Innovative Sensor Technology physical. chemical. biological.	ECR - Engineering Change Request ECN - Engineering Change Notice	A19.036
ECN Classification:	Class II (customer notification only, no approval required)	
Project:	Replacement of globtop material	Release by ☐ Customer ☒ IST: 1.12.21 Christoph Hepp Date / Signature Christoph Hepp / R&D Name (in block letters)/ Position
Division:	Research and Development	
Product:	See product list in attachement	
Customer:	N/A	
Abstract of change:	Replacement of globtop material	
Attachement	☒ Product list	

Reason(s) for change *(refer to attachment if necessary)*:

The decisive factor for the replacement of the globtop-material on HYT 271 products is a supply chain distruption with the current gloptop material. The material is required to protect the underlying ASIC and connections to the humidity sensor.

IST AG took this circumstance as opportunity to upgrade the necessary protection material to a state of the art globtop covering.

Additionally, the globtop is extended to not only cover the ASIC and corresponding bonding-wires, but will be applied to the passive elements in the HYT 271 construction in order to increase the stability and protection under condensation conditions.

All other parameters, like the HYT modules' characteristics and geometry like outer dimensions and thickness are not affected by this adaption. Also, all other materials stay unchanged.

The new version of the HYT module passed all internal tests successfully (see test-chart below). The performance of the modules is identical, as can be seen in the graphs in the following section.

Name of test	**Detailed information**	**Pass/fail**
Accuracy of humidity calibration	+/- 1.8 %RH	**pass**
Accuracy of temperature calibration	+/- 0.2 K	**pass**
Dimension: height	1.8 +/- 0.3 mm	**pass**
Performance test	4 weeks alternating temperature from -40°C to 120°C, passing over condensation limit specification to reach +/- 1.8 %RH +/- 0.2 °C	**pass**

Change details *(refer to attachment if necessary)*:

To improve the stability and give additional protection under condensation, the globtop material will cover also the passive components.
The pictures below (Figures 1 and 2) show a HYT 271 module with the adjusted covering.

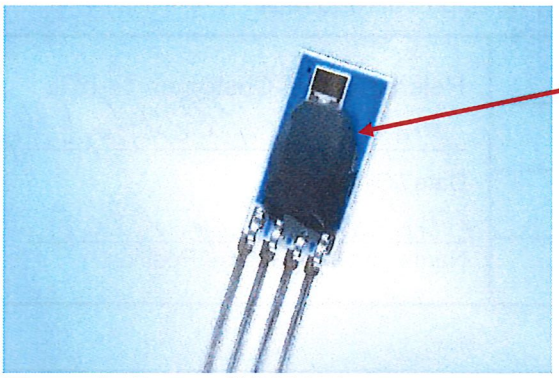

Figure 1: Photo of HYT 271

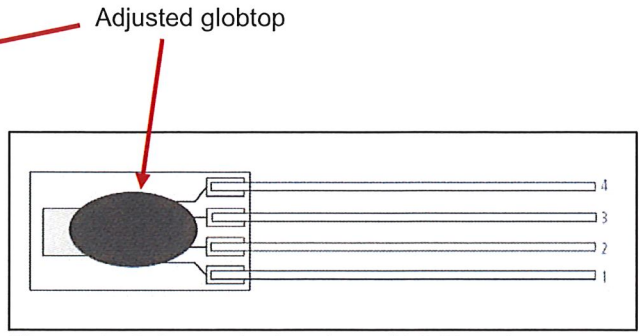

Figure 2: Schematic drawing of HYT 271

For the internal approval IST performed several tests under critical and extreme conditions to verify the suitability of the globtop material. The performance of the HYT 271 modules must be obtained at all times.
The data shown in the following graph was obtained in a four-weeks physical performance test in repeatedly alternating temperatures from -40°C to +120°C and humidities up to 100%rh, passing over the condensation limit. In this way, thermal stress conditions well beyond specification limits were reached.

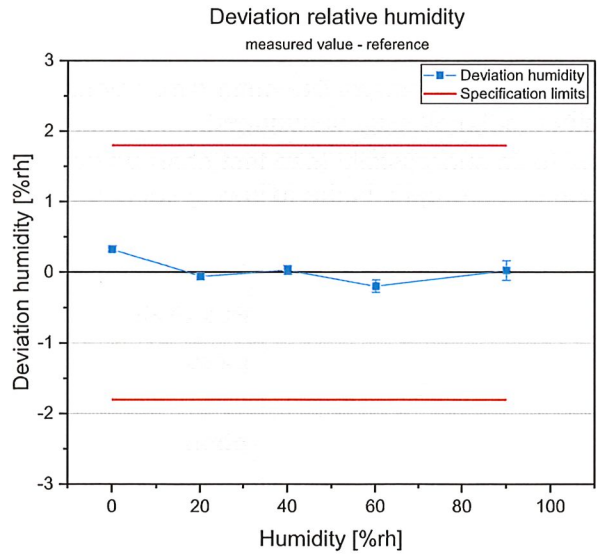

Figure 3: The relative humidity output of the HYT 271 modules was measured against a dewpoint mirror as reference after four weeks in test-conditions. The blue dots (including trend-line for better understanding) show the deviation of the HYT signal from the reference and the red lines show the HYT 271 standard specification range. Additionally, the standard deviation for each measurement point is calculated, indicated by the blue error bars.

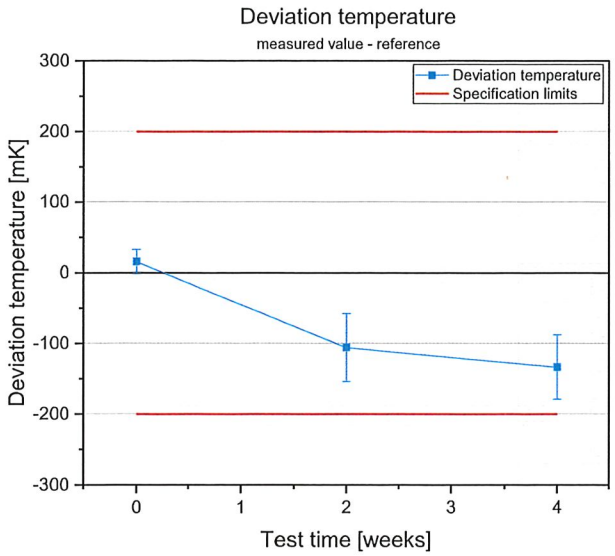

Figure 4.: The temperature output of the HYT 271 modules was measured against a dewpoint mirror as reference over a time periode of four weeks.
The blue dots show the deviation of the HYT signal from the reference and the red lines show the HYT 271 standard specification range.
Additionally, the standard deviation for each measurement point is calculated, indicated by the blue error bars.

As can be seen in the above graphs, the relative humidity signal is stable around 0%rh deviation and the sligh temperature drift over time reaches saturation after a time periode of about 4 weeks.
The relative humidity as well as the temperature are well within specification (see test chart in the previous section), even after four weeks of constant thermal and humid stress.
To conclude: All modules pass the internal test and the adaption of the globtop material does not affect the performance of the modules.

Editor: Christoph Hepp Date: 18.11.21

Attachement: product list

Product	Description	Replacement
103921	HYT 271	153349
103948	HYT 271.S	153353
103951	HYT 271.S	153354
103957	HYT.271.P.0.SK.SA.S	153357
103959	HYT.271.T.0.SK.SA	153363
103972	HYT.271.P.0.SK.SA.S	153365
103980	HYT.271.P.P2.KK.SA	153369
103981	HYT.271.P.0.KK.SA.S	153370
103986	HYT.271.P.0.SK.KA29.S	153373
103987	HYT.271.P.0.SK.KA30.S	153374
103988	HYT.271.P.0.KK.SA.S	153375
103990	HYT.271.P.P1.5.SK.SA.S	153376
103992	HYT.271.P.P.SK.SA.S	153377
103997	HYT.271.P.0.KK.SA.S	153378
104002	HYT.271.P.0.KK.SA.S	153380
150149	HYT.271.M.0.SK.SA.S	153382