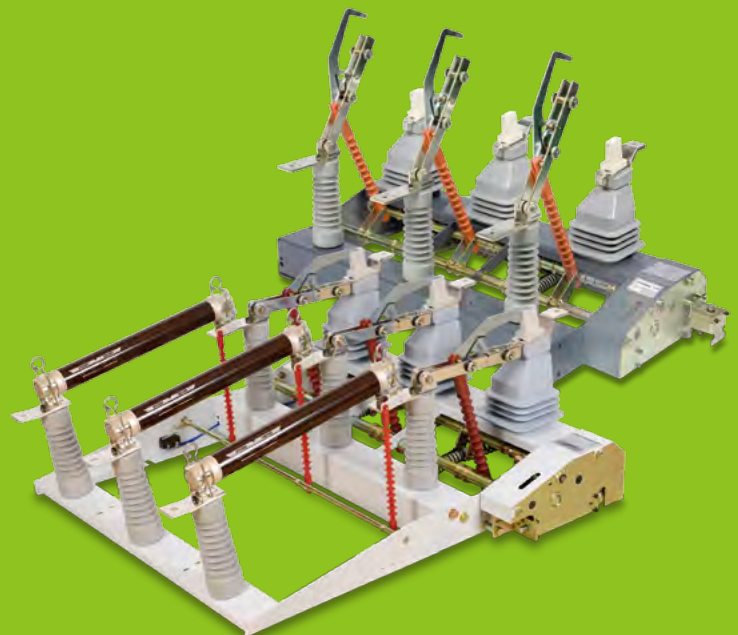


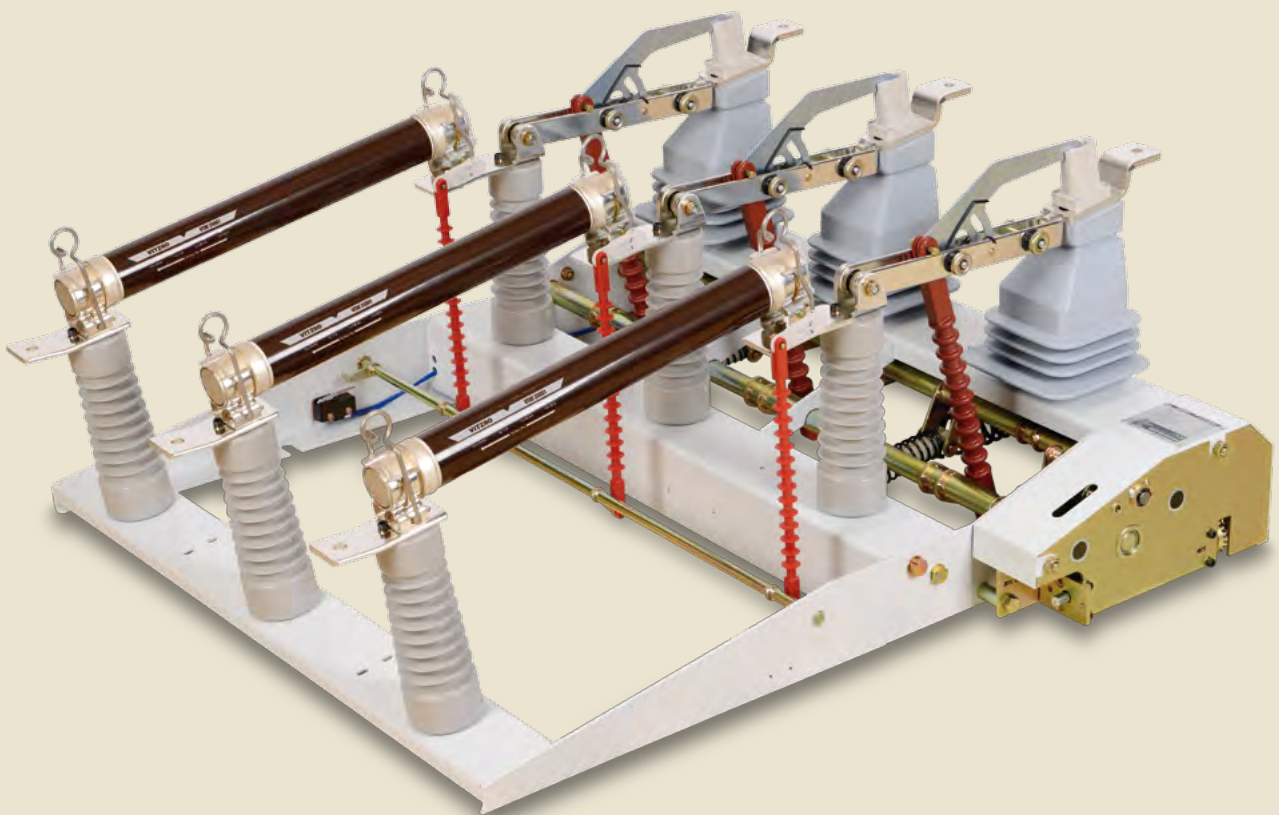
B2 Load Break Switches

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Installation Method & Structure	B2-08
Control Circuit Diagrams & Dimensions	B2-10
Fuse Selection Criterias	B2-12



Load Break Switches LBS



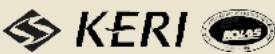
VITZRO EM Load Break Switch is a product developed from the previous model E3-Class and manufactured based on the 100A fuse-combined type test, which displays an excellent breaking performance and safety.

In addition, it is a user-friendly, innovative premium-type product with various protection functions.

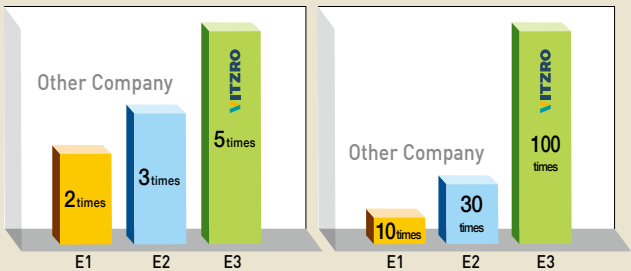
Certifications

It is successfully internationalized based on the KERI development test for the first time in the country.

- IEC62271-105 (Switch-Fuse)
- IEC60265-1 (Load Break Switch)
- Reference Standard : KSC4615



E3 Class LBS product with the best performance in the country is the first one to be manufactured by VITZRO EM.



100A Fuse Combination Type LBS that requires 3 times the existing 63A or below is developed to expand the transformer protection range up to 100A.

Other Company	~63A
VITZRO	~100A

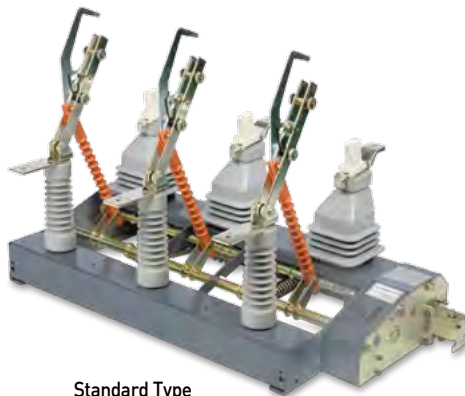
Maximum Fuse Capacity of Fuse Combination Type LBS.

Other Company	500A
VITZRO	1250A

Transfer Current Breaking Capability of LBS based on Fuse Capacity.

Ratings

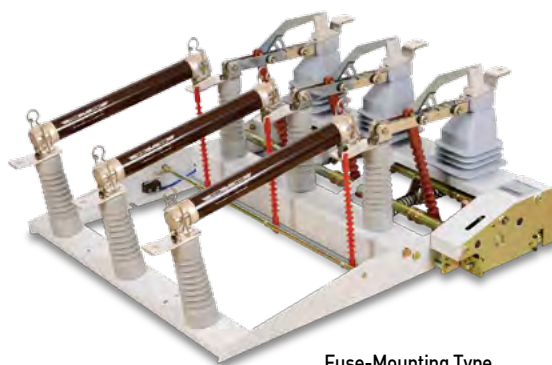
E3 Class High-
Performance
New Model



Standard Type

Type			LBS Standard Type	
Product Type			VTL 24/630A1	VTL 24/630M1
Operation Method			Electrically-Powered	Manual
Existence of Fuse			No	
Rated Voltage			24kV	
Rated Current			630A	
Switch Class (IEC Standard)			E3, M1 Class	
Poles			3 Pole	
Rated Frequency			AC 60Hz	
Rated Short Time Withstand Current			20kA/1sec	
Rated Making Current			52kAp	
Power Frequency Withstand Voltage	Between Earth		50kV/1 min	
	Between Pole		60kV/1 min	
Impulse Withstand Voltage	Between Earth		125kVp	
	Between Pole		145kVp	
Number of Current Switching	Load Current	630A	100 times	
		31.5A	20 times	
	Loop Current	630A	20 times	
	Cable	31.5A	10 times	
	Charging Current	9.45A	10 times	
	Line Charging Current	1.5A	10 times	
No-load Switching Performance			1,000 times	
Rated Breaking Current			-	
Rated Transfer Current			-	
Rated Current for Fuse (Fuse-Mounting Type)			N/A	
Rated Control Voltage			DC 110V / AC 110, 220V	-
Rated Control Current			5A	-
Manual Operating Cable Length			Standard 2.0m (Selection 1.5/1.8m)	
Weight			68kg	70kg
Certificate & Approval			IEC62271-103(IEC60265-1), IEC62271-105, IEC60282-1, KSC4615	

E3 Class High-Performance New Model



Fuse-Mounting Type

Type			LBS Fuse-Mounting Type	
Product Type			VTLF 24/630A1	VTLF 24/630M1
Operation Method			Electrically-Powered	Manual
Existence of Fuse			Yes	
Rated Voltage			24kV	
Rated Current			Switch 630A/Fuse Capacity 100A	
Switch Class (IEC Standard)			E3, M1 Class	
Poles			3 Pole	
Rated Frequency			AC 60Hz	
Rated Short Time Withstand Current			-	
Rated Making Current			104kAp	
Power Frequency Withstand Voltage	Between Earth		50kV/1 min	
	Between Pole		60kV/1 min	
Impulse Withstand Voltage	Between Earth		125kVp	
	Between Pole		145kVp	
Number of Current Switching	Load Current	630A	100 times	
		31.5A	20 times	
	Loop Current	630A	20 times	
	Cable	31.5A	10 times	
	Charging Current	9.45A	10 times	
	Line Charging Current	1.5A	10 times	
No-load Switching Performance			1,000 times	
Rated Breaking Current			40kArms	
Rated Transfer Current			1250Arms	
Rated Current for Fuse (Fuse-Mounting Type)			Mountable up to 100A 1/5/10/16/20/25/31.5/40/50/63/80/100	
Rated Control Voltage			DC 110V / AC 110, 220V	-
Rated Control Current			5A	-
Manual Operating Cable Length			Standard 2.0m (Selection 1.5/1.8m)	
Weight			92kg	88kg
Certificate & Approval			IEC62271-103(IEC60265-1), IEC62271-105, IEC60282-1, KSC4615	

Accessories

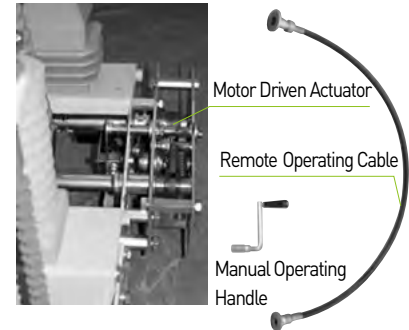
Accessories

Motor Driven Actuator

It is used for remote ON-OFF control and the standard rated voltage is DC 110V. AC 110V/AC 220V are also possible when ordered.

Manual Remote Operating Device

It is a device for manual operation at the panel door and it consists of a cable and a manual operating handle.
Cable Length: Standard 2.0 m (Option 1.5/2.6m)



Auxiliary Contact

It is a contact operated based on the operating status of the main contact of switch and it is used to display the status of the switch and to control it. 2a2b is the standard but it can be added depending on the order.



Voltage Trip Device

It is equipped with a shunt coil which enables a prompt Trip operation using a relay signal when a failure occurs.



Fuse Melting Trip Device

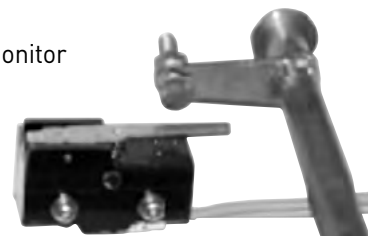
It performs a trip operation in order to prevent the open-phase operation that is generated when 1 phase fuse of 3 phases is melted due to a failure. It ensures an accurate and prompt operation due to the mechanical link.



Fuse Melting Display Contact

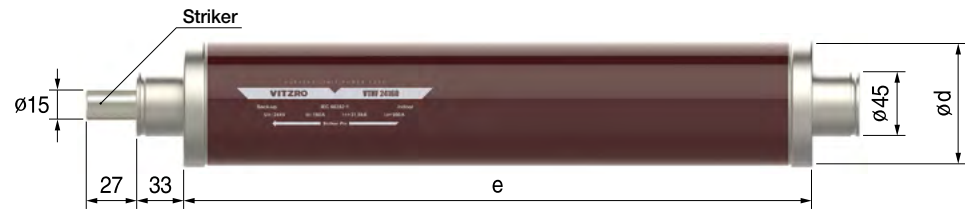
It is equipped with 1a contact in order to monitor the fuse melting in remote (F1-F2).

P	N	C	T	F1
A1	A3	B1	B3	F2
A2	A4	B2	B4	



Fuse Melting Display Contact

24/25.8kV Fuse Link



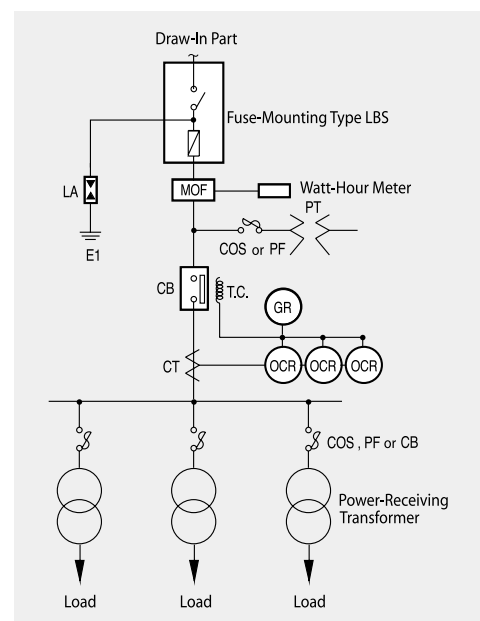
Rated Voltage [kV]	Name of Model	Rated Current I_n [A]	Rated Max. Breaking Current [kA]	Rated Min. Breaking Current [A]	External Dimensions		Weight [kg]
					e [mm]	d [mm]	
24	VTHF24001	1	40	$5 \times I_n$	442	56	2.3
	VTHF24005	5					
	VTHF24010	10					
	VTHF24016	16					
	VTHF24020	20					
	VTHF24025	25					
	VTHF24032	31.5					
	VTHF24040	40				65	3.1
	VTHF24050	50					
	VTHF24063	63					
	VTHF24080	80					
25.8	VTHF25100	100				78	4.1

Example of Fuse-Mounting Type LBS

The circuit on the right is the power receiving method based on the standard connection diagram on the special medium-voltage, power-receiving equipment of regulated chapter 7, figure 7-3.

The rated current of the power fuse is selected considering the capacity of power-receiving TR and protective coordination with the OCR.

Especially, LBS of our company is equipped with a fuse-melting trip device that enables an automatic tripping of LBS when the 1-phase fuse is melted due to the short circuit and over-current. It can be promptly and accurately interrupted in case of any failures.



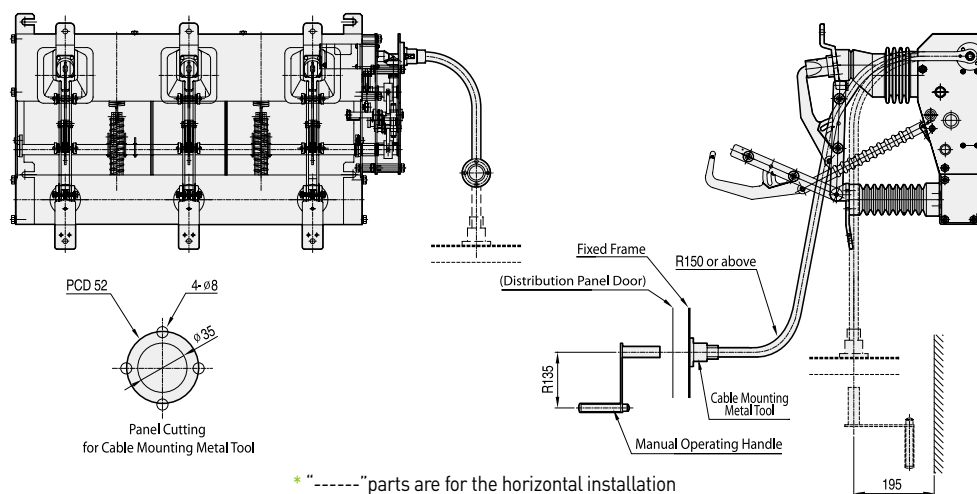
Installing Method & Structure

Body of LBS

Type	Standard Type	Fuse-Mounting Type
Installation Circuit Diagram		
Vertical Installation		
Horizontal Installation		

* Check whether the mounting part is flat so that LBS is installed without a twist.

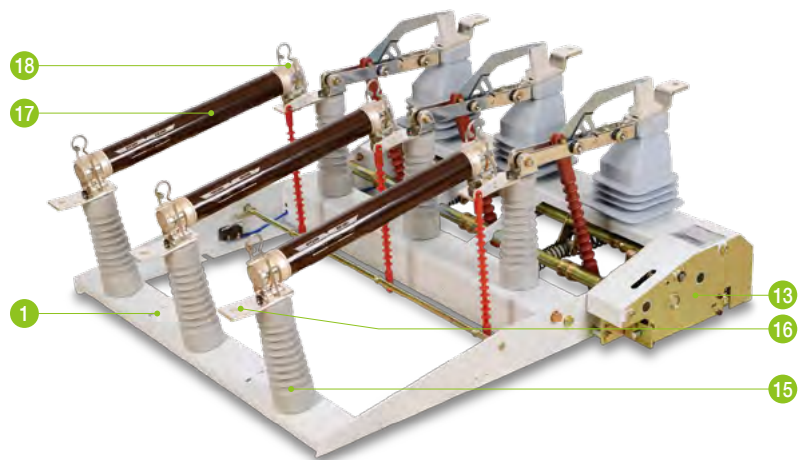
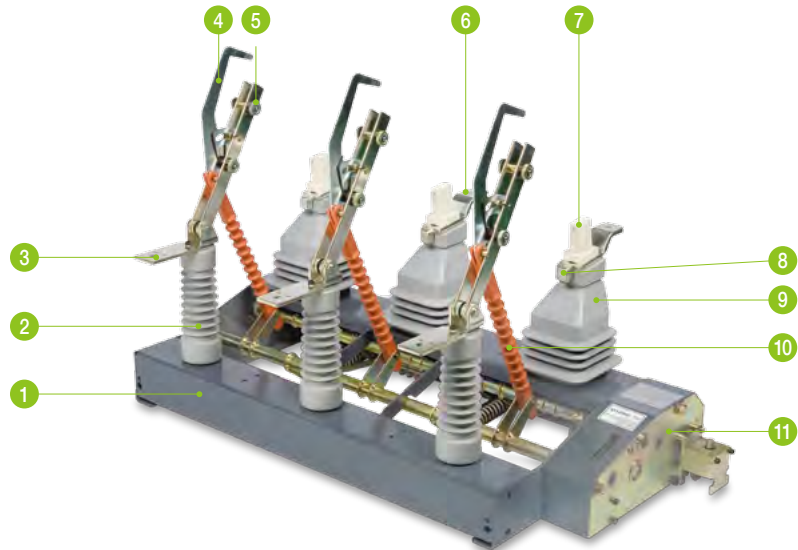
Manual Operating Device



Cable

- The standard length is 2.0m and it can be manufactured in 1.5m/1.8m when ordered.
- The cable operates smoothly if it maintains a sufficient curvature radius of R150 or above.
- It is structured to operate ON-OFF manually using the cable in one direction (right-turn).
- Use it by fixing the cable tie towards the inner wall of panel considering the insulation distance.
- Use an exclusive handle that is supplied separately for the manual operation.

Configuration



- ① Base Frame
- ② Support Insulator
- ③ Load Terminal
- ④ Arcing Blade
- ⑤ Main Blade
- ⑥ Line Terminal
- ⑦ Arc Nozzle
- ⑧ Fixed Main Contact
- ⑨ Fixed Support Insulator
- ⑩ Operating Rod
- ⑪ Operating Mechanism
- ⑫ Manual Operation Cable
- ⑬ Geared Motor
- ⑭ Manual Handle
- ⑮ Support Insulator
- ⑯ Load Terminal
- ⑰ Current limiting Fuse
- ⑱ Fuse Trip Device

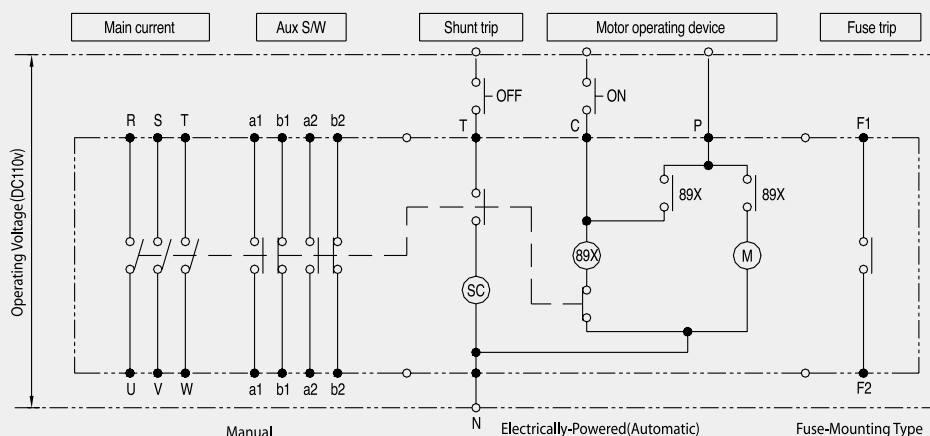


Control Circuit Diagrams & Dimensions

Control Circuit Diagrams

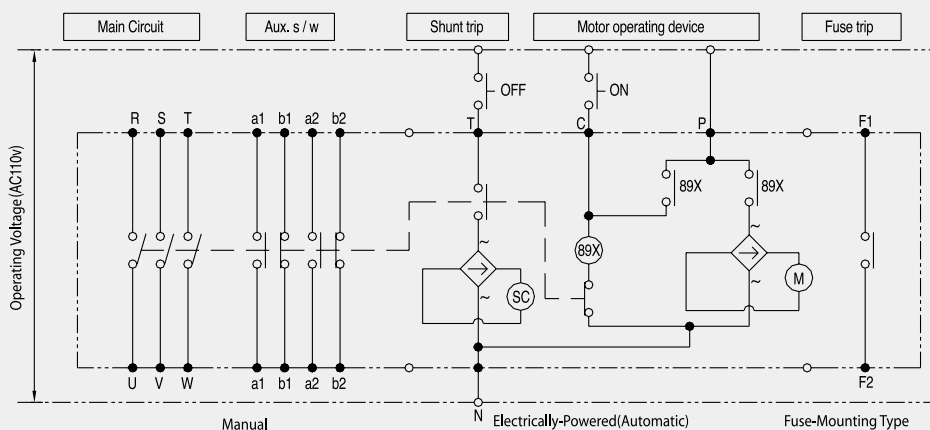
Control Circuit Diagram (In case of Motor)

DC 110V



- P : DC 110V (+)
- N : DC 110V (-)
- C : CLOSE
- T : TRIP
- SC : Trip Coil
- M : For Closing Motor
- 89X : Auxiliary Relay for Closing

AC 110V / AC 220V

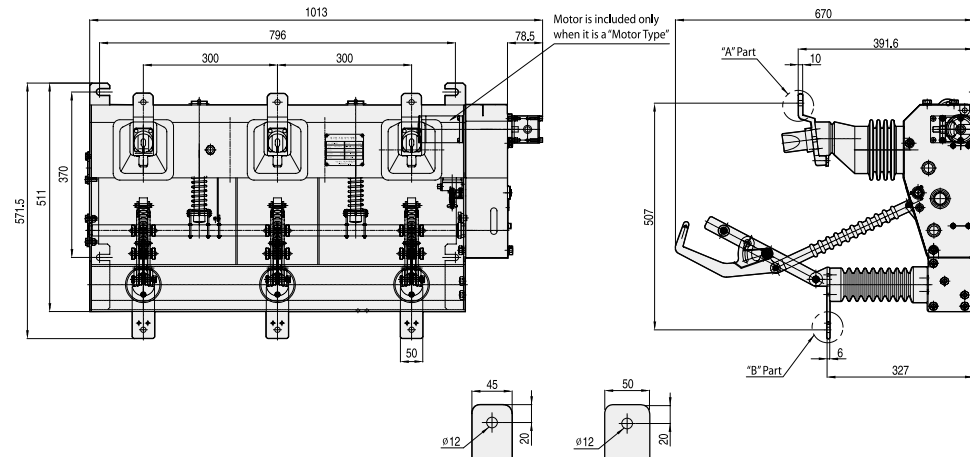


- P : AC 110V / AC 220V (+)
- N : AC 110V / AC 220V (-)
- C : CLOSE
- T : TRIP
- SC : Trip Coil (DC 110V / DC 220V)
- M : For Closing Motor (DC 110V / DC 220V)
- 9X : Auxiliary Relay for Closing

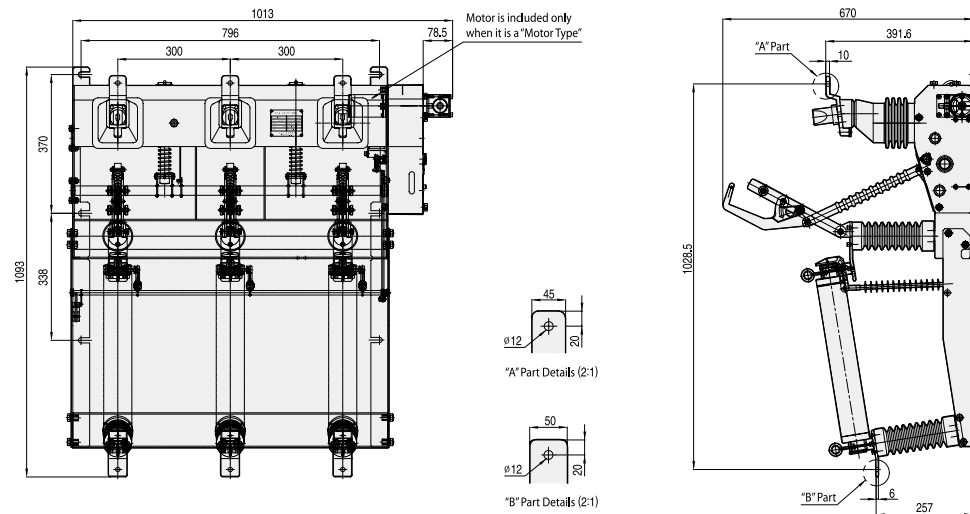
External Dimensions

VTL.....(E3 Class) New Model

Standard Type (Electrically-Powered/Manual)



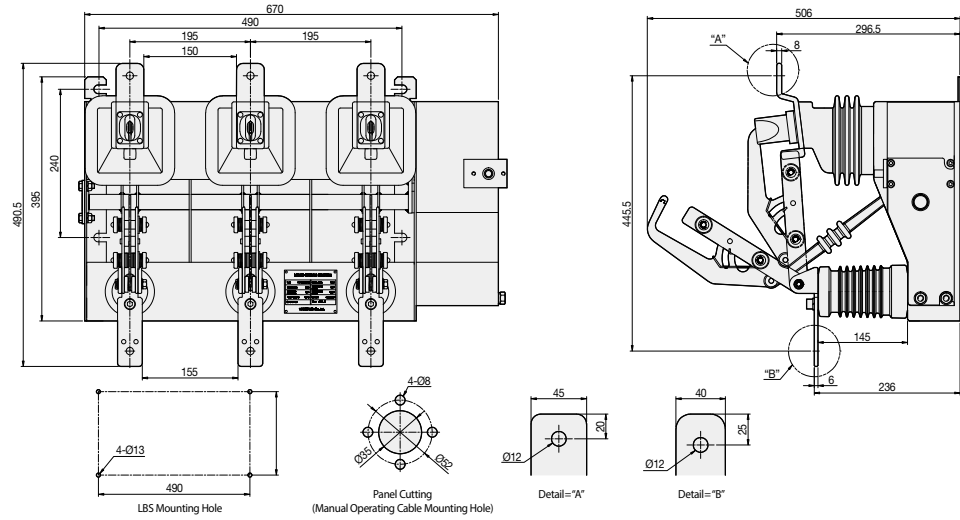
Fuse-Mounting Type (Electrically-Powered/Manual)



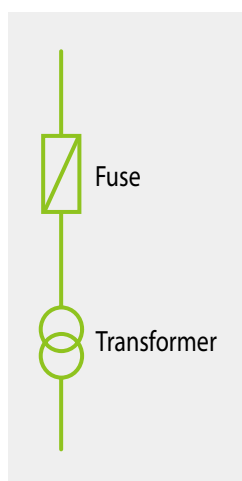
Fuse Selection Criterias

VTL 12kV
Standard
Type(Manual)

12kV Standard Type(Manual)



Fuse Selection Criteria for each purpose



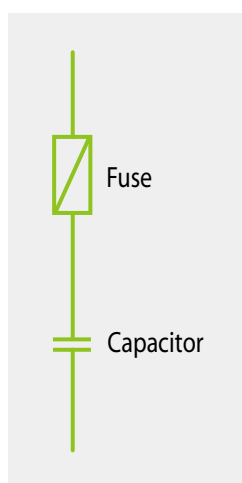
Power Fuse for Transformer Circuit Protection

Rated Voltage [kV]	Transformer Rated Capacity [kVA]		Applied Fuse Link
	1Ø	3Ø	
24	4 ~ 8	7 ~ 15	VTHF24001
	20 ~ 44	36 ~ 76	VTHF24005
	42 ~ 92	75 ~ 158	VTHF24010
	81 ~ 167	141 ~ 276	VTHF24016
	102 ~ 208	176 ~ 344	VTHF24020
	127 ~ 260	220 ~ 431	VTHF24025
	160 ~ 328	264 ~ 540	VTHF24032
	262 ~ 539	466 ~ 990	VTHF24040
	347 ~ 716	600 ~ 1238	VTHF24050
	416 ~ 916	743 ~ 1585	VTHF24063
	573 ~ 1145	990 ~ 1981	VTHF24080
	916 ~ 1527	1585 ~ 2641	VTHF25100
	1301 ~ 1908	2251 ~ 3301	VTHF24125
	2036 ~ 2443	3522 ~ 4226	VTHF24160

Detailed Selecting Conditions

1. The inrush current of transformer is selected by assuming that it is 10 times the transformer full load current for 0.1 second.
2. The rated current of fuse is selected so that it can continuously conduct 1.5 times~2 times the transformer rated current.
3. The transformer fuse is assumed and selected so that it can interrupt at 25 times of the transformer rated current within 2 seconds in case of a secondary short circuit.

Fuse Selection Criteria for each purpose



Power Fuse for Capacitor Circuit Protection

Rated Voltage [kV]	Constant	Capacitor Rated Capacity [kVA]	Applied Fuse Link
24	3Ø	~ 12	VTHF24001
		25 ~ 53	VTHF24005
		53 ~ 86	VTHF24010
		86 ~ 154	VTHF24016
		154 ~ 209	VTHF24020
		209 ~ 261	VTHF24025
		261 ~ 329	VTHF24032
		329 ~ 480	VTHF24040
		480 ~ 600	VTHF24050
		600 ~ 756	VTHF24063
		756 ~ 1200	VTHF24080
		1200 ~ 1846	VTHF25100
		1846 ~ 2500	VTHF24125
		2500 ~ 3200	VTHF24160
		3200 ~ 4000	VTHF24200

Detailed Selecting Conditions

1. The inrush current of Capacitor is selected by assuming that there is a conducting at 71 times of the Capacitor rated current for 0.002 second.
2. The rated current of fuse is selected so that it can continuously conduct 1.5 times the Capacitor rated current.
3. The transformer fuse is assumed and selected so that it can interrupt at 25 times of the transformer rated current within 2 seconds in case of a secondary short circuit.