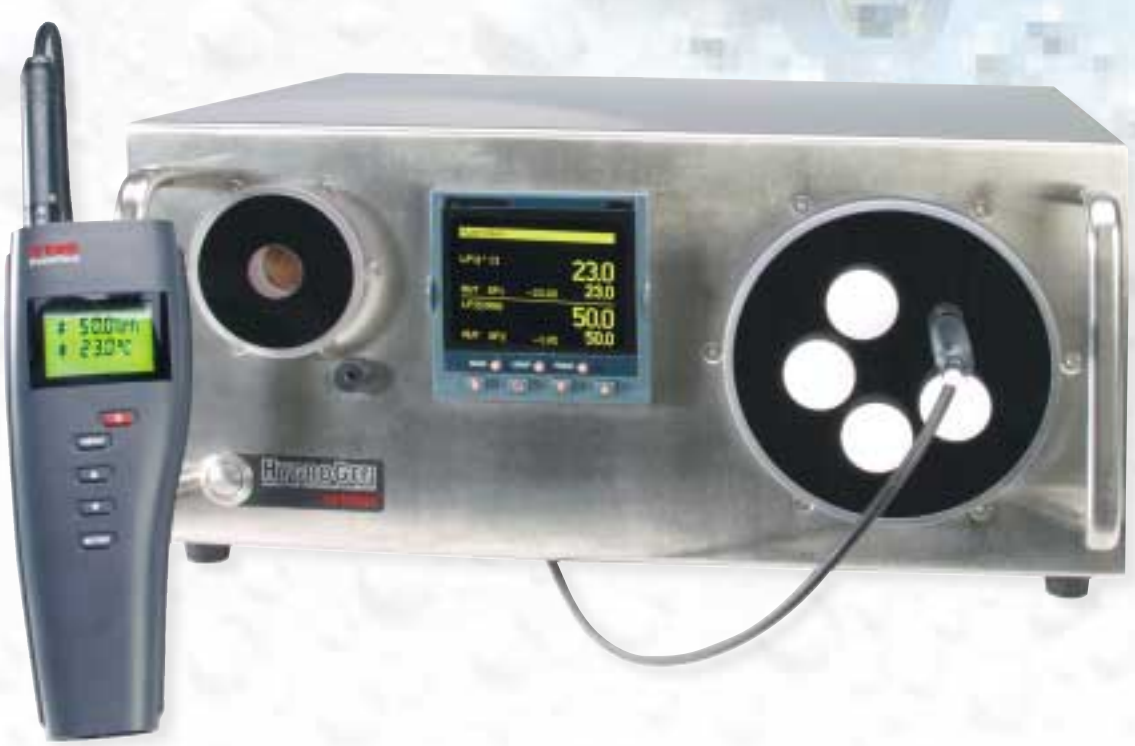
HYGROGEN

Humidity goes Digital

HYGROCLIP®



Precise Humidity and Temperature Generator

- Generates a precise humidity/temperature environment
- Minimal chamber temperature gradients
- Excellent chamber stability
- Quick to set point
- Wide operating range (5…95% RH, 5…50°C)
- Completely self contained

rotronic®

LEADING IN HUMIDITY MEASUREMENT

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HygroGen

HygroGen® is a generator of controlled relative humidity and temperature environments, primarily for the calibration of humidity instrumentation. The HygroGen is completely self-contained, requiring no external resources except mains power, and is light enough for portable use.

HygroGen distinguishes itself in the marketplace for its precise generation of controlled humidity and temperature environments. High chamber stability and low gradients result in an unmatched price / performance ratio.

Another key advantage of the HygroGen is the speed at which it can move from one condition to another. At 23°C a step change from 35% to 80% typically requires two minutes. Temperature changes are more gradual but nevertheless still fast: a step change of 25°C to 45°C requires around 10 minutes.

The HygroGen uses a mixed flow method for generating the required humidity value. A dryer cell provides low humidity, a saturator high humidity, and a control system mixes these together to create a constant environment within a well insulated chamber. Temperature is controlled using a Peltier thermoelectric heat pump. Set points are easily adjusted using the front panel mounted controller or via a PC using the standard RS232 interface and optional software.

Chamber control is facilitated using a HygroClip S inter-changeable humidity probe and a separate 3 wire passive RTD. Within the chamber there are two further HygroClip connection points available. These probes are connected to the rear panel of the HygroGen, where the outputs of all three HygroClips are available. This feature allows the customer to confirm chamber temperature uniformity and stability.

The HygroGen, with its wide humidity and temperature operating range, makes it possible to calibrate instruments over a broad range of conditions. This allows for the validation of an instrument over its range of use. With the HygroGen these checks can be made with confidence, in a short period of time, and without have to send the instruments to an external laboratory.

Finally, to insure confidence in the quality of the calibrations made with the HygroGen, each unit is supplied with detailed uncertainty analysis and worksheets to help the end-user determine their individual uncertainty budgets. Additional data is provided regarding chamber stability and uniformity. This allows the end user to verify the specifications of the HygroGen.

Internal Dryer Cell

The dryer cell is mounted internally to facilitate movement of the HygroGen. This cell is shipped with a molecular sieve desiccant. The cell can be also be used with other types of desiccant.

Stainless Steel Enclosure

The HygroGen has a stainless steel enclosure for ease of cleaning. The ability to quickly and easily clean the HygroGen is of particular interest in the Pharmaceutical, Food, and Medical Instrumentation markets.

Water Reservoir

Very little water is required by the HygroGen because of the high levels of sealing employed throughout the system. The controller features a low water level indicator on the display, and a safety cut off system to prevent humidifier damage if the water level is too low. Refilling is simple, using the dosing syringe supplied and the access port located on the front of the unit.

Industrial Controller

The HygroGen features a multi-loop industrial process controller that has been specially configured and tuned for the HygroGen. The controller can be easily replaced in the event of a failure.

HygroGen

HygroClip®



Humidity goes Digital

Intelligent Chamber Design

The internal chamber of the HygroGen is designed to provide a stable calibration environment with minimal temperature gradients. The chamber is in fact two chambers, an outer chamber mechanically insulated, and inner chamber insulated with conditioned air circulated within the chamber. This construction design allows for a defined air flow along with improved chamber uniformity.

Chamber door

Complementing the careful design of the chamber, the door to the chamber is highly insulated and precisely machined to minimize thermal loss. The probe ports include o-rings to insure a tight fit between the port and the test instrument. In addition, the plugs used to seal the ports when not in use are also highly insulated.

RS232 / Controller Upgrades

The rear panel of the HygroGen includes as RS232 interface for the controller. This interface allows the user to access PC based features such as on-screen display of control and set-points, graphing and data acquisition. Controller programming/firmware can be upgraded through the interface.

Probe Options

The HygroGen chamber includes four internal connectors for the control and optional monitoring probes. Standard configuration includes a HygroClip S probe for RH measurement and a direct PT100 for temperature. Up to two additional HygroClip probes can be connected in the chamber. These probe output signals are available on the back panel of the HygroGen. Using a B5-02-B5 cable to connect the HygroGen to a HygroLab or HygroPalm all three HygroClip probes can be read. The data can of course be transferred live to PC using ROTRONIC's HW3 software in combination with a HygroLab or HygroPalm.

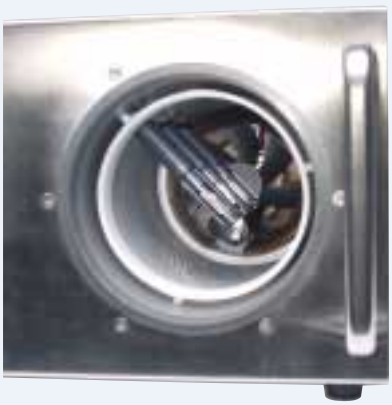
Simple Maintenance

The HygroGen requires little maintenance support from the user. Maintenance is limited to refilling the water reservoir and replacing/regenerating the desiccant. Both are front mounted for ease of access.

Validation and Calibration

As an instrument designed for the calibration of RH and temperature instruments, the HygroGen must have means by which it can be validated. There are several ways in which this can be achieved:

- Certified calibration of user supplied reference probe(s)
- Use of certified hand-held instrument
- Connection of a condensation hygrometer through an external sample loop.



HYGROGEN

Technical Specifications and Ordering Information

SPECIFICATIONS	
Control range maximum	5…95% RH and 5…50°C
Control range minimum	10…90% RH over the range 10…50°C
Control stability limit	0.35% RH or better at 20°C 0.05°C or better (at 5, 20 and 45°C)
Temperature gradient limit	0.05°C at 5 and 20°C 0.16°C at 45°C
Humidity gradient limit	0.1% RH or better from 5 to 80% RH 0.66% RH at 95% RH
Time to set-point	2 minutes (35 to 80% RH change, 23°C) 10 minutes (23 to 45°C change)
Combined standard uncertainty (HygroGen only)	
Temperature	0.03°C at 20°C for 5…95% RH 0.05°C at 45°C for 15% RH
Humidity at 20°C	0.21% RH at 95% RH 0.05% RH at 80% RH 0.12% RH at 50% RH 0.03% RH at 35% RH 0.05% RH at 10% RH 0.05% RH at 5% RH
Temperature control probe	Pt 100 RTD 1/3 Class B
Humidity control probe	HygroClip S
Humidity control probe nominal accuracy	at 23°C: ≤ ±1% RH (10…95% RH) ±0.2°C
External interface	RS232 control interface, Rotronic DIO (two additional connections fitted)
Desiccant	Molecular sieves, user refillable
Saturator	Front panel fill. Level warning on controller
Chamber volume	2 liters (122 Cubic In)
Enclosure / Dimensions	Stainless steel / 455 x 420 x 212 mm (max.) 17.92 x 16.54 x 8.35''
Environment:	Maximum relative humidity 80% RH for a temperature up to 31°C decreasing linearly to 50% relative humidity at 40°C, indoor use only. Altitude up to 2000m.
Weight	17 kg / 37.5 lb
Power	110-230VAC 3A 50-60Hz Class I
ORDER CODE	
HygroGen 1a	Humidity and Temperature Calibrator, includes 1x HG-DC, 1x HG-FILL. Please order chamber door separately.
HygroGen 2a	Humidity and Temperature Calibrator with back panel sample points and integrated pump for connection of reference chilled mirror hygrometer. Includes 1x HG-DC, 1x HG-FILL, Please order chamber door separately.
ACCESSORIES AND OPTIONS.	
HG-D-11234	Standard chamber door, for five probes 15,15, 20, 25 and 10 mm (includes insulated plugs)
HG-D-11111	Standard chamber door, for five 15mm diameter probes (includes insulated plugs)
HG-D-xxxxx	Custom door with 5 ports configured to customer's spec (includes insulated plugs)
HG-Bxx	Spare/extra plugs where xx = probe diameter
HG-D-99999	Clear polycarbonate door with 5x adjustable probe fittings for 9…17mm diameter probes
HG-B25-A	25mm plug with 6mm hole for Pt100 or cable entry
HG-DC	Additional desiccant cell, pre-filled with molecular sieve
HG-FILL	Fill tube and syringe
HG-TC	HygroGen heavy duty transit case
HG-ITOOLS-USER	Itools PC software for controller; USER version. Enables connection of controller to PC, Trends, Set point programming.
B5-02-B5	Interface cable, control/reference probes to HygroLab or HygroPalm display instruments.

Rev. 8/08/05