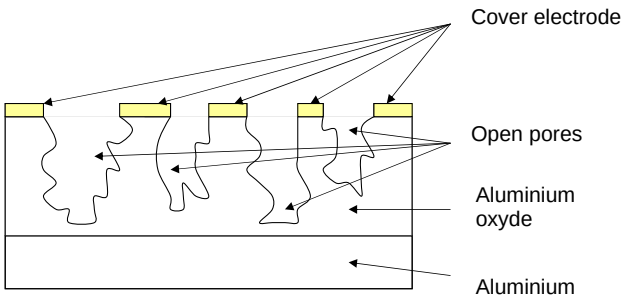
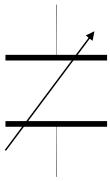
Comparison

Aluminium oxyde

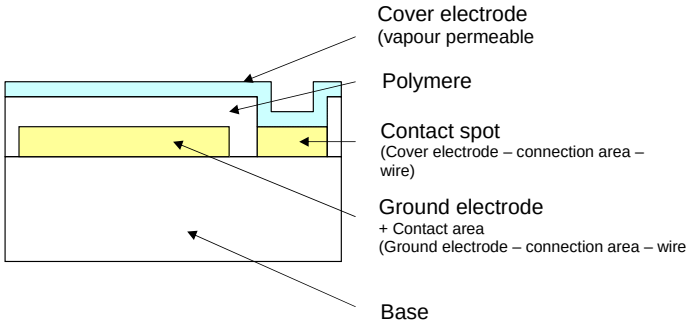


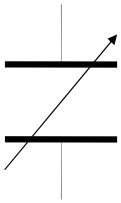


C = f(%RH)

$C_{ges}=C_{Al2O3} + C_{\%RH}$

Capacitive polymere





C = f(%RH)

$C_{ges}=C_0 + C_{\%RH}$

Principle

Surface-active condensator open towards the atmospere.	Closed condensator only sensitive towards vapour.

Measuring effect

The capacity of the sensor changes through the agglomeration of water molecules on the surface of the aluminium oxyde	Only vapour penetrates the covering electrode by diffusion and agglomerate reversibly to the polymere. Therefore, the capacity of the sensor changes.

Profile of characteristics

Sensitivity:			
Highly sensitive due to large surface. Possibility to display extremely small vapour quantities.		Sensitivity depends on the characteristics of the polymere. Each manufacturer of humidity sensors uses an own, specific polymere. FA 300 sensors are developed particularly for CS Messtechnik. They are particularly sensitive, robust and long-term stable.	
Field of application:			
Special sensor, only suitable for measurements in residual moisture.		All-round sensor with a measuring range from 0...100%RH and -40...+180°C. It has been optimized for measurements in residual moisture and for determining water content in oils.	

Cross sensitivity:			
All substances that deposit on the surface can lead to a measuring effect.		Only diffunding vapour leads to a measuring effect.	
Pollution:			
Due to the rough, open surface, dust, dirt, oil and other substances and particles can seep into the sensor.		Due to the plane sensor surface, dust, dirt, oil and other substances can only deposit on the sensor's surface but not seep into it.	
Cleaning:			
Due to the rough, open surface, the sensor is very hard to clean. Once particles have deposited, they can hardly be removed completely.		Particles, substances or other deposits can easily be removed with water/alcohol. Heavier pollutions can be cleaned in an ultrasonic bath without residue.	
Applications in the high-moisture range			
Water hammer (applications with condensate) causes water deposits in the sensor which leads to changes of the oxyde layer. This means, the sensor drifts (the measured values are incorrect.		The sensor is suitable for measurements over the whole humidity measuring range (0...100%RH). It is recommended to clean the polluted sensor with water and use ultrasonoic support, if required.	
Long-term stability			
In a constantly dry environment the air pollutants form a layer on the rough aluminium oxyde surface. These act as a barrier to the moisture. This means, the sensor can no longer detect this change. It still indicates a dry atmosphere although the relative air humidity has increased.		The special polymere is highly dimensionally stable and highly resistant to chemicals. It only responds to vapour, and despite deposits on the sensor surface water can diffuse into the sensor. Yet, the response time increases the higher the degree of pollution on the sensor surface is.	
Response time:			
The dynamic depositing processes and the special processes of yielding water that sticks to a surface for setting the diffusion equilibrium is very time-consuming (ie. it may take several days) in the residual moisture range.		Inside the polymere itself, there is no dripping. Only vapour can enter and exit and the sensor. The adjusting time is in the range of hours. Changes of the humidity conditions are indicated within a few minutes. The response time t90 is approx. 15 sec. with an streaming-in volume of 3 ltrs/min or higher.	