



DCS

Dew Point Calibration System

From the Calibration Range

An integrated system for the calibration and characterisation of dew-point sensors and instruments



DCS
Dew Point Calibration System

Features

- Self-contained system
- Automatic or semi-automatic operation with manual override
- Wide measurement range
 - DCS80: -80 to +20 °C dewpoint
 - DCS100: -100 to +20 °C dewpoint
- Operates under Windows™ software control
- Traceable to NIST and NPL Standards

The Importance of Calibration

It is critically important that industrial and scientific measurement instrumentation is correctly calibrated. In the field of dew point measurement this is particularly so, as dew-point sensors are put to use directly in the gas stream to be measured and as such are extremely prone to being affected by process contamination, corrosive gases, particulates, oil carryover etc.

Regular re-calibration at a supplier's laboratory is a viable proposition for a user that has a small quantity of dew-point hygrometers, but for larger scale users the ability to perform local re-calibration can be attractive; it allows more regular calibration intervals, it is available on demand, specific parts of a calibration range can be investigated as needed. Michell Instruments can offer you both possibilities - we have a fantastically well-equipped calibration laboratory with traceability directly to NPL and NIST standards - and we also manufacture specialised dew-point calibration systems for you to deploy in your own laboratory. We provide full commissioning and training on every dew-point calibration system and offer regular maintenance and re-calibration to preserve your own traceability.

The DCS Dew Point Calibration System

The DCS system is a fully self-contained, calibration station capable of producing a flow of air (or nitrogen if you prefer) at a pre-specified range of dew-point temperatures from a minimum of -100 °C to a maximum of +20 °C. You can specify the exact operating range of the system and from this we will determine the most economical way to generate and deliver a precise calibration dew point to your test sensors. The DCS80 uses a single stage air dryer and calibrated needle valves, operated by solenoid drivers, to generate dew points in the range -80 to +20 °C. In the DCS100 a dual stage dryer gives a zero gas source of less than -100 °C dew point and set point generation is achieved by a sophisticated mass flow control methodology (VDS technology).

Each DCS comprises the following components:

Air Compressor

A laboratory mini compressor delivering up to 10Nlmin⁻¹ of air at up to 0.7 MPa to feed the air dryer system. The compressor can be housed within the calibration rack system (<72dba noise level) or in a separate room with an air feed to the DCS system.

Air Dryer

In the DCS80 a Michell PSD-2 Dryer provides up to 5 Nlmin⁻¹ of air at a dew point of less than -80 °C in continuous operation, using 4 Å Molecular Sieve desiccant. The DCS100 variant uses a two stage drying system comprising a commercial mini dryer and a specialist Michell PSD-4 stainless steel dryer, to give a resultant output of less than -100 °C dew point.



The Dew Point Specialists



Generator

DCS80: A two stage flow mixing system using calibrated needle valves controlled by solenoid drivers mixes dry air and saturated air in precisely pre-metered proportions to give a range of dew point levels from -80 to +20 °C. The exact number of pre-sets can be specified at time of order but is normally chosen to be eleven, giving 10 °C dew point intervals across the range. The generator can be driven by computer or via the front panel manual override switches.

DCS100: A software controlled Vapour Delivery System (VDS) generator gives precise, repeatable and infinitely flexible control of the generated dew point temperature. Individual three stage mass flow controllers select precise proportions of wet and pre-mixed air and humidity injection is achieved by a liquid mass flow controller and controlled evaporation system.

Reference Hygrometer

A Michell S4000 Precision Dewpointmeter is always specified as the traceable reference instrument in a Dew Point Calibration System. The S4000 is well proven as the most accurate and reliable dew-point hygrometer and has virtually zero drift, rendering it perfect for this function. The S4000RS would normally be specified for use in the DCS80 system with the TRS being the instrument of choice for the DCS100.

Calibration Manifold

We can design and build for you a calibration manifold to suit any type of dew-point sensor, or a combination of sensors from different manufacturers. Just tell us the sensor type and we'll do the rest.

Housing

The whole system is conveniently mounted in a 19" rack unit for ease of use and convenience. The only external service required is mains power to the unit. If you have a high purity air or nitrogen supply, you may choose to use this as a feed to the system instead of the integral compressor/dryer system. Please consult with Michell's technical sales staff about how best we can accommodate this variation.

From the Calibration Range

Technical Specifications

	DCS80	DCS100
Range	-80 to +20 °C dp	-100 to +20 °C dp
Air dryer	Michell PSD-2 Dryer	Michell PSD-4 Super Dryer
Generator method	DG-5 with solenoid controlled needle valves	VDS system with mass flow controllers
Reference hygrometer	S4000RS Cooled Mirror Dewpointmeter	S4000 TRS Cooled Mirror Dewpointmeter
Calibration flow rate	2 to 5 Nlmin ⁻¹ *	5 Nlmin ⁻¹ **

DCS80 and DCS100

Best system uncertainty	±0.2 °C dew point (k = 2) at +20 °C dew point
Set-point precision	±0.5 °C dew point
Carrier gas	Oil-free compressed air (compressor supplied)
Operating temp	+15 to +30 °C
Traceability	Directly to NPL and NIST
Power	220/240 V or 100/130 V, 50/60 Hz
Housing	Wheeled 19" rack system, 1.9 m high
Weight	120 Kg (approx)

For a more detailed specification, please consult Michell Instruments' Technical Sales Department.

* dependent upon generated dew point ** fixed flow

Dimensions

Every Dew Point Calibration System is built to meet our customers' specific requirements. These specifications are only a guide to the capabilities of each system.

