

# Focus on Heating Ventilation and Air Conditioning

*By Innovative Sensor Technology*

*Innovative Sensor Technology IST is a market leader within the HVAC industry and offers a broad variety of products for the HVAC market. Innovative Sensor technology IST AG is more than a standard component supplier offering technology and materials science resources to find outstanding and tailored sensors for the various building automation applications. IST AG is today a one-stop shop for temperature, humidity, flow and differential pressure sensors and therefore an ideal partner to launch new quality products or redefine an existing HVAC sensor portfolio. Innovative Sensor Technology USA Division, 9516 W. Flamingo Rd., # 210, Las Vegas, NV 89147, Phone +1 702 894 9891, Fax +1 702 894 9993, [contact@ist-usadivision.com](mailto:contact@ist-usadivision.com), [www.ist-ag.com](http://www.ist-ag.com)*

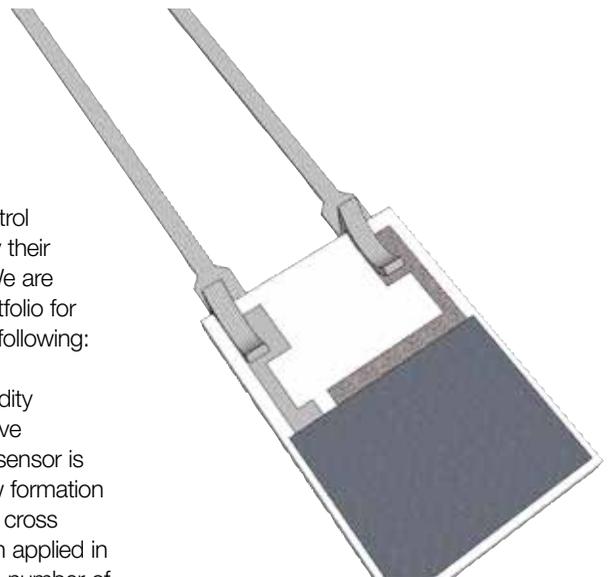
The HVAC market is in a strong uptrend today and has at the same time never been more competitive. New features in smart thermostats are setting benchmarks on a daily basis. However, no matter how smart and efficient a system is and no matter how much functionality and connectivity you plan to incorporate in the new generation of HVAC products, at the end you will always need reliable and stable sensing components.

Many companies in the HVAC market concentrate their efforts on the software communication of their systems, but do not pay attention to proof functionality and quality of their most important element - the sensing component. The result is that all the smart algorithms are only as good as the data provided from the sensor component.

The Innovative Sensor IST AG strategy is to provide well engineered sensors, which provide strong dependable values through profound material science and intelligent calibration along with state of the art manufacturing capabilities and quality machines and equipment required to perform volume output with consistent quality.

Our customers appreciate the excellence in our components and the peace of mind that comes with it, wherever HVAC instruments operate large investments under the control of their products and finally their company's brand name. We are pleased to present the portfolio for quality components in the following:

The standard P14-W humidity sensor capacitor is a passive humidity component. The sensor is designed to withstand dew formation and provides extraordinary cross contamination results when applied in different gases as well as a number of corrosive gases (ask for a test sample

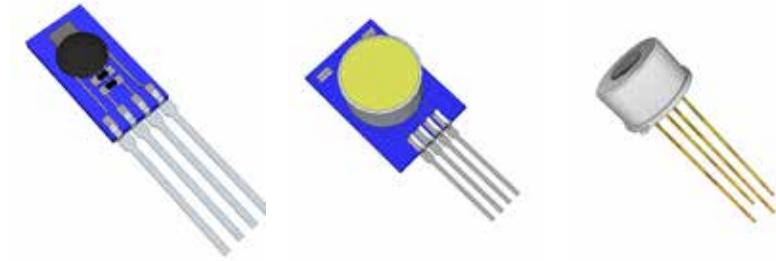


P14 W

overview). The P14 W longevity compared to other components in the market is good, especially when compared in high humidity conditions. This is the number one choice for companies intending to integrate the P14 W humidity sensor with their own electronics and calibration capabilities. It provides great stability and long lasting measurements, because of its waterproof materials such as the ceramic body and proprietary polymer design. Applications are air ducts, RH+T transmitters as well as thermostats.

### HYT calibrated digital RH+T

The HYT sensors are combined temperature and humidity digital modules. The sensors are calibrated and qualified under stringent procedures. A nine point calibration takes place to assure high accuracy over a wide temperature and humidity bandwidth, while the right materials provide longevity and satisfactory results not only on the data sheet. The HYT sensors are built on the IST AG flagship P14 capacitor sensors. The sensor component as well as its surrounding materials are engineered to guarantee almost zero moisture absorption and to prevent misreading due to false water/moisture sources. The HYT's technology is provided in exposed sensor element versions, as well as two filter cap versions



FS7 thermal mass flow sensor



(mechanical protection) for simple integrations in air duct, compressed air transmitters and wall mount thermostats.

### FS7 thermal mass flow sensors

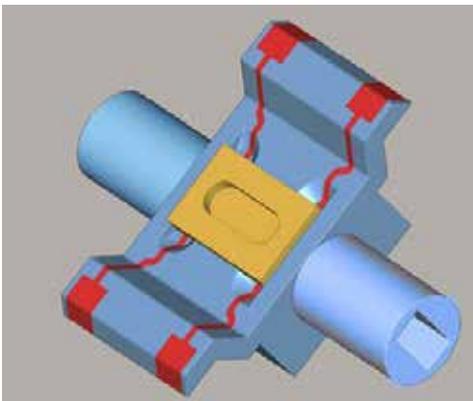
Equipped with a heating and sensing resistor the FS7 is the most recent development of mass flow sensor components at IST AG on ceramic substrates. The sensor is applied directly into the air flow and is designed to measure typical HVAC air duct flow speeds between 0 m/s to 25 m/s or more. The main advantage of the FS7 is the high sensitivity especially at lower flow rates 0 m/s to 1 m/s or 0 m/s to 5m/s, while performing within a wide dynamic range. If applied in CTA mode (constant temperature anemometer mode), the FS7 can read from 0-100 m/s flow speeds. Benefits of this design are simple

implementation for air duct flow transmitters.

Handheld devices to control air conditioning systems are using FS7 at the tip of a retractable monopod. Due to its low cost implementation it is used for filter monitoring in combination with air purifiers. High performance applications are compressed air mass flow metering and billing devices.

### MFS 05 mass flow sensor

The MFS 05 is the newest generation of the MicroflowSensor family components. A major improvement has been taken with the new design which foresees more measurement symmetry if the flow direction changes. The MFS 05 compared to the FS7 is developed on a glass substrate (not ceramic). The active components are



MID with MFS 05 Microflowsens component

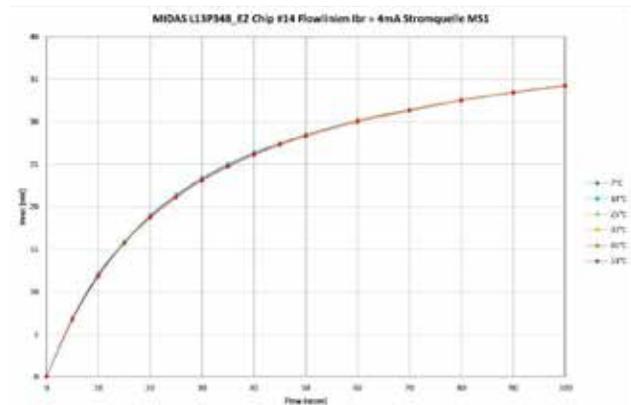
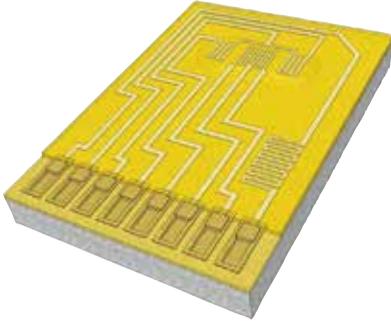


Diagram showing intrinsic temperature compensation.



*MFS 05 Microflowsens component*

a 4 platinum resistors implemented in a thin membrane with a thickness of less than 10 microns. This allows performing measurements with ultra-low thermal mass. The result is an ultra-fast sensor with a response time

of less than 10 ms. Furthermore, the MFS 05 displays an ultra-sensitive measurement in differential pressure applications, which measures with a noise free resolution of 5 mPa. The MFS 05 sensor is integrated in positive pressure ventilation systems (clean rooms, hospitals), filter monitoring, flow/glow box and micro fluidic gas applications.

### **MID packaged MFS 05 MicroflowSens component**

The MID packaged MFS05 is engineered with IST AGs MFS 05 MicroflowSens component with a proprietary thermal micro flow measurement method. The extraordinary sensor specific behavior is revealed on its low

temperature dependence also under non-isothermal conditions (see raw data measurement plot at different temperature on the diagram below). The built in flow channel provides simple system integration for ultra-low flow application 0 to 1 [sccm] and a wide dynamic range at the same time up to 200 [sccm]. The sensor comes with 10 [ms] response time in combination with detection of flow direction in one. Different MID packages are available; all can be processed with automated pick and place procedures and come with solderable contact pads. The MID packaged MFS05 microflow component can be used in a by-pass flow channel as a differential pressure and sensor is soon available in combination with different USB plug and play evaluation boards. **IAM**