

HUMIDITY

ROTRONIC NEWS

MONITORING SYSTEMS AT WELEDA.

Read how ROTRONIC is helping a market leader maintain global quality of the highest of standards.

Pages 4 and 5

OPTIMIZED PRODUCTION PROCESSES AT ROTRONIC.

ROTRONIC optimizes production with the help of an idea first introduced by Toyota in 1948.

Pages 8 and 9

ROTRONIC WINS BID TO SUPPLY SHANGHAI'S UNDERGROUND SYSTEM.

Ride with us on the N° 10 Line of Shanghai's Subway and see ROTRONIC instruments at work!

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"AND THE AWARD GOES TO..."

Turn to page 14 to find out how the HygroClip2 proved itself at the AHR Expo2009 in Chicago!

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ro-tronic

LEADING IN HUMIDITY MEASUREMENT

To all our business friends,
valued partners and interested readers

Recently, much has been written about the global economic crisis and its impact. Every day we are confronted with a negative, never-ending series of press reports: the implications may be serious!

I am not here to dismiss this crisis. But nevertheless. I am convinced that we will pass this test with flying colours! First of all, ROTRONIC has played a leading role in humidity and temperature measurement for over 40 years! And secondly, we're sailing our ship through this storm with a highly motivated and superbly trained crew. We at ROTRONIC have a team on board that stands behind our products with their heart and soul. These are the all-important advantages and strengths that will enable us to ride out this challenging period. It is important that we let our customers sense this "Team Spirit".



In the near future, nearly all of our products will be use the new "AirChip3000" technology. After the normal "teething" issues, we are now on the right track with our new generation of instruments. Recent proof of the superiority of our AirChip3000 was the "Indoor Air Quality" Award presented to us in Chicago last January (read more about it on page 14!).

Our latest success story comes this time from Weleda. A German company, rich in tradition and famous for its complementary medicines and whole-body care concept. One of our monitoring systems was recently integrated there to monitor and document temperature and atmospheric humidity.

You will find the complete article on pages 4 and 5.

I hope that you enjoy reading the year's issue of Humidity News!

Sincerely yours,

A handwritten signature in blue ink, reading 'S. Schroff', written in a cursive style.

Susanne Schroff, Managing Director, ROTRONIC AG

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EVERYTHING UNDER CONTROL

A MONITORING SYSTEM FOR NATURAL PRODUCTS.



Modern, futurewise, experienced and traditionally anthroposophic: so is Weleda AG. The company started in 1921 as a pharmaceutical laboratory with its own medicinal herb garden. Today, the company is the world's leading producer of remedies for complementary medicine (anthroposophic therapy) and holistic natural cosmetics. The company's goal and self-assigned task: to preserve, promote and where necessary, to restore the health of every individual.



This leitmotif is also reflected in the company's daily working procedures - a respectful approach to nature and to environmental protection. Weleda was one of the first companies in Germany to voluntarily submit a declaration of environmental policies and a sustainability report.

Quality products

Weleda's wide-ranging product line contains not only 1,200 drug products and 120 personal hygiene products but also 100 remedies for self-medication. The company imposes on itself the most stringent demands regarding quality throughout the entire production chain, beginning with the quality of the raw materials used.

Process validation and qualification

The guidelines set by regulatory authorities (FDA and GMP) require that pharmaceutical companies not only validate their processes regarding possible effects on product quality but also ensure that the related pieces of equipment are qualified to ensure safe (reproducible) results. These regulatory demands also apply to data logging systems consisting of measuring devices and software.

Validation ensures documented proof that the respective process or system meets previously specified demands in the course of practical use.



When validation is carried out in the pharmaceutical industry, the finished product is studied in order to find out if the process invariably brings about the intended result under the same conditions (e.g. temperature). Only methods and processes validated in this way may be used for the production and testing of remedies that are intended to be put on the consumer market.



HygroClip sensors between two sample products.

Quality control

Weleda's quality criteria apply equally for every one of the company's locations throughout the world. They take their orientation from pharmaceutical-therapeutic concepts of anthroposophic anthropology and are backed by up-to-date, specific and general quality standards. These high standards of quality are maintained by constant testing with the most modern methods of analytical chemistry (HPLC, GC). Raw materials are approved for production use only after their official release. Both preliminary products and finished products undergo continuous review.



Official presentation of certification documents:

Back, left to right: R. Scheurich, S. Schroff (both from Rotronic), R. Wiget (Weleda)
Front, left to right: Ch. Arnswald (Rotronic), D. Geiger (Weleda)

Long term stability

Weleda products are tested at pre-defined intervals to determine properties such as stability, chemical breakdown, and separation of ingredients in stored preparations. This is done by storing stability samples of pharmaceutical and cosmetic products in climatic chambers and climatic test cabinets according to ICH guidelines. Temperature and constant humidity are very critical, since they are among the major influencing factors during ongoing studies of stability. Highest-level attention and priority are given here to the function of the climatic chambers and test cabinets, since in-use stability samples with short life spans are also stored (minimum storage time: seven days); even a short fluctuation in temperature or humidity can significantly affect them and thus influence studies of stability.

These climatic chambers and climatic test cabinets are monitored, and the results are documented with ROTRONIC HygroLog-NT data loggers. All events, such as malfunctions in the server, electric power failures, user interventions, and even battery replacements are buffered and registered by the system.

A computerized system enables automated of measurement data and functional alarm signals. Top priority is given to the storage and backup of data recorded. Data loss must be avoided; the readings must be recorded reliably and managed.



With its networkable data loggers and HW4 software, ROTRONIC offers a validated solution which complies with 21 CFR, Part 11, and GAMP. That's why Weleda AG has picked ROTRONIC to validate its temperature and humidity measurements for quality control.

THE MILLENNIUM SEED BANK PROJECT MEASURING SEED MOISTURE.

Accurate measurement of seed moisture status is essential to successful seed handling and processing. Seed collectors in the field need to know the moisture level of freshly collected seeds in order to handle collections properly; seed bank staff need to know that seeds are dry enough to store, and scientists addressing seed longevity need to know exactly how much water seeds contain.



Wanted: Gentle measurement method

The most common method of measuring moisture status is by oven drying a sample of seeds at 103°C for 17 hours. Seed moisture is then expressed as percentage moisture content. The major disadvantage of this method, particularly when dealing with collections of rare and threatened species containing limited numbers of seeds, is that seeds are killed at such temperatures. It is also time consuming. To get around these problems the MSB uses a rapid, non-destructive method based on humidity sensors.

This method relies on the fact that seeds rapidly gain or lose moisture depending on their surroundings. Moist seeds in dry air lose moisture; dry seeds in moist air gain moisture. After about 30 minutes there is no further movement of moisture between seeds and air, and seeds are said to be at equilibrium.

The ROTRONIC HygroPalm!

Digital humidity sensors measure the amount of water vapour in the air at equilibrium with a sample of seeds enclosed in a sealed chamber. The reading is generally expressed as equilibrium Relative Humidity, or ERH, and may be related to conventional percentage moisture content.

Key improvements / findings:

- The speed and simplicity of this method encourages users to monitor seed moisture status.
- Portable hygrometers, used with care, can greatly assist post-harvest handling decisions in the field as well as in the seed bank.
- The temperature of the seed sample must be equilibrated to the sample chamber temperature.

Equipment specifications

- 1) Portable relative humidity logger with mini probe HygroClip SC04 sensor with HygroLog-D unit. Battery operated. Range: -40 to +100°C ($\pm 0.3^\circ\text{C}$); 0 to 100 %rh (± 1.5 %rh).
- 2) Lab-based hygrometer with docking station and clamp AW-DIO sensor with HygroPalm 3 display unit. Battery or mains operated. Range: +5 to +50°C ($\pm 0.2^\circ\text{C}$); 0 to 100 %rh (± 1.5 %rh).

What is the Millennium Seed Bank?

The Millennium Seed Bank Project seeks to develop a global seed conservation network, capable of safeguarding wild plant species. This will make direct contributions to national and global conservation/development programs, and will make a big contribution to meeting the objectives of the Convention on Biological Diversity (CBD). (www.rbgekew.org.uk).



OPTIMIZED PRODUCTION AT ROTRONIC.

We have set the bar high: reduce excess stocks and produce on demand or on order. Certain selected items from our new transmitter family are no longer kept in stock but are produced and delivered to the customer within three days.

Hardy Löw; Head of production at ROTRONIC and a certified expert in process optimization, took on the challenge and set the project in motion with an abundance of personal commitment and a will to succeed.

Tell us how you tackled this complex issue!

Hardy Löw: Five years ago, we and the company's electronics department got the go-ahead for the development of a new series of HygroClip devices. This had a major impact on the new design for the top and bottom parts of the transmitters and, as a consequence, our planning work for new production processes.

What exactly was changed in the production processes?

Hardy Löw: In order to adopt the new design, it was necessary to implement various changes in our production. From one side, work stations with new functions had to be set up for the top and bottom parts¹, and from another side, the logical sequence of production steps led us to establish a modular stock area with work stations for semi-finished goods.



What is the meaning of a "modular stock area"?

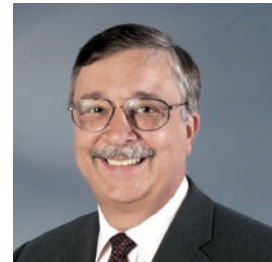
Hardy Löw: We've got to thank Toyota! In 1948, the Japanese automobile giant invented the so-called "Kanban System"² implemented in its production lines. That was the orientation point for our modular stock area. The individual base modules are already adjusted, tested and stocked in storage containers for further processing. For every different product, there are four storage containers lined up one behind the other, each with a pre-defined storage position in the modular stock frame. Any empty storage container is filled up in the production area at a functional working area specifically set aside for this purpose. As a result, each storage container, always contains its assigned version of semi-finished goods for the transmitters, has its own individual storage position and is added to the rolling stock.

¹ The new transmitter concept: joinable top and bottom parts ensure maximum flexibility: the top is used to measure moisture and temperature as well as for display and operation purposes; the bottom part contains communication components such as analog and digital interfaces.

Did this optimized production involve architectural changes as well?

Hardy Löw: Yes! Since our goal was to ensure delivery to the customer within three days, we had to move our modular stock to a new area. Not only that, but it was also necessary to install a new roller frame and set up new work stations. Today, these work stations are found at locations where the top and bottom sections are joined together, tested, and programmed as ordered by the customer and where the certificates and nameplates are printed out.

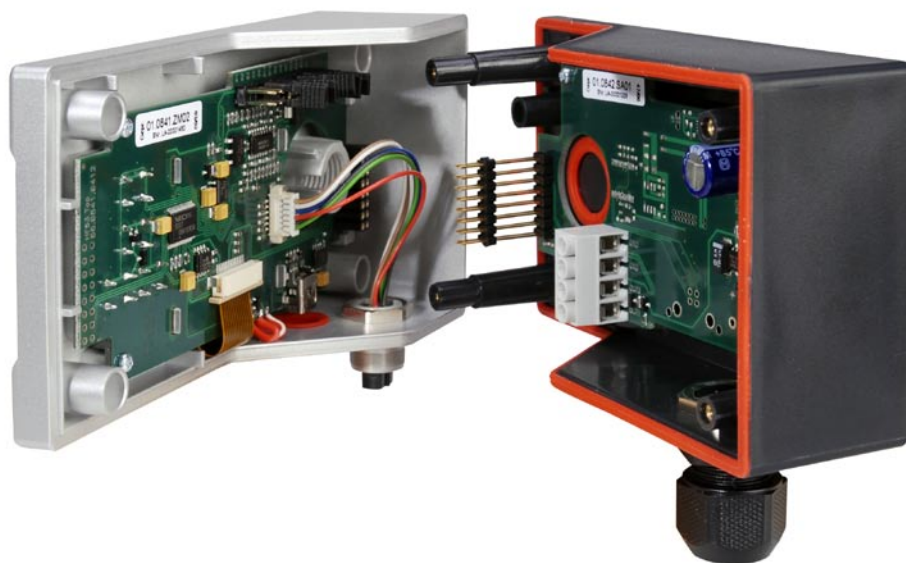
After a final quality control, the transmitter is packaged and sent to the delivery storage area. We started the physical changeover last December, and the new production area is expected to be running at full capacity by summer 2009.



Leonhard Löw, Head of
Production, Humidity and
Temperature Measurement

The Kanban System ²

"Kanban" is a method for guiding production processes according to the "pull principle" (also called the "get" or "call-off" principle). It is oriented solely to the needs of each material consuming area in the production chain. The aim of the Kanban system is to achieve "call-off" production at all stages of manufacturing as a means of reducing material stocks and ensuring a high level of adherence to deadlines. Essentially, the "Kanban System" is event or consumption-controlled rather than forecast-controlled.



Joinable top and bottom parts: the physical separation of measurement and communication parts benefits the customer with a huge variety of types and fast delivery within three working days.

ROTRONIC WINS BID TO SUPPLY SHANGHAI'S UNDERGROUND SYSTEM.

In winning the bid to supply Shanghai's new subway project, ROTRONIC has laid the tracks for a head start in other subway construction projects in China.

The Chinese market is widely regarded as highly contested and price-sensitive and any provider of goods and services who is not ready to invest time and patience over the long run is often left out in the cold. The Shanghai Subway Project is one very good example: those responsible for the subway were looking for a way to obtain reliable measurement results in the Line 10 tunnel system. "The frequently-heard question in China is: 'Can you come down just a little bit more with your price?' Even though we had a bit of leeway there, the real cost advantage of ROTRONIC products lies in their high quality and long-term stability; cost recovery comes pretty quickly there," says Albert Huang, Managing Director of ROTRONIC China.

Nearly two years passed between the first meeting and the awarding of the project contract. The first ROTRONIC offer included products from the L13 series. But those responsible for the Shanghai Subway needed time to reach their decision, and as chance would have it, it was precisely at this time that ROTRONIC brought out its newly developed AirChip3000 onto the market.

Albert Huang decided to reshuffle the cards and play his ace, the "AirChip3000" as part of the HygroFlex3 series. That meant that the Shanghai Subway would receive improved technology, but at the same price as in the original offer.

It turned out to be the highest card! The offer was convincing, ROTRONIC won the deal, and delivered more than 1,200 HygroFlex units.

Winning the project was a turning point, and gave ROTRONIC a competitive edge in similar projects: just a short time later, ROTRONIC also won a bid for the Chendu Subway system and delivered more than 750 HygroFlex3 units.



A FRESH BREEZE IN THE NEW CLEAN-ROOM.

The ROTRONIC development team eagerly awaited its chance to use the new, additional clean-room area, which has nearly doubled production and development spaces for sensor and clean-room conditions. The first fruits of these actions have already been gathered: after only a one-year phase of intensive research and development, it proved possible to put two new sensor types into normal serial production.



The Type V-1 broadens the wide-ranging spectrum of applications for ROTRONIC moisture sensors. With a high degree of mechanical stability and extreme long-term dependability in use under conditions of intense moisture with long condensation phases. Likewise, the new Type M-3-R, with a response time of less than three seconds, ventures into new areas of application which were previously out of reach with classical polymer film humidity sensors. One example is their use in weather balloon probes.

The newest product from the sensor workshop, the Type HH-1, represents a special development for use in sterilisation units with a hydrogen peroxide atmosphere. Its creation would have been impossible without the features offered by the new clean-room facilities.



This clean room, with its ultra-pure, low-particle air space, is certain to play an important role in the development of sensors which will be created by ROTRONIC in future for special areas of use and application.



The eagerly awaited new clean-room at ROTRONIC

THE **HYGROFLEX7** MADE BY ROTRONIC – DEFIES ALL ADVERSE CONDITIONS.

The new HygroFlex7 series, based on the new AirChip3000 chip technology, distinguishes itself not only due to its precise measurement technology but also, thanks to its solid metal housing, defying the most adverse conditions. The measuring instrument is perfectly suited to applications in harsh industrial environments.



The HygroFlex7 – All-round protection thanks to a solid housing

Higher, further, better...

The ROTRONIC engineers have managed to make the HygroFlex7 even better than its predecessor. For example, the HygroFlex7 with cable mounted probe can withstand temperatures of -100 ° to 150 °C whereas the wall version can be integrated into applications covering the range of -80 ° to 100 °C. The humidity range is 0...100 %rh. The humidity accuracy: ± 1 %rh; The temperature accuracy within ± 0.2 K.

The model range is available as wall, cable and duct versions and with the optional HW4 software, many useful functions can be activated, such as an automatic sensor test or drift compensation. In addition to that, the output signals are freely scaleable.

The HygroFlex7 feels right at home ...

The HygroFlex7 is a tough customer and when other instruments flag, it really gets going. This ROTRONIC measuring instrument is perfectly suited for industrial applications, convincing in process monitoring and in environments such as building management. Subway and tunnel construction also benefit from the features provided by the HygroFlex7.

Only one small step towards your own HygroFlex7...

Detailed information about the HygroFlex7 series is available from www.rotronic-humidity.com, or from your ROTRONIC distributor (see back cover for contact details).

THE NEW HYGROWIN HC2-WIN-USB.

The new HygroWin converts a PC into a humidity and temperature measurement system

The HygroWin allows simple PC based humidity and temperature monitoring in almost any application. It is based on Rotronic's new AirChip3000 technology and is connected via its USB compatible interface cable directly to a PC.

Mobile, flexible and user-friendly.

HygroWin is delivered factory-adjusted ready for use after installing the HW4 software. With a 3m USB connecting cable and no external power requirement, it's highly versatile for use in a wide range of applications.

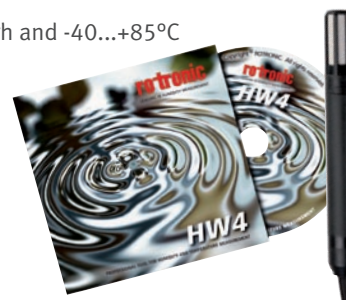
HW4 software is versatile.

The HW4 software supplied supports real time display and data acquisition. Measurement and logging intervals can be easily configured to suit your needs and users can select their preferred language.

HygroWin – The perfect entry level instrument

Thanks to its low price, HygroWin is the ideal way to introduce high quality humidity and temperature measurement. Core technology from Rotronic's high specification product range provides precise measurement capability allied to state-of-the-art PC software:

- Industrial grade RH and temperature sensors measure over the ranges 0...100%rh and -40...+85°C
- PC controlled calibration is part of the package; this allows the user to visualise the calibration process and its effect on measurement.
- As long as HygroWin is connected to your powered PC or USB power adapter, it can log measured data onto its integral memory.
- HW4 software includes a psychrometric conversion tool to allow the measured RH and temperature values to be converted to parameters such as wet-bulb, moisture content, mixing ratio and enthalpy.



A powerful ROTRONIC package:
HygroWin and HW4 software

Example Applications

Monitoring of offices, laboratories, server rooms, workshops, classrooms, incubators, chambers, store rooms, cold stores, production areas, wine stores, humidors, living spaces and test facilities.

All other info on the HygroWin.

Detailed information on the HygroWin is available from www.rotronic-humidity.com, or from your ROTRONIC distributor (see back cover for contact details).

PRECISELY: SWISS!

The new **ROTRONIC catalogue** "Humidity and Temperature Measurement 2009/2010".

Last year ROTRONIC successfully launched its new HygroClip2 with the unique AirChip3000. Now ROTRONIC present a new, comprehensive catalogue for humidity and temperature measurement.

The AirChip3000, developed and produced in Switzerland, is the result of intensive research and development. Most of the products listed in the new catalogue are based on this new chip technology. The HygroClip2 sensors can be connected to all units of the new generation. Whether industrial sensors, data loggers or hand-held measuring instruments; everything fits together.



Interested? The catalogue is available in German, French, English and Spanish, and can be ordered free of charge by calling +41 44 838 11 44, or by e-mail from humidity@rotronic.ch, or contact your ROTRONIC distributor.

ROTRONIC'S **HYGROCLIP2** SENSOR RECEIVES AWARD IN USA.

At the AHR EXPO 2009 in Chicago, awards were presented for the top achievements in a total of 9 categories. ROTRONIC's newly developed sensor, the HygroClip2, received the award in the category "Indoor Air Quality".

The AHR EXPO in Chicago is one of the most important trade shows worldwide in the area of "House, Ventilation and Air-conditioning". Every year, parallel to the exhibition, the coveted "AHR Expo Innovation Awards" are presented. In nine different categories, from "green technology" to "building management", this distinction is bestowed on the most innovative, most useful products. This year, ROTRONIC was in the running with the newly developed sensor, the HygroClip2. A sensor that, thanks to its sophisticated AirChip3000 technology, compensates temperature and humidity at 30,000 reference points, stores 2000 data records and calculates the current dew-point.

The intensive development work and commitment of the ROTRONIC engineers received its due reward.

On 27th January 2009, it was announced in Chicago: "And the Award goes to...". David P. Love, Vice President, ROTRONIC USA, accepted the "AHR Expo Innovation Award" (category "Indoor Air Quality") at the official ceremony.



Bill Harrison, President of ASHRAE, David P. Love, Vice President ROTRONIC USA, Keith Coursin, Chairman of AHRI (from left to right).

AND THE WINNER ...

.. of the latest "Humidity News Contest" has been determined and is ...

... **Hanspeter Mössner, of Novartis Pharma AG in Basel.**

The correct answer was: The new chip in the HygroClip2 is named "AirChip", and Mr. Mössner was one of 1,500 contestants who answered the question correctly.



Hearty congratulations to Mr. Mössner, and we wish him much enjoyment with his new iPod touch.

Hanspeter Mössner (right), proud winner of an iPod touch, with Raphaël Joye, ROTRONIC AG (left)

SEE ROTRONIC LIVE AT THESE EVENTS:



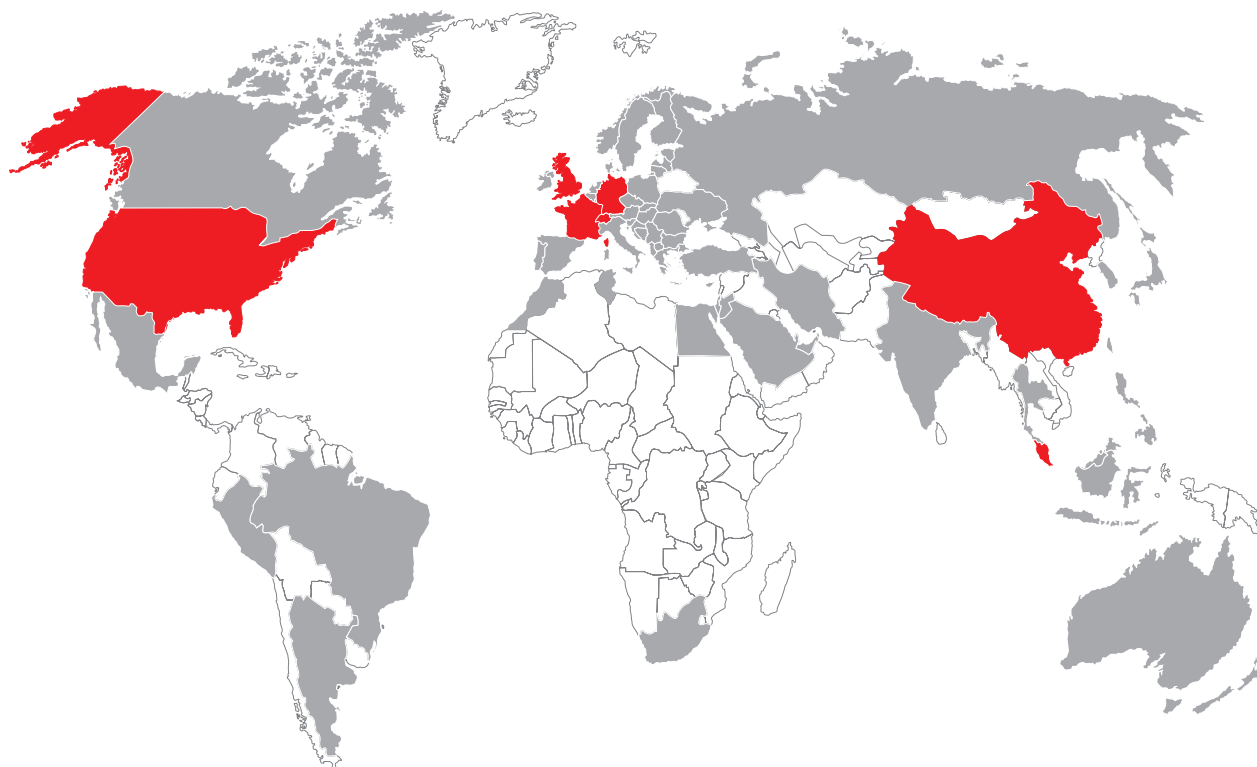
Exhibition	Venue	Date
Achema	Frankfurt a. Main (Germany)	11-15 May 2009
Sensor+Test 2009	Nuremberg (Germany)	26-28 May 2009
INTERPHEX ASIA 2009	Singapore (SG)	1-2 June 2009
Congrès de Métrologie	Paris (France)	22-25 June 2009
NCSL International	San Antonio (USA)	26-30 July 2009
Ineltec	Basel (Switzerland)	1-4 September 2009
Mesurexpo	Paris (France)	6-8 October 2009

ROTRONIC WORLDWIDE.

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-humidity.com/international

■ ROTRONIC International

■ ROTRONIC Partners



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LEADING IN HUMIDITY MEASUREMENT