Top 100
Global
Innovator
for 10 years

Susol
ULVCB

Comply with ANSI/IEEE IEEE C37.09 Vacuum Circuit Breakers

LS ELECTRIC

FEATURES

Susol VCB is full line-up new VCB which has the high interrupting capacity, interrupting current(~50kA, ~3000A), and maximized compatibility with existing products through the dual phases and compact sized models.

Susol Super Solution

VACUUM CIRCUIT BREAKER

Contents

Susol VCB

Vacuum Circuit Breaker, VCB is installed in the medium voltage distribution lines to protect life and load equipment. In case of accidents such as over current, short circuit and ground fault current, VCB works by interrupting the circuit through the inner Vacuum Interrupter which is acted by signal from the outside separate relay.

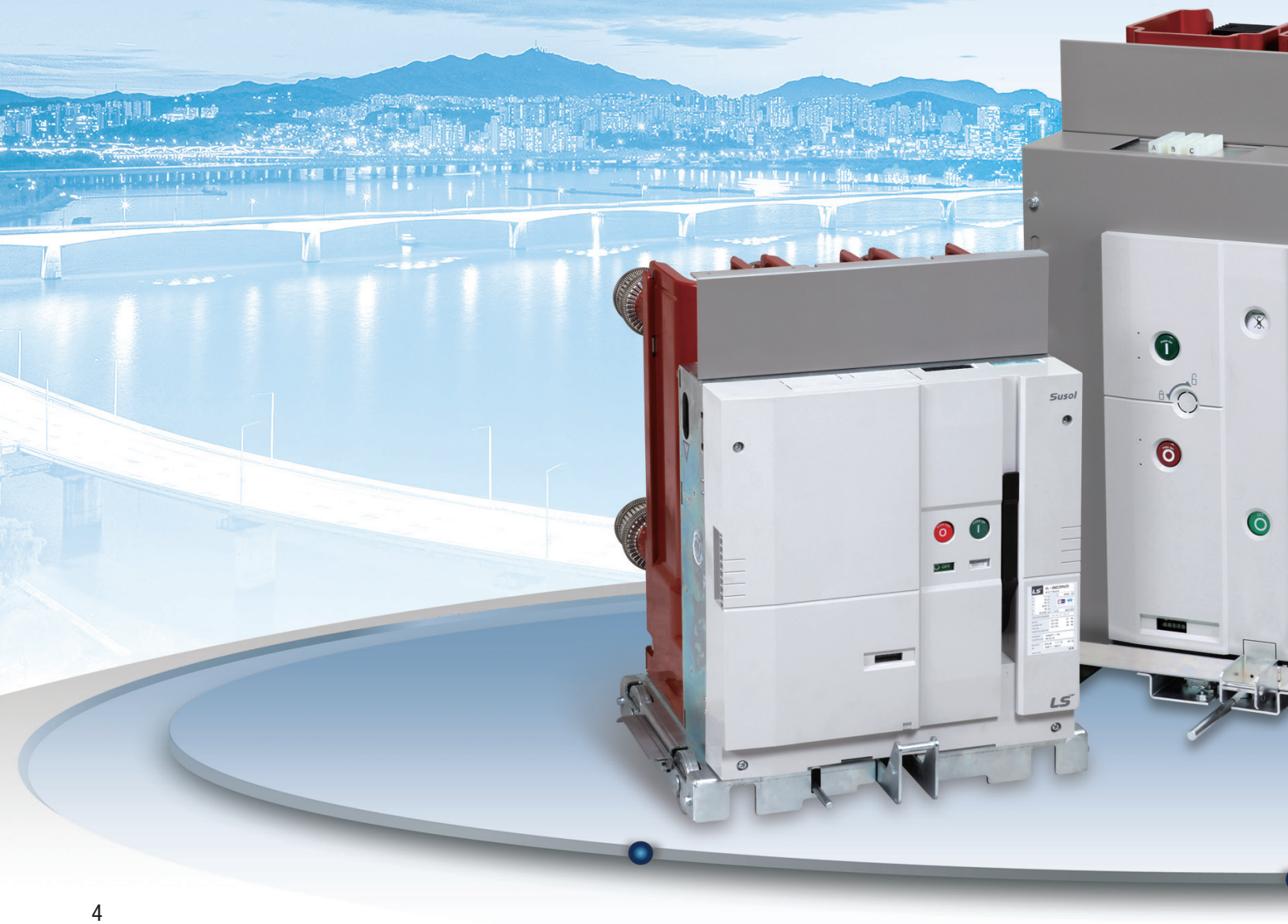
Susol VCB responds.

- customer needs for the breakers with high interrupting capacity and large current due to the integration and increase of the load capacity.
- worldwide trend of diversification in the medium voltage distribution lines.
- increase of the reliability for the temperature characteristics of circuit breakers.

Premium-type products to improve convenience and reliability of medium voltage switchgear configuration.

- full line-up modeling to the high interrupting capacity and large current.
- main structure with high reliability application.
- a variety of accessories and ability to maximize.

Suitable for use as the main circuit breaker to protect key installations in the places such as device industry, power plants, high-rise buildings, large ships.



▶ Strengthening of the high interrupting capacity and large current, LS has full line-up new VCB models.

Voltage	Interrupting current	Rated current
05/15kV	25/31.5/40/50kA	1200/2000/3000A
27kV	25kA	1200A
38kV	31.5/40kA	1200/2000A

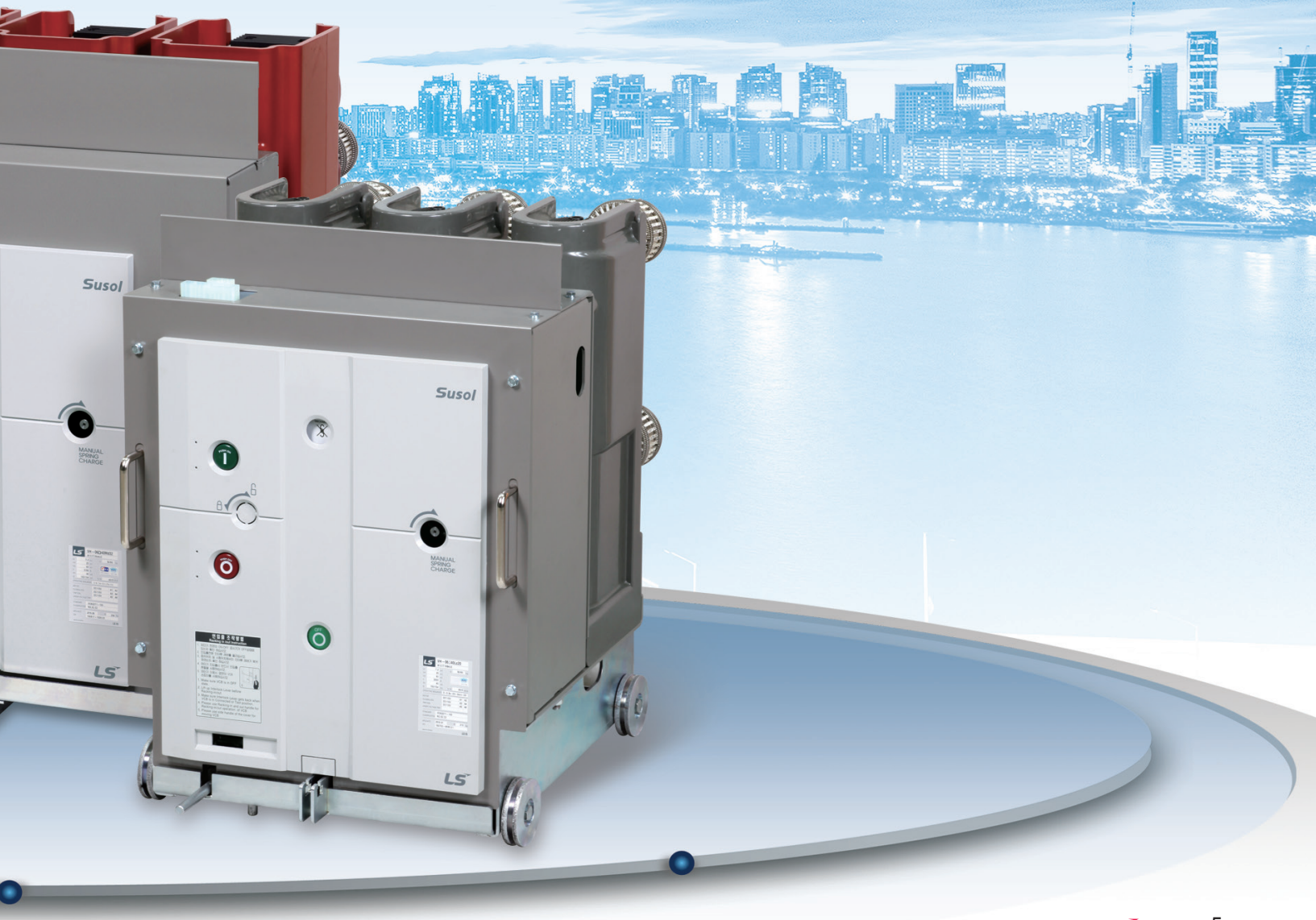
▶ Main circuit structure with high reliability.

- Maximized the durability and reliability of the main circuit contactors (Stego Tulip contactor).
- Strong structure for the temperature rise (Natural cooling system).

▶ Convenience of switchgear configuration and a variety of accessories.

- CB compartment structure: Metal isolation structures to prevent the accident spread and ensure safety. And the convenience of switchgear building is extended by its module style.
- A variety of accessories: UVT, Locking Magnet, Plug Interlock, Key lock, Temperature Sensor, MOC, TOC, Earthing S/W.
- Maximizing compatibility with existing products through the dualistic deployment of phases and compact models.

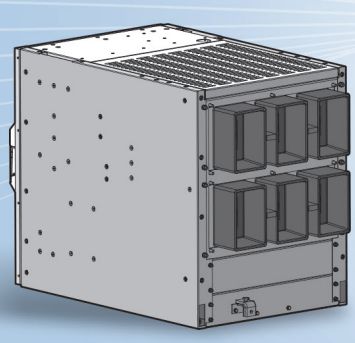
※ Type testing is complete for all models according to latest standard,
IEEE Std C37.09, IEEE Std C37.20.2, ANSI C37.54, ANSI C37.55, UL (CSA)

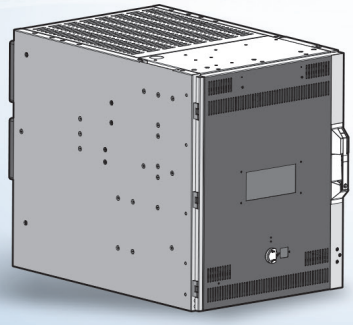


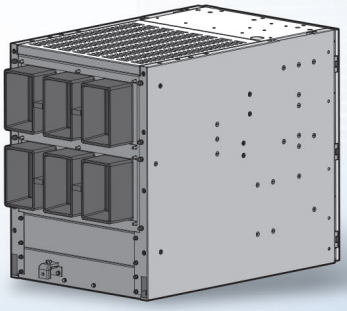
CB Compartment

Convenience in building switchgears

- CB compartment structure: H type cradle
- Metal isolation structure to prevent the accident spread and ensure safety
- Easy switchgear build

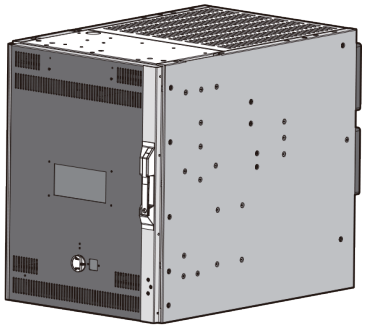






4.76/15/27/38kV 25/31.5/40/50kA

- Metal isolation structure to prevent any accident spread and ensure operator's safety
- Convenience of operation by using Truck
  - Operator is able to withdraw CB without door open
  - Mechanically CB position indicator on the front side of SWGR
- Equipped with safety devices and accessories
  - Metallic shutter
  - Door interlock
  - Plug-in interlock
- Convenience assembly of switchgear
  - Module structure enhance productivity



Accessories of CB compartment (H type cradle)

- MOC (Mechanism Operated Cell S/W)
- TOC (Truck Operated Cell S/W)
- Shutter Padlock
- Door Emergency ON/OFF Button

External structure of VCB

Breaker ... UVL type

Back side

Name of each part

1. CLOSE Button
2. OPEN Button
3. Charge/Discharge Indicator
4. CLOSED/OPEN Indicator
5. Manual Charging Handle
6. Operation Counter
7. 3 Position Indicator
   (Disconnected, Test, Connected)

Breaker ... UVH type

Back side

Name of each part

1. CLOSE Button
2. OPEN Button
3. Charge/Discharge Indicator
4. CLOSED/OPEN Indicator
5. Manual Charging Handle
6. Key Lock
7. Operation Counter
8. 3 Position Indicator
   (Disconnected, Test, Connected)

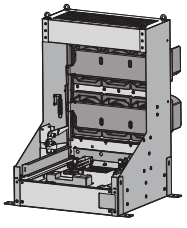
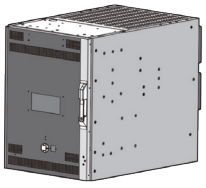
Overview of Susol VCB

Overview of VCB ratings

Rated voltage	5kV/15kV				27kV	38kV	
Ir [A] \ Isc [kA]	25	31.5	40	50	25	31.5	40
1200							
2000							
3000							

UVL-05/15
UVL-27
VH-05/15
UVH-38

Overview of VCB and cradle configuration

Version	Fixed type	Drawout type (Draw in/out)		
Cradle	-	Ha	H	He/Hf
Appearance				
Appliable CB type	• UVL-05/15/27 • UVH-38	• UVL-05/15 • VH-05/15	• UVH-38	• UVL-05/15
Description	• Fixed type (No cradle, Fixed)	• Economy Cradle for MCSG	• H type CB Compartment	• Hf: Compact H Type CB compartment (Non-Arc) • He: Compact H type CB compartment (Arc)

Susol UVL

Fixed type

Contents

Ratings and description

UVL type, Fixed type

UVL-05P / UVL-15P

Circuit breaker type			UVL-05P				UVL-15P			
Rated voltage		Ur (kV)	4.76				15			
Rated withstand voltage	Power frequency (1min)	Ud (kV)	19				36			
	Lightening impulse (1.2×50μs)	Up (kV)	60				95			
Rated short-circuit current		Isc (kA)	25		31.5		25		31.5	
Rated normal current		Ir (A)	1200	2000	1200	2000	1200	2000	1200	2000
Rated frequency		fr (Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Rated short-circuit making current		Ip (kA) at 60 Hz	65	65	81.9	81.9	65	65	81.9	81.9
Rated short-time withstand current		Ik (kA)	25	25	31.5	31.5	25	25	31.5	31.5
		3sec	●	●	●	●	●	●	●	●
Operating sequence		O - 0.3s - CO - 15s - CO	●	●	●	●	●	●	●	●

Technical data

Opening time		Less than 0.04 sec
Rated breaking time		3 Cycle
No-load closing time		Less than 0.06 sec
Type test class	Mechanical endurance	M2 (10,000)
	Electrical endurance	Reference standard (page 88)
	Apacitance current switching	C2
Operate temperature	Low	- 40 °C
	High	40 °C

UVL-27P

Circuit breaker type			UVL-27P
Rated voltage		Ur (kV)	27
Rated withstand voltage	Power frequency (1min)	Ud (kV)	60
	Lightening impulse (1.2×50μs)	Up (kV)	125
Rated short-circuit current		Isc (kA)	25
Rated normal current		Ir (A)	1200
Rated frequency		fr (Hz)	50/60
Rated short-circuit making current		Ip (kA) at 60 Hz	65
Rated short-time withstand current		Ik (kA)	25
		3sec	●
Operating sequence		O - 0.3s - CO - 15s - CO	●

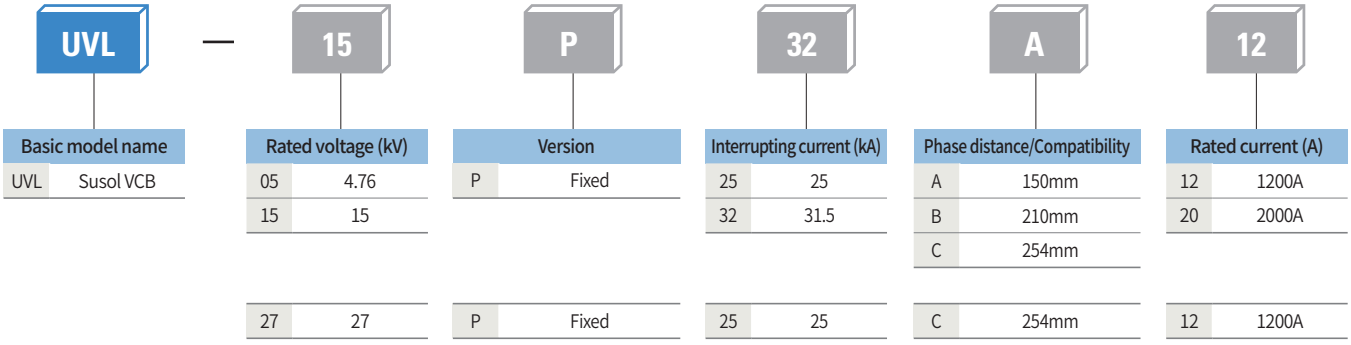
Technical data

Opening time		Less than 0.04 sec
Rated breaking time		3 Cycle
No-load closing time		Less than 0.07 sec
Type test class	Mechanical endurance	M2 (10,000)
	Electrical endurance	Reference standard (page 88)
	Apacitance current switching	C2
Operate temperature	Low	- 40 °C
	High	40 °C

Selection guide of circuit breaker type

Description for circuit breaker type

UVL type, Fixed type



Basic model name	
UVL	Susol VCB

Rated voltage (kV)	
05	4.76
15	15
27	27

Version	
P	Fixed
P	Fixed

Interrupting current (kA)	
25	25
32	31.5
25	25

Phase distance/Compatibility	
A	150mm
B	210mm
C	254mm
C	254mm

Rated current (A)	
12	1200A
20	2000A
12	1200A

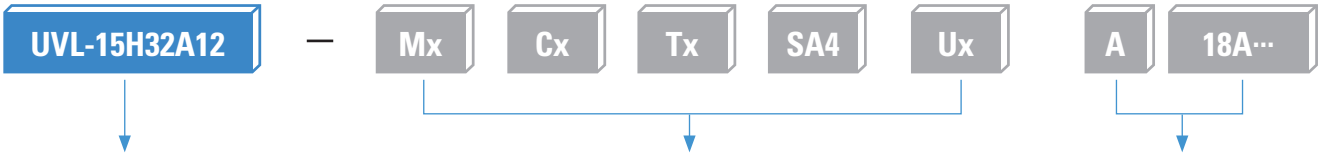
Selection table of circuit breaker type

Ur [kV]	Isc [kA]	Ir [A] p = 150	Ir [A] p = 210	Ir [A] p = 254	Type of circuit breaker	Weight [kg]	Outline dimension H×W×D [mm]	Dimension page
4.76	25	1200 2000			UVL-05P25A12 UVL-05P25A20	85 100	670×589×509 670×589×523.5	16 18
			1200 2000		UVL-05P25B12 UVL-05P25B20	100 115	670×789×523.5 670×789×523.5	17 18
				1200 2000	UVL-05P25C12 UVL-05P25C20	110 125	670×819×509 670×819×509	17 19
	31.5	1200 2000			UVL-05P32A12 UVL-05P32A20	85 100	670×589×509 670×589×523.5	16 18
			1200 2000		UVL-05P32B12 UVL-05P32B20	100 115	670×789×523.5 670×789×523.5	17 18
				1200 2000	UVL-05P32C12 UVL-05P32C20	110 125	670×819×509 670×819×509	17 19
15	25	1200 2000			UVL-15P25A12 UVL-15P25A20	85 100	670×589×509 670×589×523.5	16 18
			1200 2000		UVL-15P25B12 UVL-15P25B20	100 115	670×789×523.5 670×789×523.5	17 19
				1200 2000	UVL-15P25C12 UVL-15P25C20	110 125	670×819×509 670×819×509	17 19
	31.5	1200 2000			UVL-15P32A12 UVL-15P32A20	85 100	670×589×509 670×589×523.5	16 18
			1200 2000		UVL-15P32B12 UVL-15P32B20	100 115	670×789×523.5 670×789×523.5	17 19
				1200 2000	UVL-15P32C12 UVL-15P32C20	110 125	670×819×509 670×819×509	17 19
27	25			1200	UVL-27P25C12	125	846.5×830×542.5	20

Order form

Full description for circuit breaker

UVL type, Fixed type



❶ Type of circuit breaker (select from the previous page)

❷ Control source and auxiliary contacts & connector

❸ Accessories

※ In case of selecting ❸ Accessories, only type Symbol 'A' once. (ex. A18A)

Order form for circuit breaker

Please select only one of the items on the same horizontal line. (* Required selection)

UVL, VCB, **Fixed type**

(○ no extra charge ☐ extra charge)

❶ Type of VCB from selection table* — **ea**

❷ Control source

Motor* (Mx) — page 64

○ M0	○ M1	○ M2	○ M3	○ M4	○ M5	○ M6	○ M7	○ M8
Without motor	DC 110V	DC 200V ~ 250V	DC 125V	DC 24V ~ 30V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Closing coil* (Cx) — page 65

○ C0	○ C1	○ C2	○ C3	○ C4	○ C5	○ C6	○ C7	○ C8
VL Without CC	DC 110V	DC 200V ~ 250V	DC 125V	DC 24V ~ 30V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Shunt Trip Coil* (Tx) — page 66

○ T0	○ T1	○ T2	○ T3	○ T4	○ T5	○ T6	○ T7	○ T8
Without SHT	DC 110V	DC 200V ~ 250V	DC 125V	DC 24V ~ 30V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Auxiliary contacts & Connector type* — page 69

○ SA4 (10a10b Economic type, A-type) ☐ SQ4 (10a10b Standard, Q-type)

Under Voltage Release (Ux) — page 70

○ U0	☐ U1	☐ U2	☐ U3	☐ U4	☐ U5	☐ U6	☐ U7	☐ U8
Without UVT	DC 110V	DC 200V ~ 250V	DC 125V	DC 24V ~ 30V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

※ even without UVT, U0 must be selected to make VCB ordering code and description

Note) In case of DC24V control source(M4, C4, T4, U4), it is recommended to be used through Rated Control Voltage.

❸ Accessories

Combination table

U0	1	
U1~8		1
A1 & A2	1	

Available no. of Aux. contact

Symbol	10a10b
Standard	10 NO, 10 NC
with A1	9 NO, 8 NC
with A2	9 NO, 8 NC

Secondary Shunt Trip Coil — page 67

☐ A1 (Secondary shunt trip coil) ☐ A2 (Secondary shunt trip coil monitoring contact)

※ In case of selecting A1, maximum auxilary contacts are 9a8b ※ In case of selecting A2, maximum auxilary contacts are 9a8b

Button Padlock* — page 73

○ A8 (Button Padlock) ○ AX (Button Padlock In Open)

Lead wire* — page 74

○ AA (Lead wire)

Mecha Shaft Interlock Lever — page XX

☐ AI

Kirk Key Mounting Kit — page 72

☐ AM (KirkKey, CAMLOCK type) ☐ AN (KirkKey, CN22 type) ☐ AP (KirkKey, Double CAMLOCK type)

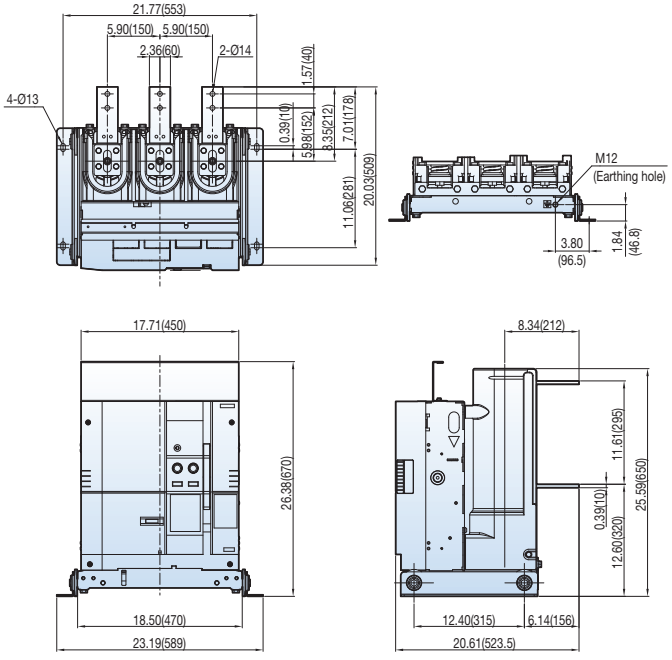
Dimensions

4.76kV, 25/31.5kA, 1200A

UVL type, Fixed type

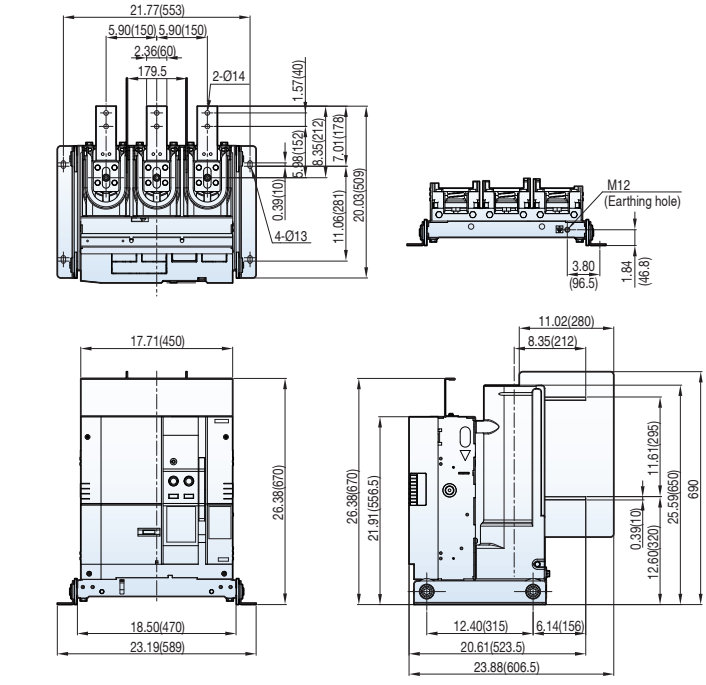
[Unit: inch(mm)]

Type of circuit breaker
UVL-05P25A12
UVL-05P32A12



15kV, 25/31.5kA, 1200A

Type of circuit breaker
UVL-15P25A12
UVL-15P32A12



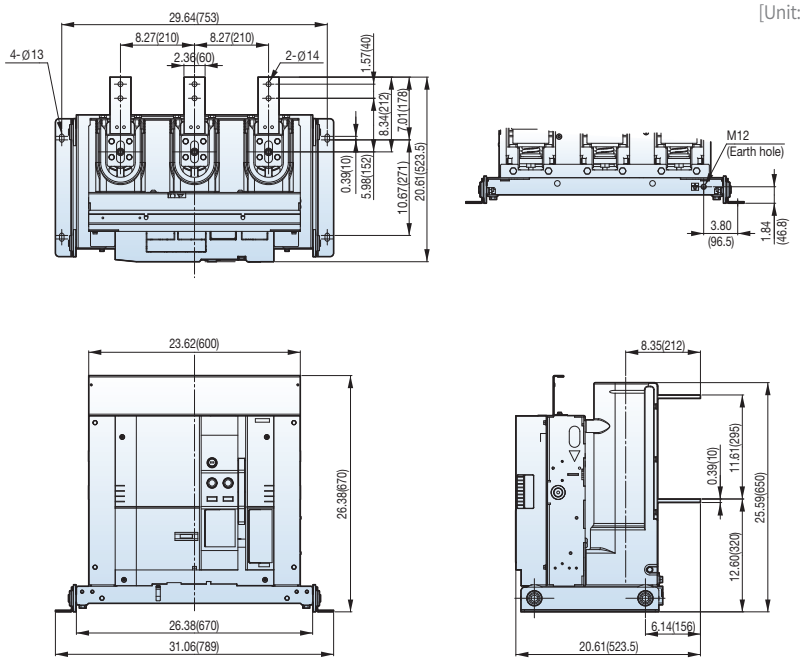
4.76/15kV, 25/31.5kA, 1200A

UVL type, Fixed type

[Unit: inch(mm)]

Type of circuit breaker

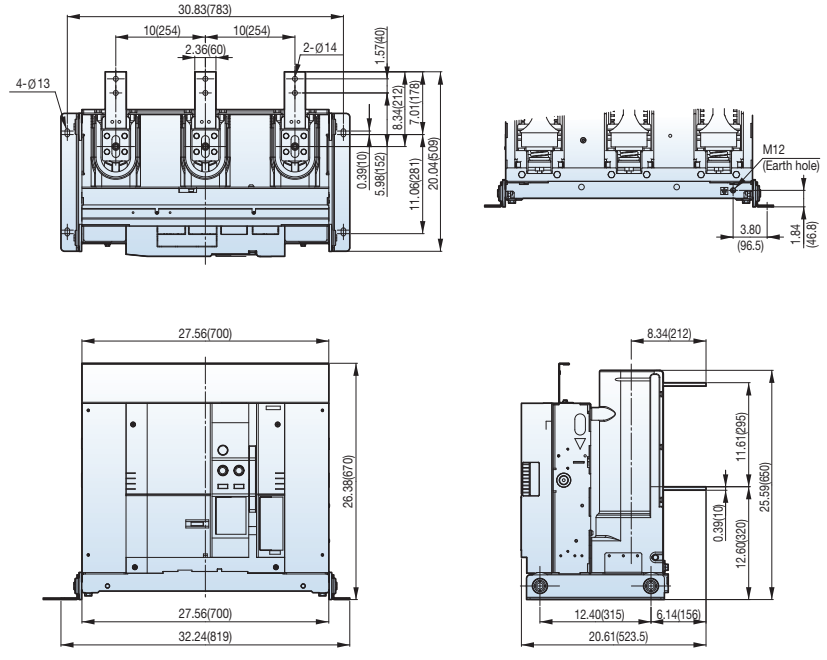
UVL-05P25B12
UVL-05P32B12
UVL-15P25B12
UVL-15P32B12



4.76/15kV, 25/31.5kA, 1200A

Type of circuit breaker

UVL-05P25C12
UVL-05P32C12
UVL-15P25C12
UVL-15P32C12



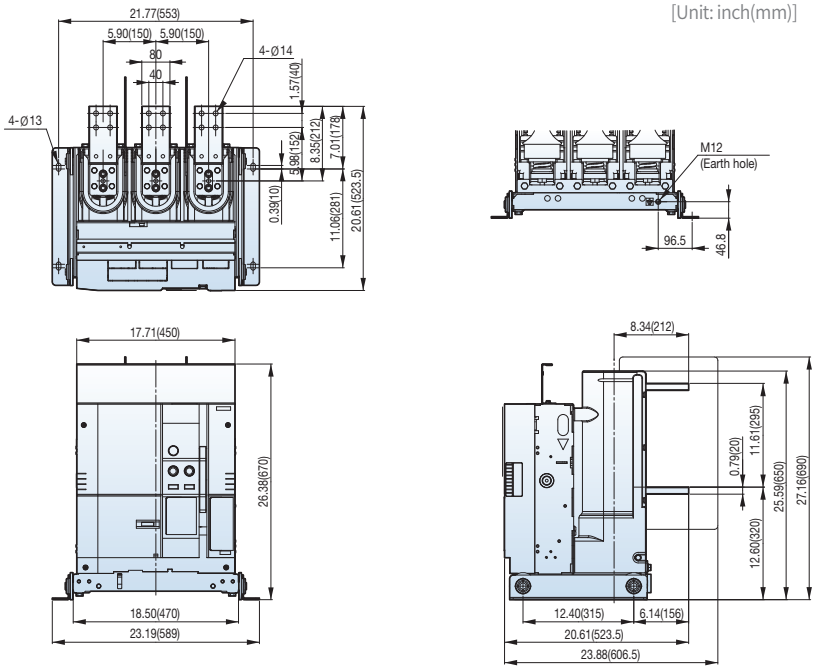
Dimensions

4.76/15kV, 25/31.5kA, 2000A

UVL type, Fixed type

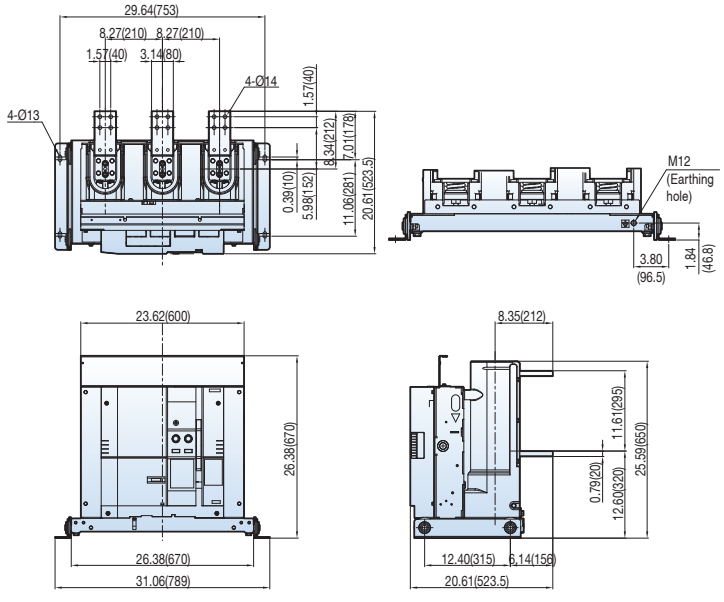
[Unit: inch(mm)]

Type of circuit breaker
UVL-05P25A20
UVL-05P32A20
UVL-15P25A20
UVL-15P32A20



4.76kV, 25/31.5kA, 2000A

Type of circuit breaker
UVL-05P25B20
UVL-05P32B20

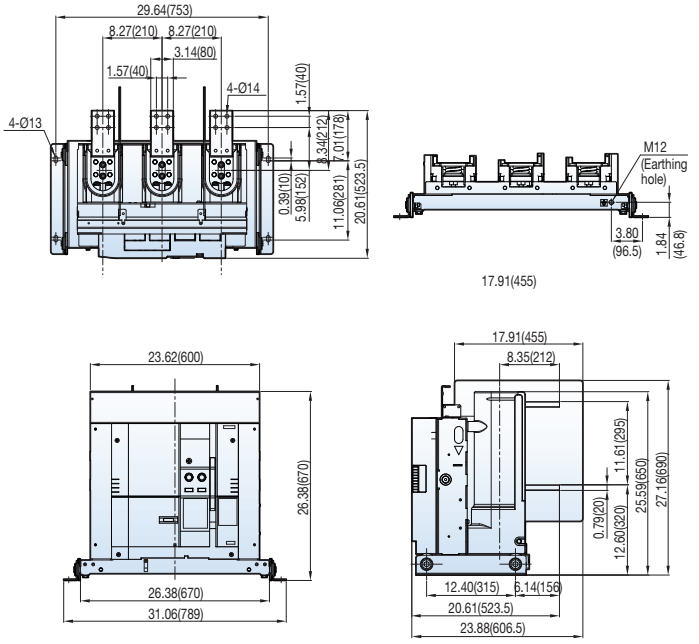


15kV, 25/31.5kA, 2000A

UVL type, Fixed type

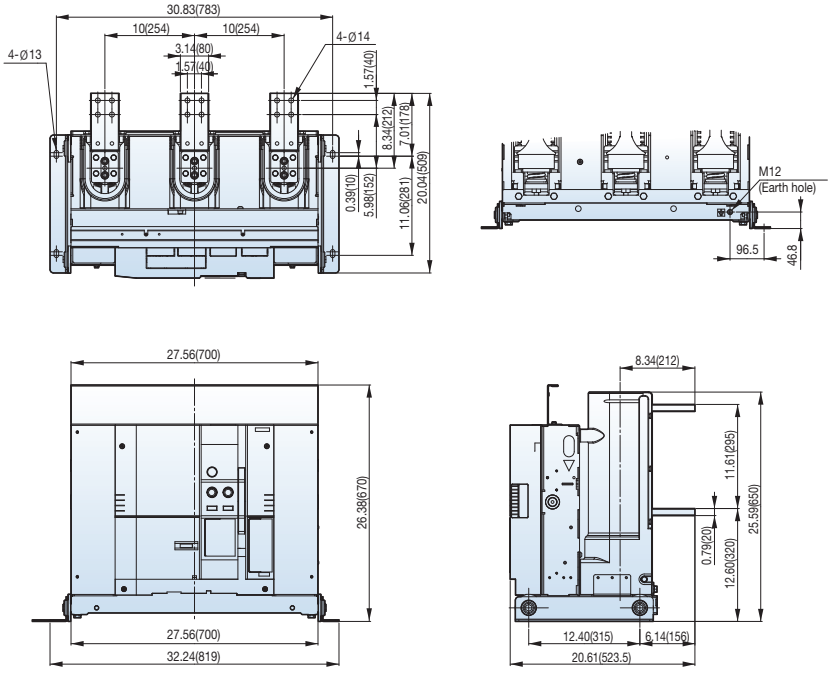
[Unit: inch(mm)]

Type of circuit breaker
UVL-15P25B20
UVL-15P32B20



4.76/15kV, 25/31.5kA, 2000A

Type of circuit breaker
UVL-05P25C20
UVL-05P32C20
UVL-15P25C20
UVL-15P32C20



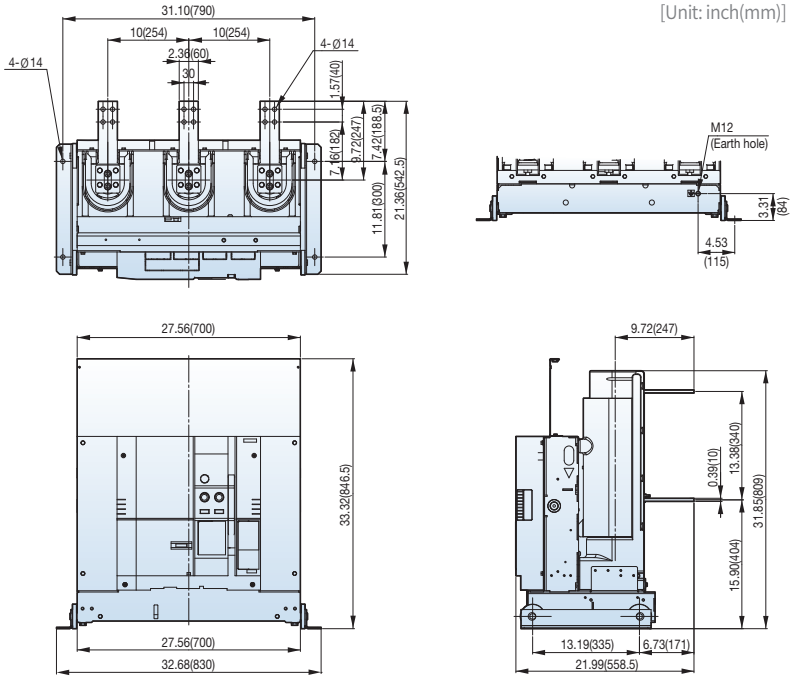
Dimensions

27kV, 25kA, 1200A

UVL type, Fixed type

[Unit: inch(mm)]

Type of circuit breaker
UVL-27P25C12



Susol UVH

Fixed type

Contents

Ratings and description

UVH type, Fixed type

UVH-38P

Circuit breaker type			UVH-38P			
Rated voltage		Ur (kV)	38			
Rated withstand voltage	Power frequency (1min)	Ud (kV)	80			
	Lightening impulse (1.2×50μs)	Up (kV)	170			
Rated short-circuit current		Isc (kA)	31.5		40	
Rated normal current		Ir (A)	1200	2000	1200	2000
Rated frequency		fr (Hz)	60	60	60	60
Rated short-circuit making current		Ip (kA) at 60 Hz	81.9	81.9	104	104
Rated short-time withstand current		Ik (kA)	31.5	31.5	40	40
		3sec	●	●	●	●
Operating sequence		O - 0.3s - CO - 15s - CO	●	●	●	●

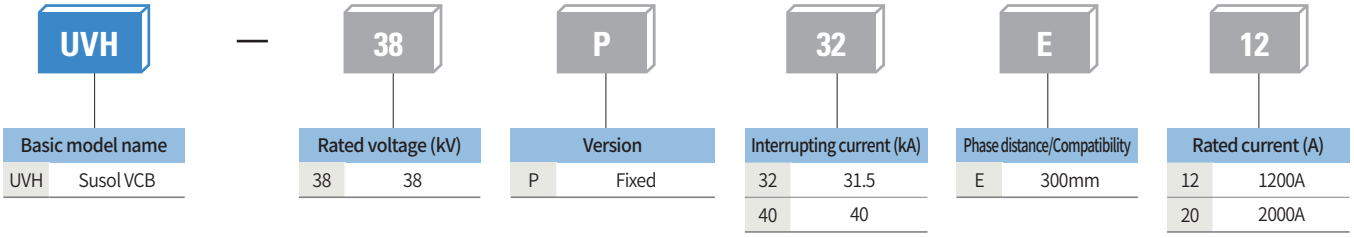
Technical data

Opening time		Less than 0.04 sec
Rated breaking time		3 Cycle
No-load closing time		Less than 0.06 sec
Type test class	Mechanical endurance	M2 (10,000)
	Electrical endurance	Reference standard (page 88)
	Apacitance current switching	C2
Operate temperature	Low	- 40 °C
	High	40 °C

Selection guide of circuit breaker type

Description for circuit breaker type

UVH type, Fixed type



Basic model name	
UVH	Susol VCB

Rated voltage (kV)	
38	38

Version	
P	Fixed

Interrupting current (kA)	
32	31.5
40	40

Phase distance/Compatibility	
E	300mm

Rated current (A)	
12	1200A
20	2000A

Selection table of circuit breaker type

Ur [kV]	Isc [kA]	Ir [A] p = 300	Type of circuit breaker	Weight [kg]	Outline dimension H×W×D [mm]	Dimension page
38	31.5	1200	UVH-38P32E12	360	1042.5×944×951.5	25
		2000	UVH-38P32E20	360	1042.5×944× 951.5	25
	40	1200	UVH-38P40E12	360	1042.5×944×951.5	25
		2000	UVH-38P40E20	360	1042.5×944×951.5	25

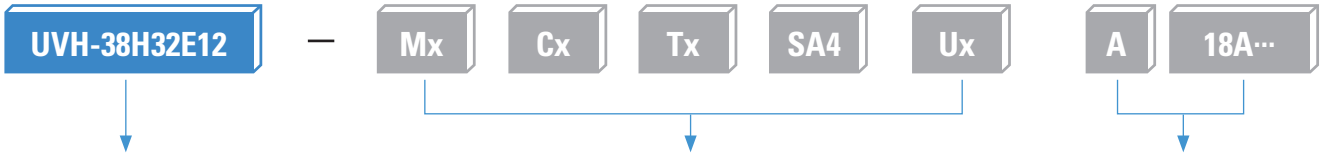
Separately sold accessories

Charge handle	**page XX**
☐ 55213143006	
CTU (Coil test unit)	**page 78**
☐ 73873171221 CTU (Coil test unit)	
UDC (UVT dalay controller)	**page 80**
☐ 52773171282 UDC (UVT delay controller) AC/DC 100~130V	
☐ 52773171283 UDC (UVT delay controller) AC/DC 200~250V	
☐ 52773171281 UDC (UVT delay controller) DC 48~60V and AC 48V	
CTD (Condenser trip device)	**page 79**
☐ 76113143001 CTD (Condenser trip device) AC/DC 100V, 110V	
☐ 76113143002 CTD (Condenser trip device) AC/DC 200V, 220V	

Order form

Full description for circuit breaker

UVH type, Fixed type



❶ Type of circuit breaker (select from the previous page)

❷ Control source and auxiliary contacts & connector

❸ Accessories

※ In case of selecting ❸ Accessories, only type Symbol 'A' once. (ex. A18A)

Order form for circuit breaker

Please select only one of the items on the same horizontal line. (* Required selection)

UVH, VCB, **Fixed type**

(○ no extra charge ☐ extra charge)

❶ Type of VCB from selection table* — **ea**

❷ Control source and auxiliary contacts & connector

Motor* (Mx) — page 64

○ M0	○ M1	○ M2	○ M3	○ M5	○ M6	○ M7	○ M8
Without motor	DC 110V	DC 200V ~ 250V	DC 125V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Closing coil* (Cx) — page 65

○ C0	○ C1	○ C2	○ C3	○ C5	○ C6	○ C7	○ C8
VL Without CC	DC 110V	DC 200V ~ 250V	DC 125V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Shunt Trip Coil* (Tx) — page 66

○ T0	○ T1	○ T2	○ T3	○ T5	○ T6	○ T7	○ T8
Without SHT	DC 110V	DC 200V ~ 250V	DC 125V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Auxiliary contacts & Connector type* — page 69

○ SA4 (10a10b Economic type, A-type) ☐ SQ4 (10a10b Standard, Q-type)

Under Voltage Release (Ux) — page 70

○ U0	☐ U1	☐ U2	☐ U3	☐ U5	☐ U6	☐ U7	☐ U8
Without UVT	DC 110V	DC 200V ~ 250V	DC 125V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

※ even without UVT, U0 must be selected to make VCB ordering code and description

❸ Accessories

Combination table

U0	1	
U1~8		1
A1 & A2	1	
A6		1

Available no. of Aux. contact

Symbol	10a10b
Standard	10 NO, 10 NC
with A1	9 NO, 9 NC
with A2	9 NO, 8 NC

Secondary Shunt Trip Coil — page 67

☐ A1 (Secondary shunt trip coil) ☐ A2 (Secondary shunt trip coil monitoring contact)

※ In case of selecting A1, maximum auxilary contacts are 9a8b ※ In case of selecting A2, maximum auxilary contacts are 9a8b

Latch checking s/w — page 71

☐ A6

※ In case of selecting UVT(U1~U0), Latch checking s/w should be selected.

Button Padlock* — page 73

○ A8 (Button Padlock)

Lead wire* — page 74

○ AA (Lead wire)

Kirk Key Mounting Kit — page 72

☐ AM (KirkKey, CAMLOCK type)

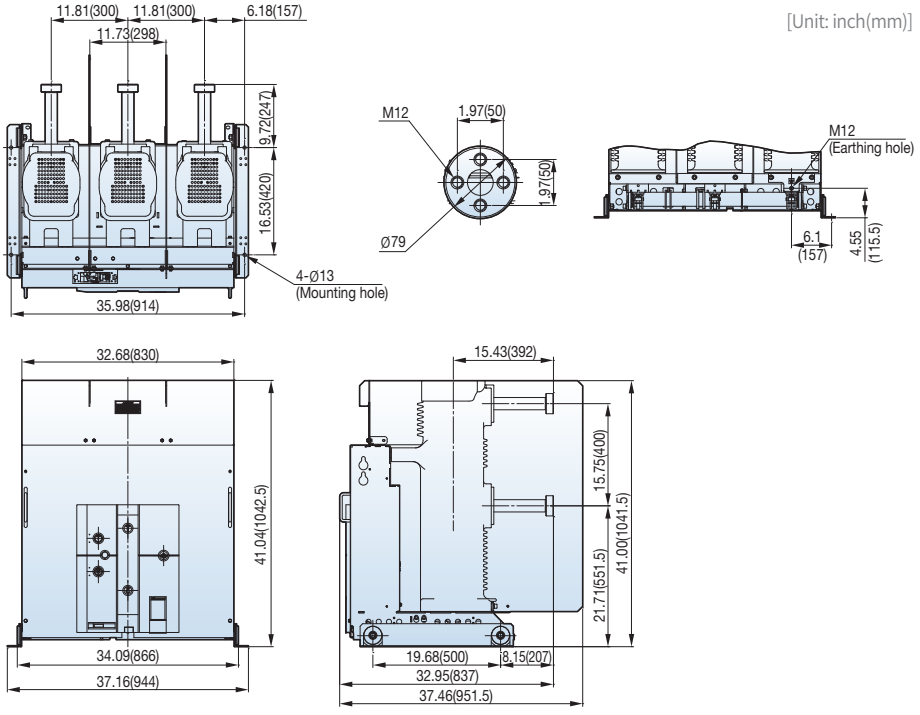
Dimensions

38kV, 31.5/40kA, 1200/2000A

UVL type, Fixed type

[Unit: inch(mm)]

Type of circuit breaker
UVH-38P32E12
UVH-38P32E20
UVH-38P40E12
UVH-38P40E20



Memo

Susol UVL

Drawout type
(Draw in/out by using screw)

Contents

UVL type, Drawout type

UVL-05H / UVL-15H

Circuit breaker type			UVL-05H				UVL-15H			
Rated voltage		Ur (kV)	4.76				15			
Rated withstand voltage	Power frequency (1min)	Ud (kV)	19				36			
	Lightening impulse (1.2×50μs)	Up (kV)	60				95			
Rated short-circuit current		Isc (kA)	25		31.5		25		31.5	
Rated normal current		Ir (A)	1200	2000	1200	2000	1200	2000	1200	2000
Rated frequency		fr (Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Rated short-circuit making current		Ip (kA) at 60 Hz	65	65	81.9	81.9	65	65	81.9	81.9
Rated short-time withstand current		Ik (kA)	25	25	31.5	31.5	25	25	31.5	31.5
		3sec	●	●	●	●	●	●	●	●
Operating sequence		O - 0.3s - CO - 15s - CO	●	●	●	●	●	●	●	●

Technical data

Opening time		Less than 0.04 sec
Rated breaking time		3 Cycle
No-load closing time		Less than 0.06 sec
Type test class	Mechanical endurance	M2 (10,000)
	Electrical endurance	Reference standard (page 88)
	Apacitance current switching	C2
Operate temperature	Low	- 40 °C
	High	40 °C

Description for circuit breaker type

UVL type, Drawout type

Withdrawl VCB, Cradle for MCSG

UVL — 15 H 32 A 12

Basic model name		Rated voltage (kV)		Version		Interrupting current (kA)		Phase distance/Compatibility		Rated current (A)	
UVL	Susol VCB	05	4.76	H	H type drawout (for MCSG)	25	25	A	150mm	12	1200A
		15	15			32	31.5				
		05	4.76	H	H type drawout (for MCSG)	25	25	S	210mm	20	2000A
		15	15			32	31.5				

Selection table of circuit breaker type

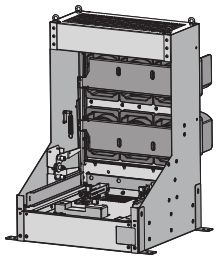
Select withrawal VCB/Cradle with same horizontal line.

Ur [kV]	Isc [kA]	Ir [A] p = 150	Ir [A] p = 210	Type of circuit breaker	Weight [kg]	Outline dimension H×W×D [mm]	Dimension page
4.76	25	1200		UVL-05H25A12	115	691×503×642	35
			2000	UVL-05H25S20	140	691×653×648	37
	31.5	1200		UVL-05H32A12	115	691×503×642	35
			2000	UVL-05H32S20	140	691×653×648	37
15	25	1200		UVL-15H25A12	115	691×503×642	35
			2000	UVL-15H25S20	140	691×653×648	37
	31.5	1200		UVL-15H32A12	115	691×503×642	35
			2000	UVL-15H32S20	140	691×653×648	37

Selection guide of circuit breaker type

Description for Cradle

UVL type, Drawout type



Ha type

UVCL — **15** **H** **32** **P** **12**

Basic model name	
UVCL	Susol VCB Cradle

Rated voltage (kV)	
05	4.76
15	15

Version	
Ha	MCSG Cradle type
H	MCSG Cradle type

Interrupting current (kA)	
25	25
32	31.5

Phase distance/ Compatibility	
P	150mm
S	210mm

Rated current (A)	
12	1200A
20	2000A

Selection table of cradle

Arc resistance	Type of cradle	Outline dimension H×W×D [mm]	Dimension page
-	UVCL-05Ha25P12	1010×700×1037	38
-	UVCL-05Ha25S20	1010×850×1037	38
-	UVCL-05Ha32P12	1010×700×1037	38
-	UVCL-05Ha32S20	1010×850×1037	38
-	UVCL-15Ha25P12	1010×700× 1037	38
-	UVCL-15Ha25S20	1010×850×1037	38
-	UVCL-15Ha32P12	1010×700×1037	38
-	UVCL-15Ha32S20	1010×850×1037	38

Description for circuit breaker type

UVL type, Drawout type

Withdrawl VCB, CB Compartment for MCSG

UVL — 15 H 32 A 12

Basic model name		Rated voltage (kV)		Version		Interrupting current (kA)		Phase distance/Compatibility		Rated current (A)	
UVL	Susol VCB	05	4.76	H	Drawout (for MCSG)	25	25	A	150 (Non-ARC)	12	1200
		15	15			32	31.5	B	210 (Non-ARC)		
								S	210 (Non-ARC)	20	2000
		05	4.76	H	Drawout (for MCSG)	25	25	R	150 (ARC)	12	1200
		15	15			32	31.5	S	210 (ARC)		
								B	210 (ARC)	20	2000

Selection table of circuit breaker type

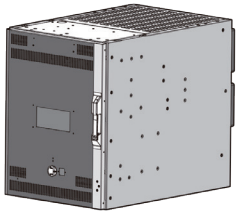
Select withrawal VCB/Cradle with same horizontal line.

Ur [kV]	Isc [kA]	Ir [A] p = 150	Ir [A] p = 210	Type of circuit breaker	Weight [kg]	Outline dimension H×W×D [mm]	Dimension page
4.76	25	1200		UVL-05H25A12	115	691×503×642	35
		1200		UVL-05H25R12	130	691×503×642	36
			1200	UVL-05H25B12	120	691×653×648	35
			1200	UVL-05H25S12	140	691×653×642	36
			2000	UVL-05H25S20	140	691×653×648	37
			2000	UVL-05H25B20	160	691×653×642	37
	31.5	1200		UVL-05H32A12	115	691×503×642	35
		1200		UVL-05H32R12	130	691×503×642	36
			1200	UVL-05H32B12	120	691×653×648	35
			1200	UVL-05H32S12	140	691×653×642	36
			2000	UVL-05H32S20	140	691×653×648	37
			2000	UVL-05H32B20	160	691×653×642	37
15	25	1200		UVL-15H25A12	115	691×503×642	35
		1200		UVL-15H25R12	130	691×503×642	36
			1200	UVL-15H25B12	120	691×653×648	35
			1200	UVL-15H25S12	140	691×653×642	36
			2000	UVL-15H25S20	140	691×653×648	37
			2000	UVL-15H25B20	160	691×653×642	37
	31.5	1200		UVL-15H32A12	115	691×503×642	35
		1200		UVL-15H32R12	130	691×503×642	36
			1200	UVL-15H32B12	120	691×653×648	35
			1200	UVL-15H32S12	140	691×653×642	36
			2000	UVL-15H32S20	140	691×653×648	37
			2000	UVL-15H32B20	160	691×653×642	37

Selection guide of circuit breaker type

Description for Cradle

UVL type, Drawout type



He, Hf type

UVCL — 15 H 32 P 12

Basic model name	
UVCL	Susol VCB Cradle

Rated voltage (kV)	
05	4.76
15	15

Version	
Hf	Compact MCSG (Non-ARC)
He	Compact MCSG (ARC)

Interrupting current (kA)	
25	25
32	31.5

Phase distance/ Compatibility	
A	150mm
B	210mm
B	210mm

Rated current (A)	
12	1200A
20	2000A

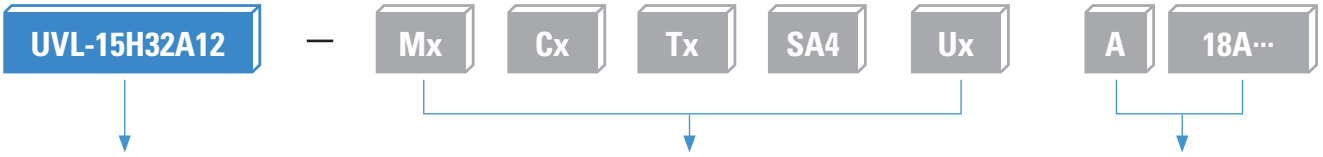
Selection table of cradle

Arc resistance	Type of cradle	Outline dimension H×W×D [mm]	Dimension page
●	UVCL-05He25A12	950×600×1467	39
-	UVCL-05Hf25A12	950×600×1467	42
●	UVCL-05He25B12	950×750×1467	40
●	UVCL-05He25B20	950×750×1464.2	41
-	UVCL-05Hf25B12	950×750×1090	43
-	UVCL-05Hf25B20	950×750×1090	44
●	UVCL-05He32A12	950×600×1467	39
-	UVCL-05Hf32A12	950×600×1467	42
●	UVCL-05He32B12	950×750×1467	40
●	UVCL-05He32B20	950×750×1464.2	41
-	UVCL-05Hf32B12	950×750×1090	43
-	UVCL-05Hf32B20	950×750×1090	44
●	UVCL-15He25A12	950×600×1467	39
-	UVCL-15Hf25A12	950×600×1467	42
●	UVCL-15He25B12	950×750×1467	40
●	UVCL-15He25B20	950×750×1464.2	41
-	UVCL-15Hf25B12	950×750×1090	43
-	UVCL-15Hf25B20	950×750×1090	44
●	UVCL-15He32A12	950×600×1467	39
-	UVCL-15Hf32A12	950×600×1467	42
●	UVCL-15He32B12	950×750×1467	40
●	UVCL-15He32B20	950×750×1464.2	41
-	UVCL-15Hf32B12	950×750×1090	43
-	UVCL-15Hf32B20	950×750×1090	44

Order form

Full description for circuit breaker

UVL type, Drawout type



❶ Type of circuit breaker (select from the previous page)

❷ Control source and auxiliary contacts & connector

❸ Accessories

※ In case of selecting ❸ Accessories, only type Symbol 'A' once. (ex. A18A)

Order form for circuit breaker

Please select only one of the items on the same horizontal line. (* Required selection)

UVL, VCB, **Drawout type**

(○ no extra charge ☐ extra charge)

❶ Type of VCB from selection table* ea

❷ Control source and auxiliary contacts & connector

Motor* (Mx) page 64

○ M0	○ M1	○ M2	○ M3	○ M4	○ M5	○ M6	○ M7	○ M8
Without motor	DC 110V	DC 200V ~ 250V	DC 125V	DC 24V ~ 30V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Closing coil* (Cx) page 65

○ C0	○ C1	○ C2	○ C3	○ C4	○ C5	○ C6	○ C7	○ C8
Without CC	DC 110V	DC 200V ~ 250V	DC 125V	DC 24V ~ 30V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Shunt Trip Coil* (Tx) page 66

○ T0	○ T1	○ T2	○ T3	○ T4	○ T5	○ T6	○ T7	○ T8
Without SHT	DC 110V	DC 200V ~ 250V	DC 125V	DC 24V ~ 30V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Auxiliary contacts & Connector type* page 69

○ SQ4 (10a10b Standard type, Q-type)

Under Voltage Release (Ux) page 70

○ U0*	☐ U1	☐ U2	☐ U3	☐ U4	☐ U5	☐ U6	☐ U7	☐ U8
Without UVT	DC 110V	DC 200V ~ 250V	DC 125V	DC 24V ~ 30V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

※ even without UVT, U0 must be selected to make VCB ordering code and description

❸ Accessories

Combination table

U0	1	
U1~8		1
A1 & A2	1	

Available no. of Aux. contact

Symbol	10a10b
Standard	10 NO, 10 NC
with A1	9 NO, 9 NC
with A2	9 NO, 8 NC

Secondary Shunt Trip Coil page 67

☐ A1 (Secondary shunt trip coil)
※ In case of selecting A1, maximum auxilary contacts are 9a9b

☐ A2 (Secondary shunt trip coil monitoring contact)
※ In case of selecting A2, maximum auxilary contacts are 9a8b

Position Switch page 71

☐ A3 (Test: 1a1S, Service: 2S) ☐ A4 (Test: 2a, Service: 2a) ☐ A5 (Test: 1a1S, Service: 1a1S)

Button Padlock* page 73

○ A8 (Button padlock) ○ AX (Button padlock in open)

Lead wire* page 74

○ AA (Lead wire)
※ In case of selecting Lead Wire as a cradle option, no need to select it with the breaker.

Plug Interlock* page 75

○ AC

Padlock* page 75

○ AD

MOC operator* page 76

○ AE

Mecha Shaft Interlock Lever page XX

☐ AI

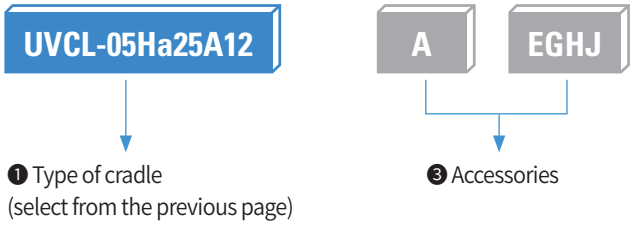
Kirk Key Mounting Kit page 72

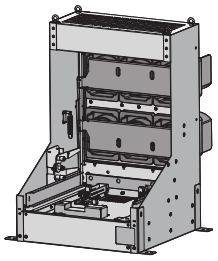
☐ AM (KirkKey, CAMLOCK type) ☐ AN (KirkKey, CN22 type) ☐ AP (KirkKey, Double CAMLOCK type)

Order form

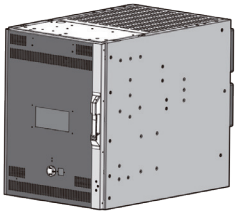
Full description for cradle

UVL type, Drawout type





Ha type



He, Hf type

Order form for cradle

Please select only one of the items on the same horizontal line. (* Required selection)

UVL, VCB, **Drawout type**

(○ no extra charge ☐ extra charge)

❶ Type of VCB from selection table*	Quantity	ea

❸ Accessories		
	Shutter Padlock*	**page 81**
	○ AE (Shutter padlock)	
	TOC*	**page 81**
	○ AF (TOC)	
	MOC*	**page 82**
	○ AG (MOC)	
	Door* (Only for He, Hf Type Cradle)	**page 82**
	○ AH (Door)	
	Door Interlock* (Only for He, Hf Type Cradle)	**page 83**
	○ AJ (Door Interlock)	
	Lead wire*	**page 74**
	○ AN (cradle attached Lead wire)	
	※ AN options are the same as the AA option that can be selected with the breaker. And when it is selected as a cradle option, it will be attached to the cradle and shipped.	

Separately sold accessories

Racking In/Out handle		page 84
	☐ 55223172407 (Normal type)	
	☐ 55223172403 (Normal extention type)	
	☐ 55223172405 (Universal type)	
	☐ 55223172406 (Universal extention type)	

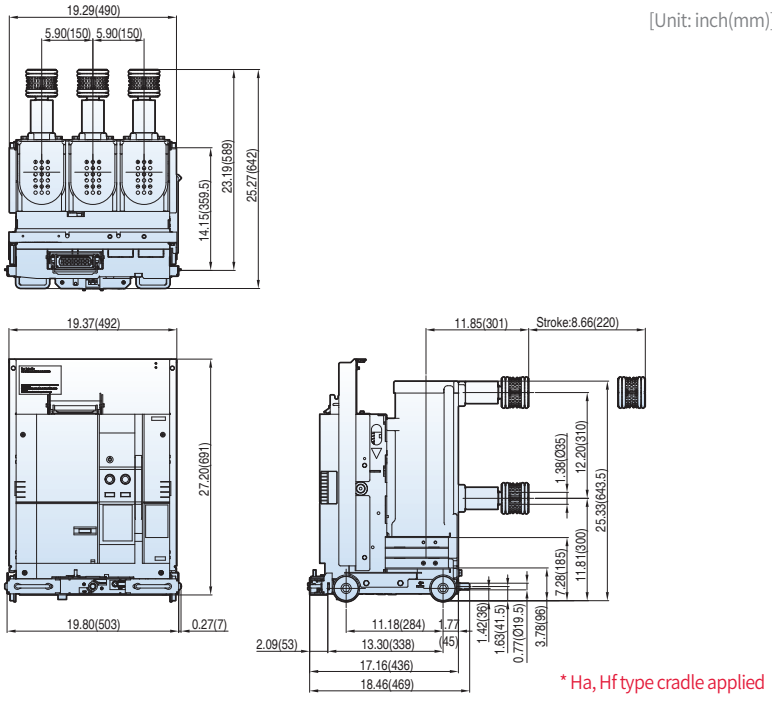
4.76/15kV, 25/31.5kA, 1200A

UVL type, Drawout type

[Unit: inch(mm)]

Type of circuit breaker

UVL-05H25A12
UVL-05H32A12
UVL-15H25A12
UVL-15H32A12

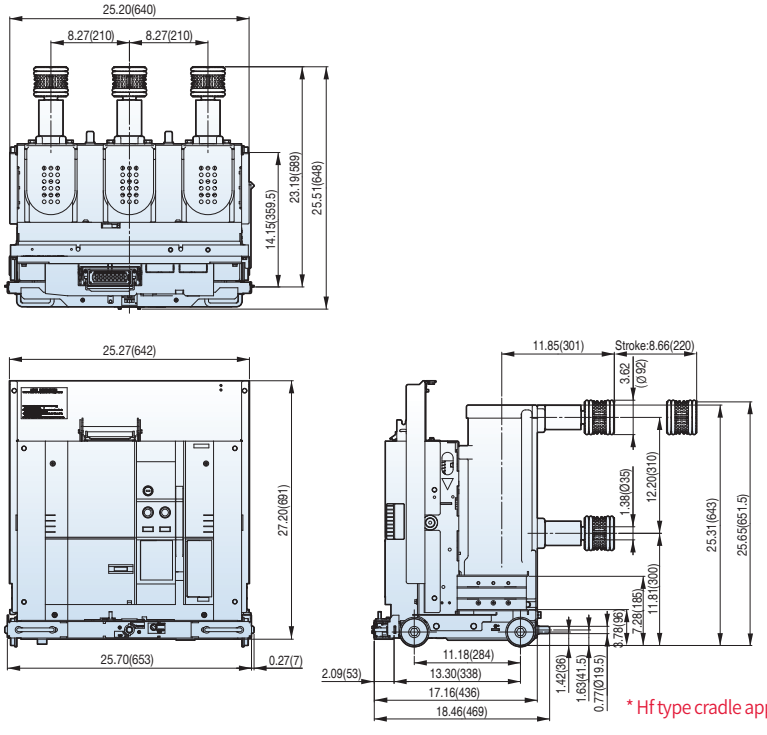


* Ha, Hf type cradle applied

4.76/15kV, 25/31.5kA, 1200A

Type of circuit breaker

UVL-05H25B12
UVL-05H32B12
UVL-15H25B12
UVL-15H32B12



* Hf type cradle applied

Dimensions

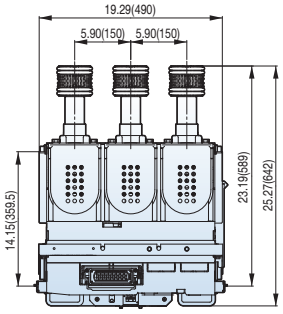
4.76/15kV, 25/31.5kA, 1200A

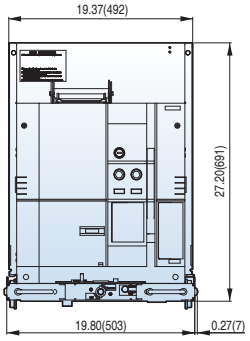
UVL type, Drawout type

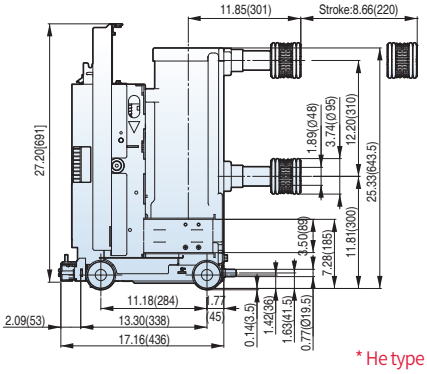
[Unit: inch(mm)]

Type of circuit breaker

UVL-05H25R12
UVL-05H32R12
UVL-15H25R12
UVL-15H32R12



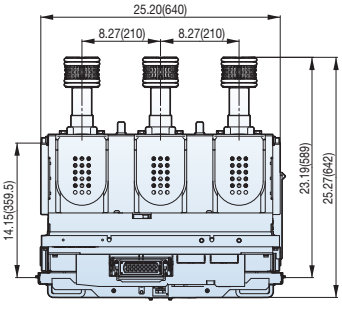


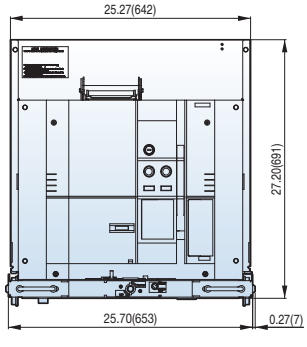


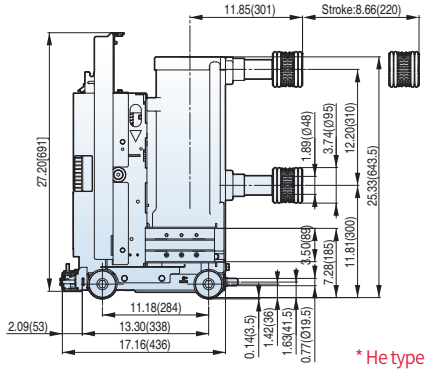
* He type cradle applied

Type of circuit breaker

UVL-05H25S12
UVL-05H32S12
UVL-15H25S12
UVL-15H32S12







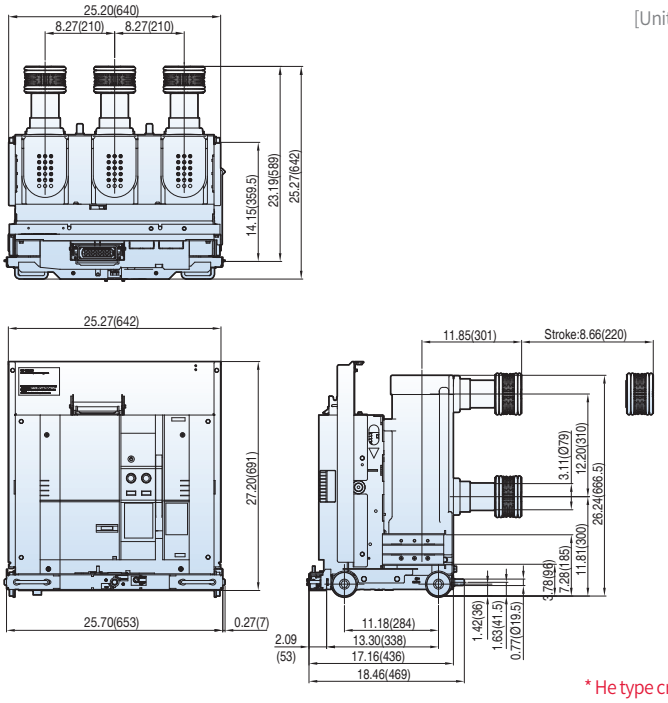
* He type cradle applied

4.76/15kV, 25/31.5kA, 2000A

UVL type, Drawout type

[Unit: inch(mm)]

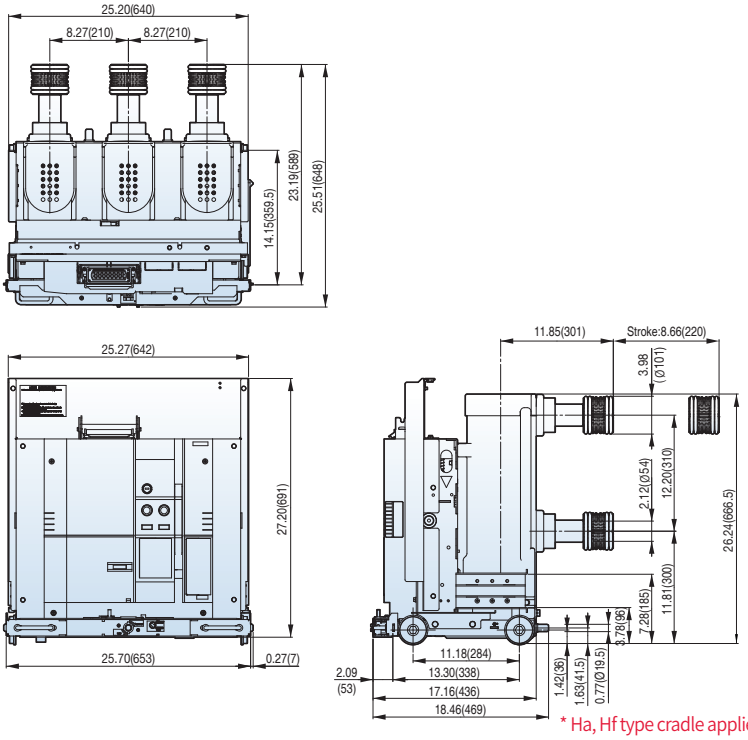
Type of circuit breaker
UVL-05H25B20
UVL-05H32B20
UVL-15H25B20
UVL-15H32B20



* He type cradle applied

4.76/15kV, 25/31.5kA, 2000A

Type of circuit breaker
UVL-05H25S20
UVL-05H32S20
UVL-15H25S20
UVL-15H32S20



* Ha, Hf type cradle applied

Dimensions

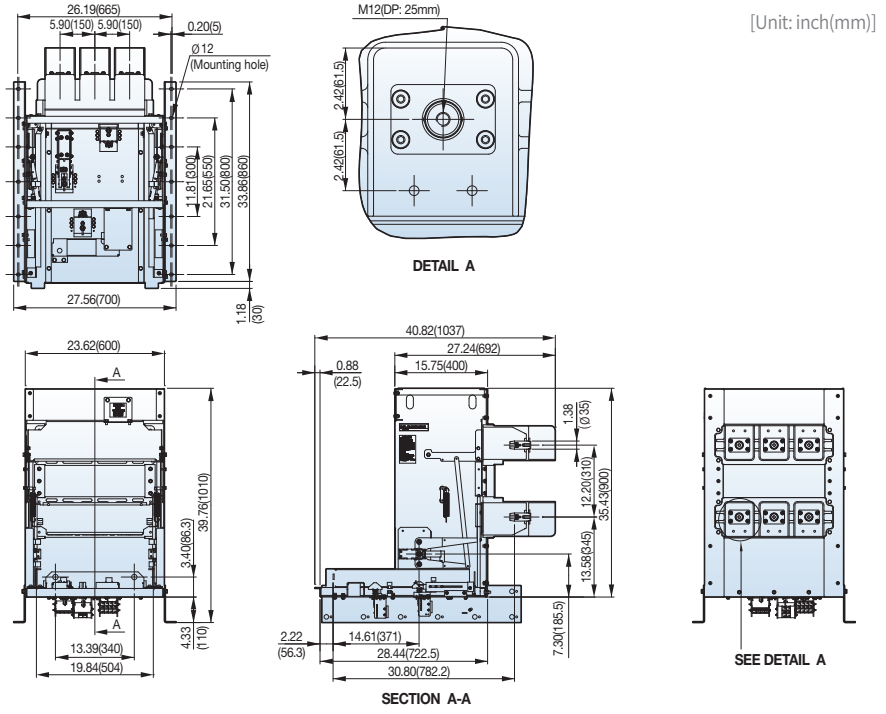
4.76/15kV, 25/31.5kA, 1200A

UVL type, Drawout type

[Unit: inch(mm)]

Type of cradle

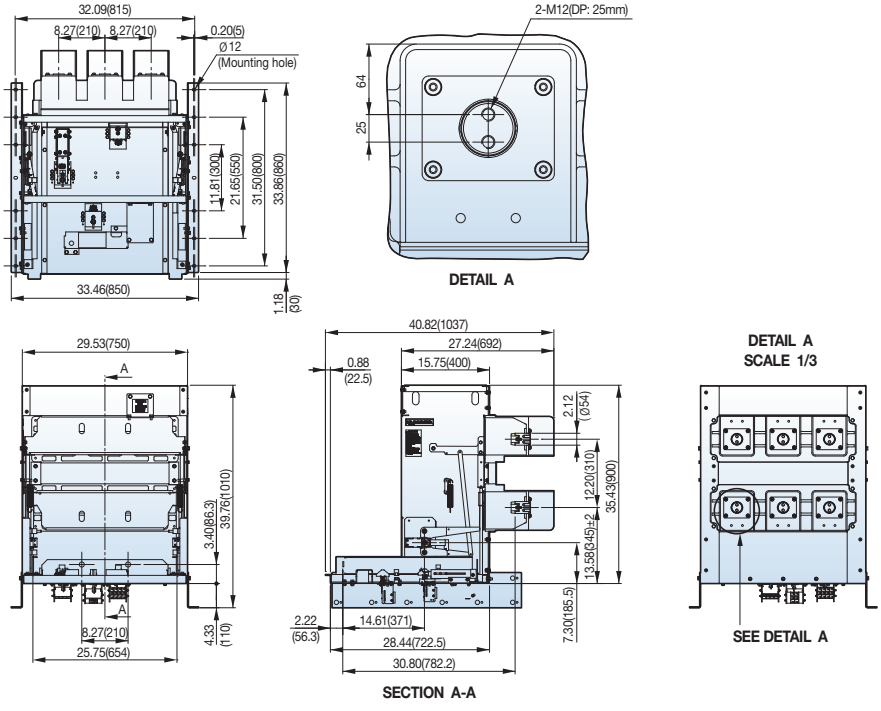
UVCL-05Ha25P12
UVCL-05Ha32P12
UVCL-15Ha25P12
UVCL-15Ha32P12



4.76/15kV, 25/31.5kA, 2000A

Type of cradle

UVCL-05Ha25S20
UVCL-05Ha32S20
UVCL-15Ha25S20
UVCL-15Ha32S20

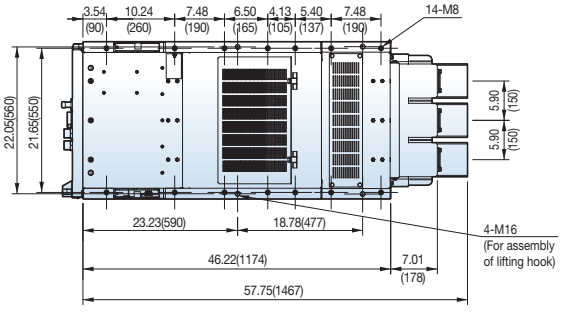


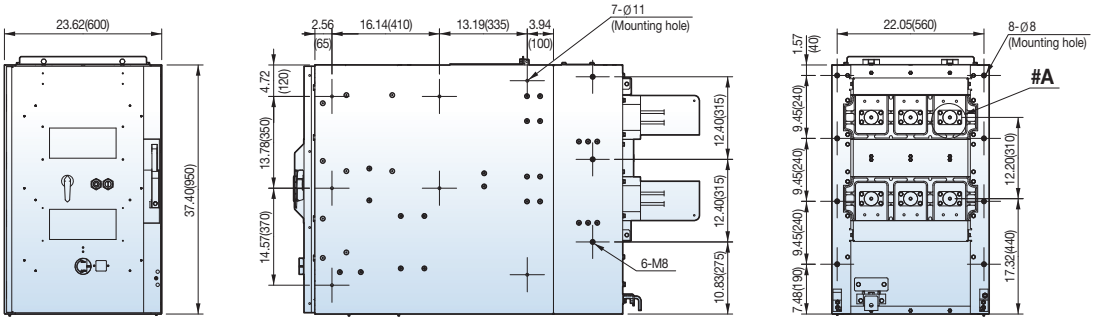
4.76/15kV, 25/31.5kA, 1200A

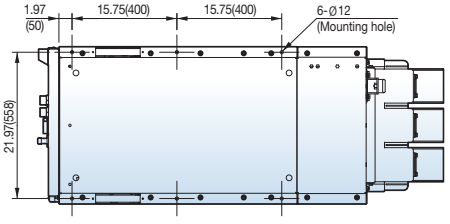
UVL type, Drawout type

[Unit: inch(mm)]

Type of cradle
UVCL-05He25A12
UVCL-05He32A12
UVCL-15He25A12
UVCL-15He32A12







Dimensions

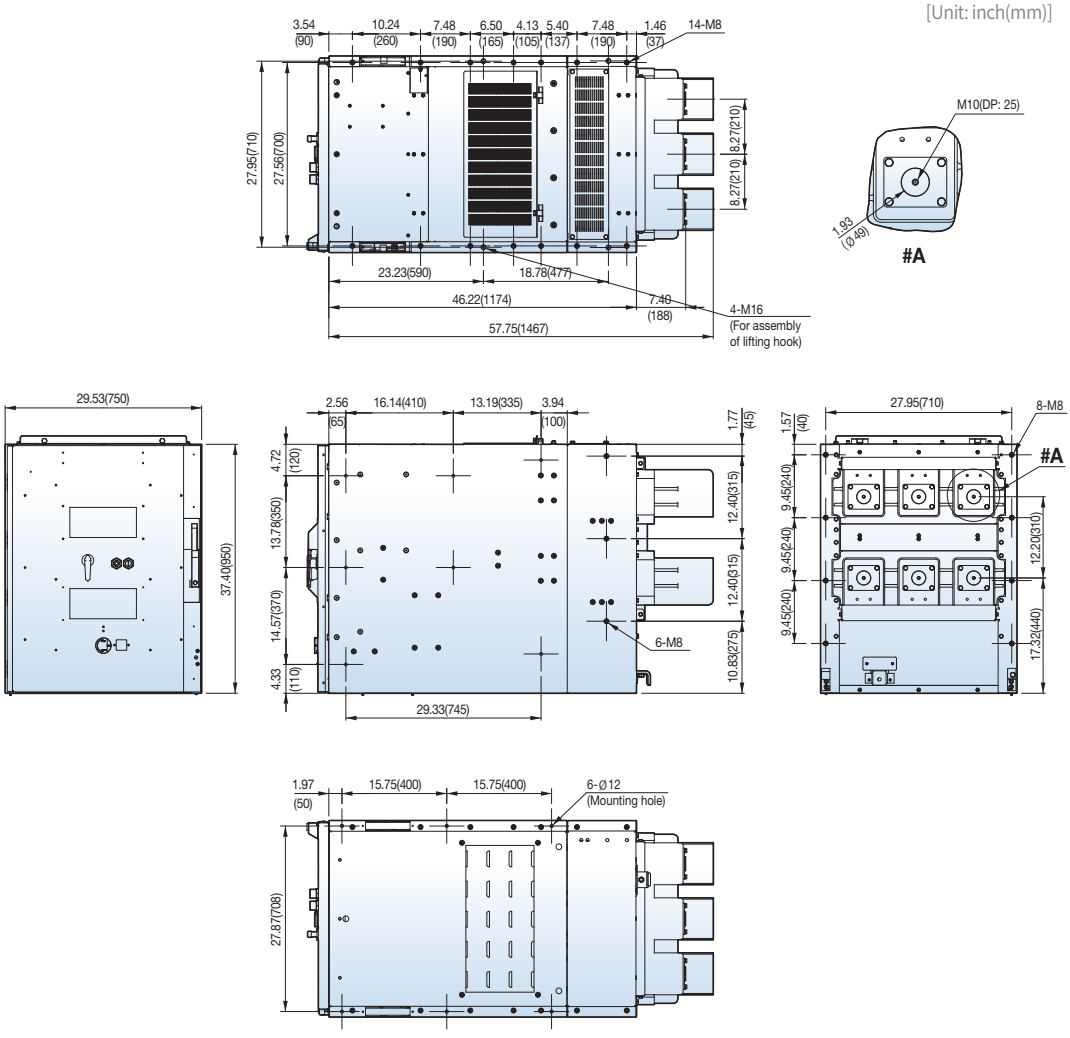
4.76/15kV, 25/31.5kA, 1200A

UVL type, Drawout type

[Unit: inch(mm)]

Type of cradle

UVCL-05He25B12
UVCL-05He32B12
UVCL-15He25B12
UVCL-15He32B12

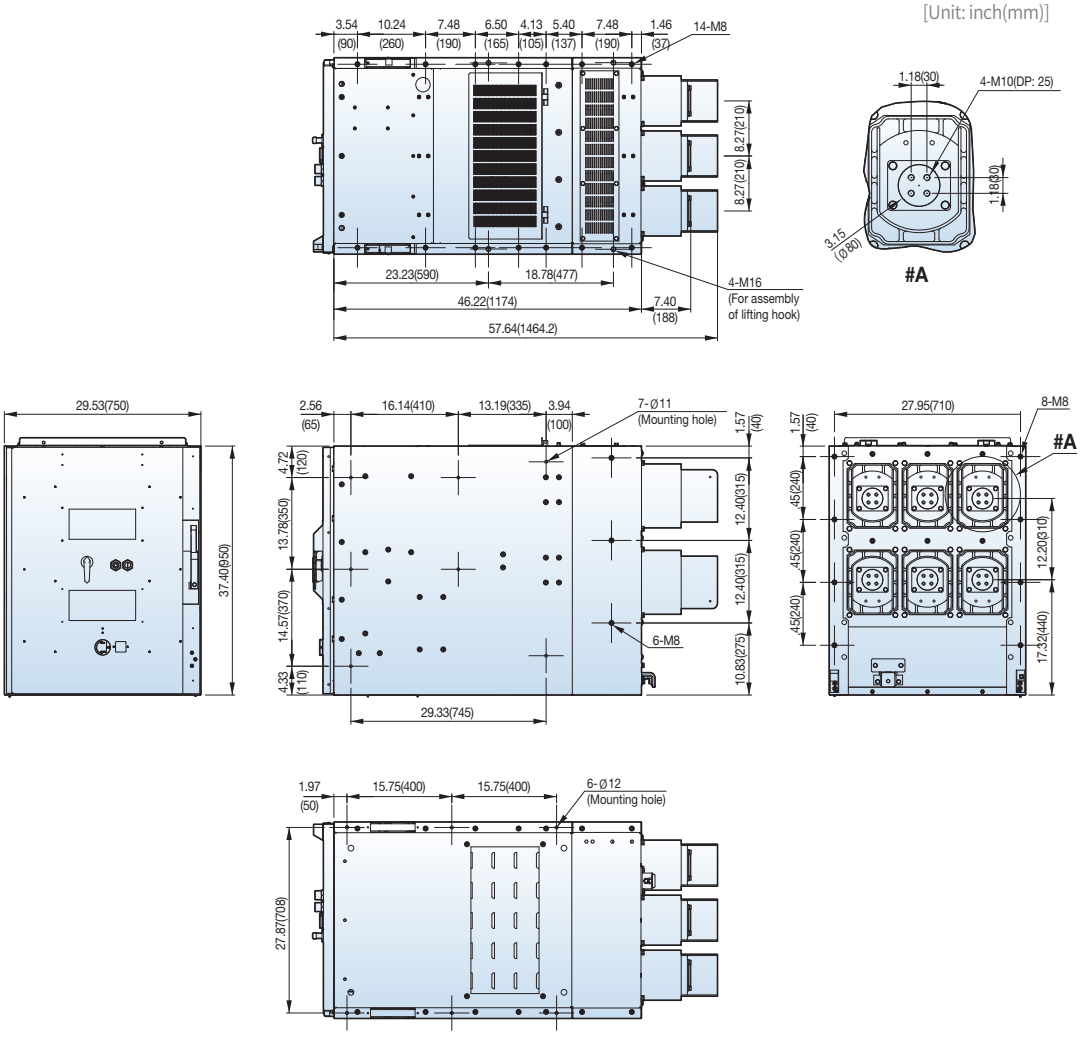


4.76/15kV, 25/31.5kA, 2000A

UVL type, Drawout type

[Unit: inch(mm)]

Type of cradle
UVCL-05He25B20
UVCL-05He32B20
UVCL-15He25B20
UVCL-15He32B20



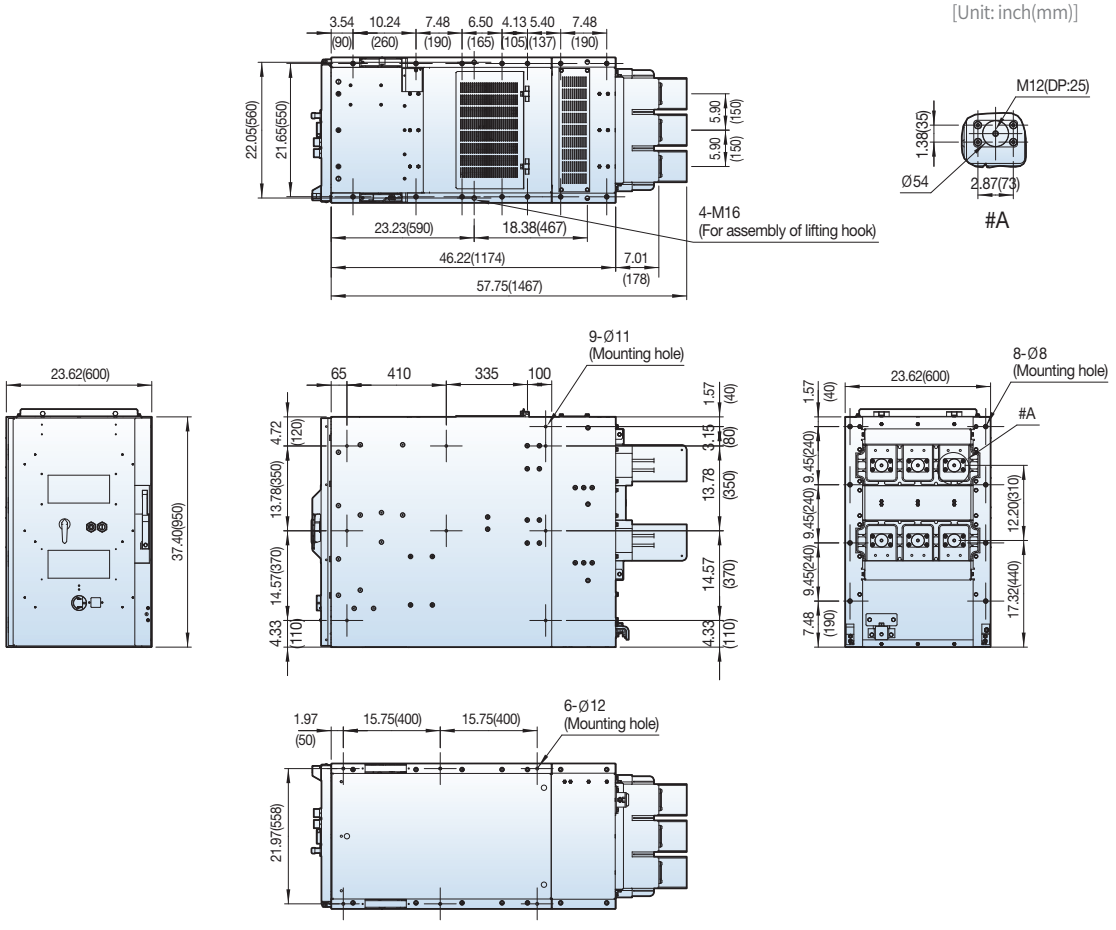
Dimensions

4.76/15kV, 25/31.5kA, 1200A

UVL type, Drawout type

[Unit: inch(mm)]

Type of cradle
UVCL-05Hf25A12
UVCL-05Hf32A12
UVCL-15Hf25A12
UVCL-15Hf32A12

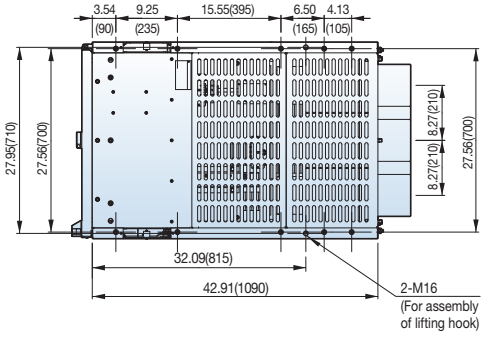


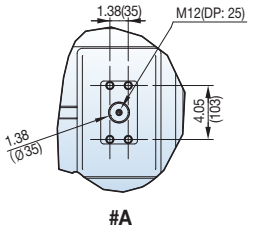
4.76/15kV, 25/31.5kA, 1200A

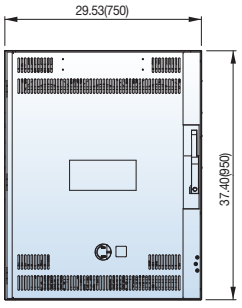
UVL type, Drawout type

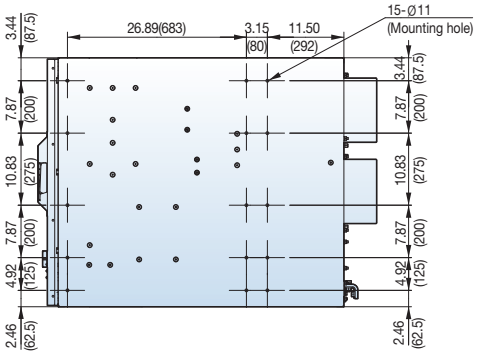
[Unit: inch(mm)]

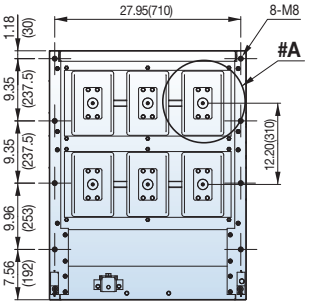
Type of cradle
UVCL-05Hf25B12
UVCL-05Hf32B12
UVCL-15Hf25B12
UVCL-15Hf32B12

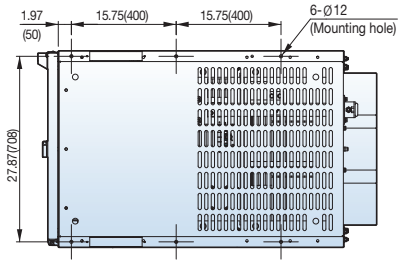












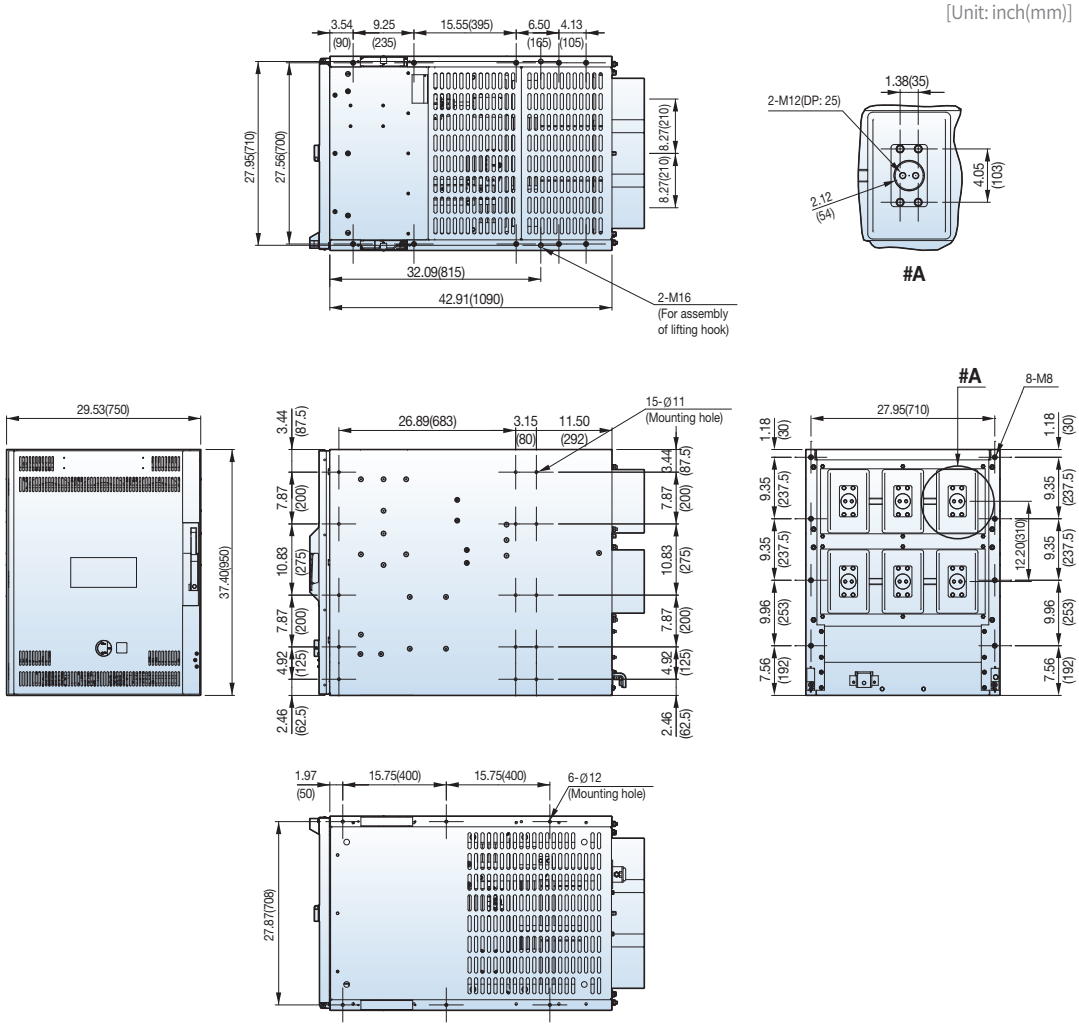
Dimensions

4.76/15kV, 25/31.5kA, 2000A

UVL type, Drawout type

[Unit: inch(mm)]

Type of cradle
UVCL-05Hf25B20
UVCL-05Hf32B20
UVCL-15Hf25B20
UVCL-15Hf32B20



Susol UVH

Drawout Type
(Draw in/out by using screw)

Contents

UVH type, Drawout type

UVH-38H

Circuit breaker type			UVH-38H			
Rated voltage		Ur (kV)	38			
Rated withstand voltage	Power frequency (1min)	Ud (kV)	80			
	Lightening impulse (1.2×50μs)	Up (kV)	170			
Rated short-circuit current		Isc (kA)	31.5		40	
Rated normal current		Ir (A)	1200	2000	1200	2000
Rated frequency		fr (Hz)	60	60	60	60
Rated short-circuit making current		Ip (kA) at 50 Hz	-	-	-	-
		Ip (kA) at 60 Hz	81.9	81.9	104	104
Rated short-time withstand current		Ik (kA)	31.5	31.5	40	40
		3sec	●	●	●	●
Operating sequence		O - 0.3s - CO - 15s - CO	●	●	●	●

Technical data

Opening time		Less than 0.04 sec
Rated breaking time		3 Cycle
No-load closing time		Less than 0.06 sec
Type test class	Mechanical endurance	M2 (10,000)
	Electrical endurance	Reference standard (page 88)
	Apacitance current switching	C2
Operate temperature	Low	- 40 °C
	High	40 °C

Selection guide of circuit breaker type

Description for circuit breaker type

UVH type, Drawout type

Basic model name	
UVH	Susol VCB

Rated voltage (kV)	
38	38

Version	
H	H type drawout (for MCSG)

Interrupting current (kA)	
32	31.5
40	40

Phase distance/Compatibility	
E	300mm

Rated current (A)	
12	1200A
20	2000A

Selection table of circuit breaker type

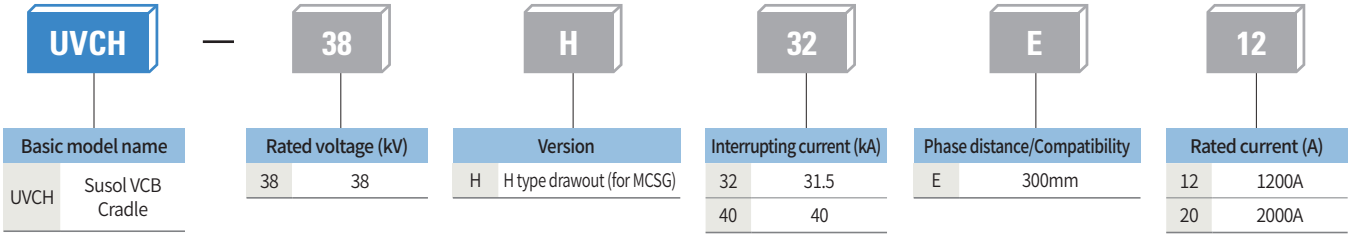
Select withrawal VCB/Cradle with same horizontal line.

Ur [kV]	Isc [kA]	Ir [A] p = 300	Type of circuit breaker	Weight [kg]	Outline dimension H×W×D [mm]	Dimension page
38	31.5	1200 2000	UVH-38H32E12 UVH-38H32E20	360 360	1100.5×963×1001.5 1100.5×963×1001.5	52 52
	40	1200 2000	UVH-38H40E12 UVH-38H40E20	360 360	1100.5×963×1001.5 1100.5×963×1001.5	52 52

Selection guide of circuit breaker type

Description for Cradle

UVH type, Drawout type



Basic model name	
UVCH	Susol VCB Cradle

Rated voltage (kV)	
38	38

Version	
H	H type drawout (for MCSG)

Interrupting current (kA)	
32	31.5
40	40

Phase distance/Compatibility	
E	300mm

Rated current (A)	
12	1200A
20	2000A

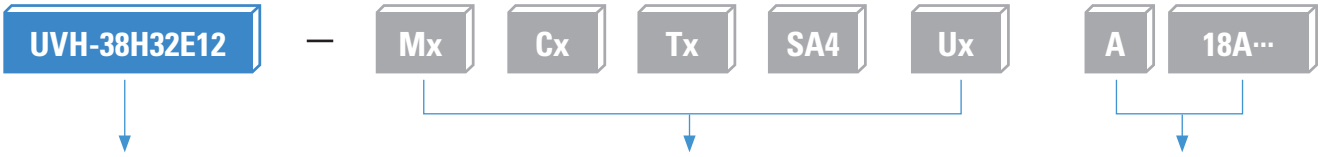
Selection table of cradle

Arc resistance	Type of cradle	Outline dimension H×W×D [mm]	Dimension page
-	UVCH-38H32E12	1827×1066×1851	52
-	UVCH-38H32E20	1827×1066×1851	52
-	UVCH-38H40E12	1827×1066×1851	52
-	UVCH-38H40E20	1827×1066×1851	52

Order form

Full description for circuit breaker

UVH type, Drawout type



❶ Type of circuit breaker (select from the previous page)

❷ Control source and auxiliary contacts & connector

❸ Accessories

※ In case of selecting ❸ Accessories, only type Symbol 'A' once. (ex. A18A)

Order form for circuit breaker

Please select only one of the items on the same horizontal line. (* Required selection)

UVH, VCB, **Drawout type**

(○ no extra charge ☐ extra charge)

❶ Type of VCB from selection table* — **ea**

❷ Control source and auxiliary contacts & connector

Motor* (Mx) — page 64

○ M0	○ M1	○ M2	○ M3	○ M5	○ M6	○ M7	○ M8
Without motor	DC 110V	DC 200V ~ 250V	DC 125V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Closing coil* (Cx) — page 65

○ C0	○ C1	○ C2	○ C3	○ C5	○ C6	○ C7	○ C8
Without CC	DC 110V	DC 200V ~ 250V	DC 125V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Shunt Trip Coil* (Tx) — page 66

○ T0	○ T1	○ T2	○ T3	○ T5	○ T6	○ T7	○ T8
Without SHT	DC 110V	DC 200V ~ 250V	DC 125V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Auxiliary contacts & Connector type* — page 69

○ SC4 (10a10b Standard Autocon type)

Under Voltage Release (Ux) — page 70

○ U0*	☐ U1	☐ U2	☐ U3	☐ U5	☐ U6	☐ U7	☐ U8
Without UVT	DC 110V	DC 200V ~ 250V	DC 125V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

※ even without UVT, U0 must be selected to make VCB ordering code and description

❸ Accessories

Combination table

U0	1	
U1~8		1
A1 & A2	1	
A6		1

Available no. of Aux. contact

Symbol	10a10b
Standard	10 NO, 10 NC
with A1	9 NO, 9 NC
with A2	9 NO, 8 NC

Secondary Shunt Trip Coil — page 67

☐ A1 (Secondary shunt trip coil)
※ In case of selecting A1, maximum auxilary contacts are 9a9b

☐ A2 (Secondary shunt trip coil monitoring contact)
※ In case of selecting A2, maximum auxilary contacts are 9a8b

Latch checking s/w — page 71

☐ A6
※ In case of selecting UVT(U1~U0), Latch checking s/w should be selected.

Button Padlock* — page 73

○ A8 (Button padlock)

MOC operator* — page 76

○ AE (MOC operator)

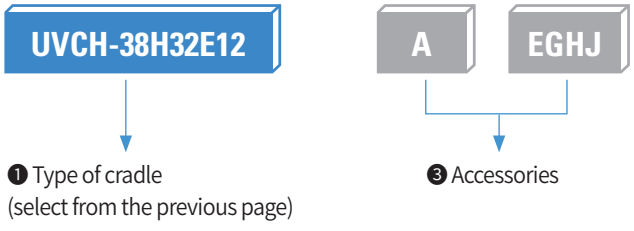
Kirk Key Mounting Kit — page 72

☐ AM (KirkKey, CAMLOCK type)

Order form

Full description for cradle

UVH type, Drawout type



Order form for cradle

Please select only one of the items on the same horizontal line. (* Required selection)

UVL, VCB, **Drawout type**

(○ no extra charge ☐ extra charge)

❶ Type of VCB from selection table*	Quantity	ea
❸ Accessories		
Shutter Padlock*		page 81
○ AE (Shutter padlock)		
TOC*		page 81
○ AF (TOC)		
MOC*		page 82
○ AG (MOC)		
Door*		page 82
○ AH (Door)		
Door Interlock*		page 83
○ AJ (Door Interlock)		
Lead wire*		page 74
○ AN (cradle attached Lead wire)		

Separately sold accessories

Racking In/Out handle	page 84
☐ 55213163003 (Universal type)	
Charge handle	page XX
☐ 55213143006	
CTU (Coil test unit)	page 78
☐ 73873171221 CTU (Coil test unit)	
UDC (UVT dalay controller)	page 80
☐ 52773171282 UDC (UVT delay controller) AC/DC 100~130V	
☐ 52773171283 UDC (UVT delay controller) AC/DC 200~250V	
☐ 52773171281 UDC (UVT delay controller) DC 48~60V and AC 48V	
CTD (Condenser trip device)	page 79
☐ 76113143001 CTD (Condenser trip device) AC/DC 100V, 110V	
☐ 76113143002 CTD (Condenser trip device) AC/DC 200V, 220V	

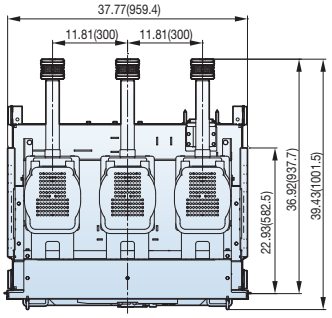
Dimensions

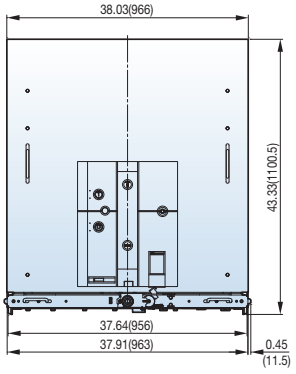
38kV, 31.5/40kA, 1200/2000A

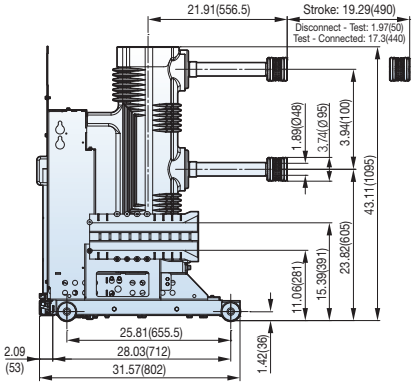
UVH type, Drawout type

[Unit: inch(mm)]

Type of circuit breaker
UVH-38P32E12
UVH-38P32E20
UVH-38P40E12
UVH-38P40E20







Dimensions

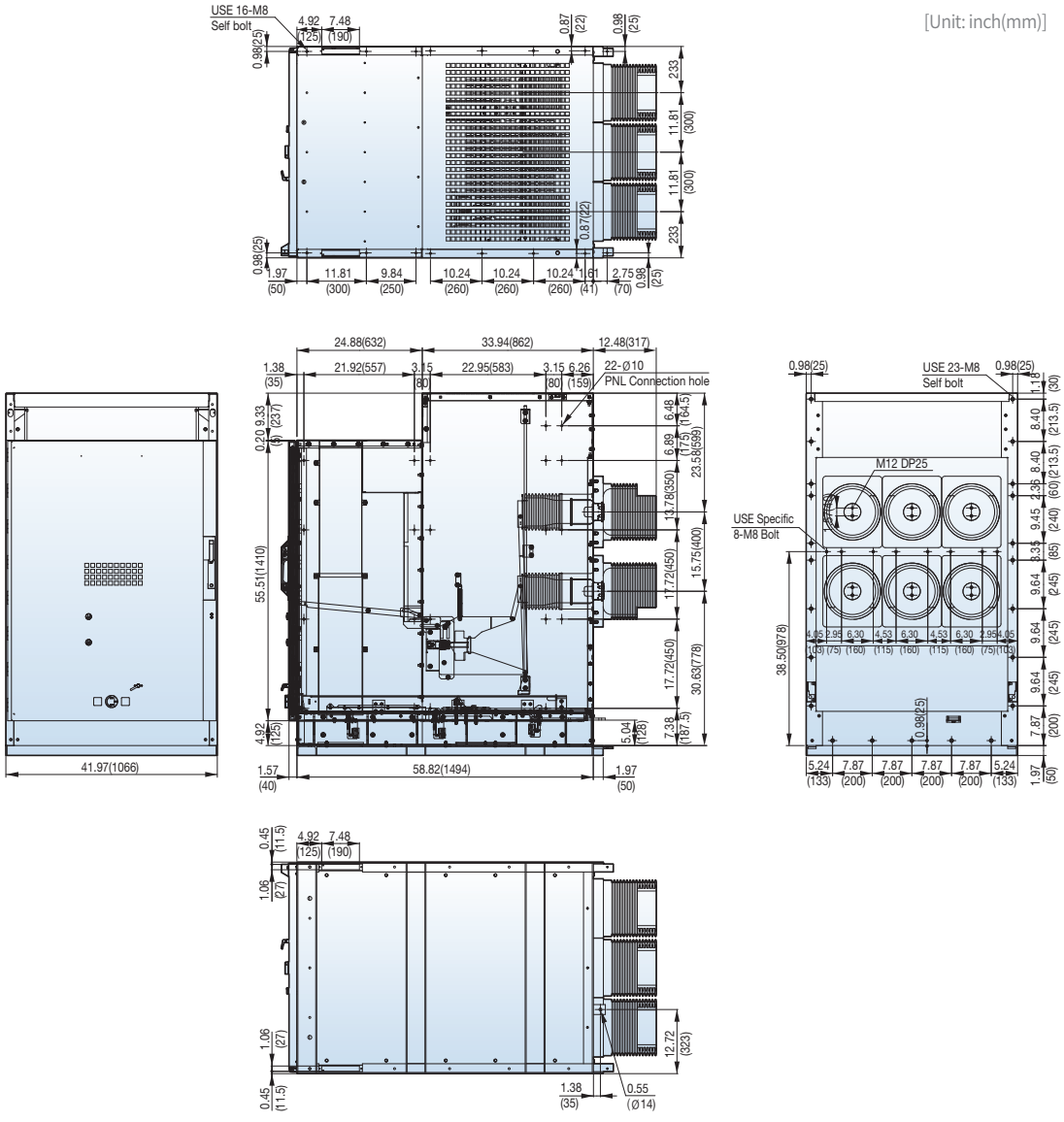
38kV, 31.5/40kA, 1200/2000A

UVH type, Drawout type

[Unit: inch(mm)]

Type of circuit breaker

UVCH-38H32E12
UVCH-38H32E20
UVCH-38H40E12
UVCH-38H40E20



Susol VH

Drawout Type
(Draw in/out by using screw)

Contents

VH type, Drawout Type

VH-05H / VH-15H

Circuit breaker type			VH-05H						VH-15H					
Rated voltage		Ur (kV)	4.76						15					
Rated withstand voltage	Power frequency (1min)	Ud (kV)	19						36					
	Lightening impulse (1.2×50μs)	Up (kV)	60						95					
Rated short-circuit current		Isc (kA)	40			50			40			50		
Rated normal current		Ir (A)	1200	2000	3000	1200	2000	3000	1200	2000	3000	1200	2000	3000
Rated frequency		fr (Hz)	60	60	60	60	60	60	60	60	60	60	60	60
Rated short-circuit making current		Ip (kA) at 50 Hz	-	-	-	-	-	-	-	-	-	-	-	-
		Ip (kA) at 60 Hz	104	104	104	130	130	130	104	104	104	130	130	130
Rated short-time withstand current		Ik (kA)	40	40	40	50	50	50	40	40	40	50	50	50
		3sec	●	●	●	●	●	●	●	●	●	●	●	●
Operating sequence		O - 0.3s - CO - 15s - CO	●	●	●	●	●	●	●	●	●	●	●	●

Technical data

Opening time		Less than 0.04 sec
Rated breaking time		3 Cycle
No-load closing time		Less than 0.06 sec
Type test class	Mechanical endurance	M2 (10,000)
	Electrical endurance	Reference standard (page 88)
	Apacitance current switching	C2
Operate temperature	Low	- 30 °C
	High	40 °C

Selection guide of circuit breaker type

Description for circuit breaker type

VH type, Drawout type

VH — 15 H 50 C 30

Basic model name	
VH	Susol VCB

Rated voltage (kV)	
05	4.76
15	15

Version	
H	H type drawout (for MCSG)

Interrupting current (kA)	
40	40
50	50

Phase distance/Compatibility	
C	254mm

Rated current (A)	
12	1200A
20	2000A
30	3000A

Selection table of circuit breaker type

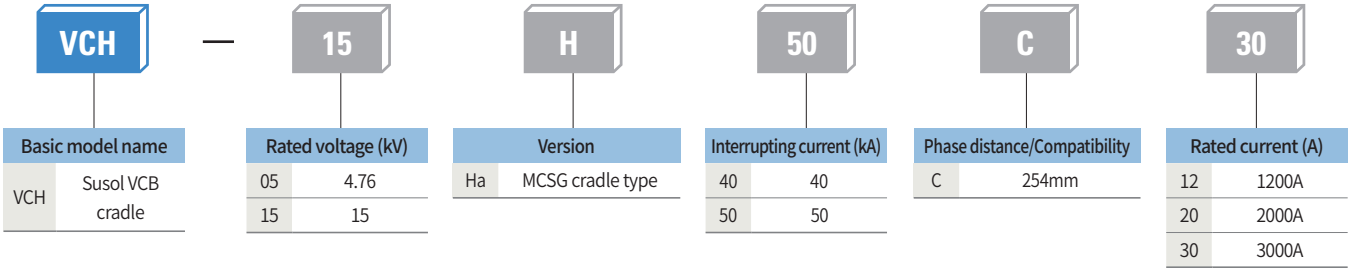
Select withrawal VCB/Cradle with same horizontal line.

Ur [kV]	Isc [kA]	Ir [A] p = 254	Type of circuit breaker	Weight [kg]	Outline dimension H×W×D [mm]	Dimension page
4.76	40	1200	VH-05H40C12	230	815×722×718	59
		2000	VH-05H40C20	230	815×722×718	59
		3000	VH-05H40C30	265	815×722×718	59
	50	1200	VH-05H50C12	230	815×722×718	59
		2000	VH-05H50C20	230	815×722×718	59
		3000	VH-05H50C30	265	815×722×728	59
15	40	1200	VH-15H40C12	230	815×722×718	59
		2000	VH-15H40C20	230	815×722×718	59
		3000	VH-15H40C30	265	815×722×728	59
	50	1200	VH-15H50C12	230	815×722×718	59
		2000	VH-15H50C20	230	815×722×718	59
		3000	VH-15H50C30	265	815×722×728	59

Selection guide of circuit breaker type

Description for cradle

VH type, Drawout type



Basic model name	
VCH	Susol VCB cradle

Rated voltage (kV)	
05	4.76
15	15

Version	
Ha	MCSG cradle type

Interrupting current (kA)	
40	40
50	50

Phase distance/Compatibility	
C	254mm

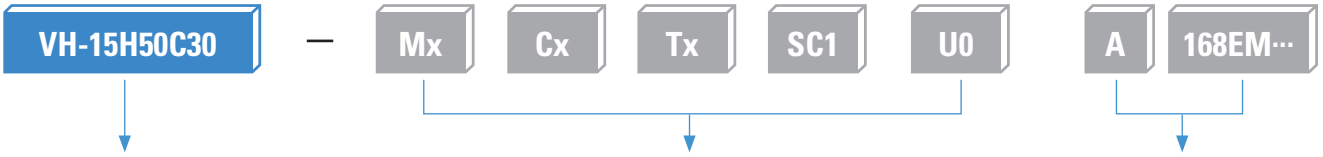
Rated current (A)	
12	1200A
20	2000A
30	3000A

Selection table of cradle

Arc resistance	Type of cradle	Outline dimension H×W×D [mm]	Dimension page
-	VCH-05Ha40C12	1035×816×1156.8	60
-	VCH-05Ha40C20	1035×816×1156.8	60
-	VCH-05Ha40C30	1035×816×1156.8	61
-	VCH-05Ha50C12	1035×816×1156.8	60
-	VCH-05Ha50C20	1035×816×1156.8	60
-	VCH-05Ha50C30	1035×816×1156.8	61
-	VCH-15Ha40C12	1035×816×1156.8	60
-	VCH-15Ha40C20	1035×816×1156.8	60
-	VCH-15Ha40C30	1035×816×1156.8	61
-	VCH-15Ha50C12	1035×816×1156.8	60
-	VCH-15Ha50C20	1035×816×1156.8	60
-	VCH-15Ha50C30	1035×816×1156.8	61

Full description for circuit breaker

VH type, Drawout type



❶ Type of circuit breaker (select from the previous page)

❷ Control source and auxiliary contacts & connector

❸ Accessories

※ In case of selecting ❸ Accessories, only type Symbol 'A' once. (ex. A18A)

Order form for circuit breaker

Please select only one of the items on the same horizontal line. (* Required selection)

VH, VCB, **Drawout type**

(○ no extra charge ☐ extra charge)

❶ Type of VCB from selection table* — **ea**

❷ Control source and auxiliary contacts & connector

Motor* (Mx) — **page 64**

○ M0	○ M1	○ M2	○ M3	○ M5	○ M6	○ M7	○ M8
Without motor	DC 110V	DC 200V ~ 250V	DC 125V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Closing coil* (Cx) — **page 65**

○ C0	○ C1	○ C2	○ C3	○ C5	○ C6	○ C7	○ C8
Without CC	DC 110V	DC 200V ~ 250V	DC 125V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Shunt Trip Coil* (Tx) — **page 66**

○ T0	○ T1	○ T2	○ T3	○ T5	○ T6	○ T7	○ T8
Without SHT	DC 110V	DC 200V ~ 250V	DC 125V	DC 48V ~ 60V	AC 48V	AC 100V ~ 130V	AC 200V ~ 250V

Auxiliary contacts & Connector type* — **page 69**

○ SC1 (3a3b Standard Autocon type)

Under Voltage Release (Ux) — **page 70**

○ U0*

Without UVT

※ even without UVT, U0 must be selected to make VCB ordering code and description

❸ Accessories

Secondary Shunt Trip Coil — **page 67**

☐ A1 (Secondary shunt trip coil)

Latch checking s/w — **page 71**

☐ A6

Button Padlock* — **page 73**

○ A8 (Button padlock)

MOC operator* — **page 76**

○ AE (MOC operator)

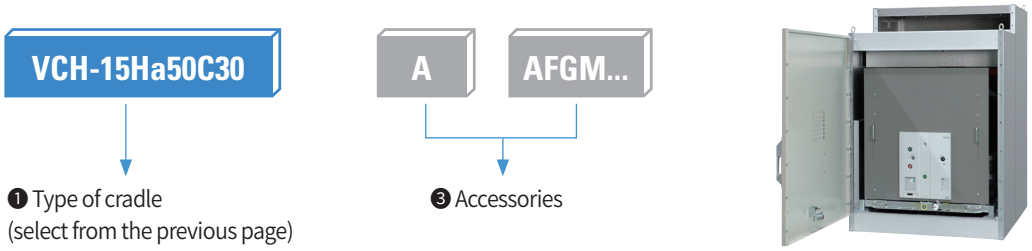
Kirk Key Mounting Kit — **page 72**

☐ AM (KirkKey, CAMLOCK type)

Order form

Full description for cradle

VH type, Drawout type



Order form for cradle

Please select only one of the items on the same horizontal line. (* Required selection)

UVL, VCB, **Drawout type**

(○ no extra charge ☐ extra charge)

❶ Type of cradle from selection table*	Quantity	ea

❸ Accessories		
TOC*		**page 81**
○ AF (TOC)		
MOC*		**page 82**
○ AG (MOC)		
Lead wire*		**page 74**
○ AM (cradle attached 3a3b Lead wire)	○ AN (cradle attached 3a3b + Secondary trip coil Lead wire)	
※ In case of selecting A1(Secondary trip coil) acc. With the breaker, AN should be selected.		

Separately sold accessories

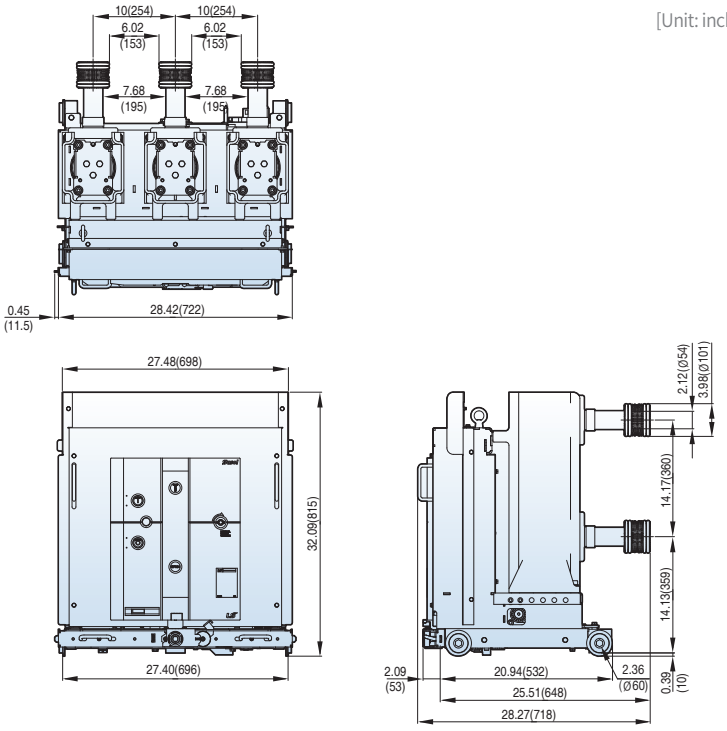
Racking In/Out handle	**page 84**
☐ 55213163003 (Universal type)	
Charge handle	**page XX**
☐ 55213143006	
CTU (Coil test unit)	**page 78**
☐ 73873171221 CTU (Coil test unit)	
CTD (Condenser trip device)	**page 79**
☐ 76113143001 CTD (Condenser trip device) AC/DC 100V, 110V	
☐ 76113143002 CTD (Condenser trip device) AC/DC 200V, 220V	

4.76/15kV, 40/50kA, 1200/2000A

VH type, Drawout type

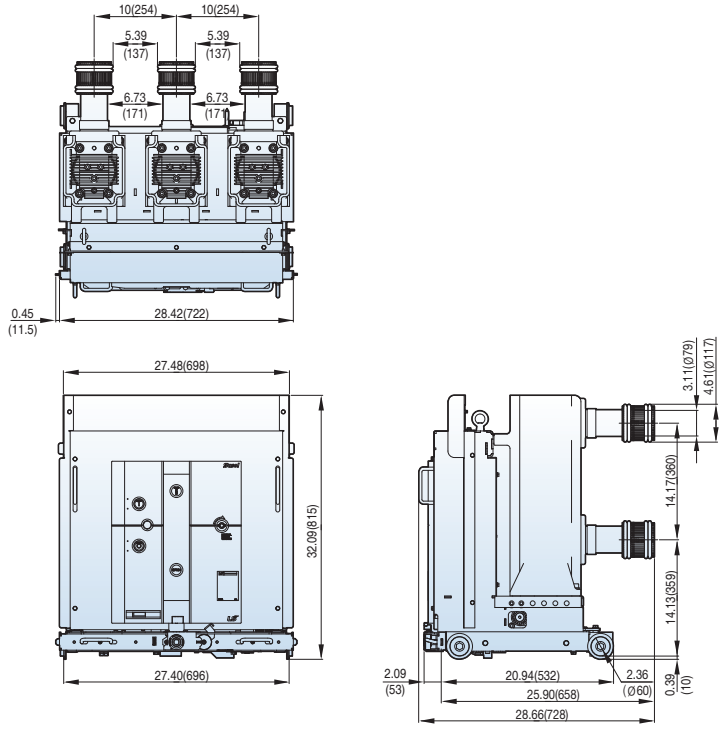
[Unit: inch(mm)]

Type of circuit breaker
VH-05H40C12
VH-05H40C20
VH-05H50C12
VH-05H50C20
VH-15H40C12
VH-15H40C20
VH-15H50C12
VH-15H50C20



4.76/15kV, 40/50kA, 3000A

Type of circuit breaker
VH-05H40C30
VH-05H50C30
VH-15H40C30
VH-15H50C30



Dimensions

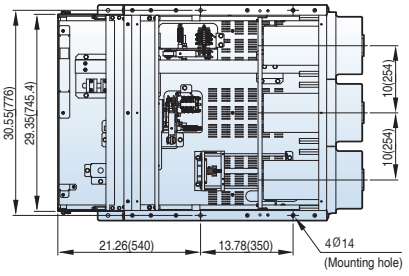
4.76/15kV, 40/50kA, 1200/2000A

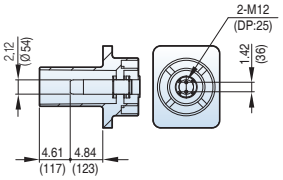
VH type, Drawout type

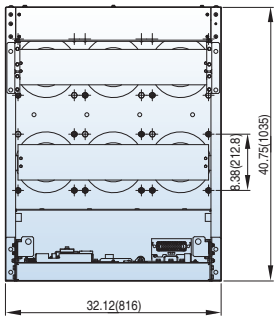
[Unit: inch(mm)]

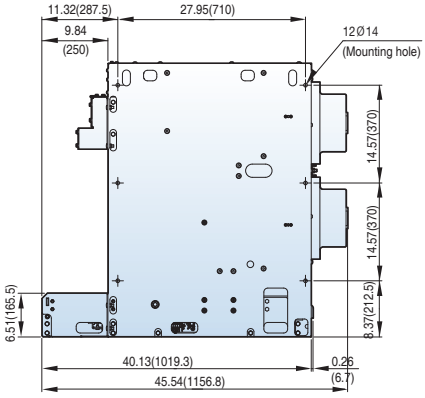
Type of circuit breaker

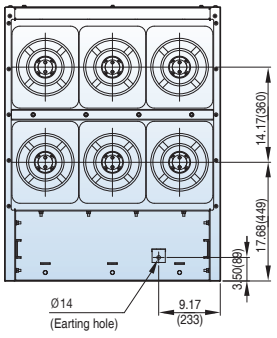
- VCH-05Ha40C12
- VCH-05Ha40C20
- VCH-05Ha50C12
- VCH-05Ha50C20
- VCH-15Ha40C12
- VCH-15Ha40C20
- VCH-15Ha50C12
- VCH-15Ha50C20

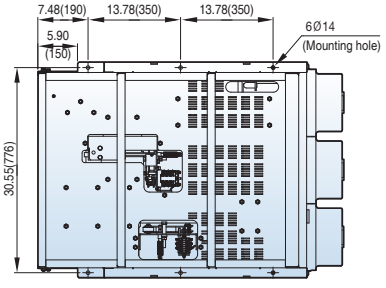












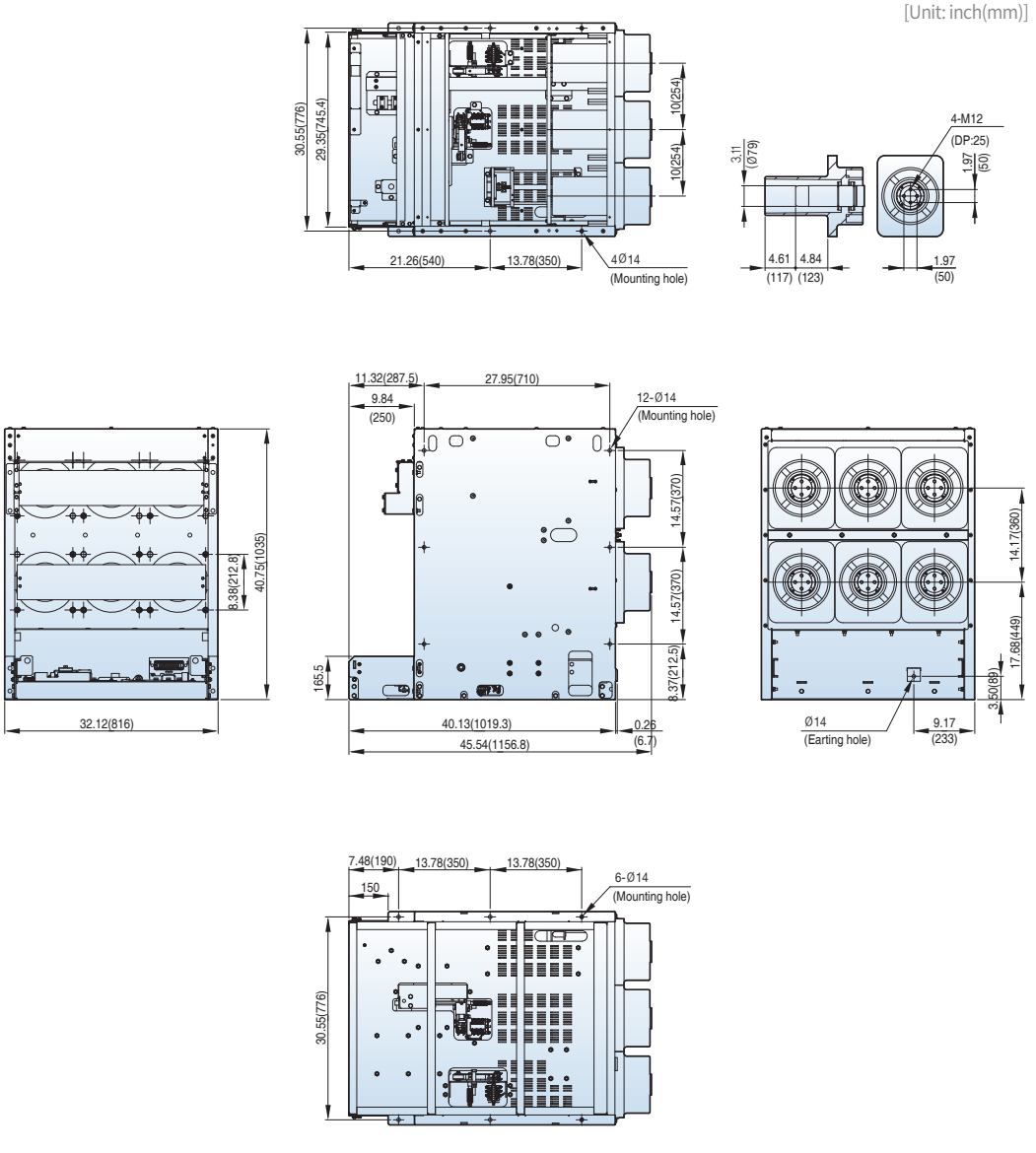
4.76/15kV, 40/50kA, 3000A

VH type, Drawout type

[Unit: inch(mm)]

Type of circuit breaker

VCH-05Ha40C30
VCH-05Ha50C30
VCH-15Ha40C30
VCH-15Ha50C30



Memo

Susol VCB

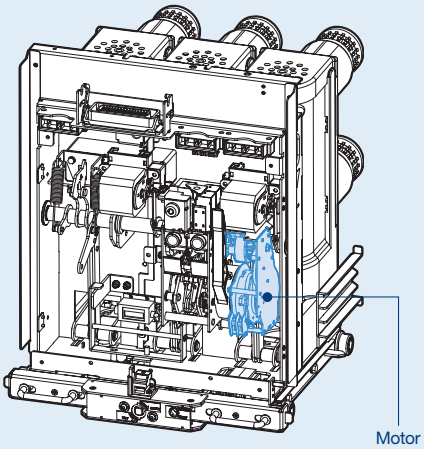
Contents

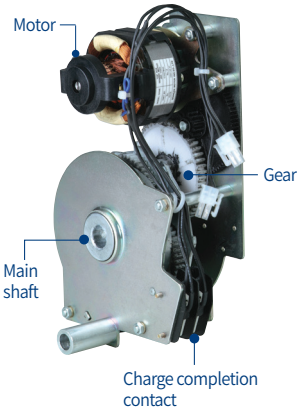
Motor: M1~M8

Standard parts

UVL 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.

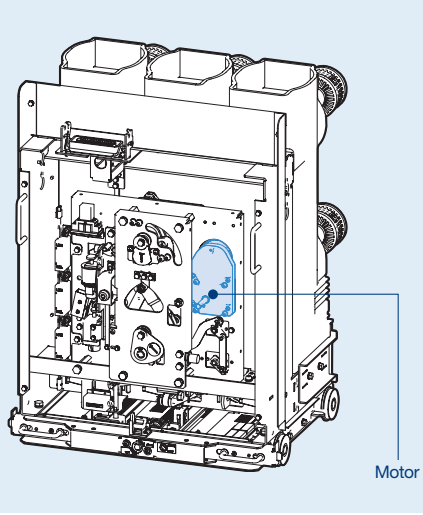


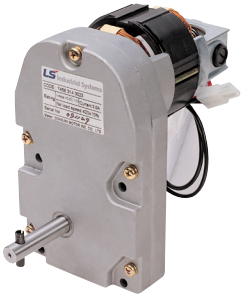


	UVL type							
Input voltage (Vn)	DC 110V	DC 200V~ 250V	DC 125V	DC 24V~ 30V	DC 48V~ 60V	AC 48V	AC 100V~ 130V	AC 200V~ 250V
Load current (A)	≤ 1	≤ 0.5	≤ 1	≤ 5	≤ 3	≤ 3	≤ 1	≤ 0.5
Starting current (A)	5 times of load current							
Charge time	Within 5 sec.							

Note) Rated operation and control voltage range, see page 68.

VH/UVH type





	VH/UVH type						
Input voltage (Vn)	DC 48~60V	DC 110V	DC 125V	DC 200~250V	AC 48V	AC 100~130V	AC 200~250V
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.						

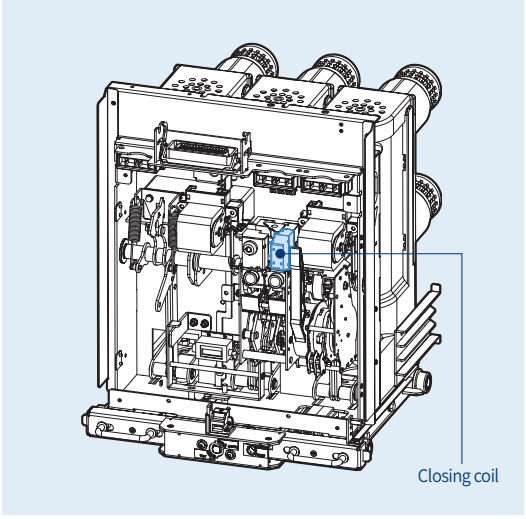
Note) Rated operation and control voltage range, see page 68.

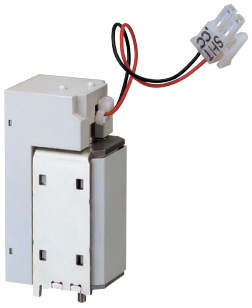
Closing Coil: C1~C8

Standard parts

UVL type

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



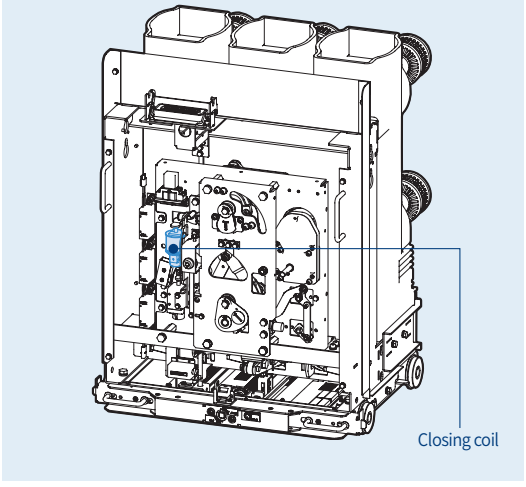


	UVL type							
Input voltage (Vn)	DC 110V	DC 200V~ 250V	DC 125V	DC 24V~ 30V	DC 48V~ 60V	AC 48V	AC 100V~ 130V	AC 200V~ 250V
Power consumption (inrush, VA)	-	-	-	-	-	200		
Power consumption (steady, VA)						≤ 5		
Rated current (A)	≤ 4	≤ 2	≤ 4	≤ 10	≤ 5	-		

Note) Rated operation and control voltage range, see page 68.

VH/UVH 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/UVH type						
Input voltage (Vn)	DC 48~60V	DC 110V	DC 125V	DC 200~250V	AC 48V	AC 100~130V	AC 200~250V
Rated current (A)	≤ 8	≤ 3	≤ 3	≤ 2.5	≤ 8	≤ 3	≤ 2.5

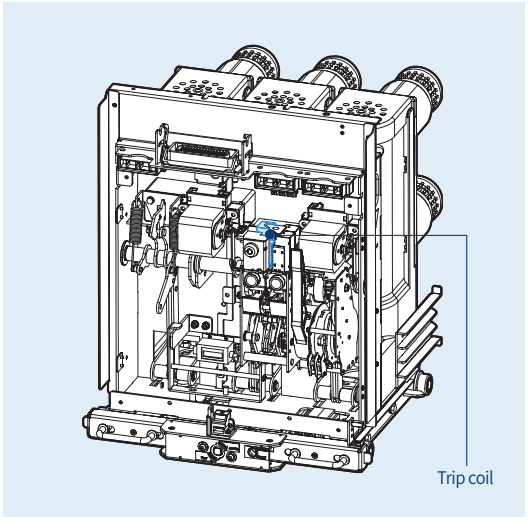
Note) Rated operation and control voltage range, see page 68.

Trip Coil: T1~T8

Standard parts

UVL 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.

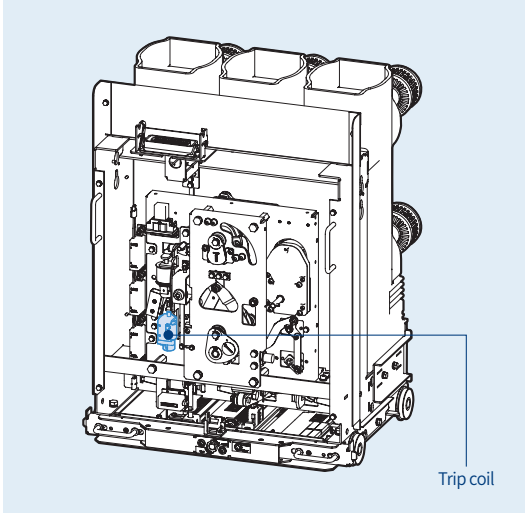


	UVL type							
Input voltage (Vn)	DC 110V	DC 200V~ 250V	DC 125V	DC 24V~ 30V	DC 48V~ 60V	AC 48V	AC 100V~ 130V	AC 200V~ 250V
Power consumption (inrush, VA)	-					200		
Power consumption (steady, VA)						≤ 5		
Rated current (A)	≤ 4	≤ 2	≤ 4	≤ 10	≤ 5	-		

Note) Rated operation and control voltage range, see page 68.

VH/UVH type

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



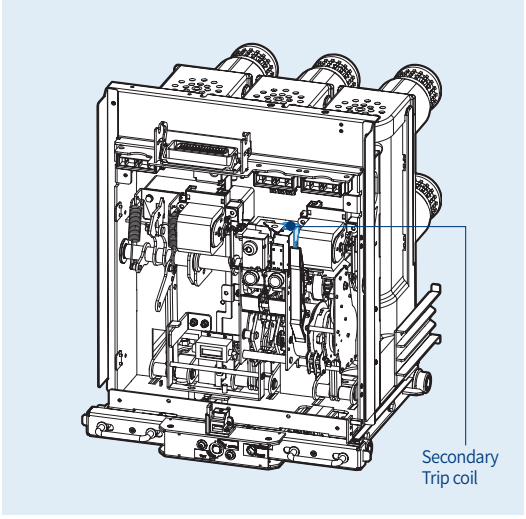
	VH/UVH type						
Input voltage (Vn)	DC 48V	DC 110V	DC 125V	DC 220~250V	AC 48V	AC 110V	AC 220V
Rated current (A)	≤ 8	≤ 3	≤ 3	≤ 2.5	≤ 8	≤ 3	≤ 2.5

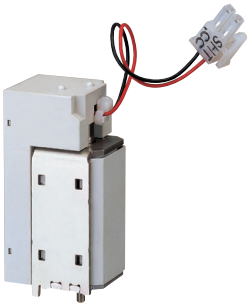
Note) Rated operation and control voltage range, see page 68.

Secondary Trip Coil: A1

UVL 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.

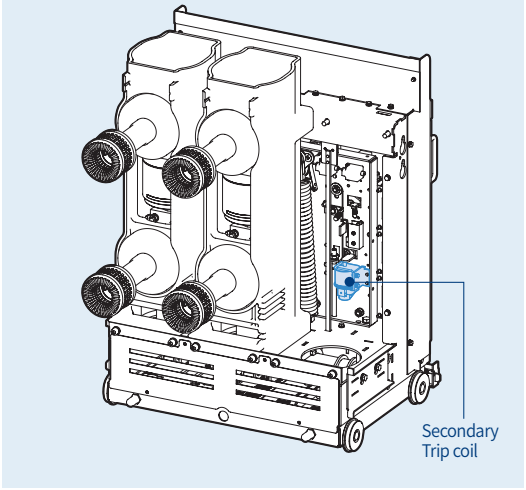




	UVL type							
Input voltage (Vn)	DC 110V	DC 200V~ 250V	DC 125V	DC 24V~ 30V	DC 48V~ 60V	AC 48V	AC 100V~ 130V	AC 200V~ 250V
Power consumption (inrush, VA)	400			200		200		
Power consumption (steady, VA)	-			≤ 5		≤ 5		

VH/UVH 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/UVH type						
Input voltage (Vn)	DC 48V	DC 110V	DC 125V	DC 220~250V	AC 48V	AC 110V	AC 220V
Rated current (A)	≤ 8	≤ 3	≤ 3	≤ 2.5	≤ 8	≤ 3	≤ 2.5

Rated operation and control voltage range

Rated control voltage range	DC Voltage range		Remarks
	Motor, Closing	Trip	
24	-	14~28	
48	38~56	28~56	
125	100~140	70~140	
250	200~280	140~280	
Applied standard	IEEE C37.09		

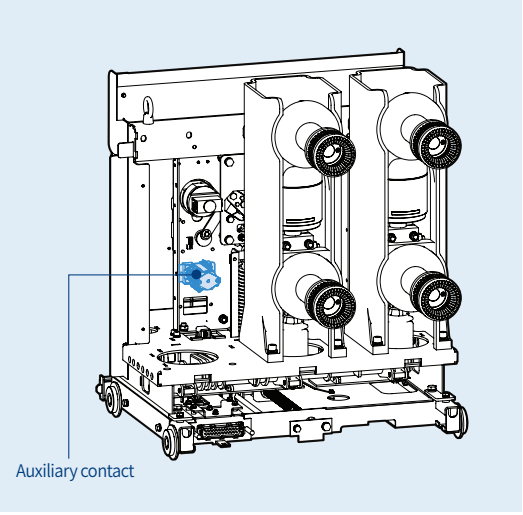
Rated control voltage range	AC Voltage range	Remarks
	Motor, Closing, Trip	
24	-	
48	-	
120	104~127	
240	208~254	
Applied standard	IEEE C37.09	

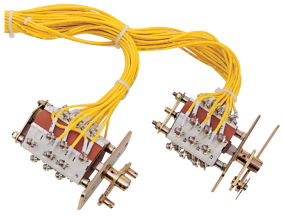
Auxiliary Contact: SC1

Standard parts

VH-05/15 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 3a3b.
- Two(2) “Early b” auxiliary contact is provided. (Terminal No. 56-57, 58-59)





Item		Resistive load(A)	Inductive load(A)
Contact configuration	DC 125V	10	5

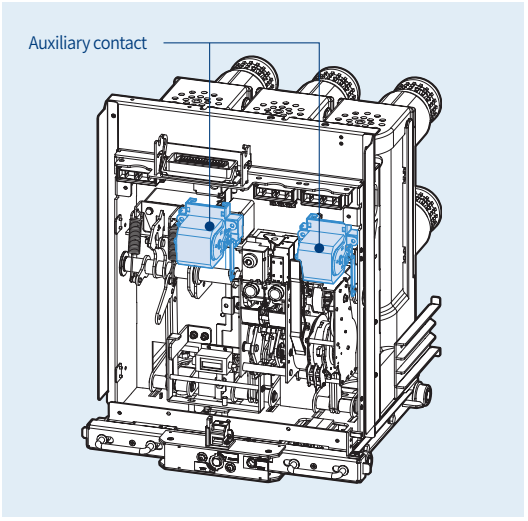
Auxiliary Contact: SA2, SA4

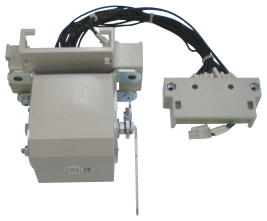
Standard parts

UVL type

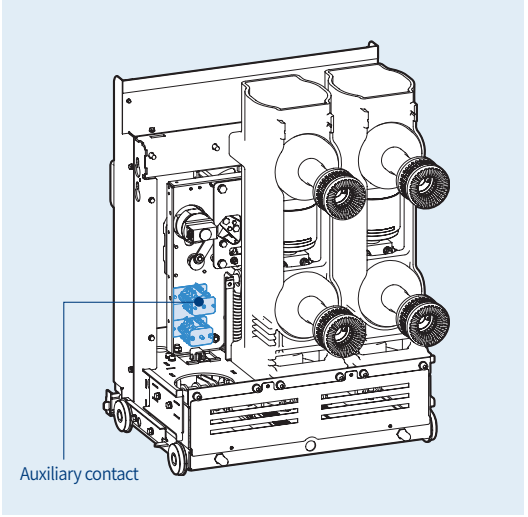
- It is a contact used to monitor ON/OFF status of a breaker from remote place.
- The auxiliary contacts supplied as standard configuration is 4a4b. 10a10b is also available on request.

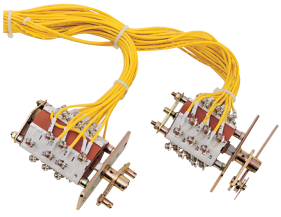
Item	UVL/VH/UVH-27 type
Standard (SA2)	4a4b
Optional (SA4)	10a10b





VH/UVH type



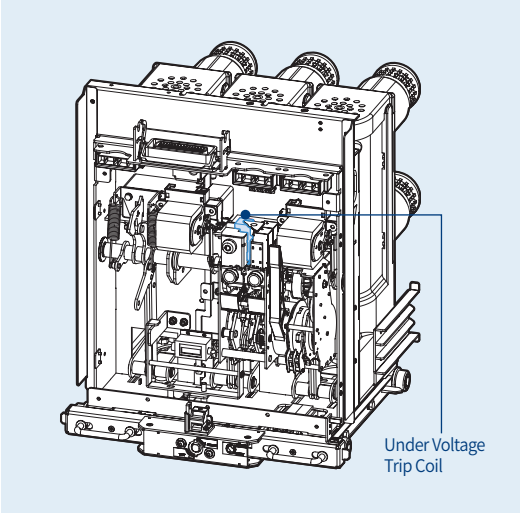


Item			UVL/VH/UVH type		
			Resistive load (A)	Inductive load (A)	Remarks
Contact configuration	AC	250V	10	5	For all models
		125V	10	5	
	DC	250V	10	5	
		125V	10	5	
		30V	10	5	

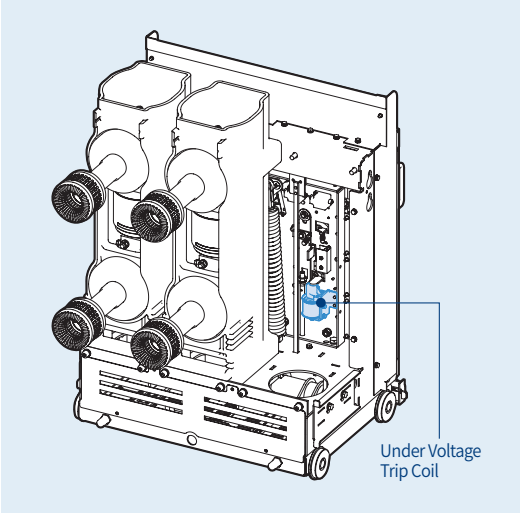
Under Voltage Trip Coil: U1~U8

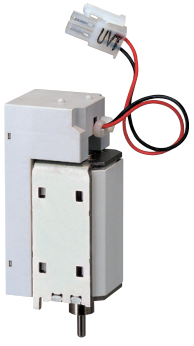
Breaker Options

UVL type



UVH type





UVL type

VH/UVH 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.

  * UVT is only applicable for Fixed type (P type)

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)

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

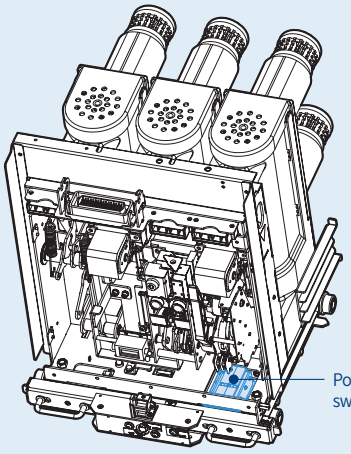
	UVH type						
Input voltage (Vn)	DC 48V	DC 110V	DC 125V	DC 220V	AC 48V	AC 110V	AC 220V
Power consumption (inrush, VA)	350						
Power consumption (steady, VA)	≤ 10						

Position Switch: A3, A4, A5

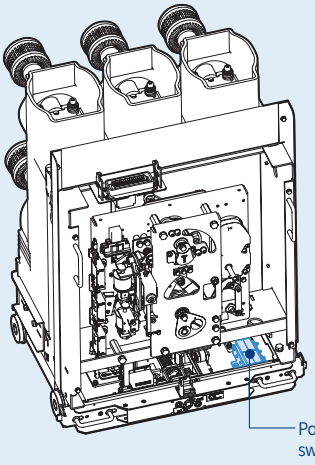
Breaker Options

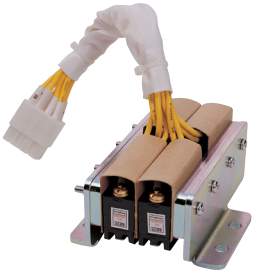
UVL type - H Cradle

UVL



VH/UVH

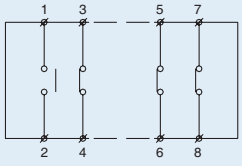


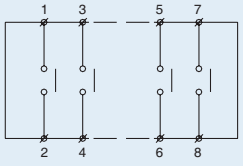


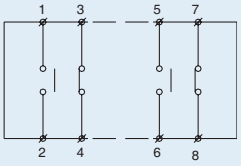
Large model (VH/UVH)

• This switch is used to indicate the breaker position (CONNECT, TEST), and contact configuration is 2a2a or 2a2b, 1a3b.

Contact configuration





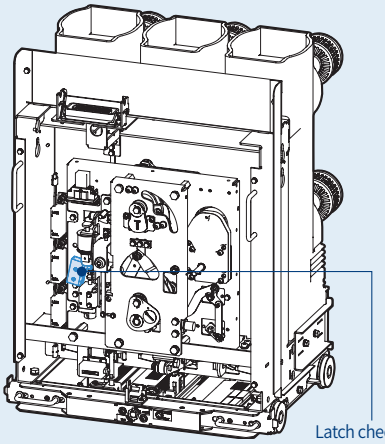


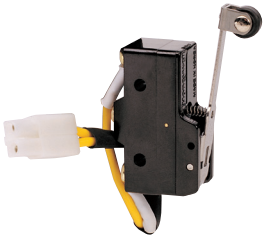
Latch checking switch: A6

Breaker Options

VH/UVH 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.





Keylock: A7, AM, AN, AP

UVL type

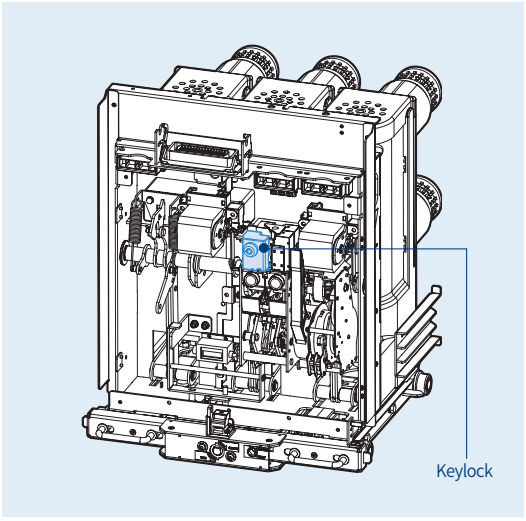
• The key is to unlock the locking device first to close the breaker electrically and mechanically.

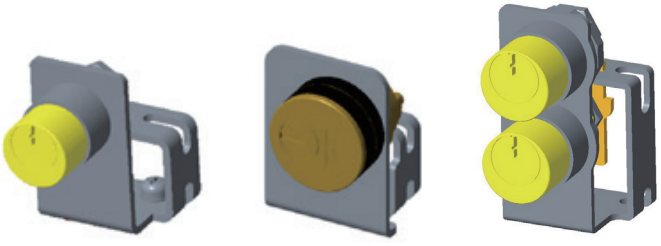
***How to operate**

- 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.

1. A7: KEYLOCK(NORMAL Type)
2. AM: KIRKKEY LOCK(CAMLOCK Type)
3. AN: KIRKKEY LOCK(CN22 Type)
4. AP: KIRKKEY LOCK(DOUBLE CAMLOCK Type)

* The KIRKKEY is not provided separately when ordering AM, AN or AP option. The assembling bracket and instruction manual are provided.



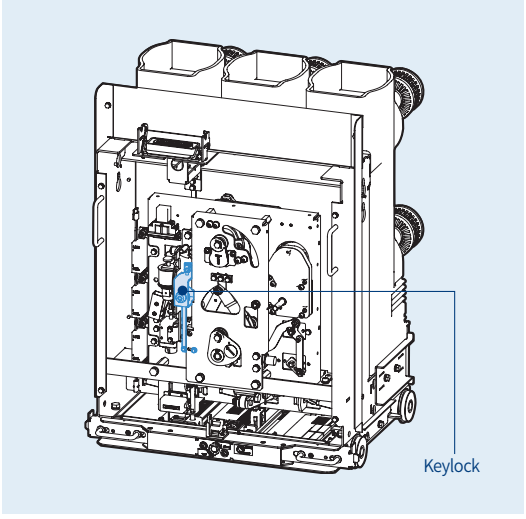


AM AN AP

VH/UVH 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, AX

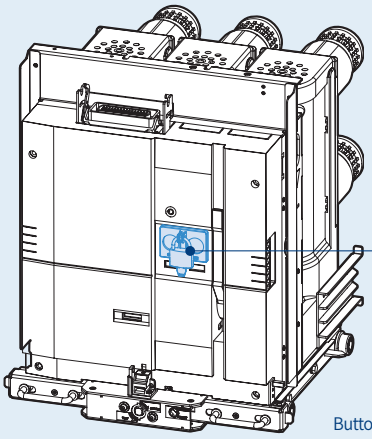
Breaker Options

UVL type

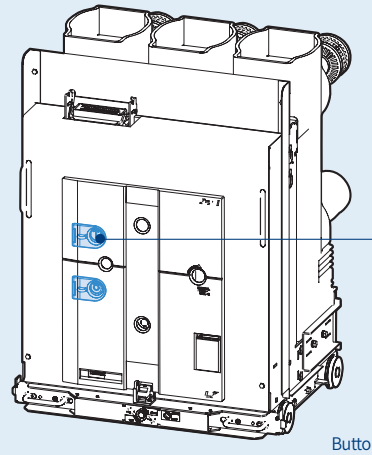
- It is to prevent manual operation of ON/OFF button due to user's wrong handling.
- A8 option: It is not possible to handle ON/OFF manual operation under the "Button lock" status.
- AX option :It is not possible to handle ON/OFF manual/ electrical operation under the "Button lock" status.

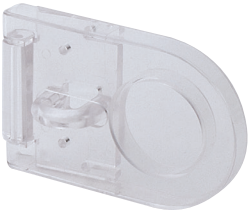
* Key lock is not supplied.

1. A8: Normal type Button Padlock
2. AX: Button Padlock In open



VH/UVH type





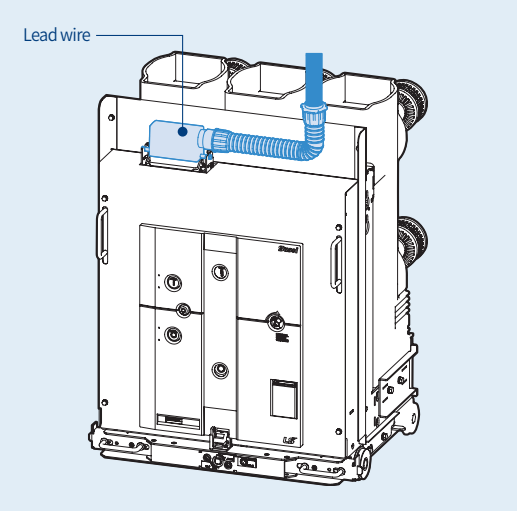
Lead wire: AA(breaker option) or AM,AN(Cradle option)

Breaker Options

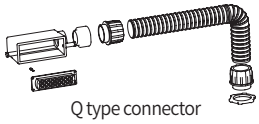
UVL/UVH type

- It is to connect with the control circuit of a breaker from outside. (supply wire length: 2m)
- A type connector is supplied for P/E/F/G type of UVL VCB.
- Q type connector is supplied for P type of VH/UVH VCB.
- The AM and AN options are the same as the AA option that can be selected with the breaker. And when they are selected as the cradle option, they will be attached to the cradle and shipped. (Customers can perform wiring work in advance)

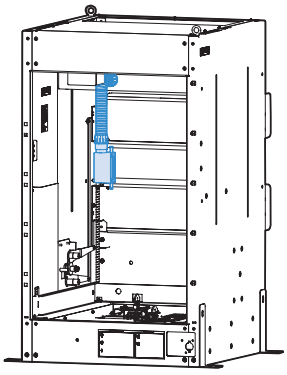
Note) Standard Lead wire length is 2m. If you need extra length, please contact LS sales.
Note) AN(standard) is for 10a10b, AM is for 4a4b



A type connector



Q type connector



Supply ways of Lead wires by VCB model

VCB model \ Cradle type	P	E	F	G	H
UVL	Enclosed in the breaker				Enclosed in the breaker Installed in the cradle (option)
VH/UVH	Enclosed in the breaker				Enclosed in the breaker Installed in the cradle (option)

Plug/Terminal for lead wire: AB

Breaker Options

UVL/UVH type

A type connector

Q 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 Q.

Plug interlock: AC

Breaker Options

UVL type

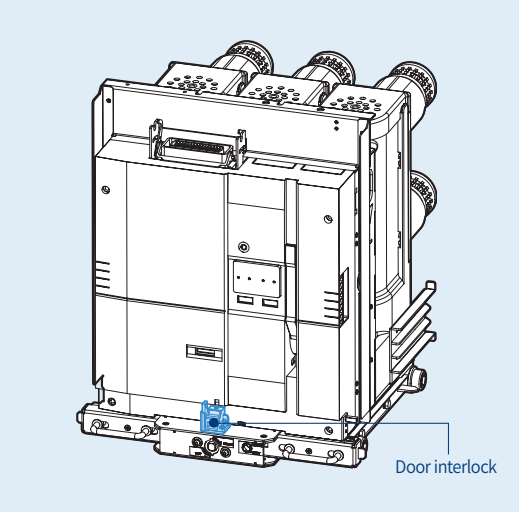
- It checks if the control power connector on the cradle (H type) is connected with the connecting terminal of the breaker before the proceeding of draw-in or out.
- It is not allowed to seperate the control power connector from the breaker in the position of draw-in /out or CONNECT, but TEST position.

Padlock/Door racking interlock: AD

Breaker Options

UVL type

- 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 CONNECT.

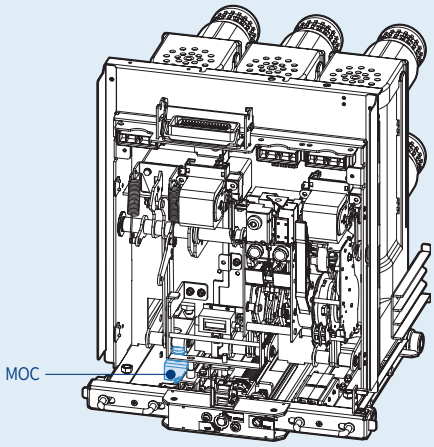


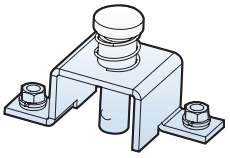
MOC operator: AE

Breaker Options

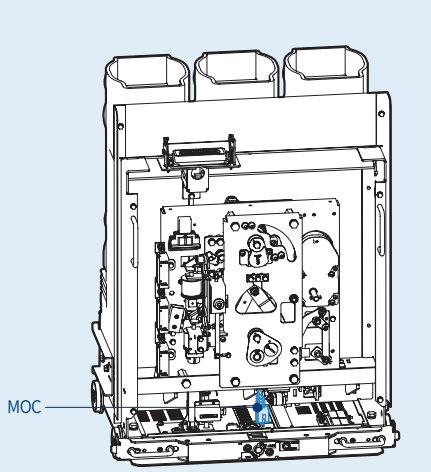
UVL type

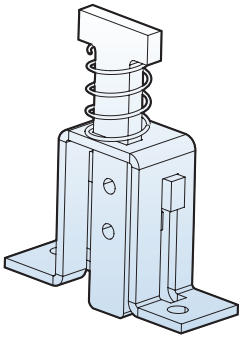
- It must be installed in the breaker to operate the MOC installed in H type cradle.
- MOC, Mechanically operated cell switch is the device to indicates the Closed/Trip status of VCB in 'CONNECT' position only.
- This MOC operator in the breaker should be installed when MOC in the cradle is used.





VH/UVH type

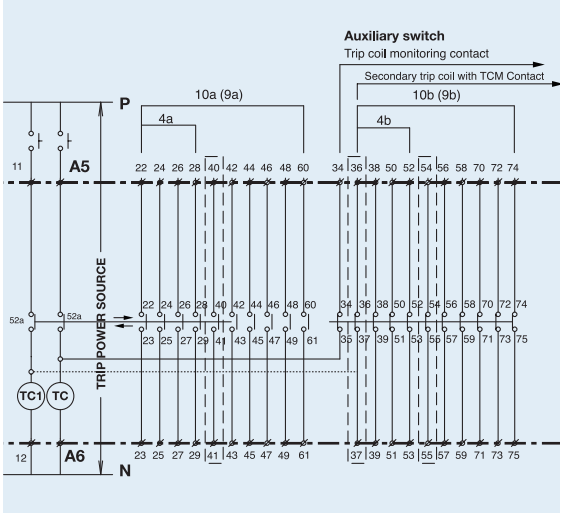




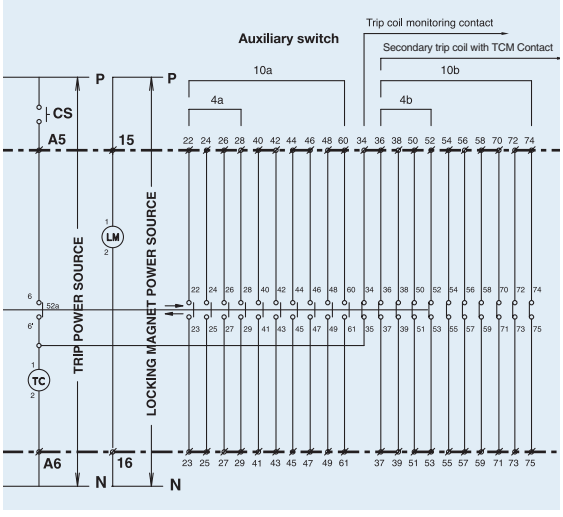
Trip coil monitoring contact: A2

UVL type

- Device for monitoring the functions of the trip coils.
- Supplied as standard for VL model and optional for VH model.
- 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) Terminals A5 and A6 monitor the trip coils in closed position of the breaker.
  2) Terminal A6 and aux. contact terminal 34 monitor the trip coils 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 of UVL type this contact works with the trip coils such as T1, T2, T3, T4 and T5.
  For VH/UVH type it works with all trip coils.



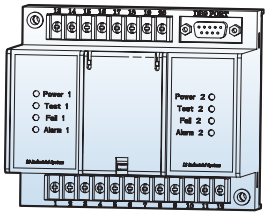
UVH type



Coil Test Unit: CTU

Breaker Options

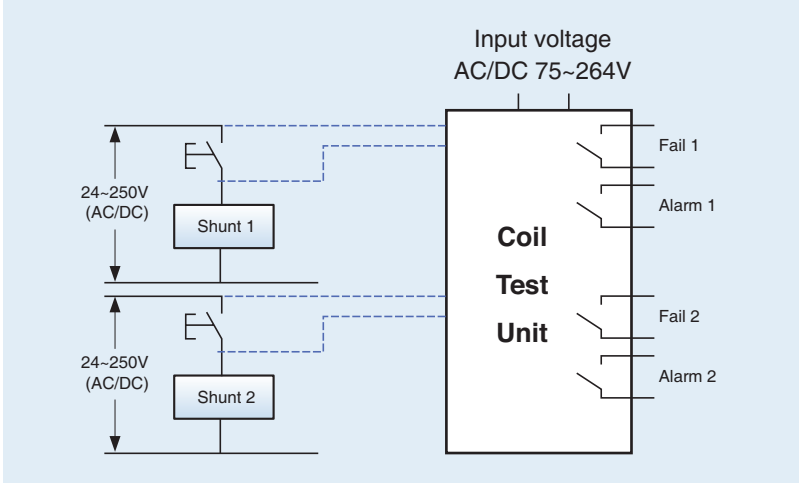
UVL/VH/UVH type

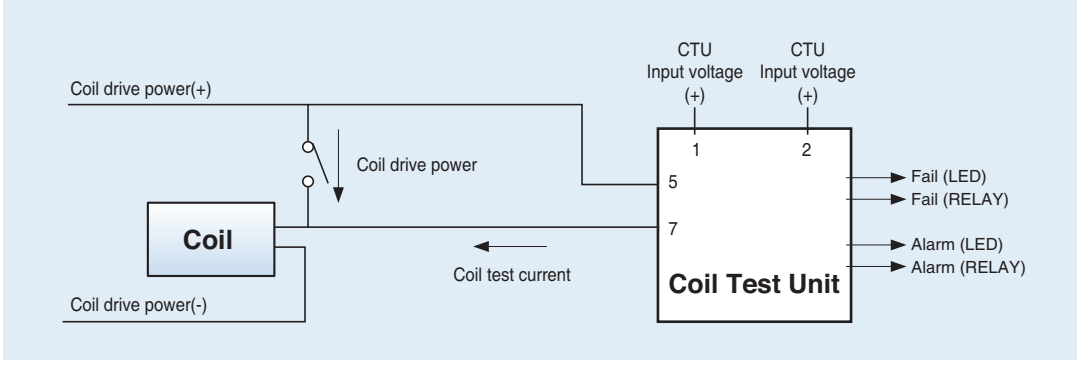


• When no current flows through the coil it gives the test current which does not cause the coil to operate to check whether the coil is disconnected or not.
- If the test current flows normally: coil normal
- If the test current does not flow through: coil disconnected

※ 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

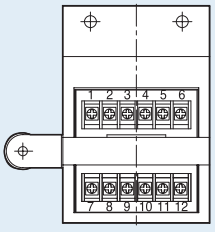
Ratings

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

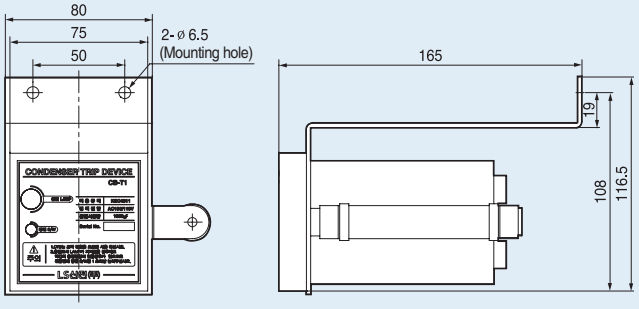
UVL/VH/UVH type

- 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.

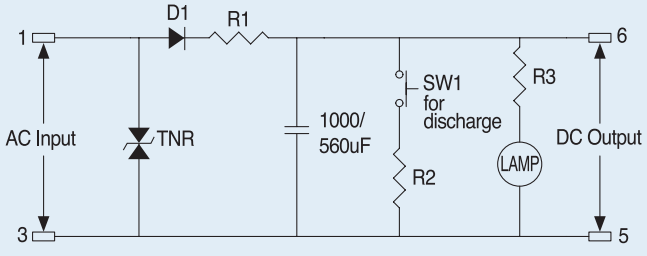
Terminal arrangement



External dimension

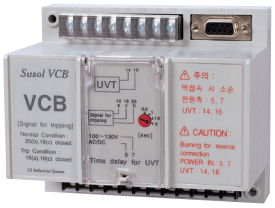


Circuit diagram



UVT Time delay: UDC

Breaker Options



UVL/VH/UVH type

- 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

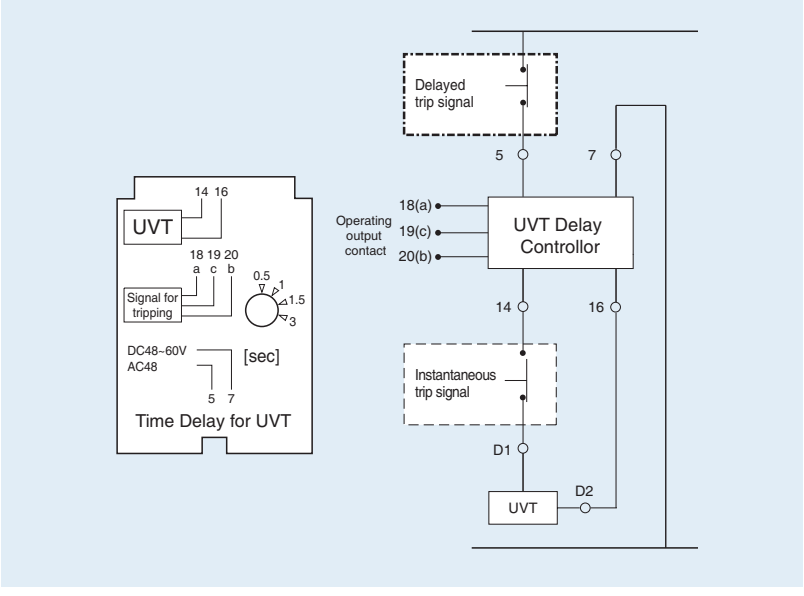
Rated voltage (Vn)		Opration voltage range (V)		Consumption (VA or W)		Time delay (ms)
DC (V)	AC (V)	Pick up	Drop out	Inrush	Steady - state	
48~60	48	0.65~0.85 Vn	0.4~0.65 Vn	200	≤ 5	0.5, 1, 1.5, 3
100~130	100~130					
200~250	200~250					

- 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



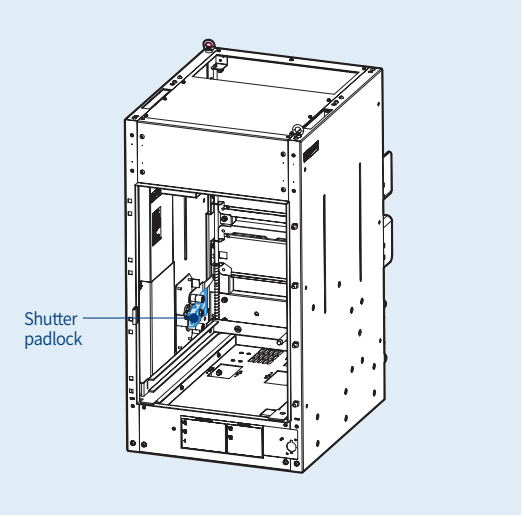
Shutter padlock: AE

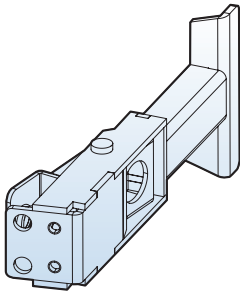
Cradle Options

UVL/UVH type

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.





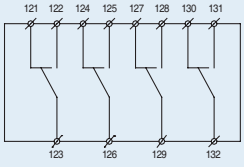
Truck operated cell switch (TOC: AF)

Cradle Options

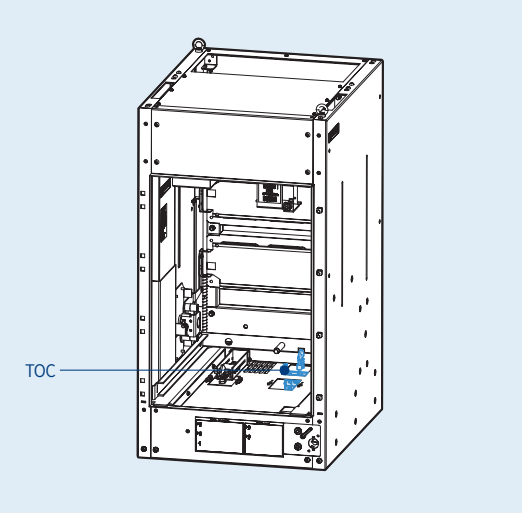
UVL/UVH type

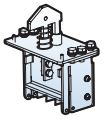
- This auxiliary switch is used to indicate the 'CONNECT' position of VCB. It is installed in the bottom of a H type cradle and operated by the frame of a breaker.
- TOC is consisted of 4 cell switches with changeover contacts as below diagram.

Circuit diagram

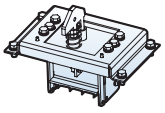


a Contact: 122-123, 125-126, 128-129, 131-132,
b Contact: 121-123, 124-126, 127-129, 130-132





VL type



VH Type

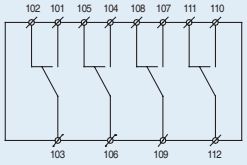
Mechanical Operated Cell Switch (MOC)

Cradle Options

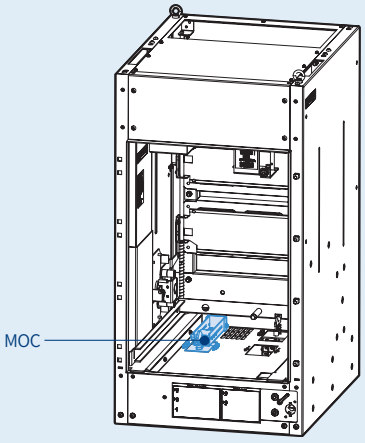
UVL/UVH type

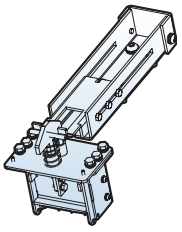
- This auxiliary switch is used to indicate the Close/Trip of VCB. It is operated mechanically at the CONNECT position and installed in the bottom of a H type cradle and operated by the frame of a breaker.
- MOC is consisted of 4 cell switches with changeover contacts as below diagram.

Circuit diagram

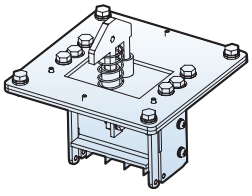


a Contact: 101-103, 104-106, 107-109, 110-112,
b Contact: 102-103, 105-106, 108-109, 111-112





VL type



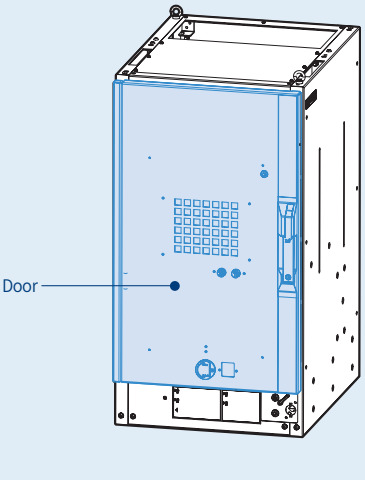
VH Type

Door: AH

Cradle Options

UVL/UVH type

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

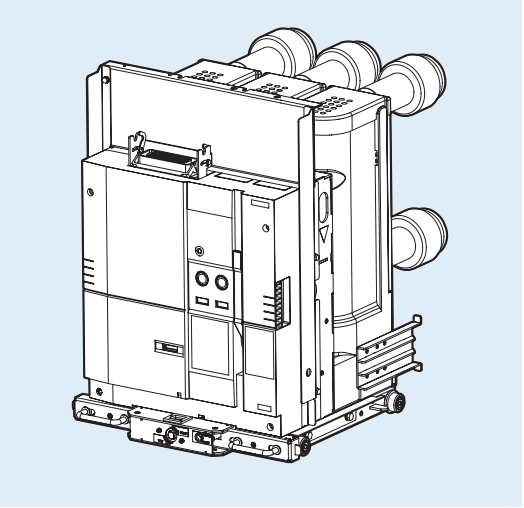


Door Interlock: AJ

Cradle Options

UVL/UVH type

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

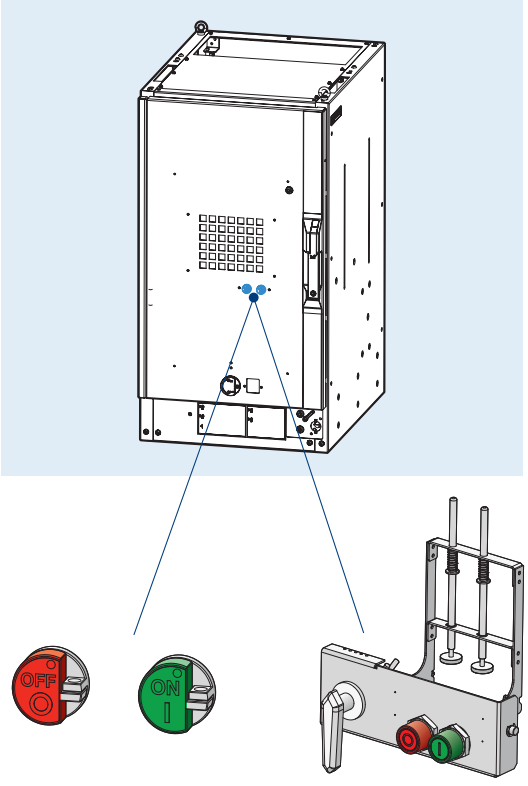


Door Emergency Push button: AK

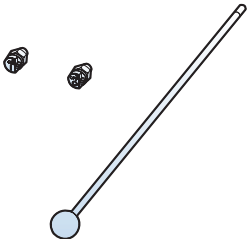
Cradle Options

UVL/UVH type

- 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.

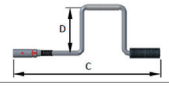
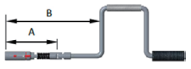


Door Emergency Push button

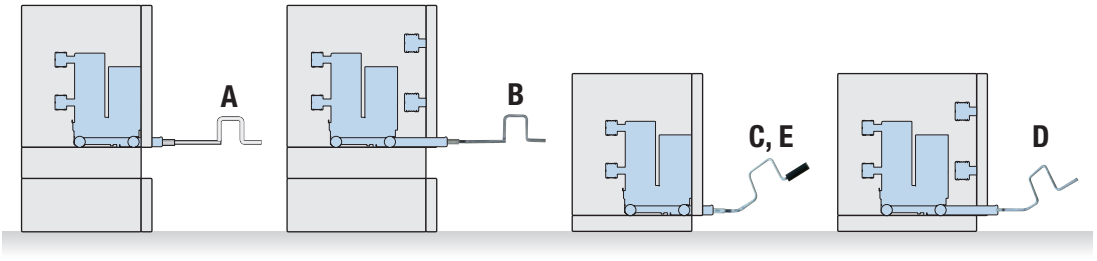


Racking In/Out handle

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	
	Type		Code	Appearance	A	B	c	D	Description	Code	Appearance
UVL	Ha, He, Hf	A	55223172407		-	213	454	140	Normal type	Not required	
		B	55223172403		-	334	575	140	Extention type (Normal)		
		C	55223172405		151	281	522	140	Universal type		
		D	55223172406		321	450	692	140	Extention type (Universal)		
VH/UVH	Ha, H	E	55213163003		73	408	532	183	Universal type	55213143006	

Racking in/out handle for cradle

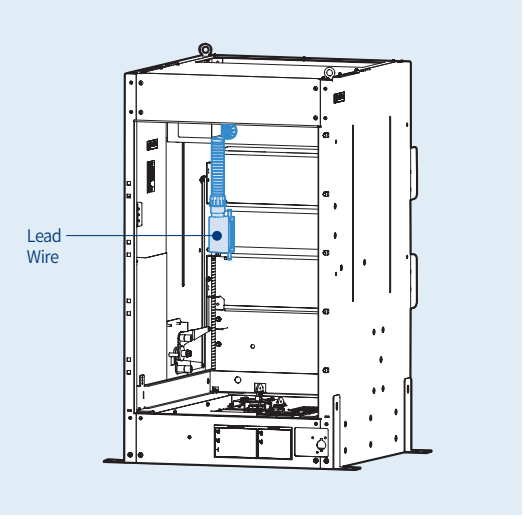


Type H Cradle Lead Wire: AM, AN

Cradle Options

UVL/UVH type

- In case of H type breaker of UVL and UVH 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.

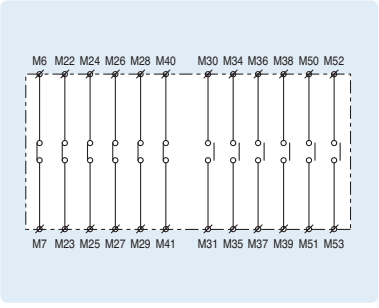


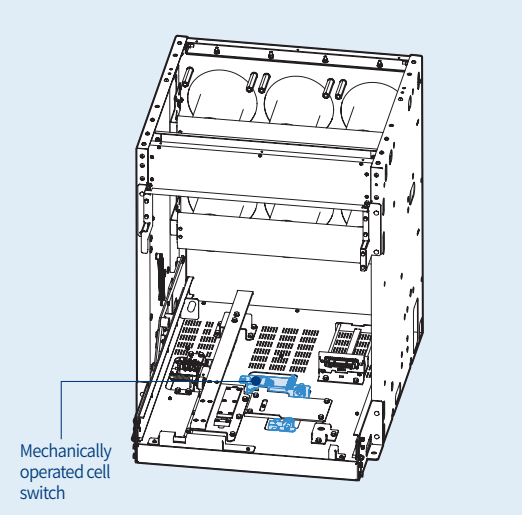
Mechanically operated cell switch (MOC)

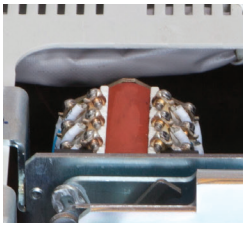
Cradle Options

VH-05/15 type

- This 6a6b switch indicates the 'ON' or 'OFF' condition of a VCB and is operated in the positions of 'Connected' and 'Test'.
  Below circuit diagram is based on 'OFF' status of VCB.





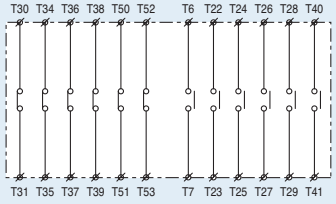


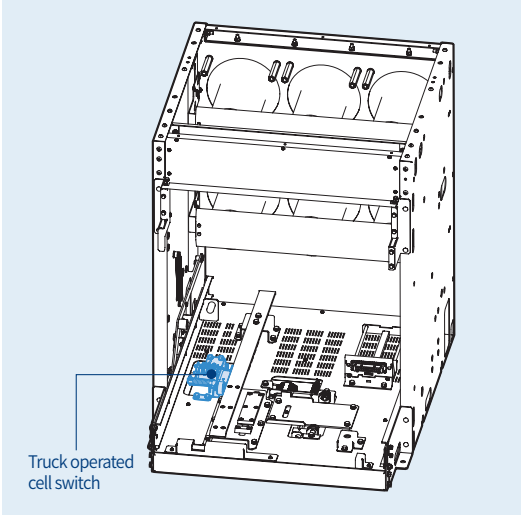
Truck operated cell switch (TOC)

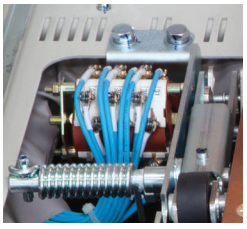
Cradle Options

VH-05/15 type

• This 6a6b switch indicates the 'Connected' state of a VCB and is operated by the movement of a VCB frame. Below circuit diagram is based on 'Test' status of VCB.







Counter: C

Standard parts

/VH/UVH typew

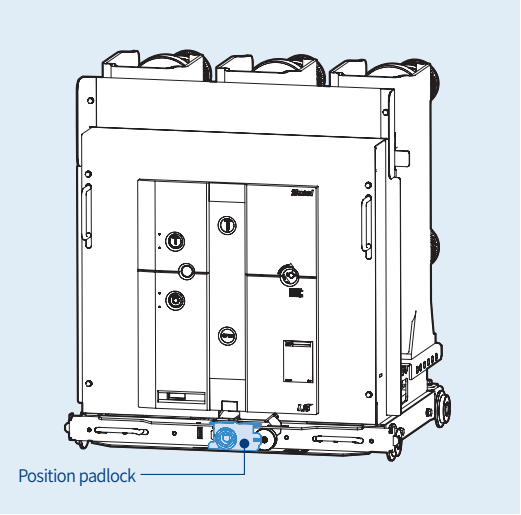
• It displays the total number of ON/OFF operations of a breaker.

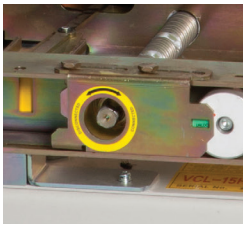
Position padlock

Standard parts

VH/UVH type

• It is located at the screw hole to prevent the draw-in and out of a breaker from the present position (Disconnected, Test or Connected)



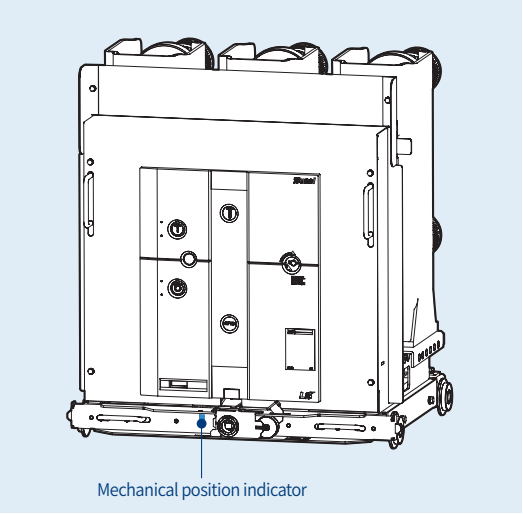


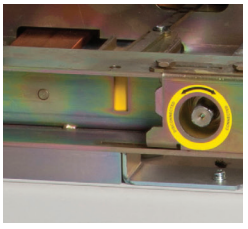
Mechanical position indicator

Standard parts

VH/UVH type

• It is located in the lower part of a breaker to check the present position - Disconnected, Test or Connected- easily.



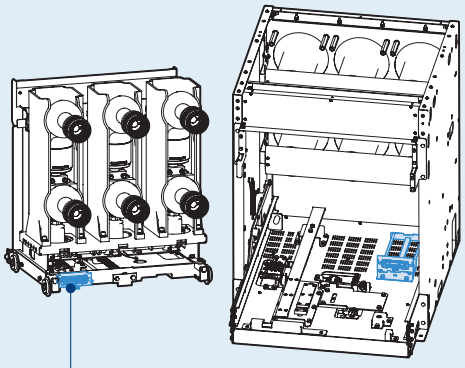


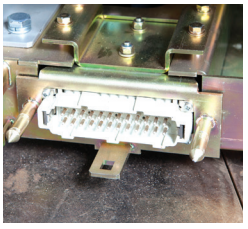
Auto connection

Standard parts

VH/UVH type

- When the breaker is moved to 'Test' position from 'Disconnected' position the connector for control powers is automatically connected. In case of reverse moving of the breaker the connector is automatically disconnected.



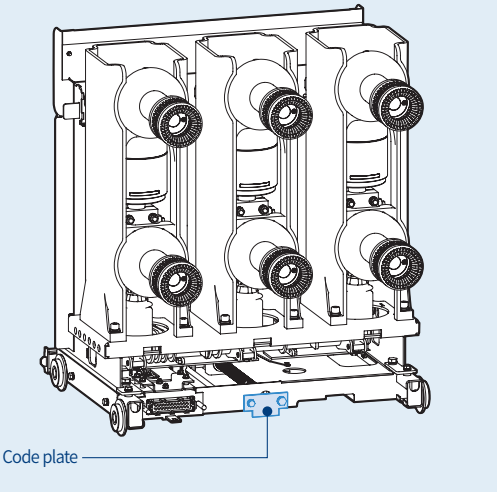


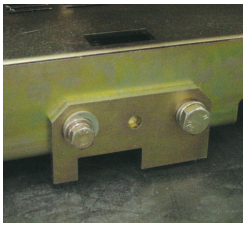
Code plate

Standard parts

VH-05/15 type

- When the breaker is inserted to the cradle, if the ratings does not match with the cradle, it mechanically prevents the breaker from being inserted into the cradle.



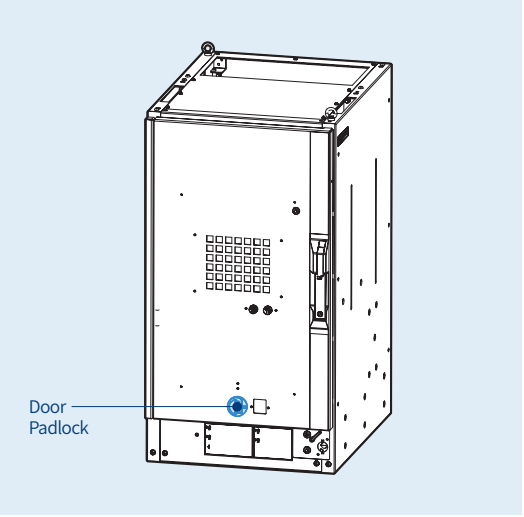


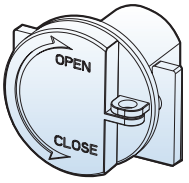
Door Padlock

Standard parts

UVL/UVH type

- 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.



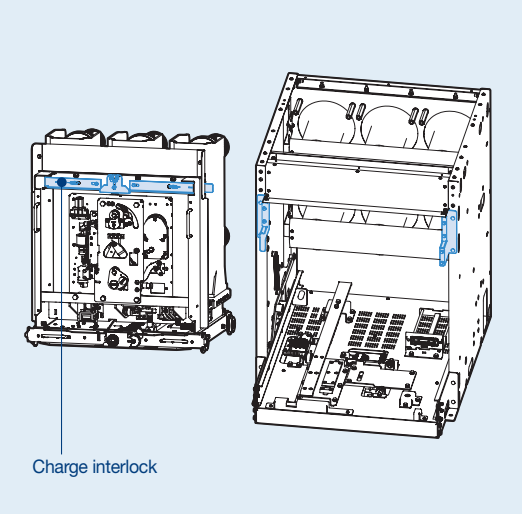


Charge interlock

Standard parts

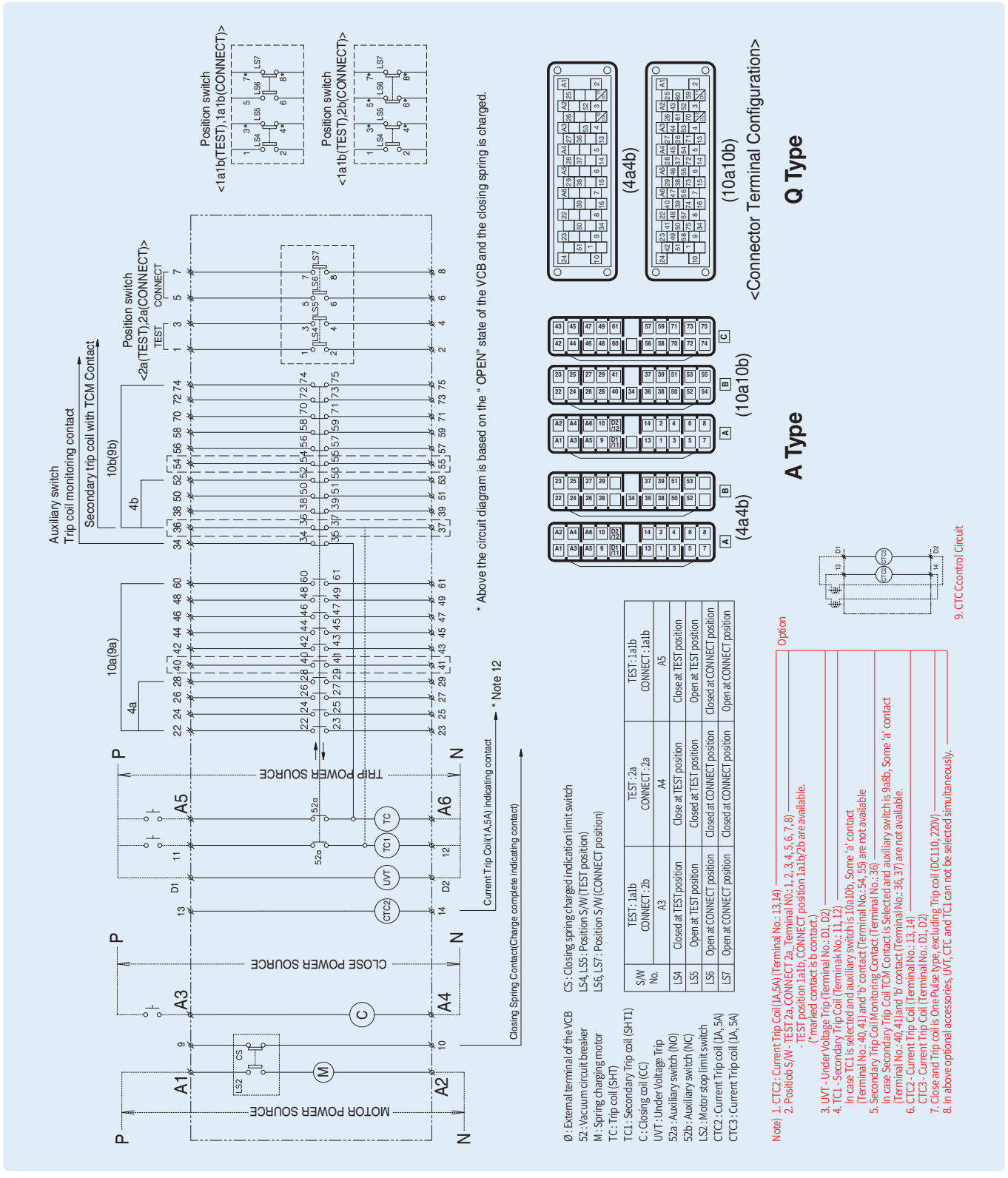
-05/15 type

- In case the breaker is drawn-out when the closing spring is charged in the 'Disconnected' position, it prevents the complete Drawout of the circuit breaker from the housing.



Circuit diagram for VCB control in remote

UVL-05/15/27



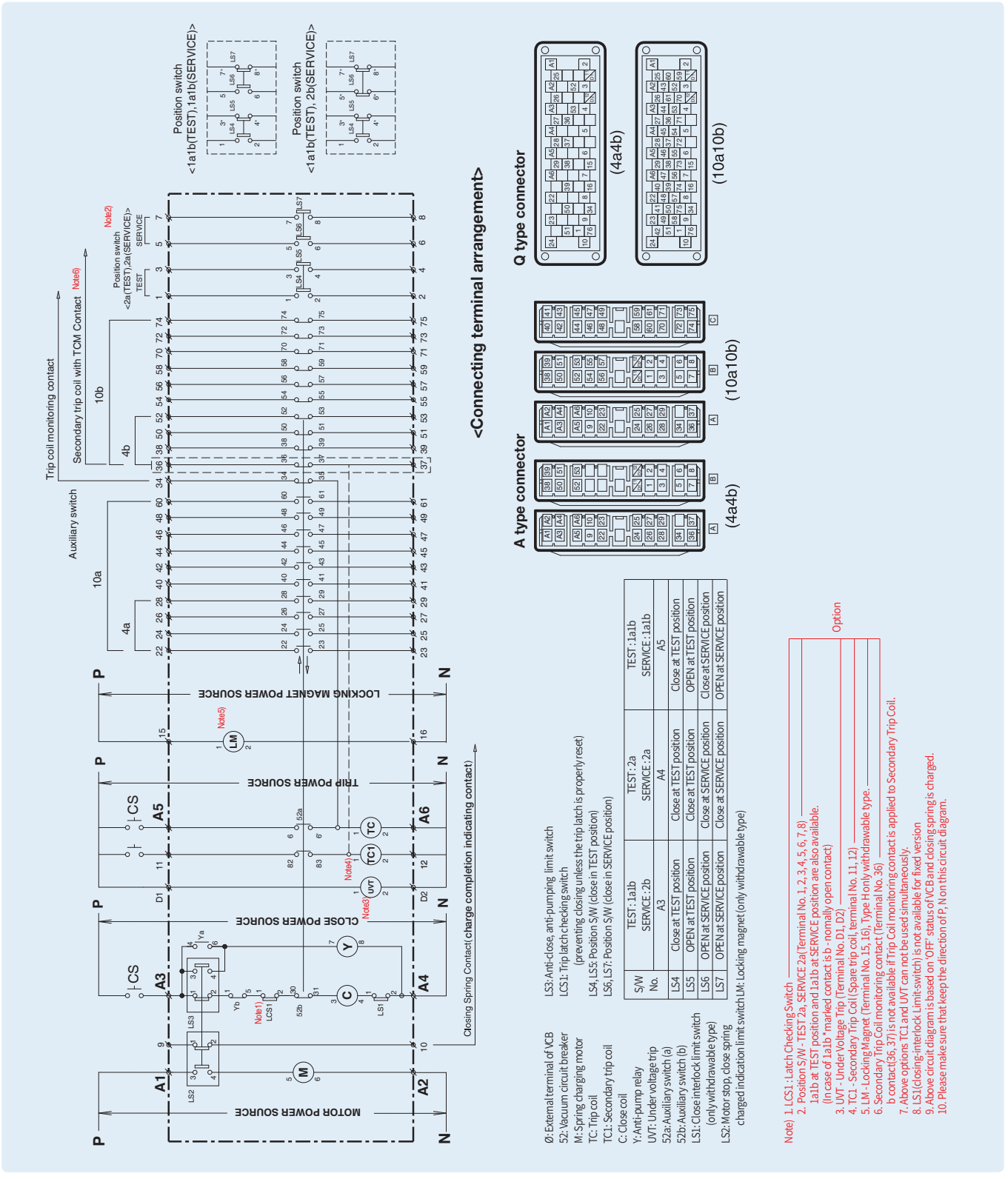
Ø : External terminal of the VCB
52 : Vacuum circuit breaker
M : Spring charging motor
TC : Trip coil (SHT)
TC1 : Secondary Trip coil (SHT1)
C : Closing coil (CC)
UVT : Under Voltage Trip
52a : Auxiliary switch (NO)
52b : Auxiliary switch (NC)
LS2 : Motor stop limit switch
CTC2 : Current Trip coil (1A, 5A)
CTC3 : Current Trip coil (1A, 5A)

CS : Closing spring charged indication limit switch
LS4, LS5 : Position S/W (TEST position)
LS6, LS7 : Position S/W (CONNECT position)

S/W No.	TEST : 1a1b CONNECT : 2b	TEST : 2a CONNECT : 2a	TEST : 1a1b CONNECT : 1a1b
	A3	A4	A5
LS4	Closed at TEST position	Close at TEST position	Close at TEST position
LS5	Open at TEST position	Closed at TEST position	Open at TEST position
LS6	Open at CONNECT position	Closed at CONNECT position	Closed at CONNECT position
LS7	Open at CONNECT position	Closed at CONNECT position	Open at CONNECT position

Note) 1. CTC2 : Current Trip Coil(1A,5A) (Terminal No.: 13,14) — Option
2. Positiob S/W - TEST 2a, CONNECT 2a, Terminal NO.: 1, 2, 3, 4, 5, 6, 7, 8)
- TEST position 1a1b, CONNECT position 1a1b/2b are available.
(* marked contact is b contact.)
3. UVT - Under Voltage Trip (Terminal No.: D1, D2)
4. TC1 - Secondary Trip Coil (Terminak No.: 11, 12)
In case TC1 is selected and auxiliary switch is 10a10b, Some 'a' contact (Terminal No.: 40, 41) and 'b' contact (Terminal No.: 54, 55) are not available
5. Secondary Trip Coil Monitoring Contact (Terminal No.: 36)
In case Secondary Trip Coil TCM Contact is Selected and auxiliary switch is 9a8b, Some 'a' contact (Terminal No.: 40, 41)and 'b' contact (Terminal No.: 36, 37) are not available.
6. CTC2 - Current Trip Coil (Terminal No.: 13, 14)
CTC3 - Current Trip Coil (Terminal No.: D1, D2)
7. Close and Trip coil is One Pulse type, excluding Trip coil (DC110, 220V)
8. In above optional accessories, UVT, CTC and TC1 can not be selected simultaneously.
9. CTC Ccontrol Circuit

UVH-38



Ø: External terminal of VCB
52: Vacuum circuit breaker
M: Spring charging motor
TC: Trip coil
TC1: Secondary trip coil
C: Close coil
Y: Anti-pump relay
UVT: Under voltage trip
52a: Auxiliary switch (a)
52b: Auxiliary switch (b)
LS1: Close interlock limit switch (only withdrawable type)
LS2: Motor stop, close spring charged indication limit switch
LS3: Anti-close, anti-pumping limit switch
LCS1: Trip latch checking switch (preventing closing unless the trip latch is properly reset)
LS4, LS5: Position S/W (close in TEST position)
LS6, LS7: Position S/W (close in SERVICE position)
LM: Locking magnet (only withdrawable type)

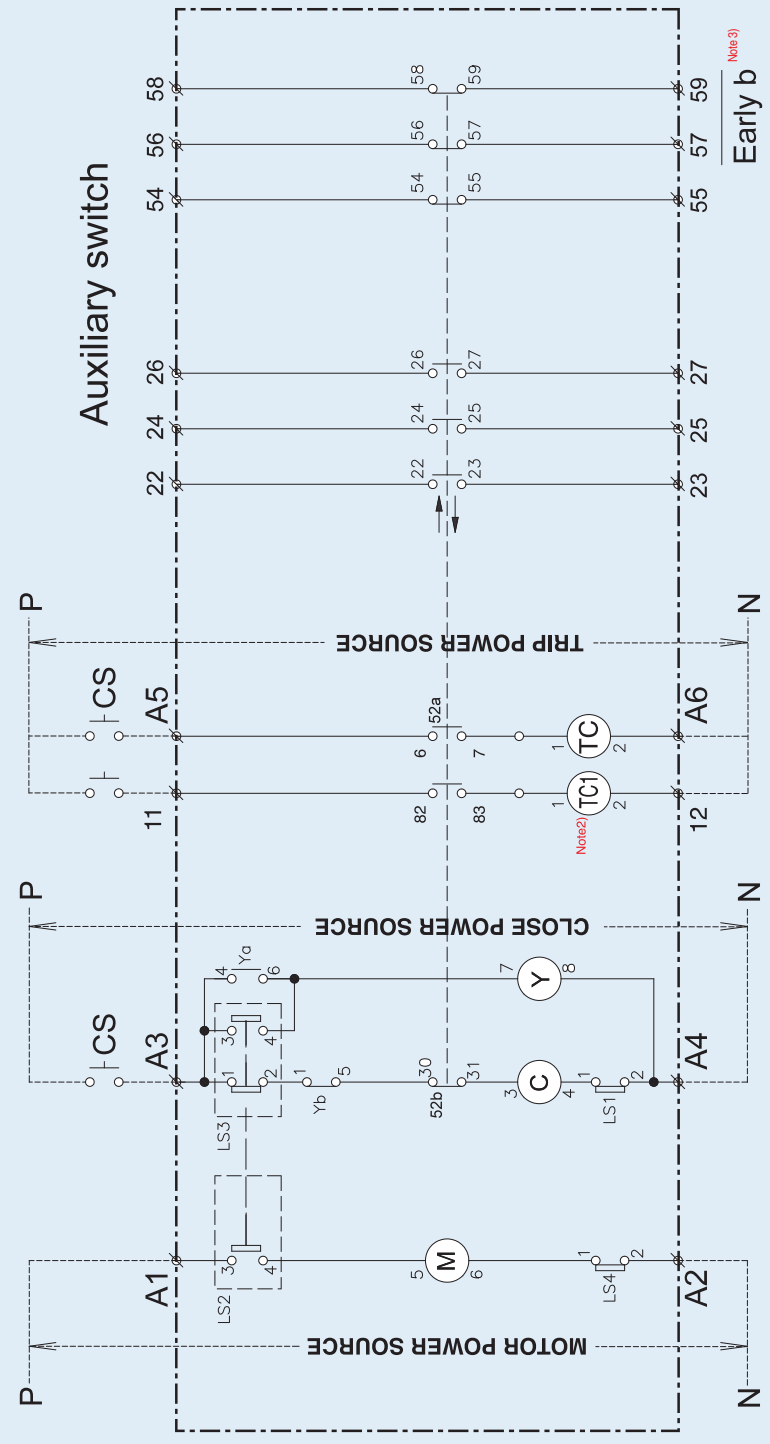
S/W No.	TEST : 1a1b SERVICE : 2b	TEST : 2a SERVICE : 2a	TEST : 1a1b SERVICE : 1a1b
	A3	A4	A5
LS4	Close at TEST position	Close at TEST position	Close at TEST position
LS5	OPEN at TEST position	Close at TEST position	OPEN at TEST position
LS6	OPEN at SERVICE position	Close at SERVICE position	Close at SERVICE position
LS7	OPEN at SERVICE position	Close at SERVICE position	OPEN at SERVICE position

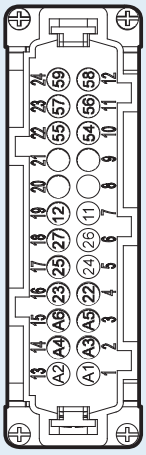
Note) 1. LCS1 : Latch Checking Switch
2. Position S/W - TEST 2a, SERVICE 2a(Terminal No. 1, 2, 3, 4, 5, 6, 7, 8)
1a1b at TEST position and 1a1b at SERVICE position are also available.
(In case of 1a1b 'marked contact is b - normally open contact)
3. UVT - Under Voltage Trip (Terminal No. D1, D2)
4. TC1 - Secondary Trip Coil (Spare trip coil, terminal No. 11, 12)
5. LM - Locking Magnet (Terminal No. 15, 16), Type H only withdrawable type.
6. Secondary Trip Coil monitoring contact (Terminal No. 36)
b contact(36, 37) is not available if Trip Coil monitoring contact is applied to Secondary Trip Coil.
7. Above options TC1 and UVT can not be used simultaneously.
8. LS1(closing-interlock Limit-switch) is not available for fixed version
9. Above circuit diagram is based on 'OFF' status of VCB and closing spring is charged.
10. Please make sure that keep the direction of P, N on this circuit diagram.

Option

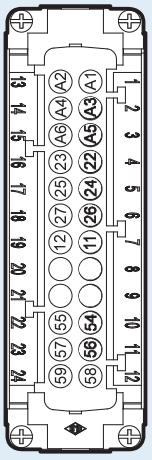
Circuit diagram for VCB control in remote

VH-05/15





SECONDARY DISCONNECT WIRING
(FRONT VIEW OF RECEPTACLE PLUG, VCB)

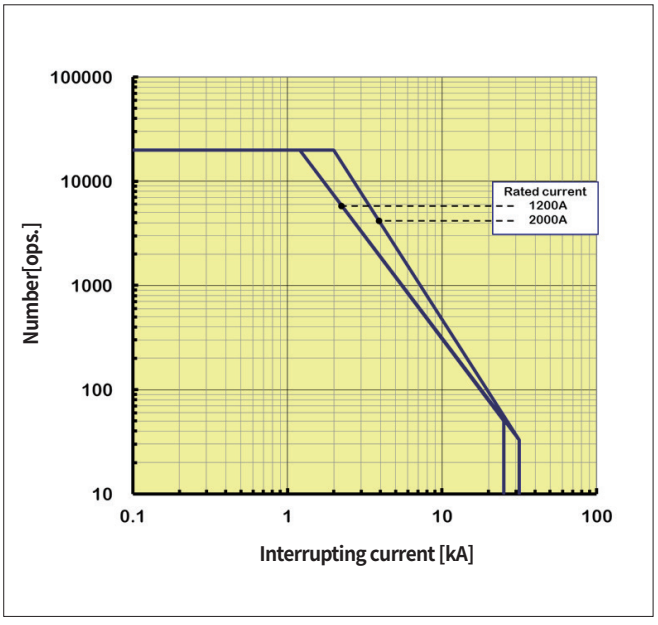


SECONDARY DISCONNECT WIRING
(FRONT VIEW OF TAP PLUG, CRADLE)

Ø : External terminal of VCB
52 : Vacuum circuit breaker
M : Spring charging motor
TC : Trip coil
TC1 : Secondary trip coil(Option)
C : Closing coil
Y : Anti-pump relay
52a : Auxiliary switch (NO)
52b : Auxiliary switch (NC)
LS1 : Close interlock limit switch
LS2 : Motor stopping limit switch
LS3 : Anti-closing, Anti-pumping limit swich
LS4 : Motor charging interlock limit swich

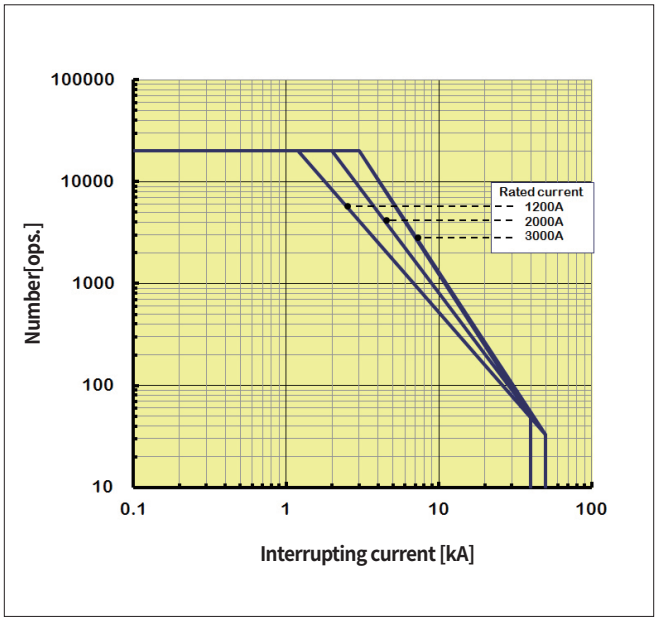
Note) 1. Above circuit diagram is based on 'OFF' status of VCB and closing spring is charged.
2. TC1(Option) - Secondary Trip Coil(Spare trip coil, terminal No.11,12)
3. Two(2) "Early b" auxiliary contact is provided.(Terminal No.56-57, 58-89)
4. Please follow direction of P,N marked in the above circuit diagram.

Electrical endurance by interrupting current



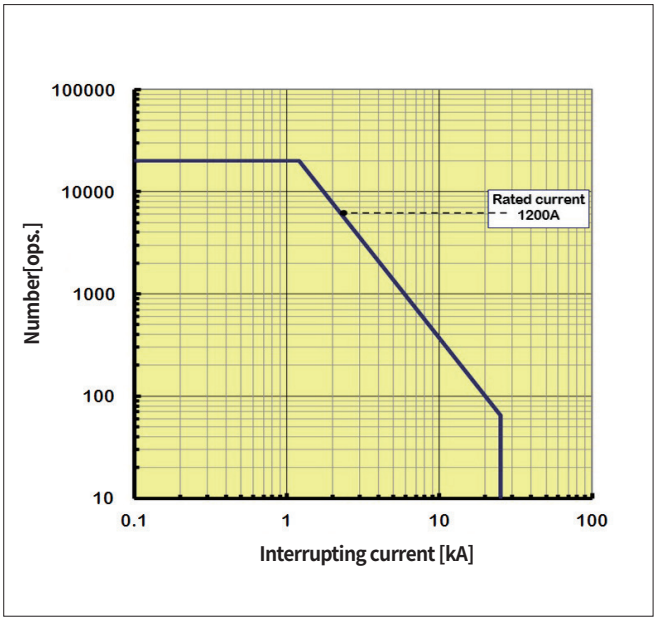
VI model LV6□ 5/15kV 25/31.5kA

- N : Operation numbers
- I : Interrupting current



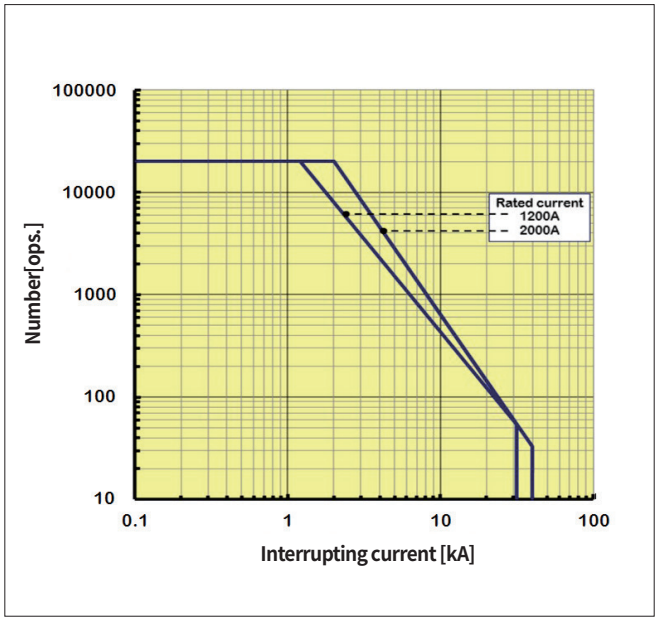
VI model LV8 5/15kV 40/50kA

- N : Operation numbers
- I : Interrupting current



VI model LV14-P1 at 27kV

- N : Operation numbers
- I : Interrupting current



VI model LV8-P at 38kV

- N : Operation numbers
- I : Interrupting current

Note) 1. Above graphs represent the characteristics of the electrical life of LS Susol VCB.
2. Life characteristics of each model in each rating represents the LOG-LOG graphs.

Basic functions

Manual operation

① Manual Charge

a) UVL type: operate the charge handle 7-8 times as a fully stroke.
b) UVH type: Insert the charge handle into the handle slot first. Rotate the handle clockwise 40 times more and then charge will be complete with a click sound.
- When the closing spring is charged fully "CHARGED" is displayed at the charge indicator.

② Manual closing

a) Pressing the CLOSE Button the breaker is closed.
b) With the closing of the breaker "CLOSE" is displayed at CLOSED/OPEN Indicator and "DISCHARGED" at the charge indicator.

③ Manual trip

a) Pressing the OPEN Button the breaker is opened.
b) "OPEN" is displayed at CLOSED/OPEN Indicator.

Electric operation

① Electric charge

The breaker is remotely closing with charging of closing spring.
If the breaker trips the closing spring is automatically charged by gear motors.

② Electric closing

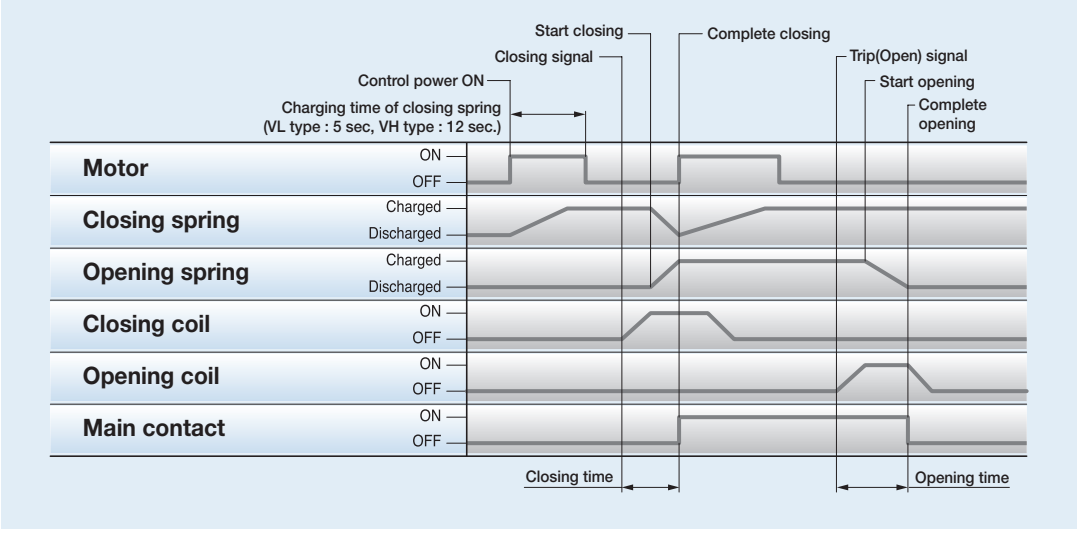
Remote closing is operated by the closing coil.

③ Electric trip

Remote trip can be operated by the trip coil or UVT coil.

Note) UVT is not equipped as standard and requires additional option selection.

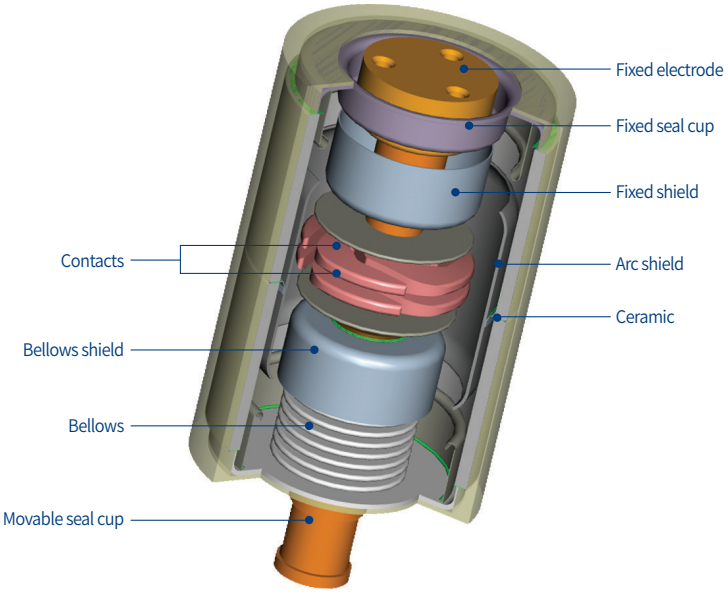
Main contacts are operated by the energy of the spring mechanism and closing spring is charged by the motor in the mechanism.
Breaker is closed by closing coil and tripped by trip coil.
These operations are repeated in VCB as shown in the below sequence chart.

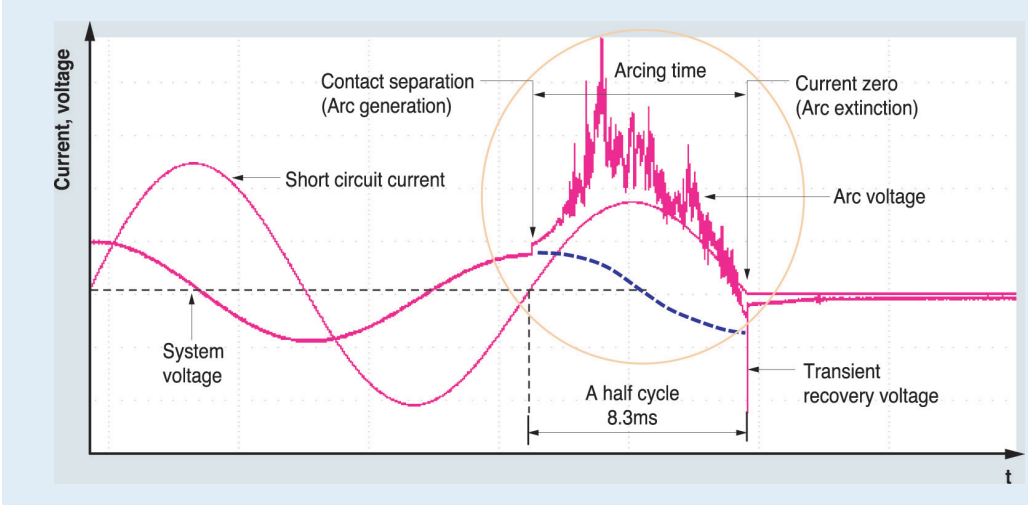


Sequence of the switching mechanism

The interruption of vacuum interrupters

The interruption of VCB is carried out by the vacuum interrupters.
Interrupter contacts as a key part made of copper - chromium (CuCr) material with spiral shape have low contact wear characteristics and withstand voltage is excellent.
Spiral contacts make the arc generated between the surfaces of contacts rotated around the surface of contact by the induced magnetic field generated due to the spiral contact structure, which results in preventing local heating, thereby corruption and interrupting instantaneously.
The vacuum rate within the VI is very high (approximately 5x10-5 Torr) and the spacing between fixed contact and movable contact is about 6~20mm, depending on the voltage. The contacts are in a structure that arc can easily be extinguished and the surfaces of the contacts are made of special alloy (copper-chromium) and the interior is completely sealed to prevent loss of vacuum. Therefore the wearing of the contacts can be minimized in the event of short-circuit and the arc energy by overvoltage or switching can be reduced effectively.

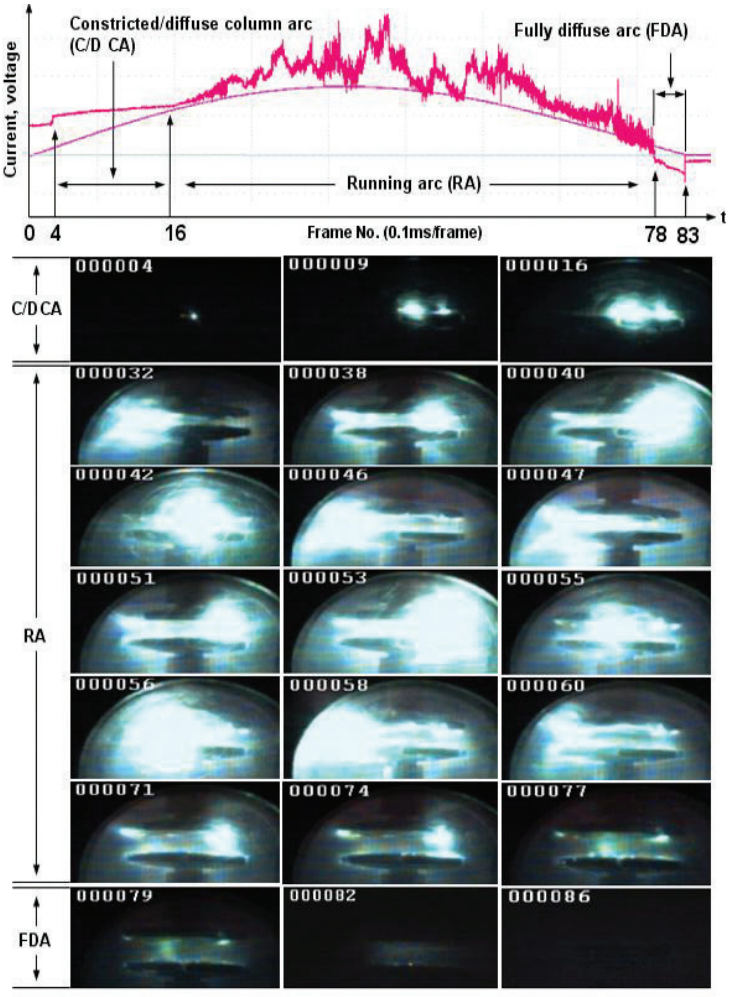




An example of oscillogram obtained through the interrupting test using LC resonant circuit

Basic functions and interrupting operation

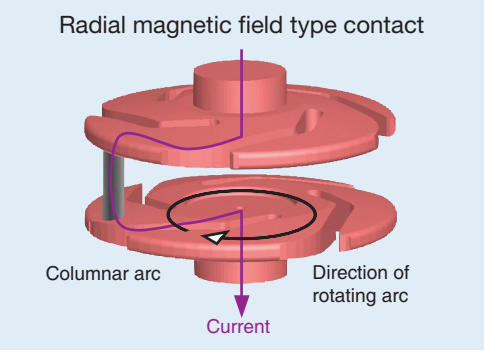
The interruption of vacuum interrupters



Arc voltage waveforms and arc image captured during arcing time

In case of using the flat contact any of the designs do not reflect on when contacts are opening the arc with high temperature is contracted and fixed in the center of the contacts,Which is called pinch effect.
To prevent the effect two kinds of contact shapes are designed.
One is Axial magnetic field which spreads the arc before its contraction, and the other is Radial magnetic field which permits the contraction of the arc but makes it rotated to disperse the energy.
Because contracted arc is shaped like a cylinder it is called Contracted arc or columnar arc.

Spiral contact structure (Radial magnetic field), using the force (F = j×B) generated by the interaction of the radial magnetic field caused by the current flowing through the arc between two contacts, disperse the arc energy evenly on the surface of contact by rotating the arc that is contracted by the pinch effect so as to minimize contact damage.
The images show arc behavior during the arcing time of about 8ms by shooting with high-speed camera capable of shooting 10,000 frames per sec. (0.1ms/frame) by focusing on parts of the arcing time on the above graph and simultaneously measured arc voltage also represented to show arc state by section.



Arc driving principle in the contacts of Radial magnetic field

Standards and certification

Susol VCB has been type tested and obtained certifications according to the latest IEC standard at international testing laboratory and can be installed and applied at the environment and conditions in accordance with the standard.

■ Standard

- IEEE Std C37.09, ANSI C37.54, UL Listed & CSA

■ Test and certification

•Test report (KERI)
•Test report (KEMA)

CERTIFICATE OF COMPLIANCE

Certificate Number 20141230-E468323
Report Reference E468323-20141227
Issue Date 2014-DECEMBER-30

Issued to: LSIS CO LTD
CHEONG JU PLANT
1 SONG JUNG-DONG, HUNG DUK-KU
CHEONG JU-SHI CHUNG CHEONG BUG-DO 361-7
KOREA

This is to certify that representative samples of: CIRCUIT BREAKERS AND METAL-CLAD SWITCHG
OVER 1000 VOLTS
Refer addedndum page

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: ANSI C37.54-2002-Indoor Alternate-Current Medium Voltage Circuit Breakers Applied as Removable Elem Metal-Enclosed Switchgear Assemblies - Conforman Test Procedures and CAN/CSA-C22.2 No. 31-14-Switchgear Assemblies

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Assistant Chief Engineer, Global Inspection and Field Services
UL LLC

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CERTIFICATE OF COMPLIANCE

Certificate Number 20141230-E468323
Report Reference E468323-20141229
Issue Date 2014-DECEMBER-30

Issued to: LSIS CO LTD
CHEONG JU PLANT
1 SONG JUNG-DONG, HUNG DUK-KU
CHEONG JU-SHI CHUNG CHEONG BUG-DO 361-720
KOREA

This is to certify that representative samples of: COMPONENT - CIRCUIT BREAKERS AND METAL-CLAD SWITCHGEAR OVER 1000 VOLTS
Medium Voltage Earthing Switch. Cat. Nos. VES, followed by "-", followed by 05 or 15, followed by H, followed by 25 or 32, followed by A or B, followed by 12 or 20, followed by A1, A2 or A4.

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: IEEE C37.20.4, Indoor AC Switches (1 kV to 38 kV) for Use in Metal-Enclosed Switchgear CAN/CSA-C22.2 No. 31-14, Switchgear Assemblies

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

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Bruce Mahrenholz, Assistant Chief Engineer, Global Inspection and Field Services
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Page 1 of 1

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Standard(s) for S

Circuit Breakers Applied as Removable Elements in Me
Enclosed Switchgear Assemblies - Conformance Test
Procedures and CAN/CSA-C22.2 No. 31-14-Switchgea
Assemblies

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

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Standard(s) for Safety: "See Addendum page"

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

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Standard Use Environment for Susol VCB

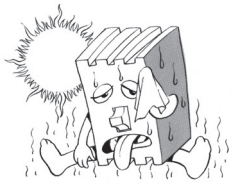
The operation characteristic of Vacuum Circuit Breaker such as insulation and endurance is often influenced largely by external environment and thus should be applied appropriately with conditions of the place where it is used taken into consideration.

The following values are the limits have been set in accordance with IEEE C37.04

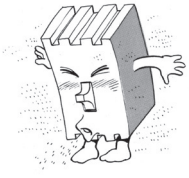
Ambient Temperature
- maximum temperature: +40°C
- 24-hour average maximum temperature: +35°C
- minimum temperature: -5°C

Altitude
- 1000m or less above sea level

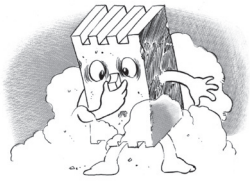
Relative Humidity
- 24 hours average value: 95% or less
- One month average: 90% or less



- If a standard circuit breaker is used in high temperature exceeding 40°C, you are advised to use it according to the current corrected for each level of ambient temperature in catalog.
- If used in conditions of high humidity, the dielectric strength or electric performance may be degraded.



- It is highly recommended to use a dust cover or anti-humid agent if it is used in dusty and humid conditions.
- Excessive vibration may cause a trip breaker such as connection fault or flaw on mechanical parts.



- If it is left CLOSE or OPEN for a long time, it is recommended to switch load current on a regular basis.
- It is recommend to put it in the sealed protection if corrosive gas is prevalent.

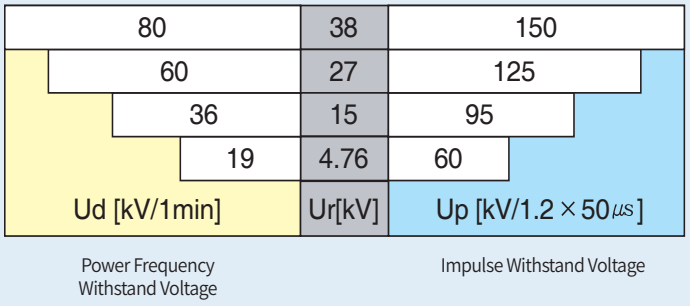
Special Use Environment

The circuit breaker is designed for use in standard use environment specified in Section 4. 1 of IEEE C37.04.
Concerning the special use environments as below the special use conditions are required to be considered, thus please contact us in advance.

- where altitude and ambient temperature are out of standard use environment.(-40°C)
- where a strong sea breeze blows
- when usually used in a humid place
- where a lot of steam or oil steam exists
- where explosive, flammable and other harmful gases might permeate the breaker
- In a dusty place
- where abnormal vibration or shock exists
- where a lot of ice and snow exist
- other special conditions

Withstand voltage compensation according to altitude

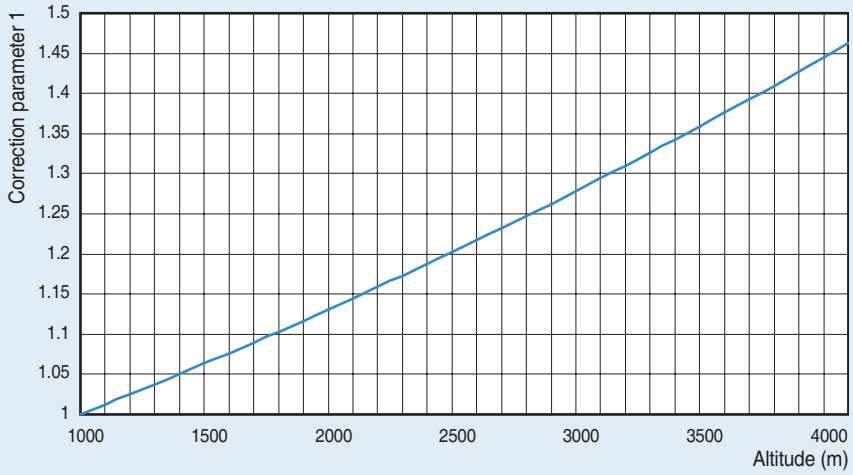
If the breaker is used in areas of sea level higher than 1000m the degradation of insulation performance should be taken into consideration.



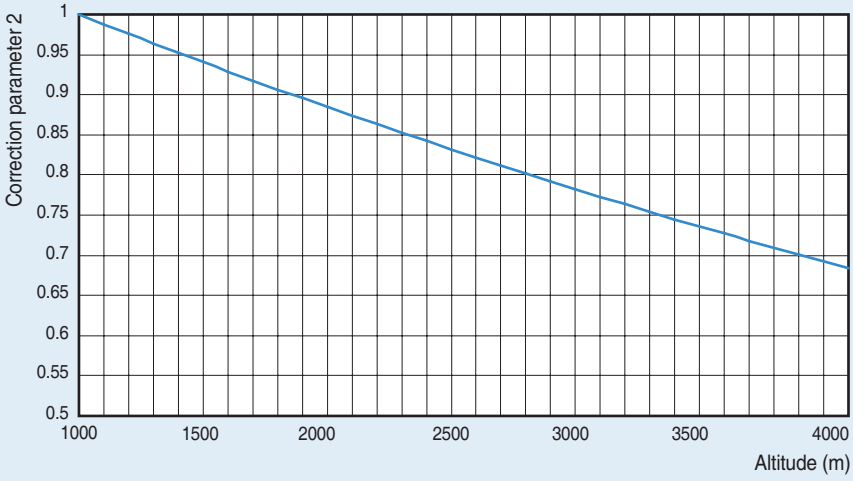
<Table 1> Criteria of withstand voltages by rated voltages specified in IEEE C37.04

Special Use Environment

Withstand voltage compensation according to altitude



<Fig.1 > withstand voltage correction parameter 1 by altitude (based on a required withstand voltage)



<Fig.2 > withstand voltage correction parameter 2 by altitude (based on a applicable withstand voltage)

Ex) Selecting a breaker to be used in a place of 2500m above sea level with a rated voltage 7.2kV (correction parameter 1 applied)

- correction parameter at 2500m is 1.2
- criteria of withstand voltage by rated voltage:
  Power Frequency Withstand Voltage (Ud) = 20kV, Impulse Withstand Voltage (Up) = 60kV
- requirements withstand voltage criteria:
  Power Frequency Withstand Voltage (Ud) = 20×1.2 = 24kV, Impulse Withstand Voltage (Up) = 72kV
  Therefore rated voltage 12kV breaker shall apply to satisfy the required withstand voltage.

Ex) To apply a breaker with a rated voltage 12kV to the place of 2,500m above sea level (correction parameter 2 applied)

- correction parameter at 2500m is 0.825
- dielectric strength of VCB : Power Frequency Withstand Voltage (Ud) = 28×0.825 = 23.1kV,
  Impulse Withstand Voltage (Up) = 75×0.825 = 62kV/1.2×50 μs
  Therefore above breaker with rated voltage 12kV shall apply to rated voltage system 7.2kV at the altitude.

Rated current compensation in accordance with ambient temperature

When normal ambient temperature exceeds the temperature specified in the environment the following formula help to select the applicable current.

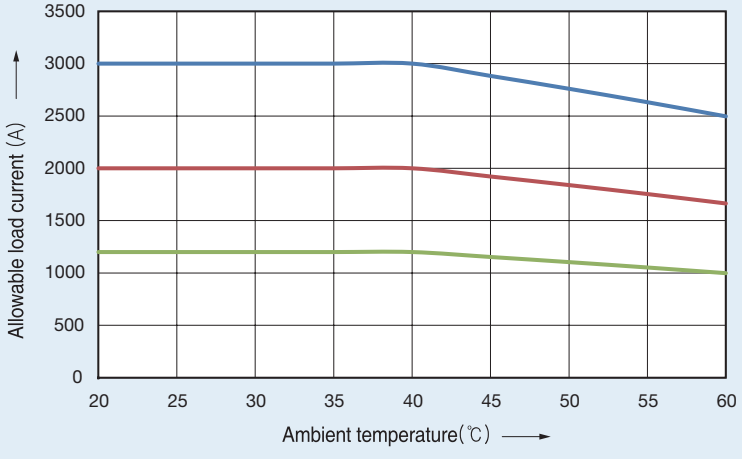
$$I_a = I_r \left((\Theta_{max} - \Theta_a)/\Theta_r \right)^{1/2}$$

Ia: allowable continuous current in the actual ambient temperature Θ_a
Ir: rated current at 40°C ambient temperature
Θ_{max}: acceptable overall temperature of the hottest spot
Θ_a: the actual ambient temperature expected at -30°C and 60°C
Θ_r: allowable temperature in the hottest place at rated current

Ex) The calculation of the applicable load current value when a breaker with rated current 2000A is used at 55 °C ambient temperature
$Ia = 2000 \times ((105-55)/65)^{1/2} = 2000 \times 0.87 = 1754A$

Rated current (A)	Ambient temperature (°C)								
	20	25	30	35	40	45	50	55	60
3000	3000	3000	3000	3000	3000	2882	2760	2631	2496
2000	2000	2000	2000	2000	2000	1922	1840	1754	1664
1200	1200	1200	1200	1200	1200	1153	1104	1052	998

<Table 2> Allowable load current by ambient temperature



<Figure 3> Allowable load current by ambient temperature

Memo

FUTURING SMART ENERGY

We open up a brighter future through
efficient and convenient energy solutions.

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.

LS ELECTRIC

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Technical Question or After-sales Service

Customer Center-Quick Responsive Service, Excellent technical support | **82-1644-5481**

2021. 09

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