



HYOSUNG


creativity inspired

HV Gas Insulated Switchgear

Since 1978



Global Excellence

- 
- The background image shows a large industrial facility, likely a power plant or refinery. In the foreground, there is a large, horizontal, white cylindrical vessel supported by a complex metal frame. To the right, two workers wearing white hard hats and safety gear are standing and looking at a large sheet of paper, possibly a blueprint or technical drawing. The background features more industrial equipment, including pipes, valves, and structural steel, under bright overhead lighting.
1. Introduction to Hyosung GIS
 2. Why Hyosung GIS

1. Introduction to Hyosung GIS

- Overview
- Product Line-up

2. Why Hyosung GIS



Overview – Production system



■ Line-Up for GIS/GCB

- 72.5kV 25/31.5kA
- 145~170kV 31.5/40/50kA
- 245~362kV 40/50/63kA
- 420~550kV 50/63kA
- 800kV 50kA
- 1100kV 50kA (Developed)

■ Production Capability

2,000 bay/year

(Based on 145kV GIS)

■ Features & Advantages

- Over 18,000 sets operated over 35 years / Environmental experience
- High Reliability
- Flexible Design as per Customer Requirements
- Full Compliance with IEC/ANSI/GOST Standards

Overview – History

- More than 35 years of Manufacturing & Service experience

- 1st 170kV GIS in 1978



- 1100kV CB in 2007



- 1978 Developed 170kV Gas Circuit Breaker (1st in Korea)
- 1980 Developed 170kV Gas-Insulated Switchgear (1st in Korea)
- 1983 Developed 362kV 40kA GIS (1st in Korea)
- 1992 Delivered 145kV 40kA GIS to TNB, MALAYSIA
- 1999 Developed 800kV 50kA GIS (3rd in the World)
- 2004 Delivered 800kV 50kA GIS to China
- 2007 Developed New Spring type 300kV 50kA GIS
Developed 1100kV 50kA CB for GIS
- 2009 Developed 420kV 63kA GIS
- 2012 Developed 550kV 63kA GIS
- 2015 Developed 245kV 50kA GIS (3-phase encapsulated)
- 2016 Developed 300kV 63kA GIS

1. Introduction to Hyosung GIS

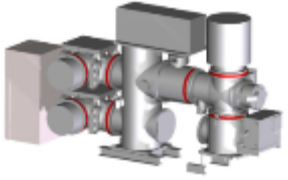
- Overview
- Product Line-up

2. Why Hyosung GIS

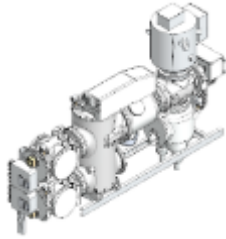


Product Line-Up

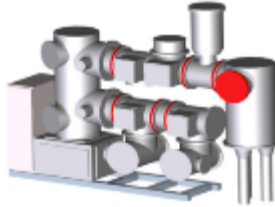
- Totally 17 types of GIS (72.5kV ~ 1100kV)



[72.5kV] HSG-074A



[145kV] HSG-144D



[170kV] HSG-175



[245kV] HSG-305C



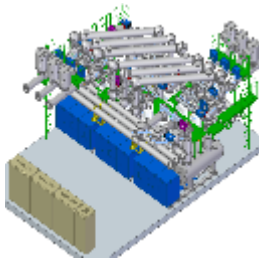
[300kV] HSG-305B



[362kV] HSG-365



[420kV] HSG-426C



[420kV] HSG-426A



[550kV] 550HGS




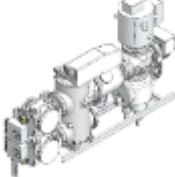
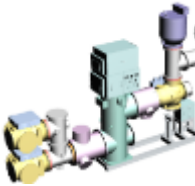




[800kV] 800HGS50



[1100kV] HSG-115

Product Line-Up

- Spring-type up to 300kV, type tested and certified

GIS Type							
Model	HSG-074A	HSG-144D	HSG-144C	HSG175	HSG-305C	HSG-305B	HSG-246A
Rated Voltage [kV]	72.5	145	170	170	220	245/300	252/300
Breaking Current [kA]	40	40	40	50	50	50	63
Rated Current [A]	2500	3150	2500	4000	3150	4000	4000
Phases per enclosure	3	3	3	1/3	3	1	1
Breaks per pole	1	1	1	1	1	1	1
Breaking times [cycles]	3	3	3	3	3	3	3
First Pole to Clear Factor	1.5	1.3/1.5	1.3/1.5	1.3	1.3	1.3/1.5	1.3
Mechanical Endurance	M2	M2	M2	M2	M2	M2	M2
Operating Mechanism	Spring	Spring	Spring	Spring	Spring	Spring	Spring
BIL [kVp]	325	650	750	750	1050	1050	1050
Type Test Certified by	CESI/KERI	CESI/KERI	CESI/KERI	KERI	CESI/KERI	CESI/KERI	CESI/KERI

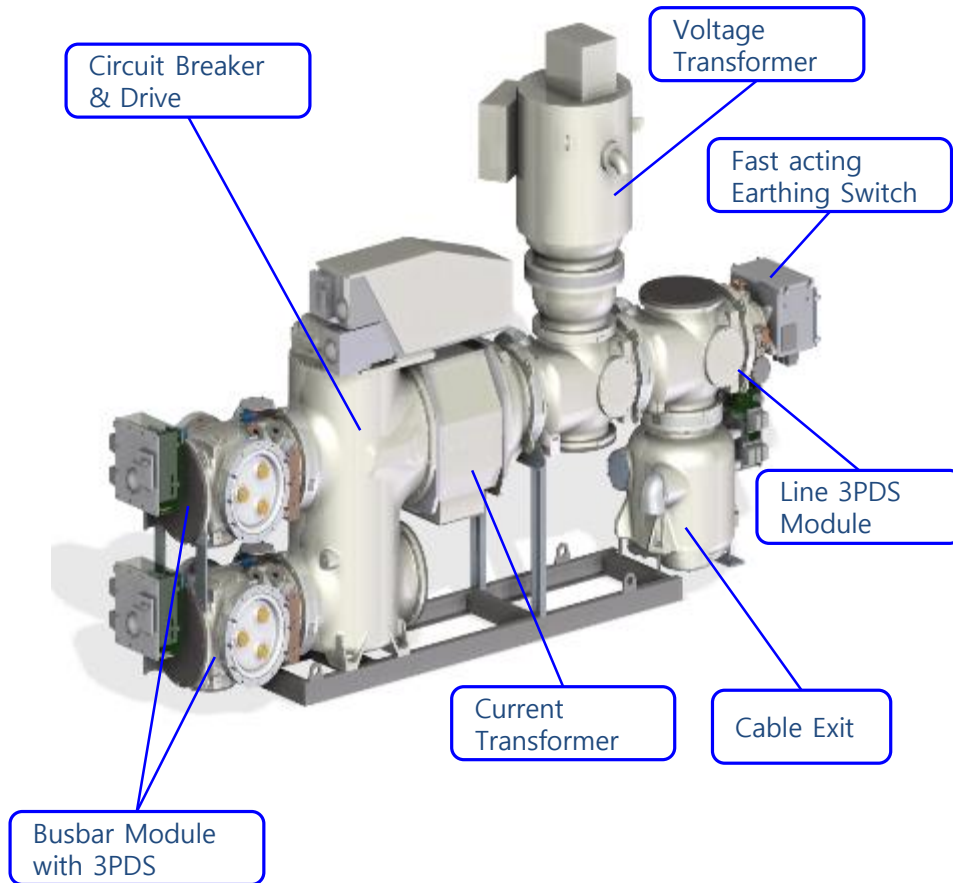
Product Line-Up

- Hydraulic-type for above-362kV-class (spring type currently under development)
- Available up to 1100kV GIS

GIS Type						
Model	HSG362	HSG-426C	HSG-426A	550HSG	800HSG50	HSG115
Rated Voltage [kV]	362	420	420	550	800	1100
Breaking Current [kA]	63	50	63	63	50	50
Rated Current [A]	6300	4000	4000	4000	8000	8000
Phases per enclosure	1	1	1	1	1	1
Breaks per pole	1/2	1	1	2	2	2
Breaking times [cycles]	3	2	2	2	2	2
First Pole to Clear Factor	1.5	1.5	1.3/1.5	1.3	1.3	1.3/1.5
Mechanical Endurance	M2	M2	M2	M2	M2	M2
Operating Mechanism	Hydraulic	Hydraulic	Hydraulic	Hydraulic	Hydraulic	Hydraulic
BIL [kVp]	1175	1425	1425	1550	2100	2100
Type Test Certified by	KERI	CESI/KERI	CESI/KERI	CESI/KERI	KERI	KERI

145kV 40kA GIS (HSG-144D) – Typical Bay Design

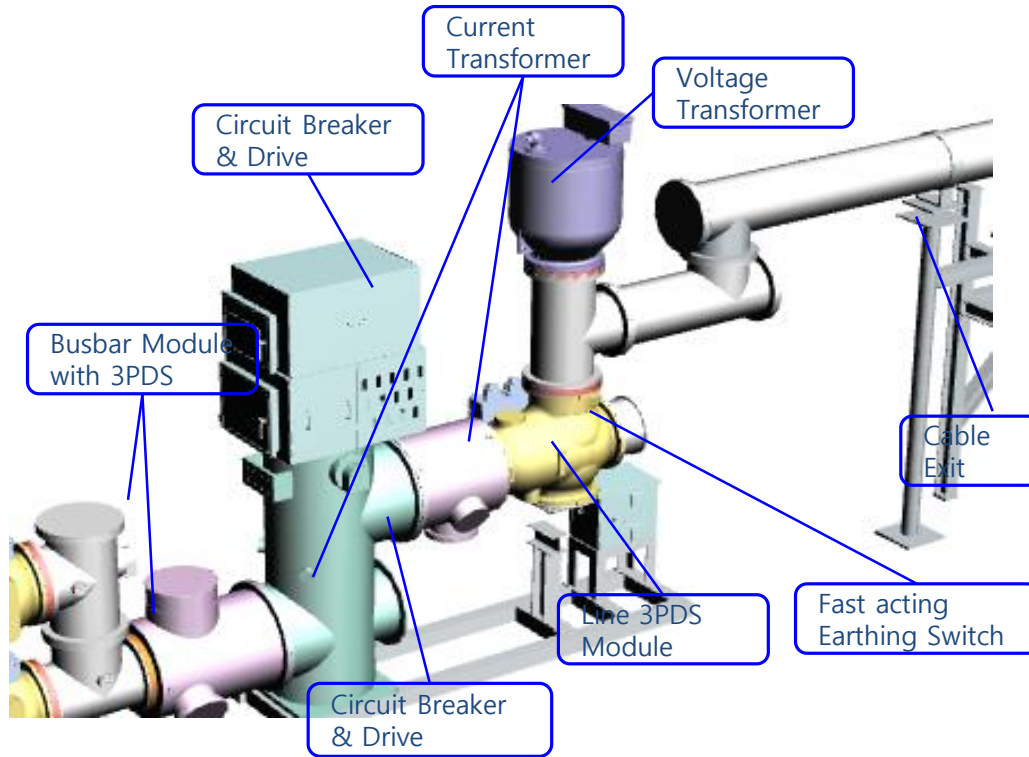
- Typical bay of Hyosung 145kV GIS with Plug-in type Cable Sealing End



Nominal Voltage	110/ 115/ 132kV
Rated Voltage	145kV
Frequency	50/60Hz
Breaking Current (Short-time Withstand)	40kA (3sec)
Breaking Time	3 Cycles
Making Current	100/104kAp
Breaker Per Pole	1
First pole to clear factor	1.3/1.5
Rated Current	2500 / 3150A
Rated power frequency withstand voltage (1 min)	275kV/315kV
Rated lightning impulse withstand voltage (1.2/50 μ s)	650kV/750kV
Operating Mechanism	Spring
Mechanical Endurance Class	M2(10,000)
Capacitive current switching class	C2
Electrical Endurance Class	E1
Re-Closing Duty	O-0.3s-CO-3min-CO
Type Test Certified by	CESI/KERI

170kV 40kA GIS (HSG-144C) – Typical Bay Design

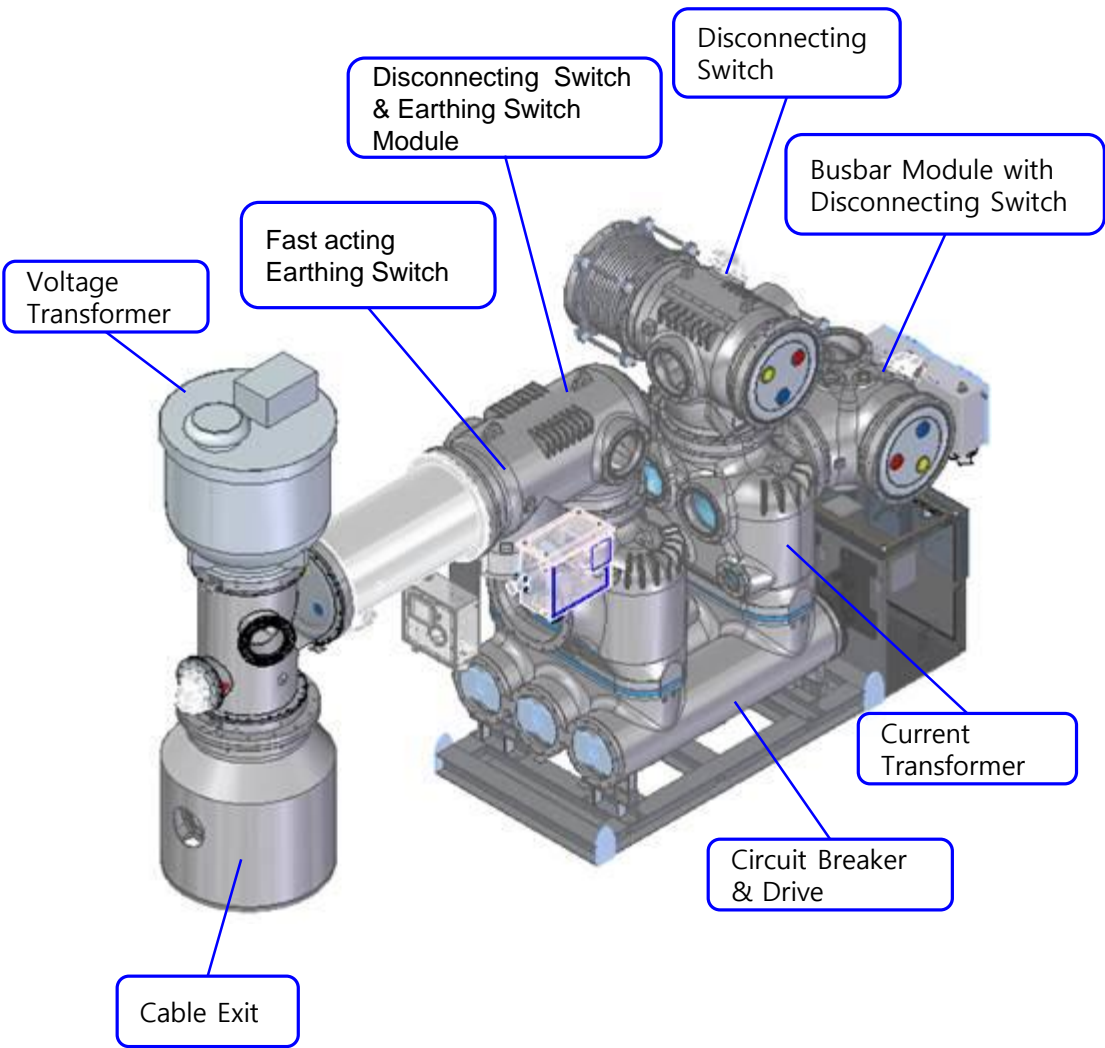
- Typical bay of Hyosung 170kV GIS with Cable Sealing End



Nominal Voltage	154 kV
Rated Voltage	170kV
Frequency	50Hz
Breaking Current (Short-time Withstand)	40kA (3sec)
Breaking Time	3 Cycles
Making Current	100 kAp
Breaker Per Pole	1
First pole to clear factor	1.3/1.5
Rated Current	2500A
Rated power frequency withstand voltage (1 min)	325kV
Rated lightning impulse withstand voltage (1.2/50 μ s)	750kV
Operating Mechanism	Spring
Mechanical Endurance Class	M2(10,000)
Capacitive current switching class	C2
Electrical Endurance Class	E1
Re-Closing Duty	O-0.3s-CO-3min-CO
Type Test Certified by	CESI/KERI

245kV 50kA GIS (HSG-305C) design

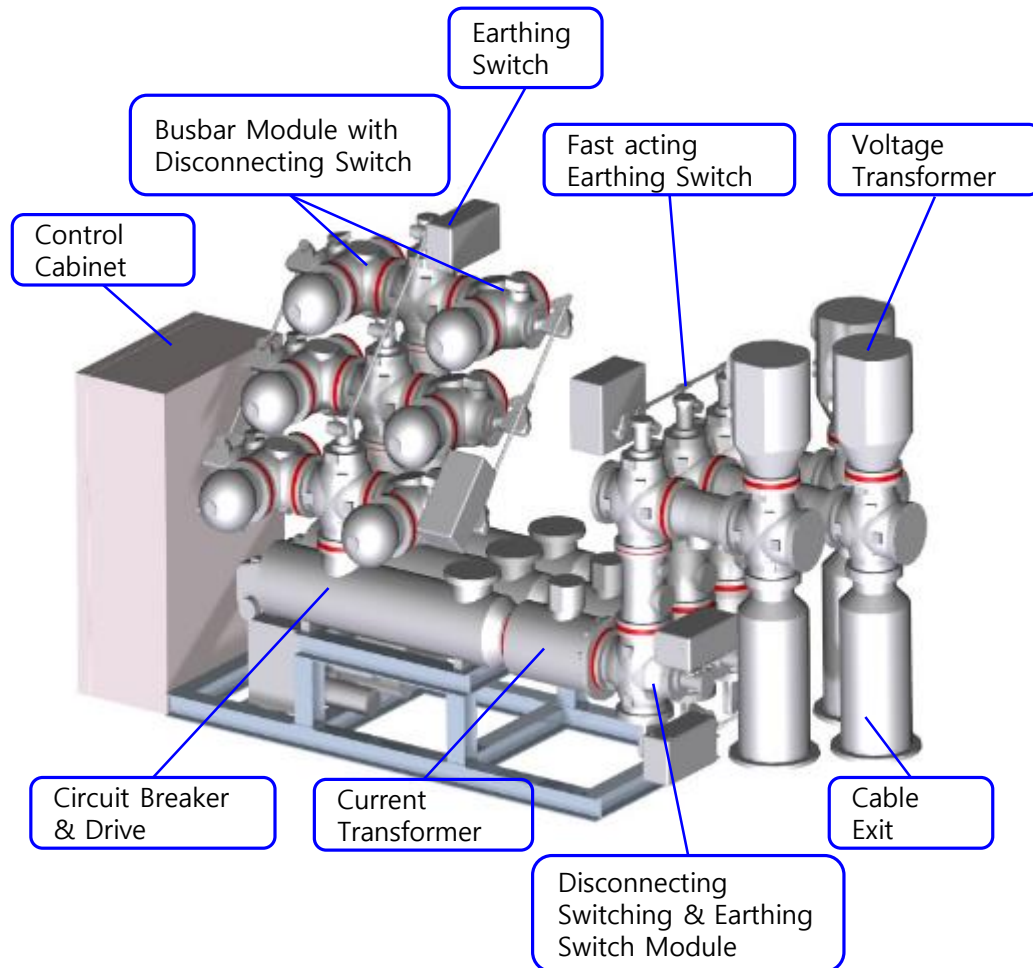
▪ Typical bay of Hyosung 245kV GIS with Cable Sealing End



Nominal Voltage	220kV
Rated Voltage	245kV
Frequency	50Hz
Breaking Current (Short-time Withstand)	50kA (1sec)
Breaking Time	3 Cycles
Making Current	125 kAp
Breaker Per Pole	1
First pole to clear factor	1.3
Rated Current	3150 A
Rated power frequency withstand voltage (1 min)	460kV/530kV
Rated lightning impulse withstand voltage (1.2/50 μ s)	1050kV/1200kV
Operating Mechanism	Spring
Mechanical Endurance Class	M2(10,000)
Capacitive current switching class	C2
Electrical Endurance Class	E1
Re-Closing Duty	O-0.3s-CO-3min-CO
Type Test Certified by	CESI/KERI

300kV 50kA GIS (HSG-305B) design

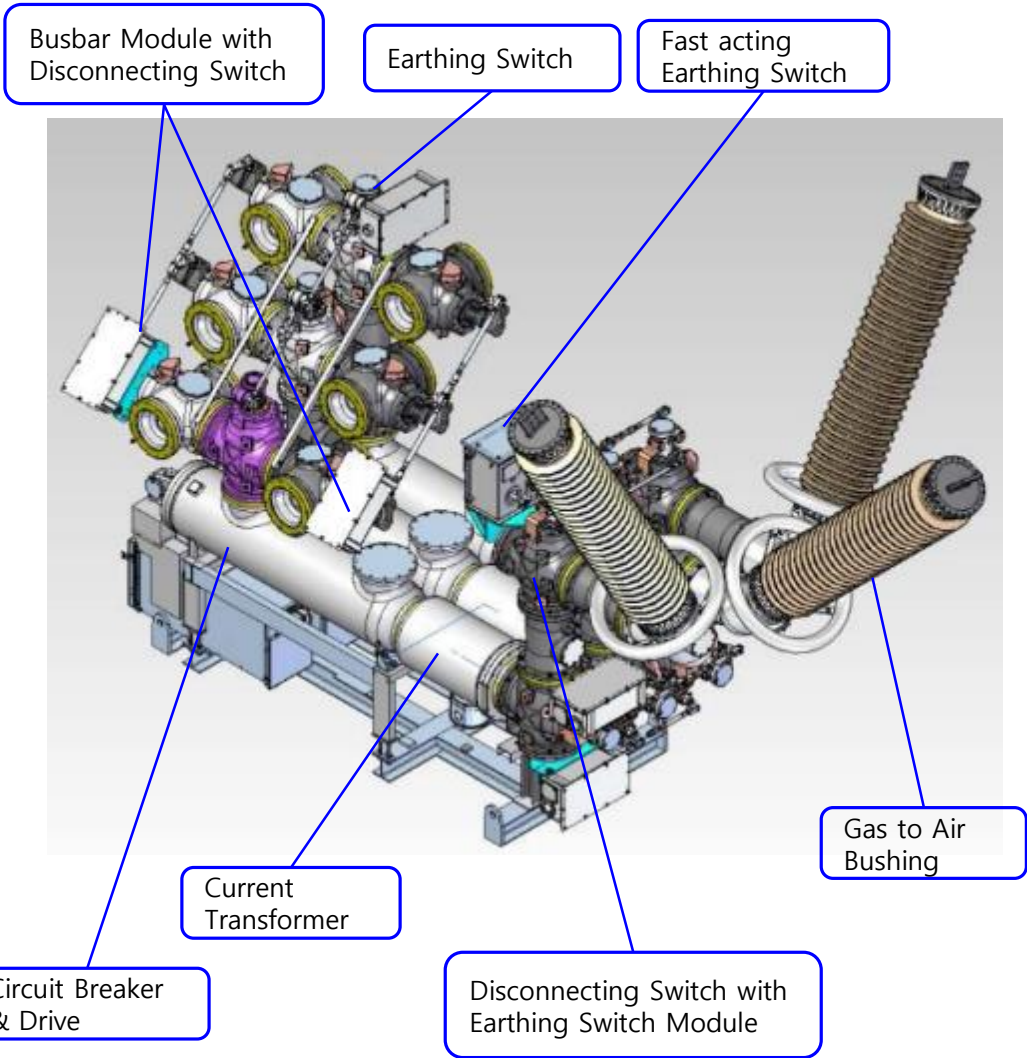
- Typical bay of Hyosung 300kV GIS with Cable Sealing End



Nominal Voltage	220/245kV
Rated Voltage	300kV
Frequency	50Hz
Breaking Current (Short-time Withstand)	50kA (3sec)
Breaking Time	3 Cycles
Making Current	130 kAp
Breaker Per Pole	1
First pole to clear factor	1.3/1.5
Rated Current	4000 A
Rated power frequency withstand voltage (1 min)	460kV/530kV
Rated lightning impulse withstand voltage (1.2/50 μ s)	1050kV/1050(+170)kV
Operating Mechanism	Spring
Mechanical Endurance Class	M2(10,000)
Capacitive current switching class	C2
Electrical Endurance Class	E1
Re-Closing Duty	O-0.3s-CO-3min-CO
Type Test Certified by	CESI/KERI

300kV 63kA GIS (HSG-246A) design

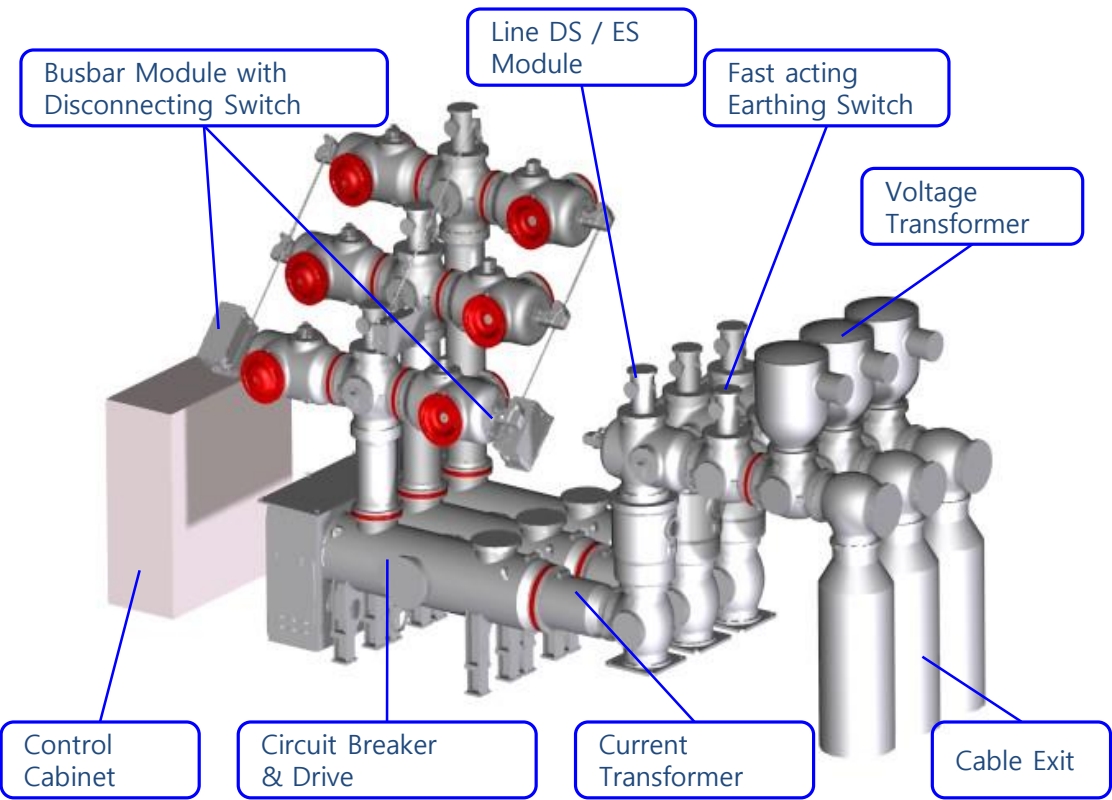
- Typical bay of Hyosung 300kV GIS



Nominal Voltage	252kV
Rated Voltage	300kV
Frequency	50Hz
Breaking Current (Short-time Withstand)	63kA (3sec)
Breaking Time	3 Cycles
Making Current	157.5 kAp
Breaker Per Pole	1
First pole to clear factor	1.3
Rated Current	4000 A
Rated power frequency withstand voltage (1 min)	460kV/530kV
Rated lightning impulse withstand voltage (1.2/50 μs)	1050kV/1050(+170)kV
Operating Mechanism	Spring
Mechanical Endurance Class	M2(10,000)
Capacitive current switching class	C2
Electrical Endurance Class	E1
Re-Closing Duty	O-0.3s-CO-3min-CO
Type Test Certified by	CESI/KERI

420kV 50kA GIS (HSG-426C) design

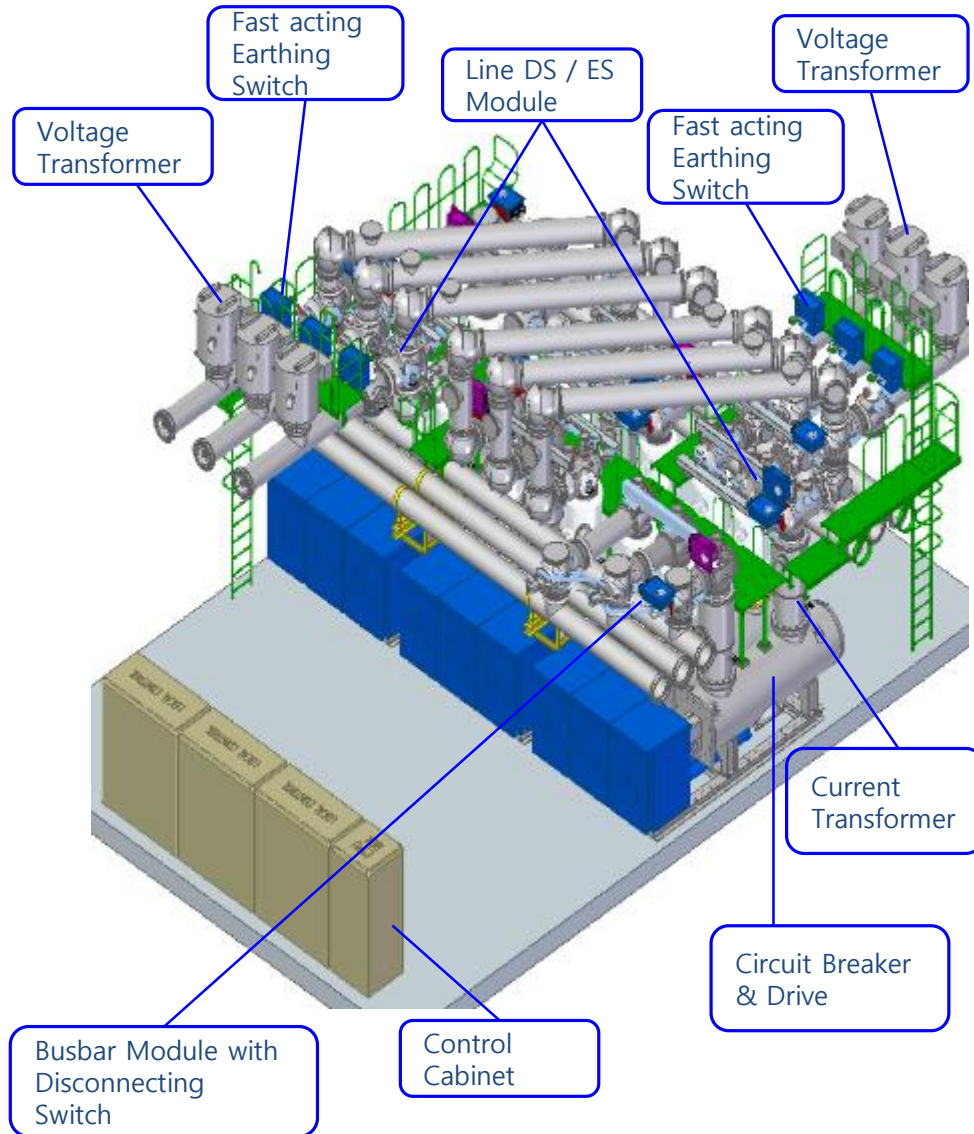
- Typical bay of Hyosung 420kV GIS with Cable Sealing End



Nominal Voltage	380/400kV
Rated Voltage	420kV
Frequency	50Hz
Breaking Current (Short-time Withstand)	50kA (3sec)
Breaking Time	2 Cycles
Making Current	125 kAp
Breaker Per Pole	1
First pole to clear factor	1.5
Rated Current	4000 A
Rated power frequency withstand voltage (1 min)	650kV/815kV
Rated lightning impulse withstand voltage (1.2/50 μ s)	1425kV/1425(+240)kV
Operating Mechanism	Hydraulic
Mechanical Endurance Class	M2(10,000)
Capacitive current switching class	C2
Electrical Endurance Class	E1
Re-Closing Duty	O-0.3s-CO-3min-CO
Type Test Certified by	CESI/KERI

420kV 63kA GIS (HSG-426A) design

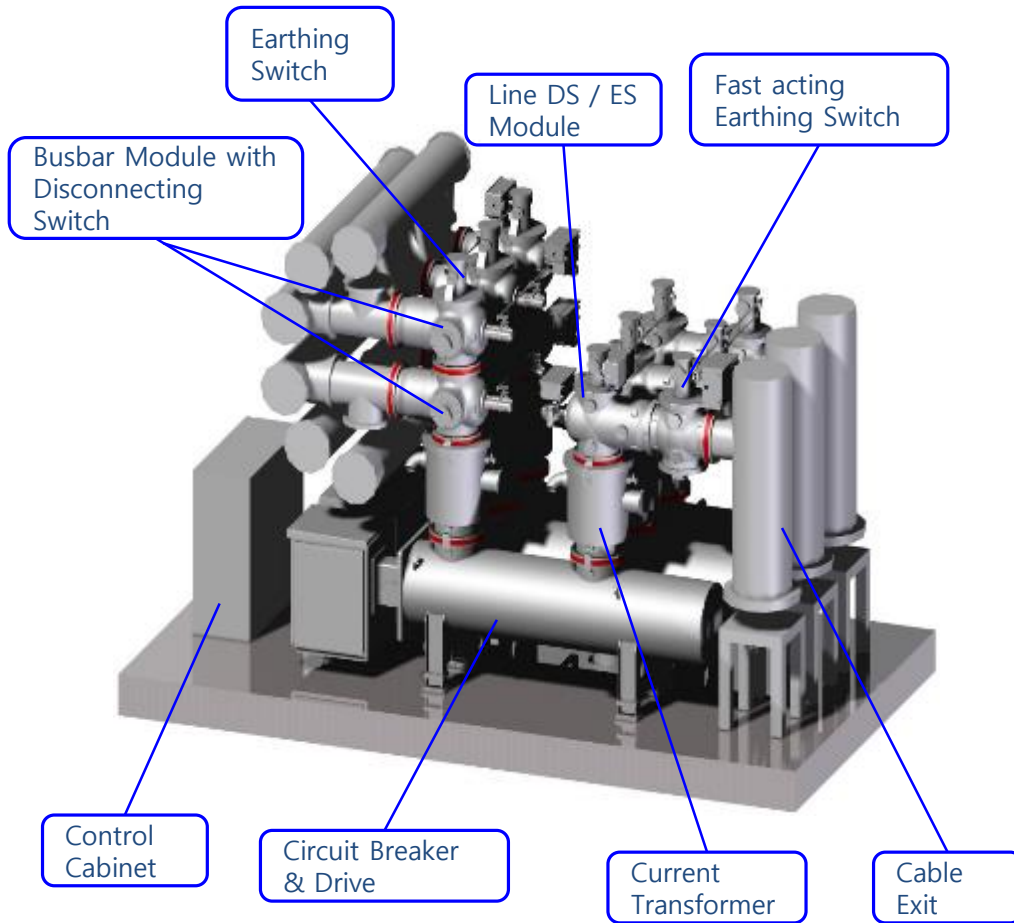
▪ Typical bay of Hyosung 420kV GIS with One & Half



Nominal Voltage	400kV
Rated Voltage	420kV
Frequency	50/60Hz
Breaking Current (Short-time Withstand)	63kA (3sec)
Breaking Time	2 Cycles
Making Current	157.5/163.8kAp
Breaker Per Pole	1
First pole to clear factor	1.3/1.5
Rated Current	4000A
Rated power frequency withstand voltage (1 min)	650kV
Rated lightning impulse withstand voltage (1.2/50 μ s)	1425kV
Operating Mechanism	Hydraulic
Mechanical Endurance Class	M2(10,000)
Capacitive current switching class	C2
Electrical Endurance Class	E1
Re-Closing Duty	O-0.3s-CO-3min-CO
Type Test Certified by	CESI/KERI

550kV 63kA GIS (550HSG) design

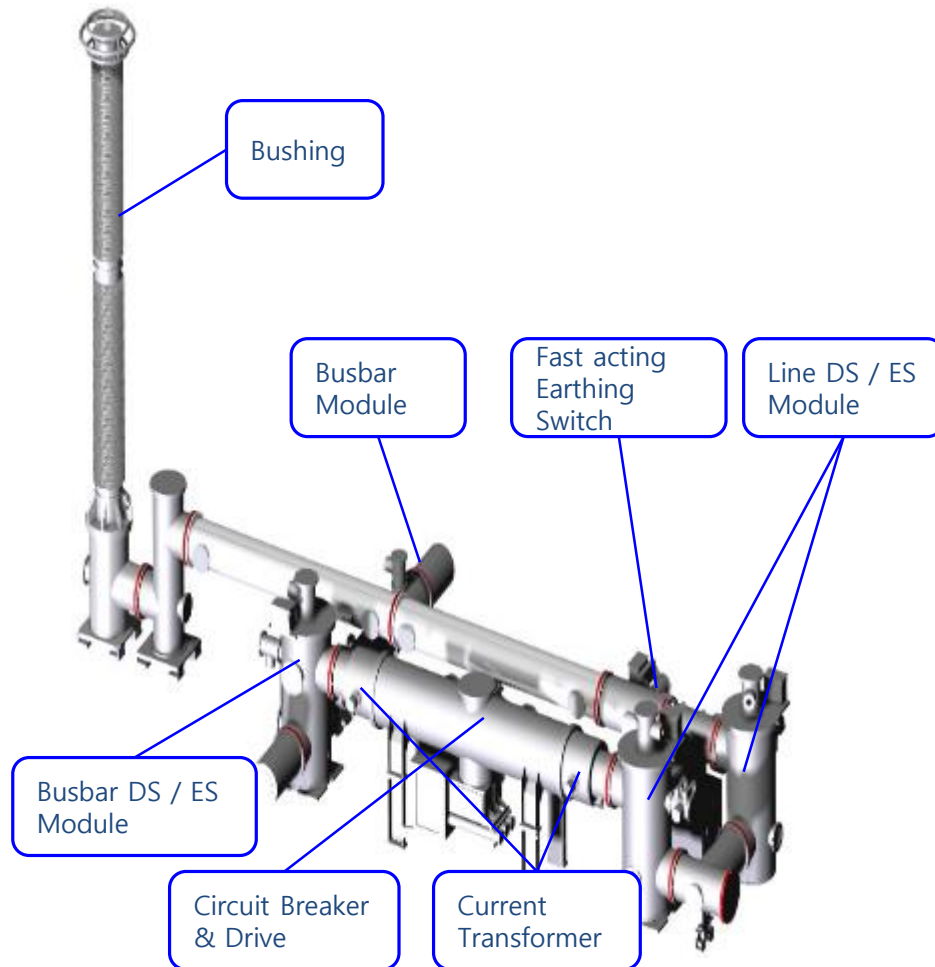
▪ Typical bay of Hyosung 550kV GIS with Cable Sealing End



Nominal Voltage	500kV
Rated Voltage	550kV
Frequency	50/60Hz
Breaking Current (Short-time Withstand)	63kA (3sec)
Breaking Time	2 Cycles
Making Current	157.5/171 kAp
Breaker Per Pole	1
First pole to clear factor	1.3
Rated Current	4000 A
Rated power frequency withstand voltage (1 min)	710kV/925kV
Rated lightning impulse withstand voltage (1.2/50 μ s)	1550kV/1550(+315)kV
Operating Mechanism	Hydraulic
Mechanical Endurance Class	M2(10,000)
Capacitive current switching class	C2
Electrical Endurance Class	E1
Re-Closing Duty	O-0.3s-CO-3min-CO
Type Test Certified by	CESI/KERI

800kV 50kA GIS (800HSG50) design

▪ Typical bay of Hyosung 800kV GIS



Nominal Voltage	765kV
Rated Voltage	800kV
Frequency	50/60Hz
Breaking Current (Short-time Withstand)	50kA (1sec)
Breaking Time	2 Cycles
Making Current	125/130 kAp
Breaker Per Pole	2
First pole to clear factor	1.3/1.5
Rated Current	4000/8000 A
Rated power frequency withstand voltage (1 min)	960kV/1270kV
Rated lightning impulse withstand voltage (1.2/50 μ s)	2250kV/2100(+457)kV
Operating Mechanism	Hydraulic
Mechanical Endurance Class	M2(10,000)
Capacitive current switching class	C2
Electrical Endurance Class	E1
Re-Closing Duty	O-0.3s-CO-3min-CO
Type Test Certified by	KERI

1. Introduction to Hyosung GIS

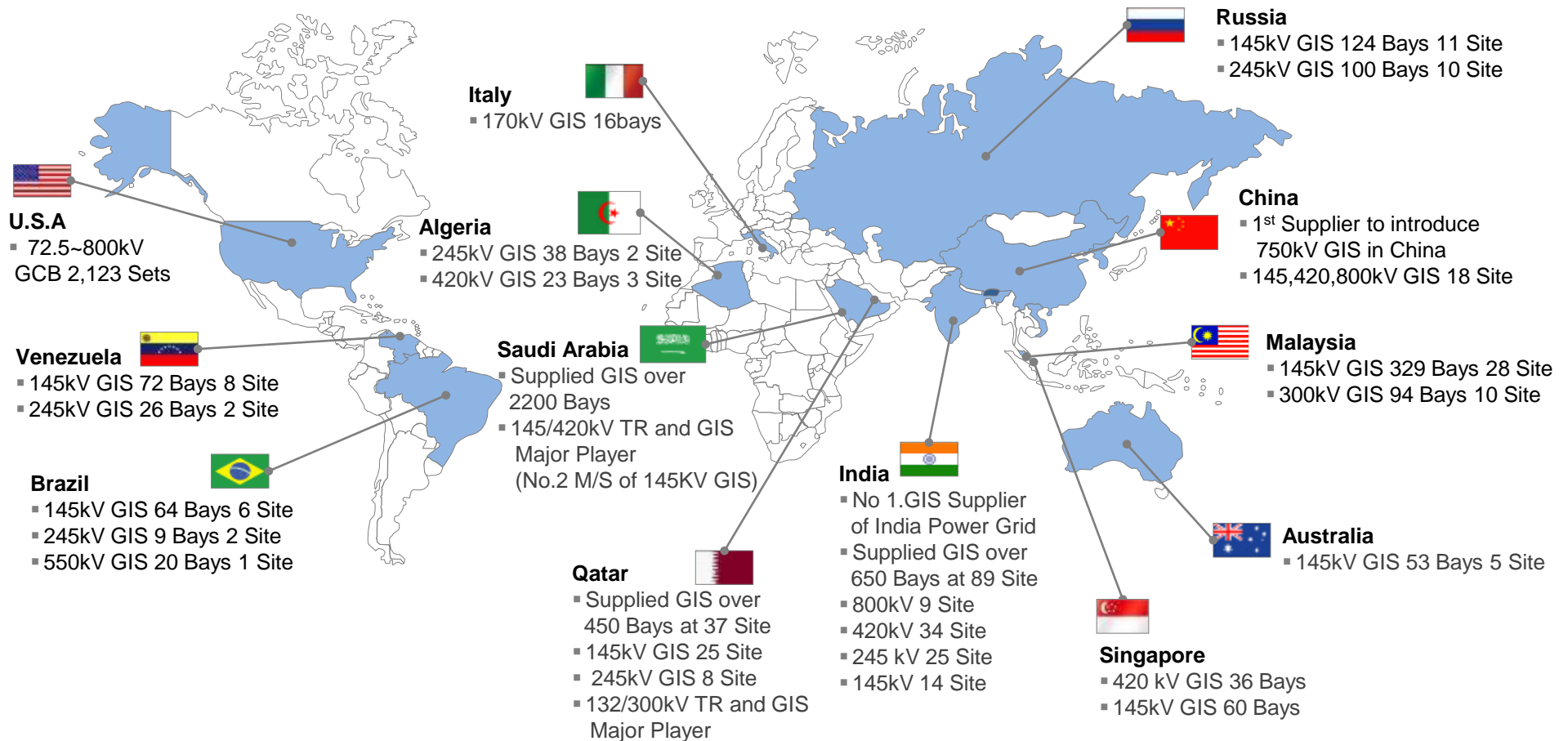
2. Why Hyosung GIS

- **Global Achievements**
- Competitiveness of Product
- Systematic Process & Service



Global Achievements

- With over 13,600 GIS bays and 4,500 GCB sets supplied around the world
- Domestic market share 60%, Global market share 20%



Global Achievements

- With over 13,600 GIS bays and 4,500 GCB sets supplied around the world
- Domestic market share 60%, Global market share 20%

▼ 145kV 8128 S/S in Saudi Arabia



▼ 170kV Terna S/S in Italy



▼ 300kV Koysug S/S in Russia



▼ 420kV Koteswar S/S in India



▼ 550kV Transener S/S in Argentina



▼ 800kV Tang-Jin Thermal Power Plant in Korea



1. Introduction to Hyosung GIS

2. Why Hyosung GIS

- Global Achievements
- **Competitiveness of Product**
- Systematic Process & Service



Competitiveness of Product – Easy Maintenance & Repair

- Hyosung GIS is not only compact, but also guarantees easy maintenance and operation.

Example of 145KV 40kA GIS

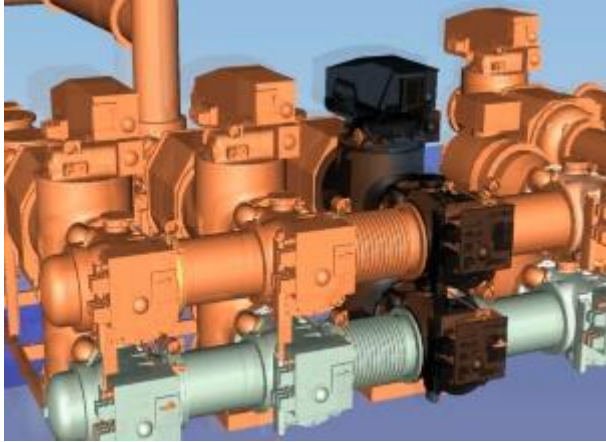
“As the whole operation mechanism box is located in the same aisle as the operator would stand, the operator can check the main bus 3PDS, the line-side HES operation mechanism, and the indicator all in one check up.”



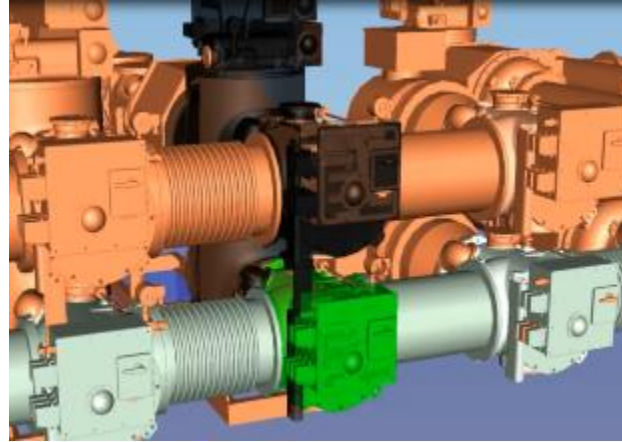
Competitiveness of Product – Easy Maintenance & Repair

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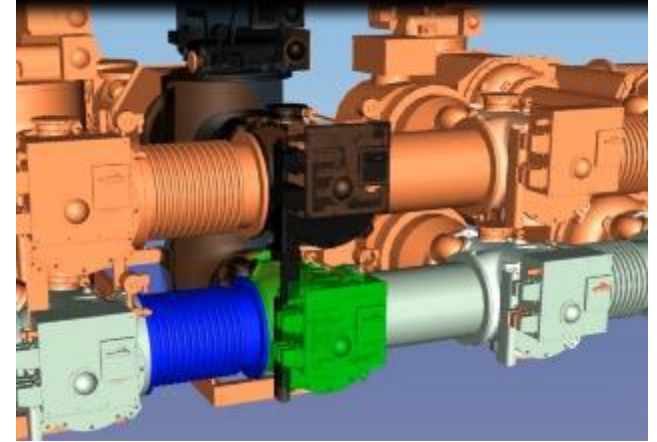
[Example case – replacing main bus ES/DS Module]



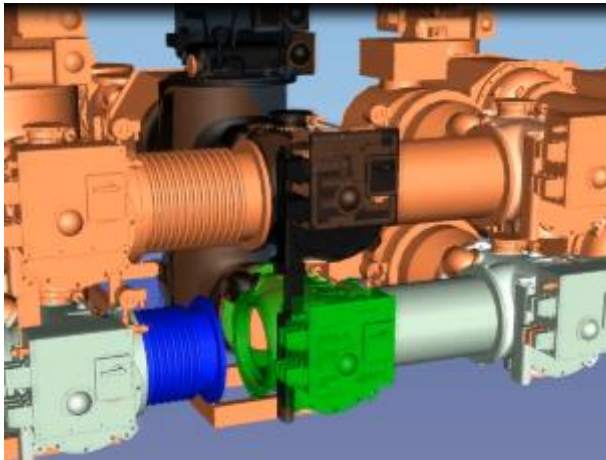
Main bus, CB, ES,DS Off



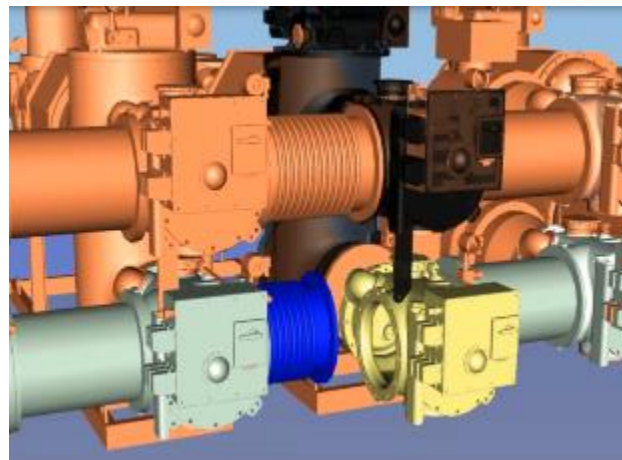
ES on



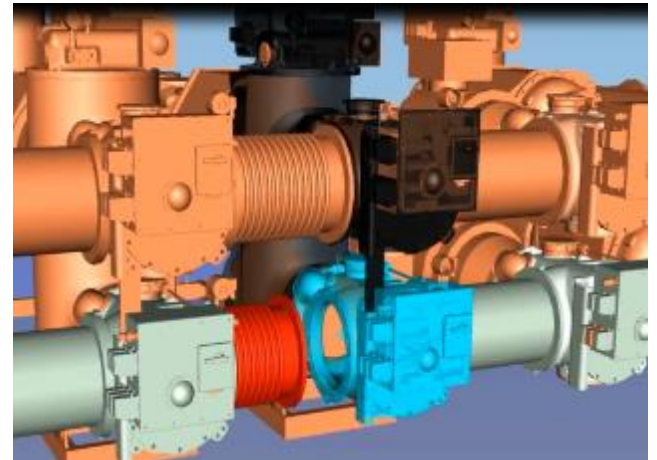
Compressing Bellows to dismantle DS/ES



Dismantling ES/DS



Retrofitting new ES/DS



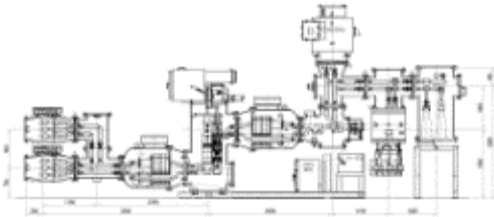
Decompressing Bellows

Competitiveness of Product – Customization

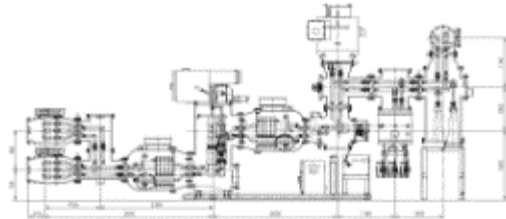
- We can fulfill any layout the customer request: not only standardized layout but also with flexible module design concept. We value our customer's requirements and respond flexibly.

145kV bay types

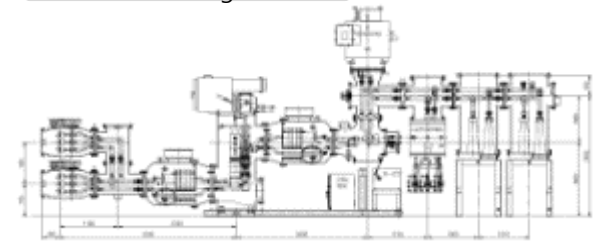
Dual CT



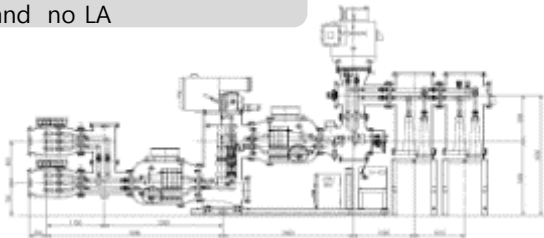
Dual CT with
three Cable sealing ends



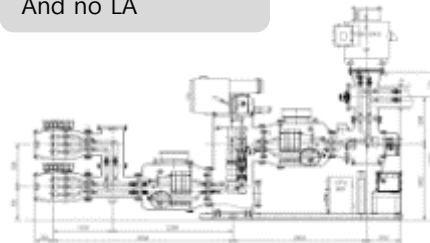
Dual CT with
two Cable sealing ends



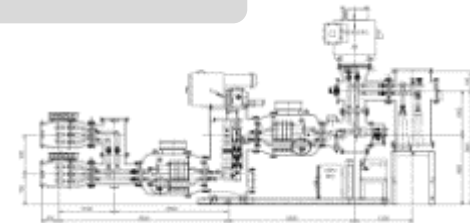
Dual CT with
two cable sealing ends
and no LA



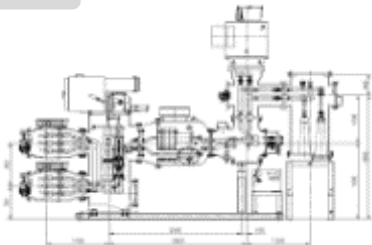
Dual CT with GIB
And no LA



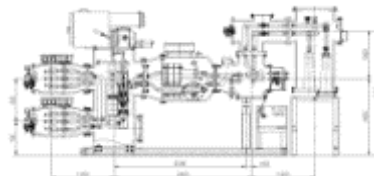
Dual CT without LA



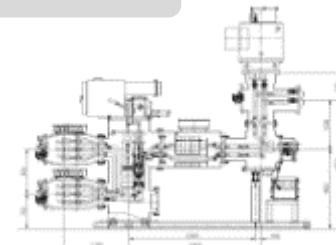
Single CT



Single CT without VT



Single CT with GIB



Competitiveness of Product – Reliability

- Hyosung GIS are operating successfully in special conditions including extremely high and low temperature conditions.

**Russia/
220kV GIS**



**Venezuela/
JBA Outdoor GIS**



**Qatar/
Semaisma 132 kV GIS**



**Korea/
Shin Bundang Underground S/S GIS**



1. Introduction to Hyosung GIS

2. Why Hyosung GIS

- Global Achievements
- Competitiveness of Product
- **Systematic Process & Service**



Systematic Process & Service – Overview

Advanced Design Verification

- Seismic Analysis
- Gas Density/Flow Analysis
- Electric Field & Structural Analysis

Manufacturing process

- In-house product for key components
- Operating Mechanism

Assembly process

- Helical Coil Application
- Long term test on insulator

Shop test process

- 1 bay or substation unit test
- 200 times no-load operation test

Transportation process

- 1-2 Bay unit transportation
- Shock and vibration control

Installation process

- Temporary clean room
- Inspection of internal part through manhole

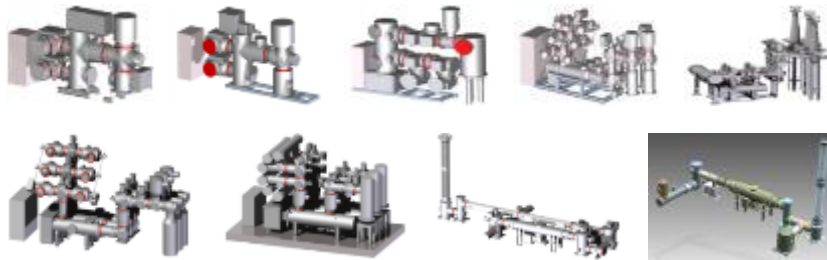
Site test process

- AIA or UHF PD measurement upon request

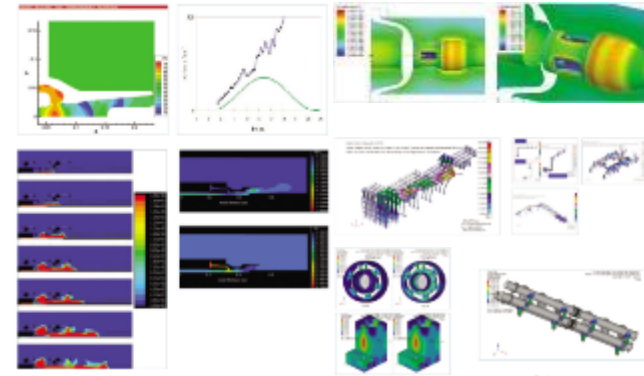
Systematic Process & Service – Research & Development

- We have well formulated R&D process. All models have been developed according to this process.

Basic Design



Detail Design



Assembling



Testing



Systematic Process & Service – Research & Development

- Our factory has sizable GIS R&D center equipped with various test facilities which are being well cared for.



Systematic Process & Service – Manufacturing

- We have large-scale production facilities for systematic manufacturing.



Systematic Process & Service – Manufacturing

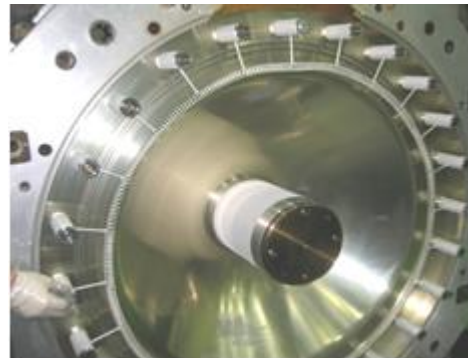
- Insulators are produced in-house. Hence, additional insulator will be provided quickly so that replacement can be carried out easily.

In-House Products

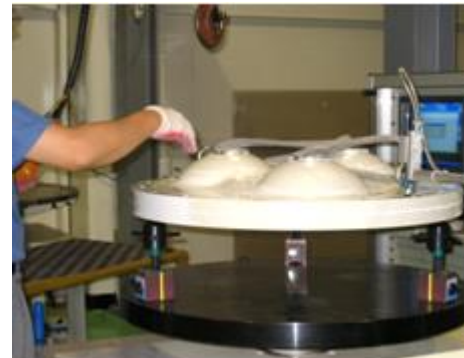
Epoxy Resin Insulator



Mold Separation



Assembly



Dimension Check



Leakage Test

Routine Test Items

- ✓ X-Ray Test
- ✓ PD Measurement
- ✓ AC HV Test
- ✓ Leakage Test

Sample Test Items

- ✓ Material Test
 - : Tg, Bending Stress, Specific Gravity, Ash Test



X-ray Test



Electric Test

Systematic Process & Service – Shop Test

- Our factory is equipped with various shop test facilities which are being well cared for.

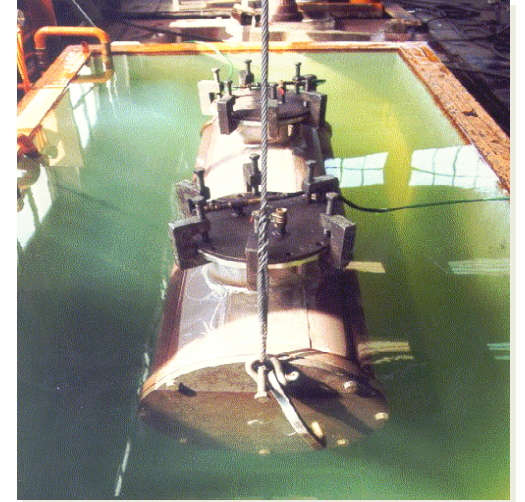


Systematic Process & Service – Shop Test

- After manufacturing, completely assembled bays are shop tested based on IEC standards. Accordingly, test list and procedure(ITP) are submitted to customer for approval.



HV/PD Test



Hydrostatic & Leakage Test



Mechanical Operation Test

Systematic Process & Service – Transportation

- 1 or 2 complete bays are packed and transported so that quality in factory can be maintained to site and assembly work at site can be reduced.



1~2 Complete bay unit transportation

- ✓ Maintain quality from factory to site
- ✓ Reduce site assembly works
- ✓ Save installation lead time

Packing in wooden box with shock indicator/recorder

- ✓ Protect GIS from damage by external shock
- ✓ Prevent failure by impact during transportation
- ✓ Possible to long-term storage

Systematic Process & Service – Installation

- Installation and assembly works at site are carried out by an established procedure.



Checking the packing status of all box



Checking dimensions for installation



Marking lines for embedded base



Unpacking main body



Delivery to GIS room



Arranging bays



Cleaning internal parts of docking points



Docking



Welding all bays to embedded base

Systematic Process & Service – Installation

- Installation and assembly works at site are carried out by an established procedure.



GIB docking



Assembling Voltage Transformer



Assembling Gas to Air bushing



Assembling platform and working for cabling



Testing of contact resistance



Testing of dew point



Vacuuming before the gassing works



Gassing

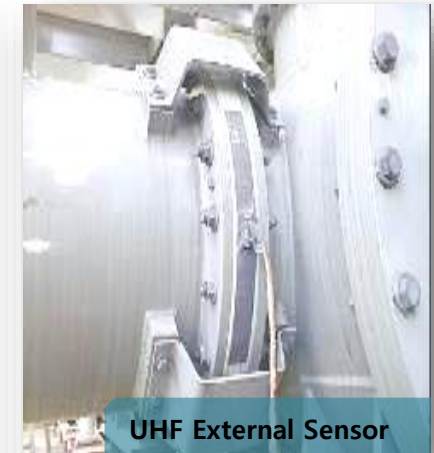
Systematic Process & Service – Site Test

- For quality assurance purposes, site tests are carried out based on IEC standards. Accordingly, test list and procedure(STP) are submitted to customer for approval.



Dielectric Test

- Oscillating Impulse Test
- AC HV Test with PD Measurement via AIA and UHF System



Systematic Process & Service – Training

- Hyosung provides training in the theory and practice for customers at Hyosung factory in Korea.

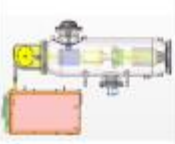












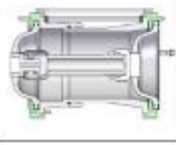



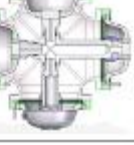


Training for customer

- ✓ Small group training is recommended for efficiency.
- ✓ If requested, courses on the customer's job site is also provided.

Systematic Process & Service – Repair & Maintenance

- Hyosung is providing all type of service (Emergency, In maintenance plan, Out of plan) by certified service engineers from Korean factory.
- 3rd party or prepared spare part kit is available for all type of electronic/electric part used in Hyosung GIS to resolve emergency case during installation, operation.
- Hyosung is controlling inventory stock of every module to provide on time service up to customer's requirement.

GCB/A	LINE DS*ES/A	LINE H-ES/A	BUSBAR ES/A	BUSBAR DS/A
				
CT/A	Bushing/A	CONNECT BUS 500mm	STRAIGHT SHORT BUS 1000mm	
				
VT	LA	90° ANGLE BUS	STRAIGHT LONG BUS	
				
SLIDING BUS	BELLOWS	45° ANGLE BUS	CHD/A	CROSS BUS
				

GIS Modules prepared by Hyosung for service



Certified engineer is always ready for site service

Systematic Process & Service – Certificate

- All procedures of Hyosung production system are guaranteed by ISO / OSHAS Certificates.

ISO 9001 Certificate since 1993



ISO 14001 Certificate since 2000



OSHAS 18001 Certificate since 2008



Systematic Process & Service – Certificate

- All types of Hyosung GIS have been certificated by CESI or KERI in accordance with IEC standards.

[HSG-144A]

Test Report		CESI	2011.06.08
		Approval	Page 1
Client	HYDRO-NG CORPORATION 494-7 Non-Bang 6-44-713 Chungwon KOREA		
Tested equipment	Data of three pole high voltage disconnecting switch (DS) of gas-insulated switchgear (GIS) type: 220kV 144B		
Tested material test	Sample phone has no test material test		
Standards/Specifications	IEC 62271-102 (2002)		
Test date	From June 15, 2008 to June 18, 2008		
The results reported in this document are only for the tests requested. Partial reproduction of this document is permitted only with the written permission from CESI.			
No. of pages	18	No. of pages annexed	78
Issue date	July 31, 2008		
Prepared	L.S.P. - Giuseppe Vito		
Verified	L.S.P. - Gianni Della Lupa, L.S.P. - La Manno Franco		
Approved	L.S.P. - Giuseppe Vito, L.S.P. - Giuseppe Vito		

[HSG-144D]

TEST REPORT		2011.06.08
		Page 1
Client	HYOSUNG CORPORATION	
Address of the client	HYOSUNG CORPORATION 171, Heondeok-ro, Seongnam-si, Gyeonggi-do 426-710, Korea GRI-710	
Manufacturer	HYOSUNG CORPORATION	
Tested components	Three phase 145 kV 40 kA 50 Hz gas insulated metal-enclosed circuit-breaker with three-phase in one enclosure and with common operating mechanism.	
Tests carried out	Three-phase short-time withstand and peak withstand current test on the main circuit	
Standards/Specifications	Client's request based on IEC 62271-100 (2012-02)	
Test date	From April 7, 2015 to April 7, 2015	
The results reported in this document refer only to the tested components. Partial reproduction of this document is permitted only with the written permission from CESI.		
No. of pages	24	No. of pages annexed
Issue date	October 7, 2015	
Prepared	L.S.P. - Gianni Della Lupa	
Verified	L.S.P. - Gianni Della Lupa, L.S.P. - Gianni Della Lupa	
Approved	L.S.P. - Gianni Della Lupa, L.S.P. - Gianni Della Lupa	

[HSG-305B]

TEST REPORT		2011.06.08
		Page 1
CLASSIFICATION	Automatic Test	
APPARATUS	High voltage test cell, high voltage switchgear	
DESIGNATION	HSG-305B	
RECEIPT No.	TNC1001058 (November 08, 2010)	
APPLICANT	HYOSUNG CORPORATION	
MANUFACTURER	HYOSUNG CORPORATION	
DATE OF TESTS	February 24, 2011 - July 31, 2011	
DATE OF ISSUE	October 25, 2011	
The tests have been carried out in accordance with applicable standards. Test procedure and test parameters were based on standards IEC 62271-100, IEC 62271-101, IEC 62271-102, IEC 62271-103, IEC 62271-104, IEC 62271-105, IEC 62271-106, IEC 62271-107, IEC 62271-108, IEC 62271-109, IEC 62271-110, IEC 62271-111, IEC 62271-112, IEC 62271-113, IEC 62271-114, IEC 62271-115, IEC 62271-116, IEC 62271-117, IEC 62271-118, IEC 62271-119, IEC 62271-120, IEC 62271-121, IEC 62271-122, IEC 62271-123, IEC 62271-124, IEC 62271-125, IEC 62271-126, IEC 62271-127, IEC 62271-128, IEC 62271-129, IEC 62271-130, IEC 62271-131, IEC 62271-132, IEC 62271-133, IEC 62271-134, IEC 62271-135, IEC 62271-136, IEC 62271-137, IEC 62271-138, IEC 62271-139, IEC 62271-140, IEC 62271-141, IEC 62271-142, IEC 62271-143, IEC 62271-144, IEC 62271-145, IEC 62271-146, IEC 62271-147, IEC 62271-148, IEC 62271-149, IEC 62271-150, IEC 62271-151, IEC 62271-152, IEC 62271-153, IEC 62271-154, IEC 62271-155, IEC 62271-156, IEC 62271-157, IEC 62271-158, IEC 62271-159, IEC 62271-160, IEC 62271-161, IEC 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Systematic Process & Service – Certificate

- Item and procedure of type tests are in compliance with relevant IEC standards.

Description of Tests	Standard	Clause
Dielectric tests	IEC 62271-203	6.2
Radio interference voltage test	IEC 62271-203	6.3
Measurement of the resistance of circuits	IEC 62271-203	6.4
Short-time and peak withstand current tests	IEC 62271-203	6.4
Temperature-rise tests	IEC 62271-203	6.5
Basic short circuit tests (T10, T30, T60, T100a, T100s(a), T100s(b))	IEC 62271-100	6.6
Line-charging & cable-charging current switching tests (LC1,2/CC1,2)	IEC 62271-100	6.111
Short-line fault tests (L75, L90)	IEC 62271-100	6.109
Out-of-phase making and breaking tests (OP2, Pre-arcing time check)	IEC 62271-100	6.11
Short-circuit current making tests	IEC 62271-102	6.101
Verification of the protection	IEC 62271-203	6.7.1
Gas tightness tests	IEC 62271-203	6.8
Additional tests on auxiliary and control circuits	IEC 62271-203	6.1
Mechanical and environmental tests	IEC 62271-203	6.102
Proof tests for enclosures	IEC 62271-203	6.103
Pressure test on partitions	IEC 62271-203	6.104
Internal arc fault tests	IEC 62271-203	6.105
Insulator tests	IEC 62271-203	6.106
Bus-transfer current switching tests	IEC 62271-102	6.106
Electrostatically induced current switching tests	IEC 62271-102	6.107
Electromagnetically induced current switching tests	IEC 62271-102	6.107
Single-phase fault tests	IEC 62271-100	6.108

Systematic Process & Service – Academic activities

- Hyosung periodically participates in International Academic & Exhibition Activities.

CIGRE



IEEE PES



GD
(Gas Discharges)



ISH



■ CIGRE Study Committees A3/B3 Working Group Member

A3: High Voltage Equipment, Representative of CIGRE KOREA

B3: Substations, Representative of CIGRE KOREA

■ Presenting 36 times of thesis at the conference since 2000

“Development of 245kV 40kA/50kA SF6 Gas Insulated Switchgears using non-conventional technology” CIGRE SC A3 Colloquium, Rio, Brazil

■ Attending Exhibitions annually



Thank You!

Always by your side

Hyosung works in a variety of industrial and technology areas that make your lifestyle more convenient and more comfortable.* In fact – from the fibers that make the fabric in your clothes, the materials for the tires and seatbelts that keep you and your car safe and the power transmission lines that provide electricity to your home, to other day-to-day items such as plastic drinking bottles, ATM machines, motors, pumps, carpets and plastic wrapping films – Hyosung and its innovative products are already closer to you than you think. You may not know us, but we are always working for you – **Hyosung is always behind you.**