

AIR/GAS/VAPOUR SUSPENDED PARTICULATE MATTER ANALYZER

MATMT-Series

Introduction: MSPA series of air/gas/moisture S.P.M. analyzers/diffusion coefficient measurement set up are available in more than eight different models virtually offering measurement solutions to suspended particulate analyzers in moisture/aire/ or any gaseous environment and is useful for textile fabric, paper, polymers, cosmetic, foam, leather, PVC, wood, cotton, insulator material, laminates, filters, cosmetic fins, civil items, food items industries. etc. It can effectively measures static/dynamic S.P.M. analyzers of particulate size varying from 1.0 to 100.0 micron under varied temperature, humidity conditions. On account of above, these S.P.M. analyzers are first choice for medical diagnostic, agro, biomedical, petrochemical, automobile, organic/inorganic chemical, milk plant, sugar, textiles, beverages, water management/treatment, academic and defense.

Operating Principle: The pressure on one side of sample of known pore size is slowly increased to remove liquid from pores to monitor bubble point pressure. After the this bubble point, flow rate raises more or less proportional to differential pressure across sample filter.ial pressures and flow rates of gas through wet and dry conditions of the sample are used to compute minimum size of particulate size, average size and also maximum size apart from its concentration. It can effectively measures static/dynamic S.P.M. analyzers of pour size varying from 1.0 to 100.0 micron measured for either air or any other gas or vapour.ranging under varied temperature, humidity conditions. Whole particle flow mechanism of flow through sample pore and its Pressure Vs flow and other dynamics is as under...

Differential pressure across sample at which bubble rupture starts afterwards flow increases in proportional to differential pressure.....

$dP = 4\gamma \cos(\theta)/D$ where γ = surface tension , D =pore diameter

Darcy model of intrinsic permeability porous material with liquid flow:

$Q = k.A.dP/u.L$ Q = Flow rate, dP = differential pore pressure, dpo = Bubble pressure, L = flow path,

Up = fluid viscosity $dP >$ bubble pressure

Flow rate through pores once bubble point is crossed is as under.....

$Q = 3.14.dP.R^4.(8L.U_p)X [1 - (1.333.(dpo/dP) + 0.333(dpo/dP)^4]$

$K = Q.U_w.L/A.Dp = 0.125.R^2.(8L.U_p)X [1 - (1.333.(dpo/dP) + 0.333(dpo/dP)^4]$

Q = Flow rate, DP = differential pore pressure, dpo = Bubble pressure, L = flow path,

Up = ratio of shear stress/shear strain when $dP >$ bubble pressure



Differential air pressure sensor



MATMT-050



MATMT-0020



ELECTRICAL/MECHANICAL SPECIFICATIONS OF Gas/Liquid S.P.M. analyzers Analyzers:

Low pressure/low flow:

MODEL	Pressure psi	Flow range 10 ⁻³ Litre/min	S.P.M. analyzers range Gmsx10 ⁻⁴ /m s Pa	Particle -size Min/max Dia-micro	Accuracy / Repeatability	Sample material/area/thickness	S.P.M. analyzers Analyzers tube-Liner	Leak rate
MATMT-00011	0.01-1.000	0.0001.0-0010.0	009.999	0.1-50/option	99.9/100	Option/1/2/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATMT-00021	0.01-1.000	0.0001.0-0010.0	09.9999	0.1-50/option	99.9/100	Option/3/4/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATMT-00041	0.01-1.000	0.0001.0-0010.0	99.9999	0.1-50/option	99.9/100	Option/1.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATMT-00071	0.01-1.000	0.0001.0-0010.0	999.999	0.1-50/option	99.9/100	Option/1.5/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATMT-00101	0.01-1.000	0.0001.0-0010.0	999.999	0.1-50/option	99.9/100	Option/2.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATMT-00201	0.01-1.000	0.0001.0-0010.0	999.999	0.1-50/option	99.9/100	Option/3.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATMT-00501	0.01-1.000	0.0001.0-0010.0	999.999	0.1-50/option	99.9/100	Option/4.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATMT-01001	0.01-1.000	0.0001.0-0010.0	999.999	0.1-50/option	99.9/100	Option/6.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATMT-02001	0.01-1.000	0.0001.0-0010.0	999.999	0.1-50/option	99.9/100	Option/8.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10

General electrical/mechanical specifications:

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

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

S.P.M. analyzers resistance range: 1.9999 Pa x sec / c.m. 10⁻⁹/10⁻¹²/10⁻¹⁵100 ampere AC/DC (optional)

Gas flow rate :0. 1-0.5 m.m./sec

Operational humidity: 10-100%

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

Suction capacity: 0.2 - 2.0 c.m./sec

Pressure of gas source: 0.4MPa~0.6Mpa

Transmission area: 38.48cm² (diameter 70mm)

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AIR/GAS/VAPOUR SUSPENDED PARTICULATE MATTER ANALYZER

General electrical/mechanical specifications:

Sample size: 1.0x1.0/ 2.0x2.0 cm²
 Response time: 1000 sample/sec
 Pressure drop Burden: less than 100 micro1.9999 Pa x sec / c.m or better
 Accuracy: 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 imedence: 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: 5X8X8 inches/rack mounted or portable/RS-232 / ADDITIONAL SOFTWARE to plot T/Rh/S.P.M. analyzers, fabric thickness.

Electrical/Mechanical Specification Gas/Liquid S.P.M. analyzers:

Low pressure /high flow:

MODEL	Pressure psi	Flow range Litre/min	S.P.M. analyzers range Gmsx10 ⁻⁴ /m ³ s Pa	Particle size Min/max	Accuracy / Repeatability	Sample material/area/thickness	S.P.M. analyzers tube-Liner	Leak rate
MATM-00012	0.01-1.000	0.01.0-0100.0	009.999	0.05-0.5/option	99.9/100	Option/1/2/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00022	0.01-1.000	0.01.0-0100.0	09.9999	0.05-0.5/option	99.9/100	Option/3/4/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00042	0.01-1.000	0.01.0-0100.0	99.9999	0.05-0.5/option	99.9/100	Option/1.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00072	0.01-1.000	0.01.0-0100.0	999.999	0.05-0.5/option	99.9/100	Option/1.5/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00102	0.01-1.000	0.01.0-0100.0	999.999	0.05-0.5/option	99.9/100	Option/2.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00202	0.01-1.000	0.01.0-0100.0	999.999	0.05-0.5/option	99.9/100	Option/3.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00502	0.01-1.000	0.01.0-0100.0	999.999	0.05-0.5/option	99.9/100	Option/4.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-01002	0.01-1.000	0.01.0-0100.0	999.999	0.05-0.5/option	99.9/100	Option/6.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-02002	0.01-1.000	0.01.0-0100.0	999.999	0.05-0.5/option	99.9/100	Option/8.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10

Electrical/Mechanical Specification Gas/Liquid S.P.M. analyzers Analyzers:

High Pressure/low flow:

MODEL	Pressure psi	Flow range 10 ⁻³ Litre/min	S.P.M. analyzers range Gmsx10 ⁻⁴ /m ³ s Pa	Particle -size Min/max Micron-diameter	Accuracy / Repeatability	Sample material/area/thickness	S.P.M. analyzers tube-Liner	Leak rate
MATM-00013	001.0-100.0	0.0001.0-0010.0	009.999	0.05-0.5/option	99.9/100	Option/1/2/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00023	001.0-100.0	0.0001.0-0010.0	09.9999	0.05-0.5/option	99.9/100	Option/3/4/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00043	001.0-100.0	0.0001.0-0010.0	99.9999	0.05-0.5/option	99.9/100	Option/1.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00073	001.0-100.0	0.0001.0-0010.0	999.999	0.05-0.5/option	99.9/100	Option/1.5/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00103	001.0-100.0	0.0001.0-0010.0	999.999	0.05-0.5/option	99.9/100	Option/2.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00203	001.0-100.0	0.0001.0-0010.0	999.999	0.05-0.5/option	99.9/100	Option/3.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00503	001.0-100.0	0.0001.0-0010.0	999.999	0.05-0.5/option	99.9/100	Option/4.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-01003	001.0-100.0	0.0001.0-0010.0	999.999	0.05-0.5/option	99.9/100	Option/6.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-02003	001.0-100.0	0.0001.0-0010.0	999.999	0.05-0.5/option	99.9/100	Option/8.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10

ELECTRICAL/MECHANICAL SPECIFICATIONS OF Gas/Liquid S.P.M. analyzers

High Pressure/High flow:

MODEL	Pressure psi	Flow range Litre/min	S.P.M. analyzers range Gmsx10 ⁻⁴ /m ³ s Pa	Particle- size Min/max	Accuracy / Repeatability	Sample material/area/thickness	S.P.M. analyzers tube-Liner	Leak rate
MATM-00014	001.0-100.0	0.01.0-0100.0	009.999	0.1-50/option	99.9/100	Option/1/2/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00024	001.0-100.0	0.01.0-0100.0	09.9999	0.1-50/option	99.9/100	Option/3/4/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00044	001.0-100.0	0.01.0-0100.0	99.9999	0.1-50/option	99.9/100	Option/1.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00074	001.0-100.0	0.01.0-0100.0	999.999	0.1-50/option	99.9/100	Option/1.5/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00104	001.0-100.0	0.01.0-0100.0	999.999	0.1-50/option	99.9/100	Option/2.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00204	001.0-100.0	0.01.0-0100.0	999.999	0.1-50/option	99.9/100	Option/3.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-00504	001.0-100.0	0.01.0-0100.0	999.999	0.1-50/option	99.9/100	Option/4.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-01004	001.0-100.0	0.01.0-0100.0	999.999	0.1-50/option	99.9/100	Option/6.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10
MATM-02004	001.0-100.0	0.01.0-0100.0	999.999	0.1-50/option	99.9/100	Option/8.0/1.0-5.0	Silo-Ceramic-rubber	<1.8x10

Company may dedicate instruments to meet specific requirement. / NOTES: The numeral after product code indicates the S.P.M. analyzers to be measured

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