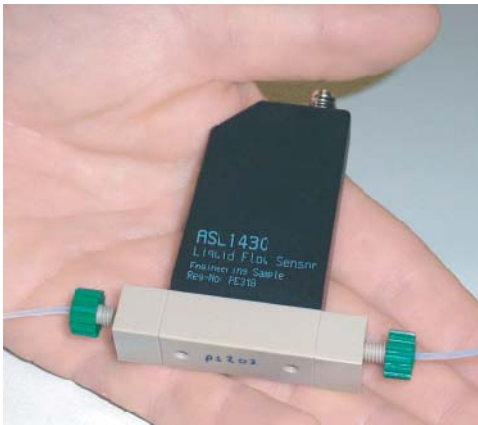


Mass flow measurement becomes '100 times faster'

Sensirion AG says it has developed a highly sensitive, digital CMOS chip that can detect flow rates as small as a few nanoliters per minute and is '100 times faster, 10 times smaller, and 25 times lighter' than conventional solutions. The chip uses the calorimetric principle, that is, a small 3 mW heater raises the

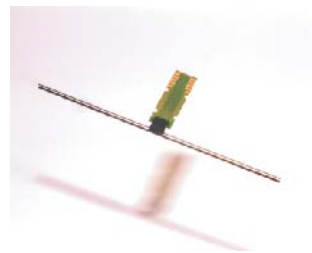


temperature of the passing fluid and a temperature sensor, located a fraction of a millimeter downstream, measures the temperature. The difference between this and a reference temperature upstream is directly proportional to the mass flow in the tube. To work properly, the meter must be calibrated for a particular fluid.

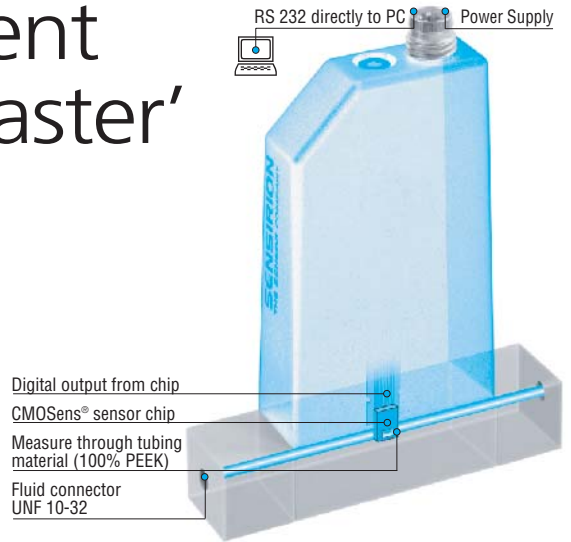
Thermal flowmeters aren't new,

but Sensirion's innovation is to place the heater and temperature sensing elements on a tiny CMOS chip that is mounted completely outside the flow tube, so that the flow media are totally isolated by walls of plastic, steel, or glass capillaries. The three elements (heater and two temperature sensors) are located in a space less than one millimeter in length. They sense the media through the walls of the pipe. For gas measurement the chip's sensing elements must be exposed directly to the media, but they do not need to protrude into the tube.

The CMOS chip that serves as the sensor also has integrated electronics to perform analogue to digital conversion, and delivers a digital, fully calibrated, linear output signal with a minimum response time of 20 msec (conventional thermal mass flowmeters have time constants



The digital sensor chip, attached to the capillary tube, detects the flow inside the tube.



ranging from 1 sec to 60 sec). The measurement error is less than 1% to 3% of the measured value or 0.2% of the full scale value.

The sensor could be used to measure much larger flow rates by installing it in a bypass system. This would make battery-powered thermal flow measurement solutions possible.

Sensirion's first liquid sensor package, the ASL 1430, will handle flow rates up to 1.5 ml/min and deliver a digital, fully calibrated, linear output signal with a minimum response time of 20 ms. The measurement error is quoted as 0.2% of the full scale value.

For more information, enter **205** on the Reader Service Card or visit www.sensirion.com

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