

Instrumentation/Media Conditioning Equipment



AVL Fuel Mass Flow Meter & Temperature Control

The combination of AVL Fuel Mass Flow Meter and AVL Fuel Temperature Control is a high precise and continuous fuel consumption measurement system, which is used world-wide at almost all engine test beds where engines of a maximum consumption of 125 kg/h are tested. The system stands out for high accuracy and excellent temperature stability.

The fuel measurement system AVL Fuel Mass Flow Meter together with AVL Fuel Temperature Control enables a high precise fuel consumption measurement also at low flow rates and short measurement times.

The following data and functions are available:

- Indication of fuel consumption in kg/h, l/h, l/h (API)
- Indication of fuel density in kg/m³
- Measurement and indication of the actual fuel consumption at a measurement frequency of 20 Hz
- Average consumption for pre-selected measuring time or pre-selected measuring weight
- Total/interval consumption for determined measuring time
- Running average calculation with additional indication of standard deviation and measurement uncertainty
- Selection of nominal fuel temperature – analogue or via RS232
- Indication of actual fuel temperature – analogue or via RS232
- Continuous evaluation of the temperature gradient in the measuring circle
- Fuel vapour bubble separation and –monitoring
- Full automatic built-in accuracy check and calibration
- Fast and efficient fuel change
- Indication of error and status report
- Service interval display

AVL Fuel Mass Flow Meter & Temperature Control

Your Benefits at a Glance

- Measurement accuracy of 0.12% through direct mass flow measurement and highest temperature stability of the fuel conditioning system
- Rapid measurements even at the lowest levels of consumption
- The highest level of reliability and universal suitability to the requirements of modern measurement methods and injection systems
- From a single cylinder through to a 600 kW large engine with one sensor and measurement system
- Built-in accuracy check and calibration according to ISO 9001

Technical information

The complete system consists of a AVL Fuel Mass Flow Meter and a AVL Fuel Temperature Control.

With a high accuracy mass flow sensor the fuel consumption is determined continuous and via direct mass flow measurement in kg/h.

The density does not have to be determined in addition to the direct determination of the gravimetric or specific fuel consumption like in volumetric measurement methods. The fuel consumption can thus be determined to an accuracy of 0.12 % for the whole system under real test bed conditions.

The measurement system stands out for simple installation at all gasoline or diesel injection systems and is therefore universally applicable. This is achieved through the use of a specially developed pressure control system that makes vehicle-like conditions possible on the test bed.

The additional measurement of the fuel density can be used for quality control or checks for the correct fuel used. The volumetric consumption information is also available.

The measurement range from 0 to 125 kg/h covers all engine types from a single cylinder through a 600 kW large engine with one sensor and measurement system.

The high dynamic AVL Fuel Mass Flow Meter has a calibration interval of minimum three years and is therefore designed to provide a permanent availability for the test bed. In addition it features a built-in accuracy check and calibration (see option calibration unit) according to ISO 9001 which can be performed at any time during running engine and with the original fuel.

The AVL Fuel Temperature Control with its high accurate and stable temperature regulation is an unchallenged market leader in the field of fuel conditioning systems.

AVL Fuel Mass Flow Meter & Temperature Control

As a controlled cooling system it allows the user to set the fuel temperature anywhere within the range of 10...80°C. The achievable fuel temperature, however, depends on the cooling water temperature or the amount of heat retained in the engine return fuel.

The high precise temperature control gives a constant pre-set fuel temperature at the engine and guarantees the high measurement accuracy of the whole test system.

Continuous fuel vapour bubble separation ensures that the fuel supply to the engine is free of bubbles. The integrated bubble monitor outputs a warning when gas bubbles occur in the measurement system.

The fuel pressure to the engine can be controlled up to 6 bar (pressure regulator on request).

Built-in service interval displays enable preventive maintenance which helps to reduce and plan downtimes.

Technical data

- Recommended measuring range: 0...125 kg/h, 0...165 l/h (at 0,75 g/cm³)
- Systematic measurement uncertainty: $U_s \leq 0,12 \%$
- Density measurement uncertainty: $\leq 0,0005 \text{ g/cm}^3$
- Step response according to ISO 16183: T10...T90 < 125 ms
- Maximum measurement frequency: 20 Hz (analogue output)
- No. of measurements (running average): 1...99
- Ambient temperature: 0...50° C
- Fuel supply pressure: 0,1...0,8 bar
- Fuel supply flow: max. consumption + 20 kg/h
- Fuel supply temperature: - 10...+ 40° C
- Fuels: diesel- and gasoline fuels with up to 20 % alcohol (M20 or E20)
option:
up to 100 % alcohol (M100 or E100)
- Cooling power: 1,6 kW at 10°C spread
- Fuel circulation capacity: 250 l/h
- Pressure control (option): feed pressure: ~ 0...6 bar
return pressure: 0...~0,8 bar
- Max. temperature control range: 10...80° C

AVL Fuel Mass Flow Meter & Temperature Control

- Temperature stability: + / - 0,02° C
- Interfaces: RS232 (AK compliant)
Analogue 0...10V
Digital I/O
- Power supply: 230V, 50 Hz
- Power consumption: 0,4 kW
- Dimensions: 770 x 1630 x 345 mm (W x H x D)
- Weight (dry): 160 kg

Options:

- Heater: Heating power 1,6 kW
- Special Temperature Ranges: -8° C...70° C
-30° C...80° C
- Power supply: 220V, 60 Hz
100V, 50-60 Hz
115V, 60 Hz
- Fuel circulation capacity: 150 l/h (single cylinder)
500 or 720 l/h (heavy duty)