

MEASUREMENT NEWS

**Optimum measurement
even at extreme temperatures**



Aseptic processing plants

Rotronic measurement transducers for Steriline



Healthy indoor air

CO₂ displays for Belimo Automation



Competition

Three Swatch smart watches must be won



James Pickering

Department Manager
Measurement Solutions / Sales

**Latest parameter
video on low
dew point.**



All you need to know
about measuring dew point



and low dew
point clearly and
concisely in
just 3 minutes.

Dear Business Partners,

Last year, ROTRONIC AG celebrated its 50th anniversary! Founded originally for server cabinet systems, we have since gained a reputation for solutions involving relative humidity and temperature. Both in Switzerland and in the export marketplace.

We have our finger on the pulse of the market, and our innovative R&D team and far-sighted product management team continually react to the ever-changing requirements in the areas of measurement, monitoring and control. We can thus offer you state-of-the-art products for new parameters, in addition to humidity and temperature.

Our product range now includes solutions for measuring low dew point, water activity, differential pressure, process pressure, airflow and indoor CO₂. In addition, our development department supports customer-specific product portfolios.

Depending on the needs of the market, different parameters can be combined in one device. An example of this is the CF1 measurement transducer. This combines relative humidity, temperature and CO₂, and thus saves costs and installation time. The CRP5 cleanroom panel is also a true all-rounder. In native mode, it measures relative humidity, temperature, pressure, and differential pressure, but its advanced analog and digital communications capabilities permit easy enhancement for further monitoring tasks.

I am convinced that, together with you, we will succeed in developing problem-oriented solutions for your specific challenging requirements. A few interesting sample applications in which Rotronic was able to provide suitable solutions for the monitoring of various parameters are described on the following pages.

Together with the entire Rotronic Measurement Solutions team,
I wish you enjoyable reading, and look forward to hearing from you!

A handwritten signature in blue ink, appearing to read 'James Pickering', written in a cursive style.

James Pickering

Business Cases



New Products



Competition



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Win one of three Swatch smartwatches

Innovative, energy saving measurements with Rotronic



Innovative measurement technology for control and monitoring data centers demands a high degree of specialized skill. Rotronic Instruments (UK) demonstrated to BladeRoom that Rotronic devices were the optimal solution for their application. The short response time and stable measurement features were decisive.

BladeRoom is a highly energy efficient modular data centre system, providing a scalable method of quickly developing data centers with an extremely low, proven annual Power Usage Efficiency (PUE). These modular data centers are built entirely in the factory, reducing the effort on site to a minimum. Set-up and commissioning therefore take only a fraction of the time it takes for a traditional build.

$$PUE = \frac{\text{Energy consumed by the system as a whole}}{\text{Energy consumed by the IT devices}}$$

BladeRoom contributes one vital factor to the success of a business: the control of the environmental conditions within very tight tolerances, assuring the reliability of the cooling system and all components.

Depending on the climatic conditions, the cooling systems, both primary and back-up, use ambient and evaporative cooling for up to 100% of the time to maximize efficiency.

To achieve this maximum efficiency, the system was designed for the specific ventilation requirements. Air is delivered seamlessly to where it is needed through the normal working zones, so ductwork and raised floors are not required.

In contrast to conventional data center cooling systems, which return and cool down the warm air from the IT equipment, a BladeRoom data center works like a server. Heavily filtered fresh air is introduced, and intelligently adjusted to the



Weather protection in use for fresh air monitoring.

needs of the IT equipment. At the same time, the warm air – depending on the requirements – is extracted completely from the data center.

Evaporative and free cooling enables the IT equipment to be cooled with supply air

Evaporative cooling

The drop in temperature resulting from the evaporation of a liquid, which removes latent heat from the surface at which evaporation takes place. This process is utilized in cooling systems, both in industry and in the home. From the point of view of physics, it is also the basis of perspiration.

Free cooling

This designates an economical method of utilizing low outside temperatures to cool water, which is then used in commercial processes or in air conditioning systems. The cold water can be used immediately, or kept in short-term or long-term storage.

temperatures of between 18 °C and 24 °C for more than 99 % of the year. The benefit of this is that mechanical cooling over a series of IT loads is not necessary. The back-up mechanical cooling system is only used for emergencies, and for partial cooling during extreme weather conditions. This system is then designed for the cooling of 100 % of the IT load.

As well as Rotronic humidity and temperature probes and measurement transmitters, BladeRoom also uses the Rotronic PF4 differential pressure transducer.

"With their short response time and stable measurements, the Rotronic humidity sensors are perfect for controlling our data center."

Adrian Edge
BladeRoom Group, England

| Data center London (1MW IT load) | Energy savings over 5 years | Energy savings over 10 years | Energy savings over 20 years |
|----------------------------------|-----------------------------|------------------------------|------------------------------|
| PUE 1.13 BladeRoom | | | |
| PUE 1.5 new data center | € 2,139,000 | € 4,277,000 | € 8,557,000 |
| PUE 2 existing data center | € 5,030,000 | € 10,059,000 | € 20,121,000 |
| PUE 3 existing data center | € 10,811,000 | € 21,623,000 | € 43,248,000 |

Assumptions: 100 % IT load, and an electricity price of 10 p per kWh.

Emission values are based on the calculations of the Carbon Trust – 544 grams of CO₂ per kWh consumed.

Boyle's law states that the product of pressure and volume is constant for a given mass of confined gas, as long as the temperature is constant.

In other words, in a constant volume, a measured difference in pressure implies a difference in temperature. It is this differential pressure that allows BladeRoom to move air effectively within the data center to maximize energy efficiency and therefore savings.

$$P_1 V_1 = P_2 V_2$$

It is precisely this innovative measurement solution that demonstrates Rotronic's work philosophy, which is characteristic of projects that hinge on highest measurement precision. The fruitful cooperation with BladeRoom is a good example of this, and forms the basis of a successful business partnership.

BladeRoom

BladeRoom has over 20 years' experience in designing and producing state-of-the-art, modular infrastructures for Blue Chip companies and public bodies.



PF4 Series

The PF4 Series is an innovative development by Rotronic. The thermal measurement technique enables high precision measurements in the smallest of spaces. This differential pressure transducer gives customers a device to measure a further important parameter in addition to devices for humidity, temperature and CO₂ measurement.

With the optional connector for a HygroClip2 probe, analog input or temperature sensor, the device is widely supported for the most diverse applications. The differential-pressure series lives up to these characteristics, with long term stability of <0.3 %/year and an accuracy of ±1.0 % of the end value.



Better air means better performance



We all know the situation: meetings where individuals' performance drops sharply. In most cases, this is a direct result of the poor quality of the air in the room.

Uncomfortable situations like this need not arise. CO₂ displays by Rotronic make it easy to measure air quality, and the results can be used to initiate the appropriate measures.

In an enclosed room, some 25 to 35 cubic metres of fresh air per person per hour are needed, given normal activities. This ensures that the carbon dioxide (CO₂) content remains below 1,000 ppm (ppm = parts per million [value of the proportion of carbon dioxide in the air]), and that the volatile substances exuded by humans

are extracted to a sufficient degree. By comparison, the CO₂ concentration in outdoor air is around 400 ppm. The CO₂ concentration is a good indication of the quality of the air in a room. The consumption of air rises particularly quickly in meetings, with many people in small rooms. By the time we notice this productivity has already declined. A CO₂ sensor is the answer here. Alfred Freitag, Sales Manager for Switzerland at Belimo Automation AG, points out that a meeting should be interrupted when the CO₂ concentration reaches 1,200 ppm and the

room should be ventilated. The CO₂ content in the air then drops rapidly, and productivity increases again.

A right to good air

Every person has a right to healthy indoor air (WHO). In the case of workplaces, the labor laws require that air quality and room climate must not represent a health hazard for employees. In the private sector, there are no regulations, and the owner is responsible. However, the Swiss Cantonal building regulations require energy-efficient buildings. This requirement can be met only when the buildings are airtight. Consequently, free exchange of air is no longer possible. Martin Bänninger, director of the SVLW (Swiss association for air and water hygiene), has this to say: "Most Cantonal building laws, or municipal building regulations, state the principle that a building must not endanger life or health of the building's users." Furthermore, buildings must be erected according to the rules of the building trade, as laid down in the standards, directives and bulletins (SIA, SWKI).

Careful planning of ventilation systems

Today, however, an adequate supply of fresh air cannot be taken for granted. In densely built-up housing areas, normal ventilation through the windows is of

"The visualization of the measured data was very important to us; it is easy and clear to read off. The Rotronic display permits global assessment of the air."

Alfred Freitag, Belimo, Switzerland



Left to right: Pascal Brunner, Key Account Manager ROTRONIC, Alfred Freitag, Sales Manager Switzerland, Martin Bänninger, Director Swiss Association for Air and Water Hygiene.

limited value. A good room climate cannot be achieved by regular airing in all buildings – climate-regulating systems are a necessity. Building owners and ventilation planners should therefore conform to the specifications in the SWKI Directives – "Hygiene requirements for room air systems and devices" – starting with the positioning of the air intake, through the controls of the ventilation and heating

should have high priority," Alfred Freitag emphasizes. To keep the ventilation systems functioning reliably, and to keep them hygienic, they must be carefully planned, constructed, regulated and maintained. Rotronic CO₂ displays can then be used to monitor these ventilation systems, the data being read out via USB stick when necessary. Asked why Belimo decided in favor of the Rotronic CO₂ displays, Alfred Freitag says, "We were very competently advised by ROTRONIC CEO Michael Taraba. He took care of our needs personally. In addition, the visualization of the measured data was very important

Belimo Automation AG

Belimo is the world market leader in the development, manufacture and sales of drive solutions for regulating and controlling heating, ventilation and air-conditioning systems. Actuator drives and water actuators are its core business area. Belimo is a listed technology company with 1,400 employees worldwide. It has been developing, producing and selling electric drives for air flaps and valves in heating, ventilation and air-conditioning equipment since 1975. With its comprehensive product range, Belimo is the leader in this specific market worldwide. Research and close-to-market innovation, combined with customer-oriented execution, are the company's basis. Its activities are characterized by engagement, credibility and reliability. Belimo delivers more than products. Customers are supported by innovative, efficient, energy-optimized solutions.

to us. They are simple and clear to read on the Rotronic display. Hitherto, Rotronic has proved a very reliable partner." In addition, the Rotronic display permits global assessment of the air. It measures CO₂, humidity and temperature. This allows suitable countermeasures to be taken.



A selection from the Belimo ventilation range.

systems to the instruction of the occupants. In the case of more complex systems, the responsibilities for surveillance and maintenance must also be clearly defined. "The maintenance of the system



CO₂ Display



The wall-mounted or bench-top CO₂ display is an inexpensive display unit that simultaneously measures and records CO₂, humidity and temperature. Equipped with the field-tested and proven ROTRONIC HYGROMER® IN-1 humidity sensor, this instrument offers unbeatable value for money. The instrument can be configured directly with buttons, and stored data can be exported to a USB stick for analysis with the free Rotronic software package SW21.

Exhibition "ladies only" in perfectly monitored climate



The Hohenzollern family came to Brandenburg 600 years ago, in 1415. Twelve Prince-Electors, seven Kings and three Emperors made Prussian, German and European history for almost 500 years.

The women at their side have mostly been overlooked by the historians. By turning the spotlight on them, the Foundation for Prussian Castles and Gardens (SPSG) has paved the way to discovering hitherto unknown aspects of Prussian and European history.

Besides the oldest authentic woman's dress in Brandenburg (c.1460), and the coronation cloak of Queen Augusta, the Foundation for Prussian Castles and Gardens (SPSG) presents some 300 exhibits from national and international donors in a total exhibition area of 900 square metres.

Room climate in exhibitions

Climate and lighting are influential factors in the state of preservation of museum exhibits, because they can cause damage by accelerating chemical and biological

degradation processes. In recent decades, the exhibition sector has developed a standard for conservation conditions in exhibitions. In those with the most varied works of art, temperatures of 18–22°C and relative humidity around 50%RH with slight variations, and lighting of 50 to 200 Lux, are striven for, depending on the sensitivity of the materials.

Preventive Conservation Department

Since 2014, the Foundation for Prussian Castles and Gardens has had a department for "Preventive Conservation" with a staff of two. In this, it follows a line of development in many castle administrations and museums.

Theater "Ladies Only"

The theater in Charlottenburg has no central air-conditioning system. The room

climate is influenced by the massive building shell, with masonry walls some 80 cm thick, solid, reinforced concrete ceilings and floors, and composite win-



The painting of Queen Augusta of Prussia, exhibited in a perfectly climatized room.

dows with double glazing. To reduce warming through sunlight, the windows on the south side have been given temporary external sunshades for the duration of the exhibition.

Challenges and requirements on measuring equipment arising from the exhibition concept

Ms. Undine Köhler, a Restoration graduate, explains that "the SPSG has hitherto had no experience with using the building as an exhibition area. For this reason, there were, in general, very high demands on the quality and availability of measurement data. All decisions on the control of mobile air conditioning equipment and ventilation are made on the basis of measurements in the individual rooms."

The concept for the exhibition combines a large number of works of art made of the most varied and sensitive materials. Mr. Wulf Eckermann, head of the Preventive Conservation department, sums up, "We observe measurement curves and developments over days, months, years. We don't so much work with absolute criteria, exceeded threshold values, etc. We have no fixed processes and tolerances, as they do in industry. We want to understand situations, become familiar with buildings, assess influencing parameters, optimize measures, motivate colleagues."

Deciding factors in the choice of measuring system were, in addition to the long-term stability, precision and reproducibility of the HydroClip2 probe, the capability of measuring right at the work of art, the flexibility with regard to parameters, the low maintenance effort, simple operation and data security.

The measurement of CO₂ in the room air, for example, is not a conservation require-

ment, because it has no potential to damage the works of art. However, the CO₂ content in the exhibition rooms is an important criterion for air quality and hygiene, and thus for the comfort of the visitors and the working conditions of the custodians. Mr. Eckermann says, "The rooms are ventilated individually, a general assessment of the air quality and exchange with outside air being made via the CO₂ content. However, only the slightest variations in the climatic values are permitted."

Wireless data loggers for active monitoring

To monitor the climatic conditions reliably and flexibly, LOG-HC2_RC wireless data loggers are used. The measured values are recorded locally and safe from manipulation in a memory with a capacity of 500,000 values, and simultaneously placed in the room in ultra-low-power mode. With no cabling requirement, and without provision of an infrastructure such as a LAN or power outlets, the loggers are mounted unobtrusively on walls and in glass cases, thus impinging only minimally on the exhibition concept.



Left to right: Wulf Eckermann and Undine Köhler, Preussische Schlösser; Roland Scheurich and Christoph Arnsward, ROTRONIC.

"The Rotronic measuring system was convincing because of its high degree of data security, but also because of its flexibility, low maintenance costs and simple operation."

Wulf Eckermann, Stiftung Preussische Schlösser, Germany

The wireless data loggers



Suitable for a wide range of humidity and temperature monitoring tasks. Wireless transmission – possible over distances of up to 100 m – saves the user wiring costs, and the data can be collected and recorded from inaccessible points quickly and easily. Thanks to the combination of wireless transmission and data logger, the greatest possible reliability against failure is ensured. Up to 100 devices can be configured and read out via the HW4 software.

Uses: meteorology, foodstuffs industry, building technology, museums, environmental/laboratory equipment, research & development, pharmaceutical/chemical/logistics and textile industry.



Precise measurement equipment for Havana cigars



Cuba stands for a long tradition of cigar making with top products for the connoisseur. The only way to ensure the high quality is to use reliable measuring equipment.

Famous brands like Cohiba, Montecristo and Partagas are often household names, even among the uninitiated. But before a cigar is made, the tobacco must be prepared and made fit for consumption. After harvesting, the tobacco leaves are tied in bundles known as gavillas in the casa de tabaco, and hung up to dry.

"The Rotronic HygroPalm is the perfect solution for quality control on site. A stand-alone measurement system that can be used freely and independent of mains."

Jose M. Guardiola Pedrosa
Tabacuba, Cuba

The drying process, which takes place in the so-called dry shed, serves to further ripen the tobacco leaves, and reduces the

sugar and water content in them. This type of drying takes up to 60 days. During this time, the workers carefully ensure the correct temperature and humidity for the drying process.

The subsequent fermentation serves to develop the aroma, and removes bitter and unpleasant substances from the leaves. The storage and ripening processes involved may take up to several years, in some cases. After the ripening process, the leaves are ready for processing in the cigar factory.

Precise equipment for measuring the optimum equilibrium moisture

The equilibrium moisture is a key factor in the quality of a cigar. There are various methods of determining the equilibrium moisture of cigars. The Rotronic water activity probes work with digital AirChip3000 HygroClip technology, which ensures their high performance and simple, digital adjustment and calibration.

HygroPalm HP23-AW for portable use

The HygroPalm offers the perfect solution for water activity measurement on site. The attachment clamp grasps the bundle of tobacco with its holding jaws, and the HygroClip DC2-S in the measuring chamber measures the equilibrium moisture of the tobacco. The values for equilibrium moisture and temperature are transmitted digitally to the connected hand-held, the HygroPalm HP23-AW.

A special measuring chamber, the "barrilito," has been developed for measurement of equilibrium moisture in cigars. The cigars are placed in the "barrilito," which is closed with a height-adjustable, airtight lid.



Barrilito filled with cigars, and HygroPalm HP23-AW evaluation unit.

Measured equilibrium moisture and calculated water content in one device

Using a large number of empirical measurements, the technical staff of the "Instituto del Tabaco" in Havana have found an algorithm that describes a correlation between equilibrium moisture and water content. This makes it possible to switch the HygroPalm and the application-optimized HygroClip probes between equilibrium moisture measurement and water content calculation.

Best storage conditions for best quality tobacco



When it comes to making cigarettes, the quality of the tobacco is essential. A system for monitoring temperature and humidity ensures perfect storage conditions, improves quality, and reduces the amount of tar.

One of the characteristics of tobacco is that it absorbs a lot of moisture in a high-temperature environment, exuding it in the form of condensation at lower temperatures. This leads to a large population of micro-organisms that cause discoloring, mold, insects, and other phenomena that lead to serious loss of quality and considerable economic losses. Permanent monitoring of the climatic conditions is therefore an extremely important factor in the manufacturing process of quality cigarettes.

Sensors distributed all over the store measure humidity and temperature, and transmit the values to the control-room in real time. The team of supervisors is thus kept informed of the climatic situation in

"Thanks to Rotronic, the quality team is kept informed about the climatic situation at all times, and can intervene at once, if need be."

XiangYing Guo
Xuchang Tobacco Factory, China

the tobacco store at all times, and can intervene if necessary. Because an alarm is triggered immediately when a preset value is exceeded. Monitoring humidity and temperature during the turning and airing process prevents variations that could seriously impair the quality of the tobacco. The Xuchang Tobacco Factory,

known as "the Tobacco Kingdom," was founded in 2003. In a total of 13 tobacco-processing centers, it produces 1.07 million packs of cigarettes a year. With a market share of more than 70%, the Tobacco Factory is among China's top 500 companies.

The overall monitoring system comprises more than 400 sets of HF520 and HC2-S

The HF520 is the Rotronic company's latest development in universal transmitters. Fitted with freely selectable analog outputs, the HF520 offers a wide range of applications, and its digital outputs ensure full network compatibility. Thanks to AirChip3000, the HygroClip2 series HC2-S probe offers a unique, convincing calibration and adjustment process. In addition, it offers the highest degree of reproducibility, and a guaranteed system precision of <0.8%RH and 0.1 K. The delivery to Xuchang was rounded off by a digital calibration solution for the factory's own calibration laboratory.



One of the 400 Hygroflex HF520 units in use at the Xuchang Tobacco Factory, China.

Rugged, versatile, precise



Measuring devices by Campbell Scientific enjoy an excellent reputation worldwide. Campbell Scientific (Canada) Corp. (CSC) in Edmonton, Alberta, Canada, stands for high quality data acquisition systems and data management services.

The ISO 9001 certified company is the leading manufacturer in the meteorological data acquisition sector – and that is not only thanks to its products. The committed team in Edmonton displays a lot of stamina and competence in the CSC core mission, which is to complete all measurement tasks to perfection.

"We value the Rotronic HC2-S3-L probe for its ability to function at extreme temperatures."

Mike Ryder
Campbell Scientific, Canada

CSC systems are world renowned for their dependability, which they demonstrate even in the most extreme climates.

Their characteristics include wide operating ranges, low energy consumption, many communications options, and the flexibility to support a wide variety of measurement and control applications. Applications include, agriculture, air quality, fire warning, water quality, weather and climate recording, structural monitoring, geo-technical monitoring, and mining.

Rotronic and CSC have been business partners for many years. CSC uses the Rotronic HC2-S3-L in many applications. Recently, CSC installed the HC2-S3-L meteorological probe in a network of Road Weather Information Systems in Kelowna, British Columbia. CSC selected the probe because of its reliability, ease of use, and accuracy. The HC2-S3-L is also highly regarded for its ability to function

in extreme temperatures. This makes it suitable for the Canadian climate, and a perfect complement to Campbell Scientific systems.



Network of Road Weather Information Systems (RWIS) in Kelowna BC with ROTRONIC HC2-S3-L, installed by CSC.

Rotronic solutions by wind and weather



LSI-Lastem is an Italian company that can look back on a history of more than 40 years in the area of environmental measurement technology.

The company was formed following a merger of the LSI company, which had been making measurement instruments for determining temperature, relative humidity and airspeed since 1972, and Lastem, which specialized in the production of meteorological systems. Right from the start of its company history, LSI-Lastem set itself apart from the competition with innovative, trail-blazing solutions. As early as the nineties, the first multi-meters came on the market, capable of controlling a large number of sensors for a variety of measurements. This concept has recently been enhanced

with complex multipoint systems that allow simultaneous measurement of different parameters at different points in the surroundings. Solutions by LSI-Lastem are used in the following areas:

- Indoor
- Monitoring of pollution levels and the environment
- many meteorological applications (weather stations)

For many years, LSI-Lastem has relied on Rotronic's vast store of knowledge, and uses the outdoor HC2-CP03 cable probes in its weather stations. These synoptic weather stations comprise a large number of different sensors, which are integrated using data-standardization software solutions. The specified Rotronic probes are used to measure basic data, such as temperature and relative humidity, which are recorded by all weather stations.

Although Rotronic offers a very wide range of products, emphasis is also placed on flexibility; again and again, tailor-made solutions are worked out for specific customer requirements. In this case, cable length, power supply and outputs were designed to fit in one and the same housing for extreme ease of use.

The highest weather station in the world on Mount Everest

By choosing Rotronic solutions, LSI-Lastem were able to assure not only optimum dimensions, but also a high level of performance. As engineer Mr. Federico Pasquini, Chief Operating Officer at LSI-Lastem, explains, "The Rotronic probes have completely fulfilled our expectations, because they overcome certain limitations on the measurement of relative humidity in higher regions, even in difficult situations, and this is

hard to achieve with other solutions." Extreme situations are the specialty of LSI-Lastem. The company implemented the highest weather station in the world on the southern peak of Mount Everest at a height of 8,000 metres. This station contains three Rotronic sensors, proving how perfectly the highly developed, reliable technologies by two partners can complement each other.

"The Rotronic probes provide a level of performance that is hard to achieve with other solutions."

Federico Pasquini
LSI-Lastem, Italy



HC2-CP03 Probe

The cable probes for meteorology and outdoor applications are equipped with a high-speed sensor, a new filter technology that significantly improves protection of the sensor against the formation of bio-film, and an increased input voltage range for battery-operated systems.

Steriline relies on Rotronic measurement devices



This dynamic company in Como has been manufacturing automatic equipment for the pharmaceutical sector for more than 25 years, relying on Swiss precision.

Steriline products combine basic principles such as reliability and precision. So it is no wonder that the company enjoys an excellent reputation with the world's leading pharmaceutical companies.

"Rotronic products are of the highest precision. Process continuity is assured, even during maintenance."

Enrico Maestri
Steriline, Italy

Among the many solutions that Steriline has implemented for the pharmaceutical industry, there are a few particularly significant ones – for example, isolators that are used for processes such as quality control and sterility testing, and wherever

precise monitoring of various environmental conditions, including temperature and humidity, are fundamentally important. The measurement and control instruments integrated in the isolators are therefore those that ensure that the end results of the processes are compatible with the strict, sector-specific regulations. Repeatability, precision and reliability of the measuring instruments are the basic prerequisites for meeting the required standards.

To ensure the necessary precision when measuring humidity and temperature in the isolators, Rotronic instruments are used. The Swiss specialists in high-technology measurement solutions guarantee highest quality and precision. For instance, all phases of production, which takes place in the company's own, strictly controlled manufacturing loca-

tions, are subject to comprehensive monitoring processes.

This is also true of the humidity measurement transducers of the type Rotronic HygroFlex5, combined with HC2-S probes, that Steriline uses.

And it's not only precision that speaks for Rotronic – it's their perfect customer service, too. Any necessary maintenance work is carried out quickly and with no red tape, ensuring uninterrupted process continuity. Reliability at the highest level, in both products and services, make Rotronic instruments the ideal components for manufacturers of machinery for the pharmaceutical industry. This ensures complete conformity to the strict quality requirements of this sector. That's why Steriline has for years depended on measuring instruments and technological expertise by Rotronic.



The HF5 measures relative humidity and temperature, and calculates all psychrometric parameters in the HVAC, industrial and pharmaceutical sectors.

Measurement probes for top-level laboratory equipment



Temperature and humidity play an important part in laboratories. What is needed is measurement solutions that are perfectly adapted to this specific environment.

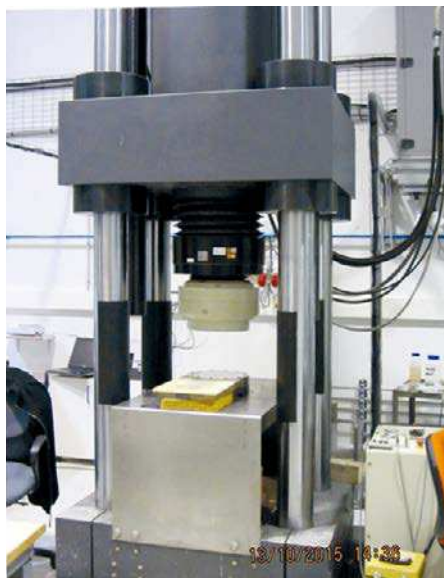
IFSTTAR was founded in 2010 as a merger of the LCPC (Laboratoire Central des Ponts et Chaussées) and the INRET (Institut National de REcherche sur les Transports). In the same year, it moved from Paris to its new location in Champs sur Marne. With more than 1,150 employees, six branch offices in France, and a budget of 100 million Euros, IFSTTAR is involved in 90 current projects and 80 registered patents Europe-wide.

Various IFSTTAR laboratories are air conditioned, and must carry out the functions of a climatic chamber, with temperatures ranging from 0 to 40 °C, and humidity from 20 to 100 %.

Limitations

Network recording is of limited use in implementing this, and involves higher costs. Monitoring must be easy to set up,

easy to access for inspection, precise and stable, and must not vary over time in the high humidity. After use in laboratory



Mechanical structure around concrete components.

acceptance experiments, the measurement probes are used for various tests.

Rotronic's solution

IFSTTAR decided to purchase ten HC2-S measurement probes, each connected to a LOG-HC2-RC (autonomous wireless data logger). The ten HC2-S probes were subjected to SCS-certified calibration (comparable to Cofrac), which followed specific IFSTTAR criteria, and embraced three measuring points each for temperature and humidity ($T = -10, 23$ and 38 °C and $H\% = 30, 65$ and 95%).

"Their **small** dimensions and exchangeability make Rotronic probes perfect for our application."

Jean-Claude Renaud
IFSTTAR, France

IFSTTAR

Central tasks of IFSTTAR:

- Basic research and applied research, methodological studies and development of tests and prototypes
- Leadership of expertise and consulting work in the areas of urban civil engineering, building materials, natural risks, and mobility of persons and goods
- Implementation of an information policy for science and technology, and assurance of the propagation of findings, in particular through publications, technical regulations and standards
- Pursuit of a policy of evaluation of results of this scientific and technological research work, in particular in the form of technical support, technology transfer, series of experiments, and certification.

Our new products at a glance

Temperature-stabilized water activity measurement

AwTherm



The AwTherm from Rotronic is a high-end laboratory instrument for water activity measurements in the food, cosmetics and pharmaceutical industries. The great advantage of AwTherm lies in the possibility to heat or cool the measurement chamber, which simplifies and optimizes the measurement process considerably in the case of tempered products, be they goods in cold storage or on heated conveyor belts.

Product information:

- ROTRONIC HYGROMER® IN-1
- Greatest accuracy through precise temperature stabilization
- Wide temperature monitoring range
- Reference probe exchangeable for calibration or cleaning
- Various sizes of sample holders



Measures dew point reliably up to 93 °C

HygroClip2 ADVANCED



The HC2A probe development combines the benefits of the AirChip3000 with a new housing. With the robust HT-1, the HC2A reaches a new level of reliability. The HT-1 sensor is also available in a plug-in version.

Product information:

- New HYGROMER HT-1 sensor
- Exchangeable sensor (optional)
- Fully compatible with HC2 devices
- Measures up to 190 °C in continuous operation and 200 °C over 100 hours, with detached sensor



The compact measurement transducer

CF1-S & CF1-R



The CF1 series is the latest development in reasonably CO₂ measurement transducers with integrated humidity and temperature measurement. Its elegant design fits in perfectly in offices, living rooms, public buildings, etc. The Rotronic SW21/HW4 software makes basic settings, adjustment, and calibration easy.

Product information:

- Scalable analog voltage or current outputs
- One relay output
- Three programmable LEDs



Measures, checks, and monitors

CRP5



The ideal device for cleanroom monitoring. Its comprehensive functionality allows perfect, application specific configuration of the CRP5.

The CRP5 is distinctive in the marketplace due to its tough glass front plate and a removable humidity sensor.

Product information:

- Measures differential pressure, humidity and temperature
- Designed specifically for cleanrooms
- Removable probe for simpler adjustment and cleaning
- Chemical resistant glass front
- FDA- and GAMP-compatible
- Very high measuring precision
- Digital communication via Ethernet RJ-45 and/or MODBUS TCP / RTU
- Analog input and output signals freely configurable
- Optical operating elements



Compact, robust construction

BF220



New parameter: Process Pressure. Rotronic present their new pressure transmitter for process pressure measurements. The process pressure transmitters are ideal for measurement of absolute pressure in applications with rapid temperature changes, and in compressed air, HVAC and pneumatic systems.

Product information:

- Piezo-resistive steel sensor
- Very high precision
- Compact, robust construction



Airspeed measurement made easy

AF1



The AF1 series is an inexpensive, highly accurate, stable transducer for measuring air velocity. The devices are equipped with a calorimetric sensor and boast outstanding long-term stability. The measurement range and output signal can be set easily via dip switches, without additional software.

Product information:

- High stability and reproducibility
- Simple mechanical installation
- Excellent price-performance ratio
- Ideal for HVAC applications



High voltage in micro-water measurement system



Sulfur hexafluoride (SF₆) is an inorganic, colorless, odorless, non-flammable, extremely inert greenhouse gas that has excellent qualities as an electrical insulator. Decomposition of SF₆ results in acidic by-products when water is added to the mix. It is therefore necessary to keep moisture in the gas chambers of

high-voltage electrical equipment at the lowest possible level.

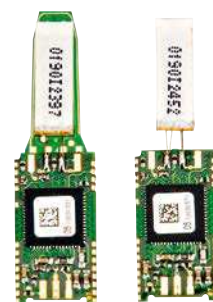
Although the injected SF₆ gas is dry, and is sealed under high pressure due to the great difference between the partial water vapor pressures on the inside and outside of the chamber, the water molecules still have a high invasive potential. It is very important to check the gas humidity in high-voltage electrical equipment after a certain period of operation.

Traditionally, the humidity has been ascertained by suctioning off gas for measurement. In recent years, however, online humidity measurement systems have become more and more important.

The density and micro-water monitoring system allows users to easily and quickly access the operational status of each substation. Detection of dynamic digital pressure and micro-water changes the monitored data to reflect any deteriora-

tion in the quality of the gas in the switch, prompting preventive maintenance on the part of the users. This system can detect micro-water of SF₆ gas, monitor line density in the gas chamber, and display all the data on the server, such as unit numbers, standard pressure (20 °C), micro-water value (ppm), the current pressure, temperature, dew point, alarms etc.

OM.M800SF6 uses ROTRONIC's ROPCB as the core component of the micro-water measurement unit. In the HC2-ROPCB humidity & temperature module, we make the heart of our sensor technology available to our OEM customers. Based on AirChip3000 technology, the sensor signal is processed to output a digital UART signal or a 0..1 VDC analog signal. It can compensate temperature and humidity at



ROTRONIC
ROPCB module

over 30,000 reference points, store 2,000 data records and calculate the current dew point. The chip's auto-diagnostic function performs regular checks, records the sensor status and triggers an alarm if necessary.

Shanghai Oumiao Power Monitoring Equipment Co. Ltd.

The company, founded in 2009, is located in Qingpu District, Shanghai. Oumiao delivers high-voltage electrical equipment, intelligent monitoring and diagnosis systems, and engineering services for energy sector users.



ROPCB integrated in micro-water detection device.

PDF logger for Hamburg raw-material dealer



BMP Pharma Trading AG is a Hamburg company that has made a name for itself as a specialist in the worldwide trade in raw materials for the pharmaceutical and food-stuffs industries.

BMP lays great store by the best possible quality in all areas. Long-term, highly qualified employees are as much part of the secret of the company's steady growth as are flexibility, speed, and reliability.

This has made the company a competent partner for the worldwide sales of any pharmaceutical or food products since 1979. A decisive factor in this is the storage of the products in ideal climatic conditions.

In order to fulfil the very latest GxP requirements on storage and transport, and to ensure the optimal climatic conditions for the storage of the sensitive raw materials,

temperature and humidity mapping were carried out with the Rotronic team.

For recording and monitoring of transportation conditions, BMP chose the Rotronic PDF logger, which convinced them with its simple handling, software independence, and automatic PDF reports.



Cold-chain temperature logger: reliable, cheap, and easy to use.

Take part and win

Answer the questions correctly, and win one of three Swatch smartwatches!

1 Above what CO₂ concentration should a room be ventilated?

- a) 400 ppm
- b) 1,200 ppm
- c) 1,500 ppm

2 What does Rotronic call its portable hand-held meters?

- a) HandHeld
- b) HygroPalm
- c) HygroHandy

3 Where is the AwTherm used?

- a) Foodstuffs industry
- b) Cosmetics industry
- c) Pharmaceutical industry



Winner 2015:

David Frei of Hälg & Co. AG in Zürich.

Answers:

| | | |
|---|---|---|
| 1 | 2 | 3 |
|---|---|---|

Send your answers (e.g. 1a / 2b / 3c) either by email to kow@rotronic.ch or enter them in the **boxes** above, add your contact details and fax to +41 44 838 13 07.

| | |
|------------|------------------|
| First name | Surname |
| Company | Position |
| Street | Postal code/Town |
| E-mail | Country |

Entry conditions

The closing date for entries is the 31st of August 2016. The winner will be informed by the 15th of September 2016, and their name may be published. Entry is free of charge, and entails no obligation. No cash alternative is available. No correspondence will be entered into regarding the competition, and the judges' decision is final. Rotronic employees and their families may not enter the competition. Personal data will be treated confidentially and not passed on to third parties.

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Events 2016

| Event | City | Country | Date |
|-------------------|-----------|-------------|--------------------|
| AHR2016 | Orlando | USA | 01/25 – 01/27/2016 |
| SIAM | Guangzhou | China | 03/08 – 03/10/2016 |
| Lounges | Stuttgart | Germany | 04/05 – 04/07/2016 |
| Data Centre World | London | England | 04/12 – 04/13/2016 |
| Pharmintech | Bologna | Italy | 04/13 – 04/15/2016 |
| InterPhex 2016 | New York | USA | 04/26 – 04/28/2016 |
| Sensor + Test | Nuremberg | Germany | 05/10 – 05/12/2016 |
| Bakery China | Shanghai | China | 05/11 – 05/14/2016 |
| ISOPOW XIII | Lausanne | Switzerland | 06/26 – 06/29/2016 |
| TEMPMEKO | Zakopane | Poland | 06/26 – 07/01/2016 |
| MTWE | Madrid | Spain | 09/27 – 09/29/2016 |
| Cibustec | Parma | Italy | 10/25 – 10/28/2016 |

You will find details at: www.rotronic.ch/rotronic-events

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