Read the operation instruction carefully before installation

W3-1600

Intelligent Universal Circuit Breaker

Product Manual

PRODUCTS CONTENTS

IntelligentUniversalCircuitBreaker

Intelligent Universal Circuit Breaker

1.Usage and range of application

In the circuit of AC 50Hz, its rated working voltage is under 400V and 690V, its rated working current reaches to 1600A,could be used for controlling the low voltage distribution net and keeping it safety. It is used to distribute electric energy, protect line and powerl equipment from overload, short circuit, undervoltage, single-phase grounding fault. Circuit breaker Introduction of the structure as a variety of protection functions, selective protection is accurate, can avoid unnecessary power outage, improve the safety andl reliability of power grid operation. Under normal conditions, it can be used for infrequent switching of routes.

The product conforms to GB/T 14048.2-2016 "Low-voltage switchgear and control equipment Part 6-1: Multi-functional electrical conversion switchgear" (IEC60947-2).

IEC60947-2、GB/T 14048.2

Rated insulation voltage: 50Hz,AC1000V

Rated operating voltage: 50Hz, AC400V, AC690V

Rated current: 200A-1600A

Installation: drawer type, fixed type

Wiring: horizontal wiring

Operation mode: electrical mechanism operation, manual mechanism operation

Tripping type: intelligent controller, undervoltage tripper, shunt release tripper

Usage Category: Class B

Pollution level: III

2.Productcatagoryandmeaning

□ W 3 – □/□ □–□–□ Ⅱ

- Appearance: dark grey
- Controller: L= economy type; M= standard type; H= intelligent type
- Rated working current :200-1600A
- Structure: G(fixed type), C(drawer type)
- Number of poles: 3P, 4P
- Shell frame grade (Inm) : 1600
- Design serial number
- Universal circuit breaker
- Enterprise code name

3.Maintechnicalparameters

Shell frame grade	Rated current In(A)
1600	200、400、630、800、1000、1250、1600

Shell frame grade	Rated working voltage	1600
Rated limit short-circuit breaking capacity Icu(kA)	400V	65
	690V	50
Rated operating short-circuit breaking capacity Ics(kA)	400V	55
	690V	42
Rated short-time withstand current Icw(kA)/1s	400V	50
	690V	42
Rated operating voltage Ue(V)	AC400,AC690	
Rated insulation voltage Ui(V)	AC1000	
Rated impulse withstand voltage Uimp(V)	12000	
Power frequency withstand voltage U	2200V 1min 50Hz	

Note: In the table, the breaking capacity is the same in the upper and lower entry lines.

4.UsageandPerformance

4.1 Energy storage

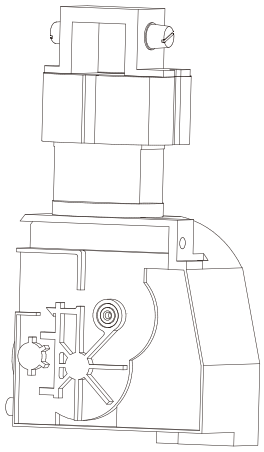
The spring in the operating mechanism must be stored before the circuit breaker is closed, which can be stored manually using the handle or by Energy storage electric operating mechanism.

4.2 Manual energy storage

Press down the handle 6 to 7 times until you hear aclick sound. At this time, the state indication of the mechanism jumps from energy release to energy storage to complete energy storage

4.3 Automatic energy storage

If electric energy storage mechanism is installed, the circuit breaker will automatically re-store energy after every closing.



Electric energy storage mechanism can operate the power supply voltage range : (85%~110%) Us

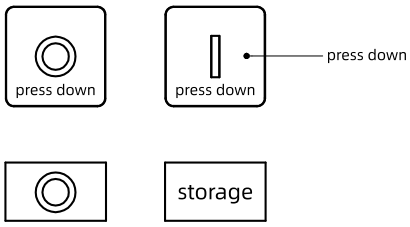
Us: rated control voltage

The circuit breaker is closed

Circuit breaker can be closed by using the closing button (I) on the shell or the closing electromagnet.

switch close button

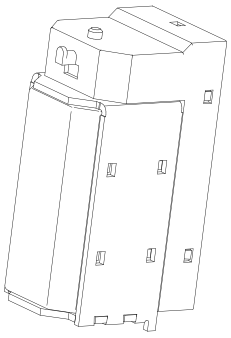
Press the CLOSING button (I) , the mechanism status indication chanes from Energy storage to Energy release, and the circuit breaker status indication is O change to I and circuit breaker is closed.



Necessary conditions for circuit breaker closing:
Off position of circuit breaker (○)
Operating mechanism energy storage
Controller trip indicating button reset status
NO off position command

Closed electromagnet

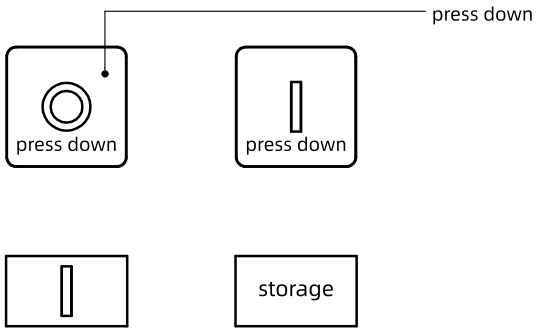
The circuit breaker is equipped with closing electromagnet, and the circuit breaker can be closed by pressing the electrical closing button.



Closed electromagnet can be operated during the (85%~110%) Us supply voltage range

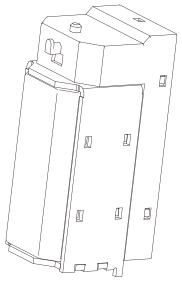
Switch off button

Press swith off button (O), circuit breaker status indication change from I too, at this time, circuit breakers is in the off state



Shunt tripper

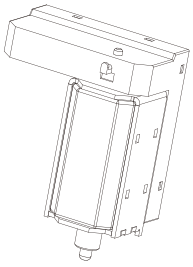
Circuit breaker is equipped with shunt tripper, which can be off by pressing the electrical off button.



Voltage range of shunt tripper: (70%~110%) Us

Undervoltage tripper

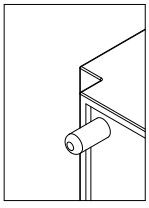
If circuit breaker is equipped with an undervoltage tripper, the circuit breaker can be off remotely.



Operation characteristics of undervoltage tripper: when 35%~70%Ue, the circuit breaker can be disconnected; when less than 35%Ue, the circuit breaker can not be closed; When 85%~110%Ue, the circuit breaker can be closed reliably Ue: Rated working voltage

Tripping of intelligent tripper

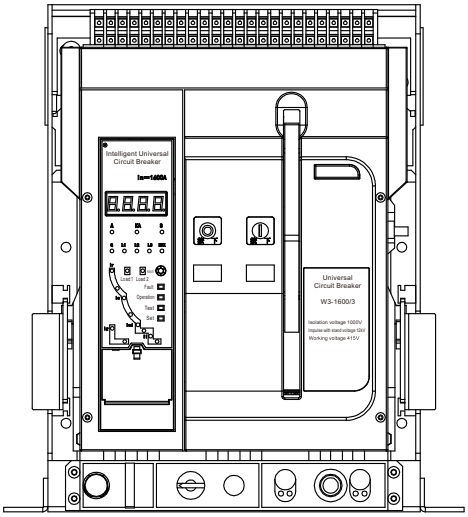
When the main feedback circuit of the circuit breaker occurs overload or short circuit or single-phase grounding and other faults, the circuit breaker trips.

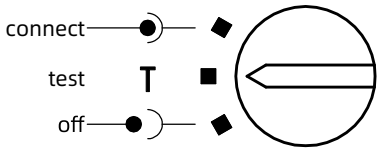


Circuit breaker trip signal through:
The tripping indication button on the controller panel pops up
Controller "Fault trip" indicating contacts (terminal number 3, 4, 5)

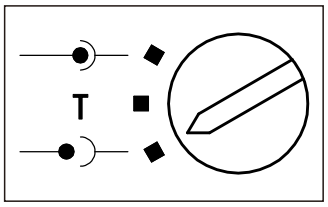
Identify the circuit breaker

Three position indicator on drawer seat indicates the position of the circuit breaker in the extraction frame



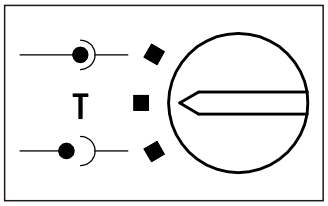


off position



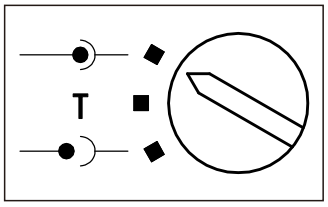
Main loop is off
arc insulation board is closed
secondary loop is off

test position



Main loop is off
arc insulation board is closed
secondary loop is off

connect position



Main loop is connected
Open arc insulation plate
secondary loop is connected

Check before install and usage

1.After unpacking the product, pls carefully read whether the parameter label matches the system (including the rated working voltage of intelligent controller, undervoltage tripper, shunt tripper, closed electromagnet, electric energy storage mechanism and other accessories).

1.After unpacking the product, pls carefully read whether the parameter label matches the system (including the rated working voltage of intelligent controller, undervoltage tripper, shunt tripper, closed electromagnet, electric energy storage mechanism and other accessories).

3.Press buttom to the "TEST" position, connect secondary loop power supply, and check whether each control accessory is working normally.

4.After confirming that there is no error, then press button to the" connection" position and put circuit breaker into operation.

Maintenance

1.Dust should be cleaned regularly to keep the insulation performance of the circuit breaker good.

2.Check the contact system regularly, especially after each short circuit current break, check whether the arc-stopping chamber is intact, whether the contact is good, and whether the connector is loose.

3.After circuit breaker reaching the life of the machine, pls contact manufacturer for maintenance.

Secondary loop wiring operation instructions

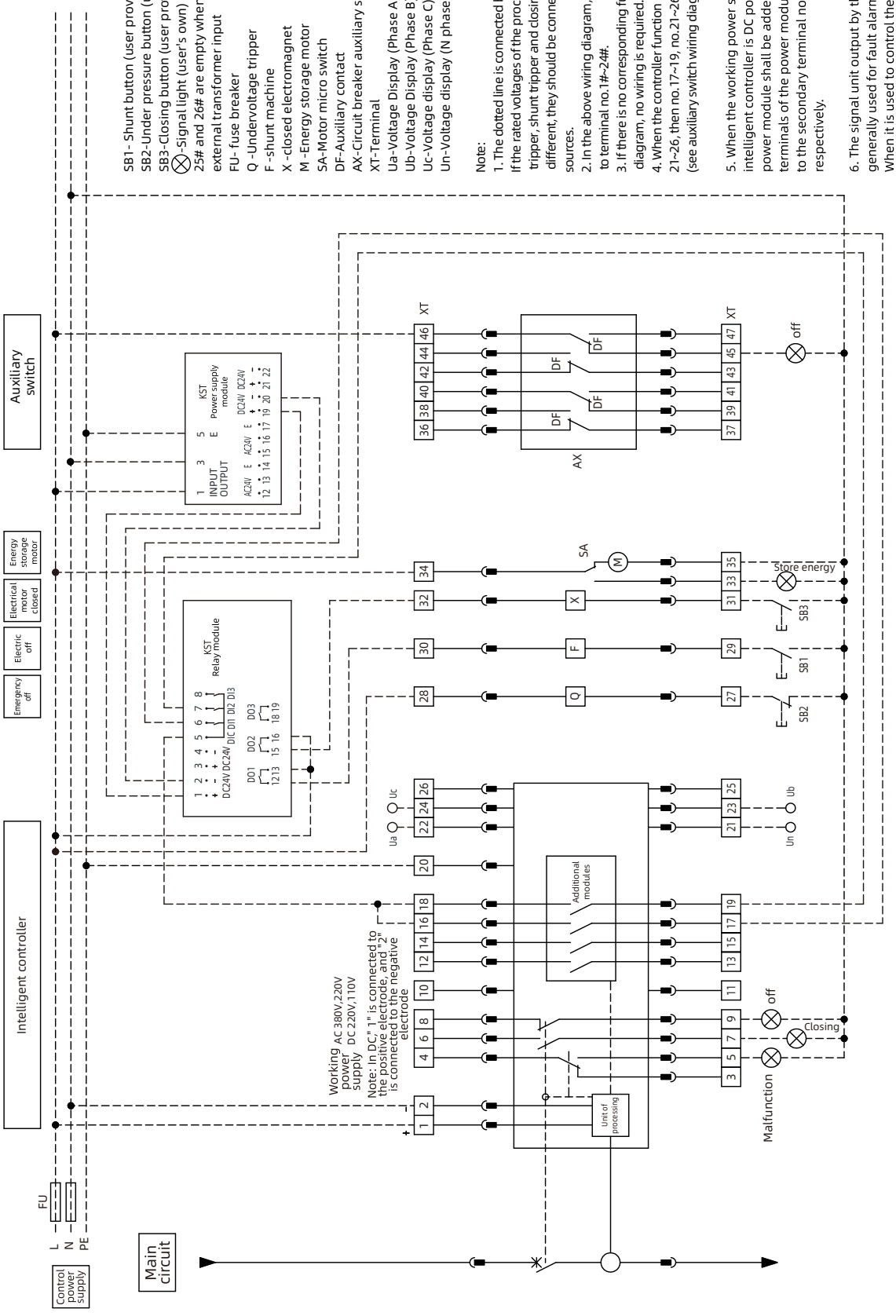
The secondary circuit wiring of this product adopts screw pressing type, please tighten the screw with across screwdriver and tighten the wire.

Primary loop wiring requirements

1.The tightening torque of the busbar connecting bolt:M10 is not less than 45Nm.

2.The connection bus should be well supported, the main circuit bus of the circuit breaker should not be subject to any direction of force, the circuit breaker must be reliably protected and grounded, the circuit breaker connection is marked with the grounding symbol

5.Secondaryloopwiringrequirements

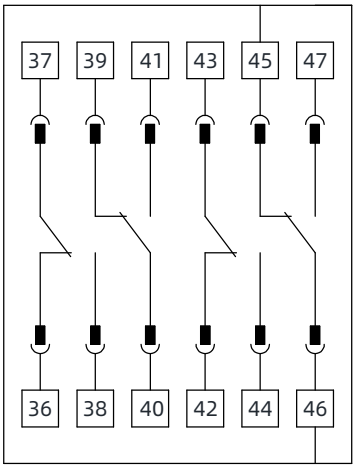


Circuit Breaker Secondary Circuit wiring diagram of 1600 frame shell Intelligent Controller

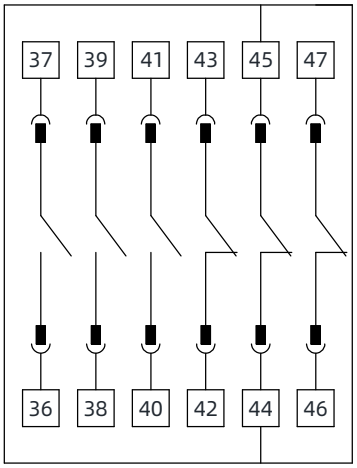
(auxiliary default four sets of conversion contacts)

W3-1600 auxiliary switch wiring diagram

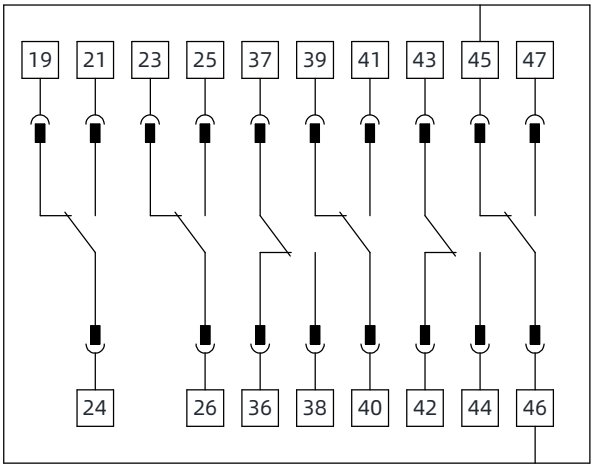
1. Four sets of conversion contacts (default configuration)



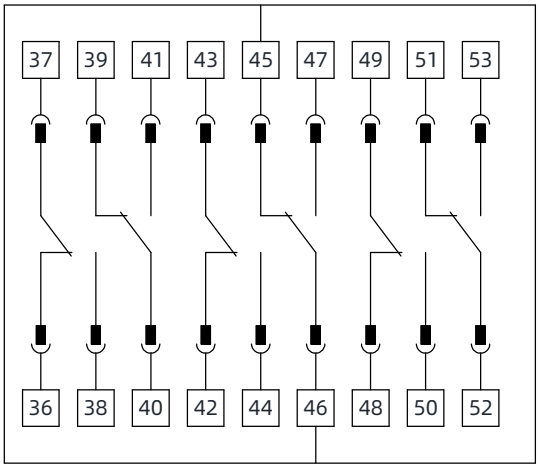
2、Three open and three closed contacts



3.1、Six sets of conversion contacts (47P terminal, suitable for L and M controller)



3.2、Six sets of conversion contacts (55P terminal, suitable for 2H, 3H and L and M controller with zero sequence transformer)



6.Instructionsforsecondarywiring

In the following table,√ is the functional wiring of the necessary accessories; o is the functional wiring of the selected accessories;
- is without this function.

terminal no.	function	Applicable controller type	
		L、M	2H、3H
1、2	Auxiliary power input	√	√
3、4、5	Fault trip contact output	√	√
6~9	6#, 7#: circuit breaker closing indication; 8#, 9#: circuit breaker opening indication	√	√
10、11	Rs485 communication (10# : P terminal; 11# : N terminal.) (simplex) remote modulation and remote communication.	-	√
12~19	Controller signal contact output (12#, 13# : the first group; 14#, 15# : the second group; 16#, 17# : Group 3:18#, 19# : Group 4.)	-	√
20	Protective ground line	√	√
21、22、23、24	Voltage display input line (21#: N phase; 22#: Phase A; 23#: Phase B; 24#: Phase C.)	-	√
25、26	Input terminal of external transformer (empty without this function)	○	○
27、28	Underpressure tripper	○	○
29、30	Shunt tripper	√	√
31、32	Closed electromagnet	√	√
33、34、35	Energy storage motor	√	√
36~55	Auxiliary switch connection terminal (45#: disconnection indication.)	√	√

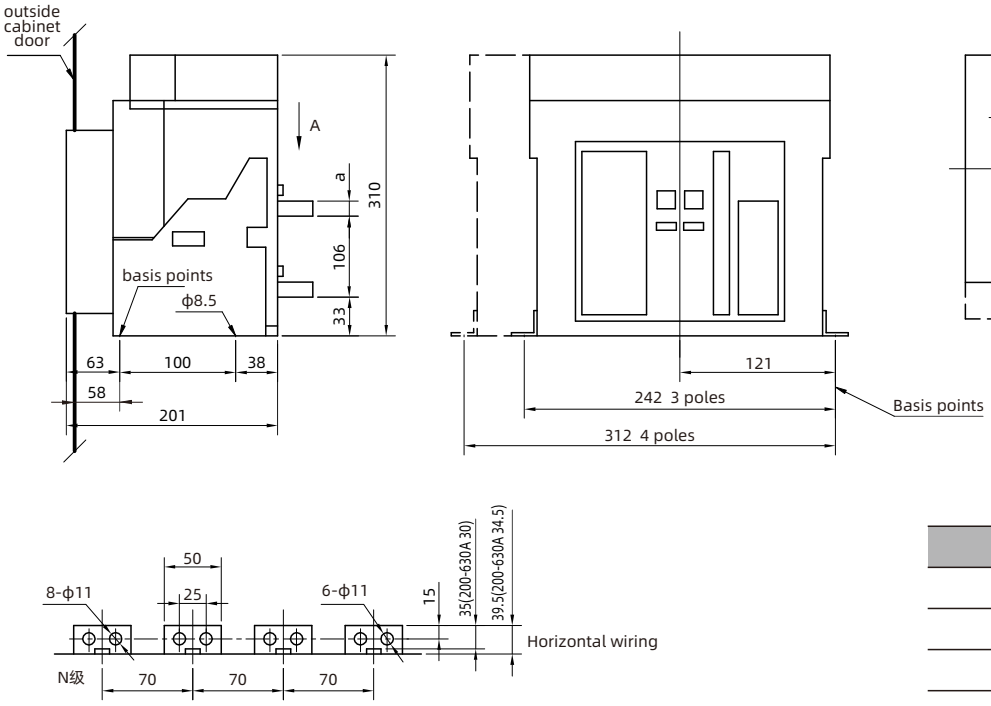
Note: In order to avoid unnecessary damage to the shunt tripper and the closing electromagnet, please connect a group of normally open (shunt) and normally closed (closing) contacts in series (can be connected in series outside the secondary terminal) before use.

Controller four sets of signal contact output terminals

Type of controller	Number of contact points				
	10、11	12、13	14、15	16、17	18、19
2H、3H	Communication interface	Load monitoring 1 Unloading signal	Load monitoring 2 Unloading signal	Remote control closing	Remote control off

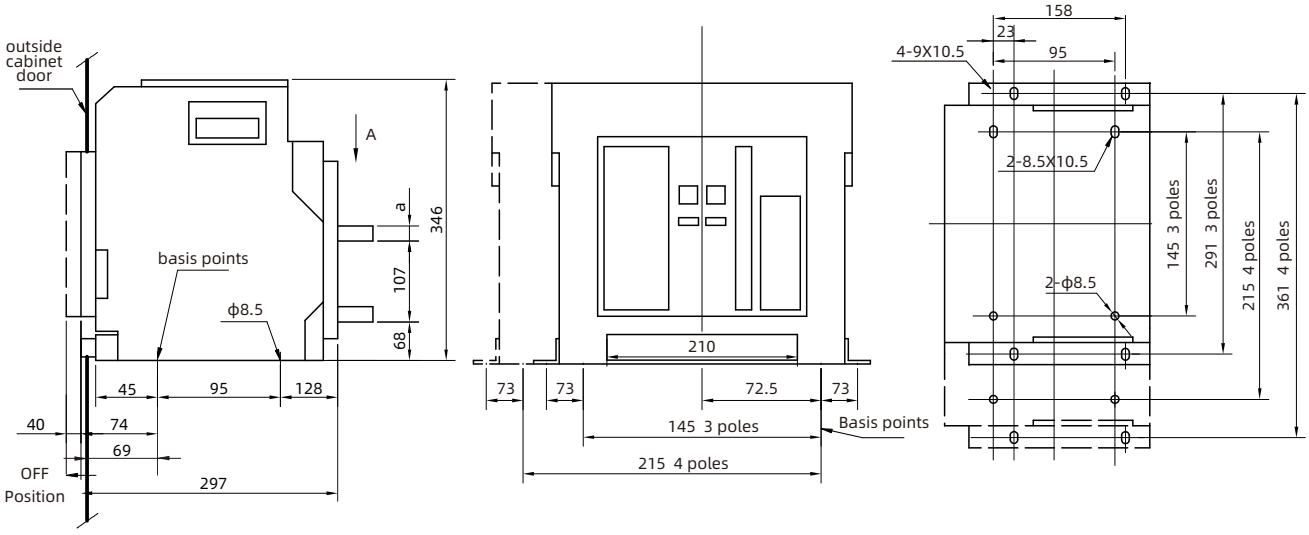
7.Appearanceandmountingdimension

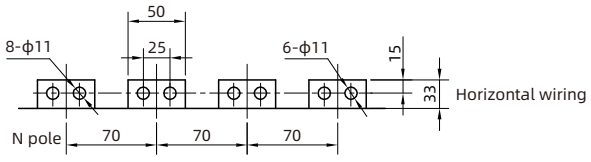
□ W3-1600/3P、4P fixed installation dimension unit: mm



In(A)	a(mm)
200~630	6
800~1000	10
1250~1600	18

□ W3-1600/3P、4P drawer type installation dimension unit: mm





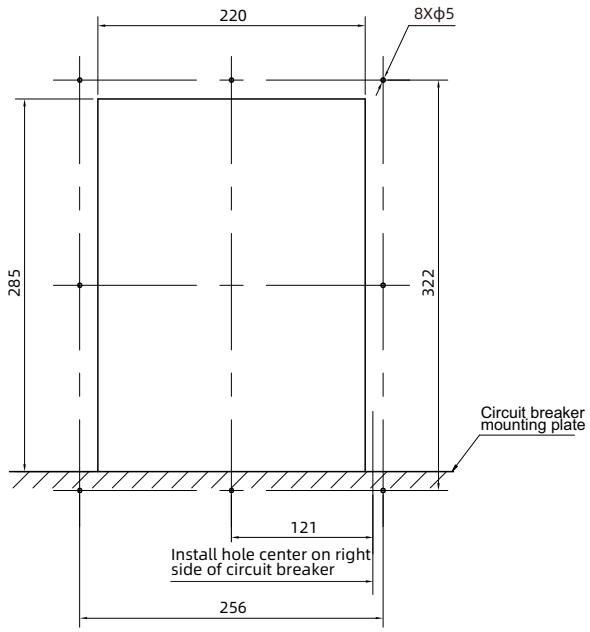
In(A)	a(mm)
200~630	6
800~1000	10
1250~1600	18

Specificationsandquantityofcopperbarsconnectedbyusers

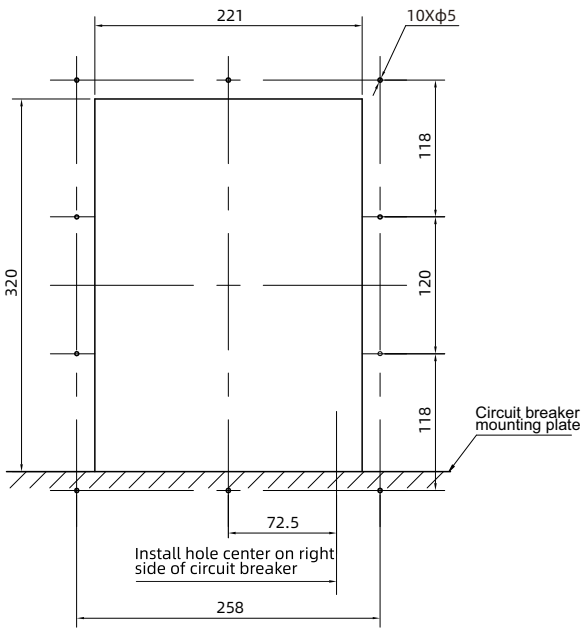
Rated current (A)	Specification of external copper bar	Number of copper bar per pole
630	40 X 5	2
800	50 X 5	2
1000	60 X 5	2
1250	80 X 5	2
1600	100 X 5	2

Doorframesizeandinstallationholespacingdiagram

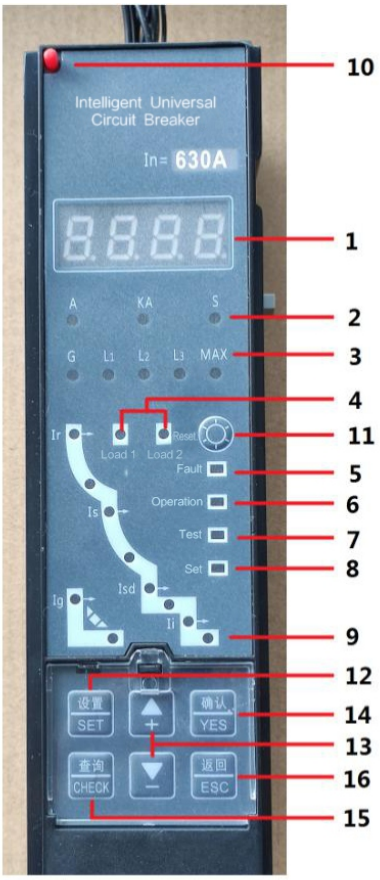
1600 fixed type



1600 drawer type



8.Displayoperationpanelofthecontroller



Controller display instructions
1,four LED digital tube display
2.Indicator light of dataunit
"A" means the four-digit LED display data unit is A;
"KA" means the four-digit LED display data unit is KA;
"S"means the unitof four-digit LED display data is S;
3,display phase indicator light
In normal operation, coefficient adjustment or fault information query, this light is always on to indicate the corresponding current phase;
"MAX" indicator indicates the maximum current phase.
4,"load one" , "load two" indicator light
5."Fault" red indicator light
This light is not on when the system is working normally.
This light is always on when a fault trip occurs.
This light flashes when querying fault information.
6."Run" green indicator light
This light always flashes as long as the controller is powered on and the controlled system is working properly.
7,"Test" yellow indicator light This light flashing means the test is in progress, this light is always on means the end of the test.
8."Setting" Green indicator light This light is always on, indicating the state of parameter setting.
9、Curve indicator light
When the protection parameter is set, the corresponding indicator light is always on to indicate the set item, the corresponding area indicator light flashes when the alarm occurs, and the corresponding indicator light is always on to indicate the fault type when the fault trips or the test ends.。
Controller button description
10.Reset button of mechanical structure
When fault trip or test trip, the button will pop out, and the circuit breaker will not close without pressing this button. 11, "Reset" small button Press this key to terminate and clear the test in the test state Press this key to clear the fault in the fault state.
12.Set key
Under normal operation, press Settings to enter the protection parameter setting state.
13,up key, down key
In running state, press up key or down key to locate and display A,B,C,N and ground current respectively. In the fault inquiry state, press the up key or down key to display the A,B,C,N, and ground currents during the fault respectively. In the setting state, press the up key or down key to modify the selected parameter value.
14.Confirm key
Press this key to save data in the parameter setting state.
15.Query key
In normal operation state, press query build to enter fault query state.
In the setting state, directly press the query to enter the non-tripping test state.
In the setting state, press the reset key first (the failure light flashes), and the npress the query to enter the tripping test state.
16.Return key
Press the return key to return the current location display to the current maximum item display,
Set the state Press return key to return to normal operation state,
Fault query status Press return key to return to normal operation status.

Controllermenustructure

Parameter setting menu		Range of setting	Step length	Default value
Load monitoring 1	Starting value	0.2-1.0In+OFF	1A	1 In
Load monitoring II	Starting value	0.2-1.0In+OFF	1A	1 In
Ground to earth protection	lg start value	0.2-1.0In+OFF	1A	OFF
	Start up delay	0.1-1.0S+OFF	0.1S	OFF
Long delay protection	Ir starting value	0.4-1.0In+OFF	1A	1 In
	Start up delay	1.5Ir		15S
Short counter time limit protection	Is start value	1.5-15In+OFF	1A	6In
Short fixed time limit protection	Isd start value	1.5-15In+OFF	1A	8In
Short fixed time limit protection	start delay	0.1-1.0S	0.1S	0.4S
Instantaneous protection	Ii start delay	frame I 1.0In-50KA+OFF	1A	12In

Overload long delay anti time limit action characteristics

Set current Ir adjustment range	(0.4-1.0)in step length 1A						
Action time tolerance ±10%	current	action time					
	1.05 Ir1	2 hours without action					
	1.30 Ir1	≤1h action					
	1.5xIr t1(s)	15.0	30.0	60.0	120	240	480
	2.0xIr t1(s)	8.43	16.9	33.7	67.4	135	270
	6.0xIr t1(s)	0.94	1.88	3.75	7.50	15.0	30.0
	7.2xIr t1(s)	0.65	1.30	2.60	5.21	10.4	20.8
Thermal simulation function	≤30min						

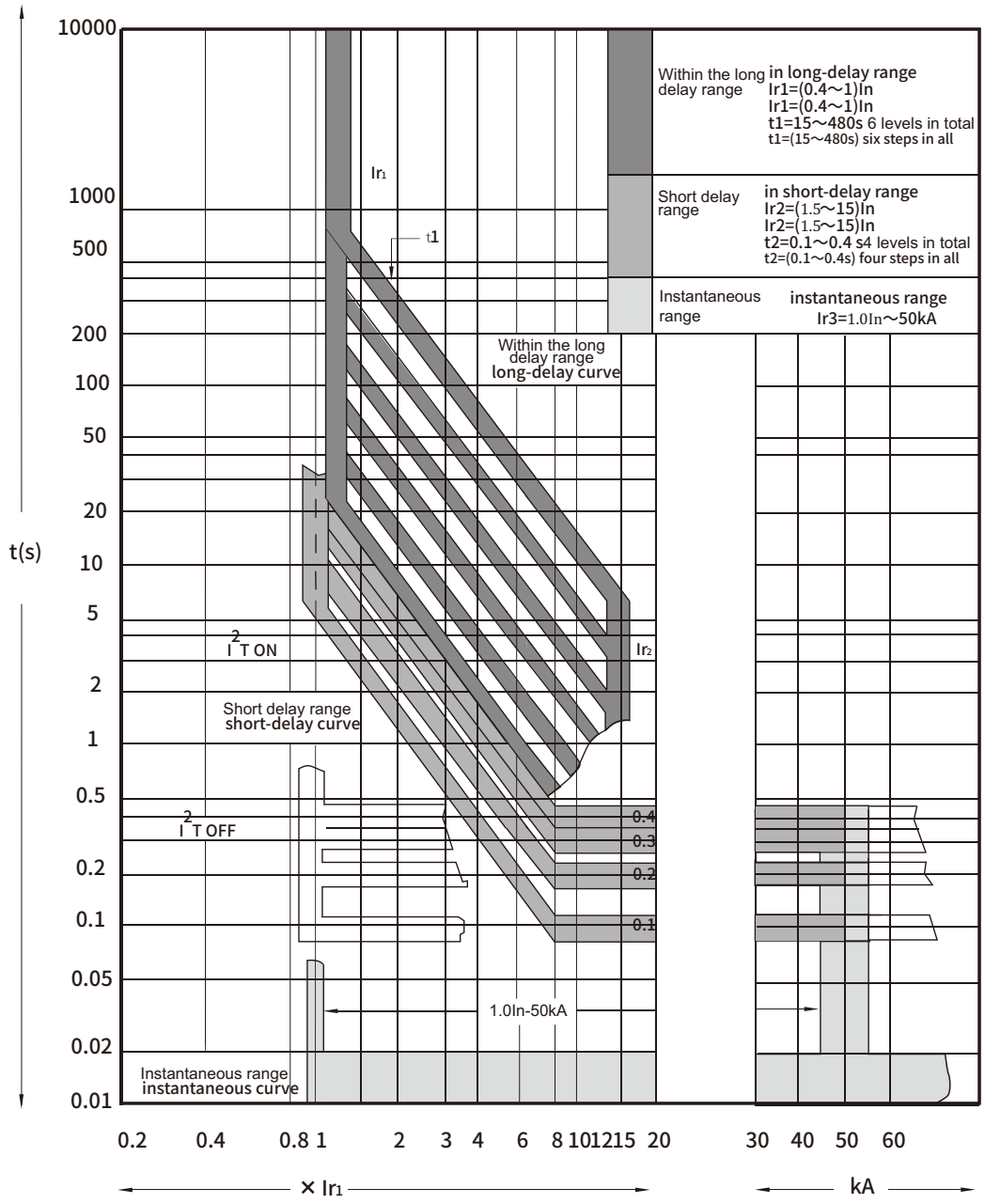
The short-circuit short-delay action feature is I^2t reverse timing feature at low multiple current; When the overload current is greater than 8Ir1, it is automatically converted to time-limited characteristics. The short delay I^2t feature can be "OFF", and the time limit feature is fixed.

Set current Ir2 adjustment range		(1.5-15)In step length 1A					
Current tolerance±10% Action time tolerance±10% Note: The maximum inherent error is+20ms	current	Action Time					
	I≥Ir2,I≤8Ir1	Inverse time limit		$I^2T2=(8Ir1)^2t2$			
	I≥Ir2,I≤8Ir1 (Or II ≥ Ir2, I ≤ 8Ir1, When the inverse time limit is OFF)	Settig Time	Fixed time limit t^2(s)	0.1	0.2	0.3	0.4
Thermal simulation function	≤15min						

■ Ground fault action characteristics

Set current Ir4 adjustment range	(0.2-1)In step length 1A											
Current tolerance ±10% Action time tolerance ±10% Note: The maximum inherent error is +20ms	Action Time											
	Fixed time limit	Setting time t4(s)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0

Time/current characteristic curve of intelligent controller



9.Installationenvironmentrequirements

The circuit breaker should be installed in a dry, dustfree, no corrosive gas, no explosive hazardous media environment, can not behit

No.	The norm
Ambient temperature	- 5 ℃ to + 40 ℃; And its 24-hour average does not exceed +35℃. Ambient temperature greater than +40℃ need to reduce capacity, can also be applied to -40℃~+70℃ (need to be customized and only applicable to L, M controller)
Relative humidity	When the highest temperature is +40℃, the relative humidity of the air does not exceed 50%. At lower temperatures, the relative humidity can be higher, such as 90% at 20℃. Special measures should be taken for the occasional condensation caused by temperature changes
Elevation of altitude	The elevation of the installation site shall not exceed 2000m
Requirements for installation	Circuit breaker installation vertical slope < 5 °
Level of pollution	Level 3
Category of use	Class B
Grade of protection	Ip30, IP40 (install protective door frame)
Type of installation	The main circuit of circuit breaker and the coil of voltage tripper, the primary coil of power converter are installed in category IV, and the other auxiliary circuits and control circuits are installed in category III
Transportation and storage conditions	-25℃~+70℃

10.Installation, inspection, use and maintenance

Installation

1.Check whether the specification of the circuit breaker meets the requirements before installation.

2.Before installation, check the insulation resistance of the circuit breaker with a 500V megohmmeter. When the surrounding medium temperature is 20℃±5℃ and the relative humidity is 50%~70%, it should not be less than 10MΩ, otherwise it should be dried and can be used until the insulation resistance meets the requirements.

3.When the circuit breaker is installed, it should be installed smoothly without additional mechanical stress, and its base should be in a perpendicular to the horizontal position and fixed with M6 screws.

4.During installation, the circuit breaker shall be reliably protected and grounded, and the grounding shall be marked with obvious grounding marks. The fixed circuit breaker shall strictly abide by the safety zone.

When the circuit breaker is installed, there should be a distance above it and it should not be close to the jumper bus. When the external bus is connected to the circuit breaker, all kinds of mechanical stress should be avoided to act on the circuit breaker.

After THE CIRCUIT BREAKER IS INSTALLED AND CONNECTED according to the relevant wiring diagram, the following operation tests and inspections should be carried out before the main circuit is powered on (the DRAWer-type circuit breaker is indicated on the drawer seat at the test position).

a) Check whether the undervoltage, shunt tripper and closing electromagnet are consistent with the operating voltage of the motor (the undervoltage tripper should be closed before the circuit breaker can be closed).

b) Pull the handle on the mask up and down, after five times, the panel displays"energy storage", and a sound of"click"is heard, the energy storage is over, press"1"button or close the electromagnet to energize, the circuit breaker is closed reliably (in the case of controller reset), pull the handle, the mechanism can not store energy again.

c) Insert the plug on the motor into the auxiliary switch, and the motor is powered on until the mask shows"energy storage", and witha"click"sound, the energy storage is over, the motor will automatically power off, press the"1"button or close the electromagnet to poweron, and the circuit breaker will be closed reliably.

d) After the circuit breaker isclosed, the circuit breaker shall be disconnected during the tripped test of the controller, whether the undervoltage, shunt tripper or the"0"buttonon the mask is used.

The use of intelligent controller

a) In the case of load current, press the"mechanical reset"button before the circuit breaker is closed, and then the circuit breaker can be put into normal operation.

b) After each test or fault trip, the"Mechanical Reset"button must be pressed first before the test or operation can be carried out again.

Maintenance of intelligent circuit breaker

Lubricating oil should be regularly injected into each rotating part during use;

Regular maintenance and dust cleaning should be done to keep the circuit breaker well insulated;

The contact system should be checked regularly, especially after each short circuit break; Check contents:

a) Arc extinguifier cover: whether the inner wall of arc extinguifier cover is broken, whether the smoke mark is cleared, whether the arc extinguifier grid is burned seriously, replace it in time according to the situation;

b) Contact system: if the contact is in good contact and the thickness of the contact is not small lmm, it should be sent to the manufacturer for replacement:

c) Connection: whether the connection parts are loose.

After maintenance to reach the electrical life, the arc extinguisher cover and contact need to be replaced;

If the mechanical life is reached without maintenance, the motor, energy storage mechanism, main contact and contact spring need to be replaced.

11. Regulare failure and failure elimination

No.	fault phenomenon	Cause of occurrence	failure elimination
1	The circuit breaker will not close	a) The undervoltage tripper has no power supply voltage and is not connected. b) After the action, the red button on the upper part of the controller panel is not reset. c) The operating mechanism does not store energy. d) The drawer body is not in the "connect" or "test" position. e) "Off position key lock" is locked.	a) Check the wiring and connect the power supply of the undervoltage tripper. b) Press the reset button. c) Energy storage of the mechanism manually or electrically. d) Transfer the circuit breaker to the "connect" or "test" position with the operate handle. e) Open the key lock with the special key.
2	The circuit breaker cannot store energy electrically	a) The power supply of the electric operating mechanism is not connected. b) Insufficient power supply capacity,	a) Check the line and connect the power supply b) Check the operating voltage should be more than 85%Ue
3	Closing the electromagnet does not close the circuit breaker	a) No supply voltage b) Insufficient power supply capacity.	a) Check the line and connect the power supply b) Check the operating voltage should be greater than 85%Ue,
4	Shunt tripper cannot disconnect the circuit breaker	a) No supply voltage b) Insufficient power supply capacity.	a) Check the line and connect the power supply b) Check the operating voltage should be more than 85%Ue
5	The fault current exceeds the long delay, short delay, instantaneous setting value port instantaneous action dry short delay and long delay action	Long delay, short delay, instantaneous setting value is not reasonable, setting in the same power supply value range.	According to principle that IR < Isd < li and its range of action, pls reset
6	Frequent tripping of circuit breaker	The overload protection tripping was caused by the overload operation on site. Because the overload hot record function failed to clear the power off in time, the gate was closed again.	The controller is powered off once. Or close the circuit breaker after 30min
7	The drawer circuit breaker operate handle cannot be inserted into the circuit breaker	The drawer guide rail or circuit breaker itself is not fully pushed into the drawer	Push the guide rail or circuit breaker body further inside, even to the bottom.
8	The drawer circuit breaker body cannot be pull out when it is under off position	a) The operate handle is not pulled out. Pls pull out the operate handle. b) The circuit breaker does not fully reach the "OFF" position.	a) Pull out the operate handle b)pls adjust the circuit breaker completely to the "OFF" position.