

M-CLAD 36

Air-insulated Withdrawable Switchgear
Metal-Clad (LSC2B)



according to

3B Energy can propose a huge number of Products related to Energy sector. We are active in the whole world of Power Transmission and Distribution. Medium Voltage switchgears, Medium Voltage switches, Low Voltage PC, Low Voltage MCCs with fix and withdrawable units, Transformers, Cabinets; 3B Energy can propose a wide range of Products for fulfilling any request and need.

3B Energy is very active and smart in assisting customers for finding Solutions related to Energy sector. We can support the customer during engineering phase of the plant, during purchasing steps, for the supply and after-sales services. 3B Energy is a real "turnkey" Solution provider; Package Substations, Transformer Substations, Mobile Cabinets; we can propose a complete solution set for letting the customer have one player only for his whole plant.

3B Energy can propose a complete and detailed list of Services which can cover each step of Engineering phase. Our technical staff is highly expert and professional and can support the customer starting from the base design of a single component till a complete apparatus for electrical application. We can design and project every component the customer may need: a single contact or a complete switching device, we can develop and engineer the technology for any product or application of Energy sector

1. Summary

1.1 General

(Figure 1/1)

M Clad - 36 air-insulated metal-clad withdrawable switchgear (hereinafter as switchgear) is a kind of MV switchgear. It is designed as a withdrawable module type panel, and the withdrawable part is fitted with withdrawable vacuum and S_f6 circuit breaker manufactured by MANY Companies. It can also be fitted with isolation truck, PT truck, fuses truck and so on. It is applicable to three phase AC 50/60 Hz power system, and mainly used for the transmission and distribution of electrical power and control, protection, monitoring of the circuit.



Figure 1/1 M Clad - 36 Switchgear



M-CLAD 36

1.2 Standards and Specifications

- IEC60694 The common technical requirements of high voltage switchgear and controlgear
- IEC62271-200 A.C. metal enclosed switchgear and controlgear at the rated voltage of 1kV~52kV
- IEC62271-100 High voltage switchgear and controlgear-Part 100:High voltage A.C. circuit breaker

1.3 Service Conditions

1.3.1 Normal Operating Conditions

A. Ambient temperature: $-15^{\circ}\text{C} \sim 40^{\circ}\text{C}$

B. Ambient humidity:

- Daily average RH no more than 95%; Monthly average RH no more than 90%
- Daily average value of the steam pressure no more than 2.2kPa, and monthly no more than 1.8kPa

C. Altitude no higher than 1000m;

D. The air around without any pollution of dust, smoke, or flammable air, steam or salty fog;

E. External vibration from switchgear and controlgear or land quiver can be neglected;

F. The voltage of the secondary electromagnetic interference induced in the system shall no more than 1.6kV.

1.3.2 Special Operating Conditions

According to IEC60694, the manufacturer and user may agree on special service conditions which deviate from the normal service conditions.

To prevent the condensation phenomena, the heater is necessary for switchgear and needs to be put into service when the switchgear is in readiness and service conditions. The heat dissipation problem of switchgear can be solved by ventilation facilities.

2 .Technical Parameters

Switchgear Technical Parameters

No.	Item	Unit	Parameters	
1	Rated Voltage	kV	36 ^①	40.5 ^①
2	Rated Frequency	Hz	50/60	
3	Rated Insulation Level	1 min power frequency withstand voltage(Valid)	95	
		Lightening impulse withstand voltage(Peak)	185	
4	Rated Current	A	630	1250 1600 2000 2500 3150
5	Rated Short Circuit Breaking Current ^②	kA	25, 31.5, 40 ^④	
6	Rated Short Circuit Making Current(Peak)	kA	63, 80, 100	
7	Rated Short-time Withstand Current (4s) ^②	kA	25, 31.5, 40 ^④	
8	Rated Peak Withstand Current	kA	63, 80, 100	
9	Auxiliary Control Circuit Rated Voltage ^③	Cycle	DC110, DC220, AC220	

① 36kV is accordance with IEC;

② Current transformer should be considered singly;

③ Other voltage is available on request;

④ 40kA x 3s

3. Switchgear Structure and Equipment Installed

3.1 Basic Structure

(Figure 3/1)

The basic structure of M Clad - 36 Switchgear comprises the panel itself, and the movable, withdrawable part with circuit breaker, fuse or other facilities. According to the electrical function inside the panel, it consists of four compartment, that is, busbar compartment A, circuit breaker compartment B, cable compartment C and low voltage compartment D, which is showing in Figure 3/1. The whole panel is constructed by bolting up the double folded steel plates manufactured through cold rolling process and CNC machining equipment.

The withdrawable parts of the switchgear panels can be fitted with VCB, PT, surge arrester, fuse, isolated truck and so on.

The indicator which is used to monitor the situation of primary circuit can be mounted in switchgear. This device is composed by two parts: high voltage sensor and indicator. Sensor is mounted on the high voltage compartments for monitoring while the indicator is mounted on the relay plate.

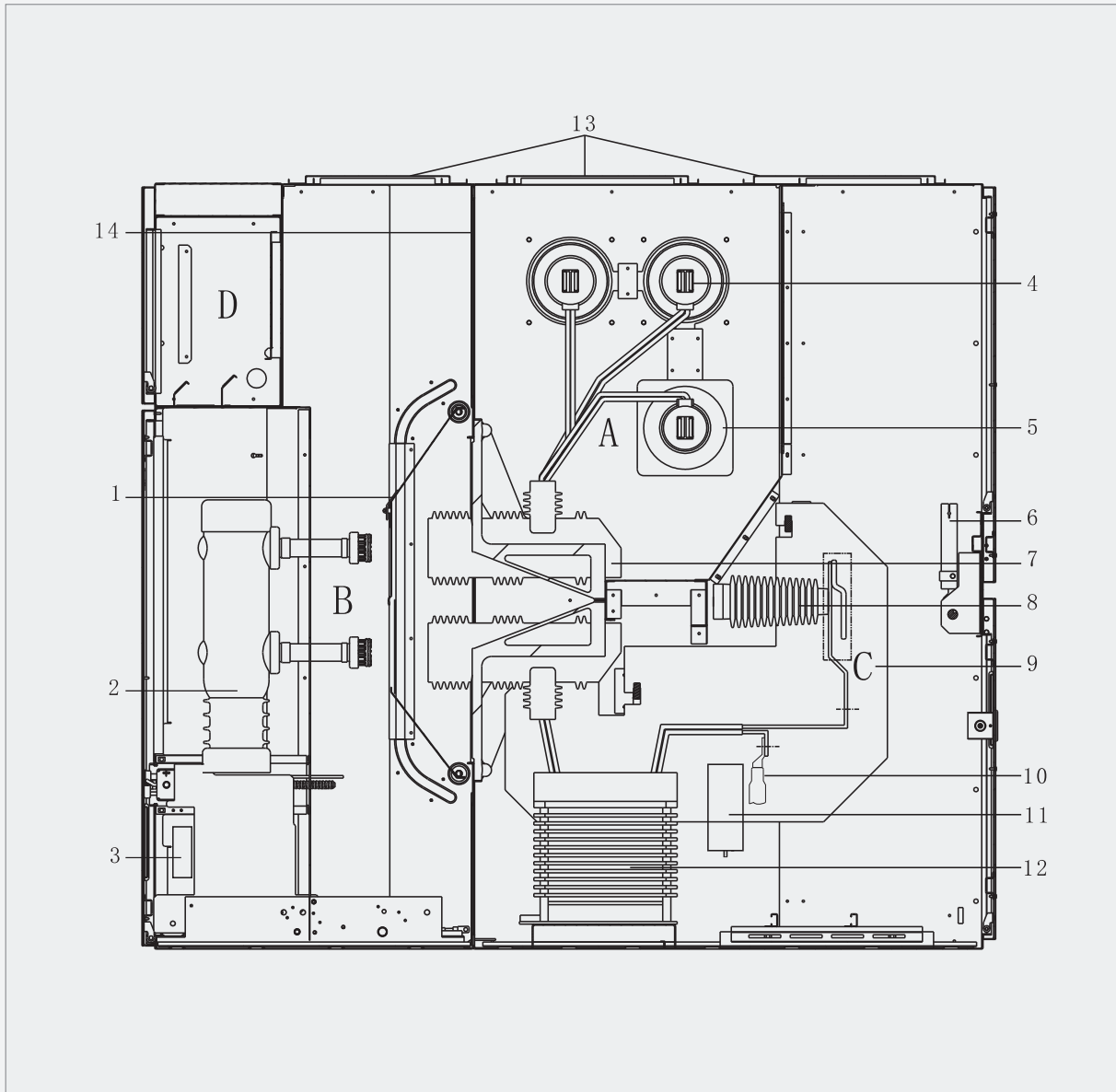
The affect of inner fault arcing of switchgear is taken into consideration during M Clad - 36 being designed and the arcing test has been done according to the stipulations of IEC62271-200, which can ensure the safety of operator and equipment.

The dimensions and weight of switchgear are as following:

Height(H)	mm	2400
Width(W) *	mm	1200
Depth(D)	mm	2600
Weight	kg	850~ 1850

* The width of the substation transformer panel depends on its capacity.

Figure 3/1 M Clad - 36 Air-insulated Metal-clad withdrawable Switchgear, Section View.



- | | | |
|--------------------------------|--------------------|-------------------------------------|
| A. Busbar Compartment | 1. Shutter | 8. Supportor(Fitted with Indicator) |
| B. Circuit Breaker Compartment | 2. Circuit Breaker | 9. Insulated Separate Plate |
| C. Cable Compartment | 3. Secondary Plug | 10. Electrical Cable |
| D. Low Voltage Compartment | 4. Main Busbar | 11. Baffle Heater |
| | 5. Busbar Bushing | 12. Current Transformer |
| | 6. Earthing Switch | 13. Pressure Relief Plate |
| | 7. Spout | 14. Partition |

3.2 Enclosure and Partitions

The enclosure and internal partitions of the switchgear consist of high quality aluminium-clad zinc plate. The switchgear has degrees of protection IP4X for the enclosure and IP2X for the partitions.

The front door and rear door of the switchgear are thoroughly disposed to prevent corrosion, and then painted with a special process which makes it have a particular resistance to impacts and corrosion.

The circuit breaker compartment, busbar compartment and cable compartment are fitted with pressure relief plates. These plates open upward if internal fault arc results in overpressure. This method of construction prevents them from danger and ensures operators in a safe condition all the time.

3.3 Compartment

3.3.1 Circuit Breaker Compartment

(Figure 3/2, 3/3)

The circuit breaker compartment is fitted with the necessary guide rails to accommodate the withdrawable part, which can be moved between the service position and the test/disconnected position.

If the withdrawable part is moved from the service position into the test/disconnected position, the fixed contacts located in the connection block in busbar compartment C and cable compartment D are automatically covered by metal plates which will be interlocked mechanically or can be locked by a padlock when the withdrawable part is moved away. In the test/disconnected position, the withdrawable part is still completely inside the panel with the door closed. The switching operations (including manual operation) are carried out with the doors closed.

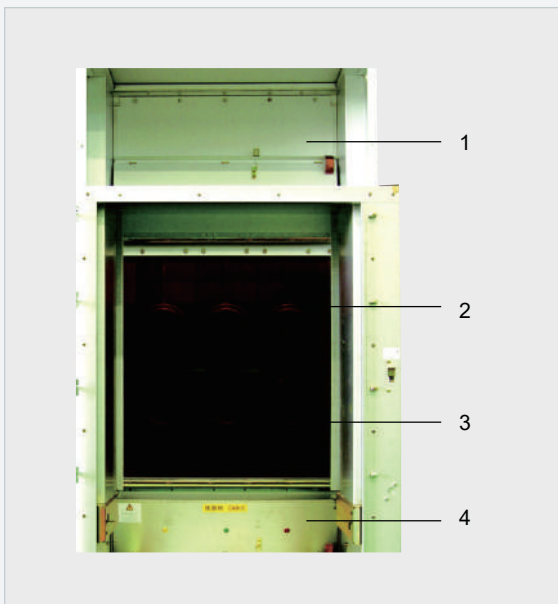


Figure 3/2 Circuit Breaker Compartment after Withdrawable Part Removed, Hinge Shutter Opened.

- | | |
|------------------|------------------|
| 1. shutter Above | 3. Contact Pin |
| 2. Spout | 4. Shutter Below |

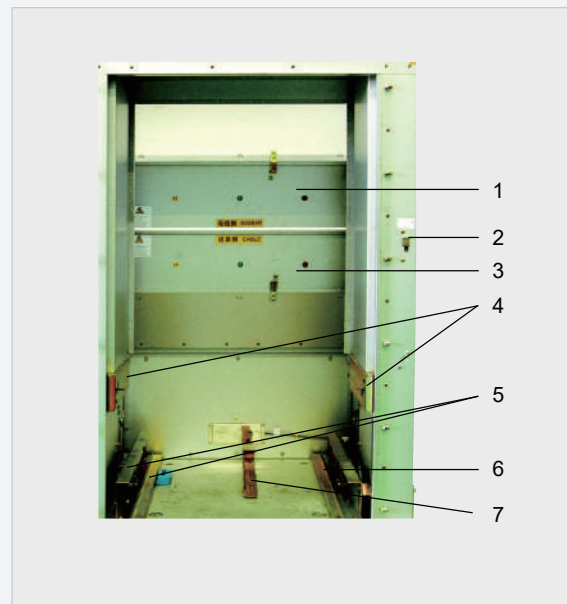


Figure 3/3 Circuit Breaker Compartment

- | | |
|--------------------------------------|---------------------|
| 1. Busbar Side Shutter | 5. Left Guide Rail |
| 2. Operating Hole of Earthing Switch | 6. Right Guide Rail |
| 3. Cable Side Shutter | 7. Earthing Device |
| 4. Locked Position of Truck | |

3.3.2 Withdrawable Part

(Figure 3/4 , 3/5)

The manually moved withdrawable part consists of a robust sheet steel structure on which the circuit breaker poles are mounted and the breaker mechanism with relevant components is installed.

Contact arms with spring-loaded contact systems are fitted to the circuit-breaker poles. These create the electrical connection to the switchgear when the withdrawable part is inserted into the service position. Detailed information on the vacuum circuit breaker can be found in the corresponding instruction manual.

The signalling, protection and control wiring between the switchgear and the withdrawable part is coupled by a multiple pin control wiring plug.

As soon as withdrawable part has been slid into the switchgear and its interlock yoke has engaged in the test/disconnected position, it is positively connected to the switchgear panel. At the same time, it is earthed by earthing contacts and earthing rail. The position of withdrawable part can be checked on the electrical position indicator or through the sight glass in the door at any time. The stored-energy spring mechanism of the circuit breaker including controls and indicators is accessible at the front of the withdrawable part. Apart from the version with a fitted circuit breaker, withdrawable parts with other equipment such as voltage transformer, are available.

3.3.3 Busbar Compartment

Busbars are laid in sections from panel to panel, and are held in place by the tee-off conductors and by busbar bushings. The conductor material used is tubing with a D-shaped cross section, in either single or double configuration depending on the current rating. The connection to the flat tee-off conductors is made without any special connecting clamps. The busbars and tee-off conductors are covered with shrink-on sleeves. The bolt connections in the busbar system are normally covered by insulating covers. In conjunction with bushings, panel by panel partitioning is realised.

The main busbar can be fitted with either single and double form or aluminium rectangle type according to the clients requirements.



Figure 3/4



Figure 3/5

3.3.4 Cable Compartment

(Figure 3/6)

Current transformers and an earthing switch (with manual operating mechanisms) are located here. Installation of surge arrester is possible. Multiple parallel power cables can also be available without difficulty. The cable sealing ends can be fitted in particularly favourable conditions. A removeable plate for cable glands is located in the cable entry area.

Installation of voltage transformers at cable side of the panel is in preparation and will have influence on the depth of the panel.

The earthing switch is designed with a making capacity of 62.5 kA (design for 80 kA in preparation).

3.3.5 Low Voltage Compartment

(Figure 3/7)

The low voltage compartment, together with its front door, accommodates the secondary equipment of the switchgear panel required for the particular application.

The control wiring in the switchgear panel area is led through generously dimensioned and metal covered ducts. The left hand duct is reserved for the incoming and outgoing control wires, and the internal wiring in the panel is located on the right hand side.

At the top of the left hand duct, an entry for control cables is reserved with the free-cut rubber sealing which will keep the protection class IP4X for the whole enclosure of the switchgear panel.

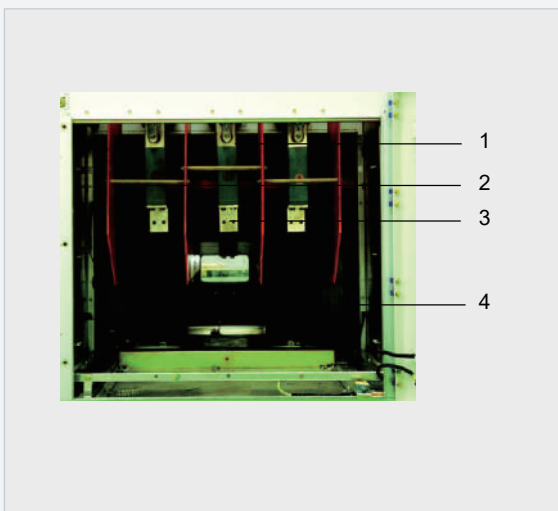


Figure 3/6 Cable Compartment
 1. Earthing Switch Fixed Contact
 2. Insulated Separating Plate
 3. Cable Connecting Copper
 4. Current Transformer



Figure 3/7 View of Low Voltage Compartment

3.4 Interlocks/Protection Against Maloperation

A series of interlocks are provided to prevent fundamentally hazardous situations and mal-operation, thus protecting both personnel and the switchgear itself. The interlocks which are normally individually effective are as follows:

- The withdrawable circuit breaker can only be moved from the test/disconnected position into the service position (and back) with the circuit breaker open and the earthing switch open (Mechanical interlock).
- The circuit breaker can only be closed when the withdrawable circuit breaker is precisely in the defined test position or service position (Mechanical interlock).
- The circuit breaker can only be opened manually in the service or test position when no control voltage is applied, and can not be closed (Electromechanical interlock).
- The circuit breaker can be only closed when withdrawable circuit breaker is in the test/disconnected position or removable position (Mechanical interlock).
- Earthing switch can only be closed when the withdrawable circuit breaker is in the test/disconnected position or the removed position (Mechanical interlock).
- The withdrawable circuit breaker cannot be moved from the test/disconnected position into the service position when the earthing switch is closed (Mechanical interlock).
- The circuit breaker control cable plug be locked when withdrawable circuit breaker is in the service position.



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4. Major Electrical Components of Primary Circuit

All the electrical components be fitted in the M Clad - 36 type switchgear are manufactured by 3B or from the acknowledged supplier of 3B . By this way , it can garrant the consistency of technical characteristic of M Clad - 36 type switchgear, matching well, then ensure the M Clad - 36 type switchgear to be the advanced technical, stable characteristic and saft, reliable distribution equipment.

he below is the abstract of primary circuit main electrical components be fitted in M Clad - 36switchgear.

Vacuum Circuit Breaker

Figure 4/1 to 4/3)

Vacuum circuit breaker is one of the main electical components in the switchgear This is the latest withdrawable type vacuum circuit breaker which are manufactured by 3B partner,and all the products Are according to the requirements of international and national standard.

Vacuum circuit breaker can be operated frequently and multiple break the short circuit current in the scope of service current. It is suited to reclosed operation and has a extreme high operation reliability.

Circuit breaker can service safely, relibly when it be used in the scope of allowed technical specification under the normal service condition, and only needs a little maintenance as sweeping and lubricate.

The operating mechanism which matches Vacuum curcuit breaker is charging spring operating mechanism. This charging spring operating mechanism has a compact structure, stable characteristic and it also operates three phase interrupter. The charging spring has two charging ways: manual and electrical.

The basic functions of operating mechanism can satisfy all clients requirements, and it has the perfect, reliable electrical and mechanical auxiliary elements.The detailed servicing priciple please see the electrical circuit diagram.

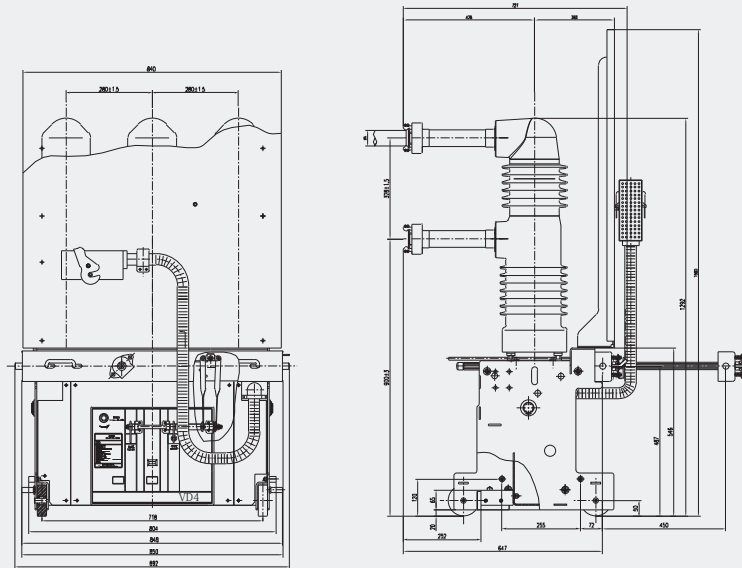


Figure 4/1 Withdrawable Vacuum Circuit Breaker Outside View

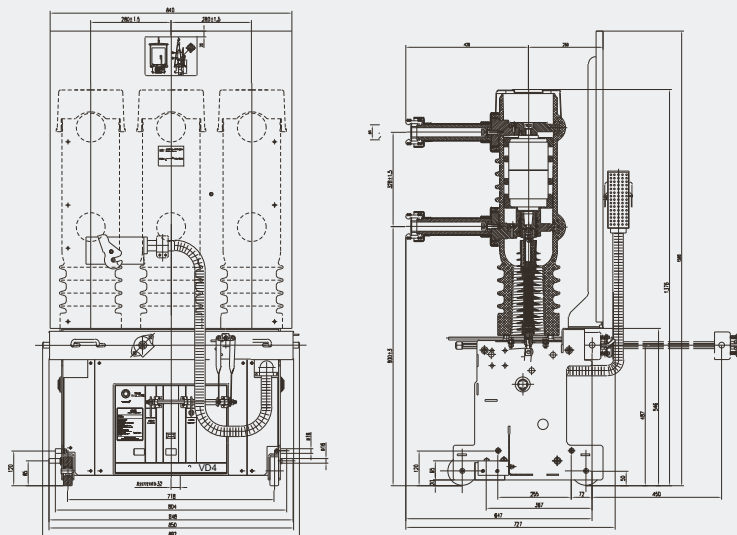
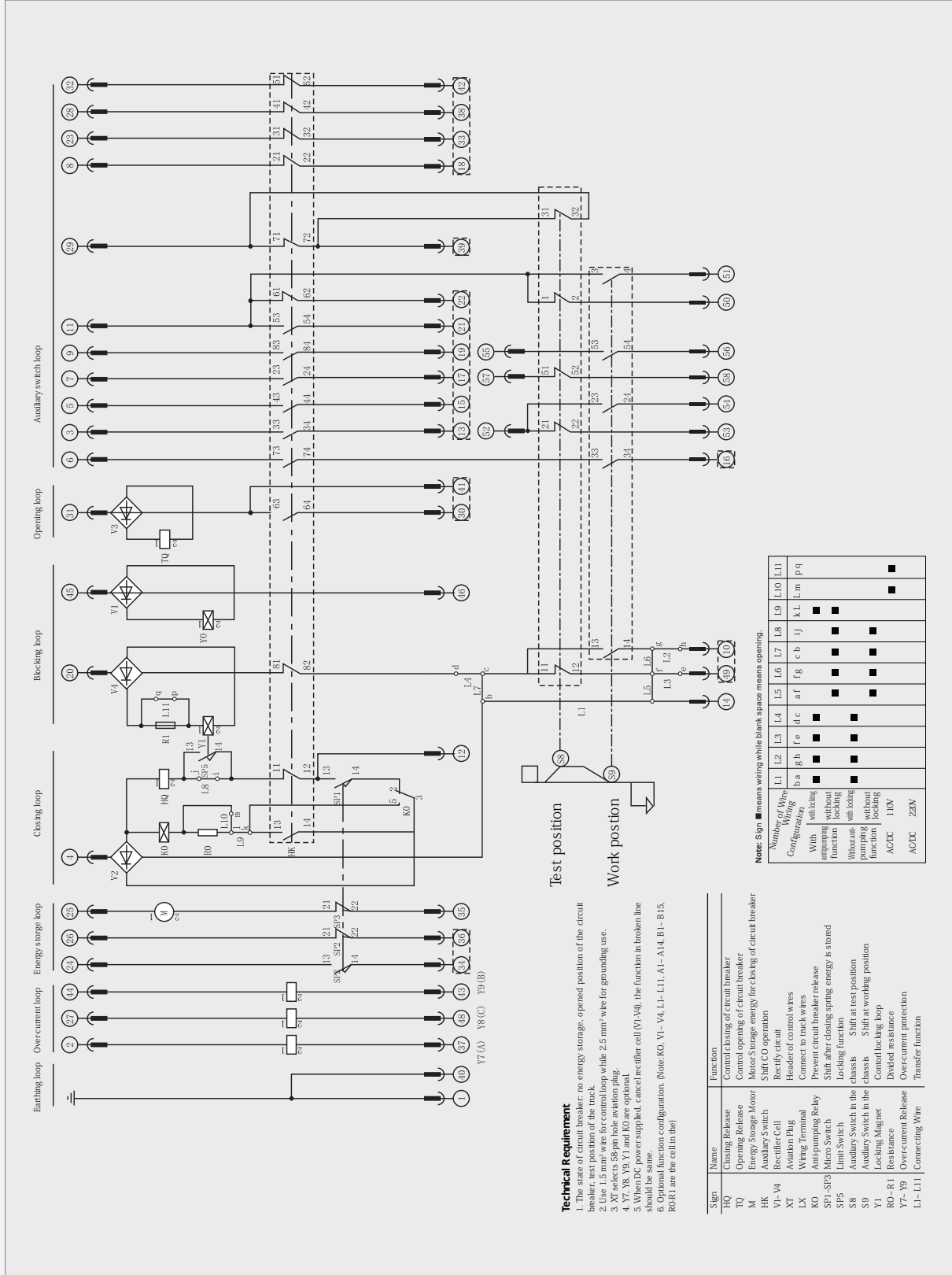


Figure 4/2 Withdrawable Vacuum Circuit Breaker Outside View

Figure 4/3 Withdrawable Vacuum Circuit Breaker Electrical Circuit Diagram



4.2 Surge Arrester

M Clad - 36 type switchgear can be fitted with zinc oxide surge arresters having the characteristic of advanced technology and reliable characteristic. It has a perfect nonlinear characteristic. When it is applied to continuous service voltage, the leakage current is less than 1mA. It immediately presents a conduction state when the over voltage appears.

Surge arrester can bear:

Rated discharge current (Peak): 10kA

Impulse current (Peak) : 100kA

Long-period wave (Peak): 550A, 2000 S

Thermal capacity: 3.4kJ / kV U_c

Arrester has many advantages: low protection residual voltage, big absorbed energy, far protection distance. The enclosure of arrester can be encapsulated by silicone, has many characteristics: anti-aging, stable data, free maintenance etc.

4.3 Earthing Switch

The earthing switch used in switchgear is fitted with a manual operating mechanism, and has the ability of making a short circuit.

Earthing switch contains an indicator of opening and closing position. The operating mechanism is operated manually, but also can use an electric motor in special conditions. Mechanical interlock mechanism can be installed on the rod of operating mechanism, interlocking with circuit breaker truck, or the interlock electromagnet can be installed, then implement the electrical interlock.

Earthing switch contains auxiliary contact, and it can supply the signal for opening and closing state of earthing switch.

EK6 Earthing Switch Technical Parameters

No.	Item	Unit	Parameters
1	Rated Voltage	kV	36
2	Center Distance Between Phases	kV	280
3	Rated Short Time Withstand Current	kA/s	31.5/4
4	Rated Short Circuit Making Capacity (peak)	kA	80
5	Power Voltage Of Interlock Electromagnet	V	DC48, 110, 220; AC110, 220

4.4 Current Transformer and Voltage Transformer

(Figure 4/5, 4/6)

The current transformer and voltage transformer are both purchased from the companies which are well-known in power systems we can ensure they are consistent with the technical characteristics of switchgear, and satisfy requirements of different clients.

The short time withstand current and peak withstand current of current transformer should be acknowledged according to the variable ratio value of current when ordering the goods.



Figure 4/5 Voltage Transformer

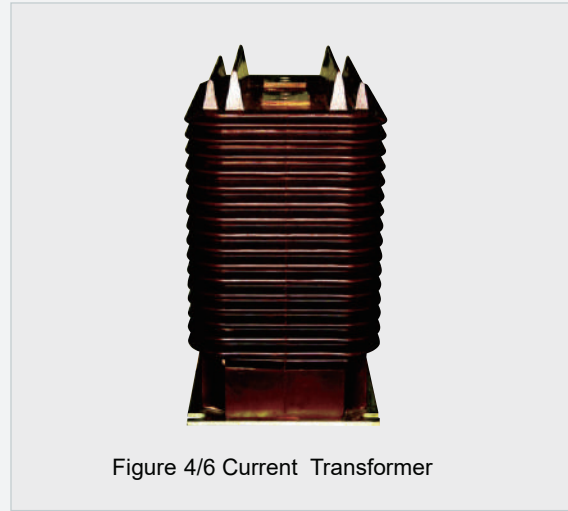


Figure 4/6 Current Transformer

Current Transformer Technical Parameters

No.	Item	Unit	Parameters
1	Rated Voltage	kV	35
2	Power Frequency Withstand Voltage	kV	95
3	Lighten Impulse Withstand Voltage (Peak)	kV	185
4	Rated Primary Current	A	50-3150
5	Rated Secondary Current	A	1, 5
6	Precision Degree		0.2,0.5,1.0,3.0,5P10,5P20,10P10,10P20
7	Rated Capacity	VA	10-30
8	Rated Short Time Withstand Current(4s)	kA	25, 31.5*
9	Rated Peak Withstand Current	kA	63, 80*

* The rated peak and short time withstand current of current transformer should be acknowledged according to the variable ratio values of current when ordering the goods.

Voltage Transformer Technical Parameters

No.	Item	Unit	Parameters
1	Rated Primary Voltage	kV	$35/\sqrt{3}$ 35
2	Power Frequency Withstand Voltage	kV	95
3	Lighten Impulse Withstand Voltage(Peak)	kV	185
4	Rated Secondary Current	A	100 $100/\sqrt{3}$ 100/3
5	Precision Degree		0.2,0.5,1.0,3.0
6	Rated Capacity	kVA	20-100



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5. Major Electrical Components of Secondary Circuit

5.1 Measuring Meter

The collocation of the measuring meter is according to the requirements of clients, and satisfy the requirements of IEC measuring meter guide rules. 3B adopts the imported meter, includes indicate meter, electric energy counter meter and transducer. 3B also can adopt national meters as the requirements of clients.

5.2 Operating Switch

M Clad - 36 switchgear is fitted with kinds of imported operating switches, which have top class quality and perfect performance.

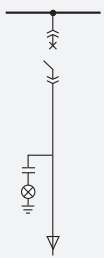
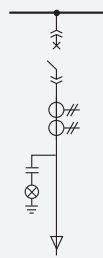
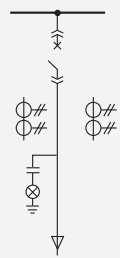
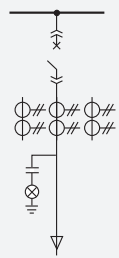
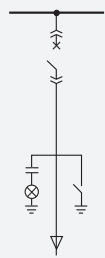
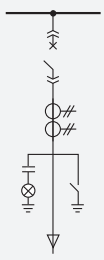
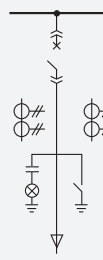
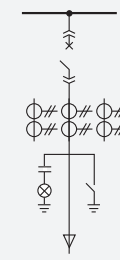
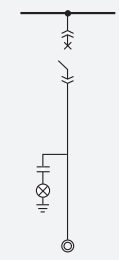
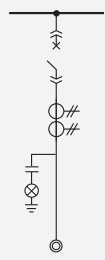
5.3 Position Indicator

M Clad - 36 switchgear is fitted with the world famous MCB as the protection of operating power, and the equipped indicators are also world famous.

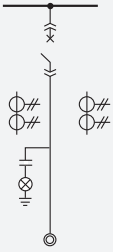
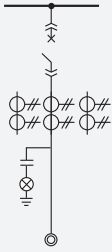
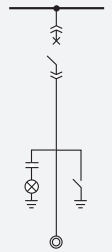
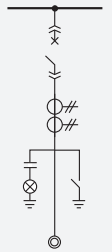
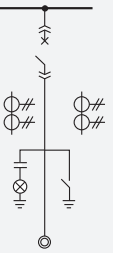
M Clad - 36 switchgear is fitted with the secondary terminals with top class quality and perfect performance.

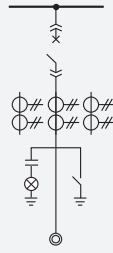
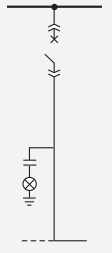
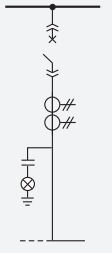
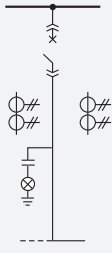
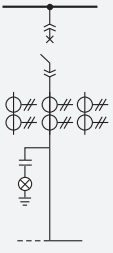
M Clad - 36 switchgear is fitted with the auxiliary switches and secondary connectors which are well known in power systems. They have many advantages: simple structure, perfect characteristic, reliable service.

6. Primary Circuit Diagram

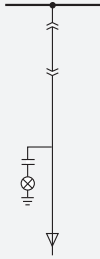
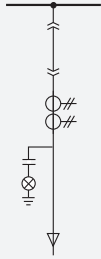
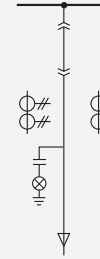
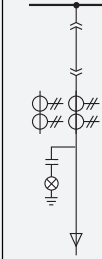
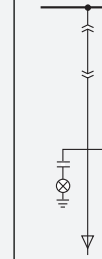
Scheme No.		01	02	03	04	05
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker	1	1	1	1	1
	Current Transformer		1	2	3	
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch					N
	Surge Arrester					
	Application	Cable Incoming (Outgoing)				
Scheme No.		06	07	08	09	10
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker	1	1	1	1	1
	Current Transformer	1	2	3		1
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch	1	1	1		
	Surge Arrester					
	Application	Cable Incoming (Outgoing)			Overhead Incoming(Outgoing)	

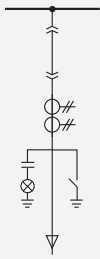
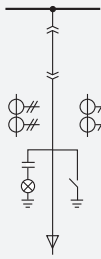
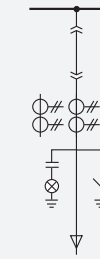
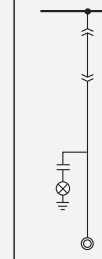
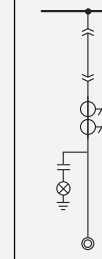
Notice: The scheme of cable or overlead incoming(outgoing) can both be installed zinc Oxide arrester.

Scheme No.		11	12	13	14	15
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker	1	1	1	1	1
	Current Transformer	2	3		1	2
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch			1	1	1
	Surge Arrester					
	Application	Overhead Incoming (Outgoing)				

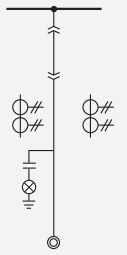
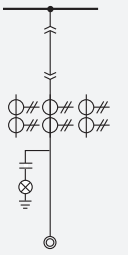
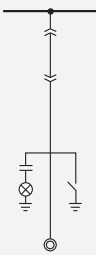
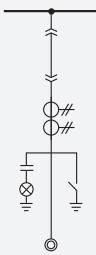
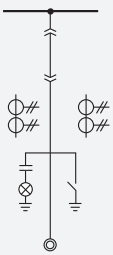
Scheme No.		16	17	18	19	20
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker	1	1	1	1	1
	Current Transformer	3		1	2	3
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch	1				
	Surge Arrester					
	Application	Overhead Incoming (Outgoing)	Busbar-tie			

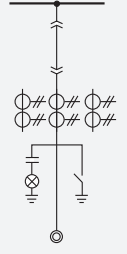
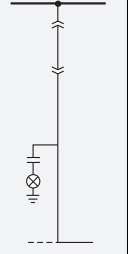
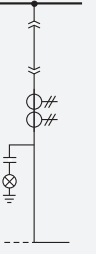
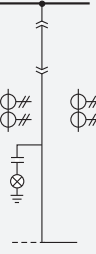
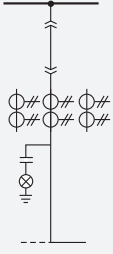
Notice: The scheme of cable or overhead incoming(outgoing) can both be installed zinc Oxide arrester.

Scheme No.		21	22	23	24	25
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer		1	2	3	
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch					1
	Surge Arrester					
	Application	Cable Incoming (Outgoing)				

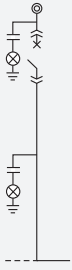
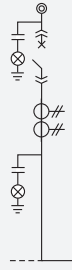
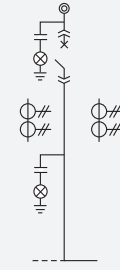
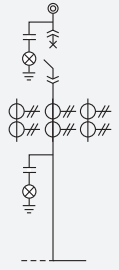
Scheme No.		26	27	28	29	30
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer	1	2	3		1
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch	1	1	1		
	Surge Arrester					
	Application	Cable Incoming (Outgoing)			Overhead Incoming(Outgoing)	


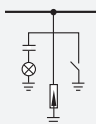
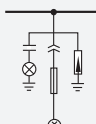
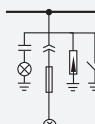
Notice: The scheme of cable or overhead incoming(outgoing) can both be installed zinc Oxide arrester.

Scheme No.		31	32	33	34	35
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer	2	3		1	2
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch			1	1	1
	Surge Arrester					
	Application	Cable Incoming (Outgoing)				


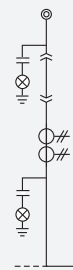
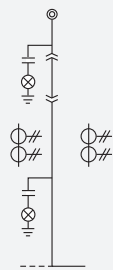
Scheme No.		36	37	38	39	40
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer	3		1	2	3
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch	1				
	Surge Arrester					
Application	Overhead Incoming (Outgoing)	Isolator+Busbar-tie				

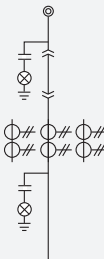
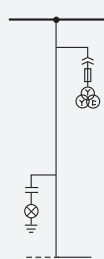
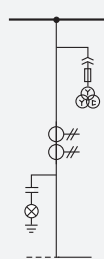
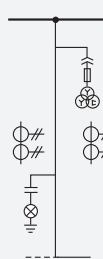
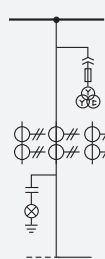
Notice: The scheme of cable or overhead incoming(outgoing) can both be installed zinc Oxide arrester.

Scheme No.		41	42	43	44	45
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker	1	1	1	1	
	Current Transformer		1	2	3	
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch					
	Surge Arrester					
	Application	Overhead Incoming (Outgoing), Busbar-tie				

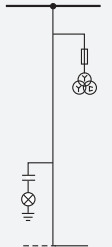
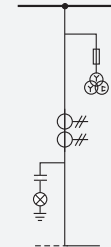
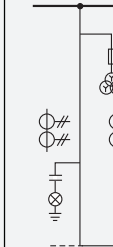
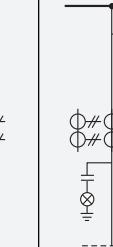
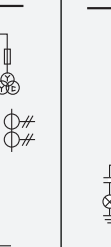
Scheme No.		46	47	48	49	50
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer					
	Voltage Transformer			3	3	
	High Voltage Fuse			3	3	
	Earthing Switch		1		1	
	Surge Arrester	3	3	3	3	
Application	Arrester		Transformer, Arrester			

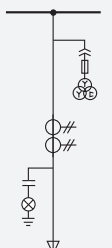
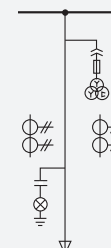
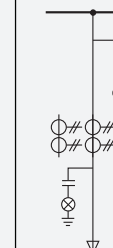

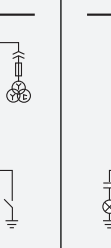
Notice: The scheme of cable or overhead incoming(outgoing) can both be installed zinc Oxide arrester.

Scheme No.		51	52	53	54	55
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer				1	2
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch					
	Surge Arrester					
	Application	Overhead Incoming (Outgoing), Busbar-tie				

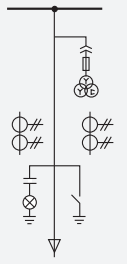
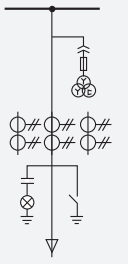
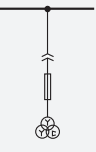
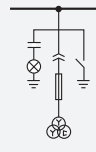
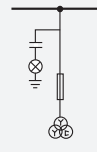
Scheme No.		56	57	58	59	60
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer	3		1	2	3
	Voltage Transformer		3	3	3	3
	High Voltage Fuse		3	3	3	3
	Earthing Switch					
	Surge Arrester					
Application	Overhead Incoming (Outgoing)	Liaison Transformer + Busbar-tie				

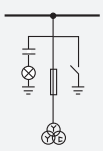
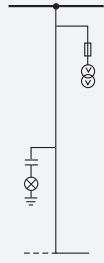
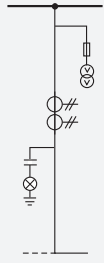
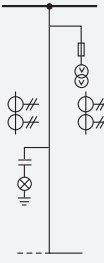
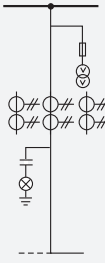
Notice: The scheme of cable or overhead incoming(outgoing) can both be installed zinc Oxide arrester.

Scheme No.		61	62	63	64	65
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer		1	2	3	
	Voltage Transformer	3	3	3	3	3
	High Voltage Fuse	3	3	3	3	3
	Earthing Switch					
	Surge Arrester					
	Application	Liaison, Transformer + Busbar-tie				

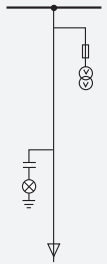
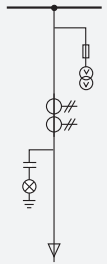
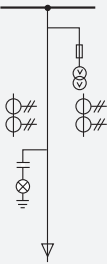
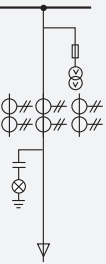
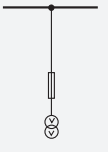
Scheme No.		66	67	68	69	70
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer	1	2	3		1
	Voltage Transformer	3	3	3	3	3
	High Voltage Fuse	3	3	3	3	3
	Earthing Switch				1	1
	Surge Arrester					
	Application	Cable Incoming(Outgoing)+Transformer				

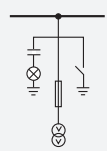
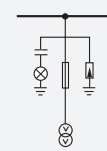
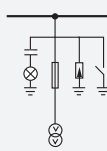
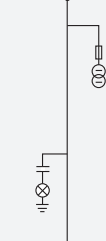
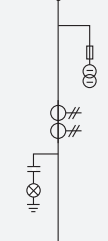
Notice: The scheme of cable or overhead incoming(outgoing) can both be installed zinc Oxide arrester.

Scheme No.		71	72	73	74	75
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer	2	3			
	Voltage Transformer	33		3	3	3
	High Voltage Fuse	33		3	3	3
	Earthing Switch	1	1		1	
	Surge Arrester					
	Application	Cable Incoming (Outgoing)			Transformer	

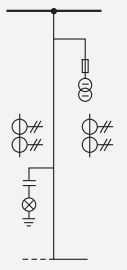
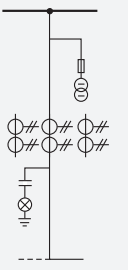
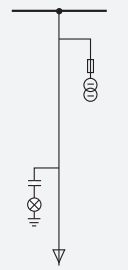
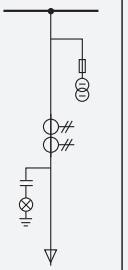
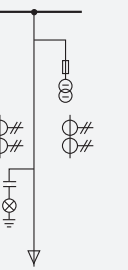
Scheme No.		76	77	78	79	80
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer			1	2	3
	Voltage Transformer	3	2	2	2	2
	High Voltage Fuse	3	3	3	3	3
	Earthing Switch					
	Surge Arrester					
	Application	Transformer	Liaison, Metering + Busbar-tie			

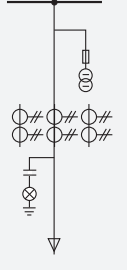
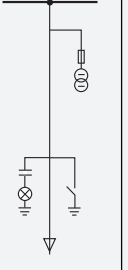
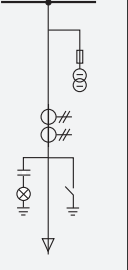
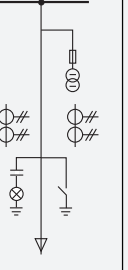
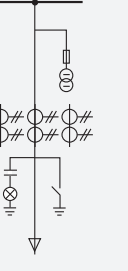
Notice: The scheme of cable or overlead incoming(outgoing) can both be installed zinc Oxide arrester.

Scheme No.		81	82	83	84	85
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer		1	2	3	
	Voltage Transformer	2	2	2	2	2
	High Voltage Fuse	3	3	3	3	3
	Earthing Switch					
	Surge Arrester					
	Application	Cable Incoming (Outgoing) + Metering				Transformer

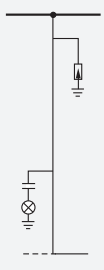
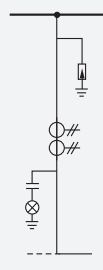
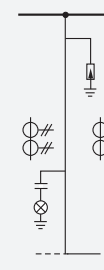
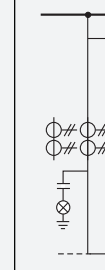

Scheme No.		86	87	88	89	90
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer					
	Voltage Transformer	2	2	2	1	1
	High Voltage Fuse	3	3	3	2	2
	Earthing Switch	1		1		
	Surge Arrester		3	3		
	Application	Transformer, Arrester			Liaison, Transformer	

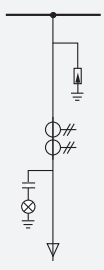
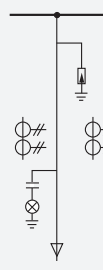
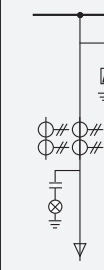
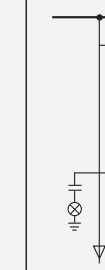
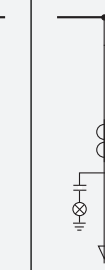
Notice: The scheme of cable or overhead incoming(outgoing) can both be installed zinc Oxide arrester.

Scheme No.		91	92	93	94	95
Primary Circuit Diagram						
Rated Current (A)					630~3150	
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer	2	3		1	2
	Voltage Transformer	1	1	1	1	1
	High Voltage Fuse	2	2	2	2	2
	Earthing Switch					
	Surge Arrester					
	Application	Liaison, Transformer			Cable Incoming(Outgoing), Transformer	

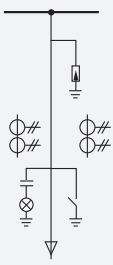
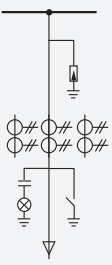
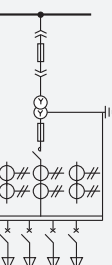
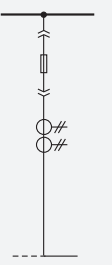
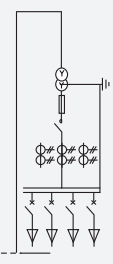
Scheme No.		96	97	98	99	100
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer	3		1	2	3
	Voltage Transformer	1	1	1	1	1
	High Voltage Fuse	2	2	2	2	2
	Earthing Switch		1	1	1	1
	Surge Arrester					
	Application	Cable Incoming (Outgoing), Transformer				

Notice: The scheme of cable or overhead incoming(outgoing) can both be installed zinc Oxide arrester.

Scheme No.		101	102	103	104	105
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer		1	2	3	
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch					
	Surge Arrester	3	3	3	3	3
	Application	Busbar-tie + Arrester				

Scheme No.		106	107	108	109	110
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer	1	2	3		1
	Voltage Transformer					
	High Voltage Fuse					
	Earthing Switch				1	1
	Surge Arrester	3	3	3	3	3
	Application	Cable Incoming (Outgoing) , Thunder-arresting + Arrester				

Notice: The scheme of cable or overhead incoming(outgoing) can both be installed zinc Oxide arrester.

Scheme No.		111	112	113	114	115
Primary Circuit Diagram						
Rated Current (A)		630~3150				
Major Electrical Components	Vacuum Circuit Breaker					
	Current Transformer	2	3		1	
	Voltage Transformer					
	High Voltage Fuse			3	3	3
	Earthing Switch	1	1			
	Surge Arrester	3	3			
	Application	Cable Incoming (Outgoing)			Transformer	

- Notice: 1.Scheme No. 113, the panel dimension of up to 50kVA transformer: 1600mm(W)x3200mm(D)x2400mm(H).
 2.Scheme No. 114, 115, these two panels only can be used as a end panel of up to 50kVA transformer: 1400mm(W)x2600mm(D)x2400mm(H).

7. Installation and Arrangement of Switchgear

In the interests of an optimum installation sequence and the assurance of a high quality standard, site installation of the switchgear should only be carried out by specially trained skilled personnel, or at least supervised and monitored by responsible persons.

7.1 General Site Requirements

(Figure 7/1)

On commencement of installation at site, the switch room must be completely finished, provided with lighting and site electricity supply, lockable, dry and with facilities for ventilation. All the necessary preparations such as wall openings, ducts, etc., for laying of the power and control cables up to the switchgear must already be completed. The detailed installation please see the figure 7.1.

7.2 Foundation Frame on Concrete Floor

Frame installation (Figure 7/2)

In order to guarantee the level degree on the basic frame, the basic frame welds part should be welding scheduled to join and click, and fix up the basic frame on concrete terrace accurately according to the installation arrangement of the electricity distribution room. The earth connection of the basic frame must use the zincplated flat-rolled steel which cross-section must not be smaller than 30X4 mm. Each basic frame should have less than two earthing connections.

Use the level meter to adjust surface degree of level of the whole basic frame carefully, and guarantee its correct height, the top surface of the basic frame should be 2 mm higher than completed electricity distribution room ground level ground, so that the switchgear is easily installed and adjusted. The flatness allowance is ± 1 mm/m, the frame material straight line degree allowance is ± 1 mm/m, but the deviation in the total length of the frame should not be greater than 2 mm. When the floor topping is applied, carefully back fill the foundation frame, leaving no gaps. The foundation frame must not be subjected to any injurious impacts or pressures, particularly during the installation phase. If these conditions are not fulfilled, problems during assembly of the switchgear and possibly with movement of the withdrawable parts and opening and closing of the doors can not be ruled out.



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