

GNW1-1600

USER MANUAL FOR
AIR CIRCUIT BREAKER

User Manual

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CONTENT

1. Application

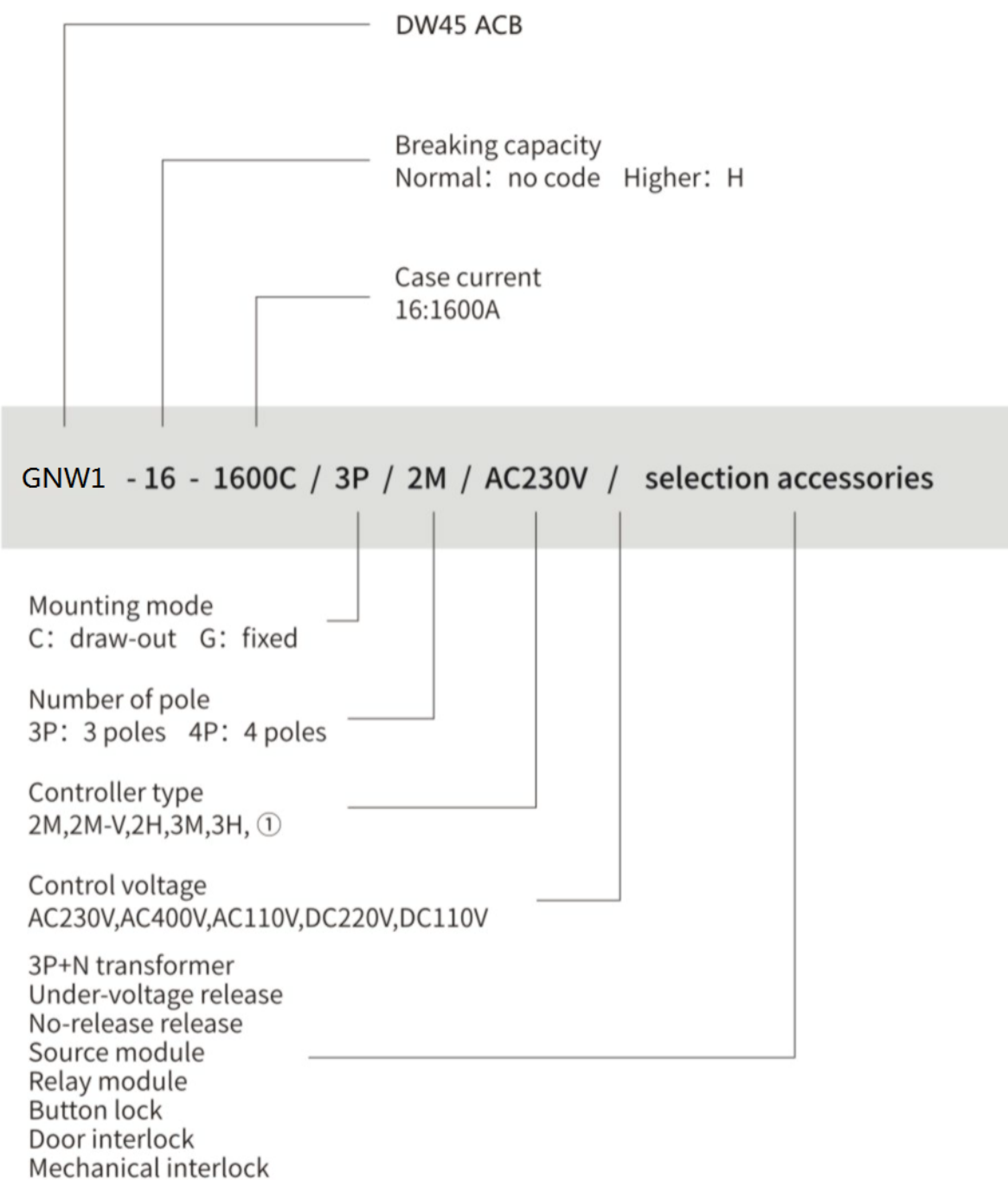
GNW1-1600 intelligent air circuit breaker (hereinafter referred to as ACB) ,which is suitable for the distribution system and distribute the power, protect circuits and power supply device against fault to over-load, under-voltage, short-circuit and single-phase grounding damage. ACB with multiple protective functions and high selection protection, which improve the reliability of power supply.

Standard:

GB/T14048.2,IEC60947-2

- Rated insulation voltage: 50Hz,AC1000V
- Rated service voltage: 50Hz,AC400V,AC690V
- Rated current: 200A~1600A
- Mounting mode: draw-out and fixed
- Connections mode: horizontal
- Operation mode: motor and manual
- Tripper type: intelligent release ,under-voltage release and shunt release
- Utilization category: B
- Level of contamination: III

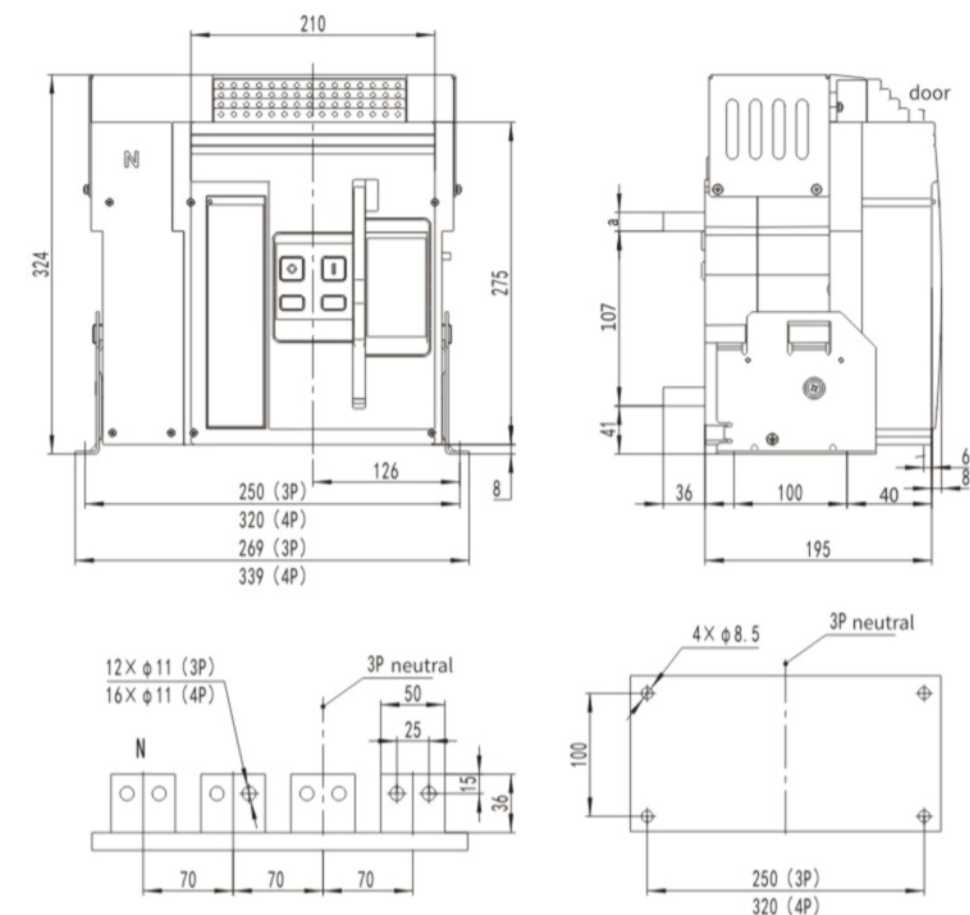
2.Type



Remarks:

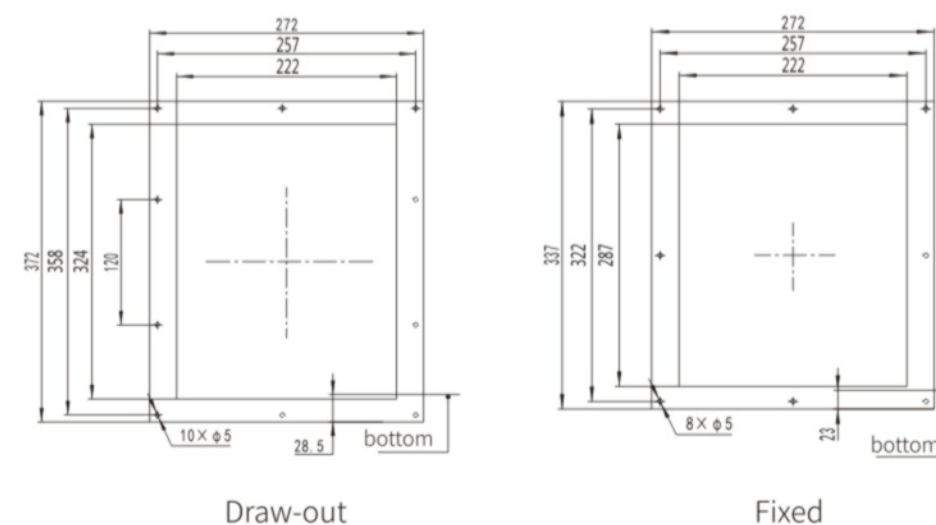
① Controller functions as per<USER MANUAL FOR 3M/3H CONTROLLER>

GNW1-1600 fixed



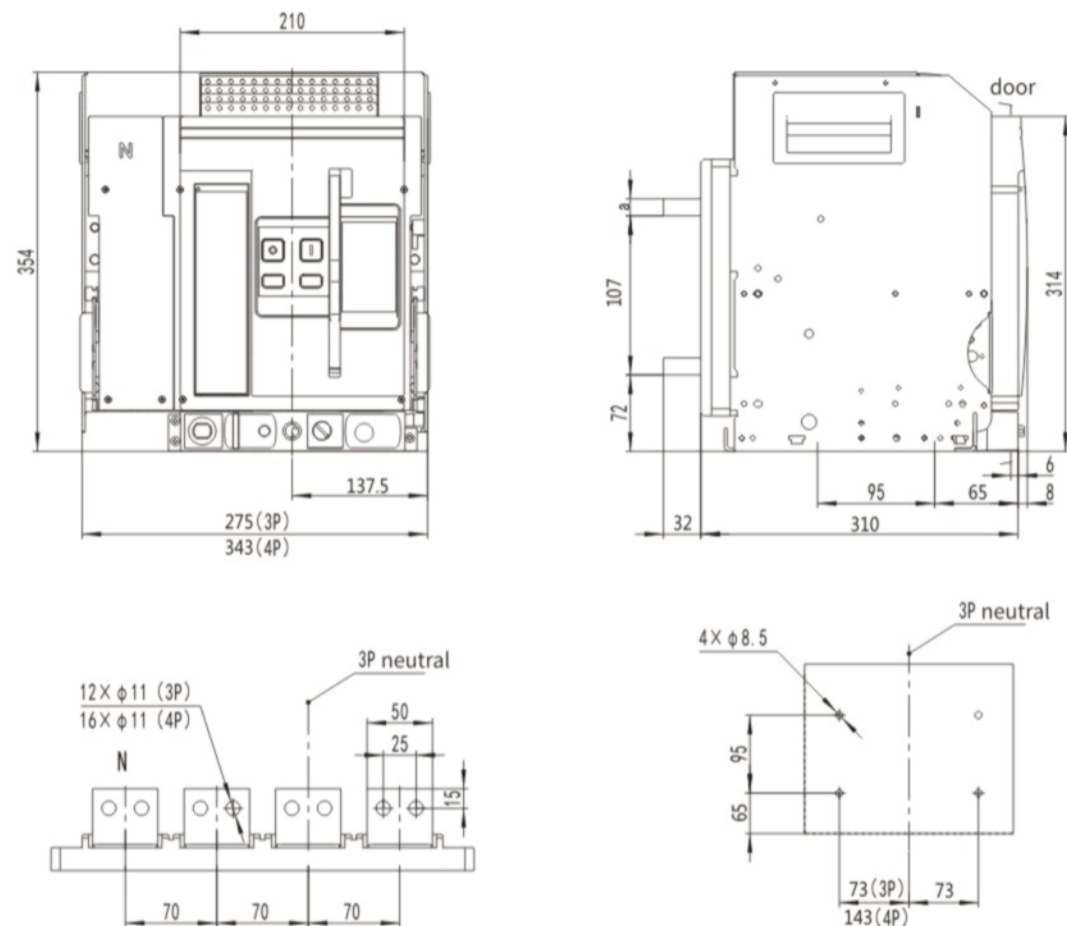
Rated current(A)	200~800	1000~1250	1600
a(mm)	5	10	18

Frame size



8.Overall & mounting dimensions

GNW1-1600 draw-out



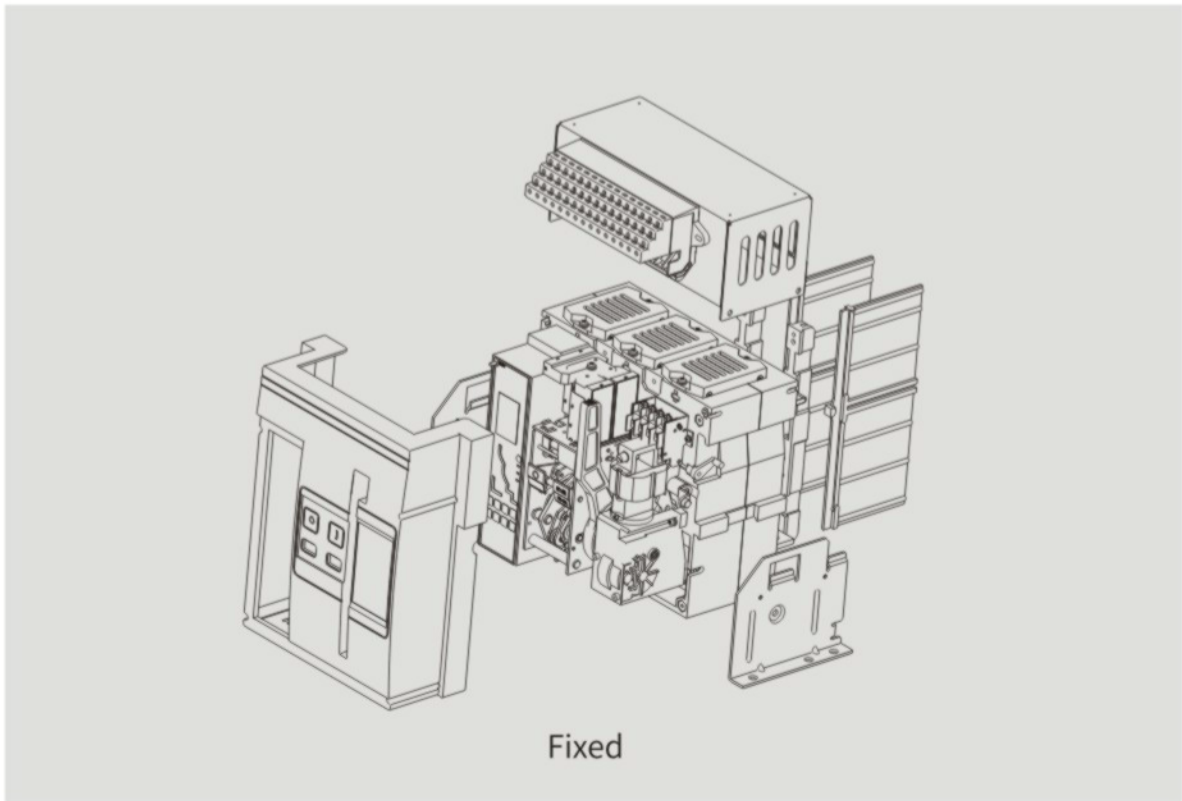
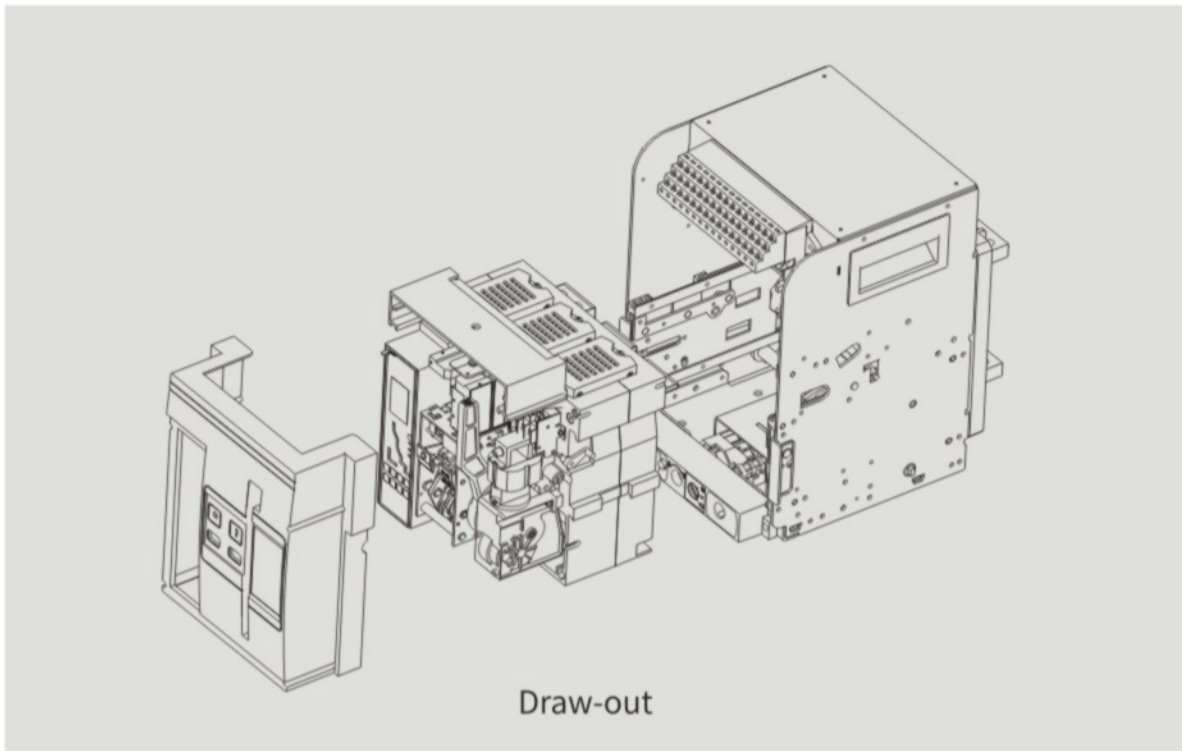
Rated current(A)	a(mm)	L(mm)
200~800	5	normal:35(default) extended:50
1000~1250	10	
1600	16	

3.Main technical parameter

ACB type			GNW1 -1600	GNW1 -1600H
Breaking capacity			Normal	Higher
Rated current(A)	In		200,400,630,800,1000,1250,1600	
Rated service voltage (V)	Ue		50Hz AC400V,AC690V	
Rated insulation voltage (V)	Ui		50Hz AC1140V	
Rated impulse withstand voltage(kV)	Uimp		12	
Number of poles	P		3,4	
Rated current for N pole(A)			100%In	
Rated ultimate short-circuit breaking capacity(kA)	Icu	400V	55	65
		690V	35	50
Rated operation short-circuit breakingcapacity(kA)	Ics	400V	42	55
		690V	35	42
Rated short-circuit withstand current(kA/1s)	Icw	400V	42	50
		690V	35	42
Rated short-circuit making capacity(kA)	Icm	400V	110	143
		690V	73.5	105
Breaking time(ms)			< 30	
Closing time(ms)			< 70	
Life(C/O period)	Mechanism		25000	
	Electric		10000	
Overall dimension: H x W x D(mm) (D no including busbar length)	Draw-out	3P	354 x 254 x 305	
		4P	354 x 324 x 305	
	Fixed	3P	324 x 269 x 203	
		4P	324 x 339 x 203	

4.Structure of ACB

ACB: draw-out and fixed type.
Draw-out type is mounted on the base and fixed type is mounted in the frame.



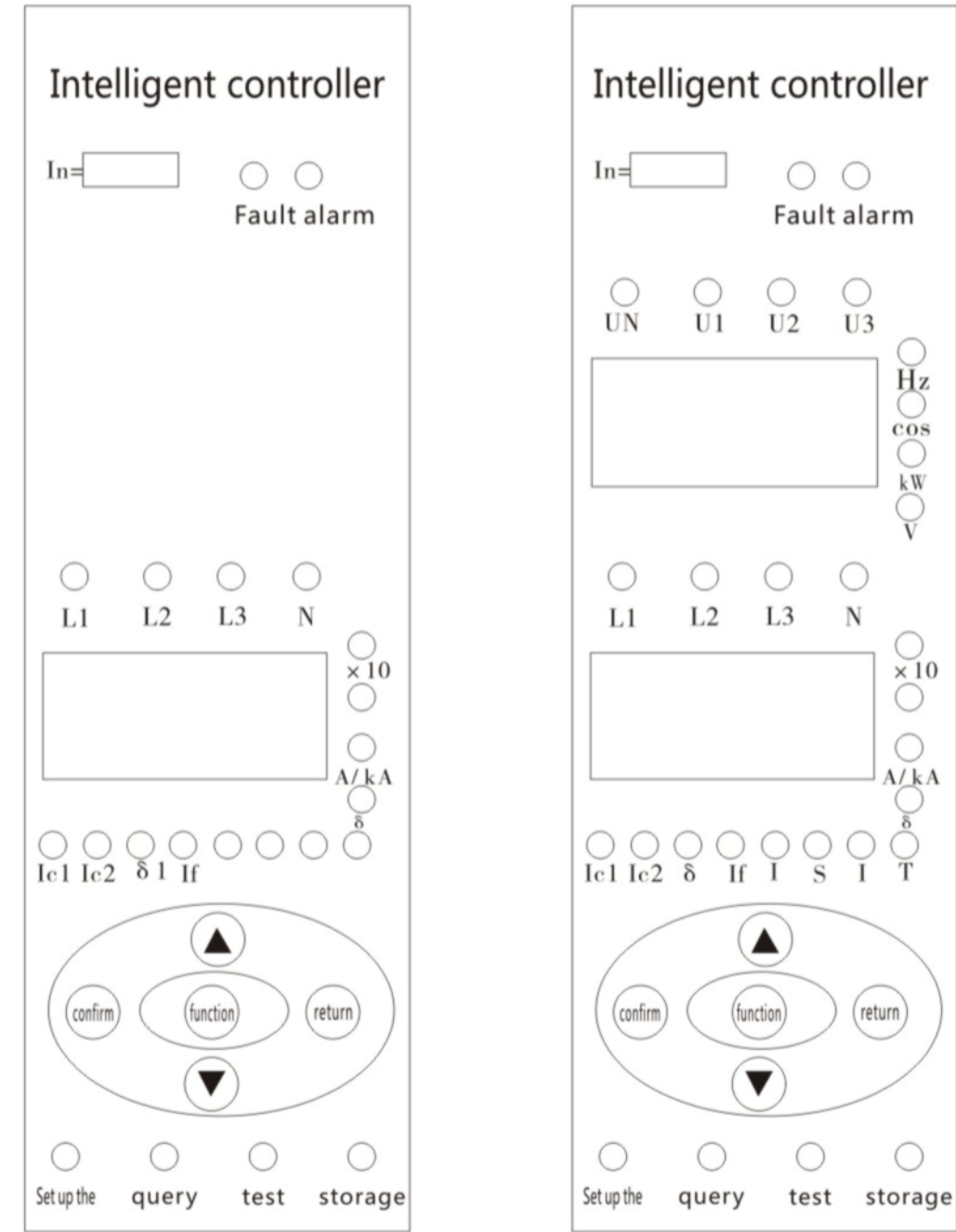
Query 8.2 normal operation parameters
Controller can automatic cycle display three current value when normal operation, when co-opted voltmeter function cycle shows that three-phase voltage value. If you want to see more running parameters, can press display parameters:
Current meter window: L1, L2, L3, N (optional) - If - the delta 1 - the delta 2 - delta 3 - % - x 10 Voltmeter window: UAB UBC - UCA - UA UB - UC

1, the current meter window display parameters
"%" when the light is bright, display value to contact wear
"X 10" when the light is bright, display value of circuit breaker has been closing operation"Delta", "%", "L1 / L2 / L3" lamp light at the same time, the display value of the corresponding phase imbalance rate "If" and "A/kA" when the light is bright, the display value of phase current N "L1 / L2 / L3" and "A/kA" lamp light at the same time, the display value of the corresponding phase current "N" and "A/kA" lights at the same time, according to the phase current value of N "A/kA kA lights flash," said A constant light

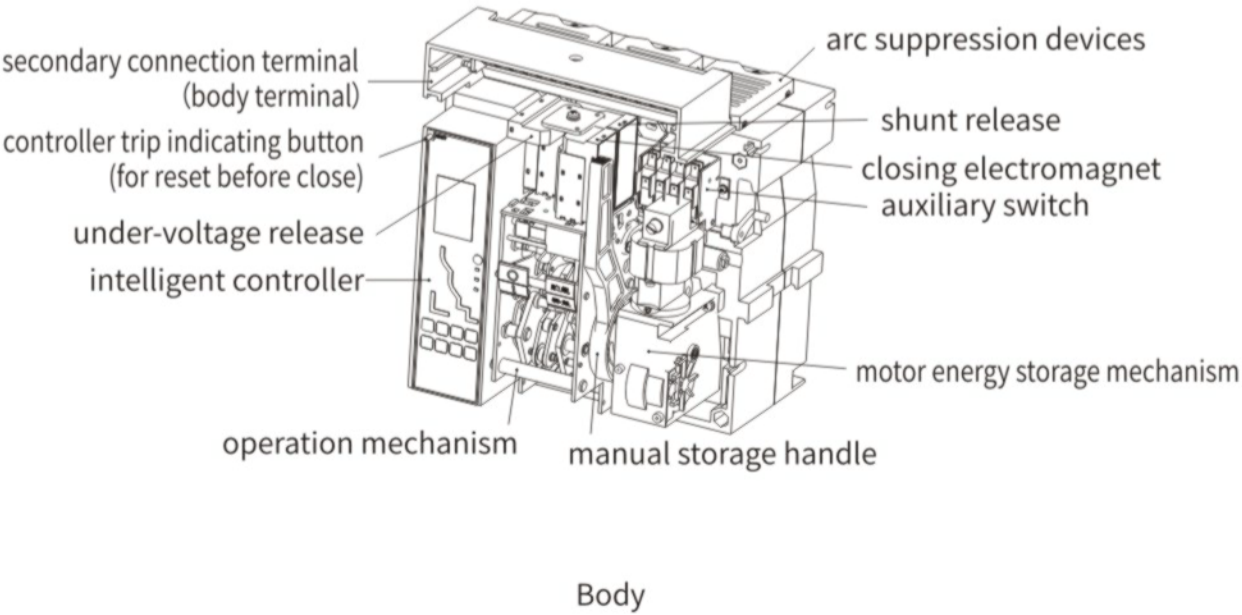
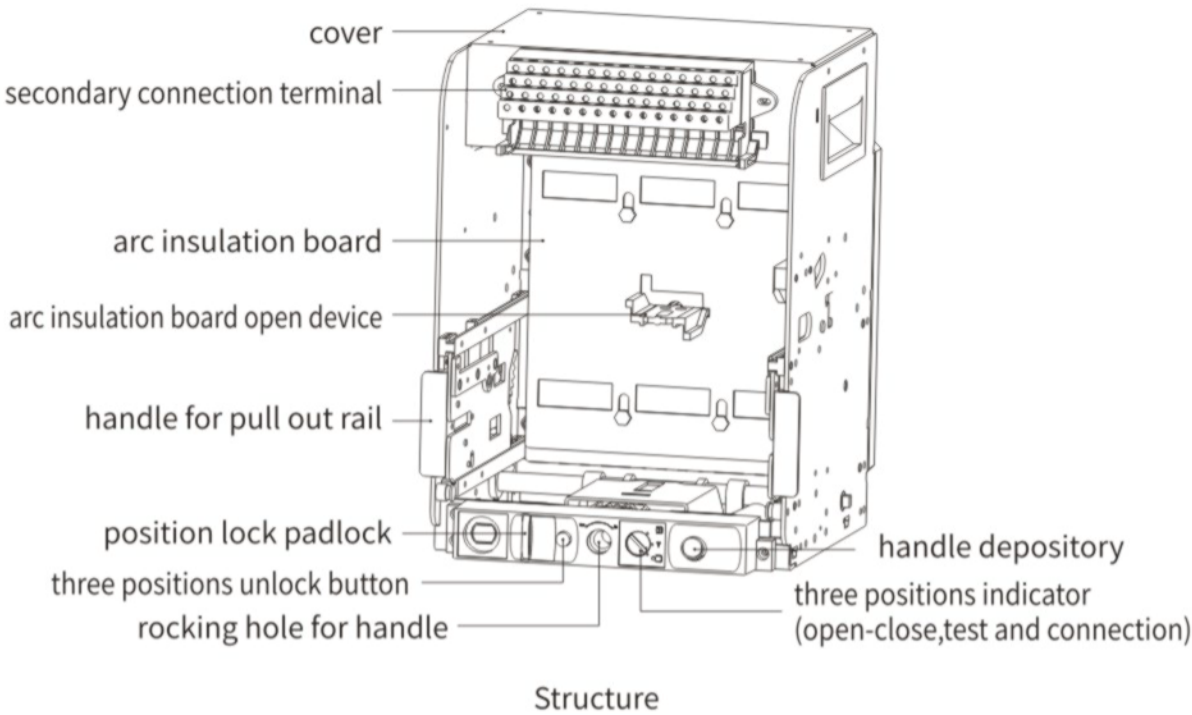
2, voltmeter, window display parameters
"1, 2, 3," in a lamp and "V" lights at the same time, according to three phase line voltage respectively "1, 2, 3," in a light, "N" and "V" lamp lit at the same time, respectively corresponding to the phase of the phase voltage When the "T" light on the control panel, said have self-diagnosis fault, press [sure] shows fault code. Such as the fault has been ruled out, according to the [return] key to clear the diagnosis fault "T" lamp, back to normal state; If you have multiple failure diagnosis, press loop to check the failure code. The fault code table 14:

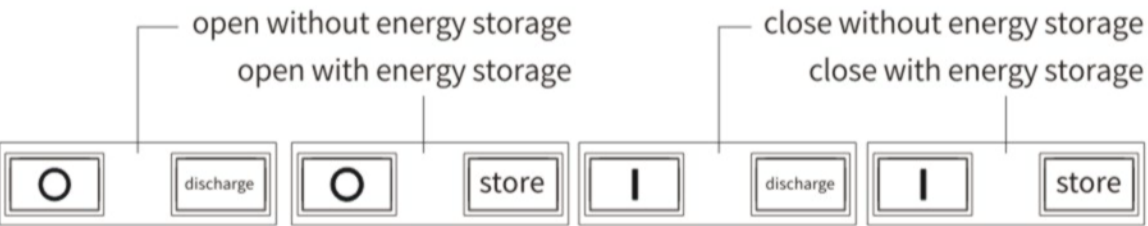
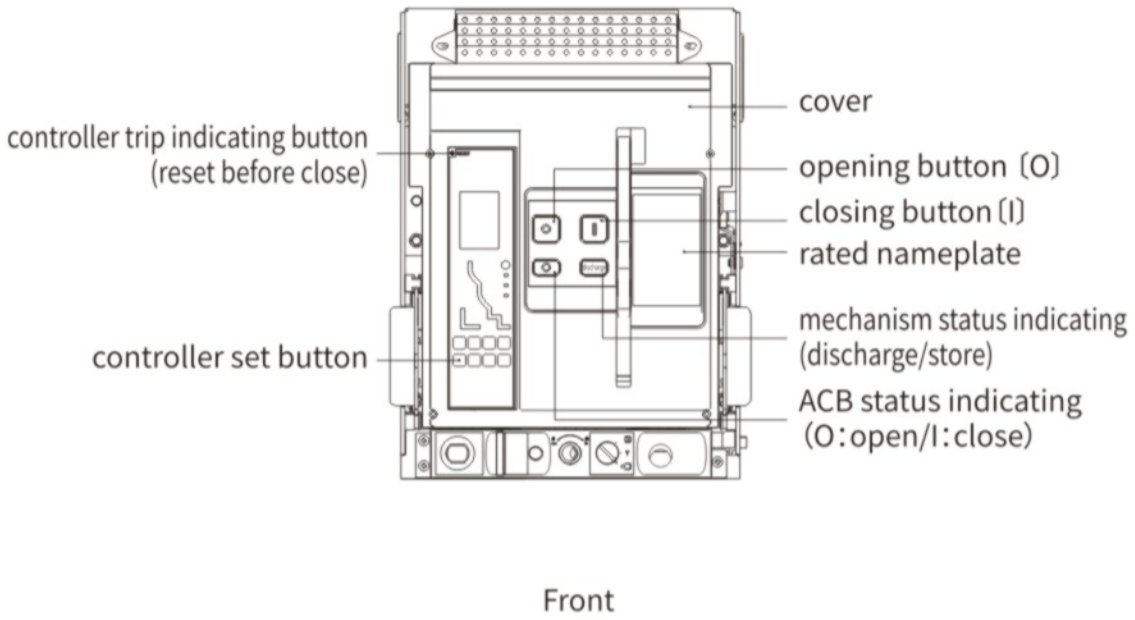
8, GNW1-1600 - M/H type intelligent controller instructions

8.1 TGW45 -1600 - M/H type intelligent controller panel figure



GNW1-1600 - M/H intelligent controller panel

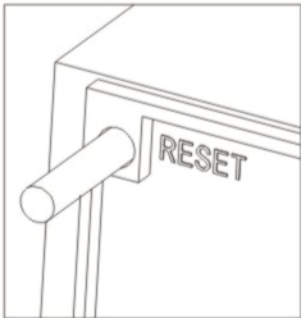




controller trip indicating button reset status



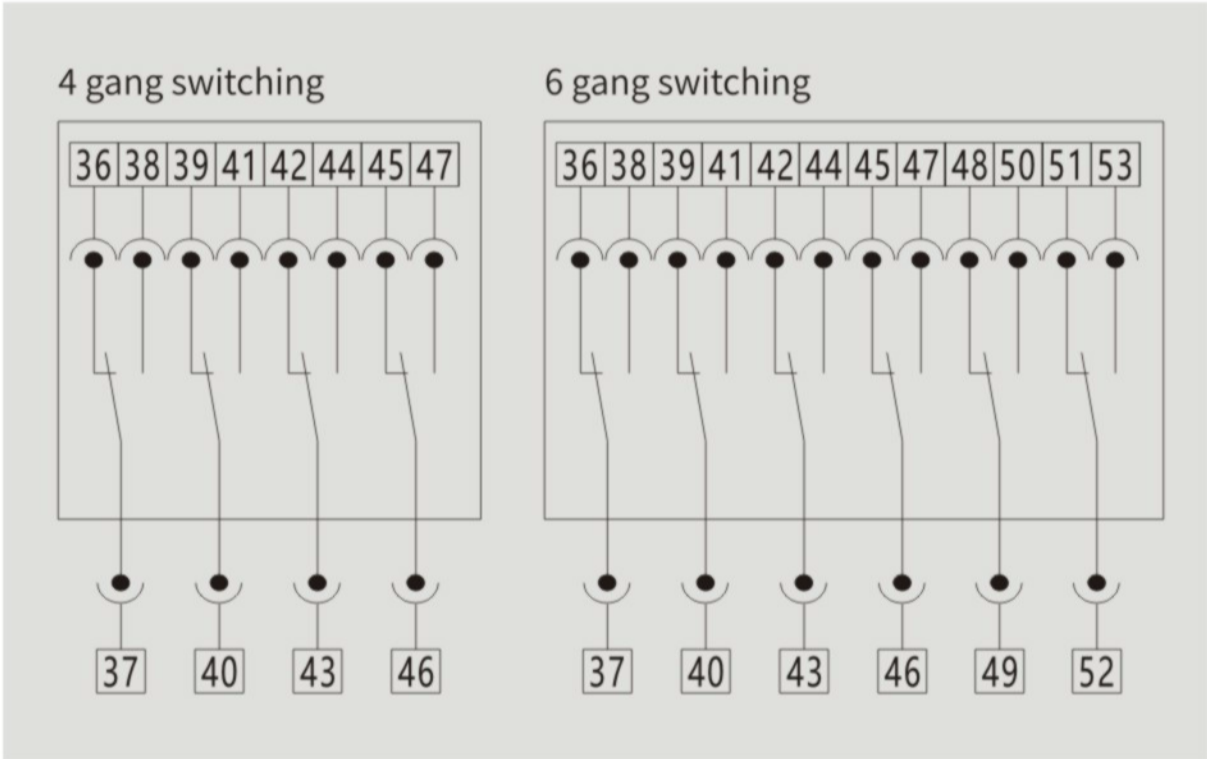
controller trip indicating button popping status



Status drawing

Q under-voltage release (no-voltage release)	F shunt release	X closing electromagnet	M motor store mechanism
HL1 fault to trip indicating	HL2 motor energy storage finish indicating	SB1 closing button	SB2 opening button
SB3 under-voltage button	SA motor travel switch for motor energy storage	FU fuse	

Auxiliary switch connections



M type controller secondary circuits terminals

1,2: auxiliary power supply incoming terminal for intelligent controller. auxiliary power supply is DC which add power module	20: controller grounding
3,4,5: signal contacts for release fault to trip indicating, 4 for common terminal	21,22,23,24: N,A,B,C phase voltage signal incoming (for selection)
6,7 & 8,9: two sets of auxiliary open contacts for ACB(for selection)	25,26: external connections N pole or incoming terminal of earth current transformer
10,11: /	27,28: under-voltage release (no-voltage release)
12,13: group 1 controller signal outgoing terminal(for selection)	29,30: shunt release
14,15: group 2 controller signal outgoing terminal(for selection)	31,32: closing electromagnet
16,17: group 3 controller signal outgoing terminal(for selection)	33,34,35: motor operation mechanism (34 for common terminal)
18,19: group 4 controller signal outgoing terminal(for selection)	36~47: auxiliary switch (4 gang switching default)

H type controller secondary circuits terminals

1,2: auxiliary power supply incoming terminal for intelligent controller. auxiliary power supply is DC which add power module	20: controller grounding
3,4,5: signal contacts for release fault to trip indicating,4 for common terminal	21,22,23,24: N,A,B,C phase voltage signal incoming
6,7 & 8,9: two sets of auxiliary open contacts for ACB(for selection)	25,26: external connections N pole or incoming terminal of earth current transformer
10,11: communication port	27,28: under-voltage release (no-voltage release)
12,13: load monitor 1(default)	29,30: shunt release
14,15: load monitor 2(default)	31,32: closing electromagnet
16,17: opening signal output	33,34,35: motor operation mechanism (34 for common terminal)
18,19: closing signal output	36~47: auxiliary switch (4 gang switching default)

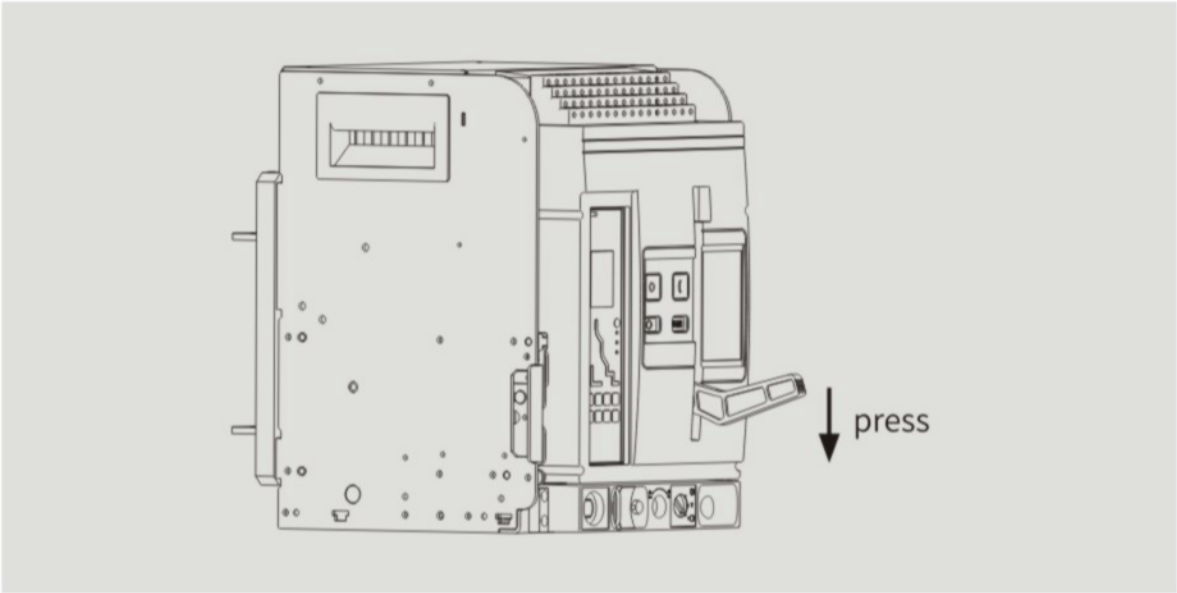
5.Use of ACB

ACB energy storage

Energy storage for operation mechanism spring before ACB close. One is manual energy storage, the other is motor energy storage.

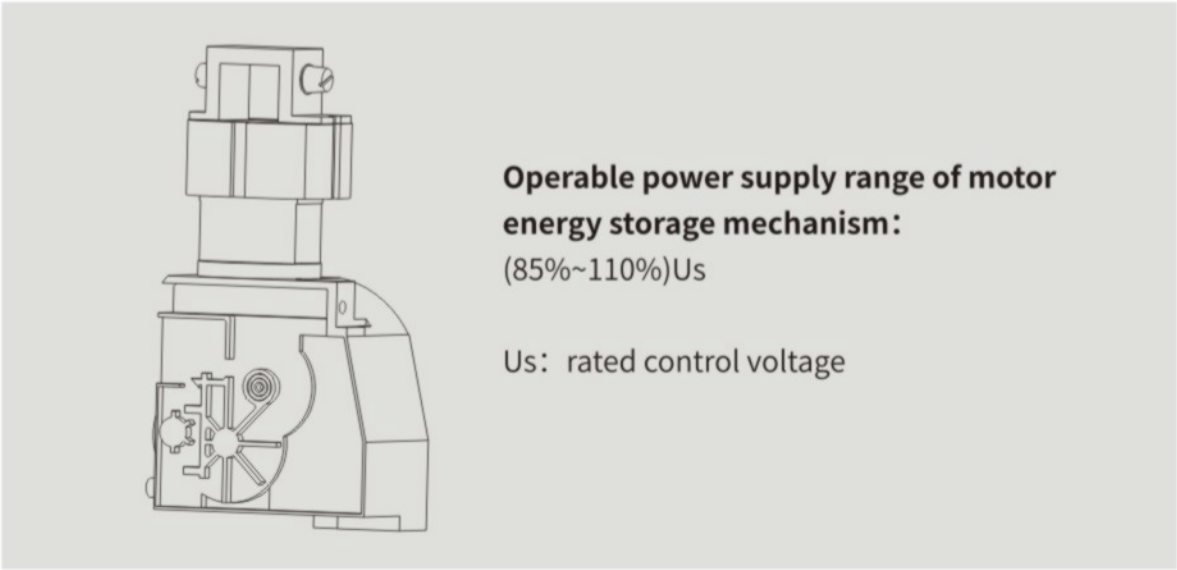
● Manual energy storage

Repeatedly press handle 6~7 times till listen to “click”.At that time mechanism status indicating from “discharge” to “store” and finish energy storage.



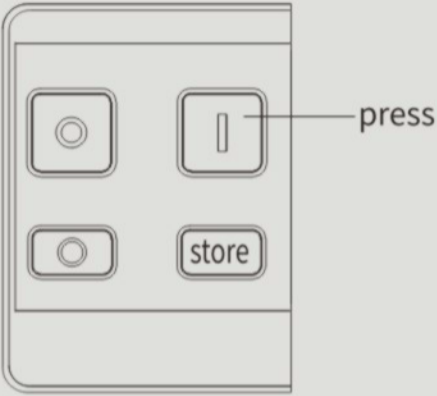
● Energy storage automatically

Energy storage automatically again closing each time if mounting motor energy storage mechanism.



ACB closing

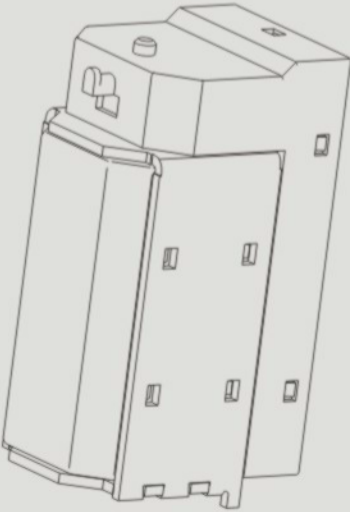
- ON button (I) on the cover or close electromagnet for close
- ON button (I)
- Press ON button(I),mechanism status indicating from"store" to "discharge",status indicating from "O" to "I",then close.



ACB closing requirement:

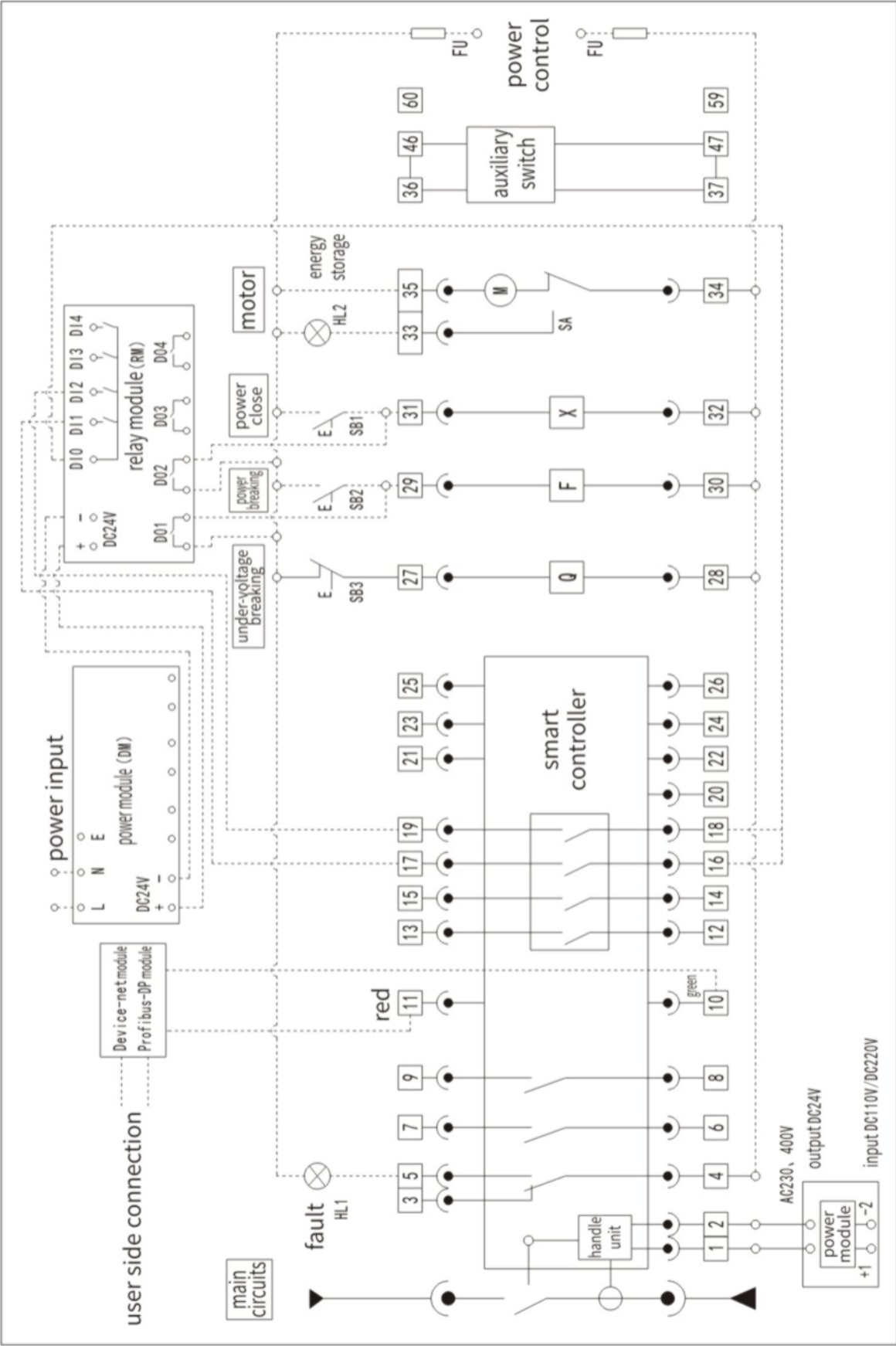
- In the position of OFF (O)
- Operation mechanism store
- Controller trip indicating button reset status
- Without trip order

- Closing electromagnet
- ACB with closing electromagnet. Press electric closing button can be close ACB.



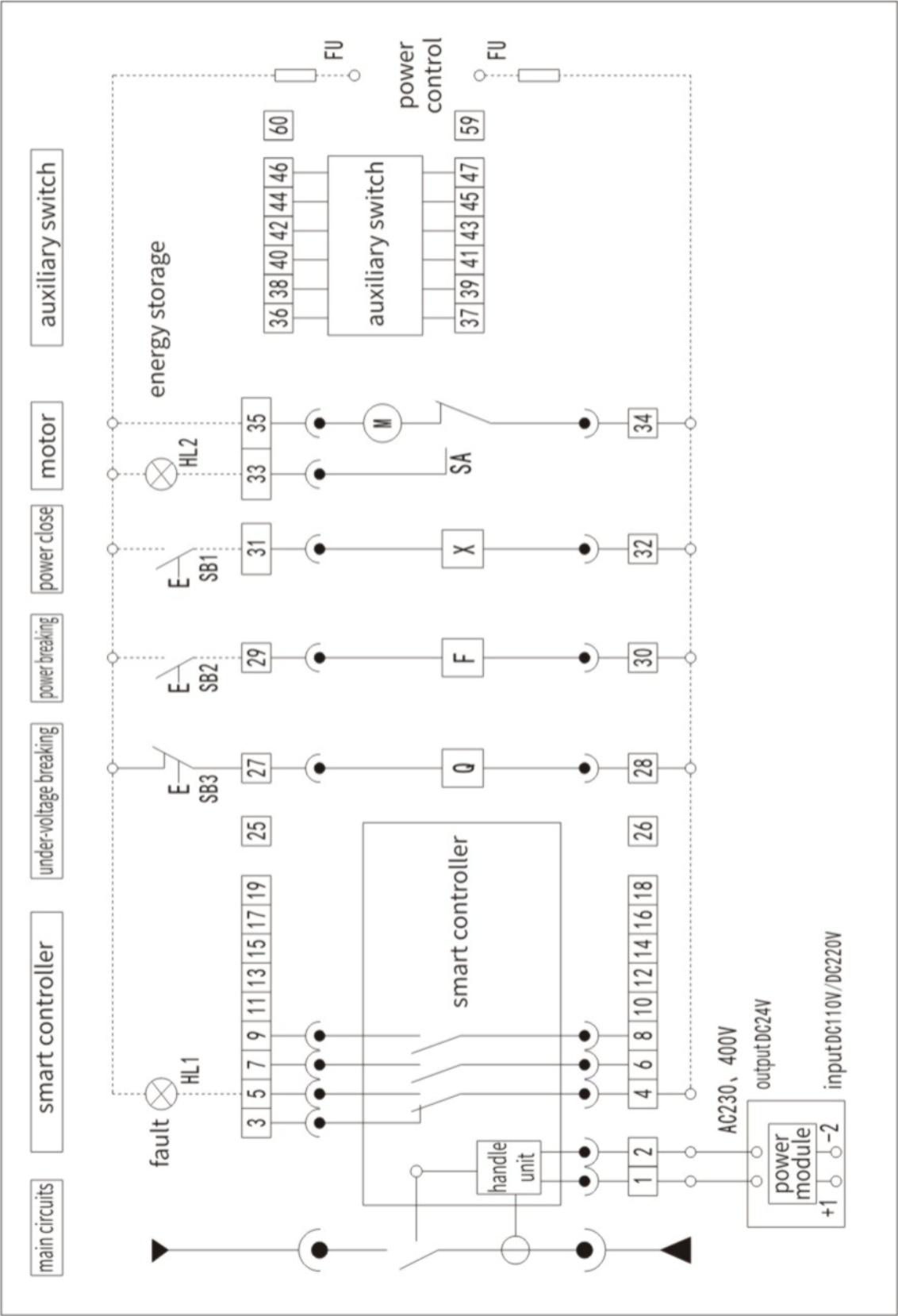
operable power supply range of close electromagnet :
(85%~110%) Us

H type controller electric connections



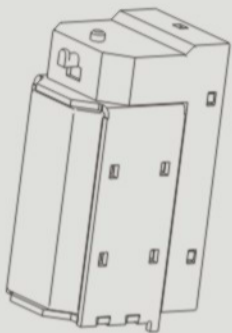
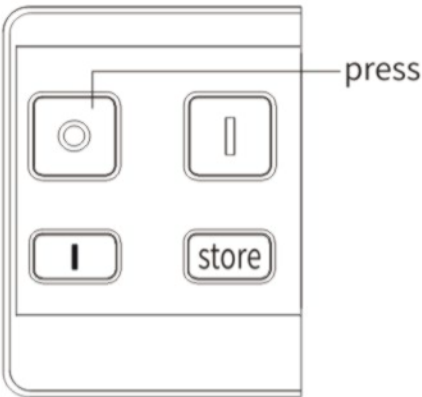
7.Secondary circuits diagram

M type controller electric connections



ACB off

- OFF button(O)
Press OFF button(O), status indicating from “I”to“O”,then off.



- Shunt release
ACB with shunt release. Press electric off button can be off ACB.
Operable power supply range of shunt release:
(70%~110%) U_s

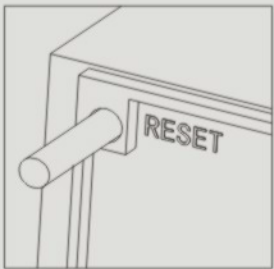
- Under-voltage release
ACB open is managed remotely if mounting under-voltage release.

Under-voltage release action characteristics

- 35%~70% U_e , ACB off
- < 35% U_e ,ACB cannot be close
- 85%~110% U_e ,ACB close reliable
- U_e : rated service voltage



- Intelligent release trip
ACB trip if main circuits of ACB for fault to over-load, short-circuit and single-phase grounding.

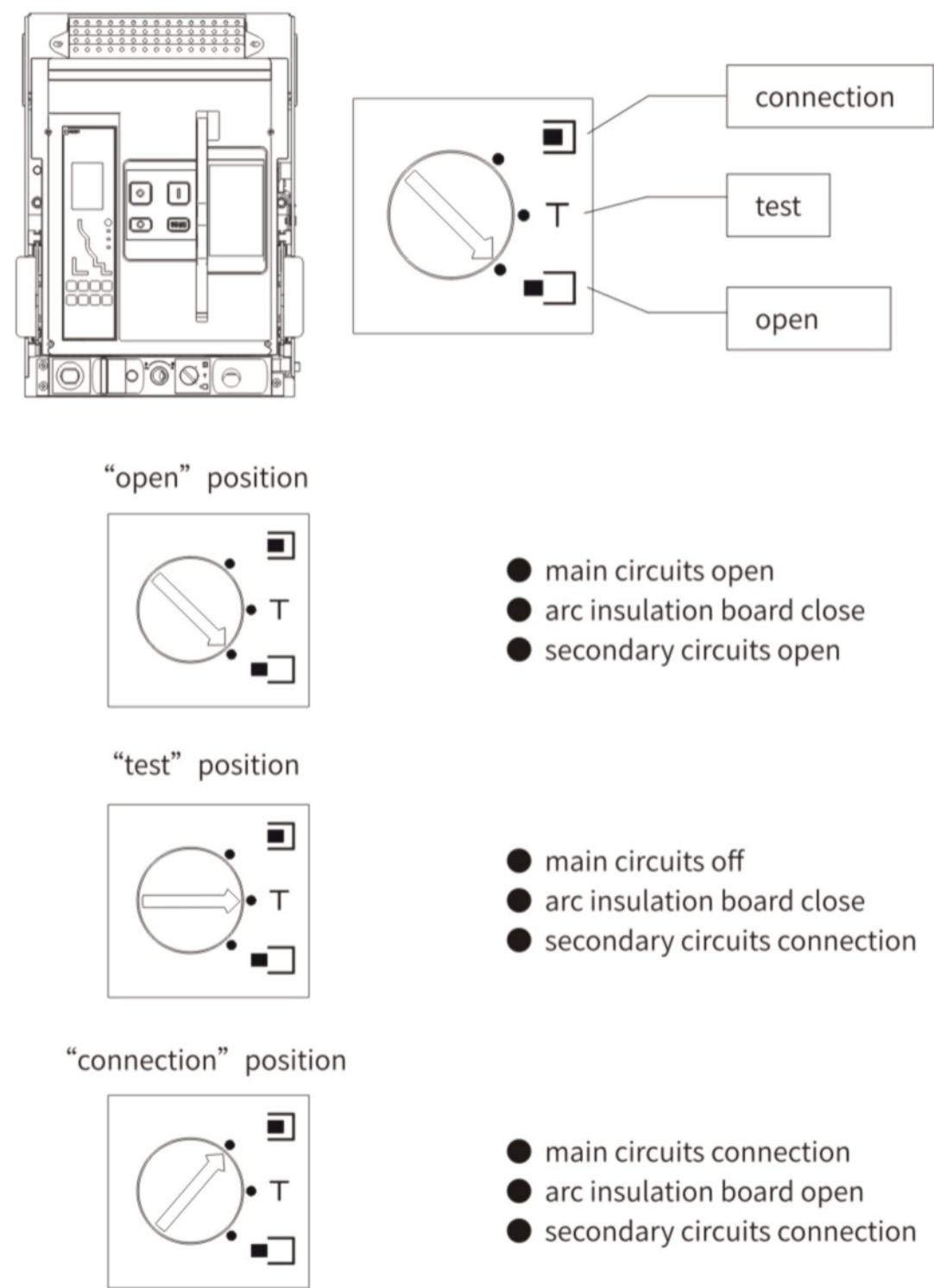


ACB trip signal:

- trip indicating button popping on ACB interface
- controller “fault to trip” indicating contacts (3,4,5 for terminal code)

Identify ACB position

Three positions indicator of draw-out base for frame position.



6.Mounting ambient

ACB shall have an adequate mounting conditions with dry heating, dust-proof, non-erosive gas and non-explosive and dangerous dielectric and ACB cannot be knocked out.

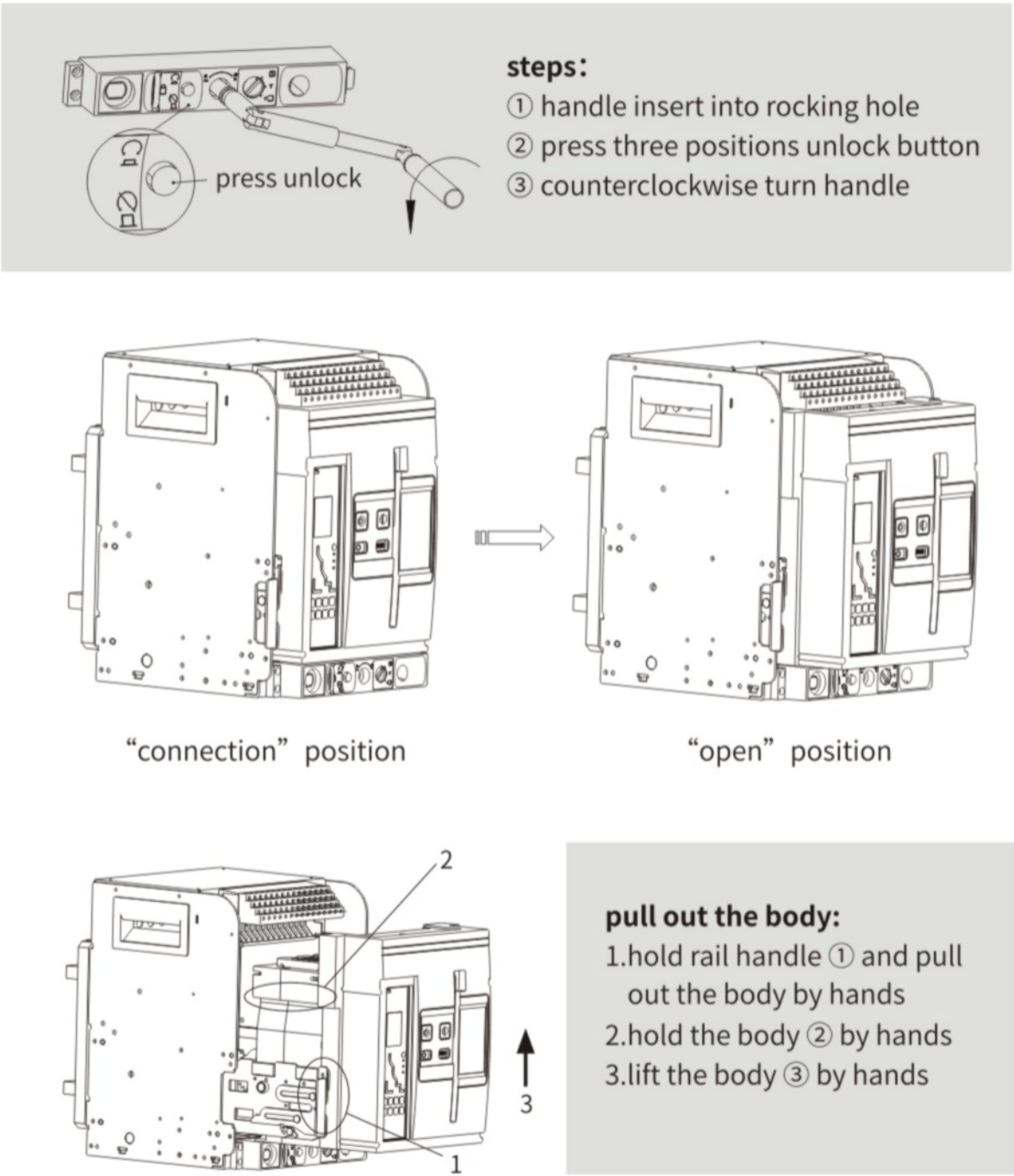
Items	Standard
Ambient temperature	-5°C ~+40°C; the average value no more than +35°C within 24 hours. Ambient temperature > +40°C ,which shall berating capacity.
Relative humidity	max. temperature up to+40°C ,relative humidity no more than 50%.Higher relative humidity while lower temperature, for example,20°C up to 90%.To make provision for occasional incur due to dewing.
Site altitude	≤ 2000m
Mounting requirement	mounting perpendicularity angularity ≤ 5°
Level of contamination	III
Utilization category	B
Protection class	IP30、 IP40(mounting protective frame)
Mounting category	main circuits, voltage release coil, primary coil of power supply transformer: IV .Auxiliary circuits and control circuits: III
Transport & storage conditions	-25°C ~+55°C

Common tackle the fault solutions:

Fault	Probable causes	Solutions
cannot be close	Under-voltage release no suction	Voltage of under-voltage release $> 85\% U_e$
	Fault button no reset	Test circuits after fault to trip. Press fault to reset button after clear the fault
	Draw-out ACB no turn completely	Body turn "connection" position
	Operation mechanism no energy storage	Mechanism energy storage and indicating "store"
	interlock	Lock ACB
	Open button lock	Test open button whether is lock
cannot be open	Low control voltage of shunt release	Test circuits and voltage
	Open button (O) lock by things	Test the button and clear after remove the cover
cannot be store	Energy storage handle by things	Test energy storage handle and clear
	Low voltage of motor energy storage mechanism	Test circuits, the voltage $> 85\% U_s$
cannot pull out from "open" position	ACB lock by things	Clear the things
	ACB no turn "open" position completely	Turn ACB body to "open" position
handle cannot insert into the rocking hole	Pull out the position lock padlock	Padlock reset
cannot turn the handle	Lock three positions of ACB body	Press unlock button and unlock
cannot press the unlock	Body is in connections/test position	Sway handle softly and press the button
trip	Fault to main circuits	Test circuits according to controller menu
	Under-voltage release action	Test circuits, main circuits voltage $> 85\% U_e$

Draw-out body

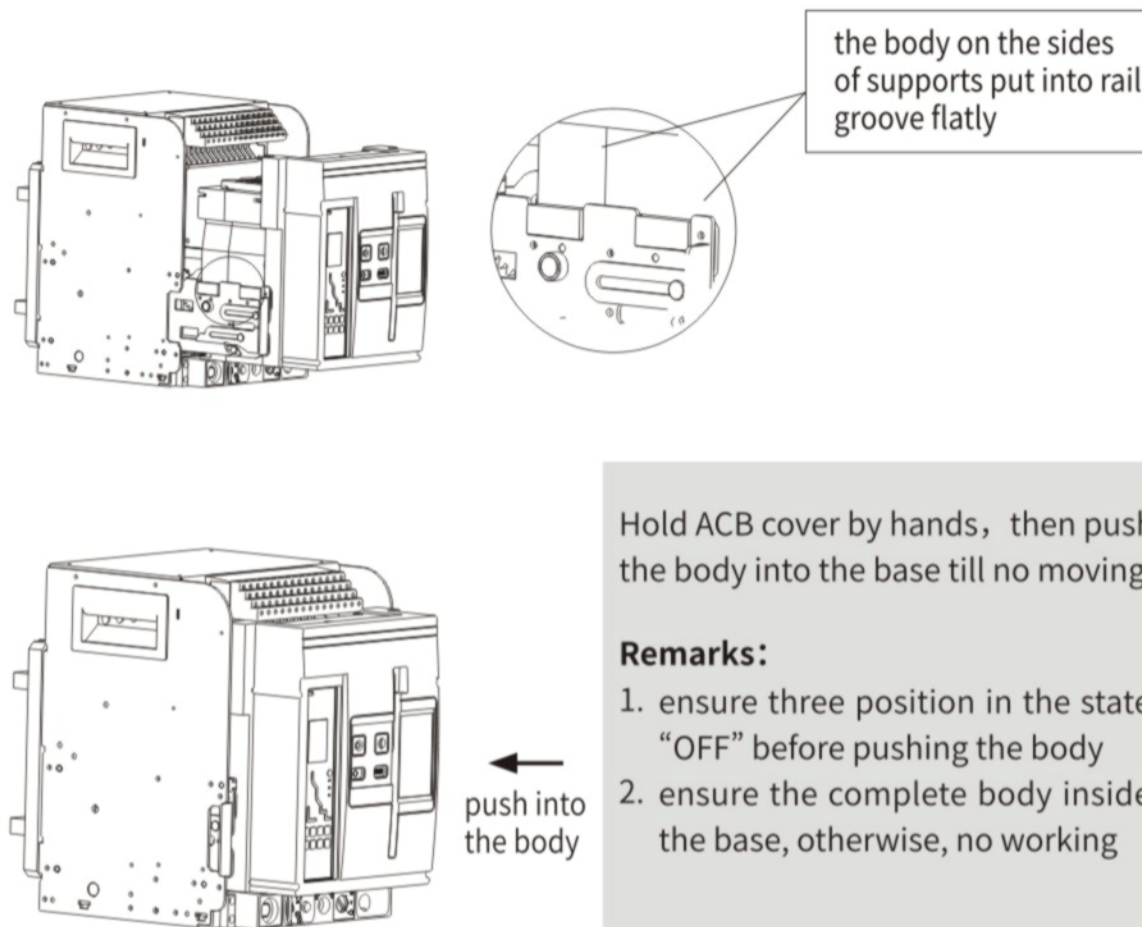
ACB body from "connection" to "open" position, then draw out rail and take out ACB body by hands.



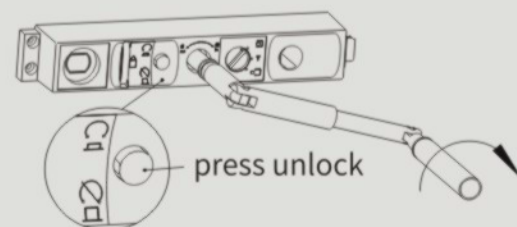
Remarks: ensure ACB in off position before ACB from "connection" position turning.

Insert into ACB body

ACB body put into rail for ensure body on the sides of support in the rail groove.



press unlock button ,clockwise turning handle till three positions indicator turning "connection" position,then unlock button popping. At that time ACB is in the "connections" position.



Remarks:

- 1、ACB is in the OFF position during connections
- 2、No press the control unit during connections

Store:

ACB store in the dust-free drying ambient(ambient temperature-25 °C ~+55 °C ,25 °C ,relative humidity \leq 95%), ACB is in the state of OFF and discharge, then sealed.

Prohibited to store in humidity and salt spray ambient against corroding metals and conductive parts.

Open the carton

Read the parameter nameplate carefully, including rated service voltage for intelligent controller, under-voltage release, shunt release, closing electromagnet and motor energy storage. Turn "test" position, connection secondary circuits power supply and test each control accessories whether working or not.

Turn "test" position, connection secondary circuits power supply and test each control accessories whether working or not.

Turn "connection" position again after confirm, and working.

Maintenance

Keep ACB insulation function well and clean regular.

Test regular contacts system, such as arc suppression devices, contacts connections and connecting piece.

Secondary circuits connections

Secondary circuits connections with tight-screw. Tighten the screw with cross screw-driver and compact the conductors.

Requirement of primary circuits connections

- Tightening torque for busbar connection bolt: $M10 \geq 45Nm$
- Connection busbar with the better support, main busbar circuits of ACB cannot bear any power and ACB with reliability protection grounding.ACB place with grounding marking \oplus .