

# TRANSMITTERS

## HYGROFLEX3 SERIES

The new HygroFlex3 series is the latest development in HVAC transmitters for relative humidity, temperature and dew point. Based on AirChip3000 technology, the transmitters offer high accuracy at a low cost.

The new generation boasts a unique calibration and adjustment process as well as many other unbeatable innovations. At the same time we have taken the sensor technology to a whole new level of performance and reliability:

The HygroFlex3 series offers you maximum reproducibility and a guaranteed system accuracy of  $\pm 2\%$  rh and  $\pm 0.3\text{ K}$ . The transmitters come in various versions and there are also thermostats/hygrostats available for the duct and wall versions. Many useful functions can be activated with the optional HW4 software.

### Applications

HVAC applications in cost-sensitive applications, building management systems, museums, libraries, etc.

### Highlights

- Unique calibration and adjustment process
- Highest reproducibility
- Guaranteed system accuracy of  $\pm 2\%$  rh and  $0.3\text{ K}$
- Space, wall and duct mount versions
- Many useful functions can be accessed with optional HW4 software



TECHNOLOGY

## HF3X SPACE MOUNT

### Applications

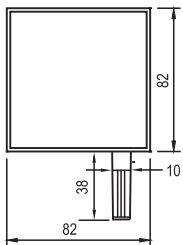
HVAC applications, cost-sensitive installations, building management systems, etc.

### Highlights and common features

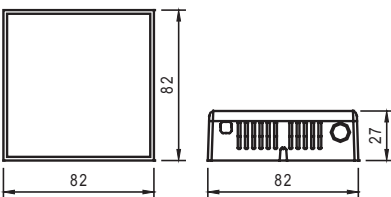
- Measures relative humidity, temperature and dew/frost point
- Range of application -40...60 °C; -10...60 °C with LCD, 0...100 %rh
- Automatic sensor test & drift compensation \*
- Saves up to 2,000 measurement pairs\*
- Use as simulator for system validation \*
- UART service interface
- Integrated, extractable probe
- Adjustment profile «Standard», factory certificate
- Adjusted at 23 °C and 10, 35, 80 %rh
- Accuracy:  $\pm 2$  %rh /  $\pm 0.3$  K



Type R



Type S



Space version	HF320-S series	HF320-R series
Type	2- or 2 x 2-wire	
Signals	Signals freely scalable *	
Probe	Fixed	Extractable
Integrated LC display	Optional	

\* Optional, requires HW4 software

Space version	HF33x-S series	HF33x-R series
Type	3/4-wire	
Signals	Signals freely selectable and scalable by user *	
Probe	Fixed	Extractable
Integrated display	Optional	

\* Optional, requires HW4 software

## HF3 WALL & DUCT VERSIONS

### Applications

HVAC applications, cost-sensitive installations, building management systems, etc.

### Highlights and common features

- Measures relative humidity, temperature and dew/frost point
- Range of application -40...60 °C, 0...100 %rh
- Automatic sensor test & drift compensation \*
- Saves up to 2,000 measurement pairs\*
- Use as simulator for system validation \*
- UART service interface
- Adjustment profile «Standard», factory certificate
- Adjusted at 23 °C and 10, 35, 80 %rh
- Accuracy:  $\pm 2$  %rh /  $\pm 0.3$  K

Duct version	HF320-D series	HF33x-D series
Type	2- or 2 x 2-wire	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Filter	Polyethylene filter	

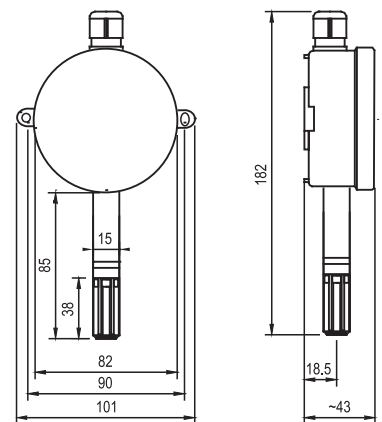
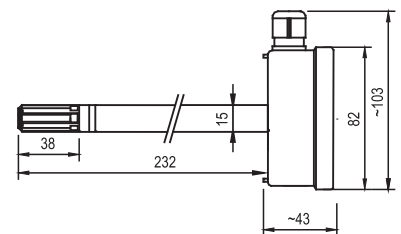
Duct version	HF346-D
Type	Thermostat/Hygrostat with 2 single pole changeover relays
Switching range	Scalable*
Switching parameters	Temperature, humidity, dew point
Switch points	Potentiometer & LED for fine adjustment

\* Optional, requires HW4 software

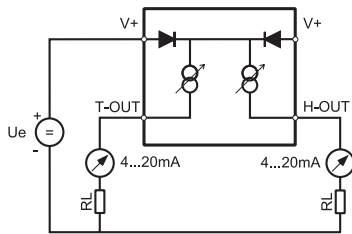
Wall version	HF320-W series	HF33x-W series
Type	2- or 2 x 2-wire	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Filter	Polyethylene filter	

Wall version	HF346-W
Type	Thermostat/Hygrostat with 2 single pole changeover relays
Switching range	Scalable*
Switching parameters	Temperature, humidity, dew point
Switch points	Potentiometer & LED for fine adjustment

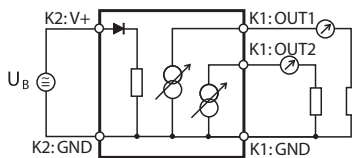
\* Optional, requires HW4 software



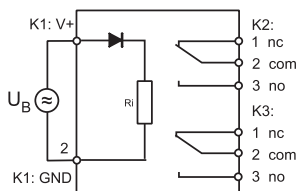
# TRANSMITTERS



Schematic 2-wire types



Schematic 3-wire types



Schematic hygrostat/thermostat

## Order information (for accessories see pages 99-102)

### HF3x transmitters with analog signals

#### Power supply and output signal type

HF320-					2- or 2 x 2-wire, <28 VDC, common supply V+, 4...20 mA
HF331-					3/4-wire (15...40 VDC / 12...28 VAC, 0...20 mA)
HF332-					3/4-wire (15...40 VDC / 12...28 VAC, 4...20 mA)
HF333-					3/4-wire (5...40 VDC / 5...28 VAC, 0...1 V)
HF334-					3/4-wire (10...40 VDC / 8...28 VAC, 0...5 V)
HF335-					3/4-wire (15...40 VDC / 12...28 VAC, 0...10 V)

#### Instrument type

D			X		Duct mount, Ø 15 x 235 mm (standard)
S					Space mount
R					Space mount with external sensor (Accuracy: ±1 %rh / 0.2 K)
W			X		Wall mount, Ø 15 x 85 mm (standard)

#### Output parameters

B			X	X	X	Humidity (0...100 %rh) & temperature
H			X	X	X	Only humidity (0...100 %rh)
T			X	X	X	Only temperature
A						Dew point & temperature

#### Standard scaling temperature \*

1	X			Temperature (0...50 °C)
6	X			Temperature (0...100 °F)

#### Optional display

D				Backlit display (only HF33x-S)
X				Without display

#### Standard scaling dew point / frost point

X	B	X	-50...50
X	C	X	-50...100

## Order information (for accessories see pages 99-102)

### Hygrostat / Thermostat HF346

#### Power supply

HF346-					3/4-wire (18...40 VDC / 12...28 VAC)
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#### Instrument type

D					Duct mount, Ø 15 x 235 mm (standard)
W					Wall mount, Ø 15 x 85 mm (standard)

#### Output parameters relay

B			X	X		Humidity & temperature
H	X	X	X	X		Only humidity
T			X	X	X	Only temperature
A					X	Temperature & dew point

#### Control range potentiometer temperature \*

1	X			0...50 °C
6	X			0...100 °F

#### Control range potentiometer dew point / frost point \*

B	X		-50...50
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#### Control range potentiometer humidity\*

4	X	0...100 %rh
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\* Other scaling on request

## TRANSMITTERS

Detailed specifications			
Power supply / Connections	HF32	HF33	HF34
Supply voltage	10...28 VDC	15...40 VDC or	8...40 VDC
	$V_{\min} = 10 \text{ V} + (0.02 \times \text{load}^*)$	12...28 VAC	12...28 VAC
Current consumption	Max. 2 x 20 mA	<50 mA	44 mA
Electrical connections	Type D and W: screw terminals and M16 cable gland Type R & S: screw terminals		N/A
Humidity measurement	HF32	HF33	HF34
Sensor	ROTRONIC Hygromer® IN-1		
Measurement range	0...100 %rh		
Accuracy at 23 °C	±2.0 %rh (type D, S and W) / ±1.0 %rh (type R)		±2.0 %rh
Repeatability	0.3 %rh		
Long term stability	<1 %rh/year		
Response time	Typically 10 s for 63% of a change 35 → 80 %rh (1 m/sec air flow at sensor)		
Temperature measurement	HF32	HF33	HF34
Sensor	Pt100 1/3 Class B		
Measurement range	-40...60 °C / -40...140 °F		
Accuracy at 23 °C	±0.3 K (type D, S and W) / ±0.2 K (type R)		
Repeatability	0.05 °C		
Long term stability	<1 °C/year		
Response time	4 sec for 63 % of a change from 23 to 80 °C (1 m/sec air flow at sensor)		
Calculated parameters	HF32	HF33	HF34
Psychrometric calculations	Dew point or frost point		
Start-up time	Typically 3.4 s	Typically 1.9 s	
Signal type (freely definable by user)	4...20 mA	0...20 mA, 4...20 mA 0...1 V, 0...5 V, 0...10 V	No analog signals
Scale limits	-999.99 ... +9999.99 units		
*Minimum/Maximum load (in Ω)	0/500 Ω	0/500 Ω (current signal), min. 1000 Ω (voltage signal)	
Optional display (only types R and S)	LCD, 1 or 2 decimals, without backlight	LCD, 1 or 2 decimals, with backlight and trend indicator	N/A
Probe material	Polycarbonate, except for types R and S		Polycarbonate
Filter material	Polyethylene, except for types R and S		Polyethylene
Housing material / Protection	ABS / IP 65, except for types R and S: IP 20		
Weight	90 g		105 g
CE/EMC compatibility	EN 61000-6-1: 2001, EN 61000-6-2: 2005 EN 61000-6-3: 2005, EN 61000-6-4: 2001 + A11		
Solder	Lead-free (RoHS-compliant)		
Fire resistance	Conforms to UL94-HB		
FDA/GAMP compatibility	Conforms to FDA21 CFR Part 11 and GAMP4		
Electronics operating range	-40...60 °C / -10...60 °C (models with display) 0...100 %rh, non-condensing		
Temperature limits at probe	-40...60 °C		
Maximum wind velocity at probe	20 m/s (7,870 ft /min), except for types R and S		
Configurable relay outputs	HF34		
Switch point adjustment	Potentiometer with scale (2 one-pole change-over relays)		
Switch point limits	-999.99...+9999.99 units (potentiometer minimum and maximum)		
Relay status indicator	LED (in housing)		
Breaking capacity	250 VAC / 6 A at ohmic load		
Service interface	UART IO D78F0114H (universal asynchronous receiver transmitter)		

# TRANSMITTERS

## HYGROFLEX4 SERIES

The new HygroFlex4 series is the latest development in HVAC transmitters for relative humidity, temperature and dew point. Based on AirChip3000 technology, these precision instruments achieve a new level of accuracy in this category of product, and are more precise than the HF3 series.

The new generation boasts a unique calibration and adjustment process as well as many other unbeatable innovations. At the same time we have taken the sensor technology to a whole new level of performance and reliability:

The HygroFlex4 series offers maximum reproducibility and a system accuracy of  $\leq \pm 1$  %rh and  $\pm 0.2$  K. The transmitters are available in wall and duct mount versions. Many useful functions can be activated with the optional HW4 software.

### Applications

High performance HVAC applications, building management systems, museums, libraries, etc.

### Highlights

- Unique calibration and adjustment process
- Highest reproducibility
- System accuracy of  $\leq \pm 1$  %rh and  $\pm 0.2$  K
- Wall and duct versions
- Many useful functions can be activated with the optional HW4 software



## HF4 WALL & DUCT VERSIONS

### Applications

HVAC applications, building management systems, museums, libraries, etc.

### Highlights and common features

- Measures relative humidity, temperature and dew/frost point
- Range of application -40...60 °C; -10...60 °C with LCD, 0...100 %rh
- Automatic sensor test & drift compensation \*
- Records up to 2,000 measurement pairs \*
- Use as a simulator for system validation \*
- UART service interface
- Integrated probe
- Adjustment profile «Standard», factory certificate
- Adjusted at 23 °C and 10, 35, 80 %rh
- Accuracy:  $\pm 1$  %rh /  $\pm 0.2$  K
- Can be mounted on a DIN rail (see accessories, page 102)

Wall version	HF420-W series	HF43x-W series
Type	2- or 2 x 2-wire	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Features	Alarm indicators, display and keypad (optional)	
Filter	Polyethylene filter	

Duct version	HF420-D series	HF43x-D series
Type	2- or 2 x 2-wire	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Features	Horizontal version with display/keypad (optional)	
Filter	Polyethylene filter	

\* Requires HW4 software

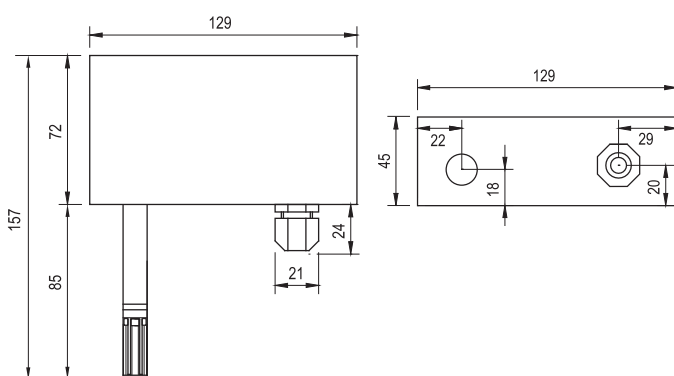
For networkable transmitters see pages 76-81



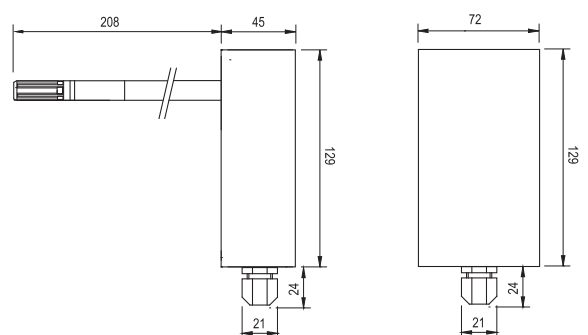
Vertical mounting



Horizontal mounting



HF4X wall version



HF4X duct version (vertical mounting)

# TRANSMITTERS

## Order information (for accessories see pages 99-102)

### Transmitters with analog output signals

#### Power supply and output signal type

HF420-							2- or 2 x 2-wire, <10...28 VDC, common V+, 4...20 mA (Only display without backlight possible)
HF431-							3/4-wire, 15...40 VDC / 12...28 VAC, 0...20 mA
HF432-							3/4-wire, 15...40 VDC / 12...28 VAC, 4...20 mA
HF433-							3/4-wire, 5...40 VDC / 5...28 VAC, 0...1 V
HF434-							3/4-wire, 10...40 VDC / 8...28 VAC, 0...5 V
HF435-							3/4-wire, 15...40 VDC / 12...28 VAC, 0...10 V

#### Instrument type

	D			X			Duct probe vertical, Ø 15 x 208 mm (standard, without display)
	W						Wall probe, Ø 15 x 85 mm (standard)

#### Output parameters

		B				X	X	Humidity & temperature
		H	X	X		X	X	Only humidity
		T				X	X	Only temperature
		A						Temperature & dew point

#### Scaling of the output signals \* (humidity: always 0...100 %rh)

		X	X				No temperature output signal
		1	X				0...50 °C
		2	X				10...40 °C
		3	X				-40...60 °C
		4	X				-30...70 °C
		5	X				-40...85 °C
		6	X				0...100 °F
		7	X				0...200 °F
		9	X				-50...200 °F

#### Optional display

				D			Display with backlight (only for horizontal mounting)
				X			No display

#### Electrical connections (analogue signals to terminals)

				1		M16 x 1.5 cable gland (horizontal, type D with display and type W)
				2		M16 x 1.5 cable gland (vertical, type D without display)
				3		1/2" conduit adapter (horizontal, type D with display and type W)
				4		1/2" conduit adapter (vertical, type D without display)

#### Standard scaling dew point / frost point

						X	X	No calculation
						B	X	-50...50 °C
						C	X	-50...100 °C
						D	X	-50...200 °F

\* Others on request

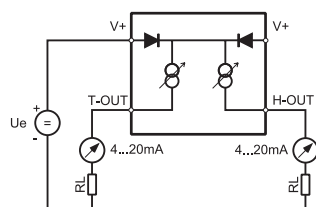
#### Off-the-shelf types:

Duct version:	HF420-DB1XX2XX	2-wire, → 4...20 mA = 0...100 %rh / 0...50 °C
	HF432-DB1XX2XX	3/4-wire, → 4...20 mA = 0...100 %rh / 0...50 °C
Wall version:	HF420-WB1XX1XX	2-wire, → 4...20 mA = 0...100 %rh / 0...50 °C
	HF432-WB1XX1XX	3/4-wire, → 4...20 mA = 0...100 %rh / 0...50 °C

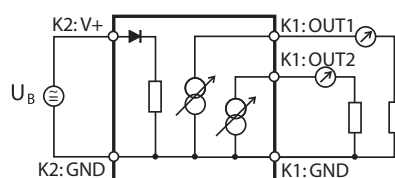


# TRANSMITTERS

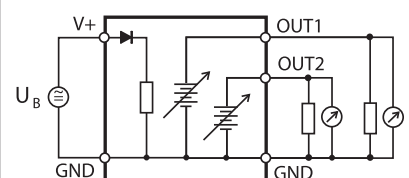
Detailed specifications		
Power supply / Connections	HF42	HF43
Supply voltage	10...28 VDC V min = 10 V + (0.02 x load*)	15...40 VDC / 12...28 VAC
Current consumption	2 x 20 mA	<50 mA
Electrical connections	Screw terminals and M16 cable gland or 1/2" conduit adapter	
Humidity measurement	HF42	HF43
Sensor	ROTRONIC Hygromer® IN-1	
Measurement range	0...100 %rh	
Accuracy at 23 °C	±1.0 %rh	
Repeatability	0.3 %rh	
Long term stability	<1 %rh/year	
Response time	Typically 10 s for 63% of a change from 35 → 80 %rh (1 m/sec air flow at sensor)	
Temperature measurement	HF42	HF43
Sensor	Pt100 1/3 Class B	
Measurement range	-50...100 °C / -58...212 °F	
Accuracy at 23 °C	±0.2 K	
Repeatability	0.05 °C	
Long term stability	<1 °C/year	
Response time	Typically 4 s for 63 % of a change from 23 to 80 °C (1 m/sec air flow at sensor)	
Calculated parameters	HF42	HF43
Psychrometric calculations	Dew point or frost point	
Start-up time	Typically 3.4 s	Typically 1.9 s
Signal type	4...20 mA	0...20 mA, 4...20 mA, 0...1 V, 0...5 V, 0...10 V Definable by user
*Minimum/Maximum load (in Ω)	0/500 Ω	0/500 Ω (current signal), min. 1000 Ω (voltage signal)
Service interface	UART IO D78F0114H (universal asynchronous receiver transmitter)	
Service cable maximum length	5 m (16.4 ft)	
General specifications	HF42	HF43
Optional display	LCD, 1 or 2 decimals, without backlight	LCD, 1 or 2 decimals, with backlight and trend indicators
Probe material	Polycarbonate	
Filter material	Polyethylene	
Housing material / Protection	ABS / IP 65 (except with USB or Ethernet interface)	
Weight	250 g	
CE/EMC compatibility	EMC Directive 2004/108/EC:	EN 61000-6-1: 2001, EN 61000-6-2: 2005 EN 61000-6-3: 2005, EN 61000-6-4: 2001 + A11
Solder	Lead-free (RoHS-compliant)	
Fire resistance	Conforms to UL94-HB	
FDA/GAMP compatibility	Conforms to 21 CFR Part 11 and GAMP4	
Electronics operating range	-40...60 °C / (models with display: -10...60 °C) 0...100 %rh, non-condensing)	
Temperature limits at probe	-50...100 °C	
Maximum air velocity at probe	20 m/s (7,870 ft /min)	



Schematic 2-wire types



Schematic 3-wire current signal



Schematic 3-wire voltage signal

# TRANSMITTERS

## HYGROFLEX5 SERIES

The HygroFlex5 series offers you ultimate performance and flexibility thanks to its interchangeable HygroClip2 probes. The transmitters come in wall and duct mount versions. Many useful functions can be accessed with optional HW4 software.

HF5-Series is available with analog and digital outputs, so compatibility with almost any monitoring or control system is assured. Digital versions may be networked together to form a dedicated environmental monitoring system using HW4 software.

The new generation device not only has a unique calibration and adjustment process, but also allows probes to be interchanged in just a few seconds. This easy interchangeability during operation reduces down-time and service costs to a huge extent. The possibility of using every probe as a simulator with fixed output values is a big advantage for system validation. In the case of networked devices this can even be carried out online from a remote PC workstation.

### Applications

High specification HVAC applications, building management systems, museums, libraries, environmental monitoring systems.

### Highlights

- Unique calibration and adjustment process
- Highest reproducibility
- Wall and duct versions; the wall version also serves for the connection of cable based probes
- Many useful functions can be activated with the optional HW4 software



## HF5 WALL & DUCT VERSIONS

### Applications

HVAC applications, building management systems, museums, libraries, etc.

### Highlights and common features

- Probe interchangeable in just a few seconds
- Measures relative humidity, temperature and dew/frost point
- Calculates all psychrometric values
- Range of application -40...60 °C; -10...60 °C with LCD, 0...100 %rh
- Automatic sensor test & drift compensation \*
- Use as a simulator for system validation \*
- UART service interface
- Precision: dependent on the probe and adjustment profile used
- Can be mounted on a DIN rail (see accessories, page 102)
- Suitable probes: all HygroClip2 (HC2x) probes
- Includes flange for duct mounting

Wall version	HF52-W series	HF53-W series
Type	2- or 2 x 2-wire	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Features	Alarm indicators, display and keypad (optional) Optional USB & RS485 interface	

Duct version	HF520-D series	HF53x-D series
Type	2- or 2 x 2-wire	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Features	Alarm indicators, display and keypad (optional)	

\* Optional, requires HW4 software

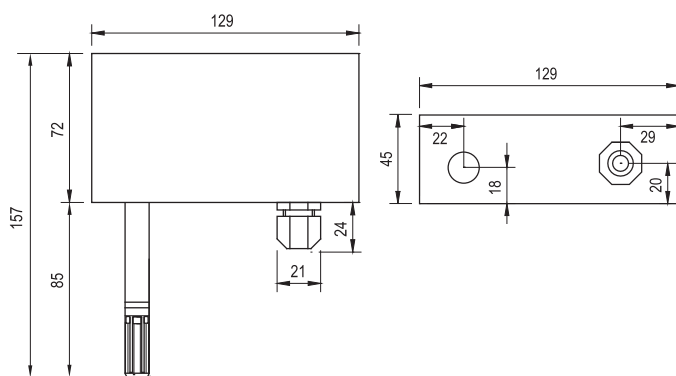
Note: Version without display for vertical mounting



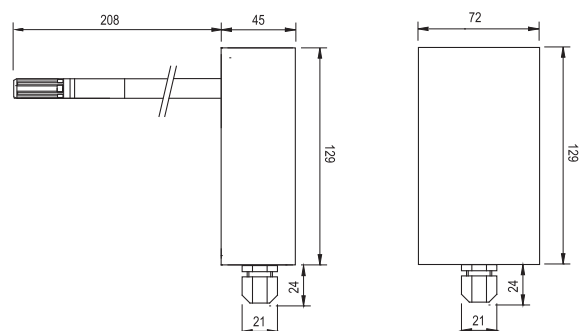
Horizontal mounting



Vertical mounting



HF5x wall version



HF5x duct version (vertical mounting)

# TRANSMITTERS

## Order information (for accessories see pages 99-102)

HF5 transmitters with analog signals

Power supply and output signal type

HF520-								2- or 2 x 2-wire, <10...28 VDC common supply V+, 4...20 mA
								Only display without backlight possible
HF531-								3/4-wire (15...40 VDC / 12...28 VAC, 0...20 mA)
HF532-								3/4-wire (15...40 VDC / 12...28 VAC, 4...20 mA)
HF533-								3/4-wire (5...40 VDC / 5...28 VAC, 0...1 V)
HF534-								3/4-wire (10...40 VDC / 8...28 VAC, 0...5 V)
HF535-								3/4-wire (15...40 VDC / 12...28 VAC, 0...10 V)

Instrument type

	D				X			Duct mount vertical, Ø 15 x 208 mm (standard, without display)
	W							Wall mount, Ø 15 x 85 mm (standard)

Output parameters \*

		B				X	X	Humidity & temperature
		H	X	X		X	X	Only humidity
		T				X	X	Only temperature
		1	X	X				Humidity & dew point
		A						Temperature & dew point
		C						Temperature & wet bulb temperature (Tw) in °C
		D						Temperature & enthalpy (H) in kJ/kg
		E						Temperature & specific humidity (Q) in g/kg
		F						Temperature & absolute humidity (Dv) in g/m <sup>3</sup>
		G						Temperature & mixing ratio (R) in g/kg

Further calculations are possible. Please consult our price list in this regard.

Scaling of the output signals \* (humidity: always 0...100 %rh)

			X	X				No temperature output signal
			1	X				0...50 °C
			2	X				10...40 °C
			3	X				-40...60 °C
			4	X				-30...70 °C
			5	X				-40...85 °C
			6	X				0...100 °F
			7	X				0...200 °F
			8	X				0...300 °F
			9	X				-50...200 °F

Optional display

					D			Display with backlight (only for horizontal mounting)
					X			No display

Electrical connections (analogue signals to terminals) & interfaces

					1			M16 x 1.5 cable gland, only analogue signals, horizontal mounting
					2			M16 x 1.5 cable gland, vertical mounting without display, only analogue signals
					7			M16 x 1.5 & USB & RS485, communication interface, horizontal mounting

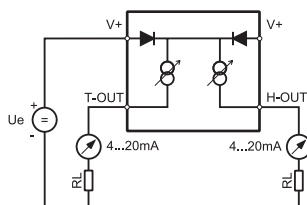
Scaling of the calculated output parameters \*

					X	X		No calculation
					B	X		-50...50
					C	X		-50...100
					D	X		-50...200

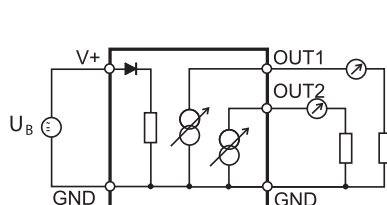
\* Others on request

# TRANSMITTERS

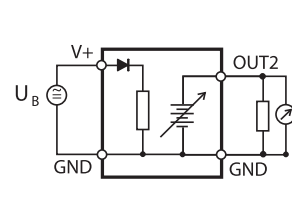
Detailed specifications		
Power supply / Connections	HF52	HF53
Supply voltage	10...28 VDC, 4...20 mA current loop $V_{min} = 10 V + (0.02 \times \text{load}^*)$	15...40 VDC / 12...28 VAC at 500 $\Omega$
Current consumption	2 x 20 mA	<50 mA
Electrical connections	Screw terminals and M16 cable gland or 1/2" conduit adapter	
Humidity measurement	HF52	HF53
Sensor	ROTRONIC Hygromer® IN-1 (depending on the HygroClip2 used)	
Measurement range	0...100 %rh	
Accuracy at 23 °C	± 0.8 %rh (probe dependent)	
Repeatability	0.3 %rh	
Long term stability	<1 %rh/year	
Response time	Typically 10 s for 63 % of a jump 35 → 80 %rh (1 m/sec air flow at sensor)	
Temperature measurement	HF52	HF53
Sensor	Pt100 1/3 Class B (in all HygroClip2 probes)	
Measurement range	-100...200 °C / -148...392 °F	
Accuracy at 23 °C	±0.1 K (probe dependent)	
Repeatability	0.05 °C	
Long term stability	<1 °C/year	
Response time	Typically 4 s for 63 % of a change from 23 to 80 °C (1 m/sec air flow at sensor)	
Calculated parameters	HF52	HF53
Psychrometric calculations	All types available	
Start-up time	Typically 3.4 s	Typically 1.9 s
Signal type (selectable by jumper)	4...20 mA	0...20 mA, 4...20 mA, 0...1 V, 0... 5 V, 0...10 V
Scale limits	-999.99...+9999.99 units, user scaleable	
* Maximum load (in $\Omega$ )	0/500 $\Omega$	0/500 $\Omega$ (current signal), min. 1000 $\Omega$ (voltage signal)
Type of interface	USB or Ethernet TCP/IP (cable connection or wireless) & RS485	
Service interface	UART (universal asynchronous receiver transmitter) on mini USB connector	
Service cable maximum length	5 m (16.4 ft)	
Optional display	LCD, 1 or 2 decimals, without backlight	LCD, 1 or 2 decimals, with backlight and trend indicator
Probe material	Polycarbonate	
Filter material	Polyethylene	
Housing material / Protection	ABS / IP 65 (except for models with USB interface)	
Weight	Approx. 250 g	
CE/EMC compatibility	EMC Directive 2004/108/EC	EN 61000-6-1: 2001, EN 61000-6-2: 2005 EN 61000-6-3: 2005, EN 61000-6-4: 2001 + A11
Solder	Lead free (RoHS-compliant)	
Fire resistance	Conforms to UL94-HB	
FDA/GAMP compatibility	Conforms to FDA 21CFR Part 11 and GAMP4	
Electronics operating range	-40...60 °C / (models with display: -10...60 °C) 0...100 %rh, non-condensing	
Maximum wind velocity at probe	40 m/s (7,870 ft/min)	



Schematic 2-wire types



Schematic 3-wire current signal



Schematic 3-wire voltage signal

# TRANSMITTERS



## HYGROFLEX6 SERIES

HygroFlex6 series provides the highest specification and widest range of configurations for industrial applications. The transmitters come in wall, cable and duct versions. Many useful functions can be activated with the optional HW4 software. The measuring circuits of the HF6x series are galvanically isolated.

This new instrument generation not only boasts a unique calibration and adjustment process, but also allows every transmitter to be used as a simulator with fixed values. This is a big advantage for system validation. In the case of networked transmitters this can even be done online from a PC running ROTRONIC HW4 software.

### Applications

HVAC applications, building management systems, museums, libraries, etc.

### Highlights

- Unique calibration and adjustment process
- Highest reproducibility
- Wall, duct and cable versions
- Many useful functions can be activated with the optional HW4 software

## HF6 WALL/CABLE MOUNT

### Applications

HVAC applications, building management systems, museums, libraries, etc.

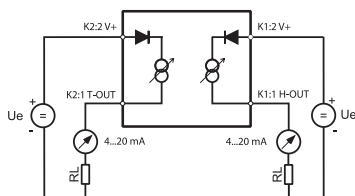
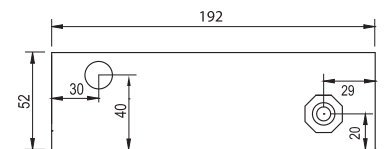
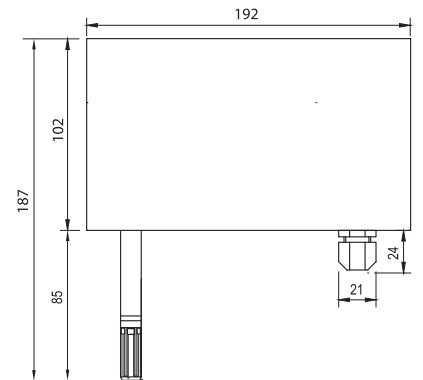
### Highlights and common features

- Measures relative humidity, temperature and dew/frost point
- Electronics operating range -40...60 °C; -10...60 °C with LCD, 0...100 %rh
- Automatic sensor test & drift compensation \*
- Saves up to 2,000 measurement pairs \*
- Use as a simulator for system validation \*
- UART service interface
- Integrated probe
- Adjustment profile «Standard», factory certificate
- Adjusted at 23 °C and 10, 35, 80 %rh
- Accuracy:  $\pm 1$  %rh /  $\pm 0.2$  K
- Mains or low voltage power supply

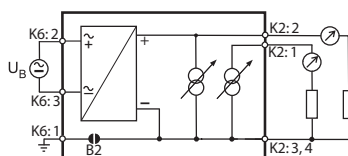
Wall mount	HF624-W series	HF63x-W series
Type	2- or 2 x 2-wire, galvanically isolated	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Features	Alarm indicators, display and keypad (optional)	
Filter	Polyethylene filter	

Cable mount	HF624-C series	HF63x-C series
Type	2- or 2 x 2-wire, galvanically isolated	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Features	Alarm indicators, display and keypad (optional) PPS probe with 2 m cable	
Filter	Polyethylene filter	

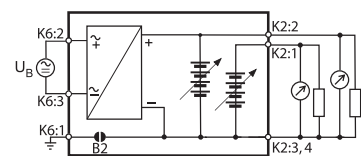
\* Optional, requires HW4 software



Schematic 2-wire types



Schematic 3-wire current signal  
Low voltage



Schematic 3-wire voltage signal  
Low voltage

## HF6 DUCT MOUNT

### Applications

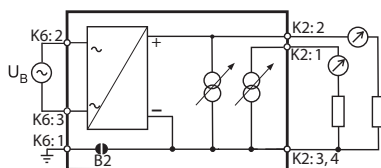
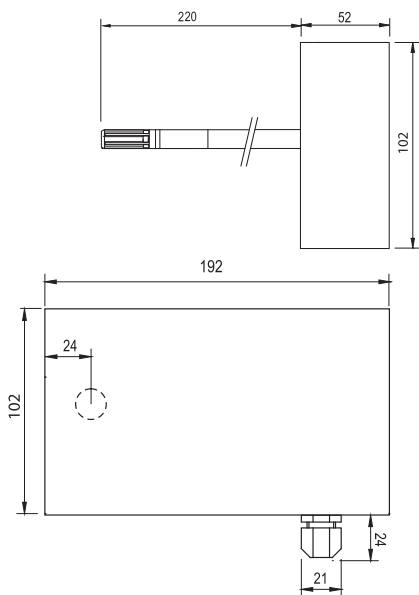
HVAC applications, building management systems etc.

### Highlights and common features

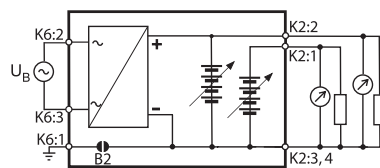
- Measures relative humidity, temperature and dew/frost point
- Range of application -40...60 °C, 0...100 %rh
- Automatic sensor test & drift compensation \*
- Saves up to 2,000 measurement pairs \*
- Use as a simulator for system validation \*
- UART service interface
- Integrated probe
- Adjustment profile «Standard», factory adjustment certificate
- Adjusted at 23 °C and 10, 35, 80 %rh
- Accuracy:  $\pm 1$  %rh /  $\pm 0.2$  K
- Mains or low voltage power supply

Duct version	HF624-D series	HF63xD series
Type	2- or 2 x 2-wire, galvanically isolated	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Features	Alarm indicators, display and keypad (optional)	
Filter	Polyethylene filter	

\* Optional, requires HW4 software



Schematic 3-wire current signal  
Mains voltage power supply



Schematic 3-wire voltage signal  
Mains voltage power supply



## TRANSMITTERS

### Order information (for accessories see pages 99-102)

#### Transmitters with analog output signals

##### Power supply and output signal type

HF624-								2 x 2-wire, <10...28 VDC, galvanically isolated
HF631-								3/4-wire, 15...40 VDC / 12...28 VAC, 0...20 mA
HF632-								3/4-wire, 15...40 VDC / 12...28 VAC, 4...20 mA
HF633-								3/4-wire, 5...40 VDC / 5...28 VAC, 0...1 V
HF634-								3/4-wire, 10...40 VDC / 8...28 VAC, 0...5 V
HF635-								3/4-wire, 15...40 VDC / 12...28 VAC, 0...10 V
HF636-								3/4-wire, 85...265 VAC, 0...20 mA
HF637-								3/4-wire, 85...265 VAC, 4...20 mA
HF638-								3/4-wire, 85...265 VAC, 0...1 V
HF639-								3/4-wire, 85...265 VAC, 0...5 V
HF63A-								3/4-wire, 85...265 VAC, 0...10 V

##### Instrument type

	2							PPS cable probe 2 m, Ø 15 x 100 mm
	D							Duct version, Ø 15 x 220 mm
	W							Wall version, Ø 15 x 85 mm

##### Output parameters

		P					X	X	Humidity and passive Pt100
		B					X	X	Humidity & temperature
		H	X	X			X	X	Only humidity
		T					X	X	Only temperature
		1	X	X					Humidity & dew point
		A							Temperature & dew point

##### Scaling of the output signals (humidity: always 0...100 %rh)

			X	X					No temperature output signal
			1	X					0...50 °C
			2	X					10...40 °C
			3	X					-40...60 °C
			4	X					-30...70 °C
			5	X					-40...85 °C
			6	X					0...100 °F
			7	X					0...200 °F
			9	X					-50...200 °F
		P	P	3					With passive Pt100 1/3 Class B
		P	P	5					With passive Pt100 1/5 Class B
		P	P	A					With passive Pt100 1/10 Class B

##### Optional display

				D				Display (only display without backlight possible for HF624)
				X				No display

##### Probe extension

				S				Standard length (D = 220 mm, W = 85 mm)
				1				Standard length (S) + 150 mm
				2				Standard length (S) + 300 mm
				3				Standard length (S) + 450 mm
				4				Standard length (S) + 600 mm

##### Electrical connections (analog signals to terminals) \*

				1				M16 x 1.5 cable gland (horizontal, type D with display and type W)
				3				x 1/2" conduit adapter (horizontal, type D with display and type W)

##### Standard scaling dew point / frost point

						B	X	-50...50
						C	X	-50...100
						D	X	-50...200

\*Types with mains voltage have 2 M16 cable glands or conduit adapters

## TRANSMITTERS

Detailed specifications		
Power supply / Connections	HF62	HF63
Supply voltage		
	10...28 VDC, 4...20 mA current loop $V_{\min} = 10 \text{ V} + (0.02 \times \text{load}^*)$ * = resistance in $\Omega$	15...40 VDC / 12...28 VAC at 500 $\Omega$ 85...265 VAC
Current consumption	2 x 20 mA, 4...20 mA current loop	<50 mA
Electrical connections	Screw terminals and M16 cable gland or 1/2" conduit adapter	
Humidity measurement	HF62	HF63
Sensor	ROTRONIC Hygromer® IN-1	
Measurement range	0...100 %rh	
Accuracy at 23 °C	±1 %rh	
Repeatability	0.3 %rh	
Long term stability	<1 %rh/year	
Response time	Typically 10 s for 63 % of a change 35 → 80 %rh (1 m/sec air flow at sensor)	
Temperature measurement	HF62	HF63
Sensor	Pt100 1/3 Class B	
Measurement range	-100...150 °C / -148...302 °F	
Accuracy at 23 °C	±0.2 K	
Repeatability	0.05 K	
Long term stability	<1 °C/year	
Response time	Typically 4 s for 63 % of a change from 23 to 80 °C (1 m/sec air flow at sensor)	
Calculated parameters	HF62	HF63
Psychrometric calculations	Dew point or frost point	
Start-up time and refresh rate	HF62	HF63
Start-up time	Typically 3.4 s	Typically 1.9 s
Signal type	4...20 mA	0...20 mA, 4...20 mA / 0...1 V, 0...5 V, 0...10 V
Scale limits	-999.99 ... +9999.99 units, user programmable	
* Maximum load (in $\Omega$ )	0/500 $\Omega$	0/500 $\Omega$ (current signal), min. 1000 $\Omega$ (voltage signal)
Service interface	UART (universal asynchronous receiver transmitter)	
Service cable maximum length	5 m (16.4 ft)	
General specifications	HF62	HF63
Optional display	LCD, 1 or 2 decimals, without backlight	LCD, 1 or 2 decimals, with backlight and trend indicator
Probe material	Polycarbonate	
Filter material	Polyethylene depending on filter, order separately, see pages 99/100	
Housing material / Protection	ABS / IP 65	
Weight	Approx. 300 g	
CE/EMC compatibility	EMC Directive 2004/108/EC: EN 61000-6-1: 2001, EN 61000-6-2: 2005 EN 61000-6-3: 2005, EN 61000-6-4: 2001 + A11	
Solder	Lead free (RoHS compliant)	
Fire resistance	Conforms to UL94-HB	
FDA/GAMP compatibility	Conforms to 21 CFR Part 11 and GAMP4	
Electronics operating range	-40...60 °C / -10...60 °C (models with display); 0...100 %rh, non-condensing	
Temperature limits at probe	-100...150 °C (applies to cable and duct models)	
Maximum air velocity at probe	40 m/s (7,870 ft / min)	

# TRANSMITTERS

## HYGROFLEX7 SERIES

The HygroFlex7 series is equipped with sturdy metal housings and stainless steel probes for harsh industrial conditions. In common with other HygroFlex transmitters, the HF7 provides superb accuracy and reproducibility and comes in wall, cable and duct mount versions. Many useful features can be activated with the optional HW4 software, including in-transmitter logging, output scaling and self-diagnostics.

The HF7 series not only has a unique calibration and adjustment process, but also allows every transmitter to be used as a simulator with fixed values. This is a major advantage in system configuration and validation.

### Applications

Industrial applications, building management systems, underground railways, tunnelling, etc.

### Highlights

- Unique calibration and adjustment process
- Highest reproducibility
- All metal construction of wall, cable and duct versions
- Highly configurable via HW4 software



## HF7 WALL/CABLE VERSION

### Applications

Industrial processes in harsh environments

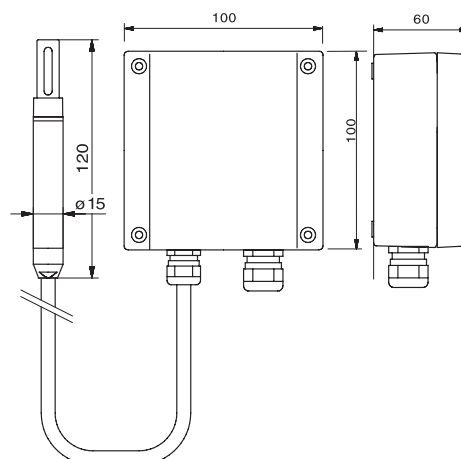
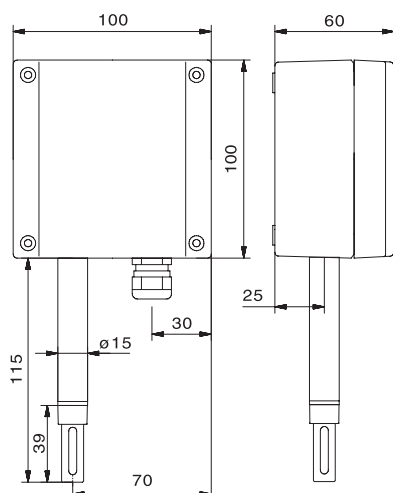
### Highlights and common features

- Measures relative humidity, temperature and dew/frost point
- Application range -100...150 °C / 0...100 %rh (depending on model)
- Automatic sensor test & drift compensation \*
- Integral 2,000 measurement pair logging \*
- Use as a simulator for system validation \*
- UART service interface
- Fixed probe/cable probe
- Adjustment profile «Standard», factory certificate
- All metal construction
- Accuracy:  $\pm 1$  %rh /  $\pm 0.2$  K
- Low voltage power supply

Wall version	HF720-W series	HF73x-W series
Type	2- or 2 x 2-wire, 4...20 mA	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Features	Without display	Without display
Filter carrier	Slotted sleeve (order filter separately)	

Cable version	HF720-C series	HF73x-C series
Type	2- or 2 x 2-wire, 4...20 mA	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Features	Without display	
Filter carrier	Slotted sleeve (order filter separately)	

\* Optional, requires HW4 software



## HF7 DUCT VERSION

### Applications

Industrial processes in harsh environments

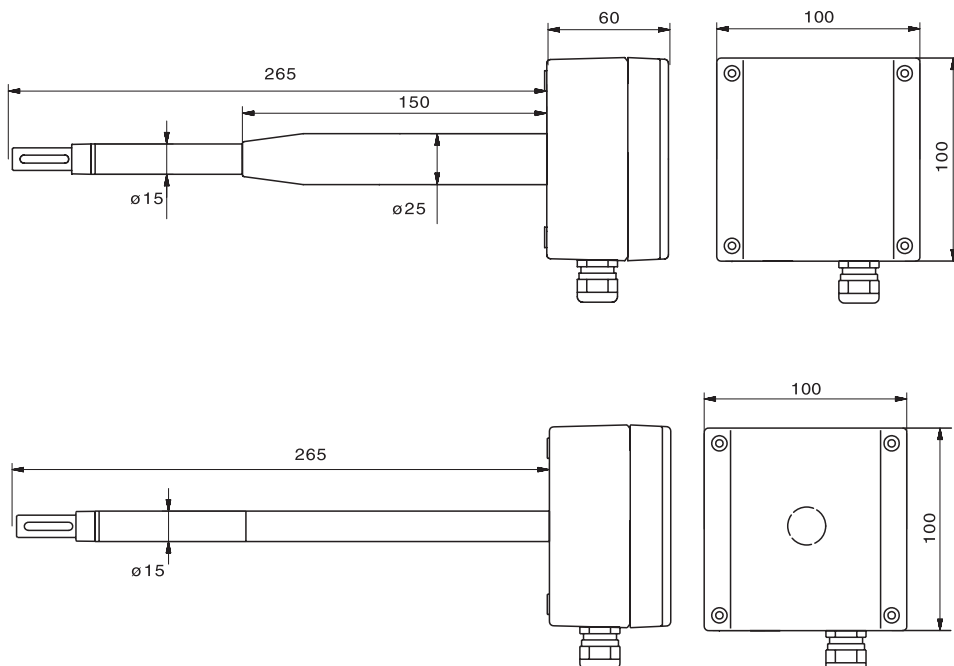
### Highlights and common features

- Measures relative humidity, temperature and dew/frost point
- Application range -100...100 °C, 0...100 %rh
- Automatic sensor test & drift compensation \*
- Integral 2,000 measurement pair logging \*
- Use as a simulator for system validation \*
- UART service interface
- Integrated probe Ø 15 x 200 mm
- Adjustment profile «Standard», factory adjustment certificate
- All metal construction
- Accuracy:  $\pm 1$  %rh /  $\pm 0.2$  K
- Low voltage power supply



Duct version	HF720-D series	HF73x-W series
Type	2- or 2 x 2-wire, 4...20 mA	3/4-wire
Signals	Signals freely scalable*	Signals freely selectable and scalable*
Filter carrier	Slotted sleeve (order filter separately)	

\* Requires HW4 software



# TRANSMITTERS

## Order information (for accessories see pages 99-102)

### Transmitters with analogue output signals

#### Power supply and output signal type

HF720-						2 x 2-wire, <10...28 VDC, 4...20 mA
HF731-						3/4-wire, 15...40 VDC / 12...28 VAC, 0...20 mA
HF732-						3/4-wire, 15...40 VDC / 12...28 VAC, 4...20 mA
HF733-						3/4-wire, 5...40 VDC / 5...28 VAC, 0...1 V
HF734-						3/4-wire, 10...40 VDC / 8...28 VAC, 0...5 V
HF735-						3/4-wire, 15...40 VDC / 12...28 VAC, 0...10 V

#### Instrument type

N						Steel cable probe Ø 15 x 120 mm, 2 m
D						Steel duct probe Ø 15 x 265 mm (standard)
A						Steel duct probe, Ø 25/15 x 265 mm (standard)
W						Steel wall probe Ø 15 x 115 mm (standard)

#### Output parameters

B						Humidity & temperature
H						Only humidity
T						Only temperature
1						Humidity & dew point
A						Temperature & dew point

#### Scaling of the output signals (humidity: always 0...100 %rh)

X	X					No temperature output signal
1	X					0...50 °C
2	X					10...40 °C
3	X					-40...60 °C
4	X					-30...70 °C
5	X					-40...85 °C
6	X					0...100 °F
7	X					0...200 °F
9	X					-50...200 °F

#### Optional display

X						No display
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#### Probe extension (duct and cable probes)

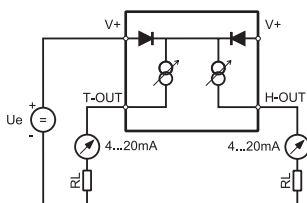
S						Standard length (N = 120 mm, D/A 265 mm, W = 115 mm)
1						Standard length (S) + 150 mm
2						Standard length (S) + 300 mm
3						Standard length (S) + 450 mm
4						Standard length (S) + 600 mm

#### Electrical connections (analogue signals to terminals)

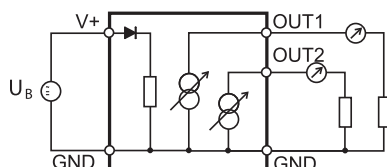
1						M16 x 1.5 cable gland
3						½" conduit adapter

#### Standard scaling dew point / frost point

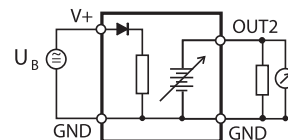
B	X					-50...50
C	X					-50...100
D	X					-50...200



36 Schematic 2-wire types



Schematic 3-wire current signal



Schematic 3-wire voltage signal

## TRANSMITTERS

Detailed specifications		
Power supply / Connections	HF72	HF73
Supply voltage		
	10...28 VDC , 4...20 mA current loop V min = 10 V + (0.02 x load*)	15...40 VDC / 12...28 VAC at 500 Ω 85...265 VAC
Current consumption	2 x 20 mA, 4...20 mA current loop	<50 mA
Electrical connections	Screw terminals and M16 cable gland or 1/2" conduit adapter	
Humidity measurement	HF72	HF73
Sensor	ROTRONIC Hygromer® IN-1	
Measurement range	0...100 %rh	
Accuracy at 23 °C	±1 %rh	
Repeatability	0.3 %rh	
Long term stability	<1 %rh/year	
Response time	Typically 10 s for 63% of a change from 35 → 80 %rh (1 m/sec air flow at sensor)	
Temperature measurement	HF72	HF73
Sensor	Pt100 1/3 Class B	
Measurement range	-100...150 °C / -148...302 °F	
Accuracy at 23 °C	±0.2 K	
Repeatability	0.05 K	
Long term stability	<1 °C/year	
Response time	Typically 4 s for 63% of a jump from 23 to 80 °C (1 m/sec air flow at sensor)	
Calculated parameters	HF72	HF73
Psychrometric calculations	Dew point or frost point	
Start-up time and refresh rate	HF72	HF73
Start-up time	Typically 3.4 s	Typically 1.9 s
Signal type	4...20 mA	0...20 mA, 4...20 mA / 0...1 V, 0...5 V, 0...10 V
Scale limits	-999.99...+9999.99 user scaleable units	
*Maximum load (in Ω)	0/500 Ω	0/500 Ω (current signal), min. 1000 Ω (voltage signal)
Service interface	UART (universal asynchronous receiver transmitter)	
Service cable maximum length	5 m (16.4 ft)	
General specifications	HF72	HF73
Probe material	Stainless steel V2A / 1.4305 / AISI 302	
Filter material	Depending on filter, order separately, see pages 99/100	
Housing material / Protection	IP 65 aluminium diecast	
Weight	Approx. 800 g + 140 g per probe extension unit	
CE/EMC compatibility	EMC Directive 2004/108/EC: EN 61000-6-1: 2001, EN 61000-6-2: 2005 EN 61000-6-3: 2005, EN 61000-6-4: 2001 + A11	
Solder	Lead-free (RoHS-compliant)	
Fire resistance	Incombustible	
FDA/GAMP compatibility	Conforms to FDA 21 CFR Part 11 and GAMP4	
Electronics operating range	-50...100 °C / 0...100 %rh, non-condensing	
Temperature limits at probe	-100...150 °C (applies to cable and duct models)	
Maximum air velocity at probe	40 m/s (7,870 ft/min)	