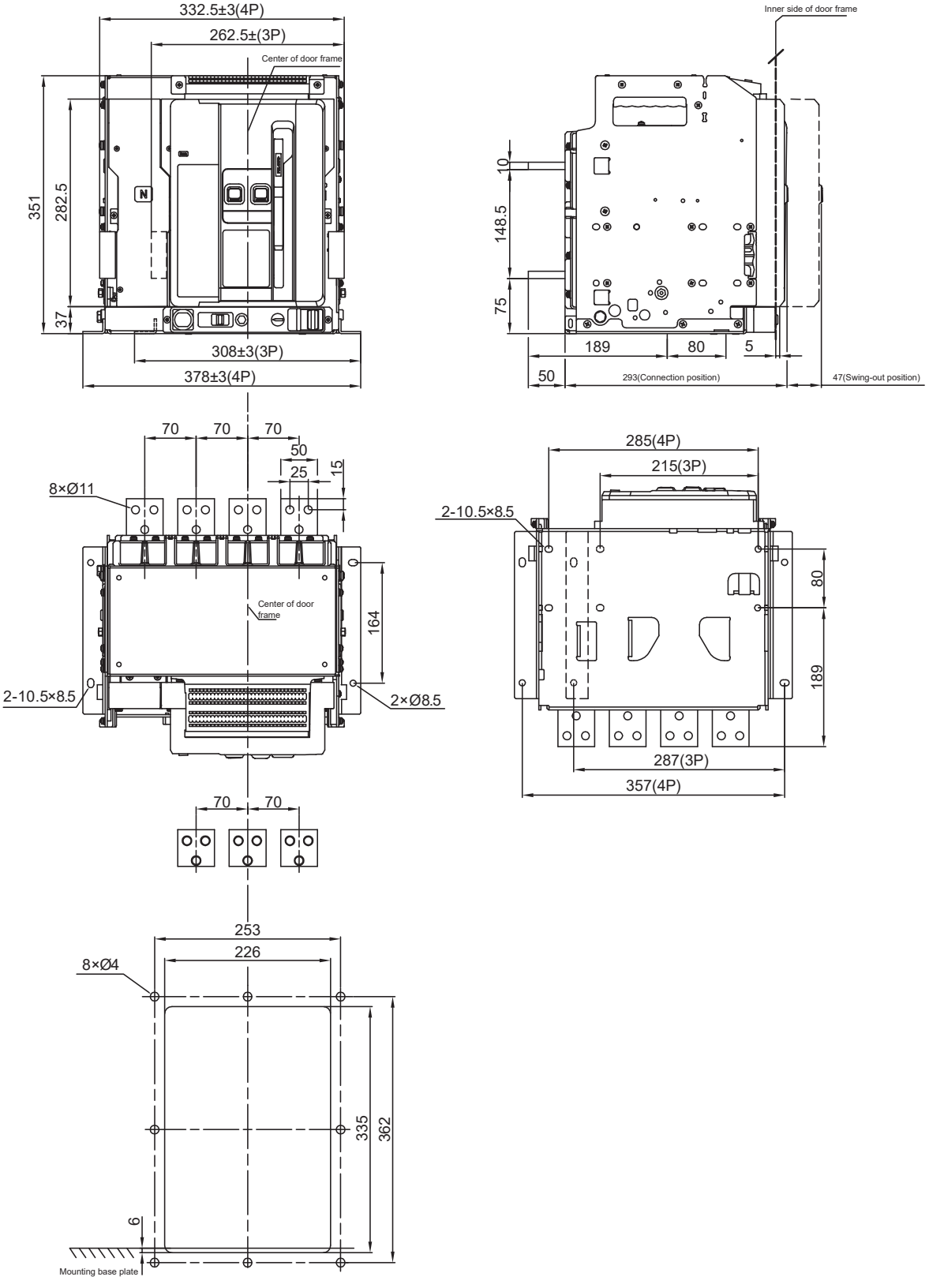
Horizontal busbar



TGW3 Series Air Circuit Breaker

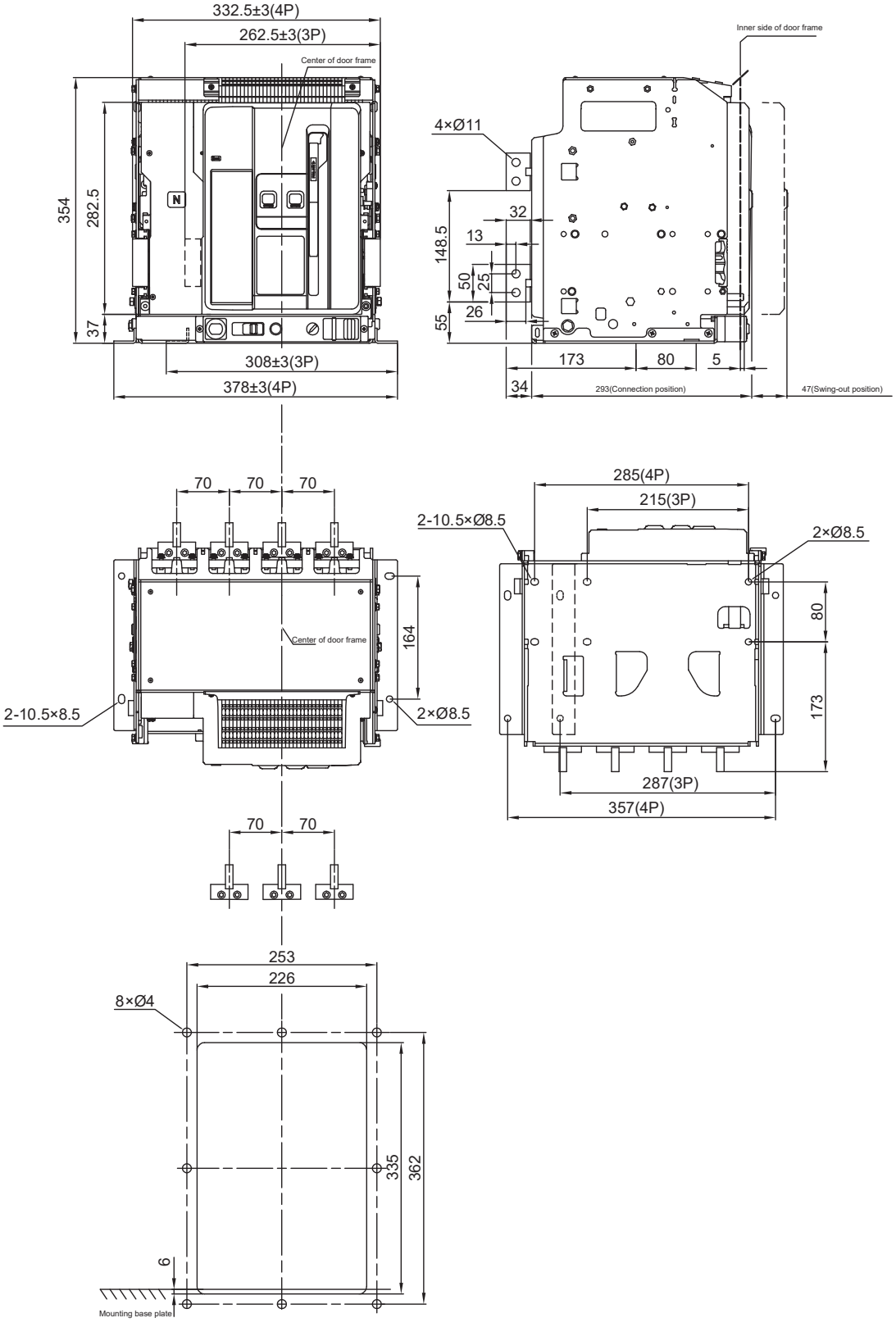
7.1.2 installation dimensions for TGW3-1600 drawer type

Horizontal busbar



TGW3 Series Air Circuit Breaker

Vertical busbar



TGW3 Series Air Circuit Breaker

7.2.1 Installation dimensions for TGW3-2000 fixed type

Horizontal busbar

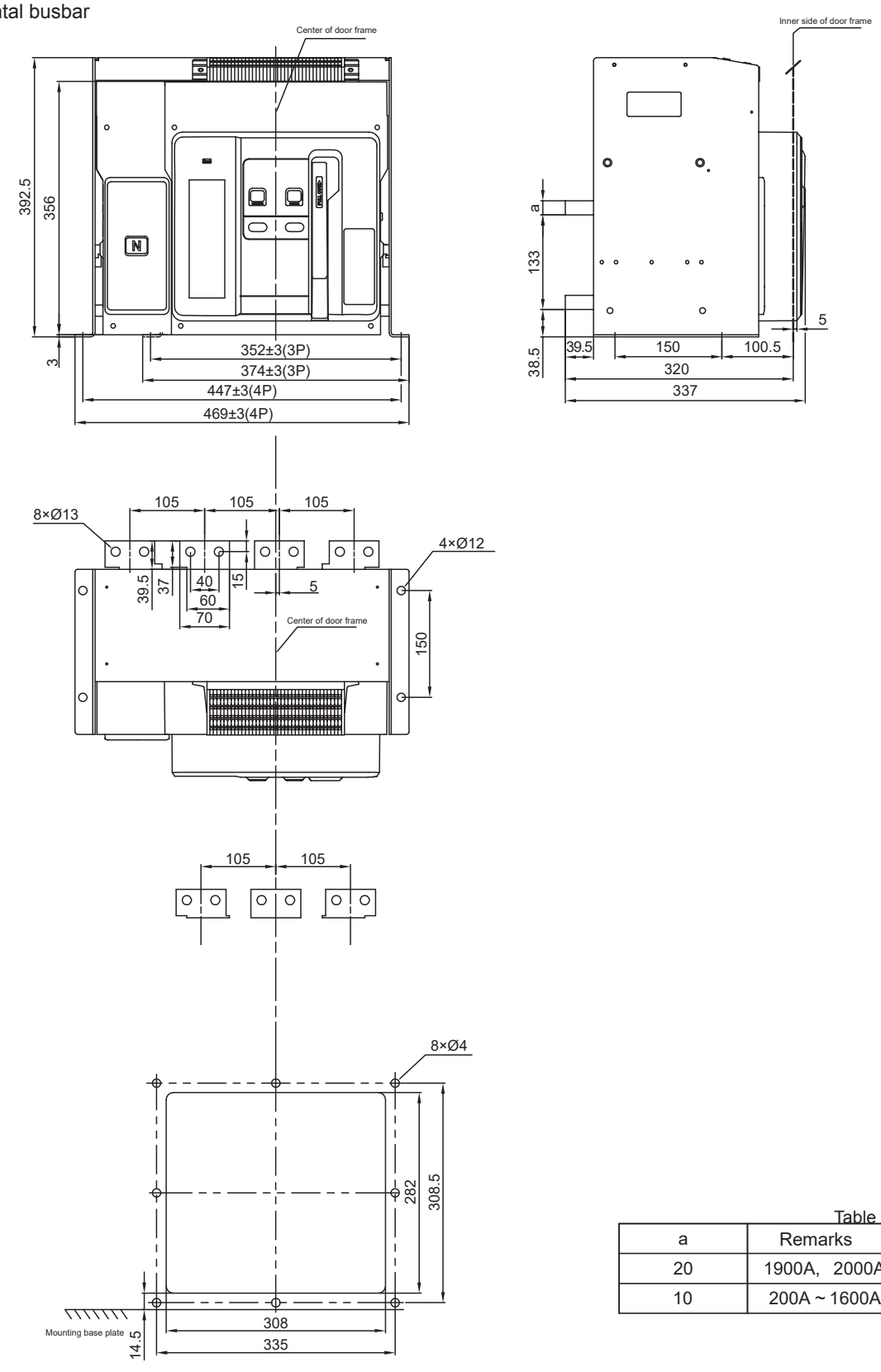


Table 14

a	Remarks
20	1900A, 2000A
10	200A ~ 1600A

TGW3 Series Air Circuit Breaker

Vertical busbar

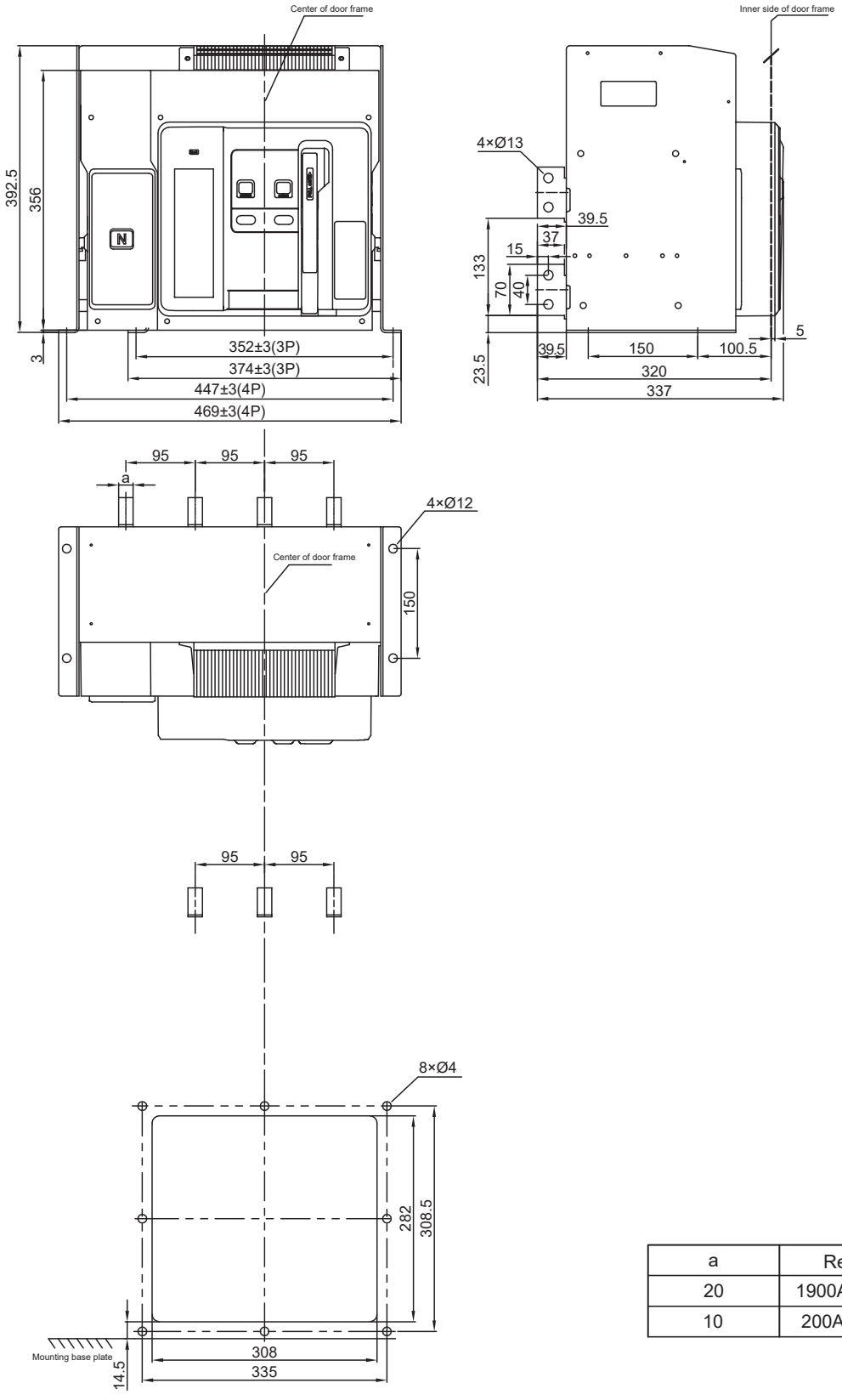


Table 15

a	Remarks
20	1900A, 2000A
10	200A ~ 1600A

TGW3 Series Air Circuit Breaker

7.2.2 Installation dimensions for TGW3-2000 drawer type

Horizontal busbar

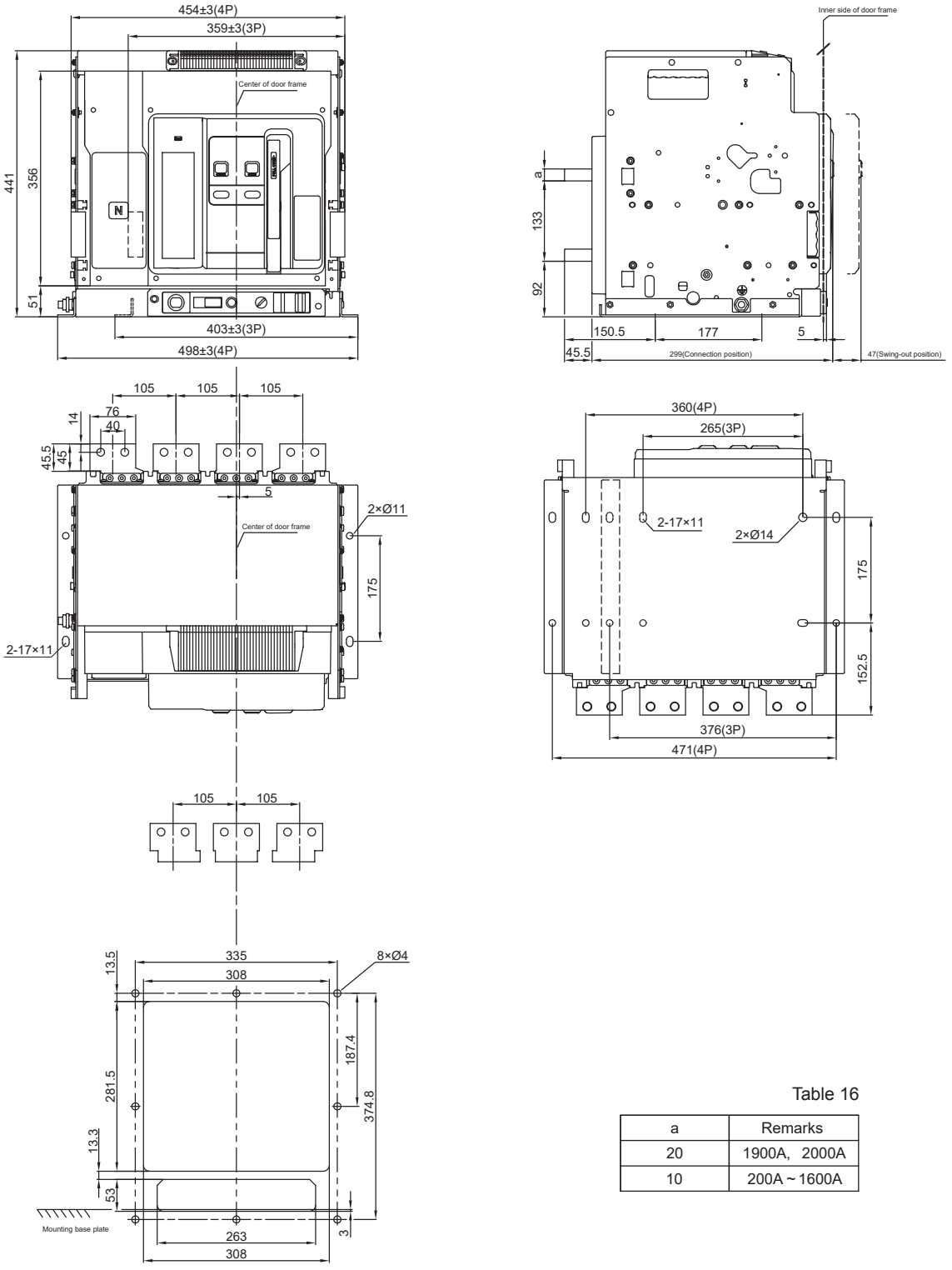


Table 16

a	Remarks
20	1900A, 2000A
10	200A ~ 1600A

TGW3 Series Air Circuit Breaker

Vertical busbar

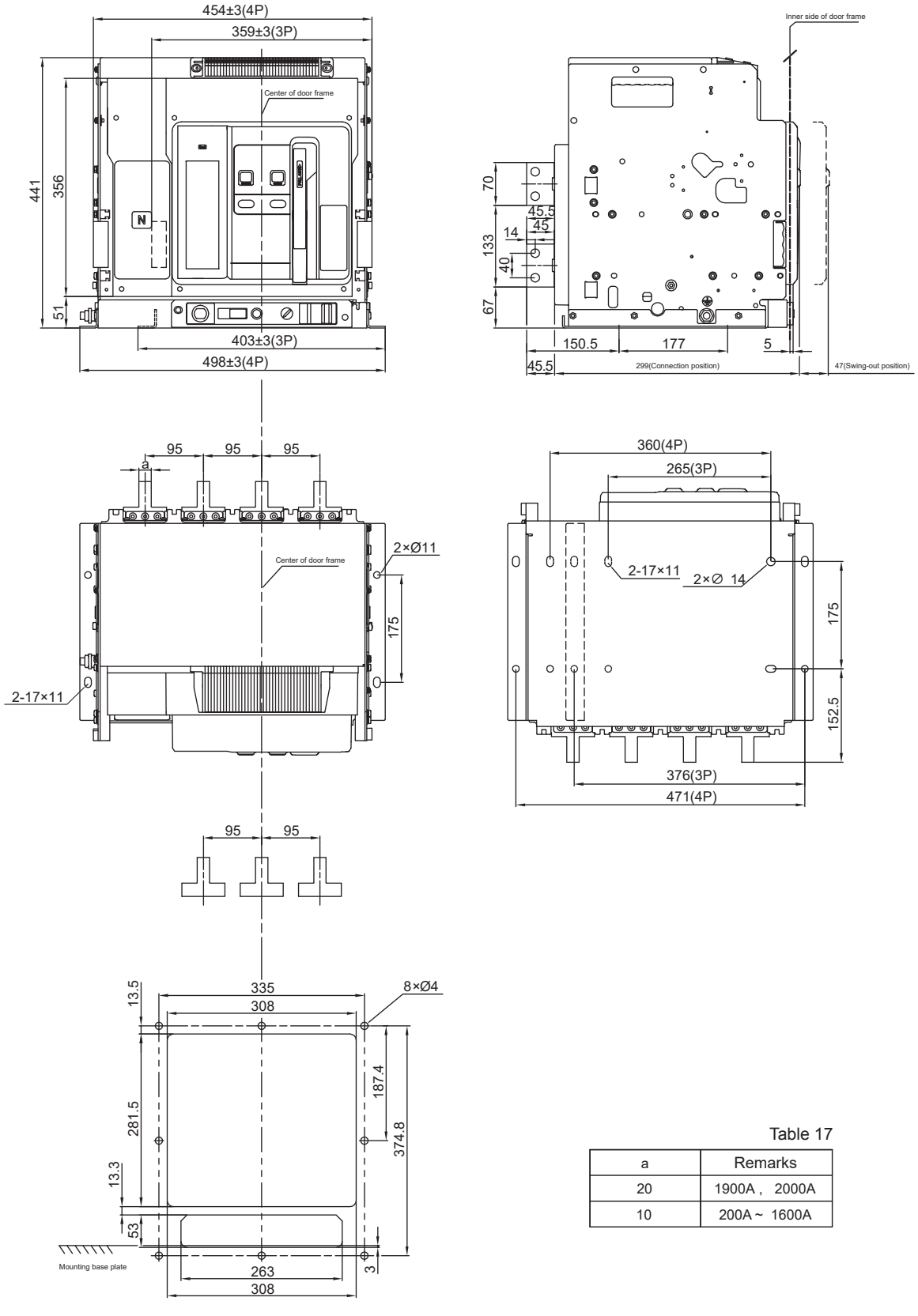


Table 17

a	Remarks
20	1900A， 2000A
10	200A～ 1600A

7.3.1 Installation dimensions for TGW3-2500 fixed type

Horizontal busbar

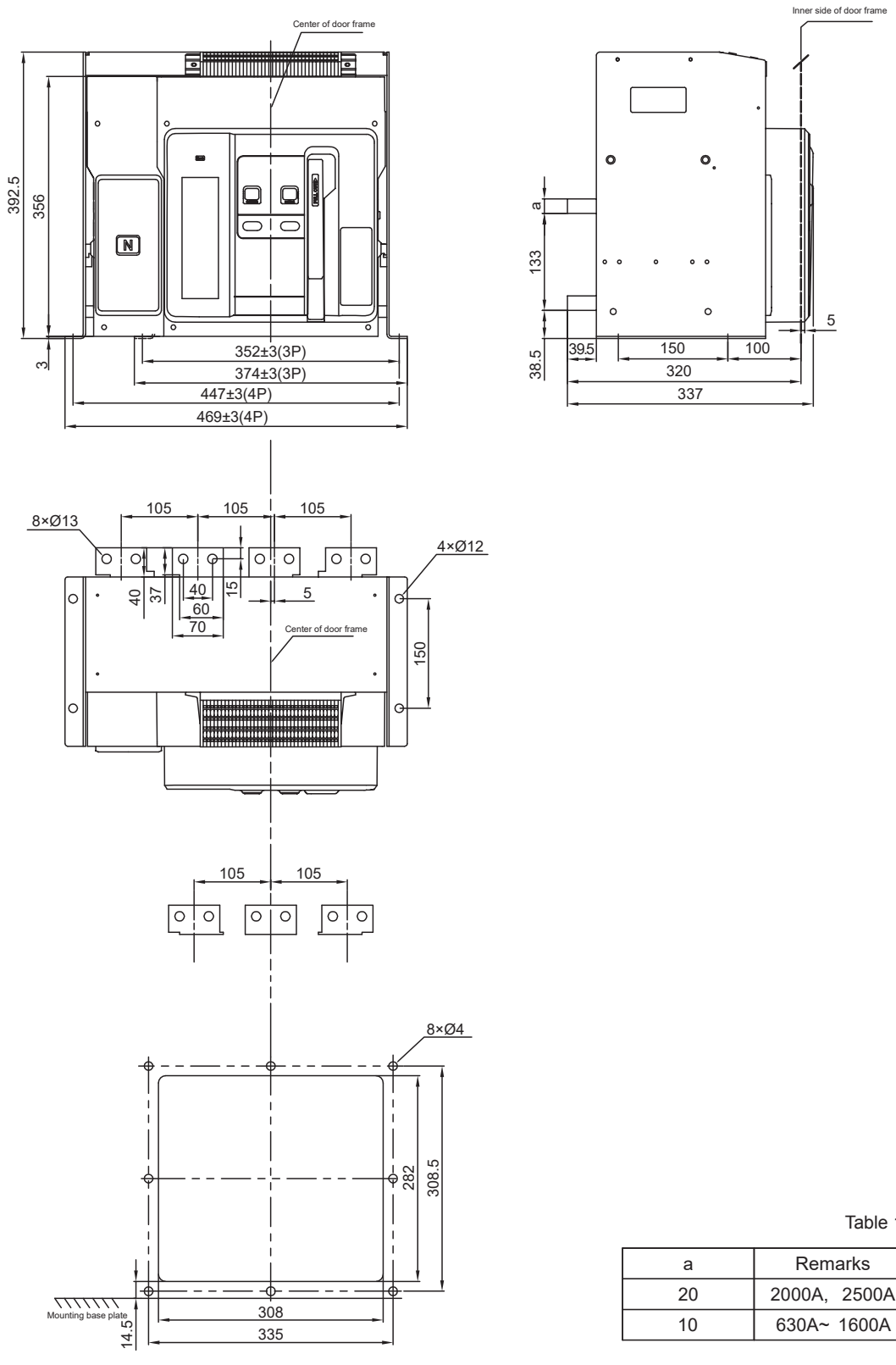


Table 18

a	Remarks
20	2000A, 2500A
10	630A~ 1600A

TGW3 Series Air Circuit Breaker

Vertical busbar

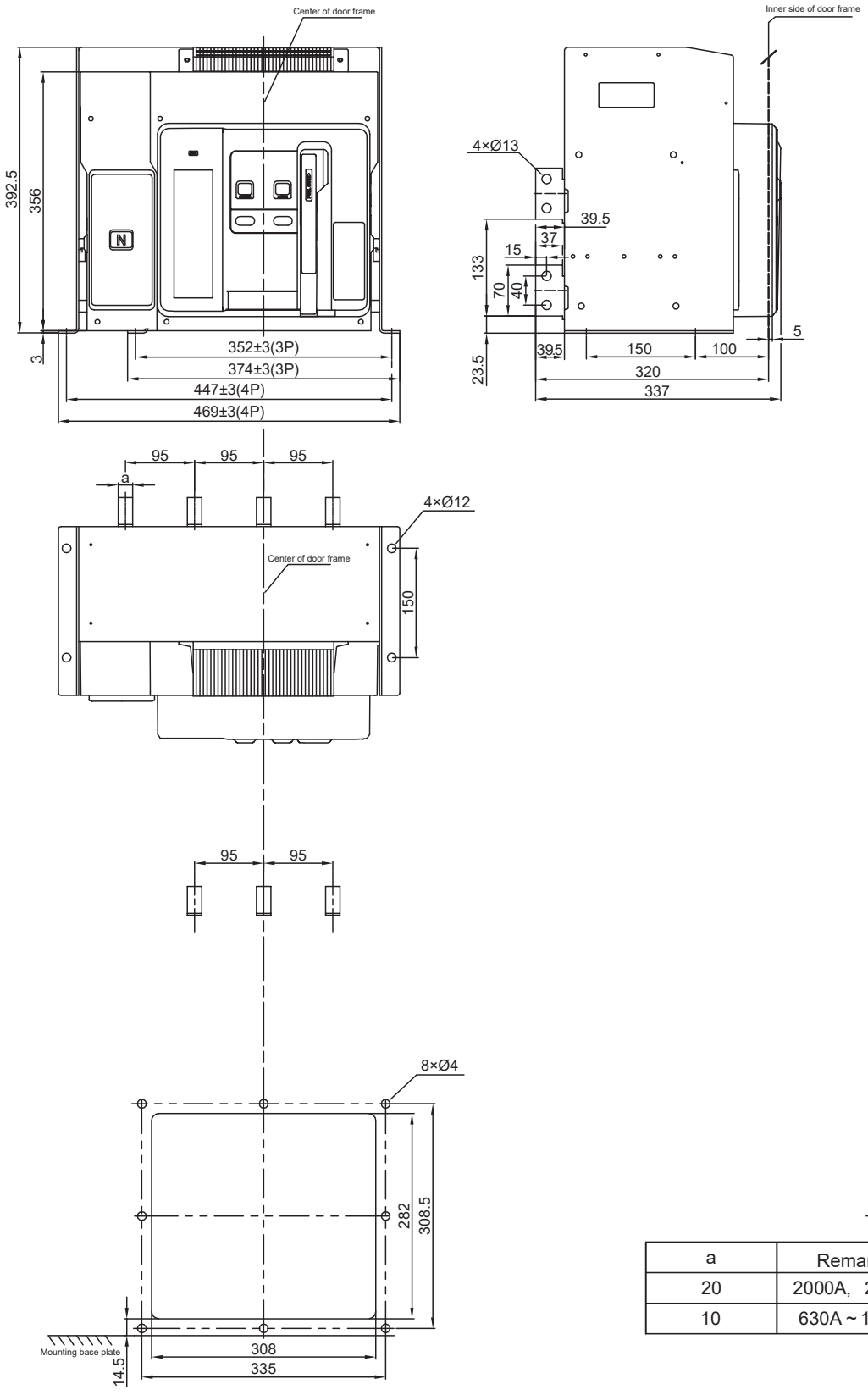


Table 19

a	Remarks
20	2000A, 2500A
10	630A ~ 1600A

TGW3 Series Air Circuit Breaker

7.3.2 Installation dimensions for TGW3-2500 drawer type

Horizontal busbar

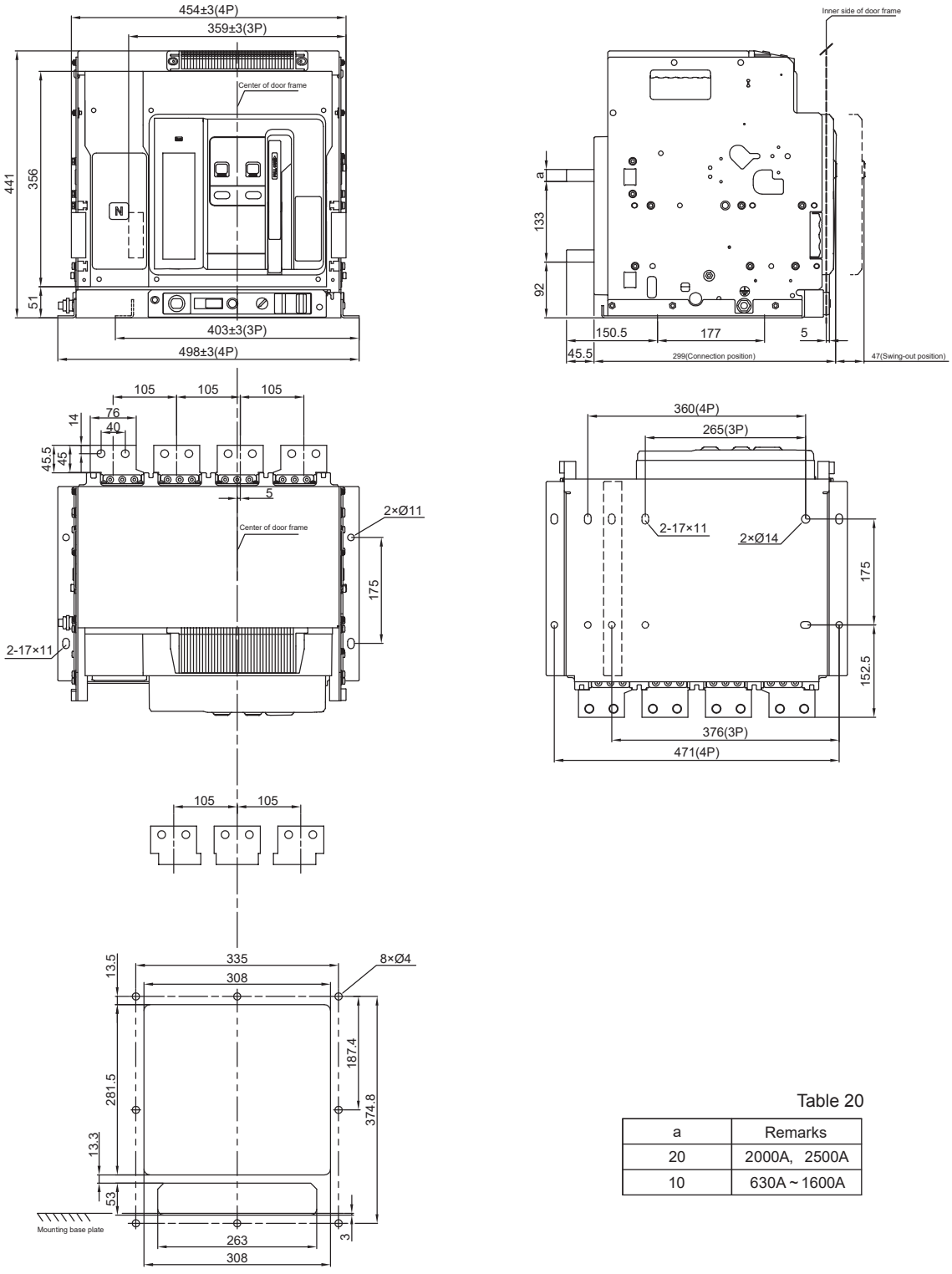


Table 20

a	Remarks
20	2000A, 2500A
10	630A ~ 1600A

TGW3 Series Air Circuit Breaker

Vertical busbar

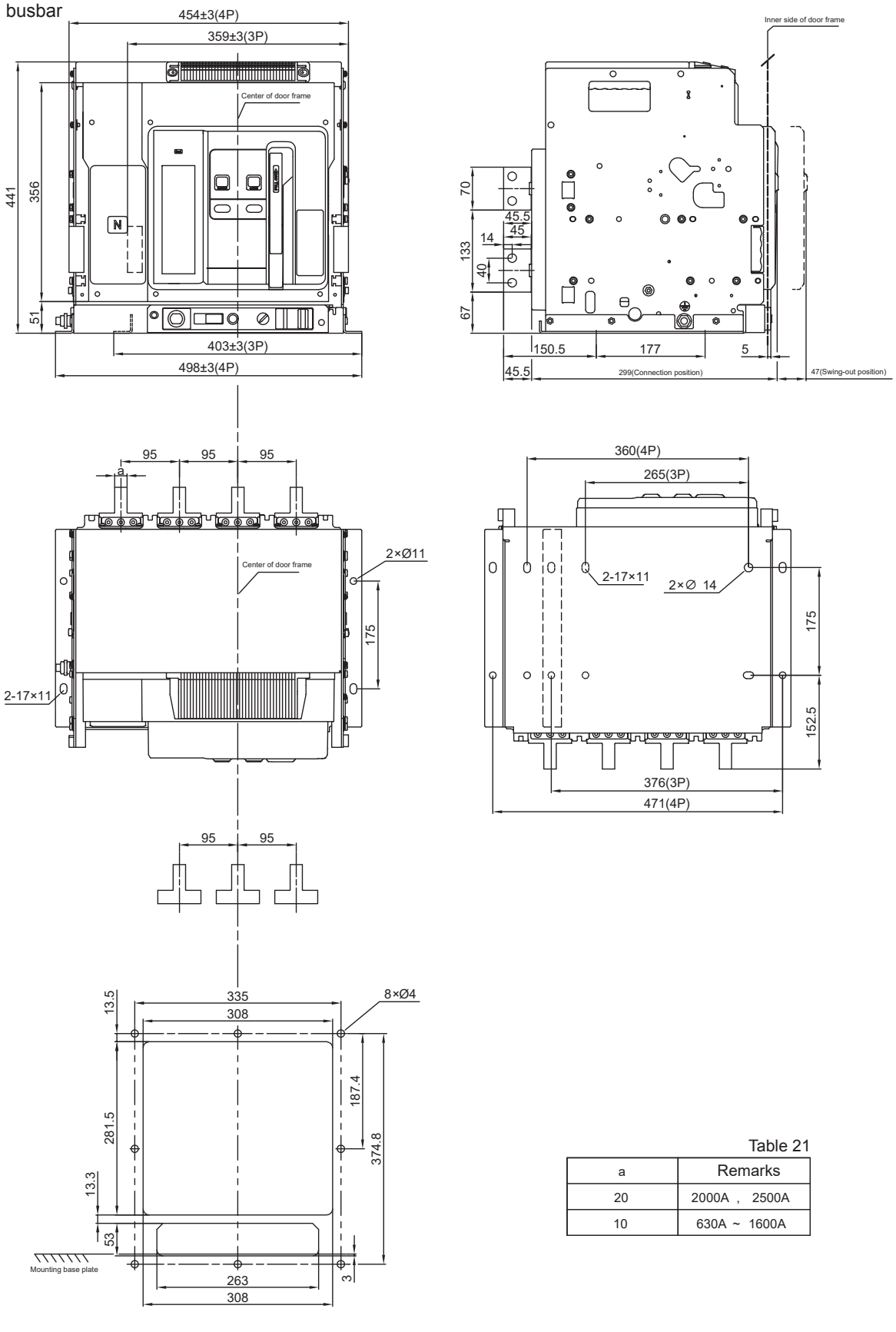


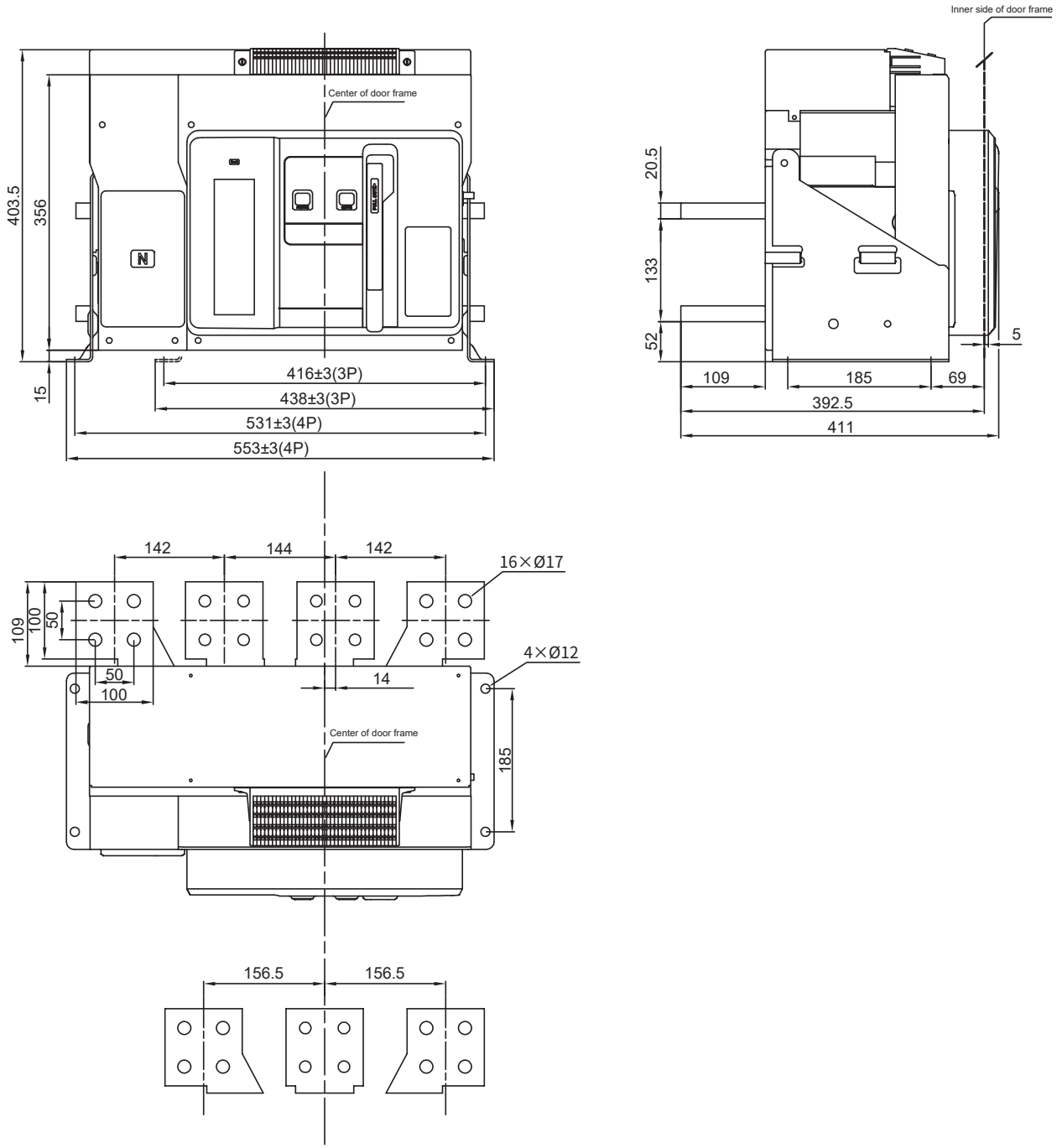
Table 21

a	Remarks
20	2000A ， 2500A
10	630A ~ 1600A

TGW3 Series Air Circuit Breaker

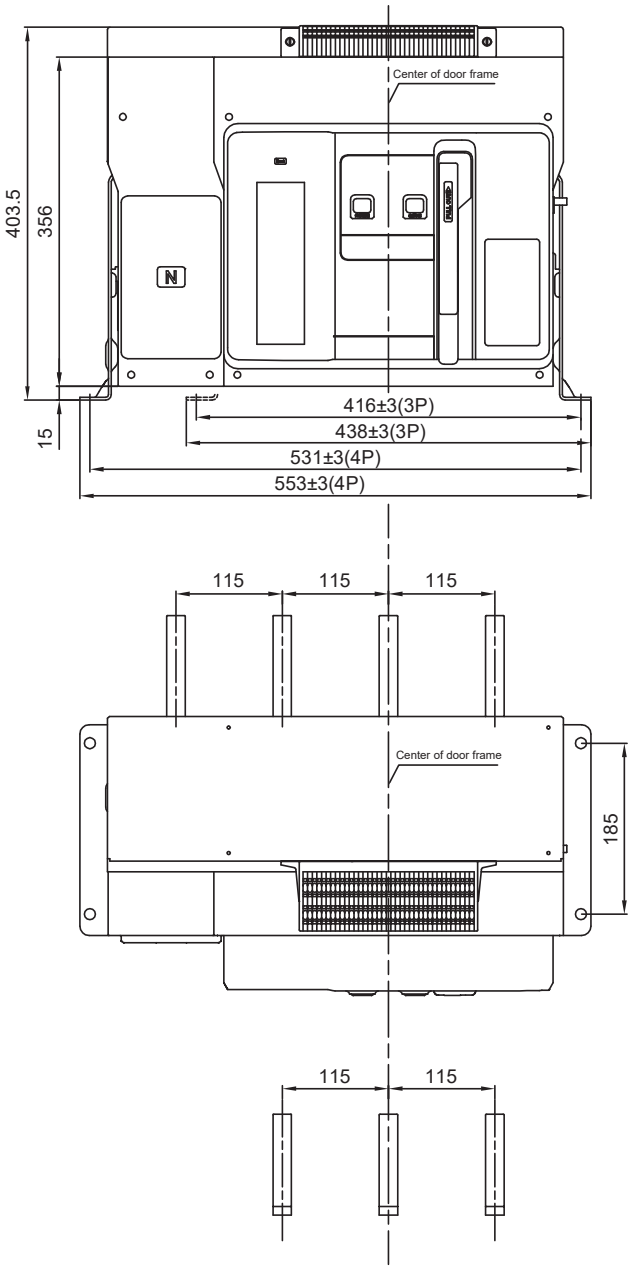
7.4.1 Installation dimensions for TGW3-3200 fixed type

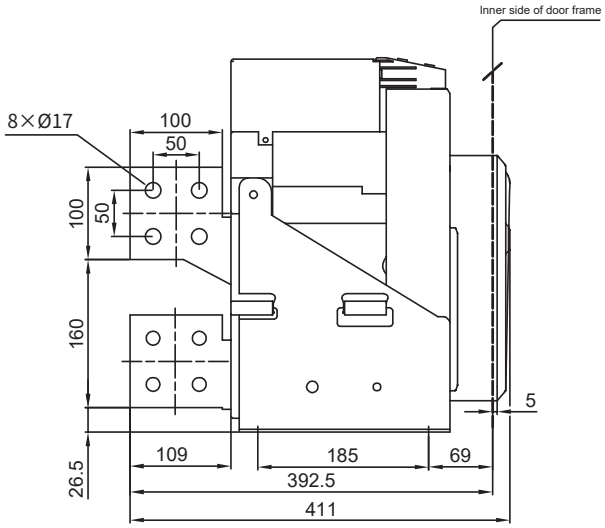
Horizontal busbar



TGW3 Series Air Circuit Breaker

Vertical busbar

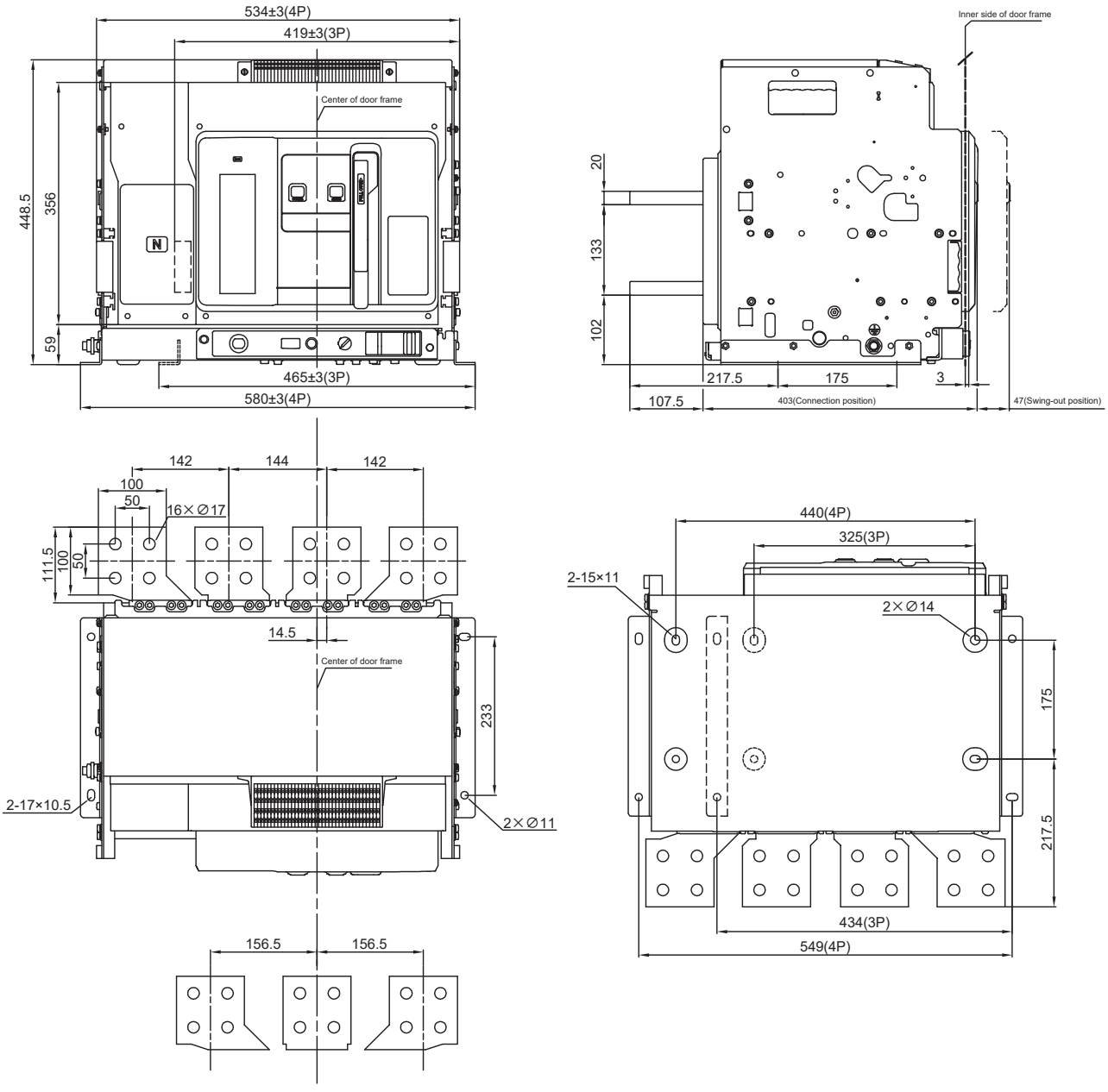




TGW3 Series Air Circuit Breaker

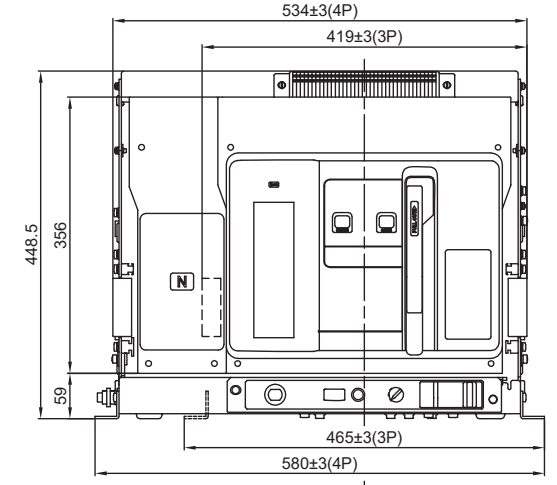
7.4.2 Installation dimensions for TGW3-3200 drawer type

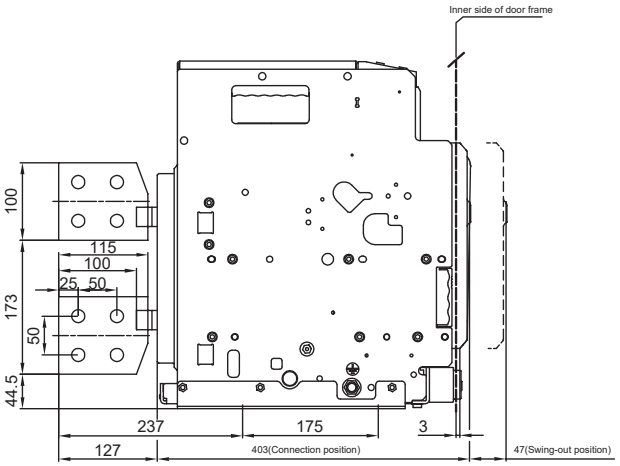
Horizontal busbar

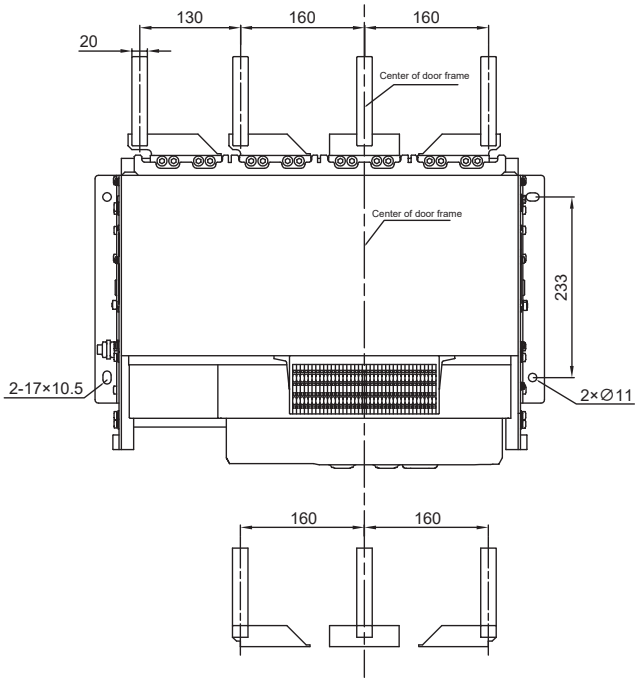


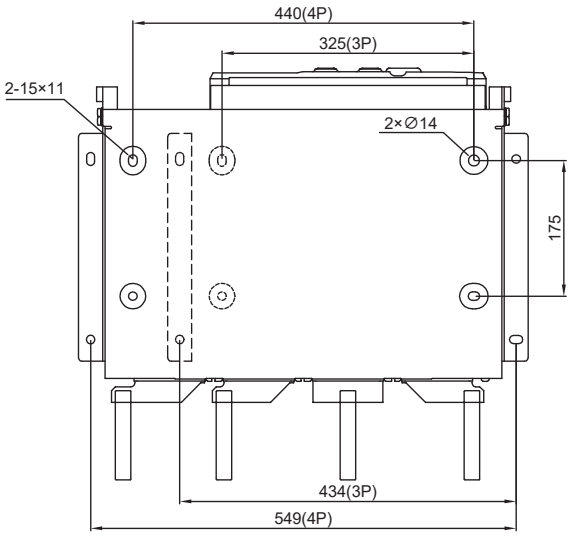
TGW3 Series Air Circuit Breaker

Vertical busbar





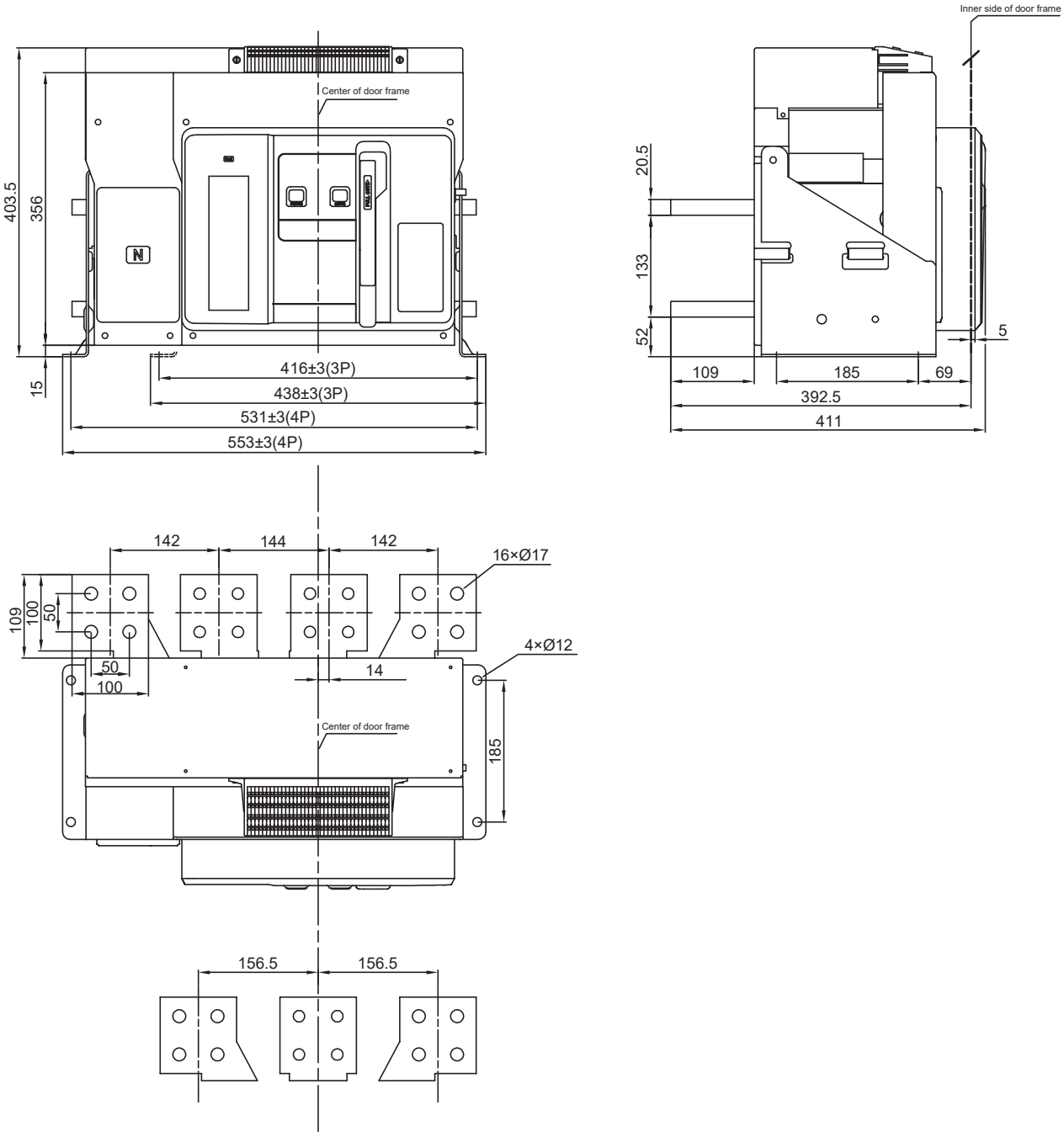




TGW3 Series Air Circuit Breaker

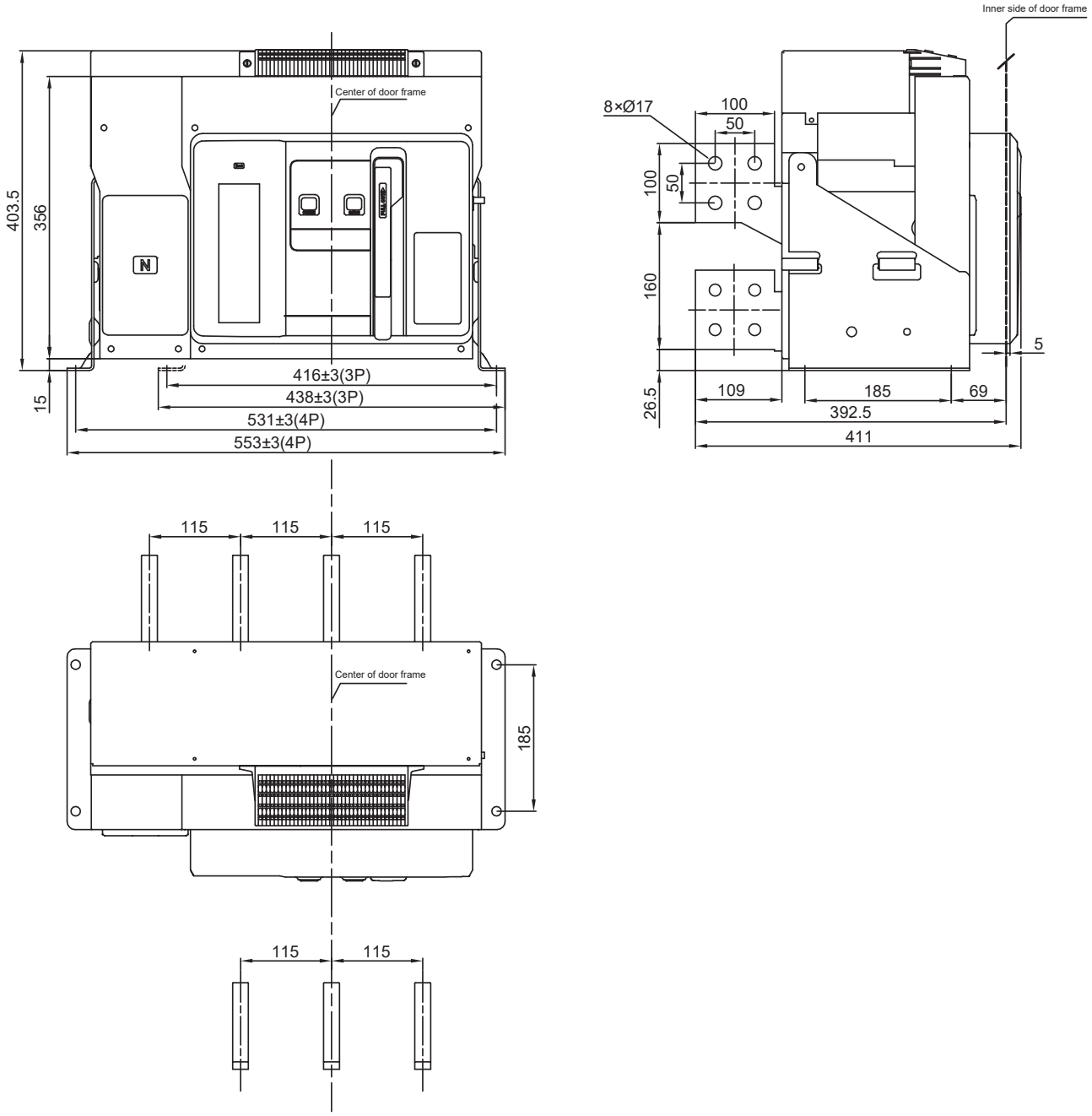
7.5.1 Installation dimensions for TGW3-4000 fixed type

Horizontal busbar



TGW3 Series Air Circuit Breaker

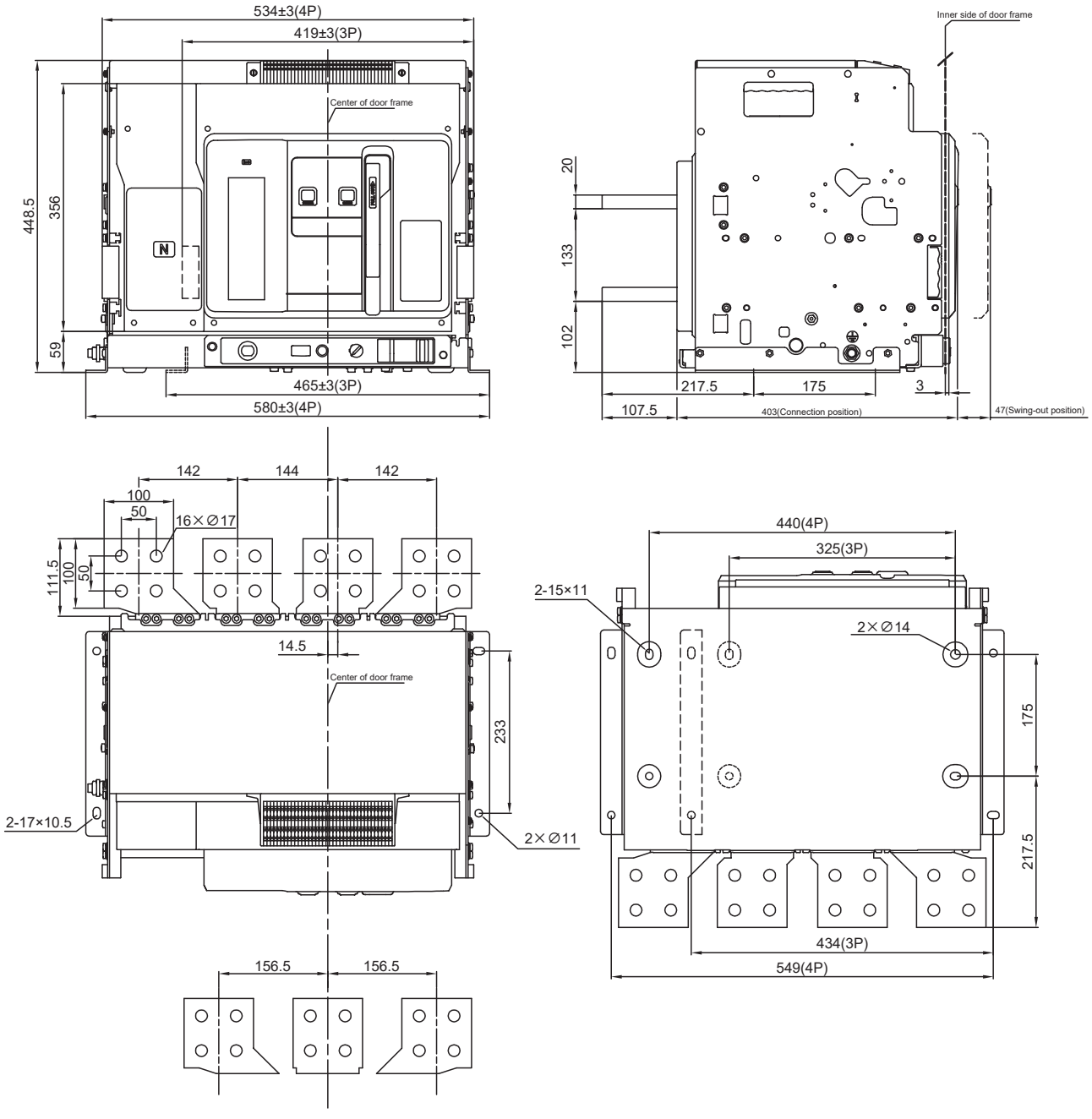
Vertical busbar



TGW3 Series Air Circuit Breaker

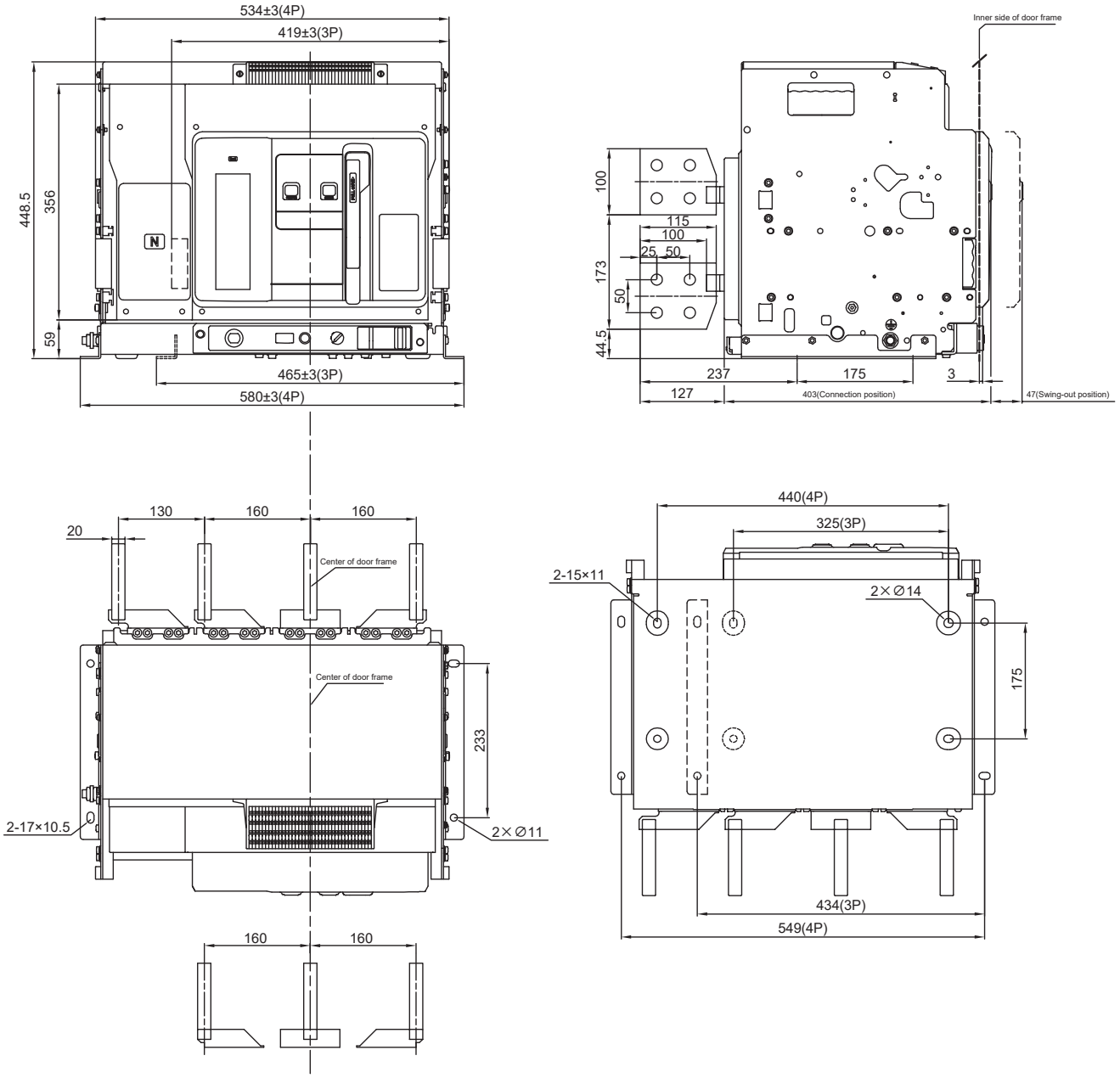
7.5.2 Installation dimensions for TGW3-4000 drawer type

Horizontal busbar



TGW3 Series Air Circuit Breaker

Vertical busbar



8 Installation, Commissioning and operation

8.1 Technical requirements for mounting foundation inspection and installation

8.1.1 Inspection items before installation:

a. Check whether your order form is consistent with the nameplate parameters on this circuit breaker:

(1) Rated current, set current;
(2) Main circuit voltage;
(3) Installation method, operation method;
(4) Intelligent trip unit voltage, shunt release voltage, undervoltage release voltage and delay time, closing electromagnet voltage, Charge motor voltage;
(5) Other special ordering requirements;

b. Check the packing contents according to the configuration instructions in the manual;

c. Please read this manual carefully before installation, operation, maintenance and inspection to avoid human damage to the circuit breaker causing unnecessary trouble.

8.1.2 Preparation before installation:

a. Unpack the product in the packing order indicated on the top cover of the package box. Do not apply brute force;

b. Remove the circuit breaker from the fixed base plate of the packing box. For drawer type circuit breakers, remove the circuit breaker from the drawer seat after removal of the circuit breaker from the fixed foot plate of the packing box, then remove the base plate from the drawer seat, and wipe out the foreign matter in the drawer seat;

c. Check the insulation resistance of the circuit breaker with a 500V megohmmeter. When the ambient medium temperature is 20°C±5°C and the relative humidity is 50%~70%, the insulation resistance should be no less than 20MΩ, otherwise the circuit breaker should be dried.

8.1.3 Recommended busbar installation by users

The busbar material adopts copper.

Recommended busbar installation by users

Table 22

Frame	Rated current (A)	Ambient temp. (-45 ~ 40) °C			
		5mm busbar		10mm busbar	
		Qty.	Spec.	Qty.	Spec.
1600	200~250	1	50*5	1	50*10
	400~800	2	50*5	1	50*10
	1000	3	50*5	2	50*10
	1250~1600	4	50*5	2	50*10
2000	200~250	1	50*5	1	50*10
	400~800	2	50*5	1	50*10
	1000~1250	3	50*5	2	50*10
	1600	4	60*5	2	60*10
	2000	6	60*5	3	60*10
2500	630~800	2	50*5	1	50*10
	1000~1250	3	50*5	2	50*10
	1600	4	60*5	2	60*10
	2000~2500	6	70*5	3	70*10

TGW3 Series Air Circuit Breaker

Table 22, continued

Frame	Rated current (A)	Ambient temp. (-45 ~ 40) °C			
		5mm busbar		10mm busbar	
		Qty.	Spec.	Qty.	Spec.
3200	2000~2500	4	100*5	2	100*10
	2900~3200	8	100*5	4	100*10
4000	2500~3200	8	100*5	4	100*10
	3600	7	120*5	3	120*10
	4000	8	120*5	4	120*10

Notes:

a. When the copper busbar selected by the user does not match the circuit breaker terminal, an extended busbar is designed and processed as an adapter. The extended busbar is designed by the user. The cross-sectional area of the extended busbar cannot be less than the values listed in the above table. The gap between the extended busbars should not be less than the gap between the circuit breaker terminals as much as possible.

b. After the busbar recommended in the table is installed, the electrical clearance between adjacent phases of the circuit breaker must be no less than 18mm.

c. When there is an electrical component that uses thyristors for three-phase rectification and high-frequency inversion in the load equipment, such as high-frequency induction heating furnaces (medium-frequency furnace steelmaking equipment), solid-state high-frequency welders (such as arc welders), and vacuum heating melting equipment (such as single crystal silicon growth furnaces), the selection of circuit breakers shall consider the influence of high-order harmonics generated by thyristors on circuit breakers in addition to considering the influence of ambient temperature and altitude. At this time, derating is required, and the recommended derating factor is (0.5~0.8).

d. After the busbar is installed by users, the electrical clearance of the upper and lower busbar fastening bolts must be no less than 20mm.

e. After the circuit breaker is installed, the safety distance between charged parts of different potentials and between live parts and the earth must be no less than 18mm.

f. The table shows the copper busbar specifications used when the circuit breaker works in an ambient temperature of up to 40°C and is openly installed under the heating conditions specified in GB/T14048.2. For environments above +40°C, the number of copper busbars should be increased or the derating is required.

g. The above data is calculated based on experiments and theories, and is for reference only.

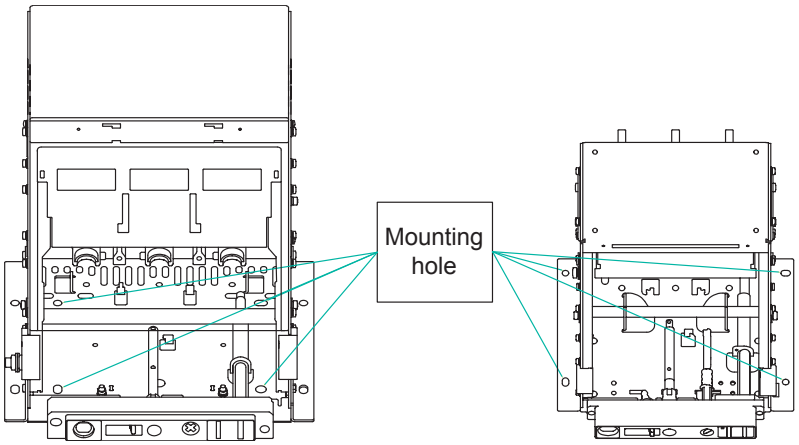
9 Installation Procedures, Methods and Precautions

9.1 Circuit breaker installation

9.1.1 Installation of drawer type circuit breakers

For drawer type circuit breakers, take the circuit breaker body out of the drawer seat, then install the drawer seat in the complete cabinet, fasten it with 4 M10 bolts (with washers), and then install the circuit breaker body back into the drawer seat.

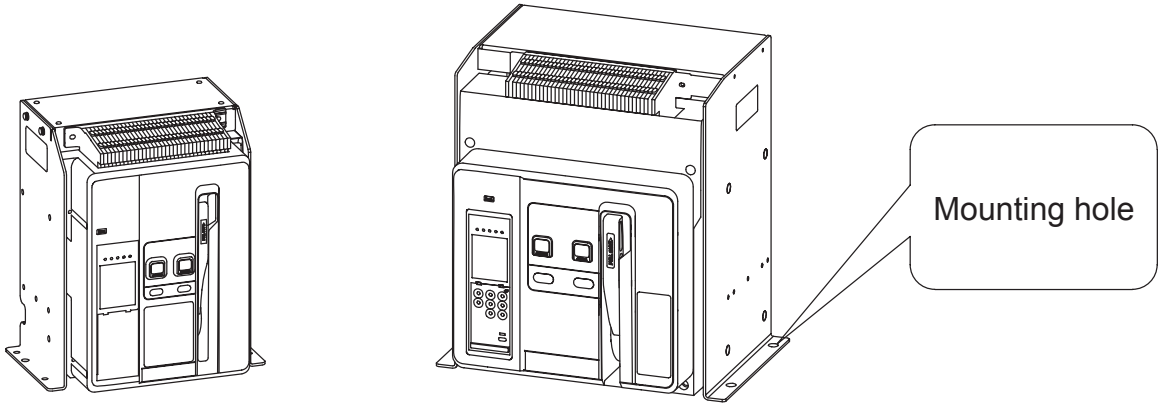
Note: Drawer type products have internal and external mounting holes. For 3200 frame and above, the internal mounting hole is available for installation.



Drawer seat mounting hole

9.1.2 Installation of fixed circuit breakers

Fixed circuit breakers are directly installed in the complete cabinet. 1600AF type is fastened with four M6 bolts (with washers), 2000AF~4000A type is fastened with four M10 bolts (with washers). The installation torques are listed in Table 24.



Mounting holes for fixed circuit breakers

9.2 Electrical connection

9.2.1 Power inlet wire

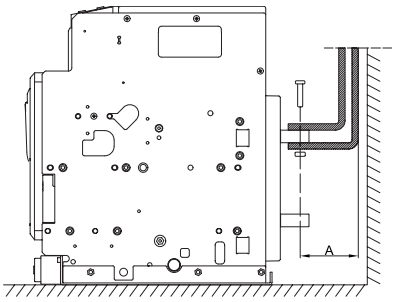
To facilitate installation in the distribution cabinet, the power supply wires can be either from the top or the bottom without affecting the performance of the circuit breaker.

9.2.2 Power connection

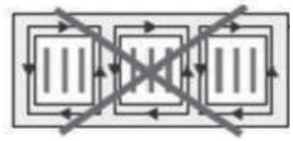
9.2.2.1 Requirements for partitions and supports

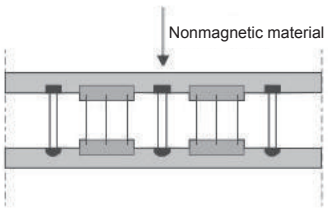
Sufficient space must be provided to ensure good air circulation. The partition between the upper and lower connections of the circuit breaker must be made of non-magnetic material.

For circuit breakers with a current of 2500A and above, the metal support or partition must be made of non-magnetic material. When a conductor passes through the metal partition, a magnetic loop cannot be formed.



Partition





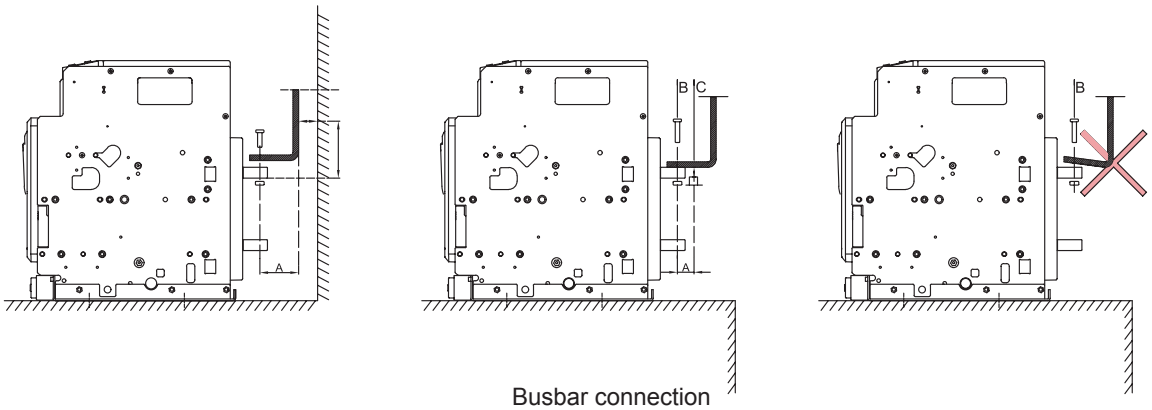
Support

No magnetic loop is strictly allowed around conductors (such as busbar supports).
To avoid this, the support must be made of non-magnetic material.

TGW3 Series Air Circuit Breaker

9.2.2.2 Busbar connection

Before bolt B is inserted into the bus and busbar, the position of the support rod and the busbar should be adjusted and located. This support rod should be fixed on the distribution cabinet frame. It is prohibited to apply the weight of the copper busbar onto the circuit breaker terminal (this support should be installed near the terminal).



Busbar connection

Electric stress: The first support rod should be kept within the maximum distance from the circuit breaker connection point. To prevent short circuit faults between the phases, this distance must meet the requirements of dynamic stability.

Maximum distance between the support rod and the circuit breaker connection point

Table 23

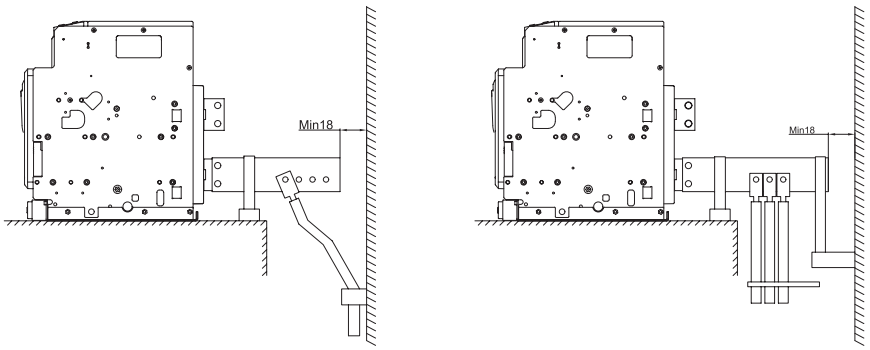
Ics(kA)	≤30	40	50	75	80	≥100
Distance A (mm)	350	320	300	200	150	150

9.2.2.3 Cable connection

It is ensured that there is no excessive mechanical force on the circuit breaker terminal when the cable connection is used. Users can use the power connection busbar to extend the terminal block of the circuit breaker. The cable can use single-core cable or multi-core cable. When wiring connection, the busbar is connected generally according to the following rules:

(1) Locate the cable lugs before inserting the bolts

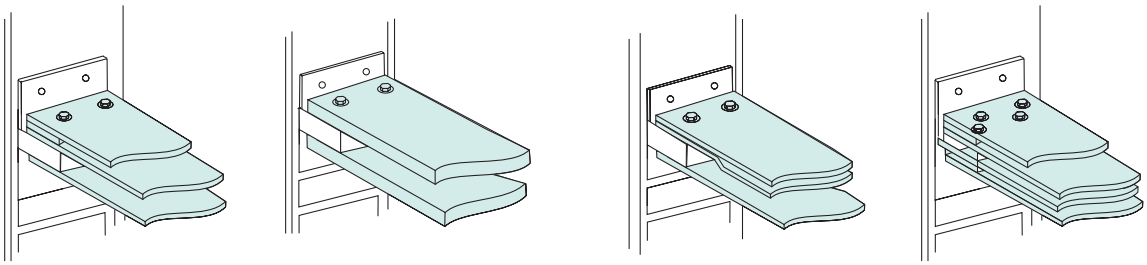
(2) The cables should be firmly fixed to the distribution cabinet frame



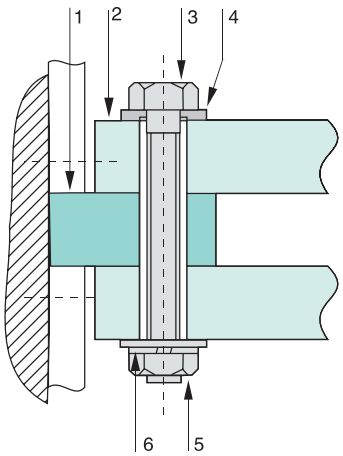
Cable connection

9.2.2.4 Terminal tightening requirements

Whether the busbar is fixed properly depends on the appropriate torques of the bolts and nuts. Too much or too little torque is not allowed. If the torque is too large, the bolts are easy to slip resulting in poor tightening; if the torque is too small, and the bolts and nuts are not tightened in place also resulting in poor tightening, which both cause excessive temperature rise. For the connection of the circuit breaker, the tightening torque is listed in Table 24: These data are applicable to copper busbars and steel bolts and nuts with grade ≥8.8. The same torque can also be used for aluminum busbars.



Recommended busbar building method



1 Circuit breaker terminal
2 Busbar
3 Bolts
4 Washers
5 Nuts
6 Elastic washers

Busbar fixation diagram

Bolts configuration

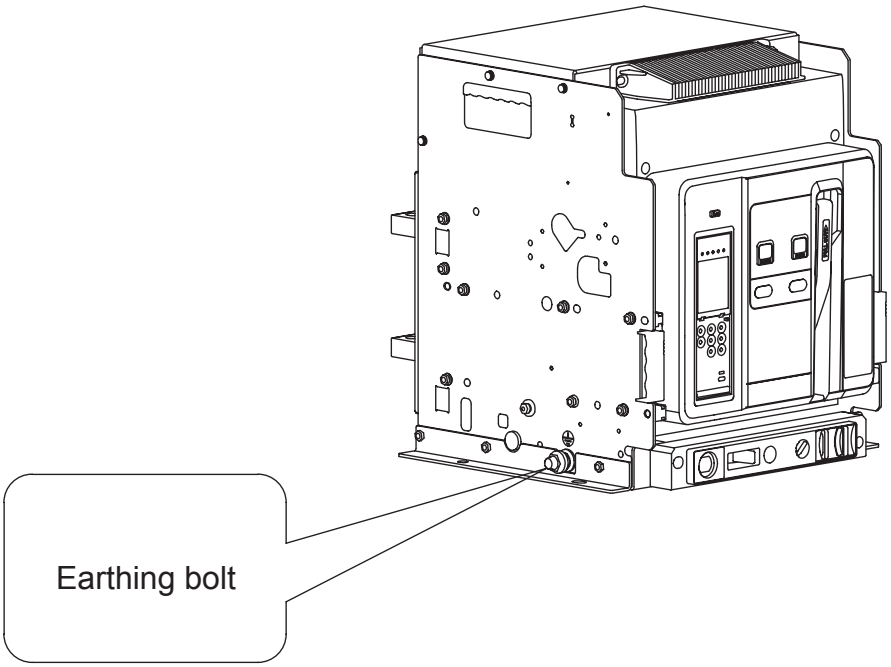
Table 24

Frame	Bolt type	Application	Preferred tightening torque
1600	M10	Tighten the bus	(36~52)N·m
2000~2500	M12	Tighten the bus	(61~94)N·m
3200~4000	M14	Tighten the bus	(61~94)N·m
1600 drawer type	M8	Fix circuit breakers	(10.3~14.4)N·m
1600 fixed type	M6	Fix circuit breakers	(5~7)N·m
2000~2500 drawer type	M10	Fix circuit breakers	(25~30)N·m
2000~2500 fixed type	M10	Fix circuit breakers	(25~30)N·m
3200~4000 drawer type	M10	Fix circuit breakers	(25~30)N·m
3200~4000 fixed type	M10	Fix circuit breakers	(25~30)N·m

TGW3 Series Air Circuit Breaker

9.2.2.5 Earthing

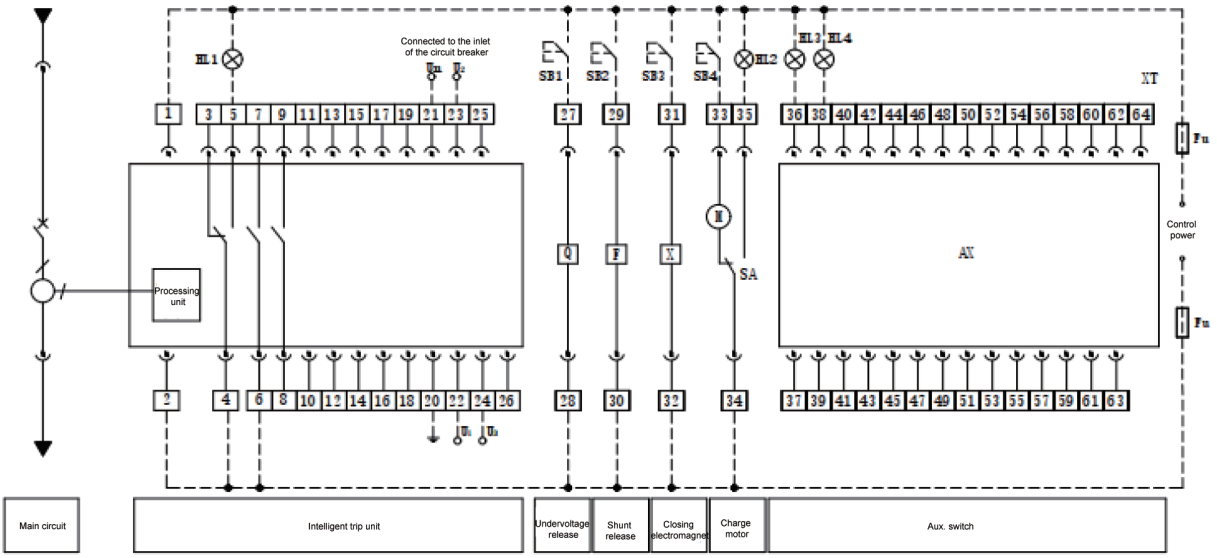
PE wires are used to connect the earthing bolt on the metal mounting plate on the left or right side of the circuit breaker to the complete earthing bar to ensure the earthing continuity of the circuit breaker and the complete switch cabinet. The cross section and requirements shall comply with the GB/T 7251.1 standard.



Isometric drawing (indicating the earthing bolt)

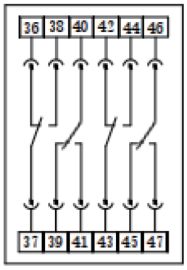
10 Secondary circuit wiring diagram

10.1 Secondary circuit wiring diagram for 1600 frame with 3-M/3-V trip unit

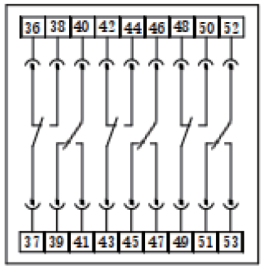


AX Aux. contact type

Four sets of aux. transfer contacts (default)



Six sets of aux. transfer contacts

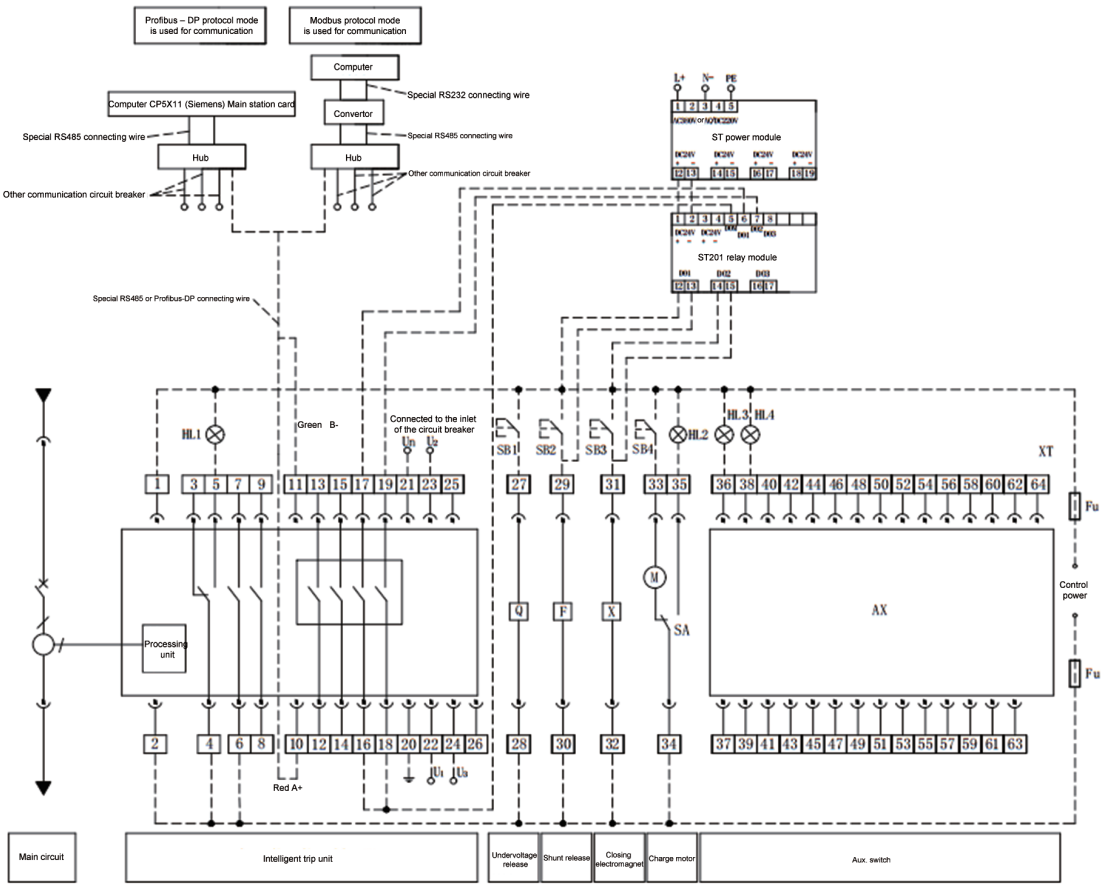


Q: Undervoltage release F: Shunt release X: Closing electromagnet
M: Electric charge mechanism SA: Travel switch XT: Terminal block
AX: Aux. contact
SB1: E-stop button SB2: OFF button SB3: OFF button
SB4: Charge button (connected or not)
HL1: Fault indicator HL2: ON status indicator HL2: Charge indicator
HL3: OFF status indicator HL4: ON status indicator
FU: Fuse (self-provided 6A or 10A)

1#, 2#: Trip unit power supply 3#, 4#, 5#: Fault trip contact output
6#, 7#: First set of contact output for circuit breaker status
8#, 9#: Second set of contact output for circuit breaker status
10#~19#: Empty 20#: PE wire of trip unit 21#: N phase voltage signal input
22#: A phase voltage input 23#: B phase voltage input
24#: C phase voltage input (3-M type trip unit has no voltage function, empty)
25#~26#: External transformer, 25# is positive, 26# is negative
27#, 28#: Undervoltage release (optional) 29#, 30#: Shunt release
31#, 32#: Closing electromagnet 33#, 34#: Electric charge
34#, 35#: Charge indicator 36#-64#: Aux. contact (including empty point)
Note: Those marked with dotted lines are connected by users. If the rated voltages of Q, F, X, M and intelligent trip unit are different, they can be connected to the power supply separately.

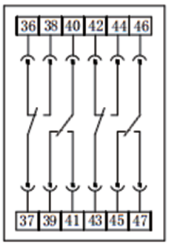
TGW3 Series Air Circuit Breaker

10.2 Secondary circuit wiring diagram for 1600 frame with 3-H/3-S trip unit

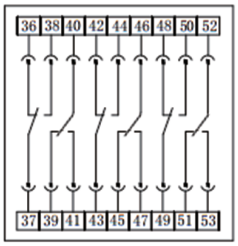


AX Aux. contact type

Four sets of aux. transfer contacts (default)



Six sets of aux. transfer contacts

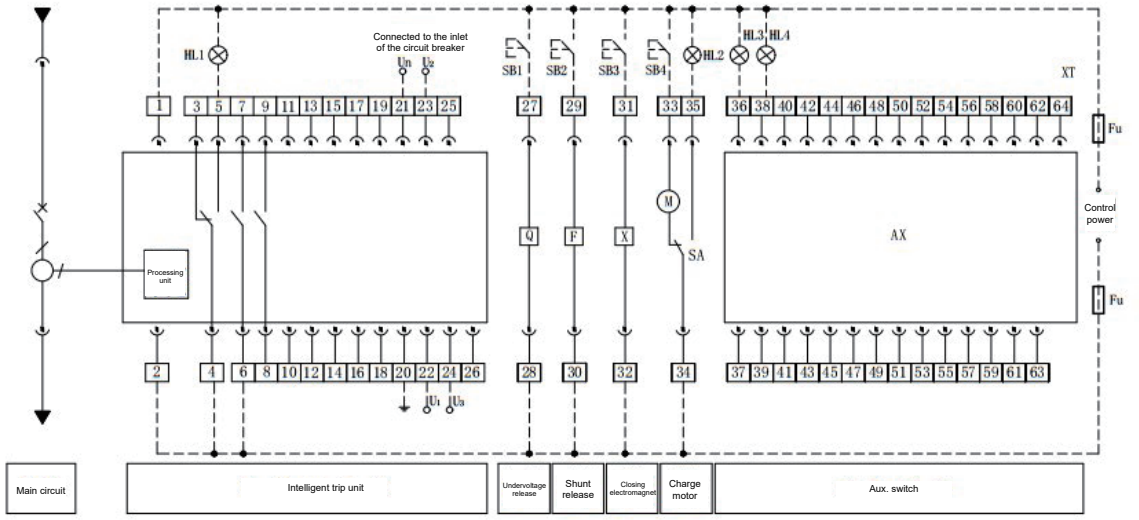


Q: Undervoltage release F: Shunt release X: Closing electromagnet
M: Electric charge mechanism SA: Travel switch XT: Terminal block
AX: Aux. contact
SB1: E-stop button SB2: OFF button SB3: ON button
SB4: Charge button (connected or not)
HL1: Fault indicator HL2: ON status indicator HL2: Charge indicator
HL3: OFF status indicator H4: ON status indicator
FU: Fuse (self-provided 6A or 10A)

1#, 2#: Trip unit power supply 3#, 4#, 5#: Fault trip contact output
6#, 7#: First set of contact output for circuit breaker status
8#, 9#: Second set of contact output for circuit breaker status
10#~11#: Communication interface output node
12#~19#: Four sets of programmable output contacts
12#, 13#: Default load 1 alarm 14#, 15#: Default load 2 alarm
16#, 17#: Default opening signal output 18#, 19#: Default closing signal output
20#: Trip unit PE wire 21#: N phase voltage signal input
22#: A phase voltage input 23#: B phase voltage input
24#: C phase voltage input
25#~26#: External transformer, 25# is positive, 26# is negative
27#, 28#: Undervoltage release (optional) 29#, 30#: Shunt release
31#, 32#: Closing electromagnet 33#, 34#: Electric charge
34#, 35#: Charge indicator 36#~64#: Aux. contact (including empty point)
Note: Those marked with dotted lines are connected by users. If the rated voltages of Q, F, X, M and intelligent trip unit are different, they can be connected to the power supply separately.

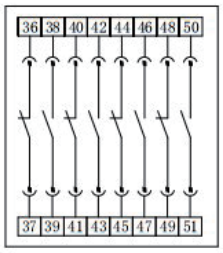
TGW3 Series Air Circuit Breaker

10.3 Secondary circuit wiring diagram for 2000~4000 frame with 3-M/3-V trip unit

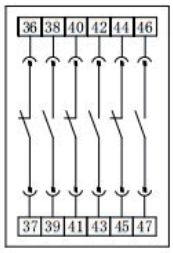


AX aux. contact type

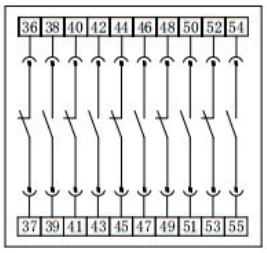
Independent four – open and four – closed aux. contact (default)



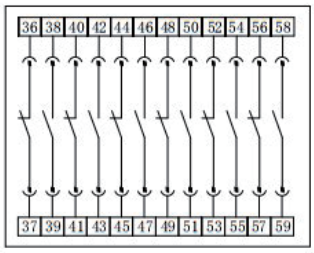
Independent three – open and three – closed aux. contact



Independent five – open and five – closed aux. contact



Independent six – open and six – closed aux. contact

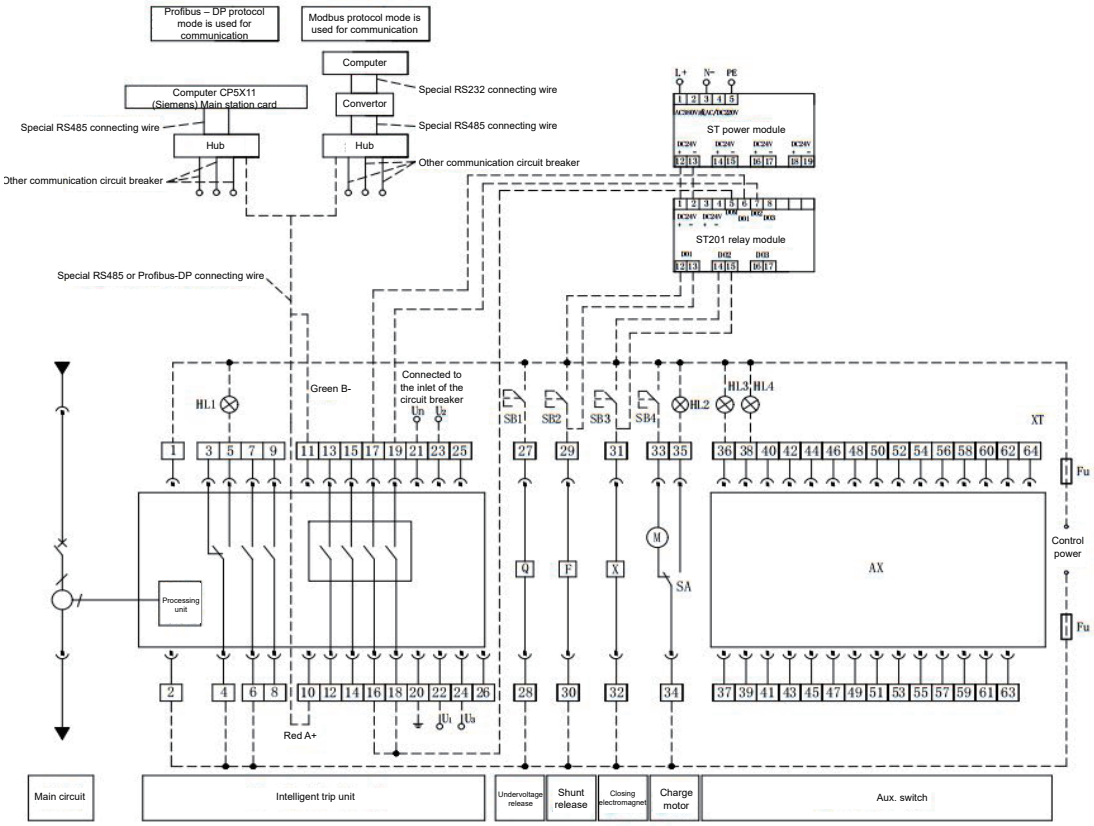


Q: Undervoltage release F: Shunt release X: Closing electromagnet
M: Electric charge mechanism SA: Travel switch XT: Terminal block
AX: Aux. contact
SB1: E-stop button SB2: OFF button SB3: ON button
SB4: Charge button (connected or not)
HL1: Fault indicator HL2: Closing status indicator HL2: Charge indicator
HL3: Opening status indicator HL4: Closing status indicator
FU: Fuse (self-provided 6A or 10A)

1#, 2#: Trip unit power supply 3#, 4#, 5#: Fault trip contact output
6#, 7#: First set of contact output for circuit breaker status
8#, 9#: Second set of contact output for circuit breaker status
10#~19#: Empty 20#: Trip unit PE wire 21#; N phase voltage signal input
22#: A phase voltage input 23#: B phase voltage input
24#: C phase voltage input (3-M type trip unit has no voltage function, empty)
25#~26#: External transformer, 25# is positive, 26# is negative
27#, 28#: Undervoltage release (optional) 29#, 30#: Shunt release
31#, 32#: Closing electromagnet 33#, 34#: Electric charge
34#, 35#: Charge indicator 36#~64#: Aux. contact (including empty point)
Note: Those marked with dotted lines are connected by users. If the rated voltages of Q, F, X, M and intelligent trip unit are different, they can be connected to the power supply separately.

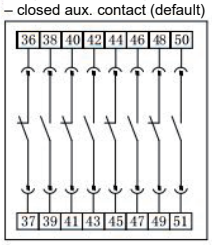
TGW3 Series Air Circuit Breaker

10.4 Secondary circuit wiring diagram for 2000~4000 frame with 3-H/3-S trip unit

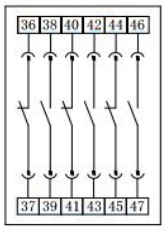


AX aux. contact type

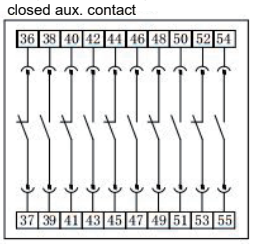
Independent four – open and four – closed aux. contact (default)



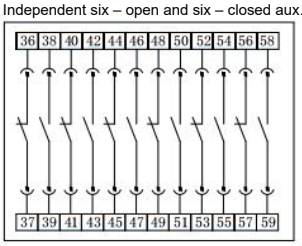
Independent three – open and three – closed aux. contact



Independent five – open and five – closed aux. contact



Independent six – open and six – closed aux. contact

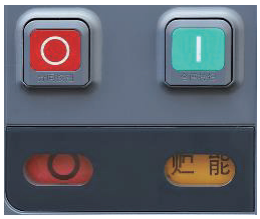


Q: Undervoltage release F: Shunt release X: Closing electromagnet
M: Electric charge mechanism SA: Travel switch XT: Terminal block
AX: Aux. contact
SB1: E-stop button SB2: OFF button SB3: ON button
SB4: Charge button (connected or not)
HL1: Fault indicator HL2: Closing status indicator
HL2: Charge indicator HL3: Opening status indicator
HL4: Closing status indicator
FU: Fuse (self-provided 6A or 10A)

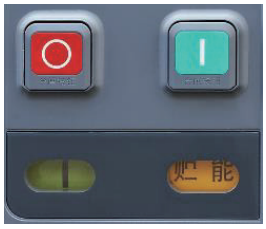
1#, 2#: Controller power supply 3#, 4#, 5#: Fault trip contact output
6#, 7#: First set of contact output for circuit breaker status
8#, 9#: Second set of contact output for circuit breaker status
10#~11#: Communication interface output node
12#~19#: Four sets of programmable output contacts
12#, 13#: Default load 1 alarm 14#, 15#: Default load 2 alarm
16#, 17#: Default OFF signal output 18#, 19#: Default ON signal output
20#: Controller PE wire 21#: N phase voltage signal input
22#: A phase voltage input 23#: B phase voltage input
24#: C phase voltage input
25#~26#: External transformer, 25# is positive, 26# is negative
27#, 28#: Undervoltage release (optional) 29#, 30#: Shunt release
31#, 32#: Closing electromagnet 33#, 34#: Electric charge
34#, 35#: Charge indicator 36#~64#: Aux. contact (including empty point)
Note: Those marked with dotted lines are connected by users. If the rated voltages of Q, F, X, M and intelligent trip unit are different, they can be connected to the power supply separately.

11 Operation of circuit breaker

11.1 Circuit breaker status indicator



a OFF charge



b ON charge

c OFF discharge

d ON discharge

Circuit breaker status indicator

11.2 Charge operation

11.2.1 Manual charge: When charging, pull the Charge handle up and down repeatedly 6 to 7 times until a "click" sound is heard, as illustrated in figure below. The charging is ended when no reaction force is no longer felt, and there is "Charge" shown in the Charge indicator.

11.2.2 Electric charge: After the control circuit is energized, the electric charge mechanism will automatically store energy immediately (when the control circuit has been connected as the automatic pre-charge form).

Manual operation

TGW3 Series Air Circuit Breaker

11.3 ON / OFF operation

11.3.1 Manual ON / OFF operation

a. ON: When the circuit breaker is in the OFF Charge state (if there is an undervoltage release, please make sure that the undervoltage is energized and closed), with the green "|" button pressed as shown in the left figure below, the circuit breaker is closed, and the circuit breaker is converted from the OFF charge state to the ON charge state.

b. OFF: When the circuit breaker is in the closed state, with the "O" button pressed as shown in the right figure below, the circuit breaker opens, and it is converted from the closed state to the open state.

Manual ON operation

Manual OFF operation

Note: When operating the circuit breaker, the distribution cabinet door must be closed to prevent accidents.

11.3.2 Electric ON / OFF operation

a. ON: When the circuit breaker is in the Charge or OFF state (if there is an undervoltage release, please make sure that the undervoltage is energized and closed), apply the rated voltage to the closing electromagnet to close the circuit breaker.

b. OFF: When the circuit breaker is in the closed state, applying the rated voltage to the shunt release can open the circuit breaker.

11.4 Reset operation after circuit breaker trip

After the circuit breaker trips due to a fault, the reset button will pop up. After confirming that the fault is eliminated, press the reset button and close the circuit breaker according to the closing operation instructions.

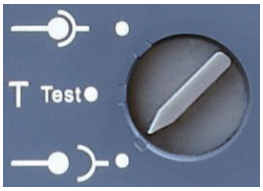
11.5 Use of drawer seat of drawer type circuit breaker

11.5.1 Working position indicator

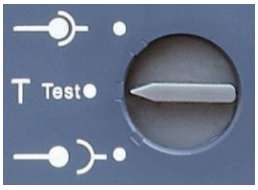
a. "Connect" position: Both the main circuit and the secondary circuit are connected;

b. "Test" position: The main circuit is disconnected and has a reliable isolation distance, only the secondary circuit is connected, and some necessary action tests can be carried out;

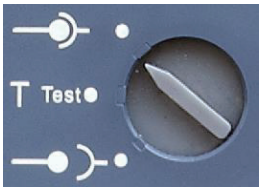
c. "Disconnect" position: Both the main circuit and the secondary circuit are disconnected, and the circuit breaker body can be removed at this time.



Disconnect



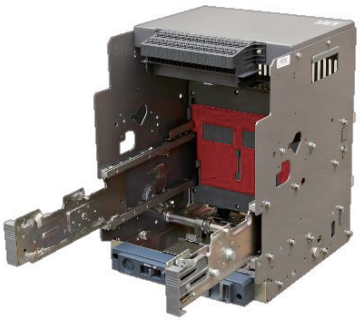
Test



Connect

Drawer seat working position diagram

11.6 Insertion operation of the circuit breaker body

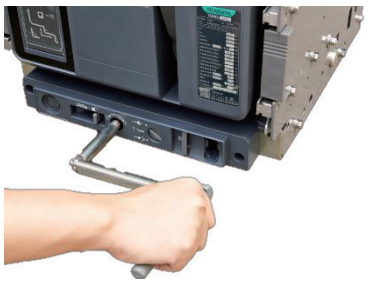


Hold the handle, and pull out the rail

Put the circuit breaker into the drawer seat

Push into the circuit breaker

Swinging preparation (swing rod and unlock)



Swing the handle clockwise, and the circuit breaker will be pushed inward; swing the handle counter clockwise, and the circuit breaker body will be exited outward.

During the shaking in and out process, when the position indicator indicates the "Disconnect", "Test", and "Connect" positions, the circuit breaker will automatically lock, and the "Unlock" button will pop out. Only with the button pressed, the handle can be swung in and out.

The shaking-in/out torque of the drawer seat is not greater than 30N.m.

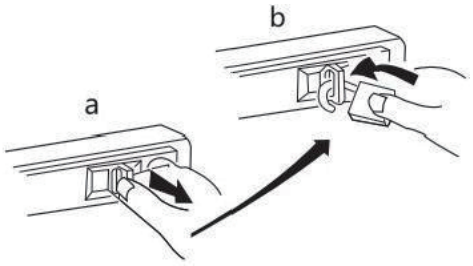
Shaking-in operation (three-position unblock)

11.7 When the circuit breaker is pulled out, the handle is swung counter clockwise, and the unlocking operation of the three-position locking device is the same as that of the swing-in operation

11.7.1 "Disconnect" position locking device (the padlock is purchased by the user)

As illustrated in the figure, pull out the lock rod, and insert the padlock. At this time, the circuit breaker cannot move from the "Disconnect" position to the "Test" or "Connect" position.

Note: 1600AF can be pulled out in the Disconnect position, and 2000AF and above can be pulled out in all three positions.



Drawer seat padlock

12 Precautions for Maintenance, Care, Lifting and Storage

12.1 Precautions

The following operations must be carried out in sequence before the maintenance and repair of the circuit breaker:

a. Open the circuit breaker to ensure that the circuit breaker is in the Open state;

b. Turn off the upper knife switch (if any) to ensure that the main circuit and the secondary circuit are not energized;

c. Discharge and opening operation of circuit breakers to ensure the circuit breaker is in the Discharge and OFF state;

d. All components that may be touched by the staff must be de-energized;

e. For drawer type circuit breakers, swing the circuit breaker out of the drawer seat to the "Disconnect" position;

f. Comply with current regulations and standards to ensure the safety of the equipment;

g. Inspection and maintenance operations should only be performed by skilled technicians who are very familiar with circuit breakers. The company will not be responsible for personal injury and property damage caused by failure to follow the instructions in this instruction.

12.2 Inspection period

The inspection period of the circuit breaker should be determined according to the working environment, service life and number of operation cycles of the circuit breaker. The inspection should be carried out by skilled technicians who are very familiar with the circuit breaker, in order to prevent failures caused by the reduction of the performance of the circuit breaker components.

12.2.1 Inspection and maintenance period according to the working environment and service life

Inspection period based on the use environment and service life

Table 25

Conditions	Environment	Inspection period	Remarks
General environment	The air is always kept clean and dry, without corrosive gas, and the temperature is ranged -5°C to +40°C	Once a year	Comply with the GB/T14048.2 General environment conditions requirements
Harsh environment	Low temperature -5°C to -45°C or high temperature +40°C to +70°C	Once every three months	
	Places with more dust or corrosive gases	Once a month	

12.2.2 Inspection period according to the number of operation cycles

Inspection period based on the number of operation cycles

Table 26

Frame current	Number of operation cycles (times)	
	OFF under load	Total times (including load and non-load)
Inm≤2500A	Every 500	Every 3000
Inm≥3200A	Every 500	Every 2000
Notes: 1. One operation cycle means one ON operation and one OFF operation 2. OFF under load current is less than In.		

12.2.3 Inspection period for special circumstances

12.2.3.1 Please check the circuit breaker immediately in the following special circumstances

a. Before the circuit breaker is put into operation after out of the service for a long time (three months);

b. After the circuit breaker is short circuited and disconnected;

c. After the circuit breaker is affected by overheating or moisture;

d. After the circuit breaker is impacted or otherwise physically damaged.

12.2.3.2 The circuit breaker must be replaced in the following situations

a. Water enters the circuit breaker;

b. The insulation resistance of the conductive parts of the main circuit is less than 5MΩ, and the insulation cannot be restored;

c. After the circuit breaker is broken due to short-circuit current, the arc extinguishing chamber or contact system is seriously damaged.

12.3 Inspection and maintenance items

12.3.1 Appearance inspection

Check the shell, secondary terminals and insulation base for cracks, breaks or deformations. If found any abnormalities, please contact our company. There should be no harmful dust or pollution deposits on the conductive parts and insulation parts of the main circuit, and remove them if necessary.

12.3.2 Operation inspection

Charge inspection: Perform manual charge operation when the circuit breaker is in the Discharge state, and after the charging operation is completed, the "Charge/Discharge" indicator shall work normally. If there are any abnormalities, please contact our company.

ON / OFF inspection: After the circuit breaker is charged, eliminate other factors that limit the closing of the circuit breaker, make the circuit breaker indicator indicate the "Charge" indication state, then perform manual ON / OFF operations and the circuit breaker should be reliably closed and opened, and the "ON/OFF" and "charge/discharge" indications should work properly.

12.3.3 Dielectric performance inspection

Insulation resistance measurement: Measure the insulation resistance of the circuit breaker with a 1000VDC megohmmeter, and the insulation resistance should be no less than 20MΩ.

The insulation resistance test parts include: between all poles and between each pole and the frame when the circuit breaker is closed, and between the inlet and outlet wires of each pole when the circuit breaker is open.

12.3.4 Circuit connection inspection

Check whether the main circuit and secondary circuit terminals are loose. If they are loose, tighten them again to ensure reliable connection.

12.3.5 Intelligent controller inspection

Perform a simulated trip test of the intelligent trip unit. During the test, ensure that the circuit breaker is closed under non-load. Energize the trip unit separately and perform a simulated trip test according to the operating instructions of the intelligent trip unit; the circuit breaker should be able to reliably trip, and the operating current and time should meet the requirements. If the measured value deviates from the standard value, please contact our company.

12.3.6 Accessory inspection

○ Check the motor mechanism: The circuit breaker should perform the electric charge operation within 5 seconds within the specified voltage range.
○ Check the undervoltage release: Apply 85% of the rated voltage on the undervoltage release, and the circuit breaker should be closed normally. It will trip when the rated voltage is reduced to 35% to 70% of the rated voltage.
○ Check the closing electromagnet and shunt release: Perform the electric ON / OFF operation of the circuit breaker, and the circuit breaker should be reliably closed and opened within the voltage range specified by the closing electromagnet and shunt release.
○ Check the auxiliary switch: Perform the ON / OFF operation of the circuit breaker, and the contact of the auxiliary switch can be switched reliably.

12.3.7 Drawer seat inspection

When the drawer seat indication is changed from Test to Connect, the circuit breaker cannot remain closed. Before the main busbar comes into contact the bridge contact of the drawer seat, the main contact of the circuit breaker must be disconnected; when the drawer seat indication is changed from Connect to Test, the circuit breaker cannot remain closed. Before the main busbar leaves the bridge contact of the drawer seat, the main contact of the circuit breaker must be disconnected.

There is no foreign matter in the drawer seat.

When the circuit breaker is swinging in and out, the safety partition should be able to open and close smoothly, and the bridge contact should not be deformed, dislocated, or oxidized.

12.3.8 Operating mechanism inspection

○ Check the cleanliness of the circuit breaker, remove all dust and pollution with a clean and dry cloth. If the dirt is thick, use a neutral detergent for removal and wipe it clean.
○ Remove foreign objects in the circuit breaker, including foreign objects dropped from the outside and internal wear-out substances of circuit breakers.
○ Check the lubrication of the operating mechanism. If found the lubricating grease is dry, fill lubricating grease into the operating mechanism. It is recommended to use the lubricating grease recommended by the original factory to lubricate the rotating overlap parts.

12.3.9 Arc extinguishing chamber inspection

Each grid and arcing sheet are free of defects, and the arc extinguishing cover is not broken. If any, please replace it in time and remove indoor dust, corrosion layer and arcing point. If found serious corrosion or rust, please replace it in time.

Note: Check it after interruption due to the short-circuit current.

12.3.10 Contact inspection

Check the cleanliness of the contact, remove all dust and pollution with a clean and dry cloth. If the dirt is thick, grind it with a fine sandpaper and wipe it clean.

12.4 Replacement of common accessories

Note: Before replacing accessories: all power supplies, including the main circuit and secondary circuit, should be cut off; the circuit breaker should be in the OFF and Discharge state; after replacing accessories, the circuit breaker housing should be installed for debugging, and it should be put into use after confirming all are OK.

12.4.1 Removal

① Remove the fixing screws of the secondary circuit bracket of the circuit breaker body, and take out the secondary circuit; remove the screws fixing the secondary circuit on the zero flashover hood, and then take out the secondary circuit;
② Remove the fixing screws of the cover above the circuit breaker accessories, and take out the accessory cover (1600AF);
③ Pull out the shunt release and closing electromagnet to complete the removal of the accessories.

12.4.2 Installation

① Put the shunt release and closing electromagnet in the designated position. Slightly turn the accessory if there is resistance during insertion, so that the bottom positioning boss of the accessory is inserted into the corresponding hole on the mechanism cover;
② Align the middle hole on the accessory cover with the installation column, slightly turn the accessory so that the top boss of the accessory is inserted into the limit hole on the cover; press the accessory cover and tighten the fixing screws to complete the installation of the accessory; the 1600 frame is of the cover-type clamping structure, and the 2000 frame and above are directly fixed with screws;
③ Align the mounting hole on the secondary circuit bracket with the corresponding screw hole of the circuit breaker body, pass the screws through the secondary circuit bracket and bakelite parts, and tighten the screws.

13 Troubleshooting and Solution

Faults Causes and Solution Table

Table 27

Fault	Causes	Solution
Circuit breaker trips	Overload fault trip (I_R indicator light on)	1. Check the breaking current and operation time on the intelligent trip unit; 2. Analyze the load and grid conditions; 3. If overloaded, eliminate the overload fault; 4. If the actual operating current does not match the long delay operating current setting value, modify the long delay operating current setting value according to the actual operating current for the proper matching the protection; 5. Press the Reset button to reclose the circuit breaker.
	Short circuit fault trip (Isd or Ii indicator light on)	1. Check the breaking current and operation time on the intelligent trip unit; 2. If there is a short circuit, please find and eliminate the short circuit fault; 3. Check the setting value of the intelligent trip unit; 4. Check the circuit breaker is in the good conditions; 5. Press the Reset button and reclose the circuit breaker.
	Earthing fault trip (Ig indicator light on)	1. Check the breaking current and operation time on the intelligent trip unit; 2. If there is an earthing fault, please find and eliminate the earthing fault; 3. Modify the earthing fault current setting value of the intelligent trip unit; 4. If there is no earth fault, please check whether the fault current setting value matches the actual protection; 5. Press the Reset button, and reclose the circuit breaker.
	Mechanical interlocking action	Check the working status of the two circuit breakers equipped with mechanical interlocks.
	Undervoltage release failure: a. Rated operating voltage is less than 70%Ue; b. Undervoltage release control unit failed.	1. Check whether the power supply of the undervoltage release is connected? 2. Check that the power supply voltage of the undervoltage release must be ≥ 85%Ue 3. Replace the undervoltage release control unit
Circuit breakers cannot be closed	Reset on the intelligent trip unit is not pressed (protruding the panel)	Press the Reset button and reclose the circuit breaker.
	The secondary circuit of the drawer type circuit breaker is in poor contact	Turn the drawer circuit breaker to the "Connect" position
	Circuit breakers failed to charge	Check whether the secondary circuit is connected: 1. Check that the motor control power supply voltage must be ≥ 85%Us 2. Check the motor charge mechanism. If found any fault, please contact the manufacturer to replace the motor g mechanism.
	The mechanical interlock works, and the circuit breaker has been locked	Check the working status of the two circuit breakers equipped with mechanical interlocks.
	Closing electromagnet: a. The rated control voltage is less than 85%Us; b. The closing electromagnet is failed and damaged.	1. Check that the power supply voltage of the closing electromagnet must be ≥ 85%Us; 2. Replace the closing electromagnet.
Circuit breakers trip after closing (the fault indicator is on)	1. Trip immediately: Short circuit current after closing 2. Delay trip: Overload current after closing	1. Check the breaking current and operation time on the intelligent trip unit; 2. If there is a short circuit, please find and eliminate the short circuit fault; 3. If there is an overload, please find and eliminate the overload fault; 4. Check the state of the circuit breaker; 5. Modify the current setting value of the intelligent trip unit; 6. Press the Reset button and reclose the circuit breaker.

Table 27, continued

Fault	Causes	Solution
The circuit breaker cannot be disconnected	1. The circuit breaker cannot be disconnected manually locally: 2. The circuit breaker cannot be disconnected electrically and remotely: a. Mechanical operating mechanism failure; b. The shunt release power supply voltage is less than 70%Us; c. Shunt release is damaged.	1. Check the mechanical operating mechanism. If there is a fault such as jamming, please contact the manufacturer; 2. Check whether the power supply voltage of the shunt release is less than 70%Us. 3. Replace the shunt release.
The circuit breaker cannot be charged	1. Unable to charge manually; 2. Electrical charge cannot be performed: a. The rated control power supply voltage of the electric charge device is less than 85%Us b. Mechanical failure of the charge device.	1. The charge device has a mechanical fault, and contact the manufacturer. 2. a. Check the control power supply voltage of the electric charge device is ≥ 85%Us; b. Check the charge device mechanics and contact the manufacturer.
Drawer type circuit breaker	1. There is a padlock in the Disconnect position 2. The plug-in rail or circuit breaker body is not fully pushed in	1. Remove the padlock 2. Push the rail or circuit breaker body to the bottom.
The handle cannot be inserted	1. The handle is not pulled out. 2. The circuit breaker has not completely reached the "OFF" position.	1. Pull out the handle. 2. Swing the circuit breaker completely to the "Disconnect" position.
Swing the circuit breaker in and out	Foreign objects have fallen into the drawer seat, jamming the swing-in mechanism or causing the swing-in mechanism gear-out faults.	Check and remove foreign objects. If it still cannot be swung in, contact the manufacturer.
	The drawer type circuit breaker cannot be pulled out in the "Disconnect" position	Select the circuit breaker body and drawer seat with the same frame rated current.
No display on the intelligent trip unit screen	1. The intelligent trip unit is not connected to the power supply. 2. The intelligent trip unit is faulty. 3. The rated control power supply voltage is less than 85%Us	1. Please check whether the intelligent trip unit is connected to the power supply. If not, please connect the power supply immediately. 2. Cut off the control power supply of the intelligent trip unit, and then power it on again. If there is still a fault, please contact the manufacturer. 3. Check that the power supply voltage of the intelligent trip unit must be ≥ 85%Us.
The intelligent trip unit fault indicator is on, and it is still on after pressing the "Reset" button	The intelligent trip unit is faulty	Cut off the control power supply of the intelligent trip unit, and then power it on again. If there is still a fault, please contact the manufacturer.

14 Warranty Period, Environmental Protection and Other Legal Provisions

14.1 Warranty period

The warranty period is 36 months from the date of production under normal storage and transportation conditions and when the product packaging or the product is not damaged. The following situations are not covered by the warranty:

1) Damage caused by improper use, storage and maintenance by the user.

2) Damage caused the disassembly and maintenance performed by the institutions or personnel not assigned by the company or by the user without permission.

3) The warranty period of the product expires.

4) Damage caused by force majeure.

14.2 Environmental protection

In order to protect the environment, when this product or its components are scrapped, please properly dispose of them as industrial waste; or send them over to a recycling station for classification, disassembly, recycling and reuse in accordance with relevant national regulations.

15 Product Models and Ordering Notice

15.1 Please tick "√" in the "□"or fill the number in the " " for the selected option; if no ticking or filling is made, the general factory setting will be provided by our company.

Product Order Form

Table 28

Frame current	1600A		2000A		2500A		3200A		4000A	
Breaking capacity	General □	H□	General □	H□	General □	H□	General □	H□	General □	H□
Rated current	200A□ 400A□ 630A□ 800A□ 1000A□ 1250A□ 1600A□		200A□ 250A□ 400A□ 500A□ 630A□ 800A□ 1000A□ 1250A□ 1600A□ 2000A□		630A□ 800A□ 1000A□ 1250A□ 1600A□ 2000A□ 2500A□		2000A□ 2500A□ 2900A□ 3150A□ 3200A□		2500A□ 2900A□ 3200A□ 3600A□ 3900A□ 4000A□	
Intelligent trip uni	M type □ (Digital display type) V type □ (Digital display type) H type □ (LCD display) S type □ (Color screen display type)									
	AC220/230/240V□ AC380/400/415V□ DC220V□ DC110V□									
Number of poles	Three poles □ Four poles □									
Installation method	Drawer horizontal □ Fixed horizontal □ Drawer vertical □ Fixed vertical □ Note: For special vertical wiring specifications that can be made, please refer to the installation dimension drawings									
Shunt, closing, motor mechanism (standard)	AC220/230/240V□ AC380/400/415V□ DC220V□ DC110V□									
Undervoltage release (optional)	AC220/230/240V□ AC380/400/415V□									
	Instantaneous □ Delay: 1s□ 3s□ 5s□ 7s□ 2000AF~4000AF: With zero voltage delay function									
Indicator accessories (optional)	Drawer seat three-position signal indicator device □									
Connection accessories (standard)	Phase partition □									
Trip unit accessories (optional)	External transformer: External N phase mutual inductor □ Earth current transformer □ Leakage transformer □ (Earth protection or leakage protection are selected)									
Lock (optional)	OFF/ON button lock □ One lock and one key □ Two locks and one key □ Three locks and two keys □ Five locks and three keys □									
	_____ lock _____ key □ Position door interlock (drawer type) □									
	Lever interlock □ Steel cable interlock (two interlocks) □									
Automatic power supply control device (optional)	1 normal +1 backup (WQ3 type) □ 2 inlet wires +1 Busbar (WQ7 type) □									
Aux. contact	1600AF: 4 sets of conversion (standard) □ 6 sets of conversion (only or AC) □									
	2000AF ~ 4000AF: Independent 4-open 4-closed (standard) □ Independent 3-open 3-closed □ Independent 5-open 5-closed □ Independent 6-open 6-closed □									
Remarks	If you have other special requirements, please fill them in the Remarks column									

TGW3 Series Air Circuit Breaker

16 Product Appendix

16.1 Shunt release

(Inm=1600A) (Inm=2000A~4000A)
Shunt release

The shunt release is used to disconnect the circuit breaker in the remote-control way. When the circuit breaker is in the ON state, the circuit breaker can be opened at any time.

The shunt release device has both AC control and DC control. When the power supply voltage is equal to any voltage value between 70% and 110% of the rated control power supply voltage, the shunt release can reliably disconnect the circuit breaker.

Shunt release working characteristics

Table 29

Rated control power supply voltage Us (V)	AC220/230/240	AC380/400/415	DC220	DC110
Operating voltage (V)	(0.7~1.1)Us			
Breaking time (ms)	≤30			
Power consumption (VA/W) Inm=1600A	500	620	400	500
Power consumption (VA/W) Inm=2000A ~ 4000A	880	1800	880	850
Note: The shunt release and closing solenoid work in the pulse energizing working mode, and the pulse time should be not less than 200ms, and the energizing interval should be greater than 15s.				

16.2 Closing electromagnet

(Inm=1600A) (Inm=2000A~4000A)
Closing electromagnet

The closing electromagnet is used to close the circuit breaker in the remote-control manner. When the circuit breaker is in the Disconnect and Charge states at the same time, the circuit breaker can be closed at any time. The closing electromagnet device has both AC control and DC control. When the power supply voltage is equal to any voltage value between 85% and 110% of the rated control power supply voltage, the closing electromagnet can reliably close the circuit breaker. Operating voltage: 0.85~1.1Us; circuit breaker response time ≤50ms; circuit breaker closing time ≤70ms; The other working characteristics are the same as the shunt release.

16.3 Undervoltage release (the power supply must be connected before closing the circuit breaker)

16.3.1 The undervoltage release has the instantaneous operation and delayed operation:

(Inm=1600A)
Undervoltage release

Undervoltage release delay time

Table 30

Product frame	Operation type	Delay time	Accuracy
1600	Self-suction	1s, 3s, 5s, 7s (Non-adjustable)	±15%
2000~4000		0.5s~10s (Adjustable)	±15%

16.3.2 When the undervoltage release is not powered, the circuit breaker cannot be closed either electrically or manually

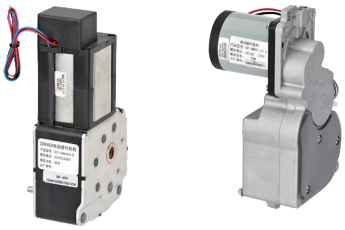
(Inm=2000A~4000A)
Undervoltage release

Undervoltage release characteristics

Table 31

Rated control power voltage Ue (V)	AC220/230/240, AC380/400/415
Operating voltage (V)	(0.35~0.7)Ue
Reliable closing voltage (V)	(0.85~1.1)Ue
Reliable non-closing voltage (V)	≤0.35Ue
Power consumption (Inm=1600A/ Inm=2000A~4000A)	20W/48W

16.4 Electric charge mechanism



(Inm=1600A) (Inm=2000A, 2500A)
Charge motor

Electric charge mechanism characteristics

Table 32

Rated control power voltage Us (V)	AC220/230/240	DC220
Operating voltage (V)	(0.85~1.1)Us	(0.85~1.1)Us
Power consumption (Inm=1600A)	100W	85W
Power consumption (Inm=2000A, 2500A)	242W	240W
Power consumption (Inm=3200A, 4000A)	150W	150W
Charge time	≤5s	≤5s

(Inm=3200A, 4000A)
Charge motor

Rated control power voltage Us (V)	AC380/400/415	DC110
Operating voltage (V)	(0.85~1.1)Us	(0.85~1.1)Us
Power consumption (Inm=1600A)	120W	110W
Power consumption (Inm=2000A, 2500A)	228W	253W
Power consumption (Inm=3200A, 4000A)	150W	150W
Charge time	≤5s	≤5s

Note: Power supply connection for a long time is prohibited to avoid damage; the power-on frequency cannot be greater than 3 times /min.

16.5 Aux. contact

Aux. contact type

Table 33

Frame	1600	2000~4000
Standard	Four sets of conversions	Independent four-open and four-closed
Special type	Six sets of conversions (for AC only)	Five normally open and five normally closed, six normally open and six normally closed

TGW3 Series Air Circuit Breaker

(Inm=1600A) Aux. contact

(Inm=2000A~4000A) Aux. contact

Aux. contact capacity

Table 34

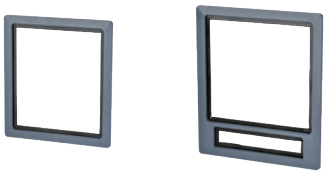
Frame	1600	
Rated voltage (V)	Rated thermal current Ith (A)	Rated control capacity
AC230	6	300VA
AC400	6	100VA
DC220	0.27	60W
DC110	0.55	60W
Frame	2000~4000	
Rated voltage (V)	Rated thermal current Ith (A)	Rated control capacity
AC380	16	6kW
DC250	5	1.25kW

Aux. rated operating current

Table 35

Frame	1600	
Type	Voltage	Current
AC-15	AC230V	1.3A
	AC400V	0.25A
DC-13	DC220V	0.27A
	DC110V	0.55A
Frame	2000~4000	
Type	Voltage	Current
AC-12	AC380V	16A
AC-12	DC250V	5A

16.6 Door frame and gasket (fixed type and drawer type)



Door frame and gasket

Installed on the door of the distribution cabinet room for sealing function, the protection grade is up to IP20.

16.7 Phase partition

Phase partition

Installed between the phases of the wiring busbar to improve the insulation capacity of the circuit breaker between phases.
Notes: 1. The phase partitions used for fixed and drawer type products are different;
2. Three-pole products only use two phase partitions, and four-pole products use three phase partitions.

16.8 "Disconnect" position locking device

Disconnect locking device

When the drawer type circuit breaker is in the "Disconnect" position, the lock rod can be pulled out and locked with a padlock, and the circuit breaker cannot be turned the "Test" or "Connect" position (the padlock is provided by the user).

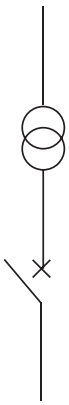
16.9 Key lock

Key lock

16.9.1 The circuit breaker's OFF button can be locked in the pressed position, and the circuit breaker cannot be closed at this time.

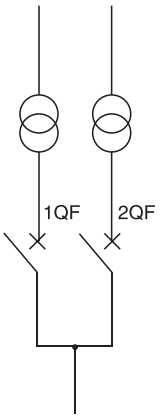
16.9.2 After it is selected by the user, the factory provides the installation and key of the lock.

16.9.3 When the user purchases a key lock separately, it is recommended to use a hole saw to drill on the panel during installation. The diameter of the hole saw is 26mm for 2000AF~4000AF and 24mm for 1600AF. The hole saw is provided by the user.



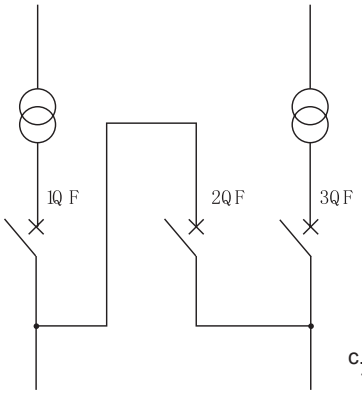
QF
0
1

a. One lock and one key: One circuit breaker is equipped with an independent lock and one key



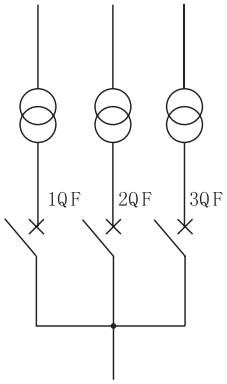
1QF	2QF
0	0
0	1
1	0

b. Two locks and one key: Two circuit breakers are equipped with two same locks and one key



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

c. Three locks and two keys: Three circuit breakers are equipped with three same locks and two same keys



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

d. Three locks and one key: Three circuit breakers are equipped with three same locks and one key

TGW3 Series Air Circuit Breaker

16.10 External leakage transformer (E mode)

It is suitable for leakage faults caused by insulation damage of equipment or leakage faults caused by human contact with exposed conductive parts. The leakage trip value I△n is directly expressed in amperes and is unrelated with the rated current of the circuit breaker. The signal acquisition method adopts the zero-sequence sampling method, and an external rectangular transformer is required, because this sampling has high accuracy and sensitivity, suitable for protection of smaller currents.

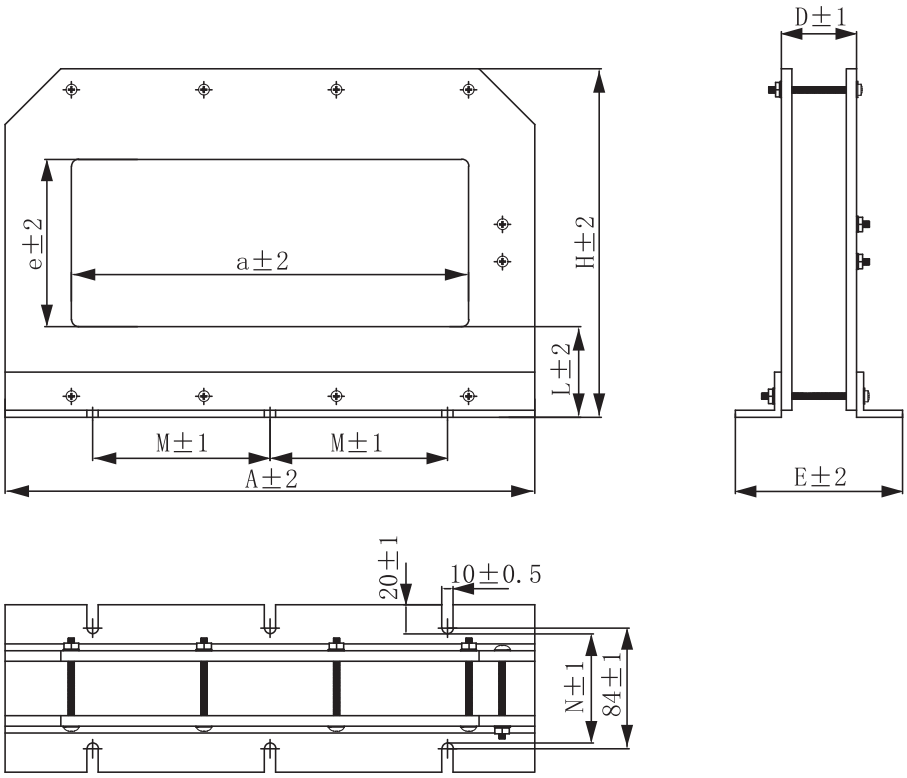


Table 36

Model	Outline dimensions					Hole size		Installation dimensions	
	A	H	D	E	L	a	e	M	N
ZCT1-285x120	380	250	54	114	68	285	120	125	74
ZCT1-390x120	485	250	54	114	68	390	120	150	74
ZCT1-420x120	515	250	54	114	68	420	120	150	74
ZCT1-500x120	595	250	54	114	68	500	120	150	74
ZCT1-900x120	995	250	54	114	68	900	120	300	74

Notes: 1600AF uses 285×120 specification by default;
2000AF and 2500AF use 390×120 specification by default;
3200/3P and 4000/3P use 420×120 specification by default;
3200/4P and 4000/4P use 500×120 specification by default;
Users can select and customize them according to the actual use situations.

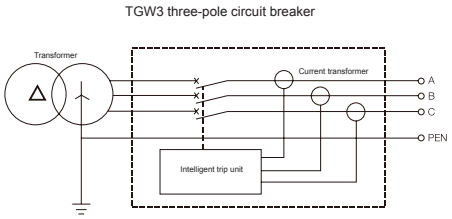
16.11 Earthing protection principle

The metallic earthing protection with a single-phase earthing protection fault current of more than several hundred amperes is generally used in a neutral point direct earthing system.

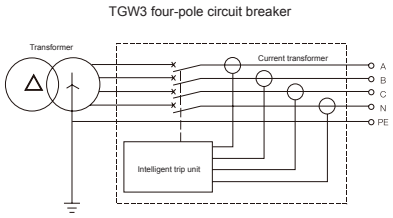
a. In a three-phase three-wire system, a three-pole circuit breaker without an external transformer equipped is selected. The earthing fault signal only takes the vector sum of the three-phase current, and the protection characteristic is definite time protection.

b. In a three-phase four-wire system, a four-pole circuit breaker without an external transformer equipped is selected. The earthing fault signal takes the vector sum of the three-phase current and N phase current, and the protection characteristic is definite time protection.

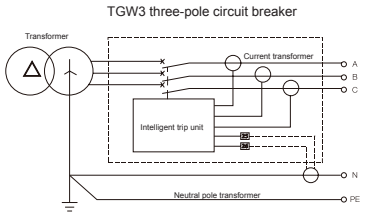
c. In a three-phase four-wire system, a three-pole circuit breaker is selected. The external neutral pole N-phase current transformer is used for earthing protection. The earthing fault signal takes the vector sum of the three-phase current and the N-pole current, and the protection characteristic is definite time protection.



3PT mode



4PT mode



(3P+N)T mode

Notes:

① The external N-phase current transformer is a special transformer configured by our company;

② In the 3PT mode, when the system unbalance current exceeds Ig, it will cause the circuit breaker earthing fault protection trips falsely. To prevent false tripping, the earthing fault protection function can be disenabled;

③ In the (3P+N)T mode, the maximum distance between the transformer and the circuit breaker does not exceed 5m.

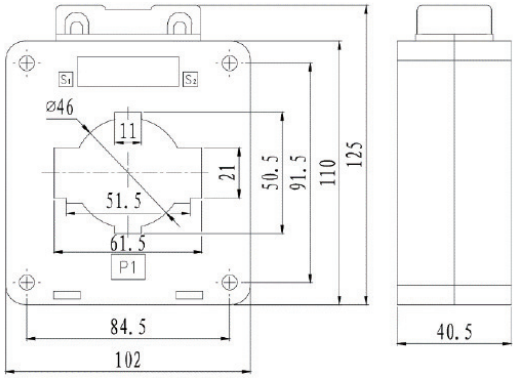
16.12 External N-phase current transformer (3P+N) T type structural dimensions

External N-phase current transformer

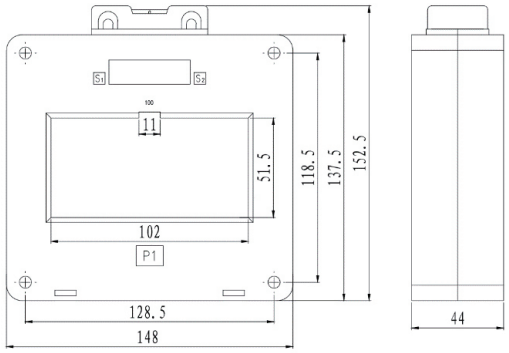
Table 37

Frame	Rated current (A)	Size of hole of transformer		
		60×20	100×50	130×60
1600	200~1600	●	○	/
2000	200~1600	○	●	/
	1900~2000	○	●	○
2500	630~1600	○	●	/
	2000~2500	○	●	○
3200	2000~3200	/	○	●
4000	2500~4000	/	○	●
Notes: ● indicates default configurations, ○ indicates optional configurations.				

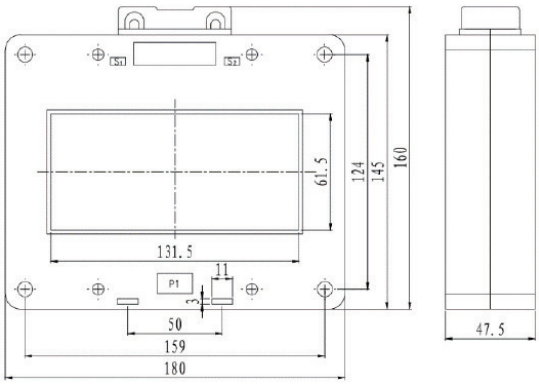
TGW3 Series Air Circuit Breaker



60 x 20 specification



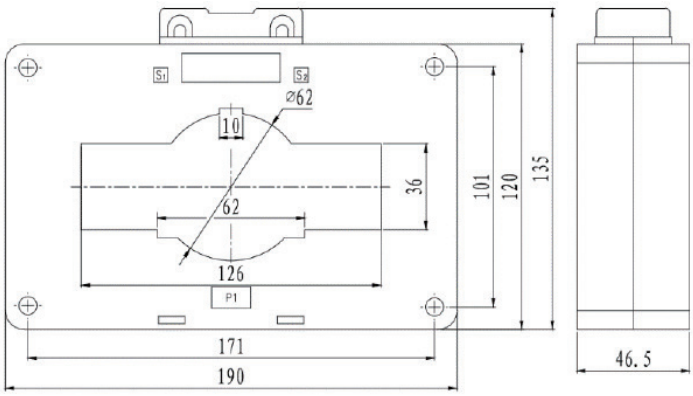
100 x 50 specification



130 x 60 specification

Dimensions of external N-phase current transformer

16.13 External earth current transformer (W mode)

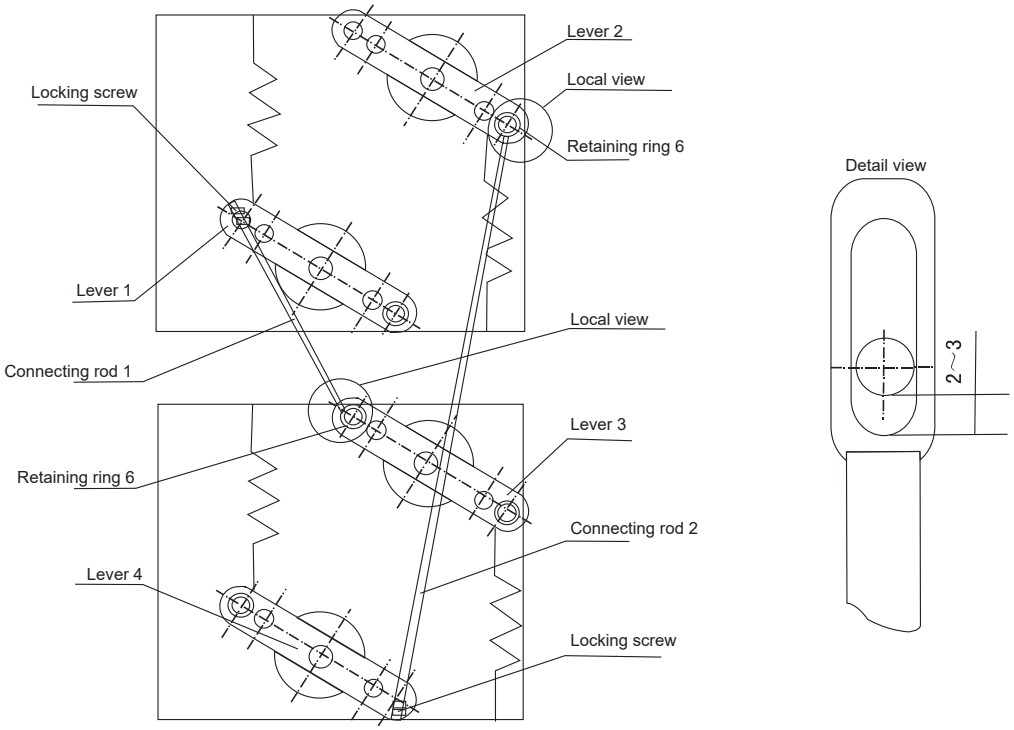


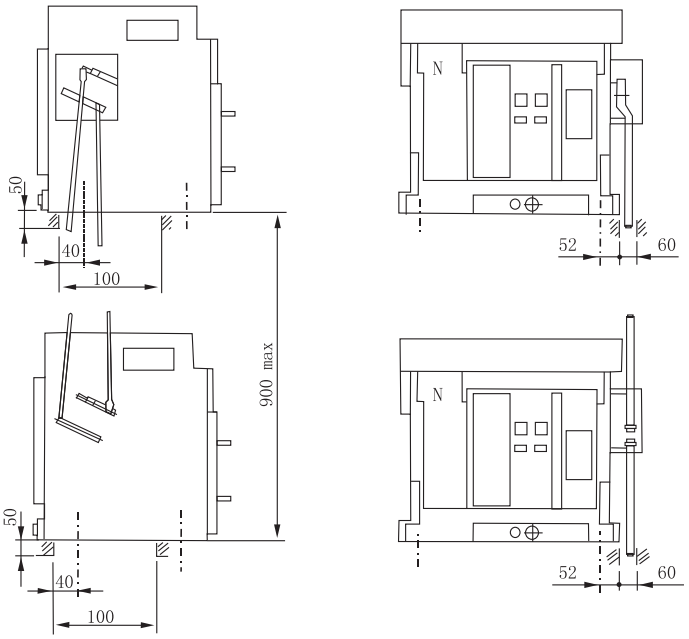
Dimensions of external earth current transformer

16.14 Lever interlock

The interlock shall realize that one is closed and the other cannot be closed for two vertically stacked 3-pole or 4-pole circuit breakers.

Note: 1. The lever interlock can only be installed vertically.

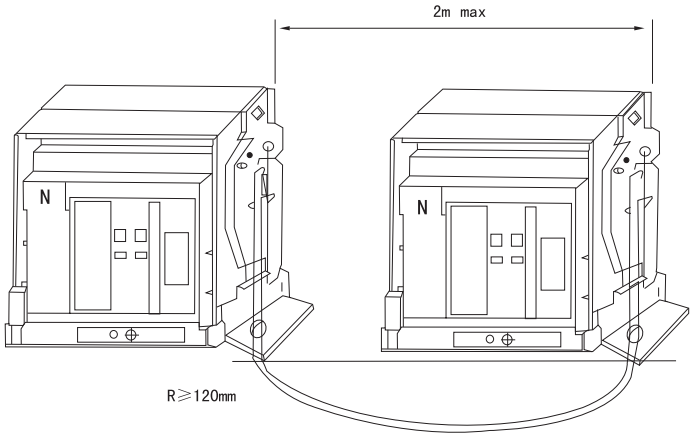




TGW3 Series Air Circuit Breaker

16.15 Cable interlock

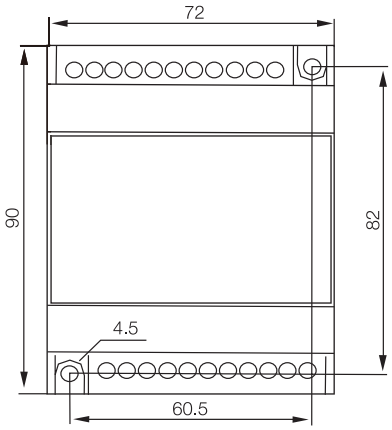
Two interlocks (can realize interlock of two three-pole or four-pole circuit breakers installed horizontally or vertically)

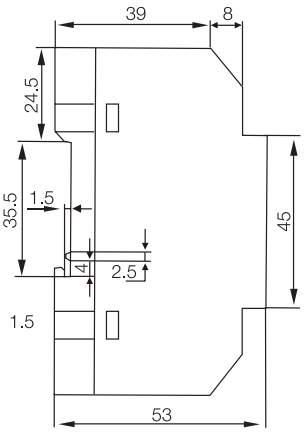


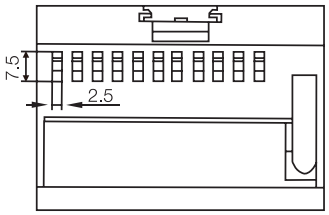
16.16 ST201 relay module, ST power module (IV)

The signal unit of the trip unit output is generally used for fault alarm or prompt. When the load capacity used to control the opening and closing of the circuit breaker is large, it shall be converted by the ST201 relay module before control. The contact capacity of ST201 is: AC250V, 10A, DC28V, 10A, and the outline and installation dimensions are the same as those of the ST power module (IV).

A DC 24V power supply with a power of not less than 9.6W can be provided, and four sets of terminal blocks can be output; the input AC or DC is universal (AC/DC220V). It can be used as the power supply of ST201 relay module. The product has two installation methods: 35mm standard rail or direct fixing. The outline and installation dimensions are as follows:







TGW3 Series Air Circuit Breaker

16.17 WQ3 dual power automatic transfer trip unit

The dual power automatic transfer switch is Class CB, and it is mainly composed of two intelligent air circuit breakers and dual power automatic transfer trip unit, suitable for two-way three-phase four-wire power grid with a frequency of 50/60Hz and a rated main circuit operating voltage of AC415V. The dual power automatic transfer switch has two types: grid-grid and grid-generator. When ordering a dual power automatic transfer trip unit, the following points must be observed:

a. In order to prevent wiring errors by users, the dual power automatic trip unit cannot be purchased separately. It shall be ordered together with the circuit breaker. Two four-pole circuit breakers are recommended.

b. The steel cable interlock and 4 sets of auxiliary conversion contact must be ordered together.

c. The default length of the secondary connecting line between the dual power automatic transfer trip unit and the two circuit breakers is 1.5m and 3m respectively. (Optional)

d. Circuit breakers with dual power automatic transfer trip units cannot be equipped with key locks.

e. Circuit breakers with dual power automatic conversion trip units cannot have door interlocks for opening and closing states.

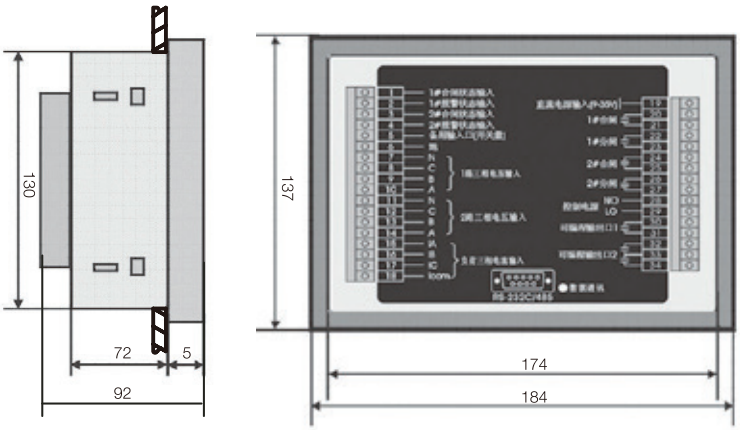
f. When a circuit breaker with a dual power automatic conversion trip unit is equipped with a communication type intelligent trip unit, the remote control circuit breaker closing and opening functions will be disenabled.

g. The circuit breaker must have an undervoltage release.

h. The circuit breaker and the dual power automatic conversion trip unit must be reliably earthed.

j. The automatic transfer automatic recover type and the automatic transfer non-automatic recover type can be set in the trip unit menu.

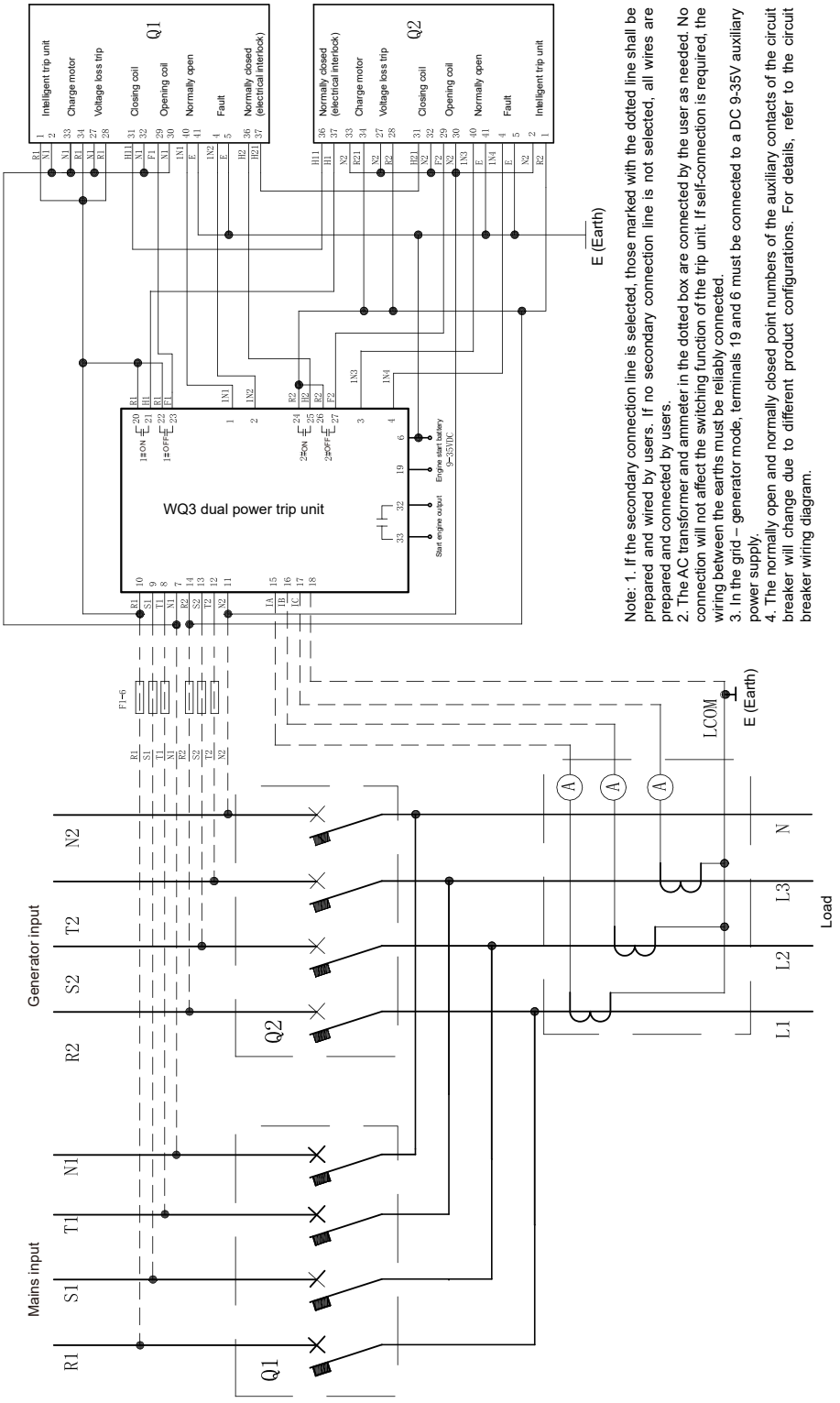
Note: After the wiring is connected and the UP and DOWN keys are pressed simultaneously, it is qualified when all lights are on.



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

TGW3 Series Air Circuit Breaker

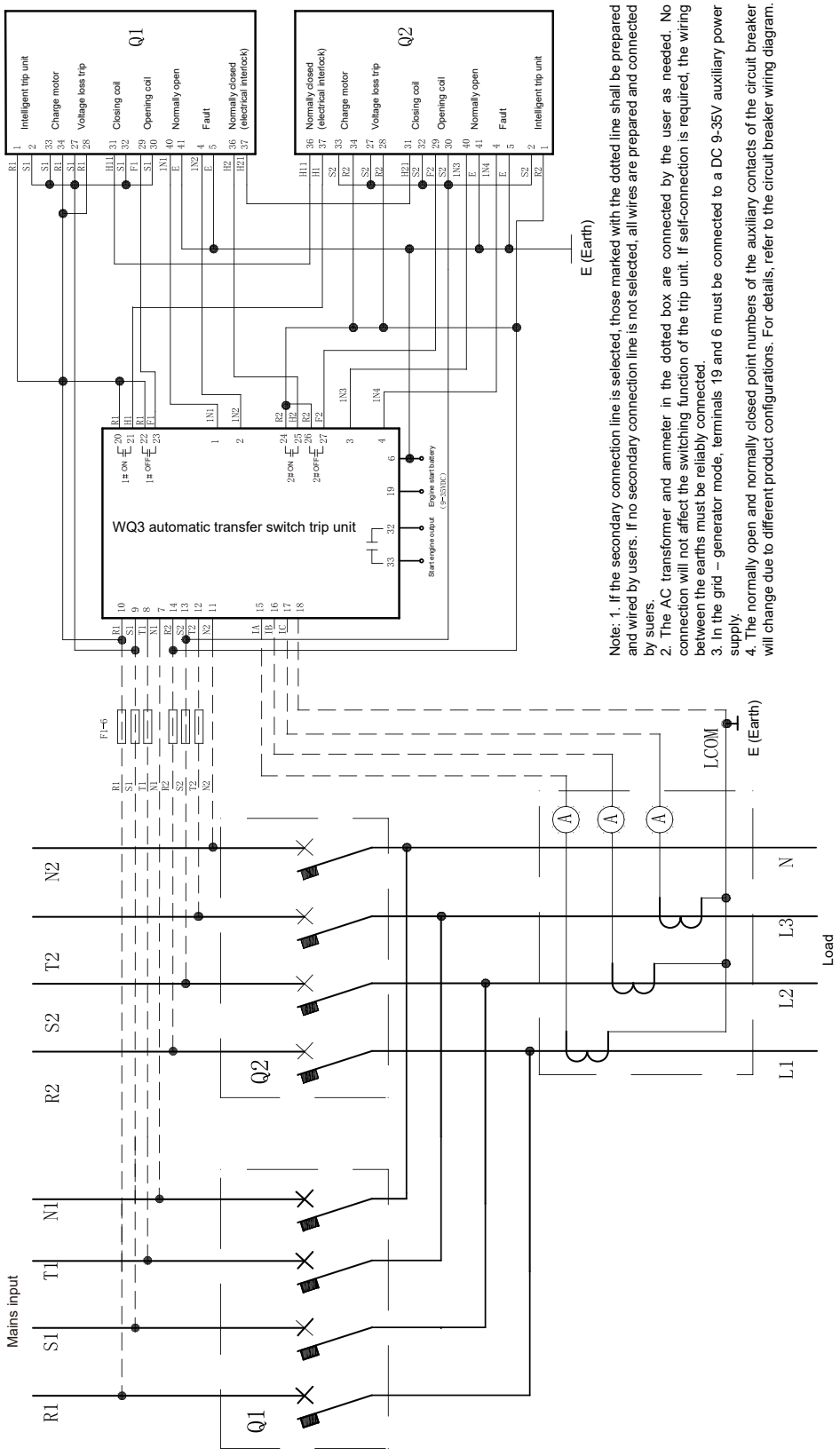
16.17.1 Wiring diagram of dual power trip unit for circuit breaker control circuit voltage AC220V



Note: 1. If the secondary connection line is selected, those marked with the dotted line shall be prepared and wired by users. If no secondary connection line is not selected, all wires are prepared and connected by users.
2. The AC transformer and ammeter in the dotted box are connected by the user as needed. No connection will not affect the switching function of the trip unit. If self-connection is required, the wiring between the earths must be reliably connected.
3. In the grid – generator mode, terminals 19 and 6 must be connected to a DC 9-35V auxiliary power supply.
4. The normally open and normally closed point numbers of the auxiliary contacts of the circuit breaker will change due to different product configurations. For details, refer to the circuit breaker wiring diagram.

TGW3 Series Air Circuit Breaker

16.17.2 Wiring diagram of dual power trip unit for circuit breaker control circuit voltage AC380V



Note: 1. If the secondary connection line is selected, those marked with the dotted line shall be prepared and wired by users. If no secondary connection line is not selected, all wires are prepared and connected by suers.
2. The AC transformer and ammeter in the dotted box are connected by the user as needed. No connection will not affect the switching function of the trip unit. If self-connection is required, the wiring between the earths must be reliably connected.
3. In the grid – generator mode, terminals 19 and 6 must be connected to a DC 9-35V auxiliary power supply.
4. The normally open and normally closed point numbers of the auxiliary contacts of the circuit breaker will change due to different product configurations. For details, refer to the circuit breaker wiring diagram.