

# S4000 RS & TRS

## Precision Dewpointmeters

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



### Features

- 0.1°C dew point accuracy
- Measurement range: -100 to +20°C dew point
- Precision 100 Ω 4 wire platinum resistance thermometer
- Dual optics detection system
- Swagelok® or VCR® couplings
- Dual multi-function LED display with unit indicator



### Applications

- Standards Laboratory reference instrument
- Research and development
- Battery manufacture
- Industrial gases

S4000 RS & TRS

## The Laboratory Standard

The S4000 range of high precision 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 S4000 RS and to -100°C dew point for the S4000 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 RS and TRS is unique in that it utilises a dual optics detection system. This greatly increases the sensitivity of the optical loop and response, stability and sensitivity are improved by orders of magnitude at low frost points.

Typical response times are as follows:

Dew Point °C	+10	-20	-50	-70	-100
Response time, minutes	0.5	4	20	40	100

## Calibration Integrity

The S4000 RS and TRS 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 RS and TRS 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. The S4000 RS and TRS is used by many of these organisations as part of their own humidity referencing systems.

[www.michell.com](http://www.michell.com)

# S4000 RS & TRS

## Precision Dewpointmeters

Accuracy 0.1°C  
dew point

Microscope for  
visual inspection  
of mirror

Dual optics detection



## Related Products



S8000 Integrale



Dew Point  
Calibration System



Dual multi-function LED display with unit indicator

Measurement range:  
RS: -85°C dp  
TRS: -100°C dp

Three stage Peltier cooling

Single (RS) or two-stage (TRS) auxiliary cooling for trace moisture measurements



Optidew Vision



Dew-Point Generators

## 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 a visible alarm is generated. 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  $\pm 0.1^\circ\text{C}$  dew point.

## Visual Verification

At trace moisture levels many professional users require visual verification to confirm the measured presence of water or ice on the mirror surface. Every S4000 instrument is delivered complete with an M4K viewing microscope.



Calibration Laboratory

Please note: Michell Instruments adopts a continuous development program which sometimes necessitates specification changes without notice.



# S4000 RS & TRS

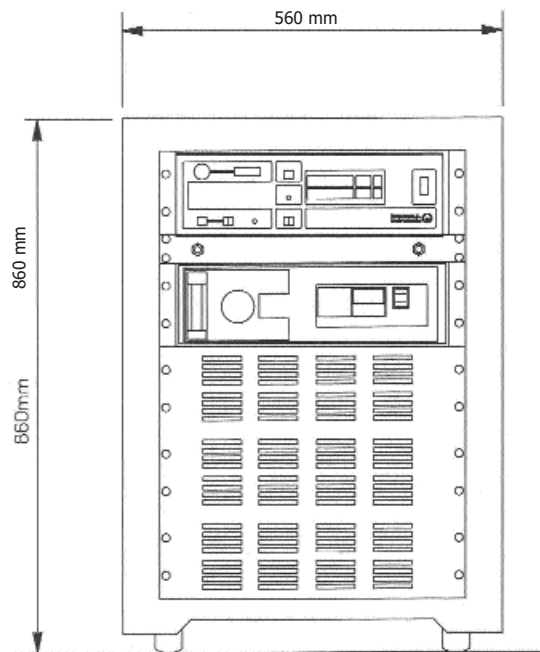
## Precision Dewpointmeters

### Technical Specifications

<b>GENERAL</b>	
Measurement range	RS: -85 to +20°C TRS: -100 to +20°C
Measurement accuracy	±0.1°C dew point ±0.1°C temperature
Measurement units	°C, °F dew point; °C, °F temperature; % 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>
Response speed	0.5°C s <sup>-1</sup> + settling time (dew point dependant)
Sensitivity	0.01°C
Repeatability	Better than 0.1°C
Resolution	0.01 (0.1 for % rh)
<b>DEW-POINT SENSOR</b>	
Mirror	Gold plated copper
Temperature measurement	4-wire 100 Ω platinum resistance thermometer 1/10 DIN class B
Sample flow rate	0.1 to 0.7 Nlmin <sup>-1</sup> (recommended)
Integrated flowmeter	0 to 1 Nlmin <sup>-1</sup>
Sensor pressure	Atmospheric
Auxiliary cooling	Internal refrigeration
<b>REMOTE PRT</b>	
Temperature measurement	4-wire 100 Ω PRT 1/10 DIN class B
<b>MONITOR</b>	
Resolution	0.01°C
Dual optics detection	Wide band red LED with dual photo sensors, all system insulated
Outputs:	
Analogue	2 channels 10 mV/°C dew point, 4-20 mA
Digital Logic	RS-232 data hold, ABC Logic status, optics alarm
Auxiliary input	
Pressure transducer	4-20 mA input for automatic compensation 0-50 psia (optional)
Operating temp	0 to +40°C
Dimensions	
RS	482W x 510D x 402H mm - Sub Rack
TRS	560W x 600D x 860H mm - Mini Rack
Weight	
RS	31.5 kg
TRS	85.0 kg
Power supply	
monitor	90 to 265 V AC; 50-60 Hz
sensor	100-115 or 220-240 V AC 50-60 Hz

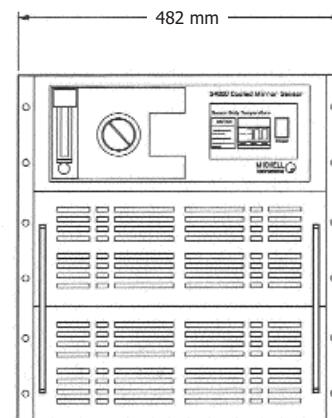
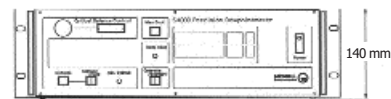
**Michell Instruments Ltd**  
48 Lancaster Way Business Park,  
Ely, Cambridgeshire  
CB6 3NW, United Kingdom  
Tel: +44 (0) 1353 658 000  
Fax: +44 (0) 1353 658 199  
Email: [info@michell.co.uk](mailto:info@michell.co.uk)  
www: [www.michell.com](http://www.michell.com)

### Dimensions



Depth = 700 mm (including clearance)

#### S4000 TRS



Depth = 604 mm (including clearance)

#### S4000 RS

Please note: The accuracy stated represents the typical variation between the instruments under test and a calibrated and corrected reference.

Please contact us for latest version: S4000 RS & TRS: Ref: S4000RSTRS-0309