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**www.atecorp.com 800-404-ATEC (2832)**



MPD 500

Partial Discharge Measuring System for Routine Test Applications



# Partial Discharge Measurement

*The MPD 500 partial discharge measuring system has been specially designed for providing fast and reliable results in a high-throughput environment. As a new member of the successful OMICRON MPD family with hundreds of systems worldwide in daily use, the MPD 500 is the ideal solution for state-of-the-art routine testing, clear pass / fail decisions and most easy reporting.*

## Reliable evaluation of insulating systems

**PD** – Partial Discharges are defined as localized electrical discharge that only partially bridge the insulation between conductors, often preceding an insulation breakdown. Therefore PD measurements are well established and widely accepted for quality assurance and factory testing of medium- and high-voltage assets.

Modern PD measurement systems based on apparent charge [pC], in accordance with IEC 60270, reveals faulty spots in electrical insulations with a high degree of sensitivity.

**RIV** – Radio Influence Voltage measurements express partial discharge activities as a voltage that appears on conductors of electric equipment. The RIV value is displayed in  $\mu\text{V}$  according to CISPR 16-1-1 and the still referenced NEMA 107-1987.

## The most convenient way to measure PD

As the newest member of OMICRON's successful PD measurement family, the MPD 500 benefits from the experience of hundreds of MPD units in daily use by major cable-, transformer-, and rotating machine manufacturers worldwide.

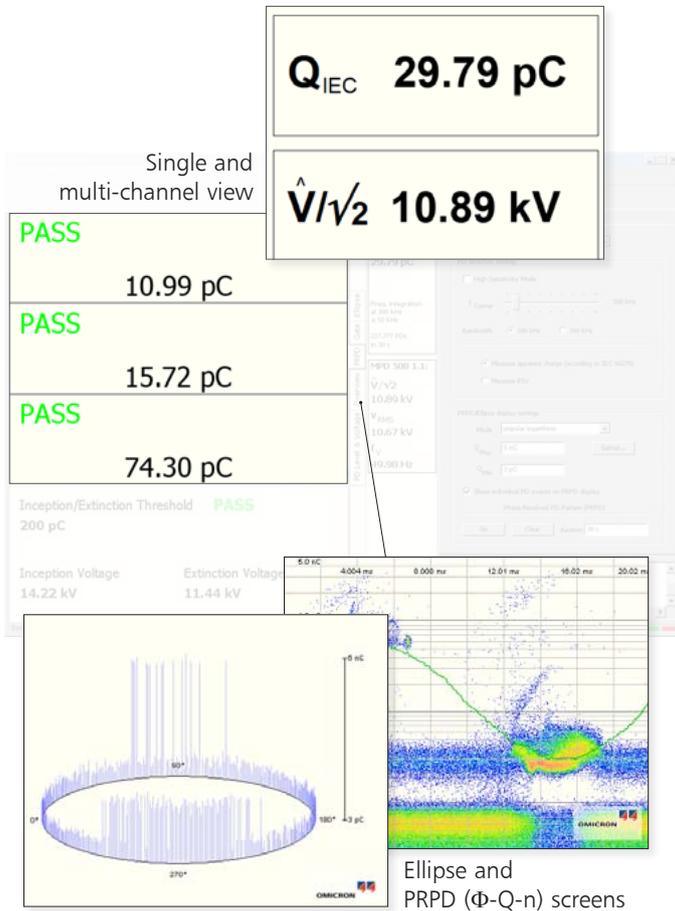
By incorporating a wide range of leading-edge technologies, highly sensitive and accurate results can be obtained by the MPD 500 as easily as operating a voltmeter.

The user-friendly software provides full remote control of the measurement devices and delivers very easy automated reporting of PD / RIV measurements. The MPD 500 also holds simultaneous multi-channel abilities, without the need for a multiplexer.



300 kV high voltage laboratory

PFIFFNER Instrument Transformers Ltd. / Switzerland



### Results at one glance

Advantages of the intuitive MPD 500 software:

- > Concise visualization of single as well as multi-channel measurements
- > User-friendly pass / fail functionality
- > Detailed diagrams for in-depth analysis

For factory routine testing the conclusive pass / fail function is ideal for fast decisions. Adjusting the thresholds is most easy, as are the inception and extinction voltage.

Using the MPD's multi-channel ability allows to display multiple actual PD measurement values simultaneously on one screen, contrasting old-fashioned multiplexer solutions. This makes the MPD 500 ideal for PD measurements in high-throughput environments.

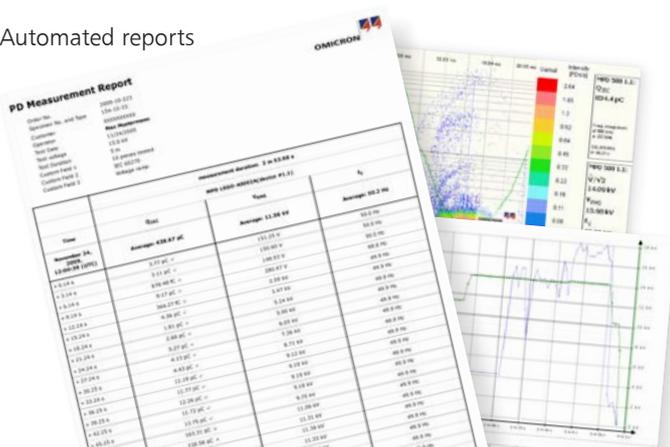
For advanced analysis classic ellipse and state-of-the-art PRPD (Φ-Q-n) visualizations show partial discharge activities in real time at 25 frames per second.

### Automate your reports

The optional comprehensive electronic reporting function automatically provides a concise test protocol within seconds. These reports contain information about the tested object, the measurement, and all data in definable intervals, as well as diagrams showing Q(t), U(t), and Q(U).

Individual screenshots can be inserted during measurement at any time by simply hitting a hotkey.

Automated reports



### Your benefits

- > Economical – PD and RIV are combined within one instrument
- > Time effective, easy operation
- > Decision support with clear pass / fail indication
- > Efficient multi-channel testing with several results displayed simultaneously
- > Save time – Fast and easy automated reporting

# Excellent Noise Suppression

There are many sources of interference which can complicate the measurement of partial discharges. The MPD 500 provides effective features for reducing or eliminating the effect of these disturbances, making the measurements more reliable and accurate.

## Advantages of fiber-optic communication

The whole MPD family utilizes the "point of PD measurement", processing and digitizing in close proximity to the coupling device as shown below. The digitized signal is transferred to the operator's control room using optical communication. This principle minimizes the effective ground loop and the influence of external interferences resulting in a significantly reduced background noise level.

Electromagnetic disturbances of nearby HV equipment have no influence on optical fibers, therefore cable routing is fast and easy, without special precautions. Safety comes first - the fully galvanic isolation between "point of PD measurement" and control room sets new standards of operational safety even during a breakdown of the test object.

Very long fiber-optic connections may be used without degrading the instrument's performance - The distance between PD detection and operator could get up to 2 km / 1.2 miles.

## Active noise suppression

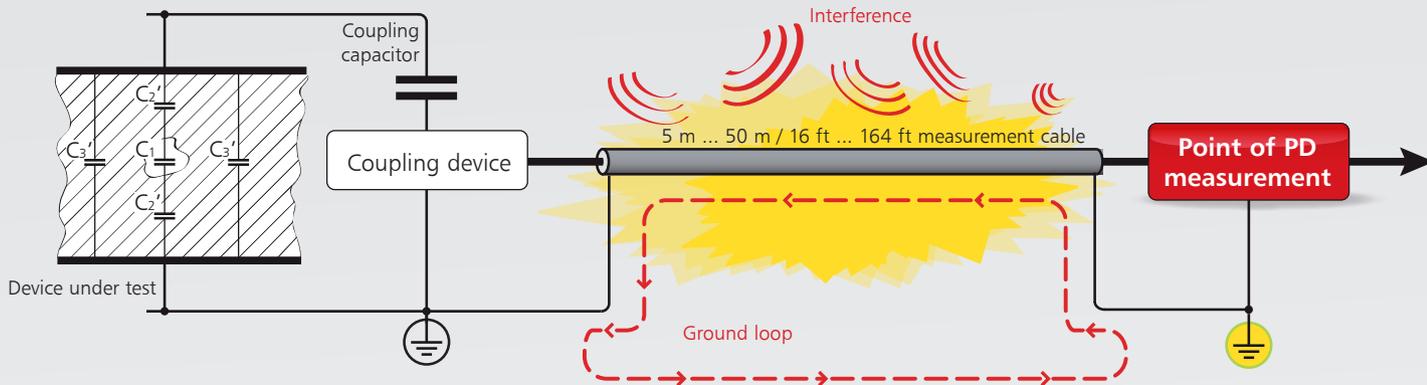
The center frequency can comfortably be adjusted via slider from 0 MHz to 2.5 MHz. Together with three selectable bandwidths, the MPD 500 can be tuned away from noise to a more "quiet" frequency range, focusing optimally on the test object's PD signals.

Simply use the mouse to enable an unlimited number of phase amplitude gates for effective suppression of phase-fixed disturbances.

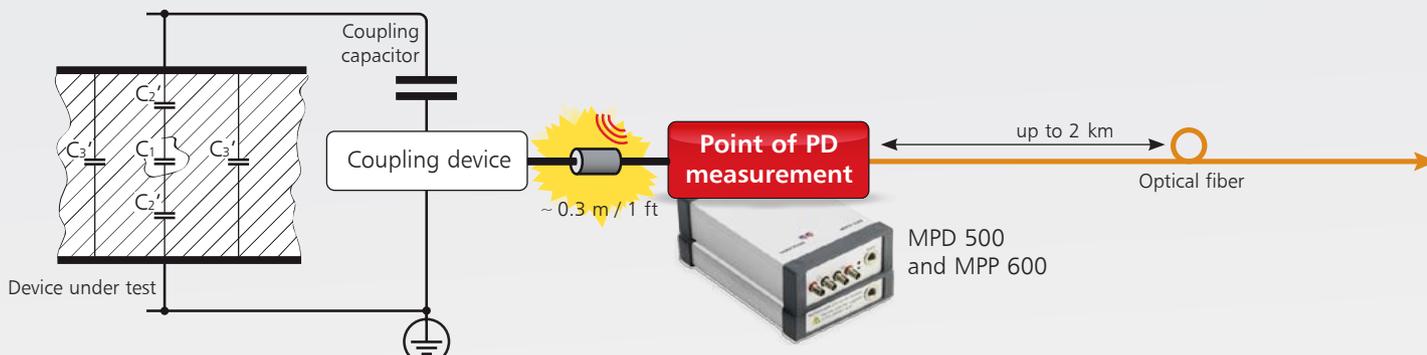
## Battery-powered portability

In addition to the advanced "point of measurement" principle, even further circuit sensitivity can be realized by eliminating noise from the mains that power the MPD 500. Every unit is supplied with a battery attachment, that has the capability of powering the system for up to 20 hours of continuous operation.

## Conventional PD detection



## Innovative PD detection with the MPD 500





### Routine factory testing

Routine PD measurements become easy with the integrated pass / fail functionality. Set the MPD 500 to the desired PD threshold level for the device under test. When this level is exceeded, it is clearly displayed in the main window.

For further investigations the MPD 500 provides advanced visualization and diagnosis tools such as ellipse and PRPD ( $\Phi$ -Q-n), typically only found in expensive high-end PD measurement systems.

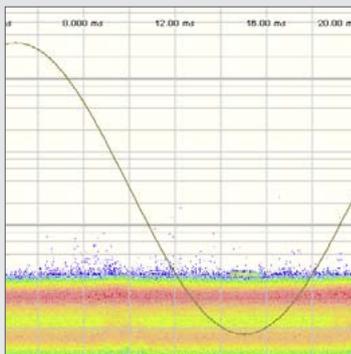
### Wide range of applications

Upgrade your testing facility to the latest technical benchmark in partial discharge measurements. The MPD 500 is ideal for examining PD faults in electrical insulations of transformers, bushings, generators, motors, and other types of electrical equipment in screened factory-routine-testing environments and testing laboratories.

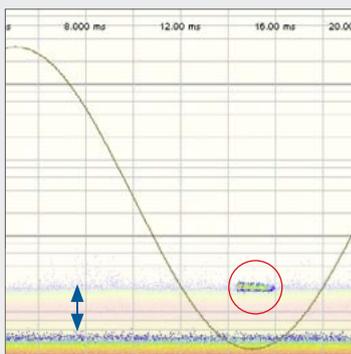
Adaptable to 19" format, the MPD 500 fills in for outdated built-in instruments. This drop-in boosts control rooms to state-of-the-art PD measuring abilities, with all benefits of a contemporary PD system. Each replacement gets optimized to the individual demands. Contact your OMICRON sales representative for further details.

### Let the equipment grow with your needs

If necessary the MPD 500 can be upgraded to OMICRON's well-established high-end MPD 600 PD measurement and analysis system at any time, even after several years in operation. This makes the MPD 500 the only risk-free choice for PD measurements, even if your demands grow.



PD signals obscured in the noise band

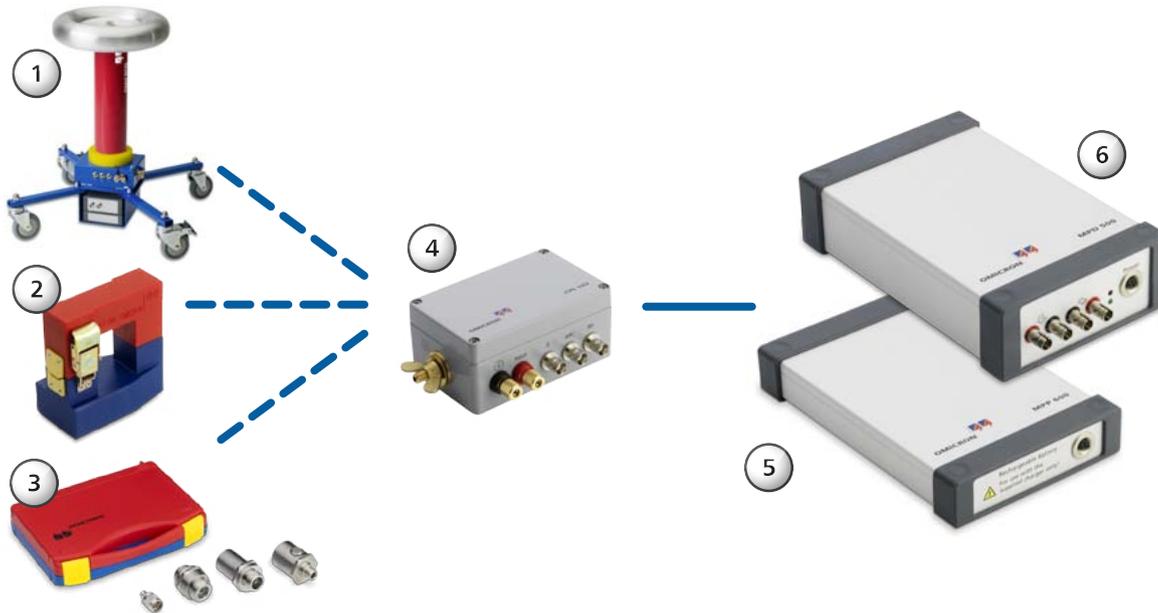


PD signal with reduced noise level

### Your benefits

- > Increased sensitivity due to greatly reduced background noise level
- > Unrivaled operational safety with galvanic isolation
- > Enhanced accuracy with progressive noise suppression tools
- > Save time – fast upgrading solution for old built-in analog PD devices
- > The only risk-free choice – upgradable to the most advanced PD measurement system

# Technical Data and Order Information



## 1 Coupling capacitors<sup>1</sup>

VEHZ4116	MCC 205, 50 kV, 1.0 nF (on mobile base) <sup>2</sup>
VEHZ4117	MCC 210, 100 kV, 1.0 nF (on mobile base) <sup>2</sup>

## 2 High frequency current transformer

VEHZ4120	MCT 100 high frequency current transformer
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## 3 Bushing adapters<sup>1</sup> (incl. transport case)

VEHZ4121	Basic adapter:	G3/4" inside to 5/8"
VEHZ4122	F&G/HSP adapter:	M24 to G3/4"
VEHZ4123	HSP adapter:	M30x1.5 to G3/4"

## 4 Measuring impedances

VEHZ4100	CPL 542, 0.5 A type
VEHZ4101	CPL 542, 2 A type
VEHZ4103	CPL 543, 5 A type

## 5 Li-poly battery

VEHZ4105	MPP 600 Power Pack Set (consisting of battery, fastener, and charger with power cord)
VEHZ4106	MPP 600 battery

<sup>1</sup> Customized articles available on request  
<sup>2</sup> Including CPL measuring impedance  
<sup>3</sup> No calibrator included

## 6 MPD 500 – Technical data

Center frequency range	0 Hz to 2.5 MHz
Input freq. bandwidth	100 kHz, 300 kHz, 1 MHz
Input frequency range	V input: 0 Hz to 2.1 kHz PD input: 0 Hz to 2,5 MHz
Input impedance	V input: 1 MΩ, in parallel 1 μF PD input: 50 Ω
Input voltage (max)	V input: 60 V rms, PD input: 10 V rms
Dynamic range	V input: 102 dB, PD input: 132 dB (overall)

### PC requirements

Hardware (minimum)	Pentium® 4 or later, Athlon® 64 or later / 1 GB RAM / USB 2.0
PC operating system	Windows 2000 Pro™ to Windows 7™

### Accuracy

PD event time resolution	< 2 ns
Input channels	PD level: ± 1 % of calibrated PD value Voltage: ± 0.05 % of calibrated voltage Frequency: ± 1 ppm

### Environmental conditions / mechanical data / supply voltage

Humidity / temperature	5 % to 100 % non-condensing 0 °C to 55 °C (operating) -10 °C to 70 °C (storage)
Dimension (W x D x H)	110 x 190 x 44 mm / 4.3 x 7.5 x 1.7 in
Weight	600 g / 1.3 lbs
Power supply	8 to 12 V DC via ext. power supply or MPP 600 Li-Poly battery



**Packages**

- VE004500 MPD 500 PD package:
  - MPD 500 measuring system hardware (consisting of MPD 500, MCU 502, CPL 542 or 543, MPP 600 Power Pack Set, BNC measurement cables, and fiber optical communication cables)
  - Transport case VEHP0044
  - Software for PD measurements, plus manual
- VE004501 MPD 500 RIV package<sup>3</sup>:
  - MPD 500 measuring system hardware (same hardware as in PD package incl. transport case)
  - Software support for RIV measurements, plus manual
- VE004502 Additional MPD 500 measuring channel (consisting of MPD 500, MPP 600 Power Pack Set, fiber optical communication cables)

**Software upgrades**

- VESM4500 MPD 500 PD software upgrade
- VESM4501 MPD 500 RIV software upgrade
- VESM4502 MPD 500 report functionality

**Upgrades**

- VE004503 Upgrade MPD 500 to MPD 600, the most advanced PD measurement system

**7 Fiber optical communication cables<sup>1</sup>**

- VEHK4003 Length: 3 m / 10 ft
- VEHK4001 Length: 20 m / 65 ft
- VEHK4002 Length: 50 m / 165 ft (on cable drum)

**8 Fiber optical bus control unit**

- VE004300 MCU 502 fiber optical bus controller

**Charge calibrators**

- VE004200 Version A: 0.1 pC to 10 pC
- VE004210 Version B: 1 pC to 100 pC
- VE004220 Version C: 10 pC to 1000 pC
- VE004230 Version D: 0.1 nC to 10 nC
- VE004240 CAL 543 online charge calibrator
- VE004241 Remote control (required for CAL 543)



**Protection cases**

- VEHP0041 MPC 600 protection case



**Transport cases**

- VEHP0043 For up to three MCT 100
- VEHP0044 For complete MPD system



**OMICRON** is an international company serving the electrical power industry with innovative testing and diagnostic solutions. The application of OMICRON products allows users to assess the condition of the primary and secondary equipment on their systems with complete confidence. Services offered in the area of consulting, commissioning, testing, diagnosis and training make the product range complete.

Customers in more than 140 countries rely on the company's ability to supply leading edge technology of excellent quality. Service centers on all continents provide a broad base of knowledge and extraordinary customer support. All of this together with our strong network of sales partners is what has made our company a market leader in the electrical power industry.

The following publications provide further information on the solutions described in this brochure:



*MPD 600 Brochure*

For a complete list of available literature please visit our website.

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