Accessory

Susol



Mounting Position	Type	Accessory	Supplied as			Remarks	page
			VL: 7.2kV 8/12.5kA	VL: 20/25kA	VH		
Breaker (Internal)	M	Motor	●	●	●	Attached at the factory	61
	CC	Closing Coil	●	●	●	Attached at the factory	62
	TC	Trip Coil	●	●	●	Attached at the factory	63
	A1	Secondary Trip Coil	Option	Option	Option	Attached at the factory	64
	A2	Secondary Trip Coil with TCM Contact	-	Option	Option	Attached at the factory	64, 80
	T9	Current Trip Coil	Option	Option	-	Attached at the factory	65
	SA (SB)	Auxiliary Contact 2a2b	●	-	-	Attached at the factory	66
		Auxiliary Contact 4a4b	Option	●	●		
		Auxiliary Contact 6a6b	Option	-	-		
		Auxiliary Contact 10a10b	-	Option	Option		
	U	Under Voltage Trip Coil	Option	Option	Option	Attached at the factory	67
	A3	Position S/W(Test: 1a1b, Service: 2b)	Option	Option	Option	Attached at the factory	68
	A4	Position S/W(Test: 2a, Service: 2a)	Option	Option	Option	Attached at the factory	68
	A5	Position S/W(Test: 1a1b, Service: 1a1b)	Option	Option	Option	Attached at the factory	68
	A6	Latch Checking Switch	-	-	Option	Attached at the factory	69
	C	Counter	●	●	●	Attached at the factory	69
	A7	Keylock	Option	Option	Option	Attached at the factory	70
	A8	Button Padlock	Option	Option	Option	Attached at the factory	71
	A9	Button cover	Option	Option	Option	Attached at the factory	72
	AA	Lead Wire: A/B type connector	Option	Option	Option	Attached at the factory	73
	AB	Plug/Terminal for Lead Wire	Option	Option	Option	Attached at the factory	73
	AC	Plug Interlock	-	Option	Option	Attached at the factory	77
	AD	Padlock (H type)	-	Option	Option	Attached at the factory	77
	AE	MOC(Mechanical Operated Cell Switch	-	Option	Option	Attached at the factory	78
	AF	Locking Magnet	-	Option	Option	Attached at the factory	79
	AJ	Door Interlock	-	Option	Option	Attached at the factory	89
	AO	Lead Wire: A type connector (Special Color: Blue)	Option	Option	-	Attached at the factory	91
		Trip Coil Monitoring Contact	●	●	●	Attached at the factory	80
Breaker (External)	CTD1	Condenser Trip Device(AC110V)	Option	Option	Option	-	82
	CTD2	Condenser Trip Device(AC220V)	Option	Option	Option	-	82
	UDC1	UVT Time Delay Controller(AD110V)	Option	Option	Option	-	83
	UDC2	UVT Time Delay Controller(AD220V)	Option	Option	Option	-	83
	UDC3	UVT Time Delay Controller(AD48V)	Option	Option	Option	-	83
	CTU	Coil Test Unit	Option	Option	Option	-	81
	TM	Temperature Monitoring	-	Option	Option	-	84



* ●: Basic Installation

Accessory

Susol



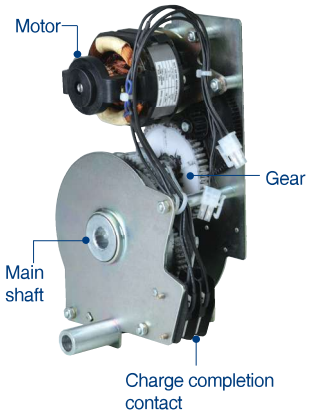


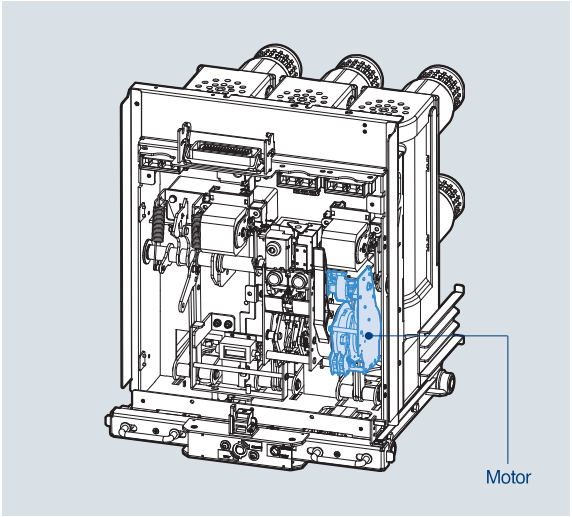
Mounting Position	Type	Accessory	Supplied as			Remarks	page
			VL: 7.2kV 8/12.5kA	VL: 20/25kA	VH		
Cradle	A1	ES(Earthing Switch)\ without Option	-	Option	Option	Attached at the factory	85
	A2	ES(Earthing Switch) with Position Switch(2a2b)	-	Option	Option	Attached at the factory	85
	A4	ES(Earthing Switch) with Position Switch(6a6b)	-	Option	Option	Attached at the factory	85
	A5	Keylock for ES(Earthing Switch)	-	Option	Option	Attached at the factory	86
	A6	Locking magnet(DC110V) for ES(Earthing Switch)	-	Option	Option	Attached at the factory	86
	A7	Locking magnet(DC220V) for ES(Earthing Switch)	-	Option	Option	Attached at the factory	86
	A8	Locking magnet(DC125V) for ES(Earthing Switch)	-	Option	Option	Attached at the factory	86
	A9	Locking magnet(DC24V) for ES(Earthing Switch)	-	Option	Option	Attached at the factory	86
	AA	Locking magnet(DC48V) for ES(Earthing Switch)	-	Option	Option	Attached at the factory	86
	AB	Locking magnet(AC48V) for ES(Earthing Switch)	-	Option	Option	Attached at the factory	86
	AC	Locking magnet(AC110V) for ES(Earthing Switch)	-	Option	Option	Attached at the factory	86
	AD	Locking magnet(AC220V) for ES(Earthing Switch)	-	Option	Option	Attached at the factory	86
	AE	Shutter padlock	-	Option	Option	Attached at the factory	87
	AF	TOC(Truck Operated Cell Switch)	-	Option	Option	Attached at the factory	87
	AG	MOC(Mechanical Operated Cell Switch)	-	Option	Option	Attached at the factory	86
	AH	Door	-	Option	Option	Attached at the factory	88
	AJ	Door Interlock	-	Option	Option	Attached at the factory	89
	AK	Door Emergency Push Button	-	Option	Option	Attached at the factory	89
	AL	Temperature Sensor	-	Option	Option	Attached at the factory	90
	AM	Type H Lead Wire 4a4b (Normal cable)	-	Option	Option	Attached at the factory	91
	AN	Type H Lead Wire 10a10b (Normal cable)	-	Option	Option	Attached at the factory	91
	AO	Type H Lead Wire 4a4b) (Flame retardant cable)	-	Option	Option	Attached at the factory	91
		Door padlock	-	Option	Option	Attached at the factory	91

Motor: M

Installed inside of a breaker as standard

VL type





- Charge the closing spring of a circuit breaker by the external power source. When the charging is complete, control power of the motor will be "OFF" by the built-in Limit S/W. Without the external power source, charge manually.

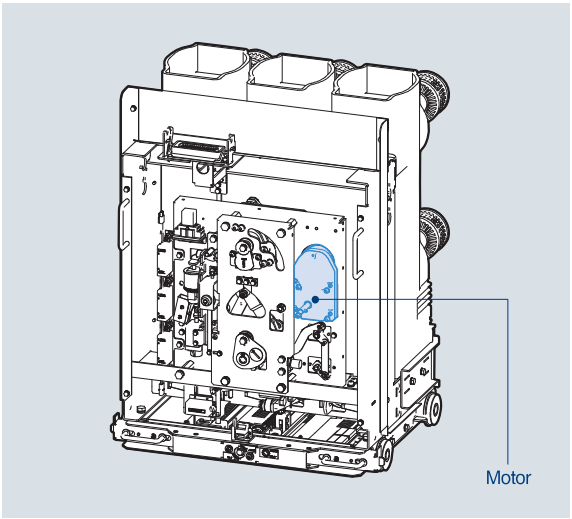
  Operating voltage range (IEC 60947)
  85%~110%Vn

	VL type							
Input voltage (Vn)	DC 24~ 30V	DC 48~ 60V	DC 110V	DC 125V	DC 220V	AC 48V	AC 100~ 130	AC 200~ 250V
Load current (A)	≤ 5	≤ 3	≤ 1	≤ 1	≤ 0.5	≤ 3	≤ 1	≤ 0.5
Starting current (A)	5 times of load current							
Charge time	Within 5 sec.							

Note) Rated operation and control voltage range, see page 65.

VH type





	VH Type						
Input voltage (Vn)	DC 48V	DC 110V	DC 125V	DC 220V	AC 48V	AC 110V	AC 220V
Load current (A)	≤ 6	≤ 3	≤ 3	≤ 2.6	≤ 6	≤ 3	≤ 2.6
Starting current (A)	≤ 30	≤ 20	≤ 20	≤ 17	≤ 30	≤ 20	≤ 17
Charge time	Within 12 sec.						

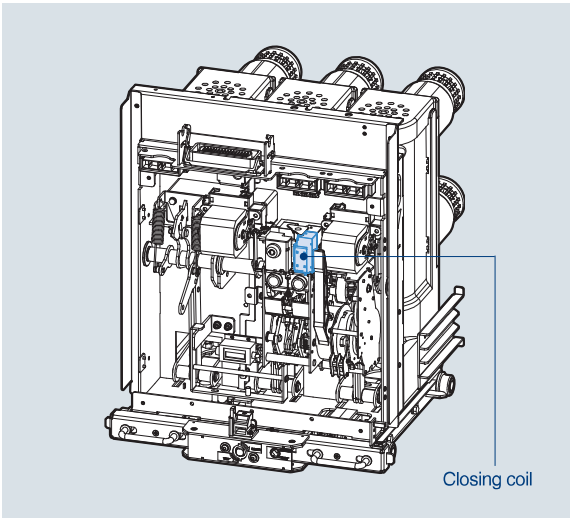
Note) Rated operation and control voltage range, see page 65.

Closing Coil: C

Installed inside of a breaker as standard

VL type





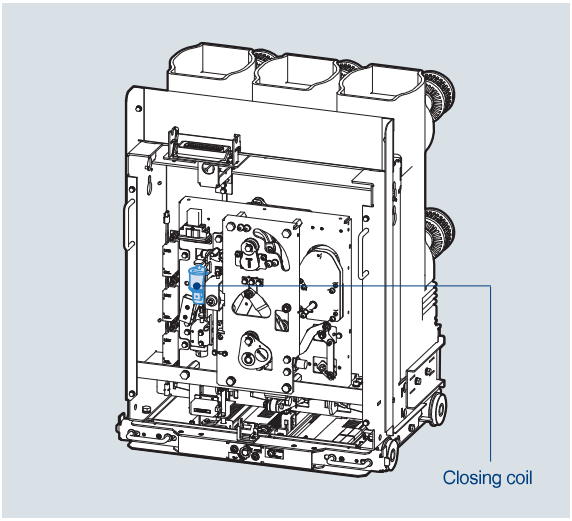
- It is a control device which closes a circuit breaker, when applying voltage continuously or instantaneously over 200ms to the coil control terminals.

	VL type							
Input voltage (Vn)	DC 24~ 30V	DC 48~ 60V	DC 110V	DC 125V	DC 220V	AC 48V	AC 100~ 130	AC 200~ 250V
Power consumption (inrush, W)	200							
Power consumption (steady, W)	≤ 5							

Note) Rated operation and control voltage range, see page 65.

VH type





- It is a control device which closes a circuit breaker, when applying voltage continuously about 45ms to the coil control terminals. Electrical pumping preventing circuit is built in.

	VH Type						
Input voltage (Vn)	DC 48V	DC 110V	DC 125V	DC 220V	AC 48V	AC 110V	AC 220V
Rated current (A)	≤ 8	≤ 3	≤ 3	≤ 2.5	≤ 8	≤ 3	≤ 2.5

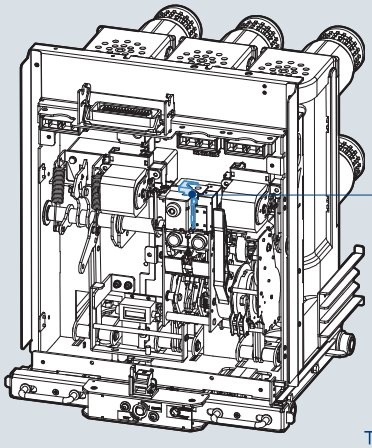
Note) Rated operation and control voltage range, see page 65.

Trip Coil: T

Installed inside of a breaker as standard

VL type





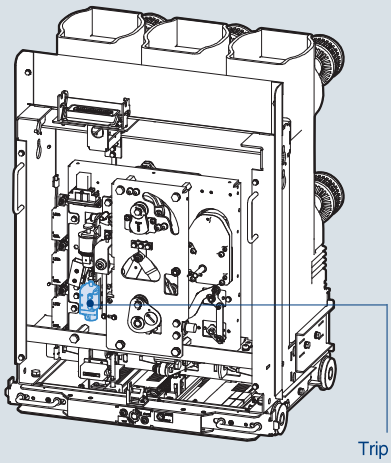
- It is a control device which trips a circuit breaker from remote place, when applying voltage continuously or instantaneously over 35ms to coil control terminals.
- When UVT coil is installed, its location is changed.

	VL type							
Input voltage (Vn)	DC 24~ 30V	DC 48~ 60V	DC 110V	DC 125V	DC 220V	AC 48V	AC 100~ 130	AC 200~ 250V
Power consumption (inrush, W)	200							
Power consumption (steady, W)	≤ 5							

Note) Rated operation and control voltage range, see page 65.

VH type





- It is a control device which trips a circuit breaker, when applying voltage continuously or instantaneously over 35ms to the coil control terminals.

	VH Type						
Input voltage (Vn)	DC 48V	DC 110V	DC 125V	DC 220V	AC 48V	AC 110V	AC 220V
Rated current (A)	≤ 8	≤ 3	≤ 3	≤ 2.5	≤ 8	≤ 3	≤ 2.5

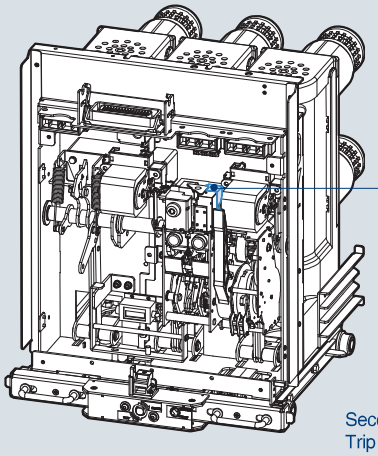
Note) Rated operation and control voltage range, see page 65.

Secondary Trip Coil: A1
Secondary Trip Coil with TCM Contact : A2

Installed inside of a breaker as an option

VL type



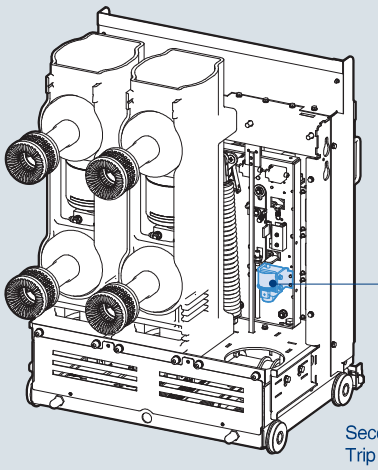


- It is a control device which trips a circuit breaker doubly from the outside. If the trip coil (T) fails, it can trip a circuit breaker safely.
- Trip coil: Install it at existing location.
- Secondary trip coil: Install it on the right side of the trip coil.
- It is not available with UVT coil when installing secondary trip coil.

	VL type							
Input voltage (Vn)	DC 24~ 30V	DC 48~ 60V	DC 110V	DC 125V	DC 220V	AC 48V	AC 100~ 130	AC 200~ 250V
Power consumption (inrush, W)	200							
Power consumption (steady, W)	≤ 5							

VH type





- It is a control device which trips a circuit breaker doubly from the outside. If the trip coil (T) fails, it can trip a circuit breaker safely.
- It is not available with UVT coil when installing secondary trip coil.

	VH Type						
Input voltage (Vn)	DC 48V	DC 110V	DC 125V	DC 220V	AC 48V	AC 110V	AC 220V
Rated current (A)	≤ 8	≤ 3	≤ 3	≤ 2.5	≤ 8	≤ 3	≤ 2.5

Rated operation and control voltage range

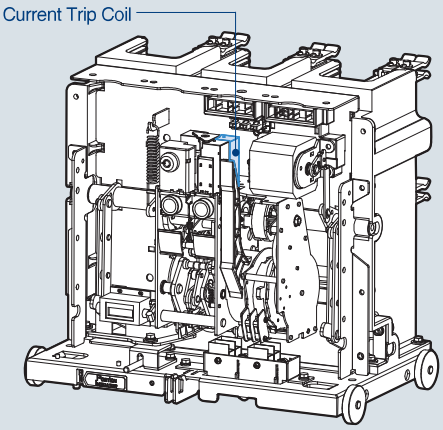
Item		Susol VCB			Remarks
		VL: 7.2kV 8/12.5kA	VL: 20/25kA	VH	
Motor	AC	85~110%	85~110%	85~110%	
	DC	75~110%	85~110%	85~110%	
Closing	AC	85~110%	85~110%	85~110%	
	DC	75~125%	85~110%	85~110%	
Trip	AC	60~125%	85~110%	85~110%	
	DC	60~125%	70~110%	70~110%	
Applied standards		IEC62271-100 (2008) KSC4611	IEC62271-100 (2008)	IEC62271-100 (2008)	

Current Trip Coil

Installed inside of a breaker as an option

VL type : T9

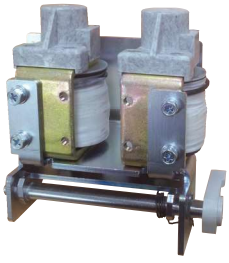


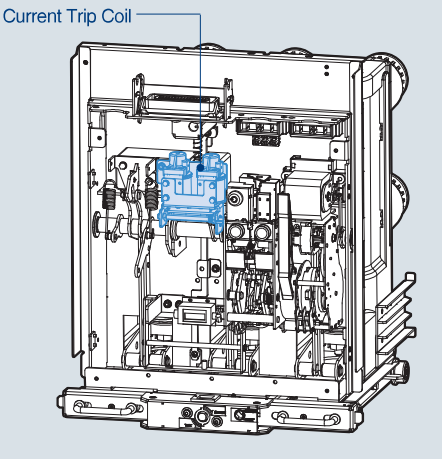


- This trip coil uses the output of the CT as its control power source and is used with over current relay in combination. Two current trip coils are supplied.
- Coil burden is 90VA.(T9)
- Coil impedance(Z) is like below
  - 3A: 10Ω or less, Operating current AC 3A (T9)
  - 1A: 160Ω or less, Operating current AC 1A (AV)
  - 5A: 6Ω or less, Operating current is AC 5A (AW)
- CT must be installed at load side.
  If it is installed at bus side there is the danger of malfunction or damage to CT.
- Don't disconnect the control power connector on main power is live condition at service position. Otherwise there is the danger of malfunction or damage to CT.

* CT is recommended to use 15VA 5P10 and more.

VL type : AV, AW



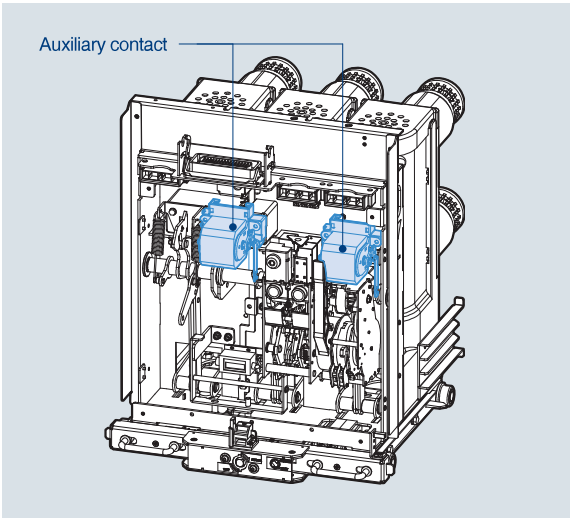


Auxiliary Contact: SA

Installed inside of a breaker as an option

VL type



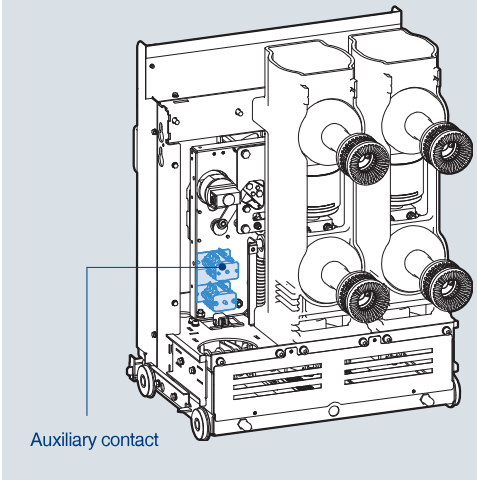


- It is a contact used to monitor ON/OFF status of a breaker from remote place.
- The auxiliary contacts supplied as standard configuration is 4a4b. 10a10b is also available on request.
- For 7.2kV 8/12.5kA VCB standard configuration is 2a2b. 4a4b and 6a6b are optional.

Item	VL: 7.2kV 8/12.5kA	VL: 20/25kA, VH
Standard	2a2b	4a4b
Optional	4a4b, 6a6b	10a10b

VH type





VL/VH Type					
Item			Resistive load (A)	Inductive load (A)	Remarks
Contact configuration	AC	250V	10	5	For all models
		125V	10	5	
	DC	250V	10	5	
		125V	10	5	
		30V	10	5	

Under Voltage Trip Coil: U

Installed inside of a breaker as an option

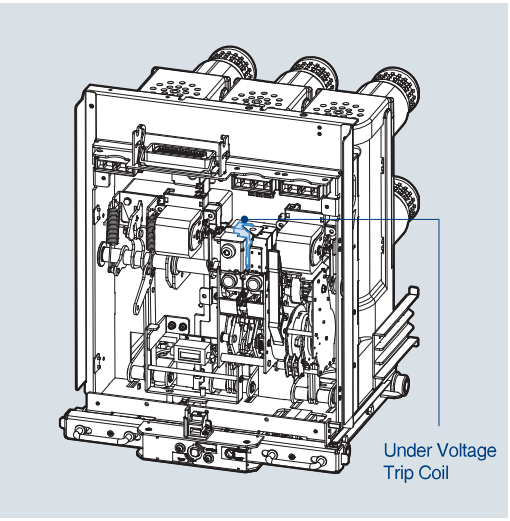


VL type

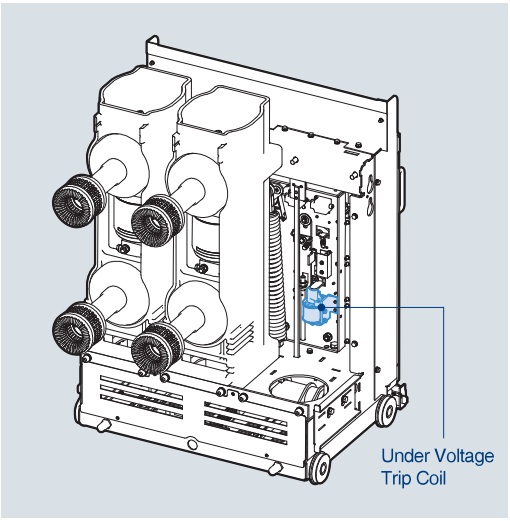


VH type

VL type



VH type



- It is installed inside of a breaker to trip when the main power or control power voltage drops below certain value. Instantaneous type is only available with UVT coil and Time delay type is available by connecting UVT coil and UVT time delay controller.
- The closing of a circuit breaker is impossible mechanically or electrically if control power is not supplied to UVT. To close the circuit breaker, 65~85% of rated voltage should be applied.
- UVT and secondary trip coil will not be selected together.

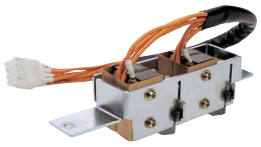
1. UVT rated voltage and characteristic
   - Operating voltage range: Pick up 0.65~0.85Vn, Drop out 0.4~0.6Vn
   - Operating voltage ranges based on the minimum value of each rated voltage (Vn)

	VL type							
Input voltage (Vn)	DC 24~30V	DC 48~60V	DC 110V	DC 125V	DC 220V	AC 48V	AC 100~130	AC 200~250V
Power consumption (inrush, W)	200							
Power consumption (steady, W)	≤ 5							

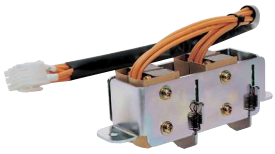
	VH Type						
Input voltage (Vn)	DC 48V	DC 110V	DC 125V	DC 220V	AC 48V	AC 110V	AC 220V
Power consumption (inrush, W)	350						
Power consumption (steady, W)	≤ 10						

Position Switch: A3, A4, A5

Installed inside of a breaker as an option



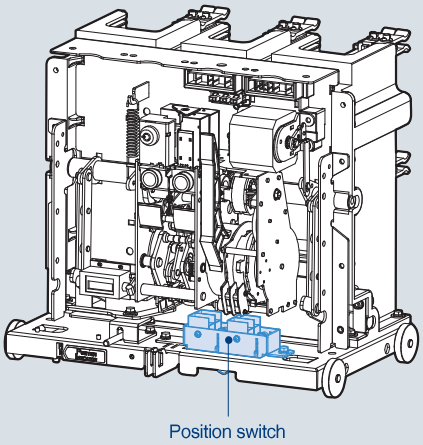
Small VCB (VL)



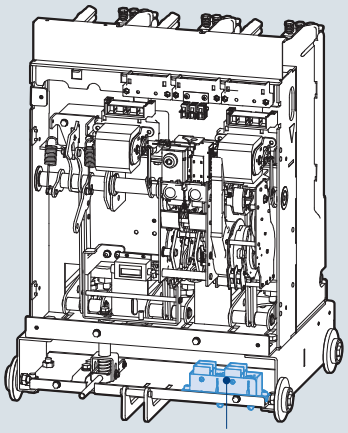
Medium VCB (VL)

VL type - E/F/G Cradle

VL: 7.2kV 8/12.5kA

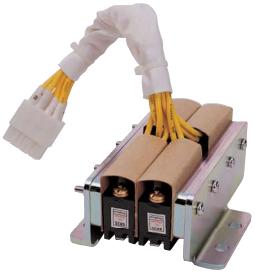


VL: 20/25kA



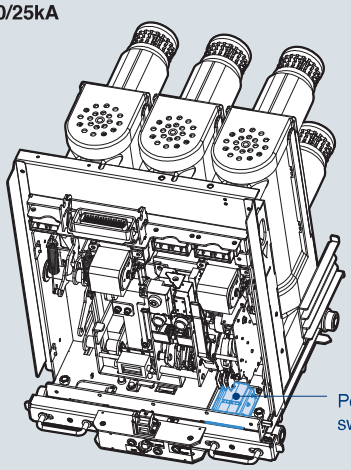
• This switch is used to indicate the breaker position (SERVICE, TEST), and contact configuration is 2a2a or 2a2b.

VL/VH type - H Cradle

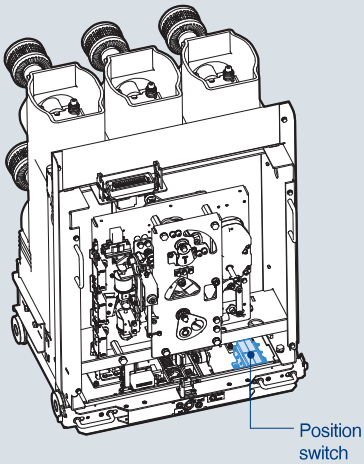


Large model (VH)

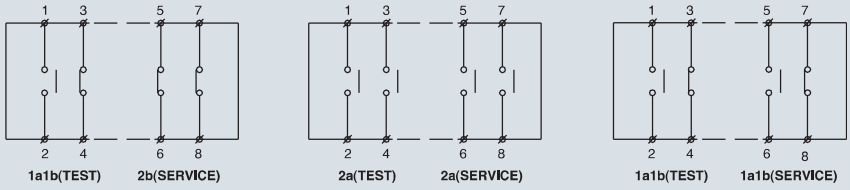
VL: 20/25kA



VH



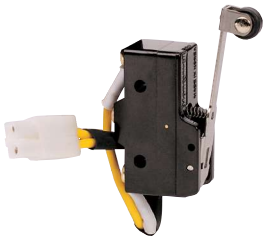
Contact configuration

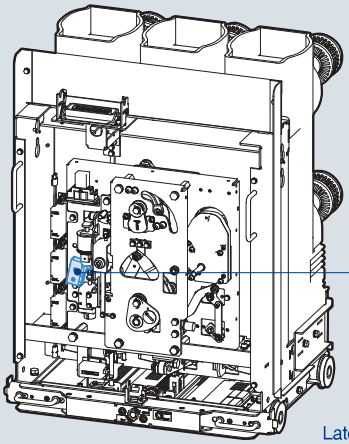


Latch checking switch: A6

Installed inside of a breaker as an option

VH type





- This switch works in conjunction with the mechanism of the breaker. It checks if the breaker is ready to be closed.
- When the mechanism is OFF and the closing spring is at charged status the switch becomes "ON", which means the mechanism is ready to be closed.
- If the latch is not in a proper position the switch prevents the breaker from closing.
  In case of VH type it is connected internally in series with the closing coil.

Counter: C

Installed inside of a breaker as standard

VL/VH type





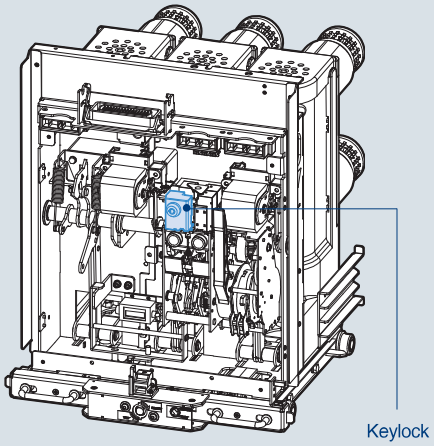
- It displays the total number of ON/OFF operations of a breaker.

Keylock: A7

Installed inside of a breaker as an option

VL type



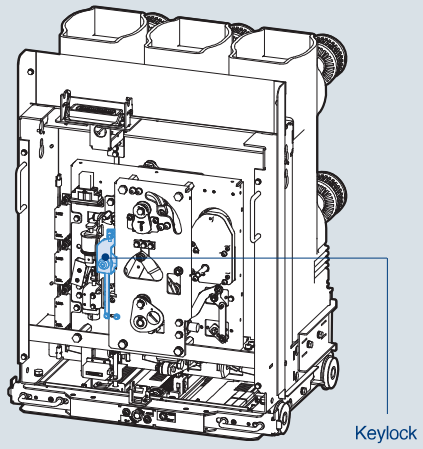


• The key is to unlock the locking device first to close the breaker electrically and mechanically.

*How to operate
- It is not possible to pull out the key in the unlocked position, possible only in locked status.
- Pushing "OFF" switch of a breaker turn the key counter-clockwise to the locked position and pull it out.
- It is not possible to close the breaker electrically and mechanically in the locked position.
- Insert the key and turn clockwise and then the breaker can be closed electrically and mechanically.

VH type





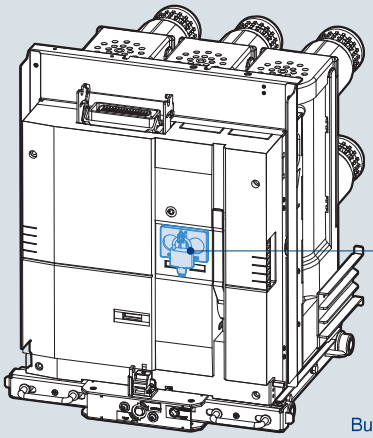
*How to operate
- It is not possible to pull out the key in the unlocked position, possible only in locked status.
- Trip the breaker first and then turn the key counter-clockwise to the locked position and pull it out.
- It is not possible to close the breaker electrically and mechanically in the locked position.

Button Padlock: A8

Installed outside of a breaker as an option

VL type



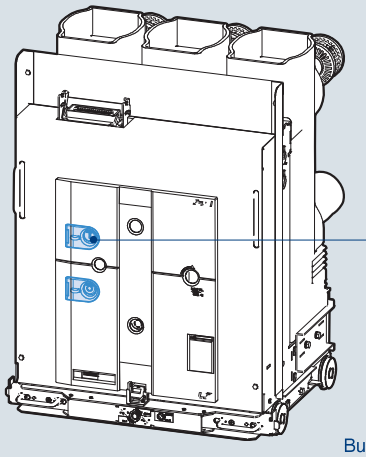


- It is to prevent manual operation of ON/OFF button due to user's wrong handling.
- It is not possible to handle ON/OFF operation under the "Button lock" status.

* Key lock is not supplied.

VH type





Button Cover: A9

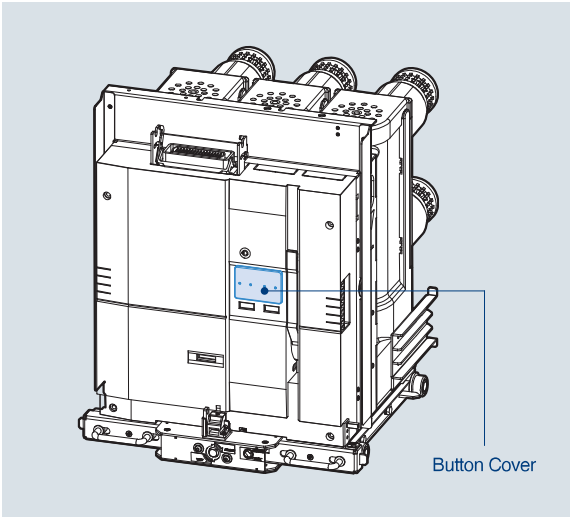
Installed outside of a breaker as an option

VL type





Push Bar



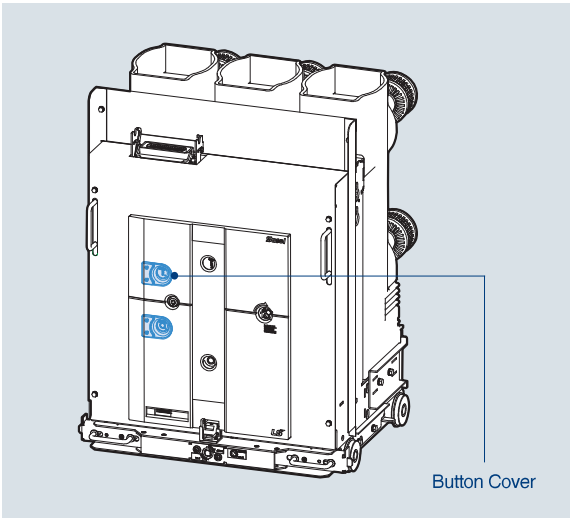
- It is a protection cover to prevent an accident due to unintended operation of ON/OFF button.
- Use the push-bar to operate the ON/OFF button.

VH type





Push Bar



Lead wire

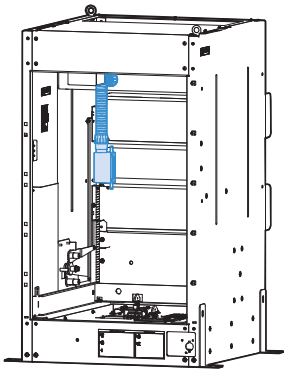
Supplied separately from a breaker as an option



A type connector

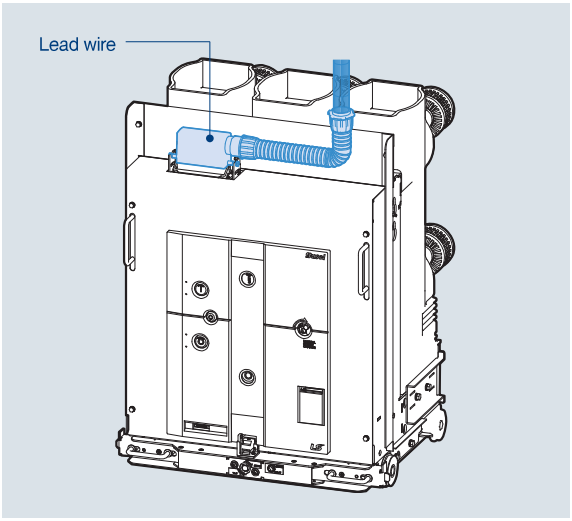


B type connector



Installation of CB Compartment

VL/VH type



- The wiring for connecting the control circuit of the circuit breaker from the outside is supplied with 2m of wiring.
- A type connector is supplied for P/E/F/G type of VL VCB.
- B type connector is supplied for P type of VH VCB.
- In case of H type breaker of VL and VH models the Lead wire is installed in the cradle when supplied.

Supply ways of Lead wires by VCB model

VCB model \ Cradle type	P	E	F	G	H
VL	Purchase separately (see page 74)				Optional purchase or cradle shipment (optional)
VH	Purchase separately (see page 74)				Optional purchase or cradle shipment (optional)

Plug/Terminal for lead wire

Supplied separately from a breaker as an option

VL/VH type



A type connector



B type connector

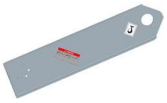
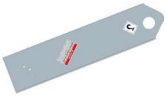
- It is connector to connect with the connector installed in the breaker. (supply connectors and terminal only for lead wire)
- Type of connector is depends on the type of connector installed in the breaker- A or B.

Standard Lead Wire

Type	Detailed breaker type	Wiring type	Auxiliary contact connector	Flammability rating	Color	Standard wiring (-)	Optional wiring (A1,A2,A3,A4,A5)
VL-Type	VL-06□08,13□04,06	Lead wire	SA1	HB	yellow	70723171101	70723171102
					blue	70723171107	70723171108
				XHHW	yellow	70723171113	70723171114
					blue	70723171120	70723171121
			SA2	HB	yellow	70723171105	70723171106
					blue	70723171111	70723171112
				XHHW	yellow	70723171117	70723171118
					blue	70723171122	70723171123
			SA3	HB	yellow	70723171103	70723171104
					blue	70723171113	70723171114
				XHHW	yellow	70723171115	70723171116
					blue	70723171124	70723171125
		User plug	SA1 SA2 SA3			77023171003	77023171003
	VL-06,12,17,20,25□20,25,31.5,40□13,20,25,32	Lead wire	SA2	HB	yellow	70723172101	70723172102
					blue	70723172112	70723172113
				XHHW	yellow	70723172116	70723172117
					blue	70723172144	70723172145
			SA4	HB	yellow	70723172103	70723172104
					blue	70723172114	70723172115
				XHHW	yellow	70723172118	70723172119
					blue	70723172146	70723172147
			SB2	HB	yellow	70723172107	70723172107
					blue	70723172149	70723172149
				XHHW	yellow	70723172109	70723172109
					blue	70723172150	70723172150
			SB4	HB	yellow	70723172108	70723172108
					blue	70723172151	70723172151
		User plug	SA2			77023172101	77023172101
			SA4			77023172101	77023172101
			SB2			70723172110	70723172110
			SB4			70723172111	70723172111
VH-Type	VH-06,12,17,20,25,36□32,40,50□13,20,25,32,40,50	Lead wire	SB2	HB	yellow	70723173109	70723173109
					blue	70723173111	70723173111
				XHHW	yellow	70723173119	70723173119
					blue	70723173112	70723173112
			SB4	HB	yellow	70723173110	70723173110
					blue	70723173113	70723173113
		User plug	SA2			70723173105	70723173105
			SA4			70723173106	70723173106
LVB-Type	LVB-06,12□-32,40□/12,20,30 VH-06,12□32,40□12,20,30 (Pro-MEC & Susol PI)	Lead wire	SA2	HB	yellow	70723143117	70723143117
					blue	70713143020	70713143020
				XHHW	yellow	70713143012	70713143012
					blue	70713143030	70713143030
			SA4	HB	yellow	70723143118	70723143118
					blue	70713143021	70713143021
				XHHW	yellow	70713143013	70713143013
					blue	70713143031	70713143031
			SB2	HB	yellow	70713143024	70713143024
					blue	70713143044	70713143044
				XHHW	yellow	70713143049	70713143049
					blue	70713143047	70713143047
			SB4	HB	yellow	70713143025	70713143025
					blue	70713143045	70713143045
				XHHW	yellow	70713143048	70713143048
					blue	70713143046	70713143046
		User plug	SA2			73263143007	73263143007
			SA4			73263143008	73263143008
			SB2			73263143030	73263143030
			SB4			73263143031	73263143031

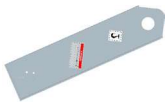
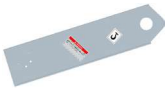
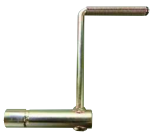
□ – Please contact us.

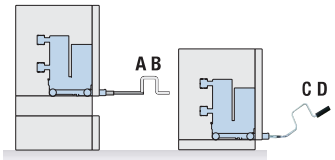
Handle & Lifting Hook

Breaker type	Cradle	Racking handle			Spring charge handle		Lifting Hook		
		code		Appearance	code	Appearance	Breaker type	code	Appearance
VL-06□08,13	P	N. A.					VH-06,12, 17□50□13, 20,25,32	75123173131	
	E, F, G	55223171101							
VL-06,12, 17□20,25,31.5 VL-24,25□13, 16,25	P	N. A.						75123173132	
	E, F, G	55213143005							
	H.K	A type	55223172407	 For medium size CB [Short]			VH-20,25□25□25	75123173105	
		B type	55223172403	 For medium size CB [Long]			VH-20,25□32, 40□13,20,32	75123173106	
		C type	55223172405	 With universal joint and plastic grip			VH-36□25,32, 40□13,20,32	75123173165	
		D type	55223172406	 With universal joint				75123173166	

Handle & Lifting Hook

<table>
<tr><th rowspan="2">Breaker type</th><th rowspan="2">Cradle</th><th colspan="3">Racking handle</th><th colspan="2">Spring charge handle</th><th colspan="3">Lifting Hook</th></tr>
<tr><th colspan="2">code</th><th>Appearance</th><th>code</th><th>Appearance</th><th>Breaker type</th><th>code</th><th>Appearance</th></tr>
<tr><td rowspan="11">VH-06□32, 40(P,E,F,G)

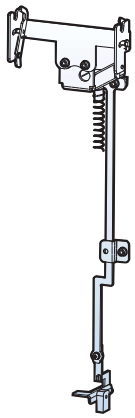
LVB-06, 12□32,40L(G/T)</td><td>P</td><td colspan="3">N. A.</td><td rowspan="20">55213143006</td><td rowspan="20"></td><td rowspan="2">VH-06,12, 17□40,50□40</td><td rowspan="2">75123173981</td><td rowspan="2"></td></tr>
<tr><td rowspan="3">E, F, G</td><td colspan="2" rowspan="3">55213143005</td><td rowspan="3"></td></tr>
<tr><td rowspan="2">VH-06,12□40, 50□,50</td><td rowspan="2">75123173982</td><td rowspan="2"></td></tr>
<tr><td rowspan="3">G/T</td></tr>
<tr><td colspan="2">55213143001</td><td></td></tr>
<tr><td colspan="3">Earthing switch operating handle (Common)</td></tr>
<tr><td colspan="2">55213143022</td><td></td><td>Panel door type</td><td>code</td><td>Appearance</td></tr>
<tr><td colspan="2">55213163003</td><td>
With universal joint</td><td>Right open (Standard handle)</td><td>55223172701</td><td></td></tr>
<tr><td rowspan="9">VH-06, 12,17□50

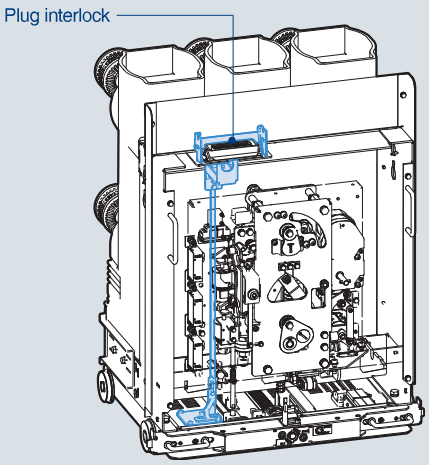
VH-20,25, 36□25,32,40</td><td>P</td><td colspan="3">N. A.</td><td rowspan="2">Right open (Standard handle)</td><td>55223172703</td><td></td></tr>
<tr><td rowspan="8">H</td><td>A type</td><td>55223172407</td><td>
For medium size CB [Short]</td></tr>
<tr><td>B type</td><td>55223172403</td><td>
For medium size CB [Long]</td></tr>
<tr><td>C type</td><td>55223172405</td><td>
For lower size CB [Universal, Short]</td></tr>
<tr><td>D type</td><td>55223172406</td><td>
For lower size CB [Universal, Long]</td></tr>
<tr><td colspan="3"></td></tr>
</table>

Plug interlock: AC

Installed inside of a breaker as an option

VL/VH type (7.2kV 20/25kA 630A~)





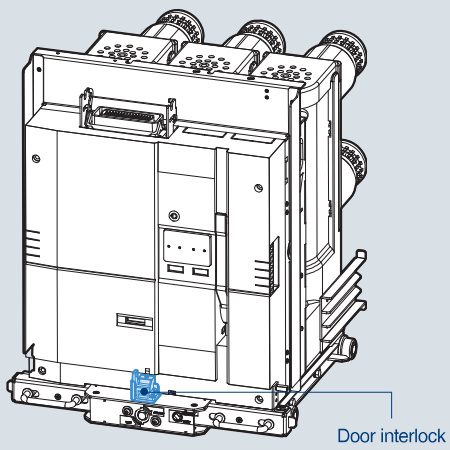
- It checks if the control power connector on the cradle (H type) is connected with the connecting terminal of the breaker before the proceeding of draw-in or out.
- It is not allowed to seperate the control power connector from the breaker in the position of draw-in /out or SERVICE, but TEST position.

Padlock/Door racking interlock: AD

Installed outside of a breaker as an option

VL/VH type (7.2kV 20/25kA 630A~)



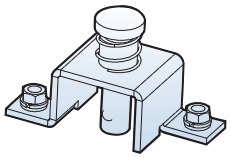


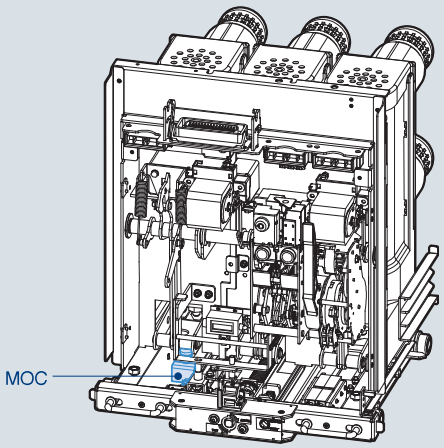
- With this door options for H type cradle draw- in/ out is allowed only when the door is closed.
- If draw-in /out is necessary when the door is open, use the operation lever put in the slot of the breaker handle.
  Insert it into the hole in the bottom of door interlock.
- Padlock is also optional, which can lock to prevents the draw-in/out of the breaker in the position of TEST and SERVICE.

MOC drive device: AE

Installed inside of a breaker as an option

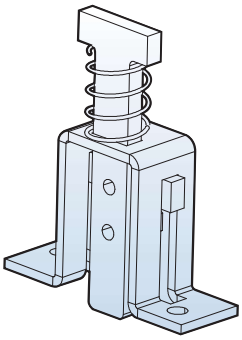
VL type (7.2kV 20/25kA 630A~)

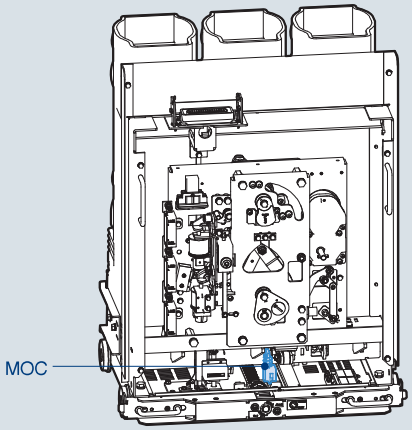




- It must be installed in the breaker to drive the MOC installed in H type cradle.
- MOC, Mechanically operated cell switch is the device to indicates the Closed/Trip status of VCB in 'SERVICE' position only.
- This MOC drive device in the breaker should be installed when MOC in the cradle is used.

VH type



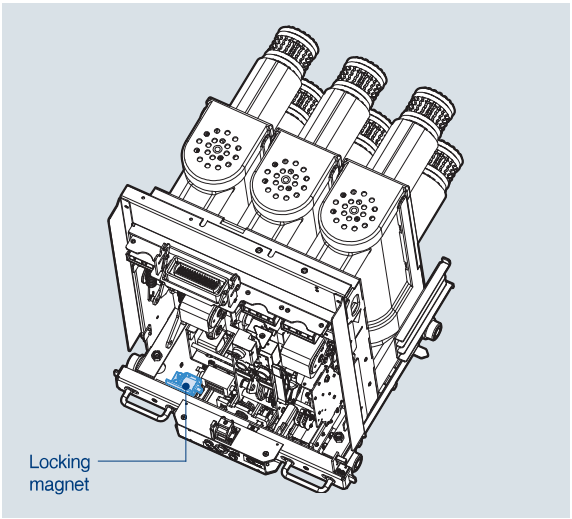


Locking magnet: AF

Installed inside of a breaker as an option



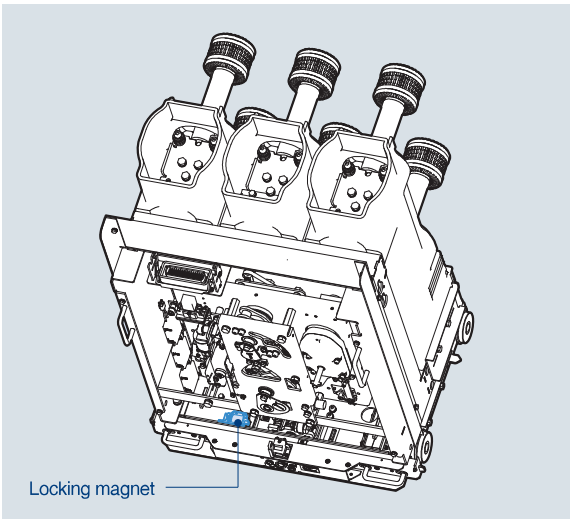
VL type



- It allows the drawing-in of the breaker in the TEST position under the condition that the control power connector on the cradle (H type) is connected with the connecting terminal of the breaker and the power is supplied.
- During the drawing-in or in the SERVICE position draw-in/out is allowed without supplying power.

* Control power rating is the same as that of a motor.

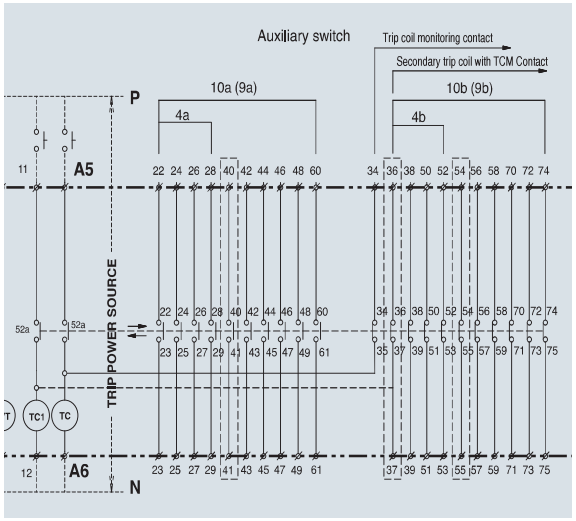
VH type



Trip coil monitoring contact

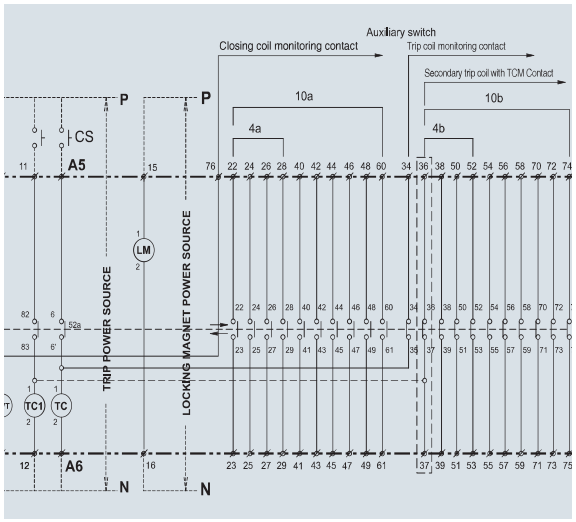
Installed inside of a breaker as standard

VL type



- Device for monitoring the functions of the trip coils.
- To monitor the trip coils connect its terminals with the trip coil monitoring relay as shown on the circuit diagram.
  - If the trip coil is normal: closed-circuit consisting
  - If the trip coil is damaged: open circuit
  1) Terminal A5 and A6 monitor the trip coils(TC) in Closed position of the breaker
  2) Terminal A6 and auxiliary contact terminal 34 monitor the trip coils(TC) in trip position of the breaker
  3) Terminal 11 and 12 monitor the secondary trip coils(TC1) in Closed position of the breaker
  4) Terminal 12 and auxiliary contact terminal 36 monitor the secondary trip coils(TC1) in trip position of the breaker
- Coil Test Unit is opional, which enable monitoring the coils by connecting in parallel with the trip coil operation switch.
- In case Secondary Trip Coil Monitoring contact for VH Type, Every Trip Coil is available.
  (VL Type : Trip Coil T1,T2,T3,T4,T5 are available)

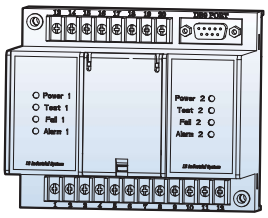
VH type



Coil Test Unit: CTU

Installed outside of a breaker as an option

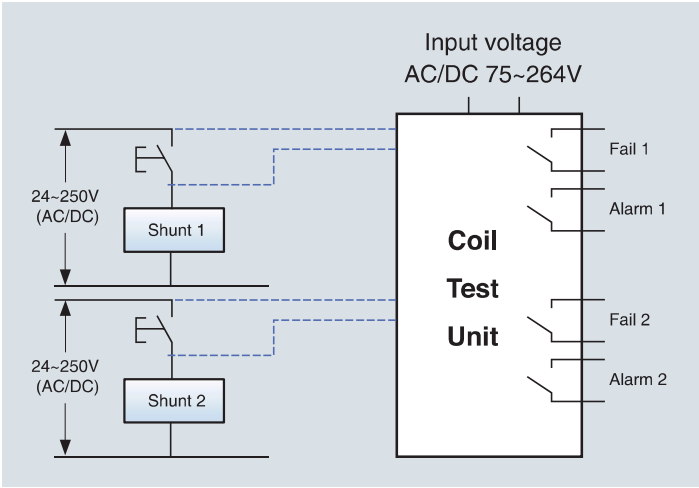


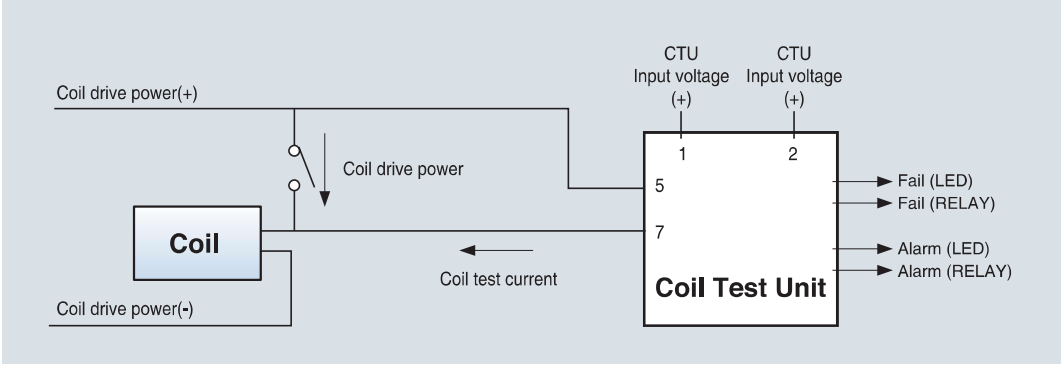


- When no current flows through the coil it gives the test current which does not cause the coil to operate to check whether the coil is disconnected or not.
  - If the test current flows normally: coil normal
  - If the test current does not flow through: coil disconnected

※ As it is connected in parallel with the control part of the coil the normal operation of the coil is not affected.
※ Monitoring of the running coils is not possible.
※ One test unit can monitor up to two coils.

1. Input voltage: AC/DC 75V~264V
2. Contact output
   1) 2×a contacts for Fail indication and 2×a contacts for Alarm
   2) 250Vac/10A Resistive, 30Vdc/10A Resistive
3. Disconnection test cycle is 12 seconds (Test LED blinks)
4. The default operation
   If Fail happens (coil disconnected), Fail LED turns on and the Fail contacts become short state.
   If Fail happens three times in series, Alarm LED turns on and the Alarm contacts become short state.
   In order to clear the Alarm status push up DIP switch on the front and then push down it (Off → On → Off)





Condenser trip device: CTD

Installed outside of a breaker as an option

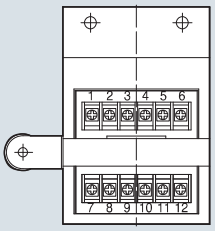


Ratings

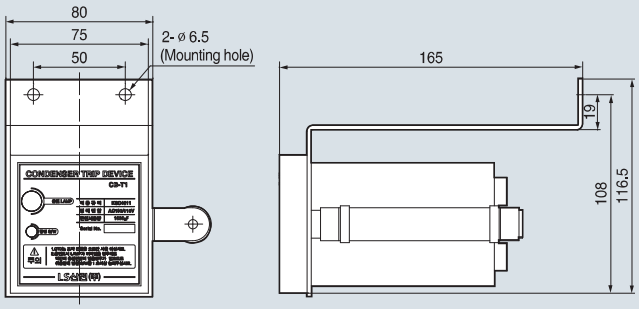
Ratings	Specification	
Model	CB - T1	CB - T2
Rated input voltage (V)	AC 100/110	AC 200/220
Frequency (Hz)	50/60	50/60
Rated charge voltage (V)	140/155	280/310
Charging time	Within 10sec.	Within 10sec.
Trip possible time	Within 30sec.	Within 30sec.
Range of Input voltage	85%~110%	85%~110%
Condenser capacity (μF)	1,000	560

- 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.
- Tripping within 30 seconds on the power failure is possible. However after that automatic trip circuit must be configured separately in the switchgear.

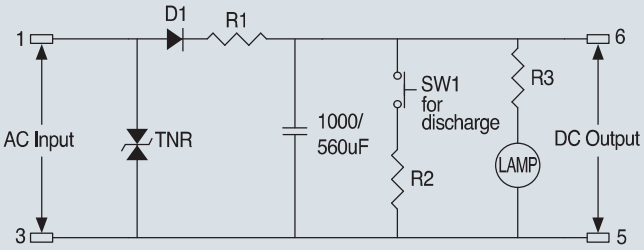
Terminal arrangement



External dimension



Circuit diagram



UVT Time delay: UDC

Installed outside of a breaker as an option



- UVT time delay, UDC is to delay the trip signal from UVT.
- Without UDC the breaker will be tripped instantaneously by the trip signal from UVT installed inside of the breaker even in the the momentary power failure.
- UDC can delay the trip time to avoid this unintended instantaneous trip in the event of such power failure.
- It can be installed on the cradle or inside of the switchgear.
- UDC provides output contacts for indication of trip status due to the UVT coil inside of the breaker. b contact is closed at normal state and a contact is closed at trip.

1. Characteristics

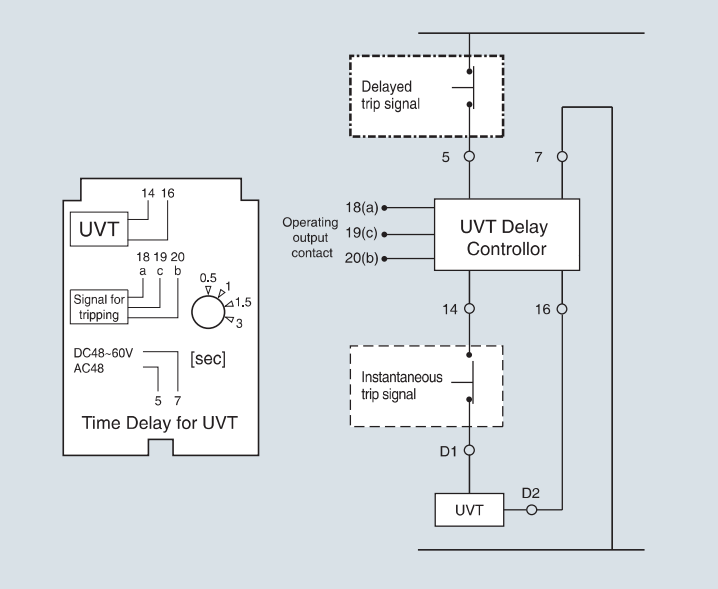
Rated voltage (Vn)		Opration voltage range (V)		Consumption (VA or W)		Time delay (ms)
DC (V)	AC (V)	Pick up	Drop out	Inrush	Steady - state	
48~60	48	0.65~0.85 Vn	0.4~0.65 Vn	200	≤ 5	0.5, 1, 1.5, 3
100~130	100~130					
200~250	200~250					

- Operating voltage ranges are based on the minimum value of each rated voltage (Vn)

2. Ratings of output contacts

Rated voltage (V)	Rated current (A), Resistive load	Max. switching voltage (A)	Max. switching current (A)
24V DC	≤ 12	110V DC 250V AC	15
120V AC	≤ 12		
250V AC	≤ 10		

3. Wiring diagram

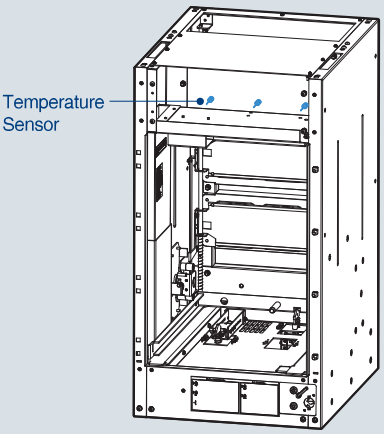


Temperature sensor and monitoring unit: TM

Installed outside of a breaker as an option

VL/VH type (7.2kV 20/25kA 630A~)

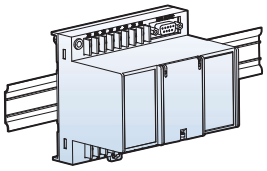


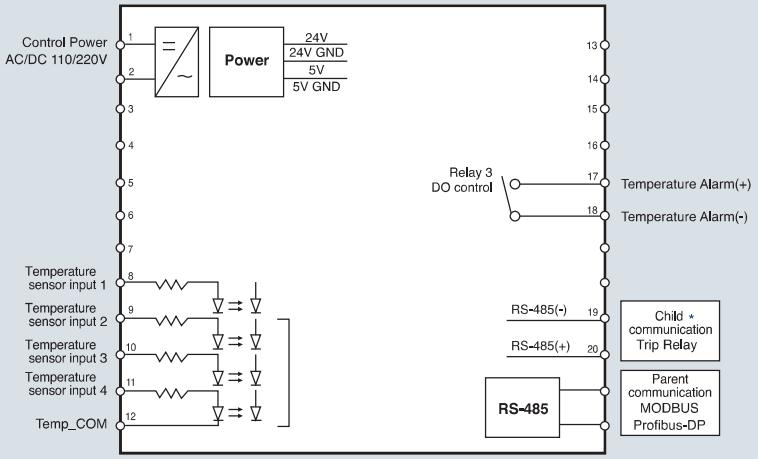


- Temperature Alarm Unit displays the input temperature detected through the temperature sensor installed in H-type cradle.
- Temperature sensor can be installed up to three (R, S, T phase).
- Temperature Alarm Unit converts the temperatures detected from the senser in the cradle and displays the maximum value and can transmit it throug communication.
- If the input temperature is above standard it may cause alarm.
  Temperature Alarm Unit supports Modbus/ RS-485 communication and contact us Profibus-DP communication.

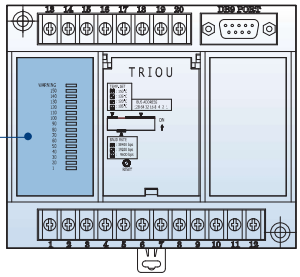


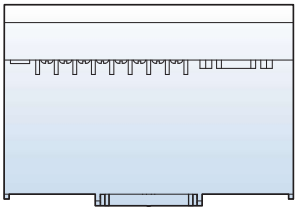
Temperature sensor and monitoring unit





LED temperature display (℃): 10 ~150℃,
Warning
Display maximum value of temperatures

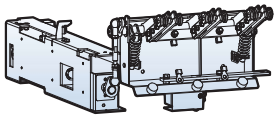


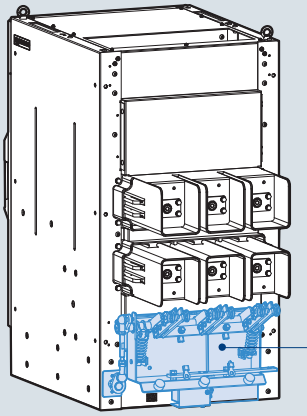


Earthing Switch: A1

Built-in a cradle as an option

VL/VH type (7.2kV 20/25kA 630A~)





- For the safety during the maintenance of switchgear in the position of TEST/Drawout discharge the charging current in the load side of a VCB with this earthing switch.
  It is available onlt for H type drawout breaker.

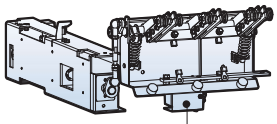
* Regarding the operations of earthing switch and related accessories see the instruction manual.
* Applicable Standards: IEC 62271-102

Position switch for Earthing Switch : A2, A4

Built-in a cradle as an option

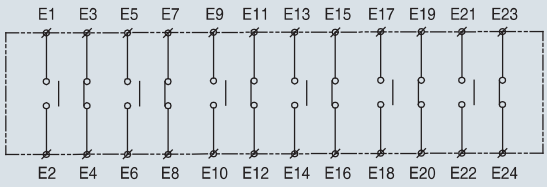
- In case of using earthing switch it can be added to indicate the ON / OFF status of the earthing switch.

** Contact configuration: 2a2b, 6a6b



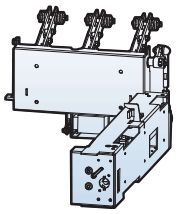
Position switch for E/S

Circuit diagram



Keylock for Earthing Switch: A5

Built-in a cradle as an option



- In case of using earthing switch it can be added for two types of interlocking.

  1) Interlock to keep opening

  2) Interlock to keep earthing

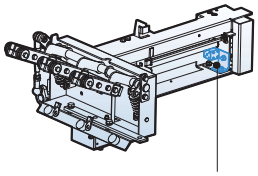


Locking magnet for Earthing Switch : A6~AD

Built-in a cradle as an option

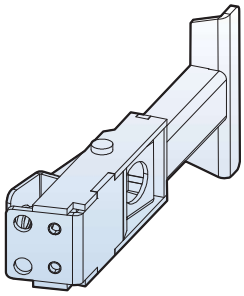


- In case of using earthing switch it can be added to prevent the earthing switch from opening or earthing before it is energized.
- Verify if the locking magnet is energized before opening or earthing the earthing switch.
- Control voltage
  - DC 24V / DC 48V / DC 110V / DC 125V / DC 220V
  - AC 48V / AC 110V / AC 220V

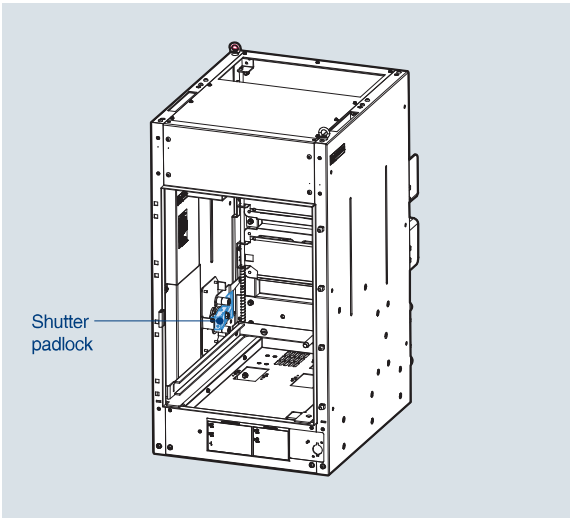


Shutter padlock: AE

Built-in a cradle as an option



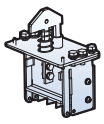
VL/VH type (7.2kV 20/25kA 630A~)



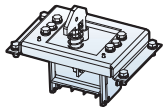
- It is the locking device to lock the primary and secondary shutter in closed state for safety while the breaker is drawn out for maintenance.
- When the breaker is drawn in, the shutter is automatically opened.
- There is a hole for padlock to lock the shutter.
- It can be applied only to H type cradle.

Truck operated cell switch (TOC: AF)

Built-in a cradle as an option

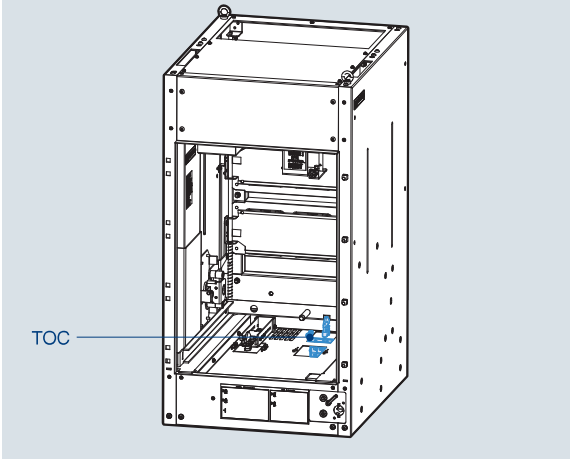


VL type



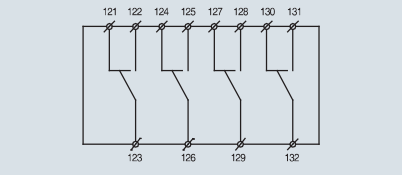
VH Type

VL/VH type (7.2kV 20/25kA 630A~)



- This auxiliary switch is used to indicate the 'SERVICE' position of VCB. It is installed in the bottom of a H type cradle and operated by the frame of a breaker.
- TOC is consisted of 4 cell switches with changeover contacts as below diagram.

Circuit diagram

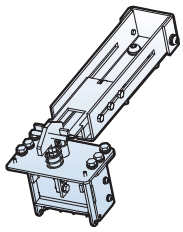


a Contact: 122-123, 125-126, 128-129, 131-132,
b Contact: 121-123, 124-126, 127-129, 130-132

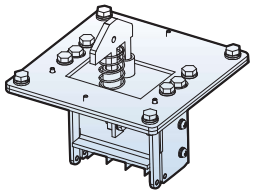
Mechanical Operated Cell Switch (MOC: AG)

Built-in a cradle as an option

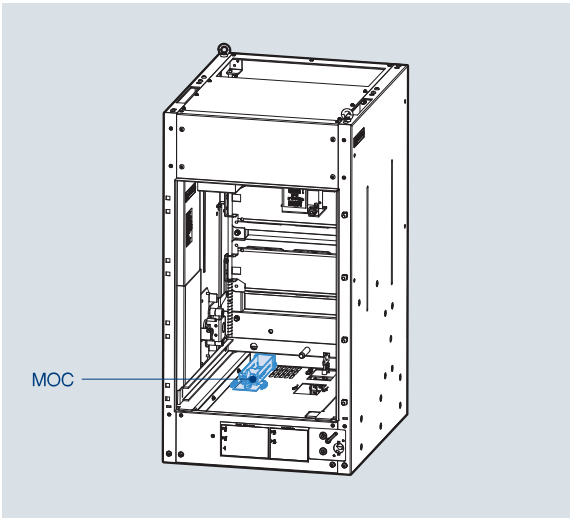
VL/VH type (7.2kV 20/25kA 630A~)



VL type

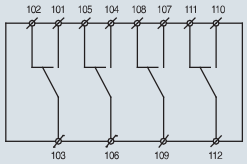


VH Type



- This auxiliary switch is used to indicate the Close/Trip of VCB. It is operated mechanically at the SERVICE position and installed in the bottom of a H type cradle and operated by the frame of a breaker.
- MOC is consisted of 4 cell switches with changeover contacts as below diagram.

Circuit diagram

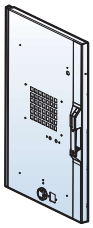


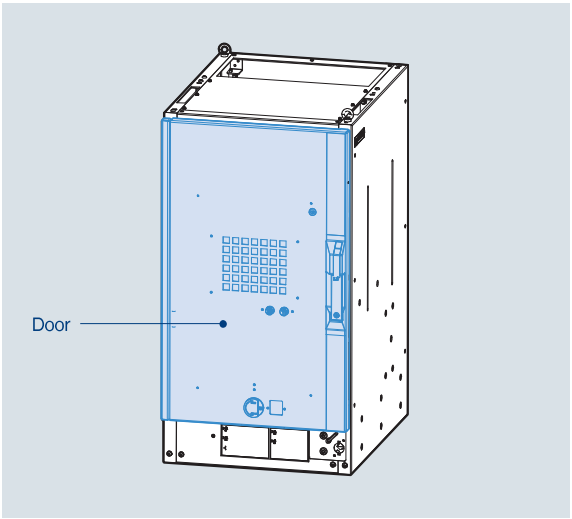
a Contact: 101-103, 104-106, 107-109, 110-112,
b Contact: 102-103, 105-106, 108-109, 111-112

Door: AH

Built-in a cradle as an option

VL/VH type (7.2kV 20/25kA 630A~)



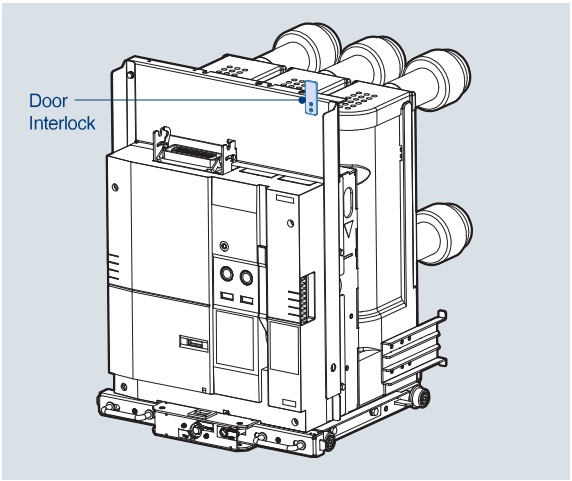


- It is outside door for H type cradle.
- Accessories are available for the door.

Door Interlock: AJ

Built-in a cradle as an option

VL/VH type (7.2kV 20/25kA 630A~)

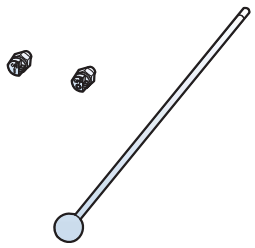


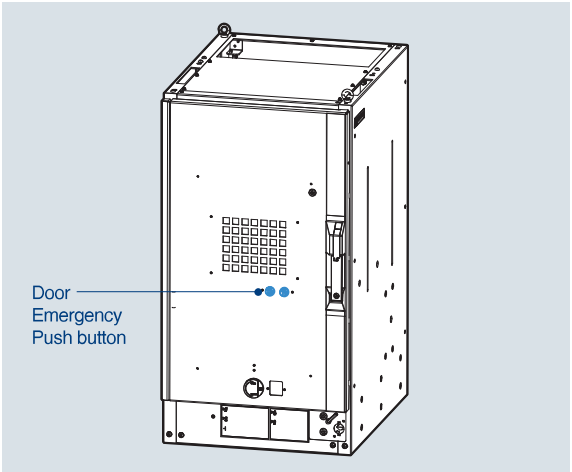
- When the Door is installed to H type cradle, this door interlock prevents opening it at SERVICE position.

Door Emergency Push button: AK

Built-in a cradle as an option

VL/VH type (7.2kV 20/25kA 630A~)





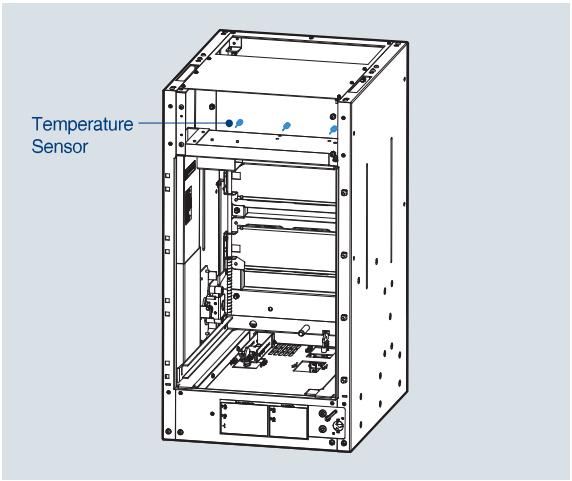
- It is used to enable the Close/Trip of the breaker manually from outside of the door installed to H type cradle during an emergency.
- Push the ON/OFF button by ON/OFF handle supplied seperately.

Temperature Sensor: AC

Built-in a cradle as an option



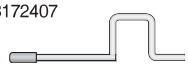
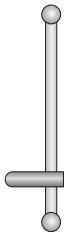
VL/VH type (7.2kV 20/25kA 630A~)



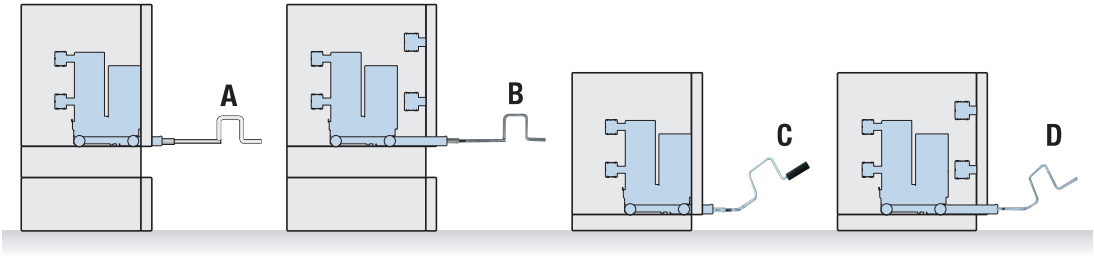
- This sensor is used to detect the temperature in H-type cradle combined with Temperature monitoring unit.
- It can be installed up to three (R, S, T phase).

Racking In/Out handle

Susol VCB offers various kinds of handle suitable for each use of types and models. The order can be proceeded with the code below and ordering quantity is flexibly adjustable.

Type	Cradle		Racking in/out handle	Charging handle	Operating handle for earthing S/W
VL-06 □ 08,13	E F G		55223171101 	Not required	-
VL-06 □ 20,25	E F G		55213143005 	Not required	-
VL-06 □ 20,25	H K	A	55223172407 	Not required	
		B	55223172403 		
VH-06,12,17, 24,35,36 □		C	55223172405 	55213143006 	
		D	55223172406 		

Racking in/out handle for H, K cradle

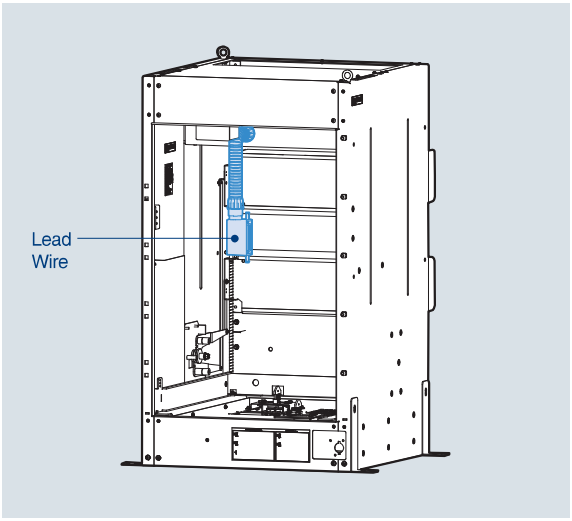


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Type H Cradle Lead Wire: AM~AO

Built-in a cradle as an option

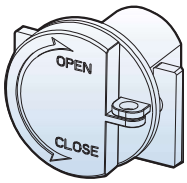
VL/VH type (7.2kV 20/25kA 630A~)



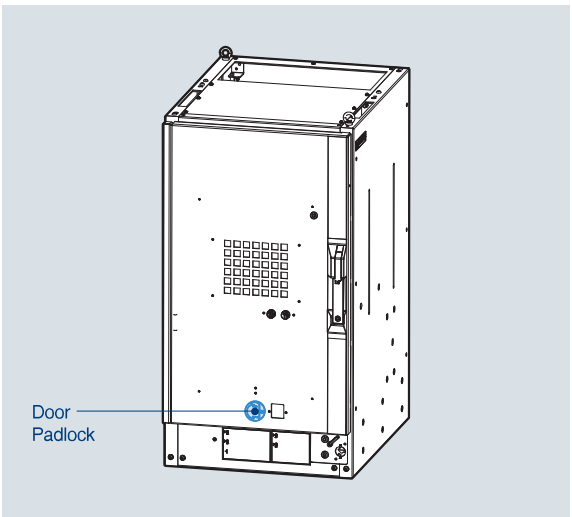
- In case of H type breaker of VL and VH models the Lead wire is installed in the cradle when supplied.
- 4a4b or 10a10b contacts are selectable according to the auxiliary contact of the breaker. Flame retardant cable is used for 4a4b.

Door Padlock

Built-in a cradle as an option



VL/VH type (7.2kV 20/25kA 630A~)



- It is supplied with a door for H type cradle as standard.
- It can be locked by seperate padlock to prevent entering the maunal handle.

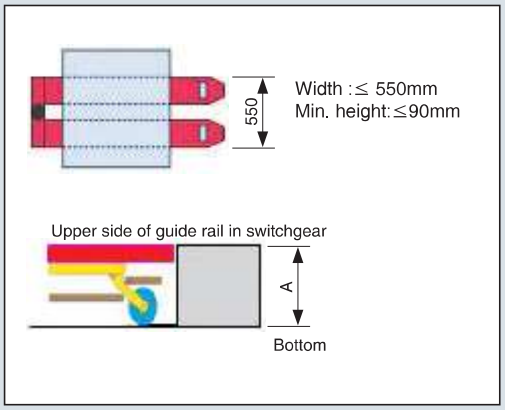
Auxiliary guide frame





- Auxiliary guide frame is provided in order to move safely 36kV breaker into the switchgear.
- It can be used in combination with the hand pallet which meets the requirement shown below.

Applicable hand pallet



<Fig 1>





If dimension A in Fig. 1 is less than 120mm B type pallet can be used.
In case of more than 120mm C type must be applied.