



# S4000 Remote

## Precision Dewpointmeter



A precision laboratory dew-point hygrometer with the ultimate accuracy, reliability and long-term performance for humidity measurement and calibration



S4000 Remote

### The Laboratory Standard

The S4000 Remote Precision Dewpointmeter offers unmatched accuracy and reliability in dew point measurements of air and gas systems and in calibration laboratories. Its powerful three-stage Peltier thermoelectric heat pump gives a depression capability of more than 80 °C at normal laboratory temperature. The S4000 Remote can measure and control at dew points (frost points) down to -50 °C from a normal room temperature, and with additional water-cooling through the integral cooling jacket can measure as low as -80 °C dew point. As its name suggests, the S4000 Remote comprises a free-standing sensor and a 19" x 3 U monitor unit, connected by individual power and signal cables for the most stable and precise dew point control.

### Contamination Compensation

Any optical system carries a risk of contamination. The S4000 Remote automatically compensates for any such build-up with its ABC (Automatic Balance Compensation) System. ABC ensures continuous optimum operation of the sensor by periodically driving off condensation to allow the optical loop to be re-balanced. When the contamination level is too high the control electronics provide a visible alarm and the sensor optical system may be cleaned with distilled water or a suitable high purity solvent (e.g. acetone).

ABC cycle time, duration and recovery time can all be adjusted according to the type of application to minimise the effect of contamination risk. The S4000 Remote also features a sophisticated data hold system, which maintains the instrument's signal outputs during an ABC cycle, allowing the S4000 Remote to be used for process control applications.

### Dual Optics for Supreme Sensitivity

At low frost points the rate of formation of frost on the mirror surface is extremely slow. As a result other cooled mirror hygrometers may give reduced accuracy, poor control stability and extremely long response times at low moisture levels. The S4000 Remote is unique in that it utilises a dual optics detection system that measures both the increase in scattered light intensity and the reduction in reflected light intensity from the mirror surface as frost forms. This greatly increases the sensitivity of the optical loop and response, stability and sensitivity are improved by orders of magnitude at low frost points.

In addition the S4000 Remote can optionally be fitted with Michell's unique speed pipe technology, giving further improvements in response speed at low moisture levels. The speed pipe concentrates the formation of ice crystals on the mirror surface and can reduce response times by a factor of four times. Typical response times are as follows:

Dew point °C	+10	-20	-50	-70
Response time, minutes	0.5	4	20	40

### Features

Super-sensitive Dual Optics

Three stage Peltier cooling

Precision 100 Ω 4 wire platinum resistance thermometer

0.1 °C dew point accuracy

Swagelok® or VCR® couplings

Dual multi-function LED display with unit indicator

Current, voltage outputs and RS232 digital communications



The Dew Point Specialists



## Unbeatable Measurement Capability

The S4000 Remote uses a highly accurate 4 wire PT100 temperature sensor and has a proven measurement capability of better than 0.1 °C dew point. It is the only instrument that is delivered, as standard, with a full UKAS certificate providing official traceability to the UK National Standard. UKAS is the United Kingdom member of European Co-operation on Accreditation (EA), the International Laboratory Accreditation Cooperation (ILAC) and the International Accreditation Forum (IAF). The S4000 Remote is also calibrated traceable to the NIST (Washington DC, USA) National Humidity Standard. No other hygrometer provides such comprehensive traceability to a worldwide network of standards organisations. That's why the S4000 Remote is used by so many of these very organisations as part of their own humidity referencing systems.

## Visual Verification

Every S4000 Remote is delivered complete with an M4K Viewing Microscope. Fitting neatly into the sensor viewing port, this microscope allows the user to confirm the presence of water or ice on the mirror surface.

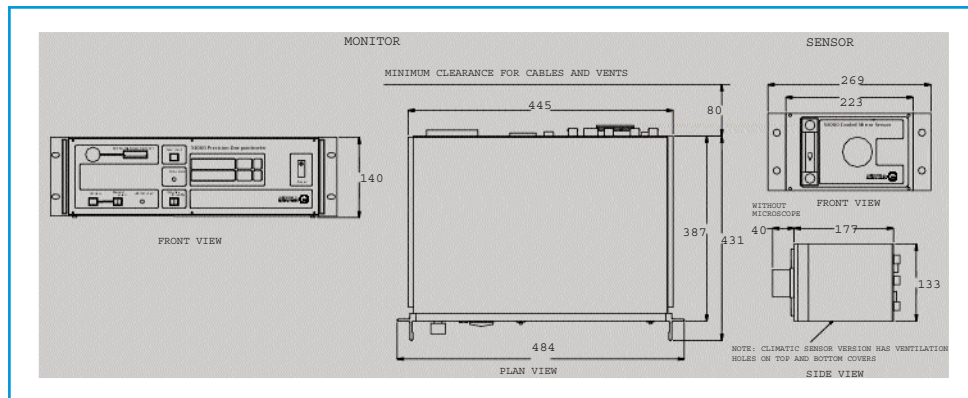
## Climatic Sensor Option

For applications where high humidities are to be measured, or where it is necessary for the sensor to react quickly to changing ambient temperatures (for example environmental test chamber measurements) a climatic sensor version is available. The climatic sensor offers the same accuracy and reliability as the standard S4000 Remote sensor but is provided with a minimum volume, open housing arrangement to give maximum thermal stabilisation and protection from condensation conditions.

## Technical Specifications

<i>Display</i>	Dual 6 digit LED, with 2 digit eng unit indicators
<i>Units</i>	°C, °F dew point; °C, °F temp; % rh, ppm <sub>v</sub> , ppm <sub>w</sub> , gm <sup>-3</sup> , gkg <sup>-1</sup> , ppm <sub>w</sub> for SF <sub>6</sub>
<i>Resolution</i>	0.01 for all units
<i>Accuracy</i>	±0.1 °C dew point (typical system accuracy)
<i>Response speed</i>	0.5 °C s <sup>-1</sup> + setting time (dew point dependent)
<i>Sensitivity</i>	0.01 °C
<i>Repeatability</i>	Better than 0.1 °C
<i>Auxiliary input</i>	Pressure transducer 4-20 mA input for automatic (optional) pressure compensation. Range = 0 to 344.0 kPa absolute (0-50 psia)
<i>Sensor pressure</i>	Atmospheric
<i>Sample flow rate</i>	0.1 to 0.7 Nlmin <sup>-1</sup> (recommended)
<i>Integrated flowmeter</i>	0 to 1 Nlmin <sup>-1</sup>
<i>Dual optics detection system</i>	Wide band red LED with dual photo sensors
<i>Outputs: analogue</i>	10 mV/°C dew point, 4-20 mA
<i>digital</i>	RS232; data hold, ABC status, optics alarm (logic)
<i>Temp measurement</i>	Four wire 1/10 DIN 100W platinum resistance thermometer
<i>Measurement range</i>	- 80 to +20 °C dew point (remote); - 80 to +85 °C dew point (climatic sensor)
<i>Sensor operating temp</i>	-30 to +30 °C (remote); -30 to +90 °C (climatic)
<i>Auxiliary cooling</i>	External liquid; external fan (climatic version)
<i>Sensor housing type</i>	Bench case; space frame (climatic version)
<i>Dimensions</i>	268W x 300D x 133H mm
<i>Weight</i>	5.5 kg; 4.8 kg (climatic version)
<i>Power supply</i>	90 to 265 V AC; 50-60 Hz (monitor)
<i>Cable length</i>	50 metres (max)

## Dimensions



Dimensions mm

S4000 Remote - Ref: S4000 remote 0809

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