

KAHN Hygrometers

Opti-Cal

Humidity Calibrator

Stand-alone calibrator for relative humidity (RH) sensors providing humidity and temperature profiling with a built-in, NIST traceable optical reference hygrometer.

- Perform RH sensor calibration in-house
- Simple and easy to use
- Fully self-contained system
- Digital control of temperature and relative humidity
- Range 10% to 90% RH over 10° to 50°C chamber temperatures
- Integrated precision reference hygrometer
- Best measurement capability <2% of reading

Precision Calibration

For the user of relative humidity sensors there is always a question over the calibration accuracy and stability of the instruments in use. RH sensors provide economical measurement but require regular calibration and adjustment for correct performance over extended time periods. It is common for RH sensors to require calibration and adjustment at three or six month intervals, depending on the criticality of the measurement process.

Opti-Cal provides in-house calibration of RH sensors, without the need to send them to a NIST traceable laboratory. For a relatively low capital investment, Opti-Cal will provide calibrations that are directly traceable to National Institute of Standards and Technology over a wide relative humidity range, and at any set temperature from 10° to 50°C*.

Integrated System

Opti-Cal is a portable, fully self-contained humidity/temperature calibrator. The system consists of a humidity/temperature controlled chamber that can house up to six or more humidity sensors, depending on their physical dimensions. Temperature and humidity within the chamber are closed-loop controlled and continuously monitored by a precision optical reference hygrometer. Opti-Cal works by time proportioning the flows of dry and saturated air according to the pre-selected relative humidity value. The chamber temperature is controlled by a four-zone thermo-electric heat pump arrangement for maximum stability and minimum temperature gradient. The saturator assembly can be filled easily with distilled water at the front of the unit and the easily accessible desiccator can be re-charged by heating when required. No other maintenance is necessary. The only external service required is a single phase 115 VAC power.

*Lowest temperature set point is 10°C below ambient.



Easy Set Up and Operation

Operation of Opti-Cal could not be easier. To set a particular combination of humidity and temperature, just select the required values on the front panel thumbwheels. Typical response time to a humidity or temperature step change is ten minutes, although the humidity sensors under calibration may require a longer setting time. A digital output from the reference hygrometer can be connected to Opti-Cal's operating software to provide on-screen monitoring of the actual conditions with chart recording and data logging capability. Alternatively, this data can be fed into an industry standard data-logging system along with information from the sensors under test. Humidity and temperature set points can also be initiated remotely via 0-10V analog signals if preferred.

Accurate and Traceable

Four wire platinum resistance thermometers (PRT) for temperature and dewpoint measurement allow Opti-Cal to provide precise humidity and temperature reference data for the calibration of relative humidity sensors. System accuracy of $\pm 0.2^\circ\text{C}$ dewpoint and $\pm 0.1^\circ\text{C}$ temperature, with a measurement uncertainty of approximately $\pm 0.2^\circ\text{C}$ means that an overall uncertainty to better than 2% of measured value is achievable. The built-in reference optical hygrometer is provided with a calibration certificate traceable to both NIST (US) and NPL (UK) and can, optionally, be provided with UKAS certification giving conformity with EA and ILAC.

Application Software

Bundled with Opti-Cal is a Windows™ application software suite that allows the user to monitor, chart and log calibration reference data on a PC for later analysis and reporting. The software also allows control of the reference hygrometer parameters for diagnosis and optimization. It provides the capability to select measurement units and configure analog outputs and alarms.



Typical screen from Opti-Cal application software.

SPECIFICATIONS

CHAMBER

Control temp range

10° to 50° ±0.2°C*

*lowest temperature set point is 10°C below ambient

Control humidity range

10% to 90% RH

Accuracy

RH: ±2% of measured value

Temperature stability

±0.1°C

Humidity stability

±0.5% RH

Chamber heating rate

1.5°C per minute

Chamber cooling rate

0.7°C per minute

Humidity ramp rate

3% RH per minute

Chamber internal volume

122 cubic inches

Humidifier

Time modulated injection, uses distilled water

Desiccator

Re-chargeable, removable cartridge, uses silica gel or molecular sieve desiccant

Control input

0.1 step thumbwheels for temperature and %RH

Control element

Embedded RH sensor

Sensor access

Pre-drilled front plate or internal mounting with 25 pin D connector lead-through to front panel.

REFERENCE HYGROMETER

Type

Kahn Optidew Transmitter

Dewpoint accuracy

±0.2°C

Temperature accuracy

±0.1°C

Display

High definition 2-line alphanumeric, °C, °Cdp, %RH, g/m³, (t-t_d), a_w, status information

Outputs

RS232, twin mA outputs configurable, alarm status

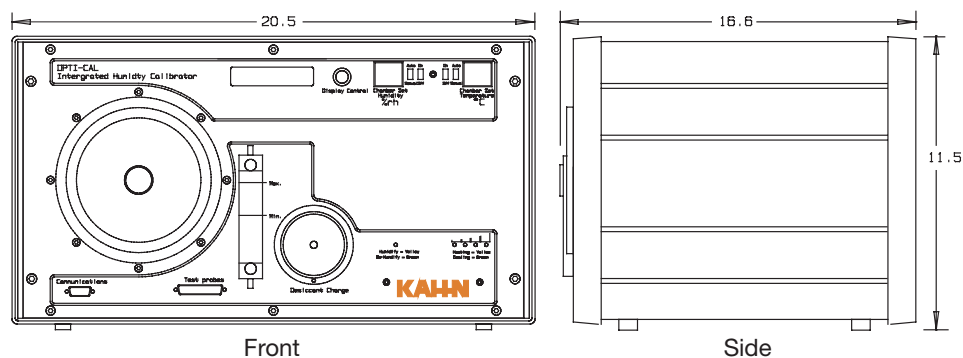
GENERAL

Dimensions and Weight

20.5 inches W x 11.5 inches H x 16.6 inches D; 34 lbs. approx.

Power Supply

90-260 VAC



NOTE: The information included herein was correct at the time of publication and supercedes all previous data. It is our policy to continually improve our products to insure even better performance. Consequently current Kahn products may incorporate modifications not shown on these pages.

Number 0404 Printed in USA

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