



FUEL CONSUMPTION MEASUREMENT

AVL FUEL MASS FLOW METER

Description

The AVL Fuel Mass Flow Meter is a high precise and continuous fuel consumption measurement system, which is used worldwide at almost all engine test beds where engines of a maximum consumption of 125 kg/h are tested.

The system stands out for a very high accuracy and because of the modular design it can be combined with existing conditioning systems.

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

With a high accuracy mass flow sensor the fuel consumption is determined continuously 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. With the FlexFuel version, up to 100% alcohol and biodiesel can be measured.



Function Summary

- Indication of fuel consumption in kg/h, l/h, l/h (API)
- Indication of fuel density in g/cm³
- Measurement and indication of the actual fuel consumption at a measurement frequency of max. 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
- Full automatic accuracy check and calibration
- Fast and efficient fuel change
- Indication of error and status report
- Service interval display
- Automatic fuel venting

Application

The fuel system AVL Fuel Mass Flow Meter enables high precise, continuous mass-flow measurements also at low flow rates and short measurement times.

Benefits

- Measurement accuracy of 0.12% through direct mass flow measurement
- Open continuous measurement system (no additional pressure increase in the measurement circuit e.g. due to temperature changes, ...)
- 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 measuring system
- Built-in accuracy check and calibration according to ISO 9001 with option: calibration unit



Technical Insight

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.



Technical Data

Recommended measuring range:	0 ... 125 kg/h, 0 ... 165 l/h (at 0.75 g/cm ³)
Systematic measurement uncertainty:	Us = 0.12%
Density measurement uncertainty:	≤ 0.0005 g/cm ³
Step response according to ISO16183:	T10 ... T90 < 125 ms
Maximal measuring 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:	Otto (EN228), diesel (EN590), up to 30% biodiesel (EN14214) and 20% methanol / ethanol With Version FlexFuel: methanol / ethanol and biodiesel up to 100%
Outlet pressure:	adjustable from 0.05 ... 0.5 bar
Electrical interfaces:	RS232 (AK protocol) analog 0 ... 10 V digital I/O
Power supply:	24 V DC
Power consumption:	Max. 8 A
Dimensions:	770 x 670 x 345 mm (W x H x D)
Weight (dry):	62 kg



Compatibility

The AVL Fuel Mass Flow Meter can be combined with the following systems:

- AVL Fuel Temperature Control FlexFuel with integrated heating-M100
- Fuel Filter fine 733.F1M
- Fuel Filter coarse 733.F2M
- Flame Filter FF1

Scope of Supply

Each consisting of:

- AVL Fuel Mass Flow Meter
- Self installation kit for stand-alone version
- Cables
- Operating instructions
- PC Software



Options/Extensions

- Version FlexFuel: methanol / ethanol and biodiesel up to 100%
- AVL Instrument Controller for remote display and operation of the AVL Fuel Mass Flow Meter
- Filling pump module for quick refilling of the measurement system
- Shut-off-valve
- Fuel filter: coarse and fine
- Flame Filter
- PUMA Task Installer