

# MEASUREMENT NEWS

Edition 2017

Live monitoring  
for perfect storage conditions



**Focus on IoT**  
Rotronic Monitoring System – RMS



**For the good of our health**  
Monitoring by Rotronic



**Competition**  
Win an iPad mini 4



**Fredi Hagenbucher**  
Head of R & D

#### Rotronic Monitoring System video



Our short video explains how the universal Rotronic Monitoring System carries out your measurement tasks.



Rotronic is continuing to invest in forward-looking digital technology. With the HygroClip we already had the slogan "Rotronic goes digital." So before IoT even got noticed, we had realized the potential of digitization. The IoT hype has now reached the industry, in the form of the so-called Industrial Internet of Things (IIoT).

IIoT is the billion-dollar business of the future. McKinsey estimates that in 2025, the possible global economic effects of the Internet of Things, depending on the sectors it is used in, will be between 3.9 and 11.1 billion USD.

### "RMS opens up new perspectives"

I am proud to have made a small contribution to the fact that we can today offer IoT and Machine-to-Machine (M2M) with the Rotronic Monitoring System RMS, and that our team are familiar with the latest digitization at the highest level. This gives us the opportunity to see new business models, and to understand them.

RMS is a modular system comprising new products and software. RMS combines IoT, M2M and Industry 4.0 which is the current trend of automation and data exchange in manufacturing technologies. The most important elements in IoT are the sensors, which provide the necessary information for new business models. RMS products have complete interaction capability. That is, they transfer information into the Internet,

or to another device, either locally or globally. The RMS software collects and analyzes data, and independently monitors, informs, alarms and documents.

Rotronic sees the business model of the future as a symbiosis between sensors and service. In the case of RMS, the device, or rather the individual component, fades into the background. The focus is on the system, and the customer's requirements. This way, RMS will ensure customer satisfaction through digital added value.

I am fully convinced that the benefits of digitization will set new standards in creativity. With RMS, Rotronic already offers user integration capability. An important factor for IoT models. Because this is nothing more or less than the integration of the customer in the processes that he or she requires.

The entire Rotronic Measurement Solutions team will be glad to support you in realizing your RMS projects at any time.

I hope you enjoy reading this issue of Measurement News!



Fredi Hagenbucher

## Business Cases



## New Products



## Competition



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# Perfect pasta with Rotronic



*In the reception area of JOWA AG (from left): Marko Schulze, qualification technician (Rotronic) with Andreas Zülle, head of production, and Oliver Höfler, head of site (JOWA, Pasta Buchs).*

It is important for JOWA AG, Pasta Buchs that its production operations run smoothly and meet strict quality standards. Probes from Rotronic accurately measure the controlled climate in the factory's six production lines. To ensure that these instruments continue to provide reliable correct data, they need to be calibrated and serviced.

JOWA AG manufactures 18,000 tonnes of pasta per year and is the largest pasta producer in Switzerland. The market is highly competitive, the euro-franc exchange rate unfavorable, the quality requirements of customers demanding and food legislation strict. It is therefore all the more important that the pasta to produced in the finest quality without production stoppages and batch rejects.

The drying process plays a key role in the production of dried pasta and is therefore accorded top priority at JOWA. In order to control the climate optimally,

temperature and humidity probes from Rotronic are used in the production lines. To preserve the food for a long shelf life and prevent mold and negative microbiological processes, the pasta is dried. Humidity and temperature therefore need to be monitored closely during production. Legislation in Switzerland states that pasta products may not contain more than 13 percent water.

#### **High demands on probe accuracy**

"The temperature and humidity of each production step must be recorded exactly." Andreas Zülle, head of production at JOWA Pasta Buchs, adds: "It is there-

**"We greatly appreciated the open and transparent collaboration with Rotronic."**

Oliver Höfler  
JOWA AG, Switzerland

fore crucial that our probes measure very accurately and are checked regularly to make sure the quality is right. In the past we checked all probes internally on an annual basis and sent them in to Rotronic for calibration if we found discrepancies. Now we have Rotronic additionally calibrate the instruments every two years even if our reference

measurements lie within the tolerance range.” There are several reasons for this. Andreas Zülle wanted to have the probes calibrated externally by experts: “Due to the interval, we are dependent on absolutely reliable calibration. In addition to this, we want a calibration certificate for all probes from the specialists Rotronic.”



*Rotronic I-2000 sensor, providing reliable service for more than 15 years.*

### **Project Workflow: good and long-term planning**

Planning for the calibration project was started around two months before implementation. JOWA AG in Buchs stops production twice a year, two weeks in winter and two weeks in summer, in order to check all equipment and machinery and so maintain the high quality standards. Andreas Zülle, head of production, ensured that the 50 probes (both the I-2000 transmitters dating back to at least the year 2000 and the newer HF5 generation) were disconnected right at the start of the last inspection so that Marko Schulze, Rotronic's qualification technician on site, could begin calibrating the measuring devices. All probes were also cataloged. Marko Schulze: “JOWA's planning was ideal: I was able to check all the probes and either get them back into shape or replace them, and then we still had enough time to test the newly adjusted probes.”

Marko Schulze also calibrated other spare probes so that faulty products can be replaced simply during operation without any interruptions in production. Smooth implementation of such an in-



*Migros dried pasta perfectly monitored.*

spection and calibration procedure is also important to Andreas Zülle: “After the calibration, our process specialists were able to start up the production lines again without any problem.”

Oliver Höfler adds: “We greatly appreciated the open and transparent collaboration with Rotronic, found Marko Schulze to be an extremely competent partner and are sure we will be able to carry out calibration of our instruments even more efficiently next time. They have now been cataloged in detail. On top of that, we can also check the probes during operation with the HygroPalm from Rotronic.” Both sides benefit from good planning and an excellent working relationship.

### **Calibration and Adjustment by Rotronic**

Even though Rotronic instruments boast excellent long-term stability, we recommend that probes are calibrated regularly – typically once a year is normally sufficient. More frequent calibration can be necessary if the probes are used in polluted/contaminated environments. Sensors can be adjusted easily if found to be necessary.



Rotronic offers a wide range of end user calibration accessories including the HG2 portable generator. Filters are service items, they need to be checked regularly and cleaned or replaced as necessary.

### **JOWA AG, Pasta Buchs, the Migros pasta factory**

JOWA Pasta Buchs has been producing dried pasta in Buchs, Switzerland for more than 50 years, largely for the retailer Migros. The durum wheat semolina needed for production comes from a mill in Wildeggen that also belongs to JOWA. A team of 46, working three shifts a day, ensure that high quality raw materials are transformed into products at an optimum price-performance ratio.

# Live monitoring at Keppel Logistics warehouses



RMS Mini Logger installed in the warehouse.

Keppel Logistics operates world-class logistics facilities with state-of-the-art IT infrastructure, and relies on the new Rotronic Monitoring System in their warehouses.

In Keppel's storage spaces, temperature monitoring is key. Keppel's customers in the pharmaceuticals sector utilize both air conditioned and non air conditioned storage.

One of Keppel Logistics' main requirements is to be able to carry out real-time monitoring, allowing both the management and their customers to have direct access to the warehouse conditions from anywhere in the world and at any time.

Furthermore, Keppel required a simple way to collect data, while at the same time maintaining the integrity of the data. Based upon Keppel's and their customers' requirements, the Rotronic Monitoring System was implemented,

**"We were convinced by the flexibility that RMS offers with regard to further expansion of the system, and by the ease of use."**

Vync Toh  
Keppel Logistics, Singapore

## Keppel Logistics

Keppel Logistics is a wholly owned company of the Keppel Telecommunications & Transportation Group in Singapore. Its core business areas are logistics and data center operations in the Asia, Pacific and Europe area.

allowing real-time monitoring and data recording, and meeting the requirements of FDA 21 CFR Part 11.

Rotronic was able to offer Keppel two solutions: either a cloud-based system hosted from either Singapore or Switzerland, or a server-based system installed directly at Keppel Logistics.

The system setup (choice of software, hardware and services) was made by the team leader. All temperature points are automatically uploaded to the system. Management just have to login to access the data, or can receive their own personalized reports remotely on a regular basis. With no more manual data collection, this saves a tremendous amount of time - the data are accessed via smartphone, tablet, or PC, from any location worldwide.

Presently, Keppel measures only the temperature. However, thanks to the flexibility of RMS, Keppel has the capability to monitor further parameters, such as relative humidity, dew point and differential pressure, also door contacts, and much more. Even third-party products can be integrated without any issues.





# Decontamination: Rotronic probes for Amira



Amira offers solutions for the pharmaceutical industry and for research centers. For their BioReset decontamination product line, the company chose the extremely robust Rotronic HygroClip2 probes.

The Amira company, located in the Province of Brianza, Italy produces devices and machines for use in various sectors, including pharmaceuticals and research centers. The BioReset line of instruments has been developed, patented, and realized in the course of the last few years, and is marketed worldwide. These instruments are for bio-decontamination using hydrogen peroxide vapor, a technology that allows a wide range of bacteria, viruses, and molds to be eradicated, even at low temperature, and without negative effects on the treated environment. The reason

for this is that the corrosive effect of hydrogen peroxide is minimized in its gaseous state.

To ensure that the vapor does not re-condense, Amira integrate specific sensors in their solutions that allow temperature, humidity, and dewpoint inside the treated rooms to be monitored with extreme precision. These Rotronic sensors are resistant to the corrosive effects of hydrogen peroxide.

## Reliability and precision

"We had no doubts whatsoever about the choice of components to be used in these areas," says Angelo Delmiglio, founder and CEO of Amira, who has known and valued Rotronic solutions for over 25 years. "Rotronic products are renowned for their reliability. Thorough comparisons have shown that these products, even in specific cases, are optimally suited to provide the necessary precision and repeatability of the processes."

From among the many solutions that Rotronic offers for decontamination with hydrogen peroxide, Amira decided in favor of the HygroClip2 (HC2) probe. Thanks to their housing made from corrosion resistant material (polycarbonate or chrome steel, depending on the model), these probes are especially suitable and, with their extreme precision and short response times, ideal for the pharmaceutical industry.

International pharmaceutical companies rely on Amira solutions, and in all applications of this kind, the Amira devices, thanks in part to the high quality of the components used in them, are 100% capable of meeting the customers' expectations.

"Our products are developed and manufactured in Italy, and are recognized worldwide, thanks to the quality of their components."

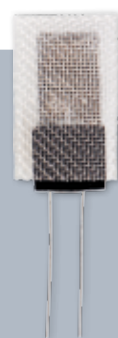
Angelo Delmiglio  
Amira s.r.l., Italy

## AMIRA s.r.l.

The company is highly regarded for the quality of its products, and is active in the global market, where, in addition to its products, it offers comprehensive after-sales service, including verification, calibration, and operator training. The complete BioReset bio-decontamination product line, developed by Amira, is sold all over the world.

## HygroMer HH-1

Hydrogen peroxide ( $H_2O_2$ ) is used to sterilize clean rooms, incubators and other equipment.  $H_2O_2$  puts heavy stress on the sensors, which is why Rotronic has developed a special sensor, the HygroMer<sup>®</sup> HH-1, which can resist the higher stress of the  $H_2O_2$ .



# The Optimum Principle in drying



*Totech cabinet combination with one active and two passive modules from the MSD series.*

This high performance drying unit is the first to allow the necessary regeneration to be dynamically adapted to the requirements.

The prerequisite for this is a precise, long-term stable humidity sensor. Compared with the cyclic method, this saves a lot of energy, and increases availability. Combined with the appropriate type of cabinet, this means tailor-made solutions for any application.

## Adsorption drying in detail

The rate of drying is strongly influenced by the differential vapor pressure. The lower the vapor pressure in the storage environment, the quicker the moisture is extracted from moistened components and circuit boards. The Totech GmbH storage systems create an atmosphere with  $< 0.5\% \text{RH}$  at room temperature, and with a water vapor content of less than  $0.05 \text{ g/m}^3$  practically generate a "moisture vacuum". This leads to an ef-

fective re-drying process, with already absorbed moisture being dissipated again. This process is extremely gentle, because it entails no thermal stress whatsoever.

## Dynamic drying unit is the core

The newly developed, dynamic, high performance drying unit U-5002 by Totech still achieves humidity values below  $0.17\% \text{RH}$ , even at  $60^\circ \text{C}$ . Even with the door open, the humidity hardly rises above  $5\% \text{RH}$ , and drops to well below  $1\% \text{RH}$  again within a few minutes. This is with an energy consumption that is lower than that of the earlier models. Whereas it was necessary previously to regenerate the drying agent at regular intervals (usually every six hours), this process can now, for the first time, be controlled as required.

The condition of the drying agent is checked continuously by a microprocessor, and compared with the stored set-point values. Only when the moisture content in the cabinet exceeds the absorption capacity of the drying agent, is thermal regeneration initiated. This in turn is individually adapted to the desired residual moisture in the cabinet. It was thus possible to further dramatically reduce the energy consumption in storage cabinets that are rarely opened. A regeneration of 15 minutes is often sufficient for several weeks' drying.

## The sensor – guarantee for reliability

One important prerequisite for control of the regeneration processes is precise, long-term stable measurement of the humidity in the dryer's atmosphere. Here, the exceptionally fast responding HC2-S probe from Rotronic has

thoroughly proved its mettle. The data logger that is integrated in the precision sensor records relevant data, such as humidity and temperature, without interruption in offline mode. In addition, these data can be stored online via the standard serial port, and monitored for threshold infringements. This forms the basis for reliable documentation in the context of Moisture Sensitive Management.

Thanks to its reliable plug connector, recalibration of the entire systems is possible by swapping in a calibrated Rotronic probe with a certificate.

**"Rotronic HygroClip2 probe – indispensable for our high performance drying unit."**

Gerhard Kurpiela  
Totech GmbH, Germany

## Totech GmbH

Totech is a leading company in the product categories of drying cabinets, dry-storage cabinets, vacuum units and nitrogen cabinets. With the dynamic drying unit in the absorption-drying storage cabinets, all moisture sensitive components are dried quickly, gently and with high process reliability. Storage in a dry atmosphere also offers optimum protection from oxidation. The maintenance-free drying units, combined with the precision sensors from Rotronic, lead the way in de-moisturizing performance paired with greatest energy efficiency.



# High quality storage for sensitive products



## Safetec products protect workers who are exposed to many infectious diseases during their working hours.

These workers include doctors, nurses, technicians, laboratory workers, first responders, maintenance, security, and many others. In order to protect everyone that comes into contact with potentially hazardous infectious material, Safetec developed and manufactures several lines of products that can combat the spread of infectious diseases.

The team at Safetec follows exemplary quality control procedures when developing and manufacturing all their products, and complies strictly with standard FDA and EPA regulations. Safetec selected Rotronic for monitoring their recently upgraded warehouse for temperature and humidity. The ability to check the environmental conditions of the warehouse, both near-term and to verify the proper operation of the upgrades was important for long term quality assurance. The Rotronic Service Team developed a mapping plan that would provide data for temperature and humidity for the warehouse areas. The facility was inspected by Rotronic with a focus on potentially hot and

cold zones. Loggers were deployed with these areas in mind with the loggers positioned evenly throughout the facility in a three-dimensional pattern.

There were several goals for the temperature and humidity mapping. Hot and cold zones would be identified. These hot and cold zones would provide a "worst case scenario" for the impact on the stored Safetec product and materials. The mapping effort would also provide the best locations for the long-term permanently installed Rotronic monitoring system. Rotronic deployed the HL-1D loggers amongst the stored product for the mapping study. The study was a two-week study conducted during the historically hottest time of the year for their Buffalo NY facility. The data was collected and a report of the data was generated to verify that a high quality storage environment is maintained for Safetec's materials and products. For the long term permanent monitoring system, a wireless system was selected which would reduce installation costs and would make the system

more flexible in the future. The highly accurate LOG-HC2-RC logger would make the system easy to reconfigure logger locations based on changing warehouse needs. Rotronic monitoring software was deployed for capturing data both in real time and to upload the logger's locally saved file history.

Laurie Ramsey states: "Safetec of America chose Rotronic for its warehouse monitoring system since it offered great flexibility, reliability and outstanding customer service. Rotronic performed warehouse mapping to ensure critical humidity and temperature data was being captured. We used the mapping data results to confirm that the daily humidity and temperature probes were placed in the correct locations. We now have a great monitoring system that is dependable and also complies with FDA requirements."

**"Rotronic offered an outstanding customer service."**

Laurie Ramsey  
Safetec, USA

### Safetec of America, Inc.

Safetec is a U.S. infection control and first aid product manufacturer, which strives with a team of 100 highly qualified employees to keep workers safe from cross-contamination of infectious diseases.

### HygroLog HL-1D



The HL-1D is a compact, inexpensive data logger capable of  $\pm 3.0\%$  RH and  $\pm 0.3^\circ\text{C}$  accuracy. The internal memory can store up to 32,000 lines.



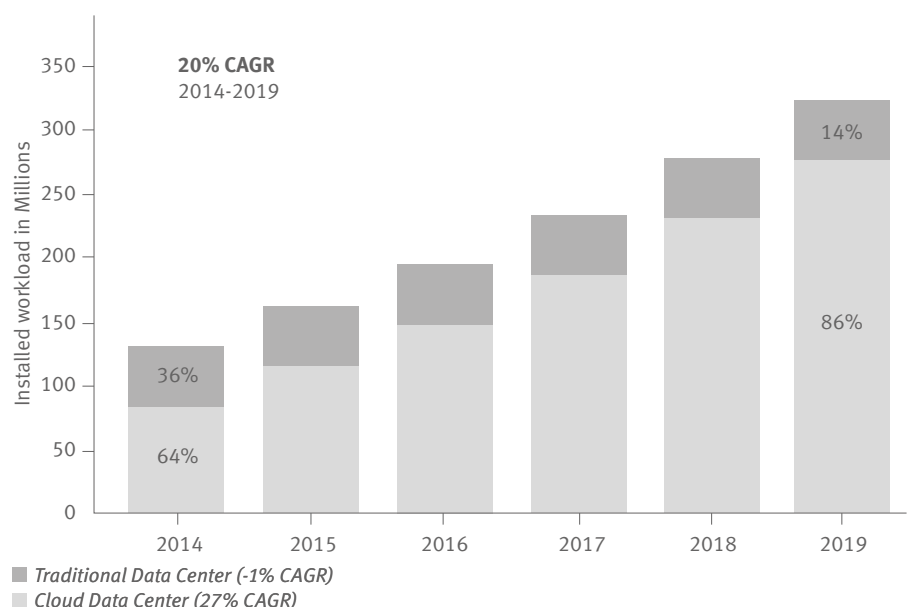
# Colt Data Centers monitored by Rotronic



The cooling of data centers is vital for servers to run smoothly. A task for Rotronic transmitters, which assure reliable control and monitoring, even in harsh conditions.

Colt Data Centre Services is a data centre operator providing flexible co-location services to customers across Europe and APAC. Colt Data Centre Services was the first data centre provider in Europe to achieve the highest M&O award which is accredited by the the Uptime Institute. The London 3 Colt Data Centre is located just outside London and is the flagship facility for Colt.

The facility provides 12,500 m<sup>2</sup> of co-location space for server racking and guarantees Tier 3 performance (meaning that the whole site can be maintained and operated all year and still deliver an uptime of >99.982%).



In a server rack virtually all energy is converted to heat, as such cooling of data centres can be extremely costly and is absolutely critical. Without cooling IT hardware would rapidly overheat. Spikes in heat can cause faster component damage leading to server failures, or servers having to be shut down for maintenance. With virtually every business on the planet having some requirement on the internet unplanned server downtime is hugely costly.

Service Level Agreements with Data Centre providers typically come with hefty fines should such events occur. A large data centre like London 3 requires substantial energy to power the servers. Colt London 3 can deliver 143,000 v of electricity for servers. Indirect adiabatic cooling is used where possible as a highly efficient method in which air is cooled simply through the evaporation of water. Cooling with the introduction of high humidity requires precise control. Colt Data Centre Services take their environmental control systems very seriously.

Refurbished and new modules at their London 3 site are now being controlled and monitored with Rotronic HygroFlex5 and ThermoFlex5 transmitters. Working with Nortek (formally Eaton Williams), Excool and system integrator Intelligent Building Automation Ltd, Colt has updated and installed several new data centre lines to further improve reliability and reduce control costs.

Ultimately, improved efficiency and reliability ensures Colt Data Centre Services is providing the most environmentally friendly solution. Previously Colt demonstrated 18% energy reduction through simple improvements to data centre efficiency. This next phase is further driving down energy use and costs through the use of Rotronic instrumentation in the data centre halls and cooling equipment.

The reputation of Rotronic combined with high accuracy and low maintenance of our products was a key factor in Colt choosing to use Rotronic in these highly critical applications.



*Indirect adiabatic cooling ensures highly efficient cooling to server racks.*

### Colt Data Centre Services

Colt Data Centre Services provides global data centre solutions across Europe and Asia Pacific (APAC). Colt manages a portfolio of 29 data centres providing ISO 27001 certified data security forming one of the worlds most connected data centre networks.

**"The company's reputation combined with high accuracy of their products made us choose Rotronic."**

Andy Freezer,  
Colt Data Centre Services, UK



### HygroFlex5

The HF5 measures relative humidity and temperature, and calculates all psychrometric parameters in the HVAC, industrial and pharmaceutical sectors. It convinces through its unique adjustment process.



### ThermoFlex5

The TF5 measures temperature only. It is just as reliable as the HF5 in production processes, storage and drying processes.



# aw-Measurement for sensitive seeds

"Rotronic has become the standard for water activity measurement at many seed storage facilities throughout the world."

Dale Simpson  
Tree Seed Working Group, Canada



## Water activity measurement plays an integral role at the Tree Seed Centre in British Columbia.

The Tree Seed Working Group has four objectives related to promoting tree seed science and technology through:

- Seed research from bud initiation to seed use
- Identification of seed problems relating to seed improvement and forest management
- Exchange of information on seed related problems
- Consulting on implementation practices

Water activity continues to be an area of interest to the Tree Seed Working Group TSWG, especially with their genetic conservation collection. "It simply is the best technology to use to maximize longevity of tree seeds" says Dale Simpson of the TSWG. Dale continues, "Rotronic has become the standard for water activity mea-

surement for many seed storage facilities throughout the world."

### Influence on the longevity of the seed

Meghan Duke works for the Ministry of Forests, Land and Natural Resources Operations, and is also a member of the TSWG. Although water activity is a relatively new technology to the Tree Seed Centre, it already plays an important role. Meghan explains: "A water activity meter is a quick, non destructive tool for evaluating moisture in a sample of seed. The meter outputs a value between 0 and 1, which is equivalent to equilibrium relative humidity (eRH) if the meter and the sample are at the same temperature. It differs from a moisture content test in that it assesses free water rather than the total water content in a sample of seed.

The amount of free water in a seed will depend on its relative composition of lipids, starches, and proteins. Storing seed in the freezer with a water activity measurement that is either too high or too low will decrease the longevity of the seed. The ideal level ultimately depends on the species; however, most people now accept the concept of a universal value. At the Tree Seed Centre, we keep within a range of  $0.35 \pm 0.05$ ".

### The role of water activity measurement

Currently, water activity is used primarily for testing seed collected for genetic conservation and research. The seed is often rare and valuable; thus a non destructive method of assessment is imperative. Collections intended for the seedbank arrive at the Tree Seed Centre grouped by population (noted by location), with each population containing, on average, a sample of 10 parent trees. Populations are stored in the cooler at 2°C to await an initial water activity assessment. If the water activity is too high, the seeds are dried back and retested prior to placement in the freezer at -18 °C to maximize seed longevity.

### aw-expertise

You can obtain the White Paper on Water Activity Measurement at [www.rotronic.com/aw](http://www.rotronic.com/aw)



# Winner of the Smart Watch – competition 2016



The lucky winner (right) in France, Pierre Kraus (AERECO), receives his Smart Watch from Thomas Ryan (Rotronic France).

## Winner for Switzerland

Mr. Ralf Wanner  
Manager, Analytic Development  
Vifor Pharma, Ettingen

## Winner for Germany

Mr. Oliver Reiterbauer  
Quality Control, Analytic Service  
Weleda AG, Schwäbisch Gmünd

## Winner for France

Mr. Pierre Kraus  
Laboratory Manager  
AERECO, Marne La Vallée

## Take part and win

Answer the questions below correctly, and win an iPad mini 4!

### 1 What does RMS mean?

- a) Rotronic Measuring Solutions
- b) Remote Monitoring System
- c) Rotronic Monitoring System

### 2 What does Water Activity measurement register?

- a) Total water content
- b) Water absorption capability
- c) Free water

### 3 Which parameters does Rotronic measure?

- a) Low dew point
- b) Differential pressure
- c) Acceleration

Forename

Surname

Company

Position

Street

Town/Post Code

e-mail

Country



### Solution:

1

2

3

Send your solution (e.g. 1a/2b/3c) by e-mail to [competition@rotronic.ch](mailto:competition@rotronic.ch) or enter it in the boxes above, add your contact details and fax: +41 44 838 13 07.

Conditions of entry: The closing date for entries is the 31st of August 2017. The winner will be informed personally, 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.

# Our new products at a glance

The One-Stop Solution

## Rotronic Monitoring System – RMS

Highest quality standards in production and storage demand a comprehensive monitoring system. The Rotronic Monitoring System checks, documents and visualizes all required measurements in one system and makes them available to the user in the desired form. The data can be retrieved from anywhere at any time by PC, tablet or smartphone. The system offers maximum flexibility, is versatile in use and easy to operate.

### Product information:

- GMP- / GLP- / GDP compatibility
- FDA 21 CFR Part 11
- EN 12830
- PDF report with chart and statistics
- Alarming by voice call, SMS or email
- Platform independent
- Suitable for smartphones and tablets



Reference Generator in XL version

## HG2-XL

The newly launched large capacity reference generator HygroGen2-XL quickly achieves stable temperature and humidity conditions for the calibration of humidity and temperature instruments. Compared to the smaller model, the HygroGen2-S, it has a chamber volume 10 times larger.

### Product information:

- Chamber volume: 20 Liters
- Working volume: 17 Liters
- Generates temperatures from 0...60 °C and relative humidity from 5...95 %
- Humidity changes (5...95 %RH, 0.1 %RH stability): <15 minutes
- Temperature changes (23...50 °C, 0.01 °C stability): < 15 minutes



The handheld meter series is extended and redesigned

## HP32 and TP31

With the two temperature measuring devices TP31-IR (infrared thermometer) and TP31-S (folding probe thermometer), Rotronic adds to its portfolio, and further penetrates into the foodstuffs and pharmaceutical industries. As the successor to the proven HP22 humidity and temperature measurement device, the HP32 will be the first in a series of new replacements for our handheld meters.





## Hygrostat/Thermostat

## HS5



The HS5 measurement transducer measures relative humidity and temperature and provides repeatability of  $< 0.02\%$  RH, and with the HC2A-S probe a guaranteed system precision of  $< 0.8\%$  RH and  $0.1\text{ K}$  (at  $10\ldots 30\text{ }^{\circ}\text{C}$ ). Measured values can be output via analog or Ethernet ports.

**Product information:**

- Measures relative humidity & temperature
- All psychrometric calculations available
- Guarantees optimal repeatability
- Highest precision
- Potential-free mechanical relay
- Digital communication via Ethernet
- Freely scalable analog signals
- Update possible via the Internet



## Compact and easy to use

## CRP1



The compact cleanroom panel CRP1 is easy to install and with full compatibility with the HygroClip2 probe series allows measurement of humidity and temperature with the highest precision. The data can be output via analog outputs or MODBUS. Measured values, alarms and trends are shown on the display.

**Product information:**

- Measures humidity and temperature
- Removable probe for easy adjustment and cleaning
- Conforms to FDA and GAMP
- Digital communication via MODBUS RTU
- Alarms: audible and visual alarms, also via relay



## The compact measurement transducer

## CF1-Duct



The newly developed CF1 Series offers a low-priced  $\text{CO}_2$  measurement transmitter with integrated humidity and temperature measurement. With its fixed probe, it is perfect for duct installation in HVAC applications. Thanks to a sophisticated algorithm (ABC), corrections are made automatically, so the sensor needs calibration only every 2-3 years. Setting, adjustment and calibration of the CF1-Duct are really simple via the Rotronic SW21/HW4 software.

**Product information:**

- Scalable analog voltage or current outputs
- Single relay output
- Relay can be assigned to any of the three parameters



## Table-top display for humidity and temperature

## HD1



The HD1 thermo-hygrometer display is ideal for monitoring the temperature, relative humidity and dew point in cabinets, rooms and your work environment. You can mount the HD1 easily on the wall thanks to its integrated fastening points, or simply set it up on a flat surface.

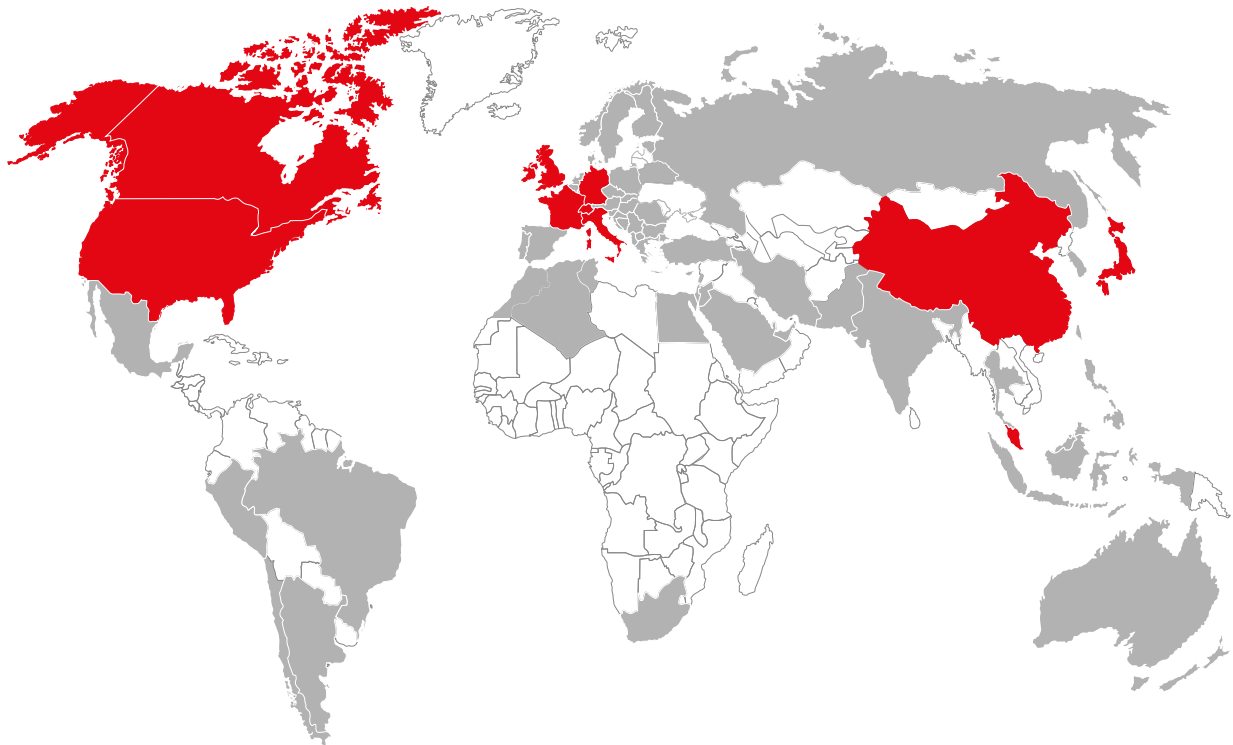
**Product information:**

- MAX/MIN/AVG function
- Audible and visual alarms
- Excellent price-performance ratio



# Rotronic Worldwide

Rotronic is present in more than 40 countries worldwide. You can find a full, up-to-date list of our partners at [www.rotronic.com/distributor](http://www.rotronic.com/distributor)



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