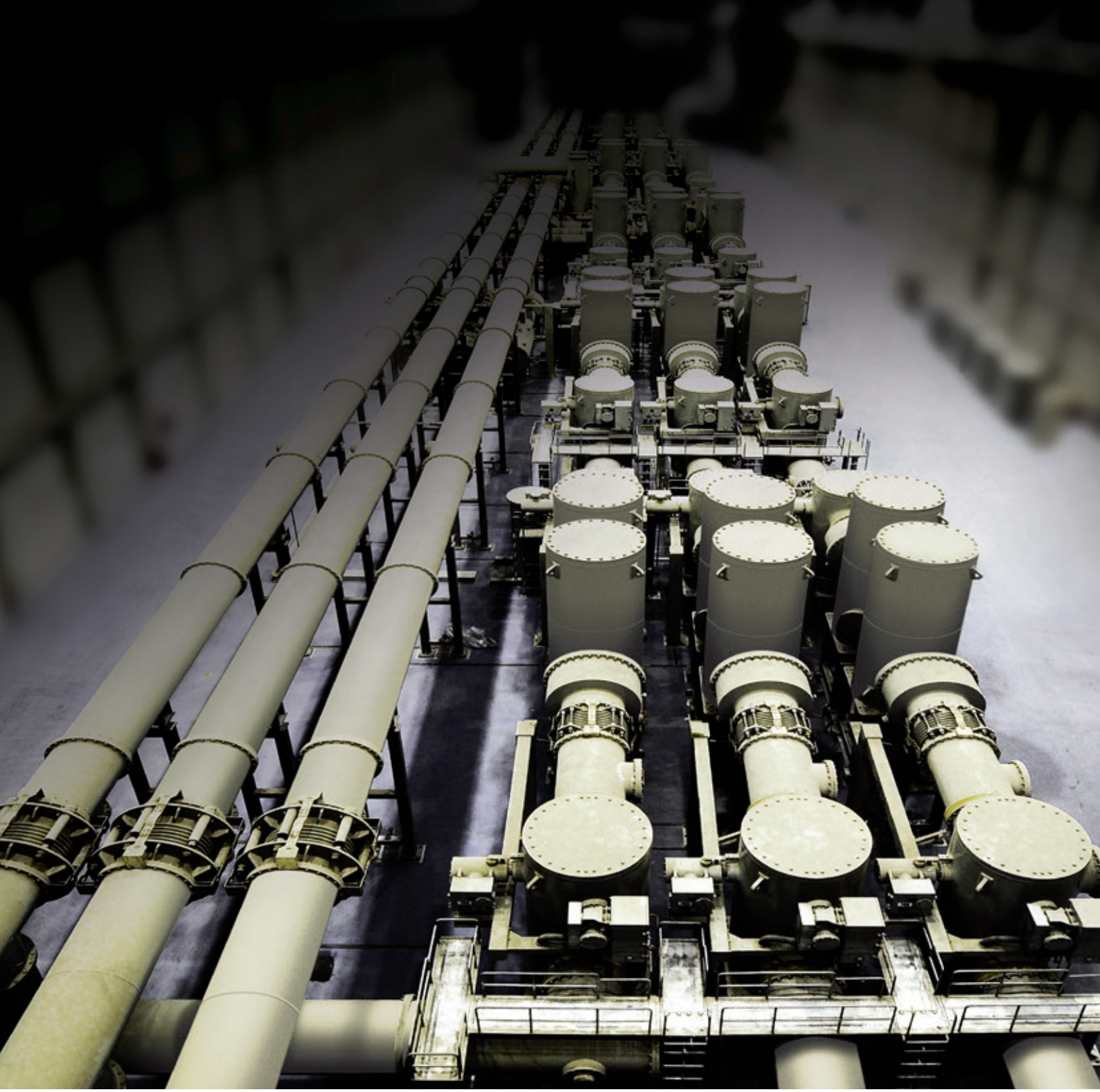


Gas Insulated Switchgear

up to 800 kV

HYUNDAI ELECTRIC

HYUNDAI Gas Insulated Switchgear

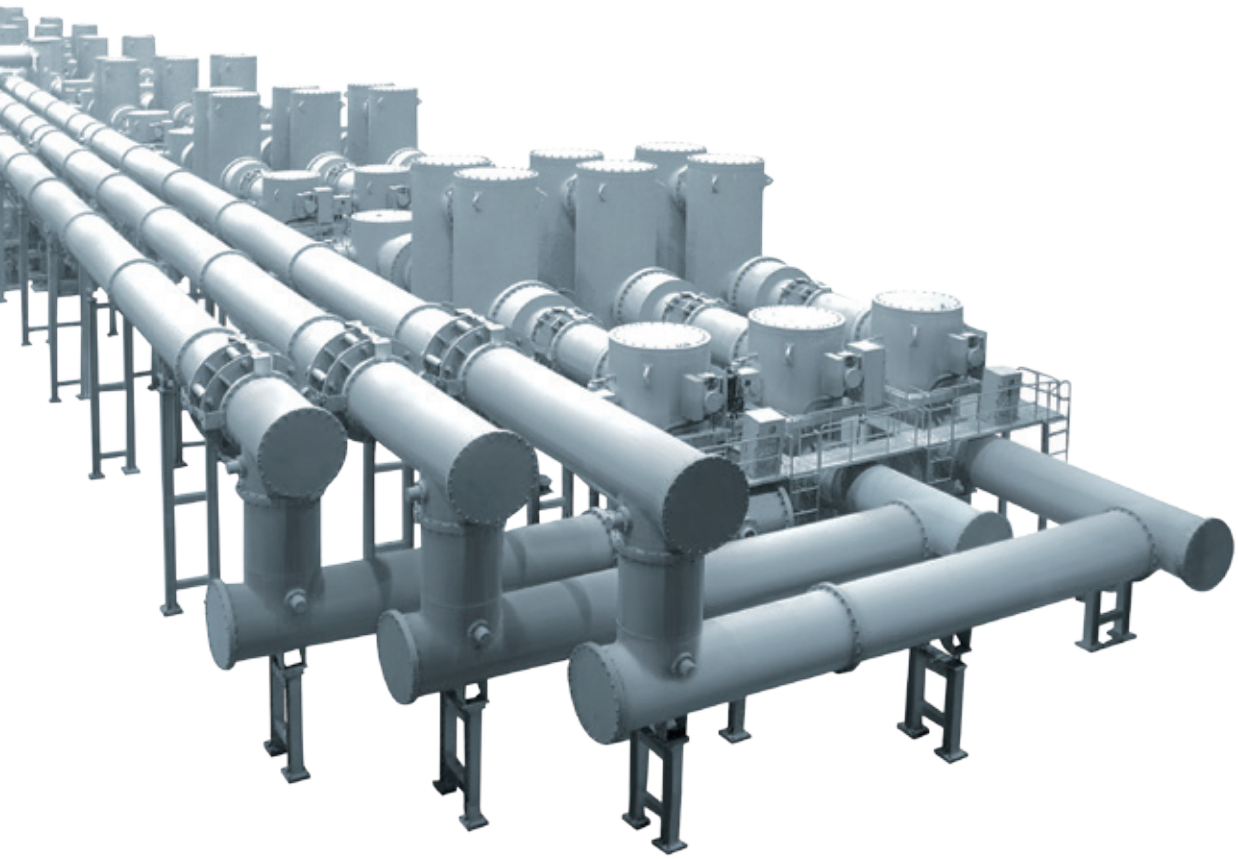
- Manufacturing up to 800 kV
- Wide range of products to fit any customer requirements
- Designed and tested according to the latest IEC standards

Contents

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

The SF_6 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 SF_6 gas, which has the best insulation and arc-quenching capabilities.

Accordingly, GIS is the most advanced 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 more economical and compact substation.



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 are contained in the metallic enclosure, they are fully protected against environmental effects, such as salt deposits in coastal regions, storms, ice, high temperature, 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 and Easy maintenance

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.

Superior quality control system assures customer satisfaction

Our responsibility is to produce equipment of high reliability

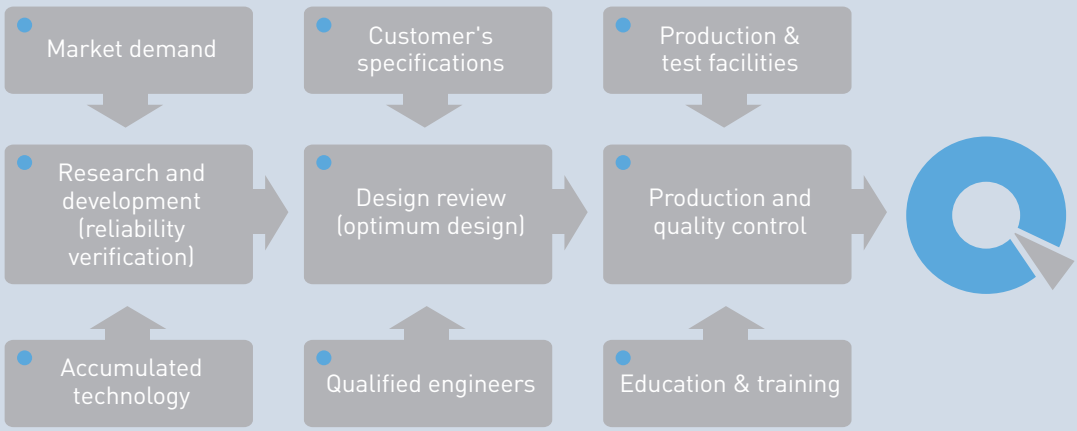
Hyundai places great emphasis on quality assurance.
A stringent quality control system covers the entire manufacturing process.

▲ 4,000 kV impulse voltage generator

◀ AC high voltage test set

▲ Under factory test

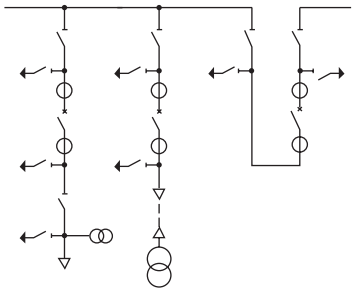
◀ 145 kV 40 kA GIS under factory test



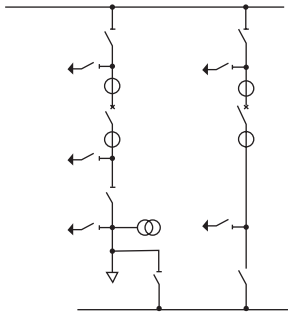
Availability of various circuit arrangement

SF_6 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.

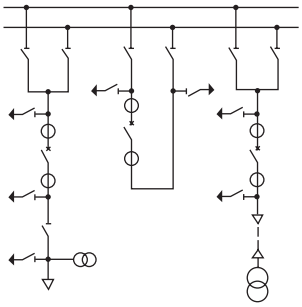
Single Bus Arrangement



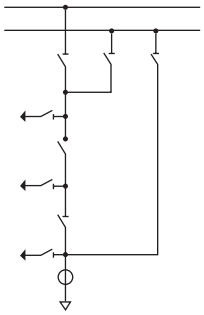
Single Bus Arrangement with By-pass Bus



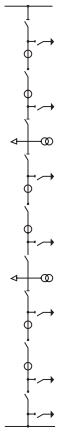
Double Bus Arrangement



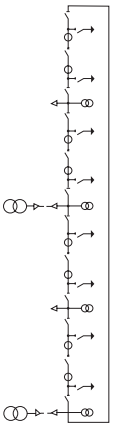
Double Bus Arrangement with By-pass Isolator



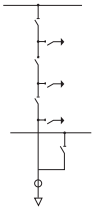
1½ Circuit Breaker Arrangement



Ring Bus Arrangement



Main and Transfer Bus Arrangement



Technical data

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	2,000	2,000
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℃)	Circuit breaker	MPa	0.5	0.6
	Other equipment	MPa	0.3	0.4
Break			1	1

145 kV	170 SR	170 SR-N	300 SR	362 SR	362 SU	550 SR	800 SR
123 / 145	170	170	245	362	362	420/550	800
275	325	325	460	520	520	710	960
-	-	-	850	950	950	1,175	1,425
650	750	750	1,050	1,175	1,175	1,550	2,250
50 / 60	60	50	50 / 60	60	60	50	50 / 60
3,150	4,000	4,000	4,000	4,000	6,300	5,000	8,000
40	50	40	50 / 63	50	63	50 / 63	50
104	130	100	164	130	163.8	170	130
104	130	100	164	130	163.8	170	130
40	50	40	50 / 63	50	63	50 / 63	50
Motor spring	Hydraulic	Hydraulic (Single phase operation)	Motor spring, Hydraulic	Hydraulic, Pneumatic	Hydraulic	Hydraulic	Hydraulic
Motor/ Manual	Motor/ Manual	Motor/ Manual	Motor/ Manual	Motor/ Manual	Motor/ Manual	Motor/ Manual	Motor/ Manual
Motor/ Manual	Motor/ Manual	Motor/ Manual	Motor/ Manual	Motor/ Manual	Motor/ Manual	Motor/ Manual	Motor/ Manual
0.6	0.6	0.6	0.7	0.6	0.6	0.7	0.6
0.4	0.4	0.4	0.5	0.5	0.5	0.45 / 0.5	0.4
1	1	1	1	1	1	1	2

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

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

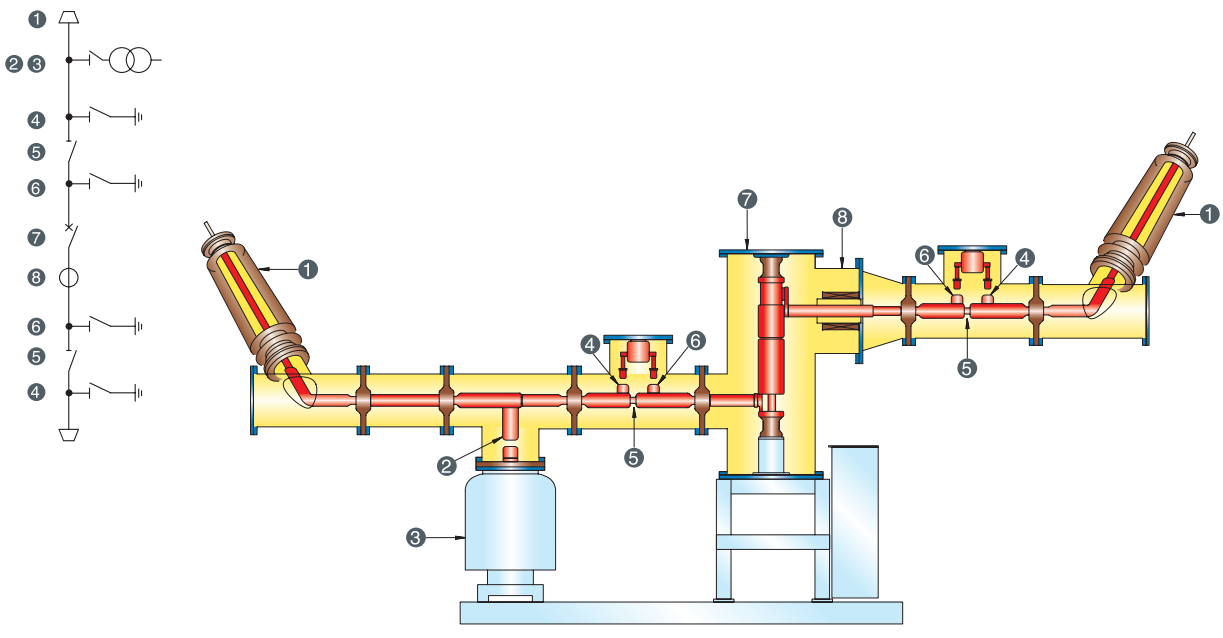
72.5 SP

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

72.5 SP-1

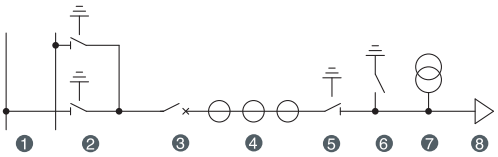
- 3-phase common enclosure type
- Combined disconnector and earthing switch
- Reliable motor spring mechanism

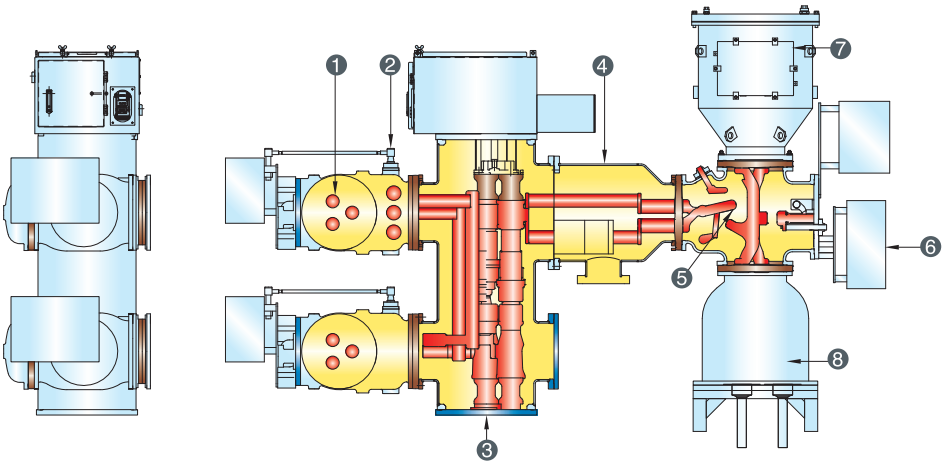
Section of 72.5 SP GIS



1. Gas to Air Bushing
2. Disconnector for VT
3. Voltage Transformer
4. Earthing Switch Make-Proof Type
5. Line Disconnector
6. Earthing Switch for Maintenance
7. Circuit Breaker
8. Current Transformer

Section of 72.5 SP-1 GIS





1 Main bus
2 3-Position Switch
3 Circuit Breaker
4 Current Transformer
5 Line 3-Position Switch
6 Line Earthing Switch
7 Voltage Transformer
8 Cable Head Box

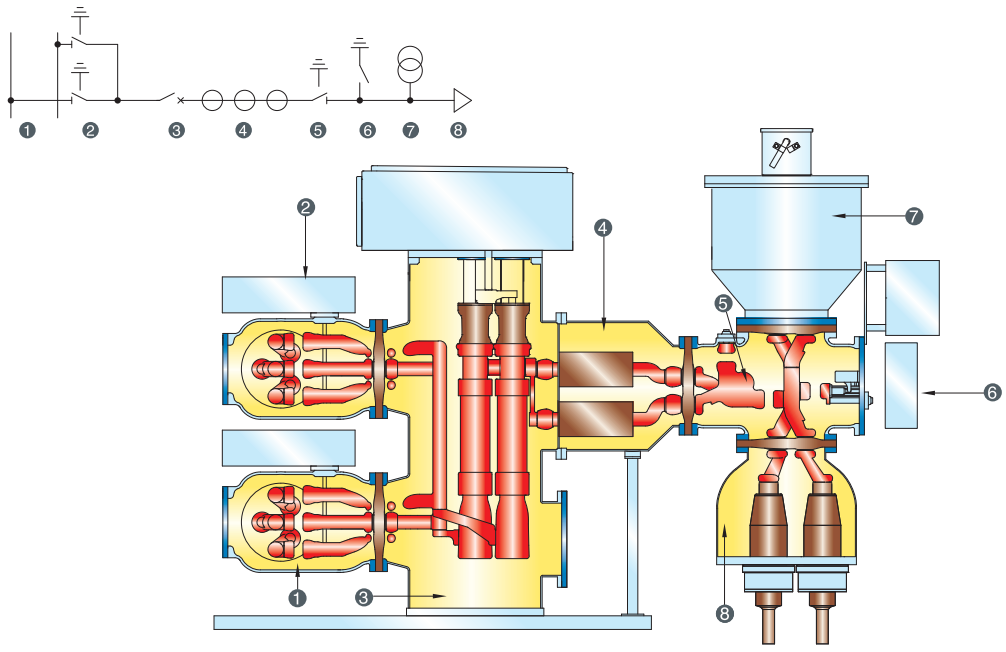
145 kV 40 kA GIS

Type 145 kV is arranged in module with utmost flexibility, which is designed with 3-phase common enclosure to reduce switchgear bay width and hysterisis loss.

145 kV

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

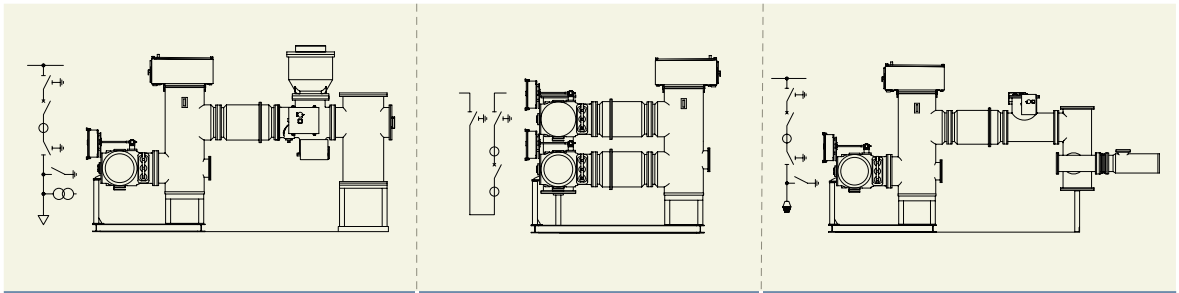
Section of 145 kV GIS



1. Main bus
2. 3-Position Switch
3. Circuit Breaker
4. Current Transformer
5. Line 3-Position Switch
6. Line Earthing Switch
7. Voltage Transformer
8. Cable Head Box

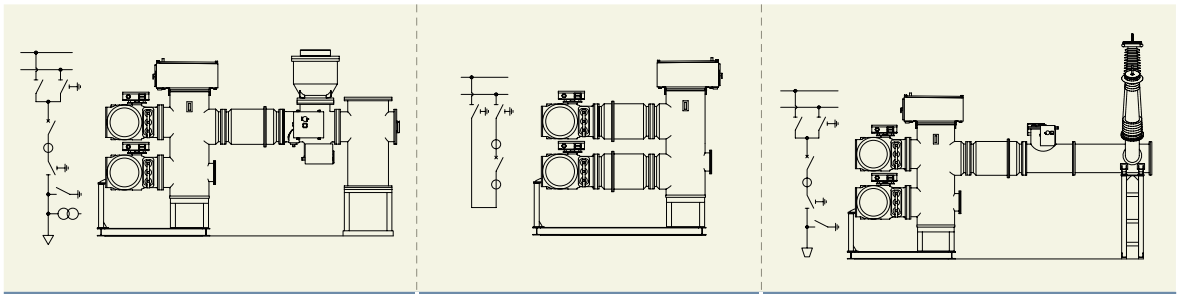
Typical Arrangements

| 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 : 1,650 mm

Type 170 SR GIS for 170 kV 50 kA

170 SR technology is based on many years of experience.

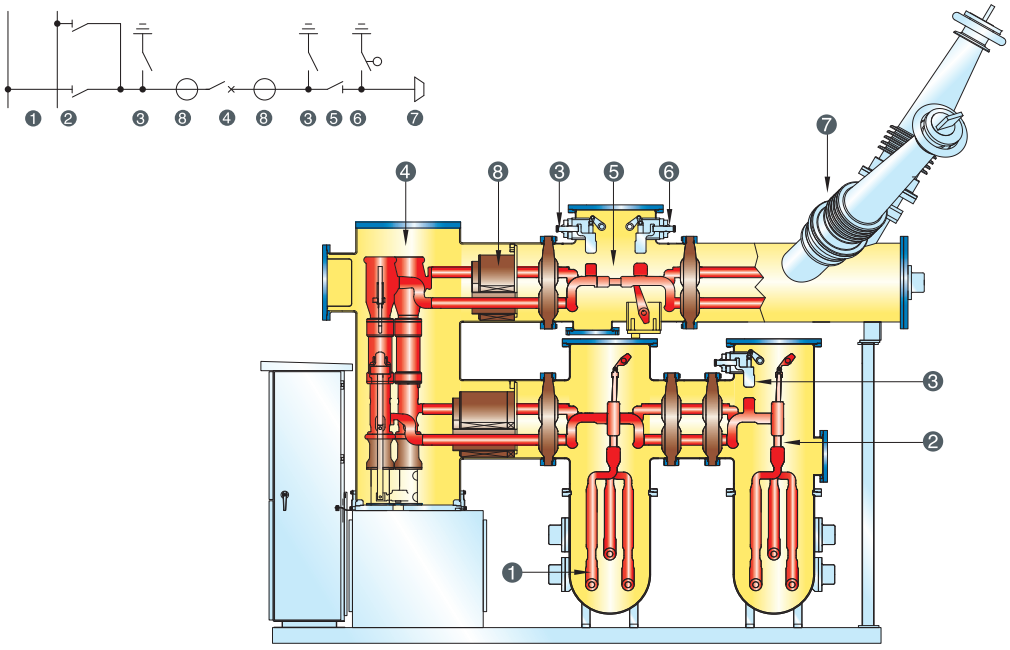
Condenserless type circuit breaker

It minimizes the ferro-resonance phenomenon and has higher breaking capacity.

Tightness of enclosure

It is obtained with well-trained manufacturing.

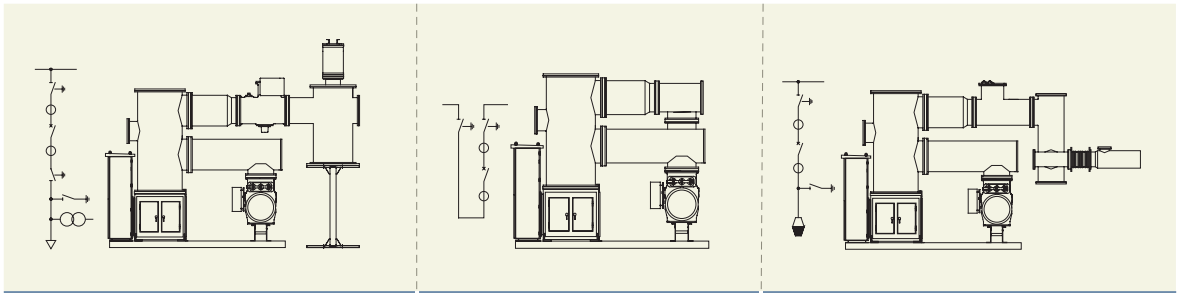
Section of 170 SR GIS



1. Main Bus
2. Bus Disconnector
3. Earthing Switch for Maintenance
4. Circuit Breaker
5. Line Disconnector
6. Make-proof Earthing Switch
7. Gas to Air Bushing
8. Current Transformer

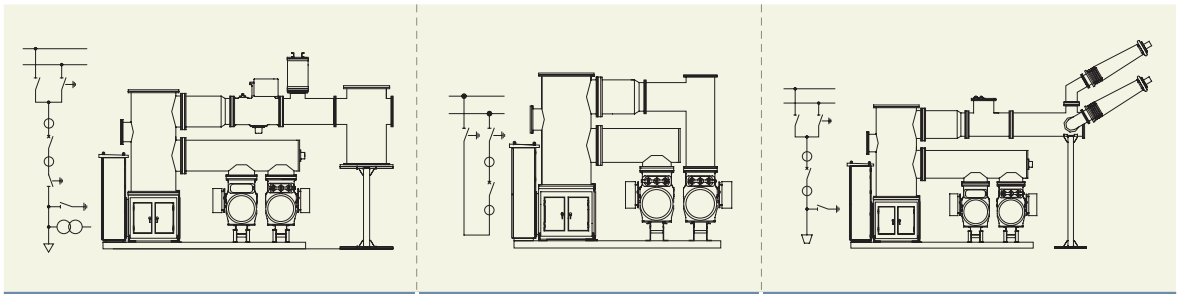
Typical Arrangements

| Single Bus |



Line Feeder | Bus Sectionalizer | Transformer Feeder (Gas to Oil Bushing)

| Double Bus |



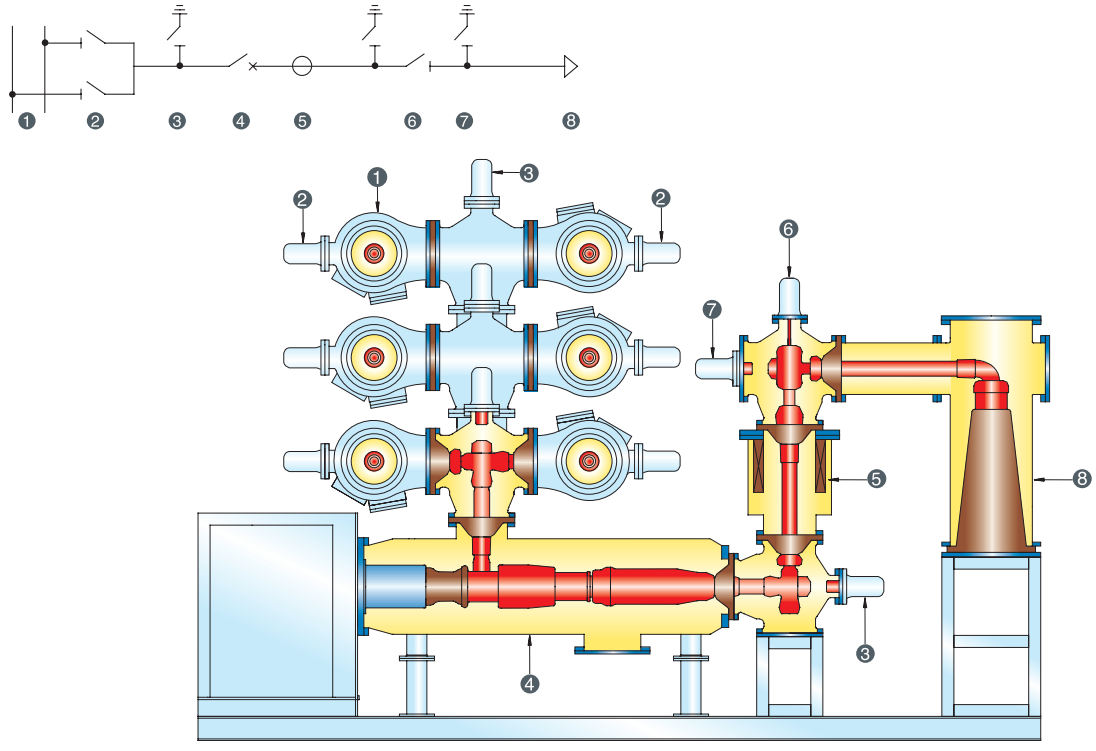
Line Feeder | Bus Coupler | Transformer Feeder (Gas to Air Bushing)

Bay width : 1,800 mm

Type 300 SR GIS for 245 kV 50 kA/63 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 motor spring or hydraulic operation from which modular elements are simply selected to permit virtual layout as desired.

Section of 300 SR GIS

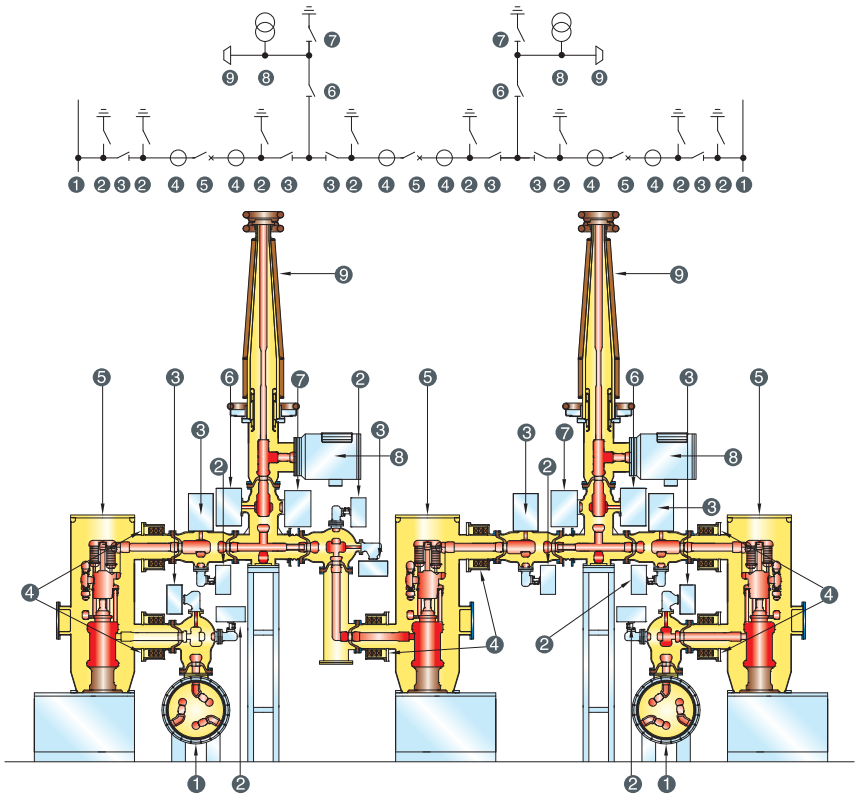


1 Main Bus
2 Bus Disconnector
3 Earthing Switch for Maintenance
4 Circuit Breaker
5 Current Transformer
6 Line Disconnector
7 Make-proof Earthing Switch
8 Cable Head Box

Type 362 SR/SU GIS for 362 kV 50 kA/63 kA

Hyundai 362 kV GIS includes 2 models divided by the rated short time current of 50 kA and 63 kA.
Having pneumatic operating or hydraulic operating mechanism, 362 SR model can be easily arranged especially in the 1½ breaker system.

Section of 362 SR GIS



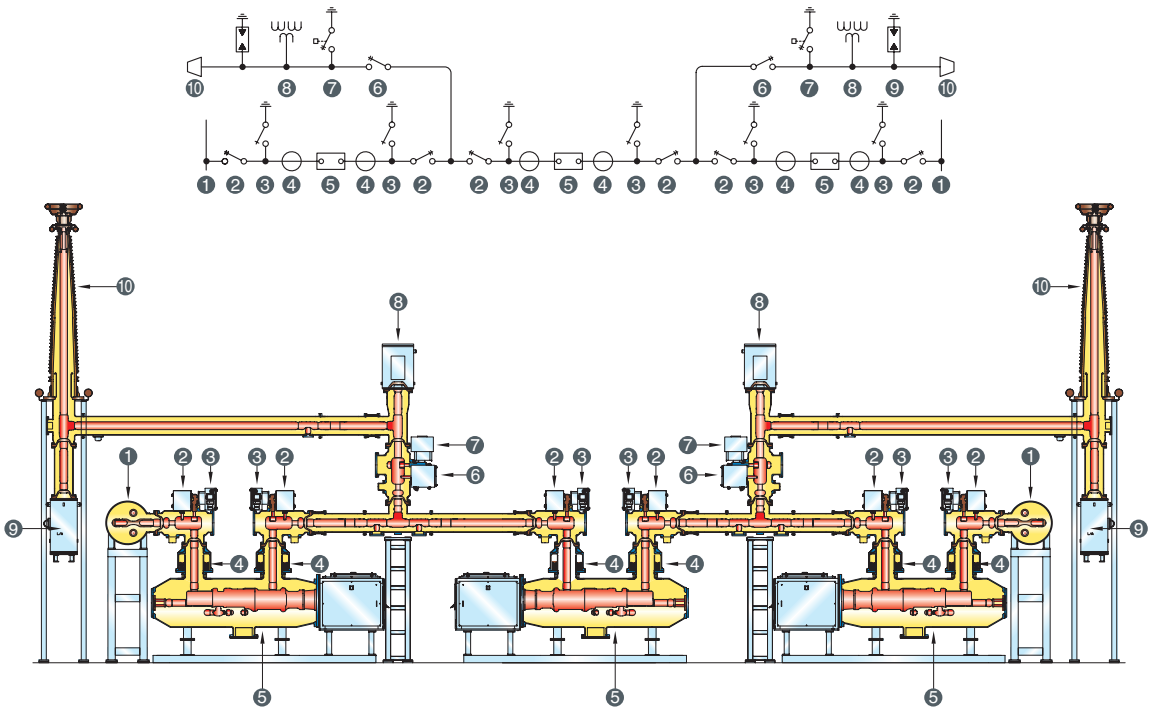
1. Main Bus
2. Earthing Switch for Maintenance
3. Bus Disconnector
4. Current Transformer
5. Circuit Breaker
6. Line Disconnector
7. Earthing Switch Make-proof Type
8. Voltage Transformer
9. Gas to Air Bushing

Bay width : 5,000 mm

Type 362 SR/SU GIS for 362 kV 50 kA/63 kA

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 GIS

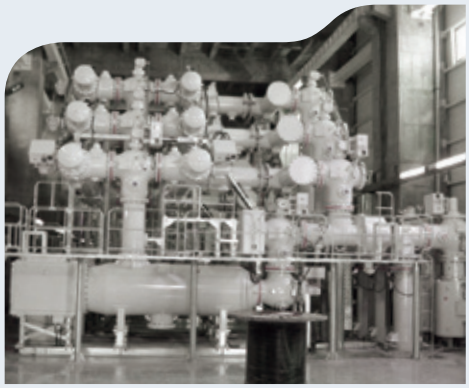


1. Main Bus
2. Earthing Switch for Maintenance
3. Bus Disconnector
4. Current Transformer
5. Circuit Breaker
6. Line Disconnector
7. Earthing Switch make-proof type
8. Voltage Transformer
9. Lightning Arrester
10. Gas to Air Bushing

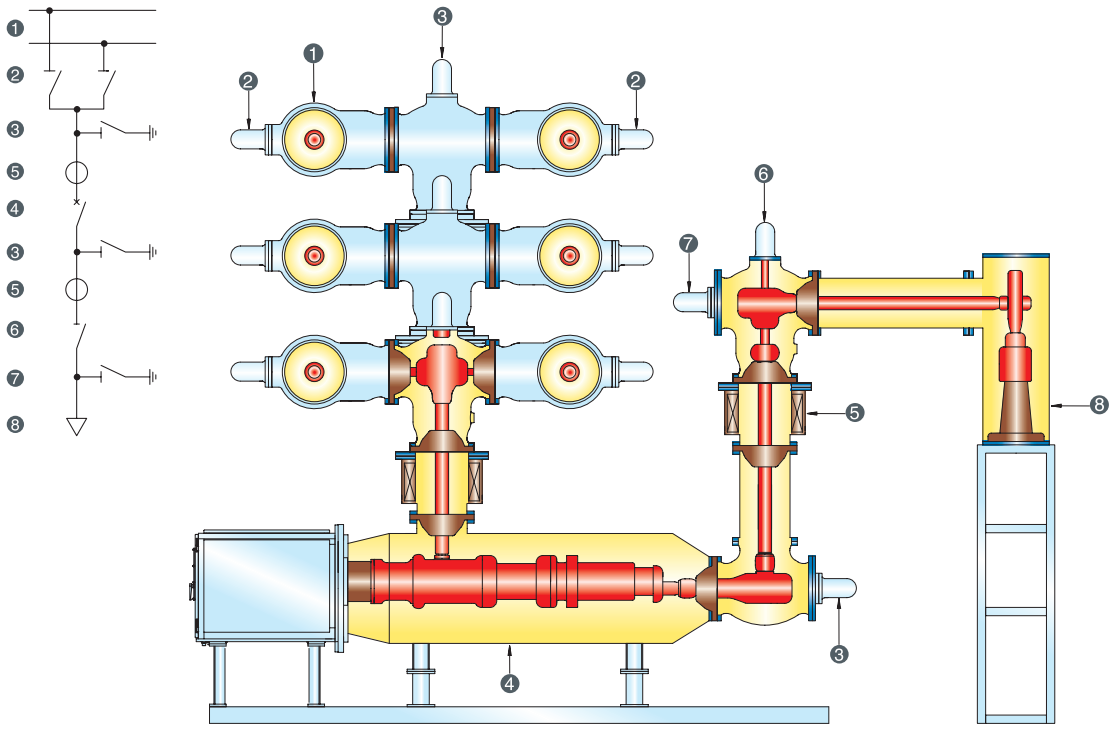
Bay width : 6,500 mm

Type 550 SR GIS for 420 kV/550 kV 50 kA/63 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 and 2cycle-breaking time show the prominent technology of Hyundai.



Section of 550 SR GIS



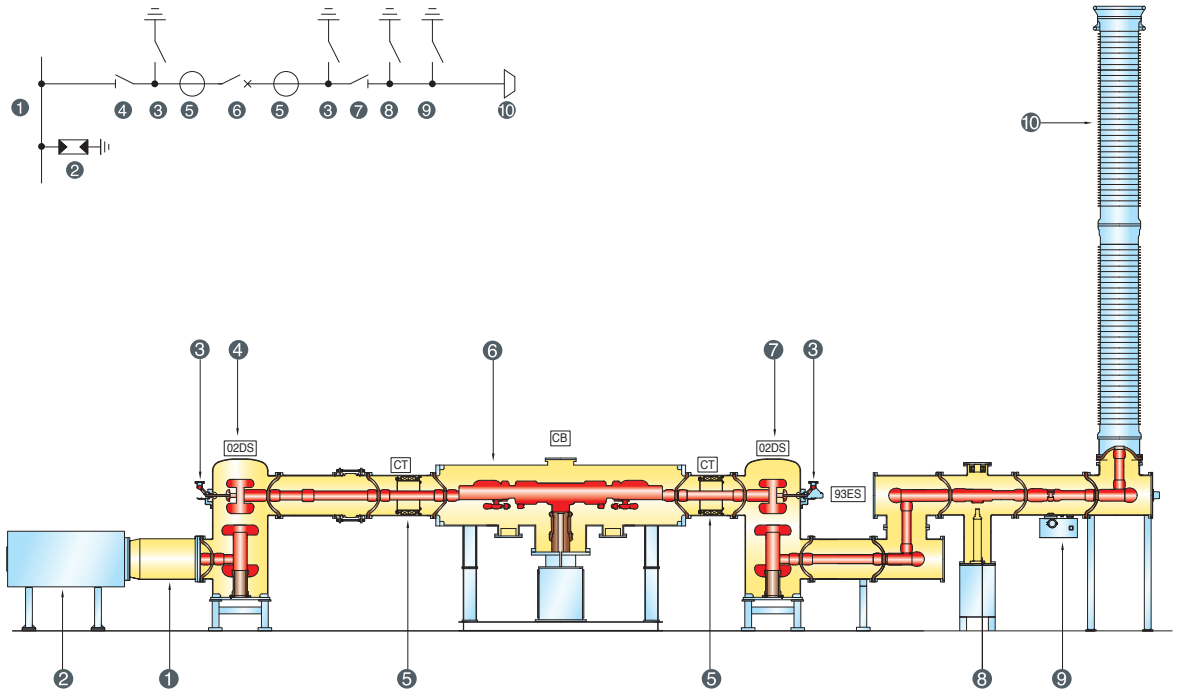
1 Main Bus
2 Bus Disconnector
3 Earthing Switch for Maintenance
4 Circuit Breaker
5 Current Transformer
6 Line Disconnector
7 Make-proof Earthing Switch
8 Cable Head Box

Bay width : 4,500 mm

Type 800 SR GIS 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 GIS



❶ Main Bus	❺ Current Transformer	❾ Line Earthing Switch
❷ Lightning Arrester	❻ Circuit Breaker	❿ Gas to Air Bushing
❸ Earthing Switch for Maintenance	❼ Line Disconnector	
❹ Bus Disconnector	❽ High Speed Grounding Switch	

Bay width : 6,500 mm

Research & Development

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

Hyundai'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.

Hyundai Electric 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(H-TECH) in Budapest, Hungary.

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

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

Certificates

| ISO 9001 Certificates |

| KEMA Certificates |

Inquiry form

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 ( ) _____








Environment-Friendly Technology
HYUNDAI Gas Insulated Switchgear





HE-HE-B01-15, 2018.2 Designed by designwat

HYUNDAI ELECTRIC

KOREA

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OVERSEAS

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China (Yangzhong)	No.9, Xiandai Road, Xinba Scientific and Technologic Zone, Yangzhong, Jiangsu, P.R.C. Zip:212212, China Tel: +86-511-8842-0666, 0500 / Fax: +86-511-8842-0668, 0231
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