METEOROLOGY

Meteorology

In meteorology the precision of measurement data is critical for accurate weather forecasting and climate research. ROTRONIC humidity and temperature probes have an excellent reputation for providing precise results even in the most demanding of environments, especially where high humidity and low temperatures prevail. Our product range offers high performance and a wide range of configurations to suit every application.

Even the best probes measure inaccurately if the conditions at the probe are not representative of the actual climatic conditions. Without an appropriate weather protection shield, the probe temperature will not be correct, and since relative humidity is temperature dependent, there will be significant measurement errors. Poorly ventilated weather protection shields can result in a micro-climate around the probes causing consequential measurement errors.

Ventilated protection shields are therefore used in applications which require a high level of accuracy. High accuracy measurements are even more important when it comes to HVAC energy optimization. The more accurate the measurements, the smaller the control errors and the greater the energy savings.

ROTRONIC meteorology probes in combination with ventilated weather and radiation protection shields provide the best possible measurement results. They can offer practically the same performance as that achieved by a dew point mirror meteorological system as used by various national meteorological organizations at a significantly lower price.

MeteoSwiss The weather protection shields were developed in close co-operation with MeteoSwiss and are utilized worldwide. Tests conducted together with MeteoSwiss clearly demonstrated the unmatched accuracy obtained by the combination of ROTRONIC probes and ventilated weather protection!

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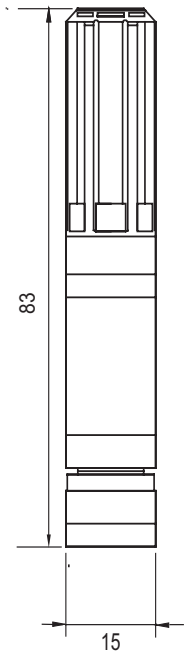


Applications

Meteorology stations, building automation systems, agricultural meteorology.

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 (HC2-S3)
- Adjusted at 23°C and 10, 20, 30, 40, 50, 60, 70, 80, 90 %RH (HC2-S3H)

Order code	HC2-S3	HC2-S3H
Probe type	Meteorology probe, white	
Range of application	-50...100 °C, 0...100 %RH	
Accuracy at 23 °C ±5 K	±0.8 %RH, ±0.1 K	±0.5 %RH, ±0.1 K
Power supply	3.3...5 VDC, adjusted at 3.3 VDC	
Long-term stability	<1 %RH / year	
Filter type	Polyethylene standard filter, 40 µm, white	
Response time	<15 s (without filter)	

Compatible

• Meteorology transmitters:	MP102H/402H
• Actively ventilated shield:	RS12T / RS24T
• Naturally ventilated shield:	AC1000

Included

- Factory adjustment certificate
- Polyethylene filter

Recommended accessories

• Polyethylene filter, white (40 µm):	NSP-PCW-PE40
• Connection cable with voltage reg. & 2 m cable, white:	E3-02XX-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

HC2-S-HEATED / HC2-S3-HEATED

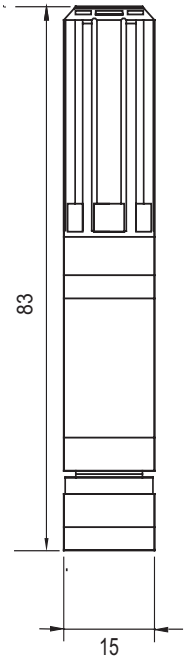
Applications

High-humidity applications such as tunnels/caves, cheese cellars, etc.

Features

- Measures relative humidity and temperature, calculates the dew/frost point
- Automatic condensation function
- No long-term thawing on sensor
- SMD Thermo sensor element

Order code	HC2-S-HEATED	HC2-S3-HEATED
Color	Black	White
Range of application	-50...100 °C, 0...100 %RH	
Accuracy at 23 °C ±5 K	±1.3 %RH, ±0.15 K	
Power supply	3.3...5 VDC, adjusted at 3.3 VDC	
Long-term stability	‹1 %RH / year	
Filter type	Polyethylene standard filter, 20 µm	
Response time	‹10 s (without filter)	
Current consumption	‹35 mA at VDD = 3.3 VDC	



Compatible

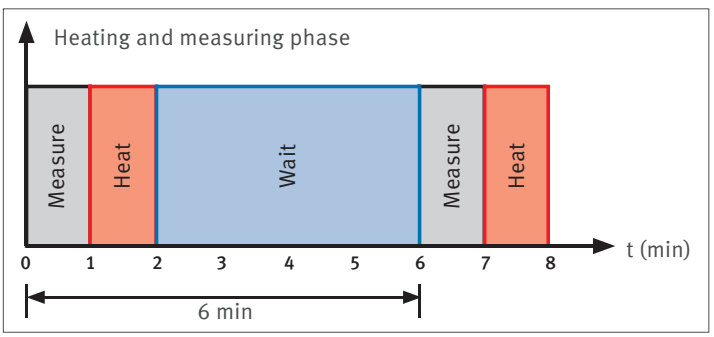
• Meteorology transmitters:	MP102H/402H
• Transmitters:	HF5 / HF8
• Naturally ventilated shield:	AC1000

Included

- Factory adjustment certificate
- Polyethylene filter
- Short instruction manual

Recommended accessories

• Polyethylene filter, white (40 µm):	NSP-PCW-PE40
• Connection cable with voltage reg. & 2 m cable, white:	E3-02XX-ACT/01



HygroMet 4

The heated meteorology probe.

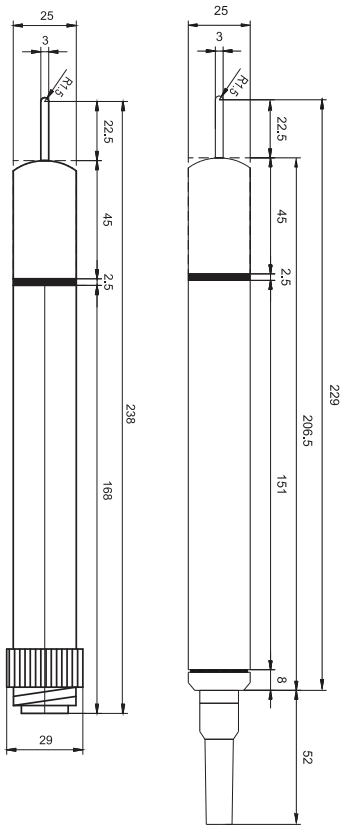
Applications

Wherever high humidity prevails for a short or long time.

Features

- No long-term condensation on sensor
- Measures relative humidity and temperature, calculates all psychrometric parameters
- Freely programmable sensor heater
- Integrated real-time clock
- Connection via Tuchel connector or cable with open ends

Order code	HM433/4/5	HM431/2
Output	Voltage output 0...1/5/10 V	Current output 0/4...20 mA
Range of application	-40...85 °C / 0...100 %RH	
Accuracy at 23 °C ±5 K	Heated: ±1.5 %RH / ±0.1 K Unheated: ± 0.8 %RH / ±0.1 K	
Resistant to	Condensation	
Measurement	Humidity: SMD Thermo Temperature: external Pt100	
Filter	Polyethylene, 20 µm	



Compatible

• Actively ventilated shield:	RS12T/24T
• Naturally ventilated shield:	AC1002 / AC1003

Included

- Factory adjustment certificate
- Instruction manual

HC2-S3C03 / HC2-S3C03-PT15

The cable probes for agricultural meteorology and outdoor applications are equipped with a new filter technology that significantly improves protection of the sensor against the formation of bio-film.

Applications

Meteorology, agriculture and OEM.

Features

- Measures relative humidity and temperature, calculates the dew/frost point
- HYGROMER® IN-1 sensor / Pt100 1/3 Class B
- Service interface (UART)
- Freely scalable analog signals 0...1 V
- Standard configuration 0...1 V = -40...60 °C / 0...100 %RH

Order code	HC2-S3C03	HC2-S3C03-PT15
Adjustment	At 23 °C and 10, 35, 80 %RH	
Accuracy at 23 °C ±5 K	±1 %RH / ±0.2 K	±1 %RH / ±0.1 K (passive Pt100)
Range of application	-50...100 °C / 0...100 %RH	
Filter	Polyethylene, white ~ 40 µm pore size	
Voltage	5...24 VDC / 5...16 VAC	
Version	3 m cable with open ends	

Compatible

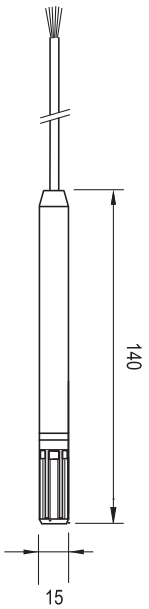
• Naturally ventilated shield:	AC1000

Included

- Factory adjustment certificate
- Filter

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
• Active UART to USB converter cable, open ends:	AC3001-XX



MP100A / MP400A

Standard meteorology probes with fixed sensors (analog technology).

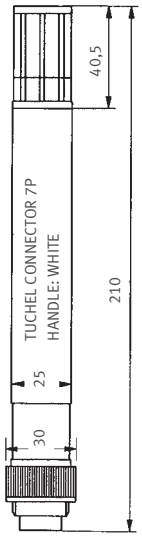
Applications

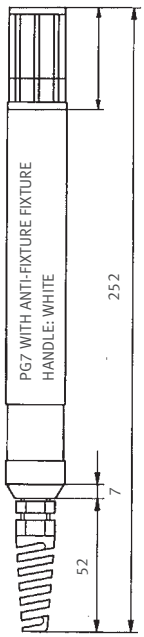
Weather stations, agriculture, ice warning systems and snowmaking systems.

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 cable with open ends

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	
Accuracy at 23 °C ±5 K	10...95 %RH: ±1.5 %RH, <10 and >95 %RH: ±2.5 %RH	
Resistant to	Condensation and dust particles	
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

Included

- Factory adjustment certificate
- Wire mesh filter (SP-W3-25)
- Instruction manual

Recommended accessories

• Calibration device:	EM-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

Order codes on request.

Specifications	HM433/4/5	HM431/2	MP100A (analog)	MP400A (analog)	HC2-S3C03	HC2-S3C03-PT15
General						
Parameters	Humidity and temperature					
Housing material / Protection	Polyoxymethylene / IP65					
Weight	150 g		120 g		80 g	
Supply voltage	5...24 VDC (0...1 V output) 10...24 VDC (0...5 V output) 15...24 VDC (0...10 V output)	15...24 VDC	4.8...30 VDC	10...30 VDC	5...24 VDC / 5...16 VAC	
Current consumption	‹55 mA		‹4 mA at 4.8 VDC	‹50 mA at 10 VDC	‹20 mA	
Application temp. housing / electronics	-40...85 °C				-50...100 °C	
Cable length compensation	To 99 m			N/A		
Humidity measurement						
Sensor	ROTRONIC SMD Thermo		ROTRONIC HYGROMER® IN-1			
Measurement range	0...100 %RH		0...100 %RH			
Accuracy at 23 °C ±5 K	Heated: ±1.5 %RH Unheated: ±0.8 %RH		10...95 %RH: ±1.5 %RH		±1.0 %RH	
Long-term stability	‹1 %RH/year					
Response time	‹15 s t63 (63 % of a jump 35...80 %RH) without filter					
Temperature measurement						
Sensor	SMD Thermo / Pt100		Pt100 1/3 Class B			Pt100 1/5 Class B
Measurement range	-40...85 °C		-50...100 °C			
Accuracy at 23 °C ±5 K	±0.1 K		±0.3 K		±0.2 K	±0.1 K
Response time	‹15 s t63					
Analog output						
Current	N/A	0(4)...20 mA	N/A	0(4)...20 mA	N/A	
Voltage	0...1 / 5 / 10 VDC	N/A	0...1 V	N/A	0...1 V	
Digital output						
	RS-485 UART		N/A			

MP102H/402H for interchangeable probe HC2-S3

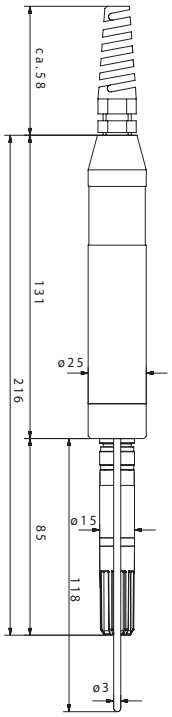
Applications

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

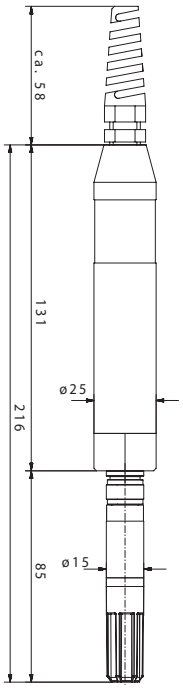
Features

- Humidity and temperature measurement using interchangeable HC2-S3 probe
- 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

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	
Voltage range	5...24 VDC	15...24 VDC



With external Pt100



Without external Pt100

Compatible

• Meteorology probes:	HC2-S3 and HC2-S3H
• Actively ventilated shield:	RS12T / RS24T
• Naturally ventilated shield:	AC1003

Included

- Short instruction manual

Order codes on request.

Specifications	MP102H	MP402H
General		
Parameters	Humidity and temperature	
	Calculates all psychrometric parameters	
Housing material / Protection	Polyoxymethylene / 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	To 99 m	
Humidity measurement		
Sensor	ROTRONIC HYGROMER® IN-1 (HC2-S3)	
Measurement range	0…100 %RH (HC2-S3)	
Accuracy at 23 °C ±5 K	±0.8 %RH (HC2-S3)	
Response time	‹15 s t63 (63 % of a jump 35…80 %RH) without filter	
Temperature measurement		
Sensor	Pt100 Class A (HC2-S3)	
Measurement range	-50…100 °C (HC2-S3)	
Accuracy at 23 °C ±5 K	±0.1 K (HC2-S3)	
Response time	‹15 s t63	
Direct Pt100 (option)	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	

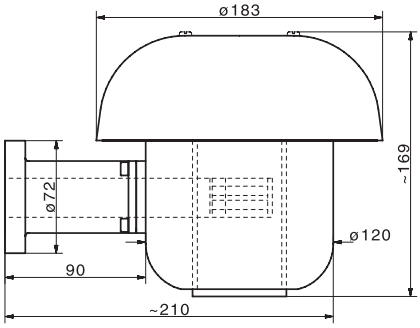
Actively ventilated shields

Applications

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

Features

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



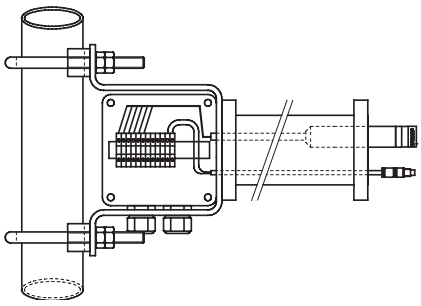
Order code	RS12T	RS24T
Range of application	-30...60 °C	
Material	Aluminum, POM, RAL 9010	
Power supply	12 VDC, 2 W	24 VDC
Fan	Papst fan IP54	
Ventilation	3.5 m/s / 900 l/min.	
Fan lifetime	At 40°C ~70,000 h (approx. 8 years)	

Compatible

- Mounting sets (see below)

Included

- Installation instructions

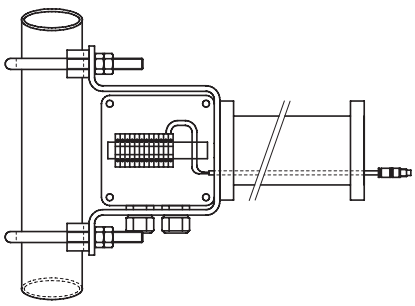


MKRS-HC2

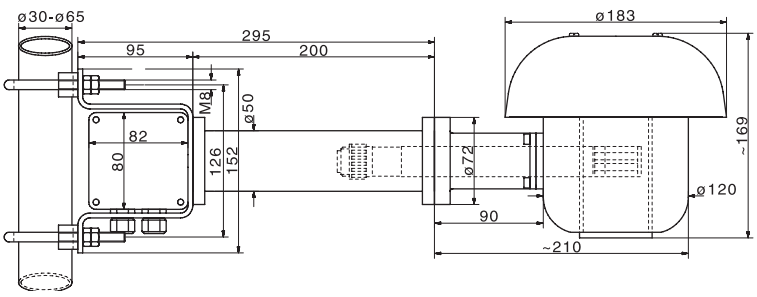
Mounting sets for RS12/24T

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

Additional models available on request



MKRS-MP102-402



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.

Applications

Snow guns, weather stations and building management systems.

Features

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

Order code	AC1000	AC1002	AC1003
Use with	HC2-S3/S3H + E3-02A or HC2-S3C03	MP100A/400A	MP102H/402H
Number of plates	9	10	14
Mounting shield	Mounting bracket + clamp for mast mounting (Ø 25…50 mm)		
Mounting probe	Probe screw connection Ø15 mm	Probe screw connection Ø25 mm	
Dimensions	Ø 130 x 140 mm	Ø 130 x 160 mm	Ø 130 x 215 mm

Included

- Installation instructions
- Mounting hardware

AC1000 with HC2-S3+E3-02XX

AC1002 with MP100A-T4

AC1003 with MP102H