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## Further temp results

1 message

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8 December 2017 at 11:17

To: Steve Nixon &lt;steve.nixon@vandagraphst.com&gt;

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Hi Steve,

To keep you updated, we have conducted few more temperature tests on the sensors to understand the temperature response between 0°C / 20°C and 40°C without calibration board. This was to rule out any variance caused by board itself.

### Test Setup

The cells were placed in environmental chamber on their sides with outputs wired to 100 kohm resistors on vero-board outside chamber. The cells were left with the chamber set to 20 °C for 1 hour before we started the test.

We then set the chamber temperature to 0 °C and immediately started recording the cell outputs every 10 minutes.

After an hour at 0 °C we set the chamber to 40 °C and left it for 1 hour before taking readings every 10 minutes for 1 hour. We can see that the outputs are slowly rising over the 1 hour period.

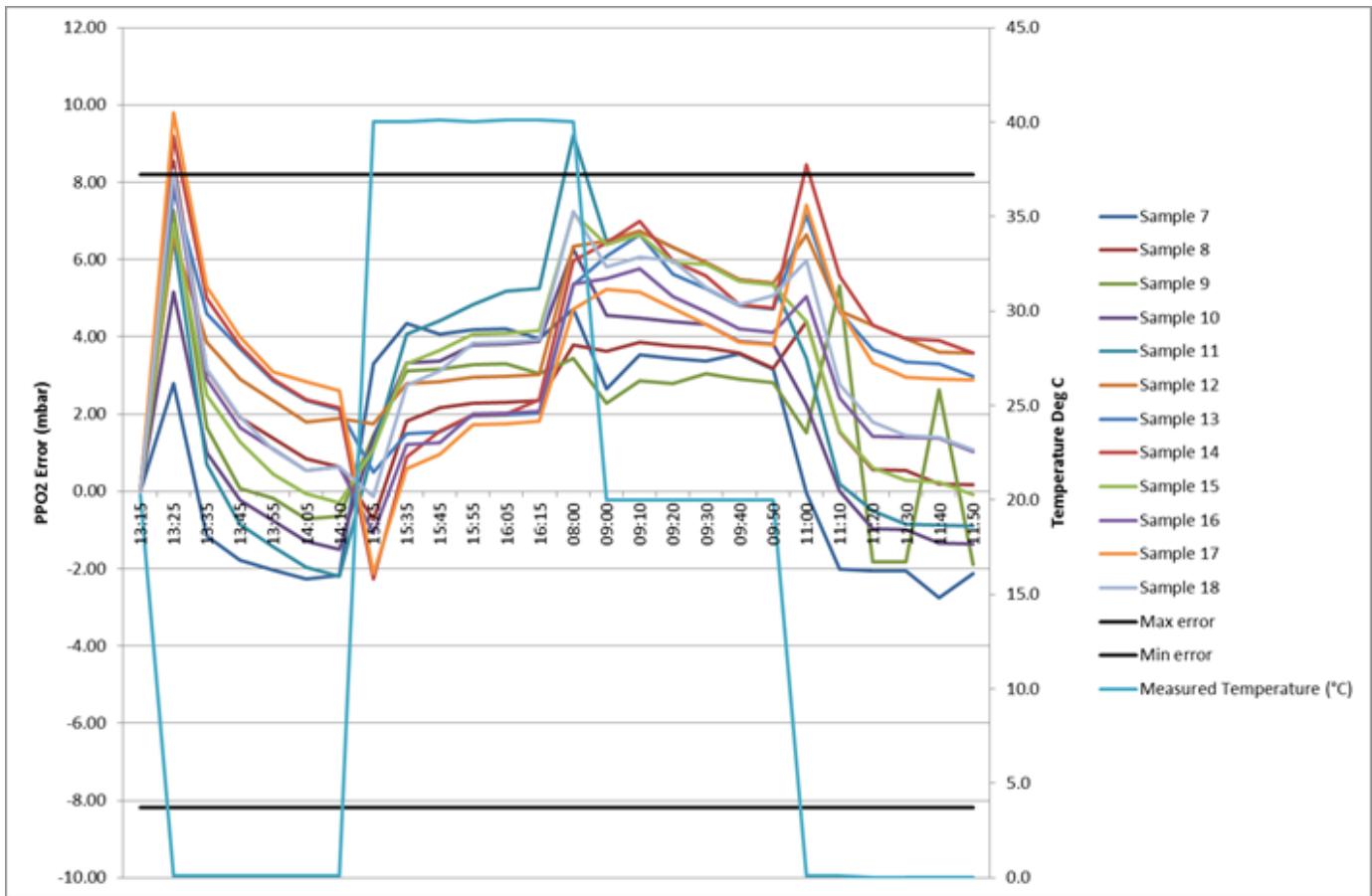
We then left the cells at 40 °C overnight and measured the outputs in the morning. The outputs had risen by ~ 3 to 4 mbar overnight.

We then dropped the temperature to 20 °C and left it for 1 hour before taking readings every 10 minutes for 1 hour. We can see that the outputs are slowly dropping over the 1 hour period.

We then dropped the temperature to 0 °C and left it for 1 hour before taking readings every 10 minutes for 1 hour. Again we can see an initial jump up then dropping slowly over the 1 hour period.

### Conclusions

- The cells are nearly meeting spec – there are 5 which cross the error bars at some point.
- It takes a long time for the cell output to settle completely after a change in temperature. We see them still changing after an hour, and results were significantly higher after leaving cells at 40 °C overnight.
- The hysteresis is still there – the readings at 20 °C after the cells being held at 40 °C overnight are ~ 2 to 6 mbar higher than before.



I have arranged the raw data as well for your reference. Could we arrange for a call on Monday / Tuesday to go through the details. Are the results similar to how you would have expected the sensors to perform?

Thanks,

Mini



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**Sample 7 to 18 cells only 20171206 to 20171207.xlsx**  
 40K