

# PRECISION FERROUS PARTICULATE ANALYZER

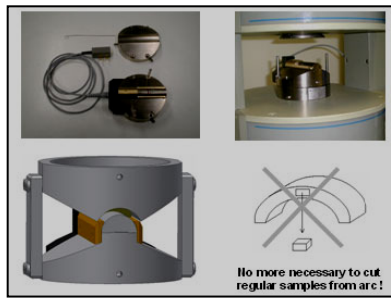
(DIFFERENTIAL-MODE)

MATMT-Series

**Introduction:** MDMFA series of differential magnetic field type ferrous particulate analyzers are available in more than eight different models virtually offering Analytical/measurement solutions to ferro-magnetit, ferromagnetic, anti-ferromagnetic, parametric, diamagnetic particulate( above 0.1 micro) measurement in oil, composites, shielding paper, functional leather/ PVC/ wood/ laminates, filters/ civil items, food items etc. It can effectively measures ppm level/mili gram/cm<sup>3</sup> of magnetic particulate contents with reasonably high degree of accuracy (using hall/fringe effect). On account of its such abilities these analyzers are first choice for metallurgical, solid state physics, medical diagnostic, agro, biomedical, petrochemical, automobile, organic/inorganic chemical, special coatings etc.

**Operating Principle:** Sample is placed in constant magnetic motive force (AC/DC) under settled thermo-mechanical conditions with reasonable stable mmf. Two precision probe measure the differential magnetic field on both side of sample with very negligible mmf drop across sensor in comparison to sample. Accordingly differential magnetic field is assessed under varied mmf condition (dc/ac) and positionally radially or spherically. Other parameter may be inferred viz permeability, incremental permeability, local hysteresis loops etc may be inferred also to cross verify assessment. The difference of incoming and outgoing magnetic flux is right indication of %ppm level of ferrous particle in sample.....

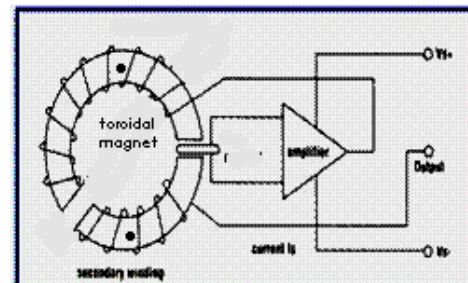
% p.p.m. =  $K1 \cdot B1(x,t) - B2(x,t)$  where B: sensed magnetic field, K, is dependent on magnetic permeability of ferrous particulate



Magnetometry of curvature sample



particulate analyzer of  
Lubrication oil



## Electrical/magnetic specifications of Magnetic particulate Analyzers:

### Low m.m.f./low magnetic field:

MODEL	Ppm level/resolution	Magnetic field Tesla	Permeability range 10 <sup>-3</sup> - 10 <sup>-4</sup>	Pole size Min/max (Dia- m.m.)	Accuracy / Repeatability	Sample material/ wxh-max/thickness	Fringe effect % of pole size
MMPA-000111	0.000000-999999.95	05.0/01.0 -999999x10 <sup>-4</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000211	0.000000-999999.9/5	05.0/01.0 -999999x10 <sup>-4</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000411	0.000000-999999.9/5	05.0/01.0 -999999x10 <sup>-4</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000711	0.000000-999999.9/5	05.0/01.0 -999999x10 <sup>-4</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-001011	0.000000-999999.9/2	05.0/01.0 -999999x10 <sup>-4</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-002011	0.000000-999999.9/2	05.0/01.0 -999999x10 <sup>-4</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-005011	0.000000-999999.9/2	05.0/01.0 -999999x10 <sup>-4</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-010011	0.000000-999999.9/1	05.0/01.0 -999999x10 <sup>-4</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-020011	0.000000-999999.9/1	05.0/01.0 -999999x10 <sup>-4</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%

### General electrical/mechanical specifications:

Operating voltage: 220 volt A.C. (50-20,000 Hz)/ 12 volts D.C.

Particulate size: 0.1-1000 micron

Measurement range (full scale): as above in different model.

Tesla signal (measurement): 10<sup>+1</sup>/10<sup>-3</sup>/10<sup>-6</sup>/10<sup>-9</sup> Tesla e AC/DC (optional)

Source M.M.F. Range: 10<sup>-3</sup>/10<sup>-4</sup>/10<sup>-9</sup> m.m.f. AC/DC (optional)

Permeability: 10<sup>-3</sup>/100/10<sup>+4</sup> with resolution upto 0.001

Measurable ppm level: 0.00000- 99999.9

Operational temperature: -10 °C to +60 °C

Magnetic field pole diameter: 2-4 mm<sup>2</sup> / upto 100 m.l.

Sample size: 1.0x1.0/ 2.0x2.0 cm<sup>2</sup>

Response time: 1000 sample/sec

M.m.f. drop in magnetic circuit: less than 10% of set value

Accuracy error: 0.5/1.0/2.0 % reading

Repeatability: 100 of reading

Resolution: 1/5 count and may be altered based on time behaviour of signal

Linearity adjustment: upto 100 count

Input impedance: ultra low (<1000 count),

Filtering: low pass (adjustable) /Offset: variable upto 10,000 count (manual/auto)

CMMR: >80 db at 50-60 Hz/Isolation: > 100 giga ohm

Connector: BNC-9 pinx2 and BNC-25 pinx2

Size: 8x8x12 "/rack mounted or portable/RS-232 / ADDITIONAL SOFTWARE to plot permeability/ magnetic field and m.m.f.



**MOTORON SEMICONDUCTORS CORPORATION**

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**TRANSIENT MAGNETIC PROPERTIES ANALYZER**

(DIFFERENTIAL-MODE)

MATMT-Series

General specifications of Magnetic particulate Analyzers:

Low m.m.f./high-magnetic field:

MODEL	Ppm level/resolution	Magnetic field Tesla	Permeability range $10^{-3}$ - $10^{-14}$	Pole size Min/max (Dia- m.m.)	Accuracy / Repeatability	Sample material/wxh-max/thickness	Fringe effect % of pole size
MMPA-000112	0.000000-999999.95	05.0/01.0 -000999x10 <sup>-3</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000212	0.000000-999999.9/5	05.0/01.0 -000999x10 <sup>-3</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000412	0.000000-999999.9/5	05.0/01.0 -000999x10 <sup>-3</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000712	0.000000-999999.9/5	05.0/01.0 -000999x10 <sup>-3</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-001012	0.000000-999999.9/2	05.0/01.0 -000999x10 <sup>-2</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-002012	0.000000-999999.9/2	05.0/01.0 -000999x10 <sup>-2</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-005012	0.000000-999999.9/2	05.0/01.0 -000999x10 <sup>-2</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-010012	0.000000-999999.9/1	05.0/01.0 -000999x10 <sup>-2</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-020012	0.000000-999999.9/1	05.0/01.0 -000999x10 <sup>-2</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%

General specifications of Magnetic particulate Analyzers:

High-m.m.f./low-magnetic field:

MODEL	Ppm level/resolution	Magnetic field Tesla	Permeability range $10^{-3}$ - $10^{-14}$	Pole size Min/max (Dia- m.m.)	Accuracy / Repeatability	Sample material/wxh-max/thickness	Fringe effect % of pole size
MMPA-000113	0.000000-999999.95	05.0/01.0 -999999x10 <sup>-6</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000213	0.000000-999999.9/5	05.0/01.0 -999999x10 <sup>-6</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000413	0.000000-999999.9/5	05.0/01.0 -999999x10 <sup>-6</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000713	0.000000-999999.9/5	05.0/01.0 -999999x10 <sup>-6</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-001013	0.000000-999999.9/2	05.0/01.0 -999999x10 <sup>-9</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-002013	0.000000-999999.9/2	05.0/01.0 -999999x10 <sup>-9</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-005013	0.000000-999999.9/2	05.0/01.0 -999999x10 <sup>-9</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-010013	0.000000-999999.9/1	05.0/01.0 -999999x10 <sup>-9</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-020013	0.000000-999999.9/1	05.0/01.0 -999999x10 <sup>-9</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%

General specifications of Magnetic particulate Analyzers:

High-m.m.f./high-magnetic field:

MODEL	Ppm level/resolution	Magnetic field Tesla	Permeability range $10^{-3}$ - $10^{-14}$	Pole size Min/max (Dia- m.m.)	Accuracy / Repeatability	Sample material/wxh-max/thickness	Fringe effect % of pole size
MMPA-000114	0.000000-999999.95	05.0/01.0 -000999x10 <sup>-3</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000214	0.000000-999999.9/5	05.0/01.0 -000999x10 <sup>-3</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000414	0.000000-999999.9/5	05.0/01.0 -000999x10 <sup>-3</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-000714	0.000000-999999.9/5	05.0/01.0 -000999x10 <sup>-3</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-001014	0.000000-999999.9/2	05.0/01.0 -000999x10 <sup>-2</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-002014	0.000000-999999.9/2	05.0/01.0 -000999x10 <sup>-2</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-005014	0.000000-999999.9/2	05.0/01.0 -000999x10 <sup>-2</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-010014	0.000000-999999.9/1	05.0/01.0 -000999x10 <sup>-2</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%
MMPA-020014	0.000000-999999.9/1	05.0/01.0 -000999x10 <sup>-2</sup>	999.999	0.1-3.0 /option	99.9/100	Option/5x5/1.0-5.0	Upto 20%

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