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**Susol** Super Solution

# DC COMPACT SWITCH-DISCONNECTORS

1200A Up to 1500Vdc



**LS** ELECTRIC

# Change Low Voltage Switchgear!

Another evolution of size, cost and performance for low voltage power circuit breakers

High  
Performance  
 $I_{cw}=50kA/1s$





**Susol**

# DC Compact Switch-disconnectors

1200A Up to 1500Vdc

UL 489B for Photovoltaic (PV) Systems

UL 489F for Battery Power Supplies

## Contents

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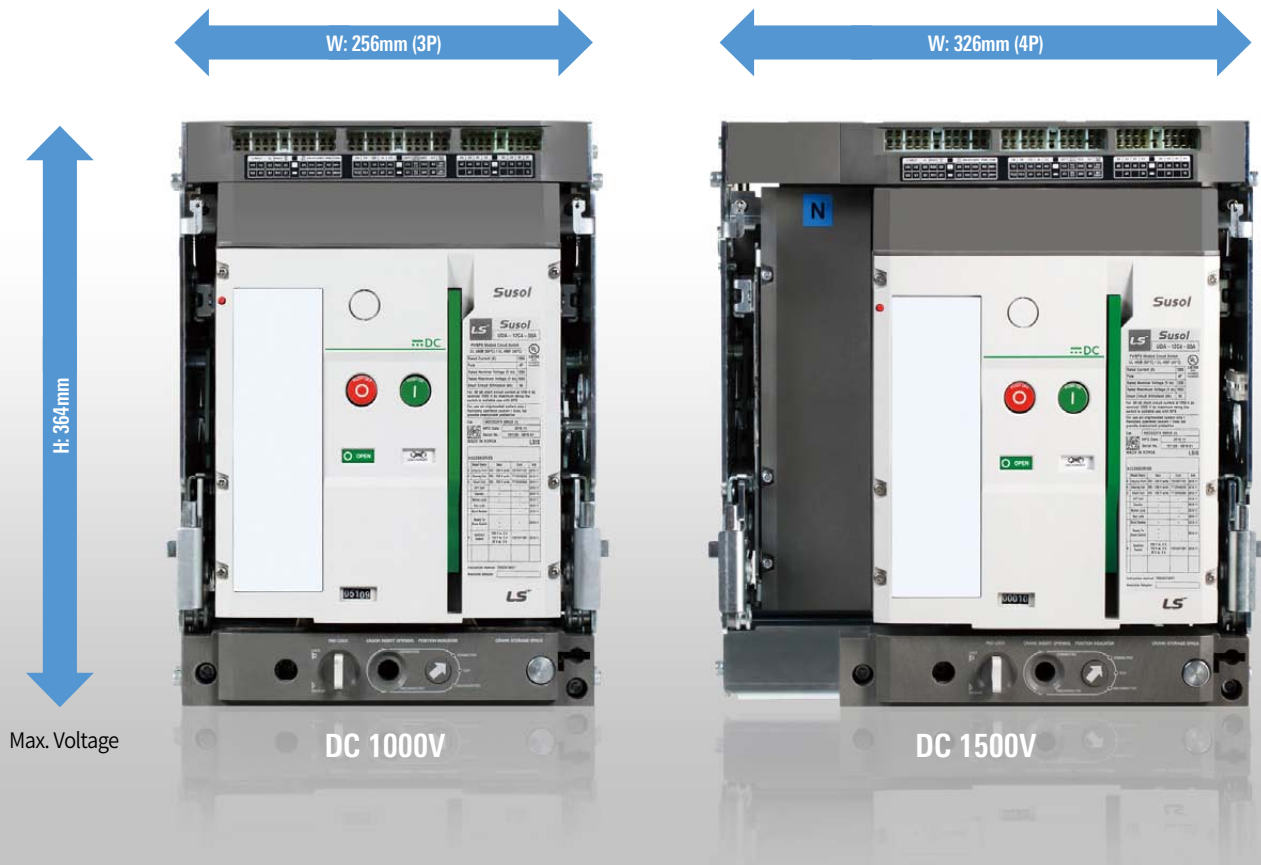
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Compact Size  
**55% ↓**

Performance **UP**  
Size **DOWN**

## DC Compact Switch-disconnectors 1200A



### Features

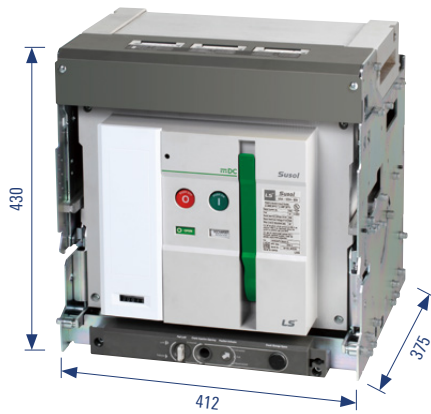
- Rated current 800 ~ 1200A
- Maximum voltage (3P : 1000Vdc, 4P : 1500Vdc)
- Rated short-time current (I<sub>cw</sub>): 50kA/1s
- Operation durability without maintenance: 12,500 times
- Various control power sources
- Various accessories
- UL File No.
  - File E491572 (UL489F : Battery Power Supply Molded-case Switches)
  - File E493630 (UL489B : Photovoltaic molded-case switches)
  - File E494756 (Adapters, Molded-case Switches)
  - File E223241 (Accessory Devices)
- UL 489 B : Molded-Case Switches for Use with Photovoltaic(PV) Systems
- UL 489 F : Molded-Case Switches for Use with Battery Power Supplies

## Compact type

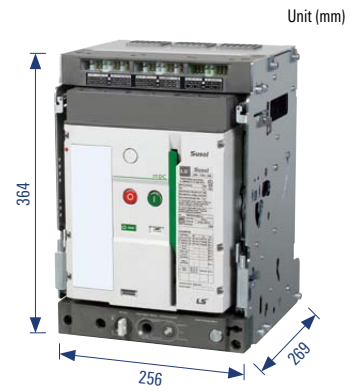
55%

Another evolution of size, cost and performance for low voltage power circuit breakers

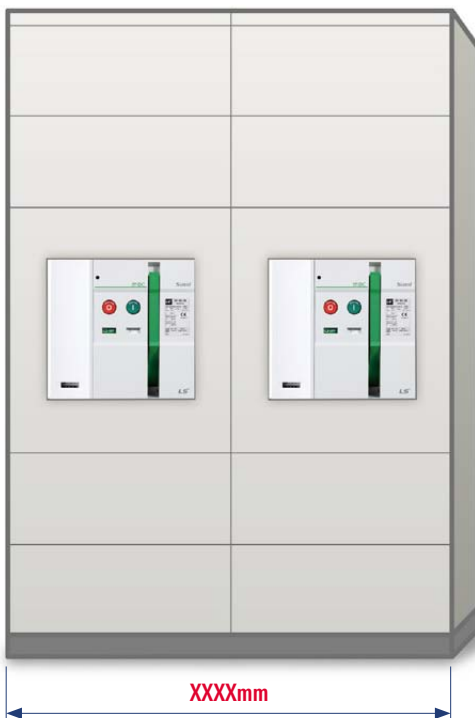
DC Switch-disconnector



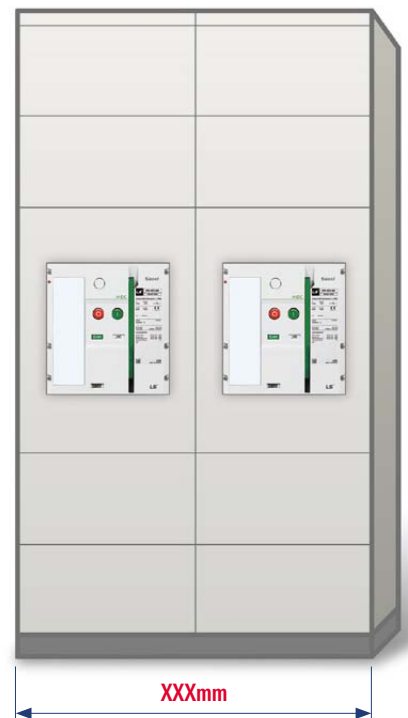
DC Compact Switch-disconnector



3-high



4-high



# Ratings



Fixed type



Draw-out type

Commonness			Characteristics			
Rated operational voltage (Ue)	(V)		DC 1000V (3P) , DC 1500V (4P)			
Rated insulation voltage (Ui)	(V)		1500			
Rated impulse withstand voltage (Uimp)	(kV)		12			
Poles	(P)		3, 4			
Installation type			Fixed type / Draw-out type			
Related standards			UL 489B (PV system), UL489F (ESS system)			
Type			UDA			
			UDA-08C	UDA-10C	UDA-12C	
Ampere frame	(AF)		800AF	1000AF	1200AF	
Rated making capacity	(kA peak)	DC	50			
Rated short-time withstand current (Icw)	(kA/1s)	DC	50			
Interrupting Rating	(kA)	DC 1500V (4P) DC 1000V (3P) (L/R=8ms)	8	10	12	
Operation time	(ms)	Opening time	max. 40			
		Closing time	max. 80			
Busbar connection method	Fixed type, Draw-out type	Horizontal	○			
		Vertical	● (Default)			
		Mixed	○			
	Flat	Flat	○			
Durability						
Opening and closing duration (times) (Unpaid)		Mechanical	12,500			
		Electrical (L/R=3ms)	800	500	400	
Common Dimension and Weight						
Weight (3P/4P)	(kg)	Draw-out	19.5(3P)/24.5(4P)			
			Without cradle			
		With cradle	35.5(3P)/43(4P)			
		Fixed	16(3P)/19.5(4P)			
Demension (W×H×D)	(mm)	Draw-out	361.3X267X255.4(3P), 361.3X267X326(4P)			
		Fixed	283X219.5X272.4(3P), 283X219.5X342.4(4P)			

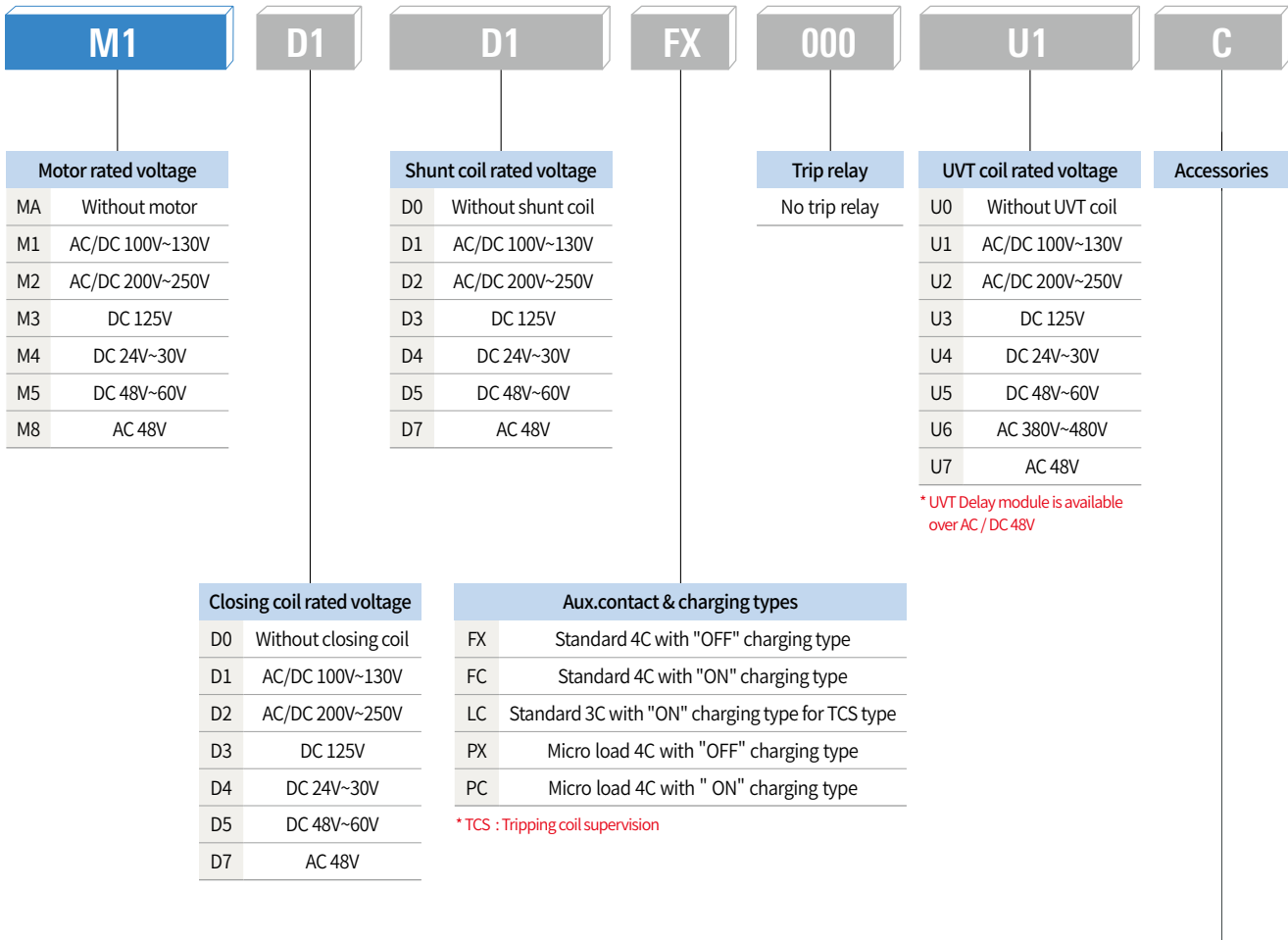
## DC Compact Switch Disconnecter

<b>UDA</b>		<b>12</b>	<b>C</b>	<b>3</b>	<b>00</b>	<b>A</b>					
<b>Switch-disconnectors</b>		<b>Ampere frame</b>		<b>Frame size</b>		<b>Poles</b>		<b>Rated current</b>		<b>Connections</b>	
UDA	1500Vdc	08	800AF	C	800~1200AF	3	3Pole (1000Vdc)	00	None	Drawout	
		10	1000AF			4	4Pole (1500Vdc)			A Bottom operating (auto connect)	
		12	1200AF							Fixed	
										H	Horizontal terminals
										V	Vertical terminals
										M	horizontal for line. Vertical for load.
										N	horizontal for line. Vertical for load.
										P	Front terminals



# Ordering

## DC Switch-Disconnectors accessories



Motor rated voltage	
MA	Without motor
M1	AC/DC 100V~130V
M2	AC/DC 200V~250V
M3	DC 125V
M4	DC 24V~30V
M5	DC 48V~60V
M8	AC 48V

Closing coil rated voltage	
D0	Without closing coil
D1	AC/DC 100V~130V
D2	AC/DC 200V~250V
D3	DC 125V
D4	DC 24V~30V
D5	DC 48V~60V
D7	AC 48V

Shunt coil rated voltage	
D0	Without shunt coil
D1	AC/DC 100V~130V
D2	AC/DC 200V~250V
D3	DC 125V
D4	DC 24V~30V
D5	DC 48V~60V
D7	AC 48V

Aux.contact & charging types	
FX	Standard 4C with "OFF" charging type
FC	Standard 4C with "ON" charging type
LC	Standard 3C with "ON" charging type for TCS type
PX	Micro load 4C with "OFF" charging type
PC	Micro load 4C with "ON" charging type

\* TCS : Tripping coil supervision

Trip relay	
No trip relay	

UVT coil rated voltage	
U0	Without UVT coil
U1	AC/DC 100V~130V
U2	AC/DC 200V~250V
U3	DC 125V
U4	DC 24V~30V
U5	DC 48V~60V
U6	AC 380V~480V
U7	AC 48V

\* UVT Delay module is available over AC / DC 48V

Accessories	
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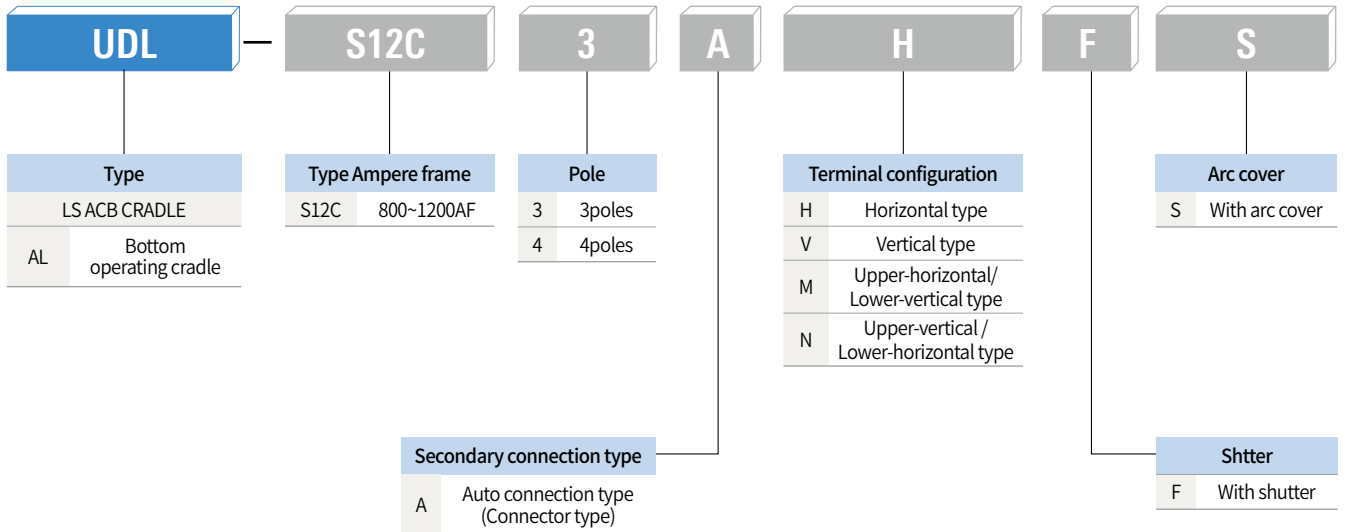
Code	Description	Option description
C	C	Counter
B	B	On/Off button lock
M	MI	Mechanical interlock
D	DI or MOC	Door Interlock or MOC (Mechanism operated cell switch)
K	K1	Key lock
K2	K2	Key Interlock Set
R	RCS	Ready to close switch
H1	SHT2 <sup>Note 2)</sup>	AC/DC 100~130V, Double shunt coil
H2		AC/DC 200~250V, Double shunt coil
H3		DC 125V, Double shunt coil
H4		DC 24~30V, Double shunt coil
H5		DC 48~60V, Double shunt coil

Note 1) \* If mixed option is more than 5, it is separated by mixed option code.

2) UVT & SHT2 can be not applicable together.



### DC Switch-disconnectors cradle



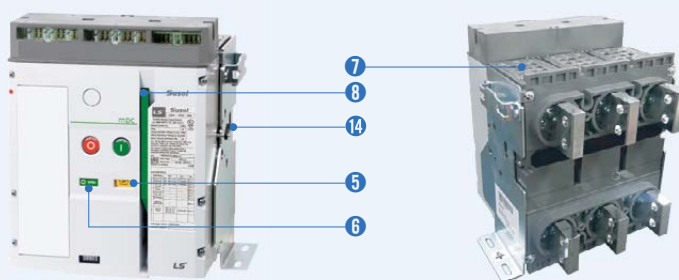
# External configuration

## Draw-out (Main body)

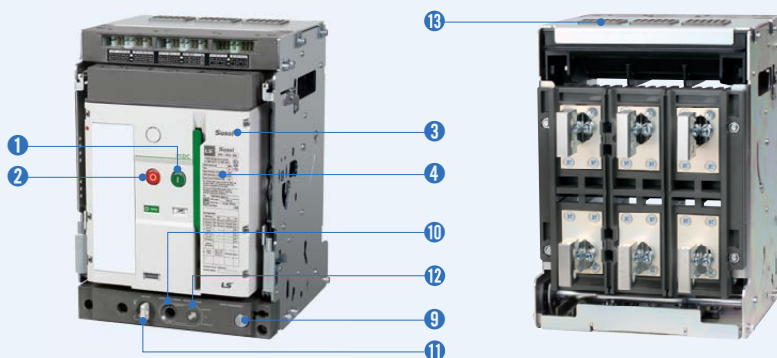
### External configuration

- ① ON button
- ② OFF button
- ③ Series name
- ④ Rated name plate
- ⑤ Charge/Discharge indicator
- ⑥ ON/OFF indicator
- ⑦ Arc chute
- ⑧ Charge handle
- ⑨ Draw-out handle
- ⑩ Handle inserting hole
- ⑪ Pad lock button
- ⑫ Position indicator
- ⑬ Arc cover
- ⑭ Mechanical interlock

#### • Fixed type



#### • Draw-out type



### Terminal Configuration

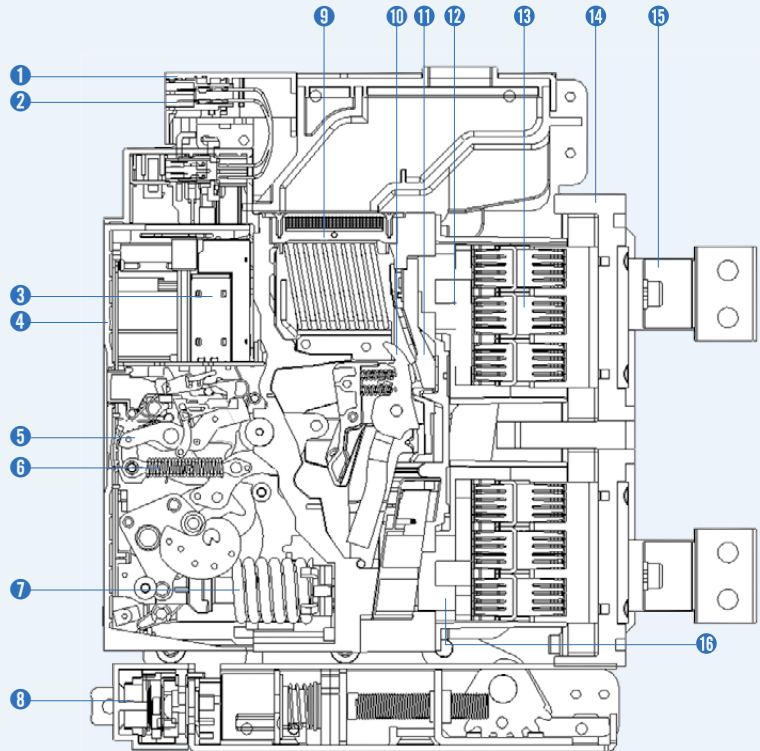
There are many possible terminal configurations when connecting bus-bar of distribution panel, vertical, horizontal, plane type, etc

Type	V	H	M	N
Form				

## 1. Internal structure and components

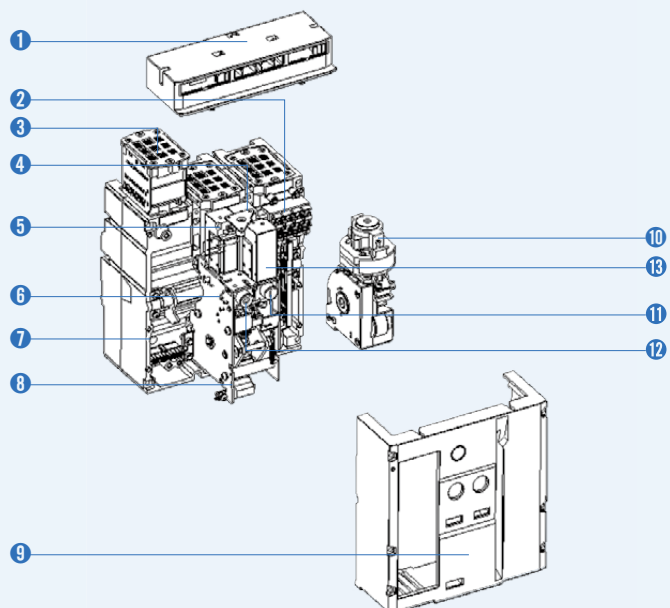
### Internal configuration

- ① Control terminal block
- ② Control terminal
- ③ Closing, Tripping, UVT coil
- ④ Front cover
- ⑤ Mechanism
- ⑥ Tripping spring
- ⑦ Closing spring
- ⑧ Draw-out device
- ⑨ Arc extinguishing part
- ⑩ Moving contact
- ⑪ Fixed contact
- ⑫ Current carrying part on line
- ⑬ Finger
- ⑭ Cradle
- ⑮ Current carrying part in circuit breaker
- ⑯ Current carrying part on load



### Components

- ① Control terminal block
- ② Auxiliary switch
- ③ Arc chute
- ④ Tripping coil
- ⑤ UVT coil
- ⑥ Mechanism
- ⑦ Main body
- ⑧ Counter
- ⑨ Front cover
- ⑩ Motor assembly
- ⑪ Button ON
- ⑫ Button OFF
- ⑬ Closing coil



# Accessories

## Main body



Miss insertion preventing device (MIP)



Auxiliary switch



Ready to close switch (RCS)



Shunt coil (SHT)



Closing coil (CC)



Under voltage trip device (UVT)



Key lock (K1)



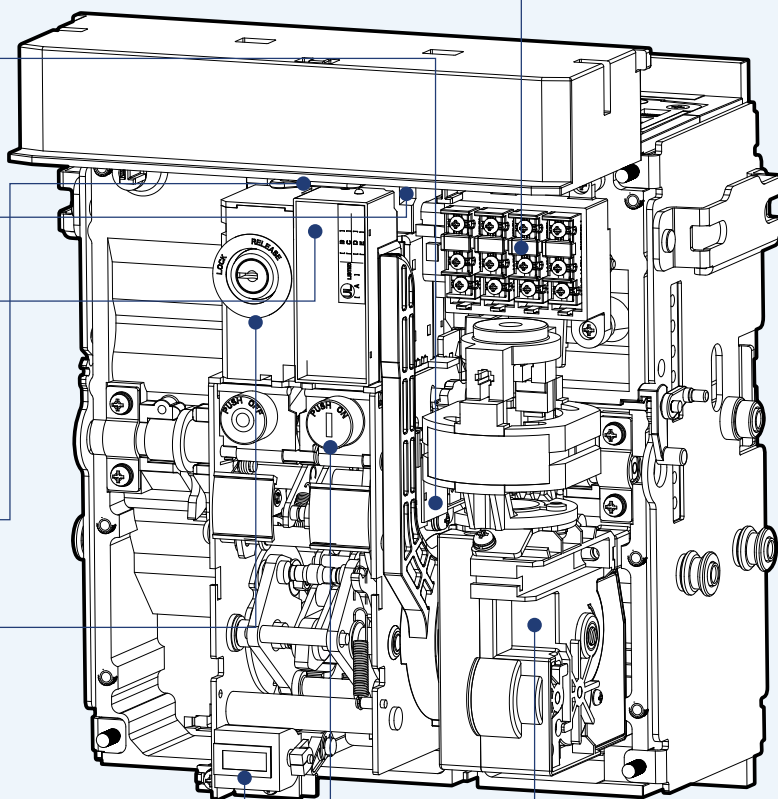
Counter (C)



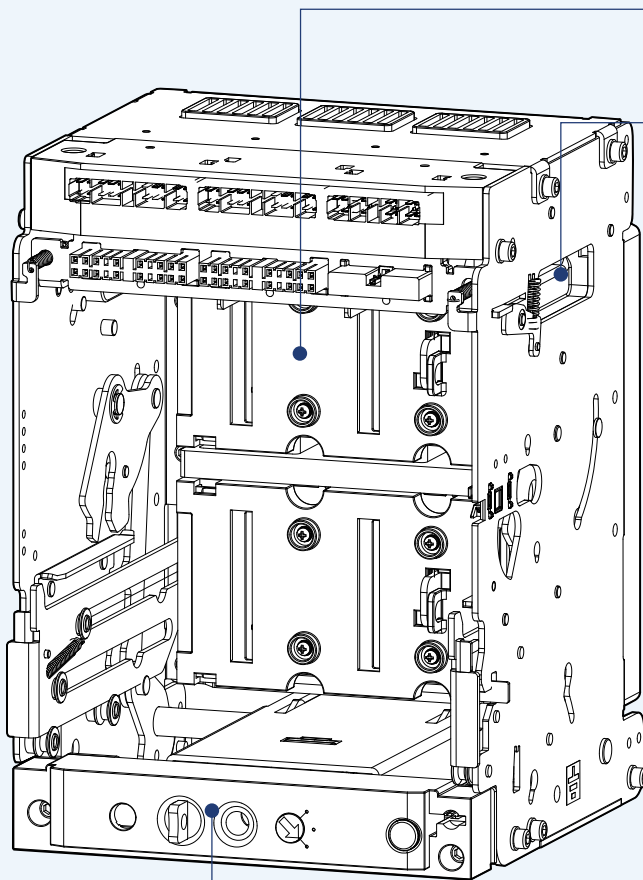
ON / OFF button padlock (B)



Motor (M)



Cradle



Miss insertion preventing device (MIP)



Condensor trip device (CTD)



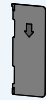
Safety shutter (ST)



Lifting hook (LH)



Interphase barrier (IB)



UVT time delay controller (UDC)



Remote I/O unit (RCO)



Cell sw (CEL)



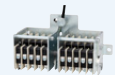
Door interlock (DI)



Mechanical interlock (MI)



Mechanical operated cell sw (MOC)



Racking interlock & position lock (RI)



Door frame (DF)

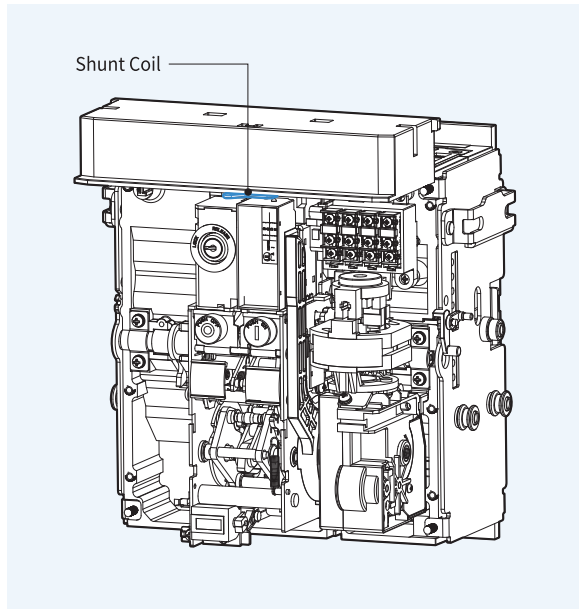


Dust cover (DC)



# Accessories

## Shunt Coil [SHT1]

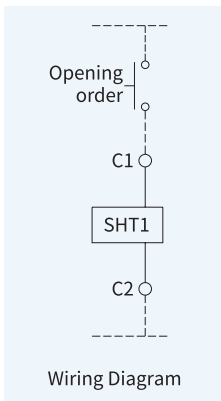


- SHT1 is a control device which trips a circuit breaker from remote place, when applying voltage continuously or instantaneously over 200ms to coil terminals (C1, C2).
- When UVT coil is installed, its location is changed.

### 1. Rated voltage and characteristics of trip coil

Rated voltage (Vn)		Operating voltage range (V)	Power consumption (VA or W)		Trip time (ms)
DC (V)	AC (V)		Inrush	Steady-state	
24~30	-	0.7~1.1 Vn	200	5	40
48~60	48	0.7~1.1 Vn			
100~130	100~130	0.7~1.1 Vn			
200~250	200~250	0.7~1.1 Vn			

Note) Operating voltage range is the min. rated voltage standard for each rated voltage (Vn).



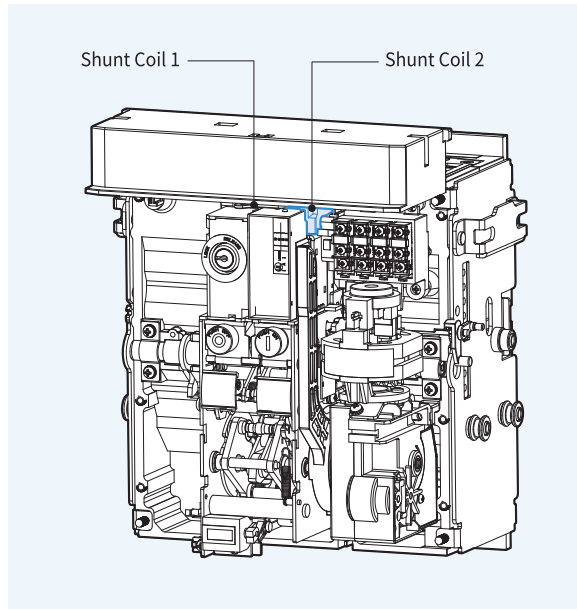
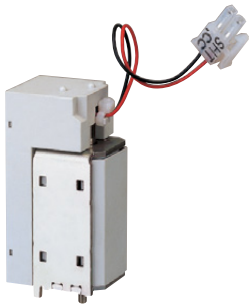
### 2. Specification of the wire

- Refer to the below table regarding the length and specification of wire when using trip coil with DC 24~30V or DC / AC 48~60V of rated voltage.

The maximum wire length

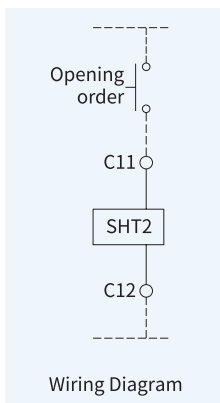
Type	Wire type	Rated voltage (Vn)			
		DC 24~30V		DC/AC 48V	
		#14 AWG (2.08mm <sup>2</sup> )	#16 AWG (1.31mm <sup>2</sup> )	#14 AWG (2.08mm <sup>2</sup> )	#16 AWG (1.31mm <sup>2</sup> )
Operating voltage	100%	95.7m	61m	457.8m	287.7m
	85%	62.5m	38.4m	291.7m	183.2m

### Double Shunt Coil [SHT2]



- SHT2 is a control device which trips a circuit breaker doubly from the outside. When SHT1 doesn't operate normally, it can trip a circuit breaker safely.
- Shunt coil 1: Install it at existing location.
- Shunt coil 2: Install it on the right side of the Shunt coil 1
- It is not available with UVT coil when installing double shunt coil.

#### 1. Rated voltage and characteristics of trip coil



Rated voltage (Vn)		Operating voltage range (V)	Power consumption (VA or W)		Trip time (ms)
DC (V)	AC (V)		Inrush	Steady-state	
24~30	-	0.7~1.1 Vn	200	5	40
48~60	48	0.7~1.1 Vn			
100~130	100~130	0.7~1.1 Vn			
200~250	200~250	0.7~1.1 Vn			

Note) Operating voltage range is the min. rated voltage standard for each rated voltage (Vn).

#### 2. Specification of the wire

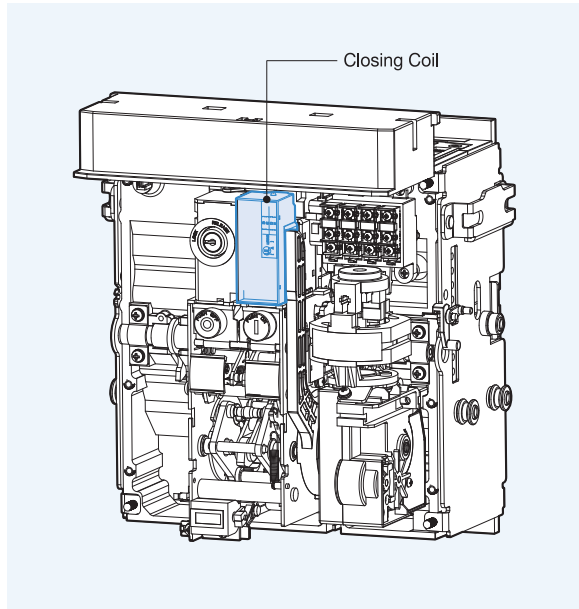
- Refer to the below table regarding the length and specification of wire when using trip coil with DC 24~30V or DC / AC 48~60V of rated voltage.

The maximum wire length

Type		Rated voltage (Vn)			
		DC 24~30V		DC/AC 48V	
Operating voltage	100%	95.7m	61m	457.8m	287.7m
	85%	62.5m	38.4m	291.7m	183.2m

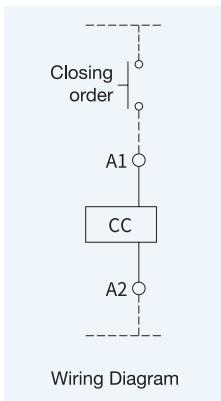
# Accessories

## Closing Coil [CC]



- It is a control device which closes a circuit breaker, when the voltage is applied continuously or instantaneously over 200ms to the coil terminals (A1, A2).

### 1. Rated voltage and characteristics of closing coil



Rated voltage (Vn)		Operating voltage range (V)	Power consumption (VA or W)		Trip time (ms)
DC (V)	AC (V)		Inrush	Steady-state	
24~30	-	0.85~1.1 Vn	200	5	40
48~60	48	0.85~1.1 Vn			
100~130	100~130	0.85~1.1 Vn			
200~250	200~250	0.85~1.1 Vn			

Note) Operating voltage range is the min. rated voltage standard for each rated voltage (Vn).

### 2. Specification of the wire

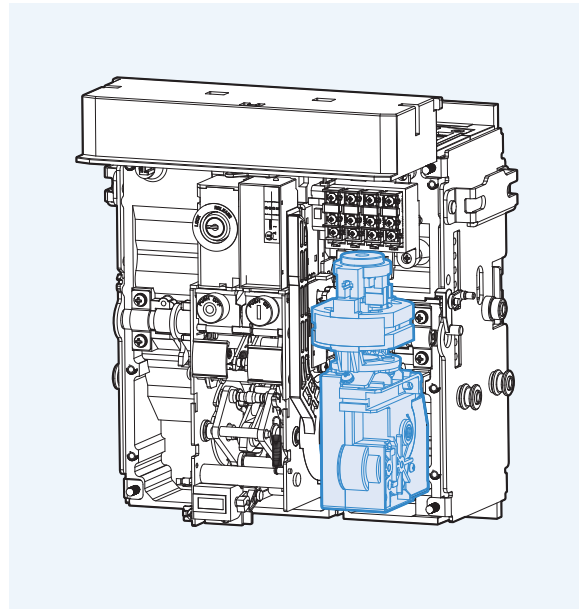
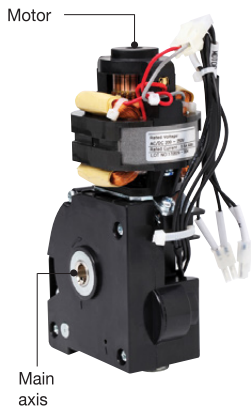
- Refer to the below table regarding the length and specification of wire when using trip coil with DC 24~30V or DC / AC 48~60V of rated voltage.

The maximum wire length

Type		Rated voltage (Vn)			
		DC 24~30V		DC/AC 48V	
Wire type		#14 AWG (2.08mm <sup>2</sup> )	#16 AWG (1.31mm <sup>2</sup> )	#14 AWG (2.08mm <sup>2</sup> )	#16 AWG (1.31mm <sup>2</sup> )
Operating voltage	100%	95.7m	61m	457.8m	287.7m
	85%	62.5m	38.4m	291.7m	183.2m



### Motor [M]



- Charge the closing spring of a circuit breaker by the external power source. Without the external power source, charge manually.
- Operating voltage range (IEC 60947) 85%~110%Vn

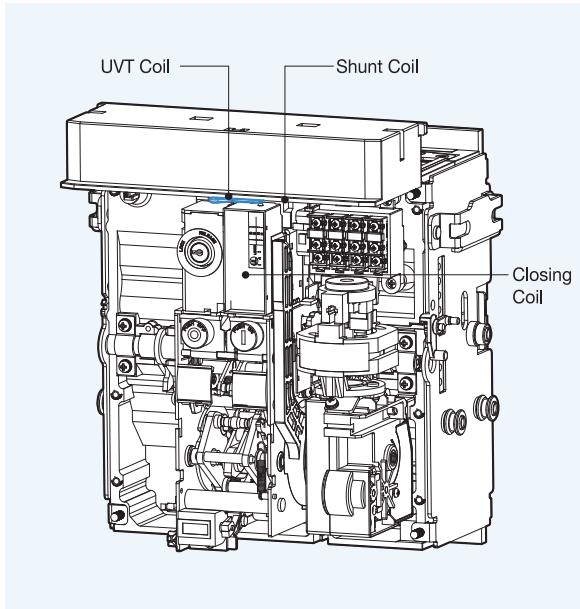
Input voltage (V)	DC 24~30V	AC/DC 48~60V	AC/DC 100~130V	AC/DC 200~250V
Load current (max.)	5A	3A	1A	0.5A
Starting current (Max.)	5 times of load current			
Load rpm (Motor)	15000~19000 rpm			
Charge time	Less than 3sec.			
Dielectric strength	2kV/min			
Using temperature range	-20°~60°			
Using humidity range	Max. RH 80% (No dew condensation)			
Endurance	15,000 cycle (Load connection, 2 times/min)			
Charge switch	10A at 250VAC			

### Charge Switch [CS1]

- It is a built-in contact which sends the signal to the outside, when motor charging is completed. (1a)
- It has a “1a” contact built-in for complete charging.
- 10A at 250VAC

# Accessories

## Under Voltage Trip Device [UVT]



- If the voltage of the main or the control power is under voltage, UVT which is installed inside of the breaker breaks the circuit automatically. Please connect with UVT time-delay device in order to present the time-delay function because UVT is technically instantaneous type.
- The closing of a circuit breaker is impossible mechanically or electrically if control power not supplied to UVT. To close the circuit breaker, 65~85% of rated voltage should be applied to both terminals of UVT coil (D1, D2).
- When using UVT coil, the double trip coil can not be used, and the location of trip coil is changed.

### 1. Rated voltage and characteristics of UVT coil

Rated voltage (Vn)		Operating voltage range (V)		Power consumption (VA or W)		Trip time (ms)
DC (V)	AC (V)	Pick up	Drop out	Inrush	Steady-state	
24~30	-	0.65~0.85 Vn	0.4~0.6 Vn	200	5	40
48~60	48					
100~130	100~130					
200~250	200~250					

Note) Operating voltage range is the min. rated voltage standard for each rated voltage (Vn).

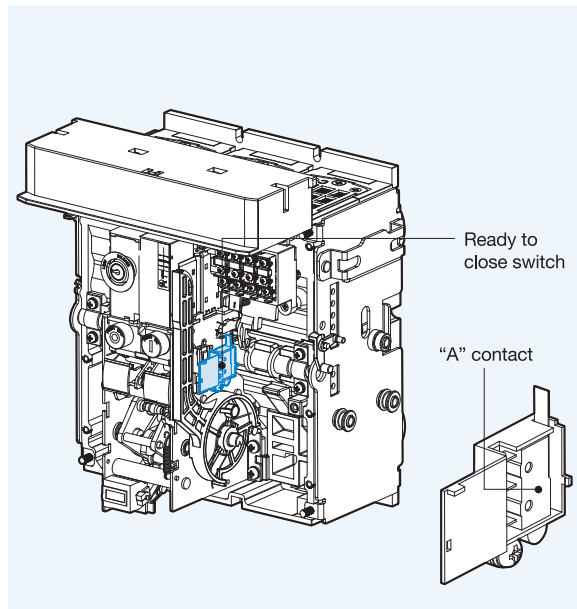
### 2. Specification of the wire

- Refer to the below table regarding the length and specification of wire when using trip coil with DC 24~30V or DC / AC 48~60V of rated voltage.

The maximum wire length

Type		Rated voltage (Vn)			
		DC 24~30V		DC/AC 48V	
Wire type		#14 AWG (2.08mm <sup>2</sup> )	#16 AWG (1.31mm <sup>2</sup> )	#14 AWG (2.08mm <sup>2</sup> )	#16 AWG (1.31mm <sup>2</sup> )
Operating voltage	100%	95.7m	61m	457.8m	287.7m
	85%	62.5m	38.4m	291.7m	183.2m

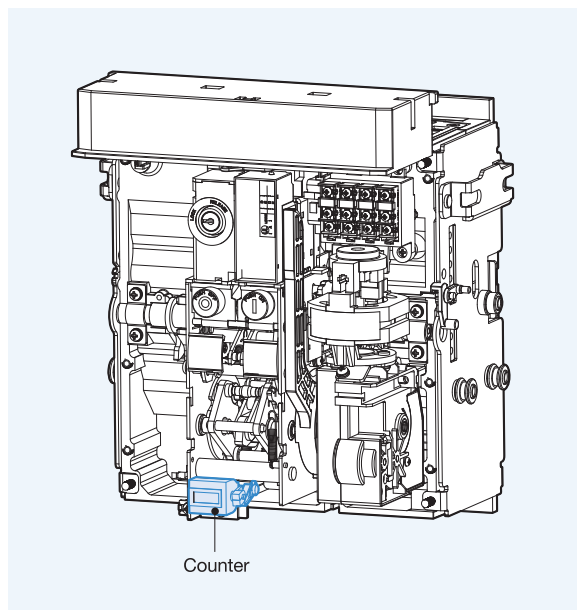
### Ready to Close [RCS]



- It interlocks with mechanism of circuit breaker.
- It indicates the status that the circuit breaker is ready to do closing operation.
- When mechanism is in OFF position or in Charge, contact is output with "ON" and it indicates that mechanism can be closed.

Classification	Standard		Remark
Contactor Capacity	250Vac	3A	
	250Vdc	5A	
	125Vdc	0.6 A	

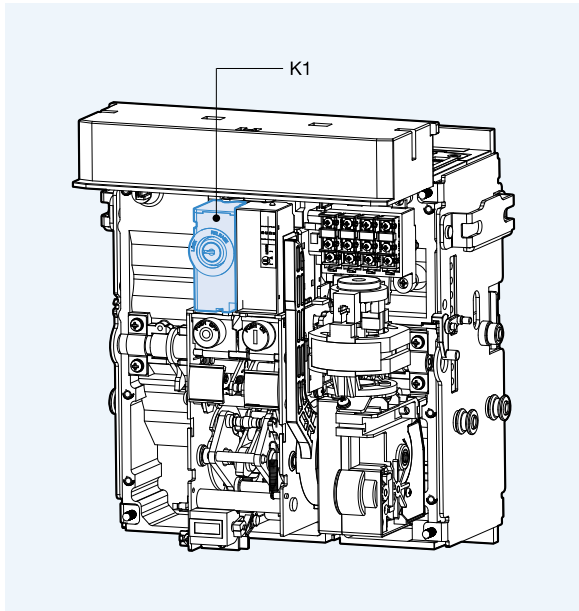
### Counter [C]



- It displays the total number of ON / OFF operation of ACB.

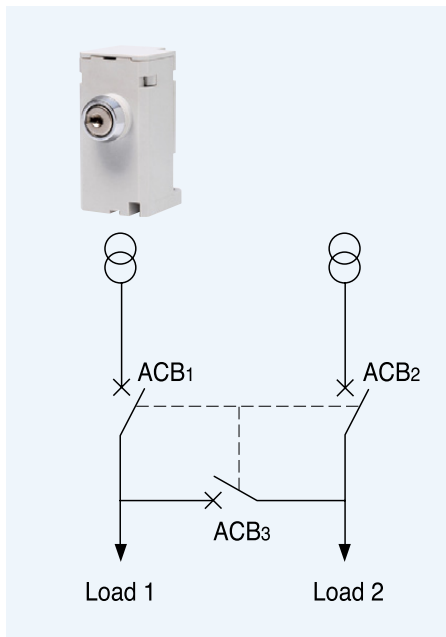
# Accessories

## Key Lock [K1]



- It is a device for locking which prevents a certain circuit breaker from being operated by user's discretion when two or more circuit breakers are used at the same time.
- K1: Preventing mechanical closing

## Key Interlock Set [K2]



### Wiring

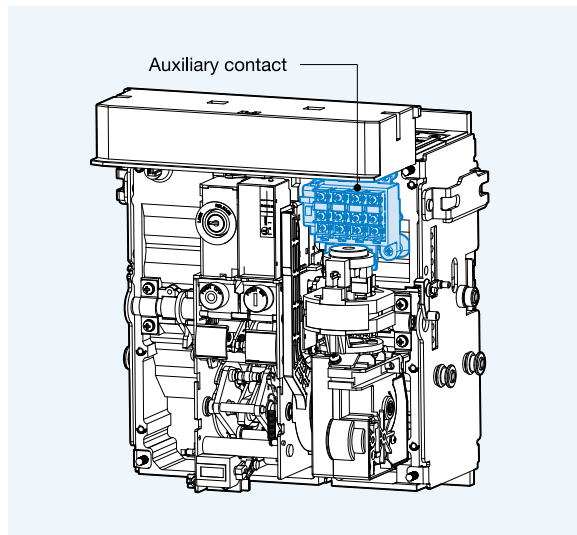
- 3 circuit breakers can be arranged for the continuous power supply to the load side and be interlocked mutually by using Key Lock embedded in each circuit breaker. Two same keys will be provided.

How to order: 3 breakers must be ordered as a set, and K2 description must be added to the additional breakers. (2 keys are provided per 3 breakers.)

ACB-1	ACB-2	ACB-3	Status	
			LOAD1	LOAD2
●	●	●	OFF	OFF
●	○	○	OFF	ON
○	●	○	ON	OFF
○	○	●	ON	ON
●	●	○	OFF	OFF
●	○	●	OFF	ON
○	●	●	ON	OFF

○: Release ●: Lock

### Auxiliary Switch [FX]



- It is a contact used to monitor ON/OFF position of ACB from remote place.

### Classification

Switch classification	Description	Resistive load	
		MAX.	MIN.
Standard	FC, FX, LC, PC, PX	AC250V 3A AC125V 5A	DC5V 160mA
Micro load	Oder No. 8301176209	AC125V 0.1A DC30V 0.1A	DC5V 1mA

### On/Off Button Lock [B]

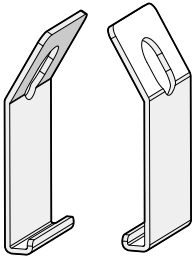


- It is to prevent manual operation of ACB's closing / tripping button due to user's wrong handling.
- It is not possible to handle ON / OFF operation under the "Button lock" status.  
(Electrical ON/OFF operation is possible)

*Note* Padlocks(Ø5 ~ Ø6) are not supplied.

# Accessories

## Lifting Hook [LH]



- It is a device to make an ACB easy to shift.
- Please hang it to both handles of the cradle.

## Condenser Trip Device [CTD]

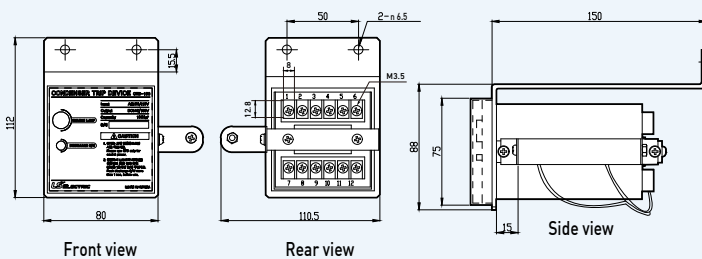


- It gets a circuit breaker tripped electrically within regular time when control power supply is broken down and is used with Shunt coil, SHT. In case there is no DC power, It can be used as the rectifier which supplies DC power to a circuit breaker by rectifying AC power.

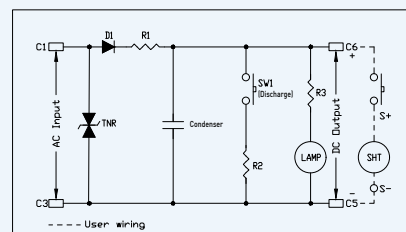
### Ratings

Type	Status	
	CTD-100	CTD-200
Model	CTD-100	CTD-200
Rated input voltage (V)	AC 100/110	AC 200/220
Frequency (Hz)	50/60	50/60
Rated charge voltage (V)	140/155	280/310
Charging time	Within 5s	Within 5s
Trip possible time	Over 3 min	Over 2 min
Range of Input voltage (%)	85~110	85~110
Condenser capacity	1000 $\mu$ F	560 $\mu$ F

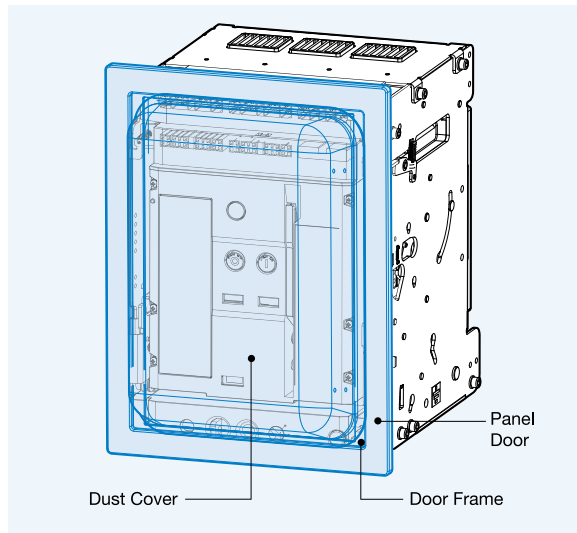
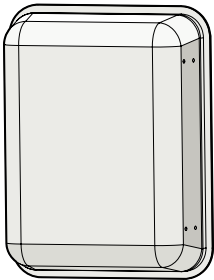
### External dimension



### Circuit diagram

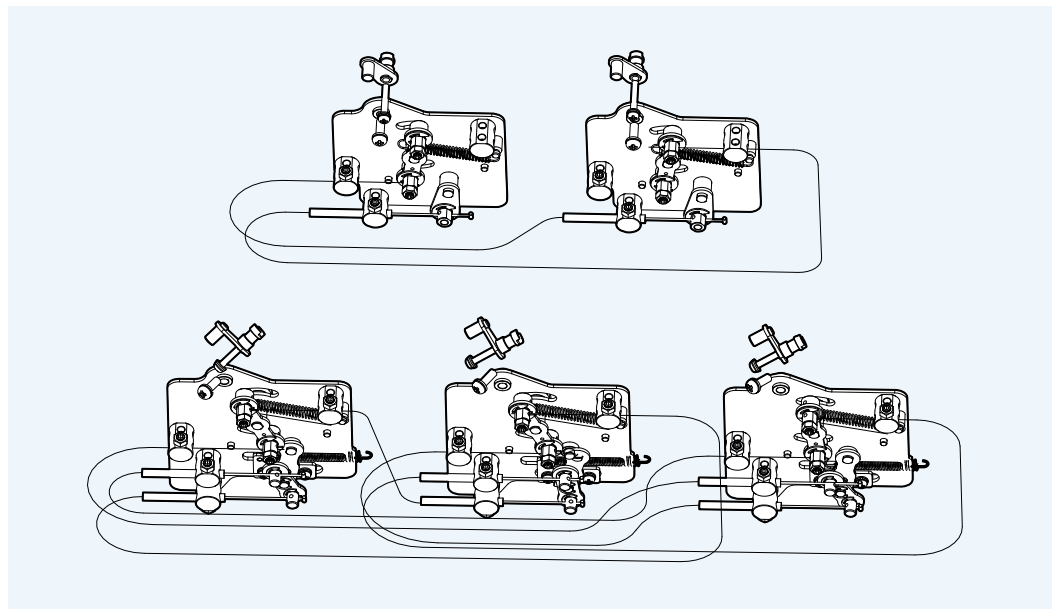


### Dust Cover [DC]



- Attached to the door frame.
- It protects the product from dust and moisture that may affect the operation of the instrument at the same time (IP54) which may cause fault operation and enhances the sealing degree by being mounted to protrude type of panel.
- It is transparent so that the front side of ACB is visible and the Cover can be opened / closed even if ACB is drawn out to until TEST position.

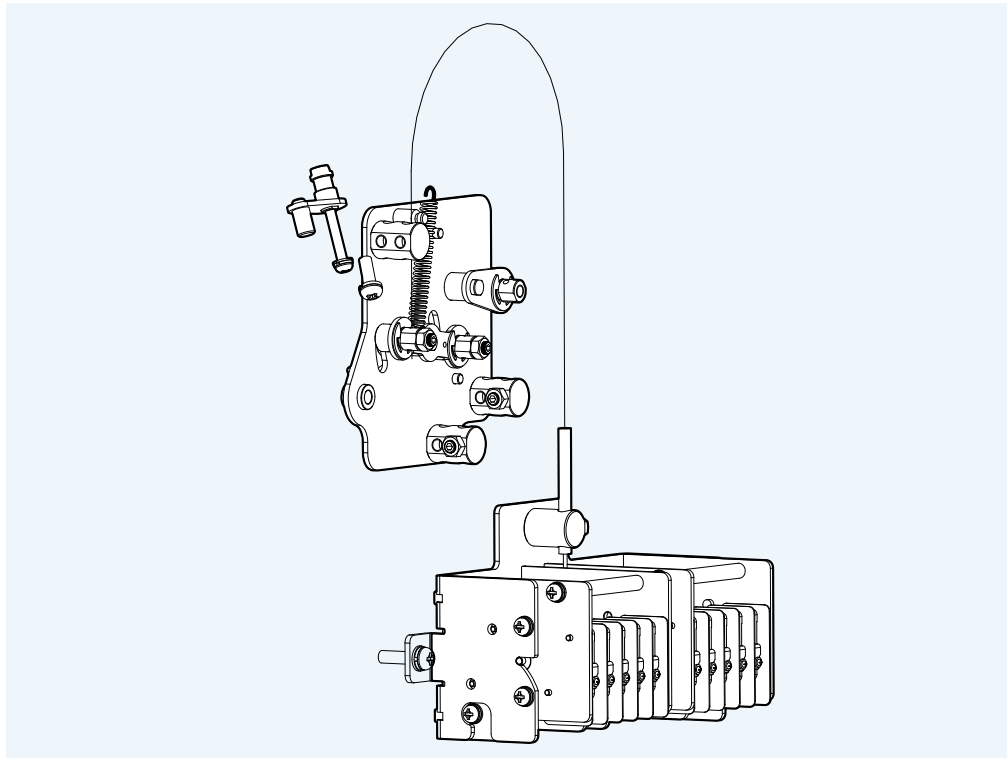
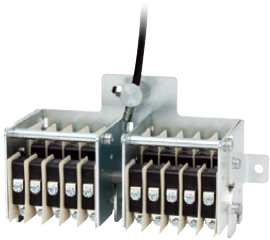
### Mechanical Interlock [MI]



- It is used to interlock closing and trip between two or three breakers mechanically so as to prevent unintended operation at the same time.
- Wire type interlock can be applied upto 3 breakers

# Accessories

## Mechanical Operated Cell Switch [MOC]

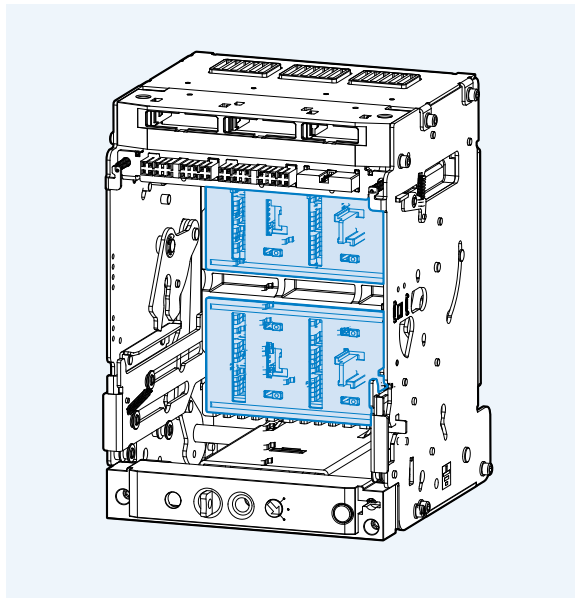
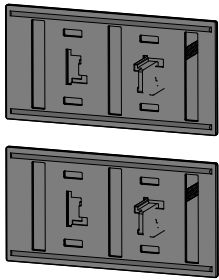


- It is the contact (10a10b) which displays the ON / OFF condition of ACB. It mechanically operates only when the breaker is "CONNECTED" position. A standard type and a high capacity type is available.
- When MOC link is installed to cradle, MOC can be equipped with the inside of panel.





### Safety Shutter [ST]



- It is the automatic safety device to protect the connectors of main circuit by cutting off dangerous contact from outside while the breaker is drawn out. When the ACB is drawn in, the shutter is automatically opened.

- Plate Shutter is a total of 2 models

The types of safety shutter plate

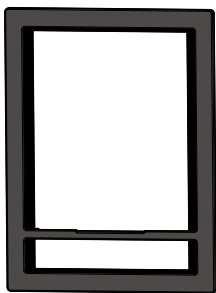
3P



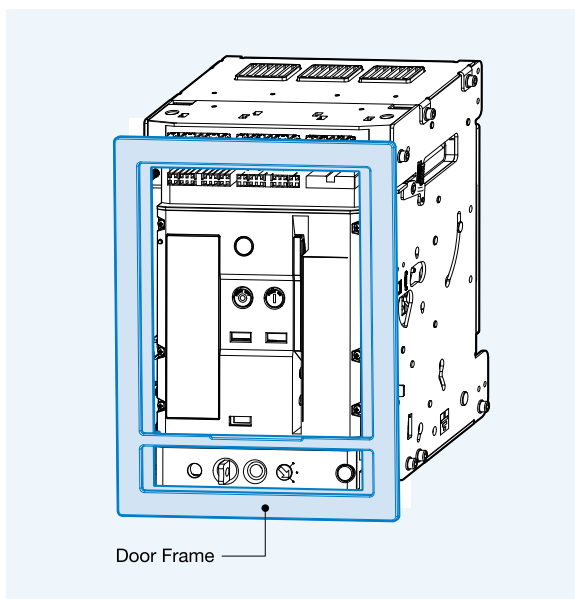
4P



### Door Frame [DF]



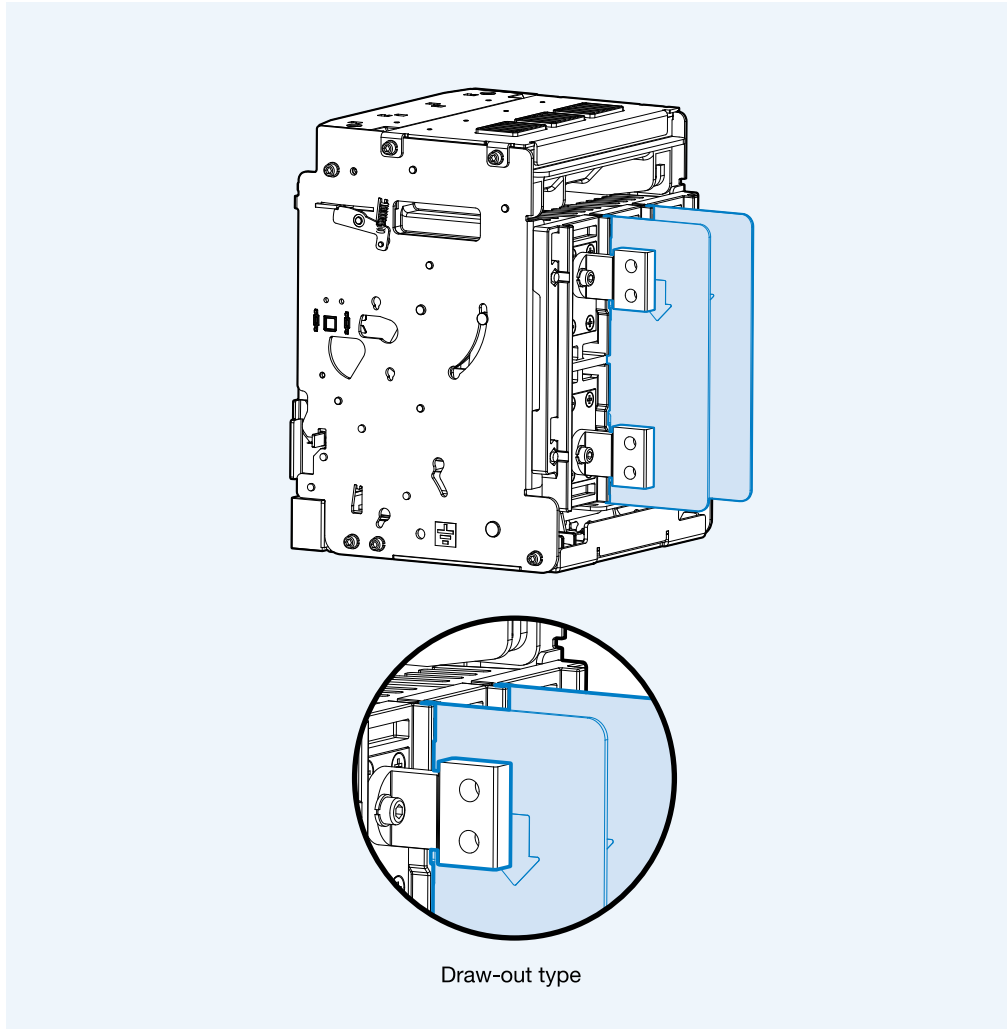
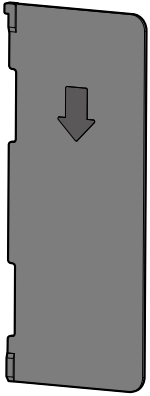
Draw-out type



- When structuring the embedded type of ACB panel, it protects the protrude front of ACB and the cutting side of panel door by attaching it to the panel door.

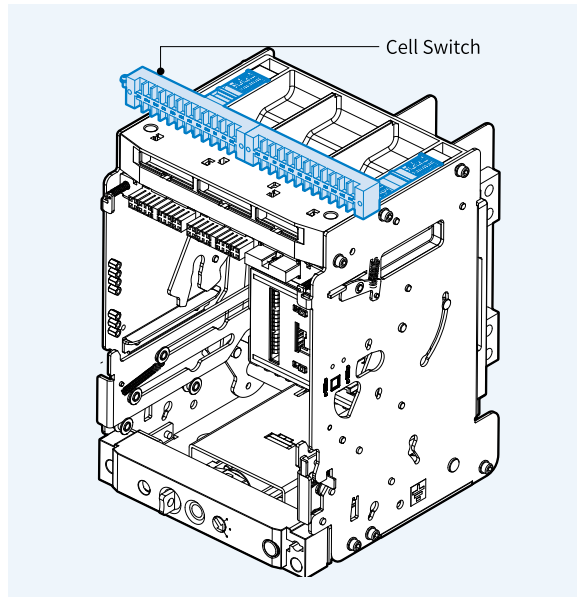
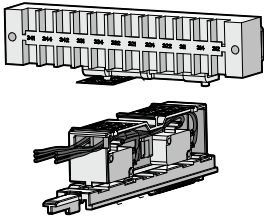
# Accessories

## Interphase Barrier [IB]



- Interphase barrier prevents the arc which may arise and result in short-circuit between phases in advance

Cell Switch [CEL]



• It is a contact which indicates the present position of ACB. (CONNECTED, TEST, DISCONNECTED)

<Contact configuration>

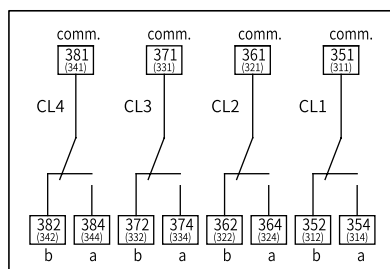
4C: 1Disconnected +1Test +2Connected

8C: 2Disconnected +2Test +4Connected

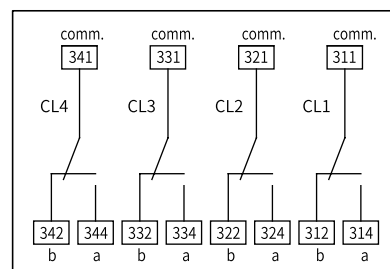
※ Contact configuration can be changeable if necessary.

Operating characteristic

ACB position		DISCONNECTED		CONNECTED	
Draw-in and draw-out position		DISCONNECTED	Test	CONNECTED	
Contact Operation	CL-C (CONNECTED)	OFF	ON	ON	
	CL-T (TEST)	OFF	OFF	ON	
	CL-D (DISCONNECTED)	ON	OFF	OFF	
Contact capacity	Voltage(V)	Resistive load		Inductive load	
		460	5	2.5	
	AC	250	10	10	
		125	10	10	
		DC	250	3	1.5
			125	10	10
30	10	10			
Contact Number		4C			



4C attached to the right side of cradle



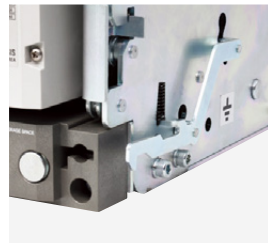
4C attached to the left side of cradle

# Accessories

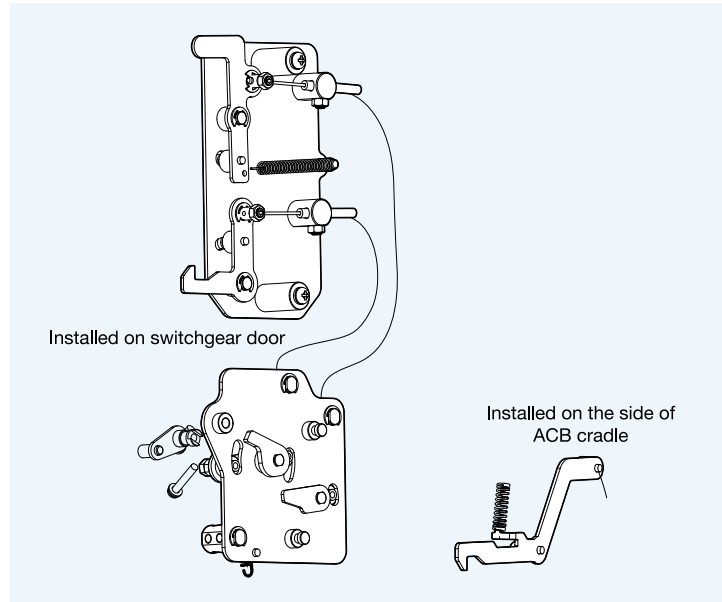
## Door Interlock [DI]



Wite type



Catch type



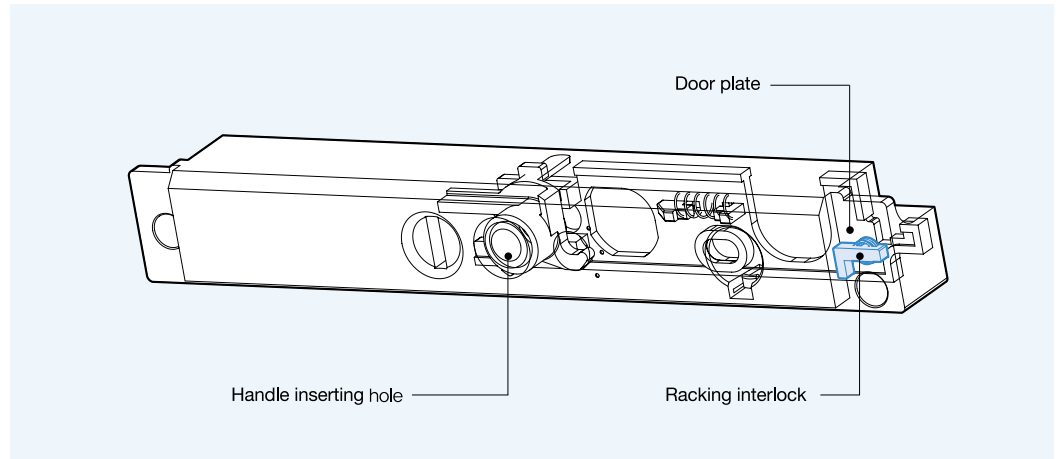
- It is a safety device which does not allow the panel door to open when a circuit breaker is in the "ON" position.

## Zero Arc Space [ZAS]



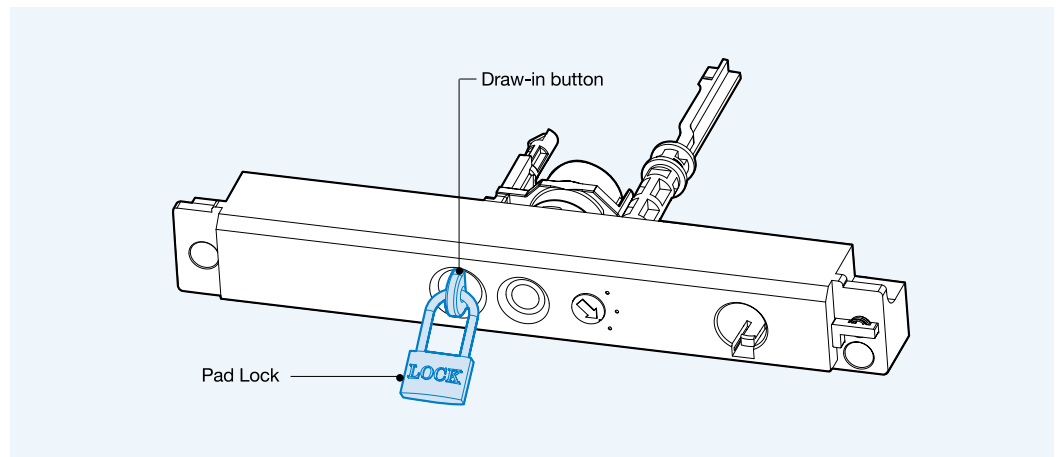
- Arc which may arise while breaking fault current is extinguished first by Arc chute in main body of circuit breaker and then completely extinguished by Arc cover.
- By preventing arc from exposing to the outside, it protects itself from all kinds of accidents.

## Racking Interlock [RI]



- When panel door is opened, Draw in / out handle doesn't be inserted.  
Thus, panel handle can be inserted only when panel door is closed.

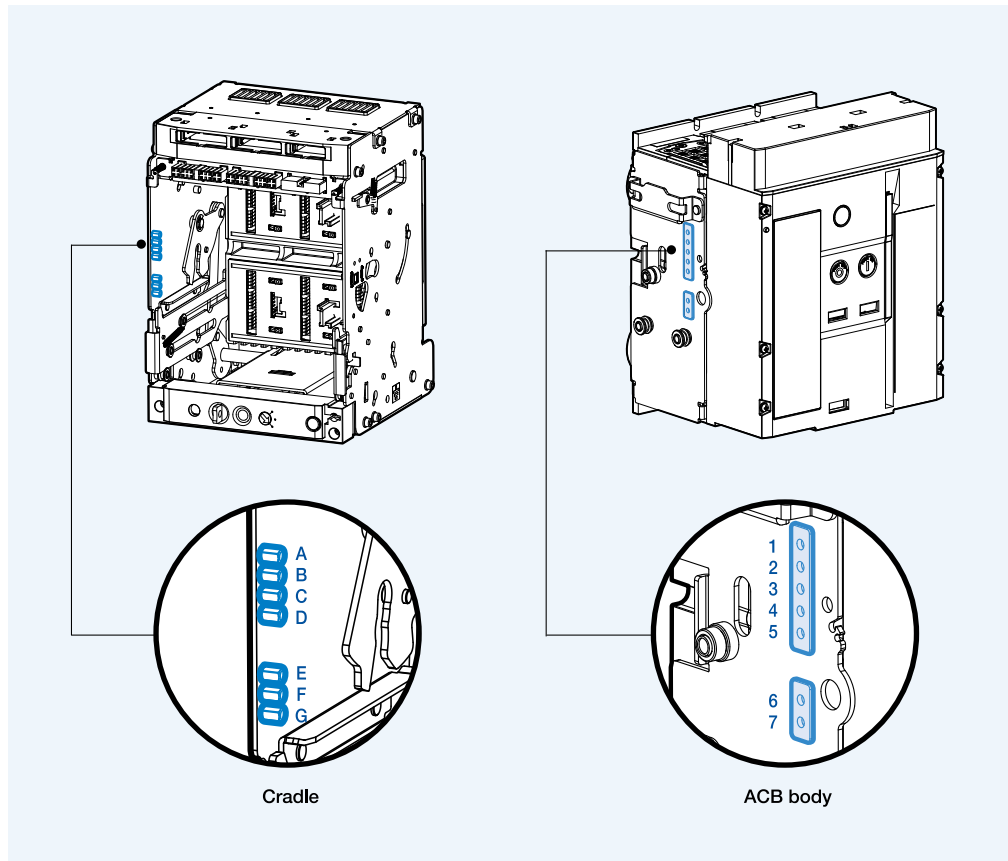
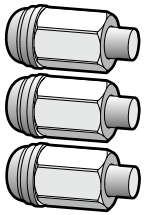
## Pad Lock / Position Lock [PL]



- ACB is subject to restriction regarding moving in connected, test, disconnected when drawing in or out. If main body of ACB is placed in 3 positions, it is locked and stopped when drawing in or out.
- As shown in the figure, if draw-in / out button pops out, it means locking is operating.
  - To continue draw-in / out operation, release lock by pushing draw-in / out button
  - In case it is locked as shown in the figure above, main body of ACB can not be drawn in or out into the cradle.
  - For the lock device, user has to purchase it. (Ø5 ~ Ø6)

# Accessories

## Miss Insertion Prevent Device [MIP]



- When the main body of ACB is inserted to the cradle, if the ratings of ACB does not match with cradle, it mechanically prevents ACB from being inserted into cradle of ACB.
- The installation method is variable according to ratings.

Type	Rating	Cradle	ACB
DDH	800	ABCD	567
	1000	ABCE	467
	1200	ABCF	457
	1250	ABCG	456
	1600	ABDE	367

Type	Rating	Cradle	ACB
DDV	800	ABDF	357
	1000	ABDG	356
	1200	ABEF	347
	1250	ABEG	346
	1600	ABFG	345

## UVT Time Delay Controller [UDC]



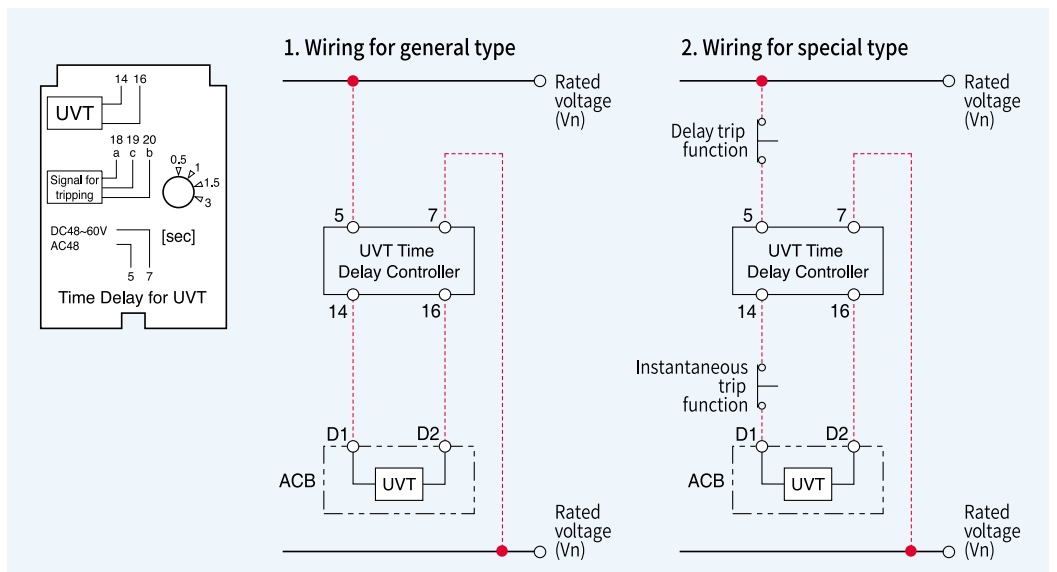
- UVT is a device which makes ACB tripped automatically to prevent the accident on load side due to under voltage or power breakdown. There are two types, Instantaneous type and time delay type.
- Instantaneous type: only available with UVT coil.
- Time delay type: available by connecting UVT coil and UVT time delay controller.
- Common use for the all types.

### 1. The rated voltage and characteristic of UVT time delay controller

Rated voltage (Vn)		Operating voltage range (V)		Power consumption (VA or W)		Trip time (ms)
DC (V)	AC (V)	Pick up	Drop out	Inrush	Steady-state	
48~60	48	0.65~0.85 Vn	0.4~0.6 Vn	200	5	0.5,
100~130	100~130					1,
200~250	200~250					1.5

Note) Operating voltage range is the min. rated standard for each rated voltage (Vn).

### 2. Wiring



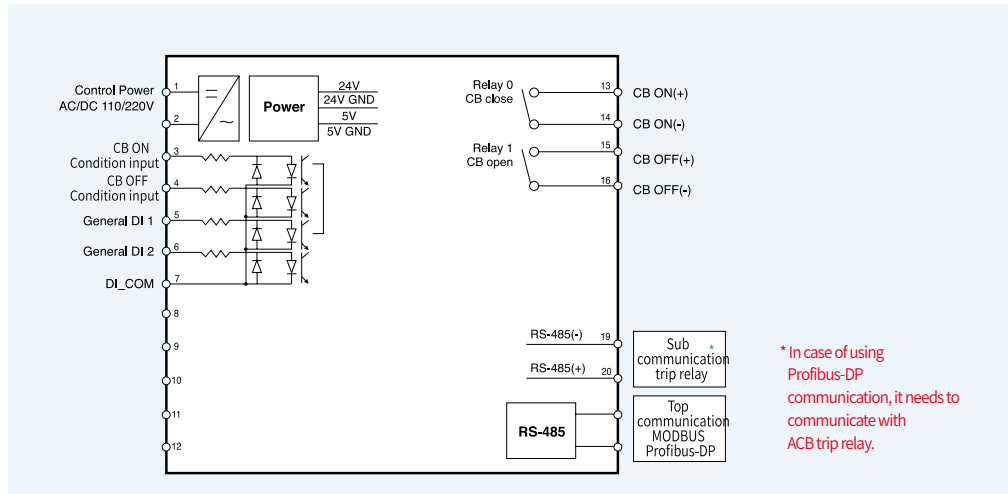
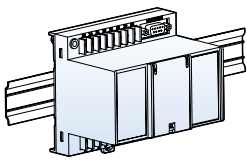
\* The wiring presented with red color should be set by users.

# Accessories

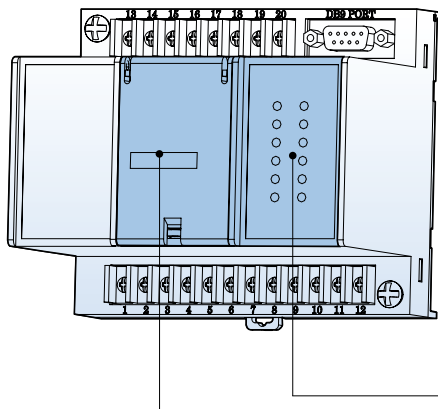
## Remote I/O Unit [RCO]



Remote I/O Unit



Classification		Applied range	Remarks
CB control	Contact switching capacity	AC230V 16A / DC30V 16A	
	Max. switching capacity	3680VA, 480W	
Alarm	Contact switching capacity	AC230V 6A / DC25V 6A	Induction load ( $\cos\theta=0.4$ , L/R=7ms)
	Max. switching capacity	1880VA, 150W	



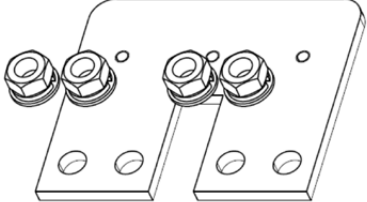
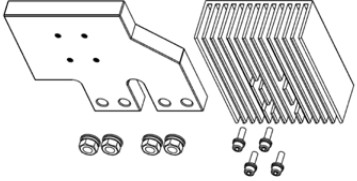
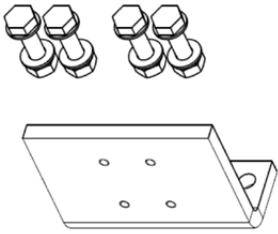
- Baud rate setting
- Comm. address setting
- Temperature setting

- Remote I / O unit has the I / O contact which can trip or close the ACB from the remote site by communication.
- For the general DO, the output of DI1 or DI2 is selectable.
- Remote I / O Unit communicates with Modbus / RS-485 communication basically, Profibus-DP need to be purchased separately.
- It supports SBO (Select Before Operation) function and guarantees the control reliability.
- Remote I / O unit can be installed on the cradle of ACB or the inside of panel.

LED		Status
1	DI1	Indicates digital Input #1condition
2	DI2	Indicates digital Input #2condition
3	DO ON	Indicates temperature alarm output is ON
4	DO OFF	Indicates temperature alarm output is OFF
5	CB ON	Indicates circuit break close condition
6	CB OFF	Indicates circuit break open condition
7	RUN LED	Indicates unit run condition
8	CB ERROR	Indicates circuit break terminal Disconnection / control Err condition



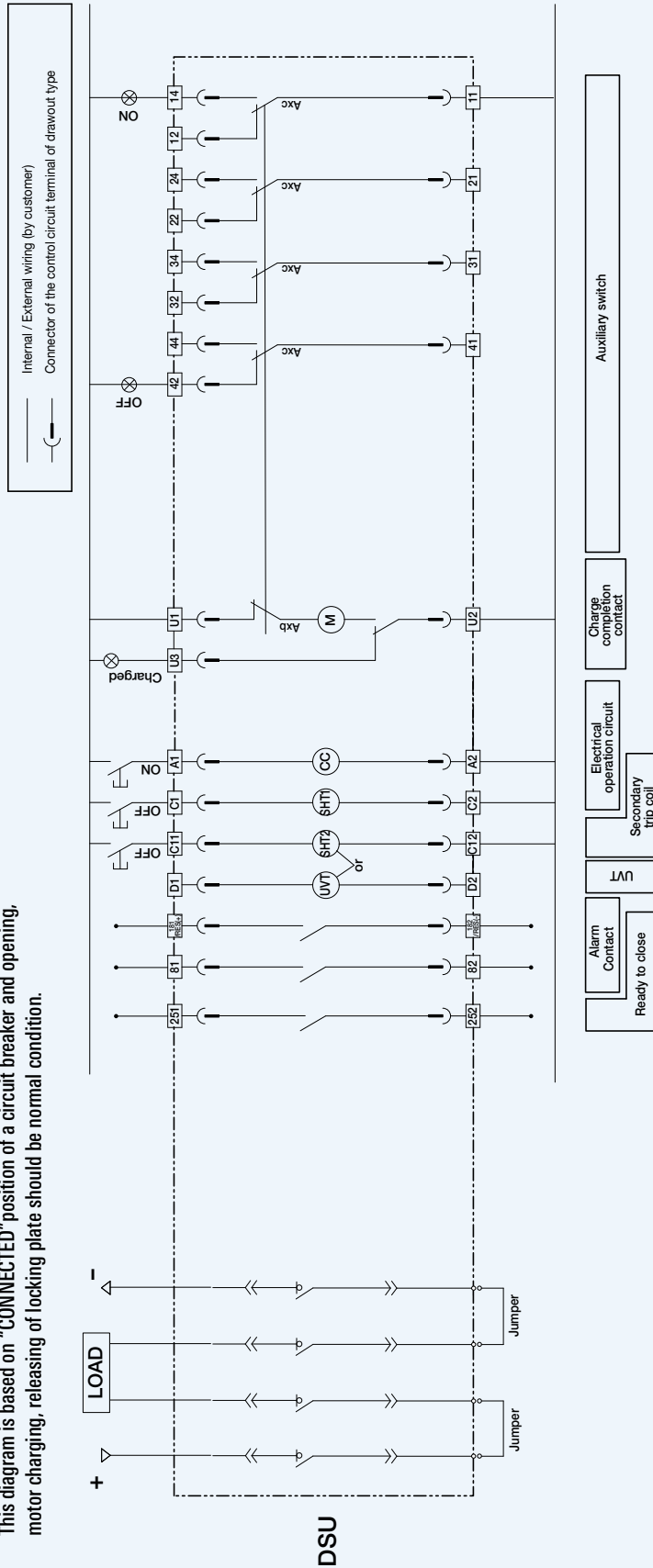
DC Short Busbar

Type	Busbar connection	Rated current	Order code	Components	Order quantity	Weight (kg/set)
Fixed type	Flat	800A	70223472603	Short busbar: 1ea/unit, M10 Nut Set: 4ea/unit 	3P : 1 unit 4P : 2 unit	0.7kg/unit
		1000 ~1200A	70223472605	Short busbar: 1ea/unit, Heatsink: 1ea/unit M10 Nut Set: 4ea/unit, M6 Bolt: 4ea/unit Barrier Pad: 1ea/unit 	3P : 1 unit 4P : 2 unit	5kg/unit
Fixed Draw-out type	Vertical <sup>NOTE 1)</sup> /Horizontal	800 ~1200A	70223472604	Short busbar: 1ea/unit, M10 Nut Set: 1ea/unit 	3P : 1 unit 4P : 2 unit	1.5kg/unit

NOTE 1) In case of vertical type adaptor, assembling the short busbar after making the adaptors horizontally by assembling the adaptors turning 90 degrees.

# Control circuit diagram

This diagram is based on "CONNECTED" position of a circuit breaker and opening motor charging, releasing of locking plate should be normal condition.



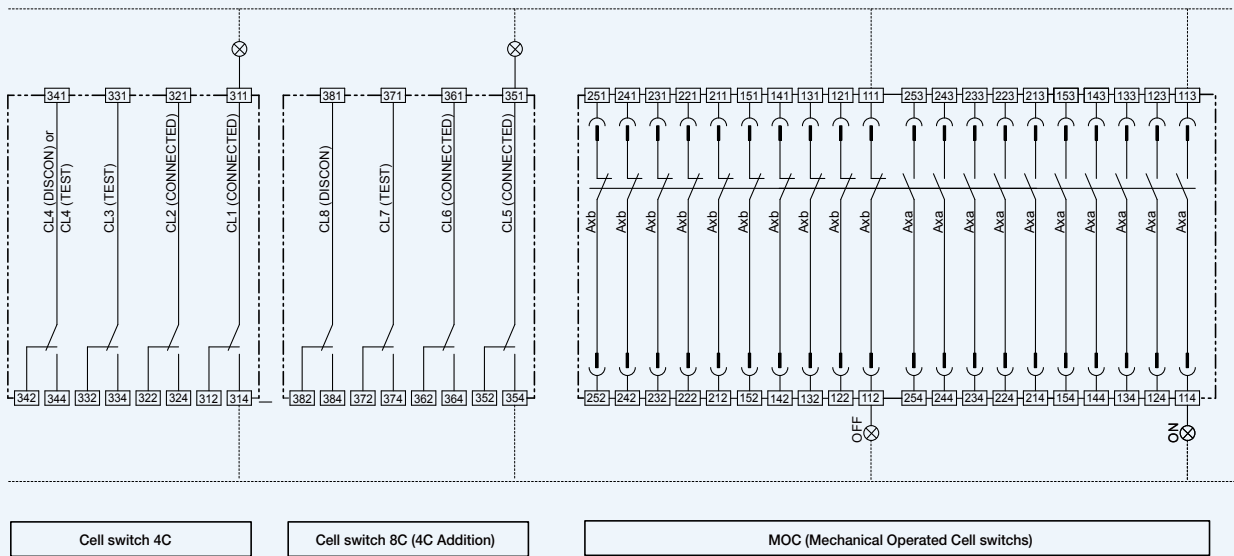
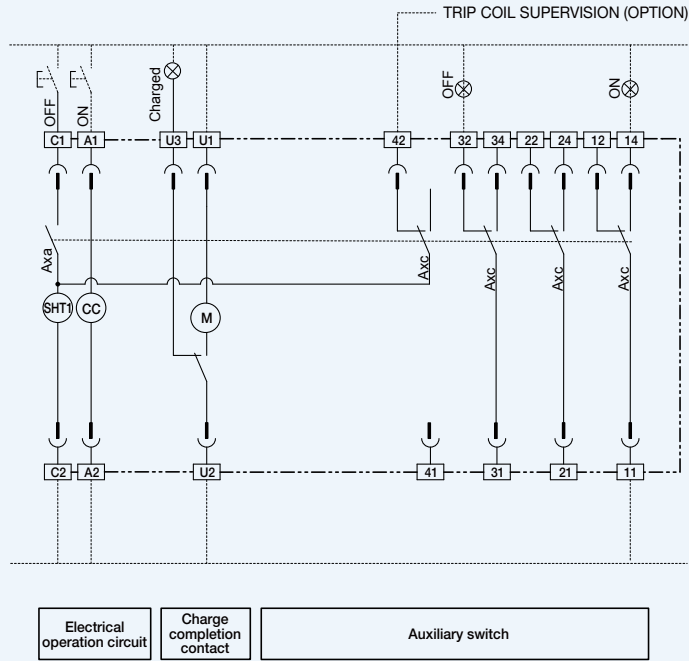
## Terminal code description

11	12	~	41	42	Auxiliary switch "b" contact
11	14	~	41	44	Auxiliary switch "a" contact
U3	U2				Charge completion signal
U1	U2				Motor charging
A1	A2				Closing coil
C1	C2				Shunt trip
C11	C12				2nd shunt trip

## Accessory code description

Axc	Auxiliary switch
CL1~CL4	Cell switch
(M)	Motor
(CC)	Closing coil
(SH1)	1st Shunt coil
(SH2)	2nd Shunt coil
(UVT)	UVT coil

- Note) 1. The diagram is shown with circuit de-energized, all devices open and charged and relays in normal position  
 2. Relay is normal condition and charging type is "Off-Charging"  
 3. The standard of auxiliary contact is 4C.  
 4. Option  
 - Ready to close contact, UVT coil, fully charged contact, secondary trip coil  
 5. Contact configuration for cell switch can be changeable if necessary



**Terminal symbol**

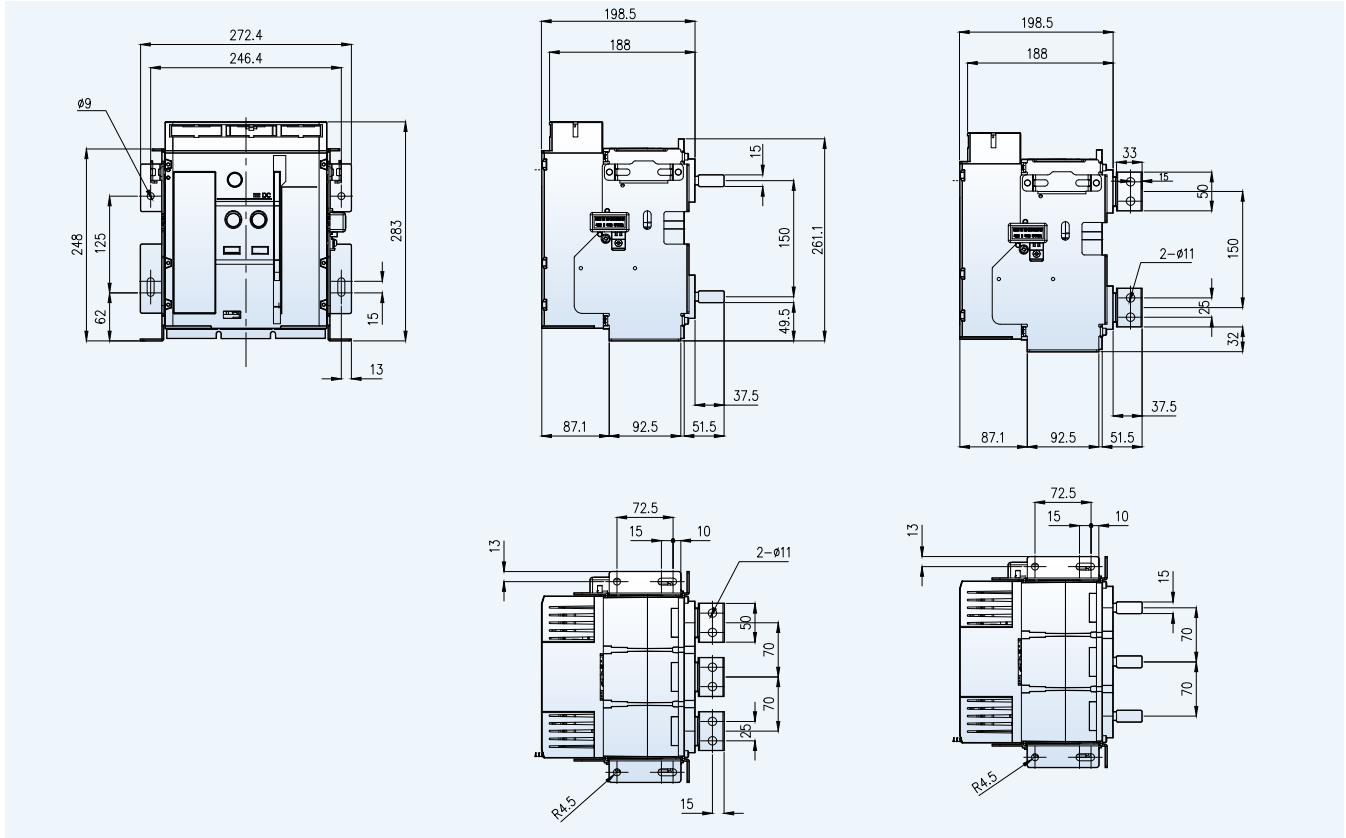
311 ~ 344	Cell switch
111 ~ 254	MOC

# Dimensions

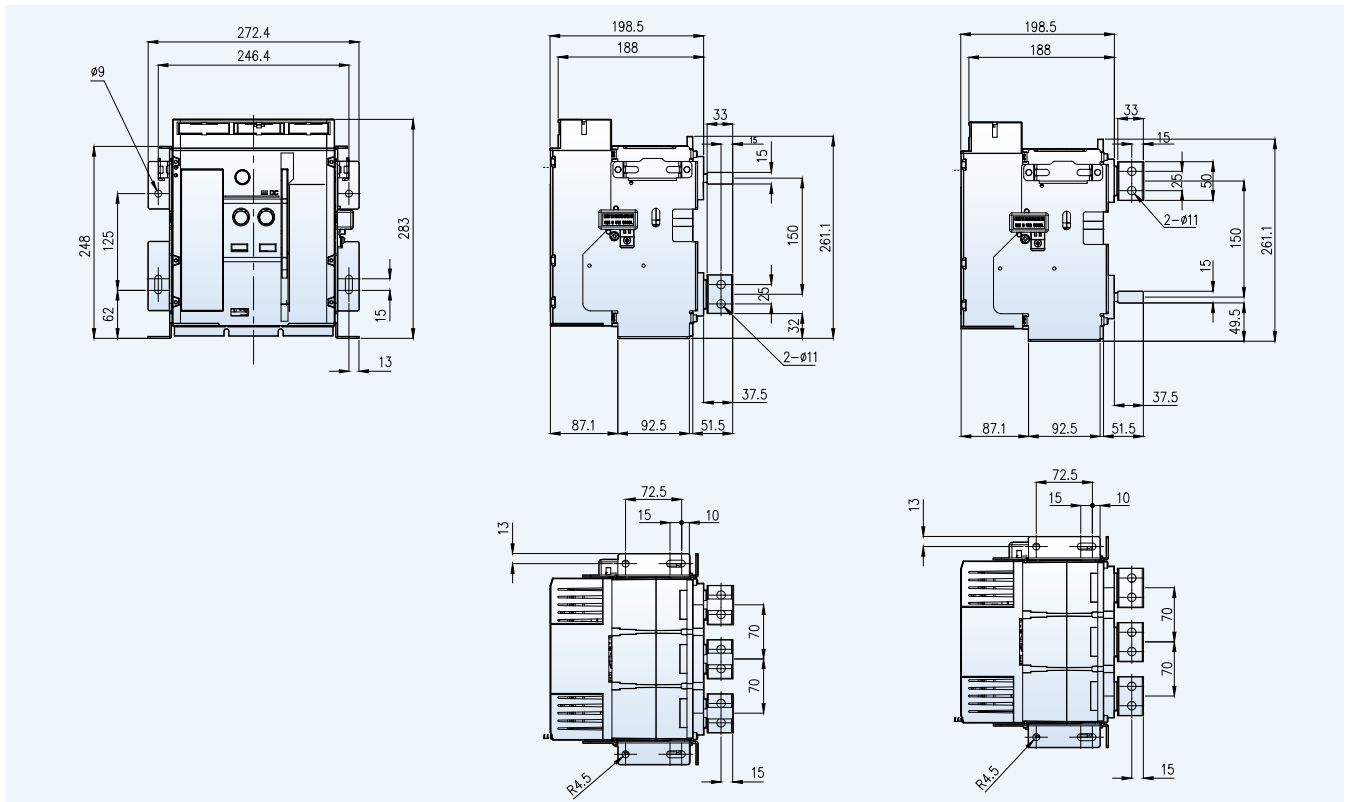
## Fixed type

• 3P [Fixed H: Horizontal type / V: Vertical type]

(Unit : mm)

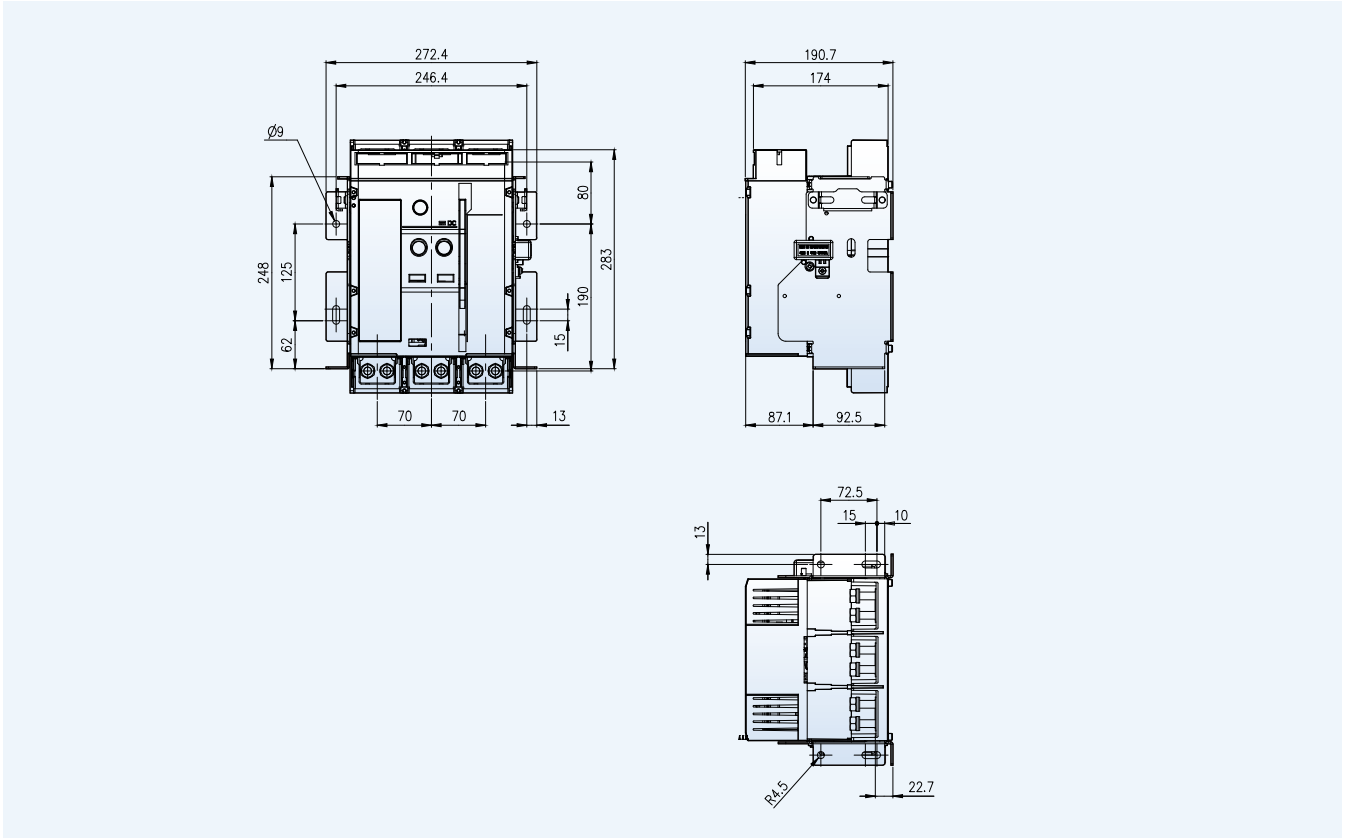


• 3P [Fixed M: Upper-horizontal type, Lower-vertical type / N: Upper-vertical type, Lower-horizontal type]



• 3P [Fixed P: Flat type]

(Unit : mm)

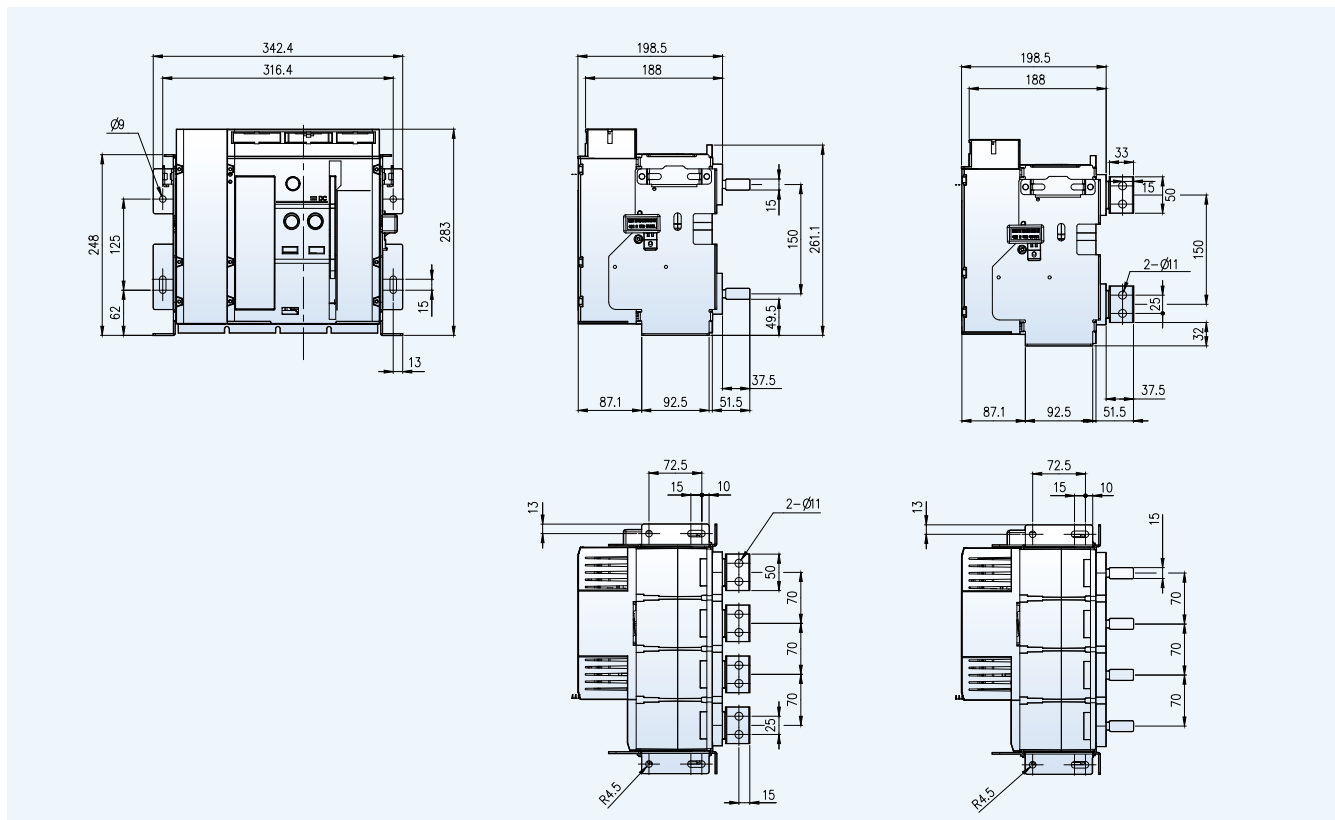


# Dimensions

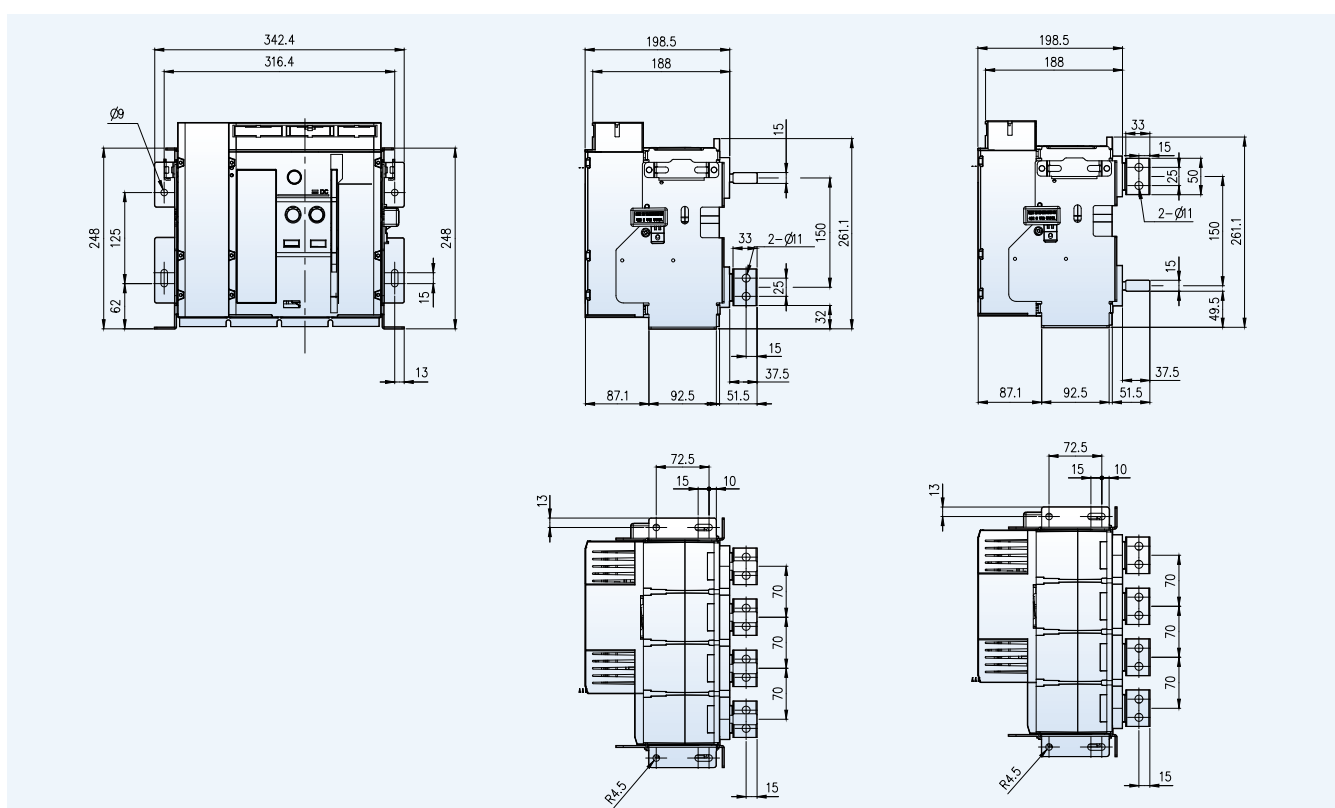
## Fixed type

• 4P [Fixed H: Horizontal type / V: Vertical type]

(Unit : mm)

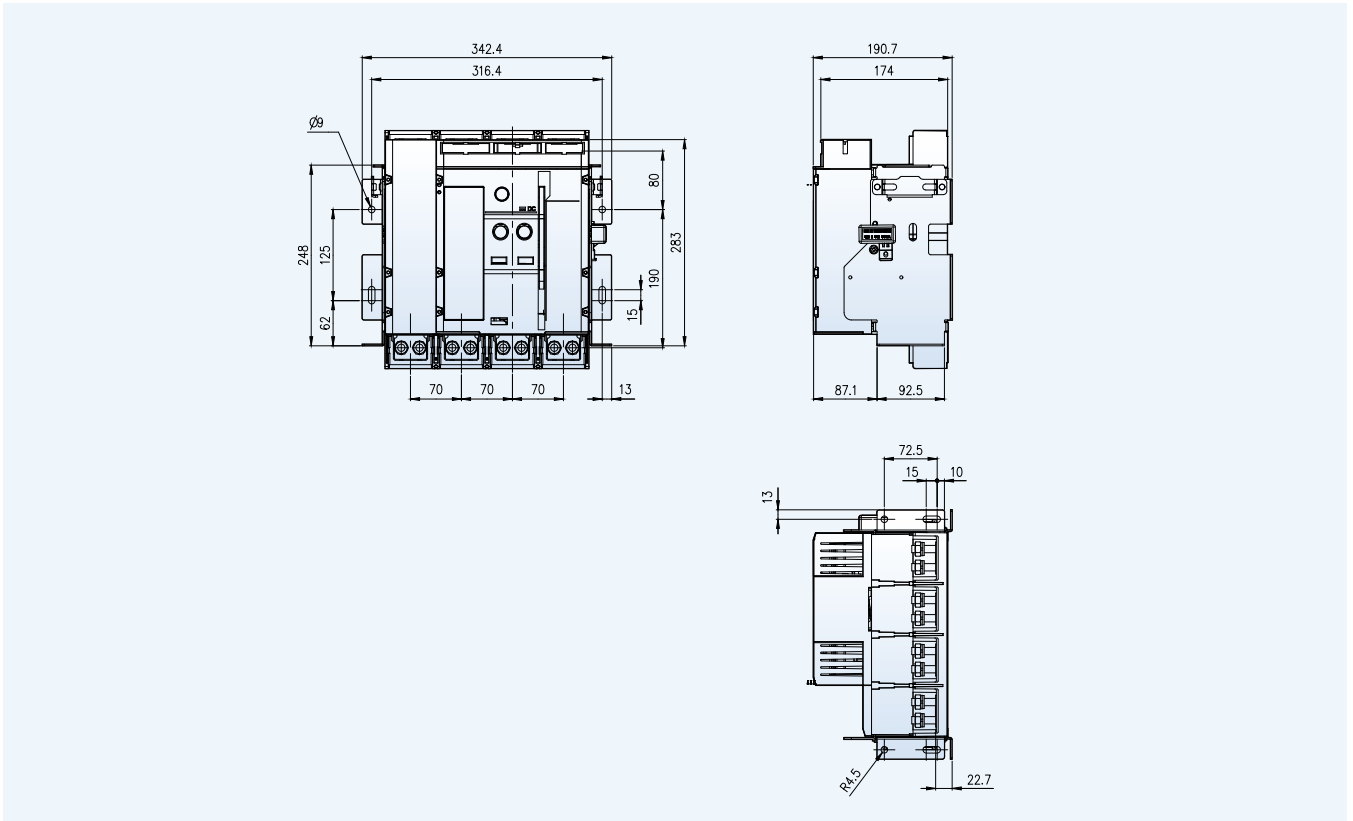


• 4P [Fixed M: Upper-horizontal type, Lower-vertical type / N: Upper-vertical type, Lower-horizontal type]



• 4P [Fixed P: Flat type / R: Spread type]

(Unit : mm)

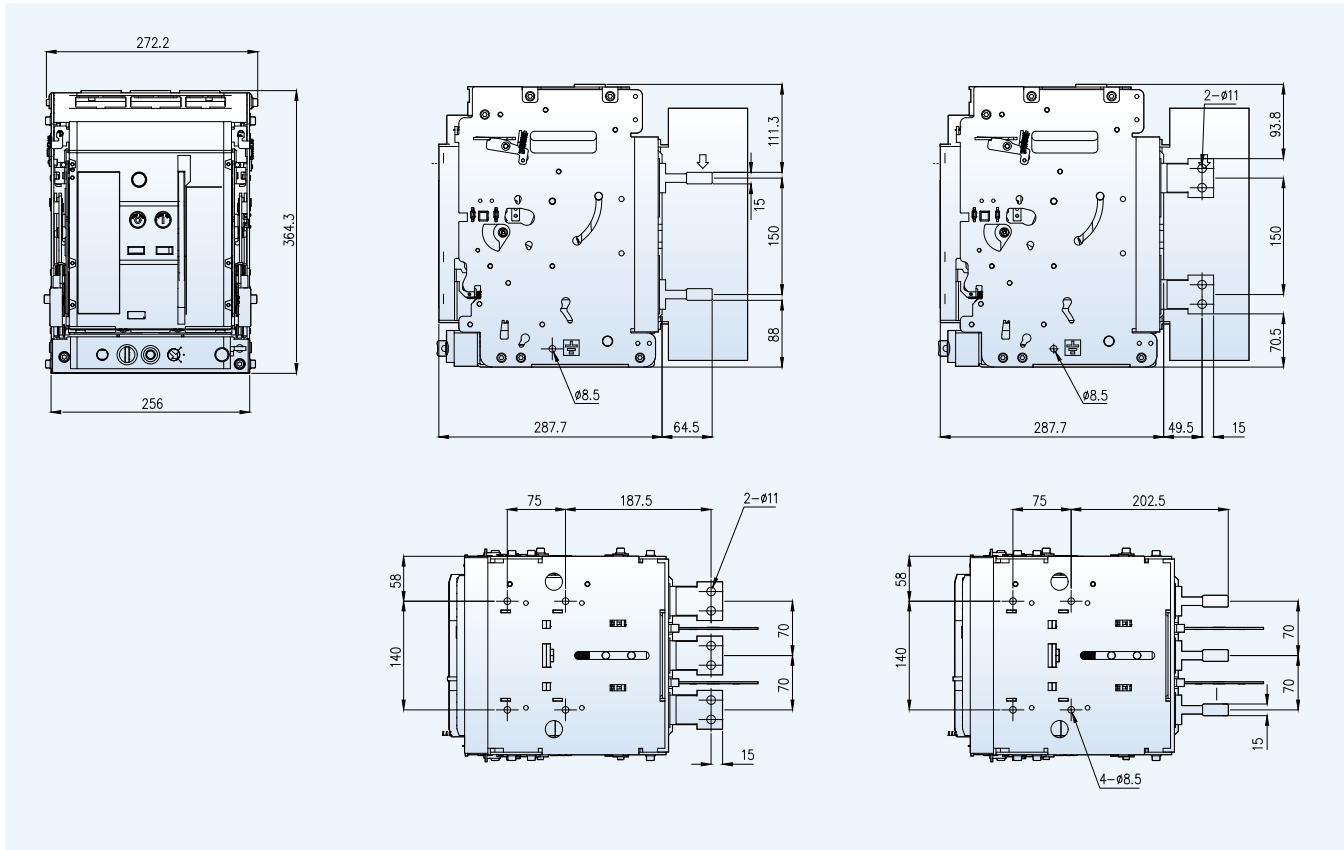


# Dimensions

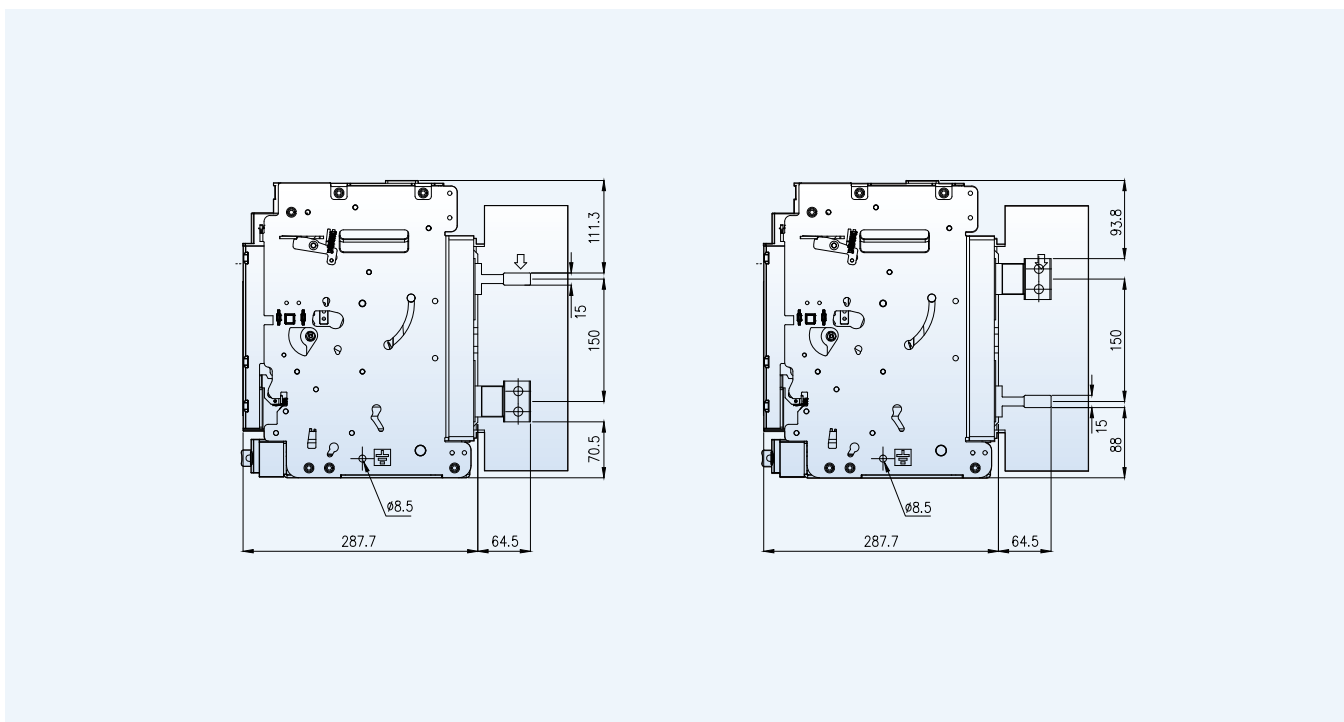
## Draw-out type

• 3P [Draw-out H: Horizontal type / V: Vertical type]

(Unit : mm)



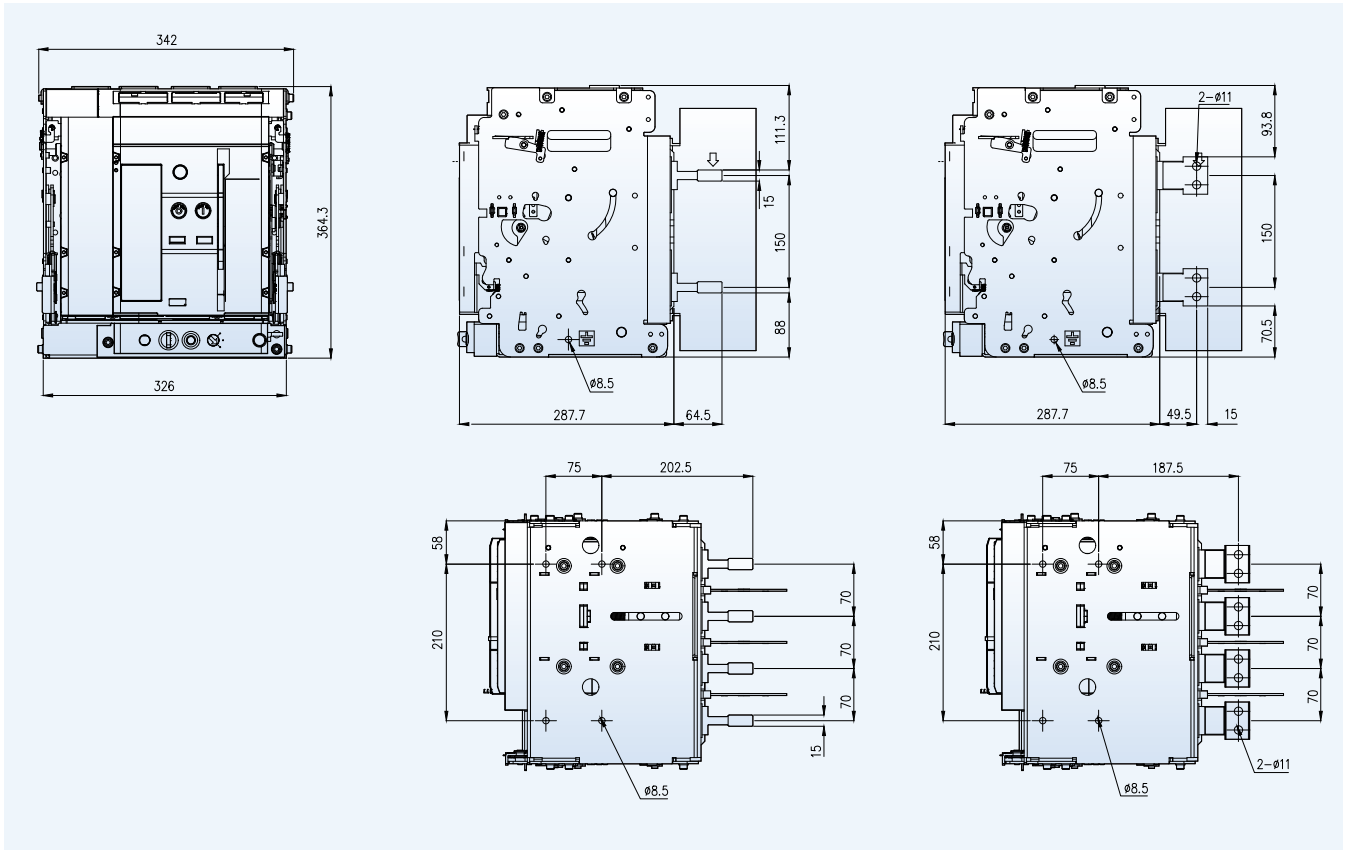
• 3P [Draw-out M: Upper-horizontal type, Lower-vertical type / N: Upper-vertical type, Lower-horizontal type]



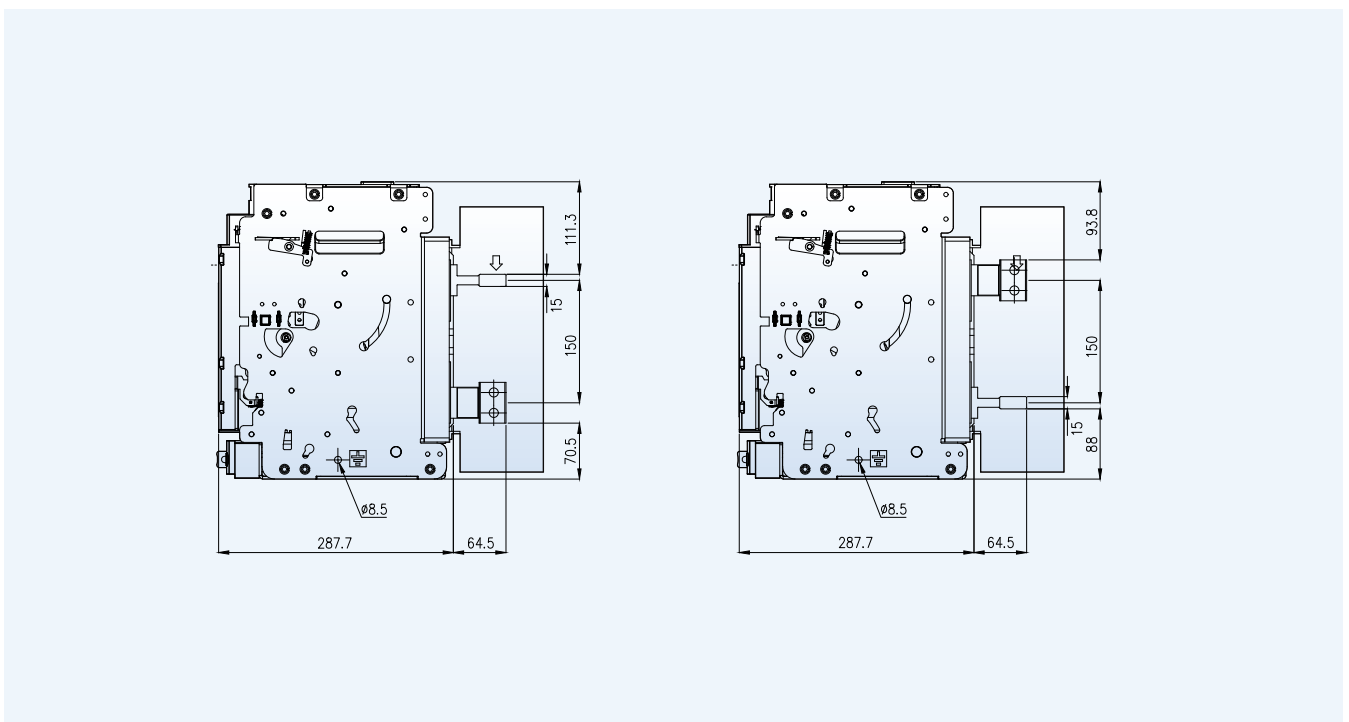


• 4P [Draw-out H: Horizontal type / V: Vertical type]

(Unit : mm)



• 4P [Draw-out M: Upper-horizontal type, Lower-vertical type / N: Upper-vertical type, Lower-horizontal type]

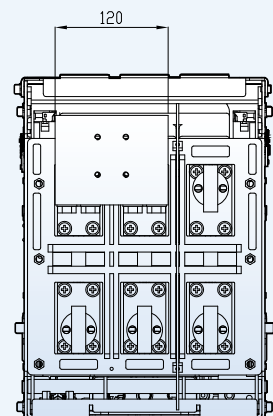
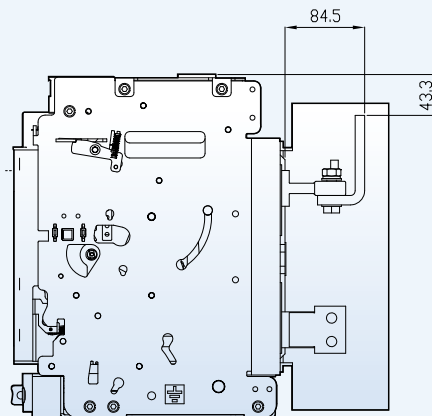
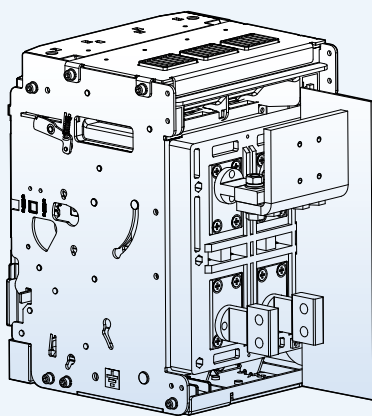
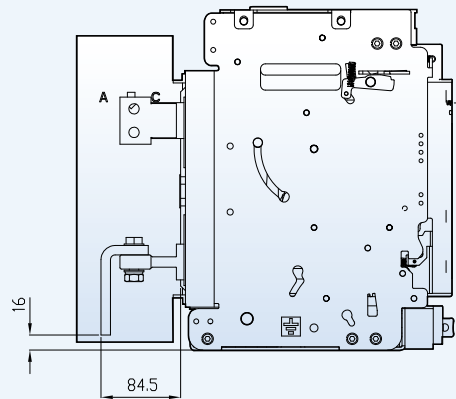
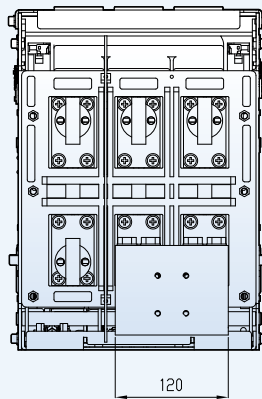
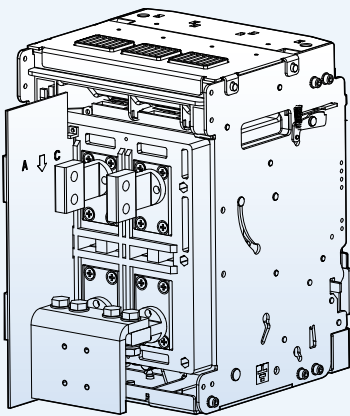


# Dimensions

## With short busbar

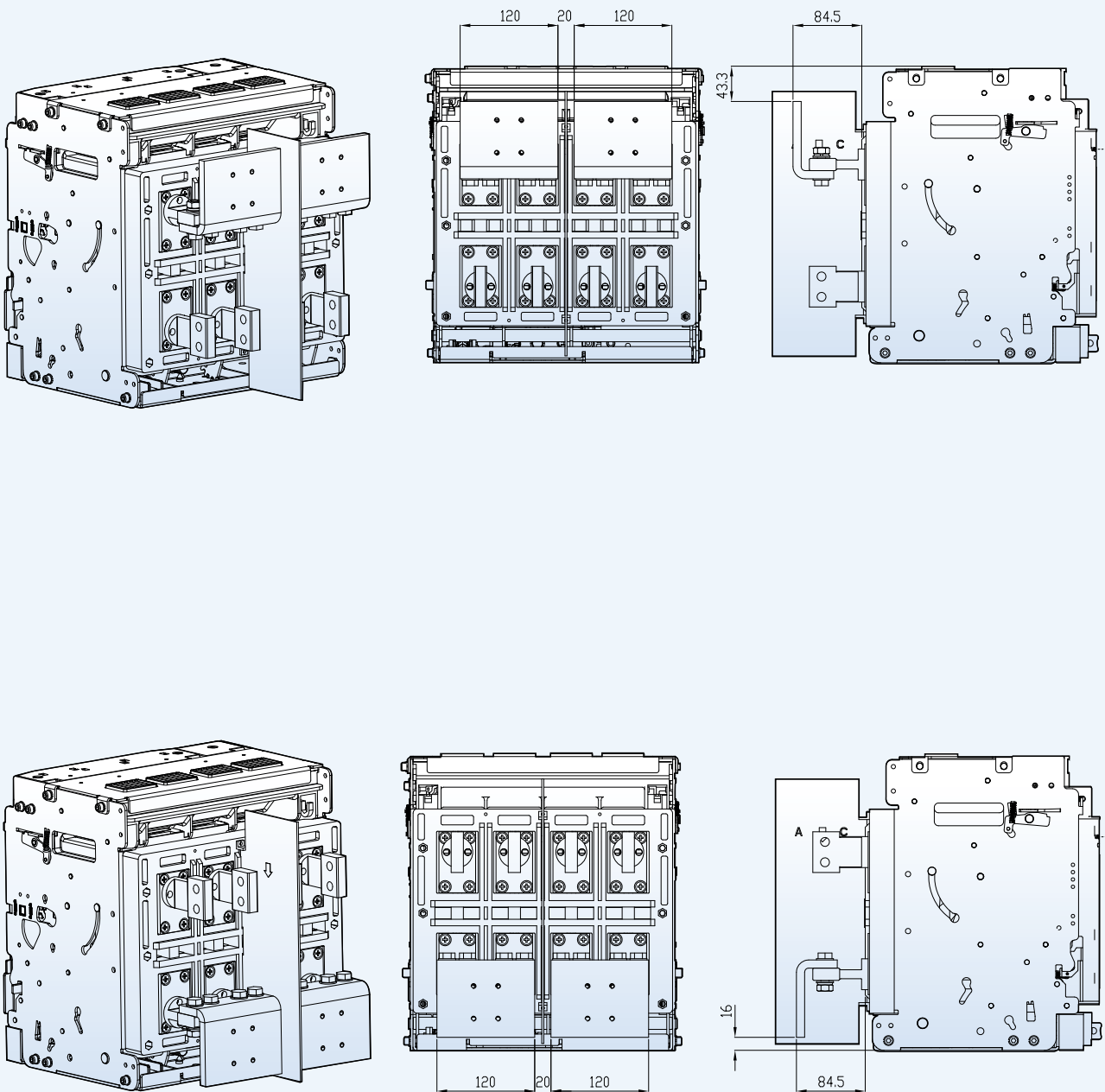
• 3P H, V, M, N Type \*Draw-out type (Up to 1200A)

(Unit : mm)



• 4P H, V, M, N Type \*Draw-out type (Up to 1200A)

(Unit : mm)

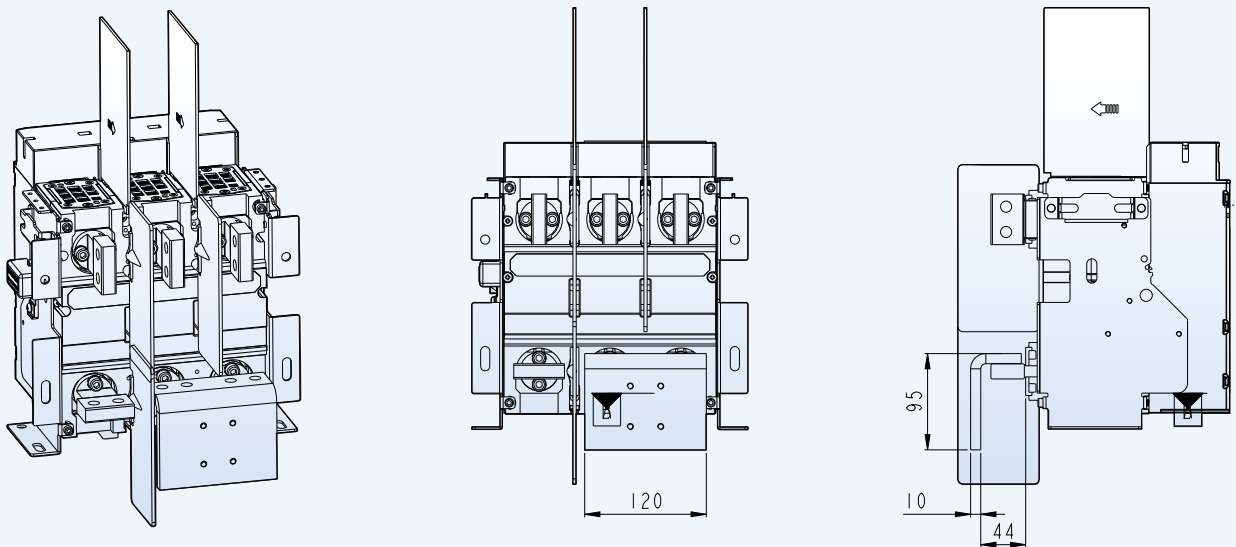
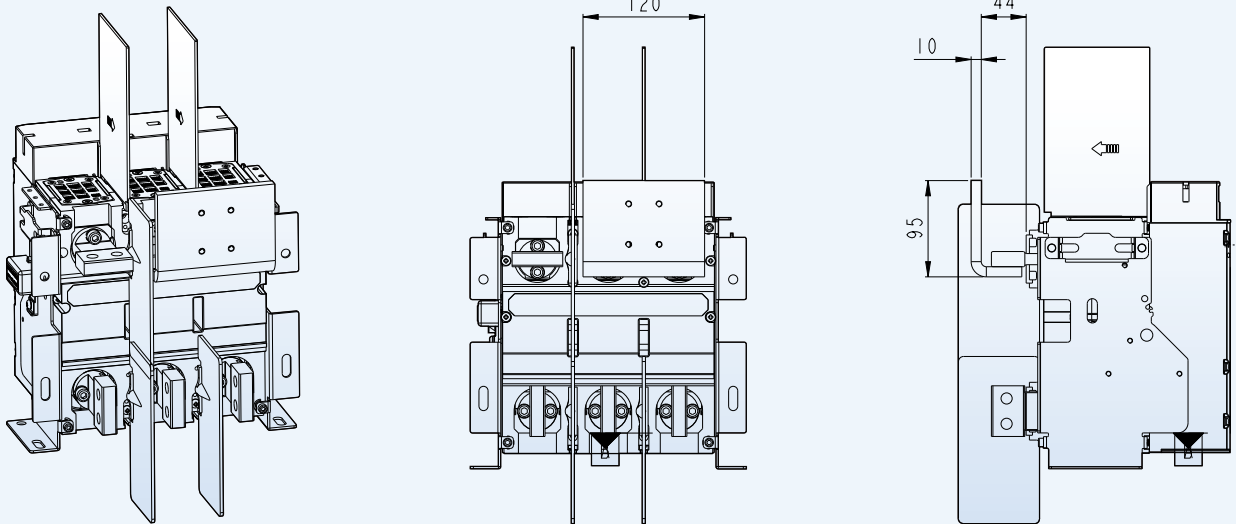


# Dimensions

## With short busbar

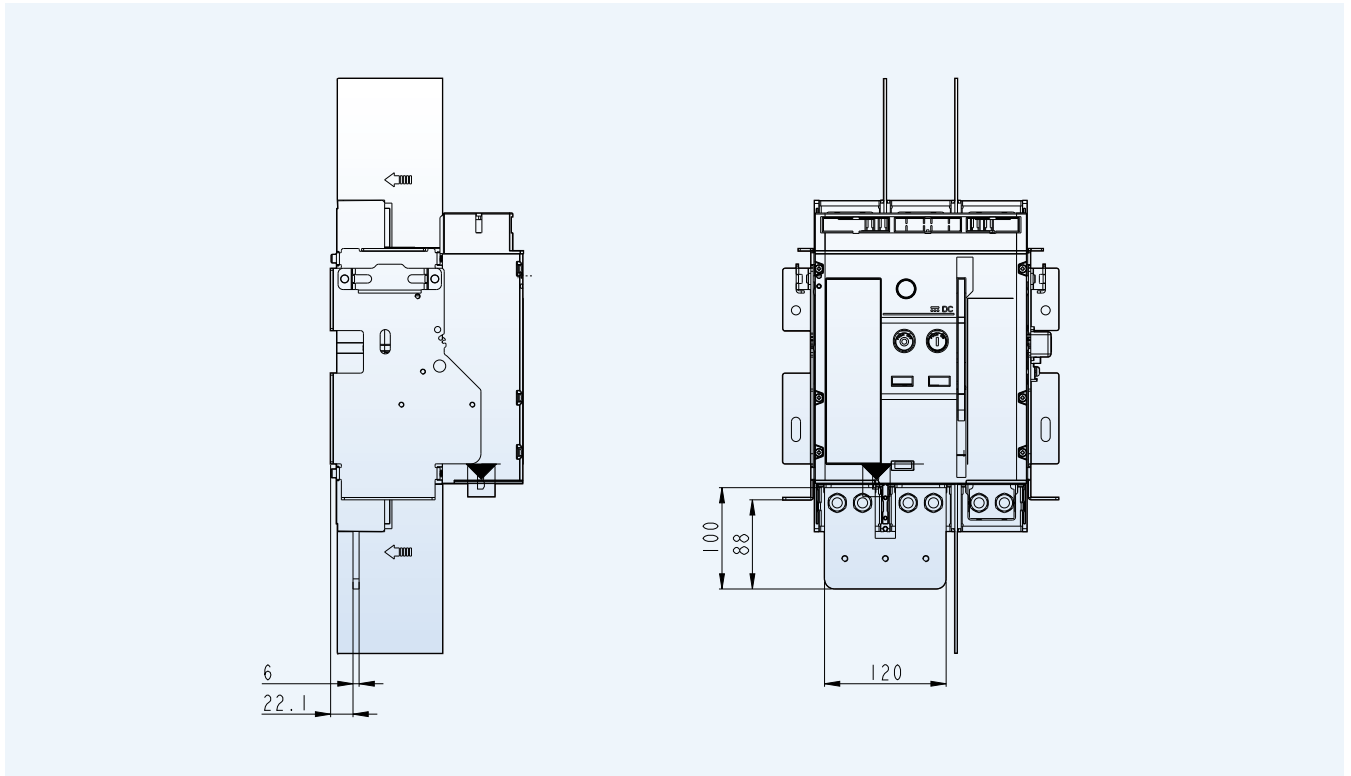
• 3P H, V, M, N Type \*Draw-out type (Up to 1200A)

(Unit : mm)

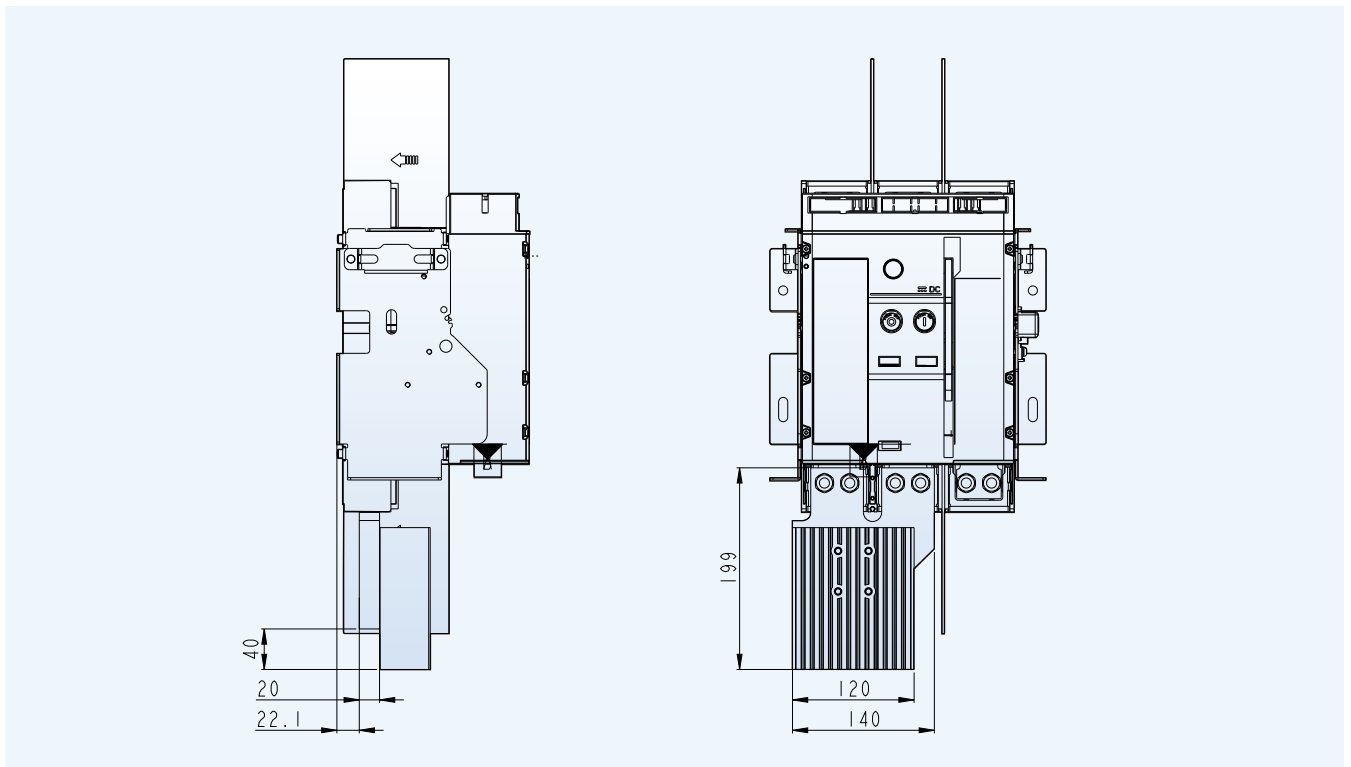


• 3P P Type \*Fixed type (Up to 800A)

(Unit : mm)



• 3P P Type \*Fixed type (Up to 1200A)

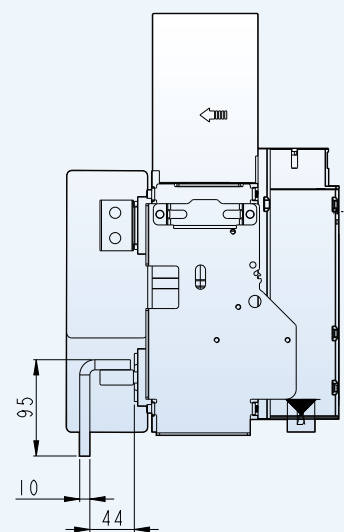
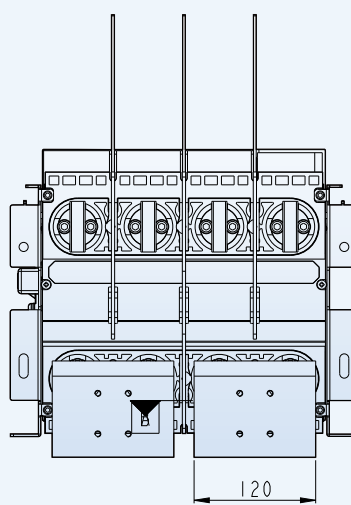
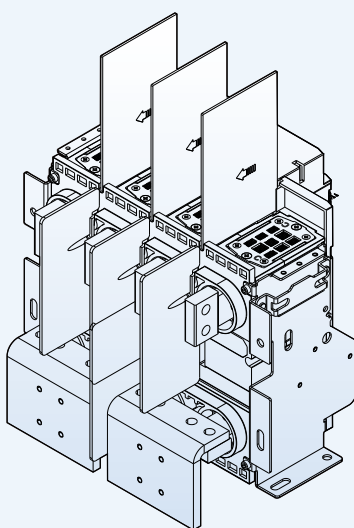
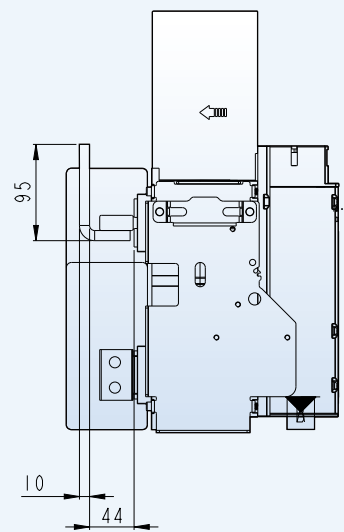
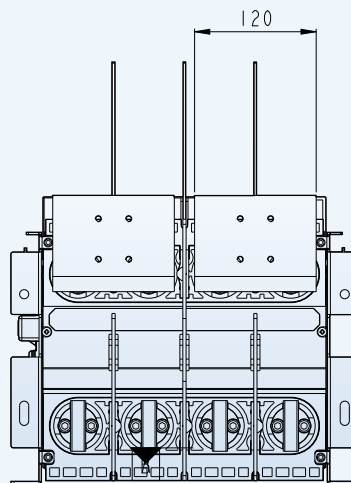
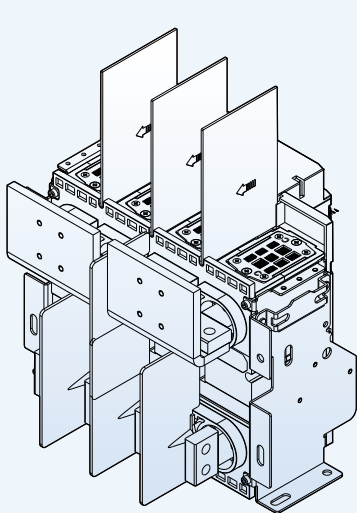


# Dimensions

## With short busbar

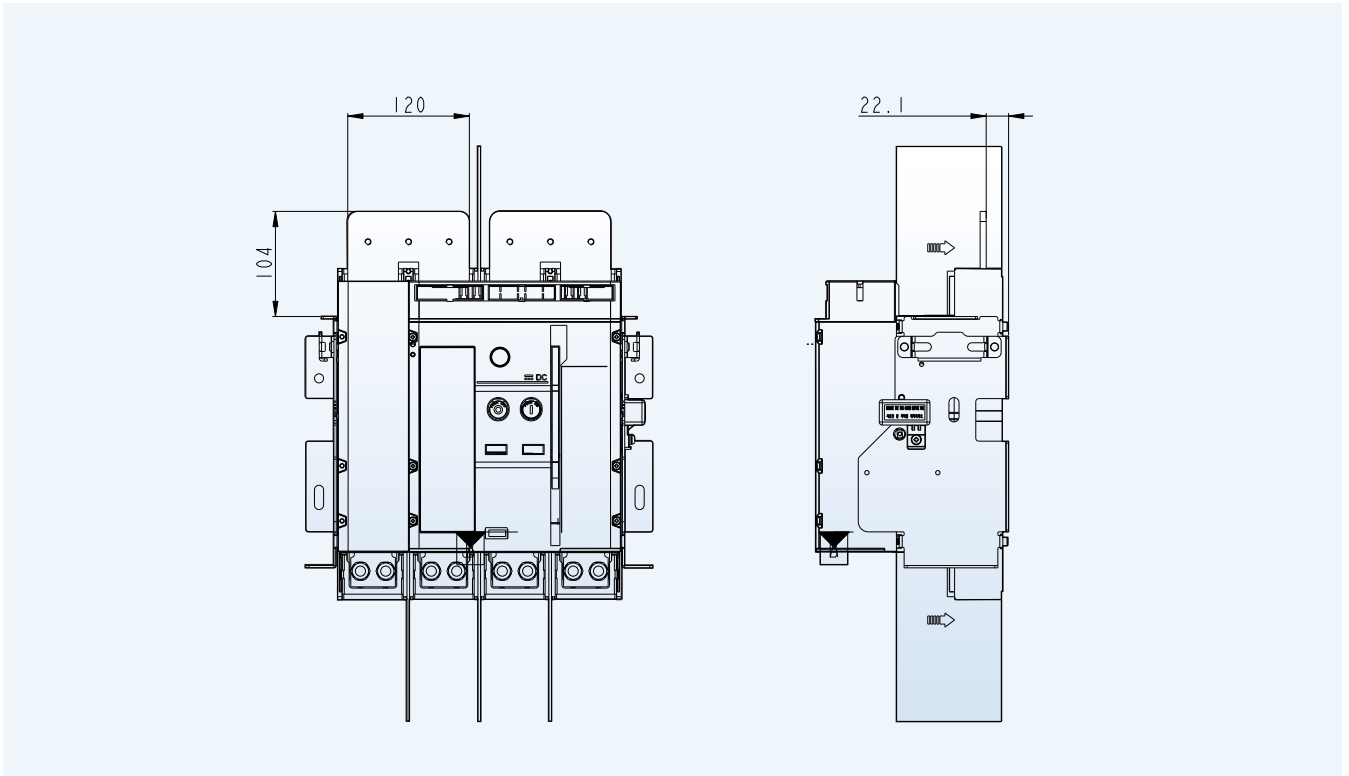
• 4P H, V, M, N Type \*Fixed type (Up to 1200A)

(Unit : mm)



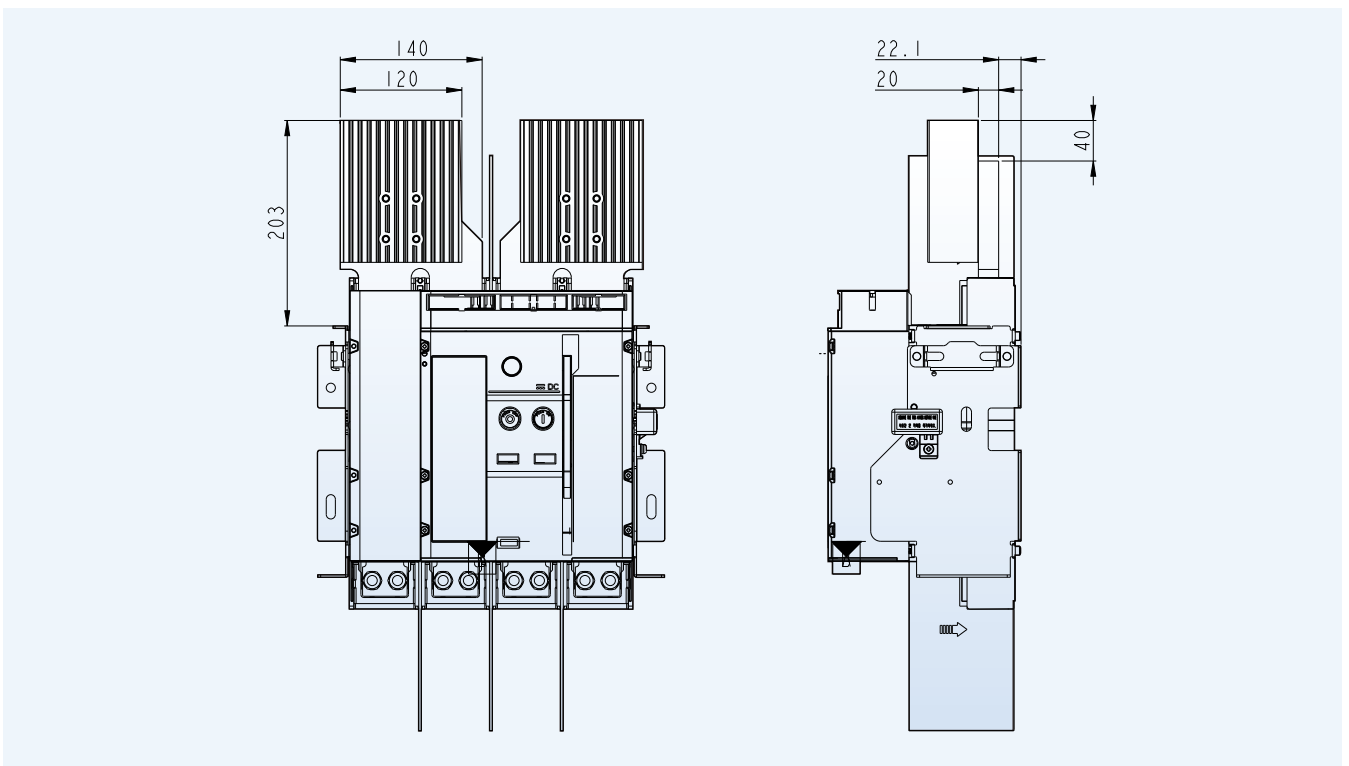
• 4P P Type \*Fixed type (Up to 800A)

(Unit : mm)



• 4P P Type \*Fixed type (Up to 1200A)

(Unit : mm)



# Technical information

## Normal / Special service condition

### Normal service conditions

If following normal working conditions are all satisfied, Compact ACB should be used under this condition unless otherwise specified.

- 1) Ambient temperature  
A range of max. +40°C to min. -5°C is recommended. However, the average temperature of 24 hours does not exceed +35°C.
- 2) Altitude 2,000m or less.
- 3) Environmental conditions  
The air must be clean, and the relative humidity does not exceed 85% at a max. of +40°C and 90% at 20°C. Do not use and store in presence of corrosive or ammonia gas. ( $H_2S \leq 0.01\text{ppm}$ ,  $SO_2 \leq 0.01\text{ppm}$ ,  $NH_3 \leq \text{a few ppm}$ )
- 4) Installation conditions  
When installing Compact ACB, refer to catalogue or the installation instructions in the instruction manual.
- 5) Storage temperature  
A range of max. +60°C to min. -20°C is recommended.
- 6) Replacement  
Approx. 15 years (depends on number of breaking of over current or service condition). Please see maintenance and inspection for further detail.

### Special service conditions

If in the case of special service condition, modified air circuit breakers are available. Please specify when ordering. Service life may be shorter, it depends on service conditions.

- 1) Special environmental conditions  
If it is used at high temperature and/or high humidity, the insulation durability and other electrical or mechanical features may deteriorate. Therefore, the breaker should be specially treated. Moisture fungus treatment with increased corrosion-resistance is recommended. When using products under this condition, please contact LS service team or nearest sales representatives.
- 2) Special ambient temperature  
If the ambient temperature exceeds +40, reduce the continuous conducting current for a use referring to Table. A.
- 3) Special altitude  
If it is used at the 2,000m or higher the heat radiation rate is reduced and the operating voltage, continuous current capacity and breaking capacity are decreased. Moreover the durability of the insulation is also decreased owing to the atmospheric pressure. Contact us for further detail.

### Table A. Rated current correction table according to ambient temperature



UL489B & UL489F Product model	Rated current	Apply BUS-BAR	Horizontal					Vertical				
			40°C	45°C	50°C	55°C	60°C	40°C	45°C	50°C	55°C	60°C
UDA-08C	800A	5T x 50 x 2ea	800A	800A	800A	800A	800A	800A	800A	800A	800A	800A
UDA-10C	1000A	6T x 50 x 2ea	1000A	1000A	1000A	994A	920A	1000A	1000A	1000A	1000A	1000A
		6.4T x 50.8 x 2ea										
UDA-12C	1200A	8T x 50 x 2ea	1200A	1200A	1200A	1122A	1039A	1200A	1200A	1200A	1181A	1094A
		6.4T x 57.2 x 2ea										



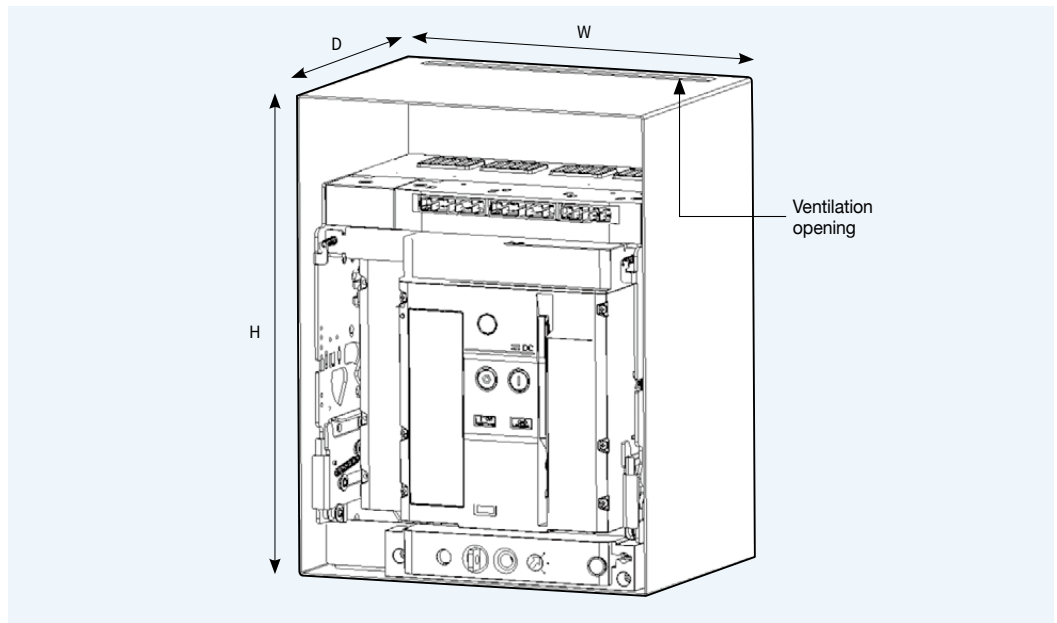
## Altitude and Isolation Voltage

### Altitude

Compact ACB is designed for operation at altitudes under 2000m. At altitudes higher than 2000m, change the ratings upon a service condition.

	2000	3000	4000	5000
Item Altitude [m] Max. operational voltage (Vdc)	1500	1350	1200	1050
	1200	1080	960	840
	1000	900	800	700
	750	675	600	525
Current compensation constant	1×In	0.98×In	0.96×In	0.94×In

### Dimensions enclosure

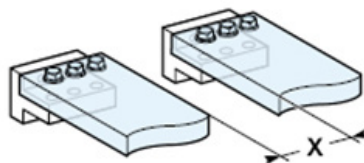


(Unit : mm)

Frame Rating	Pole	Enclosure Dimensions mm (in.)			Ventilation opening mm (in.)	
		H	W	D	Top	Bottom
1200 AF	3	450 (17.72)	275 (10.83)	250 (9.84)	290 × 20 (11.42 × 0.78)	290 × 20 (11.42 × 0.78)
	4	450 (17.72)	350 (13.78)	250 (9.84)	290 × 20 (11.42 × 0.78)	290 × 20 (11.42 × 0.78)

### Minimum clearances distance

For the safety, all the electric charging parts need to be installed over minimum clearances distance.



Maximum Voltage	Minimum clearances distance (X min)
~ 1500Vdc	25.4 mm

# Ordering sheet

If rated current or the order you placed is different from the ordering sheet listed below, please fill out another ordering sheet upon your specification.

<b>Receipt</b>	LS ELECTRIC Co., Ltd.		<b>Order day</b>				<b>Distributor name</b>			
<b>Project</b>			<b>Contractor</b>							
<b>Delivery place</b>			<b>Delivery date</b>		<b>PNL maker</b>					
<b>ACB Main body</b>	Type of ACB	DC Switch-disconnectors								
		<input type="checkbox"/> UDA								
	Frame size	<input type="checkbox"/> 800 AF <input type="checkbox"/> 1000 AF <input type="checkbox"/> 1200 AF								
	Ratings	A								
	No. of poles	<input type="checkbox"/> 3-pole			<input type="checkbox"/> 4-pole					
	Rated voltage	<input type="checkbox"/> ~ 1000 V DC			<input type="checkbox"/> ~ 1500 V DC					
	Installation type	<input type="checkbox"/> Draw-out type			<input type="checkbox"/> Fixed type					
	Closing type	<input type="checkbox"/> Manual closing								
		<input type="checkbox"/> Electrical closing								
		• Charge method		<input type="checkbox"/> Standard type (OFF-charging method)						
		<input type="checkbox"/> Rapid auto-reclosing type (ON-Charging method)								
• Motor operating voltage		<input type="checkbox"/> AC/DC 100V~130V		<input type="checkbox"/> DC 125V		<input type="checkbox"/> DC 24V~30V		<input type="checkbox"/> DC 48V~60V		
		<input type="checkbox"/> AC/DC 200V~250V		<input type="checkbox"/> AC 48V						
Closing voltage	<input type="checkbox"/> AC/DC 100V~130V	<input type="checkbox"/> DC 125V	<input type="checkbox"/> AC/DC 200V~250V	<input type="checkbox"/> DC 24V~30V	<input type="checkbox"/> DC 48V~60V	<input type="checkbox"/> AC 48V				
Trip voltage	<input type="checkbox"/> AC/DC 100V~130V	<input type="checkbox"/> DC 125V	<input type="checkbox"/> AC/DC 200V~250V	<input type="checkbox"/> DC 24V~30V	<input type="checkbox"/> DC 48V~60V	<input type="checkbox"/> AC 48V				
<b>Cradle</b>	Cradle type	Safety Shutter Attachment (F class)				<input type="checkbox"/> Automatic connection (Connector type)				
						<input type="checkbox"/> Automatic connection (Screw Joint type)				
<b>Bus-bar connection</b>	Bus-bar type	<input type="checkbox"/> Vertical	<input type="checkbox"/> Horizontal	<input type="checkbox"/> Flat	<input type="checkbox"/> Top: Horizontal, Bottom: Vertical	<input type="checkbox"/> Top: Vertical, Bottom: Horizontal	<input type="checkbox"/> Customer mounting			
<b>ACB Accessory</b>	Main body	Standard	• Aux. contact		<input type="checkbox"/> Standard type (4c, standard installation)		<input type="checkbox"/> Micro Load type (4C, installation)			
			• Key Lock		<input type="checkbox"/> Single Key (ON-Lock)					
		Accessory	• Undervoltage trip device (UVT, Instantaneous type)		<input type="checkbox"/> AC/DC 100V~130V		<input type="checkbox"/> DC 125V	<input type="checkbox"/> AC/DC 200V~250V		
					<input type="checkbox"/> DC 24V~30V		<input type="checkbox"/> DC 48V~60V		<input type="checkbox"/> AC 48V	
			• Mechanical operation contact (MOC), Door Interlock (DI)		<input type="checkbox"/> Non-attachment type		<input type="checkbox"/> Attachment type			
		• Mechanical Interlock (MI)		<input type="checkbox"/> Non-attachment type		<input type="checkbox"/> Attachment type				
		• Counter		Default						
		• Miss insertion preventive device (MIP)		<input type="checkbox"/> Non-attachment type		<input type="checkbox"/> Attachment type				
		• Double trip device (Same with Shunt voltage)		<input type="checkbox"/> Non-attachment type						
	• Ready-to-close contact		<input type="checkbox"/> Non-attachment type		<input type="checkbox"/> Attachment type					
	• Key Interlock(K2, ON-Lock)		<input type="checkbox"/> ON/OFF Button Lock							
	Separate purchase	Cradle mounting	• Cell switch (CL)		<input type="checkbox"/> 4c	<input type="checkbox"/> 8c				
			• Door Interlock		<input type="checkbox"/> Wire type		<input type="checkbox"/> Catch type			
			• Mechanical operation contact (MOC)		<input type="checkbox"/> Standard type (10a10b)					
			• Mechanical Interlock (MI)		<input type="checkbox"/> Wire type (2 terminals)		<input type="checkbox"/> Wire type (3 terminals)			
			• Miss insertion preventive device (MIP)		<input type="checkbox"/> Non-attachment type		<input type="checkbox"/> Attachment type			
		<input type="checkbox"/> Racking Interlock		<input type="checkbox"/> Insulation barrier						
		External mounting	• UVT time delay controller		<input type="checkbox"/> AC/DC 100V~130V		<input type="checkbox"/> DC 125V	<input type="checkbox"/> AC/DC 200V~250V		
			<input type="checkbox"/> DC 48V~60V		<input type="checkbox"/> AC 48V					
<input type="checkbox"/> Door frame (DF)			<input type="checkbox"/> Condenser trip device (CTD)		<input type="checkbox"/> Remote closing & trip					
<input type="checkbox"/> Dust Cover										





## Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance. Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.



- According to The WEEE Directive, please do not discard the device with your household waste.



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