ICM*compact*

The ICM*compact* is part of the ICM*series* of digital partial discharge detectors. The ICM*compact* is a compact, stand-alone instrument for evaluating the condition of medium and high voltage insulation. It is often used in quality assurance and quality control tests in manufacturing.

Stand-Alone Instrument

Partial discharge (PD) measurements are a proven method for effective, nondestructive evaluation of electrical insulation. The ICM*compact* provides a simple push-button interface and on-screen menus in an embedded LCD panel. The LCD display modes include a simple PD charge meter with adjustable "needle" sensitivity, mono-chrome phase-resolved PD patterns for characterization of defects, and a scope-like display showing phase-summed charge pulses superimposed with the applied voltage wave.

Although the ICM*compact* is an autonomous unit, it can be connected to a computer installed with software to capture screenshots or to implement remote control of the unit.

Applications

Instantly displaying information in an intuitive interface, the ICM*compact* is a good choice for applications such as quality control tests in manufacture of electrical products, and for quality assurance of industrial and utility equipment from capacitors and bushings to gas-insulated switchgear and others. A wide range of accessories adapts the ICM*compact* to specific testing applications and noise conditions.

The ICM*compact* equipped with an optional DSO board can be used to locate partial discharge defects in power cable. Using time domain reflectometry, in which the PD and its "echoes" travel the length of the cable under test, the ICM*compact* provides the proportional distance of the PD fault along the cable.

The instrument can be optionally equipped with a 12bit A/D converter for voltage measurement. This feature allows to record pd and voltage values by software, i.e. for acceptance testing or quality tests.
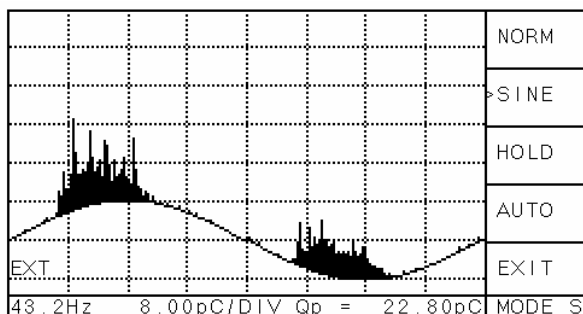
Standard Display Modes

In standard configuration the ICM*compact* comes with four main display modes. The scope display shows the maximum peak values of discharges vs. phase. The refresh
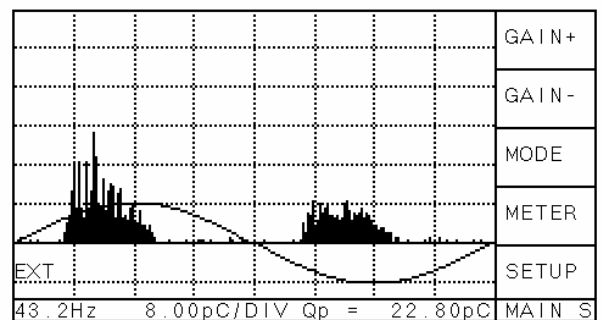

rate is about 5 pictures per second which gives a good view of increasing or decreasing
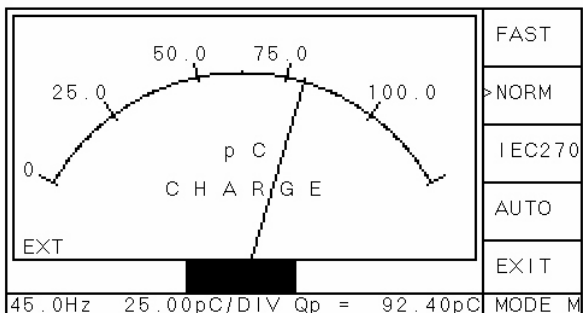
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pd activity. The pd pulses can also be put on top of the drawn sine wave as shown above.

	NORM
	>SINE
	HOLD
	AUTO
EXT	EXIT
43.2Hz 8.00pC/DIV Qp = 22.80pC	MODE S

To get a phase resolved pattern a hold function is available. Each pd pulse is plotted related to its amplitude and phase position.

	NORM
	SINE
	>HOLD
	AUTO
EXT	EXIT
48.9Hz 35.00pC/DIV Qp = 154.00pC	MODE S
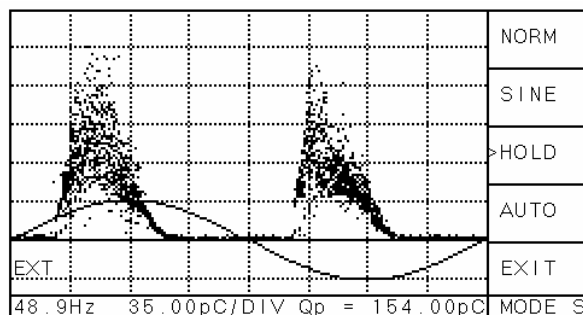
To visualize the pd activity like older analog meters the next display can be chosen. Three different meter modes like e.g. IEC60270 mode are available.

	FAST
50.0 75.0	>NORM
25.0 100.0	IEC270
0 pC CHARGE	AUTO
EXT	EXIT
45.0Hz 25.00pC/DIV Qp = 92.40pC	MODE M

Optional Features and Displays

a) Gating
This optional function for noise cancellation requires an additional input with logarithmic pre-amplifier (RPA6). The firmware is extended by a new sub-menu to adjust the gating parameters.
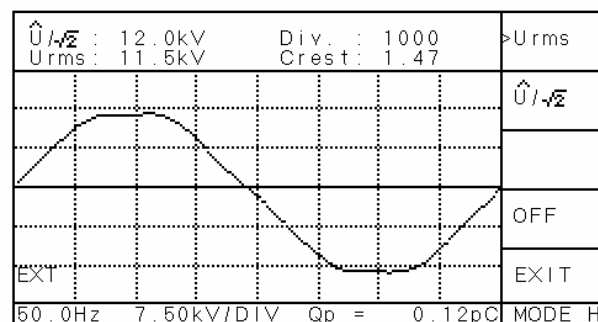
b) DSO board extension
This option allows sampling pd pulses and its reflections running over HV cables for cable

	CURS 1
600ns 51.0m	POS<<
	POS>>
	LENGTH
	EXIT
49.2Hz 400ns/DIV Qp>= 2.50pC	CURSOR
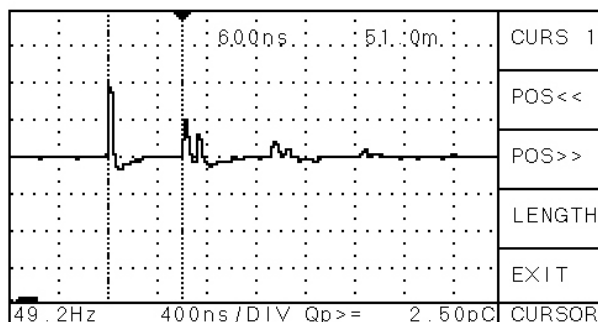
fault location. The sample rate of this DSO board is 100MSamples gives a resolution of 10ns. An additional display with cursor settings and zoom functions help to localize faults directly on-site. Advanced software gives more possibilities for evaluation and precise fault location using a PC or laptop.

c) Voltage Measurement
This enhanced board extension makes the acquisition of the voltage shape available. A 12 bit A/D converter samples about 200 values per cycle with polarity. An additional display shows this voltage shape and the calculated values for rms and peak. To record values of partial discharge and voltage in parallel the ICMcompact software can be used.

$\hat{U}/\sqrt{2}$: 12.0kV Div. : 1000	>Urms
Urms: 11.5kV Crest: 1.47	
	$\hat{U}/\sqrt{2}$
	OFF
EXT	EXIT
50.0Hz 7.50kV/DIV Qp = 0.12pC	MODE H

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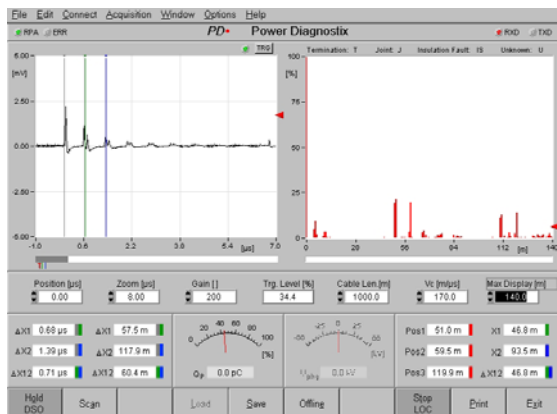**www.energy-support.de**

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Available Software

The instrument can be connected to a PC or laptop by serial interface. The upper picture shows the standard software to read out the
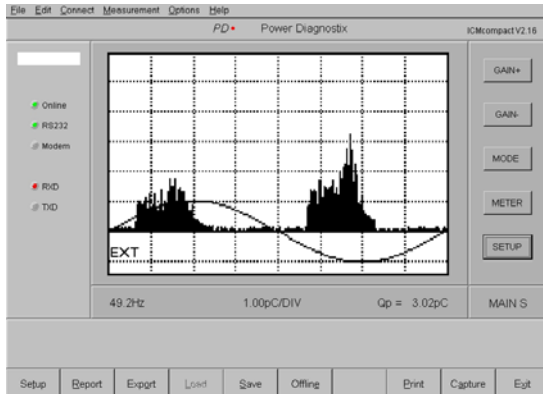
display contents and to record data like pd peak values or voltage. The next picture shows the advanced software ICM*compro* for cable fault location.

To integrate the ICM*compact* into a full test environment it is possible to use the HV*pilot* software. This software reads out data from different instruments and runs high voltage Steptests automatically.
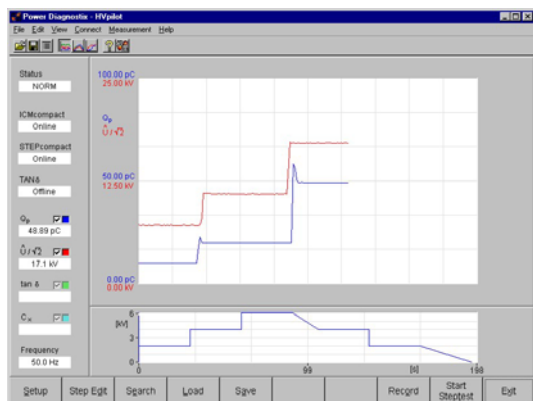
Technical Data:

Mains Supply:	85-264V_{AC}, 47-440Hz (automatic)
Line Fuse:	0.5 A (time-lag)
Power Requirements:	approx. 20VA
Display:	backlit LCD
Display Resolution:	128 x 240 Pixel S/W
Operation:	5 menu supported pushbuttons Second Pushbutton Line with Multi Channel Versions
Input Impedance (PD):	10kΩ//50pF (RPA1-Input) 50Ω (AMP IN)
Input Sensitivity:	200µV (RPA1-Input) < 2mV (AMP IN)
Lower Cut-Off (-6dB):	40, 80 or 100kHz (software controlled)
Upper Cut-Off (-6dB):	250, 600 or 800kHz (software controlled)
Synchronization:	Line, with automatic change over to external
Ext. Sync. Freq.:	w/o voltage measurement 10Hz - 410Hz (opt.510Hz) with voltage measurement 10Hz - 210Hz
Ext. Sync. Voltage:	100V_{rms} max into 1MΩ//200pF
VLF Mode (opt.):	0.1Hz, 0.05Hz, 0.02Hz (auto detect)
Recorder Output:	0-10V with R_O=100Ω (re-converted analog value of the meter reading)
Operation Temperature:	0-55°C (non condensing)
Size:	Width: 236mm Height: 133mm Depth: 300mm (exclusive BNC-Connectors)
Weight:	approx. 3kg

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