

WATER ACTIVITY



The measurement of water activity or equilibrium relative humidity is a key parameter in the quality control of moisture-sensitive products or materials. Water activity is by definition the free or non chemically bound water in foods and other products. The bound water cannot be measured with this method.

WHY IS WATER ACTIVITY MEASURED?

The free water in a product influences its microbiological, chemical and enzymatic stability. This is especially important in the case of perishable products such as foodstuffs, grain, seeds, etc. as well as in the case of many products in the pharmaceutical and cosmetic industries. If there is too much free water available, the products spoil, and if there is too little water available, other product properties can be influenced negatively.

Water activity	Contaminant
aw = 0.91...0.95	Many bacteria
aw = 0.88	Many yeasts
aw = 0.80	Many mildews
aw = 0.75	Halophile bacteria
aw = 0.70	Osmiophile yeasts
aw = 0.65	Xerophile mildew

The table shows typical growth thresholds below which the specified organism cannot reproduce and therefore spoil the product. Control of water activity therefore has a significant impact on the shelf life of a product.

The measurement of water activity also provides useful information on properties such as the cohesion, storage life, agglomeration or pourability of powders, tablet stability, and the adherence of coatings.

Based on AirChip3000 digital technology for high performance and easy digital calibration, ROTRONIC water activity probes are suitable for almost any application. All water activity stations and probes incorporate temperature measurement as a standard feature. The water activity measurement stations measure in a range of 0...1 aw, which equates to 0...100 %RH, and supply a digital output signal, which can be displayed directly on a PC (HC2-AW-USB) or the HygroLab C1 and HP23-AW-A display units. Digital calibration can be performed using these instruments or with HW4 software. The HC2-AW measurement stations have a large thermal mass. This means the probes react very slowly to temperature changes so that virtually no variations arise during measurement – especially when using the AW Quick function. The extremely small internal volume of the sensor chamber ensures humidity equilibrium is reached very quickly in the case of all products.

WATER ACTIVITY PROBES

108



INSERTION PROBES

109



LABORATORY ANALYZER

110



HANDHELD INSTRUMENT

111-112



ACCESSORIES

113



WATER ACTIVITY PROBES

HC2-AW-USB

Applications

For water activity measurements in flour, grain, spices and bulk materials and in solid and pasty products such as meat, sausage as well as oils, fats, etc.

Features

- Measurement range: 0...1 aW (0...100 %RH), -40...85 °C
- On/Off switch
- USB interface for direct connection to a PC
- Power supply: via USB interface
- Adjusted at 23 °C and 10, 35, 80 %RH
- AW Quick function for fast measurement results (typically 4-5 minutes)

Order code	HC2-AW-USB	HC2-AW-USB-SW
Feature	Measurement probe	Probe + software HW4-P-Quick
Connection	Via USB to PC, 3 m cable	
Accuracy at 23 °C ±5 K	±0.008 aw / 0.8 %RH / ±0.1 K	
Power supply	Via USB interface	
Filter type	Wire mesh filter with 20...25 µm pore size	
Weight	550 g	

HC2-AW

Features

- As HC2-AW-USB, but with UART interface

Order code	HC2-AW
Feature	Measurement probe
Connection	Via UART, 1 m cable
Accuracy at 23 °C ±5 K	±0.008 aw / 0.8 %RH / ±0.1 K
Power supply	Via display unit
Filter type	Wire mesh filter with 20...25 µm pore size
Weight	550 g

COMPATIBLE

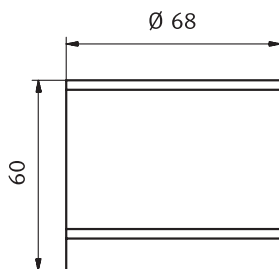
- HC2-AW-USB: with PC
- HC2-AW: with benchtop display unit HygroLab C1 and handheld instrument HP23-AW-A

INCLUDED

- Factory adjustment certificate

RECOMMENDED ACCESSORIES

- Sample holders: WP-14-S, WP-40, WP-40TH
- Calibration device: WP-14-S
- Disposable sample containers: PS-14, PS-40



INSERTION PROBES

5 / 10 mm for measurements in bulk materials

Applications

5 mm insertion probe: direct measurement of water activity in dust-free bulk materials such as tablets, grain, gel capsules and granulated materials.

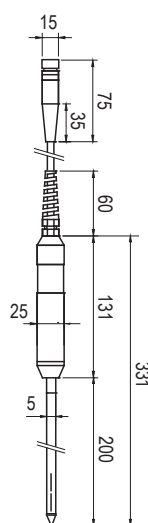
10 mm insertion probe: measurements in dusty bulk materials such as flour, sugar, etc.

Features

- Range of application: -40...85 °C / 0...100 %RH
- Digital interface (UART) and scalable analog outputs, 0...1 V
- Standard configuration: 0...1 V = -40...60 °C / 0...100 %RH
- Adjusted at 23 °C and 10, 35, 80 %RH

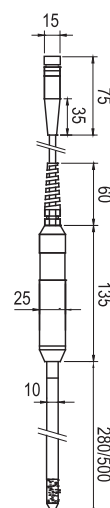
5 MM INSERTION PROBE

Order code	HC2-P05
Probe type	Ø 5 x 200 mm, insertion probe with 2 m cable
Accuracy at 23 °C ±5 K	±0.015 aW, ±1.5 %RH, ±0.3 K
Power supply	3.3...5 VDC, adjusted at 3.3 VDC, current: ~4.5 mA
Filter type	No filter available (laser-cut slots)
Response time	<15 s t63
Material	Stainless steel DIN 1.4305 (probe), POM (handle)
Weight	160 g



10 MM INSERTION PROBE

Order code	HC2-HP28	HC2-HP50
Probe length	Ø 10 x 280 mm	Ø 10 x 500 mm
Accuracy at 23 °C ±5 K	±0.008 aW, ±0.8 %RH, ±0.1 K	
Power supply	3.3...5 VDC, adjusted at 3.3 VDC, current: ~4.5 mA	
Filter type	Sintered steel	
Response time	<20 s, with filter t63	
Material	Stainless steel DIN 1.4305 (probe), POM (handle)	
Weight	200 g	300 g



COMPATIBLE

- Handheld instrument: HP23-AW-A
- Benchtop display unit: HygroLab C1

INCLUDED

- Factory adjustment certificate

RECOMMENDED ACCESSORIES

- Replacement filter HC2-HP28 / 50: ET-Z10

