



from 72.5 kV to 800 kV

Gas Insulated Switchgear



Gas
Insulated
Switchgear



Gas Insulated Switchgear



G.I.

from 72.5 kV to 800 kV

Gas Insulated Switchgear

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Gas Insulated Switchgear to meet future power requirements with many excellent features

The SF₆ Gas Insulated Switchgear (GIS) contains major substation equipment, such as gas circuit breaker, disconnecting switch, earthing switch, voltage transformer, current transformer, and lightning arrester in the grounded metallic enclosure and is filled with SF₆ gas, which has the best insulation and arc-quenching capabilities.

Accordingly, GIS is the most developed switchgear with many excellent features including compactness, safety, high reliability, easy operation, long maintenance intervals and compatibility with its surroundings.

Especially, the development of the 3-phase encapsulated GIS achieves a more economical and compact substation.

145 kV 40 kA GIS



What are the outstanding characteristic features of HYUNDAI GIS?

Small space requirements

Availability and price of land play an important role in selecting the type of switchgear to be used. GIS substation requires only 5-10% installation space compared with conventional outdoor switchgear substations. Accordingly, HYUNDAI GIS makes it possible to install a substation in densely populated areas, mountainous terrains, etc. The GIS can be installed even in residential buildings and used effectively in limited space.



Protection against contact with live parts

The earthed enclosure which contains all live parts of the switchgear provides extra safety to operating personnel.

Protection against pollution

Since all live parts of GIS are contained in the metallic enclosure, they are fully protected against environmental effects, such as salt deposits in coastal regions, storms, ice, air pollution, and humidity. Thus, high reliability can be attained.

Aesthetic compatibility with surroundings

GIS meets recent requirements for aesthetic compatibility with its surroundings.

Modular design

The GIS comprises as many standardized modules as possible, resulting in high quality production and easy assembly.

Gas tightness

The seal-off system is adopted as our standard, resulting in a small number of pipes and valves. Thus, high reliability in gas tightness can be secured.

Adoption of the puffer type gas circuit breaker

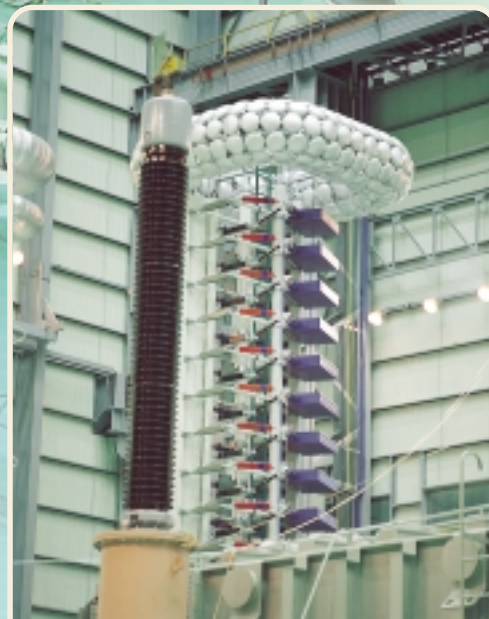
HYUNDAI GIS uses the puffer type gas circuit breaker, resulting in simple construction, fewer components, elimination of gas heating components, and high reliability.

Simple maintenance requirements

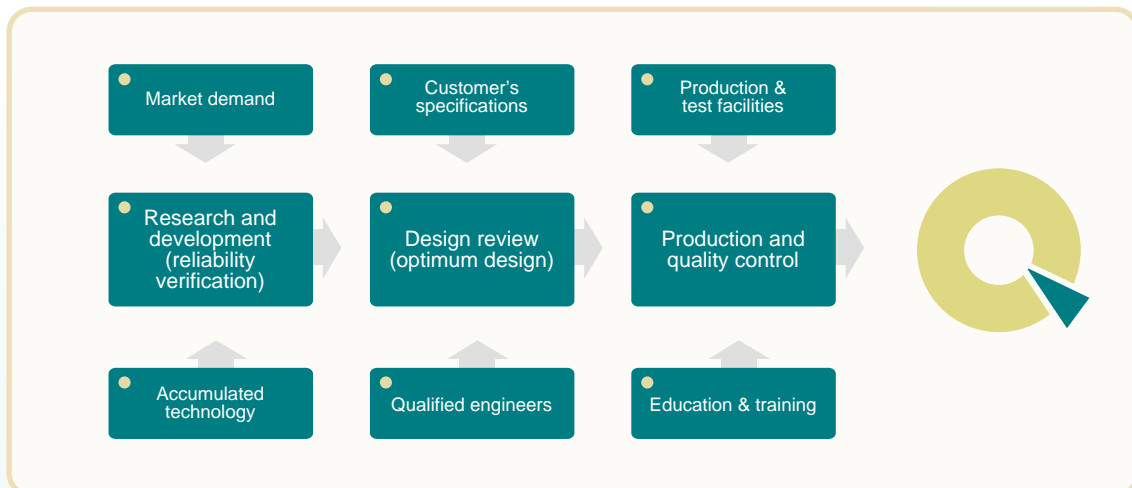
Its design makes it possible to check and exchange contacts of the circuit breaker as it is installed without any disassembly.



AC high voltage test set



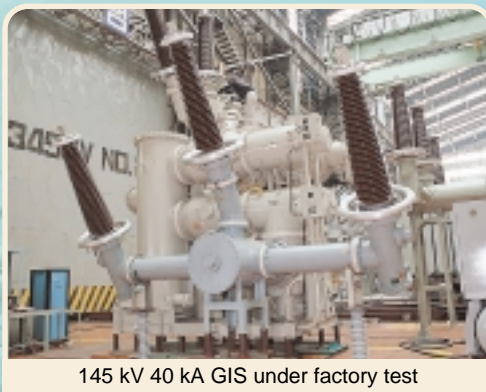
4000 kV impulse voltage generator



Superior quality control system assures customer satisfaction

Our responsibility is to produce equipment of high reliability

Hyundai places great emphasis on quality assurance. A stringent quality control system covers the entire manufacturing process.



145 kV 40 kA GIS under factory test



Under factory test

ISO 9001 Certificates



KEMA Certificates



Certificates

Availability of various circuit arrangement

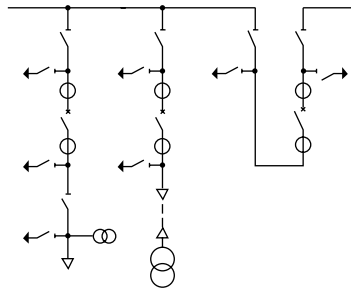
SF₆ Gas Insulated Switchgears of each rated voltage are essentially designed as standardized modules, so that all kinds of buses and feeders can be built up by the arrangement of these modules.



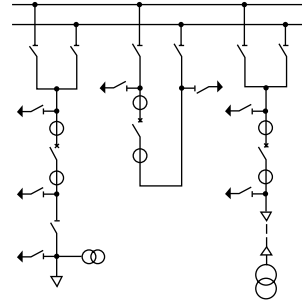
800 kV 50 kA GIS



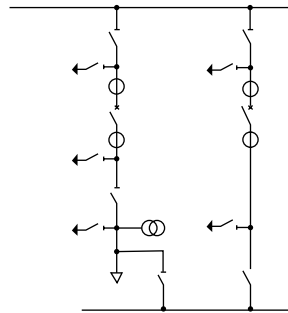
« Single bus arrangement



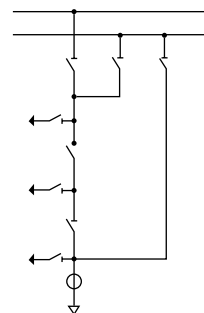
« Double bus arrangement



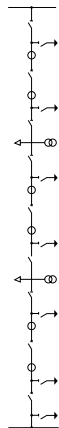
« Single bus arrangement with by-pass bus



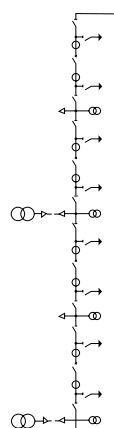
« Double bus arrangement with by-pass isolator



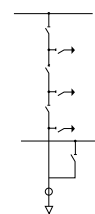
« 1½ circuit breaker arrangement



« Ring bus arrangement



« Main and transfer bus arrangement



Technical Data

HYUNDAI GIS

GIS

Type of GIS			72.5 SP	72.5 SP-1
Rated voltage		kV rms	72.5	72.5
Rated power frequency withstand voltage		kV rms	140	140
Rated switching impulse withstand voltage		kV peak	-	-
Rated lightning impulse withstand voltage		kV peak	325	325
Rated frequency		Hz	50 / 60	50 / 60
Rated normal current		A rms	2000	2000
Rated short-circuit breaking current		kA rms	20	31.5
Rated making current	Circuit breaker	kA peak	52	81.9
	Line earthing switch	kA peak	52	81.9
Rated short-time current (1 sec/3 sec)		kA rms	20	31.5
Operating method	Circuit breaker		Motor spring	Motor spring
	Disconnecting switch		Motor/Manual	Motor/Manual
	Earthing switch		Motor/Manual	Motor/Manual
Rated SF ₆ gas pressure (at 20°C)	Circuit breaker	kg/cm ² ,G	5	6
	Other equipment	kg/cm ² ,G	3	4
Number of breakers			1	1
Enclosure	Circuit breaker		2 phase	3 phase
	Disconnecting switch, Earthing switch		2 phase	3 phase
	Feeder bus		2 phase	3 phase
	Main bus		2 phase common	3 phase common
Installation			Indoor, Outdoor	Indoor, Outdoor

Type 72.5 SP/SP-1 Switchgear for 72.5 kV 20 kA/31.5 kA

Hyundai 72.5kV GIS is a quality product with integrated technology for more compact design and high availability.

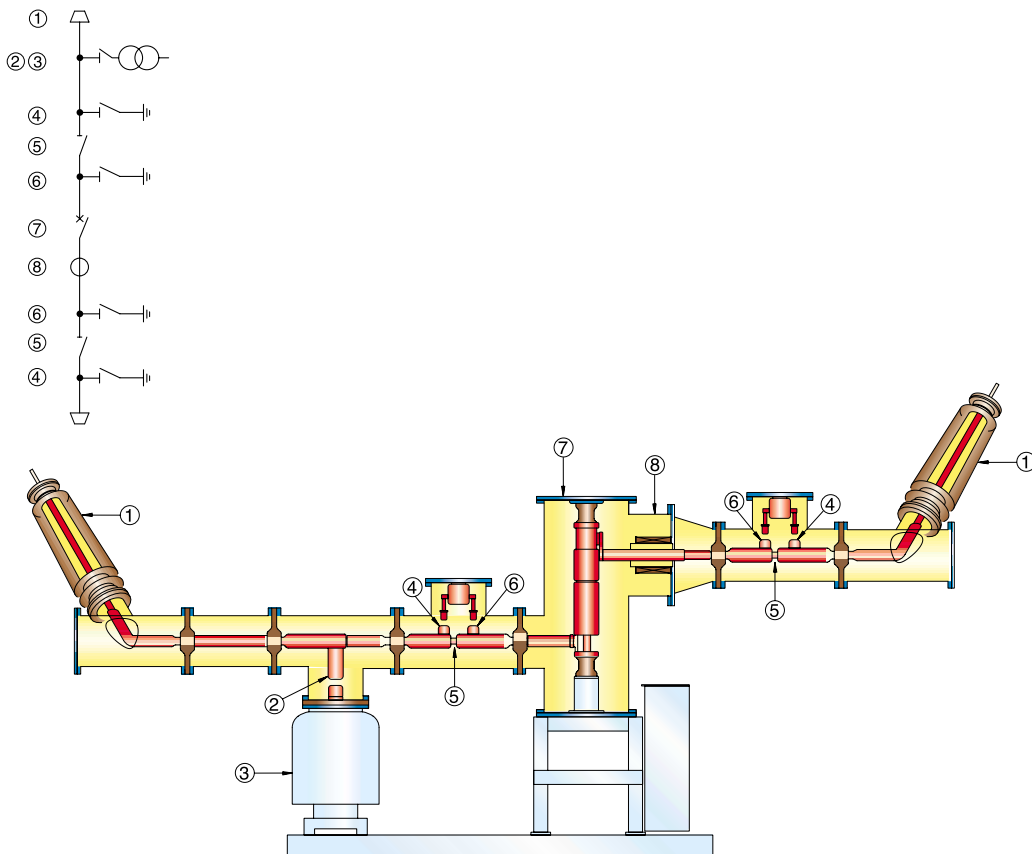
72.5 SP

2 phase type GIS suitable for Railway substation
 Reliable motor spring mechanism
 Ingenious modular system

72.5 SP-1

3 phase common enclosure type
 Combined disconnector and earthing switch
 Reliable motor spring mechanism

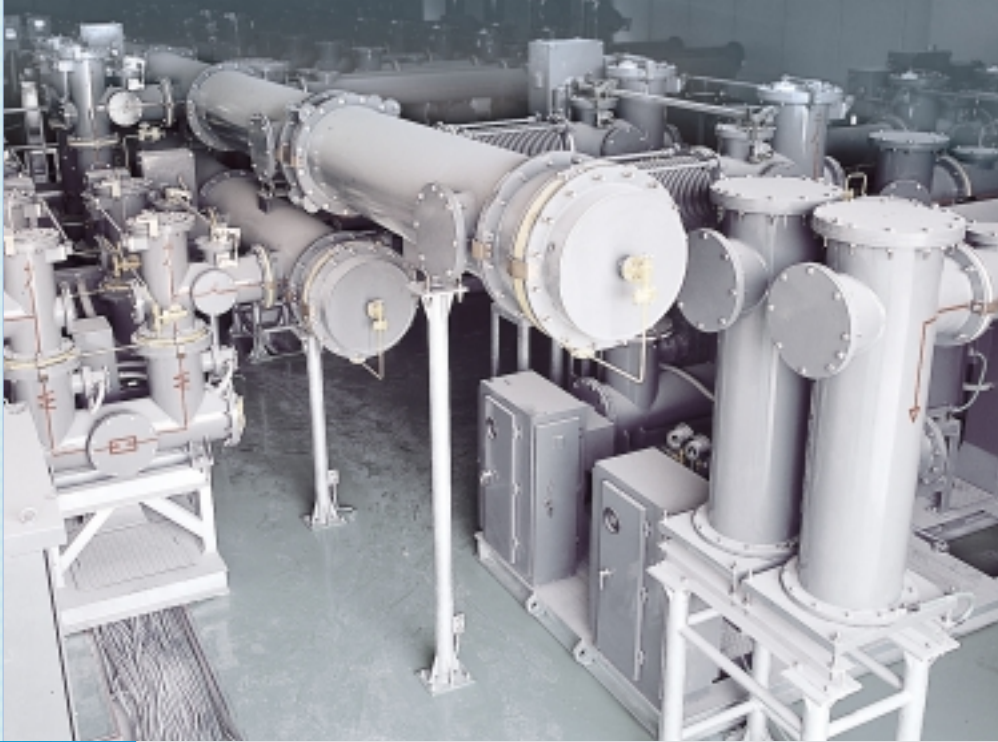
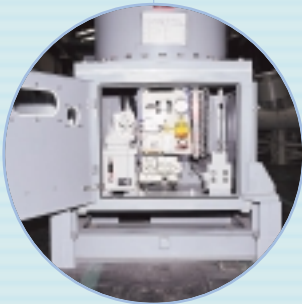
72.5 SP Switchgear



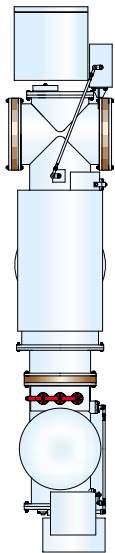
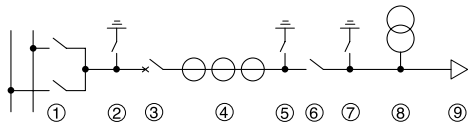
Gas to Air Bushing
 Disconnector for VT
 Voltage Transformer

Earthing Switch Make-Proof Type
 Line Disconnector
 Earthing Switch for Maintenance

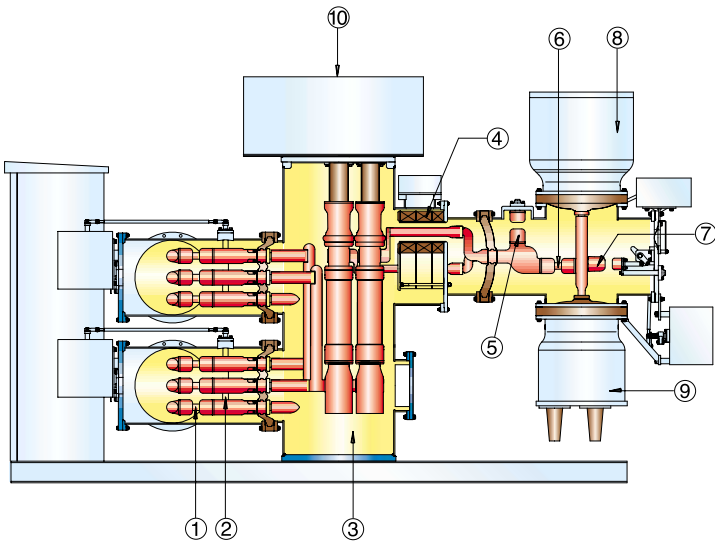
Circuit Breaker
 Current Transformer



72.5 SP-1 Switchgear



Top View



Disconnecting Switch
Earthing Switch(Maintenance)
Circuit Breaker
CT

Earthing Switch(Maintenance)
Line Disconnecting Switch
Line Earthing Switch
Voltage Transformer

Cable Head Box
Operating Mechanism

Type 145 SP/SP-1 Switchgear for 145 kV 40 kA

Type 145 SP & 145 SP-1 are arranged in module with utmost flexibility, which is designed with 3 phase common enclosure to reduce switchgear bay width and hysteresis loss.

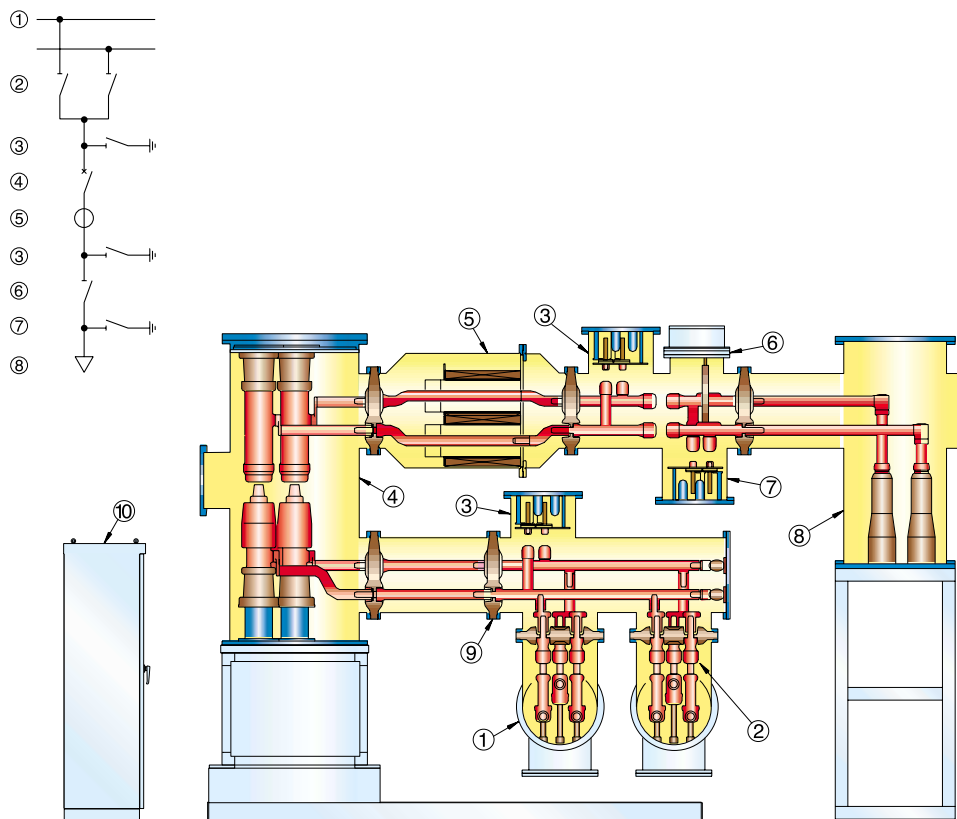
145 SP

Achieved all the advantages of metal clad design
Hydraulic operating mechanism
Single pressure puffer type

145 SP-1

Space saving, Compact design
Motor spring operation type
Use of the thermal energy of the arc

145 SP Switchgear



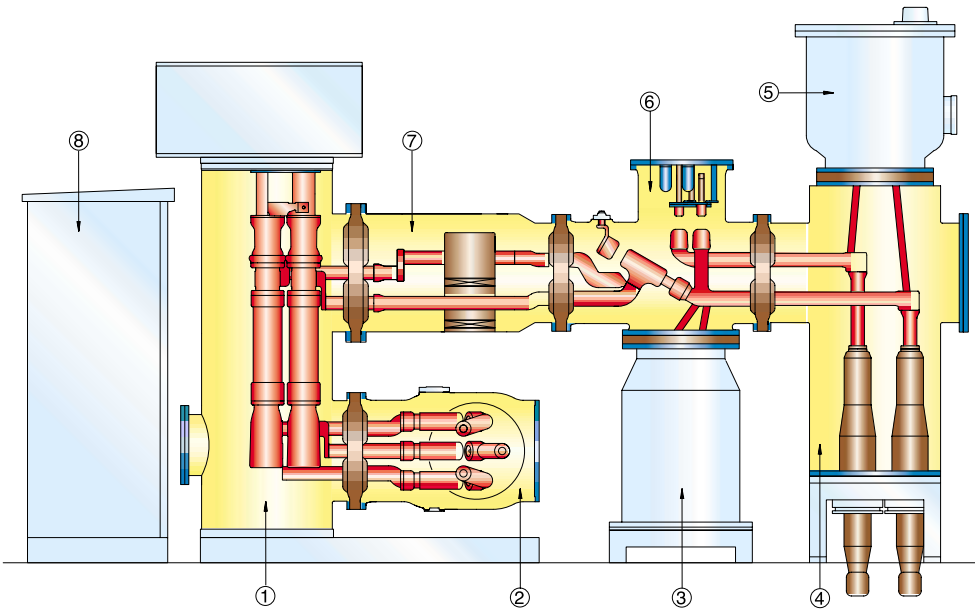
① Main Bus
② Bus Disconnecter
③ Earthing Switch for Maintenance
④ Circuit Breaker

⑤ Current Transformer
⑥ Line Disconnecter
⑦ Earthing Switch Make-proof Type
⑧ Cable Head Box

⑨ Insulation Spacer
⑩ Local Control Panel



145 SP-1 Switchgear



Circuit Breaker
Main Bus
Lightning Arrestor

Cable Head
Voltage Transformer
3-Position Switch

Current Transformer
Local Control Panel

Type 170 SP Switchgear for 170 kV 31.5 kA

Type 170 SP will give you various advantages in application, operation and maintenance with excellent features to meet future power requirements.

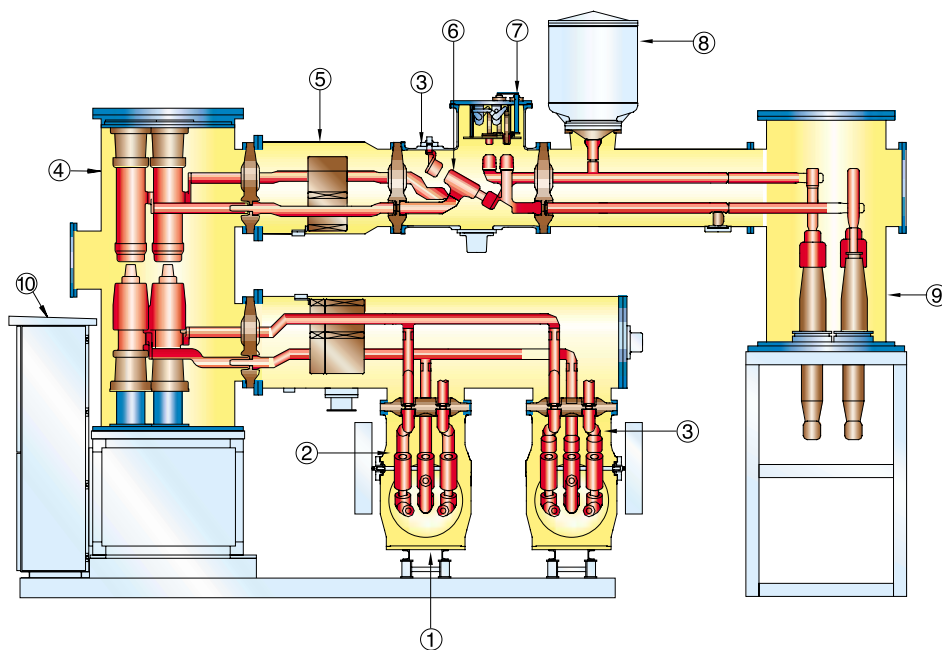
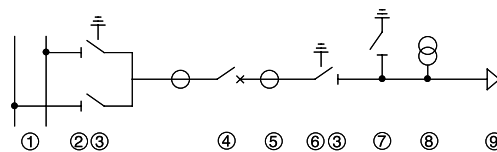
Reliable opening and closing operation

Operation mechanisms are well accessible

A number of auto reclosing operations are available without recharging

Extremely low maintenance

Section of 170 SP Switchgear



Main Bus
Bus Disconnector
Earthing Switch for Maintenance
Circuit Breaker

Current Transformer
Line Disconnector
Make-proof Earthing Switch
Voltage Transformer

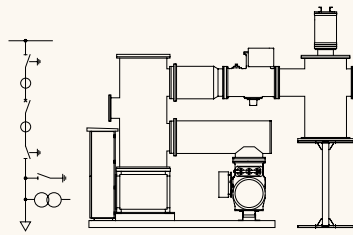
Cable Head Box
Local Control Panel



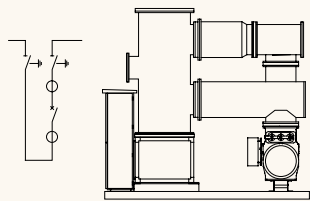
Typical Arrangements

<< Single Bus

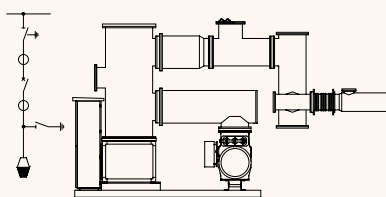
Line Feeder



Bus Sectionalizer

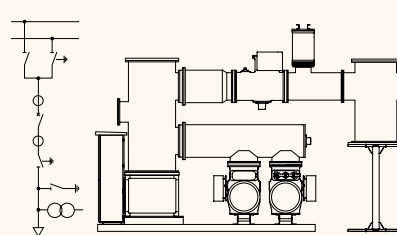


Transformer Feeder (Gas to Oil Bushing)

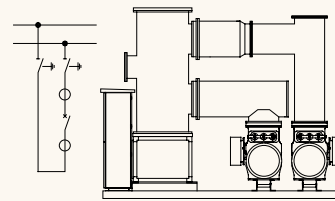


<< Double Bus

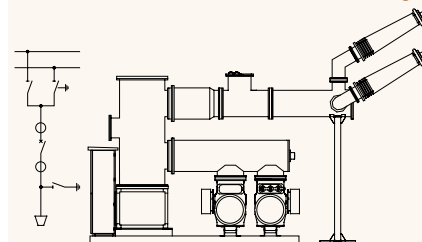
Line Feeder



Bus Coupler



Transformer Feeder (Gas to Air Bushing)



Bay width : 1700 mm

Type 170 SR Switchgear for 170 kV 50 kA

170 SR technology is based on many years of experience.

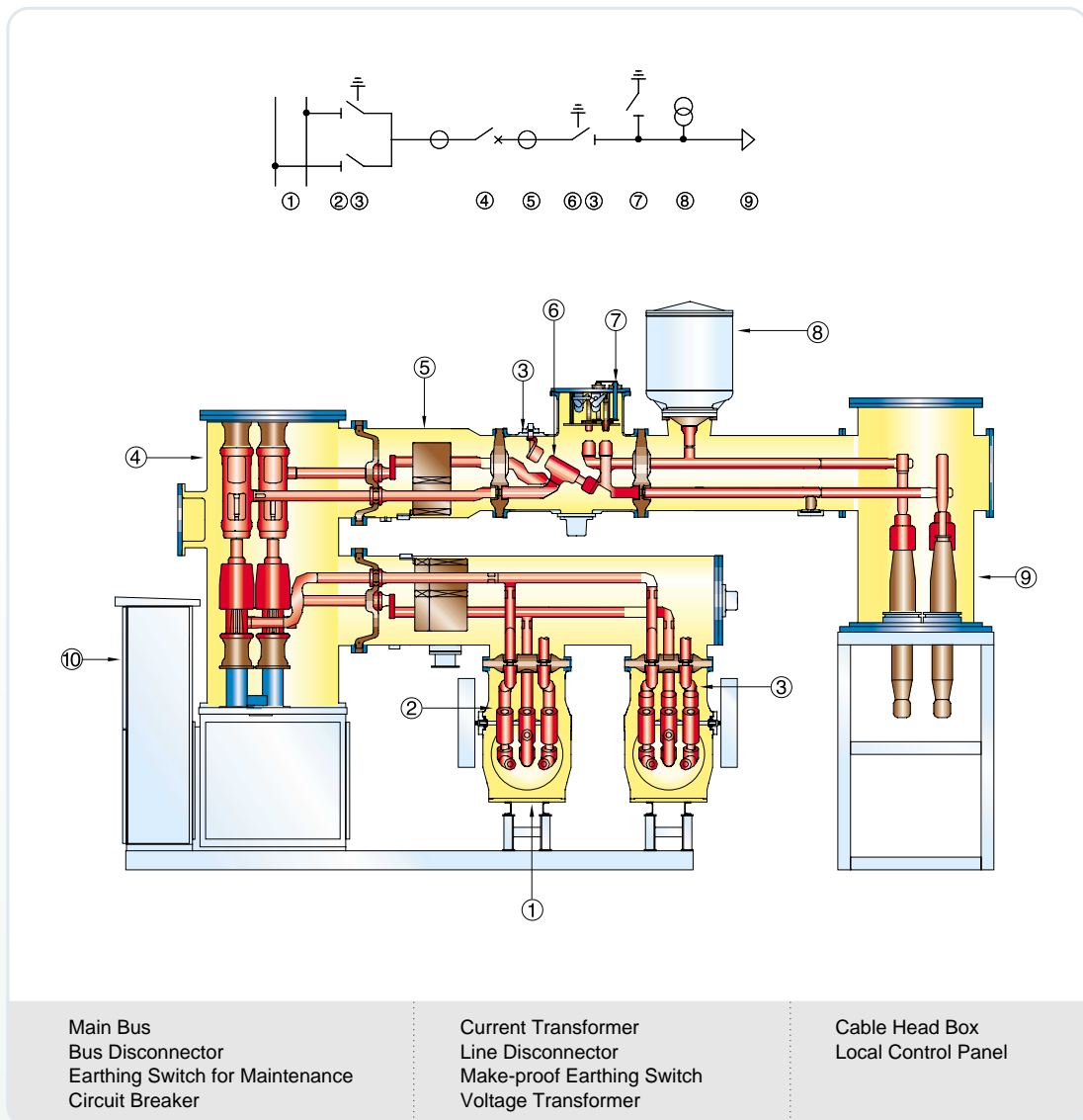
Condenserless type circuit breaker

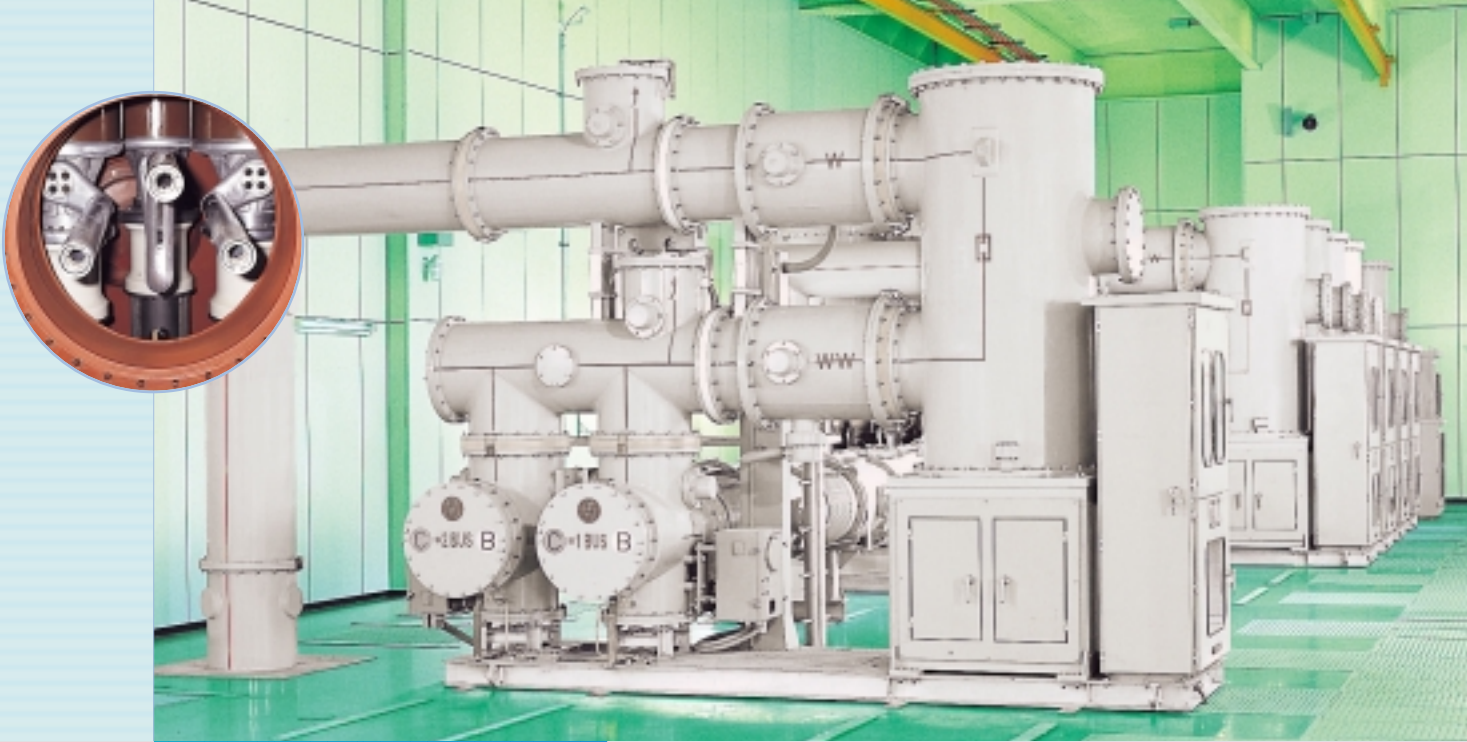
It will minimize the ferro resonance phenomenon and have higher breaking capacity.

Tightness of enclosure

It is obtained with well-trained manufacturing.

Section of 170 SR Switchgear

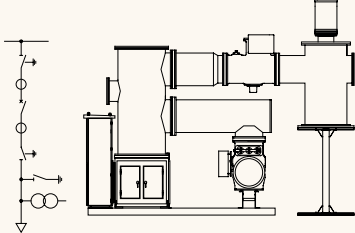




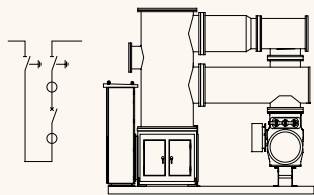
Typical Arrangements

<< Single bus

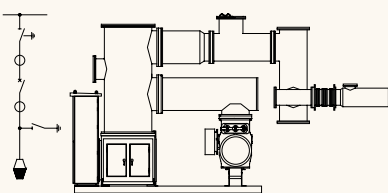
Line Feeder



Bus Sectionalizer

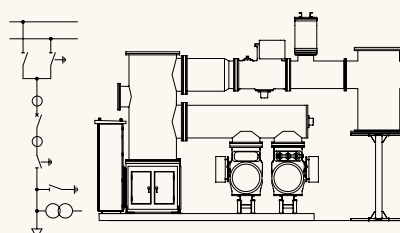


Transformer Feeder (Gas to Oil Bushing)

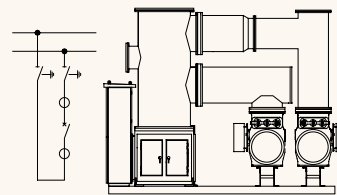


<< Double bus

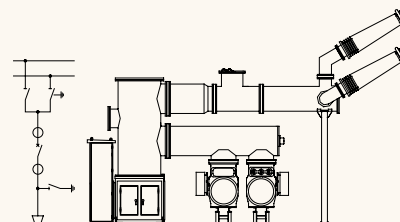
Line Feeder



Bus Coupler



Transformer Feeder (Gas to Air Bushing)

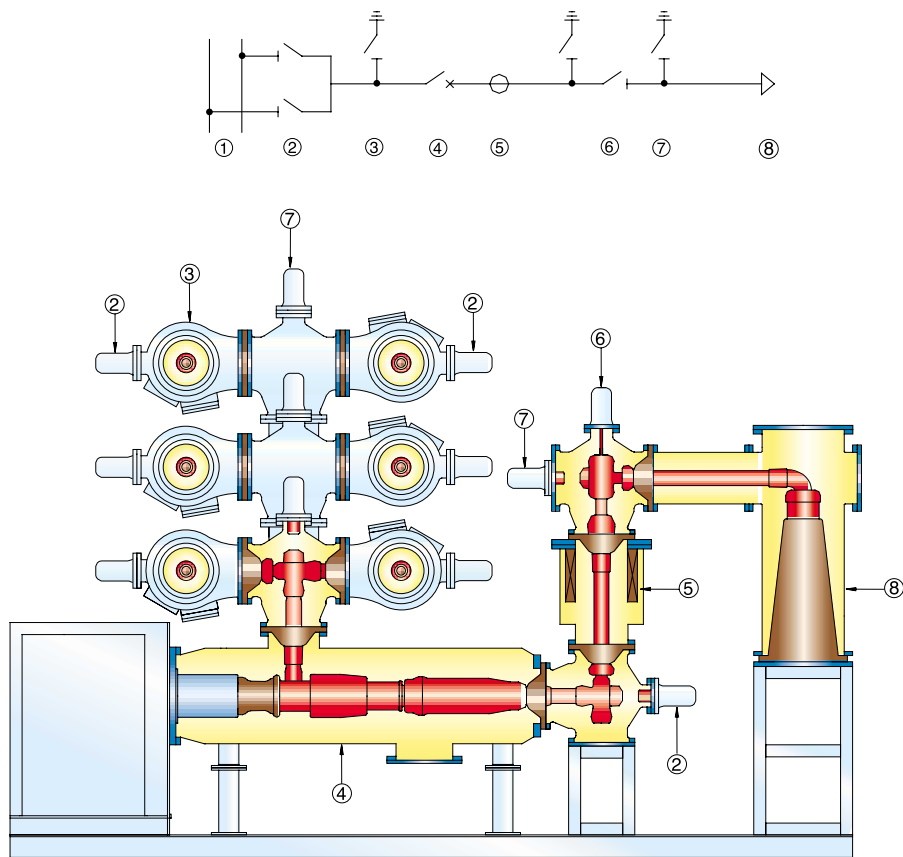


Type 300 SR Switchgear for 245 kV/300 kV 50 kA

To meet the wide range of different requirements from customers, this compact type 300 SR has been designed with the most reliable features such as single interrupter unit and hydraulic operation from which modular elements are simply selected to permit virtual layout as desired.



Section of 300 SR Switchgear



Main Bus
 Bus Disconnector
 Earthing Switch for Maintenance

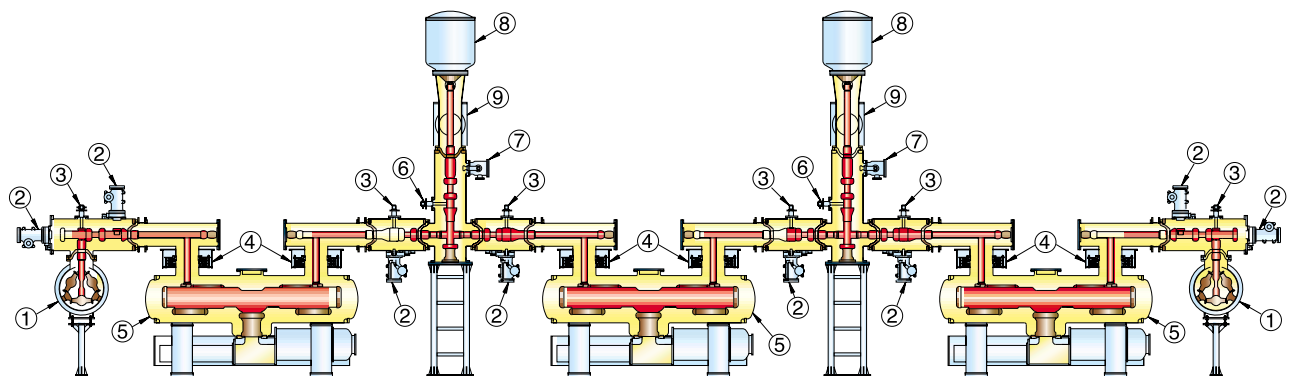
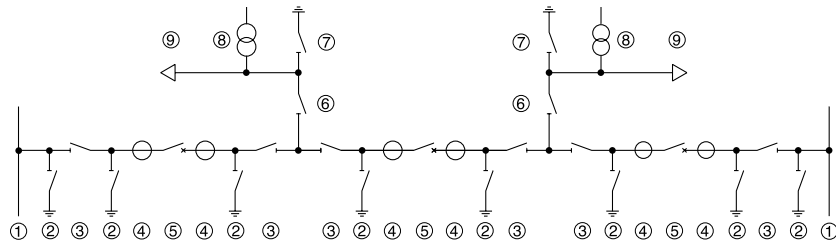
Circuit Breaker
 Current Transformer
 Line Disconnector

Make-proof Earthing Switch
 Cable Head Box

Type 362 SL/SR/SU Switchgear for 362 kV 40 kA/50kA/63kA



Section of 362 SL Switchgear



Main Bus
Earthing Switch for Maintenance
Bus Disconnector

Current Transformer
Circuit Breaker
Line Disconnector

Earthing Switch Make-proof Type
Voltage Transformer
Cable Head Box

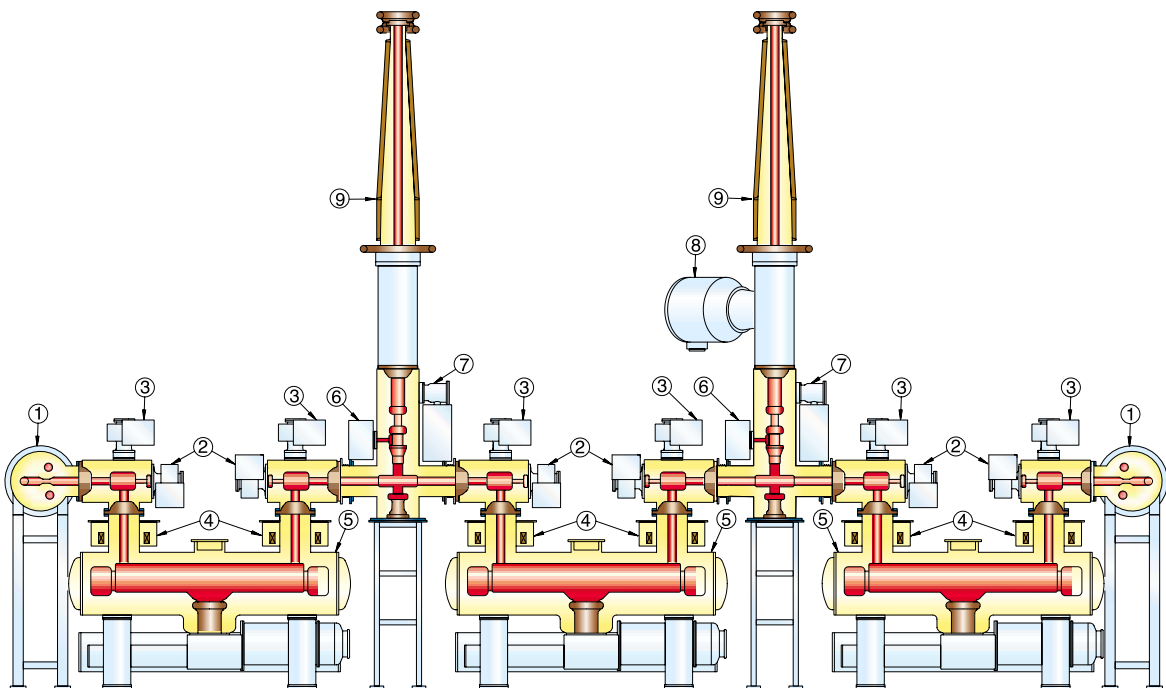
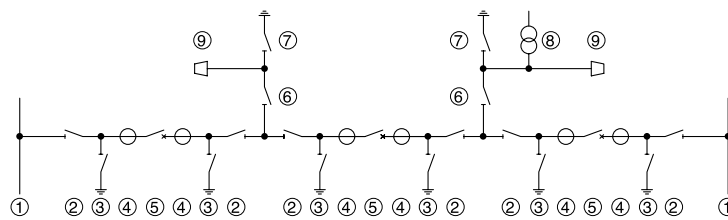
Bay width : 5000 mm

Type 362 SL/SR/SU Switchgear for 362 kV 40 kA/50 kA/63 kA

Hyundai 362 kV GIS includes 3 models divided by the rated short time current of 40 kA, 50 kA and 63 kA.

Having pneumatic operating mechanism, 362 SL/SR model (covering up to 50 kA) can be easily arranged especially in the 1½ breaker system.

Section of 362 SR Switchgear



1 Main Bus
2 Bus Disconnector
4 Earthing Switch for Maintenance

3 Current Transformer
6 Circuit Breaker
7 Line Disconnector

8 Earthing Switch Make-proof Type
9 Voltage Transformer
Gas to Air Bushing



Our new 362 kV 63 kA GIS (Model: 362 SU) is developed to meet the soaring demands of the GIS with high breaking capacity.

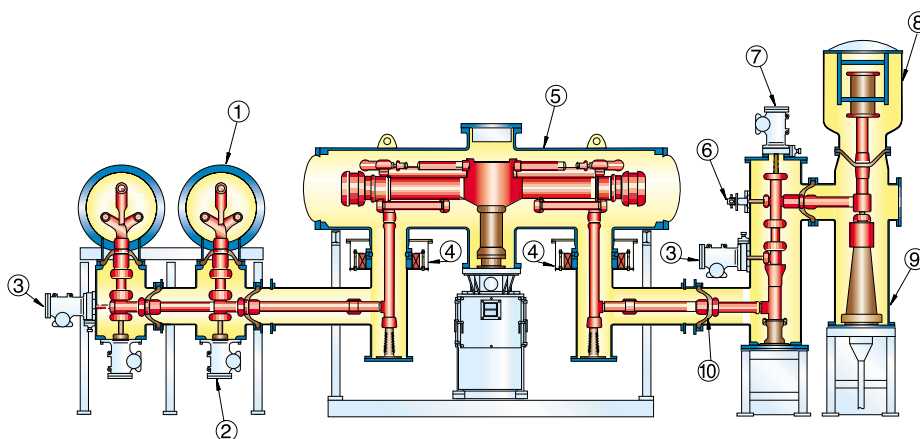
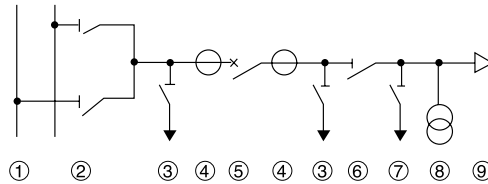
Hydraulic mechanism is adopted to operate circuit breaker for high fault current interrupting up to 63 kA.

High grade of corrosion resistant aluminium was selected for the enclosure.

Due to the low weight, it is one of the lightest constructions of its kind.

In addition, this model has the flexibility in the lay-out arrangements for various type of circuit configurations.

Section of 362 SU Switchgear



Main Bus Bus Disconnector Earthing Switch for Maintenance Current Transformer	Circuit Breaker Line Disconnector Earthing Switch Make-proof Type Voltage Transformer	Cable Head Box Insulation Spacer
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Bay width : 7000 mm

Type 550 SR Switchgear for 550 kV 50 kA

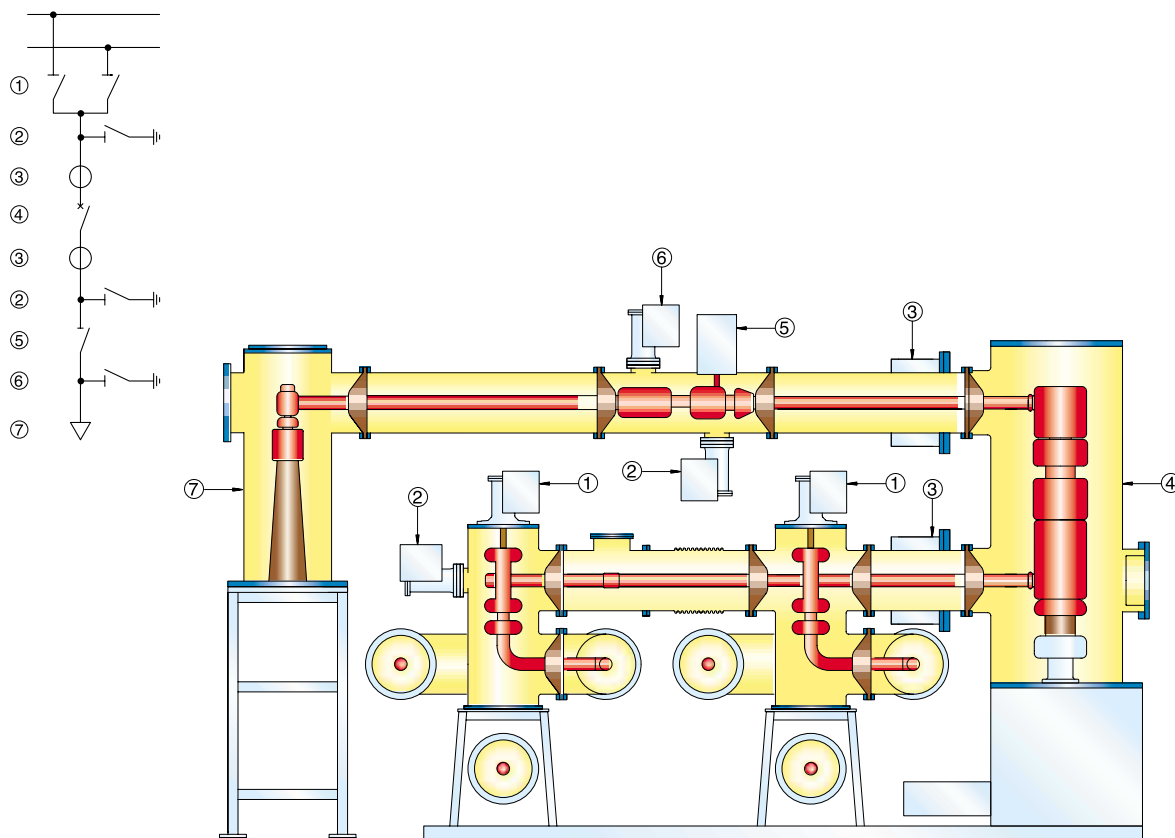
There has been continuous demands for economic efficiency, compactness, high reliability, low operating cost & long operating life from GIS users.

All these requirements are fulfilled by our switchgear type 550 SR for rated voltages up to 550 kV.

The circuit breaker works on hydraulic mechanism with well-known puffer principle. One interrupter breaking system by dual motion and 2cycle-breaking time show the prominent technology of Hyundai.

By adopting vertical type arrangement, the space-saving and good accessibility are assured.

Section of 550 SR Switchgear



Bus Disconnector
Earthing Switch for Maintenance
Current Transformer

Circuit Breaker
Line Disconnector
Earthing Switch Make-proof Type

Cable Head Box

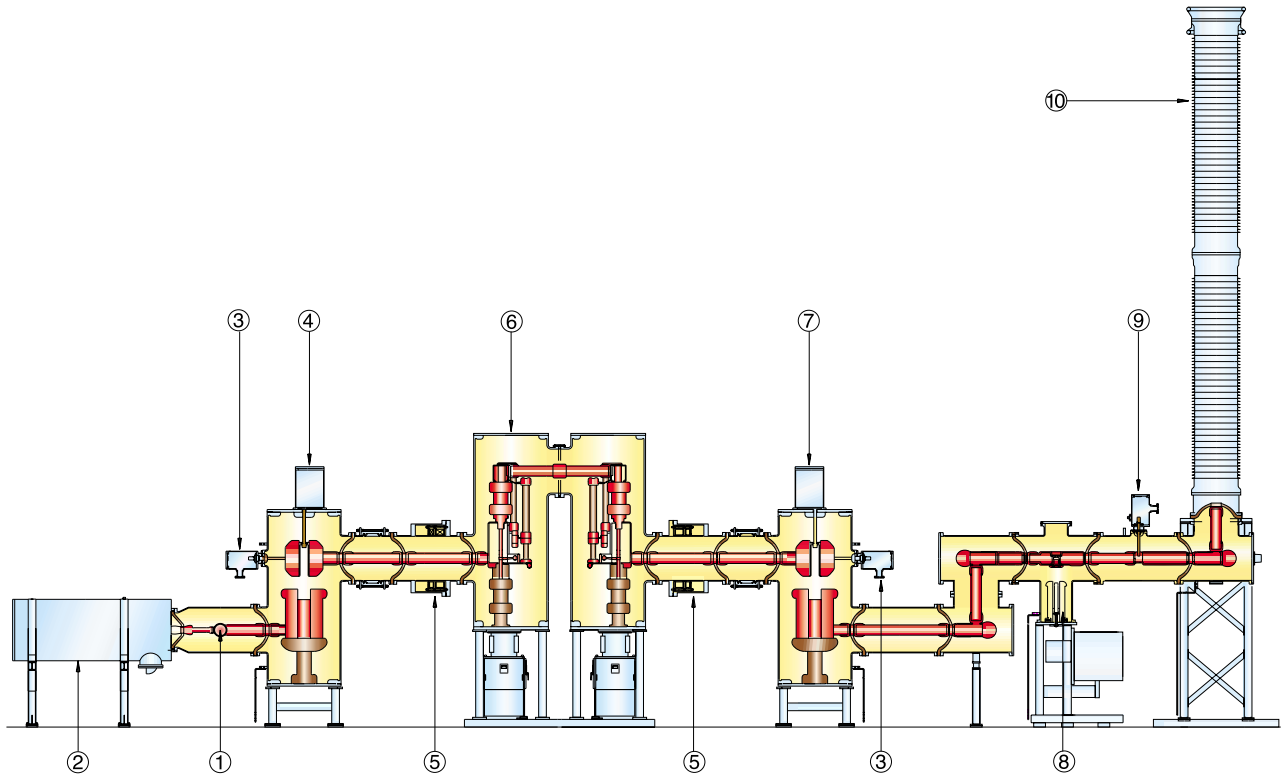
Type 800 SR Switchgear for 800 kV 50 kA

The 800 SR type GIS is a high-technology product, leading the future for the ultra-high voltage substation.

Since the introduction of the 800 kV GIS in the year 2000, Hyundai has been one of the pioneers of this technology.



Section of 800 SR Switchgear



Main Bus
 Lightning Arrester
 Earthing Switch for Maintenance
 Bus Disconnector

Current Transformer
 Circuit Breaker
 Line Disconnector
 High Speed Grounding Switch

Line Earthing Switch
 Gas to Air Bushing

Research & Development

Research & Development is an essential requirement for improvement and advance of modern technology.

HHI's commitment to research and development has been a motivating factor of the company's various technical achievements and will be vital in its advance into the 21st century.

HHI is operating three renowned in-house research institutes: HMRI(Hyundai Maritime Research Institute), HIRI(Hyundai Industrial Research Institute) and HEMRI(Hyundai Electro-Mechanical Institute) as well as an overseas institute(HUNELEC) in Budapest, Hungary.

In these institutes fully equipped with state-of-the-art R&D devices, HHI's top-notch brains are exploring the future of high technology.

Hyundai Gas Insulated Switchgear have been supplied to most of the countries all over the world and their technology, quality and reliable performance have been widely acknowledged by the customers around the world.



Gas Insulated Switchgear **G.I.S.**

NORSKE VERITAS
MANAGEMENT SYSTEM CERTIFICATE
HYUNDAI HEAVY INDUSTRIES CO., LTD.
ELECTRO-ELECTRIC SYSTEMS DIVISION

KEMA
TEST CERTIFICATE OF SHORT

Information to be given with inquiry

1. General Requirements

Applied standard : _____
 Rated voltage : _____ kV
 Rated frequency : 50 Hz ** 60 Hz **
 Rated power frequency withstand voltage : _____ kV
 Rated switching impulse withstand voltage : _____ kV
 Rated lightning impulse withstand voltage : _____ kV
 Rated short-circuit breaking current : _____ kA
 Rated duration of short circuit : 1 sec ** 3 sec **
 First-pole-to-clear factor : 1.3 ** 1.5 **
 Duty cycle (of circuit breaker) : _____
 Operating time (of circuit breaker) : Break time _____ Cycle
 Rated current : Main bus _____ A Feeder bus _____ A
 Auxiliary voltage : Control voltage _____ V Motor voltage _____ V
 Heater voltage _____ V
 Ambient temperature : Max _____ Min _____

2. Instrument Transformers

Current transformer: Primary current : _____ A
 Secondary current : _____ A
 Burden : _____ VA
 Accuracy class : _____
 Voltage transformer: Primary voltage : _____ kV
 Secondary voltage : _____ V
 Tertiary voltage : _____ V
 Accuracy class/Burden : _____ / _____ VA

3. Connections

Overhead line connection
 Insulator creepage distance : _____ mm/kV
 Cable connection
 Cable type : _____
 Cable size : _____

Please enclose single-line diagram of required GIS with this sheet

Quantity of GIS : _____ bay(s)
 Delivery : _____
 Site location (City, Town) : _____
 Service condition : Indoor () _____
 Outdoor () _____