

# ICMsystem Versatile PD measurement system



- Modular partial discharge test set for various purposes
- Versatile equipment options
- Allows PD and RIV acceptance tests according to international standards
- Parallel recording of PD activity to test complex assets
- Up to 10 parallel measurement channels (multi-channel system)

## DESCRIPTION

The ICMsystem is a universal Partial Discharge (PD) device which can be flexibly used by adjusting versatile features and accessories to fit your testing purpose. It has the highest grade of modularity and versatility, therefore, it can be used for laboratory tasks (QAQC) and on-site testing (online and offline) for all your assets.

All controls and displays are accessible on the screen of a PC via a graphical interface, a so-called virtual instrument.

The ICMsystem is primarily intended for the measurement of the following assets:

- Transformers
- Rotating machines
- Gas-Insulated Switchgears (GIS)
- Air-Insulated Switchgears (AIS)
- HV and EHV cables
- HV components such as bushings, insulators, capacitors

## YOUR ADVANTAGES

- Flexibly configurable for all assets by changing the accessories
- Time saving due to simultaneous PD measurements with optional multi-channel system

- Easy analysis of your results due to clear and understandable PD patterns

## FEATURES AND OPTIONS

As multi-purpose PD measurement instrument, the ICMsystem offers the following features and options:

- PD spectrum analysis
- High voltage measurement (HVM)
- Synchronisation frequency from VLF to 510 Hz
- DC measurement mode
- DAkkS calibrated voltage measurement and PD calibrator
- Acoustic fault location
- PD fault location on cables
- Can be equipped with up to 10 channels for parallel measurement of PD and RIV in real-time
- Effective noise gating for blocking phase-stable or phase-independent noises
- Radio influence voltage (RIV) measurement
- High-resolution PD patterns
- Available with pre-installed PCs or notebooks

**TECHNICAL DATA**

**Acquisition unit**

Mains supply	90–264 V <sub>AC</sub> , 47–440 Hz (automatic)
Line fuse	2 A (time lag) (ICMsystem with up to 4 channels) 3.15 A (time lag) (ICMsystem with 5 to 10 channels)
Power requirements	ca. 110 VA max.
Operation	Remote-controlled via ICMsystem software
Operation temperature	0–40 °C (non-condensing)
Input impedance (AMP IN)	50 Ω    50 pF
A/D converter (PD)	12 bits, compressed into 8 bits (unipolar) / ±7 bits (bipolar)
Size (W x H x D, excl. BNC-conn.)	236 x 133 x 300 mm <sup>3</sup> (ICMsystem with up to 4 channels) 450 x 133 x 300 mm <sup>3</sup> (ICMsystem with 5 to 10 channels)
Weight	Appr. 6.9–9 kg

**Standard PD mode**

Lower cut-off (-6 dB)	40, 80, or 100 kHz (software-controlled)
Upper cut-off (-6 dB)	250, 600, or 800 kHz (software-controlled)
Input sensitivity	< 500 μV <sub>rms</sub> / 5 pC (without preamplifiers)
Gain range	4, 8, 10, 20 ..., 200, 400, 800
PD pattern resolution (x-y-z)	8 x 8 x 16 bits

**Preamplifiers**

Input impedance:

RPA1/RPA1D/RPA1G/RPA4	10 kΩ    50 pF
RPA1L / RPA1H	1 kΩ    50 pF
FCU2	50 Ω    50 pF

Input sensitivity:

RPA1/RPA1D/RPA1G/RPA4	< 50 μV <sub>rms</sub> /0.03 pC
RPA1L	< 15 μV <sub>rms</sub> /0.02 pC
RPA1H	< 40 μV <sub>rms</sub> /0.05 pC
RPA2	< 800 μV <sub>rms</sub> /1 pC
RPA3	< 2 μV <sub>rms</sub>
FCU2	< 200 μV <sub>rms</sub> (46 dBμV)

Bandwidth:

RPA1/RPA1D/RPA1G/RPA4	40–800 kHz
RPA1L/RPA1H	40 kHz–20 MHz
RPA2	2–20 MHz
RPA3	200 MHz–1 GHz
FCU2	100 MHz–1800 MHz

**Synchronisation / HVM**

Synchronisation frequency	20–510 Hz (automatic) / 0.02–510 Hz (manual)
Maximum voltage	200 V <sub>peak</sub> (140 V <sub>rms</sub> ), 100 V <sub>rms</sub> nom.
Input impedance	10 MΩ
A/D converter	± 15 bits
Precision	Typ. < 1.5 %



**TECHNICAL DATA**

**Spectrum function**

Input sensitivity	< 5 $\mu V_{rms}$ / 0.5 pC (270 kHz bandwidth) < 1 $\mu V_{rms}$ / 2 pC (9 kHz bandwidth)
Maximum input voltage	120 mV <sub>rms</sub> (300 kHz bandwidth, SPEC mode) 5 mV <sub>rms</sub> (9 kHz bandwidth, SPEC mode) 2.5 mV <sub>rms</sub> (RIV measurement)
Frequency range	10 kHz–10 MHz (in steps of 10 kHz)
Bandwidth	9 kHz or 270 kHz

**PD location within cables**

Trigger	0–100 % of input signal (in steps of 3.125 %)
A/D converter	$\pm 7$ bits
Samples	100 Msamples/s ( $T_{sample} = 10$ ns)
Reduced sample rates	50 MS, 25 MS
Displayed time window	200 ... 8000 samples (2 ... 80 $\mu s$ @ 100 MS / 8 ... 320 $\mu s$ @ 25 MS)
Specimen cable length	10 to 5000 m, for 80 $\mu s$ and $v_c = 140$ m/ $\mu s$ (Localisation at cables with length > 3000 m not possible because of pulse attenuation)
Localisation precision	1 m + 0.1 % of cable length

**Acoustic fault location**

Trigger	0–100 % of input signal (in steps of 3.125 %)
A/D converter	$\pm 7$ bits
Samples	100 Msamples/s ( $T_{sample} = 10$ ns)
Reduced sample rates	50 MS, 25 MS, 10 MS, 5 MS, 1 MS
Displayed time window	200 ... 8000 samples (2 ... 80 $\mu s$ @ 100 MS / 200 ... 8000 $\mu s$ @ 1 MS)
Max. location distance	11.2 m, for 8000 $\mu s$ and $v_{oil} = 1400$ m/s

**Available communication interfaces**

- USB
- GPIB
- LAN

# ICMsystem

## Versatile PD measurement system

### ACCESSORIES

To perform a measurement the ICMsystem requires accessories – depending on your testing purpose and environment. Following accessories are recommended:

- Preamplifiers of RPA and FCU series
- Coupling capacitors
- Quadrupoles
- Current transformers
- Sensors
- Bushing adapters
- Disturbance antennas
- DAkKS certified calibrators
- Robust transportation case

For more details as well as ordering information on our accessories, please refer to our accessories catalogue.



### ORDERING INFORMATION

Product	Order no.	Options	Order no.
ICMsystem Generation 5, 1/2 19" housing	PX10026	Spectrum analysis (incl. RIV measurement)	PX10028
ICMsystem Generation 5, 19" housing	PX10030	PD fault location for cables	PX10029
Measurement plugin board	PX10027	IEEE488 communication interface (GPIB-USB)	PX90102
Cable set for ICMsystem with 1 channel	PX17006	Remote control computer system	PX90000
Cable set for ICMsystem with up to 4 channels	PX17059	Transportation case for instruments with up to 4 channels and accessories	PX18126
Cable set for ICMsystem with up to 10 channels	PX17154	High transportation case for instruments with up to 4 channels and accessories	PX18122
		Transportation case for instruments with 5 to 10 channels and accessories	PX18120
		<b>Set of measuring cables is NOT included with the instrument and must be ordered separately.</b>	
Software	Order no.		
Standard control software	PX19010		
Multi-channel control software	PX19009		
Multi-channel control software for acceptance tests	PX19000		
ICMacoustic software for acoustic fault location	PX19008		

#### SALES OFFICE

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#### ICMSYSTEM DS EN V1

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