

UHF External Sensor

For Partial Discharge Monitoring of Gas-Insulated Substation

Gas-insulated substations (GIS) have been around since the 1960's and as the equipment ages, reliability can deteriorate. In many cases, faults have a dielectric origin, with an even higher failure rate for voltages above 170 kV.

Continuous monitoring of GIS health via measurement of partial discharges is the most efficient and competitive solution to prevent potential high repair costs and long downtimes. Grid Solutions has developed and patented a new generation of highly sensitive UHF external sensors to retrofit GIS through the installation of the latest partial discharge monitoring devices.

Increasing equipment lifetimes and preventing flashovers is now possible. UHF external sensors detect partial discharges of all types in gas-insulated substations and monitoring devices.

Highly Sensitive

When retrofitting dielectric monitoring equipment, sensitivity is an issue. Signal detection is crucial to diagnosis and the measuring equipment has to find the right compromise between the high sensitivity required to detect mobile particles, the most common defect, and a PD sensitivity value that can be obtained in the field.

Retrofit all GIS

To fit with any type of GIS, the UHF sensors are designed with a 30 mm diameter and achieve twice the sensitivity compared to others on the market.

Thanks to their standard Type N socket connector, they can be connected to any PD monitoring equipment of any gas-insulated substation, regardless of the manufacturer.

Specialist Expertise

Two types of antennae were designed in conjunction with a specialist in aerospace and military applications. One is a viewport antenna that can be fitted to inspection viewports, the other is a barrier sensor to put on insulator flanges, where the flange design permits this.

The antennae are the most sensitive available today. Each has been optimised using finite element electromagnetic modelling.

Easy to Install

Because it is an external sensor, the mounting components and procedures were designed so that legacy equipment can be upgraded without having to shut down the installation or to dismantle any of the components under SF₆ gas pressure.



Early Fault Detection

- Partial Discharge detection via continuous monitoring
- Condition-base asset management
- In-service diagnostic

Modular

- Fits all GIS
- Easy to install
- Designed for legacy equipment upgrade

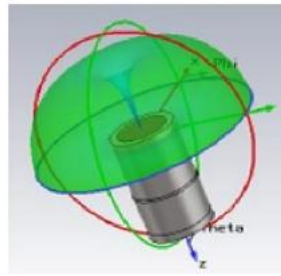
Highly Sensitive

- Sensitivity up to 3 times greater compared to alternatives
- Shielded to avoid electromagnetic interference



Modular and Highly Sensitive Sensors to Retrofit all Aging PD Monitoring Systems

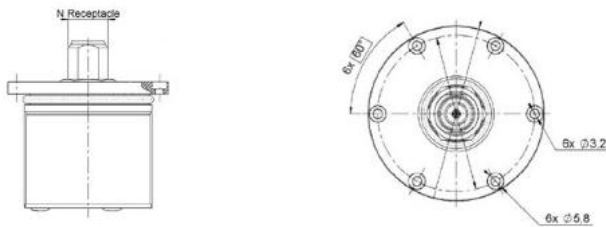
The sensors are shielded to avoid electromagnetic interference, even from mobile phones in the 300 MHz to 2 GHz range. Lab tests carried out in an anechoic chamber show results compliant with the TGN21 standard. Furthermore the sensors have far better sensitivity and accuracy than comparable devices – up to three times better in some bandwidths.



Viewport Sensor

To be used in gas-insulated equipment, the viewport sensor must have a minimum diameter of 32 mm. This type of sensor keeps the main functions of the inspection windows available.

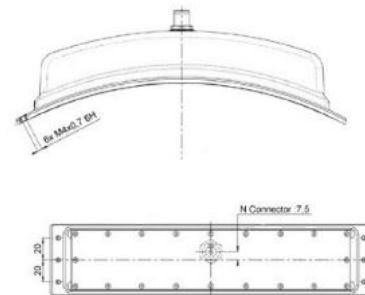
Output	N-Connector
UHF range	300-2000 MHz
Sensitivity	<-90 dBm
Type of antenna	Dipole
Op. temp.	-40/+55°C
Ingress system	IP65



Barrier Sensor

To be used in GIS equipment, the insulating plate must have a minimum width of 30 mm and not be covered with metal. The same sensor is ready for use on a wide range of GIS, regardless of diameter, and can easily be installed (no shut-down) thanks to its polyurethane belt.

Output	N-Connector
UHF range	300-2000 MHz
Sensitivity	<-90 dBm
Type of antenna	Slot
Op. temp.	-40/+55°C
Ingress system	IP65



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