

# Applications - GIS / GIL



Besides factory partial discharge testing for quality assurance, field-testing becomes increasingly important for gas-insulated equipment. For the field applications UHF and acoustic detection methods complement the low frequency detection according to the IEC60270.

### ICMcompact

The ICMcompact combines perfectly with small tank-type variable frequency test sets for the commissioning testing of gas-insulated substation equipment. Besides the flexible analog gating function, the ICMcompact comes with a TTL gating input to effectively suppress the switching impulses of the resonant test set.

For in-depth field analysis of partial discharge activity the ICMsystem can be combined with a spectrum analyzer. Power Diagnostix has written the special software ICMspectrum to utilize and control spectrum analyzers of different vendors for partial discharge analysis (HP 859xE, Agilent E4000, R&S FSL).



Field measurement set up



ATT analyzer

### ATT analyzer

The portable ATT analyzer is a simple and very effective tool to locate breakdown during the commissioning of GIS and GIL. Battery-operated acoustic sensors are externally mounted to the GIS and connected via fiber optic cable to the acquisition unit. In case of breakdown, the acoustic sensor transmits an optical signal to the ATT analyzer, when it has detected the sound wave. The ATT analyzer then displays the signals received from all sensors versus time like a logic analyzer. Following initial location of the breakdown's origin, the acoustic sensors can be repositioned closer to the flaw to further narrow down the location.

### AIAcompact

The main application of the AIAcompact is the acoustical detection of partial discharge in gas-insulated equipment. Conveniently, the unit provides the supply voltage of the different pre-amplifiers and the acoustic sensors. The instrument is lightweight and battery operated. Moreover, the AIAcompact allows conducting UHF measurements when connected to embedded or external UHF sensors. The AIAcompact automatically detects the pre-amplifier type and selects the appropriate operation mode.



Ring sensor on GIS



GIS window sensor



Breakdown sensor



Preamplifier RPA6C



Acoustic sensor

## Partial Discharge Monitoring

The same sensors (external or internal) as used for commissioning can be used for continuous on-line monitoring of the partial discharge activity. Here, acquisition units equipped with built-in multiplexer scan the number of sensors, each directly connected to a small preprocessing amplifier unit (RPA6C). This preprocessing unit acts as a detector and converts the ultra-wide bandwidth signal into a low-frequency envelope signal, which is then conveniently transmitted via regular RG58 cable. The RG58 cable also provides the DC supply for the preamplifiers. Embedded modem units or TCP/IP interfaces offer remote access to a multitude of monitoring units via the Internet, an Intranet, or the telephone network.

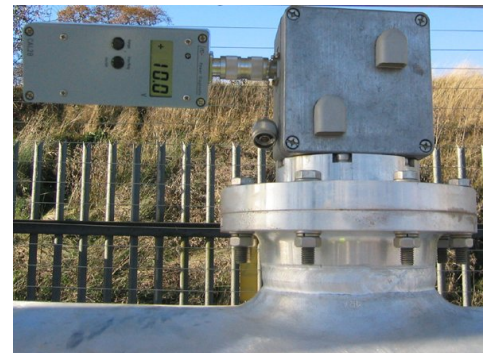


Monitoring system

## Typical Packages

Instruments for commissioning and service groups:

- AIAcompact
- ATTanalyzer
- ICMsystem with spectrum analyzer or ICMcompact
- UHF preamplifier
- External retrofit UHF sensors
- Acoustic sensors
- UHF calibrator CAL2B



UHF impulse calibrator CAL2B

Example for a PD monitoring system on a 123 kV substation:

- 1 x Portable ICMmonitor, or
- 10 x ICMmonitor for permanent installation, 8 channel multiplexed;
- Option: built-in modem or TCP/IP
- 1 x Software ICMmonitor (GIS vers.)
- 1 x Remote computer
- 1 x Impulse calibrator CAL2B
- 80 x retrofit ring or window sensors
- 80 x preamplifier RPA6C
- 80 x Set of cables

Power Diagnostix range of instruments cover the entire needs of partial discharge testing on gas-insulated substation equipment from production testing and commissioning to maintenance and monitoring.

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