Gmail **Steve Nixon <steve.nixon.viamed@googlemail.com>**

RE: Operational temp test results

1 message

Mini Nambiar <m.nambiar@jfdglobal.com> 30 November 2017 at 14:13
To: Steve Nixon <steve.nixon@vandagraphst.com>
Cc: Scott Waddell <S.Waddell@jfdglobal.com>, Michael Hossack <M.Hossack@jfdglobal.com>, Graham McLachlan <g.mclachlan@jfdglobal.com>

Hi Steve,

I have discussed with Michael and load is slightly below 10KΩ.

Details from him below:

“Load on each cell on calibration board is a 10 K pot. Output is taken from the wiper of each pot and fed in to PO2 tester, which puts a 250 K ohm load on the bottom half of the pot. So load is dependent on the setting of the pot, but will be somewhere between 9.6 K ohms and 10 K ohms (more likely near the 9.6 K ohms end since we are not adjusting the pots down much).

This is similar to the load that the cells would have in a set, since the same calibration board is used and then fed in to a high resistance input in the ECU.”

Thanks,

Mini

Mini Nambiar Project Manager
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From: steve.nixon.viamed@googlemail.com [mailto:steve.nixon.viamed@googlemail.com] **On Behalf Of** Steve Nixon
Sent: 30 November 2017 12:46
To: Mini Nambiar
Subject: Re: Operational temp test results

Hi Mini

May I just ask you to confirm that the measurement circuit is >10K?

Load required	> 10 K Ohms

Steve

On 29 November 2017 at 12:41, Mini Nambiar <m.nambiar@jfdglobal.com> wrote:

Hi Steve,

Thanks for your time earlier. As discussed the performance of the sensors was measured across the operational temperature range of 0°C to 40°C. Please see below the details of the test setup and results. The raw data is also attached for further information.

Test Setup:

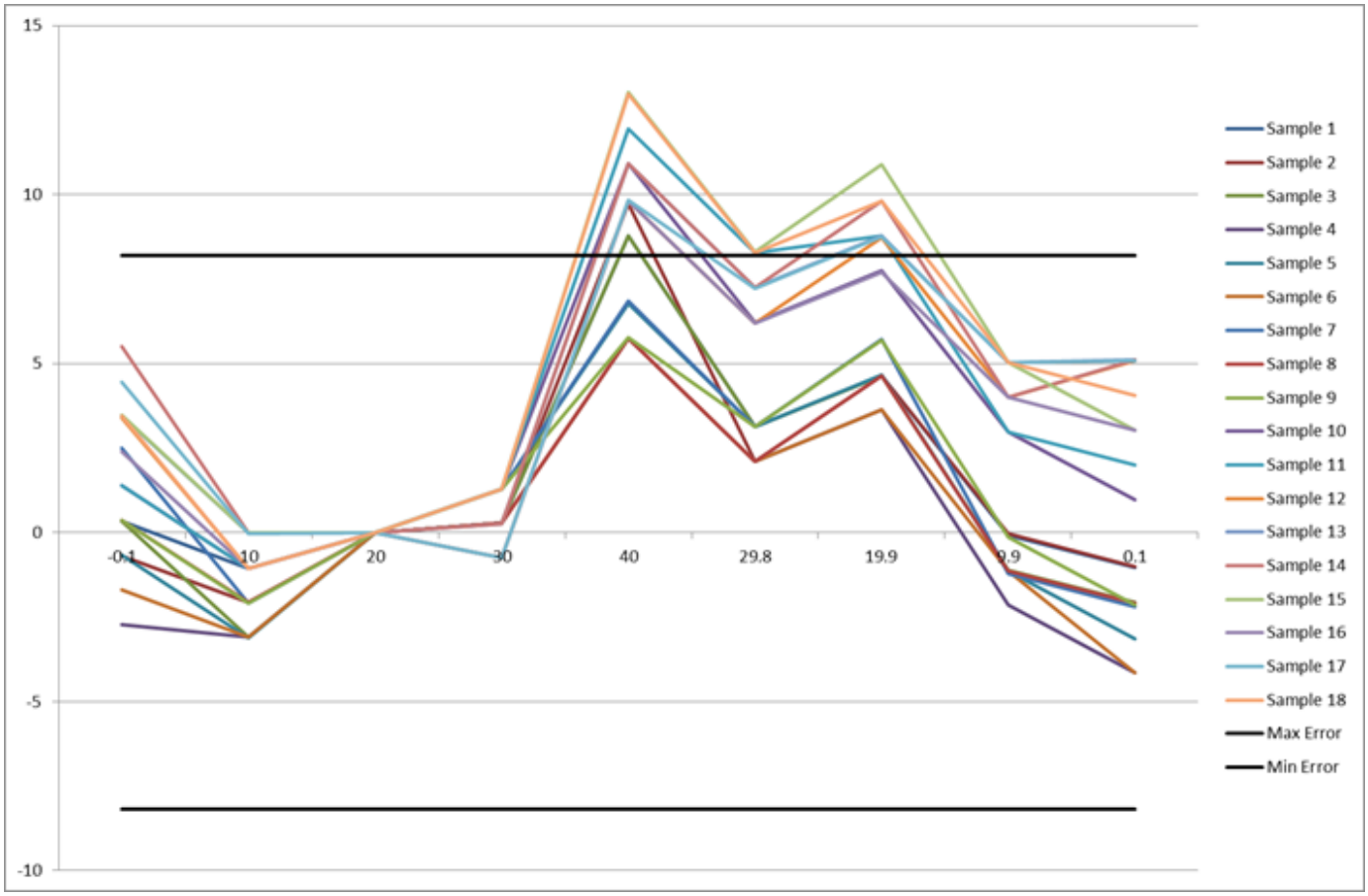
The sensors were populated into six OSMs (set of 3x) and placed in the environmental chamber. The OSM output cable was brought out through the penetrator to measure the voltage from each sensor in the connected OSM. Temperature inside the cabinet was measured using a calibrated temperature probe inside the cabinet. All readings were taken using PO2 Tester after a minimum of 4 hours at set temperature. Readings were taken at 0, 10, 20, 30, 40, 30, 20, 10, 0 °C. Ambient pressure is recorded at each set of readings. The OSMs had previously been calibrated to 1 bar PPO2 in 100% O2 prior to test.

For each temperature, the expected PPO2 reading is worked out by multiplying ambient pressure by 0.2095.

For each OSM, to simulate a precise calibration at 20 °C in air, a calibration fractional error (column O in attached sheet) is worked out. This is calculated by dividing reading at 20 °C (rising temperature) by the expected error at this temperature.

Results:

The results show that the cells are pretty good between 0 to 30 °C, but there is a big jump upwards at 40 °C. There also looks like there is hysteresis meaning that results at 30 – 10 °C when temperature is falling is higher than when rising. When temperature falls back to 0 °C results are similar to previous measurements at this temperature. Using flat error bars (least stringent test), all but three cells fail at 40 °C and six fail at 20 °C when temperature is falling. Interesting to note that reading is higher for all cells at 20 °C when temperature is falling than when the cells were at 30 °C.



Please could you review this and suggest resolution to improve the sensor performance at 40°C. Would there be anything within the cell construction to explain the higher error especially when sensor is subjected to descending temp.

Let's organise a discussion once you have had chance to go through the details.

Thanks,

Mini

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