

APPLICATION NOTE

2015_06-11- RHCAL Rev 2

Using the RH-CAL Humidity Calibrator

The Edgetech Instruments Model is a microprocessor based, programmable humidity calibration system for precise calibration of RH Sensors and Transmitters, as well as laboratory and research applications. It is a compact, portable tool used by calibration technicians to perform NIST traceable humidity calibrations and by QC engineers to conveniently test product performance in varying humidity environments.

Based on the primary standard chilled mirror measurement technique, the RH-Cal offers precision and reliability in a convenient, easy to use portable package. Unlike other calibration systems, the RH CAL is entirely self-sufficient. It does not require compressed dry gas or water connections to operate. This allows the RH-CAL to be truly portable.



With the RH CAL, temperature and relative humidity are controlled independently; therefore you are not limited to performing calibrations at the surrounding ambient temperature, which may not be appropriate for your unique calibration protocol. Using EdgeTech's Optical Chilled Mirror (OCM) primary measurement technique for traceability and feedback control, RH CAL is a standalone, portable humidity calibration system. Designed to minimize maintenance using the self-cleaning Automatic Balance Cycle (ABC) and easy access chilled mirror sensor, the RH-Cal is designed with the User in mind. Service is easy with readily accessible D2 Chilled mirror sensor probe and integral chamber temperature probe.

The Model RH CAL employs a unique control scheme to maintain precise RH control. The system incorporates volumetric proportional control valves to blend "Dry" and "Wet" gas streams to the desired humidity. Since the RH-CAL continuously monitors the sample chamber conditions via its integral chilled mirror, it is able to instantaneously react to changes in humidity and control stability.

APPLICATIONS

Calibrate RH Probes

RH exposure testing: Medical Packaging

Moisture Penetration: Food Packaging

RH exposure testing: Electronics

Materials Testing

Biomedical Experiments

Product Aging Tests

RH/ Thermal Cycling

Absorption Testing

Pharmaceutical Testing

Quality Control

Verify RH Probe operation

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Benefits

Reduce Costs/ Save Money. Economical Solution to quickly calibrate RH probes in the field. No need to send probes to a calibration house. Bring calibration service in-house.

Improve Precision and NIST traceability with the integral EdgeTech chilled mirror hygrometer
Troubleshoot all types of RH Probes

RH experimentation for scientific applications

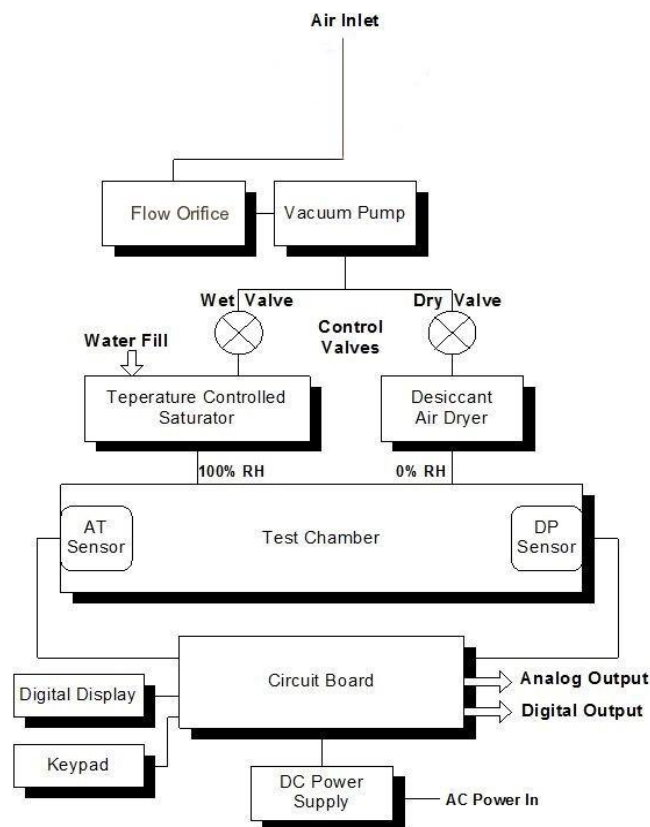
Product/Materials performance testing with on-site, mini- RH Chamber

Minimize turn-around for probe calibrations or product testing

How it works:

The RH-CAL has a built-in humidity chamber that can be set by the user to any desired relative humidity (RH). The instrument measures and controls the chamber RH by measuring both the internal air temperature (AT) and the dew point temperature (DP). Since there is a mathematical relationship between dew point temperature, air temperature, and relative humidity, a built-in microprocessor can compute the chamber RH.

Dry air (or nitrogen) is drawn into the RH-CAL and is blended with humid air to generate the desired Relative Humidity desired within the chamber. The unit is micro-processor controlled and automatically doses dry-wet feed based on the atmosphere measurements by the NIST Traceable Chilled Mirror sensor.



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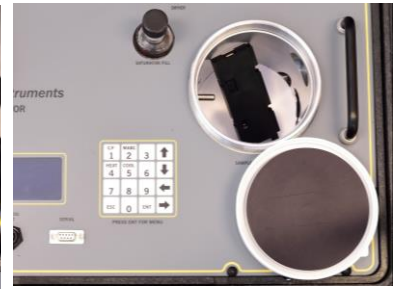
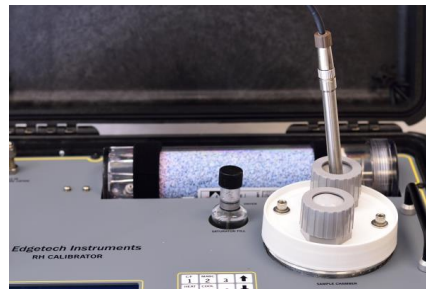
How do you use the RH-CAL:

The practical implementation of the RH-CAL is very simple. No additional gases are required but you can connect dry nitrogen or dry air into the INPUT port if you wish to generate lower RH gas in the chamber. Do not exceed 5 psig input pressure. Do not make any connections to the exhaust port that is located the lower right hand side of the RH-CAL unit. Distilled water is shipped within the humidification chamber- you need only to remove the red stopper before starting up the RH-CAL. A syringe is provided to refill more distilled water as needed.

The standard configuration of the RH-CAL may be used to easily calibrate or verify the operation of a variety of **RH probes**. The standard cover comes with two access ports that are designed to firmly grip the body of most $\frac{3}{4}$ " or $\frac{1}{2}$ " diameter probes. A round hole sized to accommodate a seal around the probe diameter may be cut into the flexible sealing discs that are supplied with the unit. Once the seal is cut to accommodate the probe body, simply re-screw on the plastic lid back onto the chamber. Be sure that both ports will be in use. If only one port is to be used, ensure the solid seal (no hole) is inserted into the second port. Once the lid is firmly seated, slide the probe into the hole far enough so that the probe sensing tip extends well into the RH-CAL chamber. Do this for a second probe in the second port. Turn on the RH-CAL and go through normal start-up procedures. Set the desired RH and temperature points and allow the unit to stabilize. Do your calibration or verification. Analog & Serial outputs are available if you wish to record the testing. It's that simple!



Inserting an RH Probe



RH Testing of Data-Logger

You can also perform a **quick environmental test on materials, medical packaging, food packaging or small electronic equipment** by inserting it into the RH-CAL chamber and running at the desired RH environment. In this case you want to use the -CK blank aluminum cover kit so that you can easily seal the lid. If the material or product is small enough to fit within the RH-CAL chamber, then you can accurately and easily perform the exposure test. Small items such as sealed food packages, cigarette packs, medical packaging, circuit boards, small electronic devices, data loggers, and even raw materials may be easily tested in controlled RH environments. Because the chamber is relatively compact, you can quickly dial in various RH environments for quick testing.

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SPECIFICATIONS

- RH Range: 5 to 95% between temperature range of 10 to 50C
- Accuracy: $\pm 0.5\%$ between the range of 25 to 75%RH
 $\pm 1.0\%$ outside of above range
- Repeatability: $\pm 0.2^\circ\text{C}$
- Stability: $\pm 0.25\%$ RH
- Response Time: Less than 3 minutes for stability
- Overall Dimensions: 52.4W x 43.7D x 21.7H cm (20-5/8 x 17-3/16 x 8-9/16 in)
- Chamber Dimensions 10.16 W x 12.70 cm (4 inch x 5 inch)
- Weight (with water): 34 lbs. (15.4 kg)
- Storage Temperature: -40 to $+50^\circ\text{C}$
- Power Requirements: 100 to 240 VAC, 50-60 Hz 150 Watts Maximum
- Input/ Output Gas Connections: $\frac{1}{4}$ in. (0.6cm) compression fittings (optional)
- Input Gas Requirement: Room air or for very low RH you can input Dry gas
- Generated RH Sample Flow (2.0 SCFH)
- Operating Temperature: 0 to $+50^\circ\text{C}$ ($+32$ to $+122^\circ\text{F}$)
- Outputs: Analog (0-5VDC or 4-20mA) and RS232C serial port

TO ORDER:

1. There are no options for the RH-CAL- just order "RH-CAL".
2. For RH probe calibration/ verification, you may want to consider ordering –SR pack of spare seals for adapting to various probe styles.
3. For materials testing, aging, or environmental testing of products, you want to be sure to order the –CK cover kit that includes a blank aluminum cover to completely seal the lid.
4. List as a separate line item Extended Warranty, if desired.

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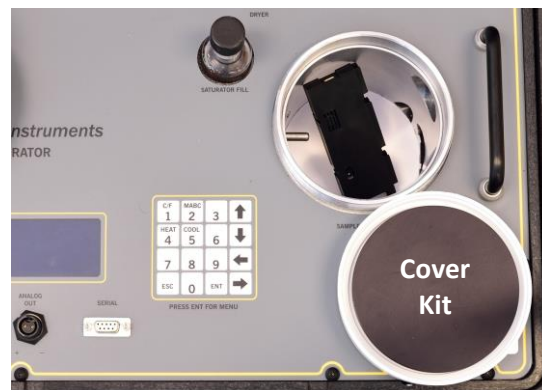
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Probe
Testing



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