

**ro-tronic**

# Humidity **news**

Issue 1/2002



**A PDA  
from  
COMPAQ  
to be won**

**ROTRONIC-Probes  
480 meters below ground level**

**ROTRONIC-Instruments work in  
weather stations  
in Turkey**

**Special Feature  
ROTRONIC presents the new  
M- and L-series**

## PREFACE



Daniel Ritler  
ROTRONIC AG

We are pleased to present another issue of our Humidity News. Since the first appearance of ROTRONIC Humidity News in 1999, we have increased the circulation from 15,000 to 42,000 because of the brochure's wide acceptance. We are delighted that you have taken so much interest, and in this issue present a few unusual applications to give an impression of the world of humidity measurement.

ROTRONIC AG constantly strives to develop and manufacture products that fulfil the customers' wishes. In this edition, the emphasis is on two new families of transmitters. Our customers in the areas of light

industry and heating, ventilation and air conditioning (HVAC) have provided a lot of ideas. These led to the development of the ROLINE-L and M Series. The clear technological edge that ROTRONIC can offer with the unique HygroClip technology now permits greatest flexibility even in the lower priced transmitters. Read more about the new products on pages 4 and 6.

We would also like to give a more detailed introduction to ROTRONIC AG. We will show you how our sales network is structured, and the areas in which we are active besides humidity measurement technology. You will find this information on page 11.

I hope that the articles in this issue will be of interest to you. We would also like to introduce your application in one of the following issues. Please write to us, or get in touch

with one of our distributors.

And now, please enjoy reading the following pages!

Daniel Ritler  
Head of Department  
Humidity and Temperature  
Measurement

**P.S.: Don't forget to participate in our competition on page 12. An attractive prize – a PDA from COMPAQ awaits the winner!**

## COMPETITION

You will, I am sure, remember the competition in our last issue, which had a digital camera as

the main prize. Many of you gave the right answer; however, there could only be one winner.



The lucky winner, Dr. Durst of Audi Ingolstadt (corrosion-protection-department) during the hand over of the first prize, a digital camera. Maybe you're the winner next time? Participate in our new competition. On page 12 you will find the details.

Dr. Durst of the Audi company in Ingolstadt, Germany, had the luck of the draw. We wish Dr. Durst every success with his photography.

There is a competition for you to enter this time too. On page 12, you will find some questions about articles and contributions in this issue of "Humidity News". Send us the correct answers by fax and win a Compaq PDA with the humidity calculator developed by ROTRONIC!

**The humidity calculator may be downloaded free of charge:**  
[www.rotronic.com](http://www.rotronic.com)



## INTERNATIONAL SALES MEETING



In June 2002, ROTRONIC held a three-day sales training course in the Golden Arch Hotel, Rümlang. The conference, at which the latest products were presented and explained, was attended by representatives of more than 30 countries.

Aside from the training and presentations, the ROTRONIC representatives were able to discuss experiences and applications, as well as socializing, in glorious sunshine.



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### Visit us at the following exhibitions:

- **r + d in Life Sciences**  
15. – 18.10.2002  
Basle, Switzerland
- **REACH for Process Solutions**  
15. – 18.10.2002  
Basle, Switzerland
- **ISA: 21. – 24.10.2002**  
Chicago, USA
- **Matelec: 04. – 08.11.2002**  
Madrid, Spain
- **HET Instrument 2002**  
04. – 08.11.2002  
Utrecht, Netherlands
- **ISA Show South America 2002**  
19. – 22.11.2002  
Sao Paulo, Brazil
- **Expoquimia**  
26. – 30.11.2002  
Barcelona, Spain
- **Sensor 2003**  
13. – 15.05.2003  
Nuremberg, Germany
- **Achema 2003**  
19. – 24.05.2003  
Frankfurt on the Main, Germany

## THE NEW CATALOGUE IN A **NEW** OUTFIT!

The new Humidity and Temperature catalogue became available in June 2002. Its 112 pages make it easy for the customer to select the latest devices on an application basis.

The catalogue is also available for download on the ROTRONIC homepage:

**www.rotronic.com**

If you would like a copy, fill in page 12 and fax it to us.



# COMFORTABLE AND HIGHLY FLEXIBLE! THE NEW M-SERIES

The measurement of humidity and temperature in the area of heating, ventilation and air conditioning (HVAC) is becoming more sophisticated from year to year. Heating, ventilation and air conditioning systems are becoming more and more important. Cooling ceilings create a pleasant interior atmosphere where there is hardly a movement of air to be felt. The circulation of air in office buildings and the like is reduced to the minimum demanded by hygiene, in order to save energy. Temperature and humidity are controlled within ever closer limits. So it is obvious that greater precision is required of the measuring instruments than was the case even a few years ago. ROTRONIC have developed a new series of instruments that fulfil these and also future requirements: the M-series. The measuring precision is  $\pm 1.5\%$  relative humidity.

## Overview

Incorporating the latest state of digital humidity measurement technology, the new M-series from ROTRONIC replaces the familiar, established instruments of the FT and FH Series. It offers more flexibility of application, particularly in view of the scalability of the output signals. This increases the resolution, because it is possible, for instance, to scale the measurement range of  $0...10\text{ }^{\circ}\text{C}$  for  $4...20\text{ mA}$ . In fact, any range can be scaled precisely to the customer's requirements. This is a tremendous advantage in the case of applications in which the control values lie within a very narrow range. It makes the controls able to work more precisely and thus more efficiently. The most frequently used types are available from stock. Versions with customer-specific programming are available from your distributor within a few days.

## Versions

The M-series is available in several different versions. The M-1 series has a fixed sensor, and will be available in room, wall and duct versions as of December 2002. The proven, long-time stable humidity sensor Hygromer® AC-1 in these devices fulfils most HVAC requirements. Precision and long-term stability are expected, so that is what ROTRONIC AG offers.

- The M-2 series offers additional flexibility to the user. The proven HygroClip S sensor module is really easy to clip on to the transmitter.

The exchangeability of the sensor reduces service and maintenance costs, and the entire control circuit can be validated according to FDA regulations with the help of suitable simulators. A version with a display is also available as an option (not for the  $2 \times 2$  wire /  $4...20\text{ mA}$  connection).

- When it is not enough just to measure humidity and temperature, and psychrometric calculations such as dew point, enthalpy or mixing ratio are needed, the M-3 series is the way to go. All psychrometric values can be calculated and fed to the output as an analogue signal. The M-3 can also be networked via RS485, and is also available in a display version. The M-3, like the M-2 series, works with the exchangeable HygroClip S humidity and temperature module.

## Calibration

The M-Series can be calibrated directly on site, using a hand-held meter from the HygroPalm series. This is a further advantage maintenance and service work.



# ROTRONIC MEASURING EQUIPMENT IN NUCLEAR RESEARCH



Carl Welinder  
Managing Director  
Swema Sweden

**R**adioactive waste from nuclear power stations needs to be stored for 100000 years before radiation levels reach that of naturally occurring Uranium. After 1000 years

the direct radiation will have declined to a harmless level. According to Thomas Karlsson at SKB (Swedish Nuclear Fuel and Waste Management) 'Time is the most critical factor in our project to develop a storage method for highly radioactive waste'.

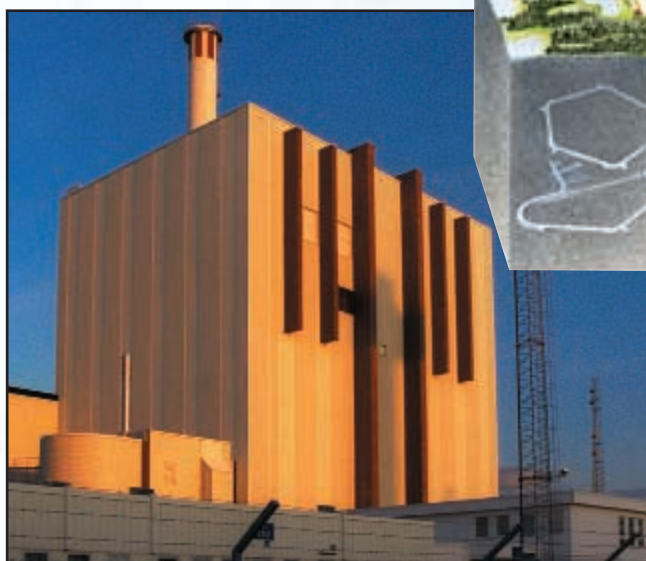
The Äspö Hard Rock Laboratory is a centre for research on the storage of nuclear waste. Its construction began in 1991 with a shaft 480m down into the hard rock outside Oskarshamn on the east coast of Sweden. At this depth, 8m x 1.75m diameter holes were drilled into the solid rock, each contains one canister (4.83m x 1.05m diameter, 27 tons). Instead of waste, a 1800 W heater is installed inside the canister to increase the temperature in order to simulate the presence of nuclear waste.

The waste itself is very non-reactive and is unlikely to contaminate ground water, but a series of additional barriers is used to prevent leakage. First level of encapsulation consists of cast iron, which is then enclosed within a 5 cm thick copper container. Filling the gap between the metal canister and the hard rock is a layer of clay.

To explain the thinking behind the method, it is necessary to consider evidence from historic natural occurrences (man-made radioactive waste has only been produced in the last 60 years). Two billion years ago in West Africa, nuclear reactions occurred underground and produced several tons of radioactive waste. Investigations have shown that radioactive isotopes permeated only a short distance

through the rock structure, which shows that certain rock can be a good containment material.

One factor of high interest is the clay's ability to absorb water from the surrounding rock. When clay absorbs water it expands, which in this application causes an increase in pressure around the canister. The fully saturated clay seals the canister from oxygen that



might cause corrosion. The research required a measurement of the moisture level present within the clay between the hard rock and the canister. By recommendation from international researchers, ROTRONIC sensors were specified as being accurate in long cable, high pressure and high temperature applications. In addition, custom filters and seals were designed. In September 2001 measurement started.

So far, the Swedish nuclear power industry has produced 5000 tons of highly radioactive waste. According to a plebiscite, the nuclear power plants in Sweden will all be shut down, and 4000 canisters with two tons of waste each will need to be buried and sealed,

with completion by 2050. In case a future generation would like to recover the waste and reuse it, a concurrent project is running to test canister retrieval methods. For each kWh of energy produced in the 12 Swedish nuclear power plants, 0.001-0.002 Euro is allocated to pay for the future storage of radioactive waste. This fund is also



financing the research at SKB, as well as other projects in Germany, United Kingdom, Finland, France, Japan, and Spain, who also run their own projects

at Äspö Hard Rock Laboratory. For instance Spanish scientists are monitoring possible movements of the canisters as the clay expands.

The picture below is taken at a depth of 480m, and shows from left to right,



Carl Welinder from ROTRONIC's distributor in Sweden – Swema, electronic engineers Thomas Karlsson from SKB and Sten Johansson from site electrical contractor JL Elektronik. In the middle –

ROTRONIC's cabinet for electronics of the 95m cable, 10 bar pressure resistant humidity and temperature probes. At the top, drilled holes for the sensor cables are shown, these lead to a clay and rock filled tunnel. In the tunnel, holes for canisters are drilled in the tunnel floor. Inside the clay around each canister the ROTRONIC humidity and temperature probes are installed.

# PRECISE AND GOOD PRICED – THE NEW ROLINE L-SERIES



The HygroPalm hand-held meter allows the L-series to be adjusted and checked if necessary. With the long-term stable Hygromer® AC-1 humidity sensor, the measurement remains within the range of precision longer than with comparable competitive products, and thus saves costs. As mentioned above, ROTRONIC AG offers varied accessories in the area of calibration. Traceable humidity standards and calibrating equipment, together with a hand-held meter for checking the transmitters (without having to disconnect them from the system) should be part of every service toolkit. The HygroPalm hand-held meter also makes it possible to pass a sensor reference to the transmitter.

There are, of course, applications in which the high precision of the ROTRONIC instruments is not a "must", the price being a more important criterion. We have developed a new series of devices for these applications, too: the Roline L-series.

Never before has the market seen an instrument in the "lower-cost" range with such good long-term stability and digital technology. The possibility of adjusting and checking the transmitter with a hand-held meter if necessary allows many service technicians to work even more efficiently.

The L-series can be used in the ranges of 0...50 °C and 10...100 % relative humidity, thus catering for a multitude of applications.

## Precision

The precision of  $\pm 3$  % relative humidity and  $\pm 0.5$  °C is adequate for a lot of applications. Many applications require good repeatability of measurement, rather than absolute precision. With a reproducibility of under 0.6 % relative humidity, ROTRONIC again sets new standards in this market segment.

## OEM-solution

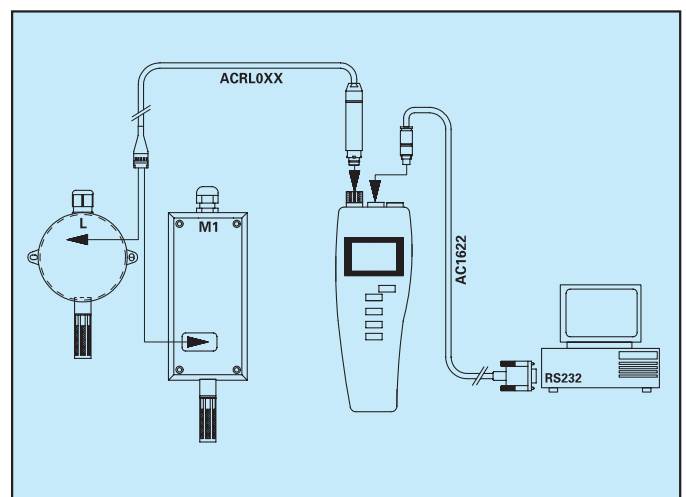
At a reasonable price, ROTRONIC also offers the L-series with individual customer branding, and the desired measuring range and output signal (0...20 mA, 4...20 mA, 0...1 V, 0...5 V, 0...10 V). Ask your ROTRONIC partner about a special OEM solution.

## Versions

The duct and wall versions differ from one another mechanically. But there are also two versions from an electrical point of view: a 2 x 2 wire version for 4...20 mA, and a 3/4 wire version for voltage and current signals are available. The ROLINE L-series can be bought as "humidity only", or as combined humidity and temperature devices.

## Adjustment

In HVAC (heating, ventilation and air conditioning) applications, it is often the case that humidity measuring instruments are not adjusted, but rather exchanged right away.



# ANALYSYS OF DRILLING MUD IN CANADA



Gary Moliver  
Inside Sales / Marketing  
ROTRONIC USA

Newpark Drilling Fluids (Canada), a division of Newpark Resources (USA) is a company operating within North America that supplies water and oil based

fluids to the hydrocarbon drilling industry.

Most of the chemicals they use in water and oil based fluids are designed to carry out different functions in the course of drilling a well. Some of these tasks include: hole cleaning, i.e. lifting the rock and dirt from the drill bit (bottom of the well) to the surface.

Penetration through and protection of the rock formations being drilled. Providing strength to the rock walls of the hole being drilled, drill string cooling, lubrication, corrosion resistance and buoyancy. Sub-surface pressures are also controlled.

In September 2001 Newpark introduced a new oil-based invert called New-100. An invert is best described as a stable salad dressing; it is water and oil emulsified together in different ratios.

(An oil-based invert has a higher percentage of oil (>50%, typically 90%) (external phase), with the water (internal phase) emulsified within the oil). Oil inverts are used primarily to add additional protection to water sensitive rock formations but the water within the invert has to be modified with salts such as



in different parts of the world; but within North America, the  $A_w$  ranges from 0.7 – 0.8. The internal phase of an invert is adjusted to be slightly less than the  $A_w$  of the rock to prevent water from flowing from the drilling fluid into the rock resulting in borehole stability problems. With the activity less than the surrounding shales, water flows from the rock to the drilling mud. This has the effect of increasing the water content of the drilling fluid.

If drilling with a calcium chloride invert, an increase in water concentration was countered with additions of calcium chloride to maintain the desired salt concentration and water activity.

With a New-100 internal phase, an increase in water concentration cannot be easily measured by titration of the internal phase. Newpark knows that the concentration is falling but how to quantify it? We solved this problem using the ROTRONIC water activity system. An increase in water content should increase the  $A_w$  of the entire invert. After preparing a number of inverts with different  $A_w$  internal phases, a correlation was made between the whole mud  $A_w$  and the amount of water added.

After five months and more than a dozen New-100 wells drilled in Western Canada, the ROTRONIC water activity analyzer has proven to be an invaluable tool for this type of application.



calcium chloride to further reduce the activity of the water phase.

The New-100 invert (which can't be titrated) replaces the calcium with a water-soluble liquid. This has two major effects, first it reduces the amount of water in the whole fluid system and secondly, it replaces the salt with an environmentally friendly liquid. New-100 is 100% biodegradable and non-bioaccumulative (i.e. no salt build up in drilling wastes disposed of at approved sites).

So how does ROTRONIC fit into this? The water activity ( $A_w$ ) of certain water sensitive shales (rock) can vary

## MILKA CHOCOLATE – RESPONSIBLY STORED



Ernst Aringer  
Manger Mepa Kühnel  
Österreich

The warehouse at Kraft Foods Austria (Suchard) stores finished chocolate products. In summer months in particular, the strict-company-internal humidity limit value for the storage of the products is exceeded. Measures are now to be taken to reduce the humidity. To take appropriate action, it was necessary to know about the condition of the air in the warehouse. For this purpose, and for the purposes of further documentation, a large number of ROTRONIC humidity temperature transmitters of the Series FH were installed in the stack and in the production store, and registered and visualised via an extension



of the existing measurement and control system from Sauter, Bregenz. On the basis of the analysis of the measured values made during the critical summer months, the project manager, Mr. Gorbach, Dipl. Ing., from the Dijon engineering company in Liechtenstein, can now make well-founded recommendations on how to reduce the humidity of the air. The project was carried out by Todt Gmür + Partner AG, Winterthur, Switzerland.



## INTERNATIONAL MUSEUMS USE HYGROLOG

### 250th Anniversary of Schönbrunn Zoo

During years of painstaking work, historians, zoologists, veterinary surgeons and zoo directors have researched new facts



about the 250-year history of the Schönbrunn zoological gardens. The results will be presented along with a large number of interesting exhibits in a special exhibition in the Natural History Museum in Vienna. Many of the exhibits, some of them from private collections, will be made accessible to the public for the first time. For several exhibits, such as valuable ceramics from the



Museum of Applied Art, a hygrographic system has been installed.

On the basis of many years' co-operation with the Natural History Museum and the Museum

of Applied Art, the MEPA KÜHNEL company was contracted to provide the humidity measurement technology. For a temporary exhibition of this kind, the HygroLog is an ideal instrument.

In the case of one glass cabinet with one beaker in it, the additional requirement was made that only the sensor should be visible in the cabinet. Here, the HygroLog was used with an extension cable, the logger being installed behind the cabinet.



# OVER 200 METEO PROBES IN WEATHER STATIONS IN TURKEY



Emre Ozmen  
System Solution  
Team Manager

**E**MO Teknik Tesisat / ISTANBUL,

exclusive distributor of ROTRONIC AG in Turkey, is involved in a big new project. In Western Turkey, 206 new automatic weather stations

are under construction, and will be installed in November 2002. The project "TEFER" is an online meteorology data acquisition and reporting system. All the stations are equipped with ROTRONIC relative humidity and temperature probes. The World Bank is financing the project, which is managed by ELITE.

ELITE Electronics Inc, a Turkish meteorology systems integrator company, received the contract from Turkey State Meteorology General Directorate for supply and installation of all 206 automatic weather observation stations. Elite Electronics Inc. uses only high quality components for their projects and ROTRONIC is very proud to be chosen in the TEFER contract. The MP101A

probes for relative humidity and temperature are well known for the high accuracy and the long term stability. The ROTRONIC Hygromer®, humidity sensor is able to withstand exposure to condensation without affecting calibration.

The pictures show an evaluation set at the headquarters of the meteorology office in Ankara. At the headquarters all the data servers will be installed. Ankara will be the central place for all weather data collected from the TEFER system.



After conclusion of the project in the western part of Turkey, the project is expected to be extended to the whole country. Approximately 600 additional stations should be installed in the coming years.

We thank EMO and ELITE for choosing ROTRONIC humidity probes.



# HYGROCLIP S – WHEN MAXIMUM PRECISION IS REQUIRED



Christophe Thubert  
Sales-Manager  
ROTRONIC France

The Danube International Company, world leader in the cleaning of industrial clothing, has been recognised since its founding in 1947 for its innovative technology

in the area of cleaning, decontamination, drying and pressing of the most diverse textiles. Both hotels and clinics – Danube's main target groups – have to fulfil the most stringent hygiene and safety requirements.

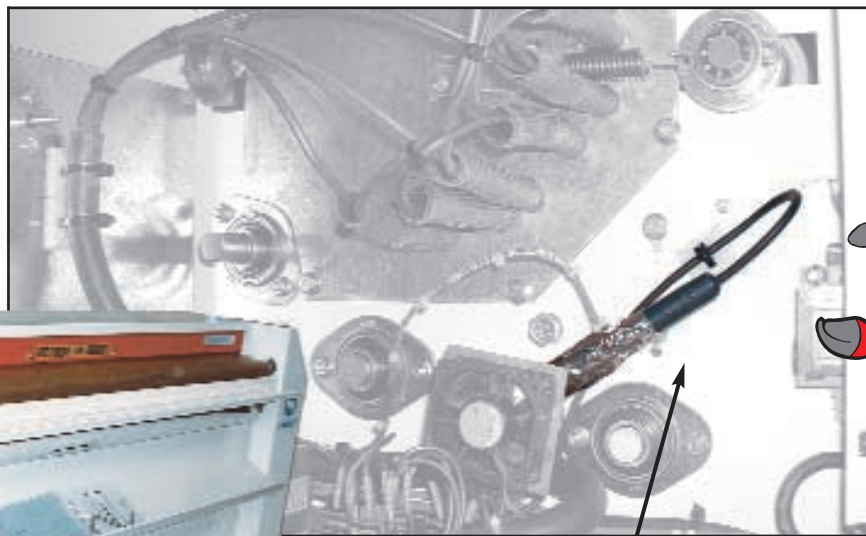
The technology in the machines manufactured and exported

Quite apart from this, the saving in time and the optimisation of the drying process can be regarded as a considerable advantage in this market.

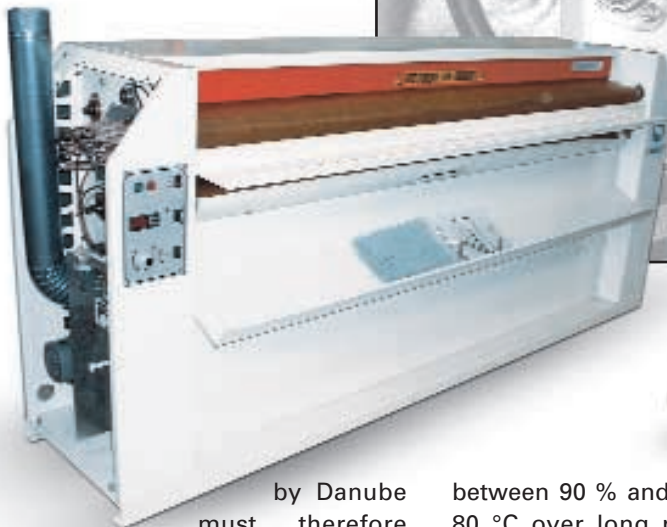
One of the main limitations was the measurement of the relative humidity of the air caused by the drying of the textiles, which had to be known in order to regulate the speed of rotation of the roller. However, it is difficult to measure relative humidity values

The sensor's resistance to saturation, its longevity, and the long-term stable precision of its measurements, have contributed significantly to this success. The exchangeability that the MOK technology permits is much valued by users with regard to the ease of machine maintenance.

In addition to that, each HygroClip S is calibrated and supplied with temperature compensation, which has



the advantage that it can be exchanged without alterations having to be made to the machine controls.



by Danube must therefore offer the utmost reliability.

Several years ago, in the course of the continuous development of its range of products, the Danube International Company applied for a patent for the fully-automated dry pressing of textiles.

The cloth is transported by a roller of variable length that is heated to about 100 °C, and dried by a turning motion.

What is new in this process is that the speed of rotation of the roller can be regulated independency of the desired residual moisture of the textiles.

between 90 % and 100 % at around 80 °C over long periods. The first competitive sensors to be tried out soon produced bad results, showed effects of saturation, and had to be exchanged frequently.

Then the Hygroclip S from ROTRONIC was tested over a period of nine months – with success!

The Hygroclip S in combination with an MOK-02-XX cable, ensures reliable humidity measurement, even in long-term operation.

At present offered as an optional extra for the new Danube series of automatic pressing machines, the Hygroclip S and MOK-02-XX components should eventually come to be installed in all the units of the series.



## ROTRONIC FACTS

**R**OTRONIC AG is well known in the international market place as a manufacturer of excellent humidity and temperature meters. The company was founded in 1965. The main milestones in the area of humidity measurement technology are:

- 1967** Development / production of humidity measuring systems
- 1969** Development and production of humidity standards
- 1995** Certification SN EN ISO 9001
- 1995** SCS accreditation to the calibration office for relative humidity at 23 °C in the range of 0.5...98 % relative humidity
- 1997** First supplier on the market with a 100 % exchangeable digital humidity and temperature module with its own ASIC; the HygroClip
- 2000** SCS accreditation for relative humidity and temperature in the ranges -10...+70 °C/ 0...95 % relative humidity

The humidity measuring systems are marketed world-wide by four subsidiary companies and 37 official distributors. The sales network is continually being widened. The following partners have joined us recently:

- Japan** SHINYEI Kaisha, Kobe
- Holland** ACIN Instrumenten BV, Rijswijk
- Estonia** EVIKON MCI, Tartu
- Peru** NPI Peru S.A.C, Lima
- Czech Republic** JD DVORAK s.r.o., Prag

You will find the list of distributors on page 12.



The company is also active in the area of computers and accessories not only in Switzerland, but also in Germany and France.

As a leading supplier of PC/server devices, notebooks, network technology and computer accessories, software and licenses, mobile phones, organizers (PDA) and mobile telephone accessories, we focus on the industrial and trade customer. Our main medium of communication is our 450-page main catalogue of roughly 5800 products, which we send to our customers three times a year. In addition, we have pictures, texts, prices and availability information of our complete range of products available in electronic form in our Online Shop at: <http://www.shop-rotronicuk.com>

The Industry Division is divided into three business units, which supplement each other ideally. We offer customers everything from the 19-inch packaging (cabinets, housings and assembly carriers) through the appropriate hardware parts such as interruption-free power supplies, industrial processors (IPCs) and industrial terminals, to assembly tools (meters), all from a single source.

ROTRONIC has a role the market as a genuine system integrator and, in co-operation with the computer/computer accessory business, optimise procurement for the customer.

We have expanded the area of computer accessories, and now market the products worldwide through our sister companies and 35 distributors.

- 1989** ROTRONIC Co., Ltd., Taiwan
- 1991** Buying company SECOMP GmbH, BRD
- 1992** Computer products ROTRONIC Logistics AG
- 1994** Worldwide distribution of computer accessories ROTRONIC Interconnections Ltd. UK
- 1998** SECOMP France

The ROTRONIC Group employs 300 people worldwide.



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1. How many versions of the new M-Series transmitters are available?

- ☐ 2 versions  
☐ 3 versions  
☐ 4 versions

2. How many meters below ground level is the Äspö hard rock laboratory?

- ☐ 360 meters  
☐ 420 meters  
☐ 480 meters

3. What is the physical unit of water activity?

- ☐ A<sub>w</sub>  
☐ B<sub>x</sub>  
☐ A<sub>x</sub>

4. How old is the "Tiergarten" in Schönbrunn?

- ☐ 250 years  
☐ 300 years  
☐ 150 years

5. How many weather stations in Turkey are equipped with ROTRONIC meteo probes?

- ☐ 196 Stations  
☐ 206 Stations  
☐ 216 Stations

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