



High-power
transmission up
to 6300 A

High Voltage Products

Gas-insulated transmission line

Factory brief

Hitachi Energy is a global technology leader with a combined heritage of almost 250 years, employing around 38,000 people in 90 countries. It is committed to powering good for a sustainable energy future, with pioneering and digital technologies, as the partner of choice for enabling a stronger, smarter and greener grid.

Hitachi Energy, introduced the gas-insulated switchgear (GIS) over 50 years ago and provided a reliable power supply for utility and industry segments. With continuous innovation and advances, we have spread a network of state-of-the-art GIS and Gas-insulated lines (GIL) manufacturing facilities and service centers worldwide.

Founded in 1999, the high-voltage factory in Xiamen, China is specialized in the production of GIS and GIL from 72.5 kilovolts (kV) up to 1200 kV. The facility has a Research and Development (R&D) center, testing laboratory and service. Based on advanced technology, Hitachi Energy continues to explore innovative solutions for its customers.

Following its global R&D and engineering platform, the factory uses modern processing techniques and efficient production management, reaching an annual capacity of more than 2000 bays. By combining our global standards with the local market needs, the production unit has fully met customers' expectations. The Ultra High Voltage (UHV) test laboratories can perform tests on all high-voltage products up to 1200 kV with advanced testing equipment and inspection techniques, reinforcing safety, reliability, and on-time delivery.

To ensure high-quality service, the factory offers a 24/7 hotline and an advanced response process to ensure effective communication and efficient solutions for our customers. Besides professional on-site service for erection and commissioning, the unit also provides an expert team for on-demand training customization. The comprehensive service portfolio is designed to enable a smooth product operation while creating a safe and superior user experience.

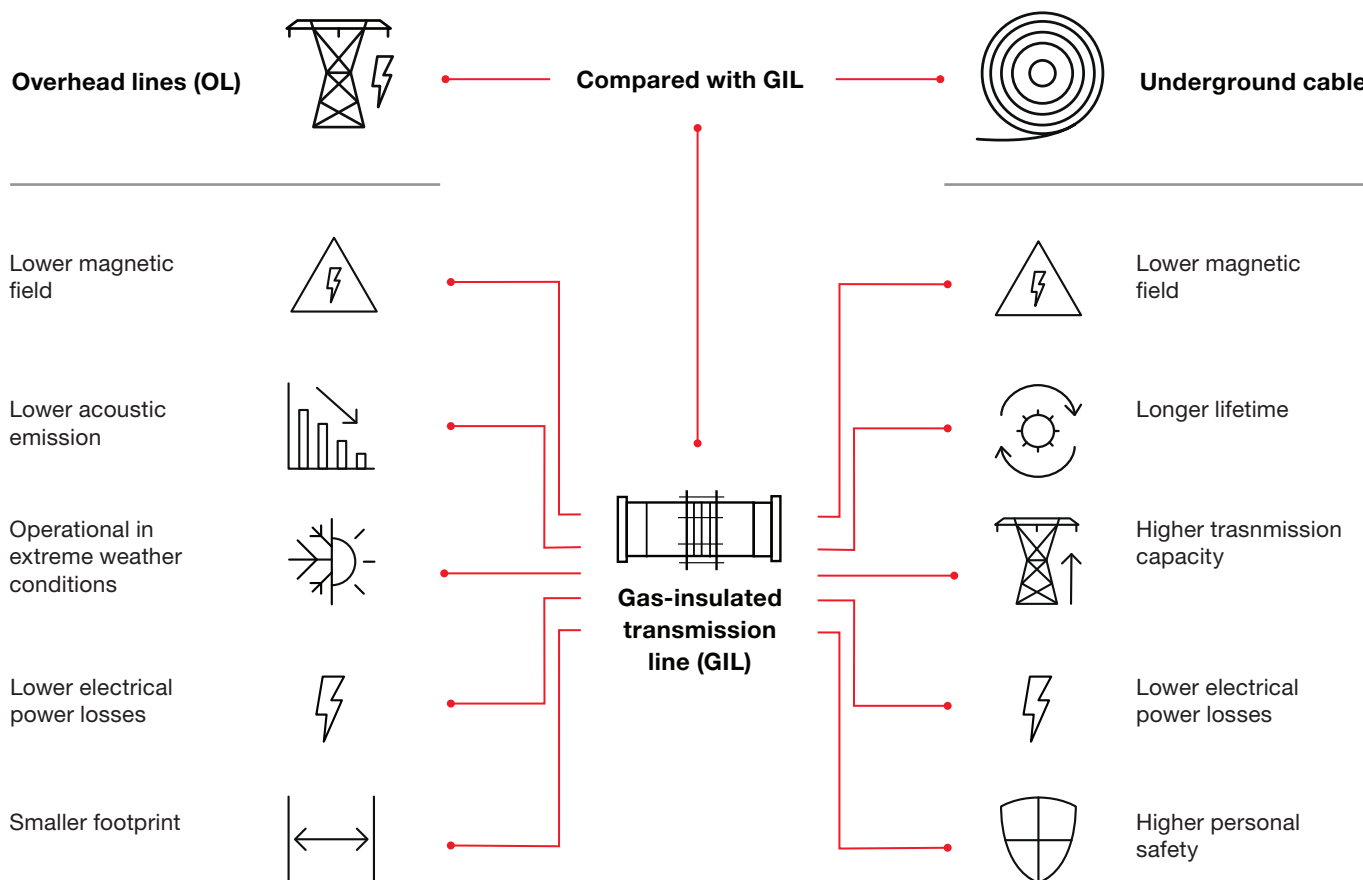
Up to now, the factory has delivered more than 7000 bays for more than 1000 substations in China and overseas markets, including the 1100 kV GIL technology and product provided for the worlds' first UHV power transmission project under the Yangtze River and the 220 kV GIS for a high altitude substation in South America. Our products and services are also delivered in the Hong Kong-Zhuhai-Macau Bridge, Beijing Olympic Stadiums – the Birds Nest and Water Cube, and to many other projects around world.

From China to overseas markets, from rural to urban areas, Hitachi Energy expands its footprint every day. As the global leader in GIS & GIL technology, our production unit in Xiamen, China forges technological innovation to enable a stronger, smarter, and greener power grid.



Why GIL?

GIL benefits, compared with overhead lines and cable solutions.



Gas-insulated transmission line

- GIL adopts a metal enclosed structure, which is not affected by the external atmosphere and environment
- Applicable to various occasions, especially occasions with special requirements, such as places with limited space in cities, high altitude places, power stations (nuclear power plants, hydropower stations with complex geological structures), etc.
- The running status can be monitored, the failure will not explode or catch fire, and the design life is 50 years

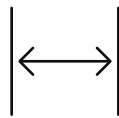
Benefits

- High safety and reliability, long service life
- Low power transmission loss, large transmission capacity, suitable for large-capacity, long-distance power transmission
- The current capacity of GIL is equivalent to that of overhead lines, which is twice that of cables
- Under the same transmission capacity, the loss of GIL is half of the cable and 1/3 of the overhead line
- Environmentally friendly, low electromagnetic pollution
- Installation and maintenance are convenient, and the equipment is basically maintenance-free after operation

Typical GIL applications and benefits



URBAN AREAS



INTERCITY CONNECTION



POWER PLANTS



ONSHORE WIND POWER

Benefits

- There is no impact of climate conditions on a GIL leading to no aging. Indoor or outdoor coating and an adapted design of assembly units is a guaranty of long-lasting operation
- Large amount of energy can be transmitted over long distances
- Saving the land for urban cities which benefit the social economy
- High reliability and safety – installation in tunnels or public areas
- Longer lifetime



GIL enables safe and reliable power transmission for multiple applications

Design and capital expenditure

Hitachi Energy's high standard of quality control and advanced R&D processes ensure superior product quality. The outstanding product design expertise with project emulation and highly experienced engineers enable a best-in-class gas-insulated line to customers worldwide.

GIL offers can be customized to project requirements related to temperature variations, ensuring proper foundations or solving vibration challenges due to multiple factors (e.g. transformer connection, cross-railway etc.)

Once completed, the maximum length of the GIL tube is 18 meters. To ensure a reliable connection, the insulator's structure is configurable with a variety of compensation modules. The basin-type barrier is installed externally and allows a stable and reliable connection of the insulators with three supporting points.

GIL's compartment has two standard connections, enabling a reduced gas leakage to an annual rate ≤ 0.1 percent. This allows for lower SF₆ inflation and working pressure. Below 20 °C, the SF₆ rated filling pressure (4.6 bars abs.) and minimum functional pressure (3.9 bars abs.)

The outstanding engineering during the design phase ensures better capital expenditure and significant project savings. Our simulation centers in Switzerland, Poland, and China provide flexibility to our customers, already in during the designing phase.



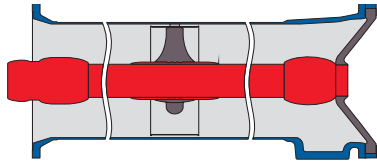
In a first-of-its-kind engineering feat, the State Grid Corporation of China (SGCC) partnered with Hitachi Energy to lay 1000 kV GIL inside the Sutong tunnel, under the Yangtze river.



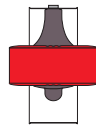
Hitachi Energy provided leading high-voltage (HV) technologies for the newly constructed Luquan converter station in Yunnan Province to ensure safe and reliable power supply. China's first "three-terminal" DC power project that transformed from a "two-terminal" DC transmission line.

Product features

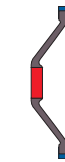
Modules overview



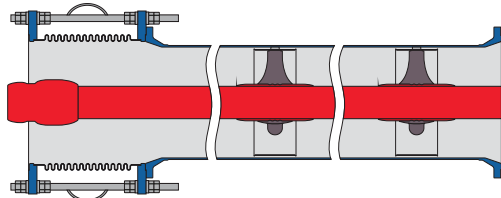
Up to 18 m tube



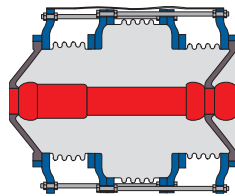
Post support insulator



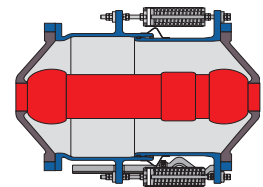
Barrier insulator



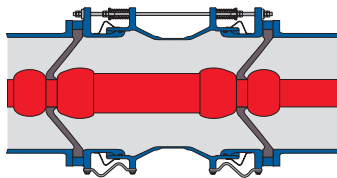
Axial compensator



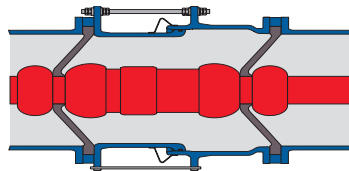
Axial compensator



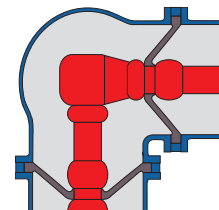
Axial compensator



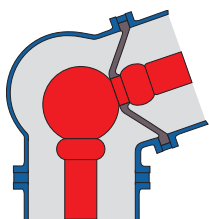
Radial compensator



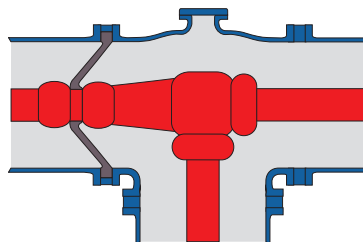
Dismantlable module



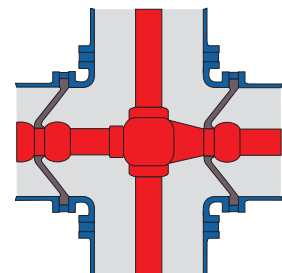
90 deg. elbow



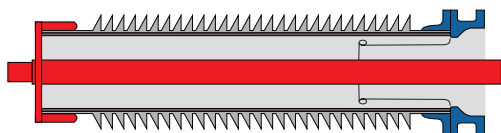
Variable angle elbow (0-90°)



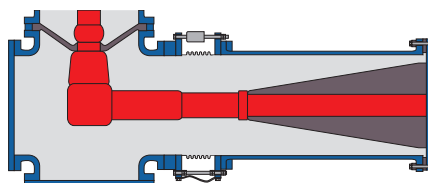
T connection module



X connection module



Porcelain/silicone rubber bushing



Transformer connection module

Hitachi Energy

High Voltage Products

Gas-insulated transmission line

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