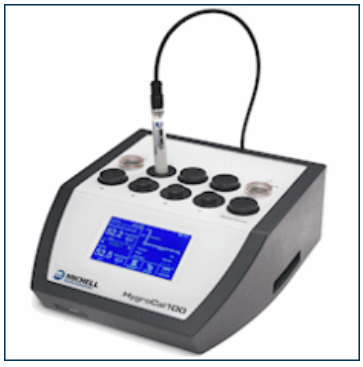
КАЛИБРОВОЧНОЕ ОБОРУДОВАНИЕ

ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

HygroCal100

The all-in-one validation package for your humidity sensors



The HygroCal100 provides a stable test chamber to quickly evaluate the performance of relative humidity sensors across a wide range of 5 to 95% relative humidity.

Its intuitive 4” touch screen display and interface allows the probes under test to be fully integrated with the chamber and user interface (UI), so up to 7 probes with a variety of diameters and output signals can be powered, monitored and logged simultaneously by one self contained unit.

The HygroCal100 allows you to automate your calibration procedure with ease, and will provide a complete logged output of all probes under test against the reference instrument in csv format, ready to download to your USB memory device.

Technical Specification

Chamber	
Generation range	5 to 95% RH
RH stability	±0.5%
RH uniformity	±0.5%
Stabilization time	Typically <5 min for full stability from step changes of 10% RH
Control Probe	
RH accuracy	±0.8%
Temperature accuracy	±0.2°C
Long term stability ±1% per year	±1% per year

Electrical Specifications	
User interface	4.3” color LCD with touchscreen
Interface with probes	24V excitation voltage, accepts signals: 0–20 mA, 4–20 mA, 0–1 V, 0–5 V, 0–10 V
Measurement units	%RH, temperature in °C, °F
Displayed resolution	0.1
Data logging	2Gb internal memory available for log files; or 10.6yrs storage at 5s intervals
Battery (optional)	1500 mAh
Power supply	24 V DC (100 to 240 V AC, 50/60 Hz adaptor included)
Mechanical Specifications	
Probe ports	8 - port adaptors to accomodate probes of diameters: 12mm, 13.5mm, 14mm, 15mm, 18.5mm, 19mm, 24mm, 25mm
Chamber volume	Approx 1050cm^3
Maximum probe insertion depth	60mm
Desiccant reservoir capacity	25cm^3

HG10 Humidity Calibrator

The Michell HG10 Humidity Calibration System is a highly flexible computer-controlled automatic calibration system for humidity sensors. The HG10 is capable of repeatable generation of temperature and relative humidity set points over the range 1 to 95% RH (-50 to +50°Cdp) at temperatures of +20 to +50°C with excellent stability. The supplied chilled mirror reference instrument provides traceability directly to national standards, and makes the system suitable for use in high-level calibration laboratories.

Technical Specifications

General	
Enclosure	19” Rack System, H= 2.1m
Power Supply	100 to 115 V or 220 to 240 V 50/60Hz
Pressure Swing Dryer	Flow: 7 Nl/min Pressure: 0.68 barg

	Moisture Content: <1ppm$_V$ (<-75°Cdp)
Required Gas Supply	Flow: 10 Nl/min Pressure: 5 to 7 barg Moisture Content: Oil and liquid water free
Type	Twin column desiccant, pressure swing
Desiccant	4 Ångström Molecular sieve bead (4-8 mesh)
Timer	Motorized cam
Operating Temperature	+5 to +35°C
Generator	
Generation Range	Humidity: 1 to 95% RH (-50 to +50°Cdp) Temperature: Dependant on temperature chamber
Generated Gas Output	Air 2 Nl/min @ 0.5 barg via heat traced line
Dual Stage MFC Mixing	Dual mass flow controllers
Power Consumption	550 V A maximum
Dual Stage MFC Mixing	Dual mass flow controllers
Operating Temperature	+5 to +40°C; 10 to 90% RH
Enclosure	19" Rack System, H= 2.1m
Control System	Closed loop feedback
Reference Instrument	
Performance	
Measurement Technology	Chilled Mirror
Measurement Range	-80 to +85°Cdp
Measurement Accuracy	±0.1°Cdp ±0.1° temperature
Repeatability	Better than ±0.1°C
Resolution	0.01 (0.1 for % RH)
Dew-Point Sensor	
Mirror	Gold plated copper
Temperature Measurement	4 wire Pt100, 1/10 DIN class B
Sample Flow Rate	0.1 to 0.7 Nl/min (recommended)
Integrated Flowmeter	0 to 1 Nl/min
Sensor Pressure	Atmospheric
Configuration	Remote
Remote PRT	

S904 Humidity Calibrator

The S904 is a completely stand-alone and transportable humidity calibrator, requiring no external services other than mains power. The calibration chamber features 5 interchangeable ports to accommodate virtually any brand, type or model of humidity sensor. This calibrator is ideal for companies or organizations looking to calibrate large numbers of probes in a laboratory or field setting.

Technical Specifications

Humidity	
Generation Range	10-90% RH
Accuracy Control Element	≤±1% RH (10–70% RH) ≤±1.5% RH (70–90% RH)
Stability	±0.2% RH (20–80% RH)
Temperature	
Generation Range	+10 to +50°C (Lowest T set point = 10°C below ambient)
Accuracy	±0.1°C
Stability	±0.1°C
Chamber	
Ramp Rate from +20 to +40°C +40 to +20°C	 1.5°C/minute 0.7°C minute
Control Element	Removable relative humidity sensor
General	
Probe Ports	up to 5 – sensor body diameters 5 to 25mm accommodated by port adapters
Chamber Volume	2000cm³
Chamber Dimensions	105 x 105 x 160mm (h x w x d)
Instrument Dimensions	290 x 520 x 420mm (h x w x d)
Set Point Resolution	0.1 for humidity and temperature
Displays	3 digit LED, 10mm characters
Supply	85 to 264 V AC, 47/63 Hz, 150 VA
Weight	20kg

OptiCal Humidity Calibrator

The OptiCal is a premium calibration solution for humidity sensors. The stand-alone and transportable humidity calibrator requires no external services other than mains power, and features an integrated chilled mirror reference instrument to enable the operator to perform calibrations that are traceable to national standards.

Technical Specifications

Humidity	
Generated Range	10 - 90% RH
Control Element Accuracy	≤ ±1% RH (10-70% RH) ≤ ±1.5% RH (70-90% RH)
Stability	±0.2% RH (20-80% RH)
Temperature	
Generated Range	+10 to +50°C (+50 to +122°F)
Accuracy	±0.1°C (±0.18°F)
Accuracy	±0.1°C (±0.18°F)
Chamber	
Ramp Rate	+20 to +40°C (+68 to +104°F): 1.5°C / minute (2.7°F / minute) +40 to +20°C (+104 to +68°F): 0.7°C / minute (1.2°F / minute)
Control Element	Removable relative humidity sensor
Reference	
Accuracy	Dew Point: ±0.2°C (±0.36°F) Temperature: ±0.1°C (±0.18°F)
Measurement Units	Dew Point: (°C/°F), % RH Temperature: (°C/°F), gm^{-3}, gkg^{-1}, water activity (a_W)
Outputs	Analog: 4-20 mA or 0-20 mA over user-settable output Accuracy: ±0.2°C (±3.6°F) Digital: 500 Ω maximum load resistance Alarm: RS232 @ 9600 baud rate Volt free contact, 30 V, 100 mA maximum
General	
Probe Ports	Up to 5 - sensor body diameters 5 to 25mm (0.2 to 0.98") accommodated by port adapters
Chamber Volume	2000cm^3 (112.1in^3)
Chamber Dimensions	105 x 105 x 160mm (4.13 x 4.13 x 6.3") (h x w x d)
Instrument Dimensions	290 x 520 x 420mm (11.4 x 20.5 x 16.5") (h x w x d)
Set-point Resolution	0.1 for humidity and temperature

DCS Dew-Point Calibration System (DCS60, DCS80 & DCS100)

The DCS system is a complete rack-mounted calibration station capable of producing a flow of air (or nitrogen) at a pre-specified range of dew-point temperatures from a minimum of -100°C (-148°F) to a maximum of +20°C (+68°F). Through customization the DCS system can be PC controlled for automated calibration sequences or manually operated at pre-determined dew-point set points.

Technical Specifications (DCS60, DCS80, DCS100)

Model	DCS60	DCS80	DCS100
Range	-60 to +20°Cdp (-76 to +68°Fdp)	-80 to +20°Cdp (-112 to +68°Fdp)	-100 to +20°Cdp (-148 to +68°Fdp)
Air Dryer	PSD2 Dryer		PSD4 Super Dryer
Generator Method	DG2 with manual flow metering DG4 with solenoid controlled needle valves		VDS system with mass flow controllers
Reference Hygrometer	S8000 Integrale Chilled Mirror Hygrometer	S8000RS Chilled Mirror Hygrometer	S4000 TRS Chilled Mirror Hygrometer
Calibration Flow Rate	2 to 5 Nl/min (4.2 to 10.6 scfh)		10 Nl/min (21.2 scfh)
Best System Uncertainty	±0.2°C (±0.36°F) dew point (k = 2) @ +20°Cdp (+68°Fdp)		
Set Point Precision	±0.5°C (±0.9°F) dew point		
Carrier Gas	Oil-free compressed air (compressor supplied)		
Operating Temperature	+15 to +30°C (+59 to +86°F)		
Traceability	Directly to NPL and NIST through Reference Hygrometer		
Power	220 to 240 V AC or 100 to 130 V DC, 50/60 Hz		
Housing	Wheeled 19" rack system, 1.9m (74.8") high		
Weight	98kg (216lbs) (approx)	125kg (231lbs) (approx)	Varies

HG1 Humidity Calibrator

A low-cost, easy to use, fully integrated system for the calibration of dew-point and relative humidity sensors from 2 to 90% relative humidity, -30 to
+20°Cdp. The HG1 is configured to operate as a stand alone calibrator or to operate from a dry compressed air supply enabling easy on-site calibrations. The calibrator features an integrated chilled mirror reference instrument to enable the operator to perform calibrations that are traceable to national standards. The chamber cover can be customised to suit the transmitters and sensors being calibrated.

Technical Specification

Model	**HG1**
Calibration Range	2 to 90% RH (-30 to +20°Cdp) @ 21°C ambient
Reference Accuracy	Typically ±2% of reading (% relative humidity), 0.2°Cdp, 0.1°C ambient temperature (with Optidew reference hygrometer)
Calibration	Through traceable calibration of integrated Optidew reference hygrometer, to NPL and NIST
Operating Temperature	+10 to +35°C ambient
Power	90 to 120 V AC @ 60Hz or 220 to 260 V AC @ 50Hz
Calibration Chamber	Steel with gasket seal, 120 x 120 x 250mm (h x w x d)
Overall Dimensions	Painted aluminium case, 305 x 520 x 400mm (h x w x d)
Sample Flow Rate	4 Nl/min for the sensor cell
Weight	20kg

Dew-Point Generators (DG2, DG3, DG4 & VDS3)

The Michell range of dew-point generators provides flexibility and control at a competitive price. Based on the volumetric mixing of dry and wet gases, the instruments can be controlled either manually or automatically to suit a wide range of calibration applications.

DG3

The DG3 is our entry-level, single-stage mixing humidity generator. It is operated by manually mixing the two gas streams using flow control valves. The DG3 provides flows up to 5 Nl/min (10.6 scfh) and generates dew points ranging from -40 to +20°Cdp (-40 to +68°Fdp).

DG2

The DG2 has two stages of gas-flow mixing which allow it to generate dew points down to -75°Cdp (-103°Fdp). The great strengths of the DG2 are its ease of use and its flexibility in manually generating an accurate target dew point by fine tuning the gas mix via its flow metering valves. Infinite mixing is achievable within its working range.

DG4

The DG4 is a two-stage push-button dew-point generator which operates in the range of -75 to +20°Cdp (-103 to +68°Fdp). It can be delivered with between 3 and 10 factory-set dew point settings, selectable from the front panel keypad. Its RS232 communication port enables further automation, particularly when used in conjunction with a UKAS certified hygrometer. The DG4 offers maximum flexibility via its pre-set values combined with the mixing ability of the DG3.

VDS3

The VDS3 is a sophisticated computer controlled dewpoint generator that operates in the range of -100 to +20°Cdp (-148 to +68°Fdp). Individual three stage mass flow controllers select precise proportions of wet and pre-mixed air. Humidity injection is achieved by a liquid mass flow controller and controlled evaporation system. The Vapor Delivery System (VDS) gives repeatable and flexible control of the generated dew point and can be programmed with up to 13 presets that can be activated manually or as part of an automatic calibration program.

Technical Specifications (DG2, DG3, DG4)

Model	DG2	DG3	DG4
Mixing Stages	2 stage	1 stage	2 stage
Humidity Range	-75 to +20°Cdp (-103 to +68°Fdp)	-40 to +20°Cdp (-40 to +68°Fdp)	-75 to +20°Cdp (-103 to +68°Fdp)
Gas Supply	7 Nl/min (14.8 scfh) @ 0.68 barg (10 psig) and -75°Cdp (-103°Fdp)		
Gas Output	1 to 5 Nl/min (2.1 to 10.6 scfh) air @ 0.5 to 1 barg (7 to 14 psig)		
Filter	Particulate filter		
Saturator	Polycarbonate and porous polyethylene sinter		

Heating	Finned heating elements, 500 watts, fan circulation		
Power Supply	220 to 240 V, 50Hz or 100 to 120 V; 60Hz		
Storage Temperature	+5 to +40°C (+41 to +104°F) (with saturators empty)		
Operating Temperature	+18 to +24°C (+64 to +75°F)		
Enclosure Size	19" sub-rack x 12U high x 400mm (15.8") deep	19" sub-rack x 6U high x 340mm (13.4") deep	
Enclosure Size	20kg (44lbs)	9kg (20lbs)	25kg (55lbs)

Technical Specifications (VDS3)

Model	**VDS3**
Dew-point range	-100 to +20°Cdp (-148 to +68°Fdp) (factory default preset values= −100, -90, -80, -70 -60, -50, -40, -30, -20, -10, 0, +10 and +20 °C (+68°F))
Output stability	±0.5°C
Required Gas Supply	30 Nl/min (63.6 scfh) @ 4.8 barg (70 psig) pressure <13.8 ppb_V (−100°C / -148°F atmospheric dew point) moisture content
Gas Output	10 Nl/min (21.2 scfh) @ 0.5 barg (7.3 psig)
Cable Connection	USB (type B) for PC Control RS485 (9 way D plug) for Setup
Water Reservoir	Material: ABS Capacity: 1 litre
Power Supply	220 to 240 V AC or 100 to 120 V AC 50/60 Hz
Power Consumption	500 Watt maximum
Power Connector	3 pin IEC
Power Supply Fuse	3A (F) quick blow
Operating Temperature	+10 to +40°C (+50 to 104°F)
Construction	Painted diecast aluminum enclosure with smoked glass door. Overall dimensions: 1020 x 555 x 600mm (40 x 22 x 24") (h x w x d)
Weight	65kg (143lbs) maximum

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