PST
PROCESS SENSING
TECHNOLOGIES
a **DwyerOmega** brand

rotronic
MEASUREMENT SOLUTIONS

Rotronic
Product Catalogue

RMS

CO₂

7.43

mA V

Rotronic measuring instruments: precision at the highest level

Based in Switzerland and established in 1965, Rotronic offers a wide range of handheld instruments, transmitters, (standard and industrial) probes, data loggers, OEM products and monitoring systems. A world leader in relative humidity and temperature measurement, our portfolio also includes solutions for water activity, CO_2 and differential pressure. We thus cover a wide range of applications from the pharmaceutical and food industries to HVAC and meteorology.

Rotronic Monitoring System: modular, flexible and reliable

The Rotronic Monitoring System is a GAMP®5 category 4 software combined with category 1 hardware, helping users monitor their GxP compliant applications, looking into the critical quality attributes and monitoring critical process parameters, helping focus on patient safety, product quality and data integrity and compliant to EudraLex Annex 11 and FDA 21 CFR Part 11.

Rotronic – a PST and DwyerOmega brand

Within the Process Sensing Technologies (PST) Group, now part of DwyerOmega, the Rotronic brand stands as the center of excellence and highest quality in relative humidity and cloud-based monitoring systems. PST unites leading manufacturers to provide an unmatched comprehensive and complementary range of instruments, analyzers, and sensors. The mergers have opened up additional application opportunities for Rotronic, enabling our customers to benefit from an even broader range of innovative products.

Guarantee and services

Rotronic products guarantee reliability: we offer validated hardware, software and systems that comply with international regulations such as GAMP and FDA.
- Highest accuracy at ± 0.5 %RH
- ISO 9001 quality with factory adjustment certificate
- ISO 17025 accredited calibration laboratories in CH, DE (SCS0065), ISO 17025 accredited laboratories in UK, USA
- Products compliant to current industry standards
- 24 months product warranty (12 months for HG2 calibration system and AwTherm water activity measuring instrument)
- More than 50 years of experience in humidity measurement
- Eco-friendly, professional and free disposal of old devices and accessories

Software

Humidity and Temperature

Temperature

Differential pressure

CO$_2$

Applications

Rotronic Monitoring System – RMS

Services

Theory

Software

Humidity and Temperature

Temperature

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Software editions

STANDARD HYGROSOFT
- Free application for Windows PC, Android and iOS Smartphones
- Visualization of multiple loggers and measured values

HYGROSOFT WITH WATER ACTIVITY MEASUREMENT (HS-AW-CODE)
- All functions of the standard HygroSoft
- AW Quick function for fast determination of water activity

Function overview

Function overview	Standard HygroSoft	HygroSoft with water activity HS-AW-Code
The HygroSoft software from Rotronic constitutes a professional configuration tool and is licensed.		
Viewing of measured values/Monitoring		
Display of measured values on a monitor for multiple instruments	✔	✔
Display of measured values		
Numeric and graphic display	✔	✔
Graphic comparisons and overlay functions	✔	✔
Analysis and calculation tool		
Psychrometric parameters	✔	✔
Printing/Reports		
Automatic generation of adjustment, calibration and configuration reports	✔	✔
Printout as table, graph or PDF report	✔	✔
Water activity measurement		
AwQuick and AwE		✔
Supported interfaces		
NFC and USB	✔	✔
Ethernet	✔	✔
Instrument-specific functions		
Instrument settings, scaling, programming, data retrieval	✔	✔
Adjustment and calibration of Rotronic probes	✔	✔
Simultaneous adjustment of probes in one group	✔	✔
Time synchronization for data loggers	✔	✔

Description of functions

VIEWING OF MEASURED VALUES

Viewing of measured values is very easy and user-friendly. Files of any device shown in the device tree can be copied and opened directly with the HygroSoft Explorer. The data is presented in both tabular and graphical formats.

Instrument configuration

The HygroSoft software can be used to adjust the settings of Rotronic instruments and probes. Depending on the instrument and probe, the following functions and settings can be changed:
- Assignment and scaling of transmitter outputs
- Definition of alarm values
- Relay switch points
- Adjustment and calibration of probes

Statistical functions / PDF report

For many users detailed data, which can be very extensive, is not necessarily of much interest. For them it is merely important that the measured values lie within a certain range. The statistical function and integrated PDF report enable simple and detailed data evaluation for this.

It shows the following values:
- Min., max. and mean value (during a defined period or during the time of an alarm)
- Standard deviation
- Mean kinetic temperature
- Number of measured values
- Total time measurements exceeded a certain value
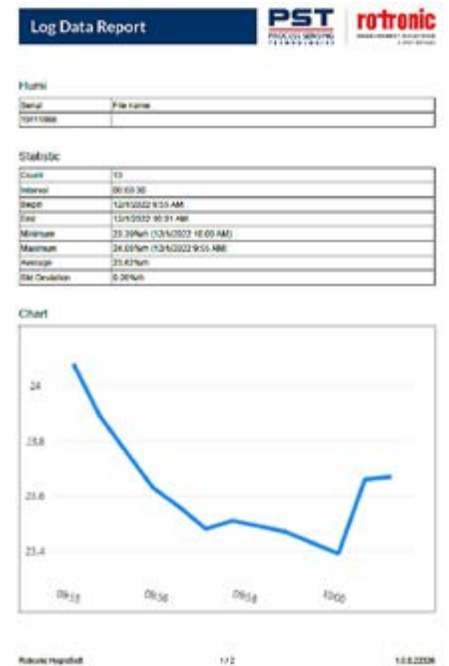
Water Activity Function

The HygroSoft offers for an additional cost a water activity license (HS-AW-Code) for the HygroSoft PC software. The additional water activity license is compatible with all Rotronic water activity products with USB and UART interface. This allows to make water activity measurement (AWE) with the special AwQuick for measurements within 4–5 minutes and AW Reports.

HygroSoft Mobile App

In addition to the normal PC software, the HygroSoft is also available as an App for iOS and Android. The App uses only the NFC interface, which will be available for the new HF5A, HF3A , TF5A and in future for other Rotronic products. This makes it possible to configure, adjust and update the device over the smartphone.

Software

Humidity and Temperature

Temperature

Differential pressure

CO$_2$

Applications

Rotronic Monitoring System – RMS

Services

Theory

Video Humidity

Interested? Then scan the QR code!

Explanation Relative Humidity

2025

Standard and high precision probes

HC2A-S / HC2A-S3 and HC2A-SH / HC2A-S3H

The HC2A-S / HC2A-S3 is the most versatile probe from Rotronic and forms the basis of the product portfolio. It measures humidity and temperature and calculates the dew/frost point. The HC2A-SH / HC2A-S3H fulfills the highest demands for measuring accuracy.

FEATURES
- Digital interface (UART) and scalable analog outputs, 0...1 V
- Standard (HC2A-S/-S3): adjusted at 23 °C and 10, 35, 80 %rh
- High precision (HC2A-SH/-S3H): adjusted at 23 °C and 10, 20, 30, 40, 50, 60, 70, 80, 90 %rh, then calibrated at 20, 50, 80 %rh
- Standard analog output scaling: 0...1 V = -40...60 °C / 0...100 %rh

APPLICATIONS
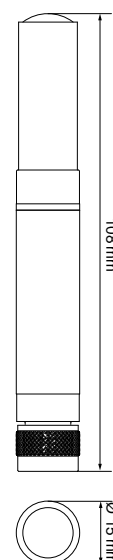HVAC, food industry, building services equipment, paper, textile and pharmaceutical industries.

Order code	HC2A-S/HC2A-S3	HC2A-SH/HC2A-S3H
Probe type	S: black, S3: white	SH: black, S3H: white
Dimensions	Ø 15 x 108 mm	
Range of application	-50...100 °C, 0...100 %rh	
Accuracy	±0.8 %rh, ±0.1 K, at 23 °C (10...90 %rh)	±0.5 %rh, ±0.1 K at 23 °C (10...90 %rh)
Power supply	3.3...5 VDC	
Current consumption	~4.5 mA, adjusted at 3.3 VDC	
Long-term stability	<1 %rh / year[1]	
Sensor type	ROTRONIC HYGROMER® HT-1, PT100 1/3 Class B	
Filter type	SPA-PE	
Response time	<15 s, without filter	
Max. wind velocity	3 m/s, without filter 20 m/s, with polyethylene filter	
Housing material	Polycarbonate	
Weight / IP protection	10 g/IP65	

[1] Drift < 1%rh per year with clean air or similar

HC2A-S
HC2A-SH

HC2A-S3
HC2A-S3H

108 mm

Ø 15 mm

Compatible		**Recommended accessories**	
• Handheld instruments	HP32	• Mounting flange	AC5005
• Transmitters	HF5A, PF4, PF5	• Filters	
• Meteorology transmitters	MP102H, MP402H	• Extension cable 2 m, black	E2-02A
		• Adapter cable, open ends, 2 m	E2-02XX-ACT/01
Delivery package		• Calibration device	ER-15
		• Humidity standard for calibration 10 %rh	EA10-SCS
• Factory adjustment certificate		• Humidity standard for calibration 35 %rh	EA35-SCS
• Short instruction manual		• Humidity standard for calibration 80 %rh	EA80-SCS
• Polyethylene filter			

Hydrogen peroxide environmental probes

HC2A-S-HH/HC2A-SM-HH

Standard humidity sensors have difficulty measuring accurately in high concentration H_2O_2 environments. The Hydrogen Peroxide inhibits the measurement of water vapour by occupying the pores on the surface of the sensor. This is why Rotronic has developed a special sensor, the HYGROMER® HH1-SK. The life of the sensor is greatly extended compared with that of the standard sensor for these applications.

FEATURES
- Digital interface (UART) and scalable analog outputs, 0...1 V
- Standard: adjusted at 23 °C and 10, 35, 80 %rh
- Standard analog output scaling: 0...1 V = -40...60 °C/0...100 %rh

APPLICATIONS
Hydrogen Peroxide sterilization of cleanrooms, incubators and other equipment. In this process the air is saturated by gassing or spraying, resulting in the formation of a microfilm on all surfaces. The hydrogen peroxide kills off all microorganisms. The H_2O_2 is then either recovered mechanically or allowed to decompose naturally over a period of 48 hours to harmless H_2O or O_2. The humidity level during the application is crucial for the effectiveness of the process.

HYGROMER HH1-SK Designed for increased load of H_2O_2

HC2A-SM-HH/ HC2A-S-HH

Order code	HC2A-S-HH/HC2A-SM-HH
Probe type	Humidity and temperature probe for H_2O_2
Dimensions	Ø 15 x 108 mm
Range of application	0...60 °C, 0...100 %rh
Accuracy	±1.0 %rh, ±0.1 K at 23 °C before and after diffusion phase
PeakLoad	H_2O_2 880 ppm/1200 mg/m³
Power supply	3.3...5 VDC
Current consumption	~4.5 mA, adjusted at 3.3 VDC
Sensor type	ROTRONIC HYGROMER® HH1-SK, PT100 1/3 Class B
Filter type	Without filter, for quick drying after condensation
Housing material	Polycarbonate/Stainless steel 1.4301
Weight / IP protection	10g / 47g / IP65

108 mm

Ø 15

Compatible		**Recommended accessories**	
• Transmitters	HF5A, PF4, PF5	• Mounting flange	AC5005
		• Filters	
Delivery package		• Extension cable 2 m, black	E2-02A
		• Adapter cable, open ends, 2 m	E2-02XX-ACT/01
• Factory adjustment certificate			
• Short instruction manual			

High-end meteriological probe

HC2A-S3A

The HC2A-S3A probe is the meteorological probe with a white housing but with a different filter (Wire-mesh filter with 10 μm filter pore size suitable for meteorological applications). It measures relative humidity and temperature and calculates the dew/frost point and is designed for the use in Rotronic meteorological applications.

FEATURES
- Digital interface (UART) and scalable analog outputs, 0...1 V
- Standard analog output scaling: 0...1 V = -40...60 °C / 0...100 %rh

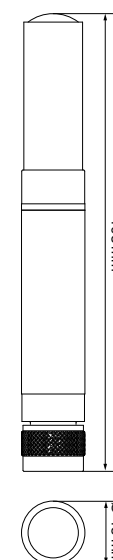**APPLICATIONS**
Meteorology, weather stations, snow cannon.

Order code	**HC2A-S3A**
Probe type	High-End Meteo
Dimensions	Ø 15 x 108 mm
Range of application	-50...80 °C[1], 0...100 %rh
Accuracy	±0.8 %rh, ±0.1 K at 23 °C
Power supply	3.3...5 VDC
Current consumption	~4.5 mA adjusted at 3.3 VDC
Long-term stability	<1 %rh / year[2]
Sensor type	ROTRONIC HYGROMER® HM1-SK, PT100 1/3 Class B
Filter type	SPA-PCW-WM
Response time	<15 s, without filter
Max. wind velocity	3 m/s, without filter 50 m/s, with wire-mesh filter
Housing material	Polycarbonate
Weight / IP protection	10 g/IP65

[1] The sensor withstands only 60 °Cdp
[2] Drift < 1%rh per year with clean air or similar

HC2A-S3A

108 mm

Ø 15 mm

Compatible		**Recommended accessories**	
• Handheld instruments	HP32	• Mounting flange	AC5005
• Transmitters	HF5A, PF4, PF5	• Filters	
• Meteorology transmitters	MP102H, MP402H	• Extension cable 5 m, white	E3-05A
• Naturally Ventilated Shields	AC1000	• Calibration device	ER-15
• Actively Ventilated Shields	RS12-T or RS24-T	• Humidity standard for calibration 10 %rh	EA10-SCS
		• Humidity standard for calibration 35 %rh	EA35-SCS
Delivery package		• Humidity standard for calibration 80 %rh	EA80-SCS
• Factory adjustment certificate			
• Short instruction manual			
• Wire-mesh filter			

Industrial steel probes

HC2A-SM

The HC2A-SM is the robust probe from Rotronic for harsh environments and adds to the wide product portfolio. It measures humidity and temperature and calculates the dew/frost point.

FEATURES

- Digital interface (UART) and scalable analog outputs, 0…1 V
- Standard analog output scaling: 0…1 V = -40…60 °C / 0…100 %rh
- Adjusted at 23 °C and 10, 35, 80 %rh

APPLICATIONS

Food, paper, textile, pharmaceutical and cosmetic industries.

Order code	HC2A-SM
Probe type	Chrome steel standard
Dimensions	Ø 15 x 109 mm
Range of application	-50…100 °C, 0…100 %rh
Accuracy	±0.8 %rh, ±0.1 K, at 23 °C
Power supply	3.3…5 VDC
Current consumption	~4.5 mA adjusted at 3.3 VDC
Long-term stability	<1 %rh / year[1]
Sensor type	ROTRONIC HYGROMER® HT-1, PT100 1/3 Class B
Filter type	SPA-WM-SM
Response time	<15 s, without filter
Max. wind velocity	3 m/s, without filter 50 m/s with wire mesh-filter
Housing material	Stainless steel 1.4301
Weight/IP protection	47 g/IP65

[1] Drift < 1%rh per year with clean air or similar

HC2A-SM

HC2-SM-EX available with ATEX certificate

Compatible

- Handheld instruments   HP32
- Transmitters   HF5A, PF4, PF5

Delivery package

- Factory adjustment certificate
- Short instruction manual
- Wire-mesh filter

Recommended accessories

- Mounting gland   AC1303-M
- Filters
- Extension cable 2 m, metal connector   E2-02A-M
- Calibration device   ER-15
- Humidity standard for calibration 10 %rh   EA10-SCS
- Humidity standard for calibration 35 %rh   EA35-SCS
- Humidity standard for calibration 80 %rh   EA80-SCS

Industrial cable probes

The Rotronic industrial probe is especially suitable for high temperatures and demanding industrial environments. It measures humidity and temperature and calculates the dew/frost point.

FEATURES
- Digital interface (UART) and scalable analog outputs, 0…1 V
- Standard analog output scaling: 0…1 V = -40…60 °C / 0…100 %rh
- Adjusted at 23 °C and 10, 35, 80 %rh

APPLICATIONS
Production environments, high temperatures, industrial manufacturing, drying processes, climate chambers.

Industrial probes

Ø 15 mm

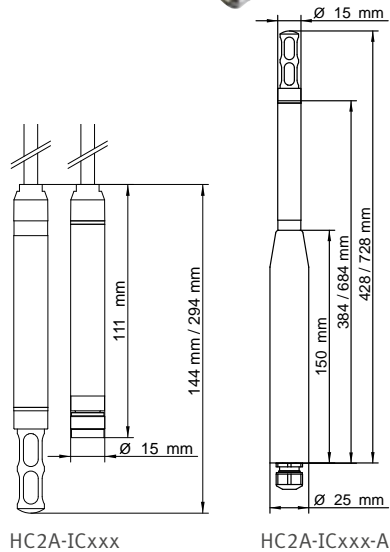| Order code	HC2A-IC1xx*	HC2A-IC302
Dimensions	Ø 15 x 144 mm	Ø 15 x 294 mm
Range of application	-100…200 °C[1]/0…100 %rh	
Accuracy	±0.8 %rh, ±0.1 K, at 23 °C	
Power supply	3.3…5 VDC	
Current consumption	~4.5 mA adjusted at 3.3 VDC	
Sensor type	ROTRONIC HYGROMER® HT-1, PT100 1/3 Class B	
Response time	<15 s, without filter	
Material	PPS	
Weight	230 g	260 g
* xx = cable length in meters (02, 05), 80 g per meter cable		

Industrial probes

Ø 15/25 mm

Order code	HC2A-IC402-A	HC2A-IC702-A
Dimensions	Ø 15/25 x 428 mm	Ø 15/25 x 728 mm
Range of application	-100…200 °C[1]/0…100 %rh	
Accuracy	±0.8 %rh, ±0.1 K, at 23 °C	
Power supply	3.3…5 VDC	
Current consumption	~4.5 mA adjusted at 3.3 VDC	
Sensor type	ROTRONIC HYGROMER® HT-1, PT100 1/3 Class B	
Response time	<15 s, without filter	
Material	PPS	
Weight	320 g	380 g

[1] Peak load: 100h. Maximal permissible continuous load: 190°C

HC2A-ICxxx

HC2A-ICxxx-A

Compatible		**Recommended accessories**	
• Handheld instruments	HP32	• Filters	
• Transmitters	HF5A, PF4, PF5	• Humidity standard for calibration 10 %rh	EA10-SCS
		• Humidity standard for calibration 35 %rh	EA35-SCS
Delivery package		• Humidity standard for calibration 80 %rh	EA80-SCS
• Factory adjustment certificate			

Industrial cable steel probes

The metal industrial probe is especially suitable for high temperatures, demanding industrial environments and applications where hygiene plays an important role. The probe measures humidity and temperature and calculates the dew/frost point.

FEATURES
- Digital interface (UART) and scalable analog outputs, 0...1 V
- Standard output scaling: 0...1 V = -40...60 °C / 0...100 %rh
- Adjusted at 23 °C and 10, 35, 80 %rh

APPLICATIONS
Food and pharmaceutical production, drying processes, industrial manufacturing.
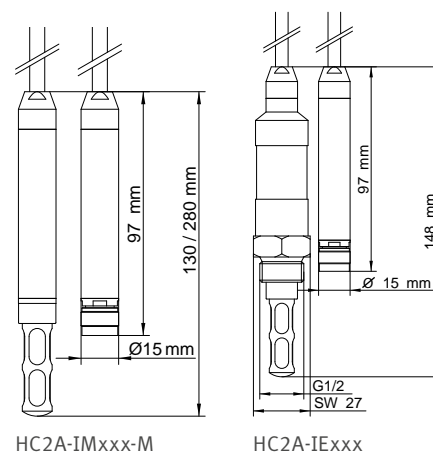
Steel industrial probes

Ø 15/25 mm

Order code	HC2A-IM102-M	HC2A-IM3xx-M*
Dimensions	Ø15 x 130 mm	Ø15 x 280 mm
Range of application	-100...200 °C[1]/0...100 %rh	
Accuracy	±0.8 %rh, ±0.1 K, at 23 °C	
Power supply	3.3...5 VDC	
Current consumption	~4.5 mA adjusted at 3.3 VDC	
Sensor type	ROTRONIC HYGROMER® HT-1, PT100 1/3 Class B	
Response time	<15 s, without filter	
Housing material	Stainless steel, DIN 1.4301	
Weight	230 g	260 g
* xx = cable length in meters (02, 05), 80 g per meter cable		

Screw-in probes

Ø 15 mm

Order code	HC2A-IE02-G	HC2A-IE02-NPT
Probe type	½" G with Rotronic connector	½" NPT with Rotronic connector
Range of application	-100...200 °C[1]/0...100 %rh	
Accuracy	±0.8 %rh, ±0.1 K, at 23 °C	
Power supply	3.3...5 VDC	
Current consumption	~4.5 mA adjusted at 3.3 VDC	
Sensor type	ROTRONIC HYGROMER ® HT-1, PT100 1/3 Class B	
Pressure	Pressure resistant from 0...100 bar / 1450 PSI	
Response time	<15 s, without filter	
Housing material	Stainless steel, DIN 1.4301	
Weight	290 g	

[1] Peak load: 100h. Maximal permissible continuous load: 190°C

HC2A-IMxxx-M   HC2A-IExxx

Compatible		Recommended accessories	
• Handheld instruments	HP32	• Filters	
• Transmitters	HF5A, PF4, PF5	• Calibration device (HC2A-IM)	ER-15
		• Humidity standard for calibration 10 %rh	EA10-SCS
Delivery package		• Humidity standard for calibration 35 %rh	EA35-SCS
		• Humidity standard for calibration 80 %rh	EA80-SCS
• Factory adjustment certificate			

High temperature handheld probes

The handheld probe is especially suitable for portable measurements of high temperatures.
It measures humidity and temperature and calculates the dew/frost point.

FEATURES

- Digital interface (UART) and scalable analog outputs, 0…1 V
- Standard output scaling: 0…1 V = -40…60 °C / 0…100 %rh
- Adjusted at 23 °C and 10, 35, 80 %rh

APPLICATIONS

Climate and temperature chambers, dryers, air ducts.

Order code	HC2-HK25	HC2-HK40
Probe type	Handheld probe	
Dimensions	Ø 15 x 250 mm	Ø 15 x 400 mm
Range of application	-100…170 °C/0…100 %rh	-100…200 °C[1]/0…100 %rh
Accuracy	±0.8 %rh, ±0.1 K, at 23 °C	
Power supply	3.3…5 VDC	
Current consumption	~4.5 mA adjusted at 3.3 VDC	
Sensor type	ROTRONIC HYGROMER® IN-1, PT100 1/3 Class B	
Response time	<15 s, without filter	
Housing material	PEEK, brass, chemically nickel-plated	
Weight	210 g	240 g
Filter	Wire-mesh filter	
Cable length	2 m	

[1] Short-term peak load (3 x 5 min)

Compatible

- Handheld instruments   HP32
- Transmitters   HF5A, PF4, PF5

Delivery package

- Factory adjustment certificate
- Wire-mesh filter

Recommended accessories

- Filters
- Calibration device   ER-15
- Humidity standard for calibration 10 %rh   EA10-SCS
- Humidity standard for calibration 35 %rh   EA35-SCS
- Humidity standard for calibration 80 %rh   EA80-SCS

Miniature probes

The miniature probe is used for humidity and temperature measurement in confined spaces. It also calculates the dew/frost point and can be installed discretely. The 4 mm probe has a spike tip for insertion in walls.
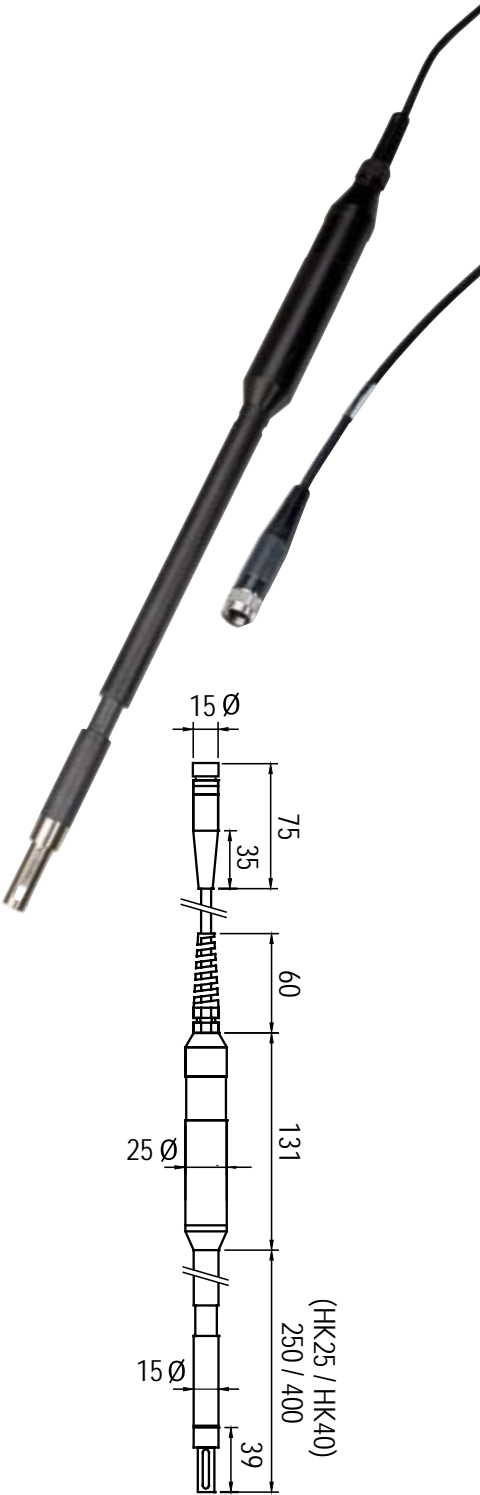
FEATURES

- Digital interface (UART) and scalable analog outputs, 0...1 V
- Standard output scaling: 0...1 V = -40...60 °C / 0...100 %rh
- Adjusted at 23 °C and 10, 35, 80 %rh

APPLICATIONS

Museums, glass cabinets, building material tests, automotive and aviation industries, testing laboratories, paper, textile and pharmaceutical industries.

Order code	HC2-C04	HC2-C05
Probe type	Cable probe, Ø 4 mm	Cable probe, Ø 5 mm
Range of application	-40...85 °C/0...100 %rh	
Accuracy	±1.5 %rh, ±0.3 K, at 23 °C	
Power supply	3.3...5 VDC	
Current consumption	~4.5 mA adjusted at 3.3 VDC	
Sensor type	ROTRONIC HYGROMER® IN-1, PT100 1/3 Class B	
Response time	<15 s, without filter	
Housing material	Stainless steel 1.4305	Brass, nickel-plated
Weight	150 g	160 g
Cable length	2 m	
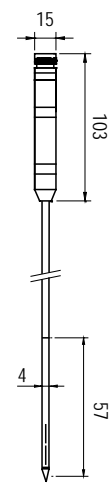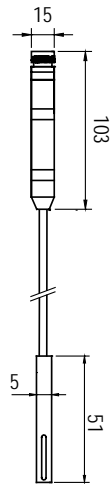
HC2-C04   HC2-C05

Compatible		Recommended accessories	
• Handheld instruments	HP32	• Extension cable 2 m, black	E2-02A
• Transmitters	HF5A, PF4, PF5	• Teflon filter for HC2-C05	SP-T05
		• Calibration device	ER-05
Delivery package		• Humidity standard for calibration 10 %rh	EA10-SCS
		• Humidity standard for calibration 35 %rh	EA35-SCS
• Factory adjustment certificate		• Humidity standard for calibration 80 %rh	EA80-SCS

Insertion probes

Ø 5 mm / 10 mm

The insertion probe is suitable for measurement in dust-free (P05) or dusty (HP28) bulk materials, bricks, concrete, etc. It measures humidity and temperature and calculates the dew/frost point.
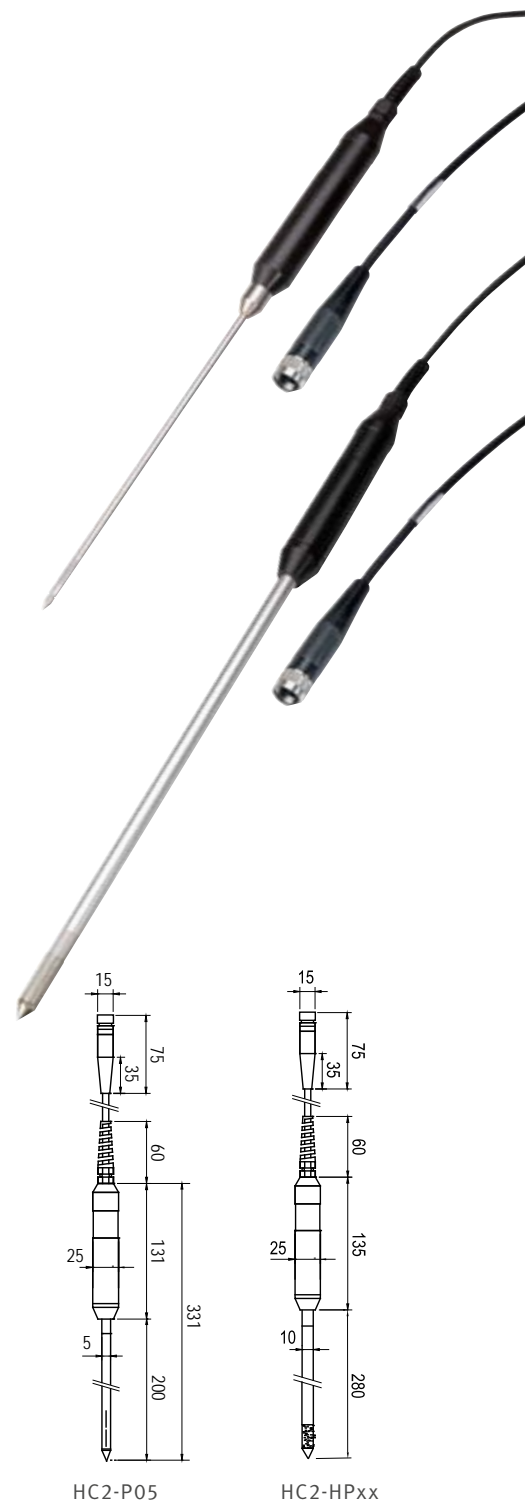
FEATURES
- Digital interface (UART)
- Standard output scaling: 0…1 V = -40…60 °C / 0…100 %rh
- Adjusted at 23 °C and 10, 35, 80 %rh

APPLICATIONS
Water activity measurement, portable measuring units with handheld instruments.

Order code	HC2-P05
Probe type	Ø 5 x 200 mm, insertion probe with laser cut slots
Range of application	-40…85 °C/0…100 %rh
Accuracy	±1.5 %rh, ±0.3 K, at 23 °C
Power supply	3.3…5 VDC
Current consumption	~4.5 mA adjusted at 3.3 VDC
Filter type	No filter available
Sensor type	ROTRONIC HYGROMER® IN-1, PT100 1/3 Class B
Response time	<15 s
Material	Stainless steel DIN 1.4305 (probe), POM (handle)
Weight	160 g
Cable length	2 m

Order code	HC2-HP28
Probe length	Ø 10 x 280 mm
Range of application	-40…85 °C/0…100 %rh
Accuracy	±0.8 %rh, ±0.1 K, at 23 °C
Power supply	3.3…5 VDC
Current consumption	~4.5 mA adjusted at 3.3 VDC
Filter type	Sintered steel
Sensor type	ROTRONIC HYGROMER® IN-1, PT100 1/3 Class B
Response time	<20 s, with filter
Material	Stainless steel DIN 1.4305 (probe), POM (handle)
Weight	200 g
Cable length	2 m

HC2-P05   HC2-HPxx

Compatible		**Recommended accessories**	
• Handheld instruments	HP32	• Replacement filter (HC2-HP28 / sintered steel)	ET-Z10
• Transmitters	HF5A, PF4, PF5	• Calibration device HC2-P05	ER-05
• Laboratory benchtop device	HygroLab	• Humidity standard for calibration 10 %rh	EA10-SCS
		• Humidity standard for calibration 35 %rh	EA35-SCS
Delivery package		• Humidity standard for calibration 80 %rh	EA80-SCS
• Factory adjustment certificate			

Sword probes

FEATURES

• Digital interface (UART) and scalable analog outputs, 0...1 V
• Standard output scaling: 0...1 V = -40...60 °C / 0...100 %rh
• Adjusted at 23 °C and 10, 35, 80 %rh

APPLICATIONS

Paper, printing and textile industries with handheld instruments.

Order code	HC2-HS28
Probe length	4 x 22 x 280 mm
Range of application	-40...85 °C/0...100 %rh
Accuracy	±0.8 %rh, ±0.1 K, at 23 °C
Power supply	3.3...5 VDC
Current consumption	~4.5 mA adjusted at 3.3 VDC
Filter type	No filter
Sensor type	ROTRONIC HYGROMER® IN-1, PT100 1/3 Class B
Response time	<15 s
Material	Aluminum (probe), POM (handle)
Weight	240 g
Cable length	2 m

Compatible

• Handheld instruments   HP32
• Transmitters   HF5A, PF4, PF5

Delivery package

• Factory adjustment certificate

Recommended accessories

• Calibration device (sword probe)   EGS
• Humidity standard for calibration 10 %rh   EA10-SCS
• Humidity standard for calibration 35 %rh   EA35-SCS
• Humidity standard for calibration 80 %rh   EA80-SCS

XD OEM probes

Thanks to its wide power supply range and freely selectable output signals, the XD OEM probe is suitable for a wide variety of applications.

FEATURES
- UART digital interface
- Different output stages programmable with HygroSoft software
- Adjusted at 23 °C and 10, 35, 80 %rh

APPLICATIONS
HVAC, climate chambers, snow guns and meteorology.

Order code	XD3xA-S3X*
Probe length	140.3 mm
Range of application	-40…85 °C/0…100 %rh
Accuracy	±0.8 %rh, ±0.2 K, at 23 °C
Power supply	5…24 VDC/5…16 VAC (0…1 V) 16…24 VDC/12…16 VAC (all output versions)
Current consumption	~ 7 mA @ 24 VDC, 0…10 V, 12 mA @ 5 VDC, 0…1 V
Long-term stability	<1 %rh/year
Sensor type	ROTRONIC HYGROMER® HT-1, PT100 1/3 Class B
Filter type	SPA-PE
Response time	<15 s, without filter
Housing material	Polycarbonate
Weight/IP protection	20 g/IP65
* x = Output (3: 0…1 V, 4: 0…5 V, 5: 0…10 V)	

Note: Not compatible with Rotronic data loggers, transmitters or handheld instruments.
* Requires HygroSoft software and service cable (XD-AC3001)

Ø 15

45

95.3
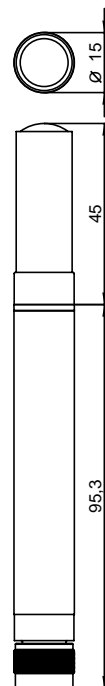
Delivery package

- Factory adjustment certificate
- Polyethylene filter
- Short instruction manual

Recommended accessories

Mounting flange	AC5005
Filters	
Extension cable 2 m, with open ends, black	E2-02XX
Calibration device	ER-15
Humidity standard for calibration 10 %rh	EA10-SCS
Humidity standard for calibration 35 %rh	EA35-SCS
Humidity standard for calibration 80 %rh	EA80-SCS
Service cable to PC	XD-AC3001

PC series

FEATURES
- High accurate measurements in precision manufacturing applications
- Built in interchangeable Hygrosmart module
- Different probe types; analog or digital
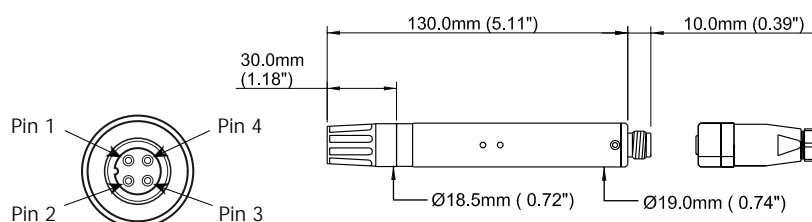- Available in different materials polymer or stainless steel

APPLICATIONS
Production environment, Industrial Manufacturing, Meteorological applications, Climate chambers.

PCMini52

PC62 & PC62V
PC33 & PC52

PC62 & PC62V

- Application range: -20…80 °C/0…100 %rh
- Accuracy: <±2 %rh (10…90 %rh), ±0.2 K @ 23°C
- Stability: ±1 %rh/year
- Materials: Molded polymer or stainless steel

Pin 1   Pin 4
Pin 2   Pin 3

130.0mm (5.11")   10.0mm (0.39")
30.0mm (1.18")
Ø18.5mm (0.72")   Ø19.0mm (0.74")

Electrical Connections

Voltage output		
Cable	**Connector**	
Brown	Pin 1	Power supply V +
White	Pin 2	Output temperature +
Blue	Pin 3	Common ground
Black	Pin 4	Output rh +

| **Cable**	**Connector**	**RS232**	**RS485**
Brown	Pin 1	Power supply V +	Power supply V +
White	Pin 2	RX	RX/TX -
Blue	Pin 3	Ground	Ground
Black	Pin 4	TX	TX/RX +

PCMini52

- Application range: -20…80 °C/0…100 %rh
- Accuracy: <±2 %rh (10…90 %rh), ±0.2 K @ 23 °C
- Stability: ±1 %rh/year
- Output: Modbus RTU/Voltage
- Materials: Molded polymer or stainless steel

80mm (3.15")
12.5mm (0.49")
11mm (0.43")
Ø12mm (0.47")   M12 x 1   M8 x 1

91mm (3.58")
12.5mm (0.49")
11mm (0.43")
Ø12mm (0.47")   M12 x 1   M8 x 1
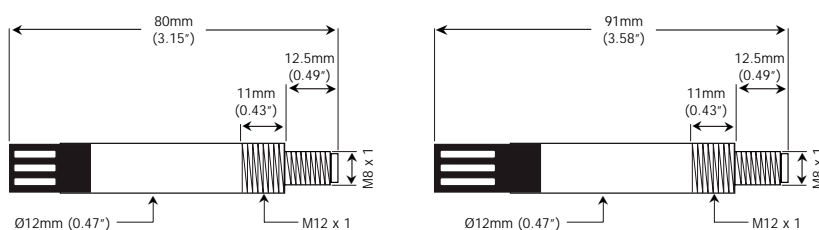
Electrical Connections

Mating Cable		**Pin**
Brown	Supply voltage V +	1
White	Modbus	2
Blue	V -	3
Black	Modbus	4

M12 x 1
M8 x 1
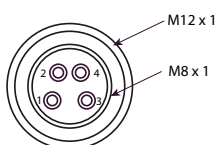
Voltage output		
Cable	**Connector**	
Brown	Pin 1	Power supply V +
White	Pin 2	Output rh +
Black	Pin 3	Output temperature +
Blue	Pin 4	Common ground

2025

PC33 & PC52

- Application range: -20...80 °C/0...100 %rh
- Accuracy PC52: ±2 %rh (10...90 %rh), ±0.2 K @ 23 °C
- Accuracy PC33: ±3 %rh (30...80 %rh), ±0.3 K @ 23 °C
- Stability: ±1 %rh/year
- Materials: Molded polymer or stainless steel

130.0mm (5.11") 10.0mm (0.39")
30.0mm (1.18")

Pin 1   Pin 4
Pin 2   Pin 3

Ø18.5mm (0.72")   Ø19.0mm (0.74")

Electrical Connections

Voltage output		
Mating Cable		**Pin**
Brown	Supply voltage V +	1
White	Output temperature +	2
Blue	Common ground	3
Black	Output rh +	4
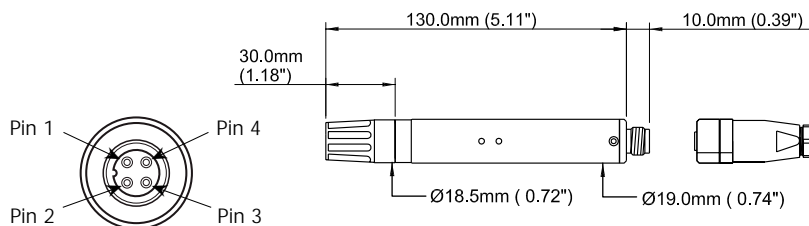
4-20 mA Output 2-wire		
Mating Cable		**Pin**
Brown	Output rh +	1
White	Output temperature -	2
Blue	Output rh -	3
Black	Output temperature +	4

Technical Information

	PC33 & PC52	PC62 & PC62V	PCMini52
Probe type	Analog relative humidity and temperature	Digital relative humidity and temperature	Digital relative humidity and temperature
Measuring range		-20...80 °C/0...100 %rh	
Accuracy at 23 °C	PC33: ±3 %rh (30...80 %rh)/±0.3 K PC52: ±2 %rh (10...90 %rh)/±0.2 K	±2 %rh (10...90 %rh)/±0.2 K	±2 %rh (10...90 %rh)/±0.2 K
Long-term stability		<1 %rh/year	
Probe housing	Molded polymer or stainless steel		Molded polymer or stainless steel
IP Protection rating		IP65	
Power supply	14...30 VDC (0...5 V/ 0...10 V output) 5...30 VDC (0...1 V & mA output)	14...30 VDC (0...5 V/ 0...10 V output) 5...30 VDC (0...1 V)	14...35 VDC (0...5 V/0...10 V output) 6...35 VDC (0...1 V output)
Output signal	4–20 mA, 0 to 1, 0 to 5, 0 to 10 V	0–1, 0–5, 0–10 V, RS232, RS485	Modbus RTU 0 to 1, 0 to 5, 0 to 10 V
Response time rh sensor		<10 sec typical (for 90% of the step change)	
Electrical connections	M12		4 pin, M8 connector 4 pin, M12 connector
Weight	30 g (1.06 oz) without cable (molded polymer version)		10 g (0.35 oz)

Compatibility

- PC-Series are standalone probes which are not compatible with Rotronic transmitters and Rotronic handhelds
- The only compatible accessories and spare parts like filters, protection caps, mounting clips etc. are listed here
- In case of insecurity, please contact your local Rotronic partner

PC-SERIES ACCESSORIES AND SPARE PARTS

Order Code	Compatibility	Product/Description
		Protection cap
A000002	PC62 & 62V, PC33 & PC52	19mm (0.75") Slotted protection cap black
A000003	PCMini52	12mm (0.47") Slotted protection cap black
A000046	PCMini52	13mm HDPE Protection cap
A000120	PC62 & 62V, PCMini52, PC33 & PC52	ø90mm (3.54") WM weather protection cap (for ø19mm (0.75") probes)
A000125	PC62 & 62V, PCMini52, PC33 & PC52	ø120mm (4.72") WM weather protection cap (for ø19mm (0.75") probes)
		Filter
A000014	PC62 & 62V, PC33 & PC52	19mm (0.75") PVDF filter
A000015	PC62 & 62V, PC33 & PC52	19mm (0.75") PVDF filter w/ protection cap black
A000017	PCMini52	12mm (0.47") PVDF filter
A000018	PCMini52	12mm (0.47") PVDF filter w/ protection cap black
A000021	PC62 & 62V, PC33 & PC52	19mm (0.75") Mesh filter w/ protection cap black
A000022	PCMini52	12mm (0.47") Mesh filter w/ protection cap black
A000023	PCMini52	12mm (0.47") Flat SS sintered dust filter
A000025	PC62 & 62V, PC33 & PC52	19mm (0.75") Arrow 5µm SS sintered filter
A000027	PC62 & 62V, PC33 & PC52	19mm (0.75") connector, no cable, w/screw terminal
A000028	PCMini52	12mm (0.47") Arrow 20µm SS sintered filter
A000040	PC62 & 62V, PC33 & PC52	19mm (0.75") Foil filter 2µm w/protection cap black
A000042	PC62 & 62V, PC33 & PC52	19mm (0.75") Oleophobic foil filter 0.7µm (w/protection cap black)
K9	PCMini52	12mm (0.47") Mesh filter with protection cap, light brown, extra long (30mm)
K10	PCMini52	12mm (0.47") PTFE filter with peek protection cap
K11	PCMini52	12mm (0.47") Slotted protection cap, light brown, extra long (30mm)
		Cable
A000030-xx xx = total length i.e. A000030-20	PC62 & 62V, PC33 & PC52	19mm (0.75") Connector - Connector - Cable (price per meter)
A000031	PC62 & 62V, PC33 & PC52	19mm (0.75") connector with 2m (6.5') cable
A000032	PC62 & 62V, PC33 & PC52	19mm (0.75") connector with 5m (16') cable
A000033	PCMini52	12mm (0.47") connector with 2m (6.5') cable
A000036	PCMini52	12mm (0.47") connector with 5m (16') cable
A000037	PCMini52	12mm (0.47") connector with 10m (32.8') cable
A000321	PCMini52	12mm (0.47") connector without cable (with solder terminal)
A000321-xx xx = total length i.e. A000321-20	PCMini52	12mm (0.47") connector - Connector - Cable (price per meter)
A000322	PCMini52	12mm (0.47") Connector with 20m (25.6') cable
		Mounting
A000100	PC62 & 62V, PC33 & PC52	3/4" NPT SS adj. fitting for SS probes
A000101	PCMini52	1/2" NPT SS adj. fitting for SS probes
A000110	PC62 & 62V, PC33 & PC52	Al mounting flange for ø19mm (0.75") SS probes (outside ø80mm (3.15"))
A000111	PCMini52	Al mounting flange for ø12mm (0.47") SS probes (outside ø40mm (1.57"))
A000150	PC62 & 62V, PC33 & PC52	Mini flange for ø19mm (0.75") polymer probe

Filter / Carrier HC2A advanced probes

DESCRIPTION

Filter carriers protect the humidity and temperature sensors against mechanical damage. Filters act as a protective barrier against contaminants/pollutants that can influence the sensor. When choosing the correct combination of filter carrier and filter there are many factors to consider. Specific conditions such as high air velocities, pollutants in the air, disinfection and cleaning routines, mechanical impacts, high bioactivity, condensation, airborne chemical contaminants and required response time are some of the many considerations.
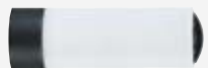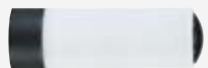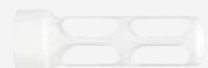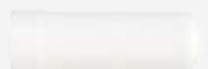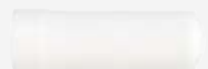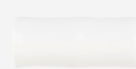
Plastic filter carrier	Metal filter carrier
• Maximum temperature 100 °C • Mechanical protection	• Maximum temperature 200 °C • Mechanical protection

Overview filters

	Teflon filters	Polyethylene filters	Sintered steel filters (stainless steel)	Wire-mesh filters (metal)
Maximum temperature (consider range of application of filter carrier)	200 °C	100 °C	200 °C	200 °C
Protection against particulates	✓✓	✓✓	✓	✓
Protection against abrasives in the air			✓✓✓	✓
Pore size	10 µm	40 µm	25 µm	10 µm
Max. air velocity [m/s] (continuous load)	50	50	70	50

✓ = low   ✓✓ = medium   ✓✓✓ = high

Overview probes												
Range of application (temp.)			-50…100 °C					-40…85°C	-100…200°C			
Probe		HC2A-S	HC2A-S3	HC2A-SH	HC2A-S3H	HC2A-S-HH	HC2A-SM	XD33A-S3X	HC2A-ICxxx	HC2A-ICxxx-A	HC2A-IMxxx-M	HC2A-IExxx
-50…100 °C	SPA-PCB			✓				✓				
	SPA-PCW			✓				✓				
-100…200°C	SPA-SS			✓		✓		✓	✓	✓	✓	✓
-50…100 °C	SPA-PCB-PE			✓				✓				
	SPA-PCB-PTFE			✓				✓				
	SPA-PCB-WM			✓				✓				
	SPA-PCW-PE			✓				✓				
	SPA-PCW-PTFE			✓				✓				
	SPA-PCW-WM			✓				✓				
	SPA-SS-PE			✓		✓		✓				
	SPA-PE			✓		✓		✓				
-100…200°C	SPA-SS-PTFE			✓		✓		✓	✓	✓	✓	✓
	SPA-SS-WM			✓				✓	✓	✓		
	SPA-SS-WM-SM						✓				✓	✓
	SPA-SSS			✓		✓		✓	✓	✓	✓	✓
	SPA-WM			✓				✓		✓		
	SPA-WM-SM						✓				✓	✓
	SPA-PTFE			✓		✓		✓	✓	✓	✓	✓

Filters & carriers

HC2A-S/HC2A-S3/HC2A-SH/HC2A-S3H/HC2A-S-HH/HC2A-S3A

Order code	Filter carrier	Filter element	Pore size	Range of application	
SPA-PCB	Polycarbonate, black	No filter, only filter carrier		-50...100 °C	
SPA-PCB-PE		Polyethylene, white	40-50 µm		
SPA-PCB-PTFE		PTFE, white	10 µm		
SPA-PCB-WM		Wire-mesh 1.4401	10 µm		
SPA-PCW	Polycarbonate, white	No filter, only filter carrier		-50...100 °C	
SPA-PCW-PE		Polyethylene, white	40-50 µm		
SPA-PCW-PTFE		PTFE, white	10 µm		
SPA-PCW-WM		Wire-mesh 1.4401	10 µm		
SPA-PE	No filter carrier, only filter	Polyethylene, white	40-50 µm		
SPA-PTFE	No filter carrier, only filter	PTFE, white	10 µm	-100...200 °C	
Particulate filter/Waterproof					
SPA-POM-FD2	POM white	Teflon	2 µm	-50...100 °C	
SPA-PE-FD2	POM white	Polyethylene	2 µm		

HC2A-IC

Order code	Filter carrier	Filter element	Pore size	Range of application	
SPA-SS	1.4301	No filter, only filter carrier		-100...200 °C	
SPA-SS-PTFE		PTFE, white	10 µm		
SPA-SS-WM		Wire-mesh 1.4401	10 µm		
SPA-SSS	Filter carrier incl. filter	Sintered steel 1.4404	25 µm		
SPA-WM	No filter carrier, only filter	Wire-mesh 1.4401	10 µm		

HC2A-IM/HC2A-IE

Order code	Filter carrier	Filter element	Pore size	Range of application	
SPA-SS	1.4301	No filter, only filter carrier		-100...200 °C	
SPA-SS-PTFE		PTFE, white	10 µm		
SPA-SS-WM-SM		Wire-mesh 1.4401	10 µm		
SPA-SSS	Filter carrier incl. filter	Sintered steel 1.4404	25 µm		
SPA-WM-SM	No filter carrier, only filter	Wire-mesh 1.4401	10 µm		

HC2A-SM

Order code	Filter carrier	Filter element	Pore size	Range of application	
SPA-SS	1.4301	No filter, only filter carrier		-50...100 °C	
SPA-SS-PE		Polyethylen, white	40–50 µm		
SPA-SS-PTFE		PTFE, white	10 µm		
SPA-SS-WM-SM		Wire-mesh 1.4401	10 µm		
SPA-SSS	Filter carrier incl. filter	Sintered steel 1.4404	25 µm	-100...200 °C	
SPA-WM-SM*	No filter carrier, only filter	Wire-mesh 1.4401	10 µm		

Note: The range of application depends on the component with the smallest temperature range.
* The SPA-WM-SM filter is shorter than the SPA-WM and is therefore only suitable for HC2A-SM/ -IE/ -IM sensors.

Suitable for web and water activity probes AwEasy, HC2A-AW-USB, HC2A-AW, HC2-AW-USB, HC2-AW

Order code	Description	
ET-W24-Set	Flat wire mesh filter with circlip, Ø 24 mm for HC2A-AW (-USB) Pore size: 20...25 µm	

Filter / Carrier HC2 probes

DESCRIPTION

Filter carriers protect the humidity and temperature sensors against mechanical damage. Filters act as a protective barrier against contaminants/pollutants that can influence the sensor. When choosing the correct combination of filter carrier and filter there are many factors to consider. Specific conditions such as high air velocities, pollutants in the air, disinfection and cleaning routines, mechanical impacts, high bioactivity, condensation, airborne chemical contaminants and required response time are some of the many considerations.

Plastic filter carrier	Metal filter carrier
• Maximum temperature 120 °C • Mechanical protection	• Maximum temperature 200 °C • Mechanical protection

Overview filters

	Teflon filters	Polyethylene filters	MFD filters (membrane)	Polypropylene filters (screen)	Sintered steel filters (stainless steel)	Wire-mesh filters (metal)
Maximum temperature (consider range of application of filter carrier)	200 °C	100 °C	120 °C	120 °C	200 °C	200 °C
Protection against particulates	✓✓	✓✓	✓		✓	✓
Protection against abrasives in the air					✓✓✓	✓
Fast response time (low damping)			✓	✓✓		
Pore size	10 µm	40 µm	-	150 µm	25 µm	10 µm
Max. air velocity [m/s] (continuous load)	50	50	15	10	70	50
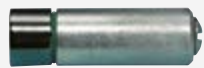
✓ = low   ✓✓ = medium   ✓✓✓ = high

Suitable for standard probes HC2-S/HC2-S3/Thread: Rotronic round thread

Order code	Filter carrier	Filter element	Pore size	Range of application	
NSP-PCB-PE	Polycarbonate, black	Polyethylene, gray	20 µm	-50...100 °C	
NSP-PCB-PE40		Polyethylene, white	40 µm		
NSP-PCB-WM		Wire-mesh	20...25 µm		
NSP-PCB-TF		Teflon	10 µm		
NSP-PCB-MFD		MFD	–		
NSP-PCB-PP100		Polypropylene	150 µm		
NSP-PCB		No filter element, only carrier			
NSP-PCW-PE	Polycarbonate, white	Polyethylene, gray	20 µm	-50...100 °C	
NSP-PCW-PE40		Polyethylene, white	40 µm		
NSP-PCW-WM		Wire-mesh	20...25 µm		
NSP-PCW-TF		Teflon	10 µm		
NSP-PCW		No filter element, only carrier			
NSP-PE	No carrier, only filter		20 µm	-50...100 °C	
Particulate filter/Waterproof					
NSP-POM-FD2	POM, white	Teflon	2 µm	-50...100 °C	
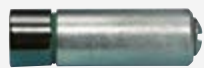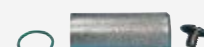
Suitable for industrial probes HC2-IC/HC2-HK
Thread: Rotronic round thread

Order code	Filter carrier	Filter element	Pore size	Range of application	
NSP-ME-WM	Brass, nickel-plated	Wire-mesh DIN 1.4401	20...25 µm	-100...200 °C	
NSP-ME-SS		Sintered steel DIN 1.4401	5 µm	-100...200 °C	
NSP-ME-TF		Teflon	10 µm	-80...200 °C	
Spare parts					
SP-M15	No filter carrier, only filter	Wire-mesh DIN 1.4401	20...25 µm	-100...200 °C	
SP-S15	No filter carrier, only filter	Sintered steel DIN 1.4401	5 µm	-100...200 °C	
SP-T15	No filter carrier, only filter	Teflon	10 µm	-80...200 °C	

Suitable for industrial probes HC2-IM/HC2-IE
Thread: M12 x 1.5

Order code	Filter carrier	Filter element	Pore size	Range of application	
SP-MC15	Brass, nickel-plated	Wire-mesh DIN 1.4401	20...25 µm	-100...200 °C	
SP-SC15		Sintered steel DIN 1.4401	5 µm	-100...200 °C	
SP-TC15		Teflon	10 µm	-80...200 °C	
Spare parts					
SP-MSB15	Brass, nickel-plated	No filter element, only carrier		-100...200 °C	
SP-M15	No filter carrier, only filter	Wire-mesh DIN 1.4401	20...25 µm	-100...200 °C	
SP-S15	No filter carrier, only filter	Sintered steel DIN 1.4401	5 µm	-100...200 °C	
SP-T15	No filter carrier, only filter	Teflon	10 µm	-80...200 °C	

Suitable for handheld probes HC2-HP28/HP50

Order code	Filter carrier	Filter element	Pore size	Range of application	
ET-Z10	No filter carrier, only filter	Sintered steel DIN 1.4401	15 µm	-40...85 °C	

Suitable for HF3 type R & S

Order code	Filter carrier	Filter element	Pore size	Range of application	
NSP-PCG-PE	Polycarbonate, gray	Polyethylene, gray	20 µm	-40...85 °C	

Suitable for HF3 type D & W

Order code	Filter carrier	Filter element	Pore size	Range of application	
SPA-PCW-PE	Polycarbonate, white	Polyethylene, white	40-50 µm	-50...100 °C	

Suitable for MP100A/400A

Order code	Filter carrier	Filter element	Pore size	Range of application	
SP-W3-25	Polycarbonate, white	Wire-mesh	20 µm	-40...85 °C	

Suitable for HF1, CP11, CL11, HP31

Order code	Description	
NSP-PCB-PE-AZ	Polycarbonate filter and filter carrier for HF1, CP11, CL11, HP31	

The HygroFlex series

	HF1	HF3A	HF5A
Parameter	Humidity, Temperature	Humidity, Temperature	Humidity, Temperature, CO_2, Differential Pressure
Range of application electronics with display option	-20…60 °C -20…60 °C	-40…85 °C -10…60 °C	-40…70 °C -10…60 °C
Temperature limits at probe	-20…60 °C	-50…100 °C[1]	Probe dependent
Accuracy at 23 °C	**Type W & D & F:** ± 2 %rh (10…90 %rh) at ±0.3 °C **Type S:** ± 3 %rh (10…90 %rh) at ±1 °C	±1.2 %rh ±0.1 °C	Probe dependent
Probe connection	Not interchangeable	Not interchangeable	1 x interchangeable probe: HC2/HC2A/HCD/TCD/CCA/PCD[2]
Space mount version	✓		
Wall version	✓	✓	✓
Duct version	15 mm probe	15 mm probe	AC5005 + E2-F3A
Cable version		2 m cable	Extension cable or industrial probe
User Interface		NFC	NFC
IP protection	IP65 (space mount version IP20)	IP65	IP65
Power supply	15…40 VDC/12…28 VAC	10…28 VDC/18…36 VDC	18…36 VDC
Analog output	2-wire: current output 3/4-wire: current or voltage output	2-wire: current output 3/4-wire: current or voltage output	2-wire: current output 3/4-wire: current or voltage output
Communication protocol		MODBUS RTU (RS485)	MODBUS RTU (RS485)
Functions		All psychrometric parameters	All psychrometric parameters

[1] The measurement range for the wall and duct mount unit is limitated to the application range due to the proximity of the probe to the electronics

[2] The PCD probe only works with a 3/4-wire transmitter

The HygroFlex series

Parameter	HF562/ HF5-S		HF73A	DT722
Parameter	Humidity, Temperature		Humidity, Temperature	Humidity, Temperature
Range of application electronics with display option	-40...60 °C -10...60 °C		-40...85 °C	-20...70 °C
Temperature limits at probe	Probe dependent		-100...200 °C (Type D)	-40...150 °C
Accuracy at 23 °C	Probe dependent		±1 %rh ±0.2 °C	< ±2 %rh ±0.2 °C
Probe connection	1 x interchangeable probe: HC2/HC2A		Not interchangeable	Not interchangeable
Space mount version				
Wall version	✓			
Duct version	✓		25/15 mm probe	200 mm, 300 mm, 500 mm, 900 mm
Cable version	Extension cable or industrial probe			2 m, 5 m
User Interface	USB or Ethernet			
IP protection	IP65/IP40	IP65	IP65	IP65
Power supply	100...240 VAC (Galvanic isolated)	15...40 VDC /12...28 VAC 9...36 VDC /7...24 VAC (Galvanic isolated)	15...40 VDC/12...28 VAC	8...32 VDC
Analog output	2-wire: current output 3/4-wire: current or voltage output		3/4-wire: current or voltage output	2-wire: current output
Communication protocol	RS485			
Functions	All psychrometric parameters		Dew/Frost point	Dew Point

HF1 series

HygroFlex1 is the low-cost series of HVAC transmitters for relative humidity and temperature. The devices are equipped with the tried-and-tested Hygromer® IN-1 sensor and boast unbeatable value for money. The freely available Rotronic HygroSoft software enables you to change the output scaling, calibrate the transmitter and adjust the humidity sensor.

FEATURES

- Accuracy*: ±2 %rh, ± 0.3 °C, at 23 °C
- Range of application*: -20...60 °C/0...100 %rh
- Small size
- Easy mechanical installation
- USB service interface
- Adjusted at 35 %rh/80 %rh

HF1 wall and duct version

APPLICATIONS

Measures relative humidity and temperature in HVAC applications.

Wall version/(Type W)
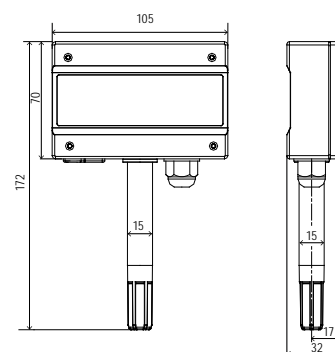
Duct version (Type D/F)
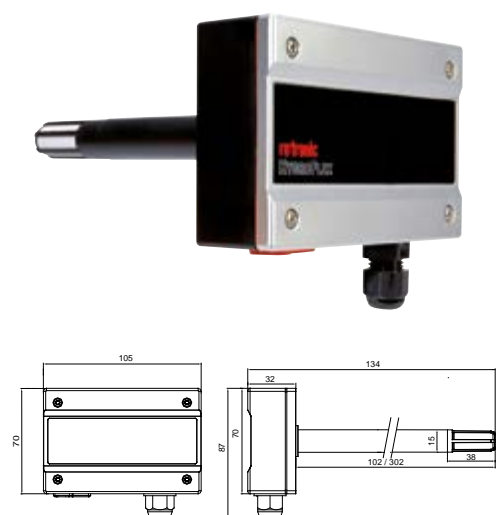
HF1 space mount version

APPLICATIONS

Offices or rooms where good looks are important.

Space mount (Type S)
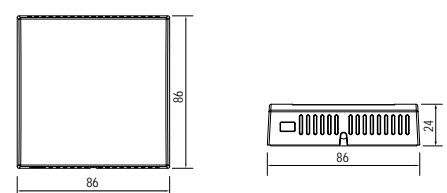
¹ The PCD probe only works with a 3/4-wire transmitter

TECHNICAL INFORMATION

Order Code	HF120 2-wire	HF13X 3/4-wire
General		
Parameters	Humidity and temperature	
Housing material/IP protection	ABS/IP65, except type S IP30	
Dimensions	105 x 172 x 32 mm (type W), 105 x 87 x 134(334) mm (type D), 86 x 86 x 24 mm (type S)	
Weight	140 g (type W and D), 200 g (type F), 90 g (type S)	
Probe connection	Fixed (Type D: Probe length 100mm/Type F: Probe length 300mm)	
Filter material	Polyethylene	
Display	LCD, 1 or 2 decimals, without backlight	LCD, 1 or 2 decimals, with backlight
Electrical connections	Connections: screw terminals inside (type D/W) Cable gland: M12	
Power supply	10…28 VDC	15…40 VDC/12…28 VAC
Current consumption	2x20 mA max.	<55 mA (current output) <15 mA (voltage output)
Service interface	USB-Mini	
CE/EMC compatibility	EMC Directive 2014/30/EU	
Humidity measurement		
Sensor	ROTRONIC HYGROMER® IN-1	
Measurement range	0…100 %rh (non-condensing)	
Accuracy at 23°C ±5 °C	±3.0 %rh (10…90 %rh)	
Long-term stability	<1.5 %rh/year	
Response time	<30 s τ63 (63 % increase 35…80 %rh) without filter	
Maximum wind velocity	20 m/s with filter	
Temperature measurement		
Sensor	NTC	
Measurement range	-20…50°C (type S), -20…60°C (type W, D, F)	
Accuracy at 23°C ±5 °C	±0.3 °C (type W, type D), ±1 °C (type S)	
Response time	4 s	
Analog output		
Number	2	
Current	4…20 mA	4…20 mA
Voltage	N/A	0…1/5/10 V

Compatible

- HygroSoft

Delivery package

- Factory adjustment certificate
- Short instruction manual

Recommended accessories

- USB service cable   AC0003
- Calibration device   ER-15
- Mounting flange   AC5005

HF3A series

The HygroFlex3 Advanced series is ideal for all applications where good accuracy measurement of humidity and temperature is of critical importance and device aesthetics matter. The transmitters is designed for fixed installation and is suitable for HVAC and light industrial application.

FEATURES
- Accuracy: ±1.2 %rh, ±0.1°C @ 23°C
- Range of application electronics: -40...85°C/-10...60 °C with display
- Fix probe transmitter available as wall, cable and duct version
- Freely programmable outputs and scaling via NFC-Interface
  & supports NFC Powerless

HF3A wall version

APPLICATIONS
Offices or rooms where good looks are important.

Wall version
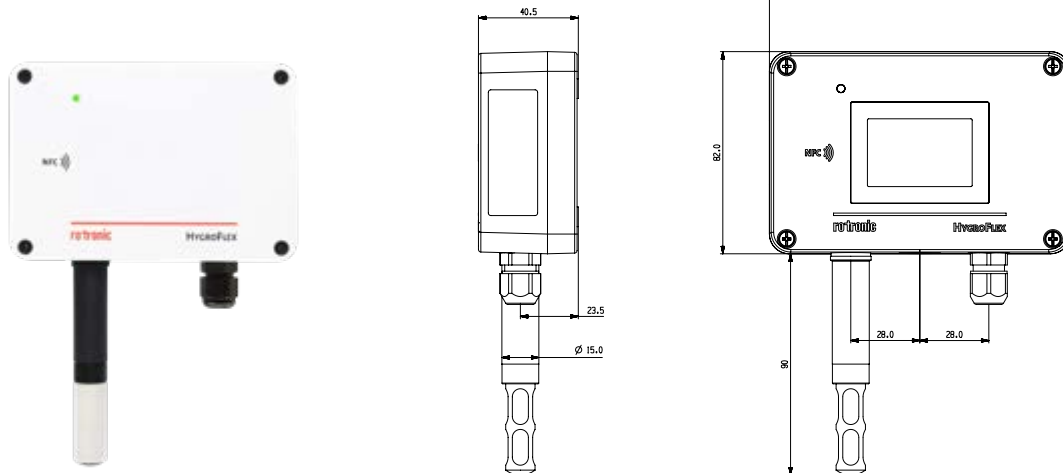
HF3A cable and duct version

APPLICATIONS
Heating, ventilation, air-conditioning.

Cable version   Duct version
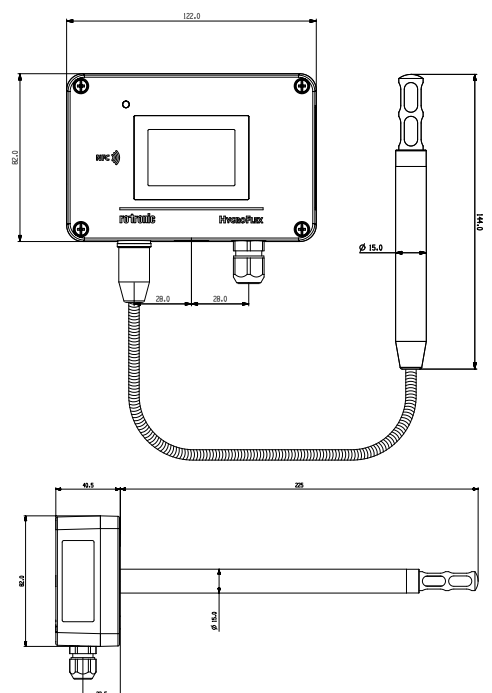
TECHNICAL INFORMATION

Order Code	HF3A-2 2-wire	HF3A-3/HF3A-D 3- /4-wire
Probe	Humidity and temperature fix mounted	
Accuracy @ 23 °C	±1.2 %rh, ± 0.1 °C	
Initialization time	Typically 5 sec.	
Measurement interval	1 sec.	
Measurement range	0...100 %rh Wall[1]: -40...85 °C/-10...60 °C Duct[2]/Cable: -50...100 °C	
Range of applications	0...100 %rh (non-condensing) -10...60 °C with display -40...85 °C without display	
Display resolution	Resolution up to 2 decimal places	
	without backlighting	with backlighting and LED-Status
Output signals analog	4...20 mA	Freely scalable 0...1, 0...5, 0...10 V, 0...20, 4...20 mA
Risoluzione Uscita analogica	≥ 15 bit	
Output signals digital	–	RS485 signals on screw terminal
Cable connections	1 x M12, screw terminals, (2 x M12 for HF3A-D)	
Psychrometric calculations	All	
Power supply	10...28 VDC	18...36 VDC
Circuit Type	2-wire	3/4 wire
Current consumption	2x23mA	< 50 mA
Load per analog output	Max. 500 Ω	
Humidty Sensor	ROTRONIC Hygromer ® HT-1	
Temperature Sensor	Pt100 1/3 Class B	
Interface	UART, NFC and USB	
Software	HygroSoft	
Housing Material	Top: PC, Bottom: ABS	
Standards	CE Conformity 2014/30/EU	
GMP/FDA Compliance	Conforms to FDA 21 CFR Part 11 and GAMP5[3]	
Dimensions	Wall: 122 x 172 x 40.5 mm Duct: 122 x 82 x 265.5 mm Cable: 122 x 82 x 40.5 mm (Housing only) 144 x ∅15 mm (Probe only)	
Weight	Wall: 204 g Duct: 226 g Kabel: 332 g	
IP-protection	IP65	
Fire protection class	Corresponds to UL94-HB	
Soldering material	Lead free (RoHS-Directive 2011/65/EU)	

[1] The measurement range for the wall-mount unit is limited due to the proximity of the probe to the transmitter electronics.

[2] The full measurement range of the duct mount unit can only be utilized if the transmitter electronics operate within the given application range.

[3] FDA comformity is applicable only when the device is operated in combination with a FDA compliance software.

Compatible

- HygroSoft software

Delivery package

- Product qualification
- Screws and plugs for mounting

Recommended accessories

- Service cable   AC3006/AC3009*
- Mounting kit DIN top-hat rail   AC5002

* Requires optional HygroSoft software.

HF5A serie

The HF5A-series is the advanced measurement transmitters compatible with a wide range of digital probes for humidity and temperature, temperature only, and differential pressure. The advanced digital probes have integrated AirChip3000 technology allowing them to achieve an unparalleled degree of accuracy.

FEATURES

- Interchangeable Probes (HC2, HC2A and RMS)
- Current output monitoring according to NAMUR NE43
- Analog and digital signals enable device control and monitoring with one transmitter
- Free programmable and scalable outputs via NFC-Interface

APPLICATIONS

HVAC Heating, ventilation, air conditioning, food industry, pharmaceutical industry, printing and paper industries.

HF5A wall and duct-kit version

Wall version

Wall version with Duct Kit

HF5A wall mount
HC2A-S/RMS-HCD-S

HF5A wall-mounted version for duct
with AC5005 and E2-F3A/HC2A
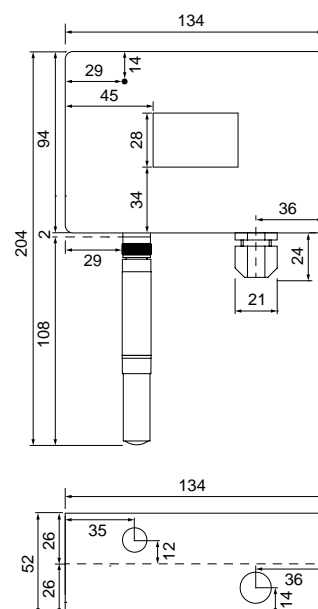
TECHNICAL INFORMATION

Order Code	HF5A-2 2-wire	HF5A-3/HF5A-D 3- /4-wire
Probe	HC2, HC2A, RMS	
Accuracy at 23 ± 5 °C	Probe dependent	
Initialization time	Typically > 30 sec.	Typically 3 sec.
Measurement range	Probe dependent	
Range of applications	-10…60 °C with display/-40…70 °C without display humidity 0…100 %rh (non-condensing)	
Trend indicator	Yes	
Display resolution	Resolution up to 2 decimal places	
Output signals analog	4…20 mA	Freely scalable 0…5, 0…10 V, 0…20, 4…20 mA[1]
Risoluzione Uscita analogica	≥ 15 bit	
Output signals digital	–	RS485 signals on screw terminal
Cable connections	1 x M16 x 1.5, screw terminals, (2 x M16 for HF5A-D)	
Psychrometric calculations	All	
Power supply	18…36 VDC (Vmin = 12 VDC + 6 VDC)	18…36 VDC
Circuit Type	2-wire	3-wire with mounted Jumper J1 (default) 4-wire galvanically separated with unmounted J1
Current consumption	50 mA (when both outputs are connected)	< 100 mA (when both outputs are connected)
Load per analog output	Max. 500 Ω	Current: Max. 500 Ω Voltage : Min. 10 kΩ
Interface	NFC Interface	
Software	Accessoire NFC-USB-READER: NFC to USB Reader or with the HygroSoft software mobile App and a mobile phone with an integrated NFC-Reader.	
Housing Material	Top: PC, Bottom: ABS	
Standards	CE Conformity 2014/30/EU	
GMP/FDA Compliance	Conforms to FDA 21 CFR Part 11 and GAMP5*	
Dimensions	134 x 94 x 52 mm	
Weight	Display version 277 g, Others 270 g	
IP-protection	IP65	
Fire protection class	Corresponds to UL94-HB	
Soldering material	Lead free (RoHS-Directive 2011/65/EU)	

* FDA comformity is applicable only when the device is operated in combination with a FDA compliance software.

Compatible

- All HC2A/HC2 probes (order separately)
- HygroSoft software

Delivery package

- Product qualification
- Mounting flange (type duct-kit)

Recommended accessories

- Standard climate probe   HC2A-S
- Probe extension cable 2 m   E2-02A
- NFC-USB-Reader

HF5-S serie

The HF5-S series is compatible with HygroClip2 probes with integrated AirChip technology – which achieve excellent accuracy thanks to their precision. This generation of instruments includes unique calibration and adjustment functions.

FEATURES

- Interchangeable HC2A/HC2 probes
- Housing material: Aluminum
- Accuracy: See chapter «Probes»
- Temperature limit at probe: See chapter «Probes»
- Range of application electronics: -40…60 °C/0…100 %rh; -10…60 °C with display
- Digital outputs, also combinable with analog outputs
- Use as %rh/°C simulator for system validation*
- Service interface

HF5-S wall and duct version

APPLICATIONS

HVAC applications, food and pharmaceutical industries, printing and paper industries, meteorology, agriculture, archaeology.

Wall version, type W (aluminium)
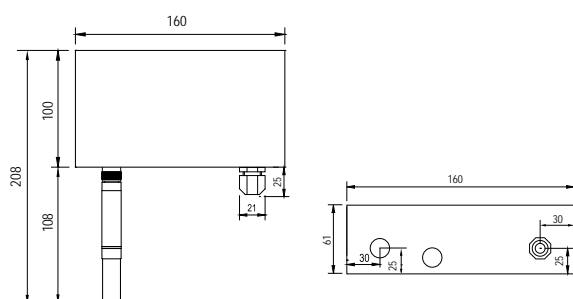
Duct version, type D (aluminium)
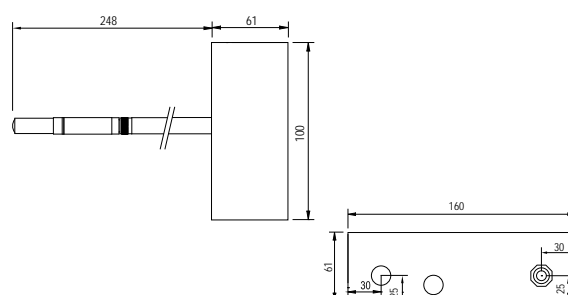
Available with ATEX certificate.

TECHNICAL INFORMATION

Order Code	HF5xx-S Type D/W
General	
Parameters	Humidity and temperature
Calculated parameters	All psychrometric parameters
Housing material/IP protection	Aluminium/IP65
Dimensions	160 x 100 x 61 mm (type D/W)
Weight	750 g
Probe connection/Interface	E2 (threaded coupling)/UART
Display	LCD, with backlight, Menu navigation, 4 °Ceys
Electrical connections	Screw terminals inside M16 cable gland Socket (USB/Ethernet)
Power supply	15…40 VDC/12…28 VDC 9…36 VDC/7…24 VAC galvanically. isolated
Current consumption	270 mA max. (without Ethernet) 420 mA max. (with Ethernet)
Firmware upgrade	Via HygroSoft software
Service interface	UART
CE/EMC compatibility	EMC Directive 2014/30/EU
Fire protection class	Corresponds to UL94-HB
Humidity measurement	
Humidity measurement	Probe dependent
Temperature measurement	
Temperature measurement	Probe dependent
Analog output	
Current	4…20 mA 0/4…20 mA*
Voltage	0…1/5/10 V*
Maximum load	≤2x500 Ω (current output) ≥1 °CΩ/V (voltage output)
Digital output	
RS-485	RS-485 & analog
USB	USB & RS-485 & analog
Ethernet	Ethernet RJ45 & RS-485 & analog

* Requires HygroSoft software and service cable.

Compatible

- All HC2A/HC2 probes (order separately)
- HygroSoft software

Delivery package

- Product qualification
- Short instruction manual
- Mounting flange (type D)

Recommended accessories

- Standard climate probe   HC2A-S
- Probe extension cable 2 m   E2-02A
- Service cable   AC3006*
- Mounting kit DIN top-hat rail (type W)   AC5002
- Calibration cable with HP23   AC2001

HF562 serie

The HF562 main-voltage transmitter is suitable for measuring relative humidity and temperature in main-voltage environments. It's ideal for applications where accurate environmental monitoring is critical. Its design ensures reliable performance in areas exposed to electrical discharges.

FEATURES

- Interchangable HC2A/ HC2 Probes
- Accuracy and Temperature limit at probe: see chapter "Probes"
- Range of application electronics: -40...60 °C/0...100 %rh; -10...60 °C with display
- Digital outputs, also combinable with analog outputs
- Service interface

APPLICATIONS

Power plants, transformer stations, test chambers, control rooms and industrial facilities with high voltage.

TECHNICAL INFORMATION

Wall version type W

Order Code	HF56x Type D/W
General	
Parameters	Humidity and temperature
Calculated parameters	All psychrometric parameters
Housing material/IP protection	ABS/IP65 (models with USB or Ethernet interface, IP40)
Dimensions	192 x 102 x 52 mm (type D/W)
Weight	500 g
Probe connection/Interface	E2 (threaded coupling)/UART
Display	LCD, with backlight, Menu navigation, 4 °Ceys
Electrical connections	2 x M16, Cable gland
Power supply	100...240 VAC (Galvanic isolated)
Current consumption	30 mA max. (without Ethernet) 45 mA max. (with Ethernet)
Firmware upgrade	Via HygroSoft software
Service interface	UART (Universal Asynchronous Receiver Transmitter)
CE/EMC compatibility	EMC Directive 2014/30/EU
Fire protection class	Corresponds to UL94-HB
Analog output	
Current/Voltage	0/4...20 mA*/0...1/5/10 V*
Maximum load	≤2x500 Ω (current output) ≥1 °CΩ/V (voltage output)
Digital output	
RS-485	RS-485 & analog
USB	USB & RS-485 & analog
Ethernet	Ethernet RJ45 & RS-485 & analog
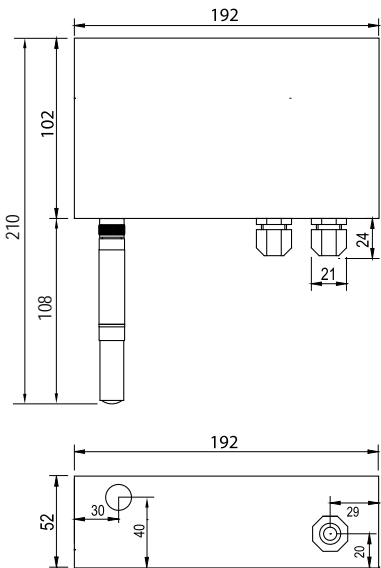
Compatible

- All HC2A/HC2 probes (order separately)
- HygroSoft software

Delivery package

- Product qualification
- Short instruction manual
- Mounting flange (type D)

Recommended accessories

- Standard climate probe — HC2A-S
- Probe extension cable 2 m — E2-02A
- Service cable — AC3006*
- Mounting kit DIN top-hat rail (type W) — AC5002
- Calibration cable with HP23 — AC2001

*   Requires optional HygroSoft software and service cable

HF73A series

The HygroFlex HF73A transmitters are used wherever harsh environments demand an optimal solution. There is hardly an industrial process in which humidity, temperature or dew point/ frost point does not need to be considered.

FEATURES

- Accuracy: ±1.0 %rh, ±0.2 °C, at 23 °C
- Temperature limit at probe: max. -100...200 °C[1] 0...100 %rh
- Range of application electronics: -40...85 °C/0...100 %rh
- Aluminum diecast housing and probe of PPS
- Various probe lengths available
- Use as a %rh/°C simulator for system validation *
- Service interface
- Adjusted at 23 °C and 10, 35, 80 %rh

APPLICATIONS

Measures relative humidity, temperature and dew/frost point in industrial environments and outdoors. For use in harsh conditions.
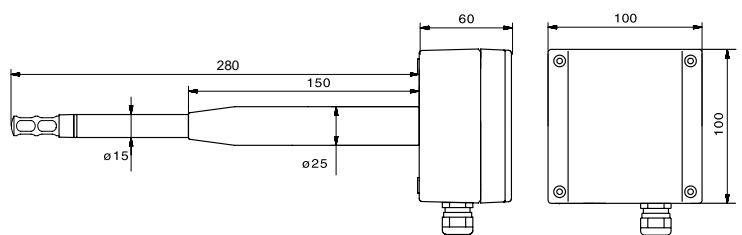
Duct version Type Q

[1] Short-term peak load (3 x 5 min).

TECHNICAL INFORMATION

Order Code	HF73A, analog, 3-wire
General	
Parameters	Humidity and temperature
Calculated parameters	Dew/Frost point
Housing material/IP protection	Aluminum/IP65
Dimensions	60 x 100 x 100 mm
Weight	600 g + 140 g per probe extension unit (150 mm)
Probe material	PPS
Probe connection	Fixed
Filter carrier	Slotted sleeve
Filter material	Filter is not supplied with transmitter (must be ordered separately)
Display	No
Electrical connections	Screw terminals inside, M16 cable gland
Power supply	15...40 VDC/13...28 VAC
Current consumption	150 mA max.
Application temp. housing/electronics	-40...85 °C, 0...100 %rh
Measurement range	-100...200 °C (type D)
Firmware upgrade	Via HygroSoft software
Service interface	UART service interface (Universal Asynchronous Receiver Transmitter)
CE/EMC compatibility	EMC Directive 2014/30/EU
Humidity measurement	
Sensor	ROTRONIC HYGROMER® HT-1
Measurement range	0...100 %rh non-condensing
Accuracy at 10...30 °C	±1.0 %rh
Adjustment at 23 °C	10, 35, 80 %rh
Long-term stability	<1 %rh/year
Response time	<15 s τ63 (63 % increase 35...80 %rh) without filter
Temperature measurement	
Sensor	PT100 1/3 Class B
Measurement range	Peak load: For 100 hours between 190 °C and 200 °C Maximal permissible continuous load: 190°C
Accuracy at 10...30 °C	±0.2 °C
Adjustment points	1
Long-term stability	<0.1 °C/year
Analog output	
Number	2
Current	0/4...20 mA
Voltage	0...1/5/10 V
Maximum load	≤2x500 Ω (current output) ≥1 °CΩ/V (voltage output)
Accuracy at 23 °C	0.02 mA 2 mV (0...1 V), 5 mV (0...10 V)

Compatible

• HygroSoft software

Delivery package

• Product qualification
• Short instruction manual

Recommended accessories

• Service cable   AC3006/AC3009*

XB32A-OEM

The XB OEM transmitter consists of a cable PPS probe, a printed circuit board without housing. Thanks to its compact size, high accuracy and choice of analog outputs, the transmitter can be adapted to meet customer requirements and used practically everywhere.

FEATURES
- Simulator mode*
- Printed circuit board with fix mounted PPS cable probe

APPLICATIONS
Climate chambers, incubators, monitoring of industrial processes, etc.

PPS probe Ø15 mm

TECHNICAL INFORMATION

Order Code	XB32A 3-wire
Humidity sensor	ROTRONIC HYGROMER® HT-1
Temperature sensor	PT100 1/3 Class B
Accuracy at 23 °C	± 1.0 %rh/0.2 °C
Resolution AirChip3000	<0.02 %rh/0.01 °C
Long-term stability humidity sensor	<1 %rh/year
Measurement range	-100...200 °C[1]/0...100 %rh (non-condensing)
Electronics operating range	-40...85 °C/0...100 %rh
Output signals	Yes
Output signals (analog)	Freely scalable by user 0...1 V, 0...5 V, 0...10 V, 0(4)...20 mA
Calculation	Dew point or frost point, freely scalable
Power supply	15... 40 VDC/12 ...28 VAC
Circuit type	3 wire
Load per analog output	V-signal: ≥1 °CΩ/V mA-signal: ≤500 Ω
Load compensation	Yes
Firmware upgradable	Yes, via HygroSoft Software
Sensor diagnostics (drift, state)	Programmable. Default: Off
Humidity adjustment	1-point or multi-point humidity adjustment/calibration
Temperature adjustment	1-point or 2-point temperature adjustment/calibration
PC interface, UART	Yes, HygroSoft Software-compatible
Cable connections	1 x M16 x 1.5, to terminals
Standards	CE conformity 2014/30/EU
Audit trail, electronic records	Conforms to FDA 21 CFR Part 11 and GAMP
IP protection & fire protection class	IP65/Corresponds to UL94-HB
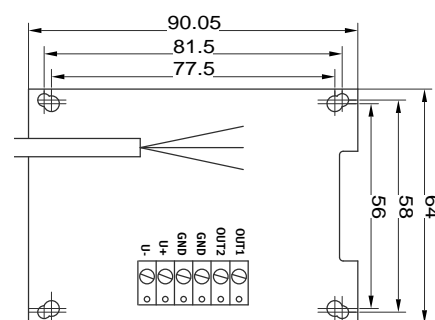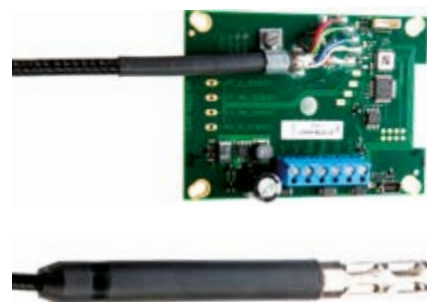
Compatible
- HygroSoft software

Delivery package
- Factory adjustment certificate
- Short instruction manual
- Note: a filter must be ordered separately

Recommended accessories
- Wire mesh (SPA-WM), sinter steel (SPA-SSS) and Teflon (SPA-PFTE) filters
- Service cable   AC3006/AC3009*

* Requires HygroSoft software and service cable
[1] Peak load: For 100 hours between 190 °C and 200 °C. Maximal permissible continuous load: 190 °C.

DT722

FEATURES

- Relative humidity, temperature measurement and dew point
- Designed for accurate measurement in a harsh environment
- Stainless steel housing
- Long term stability: ±1 %rh over 12 months
- Withstands temperatures up to 150 ºC (300 ºF)

APPLICATIONS

HVAC Heating, ventilation, air conditioning, food industry, pharmaceutical industry, printing and paper industries.

ELECTRICAL CONNECTIONS

Connections		
Cable	**Pin**	
Brown	Pin 1	Supply + 8...32 VDC
White	Pin 2	Output 2 = Temp 4...20 mA (max. 500 Ω)
Blue	Pin 3	Not connected (for calibration only)
Black	Pin 4	Output 1 = RH 4...20 mA (max. 500 Ω)
	Pin 5	Not connected (for calibration only)

Note: Both RH and T need to be connected in order for the T output to work.
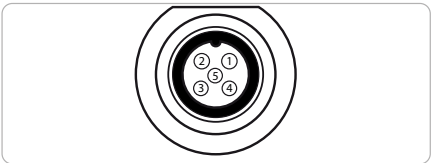
Note: Even though the DT722 has a 5 pin connector, the standard connection cable (A000031) only has four pins/wires. However, only three pins (1, 2 and 4) are needed to connect the DT722.

ACCESSORIES AND SPARE PARTS

Order Code	Description
Protection cap	
A000002	19 mm (0.75") Slotted protection cap black
Filter	
A000014	19 mm (0.75") PVDF filter
A000015	19 mm (0.75") PVDF filter w/ protection cap black
A000021	19 mm (0.75") Mesh filter w/ protection cap black
A000025	19 mm (0.75") Arrow 5 µm SS sintered filter
A000027	19 mm (0.75") connector, no cable, w/screw terminal
Cable	
A000030	Single plug, without cable
A000030-XX	19 mm (0.75") connector/cable (price per meter)
A000031	19 mm (0.75") connector with 2 m (6.5') cable
A000032	19 mm (0.75") connector with 5 m (16') cable
A000040	Metal foil filter 2 µm with protective cap, black
A000042	Oleophobic foil filter 0.7 µm with black protective cap
Mounting	
A000110	3/4" NPT SS adj. fitting for SS probes
A000100	Al mounting flange for Ø19 mm (0.75") SS probes (outside Ø80 mm (3.15"))

TECHNICAL INFORMATION

Performance	
Measurement range (RH)	0...100 %rh
Measurement range (T)	-40...150 °C (-40...302 °F)
Accuracy @ 25 °C (77 °F) humidity	< ±2 %rh (5...95 %rh)
Accuracy @ 25 °C (77 °F) temperature	±0.2 °C (±0.36 °F) typical
Stability – RH sensor	±1 %rh/year
Response time – RH sensor	<10 sec typical (for 90 % of the step change)
Electrical specifications	
Output signal	4...20 mA
Supply voltage	8...32 V DC
Supply voltage influence	±0.01 %rh/V typical
Operating humidity	
Operating humidity probe, housing, storage	10...95 %rh (non-condensing)
Operating temperatures	
Probe	-40...150 °C (-40...302 °F)
Housing	-20...70 °C (-4...158 °F)
Storage	-30...75 °C (-22...167 °F)
Mechanical specifications	
Ingress protection	IP65 (NEMA 4 level)
Housing material	Stainless steel
Weight	200 mm/800 g (7.87"/28.22 oz) 300 mm/900 g (11.81"/31.75 oz) 500mm/1040 g (19.69"/36.68 oz) 900 mm/1412 g (35.43"/49.80 oz)
Electrical connections	5 pin, M12

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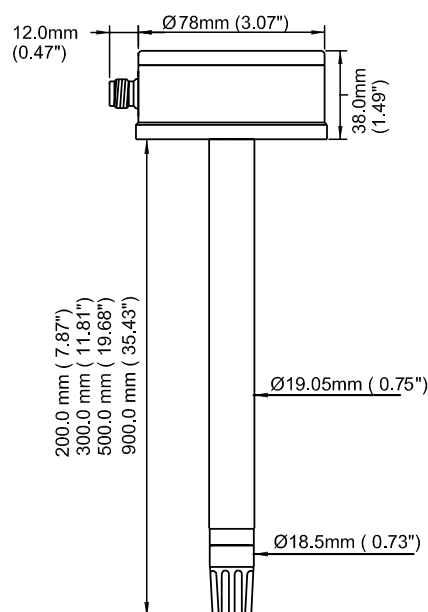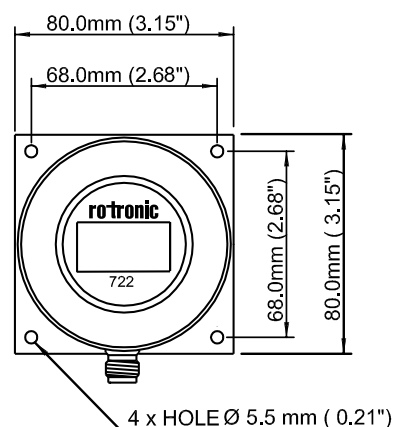
Data loggers

	Basic		Compact
	HL-1D	**BL-1D**	**HL-20D**
Parameters	Humidity and Temperature	Humidity, Temperature and Pressure	Humidity and Temperature
Memory capacity	32'000 lines	32'000 lines	20'000 lines
Sensor	HYGROMER IN-1/NTC	BOSCH BMP280/ HYGROMER IN-1/NTC	HYGROMER IN-1/PT100 Class A
Range of application	-30...70 °C 0...100 %rh	-30...70 °C 0...100 %rh 300...1100hPa	-10...60 °C 0...100 %rh
Accuracy @ 23°C	±0.3 °C/± 2 %rh	±0.3 °C/± 2 %rh/± 3 hPa	±0.3 °C/± 0.8 %rh
Calculations	–	Dew/Frost point	Dew/Frost point
Power supply	1x CR2 battery		3x AA batteries
Configurable logging interval		Yes	
Programmable alarms		Yes	
Interface	USB-Mini Port	USB-Mini Port	UART, requires AC3006 service cable
IP protection	IP67		IP40
Standards	EN12830	EN12830	–
CE/EMC compatibility		Sim	

HygroLog HL-1D

Basic logger

The HL-1D is the smallest humidity logger available from Rotronic. It offers the most important logging functions and is fully compatible with HygroSoft software.

FEATURES

- Compact with very high level of IP protection
- Free evaluation and configuration HygroSoft software
- Very long battery life, up to 3 years
- Programmable logging mode

APPLICATIONS

Logistics, Pharmaceuticals, Pharmacies.

TECHNICAL INFORMATION

Order Code	HL-1D
Parameters	Humidity & temperature
Sensor type	HYGROMER® IN-1/NTC
Accuracy at 23 °C	±2.0 %rh, ±0.3 °C
Range of application/ Storage conditions	-30...70 °C/0...100 %rh
IP protection	IP67
Weight	85 g
Dimensions	90 x 60 x 23 mm
Logging interval	30 s...24 h
Battery	1 x CR2
Battery life	Up to 3 years (logging interval 1 h)
Battery charge indicator	Yes (HygroSoft software, display and LED indicator)
Storage capacity	32'000 lines (each line contain %rh & °C)
Function	MIN/MAX/AVG
Display	LCD
Resolution	0.1 %rh, 0.1 °C
Display refresh rate	5 s (standard) or same as logging interval
LED indicators	2 LEDs
Communication	USB-Mini port (cable not included)
Standards	EN12830 (V3.0 and later)

USB-Mini port (settings and data download)

Battery compartment

Configuration & evaluation

The values stored in the HL-1D can be downloaded with the HygroSoft software and displayed graphically. The user determines the logging interval, the alarm limits, the recording mode and much more.

90   23

60

Delivery package	**Recommended accessories**
• Battery, CR2	• USB-Mini cable AC0003
• Short instruction manual	
• Function and calibration certificate	

2025
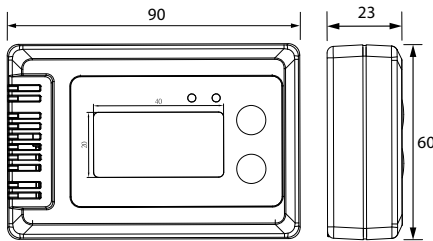
HygroLog BL-1D

In addition to humidity and temperature, the BL-1D also logs ambient pressure and dew point. Thanks to its full HygroSoft software functionality, its compact size and easy handling, the BL-1D is ideal for numerous applications.

FEATURES

- Compact with very high level of IP protection
- Free evaluation and configuration HygroSoft software
- Very long battery life, up to 3 years
- Programmable logging mode

APPLICATIONS

Logistics, Pharmaceuticals, Pharmacies.

TECHNICAL INFORMATION

Order Code	BL-1D
Parameters	Pressure/Humidity/Temperature
Calculated parameters	Dew/frost point
Sensor type	BOSCH BMP280/HYGROMER® IN-1/NTC
Accuracy at 23 °C	±3.0 hPa, ±2.0 %rh, ±0.3 °C
Range of application/ Storage conditions	-30..70 °C/0..100 %rh
IP protection	IP67
Weight	85 g
Dimensions	90 x 60 x 23 mm
Logging interval	30 s...24 h
Battery	1 x CR2
Battery life	Up to 3 years (logging interval 1 h)
Battery charge indicator	Yes (HygroSoft software, display and LED indicator)
Storage capacity	32'000 lines (each line contains °C/%rh/Pa/DP)
Function	MIN/MAX/AVG
Display	LCD
Resolution	1 hPa, 0.1 %rh, 0.1 °C
Display refresh rate	5 s (standard) or same as logging interval
Communication	USB-Mini port (cable not included)
Standards	EN12830

Configuration & evaluation

The values stored in the BL-1D can be downloaded with the HygroSoft software and displayed graphically. The user determines the logging interval, the alarm limits, the recording mode and much more.
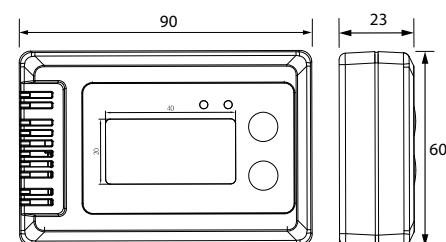
Delivery package	Recommended accessories	
• Battery, CR2	• USB-Mini cable	AC0003
• Short instruction manual		
• Function and calibration certificate		

HygroLog HL-20D

Precision compact logger

The compact data logger for humidity and temperature measurement offers high precision and reliability at a reasonable price. The HL-20 series is easy to use and suitable for a wide range of applications. Thanks to its integrated batteries, the HL-20D provides hours of operation and offers its users maximum flexibility.

FEATURES

- Freely selectable logging interval, 5 s…1 h
- Adjusted at 10, 35, 80 %rh and 23 °C
- Programmable visual alarms
- Free HygroSoft for device configuration and analysing recorded data

APPLICATIONS

Warehouses, factories, museums, office buildings, cleanrooms, transportation, libraries and test facilities.

HL-20-D   HL-20D-SET*

TECHNICAL INFORMATION

Order Code	HL-20D
Parameters	Humidity & temperature
Sensor type	HYGROMER® IN-1/PT 100 Class A
Accuracy at 23 °C	± 0.8 %rh@ 10···60 %rh/± 1.3 %rh@ 0 … 10 %rh and 60 … 100%rh/± 0.3 °C
Range of application/ Storage conditions	0…50 °C/0…100%rh
IP protection	IP40
Weight	210 g
Dimensions	130 x 72 x 32 mm
Logging interval	Min 5 sec. Up to 1 hour in 5 sec. increments
Battery	3 x AA (1.5 V) alkaline
Battery life	Up lo 13 months (logging interval 30 min)
Battery charge indicator	Yes (HygroSoft software, display and LED indicator)
Storage capacity	20'000 lines (each line contain %rh & °C)
Display	LCD
Communication	USB-Mini port (cable not included)

130 mm   32 mm

72 mm
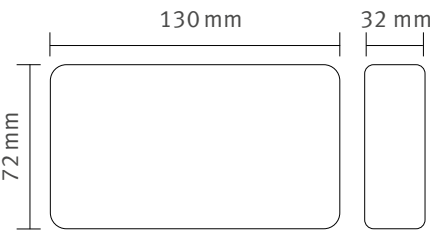
Delivery package

- Factory adjustment certificate, short instruction manual, 3 AA batteries
- Screw with plug for wall mounting

* HL-20D-SET include AC3006 service cable

Recommended accessories

• Service cable	AC3006
• Calibration device	HL-20-CAL
• Humidity standard for calibration 10 %rh	EA10-SCS
• Humidity standard for calibration 35 %rh	EA35-SCS
• Humidity standard for calibration 80 %rh	EA80-SCS

HygroPalm HP31

The HygroPalm HP31 is a handheld instrument with a fix Rotronic probe, it is able to perform spot measurements and logging of relative humidity, temperature and psychrometric parameters.

FEATURES

- Measures relative humidity, temperature and perform psychometric calculations
- Visual and audible alarms
- Graphic display for saved data
- Long-life rechargeable battery

APPLICATIONS

Field inspection and spot checks in HVAC, pharmaceutical industry, agriculture and food industry and building management systems.

TECHNICAL INFORMATION

Order code	HP31
Device type	Handheld device
Application range	-10…60 °C/0…100 %rh (non-cond.)
Storage range	-10…45 °C/10…90 %rh
Probe application range	-10…60 °C/0…100 %rh (non-cond.)
Functions	Spot measurements Programmable logging interval MIN/MAX/AVG
Accuracy @ 23°C	±2 %rh/±0.3 °C
Logging interval	1 s…24 h
Memory capacity	8 x 8000 data points
Psychrometric calculations	Dew/Frost point (Dp/Fp) Wet bulb temperature (Tw) Enthalpy (H) Vapor concentration (Dv) Specific humidity (Q) Mixing ratio by weight (R) Vapor pressure (E) Saturation vapor pressure (Ew) Saturation vapor density (SVD)
Calculation method	WMO Standard
Display refresh rate	1 s (typical)
Integrated battery	Lithium polymer, 3.7 V, 1000 mAh 48 h – Logging every 30 s, screen off 10 h – Screen always on
PC interface	USB-C port, HygroSoft software compatible
Enclosure material	ABS, TPR
IP protection class	IP65
Dimensions	160 x 63 x 30 mm
Weight	185 g

65.2 mm   30.9 mm   14.1 mm
100 mm   100 mm   150 mm

Compatible

- HygroSoft software

Delivery package

- HygroPalm HP31
- Soft case
- Short instruction manual
- USB-C service cable   AC0006

Recommended accessories

- Humidity standard for calibration 10 %rh   EA10-SCS
- Humidity standard for calibration 35 %rh   EA35-SCS
- Humidity standard for calibration 80 %rh   EA80-SCS

HygroPalm HP32

The HygroPalm HP32 can be combined without adjustment with all all HC2 and HC2A probes (except HC2-LDP). It measures relative humidity and temperature, can perform all psychrometric calculations and has trend indicators as well as a hold function to freeze measured values.
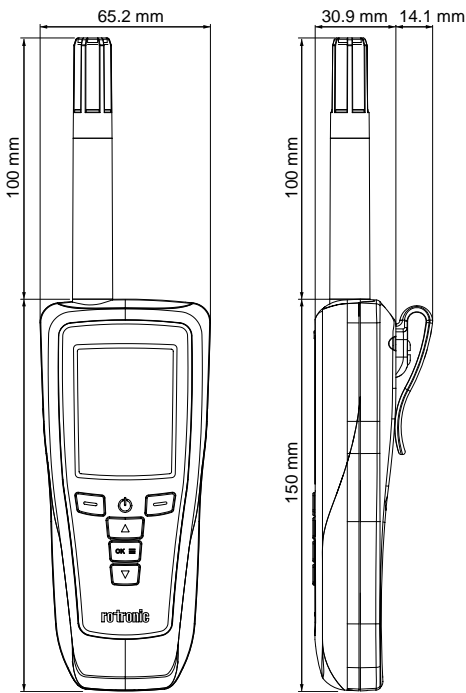
FEATURES

- Measures relative humidity, temperature and perform psychometric calculations
- Visual and audible alarms
- Graphic display for saved data
- Long-life rechargeable battery (up to 48 hours at a logging interval of 30 seconds)

APPLICATIONS

Field inspection and spot checks in HVAC, pharmaceutical industry, agriculture and food industry and building management systems.

TECHNICAL INFORMATION

Order code	HP32
Device type	Handheld device (%rh/°C)
Application range	-10...60 °C/0...100 %rh (non-cond.)
Storage range	-10...45 °C/10...90 %rh
Probe application range	Depends on probe
Functions	Spot measurements Programmable logging interval MIN/MAX/AVG
Accuracy @ 23°C	Depends on probe
Logging interval	1 s...24 h
Memory capacity	8 x 8000 data points
Psychrometric calculations	Dew/Frost point (Dp/Fp) Wet bulb temperature (Tw) Enthalpy (H) Vapor concentration (Dv) Specific humidity (Q) Mixing ratio by weight (R) Vapor pressure (E) Saturation vapor pressure (Ew) Saturation vapor density (SVD)
Calculation method	WMO Standard
Display refresh rate	1 s (typical)
Integrated battery	Lithium polymer, 3.7 V, 1000 mAh 48 h – Logging every 30 s, screen off 10 h – Screen always on
PC interface	USB-C port, HygroSoft software compatible
Enclosure material	ABS, TPR
IP protection class	IP65
Dimensions	160 x 63 x 30 mm
Weight	185 g

65.2

150

Compatible

- All HC2 and HC2A probes

Delivery package

- HygroPalm HP32
- Short instruction manual
- Soft case
- USB-C service cable

Recommended accessories

- Humidity standard for calibration 10 %rh   EA10-SCS
- Humidity standard for calibration 35 %rh   EA35-SCS
- Humidity standard for calibration 80 %rh   EA80-SCS

Specifications handheld instruments

Features	HP31	HP32
Probe type	Fixed probe	HC2A-xx (not included)
Probe interchangeable	No	Yes
Humidity/Temperature sensor	HYGROMER® IN-1 Pt100 1/3 Class B	Probe dependent
Number of probe inputs	N/A	1
Measurement range (probe)	-10...60 °C 0...100 %rh	Probe dependent
Accuracy @ 23 °C	±2 %rh/±0.3 °C	Probe dependent
Long-term stability	<1 %rh/year	
Response time humidity sensor	<15 s 𝛕63	Probe dependent
Initialization time	<2 s	
Range of application	-10...60 °C / 0...100 %rh	
Display resolution	2 decimals	
Illuminated display	Yes	
Alarm indicators	Yes	
Battery indicator	Yes	
Real time clock	Yes	
Functions		
Adjustment of transmitters	No	
Adjustment via keypad	Single & multi-point %rh Single-point °C	
Probe adjustment with dew point reference	No	
Calculations	All psychrometric parameters	
Data logging	8 x 8,000 measurement points	
Electrical specifications		
Power supply	Integrated rechargeable battery	
Rechargeable battery charge	No	
Battery life (typical, without backlight)	4...7 h	
Communication interfaces	USB-C	
Max. length probe cable	5 m	
Mechanical specifications		
Housing material	ABS, TPR (housing)	
Dimensions	250 x 65 x 31 mm	150 x 65 x 31 mm (without probe)
Weight	200 g	185 g
CE/EMC directives	2014/30/EU	
IP protection class	IP65	

HygroPalm HP-GTS

The HygroPalm HP-GTS from Rotronic is a tried-and-tested instrument for measurement of equilibrium relative humidity and temperature in stacks of paper and cardboard.

FEATURES

- Measures relative humidity and temperature in stacks of paper
- Graphical display of measured values
- Freely adjustable visual and audible alarm

APPLICATIONS

Humidity measurements in stacks of paper, cardboard and textiles for paper and textile technicians and printers.

TECHNICAL INFORMATION

Order code	HP-GTS
Device type	Handheld device
Parameters	Humidity and Temperature
Range of application of instrument and probe	-10...60 °C/0...100 %rh (non-condensing)
Humidity sensor	ROTRONIC HYGROMER IN-1
Accuracy @ 23 °C	±2 %rh/±0.3 °C
Functions	Spot measurements Programmable logging interval MIN/MAX/AVG
Logging interval	1 s...24 h
Memory capacity	8 x 8000 data points
Display refresh rate	1 s (typical)
PC interface	USB-C port, HygroSoft compatible
Integrated battery	• Rechargeable lithium polymer battery • 3.7 V • 1000 mAh • 48 h with screen off, logging every 30 s • 10 h with screen always on
Housing material	ABS, TPR
Probe material	Aluminum
IP protection class	IP65 (measuring instrument)
Dimensions	408 x 63 x 30 mm
Weight	225 g
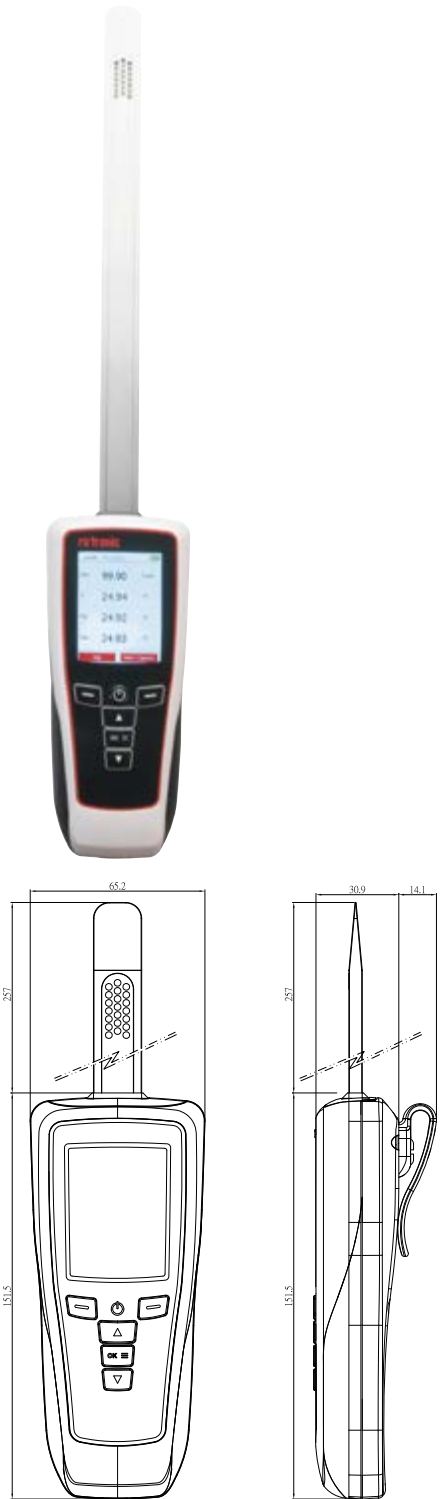
Delivery package

- HygroPalm HP-GTS
- Soft case
- Short instruction manual
- USB-C cable (computer connection and battery charging)

Recommended accessories

• Calibration device for sword probes	EGS
• Humidity standard for calibration 10 %rh	EA10-SCS
• Humidity standard for calibration 35 %rh	EA35-SCS
• Humidity standard for calibration 80 %rh	EA80-SCS

HygroGen2

Since its launch, the Rotronic HygroGen has defined the standard for portable humidity and temperature calibration. Hundreds of users worldwide have identified that this tool for the rapid generation of stable temperature and humidity conditions can save significant amounts of time in performing calibrations of all types of humidity instruments from all manufacturers.

The HygroGen2 further satisfies the stringent demands of quality and compliance regulations with its ability to calibrate instruments over their full working range, and is embraced throughout the pharmaceutical industry as the leading instrument in its class and is favored in ISO 17025 humidity calibration laboratories across the world.

Being portable and robust, it can be set up at the installation location allowing for complete system qualification. The rock-solid stability, minimal thermal gradients and quick set-point changes of HygroGen2-S are now replicated in a new family member: HygroGen2-XL, which boasts a chamber with 10 times the capacity.

External Chilled Mirror Reference Integration
(formerly "AutoCal+") External chilled mirror Reference Integration further extends the utility of the generator, with the ability to integrate chilled mirror hygrometers as the AutoCal calibration reference or within the Remote API.

FEATURES
- Generates stable humidity and temperature conditions (<±0.1 %rh, <±0.01 °C)
- Calibration solution for the laboratory and on-site
- Humidity equilibrium typically in only 5 minutes for HG2-S, 15 minutes for HG2-XL
- Calibrates multiple probes simultaneously
- «AutoCal» automatic calibration (optional)
- «Remote API» logging and control with third-party software (optional)

APPLICATIONS
On-site calibration solution for all users of humidity and temperature measuring equipment.
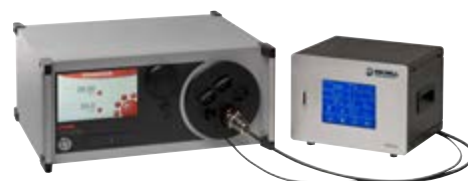
HygroGen2 with external chilled mirror hygrometer – Michell S8000 Remote

HG2-S and HG2-XL in comparison

Video HygroGen2

Interested? Then scan the QR code!

Delivery package	Recommended accessories
• Instruction manual • SCS certificate for reference probe	• See HygroGen2 accessories • «AutoCal» automatic calibration • Extended ranges of application «HumiExt» and «TempExt» • «ExtRef» chilled mirror reference • «RemoteSS» remote screen sharing • «RemoteAPI» programming interface for remote control

HygroGen2 Specifications		HG2-S	HG2-XL
Chamber volume		2 liters	20 liters
Working volume		1.5 liters	17 liters
Humidity changes (<±0.1 %rh stability)	5...95 %rh	<5 minutes	<15 minutes
Temperature changes (<±0.01 °C stability)	23...50 °C	<5 minutes	<15 minutes
	23...0 °C	<25 minutes	<35 minutes
Temperature gradients	15...50 °C	<±0.05 °C	<±0.05 °C
	5...60 °C	<±0.1 °C	<±0.1 °C
	0...5 °C	<±0.15 °C	<±0.15 °C
Probe mounting		Up to 6 probes through door ports	8 probes through the door, plus internal shelf racks
Weight & dimensions		13 kg, 45 x 41x 21 cm	37 kg, 80 x 62 x 41 cm
Working principle	Mixed flow with desiccant dryer cell and piezoelectric humidifier; Peltier thermoelectric element with radial chamber mixing fan		
Control probe specification	± 0.8 %rh (10...30 °C), ± 2 %rh (0...60 °C) ± 0.1 K (10...30 °C), ± 0.3 K (0...60 °C)		
Typical calibration uncertainty	± 1.5 %rh (k=2) at 23 °C, ± 0.15°C (k=2) 15...50 °C		
Sensor	HygroClip2, capacitive RH sensor, Pt100 temperature sensor		
Control type	Embedded multiple PID controller, touch screen graphical user interface		
Programmer function	20 user programs can be saved, up to 200 set-points per program can be changed		
External sample loop for MBW reference	Temperature controlled outlet and inlet, 6 mm fittings		
USB ports	7 front, 2 rear		
Integrated software	Rotronic HW4		
Water level	Low and high alarm, bar graph status indication		
Water quality	UV sterilization, auto time cycling		
Desiccant condition	Condition monitored during control operation		
Optional enhanced features	Temperature and humidity range extensions, AutoCal, External MBW/RHS Reference Integration, Remote Screen Share, Remote API		
Power supply	110...240 VAC 50/60 Hz, 3 A (240 VAC) 6A (110 VAC)		
Housing	Powder coated aluminum and steel, IP20		
Operating conditions	10-35 °C, <2000 m altitude		
CE	Safety:	EN 61010-1:2001	
	EMC:	EN 61326-1:2006	
		EN 61000-6-1:2007	

Order code	Description
HG2-S	HygroGen2 with touch screen, calibrated control/reference probe, set-point control & programmer function, heated sample loop, desiccant cell, fill syringe, embedded HW4 software. Order chamber door separately
HG2-XL	HygroGen2-XL with touch screen, calibrated control/reference probe, set-point control & programmer function, heated sample loop, 2 x desiccant cell, fill syringe, embedded HW4 software.
HG2-AutoCal-Code	Extension (activation key): automatic calibration function
HG2-ExtRef-Code	Extension (formerly Autocal+, requires AutoCal or RemoteAPI, activation key): MBW/RHS External Reference Integration - enables MBW chilled mirror as external reference
HG2-TempExt-Code	Extension (activation key): extended temperature range -5...60 °C
HG2-HumiExt-Code	Extension (activation key): extended humidity range 2...99 %rh
HG2-RemoteSS-Code	Extension (formerly Remote, activation key): Remote Screen Share
HG2-RemoteAPI-Code	Extension (activation key): programming interface for remote control

HygroGen2/HygroGen2-XL accessories	
Consumables	
HG2-DES-3	Desiccant for molecular sieve (3 kg)
HG2-DC	Additional desiccant cell; pre-filled with molecular sieve
HG2-FILL	Fill tube and syringe
Chamber doors, plugs and probe sleeves	
HG2-D-888888	HG2-S door, 6 x 30 mm ports with 6 bungs; order specific B8 sleeves to suit smaller probe diameters
HG2-DP-00000	HG2-S clear acrylic door (no ports) for instruments with displays
HG2-B8	30 mm bung for HG2-D-888888
HG2-B8-xx	B8 probe sleeves for HG2-D-888888 (external: 30 mm; internal: probe diameter see xx diameter codes)
HG2-D-xxxxx	HG2-S custom door for > 30 mm ports, please ask your Rotronic dealer for the doors available
HG2-Bxx	Custom bung
HG2-Bxx-xx	Custom probe adaptor sleeves
Accessories	
HG2-TB	HG2-S transit bag, lightweight
HG2-TC	HG2-S heavy-duty transit case
HG2-AC3001-L/050	HygroClip2 calibration cable, 50 cm, USB connector
HG2-CAM	Probe sleeve with high definition USB cam

HG2-D-888888 door with plugs
and probe sleeves

Door cross section

HygroGen bag

HygroGen case

HC100A

The HygroCal100 Advanced provides a stable test chamber to quickly evaluate the performance of relative humidity sensors across a wide range of 5 to 95% relative humidity. Its intuitive 4" touch screen display and interface allow the probes under test to be fully integrated with the chamber and user interface (UI), so up to 7 probes with a variety of diameters and output signals can be powered, monitored, and logged simultaneously by one self-contained unit.

FEATURES

- Portable device with optional battery pack and hard carry case
- Intuitive UI makes simple automating probe verification
- Validate 7 probes simultaneously
- Automated validation procedures for complete hands-off probe verification
- Optional chilled mirror reference hygrometer, allowing use as a calibrator

APPLICATIONS

On-site or in-lab verifications. Validation of rh probes at pharmaceutical manufacturing facilities, meteoritical offices, food manufacturing etc.

TECHNICAL INFORMATION

Chamber	
Generation range	5 to 95 %rh
rh stability	±0.5 %
rh uniformity	±0.5 %
Stabilization time	Typically <5 min for full stability from step changes of 10 %rh
Control Probe (HC2A-S)	
rh accuracy	±0.8 %
Temperature accuracy	±0.1 °C (±0.18 °F)
Long term stability	±1 % per year
Electrical Specifications	
User interface	4.3" color LCD with touchscreen
Interface with probes	7 x 24 V excitation voltage (incl. 1 x 3.3 V), accept signal: 0−20 mA, 4−20 mA, 0-1 V, 0−5 V, 0−10 V
Measurement units	%rh, temperature in °C, °F
Displayed resolution	0.1
Data logging	2 GB internal memory available for log files or 10.6 yrs storage at 5s intervals
Battery (Optional)	1500 mAh
Power supply	24 V DC (100 to 240 V AC, 50/60 Hz adaptor included)
Mechanical Specifications	
Probe ports	8-port adaptors to accommodate probes of diameters: 12 mm, 13.5 mm, 14 mm, 15 mm, 18.5 mm, 19 mm, 24 mm, 25 mm
Chamber volume	Approx. 1050 cm³ (64.07 in³)
Maximum probe insertion depth	60 mm (2.36 ")
Desiccant reservoir capacity	25 cm³ (1.53 in³)
Saturator reservoir capacity	25 ml (0.85 floz)
Environmental conditions	+5 to +40 °C (+41 to +104 °F)
Dimensions (h x w x d)	100 x 250 x 300 mm (3.94 " x 9.84 " x 11.81")
Weight	3.2 kg (7 lbs)

300mm (11.81")

100mm (3.94")

250mm (9.84")
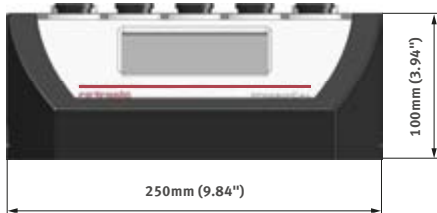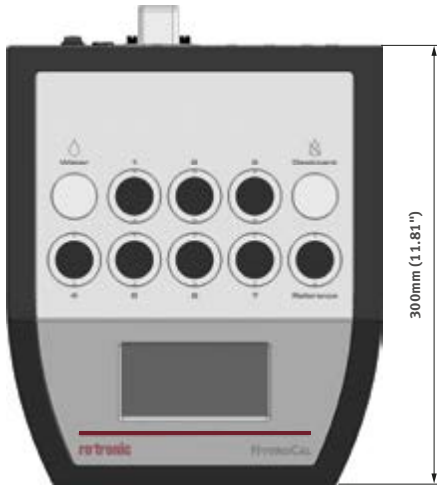
Compatible

- All HC2A/HC2 probes
- All PC series probes (with analog outputs)
- All HygroFlex Transmitters (with analog outputs)

Recommended accessories

- Transport case with foam insert	HC100-TC
- HP32 Reference Set	HP32-A-Ref-Set
- Aktive 2m extension cable for HC2A	E2-02XX-ACT/01
- 3kg (6.6lbs) desiccant	A000172

S904

FEATURES

- Simple operation and maintenance
- Excellent chamber stability and uniformity
- Manual control or optional straightforward automated set point programming
- Optional in-built data-logging for reference probe and probes under calibration

APPLICATIONS

On-site or in-lab verifications. Validation of RH probes at pharmaceutical manufacturing facilities, meteoritical offices, food manufacturing etc.

Description

GENERAL

The S904 is a completely stand-alone and transportable calibrator for humidity sensors, requiring no external services other than mains power. The calibration chamber features 5 interchangeable ports to accommodate virtually any brand, type or model of sensor. This calibrator is ideal for companies or organizations looking to calibrate large numbers of probes in a laboratory or field setting.

HIGH STABILITY

The environment within the insulated calibration chamber is temperature controlled using a 4-zone fan-assisted Peltier arrangement for maximum stability, and minimum temperature gradient. The humidity of the circulating air is precisely regulated using a closed-loop control system that functions by proportionally mixing flows of dry and saturated air.

FAST RESPONSE TIME

Two highly visible LED panels on the front of the S904 display the current humidity and temperature within the calibration chamber. The response time to a humidity or temperature step change is typically less than 10 minutes, so a simple 3-point calibration can be carried out in under an hour.

MAINTENANCE

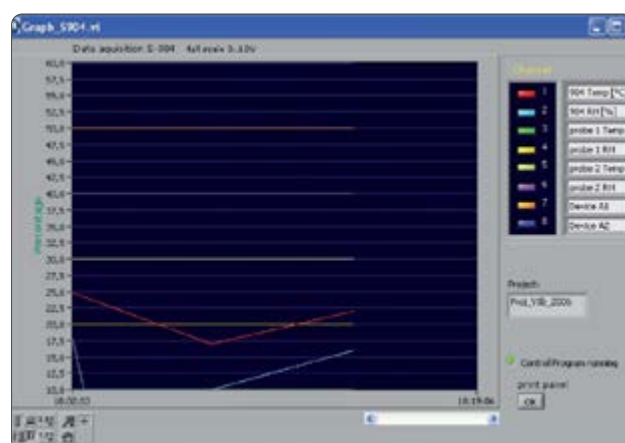The S904 is easy to maintain. The desiccant changes color to indicate when it needs to be recharged and this is visible through a clear window on the front of the unit. Recharging the desiccant is simply a matter of heating it in a conventional oven at +150°C (+302°F) for 3 hours. The water reservoir at the front of the unit shows the current saturator fill level and makes it easy to top-up with distilled water when required.

ACCESSOIRES & SPARE PARTS

Order Codes	Product/Description
	Doors and Door Ports
A000266	Door with clear window - no ports
A000268	Door without ports
A000263	Door with 5 ports – please order adaptors separately
A000264	Door kit with 5 ports and 25 adapters - 5 x Ø19 mm (0.75"), 4 x Ø12 mm (0.47"), 4 x Ø13.5 mm (0.53"), 4 x Ø15 mm (0.59"), 4 x Ø18.5 mm (0.73"), 4 x Ø24 mm (0.94") – and 25 blind stops. Adapter tool included
A000369	Door kit for use with MI OptidewOPT401/501. (Optidew dew-point sensor port opening, PRT port adapter plus 3 x Ø standard sized adapters. Adapter tool included)
A000279	Polymer adapter Ø19 mm to Ø6 mm PRT
A000290	Molded polymer port adapter & blind stop (to be modified by customer) (M30x1)
A000290X	Polymer port adapter Ø client specific & blind stop (check possibility with factory first)
A000291	Polymer port adapter for Ø12.0 mm (0.47") probe, blind stop (M30x1)
A000292	Polymer port adapter for Ø13.5 mm (0.53") probe, blind stop (M30x1)
A000293	Polymer port adapter for Ø14.0 mm (0.55") probe, blind stop (M30x1)
A000294	Polymer port adapter for Ø15.0 mm (0.59") probe, blind stop (M30x1)
A000295	Polymer port adapter for Ø18.5 mm (0.73") probe, blind stop (M30x1)
A000296	Polymer port adapter for Ø19.0 mm (0.75") probe, blind stop (M30x1)
A000297	Polymer port adapter for Ø24.0 mm (0.95") probe, blind stop (M30x1)
A000298	Polymer port adapter for Ø25.0 mm (0.98") probe, blind stop (M30x1)
A000377	Blind stop for Optidew 2 opening
A000378	Blind stop for Optidew 2 Ø6 mm opening
A000265	Tool for changing the port adapters
	Miscellaneous
A000240	Drying module (including desiccant)
A000242	Water bottle
A000171	0.25 kg (0.55 lbs) desiccant (orange)
A000172	3 kg (6.6 lbs) desiccant (orange)
HT961T00	Control sensor. (Please add to order of control sensor, which type of calibration is preferred. See calibration RH tab for choice of calibration and prices)
OCAL-TC	Transport Case for OptiCal and S904
S8K-REM-TSG	S8000 Remote guard for use in S904 and Optical

SOFTWARE

An optional integrated digital interface is available only for the S904-D. This allows the humidity and temperature set points of the chamber to be controlled with the supplied PC application software, enabling the operator to create completely automated calibration profiles for unattended laboratory operation. The software also gives the ability to monitor, chart and log data from the connected probes and calibration reference on a PC for later analysis. Alternatively, the set points can be controlled manually with the front panel controls – making the S904 ideal for field calibrations where a PC is not available.

TECHNICAL INFORMATION

Dimemsions

520.0 mm (20.47")

S-904
Humidity Calibrator

rotronic

290.0 mm (11.4")

420.0 mm (16.5")

290.0 mm (11.4")
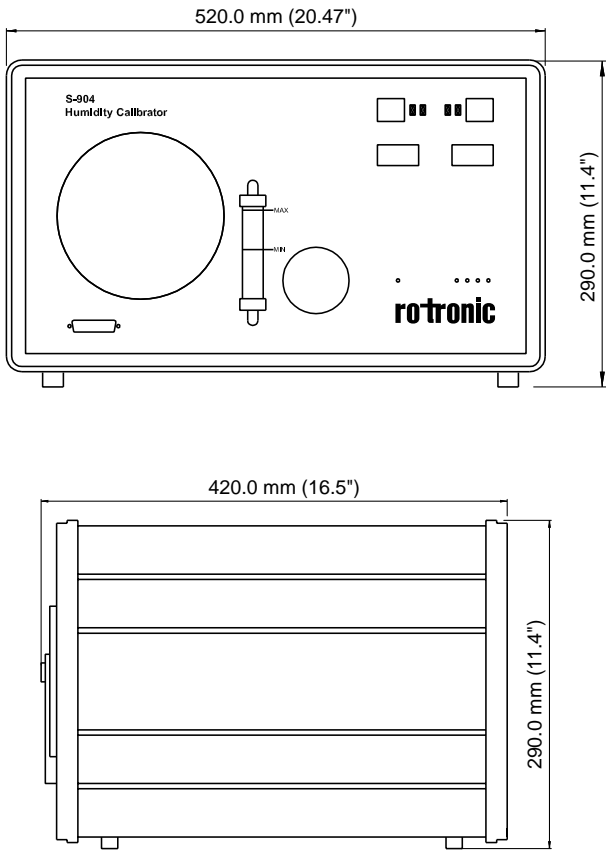
Humidity	
Generation range	10...90 %rh
Accuracy Control element	≤±1 %rh (10...70 %rh) ≤±1.5 %rh (70...90 %rh)
Stability	±0.2 %rh (20...80 %rh)
Temperature	
Generated range	10...50 °C (50...122 °F) (lowest T set point = 10 °C (18 °F) below ambient)
Accuracy	±0.1 °C (±0.2 °F)
Stability	±0.1 °C (±0.2 °F)
Chamber	
Ramp rate from 20...40 °C (68...104 °F) 40...20 °C (104...68 °F)	1.5 °C/minute (2.7 °F/minute) 0.7 °C/minute (1.2 °F/minute)
Control element	Removable relative humidity sensor
General	
Probe ports	Up to 5 – sensor body diameters 5 to 25 mm (0.2 to 0.98") accommodated by port adapters
Chamber volume	2000 cm³ (122.1 in³)
Chamber dimensions	105 x 105 x 160 mm (4.13 x 4.13 x 6.3") (h x w x d)
Instrument dimensions	290 x 520 x 420 mm (11.4 x 20.5 x 16.5") (h x w x d)
Set point resolution	0.1 for humidity and temperature
Displays	3 digit LED, 10 mm (0.39") characters
Supply	85...264 V AC, 47/63 Hz, 150 VA
Weight	20 kg (44 lbs)

Subject to technical change without notice. Printing and other errors reserved.

CHAMBER DIMEMSIONS

105 mm

105 mm

160 mm

2025
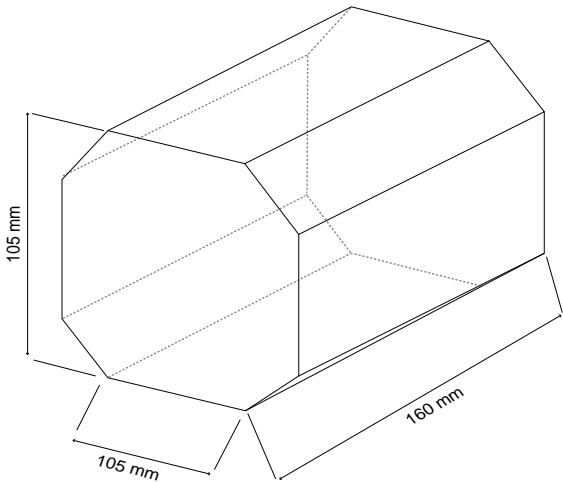
Humidity standards

Equipped with Rotronic humidity standards, a suitable calibration device and the HygroSoft software, it is easy to calibrate and adjust probes on-site at your premises. It is also possible to calibrate and adjust sensors with the HP32 hand-held measuring device or the HygroLab laboratory bench-top device (direct adjustment with the device, no software required).

FEATURES

- Traceable to national standard
- Ampoules contain unsaturated salt solutions
- Inexpensive calibration on site
- Simple and safe use
- Unlimited lifetime as long as the glass ampoules are kept sealed
- Practical packs of 5 ampoules of the same humidity value (approx. 0.8 ml per ampoule)

APPLICATIONS

Calibration and adjustment of Rotronic probes (third-party probes also possible).

Order code	Nominal value	Measurement uncertainty at 23 °C	Quantity	PADS Included
EA00-SCS	0,5 %rh	±0.3 %rh	5	5
EA00-BOX-SCS	0,5 %rh		50	-
EA05-BOX25-SCS	5 %rh		25	25
EA05-BOX-SCS	5 %rh		50	50
EA10-SCS	10 %rh		5	5
EA10-BOX-SCS	10 %rh		50	-
EA11-SCS	11 %rh		5	5
EA20-SCS	20 %rh		5	5
EA20-BOX-SCS	20 %rh		50	-
EA35-SCS	35 %rh	±0.4 %rh	5	5
EA35-BOX-SCS	35 %rh		50	-
EA50-SCS	50 %rh	±0.6 %rh	5	5
EA50-BOX-SCS	50 %rh		50	-
EA60-SCS	60 %rh		5	5
EA65-SCS	65 %rh		5	5
EA65-BOX-SCS	65 %rh		50	-
EA75-SCS	75 %rh	±0.7 %rh	5	5
EA80-SCS	80 %rh		5	5
EA80-BOX-SCS	80 %rh		50	-
EA95-SCS	95 %rh	±0.8 %rh	5	5
EA95-BOX-SCS	95 %rh		50	-
EA-PADS	-	-	-	50

Compatible

- With all calibration devices

Delivery package

- SCS certificate
- Textile pads
- Calibration instructions

Recommended accessories

- Textile pads in tubes (50 pc.)   EA-PADS

Calibration devices

APPLICATIONS

Rotronic calibration devices are small, airtight chambers that fit Rotronic probes precisely. The lower part of the device consists of a screw-on lid into which the humidity standard is poured on to an absorbent textile pad. The specified humidity is generated in the calibration device after a stabilization period. High humidity values require a longer stabilization period. The probe can then be calibrated or adjusted by comparison with the reference value of the humidity standard.

Order code	Use	
Push-on calibration devices. **Gasket with O-ring and thumb screw**		
ER-15	For 1 probe Ø 14…15 mm Brass, nickel-plated	
EDM 15/15	For 2 probes Ø 14…15 mm Brass, nickel-plated	
ERV-15	For 1 probe Ø 14…15 mm Vertical calibration position Brass, nickel-plated	
ER-05	For 1 probe Ø 4…5 mm Brass, nickel-plated	
ER-12K	For 1 probe Ø 12 mm Brass, nickel-plated	
Calibration devices for special probes		
EGS	For all sword probes Brass, nickel-plated	

Order code	Use	
Screw-on calibration devices. Gasket with seal face on probe. **Cannot be used for HC2A-S probes**		
EMV-25	For 1 probe Ø 25 mm (PG11) Vertical calibration position Aluminum, Ematal-coated	
Calibration devices for special probes		
WP-14-S	For bell probes HC2(A)-AW, HC2(A)-AW-USB POM, stainless steel 1.4305	
HL-20-CAL	For HL-20 POM Spring steel 1.4310	

Extension cables

For HC2A/HC2 probes

The HC2A/HC2 extension cables extend the HC2A/HC2 probes away from transmitters, handheld instruments or data loggers. The HC2A/HC2 extension cables can be used up to 5 meters. For longer cable runs, use the AC3003 signal amplifier for distances up to 50 meters.

FEATURES
• Range of application -40...90 °C

Extension cables for HC2A/HC2 probes			
Order code	Cable length	Shaft	Color
E2-F3A	30 cm	Normal	Black
E2-01A	1 m		
E2-02A	2 m		
E2-02A-S	2 m	Short [S]	
E2-05A	5 m	Normal	
E3-01A	1 m	Normal	White
E3-05A	5 m	Normal	
E2-02A-M	2 m	Normal	Black, with metal connector

Ex-xxA

Ex-xxA-S
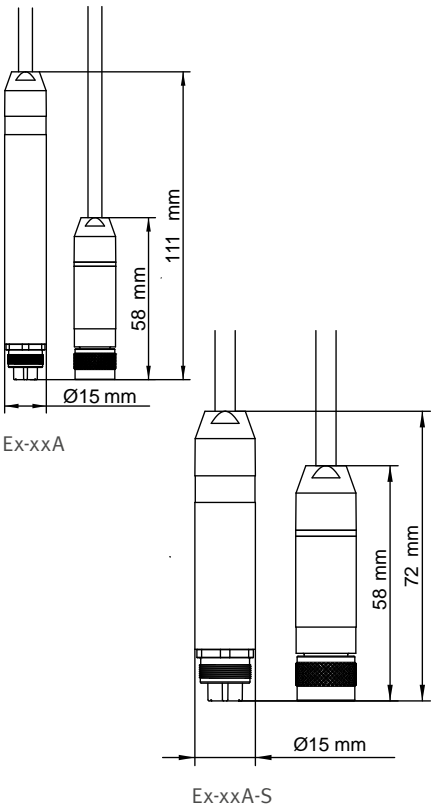
Extension cables

For use with HC2-S3C03(PT15) meteorological probe and analogue probes.

FEATURES
• Range of application -40...70 °C

Cables to connect an analog probe to a HP23-A		
Order code	Cable length	Color
A-01XX	1 m	Black
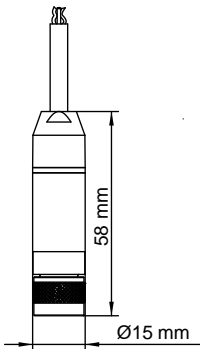
HC2A/HC2 connector

FEATURES
• Maximum wall thickness: 4 mm
• Hole diameter: 12.5 mm
• 30 cm long, color-coded wires
• Ends tin-plated
• Range of application: -40...100 °C

Order code: E2-XX
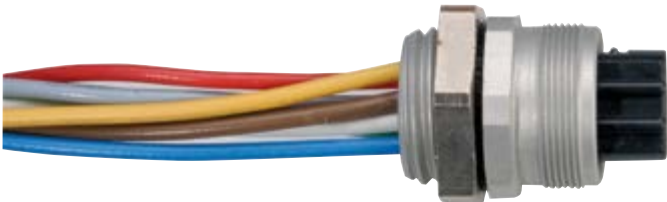
Extension cables

For HC2A/HC2 probes with open ends

The HC2A/HC2 probe extension cables with open ends can be used to integrate HC2A/HC2 probes into users' analog or digital networks.

Order code	Cable length	Shaft	Color	Range of application
Extension cables for HC2A/HC2 probes with open ends				
Supply voltage 3.3 VDC (without electronic control)				
E2-01XX	1 m	Normal	Black	-40..90 °C
E2-02XX	2 m			
E2-02XX-S	2 m	Short [S]		
E2-05XX	5 m	Normal		
E3-01XX	1 m	Normal	White	
E3-02XX	2 m			
E3-05XX	5 m			
Supply voltage 5...24 VDC/5...16 VAC (with electronic control)				
E2-02XX-ACT/01	2 m	Normal	Black	-40..70 °C
E2-05XX-ACT/01	5 m			
E2-10XX-ACT/01	10 m			
E3-02XX-ACT/01	2 m	Normal	White	
E3-05XX-ACT/01	5 m			
E3-10XX-ACT/01	10 m			
Supply voltage 5...40 VDC/6...28 VAC (with electronic control)				
E2-05XX-ACT-HV	5 m	Black	5 m	
Wire assignment				
Green	VDD (+)	3.3 VDC		
		5...24 VDC/5...16 VAC		
		5...40 VDC/6...28 VAC		
Gray	GND	Digital and power supply GND		
Red	RxD	UART		
Blue	TxD	UART		
White	Out1	Analog output 1, standard humidity 0...100 %rh = 0...1 V		
Brown	Out2	Analog output 2, standard temperature -40...60 °C = 0...1 V		
Yellow	AGND	Analog GND (connect to GND when using docking stations)		
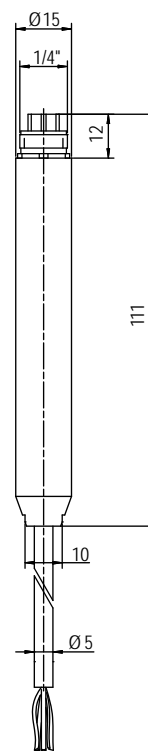
E2-01xx
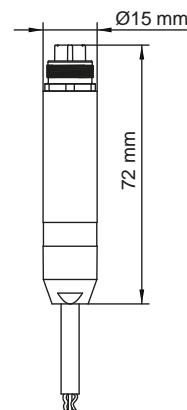
E2-02xx-S

USB converters

For HC2A/HC2 probes

FEATURES

- To connect HC2A/HC2 probes to a PC via the USB interface
- Requires HygroSoft software on the PC
- Power supply via USB interface
- Range of application: -40...70 °C
- Cable length: 2.8 m

USB converters for HC2A/HC2 probes		
Order code	**Description**	**Shaft**
AC3001	Active UART to USB converter cable	Short shaft
AC3001-L		Long shaft [L]
XD-AC3001	Active UART to USB converter cable for XD probes	Short shaft

AC3001   AC3001-L
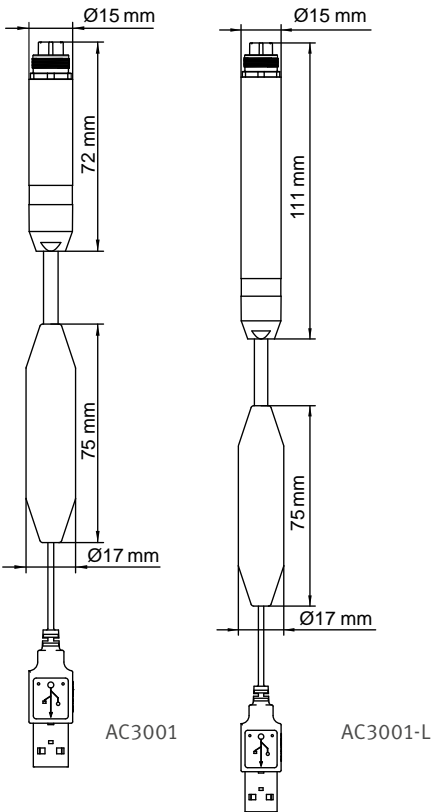
RS-485 converter

FEATURES

- To connect HC2A/ HC2/RMS-probes to a RS-485 network
- Power supply: 5...28 VDC
- Range of application: -40...70 °C

Note

Self-heating of the converter can lead to errors in the measured values; it is therefore advisable to place the probe a short distance away using an extension cable (e.g. E2-F3A).

RS-485/Converters		
Order code	**Description**	**Cable length**
E2-05XX-MOD	Converter cable for HC2A/ HC2/RMS-HCD-S/ RMS-HCD-IC/RS-485	5 m
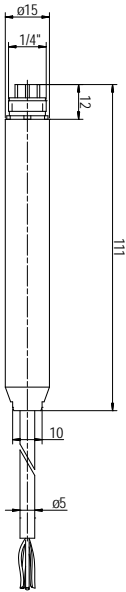
Rotronic Modbus – Digital Communication

Interested? Then scan the QR code!

Digital signal amplifiers

Using a digital signal amplifier, it is possible to achieve probe line distances of up to 50 meters.

FEATURES
- Color: black
- Range of application: -40...70 °C
- Power supply: 3.3 V/4.8 mA

Digital signal amplifiers		
Order code	**Description**	**Cable length/Shaft**
AC3003	UART signal amplifier, probe and instrument side with luster terminals	Normal shaft
AC3003/10	AC3003 with luster terminal and not pre-assembled Cat. 5 cable, normal shaft	10 m
AC3003/20		20 m
AC3003/50		50 m

AC3003

Service cables

FEATURES
- Connects Rotronic instruments via their service interface (UART) to a USB interface
- Requires HygroSoft software
- For programming (settings, scaling, firmware update, etc.)
- Two different types:
    AC3006, the instrument must be supplied with power.
    AC3009, the instrument is supplied with power via the USB interface.

Using AC3006 with any 2-wire type transmitter ensures galvanic isolation of the computer or laptop from the main power supply.

Service cables		
Order code	**Description**	**Length**
AC3006	Service cable without power supply	1.8 m
AC3009	Service cable with power supply via USB interface	3.6 m
AC0003	Mini USB-cable	1.8 m
AC0006	Micro USB-cable	1.0 m

AC3006

AC3009

	AC3006	AC3009	AC0003	AC0006
HF3A	✓	✓		
HF7A	✓	✓		
TF5A	✓	✓		
PF4	✓	✓		
PF5	✓	✓		
HL-20	✓			
BL-1D			✓	
HL-1D			✓	
TL-1D			✓	
CL11			✓	
HP31/32/GTS				✓
CP11			✓	
AwTherm			✓	
CRP5	✓			

AC3006/AC3009

AC0003
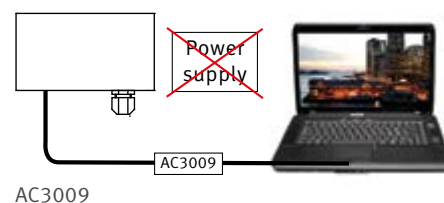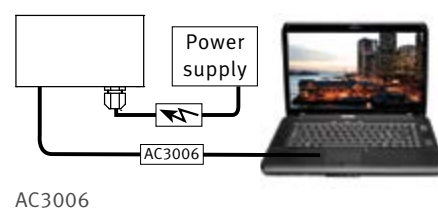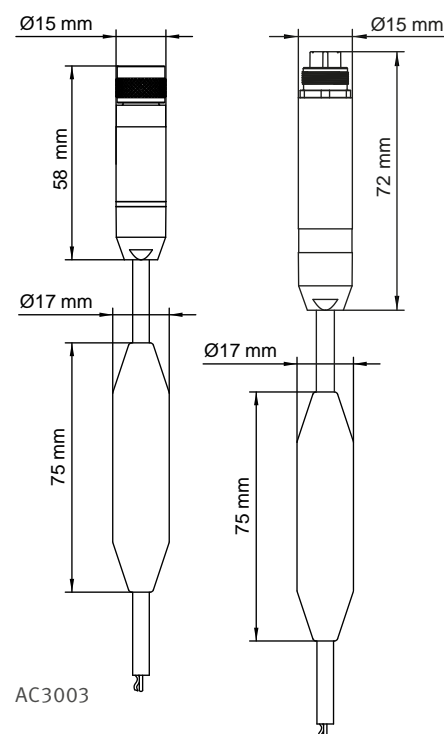
HC2 simulators

FEATURES

- Humidity/Temperature simulators with fixed values and certificate
- For system validation
- Values cannot be changed with the HygroSoft software
- Range of application: -40...100 °C

Service cables		
Order code	**Humidity**	**Temperature**
HC2-SIMC-000/0023	0 %rh	23 °C
HC2-SIMC-035/0023	35 %rh	23 °C
HC2-SIMC-050/0023	50 %rh	23 °C
HC2-SIMC-080/0023	80 %rh	23 °C

Other types available on request.

Protective caps

Protection filter

FEATURES

- Protects probes/connectors during cleaning cycles against water and chemical substances, e.g. H_2O_2

Protective caps	
Order code	**Protection**
Protection-E2/E3	Connectors
Protection-Filter	Sensor note: only compatible with HC2 probes
Protection-HC2	Complete HC2A/HC2 probe

Protection HC2   Protection E2/E3

Mounting kits

Mounting kits	
Order code	**Description**
AC5002	DIN top-hat rail adapter for PF4, PF5, HF3A, TF5A

AC5002

Mounting gland with flange

Mounting gland with flange for temperatures <100 °C	
Order code	Description
AC5005	Mounting gland with flange for 15 mm probes M20 x 1.5/to 100 °C

AC5005

Mounting glands without flange	
Order code	Description
AC1303-M	Mounting gland for 15 mm probe M20 x 1.5/brass, nickel-plated/to 200 °C
AC1304-M	Mounting gland for 25 mm probe M32 x 1.5/brass, nickel-plated/to 200 °C
AC1301-MEX	Mounting gland for 15 mm ATEX probes M25 x 1.5/brass, nickel-plated/to 95 °C

AC1303-M
AC1304-M
AC1301-MEX

Mounting flange		
Order code	Use with	Description
AC1305	AC1303-M	Mounting flange for AC1303-M Ø 80 mm/steel, nickel-plated/to 200 °C
AC1306	AC1304-M	Mounting flange for AC1304-M Ø 80 mm/steel, nickel-plated/to 200 °C
AC1307	AC1301-MEX	Mounting set for AC1301-MEX Ø 80 mm/steel, nickel-plated/to 200 °C

AC1305
AC1306

Software

Humidity and Temperature

Temperature

Differential pressure

CO$_2$

Applications

Rotronic Monitoring System – RMS

Services

Theory

PT100 probes

Rotronic offers a wide range of its own PT100 probes, but other 4-wire temperature probes can also be used.

PT100 input

4-wire PT100

Accuracy:	Class A
Wire technique:	4-wire
Connection:	4-pin Binder connector plug
τ90:	Time needed to reach 90% of the new measured value after a temperature increase (air velocity = 2 m/s)
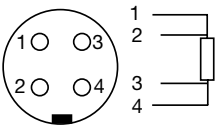
AC1900

AC1904

AC1902

AC1909

Order code	Probe type	Temperature range	Cable/handle operating range	
AC1900	Fixed probe 100 x 3 mm DIN 1.4404	-50...300 °C	-40...105 °C without cable	
AC1902	Insertion probe with handle 250 x 3 mm DIN 1.4404	-50...350 °C	-40...105 °C 1 m, PUR cable	
AC1903	Cable probe 200 x 6 mm Not waterproof DIN 1.4404	-50...350 °C	-40...105 °C 2 m, thermoplastic cable	
AC1904	Cable probe 50 x 6 mm Waterproof DIN 1.4301	-50...105 °C	-40...105 °C 2 m, thermoplastic cable	
AC1909	Fixed probe for measurements in air, 100 x 4 mm DIN 1.4401	-50...150 °C	-40...105 °C without cable	
AC1913-A	Kapton foil probe, 20 x 15 x 2 mm	-50...200 °C	-40...105 °C 1 m, four PFA wires	
AC1916-A-T	Cable probe 60 x 6 mm Waterproof DIN 1.4571	-100...250°C	-40...85 °C 2 m PTFE cable	

Order code	Probe type	
HC2A-PT100	Adapter for PT100 probes to HP32 and HF5A	
AC1607/02	Extension cable for PT100 probes, 4-pin Binder male/female connectors Max. 85 °C, min. -40 °C	2 m
AC1607/05	Extension cable for PT100 probes, 4-pin Binder male/female connectors Max. 85 °C, min. -40 °C	5 m
AC1607/10	Extension cable for PT100 probes, 4-pin Binder male/female connectors Max. 85 °C, min. -40 °C	10 m

TF5A series

The Advanced HygroFlex5 temperature series is compatible with all PT100 probes featuring a binder 4-pole connector, providing a broad range of temperature options and high accuracy.

FEATURES

- Accuracy: ±0.1°C @ 23°C
- Range of application electronics: -40...80°C / -10...60 °C with display
- Interchangeable and wide compatible PT100 probe, 4-pin Binder connection
- Freely programmable outputs and scaling via NFC-Interface
  & supports NFC Powerless

TF5A wall version

APPLICATIONS

Monitoring storage temperature for pharmaceutical drugs and vaccines, as well as temperature control in pharmaceutical and industrial manufacturing, production, storage, and drying processes.
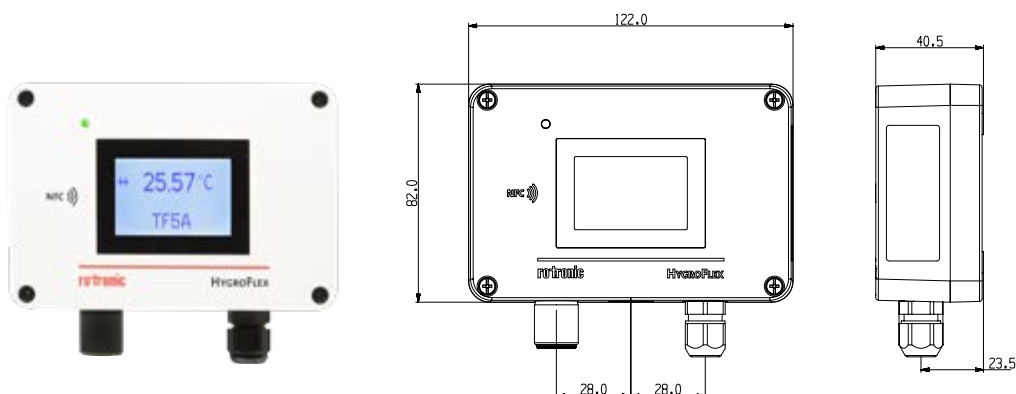
PT100 Connector pin-out

TECHNICAL INFORMATION

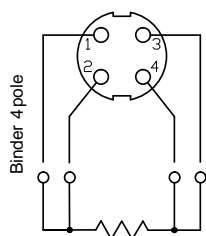| Order Code	TF5A-2 2-wire	TF5A-3 / TF5A-D 3/4-wire
Probe	PT100 Class A probes, various types	
Accuracy @ 23	± 0.1 °C	
Initialization time	Typically 5 sec.	
Measurement range	-200...600 °C (probe dependent)	
Range of applications	-10...60 °C with display -40...80 °C without display	
Display resolution	Resolution up to 2 decimal places	
Output signals analog	4...20 mA	Freely scalable 0...1/5/10 V, 0...20, 4...20 mA*
Resolution Analog output	≥ 15 bit	
Output signals digital	–	RS485 signals on screw terminal
Cable connections	1 x M12 screw terminals (2 x M12 for TF5A-D)	
Power supply	10...28 VDC	18...36 VDC
Circuit Type	2-wire	3- / 4-wire
Current consumption	2 x 23 mA	max. 80 mA (when both outputs are connected)
Load per analog output	Max. 500 Ω	
Interface	UART, NFC and USB	
Software	HygroSoft	
Housing Material	PC-ABS	
Standards	CE Conformity 2014 / 30 / EU	
GMP / FDA Compliance	Conform to FDA 21 CFR Part 11 and GAMP5	
Dimensions	122 x 82 x 40.5 mm	
Weight	204 g	
IP-protection	IP65	
Fire protection class	Corresponds to UL94-HB	
Soldering material	Lead free (RoHS-Directive 2011 / 65 / EU)	

Compatible

- All PT100 probes with 4-wire connection
- HygroSoft software

Delivery package

- Function certificate
- Screws and plugs for mounting
- Connector for third-party probe

Recommended accessories

- Service cable   AC3006 / AC3009*
- Extension cable 5 m   AC1607/05
- Mounting kit DIN top-hat rail   AC5002

* Requires optional HygroSoft software with service cable.

TL-CC1

The Rotronic cold-chain temperature logger TL-CC1 is easy to configure (without software), generates PDF reports automatically and comes at an unbeatable price.

FEATURES
- Freely configurable
- Clear alarm indication
- All-in-one logger: configuration tool, PDF report, instruction manual and calibration certificate
- High storage capacity, single use, single journey

APPLICATIONS

Monitoring of the cold chain during the transportation of sensitive freight such as pharmaceuticals, foods and technical products.

TECHNICAL INFORMATION

Order Code	TL-CC1
Parameter	Temperature
Temperature sensor	NTC thermistor
Accuracy at -30...70 °C	±0.5 °C
Resolution	0.1 °C
Range of application / Storage conditions	-30...70 °C, < 80 %rh
IP protection	IP65 (in plastic bag)
Weight	Approx. 10 g
Battery	CR2032 (not replaceable)
Dimensions without bag	80 x 43 x 2.5 mm
Dimensions with bag	105 x 55 x 2.5 mm
Logging interval	0.5/5/10/30/60/90/120 min.
Start delay	0.5/5/10/30/60/90/120 min.
Alarm ranges	-20...-10 °C, -10...0 °C, 2...8 °C, 0...15 °C, 0...25 °C, 15...25 °C, freely selectable values
Alarm type	Deactivated, single or cumulative
Storage period	12 months
Storage capacity	8192 data points
Event marking	Up to 8 points
Use	START/STOP button, MARK button
Alarm indication	LED indicators PDF reports
Communication	USB 2.0 port, type A
Operating system	Windows
Conformity	EN12830

PDF report

Delivery package

- 10 pc. per box
- Short instruction manual

TL-1D

FEATURES

- Compact with very high level of IP protection
- High storage capacity: 32,000 lines
- Free evaluation and configuration HygroSoft software
- Very long battery life: up to 3 years
- Conforms to EN12830. Version 3.0 and later
- Programmable logging mode

APPLICATIONS

Warehouses, factories, museums, office buildings, cleanrooms, transportation, libraries, test facilities, room monitoring in HVAC systems.

TECHNICAL INFORMATION

Order Code	TL-1D
Parameter	Temperature
Sensor type	NTC thermistor
Accuracy at 23 °C	±0.3 °C
Range of application / Storage conditions	-30…70°C / 0…100%rh
IP protection	IP67
Weight	85 g
Dimensions	90 x 60 x 23 mm
Logging interval	30 s…24 h
Battery	1 x CR2
Battery life	Up to 3 years (logging interval 1 h)
Battery charge indicator	Yes (HygroSoft software, display and LED indicator)
Storage capacity	32,000 lines
Function	MIN/MAX/AVG
Display	LCD
Resolution	0.1 °C
Display refresh rate	5 s (standard) or same as logging interval
LED indicators	2 LEDs Right LED flashes green during data logging Left LED flashes red when limits broken or low battery
Communication	USB-Mini port (cable not included)
Standards	EN12830

USB-Mini port (settings and data download)

Battery compartment

Configuration & evaluation

The values stored in the TL-1D can be downloaded with the HygroSoft software and displayed graphically. The user determines the logging interval, the alarm limits, the recording mode and much more.

90   23

60
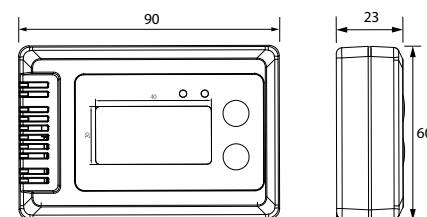
Delivery package	Recommended accessories
• Short instruction manual • Battery CR2 • Function and calibration certificate	• USB service cable AC0003

Software

Humidity and Temperature

Temperature

Differential pressure

CO$_2$

Applications

Rotronic Monitoring System – RMS

Services

Theory

Video differential pressure

Interested? Then scan the QR code!

PF4/PF5 series

The thermal measurement technique of the PF4 transmitter allows exact measurements in the smallest of ranges. The differential pressure transmitter enables Rotronic customers to measure a further important parameter in addition to humidity, temperature, low dew-point and differential pressure.

FEATURES

- Flow or diaphragm differential pressure sensors
- 1 to 3 analog outputs, 1 analog input
- Network integration (Ethernet)
- Modbus TCP or RTU over RS485
- Potential-free relay with switch contacts

APPLICATIONS

Clean rooms, operating theaters, HVAC, filter technology and applications where small pressure differences prevail.

PF4 with PT100

PF5 with HC2A-S

TECHNICAL INFORMATION
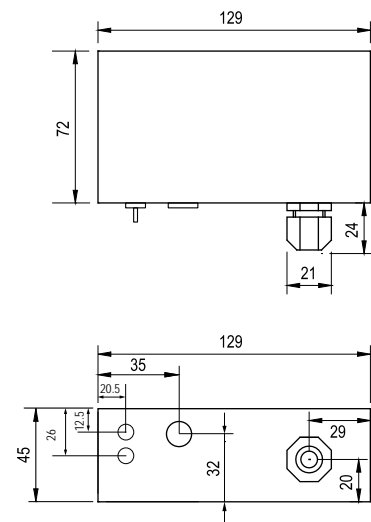
Order Code	PF44X-1 Analog 3-wire	PF44X-L Analog & digital 3-wire	PF54X-1 Analog 3/4-wire	PF54X-L Analog & digital 3/4- wire
General				
Parameters	Differential pressure, temperature and relative humidity			
Housing material	ABS			
IP protection	IP65	IP40	IP65	IP40
Mounting position	Wall mount			
Dimensions	129 x 72 x 45 mm			
Weight	243 g			
Display	Coloured TFT display			
Electrical connections	Screw terminals M16 cable gland	Screw terminals M16 cable gland, socket	Screw terminals M16 cable gland	Screw terminals M16 cable gland, socket
Power supply	18…48 VDC/16…36 VAC (galvanically isolated)			
Current consumption	<300 mA @ 24 VDC			
Application Range	-5…60°C/0…100%rh, non-condensing			
Firmware upgrade	Via HygroSoft software			
Service interface	UART service interface (inside device)			
CE/EMC compatibility	EMC-Directive 2014/30/EU			
Fire protection class	Corresponds to UL94-HB			
Differential pressure measurement				
Measurement principle	Thermal mass flow measurement		Membran sensor	
Measurement ranges	±10 Pa/±25 Pa/±50Pa/±100 Pa/±250 Pa/±500 Pa		±25 Pa/±50Pa/±100 Pa/±250 Pa/±500 Pa	
Medium	Air and non-agressive gases			
Accuracy at 23°C	±1.0 %FFS			
Long-term stability	±0.05 % FSS/year (typ.) ±0.1 % FSS/year (max.)		±0.25 % FSS (typ.) per year @ ±250 and ±500 Pa measurement range ±0.3125 % FSS (typ.) per year @ ±100 Pa measurement range ±0.625 % FSS (typ.) per year @ ±50 Pa measurement range ±1.25 % FSS (typ.) per year @ ±25 Pa measurement range	
Measurement interval	1 s			
Pressure resistance	5 bar		0.7 bar	
Leak rate	<10.8 ml/h		0	
Pressure connections	Tubing connector Ø 4 mm x 10 mm			
Measurement of temperature and relative humidity (type-dependent)				
Probe connections	Temperature: 4 pin Binder for 4-wire PT100 Humidity: Rotronic E2 for Rotronic HC2A-S probe Accuracy: probe dependent			
Outputs				
Analog outputs	Min. 1, max. 3, freely configurable			
Current	0(4)…20mA			
Voltage	0…1/5/10 V			
Relais/Switch output	1 relay potential-free change-over switch (NC - COM - NO)			
Accuracy analog output @ 23°C	Voltage output: ±1 mV/V Current output: ±20 µA			
Permissible load	> 1 kΩ/V (voltage output)/< 500 Ω (current output)			

Compatible

- HygroSoft software

Delivery package

- Factory adjustment certificate
- Screws and plugs for mounting

Recommended accessories

- Service cable   AC3006/AC3009*
- Temperature probe   AC19xx
- Mounting kit DIN top-hat rail   AC5002
- HC2A-S probe

*   Requires optional HygroSoft software and service cable.

Software

Humidity and Temperature

Temperature

Differential pressure

CO$_2$

Applications

Rotronic Monitoring System – RMS

Services

Theory

Video CO$_2$

Interested? Then scan the QR code!

2025

CL11

Benchtop display unit for monitoring indoor air quality, measuring and recording CO₂ levels, relative humidity, and temperature.

FEATURES

- Benchtop or wall mounting
- Maximum, minimum and average value display
- Adjustable audible and visual CO₂ alarm
- Real-time clock
- Includes free logging and configuration HygroSoft software

APPLICATIONS

Indoor air quality (IAQ) measurements in offices, conference rooms, schools, etc.

Order code	CL11
Probe type	CO₂: infrared (NDIR) with automatic calibration (ABC) Humidity: ROTRONIC HYGROMER® IN-1 Temperature: NTC
CO₂ measurement range	0...9999 ppm
Range of application	0...50 °C / 0...95 %rh, non-condensing
Material	ABS
Power supply	Only with AC adapter
IP protection	IP30
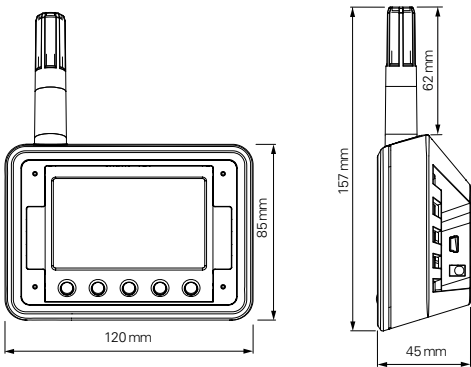
Delivery package

- Short instruction manual
- AC adapter AC1214
- Rotronic HygroSoft software
- USB cable
- Factory adjustment certificate

Recommended accessories

Humidity calibration device	ER-15
Humidity standard for calibration 35 %rh	EA35-SCS
Humidity standard for calibration 80%rh	EA80-SCS
External temperature probe	AC1215

CO₂ DISPLAY

Room / Wall panel for monitoring indoor air quality. Measures and records CO_2, relative humidity and temperature.

FEATURES

- Benchtop or wall mounting
- Adjustable, visual CO_2 alert indicator
- Data download via USB flash drive
- Display of date and time

APPLICATIONS

Indoor air quality (IAQ) measurements in offices, conference rooms, schools, etc.

Order code	CO₂ Display
Probe type	CO₂: infrared (NDIR) with automatic calibration (ABC) Humidity: ROTRONIC HYGROMER® IN-1 Temperature: NTC
CO₂ measurement range	0...9999 ppm
Range of application	0...50 °C / 0...95 %rh, non-condensing
Material	ABS
Power supply	AC adapter, 12 V
Dimensions	330 x 250 x 50 mm
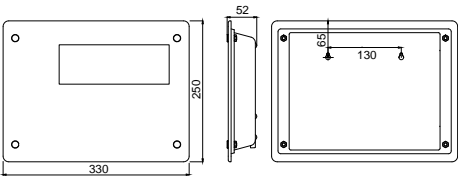
Delivery package		Recommended accessories	
• Short instruction manual		• Humidity calibration device	ER-15
• Mounting hardware		• Humidity standard for calibration 80%rh	EA80-SCS
• Factory adjustment certificate		• Humidity standard for calibration 35 %rh	EA35-SCS

CP11

Portable monitoring of indoor air quality. Measures and records CO_2, relative humidity and temperature.

FEATURES

- Maximum, minimum and average value display
- Adjustable audible CO_2 alarm
- Adjustable automatic power off function
- Includes logging and configuration software, USB data cable and case

APPLICATIONS

Mobile inspections and random tests of indoor air quality in offices, conference rooms, schools, etc.

Order code	CP11
Probe type	CO_2: infrared (NDIR) with automatic calibration (ABC) Humidity: ROTRONIC HYGROMER® IN-1 Temperature: NTC
CO_2 measurement range	0...9999 ppm
Range of application	0...50 °C / 0...95 %rh, non-condensing
Accuracy	±30 ppm ±5 % of the measured value, ±2 %rh, ±0.3 °C
Storage capacity	18,000 data points
Material	ABS
Power supply	4 AA batteries / optional AC adapter
IP protection	IP30
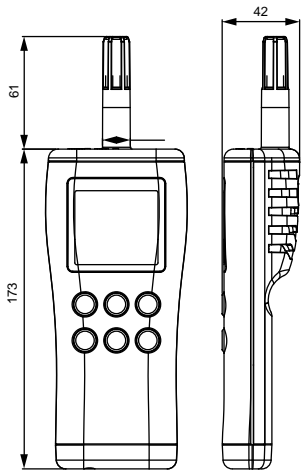
Delivery package	**Recommended accessories**	
• Short instruction manual	• 5 VDC AC adapter	AC1214
• 4 x AA batteries	• Humidity calibration device	ER-15
• Rotronic HygroSoft software	• Humidity standard for calibration 35 %rh	EA35-SCS
• USB cable	• Humidity standard for calibration 80%rh	EA80-SCS
• Soft case		
• Factory adjustment certificate		

Guidelines for a healthy indoor climate
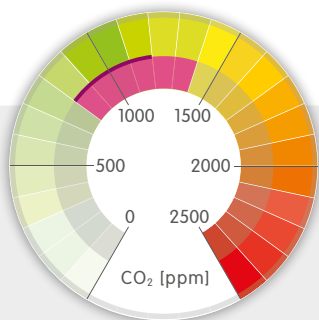
Recommendation: 800 – 1200 ppm
Optimum: 800 ppm
Maximum: 1400 ppm
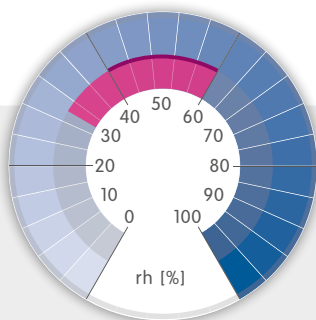
Recommendation: 40 – 60 %
Winter: 30 %
Summer: 60 %

Recommendation: 22 – 24 °C
Winter: 21 °C
Summer: 26 °C

TECHNICAL INFORMATION

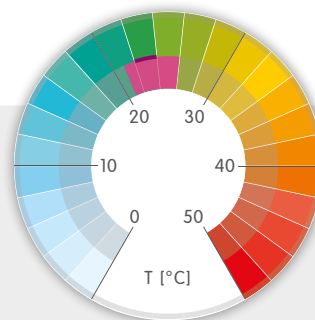|	CL11	CP11	CO₂ Display
General			
Parameters	CO_2, relative humidity and temperature		
Memory capacity	40,000 values with time stamp, automatic recording (%rh / °C / ppm)	18,000 values with time stamp, automatic recording (%rh / °C / ppm) 99 single values with time stamp, manual recording (%rh / °C / DP / WBT / ppm)	18,000 values with time stamp, automatic recording (%rh / °C / ppm)
Housing material / IP protection	ABS / IP30		
Dimensions	157 x 120 x 45 mm	77 x 42 x 234 mm	330 x 250 x 50 mm
Weight	200 g	290 g	1400 g
Display	Two-line LCD with backlight		
Alarm	Audible and visual, adjustable for CO_2 measurement	Audible, adjustable for CO_2 measurement	Visual, adjustable for CO_2 measurement
Power supply	AC adapter AC1214	4 AA batteries / optional AC adapter AC1214	AC adapter
Current consumption	50 mA	40 mA	<700 mA
Application temp. housing / electronics	0…50 °C / 0…95 %rh, non-condensing		
Service interface	CO_2-Display: USB-A port		
CE / EMC compatibility	CE conformity 2014/30/EU		
CO₂ measurement			
Measurement principle	Infrared (NDIR) with automatic calibration (ABC)		
Measurement range	0…9999 ppm		
Accuracy at 23 °C	±30 ppm ±5 % of the measured value @ 0…5000 ppm		
Null drift	<10 ppm/year		
Maintenance	No maintenance (standard indoor applications)		
Humidity measurement			
Sensor	ROTRONIC HYGROMER® IN-1		
Measurement range	0…100 %rh		
Accuracy at 23 °C	±2 %rh (10…90 %rh), others ±5 %rh		
Adjustment points	35, 80 %rh		
Long-term stability	<1.5 %rh/year		
Response time	<30 s τ63, without filter		
Temperature measurement			
Sensor	NTC		
Measurement range	-20..60 °C		
Accuracy at 23 °C	±0.3 °C		
Response time	4 s τ90		

2025

Software

Humidity and Temperature

Temperature

Differential pressure

CO$_2$

Applications

Rotronic Monitoring System – RMS

Services

Theory

Video water activity

Interested? Then scan the QR code!

Video CRP5

Interested? Then scan the QR code!

Video differential pressure

Interested? Then scan the QR code!

AwEasy

The AwEasy is a mobile device for easy and fast measurements of the water activity. The measurement head with Bluetooth can be used with the Smartphone together with the AwEasy App for iOS and Android. The AwEasy has also a small display, a light ring as an indicator and a wireless charger for an easy handling.

FEATURES

- The reliable AW Quick mode for quick results (typical 4 - 5 min)
- Easy use with a Smartphone App for iOS and Android
- Standalone measuring device with light ring and display
- Long battery life with wireless charging

APPLICATIONS

Quality assurance in food manufacturing, coffee processing and the tobacco industry, grain storage and pharmaceutical industry.
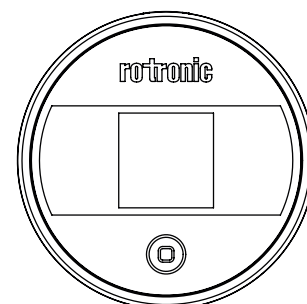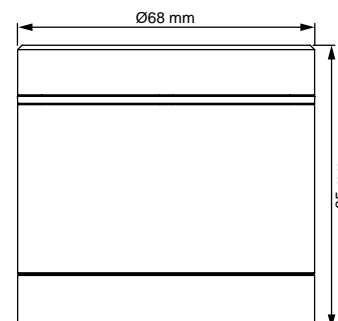
Probe	
Sensor	HYGROMER WA-1
Accuracy @ 23 °C	± 0.008 aw / 0.8 %rh / ±0.1 °C
Operating conditions	0…70 °C / 0…100 %rh
Storage conditions	-10…70 °C / 0…100 %rh
Long-term stability	< 1 %rh / year (normal conditions)
Functions	
Parameters shown	aw, %rh, °C
Status light	Yes
AW Quick Mode	Yes
Firmware update	Direct over the App
Protocols (values)	Date, time, aw / rh / °C, aw setpoint, serial no., etc.
HygroLab compatibility	No
Acoustic alarm	No
Calculations	No psychrometric calculations available
Hardware	
Batterie capacity	500 mAh
Display	1.2" LCD color display
Button	Multifunctional touch button
USB cable	USB-A to USB-C
Housing	
Dimensions	Ø68 x 65 mm
Housing material	Aluminum, stainless steel & PC
Weight	600 g
CE conform	CE 2014/30/EU
IP protection rating	IP65

Ø68 mm

65 mm

Compatible

- Smartphone with iOS and Android

Delivery package

- Factory adjustment certificate
- Wireless charger with 3 different power supply plugs
  (for the US, EU or UK)

Recommended accessories

- Sample holders	WP-14-S
	WP-40
	WP-40TH
- Calibration device	WP-14-S
- Calibration standards	EAxx-SCS
- Disposable sample containers	PS-14, PS-40
- Clamp sealing mechanism	AW-KHS

Water activity probes

APPLICATIONS

Quality assurance in food manufacturing, coffee processing and the tobacco industry, grain storage and pharmaceutical industry.

HC2A-AW-USB

FEATURES

- On/Off touch button
- USB interface for direct connection to a PC
- Adjusted at 23 °C and 10, 35, 80 %rh
- AW Quick function for fast measurement results (typically 4-5 minutes)

Order code	HC2A-AW-USB	HC2A-AW-USB-SW
Feature	Measurement probe	Probe + software HS-AW-Code
Connection	Via USB to PC, 3 m cable	
Accuracy @ 23 °C	±0.008 aw, ±0.8 %rh, ±0.1 °C	
Range of application	0…1 aw (0…100 %rh) / -40…85 °C	
Power supply	Via USB interface	
Filter type	Wire mesh filter with 20…25 µm pore size	
Weight	540g	

HC2A-AW-USB

HC2A-AW

FEATURES

- Same as HC2A-AW-USB, but with UART interface

Order code	HC2A-AW
Feature	Measurement probe
Connection	Via UART, 1 m cable
Accuracy @ 23 °C	±0.008 aw, ±0.8 %rh, ±0.1 °C
Power supply	Via display unit
Filter type	Wire mesh filter with 20…25 µm pore size
Weight	540g

HC2A-AW

Ø68 mm

65 mm
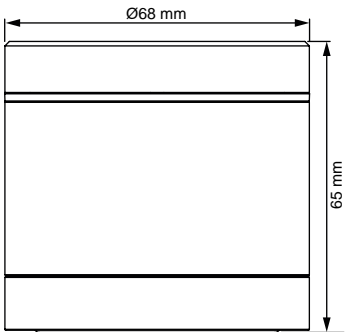
Compatible

- HC2A-AW-USB: PC
- HC2A-AW: Laboratory benchtop device HygroLab

Delivery package

- Factory adjustment certificate

Recommended accessories

• Sample holders	WP-14-S
	WP-40
	WP-40TH
• Calibration device	WP-14-S
• Calibration standards	EAxx-SCS
• Disposable sample containers	PS-14, PS-40
• Clamp sealing mechanism	AW-KHS

HygroLab

The Rotronic HygroLab is an innovative high-end laboratory benchtop device for water activity measurements with up to four measurement probe inputs. Simultaneous or asynchronous measurement with the tried-and-tested AW Quick measuring function for pharmaceutical products, tobacco, coffee, food and many more.

FEATURES

- The reliable AW Quick mode for quick results (typical 4 - 5 min)
- 4 probe inputs for simultaneous or asynchrony measurements
- Standalone laboratory measuring device with 7" touch screen (no additional software necessary)
- Remote access with PC or Tablet
- Software updates over the internet

TECHNICAL INFORMATION

| Order code	HygroLab
Operating range	0...40 °C (32...104 °F) / 0...80 %rh
Parameters shown	AW, %rh, °C, °F
Dimensions	215 ×146 ×79 mm
Accuracy @ 23 °C ± 5 % (HC2A-AW)	± 0.008 aw / 0.8 %rh / ±0.1 °C
Long-term stability (HC2A-AW)	< 1 %rh / year (Normal conditions)
AW Quick Mode	Yes
Display	7" LCD capacitive touch screen
Power button	Push button (with RGB light indicator)
Trend display	Yes
Clock	Real time clock provides a time stamp for every measurement
Storage capacity	16 GB
Power supply	12VDC 2.0A 24W Max (AC adapter)
Power supply plugs	CH (EU) / UK / US
Probe connections	4 x HC2 station probe (HC2A-S or HC2A-AW)
USB (A) types	2x 2.0 and 2x 3.0
USB power supply	5V / 500 mA
Measurement interval	15 s
Start-up time	30 s
Software update	Direct with the HygroLab over the internet
Protocols (values)	Date, time, AW / RH, °C / °F, AW Setpoint, Serial No., etc.
HygroSoft software compatible	No
Acoustic alarm	No
Calculations	Dew Point
Housing / Mechanics	
Housing material	Aluminum, ABS, stainless steel
Weight	1.02 kg (2.25 lbs)
Conformity with standards	
FDA compliance	FDA CFR 21Part 11
CE conform	CE 2014/30/EU
IP protection rating	IP30
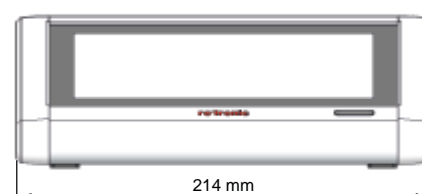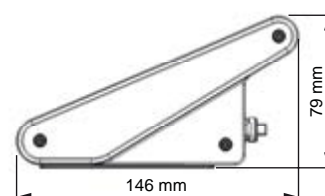
Compatible

- Water activity probe — HC2A-AW
- Humdity probe — HC2A-S

Recommended accessories

- Validation documents — HYGROLAB-VAL-DOC

Delivery package

- HygroLab
- Power adapter
- Pen
- Short instruction manual

AwTherm

With AwTherm, Rotronic offers a professional, high-end laboratory unit for temperature-stabilized measurement of water activity. The wide control range permits measurements to be integrated directly in the tempered manufacturing or storage process.

FEATURES

- Highest precision through exact stabilization of temperature
- Wide temperature-control range
- Outstanding repeatability
- Excellent long-term stability
- Reference probe exchangeable for calibration or cleaning

APPLICATIONS

Food industry, pharmaceutical industry, cosmetics industry.

Order code	AwTherm
General specifications	
Operating conditions	1...40 °C (34...107 °F)
Measurement range	0.005...1.000 aw
Accuracy	±0.005 aw (10...30 °C) / ±0.1 °C (±0.18 °F)
Power supply	110...230 V / 50...60 Hz
Display	8-line LCD with touch operation
Sample sizes	Variable (14 mm / 40 mm)
Current consumption	≤2 A
Temperature control range	0...60 °C (32...140 °F)
Temperature stability	±0.01 °C/min (±0.018 °F/min)
Chamber-temperature gradient	<0.1 °C (<0.18 °F)
Probe	
Sensor	HYGROMER® IN-1
Maintenance / Calibration	Annual calibration (recommended)
Long-term stability	<0.01 aw/year
Temperature sensor	PT100, DIN 1/3 Class B
Functions	
HygroSoft compatible	Yes
Aw-Quick function	Yes
Interface	Micro USB
Calibration / Adjustment	Rotronic humidity standards (via HygroSoft software)
Trend indicator	Yes
Approval / Conformity	
Standards	ISO 18787
CE / EMC	EMC 2004/108/EC / IEC EN 61010-1:2010
IP protection	IP21
Housing / Mechanics	
Enclosure material	PC / ABS
Housing dimensions	400 x 180 x 180 mm
Sample container dimensions	AwT-PS14: Ø46 x 14 mm / AwT-PS40: Ø46 x 40 mm
Weight	4200 g

Delivery package

- AwTherm incl. AwT-MHS
- AwT-PS14 or AwT-PS40
- AC adapter
- USB cable
- Instruction manual
- HS-AW-Code

Recommended accessories

- AwTherm measurement probe · AwT-MHS
- AwTherm sample holders · AwT-PS14 / AwT-PS40
- Disposable sample containers · PS-14 / PS-40

Insertion probes

5 / 10 mm for measurements in bulk materials

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

APPLICATIONS

5 mm insertion probe: dust-free bulk materials such as tablets, grain, jelly capsules and granulates.
10 mm insertion probe: dusty bulk materials such as flour, sugar, etc.

5 mm insertion probe

Order code	HC2-P05
Probe type	Ø 5 x 200 mm, insertion probe with 2 m cable
Accuracy	±0.015 aw, ±1.5 %rh, ±0.3 °C, at 10...30 °C
Power supply	3.3...5 VDC, adjusted at 3.3 VDC, current: approx. 4.5 mA
Filter type	No filter available (laser-cut slots)
Response time	<15 s τ 63
Material	Stainless steel DIN 1.4305 (probe), POM (handle)
Weight	160 g
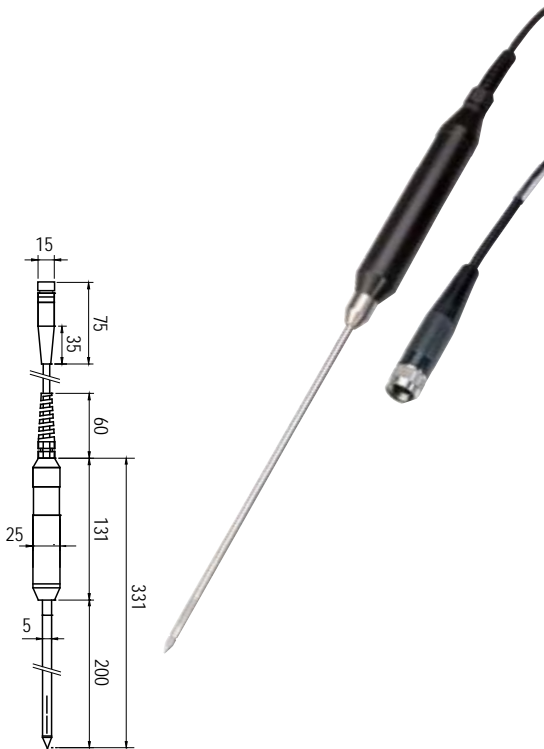
10 mm insertion probe

Order code	HC2-HP28
Probe length	Ø 10 x 280 mm
Accuracy	±0.008 aw, ±0.8 %rh, ±0.1 °C, at 10...30 °C
Power supply	3.3...5 VDC, adjusted at 3.3 VDC, current: approx. 4.5 mA
Filter type	Sintered steel
Response time	<20 s, with filter τ 63
Material	Stainless steel DIN 1.4305 (probe), POM (handle)
Weight	200 g
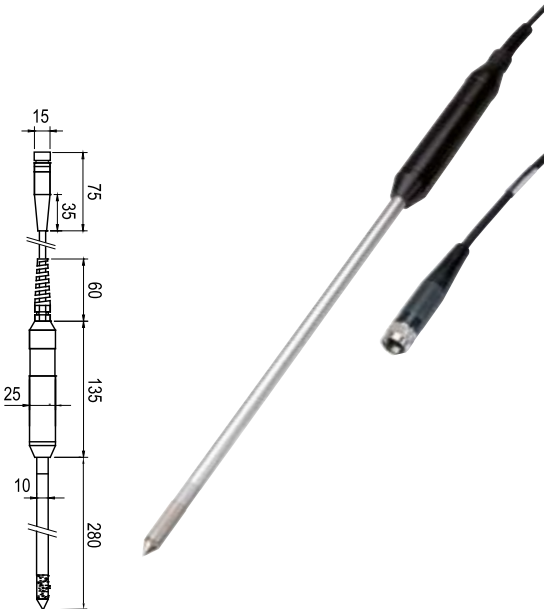
Compatible

- Laboratory benchtop device   HygroLab

Delivery package

- Factory adjustment certificate

Recommended accessories

- Replacement filter HC2-HP28   ET-Z10

Accessories

Sample holders WP-14-S / 40 / 40TH

APPLICATIONS

The stainless steel sample holders were developed specifically for the water activity probes HC2A-AW(-USB). There are two sizes available:
- WP-14-S for small samples and for calibration
- WP-40 for larger samples

Both products provide excellent sample containment and optimum temperature stability. The WP-40TH can be attached to a water bath for additional control.

Order code	WP-14-S	WP-40	WP-40TH
Use with	PS-14	PS-14 / PS-40	PS-14 / PS-40
Depth	14 mm	40 mm	40 mm
Internal diameter	46 mm	46 mm	46 mm
Material	V2A steel		Brass, nickel-plated
Weight	350 g	1250 g	1550 g

WP-14-S

WP-40

WP-40TH

Disposable sample containers PS-14 / PS-40

APPLICATIONS

The disposable sample containers ensure the optimum sample volume is filled into the WP-14-S or WP-40 sample holders. They prevent the sample holders from coming into direct contact with the product being tested, thereby preventing soiling or cross contamination. The sample containers also provide a convenient means of collecting and storing samples.

Order code	PS-14	PS-40
Use with	WP-14-S / WP-40 / WP-40TH	WP-40 / WP-40TH
Depth	14 mm	40 mm
External diameter	46 mm	46 mm
Unit	100 pc.	

PS-14

PS-40

Clamp sealing mechanism

APPLICATIONS

In the case of very dry or very moist samples additional mechanical sealing of the AW measurement probe and sample holder may be necessary to prevent external conditions influencing the sample.

Order code	AW-KHS
Use with	WP-40 / WP-40TH
Weight	1100 g

High-end meteorological HC2A-S3A

The HC2A-S3A probe is the high end meteorological probe with a white housing but with a different filter (Wire-mesh filter with 10 µm filter pore size suitable for meteorological applications). It measures relative humidity and temperature and calculates the dew/frost point and is designed for the use in Rotronic meteorological applications.

FEATURES

- Digital interface (UART) and scalable analog outputs, 0...1 V
- Standard analog output scaling: 0...1 V = -40...60 °C / 0...100 %rh

APPLICATIONS

Meteorology, weather stations, snow cannon.

Order code	HC2A-S3A
Probe type	white
Dimensions	Ø 15 x 108 mm
Range of application	-50...80 °C[1], 0...100 %rh
Accuracy @ 23°C	±0.8 %rh, ±0.1 °C
Power supply	3.3...5 VDC
Current consumption	~5 mA
Long-term stability	<1 %rh / year [2]
Sensor type	ROTRONIC HYGROMER® HM1-SK PT100 1/3 Class B
Filter type	wire mesh 1.4401, 10 um
Response time	<15 s, without filter
Max. wind velocity	3 m/s, without filter
Housing material	Polycarbonate
Weight / IP protection	10 g/IP65

*[1]: The sensor withstands only 60 °Cdp
*[2]: Drift < 1%rh per year with clean air or similar

HC2A-S3A

108 mm

Ø 15 mm
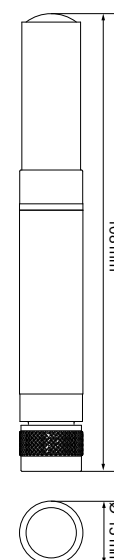
Compatible

- Handheld instruments — HP32
- Transmitters — HF5A, PF4, PF5
- Meteorology transmitters — MP102H, MP402H
- Naturally Ventilated Shields — AC1000
- Actively Ventilated Shields — RS12-T or RS24-T

Delivery package

- Factory adjustment certificate
- Short instruction manual
- Wire-mesh filter

Recommended accessories

- Mounting flange — AC5005
- Filters
- Extension cable 5 m, white — E3-05A
- Calibration device — ER-15
- Humidity standard for calibration 10 %rh — EA10-SCS
- Humidity standard for calibration 35 %rh — EA35-SCS
- Humidity standard for calibration 80 %rh — EA80-SCS

Meteorological probe HC2A-S3/S3H

The HC2A-S3 belongs to the family of HC2A-S probes that form the basis of our product portfolio. It measures humidity and temperature and calculates the dew/frost point. The HC2A-S3H fulfills the highest demands for measuring accuracy.

FEATURES

- Measures relative humidity and temperature, calculates the dew/frost point
- Digital interface (UART) and analog outputs 0...1 V
- Adjusted at 23 °C and 10, 35, 80 %rh (HC2A-S3)
- Optional with SCS adjustment at 23 °C and 10, 20, 30, 40, 50, 60, 70, 80, 90 %rh (HC2A-S3H)

| Order code	HC2A-S3	HC2A-S3H
Probe type	S: black, S3: white	SH: black, S3H: white
Dimensions	Ø 15 x 108 mm	
Range of application	-50...100 °C, 0...100 %rh	
Accuracy	±0.8 %rh, ±0.1 K, at 23 °C (10...90 %rh)	±0.5 %rh, ±0.1 K at 23 °C (10...90 %rh)
Power supply	3.3...5 VDC,	
Current consumption	~5 mA, adjusted at 3.3 VDC	
Long-term stability	<1 %rh / year[1]	
Sensor type	ROTRONIC HYGROMER® HT-1, PT100 1/3 Class B	
Filter type	SPA-PE	
Response time	<15 s, without filter	
Max. wind velocity	3 m/s, without filter 20 m/s, com filtro de polietileno	
Housing material	Policarbonato	
Weight / IP protection	10 g/IP65	
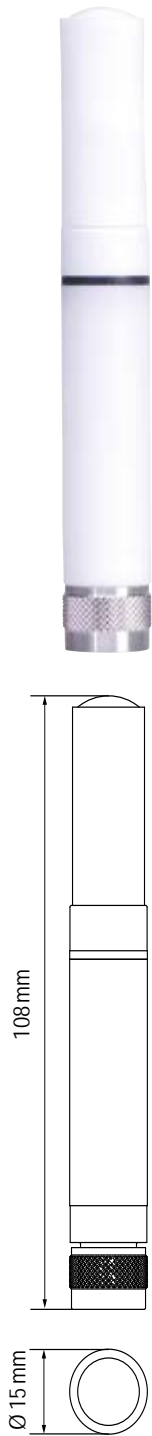
108 mm

Ø 15 mm

Compatible		**Recommended accessories**	
• Meteorology transmitters	MP102H/402H	• Polyethylene filter, white (40 µm)	SPA-PE
• Actively ventilated shield	RS12T/RS24T	• Connection cable with voltage regulator and 2 m cable, white	E3-02XX-ACT/01
• Naturally ventilated shield	AC1000	• Calibration device	ER-15
		• Humidity standard for calibration 10 %rh	EA10-SCS
Delivery package		• Humidity standard for calibration 35 %rh	EA35-SCS
		• Humidity standard for calibration 80 %rh	EA80-SCS
• Factory adjustment or SCS (HC2A-S3H) certificate			
• Polyethylene filter			

Meteorological transmitter HFM53

The HFM53 humidity-temperature transmitter is designed for high-accuracy outdoor applications like meteorological towers, airport weather stations, and building rooftops. Its marine-grade aluminum alloy enclosure withstands harsh environments, while the probe connects via a durable, sunlight-resistant 3-meter cable with a waterproof connector.

FEATURES

- Designed for HC2 and HC2A plug-in humidity-temperature probe
- Psychometric calculations
- Range of application electronics -40...60°C
- Marine-grade coated aluminium alloy housing

Order code	HFM53
Probe type	HygroClip 2, HygroClip 2 Advanced
Accuracy @ 23°C	Probe dependent
Measurement range	Probe dependent
Dimensions	126 x 100 x 64 mm
Cable Lenght	3 m
Cable connections	1 x M16, screw terminals
Range of application	-40...60 °C, 0...100 % (non condensing)
Range of application cable	-10...70°C
Power supply	15...40VDC, 12...28VAC
Circuit type	3- wire
Current consumption	< 50 mA
Housing material	Aluminium die cast
Weight / IP protection	692 g/IP65
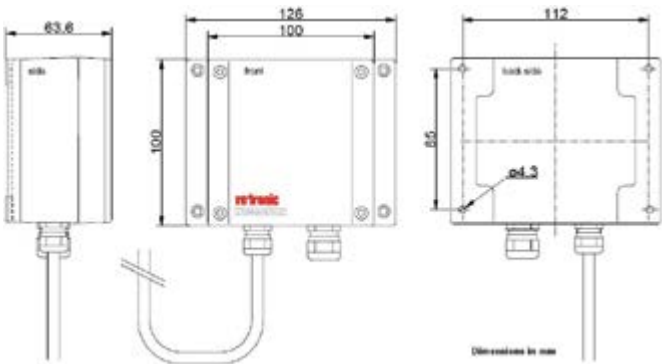
Compatible	**Recommended accessories**	
• All HC2A/HC2 probes (order separately)	• High-End Meteo probe	HC2A-S3A
• HygroSoft software	• Probe extension cable 2 m	E2-02A
	• Service cable	AC3006*
Delivery package	• Weather shield	AC1000
• Product qualification		

Meteorological probe MP100A/MP400A

Standard meteorology probes with fixed sensors (analog technology).

FEATURES

- Very robust, therefore high long-term stability
- Voltage and current outputs for humidity and temperature
- HYGROMER® IN-1 Sensor / PT100 1/3 Class B
- Cable length compensation up to 100 m
- Connection with Tuchel T4/T7 connector or fitted cable with open ends

APPLICATIONS

Weather stations, agriculture, ice warning and snow making systems.

Order code	MP100A	MP400A
Output	Voltage output 0…1 VDC	Current output 0(4)…20 mA
Range of application	-40…85 °C/0…100 %rh	
Power Supply	15…24 VDC	5…24 VDC
Accuracy @ 23°C	10…95 %rh: ±1.5 %rh Remaining range: ±2.5 %rh	
Measurement	Temperature with PT100 - direct or linear output signal	
Filter	Wire mesh filter ~ 20 µm pore size	
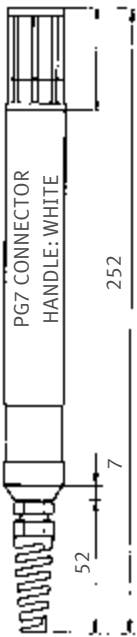
Compatible

- Actively ventilated shield   RS12T/24T
- Naturally ventilated shield   AC1002 / AC1003

Delivery package

- Factory adjustment certificate
- Wire mesh filter
- Instruction manual

Recommended accessories

- Humidity standard for calibration 10 %rh   EA10-SCS
- Humidity standard for calibration 35 %rh   EA35-SCS
- Humidity standard for calibration 80 %rh   EA80-SCS
- Wire mesh filter   SP-W3-25

TECHNICAL INFORMATION

Order code	MP100A (analog)	MP400A (analog)
General		
Parameters	Humidity and temperature	
Housing material	Polyoxymethylene	
IP protection	IP65	
Weight	120 g	
Supply voltage	4.8...30 VDC	10...30 VDC
Current consumption	<4 mA at 4.8 VDC	<50 mA at 10 VDC
Range of application/Storage conditions	-40...85 °C	
Cable length compensation	Up to 99 m	
Humidity measurement		
Sensor	ROTRONIC HYGROMER® IN-1	
Measurement range	0..100 %rh	
Accuracy at 0...30 °C	10...95 %rh: ±1.5 %rh	
Long-term stability	<1 %rh/year	
Response time	<15 s τ63 (63 % of a jump 35...80 %rh) without filter	
Temperature measurement		
Sensor	PT100 1/3 Class B	
Measurement range	-50...100 °C	
Accuracy at 0...30 °C	±0.3 K	
Response time	<15 s τ63	
Analog output		
Current	N/A	0(4)...20 mA
Voltage	0...1 V	N/A
Digital output		
	N/A	

MP102H/402H

For interchangeable probe HC2A-S3/HC2A-S3A

The MP102H and MP402H are meteorology transmitters with an analog output and RS-485 interface. Humidity and temperature are measured with an interchangeable HygroClip2 HC2A-S3/HC2A-S3A probe. Temperature measurement can be enhanced by an external PT100 in various accuracy classes.

FEATURES

- Humidity and temperature measurement with interchangeable HC2A-S3/HC2A-S3A probes (order separately)
- Calculates all psychrometric parameters
- Direct PT100 sensors available as an option
- Voltage or current output signal
- Freely scalable
- High long-term stability
- Service interface (UART) to PCB
- RS-485 interface
- Connection with cable (3...99 m) with open ends or Tuchel T7 connector

APPLICATIONS

Weather stations, snow guns, status monitoring of roads, bridges and airports, snow and ice warning systems, research in very remote areas.

Order code	MP102H	MP402H
Output	Voltage output 0...1/5/10 VDC	Current output 0(4)...20 mA
Range of application	-40..80 °C/0..100 %rh	
Power Supply	5...24 VDC	15...24 VDC
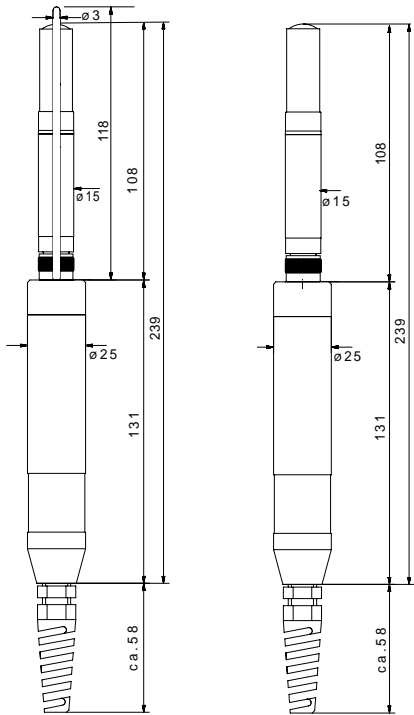
With external PT100   Without external PT100

Compatible

- Meteorology probes   HC2A-S3/HC2A-S3H / HC2A-S3A
- Actively ventilated shield   RS12T/RS24T
- Naturally ventilated shield   AC1003

Delivery package

- Short instruction manual

TECHNICAL INFORMATION

Order code	MP102H	MP402H
General		
Parameters	Humidity and temperature Calculates all psychrometric parameters	
Housing material	Polyoxymethylene	
IP protection	IP65	
Weight	150 g	
Supply voltage	5…24 VDC (0…1 V output) 10…24 VDC (0…5 V output) 20…24 VDC (0…10 V output)	15…24 VDC
Current consumption	<50 mA	
Application temp. housing/electronics	-40…80 °C	
Cable length compensation	Up to 99 m	
Humidity measurement		
Sensor	ROTRONIC HYGROMER® IN-1 (HC2A-S3)/ROTRONIC HYGROMER HM1-SK (HC2A-S3A)	
Measurement range	0…100 %rh (HC2A-S3(A))	
Accuracy at 10…30 °C	±0.8 %rh (HC2A-S3(A))	
Response time	<15 s τ63 (63 % increase 35…80 %rh) without filter	
Temperature measurement		
Sensor	PT100 1/3 Class B (HC2A-S3(A))	
Measurement range	-50…100 °C (HC2A-S3)/-50…80 °C HC2A-S3A	
Accuracy at 10…30 °C	±0.1 K (HC2A-S3(A))	
Response time	<15 s τ63	
Direct PT100 (optional)	PT100 1/3 Class B PT100 1/5 Class B PT100 1/10 Class B	
Analog output		
Current	N/A	0(4)…20 mA
Voltage	0…1 VDC 0…5 VDC 0…10 VDC	N/A
Digital output		
	RS-485 UART	

Actively ventilated shields

The ventilated weather and radiation protection shield RS12T with 12 VDC fan and RS24T with 24 VDC fan were developed in close cooperation with MeteoSwiss. This state-of-the-art device reduces the influences of thermal radiation on humidity and temperature measured values to a minimum.

FEATURES

- Easy-to-install protection shield with integrated fan
- Special white coating (RAL 9010) minimizes solar heating
- Simple probe mounting
- Suitable for various probes

APPLICATIONS

Snow guns, weather stations, agricultural meteorology and building management systems.

Order code	RS12T	RS24T
Range of application	-30...60 °C	
Material	Aluminum, POM, RAL 9010	
Power supply	12 VDC, 2 W	24 VDC
Fan	Papst fan IP54	
Ventilation	3.5 m/s/900 l/min.	
Fan lifetime	At 40 °C ~70,000 h (approx. 8 years)	

Order code	MKRS-HC2	MKRS-MP102-402
Use with	HC2A-S3/S3H	MP102H/402H
Probe connection	E2 connector	Open ends to terminals
Mast diameter	30 - 65 mm	

Further models available on request.
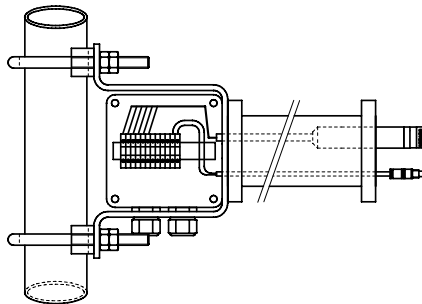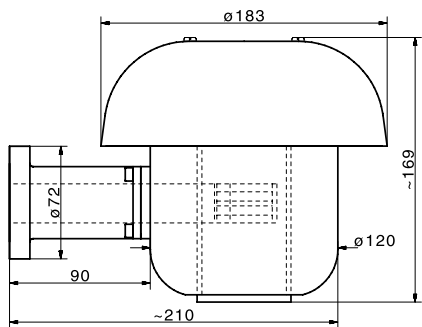
MKRS-HC2
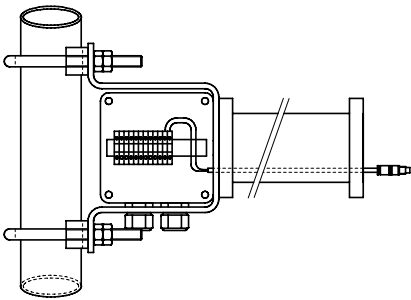
MKRS-MP102-402

Compatible	Delivery package
• Mounting sets	• Installation instructions

Naturally ventilated shields

Naturally ventilated radiation shields are used where the natural ventilation (wind) provides sufficient air flow, e,g, measurement stations in the mountains.

FEATURES

- Easy-to-install protection shield for wall and mast mounting
- Multi-plate system for natural ventilation
- Simple probe mounting
- For probe diameters of 15 or 25 mm
- For mast diameters of 25…50 mm
- Protection against wind speeds up to 70 m/s and horizontal precipitation

APPLICATIONS

Snow guns, weather stations and building management systems.

AC1000 with HC2A-S3/A/SH + E3-05XX

Order code	AC1000	AC1002	AC1003
Mounting probe	Probe screw connection Ø15 mm	Probe screw connection Ø25 mm	
Use with	HC2A-S3/A/S3H + E3-05A	MP100A/400A	MP102H/402H
Number of plates	9	10	14
Mounting shield	Mounting bracket + clamp for mast mounting (Ø 25…50 mm)		
Dimensions	Ø130 x 140 mm	Ø130 x 160 mm	Ø130 x 215 mm

AC1002 with MP100A-T4

AC1003 with MP102H

Delivery package

- Installation instructions
- Mounting hardware

CRP5 series

The differential pressure measurement of the CRP5 clean room panel is based on diaphragm sensor technology. Thanks to its functionality, this device of the highest Swiss quality can be configured perfectly for the application in question. The CRP5 stands out from the crowd with its front panel manufactured with sturdy glass and removable humidity and temperature probe.

FEATURES

- Designed for cleanrooms
- Removable humidity & temperature probe for simple cleaning
- Accuracy: Pressure ±1.0 %FS, Temperature: ±0.2 K / Humidity: ±1.5 %rh
- Digital communication via Ethernet (Modbus TCP, HygroSoft) and RS-485 (Modbus RTU, HygroSoft)
- Analog and digital inputs
- Front-side pressure connections for room pressure measurement or calibration
- High chemical resistance of glass front panel
- Alarms via relay or color TFT display
- Visual operating elements for operation with protective gloves

Power supply

- Low-voltage: 3-wire

Signal output

- 4 independent current and voltage outputs
- Ethernet (Modbus TCP) / RS-485 (Modbus RTU)
- 6 relay switch contacts

Version

- Panel version with HC2-CRP probe at the front
- Panel version with probe connection at the back

Measured parameters

- Differential pressure, temperature and relative humidity
- Analog and digital input signals
- Psychrometric calculations such as enthalpy, dew point, etc.

Measurement ranges

- -25...+25 Pa / -50...+50 Pa / -100...+100 Pa / -250...+250 Pa / -500...+500 Pa
- -5...60 °C (23...140 °F) / 0...100 %rh
- Analog IN: 0...3.3 V or 0...24 mA (freely scalable)
  Digital IN: 0...1.5 V (low level) / 3.5...24 V (high level)

Display

- Color TFT display with backlight

CRP5

APPLICATIONS

Cleanrooms, operating theaters, food industry and applications where very small pressure differences need to be detected.

Order code	CRP53x
Output signals	0…10 V / 4…20 mA (Customer rescaling possible*) 6 x solid-state relays
Pressure ranges	±50 Pa / ±100 Pa / ±250 Pa / ±500 Pa
Configuration of the pressure connections	• Caps without holes with pressure connections at the back • Cap with hole at «+» connection for room pressure measurement • Cap with hole at «−» connection for room pressure measurement
Humidity probe	Removable probe at the front (HC2-CRP) or probe connection at the back (HC2A)
Relays	1 A DC / AC 2 A DC

The magnetic HC2-CRP humidity and temperature probe can also be used independently.

CRP5 with HC2-CRP probe
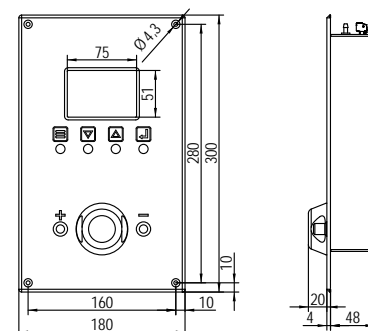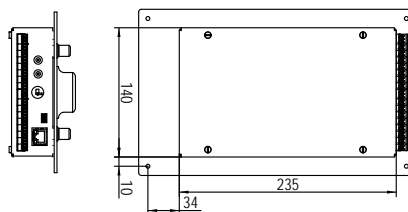
Flush mount probes

The flush mount probe is mounted in the walls of glass cabinets, showcases, gallery walls, laboratories and in cleanrooms for humidity and temperature measurement.

Order code	HC2-IS25
Accuracy	±1.5 %rh, ±0.2 K, at 0…90 %rh and 10…30 °C
Power supply	3.3…5 VDC, adjusted at 3.3 VDC, current: ~4.5 mA
Filter type	Sintered steel
Sensor type	ROTRONIC HYGROMER® WA-1, PT100 1/3 Class B
Response time	<20 s
Housing material	Polycarbonate, stainless steel DIN 1.4301
Weight	50 g
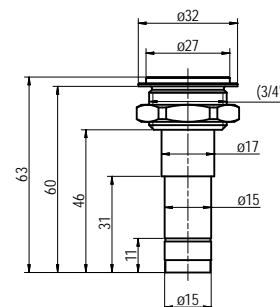
HC2-IS25, steel filter, cover

Compatible

• HygroSoft software

Delivery package

• Factory adjustment certificate
• Short instruction manual

Recommended accessories

• Service cable	AC3006 / AC3009*
• Calibration accessories	
• HC2A-S probes	

*   Requires optional HygroSoft software and service cable.

TECHNICAL INFORMATION

Order code	CRP53x
General	
Parameters	Differential pressure, temperature, relative humidity, absolute pressure, digital and analog inputs
Housing material	Front: glass Back: stainless steel
IP protection	Front: IP65 (also with detached probe) Back: IP20
Mounting position	Wall mounting
Dimensions	180 x 300 x 72 mm
Weight	1,700 g (with humidity probe) 1,550 g (without humidity probe)
Display	Color TFT display
Menu navigation	4 optical keys
Electrical connections	Screw terminals at the back
Power supply	20...48 VDC / 16...35 VAC
Current consumption	<450 mA
Range of application / Storage conditions	-5...60 °C (23...140 °F) / 0...100 %rh
Firmware update	Via HygroSoft software
Service interface	UART
CE / EMC compatibility	EMC Directive 2014/30/EU
Fire protection class	Corresponds to UL94-HB
Differential pressure measurement	
Measurement principle	Diaphragm sensor
Measurement ranges	±50 Pa / ±100 Pa / ±250 Pa / ±500 Pa
Medium	Air and non-aggressive gases
Accuracy at 23 °C ±3 K	±1.0 %FS
Zero drift	Compensated (manual or automatic zero adjustment)
Measurement interval	1 s
Pressure resistance	0.7 bar (70,000 Pa)
Pressure connections	Front: tubing connector Ø 6 mm x 10 mm Back: tubing connector Ø 4 mm x 10 mm
Measurement of temperature and relative humidity	
Probes	HC2-CRP, HC2A
Measurement range	-100...200 °C (probe dependent) / 0...100 %rh
Outputs	
Analog outputs	4, freely configurable
Analog output type	0 / 4...20 mA or 0...1 / 5 / 10 V
Switch output	6 solid-state relays
Switching capacity	<50 VDC at <2A if polarity is considered <35 VAC at <1 A if polarity is not considered
Accuracy analog output	±5 mV (voltage output) ±20 µA (current output)
Permissible load	>10 kΩ (voltage output) <500 Ω (current output)
Digital communication	Ethernet (Modbus TCP, HygroSoft software) / RS-485 (Modbus RTU)

HygroFlex5-EX series

The HygroFlex5-EX series in two-channel transmitters for precise measurement of humidity and temperature in dust and gas potentially explosive atmospheres. The interchangeable probes are cast into a stainless-steel tube and certified for operation in Zone 0/20. The transmitter itself is certified for Zone 1/21. The intelligent design of the circuitry with electrical isolation permits the measuring system to be operated without an intrinsically safe power supply for many applications.

FEATURES

• Measurement of relative humidity and temperature
• Optional output of dew point and other psychrometric calculations
• Safe operation in potentially explosive environments
• Electrically isolated analog outputs
• No intrinsically safe power supply required
• Interchangeable stainless steel probes
• Certified for two temperature classes (T4/T5)

APPLICATIONS

Storerooms, pharmaceutical/biotechnology industry, sugar and flour mills, power stations, oil industry.

HF5-EX duct/wall version

Wall version (W)
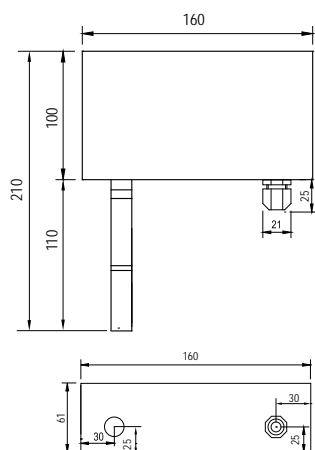
Duct version (D)
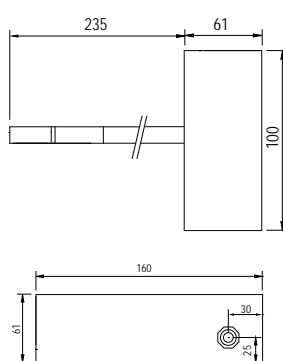
HC2-SM-EX
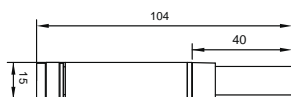
HC2-IMxxx-EX
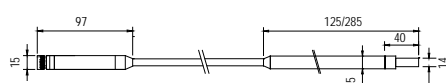
HC2-IExxx-EX
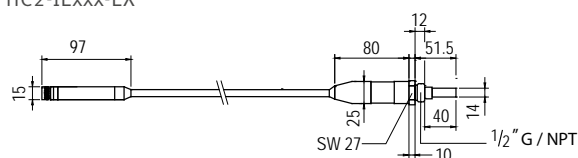
HF5-EX probes

Wall mounting

Non-explosive area

Zone 1/21

Probe
HC2-SM-EX

Duct mounting

Cable gland AC1301-MEX

Probe
HC2-SM-EX

Non-explosive area

Zone 0/20   Zone 1/21
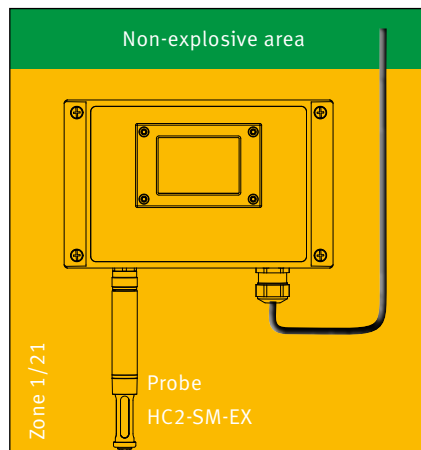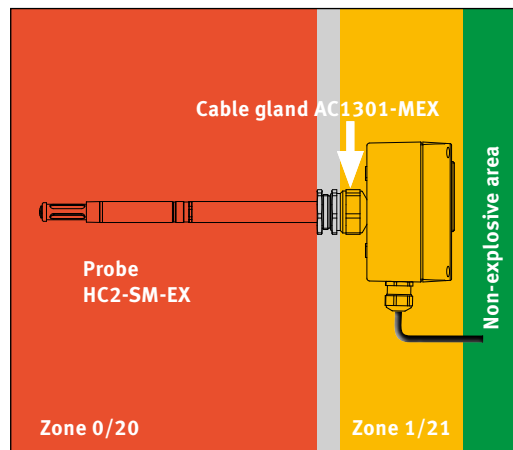
Cable probe for flexible installation

Non-explosive area

Zone 1/21

**Probe
HC2-IMxxx-EX
2/5/10 Metres of cable
130/280 mm probe**

**Cable gland
AC1301-MEX**

Zone 0/20
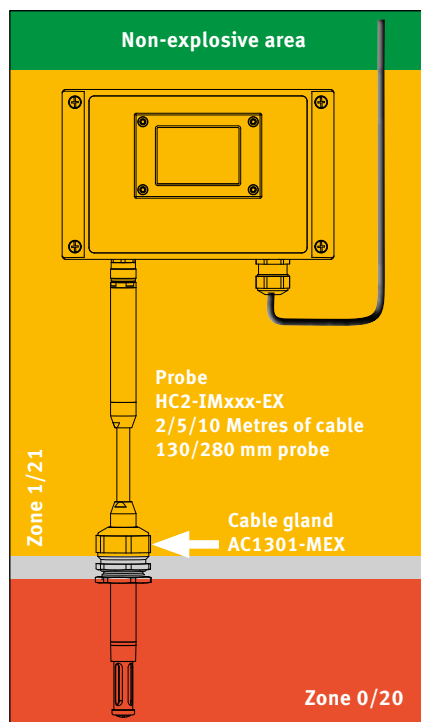
Screw-in cable probe for pressure pipe
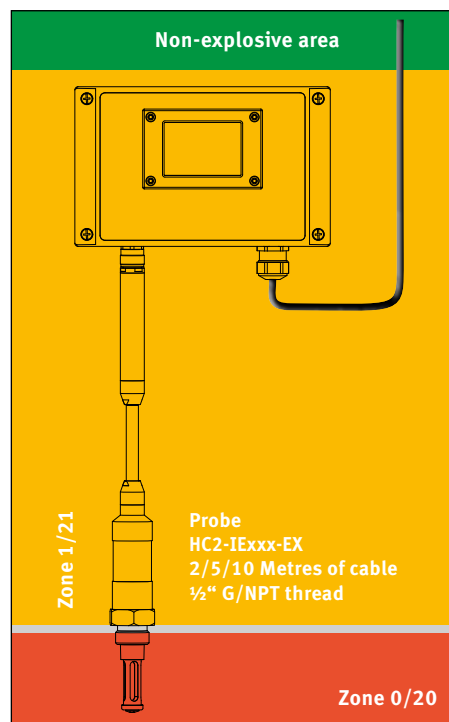
Non-explosive area

Zone 1/21

**Probe
HC2-IExxx-EX
2/5/10 Metres of cable
½" G/NPT thread**

Zone 0/20

Compatible

- HygroSoft software

Delivery package

- Factory adjustment certificate, short instruction manual
- Screws for mounting

Recommended accessories

- Service cable   AC3006*
- Calibration accessories
- Replacement filters
- Cable gland   AC1301-MEX for mounting in ducts

* Requires HygroSoft-Software and service cable.

TECHNICAL INFORMATION

Order code	HF520-EX
General	
Parameters	Humidity and temperature
Calculated parameters	All psychrometric parameters available
Housing material/Protection	Aluminium (DIN EN 1706 EN AC-AlSi 12 (Fe))/IP66
Weight	Wall mounted version: 1030 g Duct mounted version: 1140 g
Start-up time	Standard cold <60 s/warm <30 s
Measurement interval	20...240 s
Display	Optional, LCD without backlight
Electrical connections	Connections: Ex-e terminals (0.2...2.5 mm^2) Cable gland: 16 x 1.5 (Ø cable 4.5...7 mm)
Power supply	10...28 VDC
Current Consumption	2x24 mA start up/2x20 mA operation
Application temperature Housing/electronics	-40...60 °C without display -10...60 °C with display
Service interface	UART internal service interface (only to be used outside the explosive zone)
Conformity	CE, UKCA, ATEX, EMC, RoHS
EX Certification	IECEx, UKEX, QPS
EX identification	⟨Ex⟩ II 2(1) G Ex eb mb [ia Ga] IIC T5 Gb ⟨Ex⟩ II 2(1) D Ex tb [ia Ga] IIIC T80 °C Db
Analog output	
Number	2
Current	4...20 mA, two-wire
Galvanic isolation	Yes
Maximum load	500 Ohms
Accuracy at 23 °C	<20 uA

Order code	HC2-SM-EX/HC2-IM-EX/HC2-IE-EX/HC2-LDP-EX
General	
Parameters	Humidity and temperature
Housing material/Protection	Stainless steel/IP66
Cable lengths	2/5/10 metres
EX identification	⟨Ex⟩ II 1/2 G Ex ia IIC T5 Ga/Gb ⟨Ex⟩ II 1/2 D Ex ia IIIC T80°C Da/Db
Humidity measurement	
Sensor	HC2-SM/IM/IE-EX: ROTRONIC HYGROMER® IN-1
Adjustment	Not via device menu (only outside the explosive zone with Hygrosoft + AC3001)
Measurement range	0...100 %rh
Accuracy at 23 °C	±0.8 %rh
Temperature measurement	
Sensor	HC2-SM/IM/IE-EX: Pt100 Class A
Measurement range	-40...60 °C (T5)/-40...85 °C (T4)
Accuracy at 23 °C	±0.1 °C
Accessories	
Filter	Steel sinter filter, SP-FN15
Cable gland	AC1301-MEX for duct mounting and cable probes (IM)

Software

Humidity and Temperature

Temperature

Differential pressure

CO$_2$

Applications

Rotronic Monitoring System – RMS

Services

Theory

Video Universal RMS

Interested? Then scan the QR code!

2025

RMS – For every application

The Rotronic Monitoring System is a modular system of hardware elements and software. It guarantees maximum flexibility at installation time, and ensures excellent availability of the data during operation. The data loggers record all measurements by Rotronic and third-party sensors and transmit them to the database. It stores all information and makes it available to all users, regardless of whether they access the database by PC, Mac, tablet or smartphone.

Data flow

Measurement Devices

The data loggers read out Rotronic measuring instruments or other input transducers such as cameras or third-party sensors. In this way the RMS monitors various parameters, for a wide application range.

- Rotronic measuring instruments
- Digital measuring instruments from other suppliers (0/1, MODBUS TCP or API devices)
- Analog instruments from other suppliers 0...1/5/10V or 0/4...20mA, both 2
  (2 and 3/4 wire setup)
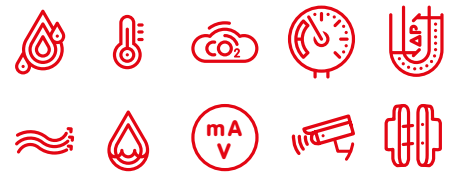
Data logger

The data logger stores all measured data and sends it to the database. Should the connection be lost, the logger stores the data internally to protect data integrity and fills the data gaps when the connection has been restored.

- Automatic internal storage
- Backfilling of data gaps
- Wireless/LAN interface
- Backup battery

Software / Database

The database covers the complete monitoring system. It contains all the measured values of the system and saves all actions. The server or cloud software alerts the relevant users in the case of problems and manages the user-specific access rights.

- SQL database
- Cloud solution can be validated
- On-premis/Server solution can be validated

Output size

The database can be accessed with smartphones, tablets and all PCs with a web browser. Visualization and alerting are therefore possible worldwide and on all common platforms.

- Real-time monitoring
- Supports all common browsers

Network environment

RMS SaaS
Hosted software/database

IT Security
ISO27001 compliant

Mobile network
Smartphone

Service Provider
Phone alarm

Alarming & Reporting

PDF CSV

Data access

Router

Internet

Firewall

Firewall

Firewall

Wireless network*
* via API

A

Production and/or storage site

RMS On-premise
Local software/
Database

RM
RM
RMS

3rd Party software*
* via API and
OPC

Regulations

FDA

GxP

ANNEX 11 COMPLIANCE

Ex

Gamp

Ethernet   Router   LAN   Ethernet

WiFi logger

Mini
Logger

Wall Logger

Wireless
Gateway

Output/input
module

DIN rail
logger

Din rail cabinet

Light /
buzzer

Wall Logger

CRP5   HF5

RMS converter
for Rotronic devices

Particle
counter

Various
digital
Sensors

IP Cameras

RMS converter for
non RMS devices
(Modbus TCP)

WiFi   868/915 MHz   Cellular   LoRa/Sigfox

105

Monitoring software

The RMS Software fulfills all requirements for server-based monitoring. The software is linked to a database that archives all the measured data and actions of the system. The data can be accessed from anywhere in the world via all common platforms as long as an internet connection is available.

Data history

The software allows access to all historical data at any time, thereby ensuring traceability according to FDA and GxP requirements. This data can be put together into a complete PDF report quickly, automatically and easily.

- Chart
- Table
- Layout
- Dashboard
- Events (audit trail)
- Analysis
- Reporting (PDF & CSV)

Alarms

Whether by voice call, email, SMS or switching of an alarm relay: the RMS offers clear alarm functions and records all events in the database:

- Errors
- Warnings
- System messages
- Reminders
- Alarms

Validation at the touch of a button

RMS enables validation with the touch of a button. The system automatically checks data integrity through a self-test by switching all input modules into their various states and verifying the corresponding alarms. The software then generates a comprehensive validation report for the entire system.

- The validation documents comply with GAMP5 requirements
  (see Rotronic Validation Guide on the Rotronic website)

Easy user management

The intelligent user management function allows for the assignment of different rights to each user based on data groups. For instance, a user may have read-only access to data group A while having write access to data group B.

Data analysis

Reports can be generated at any time for data analysis. These reports can be customized and visualized as needed for both the audit trail and the measurement data. All reports can be documented and reviewed by a second system user.

- Charts and tables (PDF or CSV)
- Statistical data (min./max./average/standard deviation)
- MKT: mean kinetic temperature
- Audit trail
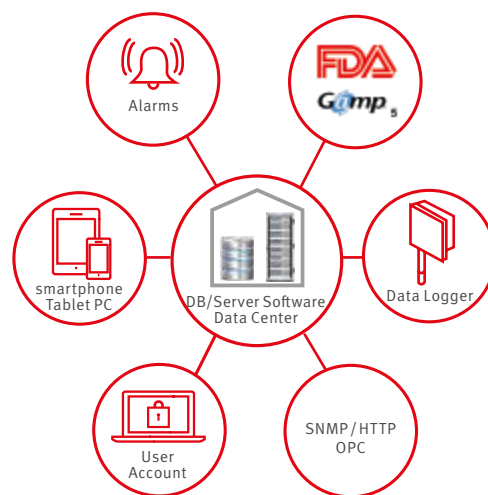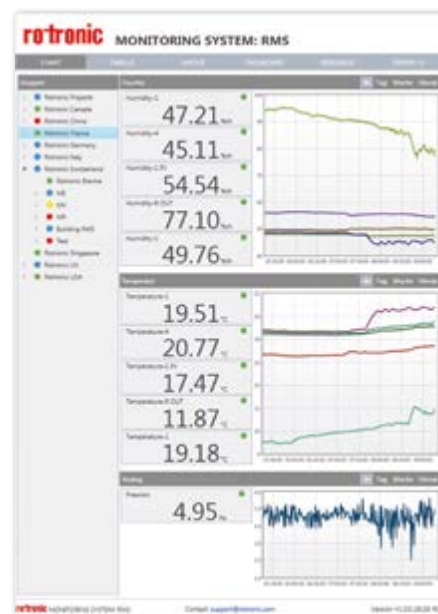
Cp and CpK calculations

- Batch Release and Batch Certification reports
- Area and Device Characterization reports (mapping)

System Maintenance Management

- The RMS system will require regular maintenance to comply to GxP regulations
- Track all maintenance tasks within the RMS audit trail to ensure that the system is always running at its best

Calibration Management

RMS is setup to be a qualified calibration management system:
- Calibration reminder notifications (E-Mail, SMS or Telephone call)
- Calibration history (Pass/Fail overview with user data)
- Calibration certificates in PDF format
- Possibility to adjust native RMS devices (offset corrections)

RMS software products

The RMS software was developed on the basis of FDA and GAMP5 guidelines.

Type	RMS On-premise			RMS Cloud/SaaS (SaaS – Software as a Service)					
Version	Basic	Professional	Enterprise	Free	Ind	Small	Professional	Enterprise	Exclusive
Chart & table view	✓	✓	✓	✓	✓	✓	✓	✓	✓
Layout view		✓	✓				✓	✓	✓
Dashboard view		✓	✓				✓	✓	✓
Data archiving			✓					✓	✓
Audit trail		✓	✓				✓	✓	✓
Calibration/Adjustment	✓	✓	✓			✓	✓	✓	✓
Validation			✓						✓
Alarm scheme		∞	∞				40	200	200
Users (freely extendable)	2	5	10	1	20	2	5	10	10
Devices or measuring points (freely extendable)	10	40	100	2	∞	10	40	100	100
Storage (freely extendable)	∞	∞	∞			12 months	12 months	12 months	∞

RMS-HCD

This digital probe is characterized by its high performance. Very low current consumption, the highest degree of accuracy and measurement results within 50 ms are its main features. This is enabled by the new AirChip4000, which together with the HYGROMER® HT-1 sensor forms a powerful combination.

FEATURES

- Measures relative humidity and temperature
- Outstanding accuracy, repeatability and long-term stability
- Advanced probe housing and construction
- Compatible with RMS data loggers and RMS software
- Low power consumption

Order code	RMS-HCD-S (black) RMS-HCD-S3 (white)	RMS-HCD-IC102 (Industrial probe, 2 m cable)
General specifications		
Measurement range	-40...+85 °C	-100...200 °C [1] (Sensor head)
Accuracy @ 23 °C	±0.8 %rh ±0.1 °C	
Long-term stability	1 %rh/year	
τ63	<15 s without filter, (temperature and humidity)	
Electronics details		
Temperature range	-40...+85 °C	
Relative humidity range	0...100 %rh	
Housing details		
Material	PC, PPS, stainless steel 1.4301	
Housing potting	Yes	
Diameter	Ø15 mm	
Length	108 mm	144mm
IP Rating	IP65 (except sensor area)	
Connector	Standard Rotronic 7-pin connector	
Sensor details		
Temperature sensor	PT 1000, Class 1/3 B	PT 100, Class 1/3 B
Humidity sensor	HYGROMER HT-1	
Battery lifetime	RMS-LOG-868/915/L: @60 s 240 d RMS-LOG-L-D: @60s 18 d	
Cable details		
Length	2 m	
Temperature range	-100...200 °C	
Technical details		
Communication	MODBUS RTU	
Output signal	UART	
Power supply	2.8...5.5 VDC	3.3...5.5 VDC
Current consumption	0.5 mA	< 3 mA
Adjustment	@ 23 °C and 10, 35, 80 %RH	
Accessories		
Hardware	AC3001, RMS-LOG-L, RMS-LOG-868/915, RMS-LOG-L-D	
Software	RMS-CONFIG; Rotronic Monitoring System	

[1] Peak load: 100 h. Maximum permissible continuous load: 190 °C.

RMS-HCD-S

RMS-HCD-IC102

Ø 15 mm

108mm

144 mm

111 mm

Ø 15 mm
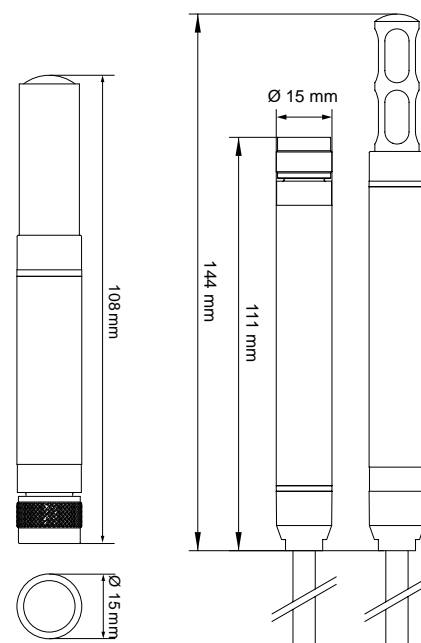
Compatible	**Delivery package**
- RMS-LOG-L/RMS-LOG-868/RMS-LOG-915 - AC3001	- HygroClip DIGITAL - Short instruction manual - Calibration certificate

RMS-TCD-S-001

The RMS-TCD-S-0001 digital probe was designed for all temperature applications where accuracy and interchangeability are crucial. The temperature probe is attached to a 2m cable to ensure flexibility and ease of use during calibration.

FEATURES

- Outstanding accuracy, repeatability and long-term stability
- Advanced probe housing and construction
- Compatible with RMS data loggers and RMS software
- Low power consumption and Digital communication
- Hot swap possibility, ensuring little to no downtime
- Automatic serial number replacement documented within the RMS audit trail

| Order code	RMS-TCD-S-001
General specifications	
Measurement range	-200...200 °C
Accuracy	±0.25 °C @ -50...85 °C
Long term stability	±0.5 °C/year
T63	90 s
Electronics details	
Temperature range	-40...85 °C
Relative humidity range	0...100 %rh
Housing details	
Material	Polycarbonate
Housing potting	Yes
Diameter	Ø15 mm
Length	110 mm
IP Rating	IP65
Connector	Standard Rotronic 7-pin connector
Sensor details	
Temperature sensor	4 wire PT100 Class A (DIN EN 60751)
Material	Stainless steel – austenitic – 1.4571 (316Ti) bar
Sensor potting	Yes
Diameter	Ø3 mm
Length	50 mm
IP Rating	IP68
Battery lifetime	RMS-LOG-868/915/L: @60 s 240 d RMS-LOG-L-D: @60s 18 d
Cable details	
Material	Perfluoroalkoxy alkanes (PFA)
Diameter	Ø2.2 mm
Length	2 m
Temperature range	-190...200ºC
Technical details	
Communication	MODBUS RTU
Output signal	UART
Power supply	3.3...5 V
Current consumption	~3.8 mA
Adjustment option 1	2 point user adjustment possible
Adjustment option 2	A, B and C coefficients
Accessories	
Hardware	AC3001, RMS-LOG-L, RMS-LOG-868/915, RMS-LOG-L-D
Software	RMS-CONFIG; Rotronic Monitoring System
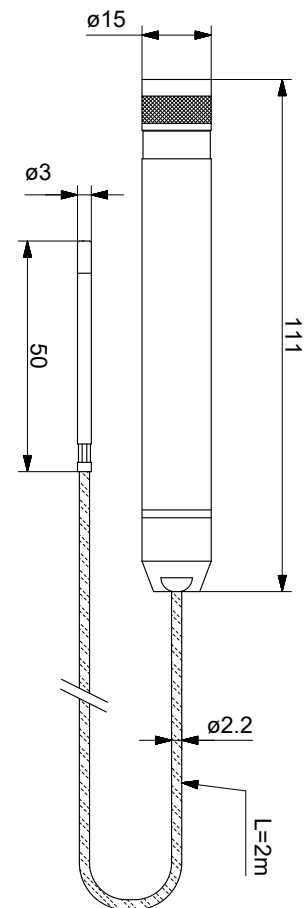
Compatible

- RMS-TD-0001
- AC3001
- RMS-LOG-L/868/915

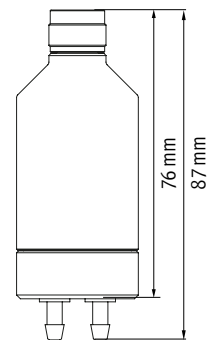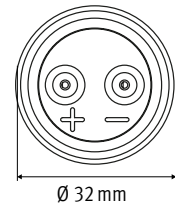**Delivery package**

- RMS-TCD-S-001
- Calibration Certificate

PCD-S-XXX

The Rotronic differential pressure probes are ideal for clean rooms, operating theaters and applications where even minor differences in pressure can have a big effect. Thanks to our two different measurement methods (thermal mass flow measurement and diaphragm measurement), this offers the perfect solution for every requirement. Together with other measurement parameters, these probes can be perfectly integrated in RMS.

FEATURES

- High-precision measurement and long-term stability
- With ambient pressure compensation
- Large overload range

Ø 32 mm

Order code	PCD-S-Mxx	PCD-S-Fxx
General specifications		
Measurement range	-25…+25 Pa/-50…+50 Pa/-100…+100 Pa / -250…+250 Pa/-500…+500 Pa	
Accuracy[1] at 23 °C	±1% FS	±1% FS [2]
Measurement interval	1 s probe/≥10s RMS/1s Modbus	
Zero point compensation [4]	Automatic, 1x per measurement interval	Manual, with external tube; via RMS software [1]
Medium	Air	Air & non-aggressive gases
Ambient pressure compensation	Automatic	Not necessary
Long-term stability [3]	±0.1% FSS/year	±2% FSS/year for ±25Pa probe ±1% FSS/year for ±50Pa probe ±0.5% FSS/year for ±100Pa probe ±0.25% FSS/year for ±250Pa and ±500Pa probes
Burst pressure	5 bar	0.7 bar
Leak rate	<180 µl/min.	0 µl/min.
Measurement interval	1 s probe/≥10s RMS/1s Modbus	
τ63	<1 s	
Electronics details		
Temperature range	-20…+80°C (0…+70°C temp.-comp.)	
Relative humidity range	0…95 %rh non-condensing	
Housing details		
Material	Polycarbonate (housing) Stainless steel DIN 1.4305 (nuts, connectors)	
Housing potting	Yes	
Diameter	Ø32 mm	
Length	87 mm	
Pressure connections	Tubing connector internal Ø 4 mm x 10 mm	
IP Rating	IP65	
Connector	Standard Rotronic 7-pin connector	
Fire protection class	Corresponds to UL94-HB	
Weight	60 g	
Sensor details		
Sensor type	Flow	Membrane
Battery lifetime	LOG-868/915 350d @ 60s interval LOG-L 395d @ 60s interval	LOG-868/915 650d @ 60s interval LOG-L 840d @ 60s interval
Technical details		
Communication	MODBUS RTU	
Output signal	UART	
Power supply	3.3…5.5 VDC	
Current consumption	30 mA (avg.)	12 mA (avg.)
Adjustment	Factory adjustment/calibration: 5 points Customer adjustment: max. 9 points	
Accessories		
Hardware	AC3001, RMS-LOG-L, RMS-LOG-868/915, RMS-LOG-L-D	
Software	RMS-CONFIG; Rotronic Monitoring System	

76 mm
87 mm

[1] Please see the device manual for detailed considerations.

[2] For maximum accuracy, Rotronic recommends strongly to perform a zero point compensation after the installation and initial operation and to repeat it annually. For aggressive environments/gas media, a more frequent zero point compensation is advised. Please see the device manual for detailed considerations.

[3] Highly reducible by a zero point compensation of the RMS-PCD-S-Mxx (membrane sensor).

[4] A zero point adjustment is recommended for every installation or position change.

Compatible

- RMS-LOG   Wireless ≥V1.5/LAN data loggers ≥V1.4

Delivery package

- Differential pressure probe
- Calibration certificate
- Short instruction manual
- Wall-mounted holder
- Short pressure tube internal Ø 4mm x 10cm (PCD-S-Mxx only)

CCA-S-20X-SET

The CCA-S-20X is an analog probe with NDIR technology for measurement of carbon dioxide (CO_2). Developed with a pyroelectric infrared detector with dual temperature compensation and an integrated semiconductor temperature sensor to maximize accuracy and minimize drift. The signal is converted to 4...20 mA by the converter with power supply (CCA-S-20X-SET).

FEATURES
- Suitable for incubators: 37 °C, 95 %rF und 5 %CO_2
- Interchangeable probes
- ±0.1 °C accuracy in measurement range

Order code	CCA-S-20X-SET
General specifications	
Measurement principle	Infrared (NDIR)
Measured parameter	Carbon dioxide concentration (%)
Accuracy	±10 % of measured value
Medium	Air & non-aggressive gases
Long-term stability	±0.24 %CO_2/year
Temperature dependence	±10 % of measured value
Pressure dependence	±0.15 % of measured value/hPa
Measurement range	0...20 %CO_2
Application range	-20...50 °C/0...95 %rh, 700...1200 hPa
Storage conditions	-20...30 °C/0...95 %rh
Startup time	60 s
Power supply	CCA-S-20X: 3...5 VDC/80 mA CCA-S-20X-Set: 24 VDC/150 mA
AC adapter requirements	100...240 VAC/50...60 Hz/0.3 A
Output signal	4...20 mA (CCA-S-20X-SET) 0.4...2.0 V (CCA-S-20X only sensor)
Standards	
Conformity	FDA CFR21 Part 11/GAMP 5
Housing/Mechanical parts	
Enclosure material	Polycarbonate (housing) Stainless steel DIN 1.4305 (nut)
Fire protection class	Corresponds to UL94-HB
Dimensions	Sensor: 32 mm x 87 mm Converter box: 100 mm x 77 mm x 40 mm (LxWxH)
IP protection class	IP40
Weight	55 g sensor 200 g converter box

Ø 32 mm

76 mm
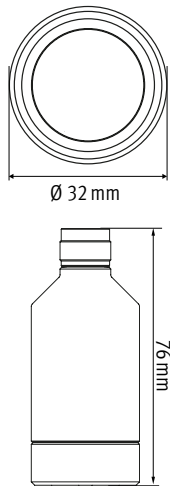
Fig.: CCA-S-20X-SET

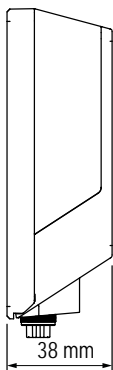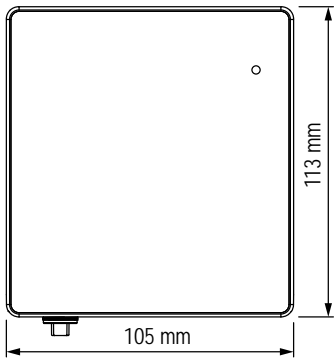| **Compatible**		**Delivery package**
• Analog Input	RMS-MADC-868/915-A	• CCA-S-20X
	RMS-ADC-L-R	• Power supply
• CO_2 Sensor	CCA-S-20X	• Converter box
• RMS On-Premise	RMS-WEB	• E2-01XX
• RMS SaaS solutions	RMS-CLD	

RMS Wall Data Logger

The data logger is the flexible component between the probe and the database in the Rotronic Monitoring System. It stores 44,000 pairs of measured values and transmits them to the RMS database via LAN or wireless link. It guarantees absolute data protection, even if power supply and communications should break down temporarily.

FEATURES

- 44'000 data point memory, including time stamp
  24VDC, PoE and backup batteries
  LAN or wireless (ISM868MHZ or ISM915MHz)
- Fail-safe, thanks to internal battery
- Wireless or LAN interface

Order code	RMS-LOG-L	RMS-LOG-868	RMS-LOG-915
General specifications			
Measured parameters	Humidity & temperature, CO_2, differential pressure, LDP		
Range of application	-40..70 °C/0..100 %rh		
Storage conditions	-40..30 °C/0..95 %rh		
Maximum altitude	2000 m ASL		
Power supply	24 VDC ±10 %/ <100 mA Battery: RMS-BAT (2xAA, LiSocl2) PoE: 802.3af-2003, Class 1		
AC adapter requirements	24 VDC ±10 %/4 W nominal/<15 W power-limited		
Battery life	3 years (at 23 °C, measurement interval 1 min., HCD-S probe)		
Device data			
Measurement interval	10 s to 15 min.		
Startup time	< 10 s		
Interfaces	Ethernet	ISM 868 MHz	ISM 915 MHz
Indoor wireless range	-	20..50 meters	15..25 meters
Protocols	HTTP/MODBUS TCP		
Ethernet cable requirement	Min. Cat. 5, SFTP, max. 30 m		
Standards			
Conformity	FDA CFR21 Part 11/GAMP 5		
Housing/Mechanics			
Housing material	ABS		
Fire protection class	UL94 −V2		
Dimensions	105 x 113 x 38 mm		
IP protection class	IP65		
Weight	200 g		

113 mm

105 mm

38 mm

Compatible

- HygroClip DIGITAL   HCD/PCD/CCD
- RMS Gateway   RMS-GW-868/915
- RMS On-premises software   RMS-WEB
- RMS SaaS solutions   RMS-CLD

Delivery package

- Data logger
- 2 batteries
- Wall bracket
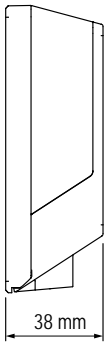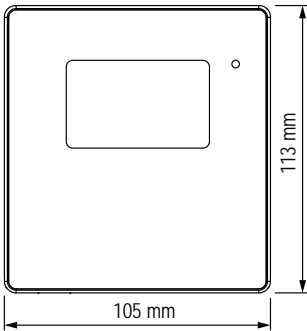- Short instruction manual
- 2 screws & 2 plugs

RMS Data Logger with Display

The RMS-LOG-L-D stores up to 44,000 pairs of measured values and transmits them to the RMS database via LAN link. Thanks to its autonomous operation, the logger can display current readings as well as visual and audible alarms even if the power supply and communication should fail temporarily.

FEATURES

- 44'000 data point memory, including time stamp
  24VDC, PoE and backup batteries
  Colour display and audible alarm
- Visual and audible alarms
- Autonomous operation on failure
- Redundant power supply

Order code	RMS-LOG-L-D
General specifications	
Measurement interval	10 s to 300 s
Startup time	< 10 s
Software compatibility	≥ V1.3.0, from V2.1 all functions
Application range	-20…70 °C, non-condensing
Storage conditions	-20…30 °C, non-condensing
Maximum altitude	2000 m ASL
Power supply	24 VDC ±10%/Battery: RMS-BAT (2xAA, LiSocl2)
Current consumption max.	50 mA
AC adapter requirements	24 VDC ±10%, 4 W minimum, > 5 W Limited Power Source
PoE	802.3af-2003, Class 1
Device data	
Ethernet cable requirement	Min. Cat 5, SFTP, max. 30 m
Interface	Ethernet
Protocols	HTTP/Modbus TCP
Number of measuring points	2
Battery life (@60 s and 600 s interval)	HCD-S/HCD-IC: 7 d
	CCD-S-XXX: 2.4 d
	PCD-S-XXX: 15 d
Standards	
Conformity	FDA CFR21 Part 11/GAMP 5
Soldering material	Lead free/RoHS conformity
Housing/Mechanics	
Housing material	PC. ABS
Dimensions	105 x 113 x 38 mm
IP protection class	IP65
Fire protection class	UL94-V2
Weight	240 g

113 mm

105 mm

38 mm

Compatible

- HygroClip DIGITAL   HCD/PCD/CCD
- RMS On-premises software   RMS-WEB
- RMS SaaS solutions   RMS-CLD
- Autonomous operation and audible alarms from V2.1

Delivery package

- Data logger, with clamps
- Short instruction manual
- 2 batteries
- Certificate
- Velcro strips

RMS-LOG-T30-L/868/915

The RMS-LOG-T30 is a data logger with two integrated analog-to-digital converters, to which two PT100 sensors can be connected for high-precision temperature measurement. The measuring accuracy of the data logger with PT100 can be improved by a 1- or 2-point adjustment. The data logger stores 44,000 pairs of measured values and sends them to the RMS database via LAN or wireless interface.

FEATURES

- Saving of up to 44,000 data points
- 2 x PT100 sensor connections
- 2-, 3- or 4-wire connection
- ±0.1 °C accuracy in measurement range

Order code	T30-L	T30-868	T30-915
General specifications			
Measured parameters	2-, 3- and 4-wire RTD measurement		
Number of measuring points	2 x PT100 probes		
Accuracy[1] (@23 °C, without PT100)	±0.1 °C (-100 °C to 200 °C)		
	±0.2 °C (-200 °C to 850 °C)		
Application range	-40...70 °C 0...100 %rh		
Storage conditions	-20...30 °C 0...95 %rh		
Power	24 VDC ±10 %/<100 mA/PoE: 802.3 af-2003, Class 1		
AC adapter requirements	24 VDC ±10 %/>4 W/power-limited		
Device data			
Measurement interval	10 s to 15 min.		
Battery life (23 °C, 60 s interval)	3 years	2.4 years	2.4 years
Interfaces	Ethernet	ISM 868 MHz	ISM 915 MHz
Indoor wireless range	-	20...50 meters	15...25 meters
Compatibility with RMS-GW-xxx Firmware	-	V2.1	V2.1
Compatibility with Software	≥ V1.3.0		
Protocols	HTTP/MODBUS TCP (T30-L)		
Ethernet cable requirement	Min. Cat 5, SFTP, max. 30 m		
Standards			
Conformity	FDA CFR21 Part 11/GAMP 5		
Housing/Mechanics			
Housing material	PC, ABS		
Fire protection class	UL94-V2		
Dimensions	105 x 113 x 38 mm		
IP protection class	IP65		
Weight	240 g		

[1] In order to improve the measurement accuracy when using the data logger and the PT100, it is possible to carry out a 1-point or 2-point adjustment. To calculate the total accuracy of the RMS-LOG-T30, all variables must be added.

113 mm

105 mm

38 mm
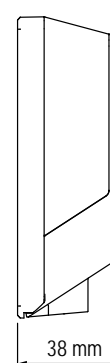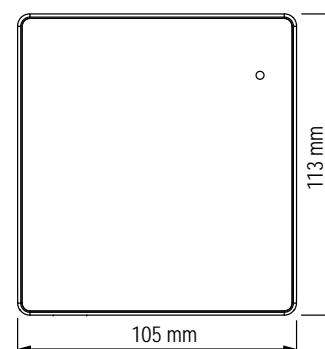
Compatible		**Delivery package**
• RMS Gateway	RMS-GW	• Data logger
• RMS On-premises software	RMS-WEB	• 2 batteries
• RMS SaaS solutions	RMS-CLD	• Wall bracket
• PT100 probe	T30-000X	• Short instruction manual
		• 2 cable glands M12 x 1.5

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RMS Mini Logger

The wireless mini data logger is the low-cost data logger in the Rotronic Monitoring System. Its small housing and wireless interface make it a really flexible data logger. The mini logger is available in various sensor variants: internal temperature sensor (NTC), external temperature sensor (NTC), light, voltage measurement, current measurement or digital switch contact. With this versatility, it can monitor refrigerators and incubators, as well as door contacts and OEM analog devices.

FEATURES

- Stores 10,000 measured values
- Fail-safe, thanks to internal battery
- Battery life up to 2.5 years
- Depending on the version, it measures temperature, current, voltage or light, or monitors a digital switch input
- ISM band 868 MHz/915 MHz
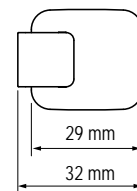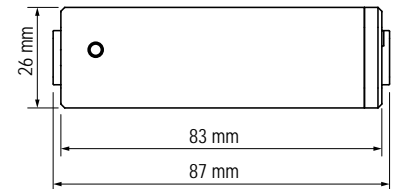
Order code	MS-MLOG-XXX-XXX RMS-MDI-XXX RMS-MADC-XXX-X	RMS-MLOG-BT-XXX RMS-MLOG-B-XXX
General specifications		
Memory size	10,000 measured values	13,000 data points
Range of application (electronics)	-30...85 °C/0...100 %rh	-40...85 °C/0...100 %rh
Battery life @23°C, 1 minute interval	2.2 years	2.5 years
IP protection class	IP65	IP30 (B), IP65 (BT)
Working range pressure	300...1100 hPa	
Storage conditions	-30...30 °C/0...95 %rh	
Battery	1x RMS-BAT	
Measurement interval	10 s to 15 min (software dependant)	
Wireless specifications		
Wireless interface	ISM 868 MHz	ISM 915 MHz
Indoor wireless range	20...50 meters	15...25 meters
Standards		
Conformity	FDA 21 CFR Part 11 / GAMP5	
Housing/Mechanics		
Housing material	ABS	
Dimensions	83 x 29 x 29 mm	
Fire protection class	UL94-V2	

Measured parameters

RMS-MLOG-B-XXX	Temperature & humidity
RMS-MLOG-BT-XXX	Temperature & barometric pressure
RMS-MLOG-T--XXX	Temperature
RMS-MLOG-T10-XXX	Temperature with external probe (NTC)
RMS-MADC-XXX-V (0...10 V)	Power
RMS-MADC-XXX-A (0...20 mA)	Power input
RMS-MDI-XXX	Digital input
RMS-MLOG-LGT-XXX	Illumination

Compatible

- Temperature probe   T10-xxxxx
- RMS Gateway   RMS-GW-868
- RMS On-premise   RMS-WEB
- RMS SaaS solutions   RMS-CLD

Delivery package

- Data logger
- Battery
- Wall bracket
- Short instruction manual
- 2 screws & 2 plugs

115

RMS-LOG-W-(T10)-D

The WiFi Data Logger with his portable design, large display, and WiFi interface make it an ideal solution for various applications across different environments It enables precise monitoring of refrigerators, incubators, cleanrooms, food and pharmaceutical manufacturing, warehouses, and HVAC systems. The WiFi Logger ensures secure data storage and transmission, performing measurements at fixed intervals and compensating for data gaps using its internal memory and external power supply.

RMS-LOG-W-T10-D

RMS-LOG-W-D

FEATURES

- Save up to 44'000 pairs of measured values
- Fail-safe, thanks to internal battery
- WiFi Standard IEEE 802.11b/g/n
- Compatible with RMS-App and RMS Cloud & on-premis
- Conforms to FDA CFR 21 Part 11/GAMP5

Order code	RMS-LOG-W-D	RMS-LOG-W-T10-D
General specifications		
Measured parameters	Humidity & Temperature, CO_2, Diffrential Pressure	Temperature
Memory Size	44'000 measured values	
Accuracy	Probe dependent	Probe dependent
Application range	-30...85 °C 0...100 %rh	
Storage conditions	-30...80 °C 0...100 %rh	
Power Supply	4.8...6.5 V USB-C or Battery (4xAA 1.5 V – Energizer L91 AA Ultimate Lithium)	
Device data		
Measurement interval	10 s to 15 min.	
Interfaces	WiFi (2.4 GHz)	
Compatibility	RMS App with RMS-Software	
Protocols	HTTPS	
Standards		
Conformity	FDA CFR21 Part 11/GAMP 5	
WiFi Standard	IEEE 802.11b/g/n	
Security	WPA-PSK and WPA2-PSK	
Housing/Mechanics		
Housing material	ABS/PC	
Fire protection class	Housing UL94	
Dimensions	74 x 120 x 35 mm	
IP protection class	IP65	
Weight	174 g with wall holder, without batteries	

73 mm

121 mm   114 mm

22.52 °C

OK

rotronic

15 mm   Ø 5mm

114 mm

73 mm

35 mm   30 mm

Compatible

- Temperature Probe   T10-XXXXX
- HygroClip Digital   HCD/PCD/TCD/CCD
- RMS-App
- RMS On-premises software   RMS-WEB RMS-CLD
- RMS SaaS solutions   RMS-CLD
- Power Supply and USB Cable PSU-USB-C
- Thermal Buffer   RMS-TD-0002

Delivery package

- Data logger
- Wall bracket
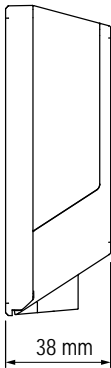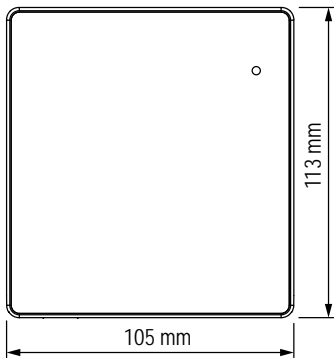- Quick Setup Guide
- Screws & dowel set

RMS Gateway

The gateway is the interface between the wireless data logger and the server software. It can manage up to 60 data loggers simultaneously, collecting all wireless-logger measurement data, and passing them on to the server software. When several gateways are used in the same network, they are configured redundantly. If one gateway should fail, the measurement values are automatically sent to the server software via another gateway.

FEATURES
- Connects 60 wireless data loggers simultaneously
- 5 wireless channels for parallel and redundant operation

Order code	RMS-GW-868	RMS-GW-915
General specifications		
Range of application	-40..70 °C, 0..100 %rh	
Storage conditions	-40..30 °C, 0..95 %rh	
Maximum altitude	2000 m ASL	
Power supply	24 VDC ±10 %/<100 mA/PoE: 802.3 af-2003, Class 1	
AC adapter requirements	24 VDC ±10 %/4 W nominal/<15 W power-limited	
Device data		
Measurement interval	10 s to 15 min.	
Startup time	< 10 s	
Interfaces	Ethernet & ISM868 MHz	Ethernet & ISM 915 MHz
Indoor wireless range	20..50 meters	15..25 meters
Protocols	HTTP	
Ethernet cable requirement	Min. Cat. 5, SFTP, max. 30 m	
Standards		
Conformity	FDA CFR21 Part 11/GAMP 5	
Housing/Mechanics		
Housing material	ABS	
Fire protection class	UL94 −V2	
Dimensions	105 x 113 x 38 mm	
IP protection class	IP65	
Weight	200 g	

113 mm

105 mm

38 mm

Compatible		**Delivery package**
• RMS Data Logger	RMS-LOG	• Gateway
• RMS Mini Logger	RMS-MLOG	• Wall bracket
• RMS Display	RMS-D	• Short instruction manual
• RMS On-premises software	RMS-WEB	• 2 screws & 2 plugs
• RMS SaaS solutions	RMS-CLD	

RMS Display

The LAN display is fully configurable and can be positioned optimally as a remote display, wherever it best suits the viewer. It can show measured values, statuses, and alarms of RMS products. The display can show up to four measured values, with two values shown at a time. If more than two values are selected, the display cycles through the selected values every 5 seconds.

FEATURES

- Shows up to 4 measured values
- Automatic adjustment of backlight on alarm

General specifications	
Device type	RMS Display
Display of measuring points	Up to 4 measuring points
Range of application	-20...70 °C/0...100 %rh
Storage conditions	-20...30 °C/0...95 %rh
Power supply	24 VDC ±10 %/<100 mA PoE: 802.3 af-2003, Class 1
AC adapter requirements	24 VDC ±10 %/>4 W/power-limited
Measurement interval	10 s
Interface	Ethernet
Protocols	HTTP
Standards	
Conformity	FDA CFR21 Part 11/GAMP5
Housing/Mechanical parts	
Housing material	PC, ABS
Fire protection class	UL94-V2
Dimensions	105 x 113 x 38 mm
Display diagonal	57,4 mm
IP protection class	IP65
Weight	206 g
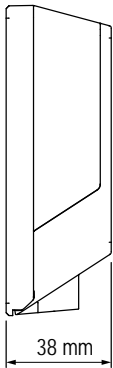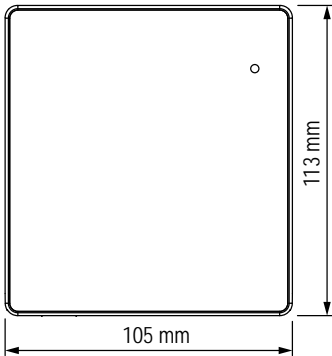
Compatible		Delivery package
• All measuring points		• Display
• RMS Gateway	RMS-GW-868	• Wall bracket
• RMS On-premise	RMS-WEB	• Short instruction manual
• RMS SaaS solutions	RMS-CLD	• 2 screws & 2 plugs

RMS-ADC-L-R

The RMS-ADC-L-R is a data logger with two integrated analog-to-digital converters to which two sensors can be connected for high-precision analog measurement. The data logger stores 44,000 pairs of measured values and sends them to the RMS database via LAN.

FEATURES

- 2 analog sensor inputs
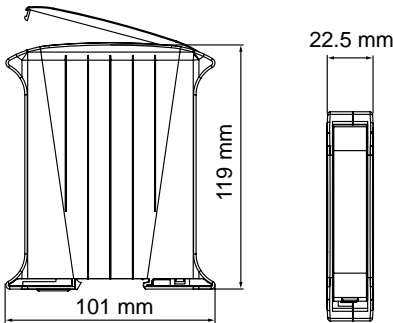- Various scaling: 0...1/5/10 V and 0/4...20 mA
- ±0.03 % f.s. measurement range accuracy

Order code	RMS-ADC-L-R
General specifications	
Measurement interval	10 s to 15 min
Startup time	< 10 s
Software compatibility	≥ V1.3.0
Protocols	HTTP/MODBUS TCP
Ethernet cable requirement	Min. Cat 5, SFTP, max. 30 m
Application range	-40...70 °C, non-condensing
Storage conditions	-20...30 °C, non-condensing
Sensor power supply (Vex)	24 V/80 mA max.
Current consumption	< 160 mA
AC adapter requirements	24 VDC ±10 %, 4 W minimum, > 5 W power-limited
PoE	802.3af-2003, Class 1
Standards	
Conformity	FDA CFR21 Part 11/GAMP 5
Soldering material	Lead free/RoHS conformity
Device data	
Accuracy	± 0.03 % full-scale
Temperature accuracy	± 0.02 % full-scale/°C
Measuring resistance/Load	25 kΩ at voltage input 250 Ω at current input
Number of measuring points	1 or 2 analog inputs
Measurement ranges	0...1 V, 0...5 V, 0...10 V, 0...20 mA and 4...20 mA
Storage capacity	44,000 data points
Sensor quality	• Detection of sensor interruption (open loop) • Detection of overload • Detection of underload at 4...20 mA
Housing/Mechanics	
Housing material	PC. ABS
Dimensions	110 x 119 x 22.5 mm
IP protection class	IP20
Fire protection class	UL94-V0
Weight	125 g

22.5 mm

119 mm

101 mm

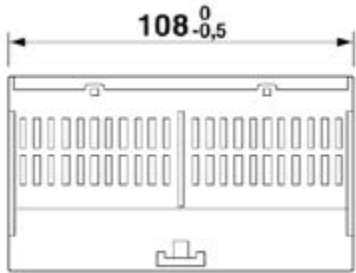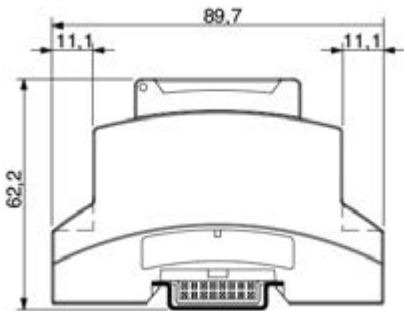| **Compatible**		**Delivery package**
• RMS On-premises software ≥ V1.3.0	RMS-WEB	• Data logger, with clamps
• RMS SaaS solutions ≥ V1.3.0	RMS-CLD	• Short instruction manual
		• Certificate

RMS-DI-L-R

The digital input module stores all measured data on an event basis and sends it to the database via Ethernet. The minimum pulse time is 100 ms. Should the connection be lost, the module stores the data intermediately to protect data integrity and fills up the data gaps when the connection has been restored. The device has a battery so that logging of measured data is also ensured in the event of a failure in the external power supply.

FEATURES
- Two input channels
- Data logging of up to 75,000 measured values

Order code	RMS-DI-L-R
General specifications	
Number of inputs	2 independent digital inputs
Range of application	-40..70 °C/0..100 %rh non-condensing
Storage conditions	-40..30 °C/0..95 %rh
Maximum altitude	2000 m ASL
Power supply	24 VDC ±10 %/<100 mA PoE: 802.3 af-2003, Class 1
AC adapter requirements	24 VDC ±10 %/4 W nominal /<15 W power-limited
Battery type	RMS-BAT
Battery life	3 years at 23 °C
Device data	
Input frequency	Max. 0.833 Hz or 1.2 s
Pulse recognition	>100 ms (periodically > 1.2 s)
Input circuit	Logic level: 0 V/5-24 V
	Trigger threshold: ~3.77 V
	Current consumption: <1 mA
Reed circuit	Max. load at input 100 kΩ
Max. cable length at input	<3 m
Measurement interval	Event-based & interval (10 s to 15 min.)
Storage capacity	75,000 data points
Interface	Ethernet
Protocols	HTTP
Standards	
Conformity	FDA CFR21 Part 11/GAMP 5
Housing/Mechanical parts	
Housing material	Polycarbonate (PC)
Fire protection class	UL94-V0
Dimensions	89.7 x 62.2 x 108 mm
IP protection class	IP20
Weight	206 g

Compatible

- RMS-Config
- RMS On-premise   RMS-WEB
- RMS SaaS solutions   RMS-CLD

Delivery package

- Digital module
- 2 batteries
- Wall bracket (wall-mounted housing)
- Short instruction manual
- 2 screws & 2 plugs

RMS-DO-L-R

The digital output module is used to display information, trigger alarms, and control events. Relays can be monitored or configured via Modbus TCP or the RMS software. Conditions can be defined within the RMS software to activate outputs accordingly.

FEATURES

• Two output channels

Order code	RMS-DO-L-R
General specifications	
Number of outputs	2, polarity-independent
Range of application	-40..70 °C/0..100 %rh non-condensing
Storage conditions	-40..30 °C/0..95 %rh
Maximum altitude	2000 m ASL
Power supply	24 VDC ±10 %/<100 mA PoE: 802.3 af-2003, Class 1
AC adapter requirements	24 VDC ±10 %/4 W nominal /<15 W power-limited
Device data	
Interface	Digital signal/galvanically isolated
Relay switching capacity	50 VAC (peak) 1 A/50 VDC/1 A, polarity-independent
Voltage output (VEX)	24 VDC (Note: The maximum current available depends on the external power supply connected)
Max. cable length at input	<3 m
Measurement interval	10 s
Interface	Ethernet
Protocols	HTTP
Standards	
Conformity	FDA CFR21 Part 11/GAMP 5
Housing/Mechanical parts	
Housing material	Polycarbonate (PC)
Fire protection class	UL94-V0
Dimensions	89.7 x 62.2 x 108 mm
IP protection class	IP20
Weight	155 g

Compatible

• RMS-Config
• RMS On-premise   RMS-WEB
• RMS SaaS solutions   RMS-CLD

Delivery package

• Digital module
• Wall bracket (wall-mounted housing)
• Short instruction manual
• 2 screws & 2 plugs

RMS Converter
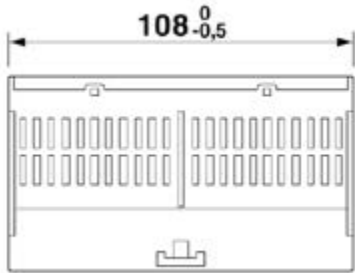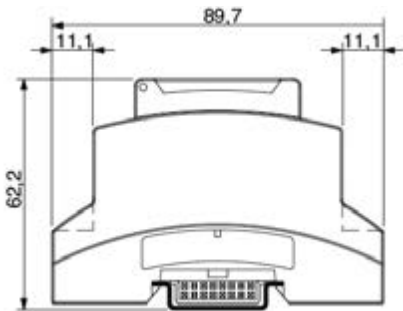
The RMS Converter facilitates the seamless integration of existing devices and networks into the RMS. Acting as an interface, it collects data from digital devices and transmits it to the RMS server software or MS SQL database. Additionally, third-party digital devices can be integrated if they use the MODBUS TCP communication protocol; however, this may require assistance from Rotronic R&D. Wherever feasible, Rotronic recommends gradually replacing legacy networks with RMS devices for long-term optimization.

FEATURES

- Integrates digital devices seamlessly into RMS
- Integrates Rotronic digital devices into RMS
- No loss of accuracy due to A/D converters, show up to 5 decimal values

Order code	RMS Converter
General specifications	
Number of measuring points	Integration of up to 100
Range of application	-0 .. 50 °C/0 .. 95 %rh
Storage conditions	-0 .. 50 °C/0 .. 95 %rh
Electrical Supply	5 VDC (universal mains adapter included)
Measurement interval	10 s to 15 min
Interface	Ethernet
Protocols	Modbus TCP
	RoASCII
	HTTP
	Customer-specific enhancements
Supported webcams	D-Link DCS-2121
Standards	
Conformity	FDA CFR21 Part 11/GAMP 5
Housing/Mechanical parts	
Dimensions	94 x 78 x 30 mm
IP protection class	IP20
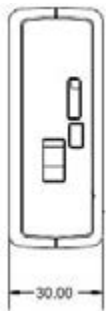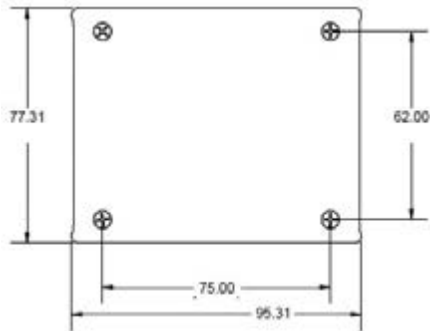
Compatible

• Transmitter	PF4/5 (Ethernet)
• RMS On-Premise	RMS-WEB
• RMS SaaS solutions	RMS-CLD
• Analogue to digital converter	RMS-8ADC-L-R-A/V
• RTD to digital converter	RMS-4RTD-L-R
• Particle counter	All with Modbus TCP interface

Delivery package

- Converter
- Short instruction manual
- AC adapter
- Ethernet cable
- USB cable

AD-0001

The AD-0001 will warn users both visually and aurally of any alarms that are setup within the Rotronic monitoring system. Alarms can be setup via the alarm scheme as well as via the script function (IF/OR/AMD/THEN) and then triggered from the actions settings.

FEATURES

• Direct visual or sound alarming
• Alarming via thresholds or scripts (IF/OR/AND/THEN)
• Permanent or blinking red LED
• Permanent or pulsing buzzer

Order code	AD-0001
General specifications	
Range of application	-20...50 °C/0...95 %rh
Storage conditions	-0...50 °C/0...95 %rh
Electrical supply	24 VDC (power can be supplied via the RMS-DO-L-R)
Light	Red LED
Sound	< 85 dB
Housing/Mechanical parts	
Height	154.5 mm without mounting bracket
Diameter	70 mm
IP protection class	IP65
Housing material	PA and PC

Sound pressure level dB (A)

					Distance in m							
1	2	3	5	10	20	30	50	100	200	300	500	1000
100	94	90	86	80	74	70	66	60	54	50	46	40
90	84	80	76	70	64	60	56	50	44	40		
85	79	75	71	65	59	55	51	45	39			
70	64	60	56	50	44	40	36					
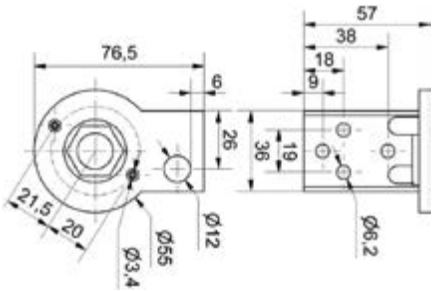
Compatible	Delivery package
• RMS-DO-L-R	• Device

RMS-TD-0001

Strict guidelines demand high temperature stability in many areas, allowing only minimal fluctuations. However, unavoidable temperature fluctuations occur when the fridge door is opened, which must be buffered to ensure that the probe's temperature measurement accurately reflects the product temperature. This approach ensures that the monitored temperature is more stable and meaningful. The sensor holder is fully traceable end-to-end and complies with all FDA and GxP requirements.

PET bottle

Mounting bracket

FEATURES

- Ensure that the temperature measurement is representative of the product temperature with this temperature buffer
- Easy installation of temperature probes in fridges and freezers

Order code	RMS-TD-0001
General specifications	
Temperature range	-196...40 °C
PET bottle	Polyethylene terephthalate (PET)
Mounting bracket	Polylactide (PLA)
Sand	Biloxit (certified)
Dimensions	34 x 110 mm

Delivery package

- PET bottle
- Lid with seal
- Sand (weighed for the bottle)
- Two centering sleeves (suitable for 6 mm diameter probes only)
- Mounting bracket
- Cable ties

WB-0001

The WB-0001 detects the presence of water or conductive fluids when the liquid level bridges the two conductive strips at the bottom of the housing. Once this occurs, audible and visual alerts are activated, along with an internal switch. The sensing height can be adjusted from 0.08 mm to 13.5 mm using the included adjustable mounting bracket, which can be attached to any flat surface using the provided adhesive strips or mounting screws.

FEATURES

- Detect leaks as soon as they occur
- Visual and audible alarm
- Battery powered
- Adjustable sensing height
- Relay output

Order code	WB-0001
General specifications	
Parameters	Water or conductive fluids
Range of application	0...50 °C
Power supply	3V CR2450 lithium metal battery
Battery lifetime	5 years steady state/48 hours during alarm condition
Power consumption	0.9 mA steady state/3.0 mA during alarm condition
Dimensions	53 x 105.23 x 30.77 mm
Housing	ABS and polycarbonate
Cable length	1.5 m
IP protection class	Water tight up to 3/4 of the body hight
Weight	137.5 g
Technical Information/Functions	
Switch type	SPST NO SSR
Audible alarm	At least 85dB @30 cm distance
Visual alarm	Red LED for water level, Yellow LED for low battery
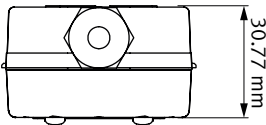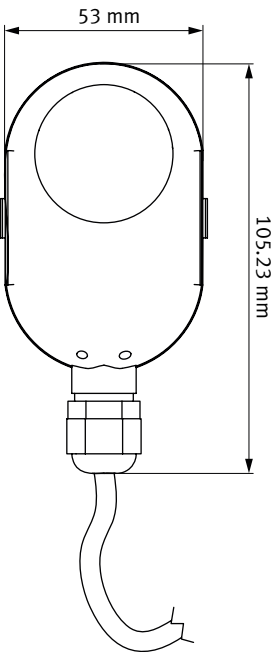
Compatible	**Delivery package**
• RMS-MDI-868/915	• 1 CR2450 lithium metal battery
• RMS-DI-L-R	• Short instruction manual

Temperature probes

The RMS temperature portfolio will cover a various array of applications, from the coldest such as liquid nitrogen tanks and cryogenic freezers to freezers, refrigerators and cold rooms to hotter ones such as water baths, incubators, ovens and autoclaves. Certain probes are also designed for specific applications for monitoring legionella within water pipes and monitoring room temperature.

T10-0001

- Applications: liquid nitrogen, cyrogenics…
- Application range: -196…-90 °C
- Cable length: 2 m
- Probe diameter: 6-6.15 mm
- Probe length: 50 mm
- IP65
- Select NTC TT10-0001 within RMS
- Sensor: NTC

T10-0002

- Applications: Dry ice, freezers…
- Application range: -80…150 °C
- Cable length: 2 m
- Probe diameter: 6-6.15 mm
- Probe length: 50 mm
- IP65
- Select NTC T10-0002 within RMS
- Sensor: NTC
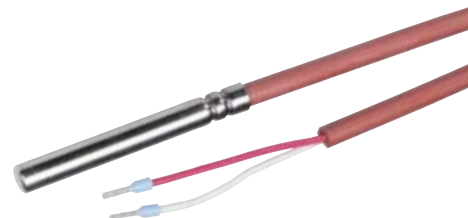
T10-0003/T10-0013/T10-0113

- Applications: freezers, fridges, cold rooms, water baths, incubators, ovens…
- Application range: -50…120 °C
- Cable length: 2 m
- Probe diameter: 6-6.15 mm
- Probe length: 50 mm
- IP65
- Select NTC T10-0003/4 within RMS
- Sensor: NTC

Temperature probes

T10-0005

- Applications: Dry ice, freezers…
- Application range: -90…50 °C
- Cable length: 4 m
- Probe diameter: 6-6.15 mm
- Probe length: 50 mm
- IP68
- Select NTC T10-005 within RMS
- Sensor: NTC

T10-0006

- Applications: freezers, fridges, cold rooms, water baths, incubators, ovens…
- Application range: -80…150 °C
- Cable length: 4 m
- Probe diameter: 6-6.15 mm
- Probe length: 50 mm
- IP65
- Select NTC T10-0002/6 within RMS
- Sensor: NTC

T30-0001/2

- Applications: Cryotechnology, dry ice
- Application range: -196…260 °C
- Cable length: 2 m/4 m
- Probe diameter: 6-6.15 mm
- Probe length: 50 mm
- IP68
- Sensor: 4 wire Pt100

T30-0003

- Applications: Standard
- Application range: -50…200 °C
- Cable length: 2 m
- Probe diameter: 6 mm
- Probe length: 50 mm
- IP65
- Sensor: 4 wire Pt100

T30-0006

- Applications: Standard
- Application range: -50…200 °C
- Cable length: 4 mm
- Probe diameter: 6 mm
- Probe length: 50 mm
- IP65
- Sensor: 4 wire Pt100

Temperature probes

T30-0010

- Application range: -190...200 °C
- Cable length: 4 m
- Probe diameter: 6 mm
- Probe length: 50 mm
- IP65
- Sensor: 4 wire Pt100

T30-0012

- Application range: -190...260 °C
- Cable length: 2 m
- Probe diameter: 3 mm
- Probe length: 50 mm
- IP68
- Sensor: 4 wire Pt100

T30-0013

- Applications: Doors
- Application range: -50...200 °C
- Cable length: 2 m
- Probe diameter: 6 mm
- Probe length: 50 mm
- IP65
- Sensor: 4 wire Pt100

Software

Humidity and Temperature

Temperature

Differential pressure

CO$_2$

Applications

Rotronic Monitoring System – RMS

Services

Theory

Video HygroGen2

Interested? Then scan the QR code!

Video mapping

Interested? Then scan the QR code!

2025

GxP consultation

Rotronic knowledge at your disposal.
Rotronic offers consulting services in GxP, supporting from project planning (URS) to the implementation and testing of systems, ensuring an optimal and efficient design. The specific needs of each application may require customized function-specific settings and measurement systems. As one of the world's leading suppliers of humidity and temperature measurement equipment, Rotronic provides expertise to help design the ideal measuring system for any application. Take advantage of this know-how to ensure the most effective solution for your needs.

Validation & qualification

FDA CFR 21 Part 11 is not just a title.
Validation is the process of creating documentation that demonstrates a procedure, process, or activity consistently maintains the desired level of compliance at every stage.

Missing information and poorly specified or inadequately tested systems represent a risk and can lead to high maintenance costs and losses in productivity.

Rotronic supports you in all areas relating to validation:
1. Development of SOP for system validation
2. Preparation of project-related validation plans and risk analyses
3. Preparation of IQ/OQ-PQ documents
4. Preparation of validation reports
5. And others
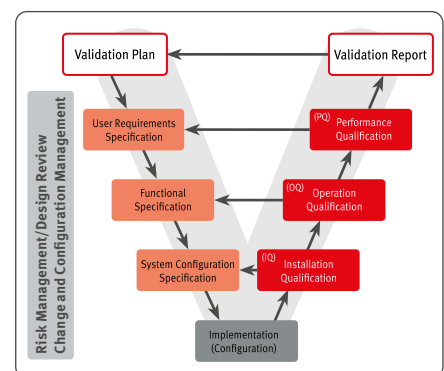
V-model (validation)

Your benefits	Queries
• Competence in validation directly from the manufacturer	ch.rotronic.support-rh@processsensing.com
• FDA/GAMP-compliant systems	

130

On-site calibration ISO 9001

Benefit from our mobile calibration facilities.
Long downtimes of measuring or test equipment can be a concern. To minimize these, take advantage of the on-site calibration service, where calibration engineers bring portable humidity and temperature generators directly to the production line, facilities, or premises, ensuring minimal downtime. If external work on production lines or facilities is not preferred due to its disruptive nature, the calibration can be conducted in an air-conditioned calibration mobile parked outside the company, ensuring seamless and efficient service. For further information, please go to: www.kalibriermobil.com

ISO 9001 calibration (laboratory)

Customers have relied on our know-how in calibration since 1965.
In the factory calibration laboratory, Rotronic operates systems according to standardized procedures, documented in accordance with ISO 9001, ensuring top and consistent calibration quality, and guaranteeing the same to customers. Ongoing communication between the SCS laboratory (ISO 17025) and the factory calibration team enhances the knowledge of both teams and benefits the customer. Additionally, as the manufacturer of the internationally recognized humidity and temperature generator HygroGen HG2, Rotronic offers expertise not only to end customers but also to competitors who utilize its know-how and equipment.

ISO 17025 calibration

The Swiss Rotronic ISO 17025 laboratory has existed since 1995 benefit from our experience.
The SCS 0065 accredited calibration laboratory at Rotronic offers the highest level of traceable accuracy for temperature and relative humidity measurement devices. Regular calibration is essential to confirm the accuracy of measuring instruments. Rotronic operates its ISO 17025 accredited calibration laboratory with state-of-the-art efficiency and quality. All reference standards are traceable to national standards, ensuring minimal measurement uncertainty. Rotronic provides calibration services for both its own instruments and third-party products, delivering precise and reliable results.

Accredited calibration laboratories worldwide
- Switzerland: SCS 0065 calibration laboratory
  ISO 17025 accredited by SAS and traceable to the national standard
- Germany: SCS 0065 calibration laboratory
  ISO 17025 accredited by SAS and traceable to the national standard.
- England: UKAS 0766 calibration laboratory
  ISO 17025 accredited by UKAS and traceable to NPL
- USA: Cert. no. 5622.01 calibration laboratory
  ISO 17025 accredited by A2LA and traceable to NIST
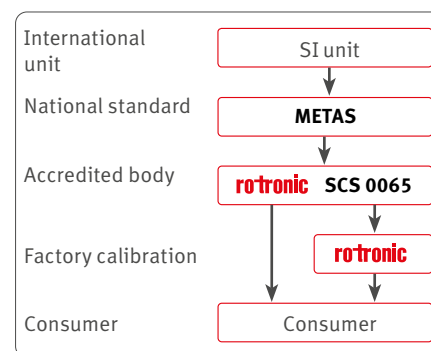
Calibration hierarchy (e.g. Switzerland)

International unit	SI unit
National standard	**METAS**
Accredited body	**rotronic** SCS 0065
Factory calibration	**rotronic**
Consumer	Consumer

Your benefits	Queries
• Higher confidence and recognition of calibration certificates by auditors (ISO 17025) • Highly accurate SCS calibration (ISO 17025) • Expedited calibration available	ch.rotronic.calibration@processsensing.com

Mapping of warehouses, climate chambers, rooms, etc.

Incorrect climatic conditions can result in expensive damage to your products.
Protecting the quality of temperature-sensitive products during transport and storage is a crucial component of the GxP directive. Compliance with legal regulations requires GxP-compliant qualification of transport equipment and storage facilities. Rotronic specializes in these services, offering efficient, tailored solutions to meet specific requirements for:

- Storage rooms
- GxP clean rooms
- Fridges
- Freezers
- Trucks
- Shipping boxes
- And many more

Take advantage of our all-round service:

- Advice on compliance with official requirements
- Placement/Distribution of the calibrated Rotronic data loggers
- Evaluation and interpretation of the climatic conditions measured
- Preparation of a GxP-compliant report incl. delivery of the calibration certificates for the loggers used
- A Rotronic qualification engineer will explain and substantiate the GxP-compliant data directly on customer request in the case of a possible audit
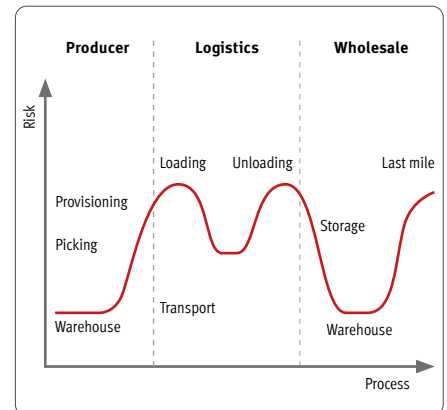
Risk assessment for shipping of pharmaceutical products
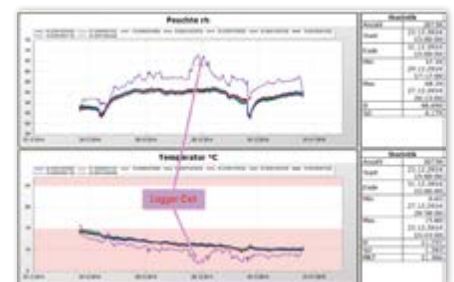
Example view of a temperature and humidity mapping

Temperature mapping warehouses

Temperature mapping production rooms

Temperature mapping climate chambers

Temperature mapping transport

Your benefits

- Exact data on the climate in the room
- Mapping conforming to FDA & GxP
- Knowledge of possible danger zones in the controlled climate

Queries

ch.rotronic.support-rh@processsensing.com

Services

- Warehouse qualification and validation (climate mapping)
- Transport qualification
- Climate chamber mapping
- Maintenance and installation of measuring systems
- On-site calibrations

Calibration seminar & training

Experience is the best teacher.Tap into a wealth of expertise and knowledge.
Seminars are designed for professionals across various fields to refresh their knowledge or learn the fundamentals, such as calibration.

Participants benefit from hands-on calibration exercises and can immediately apply the skills acquired. Seminars can be conducted either in the Rotronic training facility or at the customer's premises, offering flexibility and practical learning opportunities.

Topics:
• Principles of humidity and temperature measurement
• Principles of sensor technology and calibration
• How often should/must calibration be performed?
• What are the pitfalls in calibration?
• Open discussion on your application
• Practical exercises

Repair & maintenance

Where appropriate, efforts will be made to reduce the volume of equipment requiring disposal.
Choosing a measurement instrument from Rotronic means selecting a solution with an unmatched advantage: long-term stability.

In the event of any damage, fast, high-quality, and customer-oriented after-sales service is readily available to ensure continued reliability.

Equipment hire to customers

Rent instead of buying – Rotronic equipment is waiting for you.

HygroGen2 (HG2-S) humidity and temperature generator

Many customers choose to have their measuring instruments calibrated in the accredited Rotronic laboratory, while others prefer to perform the calibration themselves. For on-site calibrations, Rotronic offers the HygroGen2 humidity and temperature generator.

Renting this device eliminates the need for investment in your own equipment, while providing access to outstanding accuracy, traceable to the SCS (ISO 17025) laboratory. Both Rotronic and third-party probes can be easily calibrated using the HygroGen humidity and temperature generator.

For those needing initial assistance, a Rotronic technician can be hired to guide through the calibration process and provide support with the first calibrations and adjustments.

Features of the HG2-S:
- Generates a stable reference environment (humidity and temperature)
- Calibration solution for the laboratory and on-site
- Humidity equilibrium typically in only 5 minutes
- Calibrates up to 6 probes simultaneously
- Integrated touch screen PC with 9 USB ports
- Integrated FDA 21 CFR Part 11-compliant Rotronic HW4 Software
- Range 5…95 %rh (2…99 %rh with range extension option) 0…60 °C

HL-1D data logger

Data loggers are available for short-term rental, allowing humidity and temperature data to be recorded at intervals specified by the user.

Typical applications for the HL-1D data logger are:
- Humidity and temperature monitoring in storage and production rooms
- Humidity and temperature mapping in product packaging, cooling systems, shipping processes, etc. for foods and other sensitive products

The HL-1D data logger records data at user-defined intervals. For more information, please contact your local Rotronic representative.

Your benefits	Queries
• Low maintenance costs for measuring systems • High availability of replacements • Short production downtimes • Pick-up service by arrangement	ch.rotronic.support-rh@processsensing.com

Software

Humidity and Temperature

Temperature

Differential pressure

CO$_2$

Applications

Rotronic Monitoring System – RMS

Services

Theory

Fundamental terms of humidity measurement

Water vapor density (absolute humidity)

This is the amount of water vapor (kg) contained per unit volume (m³) of the gas mixture. In a gas mixture the water vapor generates a certain partial pressure that is part of the total barometric gas pressure. The vapor pressure can only rise to its saturation limit, which is determined by the temperature. Thereafter water is given off in liquid form (dew). The maximum pressure is called saturation pressure and is temperature dependent. The temperature dependency is, however, not included in the term of absolute humidity.

Relative humidity

Relative humidity is the relationship between the actual water vapor pressure and the maximum possible water vapor pressure.

$$\%rh = 100 \cdot \frac{p}{ps}$$

%rh: Relative humidity percentage
p: Water vapor pressure in the gas mixture at ambient temperature
ps: Water vapor saturation pressure at ambient temperature

100 %rh corresponds to the maximum amount of water vapor a gas mixture can contain at constant pressure and constant temperature. At constant water vapor partial pressure and changing ambient temperature, the water vapor saturation pressure changes and consequently the relative humidity also changes (see water vapor saturation pressure).

To obtain useful measurements of relative humidity, it is extremely important that the measurement probe and measured material have the same temperature.

Equilibrium relative humidity (ERH)

A hygroscopic material always tries to reach humidity equilibrium with the surrounding air. Equilibrium relative humidity is the free water content in a hygroscopic material after equilibrium is reached in an environment with constant relative humidity and temperature.

Humidity equilibrium then prevails when the amount of water absorbed and given off is equal.

Response time of Rotronic sensors

Rotronic defines the response time of its sensors as the time taken to complete 63% of a step change in humidity levels. The response time becomes greater at low temperatures and low air movement. It also increases when a filter is used as the water vapor is transported through the filter more slowly due to the reduced air flow and the water exchange takes place with slower diffusion of the water molecules.

Video Humidity

Interested? Then scan the QR code!

Psychrometric parameters

Dew point/Frost point (Dp/Fp)

The dew point is the temperature at which the air over water is saturated with water vapor at a constant air pressure. The water vapor pressure that then prevails is the same as the water vapor saturation pressure.

Wet bulb temperature (Tw)

This is the lowest temperature that can be reached by evaporative cooling. The water given off by a wet surface is then in equilibrium with the water absorption capacity of the surrounding atmosphere.

Enthalpy (H)

To obtain useful measurements of relative humidity, it is extremely important that the measurement probe and measured material have the same temperature. The specific enthalpy of moist air is an energetic property. It is composed of the specific enthalpies of the components in the mixture (dry air, water vapor) and is related to the mass fraction of the dry air. It is given in J/kg.

Specific humidity (Q) in g/kg

This is the ratio of the mass of the water vapor to the mass of the complete gas mixture containing the water vapor.

Vapor concentration (Dv) in g/m³

This is the ratio of the mass of the water vapor to the volume of the complete gas mixture containing the water vapor.

Mixing ratio (R) in g/kg

This is the ratio of the mass of the water vapor to the mass of the dry gas mixture containing the water vapor.

Water vapor partial pressure (E) in hPa

This is the fraction of the total pressure of a gaseous mixture due to water vapor.

Water vapor saturation pressure (Ew) in hPa

This is the maximum pressure that water vapor can reach over a water surface at a given temperature.

Mean kinetic temperature (MKT)

The mean kinetic temperature is the total influence of temperature on an object or product over a certain period of time.

Probe use in practice

As a world-leading manufacturer of humidity measurement instruments, Rotronic is fully aware of its responsibility to offer instruments that can withstand the harshest operating conditions, while remaining user-friendly and requiring minimal maintenance. At the same time we urge our users to ensure excellent performance of the measurement instruments at the expense of little effort. The following checklist is provided as a guide.

1. Analyze the environment in which the humidity probe is used. What suspended substances and/or chemicals exist and in what concentration?
2. Install the probe at a place representative of the measured climate with good airflow across the sensor.
3. Choose the right filter. Measurement is fastest without a filter. For wind velocities higher than 3 m/s, however, a filter must be used. The filter protects the sensor up to airflow velocities of 40 m/s. Suitable filters must also be used in the case of contaminants/pollutants and in harsh environmental conditions.
4. Install the probe correctly to suit the application.
5. Inspect and replace the filter more frequently in harsh operating conditions. Filters can be cleaned in an ultrasonic bath. However, always keep a new filter set in stock.
6. Check that the measurement probe is working correctly by performing a calibration at least every 6 to 12 months.
7. For calibration, use one of our calibration services or the SCS-certified humidity standards. This will ensure your calibration is traceable to national standards.

PT100 temperature sensors

A PT100 sensor changes its electrical resistance with every change in temperature in its environment. Its resistance value is 100 Ohms at 0 °C. This characteristic is used in a bridge circuit to generate a signal suitable for further processing. There are five quality classes with the following tolerances at 0 °C.

Class B: ±0.3 K
Class A: ±0.15 K
Class B 1/3:   ±0.1 K
Class B 1/5:   ±0.06 K
Class B 1/10: ±0.03 K

The table below illustrates the tolerances for each PT100 sensor class at different temperatures.

	Tolerance									
	Class A		Class B		1/3 Class B		1/5 Class B		1/10 Class B	
Temp. °C	± K	± Ω	± K	± Ω	± K	± Ω	± K	± Ω	± K	± Ω
-200	0.55	0.24	1.3	0.56	0.44	0.19	0.26	0.11	0.13	0.06
-100	0.35	0.14	0.8	0.32	0.27	0.11	0.16	0.06	0.08	0.03
0	0.15	0.06	0.3	0.12	0.1	0.04	0.06	0.02	0.03	0.01
100	0.35	0.13	0.8	0.3	0.27	0.1	0.16	0.05	0.08	0.03
200	0.55	0.2	1.3	0.48	0.44	0.16	0.26	0.1	0.13	0.05
300	0.75	0.27	1.8	0.64	0.6	0.21	0.36	0.13	0.18	0.06
400	0.95	0.33	2.3	0.79	0.77	0.26	0.46	0.16	0.23	0.08
500	1.15	0.38	2.8	0.93	0.94	0.31	0.56	0.19	0.28	0.09
600	1.35	0.43	3.3	1.06	1.1	0.35	0.66	0.21	0.33	0.1
650	1.45	0.46	3.6	1.13	1.2	0.38	0.72	0.23	0.36	0.11

New standard
The manufacturing tolerances were formerly sub-divided into the accuracy Classes A and B (see above). The new standard contains the additional classes AA and C. Within the validity range of every class for wire-wound resistors and film resistors, the limit deviations (tl) are given in dependence on the temperature (t) in Celsius:

Class AA: $tl = 0.1\ K + 0.0017 \cdot t$
Class A: $tl = 0.15\ K + 0.002 \cdot t$
Class B: $tl = 0.30\ K + 0.005 \cdot t$
Class C: $tl = 0.6\ K + 0.01 \cdot t$

Example for Class B: At 200 °C deviations in the measured value of up to ± 1.3 K are allowed.

Accuracy of HC2A probes

ACCURACY SPECIFICATION FOR HUMIDITY AND TEMPERATURE

With its accuracy specification, Rotronic states the maximum permissible deviation of the HygroClip probe the Rotronic SCS reference. The accuracy specification applies at the adjusted humidity and temperature values.

A validated and permanently monitored process guarantees that all HygroClip probes undergoing production match the Rotronic references used. In addition to this, samples are taken from every production batch and checked for accuracy against SCS references.

Humidity

ACCURACY OF HUMIDITY MEASUREMENTS OVER THE MEASURING RANGE

HygroClip2 industrial probes
HC2A-IC/HC2A-IM/HC2A-IE

HygroClip2 probes
HC2A-S(3)/HC2A-SM

Continuous load
Rotronic HC2A industrial probes are designed for continuous loads of up to 190 °C. Rotronic standard probes up to 100 °C.

[1] **Peak load:**
The peak load at 200 °C is 100 h. See the sensor data sheet for detailed information on the pollution loads for the sensor.
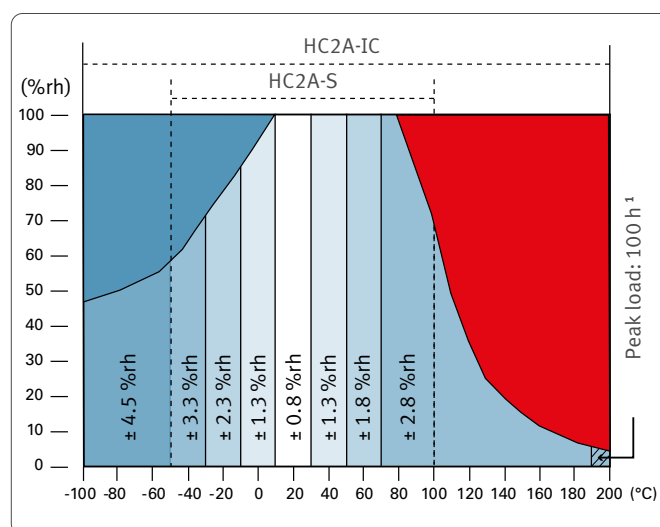
Temperature

ACCURACY OF TEMPERATURE MEASUREMENTS OVER THE MEASURING RANGE

HygroClip2 industrial probes
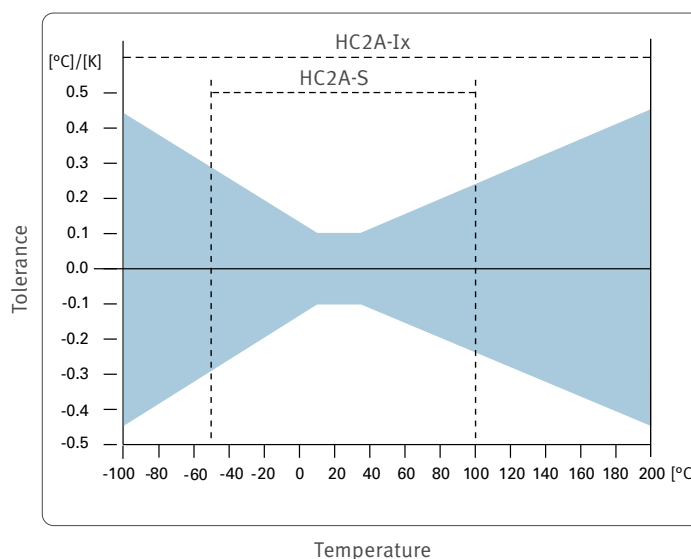HC2A-IC/HC2A-IM/HC2A-IE

HygroClip2 probes
HC2A-S(3)/HC2A-SM

Contaminants/Pollutants

Some gases and contaminants/pollutants can damage Rotronic humidity sensors. The contaminants/pollutants can be divided into two categories: gases without influence and gases with an influence on the humidity sensors.

For contaminants/pollutants with an influence on the sensors and therefore with an influence on the measurement result, the maximum constant concentration must be known (see table below).

Contaminants/Pollutants with an influence

Contaminant/Pollutant	Formula	MAC value		Permissible constant concentration					
				IN-1		HH-1		HT-1	
		ppm	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³
Acetone	CH_3COCH_3	1000	2400	3300	8000	3700	9000	3300	8000
Ammonia	NH_3	25	18	5500	4000	5500	4000	5500	4000
Petrol		300	1200		150000		150000		150000
Chlorine	Cl_2	0.5	1.5	0.7	2	1.5	4.5	0.7	2
Acetic acid	CH_3COOH	10	25	800	2000	1000	2500	800	2000
Ethyl acetate	$CH_3COOC_2H_5$	400	1400	4000	15000	4000	15000	4000	15000
Ethanol	C_2H_5OH	1000	1900	3500	6000	5800	10000	3500	6000
Ethylene glycol	$HOCH_2CH_2OH$	100	260	1200	3000	1200	3000	1200	3000
Formaldehyde	HCHO	1	1.2	2400	3000	2400	3000	2400	3000
Isopropanol	$(CH_3)2CHOH$	400	980	4800	12000	6000	15000	4800	12000
Methanol	CH_3OH	200	260	3500	6000	6000	8000	3500	6000
Methyl ethyl keton	$C2H_5COCH_3$	200	590	3300	8000	3300	8000	3300	8000
Ozone	O_3	0.1	0.2	1	2	1.5	3	1	2
Hydrochloric acid	HCl	5	7	300	500	300	500	300	500
Sulfur dioxide	SO_2	5	13	5	13	5	13	5	13
Hydrogen sulfide	H_2S	10	15	350	500	350	500	350	500
Nitrous gases	NOx	5	9	5	9	5	9	5	9
Toluene	$C_6H_5CH_3$	100	380	1300	5000	1800	7000	1300	5000
Hydrogen peroxide	H_2O_2	1	1.4	90	130	880	1200	90	130
Xylene	$C_6H_5(CH_3)_2$	100	440	1300	5000	1800	7000	1300	5000

Contaminants/Pollutants without influence

Note that the common sealing material silicone damages the sensor! When probes are installed, silicone must not be used!

Contaminant/Pollutant	Formula
Argon	Ar
Butane	C_4H_{10}
Natural gas	
Ethane	C_2H_6
Helium	He
Methane	CH_4
Neon	Ne
Propane	C_3H_8
Oxygen	O_2
Nitrogen	N_2
Hydrogen	H_2

Water activity

The measurement of water activity or equilibrium relative humidity (ERH) 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 per-ishable products such as foodstuffs, grain, seeds, as well as for 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.

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 pour-ability of powders, tablet stability, and the adherence of coatings.

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 Rotronic water-activity probes work with digital HygroClip technology, which ensures their high performance and simple, digital calibration. They can therefore be used in practically all fields of 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 (HC2A-AW-USB) or the HygroLab display unit.

Digital calibration can be performed with these instruments or with HygroSoft software running on a PC. The HC2A-AW probes have a large thermal mass. This means they 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 for all products.

Video water activity

Interested? Then scan the QR code!

CO$_2$

Principles

Carbon dioxide (CO$_2$) is a colorless and odorless gas that exists in the earth's atmosphere and which is dangerous in high concentrations. The proportion of CO$_2$ in natural ambient air is about 0.04 % or 400 ppm. When humans and animals exhale this gas, it is quickly mixed with the ambient air, including in rooms that are well ventilated.

A high CO$_2$ content becomes apparent in humans through rapid fatigue and loss of concentration. The negative effects become noticeable more quickly in small rooms in which there are many people (e.g. conference rooms).

In order to initiate suitable countermeasures such as an increase in the supply of fresh air, it is important in modern climate control systems to measure not only parameters such as relative humidity and temperature, but also the CO$_2$ content. The concentration of CO$_2$ is regarded as an important indicator for the indoor air quality.

Guidelines

350 – 450 ppm	400 – 1,200 ppm	> 1,000 ppm	5,000 ppm (0.5 %)	38,000 ppm (3.8 %)	> 100,000 ppm (10 %)
Fresh air outdoors	Room air	Fatigue and loss of concentration become apparent	Maximum permissible value at the workplace during an 8-hour workday	Breathing air (direct exhalation)	Nausea, vomiting, loss of consciousness and death

Measurement technique

The measurement technique is based on the principle of NDIR (non-dispersive infrared) sensors. This gas sensor works as a spectroscope and analyzes which wavelengths emitted by a light transmitter reach a receiver.

Calibration

All probes are pre-calibrated and have a lifetime of more than 15 years in normal applications. The automatic baseline correction means the sensors require no further calibration if they are used in indoor air applications.

Video CO$_2$

Interested? Then scan the QR code!

Differential pressure

What is pressure?

Pressure is the physical measurement of force per unit area and is often given in the SI unit Pascal [Pa]. Other units of measurement are also very widely used in pressure measurement technology. The automatic baseline correction means the sensors require no further calibration if they are used in indoor air applications.

Conversion table

| bar	mbar	psi	atm
1.00	1,000.00	14.50	0.987
Pa	**hPa**	**kPa**	**MPa**
100,000.00	1,000.00	100.00	0.10
mmH$_2$O	**inchH$_2$O**	**mmHg**	**inchHg**
10,197.16	401.46	750.06	29.53

$$p = \frac{F}{A}$$
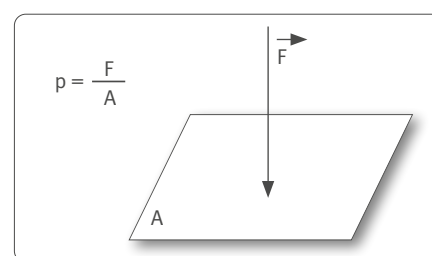
What is differential pressure?

Three different types of pressure are generally considered in pressure measurement technology: absolute pressure, relative pressure and differential pressure. Differential pressure is the drop in pressure between two spaces with different absolute pressures.

Where does Rotronic measure differential pressure?

Cleanrooms, i.e. environments in which a very low level of contamination may prevail, are pressurized slightly. This positive pressure guarantees controlled removal of dirt particles from the room. To monitor this positive pressure, one needs pressure transmitters with a very high measuring accuracy and a very low pressure measurement range. Rotronic offers such instruments.
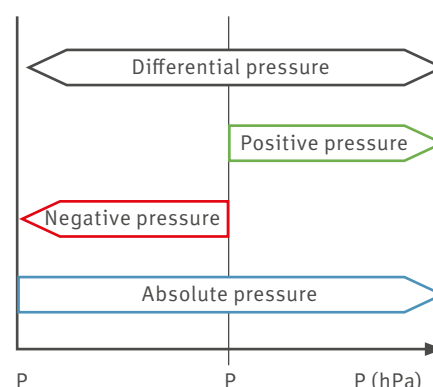
How does Rotronic measure differential pressure?

- Thermal mass flow principle
  In this measurement technique, a heating element is placed between two temperature sensitive resistors. Due to a gas flow, the temperature profile is moved towards one of the resistors, which can be measured and evaluated.
- Strain gauge principle
  In this technique the pressure is converted into a force, which stretches a diaphragm and is measured by a piezo-resistive MEMS diaphragm sensor.
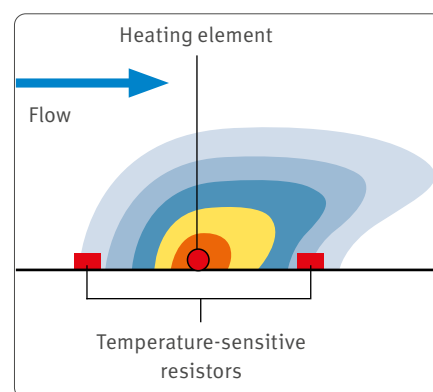
Pressure measurement technology – Glossary

Measurement range: Pressure range in which the sensor can measure
Full scale: Difference between the maximum and minimum measured pressure
% Full scale: Measurement deviation in relation to full scale
System pressure: Ambient pressure (often given as relative pressure, e.g. air pressure: 1013 hPa)

Dew point

What is dew point?

As the term implies, it is the climate point at which the relative air humidity equals 100% and begins to condense. The dew point is given in °C Td. The dew point temperature is a measurement of the water vapor content in a gas. If air is compressed or expanded, its dew point temperature changes. If air is compressed, it is able to absorb less water and the dew point rises until the air is saturated and begins to condense. In this connection, the term pressure dew point measurement is also used to describe measurement of the dew point in gases above the ambient temperature.

What does low dew point measurement mean?

A low dew point is usually when the dew point temperature falls below -30 °C Td. This means that the air is extremely dry and contains almost no water molecules. A dew point of -38 °C Td corresponds at 23 °C to a humidity value of 0.8 %rh, which corresponds to the accuracy of a Rotronic HygroClip2 probe. This shows why low dew point measurement is very demanding. Very complex electronics and a highly sensitive sensor are needed to deliver high-quality results in the measurement of residual moisture.

What is important in low dew point measurement?

The measurement of such small numbers of water molecules places high demands on the measuring point. For example, it is important that there is always good airflow across the sensor so that representative measured values can be obtained. Rotronic offers a special measurement chamber for this that was developed specifically for the mechanical design of the dew point probe. Excessive flow can lead to a local pressure drop, which influences the measurement, while insufficient flow can result in measurement of a local microclimate. The constant airflow of the measurement chamber of 1 l/min. thus guarantees stable and reliable measurement results.

The equilibrium times in dew point measurements can be considerably longer than those for humidity measurements. All the materials in the system and around the sensor must be dried out. Under certain circumstances it can take hours before a low dew point system has balanced out and the residual moisture has escaped from all the materials.

Why is low dew point measured?

There can be many reasons for monitoring the dew point. Compressed air systems with an excessively high dew point can condense, thereby causing valves to become blocked or corroded. In addition to this, dry compressed air systems require less maintenance, which saves costs. Equipment connected to the system places high demands on dryness and require a low dew point of the compressed air. Further, there are sensitive processes such as the drying of injection molding granulate and the compressed air for spray painting systems, which place particularly high demands on the dew point of the system. Compressed air systems can further be classified according to ISO 8573. Depending on the classification of the system, there are different dew points that need to be monitored and controlled.

Video dew point measurement

Interested? Then scan the QR code!

ATEX

What does ATEX mean?

ATEX comes from French and stands for Atmosphères Explosibles. The aim of this directive is to protect people when working in potentially explosive environments. It comprises two directives that define explosion protection for operation and products in risk environments. Rotronic ATEX devices are based on the ATEX Product Directive 94/9/EC.

How are ATEX devices specified?

There are two device groups. Device group I is suitable for use in mining/above ground and underground. Device group II is suitable for use in other potentially explosive atmospheres. Rotronic offers devices falling in device group II. Potentially explosive environments are subdivided into zones. A distinction is drawn between whether the explosion hazard exists because of dust or gas present in the environment.

Gas zone	Dust zone	Hazard
0	20	Constantly, frequently or over a longer period of time
1	21	Occasionally
2	22	Rarely and briefly

Temperature classes define by how much the surface of the device may heat up in the case of a fault. This temperature is stated in the case of dust versions. Gas versions, by contrast, are subdivided into the following classes:

Class	T1	T2	T3	T4	T5	T6
Max. surface temperature	450 °C	300 °C	200 °C	135 °C	100 °C	85 °C

What does the classification label of ATEX devices mean?

CE 1258

Institute
Notified Body
1258 = ElectroSuisse

GAS

Device group II
Explosive atmospheres (not mining) — **II**

Explosion proof areas 1/2
1: Zone 0
2: Zone 1 — **1/2**

Product category G
Gases, vapours, mists — **G**

Equipment protection
Ex eb – increased safety «e»
EN 60079-7
Ex ia – intrinsic safety «i»
EN 60079-11
Ex mb – encapsulation «m»
EN60079-18 — **Ex eb ia mb**

Gas explosion group IIC
Hydrogen, acetylene, etc. — **IIC**

Temperature class T5…T4
Max. temperature of the exposed surface of the product <100 °C
T4: <135 °C/T5: <100 °C — **T5…T4**

Product niveau (EPL) Ga/Gb
Very high protection level (Zone 0) — **Ga/Gb**

DUST

Device group II
Explosive atmospheres (not mining) — **II**

Explosion proof areas 1/2
1: Zone 0
2: Zone 1 — **1/2**

Product category D
Dusts — **D**

Equipment protection
Ex ia – intrinsic safety «i»
EN 60079-11
Ex tb – enclosure «t»
EN 60079-31 — **Ex ia tb**

Dust classification IIIC
Flammable fibres, non conductive dust, conductive dust — **IIIC**

Temperature class
Max. temperature of the exposed surface of the product
T80 C°…T110 C° — **T80°C… T110°C**

Product niveau (EPL) Da/Db
High protection level (Zone 1) — **Da/Db**