FUEL COMSUMPTION MEASUREMENT

AVL FUEL BALANCE

Description

The AVL Fuel Balance is the worldwide most sold discontinuous fuel consumption measuring system.

The AVL Fuel Balance is mainly used where high measuring accuracies and gravimetric measurements are required. The built in calibration device enables calibration of the system under real test bed conditions.

The fuel system AVL Fuel Balance enables a high precise fuel consumption measurement even at low consumptions and short measuring times.

Reducing the fuel consumption of engines requires the measurement of increasingly small differences in fuel flow. The AVL Fuel Balance allows measuring these slight differences with maximum reliability.

The AVL Fuel Balance is based on the principle of gravimetric measurement. The amount of fuel consumption is determined directly by measuring the time related weight decrease of the measuring vessel by means of a capacitive sensor.

Convenient calibration and easy maintenance provide optimum ease of operation. With the FlexFuel option, up to 100% alcohol and biodiesel can be measured.

Function Summary

The following measuring data and functions are available:

- Indication of the fuel consumption values in kg/h and g
- Measurement and indication of the actual fuel consumption at a measurement frequency of 10 Hz (measurement time 0.1s)
- 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 min./max. values (with option remote control)
- Fully automatic built-in accuracy check and calibration
- Fast and efficient fuel change
- Indication of error and status report

Application

The AVL Fuel Balance is used to measure the fuel consumption of engine- and chassis dyno test beds for transient and steady-state measurement.

Benefits

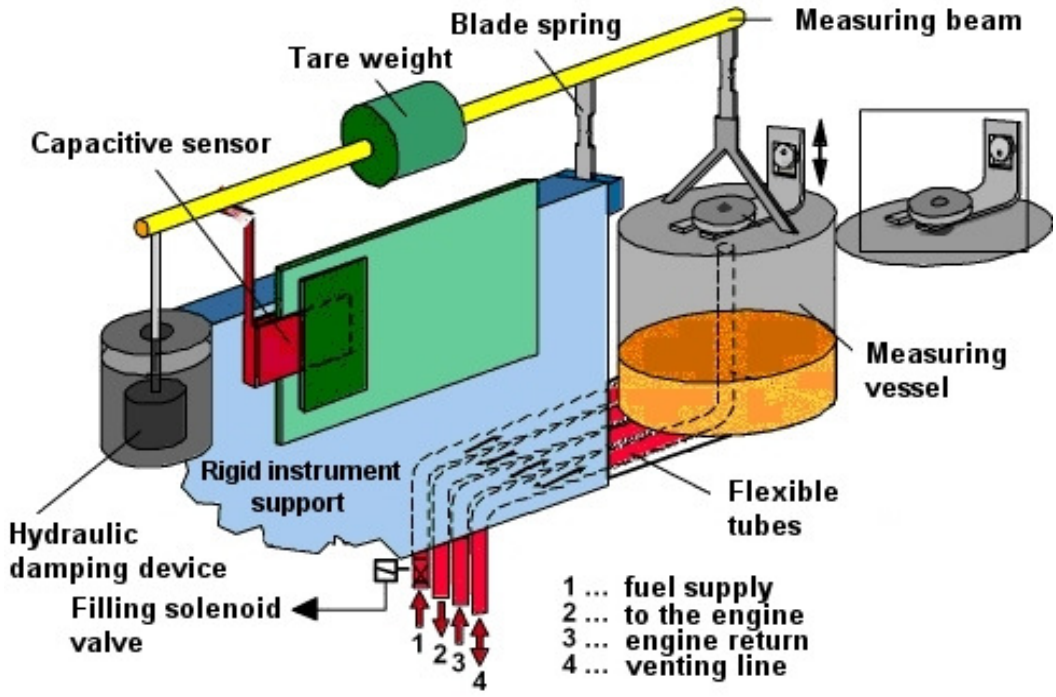
- The precision measurement accuracy of 0.12% can be verified according to ISO9001 within a few minutes on the engine test by the integrated calibration unit.
- Test bed times are minimised due to extreme reliability and long maintenance intervals.
- Dynamic fuel consumption measurement on engines with air bubbles in the engine return line.
- Easy to integrate in different automation systems thanks to the presence of compatible interfaces.
- Measurement results absolutely comparable to the AVL Fuel Mass Flow Meter
- Direct mass determination of the fuel
- Eminently suitable for state-of-the-art high-pressure injection systems
- Not sensitive to pressure pulsations from the carburettor system

Technical Insight

The fuel consumption is determined using an appropriate weighing vessel linked by a bending beam to a capacitive displacement sensor. Due to the fact that the weighting vessel has to be refilled for each measurement this is a discontinuous measurement principle.

The mass of fuel consumed is therefore determined gravimetrically, which means that the density does not have to be determined in addition. The fuel consumption can thus be determined to an accuracy of 0.12%.

The built-in calibration unit is standard scope of supply and allows calibration and accuracy check according to ISO 9001 which helps to reduce downtimes.



Picture: AVL Fuel Balance FlexFuel

Technical Data

Recommended measuring range:	0 ... 150 kg/h (wider ranges up to 240 kg/h on request)
Vessel capacity:	1800 g can be switched to 900 g/ 450 g/ 225 g
Systematic measurement uncertainty:	U_s = 0.12 %
Maximum measurement frequency:	10 Hz
No. of measurements (running average):	1 ... 99
Ambient temperature:	0 ... 60 °C
Fuel temperature:	-10 ... +70 °C
Fuel supply pressure to the system:	0.1 ... 0.8 bar
Fuel supply flow:	max. consumption + 100 kg/h
Fuels:	Otto (EN228), Diesel (EN590), up to 6% Biodiesel (EN14214) and 20% alcohol With FlexFuel option: up to 100% alcohol and biodiesel
Interfaces:	RS232 (AK compliant) or 733/730 protocol Analog 0 ... 10 V (optional) Digital I/0 (optional)
Power supply:	24 V ± 0.5 VDC, 1.6 A
Power consumption:	40 W
Dimensions:	510 x 640 x 280 mm (W x H x D)
Weight (dry):	approx. 45 kg

Compatibility

The AVL Fuel Balance can be combined with the following systems:

- AVL Fuel Temperature Control
- AVL Fuel Conditioning System

Scope of Supply

Each consisting of:

- AVL Fuel Balance
- Connecting cables
- Operating instructions
- PC-Software

Options/Extensions

- AVL Instrument Controller for remote display and operation of the AVL Fuel Balance
- Interfaces: analogue 0...10 V and digital I/Os
- Filling pump module for quick refilling of the measurement system
- Pressurizing module
- Electronic control unit for the intrinsically safe control of the shut-off-valve
- Alcohol additives up to 100% methanol or 100% ethanol (M100, E100)
- Overflow sensor
- By-pass valve
- Safety shut-off-valve
- Fuel filter: coarse and fine
- Flame Filter