Gas-insulated switchgear
Pioneer and technology leader, driving gas-insulated switchgear (GIS) innovations
ABBB pioneered high-voltage gas-insulated switchgear (GIS) more than 50 years ago and is a global leader offering a full-range product portfolio with voltage levels from 72.5 kV to 1200 kV matching current and future requirements for modern switchgears.

As a market leader in high-voltage GIS technology, ABB has a global installed base of more than 35,000 bays.

In a power system, switchgear controls, protects and isolates electrical equipment to boost the reliability of power supply. GIS is a compact metal encapsulated switchgear consisting of high-voltage components such as circuit-breakers and disconnectors.

With GIS technology, key components including breakers, switches, contacts and conductors are protected with insulating gas.

ABB has always been and continues to drive innovation in GIS technology in ratings, operations, switching technology, digital control and supervision, and compactness.

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**Many first’s from ABB in GIS**

<table>
<thead>
<tr>
<th>Year</th>
<th>First 550 kV GIS</th>
<th>First 800 kV GIS</th>
<th>Most compact 145 kV GIS</th>
<th>Chinas largest 500 kV GIS</th>
<th>Largest urban 550/220/123 kV GIS</th>
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</thead>
<tbody>
<tr>
<td>1968</td>
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<tr>
<td>1984</td>
<td>World's first 170 kV GIS</td>
<td>Largest 550 kV GIS</td>
<td>First integrated 170 kV GIS</td>
<td>Underground 145 kV GIS</td>
<td>Ultra high-voltage 1100 kV GIS</td>
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<td>1987</td>
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<tr>
<td>2010</td>
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</tbody>
</table>
Global manufacturing network

Our global network of state-of-the-art manufacturing facilities are located close to our customers.

- **Hanau, Germany**
  - GIS 72.5 kV - 170 kV

- **Xiamen, China**
  - GIS 72.5 kV - 1200 kV

- **Zurich, Switzerland**
  - GIS 245 kV - 420 kV

- **Dammam, Saudi Arabia**
  - GIS 72.5 kV - 420 kV

- **Savli, India**
  - GIS 72.5 kV - 420 kV

- **Tangerang, Indonesia**
  - GIS 145 kV - 170 kV

- **Highest voltage level in the world 1200 kV GIS**
- **Offshore 420 kV GIS**
- **Africa’s largest 145 kV GIS**

- **2012**
  - First compact 420 kV GIS

- **2013**
  - World’s first eco-efficient 170 kV GIS

- **2015**
  - Extra high-voltage 800 kV GIS

- **2017**
  - More than 35,000 GIS bays installed worldwide

- **2018**
  - PIONEER AND TECHNOLOGY LEADER

Our global network of state-of-the-art manufacturing facilities are located close to our customers.
For all types of applications

GIS can be safely operated in confined spaces and is used where space is limited, such as extensions, in city buildings, on roofs, on offshore platforms, industrial plants and hydro power plants.
Applications
1. Power transmission and distribution
2. Integration of renewable power generation units to the grid
3. Offshore and onshore wind power connections
4. Very large power plants
5. Industry applications
6. Long range power transmission

Benefits
- Advanced features for digital substation
- Low environmental impact and life-cycle costs
- Reduced installation and commissioning time
- High quality standards and safety
New generation GIS

**ELK-04 C, 145 kV**
3150 A, 40 kA

Reliable and compact solution for 145 kV. Its design yields eco-efficient performance, simplifies planning and installation while improving serviceability.

**ELK-14 C, 245 kV**
3150 A, 50 kA

245 kV eco-efficient and compact solution designed to reduce complexity, life-cycle costs and environmental impact. The compact design fits any installation environment and offers convenient operation and serviceability.

**ELK-3 C, 420 kV**
5000 A, 63 kA

High performance ratings in a compact design. A single interrupter circuit-breaker enables manufacturing, testing and shipment of entire bays, which reduces installation and commissioning time.
Proven technology

**ELK-04 up to 170 kV**
4000 A, 63 kA

The modular solution, based on a few building blocks with standardized dimensions offers a space saving design, a small footprint and high performance ratings.

**ELK-14 up to 362 kV**
4000 A, 63 kA

The modular design offers an outstanding level of flexibility for optimizing substation layouts, both in arrangement and technical features.

**ELK-3 up to 550 kV**
6300 A, 63 kA / 80 kA

Requires less space than comparable GIS systems. Its modular architecture permits flexibility and adaptation to changing needs while providing short delivery and installation time.

**ELK-4 up to 800 kV**
6300 A, 63 kA

The extra high-voltage (EHV) GIS offers maximum flexibility and customization in layout configuration. Optimized, compact and easily accessible layouts for the common one-and-a-half-breaker and two-breaker circuit schemes.

**ELK-6 up to 1200 kV**
9000 A, 63 kA

Ultra high-voltage (UHV) above 800 kV is the highest voltage level in use for bulk alternating current (AC) power transmission across long distances.
More than just products

Integrated GIS solutions up to 420 kV
ABB’s integrated GIS is a pre-designed, standardized and fully integrated switchgear for fast deployment and high reliability, based on our well proven GIS technology.

It’s the ideal solution for customers in need of substations that can be quickly energized for grid expansions, backup or emergency power needs, and for short installation time requirements.

The integrated GIS package comes with all primary and secondary equipment including control, protection, monitoring and communication completely installed in the prefabricated housing. Due to its prefabricated design and short deployment time, it is ideal for applications in the oil, gas and mining industries where it can be easily transported to the sites.

AirPlus™ enhancing eco-efficiency
ABB is committed to developing eco-efficient products and achieved a technology breakthrough in eco-efficient GIS as an alternative to sulfur hexafluoride (SF₆). It substantially lowers environmental impact with a global warming potential (GWP) of less than 1.

AirPlus™ is ABB’s family of eco-efficient gas mixtures as an alternative to SF₆ for high-voltage (HV) and medium-voltage (MV) products. ABB’s family of eco-efficient gases consists of components of air (O₂, N₂, CO₂) plus C₅-Fluoroketones.

The world’s first GIS installation with a new eco-efficient gas mixture as an alternative to SF₆ was commissioned for ewz, a power utility in Switzerland.
Providing value to our customers

Enabling digital substations
ABB’s GIS can be equipped with monitoring, measurement, control, protection and communication features for smooth integration into substation automation systems.

Benefits
- Integration into substation automation systems using IEC 61850 bus
- Non-conventional instrument transformers (NCIT) via IEC 61850-9-2LE process bus
- Local control cubicle (LCC) with Relion® series control and protection IED
- REB500 bay control IED
- Switchsync™ PWC600 for point-on-wave controlled switching
- Modular switchgear monitoring (MSM) to supervise SF6 gas density
- Station wide interlocking and double-operation interlocking

Service for GIS
ABB’s service portfolio offers comprehensive solutions that extend the operating asset life while reducing maintenance costs.

With technology development at the forefront of everything we do, upgrade and retrofitting are just two of our many offerings which can help you modernize and extend the life of your existing equipment.

Benefits
- 24/7 hotline ensures quick reaction time
- Diverse training courses for your personnel
- Customized maintenance and retrofit solutions
- Capability of bay extensions for any GIS, including non-ABB switchgears
- Options to adapt your GIS to future requirements including rating upgrades and layout modifications
- Service agreements including: Risk assessments, warranty extensions, diagnostics, consulting and much more
Comprehensive portfolio

<table>
<thead>
<tr>
<th>Product name</th>
<th>ELK-04 C</th>
<th>ELK-14 C</th>
<th>ELK-3 C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enclosure</td>
<td>Three-phase</td>
<td>Three, single-phase</td>
<td>Single-phase</td>
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<tr>
<td>Rated voltage</td>
<td>kV</td>
<td>145</td>
<td>245/253</td>
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<tr>
<td>Rated power-frequency withstand voltage</td>
<td>kV</td>
<td>275</td>
<td>460</td>
</tr>
<tr>
<td>Rated lightning impulse withstand voltage</td>
<td>kV</td>
<td>650</td>
<td>1050</td>
</tr>
<tr>
<td>Rated normal current</td>
<td>A</td>
<td>3150</td>
<td>3150</td>
</tr>
<tr>
<td>Rated short-circuit breaking current, 3s</td>
<td>kA</td>
<td>40</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product name</th>
<th>ELK-04</th>
<th>ELK-14</th>
<th>ELK-3</th>
<th>ELK-4</th>
<th>ELK-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>kV</td>
<td>145/170</td>
<td>300/362</td>
<td>420/550</td>
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<tr>
<td>Rated power-frequency withstand voltage</td>
<td>kV</td>
<td>275/325</td>
<td>460</td>
<td>650/740</td>
<td>960</td>
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<tr>
<td>Rated lightning impulse withstand voltage</td>
<td>kV</td>
<td>650/750</td>
<td>1050</td>
<td>1425/1675</td>
<td>2100</td>
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<tr>
<td>Rated normal current</td>
<td>A</td>
<td>3150/4000</td>
<td>4000</td>
<td>5000/6300</td>
<td>5000/6300</td>
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<tr>
<td>Rated short-circuit breaking current, 3s</td>
<td>kA</td>
<td>40/63</td>
<td>63</td>
<td>63/80</td>
<td>63</td>
</tr>
</tbody>
</table>
Quality assurance
We are committed to providing the best products and services. Our products comply with or exceed the latest international standards. In addition to type tests in independent laboratories, our certified design and manufacturing process guarantee the highest quality.

Our products are type tested according to international standards:
• IEC
• ANSI/IEEE
• GOST

Our products are certified by third-party organizations:
• PEHLA
• LAPEM

Sustainability
For ABB, sustainability is about balancing economic success, environmental stewardship and social progress to benefit all our stakeholders.

Sustainability considerations cover how we design and manufacture products, what we offer customers, how we engage suppliers, how we assess risks and opportunities, and how we behave in the communities where we operate and towards one another, while striving to ensure the health, safety and security of our employees, contractors and others affected by our activities. In line with our business practices, we publish environmental product declarations for each product we manufacture.
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