



**PEGASOR
PARTICLE
SENSOR** **M**

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Applications:

Pegasor M -sensor unique development from Pegasor and targeted for industrial fine particle monitoring in wide range of applications. The product is especially suited for the following vehicle emissions monitoring applications:

Continuous engine test bench monitoring
On-board vehicle monitoring
Vehicle inspection and in-use testing
Diesel Particle Filter grade efficiency monitoring
Gasoline Direct Injection (GDI) emission monitoring

Pegasor M -sensor can be used as a stand-alone product or it can be integrated to existing systems. Pegasor M -sensor is also used to power the turnkey system Mi2 from Pegasor.

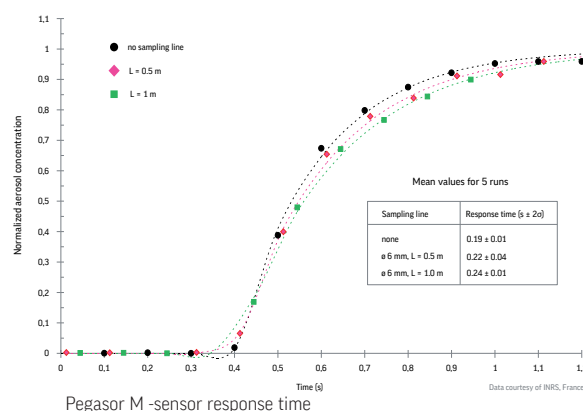
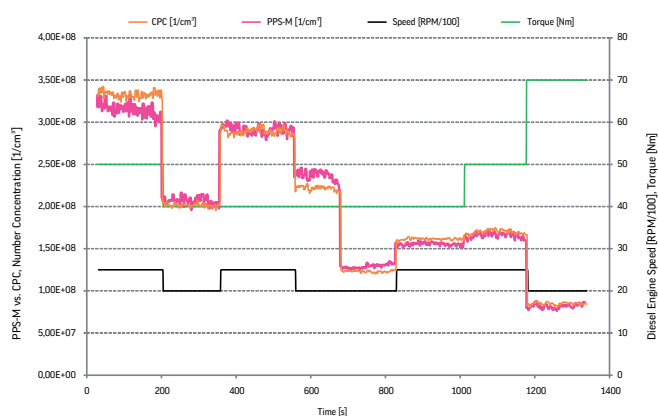
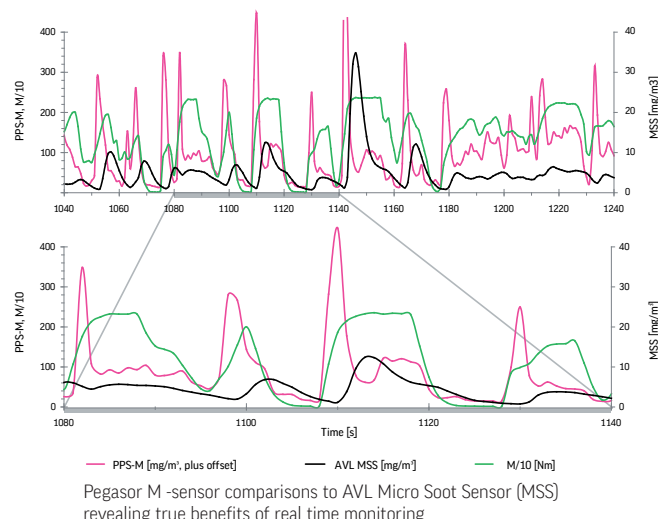
Beside engine emission monitoring, Pegasor M -sensor has been successfully applied in wide range of industrial fine particle monitoring applications, ranging from stack emission monitoring to ambient air quality monitoring.



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Some examples of results:



Unique customer benefits:

Particle mass & number

The technology used on Pegasor M -sensor enables measuring both particle number and mass - both critical measures emission regulations as well as particulate health effects.

Superior response time

With 0.2 second response time (10 Hz data acquisition) Pegasor M -sensor is able to reveal the actual timely occurrence of particle concentration change. This gives the possibility to deeply understand the reasons behind - adding value especially e.g. to engine and process development.

Wide dynamic measurement range and sensitivity

High sensitivity and wide dynamic range ($1 \mu\text{gm}^3$ - 250mgm^3) enables monitoring from harsh emission levels to clean environments. Pegasor M is an excellent tool e.g. for emission monitoring down and upstream particulate filter.

Nanoparticles can be detected from a few nanometers up to 2.5 microns.

Less downtime - more results

Pegasor M -sensor's flow through design enables long term monitoring of particles. Less time in service, no need of frequent calibration - more results. Pegasor M is also equipped with sophisticated self diagnostics to ensure proper operation of the sensor.

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Software and Graphic User Interface

Data logging software PPS-plotter is used to read and store the sensor data. Sensor and all attached hardware are also calibrated and initialized with the PPS-plotter. The software stores measurement data and produces ASCII format files for real time export and post processing.

Pegasor M -sensor provides digital output. If analog output is required the data is first analyzed and processed in the PC and then converted back to analog with a DAconverter. Pegasor provides one and four channel analog output devices.



QuadDAC is a four channel analog output device for Pegasor M -sensors.

It connects to the sensor bus along the sensors and reads data directly from the bus. After setup, PC is not needed for operation. Each channel can be assigned to read input from sensor, filter it and generate an analog voltage using user defined scaling and offset.



Principle of operation

Pegasor sensor technology is based on the measurement of electrical charge carried by particles. It is a non-collecting measurement method, ensuring long maintenance and cleaning interval.

Pegasor sensor comprises an ejector where the motive fluid flow is generated by pure, particle free gas. Typically this gas is filtered air. The motive fluid flow generates an underpressure to the sample inlet and due to the negative pressure, particle-containing gas flows into the sensor.

The clean motive fluid is ionized before it enters the sensor. This ionized air is then used to charge the particles in the sensor. Mixing between the ionized air and the sample flow is very effective and thus all particles are efficiently charged. Particle charging is relative to the particle size.

Ions that are not attached to the particles are removed from the gas flow by an ion trap. As the electrical mobility of the ions is much higher than the mobility of charged particles, the ion trap effectively removes only the ions.

When the free ions are removed, the only mechanism carrying electrical current is the flow of charged particles. The electrical current escaping from the sensor with the charged particles can be measured and this gives a direct, fast, real-time measurement of the particle concentration. The measurement result can be expressed either or both as mass concentration or as number concentration.

Complete systems available

Pegasor offers wide range of accessories to complete the necessary measurement set-up in different applications. These include e.g.:

- Heaters for the M -sensor and sampling
- Sample diluters and controllers
- Insulators
- Digital to analog converters (4 channel / 1 channel)
- Connectors etc.

Quality assurance

Before shipment each and every Pegasor product is carefully tested. Quality assurance procedure is already done during production.

Pegasor own end of line testing laboratory makes the final measurements. Each sensor shipment includes detailed data sheet for the individual product in question.

Sensor calibration has been done jointly with Laboratory of Applied Thermodynamics, Aristotle University, Greece.

Pegasor M -sensor production and assembly process is ISO 9001 certified.

Technical specifications

Minimum detectable particle size:	Minimum a few nm, up to 23 nm (dependent on selected trap voltage)
Maximum detectable particle size:	2.5 µm (dependent on measured particle size distribution)
Particle concentration range:	From 1 µg to 250 mg/m ³ (T = -20°C - 200°C) (*) From 10 µg to 500 mg/m ³ (T = -20°C - 600°C) with special inlet sample restriction plate
Operation temperature:	-20°C - +50°C
Sample temperature:	Up to 200°C (sample temperature limit inside the sensor)
System output:	USB output, optional analog output device
Software and data collection:	Data analysed by GUI provided by Pegasor Mass & number concentration calculated
Data output:	24-bit, 100Hz sample rate. SNR=100dB. Sensor self diagnostic signals
Power requirement:	6W
Computer requirements:	Windows XP/Vista/7 operating system

Length:	40 cm
Weight: (without accessories)	2.6 kg
Sample inlet:	G1/4"
Sample out:	G3/8"
Clean air supply:	G1/8"



Pegasor provides unique fine particle sensor technology and products that offer a competitive edge to its customers operating in vehicle emissions, stack emissions and air quality monitoring.

Our technology and sensors are the result of acknowledged and solid scientific research, as well as an extensive track record of industrial fine particle measurements.

Our products are available throughout Asia, Europe and North America via comprehensive network of local distributors and leading manufacturing partners.

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