ICM*system*
Versatile PD measurement system

- **Modular partial discharge test set for a range of high voltage assets**
- **Versatile equipment options**
- **Allows PD and RIV acceptance tests according to international standards**
- **Parallel recording of PD activity to test complex assets**
- **Up to ten parallel measurement channels (multi-channel system)**

DESCRIPTION

The ICM*system* 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 (on-line and off-line) 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 ICM*system* is primarily intented for the measurement of the following assets:

- Transformers
- Rotating machines
- Gas-insulated switchgear (GIS)
- Air-insulated switchgear (AIS)
- HV and EHV cables
- HV components such as bushings, insulators, and 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 a multi-purpose PD measurement instrument, the ICM*system* 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
- Effective noise gating for blocking phase-stable or phase-independent noises
- Radio interference voltage (RIV) measurement
- High-resolution PD patterns
- Can be equipped with up to ten channels for parallel measurement of PD and RIV in real-time
- Available with pre-installed PCs or notebooks

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SPECIFICATIONS

Acquisition unit

Mains supply	90–264 V AC, 47–440 Hz (automatic)
Line fuse	2 A (time-lag) (ICM*system* with up to four channels) 3.15 A (time-lag) (ICM*system* with five to ten channels)
Power requirements	ca. 110 VA max.
Operation	Remote-controlled via ICM*system* 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 connectors)	236 x 133 x 300 mm^3 (ICM*system* with up to four channels) 450 x 133 x 300 mm^3 (ICM*system* with five to ten channels)
Weight	Approx. 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 RMS/5 pC (without pre-amplifiers)
Gain range	4, 8, 10, 20 …, 200, 400, 800
PD pattern resolution (x-y-z)	8 x 8 x 16 bits

Pre-amplifiers

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 RMS/0.03 pC
RPA1L	< 15 µV RMS /0.02 pC
RPA1H	< 40 µV RMS/0.05 pC
RPA2	< 800 µV RMS/1 pC
RPA3	< 2 µV RMS
FCU2	< 200 µV RMS (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_{peak} (140 V RMS), 100 V RMS nominal
Input impedance	10 MΩ
A/D converter	±15 bits
Measurement uncertainty	Typ. < 1.5 %

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Spectrum function

Input sensitivity	< 5 µV RMS/0.5 pC (270 kHz bandwidth) < 1 µV RMS/2 pC (9 kHz bandwidth)
Maximum input voltage	120 mV RMS (300 kHz bandwidth, SPEC mode) 5 mV RMS (9 kHz bandwidth, SPEC mode) 2.5 mV RMS (RIV measurement)
Frequency range	10 kHz–10 MHz (in steps of 10 kHz)
Bandwidth	9 kHz or 270 kHz
Measurement uncertainty	Typ. < 5 %

PD location within cables

Trigger	0–100 % of input signal (in steps of 3.125 %)
A/D converter	± 7 bits
Samples	100 Msamples/s (Tsample = 10 ns)
Reduced sample rates	50 MS, 25 MS
Displayed time window	200 ... 8000 samples (2 ... 80 µs @ 100 MS / 8 …320 µs @ 25 MS)
Specimen cable length	10 to 5000 m, for 80 µs and v_c=140 m/µs (Please note: Localisation on cables longer than 3000 m is 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	± 7 bits
Samples	100 Msamples/s (Tsample = 10 ns)
Reduced sample rates	50 MS, 25 MS, 10 MS, 5 MS, 1 MS
Displayed time window	200 ... 8000 samples (2 ... 80 µs at 100 MS / 200 ... 8000 µs at 1 MS)
Maximum location distance	11.2 m, for 8000 µs and v_{oil}=1400 m/s

Available communication interfaces

USB

GPIB

LAN

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ACCESSORIES

To perform a measurement, the ICM*system* requires accessories, depending on your testing purpose and environment. The following accessories are recommended:

- Pre-amplifiers of RPA and FCU series
- Coupling capacitors
- Quadrupoles
- Current transformers
- Sensors
- Bushing adapters
- Disturbance antennas
- DAkkS certified calibration impulse generators
- Robust transportation case

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

ORDERING INFORMATION

Description	Part number
ICM*system* Generation 5, 1/2 19 inch housing	PX10026
ICM*system* Genevration 5, 19 inch housing	PX10030
Measurement plugin board	PX10027
Cable set for ICM*system* with one channel	PX17006
Cable set for ICM*system* with up to four channels	PX17059
Cable set for ICM*system* with up to ten channels	PX17154

Software	Part number
Standard control software	PX19010
Multi-channel control software	PX19009
Multi-channel control software for acceptance tests	PX19000
ICM*acoustic* software for acoustic fault location	PX19008

Options	Part number
Spectrum analysis (incl. RIV measurement)	PX10028
PD fault location for cables	PX10029
IEEE488 communication interface (GPIB-USB)	PX90102
Remote control computer system	PX90000
Transportation case for instruments with up to four channels and accessories	PX18128
Transportation case for instruments with up to four channels and acoustic accessories	PX18122
High transportation case for instruments with up to four channels and acoustic accessories	PX18126
Transportation case for instruments with five to ten channels and accessories	PX18120

Set of measuring cables is NOT included with the instrument and must be ordered separately.

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ISO 17025, ISO 45001

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