

Partial Discharge Monitoring

RMM

CONTINUOUS PD MONITORING · 15+ CHANNELS



RMM

ROTATING MACHINE MONITOR

amperis

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Continuous partial-discharge monitoring that protects the reliability and uptime of your rotating machines.

Your system's uptime matters



Turbo-generators and large motors: critical monitored assets

The Rotating Machine Monitor (RMM) raises plant reliability, lifting uptime and trimming maintenance costs. It watches partial discharge continuously while also logging and correlating the machine's operating dynamics, capturing every industry-standard PD graphical result together with the quantities defined by IEC. Motors are critical assets: IEEE and EPRI studies attribute up to 40% of electrical-origin failures on high-voltage motors to stator-insulation problems, most of them triggered by partial discharge in windings and cables. The RMM reports on that insulation's health in medium- and high-voltage motors, generators and VFD-driven machines.

Features & functions

Built around innovative sensors, monitoring hardware and controls for acquisition, analysis and diagnostics, the RMM works alongside asset-management tools so operators draw the full value from online and partial-discharge monitoring. It brings a complete range of advanced noise-cancellation techniques – including the removal of cross-coupled signals – and tracks the operating context that matters: ambient and winding temperature, humidity and load.

Optimal design

At least fifteen independent, simultaneously monitored and user-configurable channels deliver an industry-leading signal-to-noise ratio and accept PD sensors of any brand. Beyond PD, the unit reads six RTD winding temperatures, three load currents, three voltages and six user-defined 4-20 mA inputs, and can run motor-current-signature analysis to reveal broken rotor bars in induction machines. Up to two years of data are held on a first-in, first-out (FIFO) basis.

Independent operation, open communications and reuse of existing sensors — for fast, low-disruption deployment.

Communication & implementation



Optional hazardous-location enclosure (316 stainless steel)

Effective communication

The RMM keeps asset-management and maintenance teams informed in good time. It can work on its own, with no PC connected, yet still provides a broad set of built-in interfaces — Ethernet, USB and RS-485 — using ModBus as the standard protocol, with DNP-3 available on request.

Easy implementation

Designed to run with PD sensors that are already installed, the RMM avoids the purchase, engineering and installation costs of fitting new ones. Placed inside an approved enclosure, it can also be deployed in a wide variety of locations.

Optional hazardous-location enclosure

For demanding sites, a hazardous-location enclosure is offered in 316 stainless steel — the best choice for aggressive environments — with a gasketed flange whose O-ring seats inside the cover bolts to seal the unit. It is certified to Class I, Division 1 (Groups B, C, D); Class II, Division 1 (Groups E, F, G); and Class I, Zone 1, IIB T4.



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Reaching partial discharge deep in the windings — and driving a full analysis toolset.

Applications & software



Detection zone: coupling capacitors + RTD-PD module

Applications

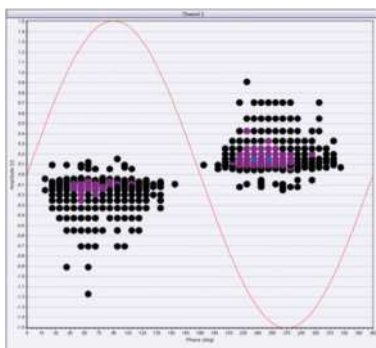
Coupling capacitors sense partial discharge only near the machine terminals; the RTD-PD module reaches the discharge that occurs deep inside the windings, where the RTDs already respond to its high-frequency content. Used together, the two techniques widen the detection zone. Whatever the machine, four parameters are recommended for correlation with PD: winding temperature, ambient temperature, relative humidity and load current. A typical arrangement for turbos, small hydro sets and motors uses two sets of coupling capacitors — one at the line terminals and one in the isolated-phase bus duct, at least two metres apart for a time-of-arrival measurement; large hydro generators often need two to four sets, one per parallel-phase group, with coaxial-cable lengths trimmed for correct time-of-arrival calibration.

Software package

The bundled Windows software drives portable and continuous insulation-monitoring systems across generators, motors, switchgear, cables, bus duct and transformers, letting users configure the instrumentation, download and store data, and analyse it with a full toolset.

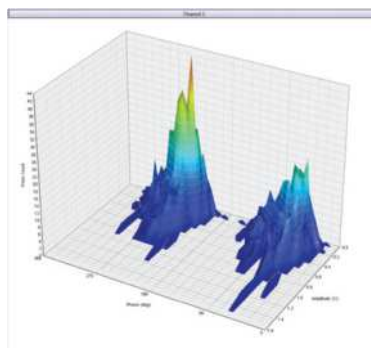
Test results are presented in every industry-standard format; all standard quantities can be trended and several channels compared on one screen.

Graphic results



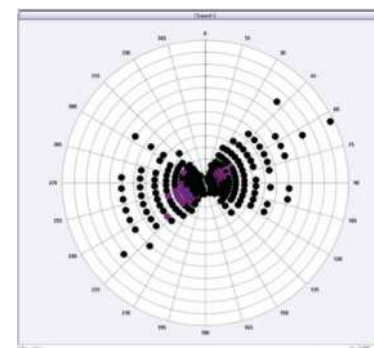
2D phase resolved

Magnitude vs. phase angle across the AC cycle



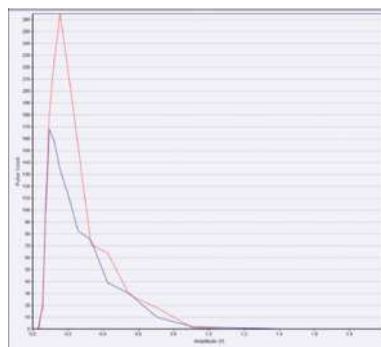
3D phase resolved

Phase-resolved view with pulse count as third axis



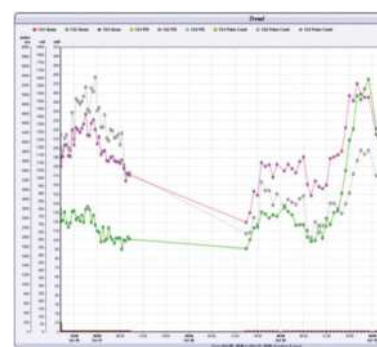
Polar phase resolved

The distribution mapped around the phase circle



Pulse height distribution

Pulse count at each discharge magnitude



Trend

Evolution of the quantities over time, by channel

Product specifications – Rotating Machine Monitor (RMM)

	PD channels	15 per module, concurrent data acquisition
	Dynamic range	70 dB, 3 mV to 10 V, no gain adjustment
Acquisition	Measurement bandwidth	1 MHz to 20 MHz
	Phase resolution	7.5° (power frequency)
	Magnitude windows	32
Auxiliary inputs	RTD winding temperatures	6
	Load currents / voltages	3 / 3
	User-defined inputs	6 × 4-20 mA
Data, interface & comms	Internal memory	8 MB
	Data storage	≈2 years, first-in first-out (FIFO)
	User interface	PC (Windows software)
	Communications	Ethernet, USB, RS-485; ModBus (DNP-3 optional)
Power & environment	Power requirement	90-264 V AC (47-63 Hz); 100-300 V DC
	Operating temperature	-40 °C to 70 °C (hazardous enclosure: -20 °C to 40 °C)
Enclosure & certifications	Mounting options	Standalone, panel-mounted, enclosure-mounted, hazardous-location
	Hazardous enclosure	316 stainless steel with gasketed flange
	Certifications	Class I Div 1 B/C/D; Class II Div 1 E/F/G; Class I Zone 1 IIB T4



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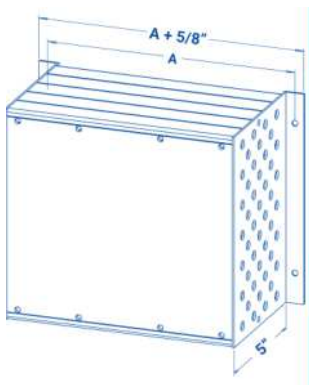
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Mounting options and mechanical dimensions for every configuration.

Dimensions & mounting

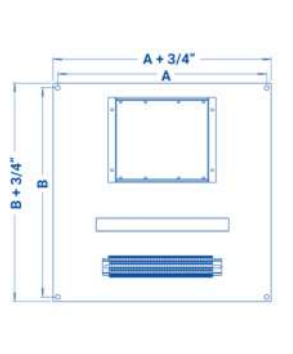
Standalone (S)



Mounting hole A

- 1 module: 20.64 cm (8.125 in)
- 2: 25.72 cm (10.125 in)
- 3: 30.80 cm (12.125 in)
- 4: 35.88 cm (14.125 in)

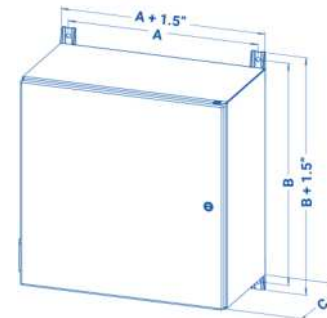
Panel mounted (P)



Mounting hole A × B

- 1: 31.12 × 36.20 cm (12.25 × 14.25 in)
- 2: 43.50 × 43.50 cm (17.125 × 17.125 in)
- 3-4: consult factory

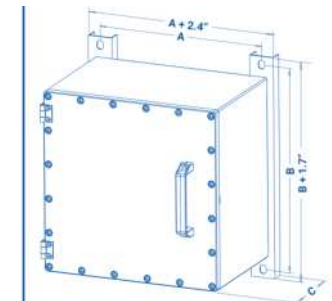
Enclosure mounted (E)



Mounting hole A × B × C

- 1: 31.75 × 35.56 × 22.86 cm (12.5 × 14 × 9 in)
- 2: 46.99 × 54.61 × 27.94 cm (18.5 × 21.5 × 11 in)
- 3-4: consult factory

Hazardous-location (H)



Mounting hole A × B × C

- 1: 48 × 48 × 36 cm (18.89 × 18.89 × 14.17 in)
- 316 stainless steel; gasketed flange