

Introduction

ROTRONIC instruments have excellent long-term stability characteristics, with better than $\pm 1\%$ rh stability over a year in normal conditions, but we still recommend that regular calibration checks are performed (once per year typically). Normal conditions can be defined when high temperature or humidity, or MAC (Maximum Allowable Concentration) levels of chemical pollutants are not typical. Many company operating procedures call for calibrations more frequently, depending on internal quality assurance systems.

Why is calibration essential?

Today, many companies are working to ISO 90xx standards and are therefore obliged to calibrate their measuring equipment on a regular basis. Organisations such as the FDA (The Food and Drug Administration in the USA) also demand that the devices are calibrated and traceable to national standards. Last but not least, the quality standards defined by each company ask for best possible accuracy and proof of traceability. Hence, it is in the interest of the user, to have equipment calibrated and adjusted in order to maintain optimum performance.

We offer calibration devices and accessories for all probes manufactured by ourselves, and also for products produced by other manufacturers. Please contact us for guidance on the most appropriate calibration device and standards.

Key features

- Non-saturated salt solutions
- Sealed glass ampoules
- Ready-to-use solutions
- SCS-certified
- Specific calibration devices

Your benefits

- ▶ Simple handling, low temperature dependence
- ▶ Long shelf life – 10 years guaranteed
- ▶ No mistakes during preparation
- ▶ Traceable to national standards
- ▶ Optimum volume for each probe

Section contains



Humidity Standards

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- Long shelf life
- Precise and easy to handle
- Ready for use – no solution-preparation

Calibration devices

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- Easy to use
- Robust
- Optimised chamber volume



Calibration with PC

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- HygroLab calibration
- HygroFlex calibration

Temperature calibration

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- Temperature calibration with Fluorine-inert
- Factory certificates for -10...120 °C



Humidity Generators

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- Generator for reference climate
- Large setting range

Rotronic and some Rotronic distributors or subsidiaries offer calibration seminars for their customers. Ask your distributor or Rotronic subsidiary for further information.

Humidity Standards and Certificates

SCS* humidity standards

The humidity standards from ROTRONIC are delivered in boxes of 5 sealed ampoules of the same humidity value. Each ampoule is marked with the %rh value and a serial number. The most frequently used values are 35 and 80 % rh, which are used to perform a 2-point calibration. All ampoules contain a non-saturated salt solution, apart from the 0 % standard, which uses a highly porous ceramic material (molecular sieve). An SCS certificate stating the traceability and uncertainty of the humidity standard is enclosed with every pack.

The National Metrology Standards world-wide regularly carry out calibration intercomparisons to ensure their standards are comparable. As a result there is now a Mutual Recognition Agreement which means that a SWISS SCS-calibration certificate is accepted in all other countries.



SCS* certified humidity standards

Order code:	Humidity value	Uncertainty at 23 ±2 °C
EA00-SCS	0.5 % rh	± 0.1 %rh
EA05-SCS	5.0 % rh	± 0.1 %rh
EA10-SCS	10.0 % rh	± 0.3 %rh
EA11-SCS	11.3 % rh	± 0.3 %rh
EA20-SCS	20.0 % rh	± 0.3 %rh
EA35-SCS	35.0 % rh	± 0.5 %rh
EA50-SCS	50.0 % rh	± 0.9 %rh
EA65-SCS	65.0 % rh	± 0.9 %rh
EA75-SCS	75.3 % rh	± 0.9 %rh
EA80-SCS	80.0 % rh	± 1.2 %rh
EA95-SCS	95.0 % rh	± 1.2 %rh



Do I need a factory certificate or an SCS-certificate?

Factory Certificate

All ROTRONIC probes are delivered with a factory adjustment certificate.

The certificate shows the probe type and serial number, the ambient temperature, adjustment points, the date of calibration and the inspection equipment used.



SCS* Certificate

SCS certificates are demanded especially by the pharmaceutical, chemical and food industry. As an accredited calibration laboratory for relative humidity, we are capable of performing SCS calibrations at 23 °C with the best possible measurement uncertainty of 0.2...1 %rh. At temperatures between -10 and 70 °C, the best possible measurement uncertainty is 0.6...2 %rh.

ROTRONIC is registered by the Swiss Federal Office of Metrology (METAS) under the accreditation number SCS 065.



* SCS: Swiss Calibration Services

Calibration Devices

The ROTRONIC calibration devices are small, airtight chambers, that fit exactly to the respective probes. The lower part is a screw-on lid, into which the humidity standard is filled, together with a textile pad. After a period of stabilisation, typically 60 minutes at stable temperature, the required humidity value is attained. The instrument can now be calibrated against the humidity reference value. Calibration devices are available for the entire range of ROTRONIC products, and we can also supply calibration devices for third party probes. Ask us for custom products.

The inner volume of the calibration device should not be too large; it should not exceed 50 ml of free space when the probe is fitted. When the volume is too large, the correct humidity may eventually not be generated and the calibration reference will be incorrect. Selection of the proper material, surface treatment and colouring are also important. Use only ROTRONIC calibration devices.

Order information:

Order No.:	Used for:	
EBFC	Plate probes BFC / BFC DIO	
EDM 15-15	for 2 probes of 15 mm, push-on type	
EDM 15-25	for 1 probe of 15 mm and 1 probe of 25 mm, screw-in type	
EGS	for all sword probes, push-on type	
EM-15 EM-25	for 15 mm probes, screw-in type for 25 mm probes, screw-in type	
EM-G	for type E, HP.. E... probes screw-in type	
ERV-15 EMV-15 EMV-25 ER-10MS	vertical for 15 mm probes, push-on type vertical for 15 mm probes, screw-in type vertical for 25 mm probes, screw-in type vertical for M1S, push-on type	
ER-05 EGL ER-15 ER-18K ER-20K	for 4/5 mm probes, push-on type for 10 mm probes, push-on type for 15 mm probes, push-on type for 18 mm probes, push-on type for 20 mm probes, push-on type	
WP-14-S	for Water Activity probes AWD, AWVC, AW-DIO, Stainless steel, DIN 1.4401	

Calibration

Calibration of HygroClip probes with HygroLab 2 & 3

The digital HygroClip probes may easily be calibrated in quantities by using the bench-top instrument HygroLab 2. Up to 4 probes can be connected simultaneously to a single HygroLab 2. When the software HW3 is used, as many as 32 HygroLabs can be networked together, thus offering the possibility of calibrating or adjusting 128 probes. For customers who must calibrate many probes, this solution can save a lot of time.

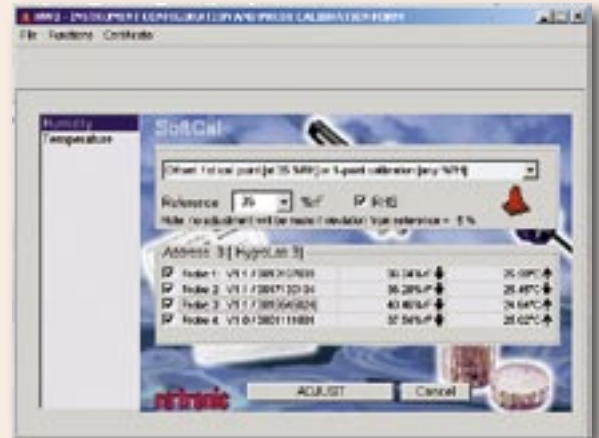
As the instruments, probes and humidity standards can be maintained in a single location, not only the acclimatisation time can be reduced but also the accuracy will be improved.

The HygroLab may be connected to any digital HygroClip probe for calibration.



Calibration with a PC and HW3 software

Up to 128 probes connected to a HygroFlex network of up to 32 transmitters may be calibrated by a PC, using HW3 software. The calibration devices can be mounted on all probes on the respective transmitters, and the calibration or adjustment performed with a few mouse clicks. The system will also print calibration reports if required.



Calibration by Direct PC Connection

Using the MOK connection cable and HW3 software, single HygroClip probes may be calibrated and adjusted directly on the PC.

Order code:

MOK-02-WIN Adapter cable
HW3 Universal software



Temperature Calibration in Fluorine-inert Bath

The calibration of temperature is always a delicate task. ROTRONIC now offers factory certificates for temperature calibration of combined humidity/temperature probes or temperature probes only.

The wide temperature range is -10 to 125 °C
Accuracy is ± 0.1 °C. SCS accreditation is in process.

Fluorine-inert is a liquid with a high boiling point that does not react with any material and is electrically isolating. Therefore, even humidity probes may be calibrated directly in the bath without being influenced.

Order code:

see price list.



Mobile ROTRONIC Humidity Generator

HygroGen 1 is a mobile generator of controlled % relative humidity and temperature environments, designed to be used on-site to calibrate measurement equipment. Its small weight and the compact construction predestine it for the use within HVAC service companies. Of course, it is also suitable for customers who need to calibrate a number of probes in a simple and low-priced way.

Key features

- Generates a controlled reference environment
- Fully integrated temperature control
- Suitable for all humidity/temperature probes
- Self contained
- Measurement chamber for max. 5 probes
- Large control range
- Fast reached equilibrium
- Portable, stainless steel housing

Your benefits

- ▶ Any value can be set
- ▶ Set your own stable temperature
- ▶ Low costs
- ▶ Requires mains socket only
- ▶ Fast calibration of multiple probes
- ▶ Also suitable for extreme values
- ▶ Save time
- ▶ On site use, cleanable surfaces



HygroGen 1

HygroGen1 is a mobile generator of controlled % relative humidity, primarily for calibrating humidity instrumentation. It is completely self-contained, requiring no external resources except mains power, and is light enough to be portable for use on-site.

HygroGen1 uses a divided flow method for generating the humidity required by the user; a desiccant cell provides low humidity and a custom saturator high humidity. Temperature is controlled using a Peltier element and a heater.

Measurement and control are provided by a combination of a ROTRONIC HygroClip probe and a multi-loop controller. Set-points can be easily adjusted, either via the front panel, and/or via the standard RS232 interface and software.

The key advantage of the HygroGen1 is the speed to reach equilibrium of the set values, which means that a multiple point calibration check can be performed in minutes, rather than hours. A further feature of the calibration chamber is the provision of two additional probe connection points, enabling calibrated reference probes to be added.

Where a primary measurement method is required, such as a condensation hygrometer, an optional front panel connection provides means of integrating an external sampling loop. This configuration flexibility ensures that the HygroGen1 can continue to be used whilst the preferred reference instrumentation is itself being calibrated.

With integrated temperature control, calibrations can always be performed at a defined and constant temperature, irrespective of the ambient conditions, making the HygroGen1 suitable for on-site calibrations.

Technical Specifications

Control range:	Maximum 5...95 %rh and 0...60 °C; Minimum 10...90 %rh over the range 5...45 °C
Control stability:	≤ ± 0.3 %rh; 0.1 °C (23 °C) 0.2 °C (full range)
Temperature gradients:	≤ 0.2 °C at 23 °C
Time to set-point:	2 minutes (35 to 80 %rh change, 23 °C) 10 minutes (23 to 45 °C change)
Reference probe:	HygroClip, calibrated at 23 °C, 35, 50 & 80 %rh (UKAS and SCS traceable, other options on request)
Probe accuracy at 23 °C:	≤ ±1.5 %rh (10...95 %rh) ±0.3 °C
External interface:	RS232 control interface, Rotronic DIO (two additional connections fitted)
Desiccant:	Indicating type, user refillable
Saturator:	Front panel fill. Level warning on controller
Chamber:	2 litres
Enclosure dimensions and weight:	Stainless steel 455 x 420 x 212 mm (Maximum) / 17 kg
Power:	110/230VAC
Approvals:	EN58001-2, EN580082-2, EN61010-1
Order Code:	HygroGen 1

ROTRONIC FG-431

FG-431 is a system for process-air conditioning, developed by ROTRONIC. It enables the simultaneous calibration of 4 humidity probes of any kind with a maximum diameter of 25 mm. Four extraordinary stable humidity values are available. A calibration according to international rules (flow rate 10 l/min at 1 m/s air speed) is terminated after only 2 minutes. In order to perform traceable and reliable calibrations, special attention was given to the conditioning of the process-air. The flow of the humid air can be adjusted by high-precision needle valves over the entire range up to 99 %rh. Each outlet is equipped with a SCS-calibrated HygroClip, which controls the air stream. ROTRONIC digital probes can be directly adjusted via the serial interface. Various adaptors for probe diameters from 4 to 25 mm and for pcb-mounted sensors are available. The calibration system is designed for mid-sized series or calibration laboratories. It can be extended in master-slave mode. With a throughput of 1000 probes per year, the system is amortised within 4 years!

Key features

- Generates 4 reference climates simultaneously
- Integrated temperature adjustment
- Large control range of the 3 controlled outputs
- Flow rate according to international norms
- Short equilibrium time

Your benefits

- ▶ Rapid multi point calibration
- ▶ Stable flow rates
- ▶ Calibration over the entire humidity range
- ▶ Approved and reproducible values
- ▶ Ready and stable within 5 minutes

Technical data

Functional principle	Conditioned process air for 4 air outlets
Standard humidity values	0 %rh, 10 %rh, 35 %rh, 80 %rh
Control range	0 %rh Fix, 0.1 %rh
	10 %rh 5...50 %rh
	35 %rh 10...80 %rh
	80 %rh 20...99 %rh
Flow rate	10 l/min for every outlet
Air speed	1 m/s
Principle of humidifier	Heated humidifier colons
Principle of dryer	Self-regenerating adsorption dryers with molecular sieve
Reference probes	HygroClip S1
Accuracy of reference	<1%rh / <0.2 K at standard values
Stability	< 0.5 %rh at stable environment temperature
Temperature of process air	Updated environmental temperature
Reference display	Humidity & temperature per outlet
Testee display	%rh / °C for ROTRONIC digital probes %rh / °C for analogue probes
Interface	RS232 for digital probes and reference
Dimensions HxWxD	990x560x770 /1060 mm (with table)
Weight	140 kg
External resources	
Power supply	230 VAC / 2 A
Compressed air supply	6 bar, min. 50 l/min (uncompressed), with cold dryer 0 °C and oil-separator
Water quality	De-ionised water, <1 µS
Order code:	FG-431

