Humiwell

Relative Humidity Calibrator

Humiwell is a Relative Humidity Calibrator developed and manufactured by MicroStep-MIS. Whether you use it as a benchtop device or take it to the field, Humiwell is always ready to deliver the highest accuracy.

The best solution for calibration of your RH probes

Laboratory workstation for Relative Humidity Calibration with Humiwell and dew point reference instrument

Wide range, fast response

Excellent stability and homogeneity

Room conditions monitoring

No external devices required

High-end parameters, low-end price

Humiwell is designed to attack parameters of the best calibrators in the class. It has the widest temperature range and achieves the temperature setpoint faster than any of its competitors. Still, the price is kept low to keep it competitive with the low-end devices. Whether you need the highest performance, or your budget is limited, Humiwell is always the best choice.

Low uncertainty lab setup

Humiwell is designed to work with chilled mirror reference hygrometer to provide the best accuracy possible. The relative humidity uncertainty with 95 % confidence is typically from 0.5 to 1.2 %, at temperature close to ambient. This makes it ideal for a calibration laboratory setup.

Suitable for field use

The built-in humidity and temperature probe may be used as a reference. In such case the Humiwell is a self-sufficient compact device to perform the calibration on site. The measurement uncertainty is about two times higher, that is the trade-off when not using the chilled mirror reference. This is the ideal setup for field calibrations.

Wide range temperature control

The temperature range from -10 °C to +60 °C makes Humiwell the most powerful humidity calibrator in the class. With more cooling power it achieves the setpoint faster. It is suitable for temperature / humidity cycling and temperature characterization.

Fast and easy setup

Intuitive color touch-screen display makes it easy to set-up a quick test in the field. In the lab, the best use is with the IMS4 CalibLab software, which provides full automation of the calibration process.

External reference readout

One RS-232 input in the back of Humiwell is dedicated to connecting of the external chilled mirror reference.

Reading the sensors values

Humiwell fits various types of probes into its temperature-controlled chamber. Up to 6 probes can be calibrated simultaneously. External read-out card allows convenient connections. It provides 6x 12 V DC power supply, 6x 24-bit differential analog input, 6x SDI-12, 6x UART (expandable to RS-232, RS-485, RS-422 using converters).

Automatic calibration and adjustment

In certain environments the humidity sensors are subject to fast degradation. To restore the original performance, we recommend to replace the sensing element and run automatic adjustment and calibration process with Humiwell and IMS4 CalibLab.

The adjustment process is fully automatic. Humiwell with IMS4 CalibLab already has many types of sensors integrated by default. In case of special requirements we can integrate new types of sensors if it is technically possible. To support a specific sensor, please contact - info@microstep-mis.com.

Remote access

Calibration process can be monitored and controlled from your office connecting the calibrator via Ethernet and enabling you to check the calibration progress remotely.

Room conditions monitoring

In calibration laboratory the ambient conditions must be monitored. Humiwell features optional connectors for sensors for measuring ambient conditions during the calibration. With IMS4 CalibLab software, the maximum / minimum values of pressure, relative humidity and temperature automatically get to the calibration certificate.

Clean and reliable humidity generator

Humiwell does not use any chemicals or salts except water and desiccant. When compared to saturated salt solutions, Humiwell reaches the set-point quickly and reliably. It suppresses the ambient temperature fluctuations and can generate any of the relative humidity and temperature in the range at your command.

Controller algorithm

Sophisticated controller algorithm for temperature and relative humidity provides fast response, high stability and helps to prevent condensation forming in the chamber.

Calibrated sensors

Standard chamber door fits up to 6 probes of round cross-section, with maximum diameter 25 mm. Door ports can be easily replaced for different probe diameters. Humiwell optionally features readout card with six inputs for sensors. The outputs are analog voltage, SDI-12 and 5 V UART compatible. RS-232, RS-485 and other buses may also be specified. The readout card connects to the rear panel of Humiwell. It solves the question how to read the calibrated sensor values during calibration. It also saves space and reduces the number of lab PC ports.

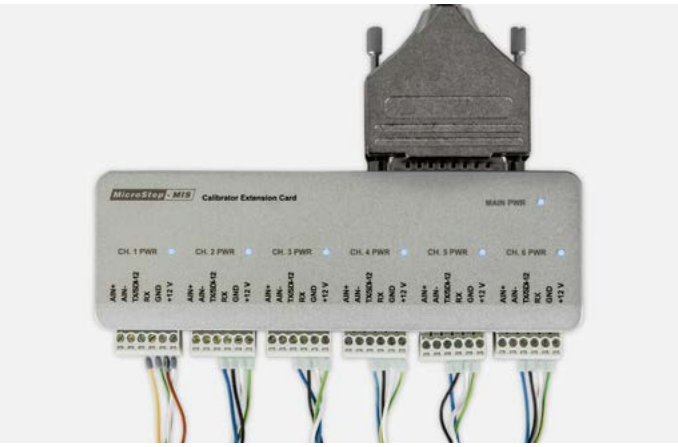
Easy to replace desiccant cartridge

Color touchscreen display

A 5-inch LCD enables a simple operation and status check. You can set a desired set-point and check the course of values in the chamber.

Connectivity

Humiwell has Ethernet and RS-232 ports as a standard. These enable remote control of the device, or even the whole calibration thanks to the fact, that calibrated sensors and reference can all be connected to Humiwell. All the data is available for the PC software.



External read-out card for convenient probes connection. It provides 6x 12 V DC power supply, 6x 24 bit differential analog input, 6x SDI-12, 6x UART (expandable to RS-232, RS-485, RS-422).

Chamber

Total volume	2.8 l
Usable diameter	140 mm
Usable depth	140 mm
Homogenization	variable speed fan
Number of calibrated sensors	6
Maximum diameter of calibrated sensor	25 mm

Relative humidity control

Method of generation	Mixed flow generator
Range	(2 to 95) %RH
Stability	Typically better than 0.1 %RH
Feedback sensor	solid state capacitive polymer
Feedback sensor accuracy @ 20 to 30 °C	(0.6 to 1.2) %RH
Resolution	0.01 %RH
Condensation prevention algorithm	yes
Consumables	desiccant (molecular sieve) distilled water

Electrical

Supply voltage	100 to 240 V AC
Maximum supply power	320 W

Communication ports

Reference	RS-232
Calibrated sensors	analog voltage 0 to 2.5 V, SDI-12, 5 V UART
Remote communication	Ethernet, RS-232
Baud rate all serial ports	adjustable
Protocol	ASCII

Delay between characters is not required

Mechanical

Dimensions of calibrator	350 x 240 x 430 mm
Weight	13 kg (approximately)
Transport case	Impact resistant Peli case (optional)
Dimensions of transport case	510 x 350 x 620 mm
Weight of transport case	10 kg (approximately)

Temperature control

Method of generation	4 thermoelectric Peltier cells
Temperature control range	(-10 to 60) °C
Stability	better than 0.05 °C
Feedback sensor	PT100 Thermometer
Feedback sensor accuracy	better than 0.1 °C
Chamber homogeneity	(0.02 to 0.11) °C
Heating time	6 minutes
Cooling time	42 minutes

Environmental

Operating temperature	10 to 35°C *
Operating relative humidity	< 80 %RH

** limited range of temperature and relative humidity*

Relative humidity uncertainty calculation

Calculation of expanded uncertainty (k = 2, 95 % probability) when using MBW 473 dew point mirror, at ambient temperature 23 °C.

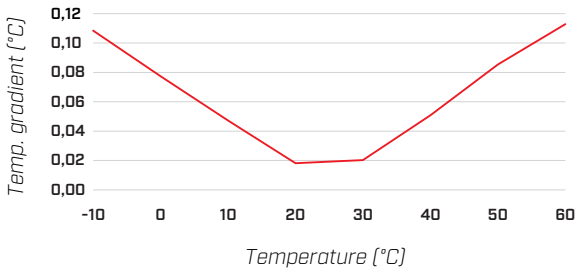
Relative humidity uncertainty

	-10 °C	**0 °C**	**20 °C**	**40 °C**	**60 °C**
20 %RH	0.66 %RH	0.52 %RH	0.25 %RH	0.32 %RH	0.39 %RH
50 %RH	1.49 %RH	1.2 %RH	0.53 %RH	0.68 %RH	0.84 %RH
80 %RH	2.26 %RH	1.8 %RH	0.8 %RH	1 %RH	1.3 %RH

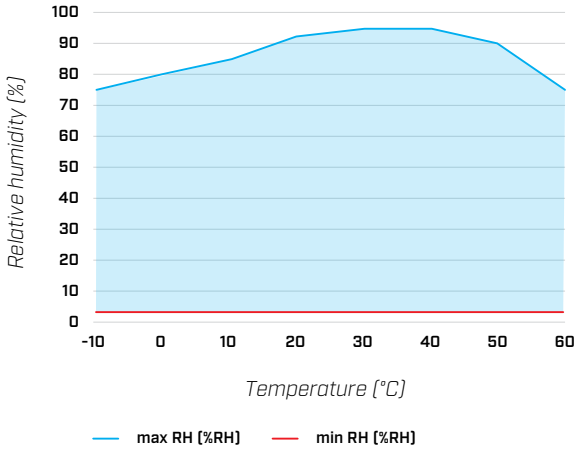
Temperature uncertainty

t (°C)	0.35 °C	0.27 °C	0.09 °C	0.19 °C	0.3 °C

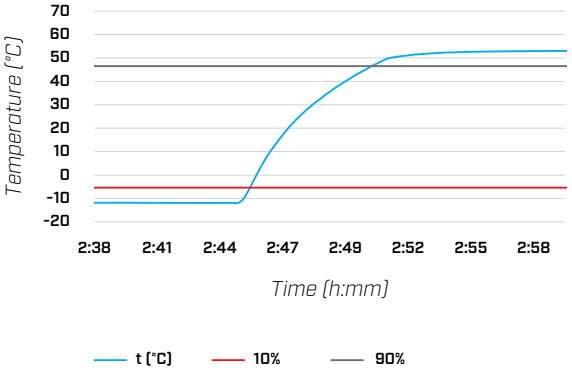
Temperature gradient according to IEC 60068-3-11:2007



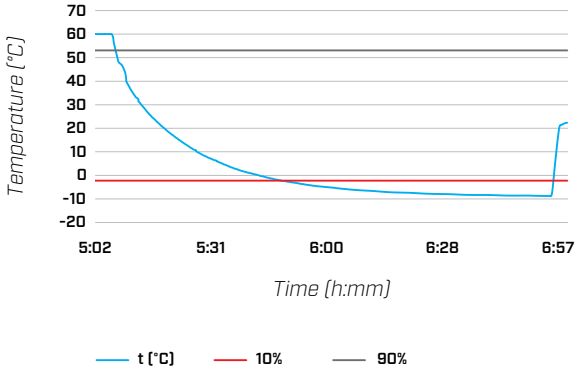
Humiwell climatogram



Heating time according to IEC 60068-3-5: 2001



Cooling time according to IEC 60068-3-5: 2001



Automatic calibration and adjustment with IMS4 CalibLab software