

MRU –
over 30 years of
innovative gas
analysis

MFplus

Multifunctional Digital Manometer

Unit dedicated to travers points volumetric
flow rate measurement in industrial stacks compliant
to European Standard EN 16911-1, to ISO 10780
and to USEPA 40CFR part 60, method 2



using S-type Pitot tube



using L-type Pitot tube

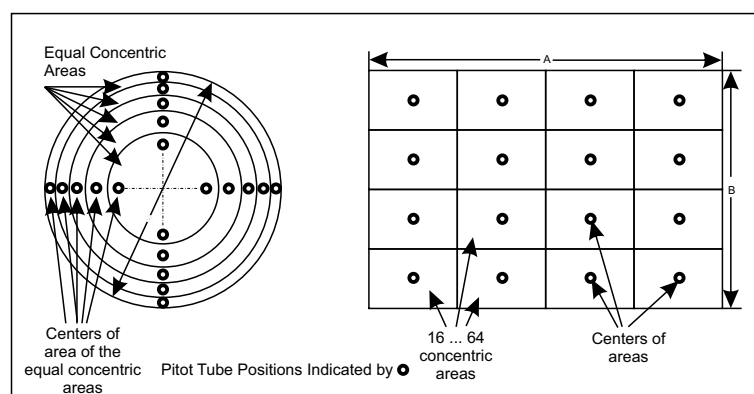


Professional solution with:

- compatible for all pitot tubes available on the market
- intuitively, bright colours graphic interface
- high accuracy pressure sensors, temperature compensated
- dual K-type thermocouple connectors
- long time operation using the NiMH built-in battery
- internal storage and SD card high volume data storage

Standard functions:

- static, dynamic (differential) pressure measurement
- ambient barometric pressure measurement
- single, differential temperature measurement
- all known measuring units, user free setting
- special dedicated software to travers points flow rate measurements in industrial stacks



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settings	
Set measuring units	
P-abs.	hPa
Cross-sect. area	m ²
v-flow	m/s
Q-flow rate	l/s
Set cross-sect. area	
Cross-sect. area	Circle
Diameter [m]	0.50
Cross-sect. area [m ²]	0.196
return	

settings	
Define gas parameters	
O2	2.5 %
CO2	0.0 %
H2O	0.0 %
CH4	1.0 %
N2	96.5 %
Mol. mass [kg/mol]	0.0280
P absolute	
P-abs. [hPa]	1013.1
return	

Gas flow measurement	
Line 1	Traverse pt. 1
P-abs. [hPa]	1013.10
P-sta. [hPa]	0.00
P-dyn. [Pa]	8.629
Q-flow rate wet [Nl/s]	639.0
stop	0:14
abort	

Main features:

- simultaneous measurement of differential pressure, barometric pressure and temperature
- intuitive menu to carry out the traverse points flow rate measurement on ducts or stacks acc. to EN-16911
- manual input of site cross sectional area parameters like size, diameter, number of traverse points in the grid
- automatic calculation of measuring point average data according to EN 15259
- input of gas data composition for gas density calculation and normalisation to standard condition
- calculation of dry and wet gas data, with temperature and barometric pressure compensation
- calculation of instant and average data with start-stop or preset average time (up to 10mins)
- calculation of stack pressure (absolute and static pressure) relative to ambient barometric pressure
- use of all pitot tube models with input of Pitot tube factor, compensation of wall effects
- up to 100 traverse points measurements and calculations for one single stack
- transfer of high volume measured data to SD card in CSV format

Technical specifications

	Measuring range	Accuracy	Resolution
Differential pressure:	± 100 hPa	± 0,5 Pa up to ± 10 Pa, ± 2 Pa or ± 1% of reading up to ± 100 hPa	0,01 Pa
Flow velocity: (calculated)	0 m/s up to 100 m/s	0 m/s up to ± 2 m/sec ± 1 m/s 2 m/s up to ± 10 m/sec ± 0,2 m/s >10 m/sec ± 0,5 %	0,01 m/s
Absolute pressure:	700 ... 1.200 hPa	± 1 % of reading	1 Pa
Gas temperature: (K-type thermocouple)	-20 ... + 1.200 °C	± 1 °C or 1 % of reading	0,1°C
Ambient air temperature: (K-type thermocouple)	-20 ... + 80 °C	± 1 °C	0,1°C
Data transfer:	Mini-USB or SD-card		
Display:	Colour, backlit 3,5" TFT		
Operating temperature:	-10 °C to +50 °C, max 95 %RH, non condensing		
Power supply:	internal NiMH battery, 30 hours mains free operation		
Mains:	USB wall-plug battery charger, 100-240 Vac, 5 Vdc-1 A		
Protection type:	IP43		
Weight:	470 gr		
Dimensions:	90 x 205 x 38 mm (WxHxD)		



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