

# S8000 *Integrale*

## High Performance Chilled Mirror Dewpointmeter

A high-precision, high accuracy hygrometer, offering very high sensitivity to changes in moisture content.



### Highlights

- Fundamental, accurate and drift-free measurement
- Rapid measurement response speed
- -60 to +40°Cdp measurement range (-76 to +104°Fdp)
- $\pm 0.1^\circ\text{Cdp}$  accuracy ( $\pm 0.18^\circ\text{Fdp}$ )
- FAST – guaranteed frost formation below  $0^\circ\text{C}$  ( $+32^\circ\text{F}$ )
- Data logging to USB or SD card
- Vertical or horizontal configuration
- Operates at pressure up to 1.7 MPa (17 barg/246 psig)

### Applications

- Metrology laboratories
- High voltage switchgear
- Clean/dry rooms
- Pharmaceutical
- Fuel cell research
- Engine testing
- ... and many more

## S8000 *Integrale* High Performance Chilled Mirror Dewpointmeter

### The NEW Bench-top Standard

The new S8000 *Integrale* continues Michell's tradition of excellence in the design of high performance products. This new generation of Michell Dew-Point Hygrometer offers unmatched accuracy and repeatability in dew-point measurement of air and gas systems in laboratories and many field applications. With its powerful state of the art thermoelectric heat pump the S8000 *Integrale* can precisely measure at dew points down to  $-60^{\circ}\text{C}$  ( $-76^{\circ}\text{F}$ ). The integrated sensor head allows the instrument to function as a stand-alone instrument. Available in the vertical and horizontal configuration the S8000 *Integrale* can also be supplied in a rugged transportable case.



### Dual Optics for Supreme Sensitivity

The rate of formation of frost on the mirror surface can be extremely slow at lower frost points. An accurate and reliable measurement with a standard hygrometer can be difficult to perform. The S8000 *Integrale* utilizes a unique advanced dual optics system to master such critical measurements at low dew points.

The integral sample gas temperature compensation and the dual optics add up to a highly sensitive and highly responsive yet stable system that is superior to standard hygrometers measuring at low dew points.

### Measurement Reliability

All of the Michell Chilled Mirror Instruments incorporate an automatic compensation system that periodically re-balances the optics to compensate for any reduction in light intensity caused by contamination of the components in the optical path. The S8000 *Integrale* utilizes a system called DCC (Dynamic Contamination Correction). The DCC system is intuitive and adapts the instrument control to the operating conditions to achieve optimum measurement performance at all times. Although the DCC system is fully automatic it can be configured by the user for individual applications.

### Visual Verification

Available with the S8000 *Integrale* is a viewing microscope. This enables the user to inspect the mirror surface during the measurement process enhancing confidence in the measurement accuracy and the formation of the correct phase of water condensate (dew or frost) on the mirror surface.



Power generation and transformers

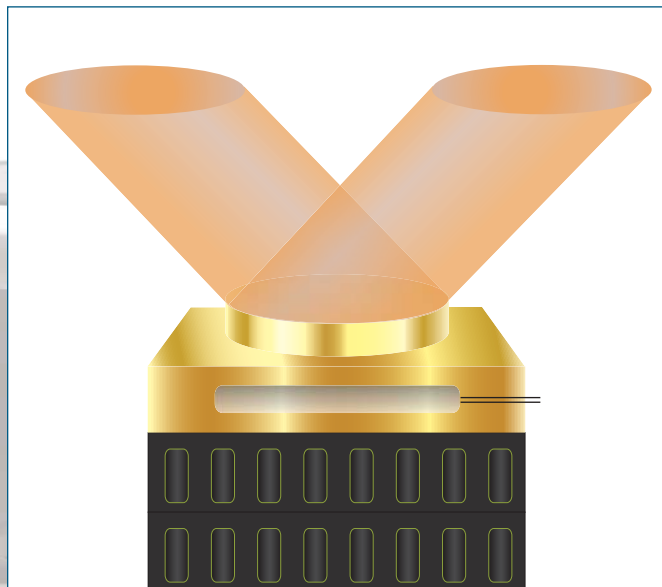
## Technology: Chilled Mirror

Michell's chilled mirror dew-point hygrometers are precision instruments for critical measurement and control applications. Chilled mirror sensors measure a primary characteristic of moisture – the temperature at which condensation forms on a surface. This means that chilled mirror instruments:

- Have no drift; the temperature at which condensation forms is measured directly so there are no calculated variables that could shift over time
- Are inherently repeatable, giving reliable results every time

The sensor operates as follows: a miniature mirror is cooled by a solid state Peltier thermoelectric heat pump until it reaches the dew point of the gas under test. When this temperature has been reached, condensation will begin to form on the mirror surface. An electro-optical loop detects that condensation is forming, by a reduction in the intensity of light reflected from the mirror surface and through the control electronics of the chilled mirror instrument. This modulates the cooling power applied to the Peltier.

The mirror surface is then controlled in an equilibrium state whereby evaporation and condensation are occurring at the same rate. In this condition the temperature of the mirror (measured by a platinum resistance thermometer) is equal to the dew-point temperature of the gas.



## Technical Specifications

General	
<b>Calibration</b>	4-point traceable in-house calibration as standard UKAS accredited calibrations optional – please consult factory
<b>Measurement range</b>	-60 to +40°Cdp (-76 to +104°Fdp)
<b>Measurement accuracy*</b>	±0.1°Cdp (±0.18°Fdp)
<b>Stability</b>	Better than 0.1°Cdp (0.18°Fdp)
<b>Repeatability</b>	<0.05°C (0.16°F)
<b>Measurement units</b>	°Cdp or °Fdp; % RH; g/m <sup>3</sup> ; g/kg; ppm <sub>v</sub> ; ppm <sub>w</sub> SF <sub>6</sub> ; ml/min
<b>Response speed</b>	2°C/sec + settling time (3.6°F/sec)
<b>Power supply</b>	264 V AC, 47/63 Hz; 100 VA
<b>Operating temperature range</b>	-20 to +50°C (-4 to +122°F)
<b>Weight</b>	<b>Vertical</b> 10.75kg <b>Horizontal</b> 9.9kg
Dew-Point Sensor	
<b>Mirror</b>	Gold plated copper
<b>Temperature measurement</b>	4 wire Pt100, 1/10 DIN class B
<b>Operating pressure</b>	
<b>Low pressure version</b>	0 to 1 barg (0 to 14.5 psig)
<b>High pressure version</b>	0 to 17 barg (0 to 246.6 psig)
Flow Sensor	
<b>Measurement range</b>	0 to 1000 ml/min (0 to 2118.88 scfh)
Display Unit	
<b>Resolution</b>	User-selectable to 0.001 dependent on parameter
<b>Outputs:</b>	
<b>Analog</b>	Three channels; user-selectable 4-20 mA, 0-20 mA or 0-1 V
<b>Digital</b>	USB, SD Card slot
<b>Alarm</b>	Two volt free changeover contacts, one process alarm, one fault alarm; 1A @ 30 V DC
<b>Cable pack</b>	Supply and USB cables. Output connectors suitable for indoor use
Optional Remote PRT	
<b>Temperature measurement</b>	4 wire Pt100, 1/10 DIN class B
<b>Measurement accuracy*</b>	±0.1°C (±0.18°F)
<b>Measurement units</b>	°C or °F
<b>Cable length</b>	2m/6.56 ft (250m/820.21 ft maximum)
Optional Pressure Sensor (In-Built)	
<b>Measurement range</b>	2.5 MPa (25 bara/362.59 psia)
<b>Measurement accuracy*</b>	0.25% Full Scale, typical
<b>Measurement units</b>	barg; psig; Kpg; MPa

\* Measurement accuracy means maximum deviation between instrument under test and corrected reference. To this must be added the uncertainties associated with the calibration system and the environmental conditions during testing or subsequent use.

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Michell Instruments adopts a continuous development programme which sometimes necessitates specification changes without notice.  
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## Dimensions

