Gas Insulated Switchgear
Modular and flexible, 52-1100kV
Tradition and Innovation
Milestones from more than 40 Years of Experience

Pioneer & Leader in GIS-Technology

- 1956 First research with $\text{SF}_6$
- 1965 First GIS, 110 kV
- 1966 First GIS, 170 kV
- 1976 First GIS, 550 kV
- 1978 First GIS, 80 kA, 245/550 kV
- 1987 First GIS, 800 kV
- 1992 First GIS, Container, 145 kV
- 1997 First GIS, very compact, 123 kV
- 1998 First GIS, 3-phase, 50kA, 170 kV
- 2003 First GIS, 3-phase, 63kA, 145 kV
- 2008 First GIS, 1100 kV
ABB GIS Product Portfolio
Modular, flexible Systems from 52-1100kV (Examples)

**ELK-04**
- Three phase
- Up to 170kV, 63kA, 4000A

**ELK-14**
- Three- and single phase
- Up to 300kV, 63kA, 4000A

**ELK-3**
- Single phase
- Up to 550kV, 63kA, 6300A

**ELK-5**
- Single phase
- Up to 1100kV, 50kA, 6300A

Size of human
## Product Portfolio, Gas Insulated Switchgear
### Technical Data

<table>
<thead>
<tr>
<th></th>
<th>Sub-Transmission 52-170kV</th>
<th>Transmission 245-1100kV</th>
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<tbody>
<tr>
<td><strong>Type</strong></td>
<td>ELK-04</td>
<td>ELK-14</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Three phase</td>
<td>Three-, Single phase</td>
</tr>
<tr>
<td>Rated Voltage (KV)</td>
<td>145/170</td>
<td>245/252/300</td>
</tr>
<tr>
<td>Rated Power Frequency Withstand Voltage* (kV)</td>
<td>275/325</td>
<td>460</td>
</tr>
<tr>
<td>Rated Lightning Impulse Withstand Voltage* (kV)</td>
<td>650/750</td>
<td>1050</td>
</tr>
<tr>
<td>Rated Normal Current (A)</td>
<td>2500/3150/4000</td>
<td>3150/4000</td>
</tr>
<tr>
<td>Rated Short Circuit Breaking Current, 3s (kA)</td>
<td>40/50/63</td>
<td>50/63</td>
</tr>
</tbody>
</table>

* Against earth
Product Portfolio, Gas Insulated Switchgear

Essential Features

- Compact, completely encapsulated active components
  - No influence of environmental conditions
  - Modular, flexible and volume optimized
  - Minimum volume of insulating gas, high gas tightness
  - Reliable function at high altitudes (> 1000m)
  - High reliability and availability

- High Economic Efficiency
  - Low life cycle - and maintenance costs
  - Long economic life-time (> 40 years)
  - Pre-fabricated, pre-tested - short project processing time

- Energy Efficient
  - Flexible Integration within center of power consumption
  - Ideal solution for integration of renewables
  - Intelligent secondary technology

- Integrated Technology
Gas Insulated Switchgear- Technology
Perfect Modules result in Perfect Systems

Circuit Diagram
- Double bus-bar bay
- Legend

1 Disconnecting and Earthing switch
2 Circuit Breaker
3 Current Transformer
4 Disconnecting and Earthing switch
5 Voltage Transformer
6 Fast Acting Earthing Switch
7 Cable Exit

ELK-04
- Double bus-bar bay
- Substation with 7 bays
- Double bus-bar
Gas Insulated Switchgear of Type ELK-04
Modular, flexible System up to 170kV

- Completely three phase encapsulated
- Continuous further development since market launch in 1992
- Complete bay fits in Container
- Worldwide experience under many different conditions
- Already today integral part of hydro power plants and offshore wind farms
- Many features protected by patents

- More than 14,000 bays in more than 70 countries successfully in operation

ELK-04
- Dubai
- 31 bays
Gas Insulated Switchgear of Type ELK-14 / 245/253
High Reliability, Proven Components

- New innovative product in three- and single phase arrangement
  - Bus-bar and feeder three phase
  - Circuit breaker single phase
- Combination of proven modules other model ranges
- Delivery complete pre-factory tested with local control cubicle and control
Gas Insulated Switchgear of Type ELK-14/300
Modular, the Right Choice up to 300kV

ELK-14/245
- Cross section
- Double bus-bar bay up to 300kV, 63kA, 4000A

Proved and tested Product in single phase arrangement
- High degree of integration
- Modular configuration
- Module with combined disconnecting- and earthing switch and one operating mechanism

ELK-14/300
- France
- 3 bays
Gas Insulated Switchgear of Type ELK-3
Most Compact Layout up to 550kV

ELK-3
- Cross section
- Double bus-bar bay up to 550kV, 63kA, 6300A

- Multi-purpose applied and proven product in single phase arrangement
- Space saving due to high degree of integration
- High reliability and availability

ELK-3
- China
- 3-gorges dam
- 73 bays
Gas Insulated Switchgear of Type ELK-4
Most Compact in 800kV Voltage Segment

ELK-4
- Cross section
- Double bus-bar bay up to 800kV, 50kA, 5000A

- Most compact 800kV switchyard
- High degree of Integration
- High reliability and availability

ELK-4
- South Africa
- 12 bays
Gas Insulated Switchgear of Type ELK-5
Innovative Technology for Ultra High Voltages

ELK-5
- Switchgear Jingmen

Innovative product in single phase technology for ultra high voltages (1100kV)
- Very compact arrangement
- 1100kV pilot project in China with 600 km overhead line and 3 Substations (Jingmen, Nanjang, Jing Don Nan)

ELK-5
- Development Testing of one pole
GIS ELK-3 up to 550 kV
GIS ELK-3 C up to 420 kV
GIS ELK-04 up to 170 kV
GIS ELK-04 C up to 145 kV
GIS ELK-4 up to 800 kV
GIS ELK-5 up to 1200 kV

GIS ELK-14 up to 300 kV
GIS ELK-14 C up to 245 kV
GIS ENK up to 72.5 kV
ELK Hybrid up to 550 kV
Integrated GIS up to 420 kV