

Textile humidification



Facts & figures:

China has the biggest textile industry directly followed by India. 2010, China's textile industry exported 25 billion Dollar worth of textiles.

The Indian textile industry has accelerated to an annual growth of 9-10%.

The biggest producer of cotton is China with 34 million bales directly followed by India with 24 million bales.

Australia's merino sheeps are providing most of the worlds wool demand.

Textiles in general

In the days when cave man ruled the world, people were dressing with animal fur to protect themselves from the elements.

Nowadays we are far beyond that point and a wide range of natural as well as synthetic fibres have widely replaced animal fur.

The modern textile industry that we know today,

grew out of the industrial revolution in the 18th Century as mass production of clothing became a mainstream industry. To handle the huge demand of textile today, sophisticated machines, that can produce impressive quantities. Up to one square meter of denim per minute for example.

To get the most out of these high performance spinning, twisting or weaving machines a constant environment and a well-conditioned fibre is crucial!

That's where humidity and temperature measurement plays an important role.

Best humidity level for	Spinning	Twisting	Winding	Weaving
Wool	50-85%rH	60-65%rH	55-60%rH	50-60%rH
Cotton	35-65%rH	50-65%rH	55-65%rH	70-85%rH
Man made fibres	50-65%rH	N/A	60-65%rH	60-70%rH

Why the need to measure humidity?

Controlling humidity in the textile industry is essential for many factors. A too dry or unbalanced environment will have the following negative effects on product and process:

Static electrification

Dry materials create more friction and are more prone to static electrification. Higher humidity reduces static problems and makes materials more manageable increasing machine speeds.

Regain

Dry air causes lower regain and this contributes to poor

quality and lower productivity. By humidifying, the materials are kept at optimum regain and are less prone to breakage, heating and friction effects, they handle better, have fewer imperfections, are more uniform and feel better.

Yarn strength

Yarns with low moisture content are weaker, thinner, more brittle and less elastic.

Fabric shrinkage

Low humidity causes fabric shrinkage. Maintained humidity permits greater reliability in cutting and fitting during garment creation and contributes

to the maintenance of specification where dimensions are important, such as in the carpet industry.

Product weight

Textile weights are standardised at 60%rH and 20°C (68° F). Maintaining humidity will ensure low product weights don't lead to lowered profits.

Dust

Humidification reduces fly and micro dust, providing a healthier and more comfortable working environment.

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What solution can Rotronic offer?

The heart of the humidity measurement comes the Rotronic capacitive foil sensor: HygroMer IN-1.

The AirChip3000 is the brains: combining an ASIC, a microcontroller and an EE-

PROM memory all in one.

All products with this logo contain an AirChip3000.



AirChip3000 advantages:

- Relative humidity, temperature and dew point outputs
- Can store 2'000 points
- Sensor self test function

And much, much more...



HF5 transmitter combined with the HC2-S probe

Rotronic products:

Humidity and temperature probes:

- **HC2-IM Series**
-100...200°C,
0...100%rh,
Ø15mm,
±0.8%rh and ±0.1K...
- **HC2-IC Series**
-100...200°C,
0...100%rh,
Ø15mm,
±0.8%rh and ±0.1K...
- **HC2-S**
-50...100°C,
0...100%rh,
Ø15mm,
±0.8%rh and ±0.1K...

Transmitter:

- **HF5 series**
For interchangeable probes,
2 or 3/4 wire configuration,
Various analogue and digital
outputs,
Display,
All psychrometric calculations
available...
- **HF7 series**
Stainless steel probe,
-100...200°C,
3/4 wire configuration,
Various analogue outputs,
Display...

Handheld instrument:

- **HP22**
For interchangeable probes,
High accurate relative humidity
and temperature measurement,
Dew point and other psy-
chrometric calculations,
Display
- **HP23**
Same functionality as HP22
plus: two interchangeable
probes, 20,000 data point
memory with real-time clock,
Data capture of 250 data points
each for up to 8 defined locati-
ons



HP23 handheld device

HC2-IC102 probe

Customer benefits:

Accuracy:

Choosing Rotronic gives you the best accuracy on the market.

Precise humidity measurements enables the HVAC controller to maintain a constant and stable climate. Due to the fast reaction time of our sensor, the humidifier or dehumidifier is only working for the minimum time needed to establish the desired environment. In addition to a stable and not overshooting system, you energy consumption to maintain the

room climate will decrease significantly.

Communication:

Networking with Rotronic is an easy affair! With all of the different communication methods, from conventional analogue output signals to RS-485, Wireless or Ethernet RJ45, Rotronic can provide the needed interface to your DDC or building automation system.

Long term stability:

With a long term stability of under 1%rh per year

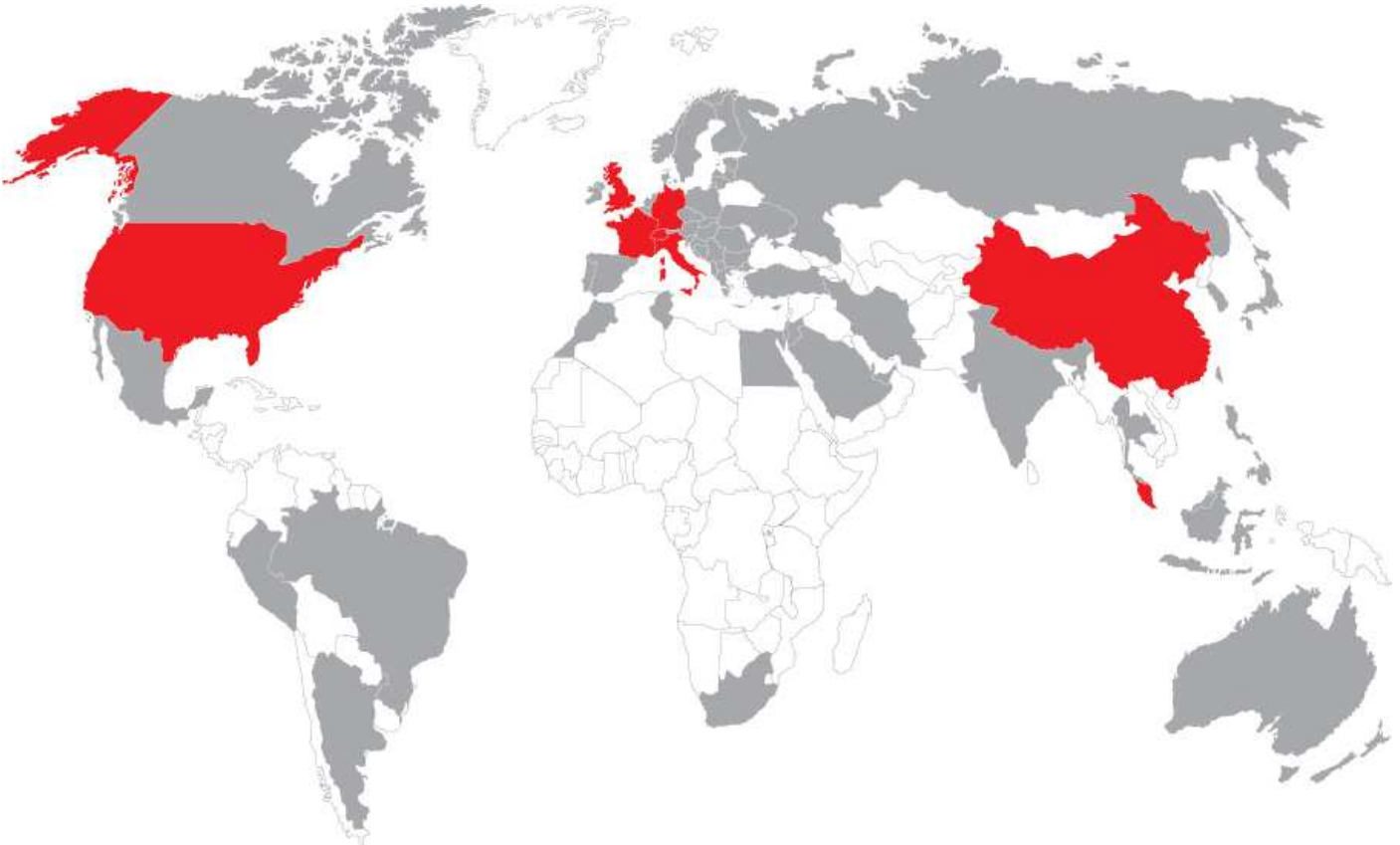
(depending on the environment), Rotronic offers the possibility to "plug & play": install the device and leave it. We would recommend frequent spot checks in-between calibrations.

Calibration:

In order to calibrate humidity measurement devices, we can offer a factory calibration certificate or even an SCS certificate if this is required. We can also supply a humidity and temperature generator, the HG2-S as well as unsaturated salts for on-site calibration.

Contact us:

Rotronic is represented in more than 40 countries around the world. An up to date list of all our partners is available at www.rotronic.com/



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