Fuji Electric

Innovating Energy Technology

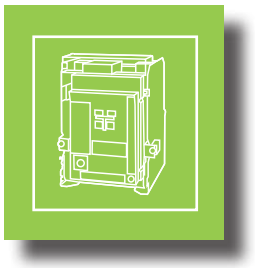
DISTRIBUTION

Air Circuit Breakers

BT3 Series



62D1-E-0163



Air Circuit Breakers

BT3 Series 1600 to 6300A

Contents

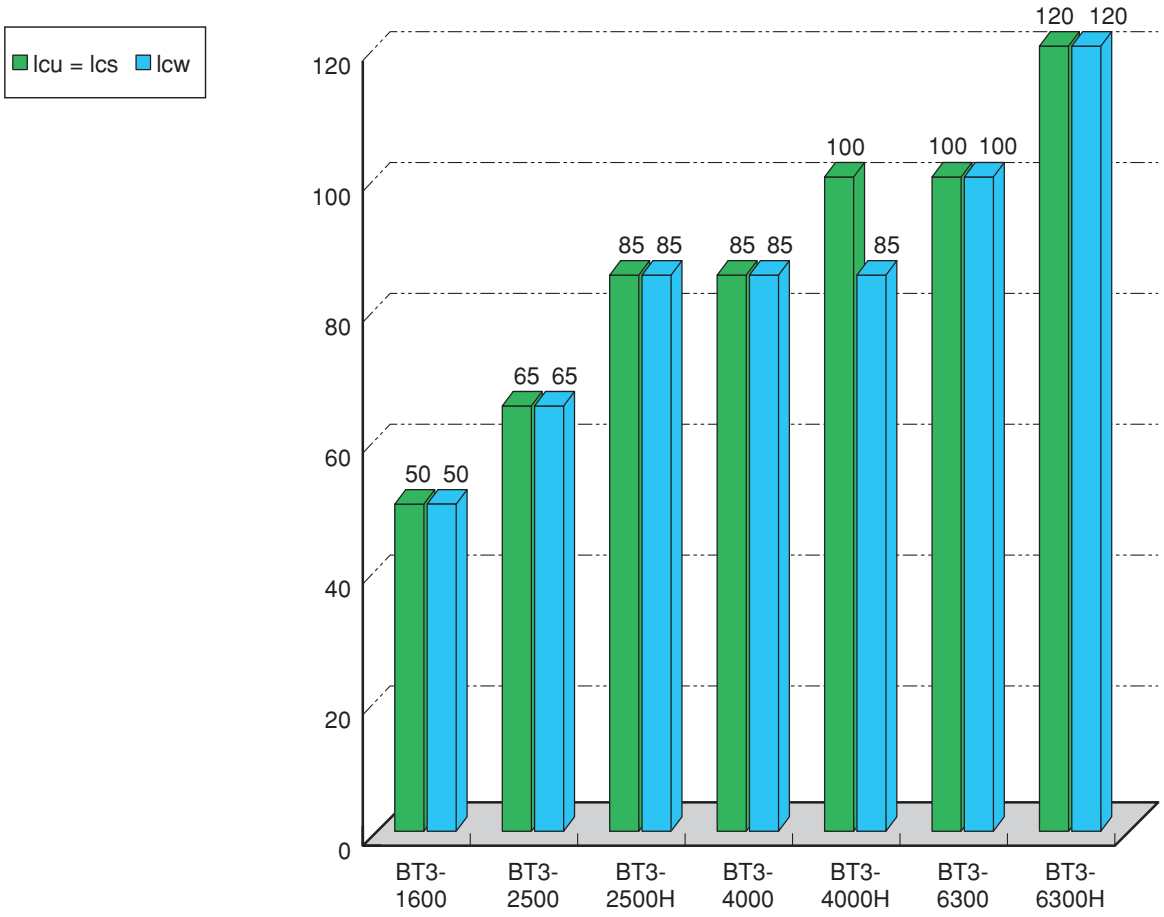
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■ Selection guide

Series		BT3 series
		
Frame size		1600, 2500, 4000, 6300
No. of poles		3, 4
Installation	Fixed	Available
	Draw-out	Available
Closing Mechanism		Manual or motor spring charging mechanism
Tripping Mechanism		Shunt trip, Under-voltage trip
Protection function		Long time delay, Short time delay, Instantaneous, Ground fault, etc.

■ Breaking Capacity

Icu is equal to Ics up to 120kA at maximum and Icw 1s is up to 120kA at maximum under AC415V distribution.



■ Compact size

BT3 series, Air Circuit Breakers, have four ampere frame sizes and physical dimensions.

Ampere frame	1600	2500	4000	6300
Appearance				
Width (3-pole, Draw-out type)	248mm	347mm	401mm	754mm

■ Installation

The bus bar terminal of the BT3 series, Air Circuit Breakers, can be simply installed as follows:

- Horizontal connection
- Vertical connection
- Composite connection



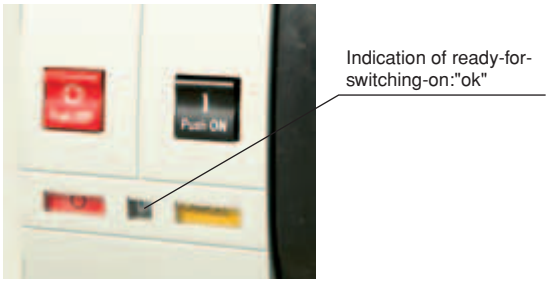
■ Safety performance

Draw-out type BT3 series Air Circuit Breakers can be operated safely at 3 positions:

1. Connected position
2. Testing position
3. Disconnected position



Clear indication of ready-for-switching-on to ensure safe manipulation and reliable operation.

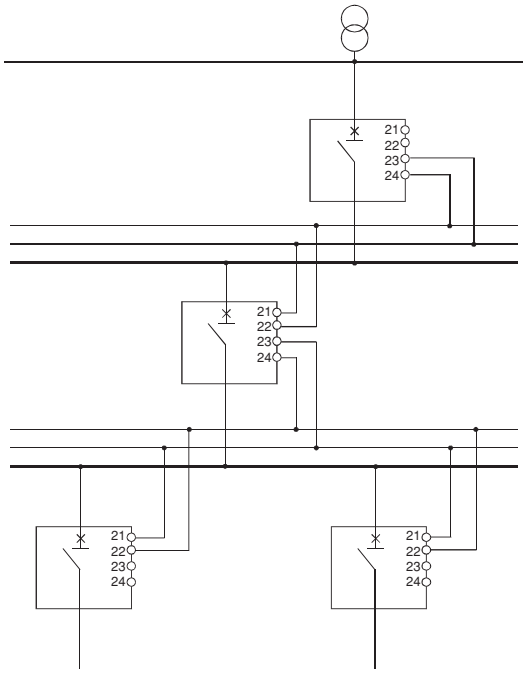


More reliable safety protection with seconday terminals of protection grade IP30



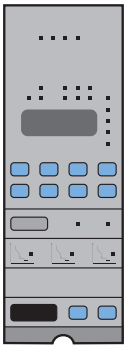
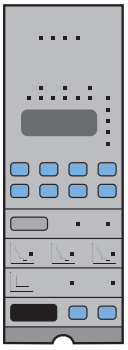
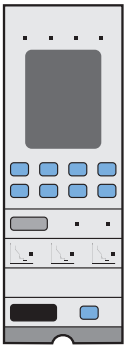
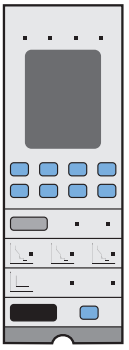
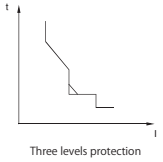
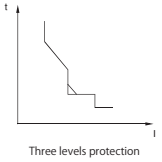
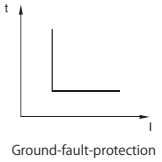
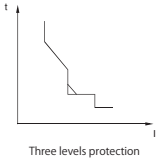
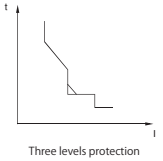
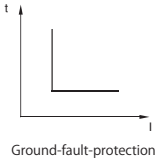
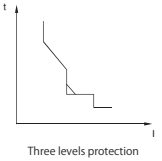
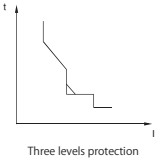
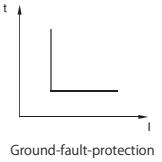
■ Protection and selection

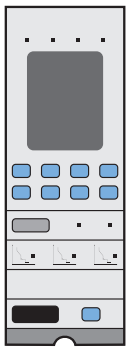
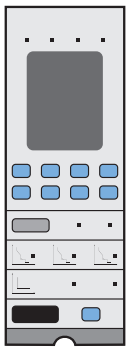
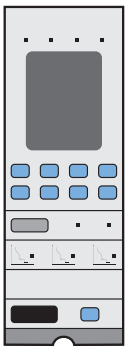
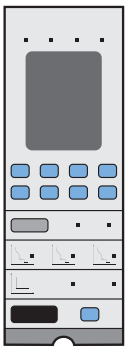
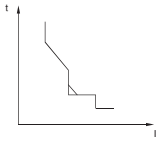
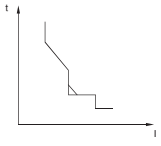
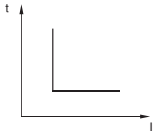
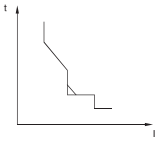
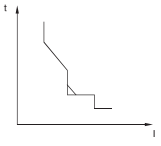
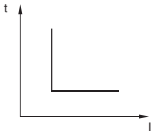
BT3 Series, Air Circuit Breakers, can implement selective interlock of ZSI Region to ensure comprehensive selection of various protection and reduce the copper bar's bearing of thermodynamic.



■ Intelligent Controller (OCR)

Selecting OCR's, it can be classified into ten types

Type	EN35	EN36	EA35	EA36	EP35	EP36
	Option	Option	Standard	Option	Option	Option
Pic						
Display/setting	LED indication	LED indication	LCD indicaiton	LCD indication	LCD indication	LCD indication
Protection/ function	 Three levels protection	 Three levels protection  Ground-fault-protection	 Three levels protection	 Three levels protection  Ground-fault-protection	 Three levels protection	 Three levels protection  Ground-fault-protection
Measurement	Current Optional function (voltage, energy, frequency, power)	Current Optional function (voltage, energy, frequency, power)	Current	Current	Current Voltage Power Frequency Energy Phase sequence Demand value	Current Voltage Power Frequency Energy Phase sequence Demand value

Type	EQ35	EQ36	EG35	EG36
	Option	Option	Option	Option
Pic				
Display/setting	LCD indication	LCD indication	LCD indication	LCD indication
Protection/ function	 Three levels protection	 Three levels protection  Ground-fault-protection	 Three levels protection	 Three levels protection  Ground-fault-protection
Measurement	Current Voltage Power Frequency Energy Phase sequence Demand value Harmonic analysis function Harmonics capture function	Current Voltage Power Frequency Energy Phase sequence Demand value Harmonic analysis function Harmonics capture function	Current Voltage Power Frequency Energy Phase sequence Demand value Harmonic analysis function Harmonics capture function Over frequency Under frequency Inverse power	Current Voltage Power Frequency Energy Phase sequence Demand value Harmonic analysis function Harmonics capture function Over frequency Under frequency Inverse power

■ Type number nomenclature

BT3-2500HP / 32500E □

Basic type

Frame size
1600, 2500, 4000, 6300

Performance
None: Standard
H : High breaking capacity

Installation
P: Fixed type
X: Draw-out type

Number of poles
3: 3 poles
4: 4 poles

Rated current
1600AF: 0200, 0400, 0630, 0800, 1000, 1250, 1600
2500AF: 0630, 0800, 1000, 1250, 1600, 2000, 2500
4000AF: 1000, 1250, 1600, 2000, 2500, 2900, 3200
3600, 4000
6300AF: 4000, 5000, 6300

English version

OCR type or Additional accessories
• OCR type (note: EA35 is standard), See page 10

Type	Code	Remarks
EN35	N35	
EN36	N36	
EA35	– (None)	
EA36	A36	
EP35	P35	
EP36	P36	
EQ35	Q35	
EQ36	Q36	
EG35	G35	
EG36	G36	

• Accessories

Type	Code	Remark
Manual operated	M1	For BT3-1600
	M2	For BT3-2500
	M3	For BT3-4000,6300
Under voltage release	R11	Instananeous : AC220V-AC240V
	R12	Instananeous : AC380V-AC415V
	R21	Time delay (0.5s, 1s, 2s, 3s) : AC220V-AC240V
	R22	Time delay (0.5s, 1s, 2s, 3s) : AC380V-AC415V
Switching OFF lock device	Q1	One lock and one key
	Q2	Two lock and one key
	Q3	Three lock and two key
Mechanical interlock device	MW1	Steel lock interlock
(Two sets of ACB's)	MB1	Link rod interlock
Mechanical interlock device	MW2	Steel lock interlock
(Three sets of ACB's : for BT3-2500 and over)	MB2	Pattern one of rod interlock
	MB3	Pattern two of rod interlock
	MB4	Pattern three of rod interlock
Pushbutton lock mechanism	L	
Interphase barriers	B3	Three-phase
	B4	Four-phase
Counter	CM	
Electrical module for indication of ready-for-switching-on	E1	
Remote reset	RMR	AC220-240V
Electrical indication mechanism of socket's position	D1	
Electrical indication mechanism of storage signal	S1	
Accessories monitoring units	AM	
Current transformer with the neutral line N	N1	For BT3-1600
connected externally	N3	For BT3-2500
	N4	For BT3-4000
	N6	For BT3-6300
Unit with transformer's center erath extermaily connected.	UT	
Programmable output expansion module	EM6	6 lines
Communication choices of accessories	S1	Components of draw-out socket communication module
	S2	Signal of ready-for-close
	S3	Signal of under-voltage
	S4	Signal of fault release
	S5	Signal of charging
Normal power supply module	PD1	DC24V
	PA1	AC220-240V
	PA2	AC380-415V
DC power supply module	PD2	DC110V
	PD3	DC220V
Automatic Transfer Switch (ATS)	AS1	R type
(included automatic controller,	AS2	S type
connector and 1.8m cable)	AS3	F type
3 lines over-current fault output module	OCF	

■ Specifications

Frame size			1600A		2500A		2500A		4000A		4000A		6300A		6300A	
Basic type			BT3-1600 □		BT3-2500 □		BT3-2500H □		BT3-4000 □		BT3-4000H □		BT3-6300 □		BT3-6300H □	
No. of poles			3	4	3	4	3	4	3	4	3	4	3	4	3	4
Rated current (A)			200, 400, 630, 800, 1000, 1250, 1600		630, 800, 1000, 1250, 1600, 2000, 2500		630, 800, 1000, 1250, 1600, 2000, 2500		1000, 1250, 1600, 2000, 2500, 2900, 3200, 3600, 4000		1000, 1250, 1600, 2000, 2500, 2900, 3200, 3600, 4000		4000, 5000, 6300		4000, 5000, 6300	
Rated current of the neutral pole (I_N)			100% In		100% In		100% In		100% In		100% In		100% In		100% In	
Rated insulation voltage (Ui)			1000		1000		1000		1000		1000		1000		1000	
Rated operational volage (Ue)			690		690		690		690		690		690		690	
Rated ultimate short-circuit breaking capacity (Icu kA, sym)		AC690V	50		55		65		75		85		85		100	
		AC415/440V	50		65		85		85		100		100		120	
		AC400V	65		65		85		85		100		120		135	
Rated service short-circuit breaking capacity (Ics kA, sym)		AC690V	42		55		65		75		85		85		100	
		AC415/440V	50		65		85		85		100		100		120	
		AC400V	55		65		85		85		100		120		135	
Rated making current (kA, peak)		AC690V	105		121		143		165		187		187		220	
		AC415/440V	105		143		187		187		220		220		264	
		AC400V	143		143		187		187		220		264		297	
Rated short time withstand current (Icw) (kA, rms) -1s		AC690V	42		55		65		75		75		85		100	
		AC415/440V	50		65		85		85		85		100		120	
		AC400V	50		65		85		85		85		120		135	
Rated impulse withstand voltage (Uimp) (kV)			12		12		12		12		12		12		12	
Installations																
	Fixed	P	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Draw-out	X	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Main circuit terminal connection																
	Fixed	Horizontal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		Vertical	●	●	–	–	–	–	–	–	–	–	–	–	–	–
	Draw-out	Horizontal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		Vertical	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Dimensions																
	Fixed	W	259	329	362	457	362	457	414	527	414	527	769	995	769	995
		H	320	320	395	395	395	395	395	395	395	395	395	395	395	395
		D	195	195	290	290	290	290	290	290	290	290	290	290	290	290
	Draw-out	W	248	318	347	442	347	442	401	514	401	514	754	980	754	980
		H	351.5	351.5	438	438	438	438	438	438	438	438	475.5	475.5	475.5	475.5
		D	297	297	395	395	395	395	395	395	395	395	395	395	395	395

● Available, – Not Available

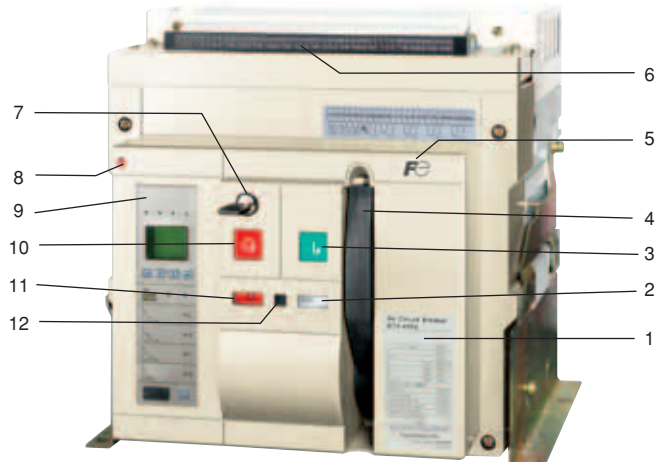
Note: If the ABC is used in IT distribution system at AC415V or above, please inform to Fuji at the time of ordering.

■ Operation environments

Ambient temperature	-5°C to +40°C
Altitude	< 2000m
Relative humidity	Not exceed 50% at +40°C
Pollution degree	3
Vertical gradient	no more than 5°

■ Appearance

• Fixed



<Common>
1: Name plate
2: Closing spring status indication
3: ON button
4: Manual spring charging handle
5: Brand
6: Auxiliary terminals
7: Key lock
8: OCR tripping indication and reset button
9: Intelligent controller (OCR)
10: OFF button
11: Indication of "ON" and "OFF"
12: Ready-to-close indication

• Draw-out



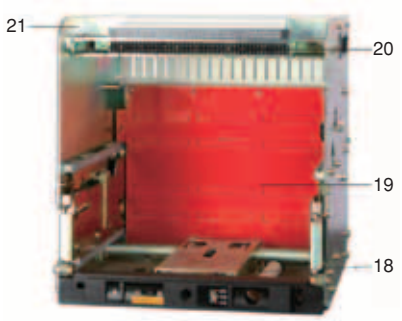
<For Draw-out>
13: Unlock button for rack-in and draw-out operation
14: Safety padlock mechanism
15: Racking shaft operating hole
16: Racking shaft storage hole
17: Indication of circuit breaker position
(Separated, Testing, or Connected)

Note: *1 "Separated": Indicates that main circuit and secondary circuit are both in isolation."Testing": Indicates that main circuit is in isolation and secondary circuit is in connection."Connected": Indicates that main circuit and secondary circuit are both in connection.

*2 The ACB can be automatically locked (racking shaft can not be turned at the point) when its main part is at the position of "separated","Testing" or "connected" by turning the racking shaft, and can be unlocked by pushing "unlock button" to the left side.

• Draw-out cradle

The cradle has the safety shutter for isolating the copper bar of the main circuit, which take the role of safety protection when the ACB is drawn out.



18: Installation hole
19: Safety shutter
20: Auxiliary terminals of secondary circuit
21: Side plate

■ Intelligent controller (OCR) functions

Selecting OCR's, it can be classified into ten types

Type	EN35	EN36	EA35	EA36	EP35	EP36	EQ35	EQ36	EG35	EG36
	Option	Option	Standard	Option	Option	Option	Option	Option	Option	Option
Display	LED	LED	LCD	LCD	LCD	LCD	LCD	LCD	LCD	LCD
Overcurrent protection (Long-time, Short-time, instantaneous)	●	●	●	●	●	●	●	●	●	●
Ground fault protection	–	●	–	●	–	●	–	●	–	●
Neutral protection	○	○	○	○	○	○	○	○	○	○
Overload pre-alarm	●	●	●	●	●	●	●	●	●	●
Current-unbalance protection	●	●	●	●	●	●	●	●	●	●
Phase-loss protection	●	●	●	●	●	●	●	●	●	●
Demand current protection	–	–	–	–	●	●	●	●	●	●
Over-voltage protection	–	–	–	–	●	●	●	●	●	●
Under-voltage protection	–	–	–	–	●	●	●	●	●	●
Voltage-unbalance protection	–	–	–	–	●	●	●	●	●	●
Over-frequency protection	–	–	–	–	–	–	–	–	○	○
Under-frequency protection	–	–	–	–	–	–	–	–	○	○
Phase sequence protection	–	–	–	–	●	●	●	●	●	●
Reverse power protection	–	–	–	–	–	–	–	–	○	○
Current shedding	●	●	●	●	●	●	●	●	●	●
Zone selective interlocking (ZSI)	●	●	●	●	●	●	●	●	●	●
MCR function	○	○	○	○	○	○				

Note: ● Reprensents fundamental functions, ○ Represents optional functions, – Represent no such functions

■ Protection characteristic

For type EN, EA, EP and EQ OCR used in general distribution circuits

Protection		Operating value	Operating delay
Overload long-time delay		I_{r1}=(0.4 to 1) In	<at 1.5I_{r1}> I^2t : t_1=(15-30-60-120-240-480)s I_t : t_1=(10-15-30-60-90-120)s I^4t : t_1=(60-120-240-480-960-1440)s
	Successive grade	10A	
	Operating tolerance		±10%
Short-circuit short-time delay		I_{r2}=(0.4 to 15) In	<at 8I_{r1}> t_2=(0.1-0.2-0.3-0.4)s
	Successive grade	10A	
	Operating tolerance	±10%	±10%
Instantaneous		Inm=1600A, I_{r3}=(1.6 to 35)kA Inm=2500A, I_{r3}=(2.5 to 50)kA Inm=4000A, I_{r3}=(4 to 80)kA Inm=6300A, I_{r3}=(6.3 to 100)kA	
	Successive grade	50A	
	Operating tolerance	<3In: ±10% >3In: ±15%	
Grand-fault		In<1250A, I_{r4}=(0.4 to 0.8)In In>1250A, I_{r4}=500A to 1200A	t_4=(0.1-0.2-0.3-0.4)s
	Successive grade	10A	
	Operating tolerance	±15%	±15%
Overload pre-alarm		I_{r0}=(0.75 to 1.05)I_{r1}	t_p=1/2t_1
	Successive grade	0.05I_{r1}	
	Operating tolerance		±10%

Protection		Operating threshold	Return threshold	Operating delay	Return delay
Current unbarance protction		20% to 80%	20% ~	1 to 40s	10 to 360s
	Successive grade	1%	1%	1s	1s
	Operating tolerance	±10%	±10%	±10%	±10%
Open-phase protection		90% to 99%	20% ~	0.1s to 3s	10s to 360s
	Successive grade	1%	1%	0.1s	1s
	Operating tolerance	±10%	±10%	±10%	±10%
Demand current protection		0.4In to 1In	0.4In ~	15s to 1500s	15s to 3000s
	Successive grade	1A	1A	1s	1s
	Operating tolerance	±10%	±10%	±10%	±10%
Under-voltage protection		50V to 690V	~ 690V	1s to 30s	1s to 100s
	Successive grade	5V	5V	0.2s	0.2s
	Operating tolerance	±5%	±5%	±5%	±5%
Over-voltage protection		200V to 1000V	200V ~	1s to 5s	1s to 36s
	Successive grade	5V	5V	0.2s	0.2s
	Operating tolerance	±5%	±5%	±5%	±5%
Voltage unbarance protection		2% to 50%	2% ~	1s to 40s	10s to 360s
	Successive grade	1%	1%	1s	1s
	Operating tolerance	±10%	±10%	±10%	±10%
Phase sequence protection		1 , 2 , 3 or 1 , 3 , 2		0.3	
	Operating tolerance			±10%	
Current shedding		0.2In to 1In	0.2In ~	(20% to 80%)t1	10s to 600s
	Successive grade	10A	10A	10%t1	1s
	Operating tolerance			±10%	±10%

■ Protection characteristic

For type EG OCR used in general distribution circuits

Protection		Operating value	Operating delay
Overload long-time delay		I_{r1}=(0.4 to 1.15) In	<at 1.3I_{r1}> I^2t : t_1=(15-20-25-40-50-60)s
	Successive grade	10A	
	Operating tolerance		±10%
Short-circuit short-time delay		I_{r2}=(0.4 to 5) In	t_2=(0.1-0.2-0.3-0.4)s
	Successive grade	10A	
	Operating tolerance	±10%	±10%
Instantaneous		Inm=1600A, I_{r3}=(1.6 to 35)kA Inm=2500A, I_{r3}=(2.5 to 50)kA Inm=4000A, I_{r3}=(4 to 80)kA Inm=6300A, I_{r3}=(6.3 to 100)kA	
	Successive grade	50A	
	Operating tolerance	<3In: ±10% >3In: ±15%	
Grand-fault		In<1250A, I_{r4}=(0.4 to 0.8)In In>1250A, I_{r4}=500A to 1200A	t_4=(0.1-0.2-0.3-0.4)s
	Successive grade	10A	
	Operating tolerance	±15%	±15%
Overload pre-alarm		I_{r0}=(0.75 to 1.05)I_{r1}	t_p=1/2t_1
	Successive grade	0.05I_{r1}	
	Operating tolerance		±10%

Protection		Operating threshold	Return threshold	Operating delay	Return delay
Current unbarance protction		20% to 80%	20% ~	1 to 40s	10 to 360s
	Successive grade	1%	1%	1s	1s
	Operating tolerance	±10%	±10%	±10%	±10%
Open-phase protection		90% to 99%	20% ~	0.1s to 3s	10s to 360s
	Successive grade	1%	1%	0.1s	1s
	Operating tolerance	±10%	±10%	±10%	±10%
Demand current protection		0.4In to 1In	0.4In ~	15s to 1500s	15s to 3000s
	Successive grade	1A	1A	1s	1s
	Operating tolerance	±10%	±10%	±10%	±10%
Under-voltage protection		50V to 690V	~ 690V	1s to 30s	1s to 100s
	Successive grade	5V	5V	0.2s	0.2s
	Operating tolerance	±5%	±5%	±5%	±5%
Over-voltage protection		200V to 1000V	200V ~	1s to 5s	1s to 36s
	Successive grade	5V	5V	0.2s	0.2s
	Operating tolerance	±5%	±5%	±5%	±5%
Voltage unbarance protection		2% to 50%	2% ~	1s to 40s	10s to 360s
	Successive grade	1%	1%	1s	1s
	Operating tolerance	±10%	±10%	±10%	±10%
Inverse power protection		20kW to 500kW	20kW ~	0.2s to 20s	1s to 360s
	Successive grade	5kW	5kW	0.1s	0.1s
	Operating tolerance	±5%	±5%	±10%	±10%
Over-frequency protection		50Hz to 65Hz	45Hz ~	0.2s to 5s	1s to 360s
	Successive grade	0.5Hz	0.5Hz	0.1s	0.1s
	Operating tolerance	±0.5Hz	±0.5Hz	±10%	±10%
Under-frequency protection		45Hz to 60Hz	~ 60Hz	0.2s to 5s	1s to 360s
	Successive grade	0.5Hz	0.5Hz	0.1s	0.1s
	Operating tolerance	±0.5Hz	±0.5Hz	±10%	±10%
Phase sequence protection		1 , 2 , 3 or 1 , 3 , 2		0.3	
	Operating tolerance			±10%	
Current shedding		0.2In to 1In	0.2In ~	(20% to 80%)t1	10s to 600s
	Successive grade	10A	10A	10%t1	1s
	Operating tolerance			±10%	±10%

■ Indication and accuracy

Type		Mesurement range of accuracy	Accuracy				
			EN	EA	EP	EQ	EG
Current measurement	I_1, I_2, I_3, I_4	(0.2In to 1.2In) A	±1.5%	±1.5%	±1.5%	±1.5%	±1.5%
	I_g	(0.2In to 2000In) A	±2.5%	±2.5%	±2.5%	±2.5%	±2.5%
Demand current measurement	I_a, I_b, I_c, I_n	(0.2In to 1.2In) A	–	–	±2.5%	±2.5%	±2.5%
Voltage measurement	Line voltage (U_{12}, U_{23}, U_{31}) and Phases voltage (U_{1N}, U_{2N}, U_{3N}), U_{ave}, U_{unbal}	30V to 690V	±1%	–	±0.5%	±0.5%	±0.5%
Power measurement	P, Q, S	-9999kW to +9999kW -9999kvar to +9999kW -9999kVA to +9999kVA	±2.5%	–	–	–	–
		-120MW to +120MW -120Mvar to +120Mvar -120MVA to +120MVA	–	–	±2.5%	±2.5%	±2.5%
Demand power measurement	P, Q, S	-120MW to +120MW -120Mvar to +120Mvar -120MVA to +120MVA	–	–	±2.5%	±2.5%	±2.5%
Power factor measurement	PF	-1 to 1	–	–	±2.5%	±2.5%	±2.5%
Energy measurement	E.P, E.Q, E.S	-9999MWh to +9999MWh -9999Mvarh to +9999Mvarh -9999MVAh to +9999MVAh	±2.5%	–	–	–	–
		-10^{10}GWh to $+10^{10}$GWh -10^{10}Gvarh to $+10^{10}$Gvarh -10^{10}GVAh to $+10^{10}$GVArh	–	–	±2.5%	±2.5%	±2.5%
Frequency measurement		45hz to 65Hz	±0.1Hz	–	±0.1Hz	±0.1Hz	±0.1Hz
Fundarmental measurement	Fundarmental current (I_{1-I}, I_{2-I}, I_{3-I}, I_{N-I})	(0.2In to 1.2In) A	–	–	–	±1.5%	±1.5%
	Fundamental line voltage (U_{12-I}, U_{23-I}, U_{31-I}) Fundamental phase voltage (U_{1N-I}, U_{2N-I}, U_{3N-I})	30V to 690V	–	–	–	±0.5%	±0.5%
	Fundarmental power (P_f, Q_f, S_f)	-120MW to +120MW -120Mvar to +120Mvar -120MVA to +120MVA	–	–	–	±2.5%	±2.5%
Harmonic measurement	Harmonic current ratio (HRI_n) Harmonic voltage ratio (HRU_n)	0 to 1000%	–	–	–	±5%	±5%
	Total harmonic distortion of current Total harmonic distortion of voltage	0 to 1000%	–	–	–	±5%	±5%

■ Maintenance function

- The contact wearing can indicate the percentage of the equivalent to wearing times of main contact to power operation cycles of the circuit breaker
- Number of switching of the ACB when the OCR is energized.
- Self-diagnosis function (against memory error, and microporocessor over-temperature.)
  OCR alarms when memory fails to work as normal.
  When microprocesor breaks down or the local ambient temperature rises over 80°C (tolerance is ±5°C) the OCR sends out alarm signals immediately.
- Accessories monitoring (disconnecting of shunt release, closing electromagnet, under-voltage release or charging energy motor)
  OCR online monitors if the disconnecting of shunt release, closing electromagnet, under-voltage release and charging motor and residual current transformer is disconnected. When error occurs it can be inquired by the OCR that which accessory exactly fails.
- History
  OCR displays the maximun of current and demand current since running. In communication the up-level device displays the maximum and minimum of current, voltage, power factor and frequency, the maximum of demand current and demand power at peak since running.
- Fault-memory function
  Type EP, EQ and EG OCR's display last 10 alarm records and release records, alarm reason, release reason, alarm threshold, release threshold and failure time. Type EN, EA OCR displays last 1 release record.
- Fault-recorder function
  12 cycles of waveform are recorded when the circuit breaker trips as a rusult of faults.

■ Function

1) Over-current protection

The over-current protection is composed of phase and neutral line protection (Four pole breaker and three pole breaker with current transformer linking externally to neutral N) from over-current.
The parameters of current and time of phase line over-current protection can be set by the company in terms of the requirements of users (can be set by customers themselves); the parameters of current and time of neutral line over-current protection can be set by tracking the phase lines automatically in proporation, and in the following 2 situations:

- Three pole breaker current mutual inductor with the neutral connected eaternally.
  Customers can setup into four types from menu : "turn off", "50% In", "100% In" and "200% In". When 200% in neutral line protection (if it has a high third harmonics) is on, the neutral line cross-section should be double leg of a circuit cross-section in the electrical power distribution system. But to BT3-6300 and type EG OCR, there is no 200% In neutral line protection.
- Four pole breaker
  Customers can setup into three type from menu : : "turn off", "50% In" and "100% In".

1-1) Overload long-time delay protection

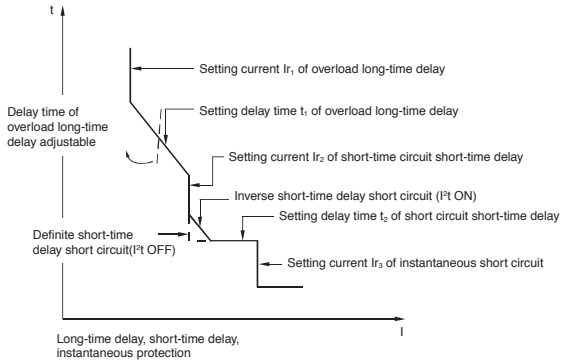
- For inverse overload long-time delay protection the setting current I_{r1} can be adjusted.
- The delay time t_1 of overload long-time delay can be adjusted.
- For the overload long-time delay characteristic of the type EA/EP/EQ, the curves can be adjusted. There are common type (I^2t), uncommon inverse-time type (It)and high-voltage fuse concert type (I^4t) to match upstream and downstream overload protection needs, I^2t only for EN controller.

1-2) Short-circuit short-time delay protection (can be OFF)

- For inverse short-circuit short-time delay protection (I^2t ON)the setting current I_{r2} can be adjusted.
- For inverse short-circuit short-time delay protection (I^2t OFF) the setting current I_{r2} can be adjusted.

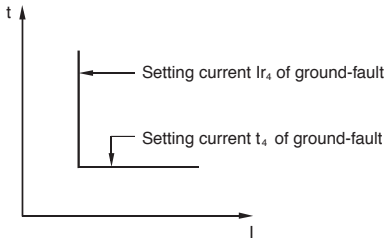
1-3) Instantaneous short circuit protection

- The setting current I_{r3} of instantaneous short circuit (can be OFF) can be adjusted.



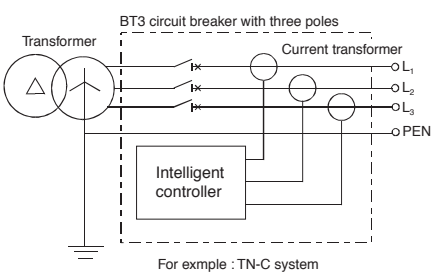
2) Ground-fault protection

- Definite ground-fault protection, and its setting current I_{r4} can be adjusted
- Delay time t_4 can be adjusted



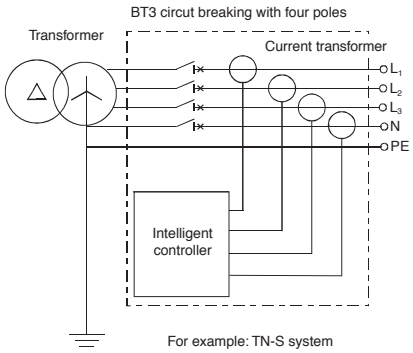
2-1) Vectorial summation type

• TN-C, TN-C-S, or TN-S, power distribution system without additional current transformer of neutral



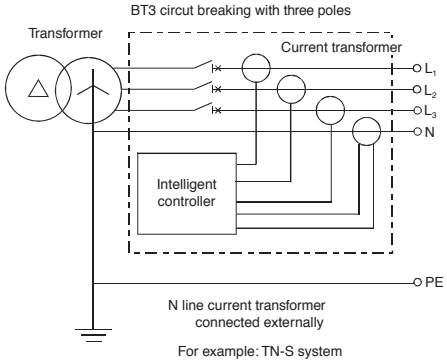
For exmple : TN-C system

• TN-S, power distribution system, 4 poles



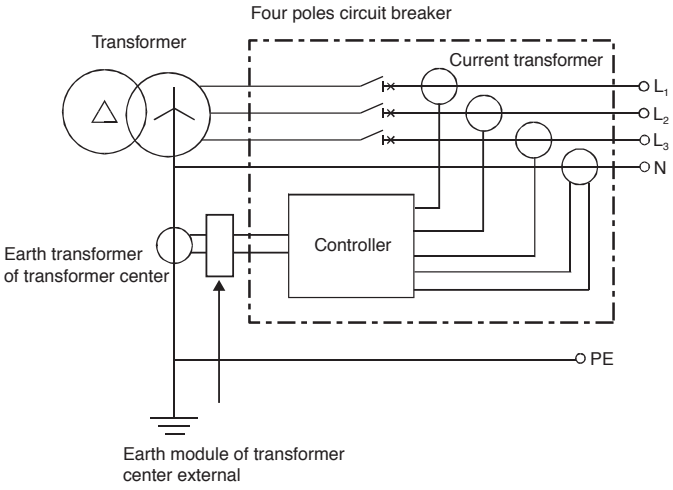
For example: TN-S system

• TN-S, power distribution system, 3 poles



For example: TN-S system

2-2) Earth type of transformer center



For example TN-S

- TN-S distribution system selects transformer's center earth type protection.
- Earth transformer with transformer's center takes the hole of sampling earth-fault center.
- The distance from earth transformer with transformer's center to externally connected transformer's center earth module which needs to select is up to 100m. The distance from earth module which is in connection with No.48 and No.50 wiring terminals of secondary circuit to circuit breaker is up to 2m.
- Earth-fault protection signal is from earth line of transformer.
- Characteristic of definite protection

3) Overload pre-alarm function

- It is mainly used for the monitoring of important load. An additional function of OCR is that pre-alarm singnal occurs when circuit breaker current rises over the setting value and pre-alarm light flashes at the moment. The pre-alarm light is always on after a period of time (t_p) and circuit breaker outputs signals. Pre-alarm function resets when current reduces below the setting value or circuit breaker trips.

4) Current unbalance protection

- It is mainly used in occasions that need high control of three-phase current. The circuit breaker trips or sends out alarm signals when three-phase current disequilibrium reaches the setting value of action threshold and rises over the action delay (definite operation).
- The funciton can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

5) Phase-loss protection

- It is the extreme case of current imbalance and mainly used in occasions that open-phase makes equipment not run as normal or broken. The circuit breaker trips or sends alarm signals when any one phase is open or three-phase current disequilibrium reaches the setting value of action threshold exceeds the time limit (definite operation). The circuit breaker lifts the alarm signals if the subsequent three-phase current disequilibrium is less than the setting value of return threshold exceeds the time limit (definite operation).
- The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

6) Demand current protection

- It is mainly used for process control. The circuit breaker trips or sends alarm signals when demand current of some phase reaches the setting value of action threshold and reses over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent demand current of the phase is less than the setting value of return threshold and rises over the return delay(definite operation)
- The funciton can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

7) Under-voltage protection

- It is mainly used in occasions that under-voltage makes equipment not run as normal or broken. The circuit breaker trips or sends alarm signals when the voltage of any one phase is lower that the setting value of action threshold but rise over the action delay (definite operation). The circuit breaker sends out the alarm signals if the subsequent voltage is less than the setting value of return threshold exceeds the time limit (definite opeation).
- The funciton can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

8) Over-voltage protection

- It is mainly used in occasions that there is external ocer-voltage or the low-voltage side is over-voltage caused by high-voltage side's earth-fault. The circuit breaker trips or sends alarm signals when the voltage of any one phase reaches the setting value of action threshold and rises over the action delay (definite operation). The circuit breaker sends out the alarm signals if the subsequent voltage is less than the setting value of return threshold and exceeds the time limit (definite operation).
- The funciton can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

9) Voltage unbalance protection

- It is mainly used in occasions that there is phase unbalance caused by center potential drift. The circuit breaker trips or sends out alarm signals when three-phase voltage disequilibrium reaches the setting value of action threshold exceeds the time limit (definite operation).The circuit breaker lifts the alarm signals if the subsequent three-phase voltage disequilibrium is less than the setting value of return threshold exceeds the time limit (definite operation).
- The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

10) Reverse power protection

- It is used to protect the generator when there is reverse power flowing to the generator. When the power flow direction is opposite to the setting, the circuit breaker will be tripped and send out alarm signal. When the reverse power is removed, the alarm signal will be turned off.
- The funciton can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

11) Over-frequency protection

- It is used to protect the generator. The circuit breaker trips or sends alarm signals when circuit frequency reaches the setting value of action threshold exceeds the time limit (definite operation). The circuit breaker lifts the alarm signals if the subsequent circuit power is less than the setting value of return threshold exceeds the time limit (definite operation).
- The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

12) Under-frequency protection

- It is used to protect the generator. The circuit breaker trips or sends alarm signals when circuit frequency is lower than the setting value of action threshold but rises over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent circuit power is less than the setting value of return threshold exceeds the time limit (definite operation).
- The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

13) Phase sequence protection

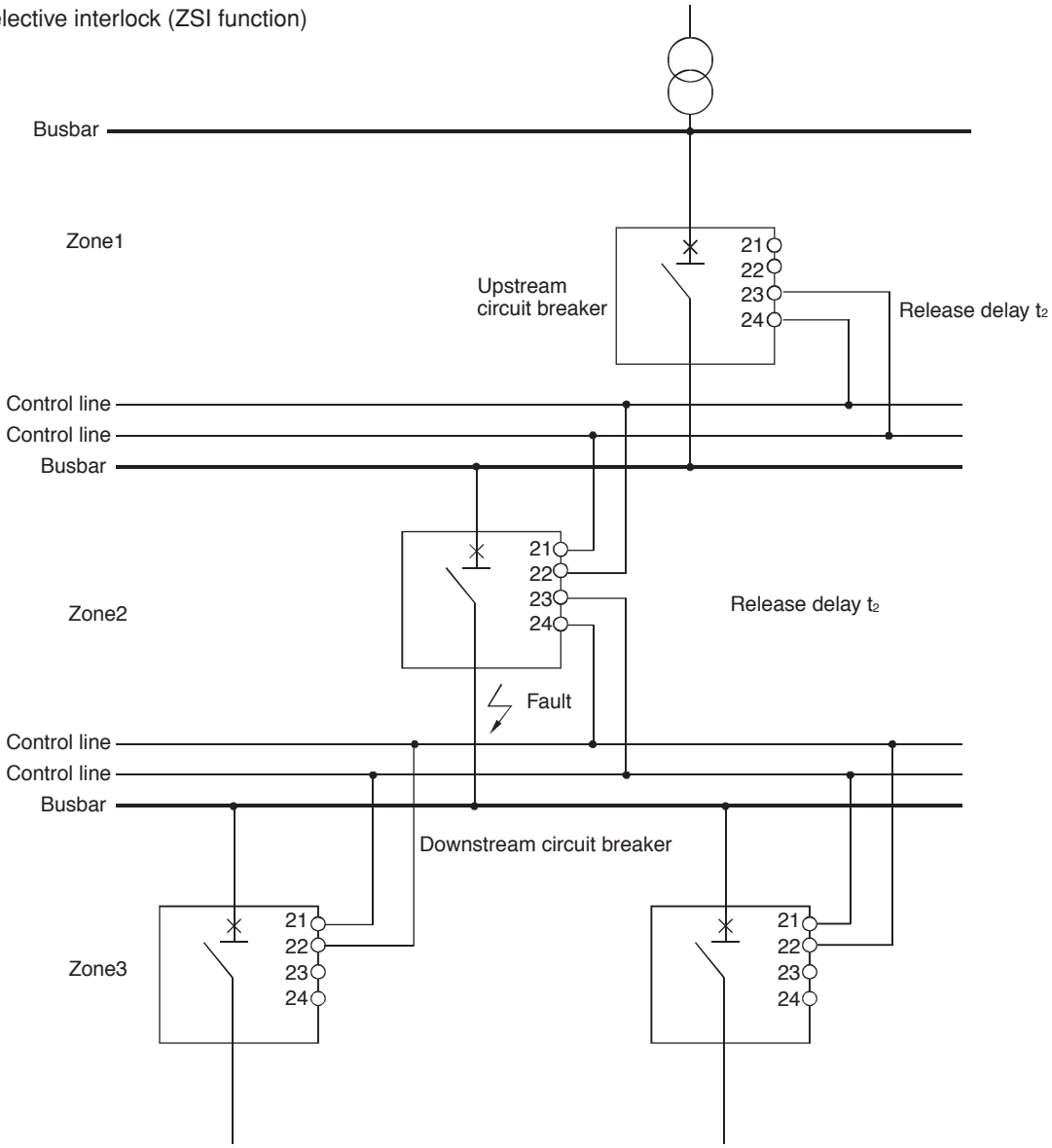
- It is used in occasions that the phase sequence is required. The circuit breaker trips or sends alarm signals when it detects that phase sequence is different from action threshold and rises over tha action delay (definite operation). The function automatically quits when there is no one-phase voltage or multi-phase voltage.
- The funciton can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

14) Current shedding funciton

- It is used in occasions that the main circuit current is monitored to keep the main circuit not to overload and it can be set to 2 lines shedding output. The circuit breaker alarms or sends alarm singals to trip the subordinate load when rewuire current of some phase reaches the setting value of action threshold and rises over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent required current of the phase is less than the setting value of return threshold exceeds the time limit (definite operaiton).
- The function can be ON or OFF.

15) Zone selective interlock

• Zone selective interlock (ZSI function)



The control circuits are connected to the terminals 21, 22, 23, 24 of the auxiliary terminal

- When several upstream and downstream circuit breakers are connected together, zone selective interlocking (ZSI) can ensure full discrimination protection so as to reduce area affected by the fault and the fault clearance time. This function serves for short circuit short-time delay (I^2t OFF) and earth-fault protection of circuit breakers.
- As the sketch shown above, control lines can interlock with pieces of circuit breakers.
- After detecting the fault the OCR (zone 2) will send out a signal to upstream circuit breaker (zone 1) and check whether the signal of downstream circuit breaker (zone 3) arrives. If the downstream circuit breaker send out a signal, the circuit breaker will be on at the time duration of release delay; if circuit breaker will break off instantly no matter whether the release has the protection or delay.

Note: The end 23 and 24 should be short-circuited.

16) MCR function

- When the circuit breaker or the controller is initially energized, the circuit breaker would trip instantly if short-time short circuit fault occurred.

17) Harmonic analysis function

- Fundamental current, fundamental line voltage, fundamental phase voltage, fundamental power, odd harminic current ratio (HRIh) for the third to thirty-first, harmonic voltage ratio (HRUh), total harminic distortion of current (THDi, thdi) and total harmonic distortion of voltage (THDu, thdu) can be measured.

17-1) Harmonic ratio (HR)

• The ratio of RMS of hth harminic component in the periodical alternating quantum to RMS of fundamental component (expressed by percent)

17-2) Harmonic current ratio of Hth expresses HRIh.

$$HRI_h = \frac{I_h}{I_{1\text{-}1}} \times 100\%$$

Note; Ih is harmonic current of hth of phase A (RMS)

17-3) Harmonic voltage ratio of Hth expresses HRUh.

$$HRU_h = \frac{U_h}{U_{12\text{-}1}} \times 100\%$$

Note; Uh is harmonic voltage of hth between phase A and phase B.

17-4) Total harmonic distortion(THD, thd)

• The ratio of harmonic content in the periodical alternating quantum to RMS of fundamental component (THD)(express by percent).

$$THD_i = \frac{\sqrt{\sum_{h=2}^{\infty} I_h^2}}{I_{1\text{-}1}} \times 100\%$$

$$THD_u = \frac{\sqrt{\sum_{h=2}^{\infty} U_h^2}}{U_{12\text{-}1}} \times 100\%$$

Note: Ih-harmonic current of hth of phase A (RMS).
Uh-harmonic line voltage of hth between phase A and B (RMS)

17-5) The ratio of harmonic component in the periodical alternating quantum to RMS of periodical alternating quantum(thd) (express by percent).

$$thd_i = \frac{\sqrt{\sum_{h=2}^{\infty} I_h^2}}{I_{1\text{-}1}} \times 100\%$$

$$thd_u = \frac{\sqrt{\sum_{h=2}^{\infty} U_h^2}}{U_{12\text{-}1}} \times 100\%$$

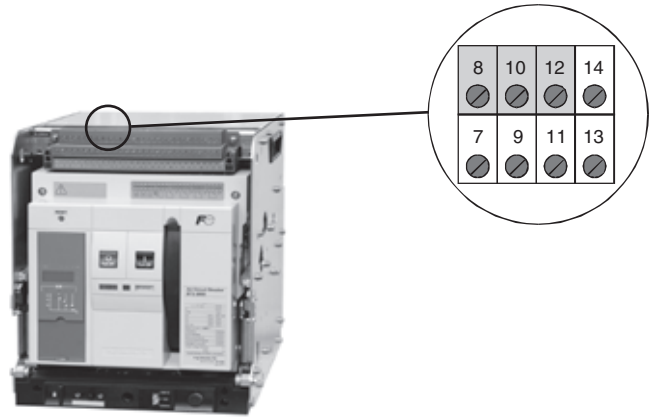
Note: Ih-harmonic current of hth of phase A (RMS)
Uh-harmonic line voltage of hth between phase A and B (RMS) OCR

■ Communication

Communicative BT3 circuit breaker can achieve these function of tele-control, tele-communication, tele-adjustment and tele-detection by RS485 interface to upstream computer. User may select one protocol of Modbus, Profibus, DeviceNet or CAN.

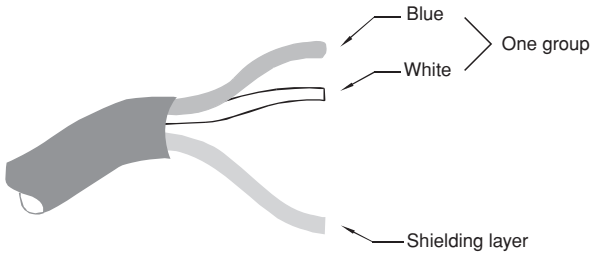
Communication data;		
Remote detection :	Real-time current, voltage, fundamental current, fundamental voltage, power, power factor, electric energy, harminic current or voltage ratio and total distortion of current or voltage	
Remote communication :	State data of circuit breakers such as alarm, fault, energy-storage, under-voltage, main body positon of breaker, ready-for-closing, the position of chosing and opening etc.	
Remote control :	Long-distance operation if closing or tripping	
Remote control :	Adjustment of the setting of the OCR of the circuit breaker	
Communication parameterl :	Modbus	Baud rate 19200bps (in favor of 1200, 2400, 4800, 9600, 38400bps)
	Profibus	Baud rate 9.6K, 19.2K, 93.75K, 187.5K, 500K, 1.5M, 3M, 6M, 12M
	DeviceNet	Baud rate 125K, 250K, 500K
	CAN	Baud rate 5K, 10K, 20K, 40K, 50K, 80K, 100K, 125K, 200K, 250K, 400K, 500K, 666K, 800K, 1000K
Communication address	1 to 119	
Byte format	first bit as start bit, eighth bit as data bit, second bit as stop bit, even check (in favor of non-check, odd check)	
Network characteristic	Twisted-pair shielded cables serve as communication lines. One line can link up 32 pieces of communicative breakers at the same time. Wiring distance is 1200m at maximum but the distance of communication can be extended by equipping with repeaters additionally.	

■ Wiring terminals for communication



Terminal	Signal	Function
8	DATA+(A+)/CAN_H	Receive/transmit data+
10	DATA-(B-) /CAN_L	Receive/transmit data-
12	SH/drain	Connection with shielded layer of communication line

■ Communication cable



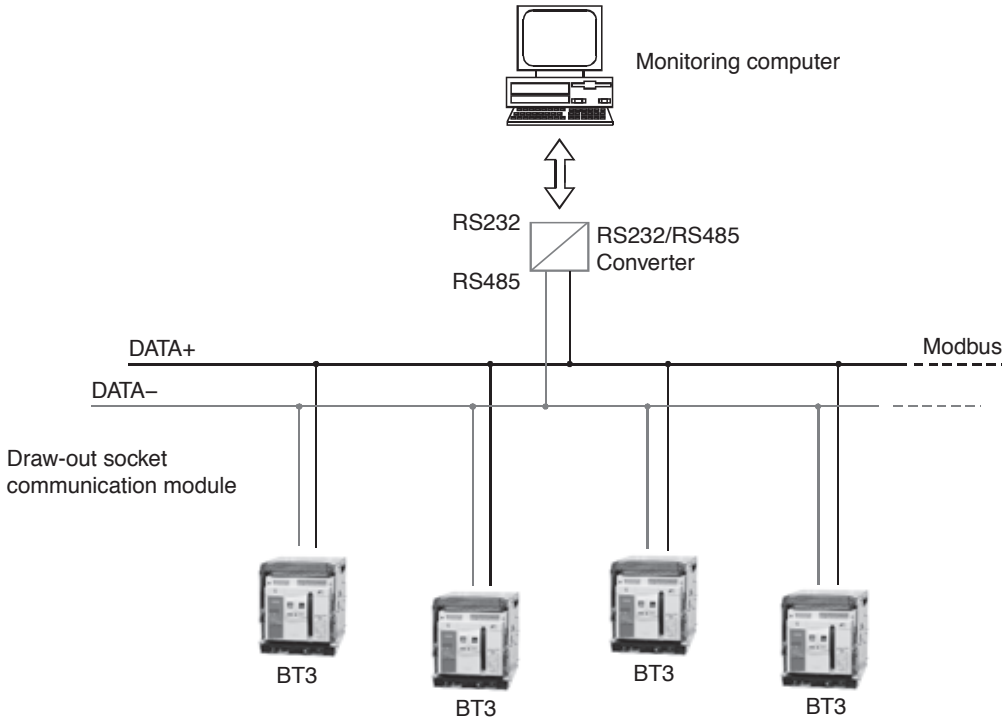
Standard twisted-pair shielded cable

Colour	Signal	Funation
Blue	DATA+	Receive/transmit data
White	DATA–	Receive/transmit data
Shielding layer	GND	Grounding

As the above diagram shows, a group of twisted-pair lines in the standard communication cable is employed as the communication line of 485 and the sheilding layer is grounded. The actual practice should be possibly different such as the application of the colour of the twisted-pair line. Users could define the ways of cable's usage by themselves but the definition of the signal of each line in the cable should be made clear in advance.

Note: please use the type of communication cable with the shielding layer and approach to circuits with strong electricity should be avoided as far as possible when wiring in the cabinet.

■ Linking diagram of communication system

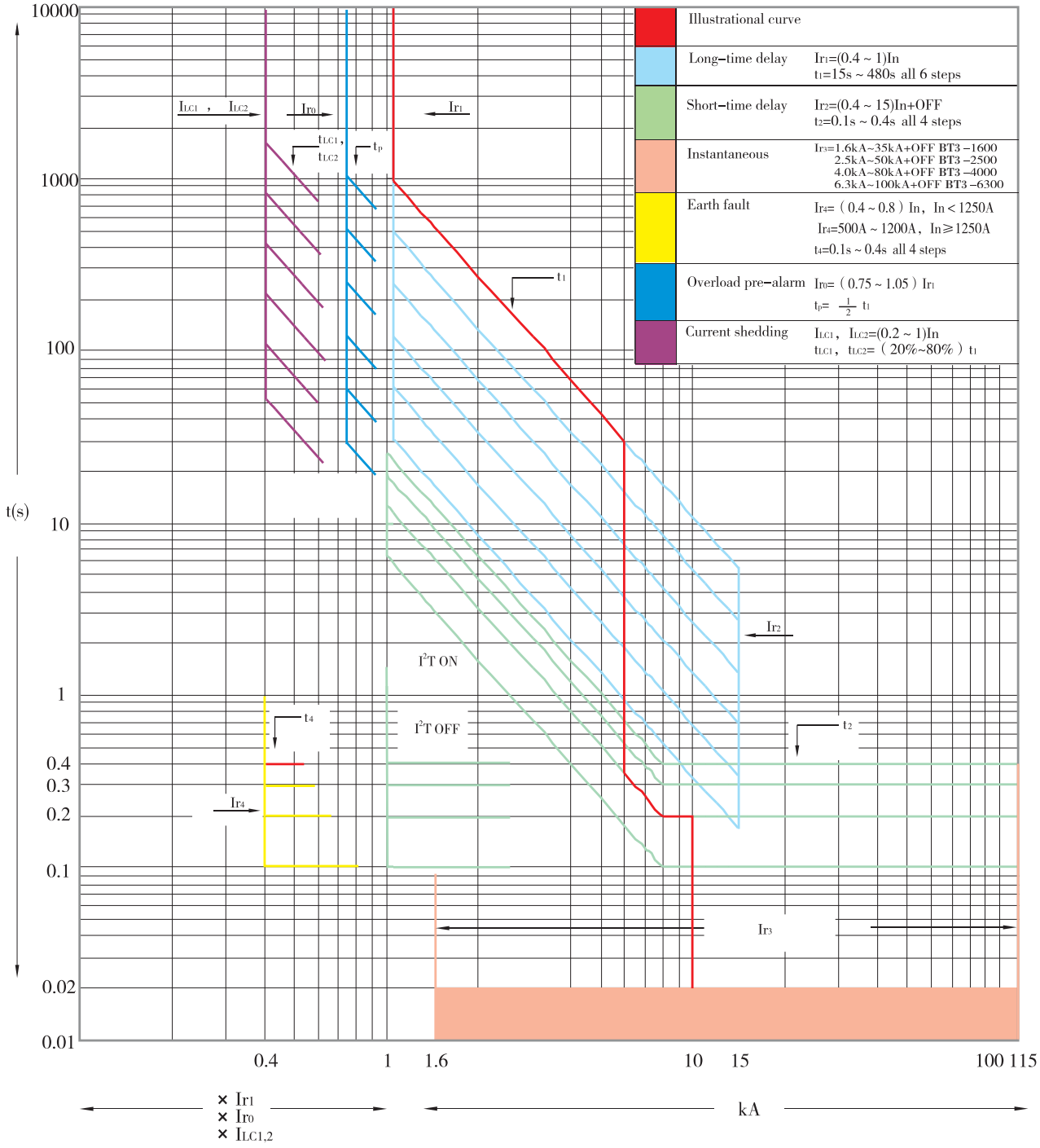


Note: As the accessory of selective purchase, the draw-out socket communication module should be selected into use when users need read the location of main body in the long distance by the choice of draw-out circuit breakers.

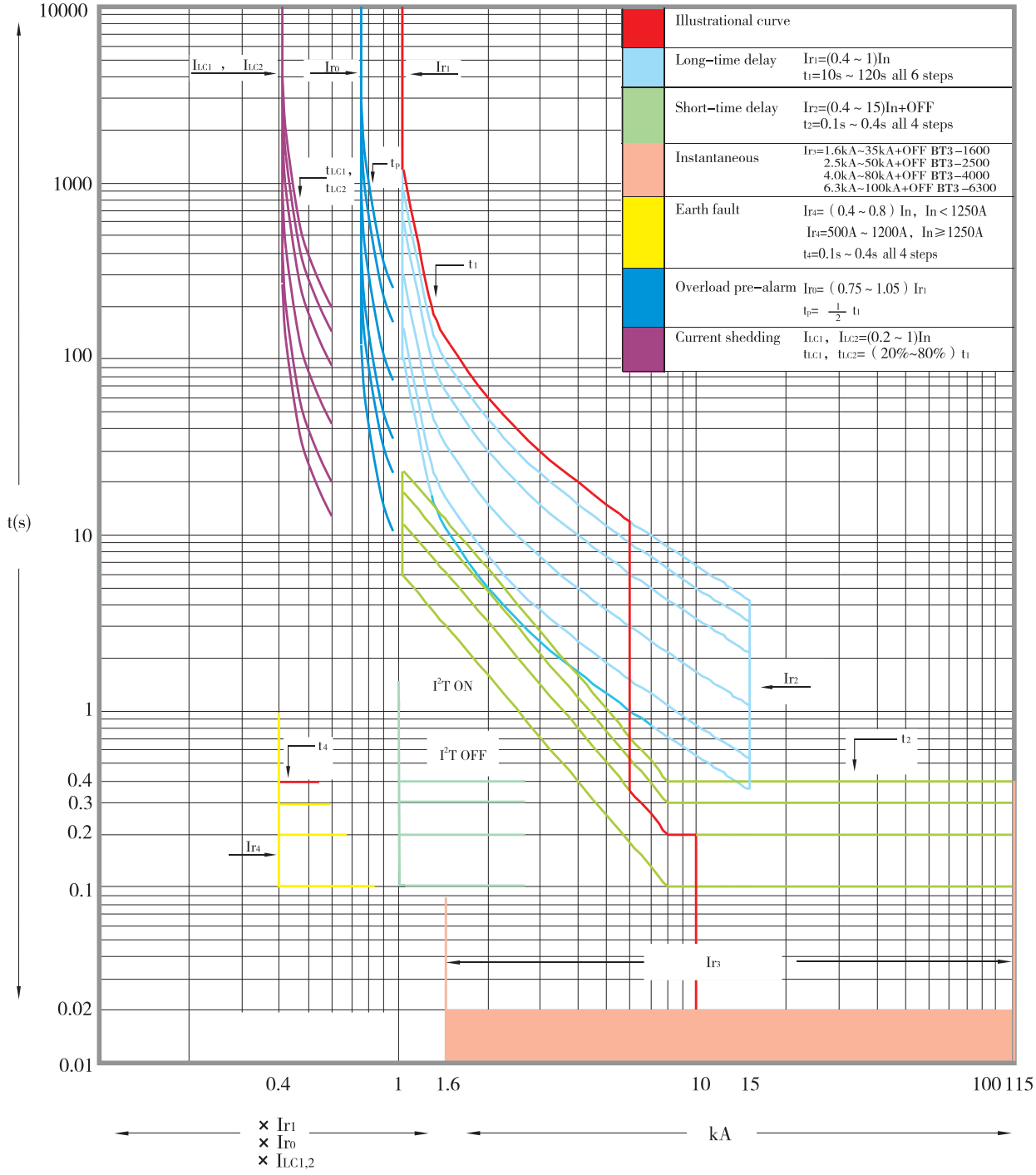
■ Characteristic curve of general I^2t

- **BT3-1600/BT3-2500/BT3-4000/BT3-6300**

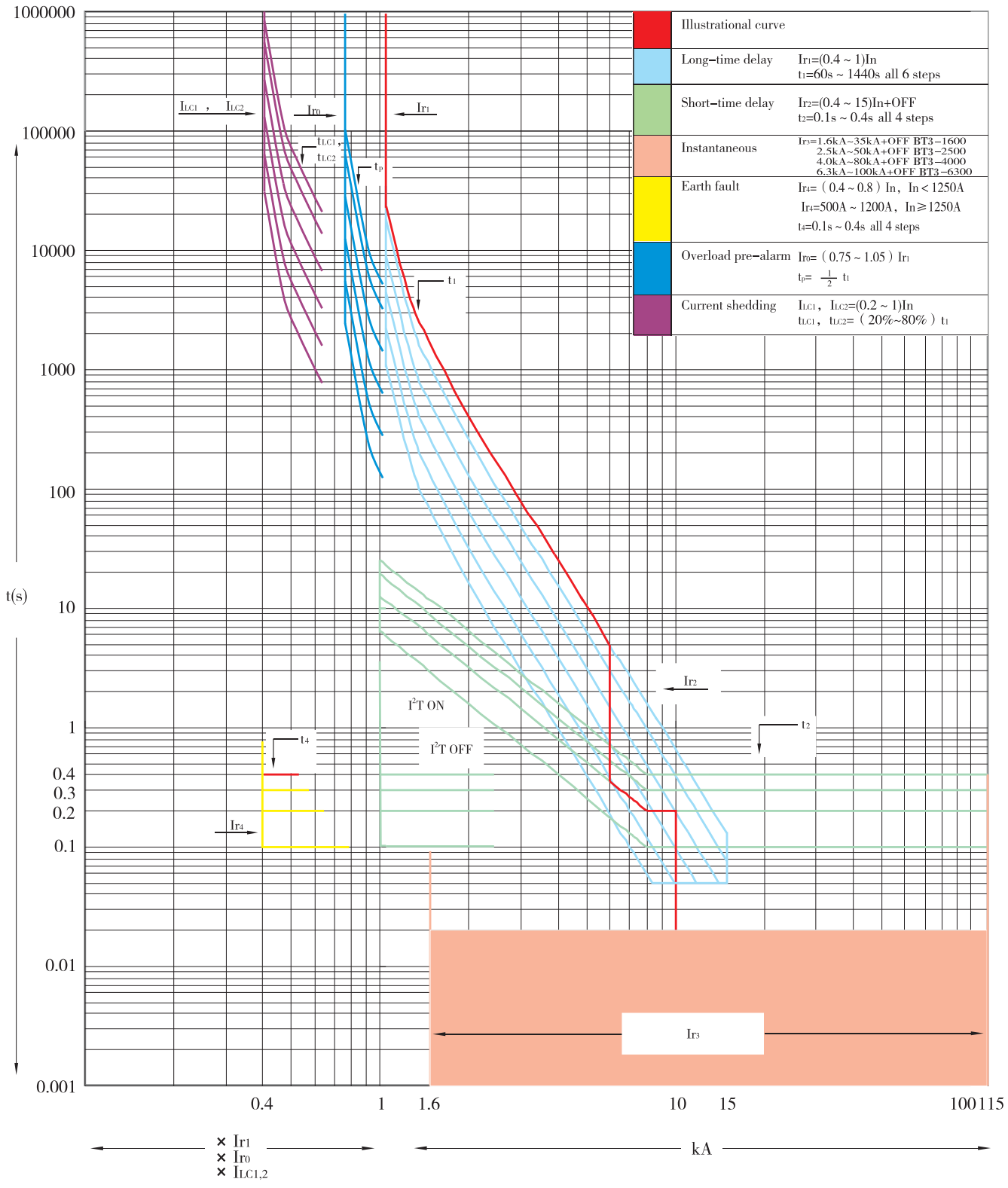
T/I (time / current) curve of I^2t of type EN, EA, EP and EQ intelligent controllers



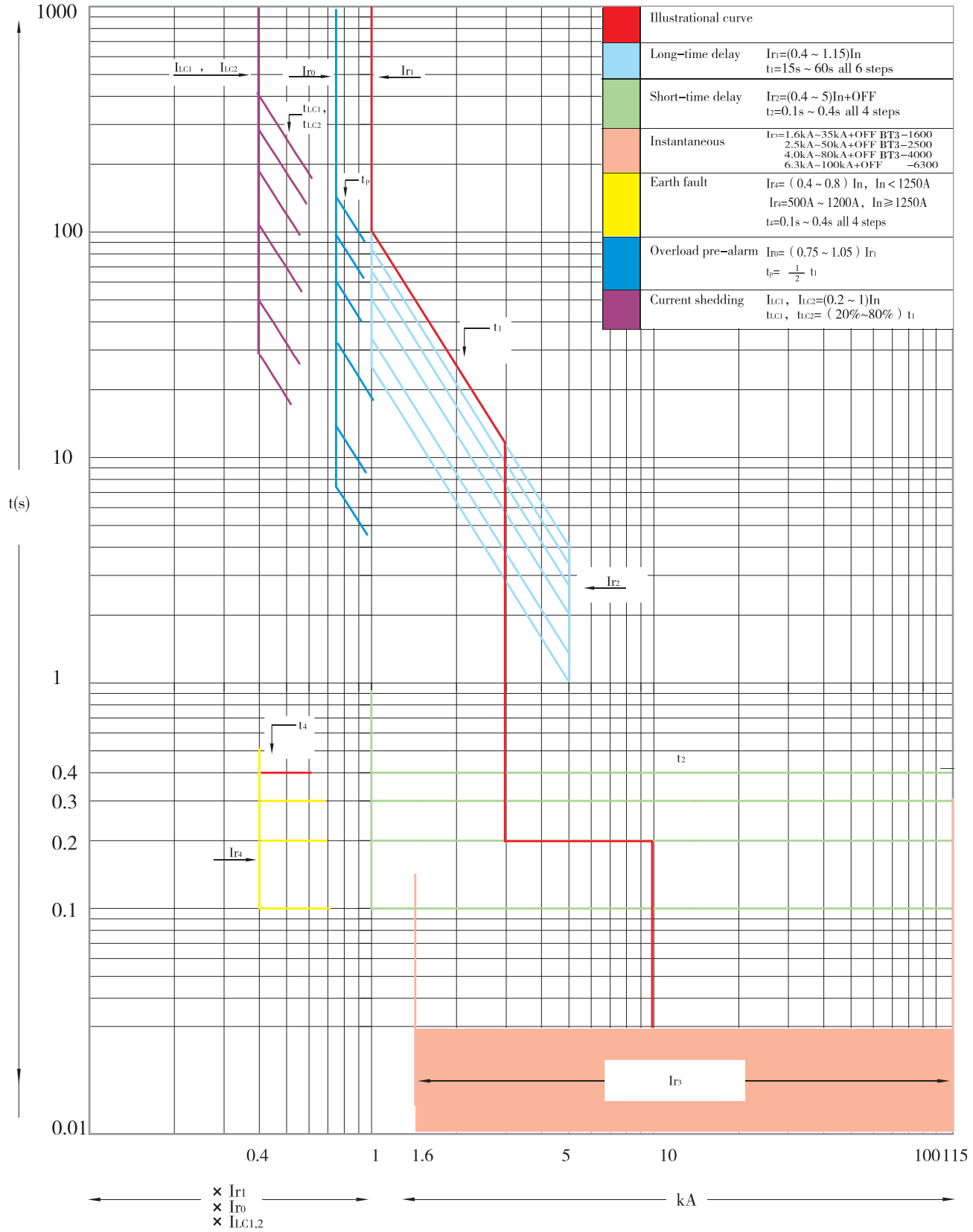
T/I (time / current) curve of uncommon inverse time It of type EA, EP and EQ intelligent controllers



T/I (time / current) curve of high-voltage fuse I^4t of type EA, EP and EQ intelligent controllers



T/I (time / current) curve of I^2t of type EG intelligent controller



■ Accessories

● Supplied accessories

Following accessories are come with each ACB's as standard supplied.

• Shunt trip device

To break the ACB by remote control.

Rated voltage of control power supply (Us)	AC380V-AC415V	AC220V-AC240V	DC220V	DC110V
Operating voltage (V)	(0.7 to 1.1) Us			
Instantaneous current (A)	0.7	1.3	1.3	2.4
Breaking time (ms)	No more than 30			



• Closing Coil

After the ACB's ends up its energy storage, the closing electromagnet will make the energy storing spring to release its energy instantly, then to close the count ACB quickly.

Rated voltage of control power supply (Us)	AC380V-AC415V	AC220V-AC240V	DC220V	DC110V
Operating voltage (V)	(0.85 to 1.1) Us			
Instantaneous current (A)	0.7	1.3	1.3	2.4
Switching-on time (ms)	No more than 70			

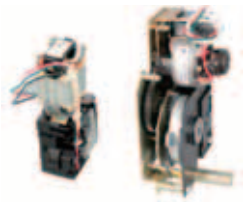


• Motor charging mechanism

ACB has the functions of drive energy storage and automatic energy-restoring.

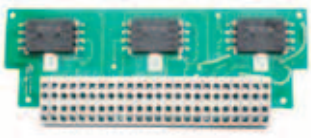
The energy storage can also be done manually.

Rated voltage of control power supply (Us)	AC380V-AC415V	AC220V-AC240V	DC220V	DC110V
Operating voltage (V)	(0.85 to 1.1) Us			
Power consumption	192VA		192W	
Energy storage time (s)	No more than 5			



• Auxiliary Switches

Type of contacts	
4 group of change over contact	
4 NO + 4NC	
6 group of change over contact	
6 NO + 6 NC	
Rated operational voltage and capacity	
AC220-240V	300VA
AC380-440V	300VA
DC220V	60VA
DC110V	60VA
Conventional thermal current	6A





• Safety padlock mechanism at the position of "separated"

When the draw-out circuit breaker indicates the position of "separated", the locking stick can be locked with padlock after being pulled out so that the racking shaft of the circuit breaker can not be turned to the position of "test" or "connected". Padlock should be provided by users themselves.



Safety padlock mechanism at the position of "separated"

● Optional accessories

• Special power module (for BT3-1600)

When the control voltage of BT3-1600 circuit breaker's intelligent control (OCR) is AC220V-AC240V or AC380V-AC415V, it must be transformed to DC24V by this power module for power module for power supply of the OCR

Note: The input of voltage to 1 and 2 terminals of the secondary circuit must be DC24V.
This module is installed by getting stuck into the standard slideway with 35mm in width inside the switchgear cabinet.



Input voltage	AC400/230V ± 15%, DC24V ± 15%
Output voltage	DC24V ± 0.5V
Output current	0.2A

• DC power supply module

When power supply of the secondary circuit is DC220V, DC110V, it should be transformed into DC24V by this module for power supply of the OCR.



Input voltage	DC220V ± 15%, DC110V ± 15%
Output voltage	DC24V ± 0.5V
Output current	0.2A

• Voltage changeover module

When there has voltage display function and the input voltage is higher that AC400V, there should have this module; the module input terminals A, B, C, N connect to the main circuit and the output terminal A', B', C', N' connect to the circuit breaker's secondary circuit connection terminals 17, 18, 19, 20.

• Under-voltage release

The under-voltage release consists of release coil and control unit.

The under-voltage release works in two ways: operating instantaneously and operating in time delay.

There are four specifications of time delay for the under-voltage time delay release: 0.5s, 1s, 2s and 3s. Users should consult with the manufacturer in the light of their order about special time-delay specifications as from 3s and above up to 9s. The time delay accurary is ±10%.

The Under-voltage release of BT3-1600 must be combined with the time-delay module which is installed by getting stuck into the standard slideway with 35mm in width.The module input terminals connect with main circuit,the output terminals connect with terminal 31, 32 of the breaker.

Type of ACB	BT3-1600			BT3-2500 and above		
Dalay time	Instantaneous	0.5/1/2/3	0.5/4/5/9	Instantaneous	0.5/1/2/3	0.5/4/5/9
Rated voltage (Ue)	AC220V-AC240V or AC380V-AC415V					
Operating voltage	0.35 to 0,7 Ue					
Closing voltage	0.85 to 1.1 Ue					
Impossible voltage	< 0.35 Ue					
Power consamption	12 (VA)					

• Programmable output module

6 lines programmable output extention module can be provided (getting stuck into the standard guide way) according to user's need-Programmable content is in the "Items of Programmable output module " table; Cotent types of 6 lines programmable output expansion module are in the "contact types of programmable output module" table; Setting time of time delay contact is in "Setting time of time delay contact" table; Electrical parameters of relay with programmable output module is in the electrical parameters of relay with programmable output module " table. The operation times on electricity are 10^5.

Item of programmable output module

No.	Funciton		Remark
A	I_{ro}	Overload pre-alarm	Overload pre-alarm and current shedding
B	I_{LC1}	Current shedding 1	
C	I_{LC2}	Current shedding 2	
D	I_{r1}	Long-time delay trip alarm	Current protection alarm
E	I_{r2}	Short-time delay trip alarm	
F	I_{r3}	Instantaneous trip alarm	
G	I_{r4}/IΔn	Earth residual current trip alarm	
H	I_{unbal}	Current unbalance operating alarm	
I	Open-phase	Open-phase alarm	
J	Over-temperature	Over-temperature alarm	Internal fault alarm
K	Memory fault	Memory fault alarm	
L	Internal accessories fault	Internal accessories fault alarm	
M	$I_{1\ max}$	Maximum demand current operation alarm	Current protection alarm
No.	$I_{2\ max}$	Maximum demand current operation alarm	
O	$I_{3\ max}$	Maximum demand current operation alarm	
P	$I_{n\ max}$	Maximum demand current operation alarm	
Q	U_{min}	Under-voltage operating alarm	Voltage protection alarm
R	U_{max}	Over-voltage operating alarm	
S	U_{unbal}	Voltage unbalanve operating alarm	
T	phase sequence	Phase sequence operating alarm	Other protection alarm
U	F_{min}	Under-frequency operating alarm	
V	F_{max}	Over-frequency operating alarm	
W	$_rP_{max}$	Inverse frequency operating alarm	

Contact types of programmable output module

Non-interlocking contact	It keeps operation until the failure alarm is gone.
Interlocking contact	It keeps operation until it is reset (reset menu).
Time delay contact	It is kept in adjustable time delay or it is reset (reset menu)

Setting time of time delay contact

Item	Range	Step	Precision
Delay time of time delay contact	1-360s	1s	±10%

Electrical parameters of relay with programmable output module

Rated operational voltage (Ue)	Conventional themal current (Ith)	Rated operational current (Ie)	Rated control capacity
AC230V	5 A (2 lines programmable output module is 1A)	AC-15: 5A (2 lines programmable output module is 1A)	1200VA (2 lines programmable output module is 230VA)
AC400V		AC-15: 3A	1200VA
DC220V		DC-13: 0.15	50W
DC110V		DC-13: 0.4	50W

• Electrical mechanism for the indication of draw-out socket' position

When the main body of the draw-out circuit breaker and the draw-out socket are at the position of "separated", "tested", and "connected" respectively, three electrical mechnisms for the indication of draw-out socket location can output the electrical signals corresponding with three positions above respectively. These mechanisms are installed inside the draw-out socket.

Characteristics

Rated operational voltage (Ue)	AC230V
Conventional themal current (Ith)	6A
Rated operational current (Ie)	3A

• **Electrical module for indication of ready-for-close**
The electrical module indicates that the circuit breaker is ready for close.

Characteristics

Rated operational voltage (Ue)	AC230V
Conventional themal current (Ith)	1A
Rated operational current (Ie)	1A



• **Current transformer with neutral line N connected externally**
It is used together with circuit breaker with three poles in the power distribution system of TN-S and installed in the neutral line N with 2 m at maximum far from the installation point.

Characteristics

Rated operational voltage (Ue)	AC230V
Conventional themal current (Ith)	1A
Rated operational current (Ie)	1A



• **Externally transformer's center earth unit**
It is used together with three-phase circuit breakers or four-phase circuit breakers in TN-S distribution system and instlled in the earth line of transformer at the low-voltage side. Current sampling signals used for earth-fault protection are sent to type EN, EA, EP and EQ OCR by the externally connected unit with transformer's center.

• **Externally connected earth module with transformer's center**
It is used together with the externally connected unit with transformer's center for transformer's center earth-fault protection. P1 and P3 connect with the externally connected unit with transformer's center and P2 and P4 connect with terminals 48 and 50 of the secondary circuit. The module is installed by getting stuck to the standard guide way with 35 mm in width the switchgear cabinet.

• **Accessories detection unit**
With accessories detection unit installed the circuit breaker can online monitor that if the coil of shunt release, closing electromagnet, under-voltage release or charging motor is disconnected to ensure the normal work of the circuit breaker.

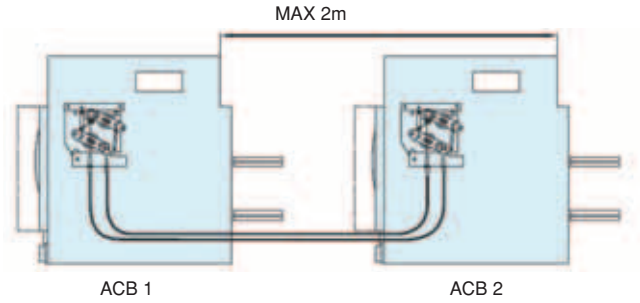
• **Remote reset**
The function can reset the reset button and remove the instructions of tripping for fault after circuit breaker trips.

Characteristics

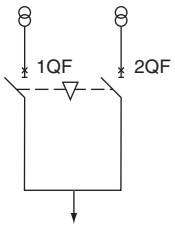
Voltage of control power supply	AC230V
Operating voltage	0.85 to 1.1 Us
Instantaneous current	1A

• **Electrical mechanism for the indicaiton of energy storage signals**
The function gives a electrical indication about charging and dissharging situation of motor driven operating mechanism.

• Two sets of circuit breakers put horizontally and interlocked with steel cable or stacked and interlocked with connecting rods. (the style of interlock between two sets of circuit breakers with connecting rods and aperture dimensions of their bases see the counterpart of three sets of circuit breakers)



Wiring diagram

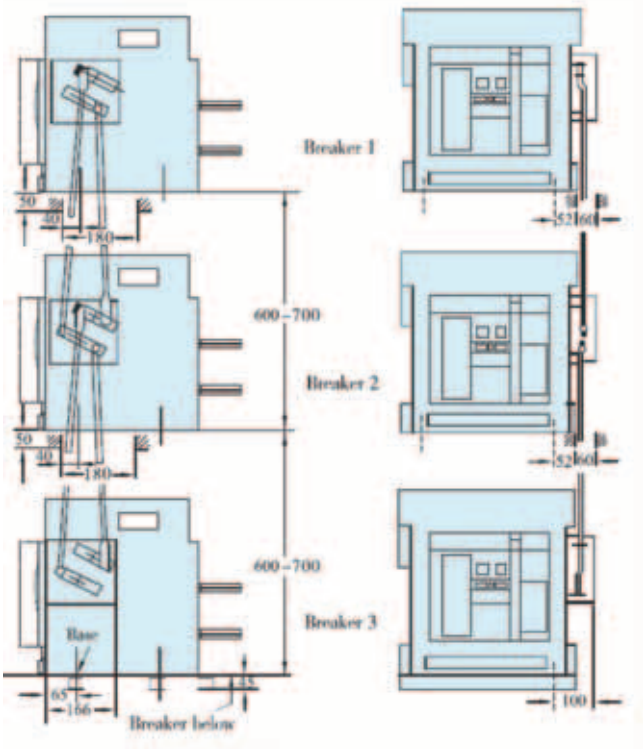


Possible operation pattern

1QF	2QF
0	0
0	1
1	0

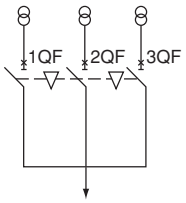
• Three sets of circuit breakers stacked and interlocked with connecting rods or three sets of circuit breakers put horizontally and interlocked with steel cable.

• **Three set of draw-out type ACB's, (BT3-2500 ~ 6300) : Stacked and interlocked**



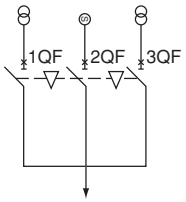
Wiring diagram — Possible operation pattern

Pattern one: three sets of power supply can only close one set of circuit breaker



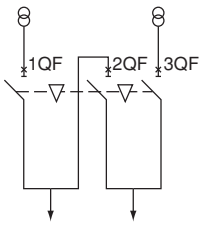
1QF	2QF	3QF
0	0	0
1	0	0
0	1	0
0	0	1

Pattern two: three sets of common power apply plus one set of altemate power supply



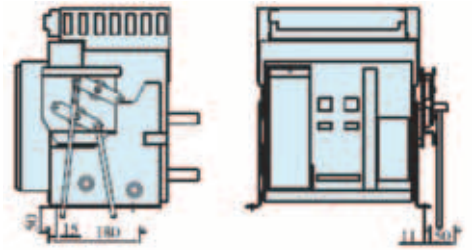
1QF	2QF	3QF
0	0	0
1	0	0
0	1	0
1	0	1
0	0	1

Pattern three: three sets of power supply plus one piece of coupling bus-bar

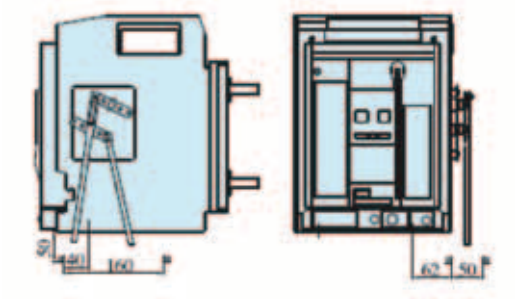


1QF	2QF	3QF
0	0	0
1	0	0
0	1	0
0	0	1
1	1	0
0	1	1
1	0	1

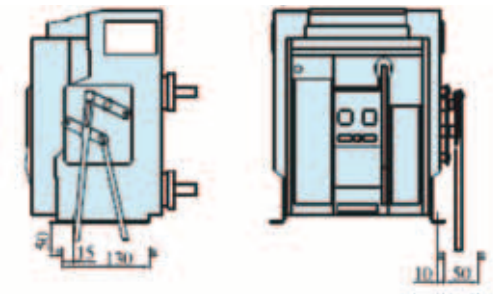
• **Three set of fixed type ACB's, Fixed (BT3-2500 ~ 6300) : Stacked and interlocked**



• Two sets of draw-out type ACB (BT3-1600) : stacked and interlocked

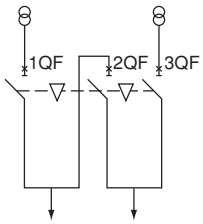


• Two sets of fixed type ACB (BT3-1600) : stacked and interlocked



• The style of interlock between three sets of circuit breakers see the interlock between two sets of circuit breakers. The maximum distance of two circuit breakers is 2m.

Wiring diagram	Possible operation pattern
Pattern three: three sets of power supply plus one piece of coupling bus-bar	



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

• Key lock mechanism
"opening" locking mechanism can lock the "OFF" button of the circuit breaker on the pressed position. As a result, the circuit breaker can not be closed. After the lock mechanism is chosen by users the manufacturer would provide locks and keys. One set of circuit breaker is equipped with one lock and one key; two sets of circuit breakers are equipped with two locks and one key; three sets of circuit breakers are equipped with three same locks and two keys.



"Opening" locking mechanism

• "Pushbutton" locking device
When "Pushbutton" locking device is installed it can pevent somebody from operating button of closing or operating by mistake.
Padlock should be provided by user themselves, and its rod should be no larger that ϕ4mm.



Pushbutton locking device

• Counter
The counter can count mechanical operation times accumulatively and an exact number is presented.

• Ready-for-close
You can get the information through the upstream device that the circuit breaker is ready for close.

• Under-voltage signal
You can get the information through the upstream device that the circuit breaker is tripping under voltage.



• Faulty tripping singal
You can get the information through the upstream device that the circuit breaker is tripping because of overload, short circuit or earth protection of the connection and devices.

• Charging signal
You can get the information of charging or discharging of motor driven operation mechanism through the upstream device.

■ Service condition

• Power loss (environment temperature + 40°C)
Power loss is the overall comsumption measured with the circuit breaker which is electrified with current below frame current.

Type	Power loss (Three/Four poles)	
	Fixed type	Draw-out type
BT3-1600	123.5 W	331.5 W
BT3-2500	356.8 W	823.4 W
BT3-4000	486.7 W	856.8 W
BT3-6300	787 W	1145 W

• Derating coefficient
The following table shows continual current-loading capacity of circuit breakers at different ambient environment temperature and under the wnditions of the satisfaction of conventional heating in IEC60947-2

Ambient envionment temperature		+40°C	+45°C	+50°C	+55°C	+60°C
Current loading capacity	Inm=1600A	1 x Inm	0.99 x Inm	0.96 x Inm	0,90 x Inm	0.87 x Inm
	Inm=2500A	1 x Inm	0.96 x Inm	0.90 x Inm	0.86 x Inm	0.80 x Inm
	Inm=4000A	1 x Inm	0.95 x Inm	0.89 x Inm	0.85 x Inm	0.78 x Inm
	Inm=6300A	1 x Inm	0.93 x Inm	0.87 x Inm	0.82 x Inm	0.75 x Inm

• Altitude derating
If altitude exceeds work environmemt for 2000m the electric property of circuit breaker can be corrected according to the following table.

Altitude (m)	2000	3000	4000	5000
Power-frequency withstand voltage	3500	3150	2500	2000
correction factor of operational current	1	0.93	0.88	0.82

• Refrence table of main circuit wiring copper bar for draw-out circuit breakers.

Reted frame current (A)	Rated current (A)	Specificaitons of copper bars	
		Number	Size (mm x mm)
1600	200	1	20 x 5
	400	1	50 x 5
	630	2	40 x 5
	800	2	50 x 5
	1000	3	40 x 5
	1250	4	40 x 5
	1600	2	50 x 10
2500	630	2	50 x 5
	800	2	60 x 5
	1000	2	60 x 5
	1250	3	60 x 5
	1600	2	60 x 10
	2000	3	60 x 10
	2500	4	60 x 10
4000	1000	2	60 x 5
	1250	3	60 x 5
	1600	2	60 x 10
	2000	3	60 x 10
	2500	4	100 x 5
	2900	3	100 x 10
	3200	4	100 x 10
	3600	4	100 x 10
	4000	4	100 x 10
6300	4000	4	100 x 10
	5000	6	100 x 10
	6300	6	100 x 10

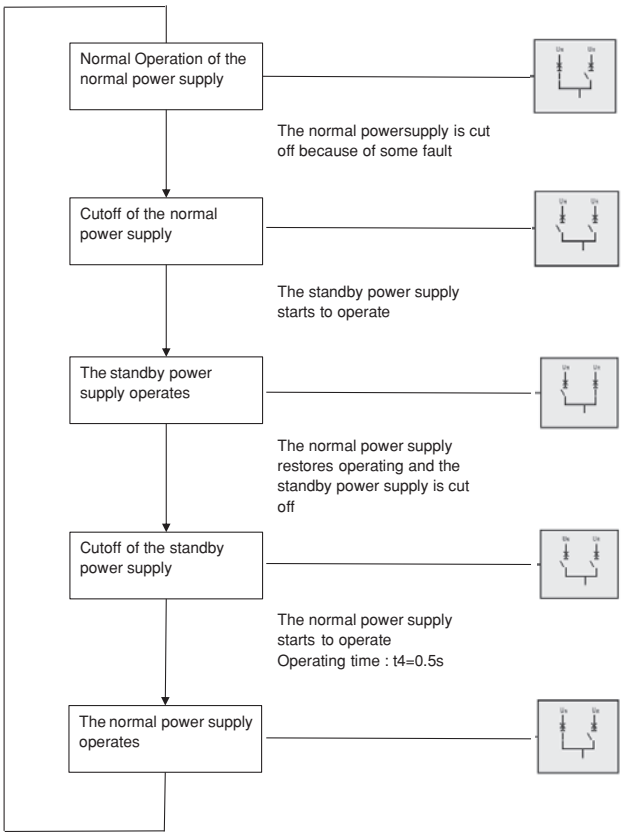
The specificaiton of cooper bars in the above table are introduced under the conditions that the circuit breakers open installed are at the maximum ambient environment temperature of 40 and satisfy conventional heating in IEC 60947-2.

• Automatic Transfer Switch (ATS)
Automatic power supply switching system guarantees reliable AC400V power supplying for users by providing two lines of power supply alternatively. It consists of automatic controllers, switching unit and cables (already prepared by the manufacturer). The system should be used together with mechanical interlock.

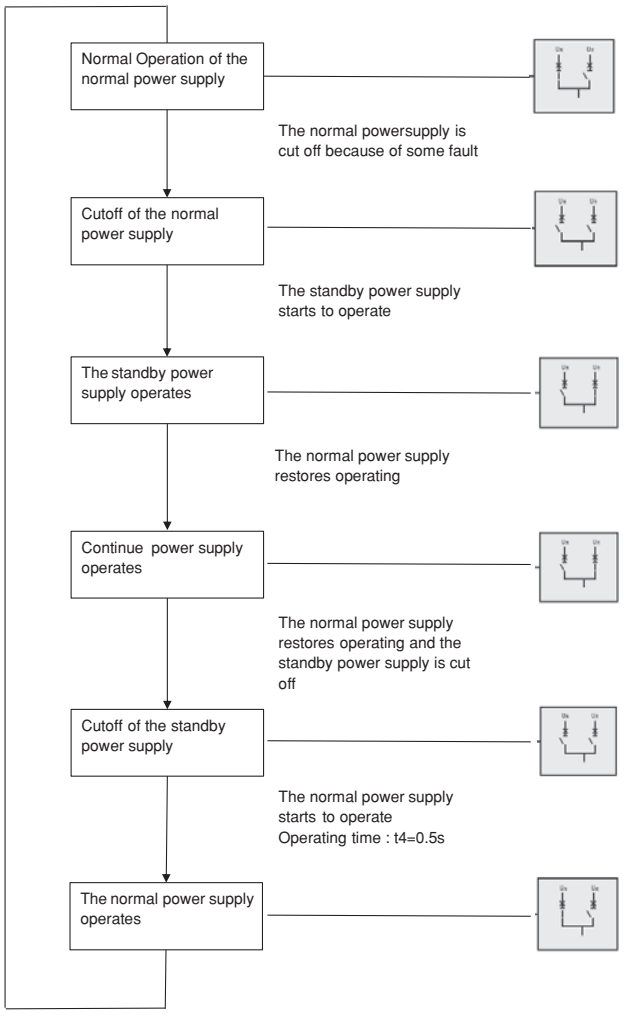
• Switching unit and automatic controller
Switching unit works with the automatic controller. The switching unit detects the voltage on all phases of the normal power supply and the value on each phase of the standby power supply. In case of over-voltage of 115% Us, under-voltage of 75% Us, phase loss or power shortage happened at any phases, an operation command will be given out. the figure of the operation unit is as follows,
The autimatic controller is shown on the page. It has four working positions that are "automatic" control, "normal" power supply, "standby" power supply and "stop" (both the normal power supply and the standby power supply can be turned off.)
The switching unit is mounted on the mounting plate of switchboard while the controller is mounted on the panel door of the switchboard. There is cable connection between controller with switching unit and between switching unit with breaker no more than 1.8m (User should make special order when requiring for distance more than 1.8m).

• According to operation order the controller can be classified as Type R with automatic switch with restoration for normal supply from the standby supply system, Type S with automatic switch but without restoration function for normal supply from the standby supply system, Type F with automatic switch with restoration for normal supply from the power generation supply system. The logic control diagram of the automatic controller of Type R, S and F is as follows,

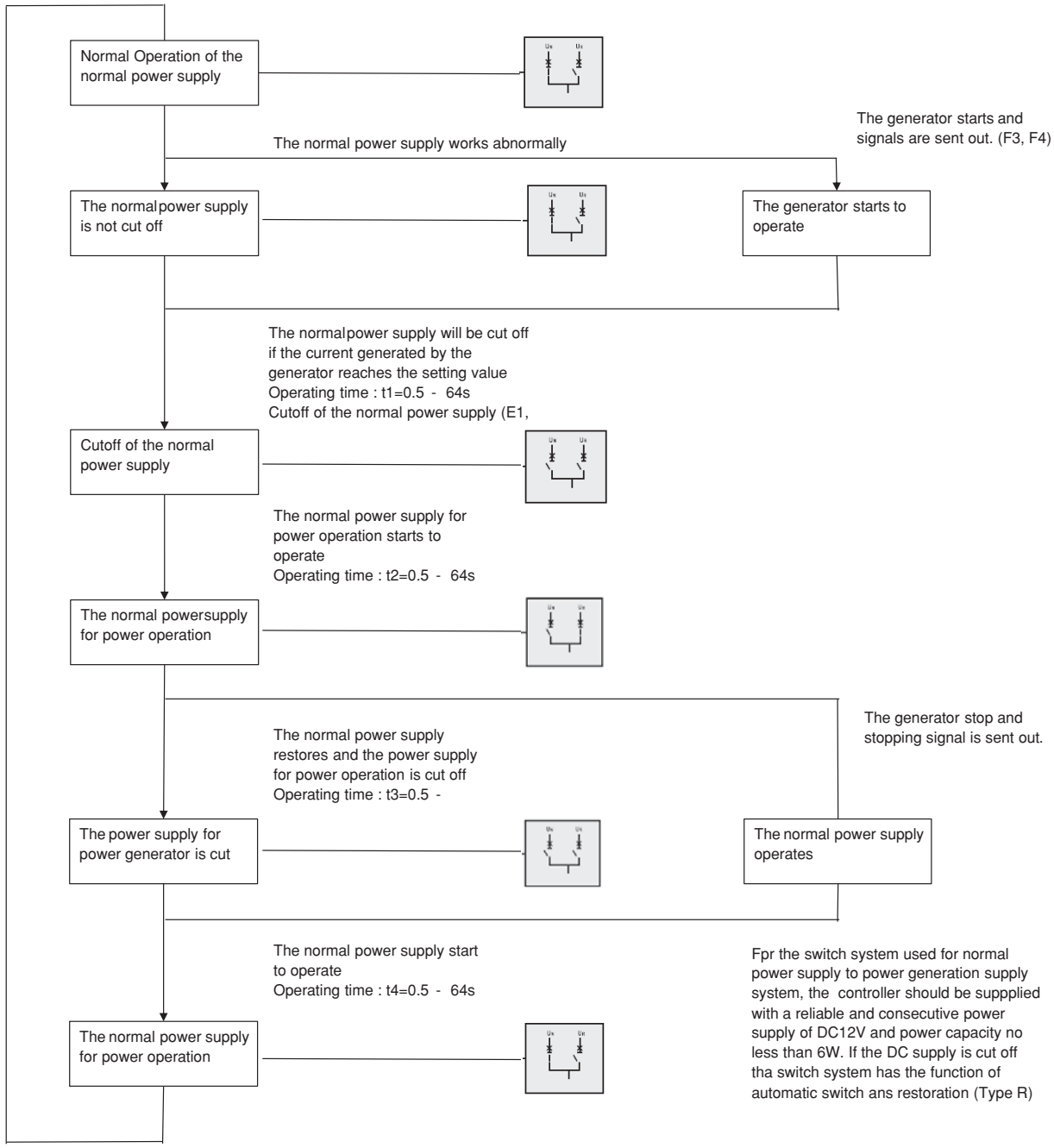
• Automatic switch with restoration for normal supply from the standby supply (Type R)



• Automatic switch without restoration for normal supply from the standby supply (Type S)



• Automatic switch with restoration for normal supply from the generation supply (Type F)



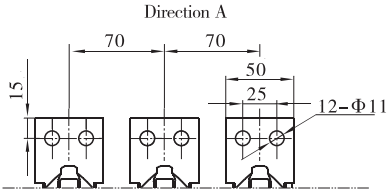
• Characteristics of the automatic controllers of type R, S and F

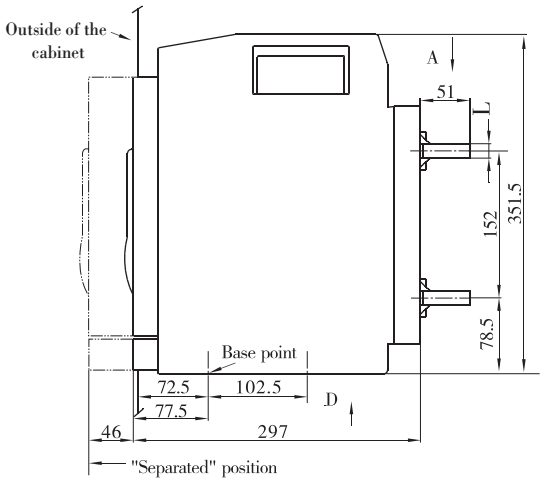
Controller type	Rated voltage of power supply (Us)	Delay time before switching to open (t1)	Delay time before switching to close (t2)	Delay time before restoring opening (t3)	Delay time before restoring closing (t4)	Delay time before giving out the command to generator power (t5)	Delay time before giving out the command to stop power generation (t6)
Type R Type S	AC230V	0.5 to 64 s adjustable	0.5s	0.5 to 64 s adjustable	0.5s	–	–
Type F	AC230V	0.5 to 64 s adjustable	0.5 to 64 s adjustable	0.5 to 240 s adjustable	0.5 to 64 s adjustable	1 to 180 s adjustable	32 to 600 s adjustable

■ Dimensions and mounting, mm

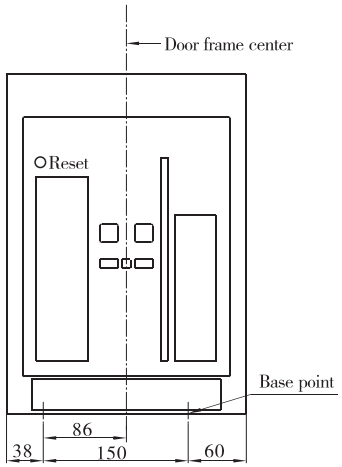
● BT3-1600 Intelligent Air Circuit Breaker with three poles (draw-out type)

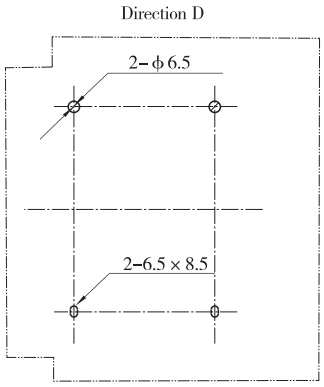
Current specifications	L (mm)
800A, 1000A, 1250A, 1600A	15
200A, 400A, 630A	10

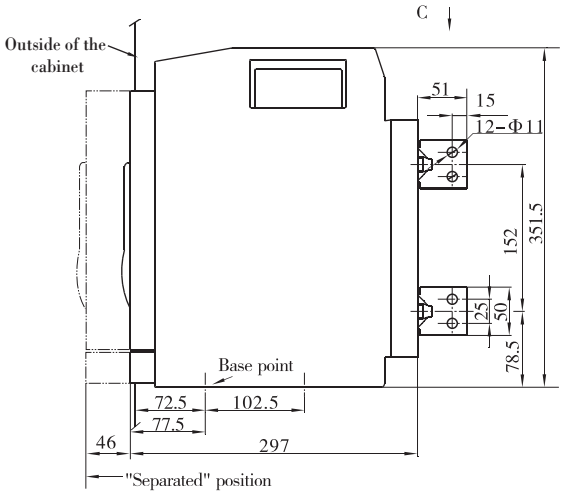




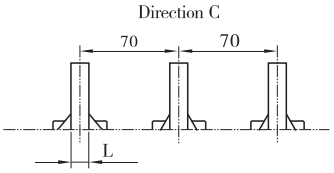
Horizontal (back set)







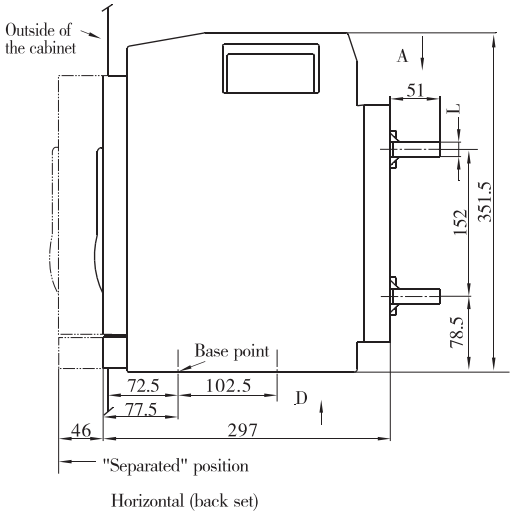
Vertical (back set)



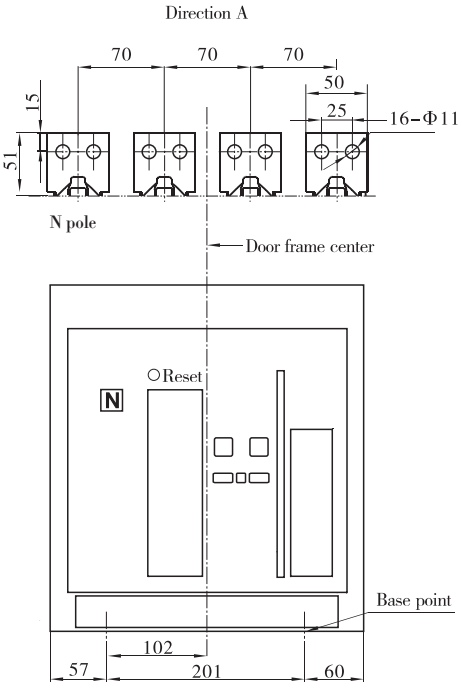
■ Dimensions and mounting, mm

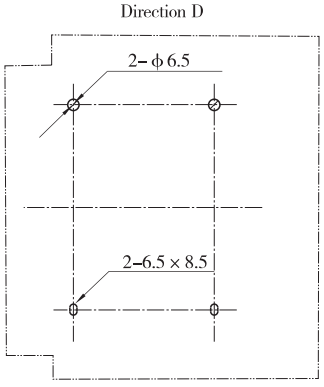
● BT3-1600 Intelligent Air Circuit Breaker with four poles (draw-out type)

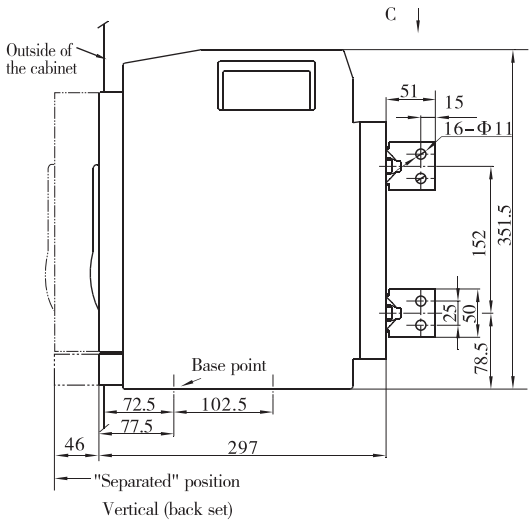
Current specifications	L (mm)
800A, 1000A, 1250A, 1600A	15
200A, 400A, 630A	10



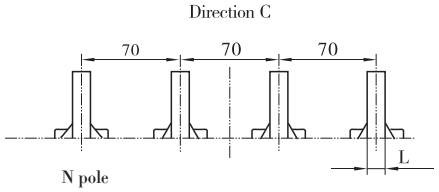
Horizontal (back set)







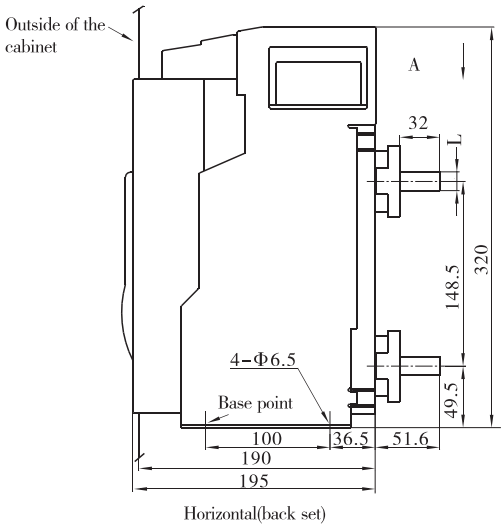
Vertical (back set)



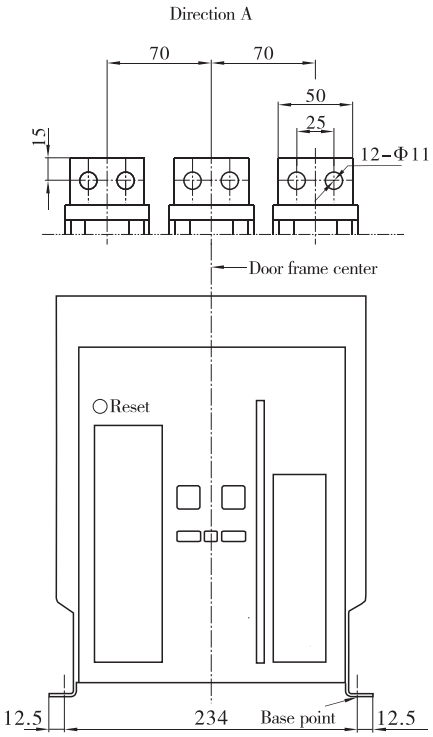
■ Dimensions and mounting, mm

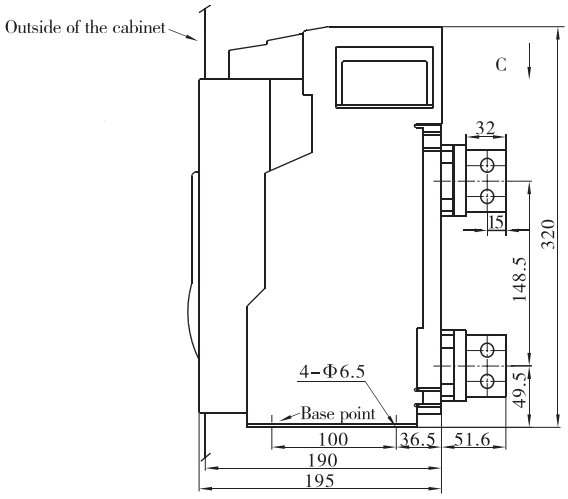
● BT3-1600 Intelligent Air Circuit Breaker with three poles (fixed type)

Current specifications	L (mm)
800A, 1000A, 1250A, 1600A	15
200A, 400A, 630A	10

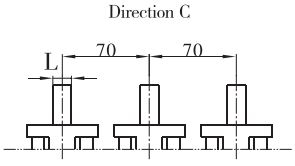


Horizontal(back set)





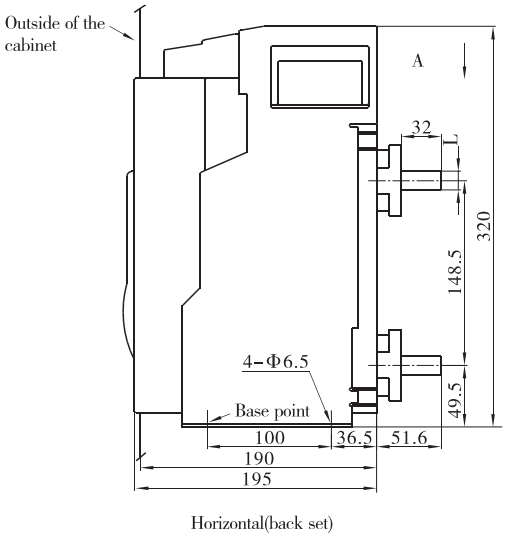
Vertical (back set)



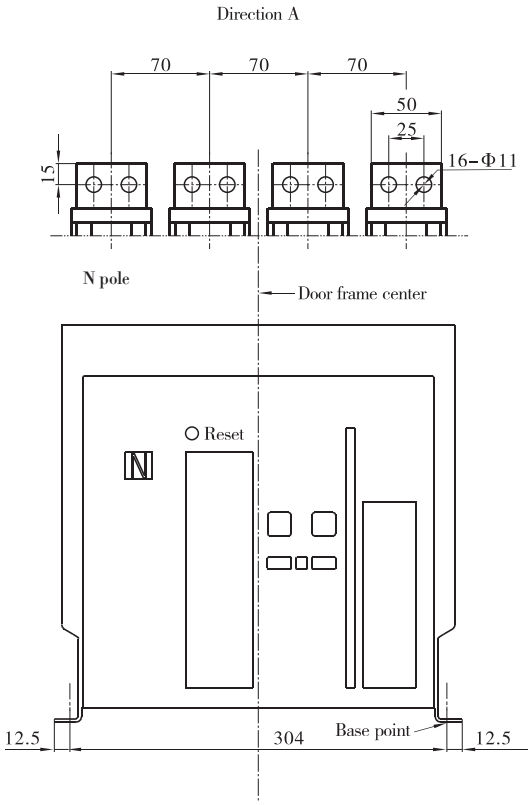
■ Dimensions and mounting, mm

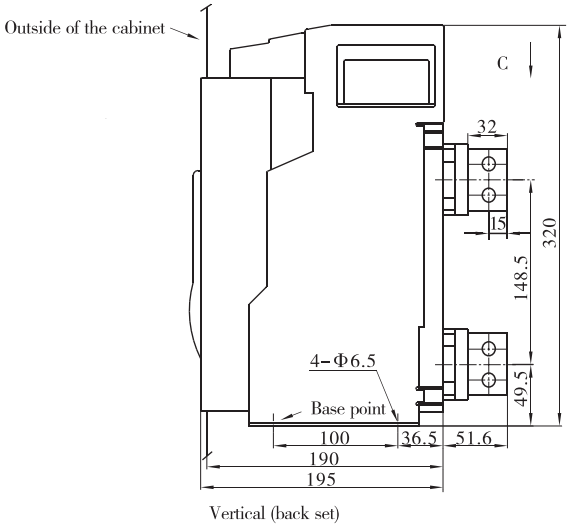
● BT3-1600 Intelligent Air Circuit Breaker with four poles (fixed type)

Current specifications	L (mm)
800A, 1000A, 1250A, 1600A	15
200A, 400A, 630A	10

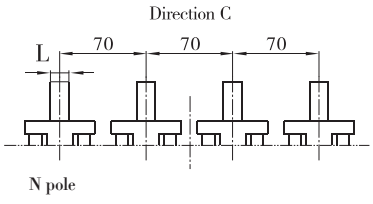


Horizontal(back set)





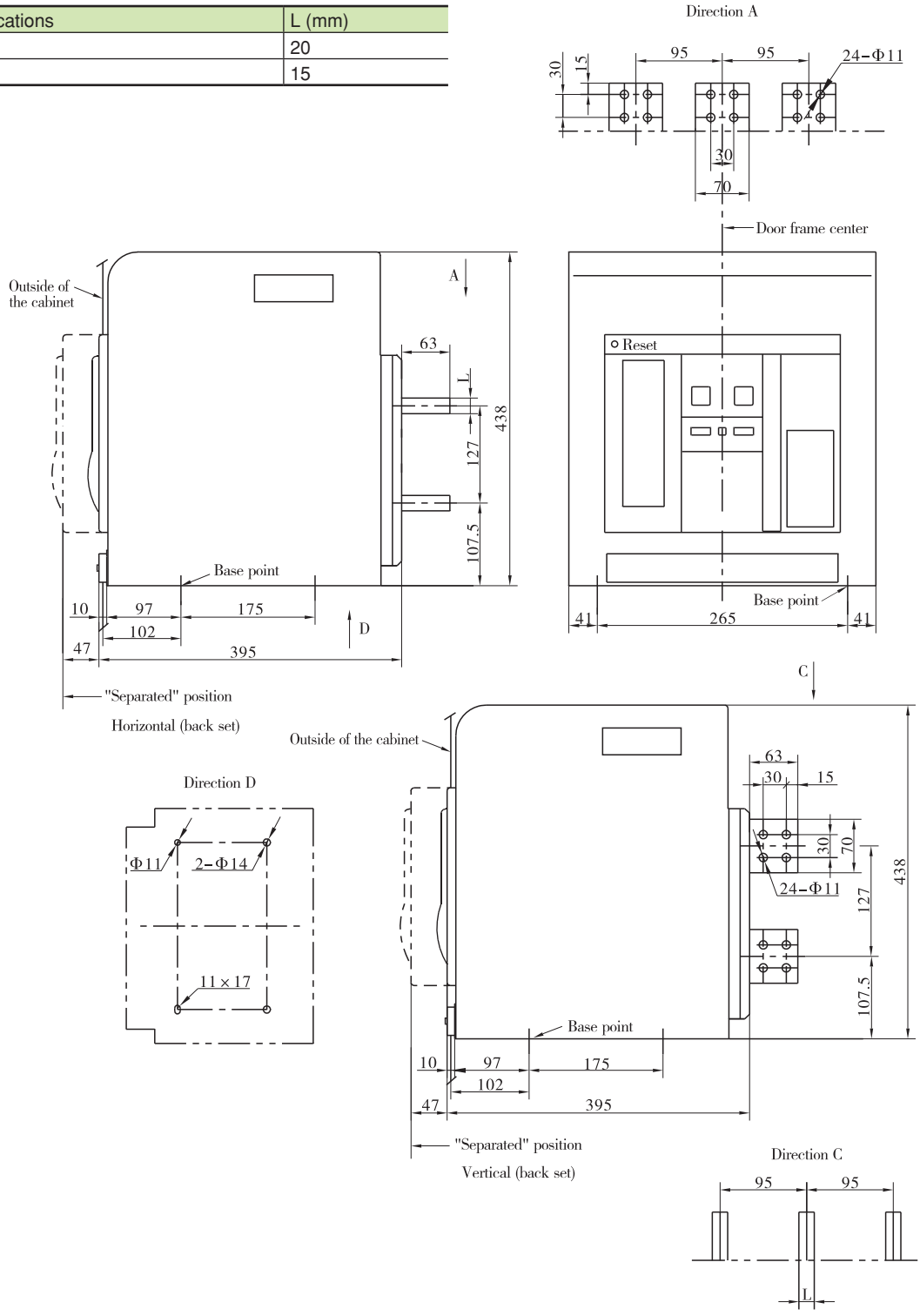
Vertical (back set)



■ Dimensions and mounting, mm

● BT3-2500 Intelligent Air Circuit Breaker with three poles (draw-out type)

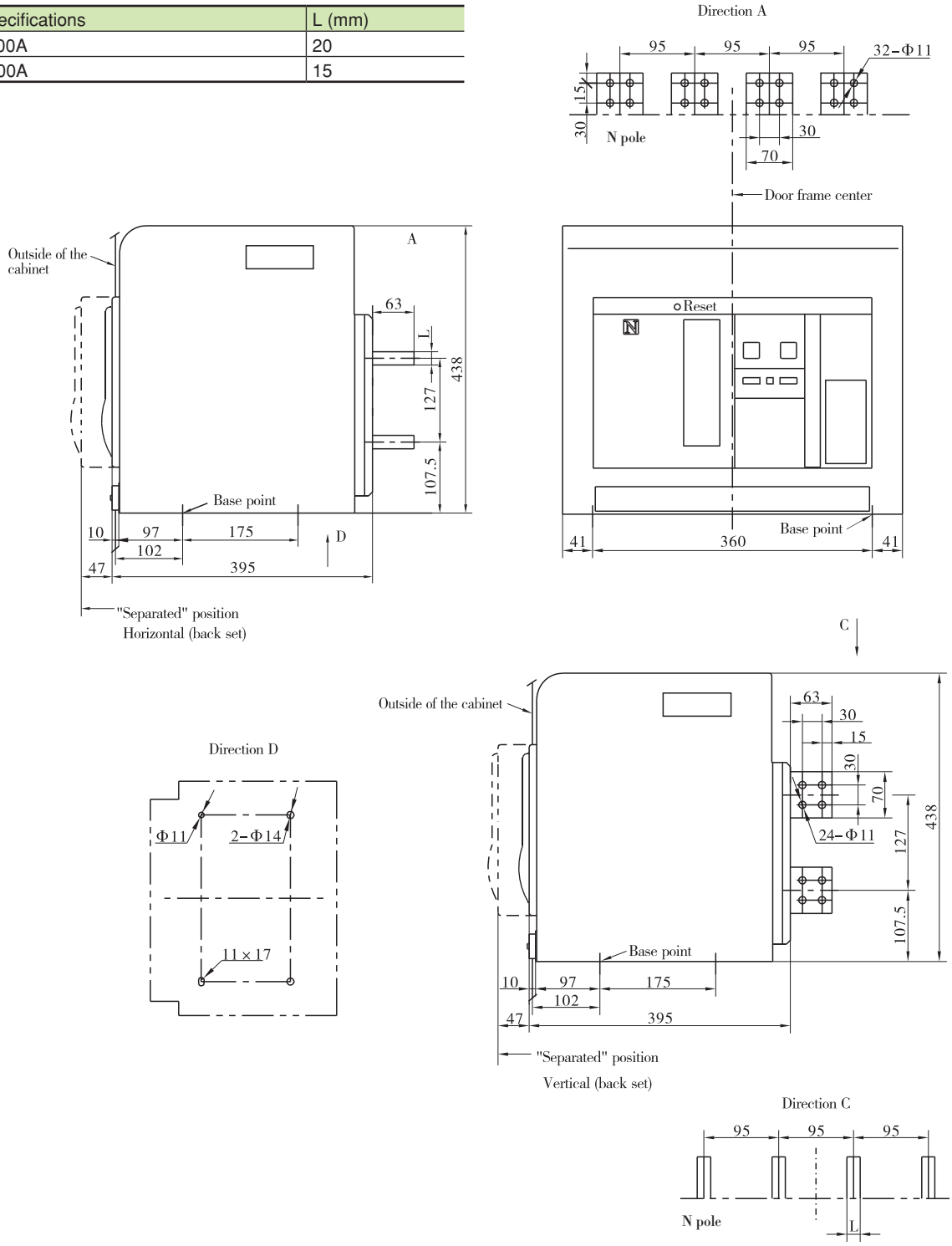
Current specifications	L (mm)
2000A, 2500A	20
630A ~ 1600A	15



■ Dimensions and mounting, mm

● BT3-2500 Intelligent Air Circuit Breaker with four poles (draw-out type)

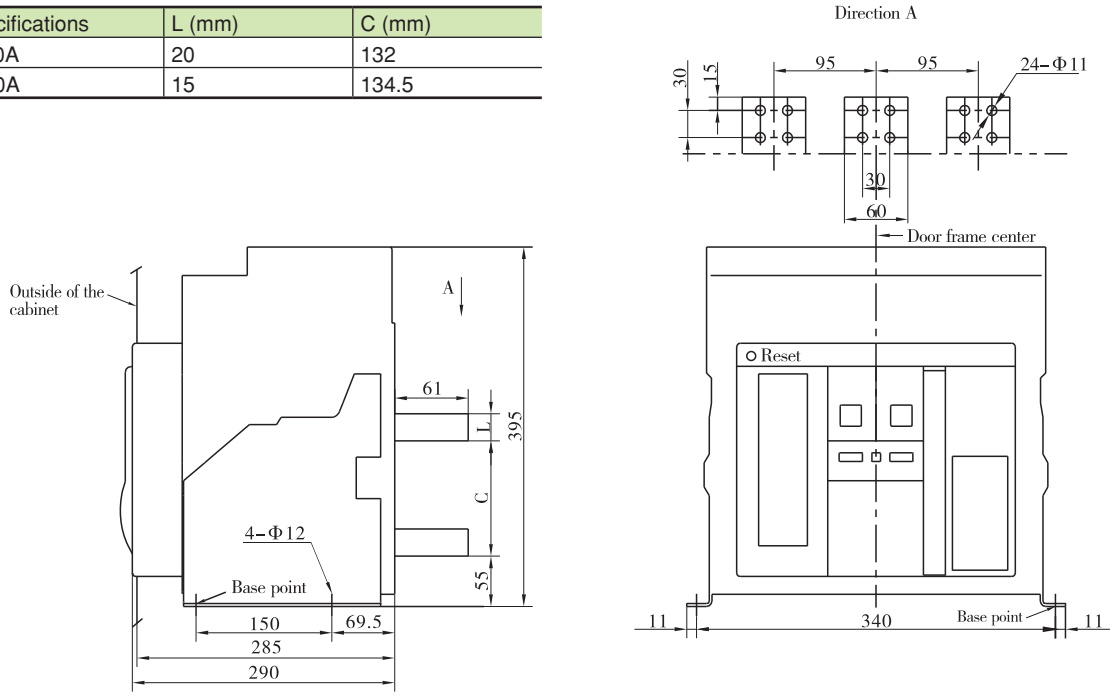
Current specifications	L (mm)
2000A, 2500A	20
630A ~ 1600A	15



■ Dimensions and mounting, mm

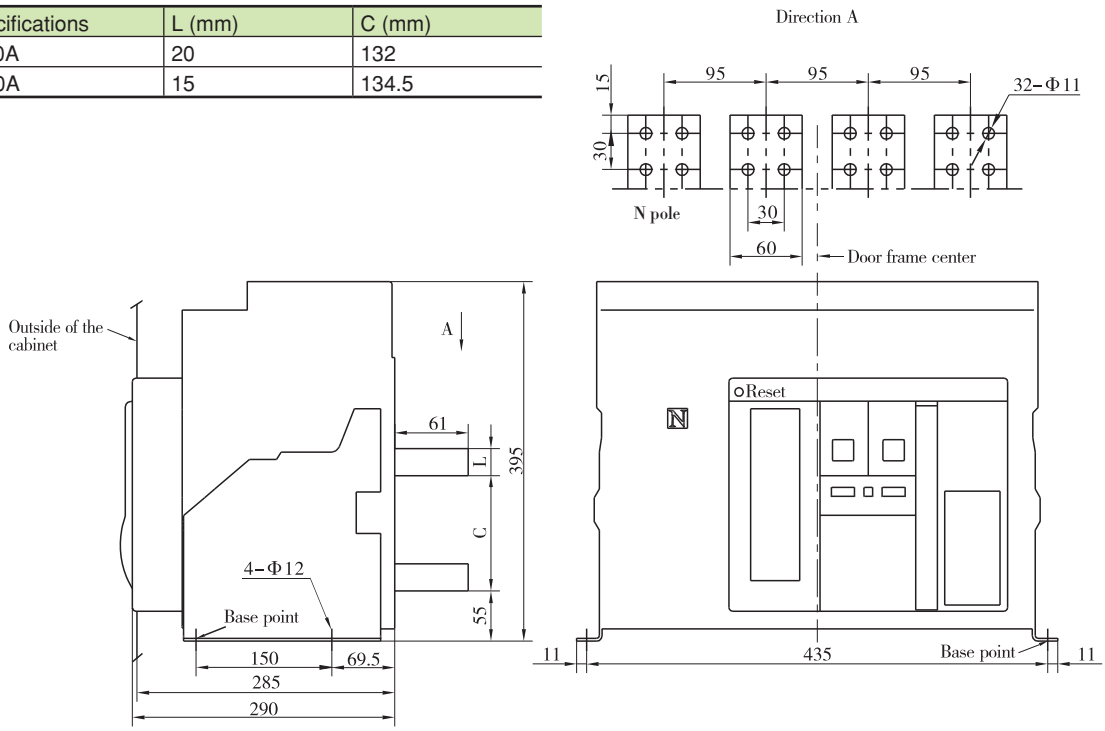
● BT3-2500 Intelligent Air Circuit Breaker with three poles (fixed type)

Current specifications	L (mm)	C (mm)
2000A, 2500A	20	132
630A ~ 1600A	15	134.5



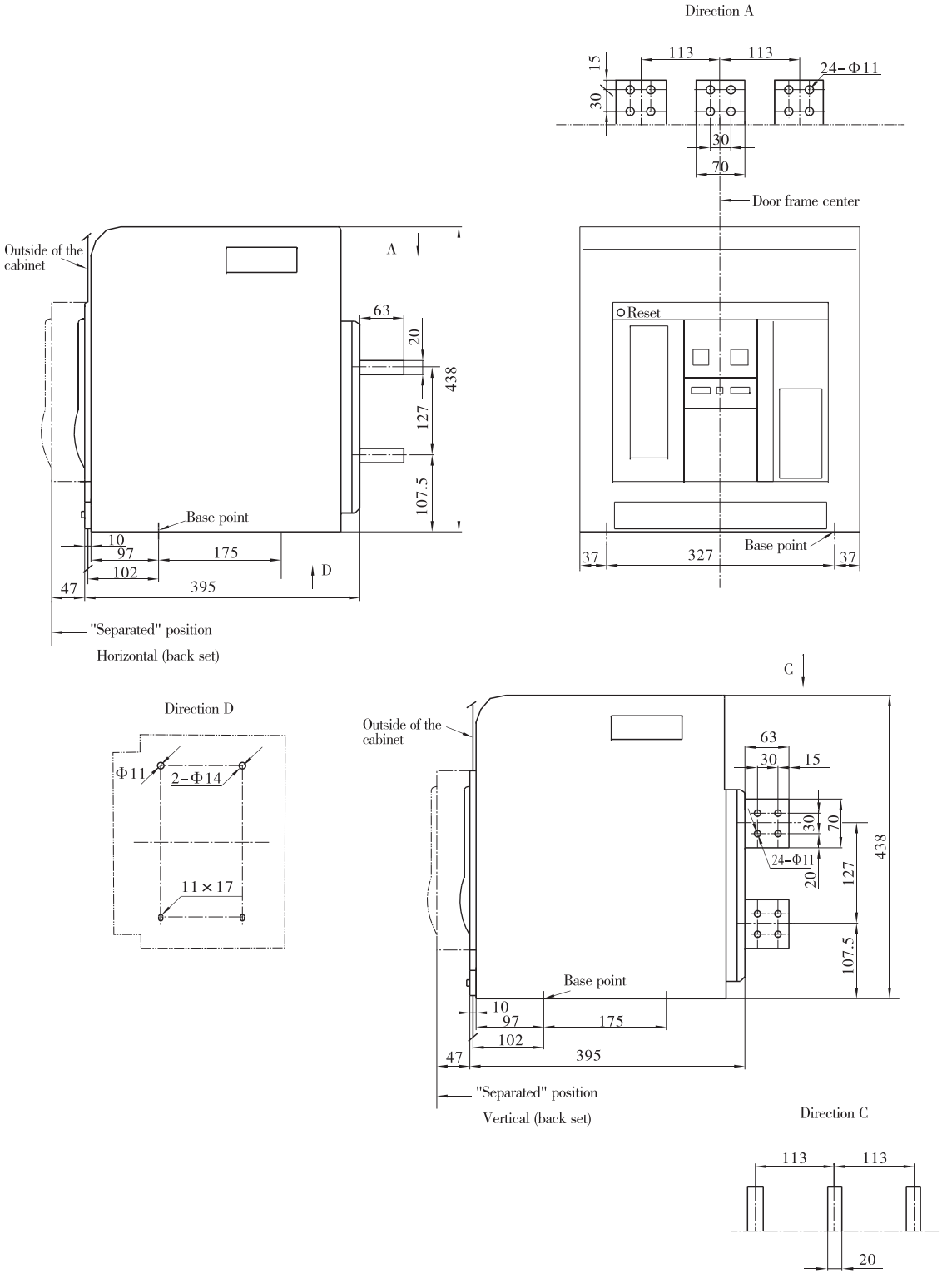
● BT3-2500 Intelligent Air Circuit Breaker with four poles (fixed type)

Current specifications	L (mm)	C (mm)
2000A, 2500A	20	132
630A ~ 1600A	15	134.5



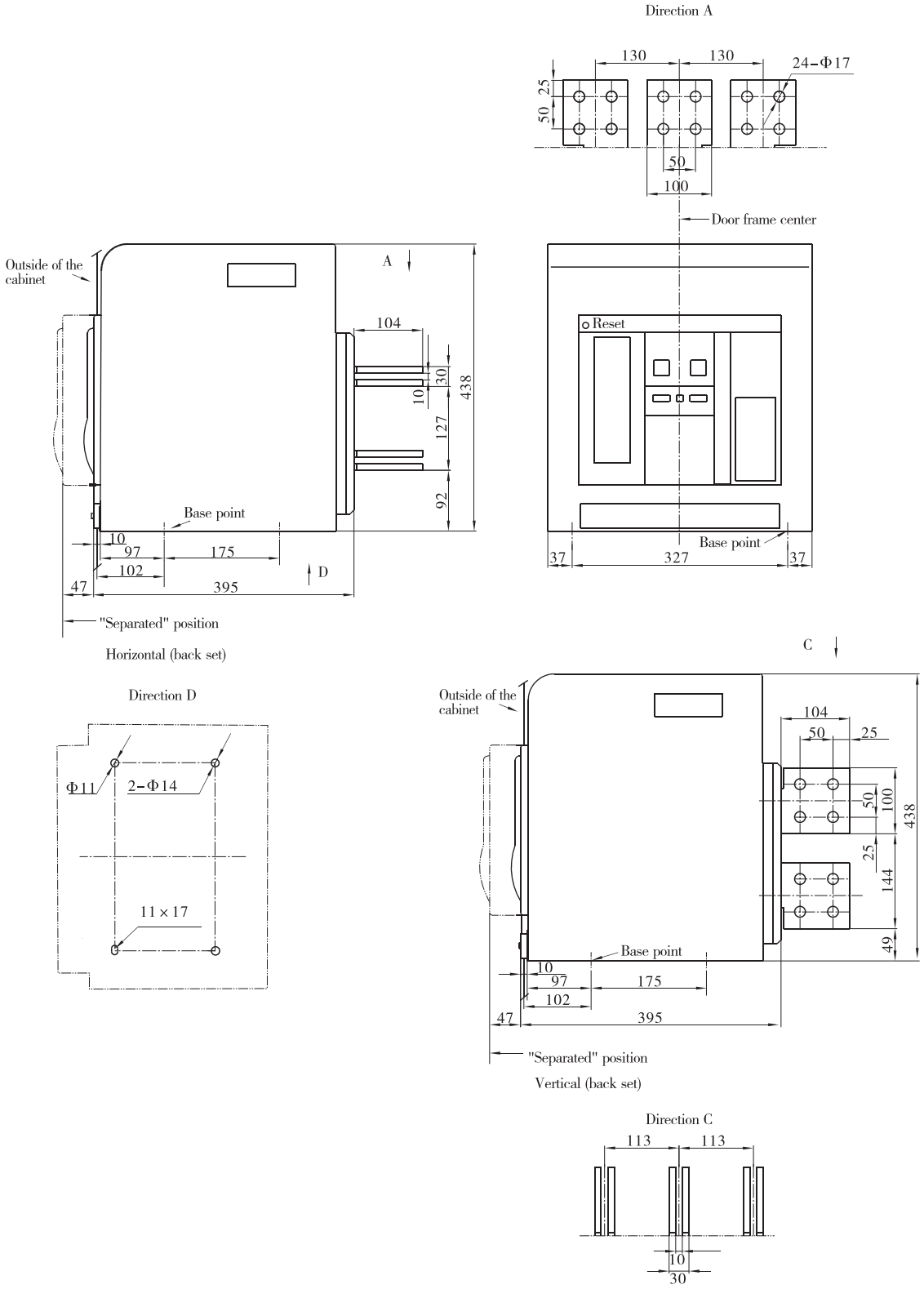
■ Dimensions and mounting, mm

● BT3-4000 Intelligent Air Circuit Breaker with three poles (draw-out type), 1000 ~ 2000A



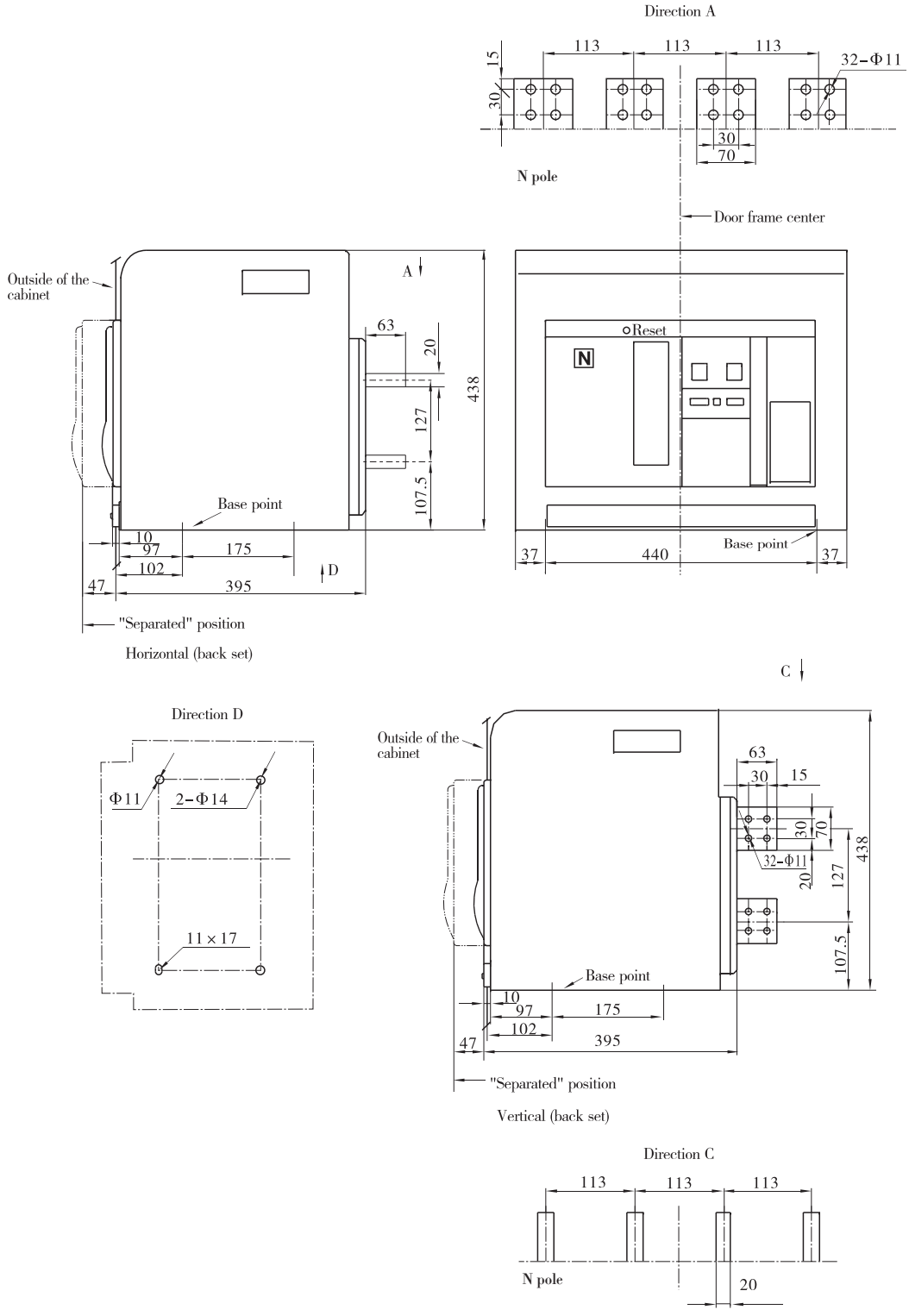
■ Dimensions and mounting, mm

● BT3-4000 Intelligent Air Circuit Breaker with three poles (draw-out type), 2500 ~ 4000A



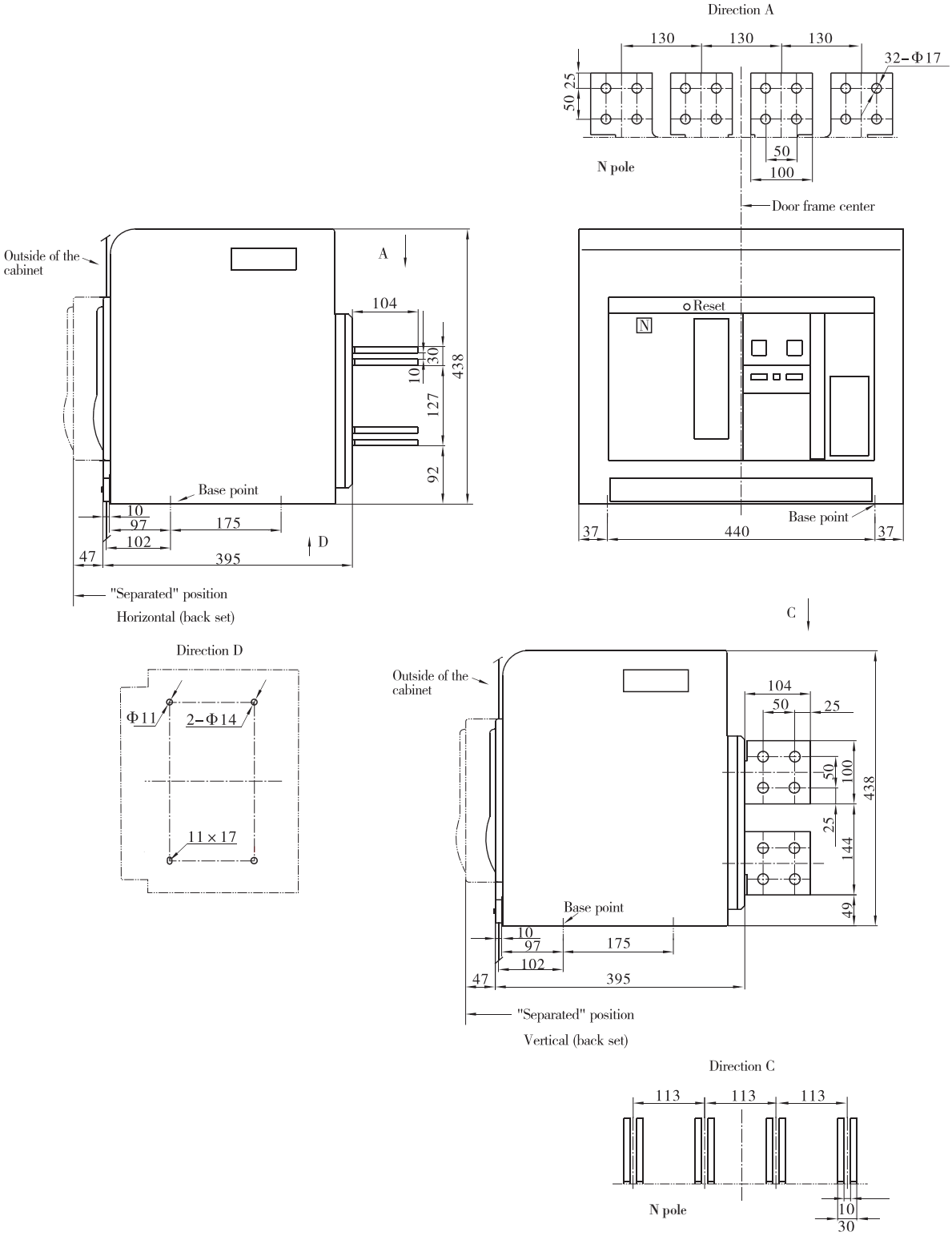
■ Dimensions and mounting, mm

● BT3-4000 Intelligent Air Circuit Breaker with three poles (draw-out type), 1000 ~ 2000A



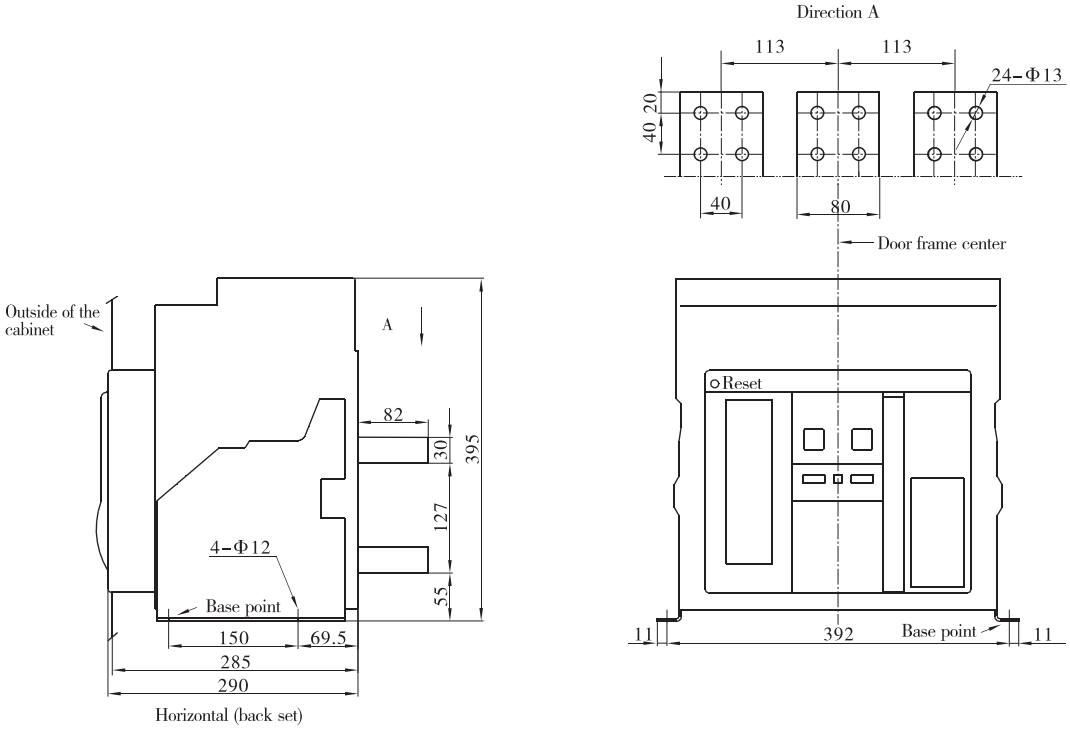
■ Dimensions and mounting, mm

● BT3-4000 Intelligent Air Circuit Breaker with four poles (draw-out type), 2500 ~ 4000A

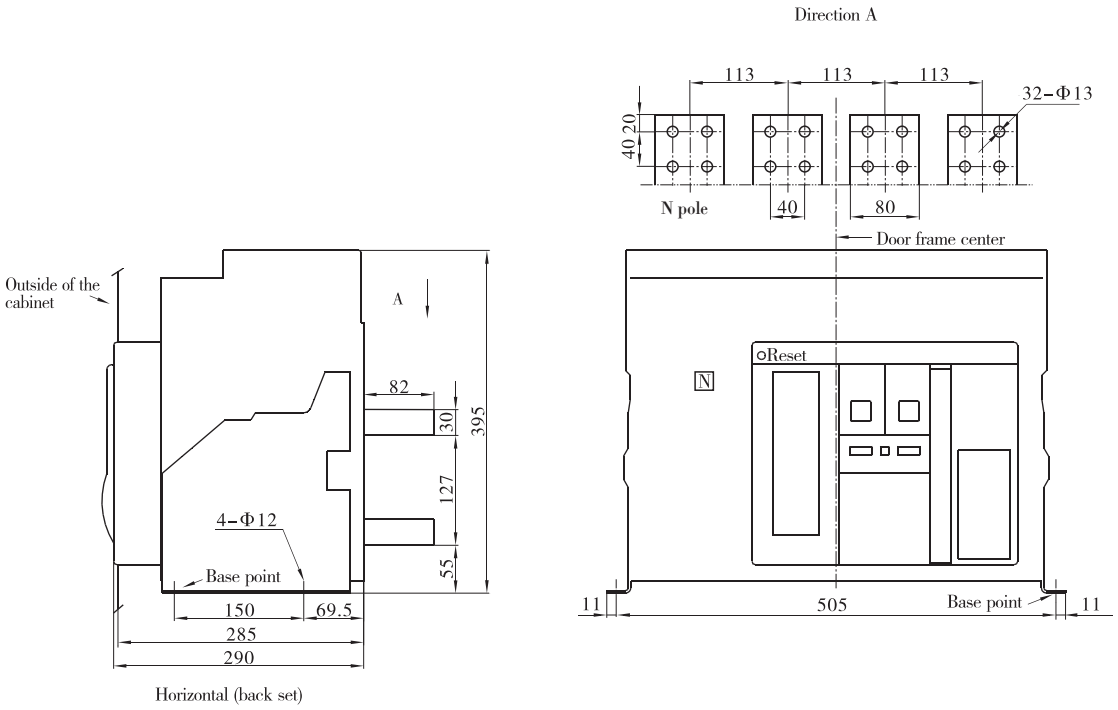


■ **Dimensions and mounting, mm**

● **BT3-4000 Intelligent Air Circuit Breaker with three poles (fixed type)**

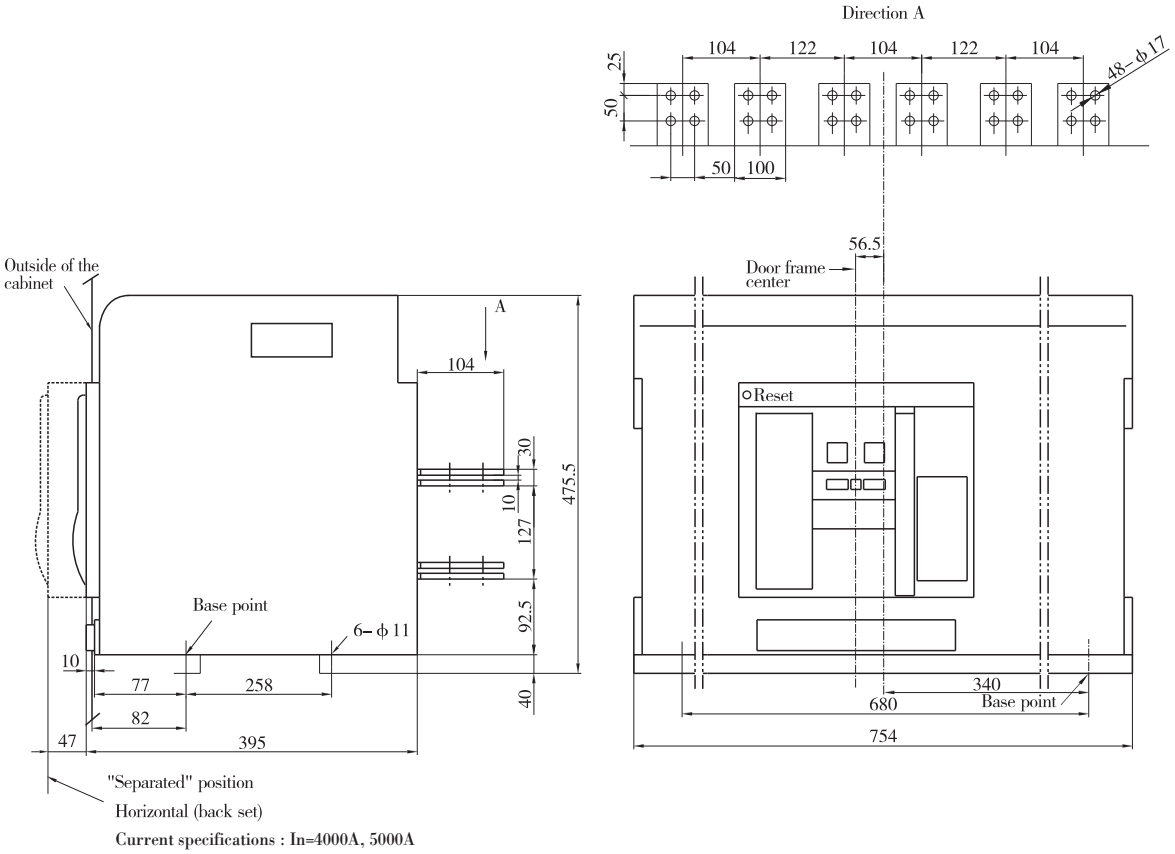


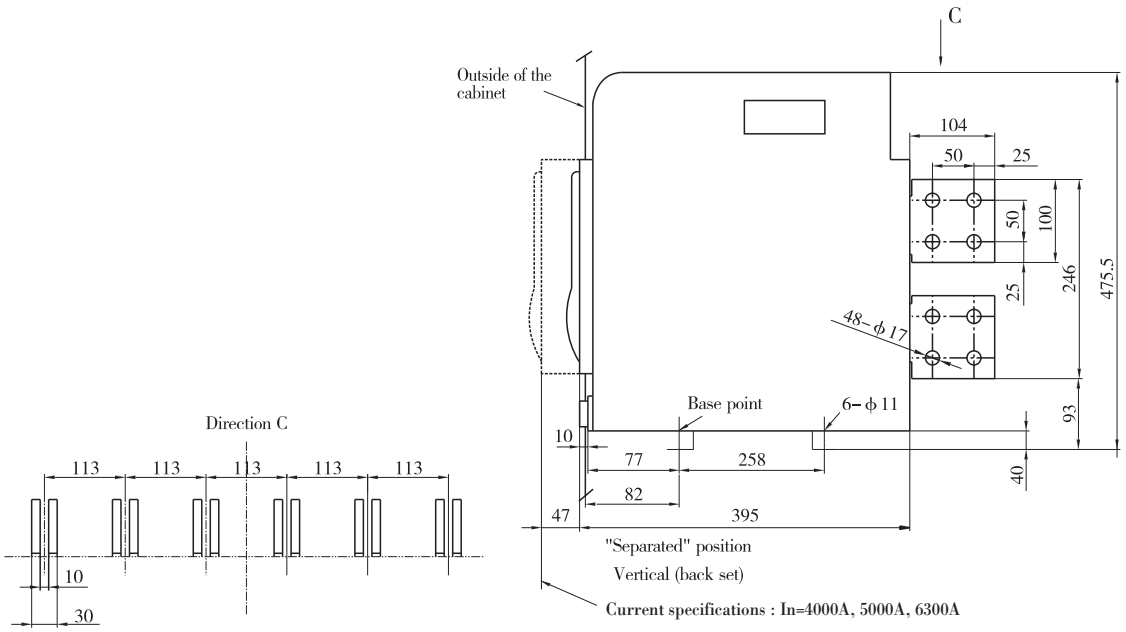
● **BT3-4000 Intelligent Air Circuit Breaker with four poles (fixed type)**



■ Dimensions and mounting, mm

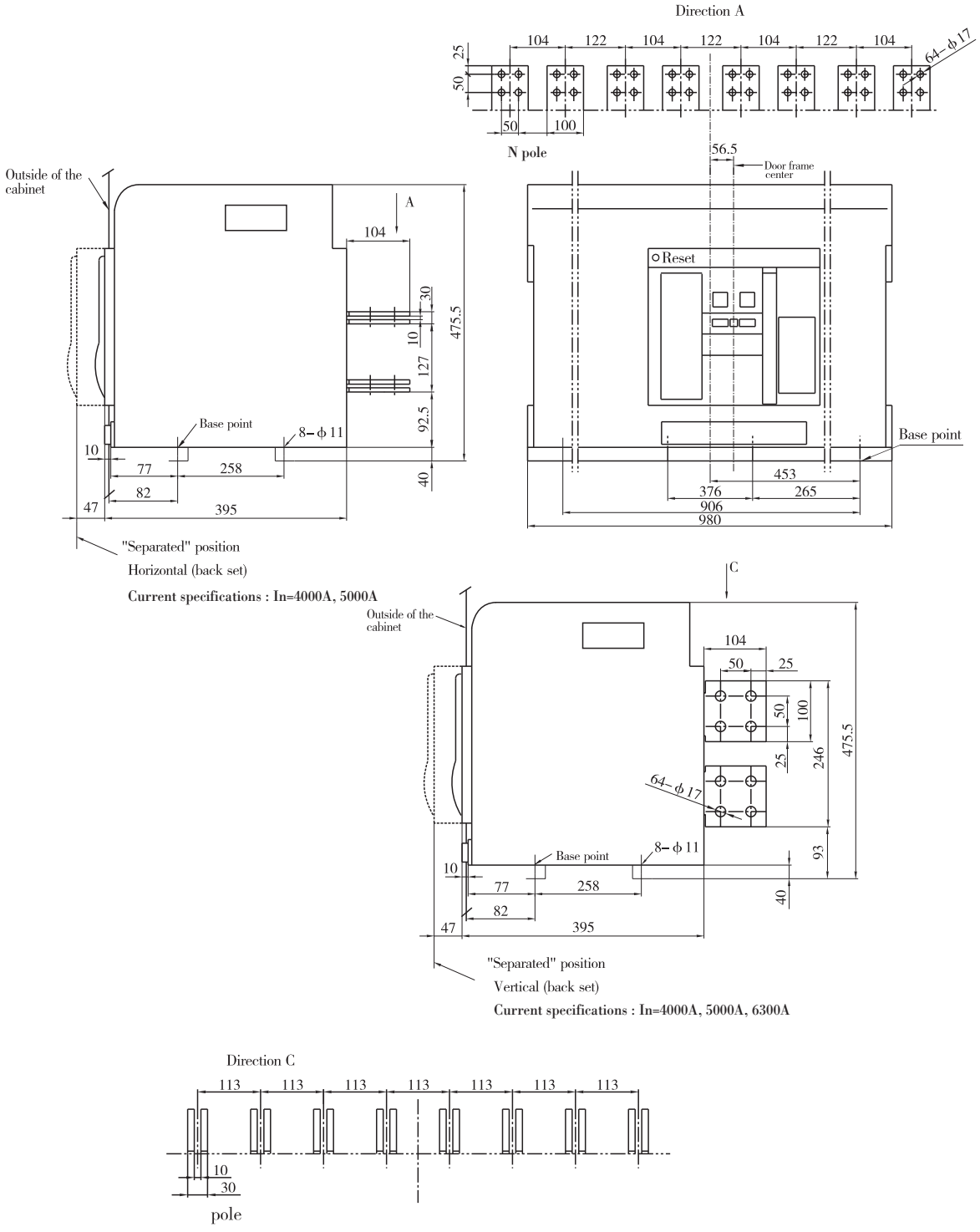
● BT3-6300 Intelligent Air Circuit Breaker with three poles (draw-out type)





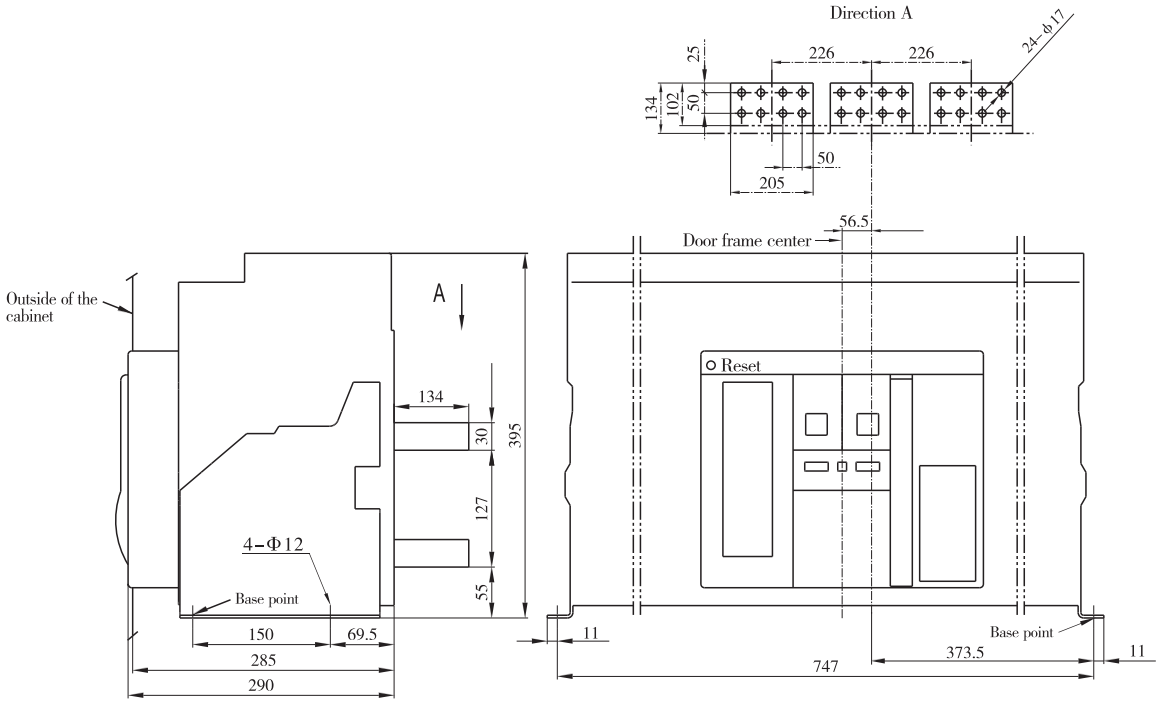
■ Dimensions and mounting, mm

● BT3-6300 Intelligent Air Circuit Breaker with four poles (draw-out type)

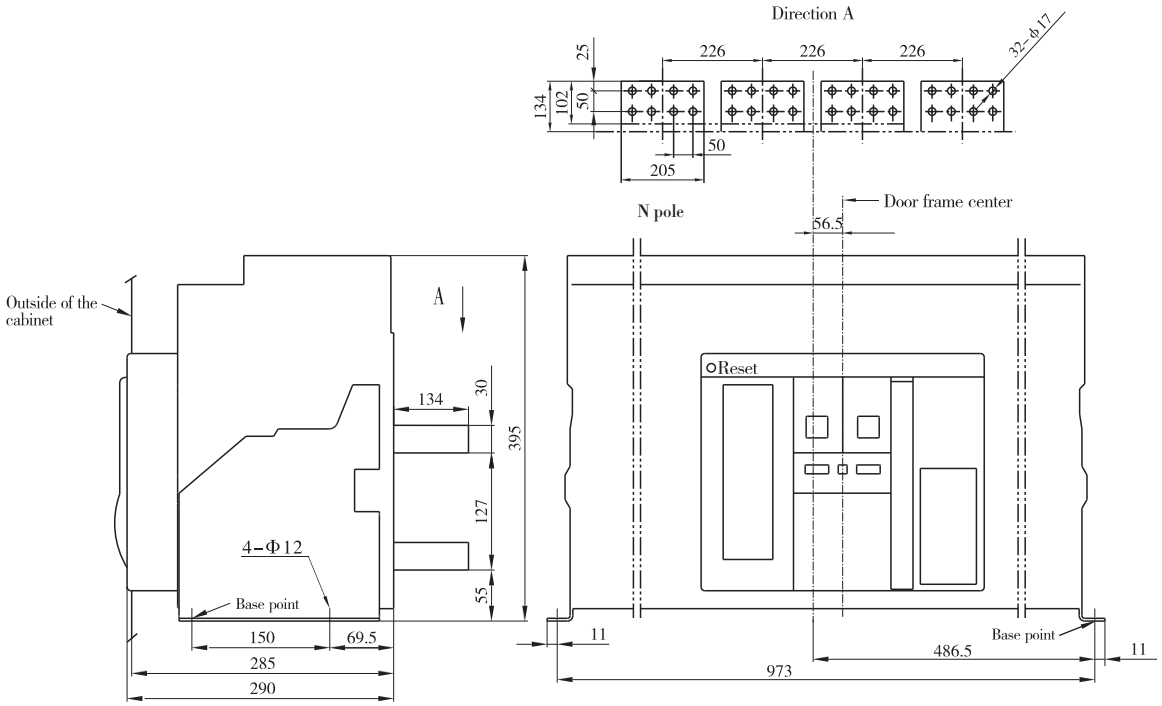


■ Dimensions and mounting, mm

● BT3-6300 Intelligent Air Circuit Breaker with three poles (fixed type)



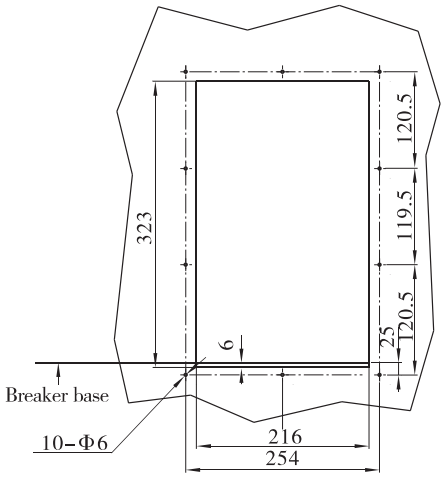
● BT3-6300 Intelligent Air Circuit Breaker with four poles (fixed type)



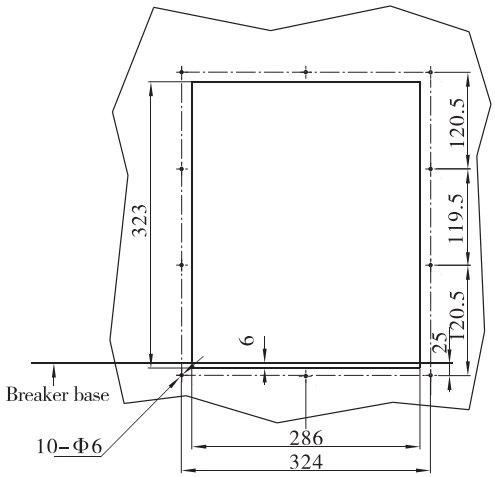
■ **Door frame dimensions, mm**

● **Cutout Dimensions of BT3-1600 doorframe**

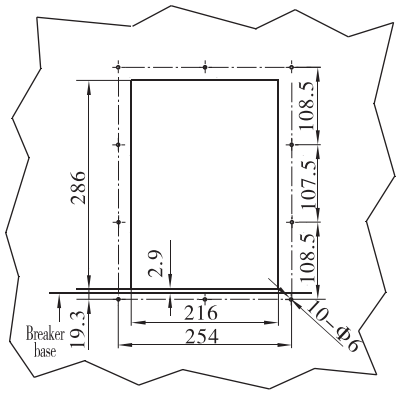
BT3-1600 Intelligent Air Circuit Breaker with three poles (draw-out type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 227mm



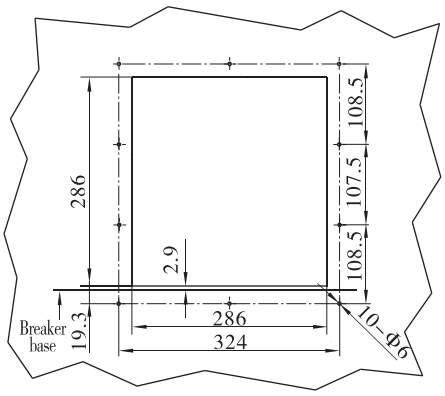
BT3-1600 Intelligent Air Circuit Breaker with four poles (draw-out type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 262mm



BT3-1600 Intelligent Air Circuit Breaker with three poles (fixed type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 227mm



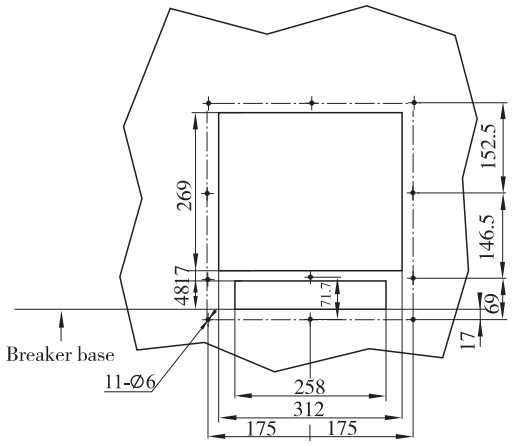
BT3-1600 Intelligent Air Circuit Breaker with four poles (fixed type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 262mm



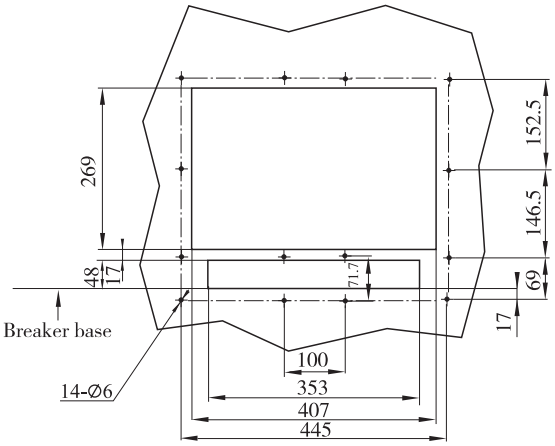
■ **Door frame dimensions, mm**

● **Cutout Dimensions of BT3-2500 doorframe**

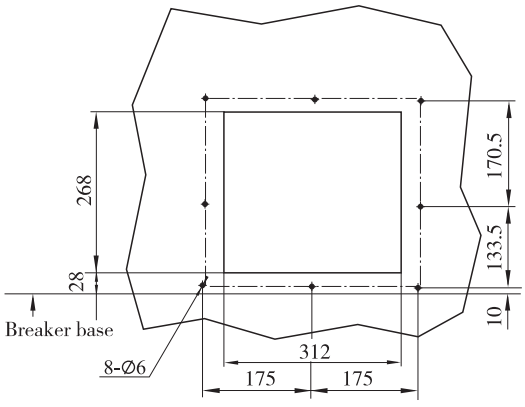
BT3-2500 Intelligent Air Circuit Breaker with three poles (draw-out type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 256mm



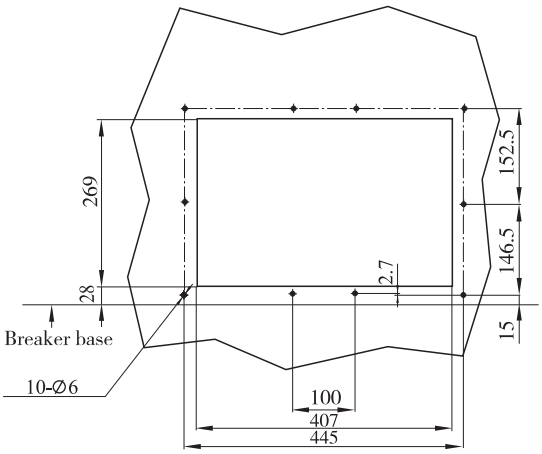
BT3-2500 Intelligent Air Circuit Breaker with four poles (draw-out type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 303.5mm



BT3-2500 Intelligent Air Circuit Breaker with three poles (fixed type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 256mm



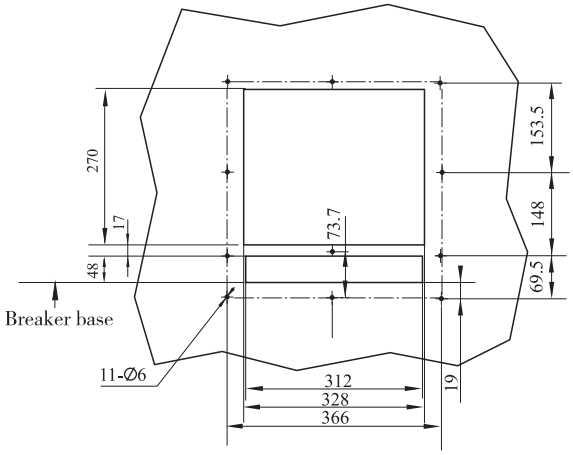
BT3-2500 Intelligent Air Circuit Breaker with four poles (fixed type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 303.5mm



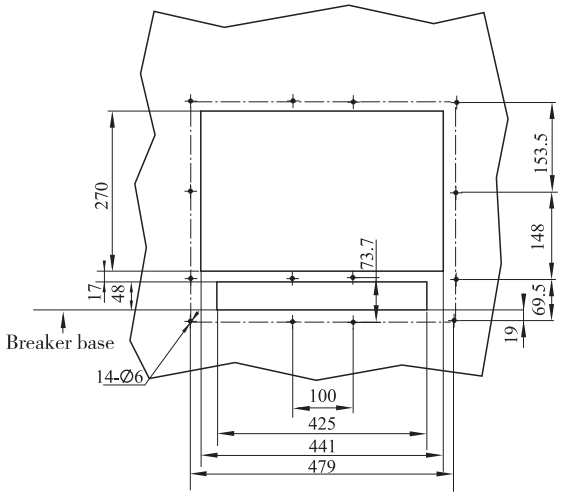
■ **Door frame dimensions, mm**

● **Cutout Dimensions of BT3-4000 doorframe**

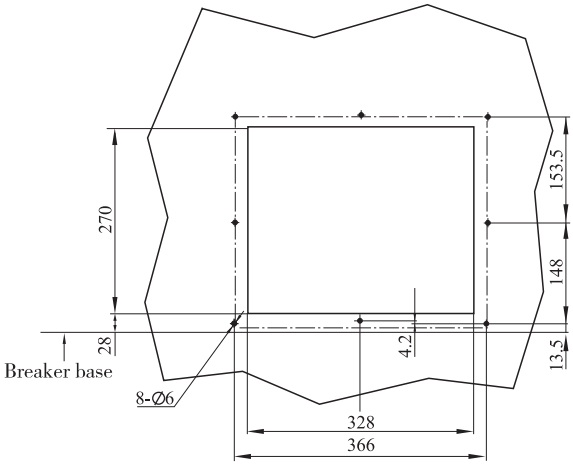
BT3-4000 Intelligent Air Circuit Breaker with three poles (draw-out type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 264mm



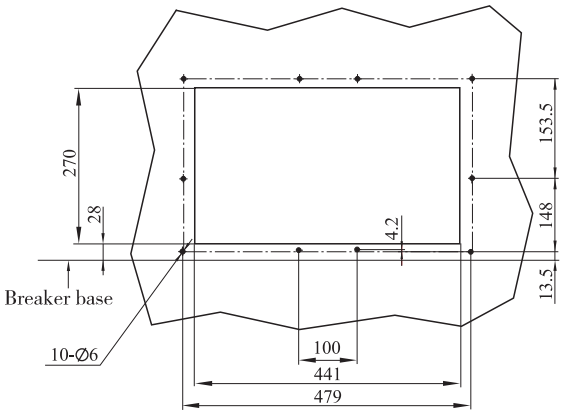
BT3-4000 Intelligent Air Circuit Breaker with four poles (draw-out type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 320.5mm



BT3-4000 Intelligent Air Circuit Breaker with three poles (fixed type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 264mm



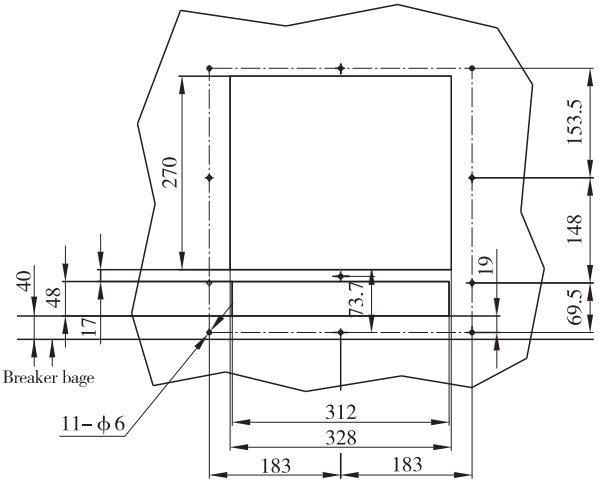
BT3-4000 Intelligent Air Circuit Breaker with four poles (fixed type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 320.5mm



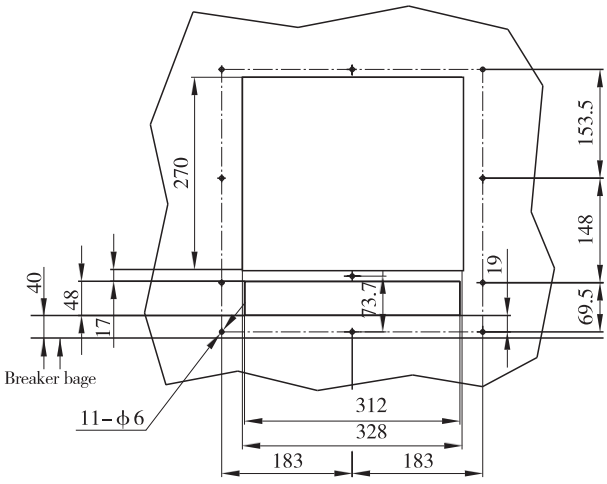
■ **Door frame dimensions, mm**

● **Cutout Dimensions of BT3-6300 doorframe**

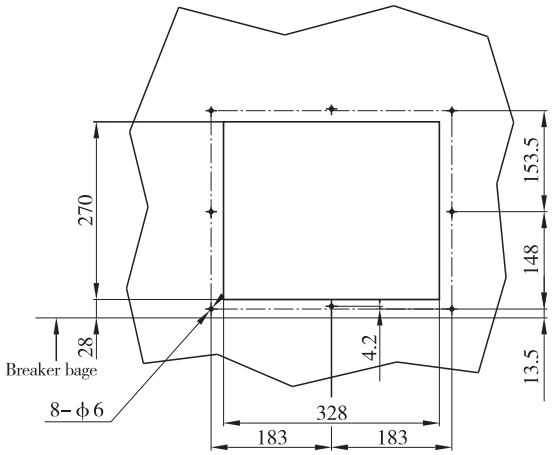
BT3-6300 Intelligent Air Circuit Breaker with three poles (draw-out type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 553.5mm



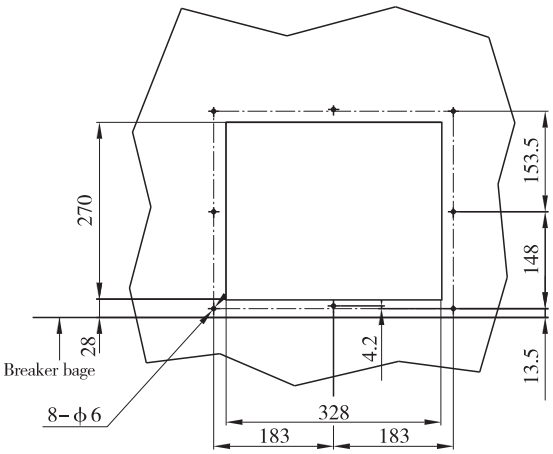
BT3-6300 Intelligent Air Circuit Breaker with four poles (draw-out type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 553.5mm



BT3-6300 Intelligent Air Circuit Breaker with three poles (fixed type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 553.5mm

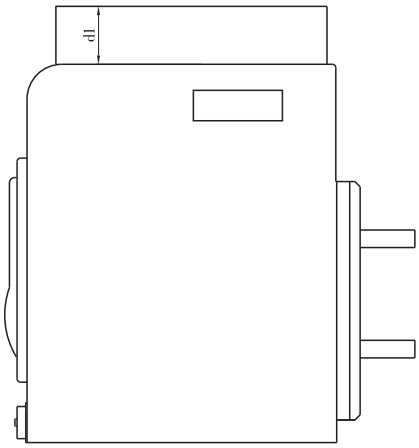


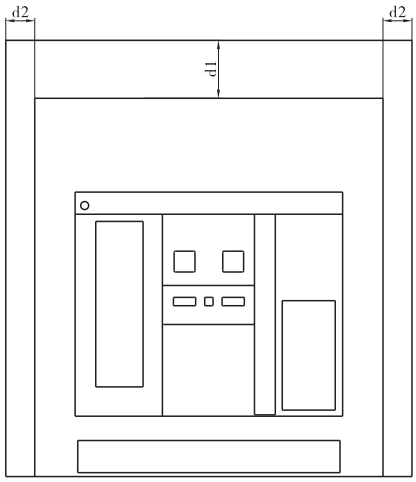
BT3-6300 Intelligent Air Circuit Breaker with four poles (fixed type)
The drawing of cutout dimensions for mounting cover of doorframe. Distance from the panel center of the circuit breaker to the right hinge of cabinet door should be at least 553.5mm



■ Mounting safety clearance

● Draw-out breaker



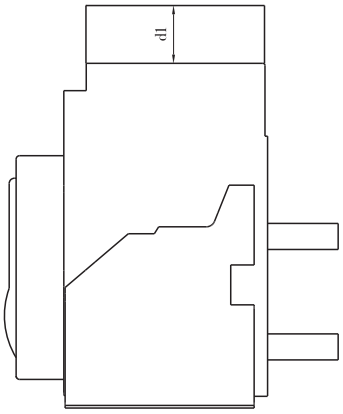


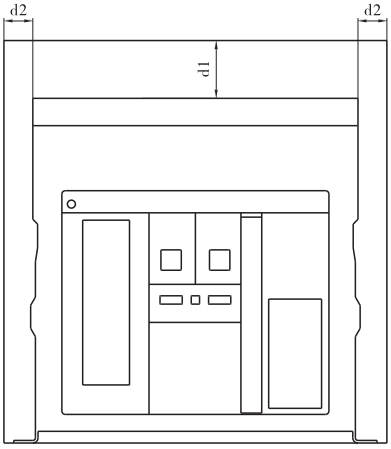
Minimum distance between breakers with switchboard wall or live part.

	Switchboard wall	Live part
d1 (Note) (mm)	0	60
d2 (mm)	0	60

Note:secondary circuit wiring must be considered for safety clearance.

● Fixed breaker





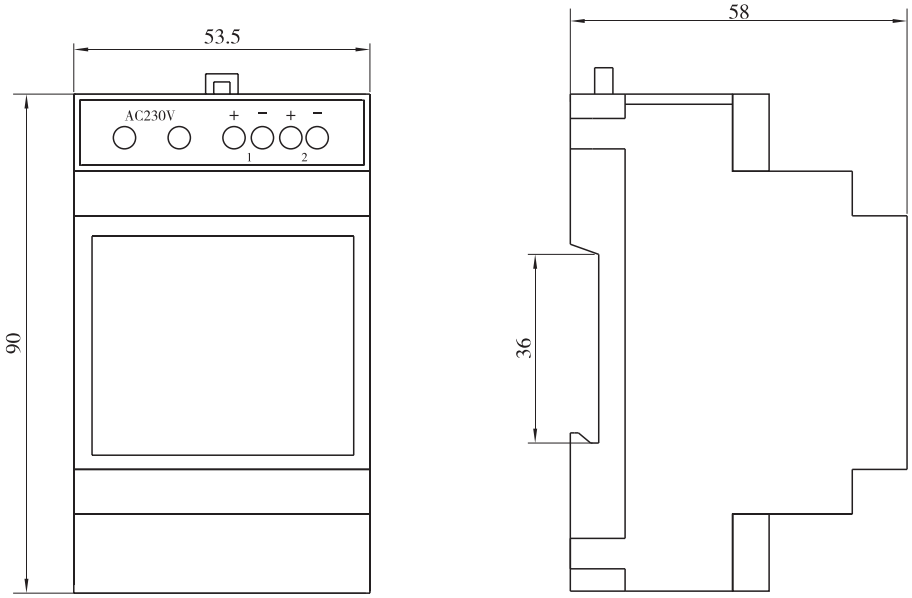
Minimun distance between breakers with switchboard wall or live part.

	Switchboard wall	Live part
d1 (Note) (mm)	0	60
d2 (mm)	0	60

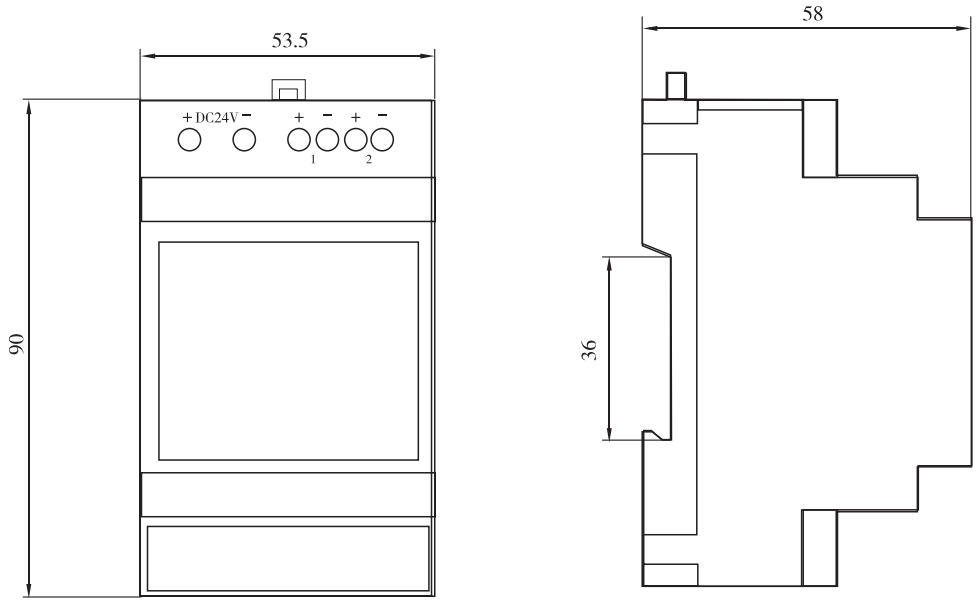
Note:secondary circuit wiring must be considered for safety clearance.

■ Dimensions and mounting of Automatic transfer switch (ATS), mm

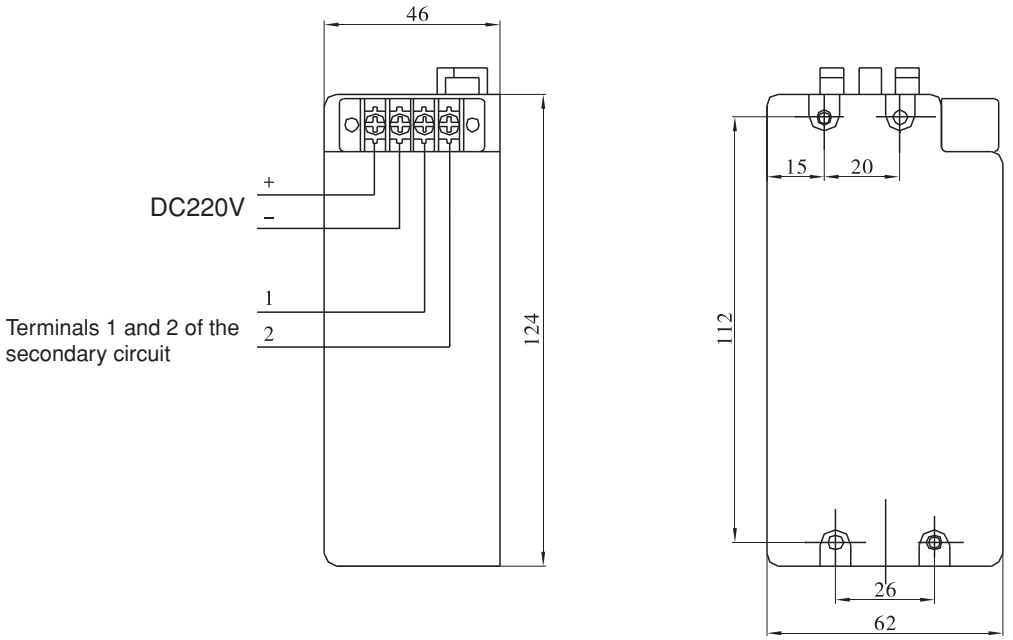
● Special power module



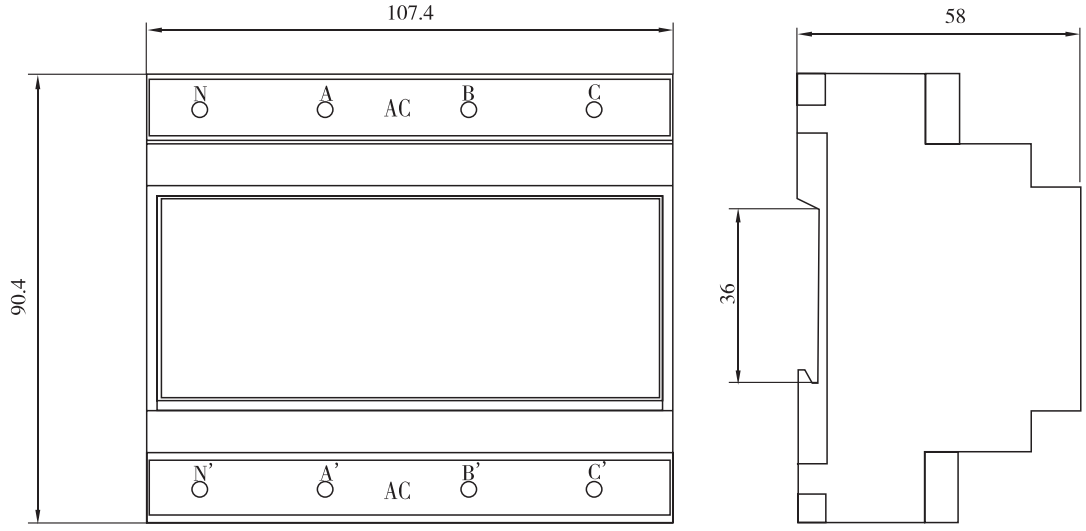
● DC24V power module



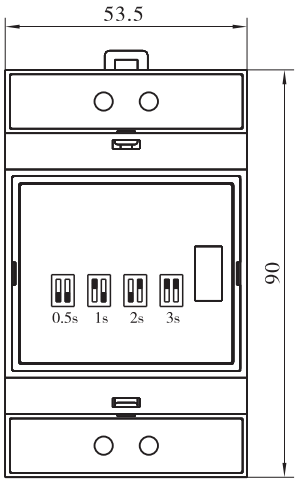
● **DC power module**

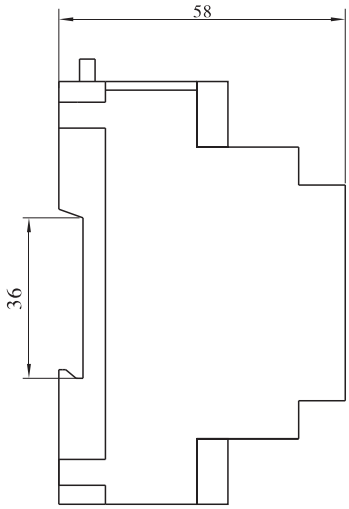


● **Voltage changover module**

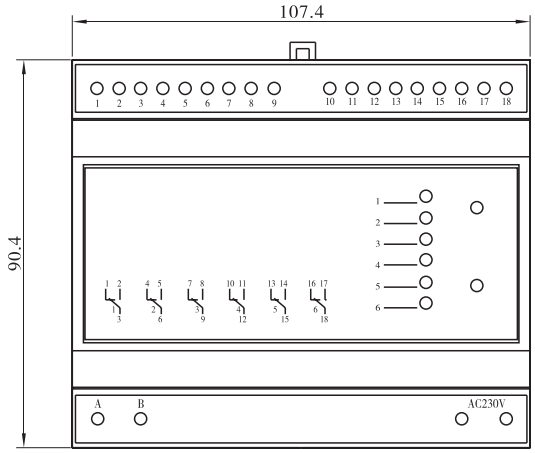


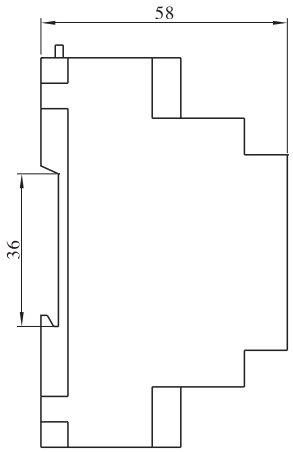
● **Delay module of under - voltage release of BT3-1600**



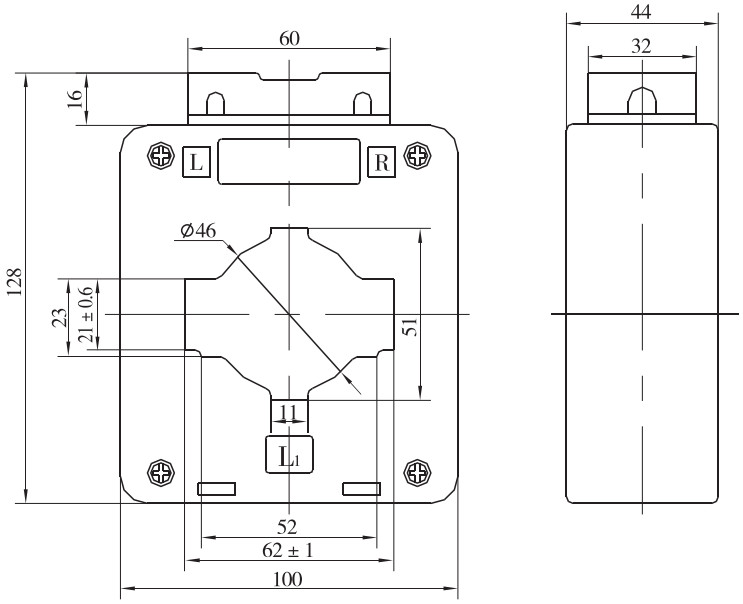


● **Programmable output expansion module**

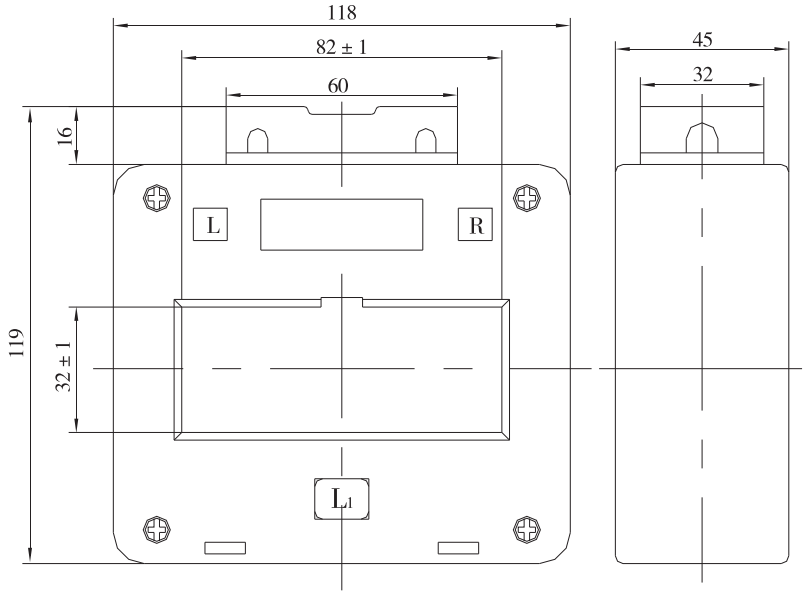




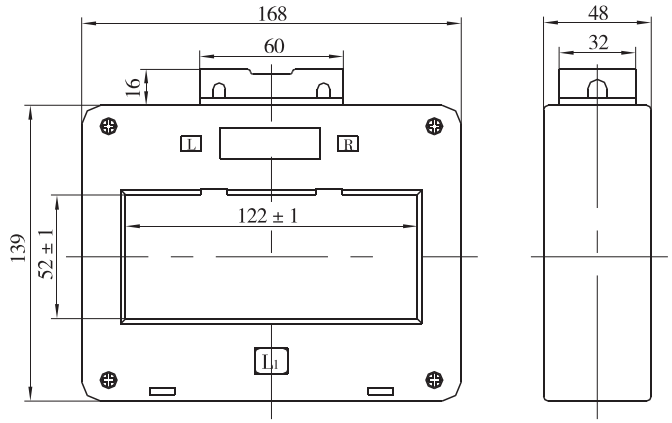
● **Neutral transformer external connected**



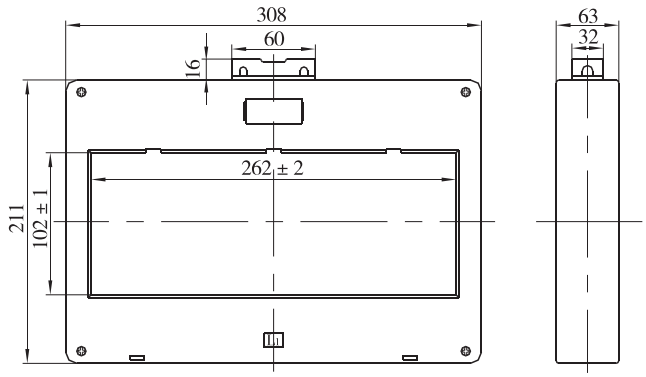
BT3-1600 for three poles



BT3-2500 for three poles

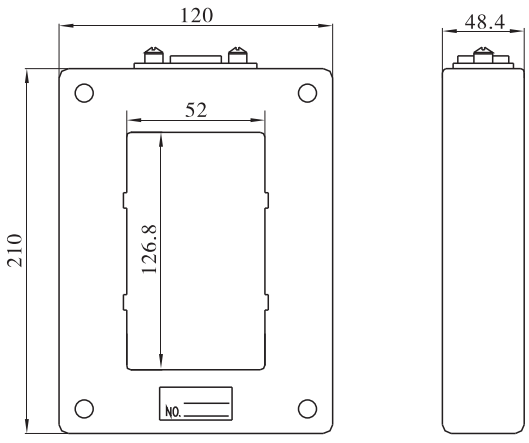


BT3-4000 for three poles

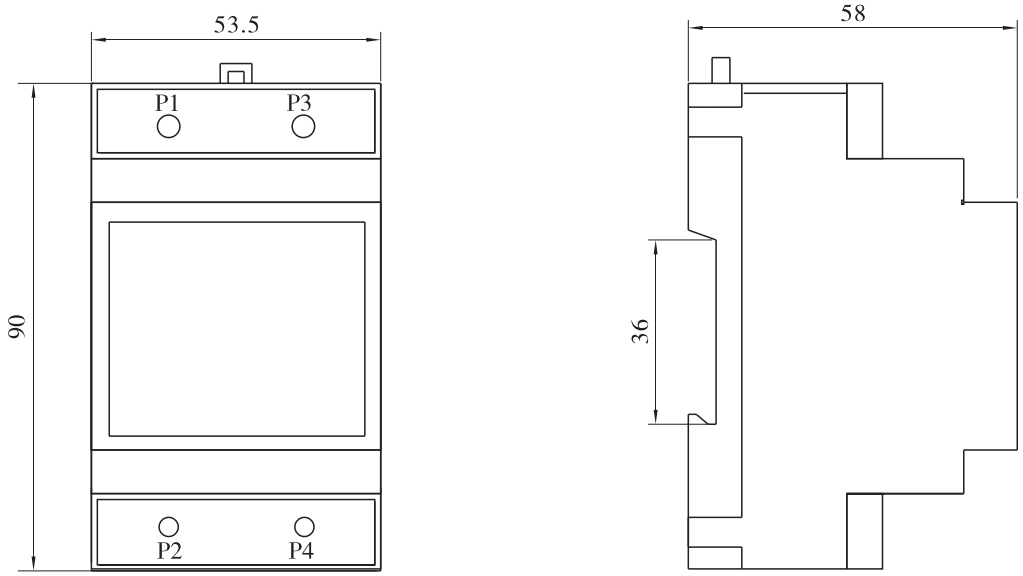


BT3/6300 for three poles

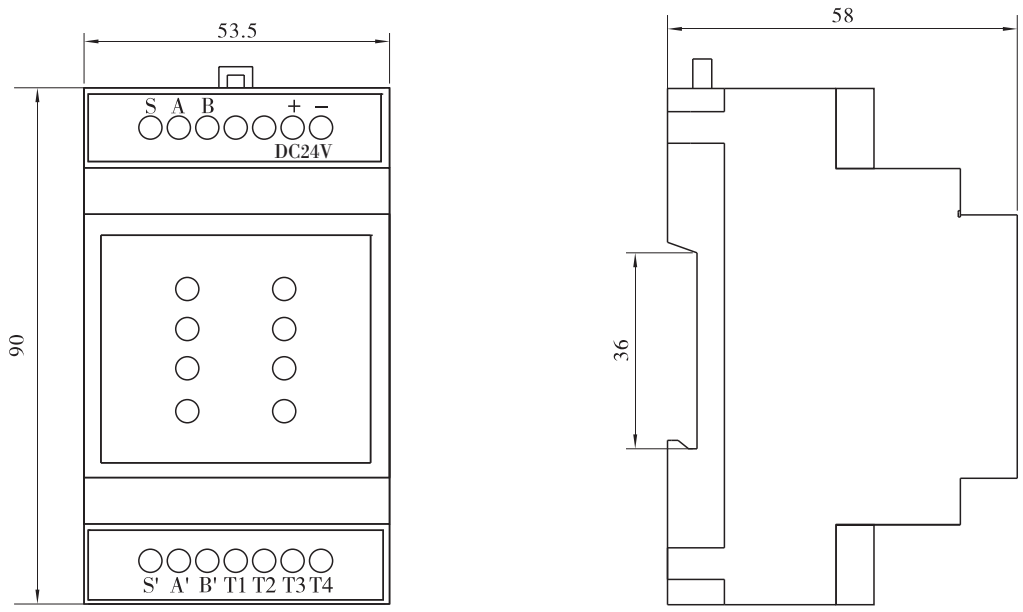
● **Earth transformer with transformer's center**



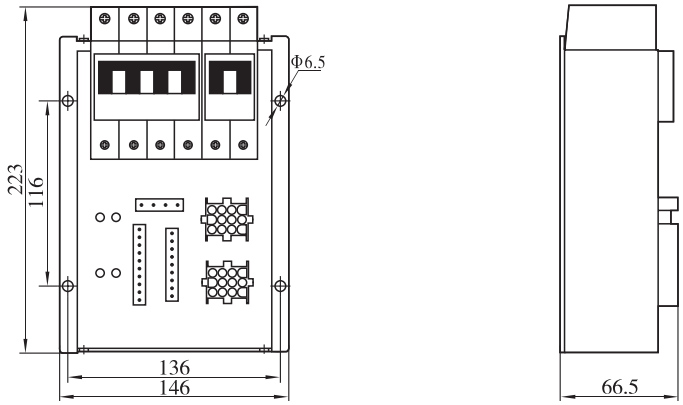
● **Earth module of transformer's center**



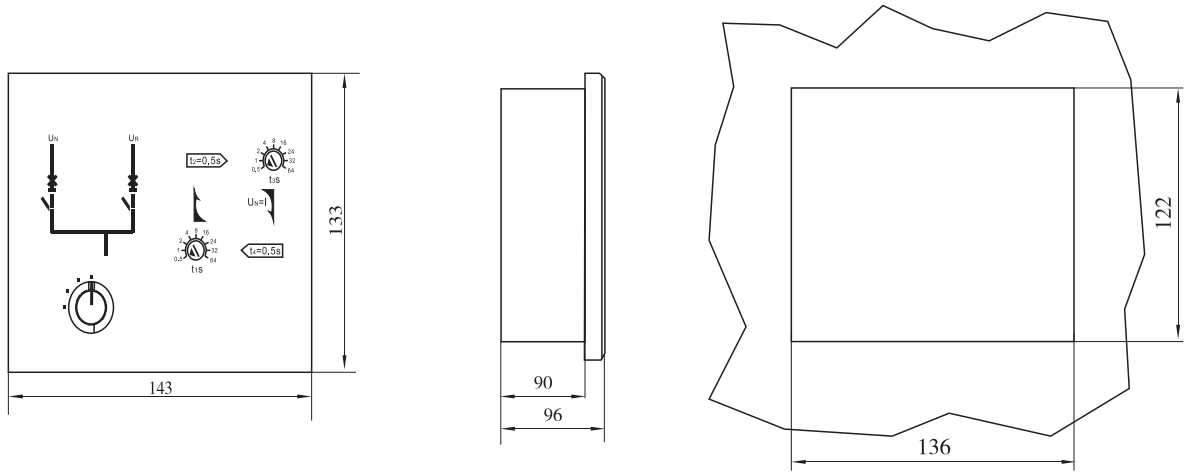
● **Draw-out socket communiction module**



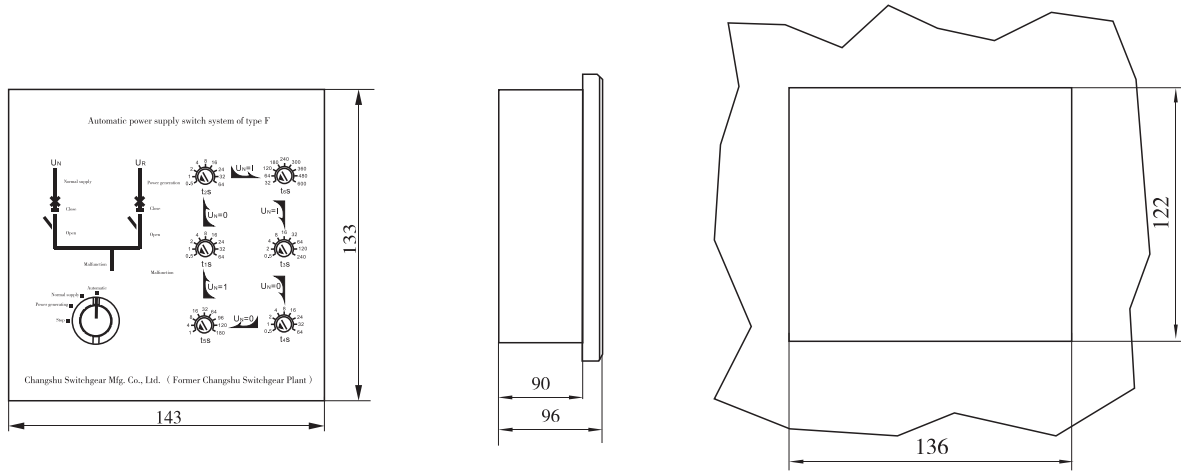
● **The switching unit**



● **Automatic power supply switch system of type R and S**

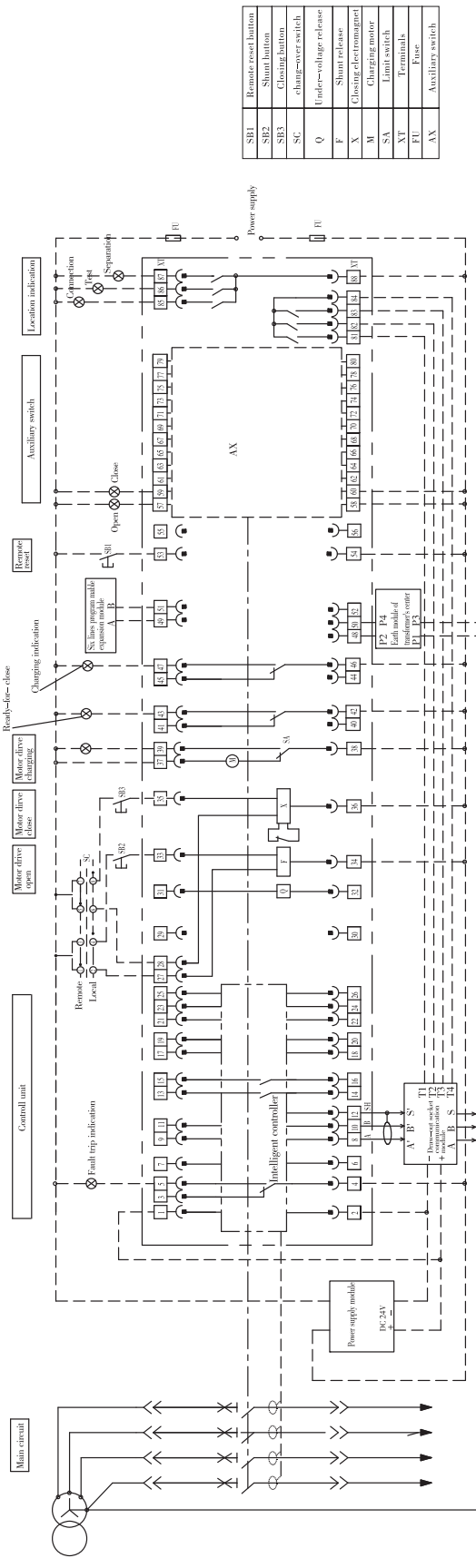


● **Automatic power supply switch system of type F**



EN35/36, EA35/36, EP35/36, EQ35/36, EG35/36

■ Wiring diagram of the breaker secondary circuit (BT3-1600)



SB1	Remote reset button
SB2	Shunt button
SB3	Closing button
SC	chang-over switch
Q	Under-voltage release
F	Shunt release
X	Closing electromagnet
M	Charging motor
SA	Limit switch
XT	Terminals
FU	Fuse
AX	Auxiliary switch

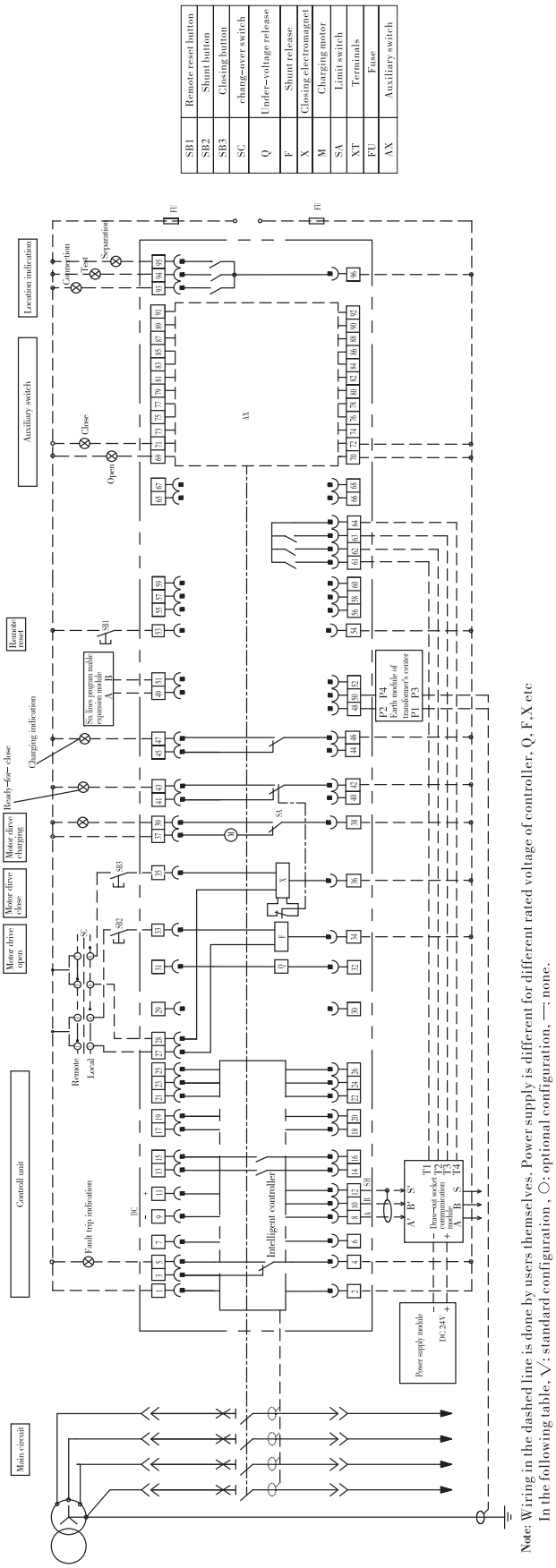
Note: Wiring in the dashed line is done by users themselves. Power supply is different for different rated voltage of controller, Q, F, X etc
In the following table, √: standard configuration , ○: optional configuration, —: none.

Terminal	Function	Controller type				
		EN35/36	EA35/36	EP35/36	EQ35/36	EG35/36
1, 2	Auxiliary power supply (DC24V)	√	√	√	√	√
3, 4, 5	Power supply (AC220V 1A)	√	√	√	√	√
6, 7	The power of circuit breaker with current transformer with neutral line N, 6 to R, 7 to L	○	○	○	○	○
8, 10, 12	A/B is RS485 interface, 8 to A , 10 to B , 12 to SH. If with components of draw-out socket communication module , 8 to A' , 10 to B' , 12 to S'	○	○	○	○	○
13, 14	Programmable out 1	○	○	○	○	○
15, 16	Programmable out 2	○	○	○	○	○
17,18,19,20	Voltage display by voltage input of the phases: A, B, C and N, when main voltage is large than AC400V. Voltage changover Module must be selected.	○	—	√	√	√
21,22	ZSI signal output. 21 connecting "+", 22 connecting "COM"	○	○	○	○	○
23,24	ZSI signal input. 23 connecting "+", 24 connecting "COM"	○	○	○	○	○
27	When remote open, connecting terminal 33	○	○	○	○	○
28	When remote close, connecting terminal 34	○	○	○	○	○
31, 32	Connect with under-voltage release	√	√	√	√	√
33, 34	Connect with shunt release	√	√	√	√	√
35, 36	Connect with closing electromagnet	√	√	√	√	√
37,38,39	Connect with Motor-driven operating mechanism. Power supply (directly gain energy-pestore) or power supply with a NO contact(indirectly gain energy-pestore). Control energy-pestore with 37,38.	√	√	√	√	√
41,42,43	Ready-for-close indication	○	○	○	○	○
45,46,47	charging indication	○	○	○	○	○
48,50,52	earth current module, 48 connecting P2, 50 connecting P4	○	○	○	○	○
49,51	Programmable expansion output, 49 connecting A, 51 connecting B	○	○	○	○	○
53,54	Remote reset	○	○	○	○	○
57~80	Connecting terminals of auxiliary switch	√	√	√	√	√
85,88	"Connected" position indication (AC250V 1A)	○	○	○	○	○
86,88	"Test" position indication (AC250V 1A)	○	○	○	○	○
87,88	"Separated" position indication (AC250V 1A)	○	○	○	○	○
81,82,83,84	Four pieces of auxiliary contacts (AC250V 1A)	○	○	○	○	○
T1, T2, T3, T4	Draw-out socket communication module, Six lines program mable expansion module, Power supply module, Intelligent controller communication. Signal of T1,82 connecting T2,83 connecting T3,84 connecting T4	○	○	○	○	○
A, B, S	Communication output of draw-out socket communication module	○	○	○	○	○
A' , B' , S'	Communication output of draw-out socket communication module, connect with communication output of the main body. Attention: with 8, B with 10, S with 12 connecting earth transformer of transformer center	○	○	○	○	○
P1, P3	Connecting earth transformer of transformer center	○	○	○	○	○

Special Note: When the voltage of auxiliary power supply is AC230V or AC400V, power supply module of CW3-1600 intelligent should be transformed into DC24V in connection with terminals of 1 and 2.
When the voltage of power supply is DC110V or DC220V DC, power supply module should be transformed into DC24V in connection with terminals of 1 and 2.
When the voltage of auxiliary power supply is DC24V DC24V power supply module should be transformed into DC24V in connection with terminals of 1 and 2.

■ Wiring diagram of the breaker secondary circuit (BT3-2500~-6300)

SB1	Remote reset button
SB2	Shunt button
SB3	Closing button
SC	chang-over switch
Q	Under-voltage release
F	Shunt release
X	Closing electromagnet
M	Charging motor
SA	Limit switch
XT	Terminals
FU	Fuse
AX	Auxiliary switch

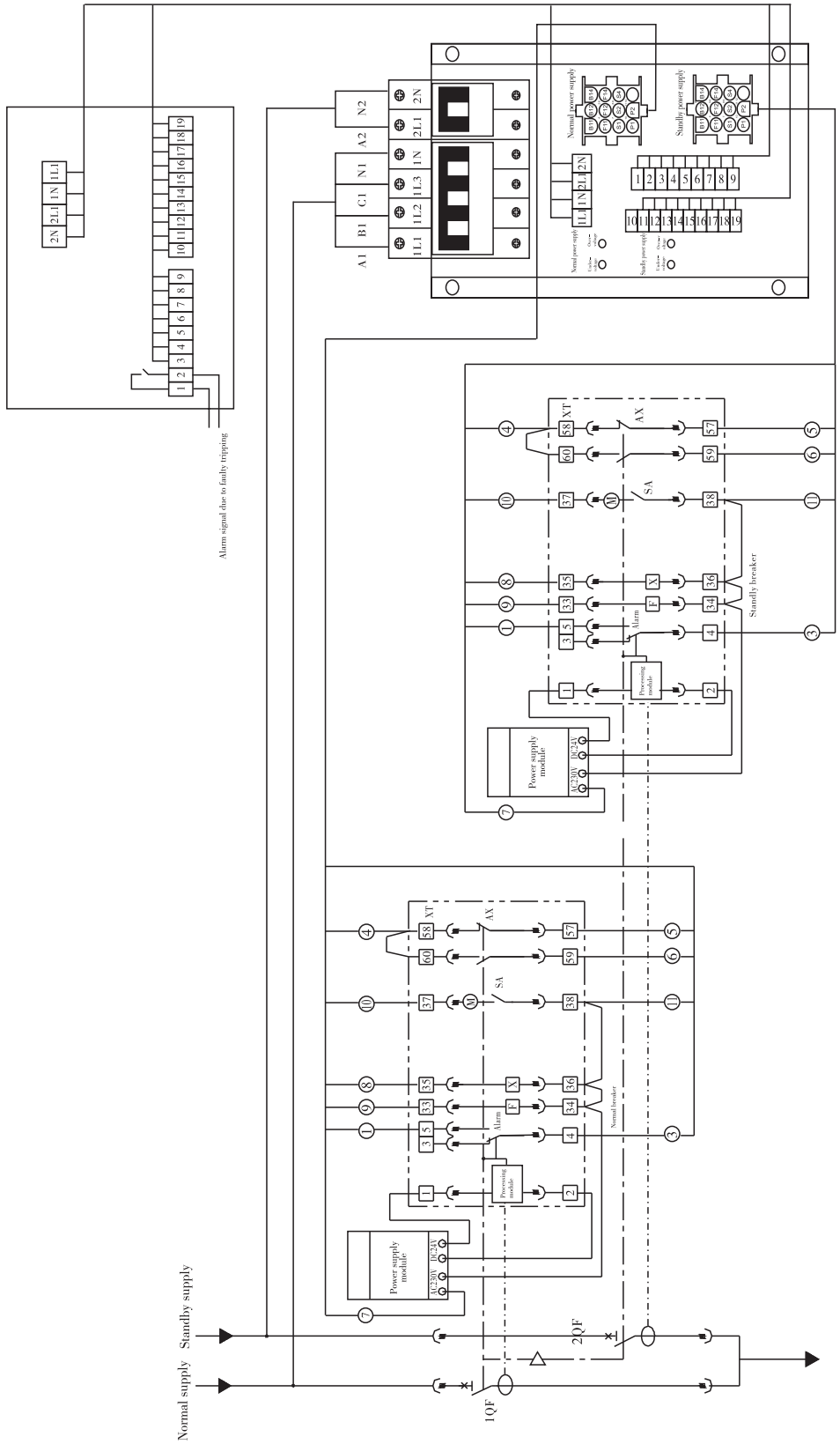


Note: Wiring in the dashed line is done by users themselves. Power supply is different for different rated voltage of controller, Q, F, X etc
In the following table, √: standard configuration , ○: optional configuration, —: none.

Terminal	Function	Controller type				
		EX3536	EA3536	EP3536	EQ3536	EG3536
1, 2	Auxiliary power supply	√	√	√	√	√
3, 4, 5	Fault Instruction (AC250V 1A)	√	√	√	√	√
6, 7	Three-pole circuit breaker with current transformer with neutral line N, 6 to R, 7 to L	○	○	○	○	○
8, 10, 12	A/B is RS485 interface, 8 to A, 10 to B, 12 to SH If with components of drag-out socket communication module ,8 to A' , 10 to B' , 12 to S'	○	○	○	○	○
9,11	connecting DC24V power supply if necessary for communicative circuit breaker	○	○	○	○	○
13, 14	Programmable out 1	○	○	○	○	○
15, 16	Programmable out 2	○	○	○	○	○
17,18,19,20	Voltage display by voltage input of the phases A, B, C and N, when circuit breaker rated voltage is 1000V, 35, 36 connecting "A", 37, 38 connected	○	—	√	√	√
21,22	ZSI signal input, 21 connecting "+", 22 connecting "COM"	○	○	○	○	○
23,24	ZSI signal input, 23 connecting "+", 24 connecting "COM"	○	○	○	○	○
27	When remote open, connecting terminal 33	○	○	○	○	○
28	When remote close, connecting terminal 35	○	○	○	○	○
31, 32	Connect with under-voltage release	○	○	○	○	○
33, 34	Connect with shunt release	√	√	√	√	√
35, 36	Connect with closing electromagnet	√	√	√	√	√
37, 38, 39	Connect with Motor drives operating mechanism(Q), power supply (neutral line connecting 39, 37 connecting "A", 38 connecting "B" when communication)	√	√	√	√	√
41, 42, 43	Ready-for-close indication Available energy (normal energy generators) with 37, 38.	○	○	○	○	○
45, 46, 47	charging indication	○	○	○	○	○
48, 50, 52	earth current module, 48 connecting P2, 50 connecting P4	○	○	○	○	○
49, 51	Programmable expansion output, 49 connecting A, 51 connecting B	○	○	○	○	○
53, 54	Remote reset	○	○	○	○	○
69~92	Connecting terminals of auxiliary switch	√	√	√	√	√
93, 96	"Connected" position indication (AC250V 1A)	○	○	○	○	○
94, 96	"Test" position indication (AC250V 1A)	○	○	○	○	○
95, 96	"Separated" position indication (AC250V 1A)	○	○	○	○	○
61,62,63,64	Parallel signal input, 61 to 62 connecting Communication Module Input of Test-set of earth current module and Parallel signal	○	○	○	○	○
T1, T2, T3, T4	Current transformer of earth current module, T1 connecting T2 and T3 connecting T4 63 connecting T1, 62 connecting T2, 63 connecting T3, 64 connecting T4	○	○	○	○	○
A, B, S	Communication output of drag-out socket communication module	○	○	○	○	○
A' , B' , S'	Communication input of drag-out socket communication module Connecting communication module with drag-out socket with 8, 10, 12	○	○	○	○	○
P1, P3	Connecting earth transformer of transformer-rentier	○	○	○	○	○

■ Wiring diagram of the automatic power supply system

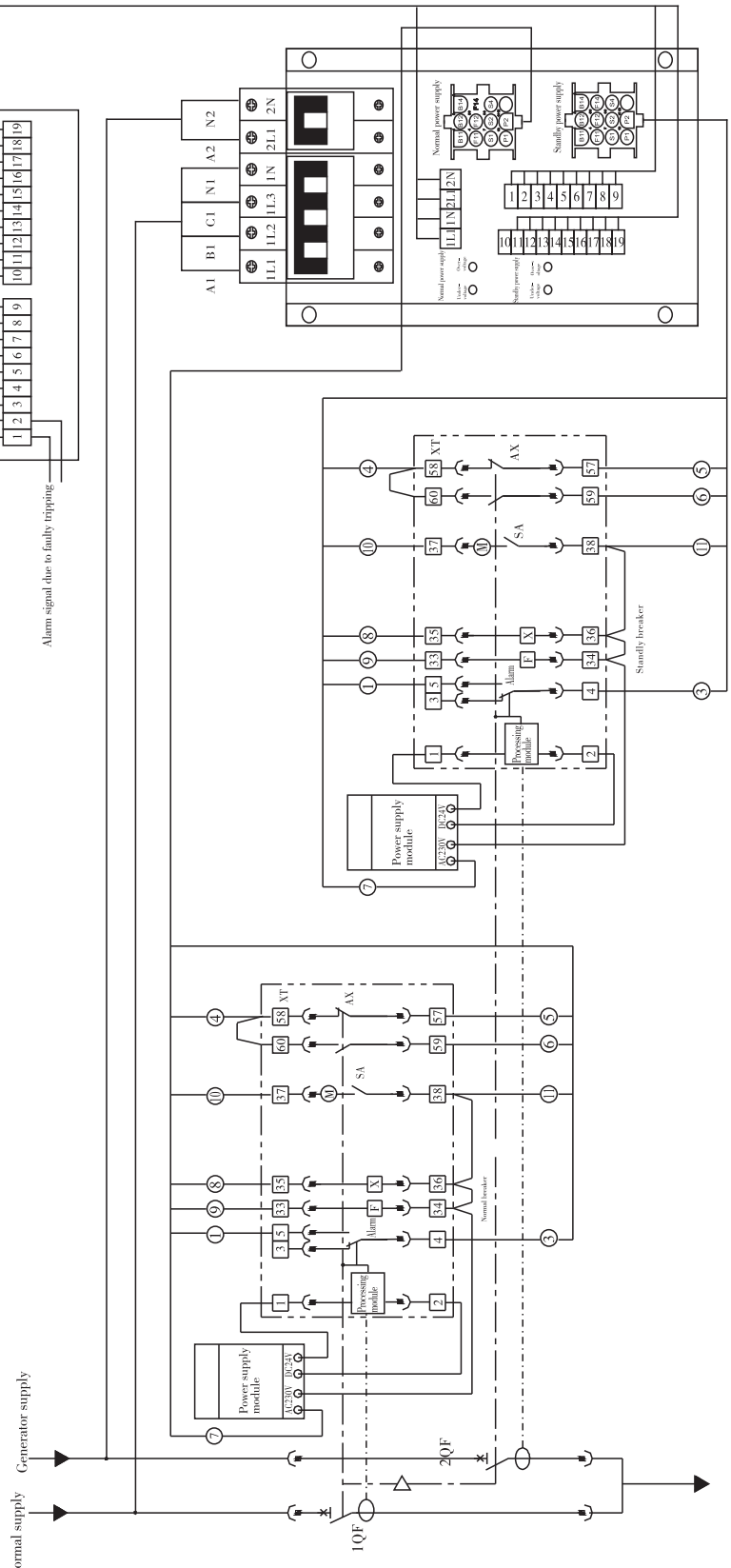
Wiring diagram of the automatic power supply system for normal supply to standby supply system BT3-1600 circuit breaker



Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.
2. When Automatic power supply switch system is at work, the voltage of intelligent controller is DC24V and the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.

AX – Auxiliary switch
F – Shunt release
X – The electro–magnet to close the breaker
M – Charging motor
SA – Travel–limit switch for the charging motor of the breaker
XT – Terminals for the secondary circuit of the breaker

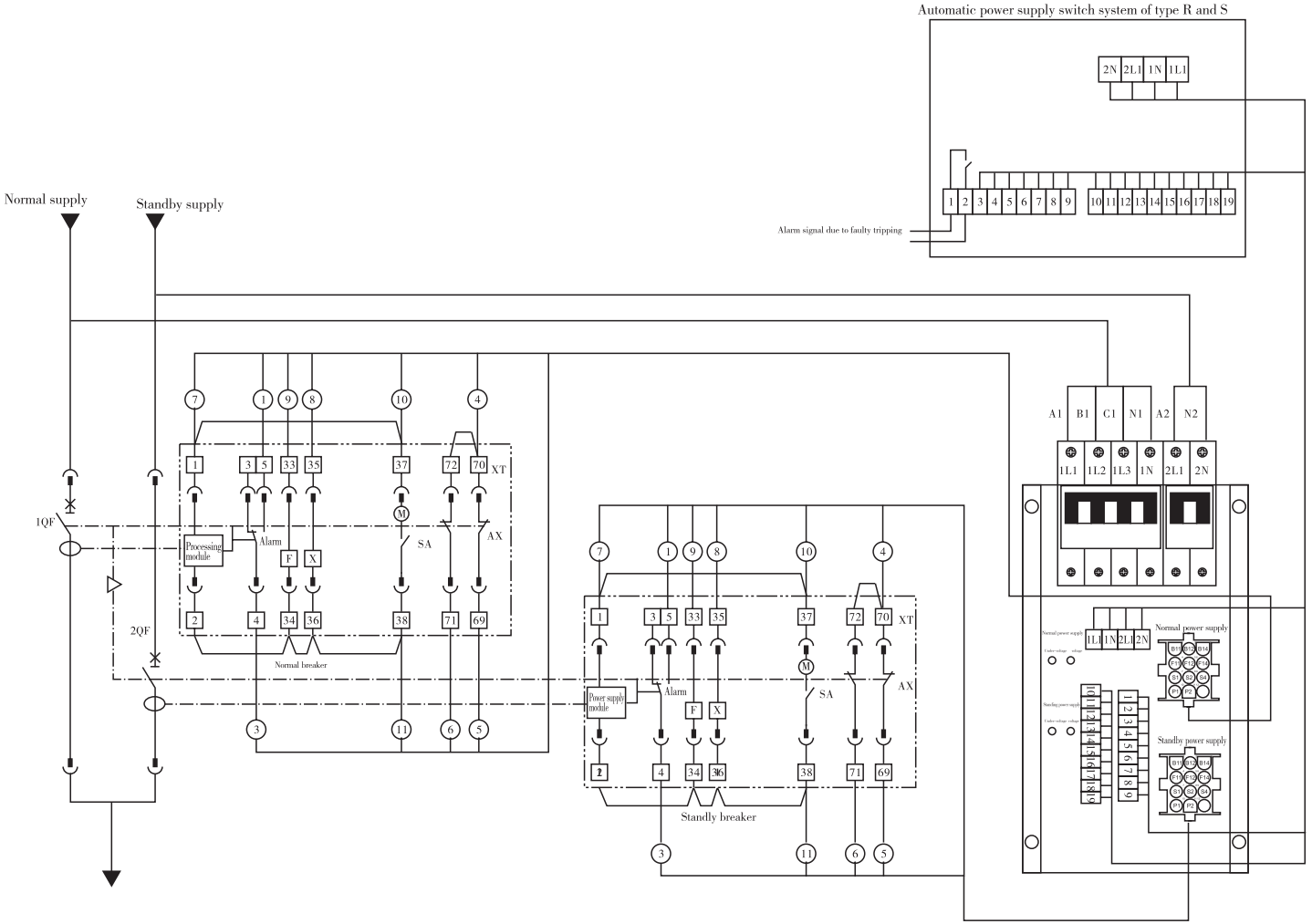
Wiring diagram of the automatic power supply system for normal supply to power generating supply system BT3-1600 circuit breaker



Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.
2. When Automatic power supply switch system is at work, the voltage of intelligent controller is DC24V and the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.

AX – Auxiliary switch
F – Shunt release
X – The electro–magnet to close the breaker
M – Charging motor
SA – Travel–limit switch for the charging motor of the breaker
XT – Terminals for the secondary circuit of the breaker

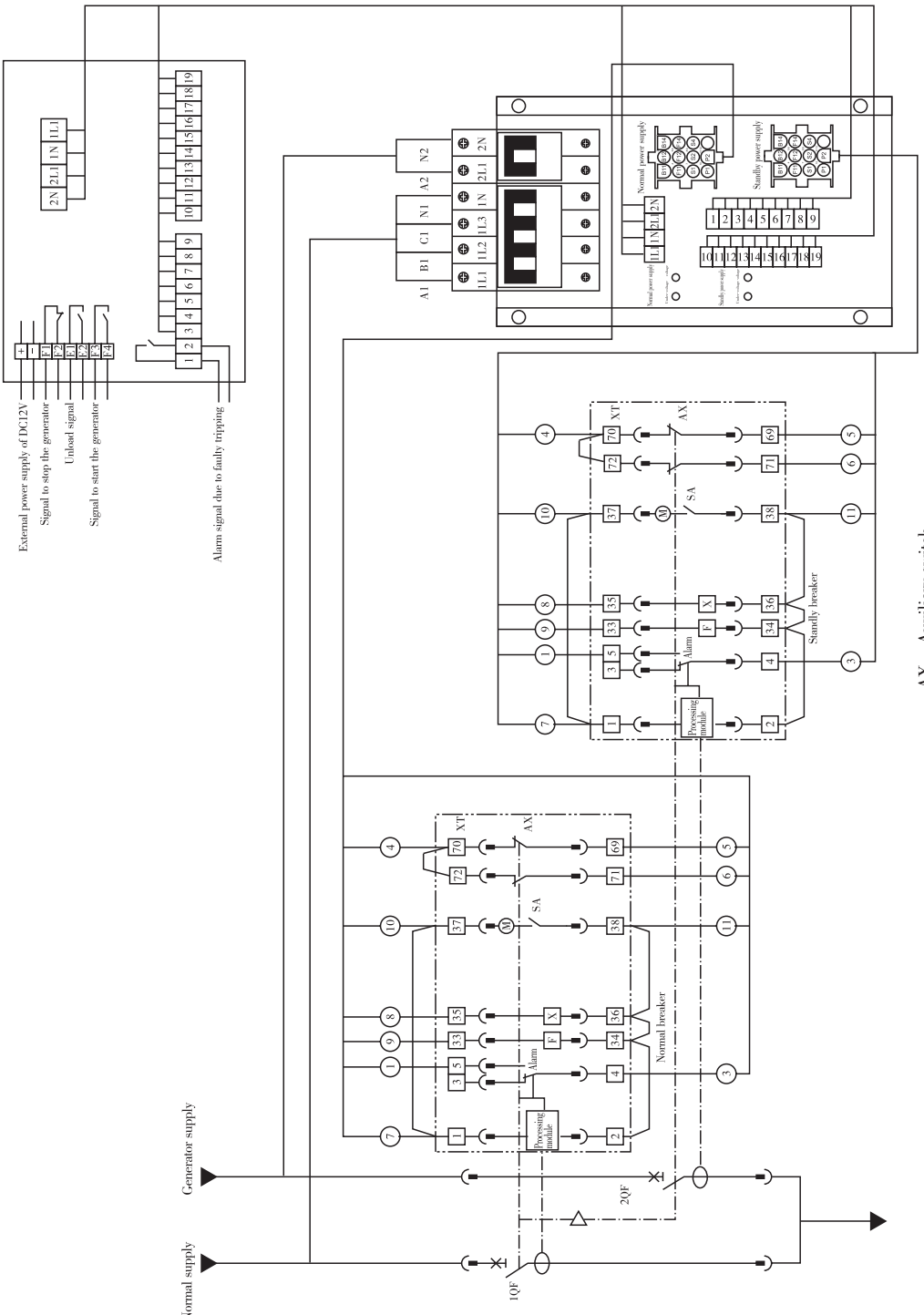
Wiring diagram of the automatic power supply system for normal supply to standby supply system BT3-2500/BT3-4000/BT3-6300 circuit breaker



Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.
2. When Automatic power supply switch system is at work, the voltage of intelligent controller, the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.

AX – Auxiliary switch
F – Shunt release
X – The electro–magnet to close the breaker
M – Charging motor
SA – Travel–limit switch for the charging motor of the breaker
XT – Terminals for the secondary circuit of the breaker

Wiring diagram of the automatic power supply system for normal supply to power generating supply system BT3-2500/BT3-4000/BT3-6300 circuit breaker



AX – Auxiliary switch
F – Shunt release
X – The electro–magnet to close the breaker
M – Charging motor
SA – Travel–limit switch for the charging motor of the breaker
XT – Terminals for the secondary circuit of the breaker

Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.
2. When Automatic power supply switch system is at work, the voltage of intelligent controller, the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.

EA35/EA36

■ Ordering form

1. Users should make sure of their detailed acquaintance of the products' technological materials and make order by the "ordering form"in terms of future applicable situations of the circuit breakers.
2. The company would configure by"Factory's setting values of the intelligent release" if users had no requirements of protection parameters when making order.

Order form of breaker (with type EA35 or EA36 intelligent controller) (Please fill number in _____ or √ mark in ☐)

Customer name			Order quantity		Date	
Type	BT3 - _____ _____ / _____ E _____			☐ On land ☐ Humid(TH type)		
Rated current	In = _____A		Rated voltage	☐ AC380V/AC400V ☐ AC415V/AC440V ☐ AC690V		
Mounting	☐ Fixed ☐ Draw-out					
Connection	☐ Horizontal ☐ Vertical ☐ The upper vertical and the below horizontal ☐ The below vertical and the upper horizontal					
Intelligent controller	Type selection	☐ EA35 ☐ EA36				
	Basic function: Long-time delay	Ir1 _____A t1 _____s , Short-time delay Ir2 _____A t2 _____s , Instantaneous Ir3 _____A				
	Basic function: Earth-fault protection	Ir4 _____A t4 _____s (Only for type 36)				
	Basic function: Curve of long-time delay	☐ General inverse long-time delay (I^2t) ☐ Special inverse delay (It) ☐ High-voltage fuse type (I^4t)				
	Basic function: Neutral protection	☐ OFF ☐ 50%In ☐ 100%In ☐ 200%In (Protection of N pole of double leg of a circuit cross-section for three-pole circuit breaker, but except for BT3-6300)				
	Selective function: Overload pre-alarm	Ir0 = _____Ir1		3 lines over-current fault out put module		
	Selective function: ☐ Current unbalance	Operating threshold ____% Operating delay ____s Return thershold ____% Return delay ____s ☐ OFF ☐ Alarm ☐ Trip				
	Selective function: ☐ Open-phase function	Operating threshold ____% Operating delay ____s Return thershold ____% Return delay ____s ☐ OFF ☐ Alarm ☐ Trip				
	Selective function: ☐ Communication (module type)	☐ Communtcative protocol	Standard	☐ Modbus		
			Special	☐ Profibus ☐ Devicenet ☐ CAN		
	Selective function: ☐ ZSI function					
	Users must choose 6 lines programmable output expansion module (external connected) and choose signal outputs by "Output number definition of programmable output module" table when they shoose alarm function.					
	Voltage of intelligent controller	☐ DC24V ☐ AC220V-AC240V ☐ AC380V-AC415V (Selective Power supply module for BT3-1600) ☐ DC220V ☐ DC110V (Equipped with DC power supply module)				
Accessories	Shunt release	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V				
	Closing coil	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V				
	Moter charging mechanism	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V				
	Auxiliary switch	Standard pattern ☐ 4 changeover contacts				
		Special pattern ☐ 4NO + 4NC ☐ 6 changeover contact ☐ 6NO + 6NC				
Choice of accessories	☐ Under-voltage release	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ Under-voltage instantaneous release ☐ Under-voltage time delay release ☐ 0.5s ☐ 1s ☐ 2s ☐ 3s				
	☐ Lock in "OFF" mechanism	One set of circuit breaker ☐ One lock and one key				
		Twe set of circuit breakers ☐ Two locks and one key				
		Three set of circuit breakers ☐ Three locks and two keys				
	☐ Mechanical interlock	Two sets of circuit breakers ☐ Steel lock interlock ☐ Link rod interlock (horizontally interlock)				
		Three sets of circuit breakers ☐ Pattern three of steel lock interlock ☐ Pattern one of link rod interlock ☐ Pattern two of link rod interlock ☐ Pattern three of link rod interlock				
	☐ Pushbutton lock mechanism ☐ Interphase barriers (must be selected for BT3-1600 vertical connection) ☐ Counter					
	☐ Electrical module for indication of ready-for close ☐ Remote reset ☐ Electrical indication machanism of socket's position ☐ Electrical indication machanism of storage signal					
	☐ Accessories monitoring units ☐ Unit with transformer's center earth externally connected					
	☐ Current transformer with the neutral line N connected externally ☐ FDH-60 ☐ FDH-80 ☐ FDH-120 ☐ FDH-260					
	☐ 6 lines programmable output expansion module Output 1 : number _____ type _____ time _____s , Output 2 : _____ _____ _____s , Output 3 : _____ _____ _____s Output 4 : number _____ type _____ time _____s , Output 5 : _____ _____ _____s , Output 6 : _____ _____ _____s					
	Communication choices of accessories ☐ Signal of fault release ☐ Signal of charging ☐ Signal of ready-for-close ☐ Signal of under-voltage ☐ Components of draw-out socket communication module ☐ Normal power supply module					
	☐ DC power supply module ☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC24V					
	☐ Automatic power supply switch system ☐ DC110V ☐ DC220V					
	☐ Automatic switch controller ☐ R type ☐ S type ☐ F type					
Note:						

Note 1: Users can choose transformer's center earth type or vectorial summation type for earth-fault protection. If they make no choices the default type is the vectorial summationtype. Users should order units with transformer's center earth externally connected (earth transformer and earth module included) if they choose the transformer's center earth type.
Note 2: The voltages of all power supply modules are input voltage, output voltage is DC24V, users may choose suitable modules by providing supply.
Note 3: With communication type, choose one of Electrical module for function of ready for sading on or signal of rcady tor close.
Note 4: Please contact Fuji when both of choose Cause of tripping output and remote reset.
Note 5: Please contact Fuji when used IT power distribution system at AC415V/AC440V/AC690V.

EP35/EP36
EQ35/EQ36

Order form of breaker (with type EP35, EP36 or EQ35, EQ36 intelligent controller) (Please fill number in _____ or √ mark in ☐)

Customer name		Order quantity		Date	
Type	BT3 - _____ _____ / _____ E _____ ☐ On land ☐ Humid(TH type)				
Rated current	In = _____A	Rated voltage	☐ AC380V/AC400V ☐ AC415V/AC440V ☐ AC690V		
Mounting	☐ Fixed ☐ Draw-out				
Connection	☐ Horizontal ☐ Vertical ☐ The upper vertical and the below horizontal ☐ The below vertical and the upper horizontal				

Intelligent controller	Type selection	☐ EP35 ☐ EP36 ☐ EQ35 ☐ EQ36		
	Basic function: Long-time delay Ir1	_____A t1 _____s , Short-time delay Ir2 _____A t2 _____s , Instantaneous Ir3 _____A		
	Basic function: Earth-fault protection	Ir4 _____A t4 _____s (Only for type 36)		
	Basic function: Curve of long-time delay	☐ General inverse long-time delay (I^2t) ☐ Special inverse delay (It) ☐ High-voltage fuse type (I^4t)		
	Basic function: Neutral protection	☐ OFF ☐ 50%In ☐ 100%In ☐ 200%In (Protection of N pole of double leg of a circuit cross-section for three-pole circuit breaker, but except for BT3-6300, 7400)		
	Selective function: Overload pre-alarm	Ir0 = _____Ir1	3 lines over-current fault out put module	
	Selective function: ☐ Current unbalance	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s	☐ OFF ☐ Alarm ☐ Trip	
	Selective function: ☐ Open-phase function	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s	☐ OFF ☐ Alarm ☐ Trip	
	Selective function: ☐ Demand current protection	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s	☐ OFF ☐ Alarm ☐ Trip	
	Selective function: ☐ Under-voltage protection	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s	☐ OFF ☐ Alarm ☐ Trip	
	Selective function: ☐ Over-voltage protection	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s	☐ OFF ☐ Alarm ☐ Trip	
	Selective function: ☐ Current unbalance	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s	☐ OFF ☐ Alarm ☐ Trip	
	Selective function: ☐ Phase sequence protection	Operating threshold ___% Operating delay 0.3 s		
	Selective function: ☐ Communication	☐ Communtcative protocol	Standard	☐ Modbus
			Special	☐ Profibus ☐ Devicenet ☐ CAN
	Selective function: ☐ ZSI function			
	Users must choose 6 lines programmable output expansion module (external connected) and choose signal outputs by "Output number definition of programmable output module" table when they shoose alarm function.			
	Voltage of intelligent controller	☐ DC24V ☐ AC220V-AC240V ☐ AC380V-AC415 (Selective Power supply module for BT3-1600) ☐ DC220V ☐ DC110V (Equipped with DC power supply module)		
Accessories	Shunt release	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V		
	Closing coil	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V		
	Moter charging mechanism	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V		
	Auxiliary switch	Standard pattern ☐ 4 changeover contacts		
		Special pattern ☐ 4NO + 4NC ☐ 6NO + 2NC ☐ 2NO + 6NC		
Choice of accessories	☐ Under-voltage release	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ Under-voltage instantaneous release ☐ Under-voltage time delay release ☐ 0.5s ☐ 1s ☐ 2s ☐ 3s		
	☐ Lock in "OFF" mechanism	One set of circuit breaker ☐ One lock and one key		
		Twe set of circuit breakers ☐ Two locks and one key		
		Three set of circuit breakers ☐ Three locks and two keys		
	☐ Mechanical interlock	Two sets of circuit breakers ☐ Steel lock interlock ☐ Link rod interlock (horizontally interlock)		
		Three sets of circuit breakers ☐ Pattern three of steel lock interlock ☐ Pattern one of link rod interlock ☐ Pattern two of link rod interlock ☐ Pattern three of link rod interlock		
	☐ Pushbutton lock mechanism ☐ Interphase barriers (must be selected for BT3-1600 vertical connection) ☐ Counter			
	☐ Electrical module for indication of ready-for close ☐ Remote reset ☐ Electrical indication machanism of socket's position ☐ Electrical indication machanism of storage signal			
	☐ Accessories monitoring units ☐ Unit with transformer's center earth externally connected			
	☐ Current transformer with the neutral line N connected externally ☐ FDH-60 ☐ FDH-80 ☐ FDH-120 ☐ FDH-260			
	☐ 6 lines programmable output expansion module Output 1 : number _____ type _____ time _____s , Output 2 : _____ _____ _____s , Output 3 : _____ _____ _____s Output 4 : number _____ type _____ time _____s , Output 5 : _____ _____ _____s , Output 6 : _____ _____ _____s			
	Communication choices of accessories ☐ Signal of fault release ☐ Signal of charging ☐ Signal of ready-for-close ☐ Signal of under-voltage ☐ Components of draw-out socket communication module ☐ Normal power supply module			
	☐ Normal power supply module	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC24V		
	☐ DC power supply module	☐ DC110V ☐ DC220V		
	☐ Automatic power supply switch system	Automatic switch controller ☐ R type ☐ S type ☐ F type		

Note:

Note 1: Users can choose transformer's center earth type or vectorial summation type for earth-fault protection. If they make no choices the default type is the vectorial summationtype. Users should order units with transformer's center earth externally connected (earth transformer and earth module included) if they choose the transformer's center earth type.
Note 2: The voltages of all power supply modules are input voltage, output voltage is DC24V, users may choose suitable modules by providing supply.
Note 3: With communication type, choose one of Electrical module for function of ready for sading on or signal of rcady tor close.
Note 4: Please contact Fuji when both of choose Cause of tripping output and remote reset.
Note 5: Please contact Fuji when used IT power distribution system at AC415V/AC440V/AC690V.

EG35/EG36

Order form of breaker (with type EG35 or EG36 intelligent controller) (Please fill number in _____ or √ mark in ☐)

Customer name			Order quantity		Date
Type	BT3 - _____ _____ / _____ E _____		☐ On land	☐ Humid(TH type)	
Rated current	In = _____A		Rated voltage	☐ AC380V/AC400V ☐ AC415V/AC440V ☐ AC690V	
Mounting	☐ Fixed ☐ Draw-out				
Connection	☐ Horizontal ☐ Vertical ☐ The upper vertical and the below horizontal ☐ The below vertical and the upper horizontal				
Intelligent controller	Type selection	☐ Generator protection type EG35 ☐ Generator protection type EG36			
	Basic function: Long-time delay Ir1 _____A t1 _____s , Short-time delay Ir2 _____A t2 _____s , Instantaneous Ir3 _____A				
	Basic function: Earth-fault protection	Ir4 _____A t4 _____s (Only for type 36)			
	Basic function: Under-frequency protection	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s ☐ OFF ☐ Alarm ☐ Trip			
	Basic function: Over-frequency protection	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s ☐ OFF ☐ Alarm ☐ Trip			
	Basic function: Inverse power protection	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s ☐ OFF ☐ Alarm ☐ Trip			
	Basic function: Neutral protection	☐ OFF ☐ 50%In ☐ 100%In			
	Selective function: Overload pre-alarm	Ir0 = _____Ir1		3 lines over-current fault out put module	
	Selective function: ☐ Current unbalance	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s ☐ OFF ☐ Alarm ☐ Trip			
	Selective function: ☐ Open-phase function	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s ☐ OFF ☐ Alarm ☐ Trip			
	Selective function: ☐ Demand current protection	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s ☐ OFF ☐ Alarm ☐ Trip			
	Selective function: ☐ Under-voltage protection	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s ☐ OFF ☐ Alarm ☐ Trip			
	Selective function: ☐ Over-voltage protection	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s ☐ OFF ☐ Alarm ☐ Trip			
	Selective function: ☐ Current unbalance	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s ☐ OFF ☐ Alarm ☐ Trip			
	Selective function: ☐ Phase sequence protection	Operating threshold ___% Operating delay 0.3 s			
	Selective function: ☐ Communication (module type)	☐ Communtcative protocol	Standard	☐ Modbus	
			Special	☐ Profibus ☐ Devicenet ☐ CAN	
	Selective function: ☐ ZSI function				
	Users must choose 6 lines programmable output expansion module (external connected) and choose signal outputs by "Output number definition of programmable output module" table when they shoose alarm function.				
	Voltage of intelligent controller	☐ DC24V ☐ AC220V-AC240V ☐ AC400V (Selective Power supply module for BT3-1600) ☐ DC220V ☐ DC110V (Equipped with DC power supply module)			
Accessories	Shunt release	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V			
	Closing coil	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V			
	Moter charging mechanism	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V			
	Auxiliary switch	Standard pattern ☐ 4 changeover contacts			
		Special pattern ☐ 4NO + 4NC ☐ 6 changeover contact ☐ 6NO + 6NC			
Choice of accessories	☐ Under-voltage release	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ Under-voltage instantaneous release ☐ Under-voltage time delay release ☐ 0.5s ☐ 1s ☐ 2s ☐ 3s			
	☐ Lock in "OFF" mechanism	One set of circuit breaker ☐ One lock and one key			
		Twe set of circuit breakers ☐ Two locks and one key			
		Three set of circuit breakers ☐ Three locks and two keys			
	☐ Mechanical interlock	Two sets of circuit breakers ☐ Steel lock interlock ☐ Link rod interlock (horizontally interlock)			
		Three sets of circuit breakers ☐ Pattern three of steel lock interlock ☐ Pattern one of link rod interlock ☐ Pattern two of link rod interlock ☐ Pattern three of link rod interlock			
	☐ Pushbutton lock mechanism ☐ Interphase barriers (must be selected for BT3-1600 vertical connection) ☐ Counter				
	☐ Electrical module for indication of ready-for close ☐ Remote reset ☐ Electrical indication machanism of socket's position ☐ Electrical indication machanism of storage signal				
	☐ Accessories monitoring units ☐ Unit with transformer's center earth externally connected				
	☐ Current transformer with the neutral line N connected externally ☐ FDH-60 ☐ FDH-80 ☐ FDH-120 ☐ FDH-260				
	☐ 6 lines programmable output expansion module Output 1 : number _____ type _____ time _____s , Output 2 : _____ _____ _____s , Output 3 : _____ _____ _____s Output 4 : number _____ type _____ time _____s , Output 5 : _____ _____ _____s , Output 6 : _____ _____ _____s				
	Communication choices of accessories ☐ Signal of fault release ☐ Signal of charging ☐ Signal of ready-for-close ☐ Signal of under-voltage ☐ Components of draw-out socket communication module ☐ Normal power supply module				
	☐ Normal power supply module ☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC24V				
	☐ DC power supply module ☐ DC110V ☐ DC220V				
	☐ Automatic power supply switch system Automatic switch controller ☐ R type ☐ S type ☐ F type				
Note:					

Note 1: The voltages of all power supply modules are input voltage, output voltage is DC24V, users may choose suitable modules by providing supply.
Note 2: With communication type, choose one of Electrical module for function of ready for sading on or signal of rcady tor close.
Note 3: Please contact Fuji when both of choose Cause of tripping output and remote reset.
Note 4: Please contact Fuji when used IT power distribution system at AC415V/AC440V/AC690V.

EN35/EN36

Order form of breaker (with type EN35 or EN36 intelligent controller) (Please fill number in _____ or √ mark in ☐)

Customer name			Order quantity		Date
Type	BT3 - _____ _____ / _____ E _____			☐ On land ☐ Humid(TH type)	
Rated current	In = _____A		Rated voltage	☐ AC380V/AC400V ☐ AC415V/AC440V ☐ AC690V	
Mounting	☐ Fixed ☐ Draw-out				
Connection	☐ Horizontal ☐ Vertical ☐ The upper vertical and the below horizontal ☐ The below vertical and the upper horizontal				
Intelligent controller	Type selection	☐ EN35 ☐ EN36			
	Basic function: Long-time delay Ir1 _____A t1 _____s , Short-time delay Ir2 _____A t2 _____s , Instantaneous Ir3 _____A				
	Basic function: Earth-fault protection	Ir4 _____A t4 _____s (Only for type 36)			
	Basic function: Curve of long-time delay	☐ General inverse long-time delay (I^2t)			
	Basic function: Neutral protection	☐ OFF ☐ 50%In ☐ 100%In ☐ 200%In (Protection of N pole of double leg of a circuit cross-section for three-pole circuit breaker, but except for BT3-6300, 7400)			
	Selective function: Overload pre-alarm	Ir0 = _____Ir1		3 lines over-current fault out put module	
	Selective function: ☐ Current unbalance	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s		☐ OFF ☐ Alarm ☐ Trip	
	Selective function: ☐ Open-phase function	Operating threshold ___% Operating delay ___s Return thershold ___% Return delay ___s		☐ OFF ☐ Alarm ☐ Trip	
	Selective function: ☐ Communication (module type)	☐ Communtcative protocol	Standard	☐ Modbus	
			Special	☐ Profibus ☐ Devicenet ☐ CAN	
	Selective function: ☐ ZSI function				
	Users must choose 6 lines programmable output expansion module (external connected) and choose signal outputs by "Output number definition of programmable output module" table when they shoose alarm function.				
	Voltage of intelligent controller	☐ DC24V ☐ AC220V-AC240V ☐ AC400V (Selective Power supply module for BT3-1600) ☐ DC220V ☐ DC110V (Equipped with DC power supply module)			
Accessories	Shunt release	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V			
	Closing coil	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V			
	Moter charging mechanism	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V			
	Auxiliary switch	Standard pattern ☐ 4 changeover contacts			
		Special pattern ☐ 4NO + 4NC ☐ 6 changeover contact ☐ 6NO + 6NC			
Choice of accessories	☐ Under-voltage release	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ Under-voltage instantaneous release ☐ Under-voltage time delay release ☐ 0.5s ☐ 1s ☐ 2s ☐ 3s			
	☐ Lock in "OFF" mechanism	One set of circuit breaker ☐ One lock and one key			
		Twe set of circuit breakers ☐ Two locks and one key			
		Three set of circuit breakers ☐ Three locks and two keys			
	☐ Mechanical interlock	Two sets of circuit breakers ☐ Steel lock interlock ☐ Link rod interlock (horizontally interlock)			
		Three sets of circuit breakers ☐ Pattern three of steel lock interlock ☐ Pattern one of link rod interlock ☐ Pattern two of link rod interlock ☐ Pattern three of link rod interlock			
	☐ Pushbutton lock mechanism ☐ Interphase barriers (must be selected for BT3-1600 vertical connection) ☐ Counter				
	☐ Electrical module for indication of ready-for close ☐ Remote reset ☐ Electrical indication machanism of socket's position ☐ Electrical indication machanism of storage signal				
	☐ Accessories monitoring units ☐ Unit with transformer's center earth externally connected				
	☐ Current transformer with the neutral line N connected externally ☐ FDH-60 ☐ FDH-80 ☐ FDH-120 ☐ FDH-260				
	☐ 6 lines programmable output expansion module Output 1 : number _____ type _____ time _____s , Output 2 : _____ _____ _____s , Output 3 : _____ _____ _____s Output 4 : number _____ type _____ time _____s , Output 5 : _____ _____ _____s , Output 6 : _____ _____ _____s				
	Communication choices of accessories ☐ Signal of fault release ☐ Signal of charging ☐ Signal of ready-for-close ☐ Signal of under-voltage ☐ Components of draw-out socket communication module ☐ Normal power supply module				
	☐ DC power supply module	☐ AC220V-AC240V	☐ AC380V-AC415V	☐ DC24V	
	☐ Automatic power supply switch system	☐ DC110V	☐ DC220V		
	☐ Automatic switch controller	☐ R type	☐ S type	☐ F type	

Note:

Note 1: Users can choose transformer's center earth type or vectorial summation type for earth-fault protection. If they make no choices the default type is the vectorial summationtype. Users should order units with transformer's center earth externally connected (earth transformer and earth module included) if they choose the transformer's center earth type.
Note 2: The voltages of all power supply modules are input voltage, output voltage is DC24V, users may choose suitable modules by providing supply.
Note 3: With communication type, choose one of Electrical module for function of ready for sading on or signal of rcady tor close.
Note 4: Please contact Fuji when both of choose Cause of tripping output and remote reset.
Note 5: Please contact Fuji when used IT power distribution system at AC415V/AC440V/AC690V.

Order form of breaker (without intelligent controller) (Please fill number in _____ or √ mark in ☐)

Customer name		Order quantity		Date	
Type	BT3 - _____ _____ / _____ E NOCR _____ ☐ On hand ☐ Humid(TH type)				
Rated current	In = _____A	Rated voltage	☐ AC380V/AC400V ☐ AC415V/AC440V ☐ AC690V		
Mounting	☐ Fixed ☐ Draw-out				
Connection	☐ Horizontal ☐ Vertical ☐ The upper vertical and the below horizontal ☐ The below vertical and the upper horizontal				
Accessories	Shunt release	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V			
	Closing coil	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V			
	Moter charging mechanism	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ DC220V ☐ DC110V			
	Auxiliary switch	Standard pattern ☐ 4 changeover contacts			
		Special pattern ☐ 4NO + 4NC ☐ 6 changeover contact ☐ 6NO + 6NC			
Choice of accessories	☐ Under-voltage release	☐ AC220V-AC240V ☐ AC380V-AC415V ☐ Under-voltage instantaneous release ☐ Under-voltage time delay release ☐ 0.5s ☐ 1s ☐ 2s ☐ 3s			
	☐ Lock in "OFF" mechanism	One set of circuit breaker ☐ One lock and one key			
		Twe set of circuit breakers ☐ Two locks and one key			
		Three set of circuit breakers ☐ Three locks and two keys			
	☐ Mechanical interlock	Two sets of circuit breakers ☐ Steel lock interlock ☐ Link rod interlock (horizontally interlock)			
		Three sets of circuit breakers ☐ Pattern three of steel lock interlock ☐ Pattern one of link rod interlock ☐ Pattern two of link rod interlock ☐ Pattern three of link rod interlock			
	☐ Pushbutton lock mechanism ☐ Interphase barriers (must be selected for BT3-1600 vertical connection) ☐ Counter				
	☐ Electrical module for indication of ready for close ☐ Electrical indication machanism of socket's position ☐ Electrical indication machanism of storage signal				

Note: Please contact Fuji when used IT power distribution system at AC415V/AC440V/AC690V.

■ Ordering notice

Factory's setting values of intelligent controller

Item		Adjusted range			Setting value	Remarks
Long-time delay protection	Curve type	I2t	It	I4t	I2t	Only I2t type EN,EG
	Setting value of current	0.4 – 1In			In	For type EA, EP, EQ
		0.4 – 1.15In				For type EG
	Setting value of time	15 – 480s	10 – 120s	60 – 1440s	480s	For type EN, EA, EP, EQ
		15 – 60s			60s	For type EG
Short-time delay protection	Setting value of current	(0.4 – 15) In + OFF			6Ir1	For type EN, EA, EP, EQ
		(0.4 – 5) In + OFF			3Ir1	For type EG
	Setting value of time	Definite time of definite and inverse time			Definite and inverse time	Inverse time
Instantaneous protection	Setting value of current	1600	(1.6 – 35) kA + OFF		In < 1000A : 15In In = 1250.1600A : 12In In > 2000A : 10In	
		2500	(2.5 – 50) kA + OFF			
		4000	(4 – 80) kA + OFF			
		6300	(6.3 – 100) kA + OFF			
Earth-fault protection	Setting value of current	< 1250A	(0.4 – 0.8) In		Maximum	
		> 1250A	500 – 1200A			
	Setting value of time	0.1 – 0.4s + OFF			Inverse time	
Neutral protection	Current setting value	OFF – N/2 – N – N x 2			OFF	For 3pole
		OFF – N/2 – N			N	For 4pole
Overload pre-alarm	Setting value of current	(0.75-1.05) Ir1			1.05 Ir1	
Current unbalance protection	Operating threshold	20-80%			60%	
	Operating delay	1 – 40s			40s	
	Return threshold	20% – operating threshold			20%	
	Return delay	10 – 360s			10s	
Open-phase protection	Operating threshold	90 – 99%			95%	
	Operating delay	0.1 – 3s			3s	
	Return threshold	20% – operating threshold			20%	
	Return delay	10 – 360s			10s	
Demand current protection	Operating threshold	0.4 – 1In			1In	
	Operating delay	15 – 1500s			1500s	
	Return threshold	0.4In – Operating threshold			0.4In	
	Return delay	15 – 3000s			15s	
Under-voltage protection	Operating threshold	50 – 690V			265V	
	Operating delay	1 – 30s			5s	
	Return threshold	Operating threshold – 690V			325V	
	Return delay	1 – 100s			10s	

Item		Adjusted range	Setting value	Remarks
Over-voltage protection	Operating threshold	200 – 1000V	725V	
	Operating delay	1 – 5s	5s	
	Return threshold	200V – operating threshold	400V	
	Return delay	1 – 36s	2s	
Voltage unbalance protection	Operating threshold	2 – 50%	30%	
	Operating delay	1 – 40s	40s	
	Return threshold	2% – Operating threshold	10%	
	Return delay	10 – 360s		
Inverse power protection	Operating threshold	20 – 500kW	500kW	
	Operating delay	0.2 – 20s	20s	
	Return threshold	20kW – Operating threshold	100kW	
	Return delay	1 – 360s	1s	
Over-frequency protection	Operating threshold	50 – 65Hz	65Hz	
	Operating delay	0.2 – 5s	5s	
	Return threshold	45Hz – Operation threshold	50Hz	
	Return delay	1 – 360s	1s	
Under-frequency protection	Operating threshold	45 – 60Hz	45Hz	
	Operating delay	0.2 – 5s	5s	
	Return threshold	Action threshold – 60Hz	50Hz	
	Return delay	1 – 360s	1s	
Phase sequence protection	Operating threshold	1, 2, 3 or 1, 3, 2	1, 2, 3	
	Operating delay	0.3s		
Current shedding	Operating threshold	0.2 – 1Ir1	1Ir1	
	Operating delay	20% – 80% t1	80% t1	
	Return threshold	0.2In – Operating threshold	0.5 Ir1	
	Return delay	10 – 600s	10s	

MEMO

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Since the user's product information, specific use application, and conditions of use are all outside of Fuji Electric FA Components & Systems'control, **it shall be the responsibility of the user to determine the suitability of any of the products mentioned for the user's application.**

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Except to the extent otherwise provided for in the Conditions of Sale issued by Fuji Electric FA, Fuji Electric FA warrants that the Fuji Electric FA products identified in this catalog shall be free from significant defects in materials and workmanship provided the product has not been: 1) repaired or altered by others than Fuji Electric FA; 2) subjected to negligence, accident, misuse, or damage by circumstances beyond Fuji Electric FA's control; 3) improperly operated, maintained or stored; or 4) used in other than normal use or service. This warranty shall apply only to defects appearing within one (1) year from the date of shipment by Fuji Electric FA, and in such case, only if such defects are reported to Fuji Electric FA within thirty (30) days of discovery by purchaser. Such notice should be submitted in writing to Fuji Electric FA at 5-7, Nihonbashi Odemma-cho, Chuo-ku, Tokyo, Japan. The sole and exclusive remedy with respected to the above warranty whether such claim is based on warranty, contract, negligence, strict liability or any other theory, is limited to the repair or replacement of such product or, at Fuji Electric FA's option reimbursement by Fuji Electric FA of the purchase price paid to Fuji Electric FA for the particular product. **Fuji Electric FA does not make any other representations or warranties, whether oral or in writing, expressed or implied, including but not limited to any warranty regarding merchantability or fitness for a particular purpose.** Except as provided in the Conditions of Sale, no agent or representative of Fuji Electric FA is authorized to modify the terms of this warranty in writing or orally.

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⚠ Safety Considerations

- Operate (keep) in the environment specified in the operating instructions and manual. High temperature, high humidity, condensation, dust, corrosive gases, oil, organic solvents, excessive vibration or shock might cause electric shock, fire, erratic operation or failure.
- For safe operation, before using the product read the instruction manual or user manual that comes with the product carefully or consult the Fuji sales representative from which you purchased the product.
- Products introduced in this catalog have not been designed or manufactured for such applications in a system or equipment that will affect human bodies or lives.
- Customers, who want to use the products introduced in this catalog for special systems or devices such as for atomic-energy control, aerospace use, medical use, passenger vehicle, and traffic control, are requested to consult with Fuji Electric FA.
- Customers are requested to prepare safety measures when they apply the products introduced in this catalog to such systems or facilities that will affect human lives or cause severe damage to property if the products become faulty.
- For safe operation, wiring should be conducted only by qualified engineers who have sufficient technical knowledge about electrical work or wiring.
- Follow the regulations of industrial wastes when the product is to be discarded.
- For further questions, please contact your Fuji sales representative or Fuji Electric FA.

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