RMV6 for Medium Voltage Cable Network

R I N G M A I N U N I T

3 to 24 kV

Application

The RMV6 is a compact extensible unit. combining different kinds of MV functional units to make ring or radial network, to protect the transformers

- Fuse switch combination up to 2000 KVA
- Fuse switch combination with watch-dog function up to 2000 KVA
- C.B(200A) with relay up to 3000 KVA
- CB(630A) with relay up to 9000 KVA

* Watch-dog functions are under request

- Line protection with 620A circuit breaker
- Network switching by load break switch
- SCADA mate : remote operation, voltage, current sensor,

  sensitive zero phase CT's
- Automatic load transfer scheme

— Using 2 switch LBS and one fuse switch combination with control

— Using 2 CB and one dummy part with control

* Very fast transfer time - outage time can be below 1cycle

- Compact and extensible

— Compact : "all in one" units in a single stainless steel enclosure

— Extensible : extensible to left and or right side without handling gases, no special tools

Description

RMV6 comprises 1 to 6 integrated functional units.

The sealed for life, stainless steel enclosure group together. the live parts, switch disconnector, earthing switch, fuse switch and circuit breaker.

The fuse canister which is metallic shielded are located at the upper side, so the cable connection can be done easily at the front side.

▌Tightness

The stainless steel enclosure is filled with SF6 at a 0.2 bar. gauge pressure and it is sealed for 30 years life time.

□ Load break switch

The arc extinction use the proven SF6 puffer technique.

□ Fused switch

The switch of fused switch units can interrupt the transfer current of 1750A at 12kV, 900A at 24kV.

The fused switch units have up-stream and down-stream earthing switch.

The fuse canister is locate at the top of enclosure and is fully metallic shielded and is accessible from front side.

□ Circuit breaker

200A and 630A are available for transformer protection and network protection.

The short circuit currents are cleared by vacuum interrupter. so, it's have long life time and also the gas will not be exposed to the arc from short circuit.

Extensible on site

The integrated RMV6 or functional units can be extensible on site from left or right side

— Without handling gases

— No special tools

— No particular preparation of the floor

 Mechanism

— Switch disconnector

Main switch : Spring toggle mechanism with motor

Earthing switch : Spring toggle mechanism

The operation time takes 0.7sec after commands

— Fuse switch, circuit breaker, automatic load transfer units

Main switch : Spring stored energy mechanism with motor

O - 0.3sec, CO - 15sec

Earthing switch : Spring toggle mechanism

— Bus tie coupling switch

CB or LBS are available as bus tie coupler with spring stored energy mechanism(CB) or spring toggle mechanism(LBS)

Operating safety

□ Cable insulation test

To inject the 42 ㎸ DC for 15 minutes for cable insulation test without disconnecting the connecting devices, it have cable test point.

The earthing bus-bar will be removed after earthing switch close and using the optional injection cable, the voltage can be injected.

□ Interlock the switchgear

The main and earthing switch are interlocked manually and or electrically.

The earthing switch can be closed when the main switch is open, and the main switch can be closed when the earthing switch is open.

□ Interlock the fused switch

One of the fuses are blown, the switch can not be closed before reset the fused part.

□ Protection from internal arc; safety membrane

The RMV6 have one or two safety membrane to protect the person from internal arc.

The hot gas will be released to the rear or to the bottom without affecting conditions in the front.

□ Voltage indicator Lamps

The voltage can be measured and indicated by lamps through the voltage taps of the bushings.

If there is no battery power, the lamp will be lit by the voltage taps and if there is battery power, the voltage will be injected to the control to measure the voltage and also the lamp will turn on using the battery power.

□ Measurement and protection

For measuring electrical quantities and for sophisticated protection (for example, directional ground fault protection), all the bushings can have voltage and current sensors.

Flux summing CT or special calibration process enables the very sensitive zero phase current sensing.

So, the control can have the functions of very sensitive earth protection even ungrounded system, compensated system and high impedance grounded system.

□ Automatic load transfer scheme.

The RMV6 can have the functions of automatic load transfer.

— Two LBS with tee-off fused switch

- □ Ground fault protection
- □ Over load, short circuit protection
- □ transfer from main to alternate source

  Close transition : Close the main and open the alternate source

  Open transition : Open the alternate and close the main
- □ Fault block during tee-off circuit fault

  Prevent transfer action when the fault was at the load side.

— Two LBS with tee-off CB

- □ Ground fault protection
- □ Over load, short circuit protection
- □ transfer from main to alternate source

  Close transition : Close the main and open the alternate source

  Open transition : Open the alternate and close the main
- □ Fault block during tee-off circuit fault

  Prevent transfer action when the fault was at the load side.

— Two CB with or without tee-off LBS

- □ Same functions with three LBS scheme
- □ Very fast transfer time (1cycles)

  For water pumping station and important load, it may necessary very fast transfer time.The actual three phase outage time can be within one cycles.

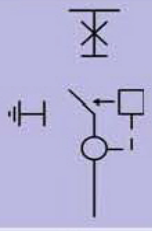
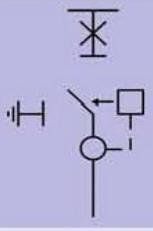
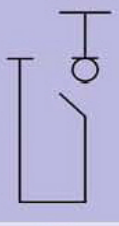
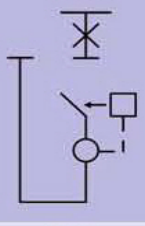
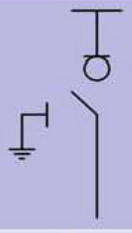
Technical Data RMV6		SD Module		FS Module		CB Module	
		Switch Disconnector	Earthing Switch	Switch Fuse	Downstream Earthing Switch	Vacuumm Circuit Breaker	Earthing Switch
Rated Voltage	kV	12/17.5/ 24	12/17.5/ 24	12/17.5/ 24	12/17.5/ 24	12/17.5/ 24	12/17.5/ 24
Power frequency withstand voltage	kV	38/38/60	38/38/60	38/38/60	38/38/60	38/38/60	38/38/60
Impulse withstand voltage	kV	95/95/125	95/95/125	95/95/125	95/95/125	95/95/125	95/95/125
Rated current	A	630		630		200/630	
Breaking capacity							
Active load	A	630					
Closed loop	A	630					
Off load cable charging	A	135					
Earth fault	A	200/150/150					
Earth fault cable charging	A	115/87/87					
Short circuit breaking current	kA					20/12.5/12.5	
Transfer current	A			1750/1750/900			
Making capacity	kA	50	50	50	12.5	50/32.5	50
Short time current 1sec	kA	25		25	5	20/12.5	
Short time current 3sec	kA	20	20	20			20
Short time current 4sec	kA	20		20			
Opperation time							
Close		0.7sec		<45ms		<45ms	
Open		0.7sec		<35ms		<35ms	
Spring charge	sec			<8sec		<8sec	

Note

 The switch disconnector, fused switch use the same interrupting part of 24kV, 630A.

 The earth switch of switch disconnector and CB are the same and the current carrying capability is the same with LBS.

Functional units

Network switch	Fused switch	200A Circuit breaker	630A Circuit breaker
			
I	Q	B	D
Bus Tie switch	**Bus Tie Circuit breaker**	**Cable Connection**	**Network switch for ATS**
			
IC	BC	O	J

TYPE of TANK

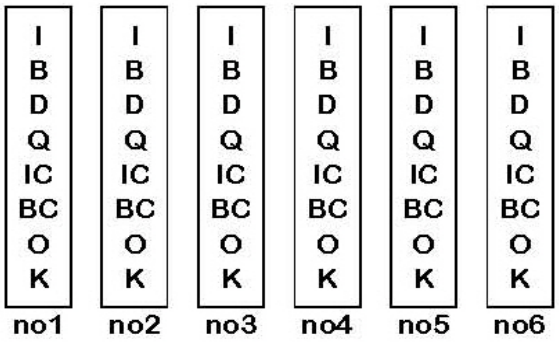
NE : Non - Extensibel

RE : Right side - Extensible

LE : Left side - Extensible

DE : Right, Left side - Extensible

Device Designation



Examples of designation

RMV6 NE - DIDIQI

RMV6 DE - DIDI

RMV6 NE - JQJ

RMV6 NE - DOD

Multi function

Unit function

Relay and Fault indicator

□ Self power fault indicator

— For switch disconnector

— Phase fault

— Ground fault

— Sensitive earth fault

— Automatic reset

□ Self power watch dog control

— For fuse switch

— Overload protection

— Counting function

— Loss of phase protection

— I_0 protection

□ Self power relay for CB

— For 200A, 630A circuit breaker

— Phase protection

IDMT or definite time

Inverse, very incerse, extremely inverse

High current trip

— Earth protection

In case of very sensitive earth fault protection, it needs flux summing CT.

— Phase, ground fault indicator

□ Battery powered fault indicator

— built-in RTU function

— Phase, Earth fault indicator

— Directional SEF indicator

□ Battery powered ATS for using switch disconnector

— Two switch disconnector and one fused switch

With fused switch combination

— Transfer block when tee-off circuit fault

— Prefer, non-prefer source mode selection

— Closed transition (open before close)

— Transfer, retransfer time setting

□ Battery powered ATS for CB

— Two CB and one switch disconnector or cable connection

— Very fast transfer time

(takes 3cycles from detecting voltage sag)

— Tee-off protection by circuit breaker

Phase, earth fault protection

I_0 protection(watch-dog)

V_0, I_0 protection

— Transfer block when tee-off circuit fault

— Prefer, non-prefer source mode selection

— Closed transition (parallel close)

— Open transition (open before close)

— Transfer, retransfer time setting

□ Battery powered ATS for LBS and CB combination

— Two switch disconnector and one CB

— Tee-off circuit protection

Phase, earth fault protection

I_0 protection

V_0, I_0 protection

— Transfer block when tee-off circuit fault

— Prefer, non-prefer source mode selection

— Closed transition (parallel close)

— Open transition (open before close)

— Transfer, retransfer time setting

□ Battery powered network ATS

— Prefer, non-prefer source mode selection

— Transfer time, retransfer time setting

— Fault block

□ Battery powered generator ATS

If the line source is lost, after time delay, it opens the SW and at the same time. send command to start the generator.

If the voltage of generator reaches to the rated voltage then it close the alternate switch.

— Fault block

— Prefer, non-prefer source mode selection

— Transfer time, retransfer time setting

— Close transition (parallel closing)

— Open transition (open generator, and close SW)

□ Battery powered Bus tie coupling

Source change over between two incoming lines and bus tie switch or CB.

— Lockout during voltage loss of two incoming source

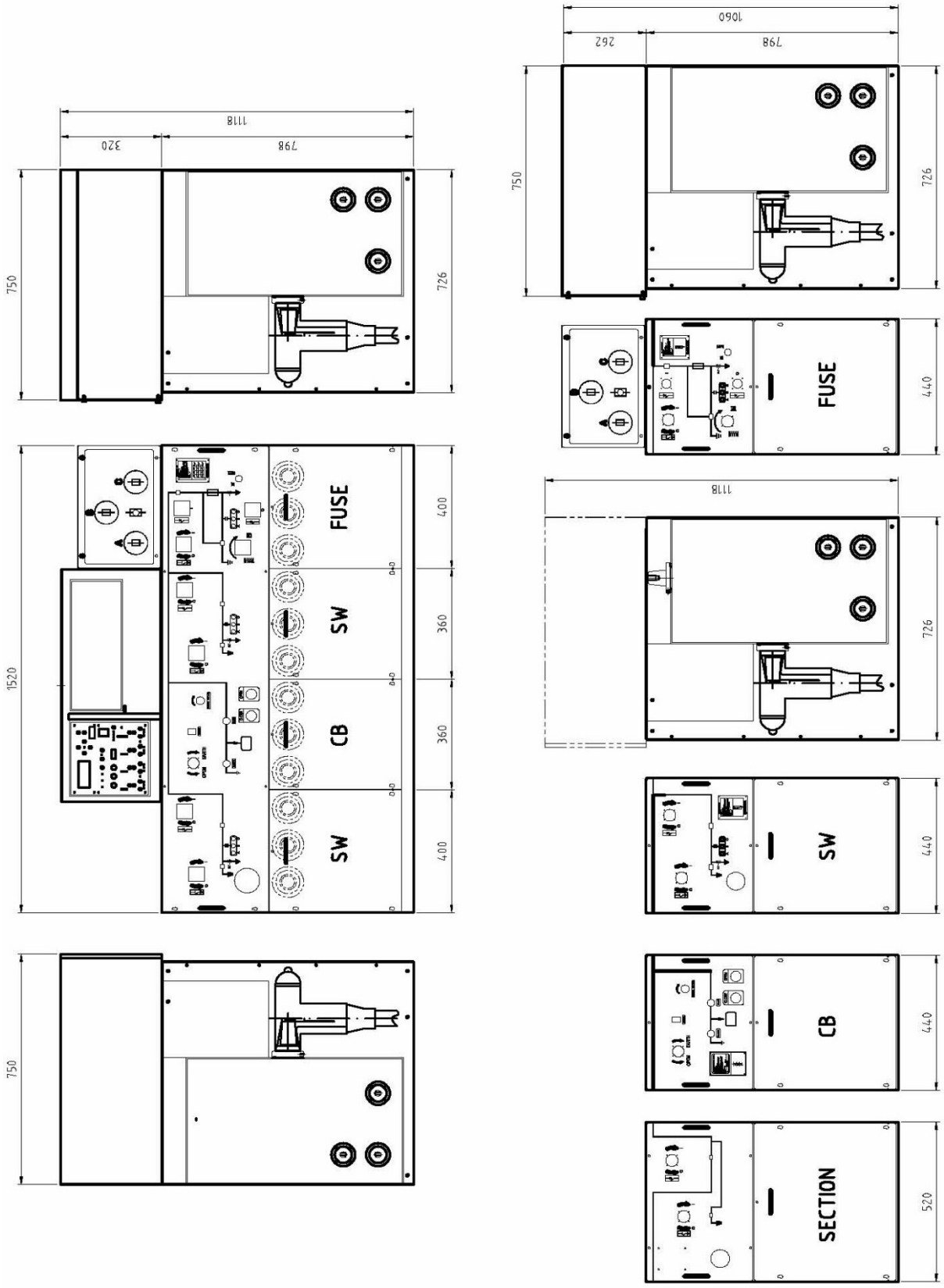
— Prefer, non-prefer source mode selection

— Transfer, retransfer time setting

— Close Transition (parallel closing)

— Open transition (open before cllose)

Layout & Dimension



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