

DMC 202

Fuel mass flowmeter version 2.1



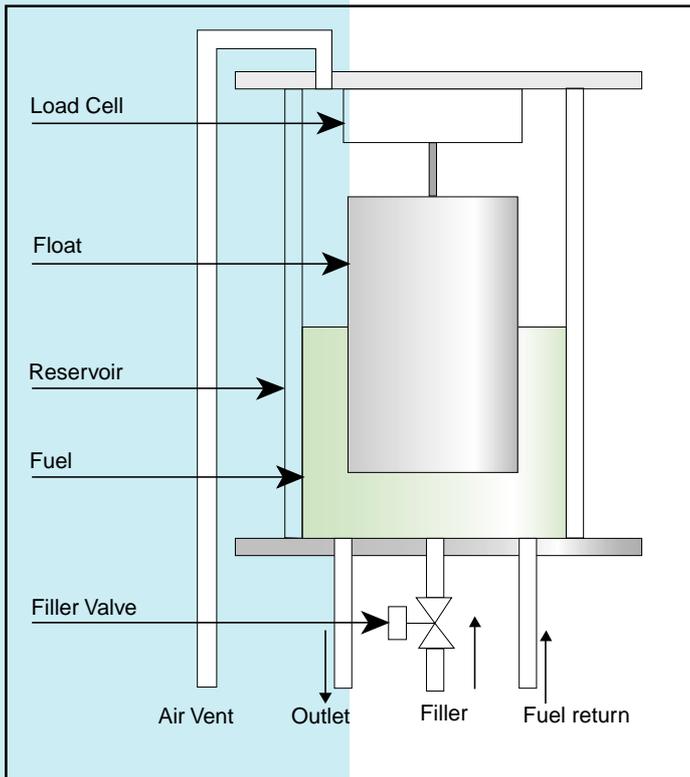
- Accuracy : to within 0.1% of the output.
- Large output range : de 1 à 200 kg/h.
- Measurement system drainage by gravity
- 3 module capacities : 350, 1000, 1800g.
- Measurement of fuel output by mass.
- Totally sealed system.
- No moving parts.

The fuel gauge

The measurement of fuel consumption is one of the more important engine performance values. Its measurement must be accurate and repeatable.

Fuel flows being rather small, a gravimetric measurement principle (measurement of mass variation within a reservoir) is the most suitable. Furthermore this method of measurement is completely independent of the fuel density.

fuel gauge



The fuel gauge comprises an aluminium cylinder located between two plates. Inside the cylinder is a float, partially submerged in the fuel and suspended from a load cell. The lower plate accommodates all fuel movements (filling, inlet and outlet), which makes emptying the fuel both easy and rapid. Filling is controlled by an electrically operated valve.

The flotation upthrust being always less than the weight of the float causes the latter to exert a permanent downward force on the load cell..



DMC 202 with its protection cover, installed in a test cell



DMC 202 without its protection cover

Measurement principle

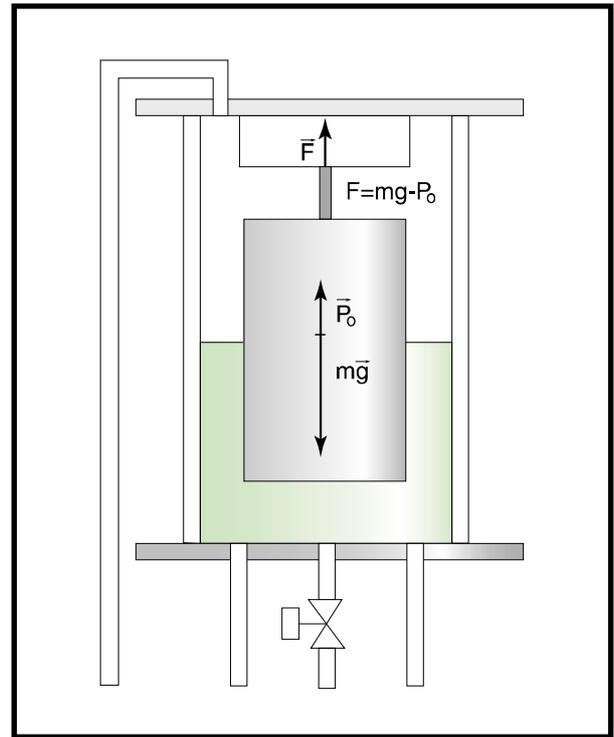
measurement

The DMC uses Archimedes' principle to measure the mass of fuel in the reservoir : the submerged float is subjected to a upward force equivalent to the weight of the displaced fuel volume.

The load cell measures the difference between the weight of the float and the upthrust caused by the displaced fuel.

The measured force is therefore proportional to the mass of fuel in the reservoir.

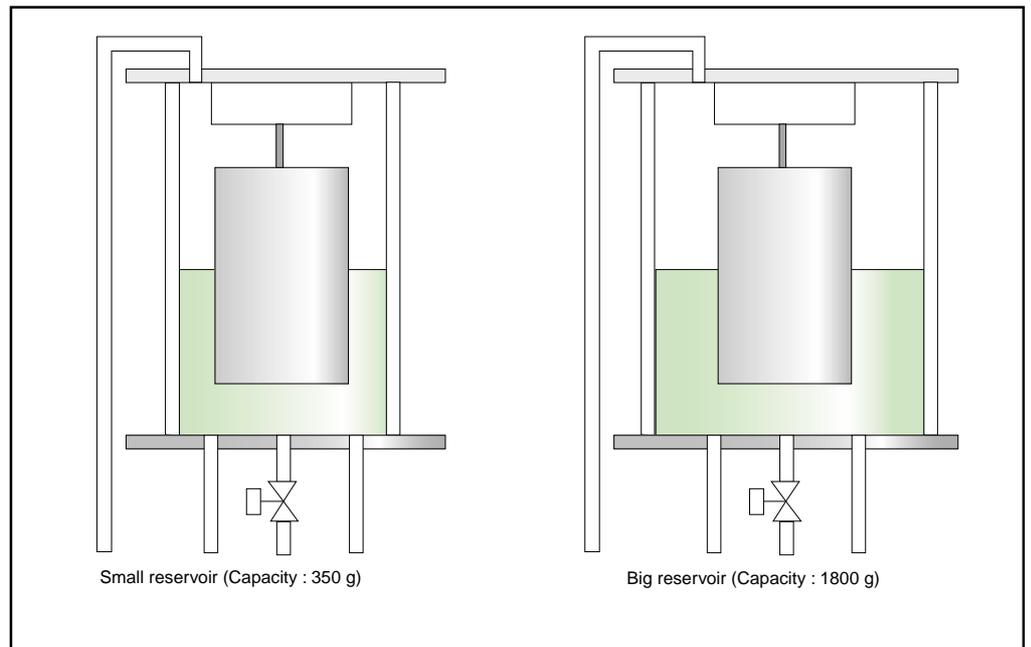
The system calculates the fuel output and hence the consumption as a function of changes in the measured force.



VARIABLE MEASUREMENT CAPACITY

One of the principal features of the system is its variable reservoir capacity. That is to say that according to requirements it can accommodate more or less fuel and hence measure very different fuel consumption rates while maintaining the same high degree of accuracy.

Simply by changing the reservoir diameter, the gauge capacity changes, while preserving the load cell and continuing to exploit its full measurement range.



In both the above cases, for the same fuel level in the reservoir, the upthrust on the float is the same, while the mass of fuel is different.

This concept maintains the same level of accuracy, **independent of the reservoir capacity.**

THE CONTROL RACK

The control rack provides the following functions :



- Load cell measurement
- Management of fuel filling
- Calculation and display of fuel flow and consumption, mean and instantaneous, as well as the mass consumed.
- Management of system parameters (Calibration, cylinder diameter, operating mode...).
- Communication with a supervisory system via a serial interface.

MEASUREMENTS AND CALCULATED VALUES

Instantaneous values :

- Instantaneous flow in gm/s or kg/h (measurement period between : 1 and 5 s.).
- Instantaneous consumption in gm / revolution (requires measurement of the engine's speed of rotation) : Measurement period between 50 and 200 engine revolutions.

Mean values :

- 2 operating modes : continuous or by manual activation.
- Measurement period between 5 s. and 2 min. or between 100 et 10000 engine revolutions.
- Mean flow in gm/s or kg/h.
- Mean consumption in g/rev. or mg/rev.
- Weight of fuel consumed.

TECHNICAL CHARACTERISTICS

Capacity : 350gm, 1000gm and 1800gm (for a fuel density of 0.8 kg/dm³)
Cylinder diameters :120mm, 140mm, 160mm.

Output range : up to 200 Kg/h.

Accuracy : up to +/- 0.1% of the output range

Dimensions : -Gauge cabinet 600x500x250mm.

-Control rack : Rack19", 3U.483x250x133 mm.

Power supply : 220V AC 50Hz.

Control interface : -Serial interface RS232, RS485. (ASCII protocol).

-Outputs 0...10V.

Weight : - Rack : 6 kg
- Gauge :35 kg

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