Pegasor M -sensor

Application note

Engine emission measurements

Safety notices

1. PPS- M sensor is intended only for fine particle measurements. Read carefully full manual for safe product operation.
2. Installation, electrical connection, operating and maintenance may only be performed by trained professionals.
3. Do not make any modifications to the product or attach any external components prior to consulting original manufacturer.
4. During heating and after use sensor is hot. Do not touch the hot sensor or leave it unattended at any point.
5. Follow carefully manufacturer´s safety and product instructions for the temperature regulator. Especially use with false type of power inverter or subzero operation may cause serious damage!

When Pegasor Particle Sensor (PPS-M) is used in engine emission measurements, care must be taken not to risk the sensor performance by mishandling it during set-up and operation. Possible examples of mishandling are:

- *Contaminating the corona needle and sensor insulators by exposing the sensor to exhaust gases without clean air supply on.*
- *Contaminating the corona needle by keeping the corona on when clean air supply is off. This may result in unstable corona voltage and current.*
- *Wetting the sensor internal parts by moist sample gas before the set sensor temperature is reached. Wetting the sensor may result in a low impedance warning and/or short circuiting the sensor (high negative output value).*
- *Zeroing the sensor before the measurement temperature has been reached. This may result in zero drift and offset.*
- *Allowing the sensor electronics temperature to increase above 50 °C may cause significant noise to the measurement signal. Exceeding 100 °C may cause permanent damage to the electronics.*

Sensor mishandling can best be prevented by the following step-by-step arrangements precautions:

1. Make sure the PPS-M internal heater temperature controller is properly grounded (refer to manufacturer´s manual).
2. Install open/close valves to sample inlet and outlet lines. Keep the valves closed until point 6.
3. Connect and start the pressurized air @1.5 bar overpressure, dry instrument air with a dew point of -10 °C or lower. *Compressed air or nitrogen should meet the quality of Class 3 of ANSI/ISA-7.0.01-1996 standard.*
4. Set the heaters to the recommended temperature (refer to manufacturer´s manual)
   - Internal sensor heater @ 200 °C (this is the temperature of the thermocouple connected to the heater coil - not the sensor itself)
   - Inlet sample heater @ 200 °C

   Safety notice for temperature controller: read and follow carefully manufacturer´s operating instructions prior use. Operation temperature is strictly limited to 0 - 50°C. Do not attach other devices (such as power inverter) prior consulting manufacturer of their applicability. Misuse may be hazardous and cause serious damage / fire !
5. Turn on the heaters and wait for appr. 30 minutes allowing the temperatures to stabilize and reach adequate level. Additionally, it is recommended to monitor the outlet gas temperature in order to verify it is clearly over 100 °C before engine start / letting the sample in (point 6).
6. Open the inlet and outlet sample line valves.
7. Zero the sensor. Absolute air filter must be installed in the PPS-M inlet.
8. Turn on the corona charger to start the measurement.

Recommended measurement set-up has been described on the next page.
By following these instructions you will generate reliable, repeatable and accurate results with the PPS-M.

www.pegasor.fi

Address: Hatanpään valtatie 34 C
33100 Tampere
Finland

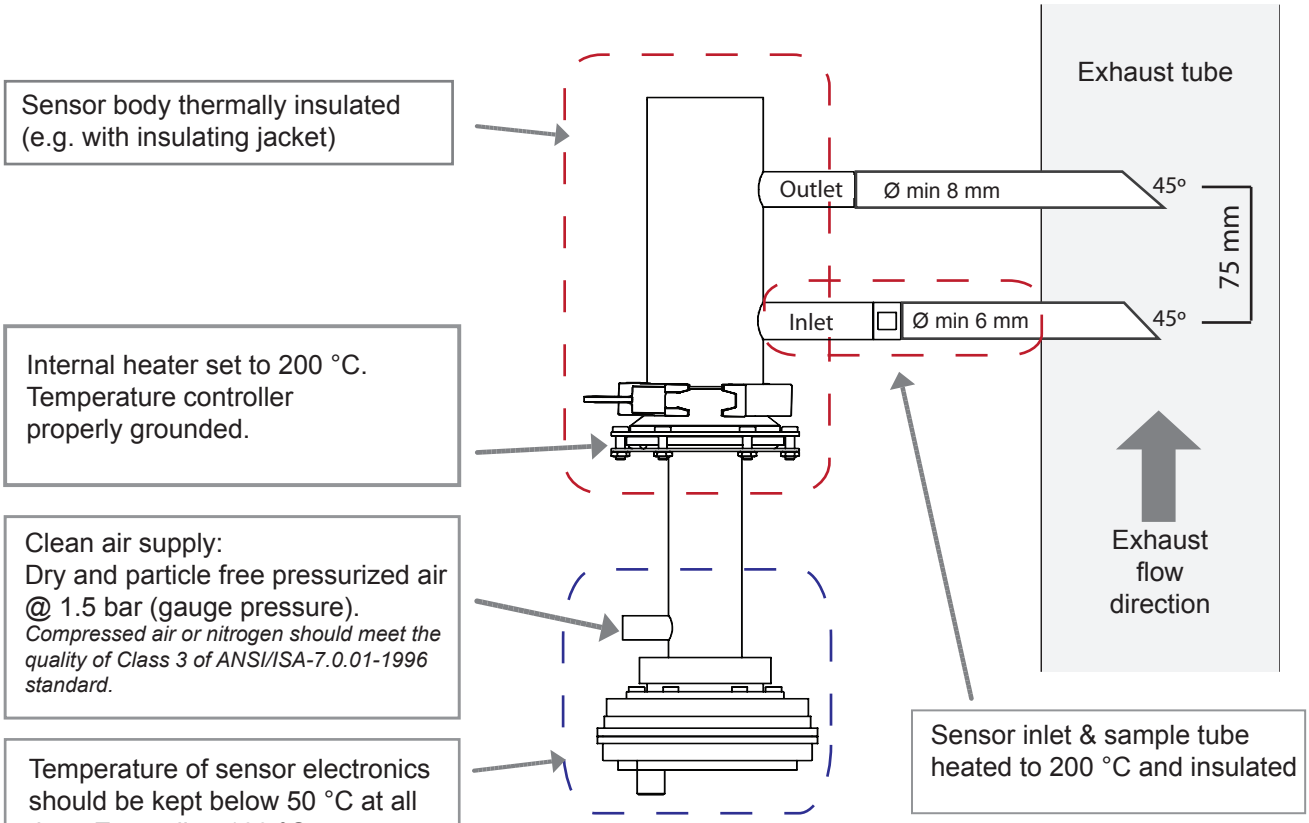
Tel. +358 10 423 7370
Vat reg FI2175488-0

Pegasor M -sensor

Application note

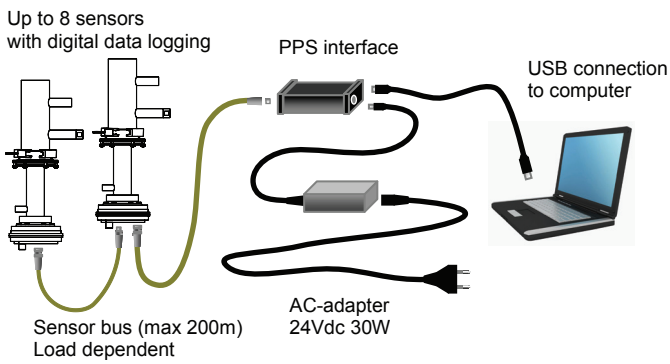
Engine emission measurements

Recommended measurement set-up in engine emission measurements:

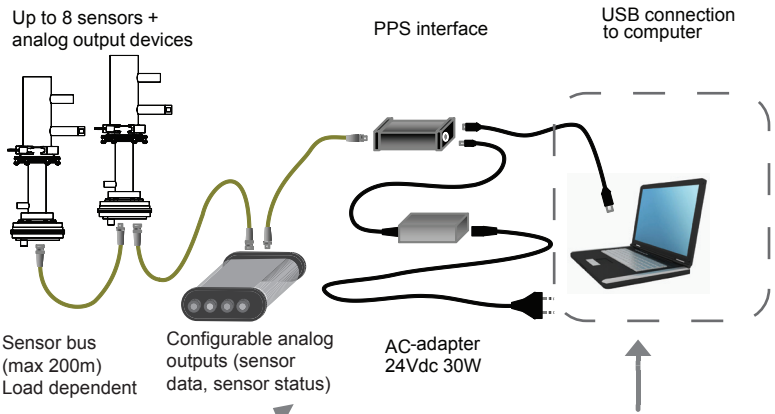


PPS-M connections:

Basic configuration:



Configuration with analog signal output:



QuadDAC is a four channel analog output device for Pegasor PPS-sensors. It connects to the sensor bus along the sensors and reads data directly from the bus. After setup, PC is not needed for sensor operation.

www.pegasor.fi

Address: Hatanpään valtatie 34 C
33100 Tampere
Finland

Tel. +358 10 423 7370
Vat reg FI2175488-0