

Vacuum Circuit Breaker

[IEEE C37.09, UL® Recognized]



HYUNDAI 4.76-38kV Vacuum Circuit Breaker

[IEEE C37.09, UL® Recognized]



Ensuring excellent breaking capability and high quality with various advantages

- ◆ Retaining the high dielectric strength with the interrupter of the high vacuum degree of 10^{-7} mbar.
- ◆ Providing reliable mechanical performance and long-life expectancy with rigid structure of motor-spring energy stored mechanism.
- ◆ Having excellent breaking capability with the special contact material designed by the advanced vacuum technology.
- ◆ Having rapid breaking time of 3 cycle. (15kV)
- ◆ Having breaking time of 5 cycle. (38kV)
- ◆ UL® Recognized(15kV), Certified by IEEE C37.09 and other related standards by HD HYUNDAI ELECTRIC in ISO9001/14001 and OHSAS18001 certified facilities.

Rigid structure to prove high reliability and long-life expectancy

- ◆ 36inch (914mm) wide switchgear available with small size & light weight. (15kV)
- ◆ 42inch (1065mm) wide switchgear available with small size & light weight. (38kV)
- ◆ Mechanical endurance of 10,000 operations

4.76kV	25kA	630-2,000A
4.76kV	31.5/40kA	630-3,000A
4.76kV	50kA	630-4,000A
8.25kV	25kA	630-2,000A
8.25kV	31.5/40kA	630-3,000A
15kV	25kA	630-2,000A
15kV	31.5/40kA	1,200-3,000A
- ◆ Mechanical endurance of 2,000 operations

38kV	31.5kA	1,200A
38kV	40kA	1,200-3,000A

CONTENTS

Features	2
Ratings	6
Type of Mounting	10
Technical Data	12
Standard Accessories	16
Additional Options	17
Control Circuits	25
15kV KIT ASSY (Cradle)	26
Dimensions	30
Order Information	41

Features

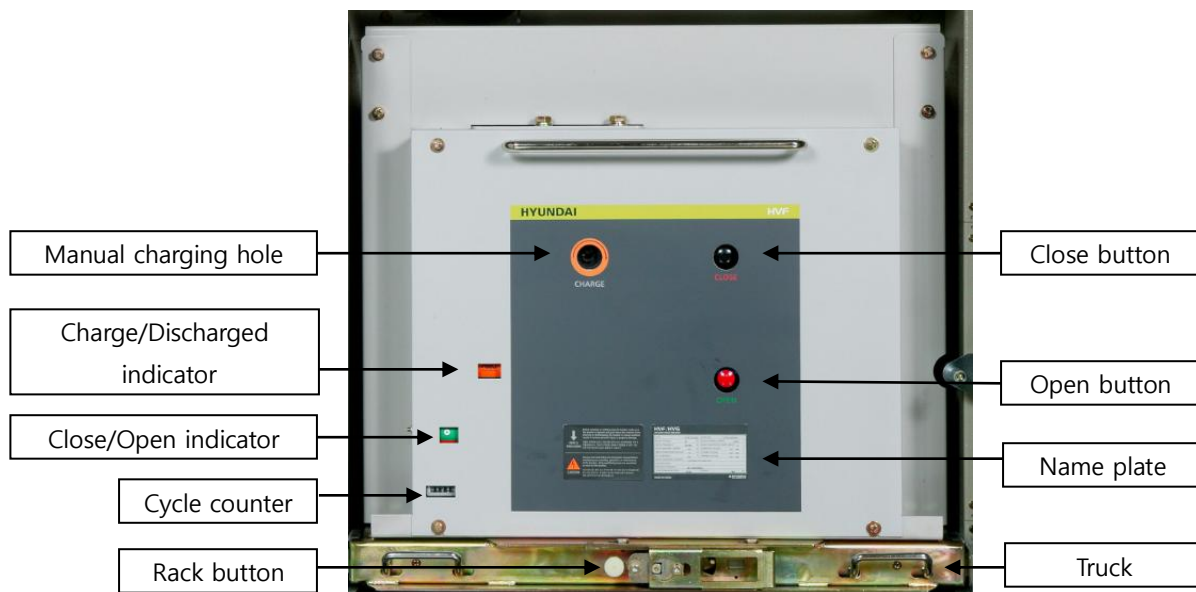
- ◆ With rigid structure and minimized moving parts, HVF breaker operation mechanism features reduced maintenance requirements providing high reliability and long-life expectancy.
- ◆ The breakers are more compactly designed in size with high performance vacuum interrupters, which are made with the special contact material and advanced vacuum technology.
- ◆ These series are certified by IEEE C37.09, UL® Recognized(15kV) and other domestic standards.

Operating mechanism

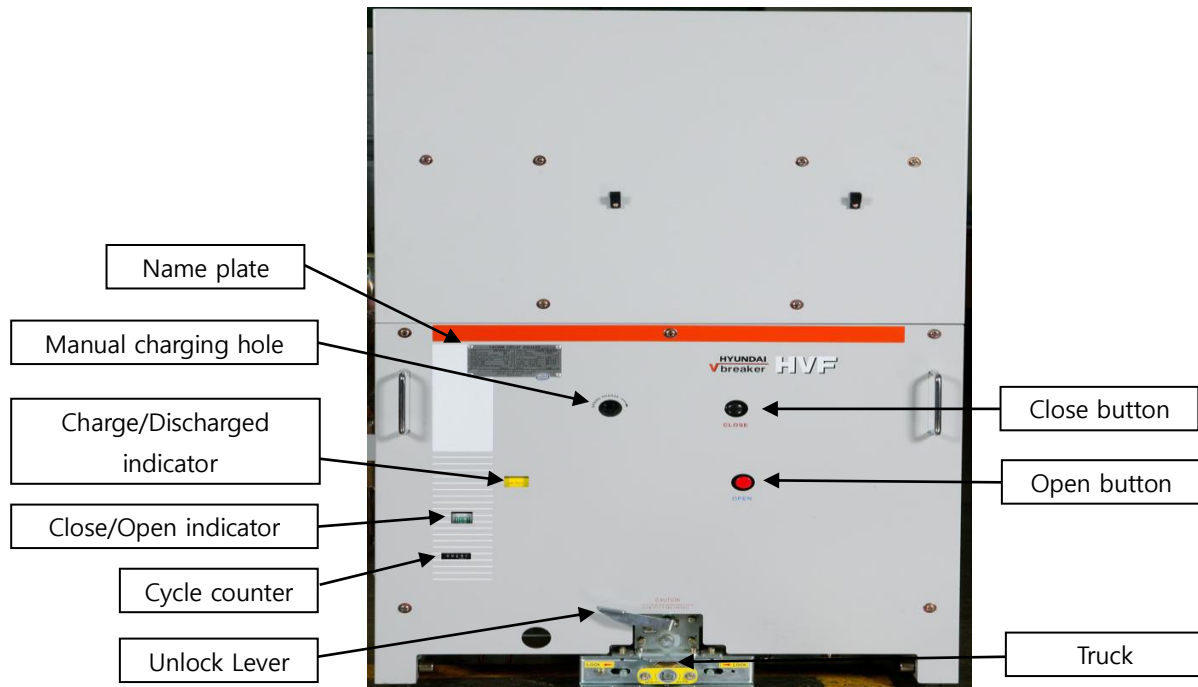
HVF circuit breakers have motor-spring energy stored mechanisms of a rigid structure. It consists of the charging mechanism, the closing spring, the trip spring, the motor, solenoids, auxiliary switches, spring charged and on/off indicators as shown in Fig.1, 2.

Depending on the intended protection functions, the operating mechanism can be supplemented by 2nd shunt release, under voltage release, lockout relay, cut-out switch, limit switch, electrical local closing and so on.

The released closing spring is automatically recharged sequences "open-close-open" which is required when unsuccessful auto-reclosing operation is attempted.



<Fig.1. Front view of draw-out VCB body for 15kV>



<Fig.2. Front view of draw-out VCB body for 38kV>

Pole part

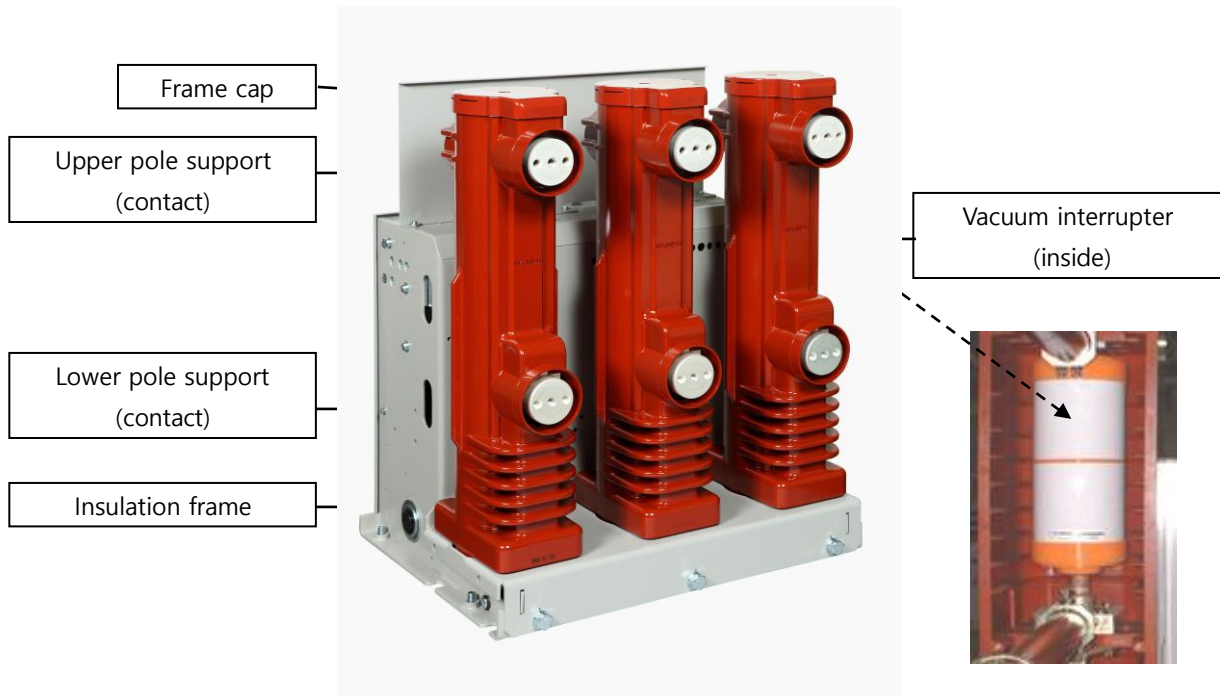
The pole parts are placed on the rear side of the operating mechanism.

The internal parts of the pole are well enclosed by the tubular type insulation frame as shown in Fig.3. This prevents dust on the internal insulation material which is highly resistant to tracking.

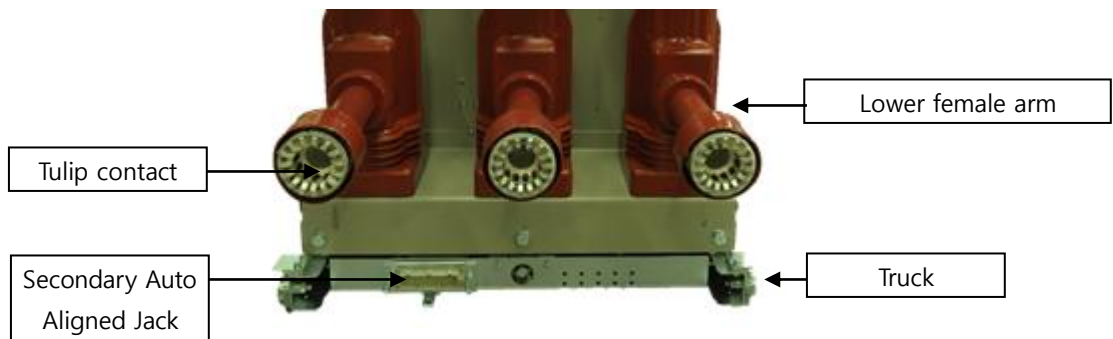
The vacuum interrupters are mounted rigidly in the insulation frame, so they can withstand forces arising from switching operation and contact pressure.

In the closed state, the necessary contact pressure is established by the contact pressure spring and the atmospheric pressure.

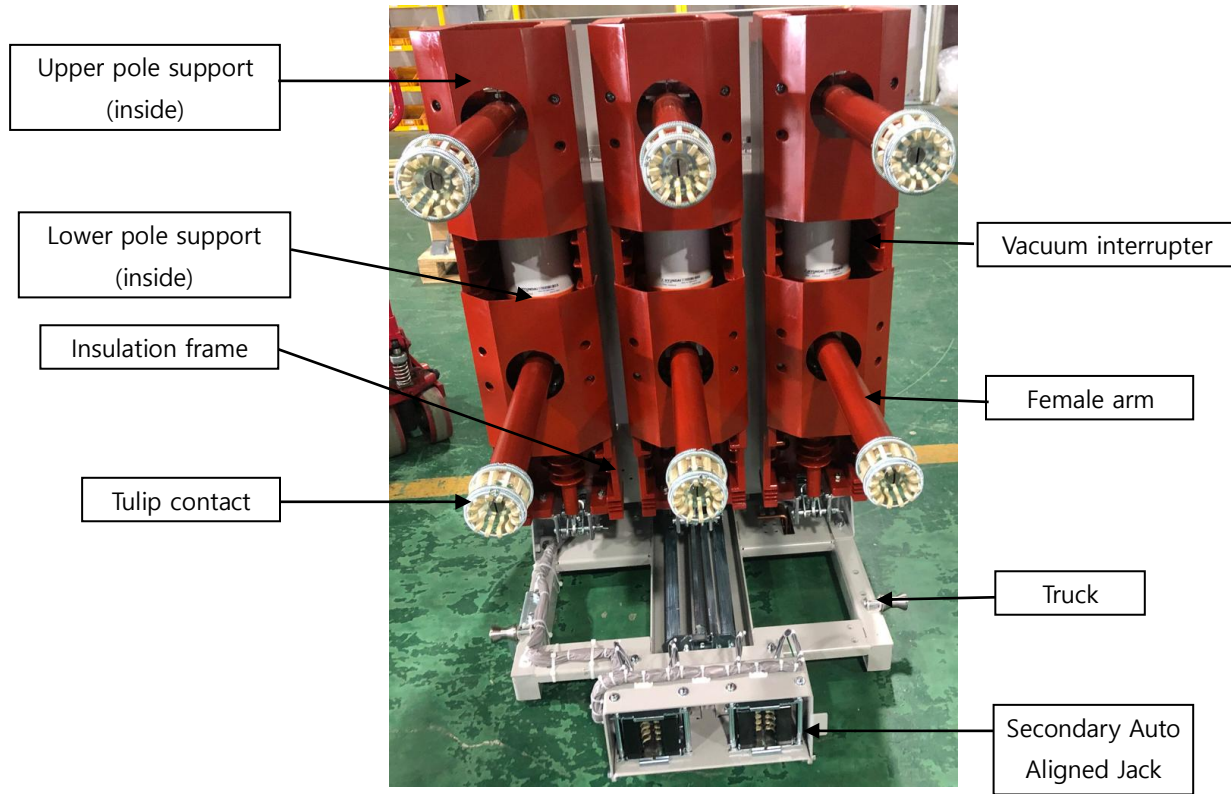
The contact pressure spring automatically compensates the arc erosion which is very small.



<Fig.3. Rear view of fixed VCB for 15kV>



<Fig.4. Rear view of draw-out VCB body for 15kV>



<Fig.5. Rear view of draw-out VCB body for 38kV>

Ratings

Model ¹⁾		HVF 144□	HVF 145□	HVF 146□	HVF 147□
Standard		IEEE C37.09, UL Recognized			
Rated voltage (kV)		4.76			
Frequency (Hz)		60			
Rated current (A)		1 630	1 630	1 630	1 630
		2 1,200	2 1,200	2 1,200	2 1,200
		4 2,000	4 2,000	4 2,000	4 2,000
		7 3,000	7 3,000	7 3,000	7 3,000
Rated short-circuit breaking current (kA)		25	31.5	40	50
Rated short-circuit making current (kA)		65	82	104	130
Short-time withstand current for 3sec (kA)		25	31.5	40	50
Power-frequency withstand voltage (kV, 1min)		19			
Impulse withstand voltage (kV, 1.2x50μs)		60			
Operating duty		O – 0.3sec – CO – 15sec ³⁾ – CO			
Closing time (ms, at DC125V)		45 – 70			45 – 55
Opening time (ms, at DC125V)		28 - 38			31.5 – 38.5
Breaking time (cycles)		3			
Closing operating	System	Motor spring stored energy			
	Supply voltage (V)	DC48, 125, 250 / AC110, 120, 240			
	Current (A)	Refer to Table 3 (see page 12)			
Closing& tripping control	Tripping system	Shunt trip			
	Supply voltage (V)	DC48, 125, 250 / AC110, 120, 240			
	Current (A)	Refer to Table 3 (see page 12)			
Operating life (times)	Mechanical operation ²⁾	10,000 ²⁾			
	Electrical operation	Refer to Table 2 (see page 11)		Refer to Table 2 (see page 11)	
Auxiliary contacts		4NO+4NC (Max. 10NO+10NC)			
Weight (kg/lbs) (Main-body)		1 170/375	1 180/397	1 180/397	1 200/375
		2 170/375	2 180/397	2 180/397	2 200/375
		4 210/463	4 220/485	4 220/485	4 220/463
		7 280/662	7 280/662	7 280/662	7 280/662
		8 280/662			8 280/662

※ 1) Type number in the square "□" shall be listed as shown in the line for the rated current.

2) The value is with maintenance, 2,000 times without maintenance.

3) HVF 147□ is 3min.

Model ¹⁾		HVF 244□	HVF 245□	HVF 246□
Standard		IEEE C37.09, UL Recognized		
Rated voltage (kV)		8.25		
Frequency (Hz)		60		
Rated current (A)		1 630	1 630	1 630
		2 1,200	2 1,200	2 1,200
		4 2,000	4 2,000	4 2,000
			7 3,000	7 3,000
Rated short-circuit breaking current (kA)		25	31.5	40
Rated short-circuit making current (kA)		65	82	104
Short-time withstand current for 3sec (kA)		25	31.5	40
Power-frequency withstand voltage (kV, 1min)		36	36	36
Impulse withstand voltage (kV, 1.2x50μs)		95	95	95
Operating duty		O – 0.3sec – CO – 15sec – CO		
Closing time (ms, at DC125V)		45 - 70		
Opening time (ms, at DC125V)		28 - 38		
Breaking time (cycles)		3		
Closing operating	System	Motor spring stored energy		
	Supply voltage (V)	DC48, 125, 250 / AC110, 120, 240		
	Current (A)	Refer to Table 3 (see page 12)		
Closing& tripping control	Tripping system	Shunt trip		
	Supply voltage (V)	DC48, 125, 250 / AC110, 120, 240		
	Current (A)	Refer to Table 3 (see page 12)		
Operating life (times)	Mechanical operation ²⁾	10,000 ²⁾		
	Electrical operation	Refer to Table 2 (see page 11)		
Auxiliary contacts		4NO+4NC (Max. 10NO+10NC)		
Weight (kg/lbs) (Main-body)		1 170/375	1 180/397	1 180/397
		2 170/375	2 180/397	2 180/397
		4 210/463	4 220/485	4 220/485
			7 300/662	7 300/662

※ 1) Type number in the square "□" shall be listed as shown in the line for the rated current.

2) The value is with maintenance, 2,000 times without maintenance.

Model ¹⁾		HVF 344□	HVF 345□	HVF 346□
Standard		IEEE C37.09, UL Recognized		
Rated voltage (kV)		15		
Frequency (Hz)		60		
Rated current (A)		1 630 2 1,200 4 2,000	1 630 2 1,200 4 2,000 7 3,000	1 630 2 1,200 4 2,000 7 3,000
Rated short-circuit breaking current (kA)		25	31.5	40
Rated short-circuit making current (kA)		65	82	104
Short-time withstand current for 3sec (kA)		25	31.5	40
Power-frequency withstand voltage (kV, 1min)		36	36	36
Impulse withstand voltage (kV, 1.2x50μs)		95	95	95
Operating duty		O – 0.3sec – CO – 15sec – CO		
Closing time (ms, at DC125V)		45 - 70		
Opening time (ms, at DC125V)		28 - 38		
Breaking time (cycles)		3		
Closing operating	System	Motor spring stored energy		
	Supply voltage (V)	DC48, 125, 250 / AC110, 120, 240		
	Current (A)	Refer to Table 3 (see page 12)		
Closing& tripping control	Tripping system	Shunt trip		
	Supply voltage (V)	DC48, 125, 250 / AC110, 120, 240		
	Current (A)	Refer to Table 3 (see page 12)		
Operating life (times)	Mechanical operation ²⁾	10,000 ²⁾		
	Electrical operation	Refer to Table 2 (see page 11)		
Auxiliary contacts		4NO+4NC		
Weight (kg/lbs) (Main-body)		1 170/375 2 170/375 4 210/463	1 180/397 2 180/397 4 220/485 7 300/662	1 180/397 2 180/397 4 220/485 7 300/662

※ 1) Type number in the square "□" shall be listed as shown in the line for the rated current.

2) The value is with maintenance, 2,000 times without maintenance.

Model ¹⁾		HVF 705□	HVF 706□	
Standard		IEEE C37.09		
Rated voltage (kV)		38		
Frequency (Hz)		60		
Rated current (A)		2 1,200	2 1,200 4 2,000 7 3,000	
Rated short-circuit breaking current (kA)		31.5	40	
Rated short-circuit making current (kA)		82	104	
Short-time withstand current for 3sec (kA)		31.5	40	
Power-frequency withstand voltage (kV, 1min)		80	80	
Impulse withstand voltage (kV, 1.2x50μs)		150	150	
Operating duty		O – 0.3sec – CO – 3min – CO		
Closing time (ms, at DC125V)		≤ 70	45 – 70	
Opening time (ms, at DC125V)		≤ 60	35 – 50	
Breaking time (cycles)		5		
Closing operating	System	Motor spring stored energy		
	Supply voltage (V)	DC48, 125, 250 / AC120, 240		
	Current (A)	Refer to Table 3 (see page 12)		
Closing& tripping control	Tripping system	Shunt trip		
	Supply voltage (V)	DC48, 125, 250 / AC120, 240		
	Current (A)	Refer to Table 3 (see page 12)		
Operating life (times)	Mechanical operation ²⁾	2,000 ²⁾		
	Electrical operation	Refer to Table 2 (see page 11)		
Auxiliary contacts		4NO+4NC		
Weight (kg/lbs) (Main-body)		㉔ 420/927(l) ㉕ 460/1015(l) ㉖ 600/1324(l)	㉔ 420/927(l) ㉕ 460/1015(l) ㉖ 600/1324(l)	

※ 1) Type number in the square "□" shall be listed as shown in the line for the rated current.

2) The value is with maintenance, 500 times without maintenance.

Type of Mounting (15kV)

As the standard version, the fixed type and three kinds of draw-out type circuit breaker can be provided on request.

The draw-out type breakers consist of truck, mechanical interlock, control terminal, and various accessories.

XA type: Fixed VCB

GA/MA type: Draw-out VCB body

GS type: Draw-out VCB with GS cradle [Metallic partition & bushing with shutter]

MS type: Draw-out VCB with MS cradle [Metallic partition & bushing with shutter, with door]

XA type



MA/GA type



GS type



MS type



<Fig.6 VCB Type for 15kV>

Type of Mounting (38kV)

XA type: Fixed VCB

MA type: Draw-out VCB body

MF type: Draw-out VCB with MF cradle [Metallic partition & bushing with shutter, hinge/stopper for door]

MS type: Draw-out VCB with MS cradle [Metallic partition & bushing with shutter]

MH type: Draw-out VCB with MH cradle [Metallic partition & bushing with shutter, with door]

MA type



MH type



MF type



MS type



<Fig.7 VCB Type for 38kV>

Technical Data [Application]

Applicable standards

HYUNDAI vacuum circuit breakers meet IEEE C37.09 standard as well as it is UL® recognized (15kV)

Rapid load transfer & operating duty

With its consistent short closing and operating times, Hyundai vacuum circuit breakers are especially beneficial in load transfer from one circuit to another without interruption of service.

This high-speed operation performs synchronizing of the systems to be paralleled at the instant of contact closure as well. According to the relevant standards and breaker types, tests were carried out for the following operating duties.

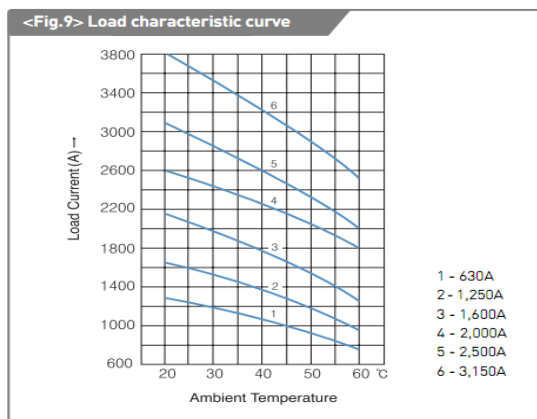
- ◆ O – 0.3sec – CO – 15sec – CO
 - ◆ O – 0.3sec – CO – 3min – CO
- (O: Open, C: Close)

Current carrying capacity

HYUNDAI vacuum circuit breakers may keep at ambient temperatures between -5 and +40 °C. The rated normal currents are determined according to IEEE standards at an ambient temperature of 40 °C.

When the breakers are operated at different temperature, the correction on the operating current must be considered. Fig.9. shows appropriate operating currents at different ambient temperatures.

However, the diagram applies only to open type switchgear so metal enclosed switchgear load currents shall be reduced accordingly.



Switching of overload transmission lines and cables

The relatively small capacitive currents of overload transmission lines and cables under no load condition can be safely interrupted without restrike and overvoltage development

Switching of capacitors

HYUNDAI vacuum circuit breakers are the solution for capacitive application by switching the circuit without restrike and over voltage. VCB above 4.76kV 25kA can switch ON/OFF up to 50A capacitive load, and higher than 50A circuit, shall be informed in advance.

Switching unloaded transformer

By the special contact materials, the chopping current of the vacuum circuit breakers is only 4A to 5A, so overvoltage is limited when transformers disconnected at no load condition

Switching of motors

Long electrical lifetime at rated current lets HYUNDAI vacuum circuit breakers be the excellent solution for high voltage motors.

Surge absorber is recommended on these motors, which have less insulation level or less than 600A starting current. Even though low surge occurrence is the feature of HYUNDAI vacuum circuit breakers, the motor and the circuit itself can be protected efficiently by the surge absorber.

Interruption of transient recovery voltage

HYUNDAI vacuum circuit breakers can break the accident current properly at down stream of transformers, generators and current limit chokes, whose rising rates of transient recovery voltages are higher than IEEE Standard, even up to 10kV/us.

Technical Data [Arc Quenching System]

A metal-vapor arc discharge in the vacuum is initiated by the current to be interrupted as the contacts open. current flows through this metal-vapor plasma until the next zero transition.

The arc extinguishes in the vicinity of the current zero, and the conductive metal-vapor condenses within a few microseconds on the metal surfaces.

As a result, the dielectric strength in the contact gap is rapidly rebuilt.

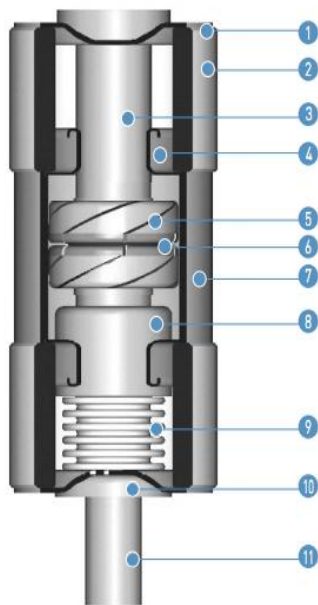
The rapid build-up of the dielectric strength even if contact separation takes place shortly before a current zero transition. The maximum arcing time for the last pole to clear is therefore only up to 15ms.

If the metal vapor arc discharge can be maintained within a certain level, the current is supposed be chopped prior to current zero.

This chopping current must be controlled to prevent build-up of unduly high over voltages when inductive circuits are switched. The sintered CuCr contact limits the chopping current up to 4A to 5A.

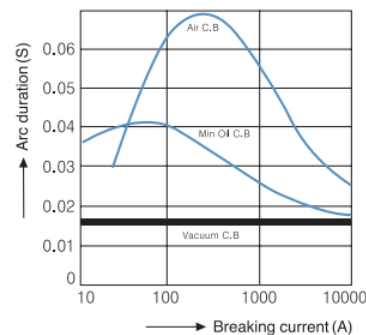
The geometry and size of the contact are designed differently according to breaking current and interrupter type.

<Fig.10> Section view of VI



- | | |
|---------------------|------------------|
| 1 End flange | 7 Act chamber |
| 2 Ceramic insulator | 8 Bellows shield |
| 3 Fixed stem | 9 Bellows |
| 4 Middle flange | 10 Bearing cap |
| 5 Contact base | 11 Movable stem |
| 6 Contact trip | |

<Fig.11> Arcing time-breaking current curve



<Table 1> Arc quenching medium

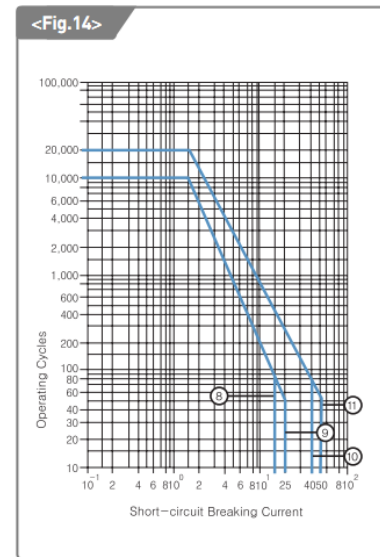
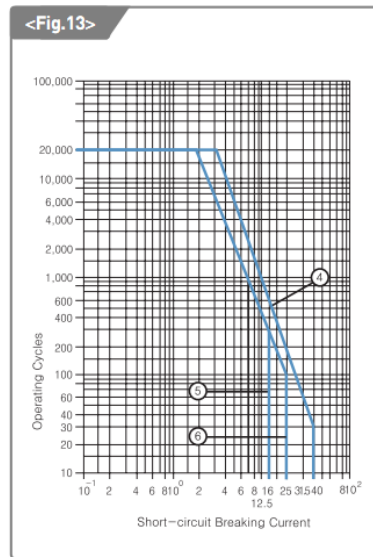
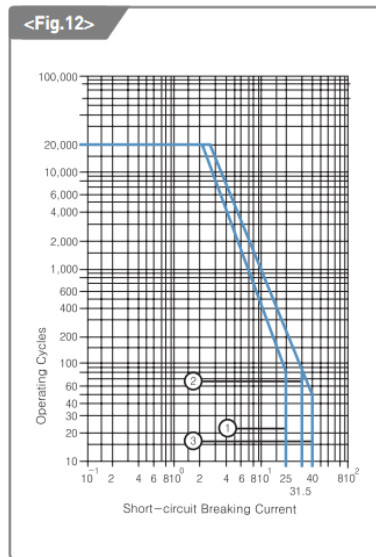
Breaker type	Arc voltage(V)
Vacuum circuit breaker	20-200
SF ₆ gas circuit breaker	500-1,000
Oil circuit breaker	1,500-3,000
Magnetic blaster circuit breaker	1,500-3,000

Technical Data [Service Life]

HYUNDAI vacuum circuit breaker needs minimum maintenance due to the simple operating mechanism and robust construction.

Vacuum circuit breaker shall be maintained periodically to ensure the perfect performance during mechanical and/or electrical lifetime.

Please refer to the instruction manual for the detailed information.



<Table 2> Electrical endurance curve number depending on VCB type

Model		HVF						
Rated voltage	kV	4.76			8.25/15		38	
Rated breaking current	kA	25	31.5/40	50	25	31.5/40	31.5	40
Curve number	630A	①	③	⑪	①	④		
	1,200A	①	③	⑪	①	④	②	④
	2,000A	①	③	⑪	①	④		④
	3,000A	-	③	⑪	-	④		④
	4,000A	-	-	⑪	-	-		

Technical Data [Power Consumption & Rated Current]

Charging Motor

HYUNDAI VCB adopts short-time duty charging motor and the specification is stipulated on Table3.

Since the motor operating time is short, the maximum value and inrush current are disregarded.

Solenoids

Closing solenoid and tripping solenoid operate latching Mechanism for VCB springs, so the VCB can be controlled remotely.

The specification is mentioned on Table 3.

The solenoids unlatch the closing spring and opening spring to close and open the VCB, respectively

Auxiliary Contacts (Secondary)

The following versions are available:

- ◆ C: Single control jack mounted on the breaker upper body with 0.8m cable, 4NO+4NC for fixed VCB (Manual jack)
- ◆ D: Double control jack mounted on the breaker upper body with 0.8m cable, 10NO+10NC for fixed VCB (Manual jack)
- ◆ I: Single control jack mounted on the breaker rear body, 4NO+4NC (Auto jack for 15kV)
- ◆ X: Single control jack mounted on the breaker rear body, 4NO+4NC (Auto jack for 38kV)

Rating of auxiliary contacts

- ◆ Operating voltage: Max. 250V AC, DC
- ◆ Continuous thermal current: 10A
- ◆ Breaking current: DC48V – 10A, DC125A – 4A, DC250A – 2A

Power consumption & control voltage <Table 3>

Control voltage	Control current (A)			Voltage range
	Motor	Closing solenoid	Tripping solenoid	
DC48V	22.0	3.0	8.0	Motor/Close: 38-56V Open : 28-56V
DC125V	8.0	1.5	3.0	Motor/Close: 100-140V Open : 70-140V
DC250V	4.0	1.0	2.0	Motor/Close: 200-280V Open : 140-280V
AC120V	8.0	1.5	3.0	Motor/Close: 104-127V Open : 104-127V
AC240V	4.0	1.0	2.0	Motor/Close: 208-254V Open : 208-254V

Standard Accessories

Draw in/out handle

- Spare Code : HVFS-MGHANDLE



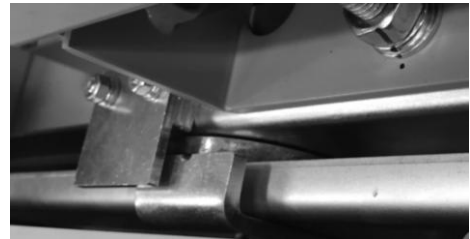
Manual charging handle

- Spare Code : HAFS-HANDLE



Coding plate

Coding plate can be provided to prevent removable elements with lesser current and insulation ratings from being inserted into compartments with greater current and insulation ratings.



[15kV]



[38kV]

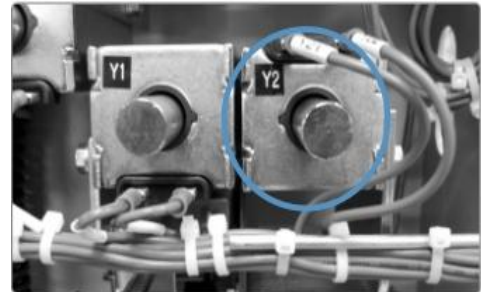
Additional Options

※ “ □ ” : Control Voltage

2nd shunt release (Y2)

- Order code : R□

2nd shunt release is used to open the circuit breaker by intelligence relay, deliberate electrical or mechanical action. 2nd shunt release can be connected to control power (AC or DC); but 2nd shunt release may also be connected to voltage transformers.



Under voltage release (Y7)

- Order code : U□

Under voltage release (UVR) trips the VCB automatically when the control voltage drops to 30% of rated voltage. UVR can be connected to voltage transformer and can be applied to DC control power. Lockout relay is recommended along with UVR to block undesirable closing attempt.



Lockout relay (F1)

- Order code : L□

Lockout relay blocks VCB closing command when the control voltage is lower than 30% of rated voltage. VCB closing command can be carried out when the control voltage recovers to 85%. When lockout relay is installed, the VCB can be closed only when UVR is energized.



Varistor module (V1, V2, V3)

- Order code : V□

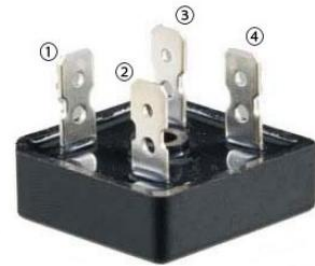
Varistor module protects charging motor and solenoids from the surge of DC control system. Potential damage caused by DC surge can be limited by applying varistor module to motor and solenoids.



Rectifier (V1, V2, V3)

- Spare code : HAFS-REC_SOL, HAFS-REC_MOT

Varistor module protects charging motor and solenoids from the surge of DC control system. Potential damage caused by DC surge can be limited by applying varistor module to motor and solenoids.



Close & Open Button Cover

- Order code : BB (both for close & open button)
- Order code : BC (for close button only)
- Order code : BO (for open button only)

Close buttons cover & open button cover protects an accident caused by manipulation of operators

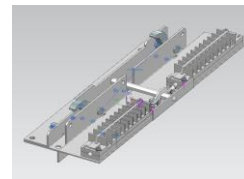


MOC(M3): Mechanism Operated Cell switches

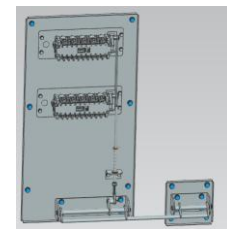
- Order code : M3, M6, MA, MP

In the TEST and CONNECTED positions of the circuit Breaker as the circuit breaker closes, MOC switch contact position is changed. MOC switch contacts operate in the same manner as the auxiliary switch contacts in the circuit breaker.

Although the MOC switch operator is provided on all circuit breakers, the compartment mounted MOC switches are only provided when specified with the order. Basic contacts are 3a+3b.



[15kV]

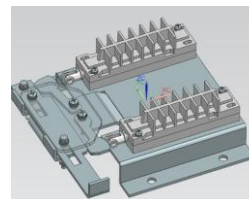


[38kV]

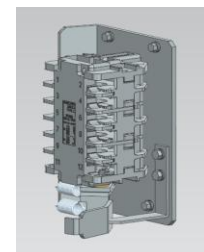
TOC(T3): Truck Operated Cell switches

- Order code : T3, T6

TOC switch operator is mounted inside the right foot of the circuit breaker. It operates the TOC switch as the circuit breaker moves to the CONNECTED position in the switchgear compartment. Basic contacts are 3a+3b.



[15kV]



[38kV]

Position padlock with Kirk key

- Order code : KL

Position padlock key locks VCB in each position



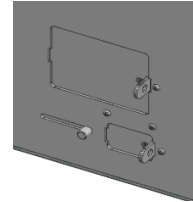
Position padlock

- Order code : PD

Position padlock locks VCB in each position.



[15Kv]



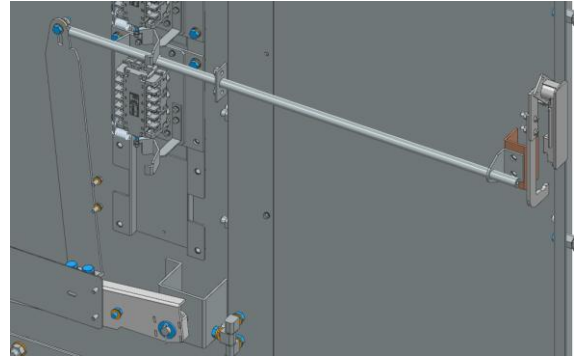
[38Kv]

Door Interlock

- Order code : DI

VCB is moved with a door closed. When a door is open, VCB can't be moved into TEST / CONNECTED position.

When VCB is in CONNECTED position or between TEST and CONNECTED position, a door can't be open.



Fan

- Order code : FA

4 fans are provided for 4000A.

Spring charged signal (S41)

- Order code : S1

Spring charged signal is an electric function to check VCB charged.

Control jack no. 21 and 22 when there is no separate discussion will be withdrawn.

※ The cable number may vary.

Trip coil supervision signal

- Order code : TC

Trip coil supervision signal is applied to a relay for monitoring a trip coil.

Control jack no. 23 when there is no separate discussion will be withdrawn.

※ The cable number may vary.

Early "b" contact

- Order code : WC, W2

Early b signal is applied to provide about 5ms faster contact time.

Basic contact is 1EA.

Condenser trip device

Even though control power is lost, condenser trip device can trip the VCB of AC control system.

Order code	HVFS-T7	HVFS-T9	HVFS-T4	HVFS-T6
Rated input voltage	AC110V	AC220V	DC110V	DC220V
Charging voltage	DC145V	DC290V	DC110V	DC220V
Ordinary current	DC2A			
Time delay	within 0.5 sec			
Frequency	50/60 Hz		-	



Vacuum checker

- Order code : HAFS-VC9(22KV), HAFS-VC9(28KV)

Vacuum interrupter has longer lifetime than VCB, but vacuum degree can be checked for more reliable operation.

Rated input voltage	AC110/220V
Rated output voltage	AC 11/22/28kV
Dimensions	W200 x L350 x H176mm

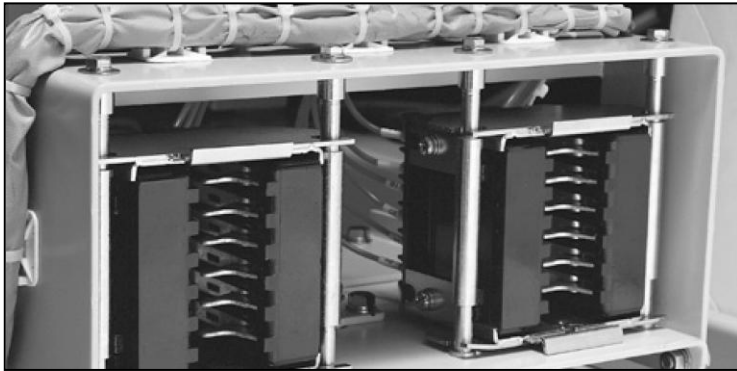


Designation Options

18

Secondary Auto Aligned Jack

This Control Jack is a method that applies to Position 3 that does not breaker to connect on a disconnecting position and automatically connects on test and connection positions. It is mounted on the VCB by default.

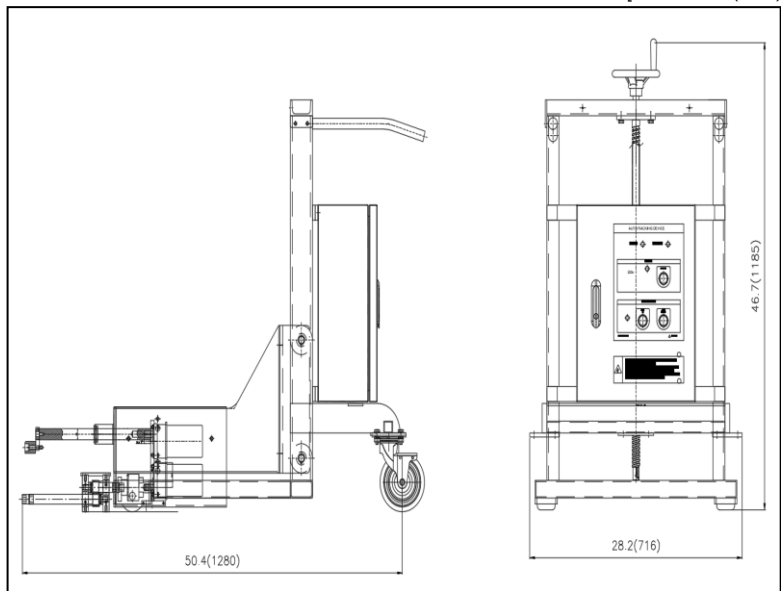


Remote racking device

This portable device enables automatic rack-in and rack-out operations.

- Order code : HVFS-15A_RACKING_110_A, HVFS-38A_RACKING_110_A

[Unit : inch(mm)]

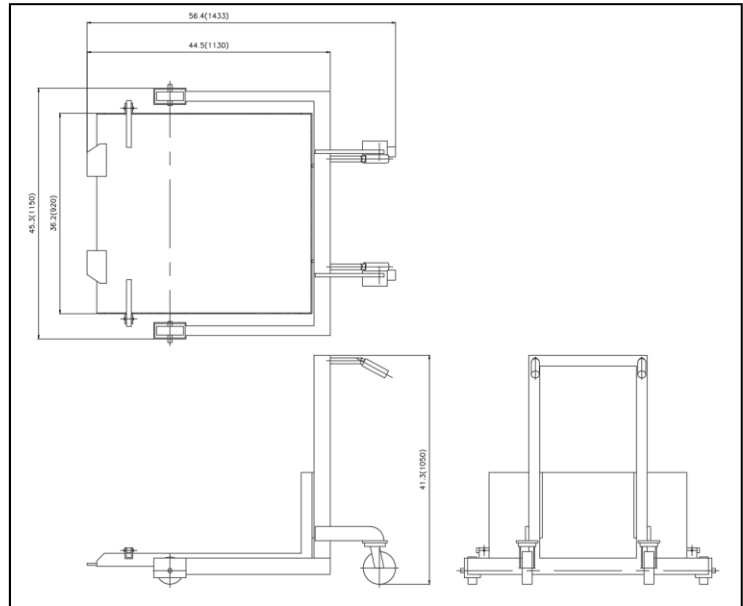


Lifter

A portable device designed to enable the movement of a VCB.

- Order code : HVFS-15_LIFTER, HVFS-38_LIFTER

[Unit : inch(mm)]

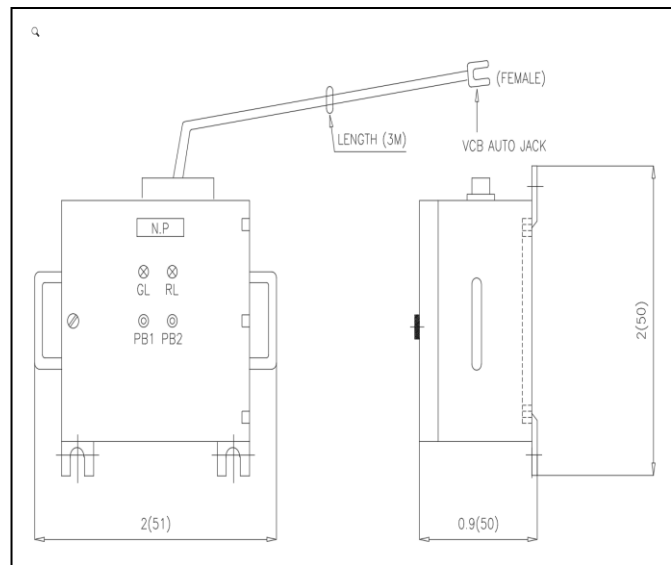


Test Cabinet

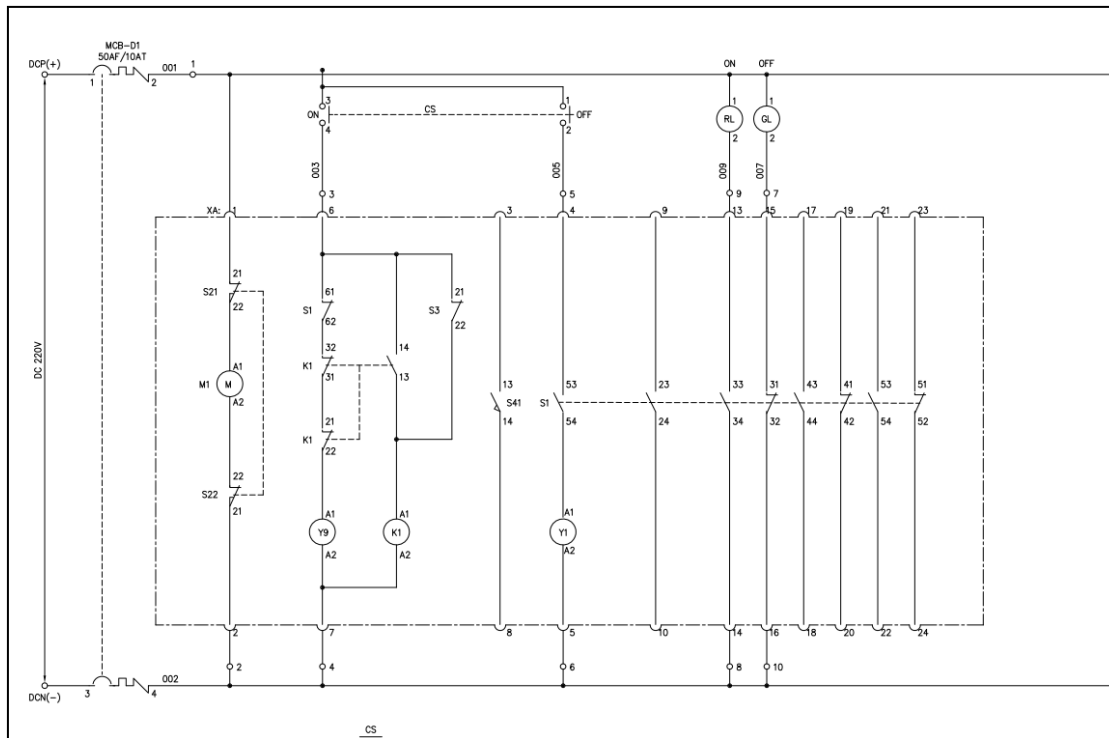
This device enables operational testing of a VCB while it is withdrawn from the panel.

- Order code : HVFS-15TEST_CABINET , HVFS-38TEST_CABINET

[Unit: inch(mm)]



- Circuit Diagram of Test Cabinet

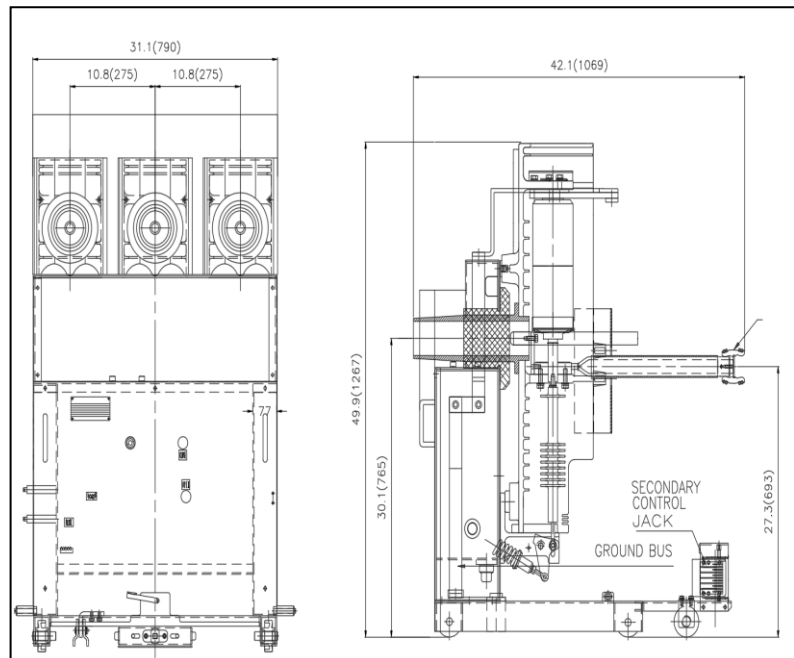
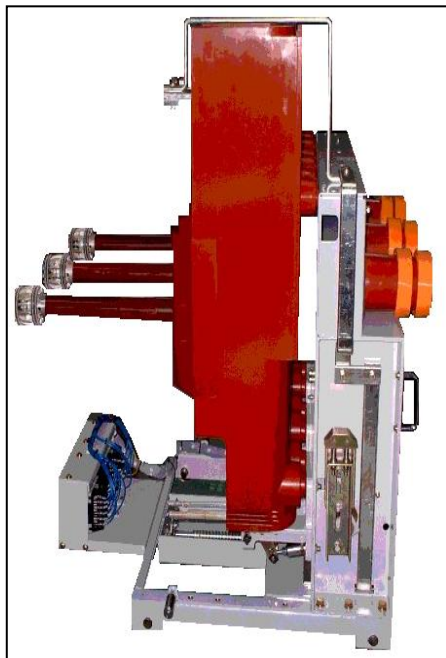


G&T Device (38kV, Electric Type)

Electric G&T Device

- Order code : HVF7052ITL55EX (Lower Type), HVF7052ITU55EX (Upper Type)

[Unit : inch(mm)]

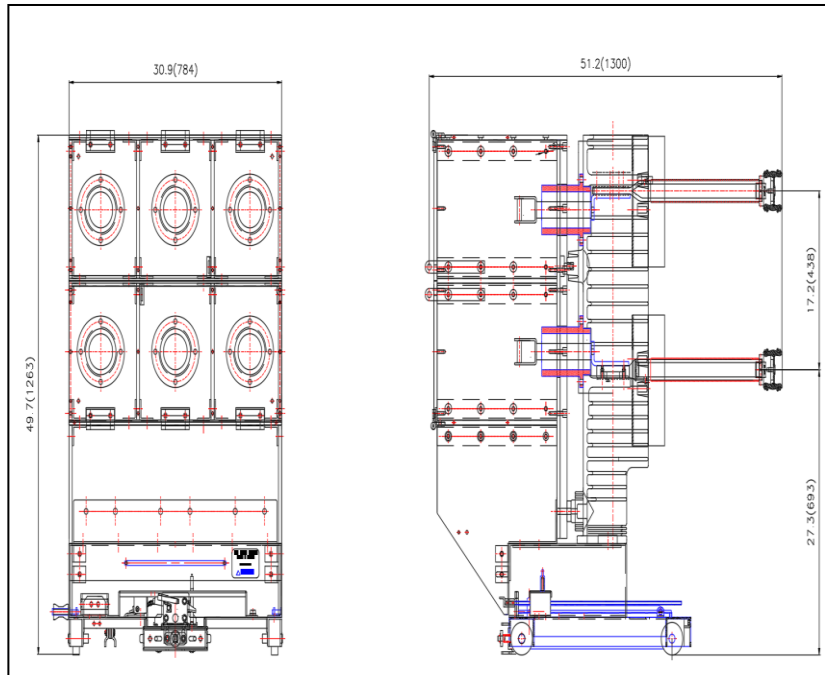


G&T Device (38kV, Manual Type)

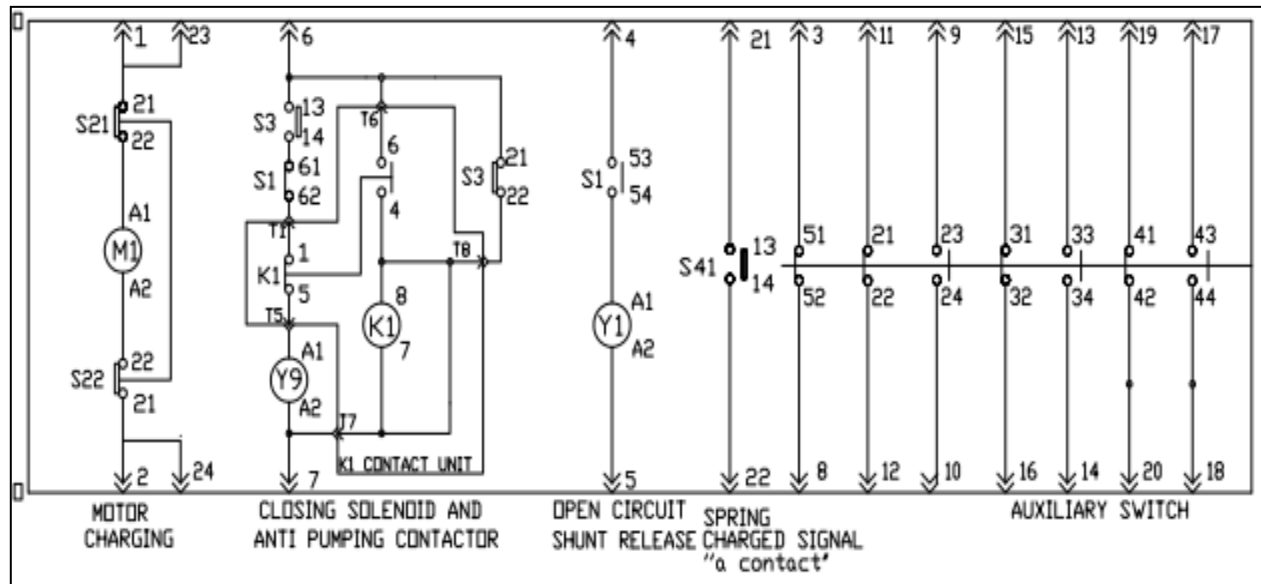
Manual G&T Device

- Order code : HVF7052ITM000X

[Unit: inch(mm)]



Control Circuit



Y1: Tripping solenoid

Y9: Closing solenoid

S1: Aux, switch

S3: Limit switch

K1: Anti-pumping relay

X0: Plug / Socket

S41, S42: Limit switch (spring charged signal)

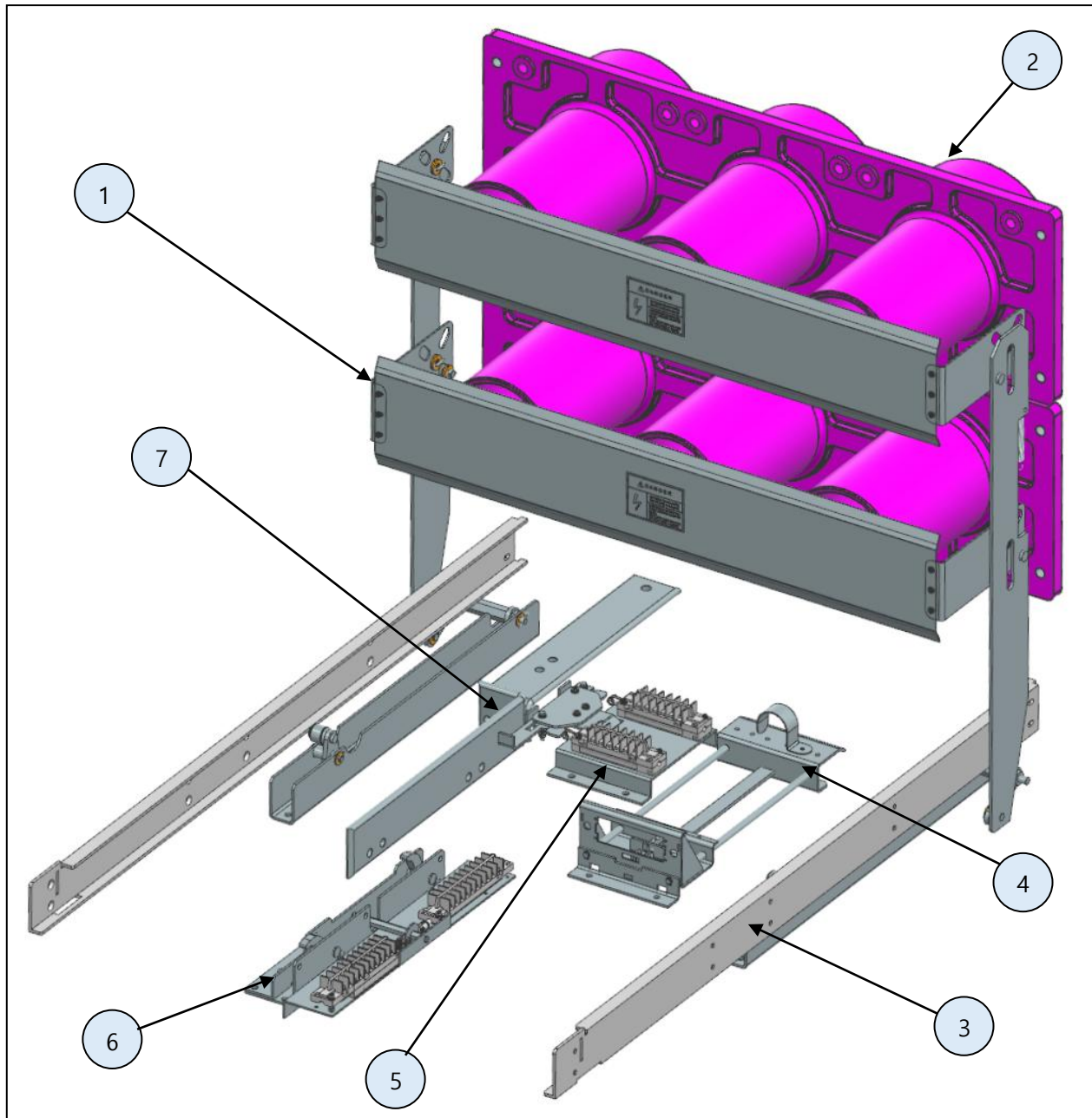
M1: Motor

S21, S22: Limit switch

15kV KIT ASSY (Cradle)

15KV Cell Kit Assy can be provided by customer's request

- Order code : HVFS-15_KIT_ASSY_1200, HVFS-15_KIT_ASSY_2000, HVFS-15_KIT_ASSY_3000



1. SHUTTER ASSY

A safety shutter mounted on the Panel to protect operators by isolating live parts.

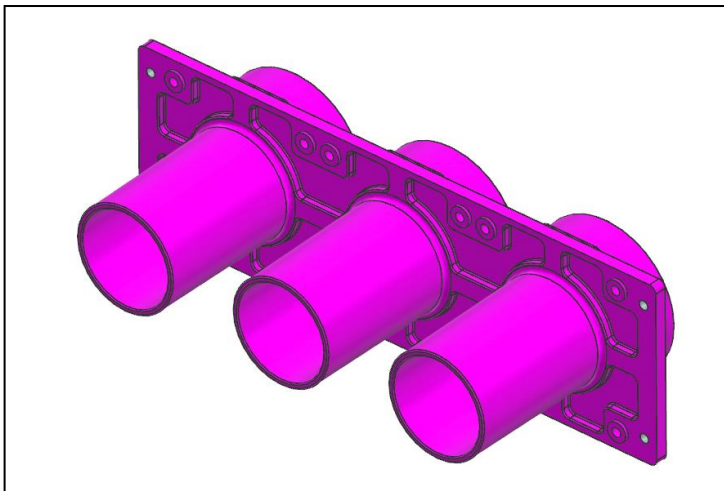
- Order code : HVFS-15_SH_ASSY_1200, HVFS-15_SH_ASSY_2000, HVFS-15_SH_ASSY_3000



2. BUSHING ASSY

An insulated bushing assembly mounted on the Panel to ensure safe and reliable power connection.

- Order code : HVFS-15_BUSHING_ASSY_1200, HVFS-15_BUSHING_ASSY_2000
HVFS-15_BUSHING_ASSY_3000



3. TRUCK RAIL (R/L)

A guide rail installed in the Panel to support and guide the truck during movement.

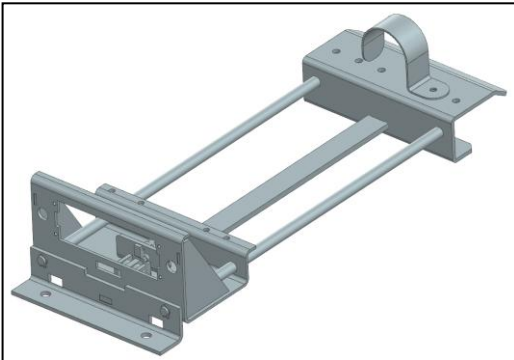
- Order code : HVFS-15_RAIL_L, HVFS-15_RAIL_R



4. SECONDARY AUTO ALIGNED JACK

A secondary auto-aligned jack installed in the panel to guide and align the truck during movement, with a 3 m cable pull-out length provided.

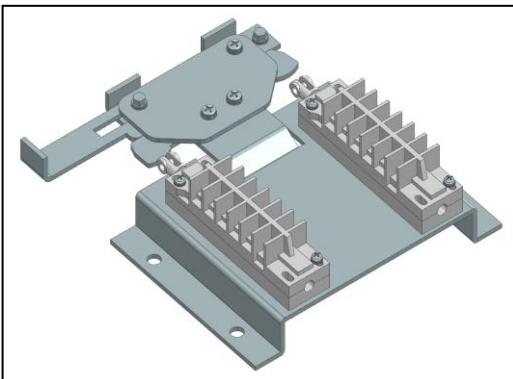
- Order code : HVFS-15_AUTO_JACK_ASSY



5. TOC (Truck Operated Contact) ASSY

A truck operated contact installed in the CB cradle to indicate the truck position.

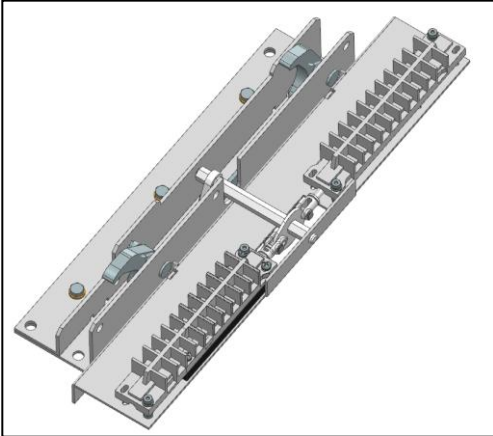
- Order code : HVFS-15_TOC_ASSY_6A_6B



6. MOC (Mechanically Operated Contact) ASSY

A mechanically operated contact installed in the Panel to indicate the breaker position.

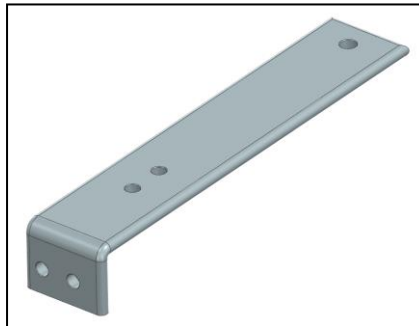
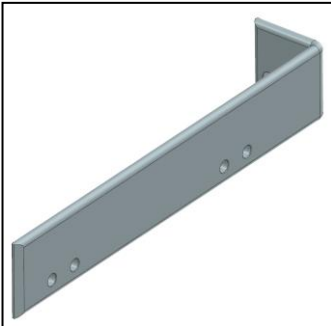
- Order code : HVFS-15_MOC_ASSY_6A_6B, HVFS-15_MOC_ASSY_10A_10B



7. EARTHING BUS BAR (A/B)

An earthing bus bar installed in the Panel to provide a reliable grounding path.

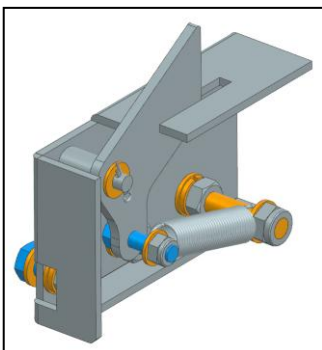
- Order code : HVFS-15_GBUS1, HVFS-15_GBUS2



8. RAMP INTERLOCK ASSY (R/L) : Sold separately

A ramp interlock assembly installed in the Panel to prevent improper operation during truck movement.

- Order code : HVFS-15_RAMP_L, HVFS-15_RAMP_R

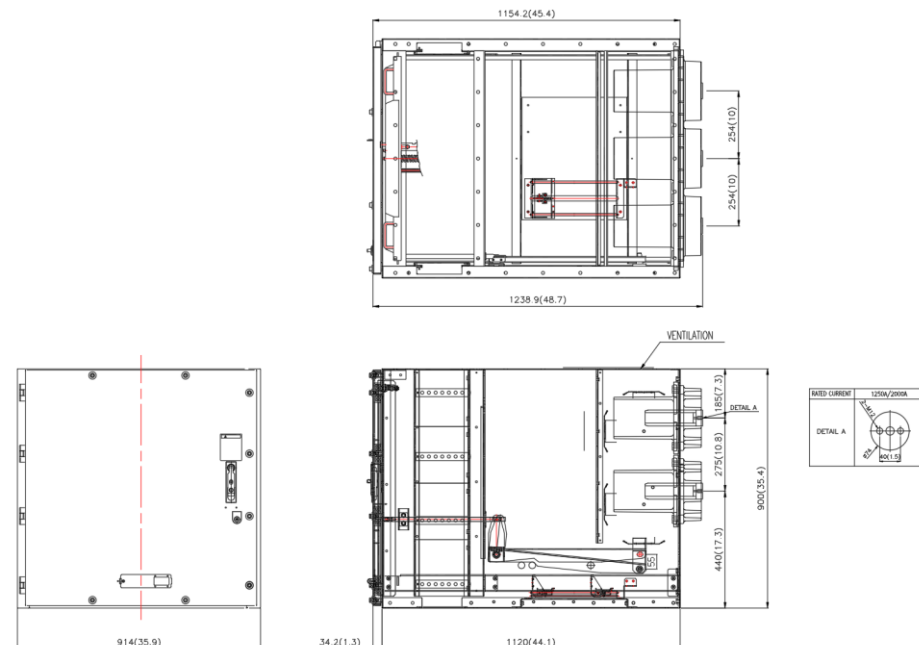


Dimensions [MS type – Draw-out VCB with MS cradle]

[Unit: mm(inch)]

※ Dimensions may be revised without notice.

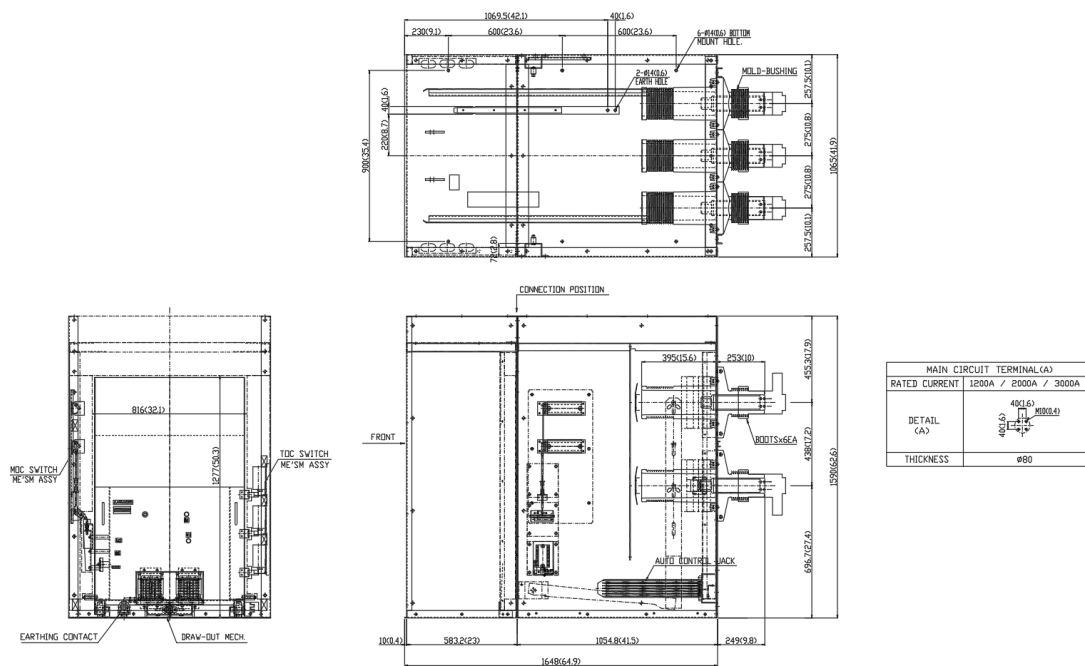
4.76/8.25/15kV 25/31.5/40kA 1200A - HVF1442,2442,3442,1452,2452,3452,1462,2462,3462
4.76kV 50kA 1200A - HVF1472

4.76/8.25/15kV 25/31.5/40kA 2000A - HVF1444,2444,3444,1454,2454,3454,1464,2464,3464
4.76kV 50kA 2000A - HVF1474


[Unit: mm(inch)]

※ Dimensions may be revised without notice.

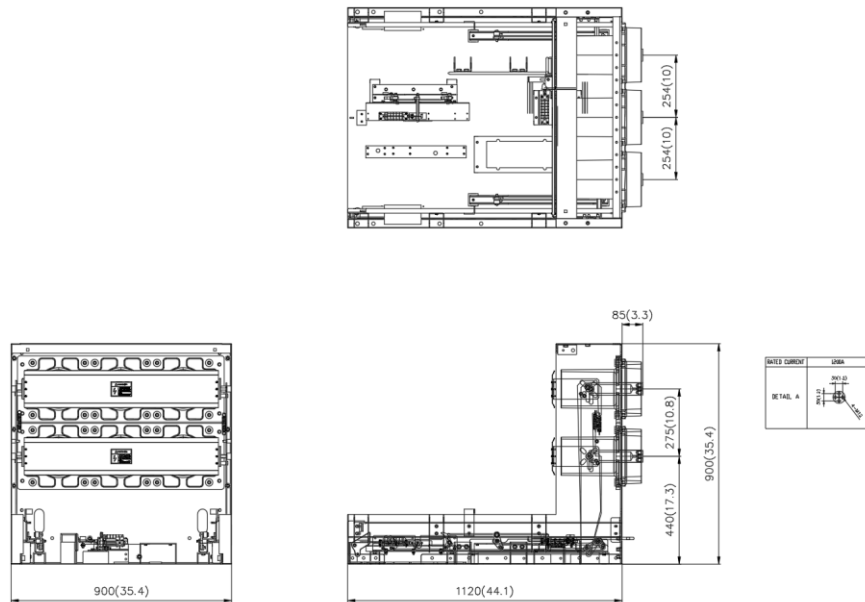
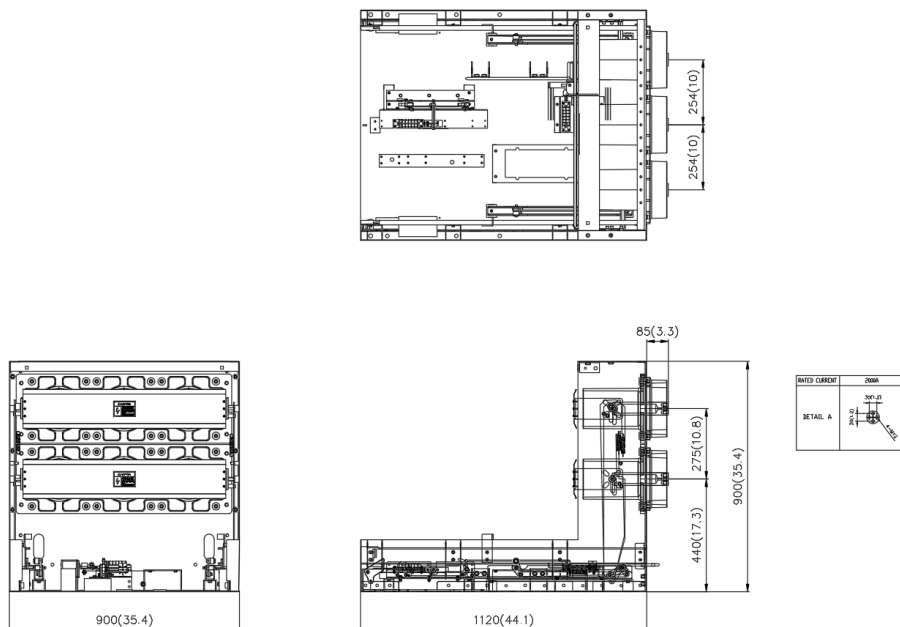
4.76/8.25/15kV 31.5/40kA 3000A - HVF1457,2457,3457,1467,2467,3467
4.76kV 50kA 3000/4000A - HVF1477,1478

38kV 31.5/40kA 1200/2000/3000A – HVF7052, 7054, 7057, 7062, 7064, 7067


Dimensions [GS type – Draw-out VCB with GS cradle]

[Unit: mm(inch)]

※ Dimensions may be revised without notice.

4.76/8.25/15kV 25/31.5/40kA 1200A - HVF1442,2442,3442,1452,2452,3452,1462,2462,3462
4.76kV 50kA 1200A - HVF1472

4.76/8.25/15kV 25/31.5/40kA 2000A - HVF1444,2444,3444,1454,2454,3454,1464,2464,3464
4.76kV 50kA 2000A - HVF1474


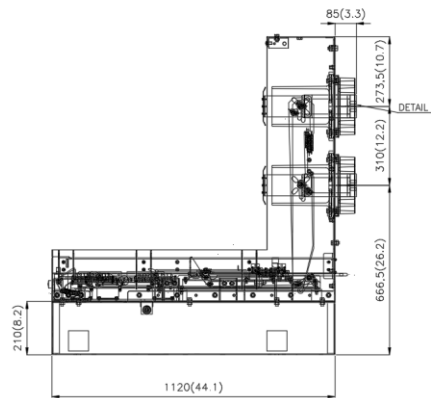
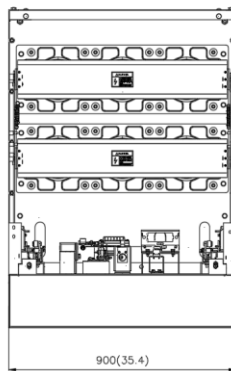
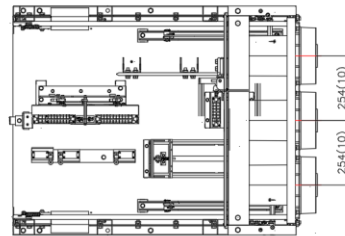
[Unit: mm(inch)]

※ Dimensions may be revised without notice.

4.76/8.25/15kV 31.5/40kA 3000A - HVF1457,2457,3457,1467,2467,3467

4.76kV 50kA 3000/4000A - HVF1477,1478

- 4000A cradles come with a cooling fan

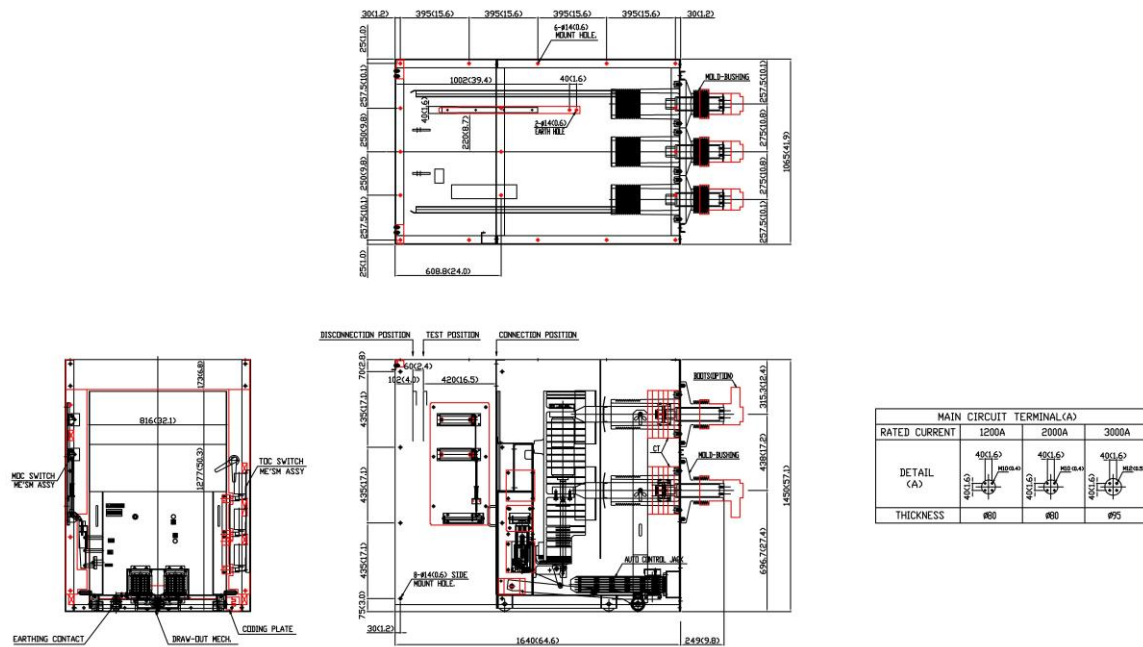


USED CURRENT	3000A
DETAIL A	

Dimensions [MF type – Draw-out VCB with MF cradle]

※ Dimensions may be revised without notice.

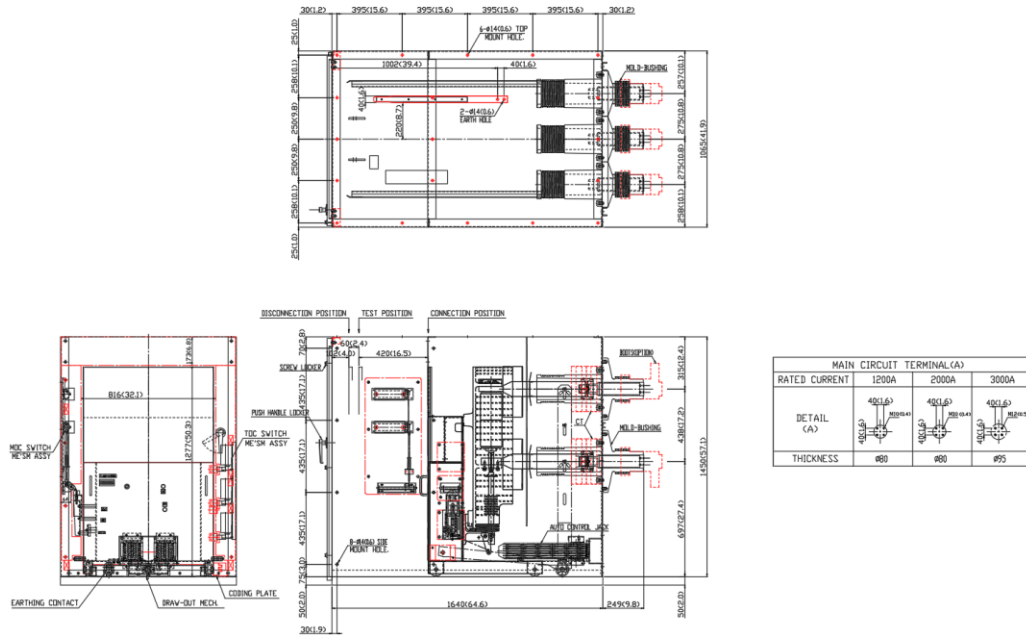
38kV 31.5/40kA 1200/2000/3000A – HVF7052, 7054, 7057, 7062, 7064, 7067



Dimensions [MH type – Draw-out VCB with MH cradle]

[Unit: mm(inch)]

※ Dimensions may be revised without notice.

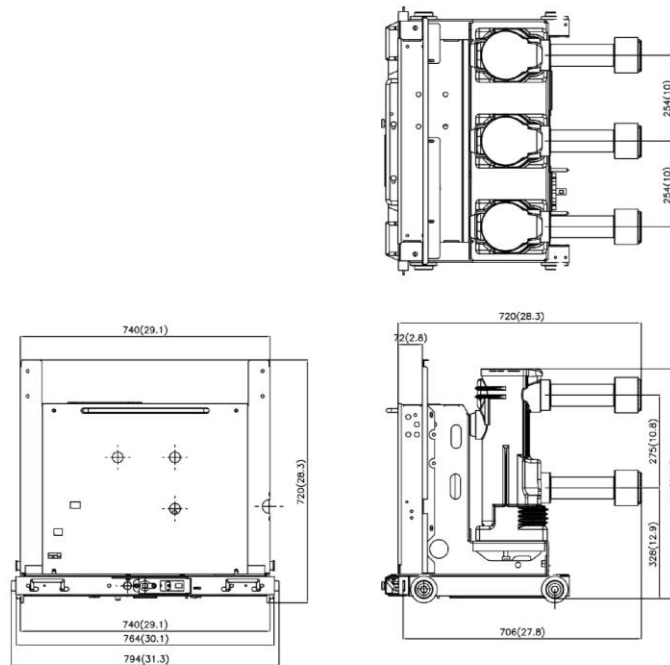
38kV 31.5/40kA 1200/2000/3000A – HVF7052, 7054, 7057, 7062, 7064, 7067


Dimensions [MA/GA type – Draw-out VCB body only for MS/GS cradle]

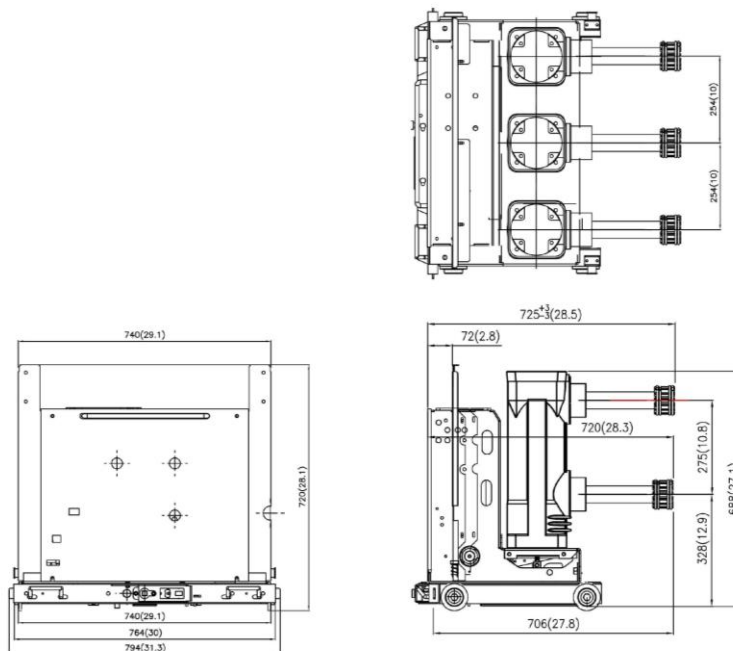
[Unit: mm(inch)]

※ Dimensions may be revised without notice.

4.76/8.25/15kV 25/31.5/40kA 1200A - HVF1442,2442,3442,1452,2452,3452,1462,2462,3462



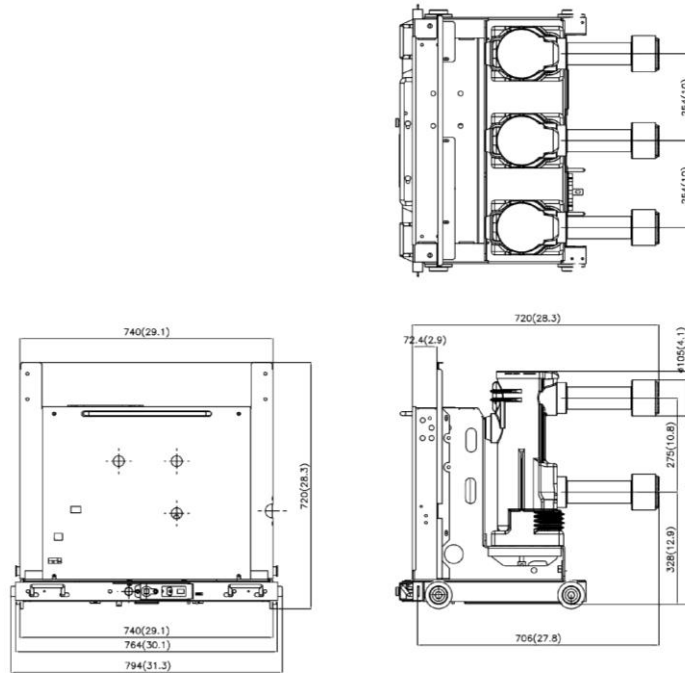
4.76kV 50kA 1200A - HVF1472



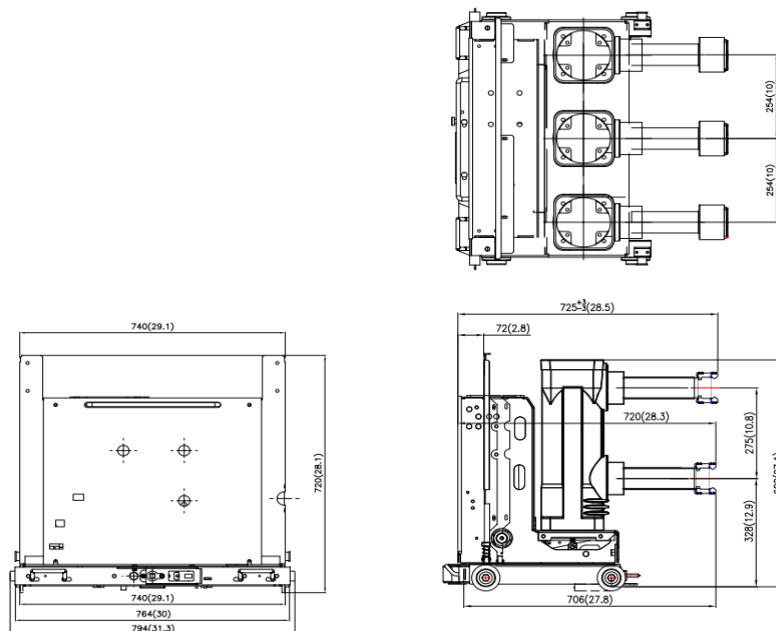
[Unit: mm(inch)]

※ Dimensions may be revised without notice.

4.76/8.25/15kV 25/31.5/40kA 2000A - HVF1444,2444,3444,1454,2454,3454,1464,2464,3464

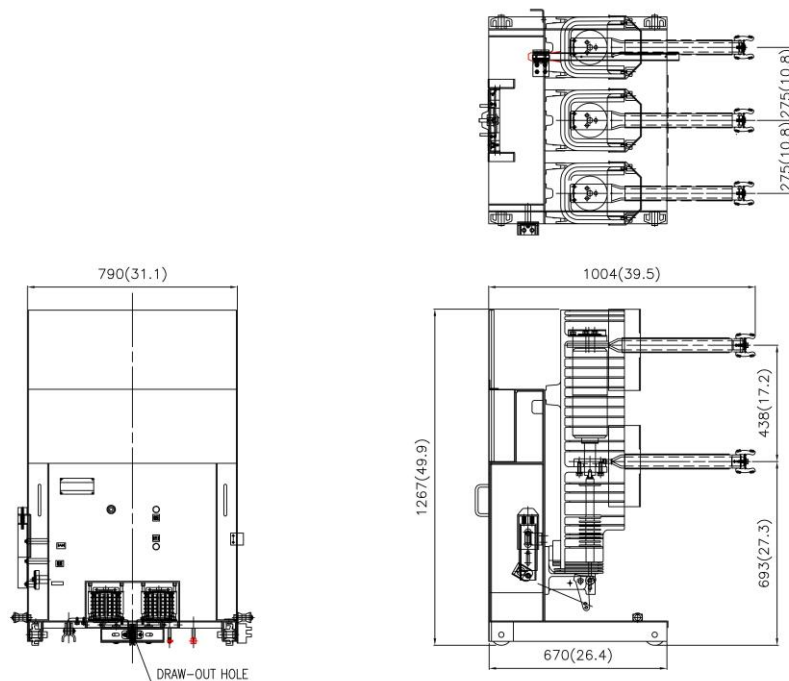


4.76kV 50kA 2000A - HVF1474



※ Dimensions may be revised without notice.

4.76kV 50kA 3000/4000A - HVF1477,1478



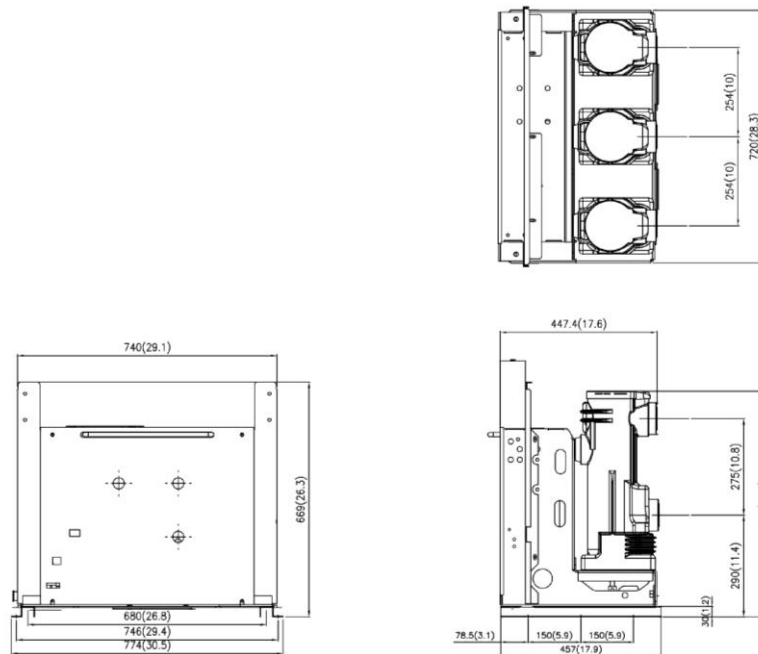
Dimensions [XA type – Fixed VCB with IEC control jack]

[Unit: mm(inch)]

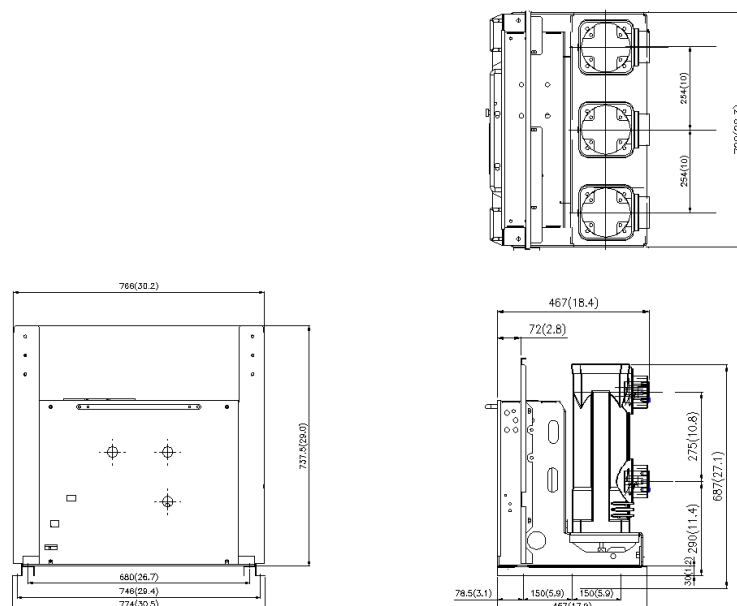
※ Dimensions may be revised without notice.

4.76/8.25/15kV 25/31.5/40kA 1200A - HVF1442,2442,3442,1452,2452,3452,1462,2462,3462

4.76/8.25/15kV 25/31.5/40kA 2000A - HVF1444,2444,3444,1454,2454,3454,1464,2464,3464

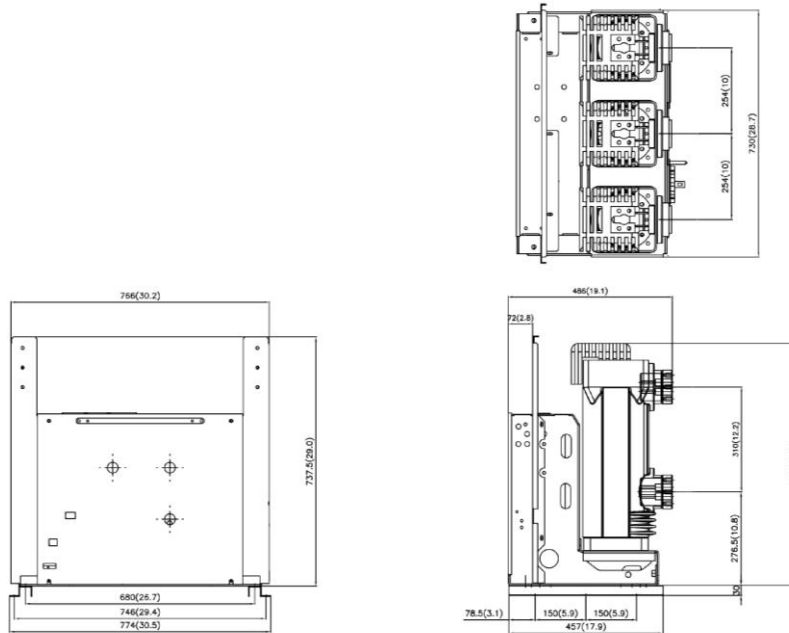
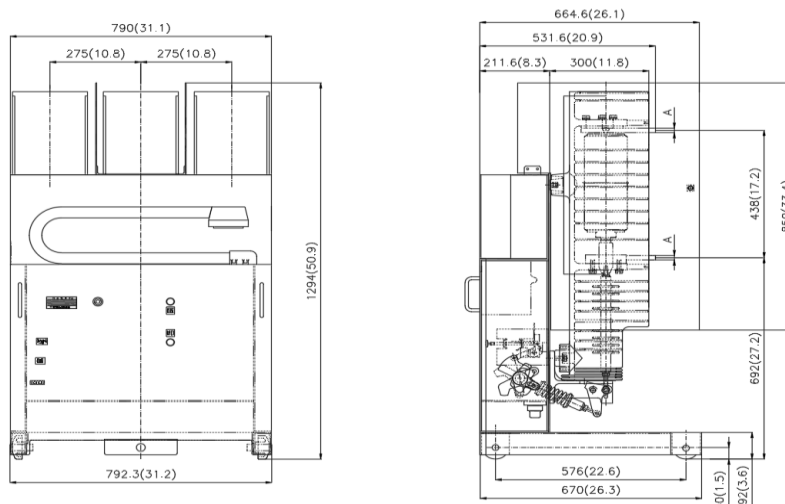


4.76kV 50kA 1200/2000A - HVF1472,1474



[Unit: mm(inch)]

※ Dimensions may be revised without notice.

4.76/8.25/15kV 31.5/40kA 3000A - HVF1457,2457,3457,1467,2467,3467
4.76kV 50kA 3000/4000A - HVF1477,147

38kV 31.5/40kA 1200/2000/3000A – HVF7052, 7054, 7057, 7062, 7064, 7067


TYPE	정격전류 (A)	Dimensions[mm(inch)]	Terminal type	Main terminal	
		A		A type	B type
HVF 7052/7062	1250(1200)	15(0.6)	A		
HVF 7054/7056/7064	2500(2000)	20(0.8)			
HVF 7057/7067	3150(3000)	30(1.2)	B		

Order Information

HVF		34		6		2		H		GS		
Model		Rated voltage		Rated breaking current		Rated current		Pole distance of VCB body		Mounting and structure		
HVF	VCB	14	4.76kV	4	25kA	1	630A	H	254mm	XA	Fixed VCB with IEC control jack	Fixed type
		24	8.25kV	5	31.5kA	2	1200A	I	275mm	GA	Draw-out VCB body only for GS cradle	Draw-out type
		34	15 kV	6	40kA	4	2000A			MA	Draw-out VCB body only for M Type cradle	Draw-out type
		70	38 kV	7	50kA	7	3000A			GS	GS cradle [metallic partition & bushing with shutter] [15kV]	Draw-out type
						8	4000A			MF	MF cradle [metallic partition & bushing with shutter, hinge/stopper for door] [38kV]	Draw-out type
										MS	MS cradle [metallic partition & bushing with shutter, with door] [15kV] MS cradle [metallic partition & bushing with shutter] [38kV]	Draw-out type
										MH	MH cradle [metallic partition & bushing with shutter, with door] [38kV]	Draw-out type

5		5		5		I		PD	
Motor control voltage		Closing control voltage		Tripping control voltage		Auxiliary contact (Secondary) and structure		Additional options	
2	DC48V	2	DC48V	2	DC48V	C	4NO+4NC, IEC control jack for fixed VCB	L□	Lockout relay [□ : Number of voltage]
5	DC125V	5	DC125V	5	DC125V	D	10NO+10NC, IEC control jack for fixed VCB	R□	Second shunt release [□ : Number of voltage]
7	AC110V	7	AC110V	7	AC110V	I	4NO+4NC (24 point), Auto secondary for draw-out VCB	U□	Under voltage release [□ : Number of voltage]
H	AC120V	H	AC120V	H	AC120V	X	1NO+2NC (12 point), Auto secondary for draw-out VCB	V□	Varistor module [□ : Quantities of voltage]
K	AC240V	K	AC240V	K	AC240V			BB	Close/Open button cover
L	DC250V	L	DC250V	L	DC250V			BC	Close button cover
								BO	Open button cover
								DD	Diode for Close and Open
								DM	Door Emergency Interlock Release Unit
								DI	Door interlock
								FA	Fan for 4000A
								KL	Position padlock with kirk key
								M0	MOC operated cell sensor
								M3	MOC operated cell switch [3NO+3NC]
								M6	MOC operated cell switch [6NO+6NC]
								MA	MOC operated cell switch [10NO+10NC]
								MP	MOC operated cell switch [12NO+12NC] [15kV]
								PD	Position padlock
								P2	Position switch [Test 1a+1b, Conn. 1a+1b]
								PI	Position indicator
								S1	Spring charged signal “a” [S41]
								S2	Spring charged signal “b” [S41]
								T0	TRUCK operated cell sensor
								T3	TRUCK operated cell switch [3NO+3NC]
								T6	TRUCK operated cell switch [6NO+6NC]
								TC	Trip coil supervision signal
								WC	Early "b" contact 1
								W2	Early "b" contact 2
								ZZ	Special application

Overseas Branches

Atlanta Branch	> Address 6100 Atlantic Boulevard, 2nd FL., Norcross, GA30071, U.S.A. > Tel 1-678-823-7839 > Fax 1-678-823-7553
Osaka Branch	> Address 1-Room 5th Floor Nagahori Plaza Bldg. 2-4-8 Minami Senba, Chuo-ku, Osaka 542-0081, JAPAN > Tel 81-06-6261-5766~7 > Fax 81-06-6261-5818
Al Khobar Branch	> Address 7th Floor, Al Khobar Business Gate Building, P.O.BOX 20753, Al Khobar - 31952 Kingdom of Saudi Arabia > Tel 966-013-849-3876~7
Riyadh Branch	> Address Office 404, 4th Floor, Akaria-3 Building, P.O.BOX 8072, Riyadh-11482, Kingdom of Saudi Arabia > Tel 966-11-464-4696 / 9366 > Fax 966-11-462-2352
Moscow Branch	> Address World Trade Center, Ent.3, #703, Krasnopresnenskaya Nab.12, Moscow, 123610, Russia > Tel 7-495-258-1381
Singapore Branch	> Address 5 Temasek Boulevard, #04-02 Suntec Tower Five > Tel 65-6337-2366 > Fax 65-6333-4680
Dubai Branch	> Address Unit 205, Building 4, Emaar Square, > Tel 971-4-425-7995 > Fax 971-4-425-7996
Frankfurt Branch	> Address Mendelssohn Strage 55-59 Frankfurt 60325, Germany > Tel 49-69-4699-4988
Bangkok Branch	> Address 19th Floor, Unit 1908, Sathorn Square Office Tower, 98 North Sathorn Road, Silom, Bangrak, Bangkok, 10500 Thailand > Tel 66-02-115-7920

R&D Centers

Hungary Technologies Center	> Address	(Hyundai Technologies Center Hungary Ltd.) 1146, Budapest, Hermina ut 22, Hungary
	> Tel	36-1-273-3733
	> Fax	36-1-220-6708

China R&D Center	> Address	Room 10102, Building 10, No.498, Guoshoujing Road, Pudong, Shanghai, China
	> Tel	86-21-5013-3393
	> Fax	86-21-5013-3393 #105

Overseas Corporations

Hyundai Ideal (Electro Electric Systems)	> Address	(Hyundai Ideal Electric Company) 330 East First Street Mansfield, OH 44902, U.S.A.
	> Tel	1-419-522-3611
	> Fax	1-419-522-9386

Alabama (Electro Electric Systems)	> Address	(Hyundai Power Transformers USA, Inc.) 215 Folmar Parkway, Montgomery, AL 36105, U.S.A.
	> Tel	1-334-481-2000
	> Fax	1-334-481-2098

Bulgaria joint venture (Electro Electric Systems)	> Address	(Hyundai Heavy Industries Co. - Bulgaria) 41, Rojen Blvd., 1271 Sofia, Bulgaria
	> Tel	359-2-803-3200,3210,3220
	> Fax	359-2-803-3203,3242

Yangzhong (Electro Electric Systems)	> Address	(Hyundai Heavy Industries(China) Electric Co.,ltd.) No.9, Xiandai Road, Xinba Scientific And
	> Tel	86-511-8842-0666,0500
	> Fax	86-511-8842-0668,0231