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# Coping even with chemical interference

## New generation Vaisala HUMICAP® relative humidity sensor

In most humidity measurement applications, the sensors are also exposed to chemicals other than water vapor. Vaporized chemicals can diffuse into the sensor and cause disturbances in the measurements. Such vapors are present in most environments, even in normal office air. Chemical vapors are also inherent in many industrial applications. For example air pollutants (NO<sub>x</sub>, SO<sub>2</sub>, etc.), disinfectants and different organic solvents are often present in ambient air. As the responses to some gases and vapors are very slow, in many cases several weeks or months, the effects are often described as “drift” or “aging” of the sensor and not as chemical interference.

The chemical interference or drift can be dealt with by setting the calibration interval according to the conditions or by improving the sensor’s ability to withstand chemicals. In some cases heating the sensor can either remove a chemical from the active polymer or prevent entry.

### Chemical resistant polymer and special new structure

Vaisala has introduced a new generation Vaisala HUMICAP® relative humidity sensor, the HUMICAP®180R. This new type of capacitive humidity sensor has been developed especially to cope with chemical interference. The resistance to chemical interference has been achieved by developing a new type of chemical resistant polymer and a special new structure. The structure slows down

the migration of adverse chemicals or completely prevents them from entering the active polymer layer. The chemical resistant active polymer and the structure of the capacitive sensor further contribute to the stability of the sensor. In contrast to earlier sensor versions developed to withstand demanding chemical environments, these improvements have been obtained without compromising the other key properties of the sensor such as high humidity stability, sensitivity and hysteresis.

### Field tests show high stability

The new Vaisala HUMICAP® sensor has been tested both in laboratory conditions as well as in typical humidity sensor applications<sup>1</sup>. The tested humidity sensors show significantly lower measurement error in most of the test environments compared to the reference sensors. The sensors perform better both in laboratory high chemical concentration tests as well as in long-term field stability tests. The results from the experiments show that the new structure and the polymer make the sensor highly resistant to chemical interference and therefore provide an improved long-term stability for the relative humidity measurement.

<sup>1</sup> IKONEN S., STORMBOM L., RANTA-AHO T., *Chemical Interference Test Results of a Novel Humidity Sensor, 5th International Symposium on Humidity and Moisture – ISHM 2006, Rio de Janeiro, Brazil (2006)*

