DELIXI
ELECTRIC
德力西电气

CDW6i-1600N CDW6i-2000N
CDW6i-2000H CDW6i-3200H
CDW6i-4000H
Universal circuit breaker

User manua

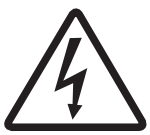
Standards compliant: GB/T 14048.2
IEC60947-2

■ Please read this user manual carefully before installing and using the product, and keep properly for future use.

Safety notice

This use manual is specially made for electrician.
Make sure the end user has this user manual.
Read and strictly abide this use manual before use.

Sign



Danger

Notice

Forbidden

Delixi provide “three guarantee service” within 36 months warranty from manufacture date for the manufacture defect under normal storage, maintenance and storage condition.

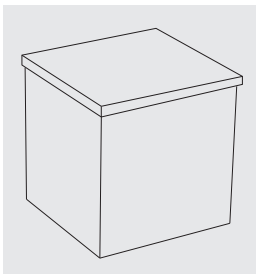
Note: this user manual does not cover CDW6i-6300L, CDW6i-6300L, which will be supplied separately.

Contents

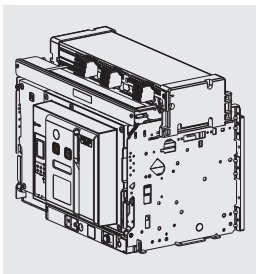
About CDW6i

Open package

Carton



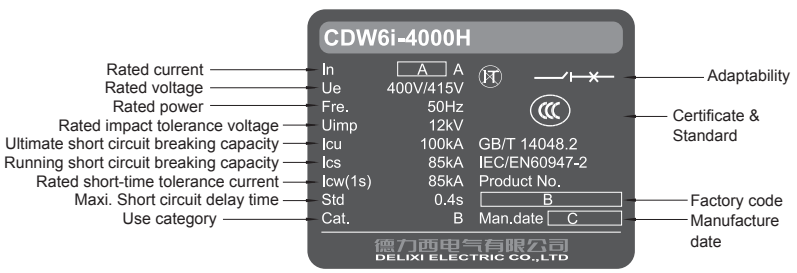
CDW6i



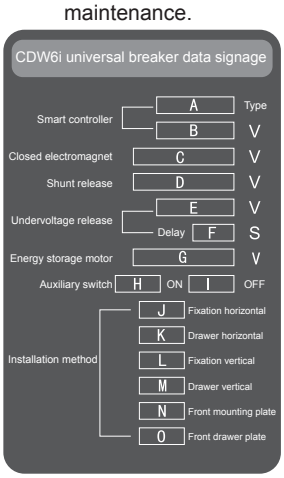
Screw

Read nameplate

Read nameplate carefully before installation

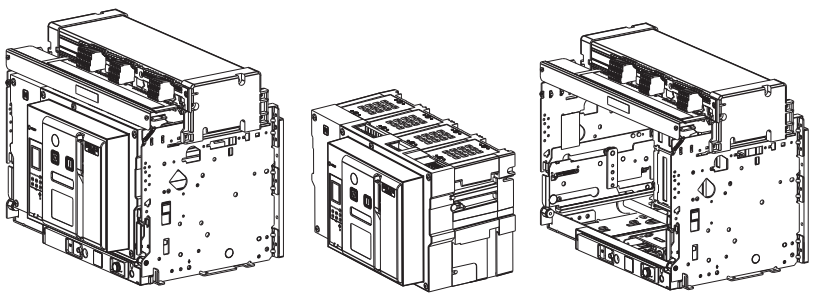


Data signage
Check data signage during maintenance.



Breaker

Drawer type

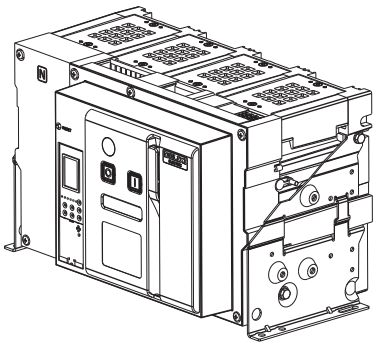


Main body

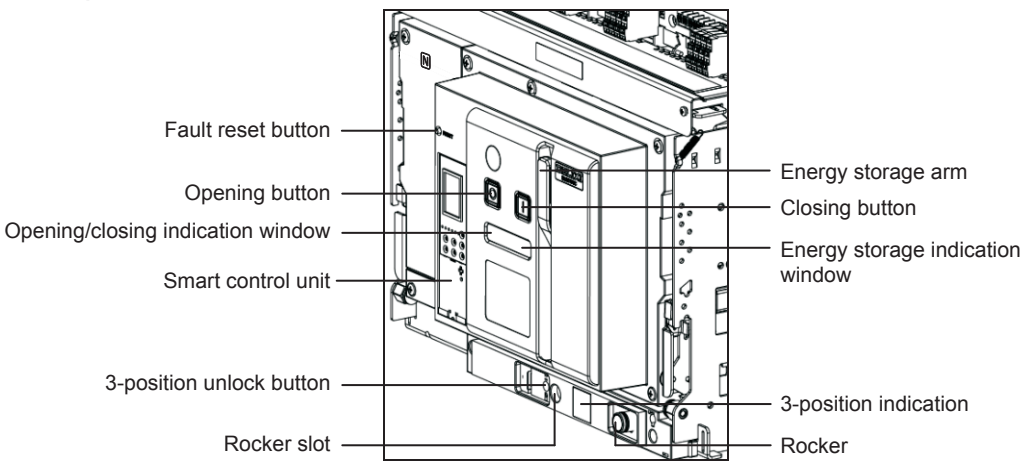
Drawer rack

About CDW6i

Fixed type



Operation instruction



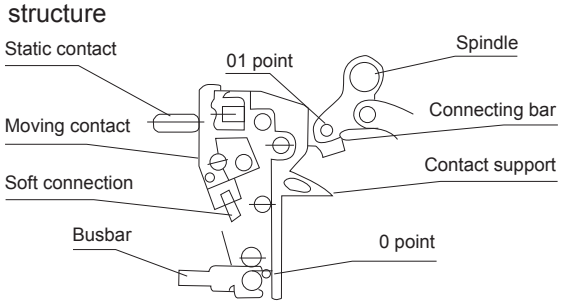
Opening/Closing operation ⚠ (Undervoltage coil must be charged first)

1 Check indication window first to confirm whether the breaker is under opening state, press opening button if under closing state.
2 Shake arm to store energy, check “Energy storage” indication window whether is in “Energy storage” state.
3 Press closing button, breaker close.
4 Press opening button, breaker open.
5 If need to close again, save energy again.

Drawer rack operation

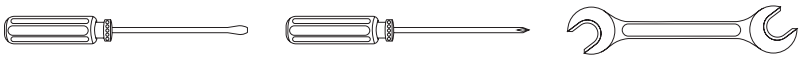
1 Breaker is installed in the connecting position, pull out rocker when indicator indicates “Connect”, insert into rocker slot.
2 Shake the rocker counter clockwise to move the breaker from “Connect” position to “Test” position, indicator indicates “Test”, and 3-position unlock button pop up, the rocker cannot be shaked anymore.
3 Press 3-position unlock button, keep shaking the rocker counter clockwise to position “Separate”, indicator indicates “Separate”, 3-position unlock button pop up.
4 Press unlock button, pull out the breaker main body.

Internal structure



Install CDW6i to enclosure

Tools required



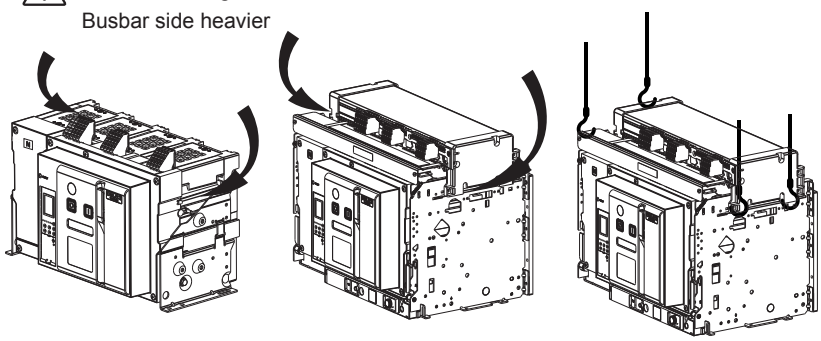
Slotted screwdriver | Phillips screwdriver | Spanner

Transportation condition

Environment temperature: -25℃~55℃
Relative humidity: ≤90% (25℃)
In transport: The product should be handled gently during transportation, do not place upside down, and avoid strong collision.

Handling

⚠ Gentle handling
Busbar side heavier

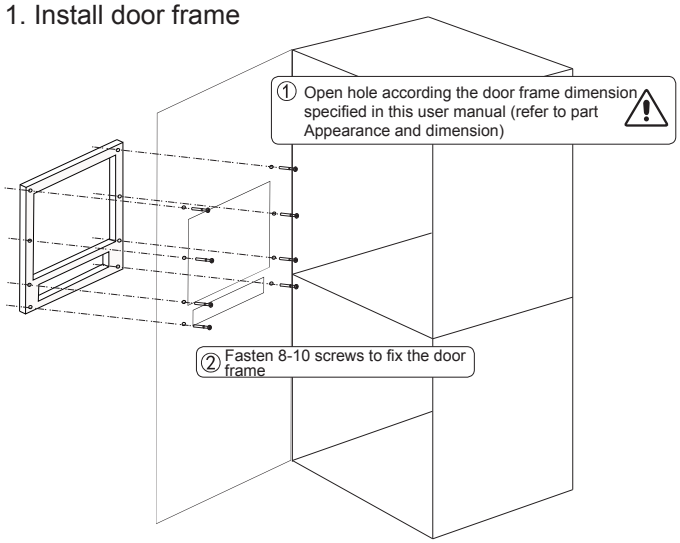


Installation condition

The installation position should be vertical, the slope of all directions should less than 5°⚠
Pollution level: level 3;
Installation level: IV for breaker main circuit, undervoltage release coil, power transformer primary coil; III for auxiliarycircuit and control circuit

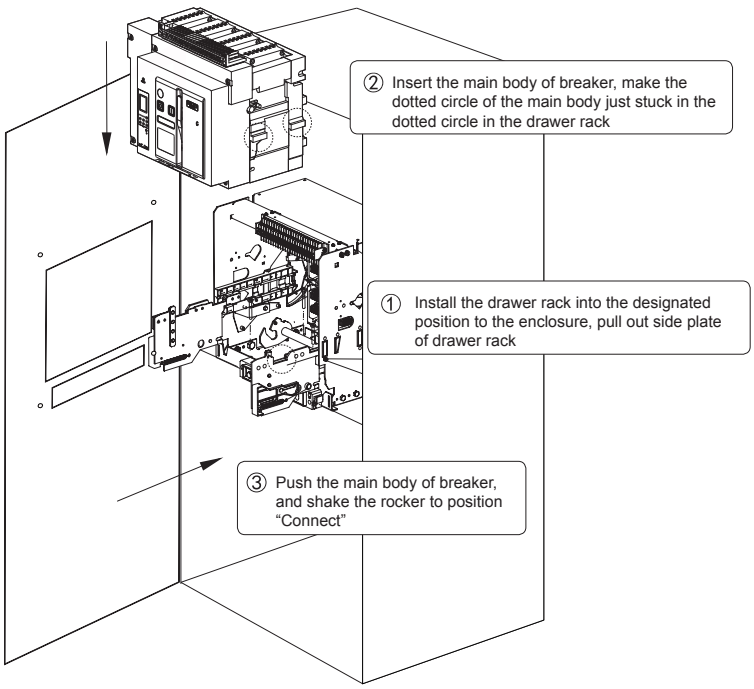
Installation method

1. Install door frame

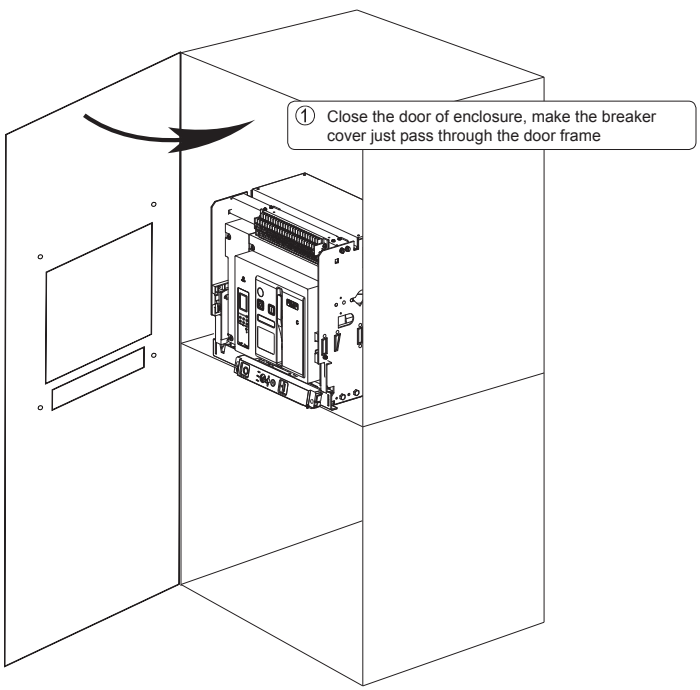


Install CDW6i to enclosure

2. Install drawer rack

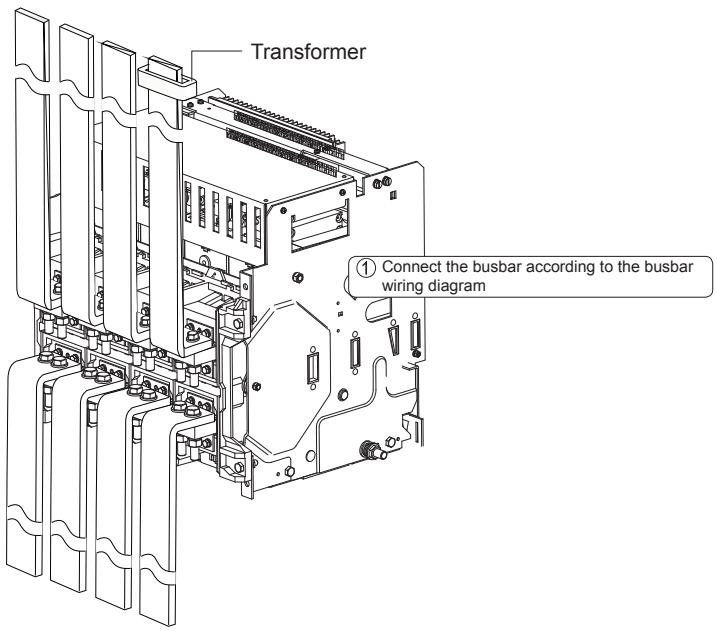


3. Positioning and fixing

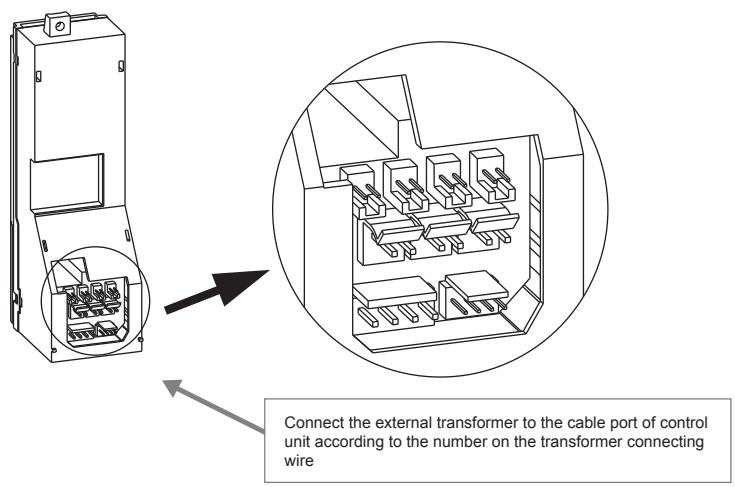


Install CDW6i to enclosure

4. Busbar wiring



⚠ • The leakage transformer, N phase external transformer (for controller 3P+N) and grounding transformer (refer to the grounding type is ground current return type) are the terminals connecting the secondary circuit.
• Grounding transformer (for controller 3P, 4P, grounding protection is residual current difference type) connects smart controller, as shown below
• Refer to Appearance and dimension in Pg. 36-37 for installation dimension of transformer
(The figure below is only for reference, please make the object as the standard)

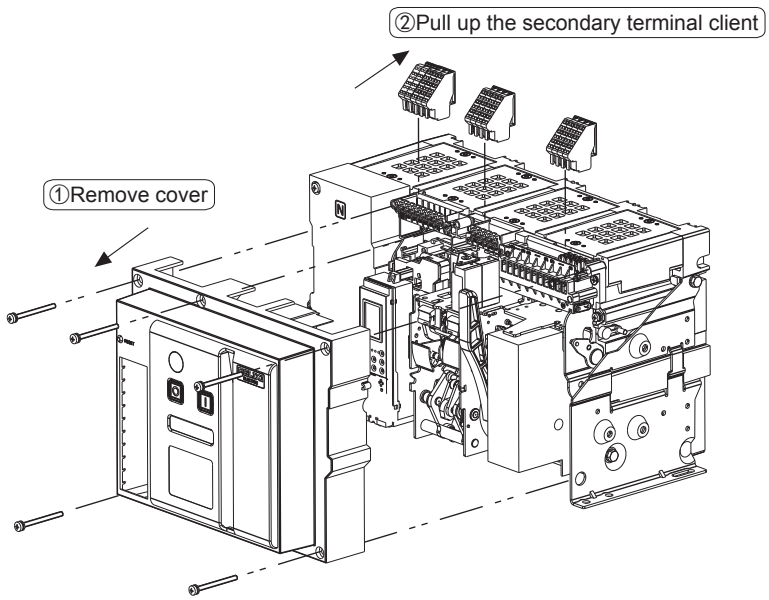


Installation accessory

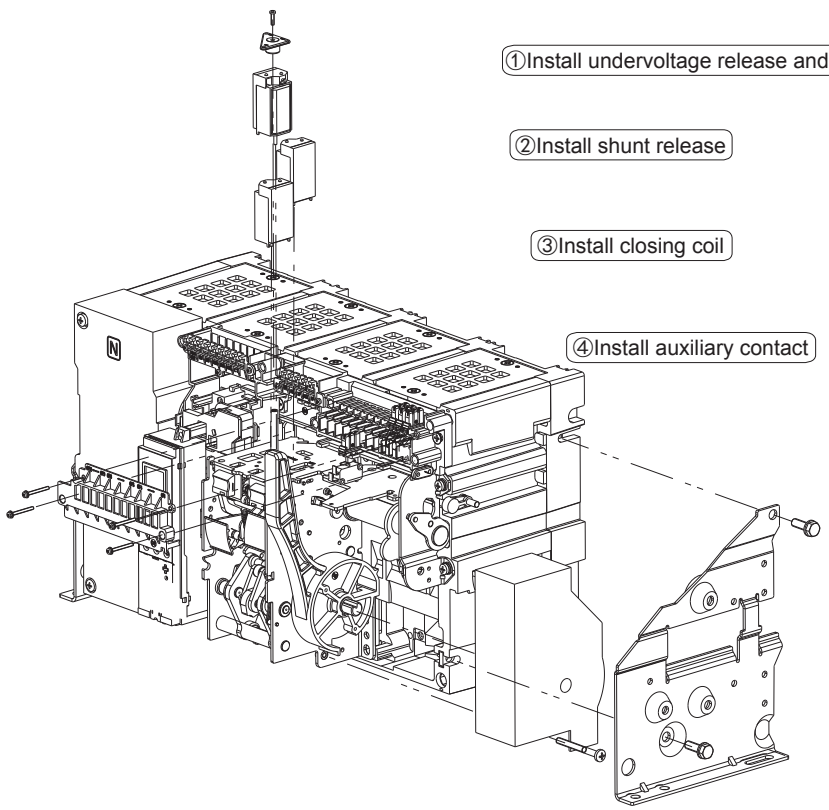
Danger: Before installation, the power must be off.
The breaker must be in the off position for drawer type.

Internal accessory

(The figure below is only for reference, please make the object as the standard)
Removecover, take off secondary terminal



Install coil, electric operatingmechanism and auxiliary contact



Installation accessory

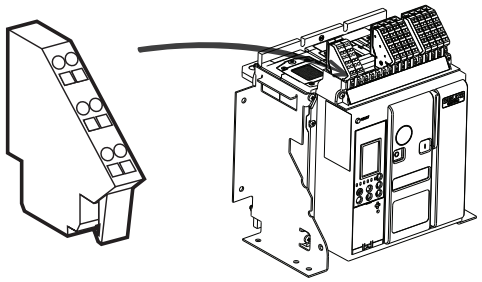
1) CDW6i-1600N

Secondary circuit wiring

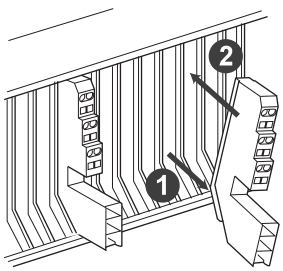
Fixed auxiliary terminal

Fixed type

Insert directly the auxiliary terminal into the breaker groove for fixed type



Drawer type

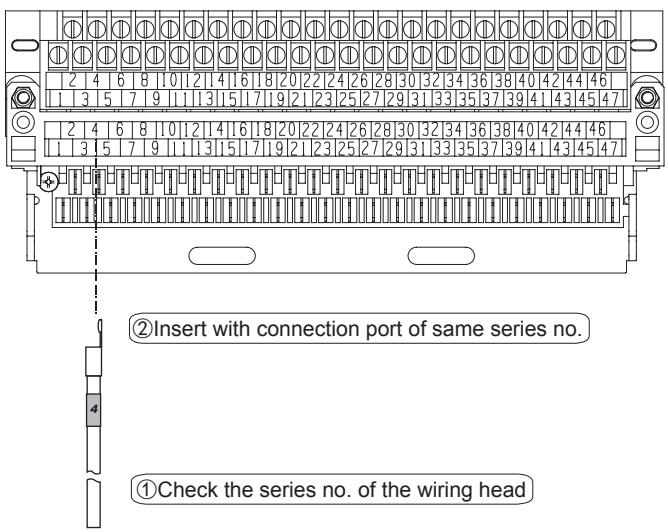


1 Fix lower auxiliary terminal, and insert the upper end of auxiliary terminal into the breaker groove.

2 Press inward the upper auxiliary terminal till hear “KATA”, which means auxillary terminal fixed.

2) CDW6i-2000N&H CDW6i-3200N

Secondary circuit wiring

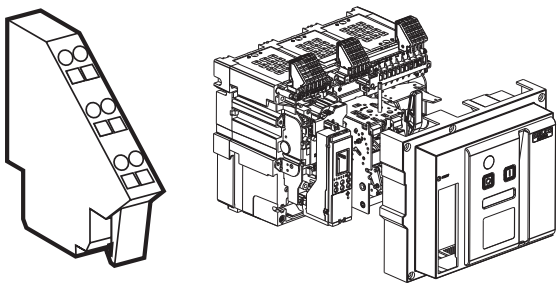


Installation accessory

3) CDW6i-4000H

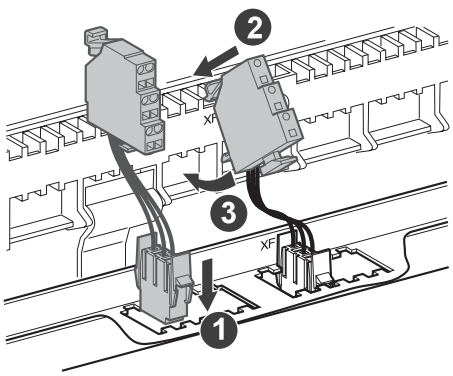
Fixed auxiliary terminal

Fixed type



Insert directly the auxiliary terminal into the breaker groove for fixed type

Drawer type



1 Hold both ends of the chuck of lower auxiliary terminal, and insert down to breaker
2 Fix upper auxiliary terminal, and insert upper chuck into the breaker groove
3 Press inward the upper auxiliary terminal till hear “KATA”, which means auxillary terminal fixed

Note: For the installation of cable interlock and leverage interlock, please visit our website www.delixi-electric.com.

Function and feature

Breaker

Technical parameter	
Common characteristics	Number of poles
	3，4
Rated working voltage Ue(AC,V)	400/415
Rated insulated voltage Ui(V)	1000
Rated impact tolerance voltage Uimp(kV)	12
Rated frequency (Hz)	50
Applicable to isolation	—/I—X—
Compliance with the beaker characteristics of GB/T 14048.2/IEC 60947-2	

Shell current						
Rated current In(A)		1600N	2000N	2000H	3200N	4000H
400		●				
630		●	●	●		
800		●	●	●		
1000		●	●	●		
1250		●	●	●		
1600		●	●	●		●
2000			●	●	●	●
2500					●	●
3200					●	●
4000						●
Breaking capacity						
Rated ultimate short circuit breaking capacity Icu(kA)		50	80	80	80	100
Rated running short circuit breaking capacity Ics(kA)		42	50	65	65	85
Rated short-time tolerance current (1s) (kA)		42	50	65	65	85
Service life						
Electrical life (AC400V/415V)		6000	6500	6500	5000	5000
Mechanical life (with maintenance)		25000	30000	30000	20000	20000
Mechanical life (without maintenance)		12500	15000	15000	10000	10000
Dimension (mm) High × Width × Depth						
Drawer type	3P	322×288×330	436×405×425	436×405×425	436×465×425	439×441×428.6
	4P	322×358×330	436×500×425	436×500×425	436×580×425	439×556×428.6
Fixed type	3P	301×276×229	397×364×327	397×364×327	397×428×327	352×422×329.5
	4P	301×346×229	397×459×327	397×459×327	397×543×327	352×537×329.5
Derating						
Product perfformance (resistance, cooling capacity etc) will change if altitude higher than 2000m						
Altitude (m)		2000	3000	4000		
Dielectric resistance voltage (V)		3500	3150	2500		
Average insulation level (V)		1000	900	700		
Max. use voltage (AC,V)		415	415	415		
Average thermal current 40℃		1XIn	0.99XIn	0.87XIn[1)]		

Note: please contact us if altitude is higher than 4000m.

1): 0.8Xin for CDW6i-1600N, 0.7Xin CDW6i-3200N.

Function and feature

Breaker

CDW6i-1600N

CDW6i-2000N&H

CDW6i-3200N

CDW6i-4000H

Derating table of CDW6i under different temperature					
Environment temperature	-5℃~+40℃	+45℃	+50℃	+55℃	+60℃
CDW6i-1600N	400	400	400	400	400
	630	630	630	630	550
	800	800	800	800	700
	1000	1000	1000	950	900
	1250	1200	1200	1150	1050
	1600	1550	1500	1450	1350
CDW6i-2000N&H	630	630	630	630	630
	800	800	800	800	700
	1000	1000	1000	1000	1000
	1250	1250	1250	1250	1150
	1600	1600	1500	1500	1300
	2000	1900	1900	1800	1700
CDW6i-3200N	2000	2000	2000	2000	2000
	2500	2400	2300	2200	2200
	3200	3000	3000	2800	2800
CDW6i-4000H	1600	1600	1600	1600	1600
	2000	2000	2000	2000	2000
	2500	2500	2500	2500	2200
	3200	3200	3200	3000	2500
	4000	4000	3600	3400	3200

Note: The derating factor and the technical parameter in the derating table are achieved from test and theoretical calculation, which can be used as a general selection guide.

Function and feature

Accessory


Remote operation

Shunt coil MX

After the energy stored of breaker, the shunt coil will open the breaker instantly under the specified current and voltage, which can be operated remotely.

- Rated control current and voltage AC220/AC230V, AC380/AC400V, DC220V, DC110V
- Action voltage (0.7-1.1) Us
- Breaking time: 50±10ms


Closing coil XF

After the energy stored of breaker, the closing coil will close the breaker under the specified current and voltage, which can be operated remotely.

- Rated control current and voltage AC220/AC230V, AC380/AC400V, DC220V, DC110V
- Action voltage (0.85-1.1) Us
- Closing time: 55±10ms


Undervoltage coil MN

There are two types of undervoltage coils, undervoltage moment and undervoltage delay. After the closing of the breaker, the breaker can be open when the voltage of the breaker reduces to 70%-35% rated voltage. The breaker can only be closed when the voltage of undervoltage coil recover to 85% of rated voltage.

- Rated control current and voltage AC220/AC230V, AC380/AC400V
- Action voltage: (0.35-0.7) Ue
- Reliable closing voltage: (0.85-1.1) Ue
- Unable to close voltage: ≤0.35Ue
- Delay time: (0.5s), (0.9s), 1s, (1.5s), 3s, 5s.


Undervoltage delay coil MNR

The undervoltage delay coil can open the breaker in (0.5s), 1s, (1.5s), 3s, 5s.

Electric operating mechanism MCH

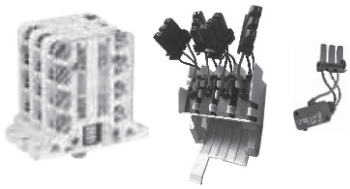
The electric operating mechanism can automatically store energy for the breaker when the breaker is open and with power supply, open or close the breaker with the action of shunt and undervoltage release and closing electromagnet. Use arm to store energy to the breaker if there is no power supply.

- Rated control current and voltage AC220/AC230V, AC380/AC400V, DC220V, DC110V
- Action voltage: (0.85-1.1) Us
- Power consumption: 75W/180W (1600N), 85W (2000N&H), 110W (3200N), 180W (4000H).
- Energy storage time: <5s
- Use type: AC15, DC13

Note: Left picture is applicable to 2000AF, 3200AF; the right picture is applicable to 1600AF, 4000AF.

Function and feature

Accessory



Indication contact

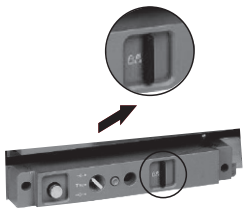
Auxiliary switch OF

Default 4O4C

(4000H can also provide 8O8C and 6O6C, 2000N&H, 3200N can also provide 6O6C)

Used for monitoring the state of breaker, like the signal light of connecting breaker position and off indicator etc.

Rated thermal current Ith: AC380V/AC400V 0.75A, DC220V 0.15A, AC220V/AC230V 1.3A



Lock

Drawer rack padlock

The padlock will be supplied by customer self.

If padlock is used, pull out the padlock when the breaker is in the “Off” position, after locking, the shake cannot be inserted.

Key lock

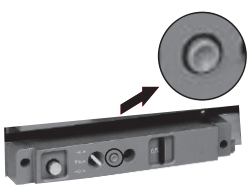
The opening lock will lock the breaker when in off position, the breaker can only be closed when the lock is opened by the key and the key is not pull out.

There are 3 types of opening local (the last two types are used in Two-wire-one communication system):

• One lock one key

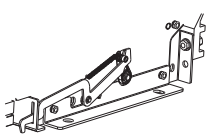
• Two locks one key

• Three locks two keys



Drawer position lock mechanism

It is lock mechanism when the breaker is in “Connect”, “Test” or “Off” position for the drawer type. The three positions of the breaker will be indicated by the indicator, advance and return arm is locked in the exact position, unlock by pressing reset button.



Door interlock

Applicable to shell frame of 2000N&H, 3200N.

For drawer type breaker, it is installed in the side of the breaker, and linkage the door of the enclosure, it is to make sure the door cannot be opened when the breaker is in connect or test position, which can prevent possible damage caused by the slipping of the breaker.

Mechanical interlock

There are two types, leverage interlock and cable interlock.

• If leverage interlock is used, two or three breakers can only be installed vertically, while for cable interlock, the breakers can be installed horizontally or vertically in Two-wire-one communication system.

• It can be used for two or three breakers and make them linkage

• Any breaker is closed, the rest ones will linkage to off

Function and feature

Accessory

Operationand protection

Door frame

• Install onto the door frame of the enclosure door, which can increase the IP protection level to IP40

• Applicable to both fixed and drawer type

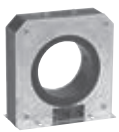
Insulated baffle

• Insulated baffle installed in the middle of breaker busbar, to increase creepage distance, and increase insulated capacity

Controller accessory

N phase externel transformer

It is used to measure the current of N phase in 3P+N grounding method, which is installed into wiring busbar by the user self.



Grounding transformer

• It is a special external transformer used to measure the current of N phase in current return type grounding method, which can provide protection in the same time to the upper and lower level ground fault of the breaker

• Only applicable to iTR326H controller

Leakage transformer

• Extra special rectangular transformer is used for leakage grounding protection type

• Only applicable to iTR326H controller

Power module

• It is used to provide auxiliary power for smart controller in circuit of AC220V/AC230V, AC380V/AC400V, DC110V.

• Input AC220V/AC230V, AC400V/AC380V, DC220V, DC110V, input fluctuation range ±20%, out put DC24V, output fluctuation range ±5%, output 4 group DC24V total power 7W.

Signal transfer module

• Output signal unit, which is used as communication function, eg. signal processing for functions like regional interlock and four remote etc. or used for fault alarm or indicating etc.

• Only applicable to iTR326H controller

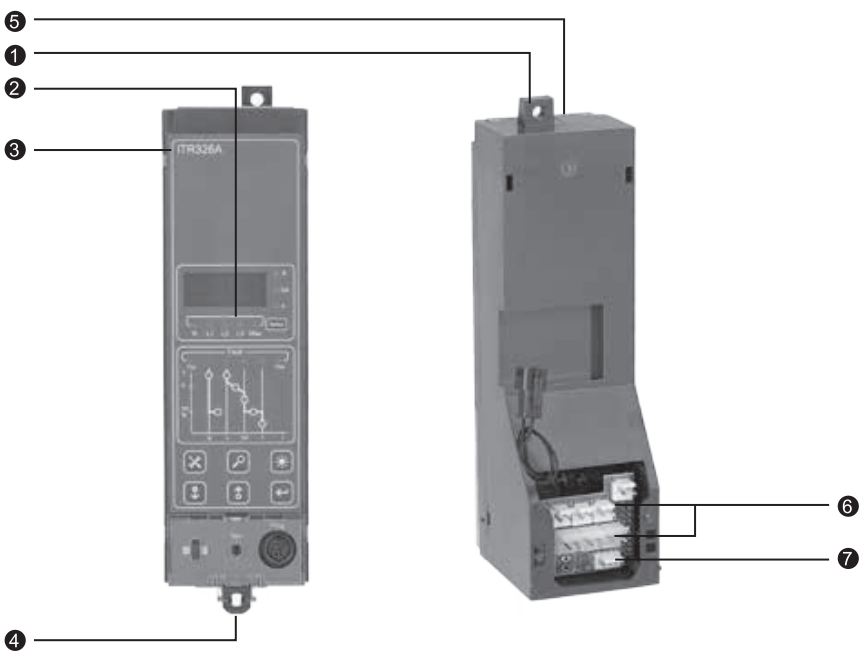
Note: Left picture is applicable to 2000AF, 3200AF; the right picture is applicable to 1600AF, 4000AF.

Function and feature

iTR326 Series Controller

Structure introduction

❶ Top fixation
❷ LED indicator
❸ Controller nameplate
❹ Bottom fixation
❺ External terminal
❻ Transformer connector
❼ Magnetic flux/ micro-motion connector



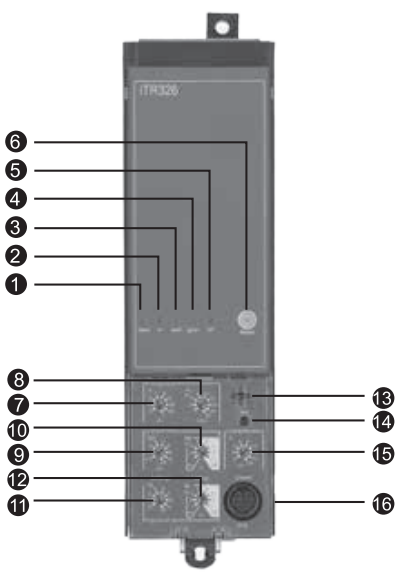
L type (basic type): iTR326

Button introduction

❶ Alarm indicator
❷ Long delay trip indication
❸ Short delay or instant trip indication
❹ Grounding or leakage fault trip indication
❺ Advanced protection
❻ Reset

Button introductionadjust panel

❼ Long delay current set I_R
❽ Long delay trip delay t_R
❾ Short delay trip Isd
❿ Short delay trip delay tsd
⓫ Grounding fault trip Ig
⓬ Grounding fault trip delay tg
⓭ Lock position
⓮ Test button
⓯ Instant trip current
⓰ Test connector



Function and feature

iTR326 Series Controller

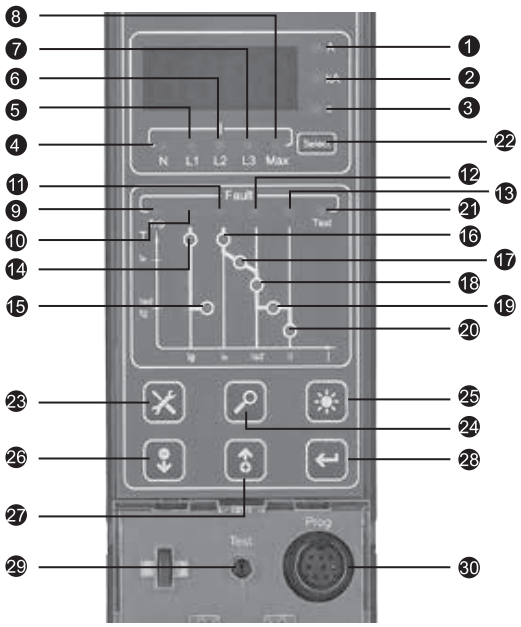
M type (standard type): iTR326A

Indicator introduction

1. Current unit
2. Current unit kA
3. Time unit S
4. N phase current
5. A phase current
6. B phase current
7. C phase current
8. Maximum current
9. Trip indication
10. Grounding protection
11. Long delay protection
12. Short delay protection
13. Instant protection
14. Grounding current set value
15. Grounding time set value
16. Long delay current set value
17. Long delay time set value
18. Short delay current set value
19. Short delay time set value
20. Instant current set value
21. Test action state

Navigation button introduction

22. Switch
23. Set
24. Inquiry
25. Back/Clear light
26. -/Pg down
27. +/Pg up
28. Ok
29. Test
30. Test connector



H type (advanced) : iTR326H

Button introduction

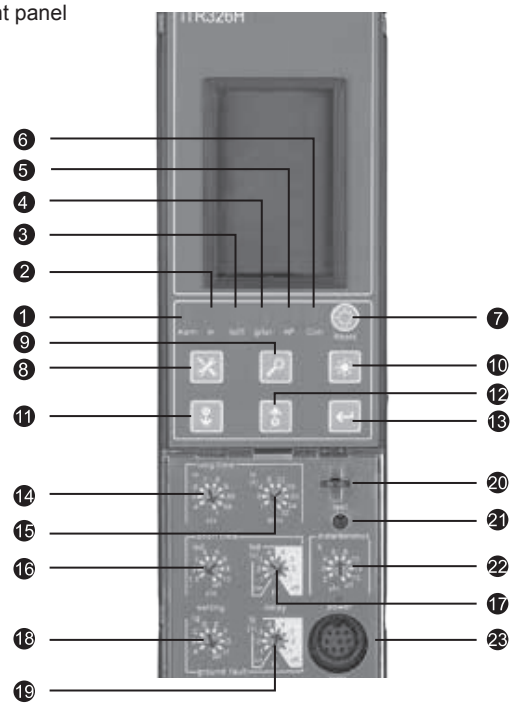
1. Alarm indicator
2. Long delay trip indication
3. Short delay or instant trip indication
4. Grounding or leakage fault trip indication
5. Advanced protection
6. Communication function
7. Reset

Navigation button introduction

8. Set
9. Inquiry
10. Back/Clear light
11. -/Pg down
12. -/Pg up
13. OK

Button introduction adjustment panel

14. Long delay current set I_R
15. Long delay trip delay t_R
16. Short delay trip Isd
17. Short delay trip delay tsd
18. Grounding fault trip Ig
19. Grounding fault trip delay tg
20. Lock position
21. Test button
22. Instant trip current
23. Test connector



Function and feature

iTR326 Series Controller

Functionintroduction

	iTR326	iTR326A	iTR326H
			
	L	M	H
Protection function	Long delay production L	Long delay production L	Long delay production L
	Shortdelay protection S	Shortdelay protection S	Shortdelay protection S
	Instant protection I	Instant protection I	Instant protection I
	Grounding protection G	Grounding protection G	Grounding protection G
	MCR protection	MCR protection	MCR protection
	HSISC protection	HSISC protection	HSISC protection
			Undervoltage protection/alarm
			Overvoltage protection/alarm
			Voltage imbalance (open phase) protection/alarm
			Phase sequence protection/alarm
			Lowe frequency protection/alarm
			High frequency protection/alarm
			Reverse power protection/alarm
Measurement function		Current measurement	Current measurement
			Voltage measurement
			Power measurement
			Frequency measurement
			Harmonic measurement
Auxiliary function	Pre-alarm	Pre-alarm	Pre-alarm
		Self diagnosis function	Self diagnosis function
	Fault history record	Fault history record	Fault history record
	Test function	Test function	Test function
Display function		LED digital tube display	LCD
Specialfunction			Load monitoring
			Regional interlock
Communication function			Modbus

Function and feature

iTR326 Series Controller

Smart controller protection characteristics

There are two types: inverse time limit and define time limit, the controller will start delay protection according to define time limit when the fault current is higher than the value of inverse time limit.

Inverse time limit curve conforms to characteristic curve I^2t

Overload long delay protection characteristics

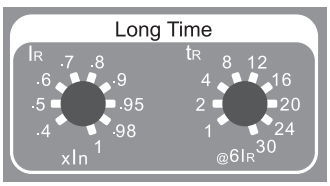
Overload long delay protection action threshold

< 1.05 I_R: > 2h no action;

> 1.2 I_R: < 1h action;

≥ 1.2 I_R delay action;

I_R current setting value: 0.4In, 0.5In, 0.6In, 0.7In, 0.8In, 0.9In, 0.95In, 0.98In, 1.0In



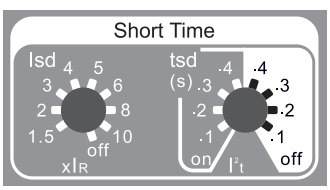
Reverse time limit characteristic				I^2t: $t=(6/N)^2 *t_R$					
Setting current multiple	Action time								
1.5 I_R	16s	32s	64s	128s	192s	256s	320s	384s	480s
2 I_R	9s	18s	36s	72s	108s	144s	180s	216s	270s
6 I_R	1s	2s	4s	8s	12s	16s	20s	24s	30s

Note: N----Multiple of fault current divided by set current I/I_R

t----Fault action delay time

t_R----Long delay time set value

Action time allowed tolerance ±10%



Short circuit short delay protection characteristic

Short circuit short delay protection action threshold

< 0.9 Isd: No action;

> 1.1 Isd: Action;

≥ 1.1 Isd: Delay action;

I_{sd} current setting value range: 1.5 I_R, 2 I_R, 3 I_R, 4 I_R, 5 I_R, 6 I_R, 8 I_R, 10 I_R +OFF

Current	Action time					
Isd<1 ≤ 8I_R	Reverse time limit	Action characteristic	$I^2t=(8I_R)^2$ tsd			
		Setting time	0.1、0.2、0.3、0.4			
I ≥ 1.1Isd	Define time limit, min. time is reverse time	Setting time	0.1	0.2	0.3	0.4
		Min.	0.08	0.14	0.23	0.35
		Max.	0.14	0.2	0.32	0.5

Note: Isd----short delay current setting value

I----fault current value

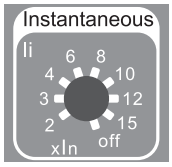
I_R----long delay setting value

t----fault action delay time

tsd----short delay reverse time limit setting value

Action time allowed tolerance ±20%

(Off in time period means I^2t off means reverse time limit end, it is define time limit; use the off of current gear close delay protection funtion.)



Short circuit instant protection characteristic

Short circuit instant protection actionthreshold

< 0.85 Ii: No action;

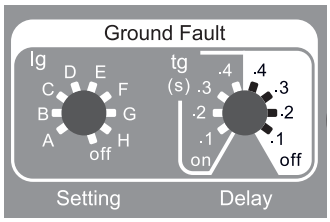
> 1.15 Ii: Action;

Currentsetting value of instant action 2In, 3In, 4In, 6In, 8In, 10In, 12In, 15In + OFF

Note: Action time tolerance ≤50ms.

Function and feature

iTR326 Series Controller



Grounding fault protection action characteristic

Grounding fault protection action threshold

< 0.9 Ig: No action;

> 1.1 Ig: Action;

≥ 1.1 Ig: Delay action

Current setting value	A	B	C	D	E	F	G	H	OFF
In<1250	0.2In	0.3In	0.4In	0.5In	0.6In	0.8In	0.9In	In	
In ≥ 1250	500A	600A	700A	800A	900A	1000A	1100A	1200A	

tg(s)	Reverse time limit	Action characteristic				
		$t = \frac{(I_J)^2}{I^2} \times tg$				
		Setting time	0.1、0.2、0.3、0.4			
	Define time limit, min. time is reverse time	Setting time	0.1	0.2	0.3	0.4
		Min.	0.08	0.14	0.23	0.35
		Max.	0.14	0.2	0.32	0.5

Note: I_J grounding protection setting value, when In≥1250A, I_J=1200A, when In<1250A, I_J=In

I fault current value

T fault action delay time

tg grounding reverse time limit setting value

Reverse time limit allowed tolerance ±20%

(Off in time period means I^2t off means reverse time limit end, it is define time limit; use the off of current gear close grounding protection funtion.)

Smart controller Factory setting

Trip curve I^2t	Long delay		Short delay		Instant	Grounding fault		Thermal memory
	I_R	t_R	Isd	ts	Ii	Ig	tg	
	1In	30s	6In	0.2s	10In	G档	0.4s	20min

For more information please visit our website: (www.delixi-electric.com) to download instruction sheet of iTR326 series smart controller.

iTR326 series theme menu

		iTR326
 Reset	Reset button	Reset if there is fault; press for a while to check the last fault
 test	Test button	Test button, instant action
		iTR326A
 Select	Selection button	Display parameter switching of power table
	Set button	Enter into parameter set mode
	Inquiry button	Inquiry fault record information
	Back button	Back to upper menu or clear fault record
	-/ Pg down	Reduce setting value by 1 (i.e. reduce 1 step)
	+/ Pg up	Increase setting value by 1 (i.e. increase 1 step)
	Ok button	Confirm the parameter modification and save
 Test	Test button	Enter into test procedure.
		iTR326H
	Set button	Enter into protection interface, back
	Inquiry button	Enter into measurement, back Edit by position: to right
	Back button	System parameter set, switch between history record and maintenance Edit by position: to left
	-/ Pg down	General state: down Edit state: -
	+/ Pg up	General state: up Edit state: +
	Ok button	Confirm the parameter modification and save
 Reset	Reset button	Under default interface: reset Under other interface: back
 test	Test button	Test button, instant action

Commissioning CDW6i

Menu parameter setting and selection

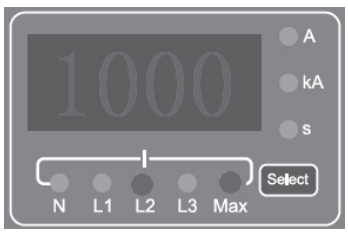
iTR326A operation

• iTR326A Smart controller operation display

This controller needs to display all kinds of operation parameter, set parameter on the panel, and display the value by LED digital tube, and display the type of displayed value by LED indicator.

• Ammeter maximum current display mode

Smart controller enters into Ammeter maximum current display mode by default, displays the maximum phase current. The controller will return automatically back to maximum current display mode if there is no any button pressing operation within 10 minutes when the running is not in maximum current display mode.



A Light on means the unit of the displayed data is A.

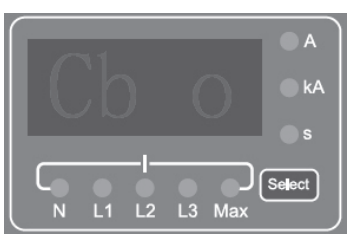
kA Light on means the unit of the displayed data is kA.

iTR326A Ammeter maximum current display mode and Ammeter display mode display

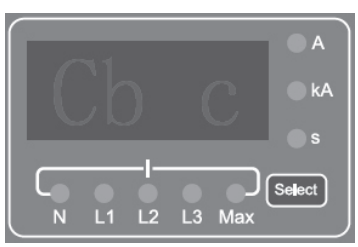
Ser. No.	Display		LED indicator	Remark
1	L1 phase current		LED_L1、LED_A/LED_kA	
2	L2 phase current		LED_L2、LED_A/LED_kA	
3	L3 phase current		LED_L3、LED_A/LED_kA	
4	N phase current		LED_N、LED_A/LED_kA	LED_N flashing (only for 4P or 3P+N)
5	Maximum current	L1 phase	LED_L1、LED_MAX、LED_A/LED_kA	
		L2 phase	LED_L2、LED_MAX、LED_A/LED_kA	
		L3 phase	LED_L3、LED_MAX、LED_A/LED_kA	
6	Grounding current		LED_N、LED_A/LED_kA	LED_N constantly on

• Ammeter display mod

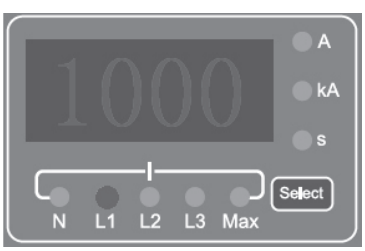
Under normal running mode, browse current value and breaker state by Select button, the display sequence is breaker state, L1, L2, L3, N phase current (LED_N flashing (only for 4P)), grounding current, maximum phase current. The controller will return automatically back to maximum current display mode if there is no any button pressing operation within 10 minutes.



Breaker in open state



Breaker in closed state



Display L1 phase current

• Parameter set and display mode

The parameter setting in the controller includes parameter setting on site (userr parameter) and factory paramter setting by manufacturer (implicit parameter), all those parameter settings are available by button and the display of LED digital tube and indicator.

• Protection parameter set and display

Set by customer on site, mainly protection parameter. User parameter setting can be done by 4 buttons (, , ,) and relevant LED indicator, the main operation procedures are as follows:

iTR326A Smart controller user setting parameter

Ser. No.	Parameter	LED indicator	Remark
1	Grounding protection current setting value	LED_I_g、LED_A	
2	Grounding protection time setting value	LED_T_g、LED_s	
3	Long delay protection current setting value	LED_I_R、LED_A	
4	Long delay protection time setting value	LED_T_R、LED_s	
5	Short delay protection current setting value	LED_I_{sd}、LED_A/LED_kA	
6	Short delay protection time setting value	LED_t_{sd}、LED_s	
7	Instant protection current setting value	LED_Ii、LED_A/LED_kA	

1) Set parameter view:

a) Press enter into parameter query mode under normal running mode, Ammeter LED digital tube displays the first setting parameter value, relevant LED indicator indicates data type;

b) Press to browse set parameter (automatically back to first parameter when browse to last parameter)

2) Parameter set operation:

a) Press enter into parameter query mode under normal running mode, and browse the parameter need to be set also by ;

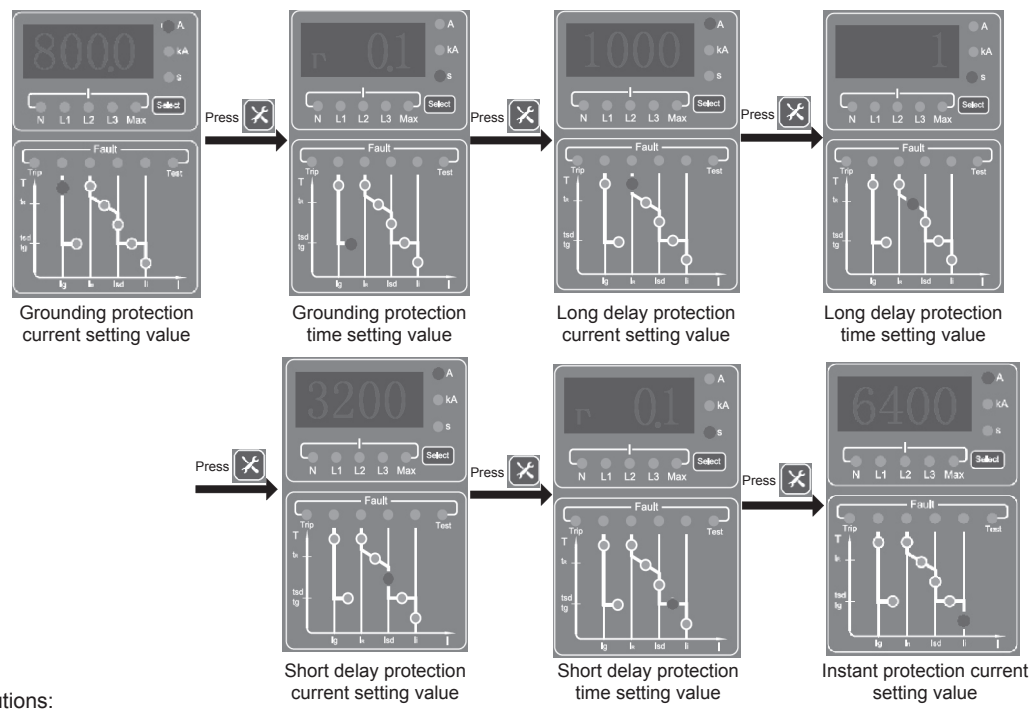
b) By enter into parameter set mode, by and to adjust the parameter to required setting value;

c) If confirm set paramete value, press to save into memory; if give up the modification, press “Back” to return.

d) When the set parameter value is saved, press to browse other set parameter, and repeat the above procedure; when all parameters are set, press back to normal running mode.

e) If the protection current setting value is set to OFF, the relevant production is closed.

Protection parameter setting and modification procedure is as follows:



Grounding protection current setting value | Grounding protection time setting value | Long delay protection current setting value | Long delay protection time setting value

Short delay protection current setting value | Short delay protection time setting value | Instant protection current setting value

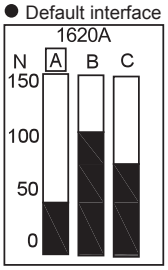
3) Precautions:

a) Modify/inquiry of controller protection parameter must be done in non alarm/fault interface of the controller, the inquiry or modify can not be done if the breaker fault is not cleared;

b) After all parameter is set, better power off and reset controller once, and check again after power on the controller to make sure the modifiction is correct, press once, the controller enters into normal running state, or wait 10 minutes without any operation, the controll will return back automatically to normal working state.

iTR326H operation:

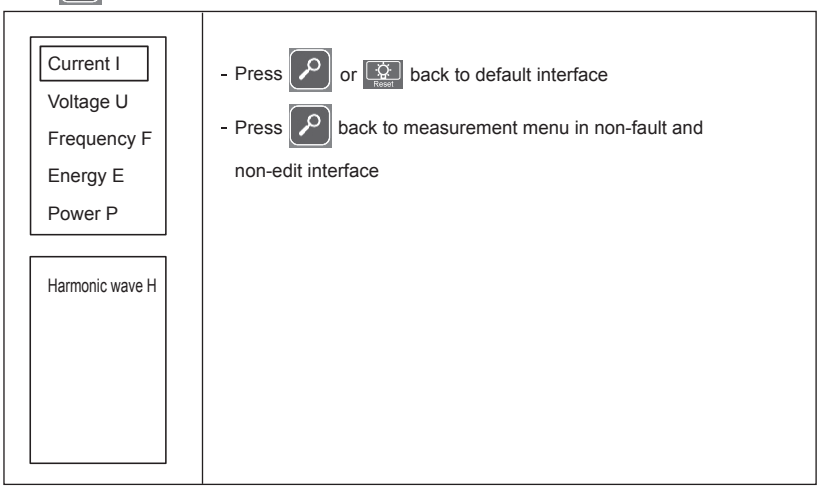
● Default interface



- Display default interface when the controller is powered on
- Press Reset in each theme menu or relevant theme button back to default interface
- The box cursor will automatically indicates to the maximum phase if there is no button operation within 5 minuts
- The controller will return automatically to default interface if there is no any button operation within 20 minutes in non-fault pop up interface.

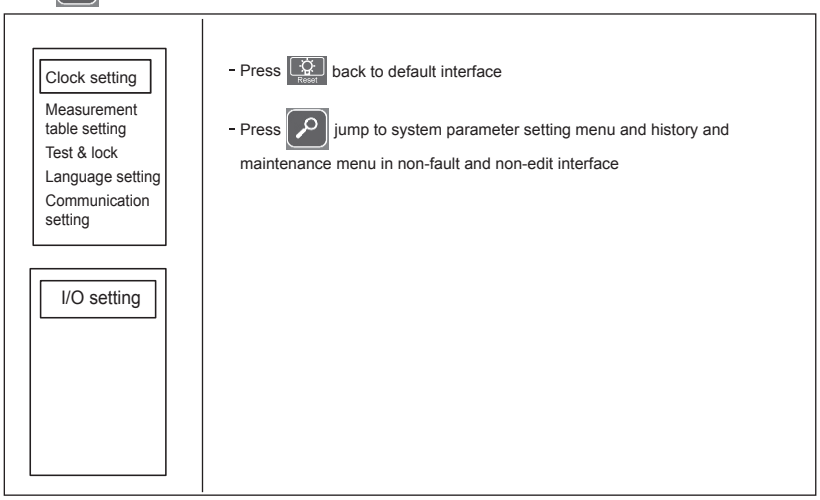
● "Measure" menu

Press enter into measurement main menu



● "System parameter setting" menu

Press enter into system parameter setting menu



Commissioning CDW6i

● “Protection parameter setting” menu

Current protection Load monitoring Voltage protection Other protection	- Press  or  back to default interface - Press  jump to protection parameter setting menu in non-fault and non-edit interface

● “History record and maintenance” menu

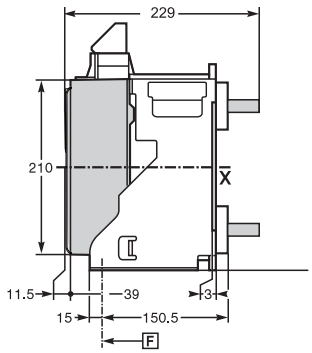
Current alarm Operation times Contact wear Position change record Trip record	- Press  back to default interface - Press  jump to system parameter setting menu and history record and maintenance menu in non-fault and non-edit interface
Alarm record Fault recording	

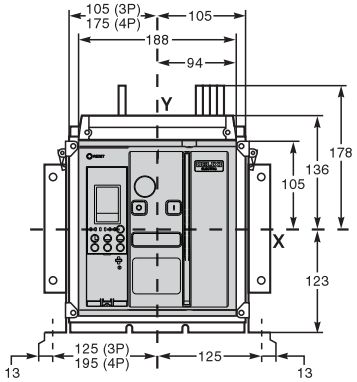
Dimension

CDW6i-1600N

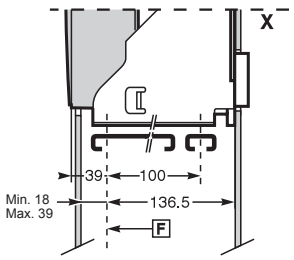
CDW6i-1600N Fixed type 3-pole and 4-pole

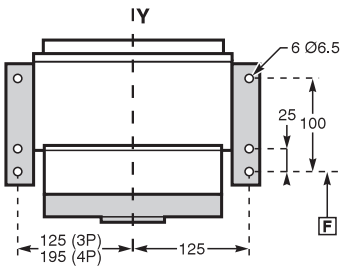
Dimension



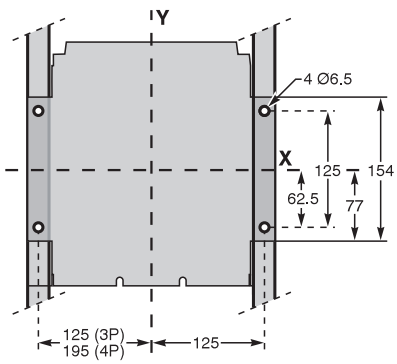


Horizontal fixation (onto substrate or track)

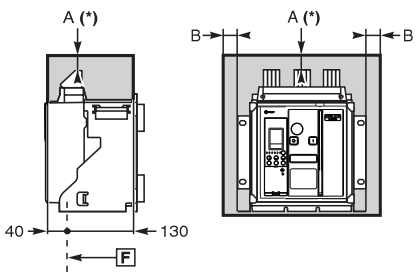




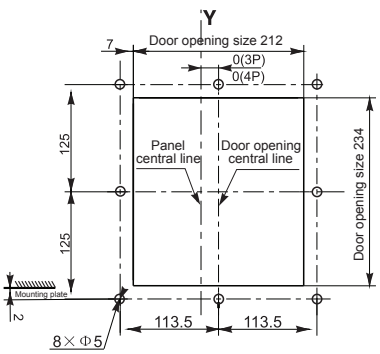
Vertical fixation detail (onto backplane or frame)



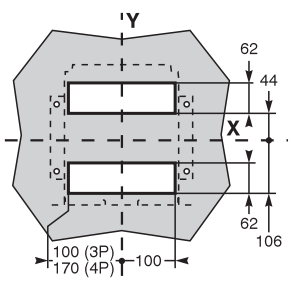
Safety spacing



Door opening size



Back panel opening size



F : Benchmark point

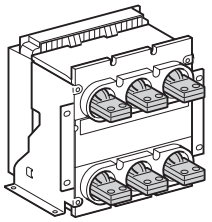
	Insulated part	Metal part	Charged part
A	0	0	100
B	0	0	60

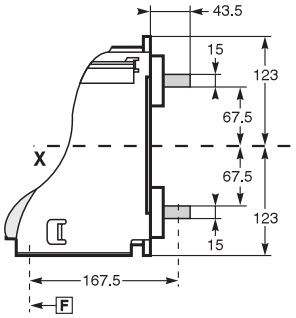
Note: The X and Y axes of the 3-level circuit breaker are symmetrical with the front cover of the circuit breaker body.
(*) Safety spacing should considering 50mm for moving arc chute, and 20mm for removing the terminal block

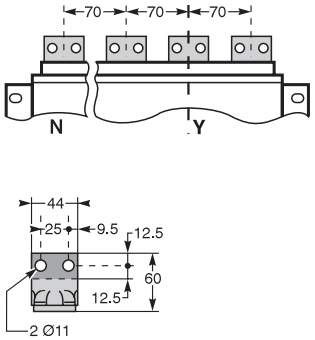
Dimension

Connection

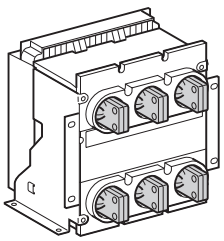
Horizontal back connection

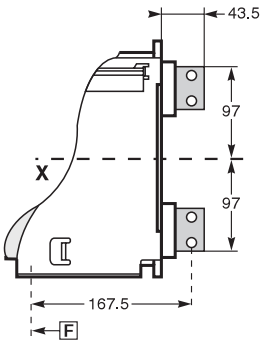


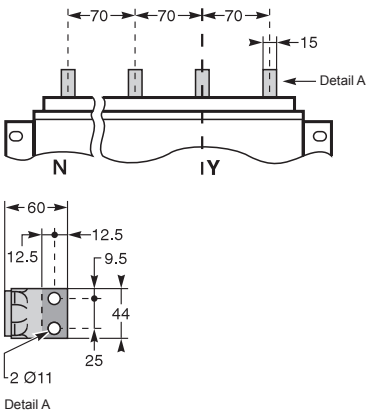




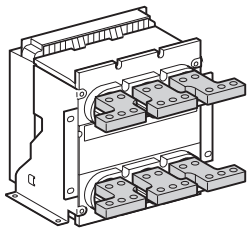
Vertical back connection

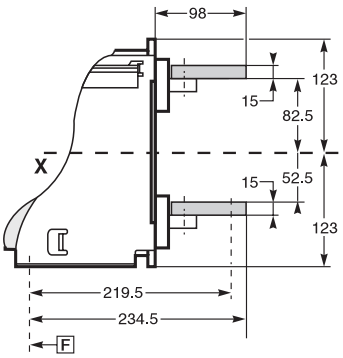


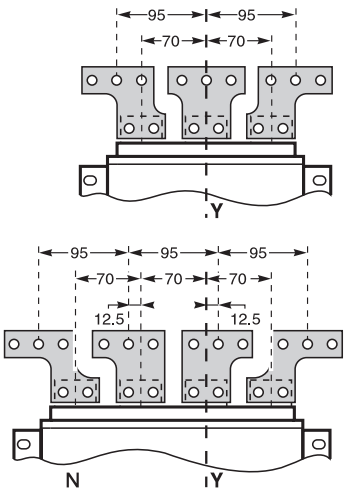




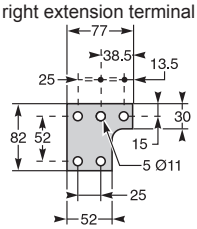
Back connection with extension terminal



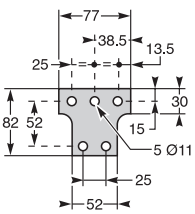




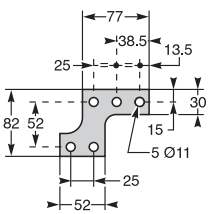
4-pole center left or right extension terminal



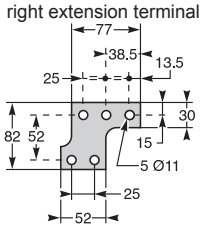
3-pole center extension terminal



4-pole left or right extension terminal



3-pole left or right extension terminal



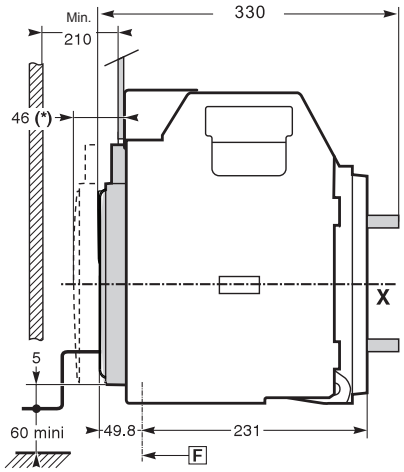
Note: The X and Y axes of the 3-pole circuit breaker are symmetrical with the front cover of the circuit breaker body.

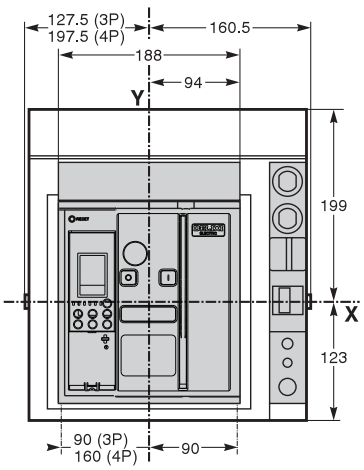
F : Benchmark point

Dimension

CDW6i-1600N drawer type 3-pole and 4-pole

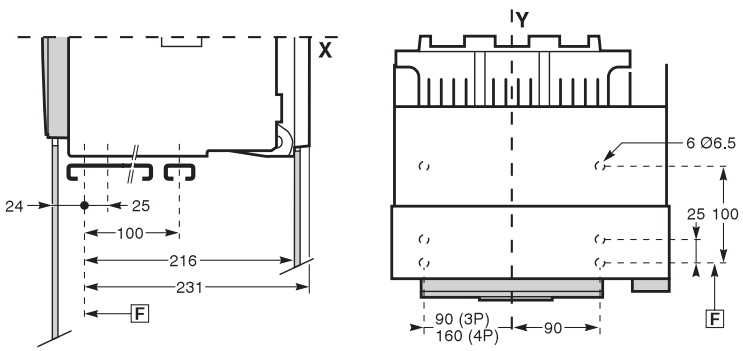
Dimension



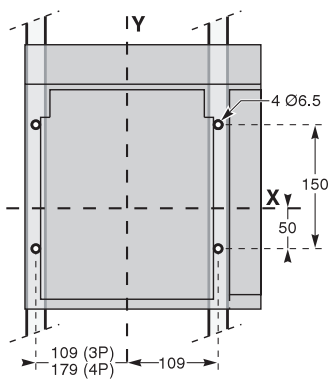


(*) opening position

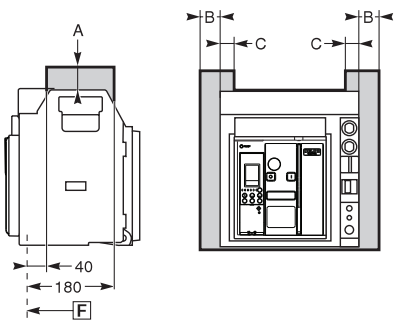
Horizontal fixation (onto substrate or track)



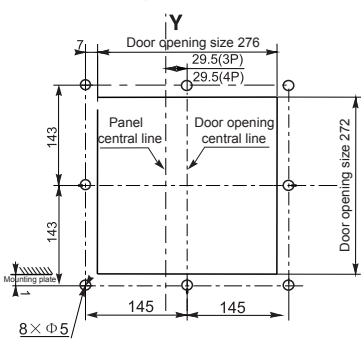
Vertical fixation detail (onto backplane or frame)



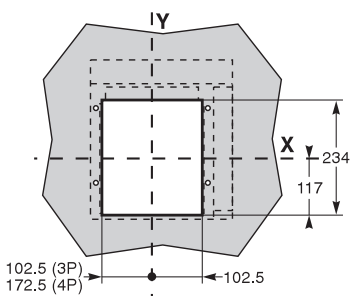
Safety spacing



Door opening size



Back panel opening size



	Insulated part	Metal part	Charged part
A	0	0	30
B	10	10	60
C	0	0	30

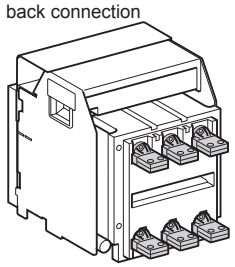
F : Benchmark point

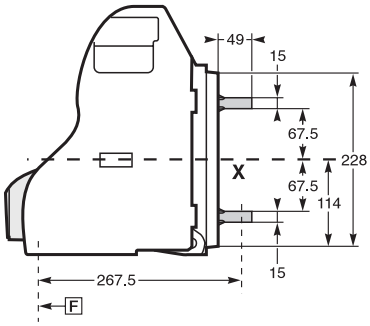
Note: The X and Y axes of the 3-pole circuit breaker are symmetrical with the front cover of the circuit breaker body.

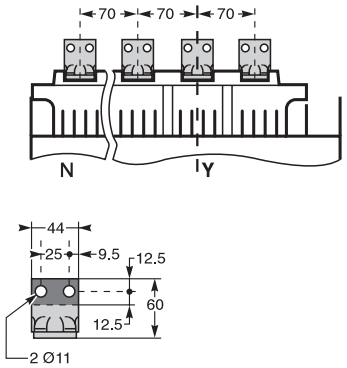
Dimension

Connection

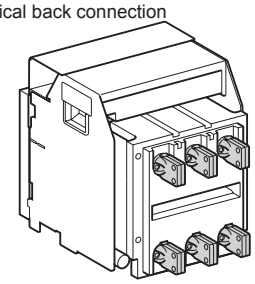
Horizontal back connection

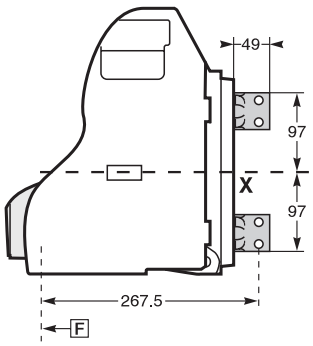


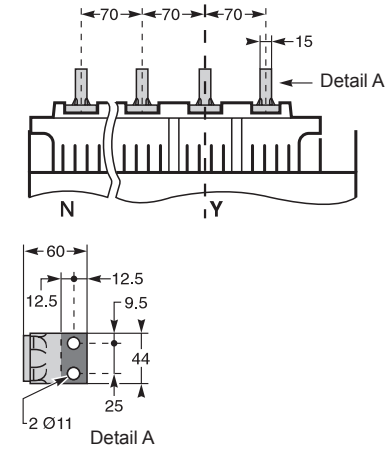




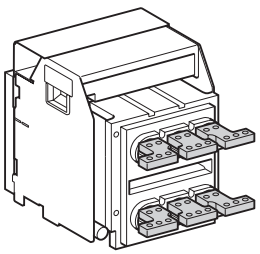
Vertical back connection

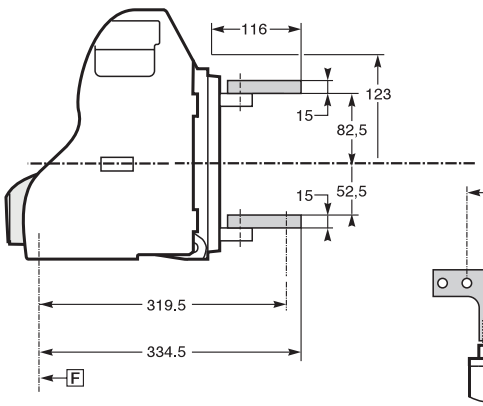


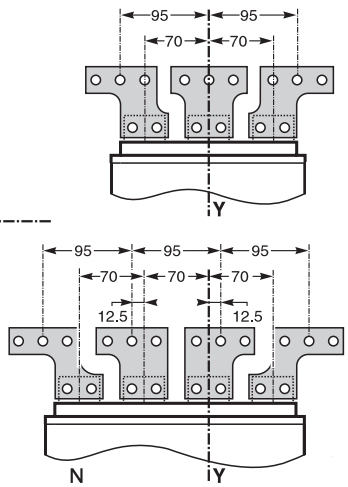




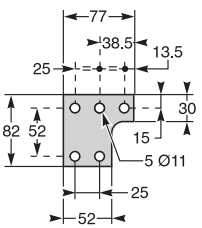
Back connection with extension terminal



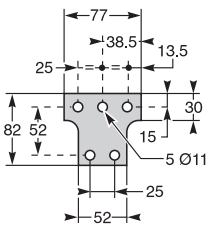




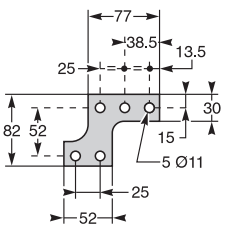
4-pole center left or right extension terminal



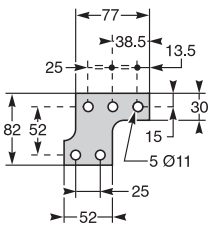
3-pole center extension terminal



4-pole left or right extension terminal



3-pole left or right extension terminal



Note: The X and Y axes of the 3-pole circuit breaker are symmetrical with the front cover of the circuit breaker body.

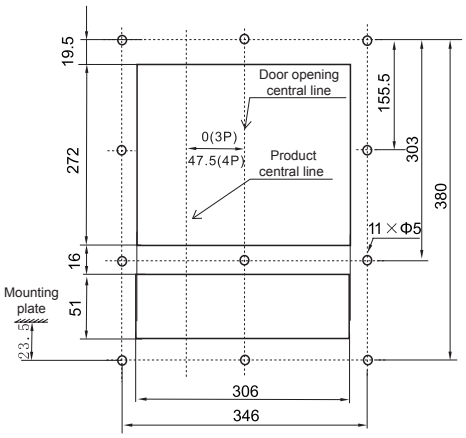
F : Benchmark point

Dimension

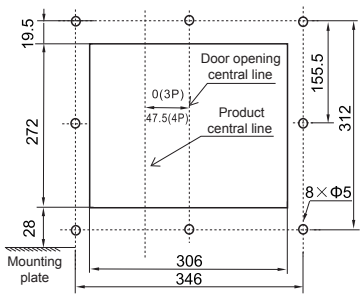
CDW6i-2000N, CDW6i-2000H

Door opening size

▪ Drawer type

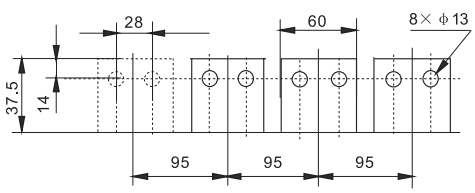


▪ Fixed type

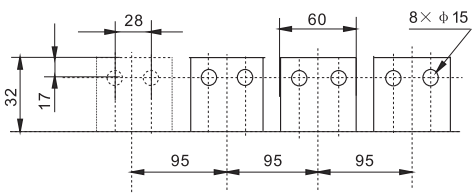


Busbar size

▪ Drawer type

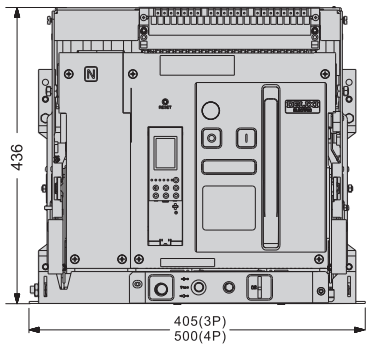


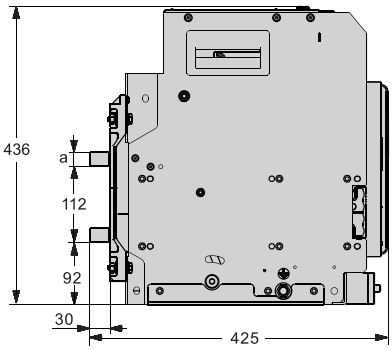
▪ Fixed type

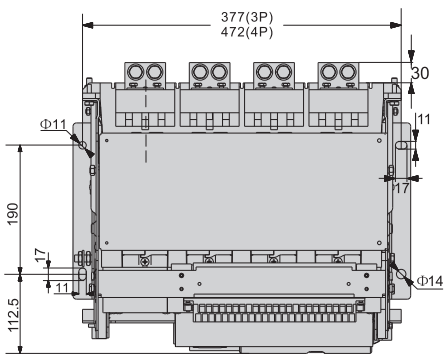


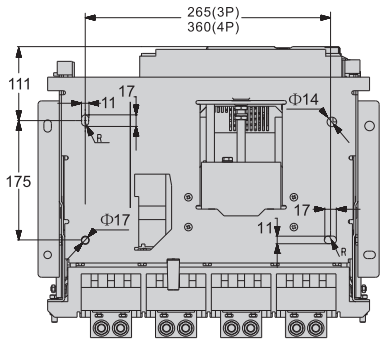
Volume

▪ Drawer type



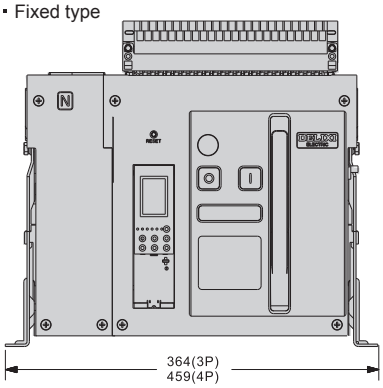


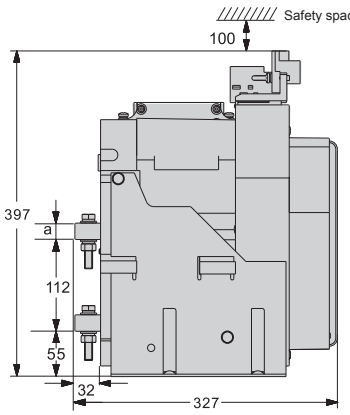


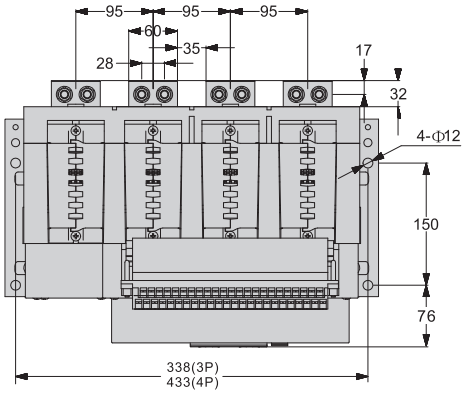


It is advisable that the cover protrudes from the door frame by 5mm.

▪ Fixed type







It is advisable that the cover protrudes from the door frame by 5mm.

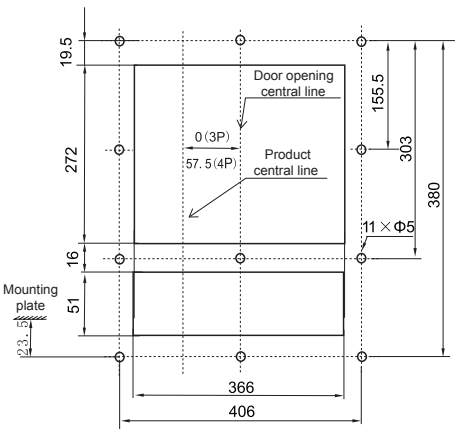
In(A)	a(mm)
630~800	10
1000~1600	15
2000	20

Dimension

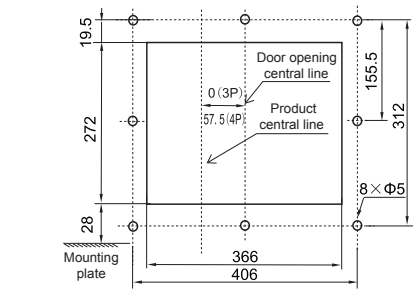
CDW6i-3200N

Door opening size

▪ Drawer type

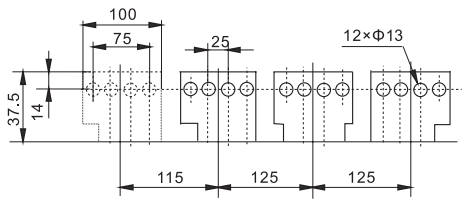


▪ Fixed type

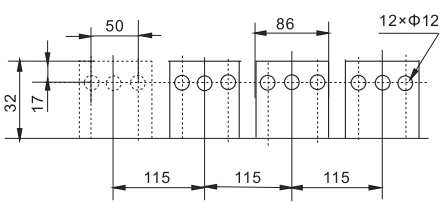


Busbar size

▪ Drawer type

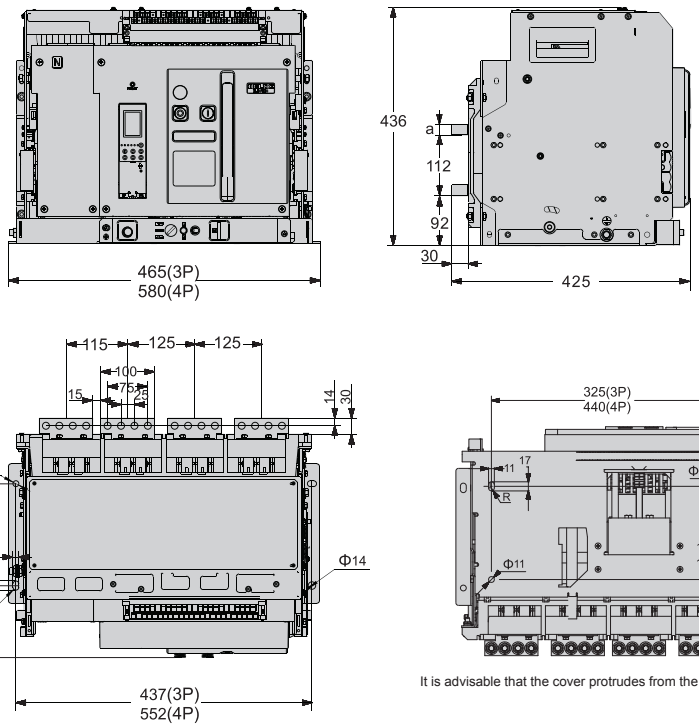


▪ Fixed type



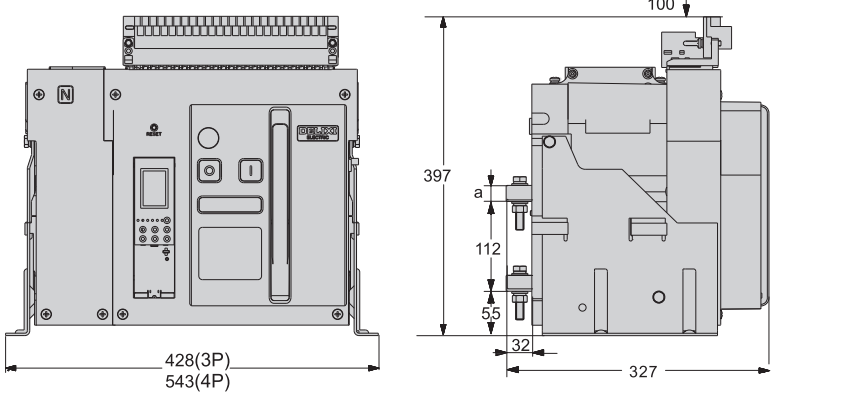
Volume

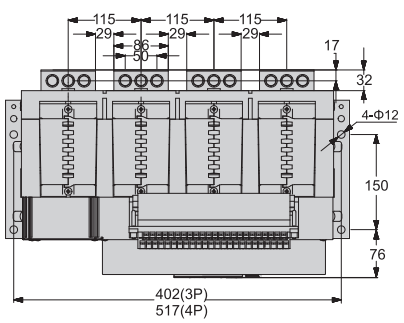
▪ Drawer type



It is advisable that the cover protrudes from the door frame by 5mm.

▪ Fixed type





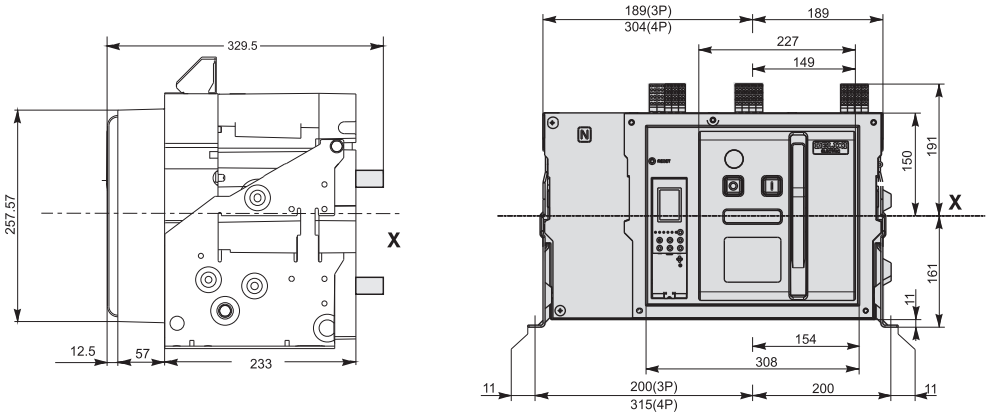
In(A)	a(mm)
2000~2500	20
3200	30

Dimension

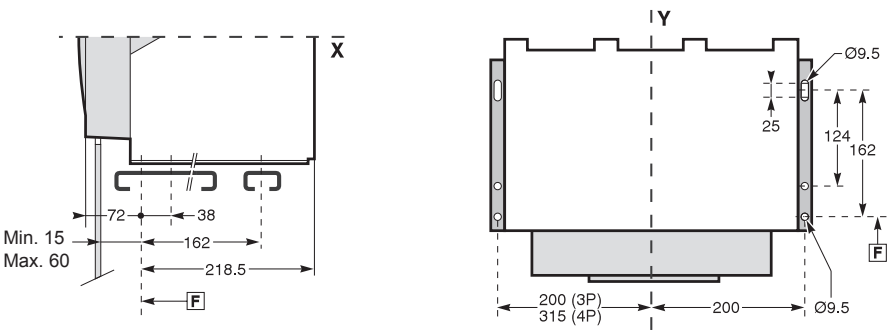
CDW6i-4000H

CDW6i-4000H fixed type 3-pole and 4-pole

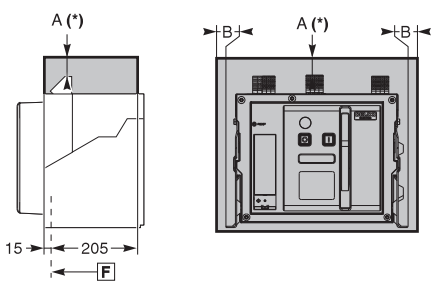
Dimension



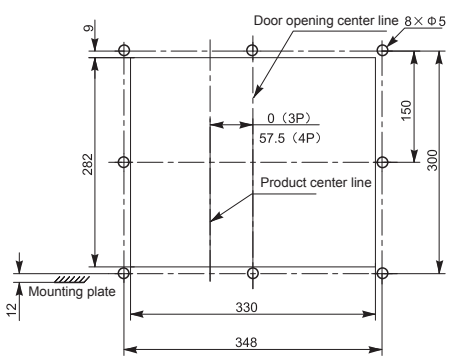
Horizontal fixation (onto substrate or track)



Safety spacing



Door opening size



	Insulated part	Metal part	Charged part
A	0	0	100
B	0	0	60

F : Benchmark point

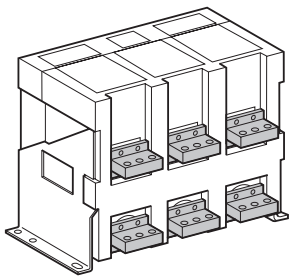
Note: The X and Y axes of the 3-pole circuit breaker are symmetrical with the front cover of the circuit breaker body.

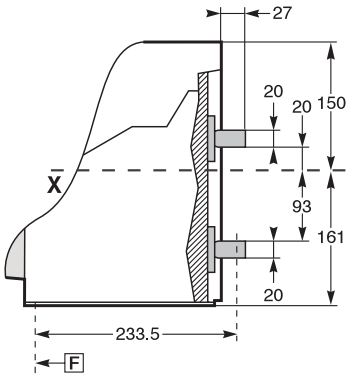
* Safety spacing should considering 110mm for moving arc chute, and 20mm for removing the terminal block

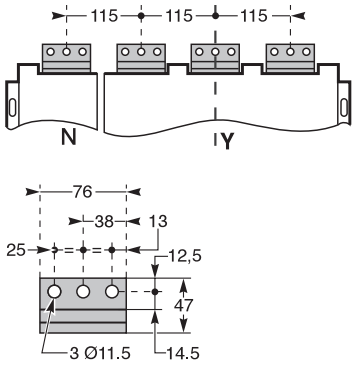
Dimension

CDW6i-4000H fixed type 3-pole and 4-pole 1600A-3200A

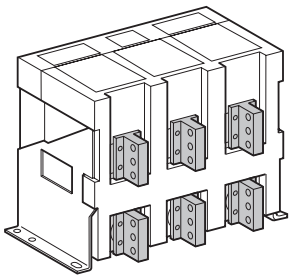
Connection
Horizontal back connection

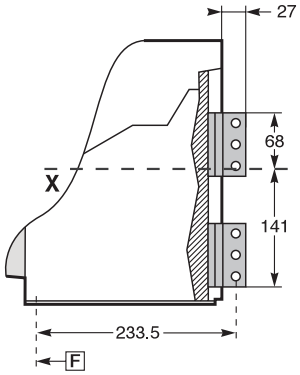


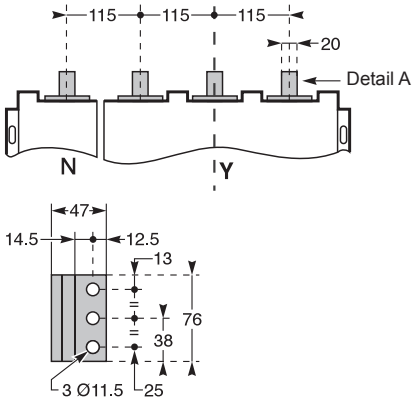




Vertical back connection





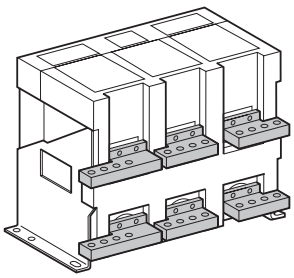


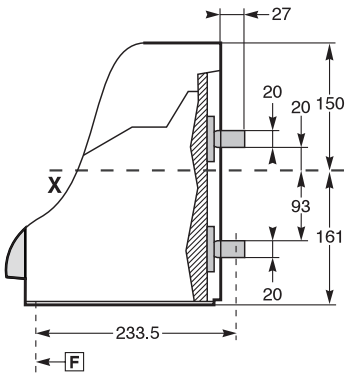
Detail A

Dimension

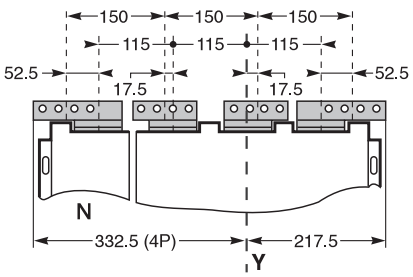
CDW6i-4000H fixed type 3-pole and 4-pole 4000A

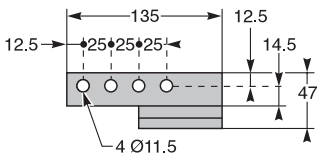
Horizontal back connection

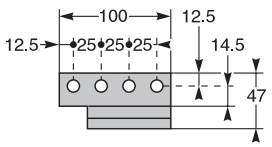




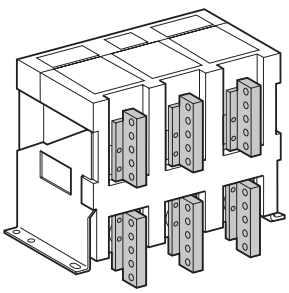
Detail

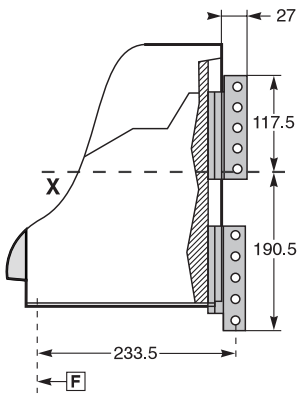


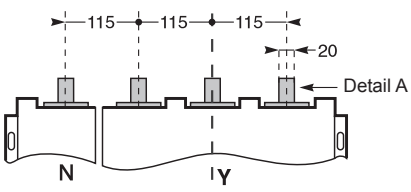


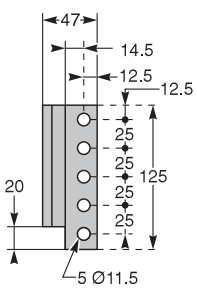


Vertical back connection







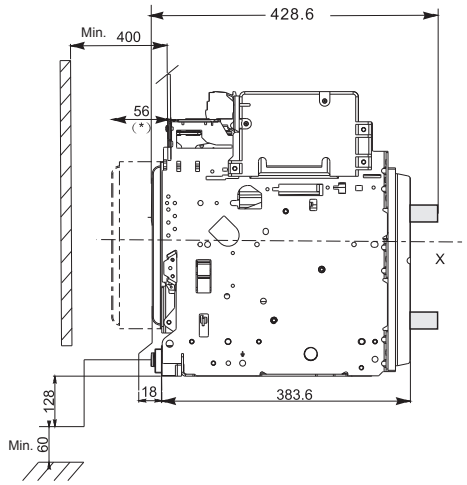


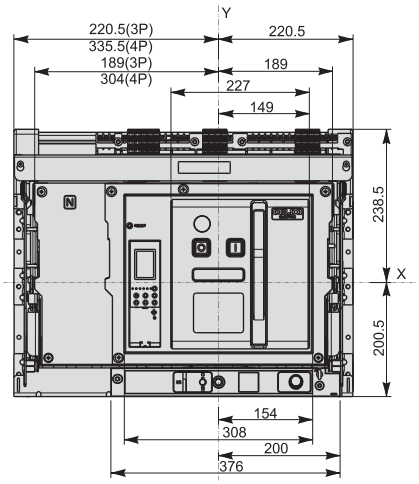
F : Benchmark point

Dimension

CDW6i-4000H drawer type 3-pole and 4-pole 1600A-4000A

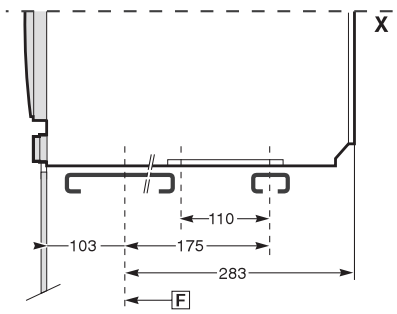
Dimension

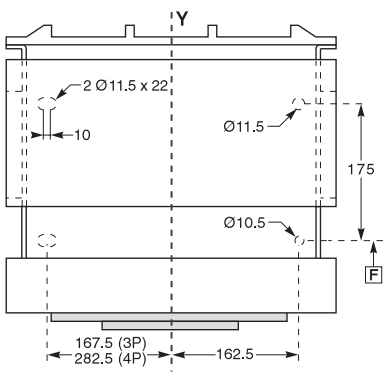




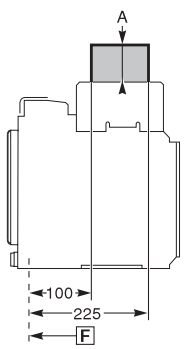
(*) Opening position

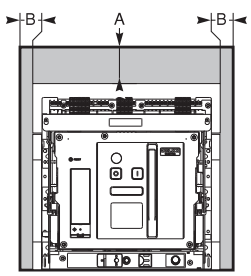
Horizontal fixation (onto substrate or track)





Safety spacing

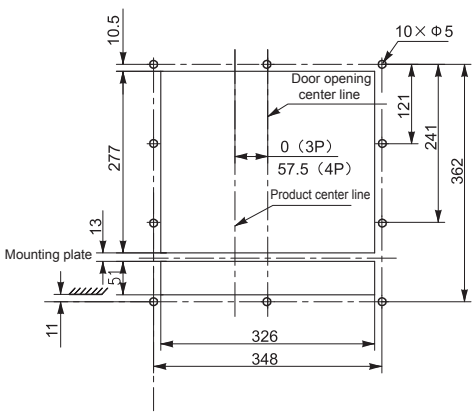




	Insulated part	Metal part	Charged part
A	0	0	0
B	0	0	60

F : Benchmark point

Door opening size



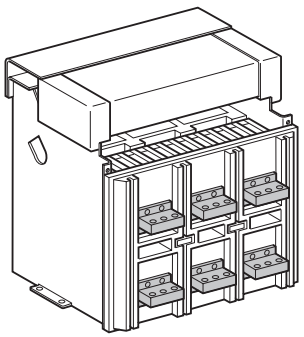
* Note: The X and Y axes of the 3-pole circuit breaker are symmetrical with the front cover of the circuit breaker body.
Safety spacing should considering the space required for moving arc chute.

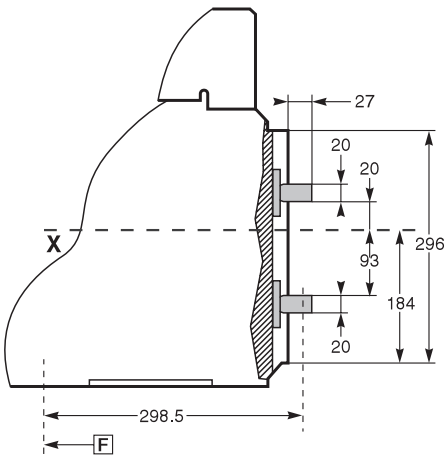
Dimension

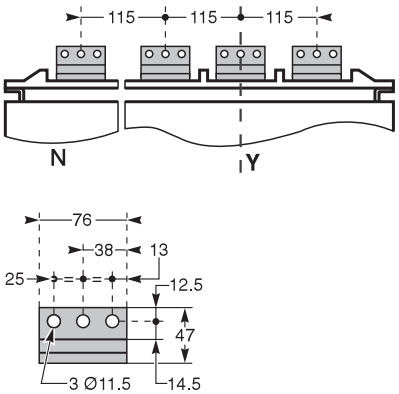
CDW6i-4000H drawer type 3-pole and 4-pole 1600A-3200A

Connection

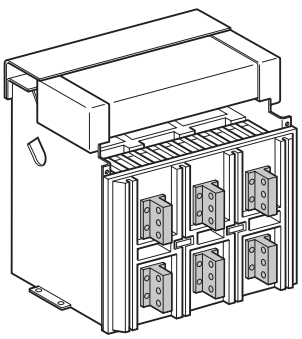
Horizontal back connection

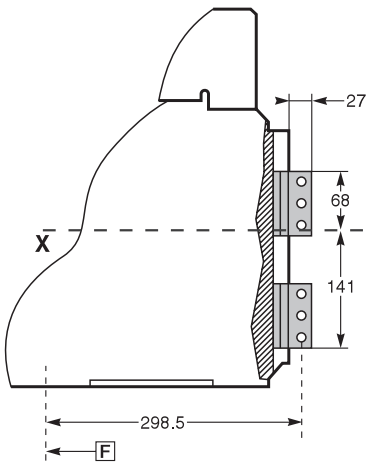


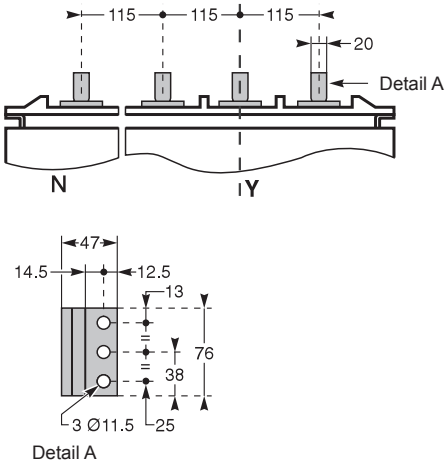




Vertical back connection





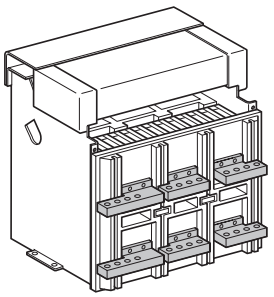


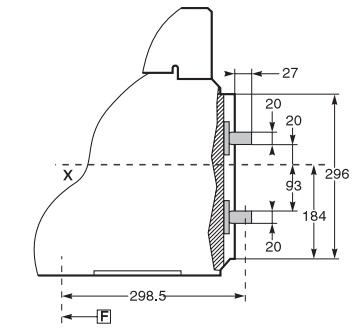
Dimension

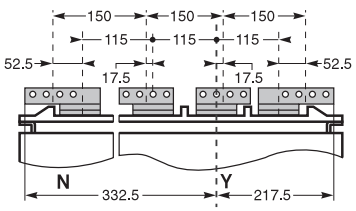
CDW6i-4000H drawer type 3-pole and 4-pole 4000A

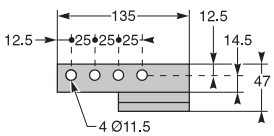
Connection

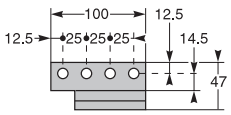
Horizontal back connection



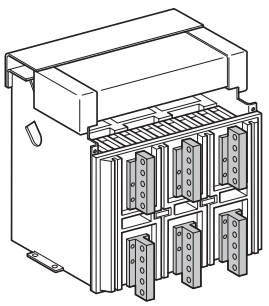


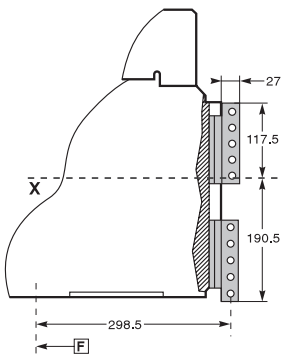


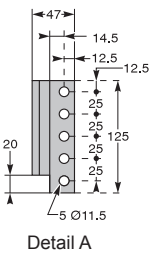


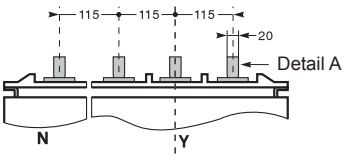


Vertical back connection









F : Benchmark point

Recommended to connect wire with the circuit breaker

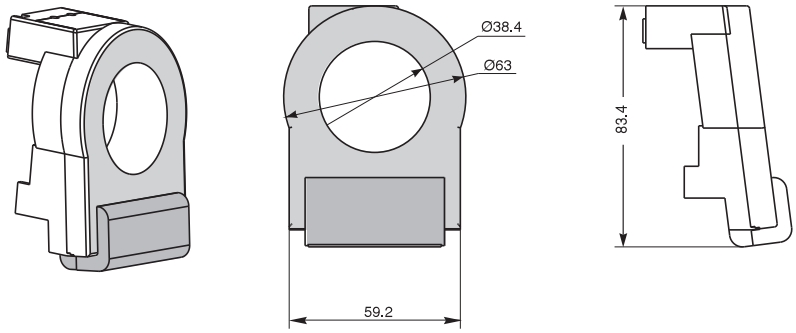
Rated current A	External copper bus specification	Number of each pole	Cross-sectional area mm²
400	Null	1	240
630	40×5	2	400
800	50×5	2	500
1000	60×5	2	600
1250	80×5	2	800
1600	100×5	2	1000
2000	100×5	3	1500
2500	100×5	4	2000
3200	120×10	3	3600
4000	100×10	5	5000

Dimension

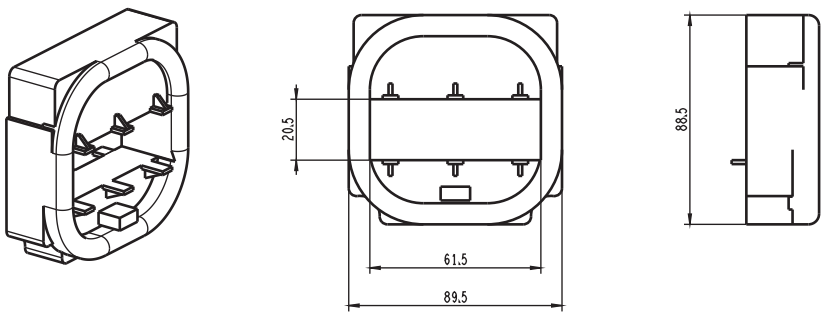
Installation size of transformer

- N phase external transfer

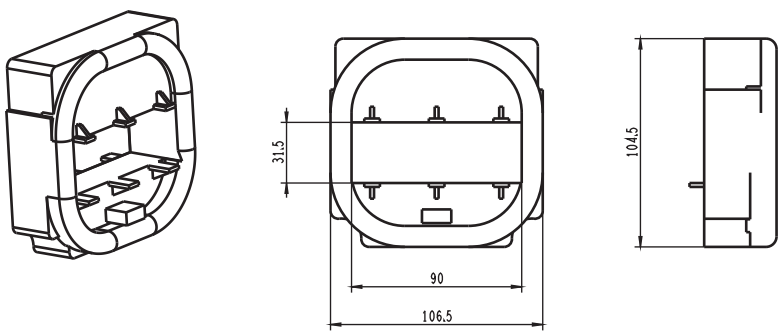
CDW6i-1600N



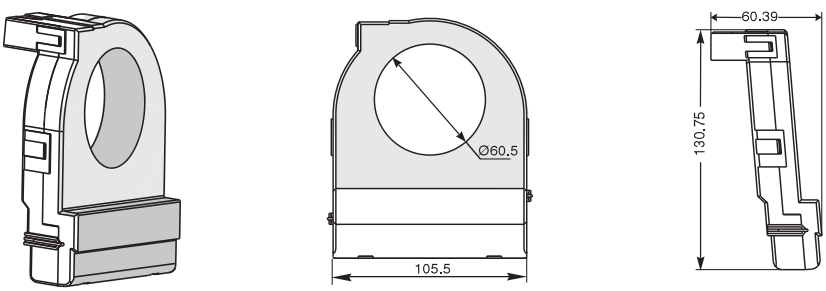
CDW6i-2000N、CDW6i-2000H



CDW6i-3200N

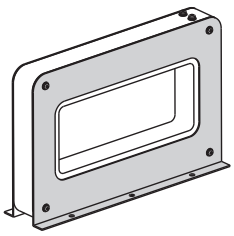


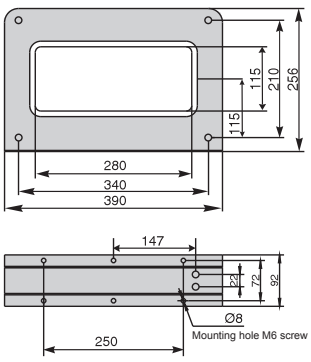
CDW6i-4000H



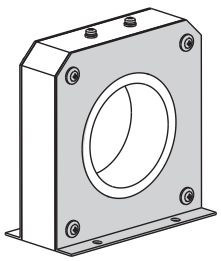
Dimension

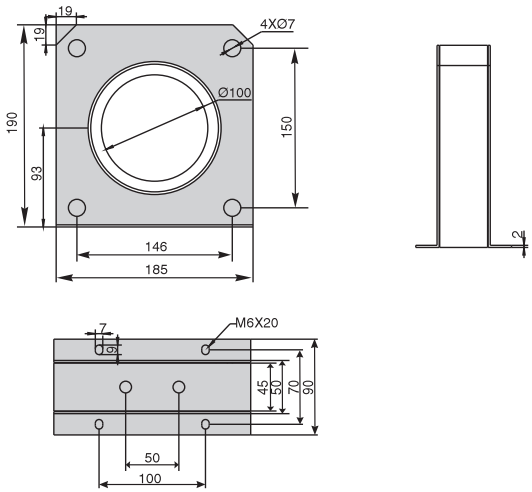
- Leakage transformer





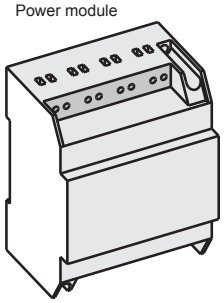
- Ground current transformer

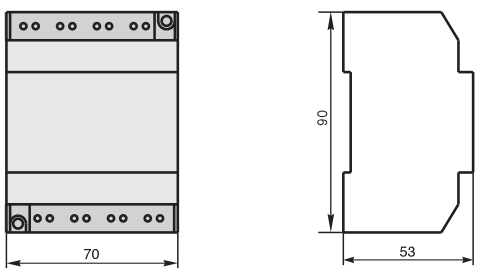




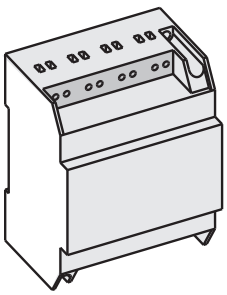
- Dimension of power module and signal transfer module

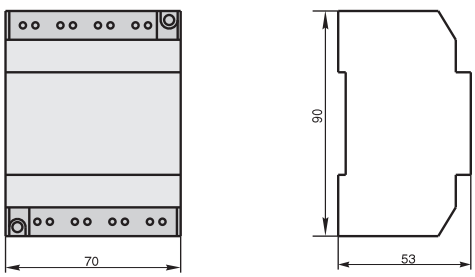
Power module





- Signal transfer module





Maintenance

Working condition

Environment temperature	-5℃~40℃, average daily temperature≤35℃ Note: Contact with supplier if the environment temperature is higher than 40℃ or lower than -5℃
Altitude	⩽2000m
Environment humidity	The humidity should not be higher than 50% when the temperature reaches the maximum 40℃, higher humidity is allowed when temperature is low (eg. 90% when temperature is 20℃), special action should be taken when there is condensation caused by the changes of temperature sometimes;
Electromagnetic interference	Applicable to environment A
Protection level	The breaker installed in a small chamber inside of enclosure, and installed with door, protection level IP40

Maintenance procedure

Regular inspection is required

Intervals	Operation method
Every year	Power on and off the local and remote equipment, use a variety of additives to test the operating program column Use small test suite to test control unit
Every two year or when the maintenance index of control unit reaches 100	Check arc extinguishing chamber Check contact system Check the connection tightness

Parts replacement according to number of business cycle

The below parts must be replaced regularly to extend the service life of equipment (the maximum value of business cycle)

Accessory	Intervening entity
Arc extinguishing chamber	User
Electric operating mechanism	User
Mechanical interlock	User
Link spring	User
Shunt coil/undervoltage coil/closing coil	User

Maintenance operation

1. Lubricating parts need to be lubricated regularly during use.
2. Check and clear the dust regularly to make sure the insulated level of the breaker
3. Check regularly the contact system, especially check after opening of each short circuit, the checking includes:

▪ Whether two-wall smoke marks in the arc chamber clear, whether arc extinguishing wall is broken, whether arc chute burnt seriously, replace as appropriate

▪ Whether the contact contacts well, if the thickness of contact is less than 1mm, please return to factory for replacement

▪ Whether there is loose between all kinds of connection parts

4. The controller can be illustrated the fault reason if the breaker is opened by fault, and with memory function after power failure. When power on, press the “Fault check” on the control panel, the last fault opening information will be shown. If new fault happens, the old memory will be cleared, and save the new memory.

Note: Analog power failure under test mode will not be memorized. Press “Reset” button after checking, the controller will return to normal mode.

Maintenance

Troubleshooting method

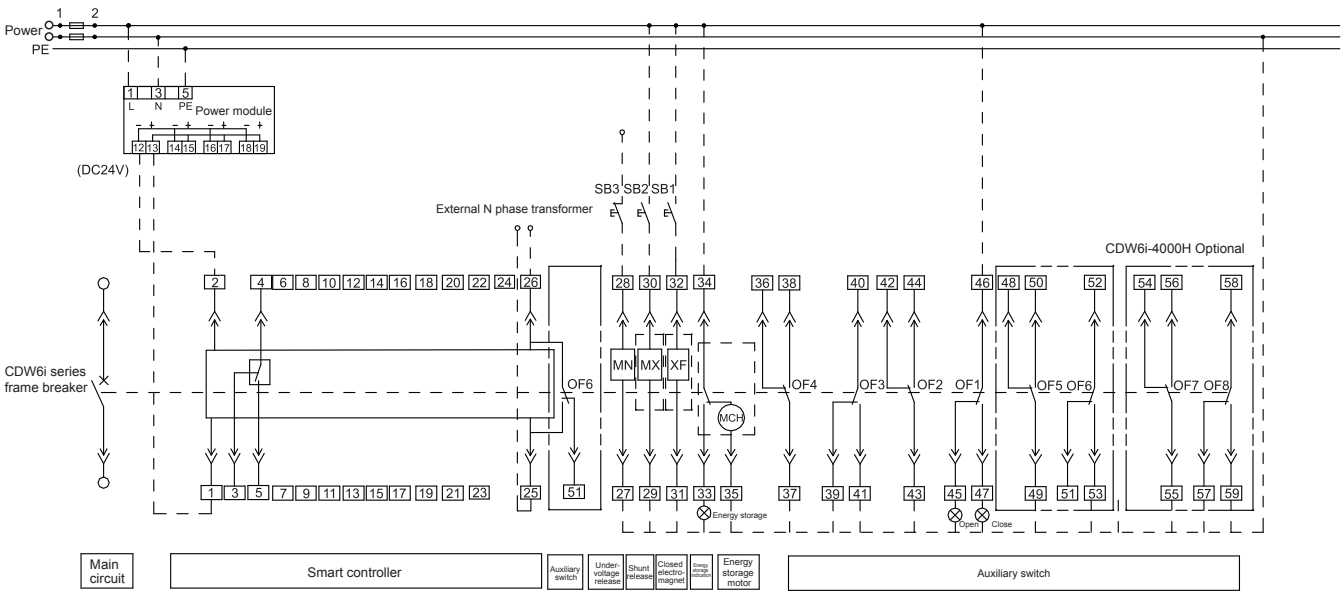
Fault phenomenon	Reason analysis	Troubleshooting method	Remarks
The motor cannot store energy or abnormal	Voltage specifications are inconsistent with circuit breaker	Check whether the data plate of the breaker is same as the order requirement, if not, replace	External power supply must meet the requirement, correct wiring
	Breaker or external circuit wiring wrong	Check the circuit by multimeter according to wiring diagram	
	Motor burnout	Replace new motor	
	Motor still running after the energy storage is finished	Bad travel switch in the mechanism, replace new travel switch	
Breaker can not be closed	Undervoltage does not pick up	Power supply for undervoltage, replace if burnout	-
	Load short circuit or controller reset button does not reset	Reset the controller reset button after the fault is cleared	
	Shunt release long time power on	Shunt release can not be powered on lone time or check the circuit, replace if burnout	
Breaker can not be opened	No action of shunt release and undervoltage release	Power on the shunt release, replace if burnout	-
		Power off the undervoltage release, if no action, replace	
	Magnetic flux converter no action	If smart controller does not send out signal, replace tripper	
		Adjust the position of magnetic flux converter	
Breaker frequently trip	Controller red reset button pop up	Check which fault light is on, clear the fault reason	
		If there is no fault in the circuit, replace controller	
	Undervoltage tripper protection	Check whether the voltage of power grid fluctuates, and voltage power is loose	
		Check whether the fault can be cleared after the removal of undervoltage release	

Order spare parts

- For electrical parts, the following may be replaced:
  Electronic operation mechanism
  Shunt coil
  Closing coil
  Undervoltage coil
  Auxiliary contact
  Install smart release accessory
  Key lock

Secondary circuit wiring diagram

Wiring diagram of iTR326 type and iTR326A smart controller



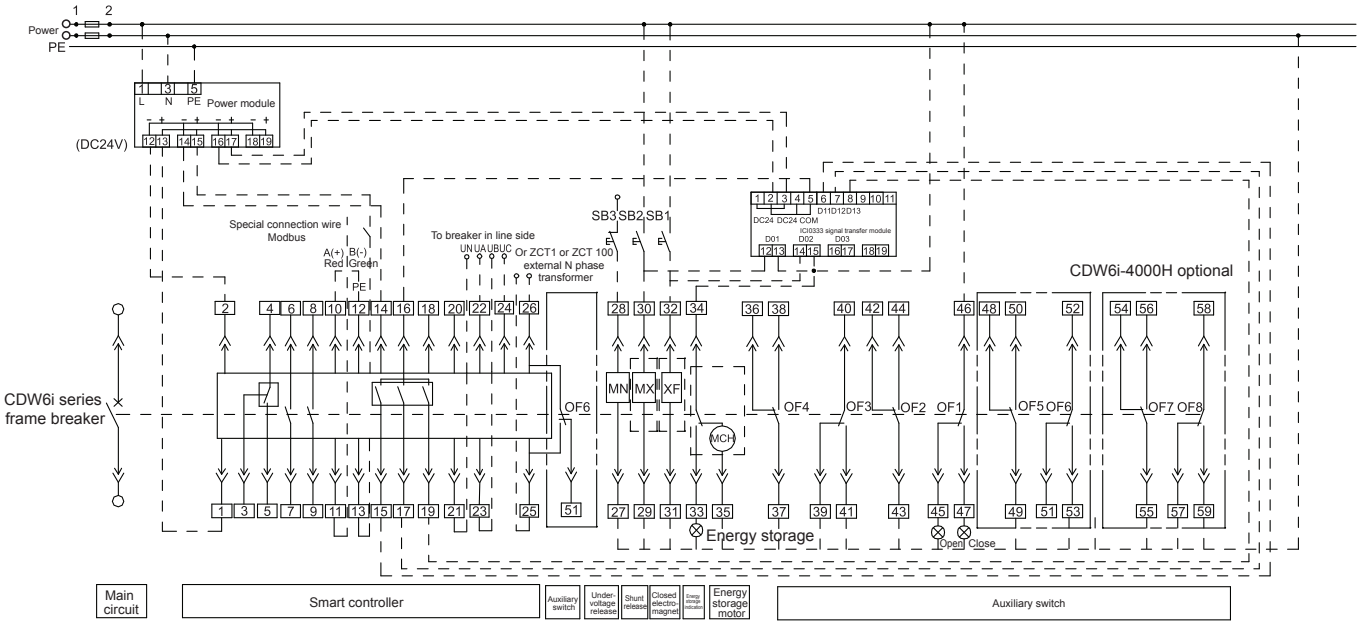
Controller wiring note:
UM: voltage test signal input
21# (UN), 22# (UA), 23# (UB), 24# (UC) are voltage input of phase N, A, B, C.
POW: External power input
1# (V1+), 2# (V2-): Auxiliary power input and output terminal, 1# (V1) is the positive terminal for DC.
SWT: fault trip contact output
3#(S2), 4#(S1), 5#(S3): fault trip contact output (4#(S1) is public terminal), contact capacity: AC400V, 5A
CT: external transformer, including external N phase transformer or ZT100 or ZCT1 (three options), where:
25# -26#: external N phase transformer input;
25# -26#:external grounding transformer ZT100 input;
25# -26#: external leakage transformer ZCT1 input;

Note 1: MN undervoltage release 27# and 28# connected to main circuit
Note 2: different power can be connected if the control power voltage of MN, MX, XF and MCH is different, the CDW6i-1600N auxiliary switch only provide 4a4b;
CDW6i-2000N&H and CDW6i-3200N auxiliary switch can provide 4a4b and 6a6b;
CDW6i-4000H auxiliary switch can provide 4a4b, 6a6b and 8a8b, where 4a4b is standard, for others the user can buy separately if needed (the dotted area in the drawing will be connected by user self);
Note 3: Terminal 35# can be connected to power (automatic pre-storage), or connect the normally open button to the power supply (manually pre-storage);
Note:4 the controller must connect with power module, use iPAU331 power module if power voltage is AC220V/AC230V, use iPAU332 power module if power voltage is AC380V/AC400V; use iPAU332D module if power voltage is DC110V and DC220;
Note 5: When CDW6i-2000N&H and CDW6i-3200N are 47 loop, the auxiliary switch is 4a4b;
Note 6: When CDW6i-2000N&H and CDW6i-3200N are 51 loop, the auxiliary switch is 6a6b (5a5b): after 25#, 26# and 51# forms a normally open normally closed contact, which can not be connected with external transformer.

Components:
MN---Undervoltage release
MX---Shunt release
XF---Closed electromagnetic
OF1-OF8---Auxiliary switch
SB1---Closing button
SB2---Openning button
SB3---Emergency open button

Secondary circuit wiring diagram

Wiring diagram of iTR326H type smart controller



Controller wiring note:
UM: voltage test signal input
21# (UN), 22# (UA), 23# (UB), 24# (UC) are voltage input of phase N, A, B, C.
ZSI: regional selective interlock
13#(Z+) and 14#(Z-) are DC24V input of regional interlock protection
16#(Z11), 15#(Z1), 17#(Z2) and 19#(Z3) are 3D0 output, optocoupler output, 16#(Z11) is public terminal
POW: External power input
1# (V1+), 2# (V2-): Auxiliary power input and output terminal, 1# (V1+) is the positive terminal for DC.
SWT: fault trip contact output
3#(S2), 4#(S1), 5#(S3): fault trip contact output (4#(S1) is public terminal), contact capacity: AC400V, 5A)
COM: communication output
10#, 11#: communication lead line of RS485A(485+), RS485B(485-) separately, 12#: PE line, shield ground
CT: external transformer, including external N phase transformer or ZT100 or ZCT1 (three options), where:
25# -26#: external N phase transformer input;
25# -26#:external grounding transformer ZT100 input;
25# -26#: external leakage transformer ZCT1 input;

Components:
MN---Undervoltage release
MX---Shunt release
XF--- Closed electromagnet
MCH---Motor
OF1-OF8---Auxiliary switch
ZCT1---Leakage transformer
ZT100---Grounding transformer
SB1---Closing button
SB2---Opening button
SB3---Emergency open button

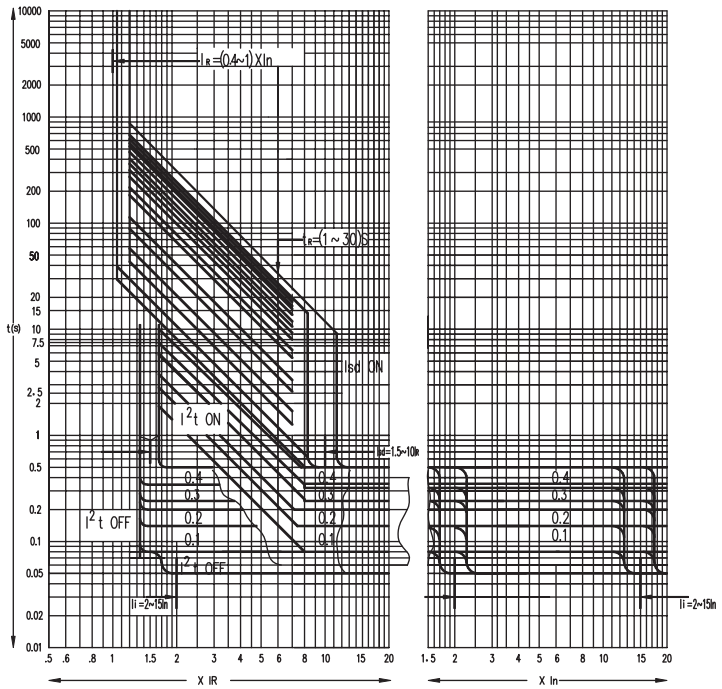
Note 1: MN undervoltage release 27# and 28# connected to main circuit
Note 2: different power can be connected if the control power voltage of MN, MX, XF and MCH is different, the auxiliary switch only provide 4a4b for CDW6i-1600N;
CDW6i-2000N&H and CDW6i-3200N auxiliary switch can provide 4a4b and 6a6b; CDW6i-4000H auxiliary switch can provide 4a4b, 6a6b and 8a8b, where 4a4b is standard, for others the user can buy separately if needed (the dotted area in the drawing will be connected by user self);
Note 3: Terminal 35# can be connected to power (automatic pre-storage), or connect the normally open button to the power supply (manually pre-storage);
Note:4 the controller must connect with power module, use iPAU331 power module if power voltage is AC220V/AC230V, use iPAU332 power module if power voltage is AC380V/AC400V; use iPAU332D module if power voltage is DC110V and DC 220;
Note 5: When CDW6i-2000N&H and CDW6i-3200N are 47 loop, the auxiliary switch is 4a4b;
25# and 26# are the input terminals for external transformer, which is used for (3P+N) T type of grounding fault protection;
Note 6: When CDW6i-2000N&H and CDW6i-3200N are 51 loop, the auxiliary contact is 6a6b (5a5b): after 25#, 26# and 51# forms a normally open normally closed contact, which cannot be connected with external transformer.
Note 7: it is required to increase signal transfer module for remote control, signal transfer module contact capacity AC240V, 10A.
Note 8: The Protocol is Modbus, if using Profibus or Devicene, need to order iCAU486 or iCAU485 module, module is powered by DC24V, input terminal connects to 10#(485+) and 11#(485-) of secondary circuit, output terminal connect with relevant Protocol bus.

Appendix

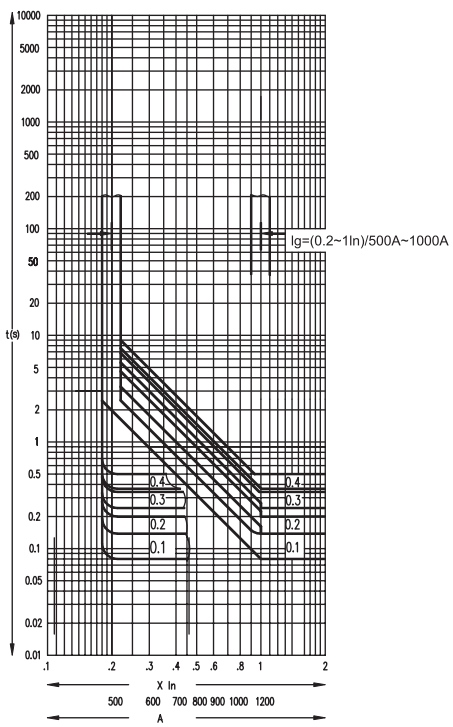
Trip curve

Trip curve

Three-stage protection



Grounding protection



Appendix

CDW6i selection table

Selection table

Quantity _____

Breaker body (required)

Shell frame specification	1600N	2000N	2000H	3200N	4000H	6300L
Rated current	400A ☐ 630A ☐ 800A ☐ 1000A ☐ 1250A ☐ 1600A ☐	630A ☐ 800A ☐ 1000A ☐ 1250A ☐ 1600A ☐ 2000A ☐	630A ☐ 800A ☐ 1000A ☐ 1250A ☐ 1600A ☐ 2000A ☐	2000A ☐ 2500A ☐ 3200A ☐	1600A ☐ 2000A ☐ 2500A ☐ 3200A ☐ 4000A ☐	4000A ☐ 5000A ☐ 6300A ☐
Number of poles	3-pole ☐ 4-pole ☐ Note: 1) 6300A of 6300L only has 3-pole					
Installation mode	Drawer horizontal ☐ Drawer vertical ☐ Fixed horizontal ☐ Fixed vertical ☐ Note: 2) vertical wiring is only for 1600N&4000h shell frame 3) 6300L only has drawer horizontal type					
Controller	iTR326 ☐ iTR326A (standard) ☐ iTR326H ☐					
Protocol (only for H controller)	Modbus (default) ☐		Profibus ☐		Devicenet ☐	

Input power

Shunt, closing, electric operating mechanism	AC230V ☐	AC400V ☐	DC220V ☐	DC110V ☐
	Note: 4) no DC220V, DC110V for 6300L.			
Undervoltage coil	No undervoltage ☐			
	Undervoltage ☐	AC230V ☐	AC400V ☐	
	Delay ☐	Specify delay seconds: _____		
		(standard: 1s, 3s & 5s. And 0.5s & 1.5s are available for customized)		

Other accessory

Auxiliary switch	Shell frame	Auxiliary switch		
	1600N	4O4C ☐		
	2000N&H	4O4C ☐	6O6C ☐	
	3200N	4O4C ☐	6O6C ☐	
	4000H	4O4C ☐	6O6C ☐	8O8C ☐
	6300H	4O4C ☐	6O6C ☐	
	Note: 5) Default standard is 4O4C.			

Connection accessory		
	Insulated baffle (standard) ☐	(no insulated baffle for 4000H of 4000A)
	Vertical L type adapter ☐	(only for 2000N&H and below 2000A)
	Extension terminal ☐	(only for 1600N shell frame)
	Door (standard) ☐	

Controller accessory			
	External transformer: Leakage transformer ☐		Signal transfer module ☐
	Grounding transformer ☐		Power module ☐
	N-phase external transformer ☐		
	Note: 6) Leakage and grounding transformer and signal transformer are only optional when choosing iTR326H controller 7) N phase external transformer is only applicable to 3P+N 8) Power module is standard.		

Lock mechanism	Lock key:		Mechanical interlock:		
		1 lock 1 key ☐		Cable interlock (2 sets) ☐	Drawer type door interlock ☐
		2 locks 1 key ☐		Cable interlock (3 sets) ☐	
		3 locks 2 keys ☐		Cable interlock (2 sets) ☐	
		4 locks 3 keys ☐		Leverage interlock (2 sets) ☐	
		Key lock ☐		Leverage interlock (3 sets) ☐	
	Note: 9) 1600N type no cable interlock (3 sets) and leverage interlock (3 sets) 10) Door interlock is only limited to drawer type 2000N&H, 3200N, 6300L shell frame 11) Choose lock key or mechanical interlock, if choosing pinlock, the product and lock key or mechanical interlock chosen are used together.				

Instruction sheet: Unervoltage delay unit instruction sheet/Mechanical interlock instruction sheet

Remarks: For normal application, please use the following standard configuration: shunt, closing, electric operation mechanism, insulated baffle, door frame, power module, and auxiliary switch 4O4C, controller iTR326A. If other special accessory is required, please check in the selection table.

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This user manual is the 2nd version since July, 2017.