



Density module

- Density measurement of liquid hydrocarbon compounds
- Density measurement ranges from 600 to 1000 kg/m³ with an accuracy of $\pm 0,5$ kg/m³
- Data output with a measurement rate of 10 Hz

Density module: advantages at a glance

Outstanding measurement accuracy

Small sample quantities are enough to determine the density of liquid hydrocarbon compounds such as conventional fuels. The density module provides reliable and long-term stable results, even under difficult conditions like vibration.

Fast measurement results

At a measurement rate of 10 Hz, the results are available within a fraction of a second because of in-line and real-time measurement.

Compact design

With dimensions of approx. 30 x 66 x 15 mm³ and a weight of 150 g, the module makes it possible to explore complete new application ranges. For instance, it is possible to use the module in plastics pipes or on moving parts such as robotic arms.

Simple Integration

Because of the compact design of the digital standard communication interface and the flexible choice of the fluidic interfaces, a simple integration of the module into a system or a facility is possible. The module is also able to measure within safety-critical applications.

Low-maintenance operation

Due to the use of low-maintenance components, an improved plant availability is achieved. The required calibration effort is minimal.

Continuous monitoring

The module can be installed directly into the process or into a bypass with a controlled flow rate. The continuous real-time monitoring of the process increases the productivity as time-consuming and costly laboratory measurements become no longer necessary.



Due to its small size, the module can be used in a wide spectrum of areas such as automotive industries and automotive supplier industries. The density module is capable of measuring the density of fuels like petrol or diesel with a high measurement accuracy. This is, for example, essential for the development of drive systems within the engine test bench.



TrueDyne Sensors AG: innovative engineering work

The density module of TrueDyne Sensors AG combines the bending vibration principle in MEMS technology with a sub-millimeter microchannel and an integrated platinum temperature sensor. The microchannel is barely thicker than a hair and provides a wealth of new application possibilities within the density measurement technology.

How does the density module work?

The fluid flows through the built-in micro-channel, which is set into resonant vibration. This leads to a resonant frequency which reveals the density of the substance. The lower the resonant frequency, the higher the density of the fluid. The density module is able to determine the precise density value, depending on the measured temperature.

Who develops the density module?

TrueDyne Sensors AG combines many years of know-how and the repeatedly proved and tested technology in bending vibration systems with the innovative MEMS technology. TrueDyne Sensors AG is a partner, who accompanies all customers from designing an individual density module right through to the operation of facilities.

Technical data: density module

Measured variables	Density and derived variables (e.g. reference density, concentration etc.)
Media	EN 590 (diesel), EN 228 (petrol), E100 with a water content of approx. 4%, Jet-A1 (also F-35 or JP-8), M100 (methanol), EN 14214 (biodiesel), test fluid n-heptan, test fluid HAKU (cold cleaner), test fluid Techniclean, test fluid isopropanol. Not allowed are watery medias.
Density measurement range	600 to 1000 kg/m ³
Accuracy of density measurement	±0,5 kg/m ³
Viscosity range	0,4 to 5 cSt
Size micro channel	160 x 200 µm (500 nl)
Particle size	Max. 30 µm
Measurement rate	10 Hz
Operating temperature range	-20 to +60 °C (ambient and process)
Process pressure	0 to 20 bar (absolute)
Material housing	Stainless steel, 1.4404 (316L)
Medium wetted material	Stainless steel, 1.4542; BOROFLOAT 33 glass; silicon; epoxy resin
Power supply	DC 5 to 12 V (max. 400 mW)
Approvals / certificates	RoHS; EMV 2014/30/EU (EN 61326-1); CE mark

The TrueDyne Sensors AG is extending the available options constantly. This leads to a broad application range of the density module.