HORIBA Global Support Network

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Dual Pitot Tube Flow Meter

PTFM-ONE

Background

The new Dual Pitot Tube Flow Meter (PTFM-ONE DT) is a patented product design that joins our best in class PTFM-1000 V2 product in our PTFM line up.

The PTFM-ONE DT takes all the best features of the PTFM-1000 such as 1kHz data capture and the highest exhaust temperature testing capability on the market.

The PTFM-ONE DT now offers a larger dynamic range allowing you to test more engine or vehicle ranges without the need to change your test cell pipework. This ‘dynamic range’ means the PTFM-ONE DT can handle flow rates from 0.3m³/min up to 14.5m³/min at 20°C due to the innovative way HORIBA has designed the pipework, switching seamlessly from the lower flow testing pitot tube to the extended range setup running 2 Pitot simultaneously.

Key Benefits

- **900°C Exhaust Gas Limit**
  - Allows the freedom to test engines under extreme conditions without worrying if the flow meter can handle those temperatures.

- **-1.25kPa to +7.5kPa Sensor Range**
  - Shows both positive flow & negative flow in the tailpipe. Also, HORIBA capped the positive pressure at +7.5kPa to ensure we cause as little backpressure on your engine as possible.

- **Dual Tube System**
  - This is a patented design using 2 Pitot Tubes that incorporates a valve to switch automatically, ensuring the system maintains the highest possible accuracy. It uses the smaller tube for flows below 4.5 m³/min and both tubes if flows peak above the smaller tubes flow limit up to 14.5 m³/min.

- **1Khz High Speed Transducers**
  - Having fast sampling of the pressure changes in the tailpipe allows for a rapid visual representation of both positive and negative spikes that occur within a combustion engine. Lower speed sampling would miss these spikes giving you an inaccurate representation of what is actually happening inside the tailpipe.

- **Temperature Compensation**
  - The PTFM-ONE automatically compensates to 20°C when testing so there is no need to warm up.

- **Multiple Communication Options**
  - The PTFM-ONE has 2 connection options, LAN for AK connections to Automation systems or the PTFM Host programme & Analogue out (0-10V with 4 configurable channels available).

- **2 Options of Absolute Pressure Sensors**
  - The PTFM-ONE can be purchased in 2 absolute pressure ranges supporting testing from sea level to a) 2100m or b) 4500m.

Optional Features

- **Climatic Version**
  - For use in Test Cells down to -20°C.

- **High Altitude Version**
  - For use in Test Cells simulating up to 4500m.

- **Tailpipe Sample Fitting**
  - Integrated sampling point.

Specifications

- **System Configuration**
  - (Standard unit)
  - The System comes with a B & C Tube in parallel with each other and a valve in between.

- **Tube Diameter & Measuring Range**
  - B-type: f42.7 / f39.7 mm (0.15 m³/min to 4.5 m³/min)
  - C-type: f60.5 / f56.5 mm (0.3 m³/min to 10 m³/min)

- **Linearity**
  - Either of the following:
    - (a) Within ±2.0 % of full scale
    - (b) Intercept: |a₀| ≤ 1.0 % of full scale
    - Slope: 0.98 ≤ a₁ ≤ 1.02
  - Standard estimated error: SEE ≤ 2.0% of full scale
  - Coefficient of determination: r² ≥ 0.990

- **Flow Rate Accuracy**
  - Within ±1 % of full scale or within ±1.5 % of readings (whichever larger)
    - (at flow rate of 20 % of full scale)

- **Exhaust Pressure Sensor Range**
  - -1.25 – 7.5 kPa

- **Atmospheric Pressure Sensor Range**
  - Standard configuration: 80 to 110 kPa
  - Optional configuration: 60 to 110 kPa

- **Environment for use**
  - Temperature: -20°C to +40°C
  - Humidity: Under 80% as relative humidity
  - Altitude: 0m to 2100m above sea level *option for up to 4500m

- **Approved Standards**
  - CE, FCC, RoHS compliant

- **Dimensions**
  - H x W x D (mm) - 923 x 480 x 1204

- **Mass**
  - 115KG Approx.