G2 Humidity Generator

Precision Humidity Generation

- **Precise generation of humidity controlled gas flow**
- **High accuracy two-pressure / two-temperature principle**
- **Flow rates up to 100 liters per minute**
- **Controls %RH, Dew Point, or other humidity parameters**
- **Simultaneous measurement of up to 3 external temperature probes**
- **Measurement of pressure and temperature at point of gas use**
- **PC software for system control and data acquisition**
- **Optional touch panel for control and status indication**

Typical Applications:

- High volume production calibration systems
- Humidity control in semiconductor manufacturing and lithography processes
- Add humidity control to existing temperature chambers

G2 Humidity Generator

Precision Humidity Generation

The G2 produces highly accurate humidity values based on RH Systems' unique hybrid combination of the NIST proven "two-pressure" and "two-temperature" humidity generation techniques. It delivers a humidified gas stream, accurately controlled to a variety of user selectable humidity parameters such as %RH, dew point, frost point, ppm, or vapor pressure. By accurately measuring the temperature and pressure at the point where the humidified gas is utilized, the G2 automatically adjusts for changes in dynamic conditions such as heat load or ambient pressure variation.

High Flow Capability

With flow rate capacity up to 100 standard liters per minute, the G2 ensures your external volume or test chamber rapidly achieves a stable, homogeneous humidity condition based on your defined RH or dew point setting.

Multiple External Temperatures

Three separate external temperature connections allow for determination of %RH at three completely independent temperatures. By splitting the high-flow gas stream and feeding into three separate chambers, with each chamber controlled at a different temperature, three unique %RH values will be produced. The G2 computes the resulting %RH at each of these three chambers based on the three external temperature measurements.

Alternatively, install up to three temperature probes in one chamber to measure uniformity of temperature and its result on %RH.

Embedded System for Control and Communication

All operations of the G2 are automated by its real-time embedded control system. Its setpoints are commanded and data is retrieved via robust serial communications. There are three fully capable, yet fully independent RS-232 serial ports, allowing for a variety of communication options. For example, up to three PCs could be connected to three temperature chambers and to a single G2 which feeds humidified gas to them all. The three PCs communicate independently with the G2 to retrieve their specific temperature and humidity data.

Simple Application Integration

The G1 is supplied in a 19" rack mountable format for integration within commercially available rack systems. A 19" rack enclosures is available as an option. All electrical, fluid, and pneumatic connections are made at the back panel of the instrument. All fluid and pneumatic connections are via industry standard Swagelok fittings.

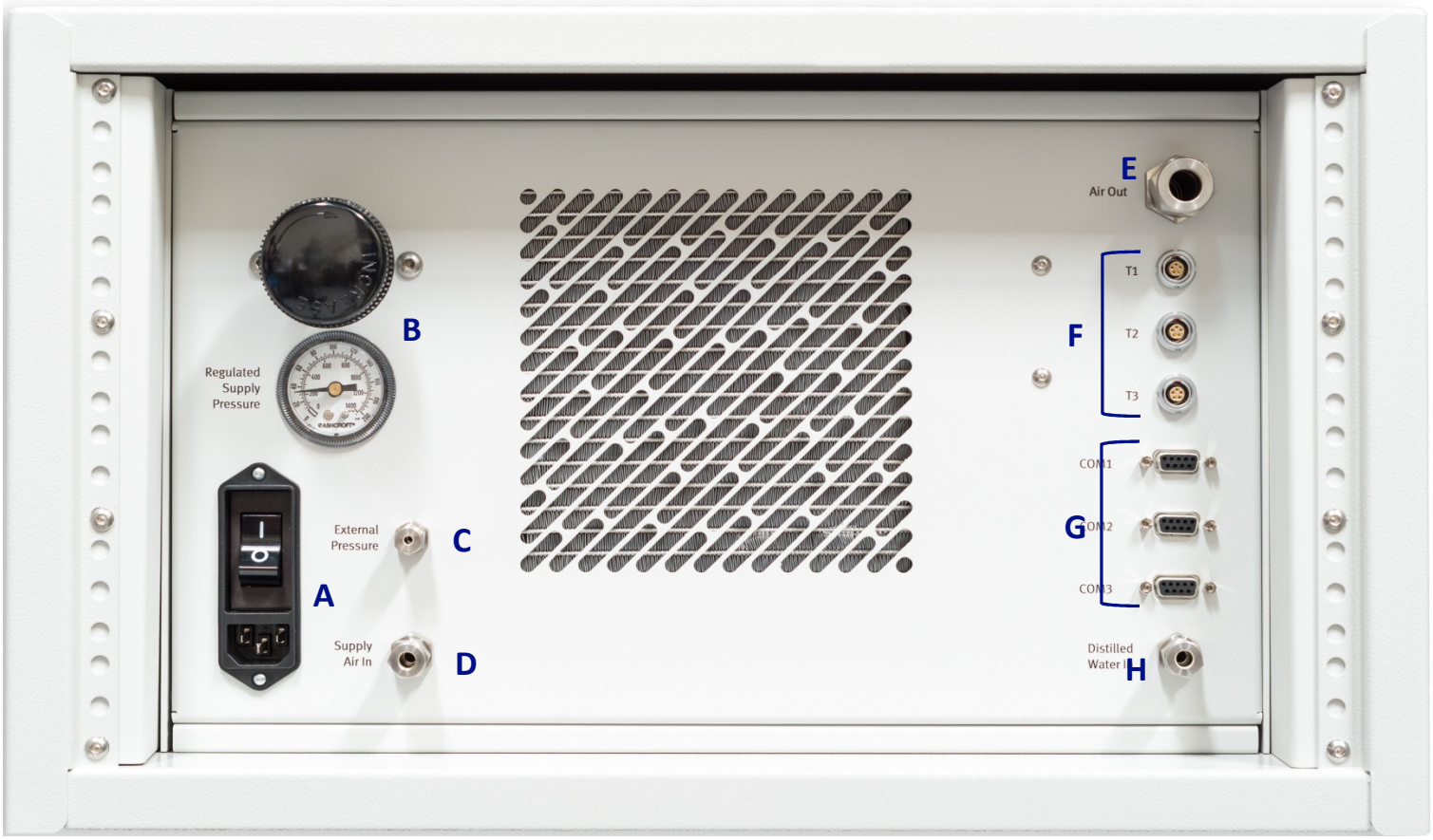
Two-Pressure Two-Temperature Hybrid Humidity Generation Technique

Utilizing the uniquely combined benefits of the two-pressure and two-temperature techniques, humidity is generated by fully saturating gas at a known temperature and pressure, then reducing the pressure to a lower value (typically ambient) and cooling or warming to an alternate temperature.

Humidity produced by this hybrid technique is determined from measurements of the temperatures and pressures alone, and does not rely on measurement of the water vapor content of the gas.

With RH Systems' hybrid humidity generation technique, the G2 is a true humidity reference instrument suitable for high accuracy calibration, product conditioning, and test applications.

G2 Humidity Generator



Connection panel side of instrument showing:

A. AC power receptacle and power switch
B. Inlet pressure regulator and indicator
C. External pressure sampling port, ⅛” Swagelok
D. Compressed air supply input, ¼” Swagelok
E. Humidity controlled air output, ½” Swagelok
F. External temperature sensor connections (3)
G. RS-232 serial communication ports (3)
H. Distilled water inlet, ¼” Swagelok

G2 Humidity Generator

Specifications:	G2 Humidity Generator	
Generator Ranges		
Frost/dew point*	-25…20 °C	
Relative humidity	10…95 %RH	
Flow rate	5…100 l/min	
Saturation Pressure	Ambient…12 bar (Ambient…175 psia)	
Measurement Ranges		
External temperature sensor	-50…100 °C	
External pressure sensor	700…1,200 mbar (10.2…17.4 psia)	
Performance		
Dew point stability	≤ ±0.02 °C	
RH Stability	≤ ±0.1 %RH	
Pressure Stability	≤ ±1 mbar (0.015 psia)	
Saturator temperature stability	≤ ±0.01 °C	
Flow control	≤ ±0.5% of full scale	
Response time	10…90 %RH < 5 min	
Standard Features		
External temperature sensor(s)	Up to 3 simultaneous sensors, 100 ohm PRT	
Pressure sensor	Internal with 1/8” Swagelok connection	
Saturator water level	Automatic level control, 1/4” Swagelok water inlet	
Gas Connection, inlet	¼” Swagelok, internally pressure regulated	
Gas connection, outlet	½” Swagelok, internally flow regulated	
Control and data acquisition	Optional touch screen controller and/or PC software	
Size	6U, 19” rack mountable module	
Digital I/O	3, simultaneous, independent RS-232 connections	
Additional Information		
Power requirements	208-240 VAC, 50-60 Hz, 1500 W	
Input pressure	Max. 16 bar, oil free	
Operation temperature*	-10…40 °C (must be higher than generated dew point)	
Storage temperature	-20…50 °C	
Humidity	Max. 98 %RH, non-condensing	
Weight and Dimensions	**6U 19” Module**	**With enclosure**
Height	267 mm (10.5”)	318 mm (12.5”)
Width	483 mm (19”)	533 mm (21”)
Depth	559 mm (22”)	616 mm (24.25”)
Weight	53 kg (117 lbs)	70 kg (154 lbs)

G2 V2014.04.01 We reserve the right to change design or specifications without notice

*Highest generated dew point is limited by ambient room temperature

RH Systems, LLC
3416 Vista Alameda NE
Albuquerque, NM 87113
USA

Phone 505 856 5766
Fax 866 891 3399

www.rhs.com
info@rhs.com