The DDX 9101 partial discharge detector belongs to our very successful family of DDX detectors. It is the ideal solution for pass/fail partial discharge testing; incorporating all the basic functions of an analogue detector and meeting all IEC and IEEE/ANSI standards for PD testing. We’ve eliminated the costly, advanced features associated with fully computerized PD detectors. The DDX 9101 simply measures the level of PD and the applied test voltage. It’s designed to help you modernize your facility at an affordable price and it’s simple to operate.

DDX 9101 is a straightforward replacement for older analogue detectors of any make or model. The system is housed in a 3U 19” rack mount case designed to slide into a rack. Or, if you need a complete new test system, the detector can be integrated with an AC power supply for production PD testing of HV components.

This simple-to-use detector is controlled via 8 control buttons on the front panel. To operate the detector, select the desired operation mode (magnitude meter or oscilloscope mode) and choose the appropriate amplifier settings. Calibrate the measurement setup, set the maximum acceptable PD level and you are ready to start the test. Once the voltage is applied to the test object, an indicator on the screen tells you if the test object passed or failed the test.

With the data acquisition / remote control software and a PC (optional) the capabilities of the unit are greatly expanded. All data is acquired during the test according to user-defined parameters, the data can then be used to generate customized test reports with graphs and charts. The user can also take “snapshots” of the ellipse any time during a test. It’s just like that camera on your old analogue scope, only easier.

The most distinguishing feature of the DDX 9101 advanced software is its ability to operate and monitor multiple detectors simultaneously. If you are a manufacturer performing routine PD tests in multiple bays, each DDX 9101 can now be linked to a single PC enabling remote controls, monitoring and acquisition of all data.

 FEATURES

- Settable PD threshold with indicator light when limit is exceeded
- Ethernet port for communication with a PC (optional)
- Data acquisition and remote control software package
- Two modes of operation - meter mode or scope mode
- Compact, 3U (19”) rack mount case ideal for integrating into a test system

 BENEFITS

- Perfect for pass/fail testing – you set the allowable PD level and the unit determines pass and fail.
- Simple to use – 8 buttons on the front panel are all you need to operate the detector.
- Straightforward replacement – if you’ve got an old analogue unit and need a cost effective, simple replacement.
- Multiple detector – with the data acquisition/remote control software you can operate and monitor multiple detectors at the same time.
- Integrated test systems – because of its compact design and functionality this unit is ideal for an integrated PD test system including an AC power supply.

 APPLICATIONS

Testing of:
- Distribution Transformers
- Power Transformers
- Current and Potential Transformers
- Rotating Machines
- Power Capacitors
- Switchgears
- Surge Arrestors
- Cables
- Research & Development
Test Status Indicator Bar
The test status indicator bar includes three sets of test indicators to aid during testing. On the left side are the user selected Range, Low Pass Filter and High Pass Filter settings. On the right side are indicator lights: auto-range shows if the auto-range feature is enabled and auto-ranging lights when the device is actively auto-ranging. The Voltage and PD Meter O/R light when the meter reading is beyond the scale of the meters. The light in the middle is the pass/fail indicator for PD levels that are over the user defined limit and shows in red during a “failed” test.

Function Menu Bar
The six buttons along side (the function menu bar) are used to enter the parameters and select settings for the unit and the test. The function menu bar along with the up/down buttons supply the user with control and the ability to set/alter the test setup.

Main Screen
The test results are displayed on the main screen and two graphical modes are available to view the test results: meter mode and scope mode. The threshold shown graphically (in color) together with different meter modes makes monitoring of the test results simple.

When operating in the meter mode, you have opted to only view the magnitudes of the partial discharge. In meter mode, two meters are displayed: one for partial discharge and one for voltage. You can select two different types of meters: a traditional analogue meter display or a bar-type digital display. In either mode you select the update rate as either fast or slow.

The scope mode display looks just like an oscilloscope. You select the type of oscilloscope display as an ellipse, straight line or a sine wave. Gating features are also available in scope mode.

Scope mode gives you the ability to see more than just the magnitude of the PD and allows a knowledgeable user to perform diagnosis of the source of the PD. You can also choose whether there’s a single or double gate, the start point, and the width to gate out undesirable interferences.
DATA ACQUISITION & ANALYSIS

The optional advanced data acquisition and analysis software allows a wide variety of possibilities like recording PD pulses occurring during each and every test voltage cycle and analyzing them both in the time and phase domain.

A chart recorder provides a hard copy of partial discharge level versus voltage and testing time for each channel in one customized graph. Any time during the test the partial discharge levels can be monitored and after the completion of the test, customized test reports for the multiple channels can be generated automatically populated with snap-shots from interesting events.

Pattern Acquisition And Analysis Module

With the pattern acquisition and analysis module, several two- and three-dimensional PD pulse patterns of all the monitored channels (when equipped with a multiplexer) can be displayed and recorded. Snapshots of the 3D patterns can be saved into a windows gallery for further uses like customised test report generation or to export them as image files. Data filters and time-sliced views further permits a detailed look at the PD pattern as deep as every cycle of the applied test voltage and in certain cases, helps separate and identify noise interferences.

Test Reports

Test report generator allows generation of test reports with pre-defined or user-defined fields (logos, tabular / graphical display of results, snap-shots, etc). The reports can be further saved as HTML files containing graphs and charts and the data can be additionally exported as comma separated value (CSV) format for further analysis.

TECHNICAL SPECIFICATIONS

Amplifier
- Gain (Attenuation): 0 dB to 75 dB in 5 dB steps
- Attenuator Accuracy: 1 %
- Gain: 3000
- Input Impedance: 50 Ω
- System Noise: < 12 µV referred to input on highest gain range
- Filters: High Pass – 20, 30, 50, 60, 80 kHz
  Low Pass - 100, 200, 400, 500 kHz

PD Measurement
- PD Resolution: Meter 10 bits displayed
- PD Capture: 8 bits (7 plus sign)
- Phase Resolution: 0.1 %
- Linearity Error: < 1 %

Voltage Measurement
- Uncertainty of Scale Factor: < 1 %
- Linearity (10-100% FS): < 1 %
- Resolution: 11 bits
- Measurement modes: Peak / √2, true RMS
- Synchronization: Local Mains, HV source (automatic)
- Sync Lock range: 20 Hz to 400 Hz

Mechanical
- Weights: 5 kg
- Dimensions: 19” 3U case, 280 mm deep
- Power Supply: 100-240 V, 40-70 Hz

Environmental
- Operating Temp Range: 0°C to 40°C
- Storage Temp Range: -10°C to 75 °C
- Humidity Range: 95% non-condensing

Ethernet Port
- Isolated: 10BaseT (note: optically isolated cable recommended)

Applicable Standards
- IEC-60060 Part 1 & Part 2
- IEC-60270
- IEC-885-2 and IEC-885-3
- IEEE Std. 4, 1995
- ICEA T-24-380
- ASTM D1868-93
- ANSI C57.113
- ANSI C57.124-91
ACCESSIONS FOR PD TESTING

CALIBRATORS

KAL 9510 Basic PD calibrator
Partial Discharge calibrator battery powered, ranges 1 pC – 50 nC in 1,2,5,10 multipliers; touch screen.

KAL 9520 Advanced PD calibrator
Double impulse Partial Discharge calibrator, battery powered, any value in range 0.1 pC – 50 nC, pulse burst mode (for DC tests), touch screen.

MEASURING IMPEDANCES

AQS 9110a
The AQS 9110 Passive quadripole is a fully configurable quadripole system optimized for PD and RIV measurement. It has a voltage divider low-arm fitted to it for voltage measurement.

AKV 9330
AKV 9330 is active measuring impedance optimized for PD testing of power capacitor as per IEC 60270. It is rated for 300 amperes.

COUPLING CAPACITORS

9230 series coupling capacitors
The coupling capacitor / HV AC divider consists of 1 unit, built into a glass fibre reinforced epoxy tube. The top electrode allows partial discharge free. For PD measurements an appropriate coupling quadripole must be added.

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