

ro-tronic

Humidity news

issue 2/2001



Win a
**Digital
Camera!**

New Water
Activity Analyzer

New Intrinsically
safe HygroClip

ROTRONIC Sensors
on Kilimanjaro



Product Focus
HygroFlex
Industrial Transmitters

PREFACE



Thanks to all our customers and distributors for the feedback we have received since the introduction of Humidity News. With each issue we aim to introduce new ideas and information, which we hope are useful and informative to our customers; please keep your comments and suggestions coming!

In this issue of Humidity News we continue to present a diverse range of applications from around the world. From the Pyramids of Egypt, to organ-builders in Switzerland, ROTRONIC products are used worldwide and we are proud to describe

their successful use, and the benefits they bring the users.

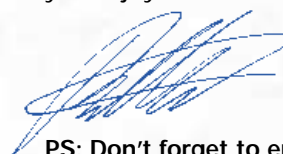
Our R&D team continues to introduce new products, features and improvements to our range of instruments for measuring humidity and temperature. In this issue we introduce two more exciting developments:

- New HygroLab 3 water activity analyzer with integrated AwQuick mode for results in 5 minutes (see page 6)
- New Intrinsically Safe HygroClip probe for use in hazardous areas (see page 9)

Both are based on our unique digital technology to bring superb stan-

dards of measurement performance and are easy to set up and use.

Finally we continue our focus on the most recent products introductions; in this issue the topic is the HygroFlex industrial transmitter with industrial HygroClip probes. As well as an overview of the main features and benefits, we introduce a new metal housing option for the most demanding industrial environments. I hope you enjoy this Humidity News.



Daniel Ritler,
Sales Manager

PS: Don't forget to enter our competition on page 12 where you could win a digital camera!

COMPETITION WINNERS

Frequent Humidity News readers are aware that in each Humidity News we do have a little contest.

In our Humidity News 2 where we showed the HygroClip digital product series for the first time, we drew for a

HygroPalm with HygroClip S in a docking station. We received many replies with the correct answers.



See picture of Mr. Walter Nievergelt from the company Lindt + Sprüngli in Switzerland getting the new HygroPalm hand held instrument. For those who didn't win this time see on page 12 the new contest. We wish you good luck.

The happy winners are:

The winner of the Big HygroPalm Contest is

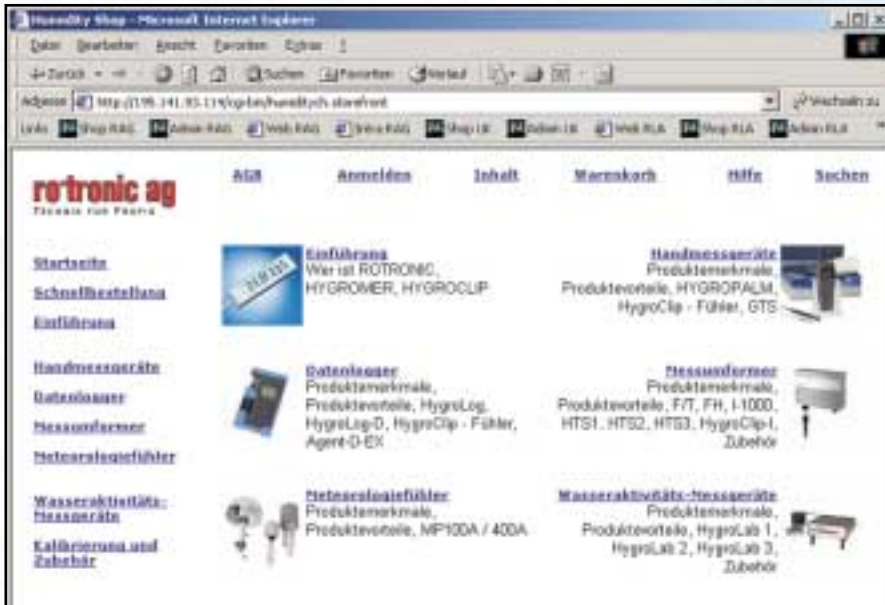
- W. Nievergelt,
Lindt + Sprüngli, Switzerland

Further winners are:

- J. Vane,
Sealeing Ltd., Finland
- J. Faria,
Provimi Portuguesa SA,
Portugal
- J. C. Walker
BAE Systems, United Kingdom
- H. Niederwieser
Residenzgalerie Salzburg,
Austria

Congratulations to all the winners!

HUMIDITY SHOP ONLINE!



ROTRONIC are the innovators of the Humidity market; our new digital products have brought many new features and benefits to the market for the first time, and we continue to introduce new ideas to make life easier for our customers.

So we are proud to announce another 'first'. It is now possible to buy a comprehensive range of ROTRONIC

humidity and temperature instruments through the Internet at our new 'Humidity-Shop'. Visitors can check product specifications and if required, place their order online. Delivery can be to anywhere in the world through our comprehensive network of distributors.

Visit www.rotronic-humidity.com today!

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CALIBRATION SEMINAR



Giancarlo Tirabassi
Sales Swiss
ROTRONIC AG



Peter Müller
Product Manager
ROTRONIC AG

Calibration of any instrument is essential if precise measurement results are to be maintained long term. In some applications it is a regulatory demand that periodic calibration is performed, for example, in pharmaceutical and food manufacturing, or where a quality system such as ISO9000 is in place.

For these reasons, many of our customers demand higher levels of calibration and training in calibration procedures. Our Swiss Sales Team has therefore introduced a Calibration Seminar, which gives a comprehensive overview.

Topics covered include calibration frequency, calibration methods, traceability, uncertainty, calibration history, instrument drift. Beside the theory a hands on training and „real“ calibration is part of the seminars.

If you would like us to run this seminar at your company, please contact your local dealer or contact:

humidity-calibration@rotronic.ch

Exhibition Schedule, Meet ROTRONIC at:

Environment Exhibition

07. – 11.11.2001

Lisbon, Portugal

Scanautomatic

19. – 22.11.2001

Stockholm, Sweden

American Meteorological Show

14. – 17.01.2002

Orlando, Florida, USA

Messtechnik Essen

23. – 24.01.2002

Essen, Germany

INTERCLIMA

05. – 09.02.2002

Paris, France

MTEC

13. – 14.02.2002

NEC Birmingham, UK

Messtechnik Stuttgart

06. – 07.03.2002

Stuttgart, Germany

AUTOMATICON Fair

19. – 22.03.2002

Warsaw, Poland

Nordbygg VVS, HSV

19. – 23.03.2002

Stockholm, Sweden

FOCUS ON HYGROFLEX



Evolution:

During the 1970's, ROTRONIC were one of the very first companies to produce humidity transmitters for the industrial market. Customers who were involved in the manufacture or storage of humidity/moisture sensitive products and materials found many advantages in being able to measure and transmit humidity values to recorders and controllers.

Early transmitters on the market were complex and expensive, so during the 1980's our development focused on simplifying the technology and reducing the product cost, but at the same time improving measurement performance. Thanks to their high accuracy and excellent long term stability, products such as the HT, I-100, I-200, I-1000 and I-2000 series of transmitters became widely used throughout many areas of industry. As the benefits of humidity measurement spread, the quantity produced rapidly increased, and in many companies ROTRONIC became the specified standard. Typical applications where industrial humidity transmitters became widely used included drying, climatic testing, process monitoring, storage and transportation.

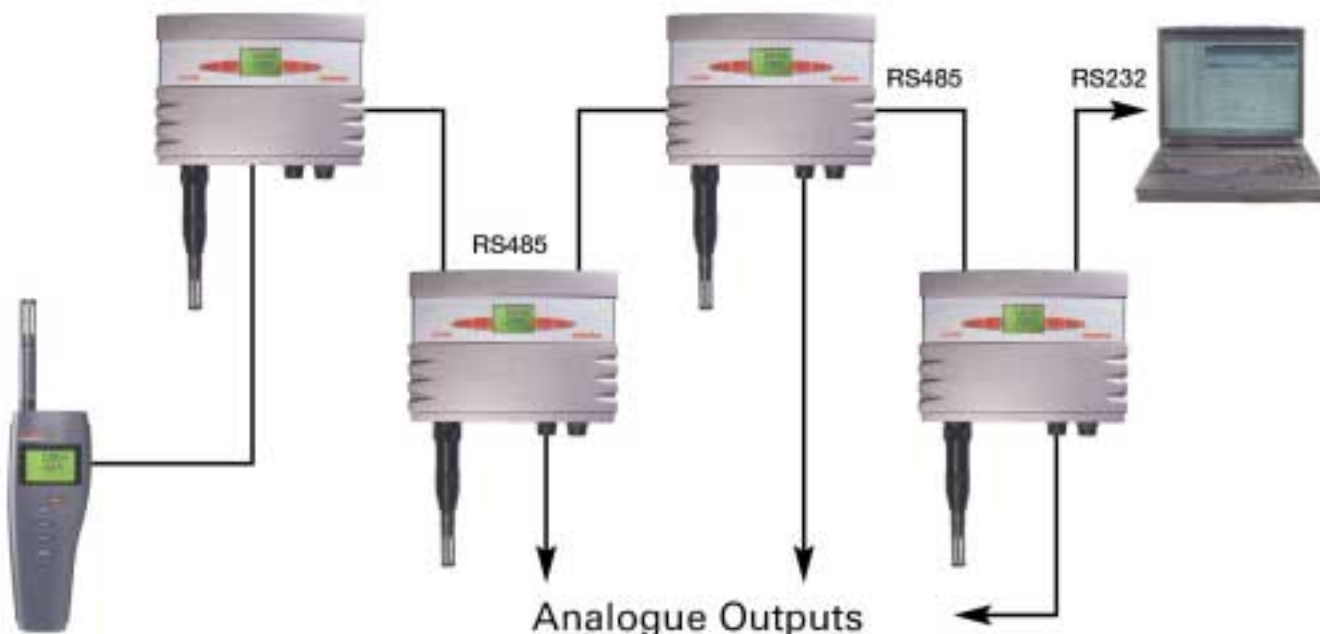
The main technical advantages of ROTRONIC industrial transmitters have always been accuracy, long term stability and integrated temperature compensation. When combined with competitive pricing and first rate technical support, it has kept them at the forefront of the humidity market for over 30 years. Our marketing, research and development teams work together and strive for constant improvements to the instru-

ment range to keep our products at the leading edge. With the introduction of our 'flagship' industrial transmitter, the HygroFlex, we believe we have taken the evolution another step forward.

The Next Generation – HygroFlex Key Features:

The fundamental difference between HygroFlex and previous generations of humidity transmitters is its digital operating system. The modern world is full of digital products; multimedia, entertainment, telecommunications, audio, visual and navigation systems, all using the simple combination of 0's and 1's to connect, communicate and present information. The fact is, digital technology provides superior performance, enhances features and costs less. HygroFlex is no exception!

HygroFlex consists of an intelligent transmitter into which you can connect a comprehensive range of intelligent digital HygroClip Industrial probes. The key advantage of this configuration is the ability to connect any probe to any transmitter, maximizing application flexibility and permitting probe interchangeability without any loss of calibration or performance. Analogue products require the probe to be 'matched' or calibrated with the transmitter, with the result that interchangeability is



not easy, and requires specialist knowledge. Maintenance and calibration of the HygroFlex is very simple as probes can be hot swapped in seconds, virtually eliminating on-site maintenance and engineering time.

As the HygroFlex communicates using digital signals, it follows that compatibility with other digital environments is possible. Using industry standard serial communications, the HygroFlex can talk to any standard PC, and in combination with our HW3 software package; it can email or send SMS text messages to the system supervisor when alarm conditions occur. This feature can be expanded to include a network of up to 32 HygroFlex transmitters, ideal for monitoring climatic chambers or warehouses.

In the majority of installations where humidity is measured and controlled, analogue signal transmission is used. Naturally the HygroFlex is fully compatible with this type of installation, offering a full range of output options including 4...20mA, 0...5V and 0...10V, which can be freely scaled by the user.

A further feature of the HygroFlex that is worth mentioning is the ability to reconfigure the measurement parameter, which is displayed and transmitted through the analogue outputs. In some situations the measured values of %rh and temperature are not compatible with the users needs, parameters such as dewpoint, wet-bulb, or mixing ratio are often required. With the HygroFlex it is possible to fully reconfigure the instrument to suit any installation.

Interchangeable HygroClip Industrial Probes:

To complement the unique range of features and capabilities of the HygroFlex, we introduced a compatible range of digital probes based on HygroClip technology. Probe options are available to suit wall, cable/duct, and pressure installations (max. 50 bar). Recently introduced, there are also three Intrinsically Safe (Ex Zone 0) versions suitable for installa-



tion in hazardous areas (see page 11 for more information).

For maximum flexibility, the user can easily interchange the different probe types without loss of calibration or reduction of measurement performance.

Calibration:

With probes that can be easily replaced by the user, on-site calibration can be virtually eliminated. By fitting a new, or pre-calibrated probe module, the transmitters calibration can be updated in seconds.

Of course, there may be some situations where a replacement probe may not be available, or the user prefers to calibrate the transmitter directly. In these circumstances HygroFlex offers two options:

1. A HygroPalm handheld indicator can be directly connected as shown in the picture above. The HygroPalm effectively becomes a digital adjustment tool so that the HygroFlex can be adjusted to any reference value applied. The same procedure can be performed with the display version if required.

2. Using the HygroData HTS interface pack, which includes an RS232 service cable and the HW3 software. You just connect the HygroFlex to a PC to control the calibration procedure.

Third Party Probe Input and Pressure Compensation

HygroFlex has the option of a third measurement input channel which can be programmed to accept any measurement input such as temperature, pressure, air velocity, light level or ph, provided the probe has an output signal within 0...2.5 VDC.

One practical use of this feature is the ability to accept a pressure measurement signal, which can be used to compensate pressure dependent calculated values such as wet-bulb temperature.

A 3rd analogue output (HygroFlex 3) means that this useful additional measurement can also be transmitted as an analogue signal along with humidity and temperature.

Metal Housing

The HygroFlex is available at extra cost with highly robust metal housing for installations in the worst industrial environments. To specify this option when ordering, use the order code HTM instead of the standard HTS.



For example:

HTS32

HygroFlex 3 with standard plastic housing

HTM32

HygroFlex 3 with metal housing

For further information on the HygroFlex, please request a brochure, or visit our website at:

www.rotronic-humidity.com

WATER ACTIVITY – QUICK!



ROTRONIC has manufactured instruments for the measurement of water activity for over 30 years. Our wealth of experience, the latest digital technology and the application of the latest software analysis techniques are combined for the first time in our latest development - Aw Quick.

Aw Quick

Aw Quick is advanced software for water activity analysis. Its key feature is to achieve final water activity results in typically five minutes or less, using digital signal processing and advanced mathematical analysis. Aw Quick mode is fully integrated within the new HygroLab 3 laboratory display instrument, or is available when using a compatible RS232 enabled display instrument and the HygroData Quick software.

HygroLab 3

HygroLab 3 is a laboratory display instrument with integral Aw Quick mode, and up to four samples can be measured simultaneously. Final results are displayed directly on the integral LC-display, and can also be automatically captured on a PC running the HygroData Quick software.

HygroData Quick

If you already have one of the latest generation of ROTRONIC digital

display instruments with an RS232 output, the Aw Quick mode is accessible by purchasing the HygroData Quick software utility.

HygroData Quick includes:



- Aw Quick mode: Accelerated water activity analysis with results typically in 5 minutes or less.
- Connecting four probes simultaneously means average sample times can be reduced.

- Standard mode: conventional water activity measurement with automatic detection of equilibrium and the option to record and graph data.
- Automatic capture of end values to a text file for record keeping. Each record includes a product description, instrument identification, date and time.

All current versions of our HW3 software are shipped with Quick function integrated. To activate and register, you need to purchase at a ROTRONIC office or distributor a product license code to give you access to the HygroData Quick utility. The software will automatically check that you have a compatible ROTRONIC display instrument and the license code will automatically be stored in the memory of this indicator. For each display instrument used in conjunction with HygroData Quick a separate license code is required.

Compatible display instruments:

HygroLab 2

Aw Quick only by connection to PC with HygroData Quick software utility activated.

HygroLab 3

Includes integrated Aw Quick mode, but requires purchase of HygroData Lab software to use in connection with PC software.

Ordering Information

Product code:	Description:
HygroData LAB	HW3 software and connecting cable for PC
HygroData QUICK	HW3 software, connecting cable for PC, licence code
HygroLab 2	HygroLab display unit with RS232 output
HygroLab 3	HygroLab display unit with integrated AW Quick mode and RS232 output

ROTRONIC HYGROLOG-D DATALOGGERS IN CHURCH-ORGANS



Peter Müller
Product Manager
ROTRONIC AG

The protection of cultural-assets is a much discussed topic. The influences of various environmental pollutants damage irreplaceable cultural possessions. Humidity is certainly one of the factors which can damage the old precious objects irreversibly. Obviously, it is of great importance to avoid such damages. However, the responsible people often just simply don't know the climate conditions of their premises. ROTRONIC dataloggers help to obtain the data needed to preserve these ancient treasures.

Within the area of preserving church-organs, the Swiss company Christoph Metzler Orgelbau, also known as „The Flying Registers“ has been doing pioneer-work since 1995. Christoph Metzler is an organ-builder in the 4th generation. This company is located in Dietikon, a suburb of Zurich, and it works together with 5 partner companies of the „IG Orgel“ all over Europe as well as in the US. It is their common aim to preserve

old organs and to restore damaged ones. The goal here is to preserve the instruments in their original condition as far as possible. Unfortunately, as time passes by, many organs are altered and partly reconstructed; some of them over and over again. Says Christoph Metzler: „With every change, an organ loses some of its character.“ The changes were usually made, when the spirit of the times changed; often also with the change of an organist. Many organs had finally to be replaced due to failed reconstructions.

Now, what happens to an organ, when the climate is wrong?

If the moisture content becomes too high, the wood starts to swell; if it's too low, it shrinks. These actions may easily destroy the glued junctions and, in extreme cases even lead to the ripping of the wood itself. If the wood swells, the organ is no longer easy to play. The reaction-time of the various components is not correct anymore; the organ does not sound good. Obviously, this effect results in a loss of value, and it seems rather logical, that many alterations and

reconstructions of old instruments have been done for that reason.

So the goal is to prevent the instruments from being damaged or even destroyed. Obviously, it is much easier to prevent than to repair. The humidity should always be in a range of 50...60 %RH. With the data loggers HygroLog, the conditions may easily be recorded.

Since the beginning of 2001, Christoph Metzler has used ROTRONIC Dataloggers HygroLog D, which are being placed inside the organs and record the climate data autonomously for long periods of time. These data give information on the reasons of eventual damages. However, even if there are no damages yet, the data give us information on the climate; thus showing whether or not the premises should be heated or just ventilated or air conditioned. Once the data is known, it is also easy to determine, whether or not a claim for warranty is justified. And of course, this is a simple task for a datalogger of ROTRONIC.

APPLICATION: PYRAMID OF SAQQUARA EGYPT/POLAND



Irmina Sibilska
President
B&L International

The Great Pyramid at Saqqara, on a desert plateau some 30 km south of Cairo is the site where the Egyptians first tried to put into practice on a massive scale their attempt to defeat time and death by building tombs and temples in stone. It is here the Egyptians built the world's first pyramid, part of an extensive funerary complex for the Pharaoh Zoser. The Step Pyramid, (a 'stairway to heaven' for the departing Pharaoh), some 62m high, is central to the complex and was constructed 4500 years ago. It is older than the more famous pyramids at Gizeh and the Sphinx, and had already been standing for over a thousand years when Tutankahmun came to the throne around 1500BC.

A new discovery

Archaeologists have been excavating the site for over 150 years. But up until 1987 no-one had explored the desert area on the complex's western side as archaeologists believed there was little to be found there. However, an archaeological mission, led by Professor Karol Mysliwiec, working on behalf of the Centre of Mediterranean Archaeology at Warsaw University discovered burials spanning nearly 4,000 years, one of which was the well-preserved and colourful tomb of a powerful Egyptian politician, a previously obscure vizier named Fefi.

A vizier was the right hand man of the pharaoh. Fefi seems to have been a colourful character who lived in the 24th century BC. The tomb's wall inscriptions portray him cavorting with a woman known as „The One Who Loves Life.“ His five wives apparently were stuck at home. He lived late in the reign of King Teti, first ruler of the Sixth Dynasty, a time of turbulence. Fefi controlled much of the nation's financial and admini-



strative affairs. The 1987 excavation found deep shafts hewn in the rock, many mummies and a wall running parallel to the pyramid, which seemed to be part of a monumental tomb. The team returned to Egypt in 1996, as part of a joint Polish-Egyptian expedition with the Supreme Council for Egyptian Antiquities.

It unearthed the courtyard of the tomb, discovering a levelled rock surface covered with a thick layer of mud. When this mud-brick rubble was finally removed, the team found colourful reliefs decorating the entrance to a funerary chapel, showing the tomb's owner in the company of a lady.

Need for preservation

The extremely fragile structure of the local limestone causes salts to concentrate on the paintings. This poses a challenge to conservators from the National Museums in Warsaw and Krakow. Conservation will take years of hard work. The work depends greatly on climate conditions inside the tomb. Of particular importance is monitoring changes in humidity conditions over time, between successive archaeological digs. To achieve this, accurate and stable data acquisition equipment was needed to

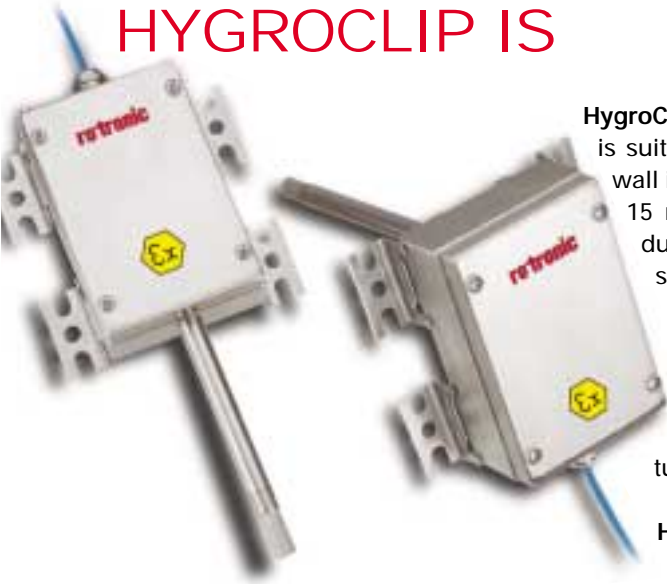
collect as much temperature and humidity data as possible.

Technology assists

In desert conditions humidity and temperature can vary widely over a 24 hour period, including excursions to high humidity and high temperature, the worst type of environment for electronic instrumentation. The product of choice for this demanding application is the ROTRONIC HygroLog, supplied through ROTRONIC's Polish distributor - B&L International (Warsaw).

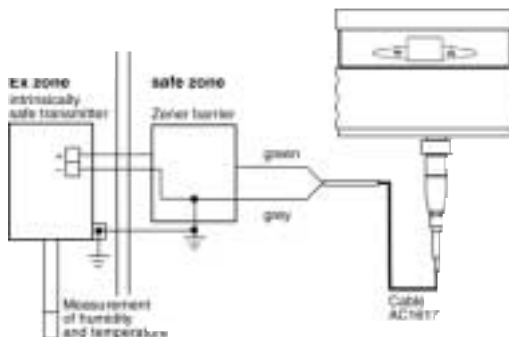
HygroLog is a self contained modular logger featuring the interchangeable HygroClip sensor module. When calibration or maintenance of the measurement hardware is required, the site personnel can simply fit a pre-calibrated new module within seconds. Continuous collection of valuable climatic data is therefore guaranteed and the conservation team are able to precisely record the conditions to which the reliefs are exposed. From this data, decisions can be made as to how the paintings need to be treated to prevent further deterioration, and therefore preserve this priceless record of the past for future generations.

HYGROCLIP IS



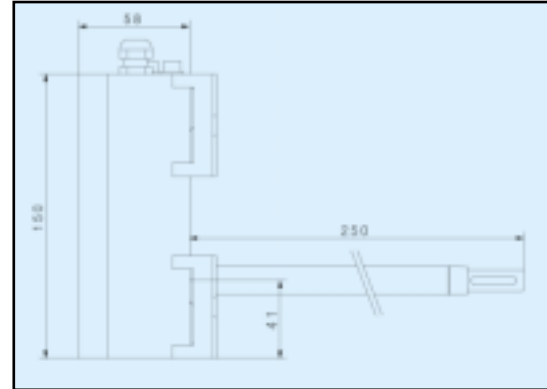
Intrinsically Safe Humidity Solutions - Introducing the HygroClip Ex

The New HygroClip-ID-Ex, IC-Ex and IW-Ex are suitable for the measurement of humidity and temperature in hazardous areas. They are rated for operation in Eex ia IIC T6, which means Zone 0 (the highest possible) and a temperature operating range for the electronics of -20 to 40°C. HygroClip Ex probes are supplied pre-fitted with 5m of Ex rated (blue) cable, which is then connected to the HygroFlex display unit via a Zener barrier. Cable length can be extended up to 200m without any effect on calibration thanks to the use of digital signal transmission between the probes and the HygroFlex transmitter. In hazardous areas a Zener barrier must be used. Typical applications include monitoring in the oil, gas and pharmaceutical industries (e.g. fluid bed dryers).



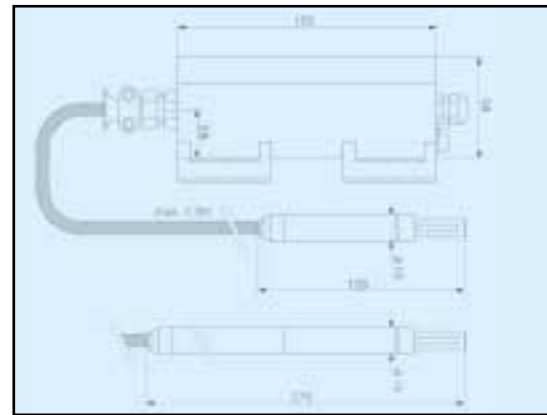
HygroClip-ID-Ex

is suitable for duct or through-the-wall installation. It features a 250 x 15 mm stainless steel probe. In duct configuration, the probe is suitable for measurement over the ranges 0...100%rh and - 50...200°C, provided that the electronics enclosure remains within its rated operating temperature of -20...40°C.



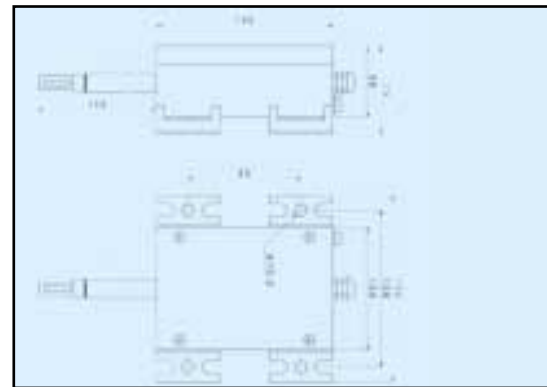
HygroClip-IC-Ex

features a cable mounted probe for maximum installation flexibility and for applications in very high or low temperatures. The probe dimensions are 120 x 15 mm and cable length is 2m. This product is suitable for measurements over the ranges 0...100%rh and -50...200°C. Probe installation hardware (mounting flange with compression fitting) is available for installations in ducts etc.



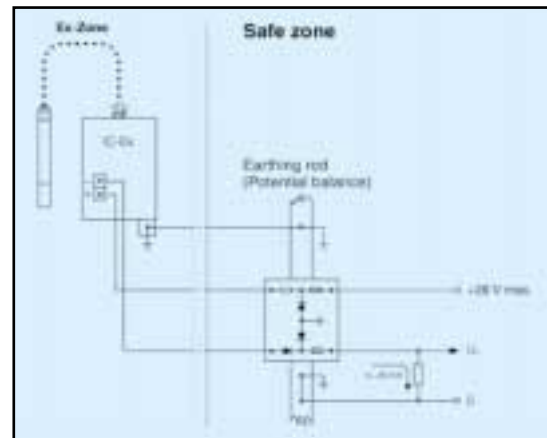
HygroClip-IW-Ex

is configured for wall mount installations with an external 150 x 15 mm probe, again with the replaceable filter system.



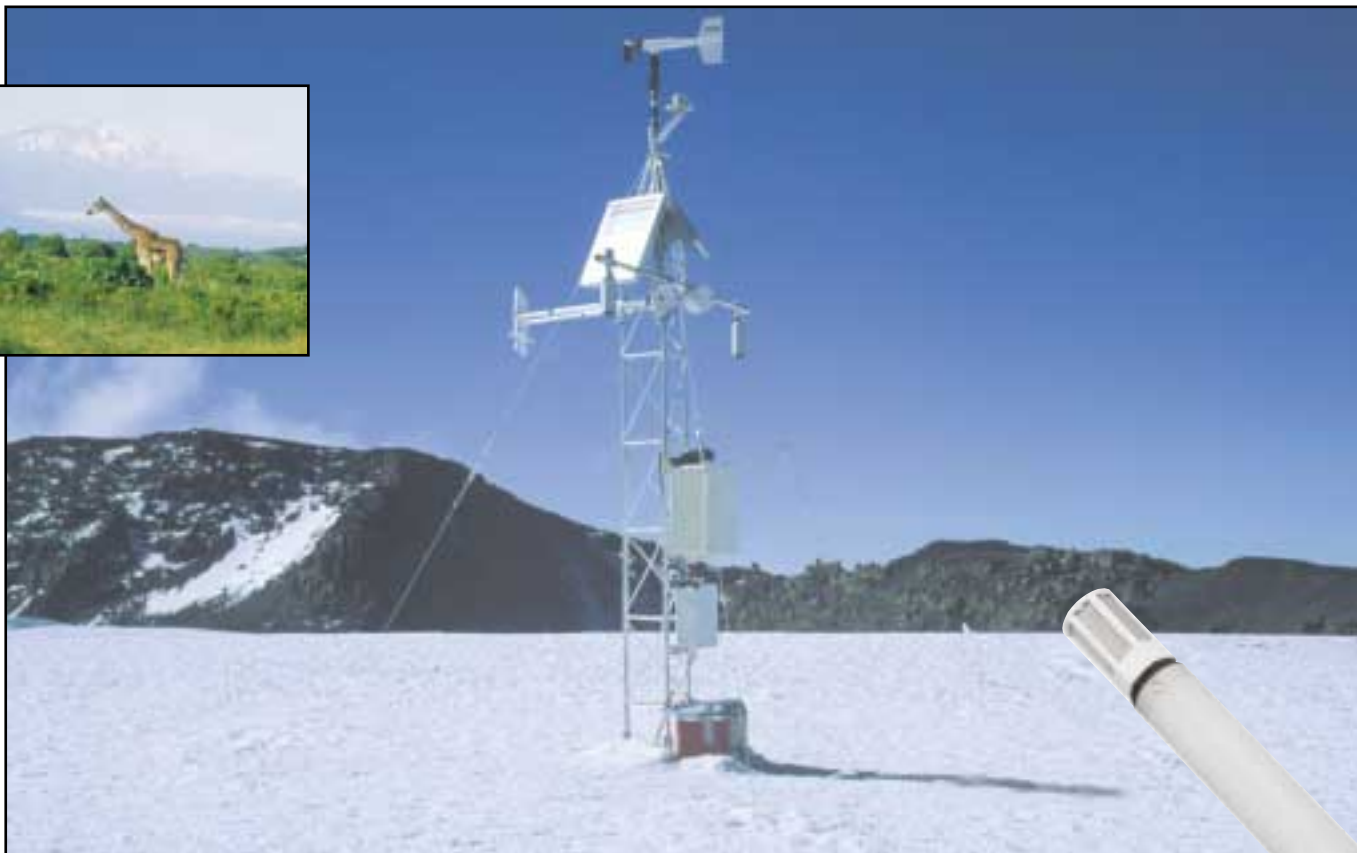
Stand Alone 4...20mA 2 wire use.

A useful feature of the HygroClip Ex probes is that they can be configured to operate without the HygroFlex as a stand alone 2 wire 4...20mA transmitter for humidity or temperature only (not combined). Configuration of this feature is by simple reconfiguration of internal jumpers, and no recalibration of the probe is required thanks again to the use of digital technology.



For full details of the HygroClip Ex, please request our brochure, or visit our website: www.rotronic-humidity.com

ROTRONIC SENSORS ON KILIMANJARO



Gary Moliver
Inside Sales/Marketing
ROTRONIC USA

The first European sighting of Kilimanjaro occurred 62 years after the ascent of Mont Blanc, yet reports of snow and ice high on the mountain were viewed for many years as an apparition. We now know that the massive equatorial volcano in Tanzania, with a summit elevation of 5895 m (19,341 feet), supported ~20 km² of glaciers until late in the 19th century. By last year, the ice-covered area that Johannes Rebmann described as „dazzling whiteness“ in 1848 had decreased by ~90%, to 2.2 km².

Today, researchers are actively investigating the meteorological conditions on Kilimanjaro, to better understand the relationship between the mountain's climate and the demise of its beautiful tropical glaciers. An automated weather station was established near the summit in February 2000,

employing ROTRONIC MP101A probes to measure humidity and temperature. Data are stored on-site and transmitted via Argos telemetry to the University of Massachusetts. ROTRONIC probes continue to provide accurate measurements, despite severe conditions including perpetually sub-freezing temperature and solar radiation often in excess of 1200 W m⁻².

Further details on the weather station and Kilimanjaro climate research are available at:

www.geo.umass.edu/climate/kibo.html

Douglas Hardy, University of Massachusetts (photo credit: Douglas Hardy, UMass Geosciences)



WATER ACTIVITY OF RAISINS



Dimitris Polymatidis
Project Manager
SCIENTIFIC
ENTERPRISES LTD

Raisins were probably discovered by accident many thousands of years ago when the sun dried grapes on the vine. Ancient civilizations found them to be flavoursome and nutritious, but best of all, they could be stored and transported without degradation. The key to the quality of raisins is the drying process and the moisture content. If the raisin is too dry, its nutritional value and flavour are diminished, too wet and the raisin degrades very quickly and will not survive storage or transportation.

The measurement of the moisture content of raisins is a challenging task due to two main problems.

1. Raisins are a mixture of complex sugars and volatile substances. The process of heating the sample during weight loss on drying analysis may also remove other substances and

hence affect the value of moisture content obtained.

2. Raisins have a semi permeable skin that does not allow for fast exchange of water molecules between the flesh of the raisin and its surrounding environment.

As a result, measurement of moisture content is very time consuming and inaccurate, so Dr Chaniotakis of the Laboratory of Analytical Chemistry at the University of Crete (Greece)

has described an analysis protocol, which solves these problems and provides fast, accurate and repeatable measurements.

Methodology:

Methodology:

For each type of raisin it is necessary to prepare a Sorption Isotherm, which is a graph or calibration curve, which plots moisture content against water activity.

Moisture content is determined at several points with a Karl



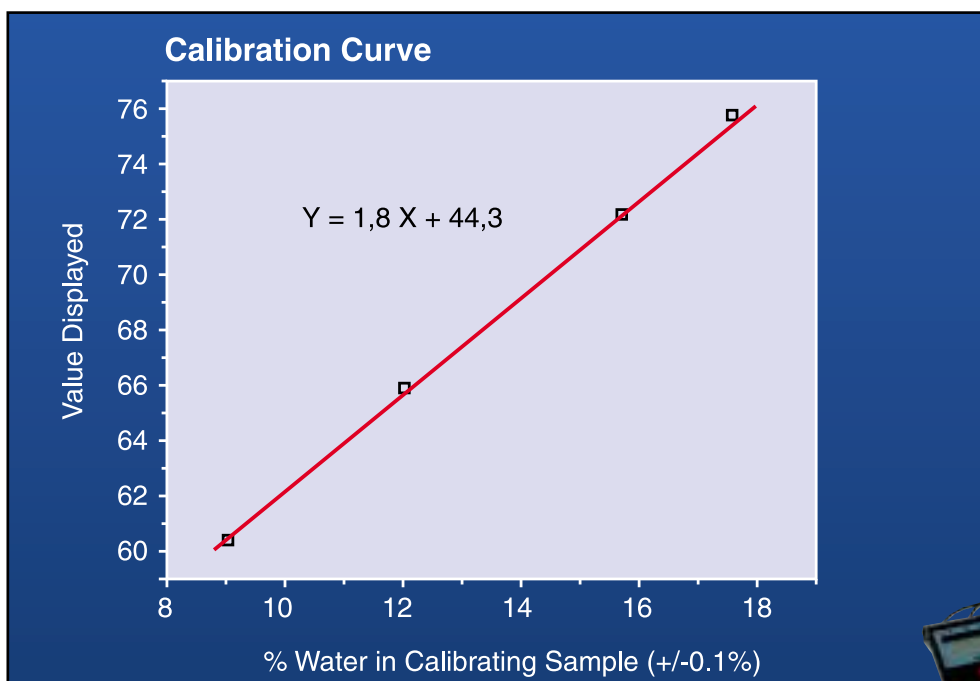
Fischer Titrator using a Hydranal 5 reagent.

Corresponding values of water activity are obtained using a ROTRONIC AWVC measurement station to measure the raisin samples. Sample preparation is critical; the skin of the raisin needs to be cut, but not removed, and Dr. Chaniotakis uses a specially designed tool.

The two sets of measurements are then plotted as a graph.



By routine measurement of water activity using ROTRONIC equipment and the Sorption Isotherm data, moisture content can be determined. With fast results and simple operation, non-skilled personnel in production and quality control departments can use this measurement whenever moisture checks are necessary to maintain the highest levels of raisin quality.



Our thanks go to Dr. Chaniotakis for allowing us to describe his methods.

This work was partly financed by E.U. 399/94 and 1905/94



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1. How many wives did the Vizier Fefi have?

- 1 wife
 5 wives
 50 wives

2. What is the maximum cable length between HygroClip Ex and the HygroFlex?

- 2 metres
 100 metres
 200 metres

3. Using a single measurement probe, how long does a water activity analysis take using AW Quick?

- 1 minute
 5 minutes
 10 minutes

4. What is the optimal humidity range for organs?

- 50...60 %RH
 40...50 %RH
 30...40 %RH

5. What is the order code for a HygroFlex 2 with a metal housing?

- HTS32
 HTM22
 HTM32

Sender: _____

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