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Solution Power

# ***MEDIUM VOLTAGE METAL CLAD SWITCHGEAR***



**LS** ELECTRIC

Solution Power

# Medium Voltage Metal Clad Switchgear



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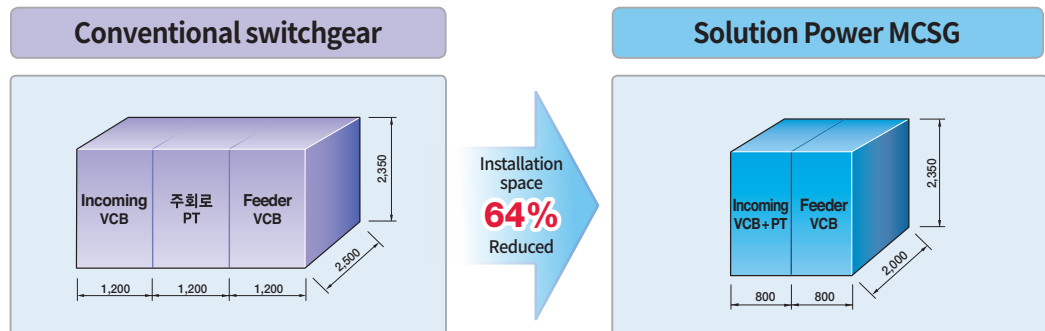




## Reduced installation space

Securing a free space for installation even in the places where safety is top priority such as Power Plant(Nuclear, Thermal, Hydro and Cogeneration), Industrial Plant(semiconductor, petrochemical, steel) and Infrastructure facilities (subways, railways, airports), etc.

- Up to 64% reduction in installation space compared to conventional switchgear
- 33% reduction in the width of switchgear with rating upto 2000A
- Integration: Incoming VCB and main PT are installed in a panel (from 2 panels before)



## Safety considerations

Solution Power switchgear provides the best protection rating out of air insulated switchgear. It is designed to remove explosion or damage to peripheral devices as possible in the event of internal arc happening.

- Metal clad type: each compartment is divided by metal partitions for the highest degree of protection rating out of air insulated switchgears.
- Short-circuit, short-time current and internal arc tests passed at KERI / KEMA / CESI by IEC 62271-200.
- Various options including
  - Mechanical interlock to prevent from inadvertent operating
  - Mechanism enable the breaker to be drawn in or out without opening the door
  - Position padlock to lock the breaker at the present position.
- Solid structure with hinge and locker
- IP cover on the face of the breaker and inspection window on the door
- Metal shutter and shutter padlock installed in CB compartment for safe maintenance
- Used reliable tube & boots for busbar insulation
- Insulation cap and padlock used for earthing switch to secure insulation and safety
- CT equipped with protective insulation wall

To prove its reliability and safety, LS use the internationally recognized testing agency, KERI / KEMA / CESI for certification as well as LS' test lab PT&T that is a KOLAS-qualified (Korea Laboratory Accreditation Scheme) accredited testing laboratory and provides worldwide testing service.

- Equipped with a short circuit testing facility of 2,000MVA capacity, high voltage testing facility, and reliability testing facility
- Rigorous and strict tests for the reliable performance and quality of products

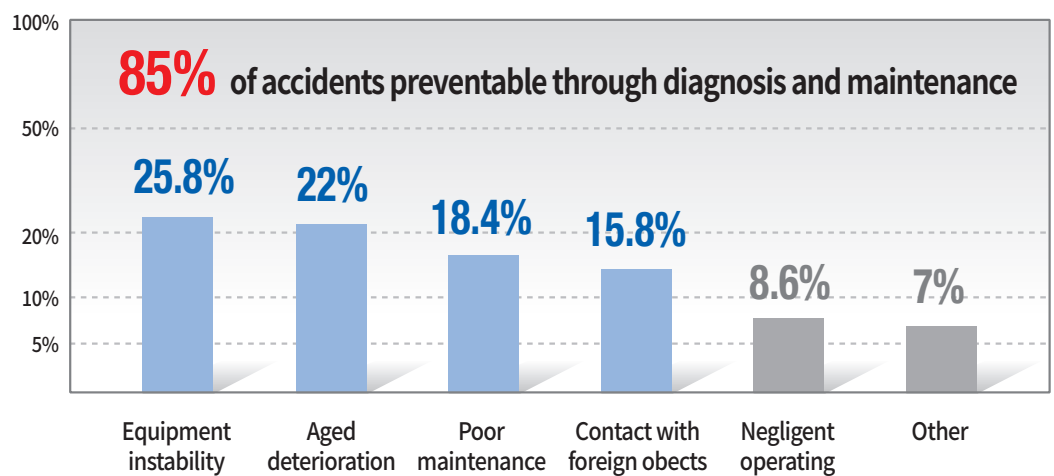




## Convenient maintenance and inspection

Preventive maintenance is essential for all switchgears. LS' one-stop total preventive maintenance activities cover continuous maintenance, inspection, remaining life expectancy and streamline. Solution power switchgear is structured for these convenient maintenance and inspection.

- Using recently developed Susol VCB for almost unnecessary maintenance and inspection.
- Low voltage compartment provides enough space to test and change the internal wiring easily, and the wiring duct at the top of it is made of steel material.
- Independent bus compartment structured not to affect any accident to adjacent panels.



## Digital type switchgear capable of digital data link

Digital protection & Monitoring device, GIPAM developed by LS is adopt for establishing convenient and reliable power protection and monitoring system, and for digital data link with remote monitoring and control system.



X GIPAM separate type touch screen applied



XGIPAM



GIPAM-2000



GIPAM-2200

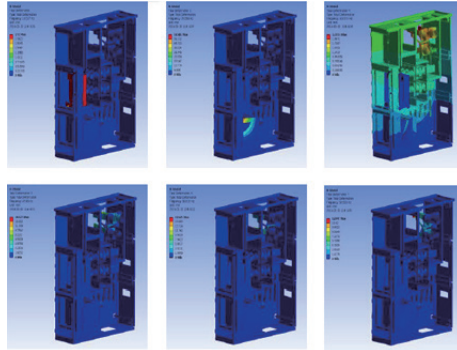
# Features

## Seismic design

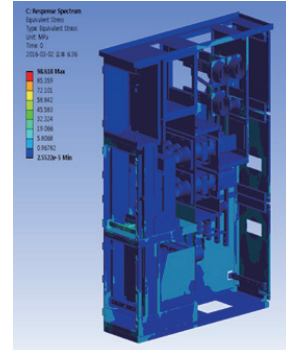
### Extended

LS manufactures and provides MCSG having proper seismic performance through a seismic qualification analysis and robust design method.

#### • Mode analysis



#### • Response spectrum analysis

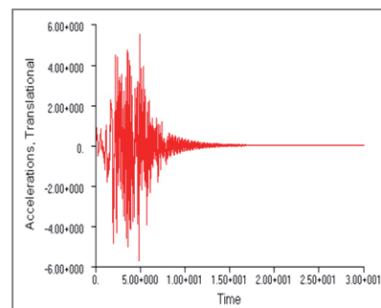
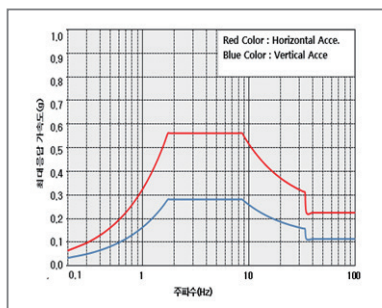


### Seismic analysis

- Applicable to the product that can be assessed for seismic performance only with demonstrating structural integrity
  - Implement seismic test for the product required demonstration of functional integrity
- Analysis method
  - Use mathematical model mode analysis to determine the method of analysis
  - Dynamic analysis (~33Hz), Static analysis (over 33Hz)
- Combining seismic analysis and test for the large and combined products

### Seismic test

- Test criteria
  - Different criteria is applied by country and product, structural/non structural factors
- Applied test load
  - Create the acceleration spectrum for product according to the damping of seismic wave and ground condition





## Specification

### 7.2kV



Section		Contents							
Model		Solution Power V7 / S7							
Rated voltage	(kV)	7.2							
Rated frequency	(Hz)	50/60							
Rated power frequency withstand voltage	(kV/1min)	20							
Rated lightning impulse withstand voltage	(kV[1.2×50μs])	60							
Rated short-time withstand current	(kA/s)	25/3	40/3	50/3					
Degree of protection		IP4X	IP4X	IP4X					
Internal arc withstand current	(kA/s)	25/1	40/1	50/0.5					
Rated current	(A)	630/1250/2000	1250/2000	3150	1250/2000	2500/3150	4000	5000	
Size	Width	(mm)	(650)750/800	(650)800	850	850	1050	1200	
	Height	(mm)	2250	2250	2250				
	Depth	(mm)	(1800)2000	(1900)2000	(1900)2200	(2000)2200	2400	(2200)2400	
Standard		IEC 62271-200							

Note) 1. Solution Power V Series: Pro-MEC VCB installed.

2. Solution Power S Series: Susol VCB or Metasol VCB(only for up to 25kA 1250A) installed.

3. The size in ( ) is for the minimum size.

4. For a panel with Metasol VCB, the minimum width is 550mm without internal arc performance and 600mm with internal arc performance 25kA/1s. The height and depth are 2300mm and 1700mm each.

### 12kV



Section		Contents							
Model		Solution Power V12 / S12							
Rated voltage	(kV)	12							
Rated frequency	(Hz)	50/60							
Rated power frequency withstand voltage	(kV/1min)	28							
Rated lightning impulse withstand voltage	(kV[1.2×50μs])	75							
Rated short-time withstand current	(kA/s)	25/3	40/3	50/3					
Degree of protection		IP4X	IP4X	IP4X					
Internal arc withstand current	(kA/s)	25/1	40/1	50/0.5					
Seismic Qualification Test		-	-	-	UBC 97 Code Zone 4/IEC 60068	-			
Rated current	(A)	630/1250/2000	1250/2000	3150	1250/2000	2500/3150	4000	5000	
Size	Width	(mm)	(650)750/800	(650)800	850	850	1050	1200	
	Height	(mm)	2250	2250	2250				
	Depth	(mm)	(1800)2000	(1900)2000	(1900)2200	(2000)2200	2400	(2200)2400	
Standard		IEC 62271-200							

Note) 1. Solution Power V Series: Pro-MEC VCB installed.

2. Solution Power S Series: Susol VCB or Metasol VCB(only for up to 25kA 1250A) installed.

3. The size in ( ) is for the minimum size.

4. For a panel with Metasol VCB, the minimum width is 550mm without internal arc performance and 600mm with internal arc performance 25kA/1s. The height and depth are 2300mm and 1700mm each.

# 1-high MCSG (Standard type)

## Specification

### 17.5kV



Section		Contents					
Model		Solution Power V17 / S17					
Rated voltage	(kV)	17.5					
Rated frequency	(Hz)	50/60					
Rated power frequency withstand voltage	(kV/1min)	38					
Rated lighting impulse withstand voltage	(kV[1.2×50μs])	95					
Rated short-time withstand current	(kA/s)	25/3	40/3		50/3		
Degree of protection		IP4X	IP4X		IP4X		
Internal arc withstand current	(kA/s)	25/1	40/0.1		50/0.5		
Rated current	(A)	630/1250/2000	1250	3150	1250/2000	2500/3150	4000
Size	Width	(mm)	800	800	950	850	1050
	Height	(mm)	2250		2250		
	Depth	(mm)	(1800)2000	(1900)2200		2200	2400
Standard		IEC 62271-200					

Note) 1. Solution Power V Series: Pro-MEC VCB installed. 2. Solution Power S Series: Susol VCB or Metasol VCB(only for up to 25kA 1250A) installed.  
 3. The size in ( ) is for the minimum size.  
 4. For a panel with Metasol VCB, the width is 600mm without internal arc performance. The height and depth are 2300mm and 1700mm each.

### 24kV



Section		Contents					
Model		Solution Power V24 / S24					
Rated voltage	(kV)	24					
Rated frequency	(Hz)	50/60					
Rated power frequency withstand voltage	(kV/1min)	50					
Rated lighting impulse withstand voltage	(kV[1.2×50μs])	125					
Rated short-time withstand current	(kA/s)	25/3		40/3			
Degree of protection		IP4X		IP4X			
Internal arc withstand current	(kA/s)	25/1		40/0.5			
Seismic Qualification Test		-		IEC 60068		-	
Rated current	(A)	630/1250	2000	2500	1250/2000	3150	
Size	Width	(mm)	800	(800)1000	1000	(800)1000	1000
	Height	(mm)	2250/2350			2250/2350	
	Depth	(mm)	2000	2200		2200	
Standard		IEC 62271-200					

Note) 1. Solution Power V Series: Pro-MEC VCB installed. 2. Solution Power S Series: Susol VCB installed.  
 3. The size in ( ) is for the minimum size.  
 4. Height 2350mm is the height of 24kV receiving equipment 5. Max internal arc capability is 1Sec for 40kA model.

### 36kV

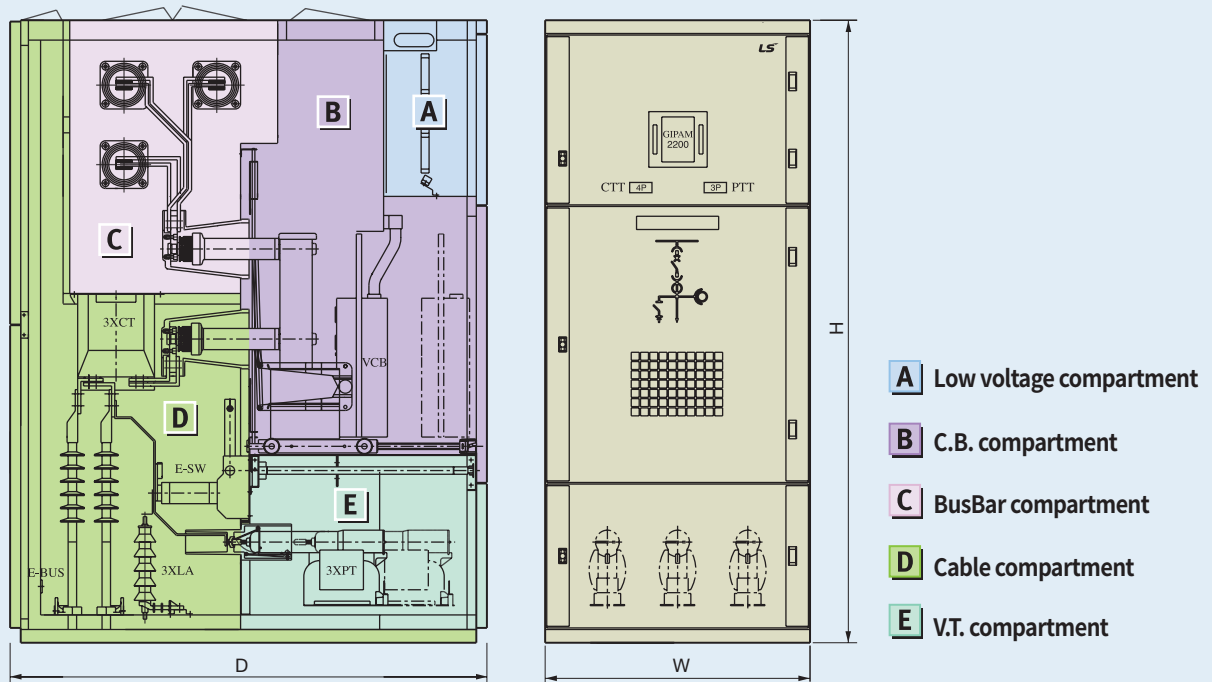


Section		Contents	
Model		Solution Power S36	
Rated voltage	(kV)	36	
Rated frequency	(Hz)	50/60	
Rated power frequency withstand voltage	(kV/1min)	70	
Rated lighting impulse withstand voltage	(kV[1.2×50μs])	170	
Rated short-time withstand current	(kA/s)	25, 31.5, 40/3	
Degree of protection		IP4X	
Internal arc withstand current	(kA/s)	40/1	
Rated current	(A)	1250/2000/3150	
Size	Width	(mm)	1200
	Height	(mm)	2250~3000
	Depth	(mm)	2600~3300
Standard		IEC 62271-200	

Note) Please contact us for exact size.



## Structures and dimensions



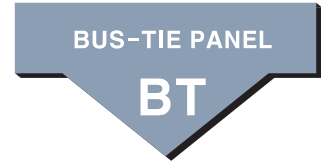
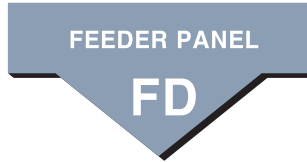
Type	Unit	Solution Power S36	Solution Power S24		Solution Power S17			Solution Power S12			Solution Power S7					
Rated voltage	kV	36	24		17.5			12			7.2					
Rated power frequency withstand voltage	kV/ 1min	70	50		38			28			20					
Rated lighting impulse withstand voltage	kV [1.2x50µs]	170	125		95			75			60					
Rated short-time withstand current	kA/s	25-40 /3	25-40/3		25-50/3			25-50/3			25-50/3					
Internal arc withstand current	kA/s	40/1	25/1, 40/0.5 <sup>1)</sup>		25/1, 50/0.5			25/1, 40/1, 50/0.5			25/1, 40/1, 50/0.5					
Rated current	A	3150 2000 1250	3150 (40kA) 2500 (25kA)	2000 1250 630	4000 3150 2500 (50kA)	2000 1250 (50kA)	3150 (40kA) 630	2000 1250 630	5000 4000 3150 2500 (50kA)	2000 1250 (50kA) 630	3150 (40kA)	2000 1250 (50kA)	3150 (40kA)	2000 1250 630		
Width	mm	1200	1000	800	1050	850	950	800	1050 (1200)	850	850	650	1050 (1200)	850	850	650
Depth	mm	2600- 3300	2200	2000 (2200)	2400/ 2200	2200	1900	1800 (1900)	2400/ 2200	2000	1900	1800 (1900)	2400/ 2200	2000	1900	1800 (1900)
Height	mm	2250- 3000	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250

Note) 1. Max internal arc capability is 1Sec for 40kA model.  
3. The size in ( ) is for 31.5~40kA models.

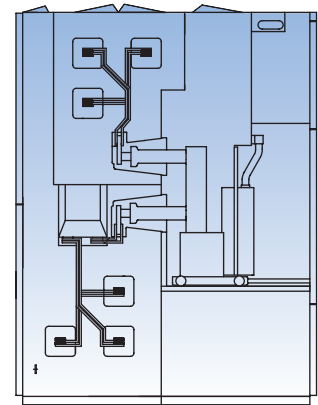
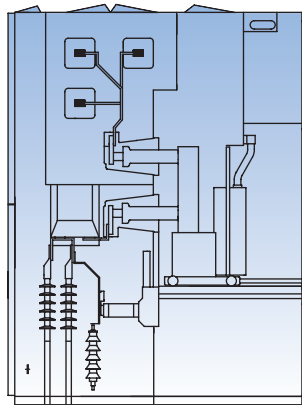
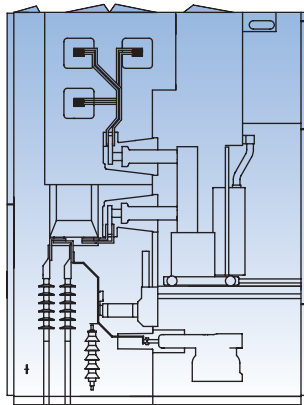
2. The size in this table is for minimum applicable size with Susol VCB.  
4. In the case of upper withdrawal/insertion of cable, depth expansion is required(300~500mm).

# 1-high MCSG (Standard type)

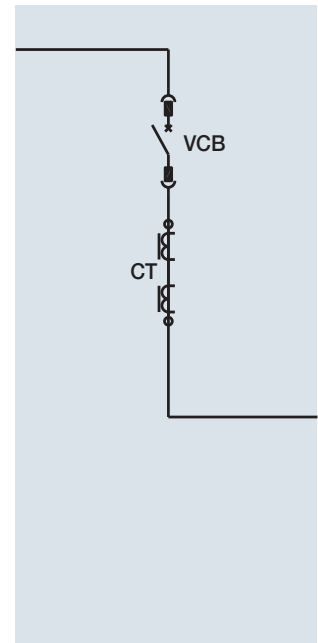
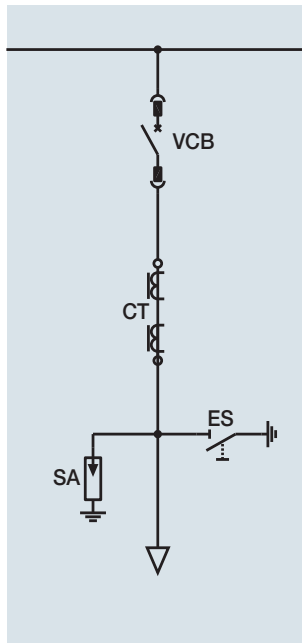
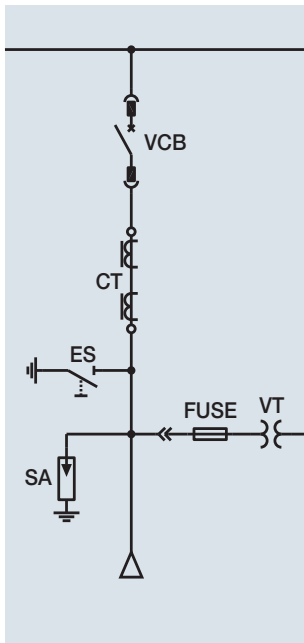
## Arrangement for general application (Solution Power V Series)



Section view



Diagram



Note) Panels except Incoming panel and Feeder panel to be applied those of a general switchgear.

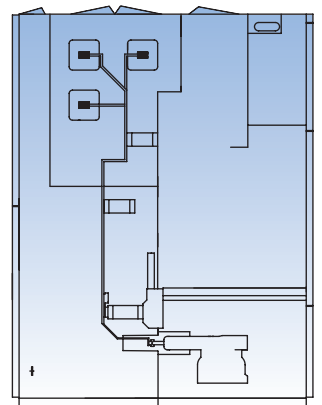
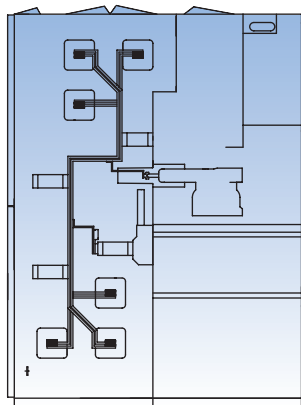
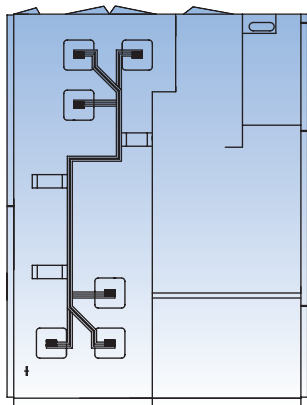


BUS-RISER PANEL  
**BR**

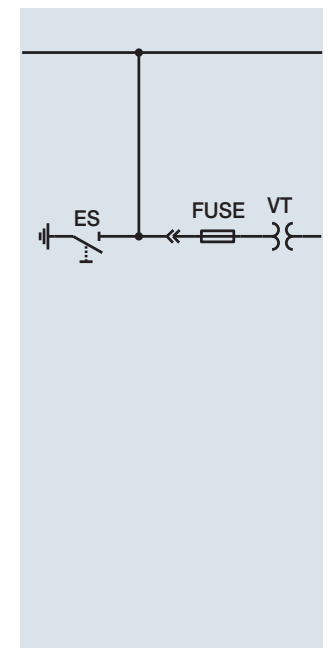
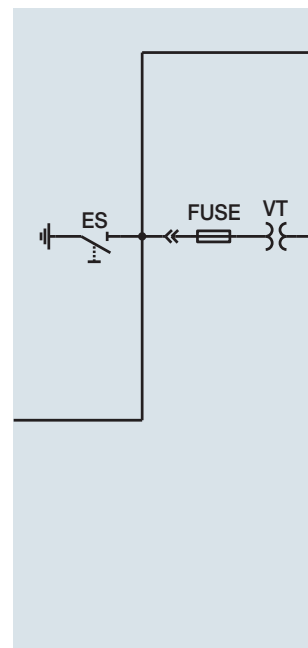
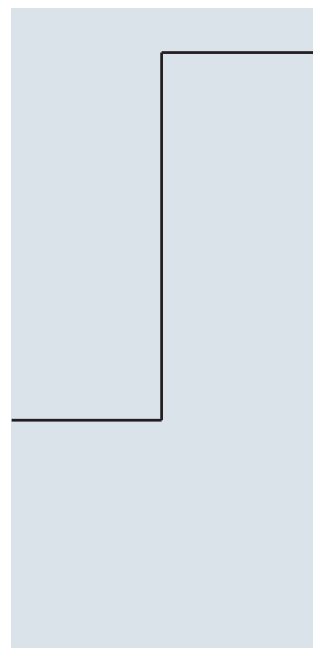
BUS-RISER PANEL  
(Withdrawable VT)  
**RP**

BUS-PT PANEL  
**BP**

Section view

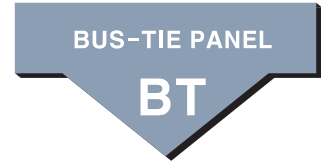
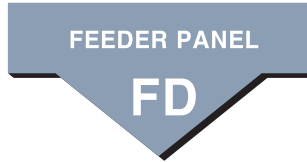


Diagram

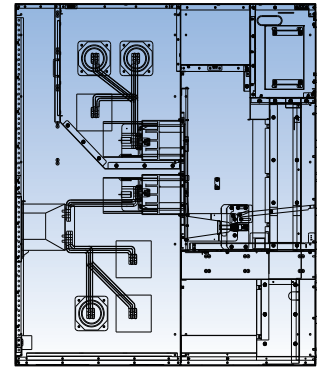
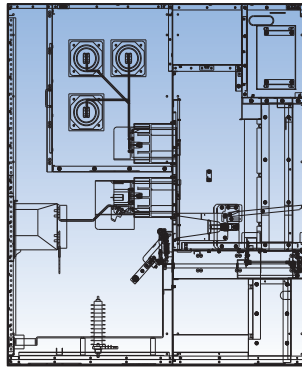
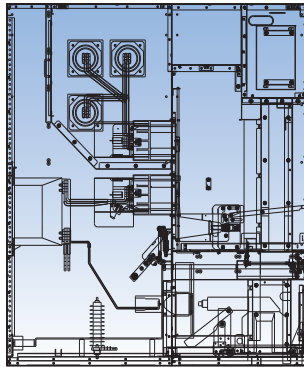


# 1-high MCSG (Standard type)

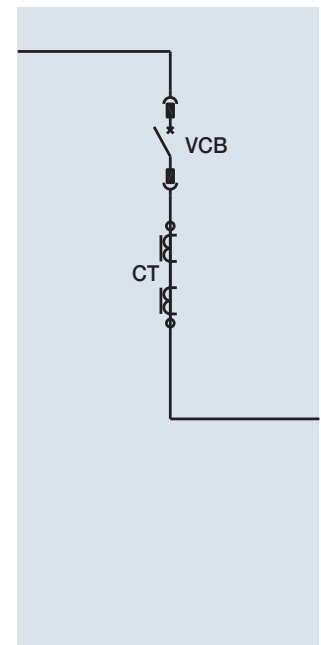
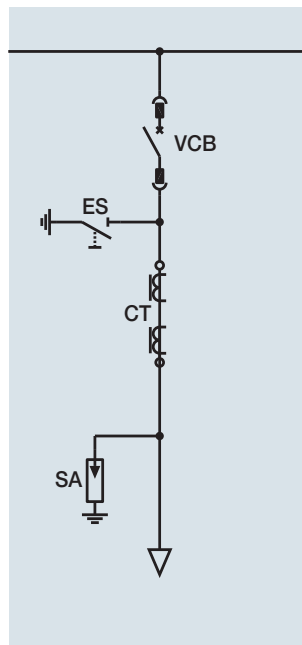
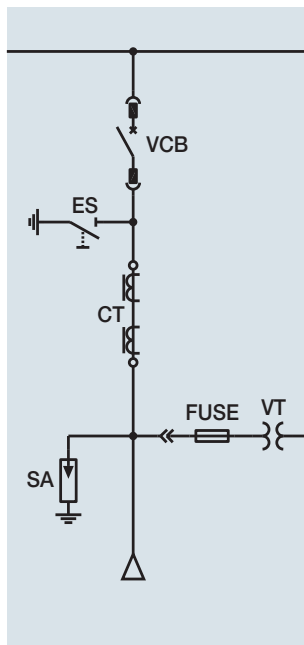
## Arrangement for general application (Solution Power S Series)



Section view



Diagram



Note) Panels except Incoming panel and Feeder panel to be applied those of a general switchgear.

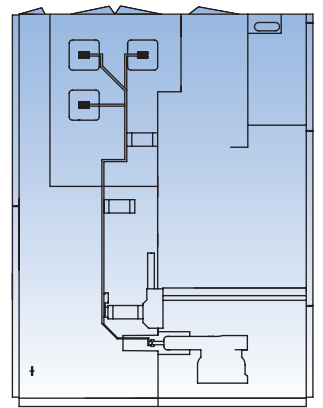
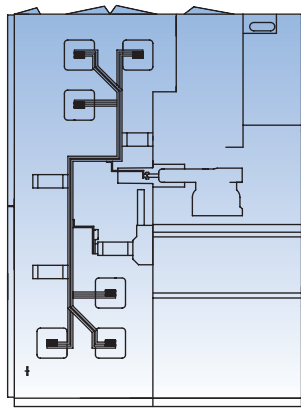
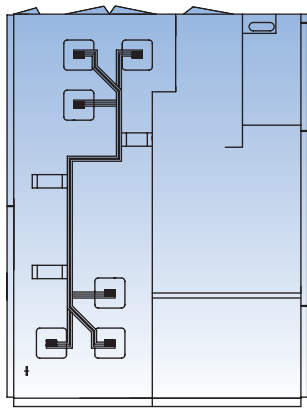


BUS-RISER PANEL  
**BR**

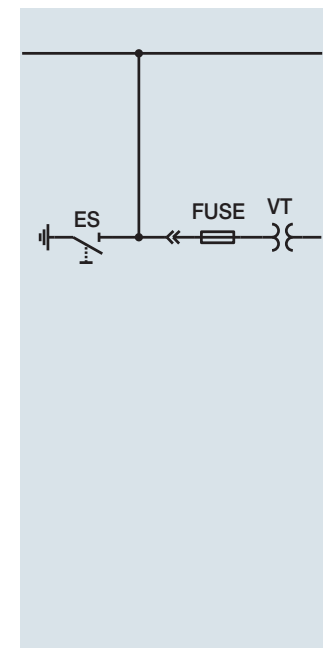
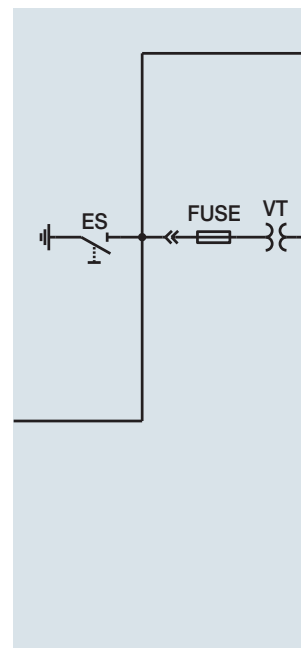
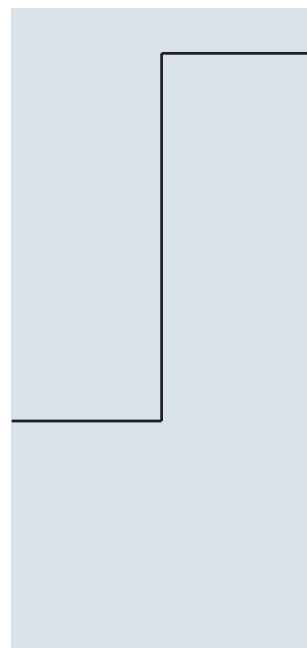
BUS-RISER PANEL  
(Withdrawable VT)  
**RP**

BUS-PT PANEL  
**BP**

Section view



Diagram



# 1-high MCSG (Front access type)

## Features

LS Front access type MCSG enables front cable installation and front maintenance in response to the customer's need to reduce the footprint of the switchgear.

### Convenience

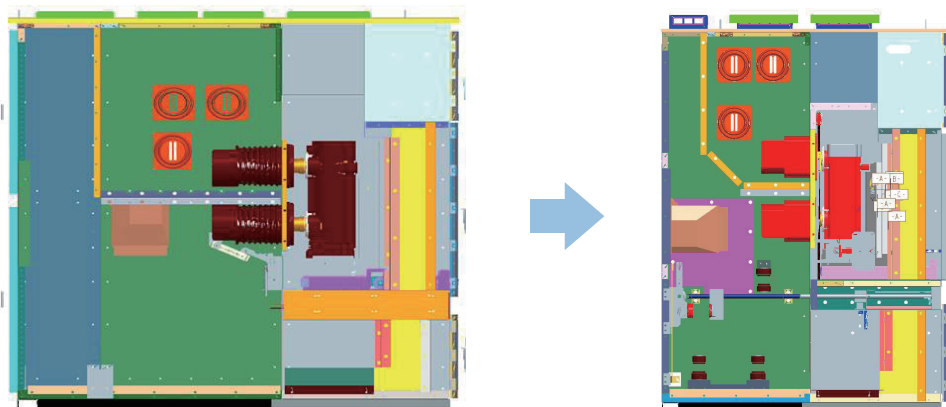
#### Securing ease of maintenance through front access

- Cable installation and maintenance work available from the front of the MCSG
- VCB Base detachable structure
- Rear installation of earthing switch panel
- Maximize assembly through separate kit structure for operation and interlock



### Compact

#### Enhancement of space utilization by reducing the size compared to the standard type MCSG



### Reliability/ Safety

- Metal partitions between each compartment
- Equipped with a mechanical interlock to prevent misoperation
- User safety through internal arc test
- Stable structure through temperature and structural analysis

## Specification

### 12kV

Section		Contents	
Model		Solution Power S12F	
Rated voltage	(kV)	12	
Rated frequency	(Hz)	50/60	
Rated power frequency withstand voltage	(kV/1min)	28	
Rated lighting impulse withstand voltage	(kV[1.2×50μs])	75	
Rated short-time withstand current	(kA/s)	31.5/3	
Degree of protection		IP41	
Internal arc withstand current		31.5/1	
Rated current	(A)	1250	2000
Size	Width	600	800
	Height	2250	
	Depth	1700	
Standard		IEC 62271-200	

### 17.5kV

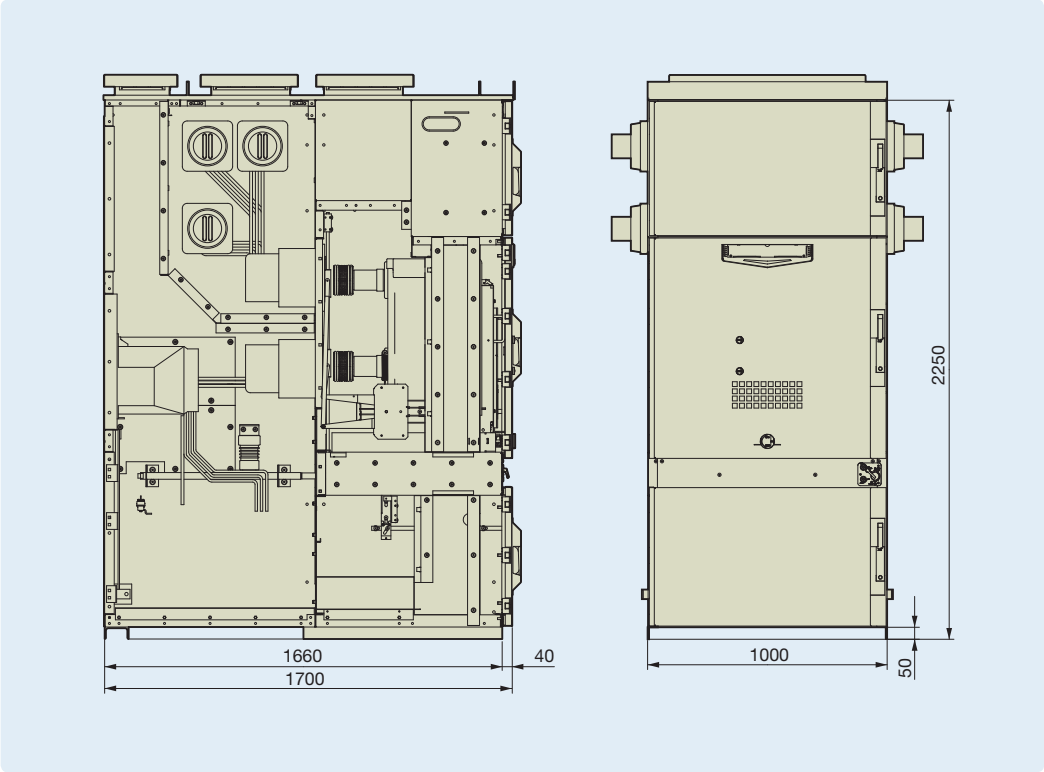
Section		Contents	
Model		Solution Power S17F	
Rated voltage	(kV)	17.5	
Rated frequency	(Hz)	50/60	
Rated power frequency withstand voltage	(kV/1min)	38	
Rated lighting impulse withstand voltage	(kV[1.2×50μs])	95	
Rated short-time withstand current	(kA/s)	40/3	
Degree of protection		IP41	
Internal arc withstand current		40/0.5	
Rated current	(A)	3150	
Size	Width	1000	
	Height	2250	
	Depth	1700	
Standard		IEC 62271-200	



# 1-high MCSG (Front access type)

## Structures and dimensions

Solution Power  
S17F



## Specification

### Compact type



Section			Contents				
Model			Compact type				
Rated voltage	(kV)		7.2		12		
Rated frequency	(Hz)		50/60		50/60		
Rated power frequency withstand voltage	(kV/1min)		20		28		
Rated lighting impulse withstand voltage	(kV[1.2×50μs])		60		75		
Rated short-time withstand voltage	(kA/s)	20/3, 25/3	31.5/3, 40/3		31.5/3, 40/3		
Degree of protection			IP4X		IP4X		
Rated current	(A)	630/1250/2000	1250/2000	3150	1250/2000	3150	
Size	Width	(mm)	750(800)	750(800)	850	750(800)	850
	Height	(mm)	2350/2450	2350/2450		2350/2450	
	Depth	(mm)	2200/2400	2200/2400		2400	
Standard			IEC 62271-200				

Note) The number of the size in ( ) is for installed PT model.

### Middle busbar type



Section			Contents				
Model			Middle busbar + LV comp.	Middle busbar + Side arc duct			
Rated voltage	(kV)		7.2	7.2			
Rated frequency	(Hz)		50/60	50/60			
Rated power frequency withstand voltage	(kV/1min)		20	20			
Rated lighting impulse withstand voltage	(kV[1.2×50μs])		60	60			
Rated short-time withstand current	(kA/s)	25/3	40/3	50/3			
Degree of protection			IP4X	IP4X	IP4X		
Internal arc withstand current	(kA/s)	25/1	40/0.5	50/0.5			
Seismic qualification test			IEEE 693	-	-		
Rated current	(A)	630/1250/2000	1250/2000	3150	1250/2000	2500/3150/4000	
Size	Width	(mm)	750	900	1000	1000	1050
	Height	(mm)	2450	2250/2450		2450	
	Depth	(mm)	2200	2400		2400	
Standard			IEC 62271-200				

Note) 1. Max internal arc capability is 1Sec for 40kA model. 2. Height 2450mm size for 50kA 2,500/3,150/4,000A is applied by customer needs.

### Double busbar type



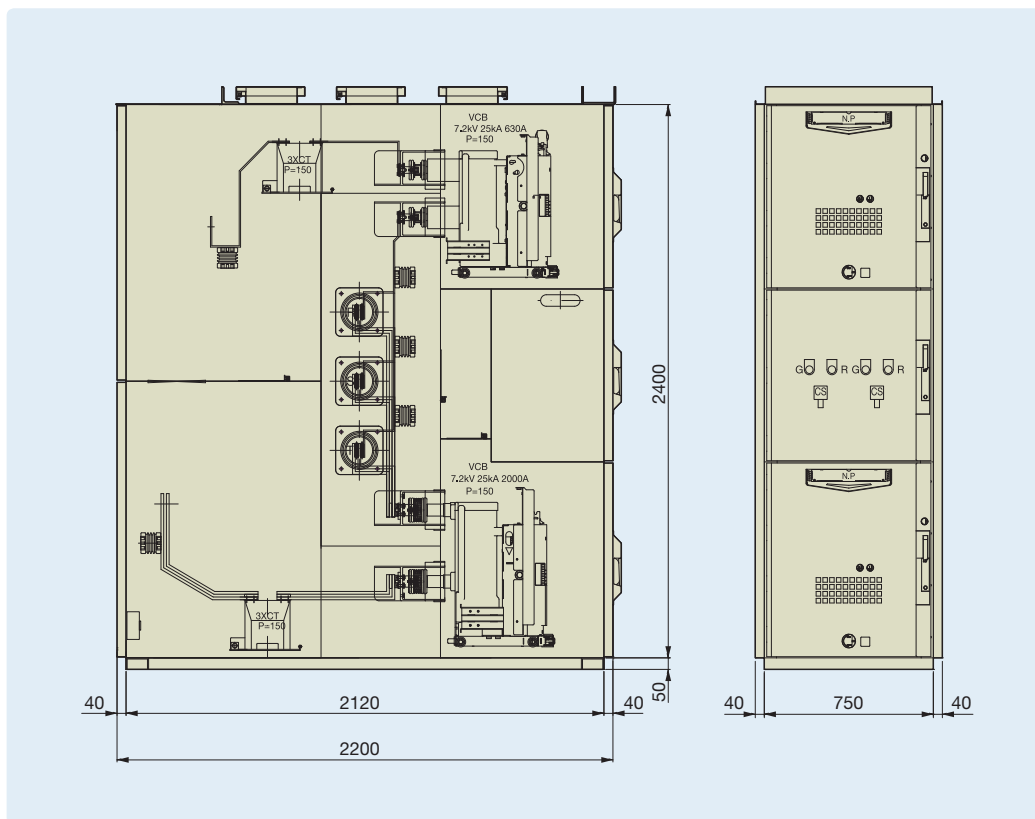
Section			Contents				
Model			Double busbar type+Earthing switch+Arc duct				
Rated voltage	(kV)		7.2				
Rated frequency	(Hz)		50/60				
Rated power frequency withstand voltage	(kV/1min)		20				
Rated lighting impulse withstand voltage	(kV[1.2×50μs])		60				
Rated short-time withstand current	(kA/s)	25/3	40/3	50/3			
Degree of protection			IP4X	IP4X	IP4X		
Internal arc withstand current	(kA/s)	25/0.5	40/0.5	50/0.5			
Seismic Qualification Test			UBC 97 Code Zone 4/IEC 60068			-	
Rated current	(A)	630/1250/2000	1250/2000	3150	1250/2000	2500/3150/4000	
Size	Width	(mm)	800	800	850	950	1050
	Height	(mm)	2700	2700		2750	2750
	Depth	(mm)	2400	2400		2300	2300
Standard			IEC 62271-200				

Note) Internal arc performance can be verified with 1Sec when customer requests

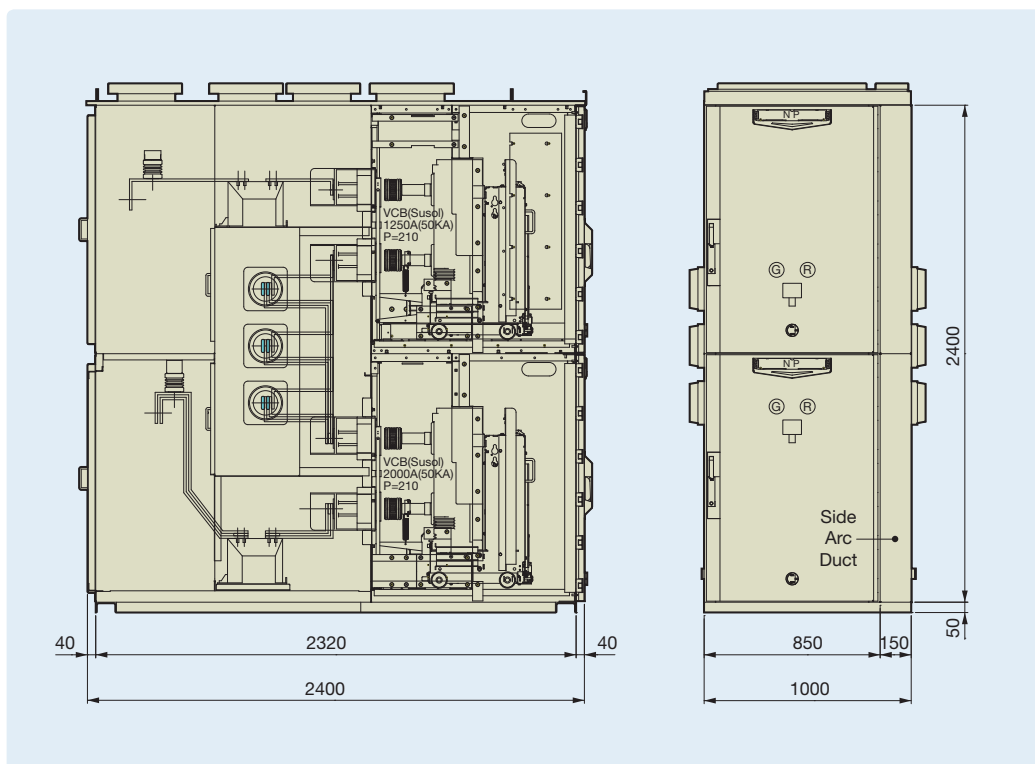
# 2-high MCSG

## Structures and dimensions

Middle busbar type  
(Middle busbar+  
LV compartment)



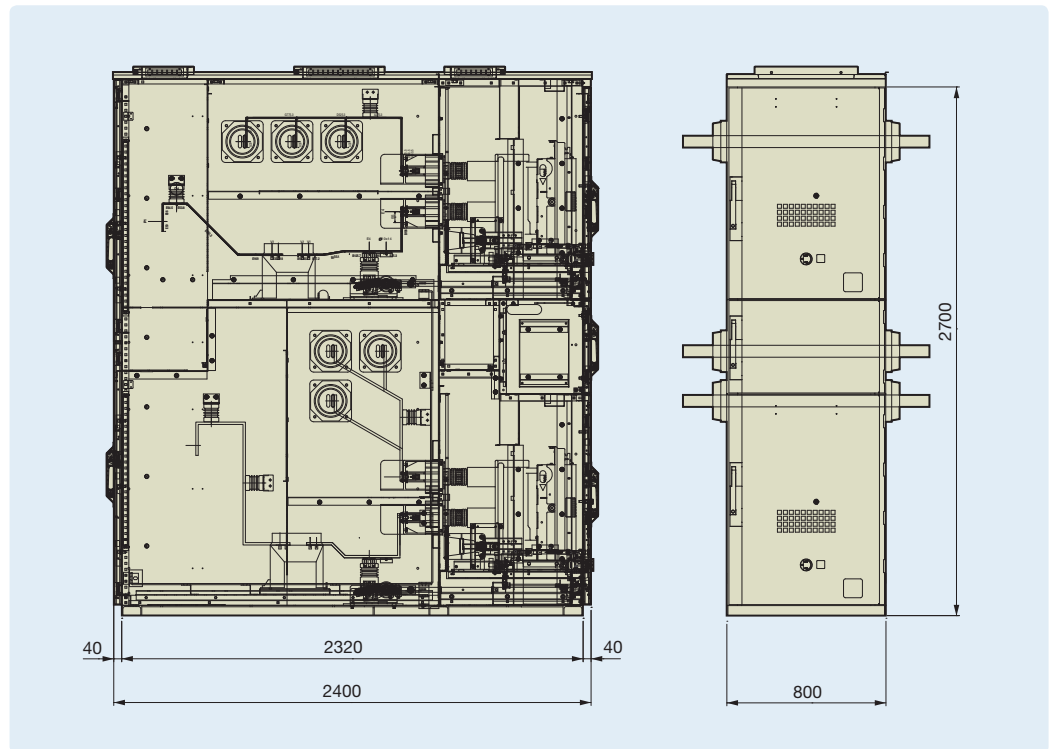
Middle busbar type  
(Middle busbar+  
Side arc duct)



Note) Width of 40kA model is 900mm.

## Structures and dimensions

### Double busbar type



## Reference of 2-high MCSG

### Middle busbar+LV comp. type

PJT name	Ratings	Market	Delivery
DGB Innovation Center (Daegu Bank)	7.2kV 20kA 630A	IDC	2018.01
Shinsegae Group Data Center	7.2kV 20kA 630A	IDC	2018.12
Samsung SDS Sangam Data Center	7.2kV 25kA 1250A	IDC	2019.01
Microsoft Busan IDC (Phase 1)	7.2kV 25kA 630/1250A	IDC	2019.11

### Double busbar+E/S+Arc duct type

PJT name	Ratings	Market	Delivery
POSCO Brazil CSP Steel Plant	7.2kV 25/40kA 630/1250/2000/3150A	Steel	2016.12
E-CL/RED DRAGON, Chile PIEM (SK E&C)	7.2kV 50kA 1250/3150A	Power plant	2017.06
Samsung SDS Sangam Data Center	7.2kV 25kA 1250A	IDC	2019.01

### Middle busbar+Side arc duct type

PJT name	Ratings	Market	Delivery
Jangmoon CCPP	7.2kV 40kA 1250/2000/4000A	Power plant	2015.10
POSCO Pohang 3 Continuous Casting	7.2kV 31.5kA 1250A	Steel	2016.03
BNK Financial Group Integrated IT Center	7.2kV 25kA 630/1250A	IDC	2016.12
POSCO No.2 EGL MV System Replacement	7.2kV 40kA 1250/4000A	Steel	2017.04
KT Mokdong IDC (2 Center)	7.2kV 40kA 1250/2000A	IDC	2017.07
POSCO Pohang 1 Hot Rolling	7.2kV 40kA 1250A	Steel	2017.08
POSCO Pohang Headquarter	7.2kV 40kA 2000A	Steel	2017.09
LS-NIKKO Copper 2 Factory (Janghang)	7.2kV 25kA 1250A	Smelting	2018.02
POSCO Gwangyang 4 Cold Rolling	7.2kV 40kA 3150A	Steel	2018.06

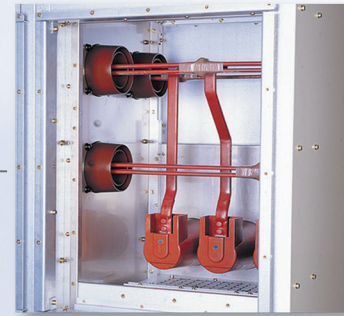
PJT name	Ratings	Market	Delivery
Wirye ES Gamil Pump Station	7.2kV 20kA 630A	Water supply	2018.08
LG MMA M3 Revamping	7.2kV 25kA 630/2000A	Petrochemistry	2018.11
Lotte Chemical Ulsan 1 Factory MEX3	7.2kV 40kA 2000/3150A	Petrochemistry	2018.12
LS-NIKKO Copper (Onsan)	7.2kV 25kA 630/1250A	Smelting	2019.03
LG Chemical IPA 50KTA EXPANSION	7.2kV 25kA 630/1250A	Petrochemistry	2019.04
SK Energy Improvement	7.2kV 40kA 1250A	Power plant	2019.05
SK Energy NAC 33 Substation	7.2kV 25kA 630/1250A	Power plant	2019.09
Korea Univ. Anam Hospital Medical Center	7.2kV 40kA 1250A, 25kA 630A	Hospital	2019.11
POSCO Gwangyang 3 Furnace	7.2kV 40kA 2000A	Steel	2019.11
Microsoft Busan IDC (Phase 1)	7.2kV 40kA 1250/2000A	IDC	2019.11



# Compartment and accessories

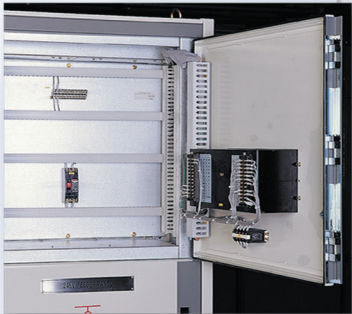


**Ventilation Cover**



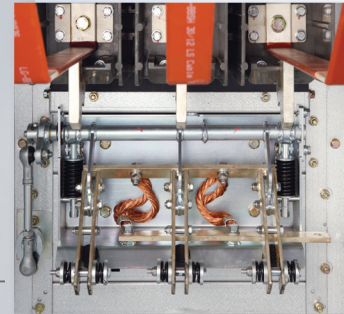
**Bus Compartment**

- Independent bus compartment structured not to affect any accident to adjacent panels.



**Low Voltage Compartment**

- Enough space to test and change the internal wiring easily.
- Wiring duct for panel connection at the top is made of steel.



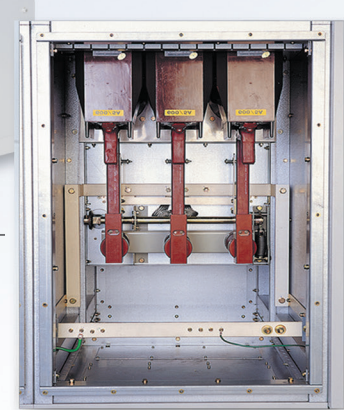
**Earthing Switch**

- Device to discharge the load side current in the position of Test and Drawout to ensure the safe maintenance



**CB Compartment**

- Can be drawn in and out C.B. without opening the door.
- Viewing window for C.B. inspection
- Solid structure with hinge and locker
- Metal shutter and shutter padlock
- IP cover on the face of C.B



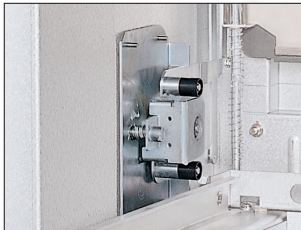
**Cable compartment**

- Sufficient spaces for wiring
- Insulation cap for the dielectric of Earthing switch
- Bottom incoming and outgoing (Top incoming and outgoing not available)

## Optional accessories for C.B. Compartment

### Shutter Padlock

The hole to lock the shutters (load and line side) in close position, to increase the safety during the maintenance of a VCB draw-out position.



### Inspection window

Viewing window permits view of the status of the breaker through the closed door.

### Emergency trip device

C.B. can be tripped by trip device without opening the door.

### Draw-in and out device

C.B. can be drawn-in and out with the door closed.

### Mechanical position indicator

Indicate the service and test position of C.B.

### VCB Interlock

The device that prevents the circuit breaker to separate the Jack Terminal when the Run position.

### Interlocking device between door and C.B.

When the C.B. is service position, customer can not open the door without releasing the interlock key.

### Earthing Switch Padlock

Prevent the accident in case of carelessness earthing switch operation. The locking of the earthing switch is available when the switch is in 'OFF' position.



## Vacuum circuit breaker

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

### LS' Super Solution, Susol VCB responds

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

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

- Full line-up modeling to the high interrupting capacity and large current.
- Main structure with high reliability application.
- A variety of accessories and ability to maximize.

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

## Features

### Strengthening of the high interrupting capacity and large current models and full line-up new VCB models to high/middle/low.

Voltage	Interrupting current	Rated current
7.2kV	8/12.5/20/25/31.5/40/50kA	400/630/1250/2000/3150/4000/5000A
12kV	20/25/31.5/40/50kA	630/1000/1250/2000/2500/3150/4000/5000A
17.5kV	20/25/31.5/40/50kA	630/1000/1250/2000/2500/3150/4000A
24kV	12.5/25/31.5/40kA	630/1250/2000/2500/3150A
25.8kV	12.5/16/25/31.5/40kA	630/1250/2000/3150A
36kV	25/31.5/40kA	1250/2000/3150A

### Main circuit structure with high reliability.

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

### Convenience of switchgear configuration and a variety of accessories.

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

### Full line-up & Compact

- Full line-up new VCB models to the high interrupting capacity and large current (~ 50kA, ~ 5000A) featuring maximization of compatibility with existing products through the dualistic deployment of phases and compact models

VL type

VL-06/12/17/20/25/36

Ur (kV)	Isc (kA)	Ir (A)
7.2	20	630
		1250
		2000
	25	630
		1250
		2000
	31.5	630
		1250
		2000
12	20	630
		1000
		1250
		2000
	25	630
		1000
		1250
		2000
	31.5	630
		1250
		2000
		2500
17.5	20	630
		1250
		2000
		2500
	25	630
		1250
		2000
		2500
	31.5	630
		1250
		2000
		2500
24, 25.8	12.5	630
		1250
	16	630
		1250
		2500
	25	630
		1250
		2000
		2500
36	25	630
		1250
		2000
		2500

- Rated short-time (to withstand current ): 3sec. 4sec\*
- Rated operating sequence: O-0.3s-CO-15s-CO
- Type test level: M2, E2 (List3), C2
- Compatibility with existing Pro-MEC breakers
- Various cradle: E, F, G, Fs, Gs and H type
- CB Compartment for MCSG available
- A variety of control power
  - DC 24~30V, DC 48~60V, DC 110V, DC 125V, DC 220V
  - AC 48V, AC 100~130V, AC 220~250V
- A variety of accessories
  - VCB part : Charge switch, UVT, Secondary trip coil, Position switch, Locking magnet, Plug interlock, Key lock, Button cover, Button padlock, Padlock(H type Door interlock), MOC
  - Cradle part : MOC(Mechanical Operating Cell switch), TOC(Truck Operating Cell switch), Temperature sensor, Earthing switch & Accessories, Door, Door interlock, Door emergency button
  - Others : Racking in/out handle, UVT Time delay controller, CTD(Condensor Trip Device), Temperature module
- Anti Pumping Device
- TEST/SERVICE Automatic Position Indicator
- Standards and certification
  - IEC62271-100(2012) [M2, C2, E2 (List3)]
  - KEMA, KERI type tested, V-check (KESCO) certification

Note ) \* Please contact us





# Main devices

## Vacuum circuit breaker

### VH type

### VH-06/12/17/20/25/36

Ur (kV)	Isc (kA)	Ir (A)
7.2 12	31.5	1250
		2000
		3150
	40	1250
		2000
		3150
		4000
		5000
	50	1250
		2000
		2500
		3150
4000		
5000		
17.5	31.5	3150
		4000
		5000
	40	1250
		2000
		3150
	50	1250
		2000
		2500
3150		
4000		
5000		
24	25	2500
	25.8	31.5
2000		
3150		
40		1250
		2000
		3150
36	25	1250
		2000
		3150
	31.5	1250
		2000
		3150
	40	1250
		2000
		3150
		4000

- Rated short-time (to withstand current ): 3sec. 4sec\*
- Rated operating sequence: O-0.3s-CO-15s-CO, (O-0.3s-CO-3min-CO\*\*)
- Type test level: M2, E2 (List3), C2
- Electrical and mechanical life: 20,000 operations
- Various cradle: K, Fs, Gs and H type
- CB Compartment for MCSG available
- A variety of control power
  - DC 48V, DC 110V, DC 125V, DC 220V
  - AC 48V, AC 110V, AC 220V
- A variety of accessories
  - VCB part: UVT, Secondary trip coil, Latch checking switch, Position switch, Locking magnet, Plug interlock, Key lock, Button cover, Button padlock, Padlock(H type Door interlock), MOC
  - Cradle part: MOC(Mechanical Operating Cell switch), TOC(Truck Operating Cell switch), Temperature sensor, Earthing switch & Accessories, Door, Door interlock, Door emergency button
  - Others: Racking in/out handle, Lifting hook, UVT Time delay controller, CTD(Condensor Trip Device), Temperature module
- Anti Pumping Device
- Standards and certification
  - IEC62271-100(2012)
  - [M2, C2, E2 (List3)]
  - KEMA, KERI type tested,
  - V-check (KESCO) certification

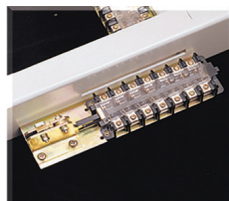
Note ) \* Please contact us  
 \*\* Please refer to ratings



LS Susol VCB is user-friendly to give more convenience and safety by providing high speed interrupting time (3cycles), adopting the rapid auto reclosing method, and having wide range of accessories.

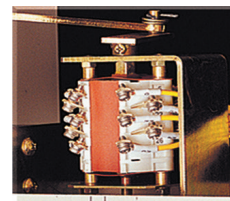


### CB Compartment Option



#### Mechanically Operated Cell switch (MOC)

Auxiliary switch, which is mechanically operated in 'Run' position, indicates 'ON' or 'OFF' condition of the breaker.



#### Earthing Switch Position Switch

The auxiliary switch (5a5b) to indicate 'ON' or 'OFF' of the earthing switch.



#### Truck Operated Cell Switch (TOC)

The auxiliary switch (3a4b), which is operated when the breaker comes to 'Run' position.



#### Earthing Locking Coil

To prevent the accident through carelessness earthing switch operation, the earthing switch can be changed to 'ON' position after releasing the lock by energizing the coils.

#### Code Plate (Miss insertion prevention)

To prevent the insertion of a breaker to a cradle if their ratings do not match.

# Main devices

## Current Transformer

### Features

#### In Door Insulator Type Current Transformer DCI-204A(W)

- Max system voltage 7.2KV to 25.8KV
- The primary and secondary coil are wound on high permeability directional core with short magnetic path. The assembly of primary, secondary and ground is entirely encapsulated with silica-filled epoxy resin.
- This ensures superior electrical characteristics and mechanical strength

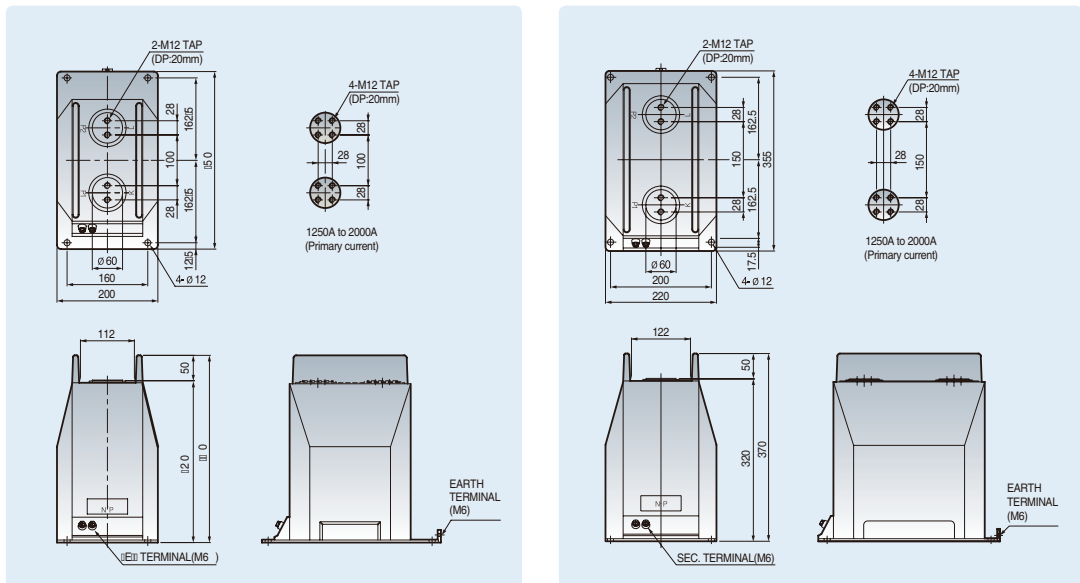


### Specification

Type	DCI-204A(W)DIC-205A(W)	TPU 60.23
Maker	Dongwoo	ABB
Rated Voltage	(kV)	24
Rated Primary Current	(A)	20 to 2,000
Rated Secondary Current	(A)	1,5
Rated Output	(VA)	40
Rated Insulation Level	Power Frequency (kV/1min)	50
	Impulse (kV/1.2×50μs)	125
Rated Short Time Current	(kA)	25

Contact us for other specification.

### Dimensions



## Voltage Transformer

### Features

#### In Door Type Voltage Transformer

- Compact and concentrated fuse holder of Y24F can be easily applied to the VTS compartment
- Mounting type
- Compact and epoxy molded for superior insulation and maintenance free

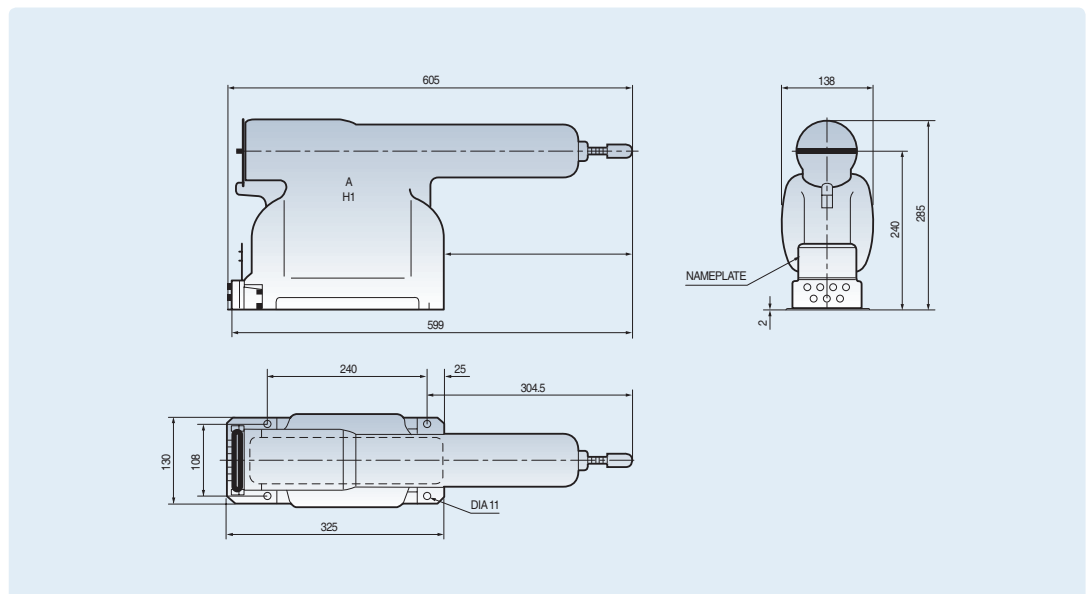


### Specification

Type	Y24F/a14 (Equipped with a fuse)	YH(G)P-24NFE (Equipped with a fuse)
Maker	SADTEM (France)	Younghwa (Korea)
Rated Voltage (kV)	24	
Rated Voltage Ratio (V)	22,900/√3/ 190/√3 or 110/√3	
Rated Output (VA)	50, 100	
Rated Insulation Level	Power Frequency (kV/1min)	50
	Impulse (kV/1.2×50μs)	125
Rated Voltage Factor	1.9×8h	

Contact us for other specification.

### Dimensions





**Safety Instructions**

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance. Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.



- According to The WEEE Directive, please do not discard the device with your household waste.



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