

AutoCal

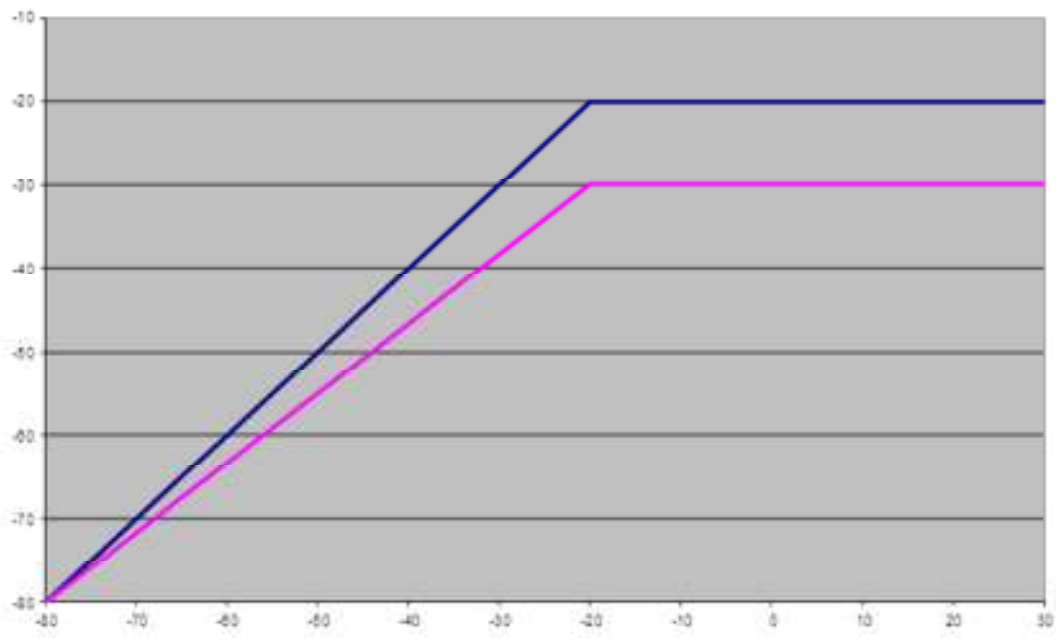
AutoCal allows users of the Alpha Moisture Systems instruments to ensure optimum accuracy between laboratory calibrations by checking the span of the instrument and correcting for any deviation.

This is normally explained as follows:

The AutoCal facility uses the fact that each sensor is designed and manufactured to give no further increase in response when it reaches its maximum moisture level. An instrument with Grey Spot sensor, for example, having a full-scale value of 0°C dewpoint, the will read 0°C dewpoint when exposed to a gas with this moisture concentration, and will continue to read 0°C dewpoint as the moisture concentration rises above 0°C dewpoint. The instrument can, therefore, be adjusted to read 0°C dewpoint on any gas with a moisture concentration wetter than 0°C dewpoint, ambient air for instance, thus setting the span to match the original calibration.

It should be carried out periodically, every 2 to 3 months, or when verification of instrument performance is required.

Normally we depict it as below, in this case for a Red Spot (-80/-20°C dewpoint) sensor.

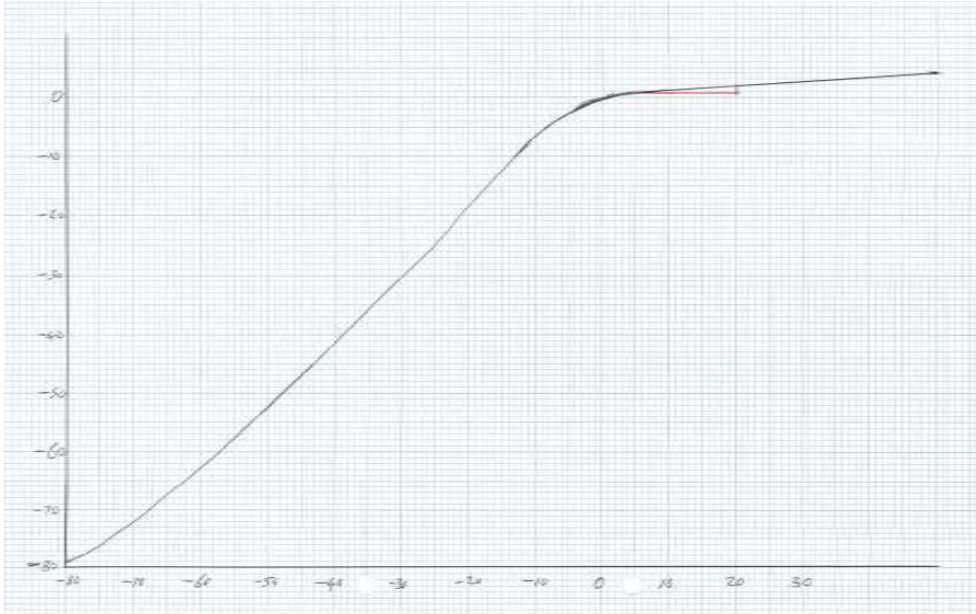


x-axis is applied dewpoint, y-axis indicated dewpoint.

The pink line shows before AutoCal and the blue after, exaggerated for clarity.

It is understandable that some engineers or scientists may be sceptical about this, pointing out that the ambient dewpoint can vary significantly on different days, which is very true.

If we now look at a typical sensor response without the linearisation we can see that, although the response above the AutoCal point is not totally flat, it does level out very significantly.



The difference in the indicated dewpoint between applied dewpoints of 5 and 15°C is perhaps of the order of 1°C (the degree of non-linearity will vary for different sensors.)

Considering that the response from -80 to 0 is linearised it can be seen that an error in the AutoCal point of 1°C dewpoint will, for example, translate to approximately 0.25°C dewpoint at -60. This is well within the stated accuracy of the instrument, and an improvement on what might have been the case without AutoCal.

All aluminium oxide type sensors, variously described as ceramic, metal oxide, silicon, AlOx lose sensitivity with time, some more rapidly than others. Alpha Moisture Systems can limit the effects of this by the application of AutoCal.