PROBES

AIR CHIP TECHNOLOGY

HygroClip2 probe

When it comes to measuring humidity with the highest accuracy, the HygroClip2 probe is in a class of its own. Thanks to the new AirChip, it also boasts a unique calibration and adjustment process as well as many other innovations. At the same time ROTRONIC has also improved the sensor technology, taking humidity measurement to a whole new level of performance and reliability: the HygroClip2 probe offers the best possible reproducibility and guaranteed system accuracy of ±0.8 %RH and ±0.1 K.

Probes in the HygroClip2 series come in various versions: from a simple plug-in probe for handheld instruments and data loggers to highly developed cable probes for high temperature and other special applications, we can provide you with exactly the right probe to suit your needs. Common to all is their high precision, which can be increased further by specific adjustments within our patented AirChip, making every probe in our range a high-end product for normal and industrial applications.

Applications

For the pharmaceutical industry, building management systems, HVAC monitoring and control, the paper industry, research and many others.

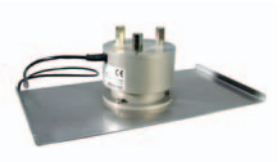
Features

- Measures relative humidity and temperature and calculates the dew/frost point
- Range of application 0...100 %RH / -100...200 °C (probe dependent)
- UART interface
- IP protection: IP65

HygroClip2 **with AirChip3000 technology**

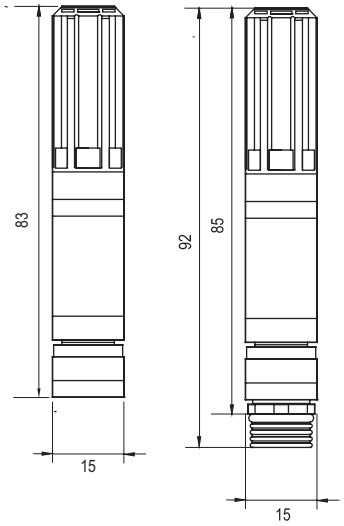
- Temperature compensation of humidity at 30,000 reference points. If programmed accordingly, it can self test and correct drift automatically
- Freely configurable: signal scaling, alarm limits and data logging intervals can be set by the user
- Active information and alarm generation
- Combines an ASIC (application specific integrated circuit), a microcontroller and a memory (EEPROM) on one microchip
- Thanks to the analog, freely scalable signal (2 x 0...1 V) and the UART interface, the chip can be integrated not only in ROTRONIC products, but also in most OEM and customer solutions
- Digital communication enables fast probe exchange without the need for adjustment
- Can be used as a reference in system qualification

CONTENTS



HC2-S
HC2-SH

HC2-S3
HC2-S3H



Standard and high precision probes

HC2-S / HC2-S3 and HC2-SH/HC2-S3H

The HC2-S / HC2-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 HC2-SH / HC2-S3H fulfills the highest demands for measuring accuracy.

Applications

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

Features

- Accuracy standard probe (HC2-S): ±0.8 %RH, ±0.1 K, at 23 °C ±5 K
- Accuracy high precision probe (HC2-SH): ±0.5 %RH, ±0.1 K, at 23 °C ±5 K
- Range of application: -50...100 °C / 0...100 %RH
- Digital interface (UART) and scalable analog outputs, 0...1 V
- Output scaling: 0...1 V = -40...60 °C / 0...100 %RH
- Standard: adjusted at 23 °C and 10, 35, 80 %RH
- High precision: adjusted at 23 °C and 10, 20, 30, 40, 50, 60, 70, 80, 90 %RH, then calibrated at 20, 50, 80 %RH

Order code	HC2-S / HC2-S3	HC2-SH / HC2-S3H
Probe type	S: black, S3: white	SH: black, S3H: white
Dimensions	Ø 15 x 83 mm	
Range of application	-50...100 °C, 0...100 %RH	
Accuracy	±0.8 %RH, ±0.1 K, at 23 °C ±5 K	±0.5 %RH, ±0.1 K, at 23 °C ±5 K (10...90 %RH)
Power supply	3.3...5 VDC, adjusted at 3.3 VDC	
Current consumption	~4.5 mA	
Long-term stability	<1 %RH / year	
Sensor type	ROTRONIC HYGROMER® IN-1, SMD Pt100 Class A	
Filter type	S: polyethylene gray, 20 µm S3: polyethylene white, 40 µm	SH: polyethylene gray, 20 µm S3H: polyethylene white, 40 µm
Response time	<15 s, without filter	
Max. wind velocity	3 m/s, without filter 20 m/s with polyethylene filter	
Housing material	Polycarbonate	
Weight / Protection	10 g / IP65	

Note:
HC2-S-HEATED, page 117
HC2-S-HH (special sensor for H_2O_2), www.rotronic.com

Compatible

• Handheld instruments	HP22-A, HP23-A
• Data loggers	HL-NT2, HL-NT3, LOG-HC2
• Transmitters	HF5, HF8
• Meteorology transmitters	MP102H, MP402H

Included

- Factory adjustment certificate
- Short instruction manual
- Polyethylene filter

Recommended accessories

• Mounting flange	AC5005
• Polyethylene filter, gray, 20 µm	NSP-PCB-PE
• Polyethylene filter, white, 40 µm	NSP-PCW-PE40
• Extension cable 2 m, black	E2-02A
• Extension cable 2 m, white	E3-02A
• Adapter cable, open ends, 2 m	E2-02XX-ACT/01
• 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 probes, steel

The HC2-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.

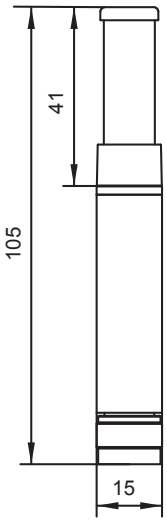
Applications

Food, paper, textile, pharmaceutical and cosmetic industries

Features

- Accuracy: ±0.8 %RH, ±0.1 K, at 23 °C ±5 K
- Range of application: -50...100 °C / 0...100 %RH
- 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

HC2-SM



Order code	HC2-SM
Probe type	Chrome steel standard
Dimensions	Ø 15 x 110 mm
Range of application	-50...100 °C, 0...100 %RH
Accuracy	±0.8 %RH, ±0.1 K, at 23 °C ±5 K
Power supply	3.3...5 VDC, adjusted at 3.3 VDC
Current consumption	~4.5 mA at 3.3 VDC
Long-term stability	<1 %RH / year
Sensor type	ROTRONIC HYGROMER® IN-1, Pt100 Class A
Filter type	Wire mesh filter
Response time	<15 s, without filter
Max. wind velocity	3 m/s, without filter 25 m/s with wire mesh filter
Housing material	Stainless steel 1.4301
Weight / Protection	47 g / IP65

Note: Cannot be operated with two-wire transmitters.

Compatible

• Handheld instruments	HP22-A, HP23-A
• Data loggers	HL-NT2, HL-NT3, LOG-HC2
• Transmitters	HF5, HF8

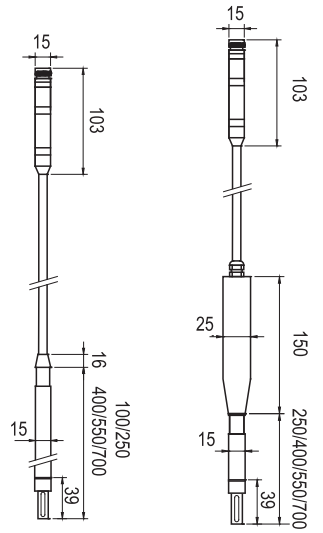
Included

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

Recommended accessories

• Mounting gland	AC1305-M
• Sintered steel filter	SP-S15
• Extension cable 2 m, black	E2-02A
• Extension cable 2 m, white	E2-05A
• 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

Industrial cable probes



The ROTRONIC industrial probes are especially suitable for high temperatures and demanding industrial environments. It measures humidity and temperature and calculates the dew/frost point.

Applications

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

Features

- Accuracy: ±0.8 %RH, 0.1 K, at 23 °C ±5 K
- Range of application: -100...200 °C[1] / 0...100 %RH
- 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

Standard industrial probes Ø 15 mm

Order code	HC2-IC1xx*	HC2-IC3xx*	HC2-IC4xx*	HC2-IC5xx*	HC2-IC7xx*
Dimensions	Ø 15 x 100 mm	Ø 15 x 250 mm	Ø 15 x 400 mm	Ø 15 x 550 mm	Ø 15 x 700 mm
Accuracy	±0.8 %RH, ±0.1 K, at 23 °C ±5 K				
Power supply	3.3 VDC ±0.1 VDC, current: ~4.5 mA				
Sensor type	ROTRONIC HYGROMER® IN-1, Pt100 Class A				
Response time	<15 s, without filter				
Material	PEEK, brass, chemically nickel-plated				
Weight	230 g	260 g	290 g	230 g	250 g

* xx = cable length in meters (02, 05), 80 g per meter cable

Industrial probes Ø 15/25 mm

Order code	HC2-IC3xx*-A	HC2-IC4xx*-A	HC2-IC5xx*-A	HC2-IC7xx*-A
Dimensions	Ø 15/25 x 250 mm	Ø 15/25 x 400 mm	Ø 15/25 x 550 mm	Ø 15/25 x 700 mm
Accuracy	±0.8 %RH, ±0.1 K, at 23 °C ±5 K			
Power supply	3.3 VDC ±0.1 VDC, current: ~4.5 mA			
Sensor type	ROTRONIC HYGROMER® IN-1, Pt100 Class A			
Response time	<15 s, without filter			
Material	PEEK, brass, chemically nickel-plated			
Weight	290 g	320 g	350 g	380 g

* xx = cable length in meters (02, 05), 80 g per meter cable

Compatible

• Handheld instruments	HP22-A, HP23-A
• Data loggers	HL-NT2, HL-NT3, LOG-HC2
• Transmitters	HF5, HF8

Included

- Factory adjustment certificate

Recommended accessories

• Filters see page 22.	
• 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

[1] Short-term peak load

Industrial cable probes, steel

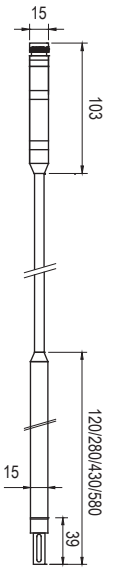
The metal industrial probe is especially suitable for high temperatures, demanding industrial environments and applications where hygiene plays an important role. The probe measures humidity and temperature and calculates the dew/frost point.

Applications

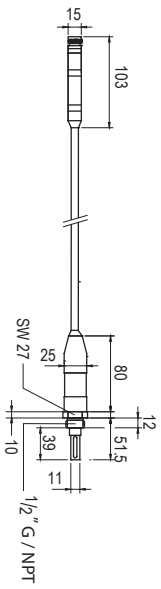
Food and pharmaceutical production, drying processes, industrial manufacturing

Features

- Accuracy: ±0.8 %RH, 0.1 K, at 23 °C ±5 K
- Range of application: -100…200 °C[1], (screw-in probe; -50…200 °C[1]) / 0…100 %RH
- 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



HC2-IMxxx



HC2-IExxx

Steel industrial probes

Order code	HC2-IM1xx*	HC2-IM3xx*	HC2-IM4xx*	HC2-IM5xx*
Dimensions	Ø 15 x 130 mm	Ø 15 x 280 mm	Ø 15 x 430 mm	Ø 15 x 580 mm
Accuracy	±0.8 %RH, ±0.1 K, at 23 °C ±5 K			
Power supply	3.3 VDC ±0.1 VDC, current: ~4.5 mA			
Sensor type	ROTRONIC HYGROMER® IN-1, Pt100 Class A			
Response time	‹15 s, without filter			
Housing material	Stainless steel, DIN1.4305			
Weight	260 g	400 g	540 g	680 g

* xx = cable length in meters (02, 05), 80 g per meter cable

Screw-in probes

Order code	HC2-IE1xx*	HC2-IE3xx*
Probe type	½" G with ROTRONIC connector	½" NPT with ROTRONIC connector
Accuracy	±0.8 %RH, ±0.1 K, at 23°C ±5 K	
Power supply	3.3 VDC ±0.1 VDC, current: ~4.5 mA	
Sensor type	ROTRONIC HYGROMER® IN-1, Pt100 Class A	
Pressure	Pressure resistant to 100 bar / 1450 PSI	
Response time	‹15 s, without filter	
Housing material	Stainless steel, DIN1.4305	
Weight	290 g	

* xx = cable length in meters (02, 05), 80 g per meter cable

Note: Cannot be operated with two-wire transmitters.

Compatible

• Handheld instruments	HP22-A, HP23-A
• Data loggers	HL-NT2, HL-NT3, LOG-HC2
• Transmitters	HF5, HF8

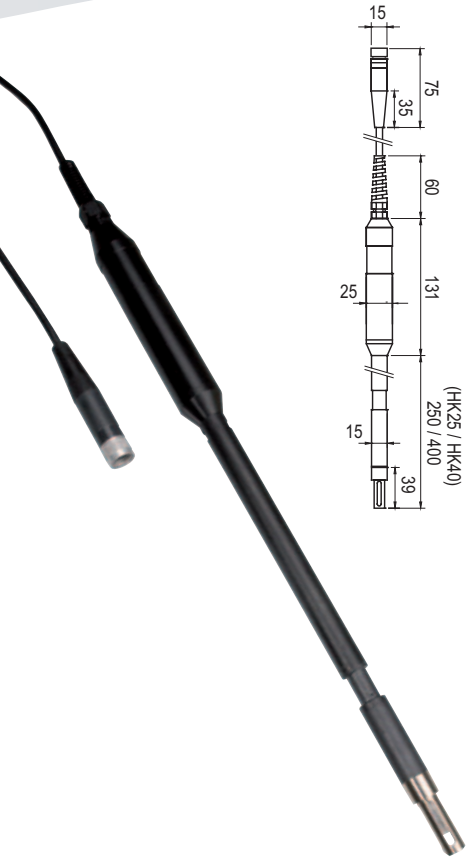
Included

- Factory adjustment certificate

Recommended accessories

• Filters see page 22.	
• 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

[1] Short-term peak load



High temperature handheld probe

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

Applications

Climate and temperature chambers, dryers, air ducts

Features

- Accuracy: ±0.8 %RH, 0.1 K, at 23 °C ±5 K
- Range of application: -100…200 °C[1] / 0…100 %RH
- 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

Order code	HC2-HK25	HC2-HK40
Probe type	Handheld probe with 2 m TPU cable	
Dimensions	Ø 15 x 250 mm	Ø 15 x 400 mm
Accuracy	±0.8 %RH, ±0.1 K, at 23 °C ±5 K	
Power supply	3.3 VDC ±0.1 VDC, current: ~4.5 mA	
Sensor type	ROTRONIC HYGROMER® IN-1, Pt100 Class A	
Response time	‹15 s, without filter	
Housing material	PEEK, brass, chemically nickel-plated	
Weight	210 g	240 g
Filter	Wire mesh filter	

Compatible

• Handheld instruments	HP22-A, HP23-A
• Data loggers	HL-NT2, HL-NT3, LOG-HC2
• Transmitters	HF5, HF8

Included

- Factory adjustment certificate
- Wire mesh filter

Recommended accessories

• Filters see page 22.	
• Humidity standard for calibration 10% RH	EA10-SCS
• Humidity standard for calibration 35% RH	EA35-SCS
• Humidity standard for calibration 80% RH	EA80-SCS
• Calibration device	ER-15

[1] Short-term peak load

HygroWin USB probes

The USB cable mount (3 m) probe measures humidity and temperature. It is ideal for PC based monitoring applications. HW4 Lite monitoring and logging software comes with the probe.

Applications

Residential and office rooms

Features

- Accuracy: ±2 %RH, 0.3 K, at 23 °C ±5 K
- Connects directly to a PC on a USB port
- Range of application: -40...85 °C / 0...100 %RH
- Adjusted at 23 °C and 10, 35, 80 %RH

Order code	**HC2-WIN-USB**
Probe type	HC2 probe with direct USB connection, 3 m USB cable
Accuracy	±2 %RH, ±0.3 K, at 23 °C ±5 K
Power supply	Via USB cable
Sensor type	ROTRONIC HYGROMER® IN-1, SMD Pt100 Class A
Filter type	Polyethylene standard filter, 20 µm, gray
Response time	‹15 s, without filter
Weight	110 g
Housing material	Polycarbonate

Included

- Factory adjustment certificate
- HW4 Lite software

Recommended accessories

• 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

Note: A maximum of three probes can be used with HW4 Lite.

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 mounted discretely.

Applications

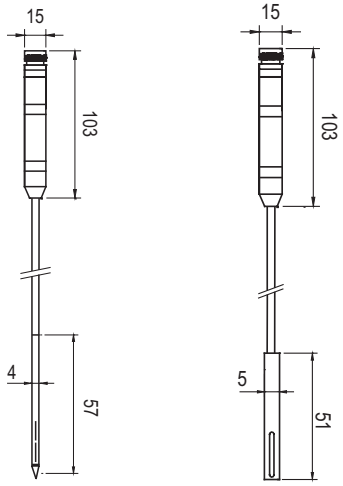
Museums, glass cabinets, building material tests, automotive and aviation industries, testing laboratories, paper, textile and pharmaceutical industries

Features

- Accuracy: ±1.5 %RH, 0.3 K, at 23 °C ±5 K
- Range of application: -40...85 °C / 0...100 %RH
- 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

Order code	HC2-C04	HC2-C05
Probe type	Cable probe, Ø 4 mm, cable: 2 m	Cable probe, Ø 5 mm, cable: 2 m
Accuracy	±1.5 %RH, ±0.3 K, at 23°C ±5 K	
Power supply	3.3 VDC ±0.1 VDC, current: ~4.5 mA	
Sensor type	ROTRONIC HYGROMER® IN-1, Pt100 Class A	
Response time	<15 s, without filter	
Housing material	Stainless steel, DIN1.4305	Brass, nickel-plated
Weight	85 g	85 g

Note: Cannot be used with two-wire transmitters.



HC2-C04 HC2-C05

Compatible

• Handheld instruments	HP22-A, HP23-A
• Data loggers	HL-NT2, HL-NT3, LOG-HC2
• Transmitters	HF5, HF8

Included

- Factory adjustment certificate

Recommended accessories

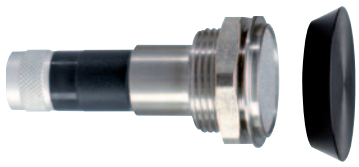
• Extension cable 2 m, black	E2-02A
• Teflon filter for HC2-C05	SP-T05
• Calibration device	ER-05
• Humidity standard for calibration 10 %RH	EA10-SCS
• Humidity standard for calibration 35 %RH	EA35-SCS
• Humidity standard for calibration 80 %RH	EA80-SCS

Flush mount probes

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

Applications

Medical technology industry, clean rooms, museums, hotels, ships, HVAC, exhibition rooms



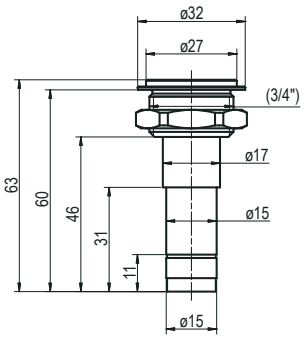
HC2-IS25, steel filter, cover

HC2-IP25, PE-HD filter, cover

Features

- Accuracy: ±1.5 %RH, 0.2 K at 0...90 %RH and 23 °C ±5 K
- Range of application: -40...85 °C / 0...99 %RH
- 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

Order code	HC2-IS25	HC2-IT25	HC2-IP25
Probe type	Wall flush mount probe		
Accuracy	±1.5 %RH, ±0.2 K at 0...90 %RH and 23 °C ±5 K		
Power supply	3.3...5 VDC, adjusted at 3.3 VDC, current: ~4.5 mA		
Filter type	Sintered steel	Teflon	Polyethylene
Sensor type	ROTRONIC HYGROMER® WA-1, Pt100 Class A		
Response time	‹20 s	‹25 s	‹20 s
Housing material	Polycarbonate, stainless steel DIN 1.4301		
Weight	50 g		



Compatible

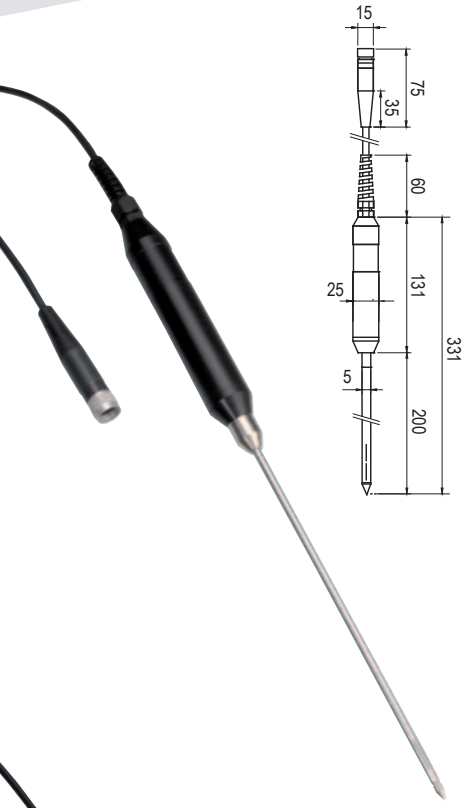
• Handheld instruments	HP22-A, HP23-A
• Data loggers	HL-NT2, HL-NT3, LOG-HC2
• Transmitters	HF5, HF8

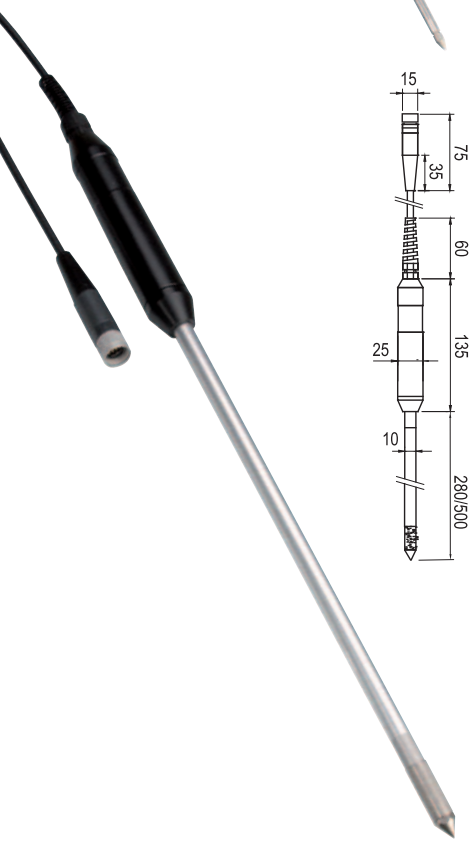
Included

- Factory adjustment certificate
- Protection cover

Recommended accessories

• Extension cable 2 m, black	E2-02A
• Calibration device flush mount probe	EIx-25
• Humidity standard for calibration 10 %RH	EA10-SCS
• Humidity standard for calibration 35 %RH	EA35-SCS
• 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 (HP28/50) bulk materials, bricks, concrete, etc. It measures humidity and temperature and calculates the dew/frost point.

Applications

Water activity measurement, page 106

Portable measuring units with handheld instruments and data loggers

Features

- Accuracy: ±0.8/1.5 %RH, 0.1/0.3 K, at 23 °C ±5 K
- Range of application: -40...85 °C / 0...100 %RH
- 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

Order code	HC2-P05
Probe type	Ø 5 x 200 mm, insertion probe with 2 m cable
Accuracy	±1.5 %RH, ±0.3 K, at 23 °C ±5 K
Power supply	3.3...5 VDC, adjusted at 3.3 VDC, current: ~4.5 mA
Filter type	No filter available
Sensor type	ROTRONIC HYGROMER® IN-1, Pt100 Class A
Response time	‹15 s
Material	Stainless steel DIN 1.4305 (probe), POM (handle)
Weight	160 g

Order code	HC2-HP28	HC2-HP50
Probe length	Ø 10 x 280 mm	Ø 10 x 500 mm
Accuracy	±0.8 %RH, ±0.1 K, at 23°C ±5 K	
Power supply	3.3...5 VDC, adjusted at 3.3 VDC, current: ~4.5 mA	
Filter type	Sintered steel	
Sensor type	ROTRONIC HYGROMER® IN-1, Pt100 Class A	
Response time	‹20 s, with filter	
Material	Stainless steel DIN 1.4305 (probe), POM (handle)	
Weight	200 g	300 g

Compatible

• Handheld instruments	HP22-A, HP23-A
• Water activity measuring instrument	HP23-AW-A
• Data loggers	HL-NT2, HL-NT3, LOG-HC2
• Transmitters	HF5, HF8
• Benchtop display unit	HygroLabC1

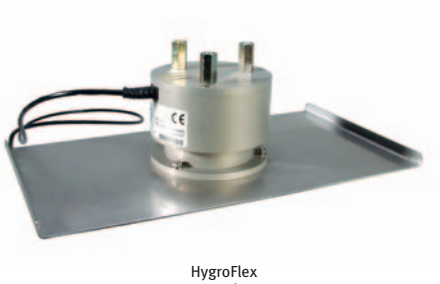
Included

- Factory adjustment certificate

Recommended accessories

• Replacement filter HC2-HP28 / 50 (sintered steel)	ET-Z10
• Calibration device HC2-P05	ER-05
• Calibration device HC2-HP28/50	EGL
• Humidity standard for calibration 10% RH	EA10-SCS
• Humidity standard for calibration 35% RH	EA35-SCS
• Humidity standard for calibration 80% RH	EA80-SCS

Web probe



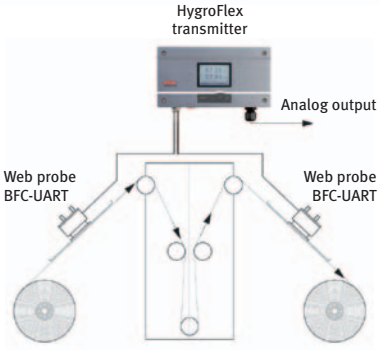
Applications

Paper and printing industries, production and processing of textiles and all types of production webs

Features

- Accuracy: ±0.8 %RH, 0.1 K, at 23 °C ±5 K
- Range of application: -40...85 °C / 0...100 %RH
- 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

Order code	BFC-UART
Probe type	HC2 web probe
Accuracy	±0.8 %RH, ±0.1 K, at 23 °C ±5 K
Power supply	3.3...5 VDC, adjusted at 3.3 VDC, current: ~4.5 mA
Filter type	Wire mesh filter
Sensor type	ROTRONIC HYGROMER® IN-1, Pt100 Class A
Response time	‹15 s, without filter
Housing material	Aluminum, stainless steel DIN 1.4301
Weight	1070 g



Sword probes

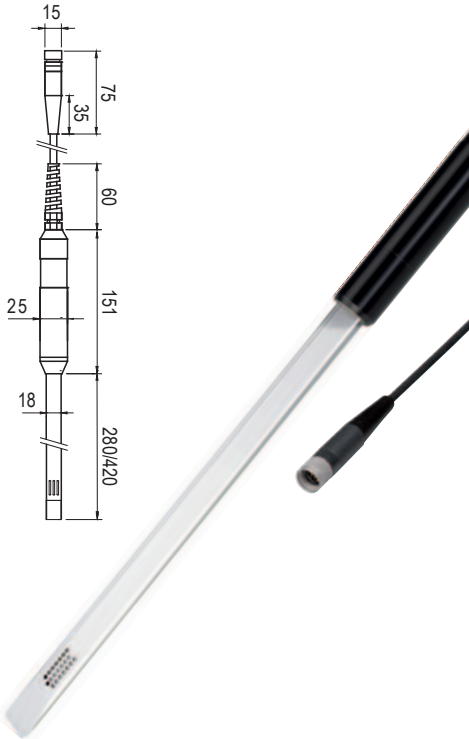
Applications

Paper, printing and textile industries with handheld instruments and data loggers

Features

- Accuracy: ±0.8 %RH, 0.1 K, at 23 °C ±5 K
- Range of application: -40...85 °C / 0...100 %RH
- 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

Order code	HC2-HS28	HC2-HS42
Probe length	280 mm	420 mm
Accuracy	±0.8 %RH, ±0.1 K, at 23°C ±5 K	
Power supply	3.3...5 VDC, adjusted at 3.3 VDC, current: ~4.5 mA	
Filter type	No filter	
Sensor type	ROTRONIC HYGROMER® IN-1, Pt100 Class A	
Response time	‹15 s	
Material	Aluminum (probe), POM (handle)	
Weight	220 g	240 g



Compatible

• Handheld instruments	HP22-A, HP23-A
• Data loggers	HL-NT2, HL-NT3, LOG-HC2
• Transmitters	HF5, HF8

Included

- Factory adjustment certificate
- Short instruction manual (BFC-UART)

Recommended accessories

• Replacement filter (BFC-UART)	ET-W37-Set
• Calibration device, web probe	WP-14-S
• Calibration device, 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

XD PROBES

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

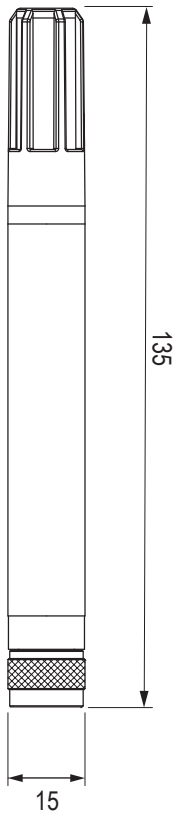
Applications

OEM, HVAC, climate chambers, snow guns and meteorology

Features

- Accuracy at 23 °C ±5 K: ±0.8 %RH, ±0.2 K
- Housing colors: black and white
- Range of application: -40...85 °C / 0...100 %RH
- Digital interface UART
- Standard output scaling: 0...1 V = -40...60 °C / 0...100 %RH
- Adjusted at 23 °C and 10, 35, 80 %RH
- Freely scalable output signals: 0...1/5/10 VDC*

Order code	XD33-S3X	XD33-W3X
Housing color	Black	White
Range of application	-40...85 °C	
Accuracy at 23 °C ±5 K	±0.8 %RH, ±0.2 K	
Power supply	5...24 VDC / 5...16 VAC (0...1 V) 16...24 VDC / 12...16 VAC (all output versions)	
Current consumption	‹12 mA	
Long-term stability	‹1 %RH / year	
Sensor type	ROTRONIC HYGROMER® IN-1 / SMD Pt100 Class A	
Filter type	Polyethylene standard filter, 20 µm, gray	
Response time	‹15 s, without filter	
Housing material	Polycarbonate	
Weight	20 g	



Included

- Factory adjustment certificate
- Polyethylene filter
- Short instruction manual

Recommended accessories

• Mounting flange	AC5005
• Polyethylene filter, gray, 20 µm	NSP-PCB-PE
• Polyethylene filter, white, 40 µm	NSP-PCW-PE40
• Extension cable 2 m, with open ends, black	E2-02XX
• Extension cable 2 m, with open ends, white	E3-02XX
• 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

Note: Not compatible with data loggers / transmitters / handheld instruments.

* HW4 software and a service cable is needed to change the analog signals.

XD INDUSTRIAL PROBES

The industrial versions are especially suitable for high temperatures and demanding industrial environments.

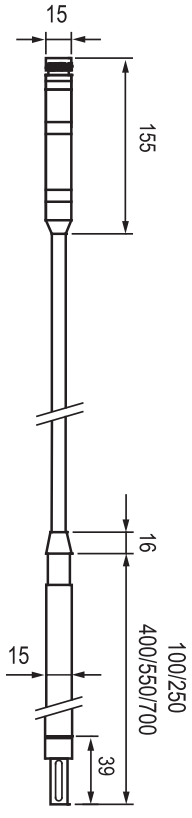
Applications

Industrial manufacturing, climate chambers, drying processes

Features

- Accuracy at 23 °C ±5 K: ±0.8 %RH, ±0.2 K
- Remote electronics
- Range of application: -100...200 °C[1] / 0...100 %RH
- Digital interface UART
- Standard output scaling: 0...1 V = -100...200 °C / 0...100 %RH
- Adjusted at 23 °C and 10, 35, 80 %RH
- Freely scalable output signals: 0...1/5/10 VDC and 0/4...20 mA*

Order code	XD33-SC12FE	XD33-SC15FE
Cable length	2 meters	5 meters
Range of application	-100...200 °C[1]	
Accuracy at 23 °C ±5 K	±0.8 %RH, ±0.2 K	
Power supply	5...24 VDC / 5...16 VAC (0...1 V) 16...24 VDC / 12...16 VAC (all output versions)	
Current consumption	‹50 mA	
Long-term stability	‹1 %RH / year	
Sensor type	ROTRONIC HYGROMER® IN-1 / Pt100 Class A	
Probe length	100/250/400/550/700 mm	
Response time	‹15 s	
Housing material	PEEK	
Interface	UART or RS-485	



Included

- Factory adjustment certificate
- Short instruction manual

Recommended accessories

• Filters see page 22	
• Mounting flange	AC5005
• 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

[1] Short-term peak load
* HW4 software and a service cable is needed to change the analog signals.

Note: Not compatible with data loggers / transmitters / handheld instruments.

System overview

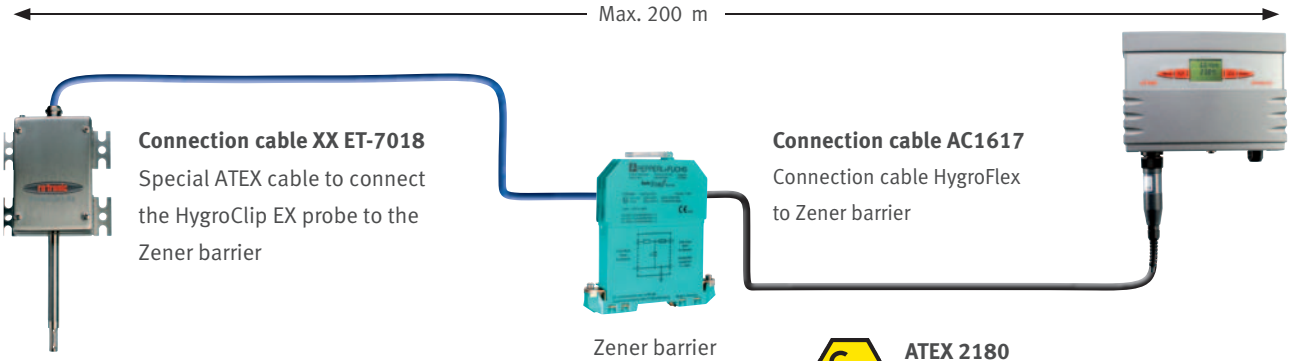
Regardless of the ATEX safety class required, the ROTRONIC ATEX measuring system consists of an intrinsically safe HygroClip EX probe and a Zener barrier (only one analog output 4...20 mA for temperature or humidity measurement). If both humidity and temperature measurements are required, a transmitter and connection cable must be used (digital signal).

HygroClip EX probes

- Intrinsically Safe probes
- Measure relative humidity & temperature
- Accuracy at 23 °C ±5 K: ±1 %RH / ±0.3 K
- Range of application electronics: -40...40 °C
- Temperature of medium at probe: max. -40...80 °C for ATEX applications, max. -50...200 °C for non-ATEX applications

HTSxx transmitters

- Transmitters for interchangeable HygroClip EX probes
- Display the humidity and temperature or the calculated value
- Up to 3 analog outputs
- Range of application electronics: -40...60 °C



ATEX 2180
Directive 94/9/EC

Applications

Zone 0/20 T5 / Zone 1/21 T6	Zone 1/21 T6	Safe zone
Class II, Division 1 Group E, F, G	Class I, Division 1 Group A, B, C, D	Zener barrier or galvanic isolation
	HygroClip IC-1-EX II 1 G EEx ia IIC T5 resp. II 2 G EEx ia IC T6 II 1/2 D IP6X T 80 °C	
	HygroClip IE-1-EX II 1 G EEx ia IIC T5 resp. II 2 G EEx ia IC T II 1/2 D IP6X T 80 °C	
Only the sinter filter may be used in zone 20/21	HygroClip ID-EX II 1 G EEx ia IIC T5 resp. II 2 G EEx ia IC T II 1/2 D IP6X T 80 °C	
Only the sinter filter may be used in zone 21	HygroClip IW-1-EX II 1 G EEx ia IIC T5 resp. II 2 G EEx ia IC T6 II 2D IP6X T 80 °C	

Note:

The total cable length between HygroClip EX probe and HygroFlex transmitter may not exceed 200 m.

HygroClip EX probes may NOT be calibrated in the EX zone because the accessories are not EX-compliant.

HygroClip EX probes

Features

- Intrinsically Safe probes, ATEX and FM approved
- Power supply via HygroFlex transmitter
- Measures relative humidity & temperature
- Range of application electronics: -40...40 °C
  Medium temperature at probe:
  max. -40...80 °C for ATEX applications
  max. -50...200 °C for non ATEX applications
- Accuracy at 23 °C ±5 K: ±1% RH / ±0.3 K
- Housing: chrome nickel steel, V4A/AISI 316/1.440

Cable probes

Order code	HygroClip IC-1-EX	HygroClip IC-3-EX
Probe length	Ø 15 x 120 mm	Ø 15 x 270 mm
Cable length	2 m	2 m

Screw-in probes

Order code	HygroClip IE-1/EX	HygroClip IE-3/EX
Thread	½" G	½" NPT
Cable length	2 m	2 m

Wall/Duct probes

Order code	HygroClip IW-EX	HygroClip ID-EX
Type	Wall probe	Duct probe
Probe length	Ø 15 x 150 mm	Ø 15 x 250 mm

HygroClip IC-EX

HygroClip IE/EX

HygroClip IW-EX

HygroClip ID-EX

Compatible

- Transmitters HTS series

Included

- Factory adjustment certificate
- Instruction manual
- Connection diagram
- Type examination certificate, ATEX and FM

Recommended accessories

- Connection cable HygroClip-EX Zener barrier (blue)
  ET-7018
- Connection cable HTS to Zener barrier AC1617-ZB/xx
  (For xx = 2, 5, 10, in 5 m steps, max 200 m)
- Zener barrier ZB1, use with HTS
- ZB1-420 Zener barrier for a two-wire system (only temperature or humidity)
- Sintered steel filter SP-S15

Transmitters HTS series

Features

- Measures relative humidity & temperature
- All psychrometric calculations available
- Range of application electronics: -40...60 °C / 0...100 %RH
  -10...60 °C with LCD
- Service interface
- Suitable probes: HYGROCLIP - IC-EX, IE-EX, IW-EX and ID-EX

Power supply

Low voltage: 3/4-wire

Mains voltage: 3/4-wire

Signal outputs

- Current outputs
- Voltage outputs
- RS-232 or RS-485 interface
- Ethernet

Versions

- Plastic housing
- Metal housing

Output parameters

- Humidity & temperature
- Humidity only or temperature only
- Humidity & Temperature + calculated parameter

Output scaling

- Relative humidity: range selectable, standard scale: 0...100 %RH
- Temperature: range selectable
- Dew point: range selectable

Display/Keypad

- LC display with 2 lines, foil keypad
- Without display

HygroClip specifications	IC-1-EX	IC-3-EX	IE-1/EX	IE-3/EX	IW-EX	ID-EX
Probe type	Cable probes		Screw-in probes		Wall probe	Duct probe
Dimensions/Thread	Ø 15 x 120 mm	Ø 15 x 270 mm	½" G	½" NPT	Ø 15 x 150 mm	Ø 15 x 250 mm
Range of application	Electronics: -40…40 °C; temperature at probe max.: -50…200 °C					
Accuracy	±1 %RH, ±0.2 K, at 23 °C ±5 K					
Sensor type	Humidity: ROTRONIC HYGROMER® IN-1; temperature Pt100 1/3 DIN					
Response time	<15 s t63 (63 % of a jump 35…80 %RH) without filter					
Housing material / Dimensions	Stainless steel / 150 x 100 x 58 mm					
Protection	IP 66					
Electrical connection	Cable gland / Terminal block					
EC approval	PTB 01 ATEX 2180					
FM approval & marking	3015571 / IS / I, II, III / 1 / ABCDEFG / T6 – 12.0724.0006 IP66					
Weight	1.7 kg	1.9 kg	1.9 kg	1.95 kg	1.3 kg	1.65 kg

Transmitter specifications	HTS1	HTS3
General		
Parameters	Humidity and temperature	
Calculated parameters	—	All psychrometric parameters
Housing material / Protection	ABS (metal housing: optional) / IP65	
Dimensions	207 x 150 x 58 mm	
Weight	310 g	
Probe connection / Interface	Threaded coupling / DIO	
Display	LCD, 3 lines	
Electrical connections	Screw terminals inside, M16 cable gland	
Power supply	12…35 VDC, 12…24 VAC or 90…250 VAC, 3.5 VA	
Current consumption	12…35 VDC (140 mA), 12…24 VAC or 90…250 VAC, 3.5 VA	
Application temp. housing / electronics	-40…60 °C / -30…60 °C (with LCD), 0…100 %RH	
Service interface	RS-232	
CE / EMC compatibility	EMC Directive 2004/108/EC	
FDA / GMP conformity	Conforms to 21 CFR Part 11 and GAMP5	
Scale limits	-999…+9999 units, measurement range -100…200 °C / 0…100 %RH	
Analog output		
Number	2	3
Current	0(4)…20 mA	
Voltage	0…1/5/10 V	
Maximum load	≤2x500 Ω (current output) ≥1 kΩ/V (voltage output)	
Digital output		
RS-485	N/A	RS-485
RS-232	N/A	RS-232

Filter carriers/Filters

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 measures, 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	20/40 µm	–	150 µm	5 µm	20...25 µm
Max. air velocity [m/s] (continuous load)	20	20	15	10	40	25

✔ = low
✔✔ = medium
✔✔✔ = high

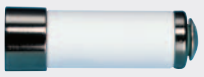
Filters and filter carriers for standard probes HC2-S / HC2-S3

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	Polyethylene, gray	20 µm	-50...100 °C	
Particulate filter / Waterproof					
NSP-POM-FD2	POM, white	Teflon	2 µm	-50...100 °C	

Filters and filter carriers for industrial probe series HC2-IC / HC2-HK
Special 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					
NSP-ME	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	

Filters and filter carriers for industrial probe series HC2-IM / 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	

Filter for 5 mm probe HC2-C05

Order code	Filter carrier	Filter element	Pore size	Range of application	
SP-T05	No filter carrier, only filter	Teflon	10 µm	-40…285 °C	

Filters for handheld probe 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	5 µm	-40…85 °C	
SP-TS12	No filter carrier, only filter	Teflon	10 µm	-40…85 °C	

Filters and filter carriers HF3

Order code	Filter carrier	Filter element	Pore size	Range of application	
NSP-PCG-PE	Polycarbonate, gray	Polyethylene, gray	20 µm	-40…85 °C	
NSP-PCG-WM		Wire mesh	20…25 µm	-80…85 °C	

Filters and filter carriers 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	

Filters for web and water activity probes HC2-AW-USB, HC2-AW, BFC-UART

Order code	Description	
ET-W24-Set	Flat wire mesh filter with circlip, Ø 24 mm for HC2-AW (-USB) Pore size: 20…25 µm	
ET-W37-Set	Flat wire mesh filter with circlip, Ø 37 mm for BFC-UART Pore size: 20…25 µm	

Filter for HF1, CP11, CL11

Order code	Description	
NSP-PCB-PE-AZ	Filter for HF1, CP11, CL11