



S4000 RS & TRS

Precision Dewpointmeters



A precision, wide range laboratory dew-point hygrometer providing ultimate accuracy, reliability and long-term performance for humidity measurement and calibration



S4000 RS & TRS

The Laboratory Standard

The S4000 RS and TRS Cooled Mirror Dewpointmeters offer unmatched accuracy and reliability in dew point measurement and calibration. The powerful three-stage Peltier thermoelectric heat pump, coupled with integrated auxiliary refrigerant cooling, gives an effective measurement range down to -85 °C dew point for the RS and to -100 °C dew point for the TRS.

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 dew-point meters may give reduced accuracy, poor control stability and extremely long response times at low moisture levels. The S4000 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 RS and TRS are both fitted as standard 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	-100
Response time, minutes	0.5	4	20	40	100

Features

- Super-sensitive Dual Optics
- Three stage Peltier cooling
- Single (RS) or two-stage (TRS) auxiliary cooling for trace moisture measurements
- 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

Calibration Integrity

The S4000 is unique amongst dew-point hygrometers. 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). As an additional benefit, the S4000 has a direct traceability path 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 is used by so many of these organisations as part of their own humidity referencing systems.



The Dew Point Specialists



Contamination Compensation

Any optical system carries a risk of contamination. The S4000 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 such as 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 also features a sophisticated data hold system, which maintains the instrument's signal outputs during an ABC cycle, allowing the S4000 to be used for process control applications.

Unbeatable Measurement Capability

The S4000 RS and TRS use a highly accurate 4 wire PT100 temperature sensor and have a proven measurement capability of better than 0.1 °C dew point.

Visual Verification

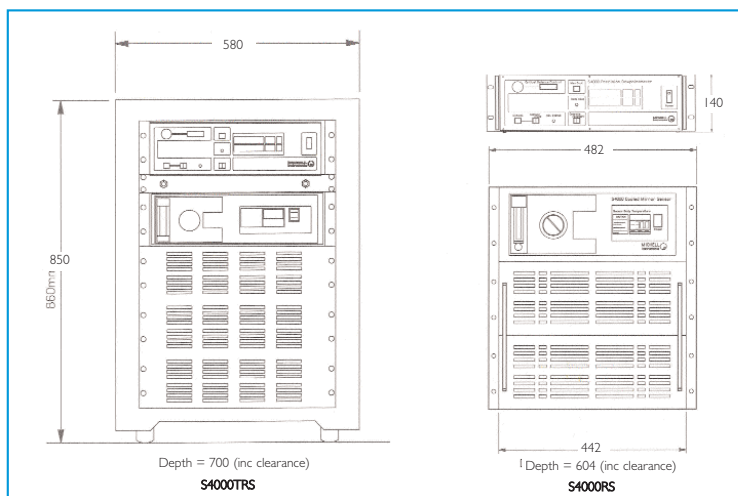
Every S4000 instrument is delivered complete with an M4K Viewing Microscope. Fitting neatly into the sensor viewing port, this microscope allows the user to confirm the presence of water or ice on the mirror surface. This is especially useful at trace moisture levels.

From the Cooled Mirror Range

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 _v , ppm _w , gm ⁻³ , gkg ⁻¹ , ppm _w for SF ₆
<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 ⁻¹ + settling time (dew point dependent)
<i>Sensitivity</i>	0.01 °C
<i>Repeatability</i>	Better than 0.1 °C
<i>Auxiliary input (optional)</i>	Pressure transducer 4-20 mA input for automatic pressure compensation. Range = 0 to 344.0 kPa absolute (0-50 psia)
<i>Sensor pressure</i>	1 MPa (max)
<i>Sample flow rate</i>	0.1 to 0.7 Nlmin ⁻¹ (recommended)
<i>Integrated flowmeter</i>	0 to 1 Nlmin ⁻¹
<i>Dual optics detection</i>	Wide band red LED with dual photo sensors, all system quartz insulated
<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 100Ω platinum resistance thermometer
<i>Measurement range</i>	-85 to +20 °C dp (RS); -100 to +20 °C dp (TRS)
<i>Operating temp</i>	0 to +40 °C
<i>Auxiliary cooling</i>	Internal refrigeration
<i>Dimensions</i>	482W x 510D x 405H mm (RS) - Sub Rack 580W x 600D x 850H mm (TRS) - Mini Rack
<i>Weight</i>	32.4 kg (RS); 85.0 kg (TRS)
<i>Power supply</i>	90 to 265 V AC; 50-60 Hz (monitor) 110/120 or 220/240 V AC (sensor)

Dimensions



Dimensions mm

S4000 RS & TRS - Ref: SRS+TRS-05-01

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